Ratoon

Subsoil loosener
EN
2/4/6/8 tine spring bolt
4/6/8 tine NSH

Ratoon

Type 2/4/6/8 tine

Congratulations on the purchase of your new Ratoon. For **safety reasons** and to achieve optimum service from the product, please read the User Guide **before use.**

This product has:

Type no.:	_____	Serial no.:	_____
Month of manufacture:	_____	Net weight kg:	_____

If contacting the manufacturer regarding spare parts or service, please state type and serial number. A spare parts list is included at the back of this manual.

EU DECLARATION OF COMPLIANCE

DAL-BO A/S
DK-7183 Randbøl

declares herewith that the above machine is manufactured in accordance with the provisions of directive 2006/42/EC, which replaced directive 98/37/EC and change directives 91/368/ECC, 93/44/ECC and 93/68/ECC on harmonization of member state legislation concerning health and safety requirements related to the construction and manufacture of machines.

CE

This machine corresponds to the safety requirements in the European Safety Guidelines.

DAL-BO A/S Date: _____

Managing Director Kaj Pedersen

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Safety

This symbol appears in the instruction manual each time there is a safety warning concerning your safety, the safety of others or functionality of the machine. All safety instructions must be observed and made available to all users of the machine.

General

- Ensure you are familiar with all aspects of the machine before use
- There are safety stickers on the machine containing important instructions for the safety of yourself and others, and correct use of the machine.
- Do not carry passengers during operation or transport.
- Ensure there are no personnel within the machine's working radius before operating. Operate machine only from inside the tractor.
- Before leaving the tractor or making adjustments, performing maintenance or repairs on the machine, fully lower to ground, or maintain in transport position, apply tractor handbrake, switch engine off and remove ignition key to secure the machine against accidental operation.
- Remember to secure the lift arm with a split pin.
- Never leave driver's seat whilst machine is moving.
- Always adapt speed to conditions.
- Do not use machine unless all safety devices are in place. Defective safety devices must be replaced immediately.

Hydraulics

- Ensure there are no personnel within the machine's working radius when activating the hydraulic system to avoid danger of crushing.
- Lower machine fully for any repair work on the hydraulic system. Relieve hydraulic pressure, switch engine off and remove ignition key.
- Clean hydraulic connections thoroughly before reconnecting. When connecting hydraulic hoses to tractor hydraulics, ensure they are not under pressure.
- Bleed the hydraulic system thoroughly after any repairs.
- Check hydraulic hoses regularly for defects such as cracks, splits, crimps, wear or breaks. Defective hoses must be replaced immediately.
- Avoid spilling oil on the ground. If oil is spilt, collect and deliver to a destruction point.
- Clean hands thoroughly after contact with oil and grease. Change oil-stained clothing immediately. Hydraulic oil can be harmful to the skin.
- Hydraulic oil released under high pressure can penetrate the skin and cause severe injury. In the event of injury, seek medical help immediately.

Mounting

- Danger of crushing! Ensure no personnel are between implement and tractor, or between the parts to be connected.

Maintenance and repair

- Ensure machine is adequately supported for all repair and maintenance work. Ensure tractor and machine are properly braked, engine stopped and ignition key removed.
- Tighten all screw connections after a few hours use. Check all screw connections regularly and tighten as required. Check all split pins and bolts to avoid mechanical failure.
- Dispose of oil, grease and filters in accordance with local environmental protection rules.

Road transport

- All safety and warning precautions mandatory by law must be fitted and tested before transporting the machine on public roads. The driver is responsible for correct lighting and warning signs in accordance with traffic regulations.

- Check with local traffic authorities whether transport on public roads is allowed given the machine's dimensions.

- When transporting machine, ensure tractor total weight and axle pressure are not exceeded.

Correct use

- Correct use of the machine includes observing the manufacturer's operating, maintenance and repair instructions, and that original spare parts are always used.

- The machine may only be used, maintained or repaired by personnel familiar with it and who are aware of the risks that can be involved.

- The manufacturer cannot be held liable for injury or damage arising from modifications made to the machine performed without prior permission from the manufacturer. Neither can the manufacturer be held liable for injury or damage arising from incorrect use. Such liability rests solely with the user.

- Do not add extra weight to the machine

Technical data

Ratoon

Technical data	2 tine	4 tine	6 tine	8 tine
Number of tines	2	4	6	8
Working width [m]	1,2	2,0	2,5	3,0
Transport width, spring bolt [m]	1,2	2,4	2,5	3,0
Transport width, NSH [m]	-	3,0	3,0	3,6
Tine rows	2	2	2	2
Bulleafstand [cm]	75	75	75	75
Tine height [cm]	72	72	72	72
Spring weight, approx. [kg]	175	325	410	500
NSH weight, approx. [kg]	-	650	750	1000
Power requirement [hp]	40	80	120	160

How to use this manual

The sequence of subject matter in this manual can seem illogical. Please refer to the table of contents for page numbers for individual items

The manual is divided into 4 main sections:

- Safety
- Operation (*Settings, Running and Operation*)
- Maintenance
- Repairs

The following symbols represent:

Points which are important to functionality and service life.

Points relevant to safety.

Uses

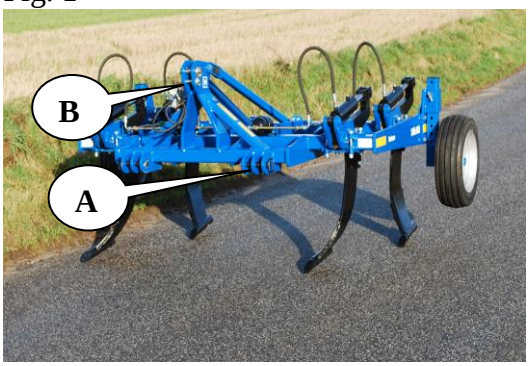
The Ratoon subsoil loosener can be used for grubbing uncultivated arable land and in plantations etc to a maximum depth of 70 cm. The Ratoon is a rear-mounted implement, and the depth it works at is governed by the tractor's 3 point linkage, its wheels and tubular packer roller. It is ideal for use on wheel tracks and pre-ploughing where arable soil is often unnecessarily compacted.

Connecting and disconnecting

Connecting

Connect lift arms first using lift pins (A). Connect top bar to point (B).

Fig. 1



Remember to secure attachment using split pins and check lift arm hook lock mechanism is engaged.
Remember to move support leg to relevant position

Hydraulics

A single-acting hydraulic outlet is required on the tractor to adjust the hydraulic stone guard system.

Disconnection

Lower machine to ground before disconnecting. Disconnect hydraulic hoses and lift arms. Disconnect light if relevant. Remember to set support leg in relevant position.

Remember to depressurise hoses before disconnecting them. **Ball cock must be closed before disconnection. Failure to do so will cause pressure loss. Machine will drop to ground.**

Setting up

The machine is supplied with factory settings, but fine adjustment will always be required before use. Numerous adjustment options make it more flexible and ensure maximum use.

Basic setting will ensure the machine will run horizontally. This is achieved using the top bar. **This basic setting is important to achieve an even field surface and uniform working depth**.

Adjusting depth

Set depth using the drilled plates (A) on wheels and using tractor lift arms. Both sections of frame must be horizontal. If the machine is fitted with a packer roller at the back, use this for setting depth rather than the wheels.

Fig. 2

Adjusting pressure of hydraulic stone guard

Hydraulic system pressure must be adjusted according to soil type. Very hard soil will require much higher pressure than sandy soils.
In ordinary conditions, a pressure from 45 bar to max. 80 bar is recommended. Remember to close ball cock on feeder hose when pressure has been adjusted. The manometer has a factory setting of 50 bar.

Pressure must not exceed 80 bar to allow tine flexibility in contact with foreign objects.

Fig. 5

Check all the accumulators on the machine **at least once a year for leaks and to ensure that the precharge pressure is set correctly**. Contact an authorized Dal-Bo dealer for more information.

Operation

Correct operation is vital for optimum use. This applies to working in the field and for safety. Always ensure you are fully familiar with all safety aspects of the machine.

Do not turn or reverse while the machine's tines are in the ground.

Working depth

The machine can be set for a very light effect. Depth can be controlled very precisely by the tractor's hydraulic lift or by a combination of wheels or packer roller. As such, it can be set for very light effect at a depth of only 25 cm approx. Working at this depth will only lightly break up the soil. Never set depth at more than 70 cm. Exceeding this setting can damage the machine.

Ensure machine works parallel to ground when in operation.

Fig. 6

Operating speed

An operating speed of 0-6 km/h is recommended, but always operate according to conditions.

Increased speed will increase wear, particularly in dry conditions. The harrowing tines can also be damaged if operating at excessive speeds in unfavourable conditions.

Power
Power requirement will depend on soil type, terrain and speed.

Troubleshooting

Fault	Cause	Remedy
Uneven working depth	• Wheels not set evenly	• Adjust wheels
	• Machine tips back-wards or forwards	• Adjust lift arm height • Adjust wheels

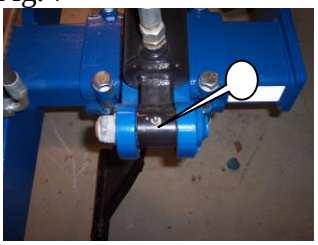
Maintenance

Good maintenance ensures long service life and optimum use. Grease nipples are fitted where wear is heaviest.

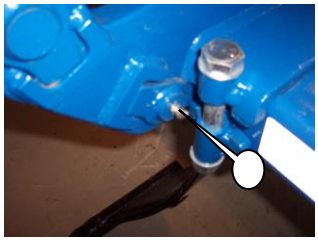
Tighten all screw connections after first working day. Check all split pins and bolts to avoid mechanical failure. Check hydraulic system for leaks.

Lubrication

Fig. 7

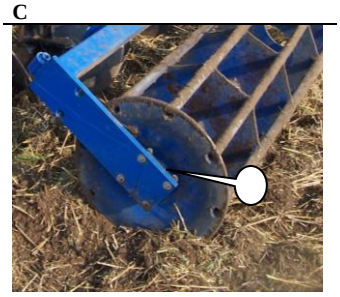


A



B

C



D

Lubrication points	Number of nipples	Lubrication intervals, hours	Illustration
Stone guard cylinder, upper	4/6/8	8	A
Stone guard pin, lower	4/6/8	8	B
Stone guard plates	4/6/8	8	C
Packer roller bearings	2	50	D

Lubricate all lubrication points at least once annually.

Hydraulics

Check all hydraulic hoses for wear or cracks. Check all hoses for crimping.

Replace defective hydraulic hoses immediately. Broken hoses can cause injury or damage to the implement.

Lubricate exposed rams with oil or pressure-resistant grease to avoid rust forming when storing for long periods. Remember to remove before use.

Replacement andrepairs

Safety is vital for **all** repair work on the machine. Always observe the following points, plus those under Safety First in the instruction manual.

All maintenance and repair work can only be performed when the machine is lowered to the ground or locked in transport position, tractor is braked, engine stopped and ignition key removed to prevent accidental start.

Particular attention must be paid to safety when repairing hydraulics. Before commencing work, depressurise hydraulic system and support part being worked on.

Always ensure hydraulic system is bled after repairs and before use to prevent mechanical breakdown and injury to person.

Replacing stone guard cylinder

Support main frame securely. Depressurise hydraulic system.

1. Disconnect hydraulic hoses
2. Remove pins. Cylinders will now be free
3. Reverse procedure for assembly

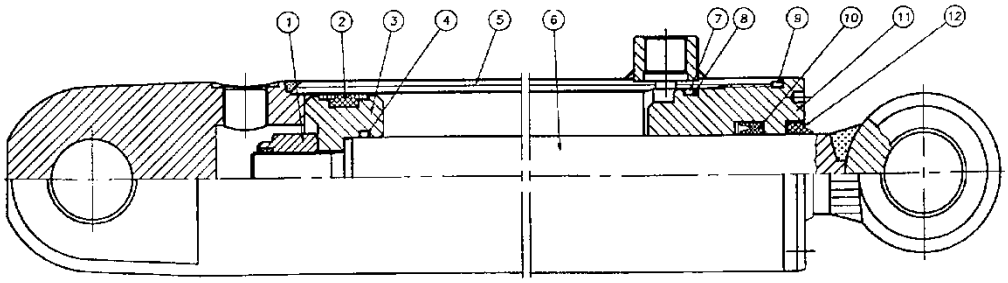
Fig. 8

Once hydraulic stone guard is fully assembled, bleed system by activating cylinder to its outer positions.

Ensure no personnel are within working radius of the implement when hydraulic system is activated.

Replacing gaskets on stone guard cylinder

Fig. 9



Cylinder 80/40-180

1. Drain oil from cylinder by moving ram carefully backwards and forwards.
2. Extend ram to centre position. Unscrew upper part (pos. 11) from cylinder tube (pos. 5). Use special tool to remove upper part. If upper part is stuck, heat front of sleeve. When upper part is detached from cylinder tube, pull ram up towards upper part and remove completely from cylinder tube. 6).
3. Remove lock nut (pos. 1) retaining collar shoe (pos. 3).
4. Remove collar shoe (pos. 3) from ram, (pos. 6).
5. Remove upper part (pos. 11) from ram, (pos. 7).
6. Remove gaskets in upper part and collar shoe, (pos. 2+4+7+8+9+10+12).
7. Clean all parts and check for particles etc. Check for rust around scraper ring (pos. 12) in upper part. If detected, remove thoroughly.

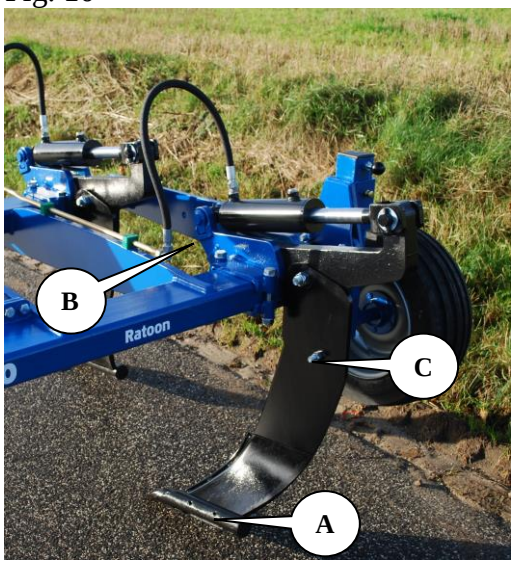
Mounting

1. Fit new gaskets (pos. 2+4+7+8+9+10+12) in upper part and collar shoe.
2. Lubricate thread in upper part (pos. 11) and cylinder tube (pos. 5) with grease or oil.
3. Fit upper part (pos. 11) on ram shaft (pos. 6).
4. Fit collar shoe (pos. 3) and screw on lock nut, **secure with Loctite**. Ensure that thread is absolutely clean and free of oil or other impurities before applying Loctite. **Do not fill with oil for 12 hours after use of Loctite.**
5. Lubricate outer collar shoe gasket in contact with cylinder tube and inside of cylinder tube with oil, push ram into centre position.
6. Fit upper part onto cylinder tube and tighten.
7. For fitting see ”Replacing stone guard ”.

Replacing wear parts and spring bolt

Support implement securely to avoid danger of crushing or falling

Fig. 10



The tip (A) and tine blade are fixed to the stalk by 2 cylindrical pins. Tips and tine blade (B) must be replaced before the stalk on which they are mounted becomes worn

A 16 mm 8.8 bolt (C) is used for the spring bolt model. In the event of frequent heavy duty work, a 10.9 bolt can be used instead.

Scrapping

Depressurise hydraulic system

Beware of the weight of any given part when removing or disassembling. All parts **must** be supported or lifted to avoid danger of falling.

Disconnect hydraulic hoses and cylinders and drain oil. Collect oil in container to avoid pollution. Send oil and hoses for destruction.

All iron used in the machine can be recycled.

Spare parts