

Valid for models:

PM 15521

PM 15522 - PM 15522 LC

PM 15523 - PM 15523 LC

PM 15524 - PM 15524 LC

PM 15525

SERIE 15.5

- G129 -

INSTRUCTION AND WARNINGS

Valid with the serial number

G.129.0001

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Original instructions in English

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1.1 - Purpose of the manual

The instructions manual contains information which is essential for the correct use of the crane (1) (hereinafter also referred to as the machine).

Its purpose is to inform the operator (2) of the instructions to follow and the fundamental criteria to apply in all machine use or maintenance operations.

Before starting up the machine for the first time, the operator must have read and understood the instructions contained in this manual, in particular those highlighted with the various symbols.

The manual is an integral part of the machine and must be kept, for future reference, until the machine is scrapped.

If the machine is resold, the seller is bound to provide the new owner with the manual.

The information contained herein is arranged in chapters, in a sequential order according to subject matter.

The indexes, both alphabetic or analytic, allow the user to refer to the different subjects quickly and easily.

The original instructions are supplied by the manufacturer in english language.

To fulfil legal or commercial requirements, the original instructions may be supplied by the manufacturer in other languages.

It is strictly forbidden to use the manual for anything other than the machine's use and maintenance.

1.2 - Manufacturer's details and machine identification data

- Manufacturer's details

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(1) The term "crane" refers to the trade name given to the machine (from the crane series) stated on the title page.

(2) The term "operator(s)" refers to the person(s) possessing the necessary expertise to use, inspect and carry out routine maintenance on the machine.

- Machine identification data

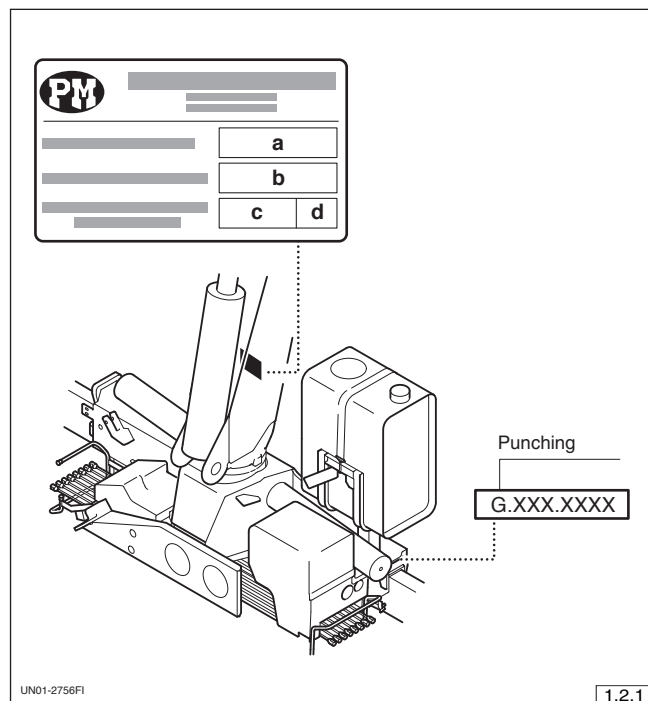


Plate details

- a** = Crane model
- b** = Serial number
- c** = Year of manufacture
- d** = Conformity "CE" stamp

1.3 - Symbology

The symbols used in this manual are intended to highlight potentially hazardous operations.

To guarantee safe working conditions, the instructions highlighted by these symbols must always be followed.



HAZARD !

This indicates information or procedures which, if not complied with exactly, cause death or serious injuries.



WARNING !

This indicates information or procedures which, if not complied with exactly, could cause death or serious injuries.



CAUTION !

This indicates information or procedures which, if not complied with exactly, could cause slight injuries or damage to the machine.



Information

This indicates useful and important information or procedures.



WARNING !

For the sake of clarity when outlining procedures to carry out, some illustrations show the machine with the guards, casings or panels removed.

Never use the machine without all the casings and guards in place.

1.4 - Technical service

Technical service requests must be addressed to the manufacturer's Technical Assistance Service (T.A.S.) or to the nearest Authorised Workshop.

1.5 - Enclosed documentation

- "EC" conformity declaration
- Warranty booklet
- Machine certificate of origin (only for markets requiring it).

1.6 - Disclaimer

The manufacturer cannot be held responsible for any occurrence arising from the following:

- total or partial failure to comply with instructions herein;
- misuse of the machine;
- unauthorised alterations or work carried out on the machine;
- failure to comply with the highway code and regulations concerning transportation when moving the machine from one site to another;
- lack of maintenance;
- use of non-original spare parts or those which are not designed specifically for the model;
- exceptional weather conditions.

2.1 - Description of the crane

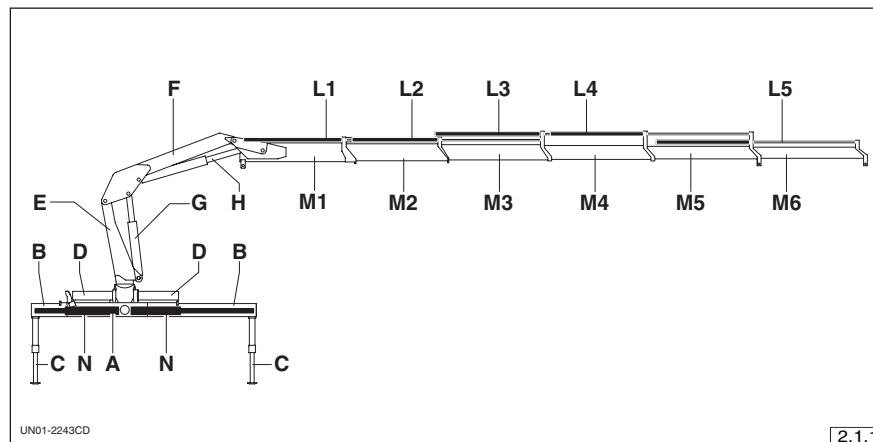
The crane is composed of a base inside which there is a rotating column with a system of articulated arms at its end.

The crane is driven by hydraulic energy generated by a motor and a pump.

This crane series is available in various models, which differ mostly in the number of extendable arms.

There is also the LC version, which has a shorter secondary arm.

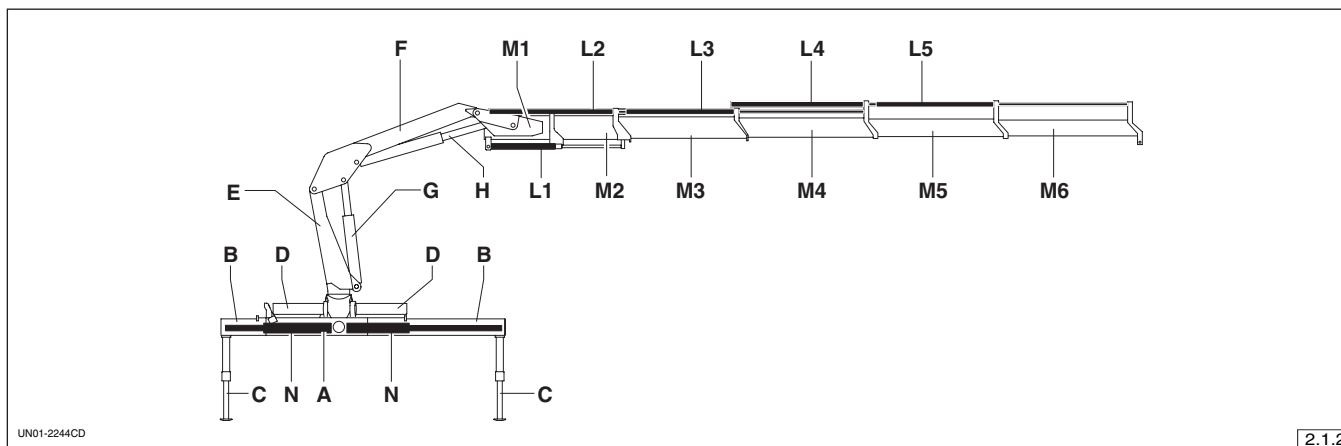
2.1.1 - Basic crane main parts



Key to the main parts

Ref.	Part	15521	15522	15523	15524	15525
A	Base	•	•	•	•	•
B	Stabiliser arm	•	•	•	•	•
C	Stabiliser jack	•	•	•	•	•
D	Rotation jack	•	•	•	•	•
E	Column	•	•	•	•	•
F	Main arm	•	•	•	•	•
G	Main jack	•	•	•	•	•
H	Secondary jack	•	•	•	•	•
L1	1st arm extension jack	•	•	•	•	•
L2	2nd arm extension jack		•	•	•	•
L3	3rd arm extension jack			•	•	•
L4	4th arm extension jack				•	•
L5	5th arm extension jack					•
M1	Secondary arm	•	•	•	•	•
M2	1st hydraulic extension arm	•	•	•	•	•
M3	2nd hydraulic extension arm		•	•	•	•
M4	3rd hydraulic extension arm			•	•	•
M5	4th hydraulic extension arm				•	•
M6	5th hydraulic extension arm					•
N	Stabiliser arm extension jack	•	•	•	•	•

2.1.2 - Basic crane LC main parts



Key to the main parts - basic crane LC

Ref.	Part	15522 LC	15523 LC	15524 LC
A	Base	•	•	•
B	Stabiliser arm	•	•	•
C	Stabiliser jack	•	•	•
D	Rotation jack	•	•	•
E	Column	•	•	•
F	Main arm	•	•	•
G	Main jack	•	•	•
H	Secondary jack	•	•	•

Ref.	Part	15522 LC	15523 LC	15524 LC
L1	Secondary arm extension jack	•	•	•
L2	1st arm extension jack	•	•	•
L3	2nd arm extension jack		•	•
L4	3rd arm extension jack		•	•
L5	4th arm extension jack			•
M1	Cover	•	•	•
M2	Secondary arm	•	•	•
M3	1st hydraulic extension arm	•	•	•
M4	2nd hydraulic extension arm	•	•	•
M5	3rd hydraulic extension arm		•	•
M6	4th hydraulic extension arm			•
N	Stabiliser arm extension jack	•	•	•

2.2 - Conditions of use

2.2.1 - Designated use

The crane is designed for the vertical lifting, handling and positioning of free loads (3), in compliance with the values given in the capacities diagram and handling speeds not exceeding the maximum prescribed limits (see specifications).

The cranes are designed in compliance with harmonised standard EN 12999, class H1-B3, which provides for non-continuous use, with a hook, for a maximum of 400 lifting cycles per week and a load equalling 3/4 of the load indicated in the relative diagram.

To use the machine with loads other than those for which it is designed, it is the user's responsibility to first contact an authorised workshop to check whether a downgrade is necessary.

(3) The term "free load" means loads whose movement is not limited.

2.2.2 - Inadmissible uses

It is forbidden to use the machine in areas where there is a risk of fires or explosions.

It is forbidden to use the crane to pull out poles, uproot trees and lift fixed loads.

It is forbidden to use the machine to lift people, with the exception of cases in which the crane is fitted with a specially designed operator's platform approved by the manufacturer.

It is forbidden to use the crane with fixed load-hoisting accessories such as hooks, bucket, grabs etc unless the accessories are authorised by the manufacturer.

It is forbidden to use the machine as a recovery means for towing broken-down vehicles.

It is forbidden to drag or push loads.

Before performing a rotation manoeuvre, the load must be lifted off the ground.

It is forbidden to lift the base truck with the stabilisers to change the tyres.

It is forbidden to lift the base truck with the stabilisers in order to move the vehicle if stuck in areas of loose ground.

It is forbidden to fit removable clamping accessories such as jibs, manual extensions etc if:

- ◆ they are not approved by the manufacturer;
- ◆ they are not designed specifically for the model in question.

2.3 - Control and limiting devices



HAZARD !

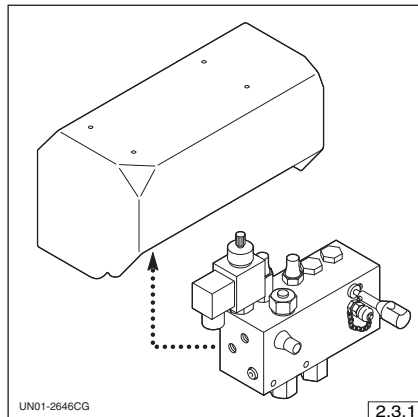
On no account must you tamper with the control and limiting devices.



Information

The control and limiting devices for the accessories are outlined in the section describing each accessory.

2.3.1 - Momentum limiting device



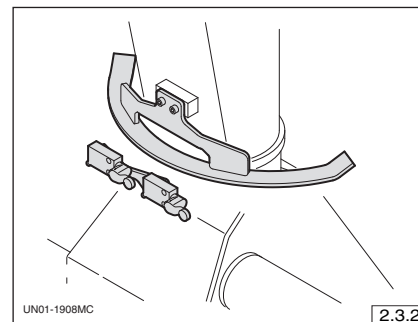
The momentum limiter automatically prevents loads exceeding the nominal load to be handled in order to safeguard the crane/truck structure and stability. Only manoeuvres to bring the load nearer to the column axis are permitted.



Information

The momentum limiter does not relieve the operator of liability if the maximum loads allowed are intentionally exceeded.

2.3.2 - Rotation locking and limiting device



- Rotation limiting device

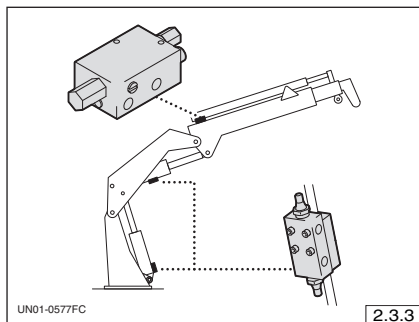
The rotation limiting device stops the crane rotating when it reaches the area in which the stability, with that particular load, is at risk.

Work may only be carried out in that area if the load is reduced (in relation to the nominal capacity) (see "Work sectors").

- Rotation lock device

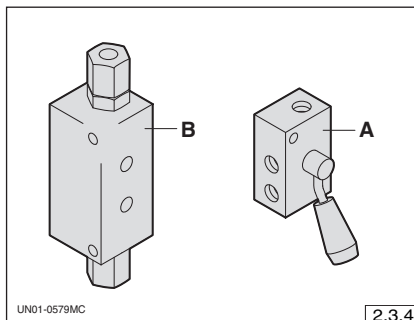
The device prevents the crane being operated in the area where the stability of the outfitting is at risk (see "Work sectors").

2.3.3 - Load support valves



The valves prevent the loads dropping unexpectedly to the ground as a result of a broken line or a sudden pump failure.

2.3.4 - Stabiliser valve



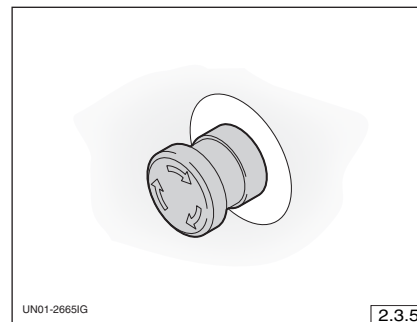
Alternatively, two types of valve can be fitted on the outriggers.

A - Lock-out valve with cock

B - Lock-out valve

The valve locks the stabiliser jack (in the position it is in at that precise moment) in the event of a broken line or that the oil delivered to the jack is suddenly cut off.

2.3.5 - Emergency stop device



Use the device to stop all the crane's movements in the event of an emergency.

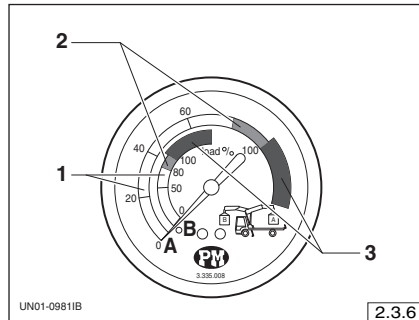
Release the button to activate the crane.



WARNING !

Ensure the hazardous conditions cannot persist before releasing the button.

2.3.6 - Load gauge



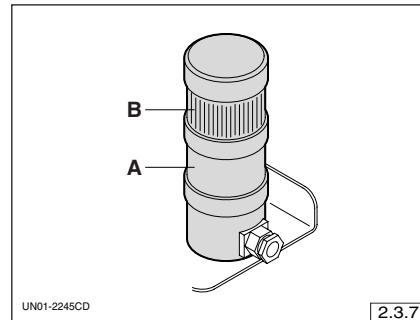
This displays the correct load in all the work areas.

- A)** Scale for work area with full load
- B)** Scale for work area with limited load (not active on this model)

The scales are subdivided into coloured sectors showing:

- 1) green section = loads within the values stated on the load diagrams
- 2) orange section = load limit
- 3) red section = load exceeds load diagram values - crane lock.

2.3.7 - Signal lamp and buzzer

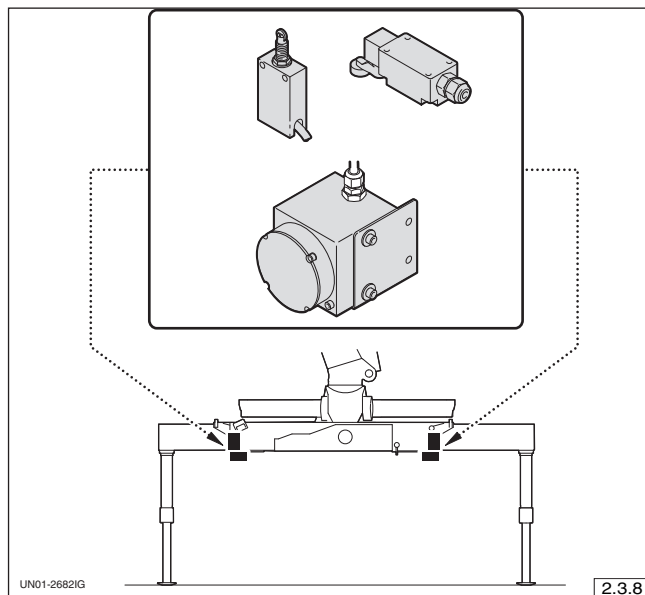


- A** - buzzer
- B** - orange light

This signals:

- ♦ with the buzzer: the lock state as a result of an overload;
- ♦ with orange light: 90% of the admissible load limit has been reached.

2.3.8 - Stabilisation controller



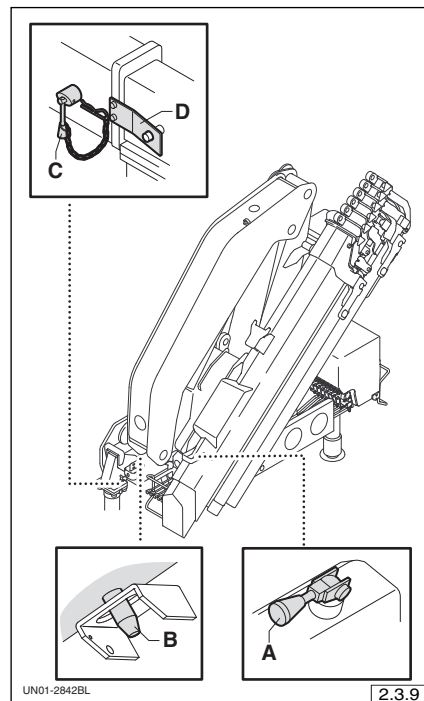
The device consists of microswitches and sensors that signal the position of the jacks and the outrigger arms to the functional control unit in order to ensure safe operation.

- These detect when the outrigger jacks are resting properly on the ground.
- These detect the extension of the outriggers; if they are not completely extended the crane may operate with reduced lifting capacity.

i Information

If featured, the device is also installed on the supplementary crossmember.

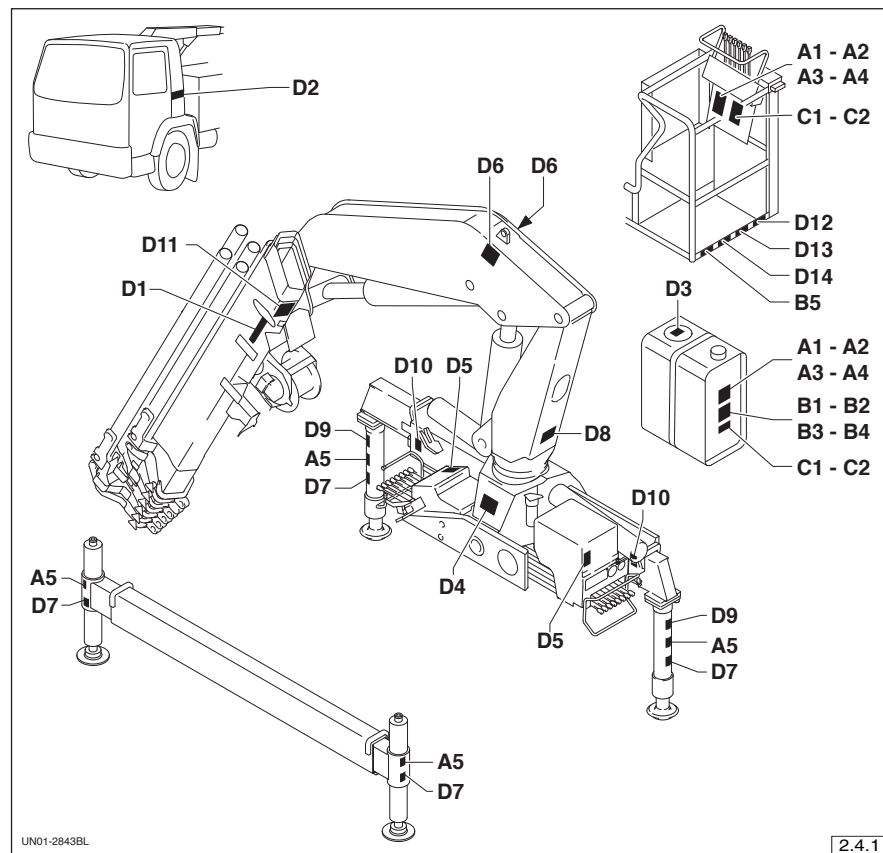
2.3.9 - Locking devices for transit on the roads



The devices keep the crane within the vehicle's profile when travelling on public roads.

- A** - Anti-extension device for arm pack (only on some LC versions).
- B** - anti-rotation device for crane;
- C** - mechanical device to prevent the accidental extension of the outrigger arms;
- D** - automatic device to prevent extension of the outriggers (alternative to option "C").

2.4 - Safety recommendations and information



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2.4.1



WARNING !

Always comply with the safety recommendations on the plates.
Check that the plates are always present and legible; if not replace them with new ones in the same position.

- Hazards signs



A1 = Risk of electric shocks (*).
 Always keep a safe distance from electricity lines.



A2 = Risk from overhanging loads (*).
 Take care not to walk or stand under overhanging loads.

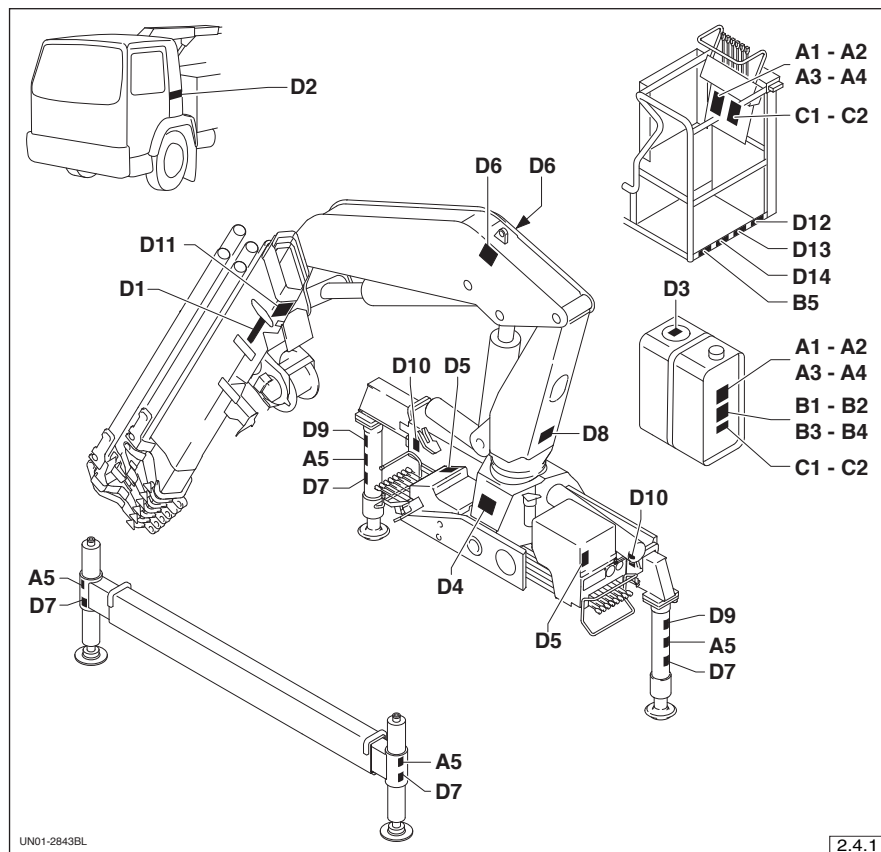


A3 = Dangerous manoeuvre signal (*).
 Operate the crane so that it opens and closes on the opposite side to the trajectory travelled by the main arm.



A4 = Obstacle risk signal (*).
 Watch out for max. admitted heights when travelling on public roads.

(*) Signals grouped together on one plate.



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2.4.1



A5 = Risk of crushing.

Lower limbs could be crushed by stabiliser jacks when in use, take care.

- Prohibition signs



B1 = No entry ().**

It is forbidden to both move around and stop in the crane's operating range.



B2 = Prohibited use ().**

It is forbidden for unauthorised persons to use the machine.



B3 = No water jets ().**

It is forbidden to use pressurised water on the electrical components.



B4 = Prohibited use ().**

Use of the machine is prohibited if the stabilisers have not been positioned correctly.

(**) Signals grouped together on one plate.



B5 = Do not close the crane.

It is forbidden to close the crane from the raised control station.

- Obligation signs



C1 = Instruction Manual plate (***)

This indicates that the operator must read the instruction manual carefully before using the machine.



C2 = Individual safety gear plate (***)

This indicates that the user is under obligation to wear the safety helmet when operating the machine.

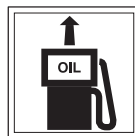
(***) Signals grouped together on one plate.

- Information signs



D2 = Power takeoff plate.

Reminds the operator to switch off the power takeoff during transfers.



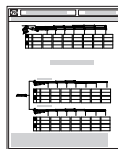
D3 = Oil tank plate.

Indicates the hydraulic oil tank.



D4 = Dead centre indication plate.

Shows the side at which the crane rotation, both clockwise and anti-clockwise, ends.



D5 = Capacities diagram plate.

This shows the performance of the machine and accessory when present.



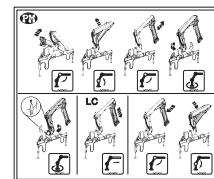
D6 = Hoisting points plate.

Indicates the hoisting hooks attachment points.



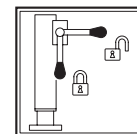
D7 = Max. stabiliser pressure signal.

Make sure the pressure on the ground does not exceed the max. limit stipulated.



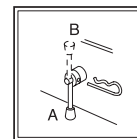
D8 = Crane opening/closing plate.

Indicates the order of the actions to set the crane in the working or resting positions.

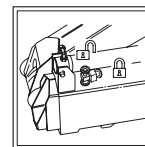
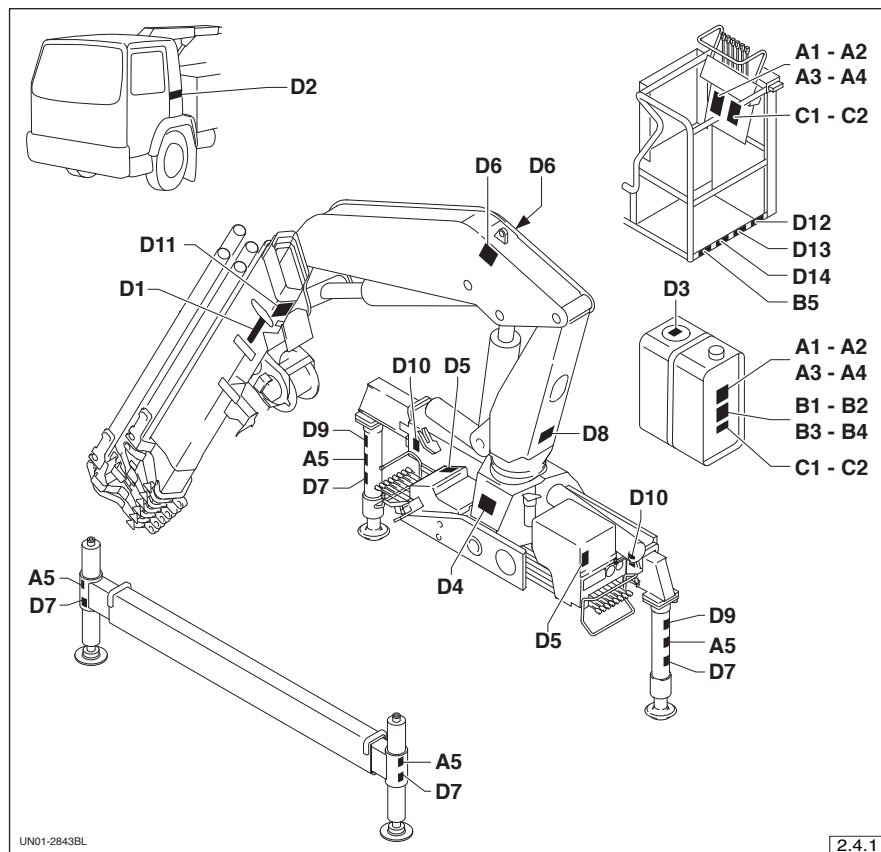


D9 = Lever position on stabiliser valve plate.

This shows the operator how to position the lever to obtain movement with the jack free or locked.



D10 = Stabiliser mobility plate. This reminds the operator to lock the stabiliser arm in position with the relative pin.



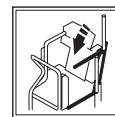
D11 = Arm mobility signal plate.

Pay attention to locking the arm during transfers (for LC version only).



D12 = Max. capacity plate.

This shows the maximum admissible load on the raised control post.



D13 = Manoeuvre signal plate.

Lower the protection before operating the machine.



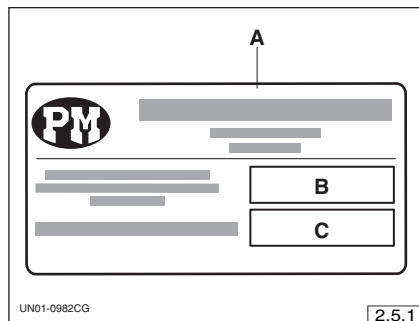
D14 = Manoeuvre signal plate.

Lower the protection before closing the machine.

2.5 - Accessories

2.5.1 - Additional crossmember

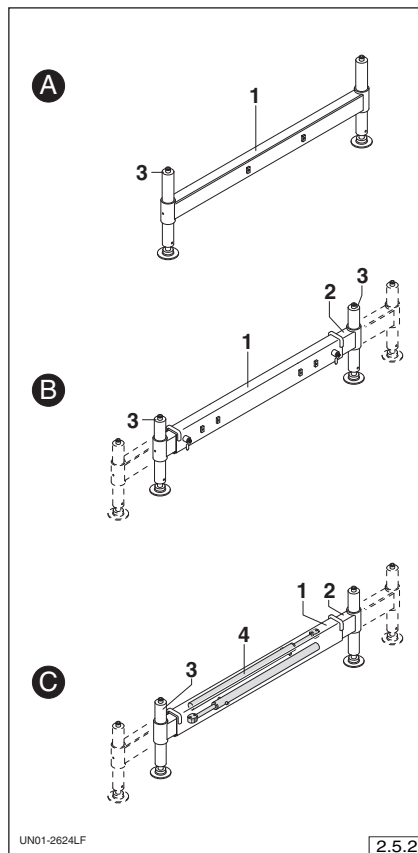
- Identification detail



- A)** Manufacturer code
- B)** Supplementary crossbeam model
- C)** Serial number

- General description

The additional crossmember is only fitted when the crane's stabiliser jacks alone cannot guarantee the crane/truck unit's stability.



- Main parts

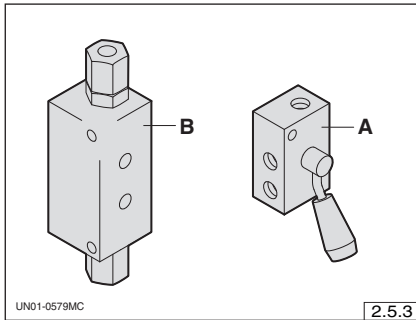
- 1** - Crossbeam
- 2** - Extendable stabiliser arm
- 3** - Stabiliser jack
- 4** - Stabiliser arms extension jack

- Installable crossbeams

- A** - Fixed crossbeam
- B** - Crossbeam with manually extended outriggers arms
- C** - Crossbeam with hydraulically extended outriggers arms

- Locking devices

Stabiliser valve



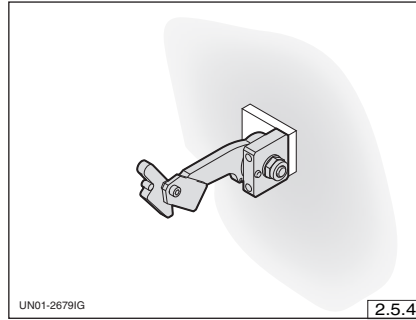
Alternatively, two types of valve can be fitted on the outriggers.

A) Lock-out valve with cock

B) Lock-out valve

The valve locks the stabiliser jack (in the position it is in at that precise moment) in the event of a broken line or that the oil delivered to the jack is suddenly cut off.

Locking devices for transit on roads

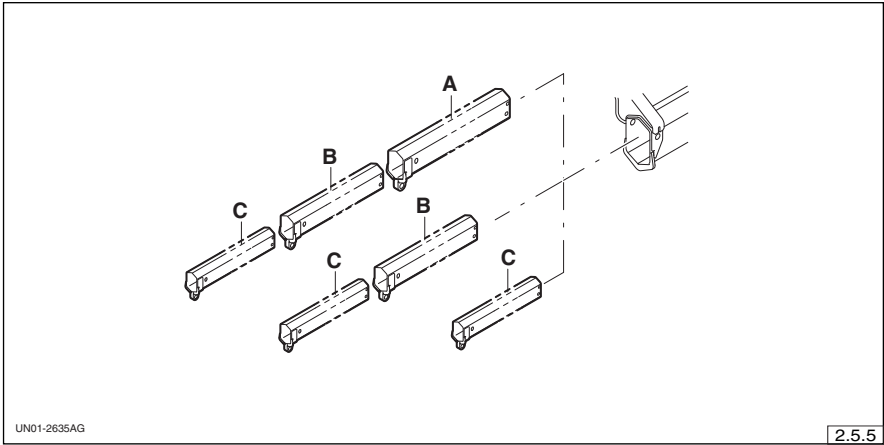


These prevent the supplementary arms extending accidentally when the vehicle is in transit.

The devices must be manually disconnected before extending the outrigger arms; closure is automatic once the arms are retracted.

2.5.2 - Manual extensions

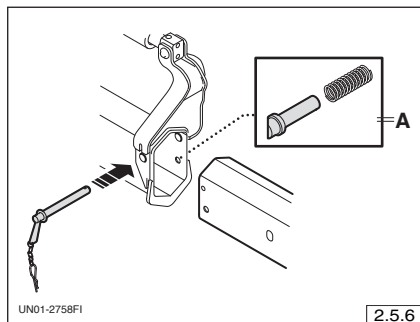
Manual extensions on basic machine



Pos.	Model basic machine					Weight kg (lbs)
	15521	15522	15523	15524	15525	
A	/	/	•	/	/	65 (143)
B	/	/	•	•	/	40 (88)
C	/	/	•	•	•	35 (77)

- Locking and limiting devices

Safety pin



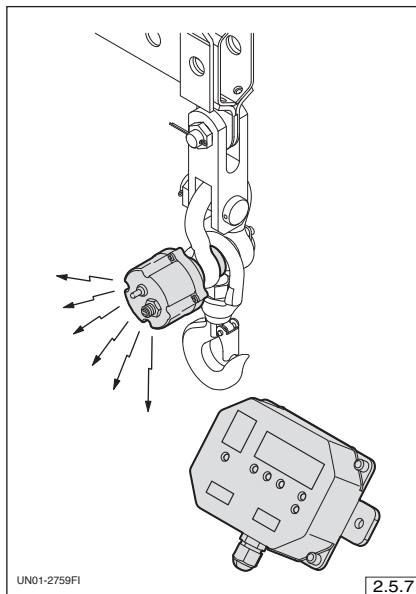
Device “A” prevents the extension dropping to the ground accidentally during its extension.



WARNING !

The device is not scaled to withstand hoisting loads, therefore each extension must be locked in position (extended or retracted) with the relative safety pin.

Manual extension load limiting device



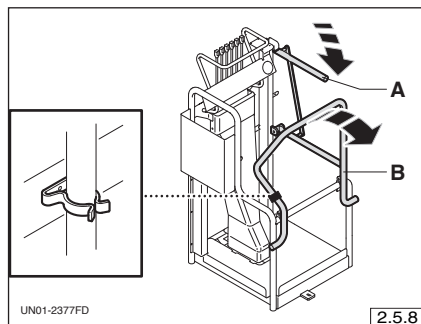
This prevents manual extension overloading (see para. “Use of the manual extension load limiter”).

2.5.3 - Raised control station



WARNING !

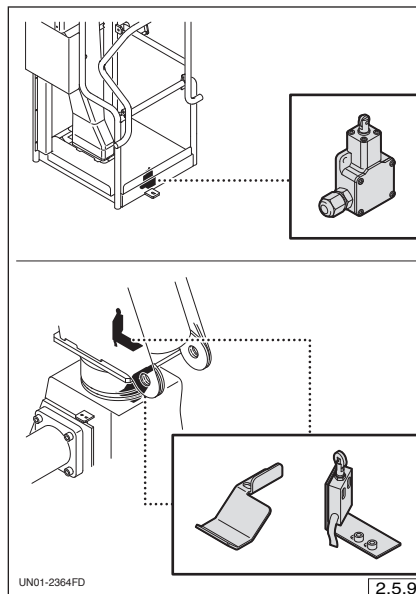
Always respect the maximum load capacity of the raised control station. Always keep the floor and handles of the raised control station clean and free from obstacles to avoid slipping or tripping over.



To control the machine from the raised control station:

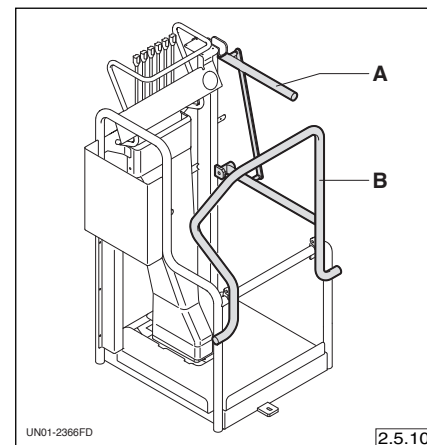
- 1 - lift protection "A" and get on the station;
- 2 - lower protection "A" and lock protection "B".

- Rotation locking device



This device prevents the use of the machine in the work area above the raised control station when the operator is present.

- Raised control station fall protection barriers



- A** - side fall protection device
B - rear fall protection device

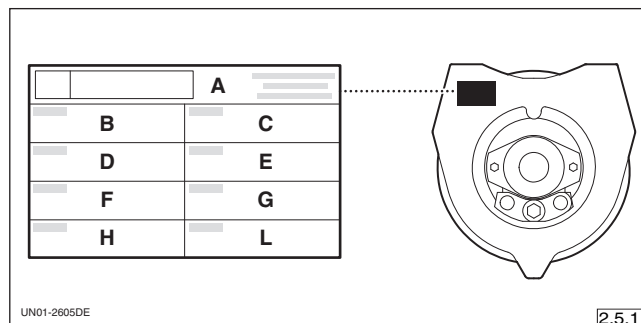
They prevent the operator from falling from the raised control station.

2.5.4 - Winch

The winch is composed of a drum, driven by a hydraulic motor, around which the load lifting cable is wound.

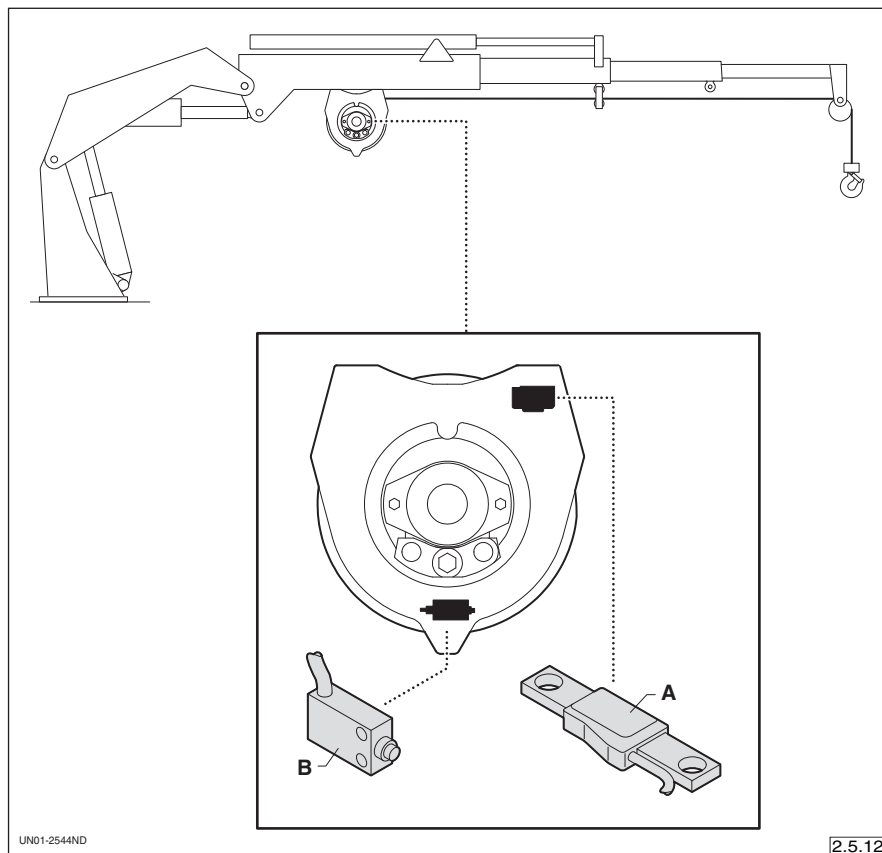
At the end of the last extendable arm there is a lifting tackle fitted.

- Identification details



- A) Manufacturer details
- B) Winch model
- C) Identification code
- D) Serial number
- E) Year of manufacture
- F) Maximum oil flow
- G) Maximum speed
- H) Maximum pull
- L) Maximum pressure (bar)

- Locking and limiting devices



A - Overload sensor

It stops the machine when:

- a) the load exceeds the permitted maximum;
- b) the lower block reaches the upper stroke limit.

B - Downwards stroke limit

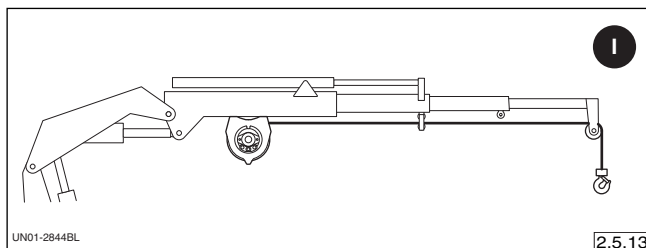
This stops the load's downwards stroke to prevent the cable around the drum being completely unwound.



Information

The operator shall be responsible for intentionally exceeding the maximum load permitted (see section on "Load diagram") even if the winch load limiter is installed.

- Assembly type



Winches installable on the basic machine

Crane model	Winch model (type I)
	P15
PM 15.5	•

- Specifications

Winch model Dinamic Oil P15/E

Cable diameter $\varnothing$ mm 10 in. 0,39"
 Minimum cable breaking load kN 94,5 lbs 21244
 Maximum cable length m 50 ft 164
 Maximum cable pull
 load (last layer) kN 19,5 lbs 4384
 Maximum cable pull
 load (first layer) kN 24 lbs 5395
 Maximum cable speed m/min 30 ft/min. 170
 Mass without cable kg 79 lbs 174
 Mass with cable kg 102 lbs 225
 Mechanism class according to
 UNI ISO 4301/1 M3

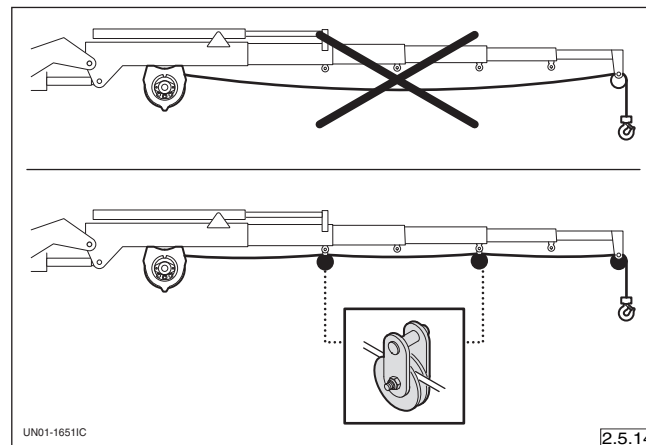
2.22

- Use of the winch



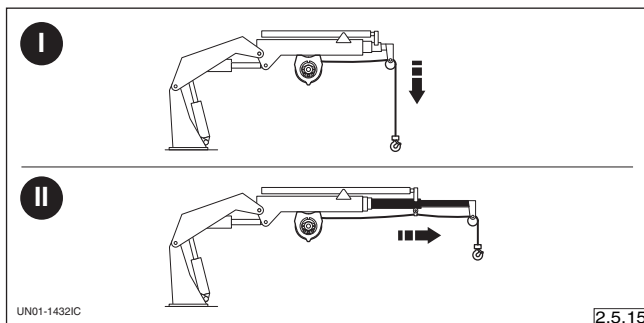
CAUTION !

The section of cable between the winch and the block must remain in contact with the arms. If this is not the case, fit the driving pulley (see "Tackle installation").



HAZARD !

It is forbidden to lift objects at an angle.



To prevent further damage to the cable, the hook must be lowered before the arm is extended.



CAUTION !

Do not use the winch when the crane arms are fully closed. To wind the cable around the winch drum properly, extend at least two arms.



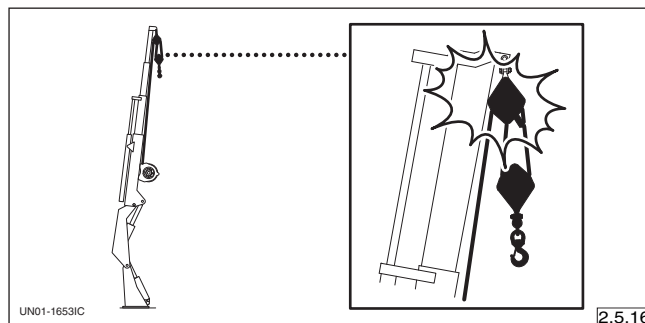
CAUTION !

During the winding/unwinding operations check that the cable is always taut, so that it positions itself correctly on the winch drum.



CAUTION !

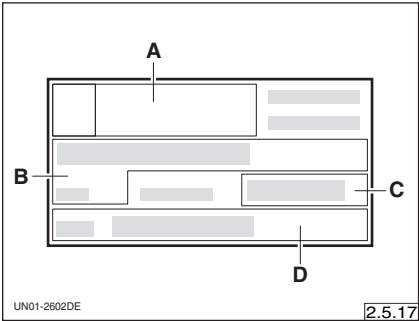
Remove the lifting tackle before closing the crane in resting position (folded behind the cab or lying down on the pile holder). Do not operate the vehicle when tackle is installed.



In order not to damage the machine, avoid contact between upper block and the arms when the latter are vertically tilted.

- Lifting tackle

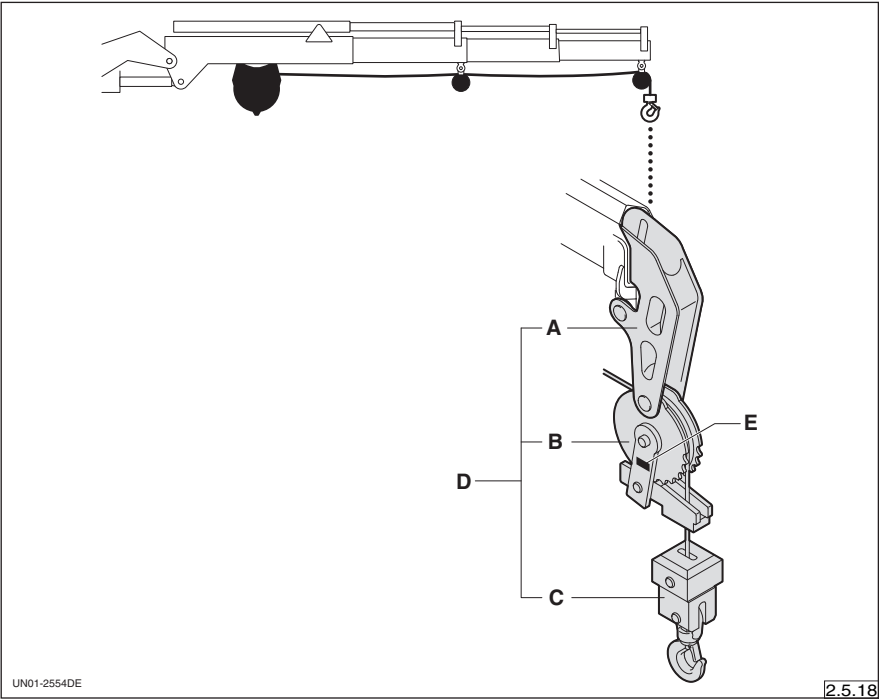
- Identification details



The tackle is composed of a system of pulleys located at the end of the last arm.

- A - Builder
- B - Tackle type
- C - Serial number
- D - Code

- Tackle types for each crane



- A - Arm
- B - Upper block
- C - Counterweight
- D - Complete tackle for direct pull
- E - Identification plate

Weights

Part - kg (lbs)			
A	B	C	D
20 (44)	28 (62)	18 (40)	66 (145)

2.6 - Noise level

Tests carried out have measured a sound pressure level below 70 Db (A).

The tests have been carried out without considering the power source (vehicle's engine) as it is not part of the supply. The installer should ask the truck's manufacturer for information about the noise level and transfer the said information to the operator.

2.7 - Vibrations

Vibration effects on the operator are considered not significant as the machine is used for short periods of time.

2.8 - Gas emissions

- Gases produced by the combustion of the fuel used by the truck endothermic engine.
- Fuel vapours emitted during refuelling.

2.9 - Electromagnetic compatibility

All the machine's components subject to the European directives 95/54/CEE (and subsequent modifications) and 2004/108/CE on electromagnetic compatibility conform to the aforesaid directives.

2.10- Residual dangers

Dangers of a mechanical nature.

Contact with the articulated parts of the machine could result in limbs being crushed or lacerated.

Dangers of thermal nature.

Contact with the machine's hot parts could result in burns.

Fire hazard.

Fuel leaking from the tank, during use or when refilling, can create a fire hazard.

Risk of fluid ejection at high pressure.

The breakage of a pipe or blow-by under oil pressure could create risk of lesions and skin infections.

Risk of slipping and falling.

Oil, grease, snow and ice on the entrance steps of the maneuvering stations and on the work platform floor can cause the operator to slip and fall.

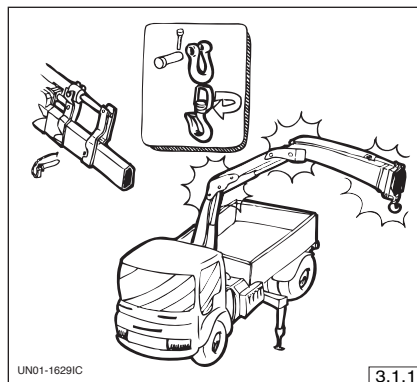
3 Safety

3.1 - Safety regulations



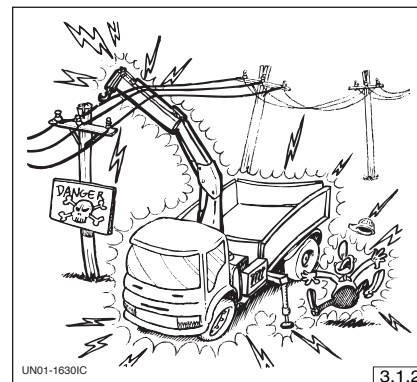
WARNING !

Read the instructions contained in this manual carefully, in particular those concerning safety and the signs affixed to the machine.



Before operating the crane

- ◆ Check the degree of wear of the accessories' lock pins;
- ◆ make sure the hook is fitted with a nut and that it rotates freely without excess play;
- ◆ make sure the hook is fitted with the safety device to prevent cables being released accidentally and that the said safety device is intact;
- ◆ carefully check the load harnesses and the chains, cables and straps are in good condition and that they are suitable for the load to be lifted;
- ◆ make sure the hoses are in good condition and that no oil leaks are present.



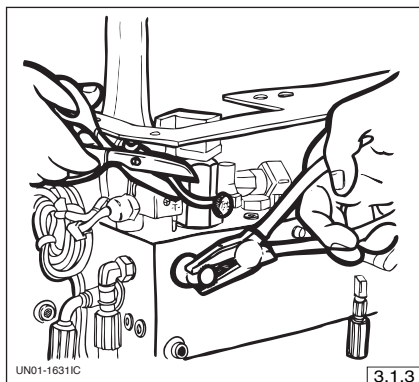
HAZARD !

Do not operate the machine in the vicinity of power lines.

To operate the crane in the vicinity of power lines, always refer to your superiors or the competent authority for special instructions.

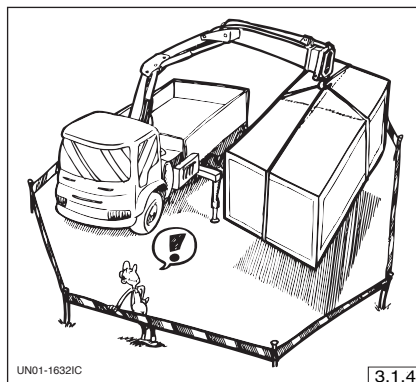
Obtain clear instructions regarding the way in which the work must be carried out. Said procedures must be studied for each particular situation and complied with exactly.

When carrying out maintenance work on power lines, you are advised to connect the metal parts on the vehicle to the earth, observing the relative regulations in force.



WARNING !

Do not remove the lead seals on the valves.



Cordon off the work area to prevent access by unauthorised persons. The operator must ensure no-one stops or moves around in the work area.

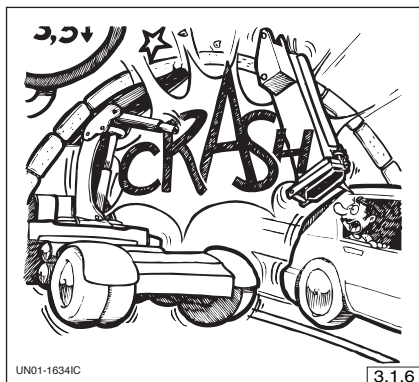


HAZARD !

It is strictly forbidden to move the load over the vehicle's manoeuvring area.

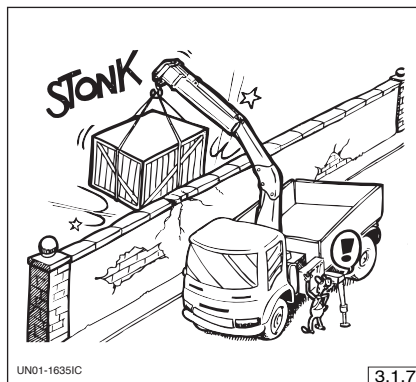
When this is unavoidable, operate the machine using the controls on the opposite side, assisted by other personnel on the ground to perform the necessary manoeuvres, or use suitable accessories provided for this purpose, such as:

- remote controls
- raised seat
- raised control station.

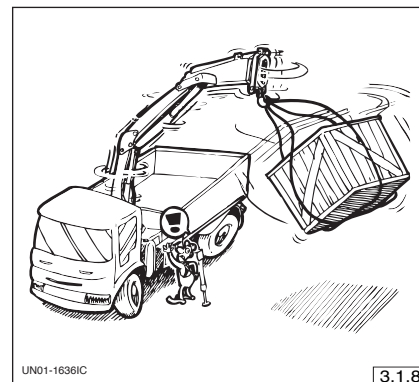


WARNING !

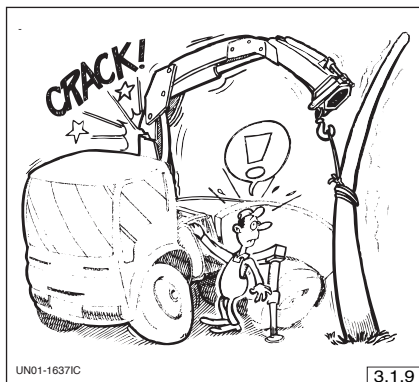
Always follow the Highway Code, in particular with regards to height limit signs.



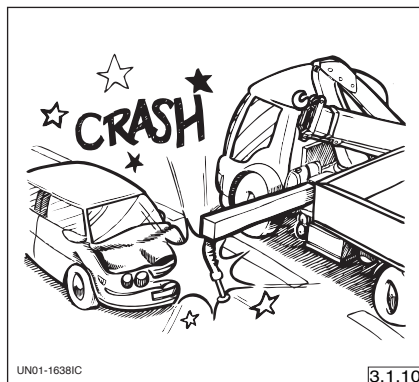
Do not operate the crane in poor visibility conditions. The operator must always have a perfect view of the work area.



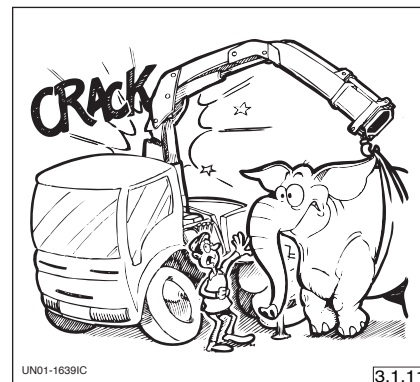
Use short harnesses and operate the levers smoothly and gently to prevent the load swinging dangerously.



Do not use the crane to remove poles, uproot trees or lift fixed loads.

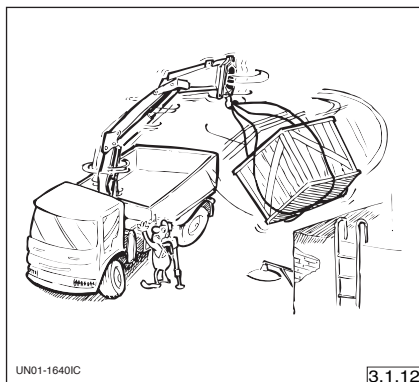


WARNING !
Before driving the vehicle, ensure all the lock devices are engaged.



WARNING !
Never lift loads exceeding the limits stipulated in the loads diagrams.

Make sure the loads are less than those indicated on the diagrams in relation to the outreach.



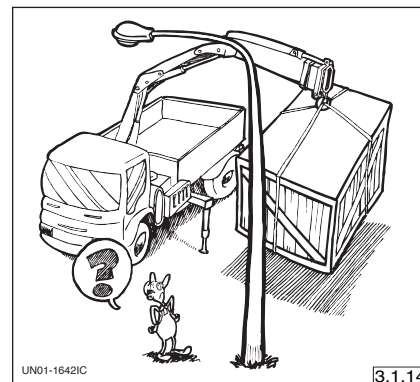
HAZARD !

Never swing the load to place it beyond the permitted outreach indicated in the load diagram.



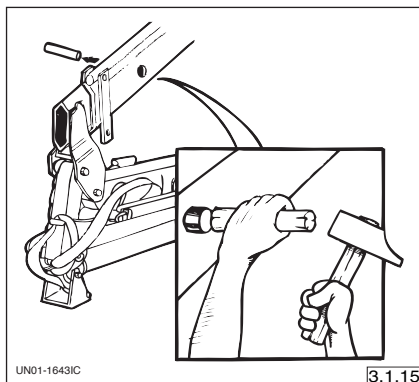
WARNING !

Never drag loads, lift them upwards.



WARNING !

In the presence of objects obstructing the crane's range of action, take precautions to prevent collisions.



WARNING !

When fitting and removing the accessories' lock pins, use equipment made of soft materials to prevent the risk of being hit by flying splinters caused by the striking of the tool.



WARNING !

Never use the crane during a storm.



HAZARD !

It is forbidden to operate the crane when the wind reaches a speed of 10.8 m/s (grade 6 on the Beaufort scale).

To calculate the wind speed, please refer to the table below.

- Beaufort scale -

Wind force		Wind speed		Effect of the wind on land	
Beaufort number	Description of the wind	m/s	Km/h (Mp/h)		
0	Calm	from 0 to 0,2	1 (0)	Calm, smoke rises straight up	
1	Light air	from 0,3 to 1,5	from 1 to 5 (from 1 to 3)	Wind direction indicated by the movement of smoke only, not by the weathervane	
2	Light breeze	from 1,6 to 3,3	from 6 to 11 (from 4 to 7)	Wind can be felt on the face, leaves rustle, weathervane moves	
3	Gentle breeze	from 3,4 to 5,4	from 12 to 19 (from 8 to 12)	Leaves and small branches move, pennants unfold	
4	Moderate breeze	from 5,5 to 7,9	from 20 to 28 (from 13 to 18)	Wind lifts dust and loose paper, moves branches and thin poles	
5	Fresh breeze	from 8,0 to 10,7	from 29 to 38 (from 19 to 25)	Small broadleaves begin to wave, slight foam appears on lakes	
HAZARD !	6	Strong breeze	from 10,8 to 13,8	from 39 to 49 (from 25 to 31)	Poles move greatly, whistling along telephone lines, use of umbrellas is difficult
	7	Near gale	from 13,9 to 17,1	from 50 to 61 (from 32 to 38)	All the trees move, it is very difficult to move against the wind
	8	Gale	from 17,2 to 20,7	from 62 to 74 (from 39 to 46)	Tree branches are broken, walking in the open air is particularly difficult
	9	Strong gale	from 20,8 to 24,4	from 75 to 88 (from 47 to 55)	Slight damage to houses (chimney pots and roof tiles are blown off)
	10	Storm	from 24,5 to 28,4	from 89 to 102 (from 56 to 64)	Trees are uprooted, considerable damage to houses

3.2 - Operator's qualifications and behaviour

The use of the crane is restricted solely to personnel meeting the following minimum requirements:

- ◆ specifically employed personnel;
- ◆ apprentices under direct supervision of the specifically employed personnel;
- ◆ staff members employed for the machine's maintenance and testing (when their skills are required);
- ◆ crane inspectors.

Only the persons listed above may access the crane's work area, and only for the purpose of fulfilling their functions. In any case, they must always advise the operator or person in charge of their presence.

- Operator's qualifications

To operate the crane, the following requirements must be met:

- ◆ possession of the necessary psychophysical qualities to ensure the operator is neither a risk to himself or to others;
- ◆ ability to understand the descriptions and illustrations in the instructions manual (including the figures and diagrams contained therein) and the symbols and instructions on the plates affixed to the machine;
- ◆ familiarity with and ability to implement the emergency procedures;
- ◆ ability to operate the machine as a whole, together with any accessories applied;
- ◆ experience of the applicable safety regulations.

- Operator's behaviour

The operator must not:

- ◆ engage in any other activity which may distract him while operating the crane;
- ◆ operate the machine in a state of drunkenness or when under the influence of drugs which may reduce either physical or mental abilities;
- ◆ leave the crane unattended with the load hanging;
- ◆ use the machine in the event of malfunctions.

4.1 - Handling and lifting

**WARNING !**

Always use lifting means which are suitable for the load to be lifted and handled.

Chains and cables must always be in good condition, never worn or frayed as this would seriously prejudice the operators' safety.

Always keep the load as low as possible when moving to guarantee better stability and visibility.

Always work with great care and carry out very slow manoeuvres for the safety of the operators present and to safeguard the good working condition of the crane.

**WARNING !**

If the crane is used without the locking devices (e.g. wooden beams, threaded bars, tie rods, screws, pins, etc.) the machine may overturn.

They type of packing must be chosen according to the means of transport and the destination of the goods.

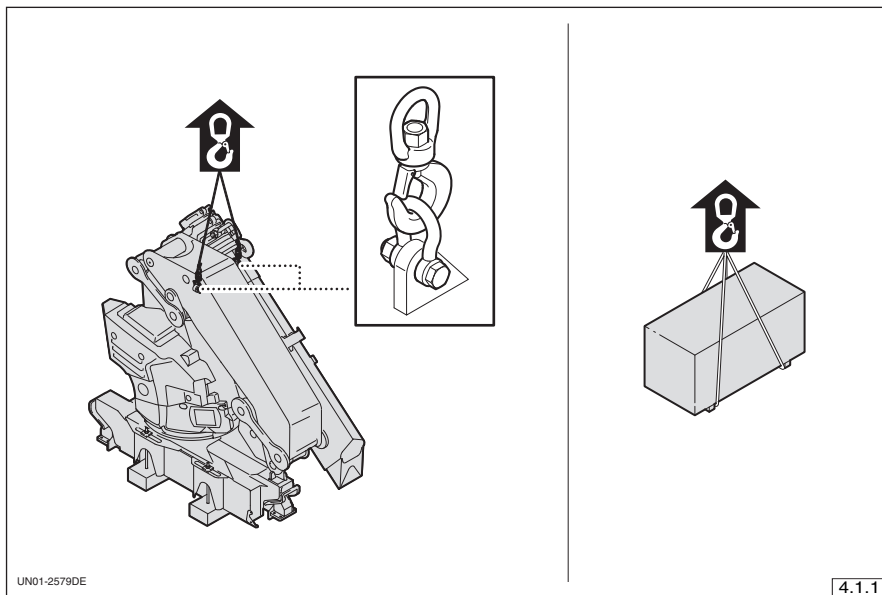
The crane is normally dispatched placed on two wooden beams with the stabilisers facing upwards or disassembled and placed in a box with the equipment used to fit the crane on the base truck.

The wooden beams must be removed during the installation of the crane on a truck.

For packaging which differs from that shown in the manual, follow the instructions and the symbols applied to the packing itself.

Before lifting the crane always check the weight on the technical information sheets.

4.1.1 - Lifting the crane with a hook



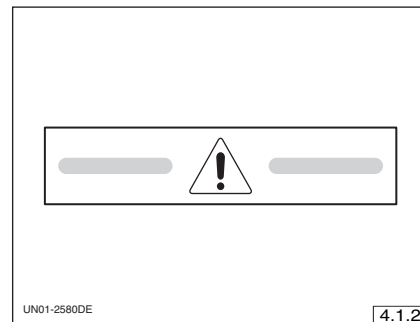
Lift the crane using the special lifting points positioned on the main arm of the crane.

If the crane is fitted with accessories such as antenna, winch, manual extensions, etc., the barycentre of the machine will be different each time.

When lifting from above pay attention to the crane swinging movement as the lifting point is never perfectly barycentric.

4.1.2 - Locking devices

PM cranes are fitted with locking devices to avoid hazardous situations during handling of the machine (e.g.: arm pack or swinging support lock) highlighted with the following sticker (fig. 4.1.2).



4.2 - Storage

Normally, the crane accessories and other equipment supplied are dispatched wrapped in a protective sheet which must be removed before they are fitted.

However, in the event of long periods during which the unit will be not be used, provide a suitable cover and store it indoors to protect it from the weather.

The storage area must not be excessively damp or dusty. The room temperature must be between -20 °C (-4 °F) and +70 °C (+158 °F) with a maximum humidity level of 90%, with no condensation.

4.3 - Fitting

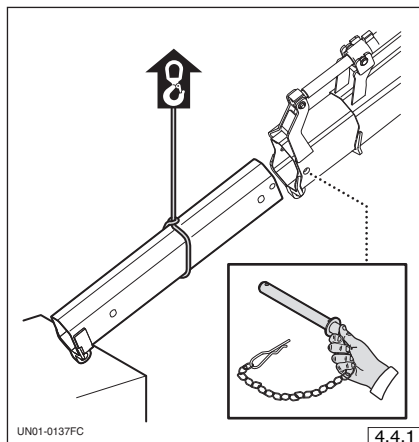
The installation of the crane on the vehicle and the inspections following installation required by the local regulations in force in each country must be carried out carefully following the information contained in the "Instruction and warnings manual for the installation of the crane on a truck" written by the company PM Group S.p.A.

All necessary information, including the "Instruction and warnings manual for the installation of the crane on a truck" is supplied to the crane owner only upon request sent by email to:

info@pm-group.eu

The fitting and any alterations to the vehicle required must comply with the regulations issued by the vehicle's manufacturer.

4.4 - Fitting the manual extension



WARNING !

The manual extensions must be fitted and removed one at a time in a sequential order.

After assembly, check that the locking device prevents the extension from moving out in an uncontrolled manner.

Proceed as outlined below.

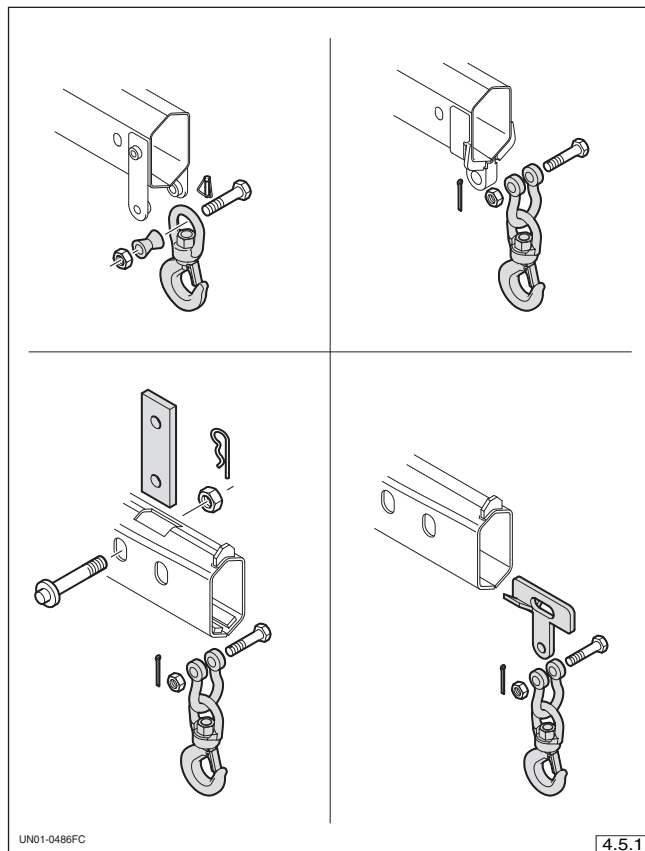
- 1 - According to its weight, harness the extension with suitable lifting means and rest it on a stable surface.
- 2 - Slide out the arms and insert the extension and so the pin holes are aligned.
- 3 - Lock the extension into position (open or closed) using the special pin and safety lock pin.

To disassemble the extension, proceed as described for the assembly but in the reverse order.

Whenever possible, keep the arm pack angled towards the ground.

4.5 - Fitting the hook

Assembly type



WARNING !

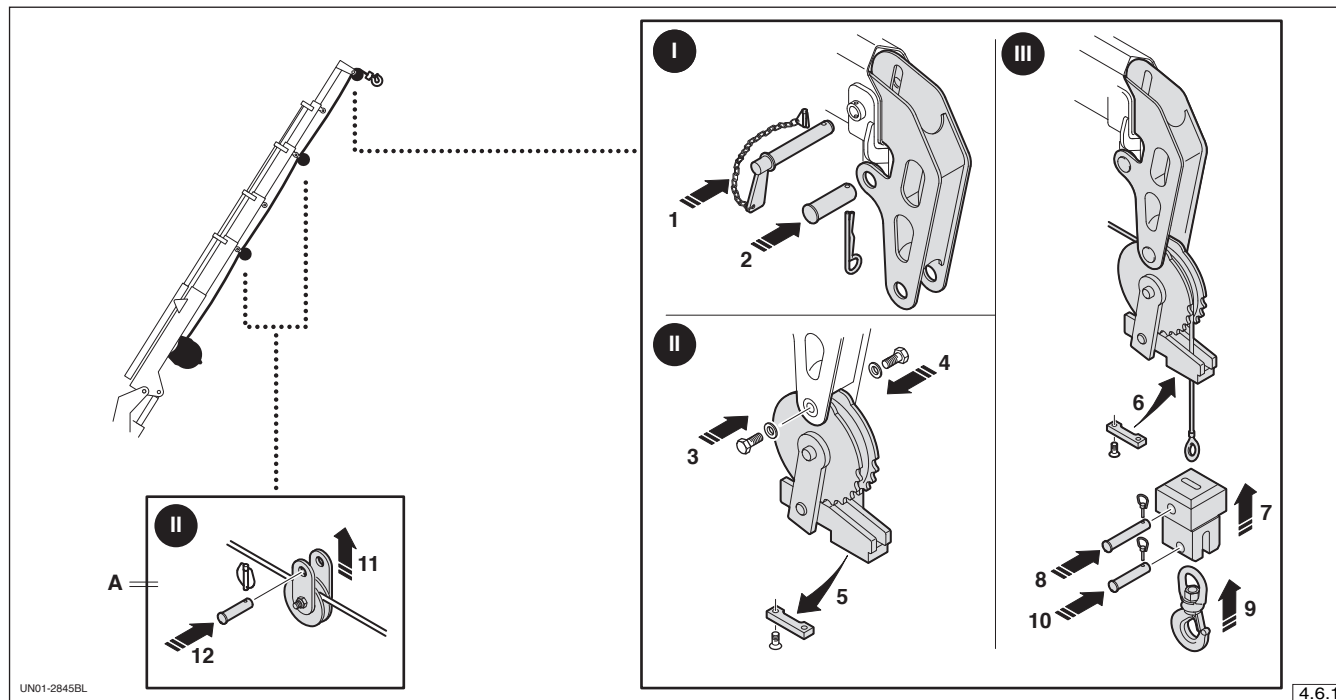
The hook can only be fitted on the last extension extended.

4.6 - Tackle installation

4.6.1 - Fitting the tackle on the crane

Fit the pulley "A" to support the cable if there are long sections between the winch and the block.

- Assembly sequence for tackle with direct pull



A = driving pulley

5 Information about adjustments

All adjustments must be performed by an authorised workshop.

6 Usage instructions

6.1 - Controls

6.1.1 - Crane control symbols

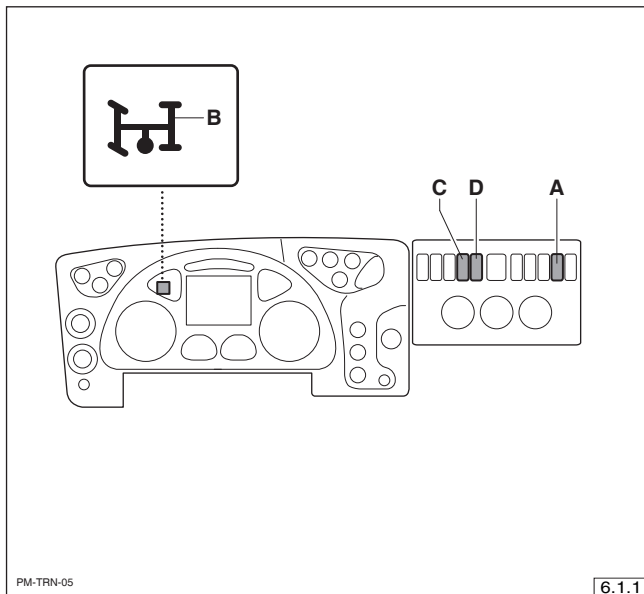
Crane stabilisers		Stabiliser activation
		Crane activation
Stabilisers		Stabiliser jack extension
		Stabiliser jack retraction
Column		Clockwise rotation
		Anti-clockwise rotation

Main arm		Lowering
		Lifting
Secondary arm		Lowering
		Lifting
Arms		Extension
		Retraction

Jib		Lowering
		Lifting
		Extension
		Retraction
Rotator		Clockwise rotation
		Anti-clockwise rotation
Grab		Grab opening
		Grab closing
Winch		Lower winch cable
		Lift winch cable
Jib arms/winch (with multiple activate device)		- Jib lifting - Winch lowering
		- Jib lowering - Winch lifting

6.1.2 - Controls and signals/gauges located in the truck cab

Controls, signal lights and warning buzzers that may be installed in the truck cab are listed below; the figure and position of the controls and signals/gauges are indicative.



A - PTO switch

This engages and disengages the PTO.

B - Signal light

When lit, this shows the power take-off (PTO) is engaged.

C - Signal light

When lit, this shows that the outriggers are not in the correct resting position. The buzzer will sound when the signal lights light up.

D - Signal light

When lit, this shows that the crane is not in the correct resting position. The buzzer will sound when the signal lights light up.



Information

For all other vehicle controls and signals/gauges, please refer to the instructions provided by the vehicle's manufacturer.



Information

In some cases a control to temporarily disable the warning buzzer can be installed.

6.2 - Radio control

The radio control is composed of a portable transmitter unit for the operator and a receiver unit installed on-board the machine.

- Safety precautions

- Do not operate the radio control if it is damaged or malfunctioning.
- Before using the radio control, check that the batteries are charged.
- Do not position the load manually.
- Do not leave the remote control unattended; otherwise the crane may be used by unauthorised persons.
- Keep under constant control:
 - work area;
 - load trajectory;
 - indicator light on-board the machine or the incremental bar on the radio control, which show the lifting of 90% or 100% of the load.
- Do not clean the remote control with a pressurised water jet or immerse it in water or any other type of liquid.

6.2.1 - "SCANRECO MINI" radio control

- Technical data

- Power voltage: 7,2 Volts
- Battery:
 - rechargeable "Scanreco".
- Working range including obstacles: 100 m (ft 328).
- Protection grade: IP65.

- Battery

The effective duration of a battery is approx. 8 hours.

The intermittent switching on three times of a buzzer and the intermittent switching on of the indicator light, indicate that the battery is nearly flat.



Information

Only replace the battery when the flashing indicator light switches off.

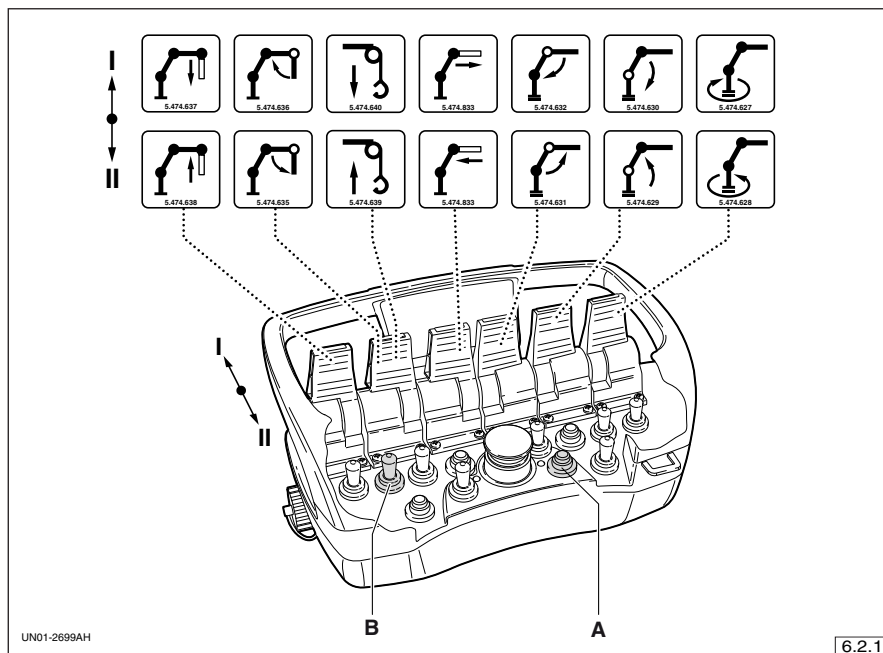
- Battery charger

Charge voltage of the battery charger supplied: 11 Vcc - 30 Vcc.

The recharging time of a completely flat battery varies from 12 to 14 hours.

- Battery charger indicator lights

- The red indicator light signals the presence of electricity supply to the charger.
- When the green indicator light is on, the battery is being recharged.



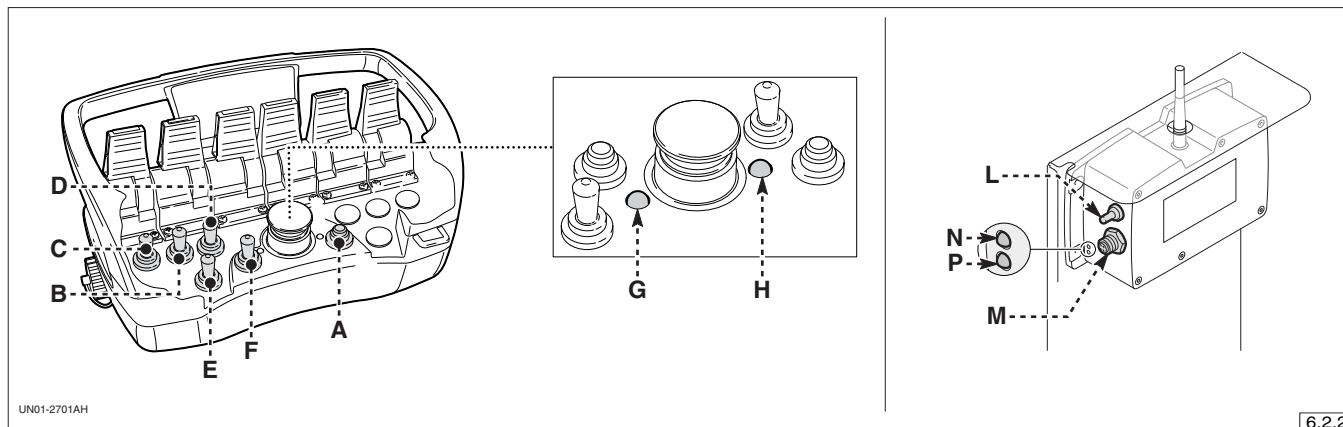
A - Switching on the transmitter unit

The button has two functions:

- I) radio control ON;
- II) buzzer.

B - Start-up/stop

Flick the switch to start up or stop the vehicle engine.



6.2.2

C - “RPM” activation

Flick the switch to place the engine rpm in automatic or manual mode.

D - Accelerator

Flick the switch to vary the engine rpm of the vehicle. It only works with switch “C” in manual.

E - Activation switch

This allows the alternate functioning of the activations:

- from the jib joint to the winch and vice versa;
- from jib arms extension with possible further accessories.

F - Speed switch

The switch activates and deactivates the functioning speed of the crane. Press repeatedly.

Each time it is pressed corresponds to a different crane speed.

Up to five different speeds are possible.

The speed chosen is indicated by the number of flashes of the indicator light “G”.

Flick the switch once only (in the off direction) to reset the normal functioning speed.

G - Indicator light

Green.

When on, it indicates the different functioning speeds of the crane (see speed switch).

H - Indicator light

Red.

When on, it indicates that the transmitter unit is switched on.

L - Three stable position switch

This switches on and off the receiver unit.

REMOTE position: the receiver unit is on.

OFF position: the receiver unit is off.

MANUAL position: the receiver unit is on and the transmitter unit is by-passed.

M - Socket

To connect the configuration unit of the receiver unit (only to be used by specialised personnel).

N - (DV) signal light

This indicates the state of operation of the wireless control.

P - (Status) signal light

This indicates the state of operation of the wireless control.

- Signal light signals

System on and transmitter unit off

Position selector "D"	Signal lights on
REMOTE	"Status" (red light)
MANUAL	"DV" (red light)

System on and transmitter unit on

Position selector "D"	Signal lights on
REMOTE (no button is pressed on transmitter unit)	"Status" (green light)
REMOTE (a button is pressed on transmitter unit)	"Status" (green light) "DV" (red light)

6.2.2 - HETRONIC radio control

- Technical data

- Power voltage: 3 (V)
- Batteries:
 - Rechargeable with Ni-Mh or Ni-Cd accumulators, 3,9 Volts;
 - Stylus/miniature type alkaline 2x1,5 Volts or 3x1,5 Volts.
- Working range including obstacles: 100 m (ft 328).
- Protection grade: IP65.

The radio control features two devices that are automatically activated in the following cases:

- if the work area is disturbed by a signal which effects the radio control's frequency range;
- the radio control is out of the transmitting unit's range.

In this case, the radio control switches to emergency mode and stops the crane operating.

Battery



*Use alkaline batteries only.
The power supplied by zinc-carbon batteries is insufficient.*

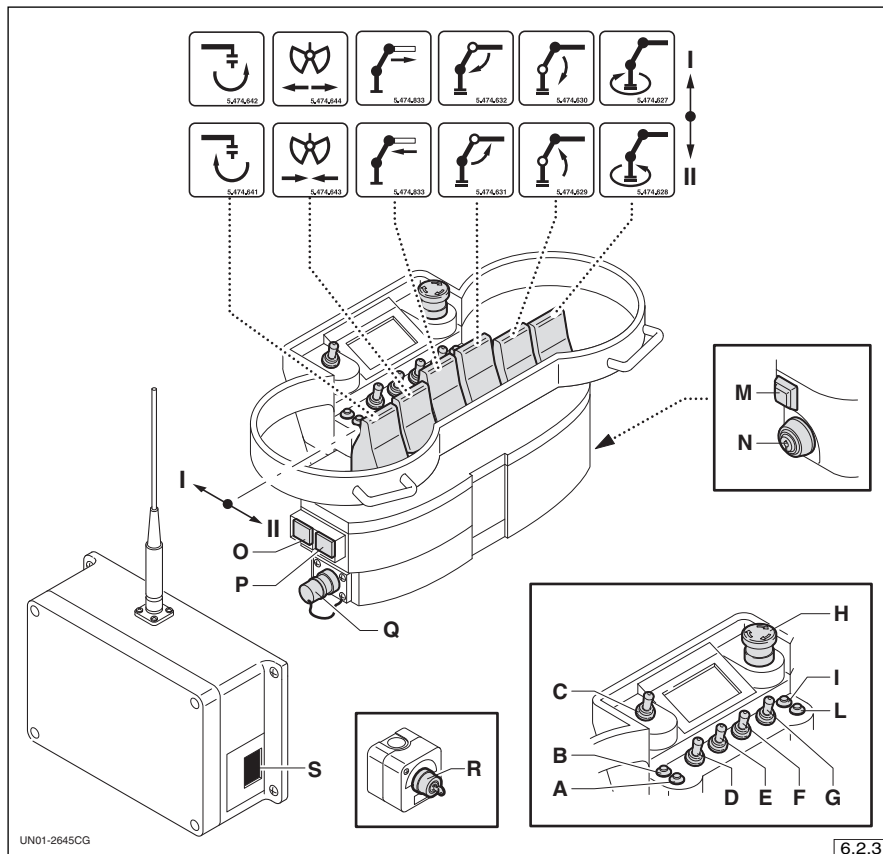
Battery charger

Charge voltage of the battery charger supplied: 12 V / 24 V.

Battery charger indicator lights

- When the signal light is switched on, this means the battery charger is live.
- When charging, the signal light should always remain on.
- As soon as the battery charging is complete, the signal light will flash.

- Controls



Information

The fig. 6.2.3 simbology illustrated controls order can be on request inverted.

A - Signal light (fitting only)

Not active.

B - Signal light (fitting only)

Not active.

C - Control commutation switch

Not active.

D - Switch ("RPM + / RPM -")

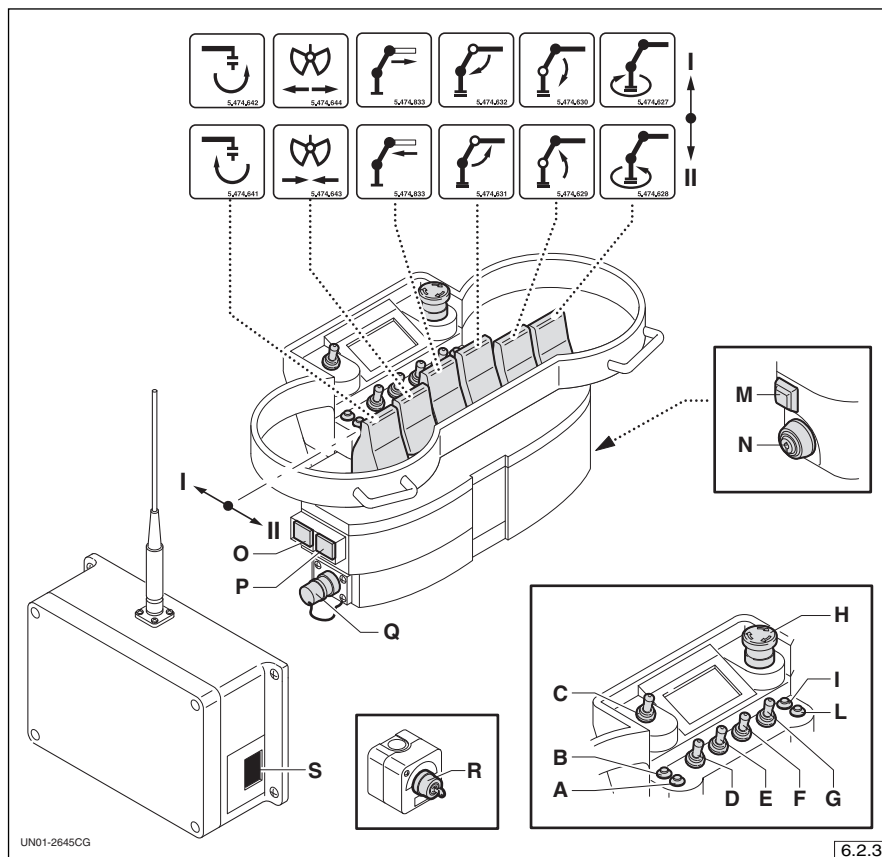
Fllick the switch to vary the engine rpm of the vehicle.

E - Speed/F3 function key switch

Activate to enable or disable the crane operating speed or the optional F3 function key.

F - Start/stop switch

Fllick the switch to start up or stop the vehicle engine.



Not active.

When on:

- with a green light, this shows the radio-control is operating normally;
- with a red light, this shows the transmitter unit batteries are flat.

The button has two functions:

- 1) enables the radio control operation;
- 2) sounds to alert the operator that the radio control is switched on.

0 = Transmitter unit is switched off

1 = Transmitter unit is live

P = Programming accessible by specialised technical staff only

Not active.

The button, used in combination with each single load lowering control command, moves the crane from a blocked situation in which all the controls are inhibited (see function reset with “3-30”).

Connection for use of the transmitter as a cable control.

Activate to enable or disable the optional F1 or F2 functions.

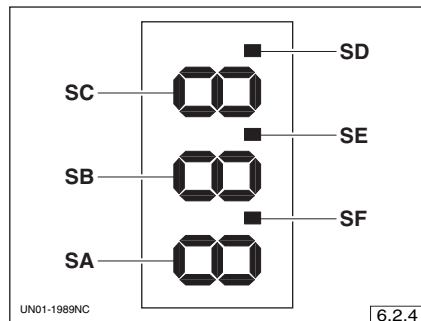
See "Safety devices".

R - Receiver unit ON switch

Hand/Manual position = manual control function activated;

Radio position = radio-control function activated.

S - Display



The display shows all the radio-control operation information.

- Alphanumeric fields

SA: shows which lever on the transmitter unit has been operated;

SB: only active during system programming carried out by specialised personnel;

SC: displays the radio-control operating status (see chart below).

- Key

Pos.	Code	Description
SA	E	Transmitter unit lever operating error. Switch the transmitter unit off then on again; if the code is still displayed, operation is inhibited
	1	Joystick 1 operation
	2	Joystick 2 operation
	3	Joystick 3 operation
	4	Joystick 4 operation
	5	Joystick 5 operation
	6	Joystick 6 operation
	7	Joystick 7 operation
	8	Joystick 8 operation
SB		System codes: these are only displayed during system programming. For use by specialised personnel only
SC	0	Radio-control activated: all manoeuvres are enabled.
	1	Receiver unit powered correctly. Radio signal present but radio-control not yet active.
	2	Emergency stop button pressed on transmitter unit.
	3	Warning message: insufficient radio signal reception.
	4	Receiver unit powered correctly but no radio signal: - transmitter unit switched off; - programming error (wrong radio channel or serial number).

Joysticks = control levers, labelled in ascending order from left to right (see fig. 6.2.3).
For example:
Joystick 3 = third lever from the left

- Points:

SD - flashing: correct radio signal reception.

SE - not active.

SF - flashing in conjunction with SD: during programming stage only.

- Switching on the radio control

- Turn the key on the receiver unit ON switch "R" (fig. 6.2.3) to the "RADIO" position.
- Turn the key on the transmitter unit ON switch "N" (fig. 6.2.3) to the "I" position.
- Press button "B" to activate the transmitter/receiver unit functions.

- Switching off the radio control

- Turn the key on the ON switch "N" on the transmitting unit (fig. 6.2.3) to position "O".
- Turn the key on the receiver unit switch "R" to the "HAND / MANUAL" position.

6.2.3 - Radio control operation check

Before starting to work:

- check the batteries are charged;
- check the radio control is in good condition;
- check the rubber guards around the levers are in good condition;
- check the receiving unit connections are in good condition;
- check the connection pins on the receiving unit are tightened properly.
- Checking emergency stop device operation.

Press emergency stop button, move the levers on the radio control in both directions and check that no crane manoeuvres are possible. Rotate the button to restore normal crane operation.

6.2.4 - Radio control stop due to power failure

In the event that the "crane locks" due to a flat battery, proceed as follows:

- I) switch off the transmitting unit
- II) replace the battery
- III) carry out the receiving unit start-up procedure.

6.2.5 - Radio control maintenance

For radio control maintenance, please refer to the instructions contained in the instruction manual provided by the radio control's manufacturer.

6.3 - Work sectors

Different devices to check the work sectors can be installed to guarantee the stability of the equipment.



Information

Machines fitted with the Power Tronic Advance control panel can perform small manoeuvres near the column axis, for example opening and closing the crane even when the outrigger jacks are not resting on the ground.

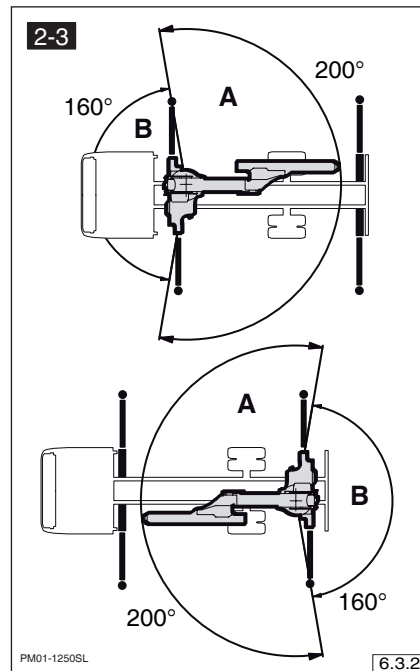
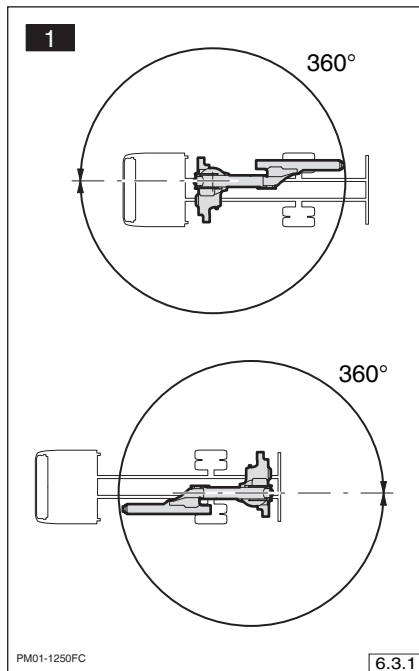


Information

The values of the angles that determine the work sectors and the outrigger extension percentages are indicative; they may vary according to the crane and type of equipment.

6.3.1 - Electrical and mechanical rotation control devices

- 1) At 360° with a nominal capacity (*) (fig. 6.3.1).
- 2) With a nominal capacity (*) in sector "A" (200°) but without the possibility of rotation in sector "B" (160°) (fig. 6.3.2).
- 3) With a nominal capacity (*) in sector "A" (200°) and a reduction in capacity in sector "B" (**) (160°) (fig. 6.3.2).



(*) nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) with a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".

6.3.2 - Stabilisation control device (TYPE 1)

This device makes it possible to work with two sectors (A - B).

- **Sector A** (rated load capacity) (*)
outriggers arms fully extended and outrigger jacks resting correctly on the ground.
- **Sector B** (reduced load capacity) (**)
outrigger jacks resting correctly on the ground.

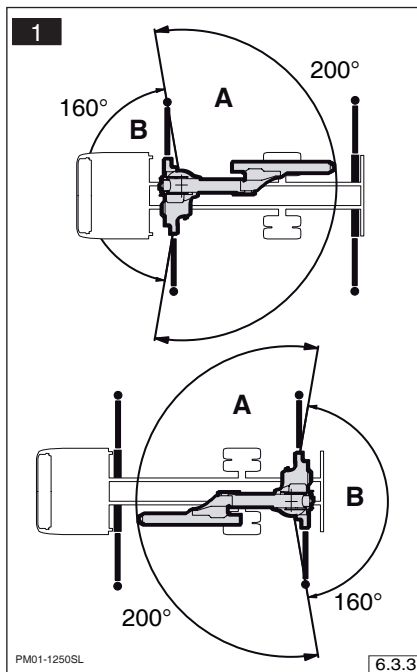


Fig. 1: outriggers arms fully extended.

(*) Nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) The sector "B" can be disabled according to the type of equipment. With a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".

6.3.3 - Stabilisation control device (TYPE 2)

This device makes it possible to work with 3 sectors (A - B - C).

- **Sector A** (rated load capacity) (*) outriggers arms fully extended and outrigger jacks resting correctly on the ground.
- **Sector B** (reduced load capacity) (**) outrigger jacks resting correctly on the ground.
- **Sector C** (reduced load capacity) outriggers arms not fully extended and stabiliser jacks resting correctly on the ground.

(*) Nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) The sector "B" can be disabled according to the type of equipment. With a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".

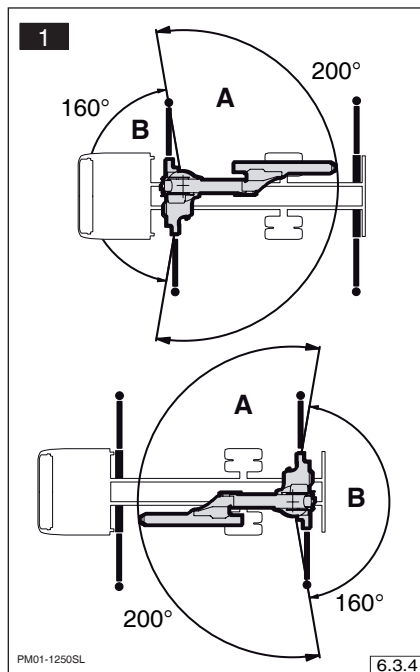


Fig. 1: outriggers arms fully extended.

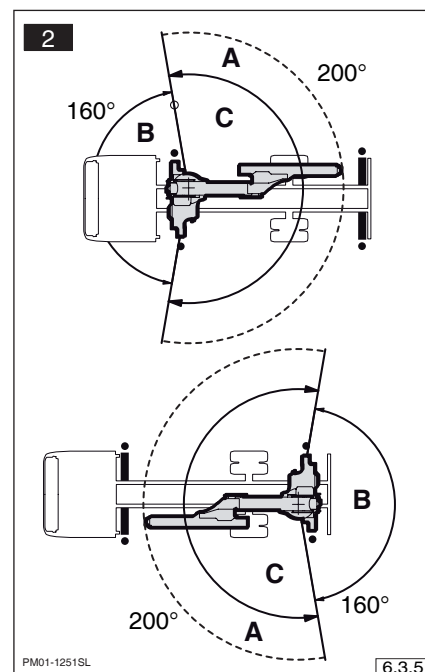


Fig. 2: outriggers arms not fully extended.

6.3.4 - Stabilisation control device (TYPE 3)

This device makes it possible to work with 3 sectors (A - B - C) differentiating the right side and the left side.

- **Sector A** (rated load capacity) (*) outriggers arms fully extended and outrigger jacks resting correctly on the ground.

i Information

With this type of device there is a sector "A", rated load capacity, where only the outrigger jacks are resting correctly on the ground (fig. 4).

- **Sector B** (reduced load capacity) (**) outrigger jacks resting correctly on the ground.
- **Sector C** (reduced load capacity) outriggers arms not fully extended and stabiliser jacks resting correctly on the ground.

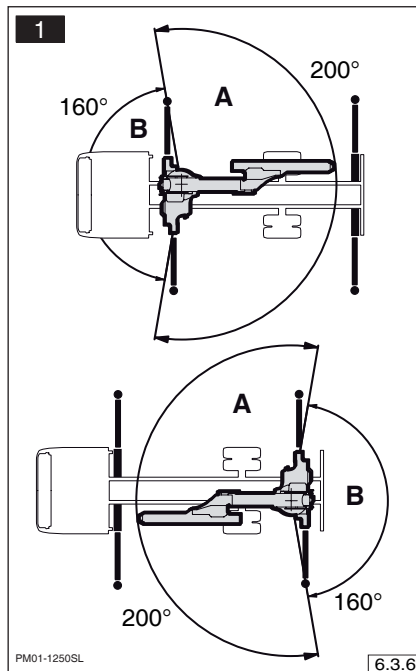


Fig. 1: outriggers arms fully extended.

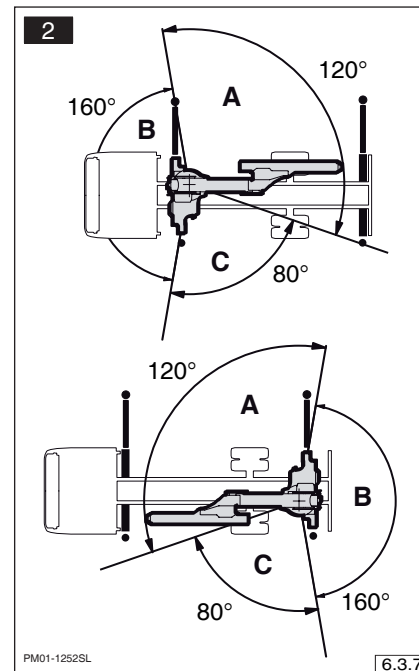


Fig. 2: outriggers arms not fully extended.

(*) Nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) The sector "B" can be disabled according to the type of equipment. With a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".

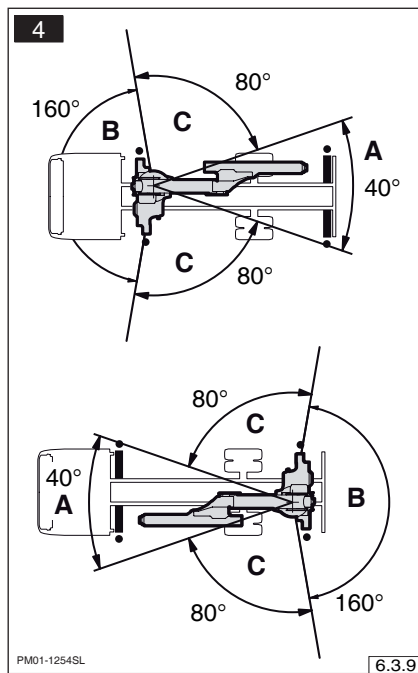
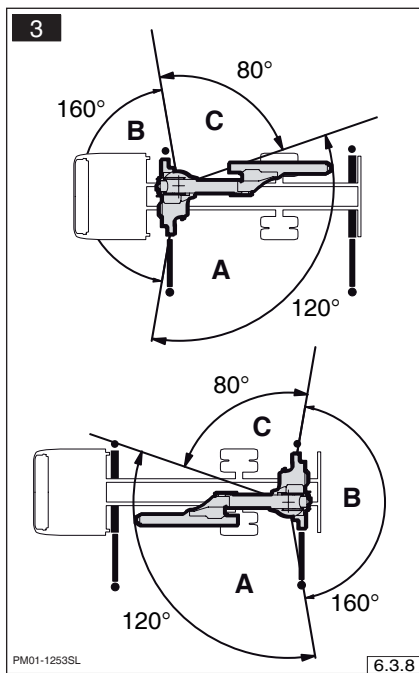


Fig. 3 - 4: outriggers arms not fully extended.

6.3.5 - Stabilisation control device (TYPE 4)

This device makes it possible to work with 4 sectors (A - B - C - D) differentiating the right side and the left side, and also differentiating the position of the outriggers arms in two intervals.

- **Sector A** (rated load capacity) (*)
outriggers arms fully extended and outrigger jacks resting correctly on the ground.



Information

With this type of device there is a sector "A", rated load capacity, where only the outrigger jacks are resting correctly on the ground (fig. 4).

- **Sector B** (reduced load capacity) (**)
outrigger jacks resting correctly on the ground.
- **Sector C** (reduced load capacity)
outrigger jacks resting correctly on the ground and at least one outrigger arm with an extension of about less than 50% compared to the maximum extension.

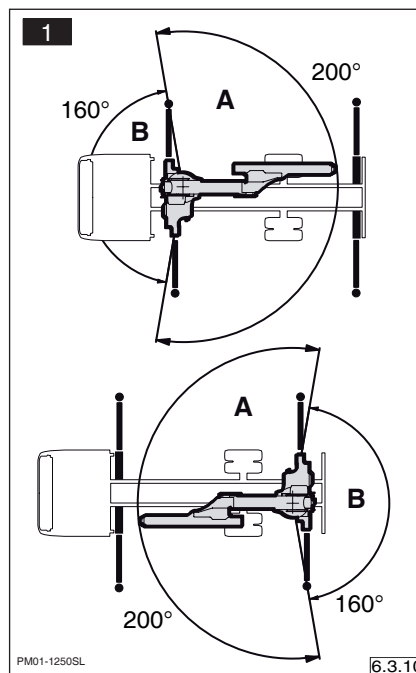


Fig. 1: outriggers arms fully extended.

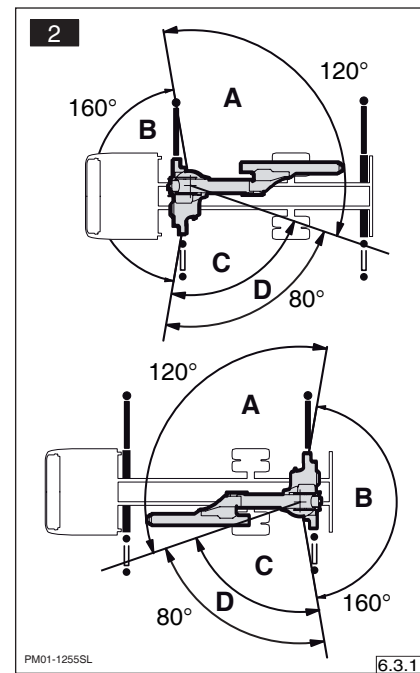
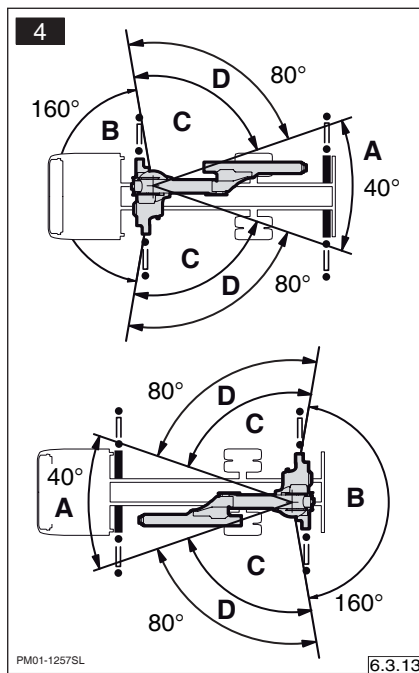
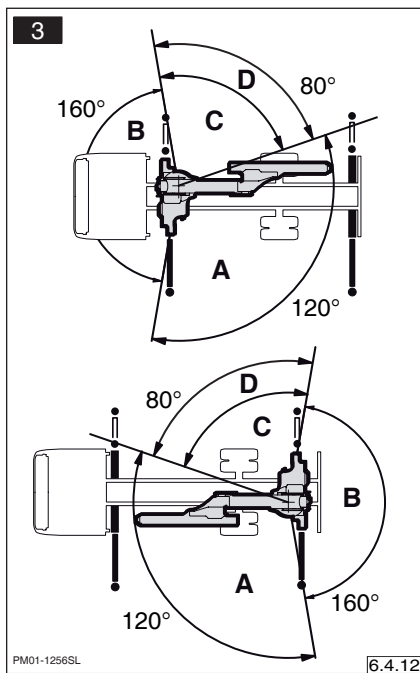


Fig. 2: outriggers arms not fully extended.

(*) Nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) The sector "B" can be disabled according to the type of equipment. With a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".



- **Sector D** (reduced load capacity)
outrigger jacks resting correctly on the ground and both outriggers arms with an extension of about more than 50% compared to the maximum extension, but not fully extended.

Fig. 3 - 4: outriggers arms not fully extended.

6.3.6 - Stabilisation control device (TYPE 5)

This device makes it possible to work with 6 sectors (A - B - C1 - C2 - C3 - C4) differentiating the right side and the left side, and also differentiating the position of the outriggers arms in 4 intervals for the crane and 3 intervals for the supplementary crossmember.

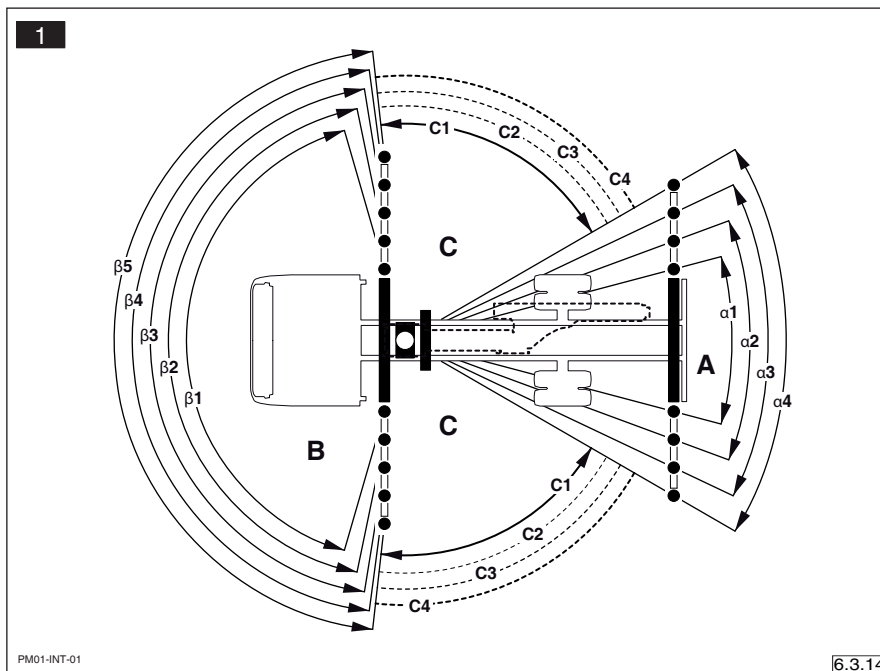
- **Sector A** (rated load capacity) (*)
outriggers arms fully extended and outrigger jacks resting correctly on the ground.



Information

With this type of device there is a sector "A", rated load capacity, where only the outrigger jacks are resting correctly on the ground (fig. 1).

- **Sector B** (reduced load capacity) (**)
outrigger jacks resting correctly on the ground.
- **Sectors C1, C2, C3, C4** (reduced load capacity)
outrigger jacks resting correctly on the ground and outriggers arms extended as shown in the table.



(*) Nominal capacity = max. load permitted in relation to a certain configuration (see "Capacity diagram").

(**) The sector "B" can be disabled according to the type of equipment. With a crane behind the truck bed, in some cases, the same load capacity of the sector "A" can be applied to sector "B".

- Stabilisation combinations between the crane and the supplementary crossmember

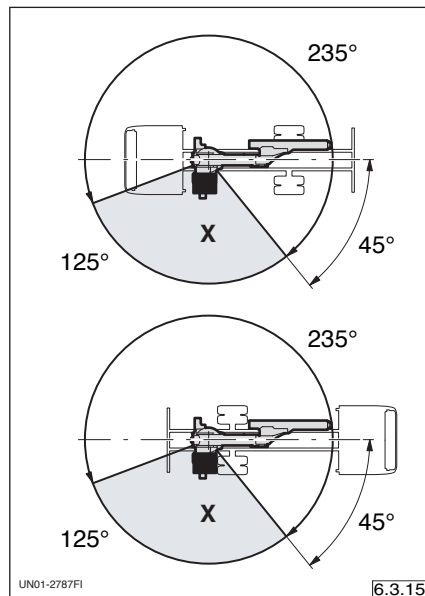
		$\alpha 1$	$\alpha 2$	$\alpha 3$	$\alpha 4$
		0% - 32%	33% - 65%	66% - 99%	100%
$\beta 1$	0% - 24 %	C1	C1	C1	C1
$\beta 2$	25% - 49%	C2	C2	C2	C2
$\beta 3$	50% - 74%	C2	C3	C3	C3
$\beta 4$	75% - 99%	C2	C3	C4	C4
$\beta 5$	100%	C2	C3	C4	A

(α) sector width given by the extension of the supplementary crossmember outriggers arms.

(β) sector width given by the extension of the crane outriggers arms.

6.3.7 - Raised control station control device

The raised control station controls another work sector (sector "X" fig. 6.3.15), regardless of the control device installed on the machine (see previous chapters), to prevent the crane from operating above the control station.



This device performs the following checks:

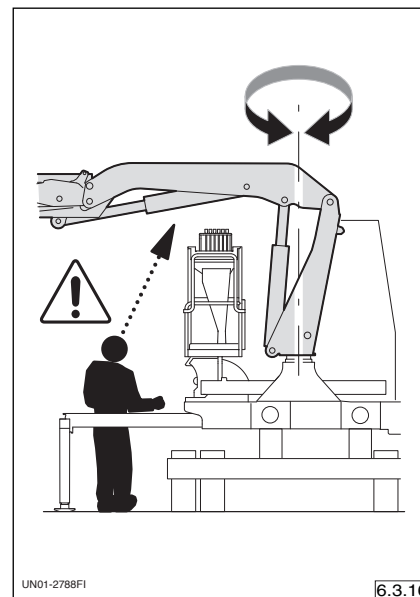
- if the user operates from the raised control station, the sector "X" is not accessible;
- if the user operates from the ground the sector "X" is accessible.



CAUTION !

When working from the ground control positions particular attention must be paid to the space occupied by the raised control station as in this operating mode the rotation locking device is not active.

- If the user operates from the ground and the Power Tronic device is featured, the sector "X" is accessible but only with the main and secondary arms of the crane above the space occupied by the raised control station.



6.4 - Crane stabilisation

6.4.1 - Stabilisation procedure

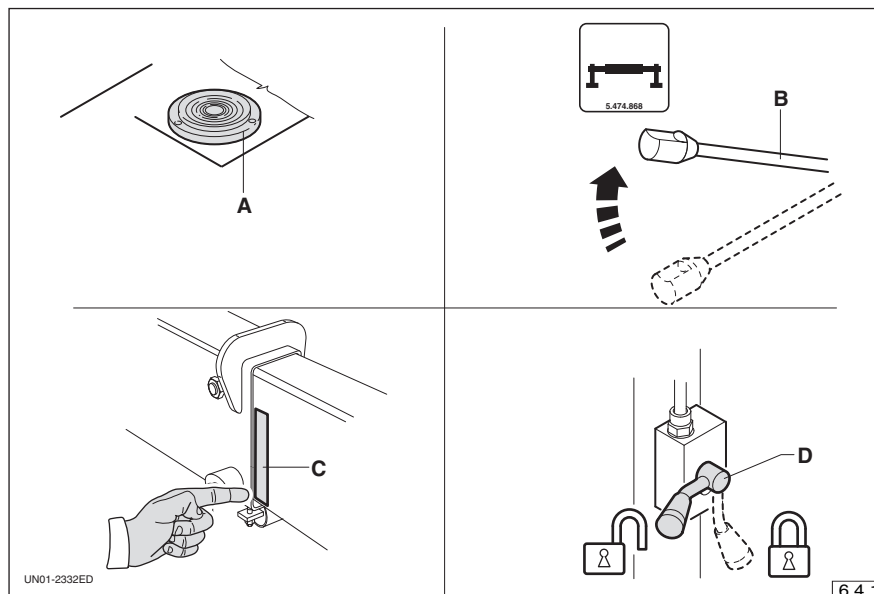


HAZARD !

The operator must know the maximum load that the stabiliser will apply to the ground (see "Enclosures") and must ensure that the ground consistency can guarantee the stability of the vehicle.

On ground that is not very solid, place the raised support plates or a hard wooden board of a suitable size between the stabiliser and the ground. Stabilise the machine by unloading the weight of the vehicle from the suspension without lifting the wheels off the ground, as this would cancel out the elastic effect of the suspension, causing it to tip over.

Check the correct levelling using the spirit level (fig. 6.4.1), which must be flat (0°) with a maximum tolerance of $\pm 1^\circ$.



CAUTION !

Before using the controls for the stabilisation, deactivate all the locking devices.

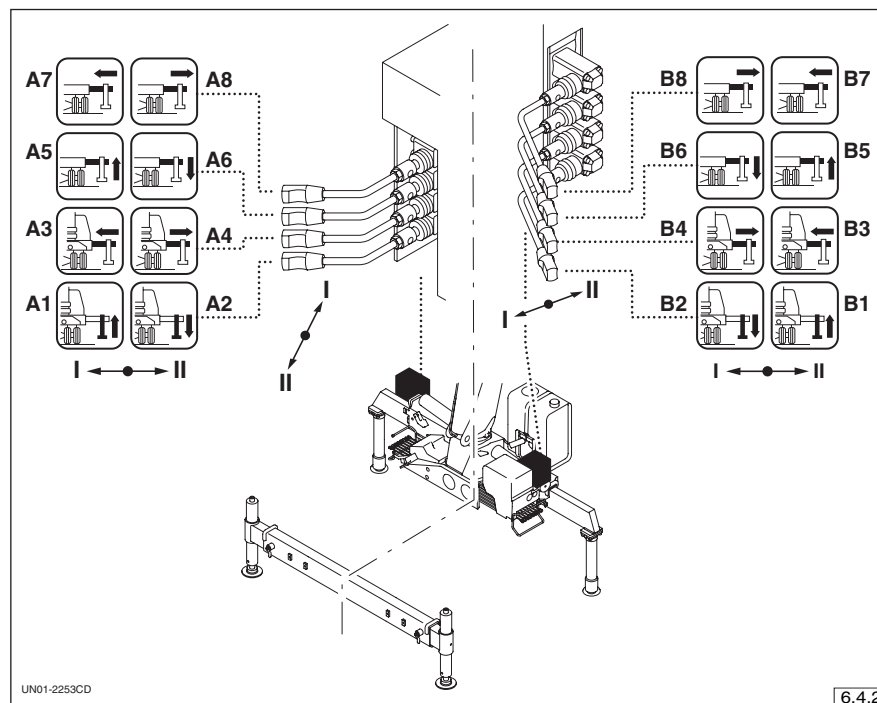
- 1 - Block the vehicle with the parking brake and place the chocks behind the wheels.
- 2 - Start the motor at minimum rpm and engage the power takeoff.
- 3 - Make sure the distributor lever "B" is in the "stabiliser enabling" position (fig. 6.4.1).

- 4 - Extend the stabiliser arms to the maximum open position signalled by the yellow indicator light "C" (fig. 6.4.1).
- 5 - Open the cock "D".
- 6 - Use the lever on the distributor to place the outrigger on the ground.
- 7 - Close the cock "D".
- 8 - Repeat the operations for each stabiliser.

i Information

In cold climates, allow the pump to run for a few minutes before manoeuvring the crane to ensure the hydraulic oil reaches the operating temperature.

6.4.2 - Stabilisation controls



- | | |
|--|--|
| A1- retraction of the crane left stabiliser jack | A4- extension of the crane left stabiliser arm |
| A2- extension of the crane left stabiliser jack | A5- retraction of the supplementary crossbeam left stabiliser jack |
| A3- retraction of the crane left stabiliser arm | |

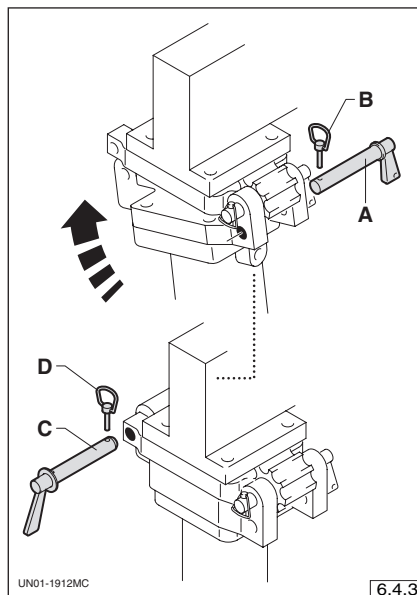
- A6- extension of the supplementary crossbeam left stabiliser jack
- A7- retraction of the supplementary crossbeam left stabiliser arm
- A8- extension of the supplementary crossbeam left stabiliser arm
- B1- retraction of the crane right stabiliser jack
- B2- extension of the crane right stabiliser jack
- B3- retraction of the crane right stabiliser arm
- B4- extension of the crane right stabiliser arm
- B5- retraction of the supplementary crossbeam right stabiliser jack
- B6- extension of the supplementary crossbeam right stabiliser jack
- B7- retraction of the supplementary crossbeam right stabiliser arm
- B8- extension of the supplementary crossbeam right stabiliser arm.

6.4.3 - Manual adjustable stabiliser



WARNING !

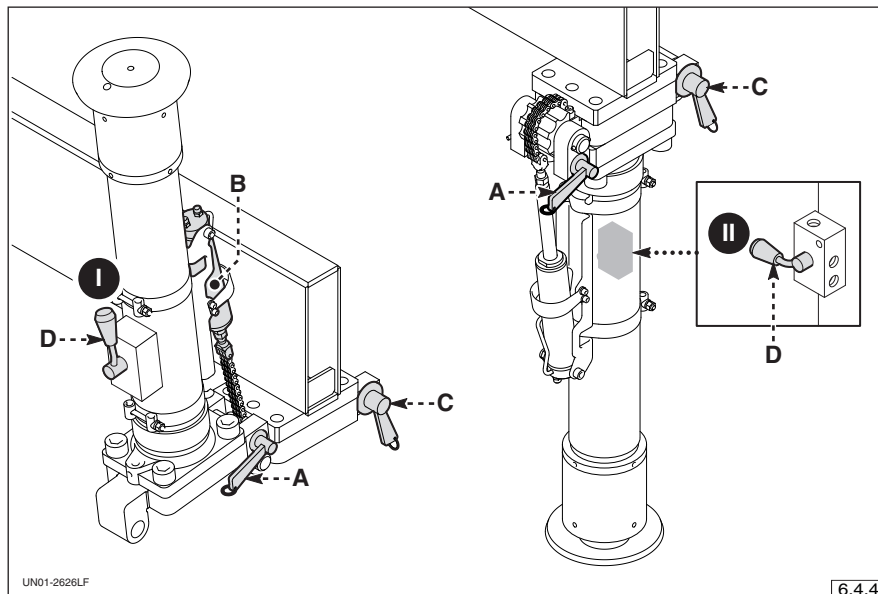
Before removing the lock pin, support the stabiliser jack (with the force required) and accompany it through the rotation movement until it reaches the upright position (work position).



- 1 - Remove the lock pin "A".
- 2 - Rotate the jack into the upright position.
- 3 - Fit the pin "C" and secure it with the safety pin "D".

Carry out the same operations but proceeding in reverse order to return the jack to the resting position. Lock it in position with pin "A" and the relative safety pin "B".

6.4.4 - Hydraulic adjustable stabiliser



Use lever "D" of turn valve to enable the rotation controls of the outrigger jack.

To rotate the outrigger jack use the extension and retraction controls of the outrigger jacks (see "Stabilisation controls").

- Stabilisation

- 1) Check that pin "A" is in its seat and locked with a safety lock pin.
- 2) Extend outrigger arm.
- 3) Check that lever "D" of the turn valve is in "I" position.
- 4) Use the outrigger jack retraction lever to pressurise jack "B".



WARNING !

Always pressurise jack "B" before sliding out pin "A" to avoid the uncontrolled rotation of the outrigger jack.

- 5) Slide out pin "A" and pin "C".
- 6) Use the outrigger jack extension lever to rotate the outrigger jack downwards.
- 7) Complete the rotation of the outrigger jack manually and slide in pin "C" and lock it with the safety lock pin.
- 8) Slide in pin "A" and lock it with the safety lock pin.
- 9) Use lever "D" of the turn valve in position "II" to enable the extension of the outrigger jack.
- 10) Use the stabilisation controls to stabilise the machine.
- 11) Use lever "D" of the turn valve in position "I" to disable the extension and retraction controls of the outrigger jack.

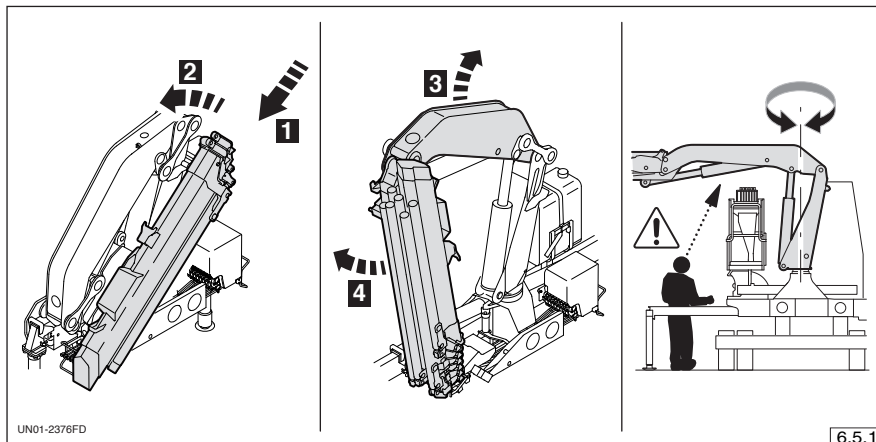
- Destabilisation

- 1) Use lever "D" of the turn valve in position "II" to enable the extension and retraction controls of the outrigger jack.
- 2) Use the stabilisation controls to destabilise the machine.
- 3) Use lever "D" of the turn valve in position "I" to enable the lifting movement of the outrigger jack.
- 4) Slide out pins "C" and "A".
- 5) Use the outrigger jack retraction control lever to completely rotate the outrigger jack.
- 6) Slide in pin "A" and lock it with the safety lock pin.
- 7) Slide in pin "C" and lock it with the safety lock pin.
- 8) Retract the outrigger arm fully.

6.5 - Working position of the crane

Before moving the crane, carefully read the section on "Safety" and the stabilisation instructions.

Check that the battery is charged and the radio control functions properly.



CAUTION !

Before starting the manoeuvres remove:

- ***the locking devices that hold the crane in position during road travel;***
- ***the locking devices which prevent the crane rotating.***

To place the crane into the working position, carry out the following manoeuvres:

- 1 - close the jack or the arm extension jacks to the end strokes;
- 2 - close the secondary jack to the end stroke;
- 3 - open the main jack;
- 4 - open the secondary jack.

The main and secondary jacks must be open enough to allow the free rotation of the crane.



CAUTION !

When working from the ground control positions particular attention must be paid to the space occupied by the raised control station as in this operating mode the rotation locking device is not active.

6.6 - Checking the efficiency of the control and limiting devices

6.6.1 - Checking the emergency stop button



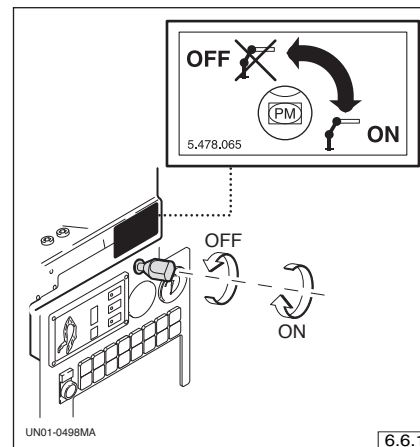
WARNING !

Check all the emergency stop buttons individually.

Conduct a test with the crane open and unloaded.

- 1) Press the emergency button.
- 2) Move the control levers in both directions and check that no crane manoeuvres are possible.
- 3) Turn the button to reset the crane functioning.

6.6.2 - Checking the hydraulic moment limiter



Conduct the test with the crane open and unloaded.

- 1) Turn the lever to pos. "OFF"; the sound signal indicates that the machine is in the "lock" condition.
- 2) Move the control lever in both directions to check that all movements are inhibited except for the arm retraction.
- 3) Turn the lever to pos. "ON" and retract the arms to restore the normal operation of the crane.

6.6.3 - Checking the rotation limiter (fig. 6.6.2)

Carry out the check with a load that is higher than what is permitted for that certain sector.

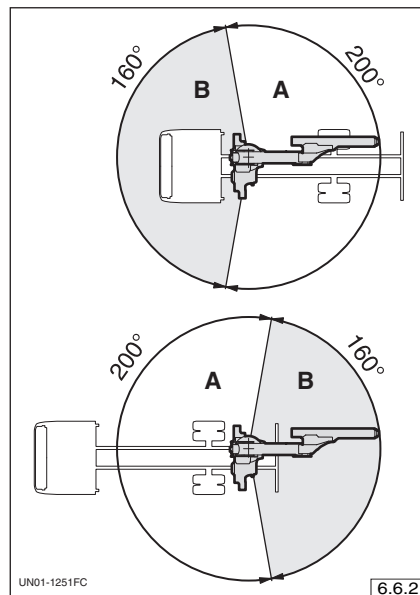
The permitted load value is provided by the authorised service centre that performed the installation and checked the stability of the assembly.

- 1) Turn the crane clockwise and anti-clockwise to check that the device prevents the rotation of the crane into sector "B".

6.6.4 - Checking the rotation block (fig. 6.6.2)

Carry out the check with the crane open and without a load.

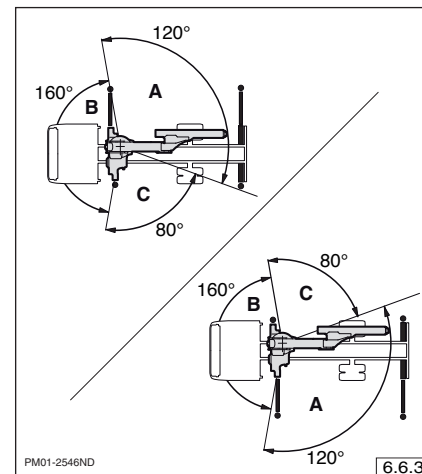
- 1) Turn the crane clockwise and anti-clockwise to check that the device prevents the rotation of the crane into sector "B".



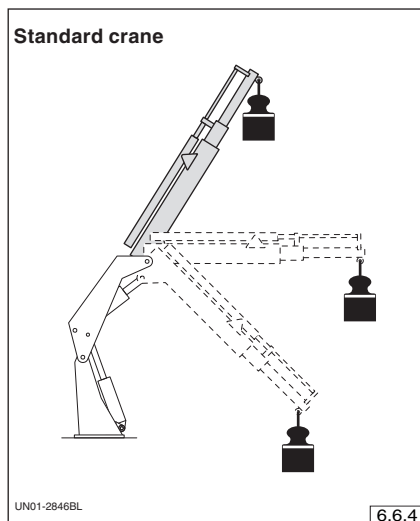
6.6.5 - Checking the rotation limiter with stabilisation control device

Carry out the test, starting from sector "A" on the right, with a load exceeding the permissible load for work sectors "B" and "C" at a certain distance (see capacities diagram).

- 1) Stabilise the machine.
 - 2) Turn the crane clockwise and anti-clockwise to make sure the devices prevent crane rotation in the sectors that are off-limits, i.e. "B" and "C", fig. 6.6.3).
- Repeat the test, starting from sector "A" on the left.



6.6.6 - Checking the load maintenance valve

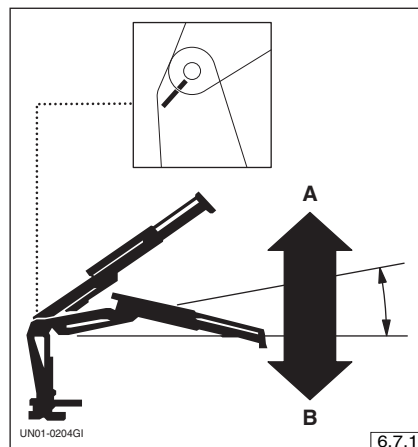


Carry out the check with a medium load.

- 1) Position the crane as shown in fig. 6.6.4.
- 2) Deactivate the power takeoff.
- 3) Remove the pressure from the system by moving the distributor lever a few times.
- 4) Wait for a short time to check that the load does not lower.

6.7 - Lifting and moving the load

- Lifting the load



To lift large loads that require the full power of the crane, work as follows.

Zone "A":

- move mainly the main jack.

Zone "B":

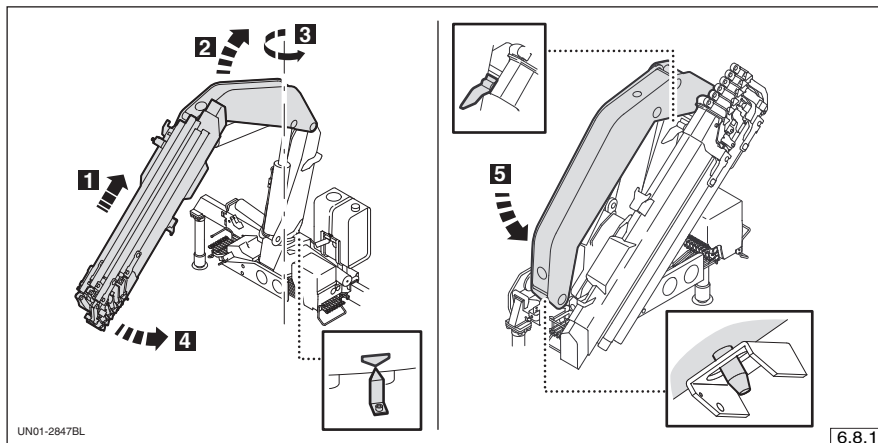
- use mainly the secondary jack and the arm extension jacks.

Maximum lifting capacity is achieved with the main arm at an angle of 27° above the horizontal, as shown in the capacities diagrams.

The value of this angle (A1) can be seen on the display of the functional control unit or of the transmitter unit; otherwise, it can be obtained by making the two references on the column and on the main arm coincide.

To speed up the loading/unloading operations, it is preferable to use the main and secondary jack, rather than the arm extension jacks.

6.8 - Crane resting position



HAZARD !

To avoid the risk of accidents, manoeuvre the crane from the opposite side to the main arm closing.



CAUTION !

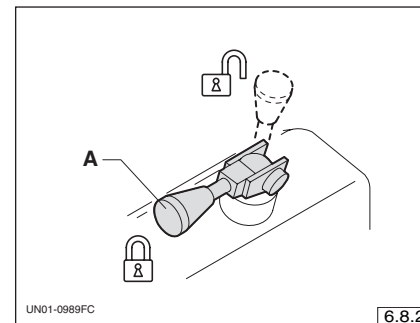
When working from the ground control positions particular attention must be paid to the space occupied by the raised control station as in this operating mode the rotation locking device is not active.

6.32

To place the crane in the resting position, carry out the following manoeuvres (fig. 6.8.1).

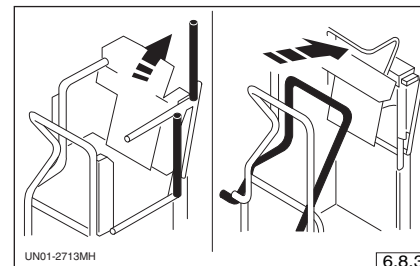
- 1 - Retract the crane arms.
- 2 - Open the main jack.
- 3 - Turn the crane until it fits the reference points located on the column and base.
- 4 - Close the secondary jack.
- 5 - Close the main jack making sure that the main arm of the crane fits into the special anti-rotation supports.

In the “LC” version check that the arms are correctly locked by the extension lock device “A”.



WARNING !

In the version with the raised control station, set guards in the resting position, before closing up the crane.



6.9 - Crane destabilisation and circulation on the roads

6.9.1 - Crane destabilisation

- 1 - Close up the machine into the resting position.
- 2 - Retract all the stabiliser jacks completely.
- 3 - Retract all the stabiliser arms completely.
- 4 - Engage all the locking devices for road transit.
- 5 - Deactivate the power takeoff.
- 6 - Check that the crane is within the maximum outreach limits foreseen by the Highway Code.

6.9.2 - Circulation on the roads



WARNING !

Before setting off, make sure the power takeoff is switched off to prevent serious damage to the vehicle.

Driving the vehicle and crane outfitting requires particular skill and training, in addition to a extreme awareness of the responsibility it entails, which is why only suitably trained and authorised persons may drive the machine.

Circulation on the road network is only permitted to approved machines and drivers meeting the requirements of the current highway code.

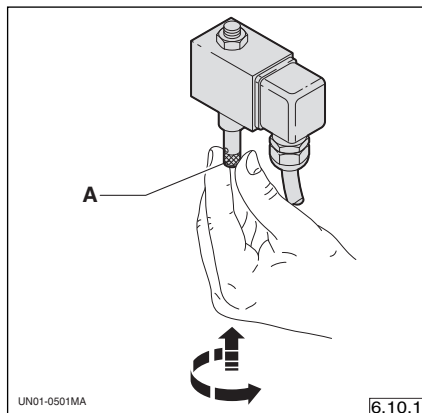
In any case, before setting off, ensure:

- the safety pins for circulation on the roads are fitted properly;
- any mobile parts which could move suddenly and unexpectedly are locked securely;
- all protruding parts are clearly marked with the relative warning plates.

6.10 - Lock situations and manoeuvres permitted

It is impossible to explain every lock situation that can be verified during the use of the machine.
As a general rule, manoeuvres that are permitted are those which bring the load towards the column.

6.10.1- Crane lock due to momentum limiting device trigger



Momentum limiting device activation causes a crane block.

Manoeuvre the load to bring it closer to the column and in doing so unlock the machine.

If the machine is locked with the hydraulically extended arms completely retracted, proceed as follows.

- 1 - Switch off the radio control.
- 2 - Remove the seals from the momentum limiter shut-off device.
- 3 - Press and turn pawl "A" until the limit switch is reached to switch off the momentum limiter.



HAZARD !

Shutting off the momentum limiter involves the risk of the truck/equipment combination tipping over, so proceed with the utmost caution. Only carry out the manoeuvres that move the load towards the column, in order to place the load on the ground.

- 4 - Set the load down on the ground and close the crane up into the resting position.



Information

The seals on the limiter's cut-off device must be replaced by an authorised workshop.

6.10.2- Winch lock

Lifting a load that exceeds the maximum allowed by the winch causes the current manoeuvre to lock.

Lower the load to get out of the lock situation and return the equipment to the starting position.

In the event that that reversal of the manoeuvre is not enough to unlock the winch, retract the crane's arms while carrying out the reversed manoeuvre with the winch at the same time.

6.11 - Failure situations

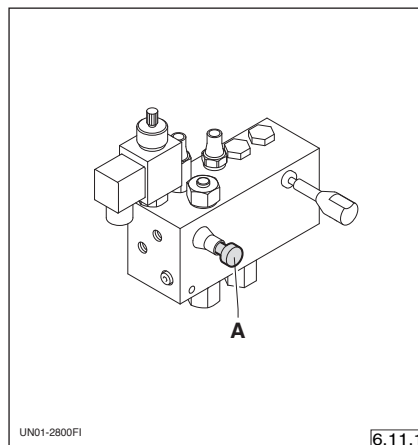
6.11.1- Momentum limiting device failure



HAZARD !

Shutting off the momentum limiter involves the risk of the truck/equipment combination tipping over, so proceed with the utmost caution. Only carry out the manoeuvres that move the load towards the column, in order to place the load on the ground.

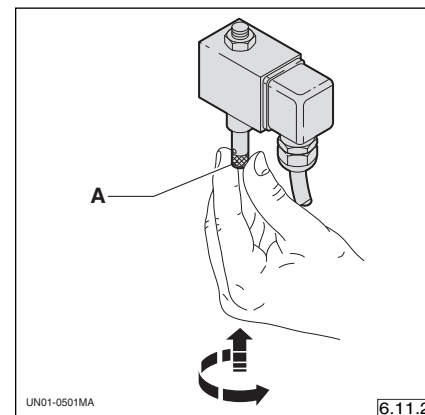
6.11.2- Hydraulic power failure



If the hydraulic power supply to the momentum limiting device is cut off, proceed as follows.

- 1 - Remove the seals from the momentum limiter shut-off device.
- 2 - Tighten the screw "A" fully.
- 3 - Set the load down on the ground and close the crane up into the resting position.

6.11.3- Electric power failure



If the electric power supply to the momentum limiting device is cut off, proceed as follows.

- 1 - Remove the seals from the momentum limiter shut-off device.
- 2 - Press and turn pawl "A" until the limit switch is reached to switch off the momentum limiter.
- 3 - Set the load down on the ground and close the crane up into the resting position.



Information

The seals on the momentum limiter's cut-off device must be replaced by an authorised workshop.

6.11.4- Radio control failure

In the event of a radio control failure, switch it off and manoeuvre the crane from the controls on-board the machine.



WARNING !

Before moving the load with the extensions, check that the transmitter pin is working and that it is mounted onto the extension that you wish to use.

Always select the number relating to the extension in use.

During movement of the load, do not for any reason change the number of the extension in use. It is prohibited to lift loads larger than those indicated on the capacity diagrams (whatever the geometric configuration of the crane is).

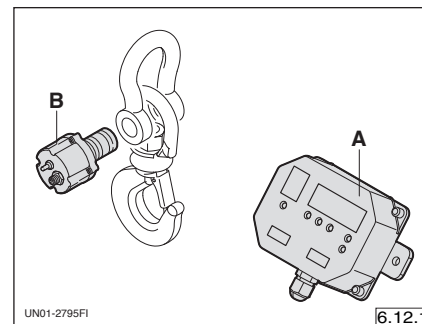
6.12- Use of the load limiter for manual extensions

- General description

The limiting device informs the operator of the weight lifted by the extension in use.

On reaching the preset value (depending on the extension in use), all the load lifting manoeuvres stop immediately and so the overloading of the extension is avoided.

- Main parts



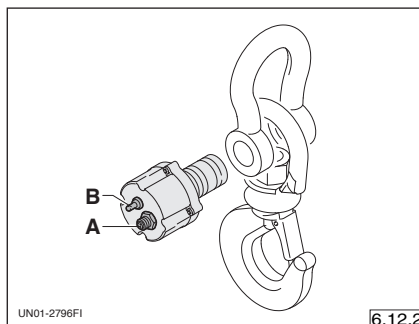
A - Receiver unit.

B - Transmitter pin.

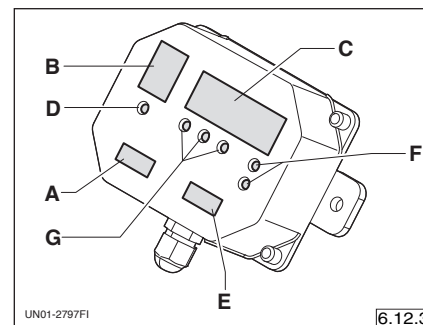
- Technical data

Power voltage	from 9 to 24 V dc
Absorption	250 mA max.
Protection	IP 65
Emission frequency	FM 2,4 Ghz (ISM)
Battery	Ni-Mh 3,6V 2,4 Ah
Indicative battery duration	120 hours

- Controls and indicators

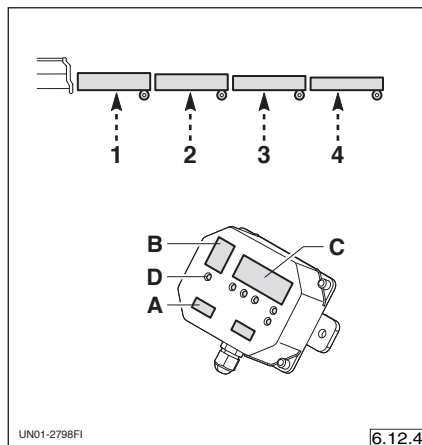


- A** - Battery charger connector.
B - Switch to switch the transmitter unit on/off.



- A** - Selection key for the extension in use.
B - Display for the extension selected.
C - Display for the weight lifted by the extension in use.
D - Light signal: when it is lit it means the load preset for the extension in use has been exceeded.
E - Measurement unit selection button.
F - Signal lights: they signal which measurement unit is shown on the display (kg or lbs).
G - Signal lights: they show the charge of the battery of the transmitter unit (green, yellow and red).
 When the battery is completely flat the message "-." and "- - - -" appears on the displays "B" and "C".

- Functioning



Proceed as outlined below.

- 1 - Using button "A", select the manual extension that you wish to use, in accordance with the diagram in fig. 6.12.4. The number of the extension appears on the display "B".
- 2 - Fit the transmitter/pin on the selected extension and switch it on.
- 3 - Lift the load.

When the maximum load liftable by the extension in use is reached, the signal light lamp "D" will light up. The corresponding icon will appear on the radio control and/or transmitter unit display and on the control unit.

All the lifting manoeuvres by the crane are blocked and only lowering movements to place the load on the ground are permitted.

With the load on the ground, the alarm stops and it is possible to start work again.



WARNING !

If all the commands are inhibited press button "A" until a flashing dash appears on the display "B", indicating that the load limiter has been deactivated.

The operator has to manoeuvre with maximum care and place the load on the ground in order to avoid any accidents.

- Displaying the maximum preset values (fig. 6.12.4)

When an extension is selected using the button "A", the corresponding preset load is shown on the display "C".

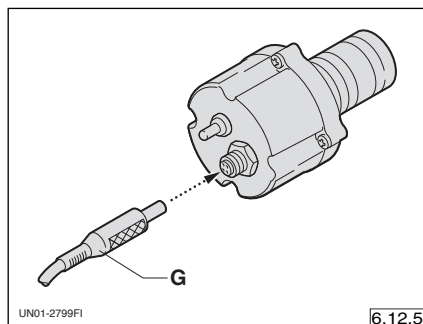


WARNING !

The values for the maximum loads of the manual extensions were originally preset by PM Group or at an authorised service centre. Any re-calibrations may only be carried out at an authorised service centre.

The maximum preset values are slightly higher than those indicated in the load diagrams, due to the tolerance of the device.

- Charging the battery



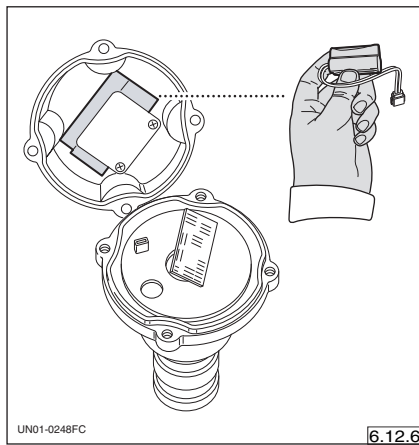
Connect the cable “G” of the battery charger to the transmitter unit and to the 12 - 24 V dc socket of the vehicle (charging time: about 4 hours).

i Information

Switch off the transmitter when not in use.

After a long period out of use it is recommended to charge the transmitter before use.

- Replacing the battery



Proceed as outlined below.

- 1 - Unscrew the four screws and open the case.
- 2 - Turn the casing upside down and unscrew the four fixing screws of the circuit board.
- 3 - Remove the connector that connects the board and replace the battery pack.

i Information

Do not use lithium batteries, as they are not suitable.

Only use batteries of the type specified by the manufacturer, the same as those already fitted in the transmitter.

7 Maintenance

7.1 - Regular checks

All the maintenance operations that are not provided for in this chapter must be carried out at an authorised PM service centre.



CAUTION !

Before carrying out any maintenance operation check that the oil has completely cooled down.

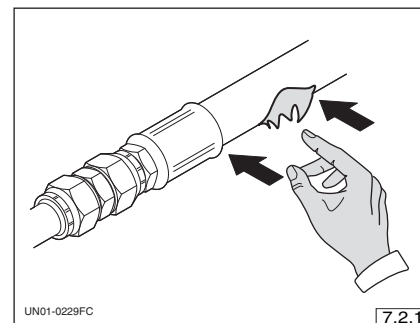
Regular checks						
Checks to be carried out by the operator						
Component	Operation	Every 10 hours	Every 100 hours	Every 500 hours (6 months)	Every 1000 hours (1 year)	Para.
Pipes and hoses	Check	•				7.2
Hosing guard	Check integrity	•				7.3
Connections	Check for leaks	•				7.4
Plates	Check integrity	•				2.4
Hook	Check	•				3.1
Hydraulic oil	Check	•				7.5
Control and limiting devices	Check	•				2.3
Structure	Inspection	•				7.6
Winch cable	Check	•				7.8
	Lubrication		•			7.9
Pulleys	Check integrity	•				7.7
	Running check	•				7.7
	Lubrication		•			7.21
Pin lock	Check		•			7.10
Crane stay rod	Check		•			7.11
Supplementary crossmembers	Check					7.13
Crane	Cleaning		•			7.16
Pins	Lubrication		•			7.21
Arms	Lubrication		•			7.15
Sliding blocks	Lubrication		•			7.21
Rotation block	Lubrication		•			7.21
Control levers	Lubrication		•			7.21
Jack sliding blocks	Check		•			7.12

Regular checks						
Checks to be carried out by the operator						
Component	Operation	Every 10 hours	Every 100 hours	Every 500 hours (6 months)	Every 1000 hours (1 year)	Para.
Filters	Check	•				7.14
	Replacement			•		7.14
Radio control batteries	Replacement				•	6.2
Manual extension limiter batteries	Replacement				•	6.12

Regular checks						
Checks that must be carried out at an authorised service centre						
Component	Operation	Every 200 hours	Every 500 hours (6 months)	Every 1000 hours (1 year)	Every 2000 hours (2 years)	Every 4000 hours (4 years)
Hydraulic oil	Check, replacement			•		
	Check contamination		•			
Control and limiting devices	Check			•		
Supplementary crossmembers	Nut and bolt tightness test		•			
Structure	Inspection		•			
Sliding blocks	Replacement					•
Valves	Calibration		•			
Manual extensions	Adjustment		•			
Winch	Lubrication check	•				
	Lubrication replacement (*)		•			
	Check brake			•		
Hydraulic system	Washing					•

(*) For oil bath lubricated winches

7.2 - Checking the condition of the hoses

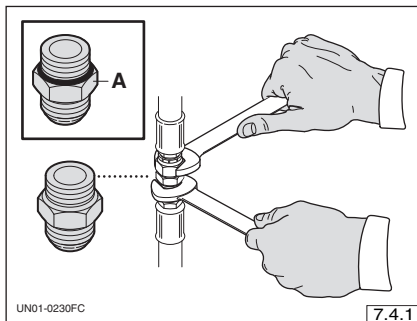


Check the fastening of the pipe connection and the condition of the hose. If the pipe shows any signs of ageing, breakage, bulging, abrasion, etc., it must be replaced.

7.3 - Checking the hosing guards

These guards protect the operator from oil spurts in the event of a breakage in the hosing. If they are worn or broken, they must be replaced.

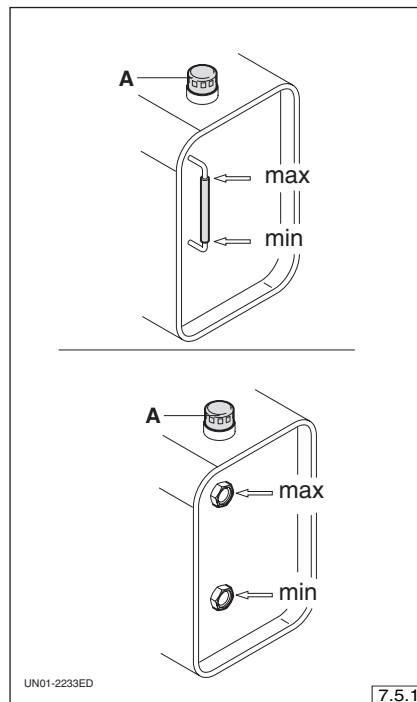
7.4 - Checking for oil leaks from the hydraulic system



Oil leaks from the connections can normally be eliminated by tightening the connections correctly.

Oil leaks from connection "A", which is supplied with an airtight washer, can only be eliminated by replacing the connection.

7.5 - Checking the hydraulic oil level



Check the oil level daily, which must be between the minimum and maximum marks.

If necessary top up via inlet "A".

For the oil characteristics see para "Oils and lubricants".

i Information

Carry out the check with the crane in the resting position, with all the jacks retracted and the vehicle on a flat surface.

7.6 - Structure inspection

Wash the crane carefully before carrying out the checks.

Visually inspect the integrity of the structure in general and in particular the welding.

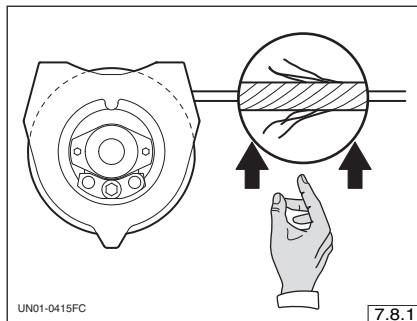
If any weakening or small cracks are noticed, immediately contact an authorised PM service centre.

As stated in the regular check schedule (para. "Regular checks") have the structure checks carried out at an authorised PM service centre.

7.7 - Pulley check

- Check that the pulley races and flaps are in good condition; if they are worn or broken, they must be replaced.
- Check that they run smoothly when rotating and if they do not, contact an authorised PM workshop.

7.8 - Cable check



According to the law, the cables must be checked every three months by expert personnel unless otherwise specified by the manufacturer. The results of these checks must be recorded in the special check register in the appendix of this manual. **The cable must be carefully examined for any wear which could alter its technical features.** The cable must be replaced when:

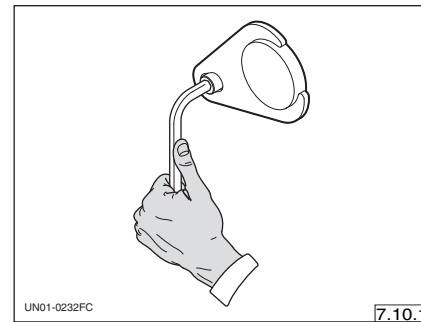
- the quantity of the broken wires (in a section whose length is equal to four times the screw pitch of the elementary wire in the strand) is over 10% of the total wires making up the cable;
- the wire wear is extremely visible (10% reduction in the diameter of the elementary wire);
- the cable is permanently warped with slackening of the trefails;
- the cable has considerable dents

- or permanent twisting, has been crushed, its core is coming out or has any other significant signs of wear;
- the sealing on the cable ends is damaged.

7.9 - Cable lubrication

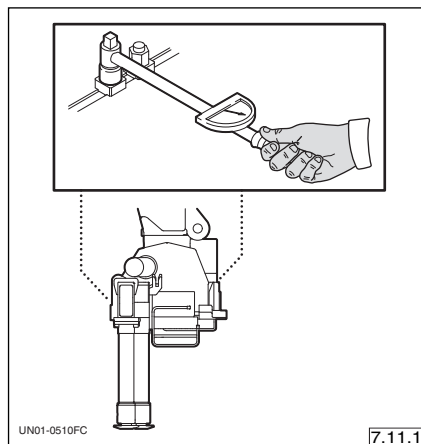
The lubrication must be carried out with particular care to protect the cable from corrosive external elements and to reduce the friction with the pulleys. For lubricant specifications, see para. "Oils and lubricants".

7.10 - Checking the pin locks



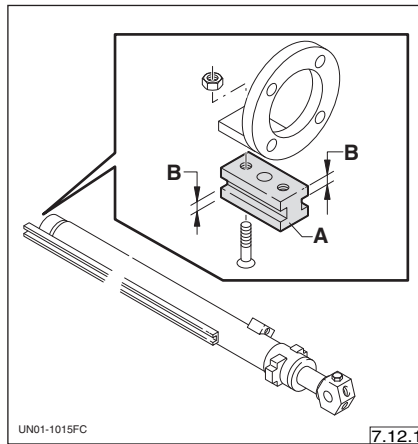
Check the fixing screws of the pin locks. If they have loosened, tighten the screws to the tightening torque of 18 daNm (133 lbf - ft).

7.11 - Checking the anchorage stay rods



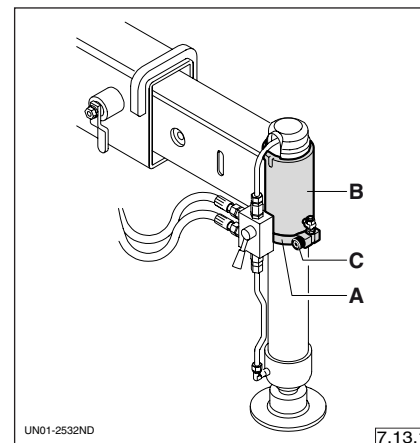
Check that the anchorage stay rods are tightened; if not, tighten the nuts to the tightening torque of 40 daNm (295 lbf - ft).

7.12 - Checking the jack sliding blocks



Check the wear of sliding blocks "A". At an authorised service centre, have the sliding blocks replaced when the wings "B" are less than 4 mm (0.157").

7.13 - Checking the supplementary crossmember



Check visually that the outrigger jacks have not moved upwards and that, with the jacks at rest, there is no play between locking collar "A" and sleeve "B". If this is not the case, contact an authorised service centre. Periodically check fastening screws "C" on the outrigger jacks. If loose, tighten the screws with a torque of 20 daNm (147 lbf - ft).

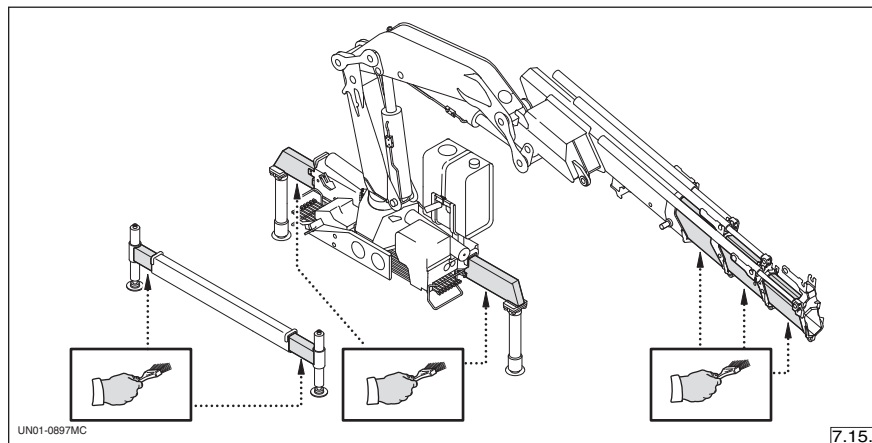
7.14- Filters



Information

Carry out the clogging check and replace filter cartridges at the intervals specified in the maintenance schedule and in general after any maintenance on the hydraulic system (see “Filters replacement”).

7.15- Lubrication of the crane arms and stabilisers



For the lubricant characteristics see para. “Oils and lubricants”.

After having carried out the lubrication, carry out some arm extension manoeuvres without a load, in order to distribute the lubricant.

- Lubricating the crane arms

Extend the outrigger arms fully and grease all the upper, lower and side surfaces.

- Lubricating the outrigger arms

Extend the outrigger arms fully and grease all the side surfaces.

7.16- Cleaning the machine

Clean the jack shafts to avoid dirt building up.

Clean the machine with a jet of pressurised water, using detergents that are authorised by the standards in force.

Do not orient a jet of pressurised water to electrical equipment to avoid damaging it.

7.17- Long periods of machine inactivity

If the crane has to remain inactive for a long period of time, it is necessary to:

- 1) wash it and fold it back into the resting position with all the jacks closed. If this is not possible, clean and lubricate the part of the jackshafts that remains exposed to the atmospheric agents.
- 2) Park the machine in a sheltered area, which can only be accessed by authorised personnel;
- 3) check and replace the damaged and worn components;
- 4) check and remove any fluid leaks;
- 5) check and top up all the fluid levels if necessary.

7.18- Starting the machine up again

Before starting the machine up again after a long period of inactivity, carry out the following checks and operations:

- 1) wash the machine completely;
- 2) grease all the components that are subject to lubrication;
- 3) check and top up all the fluid levels if necessary;
- 4) check and remove any fluid leaks;
- 5) check the integrity of the pipes and hoses;
- 6) check and replace any damaged components;
- 7) check the correct functioning of the controls and visual indicators;
- 8) check that all the control and limiting devices work properly;
- 9) carry out the maintenance operations in accordance with the planned maintenance schedule (see para. "Regular checks").

7.19- Scrapping and disposal

The demolition of the machine must be carried out by specifically qualified personnel with the necessary hydraulic and mechanical skills.

The components removed must be sorted according to the type of materials they contain and in compliance with the laws in force concerning waste collection, sorting and disposal.

With reference to European directives 2002/95 EC, 2002/96 EC, and 2003/108 EC (Waste from Electrical and Electronic Equipment), the electric and electronic parts, marked with the relative symbol, must be disposed of via a specific collection centre or returned to the dealer, still fitted, when purchasing a new machine.

Waste from electrical and electronic equipment can contain substances which may be environmentally hazardous and pose health risks, therefore you are advised to dispose of it correctly.

Illegal disposal of electric and electronic components is punishable by law with sanctions applicable according to the law in force where the parts are dumped.

7.20 - Oils and lubricants

Never mix oils of different types together, in order to avoid machine malfunctions.

For top ups, only use preventively filtered oils (maximum filtration grade, class 9, in accordance with Nas 1638-18/14 ISO 4406).

i Information

Do not dispose of the oil in the environment, as it causes pollution.

Oil working temperature -30 ÷ +140 °C (-22 °F ÷ 284 °F)

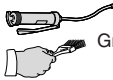
Lubricant	AGIP ⁽¹⁾	MOBIL	SHELL	TOTAL	ESSO
Hydraulic oil	OSO 32	DTE OIL 24	TELLUS OIL 32	AZOLLA ZS 32	NUTO H 32
Grease	GREASE PV 2	-	RETINAX HD 2	-	-

(1) Lubricant used by the manufacturer the first time the system is filled.

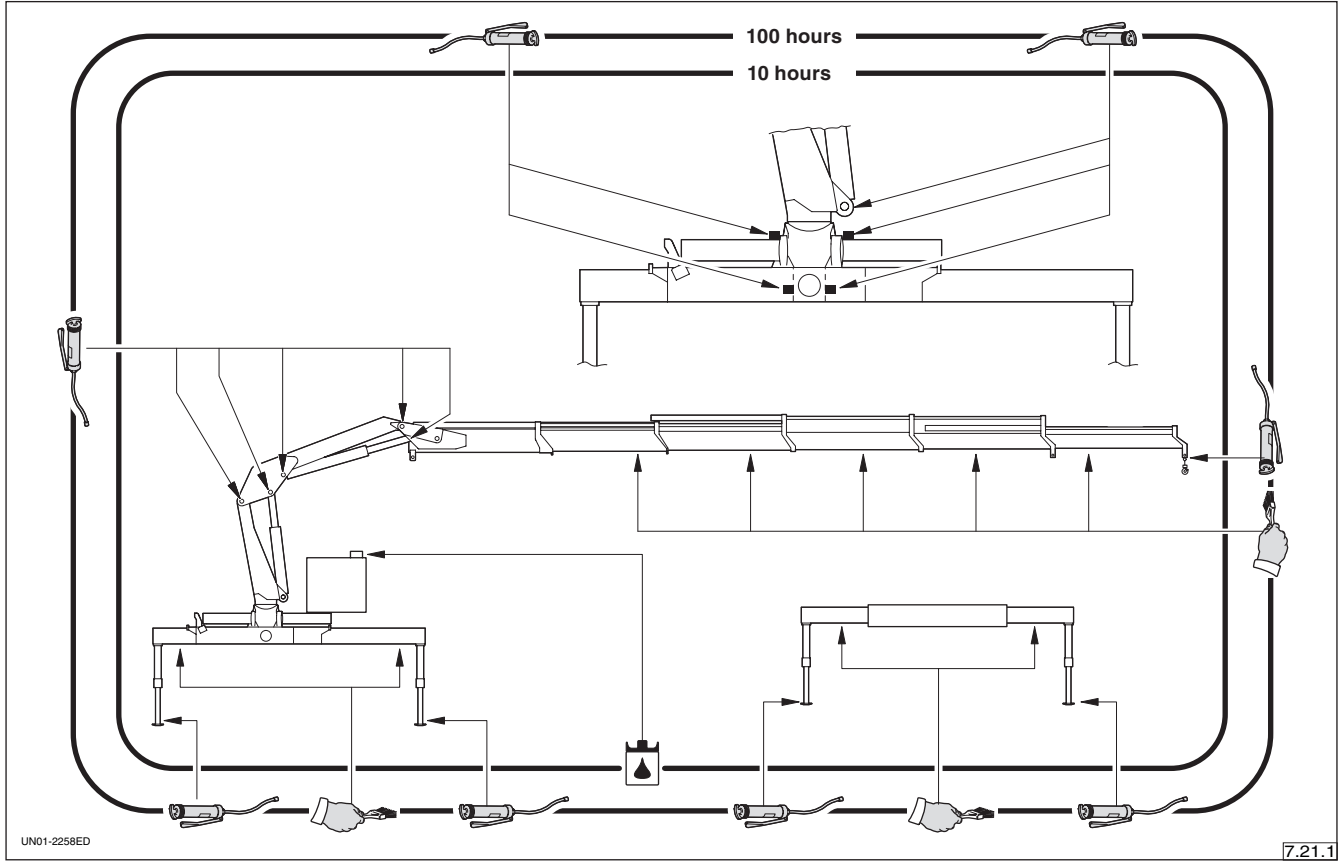
Intensive use (saline environment) oil working temperatures -30 ÷ +140 °C (-22 °F ÷ 284 °F)

Lubricant	AGIP	MOBIL	SHELL	TOTAL	ESSO
Hydraulic oil	OSO 32	DTE OIL 22	TELLUS OIL 22	AZOLLA ZS 22	NUTO H 22
Grease	RACOL SHAPPIRE AQUA2	-	-	-	-

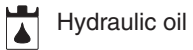
7.20.1- Lubricant comparison table

Lubricant		Oil working temperatures		
		-30 ÷ +140 °C		
Hydraulic oil	ISO 3348	ISO VG 32	ISO VG 46	ISO VG 22
 Grease	NLGI 2 calcium/lithium			

7.21 - Greasing and lubrication diagrams



Symbols key



Fault	Cause possible	Remedy
The crane is completely stopped	Emergency buttons pressed	Release the emergency stop buttons
	The moment control device has come into operation	See "Block situation and manoeuvres allowed"
	The P.T.O is not engaged correctly	Engage the P.T.O
	P.T.O. engagement malfunctioning	Repair the P.T.O. engagement.
	Electrical system malfunctioning	Check signals on push-button panel or electronic control unit displays
	Low temperature of hydraulic oil	Let the oil flow through the system until the working temperature is reached
	There may be a lever switch for a dump body located on the latter	Position the switch on crane
	Radio control malfunctioning	Check radio control devices

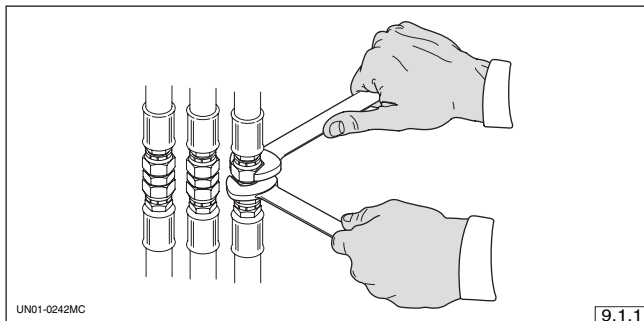
Fault	Cause possible	Remedy
The crane boom cannot hold the load and creep down considerably	The pilot operated check valve fitted on the lift cylinder in question leaks	Have the valve checked and/or replaced by an authorized repair workshop
	Oil leakage inside the cylinder concerned	Have the seals inside the cylinder replaced by an authorised repair workshop
Permanent vibrations while operating on all the movements	Insufficient hydraulic oil	Add hydraulic oil to the tank (see para. "Checking the hydraulic oil level")
	Clogging of hydraulic oil filter	Replace the filter cartridge (see para. "Filters replacement")
	Suction hose obstructed	Locate the cause of the obstruction and remove it
	Inefficient pump	Check the pump flow; if it is not regular replace the pump
Considerable reduction in the speed of the movements	Low speed of the engine	Check the exact speed of the vehicle's engine on the basis of the hydraulic boom extension time
	Radio and/or distributor system malfunctioning	Consult an authorised workshop
	Inefficient pump	Check the pump flow; if it has decreased, replace the pump

Fault	Cause possible	Remedy
It is hard to engage the P.T.O.	If pneumatic: the air into the appropriate vehicle system is insufficient If mechanical: the control cable is obstructed	Check the pressure of the air in the vehicle's pneumatic system; stop any leaks Free the control cable
Vibrations in the arm unit during load translation	Sliding pads insufficiently lubricated Sliding pads too worn Insufficient hydraulic oil	Lubricate the sliding pads according to the relative instructions Consult an authorised workshop Check the level of the hydraulic oil
Lack of tension on the whole crane	Interrupted fuses P.T.O. relay malfunctioning	Replace the fuses Replace the relay

Fault	Cause possible	Remedy
Radio control off or not working	Interrupted radio fuse	Replace the fuse (see para."Fuse replacement")
	Radio unit malfunctioning	Consult an authorised workshop
	Push-button panel battery exhausted	Recharge the battery
	Interferenced radio transmission	Connect via cable the push-button panel to the receiver on the crane
	Receiver antenna malfunctioning	Consult an authorised workshop
	Emergency stop push-button pressed	Release the emergency stop push-button
Heat exchanger not working	Exchanger activation device malfunctioning	Have the device replaced by an authorized repair workshop
	Exchanger electrical connections cut-off	Check all electrical contacts
	Fan motor not working	Have the device replaced by an authorized repair workshop

9 Spare part replacement

9.1 - Hose replacement



HAZARD !

The hosing must be replaced with the hydraulic system depressurised.

To depressurise the system, disconnect the power take off, stop the truck engine and move the control levers back and forwards. Unscrew the joints and collect oil into a suitable tank.

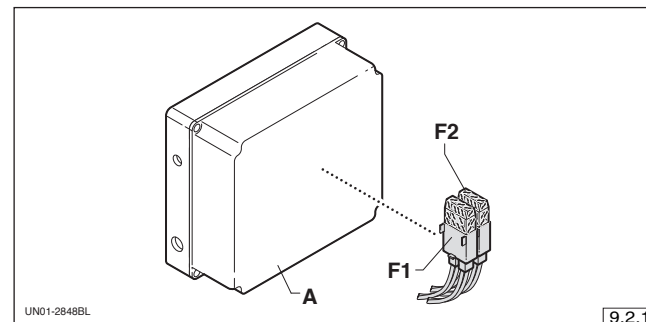
Replace the hose and tighten the joints.

9.2 - Fuse replacement

Before replacing the interrupted fuse, remove the cause of its blowing up.

Replace the blown fuse with a new one having the same characteristics.

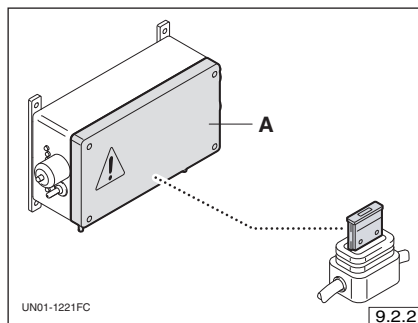
9.2.1 - Connector block fuse replacement



Remove the cap "A" and replace the interrupted fuse.

Pos.	Protected circuit	Ampère
F1	Main circuit	15
F2	Heat exchanger circuit	20

9.2.2 - Radio receiver fuse replacement



Remove the cap “A” and replace the interrupted fuse with a 10 A new one.

9.3 - Filters replacement

9.3.1 - Replacing the exhaust filter

When the filter cartridge is replaced, the exhaust plug "F", equipped with a 3 micron filtering grade air filter, must also be replaced.

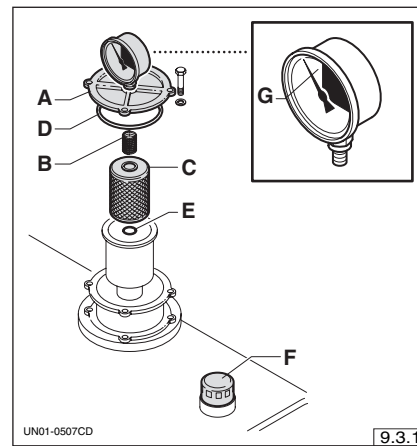
Replace the filter cartridge, as it is not washable, when the hand of the pressure gauge is in the red area "G" (clogged filter) - fig. 9.3.1.

In any case, replace the filter cartridge as specified on the maintenance schedule (see "Routine checks").

To replace, proceed as follows.

- 1 - Carefully clean the external surfaces of the filter;
- 2 - unscrew the screws on cover "A";
- 3 - remove the spring "B" and the filtering cartridge "C";
- 4 - check the condition of the washers "D" and "E"; if they are damaged replace them.

To reassemble the filter, carry out the disassembly operations in reverse.



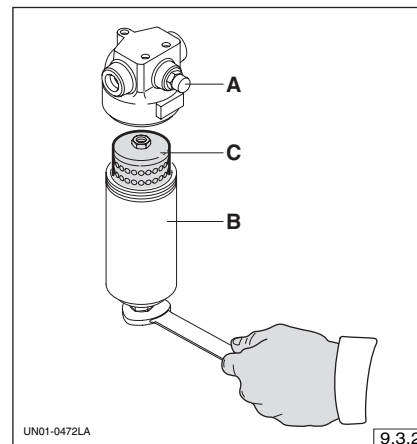
9.3.2 - Delivery filter replacement

Replace the filter cartridge when the clog signal light "A" goes red.

In any case, replace the filter cartridge as specified on the maintenance schedule (see "Routine checks").

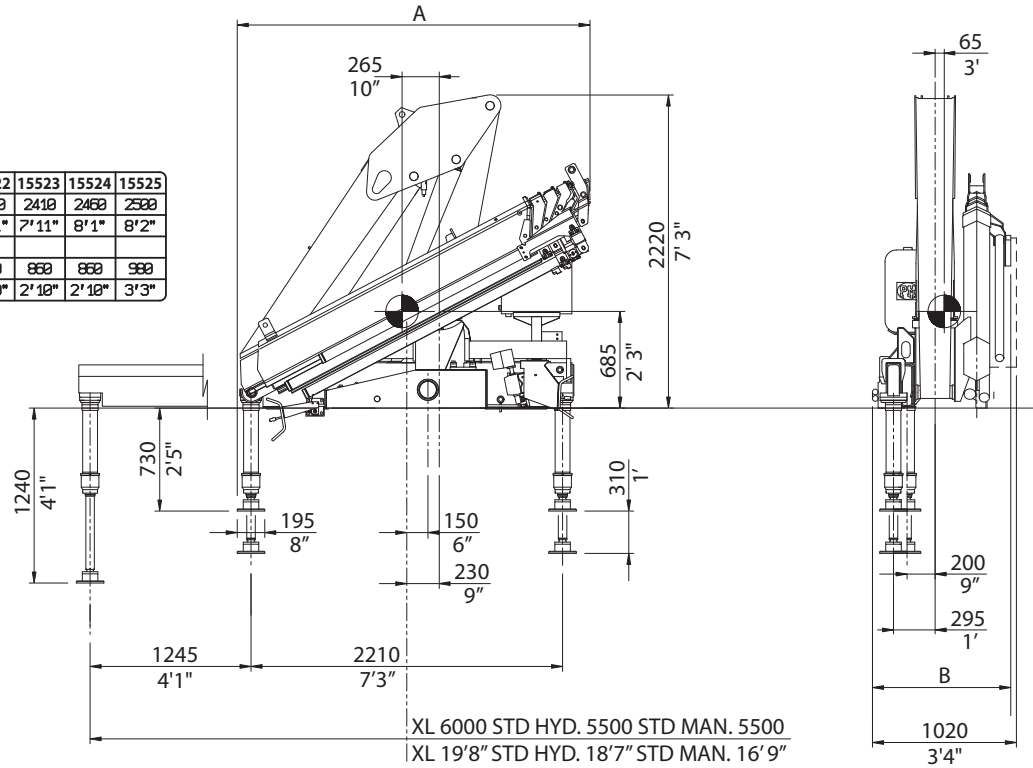
For the replacement proceed as follows:

- 1 - Carefully clean the external surfaces of the filter;
 - 2 - turn off the tank tap;
 - 3 - unscrew the filter unit "B" and drain the oil inside it;
 - 4 - replace the filter cartridge "C".
- Tighten the filter unit to a tightening torque of 10 daNm (73,7 lbf - ft).
Turn on the tank tap.



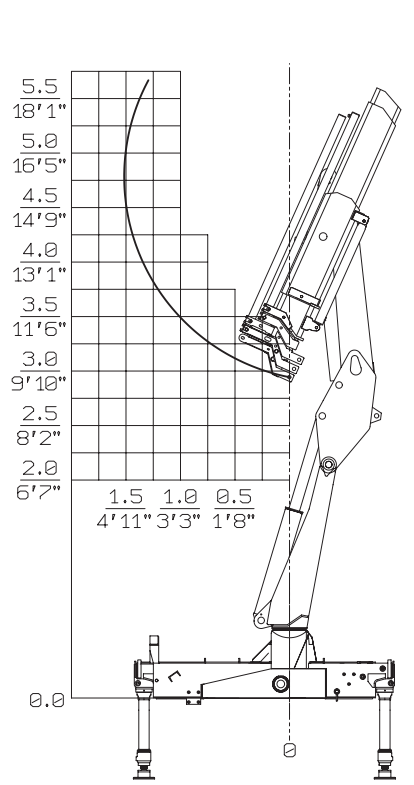
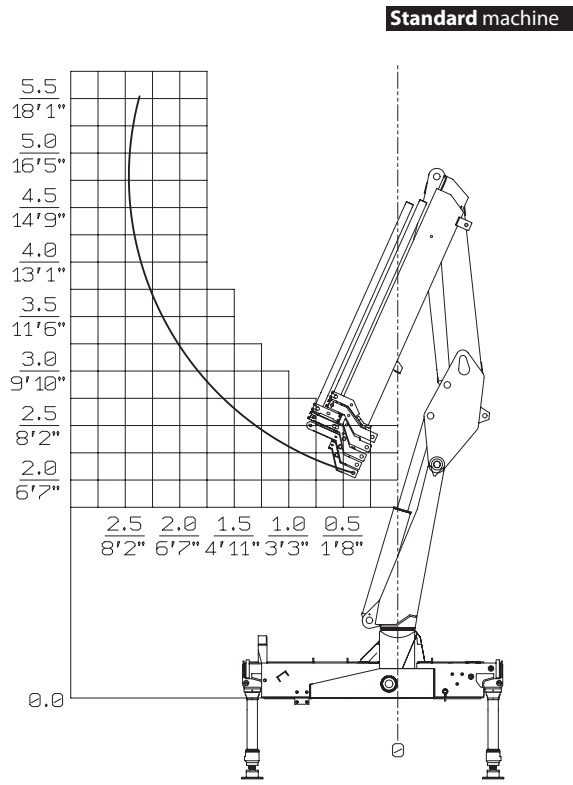
- Overall dimensions

	15521	15522	15523	15524	15525
A (mm)	2410	2410	2410	2460	2500
A (Ft)	7'11"	7'11"	7'11"	8'1"	8'2"
B (mm)	860	860	860	860	960
B (Ft)	2'10"	2'10"	2'10"	2'10"	3'3"



5.188.021

- Overall dimensions standard machine and LC machine



5.188.022_ing

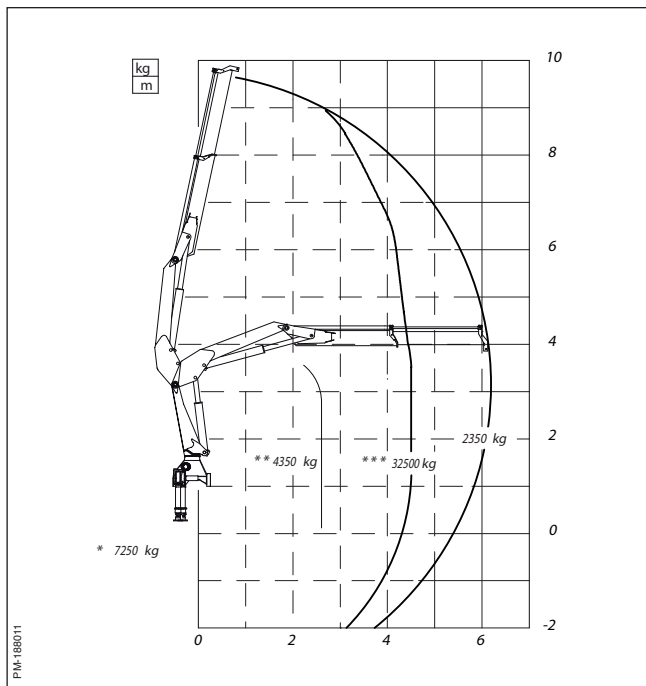
- Specifications and performances

PM 15521 - PM 15521 LC

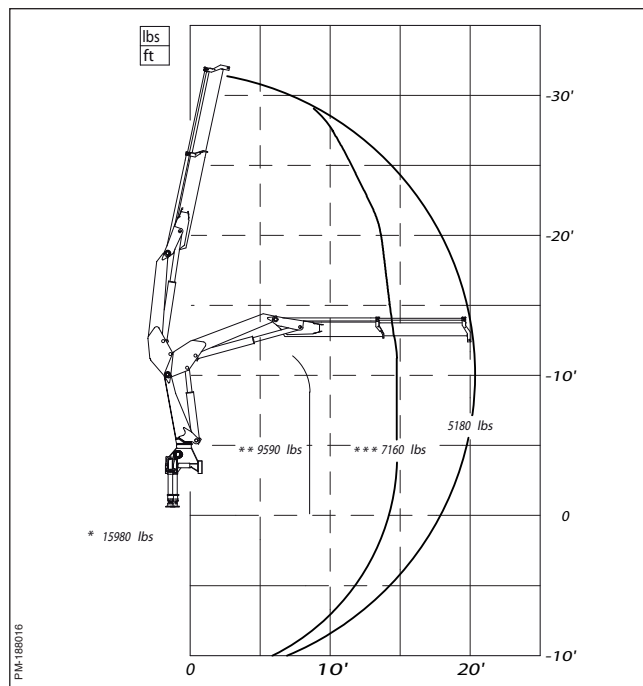
Max. lifting momentum	kNm	144.....	ft lbs	106230
	tm	14,7.....	/	/
Hydraulic outreach:				
Horizontal	m	6,50.....	ft	21'4"
Vertical	m	9,80.....	ft	32'2"
Outreach with manual extensions:				
Horizontal	m	-	ft	-
Vertical	m	-	ft	-
Hydraulic system:				
Recommended capacity.....	l/min	30.....	gals/min	8
Maximum pressure.....	Mpa	30.....	psi	4350
Oil tank capacity.....	l	88.....	gals	23
Rotation unit:				
Rotation angle	°	400.....	°	400
Rotation torque.....	kNm	16,0.....	ft lbs	11800
Weight of standard crane without oil tank.....	kg	1770.....	lbs	3905
Weight of LC crane without oil tank	kg	-	lbs	-
Maximum power absorbed by the hydraulic pump	kW	16,7.....	HP	22
Maximum force exerted on ground by stabilisers	kN	80.....	lbs	17985
Specific operating pressure of each				
stabiliser with Ø 195 mm (7,6") disk	Mpa	2,7.....	psi	389
Arm pack extension time for standard machine (Plus device off)	sec.	11.....	sec.	11
Arm pack extension time for LC machine (Plus device off)	sec.	-	sec.	-
Supplied shackle for capacity "fixed" hook - Capacity.....	kg	8500.....	lbs	18740
Supplied hook for capacity "mobile" hook - Capacity.....	kg	7500.....	lbs	16535

- Capacities diagram

PM 15521 - PM 15521 LC



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°

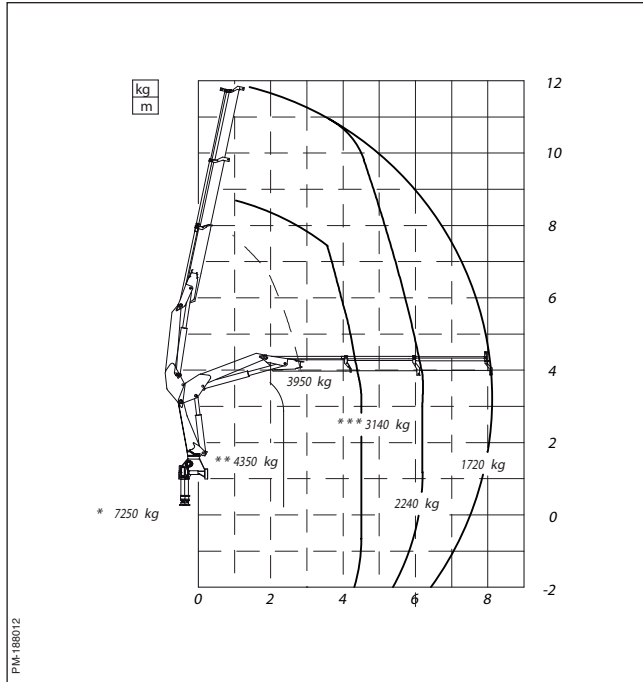
- Specifications and performances

PM 15522 - PM 15522 LC

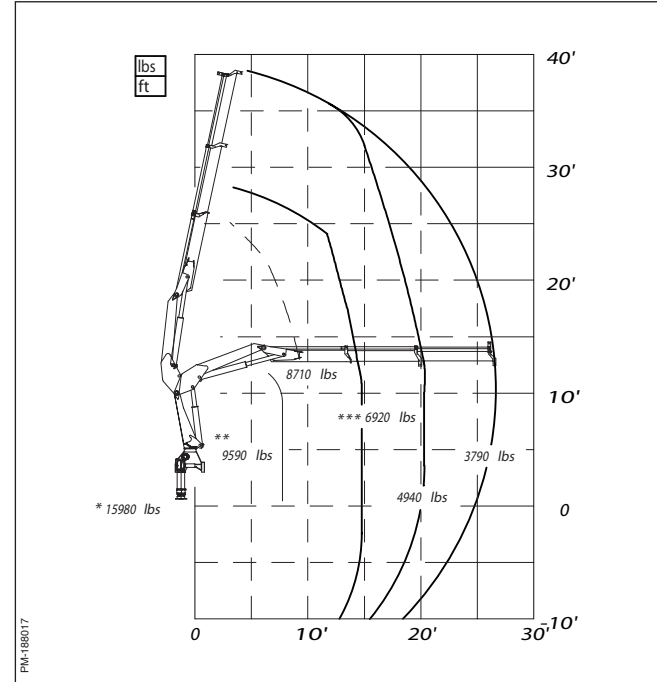
Max. lifting momentum	kNm	140.....	ft lbs	103340
	tm	14,3.....	/	/
Hydraulic outreach:				
Horizontal	m	8,45.....	ft	27'9"
Vertical	m	11,75.....	ft	38'7"
Outreach with manual extensions:				
Horizontal	m	-	ft	-
Vertical	m	-	ft	-
Hydraulic system:				
Recommended capacity.....	l/min	30.....	gals/min	8
Maximum pressure.....	Mpa	30.....	psi	4350
Oil tank capacity.....	l	88.....	gals	23
Rotation unit:				
Rotation angle	°	400.....	°	400
Rotation torque.....	kNm	16,0.....	ft lbs	11800
Weight of standard crane without oil tank.....	kg	1880.....	lbs	4145
Weight of LC crane without oil tank	kg	2030.....	lbs	4480
Maximum power absorbed by the hydraulic pump	kW	16,7.....	HP	22
Maximum force exerted on ground by stabilisers	kN	80.....	lbs	17985
Specific operating pressure of each stabiliser with Ø 195 mm (7,6") disk	Mpa	2,7.....	psi	389
Arm pack extension time for standard machine (Plus device off)	sec.	22.....	sec.	22
Arm pack extension time for LC machine (Plus device off)	sec.	28.....	sec.	28
Supplied shackle for capacity "fixed" hook - Capacity.....	kg	8500.....	lbs	18740
Supplied hook for capacity "mobile" hook - Capacity.....	kg	7500.....	lbs	16535

- Capacities diagram

PM 15522 - PM 15522 LC



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°

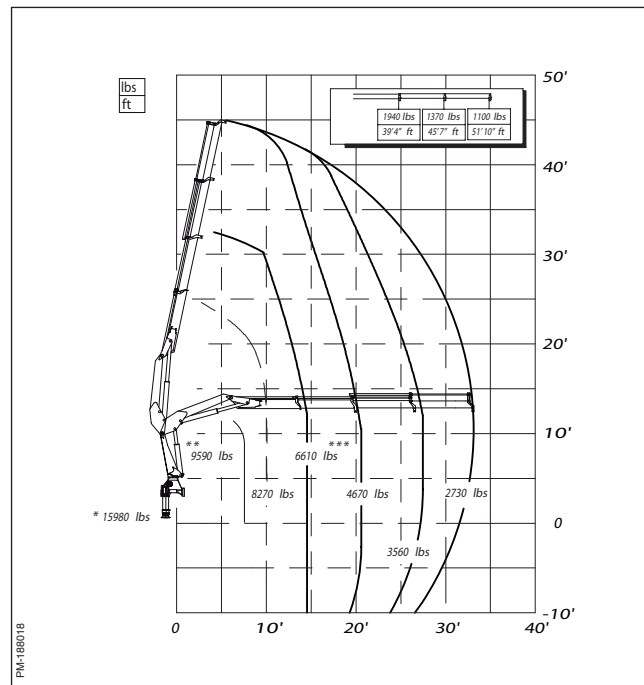
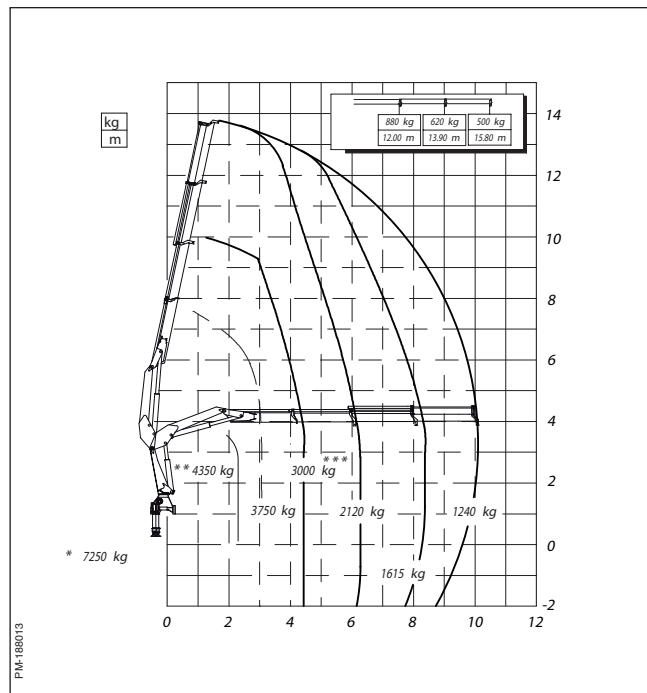
- Specifications and performances

PM 15523 - PM 15523 LC

Max. lifting momentum	kNm	135.....	ft lbs	99820
	tm	13,8.....	/	/
Hydraulic outreach:				
Horizontal	m	10,45.....	ft	34'3"
Vertical	m	13,70.....	ft	44'11"
Outreach with manual extensions:				
Horizontal	m	16,05.....	ft	52'8"
Vertical	m	19,25.....	ft	63'2"
Hydraulic system:				
Recommended capacity.....	l/min	30.....	gals/min	8
Maximum pressure.....	Mpa	30.....	psi	4350
Oil tank capacity.....	l	88.....	gals	23
Rotation unit:				
Rotation angle.....	°	400.....	°	400
Rotation torque.....	kNm	16,0.....	ft lbs	11800
Weight of standard crane without oil tank.....	kg	1990.....	lbs	4390
Weight of LC crane without oil tank	kg	2140.....	lbs	4720
Maximum power absorbed by the hydraulic pump	kW	16,7.....	HP	22
Maximum force exerted on ground by stabilisers	kN	80.....	lbs	17985
Specific operating pressure of each stabiliser with Ø 195 mm (7,6") disk	Mpa	2,7.....	psi	389
Arm pack extension time for standard machine (Plus device off)	sec.	34.....	sec.	34
Arm pack extension time for LC machine (Plus device off)	sec.	39.....	sec.	39
Supplied shackle for capacity "fixed" hook - Capacity.....	kg	8500.....	lbs	18740
Supplied hook for capacity "mobile" hook - Capacity.....	kg	7500.....	lbs	16535

- Capacities diagram

PM 15523 - PM 15523 LC



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°

- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°

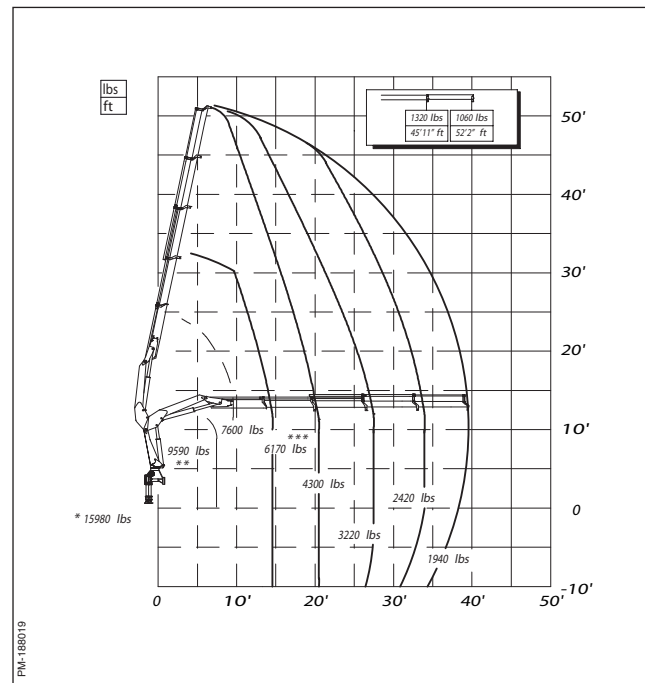
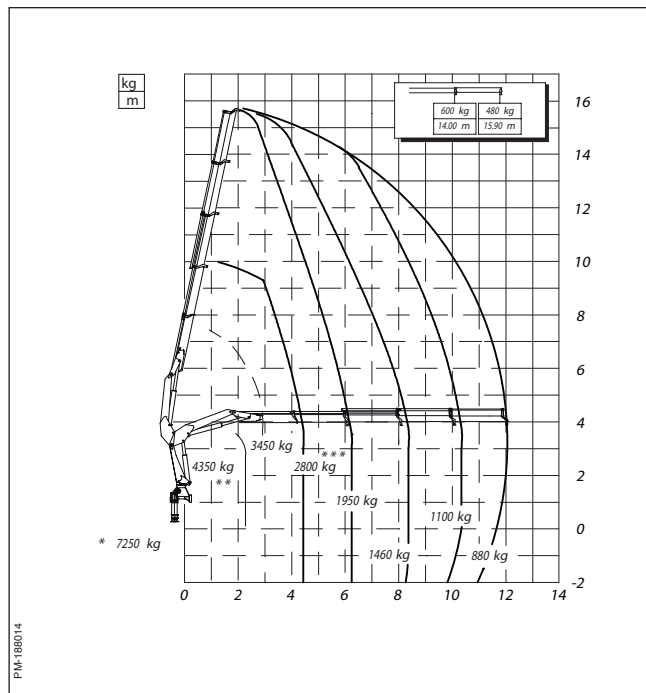
- Specifications and performances

PM 15524 - PM 15524 LC

Max. lifting momentum	kNm	129.....	ft lbs	95190
	tm	13,2.....	/	/
Hydraulic outreach:				
Horizontal	m	12,40.....	ft	40'8"
Vertical	m	15,60.....	ft	51'2"
Outreach with manual extensions:				
Horizontal	m	16,15.....	ft	52'12"
Vertical	m	19,35.....	ft	63'6"
Hydraulic system:				
Recommended capacity.....	l/min	30.....	gals/min	8
Maximum pressure.....	Mpa	30.....	psi	4350
Oil tank capacity.....	l	88.....	gals	23
Rotation unit:				
Rotation angle	°	400.....	°	400
Rotation torque.....	kNm	16,0.....	ft lbs	11800
Weight of standard crane without oil tank.....	kg	2080.....	lbs	4590
Weight of LC crane without oil tank	kg	2230.....	lbs	4920
Maximum power absorbed by the hydraulic pump	kW	16,7.....	HP	22
Maximum force exerted on ground by stabilisers	kN	80.....	lbs	17985
Specific operating pressure of each stabiliser with Ø 195 mm (7,6") disk	Mpa	2,7.....	psi	389
Arm pack extension time for standard machine (Plus device off)	sec.	46.....	sec.	46
Arm pack extension time for LC machine (Plus device off)	sec.	50.....	sec.	50
Supplied shackle for capacity "fixed" hook - Capacity.....	kg	8500.....	lbs	18740
Supplied hook for capacity "mobile" hook - Capacity.....	kg	7500.....	lbs	16535

- Capacities diagram

PM 15524 - PM 15524 LC



-- LC version capacity

* Nominal capacity at fixed hook

** Nominal capacity at mobile hook

*** Maximum capacity from horizontal to vertical

Note: the performances stated are obtained with the main arm inclined to 27°

-- LC version capacity

* Nominal capacity at fixed hook

** Nominal capacity at mobile hook

*** Maximum capacity from horizontal to vertical

Note: the performances stated are obtained with the main arm inclined to 27°

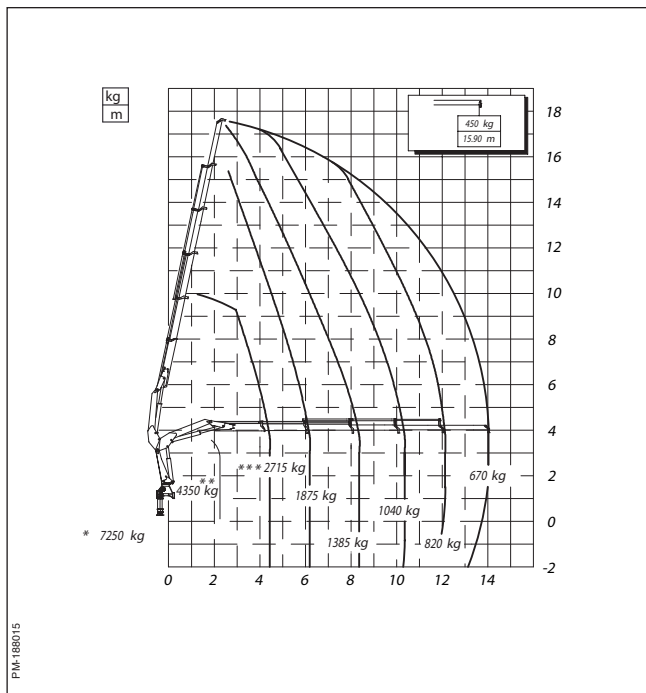
- Specifications and performances

PM 15525 - PM 15525 LC

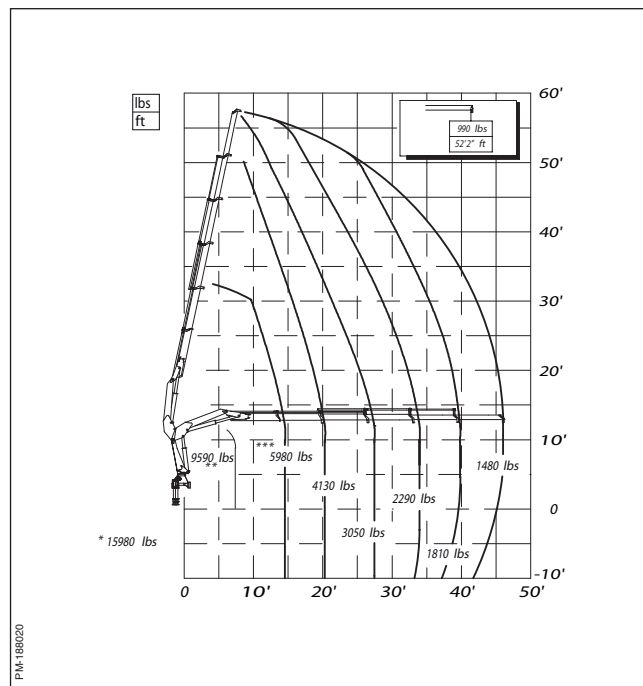
Max. lifting momentum	kNm	126.....	ft lbs	93280
	tm	12,9.....	/	/
Hydraulic outreach:				
Horizontal	m	14,40.....	ft	47'3"
Vertical	m	17,70.....	ft	58'1"
Outreach with manual extensions:				
Horizontal	m	16,15.....	ft	52'12"
Vertical	m	19,35.....	ft	63'6"
Hydraulic system:				
Recommended capacity.....	l/min	30.....	gals/min	8
Maximum pressure.....	Mpa	30.....	psi	4350
Oil tank capacity.....	l	88.....	gals	23
Rotation unit:				
Rotation angle	°	400.....	°	400
Rotation torque.....	kNm	16,0.....	ft lbs	11800
Weight of standard crane without oil tank.....	kg	2180.....	lbs	4810
Weight of LC crane without oil tank	kg	-	lbs	-
Maximum power absorbed by the hydraulic pump	kW	16,7.....	HP	22
Maximum force exerted on ground by stabilisers	kN	80.....	lbs	17985
Specific operating pressure of each				
stabiliser with Ø 195 mm (7,6") disk	Mpa	2,7.....	psi	389
Arm pack extension time for standard machine (Plus device off)	sec.	60.....	sec.	60
Arm pack extension time for LC machine (Plus device off)	sec.	-	sec.	-
Supplied shackle for capacity "fixed" hook - Capacity.....	kg	8500.....	lbs	18740
Supplied hook for capacity "mobile" hook - Capacity.....	kg	7500.....	lbs	16535

- Capacities diagram

PM 15525 - PM 15525 LC



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°



- LC version capacity
 - * Nominal capacity at fixed hook
 - ** Nominal capacity at mobile hook
 - *** Maximum capacity from horizontal to vertical
- Note: the performances stated are obtained with the main arm inclined to 27°

- “CE” declaration of conformity of the machine

The figure shows a copy of the “CE” declaration of conformity; the original is issued by the manufacturer together with this manual.

- a) Crane model
- b) Serial number
- c) Date of declaration
- d) Signature of the person authorised to write the declaration

If the machine is equipped with accessories:

- e) Name
- f) Model
- g) Serial number



CE declaration of conformity

PM Group S.p.A.
Via Verdi 22
41018 San Cesario sul Panaro MO Italia

Declares that the loader crane

--	--

Equipped with the following accessories

Name	Model	Serial No.

Complies in all its parts with directive 2006/42/EC
and directive 2004/108/EC.

The technical dossier can be requested by writing to the manufacturer
PM Group S.p.A.Via Verdi 22 41018 San Cesario sul Panaro MO Italia info@pm-group.eu

San Cesario s.p. li " / / "

The legal representative

" / / "

a

b

e

g

f

c

d

UN01-2642AG

- Register of the periodic technical inspections of the control and limiting devices

Crane model

Year of manufacture

Serial number

Year of installation

Device inspected	Kind of inspection performed	Inspection result	Date	Date of next inspection	Name, businnes name and signature of the person responsible for inspection

Device inspected	Kind of inspection performed	Inspection result	Date	Date of next inspection	Name, businnes name and signature of the person responsible for inspection

Device inspected	Kind of inspection performed	Inspection result	Date	Date of next inspection	Name, business name and signature of the person responsible for inspection

Device inspected	Kind of inspection performed	Inspection result	Date	Date of next inspection	Name, businnes name and signature of the person responsible for inspection

Device inspected	Kind of inspection performed	Inspection result	Date	Date of next inspection	Name, businnes name and signature of the person responsible for inspection

- EXTRAORDINARY MAINTENANCE check register

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

Description of the operations carried out and/or parts replaced	Actual hours of work (hour meter)	Servicing date	Stamp and signature of authorised service centre

NB: after servicing make sure that this register has been correctly filled in and stamped by the PM GROUP authorised service centre.

- CABLES AND CHAINS quarterly check register

Conditions	Inspector's observations	Inspection date	Inspector's signature

Conditions	Inspector's observations	Inspection date	Inspector's signature

Conditions	Inspector's observations	Inspection date	Inspector's signature

Conditions	Inspector's observations	Inspection date	Inspector's signature

NOTES

ENCLOSURES

01-GB-AA-304BL

- Maintenance intervention confirmation

The service interventions must be carried out in series respecting the schedule.

Interventions must be marked with a cross.

At 500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 1500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 1000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐

.....
stamp

.....
signature

At 2000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐

.....
stamp

.....
signature

At 2500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 3500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 3000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐

.....
stamp

.....
signature

At 4000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐
- . Runner replacement ☐
- . Hydraulic system washing ☐

.....
stamp

.....
signature

At 4500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 6500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐

.....
stamp

.....
signature

At 6000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐

.....
stamp

.....
signature

At 7000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐

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At 7500 hours

- . Hydraulic oil pollution check ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustment ☐

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At hours

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At 8000 hours

- . Hydraulic oil replacement ☐
- . Structural inspection ☐
- . Valves calibration ☐
- . Manual extension adjustments ☐
- . Reduction gears oil replacement ☐
- . Inspection of control and limiting devices ☐
- . Runner replacement ☐
- . Hydraulic system washing ☐

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At hours

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