User Manual
&
Spare parts catalogue
for the TP 100 wood chipper in the Garden Series



Linddana A/S ▪ Ølholm Bygade 70 ▪ DK-7160 Tørring ▪ Tel. +45 7580 5200 ▪ tp@linddana.dk ▪ www.tp.dk

LINDANA

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, i.a. laser cutting, CNC technology and robot technology in bright and open production facilities.

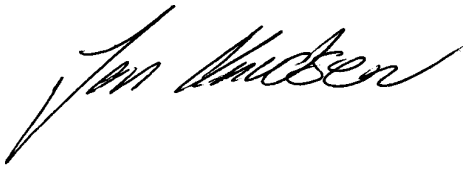
For safety reasons and in order to get maximum pleasure from the wood cutter, it is important to read these instructions before use.

The user manual explains about safety, use and maintenance so that the work with the wood chipper will be safe and profitable.

Linddana offers wet grinding for your knives: the knives are ground and returned the same day they are received (call and hear more on +4576904045).

In order to keep your machine in top shape as well as to prolong the life of the machine, Linddana offers a service contract where the machine is service by our service engineer preferably in cooperation with the user once a year. Besides a technical check, the user is instructed on how to use and maintain the machine.

Linddana A/S



Jan Knudsen, Managing director

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

Distributor stamp

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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 98/37/EC) 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: Jan Knudsen

Ølholm, 1. September 2006

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4 Use

The TP 100 wood chipper is designed for **stationary** wood chipping in the form of braches etc.

The machine must **not** be used for materials containing stone, metal or other foreign bodies. These foreign bodies can in the best case dull the knives and in the worst case break the machine. Knives and anvil can break when stone or metal comes in between them.

The machine must **not** be used for wood chipping of wood containing nails, screws, arming etc.

At feeding, the thickest end must be guided to the knives first after which the machine normally pulls the rest into the feeding hopper (see fig. 1).
With thicker branches, it might be necessary to ”hold back” a bit in order to keep the rotor from loosing revolutions.



Figure 1 Feeding of branches

Remember to keep the **knives** and **anvil** sharp, it makes feeding easier and gives a better quality chips, and besides it lovers the use of fuel considerably.

The machine must be inspected daily, meaning the rotor housing must be opened and the rotor, knives, anvil etc. must be inspected. By doing this you prevent unexpected stops and prolong the life of the machine.

The tractor and trailer upon which the machine is mounted must always have the brakes activated during work.

The machine must **not:**

- Be used for other materials than wood
- Be used to push trees, stubs etc.

There must **not** be equipment like forest chains, axes, chain saws etc. in the feeding hopper.

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5 Mounting instructions

5.1 Before use

The machine is equipped with a lifting point which is to be used when lifting the machine with a crane or any other hoisting device (ground assistance) (see Fig. 2). The machine can also be lifted with a fork lift truck.
Upon delivery from Linddana A/S the PTO models are secured to a wooden pallet. (See fig. 3)
The TP 100 MOBILE is transported mainly on the trailer wheels, but it can also be lifted with a fork lift truck under the trailer members (see fig. 4).

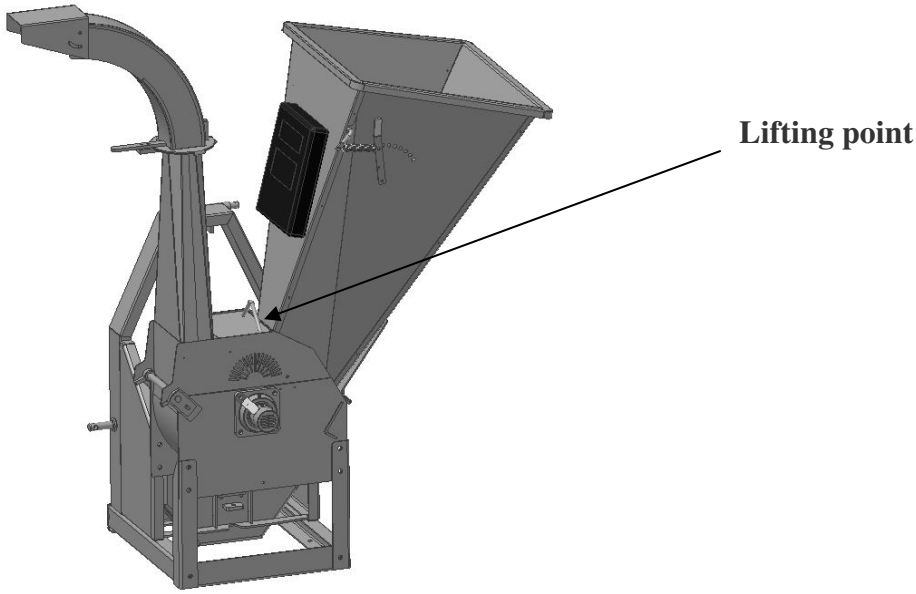


Figure 2 Lifting point on the machine



Figure 3 Lifting with fork lift truck, PTO

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Figure 4 Lifting with fork lift truck, MOBILE

Store the manuals for the PTO member with this manual in the manual box on the machine.

Before operation you must check that the wood chipper cleared of foreign bodies. The machine **must** be uncoupled from the tractor's PTO, and for the MOBILE models, the key **must** be removed from the ignition before opening for the rotor. Check that the rotor is at a complete standstill. Dismantle the bolts that hold the upper and lower rotor housing together. Lift the top part of the rotor housing up until the top part stands on its own. Turn the rotor a few times by hand. Remove any foreign bodies.

Check that the gap between the knives and the anvil is correct = **0,5 mm**.
Check that the knives are not rubbing on the anvils.

Lift the top part of the rotor housing back in place and fit the bolts.

Check that all bolts, nuts and screws are tightened properly (see fig. 11).

Remember to lubricate all the lubrication points (see maintenance schedule, page 13).

Old motor oil and used oil filters and air filters must be handed in at an approved receiving station.

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5.2 Mounting instruction

The machine is designed to be mounted on the tractor's three-point-suspension or trailer mounted with its own engine.

Machines for mounting on the tractor's three-point-suspension is delivered with a PTO axle with either 1 3/8" - 6 splines or 1 3/8" - 21 splines.
At certain types of tractors a PTO axle with 1 3/8" - 21 splines is used.

The PTO axle **must** be mounted with free running on the machine side.
Linddana uses Walterscheid 2100 with free running which comes with the machine.

The length of the PTO axle has to be adapted to the tractor following instructions from the supplier of the PTO axle. See the attached manual for the PTO axle.

The machine must stand on a plane, horizontal surface during use and the tractor mounted machines must be attached to the tractor's three-point-suspension (see fig. 5). The tractor's brakes must be properly activated. Trailer mounted machines must also have their brakes activated (see fig. 6).

When starting the machine: attachment must be done with the motor running at idle speed or at as few revolutions as possible in order to avoid overloading of the PTO axle, gear box, tractor and wood chipper.

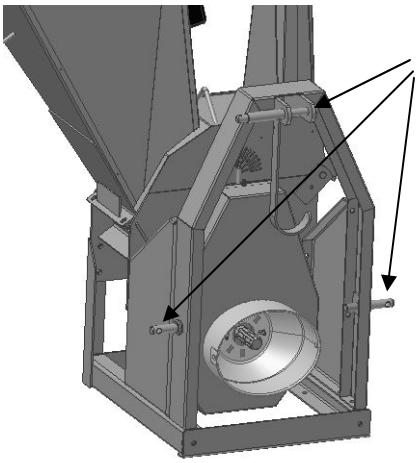


Figure 5 three-point-suspension

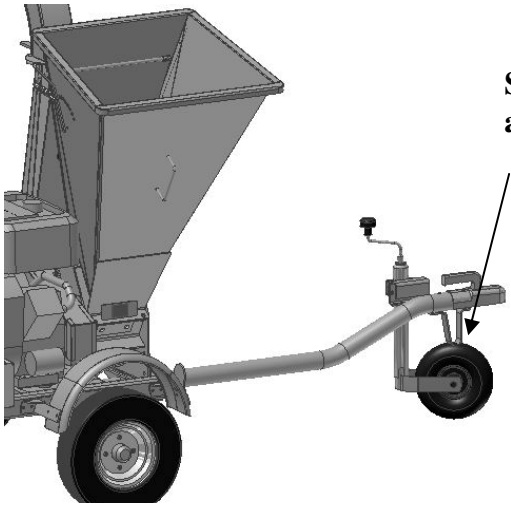


Figure 6 Locking of stabiliser

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6 Safety instructions

6.1 Safety regulations

- Use hearing protectors, safety goggles or a similar eye protection, close fitting safety clothing and safety shoes.
- When working near roads it can be prudent to wear a west whish reflects the light to be more visible to the other road-users. The displaying of signs must be in accordance with the Road Traffic Act.
- Minimum age for users of the machine is 18, for training and under surveillance from an adult the age is 16.
- During operation, all body parts must be kept away from the feeding hopper and any moveable parts of the machine.
- The machine **must** not be started without the ejector tube mounted to the machine.
- **Never** use the machine in closed or poorly ventilated spaces, because of the danger of carbon monoxide poisoning.
- The top part of the machine as well as all other shielding must **not** be opened/removed before the rotor disc is completely immovable (see fig. 7) and the tractor's motor is stopped.
- **Always** stop the machine and the tractor during inspections, service or repairs. The machine **must** always be uncoupled from the tractor's PTO.
- Tractor mounted machines have to be on the ground before service or repairs are done.
- Always remove the keys from the machine and/or the tractor before leaving it.
- After maintenance and repairs, the machine must not be started before all bolts are tightened and all safety devices are mounted.

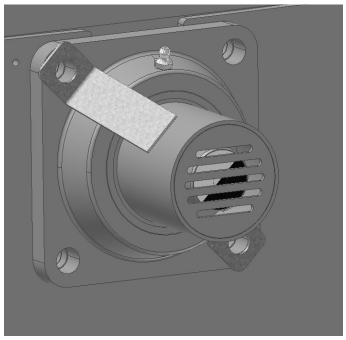
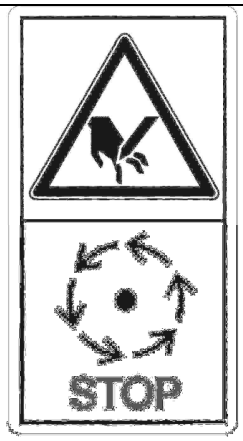
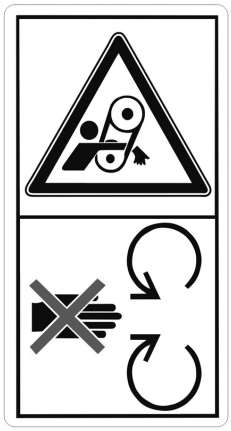
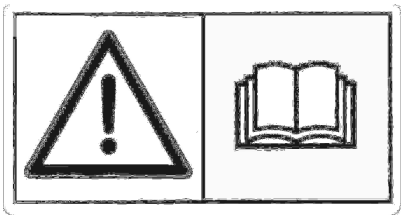


Figure 7 Two coloured axle end

- Three-point mounted machines **must** be coupled to the tractor's three-point- suspension before use.
- The maximum rpm for the machine (2000 rpm) must **not** be superseded.
- The transmission axle's tube shielding and covering must always be intact. Safety chains on the transmission axle have to be properly mounted.
- The length of the PTO axle has to be adapted to the tractor according to the recommendations from the supplier of the PTO axle.
- The ejector tube must **not** point towards people or areas where there are people. There is a safety distance of 20 m. in the direction where the chips are thrown.
- During transport or when the machine is dismantled, the PTO axle has to be placed in the machine's carrier bow.
- During transport the ejector tube has to be turned in the opposite direction of the traffic direction and properly secured.
- During transport on public roads, the provisions of the authorities must be respected.
- For cleaning a broom or similar **must** be used. Never touch the inside of the hopper when the machine is running.

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6.2 Pictograms used

		
Warning: Objects thrown! Safety distance 20m!	Warning: Rotating knives! Wait for rotor to stop!	*Warning: Rotating belts!*
		
Read the manual before use!	Hearing protector and eye protection prescribed!	*Lifting point for crane!*
		
P.T.O. max. revolution.		

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6.3 Noise level

The sound effect level and the sound pressure level from the TP 100 PTO have been measured during use at 1800 rpm on the rotor disc, powered by a tractor.

The sound effect level and the sound pressure level from the TP 100 MOBILE have been measured during use at 1300 rpm on the rotor disc, powered by the Briggs & Stratton series 30xxxx and 35xxxx motor.

The measurements have been conducted according to test 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 effect level which will be given by the manufacturer according to directive 2000/14/EC are as follows:

TP 100 PTO: 128 dB (A) re.1pW.

TP 100 MOBILE: 121 dB (A) re.1pW.

The machine's sound pressure level at the operator's seat is measured according to ISO 11201 at:

TP 100 PTO: 120 dB (A)

TP 100 MOBILE: 115 dB (A)

The above mentioned values have the common uncertainty for the method of measuring and the estimated variation in a product line for the type of machine. Detailed information on the measurements and results as well as estimation of uncertainty are found in a thorough report which can be given out on demand.
The sound level is of such a character that hearing protectors are prescribed during use of the machine.

6.4 Environmental instructions

When changing oil, oil and used oil filters and air filters must be handed in at an approved receiving station.

Oil spills must be avoided as much as possible. At oil spills, the spilled oil must be cleaned up and handed in at an approved receiving station.

Worn out parts must be disposed of for recycling.

When the machine is worn out it must be disposed of properly. Motor oil must be drained and handed in at an approved receiving station with oil filters and air filters.

The rest of the machine must be disposed of for recycling.

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7 Operation of the machine

7.1 Adjusting damper in feeding hopper

In the feeding hopper there is an adjustable damper which is in part used for regulating how fast the knives will chop the material and stop thick, short parts of branches from being flung upwards.

For branch material the handle is placed in the top positions (see fig. 8). By doing so the damper is opened so the thin branches/twigs have free access to the knives.
For thick branches which are sawed off at both ends, and therefore do not end with very thin branches/twigs, the handle is placed in the lowest positions (see fig. 9).

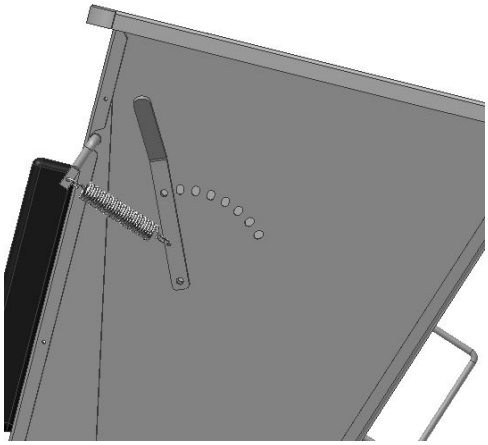


Figure 8 Damper position branches

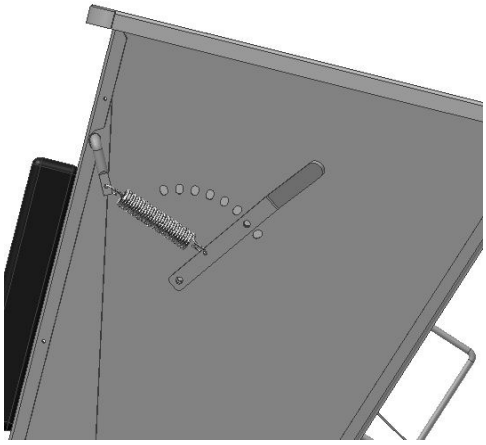


Figure 9 Damper position sawed off wood

7.2 Start/Stop of engine

The TP 100 MOBILE kW12(16hp) is equipped with a B & S engine with manual start. See the operation manual for the engine.

The TP 100 MOBILE kW14(18hp) is equipped with a B & S engine with electric start. See the operation manual for the engine.

IF THE ROTOREN IS BLOCKED AND THE ENGINE IS STILL RUNNING, THEN STOP THE ENGINE IMMEDIATELY. If this is not done, the clutch between the engine and the rotor can be damaged.

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8 Maintenance

During all maintenance and repairs the machine and the drive must be shut off. Tractor mounted machines have to be placed on an even surface and be uncoupled from the tractor's PTO.

8.1 Maintenance schedule

Interval=> hours	**8 ⌛**	**50 ⌛**	**100 ⌛**	**200 ⌛**	**1000 ⌛**	**1.000 m³**	**10.000 m³**
Lubrication of the PTO axle[1]	X						
Check of knives and anvil	X						
Tightening of all nuts and bolts[2]	(X)	X					
Lubrication of drum's main bearings[3]			X				
Tube connection for PTO axle cleaning/lubrication[4]				X			
Anvil turn/change[5]					X		
Check of V-belt[6]		X					

[1] The PTO axle is dismantled and 4 lubrication nipples are lubricated with Uniway Ep2 or something of similar quality.
[2] Bolts and nuts are tightened, the first time after 8 hours and then with an interval of 50 hours.
[3] Two lubrication nipples are lubricated with Uniway Ep2 or something of similar quality.
[4] The PTO axle is dismantled and the tube connection is pulled apart, cleaned and lubricated.
[5] The anvil is turned/changed depending on need.
[6] The tightening of the V-belt is checked.

The maintenance of the B&S engine for MOBILE models are referred to the user manual from the engine supplier. Comes with the machine.

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8.2 Changing of worn parts

8.2.1 Anvil

The anvil in the machine is used as wearing bar for the knife in order to cut the wood. The anvil must be sharp-edged otherwise the wood will bend down and the cut will become frayed.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Remove the bolts which hold the two parts of the rotor housing together and open the rotor housing. Then the rotor is secured with the locking pawl (see fig. 12).

Dismantle the two bolts which hold the anvil in place. The anvil is removed and turned/replaced. Before the anvil is put back, the anvil and the bearing surface must be cleaned carefully. The distance between the knife's edge and the anvil must be **0,5 mm**. (see fig. 10). The tightening factor for the bolts for the anvil is **200 Nm / 20 KPm.** (Additional equipment: torque wrench).

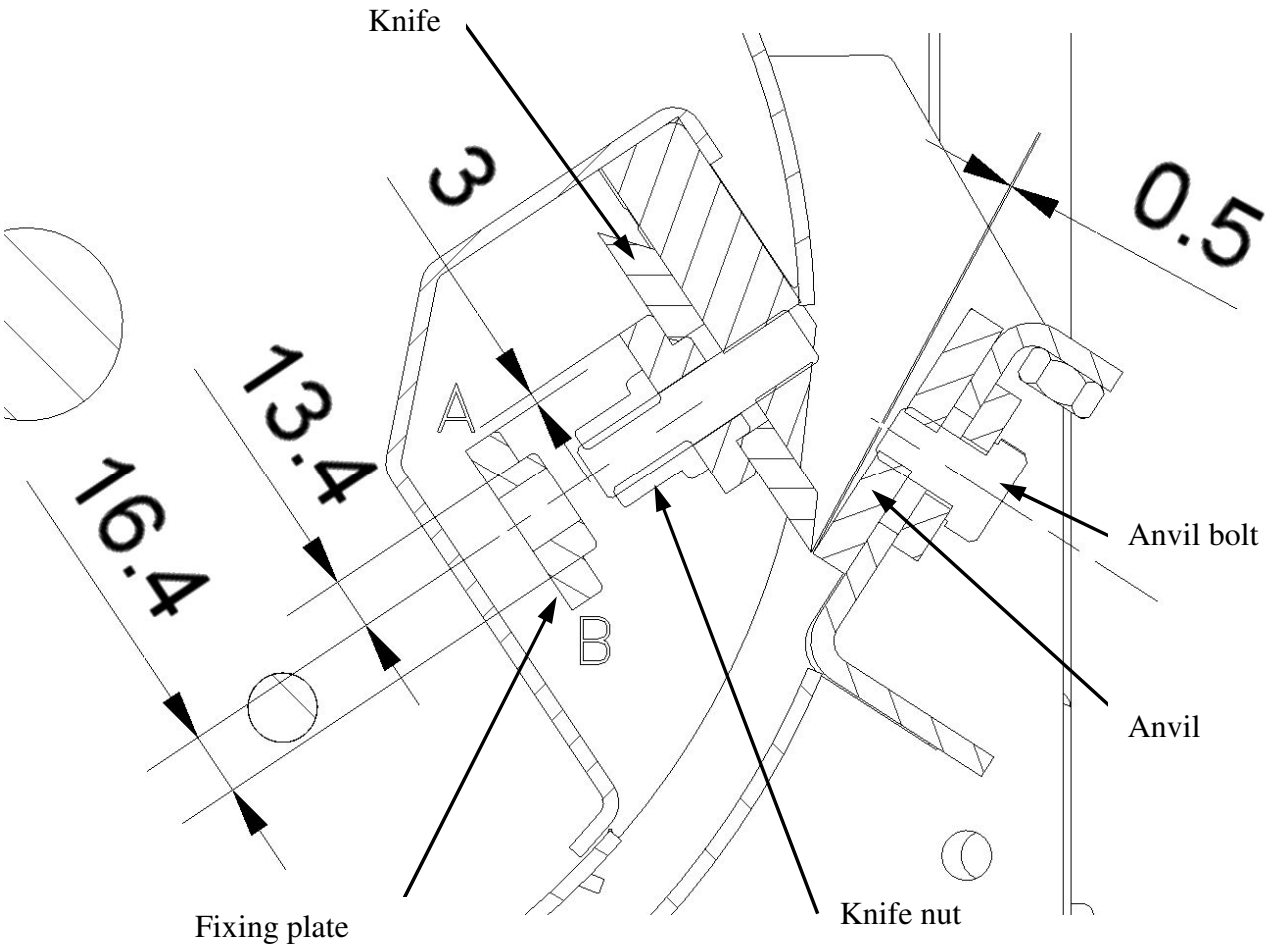


Figure 10 Distance between anvil and knife

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When the anvils have been turned or replaced and all the bolts are tightened, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and fit the bolts (see fig. 11).

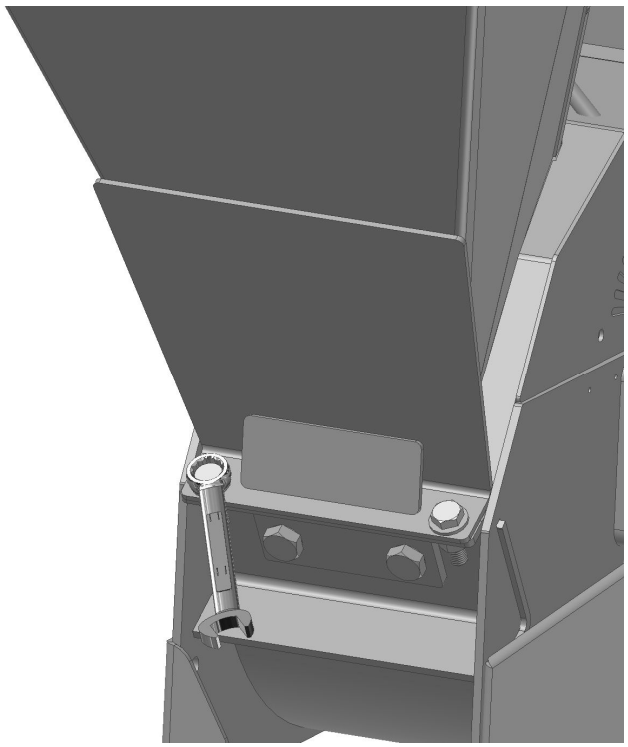


Figure 11 Fitting of bolts in the rotor housing

8.2.2 Knives

The machine is equipped with two knives.

The knives must always be changed in sets. 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 with the rotor will be out of balance which will lead to unnecessary strain on the bearings and vibrations in the whole machine.

The fixing plates can be turned in order to get maximum exploitation of the knives.

The fixing plate has two possible positions: A and B.

A The fixing plate's A side faces the anvil.
Used with new knives and knives which have been ground 2-3 times.
See fig. 10.

B The fixing plate is turned 180 degrees. The B side faces the anvil.
The knife is increased with the eccentric in the fixing plate with 3 mm.
The B position must not be used with new knives.
The B position must not be used until the small distance of 0,5 mm
between knives and anvil can no longer be achieved with the fixing plate in position A.
See fig. 10.

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This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Remove the bolts which hold the two parts of the rotor housing together and open the rotor housing.

The rotor is turned until the rotor lock can go into one of the holes on the rotor. Now the rotor is locked (see fig. 12). Be careful that your fingers are not near the knives when the rotor is turned.

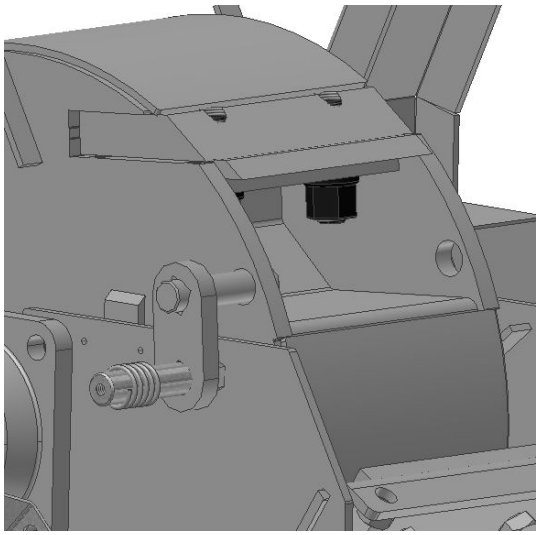


Figure 12 Locking of the rotor with the rotor lock

Remove the two nuts which hold the knife and the bearing surface to the rotor. Take out the knife. The bearing surfaces on the rotor and the knife must be cleaned properly before fitting the knives. On fitting the nuts **must** be slightly greased (μ=0,125) meaning thin oil, WD 40 or something similar. Copper grease, MoS_2 or similar low friction grease must **not** be used.

Check that the distance between the knife's edge and the anvil is set correctly at **0,5 mm**.

The nuts must be tightened with **200 Nm / 20 KPm**.
(Use a torque wrench for this. It can be bought as additional equipment).

When the knives are changed, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and fit the bolts (see fig. 11).

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8.2.3 Adjusting the V-belts

The rotor is run by V-belts. The V-belts have to be checked regularly or if they are suspected to be slack.

This is how it is done:
Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill.

PTO models

Dismantle the screen over the belt drive. Loosen the four bolts which hold the console for the large belt disc in place and adjust the tension by turning the adjusting screw (see fig. 13).

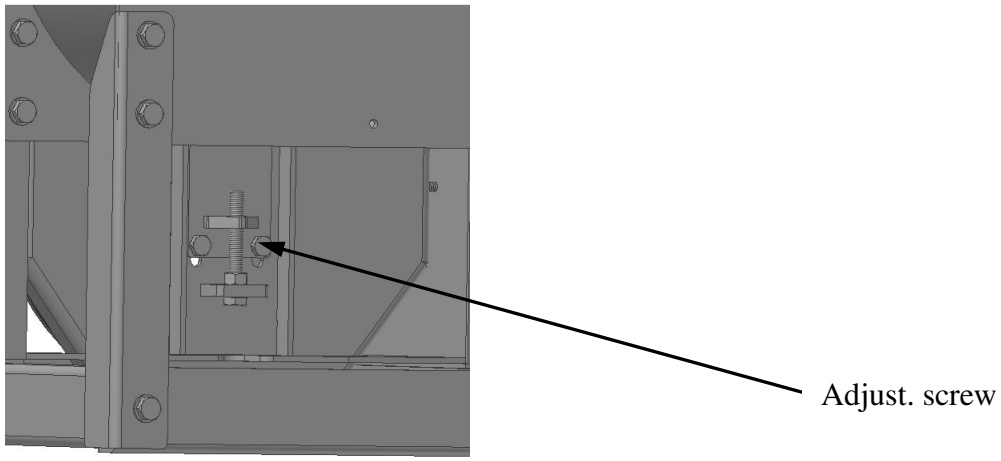


Figure 13 Adjusting the tension

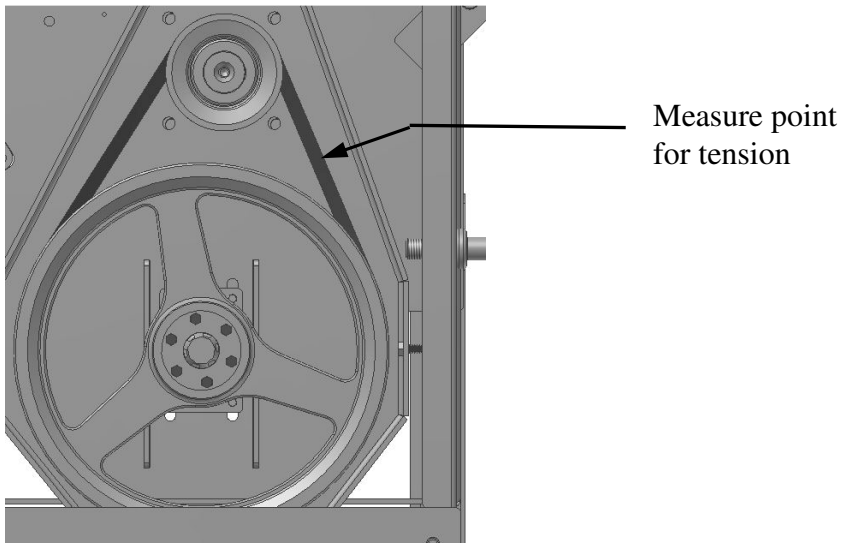


Figure 14 Measuring the tension

Used belts are allowed to bend 4,8 mm when they are pushed down with 78 N (7,8 kg), for new belts this number is 91 N (9,1 kg) (See fig. 14). The belts can be measured with a gauge for this purpose which can be bought as an accessory.

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When the V-belts have been tightened, the four bolts for the console are put back. The screen is mounted.

MOBILE models

Loosen the four bolts which hold the engine and adjust the tension by turning the adjusting screws (see fig. 15).

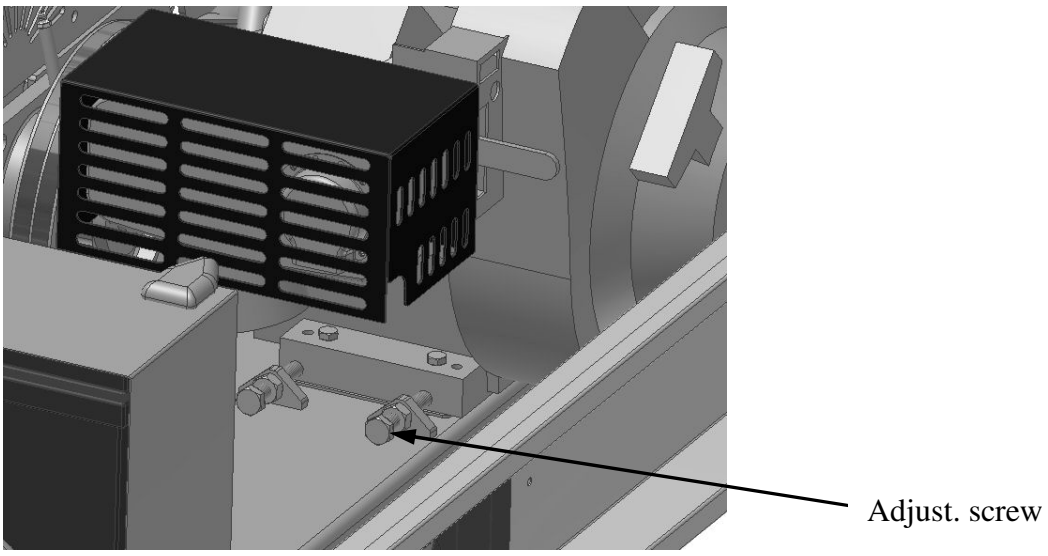


Figure 15 Adjusting the tension

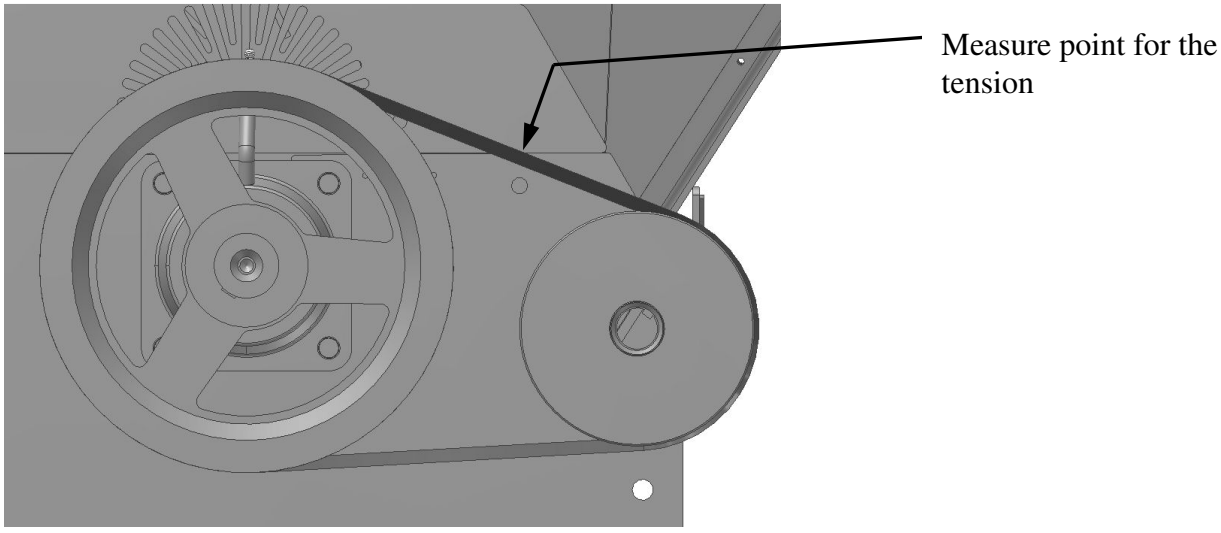


Figure 16 Measuring the tension

Used belts are allowed to bend 4,8 mm when they are pushed down with 36 N (3,6 kg), for new belts this number is 41 N (4,1 kg) (See fig 14). The belts can be measured with a gauge for this purpose which can be bought as an accessory.
When the belts have been tightened, the motor is secured. Check that the belt wheels aligned after adjustment.

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8.3 Grinding of knives

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

The grinding can be done as wet grinding with a bond stone (see fig. 17). **Never** use an angle grinder or a similar tool for grinding the knives. Wet grinding machines can be bought as an accessory at Linddana.

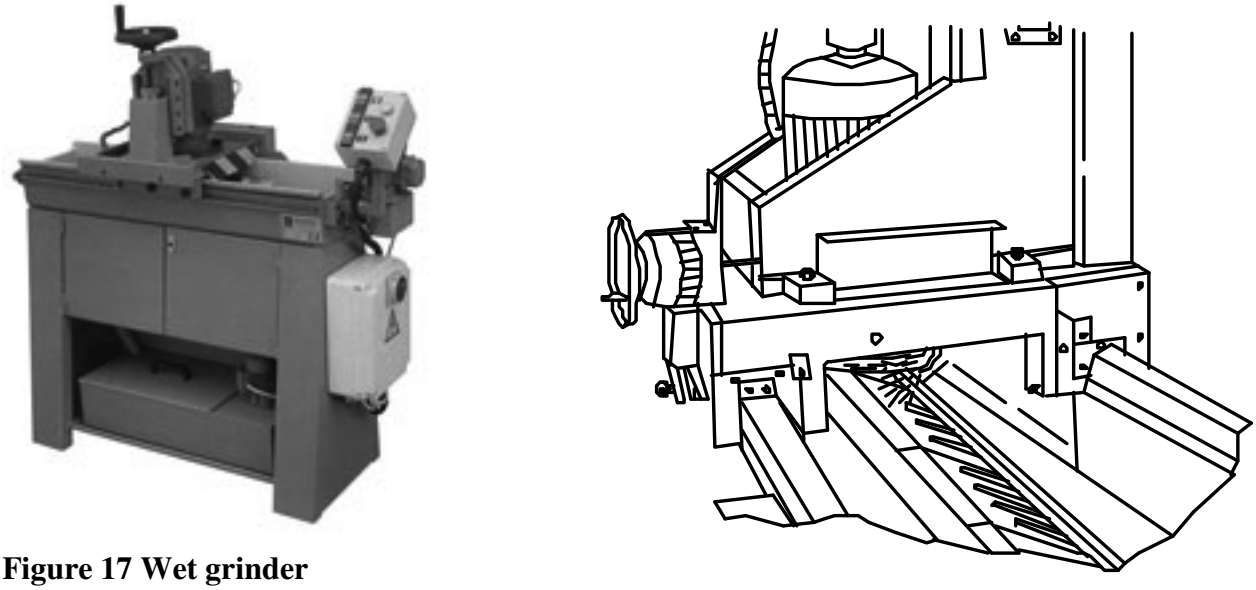


Figure 17 Wet grinder

When grinding knives you have to pay attention to the width of the knife set. The width has to be the same because of the balancing of the rotor. Therefore, the knives always have to be ground in sets. The knives must have a measurement of min. 28 mm (See fig. 18). After that they must be thrown away.

The edge of the knives must be ground at an angle of 40°. (See fig. 18)

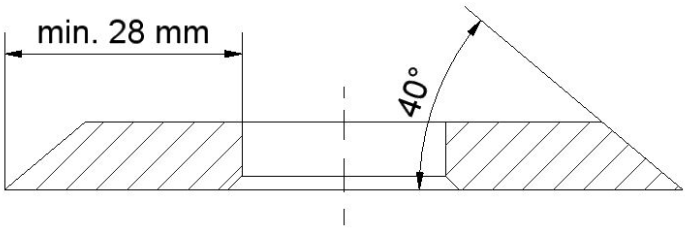


Figure 18 Grinding angle and minimum knife width for chipping knives

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9 Troubleshooting for wood chipper TP 100

Check possible causes before contacting the distributor.

Problem / Possible cause	Solution
The chip quality is not satisfactory:	
The knives are dull	Grind the knives
The anvil is worn	Turn/replace the anvil
The knife has been worn too far (<28 mm)	Change the knives
The distance between the knife and anvil is too large	Adjust the distance between the knives and the anvil
Poor throw of the chips:	
Too little drive	Not enough effect on the PTO axle or engine
Not enough revolutions on the machine	Increase speed to maximum revolutions
Driving belts too slack/worn	Adjust the belts/change the belts
Engine problems: MOBILE models	See the user's manual for B&S engines

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10 Guarantee obligation for wood chipper

The guarantee is valid for 24 months after date of purchase for the relief of faults which are provable to the material or manufacture. The guarantee does not cover defective components which are repaired or changed.

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).

Claims

Any and all risk concerning the goods is passed to the buyer at the time of delivery of the goods. A claim concerning the goods has to be done in writing to Linddana as quickly as possible, and no later than 8 days after delivery. If Linddana has not received the claim before the deadline stated, the objections to quantity and quality that the buyer might have will lapse.

Linddana is entitled and obligated to correct any and all faults which are caused by the construction, material or manufacture. Linddana alone determines whether the remedy is to be done with repairs or changes of the defective parts. In case of repairs, the buyer is obligated to deliver and collect the goods sold in the workshop determined by Linddana at no expense to Linddana. In case of changing the defective parts, the buyer is obligated to send in the defective parts to Linddana at no expense to Linddana. Linddana is entitled to changing the defective goods.

Linddana's responsibility only covers faults which occur within a year of the goods sold being delivered.

Linddana has no liability besides those stated in the present item. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

Guarantee conditions

If Linddana has decided to grant a guarantee, then this has faults in the construction, material or manufacture. A guarantee granted by Linddana does not cover faults which occur as a result of imperfect maintenance, incorrect mounting, changes made by the buyer or wrong use of the good. The guarantee furthermore does not cover normal wear and tear or deterioration. Linddana's guarantee obligation presupposes that the buyer documents that a stated fault is not due to the conditions which are exempt from the guarantee cf. afore-mentioned.

The buyer must let Linddana know in writing about any faults to the goods sold no later than 8 days after the fault should have been realized by the buyer. If the buyer does not let Linddana know before the expiration of this deadline and before the guarantee period runs out, the buyer looses the right to make any claims concerning the fault.

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Linddana is entitled and obligated to remedy any faults which are covered by a guarantee granted by Linddana. Linddana alone decides if the remedy is to be done as repairs or changes of the defective parts, everything under the terms stipulated in item 4.

Linddana has no other liability for those faults. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

The guarantee does not cover:

- If a defect with just cause can be attributed to inappropriate use.
- Use of unoriginal spare parts, including worn parts.
- Wrong adjustment or use of the machine.
- Use of wrong lubricant.
- Wear on cross at PTO axle.
- V-belts.
- Knives and anvil which break because of foreign bodies in the machine.

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11 Technical data for wood chipper

Type	TP 100 PTO	TP 100 MOBILE	TP 100 MOBILE 20 km/h
Chipping principle	Drum chipper	Drum chipper	Drum chipper
Rotor disc diameter, mm	400	400	400
Revolution PTO rpm*	540	-	-
Knives, pieces	2	2	2
Effect need min/max kW/(hp)	11-22/(15-30)	-	-
Engine effect kW/(hp)	-	12/14 (16/18)	12/14 (16/18)
Max. wood diameter, mm	100	100	100
Chip length, mm	5-20	5-20	5-20
Weight, kg	210	245	255
Height, mm	1684	1746	1690
Width, mm	1480	1375	1294
Length, mm	878	2167	1003
Tire measurement	-	4.00x8-4 layered	4.80 4.00x8/4.00x4
Tire pressure, max bar(PSI)	-	3(45)	4(60)

* PTO transmission axle: Walterscheid type 2100 with free running.

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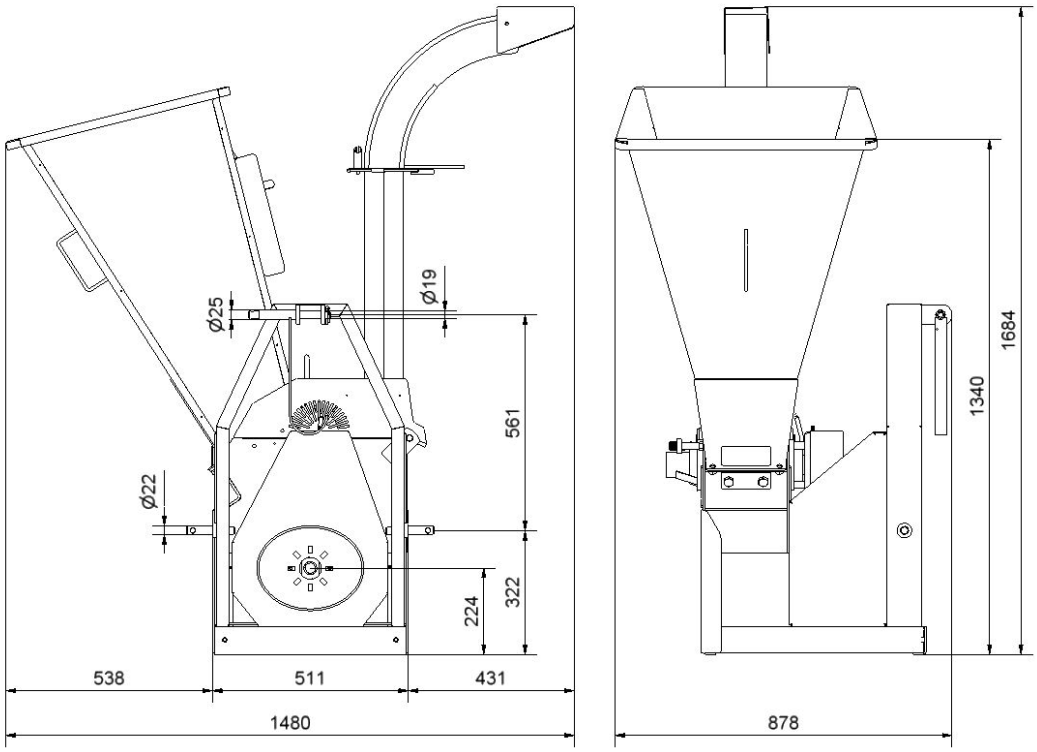


Figure 19 Dimensioned sketch TP 100 PTO

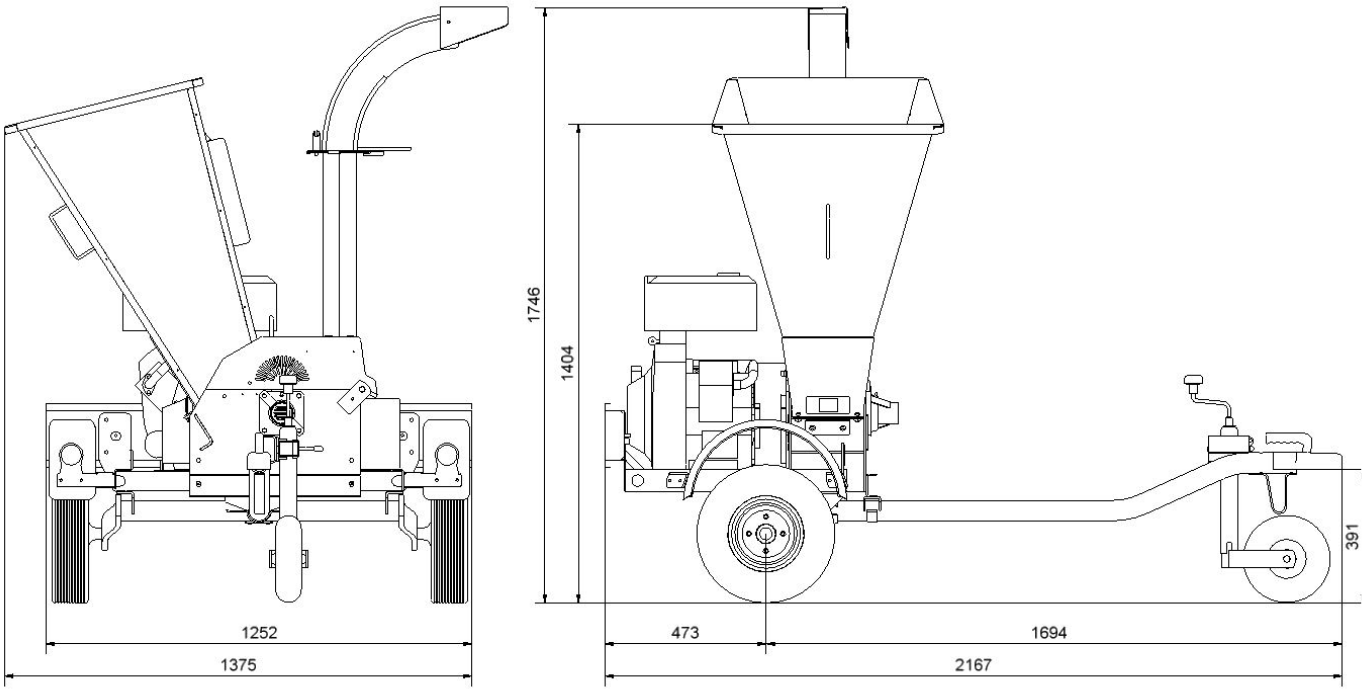


Figure 20 Dimensioned sketch TP 100 MOBILE

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Accessories

- Wet grinding machine (Figure 17)
- Torque wrench
- Extension for the ejection tube vertical

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13 Spare parts catalogue

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