

# ***RAMROD***

## **OPERATOR MANUAL**



## **A2450 HYDROSTATIC 4WD ARTICULATING LOADER**

### **RAMROD EQUIPMENT**

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# FOREWORD

Thank you for choosing the RAMROD A2450 Hydrostatic 4WD Articulating Loader. In order to correctly operate and maintain your machine, we are enclosing this manual.

This manual helps the user operate the machine safely and efficiently, when sold or rented the manual must be handed over at the same time.

This manual reports the information, instructions and whatever is considered necessary for the knowledge, the good use and normal maintenance of the loader.

The contents in the following paragraph are neither a complete description of the various components nor a detailed explanation of their operation. The user will find what is considered useful for good maintenance of the machine and working in safe conditions. The operation and duration of the machine depends on observing and understanding the instructions in this manual.

The manual is the basic tool for the operator to achieve various tasks. For example:

- Transfer or moving the machine
- Operating the machine
- Maintaining the machine

# SECTION 1

## Safe operating instructions and precautions

### 1.1 FOREWORD

Read this manual carefully, especially the parts involved with safety rules must be read with extreme care. The buyer will train the workman to correctly use and periodically maintain the machine. Be familiar with operators' safety device and precaution for general accidents.



Picture 1.1



### ATTENTION

Pay attention to the triangular symbol, it indicates a certain danger see picture 1.1



### WARNING

It is not recommended to use the machine or any attachments before reading and having a good understanding of the manual.

The manufacturer is not responsible for any damage due to non-observance or ignorance of the instructions in this manual.

The manufacturer is not responsible for any possible damage caused by misunderstanding of this manual.

The manual must be put on a safe and well know place in the machine.

In the entire lifetime of the machine, the user must keep the manual in good condition and accept its updates.

In case the manual was lost or damaged, the user should ask the manufacturer for a copy.

Due to the continuous improvement and development of the manufacturer, the Specifications and performance of your machine may be different with what is described in this manual.

## 1.2 SAFETY NORMS

### 1.2.1 SAFETY RULES

1. The machine must be operated by qualified or authorized person. DO NOT have the machine operated by inexperienced people.
2. When operating or maintaining the machine, all the safety rules and precautions must be observed.
3. The manufacturer does not recommend the transportation of people. DO NOT use the boom to lift persons or objects. DO NOT stand under the boom when it is raised.
4. The operator must have a good view while driving, if it is not clear enough the lifts should be adjusted.
5. Clean the control board, joysticks, steering wheel, operator's seat, etc to avoid difficulty while operating. Do not get on or off the machine while it is running.
6. All the operations must be taken in the operator's seat. Always keep head, hands, body and feet within the cab to reduce the least possibility of injuries.
7. Do not keep the engine on in closed spaces. Gas emissions are noxious and can be lethal.
8. Do not get on/off the machine when the engine is on. Do turn off the engine when getting off.
9. Keep the labels and instructions of used products. In case of ingestion of fuel, insecticide, chemical substances, contact the emergency department immediately and have the relative labels and instructions with you.
10. Replace the exhaust pipe of the engine if worn out or noise is excessive.

11. Respect the laws of the country in which the machine was used, relatively to use and disposal of the products employed for cleaning and maintenance of the machine.
12. The attachments chosen may cause different bearings on the telescopic arm and axes. DO NOT exceed the maximum loading capacity marked in this manual.
13. The road-holding, braking and steering ability may be influenced by the attachments adopted.
14. Only use the attachments authorized by the manufacturer.
15. Always travel with the load in a horizontal position.
16. DO NOT clean, lubricate or do any maintenance of the unit while the machine is in operation, if needed the above actions must be done after the machine is stopped, engine off and ignition key taken away.
17. Avoid touching the running parts of the machine.
18. If the machine is believed to be insecure, ask for the intervention of qualified personnel.
19. When driving the machine on secure grounds; on inclined, wet and slippery grounds proceed with extreme caution.
20. When in operation in proximity of electrical lines, it is recommended to maintain the machine at a safe distance.
21. While operating the machine make sure no people or animals are around.
22. The acids of the battery are extremely dangerous. Use gloves and protective masks for your eyes.
23. The instruction manual must be read, memorized and kept all the time, in case of resale and until the machine is dismantled. Should the manual be lost or damaged, immediately ask for a copy from the manufacturer.
24. Before operating the machine, tighten the safety belt and close the door.

### 1.2.2 KEEP AWAY FROM FIRE

1. The fuel or engine oil can be ignited by open fire, the fuel is extremely flammable, keep the fuel or other flammable liquid far away from open fire.
2. The oil tank, pipelines or other flammable parts may get worn out or broke, DO NOT smoke around the above mentions parts.
3. Turn the engine off when adding oil.
4. To stock or add fuel or other oils make sure you are in a good ventilated area.

5. If the machine was not equipped with a fire extinguisher, it is necessary to put one within easy reach in the cab. Make sure the extinguisher is full and instructions are clear.
6. The fuel and all the lubrications are flammable, DO NOT weld.
7. Fuels and lubricants can be flammable, explosive, toxic and corrosive; hence keep them in their original boxes out of reach of non-qualified personnel.
8. Do not touch the hot parts of the machine to avoid getting burnt. Use extreme caution.

### 1.2.3 GETTING ON/OFF THE MACHINE

1. Do not jump on/off the machine while it is running. Use the handle and the step to get on the machine and do not grab any joysticks while getting on the machine.
2. Keep the step and machine free of dust or oil.
3. Check the bolts every day. If required replace any broken ones and adjust any that are loose.
4. Do not keep anything movable in the cab.
5. Lower the boom, apply the brake, turn off the engine and remove the ignition key before getting off the machine.

### 1.2.4 LEAVING THE MACHINE

1. Retract the telescopic arm, lower the working arm so the attachment is on the ground.
2. Turn off the engine, lock all relative parts and remove the keys.

### 1.2.5 SAFETY PRECAUTIONS UNDER HIGH TEMPERATURE

1. Make sure the temperature of the machine has cooled down before you change the engine oil, hydraulic oil and filters.
2. To prevent hot oil or water from pouring out, turn off the engine, let the machine cool down, loosen the cap gradually to release the pressure, open the cap (To judge the actual water temperature, you can put your hands near the radiator and feel the air temperature, but do not put your hands directly on the radiator).



Picture 1.2.5

3. Do not touch any heating parts after several hours work.

### 1.2.6 AVOID EXTRUCION DANGER

1. It is forbidden to stand under the working arm.
2. To avoid injury do not stand between moving parts.
3. DO NOT repair the machine while it is operating.
4. If it is required to lift the boom when you are repairing the machine. Use the cylinder support rod to support the lifted boom otherwise the boom may come down suddenly and cause a severe accident.



Picture 1.2.6

### 1.2.7 TRAVELING SAFE

1. Do not remove the keys while the machine is running.
2. It is dangerous to start, stop or turn suddenly, moving too fast or go in "Z" formation.
3. If there is anything unusual that happens such as noise, vibration, smell or something unusual, immediately drive the machine to a safe place and check.
4. Do not use the control rod while driving, if needed please enable slowly.
5. If you need to travel on rough ground, use low speed and do not turn.

6. Try your best to avoid obstacles; if you need to do this, please have the working arm close to the ground and use low speed, the incline of the machine should be no more than 5 degrees.
7. Pay attention when travelling on a slope to avoid tipping or slipping.
8. Keep the bucket (or other attachments) 20-30 cm above the ground. If there is an emergency slow down and stop the machine.
9. Avoid turning or travelling horizontal on a slope.
10. If the engine stops while on a slope, use the emergency brake and the working arm should be down.
11. If the machine is not moving on muddy soft ground, you can try to increase the accelerator, step down on the gas pedal gradually and lower the speed.

### 1.2.8 SAFE TRANSPORT OF LOADER

1. The RAMROD A2450 Hydrostatic 4WD Articulating Loader be transported by truck or trailer. Before loading make sure the means of transport has the appropriate load capacity. The platform on which the machine is loaded must be flat to avoid movement.
2. The machine can be loaded or unloaded with the proper ramps. Make sure the ramps are strong enough and, if necessary, strengthen them with blocks. Proceed slowly on the ramps; keep the machine in the center of the platform. The angle of the ramps must not exceed 10 degrees.
3. The machine is endowed with hydrostatic traction and cannot move when the engine is off.
4. Once the machine is loaded apply the articulation locking rod.
5. The load and unload must be made on level ground and at a safe distance from ditches and road edges.
6. After loading the machine, stop it by applying brake blocks to the wheel and the hand brake. Immobilize it with ropes and chains anchored to the special junctions (two frontal and two back).
7. After the transport, it is recommended to verify the position of the machine that it does not constitute a danger before removing the ropes, the brake blocks and downloading the machine.



# SECTION 2

## General characteristics and technical specifications

### 2.1 FOREWORD



#### ATTENTION

The non-observance of what is described in this manual, incorrect operation or wrong use of the machine and the execution of non-authorized workers, will cause the exclusion of warranty.

The manufacturer declines every and any liabilities for direct and indirect damages due to the above mentioned points.

For repairs and revisions involving works of a certain complexity (motor, hydraulics), it is necessary to turn to an authorized Assistance Center with specialized personnel or directly to the manufacturer, which is available to assure a ready and accurate technical support to restore the machine to its full efficiency.

### 2.2 WARRANTY TERMS

1. For a new machine, within determined limits, the manufacturer guarantees warranty for a period of 12 months or 1000 working hours (whichever comes first).
2. The warranty includes repairs or replacement of parts for free which were proved to be defective in origin by the technical department of the manufacturer.
3. The repairs or replacement parts should not exceed the warranty period.
4. The warranty is valid on the condition that all the terms listed in the contract were observed.
5. If warranty claims happen, they should take place at RAMROD Equipment, 135 York Road East, Yorkton, Saskatchewan, Canada.

## 2.2.1 EXCLUSIONS FROM WARRANTY

1. Electric, electronics and all those parts replaced due to normal wear are not covered by warranty. Transport to/from the workshop, the inactivity of the machine and any consequent damage, all transport, works and storage costs are excluded from the warranty too.
2. The warranty will NOT BE Valid:
  - If accidents occur due to operator's fault
  - If damage was caused by insufficient maintenance
  - If the machine should suffer vibration or damage by a user without the authorization of the manufacturer or following the fitting of non-original parts
  - If instructions in this manual are not followed.
3. Damages caused by negligence or incorrect use of the machine are not covered by warranty.



ATTENTION

4. Removal of the safety device will make the warranty invalid, and non-liability of the manufacturer.
5. Replaced parts do not have warranty.
6. The machine or parts of it, returned even under warranty will be sent EXW.
7. Other exclusion of warranty:
  - tires
  - rims
  - brakes
  - chassis
  - parts of chassis more likely to be damaged
  - muffler
  - battery
  - buttons and joysticks
  - seat
  - steering wheel

- gaskets of cylinder
- all accessories

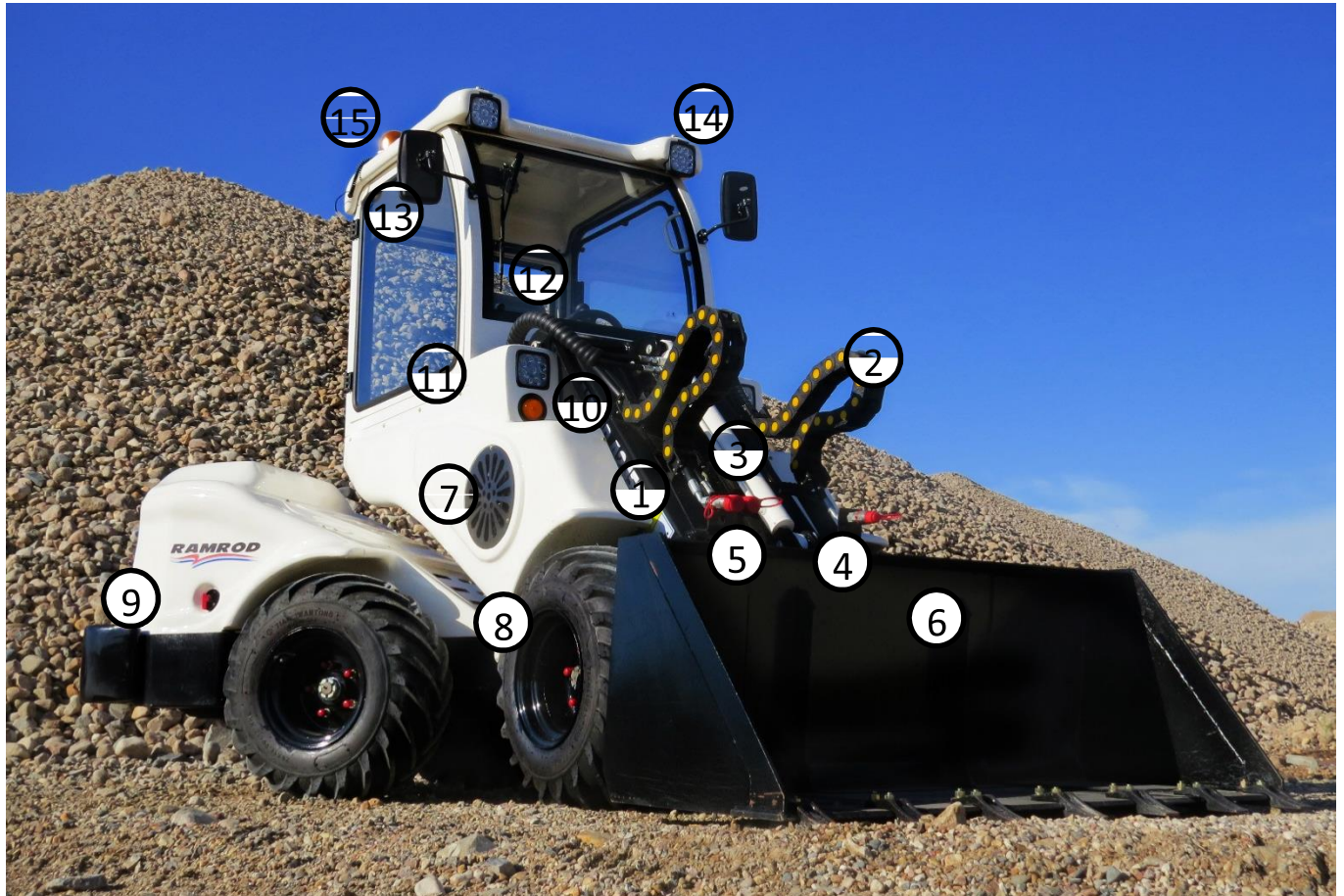
## 2.3 MACHINE IDENTIFICATION

1. Check the machine over and make sure it is complete after receiving it.
2. Possible claims must be forwarded in writing within 8 (eight) days from receipt.
3. Each machine has an identification plate. The data identifying the machine must be copied in the back cover of the manual and must be quoted every time spare parts or assistance works are requested.

The machine is equipped with:

- The operator's manual
- Manual of instructions for the use and maintenance of the engine

### 2.3.1 DESCRIPTION PICTURE 2.3.1/A and 2.3.1/B



Picture 2.3.1A

1. Lifting Arm. It allows the lifting and lowering of the attachments fixed on the attachment plate.
2. Hydraulic Circuit
3. Hydraulic cylinder. It controls the lifting arm.
4. 12V power supply. It offers power for the electric components.
5. Hydraulic outlet.
6. Interchangeable attachment plate.
7. Air intake grille.
8. Front Chassis. It bears the operator's seat and telescopic arm.
9. Back Chassis. It is joined to the front chassis through the articulation, comprise the main engine, the hydraulic pumps, the oil and diesel tank, the battery and the body with the back wheels.
10. Front traffic lights (optional)



11. ROPS Cab in conformity with ISO 3471:1994
12. Driving seat. It's the correct position from where the machine can be driven and all commands used.
13. Rear reflectors.
14. Front working lights.
15. Rotating light.



Picture 2.3.1B

16. Metal Canopy.
17. Rear Turning braking lights.
18. Fuel Tankcap.
19. Bonnet.
20. Engine cooling radiator.
21. Counter weight (optional). Taking off the counter weight: it is possible to mount a 3 point hitch (optional) for mounting attachments on the rear side of the machine, coupled with relative rear outlets.

22. Articulation. The central articulation joints the front and back chassis. The machine is commanded hydraulically through four hydraulic motors positioned in each independent wheel.

## 2.4 DESCRIPTION AND USE OF THE MACHINE

The machine described in this manual is projected to be commanded by a single operator from the driving seat. The structure of the machine is made of a front chassis and back chassis both connected to a central articulation. The machine has four independent traction wheels making it particularly strong and stable.

On the front chassis there is a lifting arm fixed through a pivot, an interchangeable attachment plate, hydraulic outlets, and a power supply of 12V for the equipment with electric commands.

A diesel engine, positioned in the back, which operates a pump that through a hydraulic circuit enables all the functions of the machine, transmits the motion.

The adoption of innovative materials and high quality solutions allow the use of all the potentialities of the machine.

The machine is to be used in agriculture, green spaces, horticulture and gardening.



**DANGER**

The machine is for professional use and the operator must be qualified and able to read and understand the contents in this manual. While using the machine keep in mind the current regulations in the prevention of accidents, conditions of use and characteristics of the machine.

The RAMROD A2450 Hydrostatic 4WD Articulating Loader described in this manual is a machine to be used for operations in agricultural fields, green spaces, construction sites, and road yards.

It is absolutely prohibited to use the machine on roads if it does not have type-approval confirming to the legislation in place in the country of use.

The RAMROD A2450 Hydrostatic 4WD Articulating Loader must not be used as a means of transportation and/or towing, or with non-original equipment.



**DANGER**

The use of the machine is NOT TO BE USED in environments in which vapors of mixtures of inflammable or explosive gas. The user must verify that the equipment can be properly attached to the machine and in compliance with current legislation.



**DANGER**

Every other use not contemplated in this manual will relieve the manufacturer of every and any responsibility for damages to persons, animals or things.

#### **2.4.1 INTERCHANGEABLE EQUIPMENT**

Corresponding interchangeable equipment can be fixed on the machine's interchangeable attachment plate. For the recommended interchangeable equipment you should contact the manufacturer.



**ATTENTION**

The manufacturer is available for further explanations and for the assembly of further equipment.



DANGER

Each attachment refers to its norms of product. The tipping moment generated by the equipment installed on the machine must be lower than the one produced by the loads stated in the chart. The weight of the equipment installed on the machine must be considered as an applied tool.

## 2.4.2 NOISE RISK

The noise level (aerial level) has been detected when the machine is in operation. Here are the levels:

Model 2450

- Level of acoustic pressure in the driving seat LpA DB 86
- Level of acoustic power LwA DB 104



ATTENTION

The level indicates that the machine produces high noise. When the machine is operated, the use of soundproof protection tools to avoid damages to the auditory system is obligatory.



### 2.4.3 LOAD DIAGRAMS

The tipping load is limited to the possibility of inclination of the machine. The load diagrams represented in picture 2.4.2 illustrates the inclination of load and the maximum weight of lifting in different positions of the arm and with different distances from the machine.

The load diagrams refer to the machine in still position and set on a solid and plain surface with an operator of 90 KG in the driving seat.

Any shift in the center of gravity of the load produces a change in the machine's loading capacity.

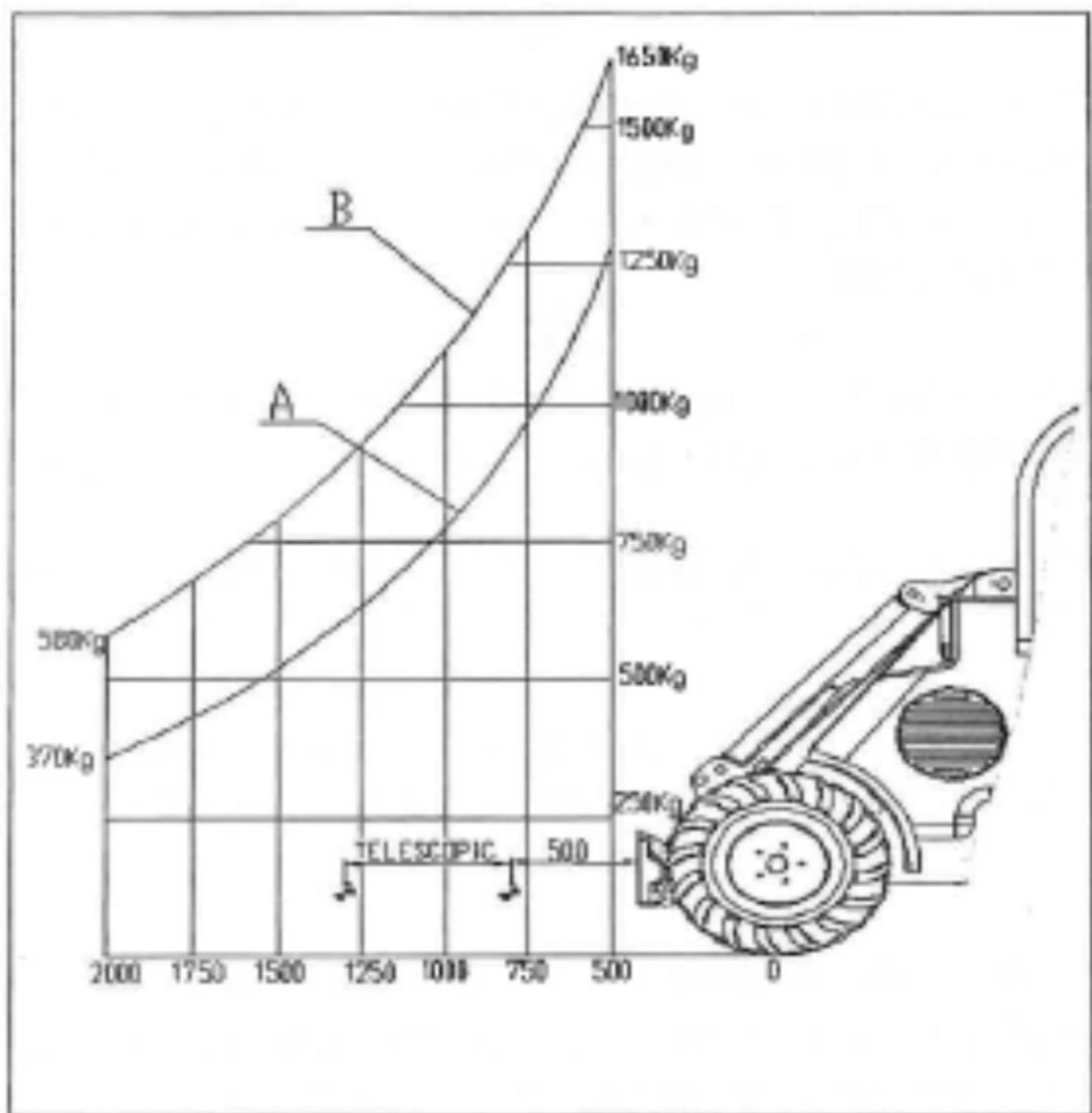
The stated lifting capacity is inclusive of the weight of the accessory used, the net lifting is therefore given by the value shown on the graph less the weight of the accessory.

In the diagram, the center of gravity of the load is located at 400 mm from the attachment coupling plate, according to ISO 14397-1 rules. While moving the arm, the load center moves from the starting position and consequently the loading capacity of the machine is different.

In the picture 2.4.3, the machine is in a position of maximum articulation. While the center of the front and back chassis are not at the same beeline, the loading capacity will correspondingly be less.

Curve A in this diagram indicates when the machine is at maximum articulation, the corresponding rated loading capacity with different distance from the gravity of the load to the front wheel.

Curve B in this diagram indicates corresponding tipping load with different distance from the gravity of the load to the front wheel.



Picture 2.4.3

## 2.5 TECHNICAL SPECIFICATION

### 2.5.2 TECHNICAL SPECIFICATION

MODEL	A2450
Maximum length (mm)	2600
Maximum width (mm)	1240
Maximum Height (mm)	2330
Turning Angle	45
Speed (km/h)	12
Weight without counterweight (kg)	1600
Standard Tire	26 x 12 - 12
Tire Pressure (bar)	2.8
Oil Tank Capacity (L)	40
Pressure (bar)	190
Oil Model (mineral oil)	L-HL-46
Engine	
Fuel	
Number of Cylinders	4
Cooling System	Water Cooling
Rated Power(kw)	24.5
Rotation Speed (r/min)	2800
Fuel Tank Capacity (L)	23

Battery Capacity (Ah)	60
Voltage (V)	12

## SECTION 3

### USE OF THE MACHINE



#### ATTENTION

Before operating the machine, verify that everything is in order, that the protections and the bonnet are installed and that all the elements subject to wear and deterioration are fully efficient.

### 3.1 COMMANDS AND CONTROLS

The diagram for the various commands and control devices see below:

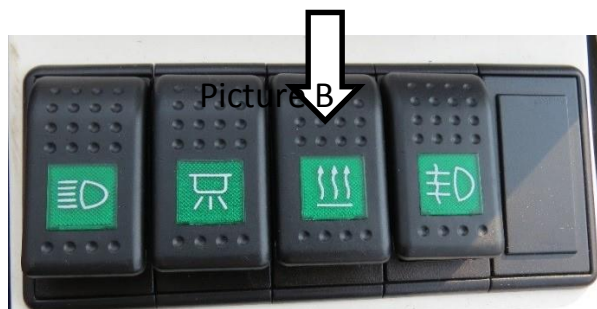
1. Warm Air (optional)
2. Steering wheel
3. Forward/reverse pedal
4. Combined switch
5. Parking brake handle
6. Multifunction display
7. Rocker switch
8. Joystick
9. Accelerator level
10. Key switch
11. Driving seat

The function of the various commands and control devices are below:

#### 3.1.1 WARM AIR (OPTIONAL)

When warm air is needed in winter, open the warm air hole first (Picture A), then turn on the warm air switch (Picture B)

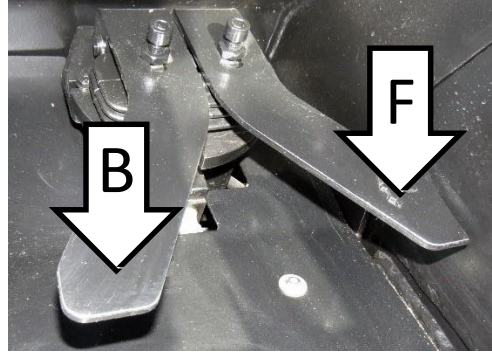
Picture A



### 3.1.2 STEERING WHEEL

Turning the steering wheel the machine can turn right or left.

### 3.1.3 FORWARD/REVERSE PEDAL



Picture 3.1.3

Step on the right pedal shown as arrowhead F, the machine moves forward; step on the left pedal showing as arrowhead B, the machine reverses.

### 3.1.4 COMBINED SWITCH



Picture 3.1.4

The combined switch can control left/right turning, the horn, wiper and the traffic lights.

### 3.1.5 PARKING BRAKE HANDLE

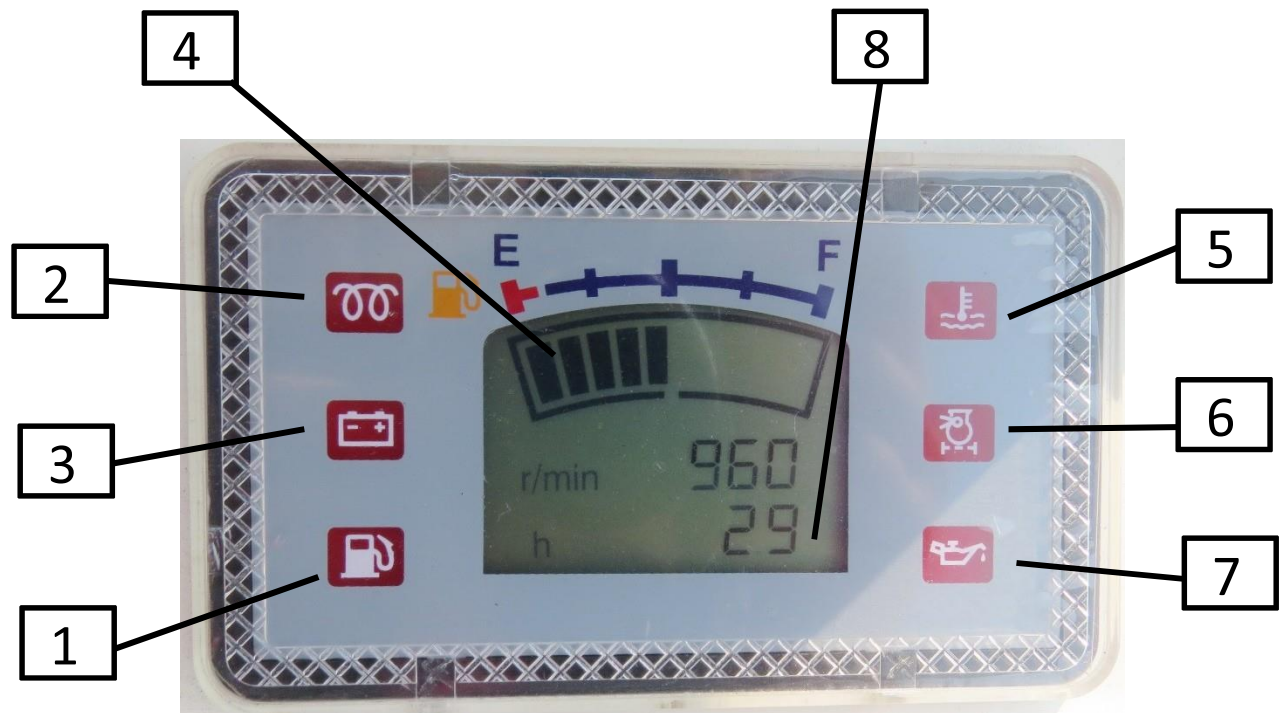


Picture 3.1.5

When the machine is stopped, pull up the handle to engage the brake on the rear wheels so that they cannot turn. When the machine moves the handle must be pulled down which will release the brake.

### 3.1.6 MULTIFUNCTION DISPLAY

The picture below is the multifunction display, each signature's meaning is below:



Picture 3.1.6

1. Fuel Capacity (red). When the fuel level is less than 10% the warning light comes on.
2. Preheating indicator (yellow)
3. Under voltage indicator (red). When the voltage for the instrument is below 13V, the warning light comes on.
4. Fan-shaped fuel capacity (totally ten section) (black).
5. Water temperature of engine (red). When the water temperature is higher than the setting the warning light comes on.
6. Hydraulic oil dirty warning (yellow). When the returning pressure reaches the setting the warning light comes on.
7. Engine oil pressure warning (red). When the engine oil pressure reaches the setting the warning light comes on.
8. Engine revolution indicator.
9. Dip switch. Is used to switch between the revolution speed and working hours.

### 3.1.7 ROCKER SWITCH

The picture below is the rocker switch. Each rocker switch's function as is below:



Picture 3.1.7

- J1. Traffic lights. When you turn on this switch the traffic lights come on and the lighting can be adjusted by the combined switch (4 picture 3.1).
- J2. Warning light switch
- J3. Warm air switch
- J4. Working lights switch
- J5. Hydraulic PTO switch. This is a two position switch, when pressed it will allow hydraulic flow to the attachments. Two positions can switch the outlet of PTO between high and low pressure. When you do not use front and rear PTO make sure that this switch is at middle position, otherwise the engine will be killed easily.
- J6. Hydraulic PTO confluence switch. Turn on this switch and the flow of the PTO is with two pumps (Only turn on this switch when the motor is on the attachments).
- J7. Differential switch

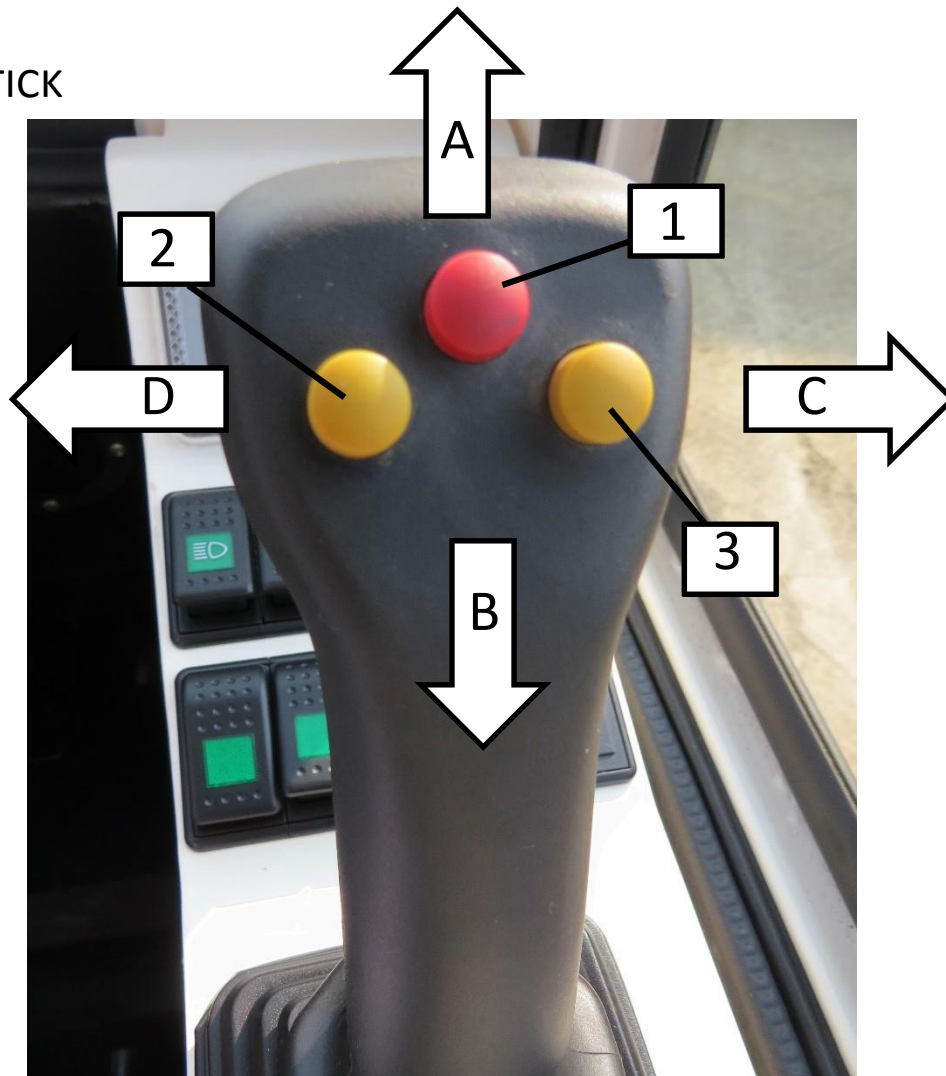


J8. Working lights indicationswitch

X1. Indicating when the working lights are on

X2. Indicating when the PTO has outlet

### 3.1.8 JOYSTICK



Picture 3.1.8

1. Push the joystick forward to <<A>>, the arm drops. By pushing the handle forward until the detent position will engage the boom floatation.
2. Pushing the joystick back to <<B>>, the arm rises.
3. Pushing the joystick to the right <<C>>, the attachment plate bends over.
4. Pushing the joystick to the left <<D>>, the attachment plate bends upwards.
5. Attachment unlocking button (button 1, red. It is as an option when the quick coupling was hydraulic). Turn on the J5 rocker switch, the mounted attachment is unlocked. (J5 is a two position switch, if one position does not work you can use the other position.)



6. Telescopic-arm retraction push-button (button 2, yellow). If pressed, it enables the retraction of the telescopic-arm.
7. Telescopic-arm extension push-button (button 3, yellow). If pressed, it extends the telescopic-arm out.

### 3.1.9 ACCELERATOR LEVER

Pulling the lever upwards or downwards, the engine speed range increases or decreases. Positioned at the front cutting edge, the engine speed range is at minimum level.

### 3.1.10 IGNITION KEY

Rotating the key to the right turns on the power supply, to the left activates the spark plug preheating and the relative light illuminates. A second click to the right turns on the engine. Once the machine is on, release the key. To turn the machine off, turn the key to the left.

### 3.1.11 DRIVING SEAT

The driving seat can be adjusted lengthwise. It is equipped with folding armrest and safety belt.

## 3.2 BEFORE USE



Familiarize yourself with the device's commands and functions.  
Make sure all protective covers are correctly installed.

Before starting the machine:

- Check the battery condition. If necessary, try to charge the battery or change it.
- Check the oil engine level (see the instructions in the engine manual).
- Check the level of fuel (see the indicator 1 picture 9)

- Check the oil level of the hydraulic circuit. A correct level should not be lower than the red line on the indicator the arrowhead in picture 3.2 shows the red line).
- If the oil level is lower than the red line, then refill it. When the machine and attachments with cylinders or hydraulic motors are used – the oil level decreases.

### 3.3 SWITCHING ON THE MACHINE

Before operating the machine, tighten the safety belt and close the door. Be careful while starting the machine for the first time; keep the engine at a low speed.

After all the checks, start the machine by:

Sitting in the driver's seat, turning the ignition key to the left which activates the electric power. Turn to the right and it will activate the preheating of the spark plug. A second click to the right starts the engine.

Once the engine starts, release the key and let the engine warm up.

Should the engine fail to start, wait a few seconds and retry.

The original antifreeze mixture allows use of the machine to minus 20 degrees.

If the external temperature is below 0 degrees the radiator is not supplied with antifreeze so drain the water and put in required amount of antifreeze.

While the machine is in operation, the operator must sit in the driving seat.



BEFORE GETTING DOWN FROM THE MACHINE, THE OPERATOR MUST LOWER THE LIFTING ARM AND THE ATTACHED EQUIPMENT, STOP THE ENGINE AND APPLY THE HAND BRAKE, STOP THE ENGINE AND REMOVE THE IGNITION KEY.

### 3.4 SWITCHING OFF THE MACHINE

- Make sure the ground where you want to stop the machine is flat.
- Shift the various controls to neutral.
- Shift the accelerator lever into low (2 picture 8) turn the key to the off position and remove it.

NEVER LEAVE THE MACHINE WHILE IN OPERATION.

- Apply the brake and stop the engine.

### 3.5 ATTACHMENT PLATE

The machine has been designed to operate with various attachments that can be installed on the front arm of the machine and hooked on the attachment plate (picture 3.5A).

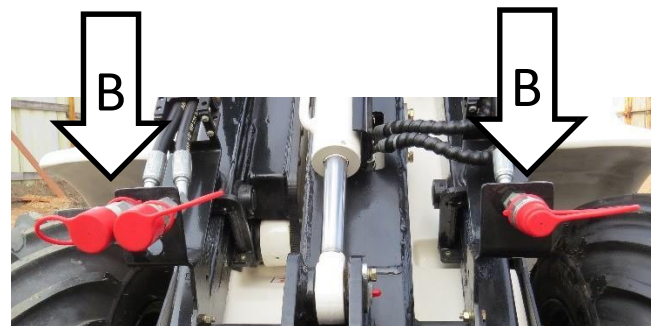
The hydraulic outlets (picture 3.5B) are located in the front arm. On demand, they can be mounted on the rear of the machine, for other attachments.

A power outlet of 12V on the boom is ready for use.

The machine is provided with coupling holes for further attachments.



Picture 3.5A



Picture 3.5B



## ATTENTION

Before hooking, unhooking or using attachments, it is necessary to consult the relative instruction manual, lay down the accessory and stop the engine. The attachments must have proper protection.

To assemble the equipment follow these steps:

- Drive the machine close to the attachment
- Gradually draw near to the attachment, turn the attachment plate, making the two plates parallel.
- Hook the two pins of the plate to the two upper points of the attachment.
- Slightly lift the arm by shifting the joystick to (B) and by the PTO rocker switch and the relative button on the handle make sure the two pins are locked.
- Connect the hydraulic pipelines to the designated quick couplers, and follow the instructions of the attachment manual.
- To detach or replace the attachments following the “attachment instructions” backwards.



## ATTENTION

Do not leave the machine with the arm raised and loaded – lay the arm down after use.

**DO NOT USE THE MACHINE ON UNEVEN GROUND**

### 3.6 GAUGE

The gauge of the machine can be set according to the user's needs by adding spacers in the front wheels and changing tire type.

Spacers 1 cm (max 3 for wheel), to increase the width of the machine to 120 cm.

Spacers 55 mm (max 1 for wheel)

To vary the gauge, follow these steps:

- Take off the wheels.
- Insert or remove the spacers, remount the wheels and tighten the screws.



ATTENTION

The setting of the gauge must be operated by using the same type of spacers.

## SECTION 4

### MAINTENANCE

#### 4.1 GENERAL INSTRUCTIONS



ATTENTION

The operating of maintenance and settings must be down when the machine is switched off.

Before proceeding with any operation, make sure the machine is on flat ground and apply the brake block to prevent any movement.

Keep the machine clean, it will help in spotting damaged parts.

Clean the machine avoiding direct high pressure water jets on the radiator, the heat exchanger and the engine compartment.

Before injecting lubricating grease in the grease nipples, it is necessary to clean the nipples to prevent mud, dust and foreign bodies from contaminating the grease.

Lubricate and grease every point.

In restoring or changing the oil, use the same type of recommended oil



#### ATTENTION

SHOULD WORK BE NECESSARY WHILE THE ARM OF THE MACHINE IS LIFTED, IT IS OBLIGATORY TO INSERT THE LOCK, LOCATED ON THE BACK SEAT, TO THE LIFTING CYLINDER IN ORDER TO WORK SAFELY.

## 4.2 ENGINE

Regarding the maintenance works of the engine, carefully follow the instructions in the engine manual.

## 4.3 AIR FILTER

Clean the air filter periodically (picture 16)

Remove the filter cap, releasing it from its housing.

Clean by using a dry air jet with a pressure up to 3 kg/cm<sup>2</sup>, directing the air jet along the whole inside surface of the filtering cartridge until the dust is completely removed. If pressed air is not available, it is sufficient to beat the cartridge on the palm of the hand. If the cartridge has greasy spots, wash with warm water and soft detergent, then rinse with

water going from the inside to the outside (pressure up to 2.8 bar). Let the cartridge drain and dry at a normal temperature. Before reassembling the filter, check the condition of the cartridge. If lacerated or worn, it must be replaced. The cartridge must be replaced after 5-6 cleaning operations and every 12 months or 200 hours.

#### 4.4 COOLING CIRCUIT

Check the liquid level of the radiator weekly. The level must be a little below the cap located under the bonnet.

The liquid is a mixture of water and coolant, suitable for temperatures to -25 degrees Celsius. In case of urgency use only water to top up the mixture level until it becomes possible to restore the original proportions of water and coolant.

Check and clean the fins of the radiator periodically. (Clean with a jet of air)

#### 4.5 TIRES

Check the pressure and the state of wear of the tires weekly – if worn or broken replace them.

Before inflating the tires, always check the condition of the rims and the external condition of the tire for any bruises, lacerations, cuts or other defects.

Never go beyond the pressure level indicated for the single types of tires and always check that the pressure of the right and left tire are the same.

#### 4.6 HYDRAULIC CIRCUIT

To check the oil level of the hydraulic circuit, lift the loader arm.



## ATTENTION

When the arm is lifted, it is obligatory to insert the safety lifting cylinder lock onto the lifting cylinder in order to work safely.

Check the oil level weekly.

Every 50 working hours change the oil.

Position an appropriate container under the lower cap on the back of the tank, remove the cap and let the content flow.

Clean and put back the lower cap.

Fill up the tank with new oil.

Start the engine and let it run for a few minutes, turn it off and check the oil level, add oil if necessary.

Screw in the upper cap.

Never start the engine with an empty tank.

See the chart for the type of oil to use – Recommended Lubricants.

## 4.7 ELECTRIC CIRCUIT

The machine has an electric wiring scheme that must be checked before any work is done on the wiring.



#### 4.7.1 BATTERY

The battery is located on the back right under the engine compartment bonnet.

Periodically check that the level of the electrolyte is 10-15 mm over the upper edge of the plates (for batteries with maintenance). Restore the level with distilled water.

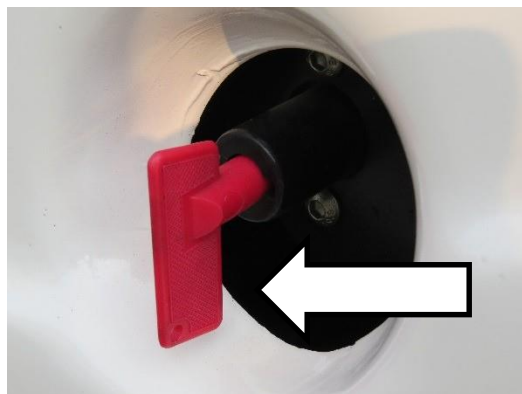
Never use acids that may damage the batter, only use distilled water. Keep the battery dry and clean to avoid harmful dispersions of electricity.

If the machine remains unused for a long time, take the battery to a dry place and recharge it every month.



The battery contains corrosive acid. Avoid contact with skin, eyes and suits. Wash eyes with a lot of water and turn to first aid.

In case of substitution of a battery, make sure the poles are correct. A wrong connection could cause serious damages to the electrical panel. When the electrical system is being repaired, disconnect the batteries with the special key (picture 4.8.1) to interrupt the flow of electricity. When welding on the machine – disconnect the battery and alternator.



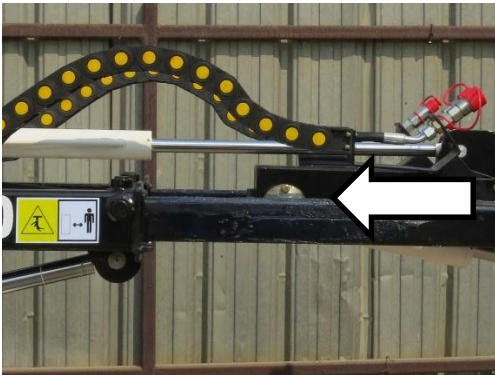
## 4.7.2 FUSES

The electric circuit is protected by a series of fuses located under the driver's seat. Check the electrical wiring for protection.

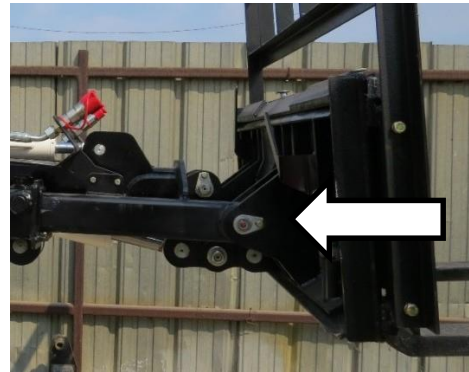
## 4.8 LUBRICATION

### 4.8.1 GREASING

The greasing points are illustrated in the picture below:

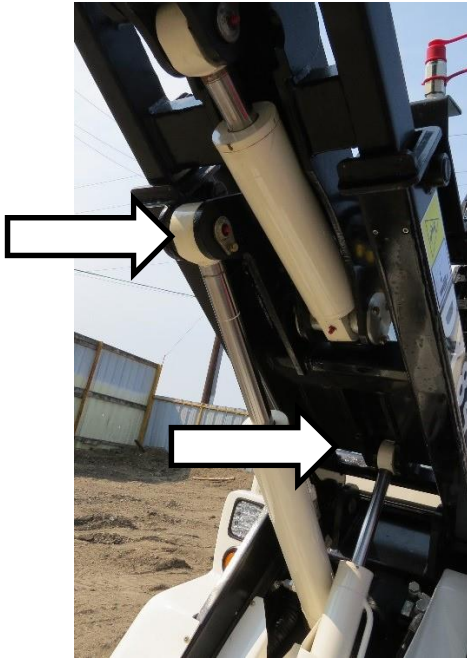


Picture 4.9.1A

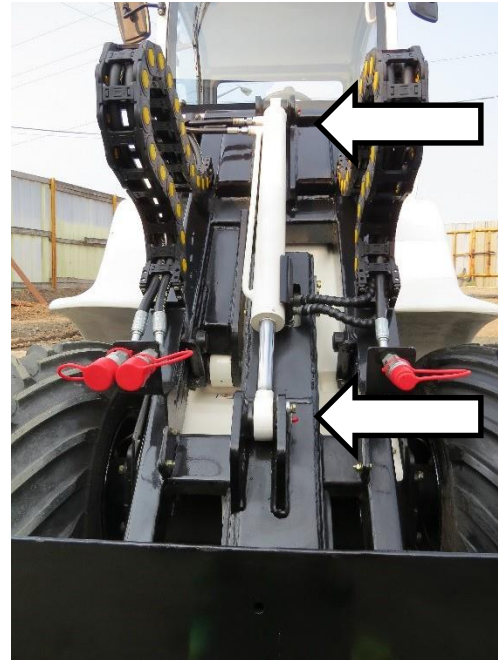


Picture 4.9.1B

Grease the points weekly shown in Picture 4.91A (the contact points of the telescopic are and the blocks) and 4.9.1B (the attachment plate and the tipping cylinder).



Picture 4.9.1C

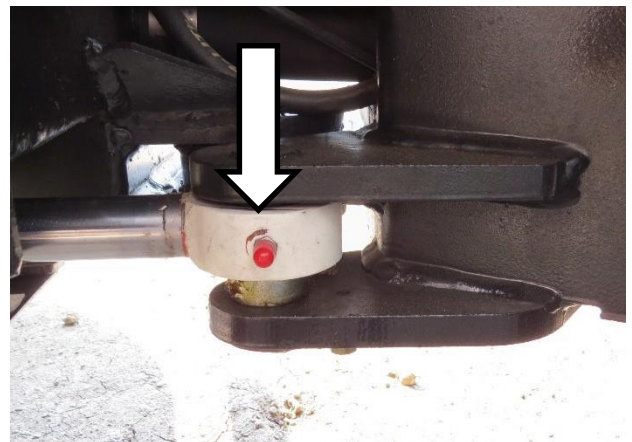


Picture 4.9.1D

Grease the points weekly shown in Picture 4.9.1C (the pivot points of the cylinder) and 4.9.1D (the pivot points of the telescopic cylinder).



Picture 4.9.1E



Picture 4.9.1F

Grease the points weekly shown in Picture 4.9.1E (the pivot points of the assisting cylinder) and 4.9.1F (the articulation of the chassis).

Grease the points weekly shown in Picture 4.9.1G (the four wheel axles).



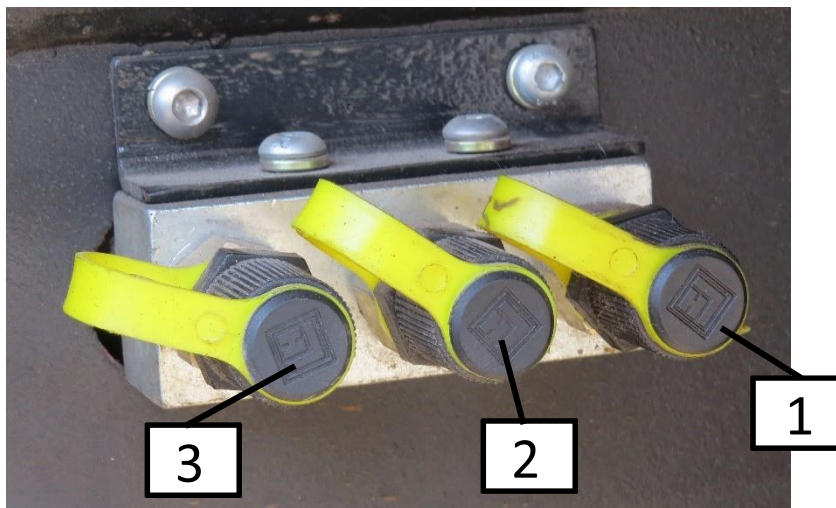
Picture 4.9.1G

#### 4.8.2 RECOMMENDED LUBRICANTS

Please contact manufacturer

#### 4.9 PRESSURE TESTING TIE-IN

There are three pressure testing tie-in on the machine, shown below:



Picture 4.10

Pressure testing tie-in 1 – test the pressure of the tracking piston pump

Pressure testing tie-in 2 – test the pressure of the first gear pump

Pressure testing tie-in 3 – test the pressure of the second gear pump

#### 4.10 SUMMARY MAINTENANCE TABLE

	EVERY DAY	EVERY WEEK	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 200 HOURS	EVERY YEAR
MACHINE						
Clean the machine	○					
Check the tires/tightening the wheel nuts		X				
Check the Battery		X				
Check the level of hydraulic oil		X				
Change the hydraulic oil			X		X	
Change the filter of the hydraulic oil					X	
Check & tighten the bolts, wrappers, etc.			X		X	
Check the pressure of the hydraulic system			○		X	X
Set the pressure of the hydraulic system			○		○	○
Grease joints, lubricants	○	X				
ENGINE						
Check the level of engine oil	X					
Replace the engine oil		X			X	X
Clean the air filter		X			X	
Substitution of the cartridge					X	X
Substitution of the fuel filter						
Check tension of the belt				X		
Check water level of the radiator		X				
Replace the coolant						X
Clean the radiator		○				

○ = ONLY WHEN NECESSARY

X = OPERATIONS OF MAINTENANCE

For further information turn to the assistance center of the manufacturer

## SECTION 5

### SPARE PARTS

#### 5.1 SPARE PARTS

Spare parts orders must be made to your provider or directly to the manufacturer and must contain the following information:

- Model, code and serial number of the machine noticeable in the plate attached to each piece of equipment (picture 1/A).
- Code number of the spare parts noticeable in the spare part book.
- Further description and quantity needed.
- Spare parts transports are to the charge of the client and travel at client's risk.

<b>MAINTENANCE CHECK</b> 50 hours Note:          Date: _____ Signature: _____	<b>MAINTENANCE CHECK</b> hours Note:          Date: _____ Signature: _____
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