DALBO

Front harrow

EN
Front-mounted harrow
300/400/500H/600H
Series no.: 100 - XXX

MADE IN DENMARK

Front harrow

Type 300/400/500H/600H

Congratulations on your new front harrow. For **safety reasons** and to achieve the best possible use out of your machine, you should read through the user instructions carefully **before taking the machine into use.**

Your front harrow has:

Type no.:	_____	Serial 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 give an overview of the individual parts.

EU DECLARATION OF CONFORMITY

DALBO A/S
DK-7183 Randbøl

hereby declares that the afore-mentioned machine is manufactured in accordance with the stipulations in Directive 2006/42/EC, which replaces the 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.

CE

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

DALBO A/S Date:

Carsten Jensen, CEO

Table of Contents

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 machine.

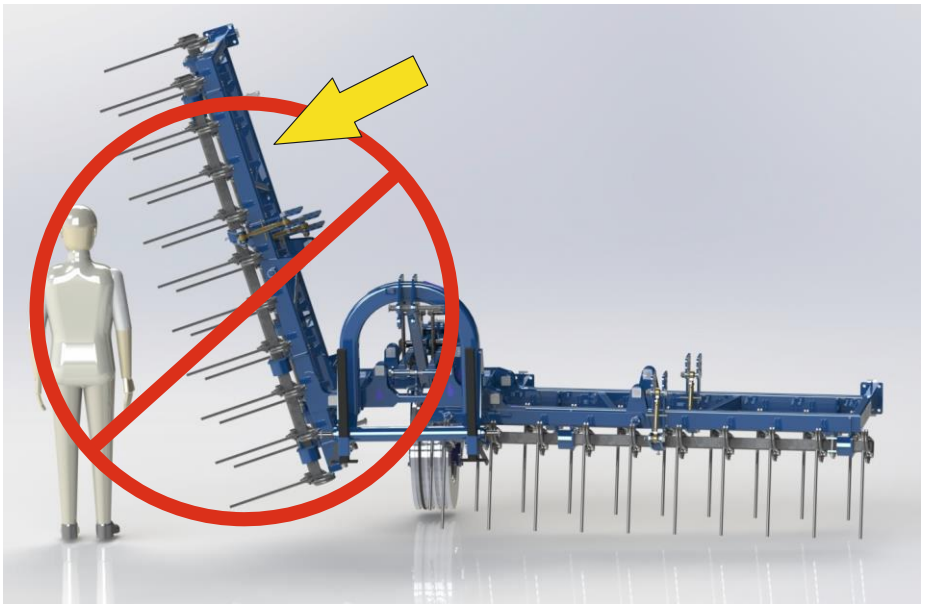
General

- Before starting work, the user must be familiar with all the parts of the machine.
- Safety markings have been placed on the machine that contain important instructions about your own safety and of others, 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 front harrow, it must be ensured that there are no people within the machine's reach. The machine may only be operated from inside the tractor.
- Before leaving the tractor, or if adjustments, maintenance or repairs need to be made to the front harrow, the machine's undercarriage shall be lowered, 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 machine against unintentional start-up.
- Remember to secure the lifting arm 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.

DALBO A/S is an innovative company, which strives to improve its products in line with technological developments and regular input from its users, with corresponding instructions and other product information. Technical specifications and other information is thus subject to changes. It is the user's responsibility to ensure that these instructions and other information is still up to date. This can be done by enquiring with our customer service: service@DALBO.dk.

Hydraulics

- No persons may be positioned within the reach of the machinery when the hydraulic system has been activated as there is a risk of being crushed.



- Prior to any repair work on the hydraulics unit, the machine's undercarriage shall be lowered. the pressure shall be removed from the unit, the engine shall be switched off and the ignition key shall be removed.

- Hydraulic connections must be cleaned thoroughly before connecting. When connecting the hydraulic hoses to the tractor's hydraulics it must be ensured that the pressure has been removed from the hydraulic system.

- 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.

- Clean hands thoroughly after skin contact with oil and grease. 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 through the skin and cause serious injuries. Seek professional medical assistance immediately in the event of any injury.

Mounting

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

Maintenance and repair

- The machine must be properly supported while undertaking all repair and maintenance work, the tractor and machine must have brakes properly activated, the engine must be turned off and the ignition key removed.

- Tighten all screw fittings after a few hours of use. All screw fittings must be checked at regular intervals and tightened when required. 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 traffic signs in accordance with traffic laws.

- Out of a regard for the dimensions of the machinery, the driver must enquire with the traffic authorities to ensure that it may be transported on public roads.

- When transporting the machine, care must be taken not to exceed the total weight and axle load of the tractor.

Correct use

- Correct use of the machine also includes compliance with the manufacturer's operating, maintenance and repair instructions, as well as the exclusive use of original spare parts.

- The front harrow 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 that results from changes to the machine carried out without the manufacturer's prior permission. Furthermore, the manufacturer is not liable for any damage that results from incorrect use. Responsibility for this rests solely with the user.

- No extra weight may be mounted on the front harrow.

Technical data

Front harrow

Type	300	400	500H	600H
Working width (cm)	300	400	500	600
HP (recommended)	30-40	40-50	50-60	60-70
Weight in kg:	625	675	995	1055
Wheels	200/60-14.5			
Transport width (cm)	300	400	225	225
Transport height (cm)	150	150	270	320
Number of harrow tines	24	32	40	48

Table 1

How to read the instruction manual

It is possible that 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 in the instruction manual are divided into 4 key sections:

- Safety
- Operation *(Settings, driving and servicing)*
- 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 front harrow is supplied completely assembled via platform truck.

If the front harrow needs to be lifted, it is recommended that this is done with straps, so that it hangs balanced.
Check the harrow for any damages upon receipt of the machinery. Check the hydraulic hoses for damage (H models). The machine must be placed on a fixed and level surface.

Limitations in use

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

- The machine may only be used for tilling land containing stubble and grass in agricultural areas that have been cultivated. Those areas to be tilled must have been subject to normal agricultural maintenance, i.e. without significant bumps or holes.
- It may also be used for the maintenance of grassy areas, paddocks, golf courses, sports facilities, parks and other places where an airing and breakdown of soil and plant residue is desired.
- The machine may only be used after first being attached to an agricultural tractor, by way of connection to the front-mounted 3-point hitch.
- The machine may work at a maximum speed of 8-14 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 aforementioned conditions, will be considered as unauthorised use, and will result is a revocation of the manufacturer's warranty.

Use

The front harrow is a front-mounted universal tool that can be used for a wide range of work in the fields. Together with a MaxiDisc disc harrow or a drum behind the tractor for example, it is possible to perform “double” the tilling of stubble and grass with a front harrow, and establish a false seed bed if desired, in one round. This can be of great benefit in a meadow, for example, or where there are large amounts of plant residue, or for the distribution of straw prior to tilling the soil itself. It is mounted with two rows of 16 mm harrow tines as standard.

Figure 1

Connecting and disconnecting

Connecting

The lifting arm is mounted first using the hitch pins (A), after which the top mount pin (B) is mounted.
Remember to raise the support legs and secure them with stud and cotter pin (C). See figure 2.

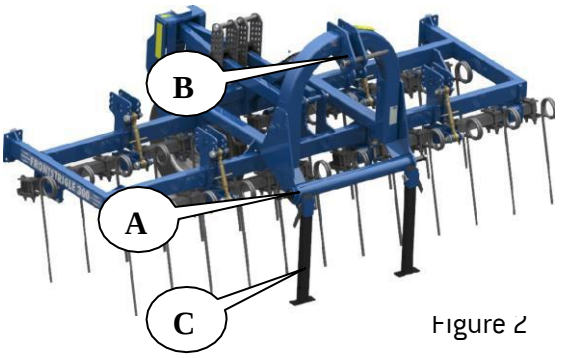


Figure 2

Remember to secure the studs with the linchpin and ensure that the lock mechanism in the lifting arm's hook has been turned on.

Angle of the lifting arm
Efforts must be made to ensure that the tractor's lifting arm, when the machine is lowered into its working position, is at a horizontal angle at minimum or pointing slightly higher. This enables the machine to roll easily over any obstacle it encounter, as the tractor pushes the machine upwards on a tilt while also maintaining control. See figures 3 & 4.

Figure 3

Figure 4

Hydraulics

A double-acting check valves is required at the front on the tractor for folding in and out (H models).
Check that the hydraulic hoses have not been crushed.

Transport lock (500H & 600H models only)

Once the hydraulic hoses have been connected to the tractor's female quick couplers and there is pressure in the system, the transport lock can be disconnected from transport position (A) and moved to position (B).

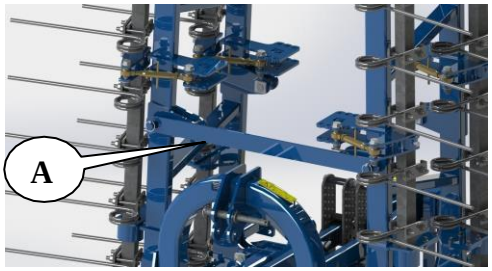


Figure 5

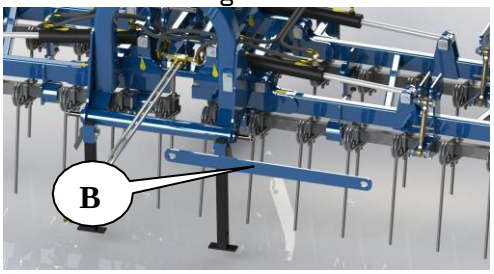


Figure 6

N.B. When driving on public roads, the transport lock must be placed in transport position!

Disconnecting

The front harrow shall be lowered onto a fixed surface before disconnecting and its sides shall be folded down (H model). Disconnect hydraulic hoses (500H & 600H models) and lifting arm/top mount. Lower the support legs and secure with studs and cotter pins, see figure 2.

Remember to remove the pressure from the connecting hoses (H models) to the hydraulic system before disconnecting the hoses. This can be done when the front harrow is folded down completely, see figure 7.

Figure 7

Settings

The front harrow is factory set at delivery, but fine tuning will always be necessary before taking into use. Many different adjustment options make your front harrow more versatile and offers the potential to gain optimal use of the machine.

As a standard setting, the front harrow shall be set to run in horizontal position while operating in the fields. **This standard setting is important in order to leave the field with an even service as well as to achieve a consistent working depth.**

Figure 8

Figure 9

Adjustment of working depth

The working depth of the harrow is set via the perforated panels (A) on the support wheel as well as with the tractor's lifting arm. The frame must be horizontal in working position on both sides, see figures 9 & 10. The front lift must be in the float position.

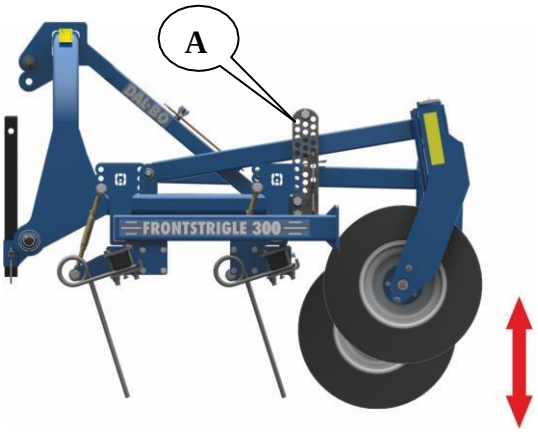


Figure 10

Adjusting the harrow tines

The tines angle on the harrow can be changed, as shown in figure 12, by using 4 spindles (A). In order to achieve the same angle on all 4 bulls, the measuring tool should be used, figure 13 (B), which is placed as shown in figure 14 (C). There are small notches on the measuring tool that can be adjusted according to the spindle

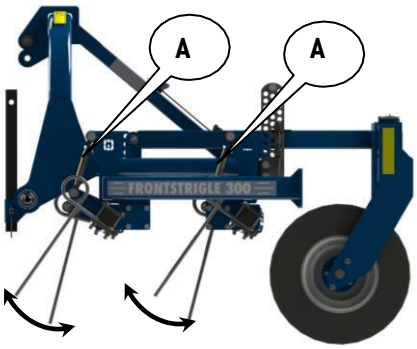


Figure 11

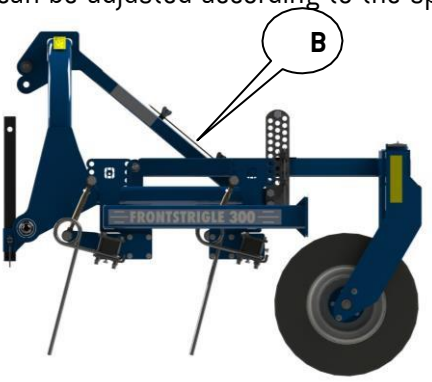


Figure 12

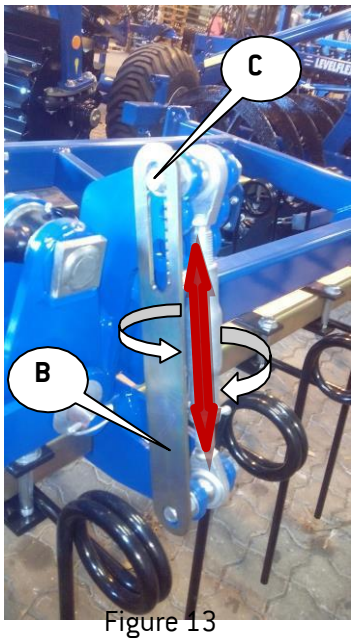


Figure 13

Driving and operating

Correct operation is important in order to get optimal use from your front harrow. This applies not only to working in the field but also in terms of safety. Which is why it is crucial that you have read the instruction manual and are familiar with the safety precautions that cover the machine.

Working depth

The front harrow can be set to a very light tilling, down to working depth of just a few cm.

Driving speed

It is recommended that the machine be driven at 8-14 km/h, but driving should always be done according to conditions.

If the speed is increased, wear will also increase, especially under dry conditions. There is also a risk of damaging the harrow tines by driving at excessively high speeds under adverse conditions.

Power

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

Trouble shooting

Problem	Cause	Remedy
Uneven working depth	• The harrow tines on the bull have not been set at the same angle.	• Adjust the spindle.
	• The front harrow tilts backwards/ forwards.	• The depth of the lifting arm needs regulating. • Regulate the support wheel.
Hard to control	• The front harrow is not level on the undercarriage – see figures 3 & 4.	• Adjust the top mount pin.
	• The top mount is too long.	• Adjust the top mount to a shorter length.
	• Too great a working depth.	• Raise the machine.

Maintenance

Good maintenance ensures a long life of the harrow and therefore optimal use of the machine. Grease fittings have therefore been mounted in places where 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. It should also be checked that the hydraulic system is air-tight.

Lubrication

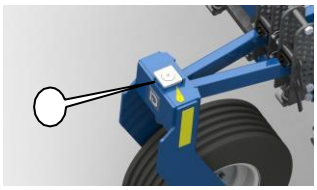
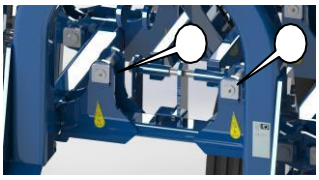
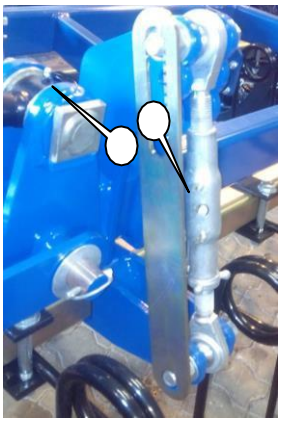
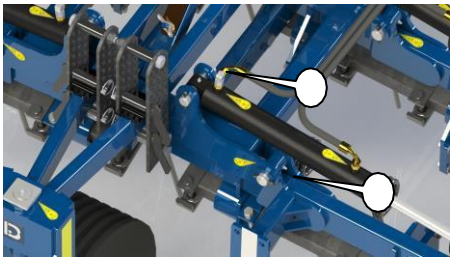




Figure 14

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

Hydraulics

All hydraulic hoses must be checked for wear or damage. Check that the hoses have not been subjected to crushing.

Defective hydraulic hoses must be replaced immediately. Broken hoses can cause injury or breakdown of the machinery.

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

Repair of the hydraulic parts must be performed by a professional repairer.

Replacements and repairs

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

All maintenance and repair work on the front harrow may only be carried out when the machine has been lowered onto a fixed surface or secured in transport position, the tractor brake has been activated, the engine is turned off and the ignition key removed, so that the machine is safeguarded against unintentional start-up.

Prior to all repair work on the hydraulics, special attention must be shown to safety. Before starting the work, remove the pressure from the hydraulic system and if required, support the part in question.

After carrying out work on the hydraulic system, the system must always have air removed before being taken into use in order to safeguard against breakdown or injury.

If irregularities are found... a professional repairer must be called!

Replacement of worn parts

The front harrow shall be securely supported so there is no risk of crushing or collapse.

Repair of cylinders (A) and other parts of the hydraulic system should be performed by expert personnel. See figure 16.

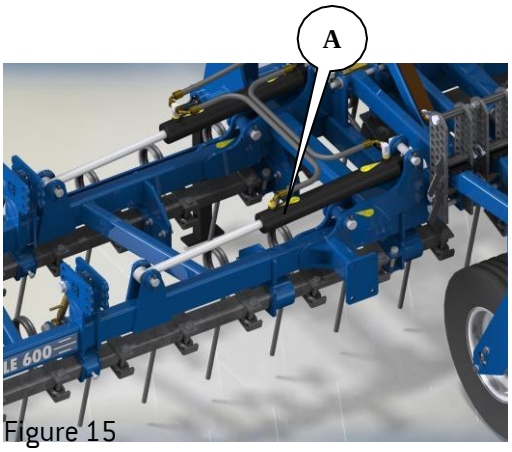


Figure 15

Replacement of harrow tines is performed as shown (B), figure 17.

Figure 16

Disposal

The pressure shall be removed from 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 lifted up, so there is no risk of collapse.

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

All iron in the machinery can be sent for recycling.

Hydraulics diagram

Hydraulics diagram for

Front harrow 500H & 600H

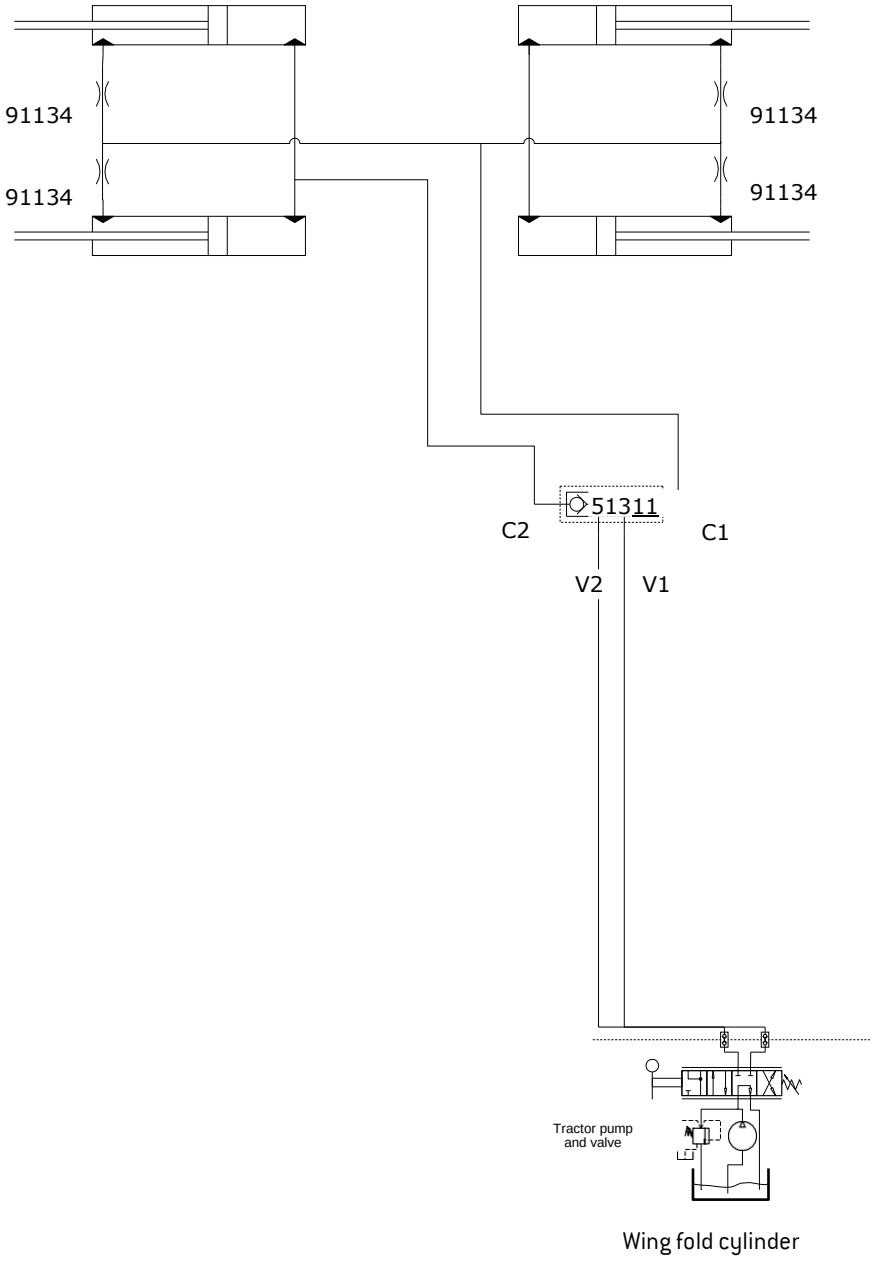


Figure 17

Spare parts