USER MANUAL

PALAX® D360

Tractor drive
Electrical drive

SERIAL NUMBER AND YEAR OF MANUFACTURE_____

PALAX®
Lahdentie 9
FI-61400 Ylistaro, FINLAND
Tel. +358 6 474 5100
palax.fi

1 Basic information and responsibilities

1.1 Introduction

This manual is intended for operators with the appropriate expertise. The operator is required to have the general knowledge and skills needed in normal situations. For example, a person purchasing a tractor-powered machine is expected to be able to operate the tractor's cardan shaft drive.

Study the manual thoroughly before installing the machine and beginning operation. In addition, familiarise yourself with the controls and the emergency stop mechanism before operating the machine. Additional information on our company's products is available on our website at www.palax.fi.

NOTE! Always keep this manual in the immediate vicinity of the machine.

1.2 EU declaration of conformity

Directive 2006/42/EC

Manufacturer: TP Silva Oy
www.palax.fi
Lahdentie 9
FI-61400 Ylistaro
Finland
+358 6 474 5100

Person responsible
for the technical file: Timo Jussila, timo.jussila@tpsilva.fi

Product: Palax D360 & D360 Ergo
Firewood processor with 4.3-metre out-feed conveyor

Driving power: Tractor output, electric motor

Model markings: TR Tractor-powered with internal hydraulics
TR/EM Tractor or electric motor powered

Machine serial number: _____

We hereby declare that this machine meets the requirements concerning the safety of machinery specified in Government Decree 12 June 2008/400, which was instituted to bring into force Machinery Directive 2006/42/EC, and that the following harmonised standards have been applied in the design of the machine:

SFS MANUAL 93 series, SFS-EN 349-1+A1, SFS-EN 609-1+A1, SFS-EN 618, SFS-EN 620, SFS-EN 847-1+A1, SFS-EN 953+A1, SFS-EN 954-1, SFS-EN 982+A1, SFS-EN 4254-1, SFS-EN 11684, SFS-EN 12100-1+A1, SFS-EN 12100-2, SFS-EN 13850, SFS-EN 13857, SFS-EN 14121-1, ISO/TR 14121-2, SFS-EN 60204-1+A1.

TP Silva Oy
1 January 2023

Seppo Koiranen
Managing Director

1.3 Purpose of use

This firewood processor with conveyor is intended for making firewood from round timber. Using the machine for other purposes is not allowed.

Max dimensions of the wood

- Cutting power, Maximum log diameter 35 cm
- Maximum length of the wood to be cut: 4–5 m.
- A separate log deck, equipped with rollers or hydraulic input, should be used for long logs.

1.4 Warning symbols


Lue ohjekirja


Varo liikkuvaa terää

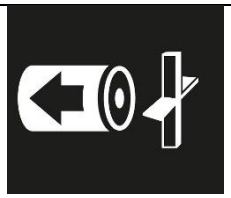

Käytä suojavaatetusta

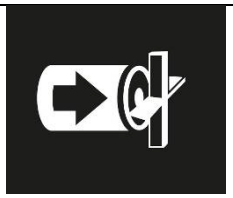

Käytä silmä- ja korvasuojaimia

Terälaipan oltava yläasennossa, jotta suoja aukeaa

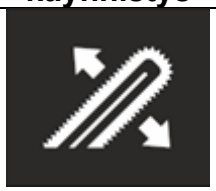

Syöttökuljettimen peruutus

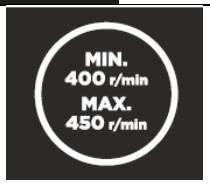

Syöttökuljettimen syöttö


Halkaisun keskeytys


Halkaisun käynnistys

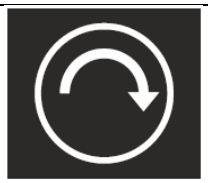

Halkaisuterän korkeudensäätö

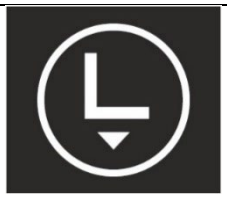

Sahaus



Nivelakselin sallittu kierroslukualue

Halkaisukourun suojaverkon avaaminen pysäyttää halkaisun


Moottorin pyörimissuunta

<table>
<tr>
<td> 
Trukin nostokohta</td>
<td> 
Nostokohta</td>
<td> 
Konetta saa käyttää vain yksi henkilö</td>
<td> 
Pysy etäällä koneen liikkuvista osista</td>
</tr>
<tr>
<td> 
Varo nivelakselia</td>
<td colspan="2"> 
Kuljettimen vaara-alue on 5 metriä kuljettimesta</td>
<td> 
Kytke kone irti virtalähteestä ennen huoltotöitä</td>
</tr>
</table>

1.5 Type plates

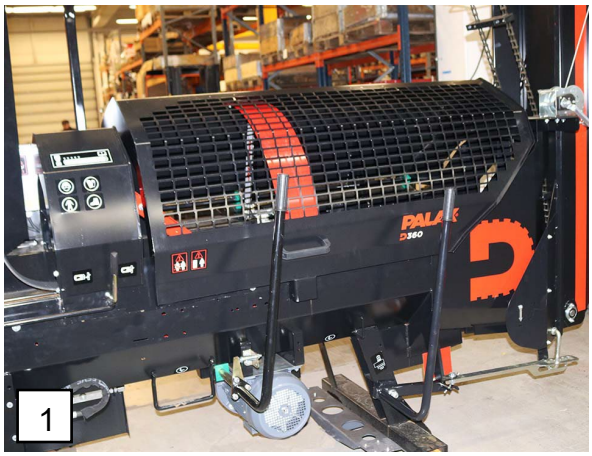
The machine's type plate

- Name and address of the manufacturer.
- Machine type.
- Production number and year.
- Machine weight.
- Chain saw bar length.
- Maximum hydraulic pressure.
- The machine type plate is located on the side of the push bar mounting cover.

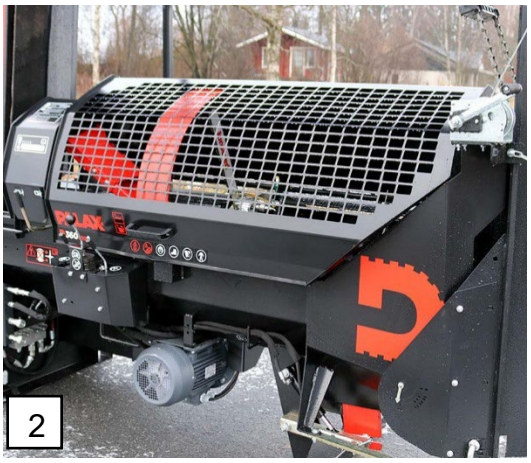
Type plates for electrical drive

- 3-phase motor
- Voltage 230/380 V or 380/600 V, may vary depending on country.
- Power 7.5 kW.

1.6 The machine's main measurements and models



PALAX D360 Ergo
With tractor or electric motor drive and mechanical steering of the cutting and splitting blades.



PALAX D360 Pro & Pro+
With tractor or electric motor drive and fully hydraulic steering of the cutting and splitting blades.

Model	D360 Ergo			D360 Pro & Pro+		
Driving power	TR	EM	TR/EM	TR	EM	TR/EM
Weight	720 kg	780 kg	800 kg	804 kg	864 kg	884 kg
Electrical drive	7.5 kW fuse size min. 25A					
Height/width/length	Transport position 239 cm/95 cm/285 cm					
Input conveyor	Length 2.4 m Height 0.9 m					
Saw bar/chain	Saw bar 15"; 325; 1.3 mm; 64 drive links					
Max log diameter	Max log diameter in cutting 35 cm					
Max/min log length	Max log length in cutting 60 cm					

- The 4.3-metre output conveyor is included in the weight.

1.7 Safety instructions

General provisions and restrictions

- Max length of log in cutting 4 metres, if log deck is not used.
- The machine has been designed solely for making firewood.
- Only one person may operate the machine.
- The danger zone of the conveyor is 5 metres around and away from the conveyor.
- When the machine is transported on public roads, it must be equipped with additional lights.
- Lift and lock the infeed table and output conveyor in their transport position for the duration of the transportation.
- Only people over 18 may operate the machine.
- Do not remove any safety devices from the machine.

Operator

- Every machine operator must read the entire manual thoroughly.
- Always use eye protection and hearing protection.

- Always use safety footwear.
- Always use work gloves.
- Do not wear loose or hanging clothing.

Before use
- Always prepare the machine and conveyor carefully for use before starting the machine.
- Ensure that no unauthorised persons are in the working area.
- Ensure that the cardan shaft is undamaged and attach the shaft guard chain in its place. The allowed rpm range of the cardan shaft is 400–450 rpm.
- Operate the machine on a sufficiently solid and even surface.
- Only use the machine with sufficient lighting.
- For tractor-powered machines, ensure that one drawbar is attached, and ensure sufficient space for the cardan shaft and its guard.
- Always check that all the guards and covers are undamaged and attached.
- Always check the condition of the saw chain.
- Always check the condition of the power cables.
- Always check the operation of all control equipment.
- Always check that the machine has a sufficient amount of oil and that the hydraulic hoses and components are undamaged.
- Ensure that the machine is standing firmly in place before starting operation.

During operation
- Careless sawing may cause severe hazard!
- When sawing, ensure that the sawing point of the log corresponds to the cutting table support roll, as incorrect placement may cause the log to spin, causing damage.
- Be careful when sawing logs with branches or turns, as incorrect sawing may cause the log to spin or bend the saw bar, causing it to break.
- Keep the working area clear of unnecessary items.
- Always stop the machine and disconnect the supply cable or cardan shaft before conducting maintenance.
- Only saw one log at a time.
- Danger! Stay clear of moving parts.

1.8 Noise and vibration
- The A-weighted sound pressure level at the working location is 89.5 dB (A), and the sound power level 100.5 dB (A).
- The vibration values do not exceed 2.5 m/s2.

1.9 Operator’s responsibilities
- The machine may only be used for making firewood.
- **All of the machine’s safety devices are necessary** for ensuring a sufficient level of safety.
- The Palax KS 35 is a very safe machine when it is operated according to the instructions, the maintenance operations are carried out regularly, and it is used carefully.
- **The machine’s operator is responsible** for making sure that the safety devices are undamaged and that the machine has been adequately serviced before commencing operation.
- The operator is responsible for ensuring that the machine does not cause danger to others.
- Altering the machine’s structure is prohibited.

- Using the machine while under the influence of alcohol or drugs is prohibited.
- Keep in mind that the operator is responsible for any accidents that may occur if safety devices have been removed from the machine.

1.10 Operating conditions

- Always place the machine as level as possible.
  - Organise the environment so as to minimise any danger, such as a risk of slipping in winter.
  - When starting the machine in extremely cold weather, the machine should be run at approximately 1/4 of the maximum rpm for 5–10 minutes in order to warm the oils up and make them move easier.
  - Only use the machine with sufficient lighting.
  - It is recommendable to acquire or build a suitable rack for the logs to be processed, which will allow them to be on the level of the infeed table of the firewood processor. This minimises any unnecessary lifting and makes the work considerably faster. We recommend using the Palax Mega log deck or the Palax Log rack.
  - The optimal operating temperature range is approximately -20 – +30 degrees Celsius. There are no restrictions in regard to weather conditions.
  - Make sure that there are no children or unauthorised persons in the working area.
  - Never operate the machine indoors, as the dust and exhaust gases may cause a hazardous situation.

1.11 Guarantee terms

The guarantee period is 12 months from the purchase date of the machine.

The guarantee covers

- Parts damaged in normal use due to faults in the material or workmanship.
- Reasonable repair expenses in accordance with the agreement between the seller or buyer and the manufacturer.
- A new part delivered to replace a faulty one.

The guarantee does not cover

- Damage resulting from normal wear and tear, improper use or neglecting maintenance.
- The saw bar, drive wheel, saw chain, and input conveyor belt are wear parts which are not covered by the guarantee.
- Defects in a machine to which the buyer has carried out or commissioned changes to the degree that the machine can no longer be considered equivalent to the original machine.
- Other potential costs or financial obligations resulting from the procedures mentioned above.
- Indirect costs and/or travel costs resulting from guarantee repairs.
- The guarantee for parts replaced during the guarantee period of the machine expires at the same time as the machine’s guarantee.

1.12 User instructions for the winch

More detailed instructions for the use of the winch can be found in the winch manual on our website at www.palax.fi.

2 Receipt and assembly of the machine

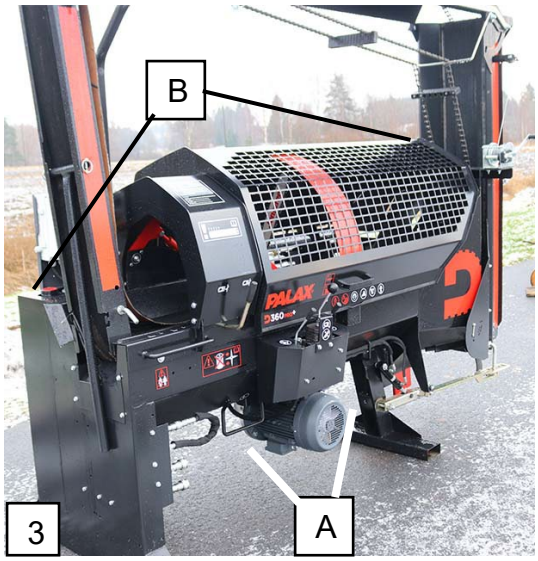
2.1 Delivery and delivery inspection of the machine

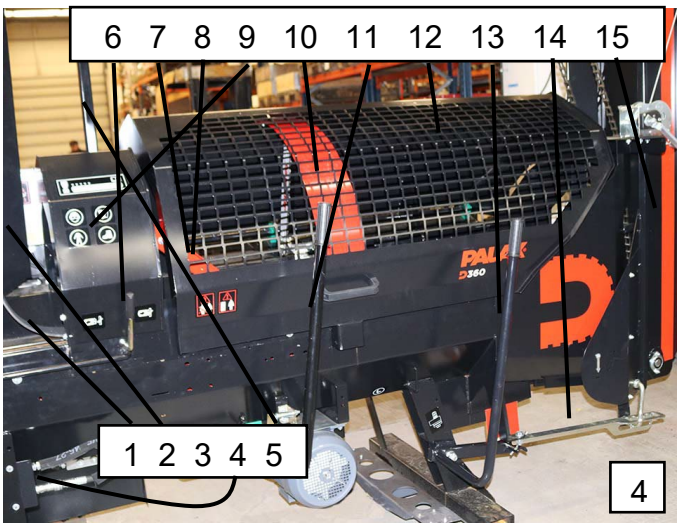
- The machine is delivered almost fully assembled, always tested and with adjustments made.
- In order to avoid damage during transportation, the adjustment levers for the cutting and splitting blades in the Ergo model are packaged separately.
- Inspect the delivery immediately.
- In case of any damage caused during transport, contact the driver and the company that sold the product.

2.2 Lifting and moving the machine, figure 3, all models

The machine can be lifted from the following places.

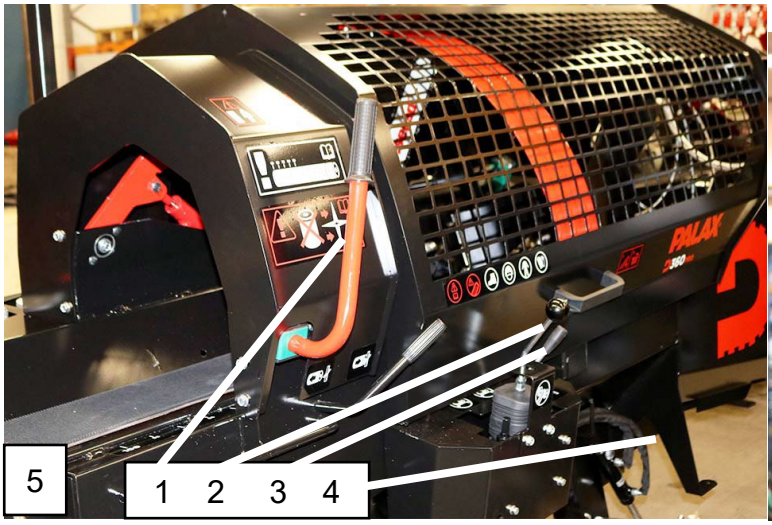
- From lifting point A on the upper side of the blade casing, using a lifting strap.
- From points B under the frame on both sides of the machine, using a forklift.





2.3 Main components of the machine, figure 4

1. Input belt
2. Extension
3. Extension support leg
4. Additional hydraulics
5. Conveyor support
6. Manual activation for splitting
7. Spring-loaded wood gripper as standard accessory, Ergo
8. Hydraulic wood gripper, accessory
9. Protective casing for input conveyor
10. Blade casing
11. Cutting operating lever, Ergo
12. Splitting groove guard mesh
13. Adjustment lever for the splitting blade, Ergo
14. Conveyor twist lock
15. Conveyor

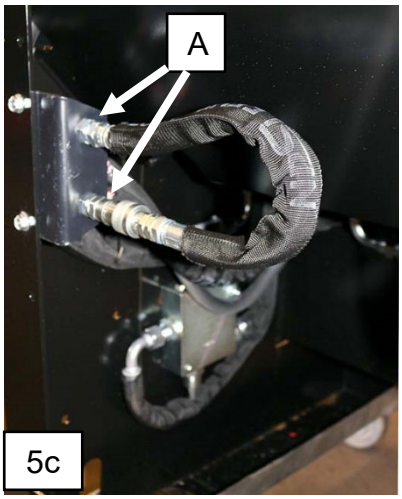


2.4 Main components of the machine, Pro and Pro+ models, figure 5

1. Hydraulic wood gripper
2. Joystick lever, hydraulic operation of the input conveyor and cutting blade
3. Height adjustment lever of the splitting blade
4. Adjustment cylinder of the splitting blade

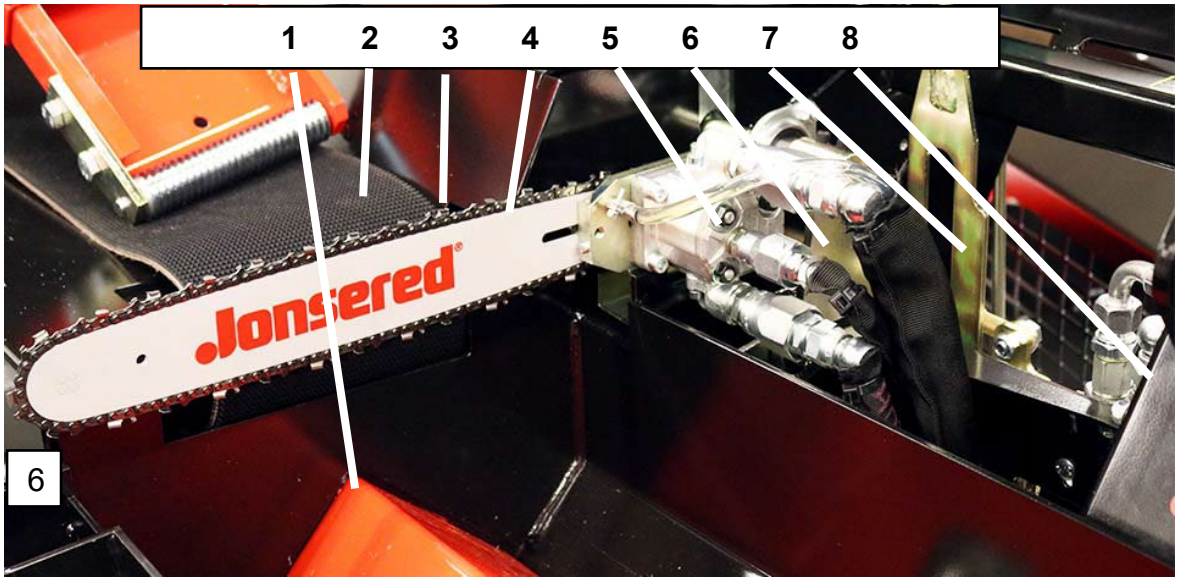
Oil cooler, accessory, figure 5B

- The oil cooler is an accessory suitable for tractor and electrically powered models. We recommend using the cooler if the machine is continuously being used in warm conditions. The cooler is operated by the thermostat.
- In the tractor-powered model, the 12 V operating voltage for the cooler is received from the tractor's 12 V light socket, and in the electric model, from the machine's electric centre.



Additional hydraulics, all models, figure 5C

- Additional hydraulic connectors, A, are intended for operating accessories such as the log rack feed rollers.
- Accessories connected to the additional hydraulic connectors operate when the input belt operates.
- When you detach the accessory, be sure to connect the hose into its place, as shown in the figure.



2.5 Main components, figure 6, all models

1. Buffer
2. Input belt
3. Drive roller
4. Saw bar
5. Saw motor
6. Motor release lever
7. Safety wedge
8. Rear stop

2.6 Main components, figure 7, all models

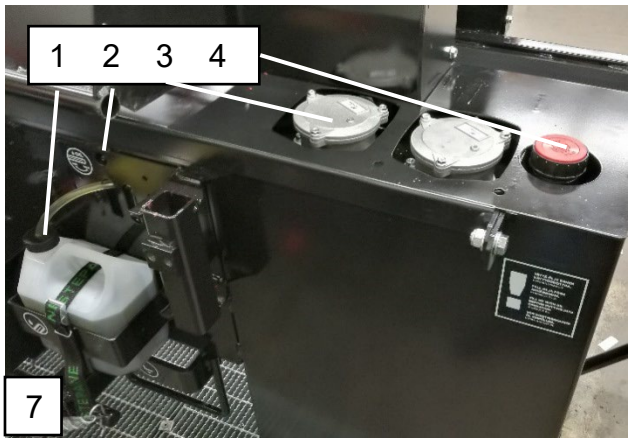
1. Chain oil filler cap
2. Lubricant
3. Filter
4. Hydraulic oil filler cap

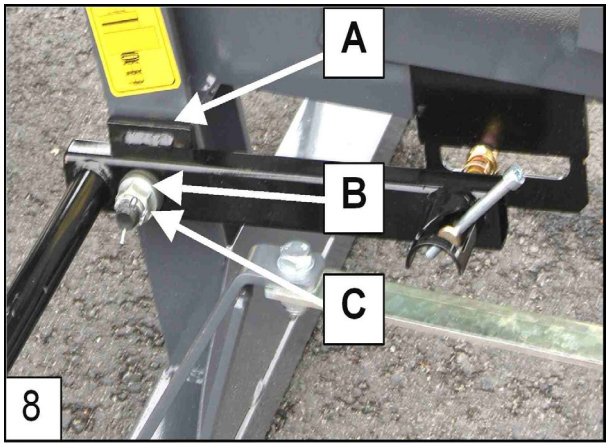
2.7 Adding hydraulic oil, figure 7, all models

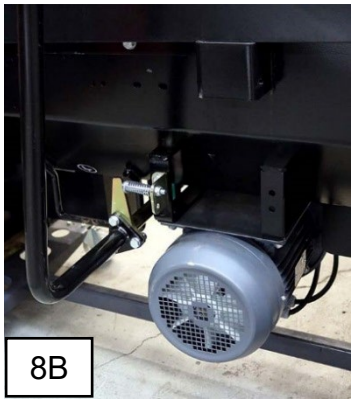
- Amount of oil 70 litres, amount of oil to be changed.
- Oil quality e.g. Univis 32, SHELL Tellus 32, NESTE HYDRAULI 32, or equivalent.
- Only use new, clean oil.
- Be particularly careful with the cleanliness of the oil, because the operation of the machine depends on clean oil.
- The level of oil must be at least 2 cm above the lower end of the oil cap dipstick.

2.8 Adding chain saw oil, figure 7, all models

- The tank capacity is approximately 3 l. It is recommended to change the can when it is empty







2.9 Installing the splitting blade adjustment lever, figure 8, Ergo

1. Remove the cotter pin, nut, and Belleville washers.
2. Set the adjustment lever in its place so that friction disc A stays between the bolster plate and the lever.
3. Set the adjustment lever in its place.
4. Set Belleville washers B according to the instruction sticker.
5. Attach crown nut C, adjust the tightness of the lever, and replace the cotter pin.

2.10 Installing the cutting blade adjustment lever, figure 8b, Ergo

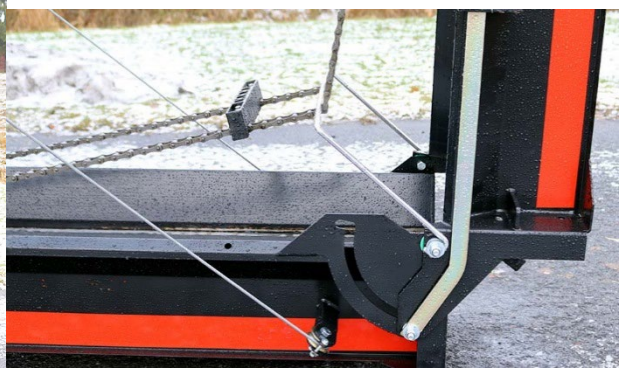
- Attach the adjustment lever to the shaft with three screws.

2.11 Placing the conveyor in working position, figures 9 and 10

1. Open conveyor lock A and locking chain B, figure 9.
2. Loosen the winch wire a few turns.
3. Pull out the conveyor so that it is supported by the winch wire.
4. Use the winch to lower the conveyor to the ground.
5. Pull open lock A, figure 10.
6. Turn the conveyor end down.
7. Remove conveyor chain handle B, figure 10, and place it in holes C on the side of the conveyor.

2.12 Placing the conveyor in transport position, figures 9 and 10

- Lower the conveyor to the ground, attach conveyor chain handle B.
- Pull open lock A and lift the end of the conveyor in an upright position.
- Ensure that lock A closes properly.
- Lift the conveyor up using the winch.
- Tighten the winch wire lightly so that it cannot become loose on the reel.
- Use the lock, chain, and fastening pin to attach the conveyor to its supports.



WARNING!

Always hold on to the winch handle when lowering the conveyor.

3 Description of the function of the Palax D360 firewood processor

3.1 Power transmission of the machine

- All of the operating equipment of the machine, including the input and output conveyors and the chain saw, are equipped with hydraulic motors.
- The hydraulic dual pump in tractor drive is equipped with a gearbox and cardan shaft drive, or an electric motor drive.

3.2 Using the Palax D360 Ergo model with mechanical steering, figure 11

- Push the control stalk A forward to feed the log on the input conveyor.

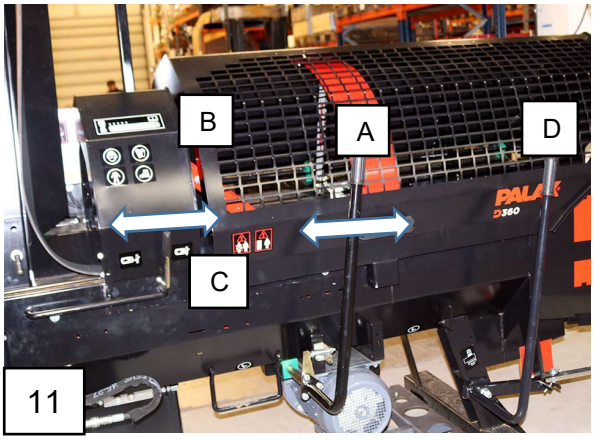
Wood gripper

- The spring-loaded wood gripper B pushes the log to the input belt, keeping the log in place during sawing.
- When sawing short or otherwise small logs, it is useful to press lever B on the wood gripper to ensure that the log stays in place during sawing.

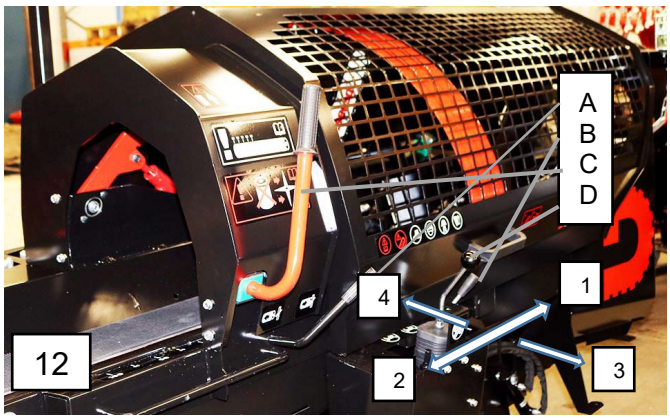
Log cutting

- The cutting motion is started by pulling control lever A backwards.
- Splitting starts automatically when lever A is pushed forwards to the input position after cutting.

NOTE! The input conveyor cannot be reversed. If you need to remove a log, use e.g. timber tongs to pull the log out, and lighten wood gripper B.



11



12

3.3 Operating levers for the fully hydraulic steering of Palax D360 Pro and Pro+, figure 12

Splitting activation and stopping lever A

- Usually, splitting is started and stopped automatically.
- The manual lever is needed in case of disturbances, and for starting the splitting for the final piece of log.

Splitting blade hydraulic operating lever B

Hydraulic wood gripper operating lever C

- The gripper automatically locks the log when a cutting motion is performed using joystick D.
- Use the manual lever for lightening the gripper when feeding small or light logs, or when a disturbance requires backing out the log.

Operation of joystick lever D

- Input conveyor forward, direction 1
- Input conveyor reverse, direction 2
- Cutting, direction 3
- Lifting the cutting blade and automated starting of splitting, direction 4

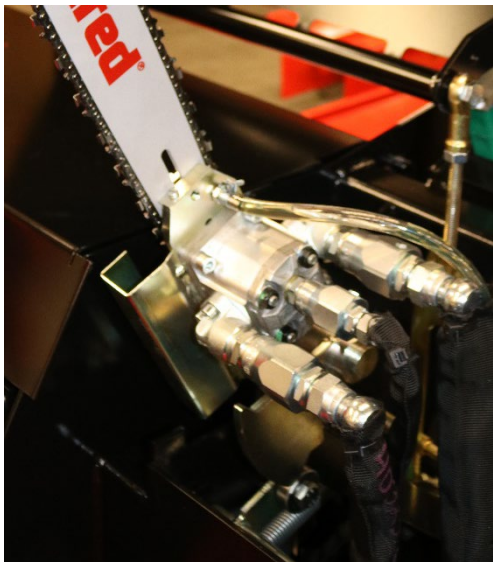
3.4 Lubrication of the chain saw, figure 13

- The machine has an automated lubrication device which uses saw chain oil.
- The machine has a piston pump with force-feeding and an accurate and adjustable oil distribution. The amount of oil can be adjusted between 0.3 and 0.7 ml/cutting.
- The tank capacity is approximately 3 litres. The dosing pump has been adjusted at approximately 0.5 ml/cutting.

NOTE! This amount of oil is sufficient for lubricating the chain well under normal circumstances. When many thick logs are being cut, the amount of oil should be increased. The amount of oil can be temporarily doubled by lifting the cutting blade up in the middle of cutting.

3.5 Adjustment of the amount of oil

- Open the adjustment screw locking nut.
- One inward turn of adjustment screw A decreases the amount of oil by approximately 0.08 ml.
- One outward turn increases the amount of oil correspondingly.



3.6 Checking the amount of oil, figure 13 b

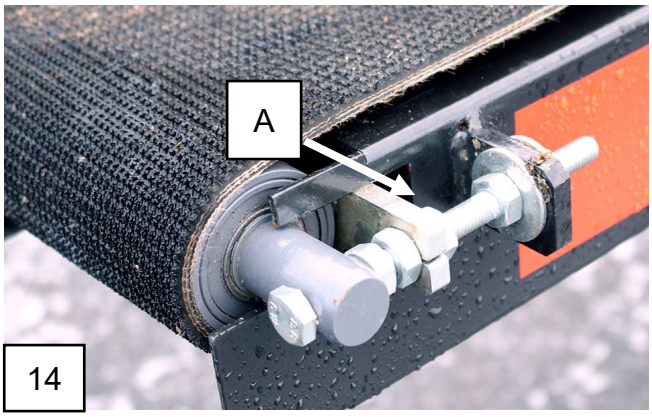
NOTE! The machine must be stopped and disconnected from any power sources before conducting any maintenance procedures.

- If the oil in the hose rises by approximately 10 mm during the cutting motion, the amount of oil is 0.5 ml/cutting.
- Oil is being distributed to the chain evenly throughout the motion.

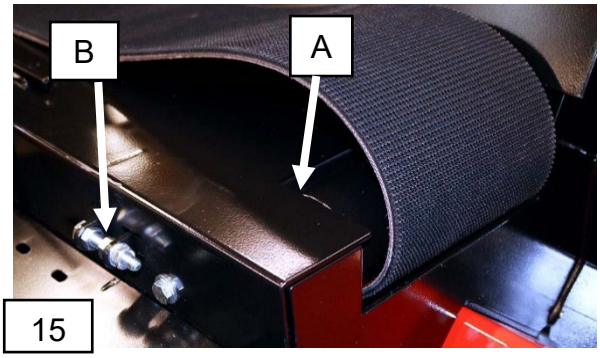
NOTE! The oil level must always be visible in gauge tube C, figure 13, as the pump takes oil on the lower end level of the gauge tube.

3.7 Input conveyor, figures 14 and 15

- The hydraulic motor-driven input conveyor is 200 mm wide and 2,200 mm long.
- The input conveyor's drive roller and folding roller have efficient scrapers that keep the rollers clean and prevent snow from being caked onto the rollers in winter, for example.
- The blade end of the input conveyor has an adjustment screw which controls the path and straightness of the belt. 15B



14



15

NOTE! The input conveyor belt is a wear part, but using it correctly increases its service life considerably.

Using the belt correctly

- Do not pull logs from the ground using the belt, because the belt sliding under logs will cause excessive wearing.
- Stop the input immediately when the log hits the back stopper.
- Use a log rack equipped with freely spinning rollers or hydraulic input to make processing the logs easier.
- Always ensure that the belt is sufficiently tight.
- Ensure that the belt does not drag against the sides of the table, adjust as necessary.
- When replacing the belt on the machine, ensure that it is installed the right way.

16

3.8 Output conveyor, figure 16

- The length of the output conveyor is 4.3 m and width 0.27 m.
- The conveyor is folding and pivoting, and its power transmission is equipped with a hydraulic motor.
- The conveyor is equipped with two chains and polyethylene plates.
- The upper end of the conveyor has automated chain tensioning.

3.9 Tractor drive

- Always attach the machine to the tractor's lifting gear.
- The suitable cardan shaft size is for example BONDIOLI 145 or WALTERSCHEID W 2100.
- The cardan shaft does not require a safety switch.
- Only use undamaged shafts and attach the guard chains to the machine.
- Ensure that the cardan shaft can move freely.
- Support the cardan shaft using the support hook in the machine when detaching the shaft from the tractor.

NOTE! When starting the machine in cold weather, the machine should be run at lower rpm for 5–10 minutes in order to warm the oils up. The maximum speed is 450 rpm.

3.10 Electrical drive

- The motor's power is 7.5 kW and speed approximately 1,450 rpm.
- The machine has an automated wye-delta starter with emergency stop function.
- All electrical installations are assembled.
- In a 380 V system, the fuse size is 25 A slow.
- A 6 mm2 extension cord is required.
- When starting to use the machine, check that the rotation direction corresponds to the direction of the arrow on top of the motor.

- Check the rotation direction by starting the motor for a brief moment and stopping it immediately.

NOTE! Only qualified personnel may perform the electric work required for changing the rotation direction.
Use an extension cord with a rotation direction inverter which can be used by turning it with a screwdriver.

Starting the electric motor

- The machine has an automated wye-delta starter.
- Push the start button. The motor starts to run slowly in the Y position on low power. The starting phase may take close to a minute.
- When the motor rotation speed increases, the D position is switched on and the motor will quickly achieve full speed. As the D position is turned on, an indicator light is turned on between the start and stop buttons.

NOTE! Do not use the machine before the motor reaches full speed, because the electric motor has very low power in the Y position.

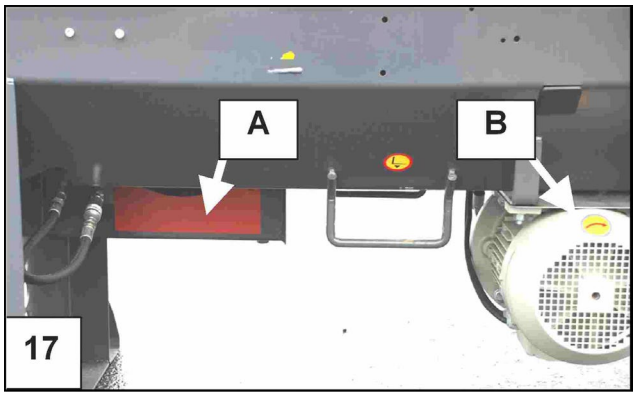
3.11 Heating the oil tank in an electrically-powered machine.

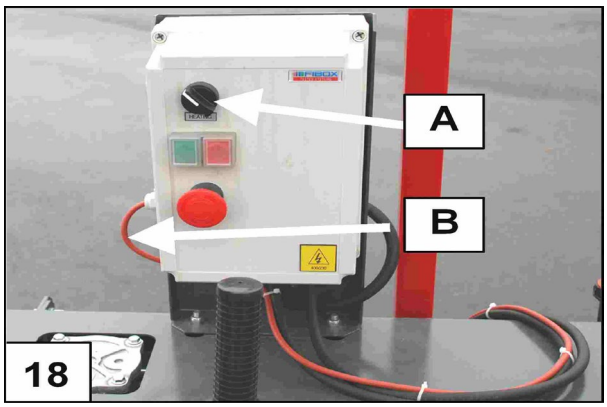
Accessory for cold conditions

- In sub-zero temperatures, hydraulic oil is cold and quite stiff. The firewood processor has parts which move in the starting phase, such as the conveyor driven with a hydraulic motor and two oil pumps.
- The electric motor always tries to start quite quickly. Stiff oil may cause the thermal relay to be triggered and starting to be prevented.
- If the machine is being used in sub-zero temperatures, we recommend equipping it with oil tank heating pad A.

3.12 Oil tank heating pad, figures 17 and 18

- The pad is attached to the lower part of the tank, figure 17 A.
- The pad's power is 300 W.
- It is equipped with a thermostat which prevents overheating.
- One hour of heating is sufficient at -15 degrees, for example.
- Heating operating switch, figure 18 A. The switch is a standard accessory in the starter box.
- Heating pad cord, figure 18 B.





4 Using the firewood processor, sawing wood

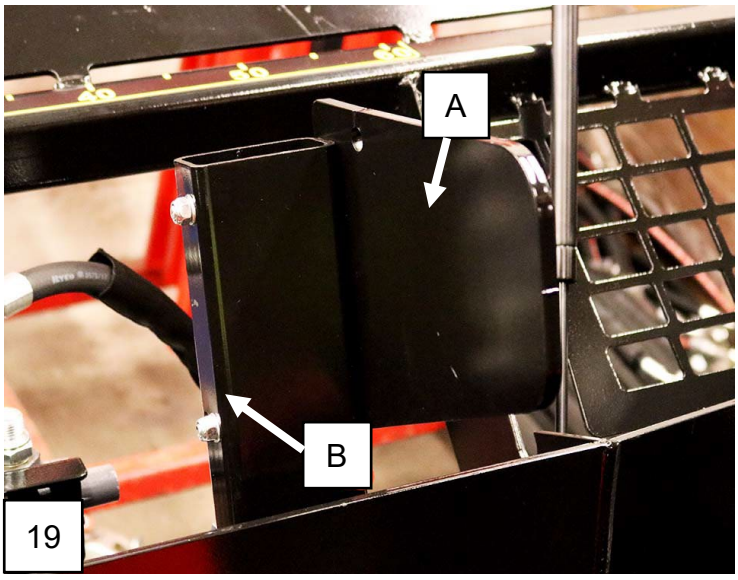
- The machine is intended to be used by one person at a time.
- Never leave a ready-to-use machine unattended.

4.1 Preparing the machine for operation

1. Place the output conveyor as instructed in step 2.7. Attach the locking chain back to its slot.
2. Place the input conveyor in a level position.
3. Put the support leg's rubber fastening in its place.
4. Adjust the rear stop to the correct distance.

NOTE! The rear stop plate is always installed to the right side of the fastening pipe, as shown in figure 19.

- This setting allows sawing logs to a length of 28 cm and longer.
- If you wish to saw logs to a length of 25 cm, for example, the rear stop plate must be attached to the left side of the fastening pipe. In this case, the fastening bolts must be installed in the rear holes, figure 19 B.



19

4.2 Inspecting the chain saw lubrication device

- Check through the gauge tube that there is oil in the tank.
- Check the oil level in the transparent hose attached to the saw bar.
- If the machine has not been used for some hours, the oil level may decrease from the upper part of the hose to the saw bar. In this case, perform some sawing motions using the saw or pump operating levers in order to raise the oil level back up.
- The pump has a backflow valve which stops the oil from running from the hose back to the tank.

4.3 Chain saw

- Check the tension of the chain, tighten as necessary.
- Check the sharpness of the chain, and if necessary, sharpen or replace the chain.
- Do not saw using a dull chain.

4.4 During sawing

- Be very careful and always keep your hands away from the blade.

NOTE! Always saw one log at a time. Otherwise, one of the logs may spin, causing the blade to bite strongly into the wood, and cause a dangerous situation.

4.5 Sawing logs

- Press the blade lightly and evenly to the log.
- Support the log with the wood gripper.
- Exercise extreme caution when sawing curved logs or logs with branches.
- Ensure that the log always runs along the back end of the input belt.

4.6 Disturbances in sawing and correcting them

Curved logs

- Saw curved logs along the curves.
- When sawing curved logs, always ensure that the sawing point of the log corresponds to the infeed table.

Large logs

- Check that the rotation speed of the cardan shaft is correct, max 450 rpm.
- If the sawing sound is soft, the speed and blade cutting speed are correct.
- If the sawing sound is strong and abrupt, the blade feeding to the log is too strong and the sawdust grooves may be blocked.
- Check the rotation speed or reduce the cutting speed.

Sawing small logs

- Ensure that the log runs along the back end of the infeed table.
- Only saw one log at a time.
- Always press the chain lightly to small logs.
- Always use the wood gripper.

4.7 Sawing the last log

- Logs will usually leave one shorter piece.
- Cut it from a longer log using the measurement scale in the table.
- For example, if you are cutting the logs into pieces of 33 cm, even out the length of the log when approximately 66 cm remains. This will allow the shorter piece to fall to the correct position in the splitting groove.
- The rest can now be cut safely, and the log remains below the wood gripper when being cut.
- The final piece can be fed directly to the buffer, and splitting can be started using the manual control lever.

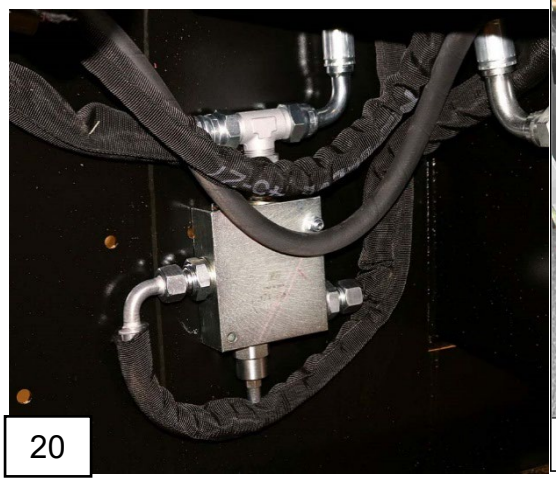
5 Using the firewood processor, splitting wood

5.1 Splitting cylinder

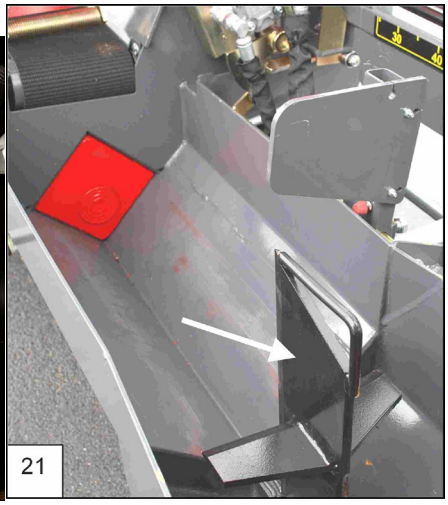
- Splitting cylinders of 3.5, 5.6, or 8.0 tonnes can be installed in the machine.

5.2 Automatic rapid motion valve, figure 20

- Accessory in the Ergo model, standard in the s model.
- If the machine is equipped with an automatic rapid motion valve, the splitting is set to the rapid motion by default.
- If necessary, the speed may slow down temporarily when thick logs require more splitting power. When the log begins to split, the required power decreases and the splitting motion returns to the rapid setting.
- The automatic rapid motion valve makes the splitting significantly faster, while reducing the stress to the power transmission. The automatic rapid motion valve can also be retrofitted as an accessory.



20



21

5.3 Splitting blades

Short straight blade, accessory

- A short, straight blade can be used to cut logs into two parts. When the blade is lowered, splitting does not take place.

A 2/4 blade, standard equipment, figure 21

- A standard blade for splitting the log into two or four parts.

A 2/6 blade, accessory

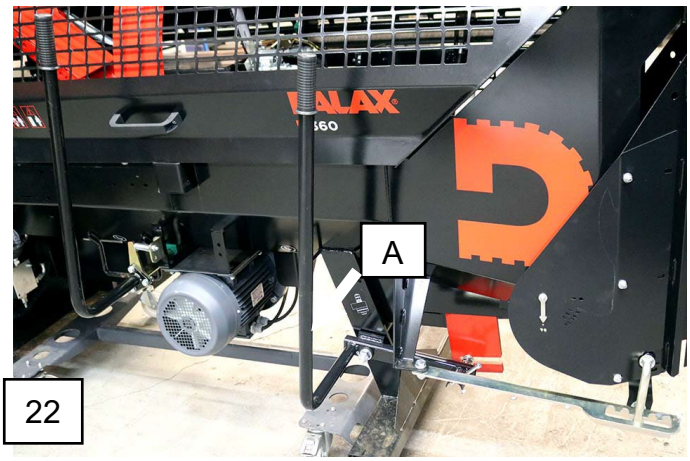
- This blade will split the logs into two or six parts.
- Usually requires a 5.6 or 8-tonne cylinder.

5.4 Manual adjustment of the splitting blade, figure 22

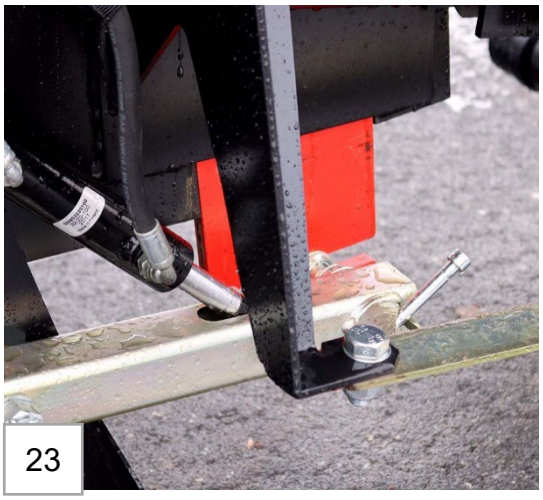
- The firewood processor has a manual splitting blade adjustment lever as standard equipment.
- The lever has friction disc A, which always keeps the blade on the correct height.

- The tightness of the lever can be adjusted by tightening the Belleville washers on the friction disc.

NOTE! Do not use grease on the friction disc.



22



23

5.5 Hydraulic adjustment of the splitting blade, s model, figure 23

- The splitting blade can be adjusted hydraulically by using the lever on the cutting table, figure 24A.
- In hydraulic adjustment, a small branch flow is separated from the main oil flow using the flow control valve.

5.6 Disturbances in splitting and solving them

Stuck log

- In case of large logs with large branches, the cylinder power may not be enough.
- When a log gets stuck to the blade, return the cylinder using the manual start/stop lever.
- Lift up the splitting blade and try splitting manually. Turning the log into a different position often helps.
- If the log does not split, open the guard mesh, which returns the cylinder to the back, locks the control valve, and allows the log to be removed safely.
- If the log has a large branch, position the log with the base end facing the blade, which allows the large branch to be split with the minimum amount of power.

Safely resplitting logs

- If you need to make small firewood from a large log, the pieces which have been split once into 4 or 6 parts may be too large.
- Below are the instructions for safely resplitting the firewood.

1 Open the guard mesh.
2 Place the logs to be split into the splitting groove, for example two pieces over each other. Grab them lightly to the blade to keep them in place.
3 Close the guard mesh.
4 Restart splitting using the manual start lever.

6 Effects of the safety devices on the machine's operation

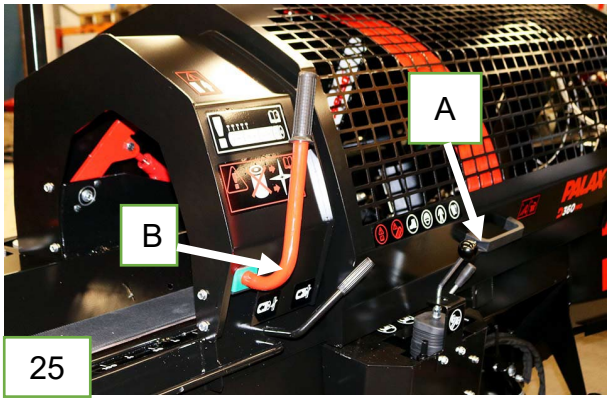
6.1 Splitting groove guard mesh A, figure 25

- The guard mesh must always be closed when the machine is used.
- The chain saw does not work with the mesh open.
- The splitting cylinder does not work with the mesh open.
- If you open the mesh in the middle of splitting, the motion stops and the cylinder returns to its back position.

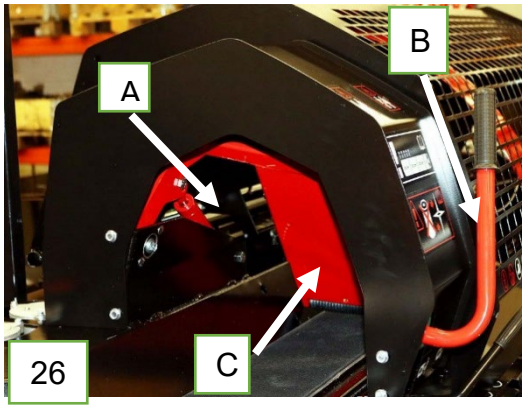
6.2 Active wood gripper B, figure 25

- A spring-loaded or hydraulic wood gripper, figures 25, 26, and 27, is an easy-to-use device for preventing the log from moving during sawing.
- The grooved roller on the wood gripper efficiently prevents the log from spinning during its sawing. The weight of long and straight logs will keep them straight on the table during sawing.
- Short and thin logs always require using the gripper, because otherwise the saw may bite too strongly into the small log and cause a dangerous situation.

The power of the gripper can be increased using lever B, if necessary.



25



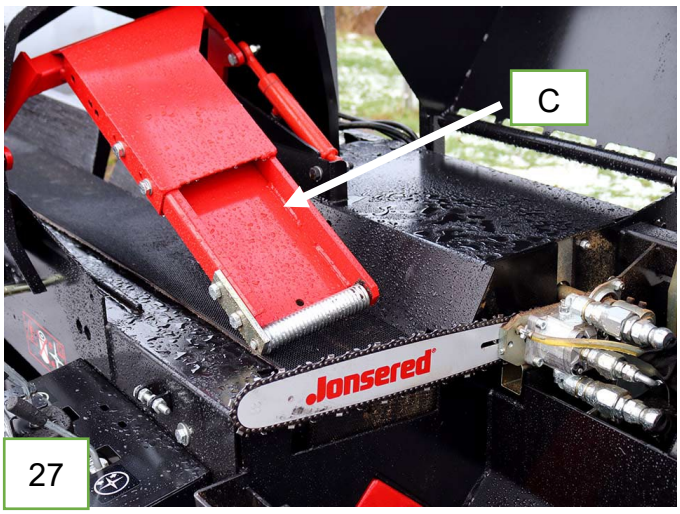
26

6.3 Spring-loaded wood gripper in the Ergo model, figure 26

- Spring A keeps the gripper always gripped to the log.
- The gripper's manual lever B can be used to increase the pressing force for short and light logs.

6.4 Wood gripper with hydraulic cylinder in the S model, figure 27

- When the cutting motion is started, gripper C presses the log immediately against the input conveyor, thereby preventing the log from moving while being sawn.
- When the cutting blade is lifted, the pressure is removed from the gripper's cylinder, and the log can be moved to the rear stop for the next cutting.
- The active gripper increases safety and reduces the amount of faults and failures.

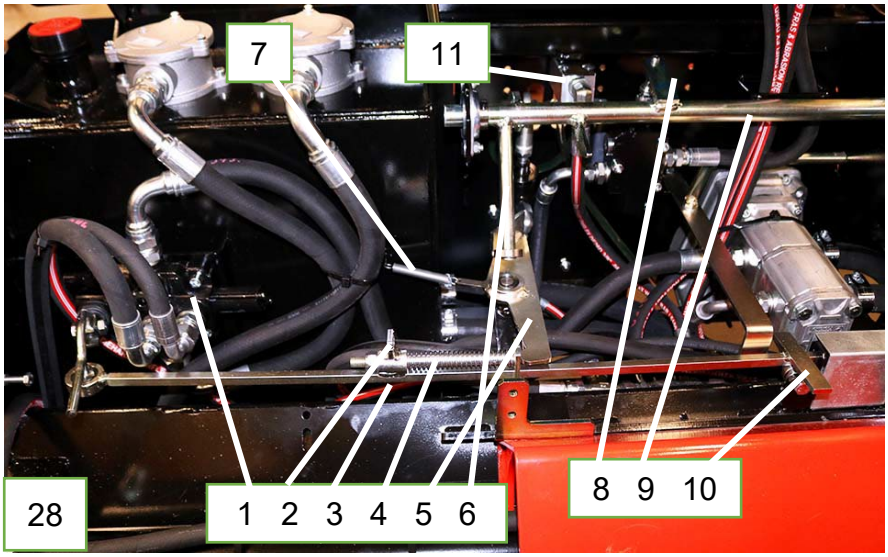


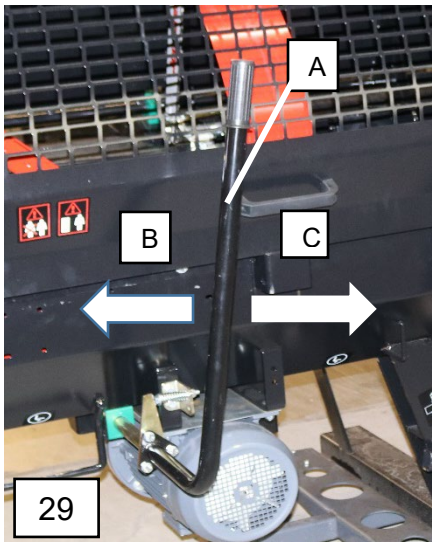
NOTE! **All of the machine's safety devices are necessary for ensuring a sufficient level of safety.**
No safety devices are to be removed, and the user is responsible for ensuring that the devices are undamaged.

7 Operation of cutting, splitting, and the input conveyor, Ergo model

7.1 Part names, Ergo model, figure 28

1. Splitting valve
2 Manual control lever
3 Trigger bar
4 Spring
5 Control lever
6 Trigger
7 Spring
8 Saw motor and input conveyor valve
9 Multifunctional shaft
10 Limiter
11 Oil pump





7.2 Operation principle of cutting, splitting, and the input conveyor, Ergo model

Cutting

- Pull control lever A in direction B, figure 29.
- Multifunctional shaft 9, figure 28, turns and shifts trigger 6 back.

Splitting

- Push control lever A in direction C, figure 29. Trigger 6 for multifunctional shaft 9 pushes release lever 5, causing spring-powered release bar 3 to start splitting valve 1.
- The splitting cylinder performs one stroke and automatically returns to its starting position.
- The chain saw stops when control lever A returns to the front against the spring-powered limiter.

Log input

- Push control lever A in direction C against the spring-powered limiter.
- Multifunctional shaft 9 starts valve 8, and the input conveyor feeds the log to the rear stop.

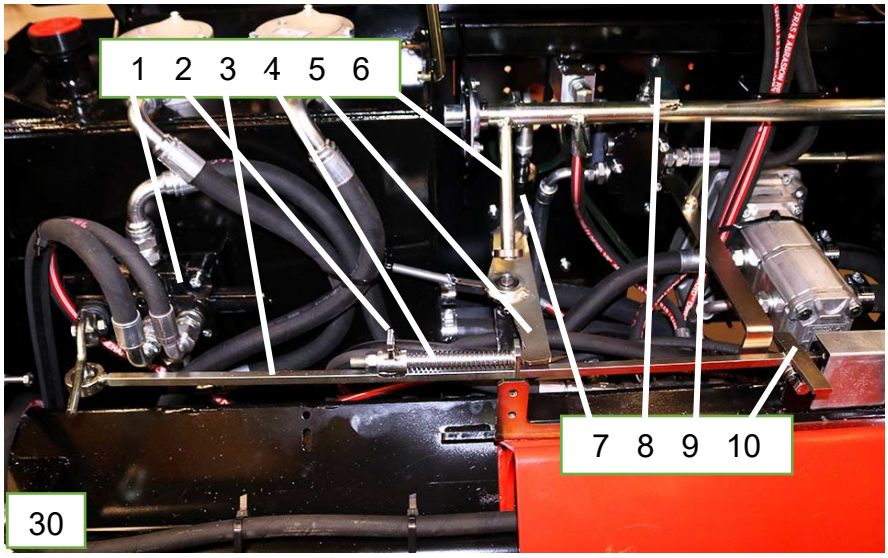
Manual activation and stopping of splitting

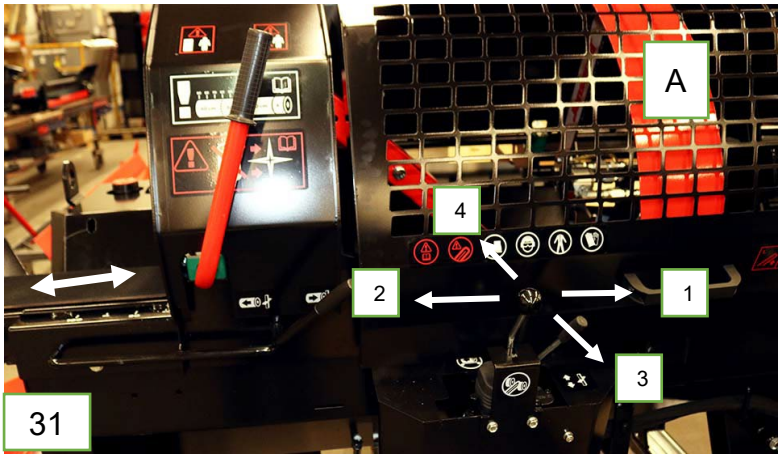
- Splitting can also be activated by pressing the manual control lever 2 to the right.
- The manual control lever affects splitting valve 1, figure 28, directly through release bar 3, activating the splitting.
- The manual control lever can also be used to stop splitting.

8 Operation of cutting, splitting, and the input conveyor, Pro and Pro+ models

8.1 Part names, Pro and Pro+, figure 30

1. Splitting valve
2. Manual control lever
3. Trigger bar
4. Spring
5. Control lever
6. Trigger
7. Cylinder
8. Input conveyor valve
9. Multifunctional shaft
10. Limiter





8.2 Operation of the joystick valve, Pro and Pro+, figure 31

Cutting

- Pull joystick lever A in direction 3, figure 31.
- Multifunctional shaft 9, figure 30, turns using cylinder 7, shifting trigger 6 back.
- Valve 8 starts the saw motor, and the log is cut.

Splitting

- Push joystick lever A in direction 4, figure 31.
- Trigger 6 for the multifunctional shaft pushes release lever 5, causing spring-powered release bar 3 to start splitting valve 1.
- The splitting cylinder performs one stroke and automatically returns to its starting position.
- The chain saw stops immediately when the lever is removed from position 3.

Log input

- Push joystick lever A to the right in direction 1 to start the input conveyor.
- Push joystick lever in direction 2 to back up the input conveyor.

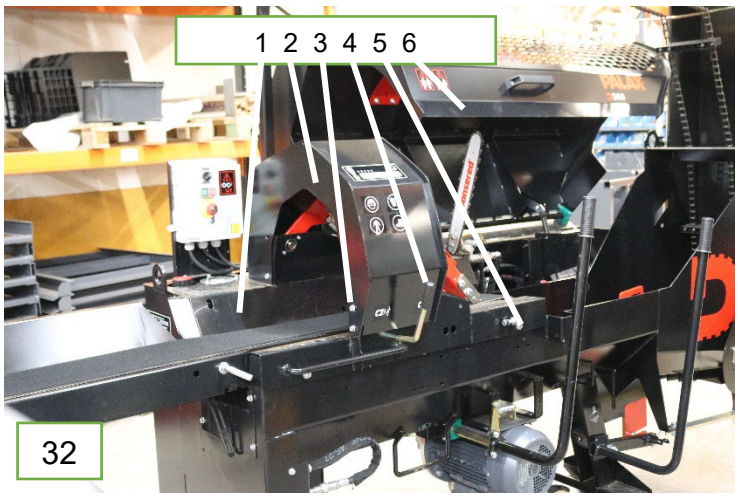
NOTE! The operations can be simultaneous so that while one piece is being split, a new log can be entered onto the rear stop and cutting can take place immediately.

9 Machine maintenance

NOTE! Always stop the firewood processor and disconnect it from its power sources before performing any maintenance procedures.
All safety devices must be installed back to their places after maintenance.

9.1 Locations of opening protective structures, figure 32

1. Infeed table
2. Infeed table protective casing
3. Protective casing fastening screws M8
4. Manual start lever
5. Infeed table fastening screws M10
6. Splitting guard

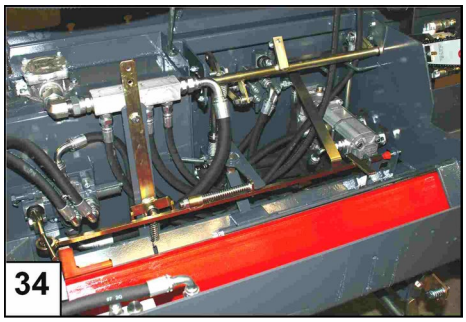


32

33

9.2 Protective devices opened for maintenance of the blade, figures 32 and 33.

1. Saw chain can be maintained by opening guard. There is no need to remove protective casings.


34

9.3 Protective devices opened for maintenance of the hydraulics, figures 32 and 34.

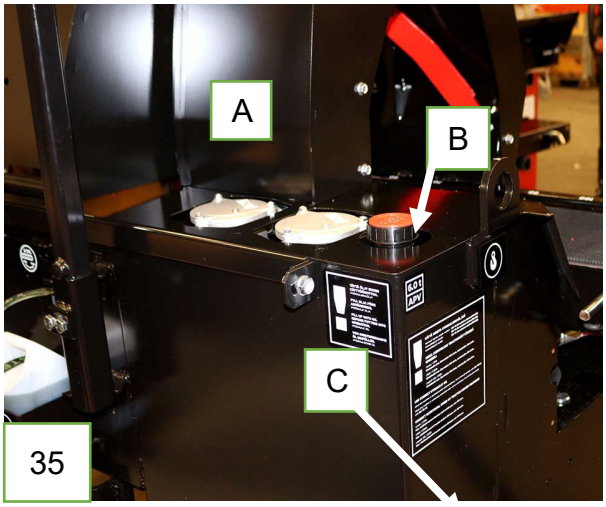
1. Open splitting groove guard mesh 9.
2. Remove infeed table protective casing 2 fastening screws and remove the casing.
3. Remove infeed table fastening screws M10.
4. Lift the input conveyor extension in an upright position.
5. Open the infeed table and set the table support in its place.

9.4 Changing the gearbox oil

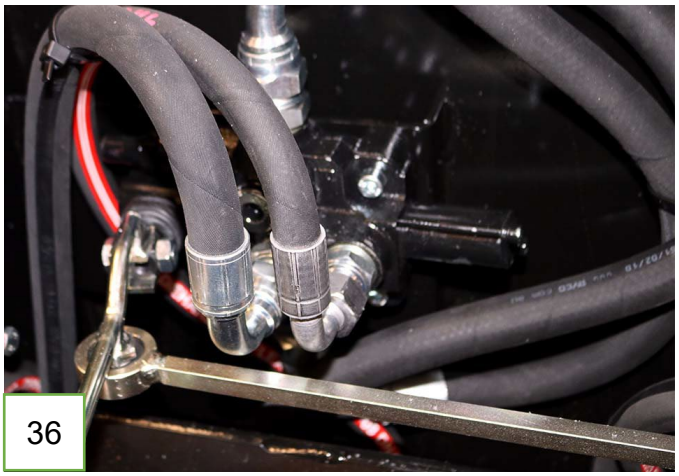
- The gearbox oil plug is located in the lower part of the gear.
- Add the new oil (approximately 0.52 l).
- Oil quality SAE 80.
- Note! The oil inspection gauge is not available in large gearboxes (3063->).

9.5 Changing the hydraulic oil and filters, figure 35

- Oil plug C is located on the bottom of the tank.
- Filter A must also be changed, because impurities come from the hydraulic system which stick to the filter.
- The amount of oil needed for the change is approximately 70 litres.
- Approximately 5 cm of empty space must remain at the top of the tank for expansion.



35


36

9.6 Valve maintenance, figure 36

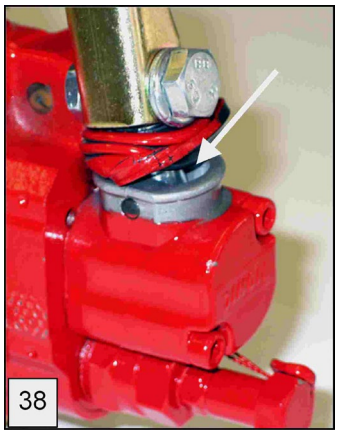
- The splitting cylinder control valve lock end A, spindle mover joint B, and ball end always require regular lubrication in order to be durable and function correctly.
- Lubrication is particularly important when the machine is unused for several months. If the parts of the lock end get rusty, the machine will not function as intended.

9.7 Valve lock end, figure 37

- There is a small hole in the middle of the end plate of the valve lock end, through which lubrication oil can be sprayed onto the moving parts of the valve lock end.
- The oil used must be of the kind which will not get stiff in sub-zero temperatures.
- The easiest way is to use a spray bottle with a spray pipe.

- Insert the spray pipe in hole A, and press for 1 second at a time for 2–3 times.
- The oil will spread evenly onto all of the moving parts of the lock end.

NOTE! Do not use sprayable Vaseline, which will become stiff at extremely cold temperatures.



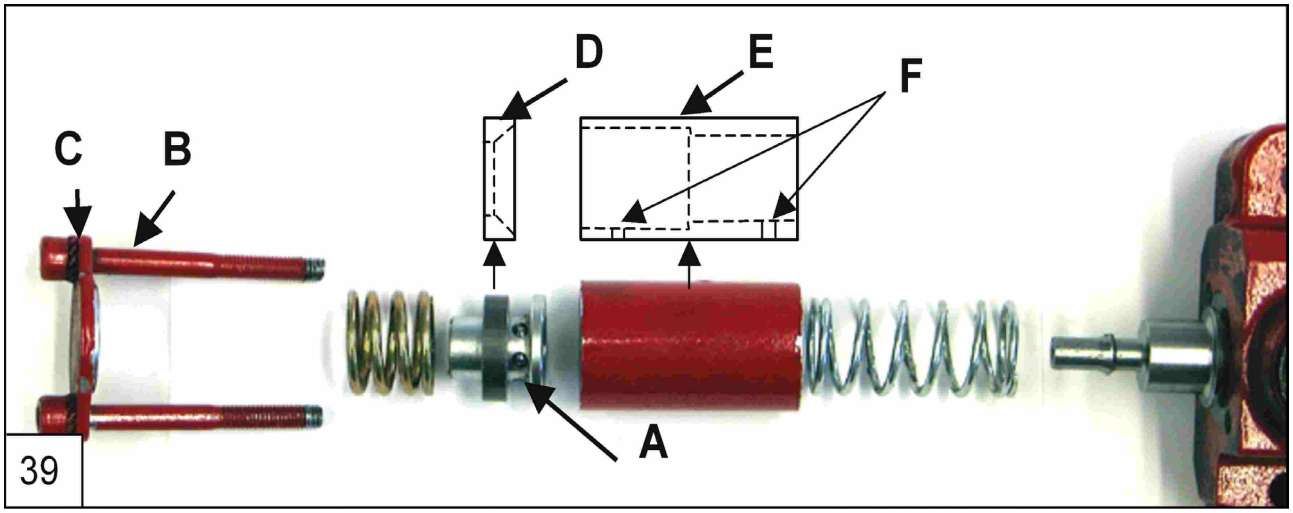
9.8 Lubricating the spindle mover, figure 38

- The spindle mover has a hinge pin and a ball end, both of which require regular maintenance and lubrication.

1 Lift up the edge of the spindle mover's rubber cover.
2 Spray lubricant to both sides of the hinge pin and to the ball end.
3 At the same time, ensure that the rubber cover is undamaged.

9.9 Structure of the lock end and the correct order of the parts, figure 39

- When opening valve screws B, press lock end cover C, because the springs may force it to come off, taking the springs and locking part balls out from their places as well.
- When reassembling the lock end, place some Vaseline into lock end holes A to keep the balls in their places during the assembly. Ensure that parts D and E are placed the correct way, as shown in the figure, with the dehumidification holes down.



9.10 Basic adjustment of the valve

- The valve has been adjusted and tested at the factory.
- The valve maintains the basic adjustments very well, so retroactive adjustments are usually not required.

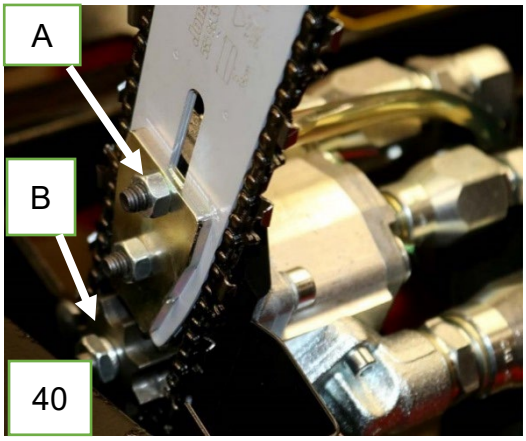
9.11 Replacing the saw chain, figure 40

NOTE! Stop the firewood processor and disconnect it from the power source before opening the blade casing.

NOTE! Use gloves when handling the sharp blade.

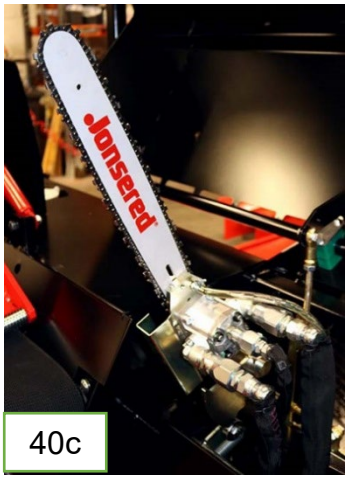
1 Open the blade casing according to the instructions in step 9.2.
2 Loosen the saw bar fastening bolts.
3 Loosen the saw bar fastening screw.
4 Remove the saw bar fastening plate, key 13 mm.
5 Remove the saw bar and chain.
6 Place the new chain over the saw bar and onto the cog, and replace the saw bar.
7 Place the fastening plate onto its place and tighten lightly.
8 Tighten the chain.

NOTE! Always retighten the chain after sawing a few logs, because a new chain will always become slightly loose during the first uses.



9.12 Sharpening the chain in the firewood processor, figure 40b

1 Pull the saw motor release lever A in the direction of arrow B.
2 Turn the motor into the horizontal position from the saw bar.
3 The chain can now be sharpened.



9.13 Lubricating the front wheel

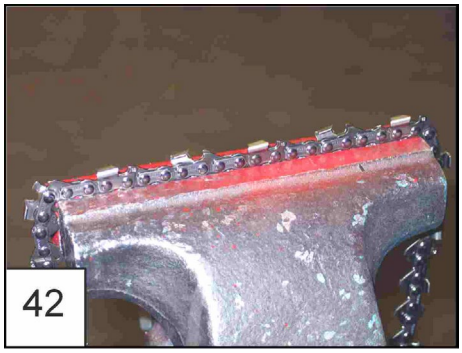
1 Open the blade casing according to the instructions in step 9.2.
2 Clean the lubrication hole shown in figure 40c.
3 Lubricate with Vaseline using a grease gun.

9.14 Sharpening the chain in a table vice, figures 41 and 42

- Place the chain onto the saw bar and attach the bar to a table vice, figure 41.
- The chain is now easy to move and will stay in the bar groove, which makes it easy to sharpen.
- Attach the chain directly to a table vice, figure 42. The chain is now steady in one place.
- Sharpen the chain teeth similarly on both sides, following the original sharpening angle carefully.

NOTE! An incorrectly sharpened chain may tilt to one side, instead of biting the log directly.


41


42

9.15 Conveyor chains, figure 43

- If the machine is being used continuously, lubricate the conveyor chains daily.
- Lubrication is easy by spraying the lubricant on while the conveyor is running at low speed, for example.
- Light daily lubrication is sufficient.
- When the machine is unused for a longer period of time, the chain should be lubricated carefully in order to avoid rusting.
- The upper end bearings of the conveyor are self-lubricated, which means that they do not require maintenance.

43

9.16 Cleaning the machine

- Keep the conveyor clean of any debris in order to ensure uninterrupted operation.
- Cleaning the conveyor is particularly important in wintertime, when the use of the machine is stopped.

9.17 Washing the machine

- Wash the machine with a pressure washer periodically. This is particularly important when the machine is left unused for a longer period of time. Lubricate the machine after washing.

NOTE! Do not aim the water jet directly at the electrical equipment or bearings.

9.18 Storage of the machine

- Although the machine is intended for outdoor use, it should be covered and stored in a sheltered location or indoors during longer periods of not being used. This way, you can avoid unnecessary corrosion and malfunctions.
- In outdoor storage, spread a sufficiently large tarpaulin over the machine.

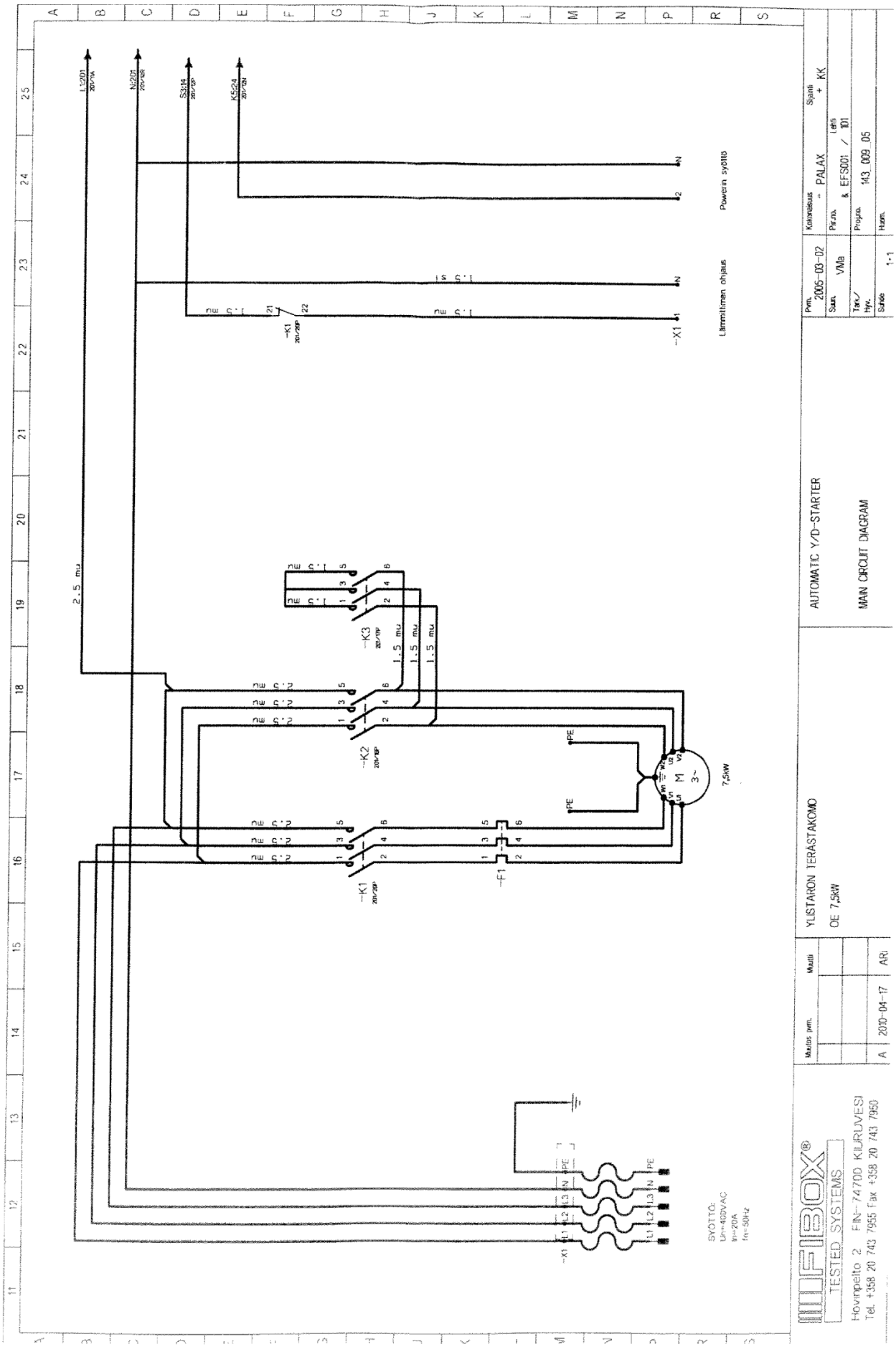
10 Maintenance table

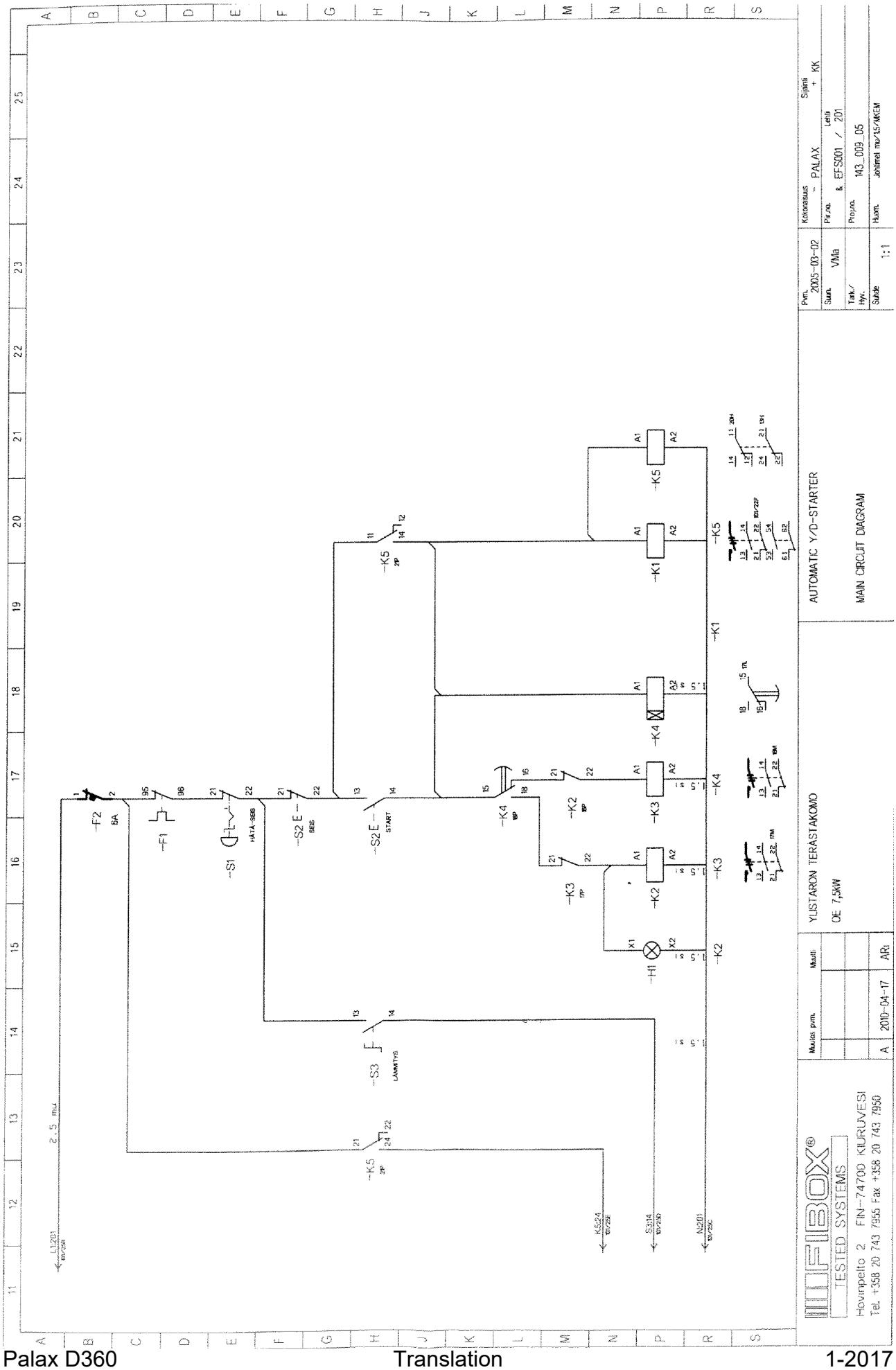
Item	Task	Daily	Interval 100 h	Interval 500 h	Interval 1,000 h	Substance/accessory item
Gearbox TR-operated	Check 1st change 2nd change		X	 X	 X	SAE 80 0.52 l
Hydraulic oil Normal conditions	Check 1st change 2nd change		X	 X	 X	Amount 55 l E.g. Esso Univis 32 Neste Hydrauli 32
Oil filter	1st change 2nd change			X	 X	FIO 100/3
Valve	Lubrication		X			Lubrication oil, spray
All levers	Lubrication	X				Lubrication oil, spray
Conveyor bearing	Lubrication		X			Vaseline
Conveyor chain	Lubrication	X				Lubrication oil, spray
Saw blade	Sharpen Replace	As necessary				
Saw bar	Replace	As necessary				
Machine	Cleaning	X				
Electric motor	Cleaning	X				
Combustion engine	Maintenance	X				Motor maintenance log
Electrical equipment	Cleaning	X				
Saw bar front wheel	Lubrication	X				Vaseline

11 Failures and remedial measures

Failure	Cause	Remedial measure
The saw chain cuts heavily and overheats.	1. The chain is dull.	1. Sharpen or change the chain.
The sawing is misaligned.	1. One side of the chain is dull, due to sawing into a nail, for example.	1. Sharpen or change the chain.
The splitting does not work.	1. The guard mesh is open.	1. Close the guard mesh.
The chain saw cannot be lowered.	1. The guard mesh is open.	1. Close the guard mesh.
Splitting will not start.	1. Fault in the adjustment of the trigger bar.	1. Adjust the machine.
Splitting is started, but stops immediately.	1. The valve cannot be locked.	1. Check the operation of the lock end. 2. Check the adjustments of the control levers.
The movement of the cylinder is irregular.	1. Malfunction in the valve.	1. Lubricate the valve lock end. 2. Lubricate the spindle mover.
The conveyor will not start rotating.	1. The cleats are frozen to the chassis. 2. Insufficient pressure. 3. Debris between the cleat and the side.	1. Lift the chain. 2. Increase the pressure and turn the relief valve approximately 0.5 turns inward. 3. Remove the debris.
The rapid motion valve only moves at one speed.	1. Debris in the rapid motion valve.	1. The valve must be opened and cleaned.

12 Connection diagrams


AUTOMATIC Y/D-STARTER
MAIN CIRCUIT DIAGRAM
YLISTARJON TERASTAKOMO
OE 7,5kW
WOLFBOX®
TESTED SYSTEMS
Hovinpelto 2 FIN-74700 KIURUVESI
Tel.+358 20 743 7955 Fax.+358 20 743 7950
Palax
143 009 05
2005-03-02
2010-04-17
7,5kW
Powerin syöttö
Lämmittimen ohjaus


AUTOMATIC Y/D-STARTER
MAIN CIRCUIT DIAGRAM
YLISTARON TERÄSTAKOMO
OE 7,5kW
UFIBOX®
TESTED SYSTEMS
Hovinpelto 2 FIN-74700 KIURUVESI
Tel. +358 20 743 7955 Fax +358 20 743 7956
Palax
Sijainti + KK
Lehti
EFS001 / 201
143_009_05
Johimet mu/15/MKEM
2005-03-02
VMa
1:1
Muutos pvm.
Muutti
2010-04-17
ARi
-F1
-F2
6A
-S1
HÄTÄ-SBS
-S2 E
SBS
START
-S3
LÄMMITYS
-K1
-K2
-K3
-K4
-K5
-H1
2,5 mu