DALBO®

DINCO

GB
260/300/380 cm.
380/470/560 cm. hydraulic
Serial no. 2930-xxxx

MADE IN DENMARK

DALBO DINCO

Type 260, 300, 380, 470 and 560 cm.

Congratulations on your new DINCO cultivator. For **safety reasons** and for optimal use of the machine, please read the following instructions carefully **before putting the machine into operation.**

Items which are important as regards safety are preceded by a ∇

∇ Tighten up all nuts and bolts after a few hours of use.

∇ Do not operate unless seated on the tractor, or with people on or in the immediate vicinity of the machine.

∇ Do not allow children to operate the machine.

∇ When driving on public road, the DINCO must be fixed in transport position.

∇ The driver is responsible for compliance with the existing Road Traffic Act concerning lights and marking.

Your DINCO has:

Serial number: _____ Type description: _____
Month of manufacture: _____ Net weight (kg.): _____

On applications concerning spare parts or service please state serial number. At the back of this manual you will find a list of spare parts to help you get an overview of the components of the machine.

EU-CONFORMITY DECLARATION

DALBO A/S
DK-7183 Randbøl

hereby declares that the above mentioned machine has been manufactured in conformity with the provisions of the 2006/42/EC-directive, which replaces the 98/37/EC-directive and the 91/368/EEC-, 93/44/EEC- and 93/68/EEC-amendments concerning the harmonisation of Member States' legislation on machinery concerning safety and health requirements for the construction and manufacture of machinery.

CE

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

DALBO A/S Date: _____

Carsten Jensen, CEO

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Employment

DINCO is a heavy-duty cultivator, which has been designed to work down stubble and crop residues. Owing to the large ground clearance and the distance between the tines great amounts of crop residues can be worked down.

DINCO has been designed to obtain complete cutting by which the growth of both crop and weeds is stopped. The shape of the tines causes the top soil and crop residues to be thrown in the air and mixed into a homogeneous mass.

DINCO consists of a harrow with two rows of tines to which an arm with inclined discs has been mounted to level the tracks after the cultivating tines. At the very back you will find the rear roller which is used to control the working depth and to crush clods and level the surface. The rear roller comes as a packer roller or with 60 cm. t-rings.

As extras a 400 mm. crumbler can be fitted behind the compulsory rear roller. Moreover, a seeddrill can be fitted to the DINCO for direct sowing of catch crops.

Advantages of using DINCO

The advantages of DINCO are:

- Exact adjustment of working depth between 4-20 cm.
- **No** supporting wheels causing compaction in the field.
- Complete cutting thus making less drives in the field necessary.
- Homogeneous mixing of crop residues.
- Keeps the soil moist.

DINCO is particularly suitable for working in the topsoil where the majority of plant transformation takes place. For that reason DINCO is an effective tool in a minimum tillage-strategy as DINCO with only one drive provides a complete cutting of the field and a homogeneous mixing of crop residues and micro-organisms in the soil. To keep the soil moist and thereby optimise the microclimate for the organisms, the working of the soil is completed by a packing.

∇ DINCO is only to be used in ordinary field work. DINCO should **not** be used in deforestation or the breaking up of old roads, paving stones or the like. If in doubt, please contact your DINCO-agent or DALBO.

∇ DINCO is not to be used as a crane, a pile driver, a hydraulic press or the like.

∇ When operating the DINCO you must be seated on the tractor.

∇ Persons are not to stay on the DINCO while driving.

- When using DINCO on stony soil some noise may be experienced. However, the level of noise is far below the danger level for the tractor driver.

- Dust formation may arise when driving under very dry conditions. It is therefore recommended that doors and windows of the tractor are kept closed while driving or that a dust mask is used.

Connecting and disconnecting

DINCO is constructed according to the DS/ISO 730-1 category II and III. If the lift construction on the tractor is not designed for this, please contact your Dal-bo agent.

Connecting

First mount the lift arm with the lift pins. Then mount the levelling bar. Adjust the levelling bar so that the frame is in a horizontal position.

∇ Please remember to secure the lift arms and the levelling bar connections with split pins.

Hydraulics

Depending on the type of DINCO different requirements for hydraulic services on the tractor are necessary.

- Hydraulically folding models require a double-acting service.
- Models with NSH require a single-acting service (**NSH=Non Stop Hydraulic**). (Hydraulically folding models with NSH require only double-acting service as the hydraulic hose for NSH can be dismounted after adjusting (see "Adjustment"), whereupon hoses for folding and unfolding can be connected to the double-acting service).

Connect the hydraulic hoses to the double/single-acting 1/2´´ socket situated near the lift.

Disconnecting

Disconnecting is done in reverse order than connecting. **Please remember to ease the pressure on the connection hose before the hydraulic hose is disconnected.** Furthermore the ball plug valve for hydraulic stone releasers should be closed (see fig. 4).

Handling without three-point hitches

If moving DINCO without the use of three-point hitches, it is recommended to use straps in the main frame to keep DINCO in balance.

Total weight of the DINCO (kg.)

Type	260 cm.	300 cm.	380 cm.	380 cm. H	470 cm. H	560 cm. H
D	1165	1250	1510	2025	2285	2575
NSH	1165	1250	1510	2025	2285	2575

H=Hydraulically folding
NSH=Non Stop Hydraulic (see fig. 8)
D=Shear bolt for stone release (see fig. 9)

Adjustment

DINCO has been adjusted from the manufacturer. A fine adjustment is, however, always necessary before putting the machine into use. Several possible adjustments make your DINCO more versatile thus making the optimal utilisation of the machine possible.

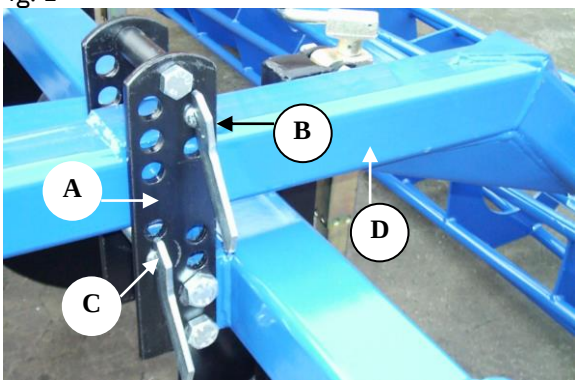
Adjustment of depth

Cultivation depth is controlled by the rear roller in the form of a packer roller or a t-ring rear roller.

The working depth of the tines is adjusted with pegs in the hole plate (A). The upper peg (B) determines the working depth while the lower peg (C) is a supporting peg, which carries the rear roller when the implement is lifted.

When changing working depth it may be necessary to readjust the levelling bar as the frame should always be level during operation.

Fig. 1



Deeper tillage

Deeper tillage can be obtained by lifting the implement from the ground so the lift arm (D) does not press against the upper peg (B). In that way the peg can be removed from the hole plate and be placed in a higher hole. The lower peg (C) is similarly moved up so that the support is as close to the lift arm (D) as possible.

When DINCO has been adjusted to deeper tillage it may be necessary to drive the tines in the soil for a while (or support the rear roller) in order to add pressure to the rear roller. After this the lower peg (C) can easily be fitted in to the hole closest to the lift arm (D).

Level tillage
More level tillage can be obtained by moving the pegs down. By this the cultivating frame and thereby the tines are lifted to a more level tillage. It may be necessary to drive the cultivating tines in the soil in order to loosen the lower peg (C, fig. 1). After having placed the lower peg (C) in a lower hole DINCO must be lifted and the upper peg (B) placed as close to the lift arm (D) as possible.

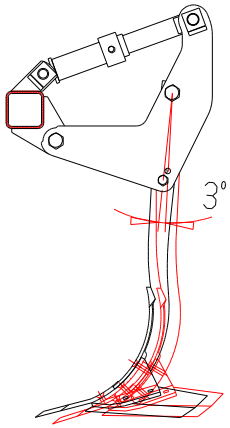
Depth adjustment of discs
The correct adjustment of the discs leaves the field level with no visible traces of the harrow tines. Fine adjustment of the discs is done with the spindle (A) and not until actually in the field. Discs must be adjusted to work the top soil, so that a suitable quantity of earth is thrown back after the harrow tine.

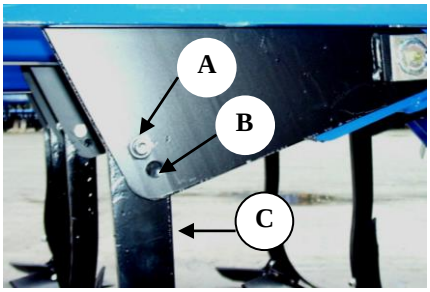
Fig. 2

The angle of the tine

Adjusting the penetration angle in two different positions (A, B) makes it possible to have a soil-searching tine all the time. From the manufacturer the shank (C) is set in its most soil-searching position in the back hole (A).

Fig. 3



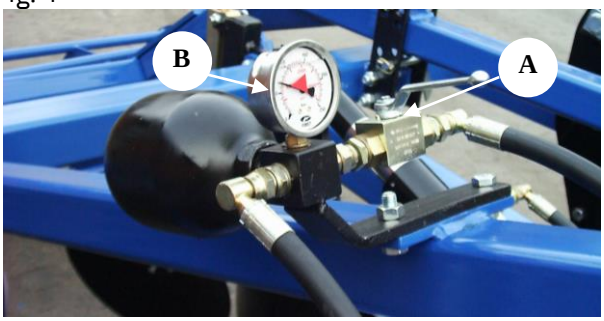


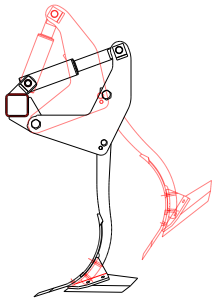
On dry and hard soil use the most soil-searching/aggressive adjustment (A, fig. 3). On light and moist soil use the front hole (B). Due to wear and tractive force the penetration angle should not be larger than necessary to obtain a satisfactory outcome.

Non Stop Hydraulic (NSH)

NSH-models are designed with hydraulic stone releasers. Adjust working pressure by connecting the hydraulic hose to the single-acting service on the tractor. Then open the shut off valve (A). During adjustment the pressure can be read on the manometer (B) at all times. When adjustment is done close the shut off valve and the hydraulic hose can be disconnected from the tractor. If the shut off valve is not closed, oil will slowly ooze back to the tractor and pressure on the system will fall.

Fig. 4





∇ The NSH-system should only be pressurised to max. 100 bar due to the danger of overloading the implement and the tractor.

Accumulator

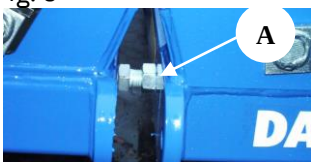
DINCO with NSH-system is equipped with an accumulator which functions as a buffer for releasing tines and enables the hydraulic stone releaser to get rid of excessive oil. The accumulator is set at 60 bar which means that it works its best at a system pressure of 70 bar, at which level the container begins to fill up.

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.

Hydraulically folding models

On hydraulically folding models adjust the side sections with the bolts (A) so that the frames on the side sections and the main frame are level (An adjustment bolt can be found on each side of the main frame).

Fig. 5



Driving and operating

The right operation is important to obtain the optimal utilisation of your DINCO.
This applies to fieldwork as well as security.

∇ **Each day before work is started check that no nuts or bolts are loose and that all splits pins are intact.**

∇ **When turning or reversing DINCO should be lifted.**

∇ **No extra weight should be mounted on the DINCO as the implement is not designed for it.**

∇ **When unfolding no persons are allowed within the radius of action of the implement.**

∇ **When driving on public road the hydraulically folding model should be fixed in transport position.**

∇ **During transport any side discs should be folded.**

The shares give a heavy cultivation. Despite the heavy cultivation the field should be left even and with no banks of any kind. This requires a correct adjustment of the implement (see "Adjustment" page 6).

Working depth

DINCO can be adjusted to very light tillage in a depth of 4 to 5 cm. This is possible only because the shape of the tine leaves the field level and completely cut.

Fig. 6

DINCO should be adjusted so that it is carried by the rear roller. The handle for the tractor lift must be lowered completely when driving in the field so that the lift is floating and can move with the terrain. The cultivation depth will thus be controlled by the rear roller in the back and by the levelling bar in the front.

When changing the working depth a readjustment of the discs is necessary. The discs are designed to work in the topsoil, however, they do not perform any real tillage except levelling out the field after the tines, so that a suitable quantity of earth is thrown back after the harrow tine.

On the models for the German market side discs for levelling the outside of the outermost tine are standard equipment whereas models for other markets are equipped with covering discs on the outermost tines. Side discs are therefore considered extras on markets other than the German (see "Extras, Side discs").

Folding and unfolding

There is no transport lock on the folding models as the side sections move right in over the main frame where they will rest on the supporting structure (A).

Unfolding is done by activating the hydraulic handle in the unfolding position. It is important that the side sections are completely unfolded and press against the adjustment bolts (fig. 5) as the main frame and the side sections should be a rigid unit.

Fig. 7

∇ Before folding the 380-model any side discs must be folded to avoid collision.

Speed

To obtain optimal tillage a working speed of 6-7 mph (10-12 kph) is recommended. **However, one should always drive according to conditions.**

Please note that wear is heavily increased when speed is increased. Shares may be lost or damaged when driving to fast under unfavourable conditions.

When driving at high speed - especially under dry conditions - wear on the tines will increase considerably.

Power

DINCO is a power-demanding implement and it is recommended to have a tractor with a sufficient power surplus so that working speed can be maintained when driving uphill. In this way the field gets a uniform treatment which may be important later on.

Power requirements (HP/KW)

Working width	260 cm.	300 cm.	380 cm.	470 cm.	560 cm.
Power	90/66	100/74	120/88	155/114	190/140

Power requirements depend on type of soil, terrain, working depth and speed

Hydraulic stone breakaway

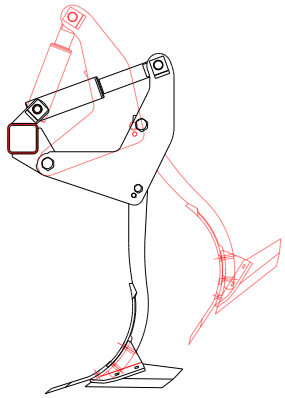


Fig. 8

NSH-models are designed with hydraulic stone breakaway – an advantage when driving under very stony soil conditions. When hitting a buried stone the tine concerned will breakaway so that the stone can pass through the cultivator. When the stone has passed the tine will automatically swing back to working position with no stops necessary.

Under normal conditions a system pressure of 60 bar is recommended, however, in extreme cases if the soil is very hard the system pressure can be increased to max. 100 bar.

System pressure above 100 bar is NOT recommended as a too heavy filling of the accumulator will be the result and consequently the tines will not breakaway sufficiently.

Mechanical stone breakaway

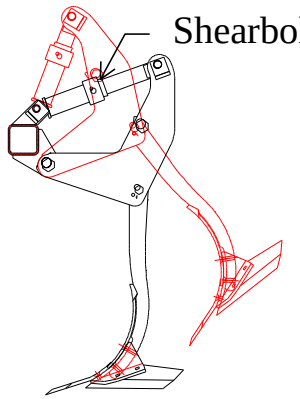


Fig. 9

The standard model D is designed with mechanical stone breakaway in the form of shearbolts, but can easily be converted to hydraulic stone breakaway (NSH) (see *"Replacement and Repairs"*).

Tine overload protection by means of shearbolts is used in fields with only few buried stones. When hitting a buried stone the bolt will shear off and the tine break back. In this way the stone can pass through the cultivator without overloading the implement or the tractor.

It is necessary to stop the tractor and change the shearbolt. Remove the broken shearbolt and tip the tine back into place and fit a new bolt 16x80mm.

Inclined discs have been secured with a 10x70mm shearbolts. The bolt shear off when overloaded and stones can pass.

∇ **Never** use fingers to remove broken shearbolts but use a screwdriver or the like.

∇ When changing a shearbolt DINCO must be lowered and rest on the foundation. If the implement is lifted a strong support of the main frame must be provided.

Maintenance

Proper maintenance lengthens the life span of the DINCO and thus secures optimal utilisation of the implement. For that reason grease nipples have been placed where the most wear happens.

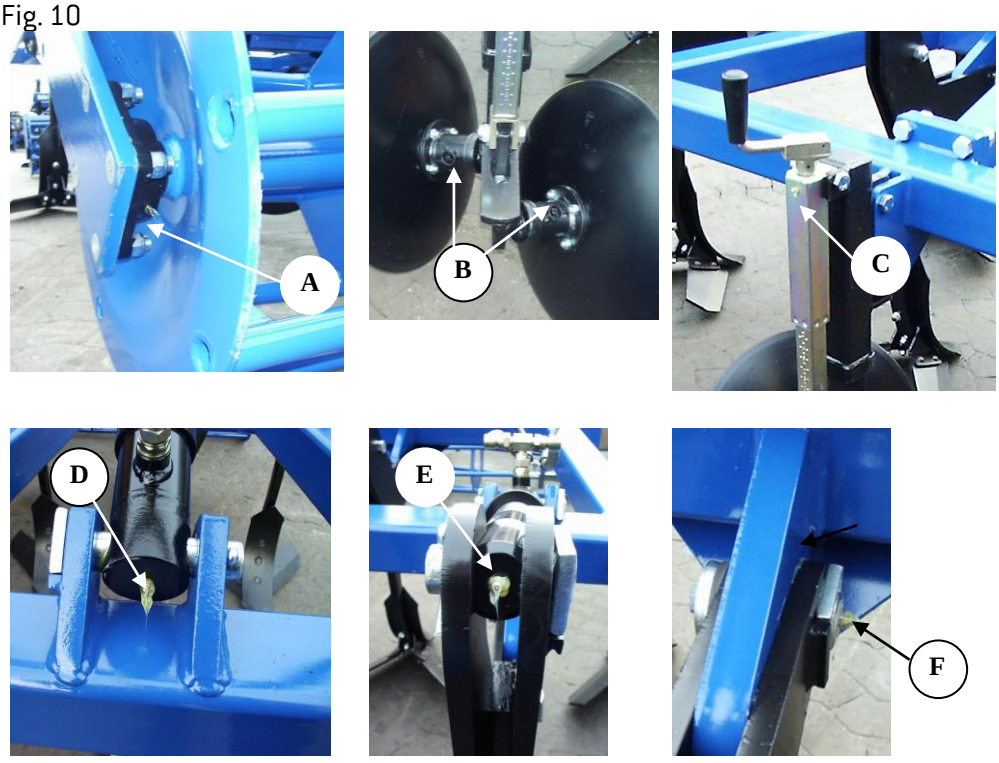
All nuts and bolts should be tightened up after the first day. Pins and bolts should be checked to avoid damage.

Lubrication

Depending on the model a different number of lubrications points exists which need lubrication after 50 hours work. The lubricating nipples by the tines, however, should be lubricated daily.

- (A) Roller bearings *(50-hour-lubrication interval)*
- (B) Disc bearings *(50-hour-lubrication interval)*
- (C) Spindle *(lubricate as required)*
- (D) Lubricating nipple for the pin in the bottom of the cylinder *(daily)*
- (E) Lubricating nipple for the pin in the eye of the cylinder *(daily)*
- (F) Lubricating nipple for the pin in the tine holding plate *(daily)*

Fig. 10



Safety

∇

It is **very dangerous** to stay under DINCO when it is lifted without proper support. At the same time the tractor should be properly braked and the engine switched off.

- Defective hydraulic hoses should be replaced immediately. Defects on hoses may cause injury to persons or damage to the implement.

- All bolted connections should be checked often and tightened when needed.

- After working with oil, hands should be carefully cleaned. Oil stained clothes should be removed immediately as it may cause damage to the skin.

Wearing Parts

The points on DINCO are reversible and should be turned before the shank to which the points have been clamped starts to wear down (see "Replacement and repairs" page 19). Points with covering discs on the outermost tines should be changed from right to left when turning the points so that the covering discs are placed on the outside.

Wings should be changed when they are worn down to the extent that the work result is no longer satisfactory or before the shank starts to wear down.

Other things

Avoid spilling oil on the ground. Should it happen anyway, gather it together and deliver it for destruction.

When parked under damp conditions for a longer period piston rods should be lubricated in oil or fat to avoid corrosion.

Cleaning and checking
When the season is over, the machine should be cleaned for dirt and moist attracting material. This facilitates later services and repairs.

Accessories

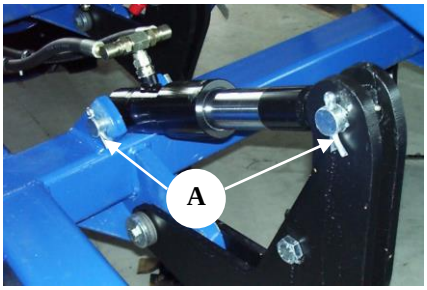
Various forms of accessories for DINCO exist, e.g. hydraulic stone breakaway (NSH), crumblers and side discs. Other accessories are lights and seeddrills.

Mounting of NSH

Mounting the NSH stone release system on a DINCO with mechanical stone release (shearbolts) is easily done as DINCO has been prepared for this conversion.

Fig. 11

Mechanical stone breakaway



NSH stone breakaway

1. Support DINCO as described in "*Replacement and Repairs*" to avoid danger of personal injury. Tines should be free of the ground in order to be able to move them freely.
2. Remove the splitpins (A) and pull out the pins. Now the mechanical shearbolt cylinders can be removed.
3. Then mount the hydraulic stone breakaway instead with the same pins. Please remember to remount the splitpins.
4. Mount the hydraulic hoses etc. according to the spare parts drawing. Connect the hoses so that they **do not** lie flat against the frame. This will extend their life span. Mount the accumulator so that the tines can break back completely without colliding with the accumulator.

∇ Please check that hoses are not in danger of being disconnected or squeezed.

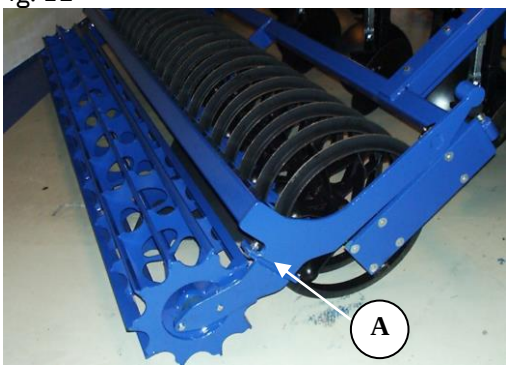
Crumbler

The crumbler is mounted behind the rear roller and gives an extra working of the field. The crumbler is designed as a roller with a smaller diameter than the rear roller, which means a faster rotation and thereby a more effective crushing of clods. At the same time the crumbler packs the topsoil to preserve the moistness of the soil.

Mounting of accessories

Depending on the type of rear roller (packer roller or t-rings) two different bearings for the crumbler exists.

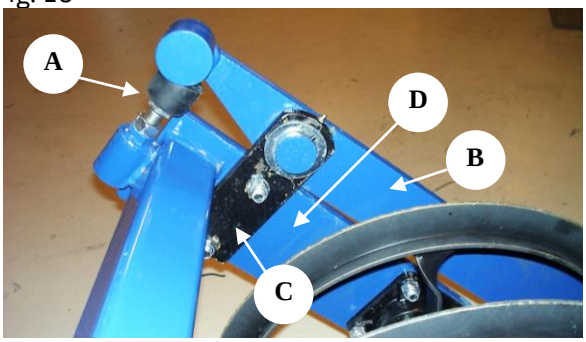
Fig. 12



T-rings

The crumbler for the t-ring roller is mounted with 4 16x50 mm. bolts, which are fitted in the flanges (A, fig. 12) at the very back of the bearings for the rear roller. The adjustment bolts (A, fig. 13) should be screwed in completely to facilitate the mounting. Fine adjustment of the crumbler is done on the basis that the adjustment bolts have been screwed in completely.

Fig. 13



Packer roller

As packer rollers come with no scrapers bearings (B, fig. 13) should be mounted before the crumbler can be mounted.

1. Mount the adjustment bolt (A) and screw it all the way in.
2. Mount the rotation stand (C, fig. 13) on the bearing (B, fig. 13), please remember the washer and split pin.
3. Bolt the rotation stand to the bearing of the rear roller (D, fig. 13).
4. Mount the flange bearings loosely on the crumbler shaft
5. Roll the crumbler in between the bearings (B, fig. 13).
6. Bolt the flange bearings to the bearing.
7. Secure the pointed screws with Locktite and tighten them.

Driving and adjusting

The crumbler is not designed to carry DINCO. Its only job is to crush, cultivate and level after DINCO as the working depth is determined by the rear roller.

The crumbler should be working in the topsoil. The pressure is adjusted by the bolts (A, fig. 13). If the bolts are loosened the pressure of the crumbler on the ground will increase and if the bolts are tightened the pressure will decrease.

∇ The crumbler should **not** be set to carry DINCO.

Side discs

To level the soil outside the outermost tines side discs can be mounted. The side discs are inclined discs on arms, which can be swung outside the outer tines. Side discs are most relevant in connection with sowing of catch crops with DINCO seeddrill.

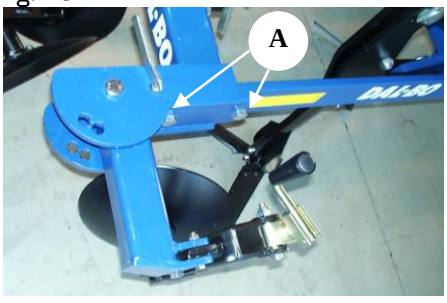
Fig. 14

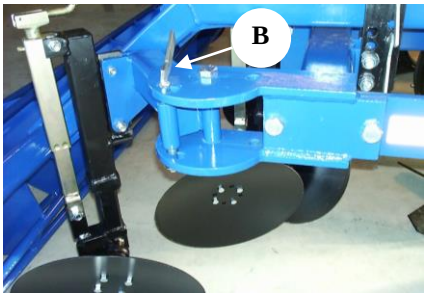
∇ During transport side discs must be locked in transport position. It is important that the plate is fixed with the pin in transport position to prevent the discs from swinging out when driving (se fig. 15, B).

Mounting

The plate for the side discs is fixed with two bolts (A) through the frame. Mount the shank with the discs on the arm so that the hollow side of the discs turn inwards.

Fig. 15





Replacement and repair

∇ All repairs and maintenance in connection with DINCO should be done while DINCO stands properly on the ground and thus rests securely on the ground.

∇ It is **very dangerous** to stay under DINCO when it is lifted without being properly supported. At the same time the tractor should be properly braked and the engine switched off.

Replacing wearing parts

∇ Support the DINCO to avoid the danger of being trapped underneath and to avoid the machine falling.

Fig. 16

The point (A) are reversible and bolted with three bolts. The points should be turned before the shank to which points and wings (B) are clamped start to wear down.

When turning points, reuse the old bolts, but when changing points new bolts should be used. If dirt or the like is present it should be removed.

- **12x70 mm carriage bolt St. 10,9 for fastening point.**
- **12x35 mm carriage bolt St. 10,9 for fastening wings.**

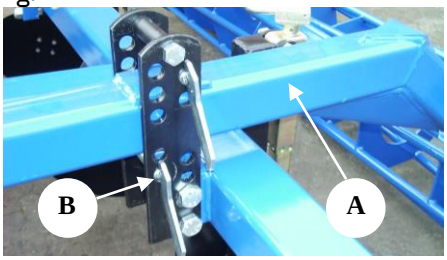
Wings should be changed when they are worn down to the extent that the work result is no longer satisfactory or before the shank start to wear down.

Replacing bearings

When DINCO is lowered the rear roller is supported so that the arms (A) rests on the lower pin (B).

1. Remove the bolts in each side of the flange bearings (C).
2. The packer roller/t-ring roller can be rolled away.
3. Loosen the pointed screws in each bearing and the bearing can be removed from the shaft.
4. Mount new bearings loosely on the shaft. Roll the packer roller/t-ring roller back in between the bearing plates. Bolt the bearings onto the these.
5. Secure the pointed screws with Locktite and tighten well.

Fig. 17



T-ring roller

The t-ring roller has been designed with a centre bearing (plummer block) to support the shaft.

1. Remove the plummer block in the middle together with the flange bearings.
2. When the bearings are free, lift DINCO. The t-rings and shaft are now free.
3. Loosen the pointed screws and remove the flange bearings.
4. Remove the t-rings in one side of the supporting bearings to change the bearing.
5. Having changed the supporting bearing mount the rings. Please note that t-rings are mounted so that they gear into each other making each other rotate.
6. Mount in reverse order. **Secure the pointed screws with Locktite**.

Removing rings from the shaft can be quite hard. Try cleaning the area between the rings and the shaft with a high pressure cleaner to remove dirt and corrosion that may be present.

Fig. 18

If DINCO cannot be lifted, it is possible to remove the scraper bar (A) and in this way free the shaft and the t-rings (see *"Replacement of scrapers"*).

Replacing scrapers

1. Screw the adjustment bolts (A, fig. 13) all the way in.

2. Remove the bolts which fasten the rotation stand (C, fig. 13) and splitpin and washer can be removed.
3. Mount the old rotation stand on the new scraper and mount in reverse order.

Replacing rear roller

When replacing the packer roller or t-rings follow the same procedure as when replacing bearings. Old bearings can be used, however, new ones are recommended.

Fig. 19

Replacing disc bearings

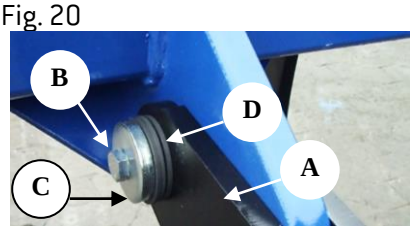
Disc bearings are changed together with the shank as one unit.

1. Remove the bolts that fasten the shank stand to the frame, the discs and spindle are now disengaged from the frame.
2. Remove the bolts that fastens the shank and the spindle and the telescopic piece can be dismantled.
3. Mount a new shank with bearings and assemble in reverse order.

Replacing bushings

If play arises in the tine hole plate (A) it is a sign of worn down bushings.

Fig. 20



1. Support DINCO according to instructions with tines lifted from the ground.
2. Remove bolt (B).
3. Remove the washer (C) and the spring washers (D) from the pin and remove the pin. Please note how the spring washers are mounted.
4. Pull or knock the bushings out.
5. Mount the new bushing. Then mount pin and tine hole plate. Please remember to mount the pin from the side where the pin stop sits.
6. Mount the spring washers so that the spring effect is obtained. Mount the first spring plate so the rest side turns towards the tine hole plate. Turn the other two spring washers the other way.
7. Mount the washer (C) and tighten the bolt (B) with c. 40 Nm. **Please remember to secure the bolt with Locktite.**

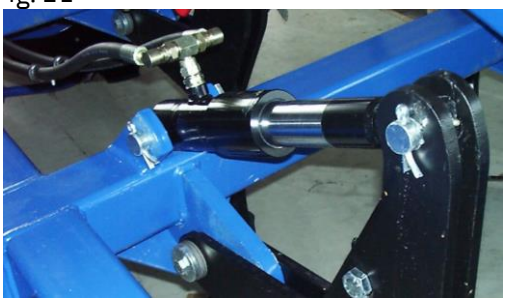
Replacing hoses for hydraulic stone breakaway

Connect the NSH-system to the single-acting service on the tractor to remove the pressure from the system. Then open the shut up valve (see fig. 4) and set the service on the tractor in floating position. The pressure on the system will disappear as oil will leak back to the tractor. The pressure can be read on the manometer at all times.

The defect hose can be removed and a new one can be mounted. To re-establish system pressure see "*Adjustment*", "*Non-Stop-Hydraulic*".

Replacing cylinders for hydraulic stone breakaway

Fig. 21

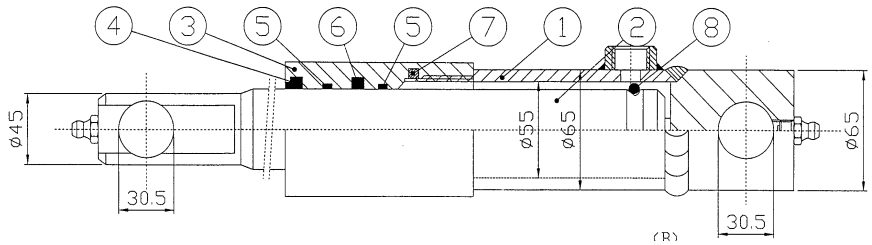


1. Support DINCO according to instructions with tines lifted from the ground.
2. Remove pressure from the NSH-system see "*Adjustments*", "*Non Stop Hydraulic*".
3. Remove the t-piece from the coupling whereupon it can be removed from the cylinder.
4. Pull the splitpins from the pins and remove the pins.
5. Mount the new cylinder and remount the pins and splitpins.
6. Mount the coupling with gaskets in the new cylinder and screw on the t-piece.

Replacing seals for hydraulic stone breakaway

For removing cylinder see "*Replacing cylinder for hydraulic stone releaser*".

Fig. 22



1. Empty the cylinder for oil by moving the piston gently back and forth.
2. Move the piston to the middle position and unscrew the end cap (pos. 3) of the cylinder pipe (pos. 1). Special tools are required for removing the end cap. If the end cap is very tight try heating up the front part of the socket. When the end cap has been removed from the cylinder pipe pull out the piston towards the end cap whereupon the piston rod (pos. 2) can be pulled from the cylinder pipe (pos. 1).
3. Pull the piston rod backwards from end cap. There is now access to the seals in the end cap.
4. Remove the metal ring (pos. 8) from the piston rod.
5. Remove the seals (pos. 4+5+6+7) from the end cap.
6. Clean all parts and check for chips, burrs etc. Check for corrosion around the scraper ring (pos. 4) in the end cap. If corrosion is found it should be removed. Moreover the piston rod should be completely clean.

Mounting

1. Mount new seals in the end cap and fit a new metal ring on the piston rod.
2. Lubricate the thread on the end cap (pos. 3) along with the seals and the piston rod (use hydraulic oil) to facilitate the mounting.
3. Mount the end cap (pos. 3) on the piston rod (pos. 2) by pushing the piston rod eye first through the end cap.
4. Lubricate the cylinder pipe on the inside and push the piston rod into middle position.
5. Mount the end cap and tighten.
6. Mount the cylinder. Mount the hoses. Please note the hoses are squeezed and that the connections are not worn down.

Replacing cylinder in the folding model

Unfold side sections and remove pressure from the cylinder. Remove system pressure by putting the lever on the tractor into floating position when unfolding after the side sections has passed the vertical position on their way down. Side sections will slowly lower to horizontal position as oil leaks back to the tractor. In this way no pressure will arise on the pilot controlled single acting valve and there will be no pressure in the system.

Please note that different lengths of cylinders exist for the model 380 and the models 470 and 560 respectively. The difference, however, is just the longer cylinder bottom. The inside designs of the cylinders are the same.

Fig. 23

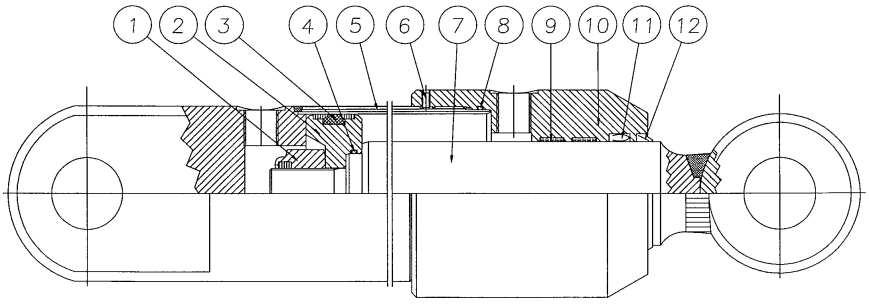
1. Remove hoses and hydraulic fittings for the cylinder.
2. Remove splitpins and pins and then remove the cylinder.
3. Mount the new cylinder and remount the pins and splitpins.
4. Connect the hoses.

∇ Please check that hoses are not in danger of being disconnected or squeezed.

∇ After the mounting of the cylinders lift and lower the side sections gently a couple of times to remove air from the system. Side sections cannot be lifted higher than 30-40 cm. from the ground so that the side sections can be lowered safely to the same side from which they were lifted.

Replacing seals for the folding model
For removing cylinder see *"Replacing cylinder for the folding model"*.

Fig. 24



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1. Empty the cylinder of oil by moving the piston gently back and forth.
2. Move the piston to a middle position and unscrew the end cap (pos. 10) of the cylinder tube (pos. 5). Special tools are required for removing the end cap. If the end cap is very tight try heating up the front part of the socket. When the end cap has been removed from the cylinder tube pull out the piston towards the end cap whereupon the piston rod (pos. 7) can be pulled from the cylinder tube (pos. 5).
3. Remove the bolt that fastens the piston (pos. 2).
4. Pull the piston (pos. 2) from the piston rod (pos. 7).
5. Pull the end cap (pos. 10) from the piston rod (pos. 7).
6. Remove the seals in the end cap and the piston (pos. 1+3+4+6+8+9+11+12)
7. Clean all parts and check for chips, burrs etc. Check for corrosion around the scraper ring (pos. 4) in the end cap. If corrosion is found it should be removed.

Mounting
1. Mount new seals (pos. 1+3+4+6+8+9+11+12) in the end cap and the piston.

2. Lubricate the thread on the end cap (pos. 10) and the cylinder tube (pos. 5) with fat or oil.
3. Mount the end cap (pos. 10) on the piston rod (pos. 7).
4. Mount the piston (pos. 2) and remount the bolt. **Secure it with Locktite** Please take care that the thread is completely clean and free of oil and other impurities. **Oil should not be used until 12 hours after using Locktite.**
5. Lubricate the outermost seal on the piston touching the cylinder tube and the inside of the cylinder tube with oil and push the piston rod into the middle position.
6. Mount the end cap on the cylinder tube and tighten.
7. Mount the cylinder.
8. Mount the hoses. Please note that hoses are not squeezed and that all connections are tight.

∇ After the mounting of the cylinders lift and lower the side sections gently a couple of times to remove air from the system. Side sections cannot be lifted higher than 30-40 cm. from the ground so that the side sections can be lowered safely to the same side from which they were lifted.

∇ Persons should not be within the radius of action of the machine as it is involves danger to life.

Scrapping

∇ Support DINCO on strong trestles so that the tines are free of the ground. Make sure that there is no danger of falling or getting trapped under the implement. A crane or the like should be used to dismantle the parts from the frame.

∇ On models with NSH stone breakaway the pressure on the system should be removed before the dismantling of the hydraulic parts are begun (see the *"Replacing hydraulic hoses on NSH"* section under *"Replacement and repairs*).

∇ After working with oil, hands should be carefully cleaned. Oil stained clothes should be removed immediately as it may cause damage to the skin.

When dismantling hydraulically folding models place the trestles under the main frame and the side sections. Unfold side sections and remove pressure from the cylinder. (Remove system pressure by putting the lever on the tractor into floating position when unfolding after the side sections has passed the vertical position on their way down. Side sections will slowly sink to horizontal position as oil leaks back to the tractor. In this way no pressure will arise on the pilot controlled single acting valve and there will be no pressure on the system).

Support the rear roller or take a hitch on it to keep it in balance. Remove the bolts in the bearings and roll away the rear roller. Disconnect the oil hose and gather the waste oil in a bucket. Remove cylinders on the NSH-models and the folding models and empty them for oil. Whereupon the arms with the bearing plates for the rear roller, the levelling bar connections, tines and shanks can be removed.

Oil and hoses should be handed in for destruction. The rest of the cultivator may be used as recycled iron.

Spare parts