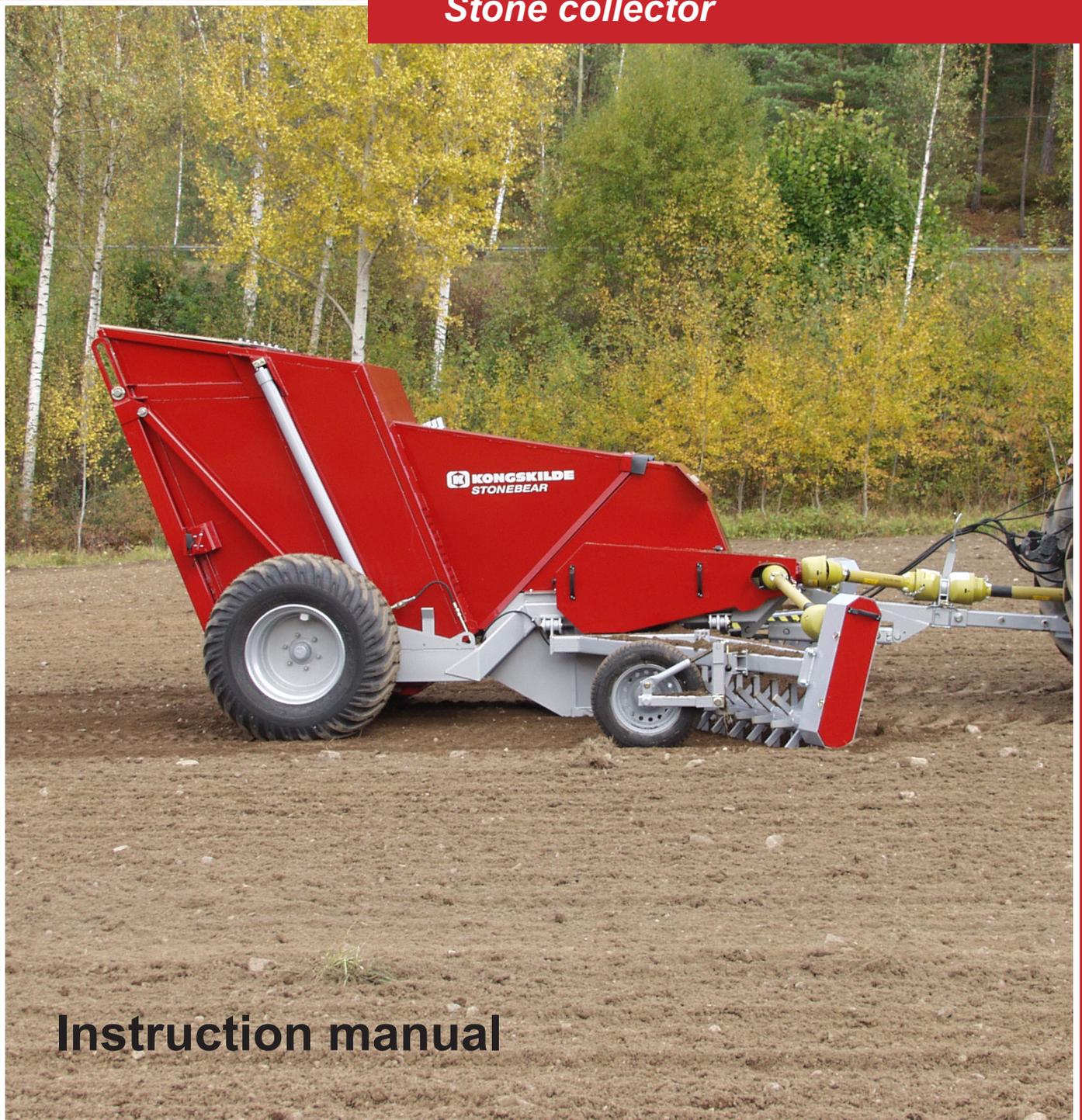


Stonebear S
Stone collector



Instruction manual

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1. Foreword

Oy Kongskilde Juko Ltd is a Finnish manufacturer of agricultural machinery belonging to the international Kongskilde Group. The Kongskilde Juko product range consists of the following agricultural equipment:

1. grain drills and and combination seed and fertilizer drills
2. potato planters
3. potato harvesters
4. sugarbeet harvesters
5. stone collectors

While we thank you for your trust in choosing a high-quality Kongskilde Juko product, we ask that you carefully read this users manual before using the machine.

If you should have any questions or comments regarding your Kongskilde Juko product, please contact your dealer or importer. For maintenance or spare parts needs, please contact the dealer. The manufacturer contact numbers are: Oy Kongskilde Juko Ltd. tel: +358 2 439 3200 or fax: +358 2 439 3210.

We sincerely hope that your purchase of Kongskilde Juko agricultural equipment fulfils your expectations and provides you with years of reliable service.

1.1. Use of this manual

This manual is intended for professional farmers, i.e., use of this machine requires that the user possess general farming and agricultural technology training and skills.

The users manual is classified in the table of contents in such a way that simplifies the location of information. The inspection and maintenance procedures outlined in the manual are of vital importance to the fault-free operation of the machine as well as the validity of the warranty.

All operation-related suggestions, warnings, and prohibitions, made expressly with user-safety and equipment durability in mind, must be carefully observed. All items of particular importance will be printed in bold text or with following warning triangles to aid in reading.



The triangle indicates an item of specific importance.



The triangle and exclamation point indicate important safety (or similar) information.

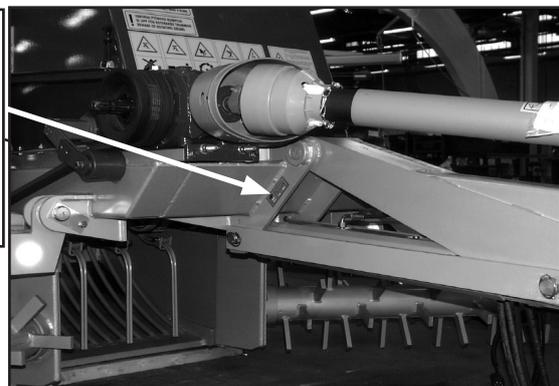
Oy Kongskilde Juko Ltd reserves the right to make any changes in its equipment and operation manuals!

1.2. Manufacturer's plate

Immediately upon purchase of this equipment, fill in the following manufacturer's plate mock-up with the same information as found on the manufacturer's plate. When dealing with the Kongskilde Juko sales agent, provide the type and serial number of the machine so as to avoid any unnecessary misunderstandings or delays.

Use only genuine Kongskilde Juko spare parts!

	OY KONGSKILDE JUKO LTD Opintie 4, FIN-23100 Mynämäki Finland Tel: +358-2-4393200 Fax: +358-2-4393210	
Year <input type="text"/>		
Typ <input type="text"/>	Nr. <input type="text"/>	<input type="text"/> Kg



2. Presentation

2.1. General presentation of the machine

Today's farming and harvesting methods require a particularly even and stone-free topsoil. In all phases of work, stones in the cultivated topsoil layer make operation difficult and can cause excessive wear and equipment damage.

The Stonebear is a unique machine which collects stones within a 4-meter operational width in only one pass. The Stonebear is equipped with a two-piece stone rakes and a rotating collecting drum, which feeds the stones into the tank.

2.2. Principal of Stonebear

The operational principal of Stonebear is as follows:

The stone rakes, equipped with wear-resistant pins, rotate against the driving direction and with the angle towards to the Stonebear, windrow stones to the centerline of the machine. When the stones have reached the centerline, they are lifted by ground resistance onto the screen share. Then, they are conveyed along the screen by the help of rotating spring tines, and loose soil together with small stones, according to the screen size, drop back on to the ground. After sieving the spring tines throw stones into the tank.

When the tank is full, it can be emptied by tipping hydraulically. When transporting the Stonebear, the rakes are raised and locked in an upright position. Thus, the machine's total width is made suitable for driving on public roads.



2.3. Technical specifications

Capacity	0.4 - 0.9 ha / h
Working width	400 cm
Working depth	0 – 7 cm
Driving speed	1 – 6 km/h
Collected stone size	3 – 30 cm
Screens, standard	40 mm
- other sizes	28, 35 and 50 mm
Tank capacity (practical)	1,8 m ³
Tipping height	230 cm
Length	585 cm
Transport width	260 cm
Weight	3350 kg
Tyres, machine	500/60 x 22,5"
- rakes	175R x 14"

2.4. Standard equipment

The Stonebear is equipped with following standard equipment:

- draw hook hitch
- drawbar, adjustable in length
- hydraulic depth adjustment
- P.T.O. shaft
- transmission with non-crossing V-belts
- rakes folded with cables
- depth control wheels for rakes
- collecting drum with tines in 5 rows
- 18 spring tines with assisting springs
- 5 spare spring tines
- 40 mm screen
- tipping tank
- screen in the bottom of tank
- absorbing rear wall in tank
- rear lights

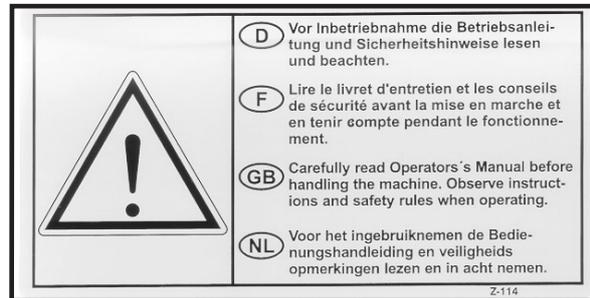
2.5. Optional equipment

The following equipment is available for the Stonebear as an option:

<u>Description:</u>	<u>Order code:</u>
Hydraulic lifting of rakes	500007201
28 mm screen	500068605
35 mm screen	500068366
40 mm screen	500068604
50 mm screen	500068368
Rake guards	520901400
Hydraulic brakes	520901401

3. Safety instructions

3.1. Warning stickers



Carefully read Operator's Manual before handling the machine. Observe instructions and safety rules when operating.



Never tip tank on soft ground or on a slope.



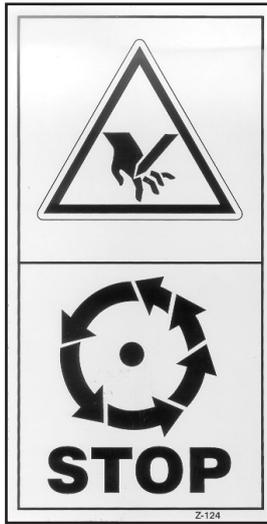
Insert safety lock before getting in dangerous area.



Stay clear of raised unsecured loads.



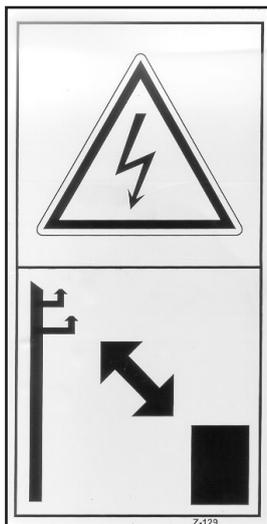
Do not open or remove safety shields while machine is running.



Wait until all machine components have stopped completely before touching them.



Stay clear while machine is running.



Keep sufficient distance to electrical powers.

3.2. General safety instructions

Know and observe all specified safety distances when operating the machine.

The operator is fully responsible for any injuries caused to bystanders.

When preparing to move, ensure that there is no one within the machine operational area.

Exercise caution when operating on sloping terrain or other difficult conditions. Always try to drive at the correct angle to the slope.

Avoid making sudden moves when operating the machine.

While operating, carefully monitor its function at all times so that, in the event of error or danger, the machine can be stopped as quickly as possible.

In emergency situations, stop the tractor and machine immediately in order to avoid causing additional damage which could result in an accident.

Removal of guards and safety equipment during operation is strictly forbidden.

Turn off the tractor and the machine during maintenance and cleaning.

The machine may not be adjusted, serviced, or have other procedures performed on it while the machine or any part of it is unsupported.

Perform all maintenance tasks on a firm, even surface so that the machine will not tip or move.

If necessary, use front counterweights on the tractor.



Never go under an unsupported machine!

Ensure that there is adequate lighting when servicing the machine.

3.3. Safety guidelines for the Stonebear user



When operating the Stonebear, stones may be thrown from the screen slots or the tipping hatch. This is why personnel standing near the machine must be warned of flying stones. The minimum safe distance is 20 m.

Always empty the tank on a firm and even surface. Avoid making sudden moves while the container is raised.

Always close the tank cylinder safety valves when going under the container. Remember to reopen them before lowering the tank.

Do not move the machine when the container is raised or, if it is being lowered, before it is completely down.

3.4. Warnings and prohibitions

Riding on the Stonebear during transport is expressly forbidden.



Do not go under an unsupported machine.

The Stonebear container may not be emptied on a sloping surface.

Do not use the Stonebear for anything other than its intended purpose.

The Stonebear may not be used for collecting stones with a diameter greater than 30 cm. These stones must be removed from the soil prior to using the Stonebear.

The rotation speed of the tractor's power take-off axle may not exceed 350 r/min.



Dismantling of a clogged collecting drum while the drive power take-off is switched on while reversing the tractor is expressly forbidden.

Maximum driving speed when the tank is full is 20 km/h.

Drive belts must not be excessively tensioned.

3.5. Notice on rim use

The manufacturer of rims used on Kongskilde Juko machinery have provided the following guidelines for their products:

1. Wheel rims

The rims are vital to the safety and driveability of the vehicle. The rims must be approved and free from defect for both the vehicle and tyre.



Important! Never make any alterations or repairs to the rim.

Several different factors affect safety. Liability for alterations or repairs made to the product after purchase, and not performed in accordance with manufacturer guidelines, is that of the individual responsible for making them.

2. Tyre mounting and removal

Mounting of tyres on the rim may only be performed by an authorized “tyre professional” who possesses the necessary training, experience, and tools. Mounting performed by inexperienced personnel may result in a safety risk and/or actual damage.

3. Retightening

The rim retention nuts and screws must generally be retightened, when the vehicle has been used for a period of time following attachment of the rim. Observe the guidelines provided by the vehicle manufacturer.

4. Tyre repair

The tyre may not be repaired while still mounted on the rim, as it will be impossible to inspect the interior of the tyre and, in addition, the pressurized tyre may explode.

4. Transport and lifting of the machine

4.1. Driving on public roads

When driving on public roads, following instruction has to

1. Check the rear lights and condition of reflectors before setting out.
2. Ensure that the slow vehicle triangle and reflectors are plainly visible.
3. The machine has to be completely empty and free from riding personnel.
4. Power transmission must be switched off.
5. The rakes has to be locked in transport position.
6. Ensure that there are no stones or loose soil on the screen or frame.
7. The tank has to be in lower position.
8. Check that the rake lifting cables do not hang too low

4.2. Lifting the machine

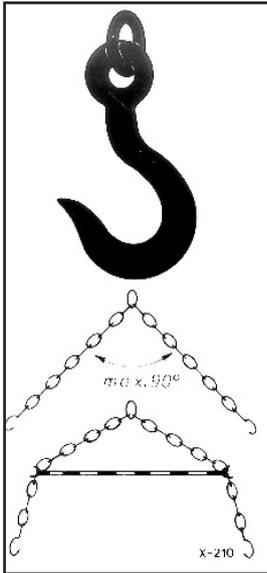
When transporting or carrying the Stonebear by equipment other than a tractor, the following guidelines must be observed:



The Stonebear may only be lifted at the specified lifting points (marked).

The Stonebear lifting points consist of three welded hooks: two at the center point on both sides of the machine and one on the front of the draw bar. The lifting points are marked with figures.





Lifting chains or straps must be of an adequate length in order to avoid abrading or otherwise damaging the Stonebear.

Only approved and completely intact lifting equipment may be used in lifting the Stonebear.

The lifting equipment must be rated to handle at least twice the weight listed on the manufacturer's plate.



The individual performing the lifting must be absolutely sure that there are no personnel under the machine at any time.

When placing the Stonebear on a truck or trailer, all traffic regulations must be observed. The load's overall height and fastening must be carefully checked.

When using a forklift or similar lifting device, use extreme caution! This lifting method is not recommended.

5. Implementation of the machine

First, carefully read the Stonebear safety and user instructions – the machine should not be used before the user is familiar with all instructions!

5.1. Installation before the implementation of a new machine

Before the implementation install all the equipment, e.g the wheels, which have possible been dismantled for the delivery. Check that the wheel nuts have properly been tightened.

5.2. Implementation of a new machine

The machine has been factory tested and preset by Kongskilde Juko for average use – any extraordinary conditional adjustments should be made by the operator themselves in order to achieve optimal results upon implementation.

Although the nut torque is set during machine assembly, it will take a few hours before the parts on a new machine settle into place. This is the reason that:



All nuts, screws, and chain tensions must be checked after 1-2 operational hours.

Specially check:

1. wheel and screen mounting screw tensions
2. collecting drum spring tine mounts – rubber plate compression should be 1.5-2 mm
3. drive belt tension – adjust if necessary
4. gear box screw tension
5. bearings mounting screw tension
6. belt pulley conical sleeve mounting screw (Allen-head screw) tension



There are always 1-2 unused holes in the conical sleeve (threads on the sleeve side), which are only intended for removal of the sleeves. Under no circumstances should any screws be inserted in these holes while the sleeve is mounted. The mounting hole threads are located on the belt pulley side.

Torque figures are listed in section 8.7.

5.3. Implementation of a used machine for a new season

Check:

1. tyre air pressure
2. condition of bearings – replace those in poor condition
3. gear box oil level – refill if necessary
4. screw, nut, and chain tensions
5. condition of hydraulic hoses and connections
6. machine lubrication
7. adjust collecting drum drive belts
8. adjust rake drive belts

If necessary, replace broken parts. Place spare parts orders early before the next season. When ordering spare parts, remember to give your machine model and serial number.

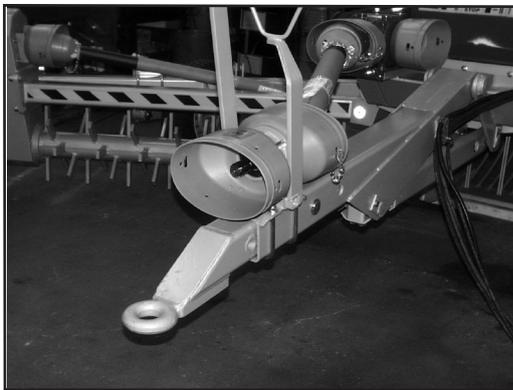
6. User instructions

The machine must be used in accordance with these instructions in order to maintain safety of the operator and ensure the long working life for the machine. When using the Stonebear, the operator must take the immediate operating conditions (temperature, soil moisture, etc.) into consideration and adjust accordingly.

Complete all here mentioned procedures before beginning operation. More detailed information on the respective operating instructions are contained in this section.

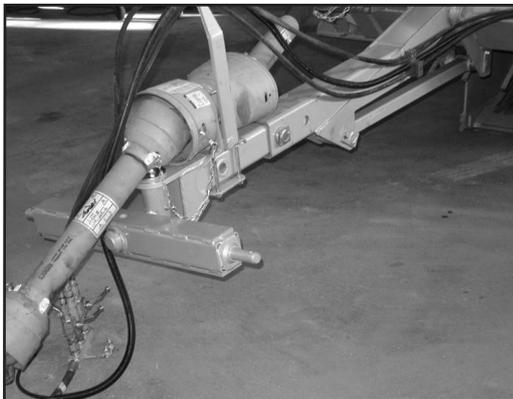
6.1. Hitching the machine to tractor

The Stonebear can be hitched to the tractor with two alternative ways:



Draw hook hitch (standard):

Drawbar is hitched directly to tractor's draw hook. The machine will follow smoothly tractor's movements. The depth of collecting drum share is adjusted hydraulically with a cylinder fitted under the draw bar. When dismantling the machine, the cylinder has to be locked with a bracket.



Swivel hitch (option):

As an option the machine can be equipped with a swivel hitch, which is connected to a tractor linkage. In that case the machine follows well the linkage, which makes turning easy e.g. in headlands. Also working depth is controlled by tractor linkage. But in uneven conditions this may cause more variation in depth. The fixed bracket is mounted instead of cylinder.

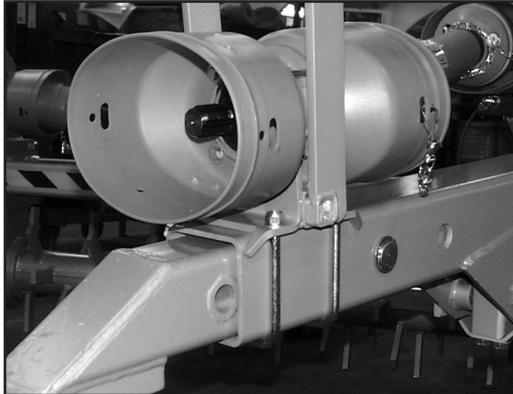
The draw bar has a telescopic adjustment in length. It gives more space for turning when e.g. dual wheels are fitted in tractor.

6.2. Connecting the P.T.O. shaft

The Stonebear is equipped with P.T.O. shaft as a standard. Before connecting the shaft, make sure that it has the correct length. The P.T.O. shaft is connected between the tractor power take off axle and the axle fitted on the machine drawbar.



The Stonebear may only be driven in 540 r.p.m. rotation rate area!



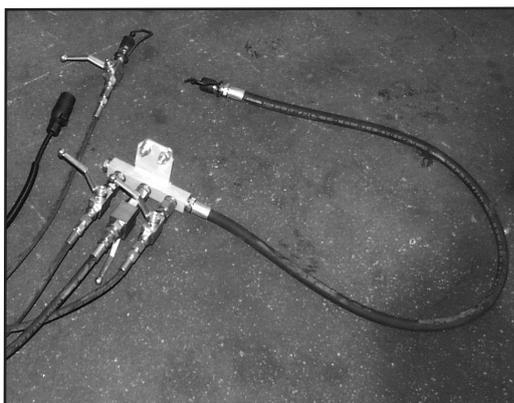
Connecting the Stonebear P.T.O. shaft to different type of tractors is easier when you can adjust the axle and bearing fitted on the drawbar.

If the inner and outer tubes are less than 15 cm inside one another in its longest position, the shaft is too short. If the P.T.O. shaft needs to be shortened, file down the edges, remove the filings, and lubricate the telescopic tube.

When the swivel hitch is used, the working height of the tractor linkage has to be set so that the draw bar is not touching the shaft. Also ensure that the linkage is not raised too far, when moving in reverse.

6.3. Connecting hydraulics

The Stonebear requires 2 single acting valves in tractor hydraulics. They are for tank tipping cylinders and depth control cylinder under the draw bar. If the machine is equipped with a hydraulic rake lifting, the hoses are connected with tank cylinder hydraulics with a separate valve system and no more valves in tractor are needed.



When the hoses are connected to tractor valves, possible ball valves can be opened. Remember to close them again before reconnection.

When connecting the hydraulic hoses, inspect the cleanliness of the quick-release coupler. There are no special requirements concerning the grade of hydraulic oil to be used in the Stonebear hydraulic system. If the Stonebear is used by more than one operator, mixing of the oil when switching tractors must be monitored.

Approximately 2.5 liters of oil will remain in the hoses when the tank is in lower position.

6.4. Rake control

Whenever raising the rakes into their transport position, first release the P.T.O. shafts from the machine-side ends and connect them to the mounting pins on the rake frame.

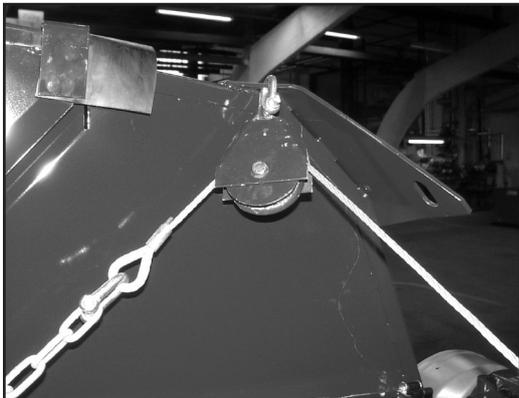


The rakes should never be raised when the articulated shafts are in position.

6.4.1. Rake control with cables

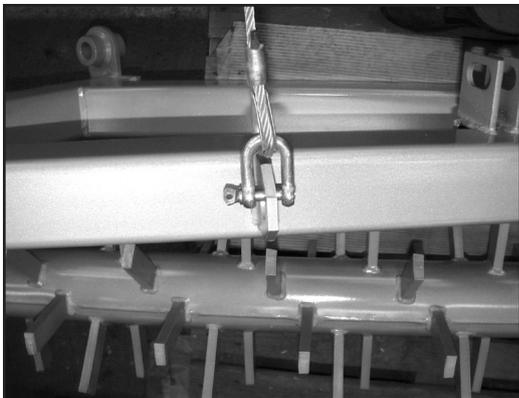


The rakes are lowered into their working position with cables attached to the front of the tank. When lowering the rakes, the lift cables must be attached to the tank mounting brackets.



Ensure that the cables are well situated on the pulleys. Raise the tank carefully until the cables are tight.

Remove the rake lock pins and carefully lower the tank, and the rakes will also lower.



Move the lift chain from the tank mounting bracket to the rakes. Leave some the chain a little loose. Connect the rake P.T.O. shafts to the gear box.

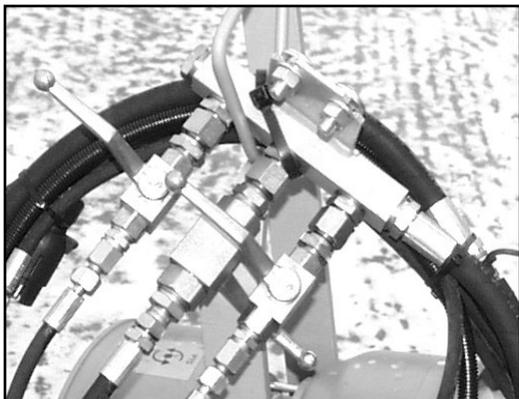


Never go under the rakes only supported by cables.

6.4.2. Hydraulic rake control



Hydraulic rake lifts are available as optional equipment on the Stonebear. These can also be installed after the delivery of machine.



Connect the hydraulic hoses leading to the share valve to the tractor's single-function valve quick-release coupler (to which the tipping cylinder line is normally connected).

Ball valves are only used for selecting a function - the actual operation and tipping are made with the tractor's valves. When raising the stone tank, the rake ball valves must be closed.

6.5. Drive belt transmission

The Stonebear transmission is designed to endure impact with stones on its own. However, in order to avoid potential damages caused by overload, the transmission is also well protected.

When the collecting drum and rakes are rotating among stones, the transmission will be subject to short, irregular load peaks. In order to reduce their effects, the entire Stonebear transmission is driven by drive belts, which also reduces the load peaks affecting the tractor's power take-off axle.

In possible overload situations, the drive belts slip and thus even out the stresses being placed on the transmission. But keep in mind that over-tensioning the belts will not increase power, instead another point in the transmission will be placed under strain in place of the protective equipment.

During long storage periods, the belt grooves may be subject to rust; this could increase the slip limit by nearly three times the norm. As a result, begin operating the machine slowly and allow the belt grooves to become polished. The rust can also be removed using sandpaper while the Stonebear is turned off.



The slip limit may suddenly drop, if the belts are muddy or wet. If this happens, do not increase tension - simply clean and dry the belts.

6.5.1. Rake transmission

A belt transmission (5 cogged belts) serves as a rake overload protector. Belt tension can be adjusted by changing the center distance.

When the rake transmission is working under too great a load, the belts will begin to slip, according to their tension. Possible causes for overload are: oversize or lodged stones, excessive working depth, or high moisture content in the topsoil. If the belts begin to slip, the Stonebear must either be raised off the ground or stopped immediately.

The belts do not necessarily have to be tensioned. Instead, in order to protect the transmission and avoid further slippage, perform the following:

- the field must be well cultivated prior to stone harvesting
- guide large stones (20-25 cm) to the center of the collecting drum
- operate at a shallower working depth, such as 5 cm
- allow the field to dry before stone collecting
- reduce driving speed

Only when the belts are slipping repeatedly and the above mentioned guidelines have been followed, can the belt tension be set according to the following instructions.

6.5.2. Setting rake drive belts

If necessary, the rake drive belt tension can be set as follows:



- open the rake end box cover
- loosen the mounting screws on the upper axle bearing (4 pcs)
- tighten the belts with vertical bolt to the correct tension
- tighten the axle bearing mounting nuts
- when tightening the belts, also check the conical sleeve tension (see instructions later)
- close the cover

6.5.3. Collecting drum transmission

The Stonebear collecting drum also operates with a drive belt transmission, which also functions as an overload protector.

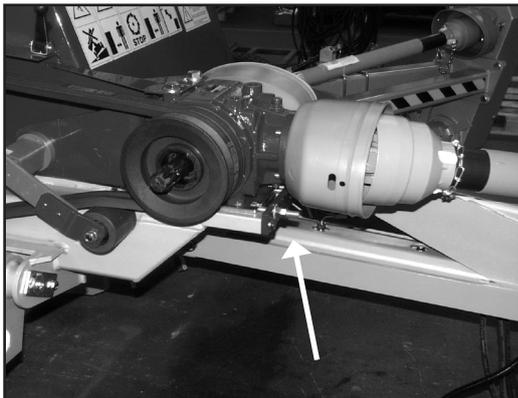


C-belts (2 pcs) transfer the rotation from the gear box to the collecting drum via the auxiliary shaft and belt pulleys.

If the collecting drum should become clogged or is otherwise overloaded, the belts will begin to slip from the larger belt pulleys. **The Stonebear must be immediately stopped in order to avoid wearing the belts down.** Collecting drum clogging and removal of oversize stones is explained in sections 7.8. and 7.9. Setting of the collecting drum drive belts is as follows:

6.5.4. Setting collecting drum drive belts

The collecting drum drive belt tension is set by moving the gear box mounting plate. Then, perform the following:



- remove the belt guard
- tighten the belts with the adjustment bars (2 pcs) in front of the gear box and the bar nuts (19 mm wrench), until the tension roller scale is in an angle of 15°
- when tightening the belts, check the belt pulley alignment
- when using the above settings, the belt will slip when overloaded
- after setting, tighten the adjustment container locking nuts
- also check the conical sleeve tension when tightening the belts (see installation instructions later)

When replacing belts, ensure that they are in the correct position. Driving with new belts on must always be started carefully and the belt tension must be initially checked at regular hourly intervals.

7. Practical working instructions

Whenever collecting stones, the operator should avoid placing any unnecessary strain on the Stonebear. Operation of the Stonebear demands caution, as the tractor usually has much more power than is required for stone picking.

7.1. Factors improving effectiveness of stone collecting

The Stonebear is designed to collect stones from the topsoil cultivation layer to a depth of 0 - 7 cm. Stone collecting and its effectiveness can be further improved by adhering to the following guidelines:

- stones larger than 25 cm are removed from the soil prior to using the Stonebear
- the topsoil must be well cultivated – the soil is even and stones are loose in the aerated surface layer
- the topsoil surface layer has been allowed to dry before harvesting
- several places for unloading – in fields with a great amount of stones, the tank may be full after only 50 m
- the most effective method is to collect the stones harvested by the Stonebear with the tractor trailer
- there is little or no base stone in the field
- there are no root clods, tree roots, or thick root weeds in the field
- stones are only harvested to a working depth of 7 cm

7.2. Rotation rate and driving speed

The Stonebear transmission is geared so that the recommended power take-off is 300 - 350 r/min. Thus, the engine rotation rate is, depending on the tractor, 1000-1400 r/min.



Under no circumstances should the rotation rate of the tractor power take-off axle exceed 350 r/min.

An excessively high rotation rate usually indicates that the rakes are beginning to throw stones backwards as the Stonebear passes over them. An excessive amount of soil may also be gathering at the machine's center, and an exceptionally high driving speed may damage the tines or belts, or cause an extraordinary wearing.



Depending on the stone content and conditions of the field, the driving speed can be from 0 - 6 km/h. If there is a high base stone content or 15 - 30 cm stones, the driving speed should be minimal (0 - 2 km/h). In fields without base stone and a general stone size of 4 - 10 cm, the driving speed can be from 3-6 km/h. One should always begin at an adequately slow driving speed.

When the right driving speed and rotation rate are set, the soil surface should have so called fishbone pattern after driving.

7.3. Working depth

The working depth of the Stonebear can be set at 0 - 13 cm. A structural factor limiting the working depth of the Stonebear is the length of the rake tines. However, only in specific circumstances can full working depth be utilized. Practically, the maximum possible working depth is 7 cm.

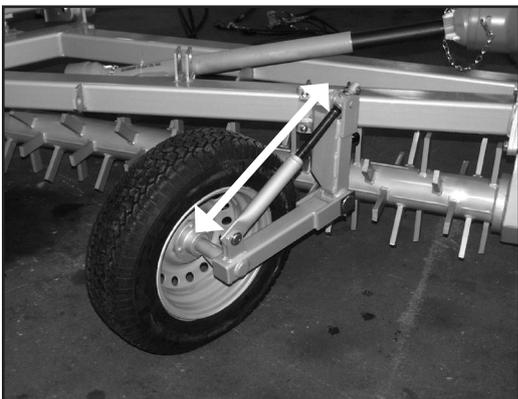
The practical working depth is limited by field stone content, soil type, and soil moisture content. Because the working depth otherwise affects the practical driving speed and work performance, it is generally not recommended to harvest stones any deeper.

The most highly recommended method of harvesting stones is surface harvesting, which only occurs at a depth of 0 - 7 cm. The screen is also designed to function in an optimal way in this operating position. Setting the Stonebear working depth is performed as follows:



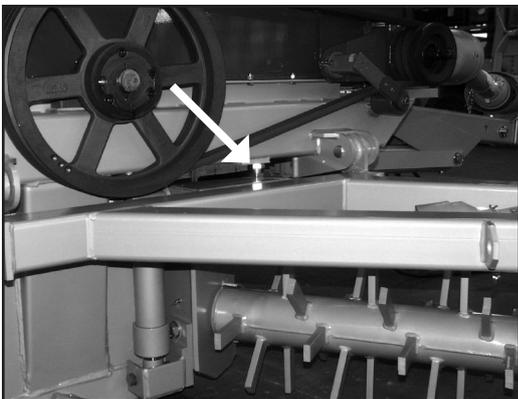
The Stonebear working depth is controlled by adjusting the length of draw bar cylinder. If the swivel hitch (option) is used, the depth is adjusted with tractor links.

Based on the working depth, the screen share and rake depth are set at the same level.



The rake working depth is set by altering the height of the rake support wheels (using the adjusting screws). The working depth must be constantly monitored.

Taking the conditions into account, an excessive working depth means that the Stonebear will not be able to move stones and earth to the center of the machine rakes quickly enough, and will instead push them in front of the screen. The amount of soil entering the tank along with the stones will also increase considerably.



The rakes can also be set pointing downwards from the horizontal level to follow the contours of the field. There are adjusting screws located on the outer side of the rake frame, with which the amount of rake downward movement can be limited.

7.4. Selection of screen size

The Stonebear screen is selected according to the desired harvest and field stone content. The purpose of the screen is to sieve out as much soil being pulled up by the collecting drum tines as possible. The screen is comprised of longitudinally arched, welded steel bars, between which spring tines rotate. The bar spacing determines the degree of harvest, and can be, depending on the various screen sizes 28, 35, 40, or 50 mm.



The 40 mm screen is most often included as standard equipment on the Stonebear, as it is well suited to a wide variety of conditions. When clearing land and on grain fields, a screen with 50 mm bar spacing can be used. For replanting lawns and on beet fields, a 40 mm screen is ideal. The tightest bar spacing of the 28 or 35 mm screens are primarily used for potato crops, basic parkland maintenance, and on road construction sites.

7.5. When to collect stones

Stones are usually collected from grain fields prior to seeding. In this case, the field must be allowed to dry for cultivation before using the Stonebear. This will decrease the amount of soil compaction caused by the Stonebear as well as making stone harvesting quicker and more effective. Excessive soil moisture content will also increase the amount of soil harvested with the stones as well as causing soil to gather at the center of the machine, thus resulting in an uneven track.

In practice, the soil must be cultivated at least once prior to stone harvesting. Driving directly on plowed land is not recommended. Cultivation of the field before stone harvesting loosens stones in the cultivation layer, levels the topsoil, and speeds drying. Thus, the actual performance of stone collecting is made significantly easier. A cultivated field must be allowed to dry before commencing stone collecting with the Stonebear.

Another possibility for removal of stones from the topsoil surface layer is to harvest stones just after seeding, and prior to germination. As a result, the working depth must be set lower than the seeding depth (nearly at the surface of the topsoil), so that the seeds will not be removed from their moist seed beds. This is advantageous in that there are no delays in seeding times and stone collecting can be performed more quickly as the stone content is small. Moisture is also preserved for seed germination. The disadvantage to this method is the degree of accuracy it requires as well as the disturbance of seeding by stones in the cultivation layer.

In other cases, such as on fallow fields and in the clearing of virgin land, stone collecting can be performed in the summer, as there are more daylight hours and the conditions for harvesting are generally better. Furthermore, the operational hours of the Stonebear can be maximized.

7.6. Miscellaneous driving instructions

When driving on sloping terrain, the direction of travel should be either uphill or at an angle towards the peak of the slope. If required to drive downhill, one should begin with an empty tank. If the tank is full, the stones will not fall out but will instead rotate in the collecting drum and cause unnecessary wearing.

When clearing new land or in the thorough renovation of fallow fields, stone collecting and cultivation should be performed several times in alternation. Thus, the Stonebear will harvest only the topsoil surface and the stones are loosened using a rake or cultivator. Old stone deposits are to be dispersed over a wide area prior to mechanical stone collecting.

7.7. Stone size effect on handling

Although the collecting drum can handle approximately 30 cm stones, the largest recommended stones should be 20 - 25 cm. There are two reasons for this. First, stones being passed along the screen will move unhindered with a wider, more open passage.

Second, the size of the stone also affects wear on the collecting drum spring tines. For this reason, it is recommended that the collecting drum rotational speed is reduced, if the stone size is 20 - 25 cm.

Single large stones having a maximum diameter of 30 cm, are to be collected as follows: stop the collecting drum, move the front edge of the screen share under the stone, and carefully turn the transmission back on. However, avoid collecting oversize stones as they will become lodged in the machine.



Single large stones are not to be guided to the collecting drum with the rakes – instead, the share must be guided directly behind the stones, according to the above instruction.

7.8. Blocking up collecting drum

The collecting drum function must be monitored during operation. If the drum stops, turn off the power take-off immediately. If the collecting drum is blocked up with oversize stones or earth clods, reverse slightly while turning the transmission quickly on and off. This shaking out of the block up is the best method to use, as the constant slippage of the drive belts wears them down unnecessarily.

Also check that the tank is not too full. If the level of stones exceeds the screen rear edge by 20 cm, empty the tank.

If the drum repeatedly stops due to block up, reduce the working depth and/or driving speed. Check to see if stones have got stuck in the screen bar spaces - this may occasionally stop the collecting drum. Also check the tightness of the collecting drum drive belts.

7.9. Removal of stuck stones

The collecting drum may occasionally stop due to oversized stones or stones which have got stuck between the screen and spring tines. Reverse slightly and raise the screen share off the ground (max 10 cm). Carefully turn the transmission on and off to try and release the stone or move it gradually past the screen halfway point, which is the tightest point in the collecting drum.

The collecting drum can also be rotated manually using an iron bar or similar, whereupon the stone will usually be released. Ensure that the screen bars have not bent. Stones can often be broken using a hammer; use protective eye protectors to prevent eye injury from flying stone chips.

If the stone is so large that it extends over the screen share, lower the Stonebear against the ground and by moving forward and backward, rub the stone loose.

7.10. Filling and emptying the tank

While working the operator has continually control the filling of the tank. When the Stonebear tank is filled up, the collecting drum tines will no longer through stones into it, instead returning them onto the screen or in front of the share. Then the transmission has to be turned off and the tank has to be emptied.



The Stonebear tank will be emptied from the rear by tipping into a trailer or directly onto a tip near the field. When emptying into a trailer, ensure that there is not too much strain placed on the trailer by a sudden or heavy load.



The tank must always be emptied on a stable and level surface. Moving the Stonebear while the container is raised is expressly forbidden.

8. Maintenance

A well-performed maintenance program ensures problem-free operation for busy working season. That is why the operator should be familiar with the following instructions.

8.1. General maintenance instructions

1. Check the tension of all screws and nuts before beginning work. The inspection and tightening of new Stonebear machines in particular must be performed within a few hours after implementation.
2. Tyre pressure must be checked, according to technical specifications.
3. The screw tightness of the rims must be regularly checked (see the “Notice on Rim Use” in section 3.5.).
4. Regular inspection and lubrication of all bearings.
Regular inspection and tightening of all pulleys and belts.
Lubrication points and the need for lubrication are outlined in detail in section 8.2. Only high-grade lubricants and oils may be used in lubricating the Stonebear; all recommendations and regulations concerning their use must be observed.
5. A visual inspection of the Stonebear frame and other structures prior to use eliminates the possibility of damaged or broken parts causing further damage during operation.
6. A thorough cleaning of the Stonebear of all loose dirt and trash after every use increases its operational reliability and service life. Cleaning can be performed with a pressurized water jet while taking care when directing the jet at certain machine parts (i.e., bearings).
7. After cleaning, applying a light coating of oil to all rust-sensitive parts is recommended. Turning the transmission on with low speed help lubricant to spread throughout the machine as well as discharge any water.
8. Repainting of worn, originally painted metal parts.
9. When performing maintenance tasks on the Stonebear, ensure that no lubricant or other substances pollute the environment.
10. Keep lubricant out of contact with rubber parts.

8.2. Lubrication

The Stonebear lubrication chart explains which points are to be lubricated and how often. High-grade, multipurpose grease is the best for this purpose. When lubricating, check that feed grease press nozzle and lubrication nipples are clean. Clogged nipples should be cleaned or replaced. The lubricant is injected into the nipple until its overflow (clean grease) is visible at the edges of the bearing, bushing, or other. Any excess grease must be wiped off.

The countless impacts that the Stonebear endures during operation as well as those parts in constant contact with the stones result in extremely abrasive equipment wear. This is why the following maintenance procedures are essential to the proper working order of the Stonebear. Maintenance performed according to these guidelines is also a condition for warranty.

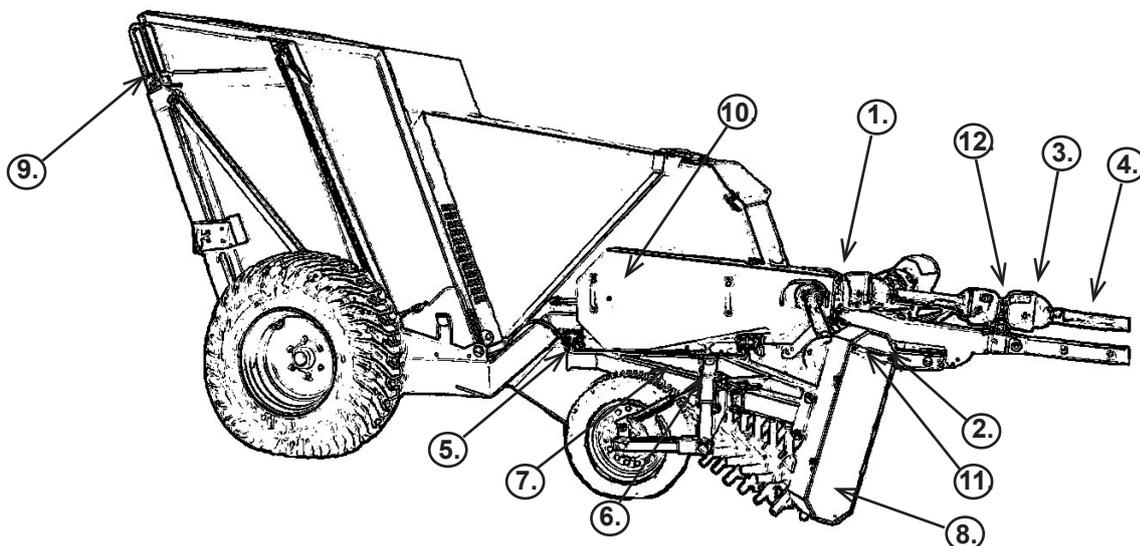
At the conclusion of stone collecting, completely empty the tank of all remaining stones and soil. Wash the Stonebear thoroughly of all dirt and trash and then perform a general equipment lubrication according to the above mentioned instructions. Those parts worn down to the bare metal must be protected from rust with a light coating of grease or oil.



Important! Avoid contacting rubber parts with lubricant!

Some of the Stonebear joints and bearings are equipped with grease nipples, and are to be lubricated regularly, according to the following table:

Location:	Qty:	Frequency:
1. Draw bar pivot	1	20 h
2. Draw bar cylinder	2	20 h
3. PTO shaft joints	8	20 h
4. PTO shaft tubes	4	100 h
5. Rake folding links	4	50 h
6. Rake height adjustment	6	20 h
7. Rake inner bearing	2	10 h
8. Rake outer bearing	2	10 h
9. Tank tipping pivot	2	20 h
10. Collecting drum bearing	2	20 h
11. Rake drive shaft bearing	2	20 h
12. Main shaft support bearing	1	10 h



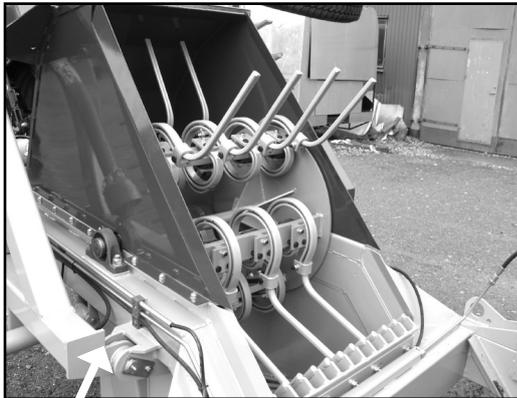


Lubrication of the rake bearings must be performed with extreme caution so that the bearing seals are not breached.

8.3. Daily maintenance

During the season, the following maintenance procedures are to be performed on a daily basis, in addition to the above mentioned lubrication:

- clear the rakes of any tangled roots, bale strings, or the like
- remove any stones or wood pieces stuck in the screen (as soon as noticed)
- check the tightness of the collecting drum spring tines and tighten if necessary
- check the tension of the collecting drum belts and tighten if necessary
- check the tightness of the conical sleeves and tighten if necessary



The collecting drum spring tines may not be out of their mounting points – the rubber plate should be evenly compressed 1.5 - 2 mm.

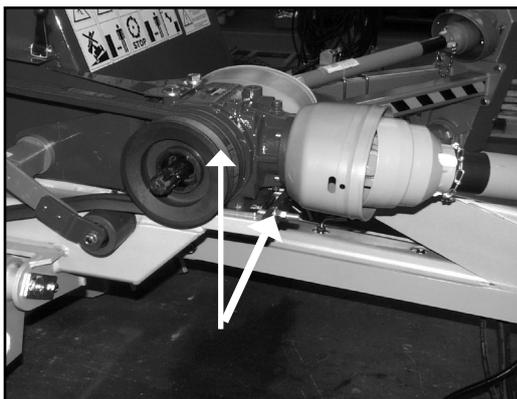
8.4. Weekly maintenance

During the season, the following maintenance procedures are to be performed on a weekly basis, in addition to the above mentioned lubrication:

- check that there are no oil leaks in the gear box
- check that there are no oil leaks in the hydraulic equipment
- check the tightness of all screws and nuts
- check for collecting drum spring tine and screen wear

As an operational meaning, it is absolutely required that the spring tines reach in the screen bar spaces. Rotate the collecting drum - if the spring tines do not reach the halfway point of the screen, they will need to be extended or preferably change to a new ones.

8.5. Gear box



In a new machine, oil in the gear box require changing after approximately 20 operational hours and then, after every 100 operational hours. The oil level must be checked daily by opening the check screw located behind the pulley on the right side of the gear box. If the oil level is visible through the hole or oil runs out when open, then the level is correct; otherwise, oil must be added. The oil volume of the gear box is approximately 1.5 liters. A high-grade transmission oil (SAE 90) is recommended to use.

8.6. Lubrication of P.T.O. shafts

In normal working conditions the lubrication of the P.T.O. shafts has to be lubricated according to the frequency outlined in the previous instructions. Shafts which have been unused for a longer time, must be cleaned and re-lubricated. The inside of the outer form tube must be lubricated. The above maintenance instructions concern all P.T.O. shafts on the Stonebear.

8.7. Torque

Unless otherwise mentioned, use the enclosed torque measurements when tightening screws. The torque depends on the diameter and hardness of the screw (the hardness is listed on the screw head).

Diameter mm	Torque in Nm	
	Hardness 8.8	10.9
5 mm	6	9
6 mm	11	17
8 mm	28	40
10 mm	55	80
12 mm	95	140
16 mm	235	350
20 mm	475	675
24 mm	825	1170
30 mm	1630	2320

8.8. Repair guidelines

The Stonebear parts, which are under an extremely wear, are the rake tines, screen, and collecting drum spring tines. They all are made of special steel metal, specifically designed for their respective purposes. The screen and collecting drum spring tines are designed as wearing parts, to be replaced as necessary. The rake tines can also be extended by welding.

8.8.1. Rake tine

If the annual use is under 100 hours, 2 - 3 hard metal runs should be welded to the rake tine tips once a year.

Under extremely demanding conditions, the rake tine can be extended by welding an extension piece onto the tine. Replacement pieces made of special steel metal are available as spare parts (spare part no. 50068213-03).

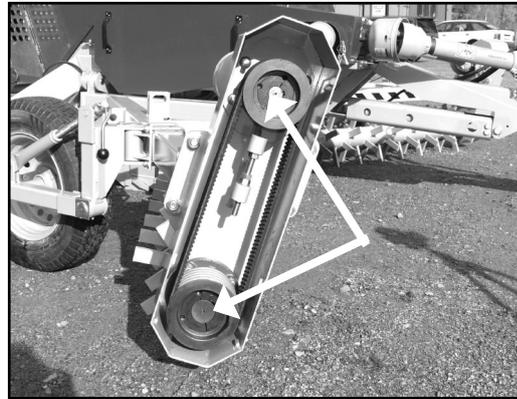
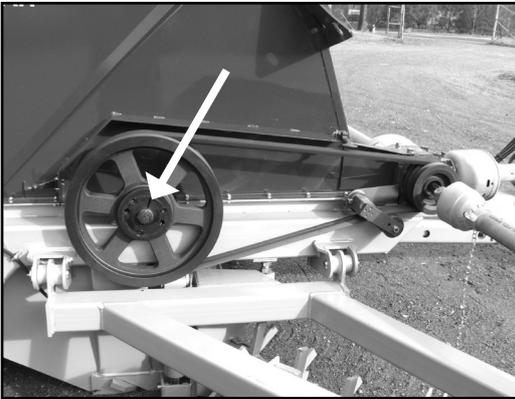
8.8.2. Collecting drum spring tine

The collecting drum spring tines are made especially for the Stonebear. Broken springs cannot be repaired by welding, but must be replaced. Only original Stonebear spring tines are suitable for the intended purpose in regards to the special shape and their durability.

The collecting drum spring tines get shorter with wear. The spring tine should be replaced when it no longer reaches in the bar spacing of the screen. Too short, bent and broken spring tines will not collect stones efficient enough causing the increase of strain for the other spring tines. Because of that reason the injured tines have to be replaced immediately.

8.9. Conical sleeve and belt pulley installation instructions

The Stonebear V-belt pulleys are mounted on the axles by means of conical sleeves. When installing and inspecting the belt pulleys and conical sleeves, the following guidelines should be followed.



8.9.1. Removal of conical sleeve

1. Remove the mounting screws and screw one or two of them into the extraction hole(s). The extraction hole threads are facing the conical sleeve.



Important!

Under no circumstances can the screws be inserted in the extraction holes if any of the mounting screws are still in place.

2. Tighten the extraction screws evenly, until the sleeve releases from its boss.
3. Remove the belt pulley from its axle.

7.6.2. Mounting of conical sleeve

1. Carefully remove the protective grease on the new sleeve and belt pulley boss.
2. Place the sleeve on the belt pulley boss and align the holes.
3. Grease the mounting screws and screw them gently into place, with the mounting holes facing the belt pulleys. The mounting screws are not to be screwed into the extraction holes.
4. Clean the axle and mount the belt pulley and conical sleeve into place. When mounting the belt pulley remember that first, the sleeve is attached to the axle and then the pulley is moved slightly towards the sleeve.
5. Tighten the screws with the key until sufficiently tight.
6. Tap the sleeve lightly and re-tighten the screws. Repeat this several times to ensure that the sleeve is tightly in place.
7. Check the screw tightness regularly.
8. Fill the extraction holes with, for example, grease in order to prevent dirt to enter.

9. Troubleshooting chart

Problem:	Troubleshooting:	Cause:	Action:
Stones left on the field.	Check working depth, screen size and condition.	<ol style="list-style-type: none"> 1. Shallow working depth 2. Screen bar spacing too wide 3. Screen bars damaged 4. Rotation rate too high 	<ol style="list-style-type: none"> 1. Slightly increase working depth 2. Replace with narrower screen 3. Fix, or replace if necessary 4. Reduce rotation rate
Stones not entering Stonebear.	Check working depth and condition of spring tines as well as field conditions.	<ol style="list-style-type: none"> 1. Working depth too shallow 2. Collecting drum tines missing 3. Collecting drum tines bent 4. Low stone content 	<ol style="list-style-type: none"> 1. Slightly increase working depth 2. Replace missing spring tines 2. Replace damaged spring tines 4. Slightly increase driving speed
Soil taken in with stones.	Check field conditions, working depth, and the condition of rake axle tines.	<ol style="list-style-type: none"> 1. Working depth too deep 2. Soil moisture content too high 3. Excessively worn rake tines 4. Screen bar spacing too narrow 5. Rotation rate too high 	<ol style="list-style-type: none"> 1. Reduce working depth 2. Allow soil to dry 3. Weld extensions onto tines 4. Replace with wider screen 5. Reduce driving speed
Rakes stop during operation.	Check if: the soil moisture content is too high, the drive belts are slipping, the axles are turning freely, the working depth is correct and the belt pulleys are oily or worn.	<ol style="list-style-type: none"> 1. Soil moisture content is too high 2. Drive belts are too loose 3. Bearings are damaged 4. Blocking between axle and frame 5. Working depth too deep 6. Drive belt broken 7. Oil on belt pulleys 8. Belt pulleys or belts are worn 	<ol style="list-style-type: none"> 1. Allow soil to dry 2. Slightly tension and test 3. Replace bearings with new 4. Clean the rake axle and frame 5. Reduce working depth 6. Replace all belts 7. Remove and clean belt pulleys 8. Replace with new
Rake drive belts are breaking.	Check if: there are foreign objects in the end boxes the belt tension the belt lengths are correct	<ol style="list-style-type: none"> 1. Soil or dirt in the boxes 2. Drive belts too tight 3. Belts incorrect length 	<ol style="list-style-type: none"> 1. Clean end boxes 2. Loosen drive belts 3. Replace all belts
Collecting drum stops.	Check condition of drive belts, stone conditions, and the tension roller.	<ol style="list-style-type: none"> 1. Belts too loose 2. Belts are broken 3. Too many stones on the screen 4. Tension roller too loose 	<ol style="list-style-type: none"> 1. Tighten belts 2. Replace both belts 3. Reduce driving speed 4. Adjust roller until tight
Collecting drum belts are breaking.	Check their tension, monitor rotation rate and that the belts slip if necessary.	<ol style="list-style-type: none"> 1. Belts are too tight 2. Stones between belts and pulleys 3. Stones get stuck in screen 	<ol style="list-style-type: none"> 1. Loosen belts 2. Reduce rotation rate 3. Reduce rotation rate and driving speed

Problem:	Troubleshooting:	Cause:	Action:
Collecting drum belts turn up and down in belt pulley grooves.	Check belt tension and condition.	<ol style="list-style-type: none"> 1. Belts are too loose 2. Belts are worn out 	<ol style="list-style-type: none"> 1. Replace with new and check tension 2. Replace both belts with new
Tank lowers slowly or is stuck when being lowered.	Check condition of quick-release couplers and tractor Check the condition of hydraulic hoses and security valves Also check the condition of sliding surfaces.	<ol style="list-style-type: none"> 1. Quick-release coupler buttons worn 2. Hydraulic hoses/lines pinched 3. Security valves broken/ blocked 4. Security valves close too easily 5. Sliding surfaces dry 	<ol style="list-style-type: none"> 1. Replace both couplers 2. Replace pinched hoses/lines 3. Clean/replace security valves. 4. Replace security valves. 5. Grease sliding surfaces
Lights do not work.	Check leads, fuses, and connections	<ol style="list-style-type: none"> 1. Fuse burned out 2. Contact problem in connection 3. Breaks in the lead 4. Electrical problem in tractor 	<ol style="list-style-type: none"> 1. Replace fuse 2. Open and clean connections 3. Replace with new lead 4. Repair tractor electrical system.

10. Storage instructions

10.1. Warehousing and storage

1. When being placed into storage, the Stonebear must be cleaned of all dirt and trash, lubricated, and carefully adjusted, according to the guidelines presented in this manual.
2. Release tension from all equipment springs.
3. Cleaning may be performed using a pressure washer, but exercise extreme caution and do not direct the water jet at bearings or other machine parts susceptible to damage.
4. All joints, PTO shafts, etc. must be serviced and lubricated.
5. Unpainted, exposed, or worn metal parts must be given a light coating of oil for longer storage.
6. The Stonebear must be kept indoors, free from moisture and dirt. If there are no such facilities available, cover the Stonebear with a plastic cover.
7. Any repairs, replacement of worn parts, or spare parts orders must be made in good time before the following season so that the Stonebear is ready for service when work begins.

10.2. Disposal, salvage and recycling

1. The disposal of hoses, oils, and rubber and plastic parts is to be performed in accordance with current regulations.
2. The disposal of metal parts does not require any special procedure.
3. The recycling of all materials and parts is recommended.

11. Terms of warranty

The manufacturer, Oy Kongskilde Juko Ltd, grants to its products warranty, based on the following terms:

- I. The period of warranty is one (1) year from the date of delivery to the end-user; this may not, however, exceed two (2) years from leaving the factory.
- II. The warranty covers those products and spare parts which the purchaser has acquired directly from an authorized Kongskilde agent or the Kongskilde Juko factory.
- III. The warranty covers material and manufacturing faults. In case an acceptable warranty, the manufacturer agrees to replace the defective part with a new or fully repaired part.
- IV. The warranty does not cover:
 - damage caused by inappropriate use
 - damage caused by natural wear
 - ordinary wearing parts
 - indirect costs as standing days, consequential material or other damage, loss of income
 - any kind of damage caused by using spare parts other than original Kongskilde Juko parts
 - freight costs
 - repair or travel costs
- V. The manufacturer will compensate warranty if:
 - the damage has occurred under what are considered normal operating conditions
 - all manufacturer operation and maintenance instructions have been observed
 - repairs have been performed by the manufacturer or a authorized service man
 - all repairs have been made only by using original parts
- VI. A warranty claim:
 - any warranty claims must always be presented to the dealer of the machine.
 - the damaged part must be returned to the dealer together with the claim.
 - the dealer will make the warranty claim with the manufacturer and return the damaged part if requested.
 - the warranty claim must be made within thirty (30) days after the damage occurring.
- VII. In keeping with the industry's latest developments, Oy Kongskilde Ltd is constantly developing its products. It therefore reserves the right to make any changes to its models without prior notification, nor is responsible for making similar alterations to equipment already manufactured.



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