User manual





Translation of the original user manual



2139 English 952.120.016 EN



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FOREWORD

Congratulation on your Power Box Rake purchase. For safe and long-lasting operation of this Power Box Rake, it is necessary to read and to understand this user manual. It is impossible to work safely with this machine *without* complete knowledge of the content of the user manual.

The Power Box Rake is not a machine that works independently. It is the user's responsibility to use the correct shovel or other towing vehicle. The user must also check the towing vehicle/Power Box Rake combination on safety aspects such as noise level, user instructions and risk analysis.

The following pages deal initially with the general safety instructions. Every user should know these safety instructions and apply them. At the end of this page, a registration card is inserted. This registration card should be returned to enable us to deal with potential future claims.

This user manual lists many instructions that are numbered in sequence. You should follow this sequence. A \triangle is an indication of a safety instruction. A \bigcirc means a tip and/or note.

All information and technical specifications provided at the moment that this document is published are the most recent ones. Design specifications may be changed without prior notice.

This document is a translation of the original operating instructions. Upon request, the original operating instructions are available in Dutch.

WARRANTY CONDITIONS

WITH DELIVERY THIS REDEXIM MACHINE IS GUARANTEED AGAINST MATERIAL DEFECTS.

THIS WARRANTY IS VALID FOR A PERIOD OF 12 MONTHS FROM THE PURCHASE DATE.

REDEXIM WARRANTIES ARE SUBJECT TO THE 'GENERAL CONDITIONS FOR SUPPLY OF PLANT AND MACHINERY FOR EXPORT, NUMBER 188' THAT ARE PUBLISHED UNDER THE AUSPICES OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE.

REGISTRATION CARD

For your own information, fill in the table below:

Serial number of the machine	
Dealer name	
Date of purchase	
Remarks	

!! SAFETY INSTRUCTIONS !!

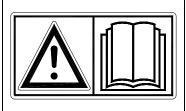


Figure 1

The Power Box Rake is designed for safe use. This can only be achieved if you completely follow the safety instructions described in this manual.

Read and understand (Figure 1) the manual *before* you start using the Redexim machine.

If the machine is not used as described in this manual, this can result in injuries and/or damage to the machine.

INTENDED USE OF THE MACHINE AND OBLIGATIONS OF THE USER

Treating fields/lawns is the only purpose of the machine. Any other use is improper. The manufacturer will not accept any liability for damage resulting from improper use. All risks occurring with this are entirely at the expense of the user.

All persons assigned to operate, maintain and repair the **machine** by the owner must completely read and understand the operation manual and in particular the chapter of **Safety Instructions**.

The machine is manufactured according to the latest technical understanding and is safe to use.

Modifications to the Power Box Rake (including its operations) that have a negative impact on safety must be rectified immediately.

The user is **obliged to check** the Power Box Rake for **visible damage and defects** before using the Power Box Rake.

For safety reasons it is in principle not permitted to make changes or adjustments to the Power Box Rake (except those approved by the manufacturer). If <u>modifications</u> to the Power Box Rake have been made, then the current CE marking is cancelled. The person that has made these modifications has to apply for a new <u>CE marking</u> himself.

Following the use, maintenance and repair instructions prescribed by the manufacturer is also considered proper use of this machine.

The user is responsible for a <u>safe combination of the Power Box Rake and the towing vehicle</u>. <u>This entire combination must be tested</u> for noise, safety, risk and user friendliness. User instructions should also be drafted.

Dress appropriately during work activities to the Power Box Rake. Wear sturdy shoes with steel toecaps, long trousers and tie up long hair. Do not wear loose clothing.

The general applicable health & safety (Dutch: ARBO) regulations must also be followed in addition to the instructions in this user manual.

Relevant traffic regulations also apply in case of using public roads.

REQUIREMENTS FOR THE ENVIRONMENT AND TOWING VEHICLES

Inspect the area to be treated before using the Power Box Rake.

As described in the Technical Data, always use the Power Box Rake in combination with a towing vehicle that is suitable for this job.

Do not use the Power Box Rake in the dark, in heavy rain/storm or on slopes with an angle larger than 20 degrees.

REQUIREMENTS DURING MAINTENANCE, REPAIR AND ADJUSTMENTS

Keep a record of the repair activities.

When unskilled people use, maintain or repair the machine, this could result in injuries to the user *and* to third parties. **This must be avoided!**

Use only original parts for maintenance or repairs because of the safety of the machine *and* of the user.

Only authorised technical personnel may carry out repairs to the Power Box Rake.

In case of maintenance, adjusting and repairs, it is necessary to block the Power Box Rake in order to prevent sinking away, driving off and/or sliding off.

If a hydraulic installation is present, you should <u>always</u> make it pressure-free *before* working on this installation.

Used oil/grease is harmful to the environment. Dispose of these substances according to the regulations that apply in your location.

REQUIREMENTS PRIOR TO AND DURING WORK ACTIVITIES TO THE MACHINE

Attach the Power Box Rake to the towing vehicle according to the regulations. (**<u>Danger of injuries!</u>**)

NEVER use the Power Box Rake in the absence of protective guards and safety stickers.

Check the Power Box Rake for loose bolts, nuts and components before every operation.

Check whether you have a clear field of vision – both close by and far away – *before* you start moving.

All persons who are going to operate the Power Box Rake must be familiar with all the functions and control elements of the Power Box Rake *before* starting any work activities.

<u>NEVER</u> crawl under the Power Box Rake. If necessary, tip over the Power Box Rake to work at the bottom side.

If present, check the hydraulic hoses regularly and replace these when the hydraulic hoses are damaged or appear old. The hoses that are replaced should comply with the technical requirements of the manufacturer.

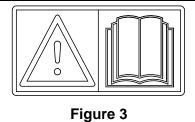
SAFETY STICKERS

Safety stickers are located on both sides of the Power Box Rake (Figures 2 and 3). These safety stickers must always be clearly visible and legible and must be replaced if they have become damaged.



- In case of maintenance, adjustments and repair, always switch OFF the engine of the towing vehicle.
- Keep a <u>distance of minimum 4 metres</u> if the machine is operating (except the operator).

Figure 2



- Prior to using the machine, the operators of the machine **must read the user manual carefully**.

Location of the Safety Stickers

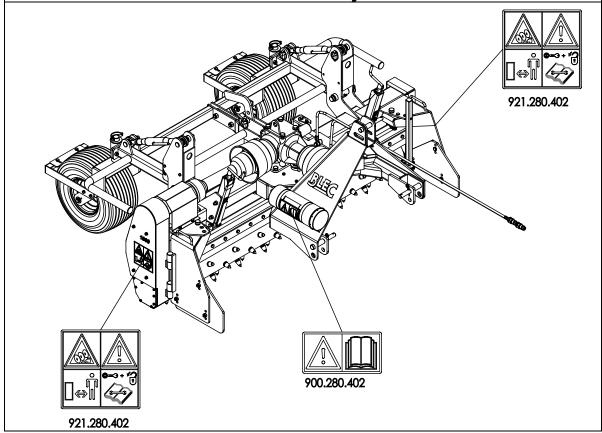


Figure 4



EU DECLARATION

We – **Redexim BV, Utrechtseweg 127, 3702 AC Zeist, Holland** – declare entirely under our own responsibility that the product:

POWER BOX RAKE WITH A MACHINE NUMBER AS INDICATED ON THE MACHINE AND INDICATED IN THIS MANUAL

to which this declaration refers, complies with the stipulation of the 2006/42/EC machine directive and with the NEN-EN-ISO 12100 : 2010 and NEN-EN-ISO 13857 : 2008 norms.

Zeist, 26/09/2016

A.C. Bos Manager Operations & Logistics Redexim Holland

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1. TECHNICAL DATA

<u>Type</u>	2400	
Recommended vehicle	Vehicle with a 55-75 hp engine and minimum 950 kg (2100 lbs) lifting capacity at 610mm behind the lifting eyes	
Working width	2.4 m (7'9")	
Working depth	50-100mm (1.9"-3.9")	
PTO speed	540 rpm	
Tyre pressure	2 bar	
Weight of the Power Box Rake	680 kg (1500 lb)	
Power Box Rake dimensions (I x w x h)	1.9x2.6x1.2 m (75"x103"x47")	
Three-point system	Cat. 1-2	
Gearbox oil	80W-90 (3.3 litres)	
Standard components	 Adjustable set of wheels Hydraulic angle-adjustment Adjustable blocking screen Adjustable side-screens PTO 	
Optional	 Laser Pole kit (hydraulic connection to tractor with free hydraulic oil return) 	

2. GENERAL DESCRIPTION

The Power Box Rake is designed to carry out various tasks, including cultivating, raking, levelling and earth-moving.

A heavy rotor with special carbide teeth is mounted on it. The rotor is PTO propelled and can rotate in both directions. The rotor can be adjusted to the left and to the right in order to move rocks, etcetera to the side. The abridged operation of the various functions is:

- Cultivating

The rotor can be lowered into the ground and grind the soil. The side plates are used to keep the soil in the machine, to sweep the waste in front of the machine and to keep the treated soil clean.

- Raking

Rocks / stones can be raked to the side(s) by adjusting the working depth in such a manner that the rotor teeth just touch the ground and by adjusting the rotor to the side(s).

- Levelling

You can level the ground accurately by adjusting the machine in such a manner that the rotor teeth touch the high points in the field and move the soil to lower lying parts of the field.

3. FIRST INSTALLATION

The machine should be prepared for use as follows:

1. Attach cables to the hoisting points (1) (see Figure 5 + 6).

Power Box Rake 2400: Make sure that the crane and hoisting cable can handle minimum 1,500 kg (3,300 lbs).

- 2. Lift the machine including the pallet approx. 100mm (4") off the ground.
- 3. Loosen the pallet by removing the 3-point pins (2).
- 4. Pull the pallet from under the machine.
- 5. Pull pin (3) out of the support and slowly lower the support (4).
- 6. Retighten the support (4) using the pin (3) at the lowest position.
- 7. Slowly lower the machine until it stands safely on the ground.

!! KEEP A SAFE DISTANCE. THE MACHINE MAY START TO SLIDE DURING HOISTING!!

⚠ !! NEVER CRAWL UNDER THE MACHINE !!

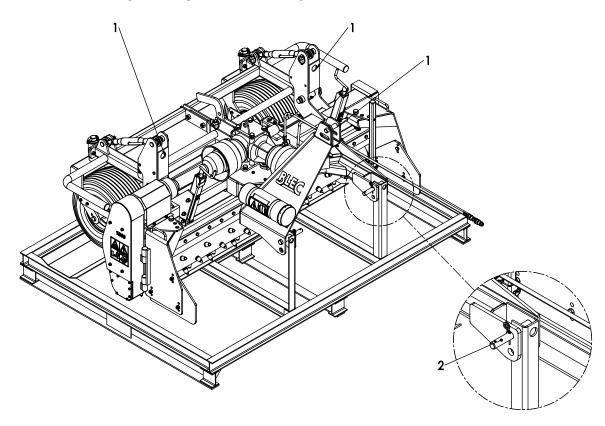


Figure 5

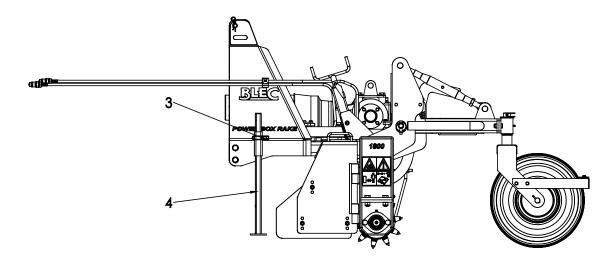


Figure 6

4. THE PTO

The PTO is a very important component that takes care of the drive from the tractor. It takes care of the drive from the tractor and safe use of the machine, provided it is installed and maintained in the correct manner. The PTO has its own CE certification. Read the PTO manual. This manual is located on the PTO.

For specific adjustments see the details given on the PTO page in the parts book. Do not exceed the given values. This can lead to an unsafe situation and overload the machine, resulting in damage.

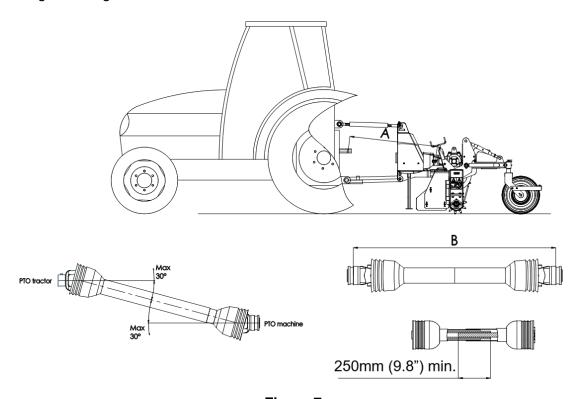


Figure 7

4.1 LENGTH OF THE PTO

The length of the PTO is **VERY** important. If it is too long, it can damage the drive of the tractor and/or the Power Box Rake. If the overlapping length of the cylinders becomes less than 250 mm (9.8") at any time, it can damage the PTO.

The length changes when the machine is lifted or when a different tractor is used! In order to set the PTO to the correct length, when a new one has been purchased or when a different tractor is used, follow these steps (see Figure 7):

- 1. Measure the distance between the PTO's connection to the tractor and to the Power Box Rake, from groove to groove, when the machine is connected to the tractor and positioned on the ground at the right angle.
- 2. Measure the distance B of the PTO in its shortest position from the locking pin to the locking bolt.
- 3. Divide the PTO in two parts and remove the protection cap at both ends.
- 4. The ends of the cylinders and the ends of the protection caps must be made shorter: (B-A) + 125 mm (4.9").
- 5. Smooth off all components, use some grease, and then assemble all components.
- 6. Mount the PTO on the side of the Power Box Rake.
- 7. Attach the other end of the PTO to the tractor.
- 8. Check the overlap of the cylinders.



Never use the machine if it has a damaged PTO protection cap. First remove any damaged parts.

4.2 Using the PTO

The following items must be checked for correct use of the PTO:

- 1. While working the angle of the pivot pins may not exceed 30 degrees.
- 2. The PTO axle of the tractor must be parallel to the PTO axle of the machine.
- 3. The overlap of the cylinders must always be minimum 250 mm (9.8").
- 4. Never use the machine if it has a damaged PTO protection cap.
- 5. See Chapter 12 for information about lubrication.

5. ATTACHING AND DETACHING THE TRACTOR

Attaching and detaching the Power Box Rake has to be done carefully. Follow the instructions below:

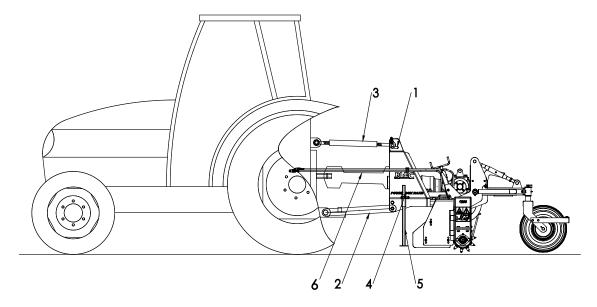


Figure 8

5.1 ATTACHING TO THE TRACTOR

Prior to attaching the machine, check the following the points:

- Check whether the Power Box Rake is undamaged and whether it is safe to attach and use the machine.
- Check whether the bolts and nuts are tightened with the correct torque.
- Check whether all safety stickers are on the machine and whether these are undamaged and easily readable. Never use the machine if it has damaged or unreadable stickers.

The Power Box Rake can be attached to the tractor by means of the three-point installation in the following manner:

- 1. Remove the 3-point pins from the Power Box Rake (1) (see Figure 8).
- 2. Carefully drive the tractor backwards until the arms **(2)** can be attached to the Power Box Rake.
- !! Make sure that the tractor and the Power Box Rake cannot move while you are attaching them !!
- !! Switch off the tractor engine *before* attaching the Power Box Rake !!
- 3. Attach the arms **(2)** to the Power Box Rake using the 3-point pins. Lock the pins using the r-clips.
- 4. Set the stabilizer to a sideways stroke of 100mm.
- 5. Mount the top link (3) onto the tractor and attach it to the Power Box Rake.
- 6. Adjust the top link so that the Power Box Rake is parallel to the ground.
- 7. Attach the hydraulic hoses to the tractor.
- 8. Attach the PTO (6) between the Power Box Rake and the tractor.
- !! Make sure that the 3-point pins are locked using the r-clips !!

- 9. Start the tractor and lift the Power Box Rake off the ground.
- 10. Dismount the pin (4) of the support (5), slide the support (5) into the highest position and subsequently, lock it again using the pin (4).

5.2 DETACHING THE POWER BOX RAKE

The machine has to be detached in the following manner (see Figure 8):

1. Drive to a spot where the tractor and Power Box Rake are in a horizontal position.



!! Make sure that the Power Box Rake and the tractor cannot move while you are detaching them !!



!! Switch off the tractor engine before detaching the Power Box Rake !!

- 2. Dismount the pin (4) of the support (5), slide the support (5) into the lowest position and subsequently, lock it again using the pin (4).
- 3. Carefully place the Power Box Rake on the ground.
- 4. Loosen the top link (3) and remove it.
- 5. Loosen the lowest arms (2).
- 6. Detach the PTO (6).
- 7. Detach the hydraulic hoses.
- 8. Start the tractor and drive off.

6. TRANSPORTING THE POWER BOX RAKE

The user is responsible for transporting the Power Box Rake over public roads. Verify the national legislation regarding the regulations. In view of the machine's weight, it is not advised to drive faster than 20 km/h (12.4 mph) with a raised Power Box Rake. Higher speeds are dangerous for people and can damage the tractor and Power Box Rake.

7. SAFETY WHEN USING THE POWER BOX RAKE

Before using the Power Box Rake, you should check the following:

- 1. Are there slopes? The maximum slope is 20 degrees for this machine. Always go from top to bottom.
- 2. Are there hard objects in the ground? If so, use the Power Box Rake at adjusted speed.
- 3. Is there danger of flying objects (e.g., golf balls) that distract the attention of the driver? If so, the Power Box Rake **CANNOT** be used.
- 4. Is there danger of sinking/sliding away? If so, postpone the treatment.
- 5. If the soil is frozen or very wet, postpone the activities until conditions improve.
- 6. Do NOT make sharp curves when the Power Box Rake touches the ground.

8. STARTING/STOPPING TO CULTIVATE

The start procedure is **VERY** important. Follow the described procedure precisely, because otherwise the Power Box Rake can get damaged.

8.1 STARTING TO CULTIVATE

The Power Box Rake can cultivate soil effectively at a depth between 50-100mm.

1. Raise the guide plate by turning the spindles (1) inward. Make sure that there is minimum 60mm distance between the rotor and the rubber plate (X) (Figure 9).

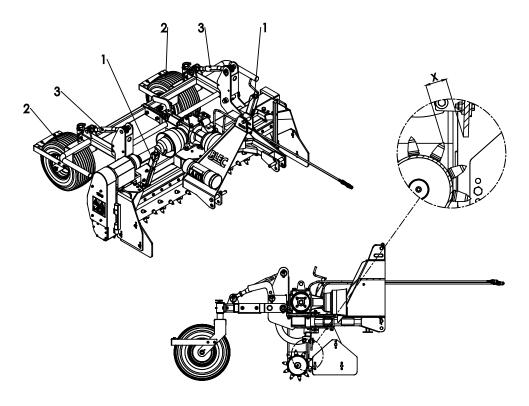


Figure 9

- 2. Make sure that the rotor frame is perpendicular to the tractor (Figure 10).
- 3. Lower the machine until the rotor is just above the ground, but does not touch it.
- 4. Set the engine of the tractor to approx. 1,200 rpm and engage the PTO.
- 5. Increase the PTO's number of revolutions to 540 rpm.

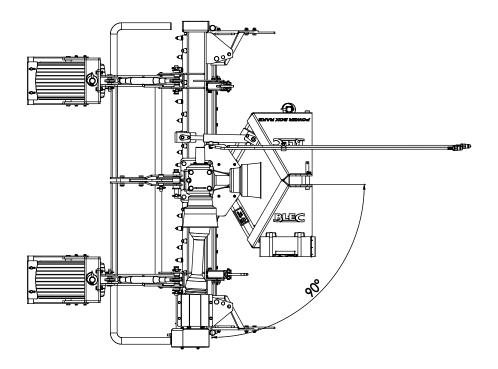


Figure 10

- 6. Start moving the tractor and lower the Power Box Rake until it sinks into the ground. Soil and rocks will now accumulate in front of the rotor, they will be forced over the rotor, and this will leave a level condition of the field behind the machine.
- 7. To adjust the working depth, the wheels (2) can be put higher or lower by turning the spindles (3) (Figure 8). The settings can be seen on the indicators (Figure 9).

Stopping occurs as follows:

- 1. Reduce the speed
- 2. Lift the machine off the ground.
- 3. Switch OFF the PTO.

8.2 STARTING TO LEVEL

The Power Box Rake can move soil, rocks, rubble, etc. This can be done by pulling the material forward using the machine.

- 1. Lower the guide plate by turning the spindles (1) inward. Make sure that there is a minimum distance (X) between the rotor and the rubber plate; make sure that the rubber plate just does not touch the teeth (Figure 9).
- 2. Make sure that the rotor frame is perpendicular to the tractor (Figure 10).
- 3. Both side plates **(2)** must be placed in such a manner that they point straight forward. This can be done by placing the locking pins **(1)** in the rear hole (Figure 11).

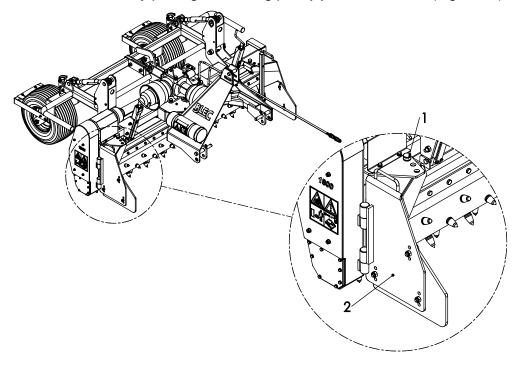


Figure 11

- 4. Make sure that the working depth is set so that the teeth of the rotor do not cut the soil. To adjust the working depth, the wheels (2) can be put higher or lower by turning the spindles (3) (Figure 9).
- 5. Lower the machine until the rotor is just above the ground, but does not touch it.
- 6. Set the engine of the tractor to approx. 1,200 rpm and engage the PTO.
- 7. Increase the PTO's number of revolutions to 540 rpm.
- 8. Start moving the tractor and lower the Power Box Rake until it sinks into the ground. Rubble and rocks will now accumulate at the front of the rotor and shifted forwards. The fine material will be forces over the rotor and this will leave a level condition of the field behind the machine.

The high parts of the surface are levelled and the lower parts are filled with soil. The machine pushes large pieces of rubble and rocks forward and by raising the machine slowly, these pieces can be laid aside at the end of the surface that is treated.

Stopping occurs as follows:

- 1. Reduce the speed
- 2. Lift the machine off the ground.
- 3. Switch OFF the PTO.

8.3 STARTING TO RAKE

The Power Box Rake can move soil, rocks, rubble, etc. to the side of the surface that is treated. When the surface to be treated is entirely raked, it is ready for further treatment e.g., sowing grass.

- 1. Lower the guide plate by turning the spindles (1) inward. Make sure that there is a minimum distance (X) between the rotor and the rubber plate; make sure that the rubber plate just does not touch the teeth (Figure 9).
- 2. Remove the side plate **(3)** at the left-hand side of the machine. (Looking to the Power Box Rake from the backside, Figure 12.)

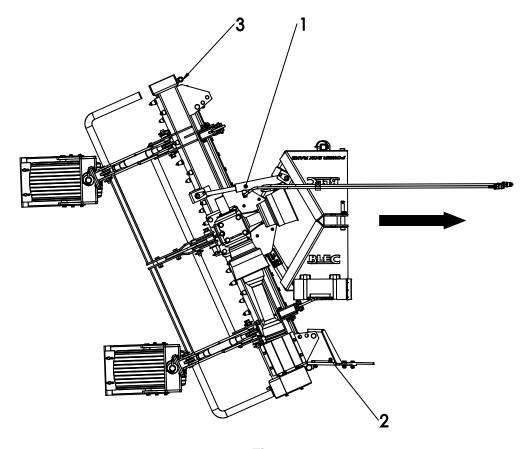


Figure 12

3. Rotate the rotor by pushing the cylinder **(1)** outwards (Figure 12) so that the material is moved to the left-hand side.

4. Adjust the right-hand side plate (2) by placing the pin (1) in the foremost hole. Now the side plate is turned to the extreme outside (Figure 13).

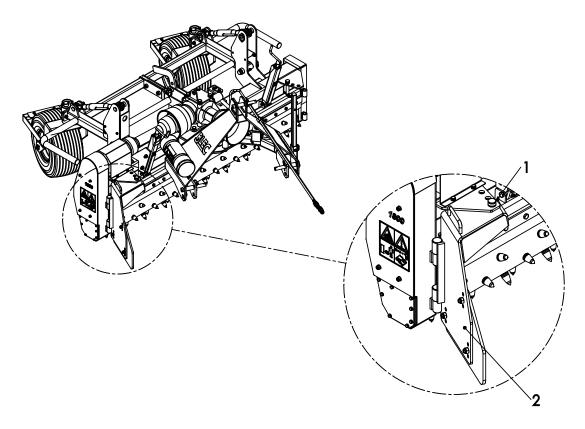


Figure 13

- 5. Make sure that the working depth is set so that the teeth of the rotor cut the soil at approx. 10-15cm. To adjust the working depth, the wheels (2) can be put higher or lower by turning the spindles (3) (Figure 9).
- 6. Lower the machine until the rotor is just above the ground, but does not touch it.
- 7. Set the engine of the tractor to approx. 1,200 rpm and engage the PTO.
- 8. Increase the PTO's number of revolutions to 540 rpm. Now drive forwards slowly at approx. 4-5 km/h.
- 9. Check the treated surface. The surface should be level and without rubble or rocks.
- 10. To obtain a finer finish, it might be necessary to drive slower or to raise the Power Box Rake by means of the spindles (3).
- 11. Pay attention that the machine always drives in the same direction. Do NOT drive back and forth along the same track; otherwise the rocks and rubble are not moved to the side of the surface.
 - You can do this by driving in ever-increasing circles.
 - Or, by starting in the centre of the field and driving back and forth along the already treated strip, making sure that the machine can move the material outwards.

9. TROUBLE SHOOTING (PROBLEM ANALYSIS)

Problem	Possible cause	Solution	
Too much damage to	 Rotor teeth are damaged. 	 Mount new teeth. 	
the treated ground	Not driving in a straight	 Try to drive in a straight line. 	
	line.	Do atmospe the average contil the a	
	Soil is too wet.	 Postpone the work until the soil is sufficiently dry. 	
	Machine is adjusted too	 Adjust the machine to less 	
	deep.	depth.	
The slip coupling of the	 Slip coupling is worn out. 	 Adjust or replace the skip 	
PTO skid too often.		coupling (see Chapter 4).	
	- Too many rocks	Adjust the working depth. Adjust the working depth.	
	Soil is too hard.Driving speed is too high.	Adjust the working depth.Adjust the driving speed.	
	PTO's rpm is too low.	Increase PTO's rpm.	
Machine vibrates.	Obstacle(s) between the	Remove the obstacle(s).	
	teeth	(-)	
	 Worn or broken teeth 	 Replace with new teeth. 	
	 Rotor is bent. 	 Replace the rotor. 	
Working depth is not	 Rear wheels are not 	 Adjust the rear wheels 	
achieved.	adjusted correctly.	correctly.	
	 Subsoil is too hard. 	 Lower the driving speed or pass over the soil more than 	
		once.	
	 Driving speed is too high. 	 Reduce the driving speed. 	
Too small granulating	 Driving speed is too low. 	 Increase the driving speed. 	
of the soil	 Guide plate is too low. 	 Set the guide plate bar higher. 	
Too coarse treatment of		 Reduce the driving speed. 	
the soil	 Subsoil is too wet. 	 Wait for better conditions. 	
	Guide plate is too high.	Lower the guide plate.	
Treated subsoil is not level.	Rear wheels are not	Set both rear wheels to the	
	adjusted correctly.	same depth; use the indicator.	
Rotor is jammed.	Subsoil is too wet.	 Wait for better conditions. 	
	Obstacle(s) between the reter and the frame	Remove the obstacle(s).	
	rotor and the frame – Guide plate is too low.	Adjust the guide ber	
	Guide plate is too low.Driving speed is too high.	Adjust the guide bar.Reduce the driving speed.	
	Too much overgrowth	Cut the overgrowth.	

10. MAINTENANCE

Time schedule	Check / Grease point	Method
Before <u>every</u> use	Check for loose bolts / nuts.	Tighten loose bolts / nuts with the correct tightening moment.
	Attach the machine to the tractor and operate the machine for 5 minutes.	Listen and observe any strange movements / sounds.
	Presence and readability of the safety stickers (Figure 4)	Replace these if not present or damaged.
After <u>every</u> use	Clean the rotor.	Remove sand and dirt from the rotor.
	Grease points of the wheel frame	Use EP2 grease – 1 shot
After the <u>first</u> 20 working hours (new or repaired)	Check for loose bolts / nuts.	Tighten loose bolts / nuts with the correct tightening moment.
(new or repaired)	Attach the machine to the tractor and operate the machine for 5 minutes.	Listen and observe any strange movements / sounds.
After every 50 hours	Check the tension of the drive chain.	If necessary, tighten the chain (see Chapter 10).
	Check whether the drive chains are greased adequately.	Grease the drive chains.
	Loose hanging parts around the PTO	Tighten the parts so that they cannot reach the PTO.
	Grease the 3-point pivot pin of the frame.	Use EP2 grease – 1 shot
After <u>every</u> 100 hours	Top up the lubrication points with grease.	Use EP2 grease – 1 shot
After every 500 hours or after one (1) year	Check whether there is sufficient grease in the gearbox.	Top up the gearbox with (xx) litres of grease.

10.1 TECHNICAL INFORMATION: LUBRICATION POINTS

To guarantee the proper functioning of the Power Box Rake, the lubrication points at both sides of the machine (Figure 14) must be greased periodically. Grease these points according to the table in Chapter 10.

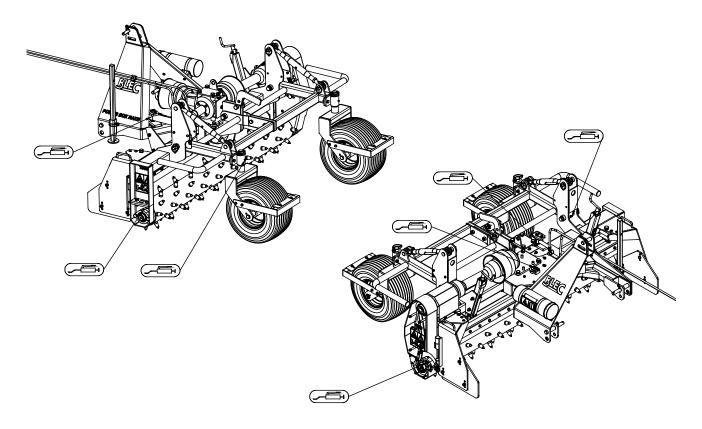


Figure 14

10.2 CHAIN TENSION

The chain tension is important and should be checked regularly. It is also important to regularly clean the chain and sprocket wheel and lubricate these with grease when necessary (Figure 15).

1. Remove the protective cover.



!! Make sure that the tractor is blocked well and cannot move on its own accord !!



- !! Switch off the tractor before descending !!
- !! Make sure that the Power Box Rake stands firmly on the ground and is blocked against sliding *before* descending from the tractor !!
- 2. You should be able to push in the chain **(1)** between 10 mm (0.4") and 15 mm (0.6"). If this is not possible, you need to adjust the chain tension.
- 3. Loosen the nuts (2, 3 and 4).
- 4. Rotate the nuts (2 + 3) until you reach the desired chain tension.
- 5. Retighten the nuts (2, 3 and 4).
- 6. Place the protective cover back on the machine.

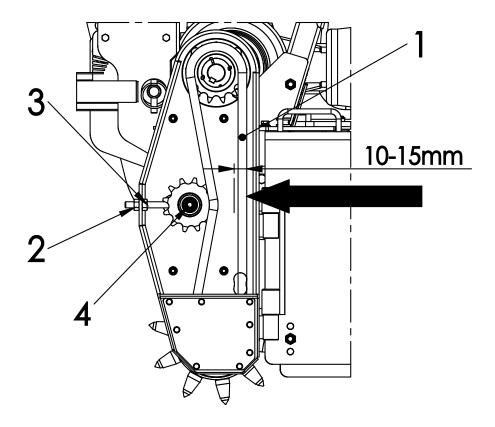


Figure 15