SWIFT COMPACT SPRAYERS

Instruction Manual

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12 VOLT SPRAYERS Operators Manual
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Identification details

Please record applicable details below:

Owners Name:

Type of Equipment:

Model:

Date:

Dealer Name:

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Illustrations, technical information and data are to the best knowledge of Hardi Spraying Equipment Pty Ltd, correct at the time of printing.

Hardi Australia Pty Ltd reserves the right to make changes in design, features, accessories, specifications and instructions at any time and without notice.

Hardi Australia Pty Ltd is without any obligation in relation to products purchased before or after such changes.

All operators of the equipment dealt with by this publication must read this entire publication prior to operating any of the equipment.
Safety sections must be thoroughly read and understood.

Failure to do so may result in injury or death.

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Introduction

The reliability and efficiency of the Hardi spraying equipment you have purchased, depends upon your care. The first step is to take the time to carefully read this manual — it contains essential information on efficient and safe operation of the chemical handling equipment.

This manual covers several models of Hardi 12 Volt sprayers, so take care to read the relevant sections.

Thankyou for choosing Hardi and welcome to the increasing family of Hardi spraying equipment owners.

Use

Sprayers in this range are suitable for use by commercial growers, home gardeners, government departments and for selected industrial applications such as pest controllers.

They are designed for application of agricultural chemicals (including herbicides, insecticides, fungicides, liquid fertilisers, organic and green formulations) to plants and soil.

If local law does not demand that the operator be certified to use spray equipment, it is still strongly recommended to be trained in the safe handling of plant protection chemicals and plant protection, to avoid unnecessary risk for persons and the environment.

Description of Equipment

The Hardi Swift range of 12 Volt sprayers consists of:

Swift Cmpact Sprayer range

· Sizes: 25, 50, 100L traytop units and 75L ATV Swift

· Lance or Optional 60S Spraygun

· Pumps: Flojet demand and Control-type pumps

Tanks

Hardi tanks are made from moulded High density Polyethylene. They are easy to clean and are translucent for easy liquid level monitoring.

The 75L ATV Tank is designed to wrap around the seat, keeping the sprayer weight forward for better balance.

Pumps

Four models of fuse-protected Flojet 12V diaphragm type pump are used on the Hardi 12V sprayer range.

Model LF14 demand pump has a capacity of 3.8L/min, 2.4 bar (35PSI)

Features

Tray-top tanks:

* Fuse-protected pump
* Internal suction system
* Raised floor in Tray-top tanks to maximise drainage
* Handle inserts for lifting ease.
* Translucent tanks with moulded level indicators
* Sealed lid

SaddlePack Tanks

* Low profile poly tank
* Raised edge to protect from spilled chemicals
* Fuse-protected pump and filters in recess
* Internal suction
* Easily fitted to ATV
* Standard equipment includes suction filter, hose rack, 6m of hose, 2m of cable

Model 2100-599 is a demand pump which has a pressure switch controlling the pump. The pump only runs when spray gun trigger is squeezed, and turns off when trigger is released.

Model 2100-848 is a twin diaphragm fan-cooled, continous running pump and is connected to an adjustable pressure control valve.
848 pump output is 5.8 litres/min at 250 K.P.A. Suitable for use with a spray gun and small booms.

Model 4100-505 is a quad diaphragm, fan-cooled pump. It is connected to an adjustable control valve with three outlets. 505 pump output is 9.6 litres/min at 250 K.P.A. This pump is suitable for spray gun and larger booms.

Features of Flojet pumps

* Santoprene diaphragm design avoids shaft seal problems
* Pump can run dry without damage
* Ball bearing drive in pump and motor
* Excellent priming capability
* Powerful permanent magnet motor

Booms

ATV Booms are available in widths of 1.5 1nd 2m rigid booms, and 3, 4 and 5m booms with spring-loaded breakaways.

End Nozzles

End nozzles are available for optional ATV booms (option).

Safety Guidelines

This is the safety alert symbol:
It means: **WARNING! Your safety is involved!**.

WARNING! Poisoning by agricultural chemicals can cause serious acute reactions, long term debilitating illness or even death. Some toxins can accumulate in the body

Poisoning with chemical concentrates can occur by:

•Inhaling fumes or dust particles.

•Absorbing the chemical through the skin, hair or eyes.

•Swallowing contaminated food or drinks.

Allergic reactions and chemical burns can also occur with exposure to chemicals.

CAUTION! Always wear protective clothing and equipment when using crop protection and cleaning chemicals.

Care must also be taken when storing, carrying or laundering contaminated clothing to avoidthe risk of exposure to chemicals.

It is advisable to use the following clothing and equipment at all times while mixing chemical solutions and transferring the solutions into your sprayer, during spraying and when cleaning equipment.

- Full-length overalls with long sleeves.
- Chemical resistant, durable waterproof gloves.
- Face mask / respirator.
- Chemical resistant, non-slip, work boots.

THINK SAFE - WORK SAFE at all times!

Note the following recommended safe operating practices and precautions:

You must read chemical labels and follow the instructions they contain prior to using them. The National Registration Authority registers chemical labels. However each state governs the purpose for which a chemical may be used, this varies from state to state.

Local law may demand that a chemical spraying operator be certified to use any chemical spraying equipment. Adhere to the law. If local law does not demand that the sprayer operator be certified , it is still strongly recommended to be trained in the safe handling of plant protection chemicals , to avoid unnecessary risk to persons and the environment.

Pressure test the equipment using clean water before adding chemicals.

Do not eat, drink or smoke while spraying or working with contaminated equipment.

Always ensure that different chemicals you intend to mix in the sprayer solution are compatible. Do not mix chemical concentrates together in the tank. Add to partially filled tank in separate batches and mix well after each additional chemical.

Rinse and wash the equipment after use and before servicing.

Never service or repair the equipment while it is operating.

Depressurise equipment after use and before servicing.

Wash and change clothes after working with the equipment.

Wash tools that are contaminated.

In case of poisoning, immediately seek medical advice. Remember to identify chemicals used.

Keep children, animals and unauthorised people away from the equipment.

When cleaning operate all valves to ensure thorough decontamination.

If any portion of this manual remains unclear after reading it, contact your Hardi dealer for further explanation before using Hardi spraying equipment.

CAUTION! Always read chemical labels for special precautions and first aid procedures.

All Terrain Vehicle (ATV) Safety

The All Terrain Vehicle (ATV), also known as a 'Three-Wheeler' or 'Four-Wheeler', has been widely used in the agricultural industry.

What hazards are associated with ATVs?

Some known hazards associated with ATV use:

Young people up to 16 years, or small-framed people, may lack the physical size for safe control.

ATVs are single operator vehicles that rely on the shifting of the operator's weight to steer and control the machine. Passengers prevent the operator from having full control of the vehicle due to the inability to weight-shift effectively.

ATVs are low to the ground and therefore not as visible as other vehicles.

ATVs are not designed for use on paved surfaces such as footpaths, driveways, highways or on dirt or gravel roads Abrupt opening of the throttle may cause the front wheels to lift off the ground, resulting in a loss of direction control and/or causing the ATV to flip backwards.

Due to the shifting centre of gravity when traversing inclines, the vehicle may become unstable particularly when fitted with attachments.

The operator may suffer physical injury from moving parts, bugs, branches or stones.

Prior to using a spray unit on an ATV:

1 **Identify the hazards,** including aspects of how the ATV will be used, where it will be used, who will use it, changing environmental conditions and the skill level of each operator.

2 **Assess the risks** - Risks may increase significantly when attachments are placed on the ATV and the operator is spraying in hilly, uneven terrain. Take into account that the tank contents (and therefore the centre of gravity) can shift dramatically during cornering and on undulating ground.

3 **Control the risks** - The aim is to eliminate the hazard, or, where that is not practicable, minimise the risk associated with the hazard through other means.

WARNING! "Even an experienced operator can be exposed to an unacceptable level of risk when operating an ATV fitted with a saddle mounted spray tank or other attachments that markedly alter the centre of gravity of the ATV. A small trailer, which can be towed behind a four-wheeled ATV, may be more appropriate when extra capacity is required or when the terrain is too steep for a bike-mounted unit."

'Hazard Alert 7: All Terrain Vehicles"
WorkCover Corporation of South Australia

What can I do to control or minimise the risks?

The following basic control measures should be implemented prior to the operation of ATVs. However, a risk assessment may identify other measures required in conjunction with these for individual working conditions.

1 Ensure that the ATVs are operated at all times in line with the manufacturer's specifications.

CAUTION! Avoid exceeding the maximum load weight recommendations of your ATV. Remember to take into account the weight of tank/s, tank contents (1L water = 1 Kg, chemicals may be heavier), boom and attachments, plumbing, control units and the operator's body weight.

2 The operator must be trained and sufficiently skilled to operate the ATV in all required work tasks, and be sure instructions are clearly understood.

3 Operators must ensure they do not, by the consumption of alcohol, or a drug, endanger their own safety or the safety of anyone else.

4 Visibility of the ATV can be increased with the use of antenna flags, and if necessary, with the use of High Visibility Vests (HVVs)

5 Any fitted attachment must be used in accordance with manufacturer's specifications

6 Modifications must only be carried out by the manufacturer or authorised agent, and accepted only after the provision of an engineer's report certifying its operational capacity

7 Personal Protective Equipment (PPE) must be provided to the operator, such as a bike helmet, eye/face shield, long-sleeved shirt and pants, sturdy boots and gloves. Wearing a helmet has been shown to markedly reduce the risk of sustaining a fatal head injury

8 ATVs are single operator vehicles, therefore passengers should be prohibited at all times

9 A daily start-up check of the machine is necessary before use, and a scheduled preventative maintenance programme developed and implemented.

Other information about ATV safety is available from manufacturers and suppliers, relevant industry groups and at www.workcover.com.

NOTE! TAKE THE TIME TO READ, UNDERSTAND AND FOLLOW ALL SAFETY GUIDELINES IN THIS BOOK. YOUR HEALTH, SAFETY AND LIFE MAY DEPEND ON IT.

Set Up

CONTROLS

On / Off power switch is fitted to the pump either on the pump body or line switch.

INSTALLATION

CAUTION! Do not exceed vehicle manufacturer's specified safe load and carrying capacity. Remember that 1 litre of water weighs 1 kilogram, and add the total weight of the water and chemicals to the empty weight of the sprayer (also include the operator's weight) when assessing the sprayer's suitability for the vehicle you intend using.

LOCATION

Position the sprayer so as to minimise the risk of contamination to the operator. With the pump away from the operator contamination due to hose failure can be minimised.

Securely attach the sprayer to the carrying vehicle to prevent movement that may result in damage to the sprayer components or vehicle, leaks and/or contamination.

The sprayer should not protrude from the vehicle so as to cause an obstruction.

FITTING ATV Swift TO VEHICLE.

Hardi ATV Swift Sprayer is designed to sit on the rear carrier frame of ATV Motorcycles.
It is held in position by two rachet tie-down straps which go around the tank and carrier on either side of the lid. There are recesses in the tank which allow for the straps to be secured and prevent slipping.

Refer to the vehicle manufacturer's instructions about load limits, positioning and methods of attachment. Generally the sprayer should be mounted centrally and so that the centre of gravity is as close to the centre of the wheelbase as possible.

SETTING UP YOUR SWIFT

1 Unscrew the handle of the spray lance and remove the hose retaining clip.
2 Slip the hose through the handle. Place the retaining clip on the hose in the same direction as it was installed in the handle.
3 Fit hose to lance and screw handle up tp retain hose.
4 Fit hose to outlet side of the pump. Placing the end of the hose in hot water will assist with fitting.

CONNECTING TO POWER.

Hardi 12V Sprayers come with battery terminal clips. A 3m loom is supplied with the sprayer to allow it to be connected to a 12 Volt DC source.

Fit the red wire to positive and black to negative terminals of battery. If you extend the wire use same gauge or larger.

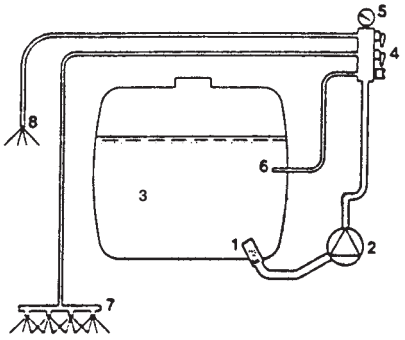
An on / off switch is fitted to the sprayer to allow power from the 12 Volt source to be switched off to prevent accidental drain of power. The switch also allows the pump to be shut down when the tank is empty, preventing overheating and damage to the pump.

It is recommended that sprayers fitted with a 777 or 848 pump be installed with a 10-amp fuse to prevent any potential damage to the electrical system of the vehicle. Consult your vehicle manufacturer's instruction manual for correct electrical connection. Sprayers with a LF11 pump have a 5-amp fuse pre-installed.

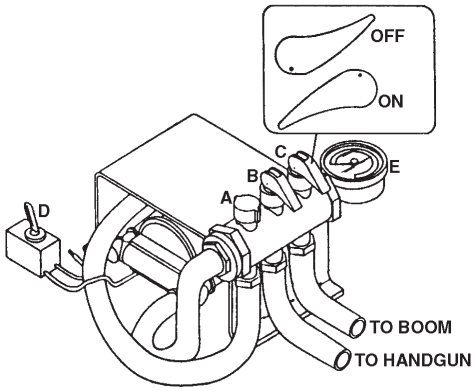
Operation

OPERATING DIAGRAM

1 SUCTION FILTER
2 PUMP
3 TANK
4 OPERATING UNIT
5 PRESSURE GAUGE
6 PRESSURE AGITATION
7 SPRAY BOOM (OPTIONAL)
8 SPRAY LANCE / SPRAY GUN (OPT)



CAUTION!
Test your sprayer using clean water only. Use extreme caution when adding chemicals.
Read chemical labels and instructions.



1 Locate your sprayer in a suitable location to spray water from the boom / lance / handgun. Check to make sure that hose under valve C goes to the boom and the hose under valve B goes to the handgun.
2 Fill your tank with water.
3 Turn dial A counter clockwise all the way out.
4 Set boom switch C on and handgun switch B off.
5 Turn electrical switch D on to expel water from the boom.
6 Increase pressure on gauge E by turning that A clockwise (lower by turning counter clockwise).
7 To operate the handgun, turn switch C off and switch 9 on. Then depress the red handle F on the handgun. Check thepressure and use step 6 to adjust.
8 To adjust the handgun spray pattern, turn the black handle G at the end - OUT for a narrow pattern for Long distances and IN for a wide pattern for more coverage at close distances.
9 When spraying with the boom, use the electrical switch 0 to turn the boom on and off.

Maintenance

In order to derive full benefit from the chemical handling equipment for many years, the following maintenance program should be followed.

> **IMPORTANT!** Always read carefully through the individual paragraphs regarding maintenance jobs before starting the job. If any portion remains unclear or requires facilities which are not available, then for safety reasons please leave the job to your Hardi dealer's workshop.
>
> **NOTE!** For maintenance of your sprayer, please refer to your sprayer's operator's manual.

To effectively maintain chemical handling and spray equipment you must:

1 **Clean all equipment as part of cleaning the sprayer, after spraying is completed and before performing any maintenance** - Refer to cleaning guideline below.

2 **Lubricate** according to the lubrication interval guidelines - Refer to *Lubrication*.

3 Perform **Adjustments** as needed following a daily inspection - Refer to *Adjustments* (P ?).

4 Immediately fit **Replacement parts** for parts that are worn or broken - Refer *Replacement Parts* (Page ?).

Cleaning (including disposal of unused chemical solution)

> **IMPORTANT!** Always refer to instructions on printed labels for individual chemicals for recommended methods of de-activation and disposal of unused chemical solution.

The entire sprayer, any separate chemical handling equipment and the boom (optional) should be cleaned together .

Please read the following guidelines for a brief overview of cleaning:

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

2 Select and use the appropriate protective clothing. Select detergent suitable for cleaning and suitable deactivating agents if necessary.

3 Flush and clean the sprayer, chemical handling equipment and tractor externally. Use detergent if necessary.

4 Remove all the filters and clean them - be careful not to damage their mesh. Re-fit the filters when the sprayer is completely clean.

5 Clean the pressure relief valve and attached hose of any residue.

6 With the pump running, flush the inside of the tank (remember the tank roof). Flush 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 soakway.

7 After spraying the liquid out, stop the pump and fill at least 20% of the tank with clean water. Note that some chemicals require the tank to be completely filled. Add appropriate detergent and/or deactivating agent, e.g. Washing Soda or Triple Ammonia.

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

8 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.

9 Drain the tank and if the pump is able to - let the pump run dry. Flush the inside of the tank, again letting pump run dry (if possible).

10 If the chemicals used have a tendency to block nozzles and filters, remove and clean them now.

11 Re-fit all the filters and nozzles and store the sprayer. If from previous experiences, it is noted that the solvents in the chemicals are particularly aggressive, store the sprayer with the tank lid open.

Lubrication

Always store lubricants in a clean dry and cool place - preferably at a constant temperature - to avoid contamination from dirt and condensed water.

Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating.

Avoid skin contact with oil products for long periods.

Service and maintenance

NOTE: This section gives a maintenance guideline for a sprayer unit, trailer and chemical handling equipment combined as all components should be maintained as a whole before, during and after each spraying session, and when stored between seasons.

10 Hours or Daily

In-Line filters (If fitted): Clean.

Nozzle filters: Clean.

Spraying circuit: Check for leaks.

50 Hours or Weekly

Do all previous +

ATV wheel studs and nuts: Re-tighten.

Drawbar bolts: Re-tighten.

Tyres: Check pressure.

250 Hours or Monthly

Do all previous +

ATV Wheel bearings: Check and adjust if necessary.

Hoses and tubes: Check for possible damage and proper attachment. Renew damaged hoses and tubes

Ocasional maintenance

Maintenance and renewal intervals for the next points depend very much on the conditions under which the sprayer operates, and are therefore impossible to specify.

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 over-tighten. Disassemble, check condition and position of the 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

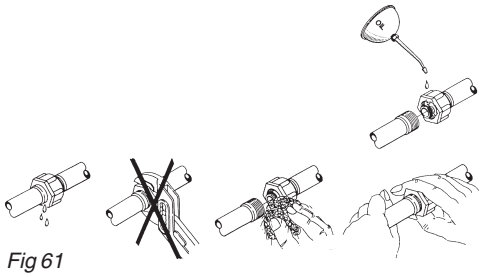


Fig 61

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

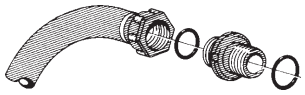
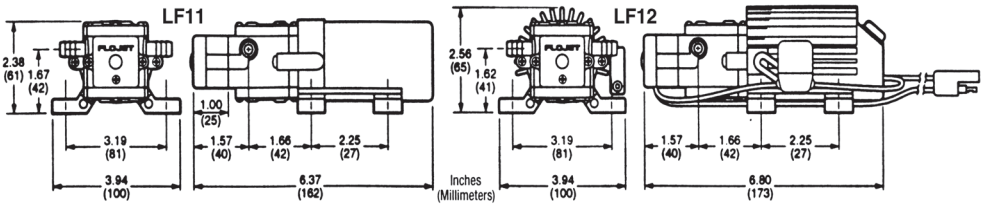


Fig 62

ATV Tyres

WARNING! Bad seating of the tyre on the rim and could cause the tyre to burst, leading to serious injury or death. Never mount or use damaged tyres or rims! Use of a damaged, ruptured, distorted, welded or brazed rim is not acceptable.

FloJet Pumps - Operation & Service



LF SERIES FLOJET

OPERATION

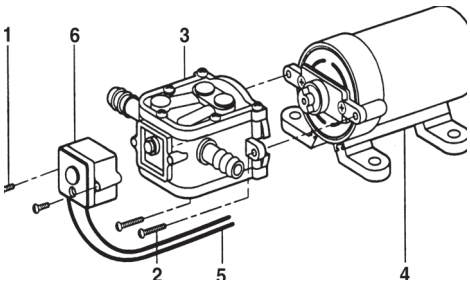
1 Allow pump to prime with discharge line (or spray valve) open to avoid an airlock.

2 Once primed, the built-in pressure switch will auto-matically turn the pump off when the discharge valve is closed / pressure reaches the set cutoff point. It will turn on when the valve is opened / pressure drops below the set cut-in point.

3 If the supply tank is empty the pump will continue to run. Running pump dry will not damage the pump. Turn off manually.

NOTE: In spraying applications the pressure generated by the pump is generally dependent upon the flow of the spray nozzle.
An undersized spray nozzle, or a lance / spray gun adjusted to produce too low a flow will cause the pump pressure switch to cycle on and off and create a pulsating flow from the pump.
To obtain a smooth flow and constant operating pressure adjust the nozzle setting on the lance / spray gun, or select a larger size spray nozzle.

NOTE: Demand Operation is considered an "intermittent duty" application. The maximum intermittent duty cycle is that which will cause the motor to reach its max thermal limits. Once the max thermal limit is reached, the motor must be allowed to settle (ideally to ambient temperature) before resuming operation.
Running the pump at or near max limit for extended periods will shorten the life of the pump and may cause immediate pump failure.



SERVICE GUIDELINE - Disconnect power first

1 To disassemble pump head, remove pressure switch cover by removing single screw (1).

2 Gently remove wires (5) from pressure switch.

3 Remove two screws (2) from front of pump head (3) and sliding it away from motor (4) assembly.

4 To reassemble, align pump head (3) with motor (4), replace screws (2) and tighten to 15 inch ounces of torque.

5 Reconnect wires (5) to pressure switch. Wires can be connected to either of the terminals.

6 Replace switch cover and secure with screw (1).

7 Reconnect pump to liquid source, then to power source.

8 Allow pump to prime with discharge line or spray valve open. Check for leaks in the system.

Preventative Maintenance

Always flush the pump and all hoses and valves with clean water after use and before storage.

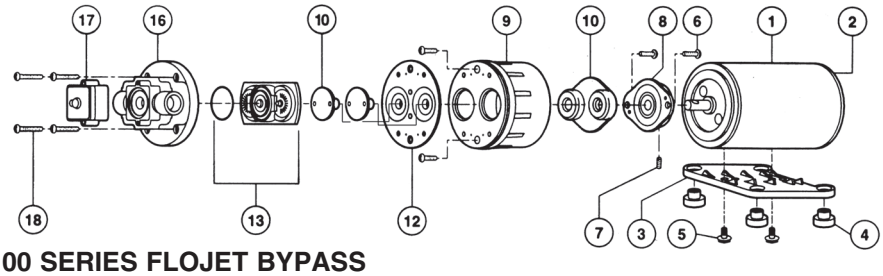
Before freezing conditions occur, pump must be liquid free or winterized with anti-freeze.

Protect the pump from water, dust, UV, and chemical residues as much as possible.

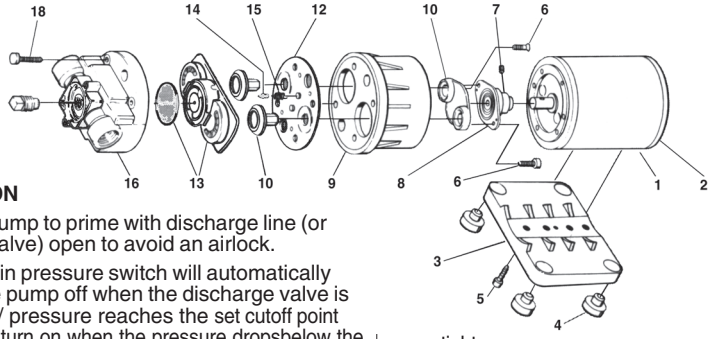
Only use hoses of the correct pressure rating and made of materials compatible with chemicals. Do not allow hoses to become obstructed.

Use of a min 40-mesh strainer will prevent debris from entering the system. Foreign matter in the system may cause inconsistent spray application or pump failures (which may not be covered by pump warranty).

2100 SERIES FLOJET DEMAND



2100 SERIES FLOJET BYPASS



OPERATION

1 Allow pump to prime with discharge line (or spray valve) open to avoid an airlock.

2 A built-in pressure switch will automatically turn the pump off when the discharge valve is closed / pressure reaches the set cutoff point and will turn on when the pressure dropsbelow the cut-in point. In the bypass model fluid re-circulates.

3 If the supply tank is empty the pump will continue to run. Running the pump dry will not damage the pump. Turn off manually.

NOTE: The pressure generated by the pump is dependent upon the flow of the spray nozzle. An undersized spray nozzle, or a lance / spray gun adjusted to produce too fine a spray will cause the pump pressure switch to cycle on and off and create a pulsating flow from the pump. To obtain a smooth flow and constant operating pressure adjust the nozzle setting on the lance / spray gun, or select a larger size spray nozzle.

SERVICE GUIDELINE - Disconnect power first

1 To disassemble, remove six pump head screws (18), rotate bearing cover (9) so drain notch is aligned with cam/bearing assembly set screw (7).

2 Loosen set screw (use 1/8" size Allen Wrench). Slide pump head off shaft.

3 Pistons (10) should always be replaced when new diaphragm is installed.

4 Replace worn parts and reassemble. Be sure raised side of diaphragm faces the motor and radiused corner of pistons face diaphragm.

5 Hex stem of inner piston (10) must be aligned (free to enter) into Hex hole in outer piston set (10). Press pistons together by hand until they snap tight.

6 Install flat head screws (6) through outer piston set and tighten screws partially, center pistons in diaphragm than tighten screws securely.

7 Place cam bearing assembly over outer piston set, align locating pins in the holes in cam bearing assembly. Install round head screws and tighten securely. (Torque to 18 inch pounds, coat motor shaft with grease prior to assembly.)

8 Reassemble bearing and cam bearing assembly to motor and retighten the set screw securely. Set screw must be positioned in shaft indentation. Position of the screw is critical to avoid misalignment and subsequent diaphragm damage.

9 Reassemble remaining pump head parts, using care to properly seat O-ring (13) in cheek valve assembly.

10 Bypass Pumps: With lower housing held vertically, place bypass poppet/s (14) and spring/s (15) on locating post/s moulded on diaphragm. Place pump head with check valve and O-ring installed over bypass poppet/s ensuring poppet/s are aligned into bypass ports in check valve housing (13)

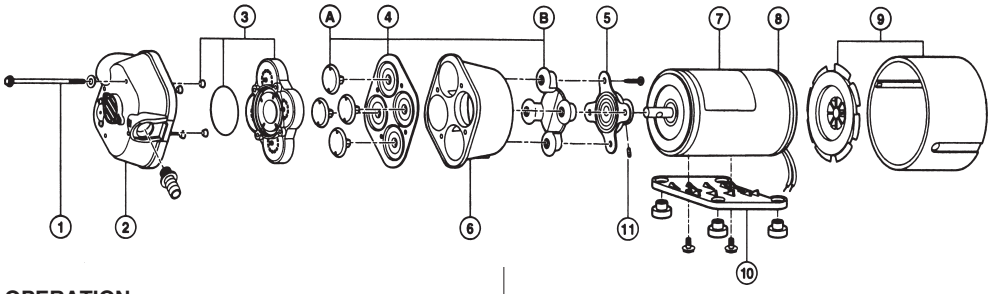
11 Tighten pump head screws (18) evenly.

Service Kits:

Flojet Cam Bearing / Diaphragm Kit includes:
Nos 6,7,8,10 and 12 in diagrams above.

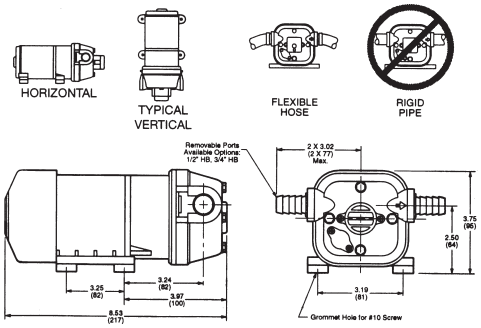
Flojet Pump Service Kit includes:
Nos 13,14 and 15 in diagrams above.

4100 SERIES FLOJET



OPERATION

1 Allow pump to prime with discharge line (or spray valve) open to prevent an airlock.



SERVICE GUIDELINE - Disconnect power first

1 To disassemble, remove four pump head screws (1). Rotate bearing cover (6) so drain notch is aligned with cam/bearing assembly set screw (11).

2 Loosen set screw with 1/8" allen wrench and slide pump head off shaft. Always use complete FLOJET repair kits upon reassembly.

3 To reassemble, install new single-piece outer piston (B) into lower housing (6) with piston tops pointing away from motor. Slightly bend outer piston (B) along premolded crease to aid assembly.

4 Place diaphragm in lower housing (6) with the molded O-ring seals facing away from motor. Insert each inner piston (A) through diaphragm into outer piston. Turn each piston until fully seated.

5 Align cam/bearing assembly (5) with outer piston (B). Secure with cam/piston screws using 18 inch pounds of torque.

6 Reassemble lower housing (4, 5, 6) to motor. Set screw MUST be positioned over shaft indentation and secured tightly.

7 Reassemble pump upper housing (1, 2, 3). Check that ferrules are installed in upper housing and O-ring is properly seated before inserting cheek valve assembly (3) into upper housing (2).

8 Align pump assembly to motor and tighten pump head screws evenly with 25 inch pounds of torque.

SERVICE KITS

Kits are readily available to repair standard Duplex 11 series pumps. To insure that the correct kits are received the model number and all name plate data must be included with the order. Contact a FLOJET distributor or FLOJET directly to order the necessary repair kits.

Storage of Sprayer and Chemical Handling Equipment

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

If chemical residues are left in the sprayer for long periods, it can reduce the life of the individual components.

Please refer to the *Storage* section in your sprayer's operator's manual regarding preparation before and after off season storage of your sprayer.

Preparation before off season storage

To preserve the sprayer and accessories and protect the components, carry out the following off season storage program.

1 Clean the sprayer andchemical handling equipment completely - inside and outside. Make sure that all valves, hoses and auxiliary equipment have been cleaned with detergent and flushed with clean water, so no chemical residues are left.

2 Renew any damaged seals and repair any leaks.

3 Empty the equipment completely and let the pump work for a few minutes. Operate all valves and handles to drain as much water off the spraying circuit as possible. Let the pump run until air is coming out of all nozzles. Remember to drain the rinsing tank. Ensure the foam marker is rinsed and drained.

4 If your equipment is not stored in a frost free place, pour in a mixture of Ethylene Glycol based anti-freeze and water at the ratio for the desired temperature protection. Volume of mixture should be about 1% of tank volume. Run the sprayer and circulate the anti-freeze in the pump, controls and boom lines.

5 Lubricate all lubricating points regardless of intervals stated.

6 When the metal parts are dry remove rust from scratches or damage in the powdercoat and touch up with paint.

7 Remove any Glycerine filled gauges and store them in a frost free vertical position.

8 Apply a thin layer of anti-corrosion oil (e.g. SHELL ENSIS fluid, CASTROL RUSTILLO or similar) on all metal parts, hoses and tyres.

9 Fold the boom to transport position and relieve pressure from all hydraulic functions.

10 All electric plugs and sockets are to be stored in a dry plastic bag to protect them against damp, dirt and corrosion.

11 Remove any control boxes (if fitted) from the vehicle and store them inside where it is dry and clean.

12 Wipe hydraulic snap-couplers clean and fit the dust caps.

13 Apply grease onto all hydraulic ram piston rods that are not fully retracted in the barrel, to protect against corrosion.

14 Chock up the wheels, to prevent moisture damage and deformation of the tyres. Tyre blacking can be applied to the tyre walls to preserve the rubber.

15 To protect against dust the sprayer can be covered by a tarpaulin. Ensure ventilation to prevent condensation.

Preparation after off season storage

After a storage period the sprayer and associated chemical handling equipment should be prepared for the next season the following way:

1 Remove covers.

2 Remove the support from the wheel axle and adjust the tyre pressure.

3 Wipe off the grease on the hydraulic ram piston rods.

4 Fit the pressure gauges again (seal with teflon tape).

5 Connect the sprayer to the tractor including hydraulics and electrics.

6 Check all hydraulic and electric functions.

7 Empty the remaining anti-freeze from the tank (If used).

8 Rinse the entire liquid circuit of the sprayer with clean water.

9 Fill with clean water and check all functions.

Troubleshooting

In cases where breakdowns in spraying systems have occurred, the same factors are often responsible.

Therefore always check components are maintained, clean and free from leaks:

- 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 results in these valves not closing 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.
- Hydraulic components that are contaminated with dirt result in rapid wear to the hydraulic system.

Therefore **always** check:

1. Suction, pressure and nozzle filters are clean.
2. Hoses for leaks and cracks, paying particular attention to the suction hoses.
3. Gaskets and O-rings are present and in good condition.
4. Pressure gauge is in good working order (Correct spray dosage depends on it).
5. EC operating unit functions properly. Use clean water to check.

PUMP FAILS TO TURN OFF AFTER DISCHARGE VALVES ARE CLOSED

- Depletion of available liquid supply
- Punctured pump diaphragm
- Discharge line leak
- Defective pressure switch
- Insufficient voltage to pump
- Debris in pump check valves

LOW FLOW AND PRESSURE

- Air leak at pump intake
- Accumulation of debris inside pump and plumbing
- Worn pump bearings (excessive noise)
- Punctured pump diaphragm
- Defective rectifier or motor
- Insufficient voltage to pump

PULSATING FLOW - PUMP CYCLING ON AND OFF

Restricted pump delivery. Cheek discharge lines, fittings, valves and spray nozzles for clogging or undersizing.

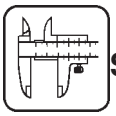
FAILURE TO PRIME

(Motor operates, but no pump discharge)

- Restricted intake or discharge line. Open all line valves, check for “jammed” cheek valve poppets and clean clogged lines.
- Air leak in intake lines
- Punctured pump diaphragm
- Defective pump check valve
- Crack in pump housing
- Debris in check valves

MOTOR FAILS TO TURN ON

- Pump or equipment not plugged in electrically
- Fuse blown
- Loose wiring connection
- Pressure switch failure
- Defective motor or rectifier
- Frozen cam bearing



Specifications

Materials and recycling

Hoses PVC

Fittings PA

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

Replacement Parts

This section is to be used to help you identify the replacement part numbers of many common parts on the various chemical handling equipment - it is not as comprehensive as the *Spare Parts* manual at your Hardi dealer.

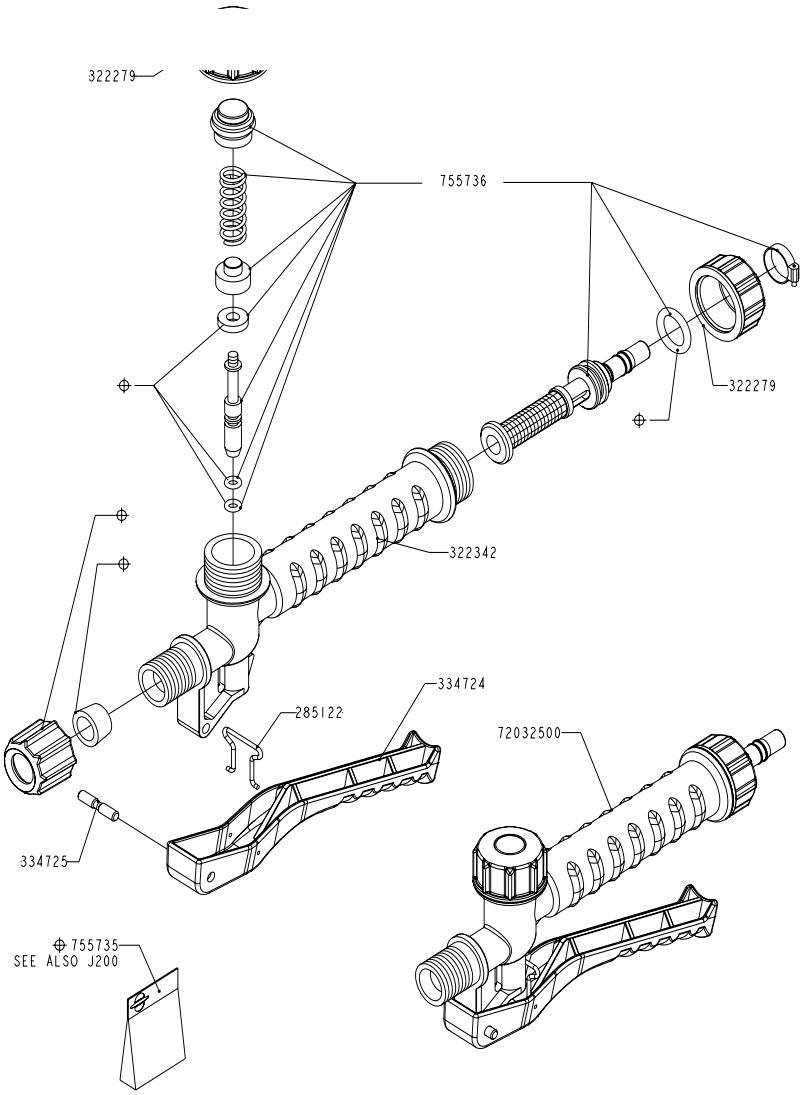
So if a part is not covered in this section, or is difficult to determine, you will need to contact your Hardi dealer.

Every part illustrated in this section has a number or is shown as part of a group of parts in a numbered kit.

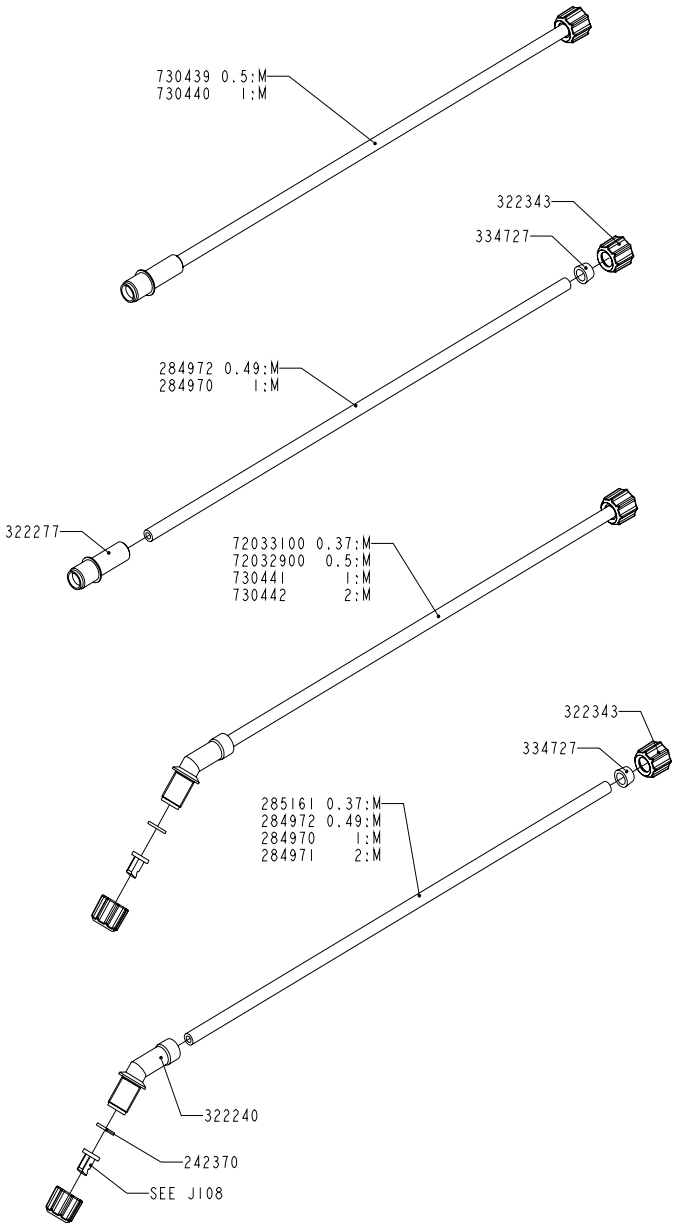
This number is the Hardi parts number for the part or kit of parts.

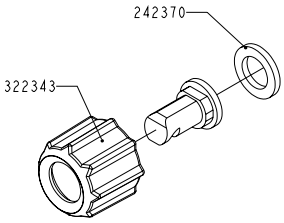
Note that drawing numbers used in this section do not represent any Hardi parts drawing numbers - they are simply used for cross-referencing within this manual.

Title	Drawing	Page
Xxxxxxxx	Drg 1	20

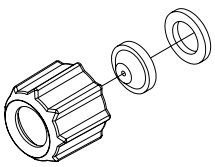


Lance Assembly

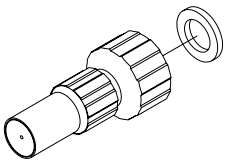

730439 0.5:M
730440 1:M
322343
334727
284972 0.49:M
284970 1:M
322277
72033100 0.37:M
72032900 0.5:M
730441 1:M
730442 2:M
322343
334727
285161 0.37:M
284972 0.49:M
284970 1:M
284971 2:M
322240
242370
SEE J108



ANVIL NOZZLES, VLV (VERY LOW VOLUME):			
REF. NO.:	PREVIOUS NO.:	ID:	COLOUR:
371847		DT0.5	ORANGE
371848		DT0.75	GREEN
371849		DT1.0	YELLOW
371850		DT1.5	BLUE
371851		DT2.0	RED
371852		DT2.5	BROWN
ANVIL NOZZLES, LV (LOW VOLUME):			
372020	371853	REFLEX 0.6	YELLOW
372021	371854	REFLEX 1.2	GREEN
372022	371855	REFLEX 1.8	BLUE
372023	371856	REFLEX 2.4	RED

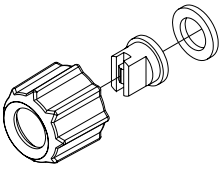


HOLLOW CONE NOZZLES:			
REF. NO.:	PREVIOUS NO.:	-	COLOUR:
371694		-	YELLOW
371682		-	RED
371695		-	BROWN
371696		-	GREY



ADJUSTABLE CONE NOZZLES:			
REF. NO.:	PREVIOUS NO.:	-	COLOUR:
371864	-	-	BLUE

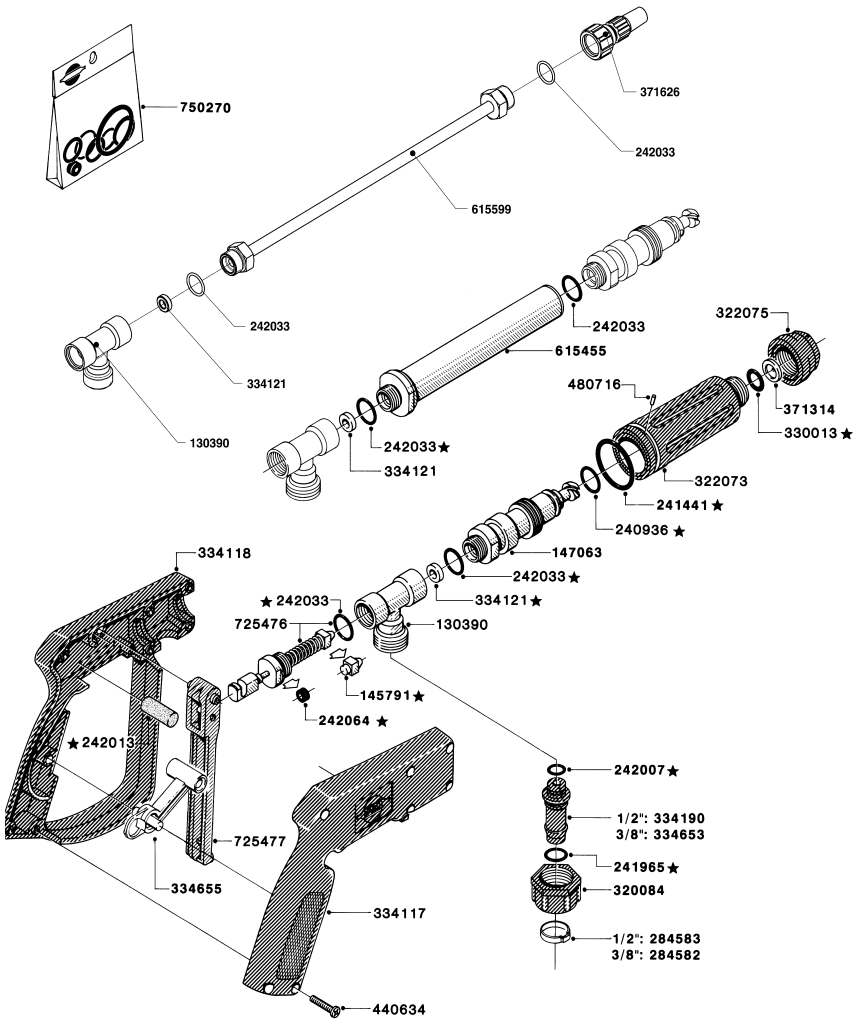
EVEN FLAT FAN NOZZLES:			
REF. NO.:	PREVIOUS NO.:	ID:	ISO COLOUR:
371857		30-02E80	YELLOW
371858		30-03E80	BLUE
371859		30-04E80	RED



TAPERED FLAT FAN NOZZLES:			
REF. NO.:	PREVIOUS NO.:	ID:	ISO COLOUR:
371706		F-01-110	ORANGE
371708		F-02-110	YELLOW
371709		F-03-110	BLUE
371710		F-04-110	RED

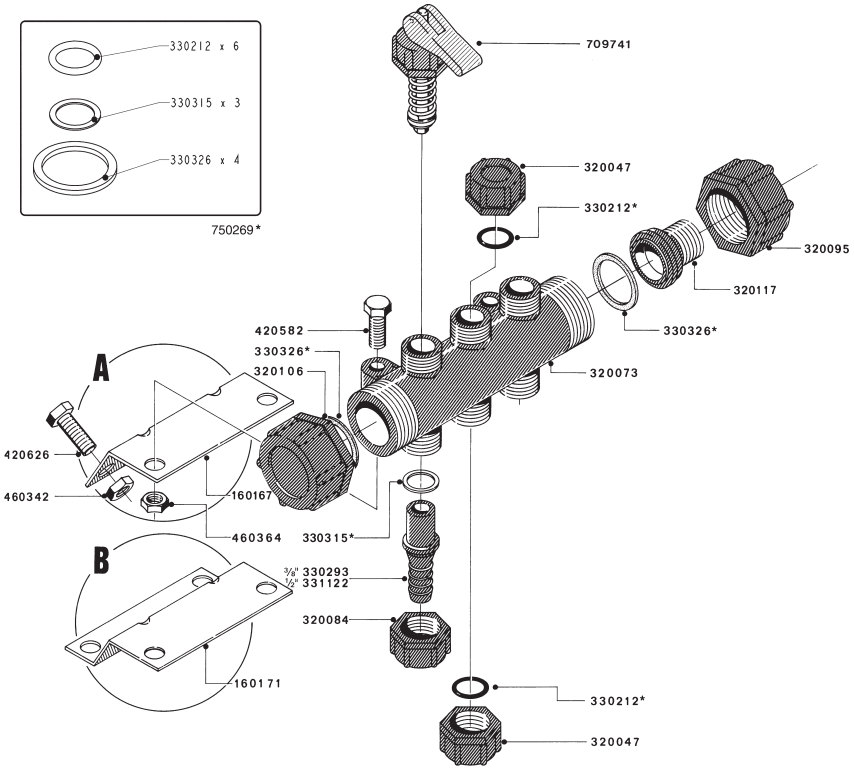
J108

Nozzles Detail



K110

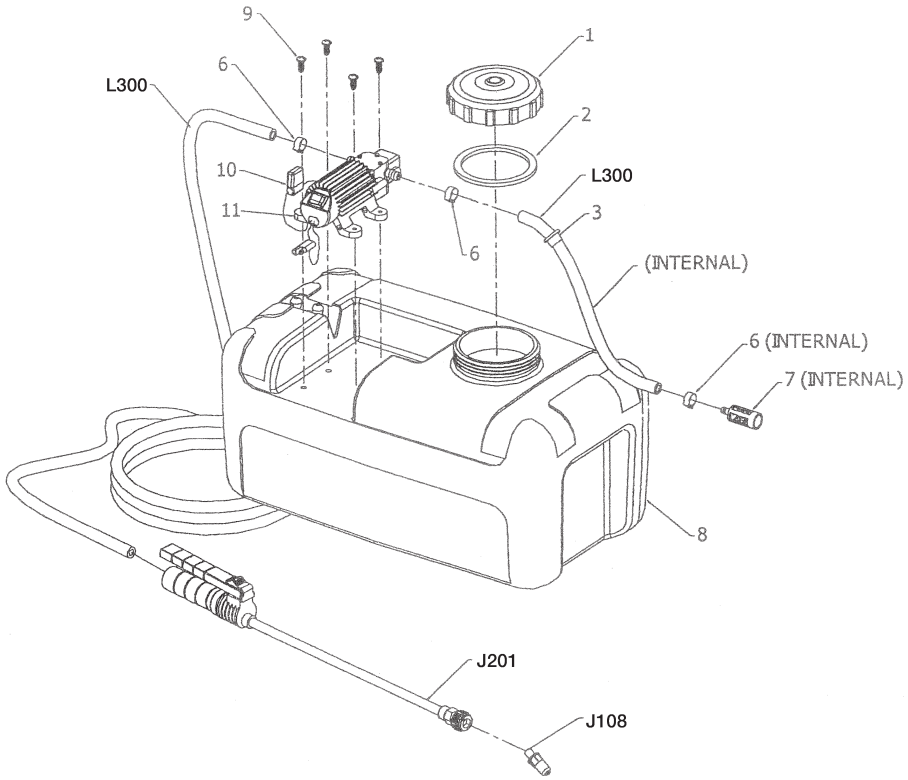
Spray gun 60S, 60L & 60E



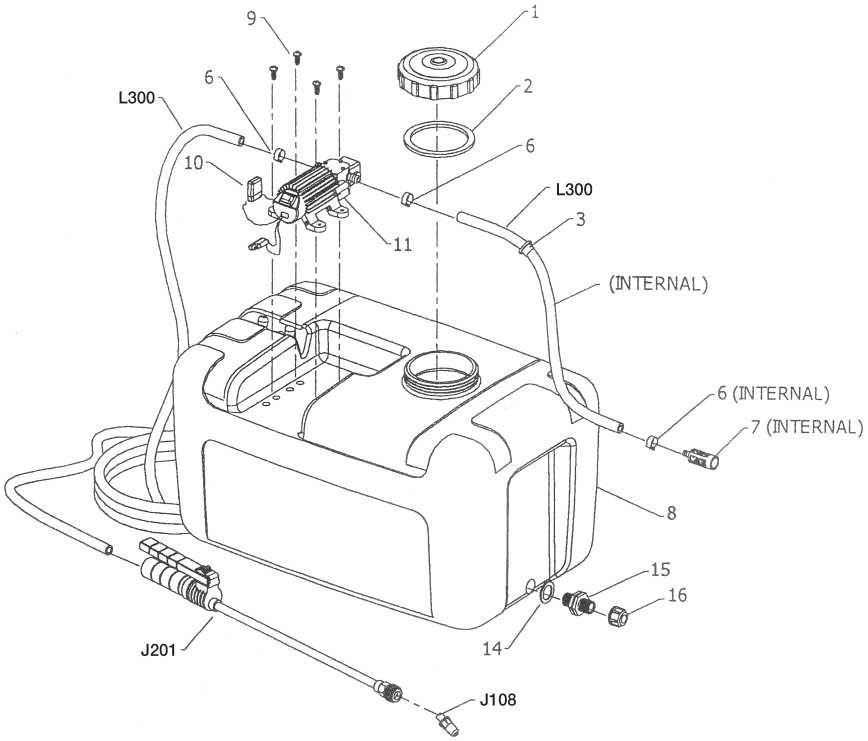
B006

3-Way Distribution Manifold

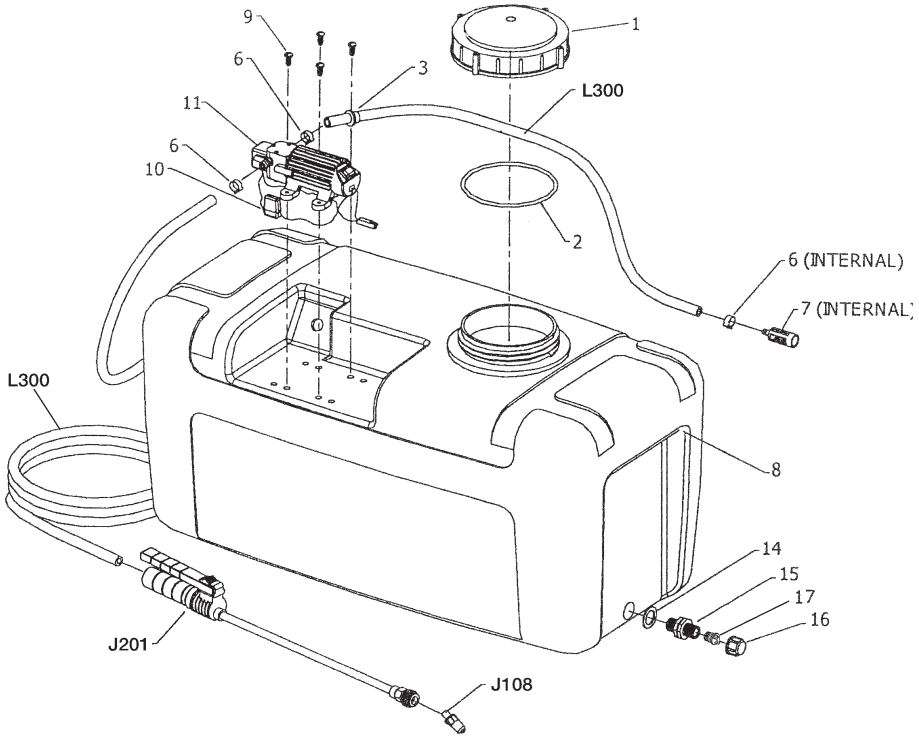
1	28049900	Lid for SC 25, SC 50
2	28050000	Seal ring for SC 25, SC 50
6	334686	Hose clamp 5/16"
6	284582	Tension ribbon D 9-16 stainl. 5/16"
6	284583	Tension ribbon D 12-22 stainl. 3/8"-1/2"
7	28053300	Strainer (S1274)
10	28048400	Fuse-clip on wire
11	28050100	Pump LF 14
	846264	SC 25 Swift Compact 25



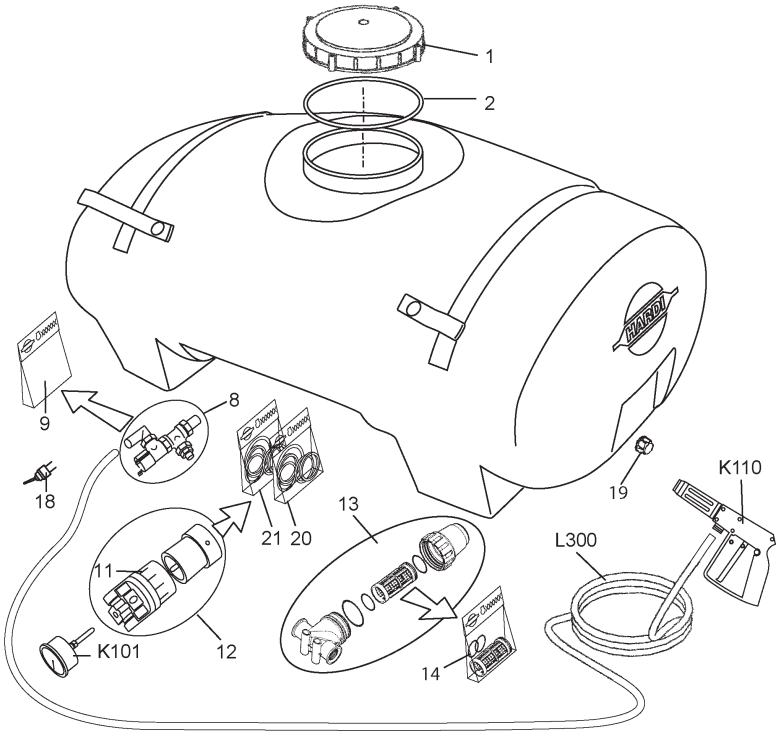
1	28049900	Lid for SC 25, SC 50
2	28050000	Seal ring for SC 25, SC 50
6	334686	Hose clamp 5/16"
6	284582	Tension ribbon D 9-16 stainl. 5/16"
7	28053300	Strainer (S1274)
10	28048400	Fuse-clip on wire
11	28050100	Pump LF 14
15	320655	Nipple 1/2"x 1/2"
16	320047	Cap 1/2"
	846265	SC 50 Swift Compact 50



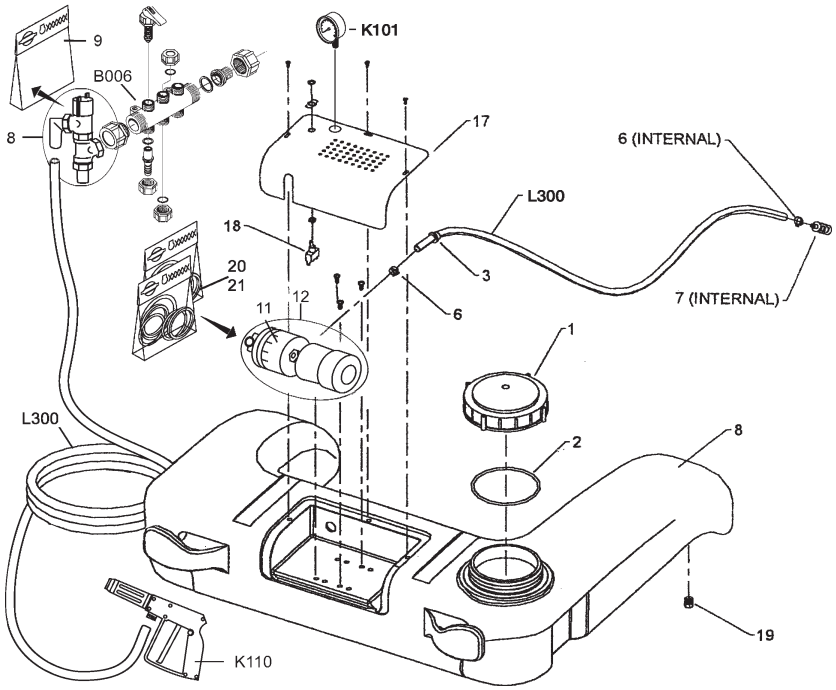
1	**28049700**	Lid for SB 75, SC 100
2	**28049800**	Seal ring for SB 75, SC 100
6	**334686**	Hose clamp 5/16"
6	**284582**	Tension ribbon D 9-16 stainl. 5/16"
6	**284583**	Tension ribbon D 12-22 stainl. 3/8"-1/2"
7	**28053300**	Strainer (S1276)
10	**28048400**	Fuse-clip on wire
11	**28050100**	Pump LF 14
15	**322144**	Nipple 3/4"x 3/4"
16	**320283**	RG Cap 3/4"
17	**716413**	Screwplug w. o-ring F. 3/4" Cap
	846266	SC 100 Swift Compact 100



1	**730602**	Lid
2	**334813**	Seal ring
8	**28054600**	Pressure Regulator
9	**28054700**	Pressure Regulator Repair kit
11	**28050300**	El. motor for 2100-848
12	**28050200**	Pump flojet 2100 - 848 complete
13	**28054800**	Line filter 1/2" 100M
14	**28054900**	Filter Element Red 38x89
18	**28055000**	Switch
19	**14010400**	Stopper 1/4" SS
20	**28050400**	2100-848 Viton valve repair kit
21	**28050500**	2100-848 Diaphragm repair kit
	846268	SP-50,Swift Pro



1	**28049700**	Lid for SB 75, SC 100
2	**28049800**	Seal ring for SB 75, SC 100
6	**334686**	Hose clamp 5/16"
6	**284582**	Tension ribbon D 9-16 stainl. 5/16"
6	**284583**	Tension ribbon D 12-22 stainl. 3/8"-1/2"
7	**28053300**	Strainer (S1274)
8	**28054600**	Pressure regulator
9	**28054700**	Pressure Regulator Repair kit
10	**28048400**	Fuse-clip on wire
11	**28050300**	El. Motor for 2100-848
12	**28050200**	Pump flojet 2100 - 848 complete
18	**28055000**	Switch
19	**14010400**	Stopper 1/4" SS
20	**28050400**	2100-848 Viton valve repair kit
21	**28050500**	2100-848 Diaphragm repair kit
	846269	SPB 75 Swift Pro Bike 75, 3 out for boom



1	**28049700**	Lid for SB 75, SC 100
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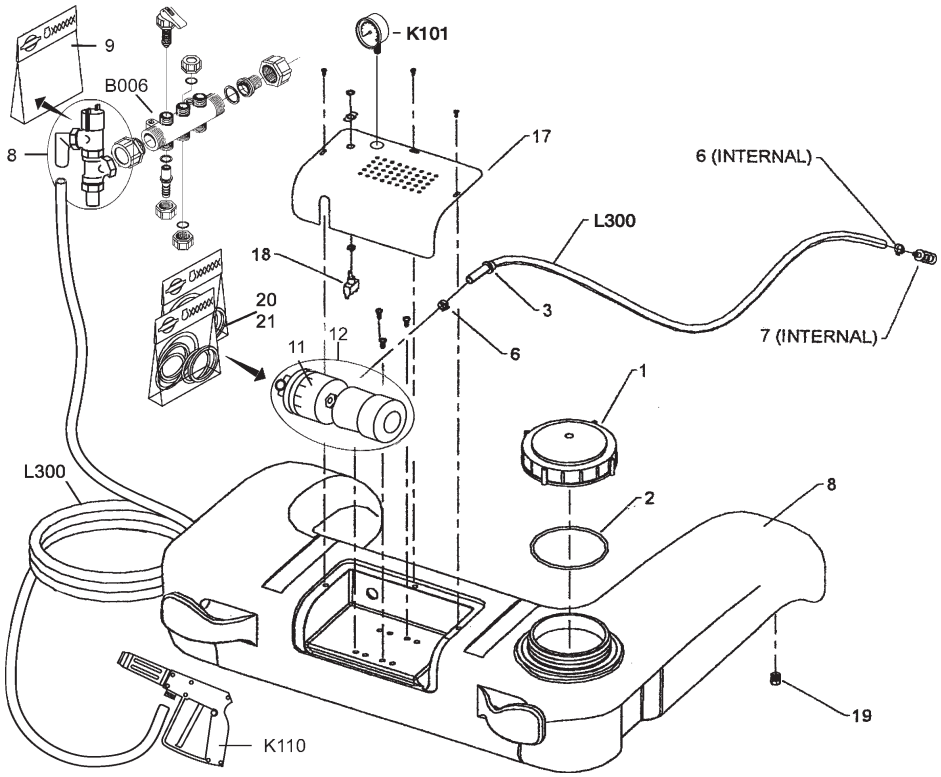

Notes