HARDI-MATIC ensures a constant volume per hectare of the liquid at varying speed in the same gear. The number of revolutions on the P.T.O. must be kept 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 HYB spray boom is equipped with 3 hydraulic rams. The LHY spray boom is equipped with 5 hydraulic rams. The folding/unfolding and elevating/lowering function is very easy, as all the functions of the boom are hydraulically operated. The frame and boom are connected by a trapeze suspension which reduces the swing of the boom when driving on uneven ground. Furthermore there is a foot board or a ladder in the centre part of the boom. This ensures an easy access for the filling of sprays, cleaning of the tank, etc.

**Identification plates**

An identification plate fitted on the frame is to indicate model, year of production, 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 to ensure correct model and version is described.
Operation diagram EC

1. Suction filter
2. Pump
3. Self-cleaning filter
4. Safety valve
5. Pressure agitator
6. Pressure regulating valve with HARDI-MATIC
7. On/off valve with pressure gauge
8. Distribution valve with pressure equalization
9. Sprayer boom
To ensure long life of the transmission shaft, try to avoid working angles greater than 15°.

On the models 800, 1000 and 1200 I the pivots can be lowered 120 mm.

Hydraulics
Hydraulic connections need one single outlet for the lift function of the spray boom and one double outlet for the folding function. Note that the hydraulic system requires an oil capacity of approx. 3 litres and a min. pressure of 130 bar.

Control box for EC-operating unit
The control box for EC-operating unit is fitted at a convinient place in the tractor cabin. The control box has 4 screw holes in the back cover. Mount it on a flat surface.

Power requirement is 12 V DC. Note polarity.
Brown pos. (+), Blue neg. (-).

Use the HARDI Electric distribution box (No. 817925) if the tractor has a doubtful power supply.

Rear lights (If fitted)
Connect plug for rear lights to the tractors 7-poled socket and check that rear lights, stop lights and tuning indicators work properly before driving anywhere.

Roadworthyness
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.
Trapeze on LHY

The function of the trapeze depends on the tension of the friction blocks. See section on Re-adjustment of the boom.

When driving on slopes the boom can be slanted in order to keep the trapeze effect. At delivery the boom is locked in pos. 2 which is used when driving on horizontal grounds. Hydraulic slanting equipment can be supplied as optional extra.
1. From pump

2. To safety valve (operating pressure is 12 bar)

3. Double filter screen

Self-cleaning filter

Operative diagram

1. Adjust the screws (A) of the throttle valve. They are screwed the basicly advised.

2. Unfold and fold the boom sev-

3. Set the adjustment screws on

er the system in order to remove ar

ens operate at the speed wanted

Clockwise = less speed,

with pry in clockwise, and then 1/4 turn back. The system is now

Speed regulation of the hydraulic movements

On the return hydraulic hose there

is a valve for regulation of the

is a valve for regulation of the
4. Guide cone
5. To operating unit
6. Replaceable restrictor
7. Return to tank
8. 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 orifice first).

The hose N is demounted at the self-cleaning filter, the restrictor is put 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 back 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. Sizes of 50 and 100 mesh are available and can be changed by opening the filter top. Check the O-rings before reassembling the filter and replace if damaged.

Pulsation Damper (if mounted)
The air pressure in the pulsation damper is preset at the factory to 2 bar, to cover spray working pressures between 3 and 15 bar. When using spray pressures outside this range, the air pressure should be adjusted as shown in the diagram. The diagram is also embossed on the damper.
Adjustment of the BK controls.

1. Open close lever 1 depending on whether pressure agitation is required. (Remember pressure agitation takes 5% to 10% of pump output.)

2. Turn orrot handle 2 to spraying position A.

3. Set all hand levers 3 on the distribution valve to spraying.

4. Turn the HARDI-MATIC valve 4 anti-clockwise to its extreme position A.

5. Pull the tractor in neutral and adjust the P.T.O. thereby the number of revolutions of the pump corresponding to the intended spraying.

6. Note the number of revolutions on the P.T.O. must be kept between 300-600 r/min.

If the recommended pressure.

Adjust the HARDI-MATIC valve 4 so that the pressure gauge indiactes...
ADJUST THE DISTRIBUTION PRESSURE EQUALIZATION IN SECTIONS AS FOLLOWS:

6. Place the first lever 3 on the distribution valve in position B (off position).

7. Turn the adjusting screw 5 until the pressure gauge again shows the same pressure.

8. Adjust the other sections of the distribution valve in the same way.

NB: HEREAFTER ADJUSTMENT OF PRESSURE EQUALIZATION WILL ONLY BE NEEDED IF YOU CHANGE TO NOZZLES WITH OTHER CAPACITIES.

9. Operating the control unit while driving:
In order to close the entire boom turn the on/off handle 2 to position B. This takes the pressure off the pump. The whole capacity of the pump will then return to the tank through the return system, and the diaphragm anti-drip valves ensure instantaneous closing of all nozzles. In order to close part of the boom, turn lever 3 of the distribution valve to position B (off position) for the part or parts to be closed. The pressure equalization ensures that the pressure does not rise in the sections which are to remain open.

Pressure filter drain valve
The operating unit has an in-built pressure filter. It is not necessary to dismantle the filter to clean it. When cleaning the sprayer (clean water circulating in the tank), open the drain valve to flush the filter;

To open: A
To close: B
1. Choose the correct nozzle. See "Spray Technique Book."

2. Open one or more of the water outlet valves depending on whether pressure agitation is required.

3. Pressure regulation switches: 1) upper 2) lower

4. Operating switch for on/off valve

5. Pressure agitation valve

6. Distribution valve

7. Control valve

8. Adjust screw for pressure agitation

Adjustment of the EC Controls

EC Operating unit

EC Remote control box
3. On-off switch A is activated against green.

4. All distribution valves switch V are activated against green.

5. Pressure regulation switch C is activated to emergency handle 3, stop rotate (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. Remember the number of revolutions on the P.T.O. must be kept between 300-600 r/min.

7. Pressure regulation 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.

NB: HEREAFTER ADJUSTMENT OF PRESSURE EQUALIZATION WILL ONLY BE NEEDED IF YOU CHANGE TO NOZZLES WITH OTHER CAPACITIES.

11. Operating the control unit while driving:
In order to close the entire boom activate on-off switch A to off position. This returns the pump outputs to the tank through the return system. The diaphragm anti-drip valves ensure instantaneous closing of all nozzles.
In order to close one or more sections of the boom 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 still possible to activate all functions of the operating unit. To operate manually, disconnect the multi plug first.

When the sprayer is put aside, the control box and the multi plug must be protected against moisture and dirt. A plastic bag may be used to protect the multi plug.
Dampers HU73

and the liquid is safely drained.

and the valve will close automatically.

To release and close the drain valve again, pull the string downwards.

and upwards in the V-shaped slit.

valve is spring-loaded, but can be kept open by pulling the string out.

Pull the string at the left hand side of the tank to open the drain valve. The

Operation of the tank drain valve

To close: B

To open: A

Operating the drain valve on the tank LTV 600
Spray Technique - see separate book.

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 - see separate book.

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.

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

Ensure the O-ring on filter housing is in good condition and lubricated.

The BK operating unit has an in-built pressure filter. See section on Pressure filter drain valve.
Unit BK 180K
18-2-91 B7
Re-adjustment of the boom

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

When adjusting the boom and the trapeze the spray boom must be in the working position and the trapeze set in unlocked position. Tractor and sprayer must be on level ground. Lubricate all moving parts before making any adjustments. See section on Lubrication.

**WARNING**

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

Re-adjustment of the HYB-boom

1. **Boom lift**
   The boom lift should be adjusted so the boom can freely move up and down when the lift ram is operated. Adjust both sides. Adjust A so gap B is equal at all 4 points.

NB: Adjustment of hydraulic ram is done without pressure in the hydraulic system.

2. **Horizontal adjustment of middle part**
   Loosen lock nut A and turn piston rod B until the middle part of the boom is horizontal. Then retighten lock nut A.

**Adjustment of transport position**
Fold boom and lower carefully onto the transport bracket. Loosen nut C and turn D until the boom is correctly placed in the transport bracket. Then retighten the nut.
3. Horizional adjustment of outer section.

4. Wire undertaken with unloaded boom.

5. Trapeze suspension

Don't lock nuts again after adjustment.
Remember to tighten all.

Locking tension nut until the boom is not too tight or too loose. Mirror image field may be necessary.

37/12 mm
## Technical specifications

### Measure and weight

#### HYA models

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<th>Spraying width m</th>
<th>Pump model</th>
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### Re-adjustment of the LHY-boom

#### Horizontal adjustment

1. Fold out the boom.
2. Loosen lock nuts A, B and C.
3. Adjust on the threaded bushing D which sets the bottom stop position of the ram. When the ram stop is screwed outwards, the boom will point forwards, and if the stop is screwed inwards, the boom will point backwards. The boom must be in alignment with the central section and may point a bit forwards.
4. Adjust on rod E until the boom is horizontal.
   **Important!** The fork bolt on each end of rod E must not exceed 90 mm as shown.
5. When the boom is adjusted, tighten nut B.
Changing of Valves and Diaphragms

**Adjustment**

After tightening all lock nut

To adjust knob nut once and

Liner adjustment of outer section
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 with dirt 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.

Diaphragms
Remove the diaphragm cover 4. The diaphragm 5 may then be changed. If fluids have reached the crankcase, re-grease the pump thoroughly.

Changing of ball seat in operating unit BK & EC
If problems with on/off valve occurs (dripping nozzles when on/off valve is closed), the ball and ball seat should be checked.

Remove the 2 bolts fixing the on/off-pressure valve unit to the bracket, unscrew the union nut A and pull the on/off-pressure 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.

Check of valve cone in distribution valves EC
Periodically check the distribution valves for proper sealing.

Run the sprayer with clean water and open on/off and all distribution valves.

Remove the clip A and remove hose B for the constant pressure device. When the housing is drained, there should not flow liquid through the constant pressure device. If there is any leakage, the valve cone E must be changed.

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

The anti-freeze solution also dries out the O-rings and gasket form pressure gauge and store in a frost-proof place in vertical position. System inking should be ordered. Remove the anti-freeze residue in the tank and let the pump run a few minutes so that the entire anti-freeze residue is flushed out before it freezes in a frost-proof place. You should take the following precautions:

1. Ensure the gauge is not stuck in a frost-proof place. You should take the antifreeze precautions.

2. Shields and protective lugs are intact.

3. Transmission shaft should be filled with anti-freeze mixture, e.g., Gold Transmission-Shaft Anti-Freeze Mixture.

4. The transmission shaft should be filled with anti-freeze mixture, e.g., Gold Transmission-Shaft Anti-Freeze Mixture.

5. Check that the transmission shaft is filled with anti-freeze mixture, e.g., Gold Transmission-Shaft Anti-Freeze Mixture.

6. Remove rust, if any, and then touch up the paint.

7. Some chemicals are very hard on paint. It is therefore advisable to consult the manufacturer.

8. Clean the spray orifice. Cleaning the spray orifice helps to keep it clean and reduces the corrosion of the O-ring.

**Level Indicator**

Note that the gauge can be replaced when necessary.

Depending on products used, it can become difficult to see the screw inside the level indicator hub.

**The Nozzle Tube**

The nozzle tube is to be lubricated at least twice a week. If the nozzle tube is not lubricated, it will reduce the life of the spray head. Clean the nozzle tube only when it is necessary. When the spray head is removed, it should be turned on the other side of the spray head. Clean the nozzle tube only when it is necessary. When the spray head is removed, it should be turned on the other side of the spray head.

**EC**

- Challenged leverages may be used.
- For axial connections, a little more.
- For radial connections, only hand tighten them.

**Tank**

- The O-ring is to be lubricated before filling out to the nozzle tube.
- Condition and position of O-ring or gasket, clean lubricate and reuse.
- Therefore, in case of leaks: Do NOT overtighten. Disassemble, check.

**Foreign Bodies**

- Dry or cleaned O-rings or gaskets.
- Damaged or incorrectly seated O-rings.
- Missing O-rings or gaskets.
- Poor seals are usually caused by:

**Nozzle tubes and fittings**

- Off-season storage.