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Spyder DT21

OPERATING AND MAINTENANCE MANUAL
ELEVATING AERIAL PLATFORM

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REV.01

OPERATING AND MAINTENANCE MANUAL AERIAL PLATFORMS

AUTOMATIC PLATFORM	**Telescopic**
MODEL	**SPYDER DT21**
CONTROL FUNCTION	**Electro-hydraulic**
FACTORY SERIAL NUMBER	**CL4958**
CE CERTIFICATE	**23M/2011**
YEAR OF MANUFACTURE	**2012**
CARRIER VEHICLE	**SELF-PROPELLED**

OPERATING AND MAINTENANCE MANUAL
AERIAL PLATFORMS

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1 INTRODUCTION

A reasonable safety condition during work is essential to prevent serious damages to oneself and to other people.

Therefore, it is essential to follow the WARNINGS and to carefully read this manual presenting accurate and fundamental instructions on routine and periodic maintenance procedures.

1.1 Purpose and limits of this instruction manual

The present instruction manual addresses, in particular, owners of the MOBILE ELEVATING PLATFORM and, in general, all those who are involved in any capacity in the road transportation, use, monitoring and maintenance of this platform, until its final dismantling.

The purpose of this instruction manual is to:

- Describe the use of the platform based on its design;
- Illustrate the principal technical characteristics of the machine;
- Provide the characteristic data of the platform for completion of the "TEST LOG" by the responsible Department;
- Provide instructions for positioning and operating the platform;
- Describe the safety devices;
- Provide ordinary maintenance and repair instructions;
- Form the basis for a support structure for training personnel;
- Provide instructions for completing the inspection register.

The present manual, however, cannot in any way be a substitute for adequate previous experience of personnel on similar machines or experience gained on this machine under the supervision of personnel trained in accordance with the chapters which follow.

In addition to observing the instructions contained in the present instruction manual, the operation of the platform is subject to observance of all safety regulations provided for by the specific legislation of the country in which the machine is used.

1.2 Where and how to store the instruction manual

The instruction manual is to be considered as a part of the machine and must, therefore, always be stored for consultation or reference on board of the platform in the basket provided, in the vehicle cab or, in any event, in a protected and dry place away from direct sunlight.

In the event that the instruction manual is accidentally damaged, request another copy from **CELA SRL**.

1.3 Modifications and integrations to the instruction manual

The manual reflects the state of technology at the time of marketing the platform; therefore, it cannot be considered to be inadequate or lacking due to subsequent modifications or integrations being introduced due to new laws, updated harmonised standards and/or newly acquired know-how.

CELA SRL reserves the right to update its production and relative instruction manuals on the basis of developments in technology, newly acquired know-how and/or changes in laws, without being obliged to act on the machines previously sold and on their manuals.

Nevertheless, **CELA SRL** will be entitled to modify and/or integrate the instruction and maintenance manuals of the previously sold products if it deems this appropriate for justified reasons.

In this case, updated or amended documents will be transmitted to the original owners of the machines. These documents must be considered as an integral part of the instruction manual and carefully stored together with the present manual or transmitted to the new owners in the event that platform has been sold.

1.4 Exclusion of liability

As manufacturer of the platform, **CELA SRL** declines any liability arising from damage due to:

- Improper use of the platform;
- Operation of the platform by untrained personnel;
- Operation in contravention of the safety regulations specified by European Community and/or national regulations in force;
- Poor ground features;
- Total or partial failure to observe the provisions of the present manual;
- Failure to observe the maintenance instructions provided in the present manual;
- Modifications or repairs not authorised by the manufacturer;
- Installation of non-original spare parts other than those indicated in the "SPARE PARTS MANUAL";
- Exceptional events.

WARNING: READ AND KEEP THIS MANUAL!

• Study operating instructions.
• The operator shall be trained on the use of this machine, he should know its lifting capacity and utilisation limits, he should know and carefully follow safety standards.
• The instruction manual is a fundamental element for the proper use and the maintenance of this equipment.

For repair and overhaul assistance please call CELA organisation which relies on highly skilled workers and on suitable equipment.

The TECHNICAL ASSISTANCE SERVICE is at your disposal for explanations, advice and for interventions with its own workers, if necessary.

Guarantee of good functioning and service life is ensured by the use of original spare parts only, for this purpose refer to “CATALOGUE OF SPARE PARTS”.

At the end of this manual there are some sheets on which every intervention, modernisation and change is to be recorded. By doing this, you and we will always have an updated statistical memorandum of the machine.

THIS MANUAL INSTRUCTIONS DO NOT TAKE THE PLACE OF BUT COMPLETE THE OBLIGATIONS ON SAFETY AND ACCIDENT LEGISLATION IN FORCE

2 NOTES FOR PLATFORM UTIILIZATION

IMPORTANT:

TO EXCEED THE LOAD VALUE INDICATED BY THE WORKING AREA CAN LEAD TO STRUCTURAL DAMAGES AND THE OVERTURNING OF THE AERIAL WORKING PLATFORM

3 PRELIMINARY INFORMATION

3.1 Documentation updates

3.1.1 Validity

This manual reflects the state of the art at the time of the machine's release into the market.
It is an integral part of the machine and is in compliance with all regulations, laws and directives binding at that time; this manual cannot be considered inadequate if subsequently updated because of more recent experiences.
Changes, adaptations, etc. (if any) made on machines sold afterwards do not oblige the manufacturer to modify the equipment sold before nor to consider it and the relevant manual insufficient and unsuited.
Any possible supplement to this manual that the manufacturer judges important to send to the user should be kept together with the manual to which is an integral part.

3.2 Reference Standards

CELA platforms are manufactured in compliance with the following Directives.

DIRECTIVES:

- 2006/42/EC (called Machinery Directive).
- 2006/95/EC (low-voltage electrical equipment)
- 2004/108/EC (electromagnetic compatibility).
- 2000/14/EC (acoustic emission)

3.3 Applied harmonised standards

- EN 12100-1:2005 Safety of the equipment (basic procedure);
- EN 12100-2:2005 Safety of the equipment (technical principles);
- EN 13857:2009 Safety distances of the upper limbs;
- EN ISO 13850:2007 Emergency stop devices;
- EN 349:2008 Distances of pressing of parts of the body;
- IEC/EN 60204-1 Electrical equipment of the machines;
- DIN 15018 sheet 3 Calculations of steel structures;
- PD 303/56 General regulations for hygiene on work
- Leg. Decree 81/2008 Regulations for prevention of accidents in the work place;
- EN 954-1:1998 Safety related parts of control system
- EN 13849-2:2005 Safety related parts of control system
- EN 280:2009 Aerial work platforms
- EN 12999:2002;A2:2009 Cranes safety- Loaders Cranes
- EN 982:1997 Safety requirements for fluid systems and their components

3.4 Number of estimated loading cycles according to EN 280

100.000 (e.g. 10 Years, 50 weeks per year, 40 hours per week, 5 cycles per hour)

Within this number of cycles a complete overhaul and a deep structural inspection of the machine should be carried out.

If working conditions are particularly heavy (e.g. always maximum load, great straddle, etc.) this inspection must be anticipated (ask the manufacturer for an inspection of the machine).

Every 1500 - 4500 hours, we suggest a complete checking procedure by the manufacturer

3.5 Cycles reduction for machines with authorised increased load capacity

66.000 (e.g. 6 Years, 48 weeks per year, 40 hours per week, 5 cycles per hour)
Within this number of cycles a complete overhaul and a deep structural inspection of the machine should be carried out.

If working conditions are particularly heavy (e.g. always maximum load, great straddle, etc.) this inspection must be sped up (ask the manufacturer for an inspection of the machine).

Every 1000 - 3000 hours, we suggest a complete checking procedure by the manufacturer

See "MAINTENANCE PROGRAMME"

3.6 Use and storage conditions

CELA platforms are manufactured to function under these environmental conditions:

- working temperature min. -10°C max. +40°C.
- humidity 30% - 95% without condensation
- storage temperature: -30°C max. +60°C.

When the machine is to be used under environmental conditions other than the standard ones, special devices are available on request.

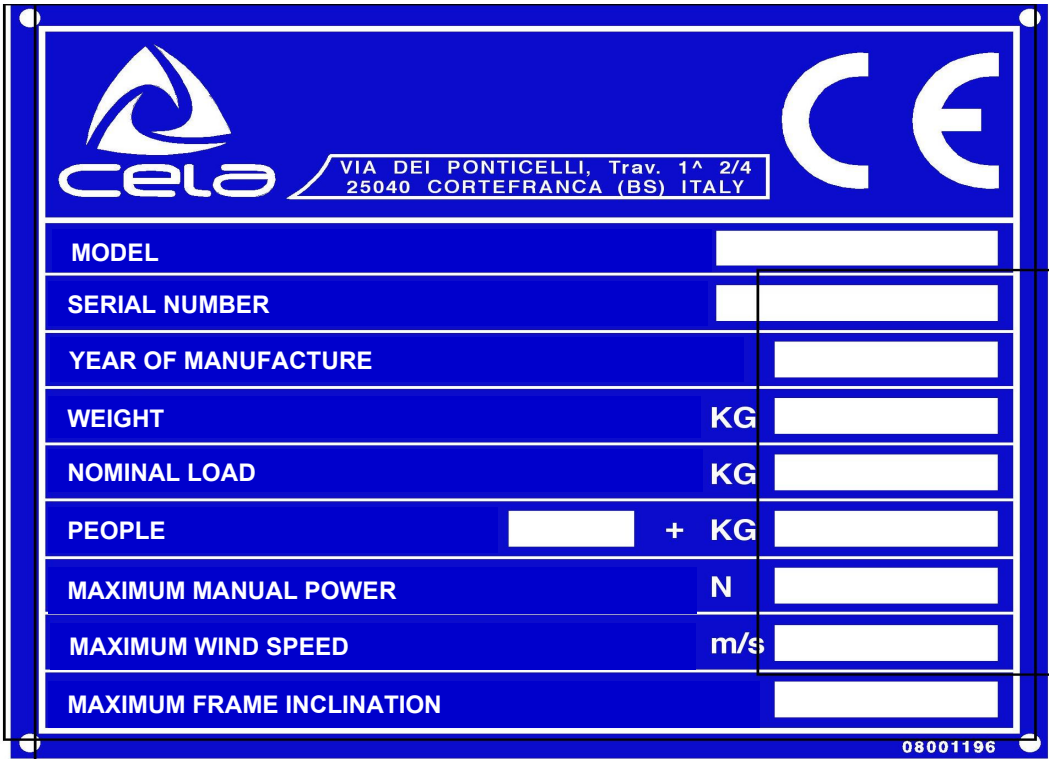
IMPORTANT: never use the machine under unfavourable air conditions (i.e.: many working hours in a marine area).

If the oil temperature tends to exceed 80° C, a heat exchanger must be installed.

3.7 Identification data

All the information for the identification of the machine is carved on a plate on the turning turret.

IMPORTANT NOTE For every request, specify type and serial number.



3.8 Static test

The machine HAS SUCCESSFULLY OVERCOME THE STATIC TEST carried out according to EN280:2001/A2:2009, in two working conditions, with outriggers open and outriggers closed, and according to the following methods:

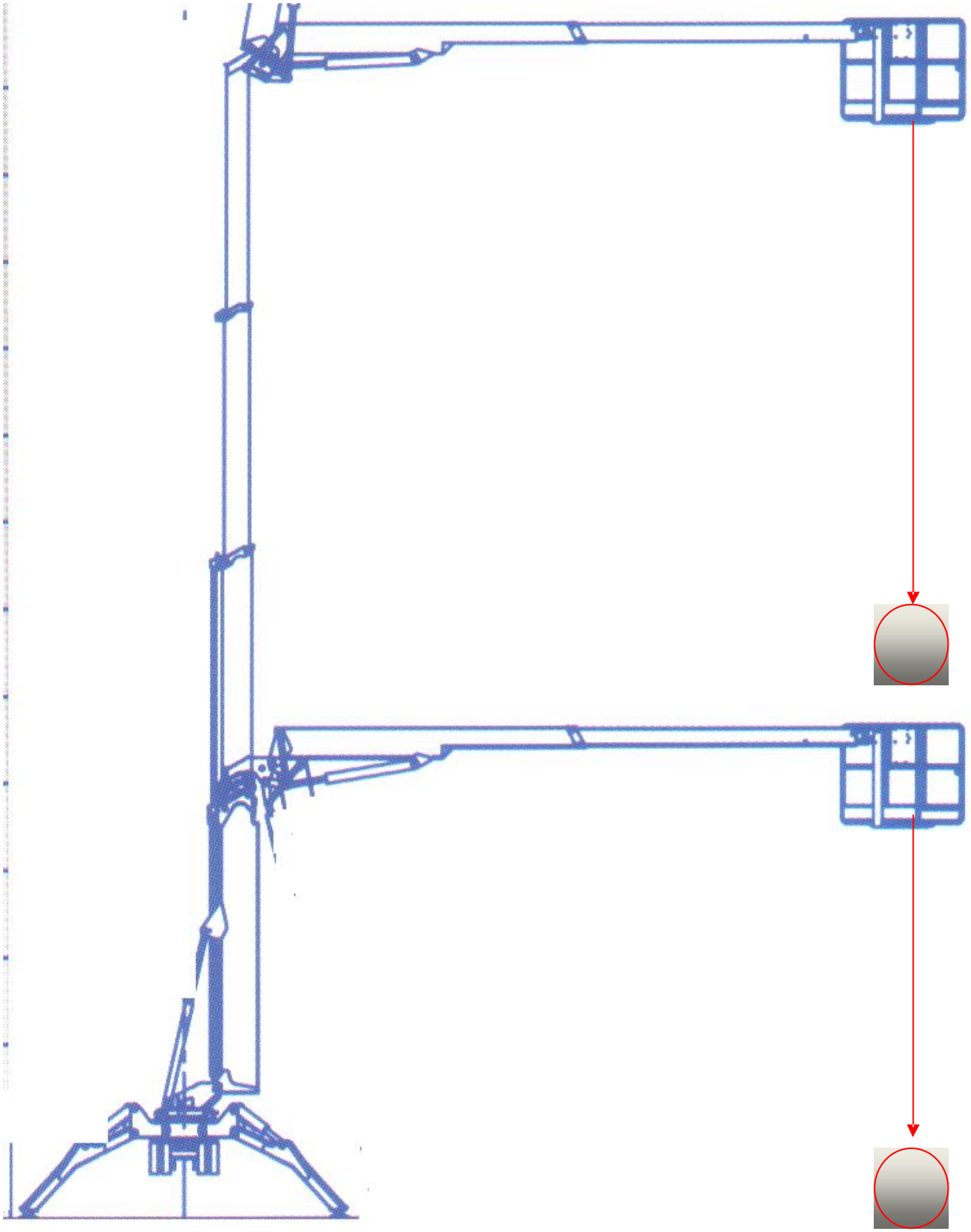
1) working conditions with outriggers open

- Machine stabilised with outriggers open in wide position
- Machine stabilised at max allowed horizontal inclination (+/-1)
- Telescopic boom totally raised and jib parallel to the ground
- Jib totally extended and basket turned at +/- 45°
- Test load equal to nominal load to which increases indicated by EN280 are added (wind, operators' pushes and dynamic effects)
- Slow starting of the machine rotation on the whole working area (at least 360°), always keeping under control the position of the outriggers opposite the boom and verifying the residue load.

2) working conditions with outriggers closed

- Machine stabilised with outriggers open in narrow position
- Machine stabilised at max allowed horizontal inclination (+/-1)
- Telescopic boom totally raised and jib parallel to the ground
- Jib totally retracted and basket turned at +/- 45°
- Test load equal to nominal load to which increases indicated by EN280 are added (wind, operators' pushes and dynamic effects). In this case the wind effects are minor.
- Slow starting of the machine rotation on the whole working area (at least 360°), always keeping under control the position of the outriggers opposite the boom and verifying the residue load.

The test is considered overcome only if in the whole working area two outriggers never lift at the same time (so only one of the outriggers can be lifted, according to the position of the boom).



4 DIMENSIONS AND PERFORMANCES

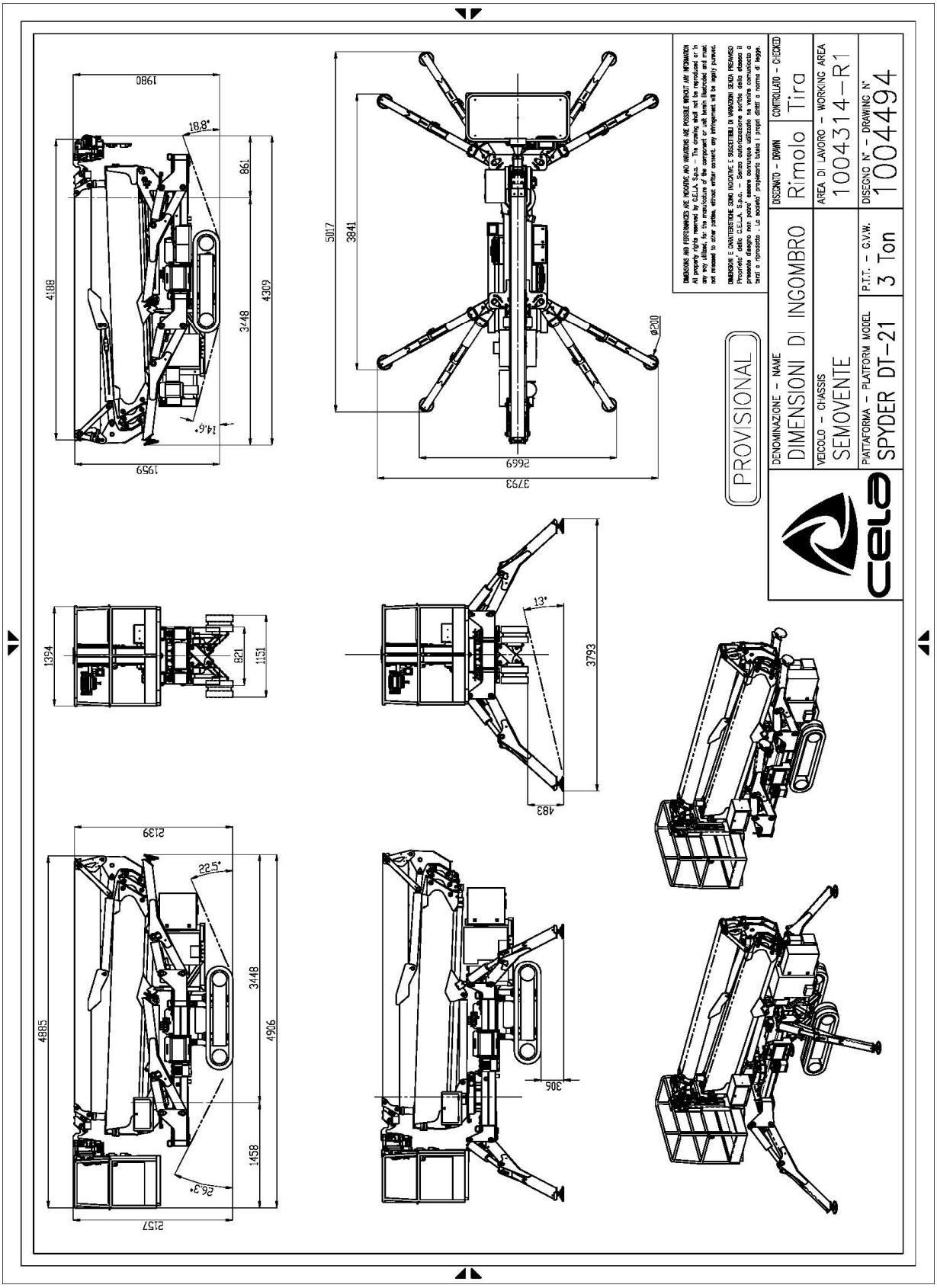
4.1 Vehicle in stationary position

Height with track closed	m	1.980
Height with track open	m	2.157
Length with basket	m	4.309
Length without basket	m	4.906
Width (tracks)	m	820/1.150
Total weight on the ground	kg	3000

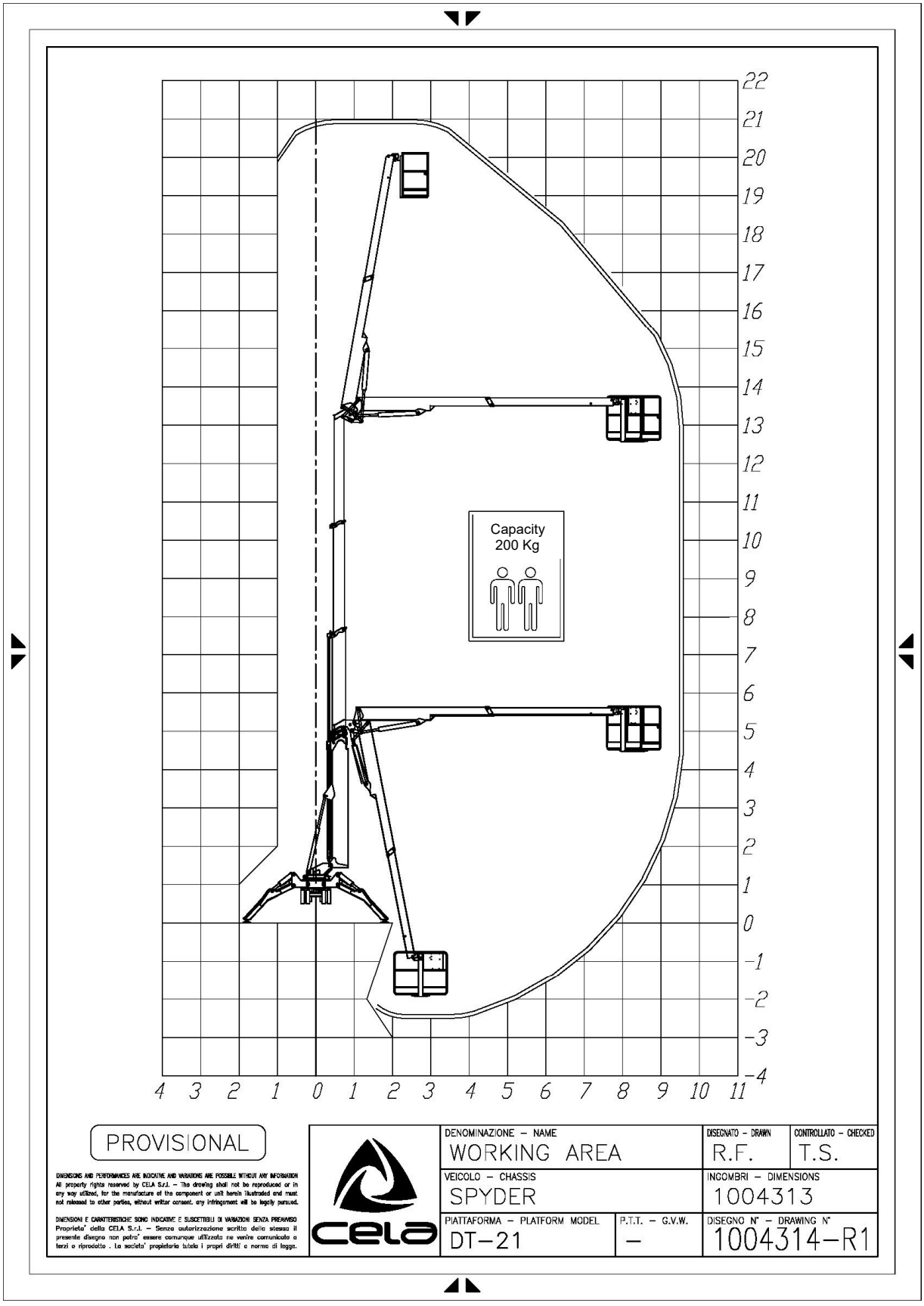
4.2 Vehicle in operating position

Max. height Walking floor operational platform	m	19
Operational platform 1st max. working range	m	9,5
Max. capacity in 1st range basket	kg	200
Max. specific pressure transmitted to the ground by the outrigger feet	daN/cm²	8
Hydraulic circuit pressure	bar	200
1st boom complete ascent time	sec	60
Jib ascent time	sec	95
360° rotation time	sec	160
Extension complete extraction time	sec	70
Extension complete retraction time	sec	35
Jib descent time	sec	90
1st boom complete descent time	sec	50

5 DIMENSIONAL DRAWING

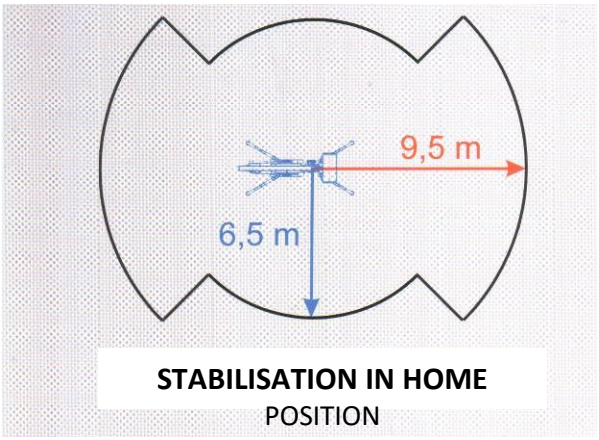


6 WORK AREA DIAGRAM

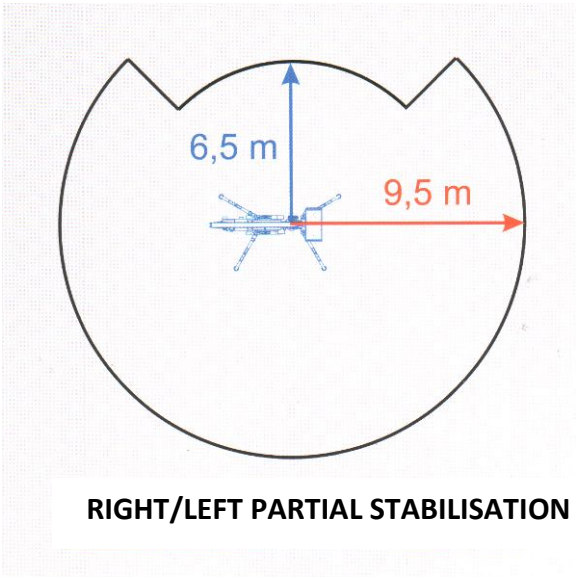


7 OPERATIONAL CONFIGURATIONS

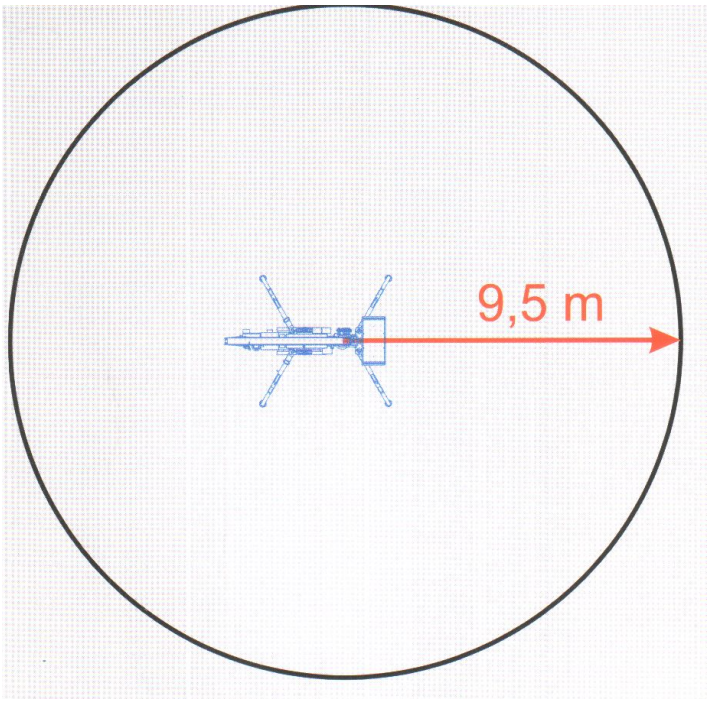
Fixed capacity 200 kg.



STABILISATION IN HOME POSITION

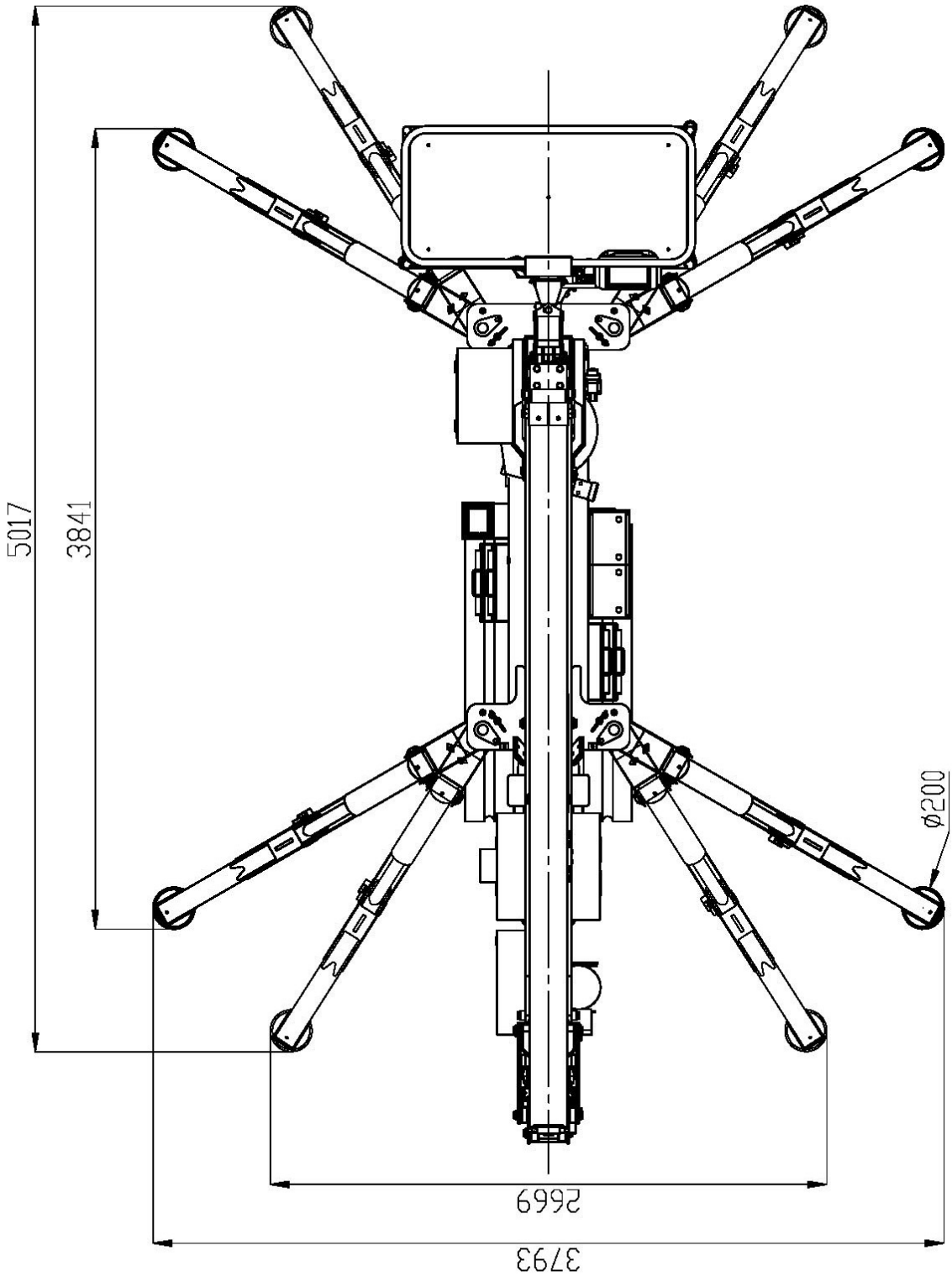


RIGHT/LEFT PARTIAL STABILISATION



TOTAL STABILISATION

8 EQUIPMENT POSITIONING PROSPECTUS



9 TECHNICAL CHARACTERISTICS

CARRIER VEHICLE	CELA SELF-PROPELLED	
SERVICE PUMP	HATZ PLP 20.8+ PLP 10.3,15	
MANUAL EMERGENCY PUMP	Displacement 20 cm3/rev	
380V. a.c. ELECTRIC SERVICE PUMP	Motor pump Flow rate	HP cm³/rev
220V. a.c. ELECTRIC SERVICE PUMP	Motor pump Flow rate	HP 3 cm³/rev
CONTROLS	Electro-hydraulic	
MAX. OPERATING PRESSURE	220 bar	
ELECTRICAL SYSTEM	24v Powered by batteries of the self-propelled carrier	
PHONOMETRIC VALUES	LWA LPA Leq	

10 SUPPLIES

PART TO BE SUPPLIED	QUANTITY	BRAND
Hydraulic oil tank	Kg. 100	SHELL TELLUS OIL 32
Rotation gear unit	10.1.1.1.1.1.1.1 Kg. 0.2	MOBIL HD 90
Parts lubricated with grease	As needed	MOBIL GREASE or MOBILUX EP2
Lubrication of booms on sliding block surfaces.	As needed	MASTER PLATE

11 LUBRICATION TABLE

GREASE, LUBRICANTS, OIL AND OTHER

CODE	DESCRIPTION	NOTES	USE
47200077	NILS WHITE STAR EP	latta 18 Kg	ingrassaggio interno bracci e traverse
47200065	MASTER PLATE CNC 2710199 (/2)	latta 18Kg	ingrassaggio superiore e inferiore bracci
47200070	MASTER PLATE CNC 2710200 (/2)	latta 1 Kg	ingrassaggio superiore e inferiore bracci
47200040	REOLUBE 365 RHE (CNC 27101999)	latta 18Kg.	ingrassaggio boccole alveolari
46100015	OLIO 80W90		lubrificazione cambio
46100010	OLIO MOTORE DIESEL 30 (RIMULA)		olio motore Diesel
46100025	ANTIGELO IP ECOBLU 100		antigelo
47200080	MOLYKOTE D-321R SPRAY	bomboletta 400ml	ingrassaggio secco fasce scorrimento
47200085	NILS KETTOLUB 12 SPRAY	bomboletta 400ml	lubrificazione e protezione catene
47200090	WURTH HSW 100 SPRAY (FUORI PRODUZIONE)	bomboletta 300ml	lubrificazione e protezione catene
46100030	OLIO IDRAULICO SHELL TELLUS T32	cisternetta	impianto idraulico standard
46100035	OLIO IDRAULICO SHELL TELLUS T22	cisternetta	impianto idraulico climi freddi
47200105	WURTH HHS 2000	bomboletta 500ml	tubazioni e cavi in catenaria
47200107	WURTH HHS GREASE CON PTFE	bomboletta 400ml	Pattini Scale,Movimento Scale,Cerniere,Giunti
47200075	NILS GR 7000	latta 18 Kg	NON PIU IN USO

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12 COMPARATIVE LUBRICATION TABLE

BRAND	MODEL
Shell	Tellus 32
Shell	Hydraulic 32
Acca	Idroil HD 600/32
Agip	Oso 32
Api	Cis 32
Barelli	Tia/ro 32
Bellini	Sprinter ADPV 32
Bergoline	Parater C 32
BP	Energol HLP-HM 32
BP	Energol HLP-D 32
Castrol	Hyspin AWS 32
Comlube	Oleon HM 32
Ergoline	Arundo 32
Ergoline	Hydraulic KNT 32
Esso	Nuto H 32
Eural	Hyder 32
Fina	Fina Hydran TS 32
FL Italia	Hidrobak 32
Fox Petroli	YE 32
Hangsterfer's	Antiwear 32
Klüber	Lamora 32
Levenit	Hydrolube 30/32
Mobil	Mobil DTE 24
Mobil	Mobil DTE EXCEL 32
Oleoblitz	Idraulic fluid 32
Oleotecna	Movo H32
Orlube	Laser 32
Orlube	Laser HVI 32
Q8	Q8 Haydn 32
Reinach	Olio EHT 13
Roloil	LI 32
Sinclair	Commander oil AW 32
Sinol	Sinydro 32
Speedoil	Hydraulic Iso 32
Stilmoil	Abacus 32
Syneco	Pacemaker 32
Tamoil	Hydraulic oil 32
Tamoil	Tamhydro oil 32

BRAND	MODEL
Tennex	Ecton 32
Tennex	Ecton X 32
Texaco	Rando HD 32
Total	Azolla ZS 32
Ultralube	Oleodin 32
Ultralube	Olneo HLP 32
Vabriol	Gamma X 32
Valvoline	Hydraulic HLP 32
Vanguard	Hydraulic 32
Viscol	Signal CO 32
Wladoil	W. Engine HY SY 32 B
Wynn's oil	Wynoil H 32
Wynn's oil	Pol 32 N
Zeller+Gmelin	Divinol HLP 32

13 OPERATING INSTRUCTIONS SAFETY STANDARDS

NOTE: For the use of platform the operators have to:

- be in perfect psycho-physical conditions
- be instructed to the use of platform
- have read and understood all the instructions and information in this manual and on the machine

IMPORTANT WARNINGS

ALL THE PROVISIONS ON USE AND MAINTENANCE CONTAINED IN THIS MANUAL ARE UNBREAKABLE, THEREFORE WE RECOMMEND TO CAREFULLY AND FREQUENTLY READ THEM AND TO ALWAYS PUT THEM INTO PRACTICE.

WITHOUT PREJUDICE TO CELA SRL'S NON-LIABILITY EXCEPT THE GRANTED WARRANTY, AFTER INSPECTION AND DELIVERY OF THE MACHINE, CELA SRL RECOMMENDS TO CAREFULLY AND REGULARLY FOLLOW ALL THE PROVISIONS CONTAINED IN THIS MANUAL AND TO CORRECTLY PUT INTO PRACTICE THE REGULATIONS IN FORCE. THE NON-ENFORCEMENT OF THAT INDICATED ABOVE IS ANOTHER REASON OF NON-LIABILITY FOR DAMAGES TO THE MACHINE, THINGS, PERSONS AND OTHERS.

IN THE ABOVE INDICATED CASES THE 12-MONTHS WARRANTY IS NOT EFFECTIVE.
TECHNICAL DATA CONTAINED IN THIS MANUAL CAN UNDERGO CHANGES DUE TO THE DIFFERENT TYPES OF TRUCKS, TO TECHNICAL CHANGES, OR TO THE ENTERING INTO FORCE OF MODIFIED REGULATIONS.
THEREFORE, THE USER SHOULD CAREFULLY STUDY THE ABOVE MENTIONED TECHNICAL DATA.
FOR SPECIAL WORKING CONDITIONS NOT INDICATED IN THIS DOCUMENT, ASK FOR THE MANUFACTURER'S WRITTEN APPROVAL.

FOR SAFETY PURPOSES, IT IS ABSOLUTELY ESSENTIAL TO ALWAYS CARRY OUT THE FOLLOWING OPERATIONS:

a. Carefully follow the user instructions (in chronological order).
b. It is absolutely forbidden to use the equipment with weights exceeding the ones indicated on the machine and in this document and in a way different from that indicated on the machine and in this document.
c. Read the content of all the plates put on the equipment and in the maintenance and use manuals of the components of the same.
d. The machine must be operated by at least two persons, one of them being a skilled worker perfectly knowing the use of the machine and who has to stay on the ground. If there isn't a control on the ground, the drives board on the ground have to be locked/forbidden so other people can't have the access.
e. Before installing this equipment, stabilise it with the help of stabilisers equipped with anchor plates; these stabilisers must necessarily rest on a solid ground. If necessary, use boards to arrange the thrusts on a big enough area with regard to the characteristics of the ground. These boards must be of a material suitable to the stabilisers' thrust, they must be thick enough and tested before use without workers on the machine which has to be at the maximum straddle, with the basket near the ground, and with a weight equal to the maximum allowed loading capacity.
f. In the event of sloping ground, stabilise the aerial platform paying particular attention to the following:
   The maximum deviation of the thrust bearing plane from the horizontal line must not exceed 1°.

- Make sure that the platform never rests on other structures, whether fixed or moving.
- Keep in mind that operations to reach the work point must be carried out by the operator on the platform. As a matter of fact, GROUND OPERATION IS ONLY ALLOWED IN CASE OF EMERGENCY since, from the ground, it is impossible to correctly estimate any interference, obstacle, real dynamic of basket movements, etc.
- Make sure there are no electric lines.
- If the platform is used on busy roads, it is compulsory to signal the presence of such platform by both the appropriate ground signals and the flashing light and to follow traffic regulations in force. When entering the basket, safety belts must be immediately fastened to the special connections and entry protections must be closed; make sure they are properly locked.
- When envisioned in the Safety Operational Plan or by the Risks Analysis, all workers should wear the safety helmet, in accordance with the law. Do not drop any material from the basket or from a height. For special works (pruning, painting, etc.) provide for necessary protections and measures to safeguard persons, surrounding things and the machine itself. It is forbidden to use working tools which are not in compliance with regulations in force.
- It is absolutely forbidden to insert tools, hands, fingers, etc. within the holes on the telescopic arms and in places where there are dangers arising from interference, cutting and crushing, etc.

13.1 While moving

- Check if the chosen road is suitable to the equipment dimensions.
- If travelling on a public road ask for prior permission from competent authorities and in any case to block traffic in order to eliminate any kind of danger.
- Check that the cross slope of the chosen route is not such as to risk the vehicle overturning.

13.2 Before going up

- Carry out daily inspections as indicated in the maintenance chapter.
- Use the protective helmets and the approved accident-prevention dress.
- Check to make sure that the automatic levelling of the basket is perfectly reset (basket horizontal) and pressurised
- Fasten safety belts.
- Close entry protections.
- Once again, make sure that all controls and safety devices are in working order and fix the working material properly, so that it cannot move or create dangers.
- Make sure that all operators are aware of use and maintenance provisions.

13.3 When at height

- While moving, mind to arm travels; during rotation, lifting, lowering, march, etc., mind to any possible obstacle.
- Keep a minimum distance of at least 5 m (five metres) from electric lines and pylons and follow current regulations on minimum distances.
- Avoid any collision of basket or arms with the stabilisers or with other parts of the machine, with fixed (buildings, etc.) or moving (vehicles, cranes, etc.) obstacles.
- Do not stand under the working area of the equipment, in particular under arms and basket.
- Use the equipment for vertical movements only, never perform any throwing or thrusting towards any direction.
- Keep your hands far from joints or openings.

13.4 At the end of work

Make sure that the structure and the operator-holding basket are in non-working position and that stabilisers have completely come back.

IMPORTANT

KEEP IN MIND THAT, ACCORDING TO ATTACHMENT VII LEG. DECREE 81/08, VARYING INCLINATION AERIAL LADDERS, INVOLUTE WAGON BRIDGES AND SUSPENSION WINCH BRIDGES MUST BE TESTED AND INSPECTED EVERY YEAR, BY THE ORGANS IN CHARGE OF SECURITY (ISPESL-USL-ASL-ARPA) IN ORDER TO DETERMINE THEIR EFFICIENCY WITH REGARD TO SAFETY.

14 SAFETY STANDARDS

FOR SAFETY PURPOSES, IT IS ESSENTIAL TO NEVER USE THE MACHINE UNDER THE FOLLOWING CONDITIONS:

- With weights and in ways other than the ones for which it has been designed, tested and delivered (which are indicated on the machine itself);
- On soft, unstable or obstructed ground;
- Never use the machine during automatic basket levelling not reset (basket horizontal) and not pressurised
- With wind exceeding 12.5 m/s;
- Near electric lines (the machine is not insulated);
- Without the entry protection bar of the basket;
- With material or objects hanging from the machine arms or sides (in any way outside the basket);
- Using ladders or other similar devices within the basket;
- Performing any throwing or horizontal/inclined thrusting exceeding 20daN per person or 40daN every 2 persons (load vertically only);
- In areas presenting explosion hazard;
- If there are cracks, flaws, hydraulic leaks, cut wires or any other anomaly in functioning;
- At a temperature lower than -10°;
- As a lifting device for materials;
- With safety devices out of order or not inspected;
- Under dangerous weather conditions (poor visibility, thunderstorms , lightning, etc.);
- With posters, banners, etc. hanging from the basket, arms or other parts of the machine.

IMPORTANT

It is absolutely forbidden to insert tools, hands, fingers, etc. into the holes on telescopic arms, cable pulleys and on joints.

DURING WASHING WITH HIGH-PRESSURE JET DO NOT AIM AT BOXES, CABINETS AND ELECTRIC COMPONENTS. DO NOT WASH WITH DETERGENTS, CHEMICALS, PETROL OR SIMILAR SUBSTANCES, WHICH CAN DAMAGE RUBBER PARTS, PLASTIC COMPONENTS AND FILMS.

ATTENTION!!! PAUSES/WORKING BREAK

Never leave the machine without care if the motor has not been turned off, the control board on ground blocked and the cabin compartment of the truck locked.

We advise you, in case of pauses or working break, to carry the platform on the ground (in transport position).

It is strictly forbidden to leave the machine open for too long without carrying out daily checks on the tightness of the different components (valves, outriggers, levelling, etc.)

ATTENTION!!! WORKING NEAR ELECTRIC LINES

Operate with aerial platform near electric lines is always very dangerous because of the mobility of the machine structure.

We remind you that there can be electric discharges even without contact between the two parts, but it can be sufficient that they near more than the minimum security distance (see the set of rules in force in the country of destination of the machine).

The set of rules in Italy (PD 164 art.11), for example, prescribes a minimum distance of 5 m. This value is to be considered the lowest distance during the different manoeuvres with the platform. In any case we advise you previously to require the interruption of the current supply for the period of working with the platform.

14.1 Residual risks and appropriate precautions

- *Abrupt working of control levers: jerks and swinging hazard.*

  GENTLY MOVE THE CONTROLS TO REGULATE SPEED AND ACCELERATION

- *Overload and horizontal/inclined thrusting: tilting hazard.*

  DO NOT EXCEED WORKING LOADING CAPACITY

- *Ground sinking: tilting hazard.*

  CHECK GROUND PRESSURE AND GROUND SOLIDITY
  (see ground pressure under stabilisers) (mind to winter thawing).

- *Wind gusts: tilting hazard.*

  DO NOT WORK UNDER DANGEROUS WEATHER CONDITIONS

- *Collision against an obstacle, whether on the ground or in the air: collision or tipping hazard.*

  BE EXTREMELY CAREFUL DURING OPERATION

- *Collision against a tension line: electric shock hazard.*

  KEEP AT A SAFE DISTANCE FROM ELECTRIC LINES

- *Work on platforms and sidewalks, etc.: tilting hazard.*

  PAY ATTENTION TO THE GROUND AND TO THE POSITION OF THE STABILISERS

- *Work in an explosive environment: explosion hazard.*

  PREVIOUSLY OBTAIN INFORMATION ABOUT EXPLOSION OR FIRE HAZARD IN THE PLACE OF INTERVENTION

- *Persons near the working area of the machine: crushing hazard.*

  KEEP WORKING AREA CLEAR AND FORBID ADMITTANCE TO UNAUTHORISED WORKERS. DURING WORKING HOURS, CHECK IF WORKERS RESPECT THIS PROHIBITION

- *Thermal engine + exhaust: burning and poisoning hazard.*

  DO NOT STAND NEAR EXHAUSTS. WHEN WORKING INDOORS, DIRECT EXHAUSTS OUTSIDE.

- *Mind to overloads from top or caused by contact with other structures.*

  BEFORE STARTING ANY WORK, PAY ATTENTION TO WORKING AREA CONDITIONS, TO THE GROUND, TO OBSTACLES, TO LUMINOSITY AND NOISE AND TO TRAINING OF WORKERS IN CHARGE OF OPERATING THE MACHINE.

- *Toxic materials*

  IN THE EQUIPMENT THERE ARE TOXIC SUBSTANCES AND MATERIALS (POISONOUS WHEN SWALLOWED OR INHALED (QUICK SILVER, OILS, PLASTICS ,ETC.) MAINTENANCE AND REPAIR OPERATIONS MUST BE CARRIED OUT BY TRAINED AND SKILLED WORKERS ONLY.

NB. IF THE MACHINE IS EQUIPPED WITH HOSES FOR EXHAUST GAS DEVIATION IT IS COMPULSORY TO USE THEM.

14.2 Utilization limits

DO NOT USE THE MACHINE:

- With a load exceeding working loading capacity.
- On a ground which is not resistant to pressure and weight under stabilisers.
- With the side stress in the basket exceeding 20daN for every person (max. 40daN for 2 persons).
- With a wind exceeding 12.5 m/s.
- Within refrigerating chambers.
- In explosive or poisonous surroundings.
- During a thunderstorm.
- With poor visibility.
- In a not enough ventilated area. Toxic exhaust gas of thermal engines.

14.3 Information about wind speed

WIND FORCE Beaufort scale	WIND SPEED M/s	DESIGNATION	FEATURE
0	0.0 - 0.2	Calm	Calm wind; smoke is whipped up vertically or nearly vertically.
1 **2**	0.3 - 1.5 1.6 - 3.3	Light breeze	The wind direction is given by the smoke one; wind is felt on the face, leaves as well as baffle plate start moving.
3 **4**	3.4 - 5.4 5.5 - 7.9	Moderate breeze	Leaves and branches move continuously. Small branches begin to move. Dust and paper are moved on the ground.
5	8.0 - 10.7	Quite strong gale	Small branches with leaves move; waves on canals and lakes are formed.
6	10.8 - 13.8	Near gale	Big branches swing, wind whistles when passing through the electric line cables; it is difficult to walk with the umbrella opened.
7	13.9 - 17.1	Strong gale	Trees swing; it is difficult to walk.
8	17.2 - 20.7	Stormy wind	Branches are broken; it is hardly possible to walk.
9	20.8 - 24.4	Storm	The wind damages houses (antennas and roofing-tiles are swept away).

WARNING

WIND SPEED IS MEASURED ON AVERAGE FOR APPROXIMATELY 10 MINUTES AT A 10-METER HEIGHT ON A LEVEL GROUND

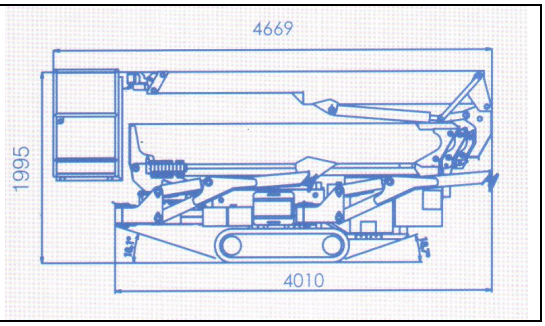
14.4 Summary of main warnings

MOVEMENT POSITION

Make sure of the complete non-working condition.

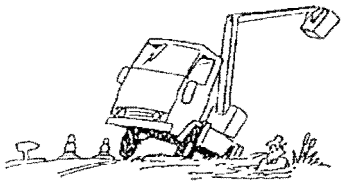
MOVEMENT

Mind to obstacles to the machine.

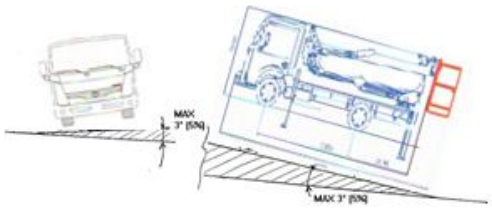


STABILISATION

Mind to ground solidity.

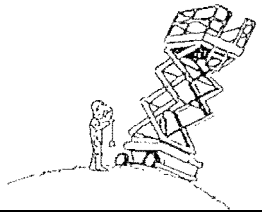


STABILISATION
Maximum inclination ground.



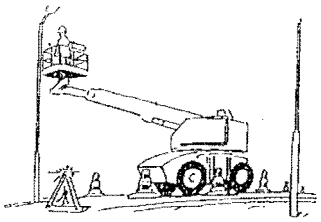
BALANCING

Check maximum allowed inclination.



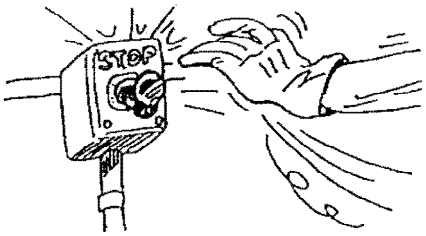
WORK AREA

Put barriers around working area.



EMERGENCY STOP

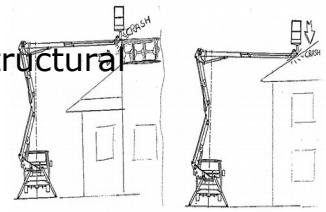
If there is any anomaly, stop
the machine. BEFORE SWITCHING ON
THE MACHINE VERIFY THAT
THE DANGEROUS CONDITIONS ARE OVER



OBSTACLES AND ELECTRIC LINES

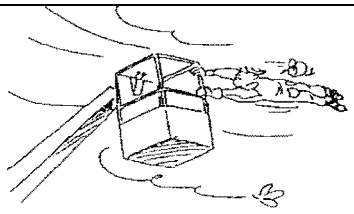
Make sure that there are no electric lines and
general obstacles.

STROKE AND THRUSTING AGAINST OBSTACLES
Collision and/or the thrusting against an obstacle (opening/closing and/or lifting/lowering) may create structural damages to the machine and serious risks of tilting the platform. Before and during the movements, always visually verify the encumbrance of the machine structure in all the directions (with particular attention to the less visible parts, such as the lower parts of the basket).



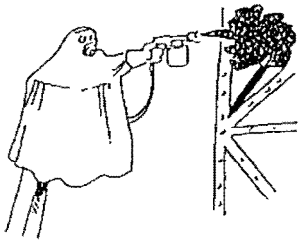
SAFETY BELTS

Pay attention to max operating wind.
The safety harnesses must be used
ALWAYS AND PROPERLY.



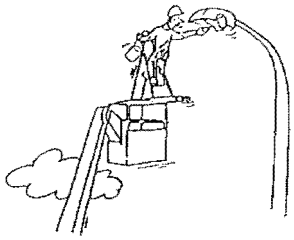
PROTECTIONS

When performing special works,
safeguard yourself and the machine.



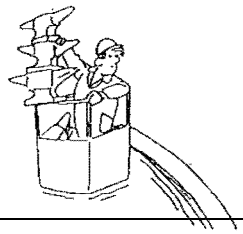
IN THE BASKET

Never use ladders, boards, or other objects,
IT IS FORBIDDEN to mount onto the banister.



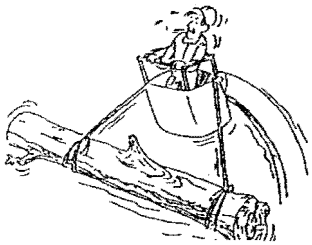
IN THE BASKET

Never exceed the allowed loading capacity in the basket.



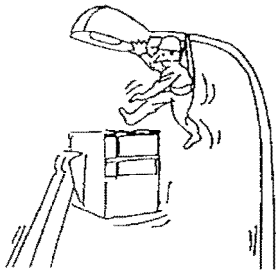
LIFTING

Never use the platform as a lifting
device, not even for small weights.



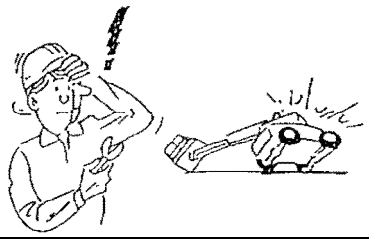
SAFETY BELTS AND HELMET

Always use safety belts and
helmet. Do not fasten belts to structures
outside the basket BUT ONLY TO THE
INDICATED SPECIAL CONNECTIONS.



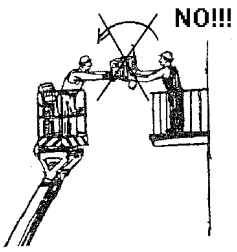
REPAIRS AND MODIFICATIONS

Do not carry out any repair or modification unless at authorised repair shops.



ATTENTION!!! LOAD ON HEIGHT

Do not load the basket while it is in height with materials or persons. This operation can cause the tilting of the machine or serious damages to the structure.



14.5 Ground consistency

During the manoeuvres of installation of the outriggers give attention to the ground where you will put the outriggers plates. Always verify the consistency and the solidity of the ground and, if necessary, interpose increased baseplates to obtain a better load distribution transmitted to the ground (if in doubt, ask the yard manager or a civil engineer experienced on the ground consistency for information). For the load values transmitted to the ground from the machine's outriggers, see chapter 3 "Characteristics and performances", and for the consistency ground values, below is a chart of the allowable pressures of certain types of ground.
For the calculation of the specific pressure loaded on the ground from the outriggers use this formula:

P= F/A
where:
P= specific pressure loaded on the ground by the outrigger (daN/cmq-kg/cmq)
F= maximum load of the outriggers (kg - see chap. 3)
A= area/bearing surface of the outrigger (cmq)

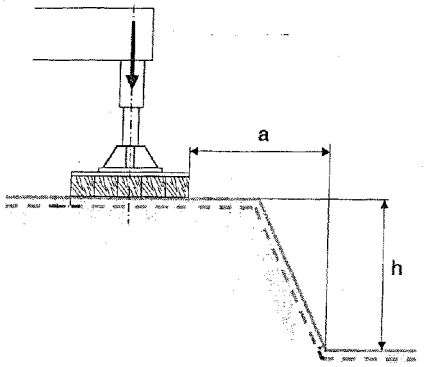
Example: Example for the platform with F= 3200 kg and the baseplates with surface A= 400 cmq (dimensions 20x20 cm)
P= 3200/400= 8 daN/cmq
With increased baseplates with surface A'= 1600 cmq (dimensions 40x40 cm)
P' = 3200 / 1600 = 2 daN/cmq

Chart with the values of the ground consistency

Type of ground	Specific pressure allowable (daN/cmq)
Shifted grounds, not compact	1 - 2
Compact and granular grounds (sand)	2 - 6
Compact grounds (sand+gravel)	4 - 10
Rocks of middle consistency (limestone-sandstone) - paving suitable for the transit of the heavy means	10 - 15
Rocks of remarkable consistency (strong limestone - strong sandstone)	15 - 30
Compact rocks (porphyry - basalt - granite)	30 - 50

14.6 Security distance from ditches/slopes

During the installation of the outriggers, keep always a sufficient security distance from ditches and slopes. This distance is a consequence of the kind of ditch/slope (propped and not propped) and of the kind of ground (we advise you to ask information to the yard manager or to a civil engineer experienced of the ground consistency). As an indication, below is the theoretical rule/scheme



- In case of ground subject to landslides or filling - a= 2xh
- In case of compact ground, not subject to landslides or filling – a=1xh

14.7 General safety regulations for platform use

In order to use the platform one must follow these safety regulations:

1. The platform can only be used by authorised personnel.

2. The platform has been designed to operate in the following environmental conditions:

temperature	-20° + 60°
humidity	30÷95% without condensation
work cycles	100.000

3. The "platform start-up" and "return to running position" instructions must be performed scrupulously and in chronological order.

4. The platform must be positioned on sturdy ground and with its base in horizontal position.

5. If operating on ground with poor consistency that is unable to resist under the specific pressure exerted by the outrigger with the standard plate, one must provide appropriate boards to distribute the load with reference to the specific pressure indicated on the plates next to each outrigger.

NOTE: BEFORE ACTIVATING THE PLATFORM, MAKE SURE THAT THE VEHICLE HAS BEEN STABILISED WITH THE OUTRIGGERS AND THAT THE TRACKS ARE LIFTED FROM THE GROUND BY AT LEAST 100 mm.

6. When on the platform, the operator must use the protective helmet and safety harness hooked on to the handrail of the platform itself.

7. Never exceed the maximum admitted load indicated on the capacity plates.

8. When one leaves the control panel in the turret to operate from the basket, lock the control levers by using the key; to prevent unwanted manoeuvres remove the key from its seat.

9. In the event of working near aerial electrical lines it is mandatory to keep at a minimum distance of 5 m from them, one must operate with particular care and attention; in any case, connect the frame of the vehicle to the ground.

10. The platform is built to perform vertical load manoeuvres, therefore it is forbidden to use it for horizontal throws or thrusts.

11. It is prohibited to use the platform as a crane.

12. It is prohibited to increase the wind load, by applying signs, shelters or structures.

13. It is prohibited to throw tools and things from below to above and vice versa.

14. The platform must never rest on other structures, whether they are fixed or mobile. All operations needed to reach the work point must be carried out by the operator on the platform. Ground operation is only allowed in the event of an emergency. During all operation and manoeuvre stages, it is prohibited to get on the cross beams of the aerial platform or adopt other measures to achieve greater heights, interposing shims on the platform floor. One must maintain a correct position with feet flat on the platform floor.

15. Position the vehicle so that the platform is as close as possible to the work point.

16. Check there are no fixed or mobile obstacles in the work area that could cause dangerous conditions during operation stages.

17. During the manoeuvre, always look in the direction of movement of the platform.

18. It is prohibited to remain near the vehicle frame when the platform is being manoeuvred; always visually check the presence of people before starting to operate with the equipment.

19. Carry out approaching manoeuvres to the working point by briefly operating the control levers.

20. Avoid abrupt manoeuvres in order to prevent repercussions in the platform or on the structure that could cause dangerous situations for operators.

21. Always manoeuvre carefully and slowly, hurried manoeuvres can cause accidents.

22. It is prohibited to tamper with the hydraulic stop valves on the cylinders and the maximum pressure valve.

23. It is prohibited to tamper with or modify any safety device.

24. Check the efficiency of the work area limiting device on a daily basis.

25. It is prohibited to position ladders or structures of any type to increase the work area of the platform.

26. Check the level of hydraulic oil in the tank on a daily basis.

27. Perform the required periodic maintenance.

28. Check the signal lights fitted on the platform and carrier vehicle on a daily basis.

29. It is prohibited to use the platform at a wind speed above 45 km/h (12.5m/s).

30. Should the platform be used along roads open to traffic, it is mandatory to signal its presence with appropriate signals on the ground.

31. Use the platform in suitably illuminated places.

15 ROAD SIGNS

A. Before starting any work, one must close off the area concerned or that may become dangerous to vehicular and pedestrian traffic.

B. In the event of areas concerned solely by pedestrian traffic, install appropriate barriers and check that during work unauthorised persons do not enter the protected area; if necessary create an alternative route for pedestrians.

In the event of interference with vehicular traffic (along roads or directly on the roadway) use the signals as required by the Highway Code (see some examples in annex 1). Please note that it is essential to arrange the signals in the exact sequence i.e. in this order:

- Pre-signalling signs ("Work in progress"), to be placed at both sides of the road concerned at the most convenient distance in relation to the characteristics of the road itself and therefore to the speed of vehicles (at least 50m before any bends or speed bumps).

- Warning signs ("Priority single lane give way"): to be placed on road margins.

- Signals to be placed on the roadway ("Mandatory direction, traffic cones"): start from the road margin and from the side vehicles come from so that traffic is gradually moved.

- Road barriers at the beginning and sides of the site. Retractable barriers may be used only to delimit the site in the longitudinal direction, parallel to traffic.

C. When replacing lamps, an operation that requires frequent stops on the roadway, whereby both of the following conditions occur:

- intervention within an inhabited area on roads with a speed limit of 50km/h in conditions of good visibility,
- vehicle properly parked so that the basket and relative arm are kept in a position that prevents dangerous interferences with other vehicles.

For the cases indicated below one must adopt the following road signs:

- with the bucket truck stationary to the side of the road, when the remainder of the roadway allows simultaneous transit in both directions of two limited sized vehicles (2.5m), one must apply, on the rear left side of the vehicle, the "Mandatory direction" sign with the arrow pointing downwards at 45°, and in the centre, the square 50x50 cm sign with white and red transversal stripes; one must report the obstacle (our vehicle and operators) before and after with the "Work in progress" sign (see fig. 1 of annex 2)
- with the bucket truck stationary to the side of the road, when the remainder of the roadway does not allow simultaneous transit in both directions of two limited sized vehicles (2.5m), one must apply signs as above and also pre-signal the one-way direction "Priority single lane give way" sign on the side of the diversion

and the "Oncoming traffic must wait" sign on the opposite side (see fig. 2 of annex 2)

- with the bucket truck stationary in the middle of the road, when the remainder of the roadway allows simultaneous transit to the right and to the left in both directions of two limited sized vehicles (2.5m), one must apply, on the rear right side and front left side of the vehicle, two "Mandatory direction" signs with the arrow pointing downwards at 45°, on the rear side only, the square 50x50 cm sign with white and red transversal stripes; one must report the obstacle (our vehicle and operators) before and after with the "Work in progress" sign (see fig. 3 of annex 2)

D. When work is complete remove the signals by following the above indications in the reverse order.

IMPORTANT NOTE: at night-time or in poor visibility conditions integrate the signals with lanterns with a fixed red light and flame torches; it is recommended that operators wear fluorescent safety jackets.

The red flag, whose use is optional, can be used as integration in signalling the work area; the flag, fixed or waved by an operator, should be used near the "Work in progress" sign.

16 OPERATING PRECAUTIONS (RESIDUAL RISKS)

16.1 Electrical lines

This machine is not electrically insulated and does not offer any protection against contact with live power lines or near them.

Working near an electrical line is always extremely dangerous.
Remember that electrical discharges occur even if the two bodies do not touch, in fact they only need to approach each other below the minimum safety distance, which is 5 meters up to 50,000 volts and 10 metres above 50,000 volts.
These values are absolutely minimal: no part of the machine nor any work stage must exceed this limit.

Note: in some countries there may be laws with different limits with which the operator must comply with.

Along with the mandatory compliance with the minimum distance, required by law, one recommends a series of precautions to be adopted to reduce the risk of accidents:

- ask the Electrical Company to interrupt power supply and earth the line;
- when it is not possible to interrupt power supply, keep all parts of the machine at a much greater distance than the mandatory one, considering that the lines can oscillate due to the wind;
- people not necessary in the operation must stay as far away as possible from the work area;
- always operate carefully and cautiously;
- adopt, when possible, protection devices such as: line proximity detector or area delimiters across and above. Please note that measures such as machine earthing or protection devices on the work surface or extendable structure, offer little or no protection against electrical shocks.

Working near radio, television or radar stations, the machine can receive a high induced voltage that can cause painful shocks and burns due to overheating of the metal structure of the platform.
Take suitable precautions before operating, consulting the technicians of the station concerned.

What to do in the event of accidental contact with any part of the machine with live electrical lines:

A. Do not act on impulse, nor panic; without direct contact you are fairly insulated. Do not jump on the platform, apart from traumas caused by falling, the electrical risk remains because the ground around the machine is to varying degrees electrified.
B. Height permitting, jump as far away as possible and move away by leaping, keeping feet together.
C. Any rescuers can approach only when a walkway made of dry wood has been set up.

D. Make everyone in the area around the machine go away immediately.
E. If the machine still works, try to get away from the point of contact with a movement opposite to that created by the contact itself.
F. If you cannot get away from the line, stay in your place until when the electrical line has been excluded.
G. When in a safe area, stop the machine and inspect to assess any damage.

It is prohibited to use the machine for welding!

16.2 Danger of burns

The batteries contain acid.
It is mandatory to use protective clothing, gloves and goggles when working on the batteries.
In the event of accidental contact with the acid, immediately neutralise and rinse thoroughly with water.

17 GENERAL CHARACTERISTICS

The equipment is made up essentially of a base truck on tracks, to which the arms unit is applied, with a people carrier platform at the end.
The frame is made of electrowelded plate and is constrained in the four independent hydraulic articulated arm outriggers.
A series of holes on the frame determines the position of the outriggers, rotating the outrigger fixing supports to the frame.
The desired position of the outriggers is maintained via special fixing pins.

The frame is fitted with a rotating turret by means of a ball-bearing fifth wheel; it is operated by a rotary table equipped with a hydraulic gearmotor and negative brake, which enables 360° rotation.

The arms unit is made up of a lifting boom within which 4 telescopic extensions slide, by means of a hydraulic cylinder and chain transmission system, at the end of which there is a telescopic jib operated by a hydraulic cylinder.

The people carrier platform floor is maintained horizontal by and electro-hydraulic system.

This device maintains the platform floor horizontal in real time and regardless of the arms movement speed.

It is equipped with a radio control to be placed on the basket to move the aerial platform; the only operations allowed from the ground are truck stabilisation and traverse.

The controls are of proportional operation type to allow for adjustment of movement speed as needed.

Two emergency stop red mushroom buttons, with rotation release, if activated stop all platform functions.

A geometric type limiter automatically defines permitted work areas.

18 DESCRIPTION OF THE MACHINE

18.1 Declared use of the machine

The CELA aerial working platform is designed and realised for lifting and moving people, who are housed inside a levelled basket, through space in the entire field of movements that can be performed.
The platform lifts the staff vertically, allows horizontal movement by means of the joints and extensions and allows angular movements via the rotary turret.
The machine works with the outriggers pressed to the ground, the chassis levelled and the truck suspensions discharged.
Staff can take tools into the basket up to the maximum capacity indicated.

19 MAIN COMPONENTS

A - Radio control
Radio control pouch for moving the aerial platform.
B – Main telescopic boom
Telescopic boom with 3 extensions and swivelling realised with two hydraulic cylinders.
C – Jib
Telescopic boom with 1 extension and swivelling achieved with two hydraulic cylinders.
D - Turret
In top quality sheet steel, it is composed of a main press-bent body and electro-welded reinforcements. It is installed on the fifth wheel coupling support of the superstructure; rotation is ensured by a hydraulic motor with worm screws and automatic brake in work position. Turret rotation is allowed up to a maximum of 359° (1 turn). A hydraulic directional valve allows moving the machine in case of electrical faults
E – Oil tank
It is the tank that contains the oil for powering the machine's hydraulic plant, complete with level indicator.
H - Outriggers
With individual, simultaneous or automatic (optional) descent, they are fixed to the secondary frame.
I – Base frame
It is the bearing structure made of steel.
L – Emergency hand pump
Hydraulic hand pump for emergency descents.
N – Emergency controls
For moving the machine from the ground during descent in emergency conditions.
P- Operator basket
It is the car that hosts the operator/s and the tools. It is made in tubular aluminium with the following dimensions: 1400x700x1100 mm. Option available is an aluminium basket of increased size 1800x700x1100 and a plastic basket with size 1300x800x1100.

20 HYDRAULIC PLANT POWER SUPPLY

Powered with a pump coupled to a Hatz single-cylinder silenced combustion engine. And alternatively an electric pump coupled to a 220v inverter.

21 DESCRIPTION, CONTROLS, FEATURES, PERFORMANCES, EMERGENCY AND PUTTING INTO OPERATION PROCEDURE

21.1 Platform start-up

21.1.1 Start-up

Turn the key in the main electrical panel to ON, then take the radio control, after verifying that the emergency button is not pressed, in this case reset it, press the GREEN button on the bottom left part to turn on the radio control.

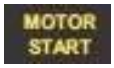
21.1.2 Use with combustion engine

Press the green power button a second time to connect with the ground unit; at this point press the engine start button and wait about 30 sec. for the number of revolutions to stabilise. Press the power button again to switch off the engine.

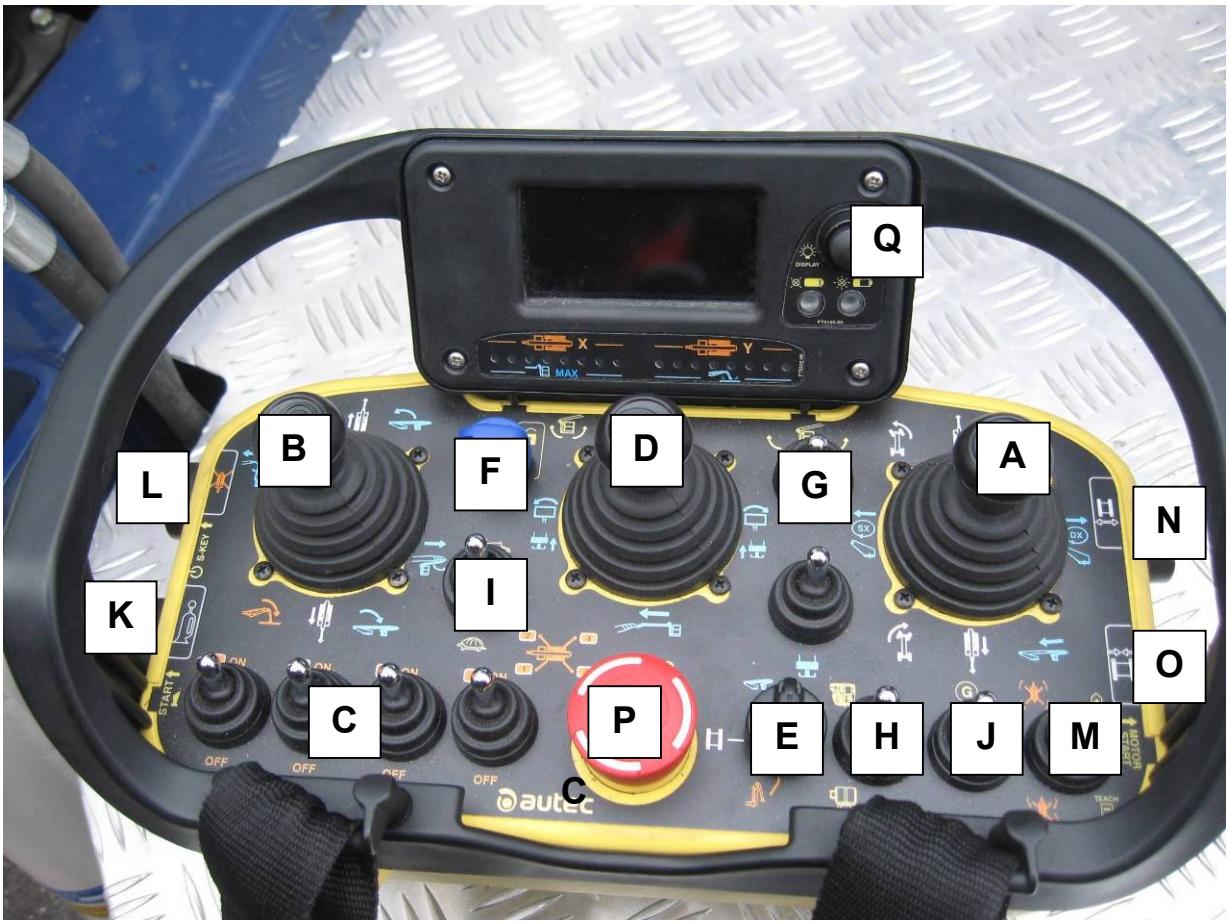
21.1.3 Use with electric pump

Connect the power supply at the main panel and then position selector H on the ELECTRIC PUMP

21.2 Description of pictograms of the aerial part

POS	Pictogram	Description and functioning	Pictogram	Description and functioning
A		Lower boom ascent		Lower boom descent
B		Jib boom ascent		Jib boom descent
C		Jib boom extension		Jib boom retraction
D		Right rotation		Left rotation
E		Lower boom extension		Lower boom retraction
F		Maximum speed		Slow speed
G		Thermal engine		Electric motor
H		Right basket rotation		Left basket rotation
I		Acoustic signal		Start thermal engine
L		Self-balancing from basket		Self-balancing from basket retracts
M		Basket orientation direction		Basket orientation direction
N		Basket orientation enabling		
O		Basket level correction		
P		Emergency button		

21.3 Description of radio control functions:



A- Forward-backward left track movements / right and left turret rotation / main boom extension/retraction control
B- Forward-backward left track movements / outriggers ascent-descent / JIB boom opening-closing / main boom ascent-descent
C- Selectors for outriggers individual control
D- Right and left basket rotation / jib boom extension-retraction
E- Truck-aerial part stabilisation movements activation selector
F- Selector to be activated for intentionally restoring basket verticality
G- Control for restoring basket verticality
H- Main engine - electric pump selector
I- Slow-fast arms speed selector
J- Hydraulic generator insertion
K- Acoustic signal
L- Automatic levelling
M- Self closing (press and hold during the entire manoeuvre)
N- Tracks widening
O- Tracks closing
P- Emergency button
Q- Display over-lighting

21.4 Traverse

To carry out traverse manoeuvres proceed as follows:

a) Move selector E onto traverse (controls enabling described in white on the radio control)
b) Joystick A controls the movement of the right track and joystick B controls the left track.
c) The Spyder DT21 can be equipped with an extendable track (optional). To widen the tracks and consequently have a more stable and safe traverse movement, one must stabilise the vehicle to lift both tracks (see STABILISATION chapter), then press button M and hold until the track is completely open, then put the vehicle back into the running position.
d) To re-close the tracks and consequently have a more limited traverse width, one must stabilise the vehicle to lift both tracks (see STABILISATION chapter), then press button N and hold until the track is completely closed, then put the vehicle back into the running position.
e) The Spyder DT21 is equipped with an automatic anti-tipping control, which via an acoustic signal and a STOP warning on the display, signals it has reached a critical angle for overturning, which varies whether the track is open or closed.

• ATTENTION: because signalling does not inhibit traverse, if one insists with the manoeuvre one can in any case cause the vehicle to overturn.
• WARNING: The presence of the overturning danger signal does not exempt the operator under any circumstances from checking vehicle stability when in traverse, as in some particular cases and/or checking failures there is still the possibility for the platform to overturn.
• During traverse manoeuvres it is good practice for the operator to stay outside the operating range of the machine.

21.5 Stabilisation

Stabilisation manoeuvres can be performed automatically or manually; in any case, to enable the modality one must move selector E on Stabilisation (enabling controls described in orange on the radio control)

21.5.1 Automatic stabilisation (OPTIONAL)

To stabilise the aerial platform automatically proceed as follows:

a. Remove the retainers from the four outriggers.
b. Widen the outriggers by detecting the stabilisation holes.
c. In any case the position of the front and rear outriggers of the same side must be the same. There are therefore two possible configurations:

- Front and rear outriggers completely open on the right and left side;
- Front and rear outriggers completely closed on the right and left side;
- Front and rear outriggers completely closed on the right side and completely open on the left side;
- Front and rear outriggers completely open on the right side and completely closed on the left side;
- Any other configuration is not allowed.

d. Re-insert the retainers of the four outriggers.

• WARNING: it is absolutely prohibited to operate with the outriggers in running position (completely closed forwards).
• WARNING: it is absolutely prohibited to operate with the outrigger retainers not completely inserted.
• WARNING:

e. Position selectors C, relating to the outriggers that one intends to move, onto ON.
f. Pull lever B towards the operator, at this point the outriggers selected via selectors C will descend simultaneously.
g. Once all four outriggers are resting on the ground release lever B and press button L and hold until the machine has stopped. This way the aerial platform levels autonomously. If one wants to lift the truck further, repeat the manoeuvre by pressing button L again.
h. minimum track height 100 mm.

• ATTENTION: check that the minimum height of both tracks from the ground is above 100 mm.
• WARNING: The presence of the automatic stabilisation system does not exempt the operator under any circumstances from checking the levelness of the vehicle which must not exceed 1°.

21.5.2 Manual stabilisation

To stabilise the aerial platform manually proceed as follows:

a. Remove the retainers from the four outriggers.
b. Widen the outriggers by detecting the stabilisation holes.
c. In any case the position of the front and rear outriggers of the same side must be the same. There are therefore two possible configurations:

- Front and rear outriggers completely open on the right and left side;
- Front and rear outriggers completely closed on the right and left side;
- Front and rear outriggers completely closed on the right side and completely open on the left side;
- Front and rear outriggers completely open on the right side and completely closed on the left side;
- Any other configuration is not allowed.

d. Re-insert the retainers of the four outriggers.

• WARNING: it is absolutely prohibited to operate with the outriggers in running position (completely closed forwards).
• WARNING: it is absolutely prohibited to operate with the outrigger retainers not completely inserted.

e. Select the outrigger/s on which one wants to act via selectors C.
f. To lift the selected outriggers via selectors C push lever B.
g. To lower the selected outriggers via selectors C pull lever B.
h. Stabilise by operating on the individual outriggers in order to level the aerial platform, checking levelness via the levels placed near the fifth wheel,
i. To return to running position, re-close the aerial part completely, then position all selectors C onto ON and push lever B until all outriggers are completely open.

21.5.3 Aerial part

After having stabilised the aerial platform one can operate with the aerial part of the vehicle.
To enable this modality one must previously move selector E onto aerial work (enabling controls described in light blue on the radio control). Climb into the basket and fix the safety harnesses to the attachments indicated.
Bring lever A upwards until the main boom opens by at least 20°, this to prevent possible stability problems.
Once this limit has been exceeded one can operate normally with the controls.
One must in any case bear the following in mind:
The main boom must be raised all the way (about 90°) before receiving extension manoeuvre consent. Obviously if the main boom has not fully retracted one cannot lower it.
One cannot simultaneously raise/lower the booms and rotate the basket.
To be able to extend the main boom, Jib must be opened by at least 5° to avoid damaging the support (Fig. 1).

Figure 1

Normally one performs the manoeuvres as per the photographic sequence, figure 2 and 3

Figure 2

Figure 3

The machine automatically stops when it reaches the angle limit of the basket level

The basket is calibrated for a maximum weight of 200 kg. Including tools, transportation of 3 or more persons is not allowed.

22 MACHINE CLOSING IN EMERGENCY CONDITIONS (MANUAL EMERGENCY CONTROLS)

In the case of fault or interruption of the hydraulic or electric power supply during use, the operator on the ground can carry out closure by performing the manual emergency manoeuvres from the ground.
If having to use the manual emergency controls, previously act on the emergency enabling key.

In case of using machine in manual emergency mode all electronic safety devices are excluded. Therefore, carefully follow the instructions on the emergency station

Emergency enabling key

Hydraulic manual emergency controls in turret

22.1 Types of faults

22.1.1 Main hydraulic power failure

This type of fault occurs if the engine is switched off (possibly it has run out of diesel/no electric power supply for 220 V electric pump).

In the case of just hydraulic power supply failure, the machine can be moved with the aid of the manual pump proceeding as follows:

1. Take the manual pump lever, insert it into the appropriate seat, placed on the truck on the right side under the fifth wheel.

2. Work normally on the platform controls while activating the manual hydraulic pump.

22.2 Electric system and main power failure

This type of fault occurs when theengine is switched off (possibly it has run out of diesel/no electric power supply for 220 V electric pump) and simultaneously there is no 24VCC electric power supply (possibly the battery breakdown and no power supply for 220 V electric pump).

In the case of electric system and main power supply failure, the machine can be moved with the aid of the manual pump proceeding as follows:

1. Take the manual pump lever, insert it into the appropriate seat, placed on the truck on the right side under the fifth wheel.

2. Remove the casing in the turret and screw on one of the two levers placed within the distributor protection casing on the first element from the right.

3. Screw on the second lever placed in the distributor protection casing on the element that supervises the movement one wishes to perform to close down the equipment

   a. II valve on left: basket orientation
   b. III valve on left: main boom ascent / descent
   c. IV valve from left: main boom extension/retraction
   d. V valve from left: Jib boom ascent/descent
   e. VI valve from left: Jib boom extension/retraction
   f. VII valve from left: arm rotation

   Within the distributor protection casing there is a label that indicates the movement supervised by each valve.

4. Move lever 1 upwards to enable the desired movement to be performed by using the other lever placed on the distributor element (lever from left from 2 to 7)

5. Activate the manual pump

22.3 Electric system failure

This type of fault occurs if there is no 24VCC power supply (possible breakage of the control unit and/or cables of the system logic unit).

In the event of electrical system failure one can move the machine as follows:

a. The manoeuvres to be carried out are the same as those in the previous case, except point 1 and 4, in that the engine is running and therefore the hydraulic system is working.

23 OUTRIGGERS RETRACTION OPERATION IN EMERGENCY

23.1 Main hydraulic power failure

In the case of just hydraulic power supply failure, the outriggers can be moved in emergency as follows:

1. Insert lever in manual hydraulic pump (see previous paragraphs)

2. Activate the manual pump and work normally with the radio unit controls until the outriggers have closed completely

23.2 Electric system and main power failure

In this case the outriggers can be moved in emergency as follows:

1. Insert lever in manual hydraulic pump (see previous paragraphs)

2. Remove the casing in the turret and screw on one of the two levers placed within the distributor protection casing on the first element from the right.

3. Screw on the second lever placed in the distributor protection casing on the element that supervises the movement one wishes to perform to close down the equipment.

   a. I valve from right: track opening/closing
   b. II valve from right: outrigger opening/closing (all together)

4. Move lever 1 downwards to enable the desired movement to be performed by using the other lever placed on the distributor element (lever from right 1 and 2)

5. Activate the manual pump,

23.3 Electric system failure

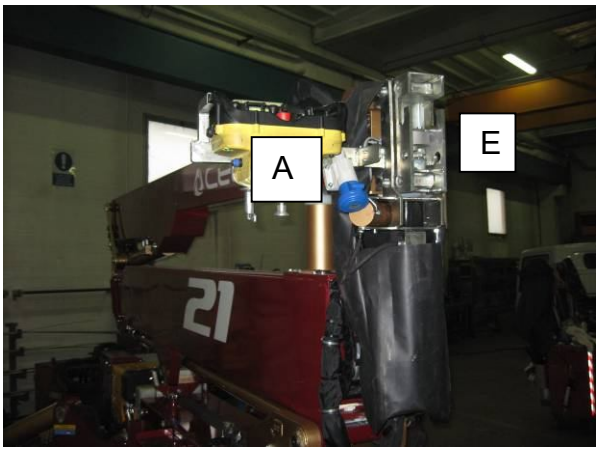
In the event of power system failure, to re-close the outriggers in emergency conditions proceed as per case "b" except for points I and V.

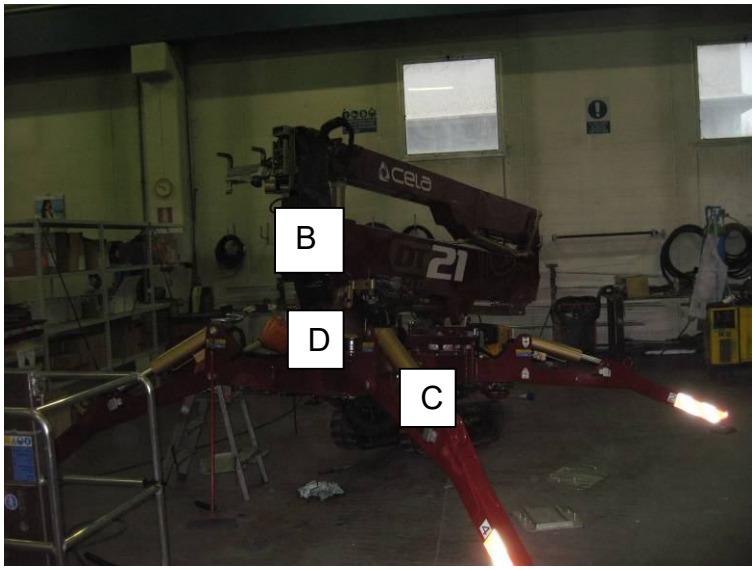
When recovery operations have been completed, restore the following:

- Unscrew the levers of the electric distributor in the turret and reinsert the protective casing.
- Remove lever of the manual hydraulic pump.

Contact a CELA authorised dealer to control the failure.

24 SAFETY DEVICES





A - Emergency stop buttons

They are present on the emergency controls in turret, of stabilisation, of emergency on ground and in car. They stop any platform function in the case of an emergency.

B - Manual basket levelling

Allows manual levelling of the basket when the boom is in the rest position.

C - Hand pump for emergency descent

Allows to move the platform and take it back to travelling in the case of breakdown. Depending on set-up, there may be an emergency electric pump present, available as an optional and powered by the truck battery.

D - Hydraulic emergency controls
They are present on the rotary turret and are used to move the platform in emergency condition and without electric energy.

E - Load limiting device on the basket
Device that blocks all platform movements if the basket is loaded with more than the maximum capacity accepted.

F - Combustion engine
Diesel/petrol engine that allows all platform movements.

G – Electric pump
220 VAC electric pump that allows all platform movements.

Flanged block valves on all cylinders
Cylinder movement is stopped if a hydraulic pipe breaks or there is a pressure drop.

Protections on electric and hydraulic plant
All flexible hoses and cables are equipped with wear-proof and burst-proof protections.

Outriggers/boom interlock (sequence valve)
The outriggers controls are only activated if the booms are in the rest position and if the appropriate control has been selected in the turret panel. If this is not the case, they cannot be used.
Once the machine is stabilised a green light switches-on on the outriggers selection panel and, by selecting the desired position on the panel in turret (basket or turret), it is possible to lift the telescopic boom and start to work.
With the boom open it is no longer possible to activate the outriggers even by selecting the control in turret.

Maximum pressure valves
They prevent the maximum pressure in the hydraulic plant, at which the platform is calibrated, from being exceeded.

Safety belt attachments
Positioned on the basket, they are used to attach the operator's safety belts during use of the platform.

Inclinometer
Stabilises the aerial platform automatically.

Other possible platform supplies

- Hydraulic socket in the basket
- Hydraulic socket in the basket
- Device for automatic repositioning of the equipment in rest position

24.1 Control panel display alarms key

Code	KEY	ACTION TO BE UNDERTAKEN
1	Boom not in transport conditions	Stabilise the machine if it is not already and completely close the equipment
2	Stabilisers on the ground	Close equipment and check all outriggers press on the ground; if required, stabilise equipment again
3	General alarm	
4	Controls from turret	Select the ground controls from the stabilisation control board
5	Ground controls	Select the turret controls from the stabilisation control board
6	Emergency button pressed	Re-arm the pressed emergency button
7	Equipment not stabilised	Stabilise equipment
8	Main boom extension not retracted	Retract the with the extension the main boom
9	Jib closed	Swivel the jib at least at 5°
11	Jib boom top stroke	Swivel with the jib so the basket descends (maximum jib angle has been reached)
12	Basket collision	Swivel with the boom/jib so the basket descends (furthest angle limit between basket and jib has been reached)
13	Low boom	Lift the main boom up to end run
14	Basket tilted	Manually restore the planarity of the basket
15	High boom stop	One has reached the maximum angle for the main boom
16	Boom on support	Lift the main boom from the support
27	Limiting device	the functioning limit of the equipment has been reached; perform the allows manoeuvres to return within the normal work area
28	Pin inserted	Verify the lock pin of the basket is correctly inserted in its seat and that it correctly engages the safety end run.
30	Boom not high and extended	Retract the with the main boom extension to allow swivelling of the main boom
31	Radio control not inserted	Connect the radio control
32	Overturning danger	Stop traverse as one risks overturning
33	Basket balancing in progress	Do not perform other manoeuvres while turning the basket
34	Basket overload	Reduce the weight in basket (the 200 Kg limit has been reached)
35	Exclusion key inserted	Release the exclusion key
36	Rear stability	Swivel the main boom upwards
37	Basket not centred	Centre the basket before performing self-closing manoeuvre
38	Basket pin missing	Verify the lock pin of the basket is correctly inserted in its seat and that it correctly engages the safety end run.

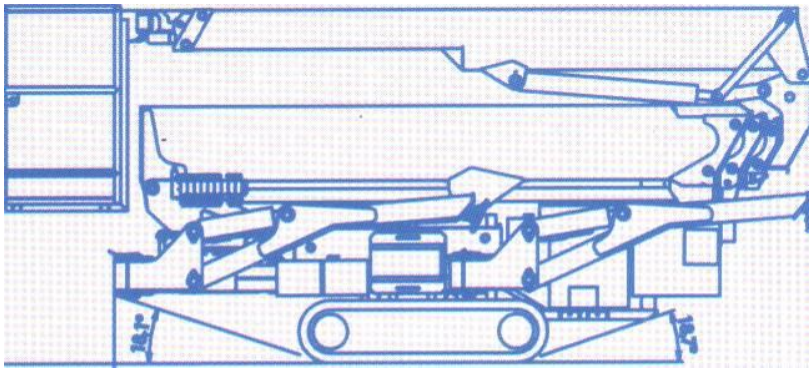
24.2 * Load limiting device

Load limiting device with maximum intervention threshold within 120% of the nominal capacity with block of all machine movements and intermittent acoustic warning that the load accepted has been exceeded. To take the machine from the block condition to that for use, the excess weight must be unloaded until lying within the accepted limit.

NB.: The platform maximum load control system does not exempt the operator from scrupulously checking that the weight of the tools or material to be loaded, necessary for work or maintenance, does not exceed the maximum admitted load for the various declared uses of the platform.

24.3 Inclinometer

It is an alarm device that continuously verifies the maximum angle at which the main boom works. If this angle is greater than 90°, the device allows only manoeuvres for reducing this angle, at the same time showing an error code in the control board display.
This device does not exempt the operator from diligently carrying out the stabilisation manoeuvres.



25 MAINTENANCE

ATTENTION!!! WELDING/RESTORATION

Different parts of the machine are made of steel with high elastic limit; never carry out welding or restorations without the authorisation and the preventive instructions of the manufacturer.

A. INTRODUCTION
B. MATERIAL TO USE
C. MAINTENANCE PROGRAMME
D. ROTATION GROUP GREASING
E. HYDRAULIC OIL LEVEL VERIFICATION
F. DELIVERY FILTER CARTRIDGE REPLACEMENT
G. REPLACEMENT/RETURN FILTER CARTRIDGE CLEANING
H. CONTROL SEAL VALVES OF CYLINDERS BLOCK
I. CONTROL PIPE-FITTING AND PIPES
J. SYSTEMS/ELECTRIC COMPONENTS
K. STRUCTURE INSPECTION
L. CONTROL BOLTS AND NUTS CLAMPING
M. SYSTEM EMPTYING AND TANK FILLING
N. GREASING OF THE HINGED PINS
O. SLIDING BLOCKS GREASING
P. CONTROL/SLIDING BLOCKS ADJUSTMENT
Q. CONTROLS
R. TROUBLESHOOTING WORKING IRREGULARITIES
S. COMPONENTS

25.1 Introduction

It is of the utmost importance that this equipment is washed with water cleaning machine to remove all polluting elements which can damage materials and impair good functioning. After washing, lubricate all components to properly restore sliding conditions and check if there are elements out of shape or which show wear. If so, it is compulsory to contact an authorised service shop to replace these elements.
For lubricating material refer to what indicated in this manual.
It is essential to take into account that even safety devices can wear and that one has to always check if they are clean, lubricated and unimpaired. Under normal working conditions cleaning and lubricating operations as described above can be carried out once a month. This interval has to be reduced if there is a situation of use or an environment more severe than normal.
It is impossible to describe all these situations, therefore, below are some examples.

- Machine setting into operation again after a long period of stoppage.
- Extremely high or extremely low environmental temperatures with subsequent fast lubricant deterioration or extreme hardening.
- Painting and sand blasting works during which the material tends to enter into the friction sliding guides and to combine with grease thus creating a mixture which is no more a lubricant but becomes an abrasive substance wearing out the components of the machine and locking the sliding guides.

We rely on your conscientiousness in tracing down, in relation to the ways in which the machine is used, when and how to perform control and maintenance absolutely necessary for the perfect functioning and good state of preservation of safety devices and of the machine in general.

WARNING

TO SAFEGUARD THE MACHINE AND THE OPERATORS IT IS COMPULSORY TO USE ORIGINAL SPARE PARTS. TO KNOW WHICH IS THE CLOSEST AUTHORISED WORKSHOP IN YOUR AREA, PLEASE CONTACT CELA CUSTOMER SERVICE.

DURING WASHING WITH HIGH-PRESSURE JET DO NOT AIM AT BOXES, CABINETS AND ELECTRIC COMPONENTS. DO NOT USE DETERGENTS, CHEMICALS, PETROL OR SIMILAR SUBSTANCES, WHICH CAN DAMAGE RUBBER PARTS, PLASTIC COMPONENTS AND FILMS.

DO NOT PERFORM MAINTENANCE ON THE MACHINE WHEN THIS IS MOVING. TURN ALL MOTORS OFF AND REMOVE KEYS FROM THE CONTROL PANEL AND FROM THE DASHBOARD OF THE TRUCK. FOR BALL JOINTS WE SUGGEST TO REPEAT GREASING WITH THE MACHINE IN DIFFERENT POSITIONS.

MAINTENANCE MUST IN ANY CASE BE CARRIED OUT WHEN THE MACHINE IS SWITCHED OFF AND AFTER THE KEYS HAVE BEEN REMOVED FROM CONTROL PANELS.

Inspection, maintenance and other intervention on the machine are to be carried out according to specific skills. As far as maintenance programme is concerned, what follows is a list of workers in charge for each operation:

a. The driver of the platform and the service shop of the company which owns the machine.
b. CELA authorised service shop.
c. CELA service shop.

Before carrying out any modifications you must to be authorized by the manufacturer.

Note: After carrying out any checks/maintenance, report the results and the operations performed on the appropriate inspection register - see chap.10.

IF THE MACHINE IS TO BE STORED FOR A LONG TIME

Store it in a dry and well-aired place.
Remove starting keys from the machine.
Clean filter and electric system.
Protect contacts and remote control switches with special antioxidant products.

- Grease sliding guides, chains and surfaces which are not protected by painting.
- Do not cover the machine with plastic material since it would create damaging condensation.
- As far as wagon is concerned, follow what indicated by its manufacturer.

Before putting the machine into operation again, carry out inspection and maintenance procedures at intervals requested every day....., every 50 hours....., once a month.

DISMANTLING AND SCRAPPING

In case of scrapping, it is necessary to dismantle the machine and broke it down into uniform parts which should be sent to the relevant storage centres.
These types of materials are present on the machine:

- Iron materials: metal structural works and mechanical components.
- Plastic materials: gaskets, belts, protections.
- Electric materials: windings, controls, electric valves and similar components.
- Oils and lubricants: hydraulic oil, gearbox lubricants, greases.
- As far as wagon is concerned, follow what indicated by its manufacturer.
- Other materials: QUICKSILVER (basket balancing sensor)

25.2 MATERIAL TO USE

GREASE, LUBRICANTS, OIL AND OTHER

CODE	DESCRIPTION	NOTES	USE
47200077	NILS WHITE STAR EP	latta 18 Kg	ingrassaggio interno bracci e traverse
47200065	MASTER PLATE CNC 2710199 (/2)	latta 18Kg	ingrassaggio superiore e inferiore bracci
47200070	MASTER PLATE CNC 2710200 (/2)	latta 1 Kg	ingrassaggio superiore e inferiore bracci
47200040	REOLUBE 365 RHE (CNC 27101999)	latta 18Kg.	ingrassaggio boccole alveolari
46100015	OLIO 80W90		lubrificazione cambio
46100010	OLIO MOTORE DIESEL 30 (RIMULA)		olio motore Diesel
46100025	ANTIGELO IP ECOBLU 100		antigelo
47200080	MOLYKOTE D-321R SPRAY	bomboletta 400ml	ingrassaggio secco fasce scorrimento
47200085	NILS KETTOLUB 12 SPRAY	bomboletta 400ml	lubrificazione e protezione catene
47200090	WURTH HSW 100 SPRAY (FUORI PRODUZIONE)	bomboletta 300ml	lubrificazione e protezione catene
46100030	OLIO IDRAULICO SHELL TELLUS T32	cisternetta	impianto idraulico standard
46100035	OLIO IDRAULICO SHELL TELLUS T22	cisternetta	impianto idraulico climi freddi
47200105	WURTH HHS 2000	bomboletta 500ml	tubazioni e cavi in catenaria
47200107	WURTH HHS GREASE CON PTFE	bomboletta 400ml	Pattini Scale,Movimento Scale,Cerniere,Giunti
47200075	NILS GR 7000	latta 18 Kg	NON PIU IN USO

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- λ NILS NILEX EP1 grease or equivalent for axes and lubricator
- σ NILS NILEX EP1 graphitised grease for the booms extensions and the outriggers' supporting beams

	DROP POINT C°	DENSITY TO 15°C (g/cm³)	WORKING TEMPERATURE (°C)	Viscosity to 40°C (mm /s²)	Flash Point (°C)	Autoignition Point (°C)
NILS NILEX EP1	approx.250	0,91÷0,95	-15/+100	approx.84.	≥ 250°	Not autoignition

Oil AGIP ARNICA 32 for hydraulic system - Hydraulic System Capacity 80 l

	Density to 15°C(Kg/l) ASTM D 1298	Viscosity to 40°C(mm /s) ASTM D 445	Flash V.A. °C ASTM D 92	Sliding °C ASTM D 97
AGIP ARNICA 32-46	0,865-0,870	32-45	202-215	-36

Equivalent: ROL LI 32 HIV
TOTAL EQUIVIS ZS 32
ESSO INVALOR EP 32
SCHELL TELLUS SX 32

ν Grease for fifth wheel rotation unit with worm gear:
- NILS NILEX EP1: for worm gear/bearings/balls and for teeth

	DROP POINT C°	DENSITY TO 15°C (g/cm³)	WORKING TEMPERATURE (°C)	Viscosity to 40°C (mm /s²)	Flash Point (°C)	Autoignition Point (°C)
NILS NILEX EP1	approx.250	0,91÷0,95	-15/+100	approx.84 .	≥ 250°	Not autoignition

IT IS ABSOLUTELY FORBIDDEN TO INTRODUCE TOOLS, HANDS, FINGERS, ETC., IN THE HOLES OF THE TELESCOPIC BOOM.

ALL MAINTENANCE OPERATIONS CAN BE CARRIED OUT WITH ORDINARY TOOLS THAT COMPLY WITH THE SAFETY RULES.

IMPORTANT

CAREFULLY CHECK THE CONDITIONS OF THE ELECTRIC CONDUCTORS OF THE BASKET CONNECTION WITH THE TURNTABLE. GIVEN THE IMPORTANCE OF SAFETY IN THE OPERATION, WE SUGGEST TO REPLACE THESE CONDUCTORS EVERY 2000 WORKING – HOURS.

25.3 Maintenance programme

Important:: After having carried out any kind of control/maintenance, and before putting the machine back into service, please carry out the control and maintenance operations foreseen “every day”.

INTERVALS	OPERATIONS	NOTES	BY
Every day before putting into operation	Check through repeated tests, without any person in the basket, the good functioning of all safety and emergency devices; in particular, be extremely mindful to: boom limiting device (if any) emergency stop buttons boom/outriggers locking systems controls and warning lights the batteries charge hydraulic oil and fuel tank levels interlock rotation for stabilisation in home position MOREOVER, MAKE SURE THAT: pin locking systems (plugs, collects, etc.) are perfectly efficient and in good condition • * instruction and safety plates can be perfectly read there are no hydraulic leaks, loose electric connections, collision signs, friction, etc.		A Platform driver
Every 50 hours of work	Check oil level in the motors. Make sure that the following components are sufficiently clean: diesel pre-filter engine air filter machine (in particular, inspect tightness of connections and hoses); take the opportunity to inspect the condition of tyres, cables, all accessories and tools. Check hydraulic oil filter saturation.		A Platform driver
Every month (~ 120 hours)	Perform a complete cycle of cleaning and greasing as indicated in the INTRODUCTION to this MAINTENANCE paragraph. Perform inspection and lubrication as indicated in the attached figure 050. Please check the lubrication conditions of the disengagement chains/ cables of the boom and proceed with the greasing of the chains/ cables transmission rollers (if any).	After the first 150 hours, replace hydraulic system oil filter cartridges	A Platform driver

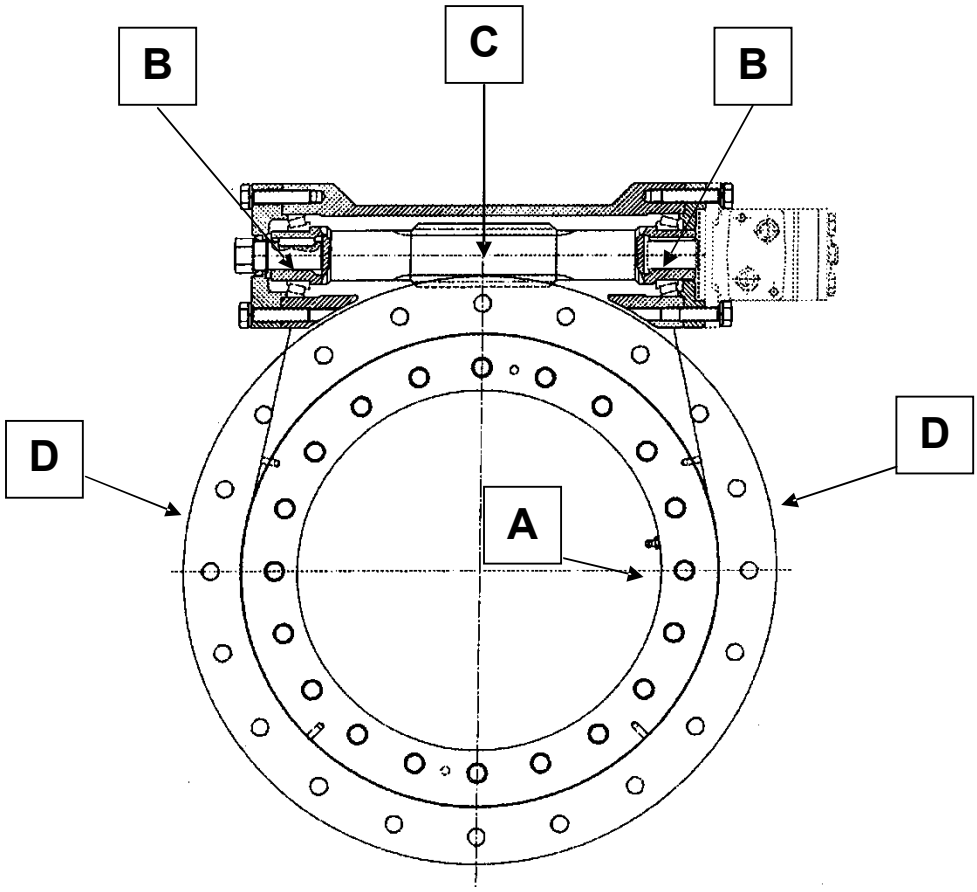
VERIFY THE PRESENCE OF
RUST THAT MIGHT
HIGHLIGHT IMPACTS, CRACKS OR OTHER
PHENOMENA REQUIRING INTERVENTION

Important: After having carried out any kind of check/maintenance, before putting the machine back into service, carry out the checks and maintenance operations envisaged under the “every day” periodic maintenance.

INTERVALS	OPERATIONS	NOTES	BY
Every 3 months (~ 360 hours)	Inspect main fixing tightening parts: thrust bearing nuts and bolts gearbox nuts and bolts truck-frame nuts and bolts pin collects. Perform inspection and lubrication as indicated in Figure 051. Replace hydraulic system oil filter cartridges and inspect locking valves. N.B. If tightening of thrust bearing screws is not correct, it is necessary to replace the screws at our authorised service shops.	In this regard, see fastening torques in chapter 3 In this regard, see “INSTRUCTIONS FOR HYDRAULIC SYSTEM MAINTENANCE”	A Platform operator and/or person in charge of safety from the owner company + B authorised service or CELA workshops
Every 6 months (~ 750 hours)	Perform a complete inspection of the machine and write down your findings onto the special sheets herewith attached in the “INSPECTION REGISTER”.		A Platform driver + Person in charge of safety from the owner company
Every year (~ 1500 hours)	Replace all the oil in the hydraulic system .	See “INSTRUCTIONS HYDRAULIC SYSTEM MAINTENANCE”	A Platform driver + Person in charge of safety from the owner company + B Authorised service shops or CELA company
Every 1-3 years (1500-4500 hours)	COMPLETE INSPECTION	N.B. For authorized platforms at increased load capacity the period is reduce every 1-2 years (1000-3000 h) and the complete overhaul every 6-7 years (9000-10000 h)	B Authorised service shops or CELA company
(~ 15000 hours) or ten years	COMPLETE OVERHAUL		B Authorised service shops or CELA company


Jib extendable boom body.
Check the conditions of the electric and hydraulic conductors in the chain
Main boom body

25.4 Fifth wheel rotation unit greasing/lubrication with worm

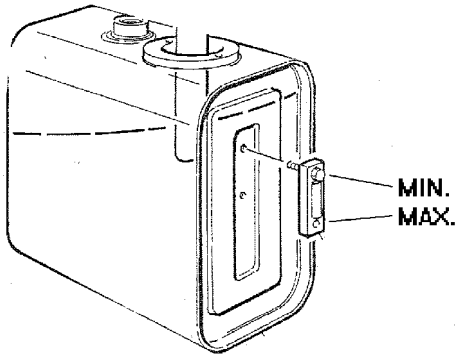


A – BALL BEARINGS – NILS NILEX EP1 (VIA LUBRICATORS)
B – BEARINGS - NILS NILEX EP1 (VIA LUBRICATORS)
C – WORM GEAR - NILS NILEX EP1 (VIA LUBRICATORS)
D – EXTERNAL TEETH – NILS NILEX EP1 (USING BRUSH)

25.5 Hydraulic oil level verification

You have to check that the hydraulic oil level in the tank is between the minimum and maximum values like in picture 1. The verification has to be made when the machine is closed and in position of transport (even the outriggers) and when the vehicle is on a ground floor. In case of oil lack you have to make the topping up with an oil that has the characteristics on page 4.4. 4.4.

FIG.1



25.6 Delivery oil filter cartridge replacement

The delivery oil filter is near the control outriggers group (pic.2).
For a correct filter cleaning you have to replace the filter cartridge because it's not washable (made of microfibre).
For the replacement operation you have to proceed in this way:

- clean the filter external body
- screw out the lower part of the filter and extract the inside cartridge (before this operation put under the filter a container to gather the oil on the inside of the filter)
- -insert the new cartridge and retighten the lower part of the filter

25.7 Cylinder stop valves seal inspection

Every three months check the seal of the stop valves on the cylinders in this way:

Outriggers stop valves operation check

1) Press outriggers to the ground.
2) Disengage the vehicle's PTO.
3) Keep the truck turned on as to continue to electrically feed the controls.
4) Move lifting control levers and make sure that they do not move.
5) Switch off the truck, wait for it to settle for a few minutes and mark the extension position of the outriggers.
6) Check after 10 minutes that there was no settlement (retraction of the outriggers).
7) Carry out the same grip test/check with the outriggers completely retracted.

Stop valves operation test on the cylinders of the superstructure

1) Partially lift the booms from the transport position, with the maximum allowed load in the basket (only use a load of material, do not perform the test with people in the basket).
2) Disengage the vehicle's PTO.
3) Keep the truck turned on as to continue to electrically feed the controls.
4) Operate on the interested controls and check that the cylinders do not make any movement
5) Switch off the truck waiting for it to settle for few minutes and mark the extension position of the various cylinders.
6) Check after 10 minutes that there was no settlement (retraction of the cylinders).

NOTE: If you detect any settling contact an authorised workshop immediately to carry out further thorough checks and any repairs.

25.8 Rigid and flexible fittings and pipes inspection

During the normal maintenance you have to control all the pipe fittings and the different hydraulic junctions of the machine to find irregularities.
The control of the pipe fittings has to be made by checking no oil is dripping and also by checking the correct clamping (if on the pipe-fitting there is a seal, if necessary, replace it).
For the flexible pipes check with attention the junction pipe/pressed pipe-fitting and the general condition of the flexible pipe (it doesn't have early aging signs, cracks, swellings or abrasions that can compromise the seal).
For the replacement of any pipes follow this instructions:

1. Turn the engine off.
2. Operate, many times, control levers (motor turned off) in order to eliminate pressure within the circuits.
3. If these hoses are under the tank, a suction phenomenon by discharge filters could occur; therefore, if necessary, disconnect hoses connected to return filters.
4. If you have to replace an induction pipe from the tank, you have to stop the exit of the oil from the tank.
5. Always proceed very carefully while removing the part to be replaced.
6. Use always original pipes/spares

After having replaced the required parts, eliminate air which has entered into the circuit by moving the various jacks at end stroke.

ATTENTION!!! PIPES-ELECTRIC CABLES

The flexible pipes and the electric cables that slide on the inside of the cable holder chains are components that can be subject to wear and they have frequently be controlled to avoid damages risks with also a stopping machine.
You have to control their correct clamping to the extremities of the cable holder chain, their external wear condition and their correct position and tension (on the inside of the cable holder chain there can't be trusses and discharge of pipes and cables).
Note: If the cable holder chain is on the inside of the boom it can be made a visual control with a portable light from the back boom opening (you have to remove the cover lock up and make attention to the cable holder chain during the extension of the boom).

25.9 SYSTEMS/ELECTRIC COMPONENTS

Check every 100 hours/one month of working the preservation state of the components and of the electric harness (control with attention the cables and the different plugs/tap). Check that the cables do not have impact signs/rubbings or superficial wears and that they are correctly fixed in their original position.
You have also to check the integrity of the different electric boxes and verify the correct water tightness of the covers and of the pipe fittings for the entry of the electric cables (to avoid dangerous water infiltrations).
For the machines having the electrohydraulic joint on the inside of the turret (machines with a continuous rotation of the turret) verify the integrity of its inside electric connections (brushes and sliding links) and lubricate them every month with adequate antioxidant product (antioxidant spray for electric contacts).

25.10 STRUCTURE INSPECTION

The complete control and the structure inspection of the platform has to be made every 1500/2000 working hours if it's possible by the expert personnel and authorised by the constructor to check the general condition of the machine.
To make this control follow this instructions:

- accurately wash/clean the entire machine
- visually inspect the entire structure of the machine (also the connection frame to the vehicle) with particular attention to the welding and to the points of rust/oxidation to find weakening signs
- if you find flaws/cracks or if in doubt, immediately contact an authorised repair shop for more in-depth checks and find solutions

25.11 Fifth wheel bolts tightness inspection

The control of the correct bolts and nuts clamping used on the platform has to be made every 300/600 working hours, if it's possible, by the expert personnel to find settlements or loosening.
You have to control the clamping of all the bolts and nuts that are on the machine (through dynamometric key with the aid of the values clamping chart below). Give attention to the follow critical points:

- clamping to the vehicle frame
- basket clamping
- clamping flanged valve on cylinder
- clamping thrust bearing/turret/frame
- clamping system for pin blocking
- outriggers clamping

ATTENTION!!!
During the controls/new clamping do not use the screws that are already at a yield/extended because they do not guarantee the correct seal characteristics.
If you find a loose clamping, in particular of the critical clamping points, replace the screw (use always original spares given by the constructor).

NUTS AND BOLTS TIGHTENING COUPLE TABLE Nm

Rated diameter (mm)	BOLT CLASS		
	8.8	10.9	12.9
5	5	7	8
6	8	12	14
8	20	29	35
10	40	60	70
12	70	100	120
14	110	160	190
16	170	250	300
18	240	350	410
20	340	500	580
22	460	680	800
24	580	860	1000
27	860	1270	1490
30	1170	1720	2010
33	1590	2340	2740
36	2040	3000	3520
39	2660	3900	4570

Precision tightening C μ= 0,15 Law E25-030 Afnor 84162
(10Nm $\cong$ 1 Kgm

TABLE OF PIPE-FITTING/PIPES TIGHTENING TORQUE

PIPE FITTING/PIPE 24° - DIN3861

T ∅EST PIPE		F THREAD	TIGHTENING COUPLE
SERIES	SP		N.m
LIGHT (L)	6	12 x 1.5	13 - 15
	8	14 x 1.5	15 – 18
	10	16 x 1.5	25 – 28
	12	18 x 1.5	27 – 30
	15	22 x 1.5	50 - 60
	18	26 x 1.5	60 – 75
	22	30 x 2	85 – 105
	28	36 x 2	120 - 140
HEAVY (S)	6	14 x 1.5	14 – 16
	8	16 x 1.5	25 – 28
	10	18 x 1.5	27 – 30
	12	20 x 1.5	43 – 54
	14	22 x 1.5	50 – 62
	16	24 x 1.5	60 – 75
	20	30 x 2	90 – 110
	25	36 x 2	125 - 145

PIPE-FITTING/PIPE 60°-BSP

T ∅EST PIPE		F THREAD	TIGHTENING COUPLE
mm	IN.		N.m
5	3/16	1/8	12 - 14
6	¼	1/4	14 - 16
10	3/8	3/8	25 – 28
12	½	1/2	45 – 60
16	5/8	5/8	55 – 70
20	3/4	3/4	90 – 110
25	1”	1”	120 – 140
32	1”1/4	1”1/4	170 – 190
38	1”1/2	1”1/2	200 - 245

25.12 System emptying and tank filling

If it is necessary to empty the equipment, you have to completely remove used oil to avoid mixing it with the new oil. Intake must be carried out starting from the equipment's lowest part; intake should be carried out when oil is hot.
The oil for refilling the equipment should be poured into the tank through a 25 micron filter. Oil must be clean and devoid of any foreign substance which could cause anomalies and early wears to the equipment; moreover, oil must correspond to specifications indicated.

25.12.1 Procedure to be followed in case of any breakdown/seizure of the pump

Under these conditions there is a risk of polluting the whole system. As a matter of fact, a breakdown in this equipment is always characterised by quite an abrasive dust which can cause serious damages to the remaining systems. You have to release tank oil, wash and clean: valves, users, hoses and tank.
Moreover, it is necessary to check if cylinders show wear.
Replace all the filters and fit provisional 25 micron filters on each return hose.
Let the equipment work for 40/50 hours approx. before removing provisional filters and refilling tank with new oil.

25.13 GREASING OF THE HINGED PINS

The hinged pins have to be lubricated with right lubricators.
For the kind of grease see paragraph 2-Products to use.

25.14 Sliding blocks greasing

To lubricate the sliding blocks you have to strew the sliding parts of the different booms with a right lubricator/grease (see paragraph 2 –Products to use) in the contact zone of the sliding blocks.
Perform some vacuum extension/retraction operations after having finished the clamping operation, to obtain the correct lubrication distribution on the sliding parts.

25.15 Inspection/adjustment of the sliding blocks of the telescopic booms

Regularly check the wear condition (and make the adjustment when necessary) of the sliding blocks of the telescopic booms.
The lateral sliding blocks are generally adjustable from the outside through a system with screw/adjustment register. The correct adjustment can't be very narrow (to avoid an early damage) and not very slow (to avoid a side clearance). We advise you to maintain a maximum allowance between sliding block and boom of 0.5mm.
The upper and lower sliding blocks are not adjustable from the outside. To control the wear condition and a new adjustment contact an authorised workshop because it is necessary to dismantle the parts.
In any case you can check their wear controlling the thickness. The head of the screws or of the backstops can't protrude from the upper surface of the sliding block. We advise you to maintain a minimum projection of the sliding block of 3 mm compared to the clamping systems.

25.16 Controls

Check that all controls (hydraulic, electric and electronic) are working properly, that the levers go back to zero properly, the graduality of the manoeuvres and relative operative speeds. If there is an anomalous working go as soon as possible to an authorized assistance point.

25.17 Troubleshooting - causes - malfunction solution

Troubles	Possible causes	Hypothesis for intervention
INSUFFICIENT PRESSURE or pressure gradient in comparison to the level required in the circuit	1. max pressure valve half-open 2. pump defect 3. extreme inner leaks 4. extreme loading loss	1. a) for too low calibration pressure b) for wearing out of tightening seats c) for dirt under seats d) for spring breakdown 2. see points 5 ÷ 11 3. a) worn collects in the cylinders or in the hydraulic motors b) distributor and valves wearing c) not enough viscous oil 4. a) too viscous oil b) oil pass - through not adequately shaped c) oil pass-through partially obstructed
PUMP DEFECT for lack of power or for power extremely below normal values	5. throttled intake 6. air inlet 7. hermetically sealed tank 8. defective working 9. too viscous oil 10. inner breakdowns in the pump 11. the pump shows too much wearing	5. a) too small or obstructed intake filter b) obstructed intake hose c) too little or crooked hose 6. a) in the tank intake take-off b) in intake connections c) in the seal of the pump shaft d) for intake of foamy oil 7. air bleed in the obstructed tank 8. a) check coupling b) too high or too low speed 9. see indications for the pump 10.a) broken inner gaskets b) pasted blades, plates or pistons c) untightened pump head d) broken inner parts which should be replaced 11. pump to be replaced
PUMP NOISY abnormally (for instance some gear pump are always a little bit noisy)	12. SPECIFICATION OF CONTROLS, MAIN FEATURES, PERFORMANCES, 13. air inlets 14 inner wearing 15. system vibrations	12. a) throttled intake: see point 5 b) excessive viscosity: see point 9 13. see point 6 14. excessive clearance in supports and plates 15. defective installation, resonance, etc.

Troubles	Possible causes	Hypothesis for intervention
OVERHEATING i.e. rising of oil temperature above prudential limit of 60°-70°	16. too high maximum pressure 17. power is uselessly engaged 18. extreme inner leaks 19. extreme loading loss 20. 21. insufficient cooling 22. extreme friction	16. excessive valve calibration 17. a) insufficient exclusion valve b) malfunctioning short-circuit at cycle end c) hydraulic circuit to be modified 18. see point 3 19. see point 4 20. increase oil tank capacity 21. a) add artificial cooling b) refrigerants, if any, not effective 22. a) defective pump inner fitting b) lack of lubrication when required c) use of not enough lubricating oil
INCORRECT MOVEMENTS of hydraulically operated elements in comparison to the required cycled	23. air in the circuit 24. valves locked 25. cylinders locked 26. extreme loading loss 27. varying accumulator pressure	23. a) let air bubbles off at the top b) eliminate air leaks: see point 6 24. a) valves locked, while closing, by rubber or other materials b) valves half-open because of dirt 25. a) cylinder inner incorrect mounting b) normal axle loading not permitted c) seizing of connecting pins 26. see point 4 27. a) insufficient accumulator capacity b) circuit greater demand because of inner leaks
EXTREME WEARING i.e. excessively fast in comparison to working period	28. oil containing abrasive substances 29. insufficient lubrication 30. high working pressure 31. defective coupling	28. a) too old oil b) filters not efficient 29. a) poor quality oil b) too fluid oil at working temperature 30. in comparison to the allowed max. pressure for pump and valves 31. abnormal strain on shafts and stems

25.18 Components

Parts/breakdown	Cause	Remedial measures
Noisy power take off	Driving with power take off applied. Working wearing.	Overhaul or total replacing.
Free power take off	Air switch breakage or air lack in the truck.	Replacement
Noisy truck pump	Lack of oil or breakage of key or of take off connecting joint	Oil refilling or replacing
Stab. insufficient oil pressure	Make sure that the arm is in non-working position and that micro-switch is depressed. Exchanger not stimulated Stab. insufficient oil pressure Nylon pin (hydraulic switch) broken down. Broken truck pump. Filter obstructed. Non-return valve open. Dirty max. exchanger valve, stabilisation distributor.	Check every single part. Clean or replace, if necessary.
Turret controls out of order	Stabilisation has not occurred. Exchange heart-basket control not switch (See electric system manual)	Check Stab. micro-switches (4) and axle micro-switch
Basket controls out of order	(See electric system manual)	
Insufficient oil pressure turret distributor	Dirty distribution max. valve. Exchanger not stimulated Arm holder microswitch broken down.	Inspection of turret panel fuses Replacing of parts (See electric system manual)
Insufficient 230 Volt oil pump pressure	Broken pump or dirty non-return truck pump valve	Clean and/or replace
Emergency stoppage for Edi System	Lack of current Coil burnt out	Check cable from frame to truck cabin Replacement
Pantograph lowering oscillation	Turret accumulator	Replacement
Potentiometer lever: it does not come back to the regular position.	Wearing of the spring	Replacement
Basket rotation out of order	Dirty electrovalve or faulty control button.	Replacement
Basket rotation and levelling out of order	Blocked electrovalve or out of order	Cleaning or replacement
Excessive rotation clearance with machine still	Loosened fixing screws	Adjust fixing plate of the gearbox and tighten screws

25.19 TRACING OF A BREAKDOWN

a. If upon engaging the PTO the engine switches off check that the emergency mushroom button is not engaged

b. The outriggers do not work:
- Check the outrigger/boom selector key is positioned properly
- Check the lifting boom is resting on the special support properly

c. Boom operation failure:
- Check that the positioned machine consent indicator light is switched on
- If the indicator light does not switch on check that the outriggers are positioned on the ground completely and that the tracks are lifted from the ground
- Check the outrigger/boom selector key is positioned properly
- Check that the hand wheel on the proportional distributor is not completely tightened

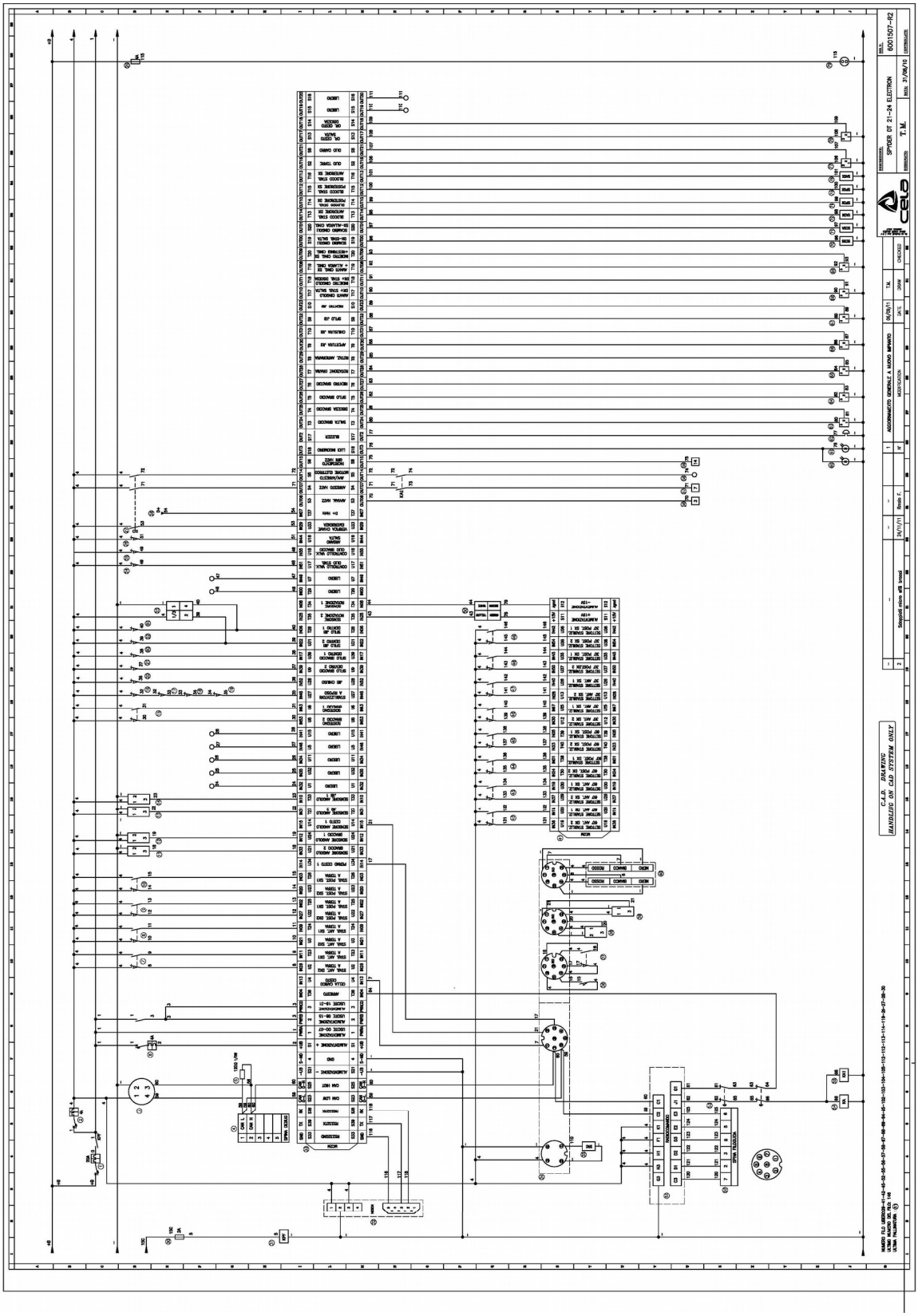
d. The basket or turret controls do not work:
- Check the outrigger/boom selector key is positioned properly
- Check that the turret/basket controls switch key is positioned properly or that the door is closed (where applicable)

e. Motor pump unit operation failure:
- Check there is mains supply and that the plug is connected
- Check that the magnetothermic switch is engaged
- Check that the motor-overload protection switch is in position "1"
- Check that the vehicle PTO is not engaged
- Check the efficiency of all fuses in the main electric panel

f. The main boom does not lower or does not extend:
- Check that the green maximum extraction limit indicator light is on; otherwise retract with the extensions or ascend with the boom

g. The emergency manual pump boom controls do not work:
- Check that the hand wheel fitted on the proportional distributor is not completely tightened

26 WIRING DIAGRAM NO. 6001507-R2



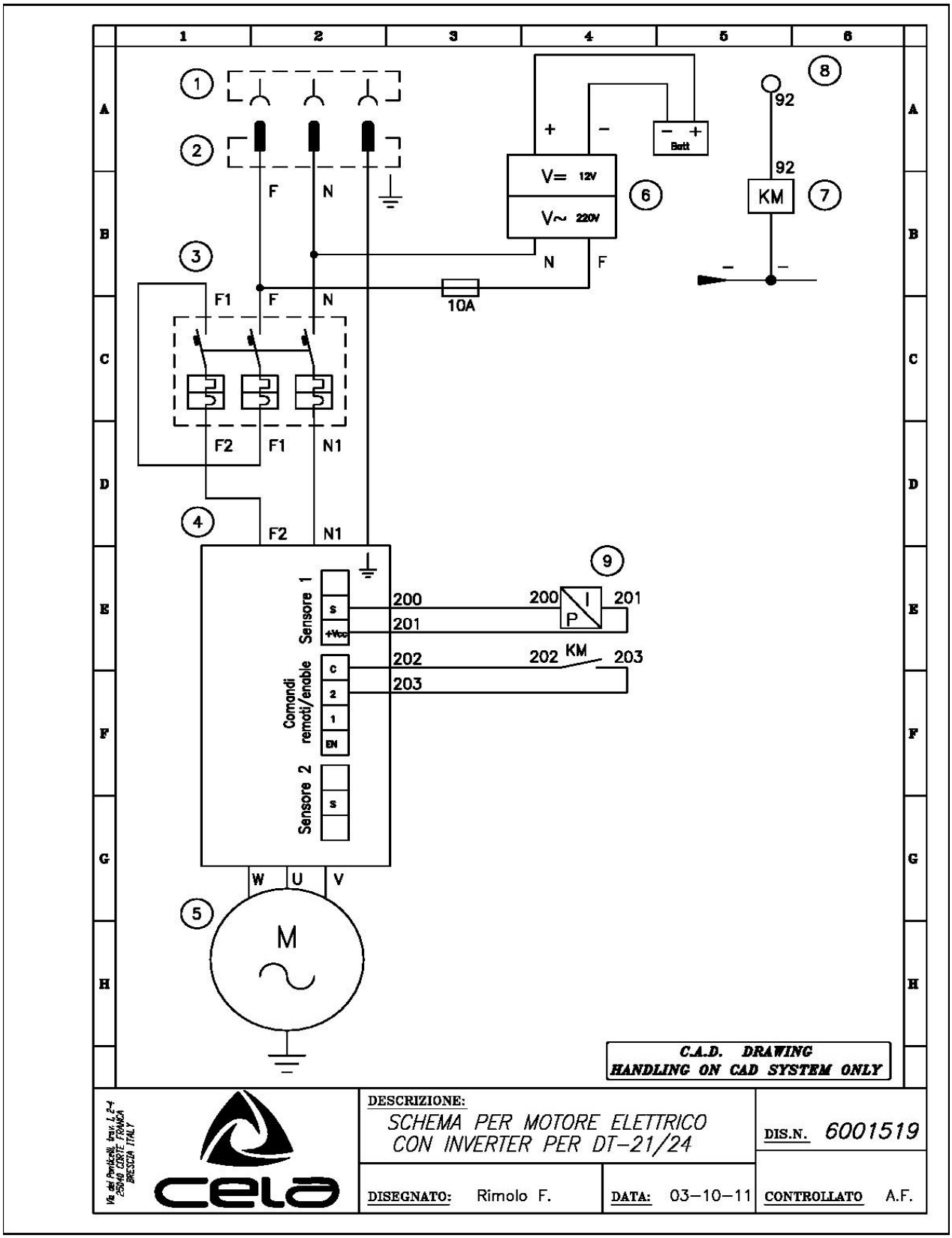
26.1 Description of wiring diagram No. 6001507-R2

NO.	DESCRIPTION	CODE
1	Automatic switch 20A	
2	Automatic switch 4A	
3	Truck level sensor	
4	Debug plug	
5	Can termination resistance	
6	Fuse 4A	
7	Front right outrigger on ground microswitch	
8	Front left outrigger on ground microswitch	
9	Right rear outrigger on ground microswitch	
10	Left rear outrigger on ground microswitch	
11	Sensor boom 2 angle	
12	Sensor boom 1 angle	
13	Sensor jib 2 angle	
14	Sensor jib 1 angle	
15	Boom support microswitch	
16	Outriggers at rest microswitch	
17	Outriggers at rest microswitch	
18	Outriggers at rest microswitch	
19	Outriggers at rest microswitch	
20	Jib closed microswitch	
21	Inside boom extraction microswitch-1	
22	Inside jib extraction microswitch-1 (for DT21)	
23	Jib extraction sensor (for DT24)	
24	Outrigger oil valve check microswitch	
25	Boom oil valve check microswitch	
26	Ascent winch microswitch	
27	Emergency key check microswitch	
28	Hatz alternator signal	
29	Fuse 4 A	
30	Fuse 2A	
31	PTO engaged relay	
32	Modem	
33	Electronic panel	
34	Basket controls panel	
35	Oil exchange directional valve basket orientation-levelling	
36	End run centred basket	
37	End run basket fastening pin	
38	End run basket angle 2	
39	End run basket angle 1	

NO.	DESCRIPTION	CODE
40	Loading cell to basket	
41	Electronic panel	
42	Front right outrigger 60° sector microswitch	
43	Front left outrigger 60° sector microswitch	
44	Rear right outrigger 60° sector microswitch	
45	Rear left outrigger 60° sector microswitch	
46	Front right outrigger 30° sector microswitch	
47	Front left outrigger 30° sector microswitch	
48	Rear right outrigger 30° sector microswitch	
49	Rear left outrigger 30° sector microswitch	
50	+15V -15V power supply	
51	Radio control	
52	Wire-guided plug	
53	Ground stop button	
54	Stop relay	
55	Emergency relay	
56	Hatz engine start-up	
57	Hatz engine stop	
58	Electric motor stop	
59	Hatz revolutions increase	
60	Clearance lights	
61	Clearance lights	
62	Buzzer	
63	Boom ascent descent directional valve	
64	Boom extension/retraction directional valve	
65	Clockwise-counterclockwise rotation electric distribution	
66	Jib opening closure directional valve	
67	Jib extension retraction directional valve	
68	Right track forward/backward - outrigger ascent/descent electric distributor	
69	Left track forward/backward - track widen/narrow electric distributor	
70	Ascent outriggers - right track exchange electric distributor	
71	Tracks widen left track exchange electric distributor	
72	Front right outrigger locking directional valve	
73	Rear right outrigger locking directional valve	
74	Rear left outrigger locking directional valve	
75	Front left outrigger locking directional valve	
76	Turret oil-truck oil electric distributor	
77	Basket orientation ascent - descent electric distributor	
78	Basket rotation sequence	
79	Basket power socket	

NO.	DESCRIPTION	CODE
80	Inside boom extraction microswitch-2	
81	Inside jib extraction microswitch (for DT21)-2	

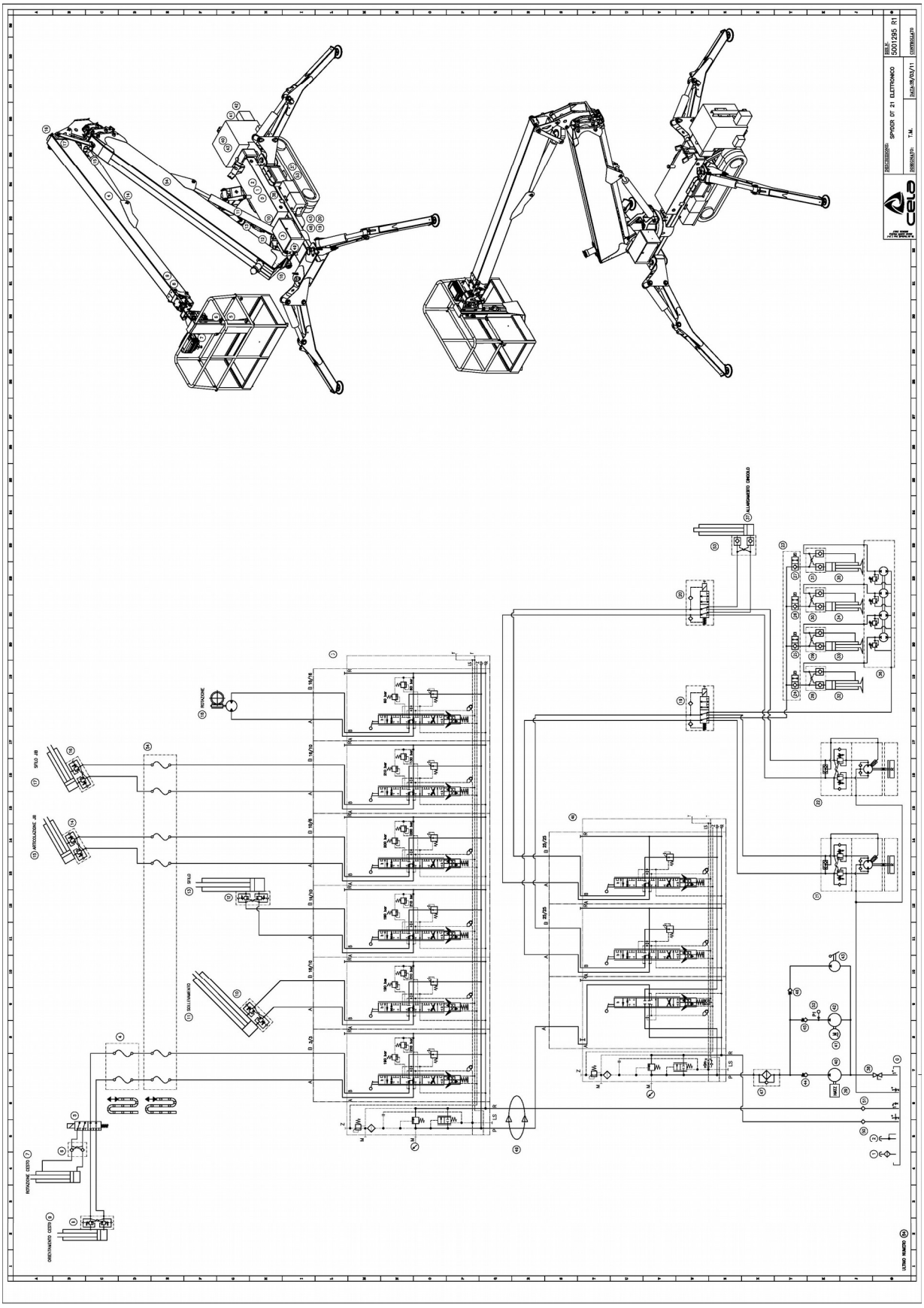
26.2 Description of wiring diagram No. 6001519



26.3 Description of wiring diagram No. 6001519

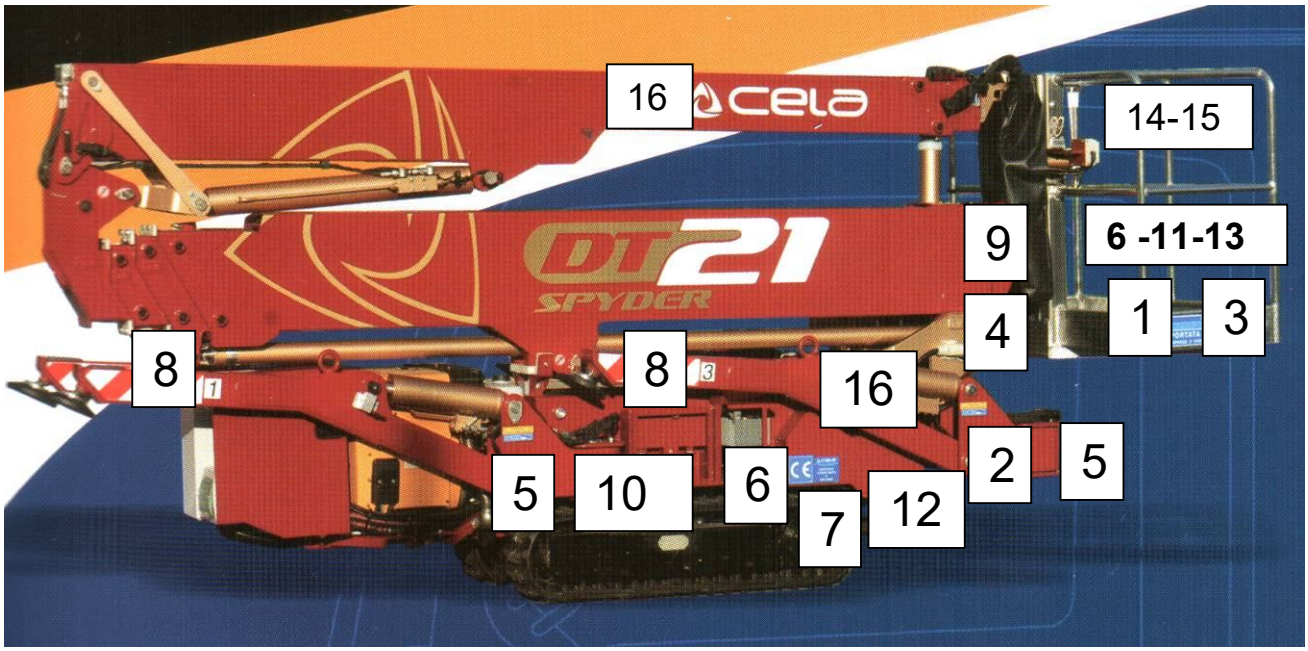
NO.	DESCRIPTION	CODE
1	220 V socket	
2	220 V plug	
3	16 A overload protector	
4	Electric pump inverter	
5	Electric pump motor	
6	Battery charger	
7	Electric pump starter relay	
8	To the electric pump supply wire	
9	Electric pump control pressure switch	

27 WIRING DIAGRAM NO. 5001295-R1

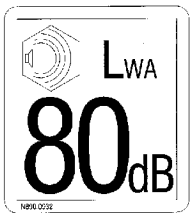
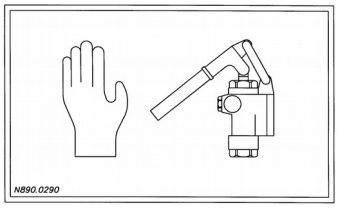
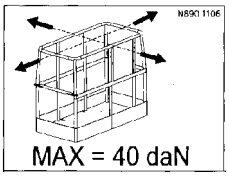
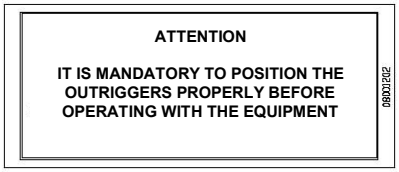
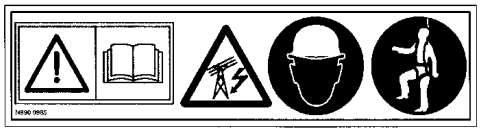
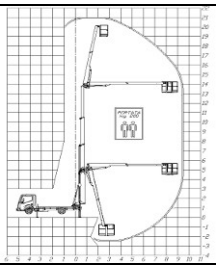
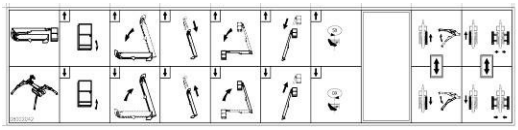


28 MARKING

THIS CHAPTER CONTAINS MACHINE IDENTIFICATION, SAFETY AND UTILISATION INSTRUCTION PLATES. IT IS COMPULSORY TO CHECK IF THESE PLATES ARE INTEGRAL AND CLEAR. Following updates, some drawings, colours or text expressions could be modified; however, the meaning of the message remains unchanged.



1	
2	 08001199 Max outrigger specific pressure daN/cm2
3	 ATTENZIONE ! MAXIMUM CAPACITY 200 kg
4	
5	 ATTENTION OUTRIGGERS EXTENSION
7	 08001245 ADESIVO 110X110 mm.
8	 N890.1255 MAX 3200 daN (12 daN/cm²)

9	
10	
11	
12	
13	
14	
15	
16	

29 INSPECTIONS REGISTER

REFERENCE REGULATIONS

This inspection register is given by Messrs. CELA to the user of this platform, in compliance with 2006/42/EC Directive.

PRESERVATION INSTRUCTIONS

This register is to be considered an integral part of the platform and should accompany this equipment during its whole working life up to final scrapping.

ATTENTION!!!!!!
According to the regulation 2006/42/EC together with this register also the certificates of the replaced components must be recorded (motor, mechanisms, structural elements, safety devices and as well as the dedicated components) as well as the reports of important repairs.

COMPILATION INSTRUCTIONS

The following instructions are given according to provisions known at the date of the lifter's placement on the market. New provisions could modify the user's obligations.

IMP.: THE FREQUENCY AND IMPORTANCE OF THE TESTS MAY ALSO DEPEND ON THE NATIONAL REGULATIONS.

This register has been conceived to write down, according to proposed charts, the following events related to the useful life of the machine:

- periodic inspections (Max every six months) to be carried out by the person in charge of safety at the company which owns the platform
- Transfer of ownership
- replacement of motor, mechanisms, structural components, safety devices and relevant components
- breakdowns of some importance and appropriate repairs

29.1 Periodic inspections

Inspection date	Date of next inspection	Name of inspector	Comments	Signature

DELIVERY OF ..... TO THE FIRST OWNER

This platform, serial number....., manufactured in .....
as indicated in this inspection register, was delivered by CELA, on..... to:
.....
.....
.....
according to the conditions set forth by the agreement, with technical, dimension and functional specifications indicated in the instruction manual and in the summary contained in this Register.

MESSRS.

SUBSEQUENT TRANSFERS OF TITLE

On ..... title of the platform in question was transferred to :
.....
.....
.....
We certify that, on the above mentioned date, technical, dimension and functional specifications of the lifter in question are in accordance to original specifications and that changes, if any, have been written down in this Register.

The Seller The Buyer

....

SUBSEQUENT TRANSFERS OF TITLE

On ..... title of the platform in question was transferred to :
.....
.....
.....
We certify that, on the above mentioned date, technical, dimension and functional specifications of the lifter in question are in accordance to original specifications and that changes, if any, have been written down in this Register.

The Seller The Buyer

....

REPLACEMENT OF STRUCTURAL COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
.....
.....
.....

The person in charge of the replacement The user
....

REPLACEMENT OF STRUCTURAL COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
.....
.....
.....

The person in charge of the replacement The user
....

REPLACEMENT OF STRUCTURAL COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
.....
.....
.....

The person in charge of the replacement The user
....

REPLACEMENT OF MECHANISMS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
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.....

The person in charge of the replacement The user
....

REPLACEMENT OF MECHANISMS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
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.....

The person in charge of the replacement The user
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REPLACEMENT OF MECHANISMS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
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.....

The person in charge of the replacement The user
....

REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
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The person in charge of the replacement The user
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REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
.....
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.....

The person in charge of the replacement The user
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REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

Date: .....
component description
.....
manufacturer: ..... supplied by: .....
reason for the replacement:
.....
.....
.....

The person in charge of the replacement The user
....

30 PERSONNEL TRAINING SHEET

(TO BE COMPULSORILY COMPILED AFTER EVERY SINGLE CHANGE OF USE)

DATE	TRAINING PERSONNEL			TRAINED PERSONNEL			NOTES
	NAME	FUNCTION	SIGNATURE	NAME	FUNCTION	SIGNATURE	