

User manual



POWER BOX RAKE 1500



Translation of the original user manual



2139 English 952.120.019 EN



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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 stipulation of the 2006/42/EC machine directive and with the norms NEN-EN-ISO 12100:2010, NEN-EN-ISO 13857:2008, NEN-EN-ISO 4254-1:2013, NEN-EN-ISO 4254-5:2018.

Zeist, 18.03.2020

A handwritten signature in blue ink, appearing to be 'A.C. Bos', written over a faint rectangular stamp area.

A.C. Bos
Manager Operations & Logistics
Redexim Holland

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.

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	

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1. SAFETY INSTRUCTIONS

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

Read and understand the manual *before* you start using this machine.

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

This user manual lists instructions that are numbered in sequence. You should follow this sequence. A



is an indication of a safety instruction. A  means a tip and/or note.

1.1. 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**.

Modifications to the machine that have a negative impact on the safety must be rectified immediately.

The user is obliged to check the machine for visible damage and defects before using the machine.

For safety reasons it is not permitted to make changes or adjustments to the machine (except those approved by the manufacturer). If modifications to the machine have been made, then the current CE marking is cancelled. The person that has made these modifications has to apply for a new CE marking 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 the safe combination of the machine and the towing vehicle, which comply with the requirements as described in the Technical Data (**see Chapter 2**). **This entire combination should be tested** for noise, safety, risk and user friendliness. User instructions should also be drafted.

Dress appropriately during work activities with the machine. 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.

1.2. Maintenance, repairs 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 should be avoided!**

Use only original **Redexim** 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 machine.

When carrying out maintenance, adjustments and repairs, it is necessary to block the machine in order to prevent it from sinking away, driving off and/or sliding off.

If a hydraulic installation is present, you should **always** 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.

1.3. Using the machine

Attach the machine to the towing vehicle according to the regulations. Pay close attention to the risk of injury!

Never use the machine in the absence of protective guards and safety stickers.

Check the machine 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 that are going to operate the machine must be familiar with all the functions and control elements of the machine *before* starting any work activities.

Never crawl under the machine! If necessary, tip over the machine 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.

2. TECHNICAL DATA

Type	Power Box Rake 1500
Recomended voertuig	Minimum 30 Hp with a minimum lift capacity 610mm behind lifting eyes of 425 Kg (935 lbs)
Working width	1.5 mtr (59")
Working depth	50 - 100mm (2" – 4")
Drive speed	Maximum 12 Km/h (7.5 mph)
Tyre pressure	1-2 bar
Weight	365 kg (803 lbs)
Dimensions (LxBxH)	1.44 x 1.75 x 1.19 mtr (56.9" x 68.8" x 46.6")
3 point system	Cat. 1-2
Grease for bearings	EP 2
Standard components	-Fixing leg -Adjustable side-screens -Adjustable set of wheels -Rotatable 3 point frame

3. 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 hydraulically 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**

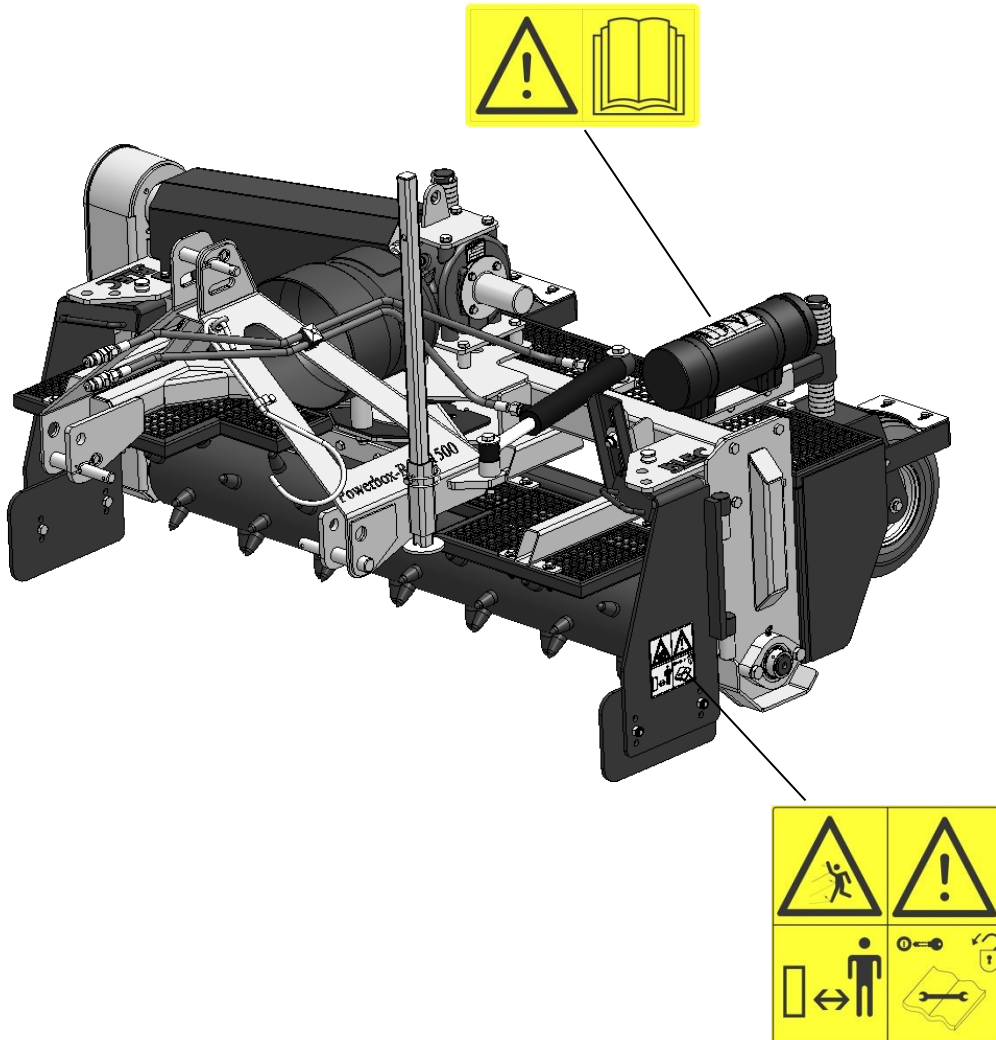
Rocks / stones can be raked to the side(s) by adjusting the working depth in such a manner that the rotor teeth just touch the ground and by adjusting the rotor to the side(s).



- **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.

4. SAFETY STICKERS

Safety stickers are located on both sides of the machine. These safety stickers must always be clearly visible and legible and must be replaced if they have become damaged.



 <p>933.280.402</p>	<ul style="list-style-type: none"> - In case of maintenance, adjustments and repair, always switch OFF the engine of the towing vehicle. - Keep a distance of minimum 4 metres if the machine is operating (except the operator).
 <p>900.280.402</p>	<ul style="list-style-type: none"> - Prior to using the machine, the operators of the machine must read the user manual carefully.

5. FIRST INSTALLATION

The machine should be prepared for use as follows (Figure 1):

1. Attach cables to the hoisting point (1).
- ⚠ Ensure that the crane and hoisting cable can handle at least the following weights:
POWER BOX RAKE 1500 650 kg (1430 lbs)**
2. Remove the wheels (2) from the pallet and mount these at the back of the machine in the square beams.
 3. Lower the front leg (3) and secure this with the clip
 4. Lift the machine including the pallet approx. 10 cm (4") off the ground.
 5. Loosen the pallet by removing the 3-point pins (4) at the bottom.
 6. Pull the pallet from under the machine.
 7. Carefully 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 !!**

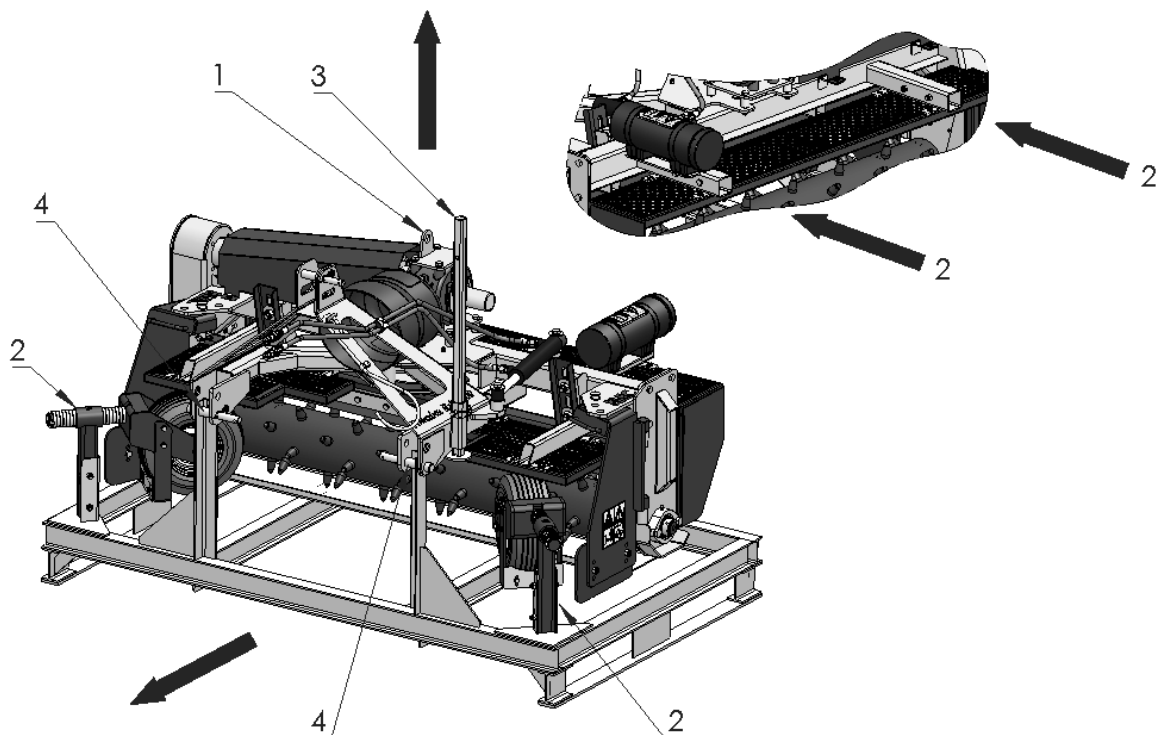


Figure 1

6. ATTACHING AND DETACHING THE MACHINE

Attaching and detaching the machine has to be done carefully. Follow the instructions below:

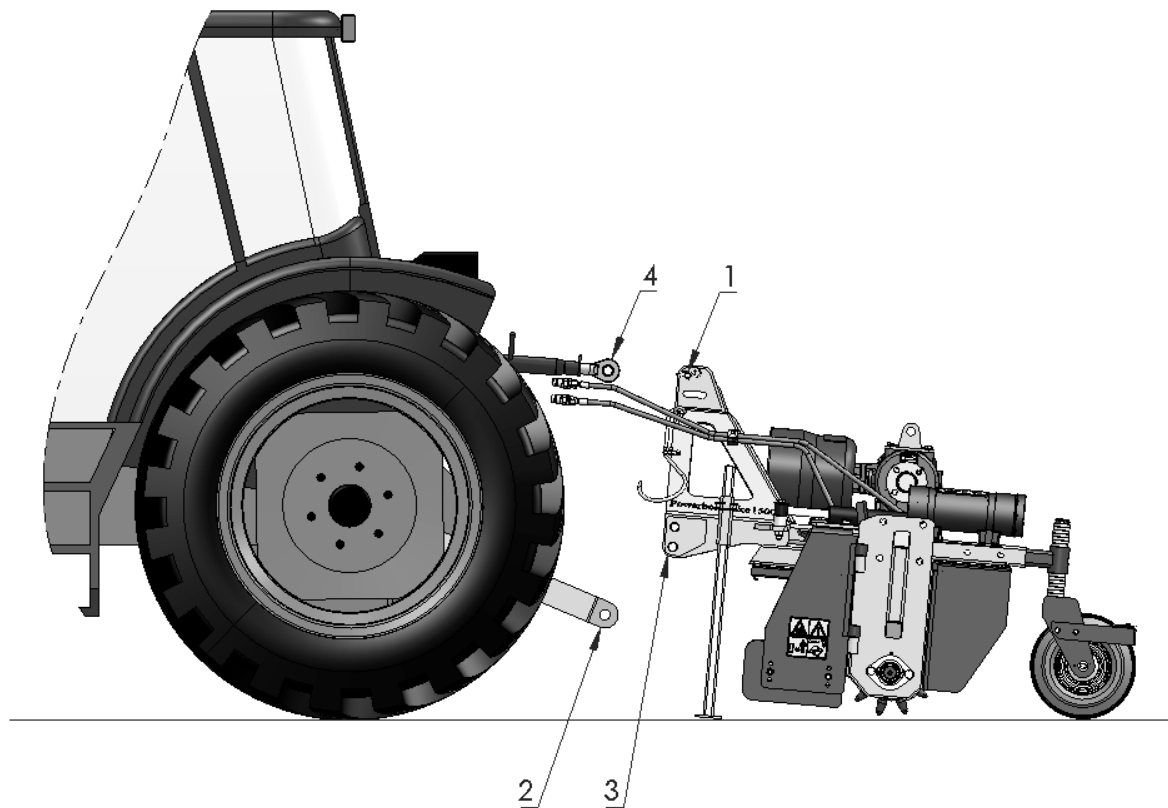


Figure 2

6.1. Attaching the machine

Prior to attaching the machine, check the following points:

- Check whether the machine is undamaged and whether it is safe to attach and use the machine.
- Check for loose bolts and nut, if so tighten these.
- 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 machine should be attached to the tractor in the following manner:

1. Remove **the 3-point pins (1)** at the top from the machine (see **Figure 2**).
2. Carefully drive the tractor backwards until the lifting arms **(2)** can be attached to the machine.



!! Make sure that the tractor and the machine cannot move while you are attaching them !!



!! Switch off the tractor engine before attaching the machine !!

3. Attach the lifting arms **(2)** to the machine using the 3-point pins **(3)**. Lock the pins using the R-clips.
4. Set the stabilizer to a sideways stroke of 100 mm.
5. Mount the top rod **(4)** onto the tractor and attach it to the machine.

6. Lift the machine above the ground and place the front leg in top position and secure this with the R-clip.
7. Lower the machine to just above the ground and adjust the top rod in such a manner that the machine is horizontal.
8. Connect the hydraulic hoses to the tractor.



!! Make sure that the 3-point pins are locked using the R-clips !!

9. Start the tractor and lift the machine off the ground.

6.2. Detaching the machine

The machine should be detached in the following manner (see **Figure 2**):

1. Drive to a place where the machine can be detached.
2. Place the front leg in the lower position, secure this with the R-clip and lower the machine carefully on a flat horizontal floor ground.
3. Disconnect the hydraulic hoses.



!! Make sure that the machine and the tractor cannot move while you are detaching them !!



!! Switch off the tractor engine *before* detaching the machine !!

4. Loosen the top rod **(4)** and remove it.
5. Loosen the lowest arms **(2)**.
6. Start the tractor and drive off.

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. PROCEDURES

The start procedure is **VERY** important. Follow the described procedure precisely, because otherwise the Power Box Rake can get damaged. The rotor can rotate in both directions. It is important to stop the rotor *before* reversing the rotating direction. Changing the rotating direction too fast can damage the hydraulic engine.



!! Redexim does not accept responsibility for damage to the hydraulic engine due to operating errors by the operator !!

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 loosen the nuts **(1)** and tighten the nuts. Make sure that there is minimum 50mm distance between the rotor and the rubber plate **(X)** (Figure 3).

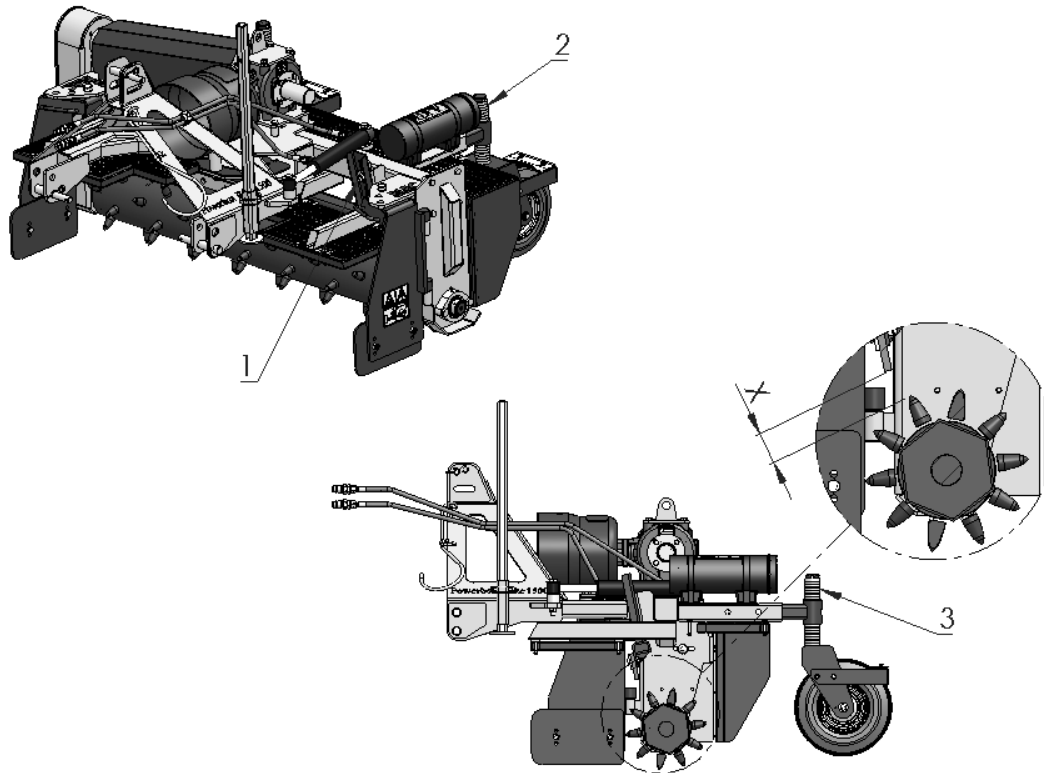


Figure 3

2. Make sure that the rotor frame is perpendicular to the tractor (Figure 4).
3. Lower the machine until the rotor is just above the ground, but does not touch it.
4. Set the engine of the shovel to approx. 1,200 rpm and engage the rotor. Pay attention: the rotating direction must be opposite to the driving direction!
5. Increase the number of revolutions of the engine to approx. 2,000 rpm. This ensures that the number of revolutions of the rotor increases.

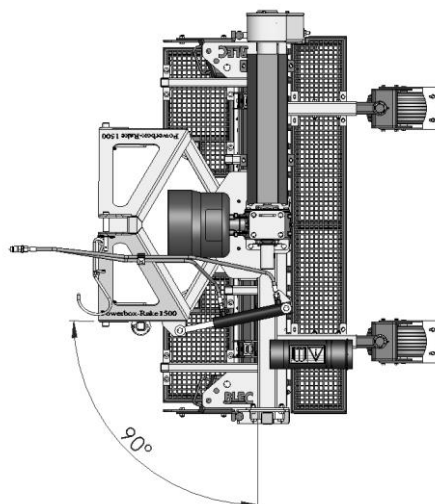


Figure 3

6. Start moving the shovel and lower the Power Box Rake until it touches the ground. It is essential to drive slowly (1-2 km/h). 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 dividing the rings differently **(3)**. Set the number of rings in the same way for both the left and right wheel. (Figure 3).

Stopping occurs as follows:

1. Reduce the speed and the number of revolutions of the engine.
2. Lift the machine off the ground.
3. Switch OFF the rotor.

8.2. Starting to cultivate

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

1. Lower the guide plate by loosen the nuts **(1)** and thigten the nuts. 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 3).
2. Make sure that the rotor frame is perpendicular to the tractor (Figure 4).
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 5).

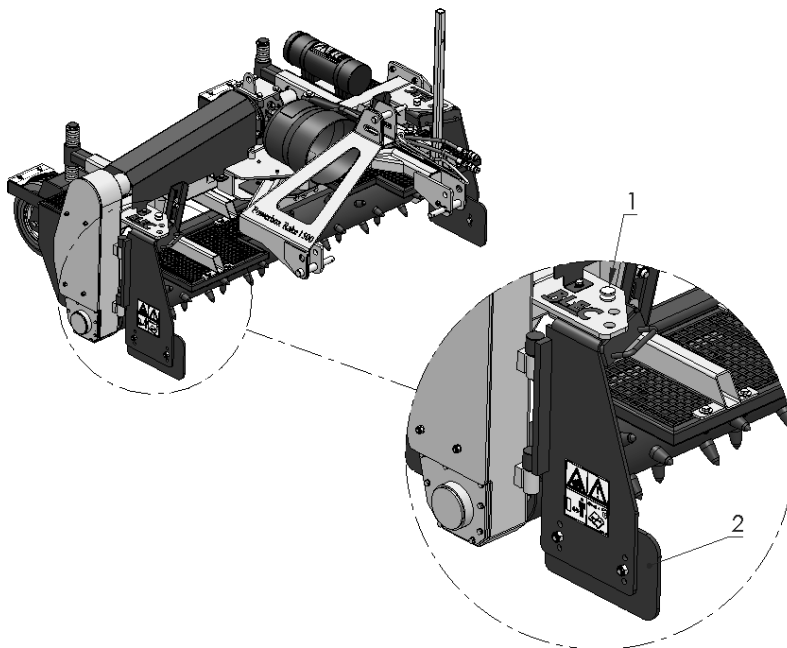


Figure 5

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 dividing the rings **(3)** differently. Set the number of rings in the same way for both the left and right wheel (Figure 3).
5. Lower the machine until the rotor is just above the ground, but does not touch it.
6. Set the engine of the shovel to approx. 1,200 rpm and engage the rotor. Pay attention: the rotating direction must be opposite to the driving direction!
7. Increase the number of revolutions of the engine to approx. 2,000 rpm. This ensures that the number of revolutions of the rotor increases.

8. Start moving the shovel 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 forced 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 cultivate

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 loosen the nuts **(1)** and tighten the nuts. 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 3).

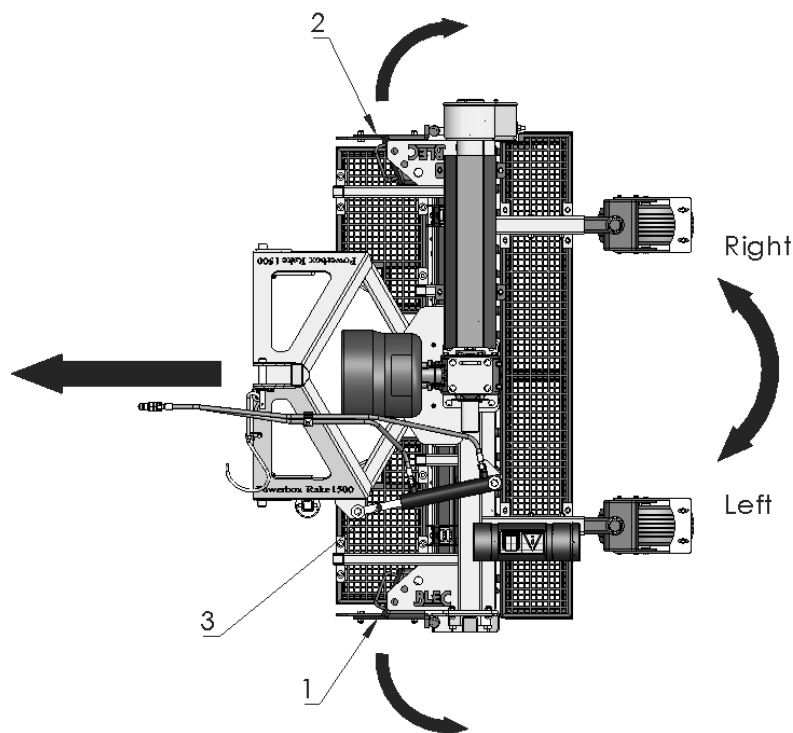


Figure 6

2. Rotate the rotor by operating the hydraulic cylinder **(3)** (Figure 6) so that the material is moved to side.

When the material has to be moved to the right side, turn the rotor to the left and place side plate **(1)** maximum turned to the outside (Figure 6). Fix the side plate by using the lock pin and secure with the R-clip.

When the material has to be moved to the left side, turn the rotor to the right and place side plate **(2)** maximum turned to the outside (Figure 6). Fix the side plate by using the lock pin and secure with the R-clip.

3. 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 dividing the ring differently. **(3)** (Figure 3).
4. Lower the machine until the rotor is just above the ground, but does not touch it.
5. Set the engine of the shovel to approx. 1,200 rpm and engage the rotor. Pay attention: the rotating direction must be opposite to the driving direction!
6. Increase the number of revolutions of the engine to approx. 2,000 rpm. This ensures that the number of revolutions of the rotor increases.
7. Check the treated surface. The surface should be level and without rubble or rocks.
8. To obtain a finer finish, it might be necessary to drive slower or to raise the Power Box Rake.
9. 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. TRANSPORT

The user is responsible for transporting the Power Box Rake in back of the tractor on public roads. Verify the national legislation regarding the regulations. On open fields while the machine is raised, the maximum permitted speed is 20 km/h (12.4 mph) due to the weight of the POWER BOX RAKE. A higher speed can be dangerous for the driver and/or the public and can even damage the machine.



!! When the machine is raised off the ground, the front axle of the tractor has to support minimum 20% of the tractor's weight !!

10. MAINTENANCE

Time schedule	Check / Grease point	Method
Before every use	Check for loose bolts / nuts.	Tighten loose bolts / nuts with the correct tightening moment.
	Attach the machine to the shovel 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 every use	Clean the rotor.	Remove sand and dirt from the rotor.
	Grease points of the wheel frame	Use EP2 grease – 1 shot
After the first 20 working hours (new or repaired)	Check for loose bolts / nuts.	Tighten loose bolts / nuts with the correct tightening moment.
	Attach the machine to the shovel 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 Section 12).
	Check whether the drive chains are greased adequately.	Grease the drive chains.
	Grease the rotation point of the frame.	Use EP2 grease – 1 shot
After every 100 hours	Top up the lubrication points with grease.	Use EP2 grease – 1 shot

Table 1

10.1. Tightening torques

Table: Tightening torques

	8.8	10.9
	N.m	N.m
M 6x1,0	11,3	16,5
M 8x1,25	27,3	40,1
M10x1,5	54	79
M12x1,75	93	137
M14x2,0	148	218
M16x2,0	230	338
M18x2,5	329	469
M20x2,5	464	661
M22x2,5	634	904
M24x3	798	1136

10.2. Tightening torques

To ensure proper operation of the Power Box Rake, the grease points on both sides of the machine (see **Figure 7**) must be greased periodically. Lubricate the points according to table 1.

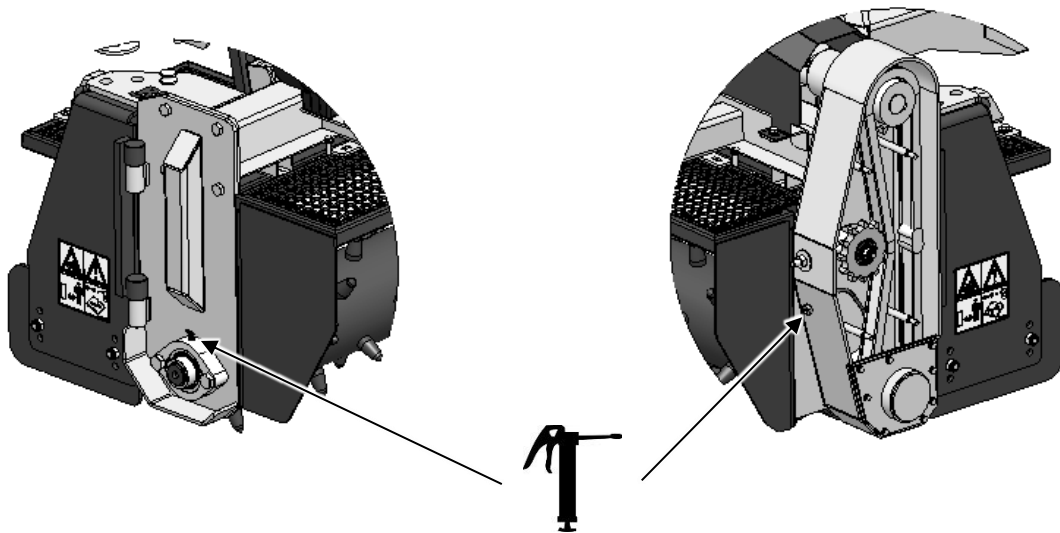


Figure 7

11. TROUBLE SHOOTING (PROBLEM ANALYSIS)

Problem	Possible cause	Solution
Too much damage to the treated ground	<ul style="list-style-type: none"> – Rotor teeth are damaged. – Not driving in a straight line. – Soil is too wet. – Machine is adjusted too deep. 	<ul style="list-style-type: none"> – Mount new teeth. – Try to drive in a straight line. – Postpone the work until the soil is sufficiently dry. – Adjust the machine to less depth.
Machine vibrates.	<ul style="list-style-type: none"> – Obstacle(s) between the teeth – Worn or broken teeth – Rotor is bent. 	<ul style="list-style-type: none"> – Remove the obstacle(s). – Replace with new teeth. – Replace the rotor.
Working depth is not achieved.	<ul style="list-style-type: none"> – Rear wheels are not adjusted correctly. – Subsoil is too hard. – Driving speed is too high. 	<ul style="list-style-type: none"> – Adjust the rear wheels correctly. – Lower the driving speed or pass over the soil more than once. – Reduce the driving speed.
Too small granulating of the soil	<ul style="list-style-type: none"> – Driving speed is too low. – Guide plate is too low. – Number of revolutions is too high. 	<ul style="list-style-type: none"> – Increase the driving speed. – Set the guide plate bar higher. – Reduce the number of revolutions.
Too coarse treatment of the soil	<ul style="list-style-type: none"> – Driving speed is too high. – Subsoil is too wet. – Guide plate is too high. – Number of revolutions is too low. 	<ul style="list-style-type: none"> – Reduce the driving speed. – Wait for better conditions. – Lower the guide plate. – Increase the number of revolutions.
Treated subsoil is not level.	<ul style="list-style-type: none"> – Rear wheels are not adjusted correctly. 	<ul style="list-style-type: none"> – Set both rear wheels to the same depth; use the indicator.
Rotor is jammed.	<ul style="list-style-type: none"> – Subsoil is too wet. – Obstacle(s) between the rotor and the frame – Guide plate is too low. – Driving speed is too high. – Too much overgrowth 	<ul style="list-style-type: none"> – Wait for better conditions. – Remove the obstacle(s). – Adjust the guide bar. – Reduce the driving speed. – Cut the overgrowth.

12. CHAIN TENSION

The chain tension is important and should be checked regularly. It is also important to regularly clean and lubricate the chain and sprocket wheel when necessary (Figure 8).

1. Remove the protective cover and rubber sealing flap.

⚠ !! 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 5 mm (0.2") and 10 mm (0.4"). If this is not possible, you need to adjust the chain tension.
3. Loosen the nuts (2 + 3).
4. Rotate the nuts (2 + 3) until you reach the desired chain tension.
5. Retighten the nuts (2 + 3).
6. Place the rubber sealing flap and protective cover back on the machine.

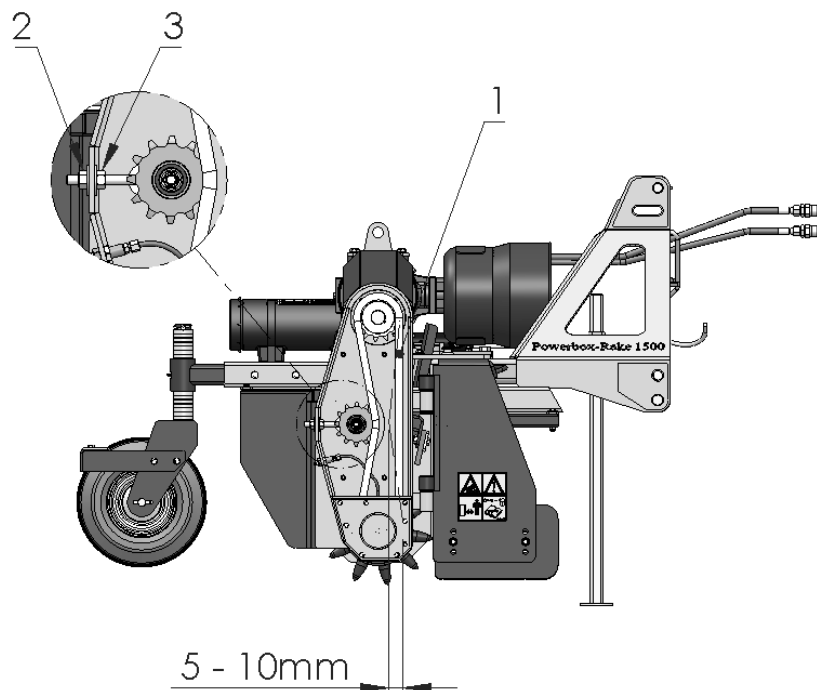


Figure 8