



Frontflex 2000



GB
150, 300 and 400 cm

DAL-BO Frontflex 2000

Type 150, 300 and 400 cm

Congratulations on the purchase of your new Frontflex 2000. To ensure **safe operation** and to obtain optimal use of the machine, please read the rules and instructions of the following operator's manual carefully **before operating the machine**.

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Your Frontflex 2000:

Serial No.: _____ Type: _____
Month of manufacture: _____ Net weight (kg): _____

For prompt service, always quote your machine serial number when making enquiries regarding spare parts or service. A comprehensive index of spare parts can be found in the back of this manual to give you an overview of Frontflex 2000 components and to facilitate ordering.

EU DECLARATION OF CONFORMITY

Maskinfabriken DAL-BO A/S
DK-7183 Randbøl

Hereby declare that the above-mentioned machine has been manufactured in compliance with the provision of the Council Directive on the approximation of the laws of the Member States relating to machinery 98/37/EC, which replaces Council Directive 89/392/EEC and amendments 91/368/EEC, 93/44/EEC and 93/68/ECC concerning the Essential Health and Safety Requirements for the design and manufacture of Machinery.

Maskinfabriken DAL-BO A/S

Date: _____

Director Kaj Pedersen

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Safety

- Tighten all nuts, bolts or any other fastened assemblies after a few hours' use.
- Operate the tractor and Frontflex 2000 only while seated in the driver's seat. Never allow anyone else to ride on or be in the immediate vicinity of the equipment.
- Never allow children to operate the Frontflex.
- The driver is responsible for the correct use of lights and markings in compliance with the present Traffic Act and Highway Code of the local traffic legislation.
- Remember to secure lift arms and top link connections with lynch pins.
- Before performing any adjustments, maintenance or repairs on the machinery, always make sure the packer roller is resting securely on the ground.
- It is strictly forbidden to allow anyone to be underneath Frontflex unless the implement is securely blocked. **Serious injury or death** could result. If the Frontflex is hitched to the tractor, it is important to set the tractor brakes.
- **When changing bearings, shafts and rings, the main frame must be securely blocked by a solid support.** Best results can be achieved by mounting the Frontflex in the three-point hitch of the tractor, with the Frontflex resting securely on the ground.
- Frontflex must not be used as a transport vehicle, a pile driver or anything similar.
- A higher level of noise is produced when driving on rocky soil or with worn roller rings. To protect against objectionable or uncomfortable loud noises, wear hearing protection.
- Driving on extremely dry soil conditions can raise a large amount of dust. It is recommended that the windows and doors of the tractor be closed or that a dust mask be used.

Important safety information is preceded by a ▽

Application

The Frontflex 2000 is a multi-purpose implement with a diverse range of applications to accommodate various types of equipment. When mounted in the front lift, it is especially suited to form part of a combination for seedbed preparation.

Frontflex 2000 is a roller of up to 400 cm, with a mechanically operated Crackerboard up to 3 m available as optional equipment. Frontflex 2000 is equipped with Crosskill rings.

Crosskill rings are excellent for seedbed preparation, as they effectively crush clods and achieve a good crumb structure.

Frontflex 2000 is constructed to be **drawn** across the soil, even though it is mounted on the front. This specially designed mounting system provides better manoeuvrability and allows minor steering corrections during operation without having to raise the implement.

Hitching and Unhitching

The Frontflex 2000 is manufactured in compliance with DS/ISO 730-1 category II. The arms of the front lift must be rigid, preventing them from moving sideways. If the front lift of your tractor is not suitable, please contact your Dal-bo distributor.

Hitching

Mount the lift arms into the hitch points (A, Fig. 1). Next, install the top link. Adjust the top link so that the main frame of the Frontflex is in a horizontal position and parallel to the ground. Raise the implement, allowing the parking stands (**front and rear**) to clear the ground and placing the implement in an operating position.



Remember to secure the lift arms and top link with lynch pins.

Fig. 1



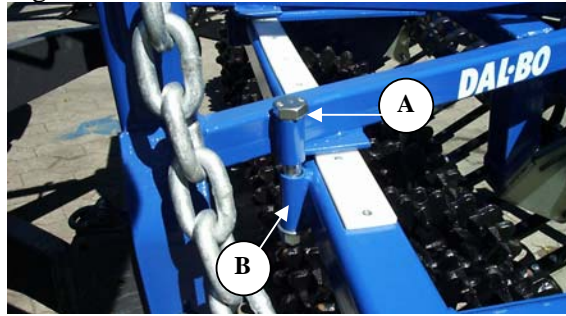
Lift arm tilt angle

With the Frontflex in an operating position, the lift arms (B) should be tilted at an angle preferably a couple of degrees above horizontal of the direction of travel or at least horizontal. This angle will enable the Frontflex to roll over any obstacles, as the tractor presses the implement tilted upwards and the steering will be simultaneously maintained. (Steering can be made even easier if the top link is shortened, so that the main frame points a few degrees upwards in the front.)

Mounting behind tractor

The Frontflex can be mounted in the three-point hitch on the rear of the tractor if needed.

Fig. 2



Insert the bolts (A) with the Frontflex resting on the ground. It is easiest to insert the bolts with the front linkage raised slightly upwards and the tubes (B) parallel. Tighten the bolts until there is no space between the main frame and the linkage.

Be extremely careful when mounting the Frontflex onto the rear of the tractor while it is equipped with the Crackerboard. The Crackerboard must be in a raised position and the tines must be tilted in the passive setting (see page 13 "Options").

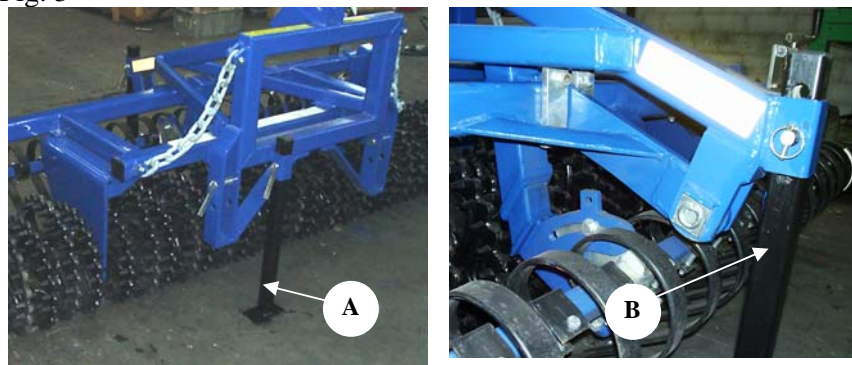
- ∇ Remember to secure the lift arms and top link with lynch pins.

Unhitching

To unhitch, the procedure for hitching should be followed in reverse order.

- ∇ It is important to secure the Frontflex with the rear (A) and front (B) parking stands to prevent the implement from tipping over.

Fig. 3



Handling without use of the three-point hitch

If you need to move the Frontflex other than by use of the three-point hitch, we recommend lifting it with straps in the main frame or in the linkage so that the Frontflex hangs in balance.

Weight (kg)

Type	Crosskill Ring
150 cm	715
300 cm	1075
400 cm	1215

Adjustments and Settings

There are no adjustments to be made on the Frontflex 2000 except for any adjustments necessary during regular maintenance.

Operation of Frontflex requires no hydraulic outlets on the tractor.

The Frontflex does not have any special transport position.

Fig. 4

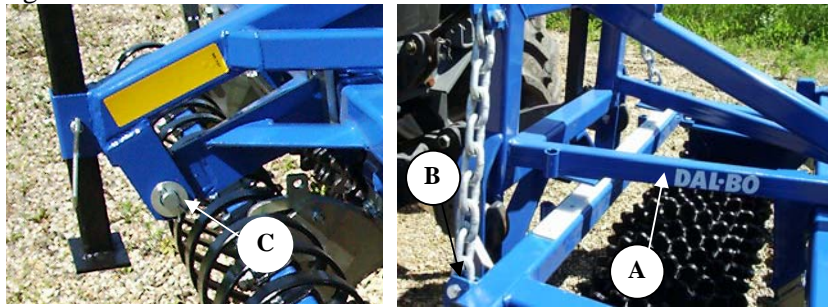


Operating and Driving Instructions

The Frontflex 2000 is constructed so that the implement's centre of gravity is close to the tractor, reducing the weight of the implement on the tractor as much as possible and easing operation.

Even when the Frontflex is mounted in the front lift, the implement is drawn across the field, making it easier to pass over minor obstacles. The frame (A) is mounted in three points (B and C). The pulling force of the tractor is transmitted through point (C) which is the only rigidly mounted point. This feature enables the operator to retain the steering capabilities of the tractor, which must be given high priority if the Frontflex is to be part of a combination for seedbed preparation.

Fig. 5



When starting operation, lower the Frontflex and place the lift in a starting position so the implement and the tractor can function independently of one another. If you are working in loose and friable soil and would like greater control over the machine, raise the linkage to reduce the slack in the chains. The implement will then be hanging from the chains (almost tight) instead of resting on the main frame. If the rings start sinking too deeply into the ground, the main frame and the packer module will quickly begin to hang from the chains.

Initially, start with the chains loose and the linkage resting on the nylon rail, enabling the packer module to follow the contours of the field surface.

A working speed between 7 and 10 km/hour is recommended, but always drive according to conditions.

Never load extra weight onto the Frontflex 2000, as the implement was not designed to carry additional weight.

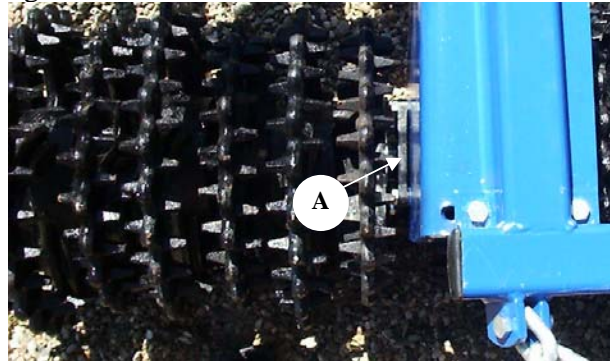
When using the double-acting front lift, weight must not be transferred from the tractor to the Frontflex.

Raise the Frontflex before backing up or turning.

Maintenance

Proper maintenance ensures a long lifetime for the Frontflex 2000 and also optimum performance from the implement. To facilitate maintenance, grease fittings (A) have been mounted on those locations where wear on the equipment is the greatest.

Fig. 6



Lubrication Points	Number of Fittings
Bearings	2

Lubricate the bearings near the rings every 50 hours of operation. Do not over lubricate since this will destroy the seals.

The top piece will slide best if the nylon rail is clean and free of oil. Therefore, do **not** lubricate the nylon rail. Lubricants can collect dirt and grit which may cause excessive wear.



Tighten all nuts, bolts or any other fastened assemblies after a few hours' use. Check often to make sure that they remain thoroughly tightened. Inspect all pins, screws and bolts for wear or damage and make sure that all are securely in place to avoid any possible damage or breakdown of the machine.

Avoid spilling oil on the ground. In case of spills, collect the oil and dispose of it properly.



In case skin should come in contact with oil or grease or in case clothing should become stained with oil, remove the stained clothes immediately and wash the affected skin areas thoroughly. Oil and grease are harmful to the skin.

Backlash in the rings

Due to normal tolerances of the castings, washers may have been added between the bearings and the roller rings and also between the lock washer (A) at the end of the shaft and the outermost ring (Fig. 7). To reduce and minimize backlash, insert a washer of suitable size between the ring and the lock washer (see page 18 "Replacing bearings/shafts/rings").

Fig. 7



Cleaning and maintenance

When preparing for storage at the end of the season, clean the machinery thoroughly to prevent corrosion and facilitate future maintenance and repairs.

Check that the rings are intact and can turn freely without unnecessary play in the bearings.

Check the linkage slide bar (nylon rail) for wear and make sure that the self-tapping screws do not stick up above the surface.

Options

Crackerboard

The Crackerboard is mounted in front of the packer roller rings and can be set to perform tillage actions of crumbling, levelling and packing as needed. Only the 150 and 300 cm models can be equipped with a Crackerboard.

Operation

The Crackerboard is a versatile piece of equipment, with several application possibilities in one unit. At a depth setting of approximately 3 to 5 cm, depending on the soil, the vibrating power of the tines will crush clods. A deeper setting of the Crackerboard provides a greater levelling effect than that of a levelling board, as a small amount of soil builds up in front of the tines.

Fig. 8



Under most conditions, best results will be achieved by setting the tines of the Crackerboard at a 70° angle to the surface of the ground. The working depth must be adjusted according to subsequent crops and the condition of the field. The Crackerboard is **not** intended for use as a bulldozer blade but rather for light tillage operations. Each tine moves and flexes individually in response to counter pressure from land contours, resulting in a more uniform field surface than that obtained from use of a levelling bar.

Angle and depth adjustment

The angle of the tines of the Crackerboard can be adjusted manually if necessary.

The angle of the tines influences the action of the tines in the soil. If the tines are set to work aggressively and the working depth is set in the uppermost soil layer, the tines will produce the greatest amount of vibrations possible to crush clods, resulting in a finely crumbled surface (Fig. 9).

If the tines are set deeper into the soil, pressure on the soil will be created and the tines will more easily be able to overcome obstructions (Fig. 9). This setting is recommended for levelling the field. At the same time, an effect similar to the clod crushing action of a levelling bar will be achieved.

Fig. 9



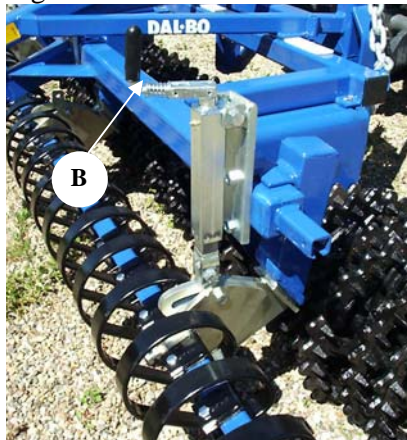
Aggressive setting



Passive setting

Adjust the depth manually by using the spindles (B, fig. 10). The sides of the spindles are marked with numbers to facilitate uniform angle adjustment. Never set the Crackerboard too deep when first starting the machine since this will put a greater strain on the Crackerboard than necessary.

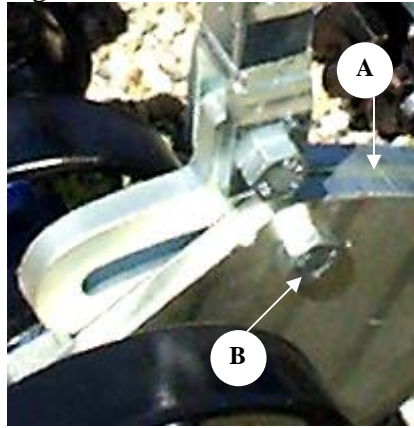
Fig. 10



If a ridge suddenly builds up in front of the Crackerboard while the implement is in operation, raise the lift slightly, but only until the chains (fig. 5, B) are tight. The Frontflex will tilt as the rigidly mounted point in the front is raised. You will still be able to achieve the same packing action after carrying out this adjustment, as no significant weight will be removed from the Frontflex.

Adjust the angle of the tines by loosening the plates (A).

Fig. 11



1. Lower the Frontflex to the ground or block it securely.
2. Loosen the bolts (B, Fig. 11). Check that the lower bolt on which the plates rotate is loose.
3. Adjust the angle of the entire Crackerboard unit by taking hold of a tine and either pulling or pushing the tine until the desired setting is obtained.
4. Tighten the bolts.

Power requirements

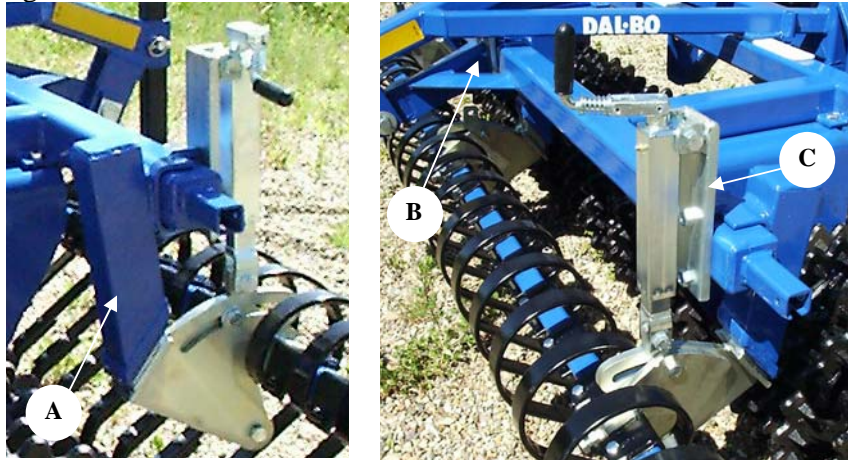
Overall, the Crackerboard does not require much power, as soil is able to pass freely between the tines. The greatest advantage of the Crackerboard lies in the fact that the tines can move independently and thus flex individually in response to counter pressure from land contours. This provides the user with greater flexibility than a levelling board since the entire levelling unit does not have to be disturbed because of a single obstacle.

Increasing the penetrating depth of the Crackerboard will result in greater power consumption, as a greater amount of field material will need to be processed.

Refitting

The Crackerboard can be mounted at the factory prior to delivery, but it can also be delivered later if necessary. The Crackerboard is delivered fully assembled and ready to be mounted on the Frontflex.

Fig. 12



1. Mount the telescoping brackets (A) behind the front tube of the main frame. Mount the middle telescoping piece halfway between the spacing piece and the towing eye (B).
2. Attach the mounting plates (C) to the threaded spindle shafts. Fasten the nuts. Only the two spindles on the outside adjust the depth. The middle telescoping piece is mounted without a spindle and a different mounting plate is used.

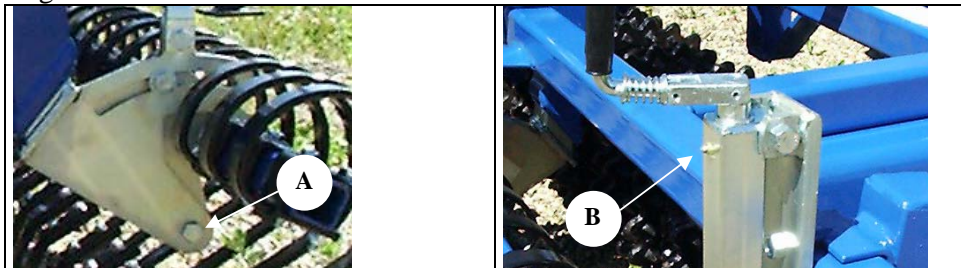
Crackerboard

Model	Weight	Number of Tines
150	115	18
300	175	22

Maintenance

Tighten all nuts, bolts, or any other fastened assemblies after the first workday. It is important that the bolts on which the Crackerboard is hinged (Fig. 13, A) are properly tightened so the Crackerboard can move freely when changing the angle. (The nuts are self-tightening). Check all nuts, bolts and fastened assemblies regularly and tighten when necessary.

Fig. 13

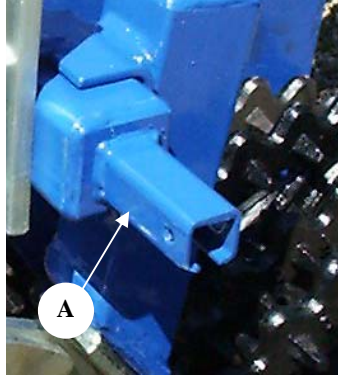


Lubricate the grease fittings on the spindles (B) every 6 months or as necessary. There are no other points on the Crackerboard that require lubrication.

Indicator Lights

When driving on public roads, indicator lights must be mounted. All Crackerboard models are equipped with a specially designed bracket for mounting indicator lights (Fig. 15, A).

Fig. 15



The use of indicator lights requires a 7-pole female socket (farm trailer socket) on the tractor in connection with the front lift.

Repairs

- ▽ Before performing any adjustments, maintenance or repairs on the machinery, always make sure the packer roller is resting firmly on the ground.
- ▽ It is strictly forbidden to allow anyone to be underneath Frontflex unless the implement is securely blocked. **Serious injury or death** could result. If the Frontflex is hitched to the tractor, it is important to set the tractor brakes.
- ▽ **When changing bearings, shafts and rings, the main frame must be securely blocked by a solid support.** Best results can be achieved by mounting the Frontflex in the three-point hitch of the tractor, with the Frontflex resting securely on the ground.

Replacing bearings/shafts/rings

Due to normal tolerances of the castings, washers may have been added between the bearings and the roller rings and also between the lock washer at the end of the shaft and the outermost ring. It depends on the new rings whether the washers can be used again or not, as the rings must be tightly adjusted but only to the extent that the lock washer (see Fig. 7) can be tightened as close as possible to the shaft end. There must be no air between the lock washer and the end of the shaft since the lock washer **must** press against the end of the shaft.

If the rings are difficult to pull off the shaft, try using a high pressure cleaner to flush out rust and soil from out between the rings and the shaft. If there is time, place the shaft upright in a vertical position, apply a rust releasing agent and let the shaft and rings stand overnight.

Rings can be so tight that it is necessary to cut through the shaft and then press the ring off with a hydraulic press. This requires getting a new shaft, as the old shaft cannot be welded together again. If only one ring is stuck, it will be more economical to cut through it with an angle grinder and save the shaft.

Crosskill rings

1. Support the packer frame so the rings are just barely touching the ground.
2. Remove the locking bolts and the washer (A, Fig. 18) and pull the rings located outside the bearing off the shaft.
3. Loosen the set screws in the bearings.
4. Remove the bolts fastening the bearing plates to the main frame and pull the bearings and the bearing plates off the shaft. If the bearings are defective, remove the bearing plates and install new bearings. If the shaft needs replacing, raise the main frame off the rings so the shaft and the rings are free. Pull the shaft out of the rings.

Mounting

1. Mount new rings, bearings or shaft. Make sure the shaft ends are of equal length on each side of the rings. (After installing the bearings, measure the protruding shaft ends to ensure that they have an equal length.).
2. Assemble in reverse order. Secure the locking bolts and the set screws with (see also introduction to section "Repairs").

Fig. 18



Check the rotational direction of the roller rings. The small and large rings alternate. Closest to the bearing there is a washer followed by a small ring. Remember the bushings underneath the large rings (see also introduction to section "Repairs").

Replacing Crackerboard tine points

Replace tine points before the tines themselves become worn.

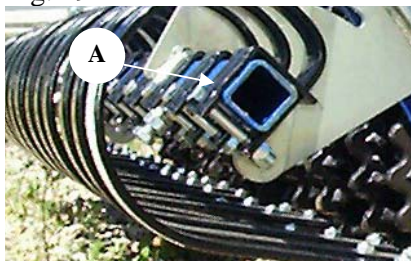
1. The Frontflex must be in a lowered position, resting securely on the ground.
2. Remove the bolts fastening the points to the tines and mount new points. The bolts may be used again if they are in good condition, but changing the bolts makes replacing points easier the next time.

Replacing tines on the Crackerboard

It may be necessary to replace the tines if they become bent or broken.

1. Remove the bolt in the mounting plate (A), freeing the tine.
2. To mount a new tine, first place the plate onto the square tube, then position the tine and insert the bolt.

Fig. 19

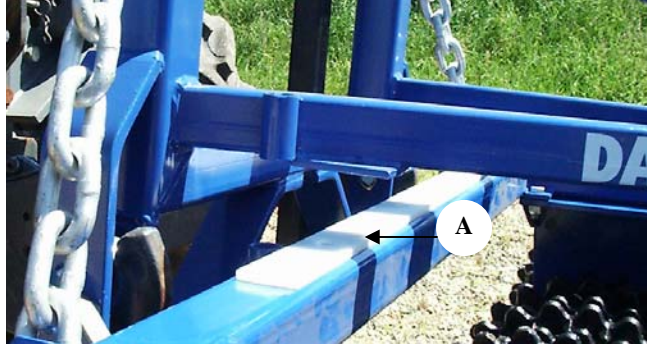


- Tine distance 140 mm

Replacing nylon rail

1. Lift the top piece (A) by using the three-point hitch of the tractor or by using a jack until the chains (A) are tight. Support the top piece to prevent the risk of getting pinched or crushed.
2. Remove the Taptite screws (self-tapping screws) from the nylon rail.
3. Remove the nylon rail and install a new rail.

Fig. 20

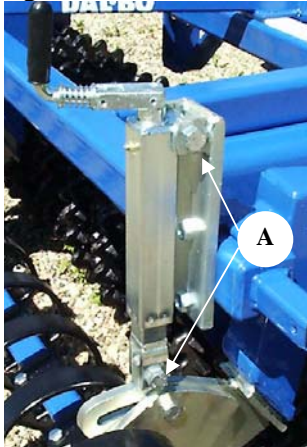


Replacing spindles on the Crackerboard

Lower the Frontflex to the ground and make sure that there is no danger of personal injury.

1. Securely block the Crackerboard.
2. Remove the bolts (A).
3. Install a new spindle.

Fig. 21



Scrapping

Remove the shaft with the rings (see section "Repairs" under "Replacing bearings/shaft/rings").

The rings are made of cast iron and the tines are made of hardened steel. All iron used in the machine is recyclable.