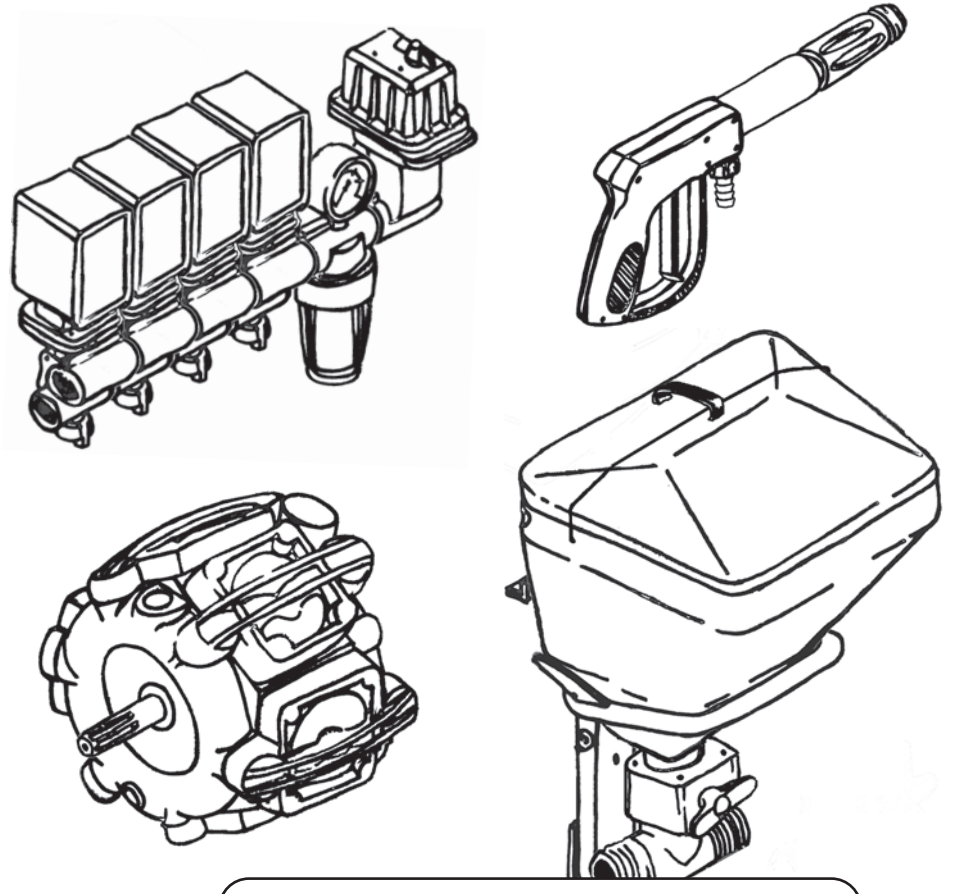
HARDI® SPRAYERS



LB-50 Mistblower

Operator's Manual

10571603 (4/97)

LB-50 Mistblower

Operator's Manual

105716 (4/97)

TABLE OF CONTENTS

Dear Owner,

Thank you for purchasing a HARDI product and welcome to the ever-increasing family of HARDI sprayer owners.

Our sprayers and accessories are rapidly becoming a familiar sight on North American farms. We believe that this results from growers becoming increasingly conscious of crop protection input costs and the vital need for cost effective spray application equipment.

Please take the time to thoroughly read the Operator's Manual before using your equipment. You will find many helpful hints as well as important safety and operation information.

Some of the features on your HARDI Mistblower were suggested by growers. There is no substitute for "on farm" experience and we invite your comments and suggestions.

Please address your correspondence to the Service Manager at one of these branches:

HARDI MIDWEST
1500 West 76th St.
Davenport, Iowa 52806
Phone: (319) 386-1730
Fax: (319) 386-1710

HARDI GREAT LAKES
290 Sovereign Rd.
London, Ontario N6M 1B3
Phone: (519) 659-2771
Fax: (519) 386-1710

Sincerely,

Tom L. Kinzenbaw
President

1.0 INTRODUCTION

The HARDI LB lift mounted mistblowers are designed for small to medium orchards. They feature piston or diaphragm pumps, easy to use operating units and axial blower units.

The power is transferred from the tractor via the P.T.O. shaft to the pump and blower unit.

The pumps are of a robust design for agricultural use. The simple mechanical design allows for easy maintenance.

The operating unit consists of pressure regulator, main on/off valve, pressure gauge and distribution valves.

The tank design is compact and has no sharp edges for easy cleaning.

A suction filter incorporating a shut-off valve and coupling for a filling device is located at the bottom of the tank. The LB-50 models have a suction filter inside the tank. Hydraulic agitation in the tank maintains a homogeneous mixture of the spray liquid.

The axial blower units have adjustable fan blades. The angle can easily be varied to suit various orchard tasks and match tractor power output. A set of color-coded ceramic nozzles are located in the blower slot. Each nozzle assembly can be turned off so that only the nozzles pointing towards the foliage are utilized.
Non-Drip nozzle bodies are available as an option.

The LB-50 features the F550 (22") fan which can be disengaged for calibration, agitation while under transport, or when using hand spray guns.

2.0 IDENTIFICATION PLATES

An identification plate fitted on the frame and pump is to indicate model, year of production with serial number and country of origin. If ordering spare parts, inform your dealer of these to identify right model.

3.0 SAFETY INFORMATION

WARNING!

ALWAYS READ OPERATORS MANUAL BEFORE USING EQUIPMENT

DO NOT REMOVE ANY SAFETY DEVICES OR SHIELDS. NEVER SERVICE, CLEAN OR REPAIR A MACHINE WHILE IT IS OPERATING

WARNING!

ALWAYS WATCH FOR THIS SYMBOL TO POINT OUT IMPORTANT SAFETY PRECAUTIONS

IT MEANS ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

RECOGNIZE SAFETY INFORMATION

This is the Safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

3.1 Follow Safety Instructions

- Carefully read all the safety messages in this manual and the safety labels fitted to the machine. Keep safety labels in good condition. Replace missing or damaged safety labels. Be sure that new equipment components include any current safety labels. Replacement safety labels are available from your authorized HARDI dealer.

- Learn how to operate the sprayer and how to use the controls properly. Do not let anyone operate the sprayer without proper instructions.

- Keep your sprayer in proper working condition. Unauthorized modifications or use may impair the function and/or safety and affect the machines life.

- If you do not understand any part of this manual and need assistance, please contact your authorized HARDI dealer.

3.2 Operating The Sprayer Safely

1. Read the complete manual carefully and become familiar with the operation of the equipment before initial operation in each spraying season. Failure to do so may result in possible over or under application of spray solution which may drastically affect crop production and/or lead to personal injury.

2. Before starting the engine on the tractor unit, be sure all operating controls are in the off or neutral position, including but not limited to the P.T.O. shaft and/or spray controls. Be sure the tractor power train is disengaged.

3. Operate spray functions only when seated in the operator's seat.

4. One of the most frequent causes of personal injury or death results from persons falling off or being run over. Do not permit others to ride on or in. Only one person, the operator, should be in the tractor when in operation.

5. Before leaving the tractor seat, stop the engine, put all controls in neutral, and put the transmission control lever in the park position or neutral with the brakes locked. Read the tractor operations manual for added safety precautions.

6. PTO driven equipment can cause serious injury. Before working on or near the P.T.O. shaft, servicing or cleaning the equipment, put PTO lever in the disengage position and stop the engine.

7. Understand service procedures before undertaking any maintenance. Never lubricate, service, or adjust the machine while its moving. Securely support any components before working on them.

8. Keep all parts in good condition and properly installed. Fix damaged parts immediately. Replace worn or broken parts. Remove excessive build-up of grease, oil, or debri.

3.3 Handling Chemical Products Safely

1. Direct exposure to hazardous chemicals can cause serious injury. These chemicals can include lubricants, coolants, paints, adhesives and agricultural chemicals. Material safety data sheets (M.S.D.S.) are available for all hazardous chemicals which inform the user of specific details including, physical and health hazards, safety procedures, and emergency response techniques.

2. Protective clothing such as rubber gloves, goggles, coveralls and respirator must be worn while handling chemicals. All protective clothing should be kept in excellent condition and cleaned regularly or discarded.

3. If chemicals come in contact with any exposed skin areas, wash immediately with clean water and detergent. Never place nozzle tips or any other components that have been exposed to chemicals to lips to blow out obstructions. Use a soft brush to clean spray nozzles.

4. Dedicate an area to fill, flush, calibrate and decontaminate sprayer where chemicals will not drift or run off to contaminate people, animals, vegetation, water supply, etc. Locate this area where there is no chance of children being in contact with this residue.
5. Decontaminate equipment used in mixing, transferring, and applying chemicals after use. Follow the instructions on the chemical label for the correct procedure required. Wash spray residue from outside of the sprayer to prevent corrosion.

6. Extreme care should be taken in measuring spray products. Powders should be used in suitable sized packages or weighed accurately. Liquids should be poured into a suitable graduated container. Keep chemical containers low when pouring. Wear a filtered respirator and let the wind blow away from you to avoid dust and/or splashes contacting the skin or hair.

7. Store chemicals in a separate, plainly marked locked building. Keep the chemical in its original container with the label intact.

8. Dispose all empty containers after rinsing in accordance with local regulations & by-laws. Dispose of all unused chemicals and left over fertilizer in an approved manner

9. Keep a first aid kit and fire extinguisher available at all times when handling chemicals.

3.4 Local Poison Information Center

PHONE NO. ____ - ____ - _____

Find the phone number for the poison control center in your phone book and write it in the space above.

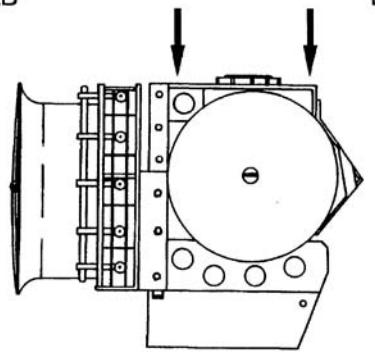
Keep a list, in the space provided below, of all the chemicals that you have in use.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

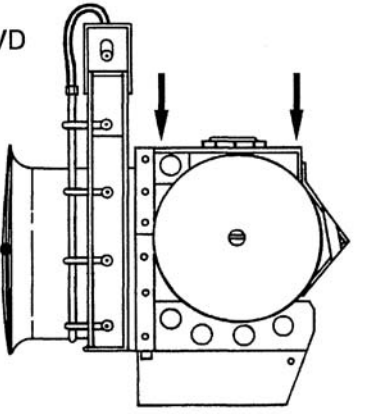
4.0 LIFTING POINTS

When loading or unloading the sprayer from a truck or trailer with a crane, use the lifting points as shown.

LB



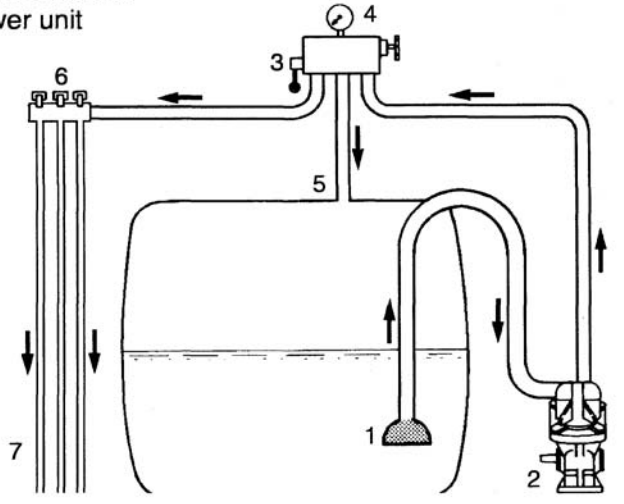
LB-VD



5.0 PLUMBING DIAGRAM

LB-50

1. Suction filter
2. Pump
3. Operating unit
4. Pressure gauge
5. Pressure regulation bypass
6. Distribution valves
7. To blower unit



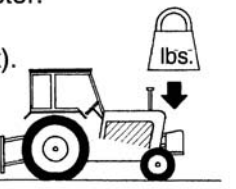
6.0 CONNECTING THE LB-50

The 3-Point lift mounted LB-50 has catagory I lift points. There are two lower link arm attachment points to assist in height adjustment.

WARNING: **NOTE THE WEIGHT OF THE SPRAYER. (See Sect. 14.1)**

It is recommended to:

1. Mount the sprayer as close as possible to the tractor.
2. Add ballast to front of tractor.
3. Increase tire pressure (see tractor instruction book).
4. Travel at slower speeds when driving with a full tank. (The tractor will have decreased braking efficiency.)
5. Be careful when filling / lifting the sprayer the first time.



6.1 P.T.O. Shaft Operator Safety

WARNING: **ALWAYS STOP ENGINE BEFORE ATTACHING THE TRANSMISSION SHAFT TO TRACTOR P.T.O. MOST TRACTOR P.T.O. SHAFTS CAN BE ROTATED BY HAND TO FACILITATE SPLINE ALIGNMENT, WHEN ENGINE IS STOPPED.**

When attaching the shaft, make sure that the snap lock is FULLY ENGAGED - push and pull shaft until it locks.

WARNING: **ROTATING TRANSMISSION SHAFTS WITHOUT PROTECTION GUARDS ARE FATAL.**

Always keep protection guards and chains intact and make sure that it covers all rotating parts, including CV-joints at each end of the shaft. Do not use without protection guard.
Do not touch or stand on the P.T.O. shaft when it is rotating - safety distance: min 5' (1.5 meters).
Prevent protection guards from rotating by attaching the chains allowing sufficient slack for turns.

Make sure that protection guards around tractor P.T.O. and implement shaft are intact.
Always STOP ENGINE and remove the ignition key before carrying out maintenance or repairs to the transmission shaft or implement.

6.2 Installation Of P.T.O. Shaft

WARNING: **THE P.T.O. SHAFT ANGLE WILL CHANGE CONSIDERABLY WHAN RAISING AND LOWERING THE SPRAYER ON THE 3-POINT LINKAGE. TO PREVENT EXCESSIVE LOADING AND BINDING ON THE P.T.O. SHAFT, IT MAY BE ADVISABLE TO LEAVE THE P.T.O. SHAFT DISCONNECTED UNTIL PUMP OPERATION IS REQUIRED.**

Initial installation of the shaft is done as follows:

1. Attach sprayer to tractor and set sprayer in the position with **shortest** distance between the tractor and sprayer pump P.T.O. shafts.
2. Stop engine and remove ignition key.
3. If P.T.O. shaft must be shortened, the shaft is pulled apart. Fit the two shaft parts at tractor and sprayer pump and measure how much it is neccessary to shorten the shaft. Mark the protection guards.

Note: The shaft must always have a minimum overlap of 6" (150mm.)

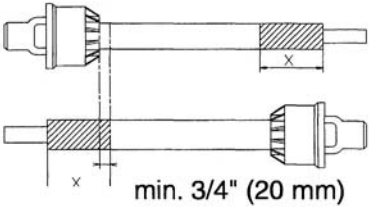


Fig. 11

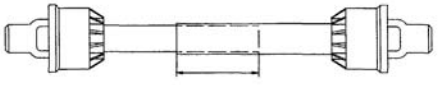
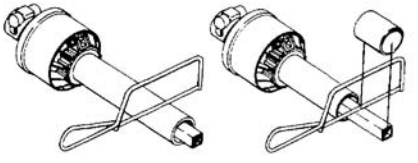
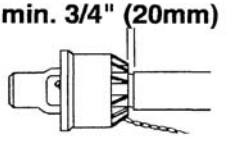


Fig. 12

4. The two parts are to be shortened equally. Use a saw, and file the profiles afterwards to remove burrs.
5. Grease the profiles, and reassemble male and female parts.





6. Fit the shaft to tractor and sprayer pump.
   Note: Female part towards tractor.
   Fit the chains to prevent the protection guards rotating with the shaft.
7. To ensure longer life of the P.T.O. shaft, try to avoid working angles greater than 15°.

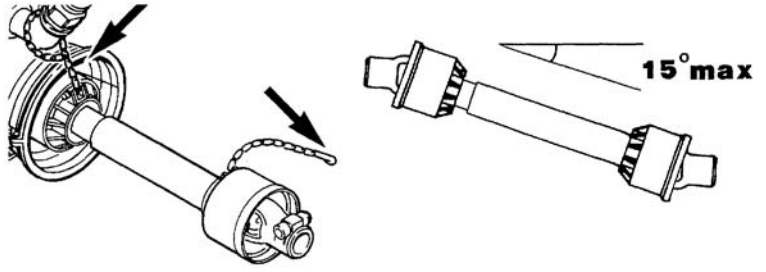


Fig. 14

7.0 OPERATING THE LB-50

7.1 Diaphragm Pump (Model 321)

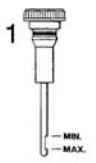
The air pressure in the pulsation damper is factory preset at 30 psi (2 bar) to cover spray working pressures between 45 psi (3 bar) and 350 psi (25 bar). When using spray pressures outside this range, the air pressure should be adjusted as shown in the diagram. The diagram is also embossed on the damper.

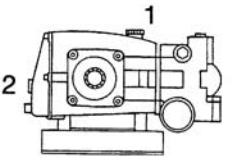
Nozzle Pressure 		Damper Air Pressure 	
PSI	**BAR**	**PSI**	**BAR**
22 - 44	**1.5 - 3**	**0 - 15**	**0 - 1**
44 - 218	**3 - 15**	**15 - 45**	**15 - 45**
218 - 360	**15 - 25**	**45 - 60**	**45 - 60**

7.2 Piston Pumps (P3L)

Check oil level of pump. Level must be between minimum and maximum mark on dipstick **(1)**. P3L pumps also have an external oil level indicator **(2)**.

Piston pumps need to be run in. To prolong the life of the pump, do not operate the pump at maximum pressure for the first 40 hours.





P3L / P3X

Pump	0 - 40 h	40 h +
P3L	500 psi /35 bar	870 psi /60 bar

WARNING: **DO NOT OPERATE PUMP OVER 540 r/min. DO NOT RUN PUMP DRY FOR MORE THAN 60 SECONDS.**

Note: To ensure long bearing life, the tractor P.T.O. must not exceed 540 r/min.

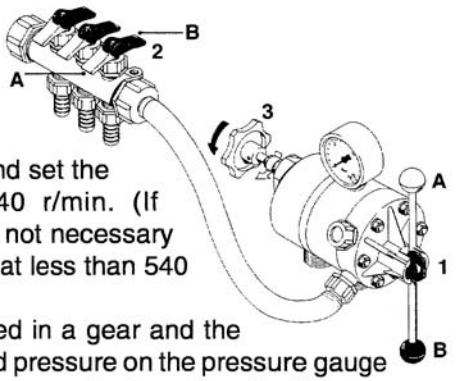
8.0 ADJUSTMENT OF CONTROLS

Please see section dealing with your operating unit. Initial adjustment and calibration is to be done with clean water. See also "Mistblowing Technique" book.

8.1 M70/2 Operating Unit

1. Turn main ON/OFF handle **(1)** to ON position **(A)**.
2. Set hand levers on the distribution valve **(2)** to ON position **(A)**.
3. Put the tractor in neutral and set the P.T.O. revolutions to 540 r/min. (If maximum blower output is not necessary the revolutions may be set at less than 540 P.T.O. r/min).
4. From a given forward speed in a gear and the nozzles chosen, the desired pressure on the pressure gauge is set by means of the pressure adjustment handle **(3)**.

   Note: Maximum pressure is 350 psi (25 bar). Do not operate over 350 psi (25 bar).

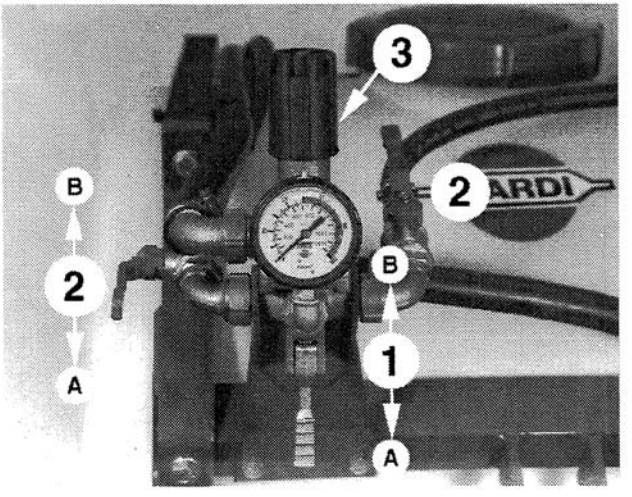


Operating the unit while spraying-
To stop the liquid flow on both sides of the blower, turn the handle **1** to OFF position **B**. This takes the pressure off the pump. The liquid will then return to the tank via the return system. If you want to spray on one side only, set handle **2** to OFF position **B** on the side you want to close off. Note that the pressure will rise and readjustment will be necessary.

8.2 M/2 Operating Unit

1. Push handle **(1)** to ON position **(B)**.
2. The two handles **(2)** are set at ON position **(A)**.
3. Put the tractor in neutral and set the P.T.O. revolutions to 540 r/min. (If maximum blower output is not necessary the revolutions may be set at less than 540 P.T.O. r/min).
4. From a given forward speed in a gear and the nozzles chosen, the desired pressure on the pressure gauge is set by means of the pressure adjustment handle **(3)**.

Note: For P3L pump, maximum pressure is 870 psi (60 bar). Do not operate over the maximum pressure.



Operating the unit while spraying-
To stop the liquid flow on both sides of the blower, set handles **(2)** to OFF position **(B)** or set handle **(1)** to OFF position **(A)**. If you only want to spray on one side only, turn handle **(2)** to OFF position **(B)** on the side you want to close off. Note that the pressure will rise and readjustment will be necessary.

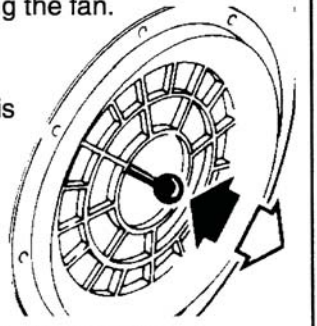
8.3 LB-50 Tank Drain

A drain plug is located at the bottom of the tank. Check drain cap is closed before filling tank.

8.4 Engaging and Disengaging the Fan

Spraying with guns or agitation under transport only needs the operation of the pump and it is therefore practical to disengage the fan.

IMPORTANT: P.T.O. must be disengaged and both pump and fan must be stationary when engaging/disengaging the fan.



The handle for engaging/disengaging the fan is in the middle of the air intake on the blower unit.
Push handle **IN** to engage fan.
Pull handle **OUT** to disengage fan.

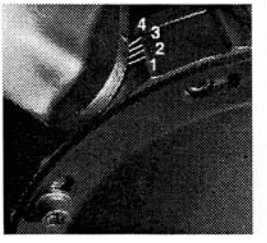
8.5 Blower Adjustment

The angle of the fan blades can be varied from among four settings marked as 1, 2, 3 and 4.
The air volume/air speed can be increased by increasing the angle of the blades. The power consumption of the fan can be reduced by decreasing the angle of the blades. This permits the sprayer to be matched to the spray task and to the tractor.

See section on Technical specifications for power consumption.

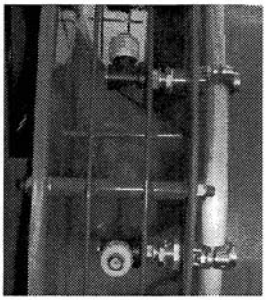
8.6 Fan Adjustment

WARNING: **DISCONNECT THE TRANSMISSION SHAFT FROM THE TRACTOR P.T.O. BEFORE ADJUSTMENT.**



1. Remove the large guard at rear of blower.
2. Loosen the Allen screws **(A)** holding the red cover. Remember to only loosen.
3. Loosen the Allen screws **(B)** in the slots. It may be necessary to hold the nut at the back of the fan.
4. Using both hands on opposite blades, turn blades to desired position (from 1 to 4). All blades should turn together.

5. Check all blades are at same position. Tighten Allen screws **(A)** and **(B)** and replace guard.



8.7 Nozzle On/Off

Individual nozzles can be turned off if the target is not in the spray direction of the nozzle.
To turn nozzle off, rotate 90°.

8.8 LB-VD Adjustment

For models with the Vertical Deflector (VD), it may be necessary to adjust the top part of the deflector. Adjust so the spray mist is directed into the foliage.

Calibration- see "Mistblowing Technique" book.
Air volume and air speed- see section on Technical specifications.

9.0 MAINTENANCE

In order to derive full benefit from the sprayer for many years to come, these few but simple points should be noted.

9.1 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.

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 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 orchard you have just sprayed.
   Note: It is advisable to increase the forward speed (double if possible) and reduce the pressure.

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 suction filter and clean. Be careful not to damage the mesh. Reassemble the filter housing without the filter. Replace filter 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. Open the distribution valves and spray the liquid out in the orchard again.

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.

8. Drain the tank and let pump run dry. Rinse inside of tank, again letting the pump run dry. Remember that piston pumps must not run dry for more than a minute.

9. Stop the pump. If the pesticides used have a tendency to block nozzles and filters, remove and clean them now.

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 ubrication of the entire machine.

Filters-

Clean filters ensure:

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

The main filter protecting sprayer components is the suction filter. Check it daily when spraying.

9.2 Adjustment of V-Belts

Correct belt tension is important for efficient power transfer. Under tensioned belts will slip and overheat reducing belt life while over tensioned belts will reduce belt and bearing life.

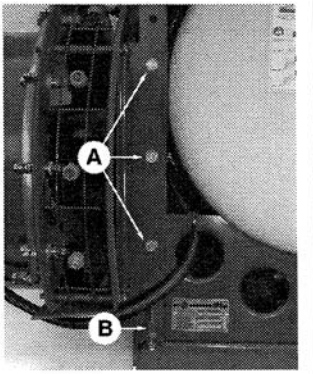
Check the V-belts regularly within the first 24 working hours as they need to be run in. Tighten if necessary. Thereafter check every 40 hours.

A visual check can be done by running the P.T.O. for a few minutes and then noting the "bow" of the V-belts on the slack side. A faint "bow" should be noted.

For LB-50-

The blower drive V-belts are tensioned by raising or lowering the blower unit. Loosen at **(A)** on the blower suspension and set the belt tension by the adjusting bolts **(B)**.

Adjust tension so that at midway between pulleys, a force of 2.2 lb. (1 kg) should deflect the V-belt 3/32" to 1/8" (2 to 3mm). Do not over-tighten the V-belts.



Note: Tighten all lock nuts and replace guards after adjustment.

9.3 Tank Contents Indicator (if fitted)

Depending on products used, it can become difficult to see the red sphere inside the level indicator tube. Note that the tube can be replaced when necessary.

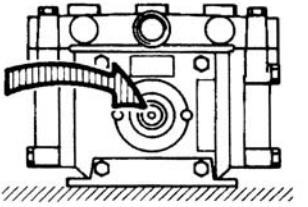
9.4 Lubrication

Recommended lubrication is shown as follows. Use ball bearing grease (lithium grease No. 2).

Note: If the sprayer is cleaned with a high pressure cleaner or it has been used to spray fertilizer, we recommend lubrication of the entire machine.

Diaphragm Pump-

Grease every 40th working hour with two or three shots of grease. Do not over grease.

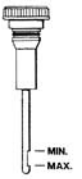


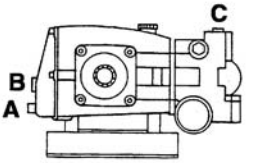
Piston pump-

Check oil level daily when spraying. Level must be visible between the minimum and maximum mark of the indicator.

The pump is filled with oil from the factory. Change the oil after the first 50 hours of work. Thereafter as described in following table or once a year.

A = Drain plug **B** = Level indicator **C** = Filling hole



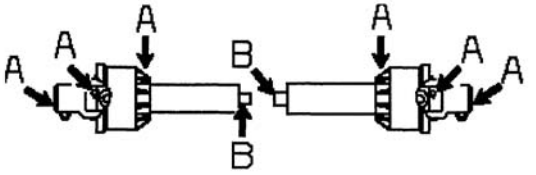


P3L

	Oil cap. qts. (ltr.)	Oil type SAE	Initial change hours	There after hours
Pump P3L	1.6 (1.5)	20/40 HD	50	150

Transmission shaft-

Lubricate the cross journals and bearings with ball bearing grease **(A)** every 8th working hour and tubes and pins **(B)** every 20th working hour.

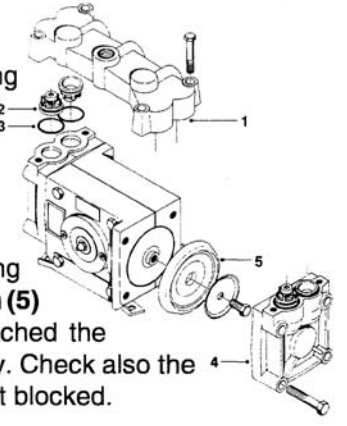


10.0 CHANGING OF VALVES AND DIAPHRAGMS / PLUNGER CUPS

10.1 Diaphragm pump

Valves-

Remove valve cover **(1)**. Before changing the valves **(2)** note the orientation of the valves so that they are replaced correctly. It is recommended to use new gaskets **(3)** when changing or checking the valves.



Diaphragms-

Remove the diaphragm cover **(4)** after having dismantled the valve cover. 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.

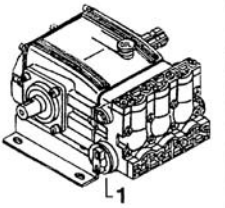
Reassemble pump with the following torque settings.

Pump Model	Valve cover ft lb. (Nm)	Diaphragm cover ft lb. (Nm)	Diaphragm bolt ft lb.(Nm)
321	38 (50)	60 (80)	45 (60)

10.2 Piston Pumps

Valves-

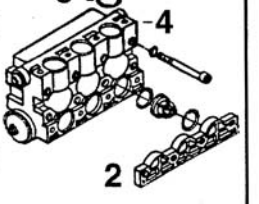
1. Remove suction cover **(1)** so that the liquid is drained from the pump.
2. Remove valve chamber **(2)**. Note orientation of the valves. It is recommended to use new O-rings **(3)** when checking or changing the valves.

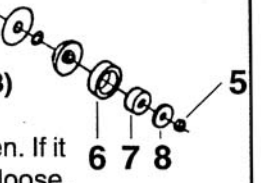


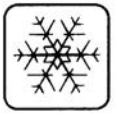
Note: For valves with ball seat, the valve seat can be rotated.

Plunger cups-

1. The valve chamber must be removed first (P3N only).
2. Remove cylinder head **(4)**.
3. Use spanner to loosen nut **(5)**.
4. Cylinder can now be removed so the cups **(6)** can be removed.
5. At reassembly, grease cups and inside of cylinder.
6. Assemble cup **(6)**, rubber expander **(7)**, washer **(8)** and self-locking nut **(5)**.
7. Tighten nut 22 ft. lbs.(30 Nm). Do **NOT** over tighten. If it is too tight, the cups will wear rapidly. If it is too loose, liquid will leak from the drain port of the cylinder.
8. Finish the assembly and run the pump for 1/2 hour. If liquid leaks from the drain ports, it is necessary to tighten nut **(5)**. Only tighten 1/4 of a turn. This may also be necessary if the cups have dried out after off-season storage.







11.0 OFF-SEASON STORAGE

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

Anti-freeze precautions-

If the sprayer is not stored in a frost- proof place you should take the following precautions: Put at least 3 gal. (10 ltrs) of 33% anti-freeze mixture in the tank and let the pump run a few minutes so that the entire system including spray lines are filled. Remove the glycerine filled pressure gauge and store it frost free in vertical position.
The anti-freeze solution also keeps the O-rings, plunger cups and gaskets from drying out.

Hoses-

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

A leaky hose causes annoying delays in the middle of spraying. Check all the hoses and replace if there is any doubt of their durability.

Paint-

Some chemicals are very corrosive. It is therefore advisable to remove rust, if any, and touch up the paint.

Operating unit-

Ensure the pressure regulating valve is relieved or released. This relieves the pressure on the spring and operating problems are avoided when starting up.

Tank-

Ensure that all chemical residues are removed from the tank and rest of the sprayer.

Transmission shaft-

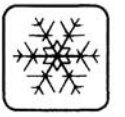
It is important that the push pins are clean and well lubricated, to ensure safe function.

Every 40 hours-

Inspection of protection guards, function and condition. Replace possible damaged parts.

Every 1000 hours-

Check condition of protection guards and replace nylon bearings.
Check general condition of cross journals and push-pin/quick release - replace if necesary.



12.0 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, reducing pump efficiency.
- Poorly reassembled pumps, especially valve covers will allow the pump to suck air resulting in reduced or no capacity.
- Worn plunger cups will reduce the pump capacity. It will be necessary to replace them when working pressure cannot be reached or liquid leaks from the cylinder ports.
- Reduced working pressure may also be due to insufficient spring strength or a worn valve cone on the pressure control unit.
- Loose or partially loose V-belts may result in lower revolutions per minute on the blower and overheating of the V-belts.
- Electrical components that are contaminated with dirt result in poor connections.

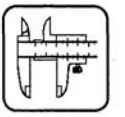
Therefore ALWAYS check:

1. Suction, 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 components are maintained clean.

13.0 TROUBLESHOOTING

Fault	Possible cause	Control / remedy
No liquid flow from pump	Suction obstructed.	Check filters. Suction cut-off open.
	Air leak on suction.	Missing O-rings. Defect hoses.
	Valves obstructed or worn.	Replace.
No pressure	Worn control unit.	Check spring strength.
	Valves obstructed or worn. Worn plungers.	Replace.
Fluctuating pressure	Valves obstructed or worn.	Replace.
	Air leak on suction.	Missing O-rings. Defect hoses.
	Suction obstructed.	Check filters.
Pump noisy	Worn bearings. Valves worn.	Replace.
	Air leak on suction.	Missing O-rings. Defect hoses.
Water in oil	Cylinder seals defect. Piston seals worn.	Replace.
	High air humidity.	Change oil twice as often.
Liquid leaks at cylinder seals	Worn plungers. Cylinder barrel worn.	Replace.
Oil leaks	Piston seals worn	Replace

14.0 TECHNICAL SPECIFICATIONS



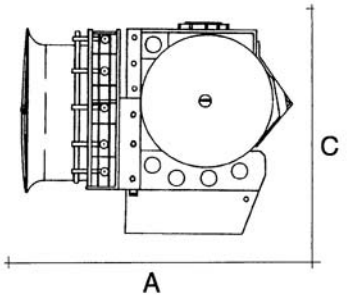
Pump power consumption and capacity

321/7.0	r/min							
	300		400		500		540	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP
0	6.34	0.29	8.72	0.38	11.62	0.48	13.47	0.59
72.5	5.81	0.48	7.93	0.68	9.78	0.87	10.57	0.98
145	5.55	0.78	7.66	1.07	9.51	1.35	10.30	1.46
217.5	5.55	0.98	7.66	1.35	9.51	1.60	10.04	1.83
290	5.28	1.16	7.40	1.60	9.25	2.04	9.78	2.24
362.5	5.28	1.46	7.13	1.94	9.25	2.42	9.78	2.61
Rotation per min.		r/min	Flow Capacity			GPM		
Power consumption		HP	Max. pressure			365 PSI		

P3L-36	r/min							
	350		400		500		540	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP
0	6.34	0.01	7.13	0.01	8.98	0.01	9.51	0.01
145	6.34	0.52	7.13	0.61	8.98	0.75	9.51	0.82
290	6.34	1.05	7.13	1.25	8.98	1.53	9.51	1.63
435	6.34	1.63	7.13	1.82	8.98	2.29	9.51	2.39
580	6.34	2.11	7.13	2.39	8.98	2.98	9.51	3.25
725	6.34	2.59	7.13	2.96	8.98	3.73	9.51	4.02
870	6.34	3.16	7.13	3.63	8.98	3.20	9.51	4.88
Rotation per min.		r/min	Capacity			GPM		
Power consumption		HP	Max. pressure			870 PSI		

14.1 Measure and Weight

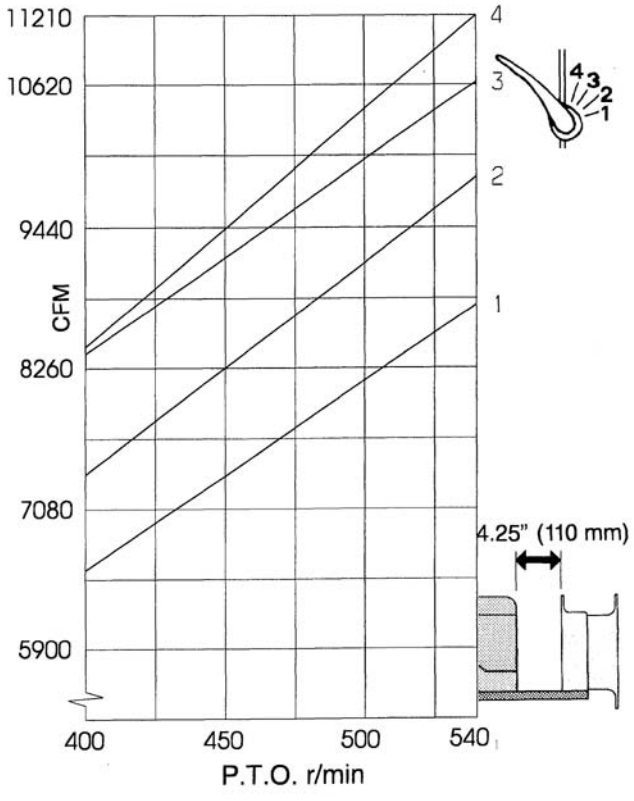
LB-50



Model	Tank US gal	Blower dia. inch	Air volume cfm	Air speed average MPH	Pump model	Power consumption HP	Dimensions A x B x C min. inch	Weight lb
LB-50	53	22	11,210	54	P3L	11	55 x 32 x 42	287
LB-50	53	22	11,210	54	321	11	55 x 32 x 42	308
LB-50	53	22-VD	11,210	54	P3L	11	55 x 32 x 45	298
LB-50	53	22-VD	11,210	54	321	11	55 x 32 x 45	320

14.2 Air Volume

F550 (LB50) Gear ration 1:4.11



Disposal of the equipment

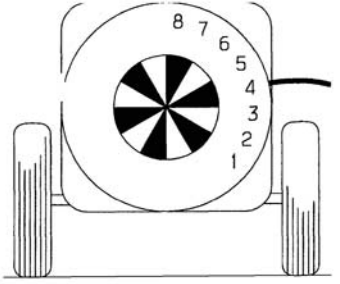
When the HARDI equipment has completed its working life, it must be thoroughly cleaned. The tank, hose and synthetic fittings can be incinerated at an authorized plant. The metallic parts can be scrapped. Always follow local legislation regarding disposal.

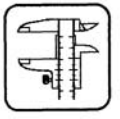
Nozzles

Standard nozzle combination

B = Brown O = Orange
Y = Yellow R = Red

LB-F550 (LB-F22)	
1	Y
2	O
3	O
4	O
5	R





15.0 NOTES

For Product, Service or Warranty Information:

- Please contact your local HARDI® dealer.

To contact HARDI® directly:

- Please use the HARDI® Customer Service number: 1-866-770-7063
- Or send your email to: CUSTSERV@hardi-us.com

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