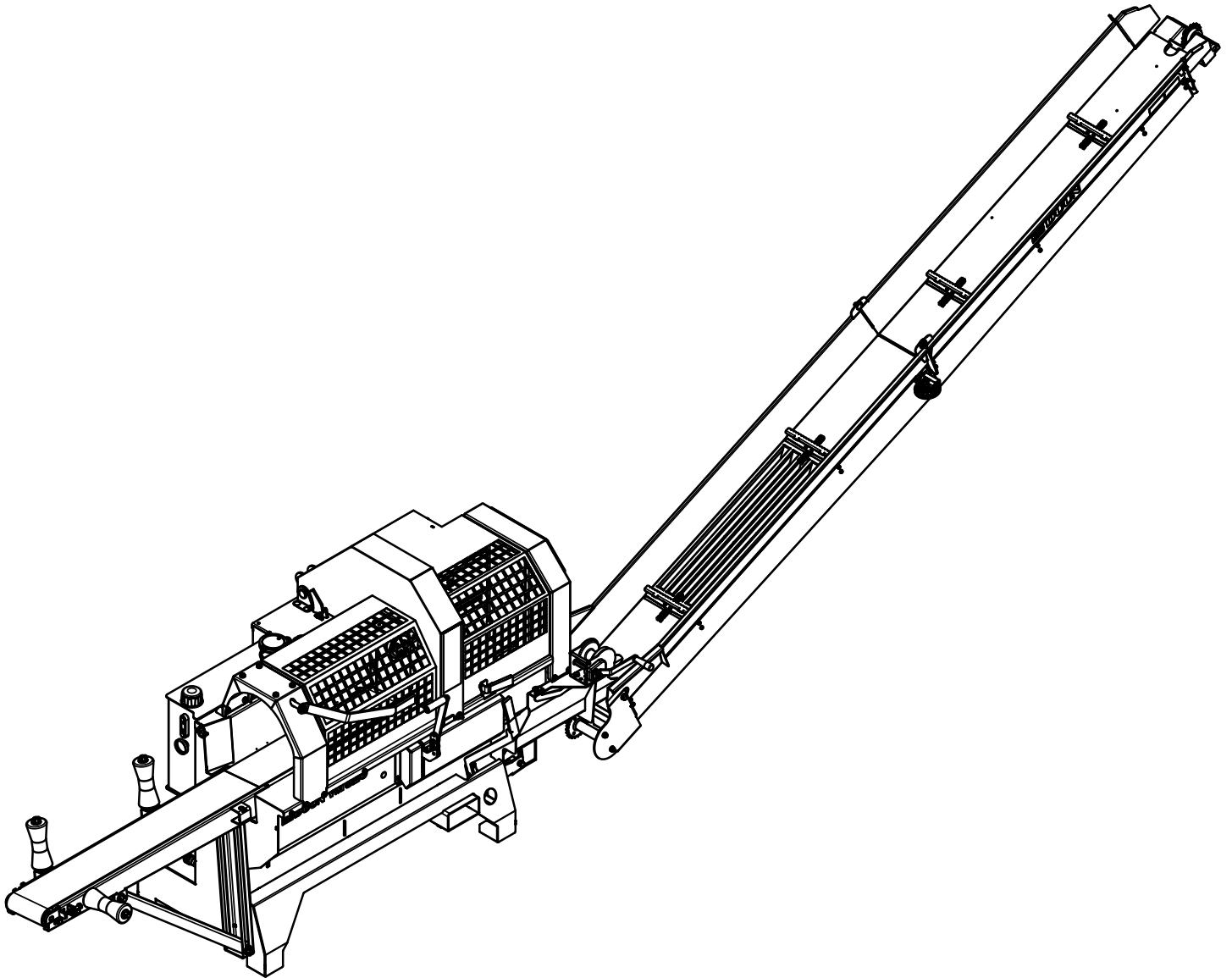




Duun Industrier as  
7630 Åsen, Norway  
[www.duun.no](http://www.duun.no)

# Fire wood processor VM320

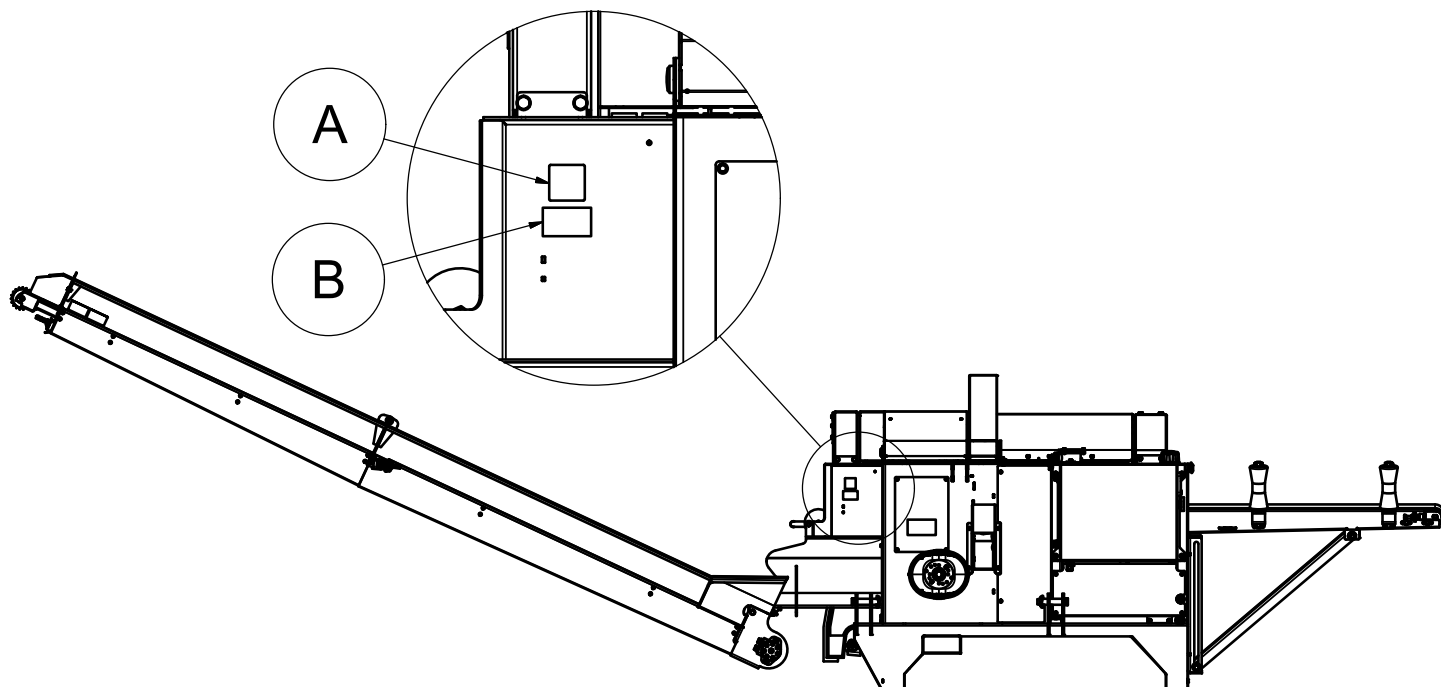
## Instruction manual



Congratulations with your Duun VM320 firewood processor.

All Duun tractor operated machines have been engineered and tested in close cooperation with end users of our products. This in order to develop reliable and user friendly machines

Please read instructions manual before you start using the machine.



## Machine identification

Serial number and manufacturer should be indicated at badge (A)

Register serial No and time of delivery as indicated.

Do always specify serial number every time requesting service for the machine.

The machine has a CE-badge (B) this confirms that the machine has been manufactured in conformity with: Directive 2006/42/EC Machinery.

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Serial number

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Time of delivery (month-year)

## Contents

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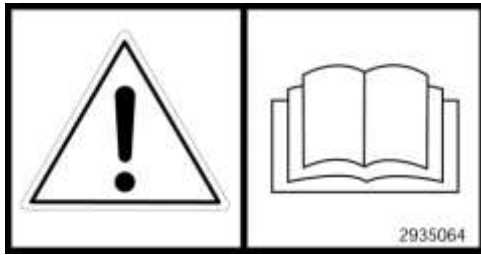
# SAFETY

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

You should always work with care when you employ agricultural machinery. Read and observe the safety instructions in this binder. Your safety is your responsibility!



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

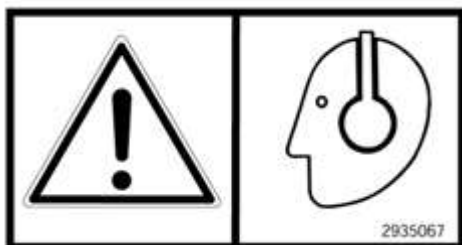
**All operators, mechanics and the owner must be well acquainted with the instruction in this instruction manual before the machine is taken into use.**



## The safety of the surroundings

Make sure that no one not concerned are present in the area of work. We emphasize, as strongly as possible that only one person is to handle the machine, i.e. operate the saw chain sword and the splitter. Nobody is to assist the main operator in the work area - risk of injury! Never start the machine when there are people or animals close to the machine or the tractor. Never stand between the tractor wheels and the machine!

If other persons than the operator of the machine are present in the risk zone, the operator is to explain the danger the machine involves!



## Personal protection equipment

You should always wear hearing protection and protective goggles when using the wood machine. Further, you should use protective footwear and sturdy work gloves during handling of the machine and the materials.



### **Clothing and the drive shaft**

Do not work in clothing that may be caught by the moving parts of the machine (for example scarf, wide coats).

The tractor must be disconnected and the hand brake activated before the shaft is connected to the tractor's power take-off. The drive shafts are always to be equipped with original protection covers.

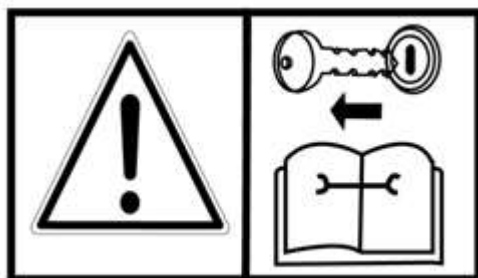
### **Damaged and worn covers are to be replaced immediately!**

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.**

Allow nobody to stay between the machine and tractor when the machine is connected to the tractor. The same applies during 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 great pressure may penetrate the skin and cause serious infections. Visit a doctor if you have had an injury. Ensure that no-one is standing close by when hydraulic functions are performed



### Rotating parts – risk of crushing

The machine's rotating parts may cause severe injuries. The same applies to risk of crushing during operation.

All covers and protective equipment is to be fitted on the machine during use. The user is responsible if an accident occurs because of defective protection.

Avoid all unnecessary stay in the working area when the machine is in operation.

Never put your hand in behind the protective screen even if the saw chain is in back position



### Zero alcohol tolerance

Persons who are under the influence of drink or drugs must not operate the machine. The same applies to tired people who do not have full control over their movements.



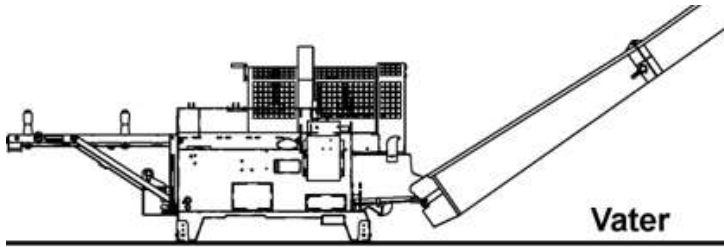
### Contact with electric wires and similar during transport.

Be aware that the processor may be taller than the tractor during transport and there is a risk of contact with electric wires, railroad underpasses etc.!



### Conveyor – conveyor belt

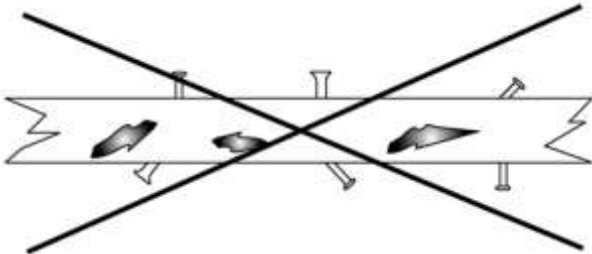
Avoid staying under the conveyor when this is under tension in order to avoid injuries in case of any uncontrolled downfall during use. Also, avoid contact with the conveyor's moving parts during use.



### Horizontal positioning and tidiness on the workplace

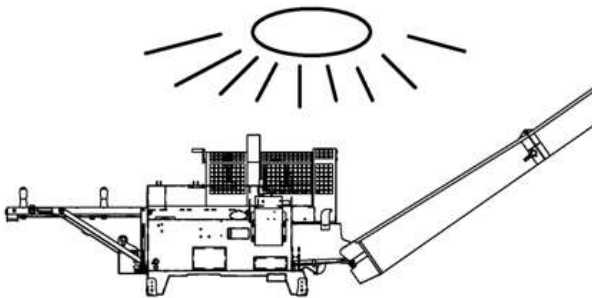
Always place the machine as horizontally and steady as possible to secure stable working conditions.

Keep the workplace as tidy as possible. This contributes to generally better safety against unwanted events.



### Area of application

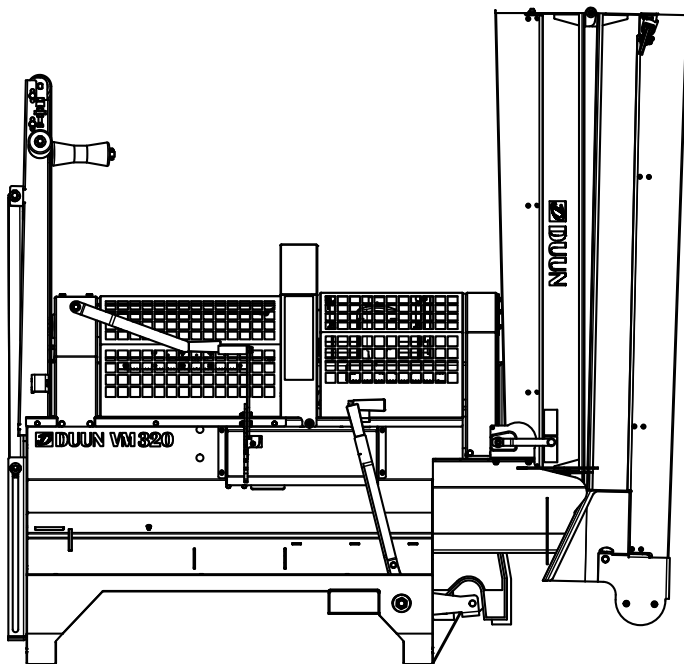
The machines are only intended for production of firewood from "pure" wood material without any contaminants. It is not allowed to employ the machine for other material such as construction waste and similar with metal parts such as nails, screws and similar. The same applies for materials that are polluted with plaster and similar coatings. The saw chain is only designed for wood materials without contaminants.



### Good lighting – a necessity.

The machine must only be used in daylight that secures a good overview of the operations – or with artificial lighting, which provides good overview of the work area.

Good lighting is very important with reference to safety.

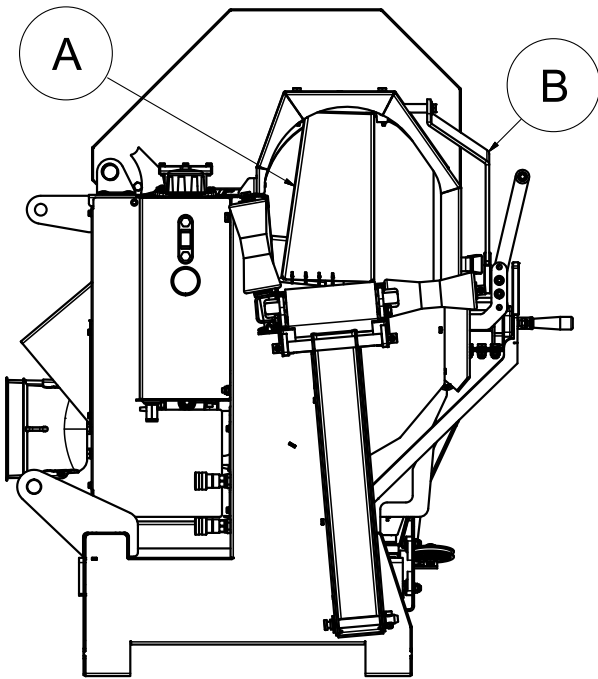


### Safe transport

Before moving the machine both feeding belt and the conveyor should be in upright position as illustrated

The feed belt to be secured by a lash pin.

The conveyor to be secured by a locking bracket close to the winch, ensuring that the conveyor do not fold out during transportation.



### **Safe cutting**

Avoid placing your hands close to the saw chain. This is obtained by consequently using the log holder A and the handle B to operate it.

For cutting the last log of wood, it is important to retain a “suitable” length and cut a shorter piece as the next to last..

You are advised to use the “count-down ruler” for the last three lengths so that these may be cut to a somewhat shorter even length than the desired length.

When you want to cut twiggy or crooked logs, it is important to make sure that these are securely placed.

Before start-up after maintenance, you should check that all tools have been removed and brought back into place.

Before the machine is elevated or lowered, you should check that no one is close to or touch the machine.

**If any warning signs are removed during repair or service, new signs must be fitted**



## Warranty terms

Fire wood processor VM320 has a 12-month guarantee against defects in materials and workmanship.

Parts that are not originally manufactured by Duun Industrier AS, for example shafts, bearings etc. are subject to these suppliers' guarantees and terms.

Parts that are considered to be wear parts are not part of the basis of the guarantee - these have been specified in a separate survey on the bottom part of this page.

In cases where a repair is considered to be covered by the guarantee, the representative must inform the supplier's representatives that the repair is intended executed on the basis of the guarantee.

In this context, the following information must be recorded:

- Product name
- The products serial no. (see the machine identification pp. 6 and 7]
- Date of sale
- The product owner's telephone no.
- Dealer with address, telephone 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 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.

The guarantee liability assumes that the prescribed maintenance has been carried out.

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

What is not included by the guarantee

- The guarantee does not cover economic loss because of interruptions.
- The guarantee does not cover consequential loss due to defects.
- The guarantee does not cover defects or damage caused by misuse and use that is not in accordance with the instruction manuals specifications and guidelines.

**The following parts and material are considered as wearing parts and are not covered by the guarantee:**

- The chain saw bar
- The saw chain
- The wood splitter knives
- The feeding belt
- Oil filter
- Hydraulic oil
- Filter cartridge for hydraulic oil
- Wear parts in splitting mechanism

# Delivery form for Duun VM320 firewood processor

## Machine specifications

Model \_\_\_\_\_

Serial No.. \_\_\_\_\_

## Customer details

Machine owner \_\_\_\_\_

Address \_\_\_\_\_

Aip code. \_\_\_\_\_

Town \_\_\_\_\_

## Hand over of machine

Sales representative and customer have controlled that the machine do not have any transportation damages and that specified equipment is delivered..

The customer has been instructed how to use the machine:

- General safety (page 4-8)
- How to prepare machine for use from transport position. (page 13)
- Height adjustment of machine and correct length of pto to reduce strain from too steep angle between tractor and processor (page 15)
- How to control temperature and oil level. (page 14)
- How to control eventual condensation level in oil tank (page 14)
- What is correct pto speed (page 16)
- The machine functions.
- Feed belt: Speed adjustment (page 17)
- Cutting : Adjustment of saw movement speed and power (page 17)
- Sharpening and tightening of chain. (page 19)
- Adjustment of chain lubrication (page 20)
- How to use log clamp. (page 18)
- Splitting: Main functions (page 17)
- Elevation of splitting knives and change and splitting knives (page 17)

Sales representative and customer have read about service and maintenance (page 21-23).

The customer has been introduced to warranty terms (page 9)

The customer has been introduced to conditions for practical use (page 16)

Part list is available at sale representative.

Place \_\_\_\_\_

Date \_\_\_\_\_

Customers signature

Sales representatives signature

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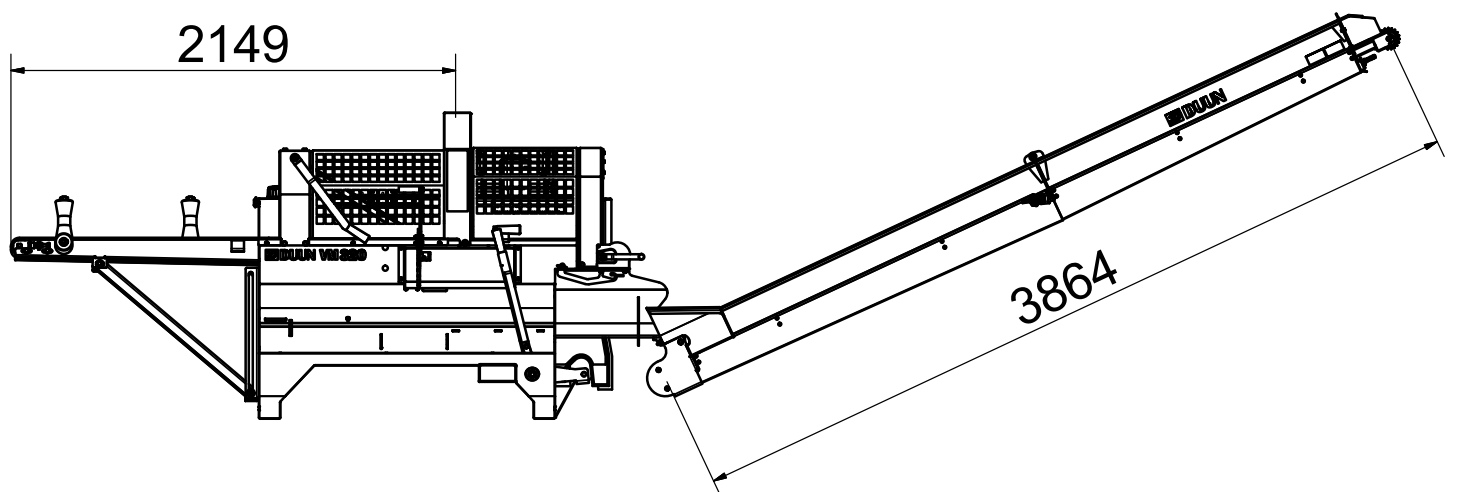
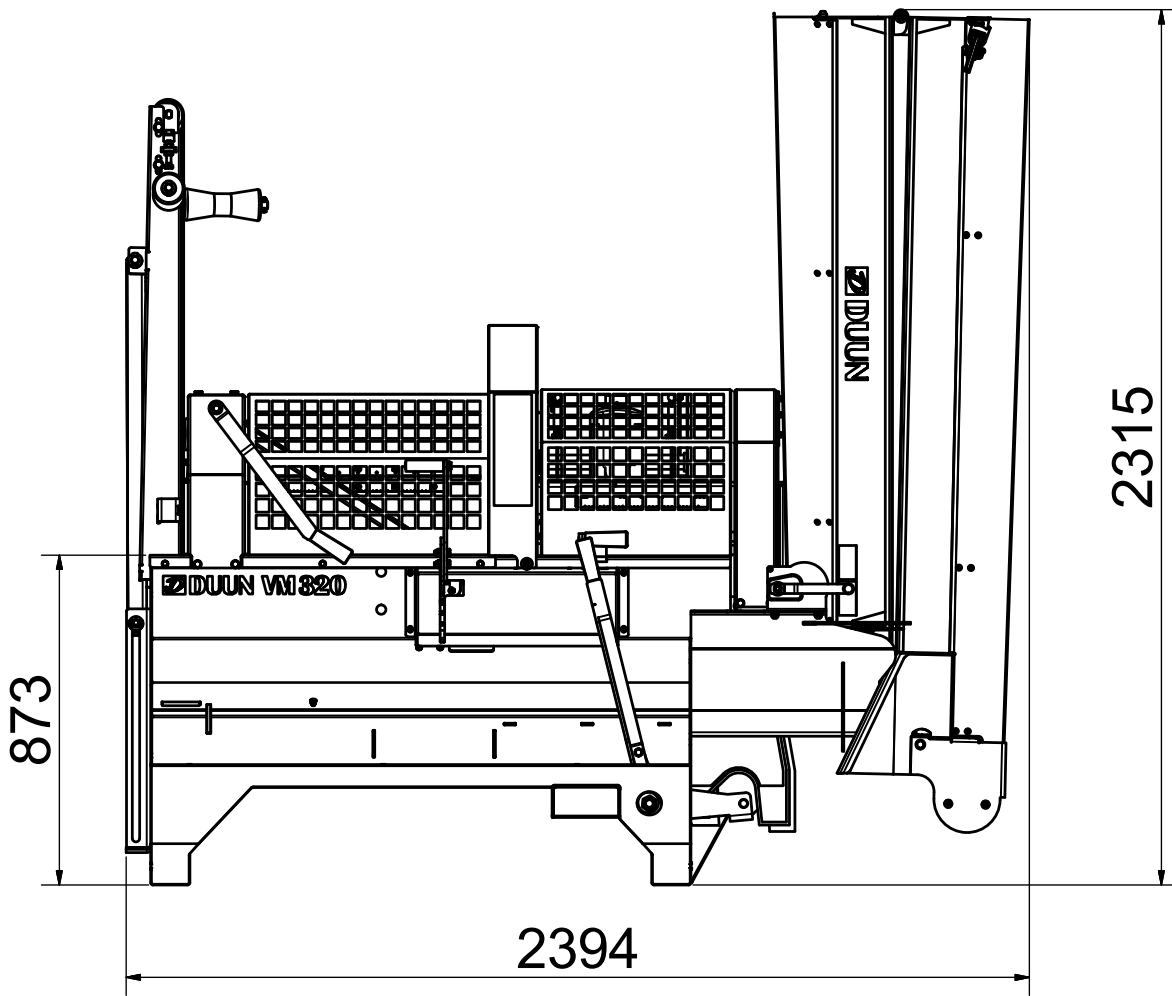
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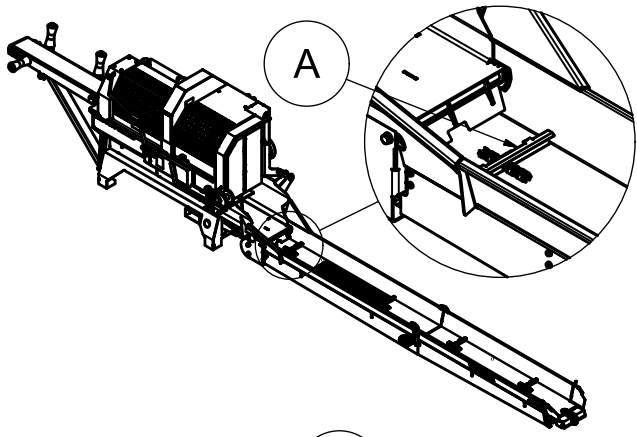
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## Specifications

Feature	VM320
Cutting diameter max	32cm
Splitting force	5600 kg
Chain drive	Hydraulic
Log cut length	20-50 cm stepless
Saw chain type	1,6 mm
Chain speed	23 sekundmeter
Size saw chain	0,325"
Saw chain links total	73 links
Weight	Ca 600 kg
Mowing log stop	Yes
Height of work table F	880-960 mm
Splitting knife	4-part
Rinsing conveyor	Yes
Saw chain lubrication	Separate pump
Knife adjustment	Manual
Number og hydraulic pumps	1
Feeding belt	Hydraulic
Conveyor length	4000 mm
Conveyor sideways movement	Firm position
Maximum height E	2315 mm
Maximum width C	2394 mm
Depth transport position	1260 mm
Saw chain oil container	2,5 liter
PTO-speed	400 rpm
Hydraulic oil volume	40 liter

Accessories	Item No.
Triangel quick connect	1252637
HMV quick connect	1252638
Log rack manual	141409001
Log rack hydraulic	141409002
Connection kit for hydraulic log rack	141329050





## Transport and preparation before use

1 Pull the carrier (A) so that none of these touches the covering lid at the bottom inside the conveyor.

2 Bend the conveyor at the middle and fold it.

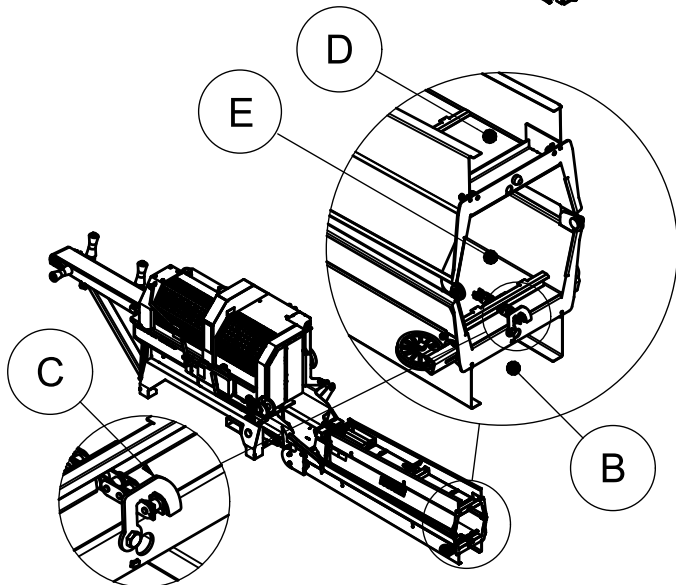
3 Pull the chain from the lower side of the bent conveyor (B) and fasten the chain with the yellow hook (C)

4 Pull the chain from the upper side(D) and put all slack into the middle of the bent conveyor (E )

5 Tighten the conveyor with the winch (F)

6 Lock the conveyor with the bracket (G) ensuring that the conveyor do not fold out during transport

7 Lift the feed belt to upright position and secure position with a latch pin.



The VM320 body is equipped with a fork pocket for handling with forklift truck or pallet trucks. Be aware that one individual machine weighs about 600 kg. Use lifting equipment designed for such total weight

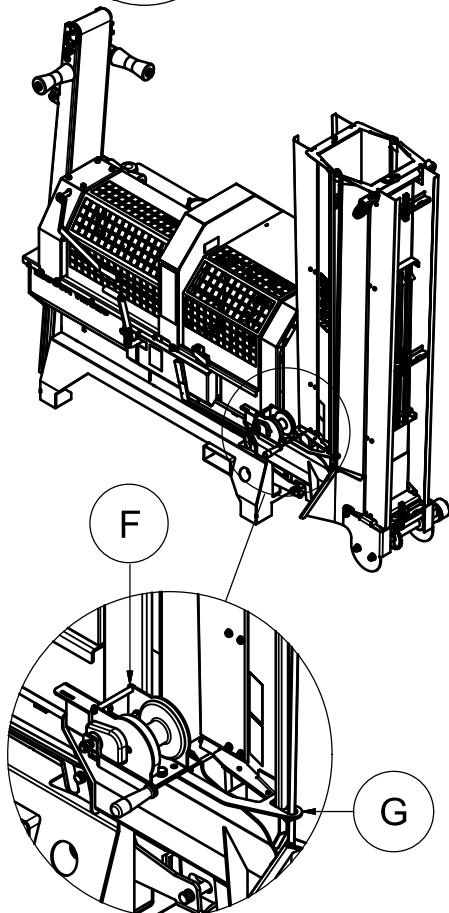
The conveyor should be prepared for use by following the instructions in opposite direction

The feed belt to be placed in working position by removing the latch pin.

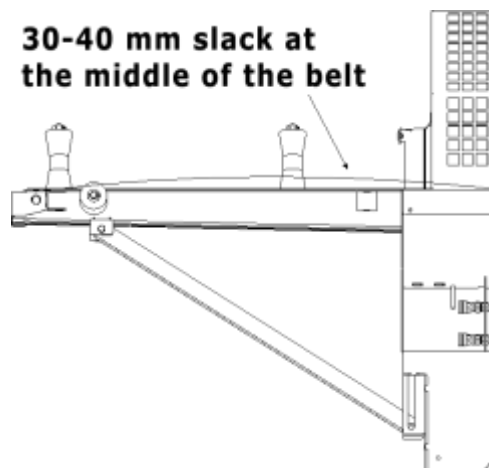
The feed belt is correctly tightened when feeding logs and not spinning.

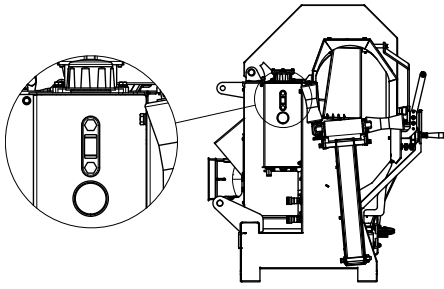
If the tightening is too tight wear will increase and reduce life time significantly.

The belt to be adjusted by screws placed at the end of the belt.



**30-40 mm slack at the middle of the belt**





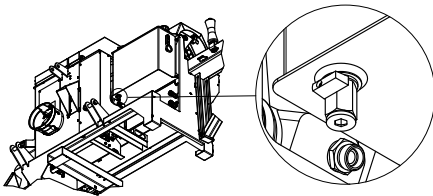
### Hydraulic oil - quality.

The machine's performance will, to a high degree, depend on keeping the hydraulic oil intact. The greatest elements of risk for the quality of the oil are

- Excessively high temperature which entails poor lubrication performance and risk of faults and break-down of expensive components such as valves, pumps and motors.
- Condensation which is formed during conditions including humid air combined with temperature fluctuations. (the oil tank breathes through the filter and sucks in humid air)
- Condensation water in the oil has the same effect as excessively high oil temperature. Condensation appears mainly during use in conditions involving humid air and temperature around 0°C. The oil tank is equipped with a draining plug for changing oil and checks for condensation

### Oil level check.

The machines are filled with 40 litres hydraulic oil from the factory. Recommended oil quality is ISO VG46 (viscosity group 46). Examples of such oils are Ambra Hydrosystem 46 HV, Mobil DTE15m, Statoil Hydraway HVXA46.



The oil level must be checked by observing the sight glass which is fitted directly to the tank.

### Oil temperature check

It is very important to keep track of the oil temperature and avoiding situations exceeding 70°C. This can occur during unfavorable conditions among other too high pto speed during operation. Do never exceed 400 rpm pto speed.

### Condense check

The oil tank is equipped with a drainage plug in the bottom Grey oil is an indication of water in the oil. (watch page 20)

Hydraulic oil to be changed every year or after 500 working hours (what first occurs) in order to ensure maximum oil quality.

## **PTO shaft**

The pto shaft must be maintained and used according to the manual.

In order to obtain better operating angle, you may let the machine stand by itself and place the tractor at a distance and employ a longer drive shaft during operation.

The size and length and the pto shaft depends on the size of tractor and length of the linkage arms.

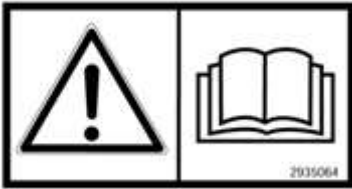
If there are great angles, it might be advantageous either to lower the tractor or elevating the machine.

Ensure that the pto shaft has sufficient length. The profile tubes in the shaft are, after any cutting, to have overlap by half the tube length. Any cutting of the shaft must be executed in accordance with the instructions for such operations – the cut must be trimmed for burrs both on the inside as well on the outside and the profile tubes should be well greased. Too short telescope length of the shaft entails a risk of overload of the tractor's power take-off and the gearbox of the VM320.

Please lubricate the PTO drive shaft before use.

The locking chains for the plastic covers are always to be fixed to the appropriate brackets in order to prevent the covers to rotate.

## Practical use



### Condition

The machine **may not be used** before the operator has done the following:

- Has read the instruction manual and knows how the machine works and how to operate it.
- Has made himself acquainted with and observed the information regarding safety described on pages 8 to 12 in the instruction manual.
- Employs suitable clothing; i.e. hearing protection – protective goggles – protective footwear – work gloves.
- Does not use clothing that may be caught by the moving parts of the machine (for example scarf, wide coats).

**If any faults occur in the functions of the machine during employment, the machine is to not to be used before the defects have been repaired.**



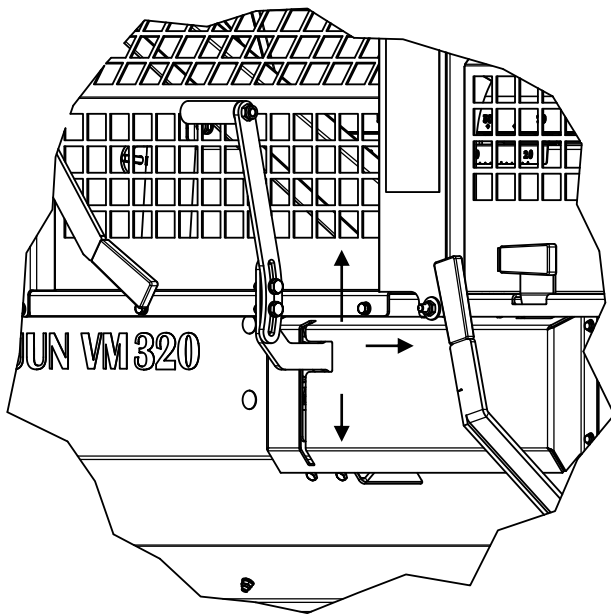
### Start-up and suitable rotating speed – 380 – 400 rpm

The power take-off of the tractor is connected at low rotating speed and increased slowly to 400 rpm which is the max rotating speed of the pto. In order that the machine is to work at its optimum, the rotating speed must be between 380 and 400 rpm.

At lower speed, some functions will receive too low oil pressure.

Let the machine run for some minutes before you start the hydraulic functions





## Main functions – main handle

The main functions are

- Make the feed belt run forwards
- ↓ Activating the saw upwards - downwards
- ↑ Activating splitter. Step 1-Fast movement  
Step 2-Power mode

The splitter returns when the handle is back in neutral position.

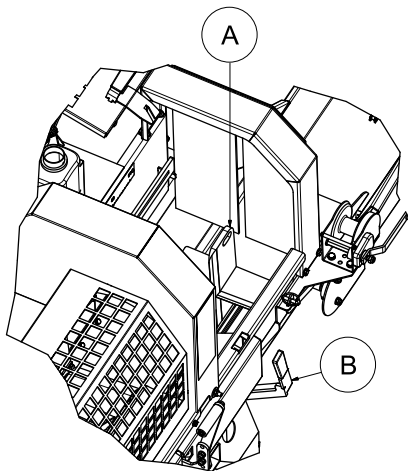
It is important that the feeding of logs is moderate in order to prevent the logs from bouncing back from the log stopper.

### Split stop

If the splitter do not manage to split the wood – press the handle from you to step two activating power mode increasing power and decreasing speed.

If the splitter still does not manage to split the wood, let go the handle grip and the splitter returns automatically. Open the safety shielding, release the wood piece, and try again.

A tip is to place the cutting knife in the lowest position reducing the demand for splitting power.

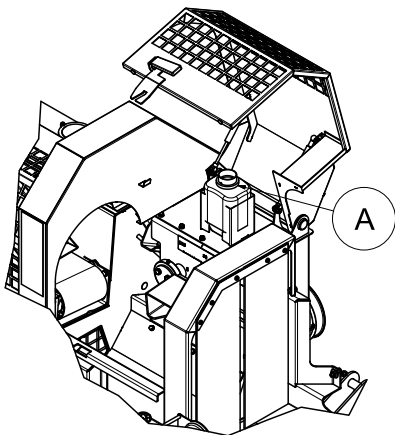


## Manual knife movement

The splitting knife **A** is up- and downwards adjusted by pushing the handle **B** to the left or right.

How to change knife

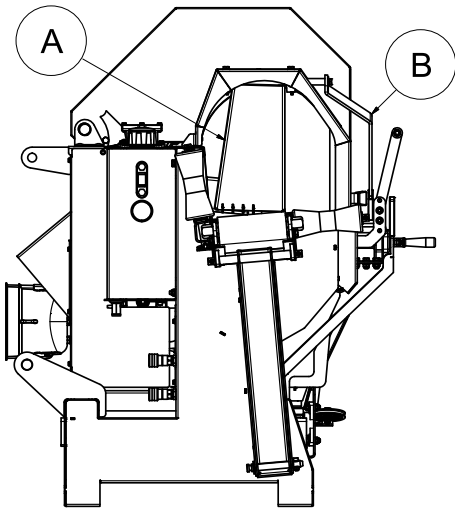
Release the locking pin keeping the knife in position and lift out. Insert a new knife and lock with bolt



## Filling saw chain oil

The processor has a separate container **A** for chain oil.

The chain is greased at every cut movement and it is very important to supply oil before the container is empty. Regular saw chain oil for chainsaw is recommended.

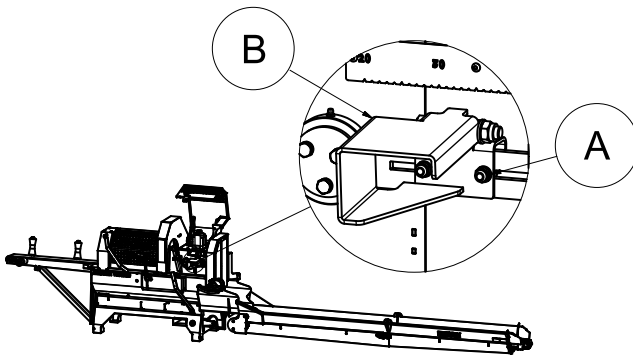


### Safety hand operated log holder

Avoid placing your hands close to the saw chain. This is obtained by using the log holder B and the handle A to operate it.

For cutting the last wood piece, it is important to retain a "suitable" length and cut a shorter piece as the second latest. During this operation, it is especially important to use the hand operated log holder B by means of the handle A so that the user does not receive an unexpected backlash from the final piece.

**When you want to cut twiggy or crooked logs, it is important to make sure that these are securely placed. Use the hand operated log holder as much as possible during cutting of such wood materials to prevent that fingers/hands are squeezed**



### Adjusting cut length

Adjust the cut length by loosening the screws in position A and adjusting log stop B to correct cut length.

# Chain sharpening and tightening

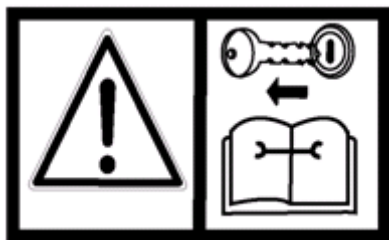
## General

Blunt chains and “slant-sharpened” chains entail great wear on the chain bar and risk of extra costs and complications.

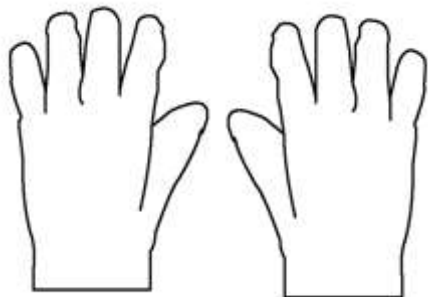
In order to avoid this, Duun VM320 is designed so that the saw chain always must be dismantled from the machine for any sharpening or replacement.

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

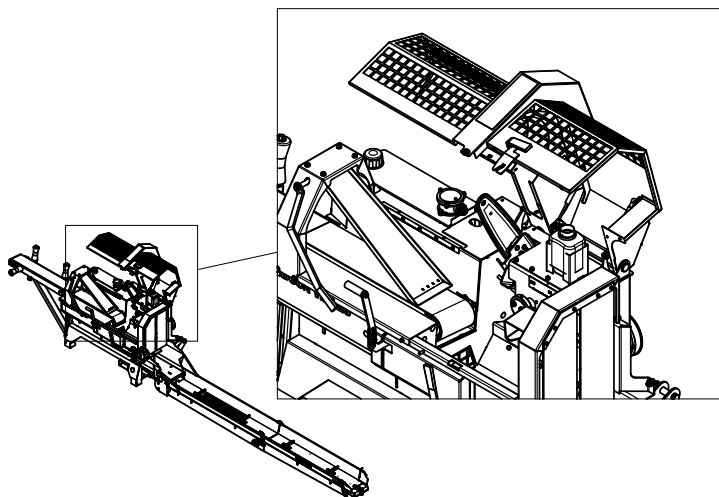
Alternatively, the saw chain may be sharpened in accordance with the standard procedure with a file with file gauge for 4,8mm chain and rider gauge. This is to safeguard against faulty sharpening and complications.



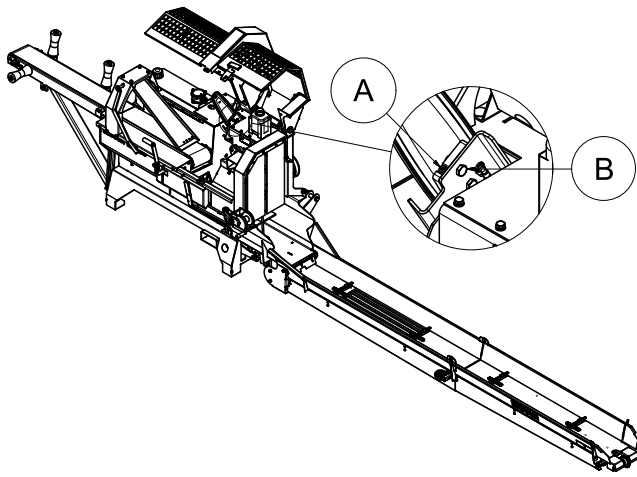
Before any sharpening work is initiated – stop the machine and tractor and remove the key to ensure unintentional start during the work



Always use work gloves during work with the chain!



The covers over the chain bar and the cover over the splitting cradle can be opened as illustrated



To replace the chain both screws **B** are loosened. The screw **A** to be release so far that the saw chain can be hitched off for maintenance or replacement.

In order to tighten the chain the loosened screws **B** are still loose and screw **A** tightened.

Then screws **B** to be tightened.

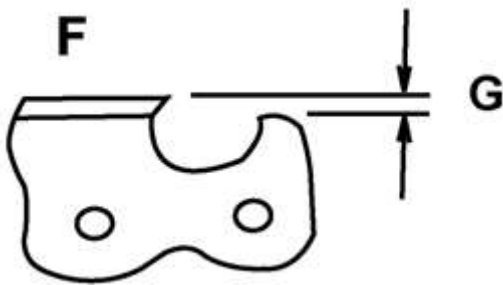
Inspect the tightening by pulling the chain upwards at the middle of the saw bar. If you can stretch the chain 4-5mm upwards, the tightening is correct.

A new saw chain enlarges rapidly and must be frequently inspected



File dimension 4,8 mm

The chain is now available for sharpening with a round file from both sides. It is very important to maintain the correct shape of the teeth as illustrated. The main concern is to employ the correct file dimension and make sure you maintain the correct angle of the cutting edge – i.e. 30 – 35 degrees. Figure F shows the correct shape of a sharpened tooth.

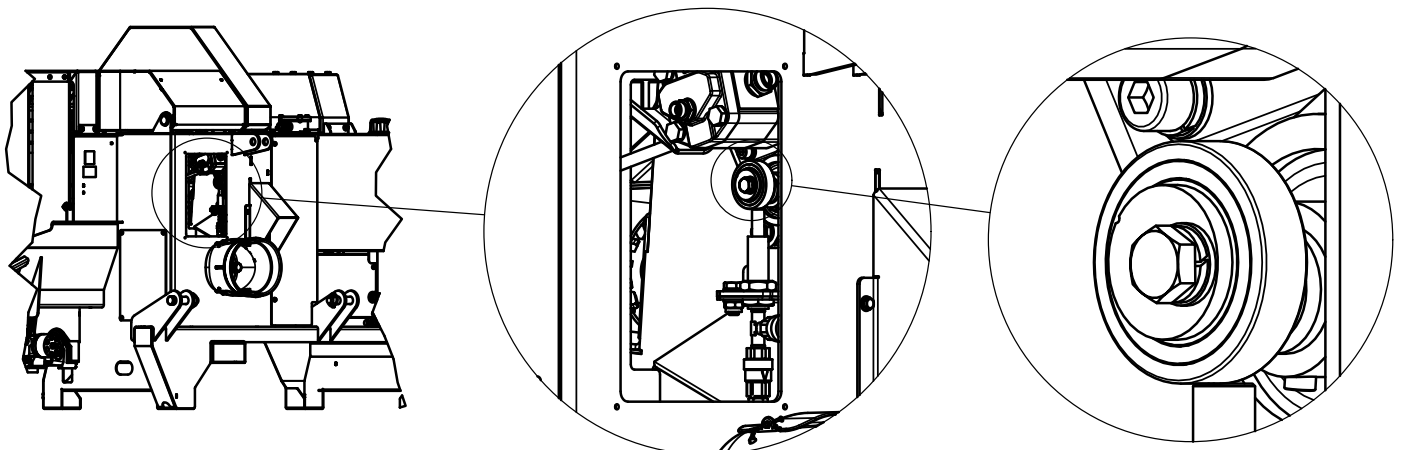


Also, remove damages from the saw bar and turn the saw bar regularly. This in order to achieve even wear on both sides.

### Adjustment of the chain lubrication

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

The lubrication is adjusted by releasing the connection (D) and turning the eccentric disk clockwise (+) to increase the lubrication quantity per blow or the opposite (-) to reduce the flow.



# Service and maintenance

Before opening any lids or covers always stop tractor or motor powering the processor in order to avoid injuries

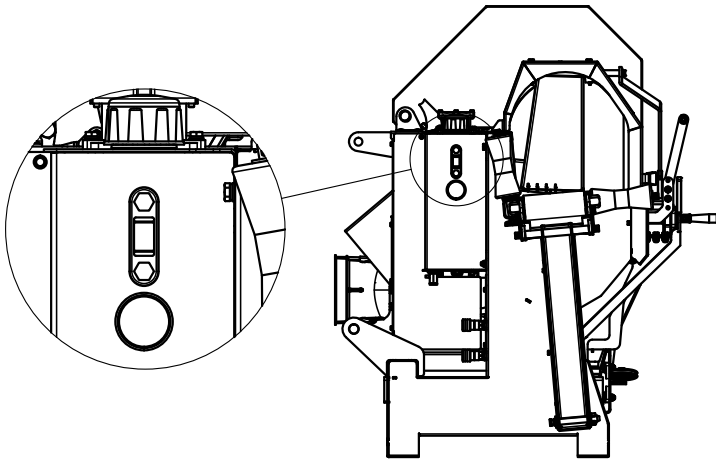
**Please note:**

**There are movable parts inside the machine which involve great power and risk of crushing. The machine should never be operated when the covers are removed.**

The processor has been test run and adjusted from factory and the hydraulic oil should have reached a working temperature of minimum 20 degrees C before any adjustments are made.

## Everyday maintenance and inspection

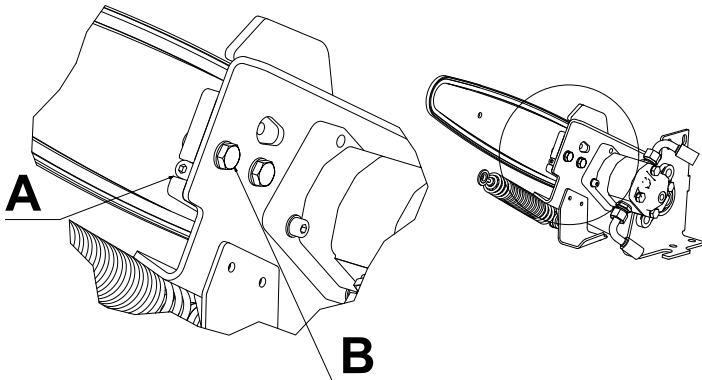
Keep a clean and tidy enviroment around the machine. Ensuring optimal function and also ensuring that chips are removed and giving the machine "air".



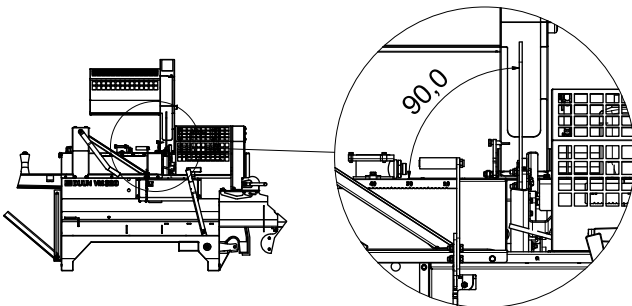
Inspect oil level and hydraulic oil temperature regularly. Refill oil if necessary  
Correct oil level should be in the middle of level glas when placed at horizontal level

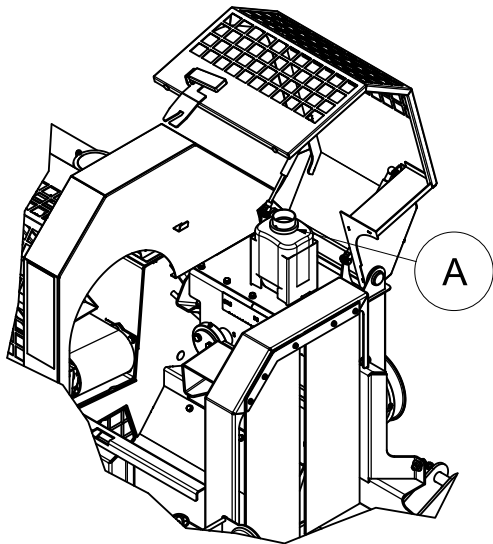
The temperatur should never be higher than +70°C.

If the temperature reaches critical level, the pto speed should be reduced. NB max. 400 rpm.



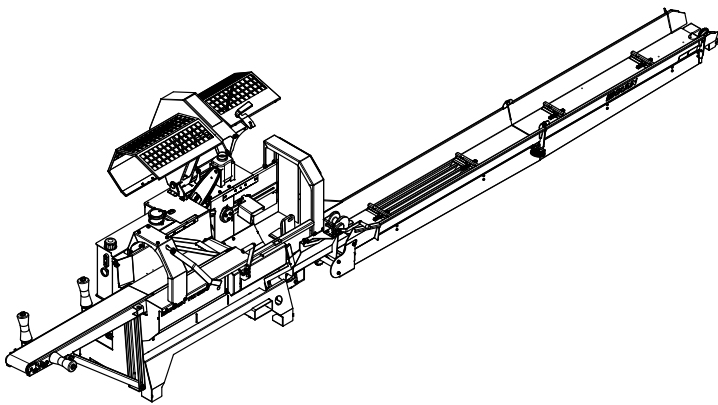
Inspect cutting chain and saw bar regularly. Sharpening ang tightening of the saw chain ensures effective cutting. Check that the vertical angle of the saw bar (90 degrees) so that the saw bar does not jam during cutting.



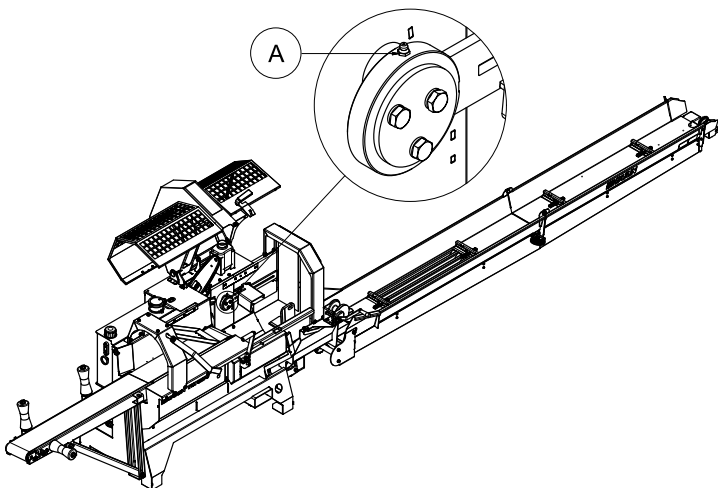


Ensure that the chain oil container does not drain during use. Also inspect that oil is consumed and the chain lubricated..

### Weekly maintenance

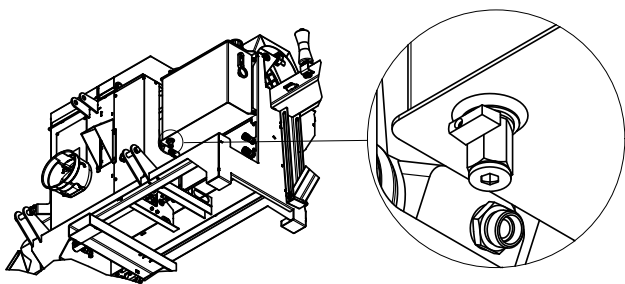


Open all lids and safety covers and clean these with compressed air. Saw dust and dirt will deposit inside the machine and it is vital to remove this ensuring optimal cooling and making all functions function..



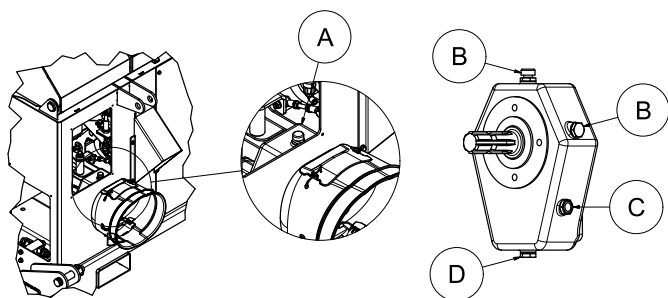
Grease the log stopper **A**.

## Monthly maintenance

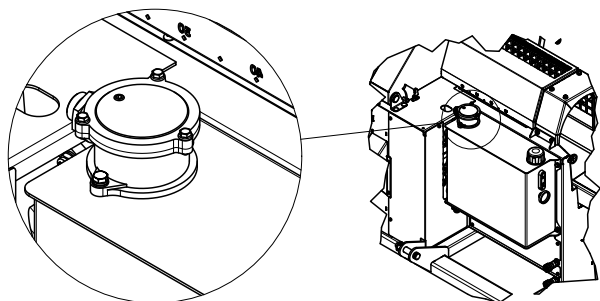


Regularly drain a small amount of hydraulic oil to check the oil quality. Grey oil is an indication of water in the oil caused by condensation. Perform this inspection when the machine is cooled and eventual water concentrated at bottom level. Drain until clean oil comes out. All oil is to be replaced.

## Yearly maintenance



Check the oil level after each season by releasing level screw **C** as illustrated in the sketch (the oil to leak at sufficient level). Replacing oil via the breathing plug **B** on the top and the drainage via the plug **D**. The first oil change to be performed after 50 hours and then every other season or after 500 operating hours (whatever occurs first). Recommended oil: Statoil Gearway PS45 75-90 Specification API GL-5 or similar. The oil volume is 0.35 litres.



Replace the Filter cartridge in the oil filter after the first 50 operating hours, and afterwards once a year or after 500 operating hours (depending on whatever occurs first).

Change hydraulic oil after the first 50 operating hours, and later every year or after 500 operating hours (whatever occurs first).

Filter cartridge, SIF.20C10  
Item No. 2251065

Clean and lubricate the machine between each season.

The VM320 has many lubrication points. Many of these have a very light load and are equipped with «forever» greased bearings.

Other bearings are mainly flange-mounted ball bearings demanding very modest greasing. The main rule to avoid excessive greasing and damage to seals for the bearings.

# 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: VM320 Firewood processor  
Manufacturer: Duun Industrier as  
Type: Duun Firewood processor VM320  
is in accordance with:

Directive 2006/42/EC Machinery

Signed by:

  Duun  
Industrier as

Karl Martin Eggen

Åsen, 15.09.2020