

**DALBO®**

# COMBIFLEX



EN  
300 cm  
Series no.: 00100-XXXX

MADE IN **D**ENMARK



# COMBIFLEX

Type 300 cm

Congratulations on your new drum. For **safety reasons** and for optimal use from your machine, you should read through the user manual thoroughly **before use**.

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## Your drum has:

Type no.: \_\_\_\_\_ Series no.: \_\_\_\_\_  
Month of manufacture: \_\_\_\_\_ Tare weight in kg: \_\_\_\_\_

When enquiring about spare parts or servicing, we kindly ask that you always provide the type number and serial number. At the back you will find a list of spare parts, which helps provide an overview of the individual parts.

## EU DECLARATION OF CONFORMITY

**DALBO A/S**  
**DK-7183 Randbøl**

hereby declares that the machine described above has been manufactured in accordance with the provisions in the directive 2006/42/EC, which replaces directive 98/37/EC and the change directives 91/368/EEC, 93/44/EEC and 93/68/EEC on the approximation of the laws of the Member States relating to 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.

DALBO A/S

Date: \_\_\_\_\_

Alessio Riulini, CEO



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## Safety



You will find this symbol in the instruction manual each time advice is given regarding your own safety, the safety of others or the safe operation of the machine. All safety instructions must be observed and made available to all users of the machine.

### General

- Before starting work, the user must be familiar with all parts of the machine.
- Safety markings have been placed on the machine that contain important instructions about your own and others' safety, as well as on the correct use of the machine.
- There must be no passengers on the machine, either during work or transportation.
- When operating the drum, it must be ensured that there is no one located within reach of the machine. The machine may only be operated from inside the tractor.
- The hand levers are secured against unintentional operation.
- Before leaving the tractor or if adjustments, maintenance or repairs must be made to the drum, the machine must be secured against accidental starting by lowering the machinery at the base or maintaining it in transport position, the tractor is braked, the engine stopped and the ignition key removed.
- Remember to secure the support and any lifting arms with linchpins.
- Never leave the driver's seat while the machine is driving.
- The driving speed must always be adjusted to the conditions.
- Only use the machine if all safety devices have been mounted. Defective safety devices must be replaced immediately.

## Hydraulics

- Before making any repairs to the hydraulics system the machinery must be lowered at the base, the pressure released from the system, the engine stopped and the ignition key removed.
- Hydraulic connections must be cleaned thoroughly before connecting. When connecting the hydraulic hoses to the tractor's hydraulics, it is vital that you ensure the pressure has first been released from the hydraulic system.
- For hydraulic systems with a built-in, pilot-operated check valve, it can be difficult to release the pressure completely. In this case hold a rag around the relevant fittings/part, which is being uninstalled in order to stem any oil leakage.
- After repairs on the hydraulic system have been completed, all air must be thoroughly removed from the system.
- Check the hydraulic hoses regularly for defects such as tears, cracks, wear or damage. Defective hoses must be replaced immediately.
- Avoid spilling oil on the ground. If this should happen anyway, it should be collected and sent for destruction.
- Hands must be cleaned thoroughly after contact with oil and grease on the skin. Change out of oil-soaked clothing immediately, as this can be harmful to the skin.
- Hydraulic oil that flies out under high pressure can penetrate the skin and cause serious injuries. Seek professional medical assistance immediately in the event of any injury.

## Installation

- There is a risk of being crushed when mounting. People must not be positioned between the machinery and the tractor or between the parts that are being connected.

## Maintenance and repair

- When carrying out all repair and maintenance work the machine must be properly supported or unfolded, the tractor and machine must be properly braked, the engine turned off and the keys removed.
- Tighten all screw fittings after a few hours of use. All screw fittings must be checked at regular intervals and tightened when necessary. Check cotter pins and bolts to avoid breakdowns.
- Oil, grease and filters shall be disposed of in accordance with the applicable environmental legislation.

**Driving on roads**

- When driving on public roads, all safety arrangements and warnings required by law must be mounted and tested. The driver is responsible for correct use of lights and marking in accordance with the highway code.
- In consideration for the dimensions of the machinery the driver must refer to traffic authorities to ensure that it may be transported on public roads.
- When transporting the machine, the total weight of the tractor must be taken into consideration, the pressure on the axles must not be exceeded, and the load on the tractor's front axle must not be less than 20 percent of the vehicle's total weight. In this case the ballast weight of the tractor must be used.

**Correct use**

- The correct use of the machine also includes complying with the manufacturer's operating, maintenance and repair instructions, as well as using only original spare parts.
- The drum may only be used, maintained and repaired by people who are familiar with the machine and who have knowledge of the dangers that can arise.
- The manufacturer is not liable for damage as a result of changes to the machine that are carried out without the manufacturer's prior consent. Furthermore, the manufacturer is not liable for any damage that results from incorrect use. Responsibility for this rests solely with the user.
- Extra weight must not be mounted on the drum.

**Technical data**

**COMBIFLEX**

<b>Working width (cm)</b>	<b>300</b>
HP (recommended)	80-100
* Gross weight in kg:	1230
Transport width	3 m
Sections (pieces)	1
Shafts (pieces)	1

\*Depending on the type of goods (weighted by 50 cm Snowflake)



## How to read the instruction manual

It may seem like the order in which the topics are listed does not appear as logical. Please refer to the table of contents, where the titles for the relevant topics can be found

The main points of the instruction manual are divided into the following main sections:

- Safety
- Description of the machine, including setup
- Getting Started and Driving
- Additional Equipment
- 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 machine.



Points that are relevant to safety.

### Delivery

The drum is delivered fully assembled on flatbed truck.

If the drum must be lifted, it is recommended that it is rigged with straps on the main frame and towed so that the machine is balanced.



## Limitations in use

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

- The machine may only be used for rolling and levelling of ploughed or germinated agricultural areas which are in rotation. The drum can also be used for rolling grass in fields. The areas that are being cultivated must be in a state of normal agricultural maintenance, that are without significant irregularities or holes.
- The machine may only be used tightened to an agricultural tractor where it must be attached to its drawbar. It can be transported on public roads via the tractor's three-point hitch.
- The machine can work at a maximum speed of 10 km/h. The speed shall, however, always be adjusted to the nature of the area.

Any other use of the machine, which does not fulfil the above-mentioned conditions, will be considered as unauthorised use and will result in the factory warranty being void.

## Description of the machine

### The machine's structure

COMBIFLEX is a robustly-constructed drum with the following structure:

- The machine is built up of one section, a main frame.
- COMBIFLEX is constructed in such a way that goods of up to 061 cm in diameter can be mounted.

COMBIFLEX is factory-assembled such that it is ready to mount for the following additional equipment:

- All versions of COMBIFLEX can be installed with hydraulic wheel frame.

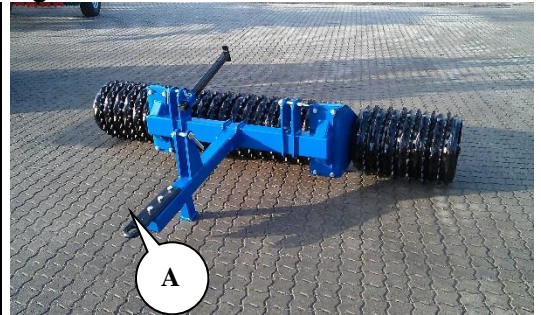


## Connecting and disconnecting drawbar eye

### Connecting

The drum is connected to the tractor's permanent drawbar, whereby the drawbar eye (A) must be positioned between the drawbar forks. Fig 1 Insert hitch pin.

Fig. 1



Secure the hitch pin with linchpin or similar.

### Disconnecting



Remove the hitch pin.

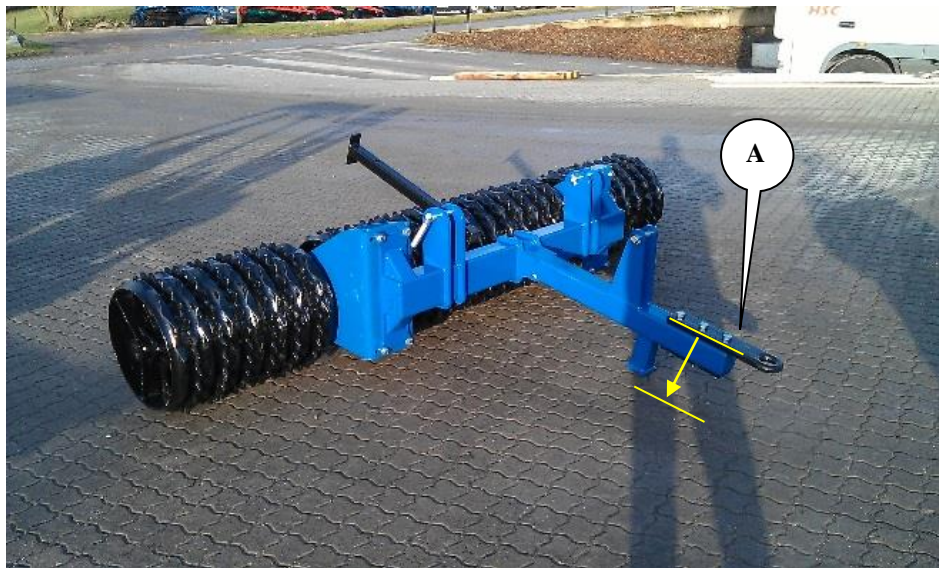
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## Settings

The drum has been factory set by the manufacturer, but a fine tuning will always be necessary before use. Many different adjustment possibilities make your drum more versatile and allow the opportunity to obtain optimal use from the machine.

In order to achieve uniform pressure across the field the tow must be set correctly for the tractor in question. The hitch height of the tractor must be between 35-60 cm.

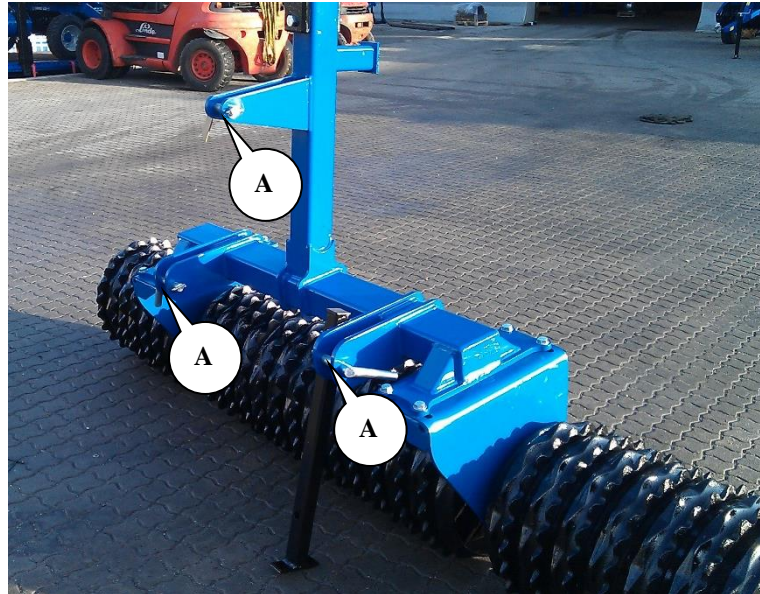
### Adjustment of hitch height



*Height under  
tow bar (A):  
35-60 cm*

## Connecting and disconnecting of lifting arm

### Connecting



Connect the drum to the vehicle's three-point hitch at these points (A).



Secure hitch pins with linchpin or similar.

### Disconnecting



Remove hitch pins.

In this way, the drum can be used both in fields and on roads.

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## Driving and operating

Correct operation is important in order to get the optimal benefit from your drum. This applies not only to working in the field but also in terms of safety. Thus, it is important to study the safety information relevant to the machine



**There must never be people present within the machinery's range of movement.**

### Driving speed

Driving at 6-10 km/h is recommended, but driving must always be carried out according to the conditions.

The power requirement is very dependent on the type of soil and terrain as well as the speed.

Table 1, **Guide for power requirements in HP**

Working width	<b>300</b>
Power requirement, approx.	40-80

## Maintenance

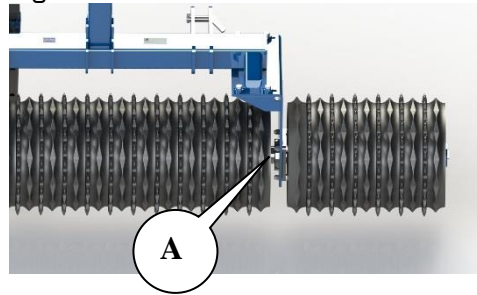
Good maintenance ensures a long lifetime for the drum and thus optimal use of the machine. Lubrication points have therefore been mounted in the places where wear and tear are greatest.



All screw connections must be tightened after the first day of work. Cotters and bolts are checked in order to avoid breakdown.

### Lubrication

Fig. 2



Lubrication points	Number of nuts	Lubrication interval hours	Ball
Flange bearings	2	50	A



All lubrication points should be lubricated at least once a year. Fig. 2

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## Replacements and repairs



Safety is important with regards to **all** repair work on the drum. The following items must therefore be observed at all times, as well as the items under safety at the beginning of the instruction manual.



When replacing cylinders, the cylinder must always be filled with oil before it is subjected to any load. It is therefore recommended that the cylinder is mounted on the fixed part of the frame first, after which the cylinder is filled with oil and then mounted onto the opposing section.



All maintenance and repair work on the drum may only be carried out after the machine has been secured against accidental starting by lowering the machinery at the base or maintaining it in transport position, the tractor is braked, the engine stopped and the ignition key removed.



For all repair work on the hydraulics, always pay close attention to safety. Before starting work, the pressure must be released from the hydraulic system and it is a requirement that the section is supported from below.

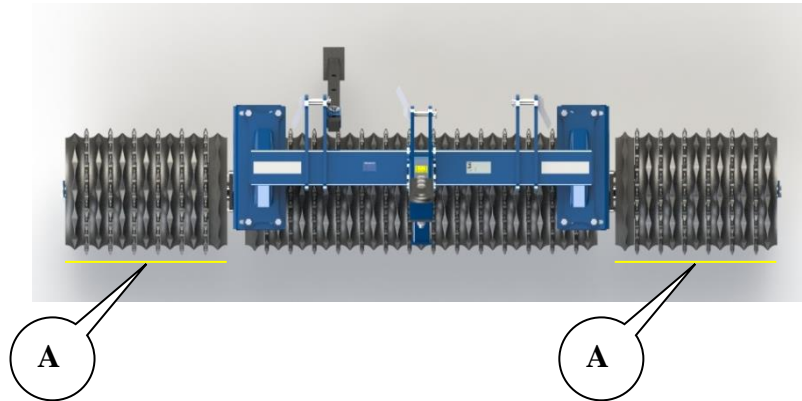


After any repair work on the hydraulic system, all air must be removed from the system before use in order to protect against breakdown and personal injury.



## Uninstalling of drum goods on the outside of bearing plates (A)

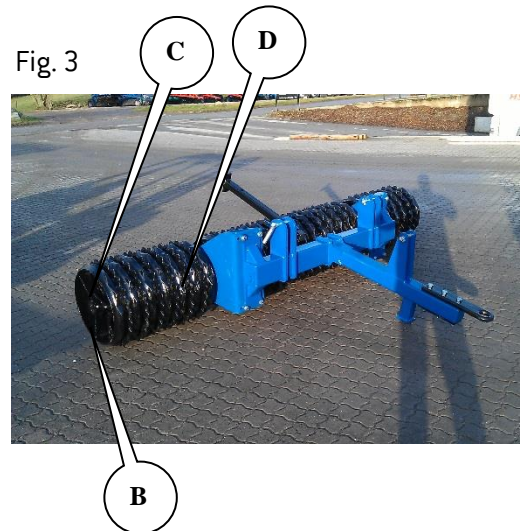
Repairs must be carried out on an even surface with the drum connected to a tractor.



### Replacing drum goods

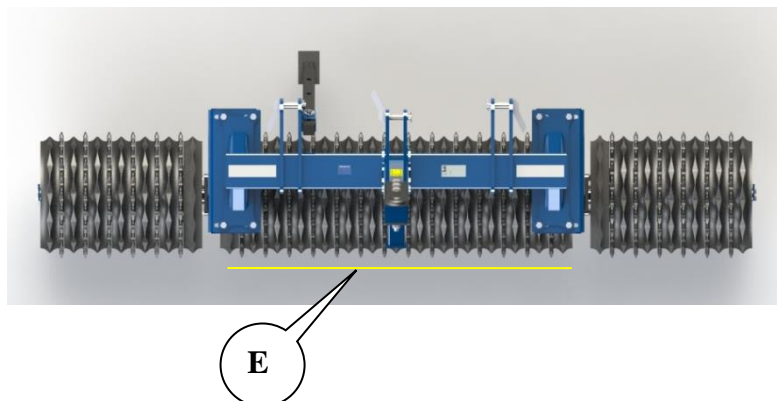
1. The machine is mounted onto the tractor's hitch.
2. Loosen the bolts (B).
3. Remove plate (C).
4. Pull out the ring (D).
5. Mounting is undertaken in the reverse order.

Fig. 3



## Uninstalling drum goods on the inside of bearing plates (E)

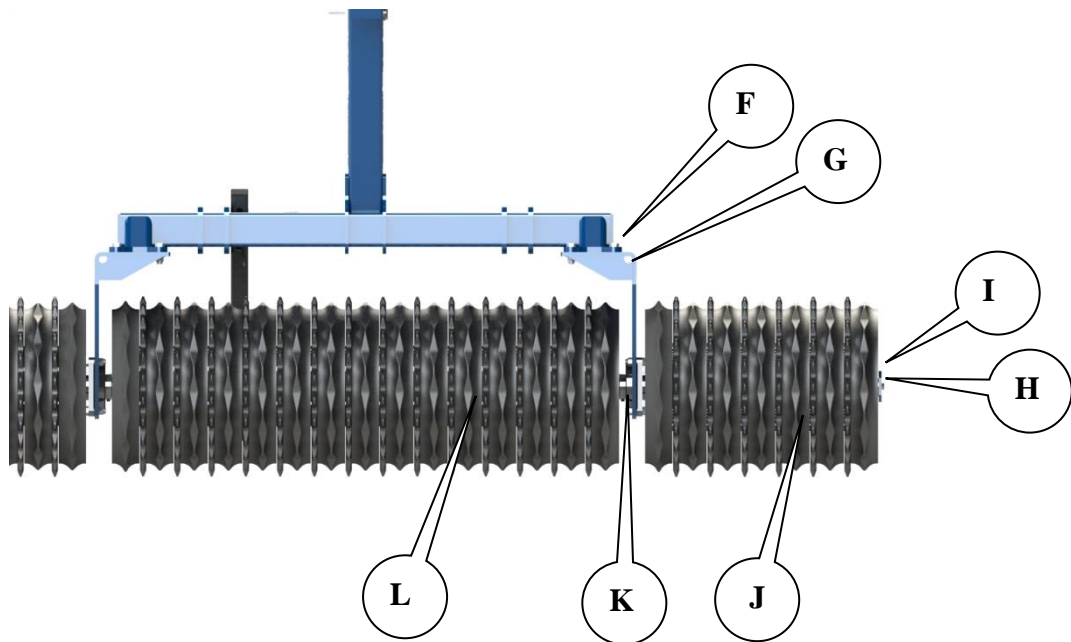
Repairs must be carried out on an even surface with the machine jacked up and then tilted.



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### Replacing drum goods

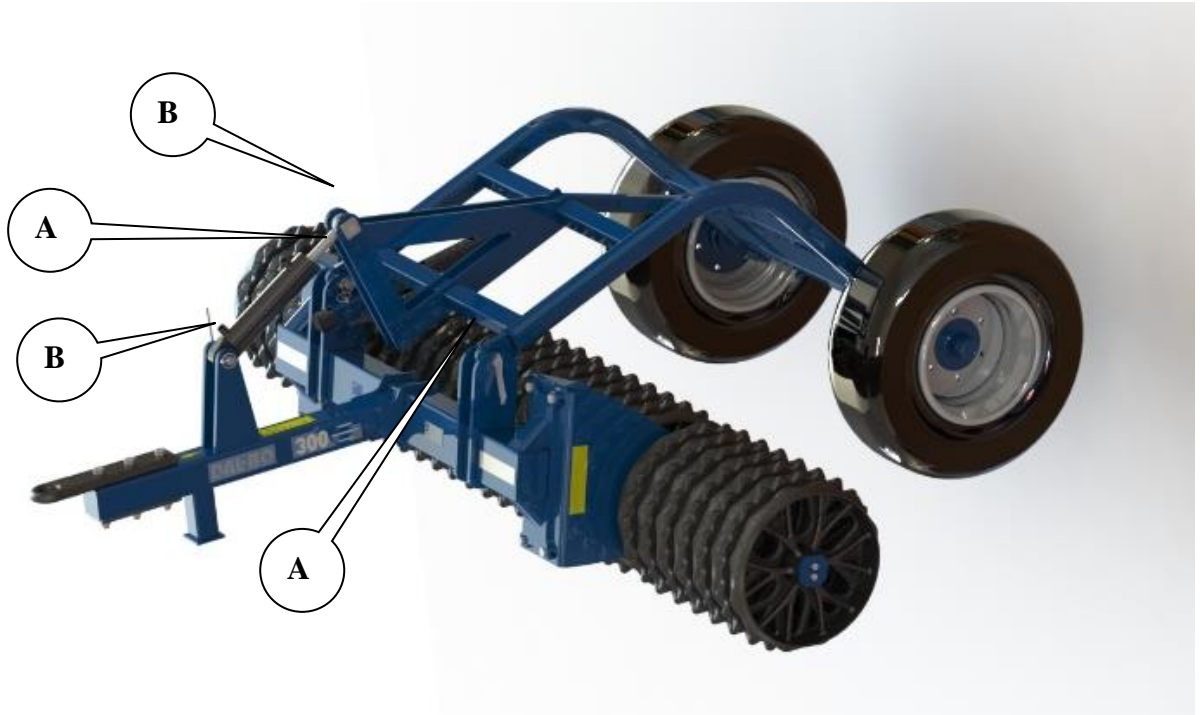
1. Loosen bolts/nuts (F).
2. Bearing plates incl. goods on the shaft (G) are removed from the main frame.
3. Goods on shaft incl. bearing plates are jacked up on an even surface and tilted.
4. Loosen the bolts (H).
5. Remove plate (I).
6. Pull out the ring (J).
7. Remove the flange bearing (K), incl. bearing plate, bolts/nuts.
8. Pull out ring (L).
9. Mounting is undertaken in the reverse order.



## Additional Equipment

### Wheel frame for COMBIFLEX

COMBIFLEX can be supplied with hydraulic wheel frame.



The wheel frame is mounted with stud and linchpin (A) on the main frame, and the cylinder is mounted between the main frame and wheel frame with stud and cotter/linchpin (B).



Hydraulics must not be activated when there are people within reach of the machine.

## Hydraulics

### Connecting

A double-acting hydraulic cylinder is required, which is used to raise/lower the wheel frame.

Cylinder name	Colour	Outlet	Function
Tilting cylinder	White	Double-acting	Tilt the wheel frame up from the ground and down into working position.

- Make sure the hydraulic hoses have not been crushed.

### Disconnecting

The wheel frame must be unfolded before disconnecting.  
Remove the stud and uninstall the hydraulic hoses.



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

### Releasing air from the system

Longer periods of inactivity can result in small amounts of air getting into the system. This can be seen while working with the boards not completely aligned. In this case, the air must be released from the system. This is done by moving the board to its maximum depth with use of hydraulics (the cylinders must be as short as possible). In this position, keep the pressure on the system for some time (try to make the cylinders even shorter), even though the cylinders are as low as they can go. The cylinders are designed so that when in their shortest position possible, oil can pass through the piston via a channel. Thus forcing any air out of the system.

## Maintenance

Good maintenance ensures a long lifetime for the drum and thus optimal use of the machine. Lubrication points have therefore been mounted in the places where wear and tear are greatest.



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

### Lubrication



Lubrication points	Number of nuts	Lubrication interval hours	Ball
Folding cylinder	2	50	A
Hub	2	50	B



All lubrication points should be lubricated at least once a year.

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## Adjustments

### Wheels

The wheel bearings must be lubricated and adjusted once a year. Similarly, the correct tyre pressure must also be ensured (see recommended pressure on the tyre).

Adjustments and lubrication of wheel bearings

1. The hub cap is removed.
2. The cotter is removed.
3. The castellated nut is tightened by 1/6 of a rotation so that the hole is in line with the shaft. The wheel is spun around and there should be no resistance. Only a little bit of slack should be felt in the hub housing when the wheel is moved from side to side. If there is too much slack, repeat the process.
4. The cotter is installed
5. The hub cap is filled  $\frac{3}{4}$  with grease and fitted.

## Hydraulics



All hydraulic hoses must be checked for wear or damage. Ensure the hoses are not subjected to any crushing.



When parking for longer periods, any protruding piston rods should be lubricated with oil or pressure grease in order to avoid rust forming on the piston rods. Remember to remove it again before use.

## Replacements and repairs



Safety is important with regards to **all** repair work on the drum. The following items must therefore be observed at all times, as well as the items under safety at the beginning of the instruction manual.



When replacing cylinders, the cylinder must always be filled with oil before it is subjected to any load. It is therefore recommended that the cylinder is mounted on the fixed part of the frame first, after which the cylinder is filled with oil and then mounted onto the opposing section.



All maintenance and repair work on the drum may only be carried out after the machine has been secured against accidental starting by lowering the machinery at the base or maintaining it in transport position, the tractor is braked, the engine stopped and the ignition key removed.



For all repair work on the hydraulics, always pay close attention to safety. Before starting work, the pressure must be released from the hydraulic system and it is a requirement that the section is supported from below.



After any repair work on the hydraulic system, all air must be removed from the system before use in order to protect against breakdown and personal injury.

### Hydraulics

#### Replacing cylinder for unfolding and folding of wheel frame

Repairs are carried out with the wheel frame unfolded into working position and resting on the sub-frame.

1. Release the pressure from the cylinder.
2. Remove the hoses.
3. Remove cotters and studs and the cylinder is free.
4. Mount the new or repaired cylinder. Remember to secure the stud's grip in the stud stopper and secure the studs with cotters.
5. Mount the hoses. After mounting, ensure that there is no risk of tearing or crushing the hoses.



After mounting, activate the cylinder by folding and unfolding until a little water comes out of the cylinder. The cylinder is then activated in the opposite way until the cylinder is back in the starting position. The cylinder sometimes moves in this way. The drum is then tipped up onto the wheels and the side sections are moved completely out into their outer positions in order to release all air from the system.



If a cylinder is not aired out correctly as described above, there is a risk upon activation that part of the machine will **suddenly move at a greater velocity than normal, and without the tractor driver being able to stop this movement.** This is because the air (as opposed to the oil) can be compromised. It is therefore possible to experience, for example, a side section swinging completely out very fast if the correct airing has not been carried out. This presents a serious risk of personal injury and damage to the machine.



There must never be people placed within reach of the equipment.

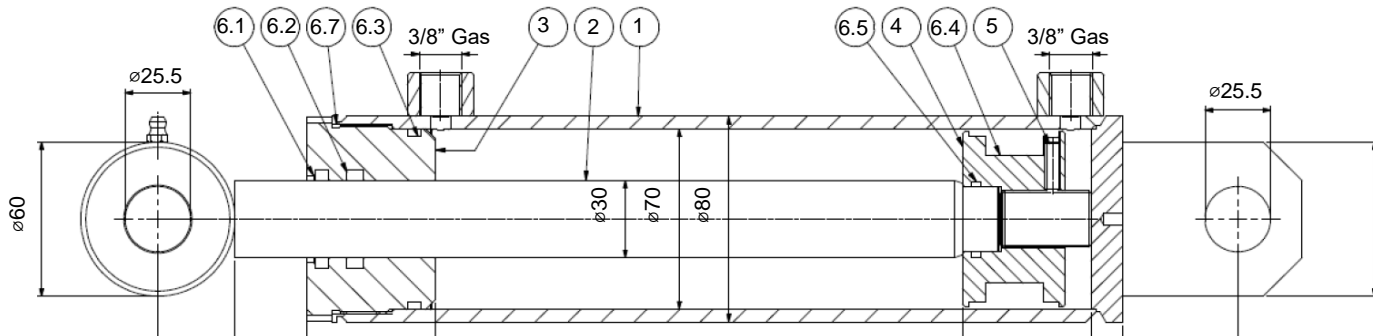


## Gasket set

### Replacement of gasket set

#### REMOVAL:

1. Empty the cylinder of oil (this can be done by using the air pressure to move the piston backwards and forwards in order to push the oil out).
2. Move the piston in the middle position, whereby the end cap (pos. 3) is unscrewed from the cylinder tube (pos. 1). If the top part is stuck, this can be remedied by warming up the front part of the sleeve slightly. Once the top part has been unscrewed from the cylinder pipe, pull the piston out towards the top part, and the piston rod can now be pulled out of the cylinder pipe.
3. Remove the screw (pos. 5), which secures the piston head (pos. 4) in place.
4. The piston head (pos. 4) is pulled off the piston rod.
5. The cap (pos. 3) is pulled off the piston rod.
6. The gaskets (pos. 6.1+6.2+6.3+6.4+6.5) in the cap and the piston head are removed.
7. All parts are checked for chips, burrs, etc. Check for rust around the scraper ring (pos. 6.1) in the cap. If this is the case it must be removed.



- INSTALLATION: 1. New gaskets are mounted in the cap and the piston head. Remember to mount the gasket the correct way up.
2. Lubricate the thread on the cap (pos. 3) and the thread on the cylinder tube (pos. 1).
  3. The cap (pos. 3) is mounted on the piston rod.
  4. The piston head (pos. 4) is mounted on the piston rod and the screw (pos. 5) is tightened 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 gasket (pos. 6.4) on the piston head, which is in contact with the cylinder pipe, as well as the inside of the outer end of the cylinder pipe (pos. 1) with oil and push the piston into the middle position.
  6. The cap is mounted on the cylinder tube and tightened.

## Uninstalling/installing of wheels

When uninstalling the wheel, unhinge the drum with the wheel frame raised. The wheels will thus be free of the ground.

The wheel nuts are removed and the wheel can be replaced. After mounting the new wheel, screw the nuts on and tighten with a "firm hand". Next, lower the wheels so that they are touching the ground and tighten the nuts with 300 Nm.



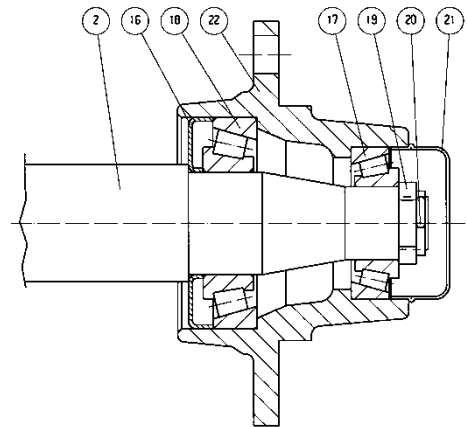
It is important that the wheel nuts and wheel surfaces are clean, otherwise the wheel nuts may loosen.

### Replacing the bearings

1. The hub cap pos. 21 is removed
2. The cotter pos. 20 is removed
3. The castellated nuts pos. 19 are removed
4. The shaft pos. 2 can now be knocked out
5. The bearings pos. 17+18 are removed
6. The sealant ring pos. 16 is removed

Fig. 22

FL55-6

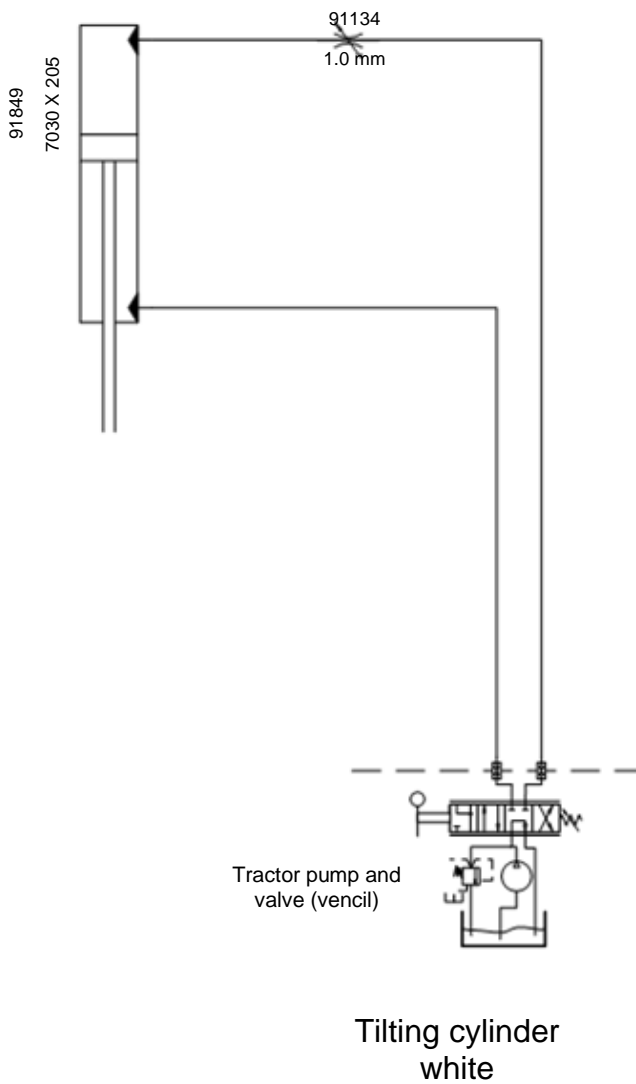


### Installation

1. The outer rings of the bearings pos. 17 + 18 are mounted in the hub housing pos. 22
2. The sealant ring pos. 16 is installed
3. The inner bearing ring pos. 18 is mounted on the shaft pos. 2 and the shaft is mounted in the hub housing
4. The inner bearing ring pos. 17 is mounted on the shaft pos. 2
5. The castellated nuts are screwed onto the shaft pos. 2, while the hub housing pos. 22 is rotated. The castellated nuts are tightened to the slowly rotating hub housing. Then loosen the castellated nut a quarter turn or until the hub turns around easily.
6. The splitter pos. 20 is installed
7. Hub cap pos. 21 is filled halfway with ball bearing grease and the hub cap is mounted

Hydraulics diagram for

# COMBIFLEX wheel frame



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## Warranty

DALBO A/S provides a 1 year warranty on all new machines sold by an authorised DALBO dealer. The warranty is valid for 1 year calculated from the deliver date to the end user.

**The warranty covers fixing material and production faults.**

The warranty is void in the following situations:

- **The machine was used for other purposes than that described in the user manual.**
- **The machine has been misused, or treated with excessive force**
- **Damage that has occurred as a result of incorrect setup of the machinery**
- **Absence of maintenance**
- **External accidents, weather, falling objects and the like.**
- **Transportation damage**
- **Unprofessional repairs took place**
- **The machine's construction was altered without DALBO A/S's written permission**
- **No original spare parts were used.**

Under no circumstances can DALBO A/S be made responsible for consequential damage, loss of income or operating losses as a result of error. DALBO A/S cannot also be held responsible for hourly labour costs in addition to those which may have been reasonably required for the repair or replacement of warranty parts.

DALBO A/S is not responsible for the following expenses:

- **Installing the machine**
- **Costs of normal maintenance, cleaning, lubrication and replacement of worn out parts.**
- **Transportation of the machine to and from the repair workshop**
- **The dealer's expenses, such as the consignment of persons or parts to and from the machinery and/or repair workshop.**

The following conditions are essential for the warranty:

- **The warranty is void if the dealer has not readied the machine, as well as instructed the user in the use of the machine.**

## Disposal



Unhinge the drum. It is crucial to release the pressure from **all** the cylinders.



When mounting/dismounting, attention should be directed towards the weight on the part in question. Which is why it is **important** to support this section underneath or with rigging, so that there is no danger of falling.

Hydraulic hoses and cylinders must be disconnected and any residual oil emptied out. The oil must be collected to avoid pollution. Oil and hoses must be sent for destruction.

All iron in the machinery can be recycled.

## Spare parts