ENGLISH

HAKKIPILKE®

Hakki Pilke Raven

FIREWOOD PROCESSOR
– Instructions for assembly, operation and maintenance
– EC Declaration of Conformity
– Safety instructions
– Guarantee terms

THE OPERATOR MUST READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE OPERATING THE FIREWOOD PROCESSOR.

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Table of contents

1 General information

1.1 INTRODUCTION

The purpose of this manual is to ensure that the machine is used in the manner intended by the manufacturer, taking safety into consideration. Everyone operating the machine or working in close proximity to it must study this manual carefully.

Operators of the machine are expected to have basic skills in tractor handling, such as utilising the cardan shaft drive and the tractor's lifting equipment. Before commencing work, operators must also familiarise themselves with the machine's control and safety equipment, and ensure their proper operation.

Additional information on Maaselän Kone Oy's products is available on our website at www.maaselankone.fi.

Keep this manual in the immediate vicinity of the machine.

1.2 PURPOSE OF USE

The Hakki Pilke Raven firewood processor is designed for the preparation of firewood from pruned wood or logs. The firewood processor must not be used to process any treated wood, such as is found in construction waste, for example. Sand, nails or other impurities in the wood may damage the machine.

The maximum diameter of the logs to be processed is 30 cm. This limit must not be exceeded. When estimating the diameter of the log you are about to cut, note that the shape of the log and other factors, such as branches and burrs, make the actual diameter larger, and may prevent the log from being fed to the machine. Do not split logs that exceed 50 cm in length.

1.3 MACHINE MODELS AND BASIC INFORMATION

Model	TR	Electrical
Driving power	Tractor's cardan shaft (TR)	Electric motor
Weight	710 kg	750 kg
TR/Electrical drive	min 20 hp/max 410 rpm 5.5 kW	
Height/width/length in transport position	Transport position 251/136/262 (cm)	
Input/output conveyor	220/400 (cm)	
Saw bar/chain	bar: 15” groove 1.5 mm chain: 66 loops, pitch 0.325”	
Max log diameter	30 cm	
Max/min log length	Log max 50 cm; min 17 cm	

The machine’s serial number, date of manufacture, weight, operating voltage (electrically operated machines) and model are indicated on the grey type plate located on the machine frame below the locking latch of the output conveyor, on the right side of the operator.

1.4 OPERATING CONDITIONS

The temperature range within which the machine can be operated is -20 to +30°C. In the winter, the operator must ensure that there is no risk of slipping in the working area.

- The working area must be level and clear of unnecessary items. No unauthorised persons must enter the working area. The machine may only be used in sufficient lighting conditions. These requirements must be met for the entire duration of the work.
- The machine may not be used indoors.

1.5 SAFETY INSTRUCTIONS

- This device is designed to be operated by only one operator. The danger zone is 10 m from the machine.
- Persons under 18 years of age may not operate the machine.
- The operator must ensure that use of the device does not cause danger to others and that there are no unauthorised persons in the danger zone.
- The machine may not be operated while under the influence of alcohol or other drugs, or when tired.
- The machine may not be operated unless the operator has familiarised themselves with this instruction manual.
- The machine has been designed solely for making firewood.
- The machine must be placed in the transport position whenever it is moved. When transporting the machine on a public road, it must be equipped with additional lights.
- The operator is not permitted to modify the structure or operation of the machine, or to remove protective equipment.
- The operator must wear ear protectors, sufficiently tight-fitting work clothing and gloves, protective goggles and safety footwear.
- Before starting up the machine, the operator must ensure that the machine and its guards are intact.
- When powering the machine with a tractor, the operator must ensure that the cardan shaft is undamaged and that the rpm range is correct. The machine must be attached to the tractor's lifting equipment during operation.
- Before starting up the firewood processor, the operator must ensure that all the control and safety devices are functional.
- When cleaning the machine or carrying out any maintenance, it must be disconnected from its power source.

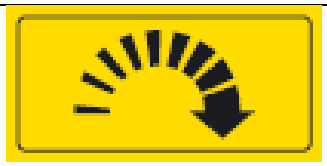
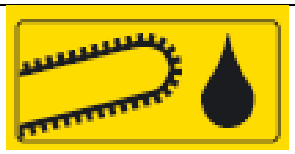
- **Note! Do not leave a running machine unsupervised!**

1.6 NOISE AND VIBRATION

The vibration values do not exceed 2.5 m/s2.

Warning symbols

 READ THE MACHINE'S MANUAL BEFORE OPERATING THE MACHINE.	 WEAR EYE AND EAR PROTECTION.	 WEAR SAFETY FOOTWEAR AND WORK GLOVES.
 DO NOT WEAR ANY LOOSE ITEMS OF CLOTHING.	 ALWAYS GRAB THE PIECE OF WOOD OR LOG FROM THE SIDE.	 LIFTING POINT FOR FORKLIFT.
 BEWARE OF MOVING PARTS.	 BEWARE OF THE CARDAN SHAFT.	 BEWARE OF THE CHAIN.
 BEWARE OF THE KNIFE.	 ONLY ONE PERSON MAY OPERATE THE MACHINE.	 DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT MAINTENANCE PROCEDURES.

 THE DANGER ZONE IS 10 M FROM THE MACHINE.	 RISK OF CRUSHING	
 THE MAXIMUM PERMITTED ANGLE OF THE CONVEYOR IS 40°. DO NOT PASS UNDER THE CONVEYOR.	MAX 410 RPM THE MAXIMUM SPEED FOR THE CARDAN SHAFT IS 410 RPM.  HYDRAULIC OIL	 THE ROTATION DIRECTION IS IN THE DIRECTION OF THE ARROW.  SAW CHAIN OIL
 DANGER ZONE	 LUBRICATION POINT	

2 Setting up the machine for operation and transport

2.1 DELIVERY INSPECTION

Dispose of the machine's packaging material in an environmentally friendly manner.
Check that the machine has not sustained any damage during transit, and ensure that all necessary parts are included in the package. In the event of any defects or damage, contact the retailer immediately.

2.2 MAIN COMPONENTS OF THE MACHINE

The main components of the Hakki Pilke Raven firewood processor are presented in the figure below.

A. Input conveyor
B. Control unit
C. Cutting and splitting unit
D. Output conveyor

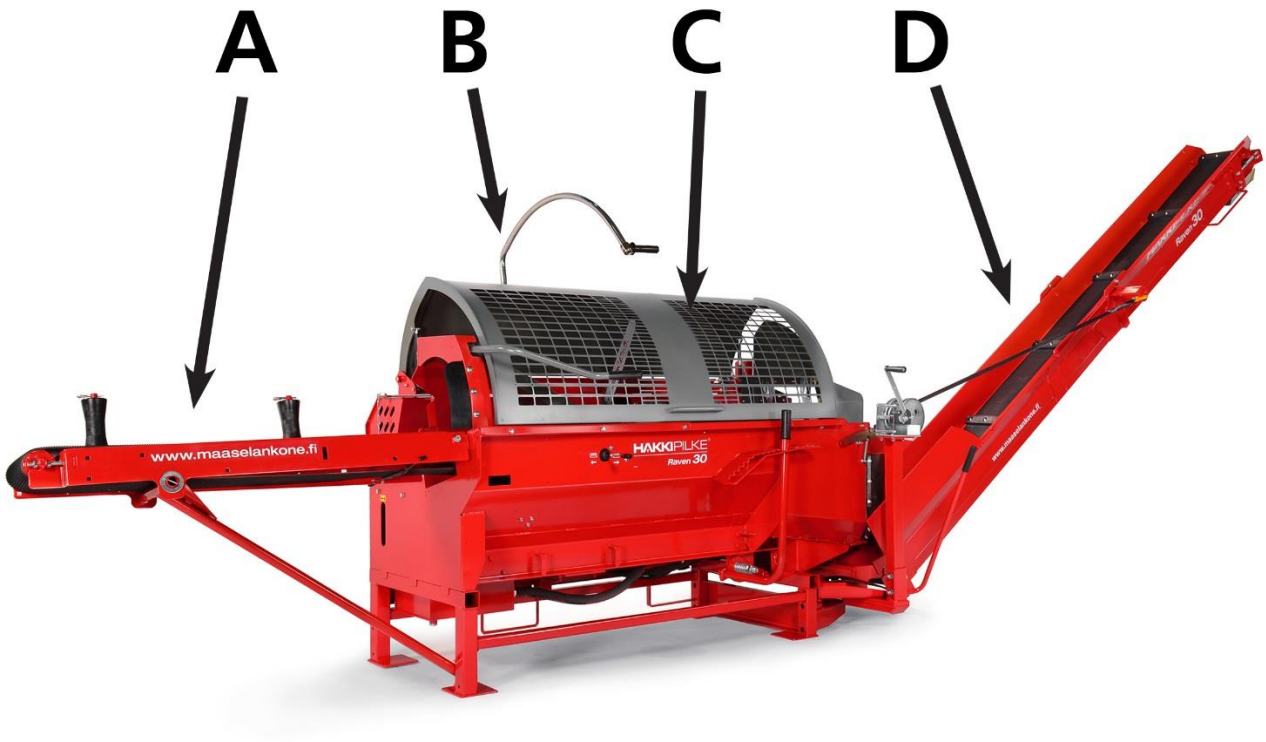


Figure 1. Main components of the machine

2.3 ARRANGING THE MACHINE FOR OPERATION AND TRANSPORT

Before arranging the machine for operation, ensure that the operating conditions detailed in Section 1.4 are met and review the safety instructions in Section 1.5.

Note! Inspect and clean the machine before setting it up for transport!

Placing the output conveyor in the operating or transport position

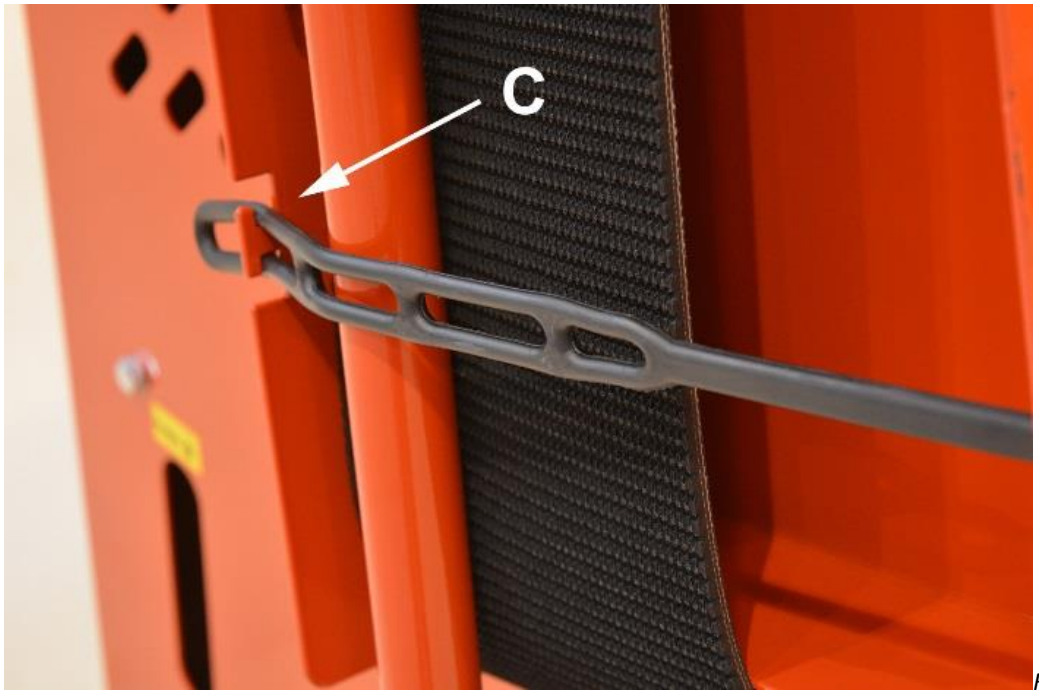


Figure 2.

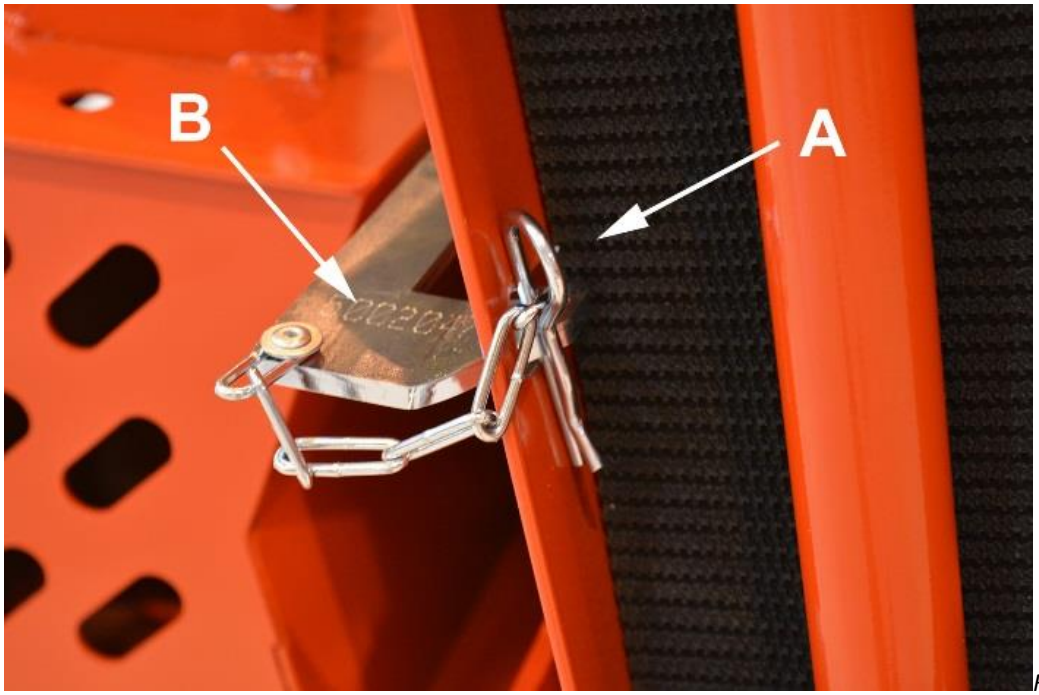


Figure 3.

Place the input conveyor in the operating position as follows:

1. Ensure that sufficient room is available to lower the input conveyor (approx. 2 m).
2. Remove the other end of the support leg holder C from the lug (Figure 2).
3. Release the lock by removing pin A and turning locking latch B out of its slot (Figure 3).

Note! At the same time, hold the end of the input conveyor with your left hand!

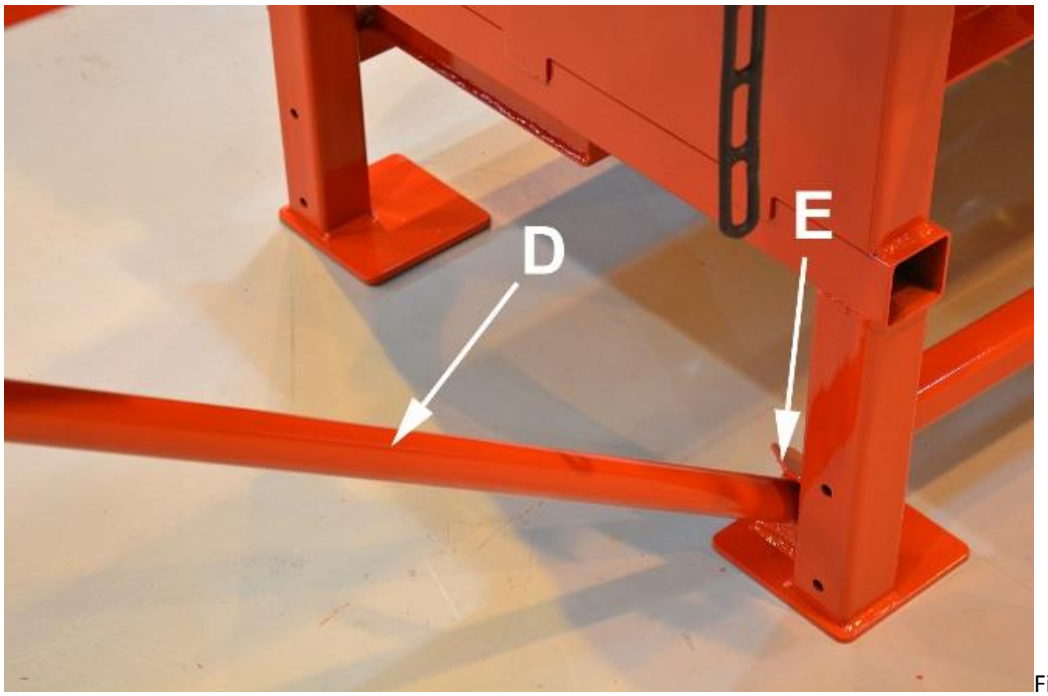


Figure 4.

4. Lower the input conveyor with your left hand while simultaneously using your right hand to guide support leg D into slot E (Figure 4).

When placing the input conveyor in the transport position, lift the conveyor to the upper position, turn locking latch B into its slot and insert pin A (Figure 3). Use holder C to lock the support leg in place (Figure 2).

Placing the output conveyor in the operating or transport position

Place the output conveyor in the operating position as follows:

1. Ensure that there is sufficient room for opening the output conveyor.

2. Turn off the machine and disconnect it from the power source.

3. Keep lock A (Figure 5) open and lower the output conveyor using a winch to its lowest position.

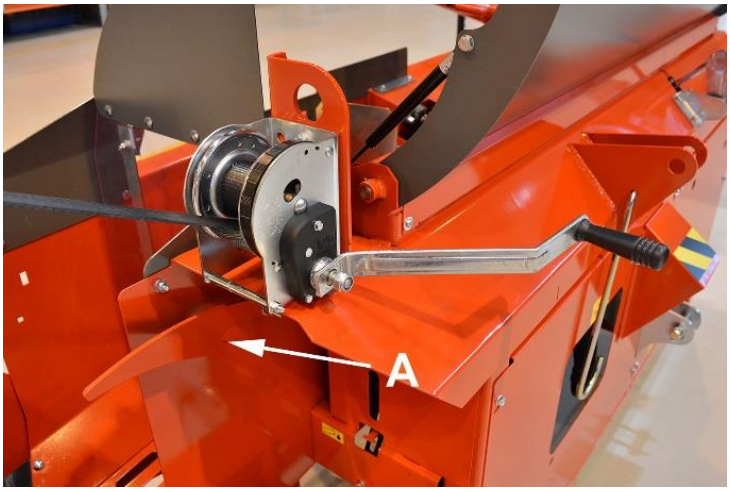


Figure 5.

4. Turn the upper section of the conveyor into the operating position using handle B (Figure 6).

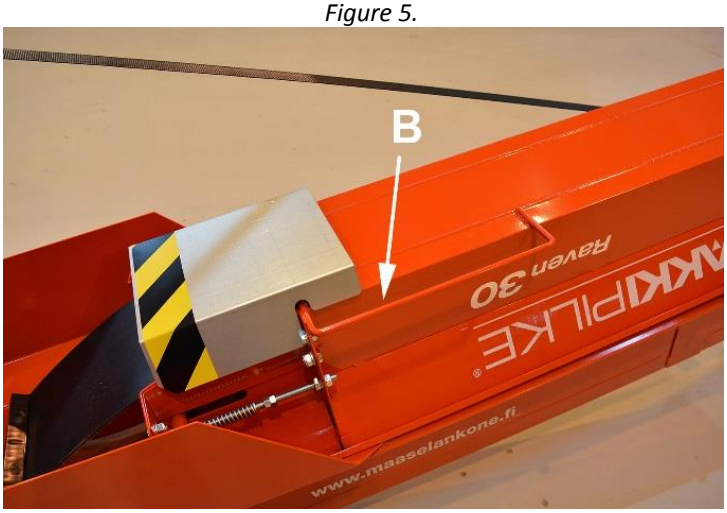


Figure 6.

5. Turn support bar C on the output conveyor belt (Figure 7) to the side.

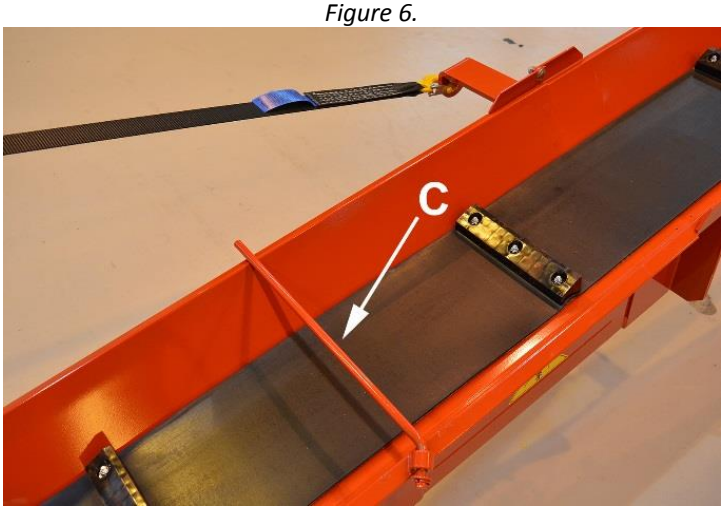


Figure 7.

6. Use a winch to lift the conveyor to the desired angle (max 40°) and lock the upper section of the output conveyor to the operating position using lock D (Figure 8).

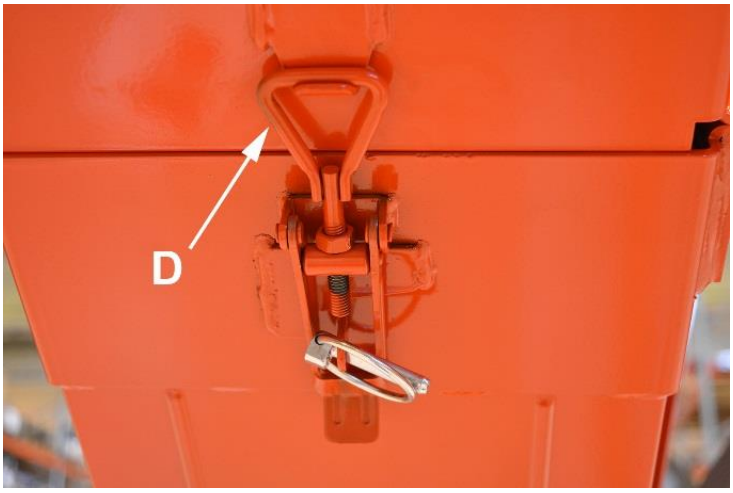


Figure 8.

Place the output conveyor in the transport position as follows:

1. Turn off the machine.
2. Release lock D (Figure 7) and lower the conveyor to the lowest possible position with the winch.
3. Turn support bar C (Figure 7) to a position over the belt, and turn the upper section of the conveyor onto the lower section using handle B (Figure 5).
4. Turn the conveyor to the middle position (only in machines with a pivoting conveyor). See Section 3.6.
5. Lift the conveyor with the winch until it locks into the raised position. Ensure that lock A (Figure 5) settles properly into place.

Note! Do not stand on the output conveyor! Do not use the winch if the belt is worn!

2.4 CONNECTING THE MACHINE TO A POWER SOURCE

Tractor-powered model

A tractor-powered firewood processor is connected to the tractor's three-point lifting device and cardan shaft.

Connecting the cardan shaft is a task for only one person. When connecting the machine to the tractor, there must be no one in the tractor cabin, so as to prevent any accidental contact with the controls. Check all the connecting devices of the tractor and the firewood processor before connecting them. Never use faulty equipment.

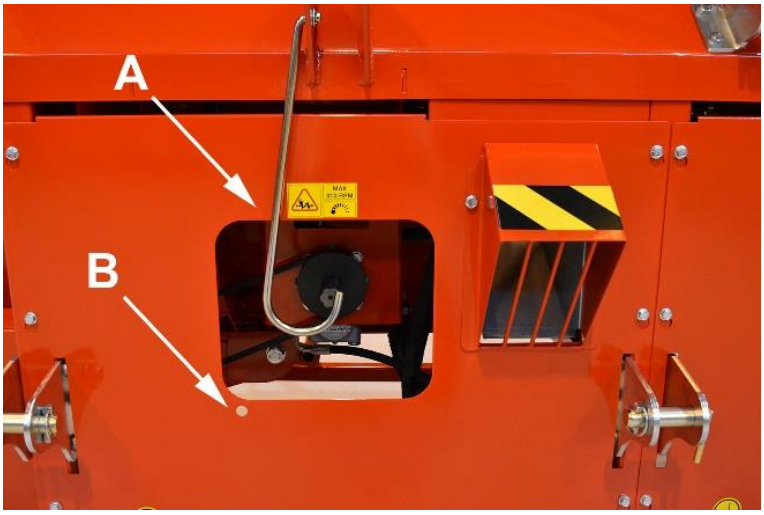


Figure 9.

When using the cardan shaft, observe any instructions provided by the manufacturer of the shaft. The machine requires 5.5 kW of power, which must be taken into account with regard to the capacity of the cardan shaft. A suitable cardan shaft is of power class four. Make sure that the connected shaft is locked to the splined shaft of the multiplier gear. Connect the chain that prevents the turning motion of the guard to hole B (Figure 9). Hang the cardan shaft from hook A (Figure 9) when the machine is not being operated and it is disconnected from the tractor. Finally, ensure that all connections are safe and secure. Never use a damaged or unprotected cardan shaft.

Note! Tractor-powered machines must be attached to the lifting equipment of the tractor.

Electrically powered model

An electrically powered machine functions with a power of 5.5 kW. The IP rating of the electric motor is 55. The fuse must be of at least 16 A. The electrical cable must be at least 5 x 4 mm², and it is connected to the socket in Figure 10.

Figure 10. Electric motor connector.

The firewood processor can be activated with the green starter button on the front section of the machine. Use the red button to turn off the machine.
If the electric motor rotates in the wrong direction (i.e. the machine makes an abnormal noise and the hydraulic functions are inoperable), the current phase is incorrect.

We recommend using an extension cord that allows you to switch the current phase, or an adapter.

Figure 11. Starter.

Note! If the extension cord does not have a phase switch, the electrical work related to changing the phase must only be performed by an electrician.

Note! Only connect the machine to a fault current protected socket.

2.5 LIFTING AND MOVING THE MACHINE

When moving the machine, make sure that the moving and lifting capacity of your tractor or fork-lift is sufficient for the weight of the machine (approx. 600 kg). Only lift the machine by the indicated lifting points or with the lifting equipment of the tractor.

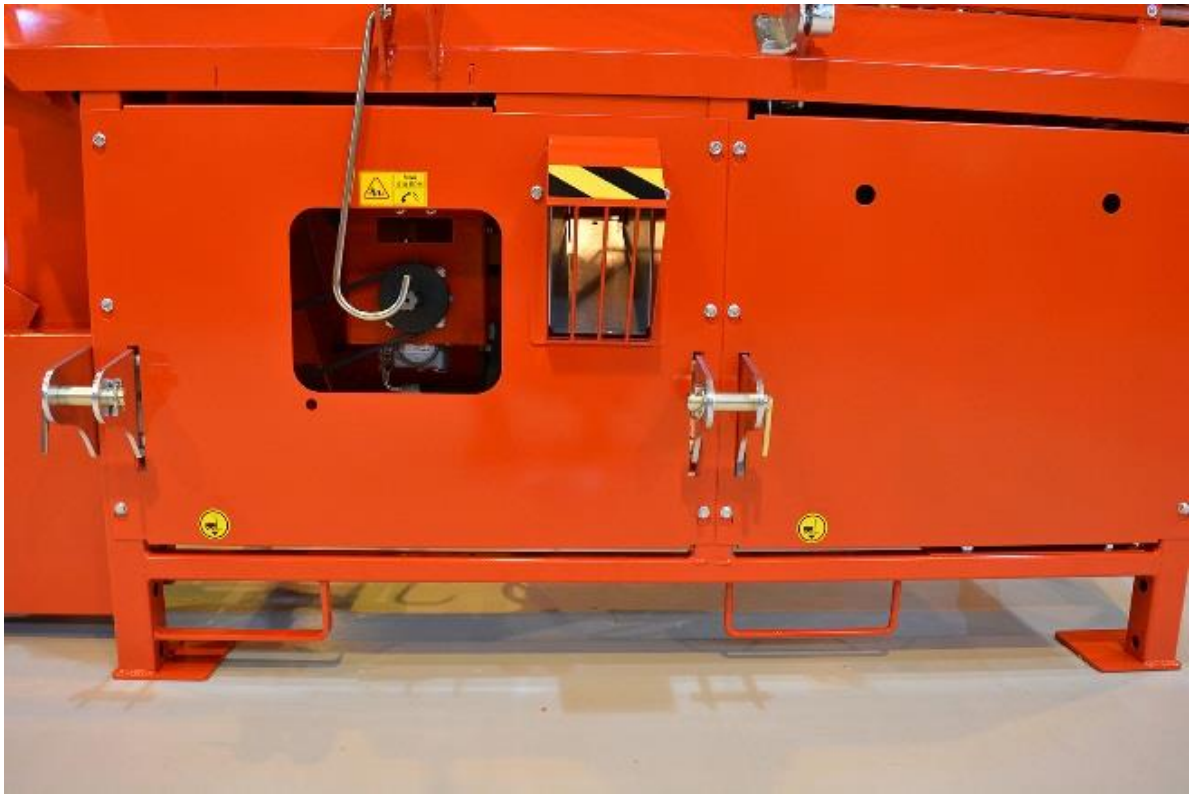


Figure 12. Lifting points of the machine

When connecting the machine to the tractor's lifting equipment, there must be no one in the tractor cabin, so as to prevent any accidental contact with the controls. Check all the connecting devices of the tractor and the firewood processor before connecting them. Never use faulty equipment. The pins that are used to connect the pushbars and drawbars to the machine must be of the correct size, and the appropriate locking pins must be used to secure them.

The machine must be placed in the transport position whenever it is moved. Exercise extreme caution when moving the machine in the operating position. Always lower the machine to the ground when you stop.

Note! Incorrect lifting may cause a hazardous situation or damage the machine.

2.6 ADDITIONAL HYDRAULICS CONNECTIONS (ACCESSORIES)

2.7 IN-FEED CONVEYOR BELT SPEED CONTROL (ACCESSORY)

The control valve in Figure 13 adjusts the in-feed conveyor belt speed to correspond with the speed of the splitting cycle. Rotating the valve adjustment screw clockwise slows down the speed of the in-feed conveyor belt in relation to the splitting cycle and vice versa.

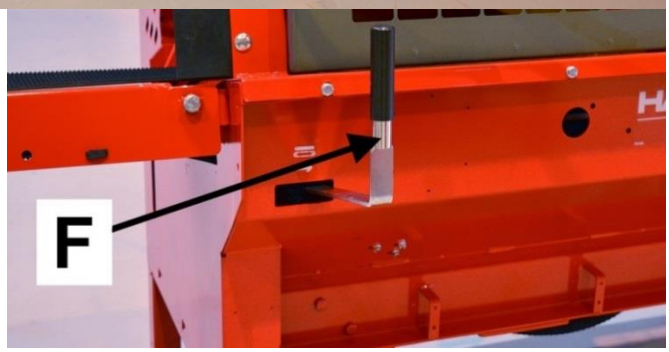
The control valve is only needed when the machine is equipped with a larger splitting cylinder (6 t), which makes the speed of the in-feed conveyor belt faster than that of the splitting cycle. The control valve makes sure that the end of the log meets the measuring device at the desired point of the splitting cycle.

Figure 13

3 Operating the machine

3.1 MACHINE CONTROLS AND FUNCTIONS

Names and functions of the controls in Figure 15:



Names and functions of the controls in Figure 15:

A. Input conveyor control lever
   - The input conveyor belt rotates forward by moving the lever to the right.

B. Wood gripper control lever

C. Cutting and splitting control lever
   - The splitting beam moves forward by pushing the lever up. This also moves the input conveyor forward.
   - The splitting beam moves backwards by pulling the lever down. This also rotates the saw chain.

D. Height adjustment of the splitting knife.

E. Out-feed conveyor locking lever (only in the Deluxe model)
   - The swivel out-feed conveyor can be locked to the desired position using the lever

F. In-feed conveyor lever. The in-feed conveyor belt rotates forward by moving lever F in Figure 15 to the right.

Before the actual operation of the machine, a test run and functional test must be carried out. Both the test run and testing can only be performed by a person who has studied the machine's manual.

Before the test run, all of the components of the firewood processor must be checked. If any faults or wear and tear that may affect the safe use of the machine are discovered, the processor must not be used until the faulty or worn component is replaced and safe use can be ensured.

- Before using the machine, the operator must ensure that
- the machine has not sustained any damage
- the machine's operating environment is in accordance with Section 1.4
- the machine is positioned on a solid foundation
- no unauthorised persons are within the machine's danger zone
- all guards and safety devices are in place and functional
- opening the splitting and cutting guard stops the machine's hazardous functions (see items 11, 12 and 15 in Section 3.3)
- the hydraulic hoses and pipes are undamaged. The pipes must be replaced if there is a tear in the hoses or pipes, if they leak, or if the surface layer of the hydraulic hose has worn all the way down to the supporting weave.
- the machine does not leak oil
- the machine functions properly (Section 3.3).

Note! Do not use the machine if the requirements listed above are not met!

3.2 PERFORMING A TEST RUN ON THE MACHINE

1. Check that the guard for the firewood processor's cutting and splitting section is down.
2. Check that the input and output conveyors are in the operating position.
3. Ensure that the splitting groove is empty.
4. Make sure that you are familiar with the functions of the machine's controls. If necessary, refer to Section 3.1.
5. Activation:
   - Tractor drive: Start the tractor and connect the output, starting with a slow speed and increasing the speed to a maximum of 410 rpm.
   - Electrical drive: Connect the cable to the socket of the firewood processor, start the machine by pressing the start button and wait a moment. This will activate the electric motor at full speed.
6. Start the splitting motion by pushing up lever C. The splitting beam must move forward by pushing the lever up, and must stop immediately when the lever is returned to the initial position. The splitting beam must move backwards by pulling the lever down, and must stop immediately when the lever is returned to the initial position.
7. Do the following to ensure that the saw chain lubrication functions automatically: (If necessary, see Section 4.10).
   a. Use lever C (Figure 15) to perform a few sawing motions without any actual logs.
   b. Turn off the machine and disconnect it from the power source.
   c. Open the guard and see if the saw chain has been supplied with oil.
8. Ensure that the saw chain starts running when you lower the saw bar by about 2 cm using lever C (Figure 15).

Note! In cold weather, the saw valve shaft may be sluggish at first, which means that the saw bar must be driven to the bottom position a couple of times for the saw chain to run.

9. Move the splitting beam forward and stop it by opening the cradle guard of the cutting and splitting section.
10. Ensure that the splitting beam moves backwards by pulling down lever C (Figure 15).
11. Test run the feed motion of the input conveyor by pushing lever A (Figure 15) to the right.
12. Visually check that the output conveyor runs at normal speed.
13. Ensure that the splitting motion or saw chain cannot be activated with the guard open.

If a fault occurs during the test run, determine the cause of the fault and take remedial action as deemed necessary. The machine must be shut down and disconnected from the power source for the duration of both the diagnostics and repairs.

Note! Do not leave a running machine unsupervised!

3.3 WOOD FEEDING, CUTTING AND SPLITTING

The input conveyor belt or feed roller feeds the wood to be processed into the machine. Feed wood into the machine using control lever C (Figure 15 in Section 3.1).

When feeding wood into the machine, make sure that it does not present a risk of your clothes, hands or other parts getting caught in the machine, such as due to the shape of the log. Do not use your hand to guide the log into the cutting section. Adjust the measuring device to the desired measurement.

1. Choose the log to process. Note that the maximum log diameter is 30 cm. The knottiness and shape of the log can increase the diameter.
2. Use the input conveyor to feed wood into the cutting section by pushing up lever C (Figure 15 in Section 3.1). **The input conveyor belt can also be driven forward by pushing lever A (Figure 15) to the right, especially when the log is further away from the cutting section and a longer and continuous feed motion is required.**
3. Once the log stops for cutting in the mechanical measuring device, lock the log in place with the wood gripper by pressing down handle B (Figure 15).
4. Cut the log by pulling down lever C (Figure 15), which activates the saw chain and lowers the saw bar. Simultaneously, the splitting beam returns to its initial position.
5. Return the saw bar to the upper position by pushing up lever C (Figure 15). This moves the splitting beam forwards and splits the log. Simultaneously, the input conveyor pushes the log forwards for the next cut.

   Note! Only move the splitting beam forward for the required length. For example, if you have adjusted the machine for logs of 35 cm in length, the splitting beam needs to move only approx. 37 cm. This notably increases the efficiency of the machine.

Re-splitting or splitting without cutting

Raise the guard of the cutting and splitting section.
Place the log you want to split in the splitting groove.
Close the guard of the cutting and splitting section.
Move the splitting beam forwards for the desired length by pushing up lever C and return the splitting beam backwards by pulling down lever C.
The above procedure can be used to split wood without cutting it.

Placing logs on the input table
We recommend the use of auxiliary devices, such as the HakkiFeed 371 timber deck. If a timber deck is not attached to the machine, the maximum allowed length is 4.5 m. Always lift and place wood on the input table in a safe manner that does not endanger the operator.

Note! Placing logs directly on the input table with a loader is strictly prohibited.
Note! Ensure that the log's centre of gravity stays on the conveyor.

Sawing the last log
When sawing wood, the second to last piece should be sawn in such a way that the remaining piece is of a sufficient length. This ensures that the log will stay firmly under the wood gripper and that the sawing will be steady and safe.

3.4 USING THE OUTPUT CONVEYOR

The Hakki Pilke Raven firewood processor's output conveyor belt is driven by a hydraulic motor.
The output conveyor can be adjusted laterally and vertically. The following describes how the conveyor can be turned laterally (accessory) by using turning lever A and handle B (Figure 16):

Release the lock of the conveyor by pushing lever A (Figure 16) towards the conveyor, and turn the conveyor to the desired position with handle B.

The maximum operating angle for the output conveyor is 40°. The maximum angle is indicated on the label (Figure 17) and the instructions attached to the output conveyor.

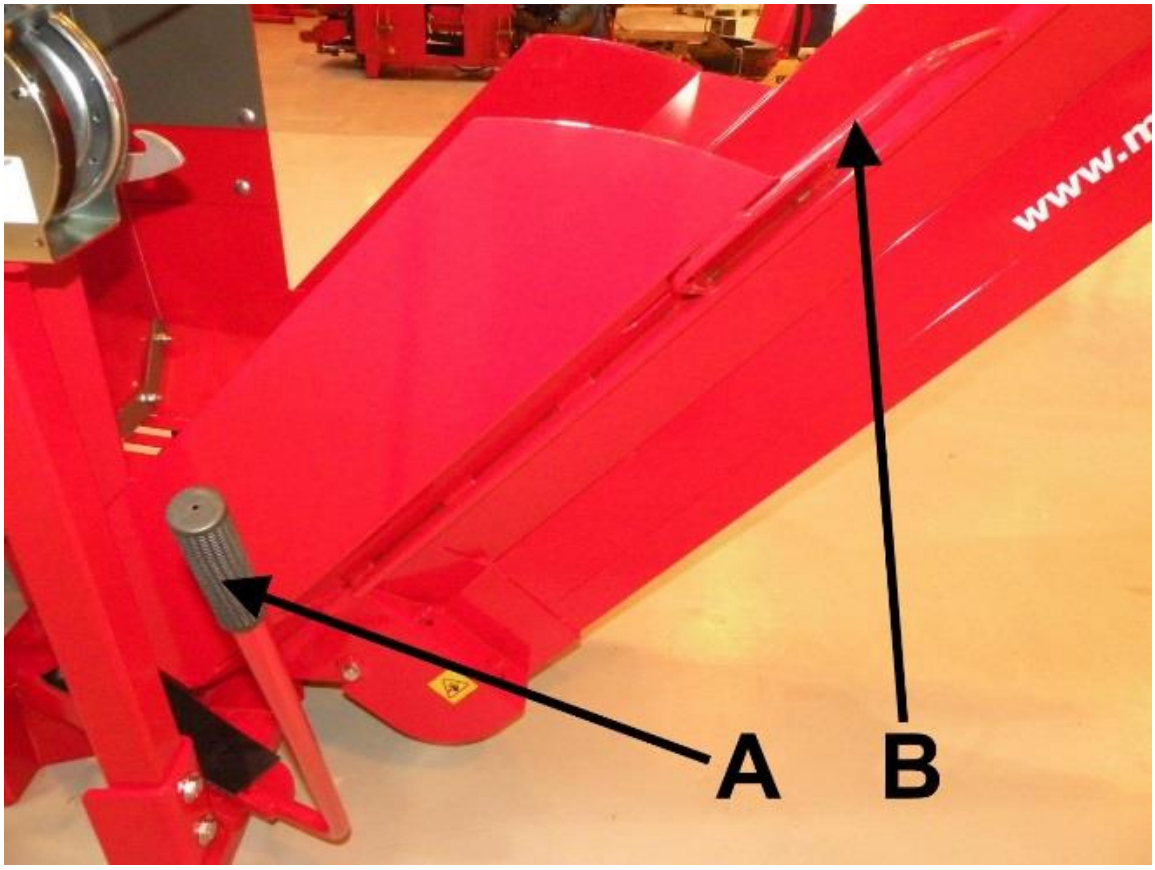


Figure 16.

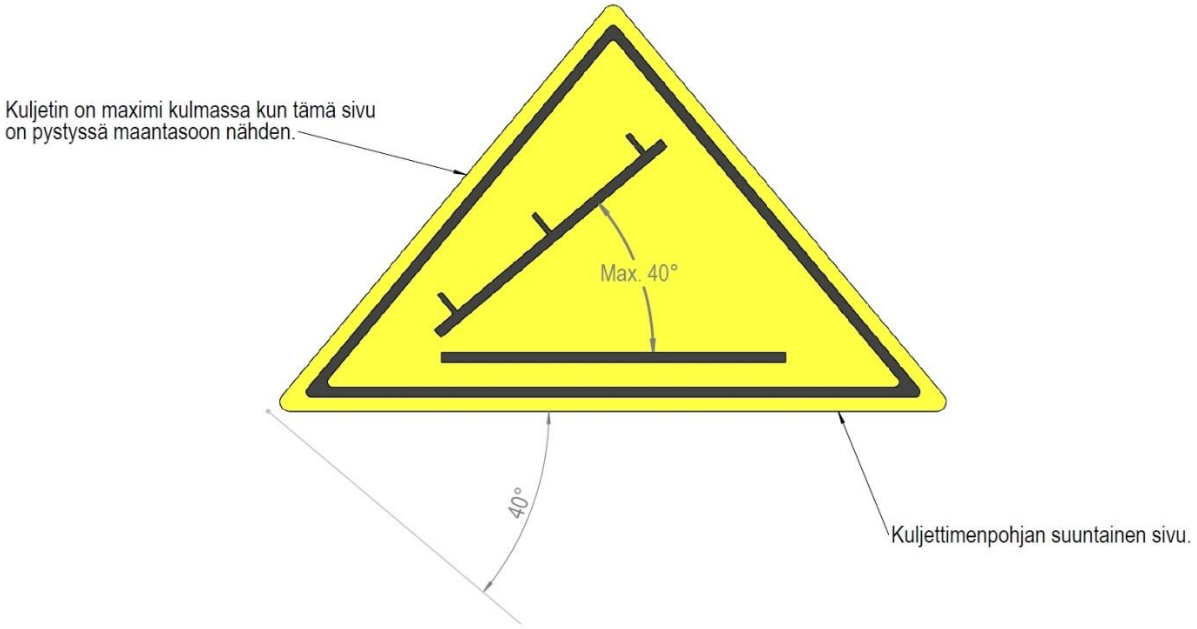


Figure 17.

If the conveyor is jammed for any reason, the machine must be shut down before removing the cause. There must be at least 50 cm between the end of the output conveyor and the pile of processed firewood.

3.5 AFTER USE

1. After you have finished making firewood, stop the output conveyor, shut down the machine and remove the firewood from the splitting groove and conveyor.
2. Ensure that the machine has not been damaged.
3. Place the output conveyor into a position that allows the conveyor and firewood processor to be moved safely off the processed firewood.
4. Clean the machine.

If you will not be using the firewood processor for a while, do the following:

5. As necessary, use your tractor's hydraulics or a forklift to hoist the firewood processor and carefully move it to a location where you can place the input and output conveyors as well as the working platform into their transport and storage positions.
6. Place the conveyors into the transport and storage position.
7. Clean the machine and carry out any maintenance.
8. Store the machine according to the instructions in Section 4.13.

4 Maintenance and adjustment of the machine

The machine must be disconnected from its power source before maintenance, adjustment, replacement or cleaning procedures. Only use spare parts that are supplied by the manufacturer or your retailer. If the guards of the machine have to be removed for maintenance, they must always be reattached before activating the machine. After maintenance and adjustment measures, a test run must be carried out on the machine, according to the instructions in Section 3.3.

4.1 DISCONNECTING THE MACHINE FROM ITS POWER SOURCE

Tractor-powered model
Turn off the tractor and disconnect the machine’s cardan shaft from the tractor.

Electrically powered model
Turn off the machine and disconnect the power cable from the socket.

Ensuring that the machine is inactive
Once you have disconnected the machine from its power source, always ensure that the machine is completely inactive before performing any other measures!

4.2 ADJUSTING THE LOG LENGTH

The Hakki Pilke Raven firewood processor is equipped with a mechanical log measuring device with an incremented adjustment value of 25 to 50 cm.

1. Turn off the machine, disconnect it from any power source, and open the protective cover of the machine.

2. Set the wood limiter in the splitting section to the desired length by removing cotter pin B from the limiter's locking pin and pulling out locking pin A (Figure 18). Lock limiter plate C (Figure 18) in the desired position. Re-insert locking pin A and cotter pin B.

Note! Turn the limiter plate to the correct position according to the thickness of the log. (See Figures 19 and 20).

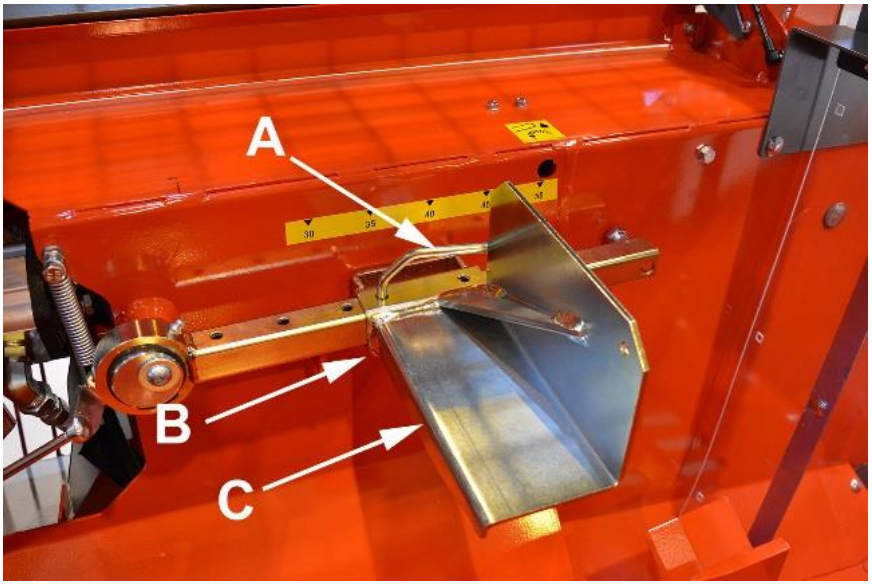


Figure 18. Log length adjustment

Figure 19. Limiter plate position for smaller logs

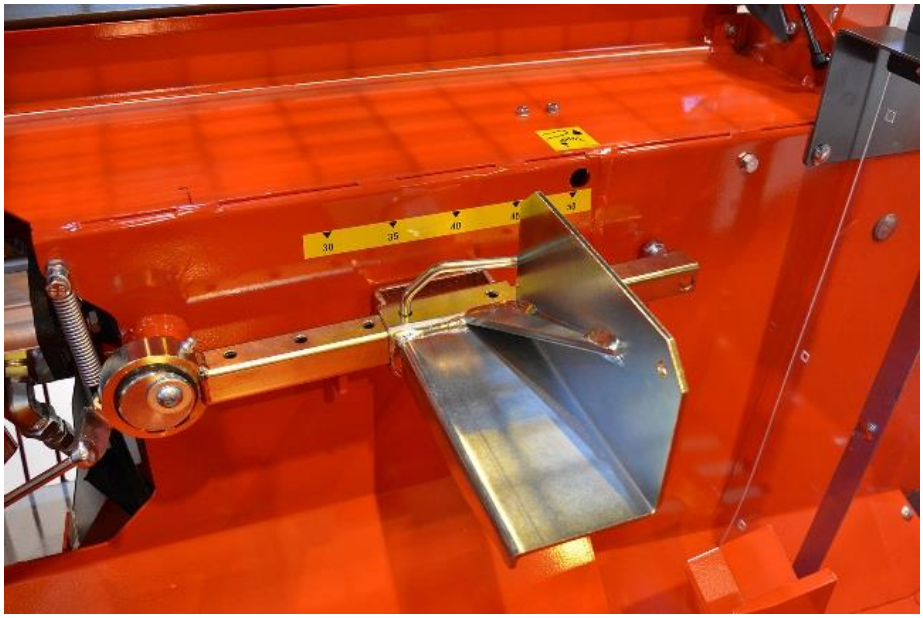


Figure 20. Limiter plate position for larger logs of more than 20 cm in diameter

4.3 HEIGHT ADJUSTMENT OF THE SPLITTING KNIFE

The splitting knife can be controlled mechanically by moving control lever D (Figure 15) up or down. The splitting knife can be raised by moving lever D (Figure 15) to the left and vice versa, as indicated by the label in Figure 21. Logs should always be as centred as possible when passing the knife, in order to keep the size of the firewood consistent.

The knife can be driven to the lowest position in one go by raising the knife and clearing the space under the knife of firewood. The machine must be shut down and disconnected from its power source for the duration of the cleaning.


Figure 21.

4.4 REPLACING THE SPLITTING KNIFE

Exercise extreme caution when handling the knife, and wear protective gloves.

1. Remove any firewood under the splitting knife and lower it to the lowest position using lever D (Figure 15), as shown in Figure 22.

2. Turn off the machine and disconnect it from its power source.

3. Open the guard and lift the splitting knife out of its slot.

Install a new splitting knife by reversing the above steps.

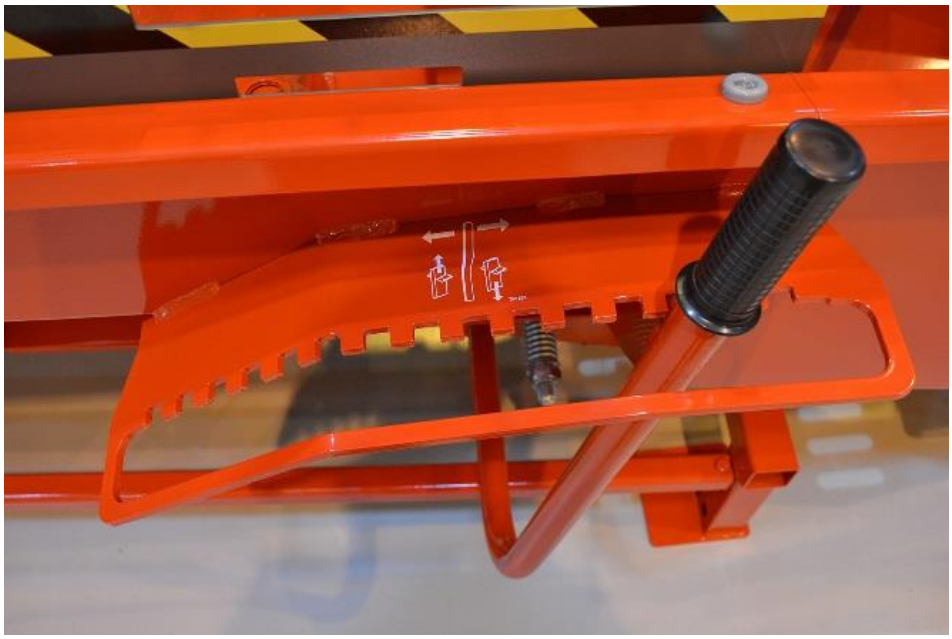


Figure 22.

4.5 ADJUSTING THE TIGHTNESS AND ALIGNMENT OF THE OUTPUT CONVEYOR BELT

The tightness and alignment of the output conveyor belt can be adjusted using nuts A (2 pcs) in Figure 23. Loosen adjustment nuts A on the side you wish the belt to run.

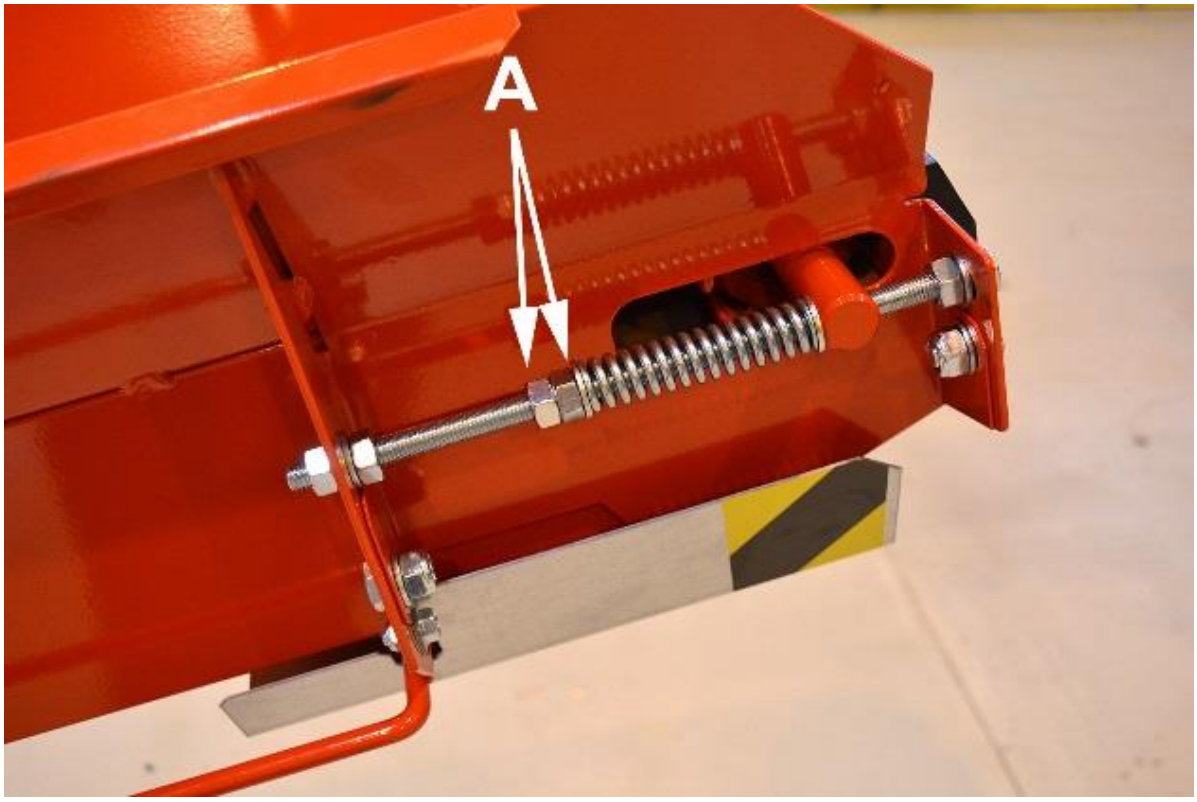


Figure 23.

4.6 CUTTING BLADE AND DRIVE END

If the cutting blade of the machine does not penetrate the wood properly or the cut is skewed, the saw chain is most likely blunt. It is a good idea to keep a replacement chain handy, so that you do not need to interrupt your work to sharpen the chain.

Replacing and tightening the saw chain

Replace the saw chain as follows:

1. Turn off the machine and disconnect it from its power source.
2. Open the guard.
3. Loosen saw bar bolts B (Figure 24).
4. Fully loosen adjustment screw A for saw chain tension (Figure 24).
5. Remove the old saw chain.
6. Install the new saw chain and ensure that the cutting teeth come first in relation to the rotating direction.
7. Lift the saw bar from the front section to tighten the chain as you are attaching the bolts.
8. Use adjustment screw A to tighten the chain and tighten fastening bolts B (Figure 24).

To check the tension of the saw chain, wear protective gloves and pull the lower edge of the chain. The tension is correct if you can pull out three to four teeth of the chain **into full view** by applying moderate force.

Note! Use protective gloves when handling the saw!

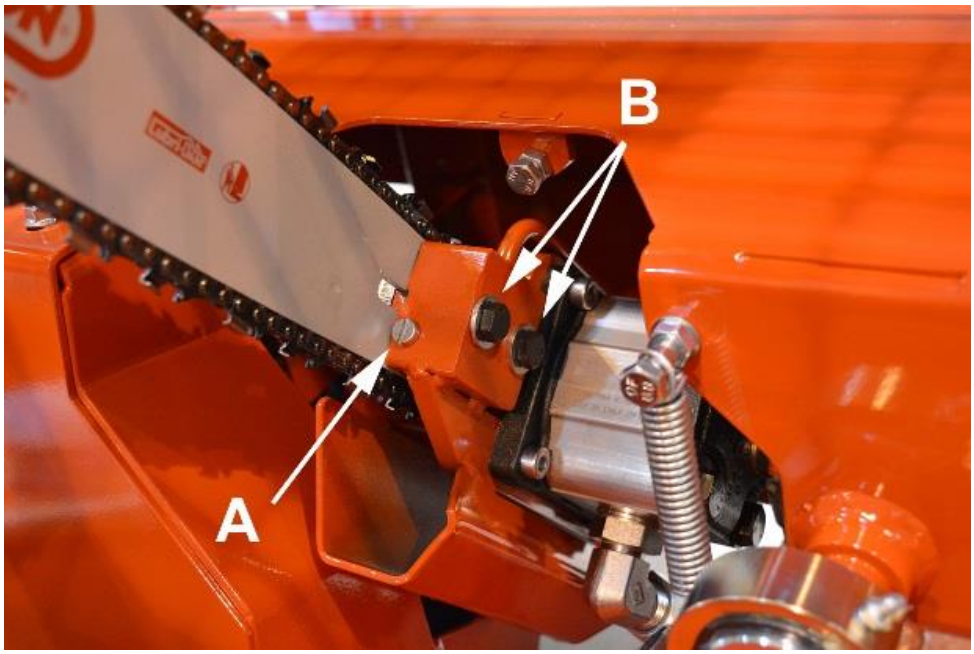


Figure 24.

Replacing the saw bar

Replace the saw bar as follows:

1. Remove the saw chain according to steps 1-5 of Section 4.6 “Replacing and tightening the saw chain”.
2. Remove the saw bar bolts (2 pcs) and remove fastening plate A (Figure 27)
3. Remove the saw bar from the groove.
4. Place the new bar against gear wheel B (Figure 27), twist it into the groove and loosely attach the saw bar bolts and fastening plate A.
5. Attach and tighten the saw chain according to steps 6-8 in Section 4.6 “Replacing and tightening the saw chain”.

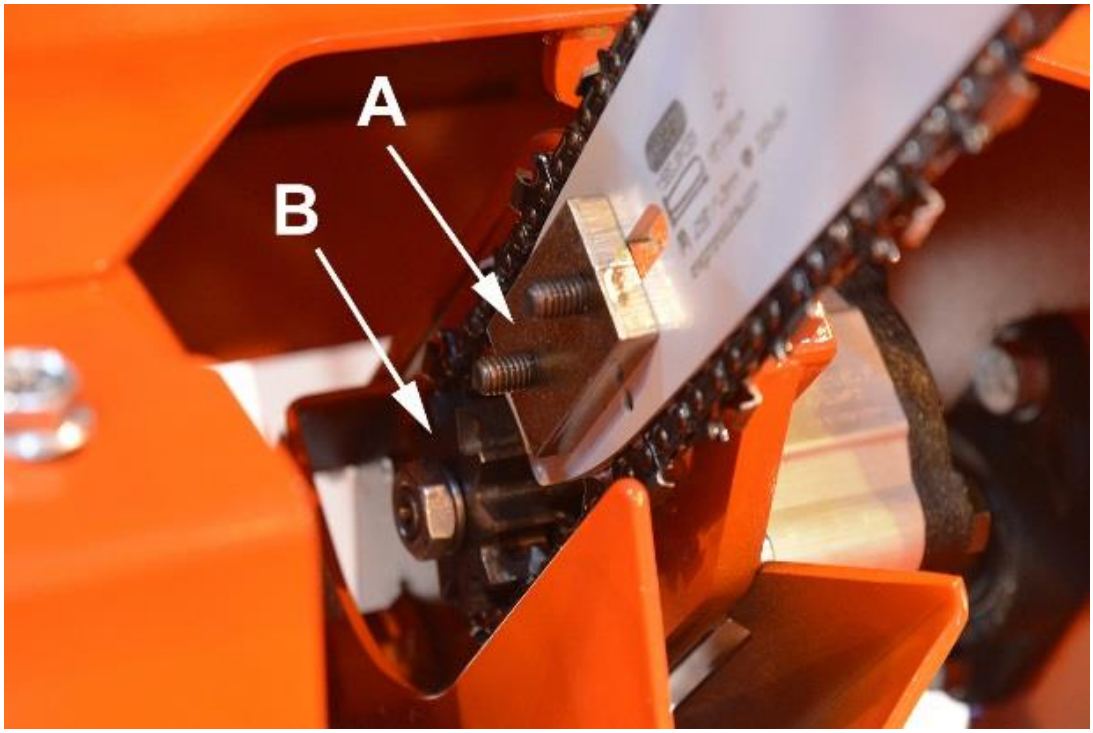


Figure 27.

4.7 CHANGING THE OIL

Change the hydraulic oil of the firewood processor as follows:

1. Turn off the machine and disconnect it from its power sources.
2. Open filler cap A of the hydraulic oil tank in Figure 28 (this will allow the oil to drain more easily).
3. Open drain plug B (Figure 29) and drain the oil into a suitable container.
4. Open the hydraulic filter cover C (Figure 28) and replace the filter.
5. Tighten plug B firmly, and fill the tank with fresh oil (approx. 40 litres).
6. Finally, ensure that the oil level settles at the halfway point of gauge D (Figure 30).

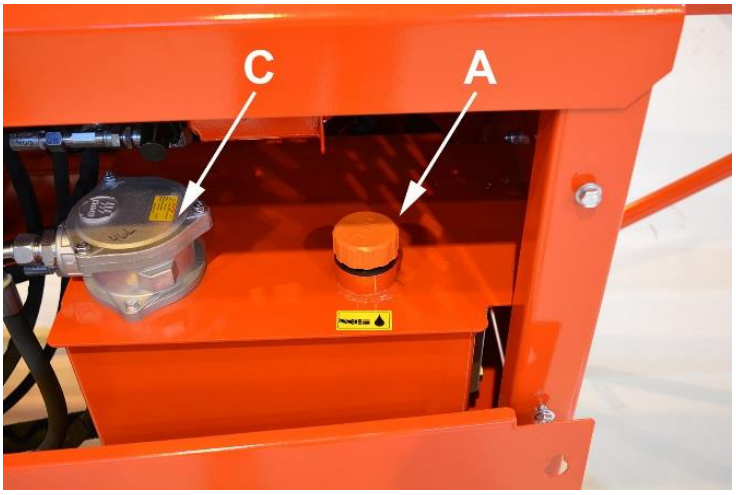


Figure 28.

Figure 29.

Figure 30.

4.8 CHANGING THE OIL OF THE MULTIPLIER GEAR

1. Run the machine for a while in order to warm up and mix the oils.
2. Turn off the tractor and remove the cardan shaft from the multiplier gear splined shaft.
3. Open breather cap A in Figure 30 (this will allow the oil to drain more easily) as well as drain cap B, and drain the oil into a suitable container.
4. Close drain cap B.
5. Add **0.09 litres** of appropriate oil to the angle transmission through the breather opening. (The multiplier gear is small, so approx. 1 dl of oil is sufficient).
6. Finally, close breather cap A (Figure 30).

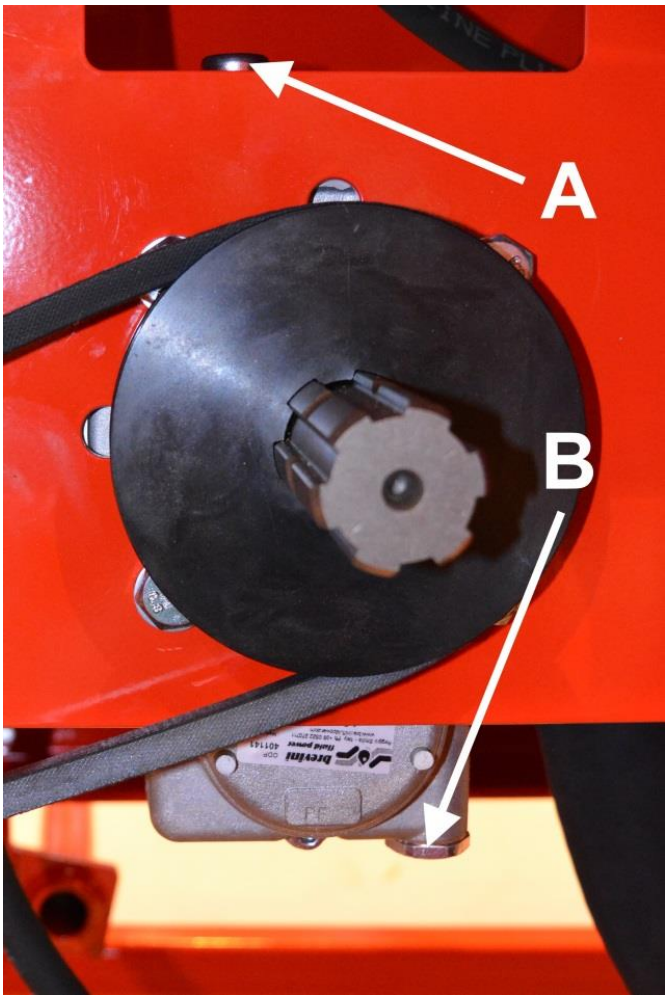


Figure 30.

4.9 CONVEYOR MAINTENANCE

Replacing and tightening the input conveyor belt

Replace the input conveyor belt as follows:

1. Turn off the machine and disconnect it from its power sources.
2. Raise and lock the input conveyor into the transport position. (See Section 2.3).
3. Move the belt joint to a suitable height.
4. Disconnect the joint by using pliers, for example, to pull out pin A (Figure 31) that holds the joint together.

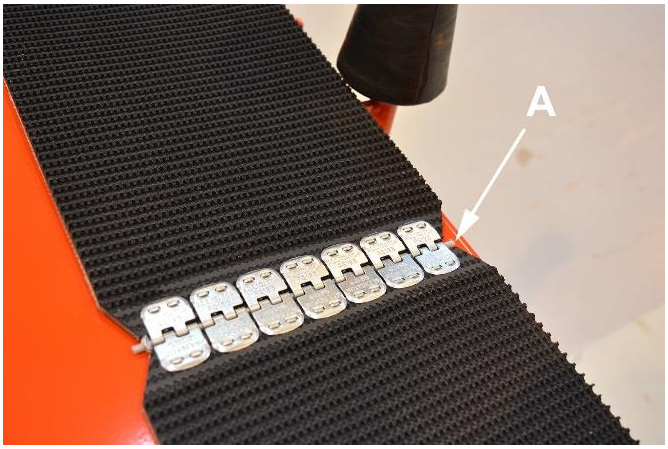


Figure 31.

5. Remove the old belt.

6. Insert the new belt from the side of the input conveyor's drive roller through opening B (Figure 32), until you can pull the belt out from other end C (Figure 33). Note! If necessary, remove the guard of the input conveyor in accordance with the instructions in Section 4.5.

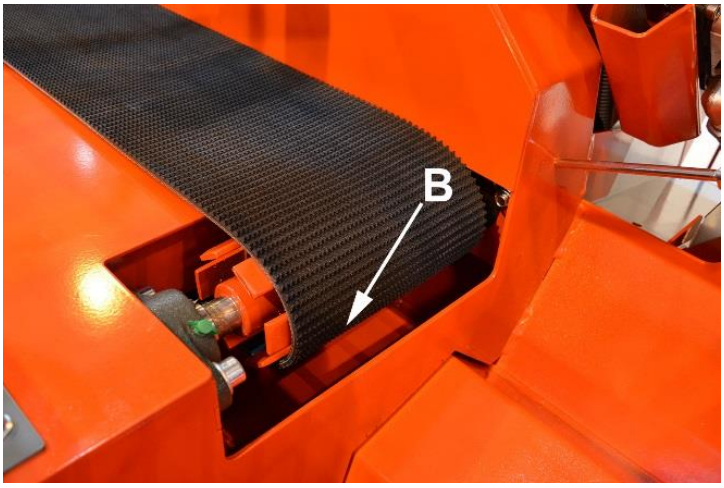


Figure 32.

7. Lead the rest of the belt under the wood gripper, around the rear roller and, finally, behind the conveyor.

8. Connect the joint by inserting pin A (Figure 31) into the joint.

Figure 33.

9. Turn the conveyor back to the operating position and tighten the belt. Use adjustment nuts D (Figure 34) to adjust the belt.

The belt is at the correct tension when its middle section is raised approx. 5 cm when the conveyor is in the operating position. An excessively tight belt may be damaged more easily, and it places unnecessary strain on the conveyor bearings.

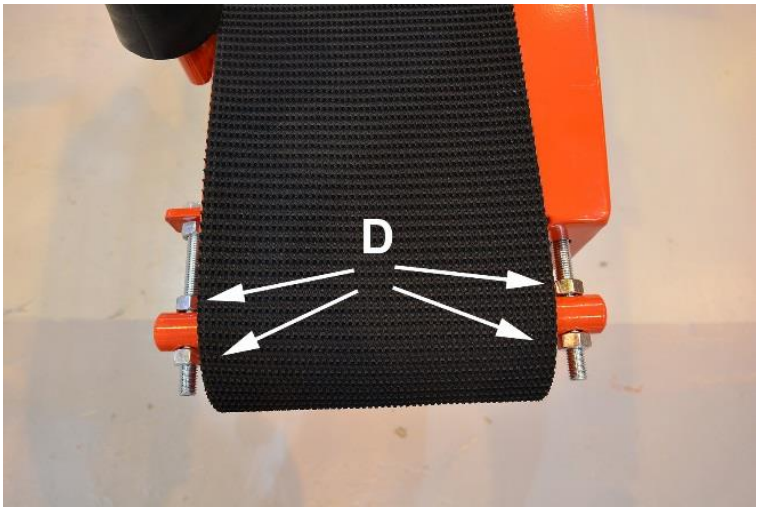


Figure 34.

Replacing and tightening the output conveyor belt
The instructions for tightening and aligning the output conveyor are presented in Section 4.6.
Replace the output conveyor belt as follows:

1. Pull out the pin locking the conveyor in place, and lower the conveyor to the ground.
2. Turn off the machine and disconnect it from its power sources.
3. Move the belt joint to the beginning of the conveyor.
4. Fold the conveyor, but do not place the belt support in the transport position. This will allow the belt to hang loose.
5. Disconnect the joint by opening the bolts.
6. Remove the old belt.
7. First, insert the new belt under the folded conveyor (bottom opening) from the end of the conveyor with the plates facing downwards. Feed the belt in until you can pull it out from the other end of the conveyor. Pull out a length of approx. 60 cm.
8. Push the other end of the belt into the upper section of the folded conveyor (top opening) from the end of the conveyor. Feed it in until you can connect the joint.
9. Pull the excess belt to the start of the conveyor.
10. Open the conveyor to the operating position, and tighten and adjust the belt.

The belt is at the correct tension when its middle section is raised approx. 15 cm when the conveyor is in the operating position. An excessively tight belt may be damaged more easily, and it places unnecessary strain on the conveyor bearings.

Replacing the output conveyor plates
The output conveyor plates can be replaced by disconnecting the bolt joints (3 x M8) fastening the plates and replacing the plates with new ones. It is recommended to move the belt into a position that puts the plate to be replaced above the conveyor. Turn off the machine and disconnect it from the power source for the duration of the procedure.

4.10 LUBRICATION

All of the firewood processor's lubrication points, which require Vaseline, have been labelled. The lubrication must be performed every 50 hours. There are nine lubrication points, presented in Figures 35–40. In order to access all grease nipples, remove the bolt pin and bolt of the lifting lug (Figure 35). Loosen the bolts circled in Figure 36 (or loosen them enough to slide the plate out) and remove the cover plate.

1. Nipples (2 pcs) of the saw control shaft in Figures 37 and 38.
2. Grease nipple of the input conveyor drive roller in Figure 39.
3. Grease nipple of the wood limiter in Figure 40.
4. Guard nipples (2 pcs) in Figures 41 and 42.
5. Nipples (2 pcs) of the output conveyor's drive roller in Figure 43.
6. Nipples in Figures 44-47.

Figure 35.

Figure 36.

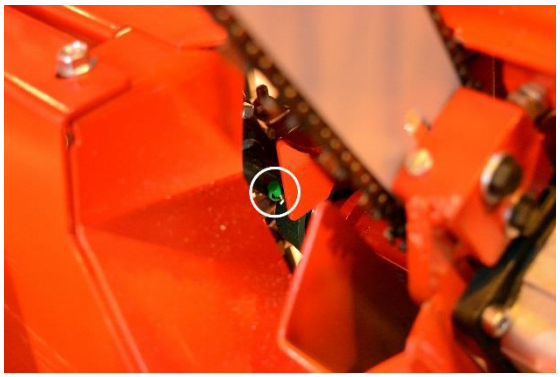


Figure 37.

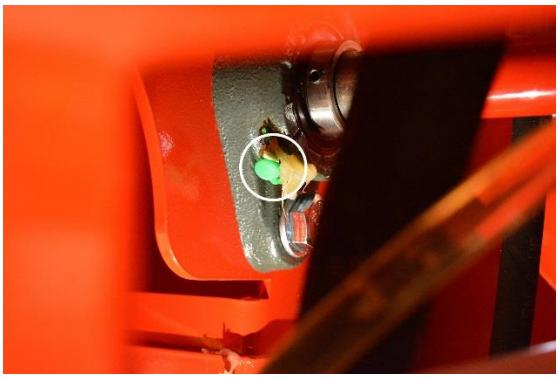


Figure 38.

Figure 39.

Figure 40.

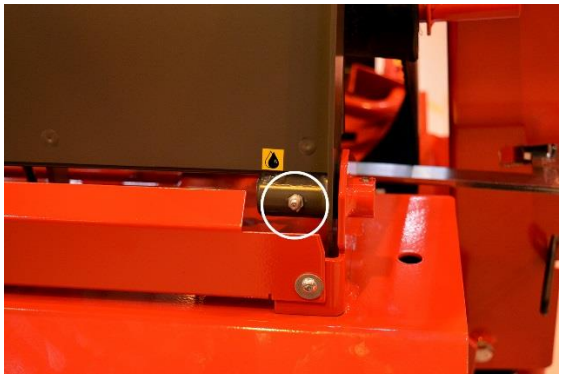


Figure 41.

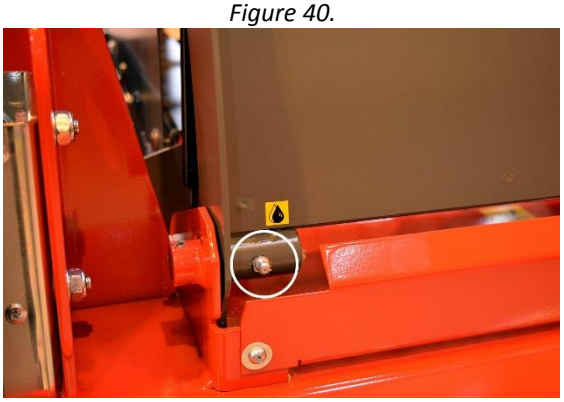


Figure 42.

Figure 43.

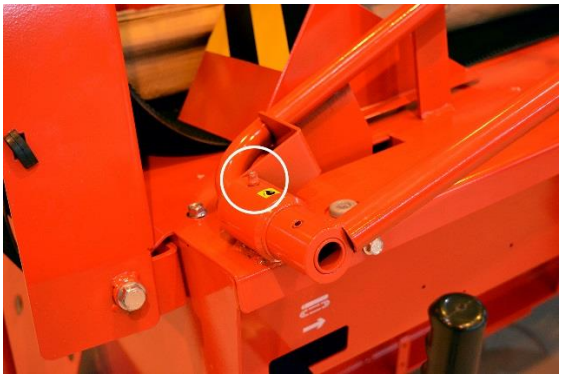


Figure 44.

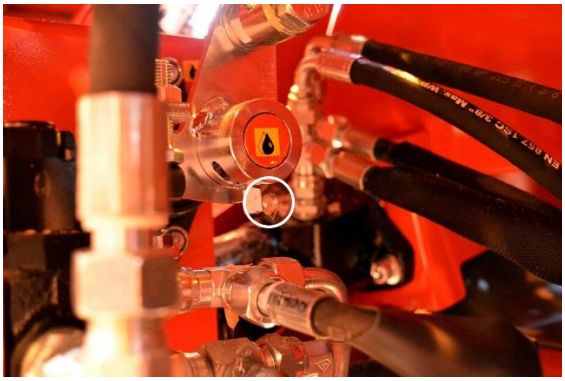


Figure 45.

Figure 46.

Figure 47.

Saw chain lubrication

The saw chain is automatically lubricated whenever the saw bar is pressed down. In other words, the oil is pressure-fed from canister B using oil pump A (Figure 45).

The amount of saw chain oil can be adjusted with adjustment screw F (Figure 46). When the screw is tightened, less oil is fed to the saw chain, and vice versa.

Inspection opening E in Figure 47 can be used to monitor the oil level. Oil should be added when there is approx. 5 cm of oil left in the canister.

Detach the protective cover of the canister by removing locking screw D (Figure 47) and lifting the protective cover using opening C.

Note! If the oil has run out and air has entered the system, the saw chain pump must be bled of air as follows:

- Add oil or replace the empty canister with a full one and place the suction hose in the canister, as in Figure 45.
- Remove hex socket screw F (Figure 46).
- Pump the piston under the screw with a hex key, for example, until oil rises near to the pump in the clear hose in Figure 45.
- Insert screw F back in place and adjust the amount of oil.

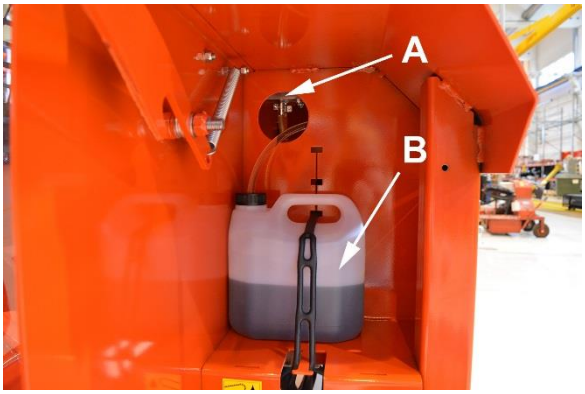


Figure 45.

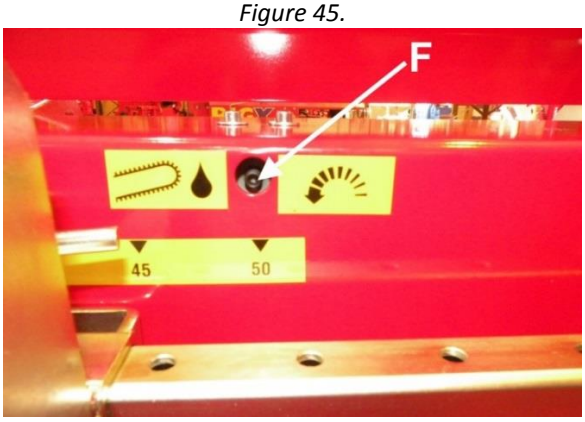


Figure 46.

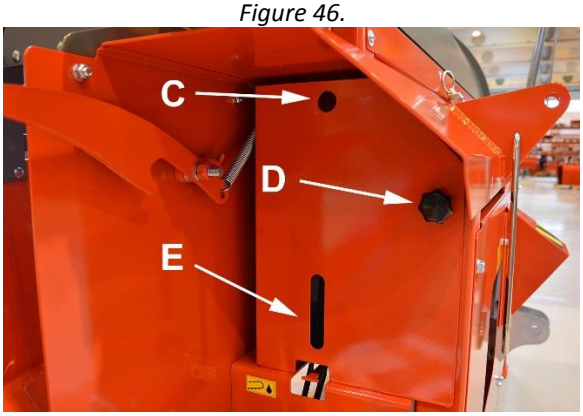


Figure 47.

4.11 PRESSURE REGULATING VALVES

The pressure regulating valves are adjusted to the correct settings at the factory. The firewood processor's guarantee is voided if the factory adjustments are changed. If you need to change the adjustments, first contact the manufacturer or retailer and follow their instructions carefully. Changing the cartridge settings incorrectly may damage the machine or render it hazardous to operate. The relief valve adjustments can be changed as follows: loosen the locking nut (or remove the protective cup) and rotate the hex socket screw clockwise or anti-clockwise (when turning the screw clockwise, the pressure increases and vice versa). Finally, tighten the locking screw. The locations of the relief valves are indicated in the following figures.

1. Cutting and splitting valve pressure regulating screw (200 bars) in Figure 48.
2. Relief valve pressure regulating screw (80 bars) in Figure 49.
3. Output conveyor relief valve (100 bars) in Figure 51.
4. Sequence valve pressure regulating screw (40 bars) in Figure 50.

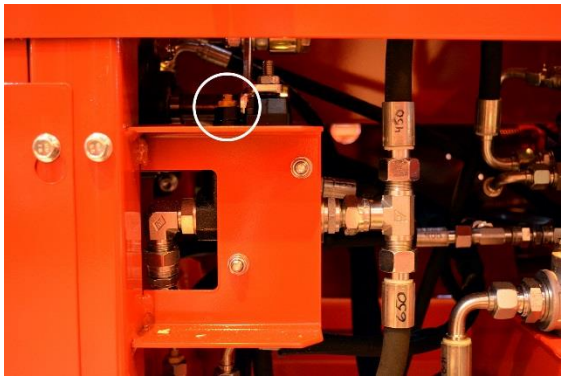


Figure 48.

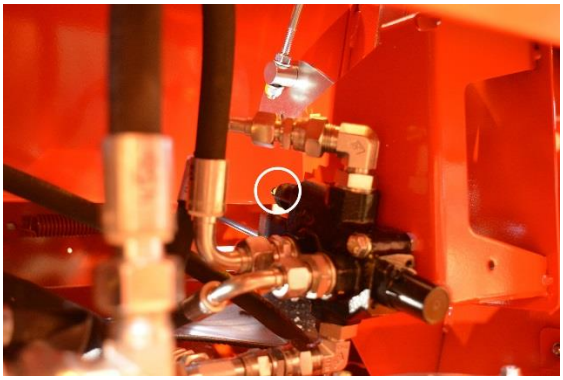


Figure 49.

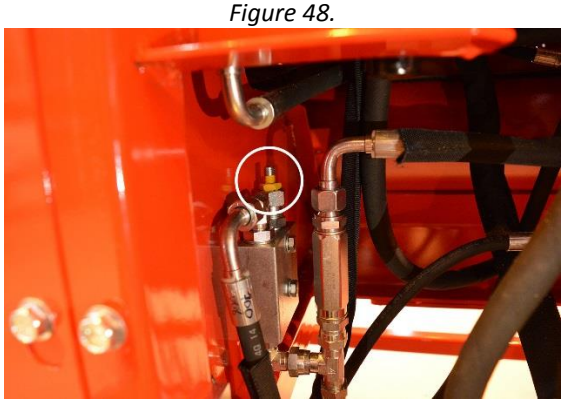


Figure 50.

Figure 51.

4.12 WASHING AND CLEANING

Loose debris and sawdust can be cleaned from the machine with pressurised air, for example. The machine can also be washed with a pressure washer, as long as the water jet is not aimed directly at the bearings or electrical equipment.

Always ensure that the machine and the working area are sufficiently clean during operation. The machine must always be cleaned after use. Clean the machine as necessary, and always before storing the machine for a prolonged time. After washing, the machine must be lubricated according to the instructions in Section 4.11.

4.13 STORAGE

The firewood processor must be stored on a level and solid foundation. Although the machine is intended for outdoor use, it should be covered and stored in a sheltered location or indoors. Before prolonged storage, the machine must first be cleaned, then washed according to Section 4.12 and lubricated according to Section 4.10.

4.14 MAINTENANCE TABLE

Target	Task	Daily	Interval 50 h	Interval 500 h	Substance/accessory item
Multiplier gear oils (TR model only)	Check (leaks) 1st change Subsequent	X	X	X	SAE 80/90 approx. 0.1 l See Section 4.8.
Hydraulic oil Normal conditions	Check 1st change Subsequent	X	X	X	Amount approx. 40 l Such as Teboil S 32
Oil filter	Always when changing oil				HEK02-20.077-AS-SPO25-VM-B17-B Spare part number: **97290**
Cutting blade	Sharpen as necessary				0.325” 66/1.5 Spare part numbers: Chain: 95148 Bar: 95145
Machine	Clean Wash	X			
Electric motor	Clean	X			
Electrical equipment	Clean/check visually	X			

Winch and strap	Check	X			

5 Failures and remedial measures

Cause-effect table for failures and their removal

Failure	Cause	Remedial measure
The splitting force is insufficient for splitting the wood.	The relief valve of the splitting and cutting valve has been tightened excessively. The seal of the splitting cylinder piston is leaking.	Clean and open the relief valve slightly by tightening the hex socket screw (Figure 48). First ask for additional instructions from your machine's retailer! Change the cylinder seals.
The input conveyor belt does not move.	The belt is too loose.	Tighten the belt in accordance with the instructions in Section 4.9 "Replacing and tightening the input conveyor belt".
The output conveyor does not move.	The belt is too loose. The output conveyor's relief valve is leaking.	Tighten the belt in accordance with the instructions in Section 4.5 "Replacing and tightening the output conveyor belt". Clean the relief valve (Figure 51) or replace it as necessary.
The cutting motion does not fully cut the log.	The path of the saw bar is incorrectly adjusted.	Lower the path of the saw bar.
The saw chain does not properly penetrate the wood.	The saw chain is dull or veers to the side (due to uneven sharpness). The saw bar is crooked.	Sharpen or replace the saw chain. File the bar to make it straight.
The machine starts but none of the functions work. The machine makes an abnormal noise.	The electric motor runs in the wrong direction.	See Section 2.4
The electric motor does not start.	The machine makes a loud noise, but does not start. The input cable is faulty.	The fuse has blown. Replace it. Replace the cable.

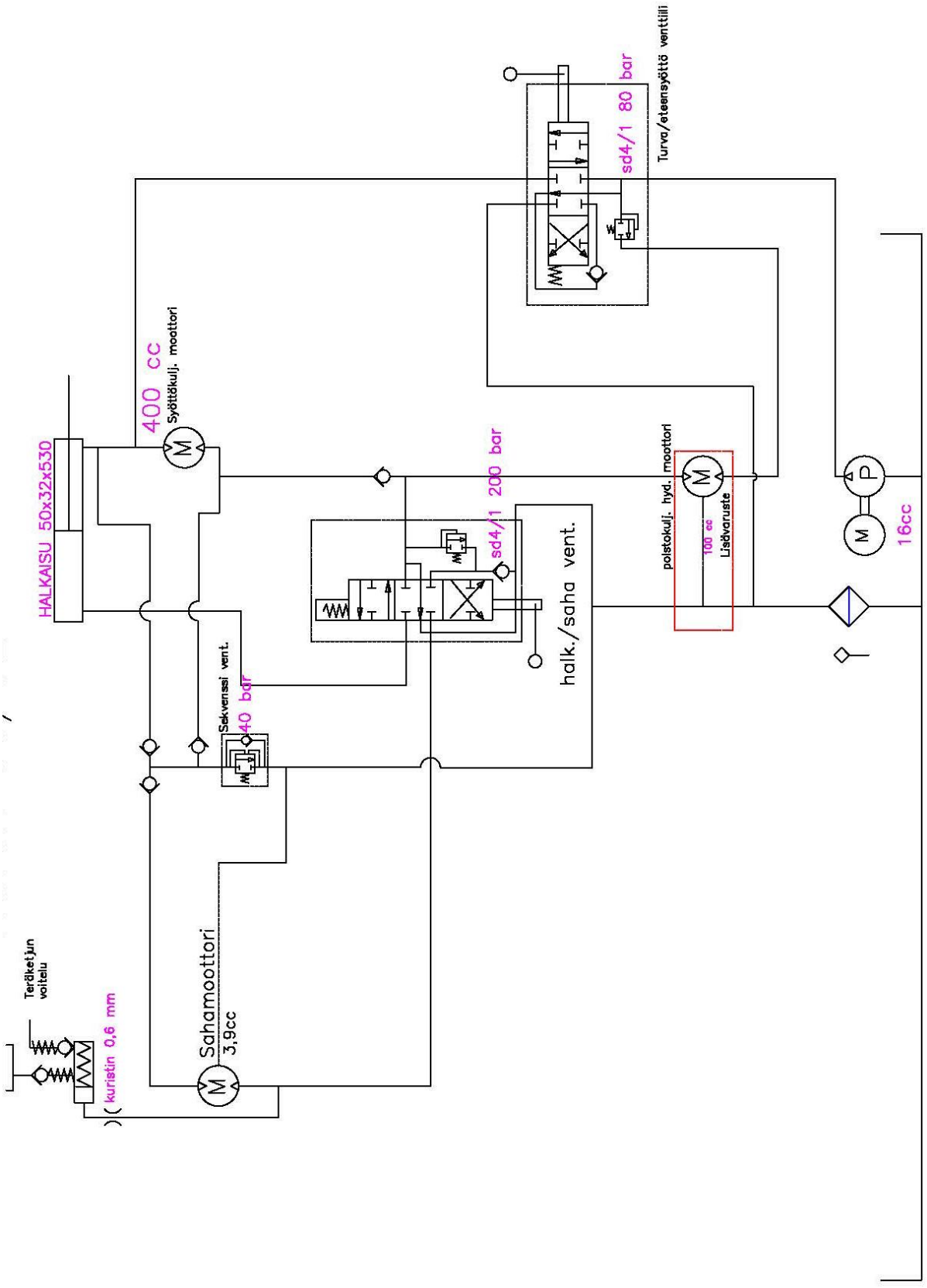
5.1 JAMMING OF THE CUTTING BLADE

If the cutting blade gets jammed in the log, stop sawing and try again on another section of the log. If the cut is **misaligned because the bar drags to one side, the sharpness of the saw chain must be checked.** A chain that is not evenly sharp will always drag towards the blunter side, which will make cutting a thick log impossible. Moreover, sawing with an evenly dull chain is inefficient, and the chain must be sharpened or replaced (see Section 4.6).

5.2 JAMMING OF THE WOOD ON THE SPLITTING KNIFE

If a piece of wood gets jammed on the splitting knife in a situation where the splitting force is insufficient to push the piece past the knife despite several attempts to do so, do the following:
Return the splitting cylinder to the initial position with lever C (Figure 15).
Ensure that the log to be split does not exceed the maximum allowable dimensions.
Lift the splitting knife to the highest possible position with lever D (Figure 15) and activate the splitting.
If necessary, cut a sufficiently thick piece of wood (approx. 10 cm), place it into the splitting groove behind the jammed piece, and activate the splitting process. The new piece will then push the bottom part of the jammed piece past the knife. Lower the knife by approx. 5 cm and repeat step 3. Repeat step 4 until the jammed wood has passed the knife, piece by piece.

6 Hydraulics diagram (tractor-operated machine)



7 Guarantee terms and declaration of conformity

We offer a guarantee on our machines, with the following conditions:

1. This guarantee covers defects caused by manufacturing or material failures, except for defects in components that are classified as parts that will sustain wear and tear.
2. The guarantee is valid for the original buyer for one (1) year, starting from the day of purchase, but for no more than 1,000 operating hours.
3. The guarantee becomes void if
    a. the instruction manual is not observed when using the machine
    b. the machine is used for a purpose other than which is defined by the manufacturer
    c. modifications are made to the operation of the machine
    d. parts that are not original spare parts are used in the machine
    e. the maintenance procedures defined in the instructions are neglected.
4. A guarantee demand has to be issued in writing immediately upon discovery of a defect to the seller or the manufacturer. Repair under guarantee requires that the customer can reliably prove that the guarantee is valid.
5. The guarantee does not include standard adjustments, user guidance, care, maintenance or cleaning procedures.
6. Repair under guarantee requires that no attempts have been made to fix the machine or a part of it before a written notification of the defect has been issued to the seller, manufacturer or importer.
7. Only service professionals authorised by the manufacturer or the importer are allowed to carry out repairs under guarantee. Washing, cleaning, or changing oils and fuels done while carrying out the said repair are not covered by the guarantee.
8. The repair work costs are compensated for according to the standards defined by the manufacturer.
9. The manufacturer of the machine is not liable to compensate for any travelling costs that may result from the repair work.
10. A spare part will be delivered free of charge when using the usual means intended for such parts, in accordance with the normal schedule.
11. The receiver is liable for costs occurring from special deliveries, such as express mail.

EC Declaration of Conformity for the machine

(Machinery Directive 2006/42/EC, Appendix II A)

Manufacturer: Maaselän Kone Oy
Address: Valimotie 1, FI-85800 Haapajärvi, Finland

Name and address of the person who is authorised to compile the technical file:

Name: Tapio Aittokoski Address: Valimotie 1, FI-85800 Haapajärvi, Finland

The aforementioned person assures that

Hakki Pilke Raven firewood processor Serial number: ……

is compliant with the applicable regulations of the Machinery Directive (2006/42/EC).

Location and date: Haapajärvi 1 July 2015

Signature:
Anssi Westerlund
Managing Director