

POWER 100S
OPERATING MANUAL

PALAX 100

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1.0 General

1.1 EC Declaration of conformity

Directive 98/37/EY

Manufacturer: Ylistaron Terästäkomo Oy
Lahdentie 9
61400 Ylistaro
Finland

Product: PALAX Power Firewood Processor with Conveyor
Model: Palax Power 100 S

Meets all the requirements set forth by Machine Directive 98/37/EY and its amendments as well as the national decrees through which it has been brought into force. During the manufacturing process the following harmonized standards have been applied.

Powered by: The machine can be driven either by a tractor, an electric motor or a combustion engine

Models: TR Powered by tractor equipped with own hydraulic system
SM Powered by electric motor

The following standards have been applied in manufacturing the machine

SFS-EN 1870-3 Safety of woodworking machines. Circular sawing machines. Part 3
Down cutting cross-cut saws and dual-purpose down-cutting cross-cut saws/circular saw benches.

SFS-EN 609-1 Agricultural and forestry machinery. Safety of log-splitters.
Part 1 Wedge splitters

SFS-EN 60204-1 Electrical equipment of machines.

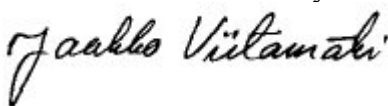
SFS- EN 292-2+A1 Basic concepts, general design principles.

SFS- ISO 11684 Safety signs and hazard pictorials.

EN 982 Hydraulics

Notified body: Deutsche Prüfstelle für Land- und Forsttechnik DPLF
Bundesverband der landwirtschaftlichen
Berufsgenossenschaften e.V.
Weisenstrase 70/72
34131 Kassel

Ylistaron Terästäkomo Oy



Jaakko Viitamäki
Managing director

1.2 Intended use of the machine

This Firewood Processor with Conveyor is intended to be used for production of firewood from round timber.

Use of the machine for any other purposes is prohibited.

Max. size of the wood:

Cross-cut capacity, the max. diameter of the tree is about 40 cm.

Depending on the type of infeed deck, the longest allowed billet size of the processed tree is 4...6 m.

1.3 Markings affixed to the machine

Informative decals

The decals for movements of the operating controls, the informative decals for cutting and splitting, the direction of rotation, the revolution range, decals advising use of eye and ear protectors.

Warnings decals

Warning decal for crosscut saw-blade, adhesive tape with yellow and black stripes warning of the danger of getting squeezed at the top end of the conveyor.

1.4 Name plates

The name and address of the manufacturer.

Designation of the machine type.

Total weight of the machine 1 850 kg

Diameter of the circular saw-blade 1000 mm, the hole 40 mm.

The highest permitted rotation speed 1000 rpm.

Hydraulics, max. 200 bar

Serial number and year of manufacture.

Nameplate at the rear of the blade housing.

1.5 Nameplates on the electric drive

3-phase motor

Voltage 230 / 380 V or 380 / 600 V, may vary depending on the country.

Output 15 kW.

1.6 Safety instructions

Always use eye guards and hearing protectors

Do not wear loosely-fitting or hanging clothing.

Keep the working space clean and clear of foreign objects.

Never use the machine indoors: Risk for dusting.

Only operate the machine in a space with sufficient lighting.

Make sure that all other people stay outside the operating range. The machine is intended for operation by one person only.

The machine is exclusively intended for the production of firewood.

During the cut-off operation, make sure that the tree at the cutting point always leans against the support roller of the cross-cut deck and the infeed roller: danger of rolling over!

Exercise particular caution when cutting knotty or crooked trees, because, as a result of faulty cutting, the tree may roll over or twist the saw-blade with a force which breaks or splits the blade.

Carelessness during the cut-off operation may constitute a serious danger.

Always stop the machine before servicing.

Always ensure that the electric conductors are intact.

Always lift the table extension or transportation and fix it in this position.

Never remove any safety-related devices from the machine. Remember that you are responsible for possible injuries if any safety-related devices have been removed from the machine.

Always carry out the required preparations on both the machine and the conveyor before starting the operation.

1.7 Noise emission and vibration

Equivalent continuous A-weighted sound-pressure level at the workstation is 87.5 dB (A) and the sound power level is

102,0 dB (A). The vibration emission values do not exceed 2.5 m/s².

1.8 Responsibilities of the operator

The machine may only be used for the production of firewood.

All the safety-related devices in the machine are necessary to ensure the sufficient level of safety.

PALAX is a very safe machine provided that the given instructions are followed, the regular maintenance routines are duly executed and the work is carried out without haste.

The operator of the machine is responsible for the flawless operation of the safety-related devices and for ensuring that the machine has been serviced in a due manner.

The operator is responsible for ensuring that no others are subjected to any danger.

Changing the construction of the machine is prohibited.

Remember that you as the operator are responsible for any injuries if safety-related devices have been removed from the machine.

1.9 Operating conditions

Never use the machine indoors: Risk for dusting.

Only operate the machine in a space with sufficient lighting.

Make sure that other people, especially children, are not present inside the operating range.

It is recommended to purchase or make a suitable stand for the trees to be processed where the logs are ready at level with the infeed table. Hence, unnecessary lifting will be avoided and the work will proceed much faster.

Always place the machine in a straight position on as level a surface as possible.

The suitable temperature range for operation is approximately - 20 to +30 degrees centigrade. No other restriction concerning the weather apply.

1.10 Weight of the machines without packing

The firewood conveyor is included in the weight

Machine	Type	Product: No.	Weight/kg	Serial no.
Palax Power 100 S	SM	100xxxxxx	1850	

1.11 Terms of warranty

The warranty period is 12 months from the date of purchase.

The warranty covers

Parts, which have been damaged during normal operation of the machine due to defects in material or workmanship.

The reasonable repair cost as set forth in the agreement between the buyer and the manufacturer.

A new part delivered as a replacement for the defective one.

The warranty does not cover

Defects due to normal wear, faulty operation or negligence of maintenance.

Cut-off saw-blade, V-belts and oils.

Defects in the machine which are due to any changes which the buyer has carried out or ordered from a third party and which have affected the machine in such a way that the machine can no longer be considered to correspond to the original configuration.

Other possible expenses or financial demands due to the above-mentioned measures.

The travel expenses accrued due to repairs under warranty.

The warranty for parts changed during the warranty period expires at the same time as the warranty period of the machine.

Consult your dealer in matters related to the warranty.

2.0 Reception and pre-assembly of the machine

2.1 Lifting the machine



Fig. 1

The machine can be lifted with a forklift truck from both sides. There are guide rails for lifting forks under the chassis. There is also a lifting lug on the upper part of the machine frame.

2.2 The transport set-up and unpacking

The machine is delivered almost ready assembled and with the conveyor attached.

The extension table for the infeed transporter and the loading conveyor are in the transport position.

The angle gear is filled with transmission oil.

2.3 Acceptance inspection

Check the delivered goods without delay.

If the product shows evidence of transport damage, mark the damage on the freight bill, and then contact the freight company and your dealer.

2.4 Main parts of the machine

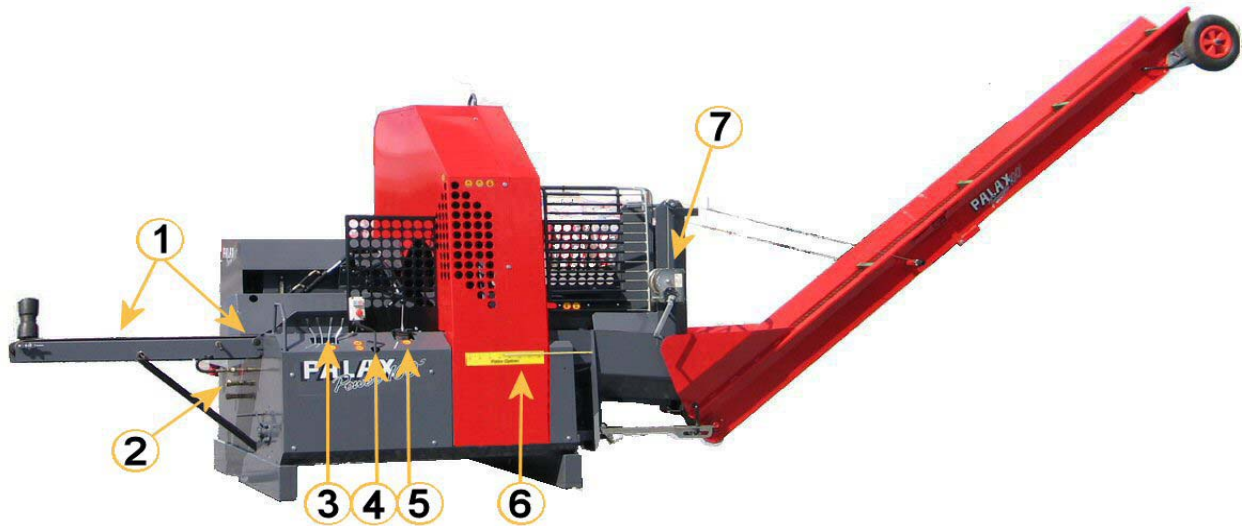


Fig. 2

1. Infeed conveyor and table extension
2. Hydraulic out-take for log-table
3. Control levers for adjusting the machine
4. Operating lever for launching the splitting cylinder
5. Operating lever, hydraulic control of the saw-blade and the infeed conveyor as well as the automatic start of the splitting cylinder.
6. Scale for the *Palax Optimi* system
7. Winch for conveyor

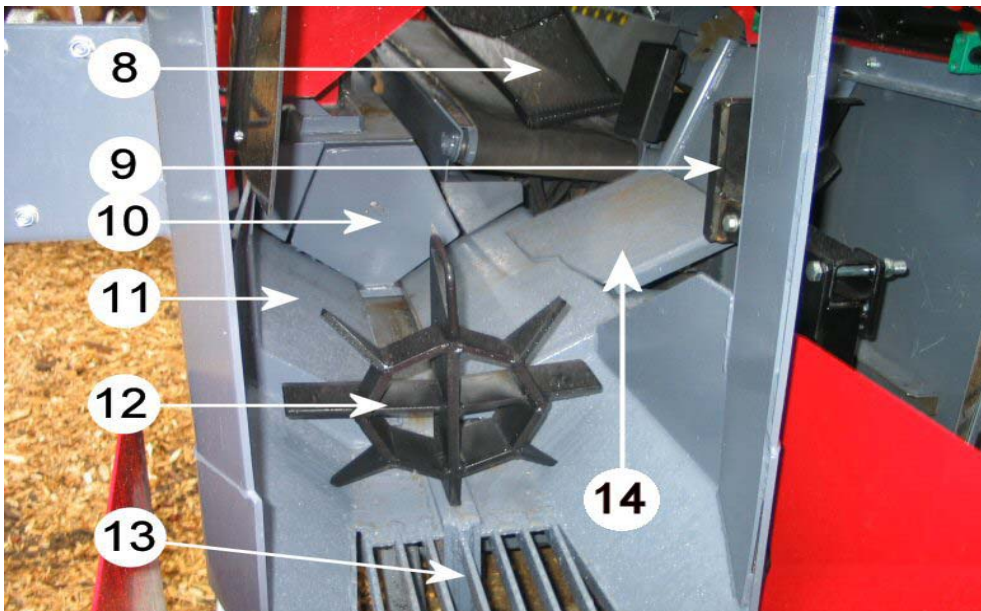


Fig. 3

8. Clamp
9. Cutting length limiter
10. Ram
11. Splitting trough
12. Splitting wedge
13. Grate
14. Dropping plate

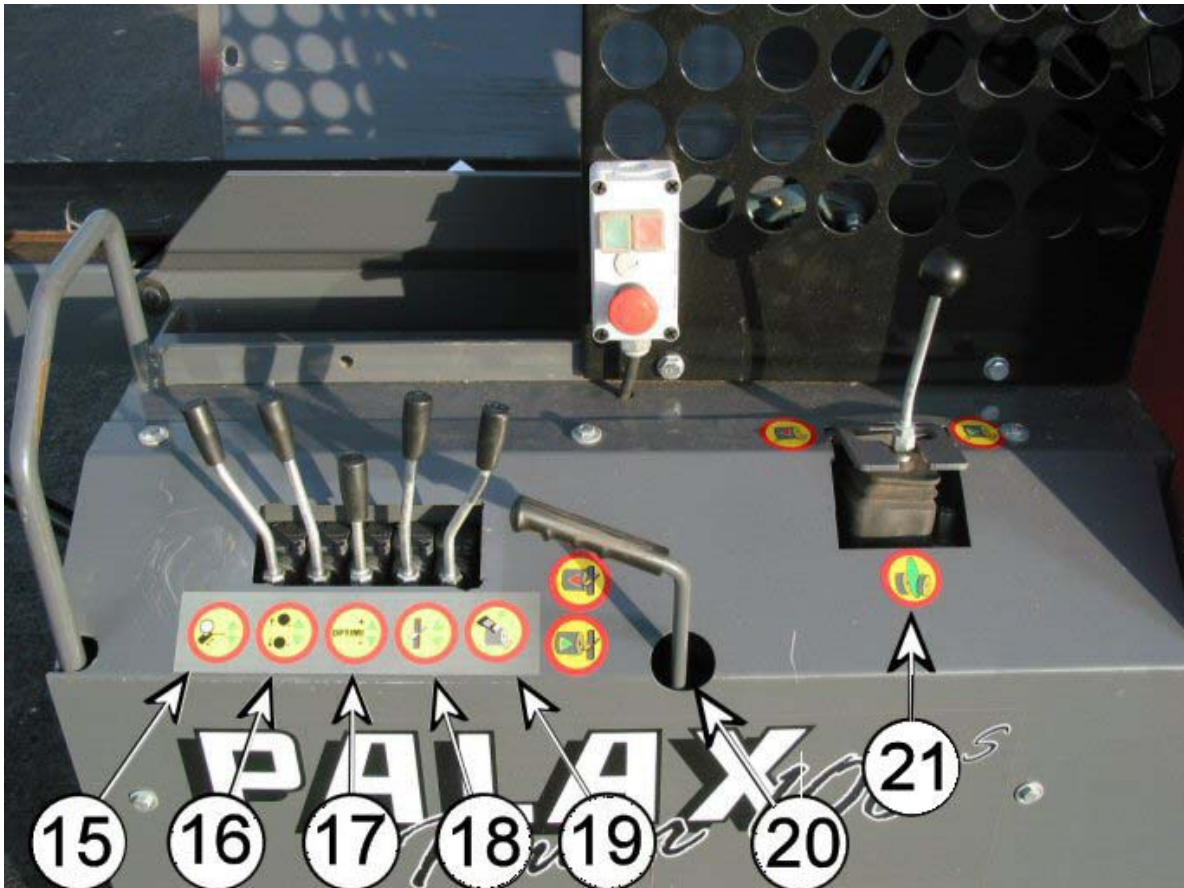


Fig. 4

- 15. Control of log-deck
- 16. Dropping plate
- 17. Adjustment of cutting length
- 18. Height adjustment of splitting wedge
- 19. Lightening of the clamp
- 20. Control of forced splitting cylinder motion
- 21. Multi-function lever: Controls the machine's main functions

2.5 Setting up the machine for operation and transportation

2.6 Table extension

Pull the handle of the fixing device, swing the table extension (Fig. 5) into the working position and place the stay in the slot.



Fig. 5

2.7 Setting the log-stop



Fig. 6

The Power 100S is equipped with a special Palax Optimi cutting length adjuster, which adjusts the stroke length of the splitting cylinder in accordance with the actual cutting length. The cutting length is adjusted hydraulically using the control lever in the centre and the scale (Fig. 5) at the right side of the machine's main frame.

2.8 Bringing the conveyor to the work position



Fig. 7

Pull down the conveyor and leave it supported by the winch ropes and the tip wheel. Remove the conveyor chain holder from under the conveyor.

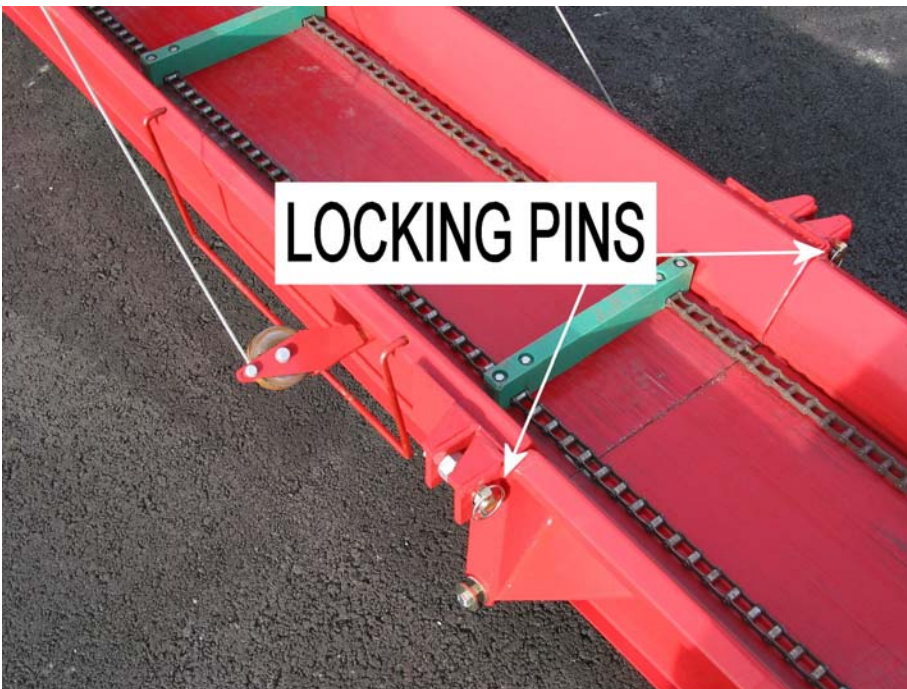


Fig. 8

Lower the conveyor with the winch and lock it in a straight position using the split cotters. Adjust the correct cotter gap with the locking pins. The recommended gap is about 0.5 -1mm.



Fig. 9

Adjust the conveyor to a suitable height for working.

WARNING!

Make sure that there is nobody under the conveyor as you perform the height adjustment. Always hold by the winch handle as you perform the height adjustment of the conveyor.

2.9 Bringing the conveyor to the work position

Use the winch to lower the conveyor until the tip wheel touches the ground.

Put the conveyor chain holder in place.

Remove the locking cotters from the conveyor.

Lift the conveyor into an upright position against the transport support.

3.0 Operating the firewood processor

3.1 Electric drive, starting and emergency stopping

The power output of the motor is 15 kW and the speed is 1500 rpm.

The machine is equipped with a starter with an emergency stop switch.

All the electric installations have been made ready.

In the 380 V system the fuse size is 35 A slow.

The required cross-section of the extension cord is 6 mm²

When putting the machine into operation, check the direction of rotation. If the circular saw is rotating in the wrong direction, try switching the positions of the two phases in the plug. If you are not sure how to do this, leave it to a professional.

The machine is equipped with automatic star-delta starting.

Emergency stop of an electric-motor-powered machine

The emergency stop is carried out by depressing the Emergency Stop button, button B on the starter.

The button is reset by pulling it up.

NOTE!

If a machine powered by electric motor is operated in temperatures below -15 degrees Centigrade, it is recommended that a less viscous hydraulic oil be used, such as ISO VG22S multigrade oil or synthetic hydraulic fluid, because a machine with electric drive takes the full revolutions right from the start of operation.

4.0 Control of the machine

Cross-cutting, start of the splitting and the operation of the infeed conveyor are controlled with one lever.

When the control lever is in the neutral position, the operating cylinder of the wedge and the engine of the infeed conveyor are not subjected to any pressure.

Advancing the infeed conveyor

To feed the log forward, depress the lever upwards and to the right.

Reversing of the infeed conveyor

To reverse the log, depress the lever upwards and to the left.

Cutting the wood

Pull the lever down to make the saw-blade perform a work cycle and cut the wood.

To raise the saw-blade push the lever up.

The splitting cycle will start automatically as the saw-blade reaches its upper position.

4.1 Operation of the Firewood Processor

The machine is intended for operation by one person only.

Never leave the machine, which is easy to start, unattended.

4.2 Operation of the saw-blade, before sawing

Clean any protective grease off the new circular saw-blade, because a greasy blade accumulates resin easily, causing it to get hot, lose its tension and change shape.

4.3 During sawing

Exercise caution, always keep your hands away from the saw-blade.

Never stop the rotation of the blade by pressing wood against it.

During the cut-off operation, make sure that the tree always leans against the support roller at the cutting point.

4.4 Placing the log on the deck

Place the log on the deck so that it touches the wall behind the conveyor. Otherwise, the log may move during cutting.

Do not cut very crooked trees.

WARNING!

Crooked trees may be turned on the deck by the cutting force thus twisting the blade so strongly that it breaks.

4.5 Cutting the log

Pull the control lever of the hydraulic valve backward to bring the saw-blade down and cut through the wood.

Be especially careful when you cut knotty or crooked trees.

4.6 Cross-cutting the last log

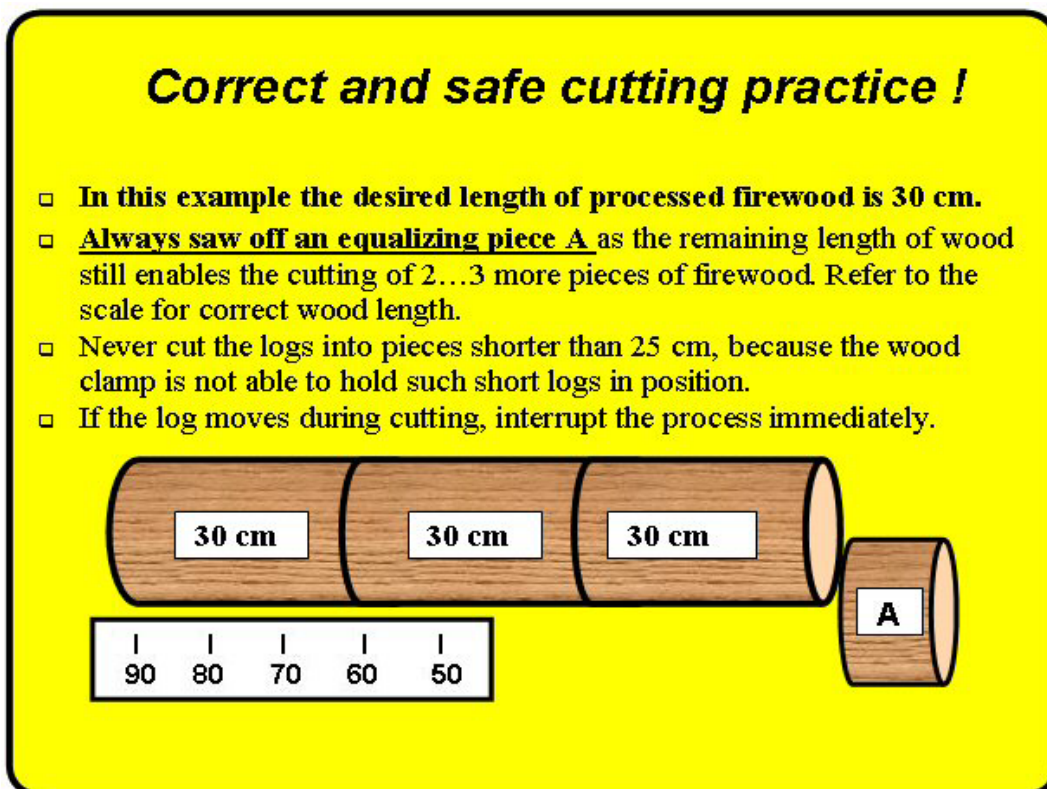


Fig. 10

Always observe the remaining length of the log. If you intend to cut pieces of firewood 30 cm in length, then you must cut the so-called equalizing piece at the latest when the remaining length of the log is 2 times the cutting length (in this example 2×30 cm). This ensures that the last piece cut is never too short. The clamp (Fig. 3) cannot prevent a log that's too short from swinging against the saw-blade. The swinging of the log may break the blade.

4.7 Feeding the last log for splitting

Drop the last piece of the log, without allowing it to touch the blade, onto the dropping plate (Fig. 3) and from there to the splitting chute for splitting (Fig. 4, lever 16). In this case launch the splitting motion manually (Fig. 4, lever 20) after first ensuring that the log has fallen into the chute in the correct position. The scale above the infeed conveyor helps to cut the equalizing piece.

4.8 Disturbances during the cross-cut operation and their remedy

Crooked trees

Cut crooked trees where they bend.

As you cut crooked trees, make sure that the log is leaning against the support roller.

Big trees

If the cutting sound is soft, the cutting speed and the saw-blade revolutions are correct.

If the cutting sound is loud and cracking, the blade is proceeding too fast and the sawdust grooves get clogged. Check the rotation speed and the sharpness of the saw-blade.

If the tree gets stuck in the blade as a result of faulty cutting, stop the machine immediately

Inspect the stuck saw-blade before continuing the cutting and verify no cracks have emerged.

A faulty saw-blade must not be used for cutting.

5.0 Operation of the Firewood Processor, splitting the wood

5.1 Splitting cylinder

The machine can be equipped with a splitting cylinder of either 9 tons or 16 tons.

5.2 Splitting wedges

Standard wedge

The 2/6 wedge for splitting the wood in 2 or 6 ways.

Optional wedges

The short straight wedge for splitting the wood in 2 ways or, if the wedge is lowered, no splitting will take place.

The 2/8 wedge for splitting the wood in 2 or 8 ways. Normally requires a cylinder of 9 tons.

The 2/12 wedge for splitting the wood in 2 or 12 ways. Normally requires a cylinder of 16 tons.

5.3 Height adjustment of the splitting wedge

The machine is equipped with a hydraulic system for height adjustment of the wedge.

It is possible to both raise and lower the wedge during the operation.

5.4 Problems during the splitting operation and their remedy

A stuck log:

As the logs are big and have big branches, the cylinder force may not be sufficient.

If the log sticks to the wedge, reverse the cylinder using the manual control.

Raise the splitting-wedge and retry the splitting using the manual control. Changing the position of the log will help in many cases.

If the log will not split, open the cover and knock the stuck log loose using another log.

If there is a big branch in the log, turn the tree to such position where you can push it towards the wedge with the butt end first to make the branch split. Doing so requires the least power.

If the log has fallen into the splitting chute in a wrong position:

After the cutting operation, if the log for some reason falls into an upright position, then the splitting motion may be prevented by pushing forward the control lever for forced splitting (Fig. 4, lever 20). This ensures the crosscut blade will come up in a normal way, but the splitting motion will not start.

After that, correct the position of the log and start the splitting motion using the lever for forced splitting.

5.5 Re-splitting the logs safely

If you want to produce small-sized pieces of firewood from large logs, then even wood split once may still be too large in size.

Proceeding in the following way will help you to split the wood safely into even smaller pieces.

Open the cover.

Put the wood you intend to split into the splitting-trough, e.g. one on top of the other. The wood will stay in this position, if you hit them carefully against the wedge.

Close the cover.

Start the splitting motion using the lever for forced splitting.

6.0 Maintenance of the machine

NOTE!

Always stop the machine before servicing.

6.1 Removal of the saw-blade



Fig. 11

Remove the attachment screws of the cover casing, a 13 mm wrench.

Swing the large cover casing to the back.

Unscrew the blade-nut using the special wrench delivered with the machine. Right-hand thread, a 36 mm wrench

Carefully clean the surfaces of the flanges before re-installation of the blade.

6.2 Sharpening of the blade, hard-metal blade

The hard-metal blade can be sharpened "lightly" using a diamond file.

Depending on the cleanliness of the wood, as many as 500...1,000 bulk cubic metres of wood can be processed with a hard-metal saw-blade with sharpening.

The best sharpening result and durability of the blade is achieved when the saw-blade is sharpened using an appropriate grinding machine and a diamond wheel.

6.3 Prestressing of the saw-blade, hard-metal blade

The hard-metal blade does not normally show any tendency for tension fault, but especially when a blunt saw-blade is used for cutting and it gets very hot, tension faults can occur.

Leave the prestressing of the hard-metal blade to a professional.

6.4 Tightening the V-belts, angle gear /centre shaft

The Palax Power 100S is equipped with automatic tightening devices for the belts.

6.5 Tightening the V-belts, centre shaft/ saw-blade shaft

The Palax Power 100S is equipped with automatic tightening devices for the belts.

6.6 Replacement of the V-belts, angle gear /centre shaft

Remove the rear cover plate from the machine.

Remove the attachment flange of the oil pump, 4 pcs of M 10 screws, a 17 mm wrench.

Slacken the belts by turning the tightening devices further away.

Replace the old belts with the new ones.

Release the tightening device. Thus the belts will automatically attain their correct tightness.

Replace the rear cover.

6.7 Replacement of the V-belts, centre shaft / saw-blade shaft

Remove the attachment screws of the cover casing, a 13 mm wrench.

Swing the large cover casing to the back.

Remove the saw-blade. Unscrew the blade-nut using the special wrench delivered with the machine(right-hand thread, 36 mm wrench).

Slacken the tightening device of the belt.

Change the belts.

Carefully clean the surfaces of the flanges before re-installation of the blade.

Before installation of the blade, make sure that the pin, which prevents the saw-blade from rotating, is in place.

Attach the cover casing.

6.8 Tightening the infeed conveyor belt



Fig. 12

There are tightening screws between the infeed conveyor and the extension deck, which can be used for tightening the belt.

As you tighten the belt, make sure that the belt travels in the centre of the roller.

6.9 Replacement of the infeed conveyor belt

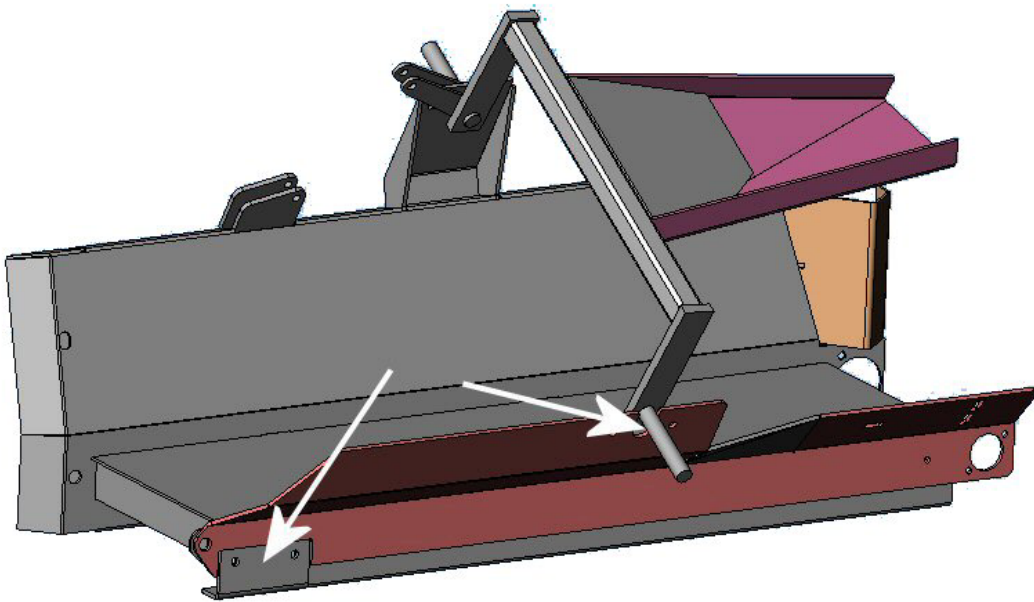


Fig. 13

Swing the extension table of the infeed conveyor into the transport position. Remove the elevation piece from the lower edge of the infeed conveyor's left end. Remove the lower bearing bracket of the clamp. This makes it possible to turn the clamp to the side. Differing from the illustration, the hydraulic motor and the drive roller may be in place during the performance of this service measure.

6.10 Oil change of the angle drive

Open the oil filling cap and drain the used oil, for example by using a suction drainage device. Refill with about 0.5 litres of new oil.

6.11 Change of the hydraulic oil

The normal hydraulic oil volume is 160 litres.

The quality of oil should be ISO VG 32, e.g. Univis 32, SHELL Tellus 32, NESTE HYDRAULI 32 or equivalent.

For continuous operation under warm conditions, use ISO VG46

If a machine powered by electric motor is operated in temperatures below -15 degrees, it is recommended that a less viscous hydraulic oil be used, e.g. ISO VG 22S multigrade oil or synthetic hydraulic fluid, because a machine with electric drive works at full speed right from the start of operation

Observe particular cleanliness during the oil change, because the flawless operation of the machine is highly dependent on the purity of the oil.

6.12 Lubrication of the machine

The-ball bearings on the centre shaft and the saw-blade shaft. Lubrication interval about 50 hours and always at the end of the working season if the machine is to be left standing for a long period of time. Thus the bearings will be soaked with new grease which efficiently protects them against moisture and corrosion.

The ball-bearings on the top end of the conveyor, the infeed deck and the control levers as well as the spherical plain bearings on the saw.blade lever. Lubrication interval about 200 hours and always at the end of the working season if the machine is to be left standing for a long period of time. Thus the bearings will be soaked with new grease which efficiently protects them against moisture and corrosion.

Greasing of the infeed deck support roller, auxiliary deck joints is required once a week.

Greasing of the spool ends of the hydraulic valves is required once a year. Only open the cover on the spool detent end. When the cover is removed, the spool must not be shifted, as the balls inside the detent bushing can easily fall out and get lost. Spray plenty of CRC-type lubrication oil on the detent end of the spool and install the cover.

The same grease is used on the joint head as on the ball-bearings.

6.13 Tightening the conveyor chain, illustration

The conveyor is hydraulically driven and equipped with automatic tightening of the chain.

NOTE!

As you bring the conveyor to the work position, check that the chain rests on the tightening roller at the lower end.

6.14 Cleaning the conveyor

Keep the conveyor free of debris to ensure its trouble-free operation.

It is especially important to always clean the conveyor at the end of working sessions in wintertime.

The conveyor can also be washed with a high-pressure cleaner.

6.15 Washing the machine

Wash the machine occasionally with a high-pressure cleaner. This is especially important, if the machine is left standing for a longer period of time. Lubricate the machine after washing.

Note! Do not direct the water jet onto electric devices or bearings.

6.16 Storing the machine.

The machine is intended for outdoor use but it is recommended to keep it under cover for longer standstills to avoid corrosion and malfunctions.

7.0 Maintenance schedule

Object	Task	Daily	Service interval hours	Item
Angular gear	Check 1 Change 2 Change		100 500 1000	SAE 80 0.5 l Suction drainage
Hydraulic oil	Check 1 Change 2 Change		X 500 1000	Hydraulic oil (x) ISO VG 32
Oil filter	Check 1 Change 2 Change		500 1000	FIO 60/ 3
All ball bearings	Lubrication		50	Ball bearing Vaseline
All levers	Lubrication	X		Lubrication oil
Machine	Cleaning	X		

X) Continuous operation under warm conditions ISO VG46

Electric motor driven under cold conditions, temperature below -15° C, ISO VG 22S multigrade oil

8.0 Malfunctions and their remedy

Disturbance	Cause	Remedy
The saw-blade speed drops while cutting	1. The blade is blunt	1. Sharpen the saw-blade
The saw-blade starts to wobble after a short time of cutting	1. The blunt blade is hot and has lost its tension	1. Sharpen the saw-blade and check its tension
The blade whines	1. Speed too high, max. allowable speed 1,000 rpm. 2. Crack in the blade	1. Lower the rotation speed 2. Do not operate
The saw-blade rotates in the wrong direction	The phase-order of the electric motor wrong	Switch places of 2 phase conductors
The electric motor stops easily.	1. The blade is blunt 2. Incorrect setting of the thermo-relay	1. Sharpen the saw-blade 2. Reset the thermo-relay