User instructions
&
Spare parts catalogue
for TP 230 wood chipper from
the Forest series

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1 Introduction

Congratulations on your new TP wood chipper.

Linddana manufactures top-quality TP wood chippers using the most modern production technology, including laser-cutting, CNC technology and robot technology, at light, open production premises.

For safety reasons and in order to gain maximum benefit from your wood chipper, it is essential to read through the user instructions before using the machine for the first time.

The user instructions explain about safety, use and maintenance, so that work with the wood chipper can proceed safely and profitably.

This manual has been translated from Danish.

Linddana A/S

Jørgen Due Jensen, director

Your dealer is always available to provide spare parts, useful advice and guidance.

Dealer's stamp

2 EU declaration of conformity.

Manufacturer:

LINDDANA A/S, Ølholm Bygade 70, Ølholm, 7160 Tørring, Denmark
hereby declares that

Wood chipper: _____

is in concordance with the provisions of the Machine Directive (Directive 06/42/EF) and with the national legislation which translates this directive;

is in concordance with the following other EC Directives:
2000/14/EC

Furthermore it is stated that
EN 13525 (harmonised standard), has been used.

Title: Managing director
Name: Jørgen Due Jensen

Ølholm, 02 november 2015

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4 Use

The TP 230 wood chipper has been specially designed for **stationary** wood chipping, in the form of branches, bushes and wood waste from hedgerows, parks, trees along roads, etc.

Consequently, the machine must **not** be used for materials containing stone, metal or other foreign matter. Such foreign matter can, at best, make the knives blunt, and, at worst, break the machine. Knives and anvils can get broken if stone or metal objects get between them.

The machine must not be used for chipping wood that may contain nails, screws, reinforcement, etc.

When feeding in branches, you must stand to the side of the feed funnel (See Figure 1).
Branches can whip about when the feed rollers catch them.
When feeding in logs, push these in from the rear (See Figure 2).

Figure 1 Feeding in branches

Figure 2 Feeding in logs

Remember to keep **knives** and **anvils** sharp; this facilitates feeding and provides better chip quality. It also reduces fuel consumption.

The machine must be inspected daily, i.e. the rotor housing must be opened and feed mechanism, rotor, knives, anvils, etc. checked. This protects against unexpected stoppages and ensures a longer service life for the machine.

The tractor to which the wood chipper is attached must always be secured in a stationary position during work.

The machine must **not:**

- be used for any material other than wood
- be used to push over trees, stumps, etc.

Equipment such as choke chains, axes, power saws must **not** be placed/transported in the feed funnel.

5 Assembly instructions

5.1 Before initial operation

The machine is equipped with a lifting eyelet that can be used when the machine is lifted by crane or other hoisting device (hoisting). (See Figure 3)**.** The machine can also be lifted using a forklift truck, but great care must be exercised, as the machine may tip over (See Figure 4).

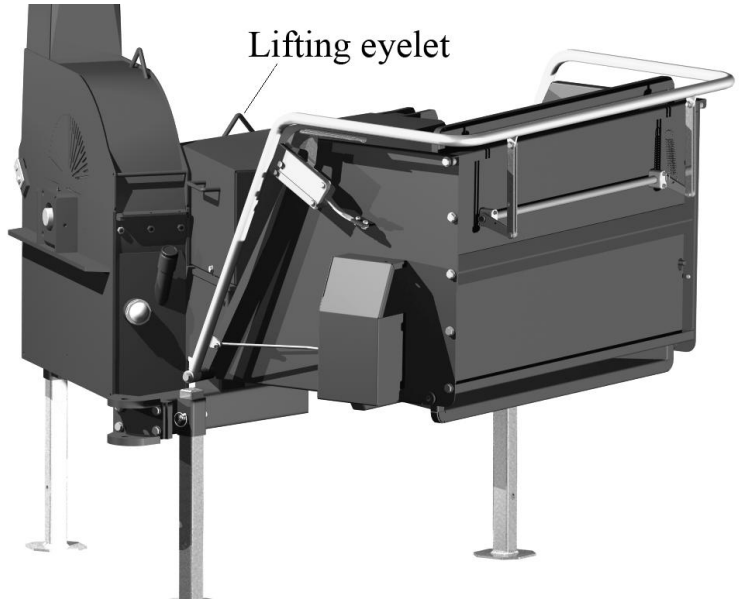
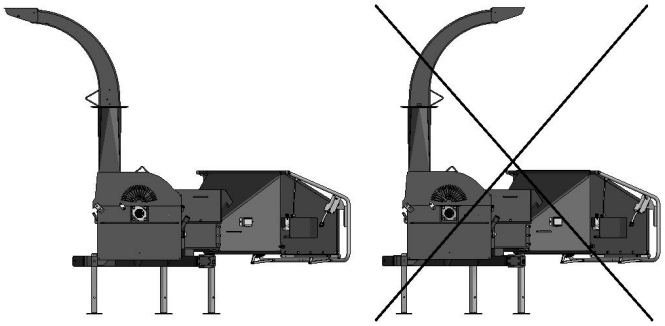


Figure 3 Lifting eyelet on the machine

Figure 4 Lifting using a forklift truck

Keep user instructions for the PTO shaft together with these user instructions in the special manual box on the machine.

Before start-up you must check that the wood chipper is free of foreign matter. Loosen the bolts that hold the upper and lower rotor housing together. Lift up the top part of the rotor housing until the ejector tube rests in position and turn the rotor several revolutions by hand. Remove any foreign matter.



Figur 5

Position of ejector tube when opening rotor

Check whether the knives are the correct distance (**1 mm)** from the anvil. The knife gap is set to **10 mm** at the factory. Check whether the knives run free of the anvils.

Lift the top part of the rotor housing into place again and replace the bolts.

Check that all bolts, nuts and screws are properly tightened.

Remember to lubricate all lubrication points (See maintenance schedule on page 13).

Take old hydraulic and motor oil and used oil and air filters to an approved receiving station.

5.2 Coupling instructions

The machine is designed for coupling to a tractor's three-point hitch.

The factory can supply the machine with a PTO shaft equipped with either 1 3/8" - 6 splines or 1 3/8" - 21 splines
A PTO shaft with 1 3/8" - 6 splines is used on the tractor at 540 rpm. At 1000 rpm, a PTO shaft with 1 3/8" - 21 splines must be used for some types of tractor.
The PTO shaft **must** be fitted with free-wheel on the machine side.
Linddana uses Walterscheid 2400 with free-wheel, which accompanies the machine.

The length of the PTO shaft must be adjusted for the tractor according to the instructions from the supplier of the PTO shaft. See attached user instructions for PTO shaft.

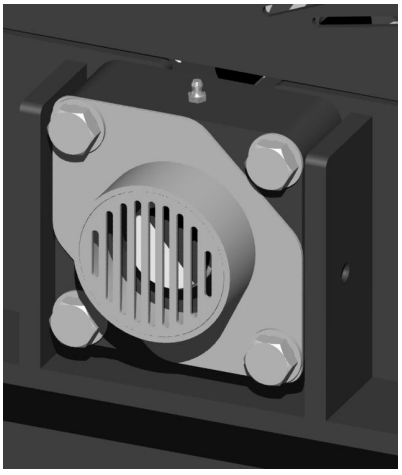
The machine must be standing on firm, level ground when in use. The tractor must be hooked up to the three-point hitch. The tractor must always be secured in a stationary position.

When starting up the machine: Coupling must be undertaken while idling or with as low a motor speed as possible, in order to avoid overloading the PTO shaft, gearbox, tractor and wood chipper.

6 Safety instructions

6.1 Safety regulations

- Use hearing protection, safety goggles or equivalent eye protection, close-fitting protective clothing and safety shoes.
- When working along roads, it is a good idea to wear a reflective vest in order to be more visible to other road users. Road signs must comply with applicable traffic regulations.
- Minimum permitted age for operating the machine is 18 years, but 16 years when training under the supervision of an adult.
- Keep all body parts away from the feed funnel and the machine's moving parts during operation.
- Always stand to the side of the feed funnel when filling the machine. Always be aware of the nature of the ground around the machine. Falling over close to the machine can be dangerous!
- Before starting up, check that the machine's safety devices are functioning correctly. This applies in particular to the operating guard's stop and return function.
- Never use the machine in enclosed or poorly ventilated spaces due to danger of carbon monoxide poisoning
- The top part of the machine must **not** be opened unless the rotor disc is completely stationary and the tractor's motor has stopped.
- **Always** stop the machine and tractor for any inspections, servicing and repair work.
- Tractor-mounted machinery must be lowered to the ground before performing any servicing or repair work
- Always remove ignition keys from the machine and/or tractor when leaving the machine.



Figur 6 Twocolored shaftend

- Following maintenance and repair work, the machine may only be started once all bolts have been tightened and all safety devices fitted.
- Three-point hitch-mounted machines **must** be coupled to the tractor's three-point hitch before use.
- The machine's maximum motor speed (1000 rpm) must **not** be exceeded.
- The PTO shaft shielding and cover must always be intact. Safety chains on the PTO shaft must be securely fitted.
- The length of the PTO shaft must be adjusted for the tractor according to the instructions from the supplier of the PTO shaft.
- The ejector tube must **not** point towards people or areas where people are walking.

- **<u>IN THE EVENT OF DANGER:</u> PUT THE OPERATING GUARD IN NEUTRAL**
  (See Figure 8)

- During operation set the machine's height to at least 600 mm above the ground (Figure 7).

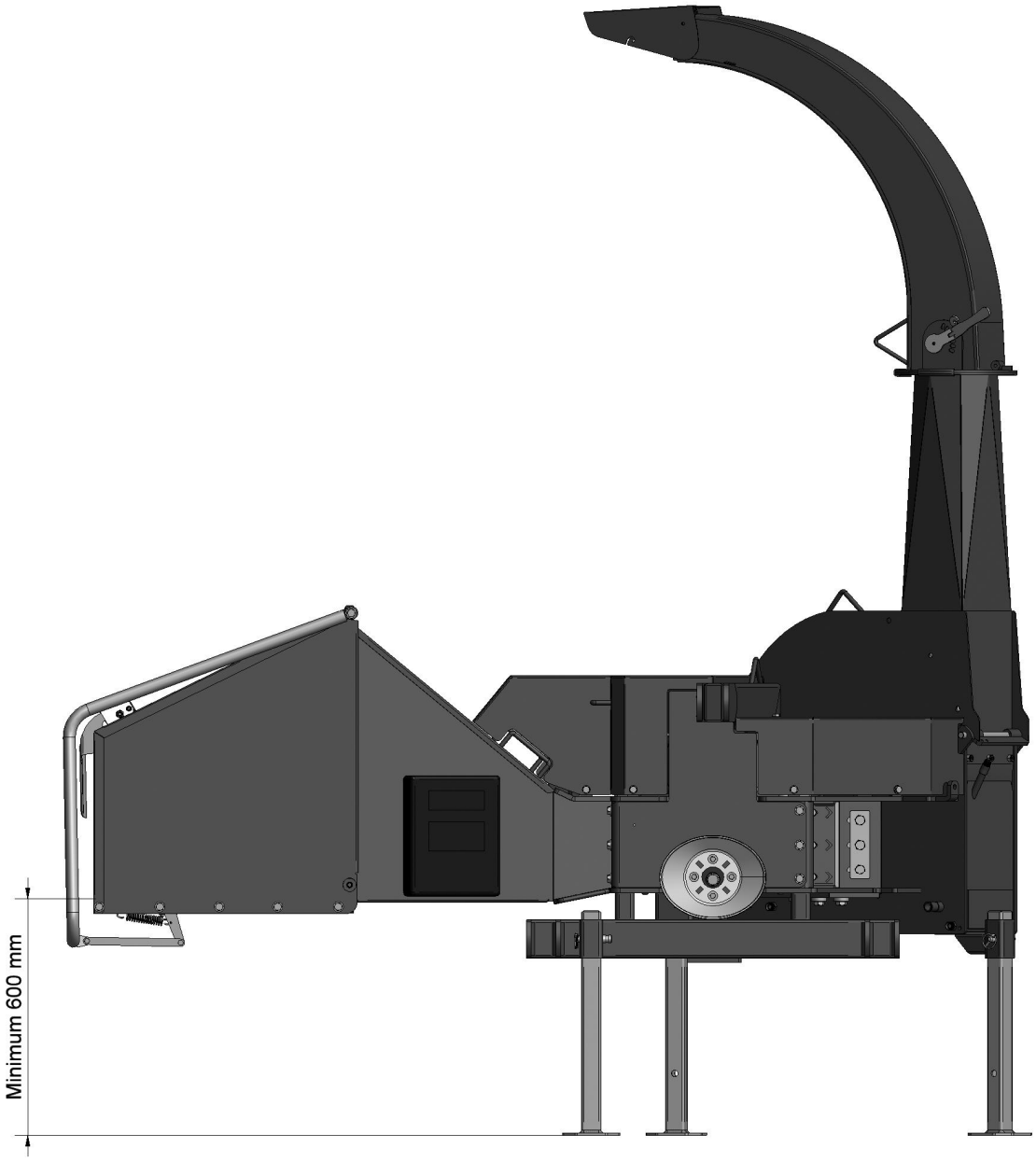
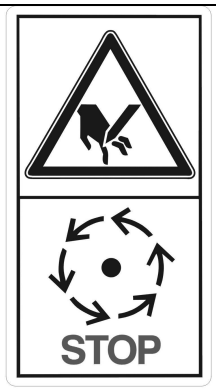
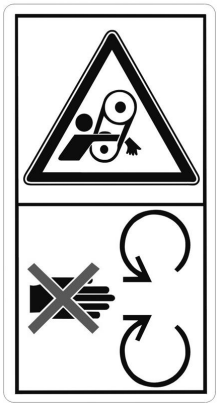
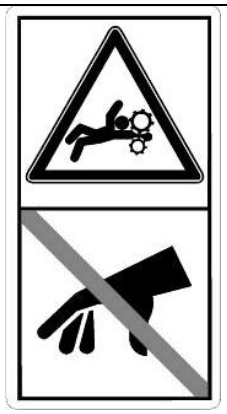
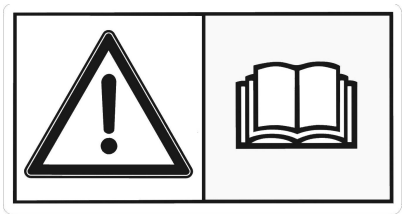
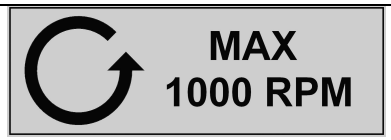


Figure 7 Minimum height above the ground

- During transport or when dismantled, place the PTO shaft in the machine's shaft holder.
- In case of transport on roads the ejector tube is turned so it is placed appropriately within the width of the machine and then it is fixed securely.For transport on public roads, official regulations must be obeyed.
- The machine is equipped with a tilting funnel; this must be tipped up and secured with split pins during transport.
- When cleaning small chips from the base of the funnel, **THE FEED ROLLERS MUST BE STOPPED.**
- A brush or similar item **must** be used for cleaning. Never touch the inside of the funnel when the machine is in operation.

6.2 Pictograms used

		
Warning: Objects thrown! Safety distance 20m!	Warning: Rotating knives! Wait for rotor to stop!	*Warning: Rotating rollers!*
		
Warning: Rotating belts!	Warning: Danger of retraction! Do not touch the hopper!	*Warning: Danger of retraction!* *Do not step on the hopper!*
		
Read the manual before use!	*Hearing protector and eye protection prescribed!*	*Lifting point for crane!*
		
Warning: Max 1000 rpm, anti-clockwise direction of rotation!		

6.3 Noise level

The sound power level from the wood chipper has been measured during operation at 1000 rpm on the rotor disc, powered by a tractor.

The measurements were performed according to testing regulations
Directive 2000/14/EC, 3 July 2000
EN ISO 3744, 1995
ISO 11094, December 1993
ISO 4871, 19 March 1997

The warrantyd sound power level that must be disclosed by the manufacturer pursuant to directive 2000/14/EC is as follows:

TP 230 wood chipper: 123 dB (A) re.1pW.

The above values take into account the common uncertainty of the measurement method and the estimated variation in a product range for the machine type. Detailed information on measurements and results and estimation of uncertainty can be found in an in-depth report, supplied on request.

The sound level is such that hearing protection is mandatory during use.

6.4 Environmental instructions

When replacing hydraulic or motor oil, dispose of oil and oil and air filters in a responsible manner; take to an approved receiving station.

Oil spills must be avoided as far as possible. In the event of a spillage, the spilled oil must be cleaned up and taken to an approved receiving station.

Take worn-out parts for recycling.

When the machine is no longer functional, it must be disposed of responsibly. Hydraulic and motor oil must be drained and taken to an approved receiving station together with oil and air filters.

Take the rest of the machine for recycling of the materials.

7 Operation of the machine

The wood chipper is equipped with two hydraulic rollers, pressure-compensated flow valve, control valve and operating guard on the feed funnel (See Figure 6). The feed funnel can be tilted. The operating guard must be in the stop position (0) during start-up (See Figure 7). After start-up, pull the operating guard to the central position (A) and the rollers will turn. The material will now be drawn into the machine.

Drawing the operating guard all the way towards you (B) will reverse the oil flow in the control valve, reverse the rollers, and the material will now run out of the machine.

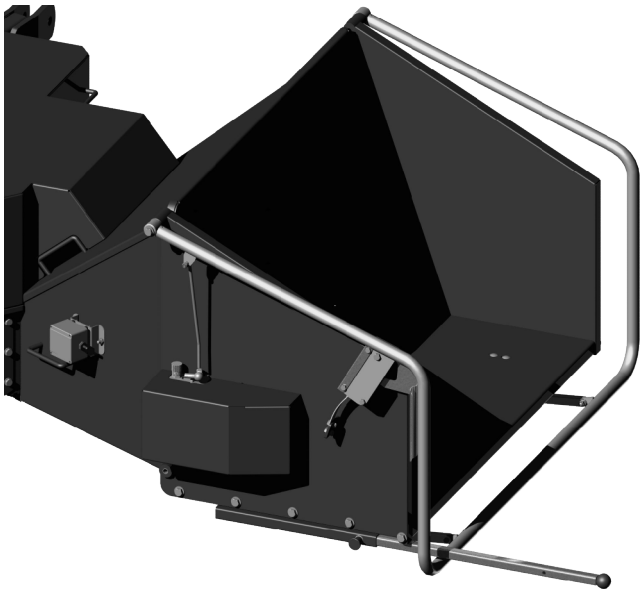


Figure 8 Feed funnel TP 230 with operating guard

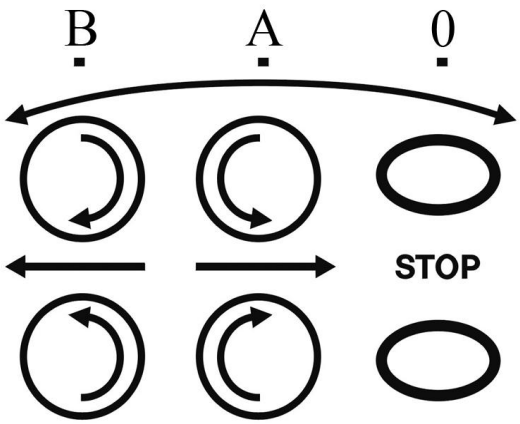


Figure 9 Directions for the operatin

By adjusting the adjusting screw on the flow valve, you can determine the correct rotation speed. Never run the rollers too fast, as the wood, together with too much pressure on the rotor, will act as a brake, resulting in increased fuel consumption. Branches can wind around the rollers if the rotation speed of the rollers is too fast.
The table below (Table 1) shows the recommended rotation speeds of the feed rollers for the required chip length. The speed varies with the rotation speed of the PTO shaft. The chip length can be regulated using the wood chipper's flow regulation valve for chip lengths smaller than specified in the table.

7.1 Table 1 Rotation speed settings for feed rollers

TP 230 (3 knives)				
Knife gap	1000 rpm	*theoretical m/min*	*theoretical m/min*	Chip length mm
12	81	*53*	29	18
10	67	*44*	24	15
8	54	*35*	19	12

8 Maintenance

The machine and any power must be stopped for all maintenance and repair work. Tractor-mounted machinery must be positioned on firm, level ground.

8.1 Maintenance schedule

Interval=> hours	**8**	**50**	**100**	**200**	**1000**	**1.000 m³**	**10.000 m³**
Lubricate PTO shaft[1]	X						
Check knives and anvil	X						
Tighten all bolts and nuts[2]	(X)	X					
Lubricate main bearings for rotor disc[3]			X				
Clean/lubricate PTO shaft pipe connection[4]				X			
Lubricate roller bearings[5]				X			
Replace return filter for hydraulic pump[6]		(X)			X		
Change hydraulic oil[7]					X		
Turn/replace anvil[8]					X		
Change guard in top rotor housing[9]					X		
Turn/replace triangular and square scrapers[10]						X	
Sharpen flat steel on feed rollers[11]						X	
Check V-belts[12]		X					
Oil change turning gear[13]		X			X		
Check ejector blades for wear					X		
Check casing for wear							X

[1] Remove the PTO shaft and lubricate 4 lubricating nipples with Uniway Li62.
[2] Tighten bolts and nuts, first time after 8 hours and then at 50-hour intervals.
[3] Lubricate two lubricating nipples with Uniway Li62.
[4] Remove PTO shaft and draw the pipe connections apart, clean and lubricate.
[5] Lubricate two lubricating nipples with Uniway Li62.
[6] Replace first time after 50 hours and then after every 1000 hours.
[7] Drain the hydraulic oil and fill with new oil using 21 litres of **Hydraway HVXA 46** or oil that has the equivalent specifications. The interval between changing oil can be extended by using biodegradable hydraulic oil, such as the type **Hydraway SE 46 HP** and taking oil samples on an ongoing basis.
[8] Turn/replace anvil.
[9] Change guard in top rotor housing, if fitted.
[10] Turn/replace triangular scraper in rotor housing. Turn/replace square scraper on rotor.
[11] Sharpen feed rollers.
[12] Check tension of V-belts
[13] The first oil change should be effected after the first 50 working hours, subsequently changes should take place after 500-800 hours or at least once a year. Pour 1,2 l SAE90EP, or similar oil quality, in the upper part of the gear, and 1,7 l in the lower.

8.2 Lubrication and oil

The Wood Chipper is as standard, factory-filled with hydraulic oil of the type **Hydraway HVXA 46**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

As an accessory, the Wood Chipper can be delivered factory-filled with biodegradable oil of the type saturated ester, **Hydraway SE 46HP**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

When replacing the hydraulic oil, open the filling nozzle (see Figure 8).
Unscrew the drain plug. Collect the oil in a container for proper disposal. Once the tank is empty, use oil suction equipment to suck the tank totally dry. Screw the drain plug back in and fill slowly with new hydraulic oil (21 litres for TP 230).
Fill until the oil reaches the midpoint of the sight glass.

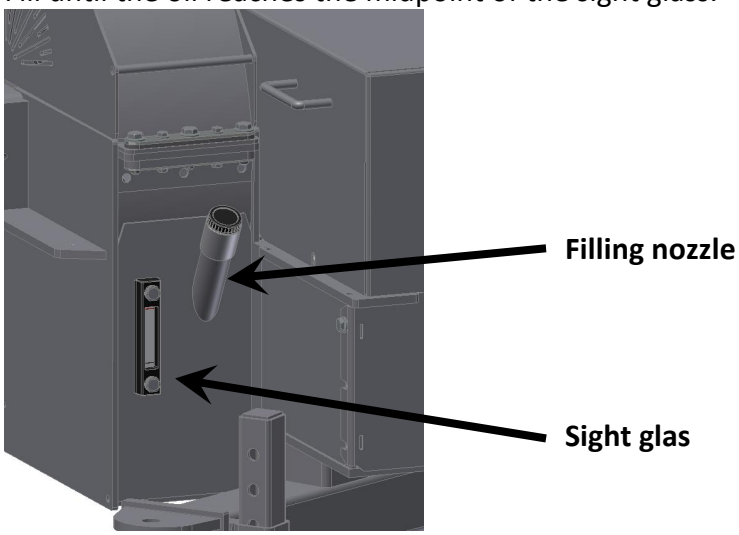


Figure 10 Filling with hydraulic oil

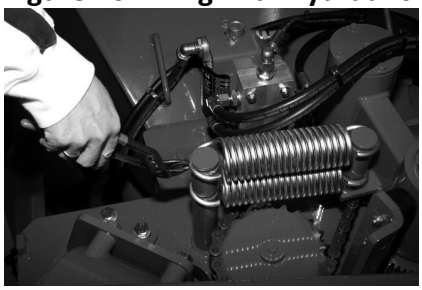


Figure 11 How to lift off the spring

8.3 Replacing wearing parts

8.3.1 Anvil

The anvil in the machine is used as a bedplate for the knives to cut the wood. The anvil must have sharp edges, as otherwise the wood will bend and the cut edge will be frayed. The machine is equipped with one horizontal anvil with two reversible cutting edges and one vertical anvil with four reversible cutting edges.

What to do:

Stop the machine and turn off any power. Remove the screen above the revolving roller. Loosen the bolts holding the two sections of the rotor housing together and open the rotor housing. Using multigrip pliers lift the two springs off the revolving feed roller and pull the roller to the side (See Figure 11)**.**

Remove the three bolts holding the horizontal anvil in place. You access these from outside and below. Take the anvil out from above and turn/replace. Before replacing the anvil, both the anvil and contact surface must be carefully cleaned. The gap between the knife edge and anvil must be **1 mm**. (See Figure 12).

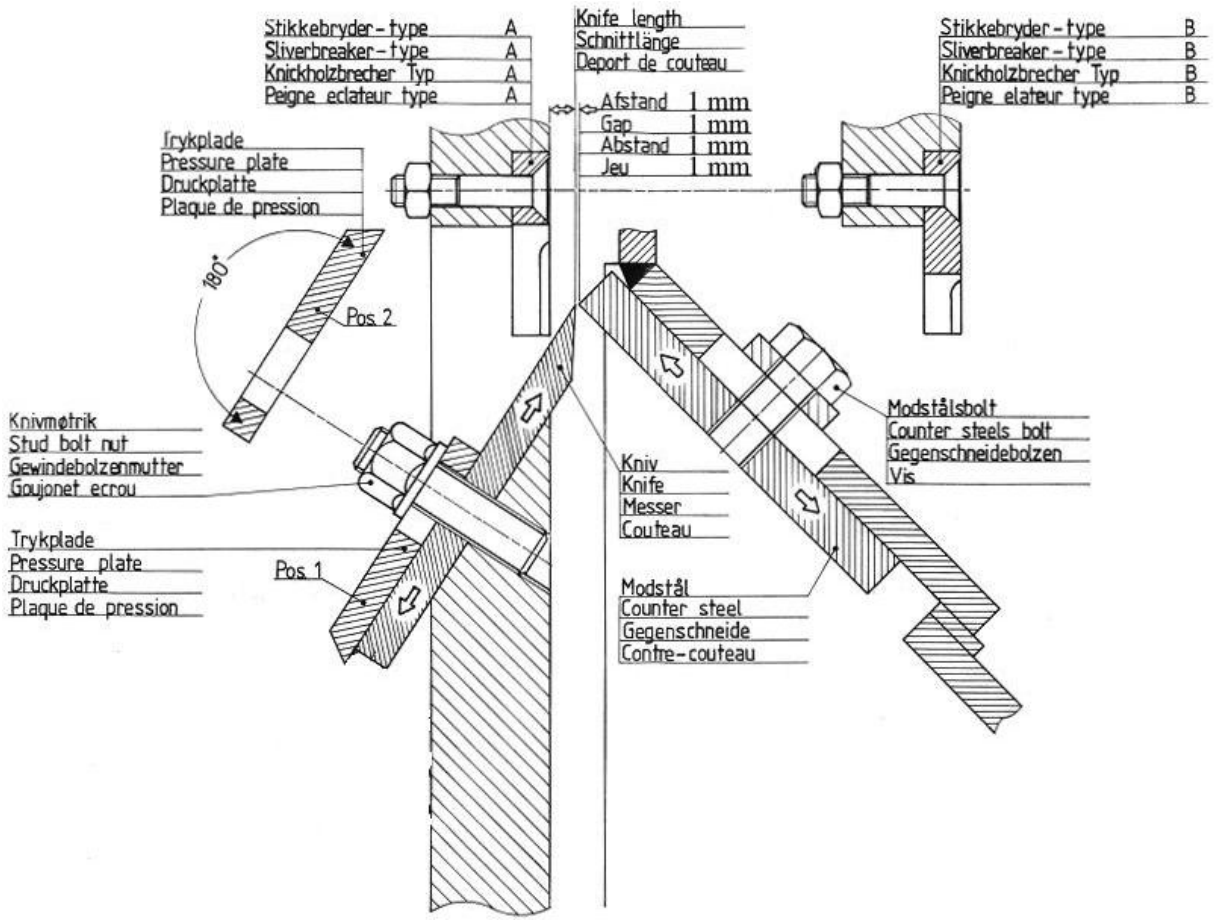


Figure 12 Gap between anvil and knife

The tightening torque for the anvil bolts must be **200 Nm/20 KPm.** Use the wrench included in the tool kit (can be purchased as extra equipment).

Unscrew the vertical anvil and remove from inside. Before inserting a new one, clean the contact surface and the anvil carefully. Set the anvil at **1 mm** from the knives. Use a feeler gauge. Tighten the bolts for the vertical anvil to **200 Nm/20 KPm.**

Once the anvils have been turned or replaced and all bolts tightened, draw the revolving feed roller back into place. Refit the springs using multigrip pliers (See Figure 11).

Turn the rotor several revolutions to ensure there are no objects in the rotor housing. Close the rotor housing and replace the bolts (See Figure 13).

Figure 13 Fitting bolts in the rotor housing

8.3.2 Knives

The machine is equipped with three knives.

The knives must always be replaced as a set. The knives form a set and should be sharpened so that they are always of equal width. If the knives are not the same width, the rotor will not be balanced, which will cause unnecessary strain on the bearings and vibrations throughout the machine.

What to do:

Stop the machine and turn off any power. Loosen the bolts holding the two sections of the rotor housing together and open the rotor housing.

Turn the rotor until the rotor lock connects with one of the ejector blades on the rotor. The rotor is now locked (see Figure 14). Keep your fingers well away from the knives when turning the rotor.

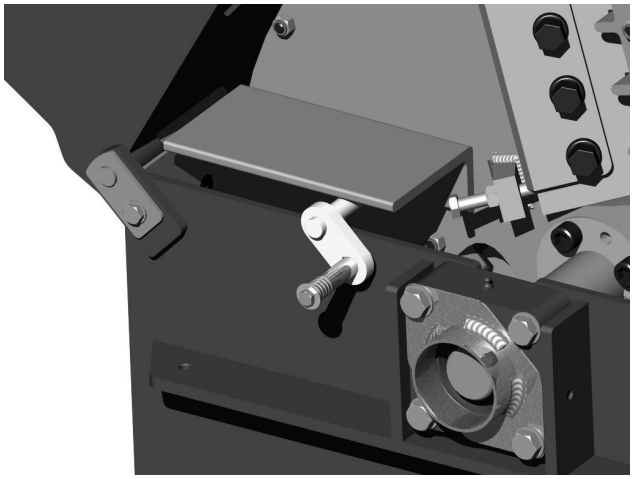


Figure 14 Locking the rotor using the rotor lock

Figure 15 Knife measure

Remove the four nuts holding the knife and the clamping plate to the rotor. Remove the knife and any sliver breaker. The contact surfaces on the cutting disc and the knife and sliver breaker must be cleaned thoroughly before fitting knives and sliver breaker. When fitting, the nuts **must** be lightly oiled (μ=0.125), i.e. light oil, WD 40 or equivalent. Copper grease, MoS_2 or equivalent low-friction grease must **not** be used.

When fitting knifes the knife measure (See Figure 15) is used for correct knife distance.

Check that the gap between knife edge and anvil is correctly set to **1 mm**.

The nuts must be tightened to **200 Nm/20 KPm**. Use the wrench, included in the tool kit, for this. This can be purchased as extra equipment.

Once the knives have been replaced, turn the rotor several revolutions to ensure there are no objects in the rotor housing. Close the rotor housing and tighten the bolts (See Figure 12).

8.3.3 Sliver breakers

To improve the chip quality, the machine is equipped with type A sliver breakers at the factory (see Figure 16).
When chipping hard seasoned wood, use type B sliver breaker (see Figure 17).
Type B sliver breaker is extra equipment.

Figure 16 Sliver breaker type A

Figure 17 Sliver breaker type B

What to do:

Stop the machine and turn off any power. Loosen the bolts holding the two sections of the rotor housing together and open the rotor housing. Remove the four bolts and nuts holding the sliver breaker in place (see Figure 18).

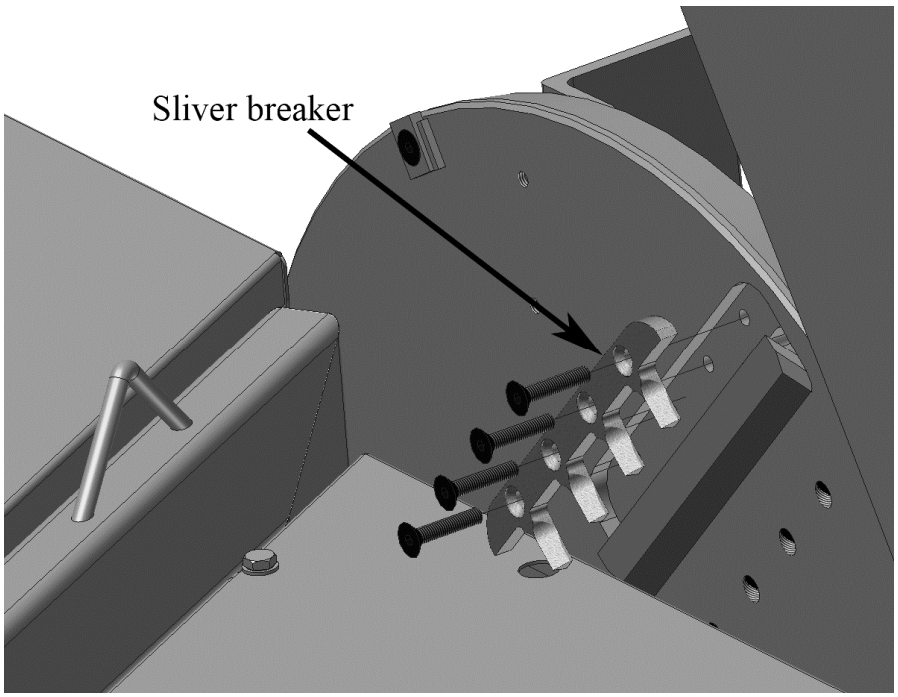


Figure 18 Replacing sliver breaker

When using sliver breaker type B, the knife gap must be **max. 8 mm**.

Once the sliver breakers have been removed or replaced, turn the rotor several revolutions to ensure that it runs freely and there are no loose objects in the rotor housing. Now close the rotor housing and tighten the bolts (see Figure 13).

8.3.4 Scrapers and blanking plate

The machine is equipped with three square scrapers on the rotor disc, one triangular scraper in the rotor housing and a blanking plate in the ejector tube (see Figure 19):

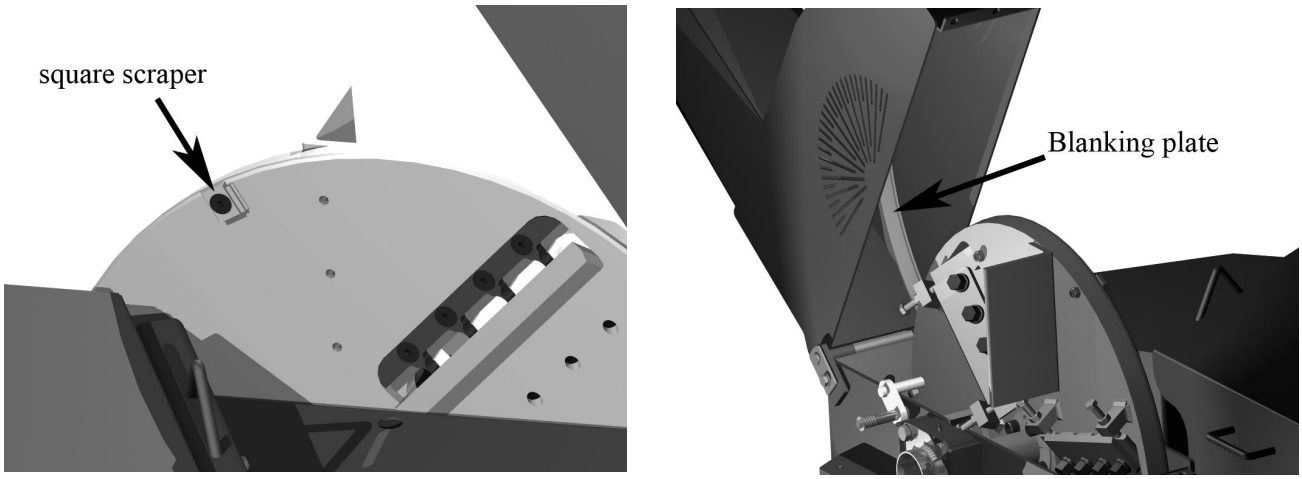


Figure 19 Location of scrapers and blanking plate

The purpose of the scrapers is to remove material that may jam the knives.
At the same time the square scraper on the rotor removes material that falls off before the cutting disc.
This reduces the wear on the casing and reduces the fuel consumption.

The square scrapers can be turned once before they must be replaced, while the triangular scraper and blanking plate must always be replaced once they become worn.

What to do:

Turn the rotor until the rotor locking bolt connects with one of the ejector blades on the rotor. The rotor is now locked (see Figure 14).

Remove the countersunk bolts holding the square scraper in place on the rotor. Turn the square so that a sharp corner points upwards. Clean the block and contact surface. Replace the square scraper. If it is worn on two corners, the square scraper must be replaced. Always replace the square scrapers on the rotor as a set. Replace the triangular scraper once it becomes worn.

The blanking plate is installed in the top section of the rotor housing and can easily be replaced by removing three bolts on the outside of the rotor housing. If chip quality is not of crucial significance, it can be beneficial to remove the blanking plate in the ejector tube. This will increase the capacity of the machine and save fuel. The blanking plate must be removed when chipping wet softwood with numerous needles. This ensures good discharge.

Once the scrapers have been turned or replaced, turn the rotor several revolutions to ensure that it runs freely and there are no loose objects in the rotor housing. Now close the rotor housing and tighten the bolts (See Figure 13).

8.3.5 Casing

The TP 230 is equipped with a replaceable casing at the base of the rotor housing. The casing bears the wear and tear that would otherwise affect the base of the rotor housing.

What to do:

Stop the machine and turn off any power. Loosen the bolts holding the two sections of the rotor housing together and open the rotor housing. Remove the top section of the rotor housing.

Remove the six bolts and nuts securing the casing to the bottom section of the rotor housing (Figure 20).
Tap the section of the casing protruding beyond the edge of the rotor housing on the hinge side with a hammer to loosen it. The casing can now be drawn out.

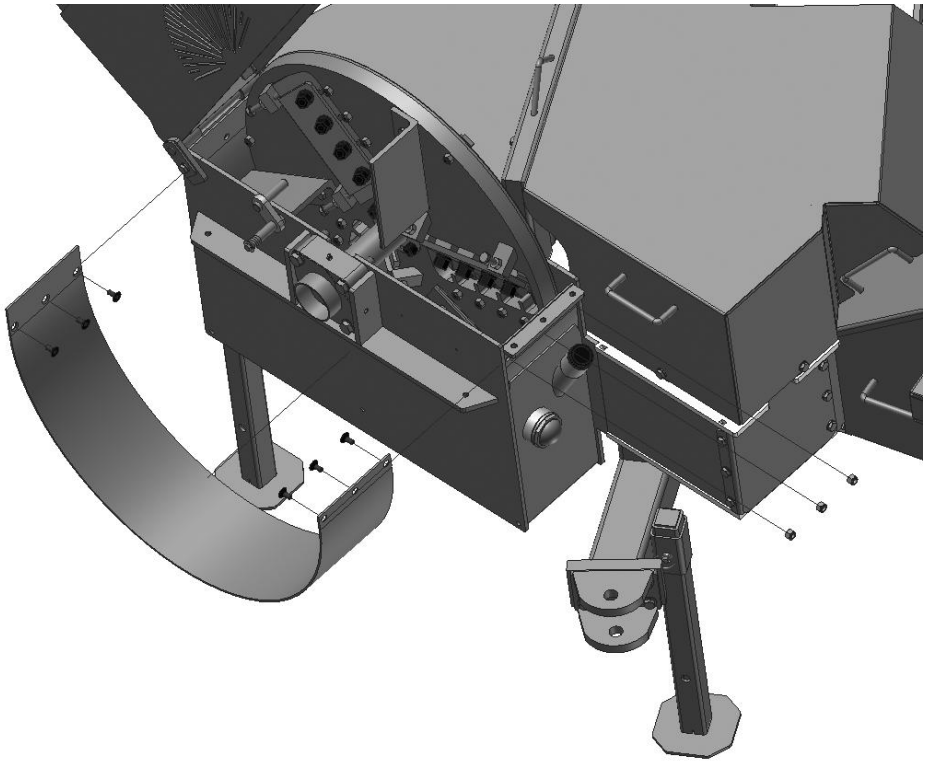


Figure 20 Replacing the casing

Before a new casing can be fitted, any dirt and rust must be cleaned from the base of the wood chipper. Fit the new casing using six bolts. Replace the top part of the rotor housing.

Once the casing has been replaced, turn the rotor several revolutions to ensure that it runs freely and there are no loose objects in the rotor housing. Now close the rotor housing and tighten the bolts (see Figure 13).

8.3.6 Adjusting V-belts

The feed rollers are hydraulically powered. The hydraulic pump for the feed rollers is powered by V-belts. The V-belts must be checked at regular intervals or if you suspect they are slack.

What to do:

Stop the machine and turn off any power. Remove the bolts holding the two sections of the rotor housing together and open the rotor housing.

Loosen the four bolts holding the hydraulic pump in place and adjust the tension using the adjusting screw. Used belts may yield 5.5 mm when pushed down using 38 N (3.8 kg), the figure for new belts is 43 N (4.3 kg) (see Figure 21). The belts can be measured using a special measuring instrument, which can be purchased as extra equipment.

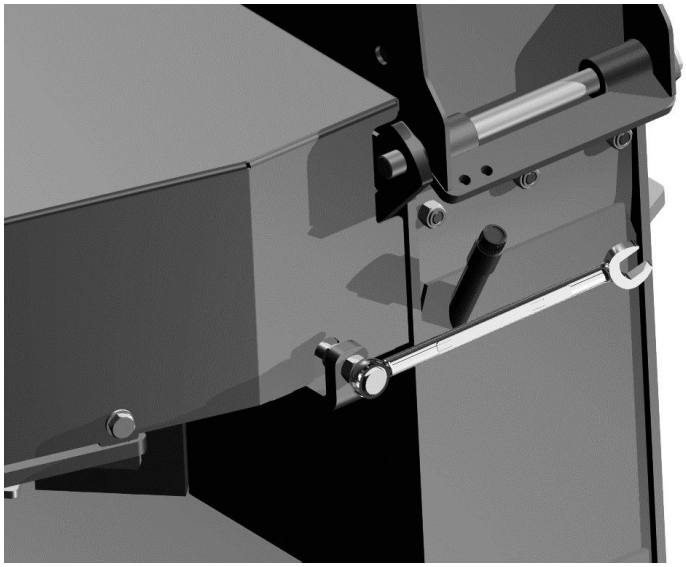


Figure 21 Tightening V-belts

Once the V-belts have been tightened, turn the rotor several revolutions to ensure there are no objects in the rotor housing. Now close the rotor housing and replace the bolts (See Figure 13).

8.4 Sharpening knives

The sharpness of the knives is very important for chip quality; this must be checked at least once a day. The sharpening interval for the knives can be extended by sharpening them at regular intervals using a carborundum brick.

The sharpening method must be **wet grinding** using a grindstone (See Figure 22). **Never** use an angle grinder or similar for sharpening knives.

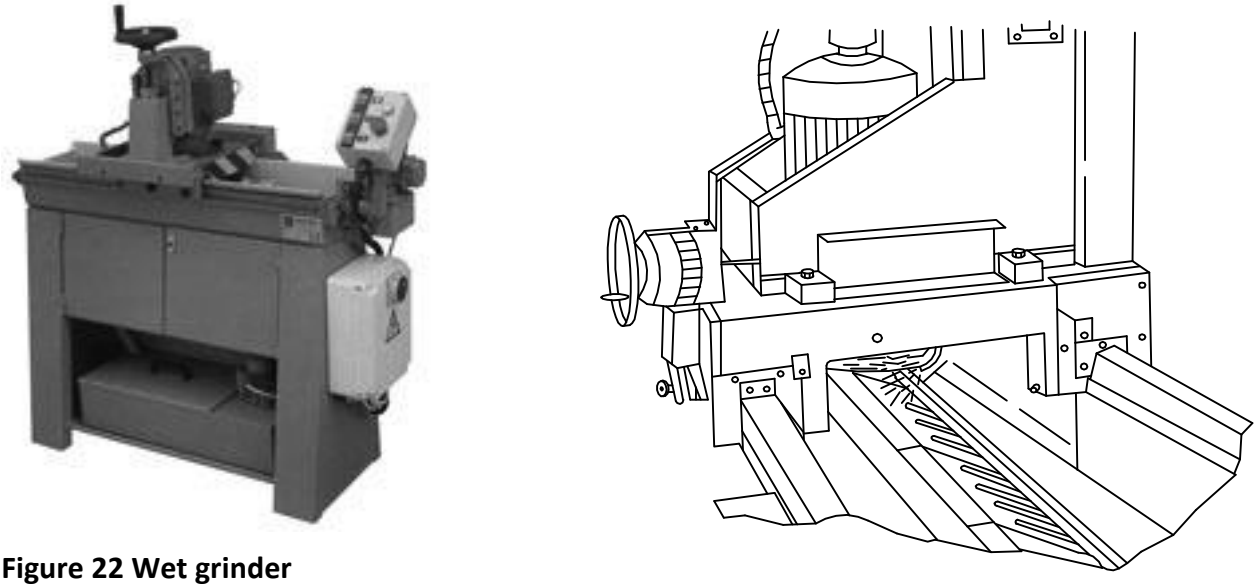


Figure 22 Wet grinder

When sharpening knives, you must make sure that the width of the knife set is uniform to ensure balancing of the rotor. Consequently, the knives must always be sharpened as a set. The knives may be ground down to a minimum measurement of 106 mm (see Figure 23). After that they must be discarded.

The knives' cutting edge angle must be ground at 30°. (See Figure 23)

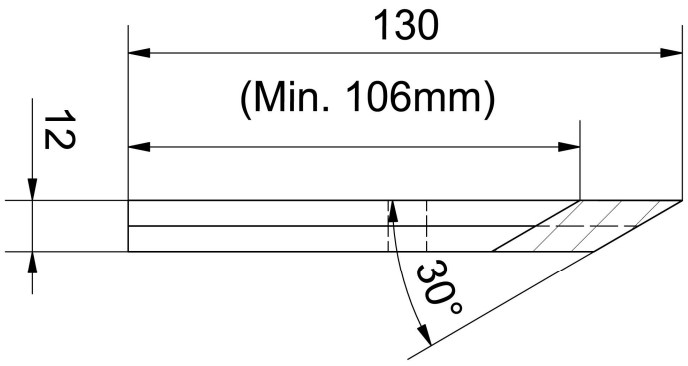


Figure 23 Sharpening angle and minimum knife width for cutting knifes

9 User Instructions for TP PILOT 01

9.1 General operation

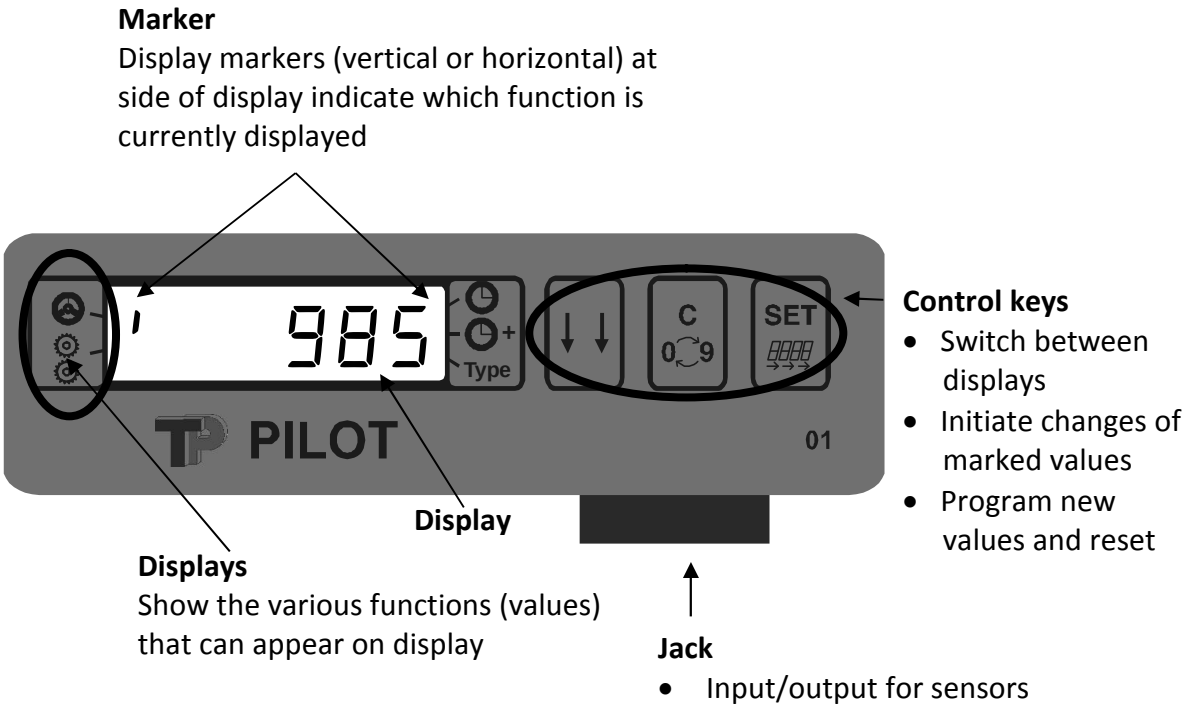
The TP Pilot gives you the opportunity to monitor the revolutions of the engine and retract rollers and sounds an alarm when low or high limit values are exceeded.
Parameters and machine type can be change by entering an access code.
Valid from version 816.14. See setting table for machine types.

Various functions and displays

The computer has the following functions:

Symbol:	Denomination:	Limit value:	Access code needed
	Programmable revolution guard **Rotor** (used with sensor for rotor rpm)	1 – 9999 rpm (in practice not under 12 rpm)	X
	Programmable revolution guard **Roller** (used with sensor for roller rpm)	1 – 9999 rpm (in practice not under 12 rpm)	X
	Work time	0:0 – 99:59 hours: minutes 9999 whole hours	
+	Work time total	0:0 – 99:59 hours: minutes 9999 whole hours	
Type	Choice of machine type	1 – 12	X

Monitor



Explanation for operation keys


-Key

By pressing the  key you switch between the different display indications (seen in the window at the left end of the display) and thereby the different functions of the monitor. With each press on the key, the position of the marker/display indication changes one step. The marker starts in the top left corner and then moves ”down”.

The key is also used to leave the change menu (cf. next paragraph).


-Key

The  key is used for programming (changing/deleting) values in the computer, e.g. putting in alarm values for high and low revolutions.


-Key

With the  key the values that are going to be programmed (chosen by using the  key) are changed or deleted.

The computer is equipped with an internal memory which saves all values when the power is cut.

9.2 Programming

The following parameters can be adjusted as desired.

Parameter	Meaning	Comment
L(ow)	Lowest rpm	Deviation from normal revolutions. If the machine is loaded to under ”lowest rpm”, the feeding is uncoupled so that the machine has the possibility to get to normal rpm where the rollers start.
h(igh)	Normal rpm	Normal revolutions that the rotor disc has to hold and where the feeding starts.
T(ype)	Machine type	According to the setting table for machine types.

Alarm activated by feed-in roller. If RPM value on feed-in roller exceeds upper limit value (Roller blink) display will alternately blink between 0 and 9999.
Roller speed can be adjusted by adjusting the manual regulation of oil to hydraulic motors.
When roller speed is once more under limit value, actual RPM will be displayed again.

<u>Entering the access code</u>
When changing the parameters and machine type, access code **1001** is required. Enter the access code with following procedure

With the  key you can navigate to the function/indication you want to change/programmed.

Then the 

key is held for approximately 1 second until _c0000 start flashing.

With the 

key the first digit in the value you want to program is now changed or deleted.

By pressing the 

key, the marker moves to the next digit in the value and so on until all the digits are changed/programmed. The programming menu is left by pressing the  key.
The access code is required at every change.

Here you see an example for programming of limit values on the rotor.

Example of changing low limit value to 850 rpm and high limit value to 1025 rpm		
Push key:	**The display shows:**	**Explanation:**
↓↓	0	Find the revolution guard for the rotor by pressing the key repeatedly.
SET	L X800	Press the key for 1 second, **enter access code** ”L” lights up to the left and the first digit (of 4) is flashing.
C	L _800	Press the key until the digit has the correct value. Notice that zero appears as _ here.
SET	L _X00	Press to put/change the next digit (the second digit will flash).
C	L _800	Press the key until the desired digit is correct.
SET	L _8X0	Press to put/change the next digit (the third digit will flash).
C	L _850	Press the key until the desired digit is correct.
SET	L _85X	Press to put/change the last digit.
C	L _850	Press the key until the desired digit is correct.
↓↓	h X000	Press the ”arrow” key and ”h” (high) will light up to the left and the first digit (of 4) will flash.
C	h 1000	Press the key until the desired digit is correct.
SET	h 1X00	Press to put/change the next digit (the second digit will flash).
C	h 1000	Press the key until the desired digit is correct.
SET	h 10X0	Press to put/change the next digit (the third digit will flash).
C	h 1020	Press the key until the desired digit is correct.
SET	h 102X	Press to put/change the last digit.
C	h 1025	Press the key until the desired digit is correct.
↓↓		Press to complete and exit the programming menu.

If alarm rotor limit values are exceeded, current RPM value will continue to show whilst feed-in rollers stop. If rotor has run under lower value, feed-in rollers will re-start when rotor RPMs come over set upper value ‘h’ (e.g. 1000 RPM).

Setup table for machine types.

Model	PTO / rotor	RPM L	RPM h	Type No.
TP230 PH	1000	850	1000	11

Table for reduced chip length.

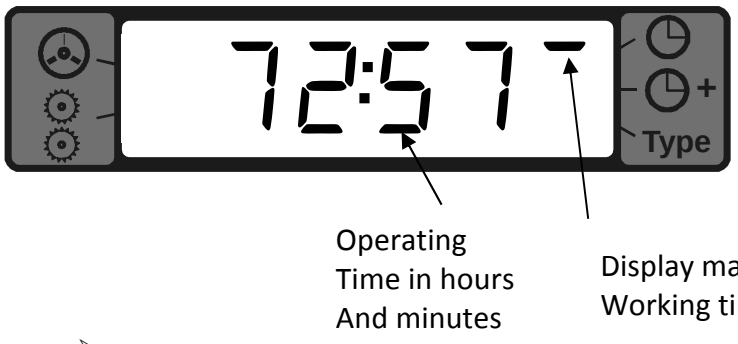
Chip length Model	Rotor RPM	8 mm	10 mm	13 mm
TP230 PH	1000	54	67	81

Roller RPM for chip length required can be found on table above.
RPM value can be set using regulation screws on manoeuvre valve.

WORKING HOURS

Display of rotation time

The middle horizontal marker will be activated on the right of this display. Total rotation time will be shown as illustrated in figure below.



Operating
Time in hours
And minutes

Display marker for
Working time

-
- Over 99:59 hours/minutes will shown as whole hours only

Resetting rotation time display

Rotation time (operating hours) can be reset at any time. Press ↓↓ key until working time display appears. Perform following key sequence:

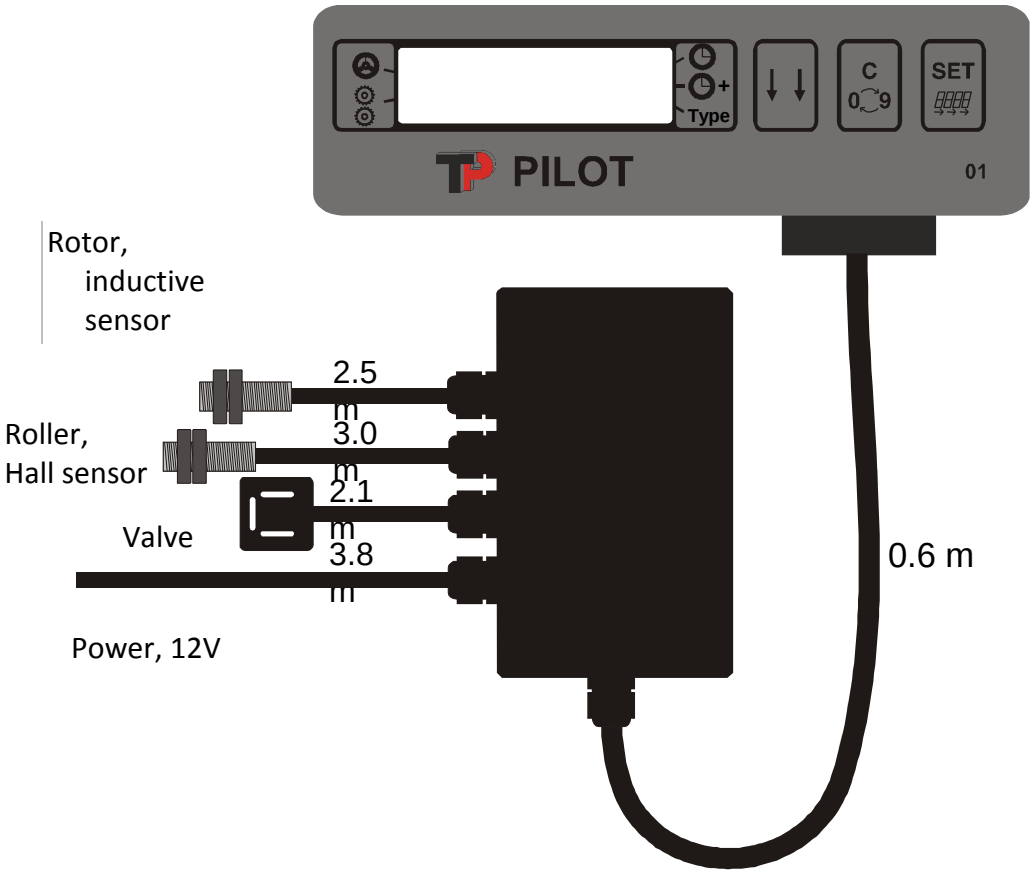
Press key:	Display:	Explanation:
↓↓	72:57 (example)	Find job hours by pressing key repeatedly.
SET	72:57	Hold key for 5 secs. until figures blink.
↓↓	00:00	Press key to reset rotation time.

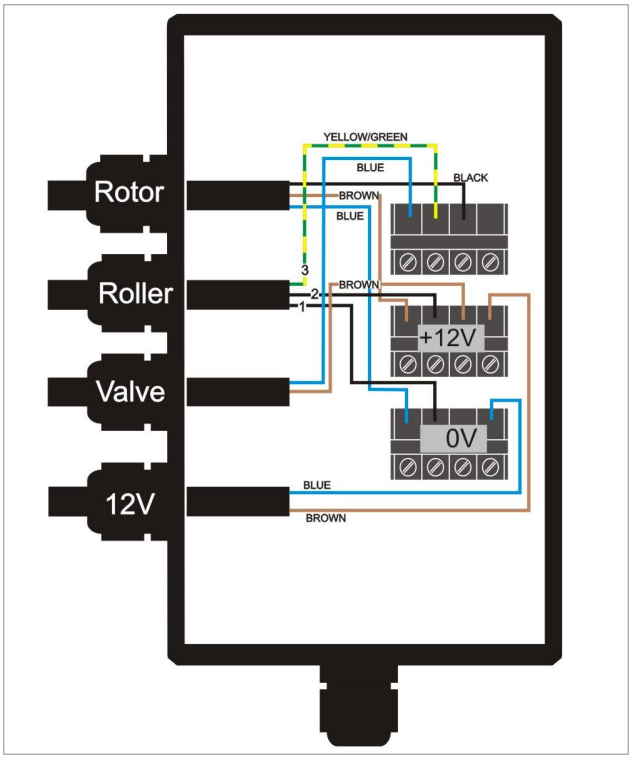
Note: Total hour counter (bottom vertical marker) cannot be reset. This is used to register machine's total working hours.

9.3 Installation

<u>Mechanical setup and installation diagram</u>

Installation diagram using electronic sensors (hall or inductive):





9.4 Technical data

Display: 6 digit.

Power supply: 12 Vdc / 1.24 A

Temperature range: TP Pilot is fully operational within -10 / +70 °C.

Sensor pulse signals: Max. 225 pulse/sec.

Note

Control system/monitor intended for use with function described. Any other use of control system/monitor can entail major risk for which the supplier of the control system cannot be held liable.

10 Troubleshooting for TP 230 wood chipper

Investigate possible causes before contacting the supplier.

Problem/Possible cause	Solution
The rollers are not turning properly:	
Too little oil in the hydraulic system	Top up the hydraulic oil
The flow valve has been unscrewed too far	Screw flow valve back in
The fixed roller is jammed	Clean under and behind the roller
The bypass valve is clogged	Clean the bypass valve
Blocked by shaft speed monitor	Increase rotations of the rotor
The operating guard is in position 0	Set the operating guard to position A
The rollers are not drawing adequately:	
Too little flow	Unscrew the flow valve further (open)
V-belts too slack	Tighten V-belts
The hydraulic oil is too hot	Allow the machine to cool down while you investigate the cause
Viscosity of hydraulic oil too poor	Replace the hydraulic oil
The hydraulic filter is clogged	Replace the hydraulic filter
The oil pump may be worn or damaged	Replace the hydraulic pump
The oil motor is defective	Replace the oil motor
The pressure release valve in the control valve is clogged	Clean the pressure release valve
The chip quality is unsatisfactory:	
The knives are blunt	Sharpen the knives
The anvil is worn	Turn/replace the anvil
The knife is too worn down	Replace the knife
The gap between knife and anvil is too great	Adjust gap between knives and anvil
Sliver breaker not fitted or worn	Fit or replace sliver breaker
Poor discharge of chips:	
Too little power	Insufficient power on PTO shaft or motor
Scraper is worn	Replace scraper
Ejector blades are worn	Replace ejector blades
The blanking plate in the top part	Remove the blanking plate in the top part
Too few revolutions on the machine	Increase speed to maximum revolutions

11 Warranty commitment – wood chipper

The warranty is valid 12 months from date of purchase to rectify defects that irrevocably are due to defects in materials or workmanship. The warranty covers faulty components which are repaired or replaced.

Transportation costs and wages for changes are the responsibility of the customer.

Upon any claims, the changed parts must be sent to Linddana for investigation.

Linddana alone decides whether the claim can be approved.

The following is an excerpt from Linddana's Terms of Sales and Delivery (item 4 and 5).

Complaints

Any risk associated with the goods transfers to the purchaser at the time the goods are delivered. Any complaint regarding the goods must be made in writing to Linddana as soon as possible, and no later than 8 days after delivery. If Linddana receives no complaint within the stated deadline, purchasers' objections concerning quantity and quality become void.

Linddana is entitled and obliged to remedy all defects caused by design, material or manufacturing faults. Linddana itself will decide whether correction will involve repair or replacement of the defective part(s). In the case of repair, the purchaser is obliged to deliver and collect the sold item to/from the workshop specified by Linddana at no cost to Linddana. In the case of replacement of the defective part(s), the purchaser is obliged to forward the defective part(s) to Linddana in advance at no cost to Linddana. Linddana is entitled to undertake replacement delivery of defective goods instead.

Linddana's liability only covers defects that arise within one year of the date on which the sold item was delivered.

Linddana is not liable for defects over and above that stated in this point. This applies to any loss resulting from the defect, including operating loss, lost earnings and other resulting financial losses.

Warranty stipulations

If Linddana has undertaken to grant a warranty, this covers faults and defects in design, material or manufacturing. A warranty granted by Linddana does not cover faults and defects resulting from inadequate maintenance, incorrect assembly, modifications performed by the purchaser or incorrect use of the item. Furthermore, the warranty does not cover normal wear and tear and deterioration. Linddana's warranty commitment requires the purchaser to prove that a stated fault or defect is not due to the circumstances that are exempt from the warranty (see above).

The purchaser must give Linddana written notification of faults or defects affecting the sold item no later than 8 days after the fault or defect is or should have been detected by the purchaser. If

the purchaser does not inform Linddana before expiry of this deadline and before expiry of the warranty period, the purchaser will forfeit their right to submit claims in connection with the fault or defect.

Linddana is entitled and obliged to remedy all defects covered by a warranty granted by Linddana. Linddana itself will decide whether correction will involve repair or replacement of the defective part(s), or will comply with the terms stated in point 4.

Linddana is not liable in other respects for such defects. This applies to any loss resulting from the defect, including operating loss, lost earnings and other resulting financial losses.

Consequently, the warranty does not cover:

- Damage that can rightly be attributed to inappropriate handling.
- Use of unoriginal spare parts, including wearing parts.
- Incorrect setting or use of the machine.
- Use of incorrect lubricant or hydraulic oil.
- Wear and tear of cross piece on PTO shaft.
- Tightening spring for rollers.
- V-belts
- Knives and anvils that break as a result of foreign matter in the machine.

12 Technical data – wood chipper

Type	TP 230
Chipping principle	Disc chipper
Rotor disc diameter, mm	760
Rotation speed, PTO rpm*	1000
Number of knives	3
Power requirement, min/max kW/(HK)	37-90/(50-120)
Max. wood diameter, mm	230
Chip length, mm	10-18
Weight, kg	990
Height, mm	2950
Width (folded), mm	1950
Width (unfolded), mm	2525
Length, mm	1550

PTO shaft: Walterscheid type 2400 with free-wheel.

We reserve the right to make changes to the design and specifications without prior notice.

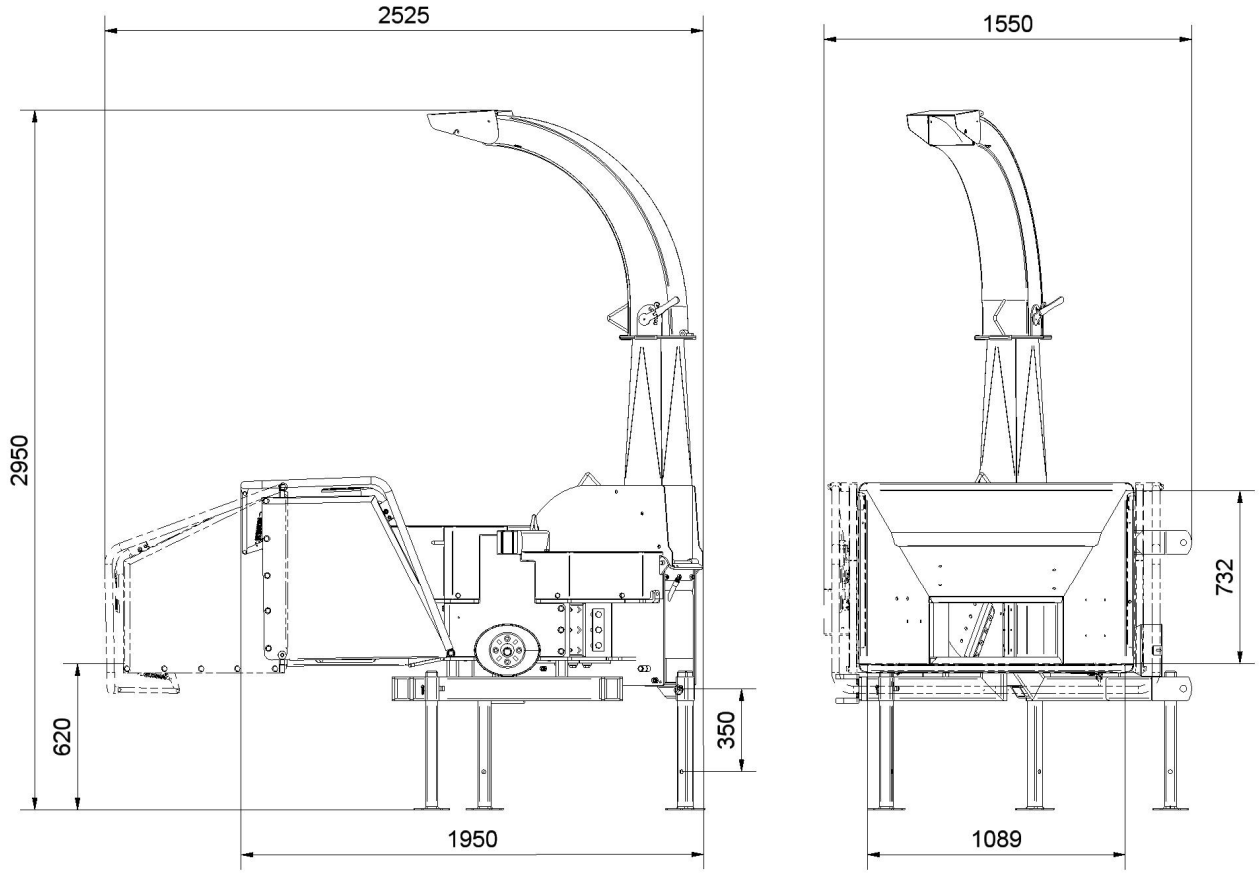


Figure 24 Dimension sketch for TP 230

13 Hydraulic diagrams

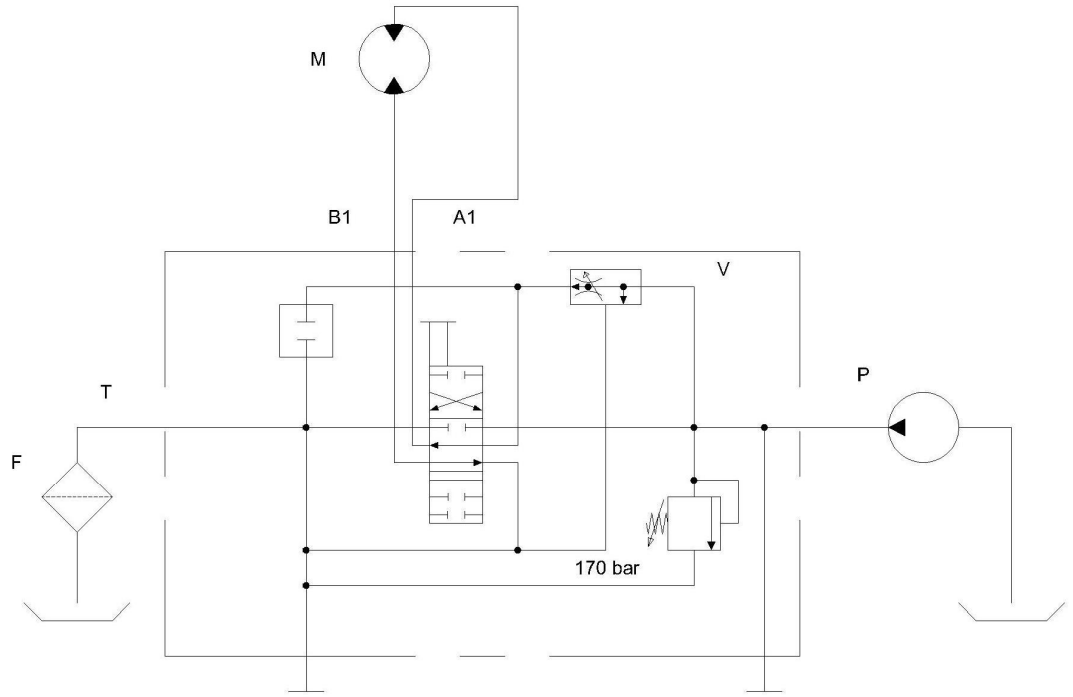


Figure 25 Hydraulic diagram for TP 230 without shaft speed monitor

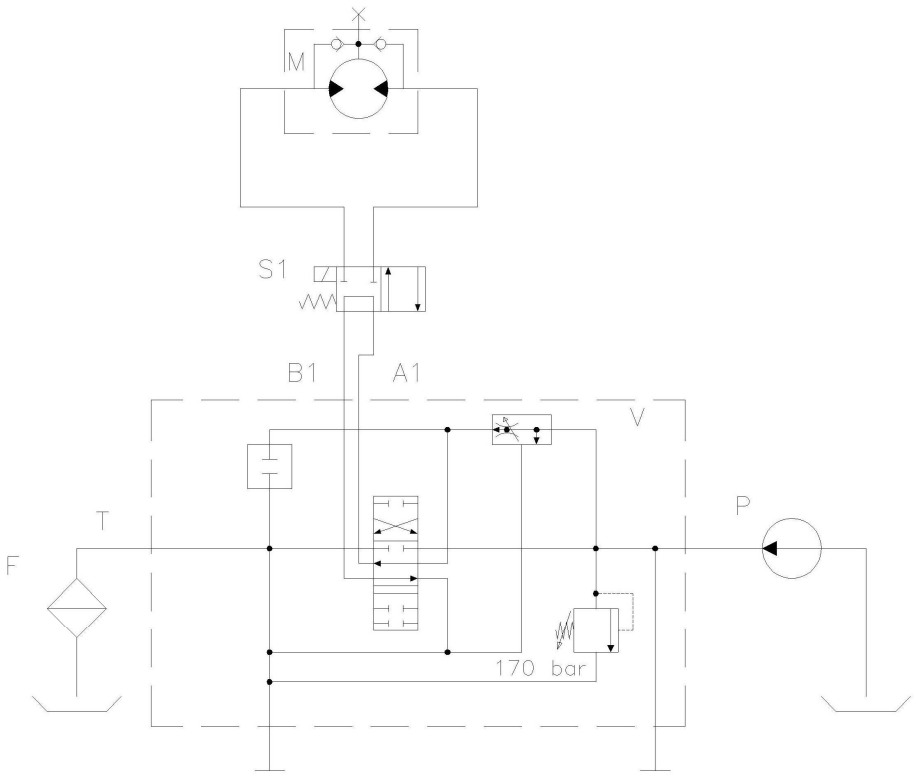


Figure 26 Hydraulic diagram for TP 230 with TP PILOT shaft speed monitor

14 Accessories

- Tool kit incl. torque wrench.
- Prolonged ejector tube horizontal.
- Extension for ejector tube vertical.
- Sliver breaker type B (Figure 27)
- Revolution guard TP PILOT

15 Spare parts catalogue

