

# DEMOUNT

**Instruction book**

674679-GB-95/8

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**EU Declaration of Conformity****Manufacturer,**

HARDI INTERNATIONAL A/S

Helgeshøj Allé 38  
DK 2630 Taastrup  
DENMARK

**Importer,**

declare that the following product;

.....

.....

Adhere extra shipping package labels to inside cover.

**A.** was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directives 91/368/EEC and 93/368/EEC) with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines.

**B.** was manufactured in conformity with the standards current at that time that implements a harmonised standard in accordance with Article 5 (2) and other relevant standards.

Taastrup 1.8.95

Erik Holst  
Managing Director  
HARDI INTERNATIONAL A/S

**Operator safety**

Watch for this symbol . It means WARNING, CAUTION, NOTE. Your safety is involved so be alert!

Note the following recommended precautions and safe operating practices.

- Read and understand this instruction book before using the equipment. It is equally important that other operators of this equipment read and understand this book.
- Local law may demand that the operator must be certified to use spray equipment. Adhere to the law.
- Pressure test with clean water prior to filling with chemicals.
- Wear protective clothing.
- Rinse and wash equipment after use and before servicing.
- Depressurize equipment after use and before servicing.
- Never service or repair the equipment whilst it is operating.
- Disconnect electrical power before servicing.
- Always replace all safety devices or shields immediately after servicing.
- If an arc welder is used on the equipment or anything connected to the equipment, disconnect power leads before welding. Remove all inflammable or explosive material from the area.
- Do not eat, drink or smoke whilst spraying or working with contaminated equipment.
- Wash and change clothes after spraying.
- Wash tools if they have become contaminated.
- In case of poisoning, seek doctor or ambulance. Remember to identify chemicals used.
- Keep children away from the equipment.
- Do not attempt to enter the tank.
- Do not stand on the sprayers platform during driving or spraying.
- Do not go under any part of the sprayer unless it is secured. The boom is secure when placed in the transport brackets.
- Do not use the step unless the sprayer is connected to the tractor or the sprayer is correctly placed on a hard, flat surface.



We congratulate you for choosing a HARDI plant protection product. The reliability and efficiency of this product depend on your care. The first step is to carefully **read and pay attention** to this instruction book. It contains essential information for the efficient use and long life of this quality product.

As the instruction book covers all DEMOUNT models with hydraulic LHZ and OLH booms, please pay attention to the paragraphs dealing with precisely your model. This book is to be read in conjunction with the "Spray Technique" book.



## Description

The HARDI DEMOUNT model was designed especially for all JCB FASTRAC models. It consists of a short, compact frame, which is fixed to your tractor, as well as a second frame with a 2000 litre polyester tank, pump, EC operating unit, self-cleaning filter, support legs, and a hydraulic boom (DAH) of 12 to 24 metres. Additional equipment of the DEMOUNT model is HARDI MANIFOLD SYSTEM, HARDI FILLER of 35 l, and a rinsing tank of 200 l fitted on the three-point linkage at the front.

The frame has a strong chemical and weather-resistant lacquer. Screws, nuts, etc. have been DELTA MAGNI treated and are therefore corrosion resistant.

The tank, made of chemical resistant polyester, has a purposeful design with no sharp corners for easy cleaning.

The design of the hydraulic pump, with 6 diaphragms, type 361 or 462, depending on boom width, is with easily accessible diaphragms and valves that ensures liquid does not contact the vital parts of the pump.

The EC operating unit is constructed of modules and consists of main ON/OFF valve, pressure gauge, pressure regulation with built-in HARDI-MATIC and distribution valves with pressure equalization. HARDI-MATIC ensures a constant volume per hectare of the liquid (l/ha) at varying speed in the same gear when the number of P.T.O. revolutions are between 300-600 r/min.

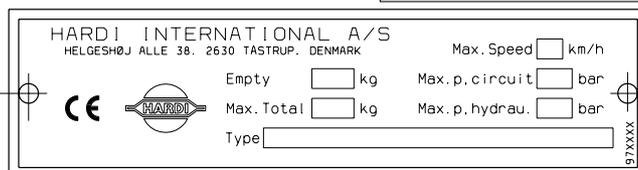
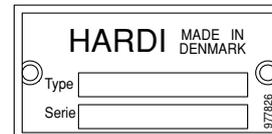
With the self-cleaning filter the impurities that exist in the spray liquid will by-pass the filter and be recirculated back to the tank via the return flow.

The hydraulic system consists of a hydraulic pump with gear connected directly to the transmission shaft of your tractor and a hydraulic motor fitted on and operating the diaphragm pump. Further a double acting hydraulic outlet is needed to operate the spray boom.

The fully electrical/hydraulic spray boom is equipped with individual slanting control. LHZ booms of 12-16 m are mounted on the frame by trapeze suspension, OLH booms of 18-24 m by pendulum suspension. All booms are equipped with HARDI COLOR TIPS and TRIPLET SNAP-FIT.

## Identification plates

An identification plate fitted on the frame and pump is to indicate model, serial number and country of origin. Boom centre frame, and inner/outer sections also have identification plates indicating boom type and part no. of steel parts. If ordering spare parts, inform your dealer of these so the right model and version are described.

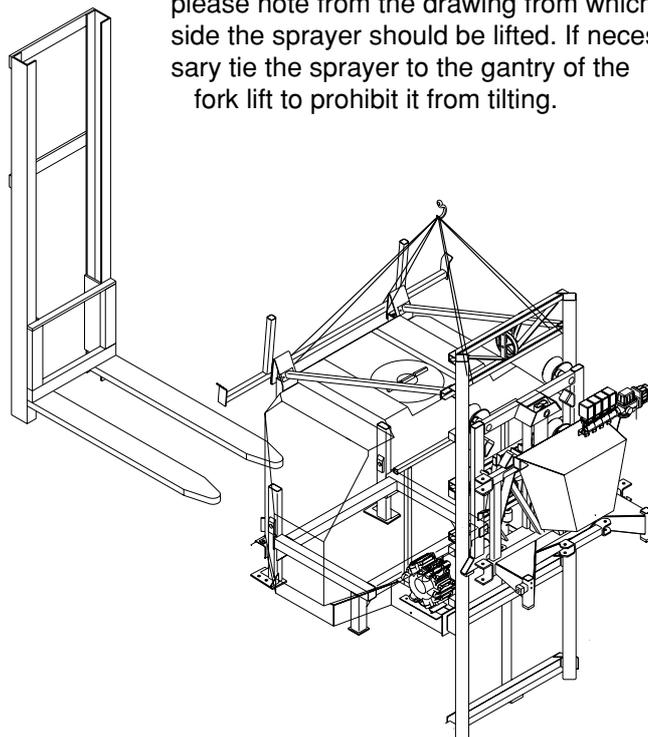


## Sprayer use.

The DEMOUNT sprayer is for the application of crop protection chemicals and liquid fertilizers. The equipment must only be used for this purpose. It is not allowed to use the sprayer for other purposes. If no local law demands that the operator must be certified to use spray equipment, it is a very good idea to be trained in correct plant protection and in safe handling of plant protection chemicals to avoid unnecessary risk for persons and the environment when doing your spray work.

## Unloading the sprayer from the truck.

For the unloading of the sprayer you need a crane or a fork lift. When loading with a crane please observe the lifting points as shown on the sketch, and make sure that the straps or belts used for lifting are strong enough. When unloading with a fork lift, please note from the drawing from which side the sprayer should be lifted. If necessary tie the sprayer to the gantry of the fork lift to prohibit it from tilting.





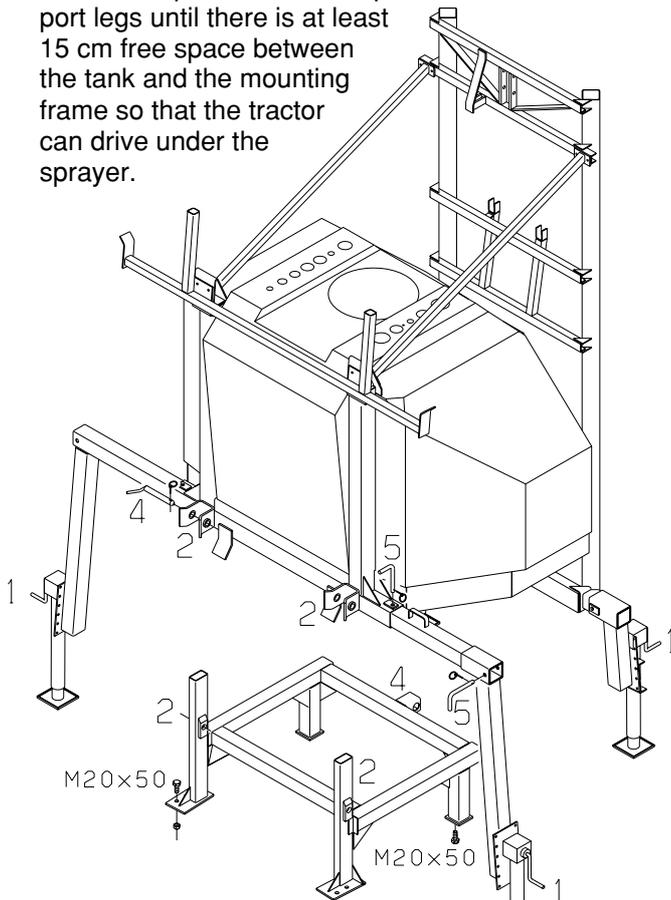
## Connecting the sprayer

### Attachment of the mounting frame

The mounting frame is fixed to the tractor with 4 screws in front and 2 screws behind. Remember to tighten up the screws.

### Connecting of the sprayer on the mounting frame

1. Raise the lift arms of the tractor to the upper position as this facilitates the mounting. Jack up the sprayer in small steps on the four support legs until there is at least 15 cm free space between the tank and the mounting frame so that the tractor can drive under the sprayer.



2. Drive the tractor under the sprayer until the mounting frame is right below the tank frame so that both of the front brackets slot together.
3. Now lower the sprayer with the jacks on until the tank frame is resting well on the mounting frame. Then lift up the jacks several times in small steps.
4. When the sprayer is placed correctly on the mounting frame, fit the two front pins and the single rear pin to the brackets and secure with clevis pins.
5. Now pull out the pins from the front support legs and remove the first part of these legs. Then pull out the pins on the front of the mounting frame and remove the second part of the support legs. As to the rear support legs you pull out the pins at the gantry and remove the support legs.

### Demounting of the sprayer

The demounting takes place in the opposite direction.

However, always make sure that there is enough space between the sprayer and the basic frame to remove the tractor without damaging the bottom of the tank.

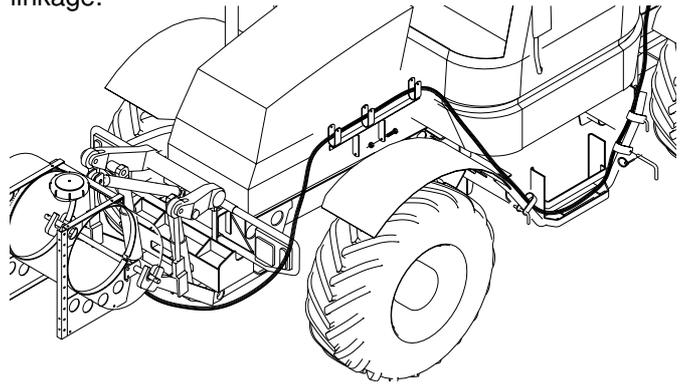


**NOTE!** The sprayer must be demounted and placed on level and hard surface.

**IMPORTANT!** The sprayer must only be demounted and placed on the jacks with **empty** tank!

### Mounting of the front rinsing tank and hoses

Mount the rinsing tank on the tractor front three-point linkage.

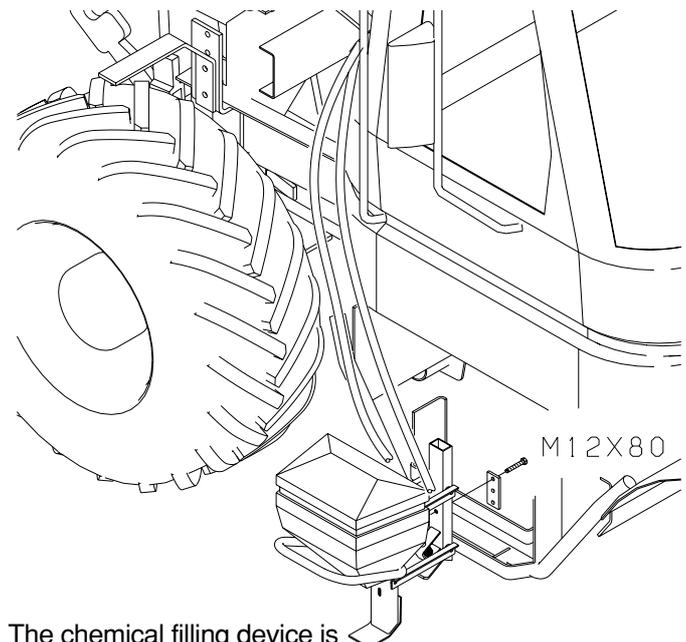


Then fix the hose support on the bracket of the front axle spring suspension on the left side and place the hose. Fix the support in such a way that the longer part is pointed backwards.

Fasten the hose with the clamps to the protection rack of the left and right side of the cabin ladder.

Then place the hose within the rear wheel in the three clamps of the tank frame and connect it to the yellow symbol of the rinsing tank of the MANIFOLD SYSTEM.

### Mounting of the HARDI FILLER chemical filling device.



The chemical filling device is fitted at the FASTTRAC RH step with brackets as shown.

## Hydraulic system

The D.A.H. system requires a double acting hydraulic outlet. The hydraulic hoses are marked with arrows to indicate direction of oil flow.

The D.A.H. system requires an oil flow between 10 to 90 l/min and a min. pressure of 130 bar. The system has a built-in flow regulator that maintains constant speed on hydraulic movements.

Before operating the hydraulics, the clip at the distribution valve (situated under the platform behind the pump) should be set for OPEN CENTRE tractor hydraulics.

## Hydraulic pump transmission

Before initial start fill the hydraulic oil tank with the 70 l of hydraulic oil, type "SHELL TELLUS T46", enclosed in containers.

## Connecting the hydraulic pump

Connect the hydraulic pump with the P.T.O. shaft of the tractor. Make sure that the pump "locks" correctly. Fix the pump in such a way that the profile fitted on the right side is located on the right side of the coupling device preventing the pump from rotation.

The hydraulic pump gear has already been filled with 0.7 l (25 imp.fl.oz) oil. However, check level before initial start and never omit the regular service intervals.

## Oil cooler (if fitted)

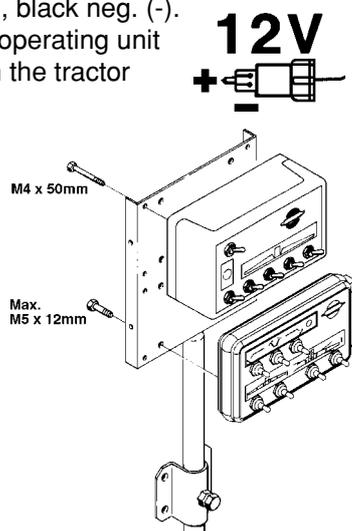
If the sprayer is operating in ambient temperatures above 30°C (112°F) an oil cooler kit must be fitted in order to keep transmission oil temperature at the specified level. The thermostat will engage the electric fan when the oil temperature reaches appr. 50°C (148°F) and disengage at appr. 40°C (130°F).

Connect the fan electric plug to a 12 V socket.

## Control boxes and power supply

Two power boxes of 12V are required. Note polarity!  
 For EC: Brown pos. (+), blue neg. (-)  
 For D.A.H.: White pos. (+), black neg. (-).  
 The control boxes for EC-operating unit and for D.A.H. are fitted in the tractor cabin at a convenient place. See section on assembly for initial mounting.

The wires must have a cross-sectional area of at least 4.0 mm to ensure sufficient power supply. For the EC-operating unit the tractor circuit should have an 8 Amp fuse and for the D.A.H. a 16 Amp fuse.



## Roadworthiness

When driving on public roads and other areas where the highway code applies, or areas where there are special rules and regulations for marking and lights on implements, you should observe these and equip implements accordingly.

## Before taking the sprayer into operation

Although the sprayer has been applied with a strong and protective surface treatment on steel parts, bolts etc. in the factories it is recommended to apply a film of anti-corrosion oil (e.g. CASTROL RUSTILLO or SHELL ENSIS FLUID) on all metal parts in order to avoid chemicals and fertilizers to discolorate the enamel.

If this is done already before the sprayer is put into operation the first time, it will always be easy to clean the sprayer and keep the enamel shiny for many years.

This treatment should be carried out every time the oil film is washed off.



## Operating instructions

### Filling of water

Water can be filled into the main tank in following ways:

1. Filled through tank lid.
2. Filled by diaphragm pump through suction side fitted filling device (optional extra) by normal pump capacity directly to the tank.
3. Filled by diaphragm pump through pressure side fitted injector/venturi type Fast Filling Device (optional extra) by up to 3 times normal pump capacity.
4. Combination of 2 and 3.

The tank should normally be filled  $\frac{2}{3}$  with water, before adding the chemicals - always read instruction at chemical container!



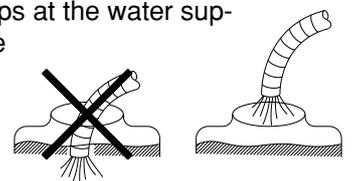
**NOTE!** Max. permitted tank content is 2000 kg (4410 lb) corresponding to 2000 litres (440 imp.gal.) water or appr. 1550 litres (340 imp.gal.) of liquid fertilizers.

### Filling through tank lid

Remove tank lid and fill water through strainer to prevent rust or other particles to enter the tank. It is recommended to use as clean water as possible for spraying purposes.

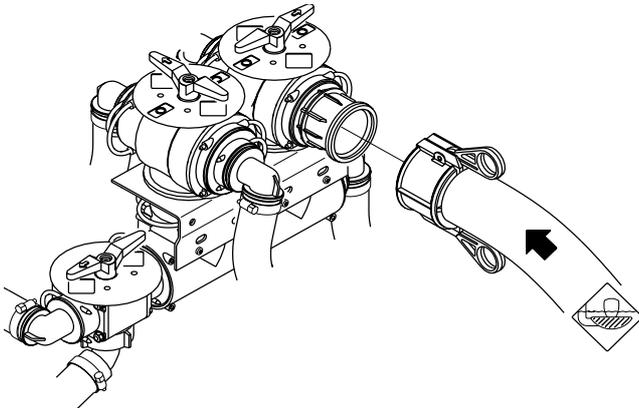


**WARNING:** Do not let the filling hose enter the tank. Keep it outside the tank, pointing towards the filling hole. If the hose is lead into the tank and the water pressure drops at the water supply plant, chemicals may be syphoned back and contaminate the water supply lines, plant and well.



## Suction Filling Device.

The Suction Filling Device is operated as follows:



1. Connect suction hose to Suction Manifold.
2. Engage diaphragm pump and set P.T.O. revs. at 540 r/min. Turn handle on Suction Manifold towards Filling Device.



**WARNING!** Always engage pump **before** turning the valve towards Filling device to avoid spray liquid streaming back in suction hose contaminating the water reservoir!  
Do not turn handle towards Filling device unless the pump is working!

3. The tank is now filled by water. Keep an eye on liquid level indicator.
4. Turn handle on Suction Manifold away from Filling Device to discontinue filling process.
7. Disconnect suction tube.



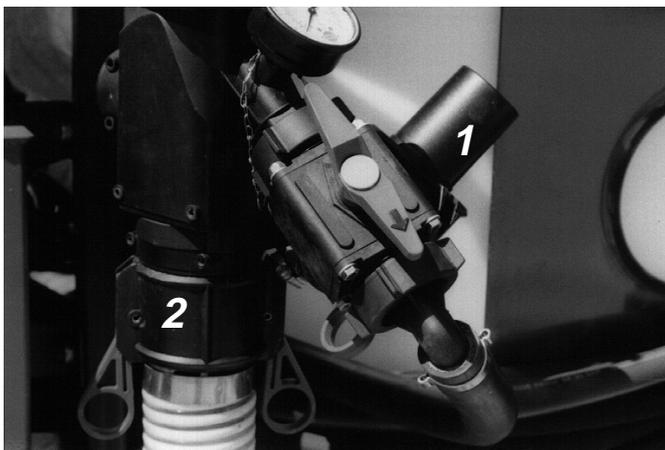
**NOTE!** Observe local legislation regarding use of Filling Device. In some areas it is prohibited to fill from open water reservoirs (lakes, rivers etc.). It is recommended only to fill from closed reservoirs (mobile water tanks etc.) to avoid contamination.



**WARNING!** If suction hose/filter is carried at the sprayer during spraying, it can be contaminated by spray drift which will be transferred to lake/river when filling!

## Fast Filling Device

The Fast Filling Device is operated as follows:



1. Ensure spray liquid tank contains at least 50 liters of water.
2. Remove cover (1) and connect suction hose (2).
3. Turn handle on Pressure Manifold towards Fast Filler. With the P.T.O. at 540 r/min, the pressure gauge should indicate about 10 bar.
4. If water is not seen in transfer tube, prime by turning valve.
5. Keep an eye on liquid level indicator.
6. Turn handle on Pressure Manifold away from Fast Filler to discontinue filling process.



**NOTE:** Turn handle towards EC-operating unit **before** turning away from Fast Filler in order to avoid peak pressure blowing the safety valve!

7. Disconnect suction tube (2) and replace cover.

The Filling Device and the Fast Filling Device can be used simultaneously - this gives even bigger filling capacity.



**WARNING:** Do not leave the sprayer whilst refilling the tank and keep an eye at the level gauge in order NOT to overfill the tank!

**NOTE!** Observe local legislation regarding use of Filling Device. In some areas it is prohibited to fill from open water reservoirs (lakes, rivers etc.). It is recommended only to fill from closed reservoirs (mobile water tanks etc.) to avoid contamination.



**WARNING!** If suction hose/filter is carried at the sprayer during spraying, it can be contaminated by spray drift, which will be transferred to lake/river when filling!

## Filling the Rinsing tank

Remove the tank lid and fill with clean water and replace lid.

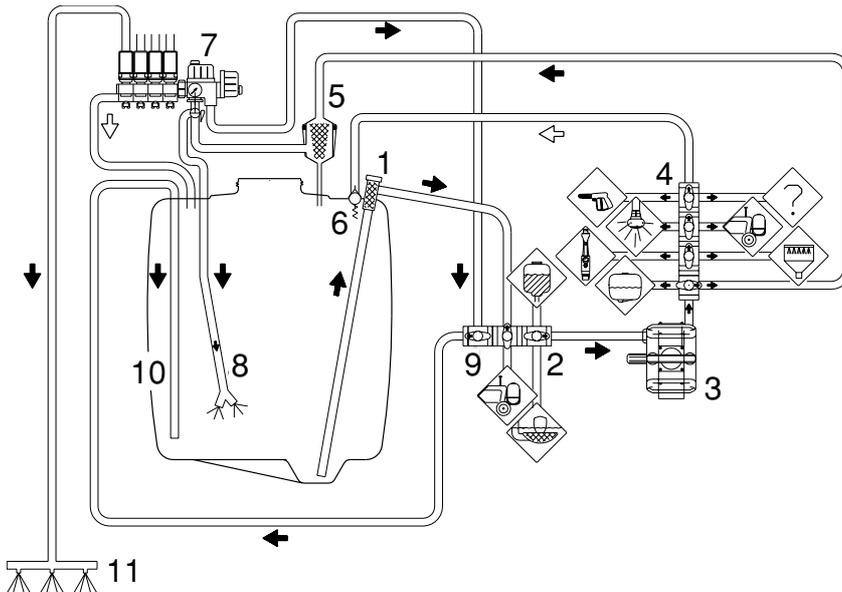
## MANIFOLD SYSTEM

The MANIFOLD SYSTEM is located at the left side of the sprayer and permits operation of all HARDI optional extras from this one position. The modular system facilitates the addition of up to three optional extras on the suction side and five extras on the pressure side. Furthermore the suction manifold can be fitted with a return valve which ensures better draining of the sprayer before cleaning.

**Function diagram**

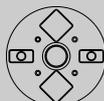
1. Suction filter
2. Suction manifold BLACK with 2 valves
3. Pump
4. Pressure manifold GREEN with 3 valves
5. Self-Cleaning Filter
6. Safety valve
7. Operating unit
8. Pressure agitator
9. Return valve BLUE
10. Return to tank
11. Sprayer boom

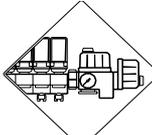
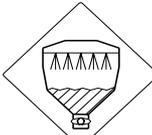
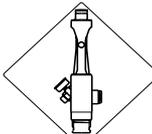
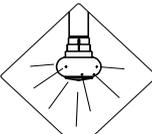
The diagram shows examples of options. These are individual for each sprayer.



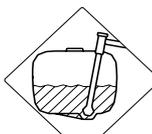
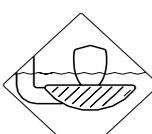
**Symbols**

The pressure, suction and return valves are distinguished by coloured identification discs on the 3-way valves. Symbols corresponding to the optional extras are located on the discs for easy identification and operation.

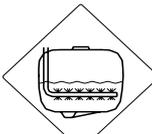
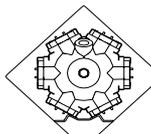
 **Green disc = Pressure valve**

	To Self-Cleaning Filter/operating unit		To HARD FILLER
	To Fast Filling Device		To Tank Flushing Nozzle
	To main tank		

 **Black disc = Suction valve**

	From main tank (suction filter)		From Filling Device
	From Rinsing Tank		

 **Blue disc = Return valve**

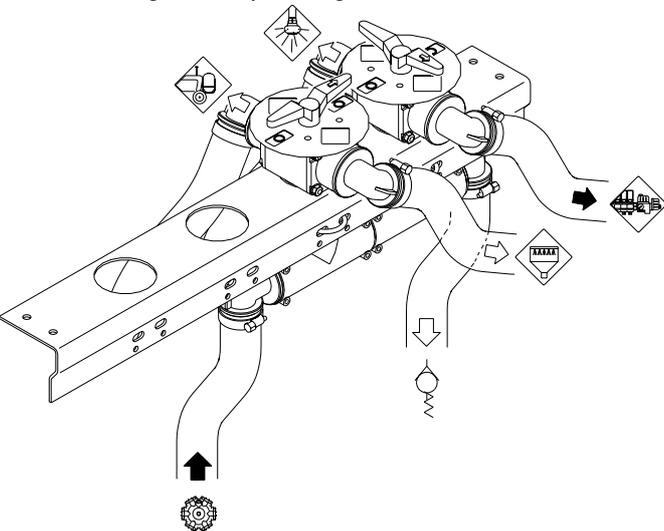
	Return from operating unit to agitation		Return from operating unit to pump suction
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**Operating of MANIFOLD SYSTEM**

The green pressure valves and the black suction valves have 4 positions. Two positions are for options. The other two are marked "O" indicating the valve is closed. The blue return valve only has 2 positions. The arrow on the handle indicates which position is selected.

**Green pressure valves**

To select the optional equipment, the handle is turned so the arrow and thereby liquid is directed to the optional extra instead of the Self-Cleaning Filter/operating unit. When spraying is to resume, turn the handle so the Self-Cleaning Filter/operating unit is selected.

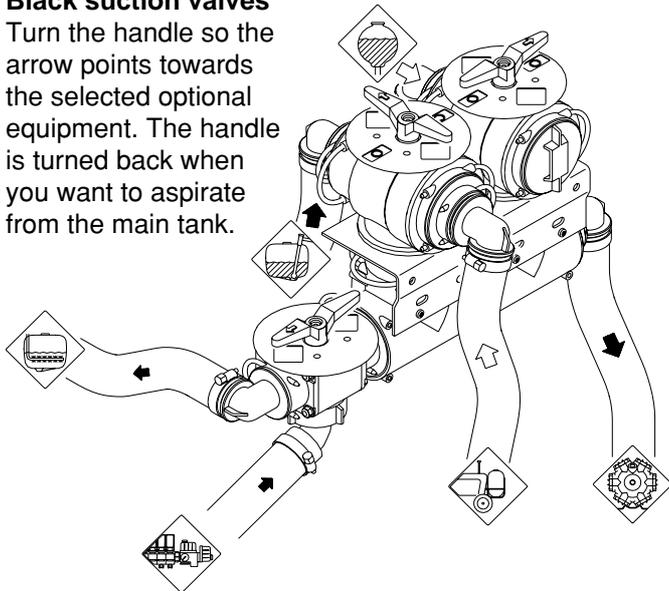


If 2 or more valves are fitted, the arrow must point towards the optional extra you select. Remaining handles are turned to “O” (closed). When spraying is to resume, select the Self-Cleaning Filter/operating unit. The other handles are turned to “O”.

If all the green pressure valves are closed the safety valve will open inside the tank.

**Black suction valves**

Turn the handle so the arrow points towards the selected optional equipment. The handle is turned back when you want to aspirate from the main tank.



If 2 valves are fitted, eg. Front Tank and Rinsing Tank, select optional extra and turn the other valve to “O” (closed). To resume aspiration from the main tank, the arrow must point towards the main tank. Remaining valve must be closed.

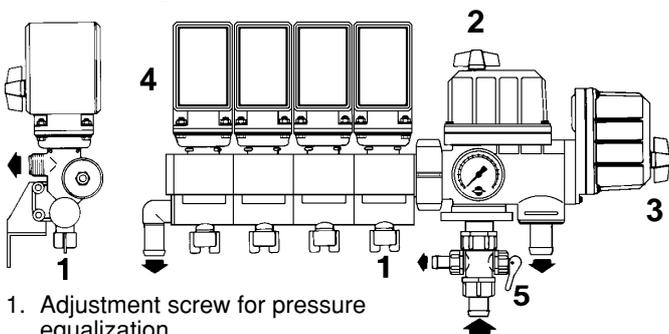
**Blue return valve**

Normally the liquid is directed to the tank return. When the tank is nearly empty, the handle is turned so the liquid is directed to the suction side of the pump instead of the tank return.

**Adjustments of EC operating unit**

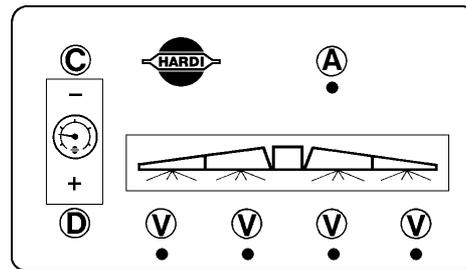
Before spraying the EC operating unit is adjusted using clean water (without chemicals).

**EC operating unit**



- 1. Adjustment screw for pressure equalization
- 2. Main ON/OFF valve
- 3. Pressure control valve
- 4. Distribution valves
- 5. Pressure agitation valve

**EC Remote control box**



- A. Operating switch for main ON/OFF valve
- V. Operating switch for distribution valves
- C. Pressure control switch (to lower)
- D. Pressure control switch (to raise)

1. Choose the correct nozzle. TRIPLET nozzle turrets are turned to the suitable nozzle for the spray purpose. Make sure that all nozzles are the same type and capacity. See “Spray Technique” book.
2. Open or close lever 5 depending on whether pressure agitation is required. (Remember pressure agitation takes 5% to 10% of pump output).
3. Main ON/OFF switch A is set towards green.
4. All distribution valves switches V are set towards green.
5. Pressure control switch C is activated until emergency handle 3, stops rotating (minimum pressure).
6. Put the tractor in neutral and adjust the P.T.O. and thereby the number of revolutions of the pump corresponding to the intended travelling speed.



**NOTE:** The P.T.O. revolutions must be kept between 300-600 r/min.

7. Pressure control switch D is activated till the recommended pressure is shown on the pressure gauge.

**ADJUSTMENT OF PRESSURE EQUALIZATION:**

8. Close the first distribution valve switch V.
9. Turn the adjusting screw 1 until the pressure gauge again shows the same pressure.
10. Adjust the other sections of the distribution valve in the same way.

Hereafter adjustment of pressure equalization will only be needed if you change to nozzles of other capacities.

**OPERATING THE CONTROL UNIT WHILE DRIVING:**

11. To stop the liquid flow to the boom switch ON/OFF A to OFF position. This returns the pump output to the tank through the return system. The diaphragm anti-drip valves ensure instantaneous closing of all nozzles.

To stop the liquid flow to one or more boom sections, switch the relevant distribution valve V to OFF position. The pressure equalization ensures that the pressure does not rise in the sections which are to remain open.

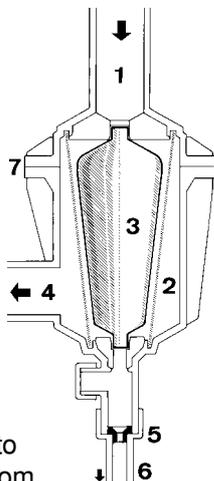
In case of power failure it is possible to activate all functions of the operating unit. To operate manually, disconnect the multiplug first.

When the sprayer is put aside, the control box and the multiplug must be protected against moisture and dirt. A plastic bag may be used to protect the multiplug.

## Self-Cleaning Filter

### Function diagram

1. From pump
2. Filter screen
3. Guide cone
4. To operating unit
5. 3, 4, 5 or 6 mm restrictor
6. Return to tank
7. Ring nut

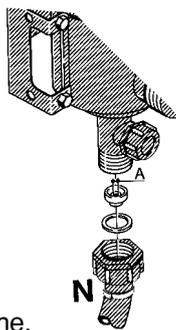


### Choice of restrictor

It is important to have a large flow through the filter. This is achieved by choosing the restrictor size in relation to the liquid consumption of the spray boom.

4 restrictors are supplied. Use the green one (largest A orifice first).

Hose N is unscrewed from the filter. Be careful not to lose the seal. The restrictor is placed in the hose and the hose is mounted again.



If the required working pressure cannot be obtained, the restrictor is too large. Choose a smaller restrictor. Start with a black one, then a white and finally a red one.

When cleaning the filter remove hose N and the hose at the safety valve and check there are no residues. Standard filter size is 80 mesh. Filters of 50 and 100 mesh are available. To remove filter mesh undo the large ring nut. Check condition and placement of O-rings before reassembly.

## Filling of chemicals

Chemicals can be filled in the tank in 2 ways:

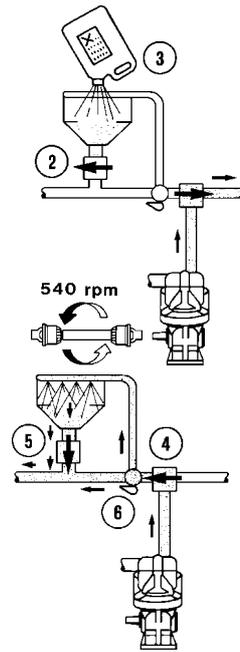
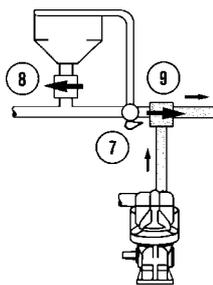
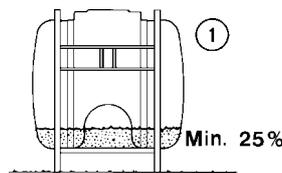
1. Through tank lid
2. By means of HARDI FILLER chemical filling device (optional extra in some countries).



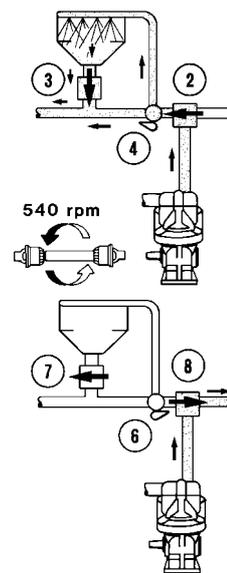
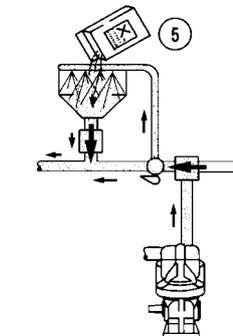
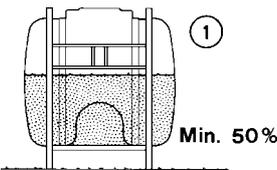
**Warning!** Be careful not to slip or splash chemicals when carrying chemicals up to the tank lid!

## Filling by HARDI FILLER

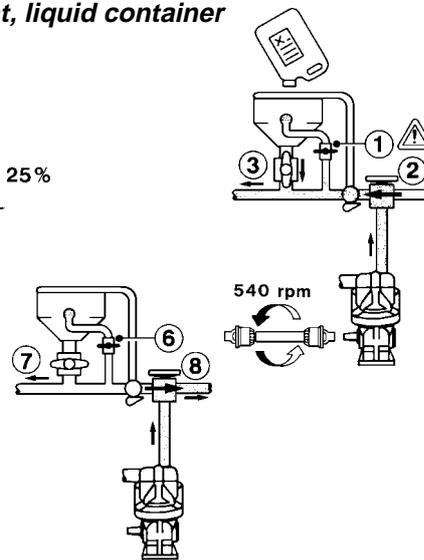
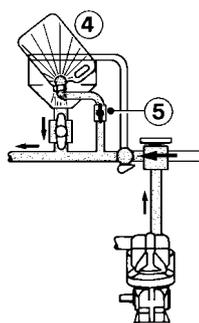
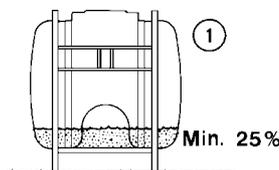
### Liquid



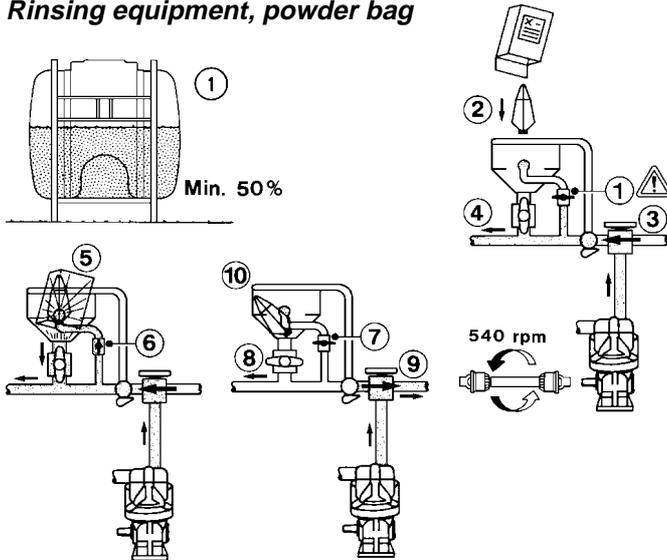
### Powder



### Rinsing equipment, liquid container

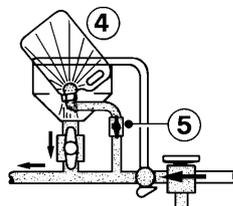


**Rinsing equipment, powder bag**



**Operation of rinsing equipment.**

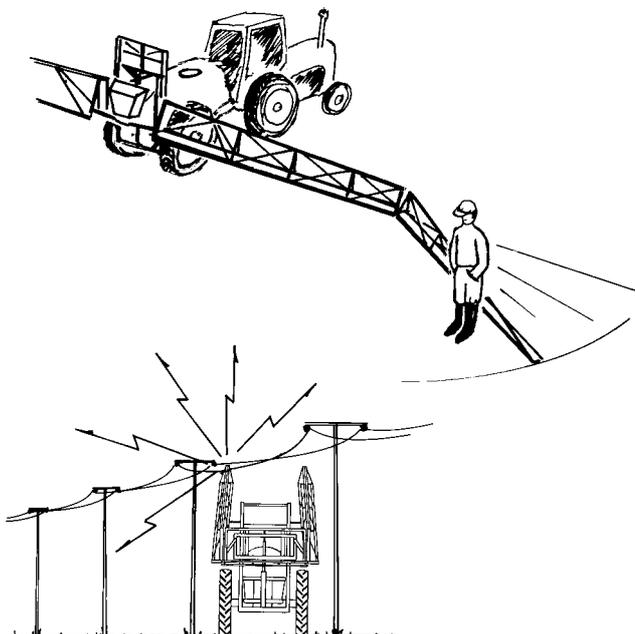
**WARNING:** The rinsing valve **5** must **not** be operated before the package is placed above the rinsing nozzle as jets from the nozzle can hit the operator.



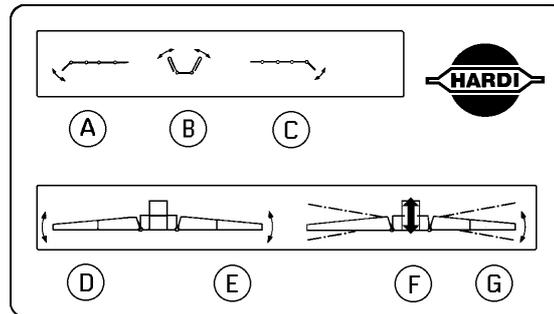
**Operating the boom (All models)**

**WARNING:** Be cautious with initial use of the hydraulic systems. If there is air in the system, this may cause violent movements of the boom. Therefore take care that no persons or objects are hurt or damaged in the process of testing.

**DANGER:** When folding and unfolding the boom, be sure that no persons or objects are in the rotating field of the boom and that the boom cannot touch any electrical conductors.



**Operation of the LHZ boom**  
Boom manoeuvring is as follows.



- A. Unfolding/folding of left outer section
- B. Unfolding/folding of inner section
- C. Unfolding/folding of right outer section
- D. Boom tilt for left side
- E. Boom tilt for right side
- F. Raising and lowering of boom
- G. Slanting of boom

**Unfolding**

**WARNING:** ENSURE THAT THE BOOMS ARE CLEAR FROM THE TRANSPORT BRACKETS BEFORE UNFOLDING.

1. Push switch **F** upward to lift the boom clear of the rear transport brackets.
2. Push switch **D** and **E** upward to ensure boom sections are clear of the front transport brackets.
3. Push switch **B** upward to unfold the inner sections.
4. Push switch **A** and **C** upward to unfold outer sections.
5. Push switch **D** and **E** downward to lower right and left sections.
6. Push switch **F** downward to lower the boom to correct height above crop or ground level.

**CAUTION**

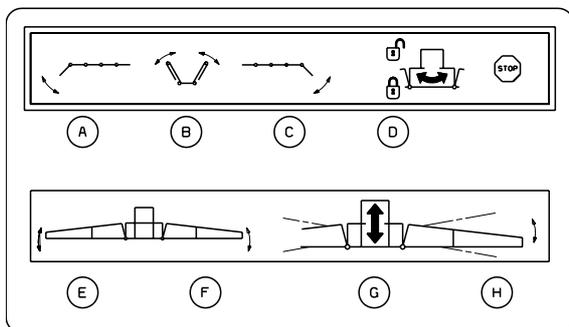
**WARNING:** The 3 upper functions, in the red rectangle with STOP sign, must only be operated when sprayer is stationary. Failure to do so will damage the boom.

**Folding**

1. Raise boom **F** to upper position.
2. Check the slanting function is midway **G**.
3. Fold outer sections, **A** and **C**.
4. Raise right and left sections **D** and **E**.
5. Fold inner sections **B**.
6. Lower boom **F** until boom rests on rear transport brackets.
7. Lower right and left boom sections until they rest the front transport brackets **D** and **E**.

## Operation of the OLH boom

The boom unfolding/folding can be proceeded according to instructions below.



- A. Unfolding/folding of the left outer section
- B. Unfolding/folding of the inner sections
- C. Unfolding/folding of the right outer section
- D. Pendulum locking device
- E. Boom tilt, left side
- F. Boom tilt, right side
- G. Boom lift, up/down
- H. Slanting control, pendulum

### Unfolding



**WARNING:** When unfolding and folding the boom, be aware of overhead high-voltage cables! Booms touching high-voltage cables are lethal!



**ENSURE THAT THE BOOMS ARE CLEAR FROM THE TRANSPORT BRACKETS BEFORE UNFOLDING IS PROCEEDED.**

To unfold the boom, please carry out following procedure:

1. Push **boom lift** switch **G** upwards to lift the boom clear of the rear transport brackets.
2. Lift the right and left boom parts by activating the **boom tilt** function, switch **E** and **F**
3. Push switch **B** to unfold the inner sections completely
4. Push switch **A** and **C** to unfold outer sections completely
5. Push switch **G** downwards to lower the boom to approximately 50 cm above crop or ground level.
6. Unlock the pendulum suspension by pushing switch **D** upwards.



**REMARK!** The 3 upper functions at the control box (folding functions) may only be operated when sprayer is standing still.

### Folding

When folding the boom, please carry out following procedure:

1. Lock pendulum locking device by pushing switch **D** downwards.
2. Raise boom lift **G** to upper position.
3. Check that trapeze slanting control is levelled to middle position - if not correct by activating switch **H**.

4. Fold outer sections, **A** and **C**.
5. Lift up right and left hand side boom by activating right and left boom tilt, **E** and **F**.
6. Fold inner sections by activating switch **B**.
7. Lower right and left boom side until they touch the front transport brackets by activating boom tilt **E** and **F**.

## Operation of rinsing tank.

The front mounted 200 l rinsing tank can be used for two purposes:

**A.** In-field diluting of remaining spray liquid residues in the main tank for spraying the liquid in the field, before cleaning the sprayer.

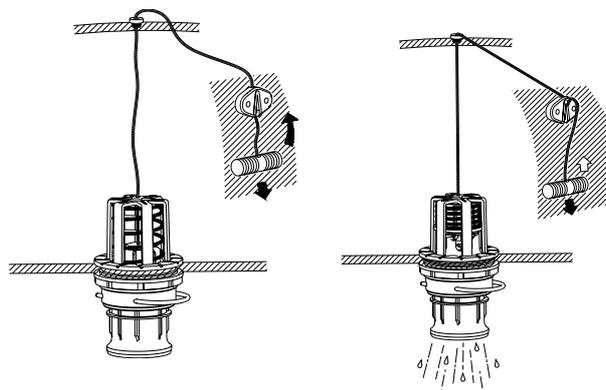
1. Turn suction valve towards rinsing tank.
2. Turn pressure valves towards rinsing nozzle (if fitted).
3. When rinsing tank is empty, turn back suction valve towards suction from main tank and operate all valves, so all hoses and components are rinsed.
4. Turn pressure valve back to EC-operating unit and spray liquid in the field you have just sprayed.

**B.** Rinsing the pump, operating unit, spray lines etc. in case of stop in spraying before main tank is empty (e.g. beginning rain etc.).

1. Turn suction valve towards rinsing tank
2. Turn blue return valve (if fitted) towards pump suction line
3. Spray water from rinsing tank out in the field until all nozzle tubes/nozzles are flushed with clean water.

## Operation of the tank drain valve

Pull the red handle on the side of the tank to open the drain valve. The valve is spring-loaded, but can be kept open by pulling the string out and upwards in the V-shaped slit. To release, pull the string downward and the valve will close automatically.



**Spray Technique - see separate book.**  
**Optional Extras - see separate books.**



## Maintenance

In order to derive full benefit from the sprayer for many years the following few but important rules should be kept:



## Cleaning the sprayer

### Guidelines

Read the whole label of the chemical. Take note of any particular instructions regarding recommended protective clothing, deactivating agents, etc. Read the detergent and deactivating agent labels. If cleaning procedures are given, follow them closely.

Be familiar with local legislation regarding disposal of pesticides washings, mandatory decontamination methods, etc. Contact the appropriate body, eg. Dept of Agriculture.

Pesticide washings can usually be sprayed out on a soakaway. This is an area of ground that is not used for cropping. You must avoid seepage or run-off of residues into streams, water courses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Drainage must lead to a soakaway.

Cleaning starts with the calibration, as a well calibrated sprayer will ensure the minimal amount of remaining spray liquid.

It is good practice to clean the sprayer immediately after use thereby rendering the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components.

It is sometimes necessary to leave spray liquid in the tank for short periods, eg. overnight, or until the weather becomes suitable for spraying again. Unauthorized persons and animals must not have access to the sprayer under these circumstances.

If the product applied is corrosive, it is recommended to coat all metal parts of the sprayer before and after use with a suitable rust inhibitor.

**Remember:** Clean sprayers are safe sprayers.  
Clean sprayers are ready for action.  
Clean sprayers can not be damaged by pesticides and their solvents.

## Cleaning

1. Dilute remaining spray liquid in the tank with at least 10 parts water and spray the liquid out in the field you have just sprayed.



**NOTE:** It is advisable to increase the forward speed (double if possible) and reduce the pressure. For S4110 nozzles, pressure may be reduced to 1.5 bar.

2. Select and use the appropriate protective clothing. Select detergent suitable for cleaning and suitable deactivating agents if necessary.
3. Rinse and clean sprayer and tractor externally. Use detergent if necessary.
4. Remove tank and suction filters and clean. Be careful not to damage the mesh. Replace suction filter top. Replace filters when the sprayer is completely clean.
5. With the pump running, rinse the inside of the tank. Remember the tank roof. Rinse and operate all components and any equipment that has been in contact with the chemical.  
Before opening the distribution valves and spraying the liquid out, decide whether this should be done in the field again or on the soakaway.
6. After spraying the liquid out, stop the pump and fill at least 1/5 of the tank with clean water. Note that some chemicals require the tank to be completely filled. Add appropriate detergent and/or deactivating agent, eg. Washing soda or Triple ammonia.



**NOTE:** If a cleaning procedure is given on the chemical label, follow it closely.

7. Start the pump and operate all controls enabling the liquid to come in contact with all the components. Leave the distribution valves until last. Some detergents and deactivating agents work best if left in the tank for a short period. Check the label.  
The Self-Cleaning Filter can be flushed by removing the bypass hose from the bottom of the filter. Stop the pump and remove the hose. Start the pump for a few seconds to flush filter. Be careful not to loose the restrictor nozzle.
8. Drain the tank and let pump run dry. Rinse inside of tank, again letting the pump run dry.
9. Stop the pump. If the pesticides used have a tendency to block nozzles and filters, remove and clean them now. Check also for sediment on the pressure side of the safety valve for the Self-Cleaning Filter.
10. Replace all the filters and nozzles and store the sprayer. If, from previous experiences, it is noted that the solvents in the pesticide are particularly aggressive, store the sprayer with the tank lid open.



**NOTE:** If the sprayer is cleaned with a high pressure cleaner we recommend lubrication of the entire machine.

## Cleaning and maintenance of filters

Clean filters ensure :

- Sprayer components such as valves, diaphragms and operating unit are not hindered or damaged during operation.
- Nozzle blockages do not occur whilst spraying.
- Long life of pump. A blocked suction filter will result in pump cavitation.

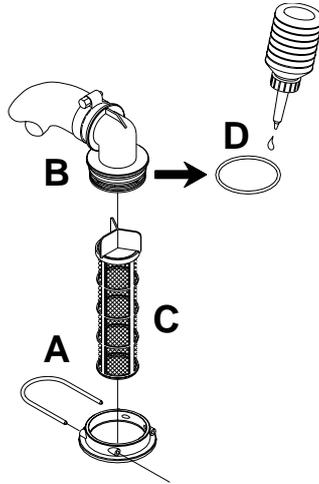
# Demount

## Suction filter

The main filter protecting sprayer components is the suction filter at the top of the tank. Check it regularly.

To service the suction filter:

1. Pull the steel clip **A** out.
2. Lift the suction hose fitting **B** from housing.
3. Filter guide and filter **C** can now be removed.



To reassemble:

4. Press the guide onto filter end.
5. Place the filter into housing with guide facing up.
6. Ensure the O-ring **D** on the hose fitting is in good condition and lubricated.
7. Refit the suction hose **B** and steel clip **A**.

## Oil cooler (if fitted)

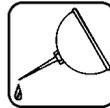
Clean the oil cooler radiator carefully with compressed air.



**WARNING!** Disconnect fan electric plug prior to cleaning the radiator.

## In-Line Filters (if fitted)

The boom may be equipped with In-Line Filters. Unscrew the filter bowl to inspect and clean the filter. Alternative filters are available. See section on Technical specifications - Filters and nozzles.



## Lubrication

Recommended lubrication is shown in following tables. Use ball bearing grease (lithium grease NLGI No. 2).

**NOTE:** If the sprayer is cleaned with a high pressure cleaner or fertilizer has been used, we recommend lubrication of all sections.

### POS. Position on sprayer



Oil



Grease



Operation hours

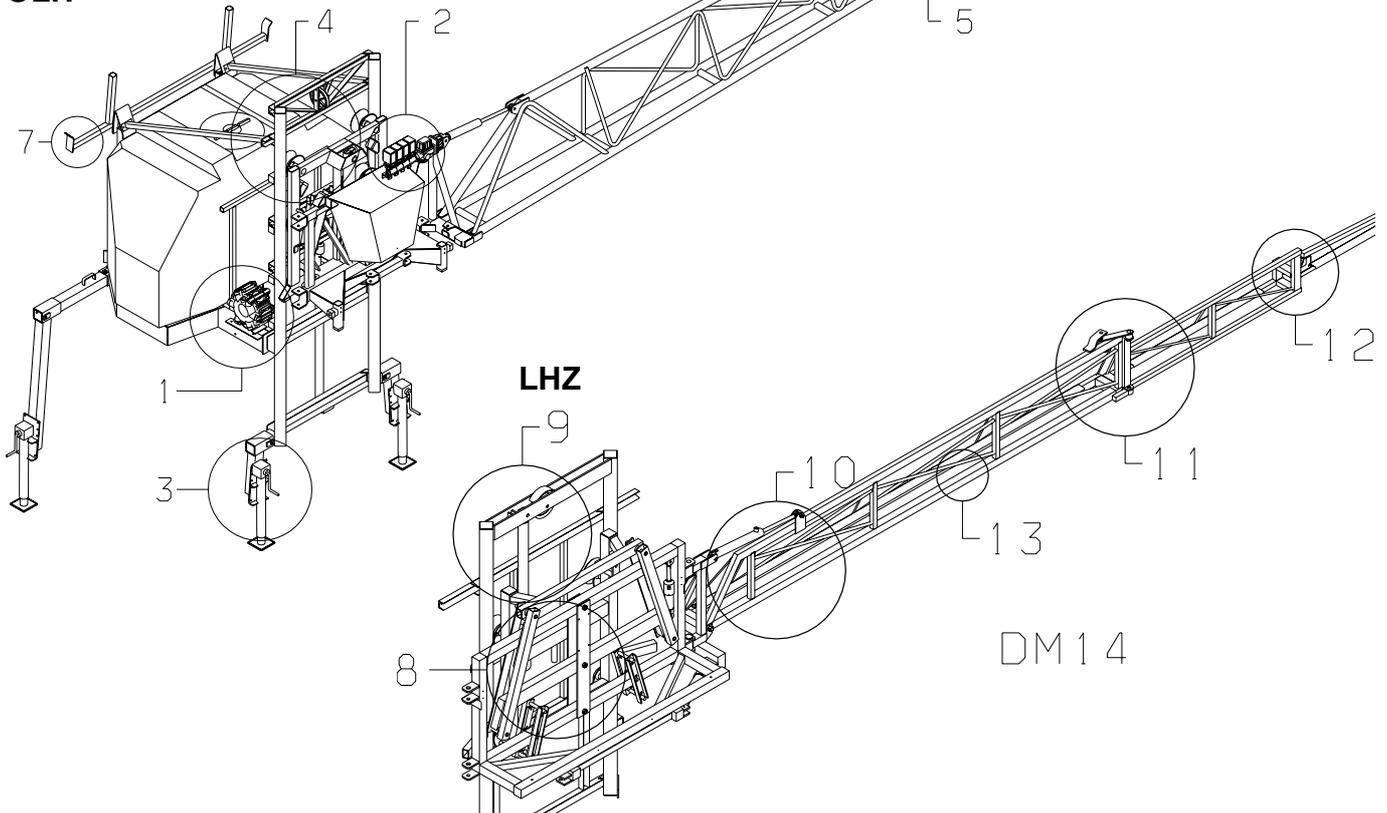


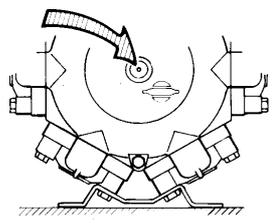
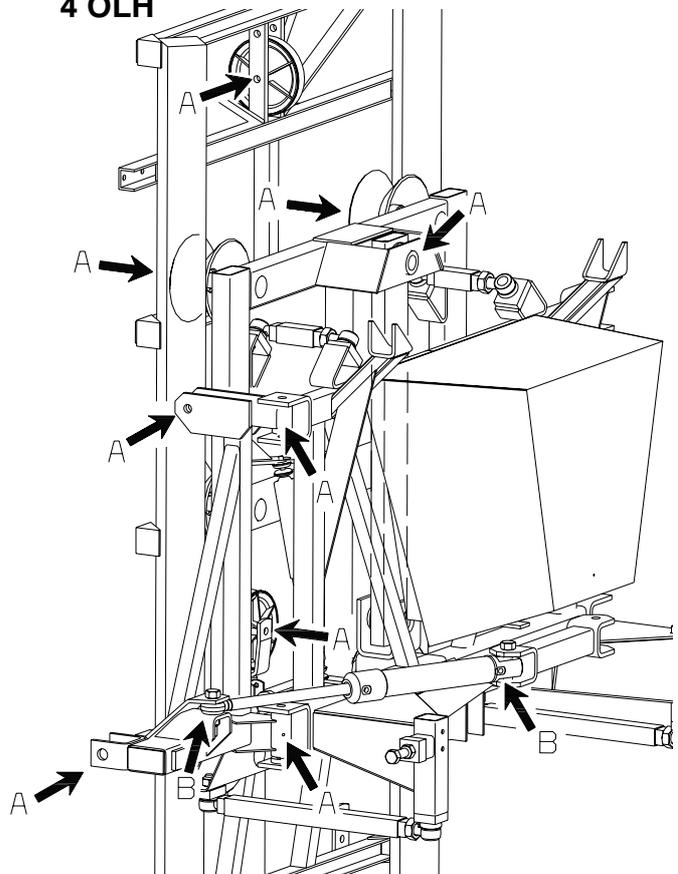
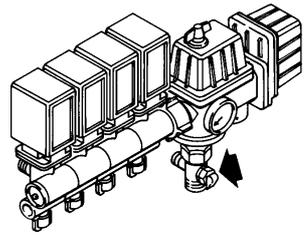
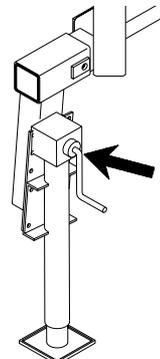
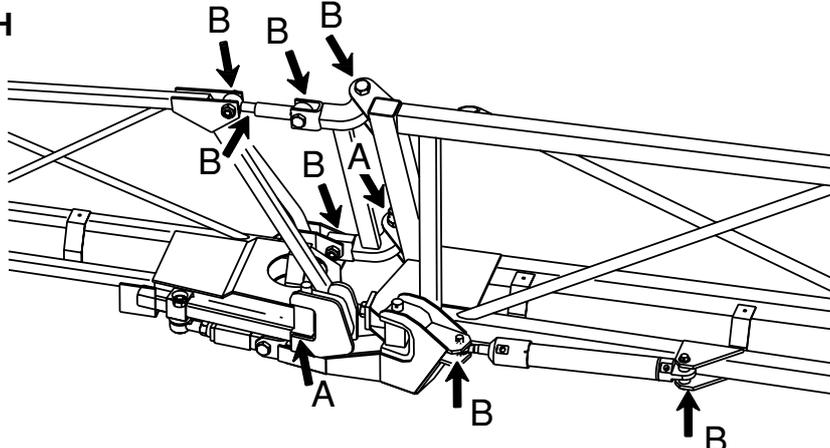
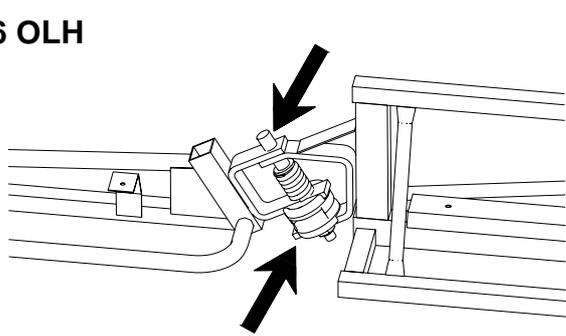
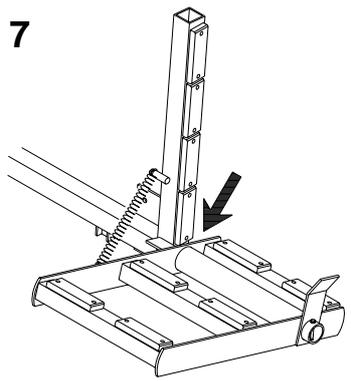
Page to find more information

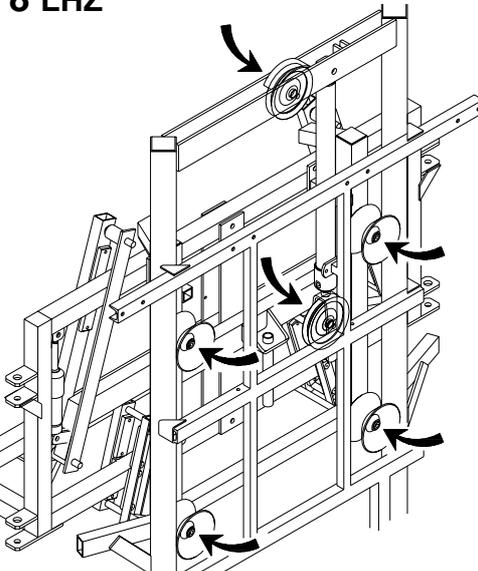
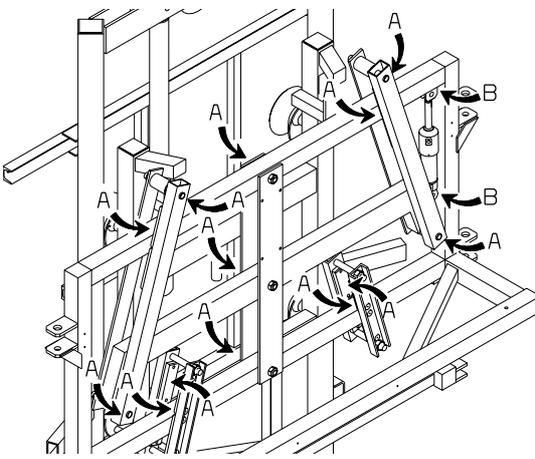
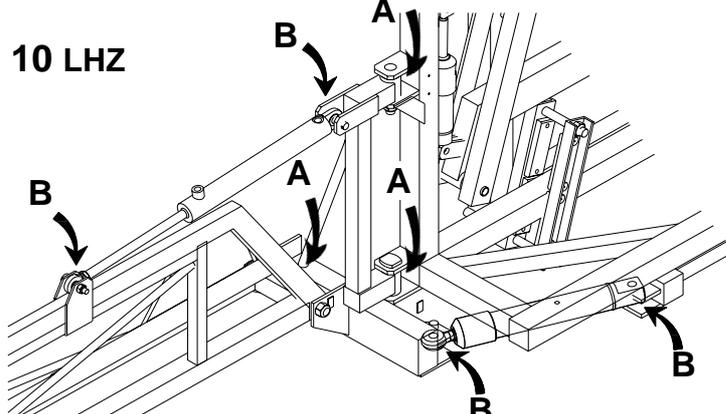
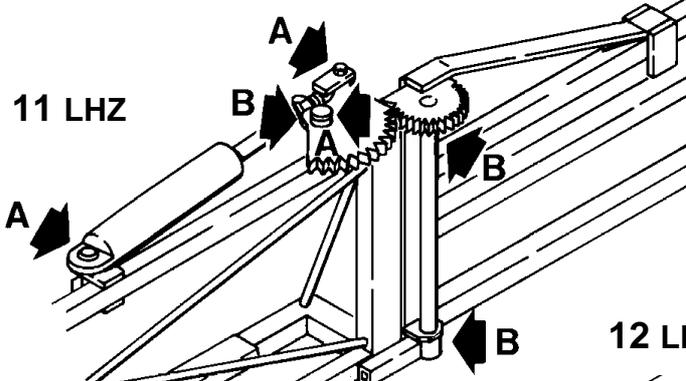
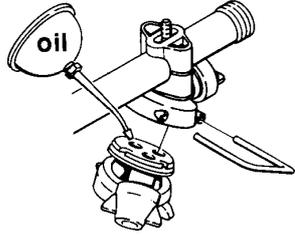
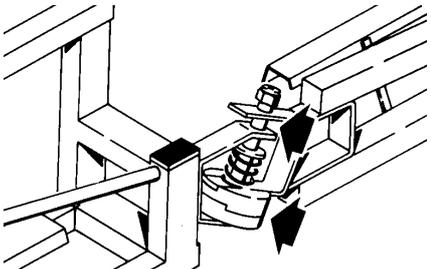


Winter protection or off-season storage

## OLH



POS.					
1		x	40	<b>1</b> 	
2	X		200	<b>4 OLH</b> 	
3	x		200	<b>2</b> 	
4		x	40	<b>3</b> 	
A			40		
B	x		40		
5		x	40	<b>5 OLH</b> 	
A			40		
B	x		40		
6		x	40	<b>6 OLH</b> 	
7	x		200	<b>7</b> 	

POS.						
8		x	40	<p><b>8 LHZ</b></p> 	<p><b>9 LHZ</b></p> 	
9 A B	x	X	40 40			
10 A B	x	x	40 40	<p><b>10 LHZ</b></p> 		
11 A B	x	x	40 40	<p><b>11 LHZ</b></p> 	<p><b>13</b></p> 	
12		x	40		<p><b>12 LHZ</b></p> 	
13	x		200			

### Re-adjustment of the boom

After having used the sprayer for some days the boom should be adjusted according to the following instructions.



**NOTE:** Tractor and sprayer must be on level ground. Sprayer must be lubricated. (see section "Lubrication").

**WARNING** NOBODY MUST STAND UNDER THE BOOM WHILST ADJUSTMENT IS TAKING PLACE.

### Re-adjustment of the LHZ boom

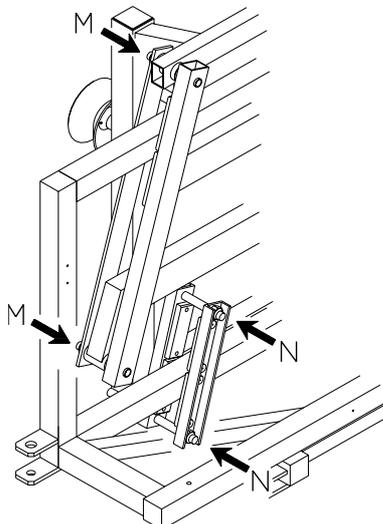
#### Boom lift

The boom lift does not require any adjustments. Only lubrication - see lubrication chart.

#### Trapeze suspension

For the trapeze to function it must not be overtight. If it is too loose the boom will yawn (forwards and back movement). This results in a poor spray distribution.

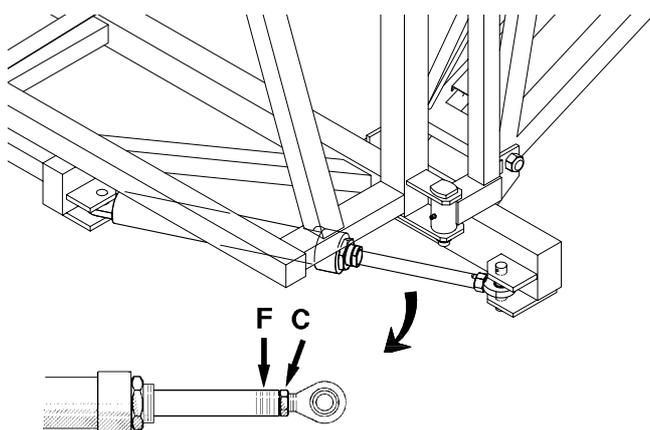
1. With the boom unfolded, check the tension on nuts **M**. They must not be overtight.
2. The trapeze function is adjusted by tightening or loosening the 4 nuts **N**. Minor adjustment in the field might be necessary.



#### Transport position

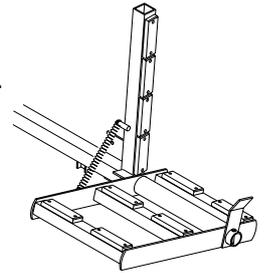
The boom and transport brackets are to be adjusted so that boom movement is prevented when in transport.

1. Fold the outer sections and then the inner sections until the folding rams are at maximum length and carefully place the boom in the transport brackets.



**NOTE:** The following is best done without pressure in the hydraulic rams.

2. Loosen counter nut **C** and adjust the length of the rod **F** until the boom fits in the transport bracket.

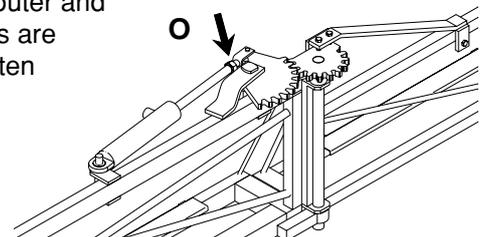


#### Linear adjustment of outer sections



**NOTE:** The following is best done without pressure in the hydraulic rams.

1. Unfold the boom.
2. Loosen counter nut **O** and adjust the length of the rod until the outer and inner sections are parallel. Tighten counter nut.

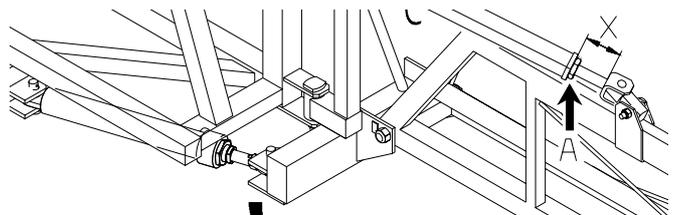


#### Linear adjustment of inner sections

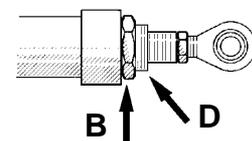


**NOTE:** The following is best done without pressure in the hydraulic rams.

1. Unfold the boom.
2. Loosen counter nut **B**. Adjust the threaded bushing **D** until the boom is at right angle to the tank frame. Tighten counter nut.



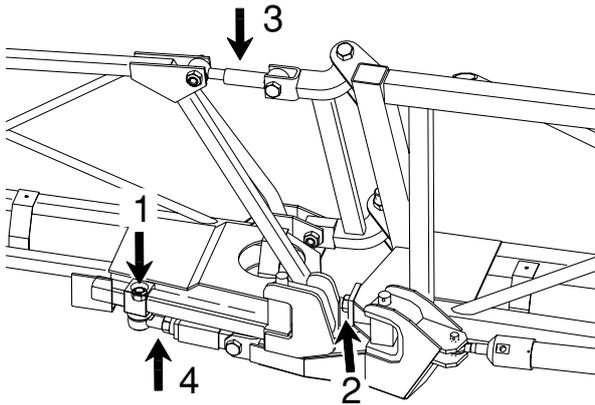
REMEMBER TO TIGHTEN ALL COUNTER NUTS AFTER ADJUSTMENT.



### Re-adjustment of the OLH boom

#### Adjustment of outer section folding

1. Boom must be unfolded to working position
2. Remove bolt **1** from ball joint rod
3. Adjust inner/outer section alignment at adjustment screw **2**
4. Adjust inner/outer section alignment at adjustment screw **3**



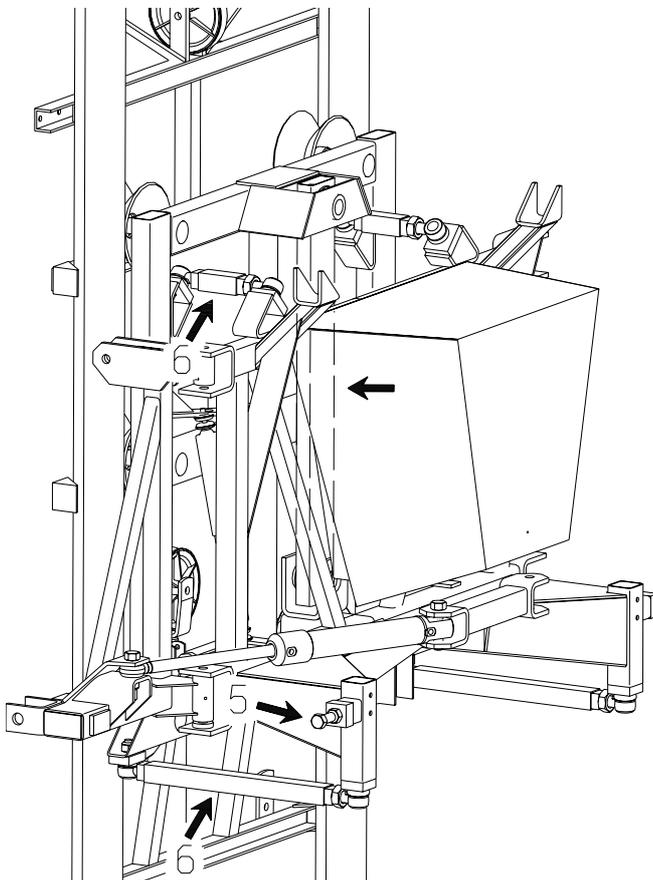
5. Adjust length of ball joint rod 4, until the bolt 1 fits - assemble the locking device again.
6. Remember to tighten all counter nuts.

### Adjustment of inner section folding

1. Boom must be unfolded to working position
2. Adjust inner section/center section alignment at adjustment screw 5. Remember to tighten counter nut.

### Adjustment of pendulum suspension

1. Boom must be unfolded to working position.
2. Remove the 4 stabilizing rods 6 by detaching the ball joints.
3. When the boom is hanging free, adjust the length of the stabilizing rods and attach the ball joints again.



### Break-away

The function of the breakaway is to prevent or reduce boom damage should it strike an object or the ground. The break-away can not be adjusted, but shall only be kept greased (see section „Lubrication“).

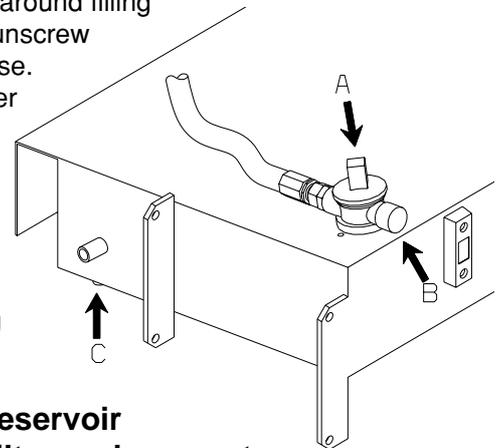
REMEMBER TO TIGHTEN ALL COUNTER NUTS AFTER ADJUSTMENT.

### Hydraulic transmission oil filter replacement

After the first 50 working hours, then every 250 working hours or once a year (which ever comes first) the hydraulic oil filter must be changed.

Following procedure must be carried out.

1. Clean area around filling cap A and unscrew anti clockwise.
2. Replace filter cartridge with new cartridge.
3. Check O-ring on filling cap and fit filling cap again.



### Hydraulic reservoir breathing filter replacement

The breathing filter is changed every 250 working hours or once a year (which ever comes first).

Following procedure must be carried out:

1. Clean the area around the breather and push retaining clamp sideways off the filter cap.
2. Replace filter cap with a new one, and pull retaining clamp back on.

### Hydraulic transmission oil change.

Every 1000 working hours, or once a year (which ever comes first) the transmission oil must be changed.

The oil change is done best when the transmission has been working for appr. 2 hours, and the oil is warm.

Following procedure is carried out:

1. Clean area around filling cap A and drain plug C and remove these from the oil tank. Retain waste oil in appropriate container.
2. When oil is completely drained, fit drain plug C again.
3. Fill reservoir with fresh hydraulic oil until oil reaches correct level in sight glass. Oil quality: ISO HV 46 hydraulic oil (e.g. SHELL TELLUS T46 or equivalent). Oil quantity: Appr. 70 litres (15.4 imp. gal.)
4. Fit filling cap again.
5. Engage the P.T.O. and let the transmission run idle

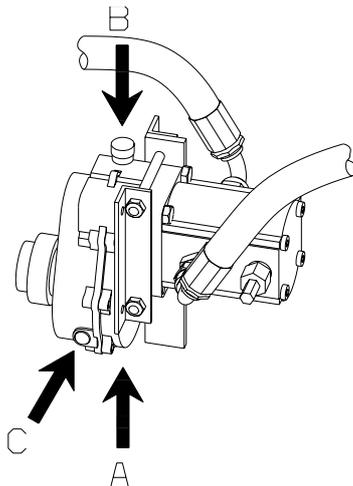
for 5 minutes to prime the hydraulic circuit before using the sprayer again.

6. Check hydraulic oil level again after 5 min. use.

### Hydraulic pump gear oil change

After the first 50 hours, then every 1000 hours or once a year (which ever comes first) the gear oil in the hydraulic pump gear is changed by following procedure. The oil change is best done after appr. 2 hours work so the oil is warm.

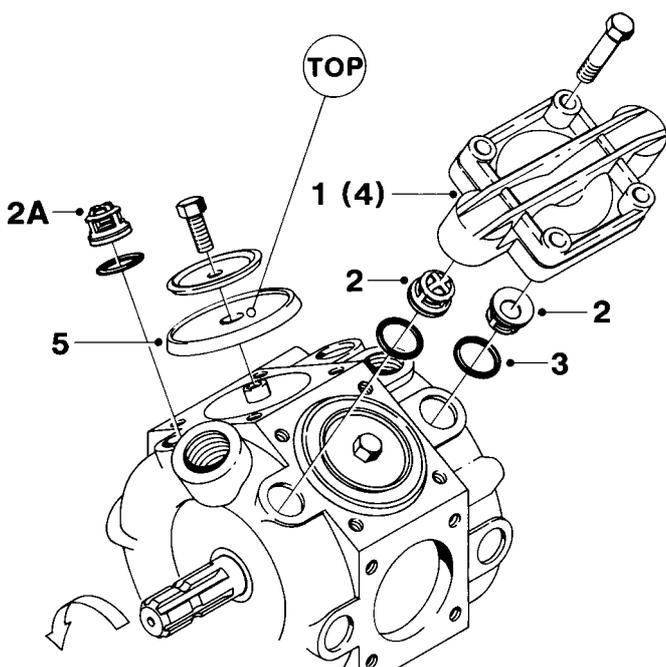
1. Clean gear and pump assembly thoroughly, remove drain plug **A** and drain the gear. Retain waste oil in an appropriate container.
2. Remove filling plug **B**, level plug **C** and fill fresh oil till it reaches the level hole.
3. Fit filling plug and level plug again.



Oil quality: Universal or engine oil SAE 15W40. Oil quantity: 0.7 litre (25 imp.fl.oz.).

### Replacement of valves and diaphragms

**WARNING!** To avoid personal injury the booms must always be in transport position so the boom is secured and cannot be lowered before servicing the pump.



### Valves

Remove valve cover **1**. Before changing the valves **2** note their orientation so they are replaced correctly.



**NOTE:** One special valve with white flap **2A** is used. It has to be placed in the valve opening shown.

It is recommended to use new gaskets **3** when changing or checking the valves.

### Diaphragms

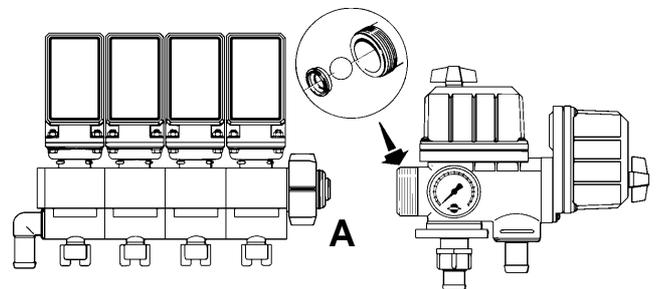
Remove the diaphragm cover **4**. The diaphragm **5** may then be changed. If fluids have reached the crankcase, re-grease the pump thoroughly. Check also the drain hole at the bottom of the pump is not blocked. Reassemble with the following torque settings.

Pump Model	Valve cover Nm	Diaphragm cover Nm	Diaphragm bolt Nm
361/462	70		60

1 Nm = 0.74 ft-lb

### EC ON/OFF valve ball seat check/replacement

If the main ON/OFF valve does not seal properly (dripping nozzles when main ON/OFF valve is closed), the ball and seat should be checked.



Remove the 2 bolts fixing the main ON/OFF-pressure valve unit to the bracket, unscrew the union nut **A** and pull the valve away from the distribution valves.

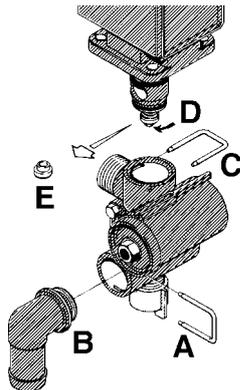
Check the ball for sharp edges and scratches, and check the ball seat for cracks and wear - replace if necessary.

### EC distribution valve cone check/replacement

Periodically check the distribution valves for proper sealing. Do this by running the sprayer with clean water and open ON/OFF valve and all distribution valves.

Cautiously remove the clip **A** and pull out the hose **B** for the pressure equalization device. When the housing is drained, there should be no liquid flow through the pressure equalization device. If there is any leakage, the valve cone **E** must be changed.

Remove the clip **C** and lift the EC-motor housing off the valve housing. Then unscrew the screw **D** and replace the valve cone **E**. Reassemble in opposite sequence.

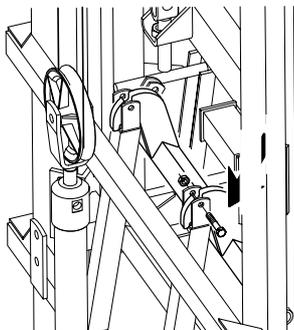


## Boom lift steel cable replacement

The steel cable is holding the entire boom, and its proper condition is essential. The cable is replaced by first sign of wear. Proceed as follows:

The sprayer must be connected to the tractor first.

1. Fold boom in transport position, and lower until it rests in the front and rear transport brackets.
2. Push the boom lift switch on the D.A.H. box in position "lower" (see paragraph "Operating the boom") and lower until the cable can be removed.
3. Fit new cable and secure with new cotter pins. Lubricate cable.



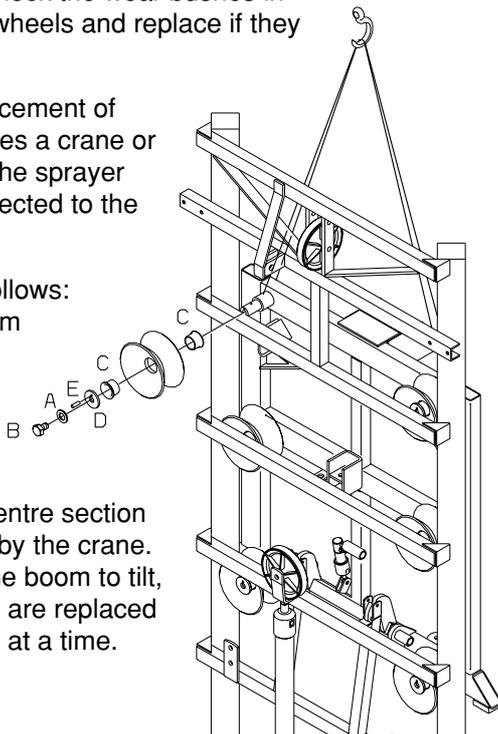
## Lift wagon wheels wear bush replacement.

Periodically check the wear bushes in the boom lift wheels and replace if they are worn.

**NOTE!** Replacement of bushes requires a crane or lift facilities. The sprayer must be connected to the tractor first.

Proceed as follows:

1. Unfold boom to working position.
2. Attach a rope as shown and keep the centre section in position by the crane. To avoid the boom to tilt, the bushes are replaced at one side at a time.



3. Remove the set screws **B** at the RH wheels and pull the boom wagon carefully off the wheels at RH first.
4. Replace worn bushes **C** and the shake proof washer **A**. Secure the washer **D** with a new spring tension pin **E**. Fit the set screw **B**.



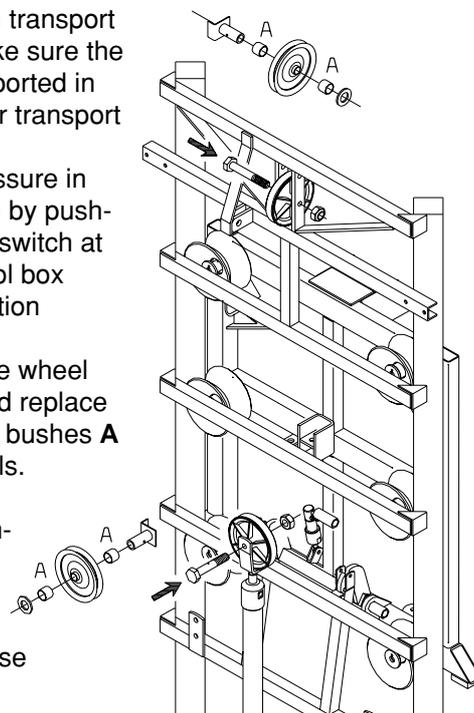
**Important!** Use Loctite No. 242 to secure the set screws **B**.

5. Repeat 3. and 4. at LH wheels.
6. Lower and remove rope.
7. Grease through grease nipples

## Boom lift wheels wear bush replacement

To remove wear bushes in the boom lift wheels proceed as follows:

1. Fold boom in transport position. Make sure the boom is supported in front and rear transport brackets.
2. Remove pressure in boom lift ram by pushing boom lift switch at D.A.H. control box towards position "lower".
3. Dismantle the wheel assembly and replace the two wear bushes **A** in both wheels.
4. Reassemble wheel assembly.
5. Grease wheels through grease nipples.



## Shock absorbers (OLH boom only)

If the shock absorbers lose their efficiency or start leaking oil, they should be replaced.

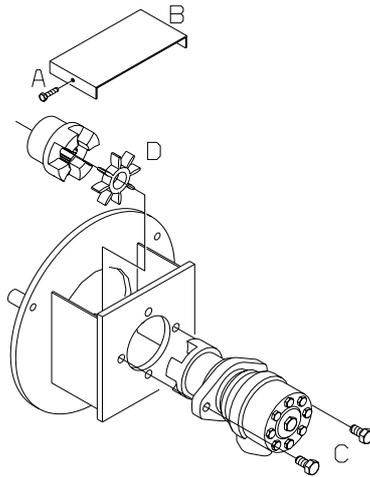
## Diaphragm pump coupling flex tooth ring check/replacement

Occasionally the tooth ring in the pump coupling should be checked.

To have access to inspect the ring, the screws **A** and cover **B** are removed.

If the ring is worn or damaged it must be replaced.

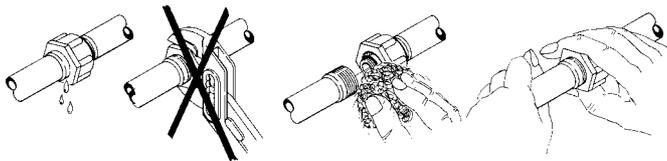
1. Remove the bolts **C** and pull the Danfoss motor out of the flange.
2. Replace the tooth ring **D**.
3. Fit the Danfoss motor, bolts and cover again.



### Nozzle tubes and fittings

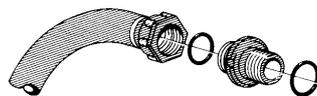
Poor seals are usually caused by;

- missing O-rings or gaskets
- damaged or incorrectly seated O-rings
- dry or deformed O-rings or gaskets
- foreign bodies



Therefore, in case of leaks: **DO NOT** overtighten. Disassemble, check condition and position of O-ring or gasket, clean, lubricate and reassemble. The O-ring is lubricated **ALL THE WAY ROUND** before fitting on to the nozzle tube. Use non-mineral lubricant. For **radial** connections only hand tighten them.

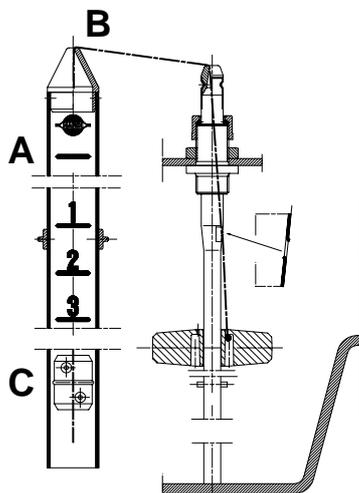
For **axial** connections, a little mechanical leverage may be used.



### Level indicator

The level indicator should be checked regularly. When the tank is empty, the floater should rest on the stop pin on the rod and the O-ring at the indicator should be positioned at the top position line **A**.

If any deviation is found, pull out the plug **B**, loosen the screws **C** and adjust the length of the cord.



### Level indicator cord replacement

If the cord on the level indicator has to be changed, the float guide pole is removed:

1. Remove the tank drain valve (see paragraph "Main tank drain valve seal replacement") and loosen the fitting holding the pole in position.
2. Pull the pole down through the drain valve hole till it is free in the top of the tank.
3. The pole can now be removed from the tank through the filling hole.



**WARNING!** Do not attempt to enter the tank - the float pole can be removed from the outside of the tank!

4. Fit a new cord and assemble in reverse order. See illustration under "Level indicator".
5. Adjust the gauge as described in paragraph "Level indicator".

### Main tank drain valve seal replacement

If the main tank drain valve leaks, the seal and seat can be changed the following way.

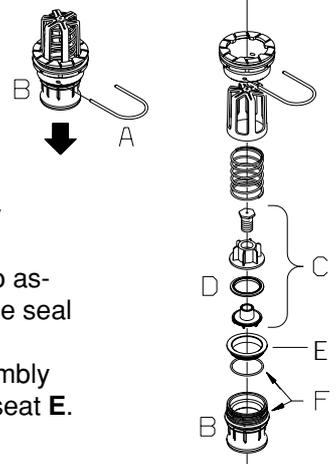


**NOTE!** Do not enter the inside of the tank - the parts can be changed from underneath the tank!



**WARNING!** Use eye / face protection mask when dismantling the tank drain valve!

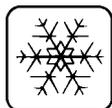
1. Make sure the tank is empty and clean.
2. Let the valve be closed and the string be loose.
3. Pull out the clip **A** and pull down connecting piece **B**. The entire valve assembly can now be pulled out.
4. Check cord and valve flap assembly **C** for wear, replace seal **D** and assemble again.
5. Assemble the valve assembly again using a new valve seat **E**. Lubricate O-rings **F** before assembly.
6. Fit clip **A** again.



**NOTE!** Check function of valve with clean water before filling chemicals into the tank!

### Repair of polyester tank

Minor damages on the main tank can be repaired with polyester tissue and a special glue. Contact your HARDI dealer.



### Off-season storage

When the spraying season is over you should devote some extra time to the sprayer before it is stored.

#### Hoses

Check that none of the hoses are caught or have sharp bends.

A leaky hose can give an annoying delay in the middle of the spraying job. Therefore check all the hoses and change if there is any doubt about the durability.

#### Paint

Some chemicals are very rough on paints. It is therefore well advised to remove rust, if any, and then touch up the paint.

#### Tank

Check that no chemical residues are left from the last spraying. Chemical residues must not be left in the tank for a long time. It will reduce the life of the tank. See section on Cleaning the sprayer.

#### EC Operating unit

When the sprayer is put away the control box and the multiplug must be protected against moisture and dirt. Possibly use a plastic bag.

#### Anti-freeze precaution

If the sprayer is not stored in a frost free place you should take the following precautions: Put at least 25 litres of 33% anti-freeze mixture in the tank and let the pump run a few minutes so that the entire system including spray hoses are filled. The anti-freeze solution also hinders the O-rings and gaskets from drying out. Remove the glycerine filled pressure gauge and store it frost free in vertical position.



### Operational problems

In cases where breakdowns have occurred the same factors always seem to come into play:

- Minor leaks on the suction side of the pump will reduce the pump capacity or stop the suction completely.
- A clogged suction filter will hinder or prevent suction so that the pump does not operate satisfactorily.
- Clogged up pressure filters will result in increasing pressure at the pressure gauge but lower pressure at the nozzles.
- Foreign bodies stuck in the pump valves with the result that these cannot close tightly against the valve seat. This reduces pump efficiency.
- Poorly reassembled pumps, especially diaphragm covers will allow the pump to suck air resulting in reduced or no capacity.
- Electrical and hydraulic components that are contaminated will result in poor connections and rapid wear to the hydraulic system.

#### Therefore ALWAYS check:

1. Suction, Self-Cleaning, pressure and nozzle filters are clean.
2. Hoses for leaks and cracks, paying particular attention to suction hoses.
3. Gaskets and O-rings are present and in good condition.
4. Pressure gauge is in good working order. Correct dosage depends on it.
5. Operating unit functions properly. Use clean water to check.
6. Electrical and hydraulic components are maintained clean.

Fault	Probable cause	Control / remedy
<b>Liquid system</b> No spray from boom when turned on.	Air leak on suction line.	Check if suction filter O-ring is sealing.
		Check suction tube and fittings.
	Air in system.	Check tightness of pump diaphragm and valve covers.
	Suction/pressure filters clogged.	Fill suction hose with water for initial prime.  Clean filters.  Check yellow suction pipe is not obstructed or placed too near the tank bottom.
Lack of pressure.	Incorrect assembly.	Agitation nozzles not fitted.
		Restrictor nozzle in Self-Cleaning Filter not fitted.
		Safety valve spring for Self-Cleaning Filter not tight.
		Too little distance between yellow suction pipe and tank bottom.

<b>Fault</b>	<b>Probable cause</b>	<b>Control / remedy</b>
	Pump valves blocked or worn.	Check for obstructions and wear.
	Defect pressure gauge.	Check for dirt at inlet of gauge.
Pressure dropping.	Filters clogging.	Clean all filters. Fill with cleaner water. If using powders, make sure agitation is on.
	Nozzles worn.	Check flow rate and replace nozzles if it exceeds 10%.
	Tank is air tight.	Check vent is clear.
	Sucking air towards end of tank load.	Excessive agitation, turn off. Returns inside tank need relocation.
	Pressure filters beginning to clog.	Clean all filters.
Pressure increasing	Agitation nozzles clogged.	Check by turning agitation off and on.
Formation of foam.	Air is being sucked into system.	Check tightness / gaskets / O-rings of all fittings on suction side.
	Excessive liquid agitation.	Turn agitation off.
		Reduce pump r/min.
		Check safety valve for Self-Cleaning Filter is tight.
		Ensure returns inside tank are present.
Use foam damping additive.		
Liquid leaks from bottom of pump.	Damaged diaphragm.	Replace. See Changing of valves and diaphragms.
<b>EC Operating unit</b> Operating unit not functioning	Blown fuse(s).	Check mechanical function of microswitches. Use cleaning/lubricating agent if the switch does not operate freely.
		Check motor. 450-500 milli-Amperes max. Change motor, if over.
	Wrong polarity.	Brown - pos. (+). Blue - neg. (-).
	Valves not closing properly.	Check valve seals for obstructions.
		Check microswitch plate position. Loosen screws holding plate a 1/2 turn.
No power.	Wrong polarity. Check that brown is pos. (+), Blue is neg. (-).	
	Check print plate for dry solders or loose connections.	
	Check fuse holder are tight around fuse.	

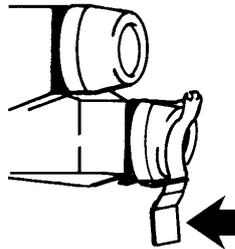
# Demount

Fault	Probable cause	Control / remedy
<b>D.A.H. Hydraulic system</b>		
No boom movements when activated	Insufficient oil pressure	Check oil pressure - min. 130 bar, max. 160 bar.
		Check tractor hydraulic oil level
	Insufficient oil supply.	Oil flow must be min. 10 l/min. and max. 90 l/min.
		Check tractor hydraulic oil level.
	Blown fuse.	Check / replace fuse in junction box.
	Bad / corroded electrical connections	Check / clean connections, multi plugs etc.
	Insufficient power supply.	Voltage on activated solenoid valve must be more than 8 Volts. Use wires of at least 4 mm <sup>2</sup> for power supply.
	Defect relay / diodes in junction box.	Check relays, diodes and soldering at PCB in junction box
Boom lift raises to max. pos. when tractor hydraulics are engaged.	Clogged restrictors <b>B</b> or <b>C</b> in by-pass block.	Remove and clean restrictors <b>B</b> and <b>C</b> in by-pass block (See hydraulic diagram) Change hydraulic oil + filter
	Wrong polarity.	Check polarity. White pos. (+) Blue neg. (-).
	Wrong oil inlet to by-pass block.	Connect hydraulic snap couplers opposite in tractor outlets, or engage spool valve lever in opposite direction
Oil heats up in Closed Centre systems	Back pressure in return line exceeds 20 bar	Connect the return line with free flow to hydraulic oil reservoir. Divide return line in two and lead return oil back to reservoir via two spool valves.
	By-pass valve <b>0</b> does not close properly	Check / replace locking clip on by-pass valve <b>0</b> .
Individual ram does not move	Internal leaks in flow regulator	Replace flow regulator O-rings and back-up rings. Replace flow regulator.
	Clogged restrictor	Dismantle and clean restrictor
<b>Hydraulic pump transmission.</b>		
Pump does not work.	No oil in reservoir	Fill to correct oil level
Transmission pump works noisily	Oil level low - sucks air. Wrong oil quality	Fill to correct oil level Change oil to correct quality
Diaphragm pump cannot keep same revolutions as tractor P.T.O.	Pump or Orbit motor worn out	Get pump/motor inspected by your HARDI dealer.

### Emergency operation of the sprayer

#### The boom

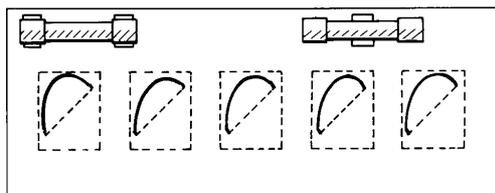
In case of power failure the boom can be operated manually by pressing the individual buttons on the solenoid valves. This is done by locking the by-pass valve, as is done when using tractors with closed centre hydraulics.



Remove the protection box of the solenoid valves at the boom. The boom can now be operated by pressing the individual buttons on the solenoid valves.

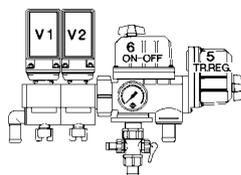
Remember to reset the system to open centre hydraulic, if the tractor has an open centre hydraulic system. The problem may be due to a blown fuse. One spare fuse is located inside the junction box.

Fuse type T 10 A 250 V  
HARDI ref. No. 261272

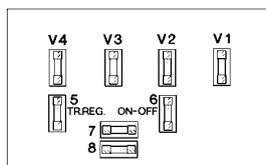


#### Emergency operation of the operating unit

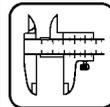
In case of power failure it is possible to operate all functions of the operating unit manually. First disconnect the multiplug from the control box. Now manually turn the emergency control knobs.



The problem may be due to a blown fuse. The fuses are placed in the control box and are marked according to functions. Fuses 7 and 8 are spare fuses.



Fuse type T 500 mA HARDI ref. no. 261125



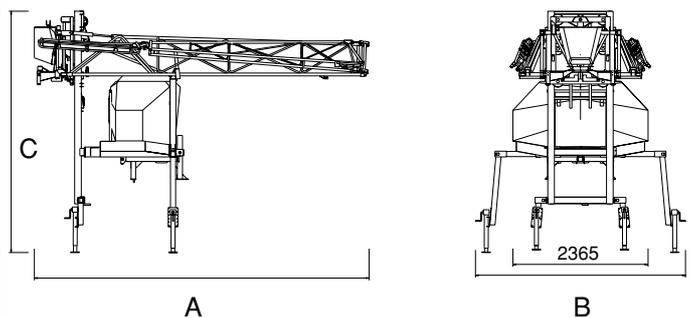
### Technical specifications

#### Pump power consumption and capacity

361/9.5	r/min									
	300		400		500		540		600	
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	95	0,92	127	1,33	158	1,56	171	1,69	189	1,85
5	92	1,49	123	1,93	151	2,38	165	2,63	183	2,98
10	91	2,22	120	2,89	148	3,69	163	4,02	180	4,74
15	89	3,03	119	3,92	148	4,90	160	5,40	177	6,15
Rotation per min.	r/min	Capacity				l/min	Suction height		0,0 m	
Power consumption	kW	Max. pressure		15bar		Weight		54 kg		

462/10.0	r/min									
	300		400		500		540		600	
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	134	0,94	180	1,23	223	1,56	242	1,69	265	1,91
5	130	1,71	173	2,36	213	2,97	231	3,21	254	3,69
10	127	2,69	169	3,69	209	4,82	226	5,37	248	6,00
15	125	3,71	166	5,03	205	6,28	221	6,87	243	7,66
Rotation per min.	r/min	Capacity				l/min	Suction height		0,0 m	
Power consumption	kW	Max. pressure		15bar		Weight		70 kg		

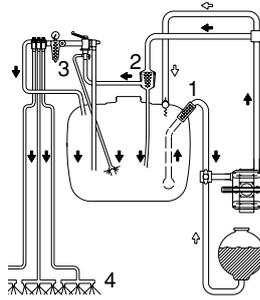
#### Measure and weight



Tank size	Boom width & type	Pump model	Dimensions A x B x C	Weight kg
2000 l	12 LHZ	361	3100 x 3980 x 2500	1720
2000 l	15 LHZ	361	4100 x 3980 x 2500	1765
2000 l	16 LHZ	361	4100 x 3980 x 2500	1775
2000 l	18 OLH	361	5800 x 3980 x 2500	1980
2000 l	20 OLH	462	5800 x 3980 x 2500	2000
2000 l	21 OLH	462	5800 x 3980 x 2500	2010
2000 l	24 OLH	462	5800 x 3980 x 2500	2030

## Filters and nozzles

Pos.	Mesh/ colour	Description/ nozzle
1	30 green	Suction filter
2	80 red	Self-Cleaning Filter (if fitted)
3	50 blue	Pressure filter
4	50 blue	Nozzle S4110-14 Nozzle S4110-16 Nozzle S4110-20



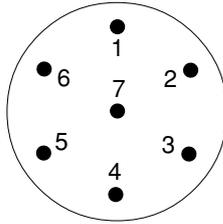
## Temperature and pressure ranges

Operating temperature range:	2° to 40° C.
Operating pressure for safety valve:	15 bar
Max. pressure on the pressure manifold:	20 bar
Max. pressure on the suction manifold:	7 bar

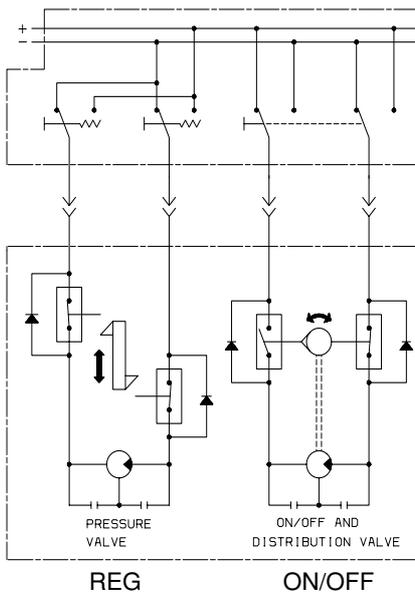
## Electrical connections

### Rear lights

Position	Wire colour
1. LH direction indicator	Yellow
2. Free	Blue
3. Frame	White
4. RH direction indicator	Green
5. RH rear position lamp	Brown
6. Stop lamps	Red
7. LH rear position lamp	Black



## EC operating unit



## EC

Valve	Number of distribution valves		
	2 / 3 / 4	5 / 6	7
ON/OFF		Wire number or colourcode	
V1	1-2	1-2	1-11
V2	3-4	3-4	2-12
V3	5-6	5-6	3-13
V4	7-8	7-8	4-14
V5		9-10	5-15
V6		11-12	6-16
V7			7-17
REG	9-10	13-14	9-10
ON/OFF	11-G/Y	15-G/Y	8-G/Y

G/Y = green/yellow

## Materials and recycling

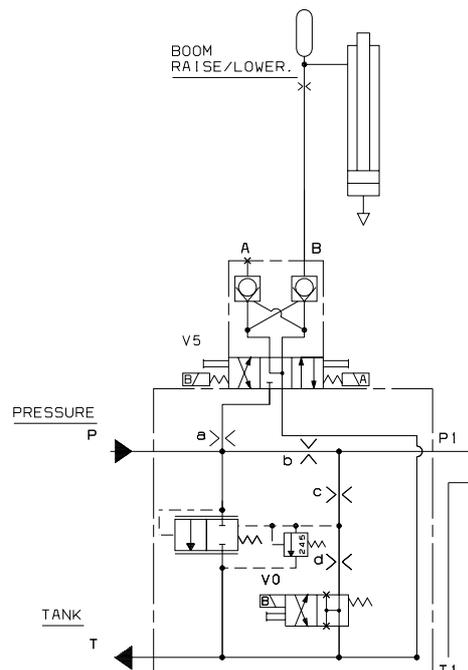
Tank:	polyester
Hoses:	PVC
Valves:	mainly glass-filled PA.
Fittings:	PA

## Disposal of the sprayer

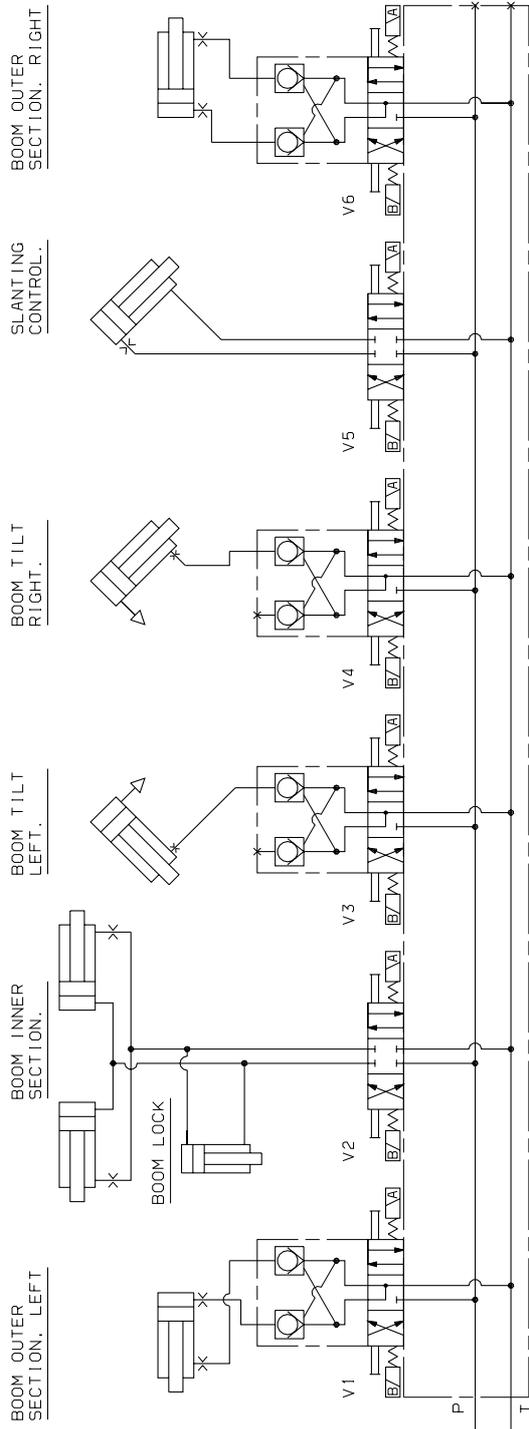
When the equipment has completed its working life, it must be thoroughly cleaned. The tank, hose and synthetic fittings can be incinerated at an authorized disposal plant. The metallic parts can be scrapped. Always follow local legislation regarding disposal.

## Electric and hydraulic diagram

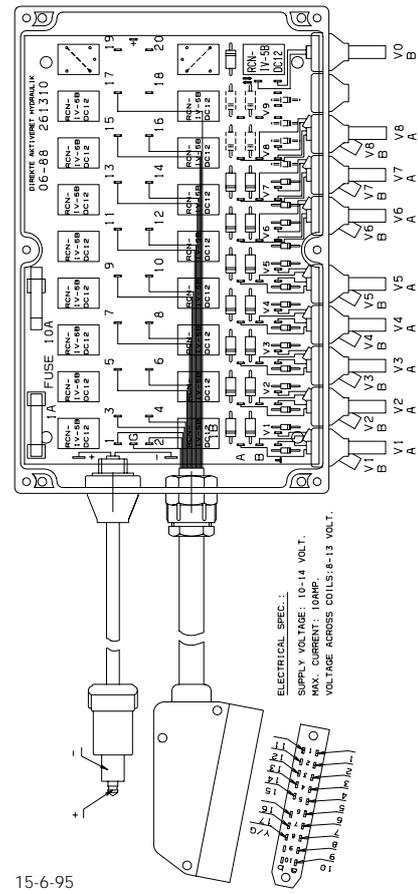
### By-pass and boom raise/lower



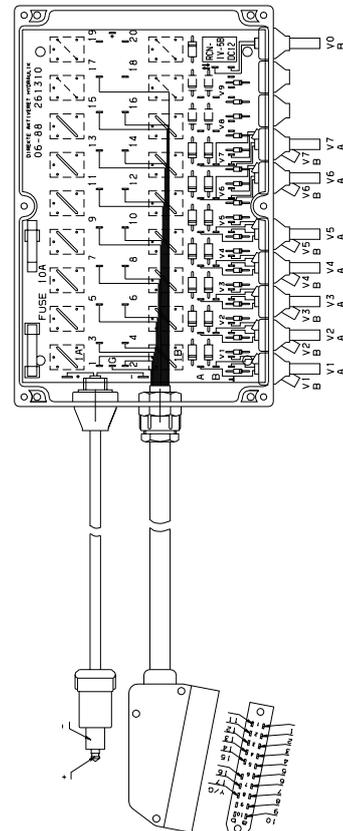
Hydraulic system LHZ



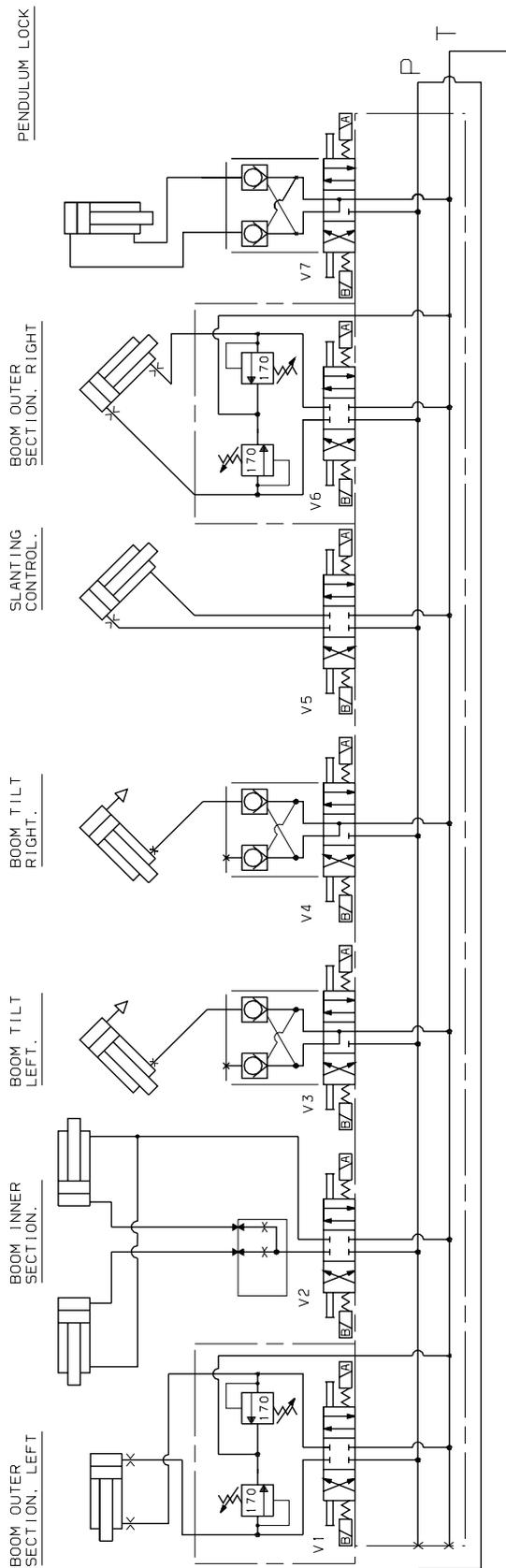
Junction box OLH



Junction box LHZ



## Hydraulic system OLH 18,20,21,24,28 m



## Pictorial symbols



Description



Function



Connection



Warning



Operating



Service adjustment



Liquid flow



Pressure



Cleaning



Lubrication



Winter storage



Operational problems



Technical specifications



EU Declaration of Conformity







