

Instruction and Spare Parts manual

Palax X 1000

- Tractor-powered by tractor's hydraulics
- Tractor-powered via the PTO shaft
- Powered by electric motor
- Powered by combustion engine



Serial number _____

Year of manufacture _____

PALAX

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1. BASIC SPECIFICATIONS AND RESPONSIBILITIES

1.1 Foreword

This Instruction Manual is intended for a professional operator of the machine. The operator must have usual general knowledge and skills. For example, the buyer of a tractor-powered machine is expected to master the use of power take-off shaft transmission.

Before the installation and operation, the operator of the machine must become thoroughly familiar with the contents of the manual. The operator is also obliged to gain familiarity with the operating controls of the machine and the emergency stop mechanism. For more information about our products, please visit our website at www.palax.fi.

NOTE! Keep this manual with the machine at all times.

1.2 EU Declaration of Conformity

Directive 2006/42/EC

Manufacturer: Ylistaron Terästäkomo Oy
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Product: X 1000
Hydraulic wedge splitter for firewood
Powered by: Tractor PTO, electric motor, combustion engine
Models: TR Tractor-powered by tractor's hydraulics
TR/ OHD Powered by tractor with PTO shaft
SM Powered by electric motor
PM Powered by combustion engine

Serial number of the machine: _____

We hereby certify that the machine meets the requirements of the Government Decree 12.6.2008/400 on safety of machinery through which the Machine Directive 2006/42/EC has been put into effect, and that during the manufacturing process the following harmonized standards have been applied.

SFS-HANDBOOK 93-series, SFS-EN 349-1+A1, SFS-EN 609-1+A1, SFS-EN 730-1, 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.

Ylistaron Terästäkomo Oy
18.10.2016



Pekka Himanka
Managing Director

1.3 Intended use of the machine

This hydraulic splitting machine is intended for splitting firewood.







Use of the machine for any other purposes, such as for example cutting, is prohibited.

Maximum size of the wood:

Max. diameter of the log 40 cm.

Max. length of the log 100 cm

1.4 Warning signs

 <p>Read the User Manual for the machine</p>	 <p>Wear eye guards and hearing protectors</p>	 <p>Keep clear of moving parts To be operated by one person only</p>
 <p>Lifting point of the machine</p>	 <p>Disconnect the machine from the electric supply before taking to any service measures</p>	 <p>Beware of PTO shaft</p>

1.5 Nameplates

Nameplate on the machine:

- Name and address of the manufacturer.
- Mark showing type of machine.
- Total weight of the machine.
- Max. hydraulic pressure 180 bar.
- Serial number and year of manufacture.
- Nameplate on the frame beam

Nameplates on the electric drive:

3-phase motor.

- ❑ Voltage 380/ 600 V, may vary depending on the country.
- ❑ Output 7.5 kW.
- ❑ Fuse size 16 A.
- ❑ The nameplate is located at the side of the electric centre.

1.6 The main dimensions and models of the machine

Models	X 1000			
DRIVING POWER	TR	TR/ OHD	SM	PM
Weight	230kg	273kg	320kg	300kg
Height/width/length	Transport position 0.9m / 9.50m / 2.82m			
Max. diameter of the log	Max. length of log that can be split 40 cm			
Max./min. length of the log	Max. length of log that can be split 100 cm			

1.7 Safety instructions**General regulations and restrictions**

- ❑ The machine is exclusively intended for the production of firewood.
- ❑ The machine may only be operated by one person.
- ❑ The three-point linkage of the tractor is of size-category two. If using a tractor larger in size, check that there is sufficiently space for the PTO shaft and its protective guard.
- ❑ Only persons over 18 years of age are allowed to operate this machine.
- ❑ Never remove any safety-related devices from the machine.

The operator

- ❑ Every person operating the machine, must thoroughly study the entire user manual.
- ❑ Always use eye guards and hearing protectors.
- ❑ Always wear protective shoes.
- ❑ Always wear work gloves.
- ❑ Do not wear loosely-fitting clothing.

Before use

- ❑ Make sure that all other people stay outside the operating range.
- ❑ Only use a fault-free PTO shaft and attach the chain for the shaft-guard. The permissible revolutions range of the power take-off shaft is 450–480 r.p.m.
- ❑ Only operate the machine on a sufficiently firm and level surface.
- ❑ Only operate the machine in an adequately lit space.
- ❑ The exhaust pipe of the combustion engine-powered machine may get hot and cause a fire hazard. Ensure that the exhaust pipe is at least one metre's distance from anything that might catch fire.
- ❑ Keep the tractor-powered machine connected to the three-point linkage. Also ensure that sufficient space is provided for the PTO shaft and its guard.
- ❑ Always check that all the covers are intact and properly fastened.
- ❑ Always ensure that the electric conductors are intact.
- ❑ Always check that all the controls are operational.
- ❑ Always check the oil level and make sure that the hydraulic hoses and components are free of damage.

- ❑ Before starting the work, make sure that the machine is firmly in position.

During operation

- ❑ Carelessness during the splitting operation constitutes a major hazard!
- ❑ If the log slips aside from the pusher, interrupt the splitting immediately, because such a log constitutes a hazard and could break the machine.
- ❑ When splitting short logs, do not place two logs one after the other, but adjust the stroke to a suitable length.
- ❑ When splitting a log with an oblique end, place the log in such a way that its longer side is lowest, so the log cannot slip to the side from the log feeder.
- ❑ Be careful when splitting knotty or crooked trees.
- ❑ Keep the working space clean and clear of foreign objects.
- ❑ Always stop the machine by disconnecting the power supply cable, stopping the combustion engine or the PTO shaft before servicing.
- ❑ Stop the combustion engine for refuelling.
- ❑ Only split one log at a time.
- ❑ Danger! Stay away from moving parts.

1.8 Noise emission and vibration

The equivalent continuous A-weighted sound-pressure level at the workstation and the sound power level vary depending on the power source. Refer to the user manual of the respective combustion engine or tractor for noise emission values. The vibration emission values do not exceed 2.5 m/s².

1.9 Responsibilities of the operator

- ❑ The machine may only be used to produce firewood.
- ❑ **All the safety-related devices** are necessary to ensure a sufficient level of safety.
- ❑ The X 1000 is a very safe machine provided that the instructions supplied are properly followed, the regular maintenance routines are duly executed and the work is carried out without haste.
- ❑ It is the **responsibility of the operator** to ensure before the work is started that all the safety-related devices are in perfect order and the machine has been serviced in a due manner.
- ❑ The operator is responsible for ensuring that no one else is subjected to any danger.
- ❑ Modifying the construction of the machine is prohibited.
- ❑ The machine must never be operated under the influence of alcohol or drugs.
- ❑ Remember that as the operator you are responsible for any injuries caused if safety-related devices have been removed from the machine.

1.10 Operating conditions

- ❑ Always place the machine on as level a surface as possible.
- ❑ Prevent risks, such as slipping in winter, by organising the work site in a due manner.
- ❑ When starting the machine in severe frost, allow it to idle at about 1/4 of the maximum speed for about 5 to 10 minutes in order to warm up the oil and make it less viscous.
- ❑ Only operate the machine in an adequately lit space.
- ❑ The most suitable temperature range for operation is approximately - 20 to +30 degrees Centigrade. Otherwise, the weather conditions do not set any restrictions on the operation.

- ❑ Make sure that no other people, especially children, are present inside the operating range.
- ❑ Never use the machine indoors – risk of exhaust gas.

1.11 Terms of warranty

The warranty period runs for 12 months from the date of purchase.

The warranty covers:

- ❑ Parts which have been damaged during normal operation of the machine due to any defects in material or workmanship.
- ❑ The reasonable repair cost as set forth in the agreement between the buyer and the manufacturer.
- ❑ A new part is delivered as a replacement for the defective one.

The warranty does not cover:

- ❑ Defects due to normal wear, faulty operation or negligent maintenance.
- ❑ Oils.
- ❑ Defects in the machine due to any modifications which the buyer has made or ordered from a third party and which have affected the machine in such a way that it can no longer be considered to correspond to its original configuration.
- ❑ Other possible expenses or financial claims due to the above-mentioned measures.
- ❑ Any indirect costs and/or travel expenses incurred from making repairs under the guarantee.
- ❑ For parts changed during the warranty period, the warranty expires at the same time as the warranty period of the machine.
- ❑ Consult your dealer about matters related to the warranty.

1.12 Operating instructions for the combustion engine

Please refer to the user manual of the combustion engine or visit importers website at www.brandt.fi for more detailed operating instructions for the engine.

2 TAKING DELIVERY AND SETTING UP THE MACHINE FOR OPERATION

2.1 Lifting the machine

The machine can be lifted with a forklift truck from both sides. The lifting points for the forklift forks are pointed out with decals. There is also a lug for lifting the machine on the upper part of the machine frame.

2.2 The transport set-up and unpacking

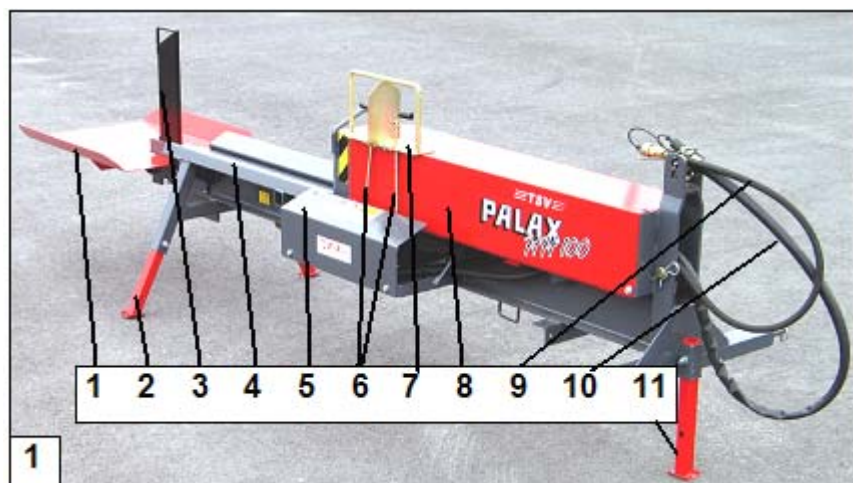
- ❑ To save costs and avoid transport damage, the machine is delivered partly dismantled with the extension table having been packed separately.
- ❑ Check the delivered goods without delay.
- ❑ If the product shows transport damage, contact the transport company and your dealer immediately.
- ❑ All the required adjustments of the splitting machine have been finalised at the factory.

2.3 Acceptance inspection and setting up the machine for operation

- ❑ The hydraulic system has already been charged with oil, also the engine has already been charged with oil. See the instruction manual for the engine.
- ❑ For the electric-motor-powered machines, check the direction of rotation.
- ❑ Start the motor and then stop it immediately. Check whether the fan wings rotate in the direction indicated by the arrow.
- ❑ The attachment bolts for the table extension are in place in the machine.
- ❑ Put the table extension in place and tighten the bolts properly. A 17-mm wrench
- ❑ Make sure that the direction of rotation of the electric motor is correct.

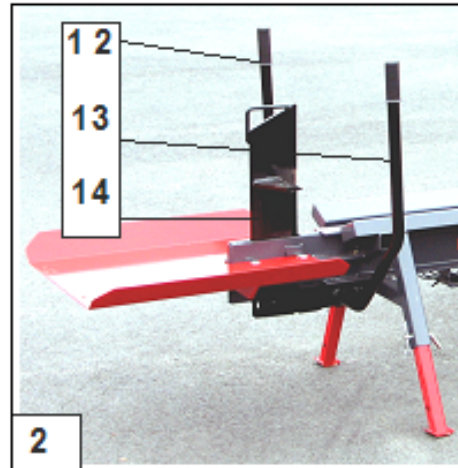
2.4 Main parts of the machine, Figs. 1 and 2.

1. Table extension
2. Rear leg
3. Splitting wedge, which splits in 2 ways
4. Frame
5. Protective cover for the valve
6. Operating levers for the cylinder
7. Protective frame for the operating levers
8. Protective cover for the pusher
9. Return oil hose
10. Pressure hose with protective tube
11. Front leg



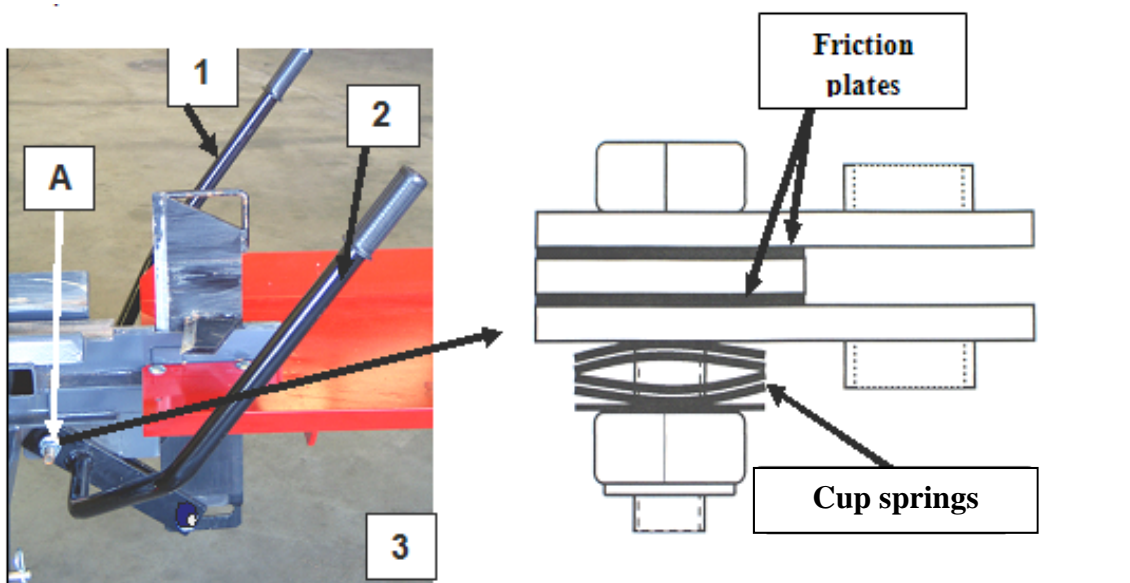
Adjustable 2/4-way wedge is optional

- 12. Right-hand adjustment lever for the wedge
- 13. Left-hand adjustment lever for the wedge
- 14. splitting wedge



2.5 Installation of the adjustment levers for the splitting wedge, Fig. 3

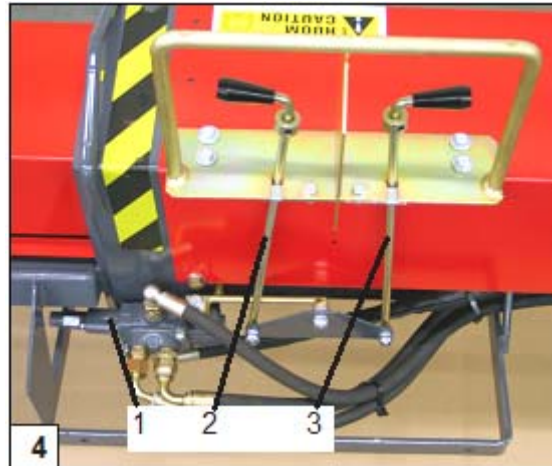
- Put the wedge in place.
- Place the friction plate on the bolt of the lever 1 and push the lever into place.
- Place another friction plate on the other side of the frame.
- Put the lever 2 in place.
- Affix the nut A and wrench it to a suitable tightness for effortless operation. A 30-mm wrench.
- Assemble the friction plates and the spring washers in the order illustrated in the picture.



3 HYDRAULICS OF THE MACHINE

3.1 Hydraulic valve with high-speed operation, Fig. 4

- ❑ The machine comes with the valve 1, featuring the high-speed operation as standard.
- ❑ The relief valve has been set to 180 bar.
- ❑ The valve always requires a pressure connector and a free return oil connector to the tractor.
- ❑ When the machine is not in operation, the valve spool is always in its centre position and the circulation of oil is free.



3.2 Operation of the 2-speed valve; max. thrust force and the force at high speed

- ❑ The max. thrust force is about 5.6 tonnes and the force at high speed is about 2.3 tonnes.
- ❑ The valve spool is equipped with a soft spring and a hard spring.
- ❑ The maximum thrust force is achieved when both operating levers 2 and 3 are pushed to almost as far as they go, all the way to the harder springs.
- ❑ When the levers are pushed to as far as they go, the splitting force will be doubled, but at the same time the force will be decreased to a half.
- ❑ At the high speed, the stroke speed will increase by about 60 % and the total time required for splitting will decrease by about 37 %.

3.3 The valve is easy to use after a small amount of training.

Small logs up to about 15-20 cm in diameter are easily split into two halves at the higher speed.

If the force is not sufficient at the high speed, lift the operating levers about 10 mm to double the force and launch the splitting. After that you can push the levers down to shift the splitting movement back to high-speed operation. We recommend using a wedge with straight splitting edge, because then almost the entire splitting operation can be carried out at high speed.

3.4 Separate hydraulics

- ❑ The machine can also be equipped with a hydraulic system of its own, which enables it to be operated either with tractor PTO, electric motor of 7.5 kW or a combustion engine of 13 h.p.
- ❑ The capacity of the oil tank is 40 litres.
- ❑ Oil type e.g. Unavis 32, SHELL Tellus 32, NESTE HYDRAULI 32 or equivalent.

The oil volume in the multiplier gear is about 0.3 l, SAE 90.

3.5 Basic settings of the splitting cylinder

There are adjustable limiters for both the extension and the retraction of the splitting cylinder, which prevent the piston from banging at its extreme positions.

The following basic settings have been finalised at the factory, and normally need not be readjusted.

- ❑ The reverse stroke of the cylinder is restricted by the limiter 1, Fig. 6.
- ❑ The work stroke of the cylinder is restricted by the limiter 1, Fig. 7.

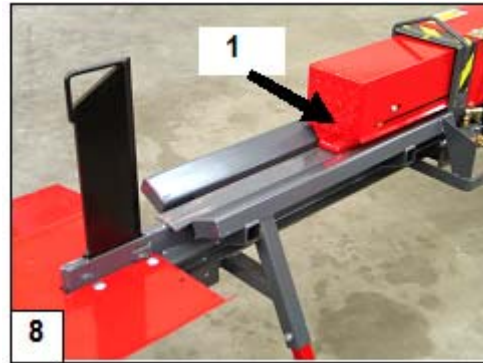
3.6 Adjusting the splitting cylinder stroke

- ❑ If the machine is used for splitting short logs, the cylinder stroke can be decreased to increase the splitting speed considerably.
- ❑ Push down both operating levers to extend the cylinder.
- ❑ Let go one of the levers to make the cylinder movement stop.
- ❑ Using a 13-mm ring spanner, loosen the adjustment screw 2 for the stroke limiter (Fig. 6) and shift the limiter to the rear.



- ❑ Tighten the adjustment screw lightly.
- ❑ Also let go of other operating lever – now the cylinder will retract all the way to the adjusted limiter.

3.7 Now the stroke is suitably adjusted for short logs, Fig. 8



4 OPERATING THE SPLITTING MACHINE WITH DIFFERENT POWER SOURCES

4.1 Operation by tractor hydraulics

- ❑ Always connect the machine to the tractor before starting operations.
- ❑ Connect the hydraulic hoses to the tractor.
- ❑ The pressure hose is equipped with a male connector and a protective tube.
- ❑ The return hose is equipped with a female connector.
- ❑ The engine speed of the tractor is just right when the oil flow is about 25-40 l.p.m.
- ❑ Thanks to the high-speed operation, even a tractor with small oil flow is perfectly suitable.

4.2 Operating powered by PTO shaft and separate hydraulic system, Fig. 9

- ❑ The machine is equipped with a multiplier gear and a pump, which produces an oil flow of about 50 l.p.m. at the PTO shaft speed of 540 r.p.m.
- ❑ The PTO shaft revolutions should range from 400 to 450 r.p.m.
- ❑ If the tractor has a high-speed power take-off for a PTO shaft, it is advisable to use that, because the output of even a small tractor is sufficient and the tractor can be run at low revolutions.
- ❑ This makes working with the machine economical.



Warning ! Always hitch the machine to the three-point linkage of the tractor.

NOTE! Do not run the machine at too high revolutions, as this can cause the oil to overheat and damage the pump or gaskets.

4.3 Operation by combustion engine, Fig. 10

- ❑ Palax X 1000 PM is equipped with a Honda combustion engine of 13 h.p.
- ❑ The fuel is unleaded petrol 95.
- ❑ Engine oil 10W30.
- ❑ Read the operating and maintenance instructions for the engine in the engine's own manual.



Warning !

Make sure that there is nothing near the machine that might easily catch fire, because the exhaust gases are very hot!

The machine must not be operated indoors – danger of exhaust gases!

4.4 Operation by electric engine, Fig. 11

- ❑ The power output of the motor is 7,5 kW at a speed of 1450 r.p.m.
- ❑ The machine is equipped with an automatic Y-D starter with emergency stop.
- ❑ All electric installations must be completed.
- ❑ In the 380 V-system the fuse size is 16 A slow.
- ❑ The cross-section of the required extension cord is 2,5 mm².
- ❑ We recommend using an extension cord with a switch that changes over the rotational direction of the motor, and that can be turned using a screwdriver.



NOTE!

Verify that the motor is running in the right direction by starting it for a moment and then stopping it.

The motor must not be operated rotating in the wrong direction, as this could damage the pump.

If the motor is rotating in the wrong direction, the positions of two of the phase conductors in the plug must be switched. Only a qualified electrician is allowed to do this operation.

We recommend using an extension cord with a switch that changes over the rotational direction of the motor, and that can be turned using a screwdriver.

4.5 Own transport platform, Fig. 12

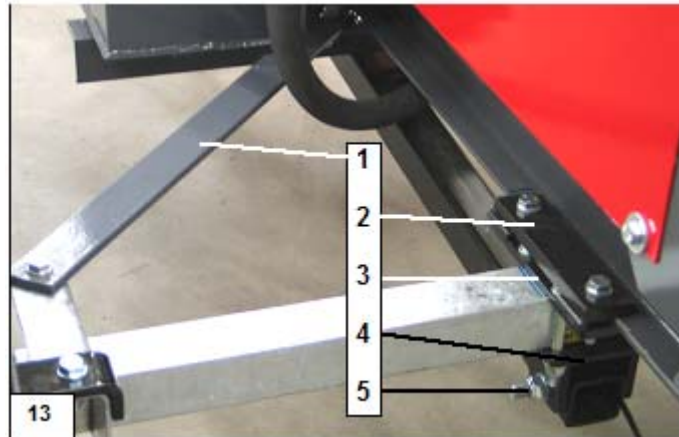
On both the combustion engine- and electric motor-powered machines it is easy to mount a dedicated platform for towing, for example, by a passenger car.



4.6 Installing the transport platform

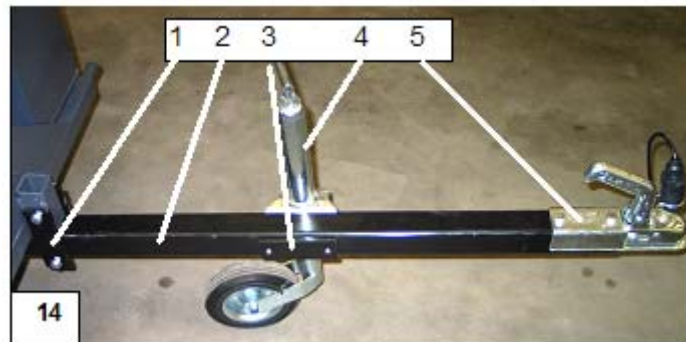
To save transport space, the machine is delivered with the wheels, mudguards and towbar detached.

The length of the support bars 1 (Fig. 13) is adjusted so that the axle ends up in the correct position under the splitting ram.



Installation

- ❑ Lower the rear legs.
- ❑ Prop up the front part of the machine using suitable logs.
- ❑ Attach the wheels and the mudguards to the axle.
- ❑ Fasten the towbar 3 to the bracket 4 for the axle, Fig. 13.
- ❑ Fasten the front part of the towbar to the brackets 1, Fig. 14.
- ❑ Fasten the light panel to the table extension and install the cable using cable ties so that the cable neither makes contact with the ground nor prevents the light panel being shifted to the side of the machine away from the work area.



5 USING THE MACHINE

5.1 Splitting small logs, under 20 cm in diameter, into two parts

- ❑ Place the log into the splitting chute.
- ❑ Launch the high-speed operation by pushing the operating levers all the way down.

- If the force falls short, raise the operating levers slightly to attain maximum force.
- When the log starts to split, push the levers all the way down to activate the high-speed operation.

5.2 Big trees

- With this machine you can split logs of up to 30-35 cm in diameter in four ways. This requires the maximum force.
- If the thick logs are crooked and knotty, it pays to split them first in two ways. This way the force does not fall short and amount of splinters being created is smaller.
- A good way to split 40-50-cm-thick logs is to place a small piece of split firewood on the bottom of the splitting chute and then put the large log on top of it. The large log then adopts an eccentric position with respect to the splitting wedge and the splitting can be commenced from the edge.

5.3 Using supports

- Using supports makes working easier and requires less effort as half of the large log can be placed on the supports to wait until the other half has been re-split.

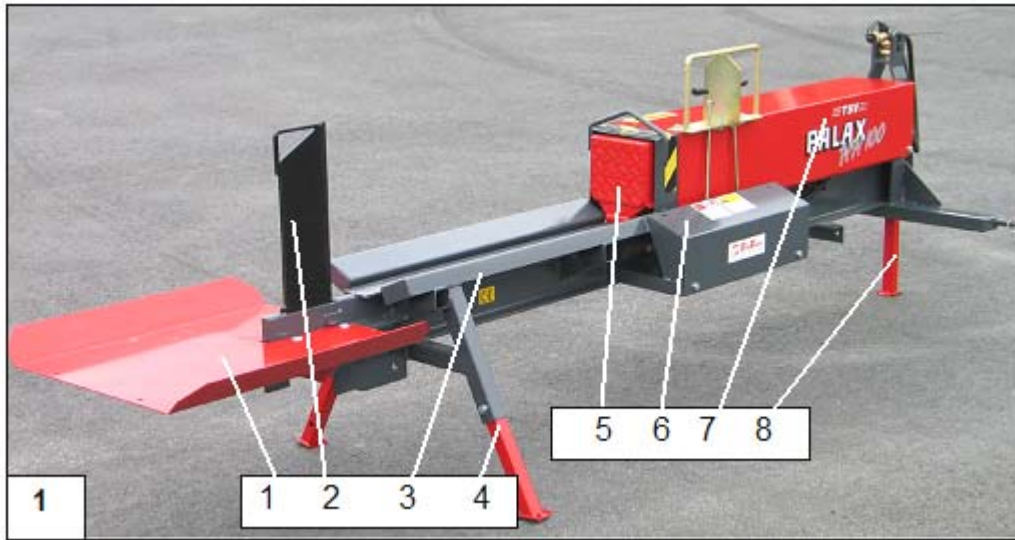


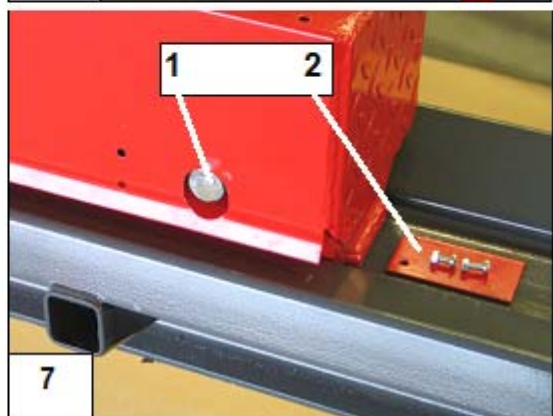
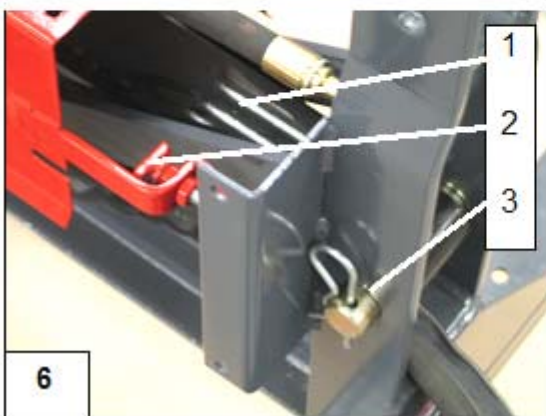
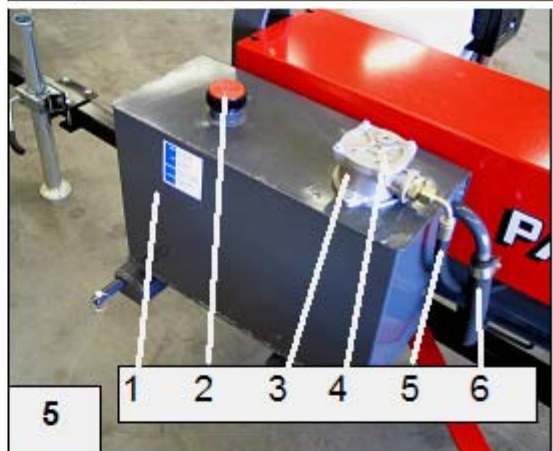
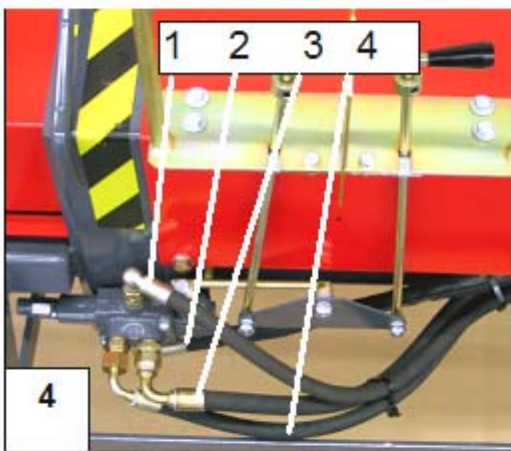
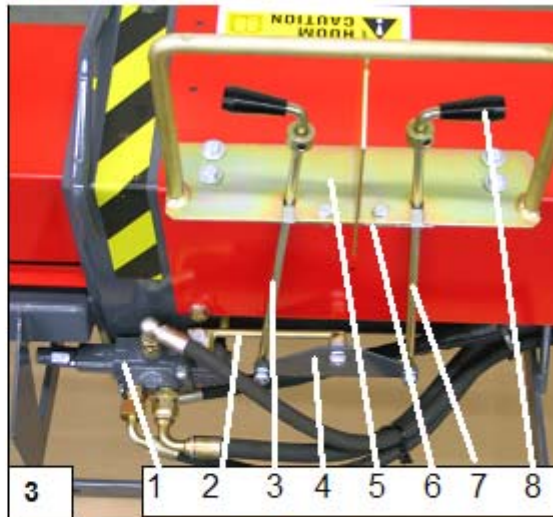
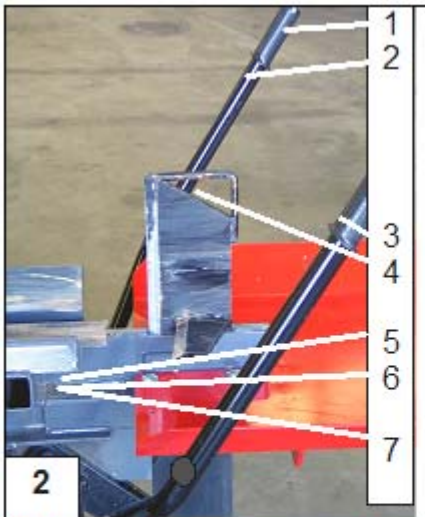
- As required, the supports can be placed on either side of the machine
- Half of a large log on the supports

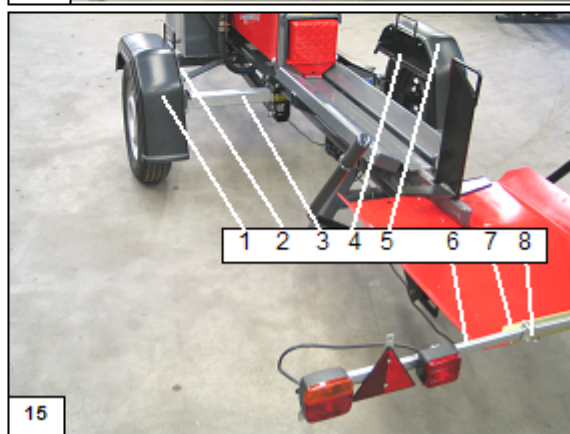
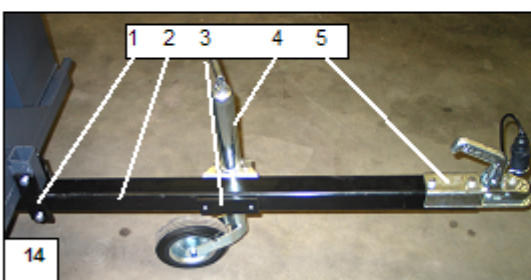
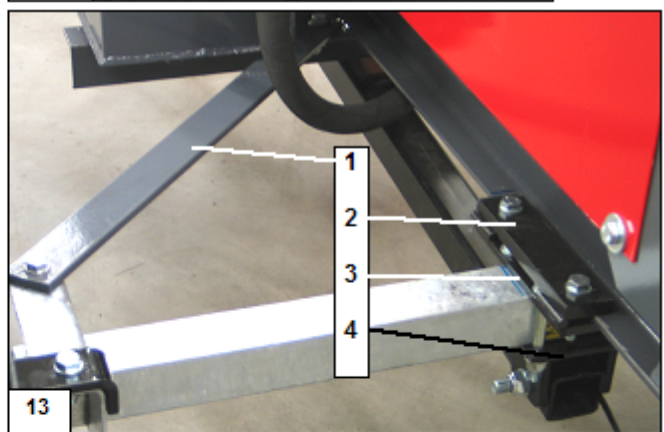
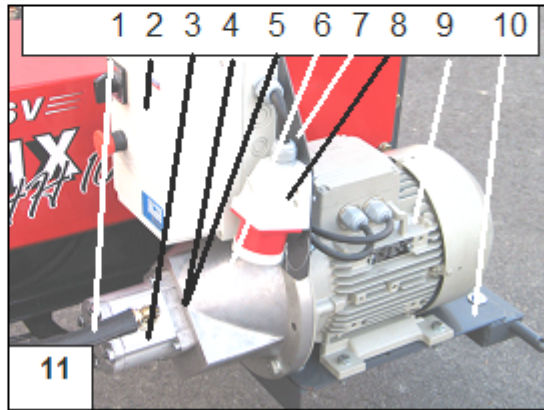
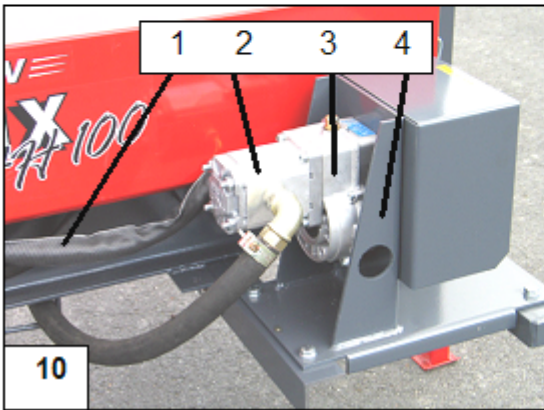
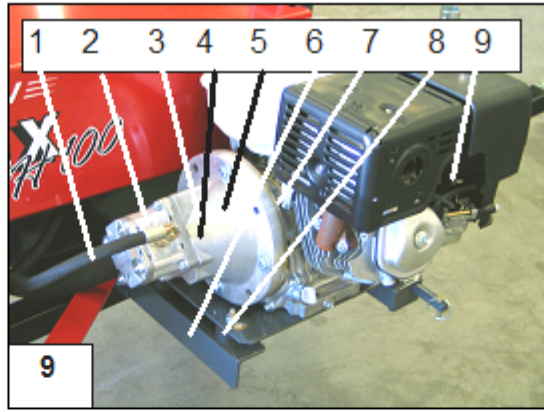
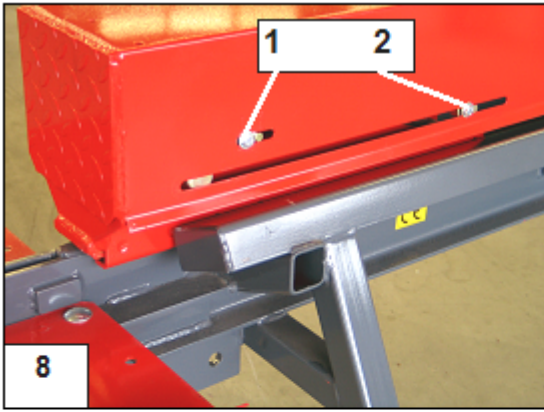
6 MAINTENANCE OF THE MACHINE

Object	Task	Daily	Service interval 100 t	Service interval 500 h	SERVICE INTERVAL 1,000 T	Material /Method
Oil volume of the direction shifter OHD – model	Check 1 Change 2 Change	Checking the level glass	X	X	X	oil change SAE 90 0.3 l
Combustion engine Engine oil	Check 1 Change 2 Change	X	X	X		Instruction manual of engine
Hydraulic oil Normal conditions	Check or change of oil	Check the oil level in the tank with the dipstick.	First oil change		Following oil changes	Volume 40 l e.g. Esso Unavis 32 Neste Hydraul 32
Oil filter	1 Change 2 Change			X	X	F 10 60/3
All levers	Lubrication	X				Lubrication oil
splitting wedge	Sharpen as required					Angle grinder As required
Machine	Cleaning	X				
Electric motor	Cleaning	X				
Combustion engine	Service	X				Instruction manual of engine
Electric equipment	Cleaning	X				

7 SPARE PARTS







Picture	Part	Code	Denomination	Note !
1	1	10 114	Table extension	
1	2	10 115	splitting wedge	in 2 ways
1	3	10 116	Frame	
1	4	10 121	Rear leg "oblique"	
1	5	10 118	Pusher	
1	6	10 119	Side cover	
1	7	10 120	Protective plate	
1	8	10 117	Front leg "straight"	
2	1	10 012	Rubber handle	
2	2	10 123	Adjuster	
2	3	10 125	Adjuster	
2	4	10 126	splitting wedge	in 2 and 4 ways
2	5	10 017	Friction plate	
2	6	10 128	Cup spring	
2	7	10 129	Crown nut	
3	1	10 130	Valve	
3	2	10 131	Valve guide	
3	3	10 132	Operating lever L	
3	4	10 133	Rocker lever	
3	5	10 134	Lever guide	
3	7	10 135	Operating lever R	
4	1	10 136	Hose assembly	
4	2	10 124	Hose assembly	
4	3	10 137	Hose assembly	
4	4	10 139	Hose assembly	
5	1	10 140	Oil tank	
5	2	10 141	Fill cap	
5	3	10 026	Filter cartridge	
5	4	10 027	Filter	Complete
5	5	10 144	Hose assembly	
5	6	10 145	Suction hose	
6	1	10 146	Cylinder 5.6 T	
6	2	10 147	Rear stopper	
6	3	10 148	Pin	
7	1	10 149	Pin	
7	2	10 150	Locking plate	
8	1	10 151	Back stop	
9	1	10 153	Hose assembly + protective tube	
9	2	10 152	Pump	
9	3	10 154	Claw-clutch	Compl. 25 mm/ GP2
9	4	10 047	Rubber	
Picture	Part	Code	Denomination	Note !

9	5	10 155	Flange	
9	6	10 138	Installation beam	
9	7	10 157	Attachment flange	
9	8	10 156	Vibration damper	
9	9	10 159	Honda	
10	1	10 153	Hose assembly	
10	2	10 160	Pump	
10	4	10 161	Speed multiplier gear	
10	6	10 162	Gear bed	
11	1	10 153	Hose assembly	
11	2	10 164	Starter	
11	3	10 165	Pump	
11	4	10 965	Claw-clutch	Täyd. 38 mm/GP2
11	5	10 047	Rubber	
11	6	10 167	Flange	
11	7	10 168	Starter bed	
11	8	10 169	Appliance inlet	
11	9	10 170	Electric motor	
11	10	10 158	Motor rack	
12	1	10 171	Support	
13	1	31 242	Oblique support	
13	2	31 243	Axle bracket	
13	3	31 244	Fixing plate of axle	
13	4	31 245	Towbar bracket	
14	1	31 246	Bar, towbar bracket	
14	2	14 749	Towbar, without brakes	
14	3	31 247	Support plate	
14	4	32 105	Jockey wheel	
14	5	32 106	Ball coupling	
15	1	31 551	Pair of mudguards	Pair of mudguards
15	2	31 516	Mudguard holder, left	
15	3	32 107	Axle, without brakes	
15	4	31 256	Mudguard holder, right	
15	5	31 551	Pair of mudguards	Pair of mudguards
15	6	32 108	Rear light kit	
15	7	32 109	Light panel	
15	8	32 110	Lock plate	

