User Manual
&
Spare Parts Catalogue
for TP 200 wood chipper in the Park Series



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1 Introduction

Congratulations on your new TP wood chipper.

Linddana produces TP wood chippers of the finest quality by using the most modern production technologies, such as laser cutting, CNC technology and robot technology in bright and open production facilities.

For safety reasons and in order to get the maximum benefit from your wood chipper, it is important you read the user manual before use.

Originally written in Danish, the user manual provides an explanation of safety, use and maintenance, to ensure working with the wood chipper will be safe and profitable.

Linddana A/S



Hans Anker Holm, CEO

Your local dealer is always available with spare parts, advice and guidance.

Dealer stamp

Applies to Denmark (for all other countries contact the local TP dealer):
Linddana provides a knife sharpening service, so your knives can be sharpened and sent back on the same day as they are received (for more details tel.: +45 76904045).

To keep your wood chipper in top condition and prolong its lifetime, Linddana offers a service contract, under which the wood chipper will be checked once a year by our technician, ideally in collaboration with the user. In addition to a technical check, the user will be given advice on the use and maintenance of the wood chipper.

2 EU DECLARATION OF CONFORMITY

Manufacturer:

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

Wood chipper:

_____

and accompanying extra equipment is in conformity with the requirements of the Machinery Directive (Directive 2006/42/EC) and with the national legislation which translates this directive;

furthermore, is in conformity with the following EC Directives:
2000/14/EC

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

Title: CEO
Name: Hans Anker Holm



Ølholm, 21 April 2017

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3 Contents

1 Introduction 2
2 EU DECLARATION OF CONFORMITY 3
3 Contents 4
4 Use and safety 5
4.1 Mandatory Instructions and Warnings 5
5 Pictograms used 18
6 Fitting instructions 21
6.1 Before use 21
6.2 Fitting instructions 23
7 Noise level 24
7.1 Environmental instructions 24
8 Operation of the machine 25
8.1 Table 1 Setting the rpm monitor for feed rollers 26
9 Maintenance 27
9.1 Maintenance schedule 27
9.2 Lubrication and oil 28
9.3 Maintenance of the feed rollers 29
9.4 Replacement of wearing parts 30
10 Scrapers and facing plate 33
10.2 Sharpening knives 36
11 Special instructions for TP 200 MOBILE 38
12 Special instructions for TP 200 MOBILE TURNTABLE 38
13 Hydraulics diagram, TP 200 without rpm monitor 40
14 Hydraulics diagram, TP 200 with rpm monitor 40
15 Instructions for rpm monitor TP PILOT 41
15.1 Overall operation 41
15.2 Changing parameters and machine type 43
15.3 Fitting 47
15.4 Technical data 48
16 Troubleshooting for the TP 200 wood chipper 49
17 Warranty terms wood chipper 50
18 Technical data wood chipper 51
19 Extra equipment 53
20 Spare Parts Catalogue 54

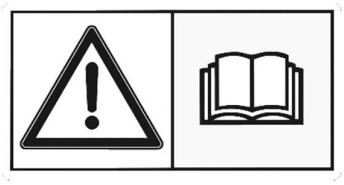
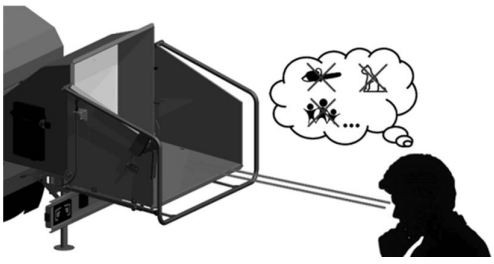
4 Use and safety

This TP wood chipper is specially designed as a stationary wood chipper, which chips wood in the form of branches, bushes and waste wood from windbreaks, parks, roadside trees, etc.

Any modification to the design of the machine is strictly prohibited. In the event that modifications are made, Linddana A/S disclaims all liability.

4.1 Mandatory Instructions and Warnings

4.1.1 Before use

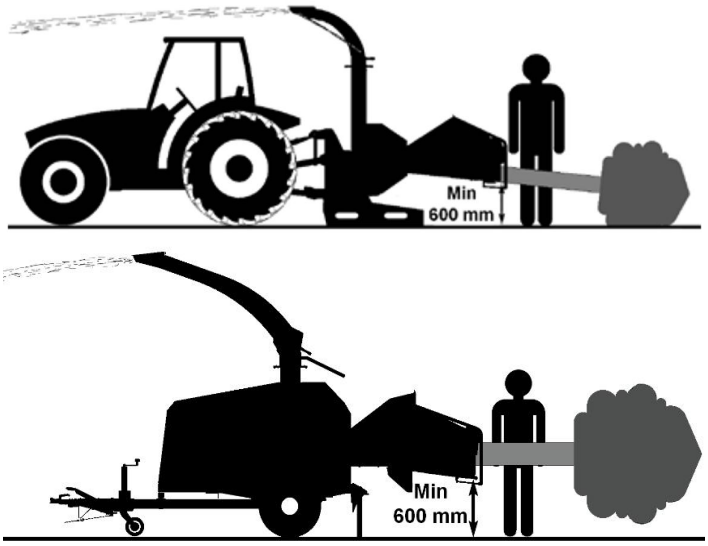
	 **ALWAYS** read the user manual before using the wood chipper. Remember to store the user manual in the manual box.
	 **ALWAYS** wear ear defenders, safety goggles, close fitting safety clothing and safety shoes.
	 **ALWAYS** ensure that the funnel is free of people, animals and other foreign bodies before starting the wood chipper.

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ALWAYS ensure that all of the guards are securely closed/fitted before starting the wood chipper.

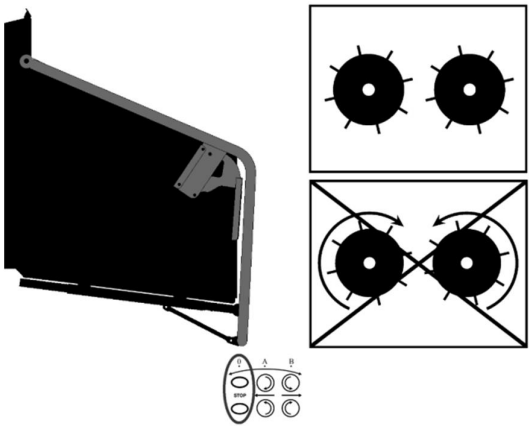
ALWAYS ensure that the tractor which drives the wood chipper is safely parked before starting the wood chipper (applies to the PTO model).

ALWAYS ensure that the wood chipper is safely parked before starting the wood chipper (applies to the MOBILE model).



ALWAYS ensure there is more than 600 mm of clearance between the ground and the wood chipper's lowest funnel edge and that it stands on a level surface (applies to both the PTO and MOBILE model).

ALWAYS ensure that the wood chipper is fitted to the tractor's three-point suspension (applies to the PTO model).

	 **ALWAYS** ensure that all of the safety devices function correctly before starting the wood chipper. This applies in particular to the safety bar's STOP function.
	ALWAYS observe the ground conditions around the wood chipper. Falling down in the vicinity of the wood chipper is hazardous.
	ALWAYS ensure the length of the PTO shaft is suitable for the tractor in accordance with the recommendations from the supplier of the PTO shaft (applies to the PTO model).
	ALWAYS ensure that the PTO shaft's tube guard and cover is intact and that the safety chains on the transmission shaft are safely fitted (applies to the PTO model).

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NEVER allow anyone under 18 years of age to operate the wood chipper (however, anyone who is 16 years old and over may do so under the supervision of an adult).



NEVER operate the wood chipper if under the influence of alcohol or narcotic substances.





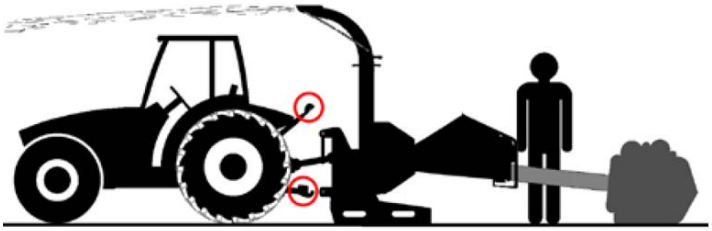
NEVER operate the wood chipper on uneven or inclined surfaces.

NEVER start the wood chipper without the ejector spout fitted.

NEVER use the wood chipper in enclosed or poorly ventilated spaces, because of the danger of carbon monoxide poisoning.

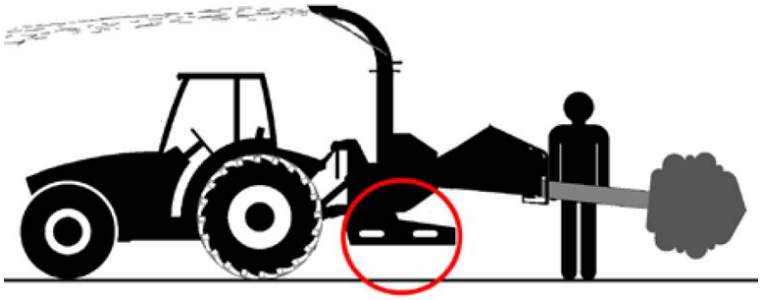


NEVER point the ejector spout in the same direction as people or at an area that people move around in.
A safe distance of 20 m must be maintained in the direction of where the woodchip is ejected.

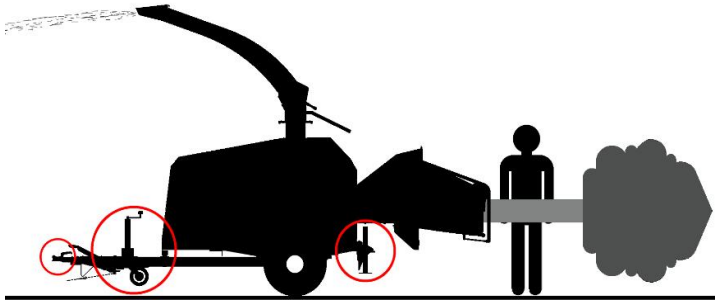


NEVER start or operate the wood chipper before it has been fitted to the tractor's three-point-suspension (applies to the PTO model).

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NEVER start or operate the wood chipper if it does not stand on the ground (applies to the PTO model).



NEVER operate the wood chipper without support from the jack and support leg or from the vehicle's trailer hitch (applies to the PTO model).

NEVER use the wood chipper with material that is not wood.

NEVER use the wood chipper to push trees, stumps, etc.

NEVER transport equipment in the funnel, such as forest chains, axes, chainsaws, etc.

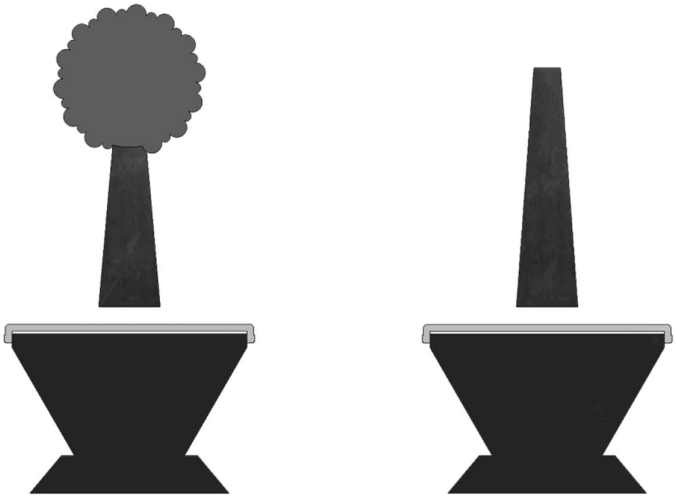
4.1.2 During operation

	ALWAYS push the safety bar into the STOP position if a dangerous situation arises (see chapter 8).
	ALWAYS keep body parts away from the funnel and wood chipper's other moving parts.
	  **ALWAYS** stand at the side of the funnel when the wood chipper is chipping trees that have branches.
	 **ALWAYS** push logs in from the rear of the log.

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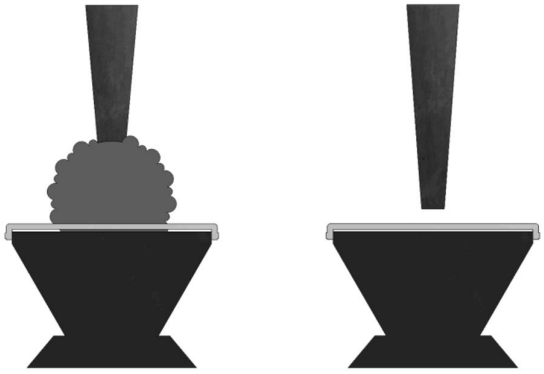


ALWAYS use a rod to push short pieces of tree into the rollers.



ALWAYS feed the wood chipper with the thick end of the log first.

ALWAYS feed the wood chipper so that the tree crown points away from the funnel.



NEVER feed the tree crown into the wood chipper first.

NEVER feed the wood chipper with the thin end of the log first.

NEVER exceed the wood chipper's nominal rpm (see chapter 18). (Applies to the PTO model).

NEVER attempt to remove any trapped material from between the feed rollers before the wood chipper has stopped and the roller console has been opened as described in chapter 9.3.

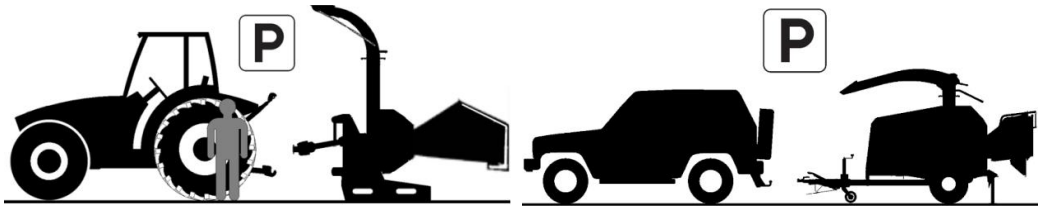


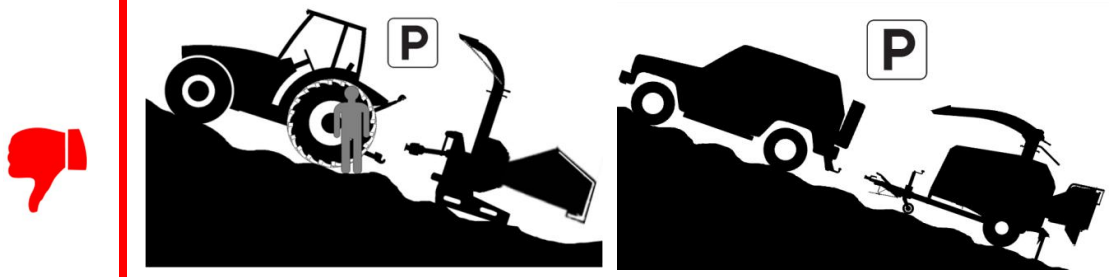
NEVER reach into the funnel to push wood into the rollers.

NEVER open or remove the guard while the wood chipper is operating.

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4.1.3 Transport and parking

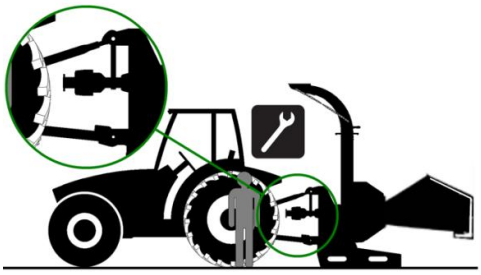
	 **ALWAYS** park the wood chipper on a level surface.
	ALWAYS keep the ejector spout within the width of the machine during transport. Remember to ensure that the ejector spout is securely fastened.
	ALWAYS keep the PTO shaft in the carrier shackle when removed (applies to the PTO model).
	ALWAYS place the foldable funnel in the transport position during transport (the funnel must be folded up and locked using the pin).
	ALWAYS ensure that all of the wood chipper lights work correctly before operating the machine (applies to the MOBILE model).
	ALWAYS comply with local public authority regulations when transporting the wood chipper on public roads.



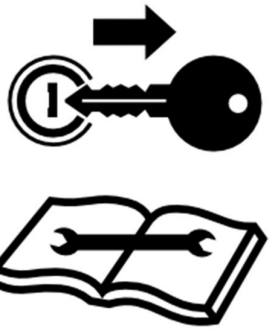
NEVER park the wood chipper on inclined or uneven surfaces.

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4.1.4 Service and repairs



ALWAYS disconnect the wood chipper from the tractor and ensure the disc has stopped moving before carrying out service or repairs (applies to the PTO model).



ALWAYS remove the key from the ignition and ensure the disc has stopped moving before carrying out service or repairs (applies to the MOBILE model).

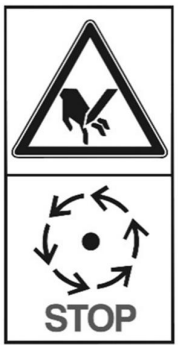
ALWAYS after service or repair, ensure that all of the wood chipper bolts are fitted and tightened securely and that all of the safety devices are fitted and function properly.

ALWAYS ensure that the knives, counterknives and rollers are kept sharp. This results in smoother in-feed, higher woodchip quality and less fuel consumption.



NEVER carry out service or repairs on the wood chipper while it is connected to the tractor (applies to the PTO model).

NEVER carry out service or repairs on the wood chipper while the key is in the ignition lock (applies to the MOBILE model).



NEVER remove or open the guards before the disc has stopped moving and the PTO shaft has been removed (applies to the PTO model).

NEVER remove or open the guards before the disc has stopped moving.

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5 Pictograms used



Warning: Ejected Objects!

Warning: Safe distance of 20 m!



Warning: Rotating knives!

Warning: Wait for disc to stop!



Warning: Crushing hazard!

Warning: Rotating rollers!



Warning: Crushing hazard!

Warning: Rotating belts!



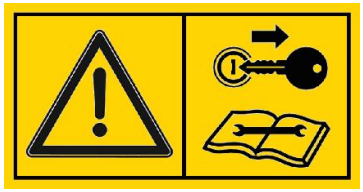
Warning: Hot surface!
(Fitted on the MOBILE model)



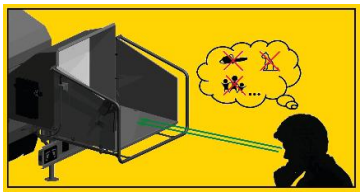
Warning: Amputation hazard!
Warning: Crushing hazard!
Warning: Do not step on the funnel!
Warning: Do not touch the funnel!
Warning: Do not crawl up into the funnel!



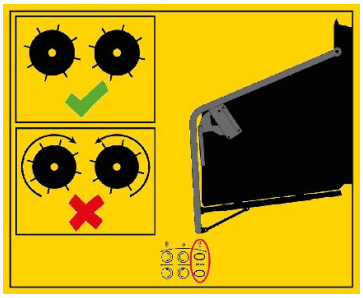
Warning: Read the instruction manual before use!



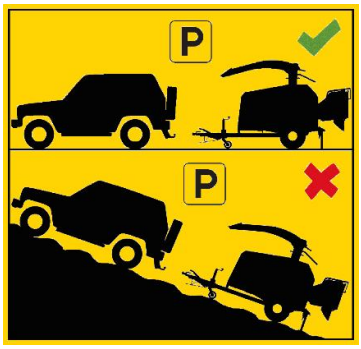
Warning: Remove the ignition key and read the user manual before service or repairs.
(Fitted on the MOBILE model)



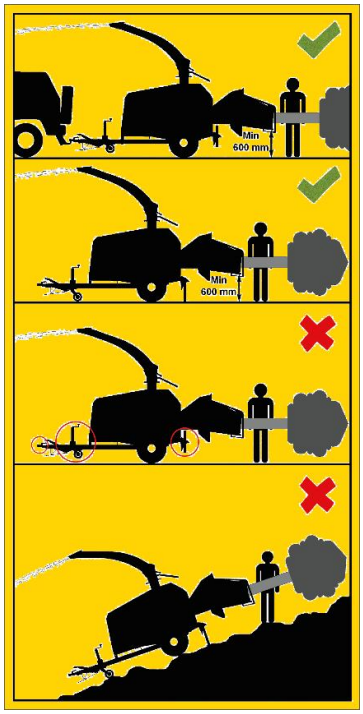
Warning: Ensure that the funnel is free of people, animals and other foreign bodies!



Warning: Ensure the safety bar works!



Warning: Do not park on uneven or inclined surfaces!
(Fitted on the MOBILE model)



Warning: Do not operate the wood chipper without support from the jack and support leg or from the vehicle's trailer hitch!

Warning: Do not operate the wood chipper on uneven or inclined surfaces!
(Fitted on the MOBILE model)

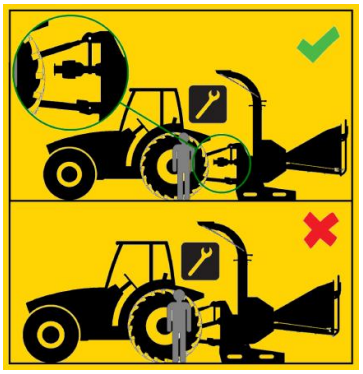
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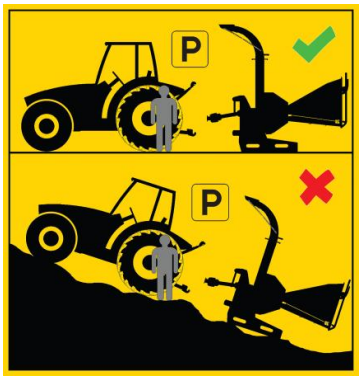
Warning: Max 1000 rpm, anti-clockwise direction of rotation!
(Fitted on the PTO model)



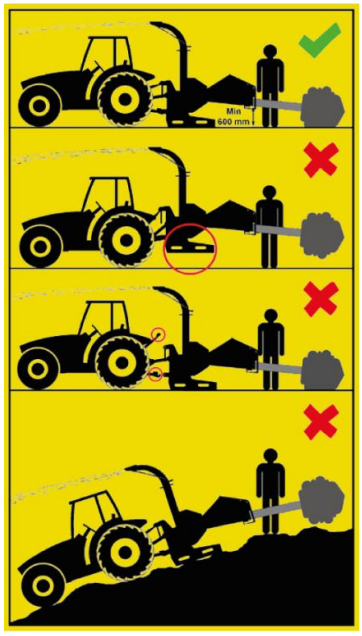
Warning: Max. 540 rpm, anti-clockwise direction of rotation!
(Fitted on the PTO model with speed-up gear fitted)



Warning: Never carry out service or repairs on the wood chipper while it is connected to the tractor' PTO!
(Fitted on the PTO model)



Warning: Do not park on uneven surfaces!
(Fitted on the PTO model)



Warning: Do not operate the wood chipper if it is raised!

Warning: Do not operate the wood chipper if it is not fitted to the tractor' three-point-suspension!

Warning: Do not operate the wood chipper on uneven or inclined surfaces!
(Fitted on the PTO model)



Lifting point for forklift truck!
(Fitted on the PTO model)



Ear defenders and eye protection mandatory!



Lifting point for crane!

For safety information and pictograms relating to the engine, see the engine manual.

6 Fitting instructions

6.1 Before use

The machine has a lifting point, which must be used whenever it is lifted by a crane or other lifting gear (rigging) (see figure 1).
The machine can also be lifted using a forklift truck. This is done by using the holes made for this purpose on both sides of the foot (see figure 2). Make sure that the forks of the forklift truck are inserted all the way through, otherwise the machine can tip over.
The TP 200 MOBILE is mainly transported on the trailer wheels, but it can also be lifted by a fork lift truck under the trailer bearers (see figure 3).

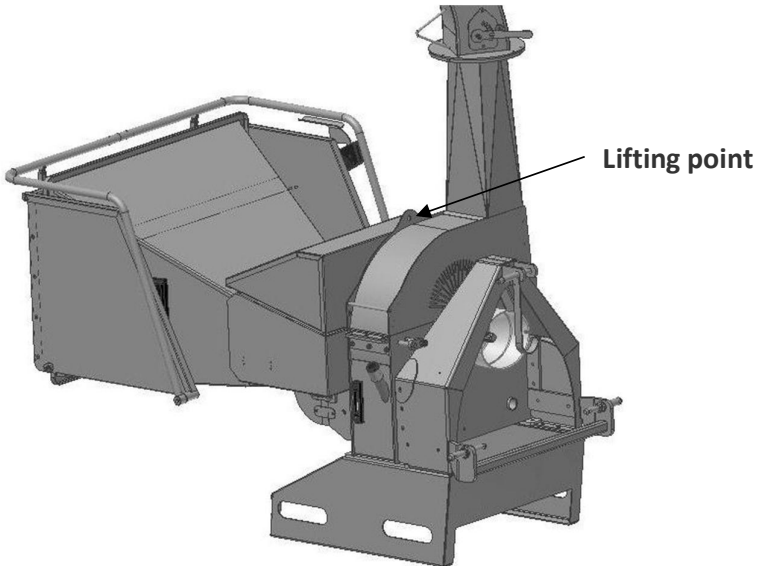


Figure 1 Lifting point on the machine

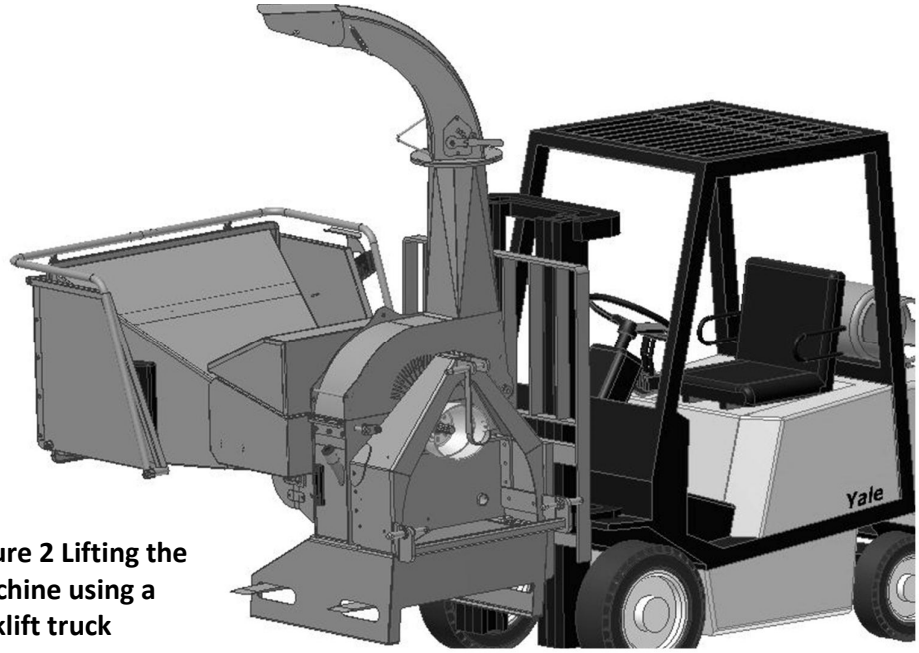


Figure 2 Lifting the machine using a forklift truck

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Figure 3 Lifting the machine using a forklift truck

Store the user manual for the PTO shaft with this user manual in the manual box on the machine.

Before start-up, ensure that the wood chipper is free of foreign bodies. The machine **must** be disconnected from the tractor PTO, and for MOBILE models, the key **must** be removed from the ignition when opening up for the disc. Ensure that the disc is at a complete standstill. Turn the ejector spout so it faces the opposite direction of the disc housing (Figure 4). Loosen the bolts that hold the upper and lower disc housing together. Lift the top part of the disc housing up until the ejector spout rests on its own. Turn the disc a few times by hand. Remove any foreign bodies.

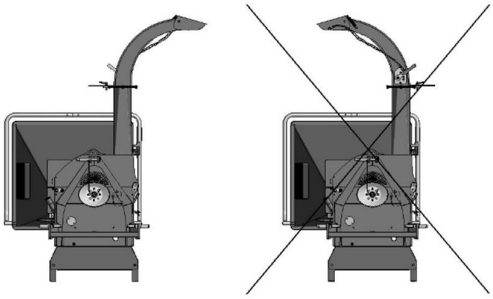


Figure 4

Position of the ejector spout when opening disc housing

Check that the distance between the knife and the counterknife is correct = **0.5–0.9 mm**. The knives have a fixed position of **10 mm**. Check that the knives run clear of the counterknife.

Lift the top part of the disc housing back into place and tighten the bolts.

Ensure that all bolts, nuts and screws are tightened securely.

NB: Lubricate all of the lubrication points (see maintenance schedule, page 27).

Old hydraulic oil and motor oil and used oil filters and air filters must be disposed of at an approved waste disposal station.

6.2 Fitting instructions

The machine is designed to be fitted to a tractor three-point-suspension or fitted to a trailer with its own engine.

Machines that shall be fitted to a tractor three-point-suspension are delivered with a PTO shaft with either 1 3/8" - 6 splines or 1 3/8" - 21 splines.
At 1000 rpm, some tractor types must use a PTO shaft with 1 3/8" - 21 splines.

The PTO shaft **must** have free running fitted on the machine side.
Linddana uses Walterscheid 2400 with free running which comes with the machine.

The length of the PTO shaft must be adapted to the tractor in accordance with the instructions from the PTO shaft supplier. See attached PTO shaft user manual.

The machine must stand on a secure and a level surface during use and tractor-fitted machines must be attached to the tractor three-point-suspension (see figure 5). The tractor brakes must be properly activated.
Trailer-fitted machines must also have their brakes activated (see figure 6).

When starting the machine: Attach only when the motor is running at idle speed or at as few revolutions as possible to avoid overloading the PTO shaft, gear box, tractor or wood chipper.

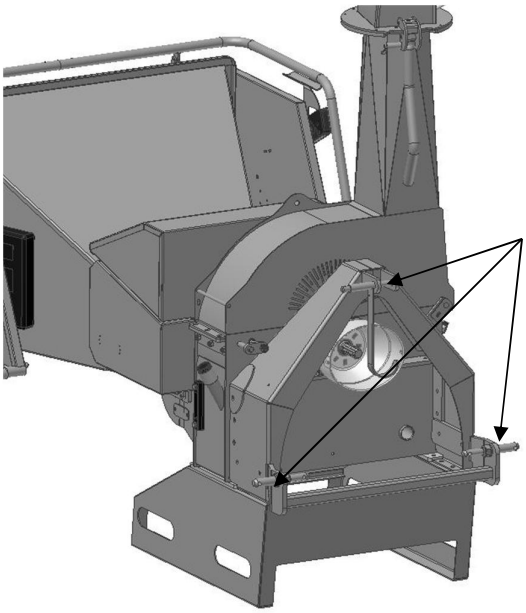


Figure 5 TP 200 PTO three-point suspension

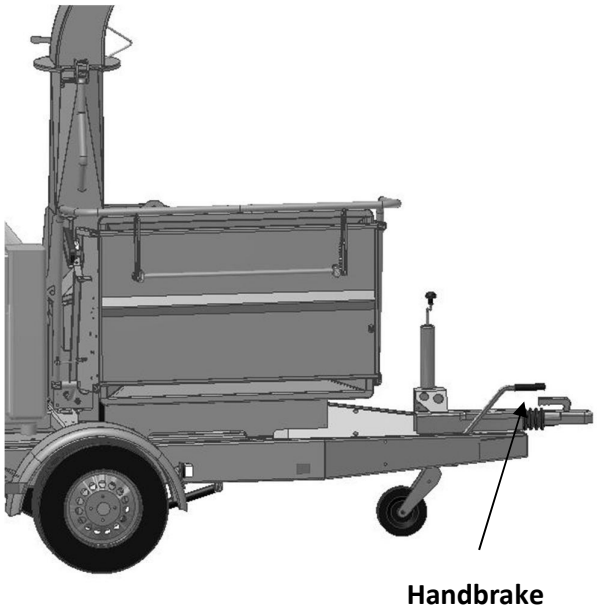


Figure 6 TP 200 MOBILE handbrake

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7 Noise level

The sound output level and the sound pressure level from the TP 200 PTO have been measured during use with the disc running at 1000 rpm, powered by a tractor.

The sound output level and the sound pressure level from the TP 200 MOBILE have been measured during use with 1000 rpm on the disc, powered by a Hatz 3L41C engine.

The measurements have been conducted in accordance with testing provisions
Directive 2000/14/EC, 3 July 2000
EN ISO 3744, 1995
ISO 11201, 1995
ISO 4871, 19 March 1997
EN 13525, 17 February 2005

The guaranteed sound output level which must be stated by the manufacturer in accordance with Directive 2000/14/EC is as follows:

TP 200 PTO: 125 dB (A) relative to 1 pW
TP 200 MOBILE: 125 dB (A) relative to 1 pW

The machine's sound pressure level at the operator's seat is measured in accordance with ISO 11201 and measured as:

TP 200 PTO: 104 dB (A)
TP 200 MOBILE: 107 dB (A)

The values stated above are subject to the common uncertainty of the measuring method and the estimated variation in a product series for the type of machine. Detailed information about the measurements and results and estimation of uncertainty are found in a detailed report which can be supplied on request.

As a result of the actual sound levels, the wearing of ear defenders is mandatory when using the machine.

7.1 Environmental instructions

When changing hydraulic oil or engine oil, oil and used oil filters and air filters must be disposed of at an approved waste disposal station.

Oil spillage must be avoided as far as possible. Should oil spillage occur, the spilled oil must be cleaned up and disposed of at an approved waste disposal station.
Worn out parts must be disposed of for recycling.
When the machine reaches the end of its operating life it must be disposed of responsibly.
Hydraulic oil and engine oil must be drained and disposed of along with oil filters and air filters at an approved waste disposal station.

The rest of the machine must be disposed of at an approved recycling centre.

8 Operation of the machine

The wood chipper is equipped with two hydraulic rollers, a pressure compensated flow valve, a control valve, a safety bar with a reset handle and a funnel lever on the feeding funnel (see figure 7).
The feeding funnel is foldable.
To make it easier to open and close the foldable feeding funnel, use the funnel lever, which is pulled out. After the feeding funnel has been opened or closed, push the funnel lever back again.

The safety bar must be in the stop position (0) during start-up (see figure 8). After start-up, release the reset handle and pull the safety bar into the middle position (A) and the rollers will turn. The material is now pulled into the machine.

By pulling the safety bar towards you (B), the flow of oil in the control valve is turned, which puts the rollers into reverse and the material is now pushed out of the machine.

When the machine stops (0) or reverses (B), the reset handle will mechanically stop the safety bar. The reset handle must now be released before the safety bar can be moved into the middle position (A) and the rollers can pull the material into the machine.
This reset handle is a safety measure to ensure you cannot unintentionally start the rollers which would otherwise cause material to be unintentionally pulled into the machine.

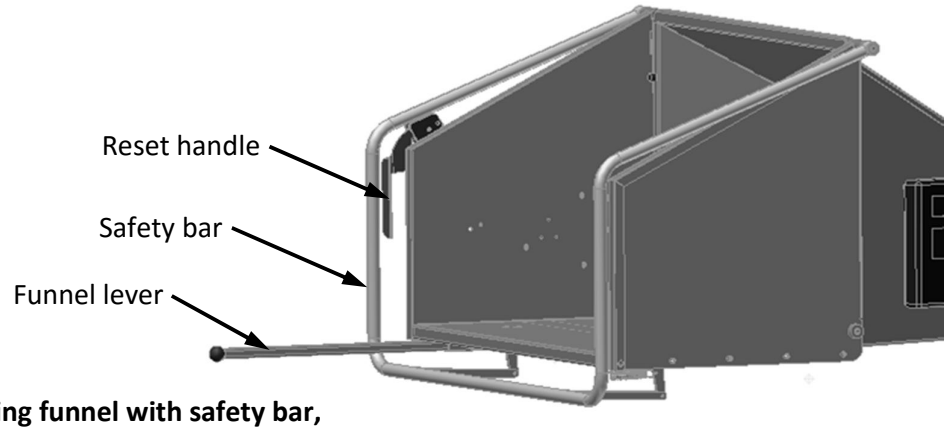


Figure 7

TP 200 Feeding funnel with safety bar, reset handle and extended funnel lever

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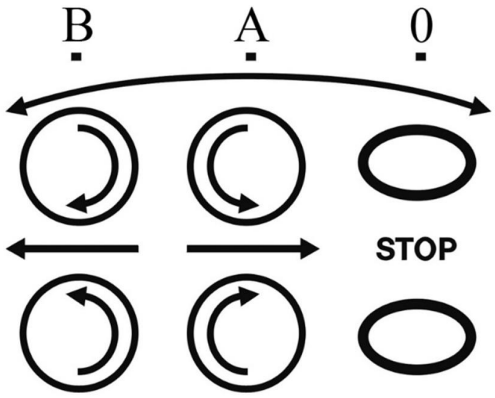


Figure 8

Safety bar instructions

During start-up, the safety bar must always be in position 0.

<u>IN CASE OF POTENTIAL HAZARDS:</u> PUSH THE SAFETY BAR INTO THE STOP POSITION (position 0).

Turn the adjusting screw on the flow valve to find the correct rpm. Never operate too quickly with the rollers because the wood will act like a brake if the pressure on the disc is too great with the ensuing increase in use of fuel. Branches may become wrapped around the rollers if the rpm is too high.

The table shown below (Table 1), provides the recommended rpm of the feed rollers with the desired woodchip length. The speeds vary with the number of revolutions on the PTO shaft. The woodchip length can be regulated on the flow-regulation valve on the wood chipper for smaller woodchip lengths than indicated in the table.

8.1 Table 1 Setting the rpm monitor for feed rollers

Woodchip length **Model**	**Disc rpm**	**4 mm**	**6 mm**	**8 mm**	**10 mm**
TP200 PTO	1000	19	29	38	48
TP200 MOBILE	1100	21	32	42	53

9 Maintenance

In the case of all maintenance and repair work, the machine and the drive must be at a complete standstill before any work can be carried out. Tractor-fitted machines must be placed on a secure and level surface and must be uncoupled from the tractor PTO.

9.1 Maintenance schedule

Interval=> hours	**8 ⌛**	**50 ⌛**	**100 ⌛**	**200 ⌛**	**1000 ⌛**	**1000 m³**	**10,000 m³**
Lubricate the PTO shaft[1]	X						
Check knives and counterknives	X						
Tighten all bolts and nuts[2]	(X)	X					
Lubricate disc main bearings[3]			X				
Clean/lubricate tube connection for PTO shaft[4]				X			
Lubricate roller bearings[5]				X			
Replace hydraulic pump return filter[6]		(X)			X		
Change hydraulic oil[7]					X		
Reverse/replace counterknife[8]					X		
Replace facing plate in top disc housing[9]					X		
Reverse/replace triangle and square scrapers[10]						X	
Grind carriers on feed rollers[11]						X	
Check V-belts[12]		X					
Check ejector wings for wear					X		
Check casing for wear and tear							X

[1] Remove the PTO shaft and lubricate the four lubrication nipples using Uniway Li62 or equivalent lubricant.
[2] Tighten bolts and nuts, the first time after eight hours and then at intervals of 50 hours.
[3] Lubricate two lubrication nipples with Uniway Li62 or equivalent lubricant.
[4] Remove the PTO shaft and pull apart the tube connection, clean and lubricate it.
[5] Lubricate two lubrication nipples with Uniway Li62 or equivalent lubricant.
[6] Change for the first time after 50 hours and then every 1000 hours.
[7]Drain the hydraulic oil and fill with new oil using 16 litres of **Hydraway HVXA 46** or an 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] Reverse/change the counterknife when necessary.
[9] If fitted, change the facing plate in the top disc housing, as necessary.
[10] Reverse/replace the triangle scrapers in the disc housing. Reverse/replace the square scraper on the disc.
[11] Grind the feed rollers sharp.
[12] Check the tensioning of the V-belts.

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9.2 Lubrication and oil

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

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

Old hydraulic oil and engine oil as well as used oil filters and air filters must be disposed of at the municipal waste disposal station.

Lubricate the nipples in accordance with the maintenance schedule with Statoil **Uniway Li62** or a similar product.

The machine is equipped with a hydraulic oil tank which is integrated in the disc housing. The tank is equipped with a filler neck, a bleeder valve, a level glass, a drain plug and a return filter.

When changing the hydraulic oil, open the drain plug (see figure 9).
Unscrew the drain plug. Drain the oil into a suitable disposal container. When the tank is almost empty, suck the tank empty using an oil suction device. Screw the drain plug back on and slowly fill up with new hydraulic oil (16 litres for TP 200).
Fill the oil until the oil level is at the middle of the level glass.

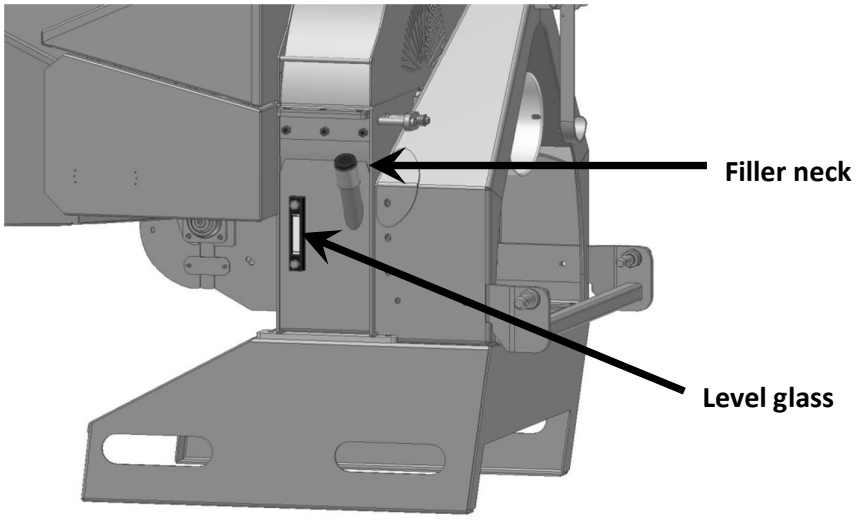


Figure 9 Filling with hydraulic oil

9.3 Maintenance of the feed rollers

The feed rollers draw material into the disc and the knives.

The plates on the bottom feed roller must be kept sharp in order to maintain the feed force.

Procedure:

Stop the machine and the drive. Uncouple the tractor PTO. Ensure that the disc is at a **complete** standstill. Turn the ejector spout so that it faces away from the disc housing (figure 4). Loosen the bolts that hold the two parts of the disc housing together and open the disc housing. Using multigrip pliers or similar, lift the spring from the top feed roller.
Grip the handle and lift the roller housing and push the locking pawl into the lock in the side plate (figure 10). Next, secure the roller housing by letting it fall.
Now the carriers on the bottom feed roller can be sharpened with an angle grinder.

Carefully turn the disc using the safety bar in a forward or reverse position. By doing this, the feed roller is turned so all the plates can be sharpened.

NB: The weld seams must not to be ground away!

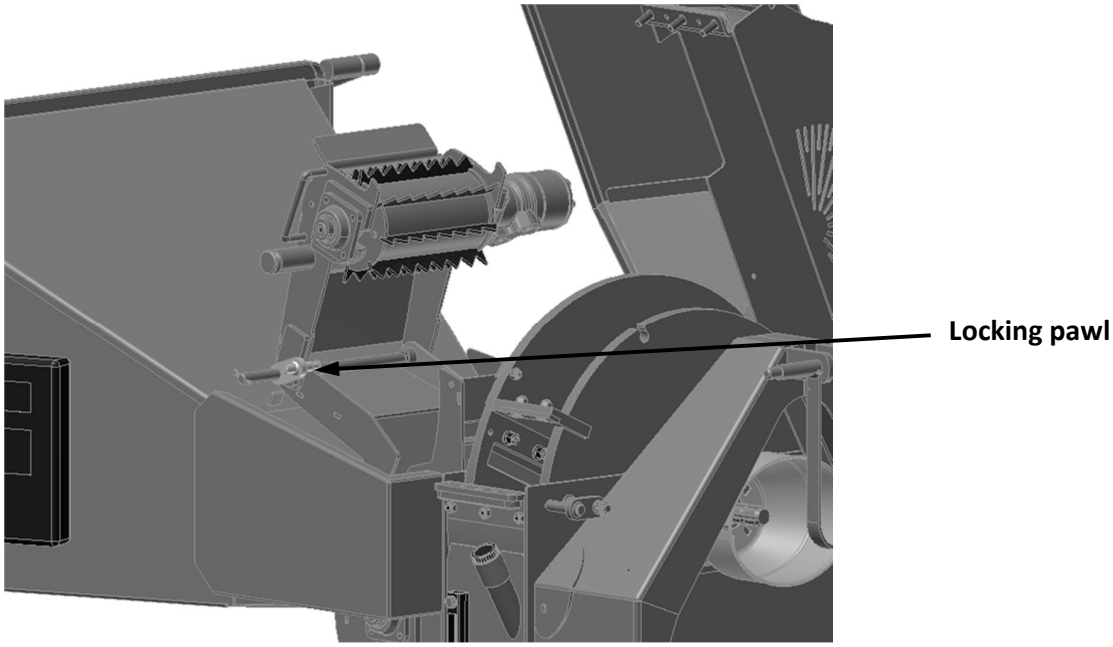


Figure 10 Securing using the locking pawl

When the roller has been grounded, lower the top feed roller back in place. Put the spring back using multigrip pliers. Close the disc housing and tighten the bolts.

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9.4 Replacement of wearing parts

9.4.1 Counterknife

The counterknives in the machine are used by the knives to cut the wood. The counterknives must have a sharp edge otherwise the wood will bend and the cutting face become frayed. The machine is equipped with one horizontal counterknife with two cutters and a perpendicular counterknife. The horizontal counterknife can be reversed.

Procedure:

Stop the machine and the drive. Uncouple the tractor PTO. Ensure that the disc is at a **complete** standstill. Turn the ejector spout so that it faces in the opposite direction to the end of the disc housing (figure 4). Loosen the bolts that hold the two parts of the disc housing together and open the disc housing. Using multigrip pliers, lift the spring of the top feed rollers and lift the feed roller housing. Next, secure the roller housing using the locking pawl (see figure 10).

Remove the three bolts which hold the horizontal counterknife. This is done from the outside and from below. Take out the counterknife and reverse/replace. Carefully clean both the counterknife and the contact surface before reinserting the counterknife.
The distance between the edge of the knife and the counterknife must be **0.5–0.9 mm** (see figure 11).
The bolts in the horizontal counterknife must be tightened to **200 Nm/20 KPm** (extra equipment in the tool kit comes with a torque wrench).

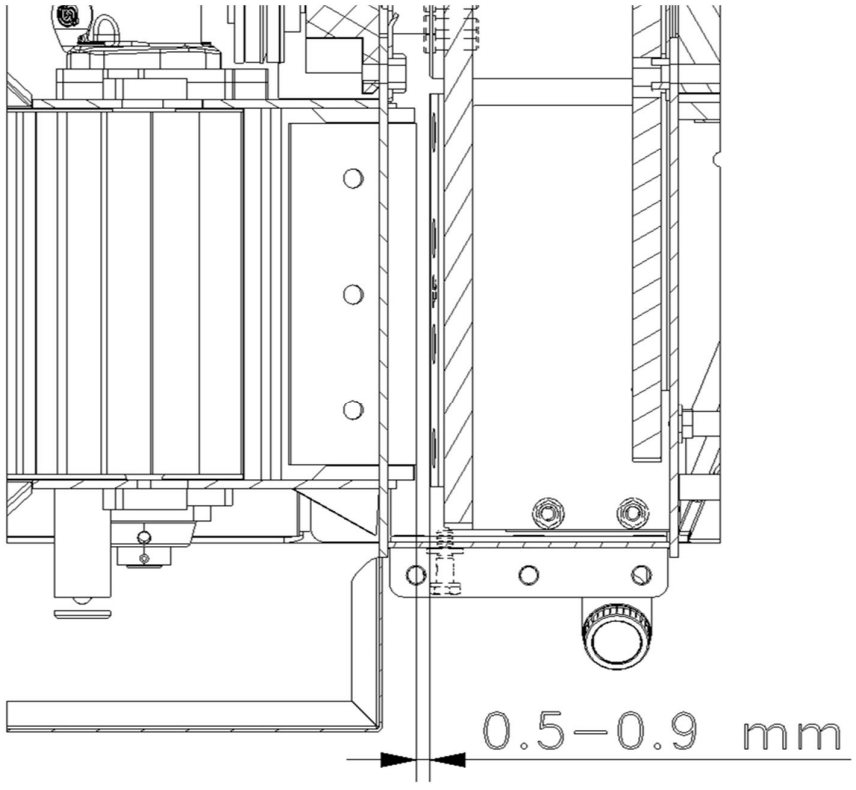


Figure 11 Distance between counterknife and knife

Unscrew the vertical counterknife and remove it from the inside. Before a new one is inserted, the counterknife and the contact surface must be cleaned carefully. Set the counterknife distance to the knives to **0.5–0.9 mm**. Use a precision feeler gauge. Tighten the bolts on the vertical counterknife to **50 Nm/5 KPm**.

When the counterknives have been reversed or replaced and all the bolts are tightened, lower the roller housing into place using the top feed roller. Put the spring back using multigrip pliers (see figure 10).

Turn the disc a few times to make sure that there are no objects in the disc housing. Close the disc housing and tighten the bolts (see Figure 12).

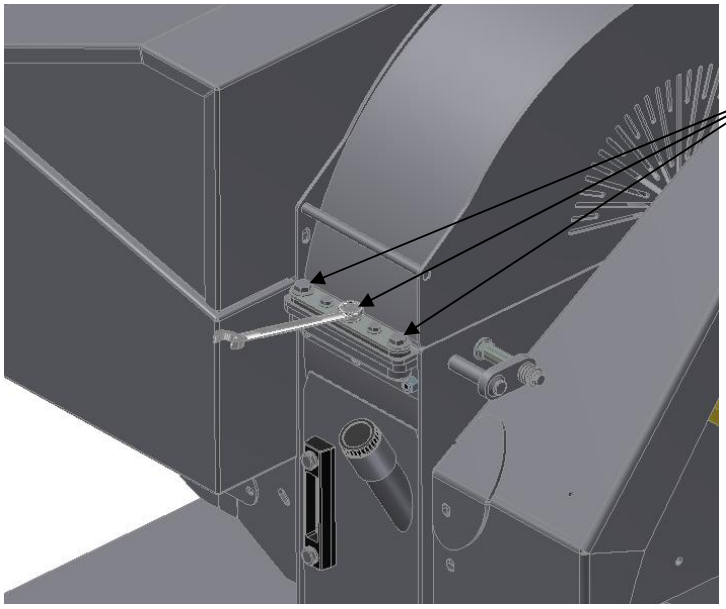


Figure 12 Tightening bolts in disc housing

9.4.2 Knives

The machine is fitted with three knives.

The knives must always be changed as a set. The knives belong together in sets, also when they are ground so that they are always of equal width. If the knives are not of equal width, the disc will be out of balance which will lead to unnecessary strain on the bearings and vibrations in the whole machine.

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Procedure:

Stop the machine and the drive. Disconnect the machine from the tractor PTO. Check that the disc has stopped **completely** by looking between the rollers. Turn the ejector spout so that it faces away from the disc housing (figure 4). Loosen the bolts that hold the two parts of the disc housing together and open the disc housing.

Turn the disc until the disc lock can go into one of the holes on the disc. The disc is now locked (see figure 13). Keep fingers away from the knives when turning the disc around.

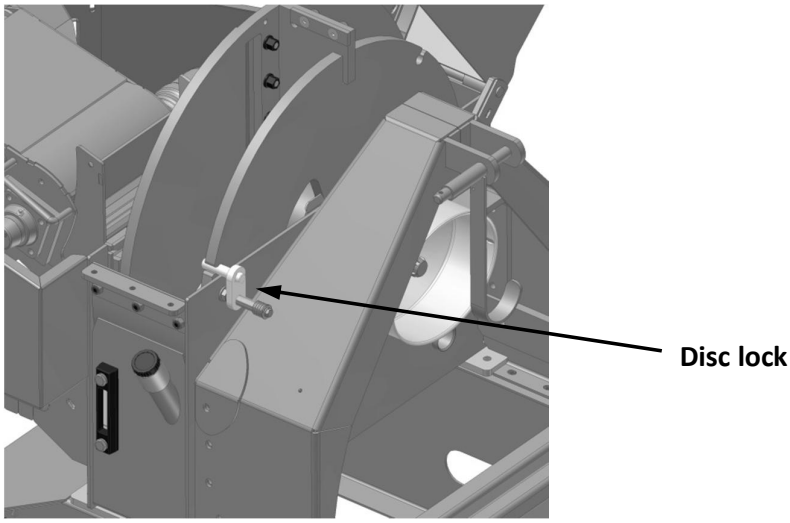


Figure 13 Locking the disc using the disc lock

Remove the four bolts which hold the knife to the disc. Take out the knife and sliver breaker. The bearing surfaces on the chipping disc, the knife and the sliver breaker must be cleaned thoroughly before fitting the knife. When fitting, the bolts **must** be lightly oiled (μ = 0.125), i.e. light oil, WD 40 or an equivalent product. Do **not** use copper grease, MoS_2 or similar low friction grease.

Check that the distance between the knife's edge and the counterknife is set correctly to **0.5–0.9 mm**.

Tighten the bolts to **95 Nm/9.5 KPm** (use a torque wrench which is included in the tool kit for this purpose. It can also be purchased as an accessory).

When the knives have been replaced, turn the disc a few times to make sure that there are no objects in the disc housing. Close the disc housing and tighten the bolts (see figure 12).

10 Scrapers and facing plate

The machine is equipped with three square scrapers on the disc, a triangle scrapers in the disc housing and a facing plate in the ejector spout (see figure 14).

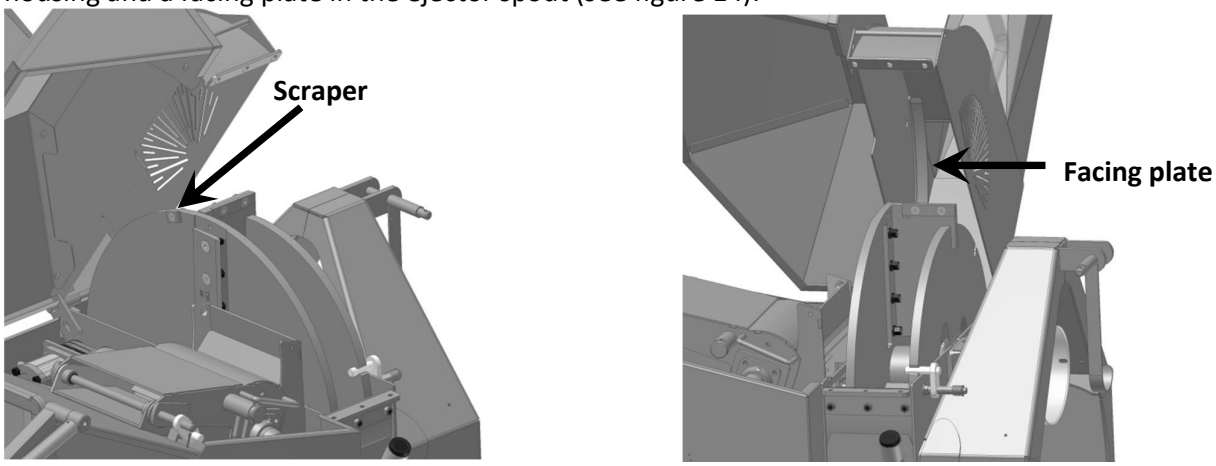


Figure 14 Positions of scrapers and facing plate

The purpose of the scrapers is to remove material that can become stuck to the knives.
At the same time the square scraper on the disc removes material which falls off in front of the chipping disc.
This reduces fuel consumption and wear on the casing.

The square scrapers can be turned once before being replaced, while the triangle scraper and the facing plate should always be replaced when they are worn.

Procedure:

Turn the disc until the disc lock can go into one of the holes on the disc. The disc is now locked (see figure 13). Keep fingers away from the knives when turning the disc around.

Remove the countersunk bolts which hold the square scraper on the disc. Turn the square so that a sharp corner points up. Clean the block and the bearing surface. Re-fit the square scraper. If it is worn on two corners, the square scraper must be replaced. Always change the square scraper on the disc in sets. Replace the triangle scraper when it is worn.

The facing plate is mounted in the top part of the disc housing and can easily be replaced by removing the three bolts on the outside of the disc housing. If woodchip quality is not an important factor, it is a good idea to remove the facing plate in the ejector spout. This will increase the capacity of the machine and save fuel. The facing plate must be removed when chipping wet conifer wood that has a lot of needles. This ensures good ejection.

When the scrapers have been reversed or changed, turn the disc a few times to make sure that there are no objects in the disc housing. Close the disc housing and fit the bolts (see figure 12).

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10.1.1 Casing

The TP 200 is equipped with an interchangeable casing at the bottom of the disc housing. The casing absorbs the wear and tear which would normally occur at the bottom of the disc housing.

Procedure:

Stop the machine and the drive. Uncouple the tractor PTO. Ensure that the disc is at a **complete** standstill. Turn the ejector spout so that it faces away from the disc housing (see figure 4). Loosen the bolts that hold the two parts of the disc housing together and open the disc housing. Remove the top part of the disc housing.

Remove the six bolts and nuts which attach the casing to the bottom part of the disc housing (see figure 15).
Using a hammer, hit the part of the casing which sticks up above the edge of the rotor housing at the hinge side to loosen the casing. The casing can now be removed.

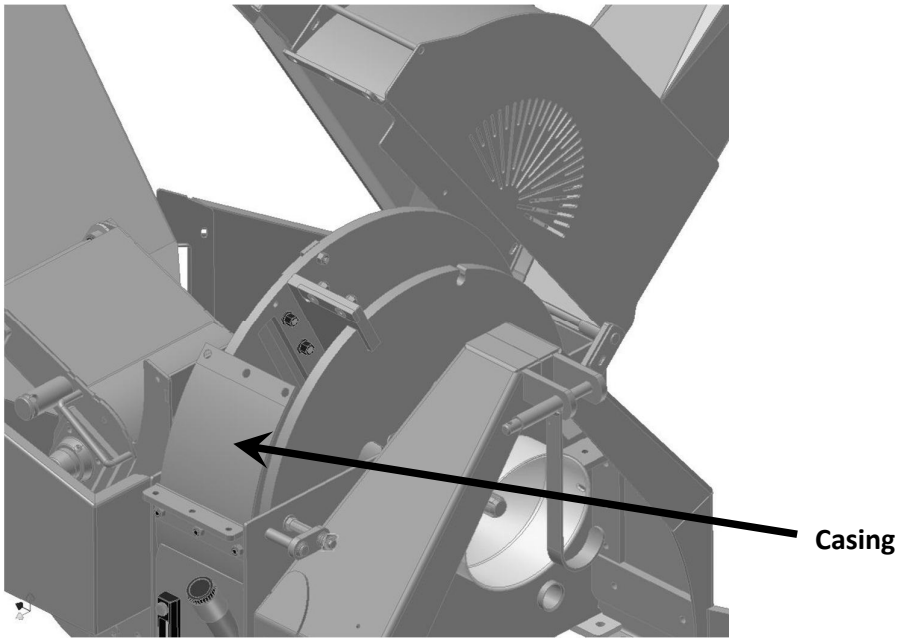


Figure 15 Replacing the casing

Before fitting a new casing, rust and dirt must be cleaned away from the bottom of the wood chipper. Mount the new casing with six bolts. Replace the top part of the disc housing.

When the casing has been changed, turn the disc a few times to make sure that there are no objects in the disc housing. Close the disc housing and fit the bolts (see figure 12).

10.1.2 Adjusting the V-belts

Pump transmission (all models)

The feed rollers drive the hydraulics. The hydraulic pump for the feed rollers is driven by V-belts. The V-belts must be checked regularly or whenever the belts are suspected of being slack.

Procedure:

Stop the machine and the drive. Uncouple the tractor PTO. Ensure that the disc is at a **complete** standstill. Turn the ejector spout so that it faces away from the disc housing (figure 4). Loosen the bolts that hold together the two parts of the disc housing and open the disc housing.

Loosen the four screws which hold the hydraulic pump in place and adjust the tension by turning the adjusting screw. Used belts may yield by 5.5 mm when they are pressed down with 37 N (3.7 kg). For new belts the figure is 42 N (4.2 kg) (see figure 16). The belts' tension can be measured with a suitable gauge, which can be purchased as an accessory.

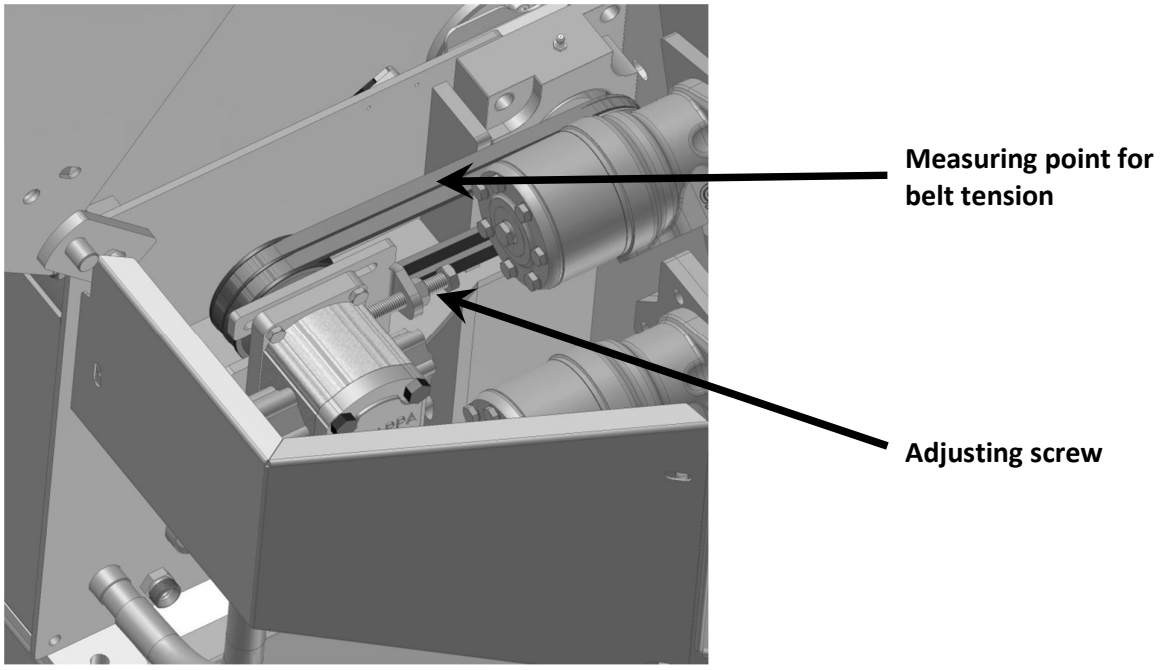


Figure 16 Adjusting belt tension

When the V-belts have been tightened, turn the disc a few times to make sure that there are no objects in the disc housing. Close the disc housing and tighten the bolts (see figure 12).

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10.2 Sharpening knives

It is very important for the quality of woodchips that the knives are sharp. They must be checked at least once a day. The grinding interval of the knives can be prolonged by grinding them regularly with a carborundum stone.

The grinding process must be by **wet grinding** using a header (see figure 17). **Never** use an angle grinder or a similar tool for grinding the knives.

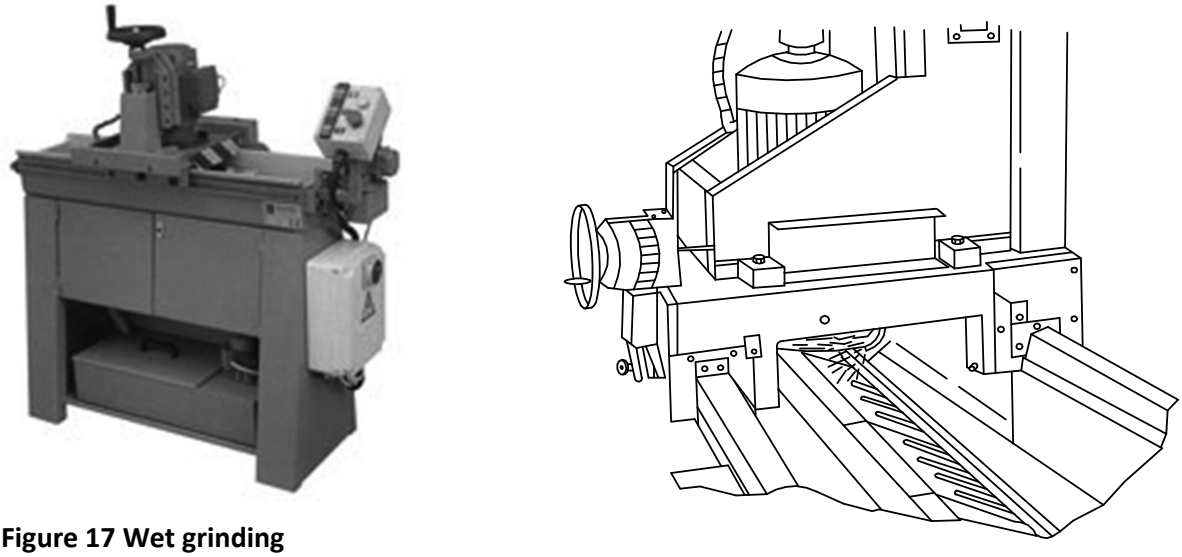


Figure 17 Wet grinding

When grinding knives, ensure that the width of the knives in the set are uniform. Their widths must be the same to keep the disc in balance. This means that the knives must always to be ground in sets. The knives must have a measurement of min. 75 mm (see figure 18). After that they must be discarded.

The edge of the knives must be ground at an angle of 28° (see Figure 18).

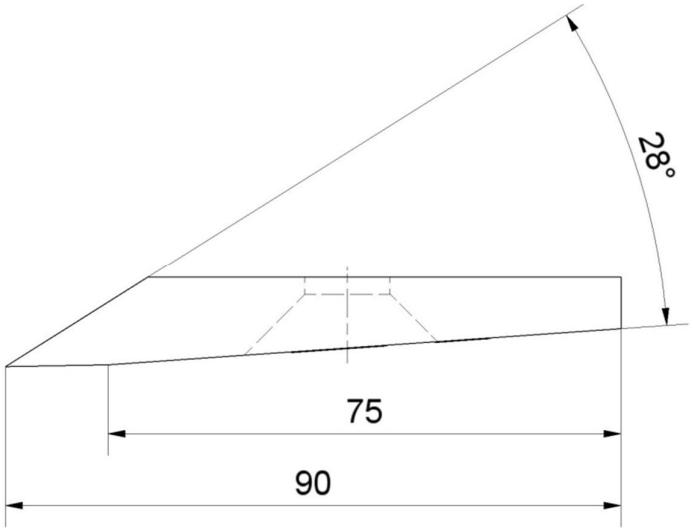


Figure 18 Grinding angle and minimum blade width for the chipping blade

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11 Special instructions for TP 200 MOBILE

TP 200 MOBILE is a trailer-fitted wood chipper, consisting of a trailer on which a wood chipper with its own engine is fitted and is registered as a trailer tool. The trailer can be fitted to a vehicle with a ball and socket head as a coupling without requiring inspection. When coupling, the 7/13-pole connector and the safety chain must be coupled to the vehicle and the supporting leg must be raised. Release the handbrake before driving.
Check that lights, brake lights and turn signal lights work before driving.

Trailer dimensions: Width 1760 mm. Length incl. ball and socket head 3020 mm.
Tyre assembly: 175/80xR13
Tyre pressure: 4.5 bar = 65 psi

TP 200 MOBILE TURNTABLE
Tyre assembly: 185/60xR13
Tyre pressure: 3 bar = 44 psi

To avoid irreparable damage to the electrical system, the following points must be followed:
1. Start key must never be in the neutral position when machine is operating.
2. Frame connections must be clean.
3. When using a battery charger, the ground cable on the battery must be removed.

During transport on public roads, the ejector spout has to be turned to point backwards in relation to the driving direction and secured against rotation. This is done by activating the lock on the handle.

12 Special instructions for TP 200 MOBILE TURNTABLE

Every 50 hours, lubricate 3 lubrication nipples on the turntable, and 1 lubrication nipple on the locking handle for the turntable.
During operation, the locking bolt on the turntable must be inserted and the bolt made secure using the hairpin.

Instructions for wood chipper: See TP 200 PTO

Service and maintenance of engine: See the separate service sheet at www.hatz.com

Activating the wood chipper.

In the case of a cold start: Start the engine. Set the throttle so that the engine runs evenly at low rpm. Let the engine run 30–60 seconds, dependent on the temperature. Next, engage the wood chipper slowly and increase the engine rpm until working speed is at its "full throttle".

In the case of a warm start: The same procedure is followed. However, it is not necessary to let the engine warm up before activating the wood chipper.

The wood chipper must not be activated with full throttle on the engine.

When stopping: Operate the wood chipper until it is empty of material. Disengage the wood chipper. Let the engine run for about 30 seconds in idle, then turn the throttle to stop.
Turn the ignition key to neutral. (See symbols on the start box).

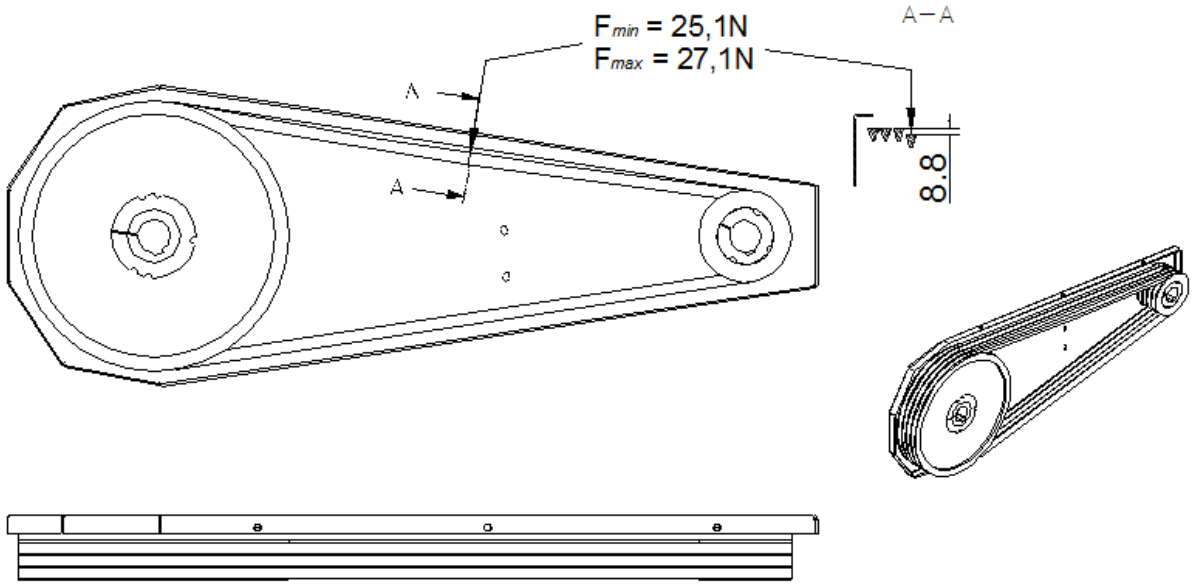
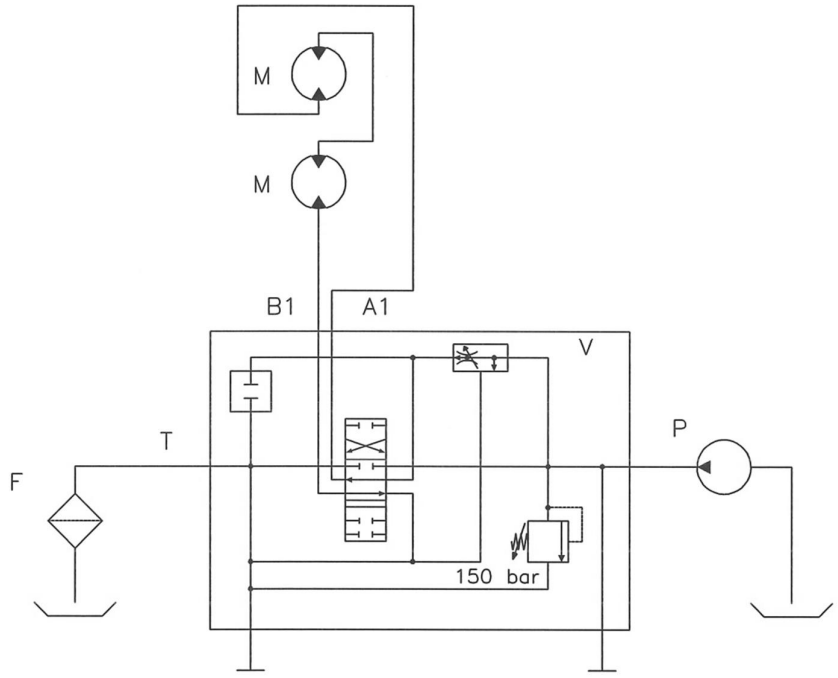


Figure 19 V-belt tension

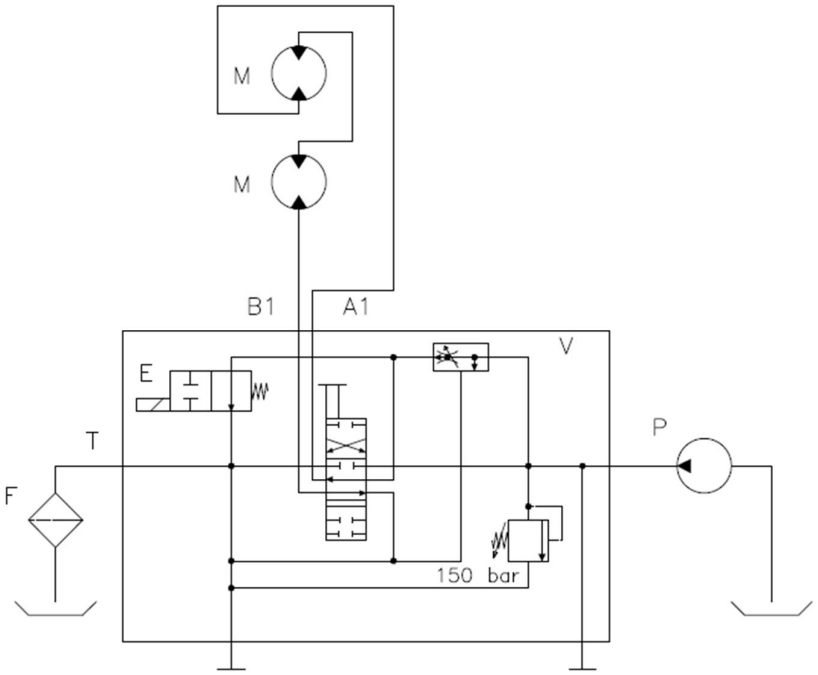
Check the V-belts between the engine and wood chipper:
Stop the engine and make sure that the disc has stopped moving. Remove the outer guard above the V-belts.
If the V-belt requires tightening:
First, loosen the bolts that hold the wood chipper on the engine console. Next, tighten the tensioning bolt so that the wood chipper shifts to the side.
Check that the two pulley wheels are parallel and aligned.
Next, tighten the bolts and counter nuts (re-check the V-belt tension).
Fit and close the guard.

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13 Hydraulics diagram, TP 200 without rpm monitor



14 Hydraulics diagram, TP 200 with rpm monitor



15 Instructions for rpm monitor TP PILOT

15.1 Overall operation

The TP Pilot allows the user to monitor the revolutions of the engine and feed rollers and sounds an alarm when low or high limit values are exceeded.
The parameters for limit values and choice of machine type may be changed by entering a code, applicable from version 816.14. See the set-up table for the machine type.

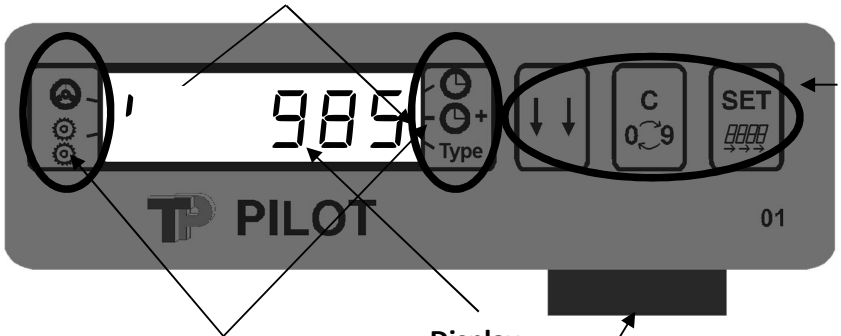
Different functions and display indications

The following functions are included in the computer:

Symbol:	Term:	Limit value:	Required code:
	Programmable revolutions monitor **Disc** (used with sensor for disc rpm)	1 – 9999 rpm (in practice not under 12 rpm)	X
	Programmable revolutions monitor **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	1–26	X

Overview of the monitor

Marker
- Display marker (vertical or horizontal) at the sides of the display indicates which function is shown at the moment



Operation keys
- Change between display indications
- Starting changes to the marked value
- Programming of new numerical values and resetting.

Display indications
- Shows the possible functions (values) which can be shown in the display

Display

Connector
- Inputs to enclosed sensors and any outputs

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Explanation for operation keys

 **Key**

Press the  key to change between the different display indications (seen in the window at the left end of the display) and through that the different functions of the monitor. With every press of 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 exit the change menu (see next section).

 **Key**

Use the  key for programming (change/delete) values in the computer, e.g. entering alarm values for high or low rpm.

 **Key**

Press the  key to change or delete the values that shall be programmed (must first flash by using the  key).

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

15.2 Changing parameters and machine type

The TP Pilot is pre-programmed with 26 machine types with which the factory settings for the current machine type can be chosen.
The following parameters can be finely-adjusted, as needed:

Parameter	Meaning	Comment
L(ow)	Least rpm	Deviation from normal rpm. If the machine is loaded to under "lowest rpm", the feeding is uncoupled so that the machine has the possibility of reaching normal rpm, at which point the rollers are re-coupled.
h(igh)	Normal rpm	Normal rpm, which the disc must maintain and at which point the feeding in starts.
T(ype)	Machine type	According to the set-up table for machine types

Triggers an alarm on the feed roller. If the rpm on the feed roller exceeds the upper limit value (Roller flashes) the display will blink between the **rpm value** and **high**.
Adjust the roller speed by turning the manual regulation of the oil quantity for the oil engines.
When the roller speed falls below the limit value again, the current rpm is displayed.

<u>Entering code</u>

When changing parameters and machine type, the code **1001** must be entered.
Procedure for entering code:

Use the  key to select what is required to be changed on the display.

Press the 

key for one second until _c0000 flashes.

Use the 

key to enter the first digit of the code number. Press the 

key to move the marker to the next digit in the number and so on, until all the digits are changed/programmed.

Finally, press the  key once to exit the menu.
The code must be entered with every change.

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Here you can see an example of the programming of limit values on the disc.

Example of changing low limit value to 850 rpm and high limit value to 1025 rpm		
Press the key:	**The display shows:**	**Explanation:**
↓↓	0	Find the revolution monitor for the disc by pushing the key repeatedly.
SET	L X800	Press the key for one second and **enter the access code**. L lights up on the left and the first digit (four digits in total) flashes.
C	L _800	Press the key until the digit has the correct value. NB: Zero is shown as _ in this position.
SET	L _X00	Press to set/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 set/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 set/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 four) will flash.
C	h 1000	Press the key until the desired digit is correct. NB: Zero is shown as _ in this position.
SET	h 1X00	Press to set/change the next digit (the second digit will now flash).
C	h 1000	Press the key until the desired digit is correct.
SET	h 10X0	Press to set/change the next digit (the third digit will now flash).
C	h 1020	Press the key until the desired digit is correct.
SET	h 102X	Press to set/change the last digit.
C	h 1025	Press the key until the desired digit is correct.
↓↓		Press to exit the programming menu.

When an alarm limit on the disc is exceeded, the current rpm is still shown while the feed rollers are stopped.
If the disc has been under the lower limit value, the feed rollers will start when the disc's rpm is above the set upper limit value 'h' (e.g. 1000 rpm).

Set-up table for included machine types.

Model	PTO/disc rpm	rpm 1 L	rpm 1 h	Type No.
TP 200 PTO	*1000*	850	1000	4
TP 200 MOBILE	*1100*	1000	1100	7

Table for reduced woodchip length.

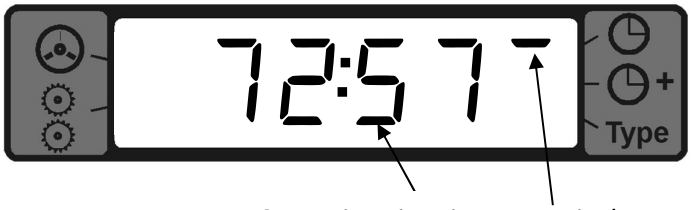
Blade position / Model	Disc rpm	4 mm rpm	6 mm rpm	8 mm rpm	10 mm rpm
TP 200 PTO	*1000*	19	29	38	48
TP 200 MOBILE	1100	21	32	42	53

From the above table the roller's rpm can be seen for the desired woodchip length.
The rpm is set by means of the regulation screw on the control valve.

Working time on the machine:

Indication of rotation time on the machine

In this display indication, the middle horizontal marker is activated on the right side.
The complete rotation time will be shown as illustrated in the following figure.



Operation time in hours and minutes

Display marker for work time

- Over 99:59 hours/minutes, only whole hours are shown.

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Resetting the rotation time on the machine

Resetting the rotation time (operation time) on the machine can be done at any time. First, press the ↓↓ key until the display for work time appears. Next, enter the following:

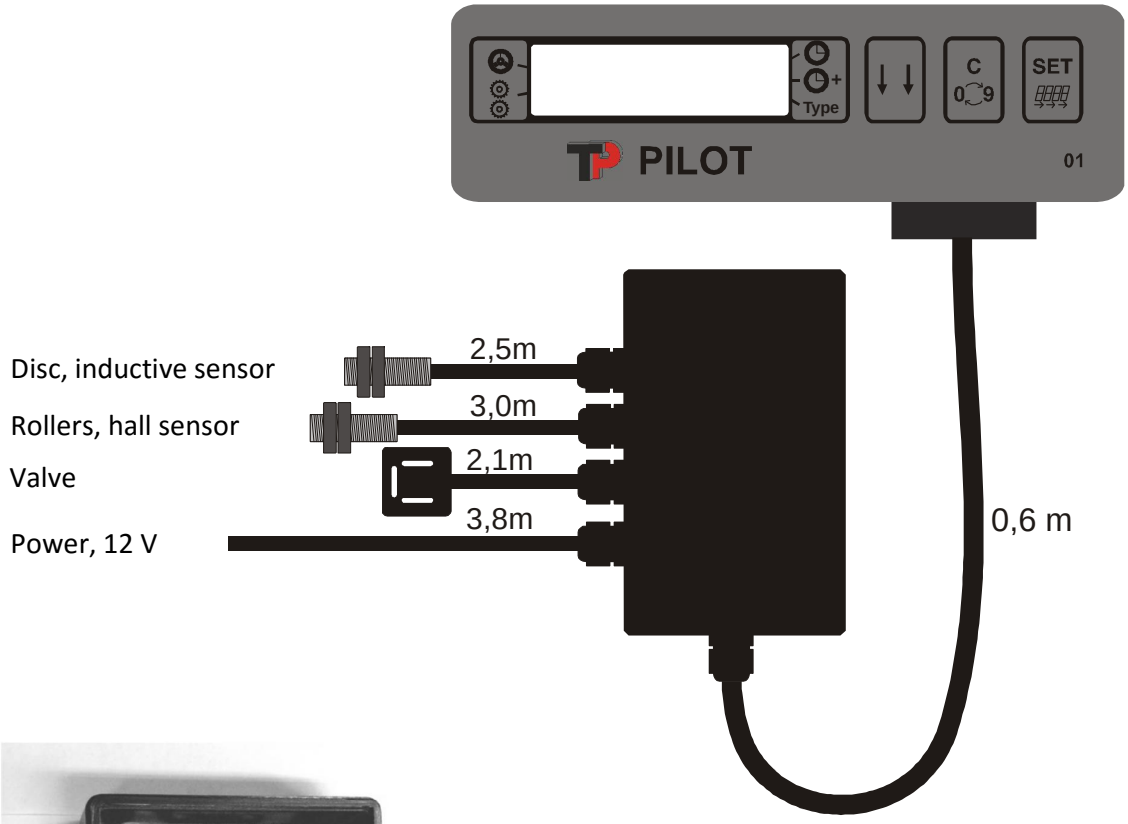
Press the key:	**The display shows:**	**Explanation:**
↓↓	72:57 (example)	Find job hours by repeatedly pressing the key.
SET	72:57	Press the key for five seconds until the number blinks.
↓↓	00:00	Press the key to reset the rotation time.

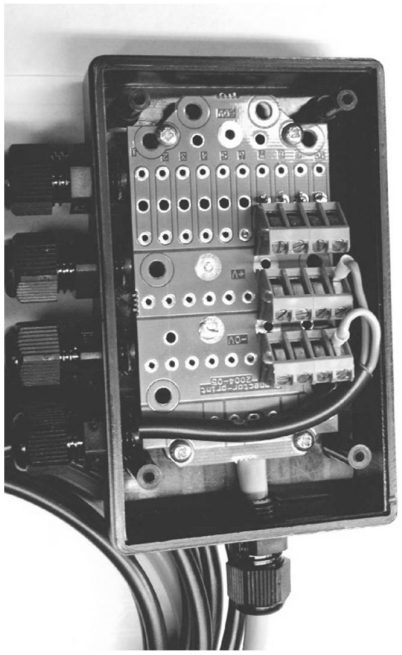
NB: Total hour counter (bottom vertical marker) cannot be reset. It is used for registering the machine's total work time.

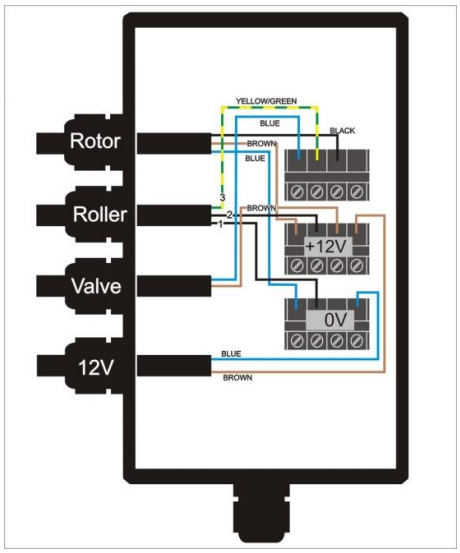
15.3 Fitting

Mechanical set-up and installation diagram

Installation diagram when using electronic sensors (hall or inductive sensors):







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15.4 Technical data

Display:	Six digits
Power supply:	12 VDC / 1.24 A
Temperature ranges:	TP Pilot is fully operational in the temperature range -10 to +70 °C.
Pulse signals from sensor:	Max. 225 pulses/second

NB:

The control/monitoring system has been designed for use in connection with the functions described. Any other use of the control/monitor system may be associated with significant hazards and exempts the supplier of the control system from liability.

16 Troubleshooting for the TP 200 wood chipper

Check possible causes before contacting the supplier.

Problem/Possible Cause	Solution
The rollers are not turning around satisfactorily:	
Not enough oil in the hydraulics system	Fill up with hydraulic oil
The flow valve is screwed out too far	Turn up the flow
The stationary roller is blocked	Clean under and behind the roller
The bypass valve is dirty	Clean the bypass valve
The revolutions monitor is blocking operation	Increase the rpm on the disc
The safety bar is in the 0 position	Put the safety bar in the A position
The rollers are not pulling satisfactorily:	
Not enough flow	Screw out further the flow valve (opened)
The V-belts are too slack	Tighten the V-belts
The hydraulic oil is becoming too hot	Let the machine cool down while checking why
Poor viscosity of the hydraulic oil	Change the hydraulic oil
The hydraulic filter is clogged	Replace the hydraulic filter
The oil pump is worn or damaged	Replace the hydraulic pump
The oil engine is defective	Replace the oil engine
The pressure control valve in the control valve is dirty	Clean the pressure control valve
Unsatisfactory woodchip quality:	
The knives are blunt	Sharpen the knives
The counterknife is worn	Reverse/replace counterknife
The knives are worn down too far.	Replace the knives
The distance between knife and counterknife is too big	Adjust the distance between the knives and counterknives
Sliver breaker not mounted or worn	Fit or replace the sliver breaker
Poor ejection of woodchip:	
Not enough drive	Not enough power on the PTO shaft or the engine
Square scrapers are worn	Replace the square scrapers
Ejector wings are worn	Replace the ejector wings
The facing plate in the top part	Remove the facing plate from the top part
Too low rpm on the machine	Increase speed to maximum revolutions

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17 Warranty terms wood chipper

Refer to the issued warranty certificate.

18 Technical data wood chipper

Type	TP 200 PTO	TP 200 MOBILE	TP 200 MOBILE TURNTABLE
Chipping principle	Disc chipper	Disc chipper	Disc chipper
Disc diameter, mm	760	760	760
rpm*	1000 (540 with speed-up gear)	1000	1000
Total number of knives	3	3	3
Power requirement min./max. kW/(HP)	30–85/(40-115)	39/(52)	39/(52)
Max. Wood diameter, mm	200	200	200
Chip length, mm	10	10	10
Weight, kg	700	1350	1550
Height, mm	2440	2607	2741
Width, mm	1424	1760	1760
Length, mm	1883/2480	3017	3017

PTO transmission shaft: Walterscheid type 2400 with free running.

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

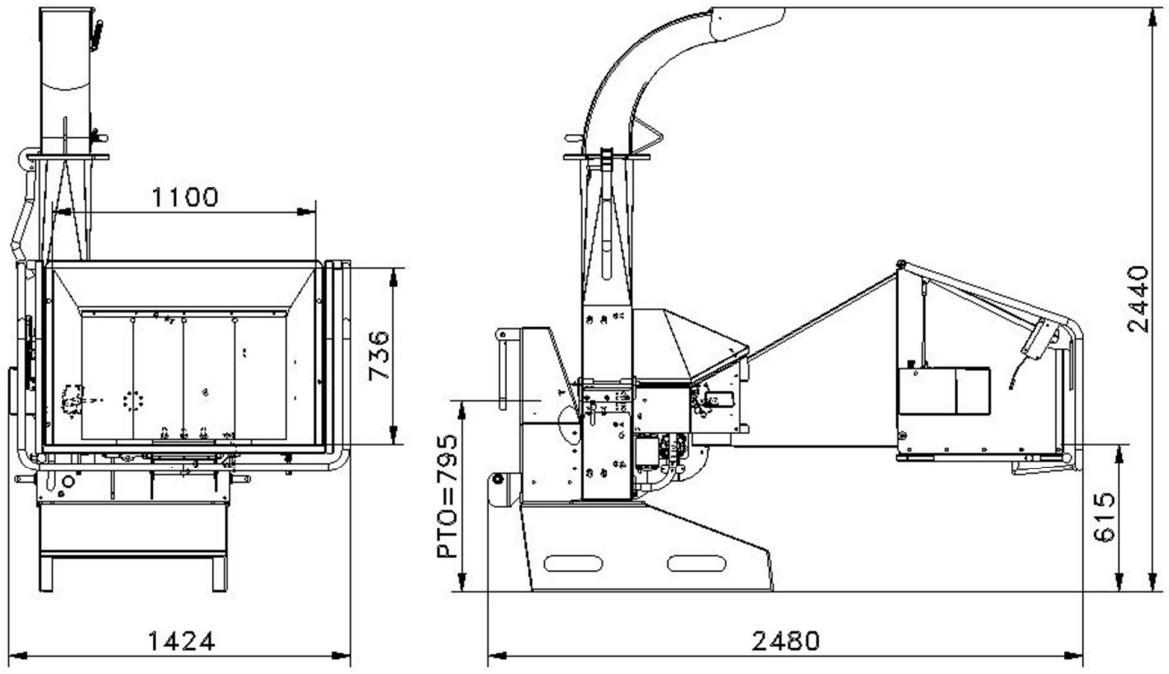


Figure 1 Dimensional drawing for TP 200 PTO

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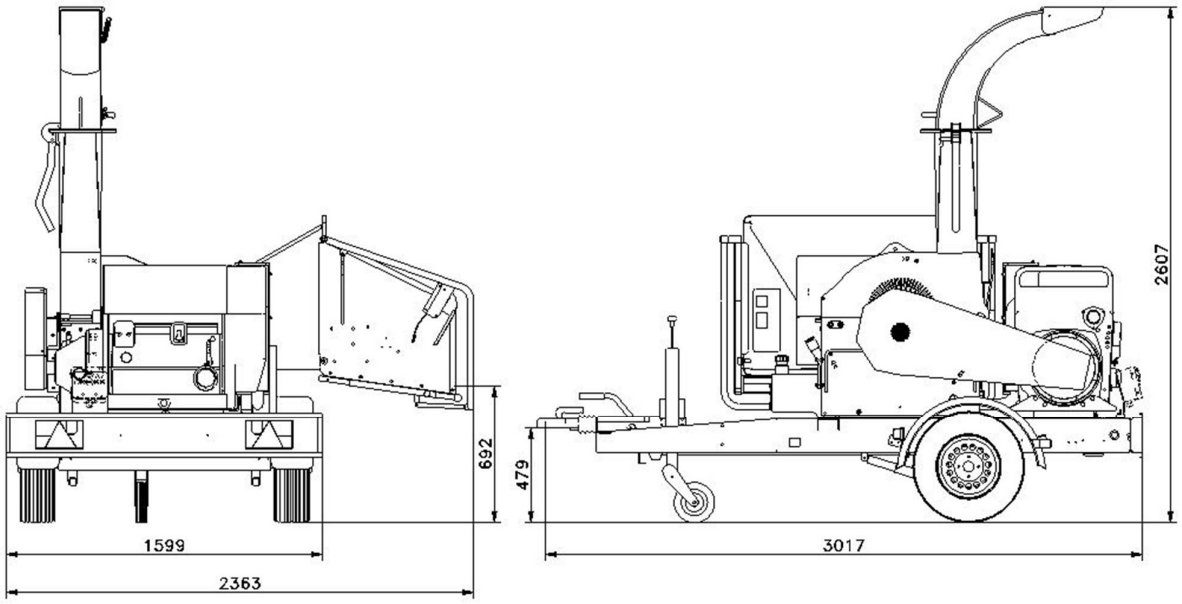


Figure 2 Dimensional drawing for TP 200 MOBILE

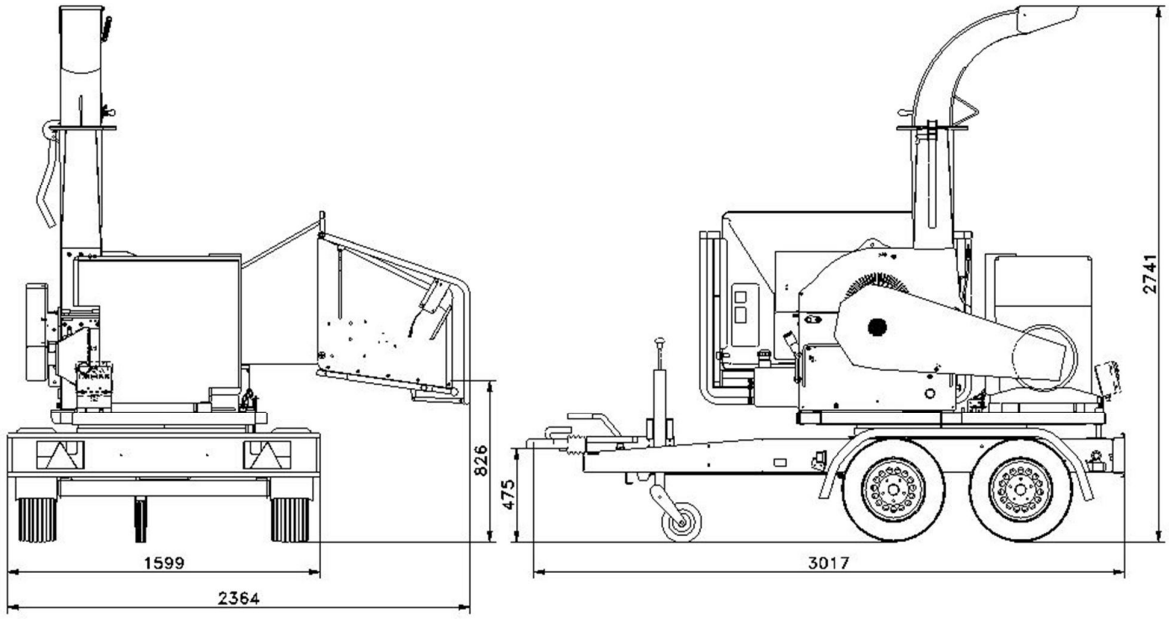


Figure 3 Dimensional drawing for TP 200 MOBILE TURNTABLE

19 Extra equipment

- Tool kit including torque spanner
- Extended ejector spout horizontal
- Extension for ejector spout vertical
- Lock for ball and socket coupling (TP 200 MOBILE)
- Light boom (TP 200 PTO)

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20 Spare Parts Catalogue