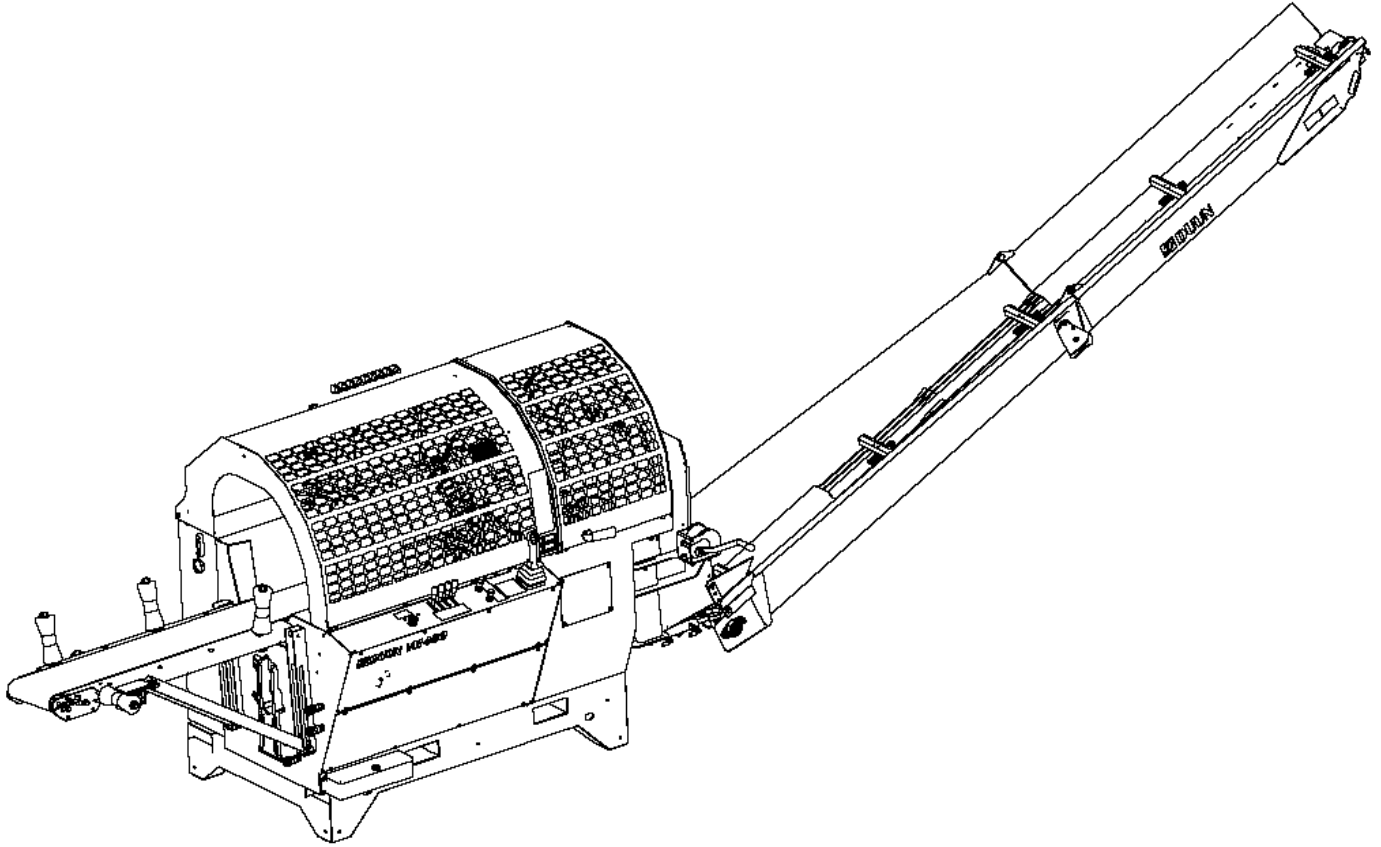


VM450 Instruction manual

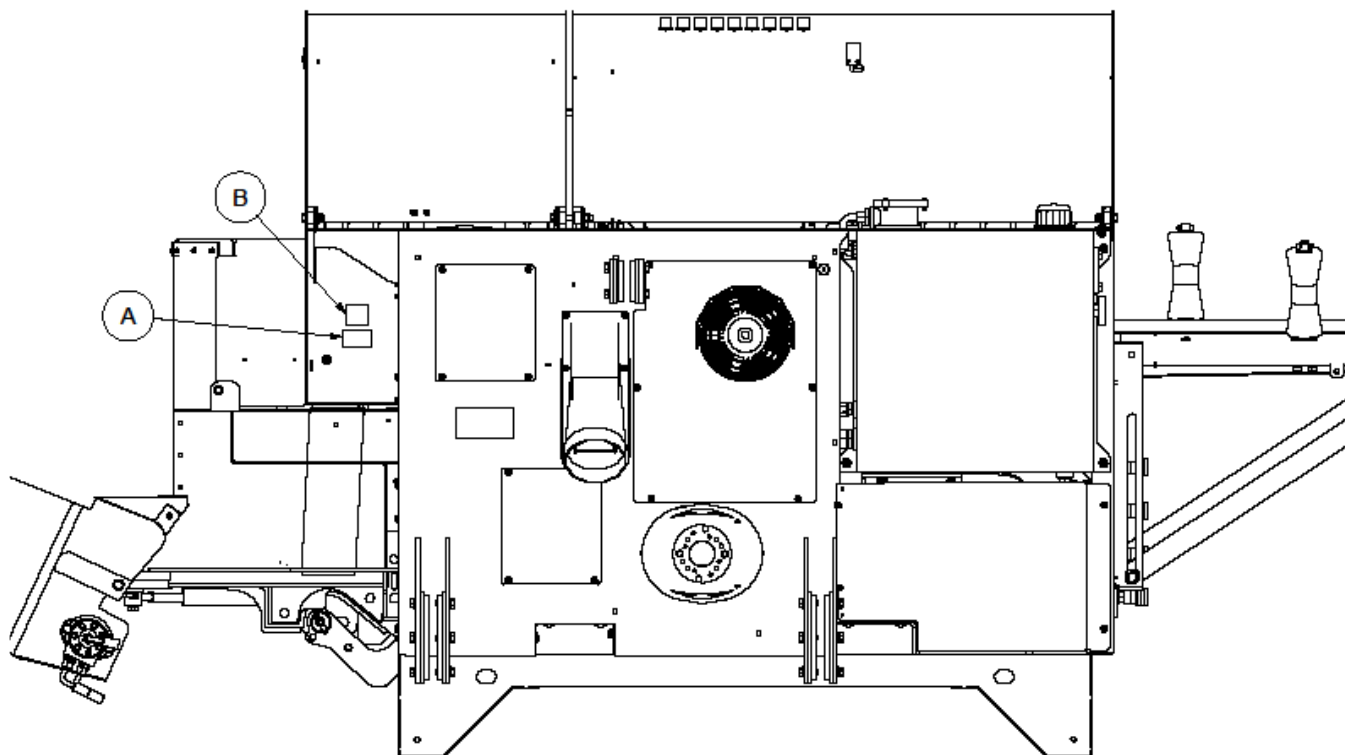


Congratulations on your Duun VM450 firewood processor.

All Duun tractor operated machines have been engineered and tested in close cooperation with representative users to produce functionally safe and user-friendly machines.

Please read this instruction manual before using the machine.

Good luck!



Machine identification

Serial number and manufacturer are indicated on badge (A).

Register serial number and delivery time as indicated.

Always specify serial number when requesting service for the machine.

The machine is CE-marked (B). This marking confirms that the machine has been manufactured in conformity with EU Directive Machinery.

Serial number

Time of delivery (month/year)

CONTENT

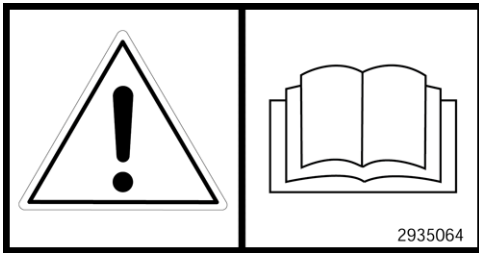
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Safety

All operators, mechanics and the owner must always work carefully with agricultural machinery. Read and observe safety instructions in this instruction manual.

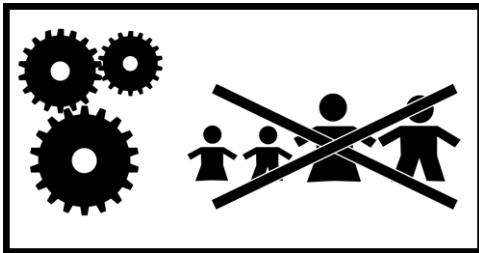


Be particularly aware of warning signs with this symbol, it marks measures that must be carried out in order to avoid accidents. The symbol appears in the instruction manual and on warning signs on the machine.



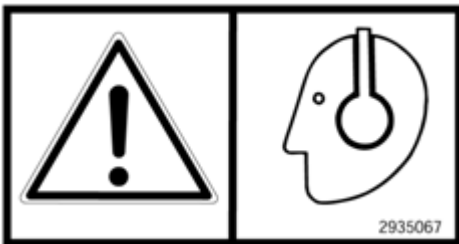
Instruction manual

All operators, mechanics and the owner must be well acquainted with the instruction in this instruction manual before the machine is taken into use.



Safety of the surroundings

Be very careful when other people or animals are near the machine or tractor. Never stand between the tractor wheels and the machine!



Protective equipment

Always wear hearing protection and safety glasses when using the firewood processor. Furthermore, safety shoes and sturdy work gloves should be used when operating the machine and materials.



Clothing and Power transmission shaft

Do not work in clothing that can be pulled into moving parts of the machine (e.g. scarves, long coats).

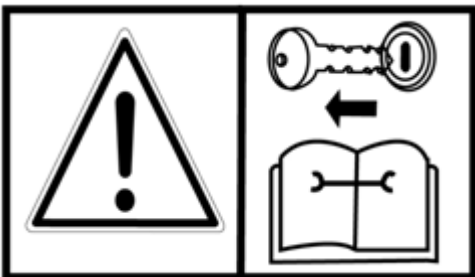
The tractor is disengaged and the handbrake is applied before the shaft is connected to the tractor's PTO. The maximum power output speed is 400 rpm. The drive shafts are always to be equipped with original protection covers.

Damaged and worn covers are to be replaced immediately! Make sure that all covers for the shaft are in good condition and correctly fitted. Never start the machine when this is not in order. The locking chains for the plastic covers are always to be fixed to the appropriate brackets in order to prevent the covers to rotate.



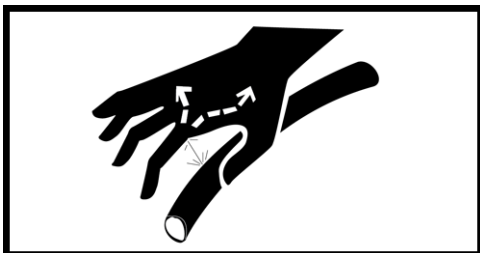
Safe connection and use

Do not allow anyone to stay between the machine and the tractor when the machine is connected to the tractor. The same applies during the use of the machine. Make sure that the connection is carried out in a safe manner.



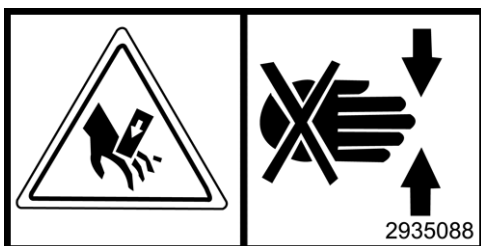
Safety in case of interruptions and maintenance

Remember always to stop the tractor's engine and remove the ignition key before you lubricate, adjust, clean, or carry out repairs. This is to secure that the tractor does not start before you have completed the operation.



Hydraulic high fluid pressure

Be careful when you work with hydraulics. Wear eye protection and gloves. Hydraulic oil under high pressure may penetrate the skin and cause serious infections. See a doctor if you have sustained an injury. Make sure no one is close by when performing hydraulic functions.



Danger of crushing at marked points

Pay particular attention to the risk of crushing at points marked for this.



0-promille

People under the influence of alcohol cannot operate the machine. The same applies for tired people who do not have full control over their movements.



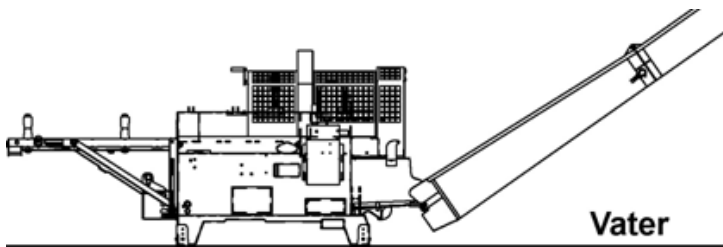
Contact with current-carrying cables etc. during transport.

Please note that the firewood processor can tip over the tractor during transport and there is a risk of contact with live wires, railway underpasses etc.!



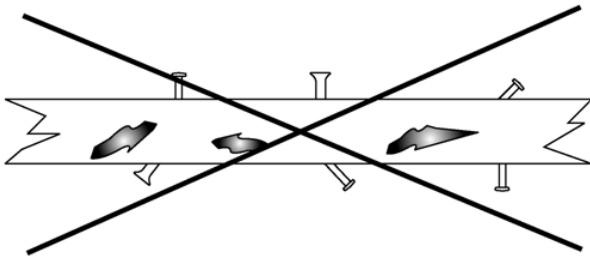
Conveyor belt – transporter

Do not stay under the conveyor when it is tensioned to avoid damage of an uncontrolled fall during use. Also avoid contact with the conveyor's moving parts during use.



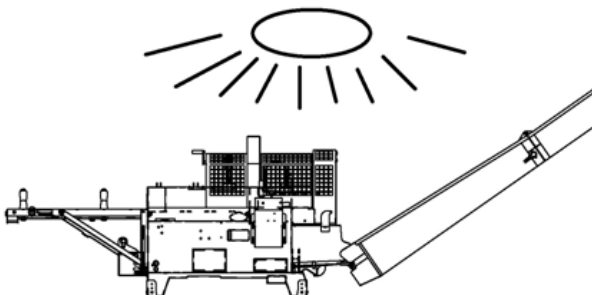
Horizontal placement and tidiness

Always place the machine as level and stable as possible to ensure stable working conditions. Keep the workplace as tidy as possible. This contributes to generally better security against unwanted incidents.



Purpose of use

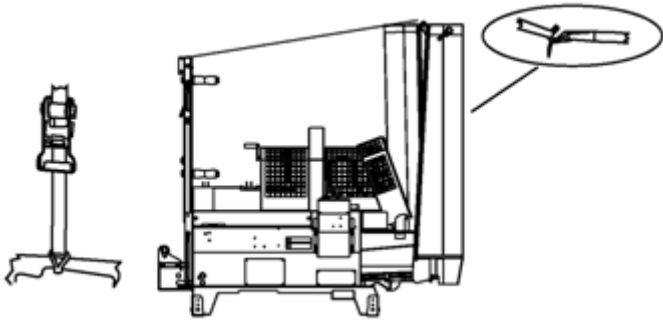
The machines are only intended for the production of firewood from branched material without other extraneous objects. It is not permitted to use the machine for other material such as construction waste and similar material with metal objects such as nails, screws or similar things. The same applies to material contaminated with plaster and similar coatings. The saw chain is only intended for materials without extraneous objects.



The necessity of good lighting

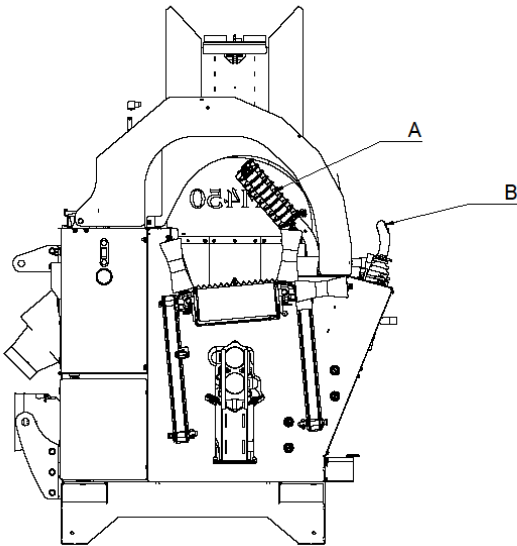
The machine is used only in daylight, which ensures a good overview of the operations - otherwise, with artificial lighting, which gives a good view of working area.

Good lighting is very important for the safety reasons.



Safe transportation

Before the machine is moved, the feed belt and conveyor (both in the folded-up position as outlined) must be strapped together with a load strap to ensure that they cannot fall down. The loading stop has an attachment at the bottom of the feed belt and secures the belt from falling off during transport.



Safe cutting

Avoid using your hands near the saw chain. This is achieved by consistently using the log holder **A** and button **B** (RED) to operate it.

Before starting up after maintenance, check that all tools have been removed and replaced.

Before raising or lowering the machine, check that no one is near or touching the machine.

If warning signs are removed during repairs or service, new signs must be installed immediately!

Warranty terms

Duun VM450 has 12 months guarantee against defects in materials and workmanship.

Parts that are not originally manufactured by Duun Industrier as, for example, wheels, hydraulic parts, etc. are subject to these suppliers' guarantees and terms.

Parts that are considered wearing parts are not included in the warranty - these are specified in a separate table at the bottom of this page.

In cases where a repair is considered to be included as a matter of warranty, the representative must inform the supplier's representatives that the repair is thought to be carried out as a matter of warranty.

The following information must be registered in this connection:

- The product designation
- The product's serial number. (see machine identification p.2)
- Date of sale
- The product owner address, tel. no.
- The seller with address, tel. no.

In case of such a repair, the supplier is presented with a claim within 3 weeks after the repair date.

Replaced parts are to be kept until a decision has been made with reference to the claim and the replaced parts are to be forwarded to Duun Industrier as for assessment if so required.

As the employment of the product is beyond our control, we may only guarantee the quality and do not accept liability for the product's general performance.

Warranty liability requires that scheduled maintenance be done.

Duun Industrier as reserves the right to modify the design and specifications and/or make alterations and improvements without notification.

What is not included in the guarantee:

- The guarantee does not cover financial loss as a result of interruption of operation.
- The guarantee does not cover consequential loss due to defects.
- The guarantee does not cover defects or damage caused by misuse and uses that are not in accordance with the instruction manual's specifications and guidelines.

The following parts and materials are considered wearing parts and are not covered by warranty:

- Chain saw bar
- Chain saw
- Splitting knives
- Feeding belt
- Oil filter
- Hydraulic oil

DELIVERY FORM OF DUUN FIREWOOD PROCESSOR

MACHINE INFORMATION

Model _____

Serial no. _____

Purchase date _____

CUSTOMER INFORMATION

Machine owner _____

Address _____

Aip code _____

Town _____

DELIVERY OF THE MACHINE

Seller and customer have together checked that the machine is free of transport damage and that all equipment is included.

The customer has been made aware of the use of the machine:

Seller and customer have undergone service and maintenance together.

The customer has been made aware of the warranty regulations.

The customer is made aware of the conditions for practical use.

The parts catalog is available from the retailer.

Place _____

Date _____

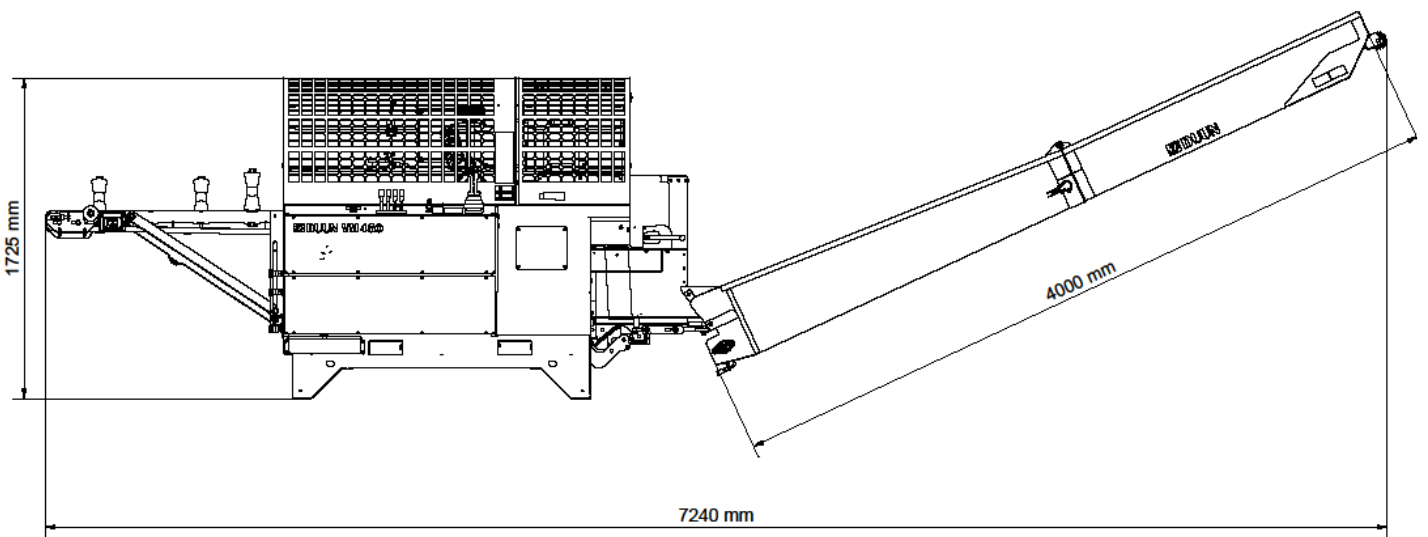
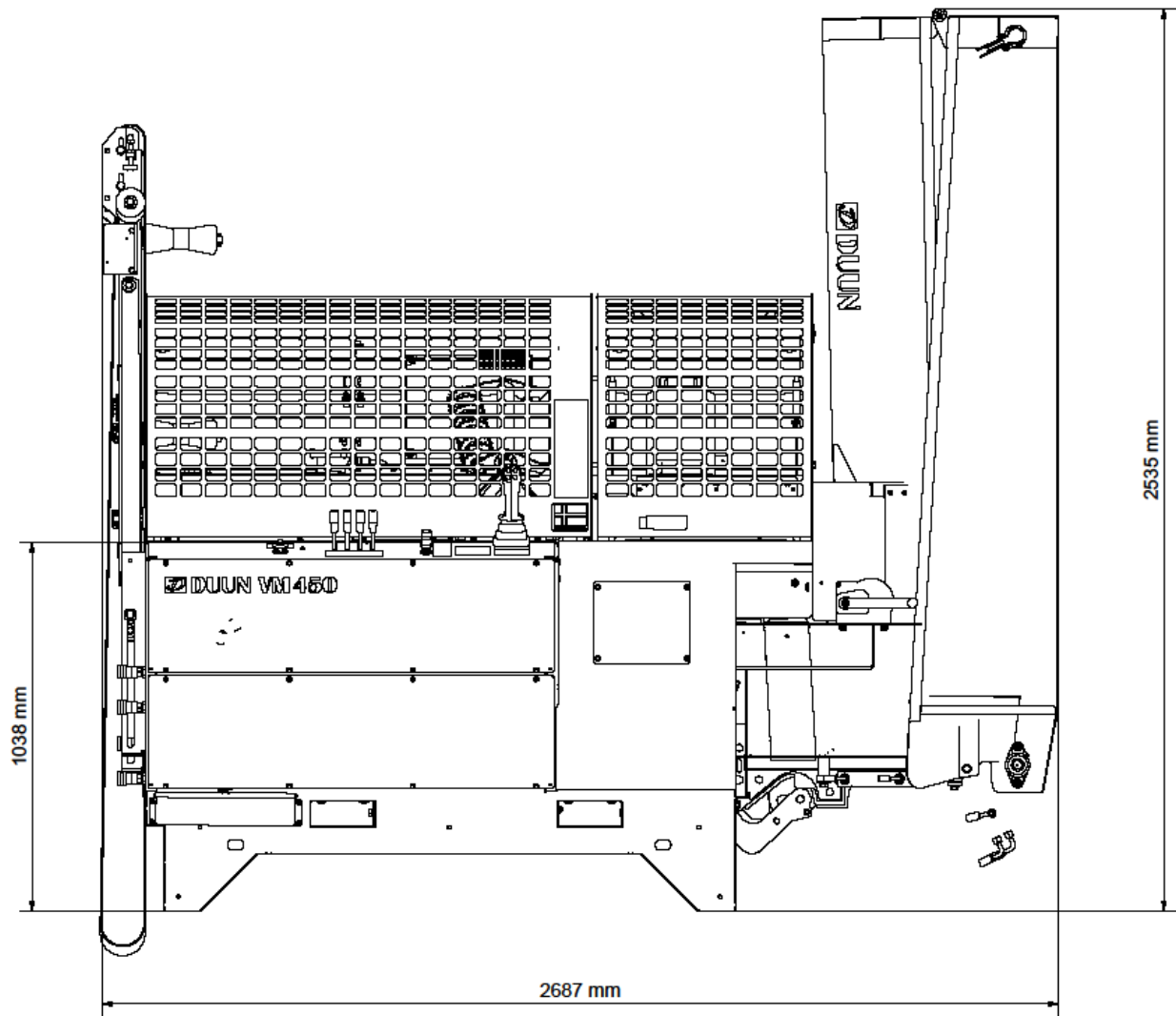
Customers signature

Sale representatives signature

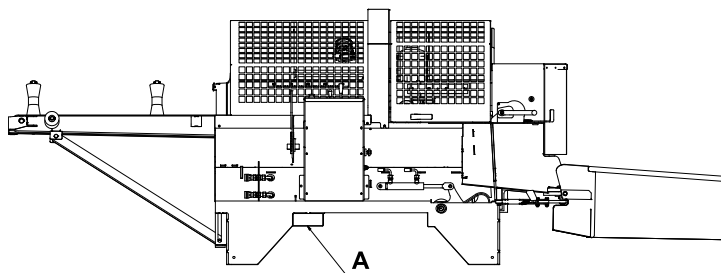
Technical data

Features:	VM450
Net weight	1450 kg
Height transport mode	2540 mm
Width transport mode	2665 mm
Depth transport mode	1470 mm
RPM PTO input	400 rpm
Cutting diameter max	450 mm
Splitting force max	16000 kg
Saw chain drive	Hydraulic
Operation	Joystick
Saw chain	0,404 division 1,6 mm
Cutting length	20-60 cm
Log stopper	Photocell
Splitter	12- piece
Cleaning grate in the conveyor belt	Yes
Saw chain lubrication	Separate pump
Volume saw chain oil tank	5 litres
Knife lift	Hydraulic
Number of hydraulic pumps	3
Conveyor	4 meters
Feed belt operation	Hydraulic
Log holder	Hydraulic
Outlet log table	Yes
Output step feeder	Yes

Accessories	Article number
4- splitter knife	
8- splitter knife	
16- splitter knife	
Triangel utensil fastening	
HMV utensil fastening	
Manual Log rack	
Hydraulic Log rack	

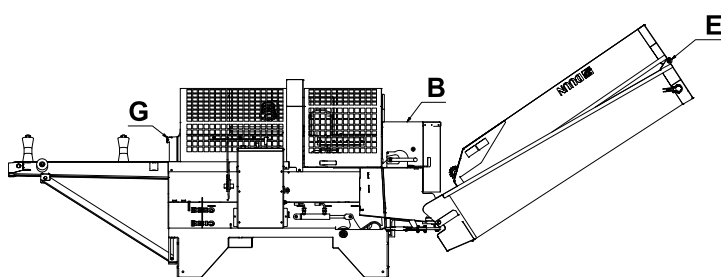
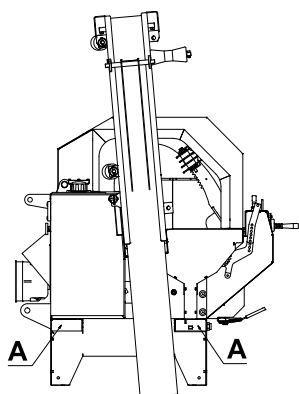


Transport and handling before use



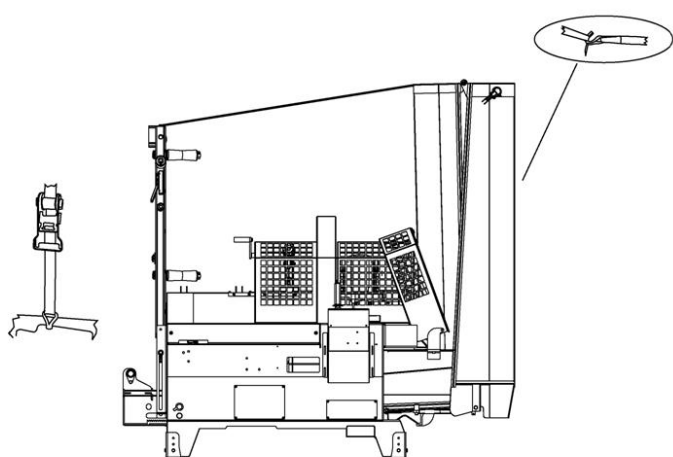
Transport and handling before use

The hull for the VM450 is equipped with a fork pocket (A) for handling with a forklift or pallet forks. Please note that a single firewood processor weighs approximately 1450 kg. Use lifting equipment designed for such a total weight!



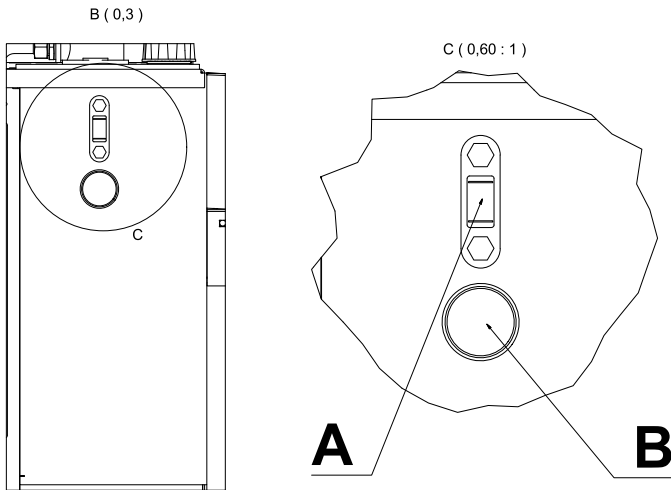
Preparation for movement by tractor

Fold the conveyor together at joint point E. The conveyor is then pulled to a vertical position using the winch wire. During this process, the protective cover is moved at point B. The feeding table and belt are adjusted to a vertical and horizontal position by releasing the locking pin at point G.



Transmission security

Finally, the connection between the feeding table and the conveyor is secured with a tensioning strap for this with attachment at points as illustrated. This is important to ensure that the feeding belt is kept in place during transport and that the connection between the feeding table and the conveyor is properly secured.



Hydraulic oil quality

The machines' ability to function will mostly depend on the hydraulic oil being intact. The biggest dangers to oil quality are:

- Too high a temperature, which is accompanied by poor lubrication and the risk of malfunctions and damage to expensive components such as valves, pumps and motors.
- Condensation that forms in conditions of moist air combined with temperature fluctuations. (the oil tank breathes through the filter and sucks in air with moisture).
- Condensation in the oil has the same effect as an excessively high oil temperature. Condensation primarily occurs during use in moist air and temperatures around 0°C. The oil tank is equipped with a drain plug at the bottom for changing the oil and checking for condensation.

Oil level control

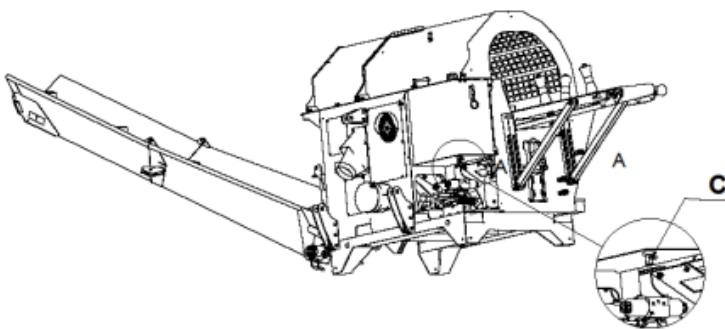
The machines are filled with 95 liters of hydraulic oil from the factory. Recommended oil quality is ISO VG46 (viscosity group 46). Examples of such oils are Mobil DTE15m and Statoil Hydraway HVXA46.

The oil level is checked by observing the level glass **A**, which is located in the suction grid for the hydraulic tank.

Oil temperature control

It is very important to keep control of the oil temperature **B** and avoid it exceeding 70 degrees. This can occur under unfavorable operating conditions, for example when the rpm is too high during use. Under no circumstances higher than 400 rpm.

The machine has built-in temperature protection which means that the hydraulics stop working if the temperature of the hydraulic oil gets too high. Stop the machine and let it cool down before continuing.



Condensation control

The oil tank has drain plug **C** at the bottom. Gray oil is an indication of water in the oil. (see page 25)

In addition to this, the hydraulic oil must be changed every year or after 500 operating hours (whichever occurs first) to ensure maximum oil quality.

Power transmission shaft

The power transmission shaft is maintained and used in accordance with the instruction manual for it. To achieve a better operating angle, it is recommended to leave the machine standing alone and place the tractors at a longer distance and use a longer power transmission shaft during operation. The need for the length of the power transmission shaft will vary in accordance with the size of the tractor and the length of the drawbars.

For working angles of 25 degrees and above, a category 6 shaft should be used for durability.

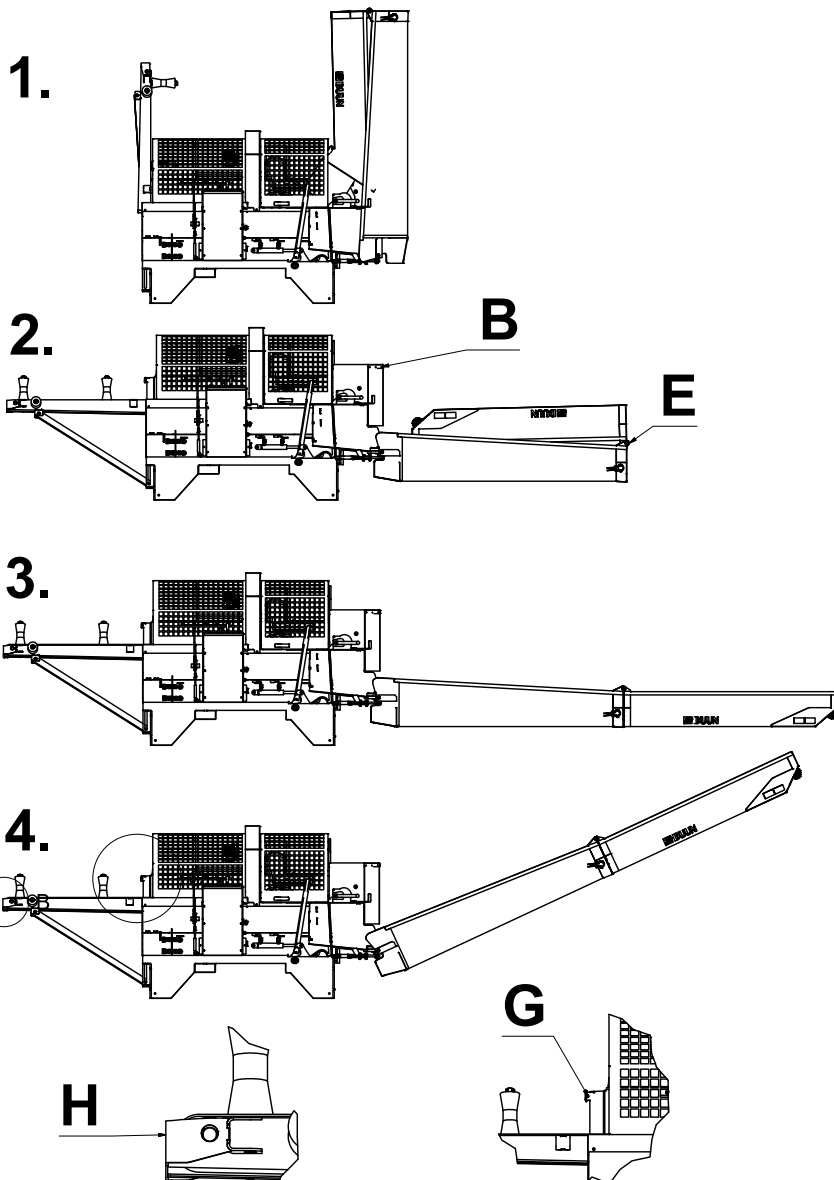
If large angles occur, it may be advantageous to either lower the tractor or raise the machine. It can be raised with the support legs which are standard equipment mounted in the corners and raise the machine up to 80 mm.

Make sure the PTO shaft has sufficient length. After any cutting, the profile tubes in the shaft must overlap each other by half the tube length. Any cutting of the shaft is carried out in accordance with the instructions for this – the cut point is chamfered inside/outside and the profile tubes are lubricated with grease.

NB! Too long shaft can lead to spraining of the shaft and risk of overloading the tractor's PTO and the gearbox in VM450.

Please lubricate the power transmission shaft before use.

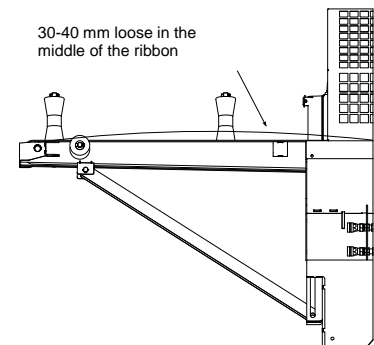
The locking chains for the protective covers must always be attached to suitable fasteners to prevent the covers from rotating.



Transporter preparation

The transporter is prepared by:

1. Loosen the strap attachment and loosen the tension strap at the outlined points.
2. The conveyor is deployed by releasing the winch and the wire holding it - then the conveyor falls outwards in a controlled manner until it is at ground level.
3. Fold out the conveyor to its full length at the hinge point E.
4. The conveyor is raised to the desired height by the winch.

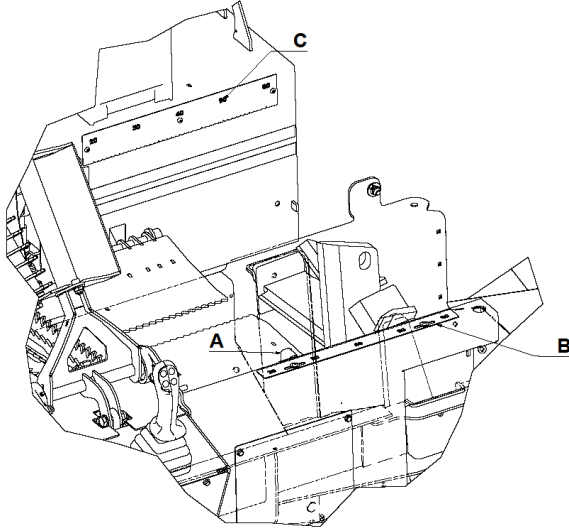


Feeding belt preparation

Fold the feed belt into place by loosening the locking pin at point **G** which locks it off.

The band is tightened by adjusting the screws at point **H**. The band is sufficiently tensioned if it feeds the wood without slurping. Tightening too hard increases wear on the belt and significantly reduces its service life.

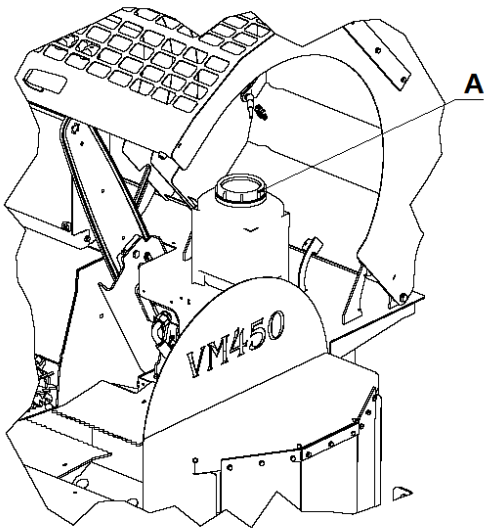
An indication of proper tightening is when the belt in the middle of the feed table can leave 30-40 millimeters of space - Ref. Illustration 4.



Adjustment of the cutting length

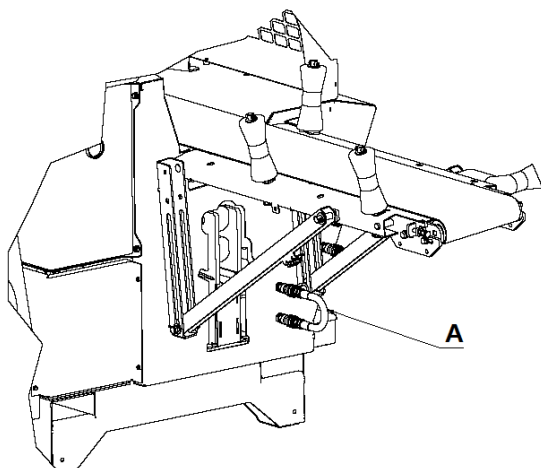
The cutting length is set by releasing the screw marked **A** and moving the photocell to the desired sheath length.

The cutting length can be read off on the rulers marked **B** and **C**. If you place the 28 cm photocell on ruler **B**, the cutting length will be approx. 30 cm.



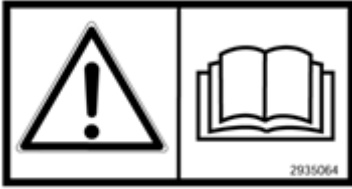
Refilling saw chain oil

The machine has a separate container **A** for saw chain oil. The chain is lubricated for each cutting movement and it is important to refill before the container is empty. Use ordinary saw chain oil designed for chainsaws.



If the machine is to be used without being connected to a hydraulic log table, the hose marked (**A**) must be connected to the outlet as shown in the figure. This hose is in the toolbox.

Practical use



Conditions

The machine must not be used until the operator has carried out the following:

- Has read the instruction manual and knows how the machine works and how to control it.
- Has familiarized himself with and aligned himself with the information about safety described on pages 4 to 7 of the instruction manual.
- Uses suitable clothing, hearing protection - safety glasses - safety shoes - work gloves.
- Do not wear clothing that can be pulled into moving parts of the machine (e.g. scarves, wide coats).

If an error occurs in the machine's functions during use - the machine must not be used until the error function has been rectified.

Start-up and appropriate speed

The PTO on the tractor is switched on at low rpm and carefully increased to 400 rpm, which is the maximum rpm of the PTO.

For the machine to work as well as possible, the speed must be between 380 and 400 rpm.

At lower speeds, certain functions will get too little oil pressure.

Allow the machine to run for a few minutes before starting the hydraulic functions.

Activation of electrical control

The machine has electrically controlled valves and safety functions.

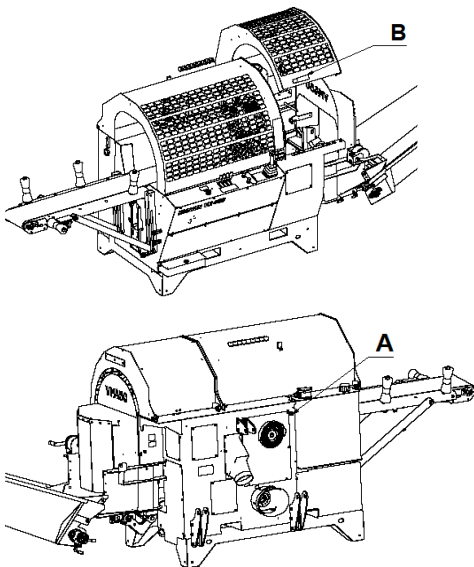
Connect the supplied cable to the socket marked A to the power source on the tractor. If the tractor does not have a 3-pole connector, this must be installed or you can use other power sources with 12 volts, for example directly on the tractor's battery. Use 2.5 square wire when extending the wire.

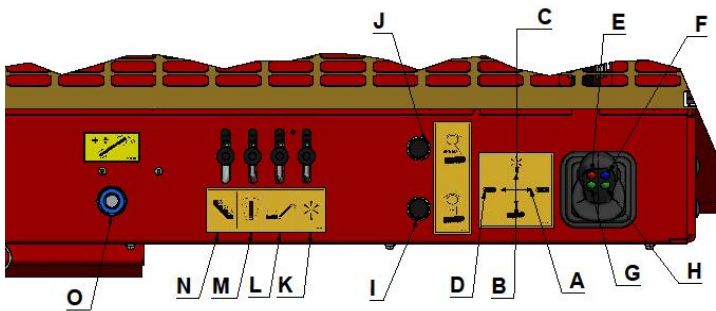
Starting the machine or every time the power is interrupted, the cover (B) of the splitting cradle must be opened and closed to activate the electric control of the machine. If the machine's hydraulics overheat, the electrical functions stop working. Let the machine cool down. Cover (B) must be opened and closed and the splitting function must be reset. See function E in the next page.

Maks. hastighet p.t.o.

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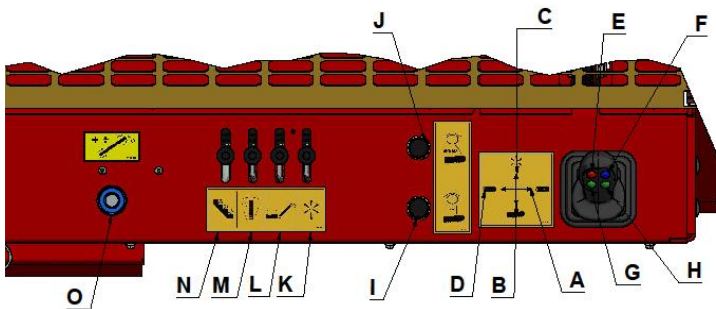


The main functions-feeding- conveyor belt speed regulation

The material to be cut is fed onto the infeed belt.

The main functions are:

- A. Move the feeding belt forward/backward.
- B. Operate the cutting blade up and down.
- C. Triggering of cutting.
- D. Return of feeding belt.
- E. Activate and deactivate log holder.
- F. Activating and deactivating hatches over the splitting cradle.
- G. Scroll through the LCD screen menu.
- H. Forced running of the feeder belt even if the photocell is triggered.
- I. Regulates the pressure on the saw blade.
- J. Regulates the speed of the saw blade.
- K. Hydraulic regulation of the splitting knife
- L. Hydraulic regulation of the splitting stroke.
- M. Hydraulic side swing on the conveyor belt.
- N. Step feeder output.
- O. Speed regulation of the conveyor belt.



Cutting adjustment

To adapt the cutting function as best as possible to the material, the speed and pressure of the blade can be regulated.

The speed of the sword's downward movement is regulated with the wheel marked J.

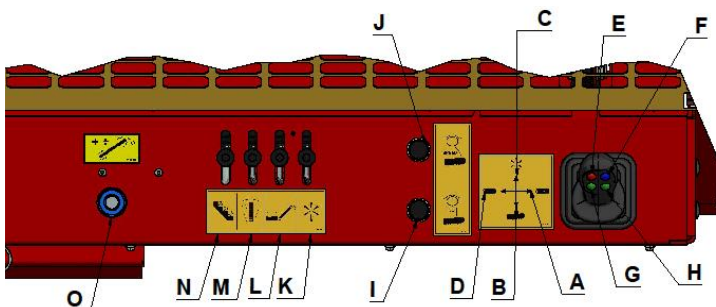
The pressure on the blade is regulated with the dial marked I.

Start with low pressure and adjust upwards.

Pressure that is too low can cause the saw bar not to be able to move all the way down. Too high a pressure can cause the motor to be unable to pull the chain and disconnect via the safety valve.

The steering wheel is marked with + and -.

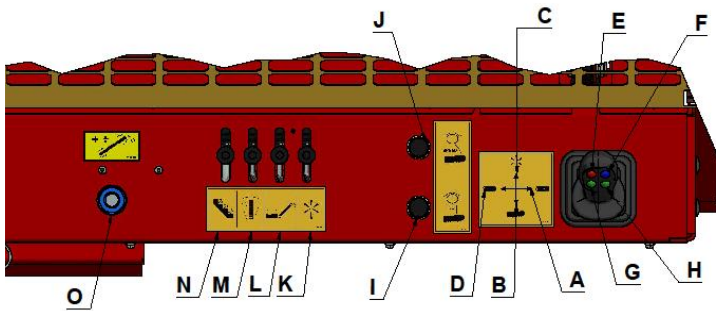
Turning the steering wheel clockwise increases the pressure.



Conveyor belt speed

This is regulated with the regulation wheel attached to the regulation block O as illustrated.

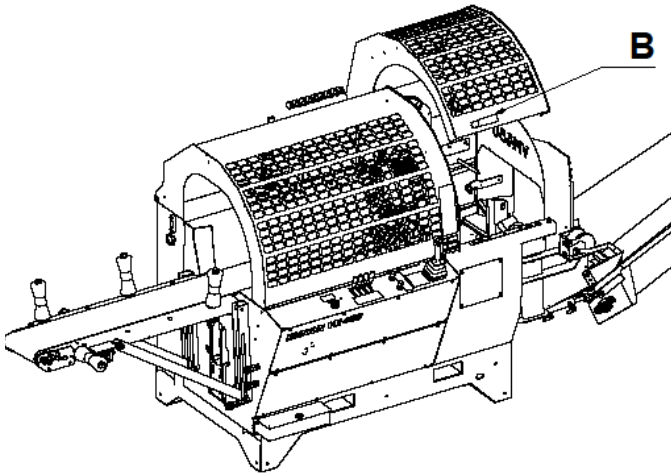
Choose a speed that suits the purpose - depends, among other things, on the desired throw length, and the container in which the wood will be stored. Make sure that the steering wheel does not get stuck in the block. Lubricate the threads with grease after each season.



Hydraulic knife lift

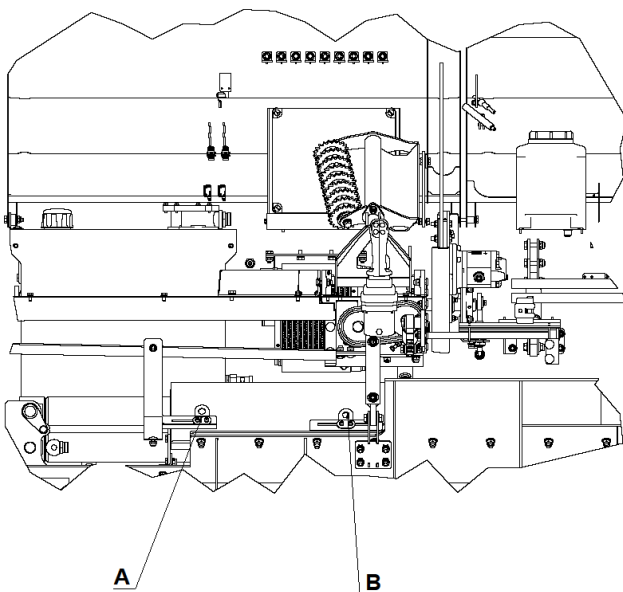
The splitting knife is adjusted up and down with the handle **K**.

To change the knife, run the knife all the way to the top. Loosen the bolt that holds the knife in the lower edge and lift out.



Stuck material

If the splitter is unable to split the wood - the piston is driven back by moving the joystick forward **C**, or open the safety cover marked **B** so that the splitter stops. The wood has to be solved manually. Close the cover and the cleaver will automatically return. The cube can be thrown in for another attempt.



Adjusting the position of the splitter

The stop signal and return signal for the splitter piston occurs via two solenoid valves. These contact points can be adjusted by positioning the solenoid valves on the brackets.

Solenoid valve **A** adjusts the stop signal.

Solenoid valve **B** adjusts the return signal.

It is important that the cylinder does not go all the way in and all the way out.

Chain sharpening and tightening

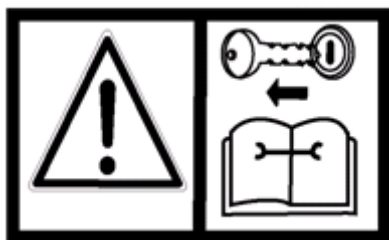
General

Blunt chains and skewly sharpened chains entail great wear on the saw chain sword and risk of extra costs and complications.

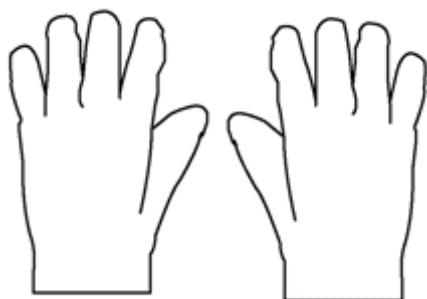
To avoid this, the Duun VM450 is designed that the saw chain must always be removed from the machine for sharpening or replacement.

As a starting point, we recommend replacement of the chain or sharpening in equipment designed for this purpose.

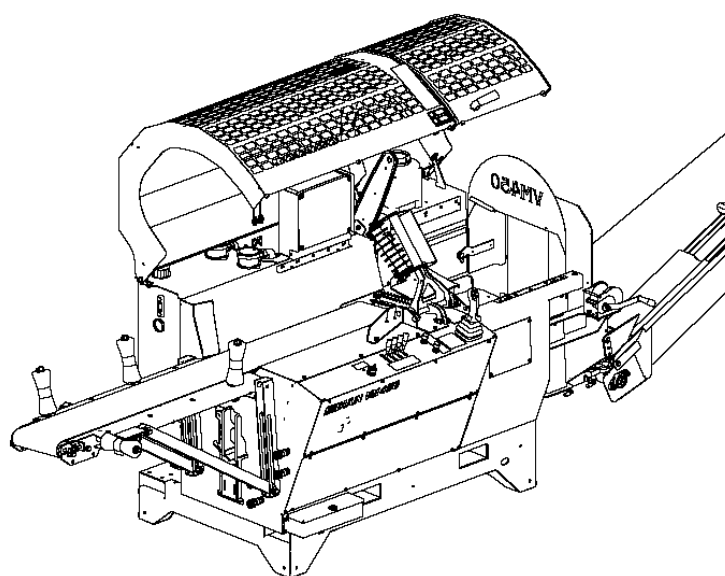
Alternatively, the saw chain can be sharpened according to the standard procedure with a file with a file template for a 5.5mm chain and a rider gauge. This is to safeguard against faulty sharpening and complications.



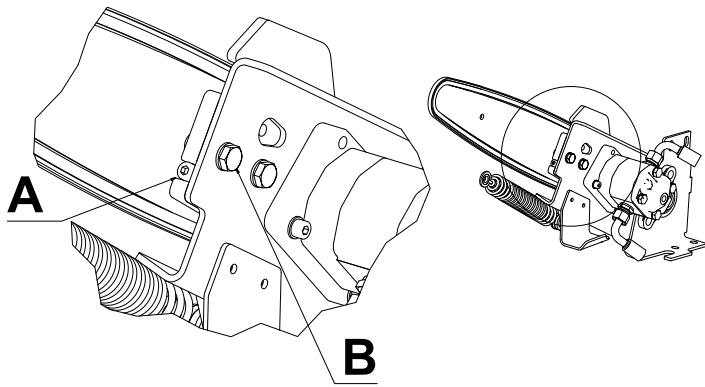
Before any sharpening work is initiated – stop the machine and the tractor and remove the key to prevent accidental start during the work.



Always wear work gloves when working with the chain!



The covers over the saw chain itself and the cover over the splitter are opened as illustrated.



To change the chain, loosen both screws **B**. The screw **A** is loosened so far that the chain could be unhooked at the rear for maintenance or replacement.

To tighten the chain, loosen screws **B** and tighten with screw **A**.

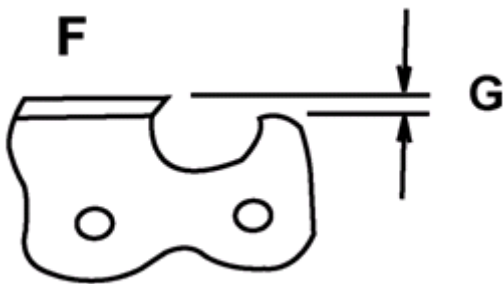
Check the chain tension by pulling the chain in the middle of the long side of the bar. If you can stretch the chain 4-5 mm upwards the tightening is correct.

A new chain loosens more quickly and needs to be frequently inspected.



File dimension is 5.5 mm

The chain is now available for sharpening with a round file from both sides. It is very important to keep the correct shape of the saw teeth as illustrated. The main point is to use the right size file and make sure to maintain the right angle on the edge - i.e. 30-35 degrees. Figure **F** shows the correct shape of a sharpened tooth.



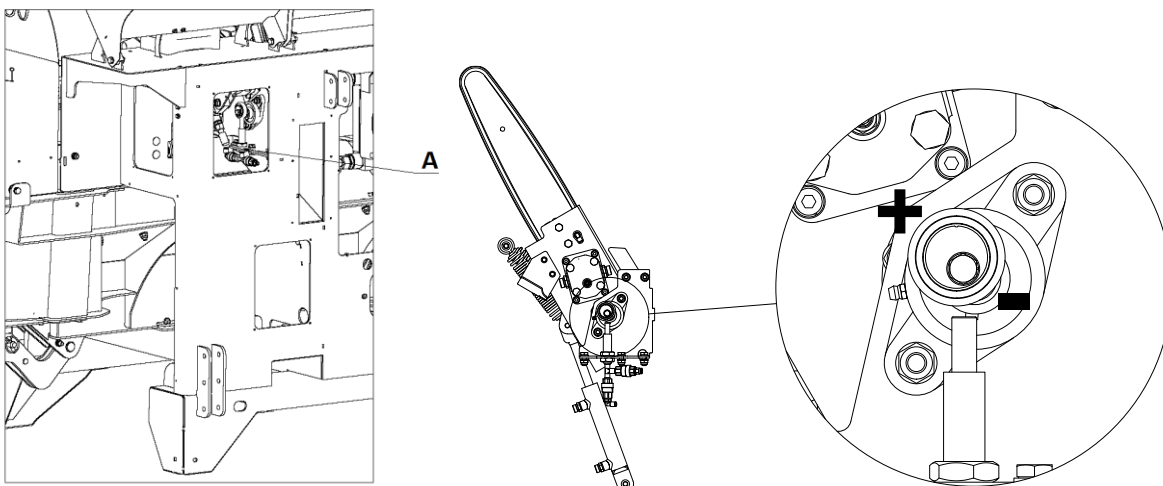
Also remove damages from saw bar and turn the saw bar regularly. This in order to achieve even wear on both sides.

Adjustment of the chain lubrication

Adjustment of the chain lubrication

The need for chain lubrication may vary with the average thickness of the material.

Open the cover above the hatch marked **A**. Adjust by loosening the connection and turning the round eccentric disc (+) to increase the amount of lubrication per stroke or opposite (-) to reduce the quantity.



Service and maintenance

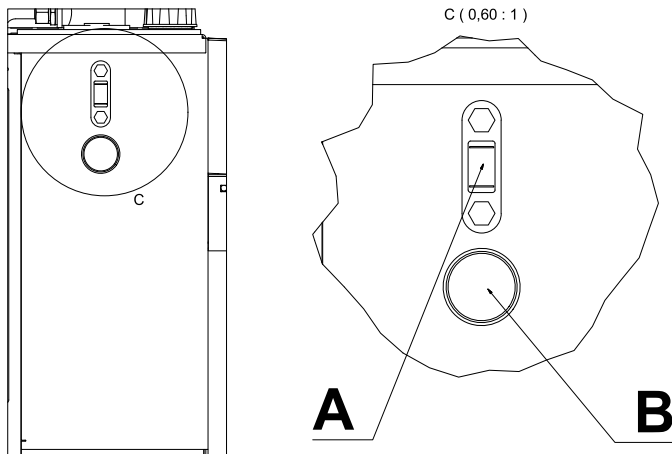
Before opening any covers and carrying out service and maintenance, always switch off the machine to avoid damage.

NB! There are movable parts in the mechanism with great power and a risk of crushing. The machine should never be run with the covers removed.

The machine is factory set. Do not adjust any functions until the machine has reached a working temperature of over 20° C.

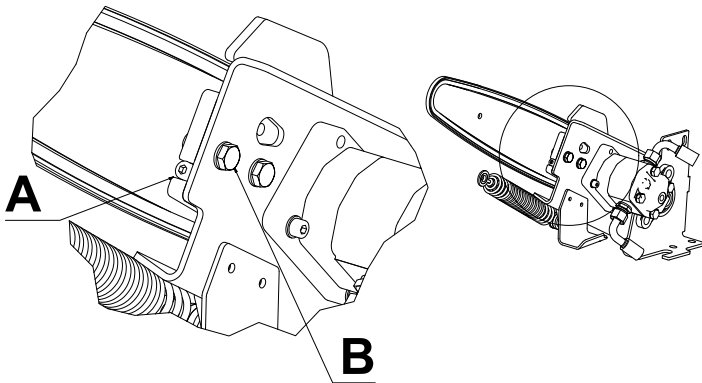
Daily maintenance

Keep a clean and tidy environment around the machine. In order for the machine to function optimally, it must be able to get rid of chips and have air under it.

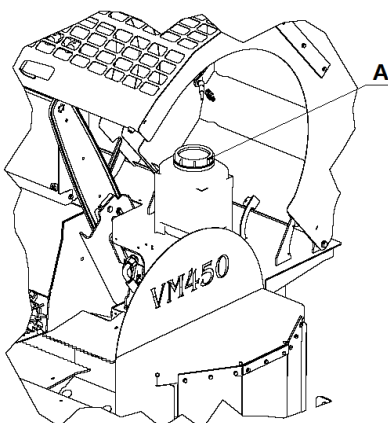


Check the oil level and temperature of the hydraulic oil regularly. Refill oil if necessary. The oil level should be in the middle of the level glass A when the machine is on level ground.

The temperature **B** must not be higher than 70°C. If the temperature gets too high, the speed of the machine must be checked. NB! Max 400 rpm.

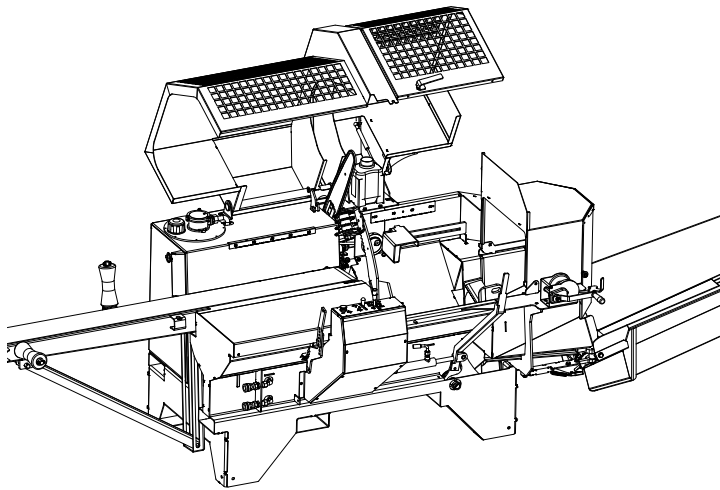


Check the saw chain and the cutter bar regularly. Wetting and tightening the saw chain is important for efficient cutting. Also check the vertical angle of the sword so that the sword does not wedge against the stock.



Make sure that the chain oil tank does not run out of oil. Also make sure that oil is consumed and the chain is lubricated.

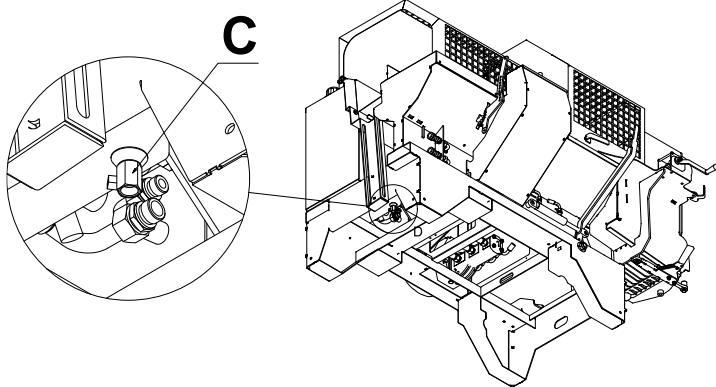
Weekly maintenance



Open all lids and safety covers and blow clean of dirt and grime.

Sawdust and dirt will settle inside the machine and it is important to remove this in order for the machine to have optimal cooling and for all functions to work.

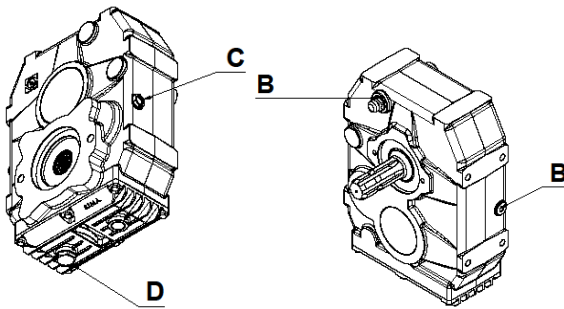
Monthly maintenance



Drain some oil from the drain plug on the tank and check the oil at regular intervals. Gray oil is an indication of water in the oil due to condensation. Check this when the machine is cold and the water has collected at the bottom of the oil tank.

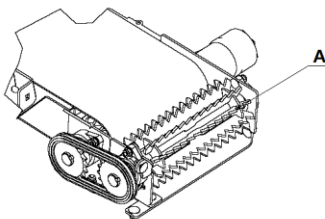
Drain until clean oil comes out and refill the tank.

Annual maintenance



Check the oil level in the gearbox after each season by loosening level screw **C**. Oil should then leak out at a sufficient level. Filling takes place via the breather plug **B** at the top. Draining takes place via drain plug **D**. Oil changes are made after the first 50 operating hours and then every other season or after 500 operating hours. Whichever occurs first.

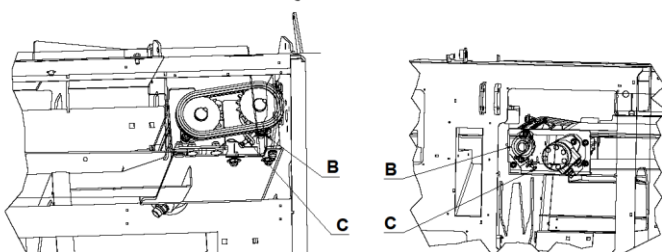
Recommended oil: Statoil Gearway PS45 75-90 Specification API GL-5. or equivalent. The oil volume is approx. 0.35 liters depending on the make of the gearbox.

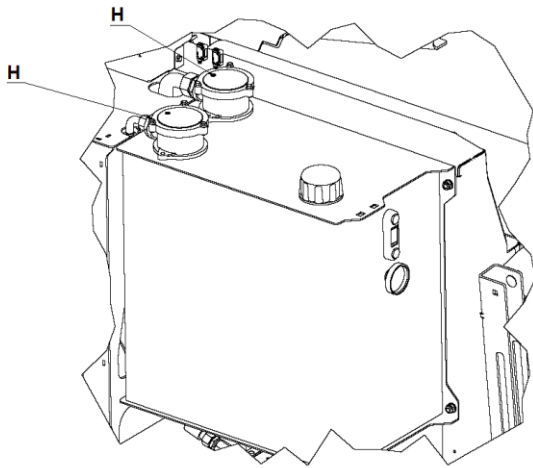


The spiked roller (**A**) for the feed has a chain drive.

This chain should be checked and re-tightened at regular intervals.

The chain is tightened by adjusting (**B**) and (**C**).





Change filter insert **H** in the oil filter after the first 50 operating hours and then every year or after 500 operating hours. Whichever occurs first. Change the hydraulic oil every year or after 500 operating hours. Whichever occurs first.

Filter insert, SIF.20C10
Item no. 2251065

Clean and lubricate the machine properly between each season.

The VM450 has many bearing points, many of which are lightly loaded and are therefore equipped with one-time lubricated bearings.

Other bearings are mainly flanged bearings that should be moderately lubricated. The main rule here is to avoid over-lubrication and squeezing of the seal rings in the bearings.

USER MANUAL FOR DISPLAY IN VM450



Applies to software version v0.0 – v2.2.

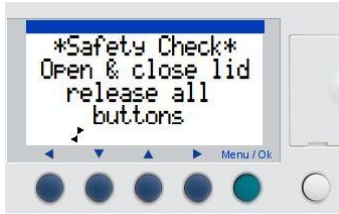
Start-up

Safety Check



Starting the machine, it will be necessary for safety reasons to test the safety switch on the firewood processor's cover. The cover must be opened and closed. If, for some reason there is a loss of supply voltage, such a test will again be required.

Release all buttons



There is also a check that neither the buttons nor the joystick are in an affected position at start-up. Check that the buttons or joystick are not stuck or frozen. This applies to the four buttons on the joystick, the two buttons on the feeding belt, as well as the four directions of the joystick.

Safety Check OK



Confirmation of an approved safety test.

Display menu



By pressing the joystick's left green button, you can scroll through the display's menu. This can only be done with the cover in the open position.

The menu has seven images, and you will scroll through them continuously by pressing the button.

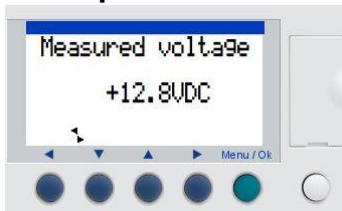
The display's push buttons are not in use on this device, and will have no effect if pressed.

Menu picture 1



This image will always be displayed after startup. It is mainly used for possible troubleshooting. The upper row (1-G) are inputs on the control, and the lower row (1-A) are outputs.

Menu picture 2



Measured voltage

Here the supply voltage can be read during the operation.

Menu picture 3



No of splits

Counts the number of splits the firewood processor has been instructed to perform.

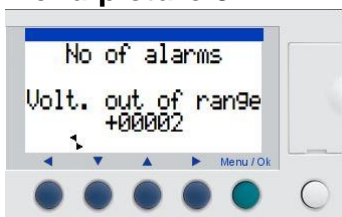
Menu picture 4



Power ON time

Counts the number of hours the machine has been powered on.

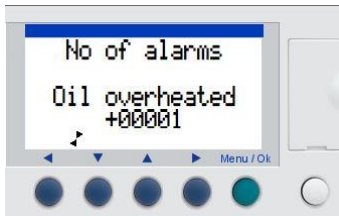
Menu picture 5



No of alarms: Voltage out of range

Counts the number of times the supply voltage has been too low or too high.

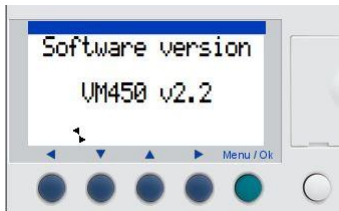
Menu picture 6



No of alarms: Oil overheated

Counts the number of times the oil temperature has been too high.

Menu picture 7

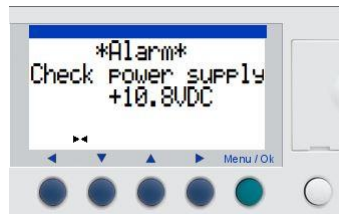


Software version

Shows which software version is on the device.

Alarms

Check power supply



The alarm occurs if the supply voltage is below 10.8 VDC or above 14.4 VDC. Within this is the recommended voltage range.

The alarm cannot be acknowledged, but remains until the voltage is within these values. The machine is operational, but some functions may fail.

Movement stopped



The alarm comes if a movement is not completed within a reasonable time. This applies to the movements for splitting, sawing and feeding belts. Resets by releasing the button/joystick and, if necessary, reactivating it.

Oil overheated



If the hydraulic oil on the machine gets too hot, this alarm will sound. You can finish any movement that has started, but you cannot start a new movement until the machine has cooled down.

Declaration of conformity

Responsible person

Name: Karl Martin Eggen
Position: CEO
Company name: Duun Industrier as
Address: N-7630 Åsen
Norway
Telephone: +47 74 01 59 00

Person responsible for the technical documentation: Rolf Even Duun

Declares that the following machine: VM450 Firewood processor
Manufacturer: Duun Industrier as
Type: Duun Firewood processor VM450
is in accordance with:

Directive 2006/42/EC Machinery

Signed by:



Karl Martin Eggen

Åsen, 01.02.2023