

DALBO®

TRIMAX

410 + 520 LIFT

USER MANUAL

Original edition



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Serial no.:	108750

MADE IN **D**ENMARK

TRIMAX

Type 410 + 520 cm

Congratulations on your new TRIMAX. For **safety reasons** and to achieve the best possible use out of your stubble cultivator, you should read through the user instructions carefully **before use**. It is important that the operator fully understands the content of this user manual before operating the stubble cultivator.

If, at some point in the future, the stubble cultivator is sold **the user manual** must be given to the new owner.

The content of this manual is based on the information available at the time of publication. Since our products are being developed and improved continuously, it cannot be avoided that the specifications are changed from time to time. Should you find information in this user manual which differs from the mentioned stubble cultivator, our aftersales department will be happy to assist you.

Your TRIMAX has:

Type no.: _____ Serial no.: _____
Month of manufacture: _____ Tare weight in kg: _____

When enquiring about spare parts or servicing, please always provide the type number, serial number and year of manufacture.



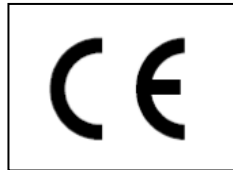
EU DECLARATION OF CONFORMITY



**Bindeballevej 69
DK-7183 Randbøl**

Product:	<i>Dalbo TRIMAX 410 Lift</i>	<i>Dalbo TRIMAX 520 Lift</i>
Type number:	60150	60109
Serial number		
Type:	Heavy duty stubble cultivator	Heavy duty stubble cultivator

hereby declares that the aforementioned machine is manufactured in accordance with the stipulations in Directive 2006/42/EC, which replaces Directive 98/37/EC and the amending Directives 91/368/EEC, 93/44/EEC, and 93/68/EEC on a mutual approach for member state legislation on machinery for health and safety requirements in connection with the construction and manufacture of machinery.



This machine complies with the safety requirements of the European safety guidelines.

On behalf of DALBO A/S

Date: _____

Alessio Riulini, CEO

PREFACE

DALBO – innovative soil processing techniques

DALBO A/S specializes in the development and production of quality machines for soil cultivation and the preservation of green areas, for instance in agriculture, on golf courses and within municipalities. Within our core competence area, field rollers, DALBO is among the largest and best known manufacturers in Europe. Packers, stubble implements and seedbed preparation harrows are other groups of products where we at DALBO have shown true, Danish pioneering spirit. Disc rollers complete the assortment. Building on 70 years of experience, it is the intention of DALBO to follow the structural development and seek to meet the need of modern agriculture for efficient and reliable machines. We wish to be a close-to-the-market alternative to the large suppliers of overall solutions. Thus, a flexible production with short delivery times is a high priority. The products are sold via our own sales organisations, trained dealers and import businesses in over 40 countries. This ensures professional guidance and service close to the customer.

Dalbo **Trimax** is manufactured based on the newest techniques as well as acknowledged provisions, standards and rules regarding technical safety.



This user manual contains information and instructions which are important for the preservation of the operational reliability and value of your DALBO **Trimax**. Therefore, read the user manual carefully, since it will familiarise you with mounting, operation, maintenance and care. Pay special attention to the instructions regarding safety.

Please visit our website www.dalboagro.com – where you can access the latest editions of the user manuals and spare part brochures across the entire product range.

We hope that you will be satisfied with your new DALBO **Trimax**.

Best Regards

Alessio Riulini, CEO

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Introduction and identification of serial number

Information

- This user manual is intended for the person who uses and maintains the stubble cultivator. It contains all items concerning safety, use and maintenance. It is very important that all users read and understand the user guide before starting to use the stubble cultivator.
- It is very important that anyone who is new to using the stubble cultivator is instructed in its correct use. This includes a review and a read-through of the user manual and starting operations in the field.
- If there are doubts regarding reading the user guide or concerning the general use and safety of the stubble cultivator, it is very important that you stop using it and contact your supplier or DALBO A/S.

Location of the user manual

The user manual can be found in a plastic case on the stubble cultivator. Remove the plastic case before starting the stubble cultivator and keep the user manual in a safe and accessible place for all users of the stubble cultivator.

Fig. 1



Location of the serial number

The type plate on TriMax is located in a central position within the triangular frame of the stubble cultivator.

The serial number of your stubble cultivator can also be found on page 2 in the user guide.

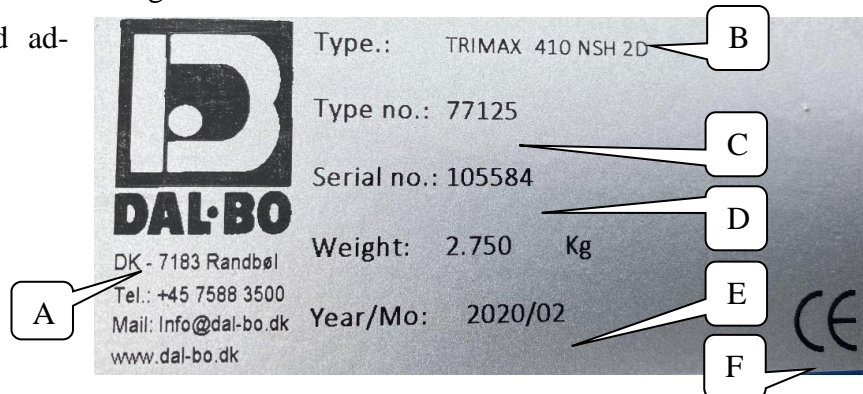
Fig. 2



The stubble cultivator comes equipped with a type plate. Below, a typical type plate is shown, containing the following data:

Fig. 3

- A: Name, manufacturer and address.
- B: Machine type.
- C: Type no.
- D: Serial number.
- E: Year of production.
- F: CE mark.



Warranty provision

By default, your TriMax is delivered with a 2-year warranty from the date of delivery. DALBO A/S shall bear no liability for damage caused by the improper use of the stubble cultivator.



Safety

You will see this symbol in the instruction manual each time advice is given about your safety, the safety of other users, or the functional safety of the machine. All safety instructions must be observed and made available to all users of the stubble cultivator.

In addition, the safety instructions provided by the tractor manufacturer must be followed.

If the stubble cultivator is used on a public road, the prevailing regulations apply.

Even though a broad range of risks have been mentioned here, it is impossible to foresee all eventualities, resulting from varying conditions under which the appliance might be operated. No amount of good advice can replace “common sense” and “paying attention” at any given time, but the instructions mentioned above are a great start to a safe and secure operation of your DALBO stubble cultivator.

General

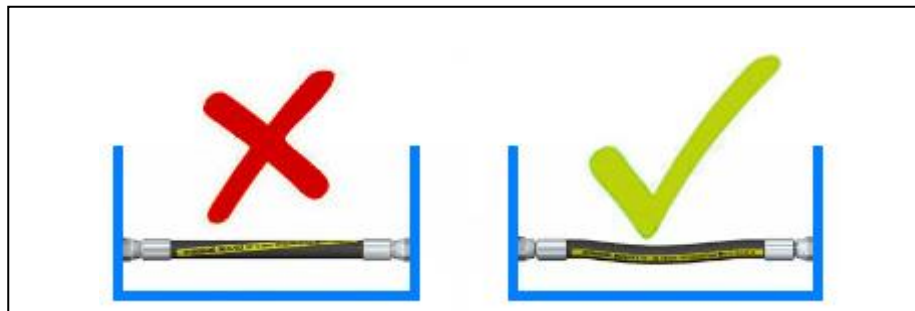
- Before using the stubble cultivator, the user must be familiar with all its parts.
- Safety labels have been placed on the machine. These contain important instructions about your own safety and that of others, as well as the correct use of the stubble cultivator.
- The stubble cultivator must not carry any passengers when it is being used and transported.
- When operating the stubble cultivator, ensure that there are no persons within the machine’s radius of action. The stubble cultivator may only be operated from inside the tractor.
- Before leaving the tractor, or if adjustments, maintenance or repairs need to be made to the stubble cultivator, the stubble cultivator shall be lowered to the ground, the tractor’s brake shall be applied, the engine shall be turned off and the ignition key shall be removed, in order to safeguard the stubble cultivator against unintentional start-up.
- When performing maintenance work on the stubble cultivator when it is in a raised position, the stubble cultivator must be secured with appropriate support structures.
- Remember to secure upper bar and any hoisting bars with cotter pins or bolts.

- Never leave the driver's seat while the stubble cultivator is in operation.
- The driving speed must always be adjusted according to the conditions.
- Only use the stubble cultivator if all safety devices have been mounted. Defective safety devices must be replaced immediately.

Hydraulics

- No persons may be positioned within the operational radius of the stubble cultivator when the hydraulic system has been activated, since there is a risk of being crushed.
- Prior to any repair work on the hydraulics unit, the stubble cultivator must be lowered to the ground, the pressure must be removed from the unit, the engine must be switched off and the ignition key must be removed.
- Hydraulic connections must be cleaned thoroughly before connecting. When connecting the hydraulic hoses to the tractor's hydraulics, ensure that the pressure has been removed from the hydraulic system.
- After repairs on the hydraulic system, all air must be bled from the system.
- Check the hydraulic hoses regularly for defects such as tears, cracks, wear, or damage. Defective hoses must be replaced immediately. Never try to localise a leak in the hydraulics using your hands. Use a piece of cardboard instead. Avoid twisting the fittings when changing hoses. Use 2 wrenches for tightening and loosening.

Fig. 4



- Avoid spilling oil on the ground. If oil is spilled, it should be removed and safely disposed of immediately.
- Clean hands thoroughly after skin contact with oil and grease. Remove oil-soaked clothing immediately, as this can be harmful to the skin.

- Hydraulic oil flowing out under high pressure can penetrate the skin and cause serious injury. Seek professional medical assistance immediately in the event of any injury.
- The warranty for hydraulic hoses is limited to the exchange of hoses due to defective materials or manufacturing defects. The warranty does not apply for: wear and tear, friction, cuts, or hoses that have been squeezed.

Mounting

- When mounting, there is a risk of crushing. Ensure that no person is positioned between the stubble cultivator and the parts of the tractor that are being connected.

Maintenance and repair

- The stubble cultivator must be properly supported or unfolded while undertaking all kinds of repair and maintenance work, the tractor and stubble cultivator must have their brakes properly activated, the engine must have been turned off and the ignition key removed.
- Tighten all screw connections after a few hours of use. All screw connections must be checked at regular intervals and tightened when necessary. Cotter pins and bolts should be checked to avoid breakdowns.
- Use only your own tools and use sturdy gloves, safety shoes and safety goggles.
- Oil, grease and filters must be disposed of in accordance with current environmental regulations.

Driving on roads

- When driving on public roads, all safety arrangements and warnings required by law must be fitted and tested. The driver is responsible for proper lighting and markings to comply with traffic regulations.
- With regard to the dimensions of the stubble cultivator, the driver must make enquiries with the traffic authorities to ensure that it can be transported on public roads.
- When transporting the stubble cultivator, care must be taken not to exceed the total weight and axle load of the tractor and that the load on the front axle is no less than 20 percent of the tractor's overall weight. If that is the case, use front weights on the tractor.

Correct use

- Correct use of the stubble cultivator entails compliance with the manufacturer's operating, maintenance and repair instructions, as well as the exclusive use of original spare parts.
- The stubble cultivator may only be used, maintained and repaired by people who are familiar with the machine and who are aware of the dangers that can arise.
- The manufacturer is not liable for damage caused by any modifications to the stubble cultivator, carried out without the manufacturer's prior permission. Furthermore, the manufacturer is not liable for any damage resulting from incorrect use. Responsibility for this rests solely with the user.
- No extra weight may be fitted to the stubble cultivator.

Technical data

Fig. 5.

TRIMAX 410	
Size (cm)	410
HK (recommended)	180
Gross weight kg:	3500
Number of tines	15
Number of discs	12
Number of T-rings	30
Additional equipment	
	NO

Fig 5A.

TRIMAX 520	
Size (cm)	520
HK (recommended)	300
Gross weight kg:	4000
Number of tines	19
Number of discs	14
Number of T-rings	36
Additional equipment	
	NO

Delivery

The stubble cultivator is delivered fully assembled, on a truck. For export purposes, the machine is sometimes partially disassembled.

If the stubble cultivator is to be lifted, we recommend hitching the machine with straps in the middle section to ensure that the stubble cultivator hangs in a balanced position.

How to read the instruction manual

It may be that the order of the topics described does not appear to be in a logical order. Reference is therefore made to the table of contents, where the titles for the relevant topics can be found.

The main points in the instruction manual are divided into key sections:

- Safety
- Start-up and operating
- Maintenance
- Repairs

The following symbols are used in the instruction manual for



Points that are especially important for the functionality as well as the lifetime of the stubble cultivator.



Points that are important to safety.

Use

TRIMAX is a heavy-duty stubble cultivator, used for the mulching of stubble and plant residue. Due to the large ground clearance and wide tine spacing, large amounts of plant material can be mulched.

Fig. 6



TRIMAX is designed in a way to ensure a complete cut, so that the growth of crops as well as weeds is interrupted. The shape of the tines causes soil and plant residue to be flung into the air and mixed in a uniform mass.

TRIMAX consists of a three-bullet harrow, with a row of angled discs mounted behind it, so that the discs even out and finely part the material just behind the tines of the harrow. At the very back is the drag harrow. It controls the working depth and at the same time it crushes the clods, packs the materials and evens out the layer. The drag harrow is equipped with 60 cm t-rings.

Benefits of using the TRIMAX

Benefits of the TRIMAX include:

- Precise setting of depth between 4 and 30 cm.
- **No** weight carrying wheels which may cause uneven packing in the field.
- Complete cut, reducing the need for further passes.
- Uniform mixing up of plant residue.
- Preserves the moisture in the soil.

TRIMAX is particularly suited for work on the upper layers of soil, containing the biggest turnover of plant materials. Therefore, TRIMAX is an efficient tool to include in a strategy for reduced soil treatment, since TRIMAX can provide a complete cut of the field with just a single pass, including a uniform mixing up of plant residue and microorganisms in the soil. In order to preserve the moisture in the soil and to optimise the micro-climate for the organisms in the soil, the soil treatment is finished with a tight packing step.

Limitations in use

The following describes what the machine may/must not be used for:

- The machine may only be used for levelling, compaction, and harrowing of cultivated agricultural areas. Those areas to be tilled must have been subject to normal agricultural maintenance, i.e. without significant bumps or holes.
- The machine may only be used after first being attached to an agricultural tractor, by way of connection to the rear 3-point hitch.
- The machine can work at a maximum speed of 12km/h. The speed shall, however, always be adjusted to the nature of the terrain.
- When undertaking a turn, the machine should be lifted from the ground to prevent unnecessary wear and tear.

Any other use of the machine, which does not fulfil the aforementioned conditions, will be considered unauthorised use, and will therefore be in breach of the manufacturer's warranty.

Preparation of the tractor

The ballast of the tractor

When mounting the appliance, it is absolutely necessary that the highest degree of stability between appliance and tractor is achieved – this can be ensured by using ballast, in order to counter-balance some of the weight of the mounted stubble cultivator.

Front weights

May be necessary when mounting appliances behind the tractor, in order to place some of the total weight of the appliance on the front axle. This ensures stable road transportation and reduces the “jumping” of the tractor during field work.

Factors which influence the stability

- The centre of gravity for the tractor/appliance/machine combination.
- The geometric conditions, such as the exact location of the appliance and the ballast.
- Weight, track width and the axle distance of the tractor.
- Acceleration, braking, turning and the relative location of the appliance during those manoeuvres.
- The nature of the terrain, is it hilly, what type of ground and the condition of the ground.
- The flexibility of the mounted appliance.
- Pay special attention to the fact that on articulated tractors the balance is shifted, according to the sharpness of a turn.

Suggestions for improved stability

- Increasing the track width; a tractor with a greater track width has more stability.
- Front weights.

NOTE: The suggestions mentioned above are purely for guidance purposes with regard to stability, they are not meant for guidance when it comes to the power of the tractor. It is recommended that you contact your tractor manufacturer or your local dealer for specific guidance regarding this. You should also contact a tyre specialist for advice regarding tyre pressure etc., so that all settings are compatible with the type of appliance that you wish to mount.

Connecting and disconnecting

Connecting

Fig. 7

The hoisting arms should be mounted first, followed by the top bar. The top bar is adjusted so that the frame is in a horizontal position, aligned with the driving direction.

The hoisting arms must be adjusted to an identical height and the tyre pressure in the rear wheels must be the same on either side.

The lift should stand in position control.



- Remember to secure where needed with a split pin or bolt

Hydraulicsconnection

On the TRIMAX, different hydraulic outlets on the tractor are necessary.

Fig. 8 Hose labels

Model	Outlet	Colour	Function
410 + 520	1 Double-acting DV	Red	Folding of side sections
410 + 520	1 Double-acting DV	Green	Depth control
410 + 520	1 Single acting EV	Black	3D stone control / tine control

Fig. 9

The hoses are marked in colours as sets with red and green, respectively.

The 3D stone control is adjusted hydraulically to the green area on the manometer.



Check that the hydraulic hoses have not been crushed.

Disconnecting

The TRIMAX must be disassembled in a folded-out state.

Fig. 10



Remember to release the pressure from the connecting hoses to the hydraulic system before disconnecting the hoses. (Hose marking, Red)

Fig. 11

The ball valve of the hydraulic stone release mechanism must also be closed.



Remember to release the pressure from the connecting hoses to the hydraulic system before disconnecting the hoses.

Place the TRIMAX on solid, level ground. Disassemble the top bar and hoisting arms.

Settings

TRIMAX is factory set at delivery, but fine tuning will always be necessary before putting it into operation. Several options for adjustment makes your TRIMAX more versatile and enables an optimised use of the stubble cultivator.

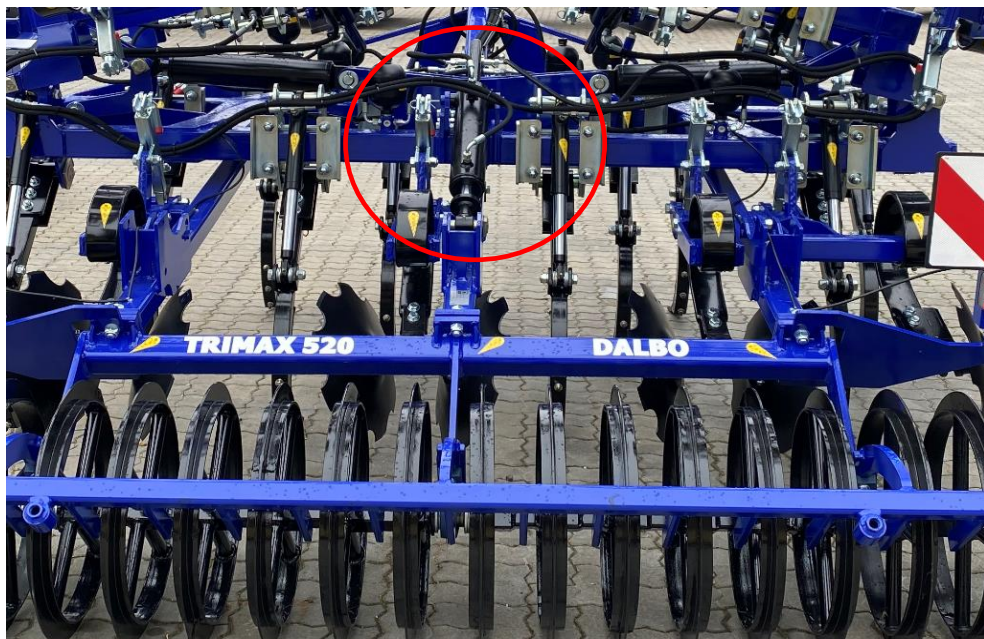
Depth

The working depth is controlled by the T-ring drag harrow positioned at the very back, as well as the lifting height setting at the front end. The setting of the working depth is made via the double-acting hydraulic functionality (Hose marking, Green). The working depth can be read in the LCD display of the *Dalbo Depth Control*.

Deeper soil cultivation

To change to a deeper setting, the T-ring drag harrow is pulled up via the double-acting hydraulic functionality (Hose marking, Green). The working depth can be read in the *Dalbo Depth Control* LCD display in the cabin. The length of the upper bar is adjusted, if necessary until the frame is horizontal.

Fig. 12



When changing the depth, it may be necessary to adjust the upper bar, as the frame should always be in a horizontal position.

More shallow soil cultivation

To change to a more shallow setting, the T-ring drag harrow is pulled up via the double-acting hydraulic functionality (Hose marking, Green). The working depth can be read in the *Dalbo Depth Control* LCD display in the cabin. The length of the upper bar is adjusted, if necessary until the frame is horizontal.



When changing the depth, it may be necessary to adjust the upper bar, as the frame should always be in a horizontal position.

Dalbo Depth Control

The working depth is controlled by the T-ring drag harrow positioned at the very back, as well as the lifting height setting at the front end. Setting the working depth "*Dalbo Depth Control*" is made via the double-acting hydraulic functionality (Hose marking, Green). The working depth can be read in the LCD display in the cabin, or, alternatively, the mechanical depth scale mounted close to the hydraulic cylinder.

Fig. 13

Dalbo Depth Control provides a clear overview of the task at hand, regardless of the conditions in terms of light and dust. Strongly improved ergonomics for the driver and increased uniformity in the soil cultivation.

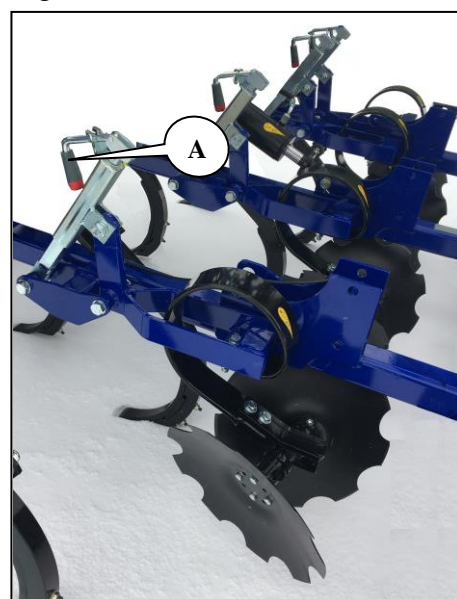


When changing the depth, it may be necessary to adjust the upper bar, as the frame should always be in a horizontal position.

Depth adjustment of the discs

The correct adjustment of the discs leaves behind a plain field without visible traces from the harrow tines. The fine-tuning of the discs is made using the spindle (A) and cannot be done before TRIMAX is actually in the field. The discs are adjusted for work in the surface, so that an adequate amount of soil is thrown back towards the harrow tine. This can be applied up onto a certain speed, depending on the soil conditions.

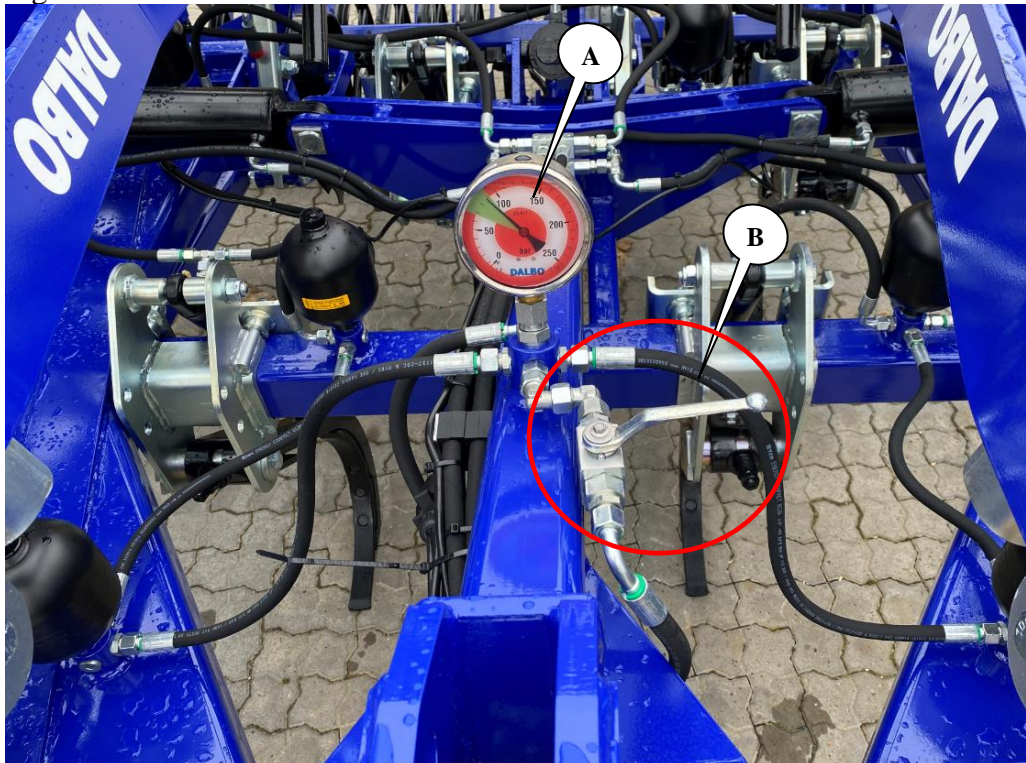
Fig. 14



Hydraulic 3D stone release

The working pressure is adjusted to around 70 bar = green area on the manometer (A). The actual pressure can be controlled continuously on the manometer (A). After the adjustments have been made, shut the ball valve (B) and the hydraulic hose can be disconnected from the tractor. If the ball valve is not shut, the oil will slowly seep back to the tractor and the pressure on the installation will fall, since the outlet on the tractor is not completely sealed.

Fig. 15



Driving and operation

Proper operation is important in order to get optimal performance from your TRIMAX. This applies to both work in the field and in terms of safety. It is therefore crucial that you have thoroughly read the safety precautions covering the stubble cultivator.

For best results, it is recommended to drive slightly at an angle to the sowing direction.

TRIMAX must be set so that it is carried by the drag harrow. The handle of the tractor lift must be lowered when driving in the field, so that the lift will float and can move according to the terrain (position control). The depth will then be controlled by the drag harrow in the back and by the top link at the front.

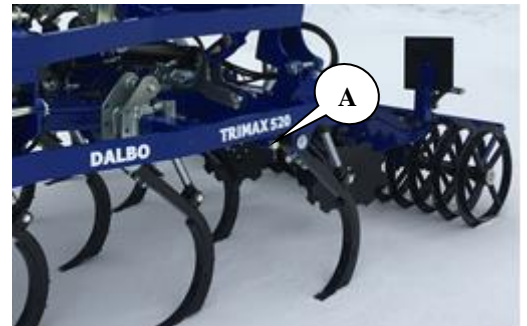
When changing the depth, it may be necessary to adjust the discs. The discs are supposed to work in the surface, but not to do any actual soil conditioning, apart from levelling out the surface after the tines, so that an adequate amount of soil is thrown back towards the harrow tine.

Unfolding and folding

Activate the hoses marked with red markings. The side wings are fully unfolded.

If, after this, the stubble cultivator is not horizontal, the full extent of the unfolding can be adjusted individually for each wing on adjustment bolt A.

Fig. 16



Folding out and folding in must always be performed with the tractor in a parked position and on level ground.

Never stand in the moving radius of the machine while the side wings are being folded or unfolded.

Driving speed

In order to achieve an optimised cultivation of the soil, a speed between 8 and 12 km/h is required. **However, always operate the machine according to conditions.**

We are obliged to inform you, that wear and tear will increase significantly as the speed is increased. There is a risk of loss and damage to blades when driving at too high a speed under unfavourable conditions.



At a high driving speed, especially with dry conditions, the wear and tear on the tines will increase significantly.

Troubleshooting

Fig. 17

Problem	Cause	Fixing
The harrow tracks are not covered properly	Discs adjusted wrongly	The discs are adjusted for work in the surface, so that an adequate amount of soil is thrown back towards the harrow tine
	Length of the top link adjusted wrongly	Adjust top link so that the middle section is horizontal, lengthwise
One of the outermost side sections are pressing too much/not pressing enough	End stop for side section incorrectly adjusted	The end stop can be adjusted individually for each wing on the adjustment bolt. The stubble cultivator must be horizontal, both lengthwise and widthwise
Excessive wear and tear on the harrow tines	The driving speed has not been adjusted to the conditions	Normally, a working speed between 8 and 12 km/h is appropriate. However, driving should always be done according to conditions. Wear and tear will increase significantly as the speed is increased
	Driving speed too high with dry conditions	At a high driving speed, especially with dry conditions, the wear and tear on the tines will increase significantly
The harrow tines deviate too easily	The accumulator pressure in the 3D stone control is too low	Working pressure around 70 bar = green area on the manometer. After the adjustments have been made, shut the ball valve and the hydraulic hose can be disconnected from the tractor. If the ball valve is not shut, the oil will slowly seep back to the tractor and the pressure on the installation may start to drop
Harrow tines do NOT deviate, even if they come across large stones	The accumulator pressure in the 3D stone control is too high	The manometer may NOT be in the red area. Working pressure around 70 bar = green area on the manometer. After the adjustments have been made, shut the ball valve and the hydraulic hose can be disconnected from the tractor. If the ball valve is not shut, the oil will slowly seep back to the tractor and the pressure on the installation may start to drop
Tractor cannot be controlled in the headland	The stubble cultivator may NOT be in the ground during turns	Always make sure to lift the stubble cultivator, when performing turns in the headland.

Maintenance

Good maintenance ensures a long life for the TRIMAX and therefore optimal use from the stubble cultivator. Grease nipples have therefore been fitted in places where the wear is greatest.



All screw connections must be tightened after the first day of work. Cotter pins and bolts should be checked to avoid breakdowns. The hydraulic system should also be checked to ensure it is air-tight.



All maintenance and repair work on TRIMAX must be conducted only when the machine is lowered to the ground or, is set in transport mode, the tractor has the brake on, the engine is switched off and the ignition key is removed, so that the machine is secured and crushing accidents are prevented.

Lubrication

Fig. 18

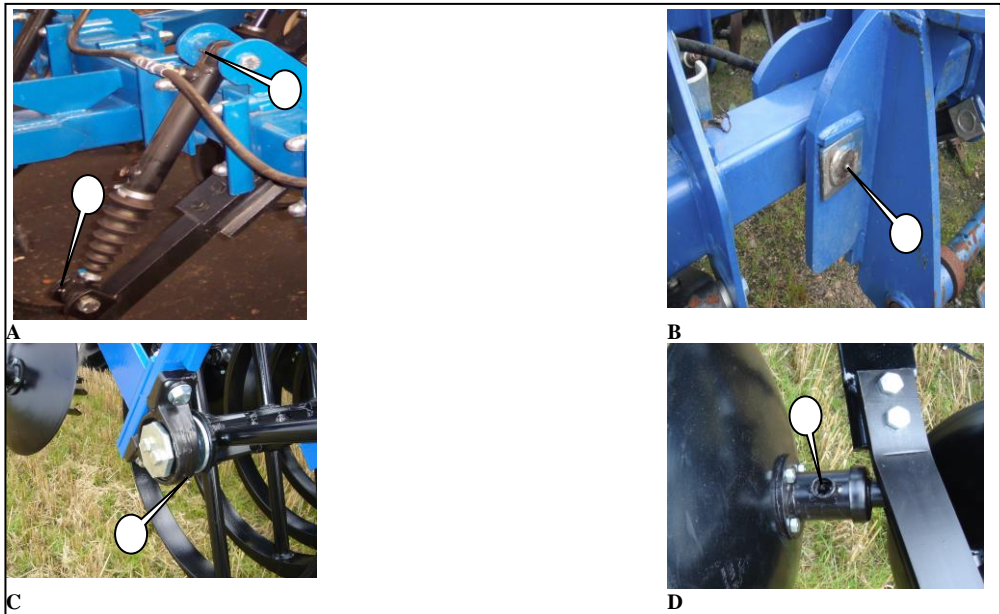


Fig. 19

Lubrication points	Lubrication interval hours	Images
Tine	8	A
Frame	8	B
Dry harrow bearings	50	C
Disc bearings	50	D



All lubrication points should be greased at least once a year and after washing.

Hydraulics



All hydraulic hoses must be checked for wear, tear and breakage. Ensure the hoses are not subjected to any crushing.



If left parked for longer periods of time, protruding piston rods on the cylinders should be greased with oil or pressure grease in order to avoid the build-up of rust on the piston rods. Remember to remove it again before use.

Disc pivot

The disc pivots should be tightened once a year or as needed.

1. The disc is removed.
2. The split in the pivot nut is removed.
3. The pivot nut is tightened a quarter of a turn or until there is no more deviation in the pivot.

Fig. 20



Wear parts. Tines

The tips of the tines on the TRIMAX can be turned around and this must be done before there is any wear and tear on the console onto which the tines are clamped.

The tips of the tines must be replaced once the wear and tear is significant enough to cause the result of the fieldwork to be unsatisfactory or before any wear and tear on the console can be detected.

Always make sure to use original spare parts from Dalbo A/S

Replacement and repairs



Safety is crucial in regard to all repair work on the TRIMAX. Therefore, the following points must always be observed as well as the points under safety first in the instruction manual.



All maintenance and repair work on the TRIMAX must be carried out only when the stubble cultivator is lowered to the ground, the tractor has the brake on, the engine is switched off and the ignition key is removed, so that the stubble cultivator cannot move or start accidentally.



For all repair work on the hydraulics, always pay close attention to safety. Before the work is started, release the pressure from the hydraulics system.



When replacing cylinders, the cylinder must always be filled with oil before it is subjected to load. It is therefore recommended that you mount the cylinder in the fixed part of the frame first, after which the cylinder is filled with oil and then mounted in the counterpart.



Once the repair work on the hydraulics system is complete, the system must always be vented before use to prevent mechanical breakdown and/or personal injury.

Hydraulics

Unfolding and folding of side sections. Changing the cylinder

Any repairs must be carried out with the TRIMAX unfolded and resting on the ground.

1. The pressure is removed from the cylinders. The hoses are removed.
2. Cotter pins and pins are removed, and then the cylinder is free.
3. The new or repaired cylinder is fitted. Remember to secure the pin's engagement in the pin stop, and secure the pins with cotter pins.
4. Hoses are fitted. After installation, ensure that there is no risk of tearing or clamping the hoses.

Fig. 21



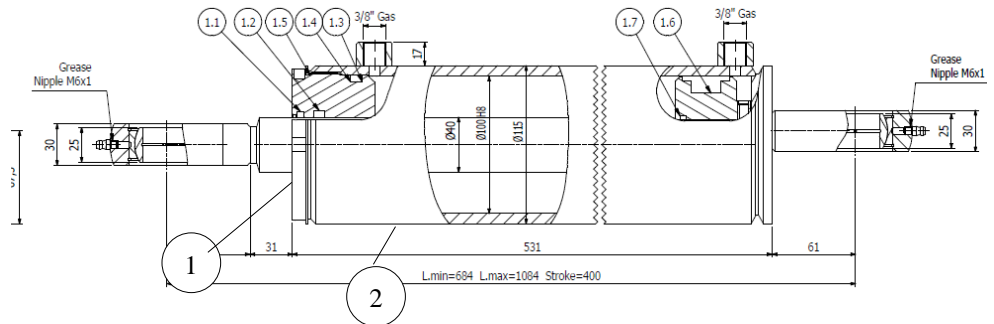
After mounting, the cylinders are activated for unfolding and folding until a small amount of movement can be felt in the cylinders. The cylinders are then activated in the opposite direction until the cylinders are back in the starting position. The cylinders are moved in this way a few times.



Never stand within the operating radius of the machine.

Unfolding and folding of side sections. Replace gaskets

Fig. 22



1. The cylinder (part no. 33249) is emptied of oil by carefully moving the piston back and forth.
2. Move the piston to the middle position, then unscrew the upper cap (pos. 1) from the cylinder tube (pos. 2). A special tool must be used to remove the cap. If the cap is stuck, it may help to warm up the front of the cap. When the cap is unscrewed from the cylinder tube, pull the piston towards the cap. The piston rod can then be removed from the cylinder tube (pos. 2).
3. The gaskets in the cap (pos. 1) as well as the piston are removed.
4. All parts are cleaned and checked for chips, burrs etc. Check for rust around the scraper ring in the cap (pos. 1). If this is the case, remove it.

Mounting

1. New gaskets are mounted in the cap (pos. 1) and the piston.
2. The thread on the cap (pos. 1) and the cylinder tube (pos. 2) is lubricated with oil or grease.
3. The cap (pos. 1) is mounted on the piston rod.
4. The piston is mounted and the locking nut is screwed on and **secured with Loctite**. Make sure the thread is absolutely clean and free of oil and other impurities before using Loctite. **Do not fill with oil within 12 hours of using Loctite.**
5. Lubricate the outermost gasket on the piston that comes in contact with the cylinder tube and the cylinder tube internally with oil and push the piston into the middle position.
6. The cap (pos. 1) is fitted on the cylinder tube (pos. 2) and tightened.
7. The cylinder is fitted.
8. The hoses are fitted. Make sure that the hoses are not being squeezed and that the connections are tight.

Hydraulic 3D stone release. Changing the hose

The system is made **pressure free** by connecting the system to the single working outlet of the tractor. Next, the ball valve is opened and the outlet of the tractor is put in floating position. The defect hose can now be removed and you can mount a new one.

Hydraulic 3D stone release. Changing the cylinder

Fig. 23

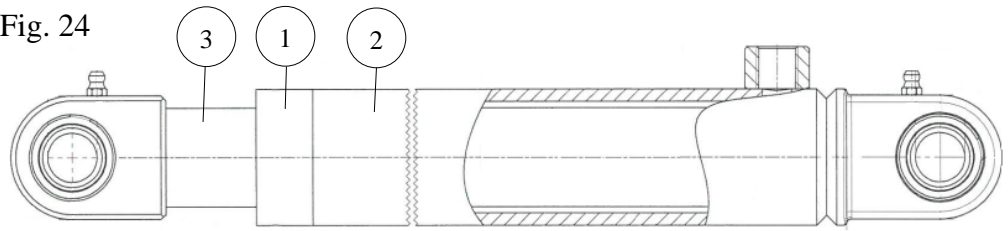
The TRIMAX is supported according to the instructions, with the tines just barely lifted from the ground.

1. The pressure is removed from the stone release system.
2. The hoses are removed.
3. Fasteners and cotter pins are removed.
4. A new cylinder, fasteners and cotter pins are mounted.
5. Hoses are fitted.



Hydraulic 3D stone release. Replace gaskets

Fig. 24



DISMANTLING:

1. The cylinder (part no. 77963) is emptied of oil by carefully moving the piston (pos. 3) back.
2. Move the piston (pos. 3) to the middle position, then unscrew the end cap (pos. 1) from the cylinder tube (pos. 2). A special tool must be used to remove the cap. If the cap (pos. 1) is stuck, it may help to slightly warm up the front of the valve. When the cap (pos. 1) is unscrewed from the cylinder tube (pos. 2), pull the piston rod (pos. 3) out of the cylinder tube (pos. 2).
3. The piston (pos. 3) is pulled back out of the cap (pos. 1), and next the gasket set in the cap can be accessed (pos. 1).
4. The gaskets are removed.
5. All parts are cleaned and checked for chips, burrs etc. Check for rust around the scraper ring in the cap (pos. 1). If this is the case, remove it. Also, the piston rod (pos. 3) must be completely clean.

MOUNTING:

1. New gaskets are mounted in the cap (pos. 1) and the piston rod (pos. 3).
2. The thread on the cap (pos. 1) and the cylinder tube (pos. 3) is lubricated with hydraulic oil to ease the mounting.
3. The cap (pos. 1) is mounted with the piston rod (pos. 3) by pushing the piston rod through the cap.
4. Grease the cylinder tube (pos. 2) with hydraulic oil on the inside and push the piston rod (pos. 3) into the middle position.
5. Screw on the cap (pos. 1) and tighten. A special tool must be used to remove the cap.
6. The cylinder is fitted. The hoses are fitted. Make sure that the hoses are not being squeezed and that the connections are tight.

T-ring drag harrow cylinder. Changing the cylinder

Fig. 25



DISMANTLING:

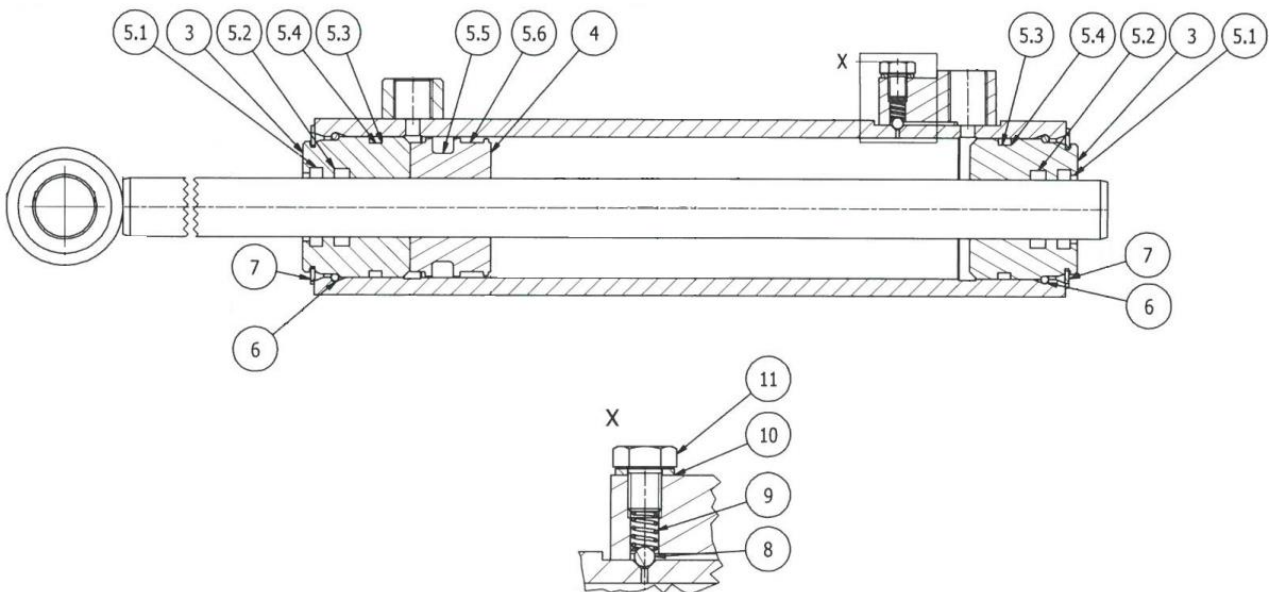
1. The T-ring drag harrow is placed on even ground.
2. The hydraulic pressure is removed from the cylinders.
3. The hoses are removed.
4. Fasteners, bolts and cotter pins are removed.
5. The cylinders are removed.

MOUNTING:

1. The new cylinder is fitted.
2. Fasteners, bolts and cotter pins are fitted.
3. Hoses are fitted.
4. Apply hydraulic pressure carefully, and drive the cylinder to the extreme position in both directions a couple of times to synchronize the three cylinders.

T-ring drag harrow cylinder. Replace gaskets

Fig. 26

**DISMANTLING:**

1. Empty the cylinder of oil, (if necessary, use compressed air to move the piston back and forth to push the hydraulic oil out).
2. Drive the piston to the centre position. Locking ring (pos. 7) is removed from the head at both ends. Push in the head a little, and the locking ring (pos. 6) can be removed.
3. Now, the head can be pushed out at both ends by pushing the piston rod.
4. The piston rod is pulled out entirely, and all gaskets can be accessed.
5. The gaskets are removed, (if required, use an awl or screwdriver).
6. All parts are cleaned and checked for chips, burrs, etc.

MOUNTING:

1. New gaskets are mounted.
2. Piston rod is installed together with one cap. It is pushed in far enough so that the locking ring (pos. 6) can be installed.
3. The other head is installed and is pushed in far enough so that the locking ring (pos. 6) can be installed.
4. Carefully, start putting some pressure on in one direction, so that the head protrudes enough for the locking ring to lock (pos. 7). Then, do the same in the other direction.
5. All cylinders are driven into stop both ways, in order to synchronise via the valve (pos. 8-9-10-11).

Replacement of shaft, bearings and T-rings

TRIMAX is lowered onto the ground. Support for the dry harrow is established, if required.



Pay attention to unintentional rolling when the bolts in the bearings are removed.

- 1 The bolts in the bearings are removed.
- 2 The shaft with the T-rings can be rolled away from the frame.
- 3 Remove the crown nut at the shaft end together with the pinol screws in the bearings.
- 4 The T-ring can now be pulled off the shaft.
- 5 Mounting is carried out in reverse order.
- 6 Apply Loctite glue to the pinol screws

Fig. 27



Changing the tips of tines



TRIMAX must be securely supported so there is no risk of crushing or collapse

The tine tips (A) can be turned around and are bolted into place using three bolts. The tips must be turned or exchanged before any kind of wear and tear is detected on the stalk onto which the tip is bolted.

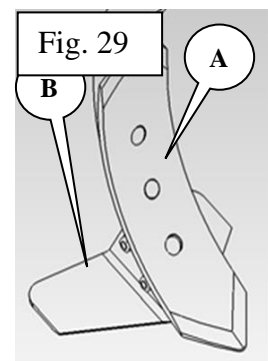
When turning tips, the old bolts can be used, but when tips are exchanged, new bolts must be used. Any residual soil residue squeezed between stalk and the worn part must be removed.

Fig. 28



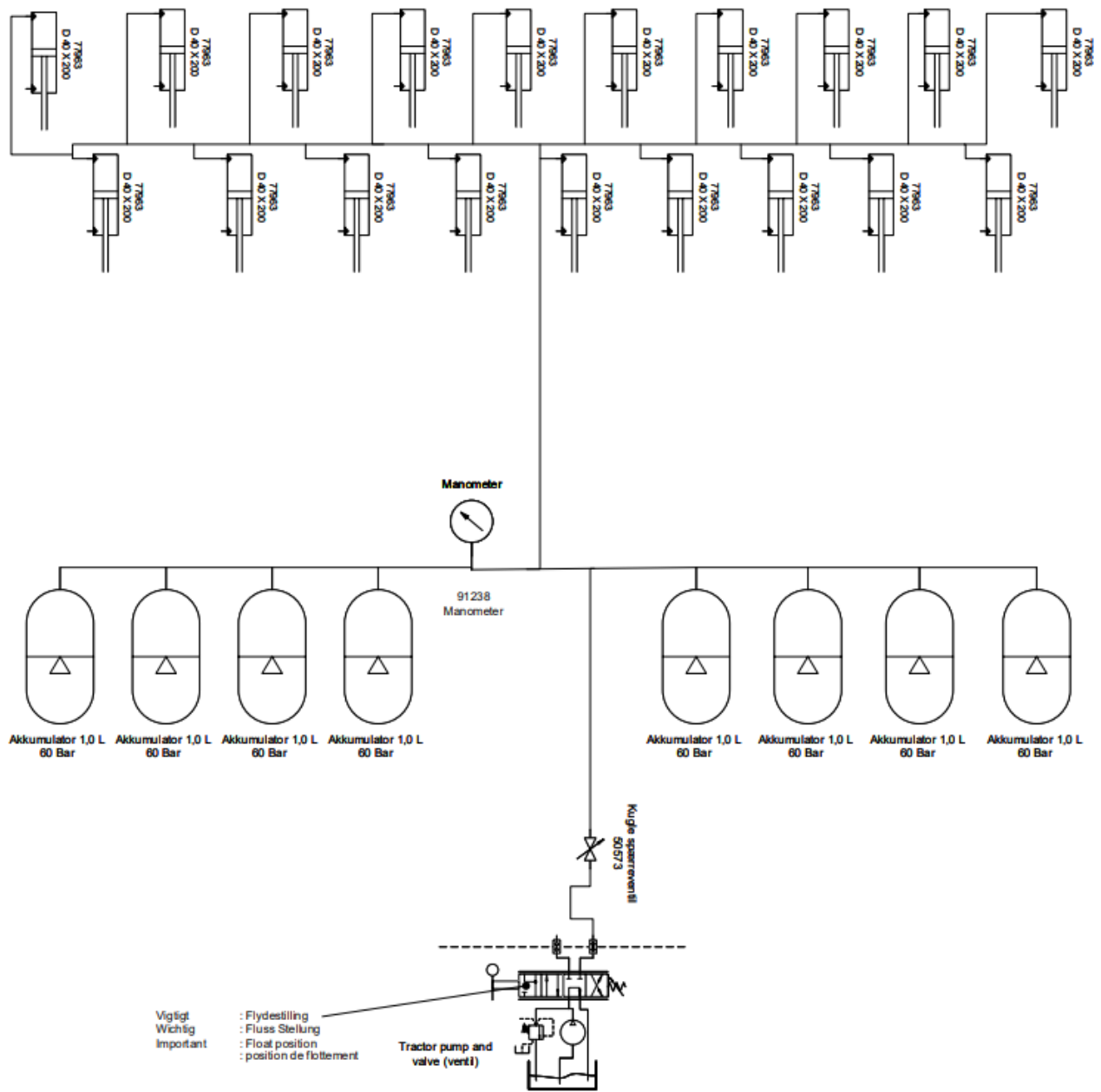
- **12x90 mm plough bolt Size. 10.9 for the fixation of the tip**

It is possible to purchase a “goosefoot” (B). It is mounted under the standard tine tip (A).



Diagrams

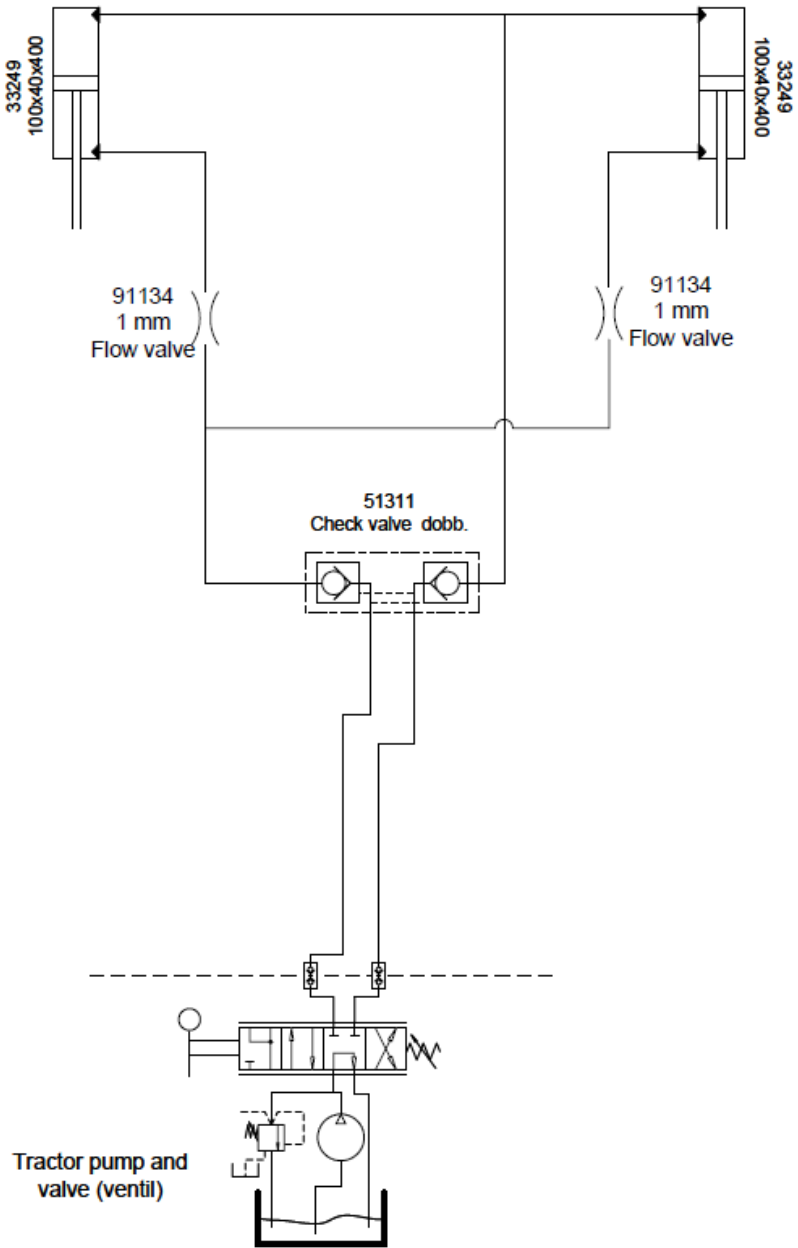
Hydraulic 3D stone release



NSH stone protection

Hydraulic hose marked with BLACK

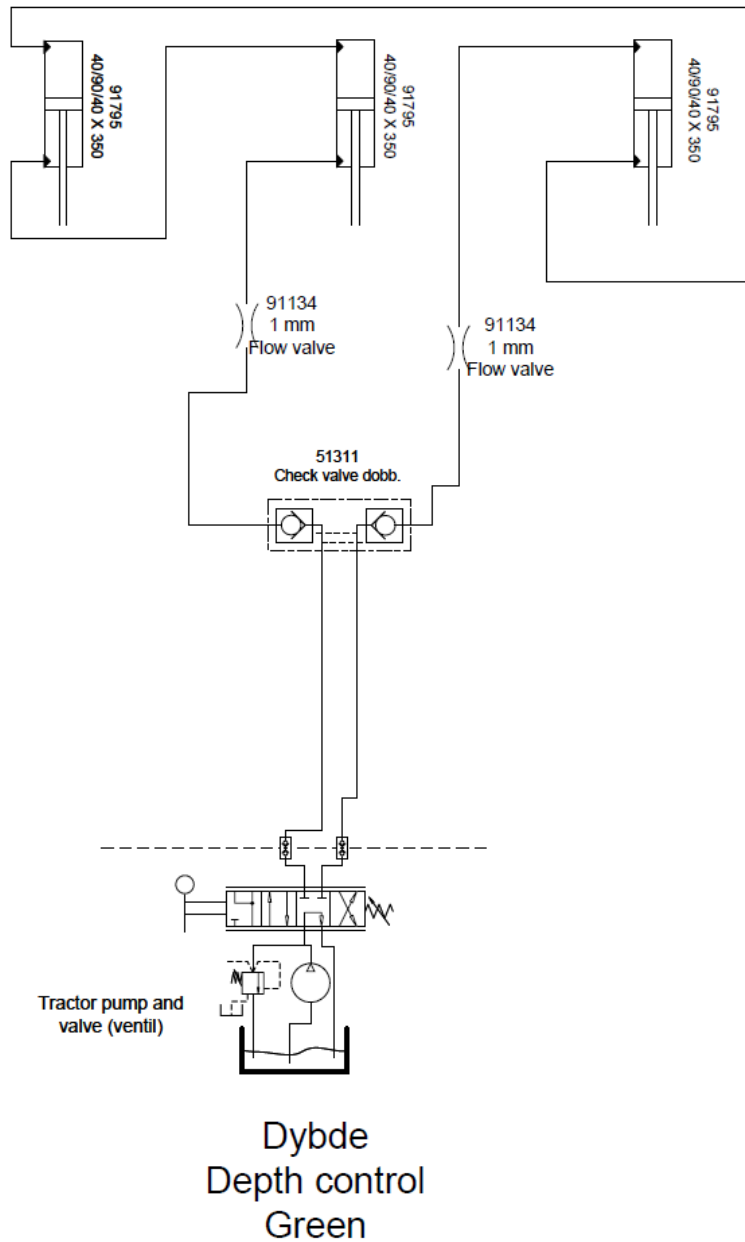
Side Wings



Klap
Folding
Red

The hydraulic hose marked with RED

T-ring drag harrow



The hydraulic hose marked with GREEN

Disposal

The pressure must be taken off the hydraulic system.



When mounting/dismounting, attention should be directed towards the weight on the part in question. It is therefore important that this part is supported or braced, so that there is no risk of collapse.

Hydraulic hoses and cylinders must be disconnected and any residual oil removed. The oil must be collected to avoid pollution. Oil and hoses must be dispatched for disposal.

All iron parts to the machinery can be sent for recycling.

Spare parts notes
