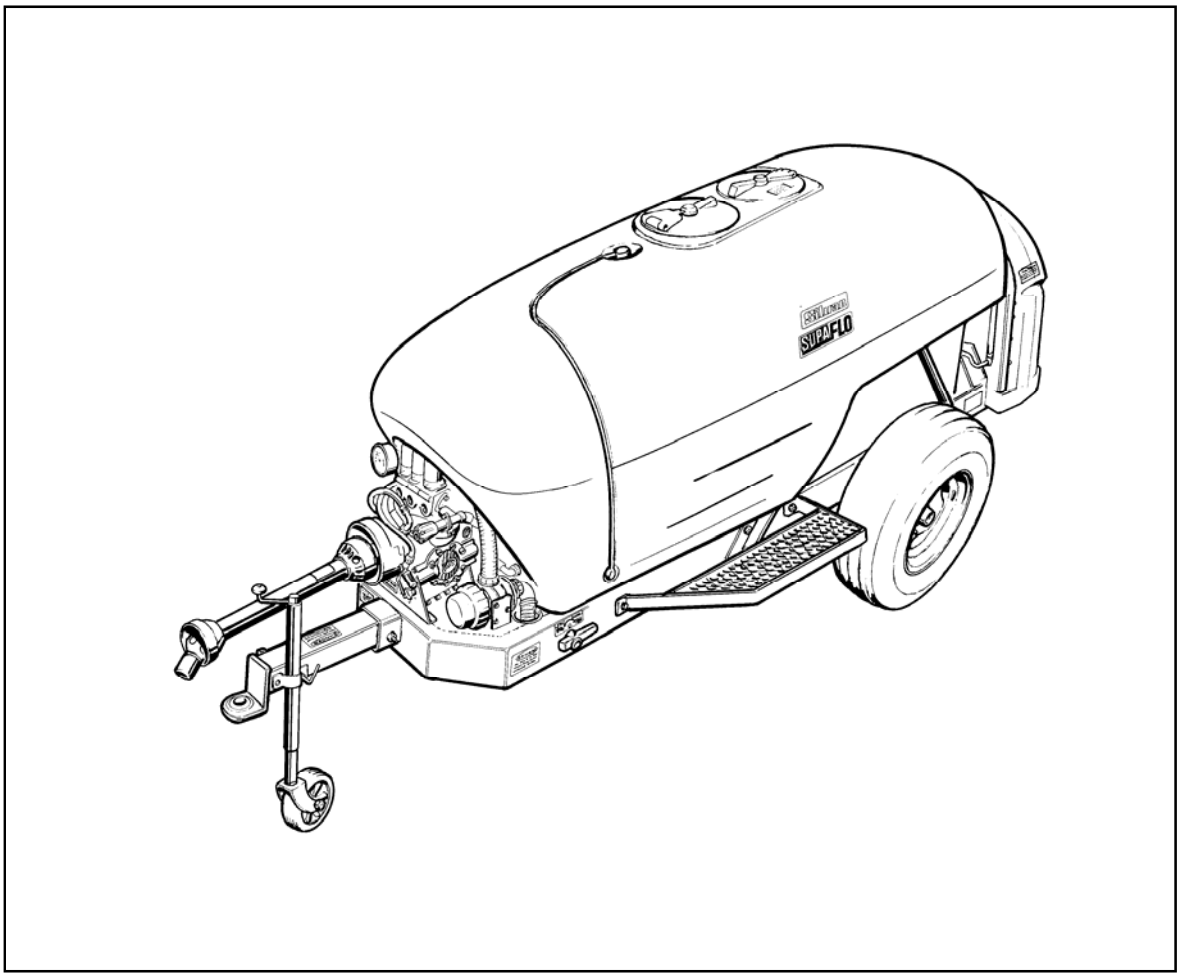
Operator's Manual

MANAB11 Rev D 25/10/06

Supaflo Airblast Sprayer 3500 litre



Contents

Introduction

Silvan is an Australian owned company specialising in the supply of crop protection equipment to primary producers. A leader in the design of agricultural sprayers, the company was established in 1962 and has grown to become the largest manufacturer and supplier of crop protection equipment in Australia.
Our reputation for quality products backed by quality service is something of which we are extremely proud. Your investment in a Silvan sprayer is an investment in quality.

This manual covers the Supaflo Airblast Sprayer of 3500 litre capacity and its associated equipment. This sprayer has been designed and manufactured to provide a high standard of performance and safety and incorporates many innovative features. To ensure continued efficient performance and safe operation of your sprayer, you need to read this manual thoroughly and fully familiarise yourself with all aspects of its operation, maintenance and safety procedures.

Now that you're a proud Silvan owner, all our services and dealer support are available to you should you need them. We assure you of our best attention at all times.

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the Silvan Warranty

This warranty is the only warranty applicable to Silvan new products ('Products') and, to the maximum extent permitted by law, is expressly in lieu of any other conditions or warranties expressed or implied in relation to the Products.
Subject only to legislative obligations to the contrary, Silvan shall not be liable for incidental or consequential damage resulting from ownership or use of a Product.
Silvan does not authorize any person to create for it any other obligation or liability in connection with these products.

Silvan warrants its authorised Dealer, who in turn warrants the original purchaser (owner) of each new Silvan product that it will repair or replace the product, or, pay the cost of repair or replacement, as determined by Silvan without charge for labour or any defective or malfunctioning parts in accordance with the warranty limitations and adjustment schedule below.
The warranty period begins on the date the product is delivered to the first retail purchaser for a period of 12 months

This Warranty Covers

Only conditions resulting directly from defects in workmanship or material under normal use and service.

Warranty Exclusions

The Warranty does not cover:

- Conditions resulting from misuse, use of incompatible chemicals, exceeding machine specifications including overloading, impact damage, negligence, accidental damage or failure to perform recommended maintenance services.
- Any product which has been repaired by other than an authorised Silvan service outlet in a way which, in the sole and absolute judgement of Silvan, adversely affect its performance or reliability.
- The replacement of maintenance items such as diaphragms, batteries, V belts and ground engaging components, etc.
- Loss of time, inconvenience, loss of use of the product liability to third parties or any other consequential damages.
- Incidental costs associated with a warranty repair including any travel costs, out of hour's labour charges, cleaning costs, transportation costs, freight costs or any communication costs.

The repair of a defective product qualifying under this warranty will be performed by any authorised Silvan service outlet within a reasonable time following the delivery of the product, at the cost of the owner, to the service outlet's place of business. The product will be repaired or replaced, using new parts supplied by Silvan. Silvan, in its absolute discretion, may choose to pay the cost of replacement or repair of the product.

The owner is responsible for the performance of regular maintenance services as specified in the Owner/Operator Manual applicable to the product. Failure to carry out regular maintenance may invalidate warranty

About your warranty

Silvan Australia Pty. Ltd. builds equipment to a high level of specification using components from quality suppliers. The following information is provided to assist you with any repairs required within the warranty period.

- All warranty repairs on Silvan products are carried out by Silvan dealers. If any warranty repairs are required on Silvan products, it is recommended that the product be returned to the place of purchase.
- It is good practice to keep a record of equipment maintenance both during and after the warranty period.

The following information on warranty coverage explains the extent and limitations of your Warranty coverage on Silvan Products.

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Features and Specifications

The Supaflo 3500 Airblast Sprayer is designed for the application of agricultural chemicals in orchards and vineyards. It uses a high pressure pump and nozzles to atomise the chemical solution, together with a high volume axial flow air fan to distribute the spray.

Tank
3500 litre capacity.
Polytuff impact resistant polyethylene with floating ball calibrated sight line.
Two 455 mm diameter flip top lids
- basket strainer for liquids
- receptacle for chemicals.

Drain valve with 38 mm diameter outlet.

Chemical Filling System
Venturi induction system.
30 litre chemical receptacle.
Water jets for flushing residue into tank.

Agitation
Continuous by-pass fluid agitation plus two, belt driven propeller agitators in the bottom of the tank.

Clean Water Tank 40 litre capacity

Drive
BYPY 540rpm shielded PTO shaft direct coupled to pump with shaft through to fan gearbox.

Pump
Positive displacement oil backed, Nitrile diaphragm pump of varying size depending on sprayer specification.

	Performance at 540 PTO rpm	
Pump No.	Output l/min	Max. Pressure Bar
APS-166	163	50
IDS-2200	208	50
IDS-2600	249	50

Fan and Drive
900mm or 1000mm diameter 10 blade axial flow fan with cast aluminium hub.

900mm fitted with variable pitch blades and adjustable polyethylene cowling with protective mesh screen.

1000mm fitted with fixed blades and galvanised cowling with airblast straightening vanes and protective mesh screen.

Two speed, oil bath gearbox with neutral position direct coupled to fan through centrifugal clutch.

Fan Speed at 540 PTO rpm - both fan sizes

Low gear 1:3.ratio	1620 rpm
High gear 1:4 ratio	2160 rpm

Air Speed in high gear

- 900mm	50 m/sec
-1000mm fan	50 m/sec

Air Flow in high gear

- 900mm fan	85,500 m^3/hr
-1000mm fan	107,000 m^3/hr

Controls
APS-166 Pump Quick detach, cab mounted lever and cable system for on/off and left and right outlets.
Screw type pressure regulator and 60 Bar glycerine filled gauge mounted at pump.

IDS-2200 Pump Tractor mudguard mounted, single lever, two outlet Pentomatic control with screw type pressure regulator and 60 Bar glycerine filled gauge.

IDS-2600 Pump Cab mounted electric controls for on/off and left and right outlets.
Screw type pressure regulator and 60 Bar glycerine filled gauge mounted at pump.

Filtration
Two stage with removable elements.
Tank lid strainer 30 mesh.
Suction line filter 50 mesh (white).
Pressure filter Integral on cable control valve
Nozzle strainers Stainless steel.

Nozzles
Twin jet, non-drip nozzles for easy changing of application rate. Flip over action to turn on or off.
Brass body with removable ceramic jets and stainless steel swirl plates.
16 nozzles with 900mm fan
18 nozzles with 1000mm fan

Frame and Hitch
Heavy duty galvanised steel construction.
Adjustable drawbar with jockey wheel.

Axle and Wheels
60 mm square Glideflex axle.
Galvanised steel rims.
11.00 x 16 Ribbed tyres.
Operating pressure 250 kpa (35 psi).

Optional Equipment
For 900mm fan models only
Airblast straightening vanes.
Single sided conveyor.
Double sided Adjustable Vineyard Conveyor
For 1000mm fan models only
Double sided Full Row Conveyor.
For both models
Electric controls (APS-166 & IDS-2200 pumps)
Hydraulically adjustable Citrus Mast
High pressure filters.
Constant velocity PTO shaft.
Extended Drawbar

Dimensions and Weights (drawbar retracted)

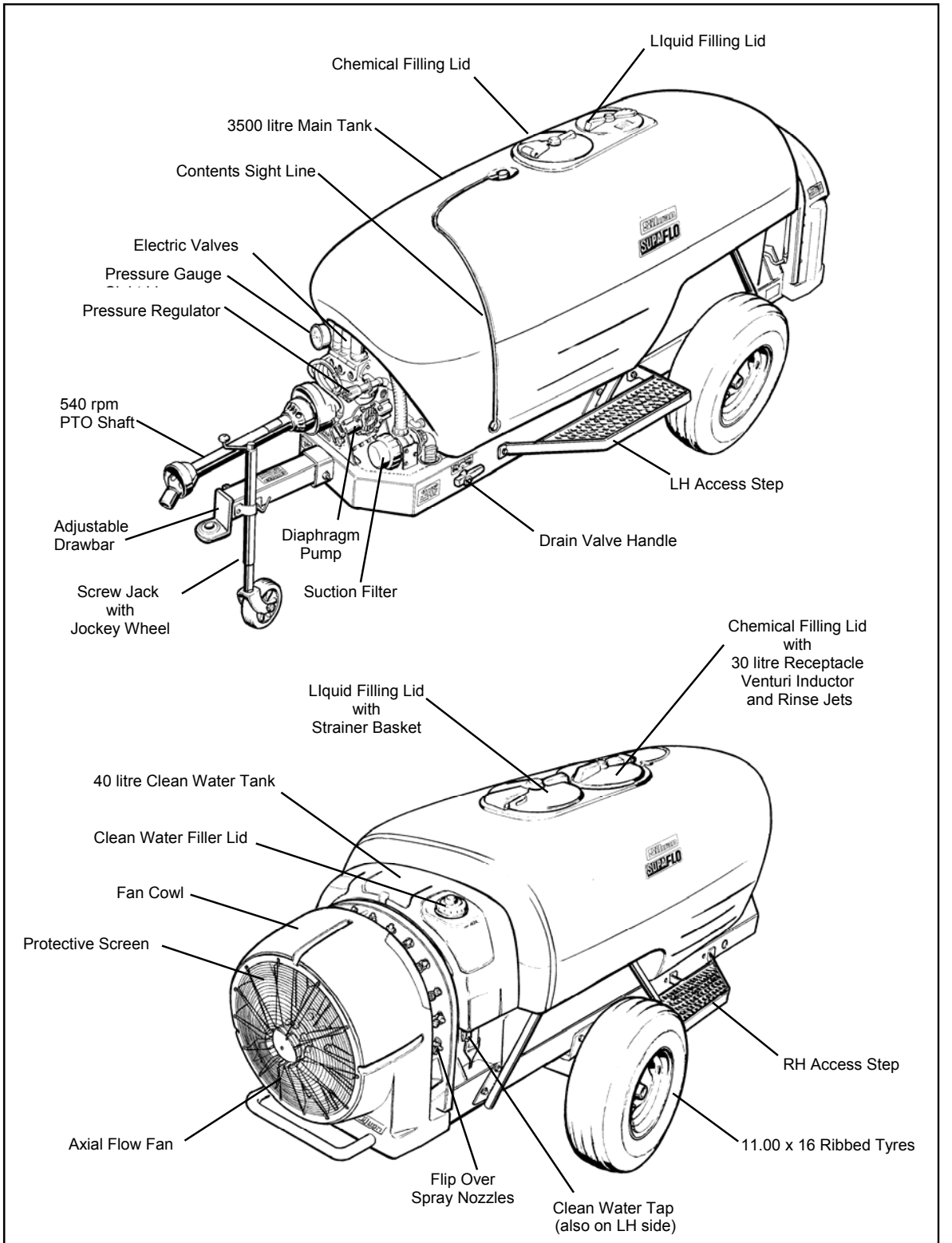
Length	**Width**	**Height**	**Mass** (kg)	
(all dimensions in mm)			Empty	Full
4755	1830	1800	800	4300

To calculate part filled mass, add to empty mass 1 kg per litre of fluid e.g. 500 kg for 500 litre.

Minimum Tractor Power Requirement
900mm fan - 60 PTO HP at 540 rpm
1000mm fan - 90 PTO HP at 540 rpm

Maximum Towing Speed
Depends on tractor power and terrain but should not exceed 30 kph under any circumstances.

Features and Specifications



FEATURES OF THE SUPAFLO 3500 AIRBLAST SPRAYER
Upper diagram shows sprayer with 900mm fan and optional electric controls.
Lower diagram shows sprayer with 900mm fan and optional air straightening vanes with extended fan cowl.

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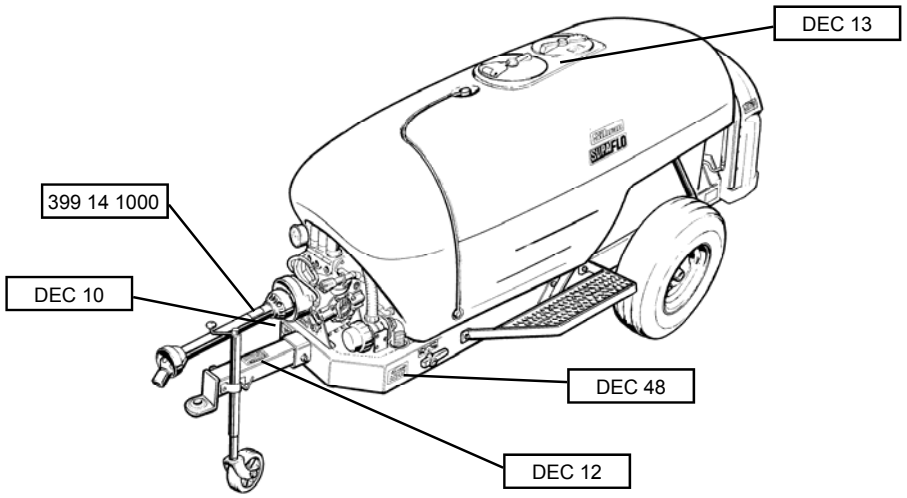
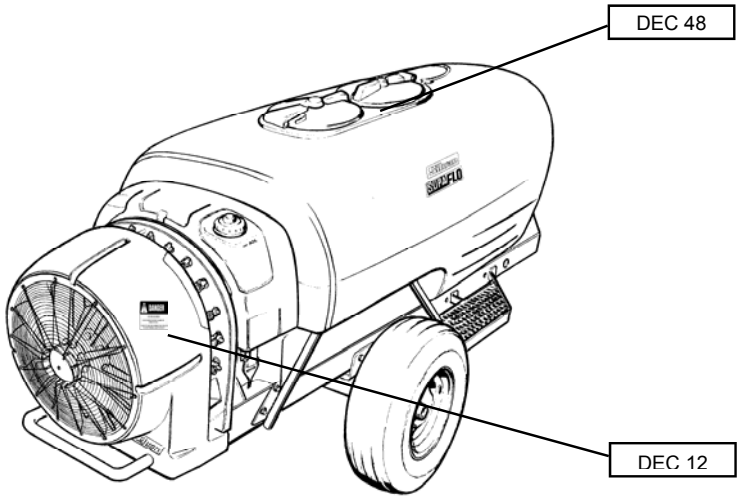
Safety Information

WARNING

The locations of the safety decals fitted to Supaflo Airblast Sprayers are shown in the diagrams below and their wording is shown on the page opposite.
It is important that all operators read and follow the information on all safety decals before operating the sprayer.
Failure to comply with these warnings could result in serious injury or death.
Safety decals should be kept clean and legible at all times. If any decals are missing or unreadable they should be replaced by ordering new decals from your Silvan dealer using the part numbers shown below.



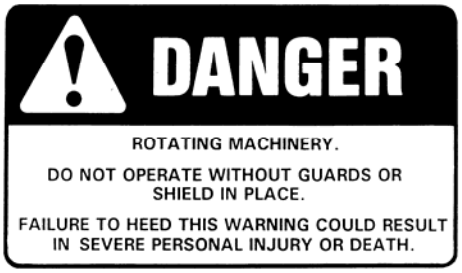
SUPAFLO 3500 AIRBLAST SPRAYER - FRONT VIEW



SUPAFLO 3500 AIRBLAST SPRAYER - REAR VIEW

Safety Information

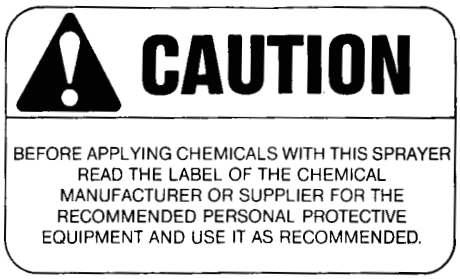
Part Number DEC 10



Part Number DEC 12

Part Number DEC 48

Part Number 399 14 1000



Part Number DEC 13

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Safety Information

Before operating the sprayer read the following safety instructions.
Failure to comply with these warnings may result in serious injury or death.

- ▲ The sprayer is designed and manufactured solely for the purpose of applying agricultural chemicals to crops. Under no circumstances should it be used for any other purpose.
- ▲ Before using the sprayer carefully read and ensure you understand the contents of this manual and any other manual supplied with the sprayer.
- ▲ Before operating the sprayer read all the safety warnings which are carried on various parts of the machine. Refer to the previous page for the wording of these warnings.
- ▲ Never allow an inadequately trained person to attach or operate the sprayer.
- ▲ Do not operate the sprayer whilst wearing loose clothing, unrestrained long hair, jewellery or anything which could become entangled in rotating components or limit your vision.
- ▲ Wear ear protection when operating the sprayer on a tractor which is not fitted with a sound proofed cabin.
- ▲ Ensure the towing capacity of the tractor is suitable for the loaded mass of the sprayer. Refer to the tractor operator's manual for safe working loads and relevant tractor safety instructions.
- ▲ Exercise extreme care when operating in hilly or uneven terrain to ensure proper stability. Refer also to the tractor manufacturer's operating and safety instructions .
- ▲ Do not allow any person to ride on the sprayer or tractor whilst it is in motion.
- ▲ Do not operate the sprayer at speeds greater than 540 PTO rpm.
- ▲ Do not operate the sprayer without all the tractor and sprayer safety shields in place. Carefully check that PTO and driveline shields are correctly installed.
- ▲ Stop the tractor PTO, apply the parking brake and switch off the tractor engine before approaching the sprayer or performing any work on it.
- ▲ Disconnect the PTO shaft at the tractor and ensure the sprayer is properly supported before performing any maintenance work. Do not support the sprayer by the jockey wheel when the tank is full or partly full of liquid.
- ▲ Do not adjust the drawbar without the sprayer being properly supported. Do not support by the jockey wheel.
- ▲ **Before use of any chemicals** refer to the chemical manufacturer's label and safety instructions for safe handling procedures and correct method of use. Always use the recommended personal protective clothing and safety equipment.
- ▲ Always wear gloves when removing and cleaning filters.
- ▲ Dispose of empty chemical containers in accordance with the instructions supplied by the chemical manufacturer.
- ▲ Ensure that all operators and associated personnel are familiar with the legal regulations and codes of practice that apply to the safe use and storage of spray chemicals.
- ▲ **Do not enter the sprayer tank under any circumstances.** If service is required contact Silvan for correct maintenance procedures.

Installation

Attaching to the Tractor

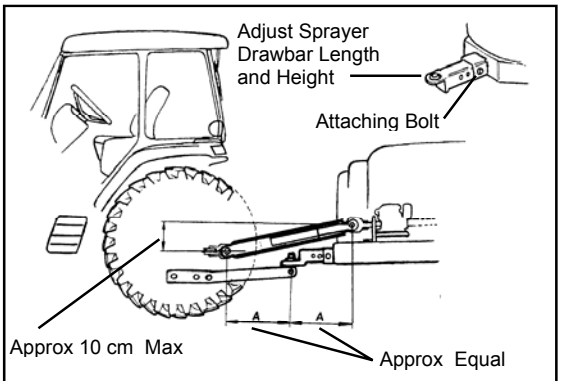
Adjust the height of the tractor drawbar and/or sprayer hitch to level the sprayer. The sprayer drawbar can be installed with the hitch ball in either the high or low position. To alter the sprayer hitch ball height, remove the drawbar attaching bolt and slide the drawbar out. Rotate the drawbar through 180^0 and reinstall it in the alternate position. Ensure the drawbar attaching bolt is securely retightened.

Attach the sprayer hitch to the tractor drawbar using the tractor hitch pin.

Clean and grease the splines on the tractor and sprayer PTO stub shafts and install the PTO shaft making sure that the spring loaded locking pins engage in the grooves of both stub shafts. Ensure that the tractor's PTO shaft guard is attached to the tractor.

PTO Shaft Length

Note: Upon delivery of a new sprayer it is the selling dealer's responsibility to install and set the PTO shaft to the correct length. The following information is provided for reference.

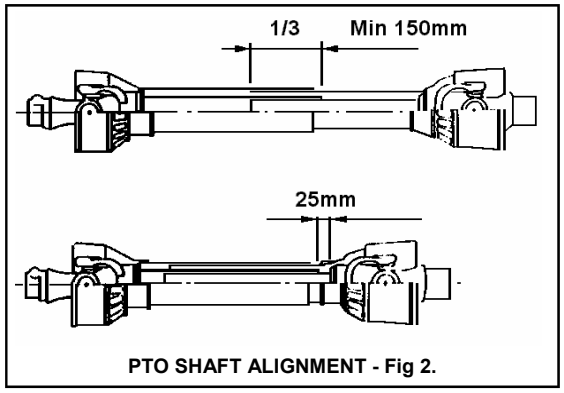


PTO SHAFT ALIGNMENT - Fig 1.

The hitch point between the tractor and sprayer should be approximately midway between the universal joints of the PTO shaft and the height difference between the joints should not be greater than about 10 cm, refer Fig 1. This will ensure the joint angles are approximately equal during turns and do not exceed the allowable limit.

The length of the sprayer drawbar can be adjusted by removing its attaching bolt and sliding the drawbar in or out to one of the three positions where the bolt holes align. Reinstall the drawbar bolt and tighten securely.

The length of the tractor drawbar may also need to be adjusted.



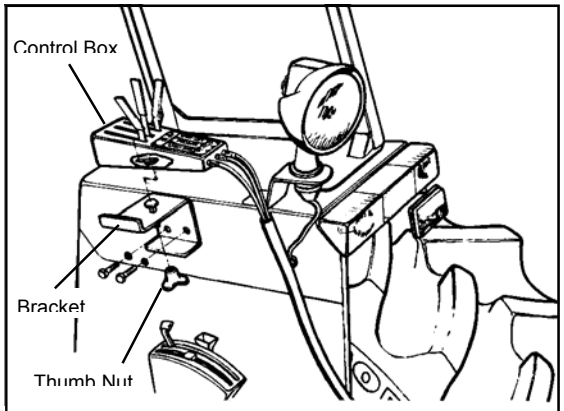
PTO SHAFT ALIGNMENT - Fig 2.

The telescoping tubes must overlap by at least 1/3 their length, but not less than 150mm, in all possible operating positions and there must be at least 25mm telescopic movement remaining at the minimum operating length, refer Fig 2.
If the PTO shaft must be shortened cut equal amounts from both male and female shafts and safety covers. Carefully remove all burrs then clean and relubricate before reassembling.
If after adjusting the sprayer and tractor drawbar, the joint angles exceed 35^0 during turns it may be necessary to fit a PTO shaft with constant velocity joints (see your Silvan dealer).

Installing the Cabin Controls

1. Cable Controls (if applicable)

The cable control unit is supplied with a quick release mounting bracket so that it can be easily installed or removed from the tractor when the sprayer is coupled or uncoupled. The control slides over the head of the attaching bolt on the bracket and is secured with a thumb nut while the cables remain permanently connected to the sprayer.



CABLE CONTROL CABIN INSTALLATION

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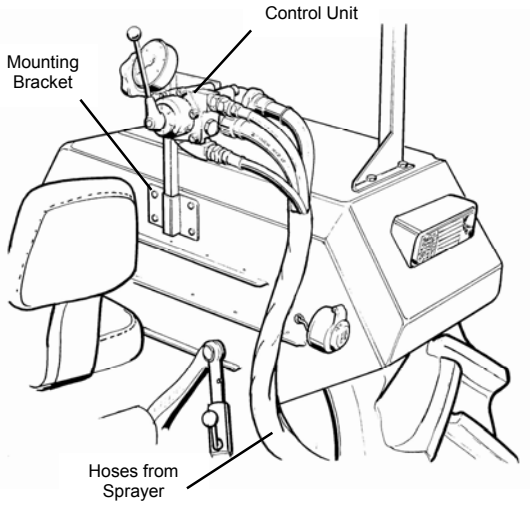
Installation

Using the mounting bracket as a template, drill two 11mm holes and install the mounting bracket in a convenient location on the tractor with two 10mm bolts, nuts and washers. Ensure that the control levers will be clearly visible and within easy reach of the driver.

Loosen the black thumb nut and slide the Control Box over the square head of the quick attach bolt. Ensure that the cables are clear of the PTO shaft and tractor wheels, particularly when turning.

2. Single Lever Control Unit (if applicable)
The Pentomatic control unit is supplied with a quick release mounting bracket so that it can be quickly installed or removed from the tractor when the sprayer is coupled or uncoupled. The control plugs into the bracket and the hoses remain permanently connected to the sprayer.
Select a location for the bracket on the mudguard of the tractor that will provide convenient access to the control lever and visibility of the pressure gauge. Drill four holes in the mudguard using the bracket as a template and attach the bracket with the four bolts provided.

Install the control in the bracket and ensure that the hoses are clear of the PTO and tractor wheels. Check the clearance when turning and support the hoses if necessary.

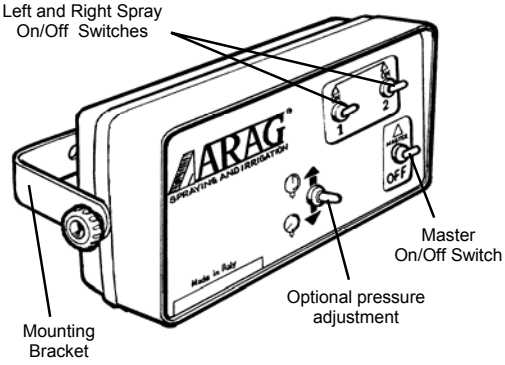


SINGLE LEVER CONTROL INSTALLATION

3. Electric Controls (if applicable)
Install the electric control box in the cabin of the tractor using the bracket and hardware provided. Ensure that it is clearly visible and within easy reach of the driver. Use the bracket as a template to drill the required holes. All switches should be in the "off" position whilst installing.

Connect the electrical cable provided directly to the battery. Positive = Red Negative = Black
If the cable needs to be extended it is important to use wire of the same diameter.

Run the control box wiring loom back to the sprayer through a convenient outlet in the tractor cabin ensuring that it does not rub on any sharp edges. Connect the control loom to the sprayer loom at the quick release coupling and ensure that all wiring is clear of the PTO shaft and tractor wheels.



ELECTRIC CABIN CONTROL BOX

Adjusting the Fan

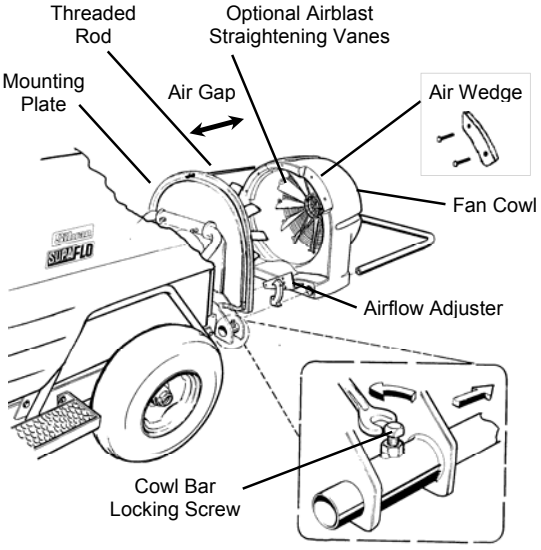
The Supaflo fan can be adjusted to regulate the air flow to suit particular applications. The range of adjustments differ on the 900mm and 1000mm fans as described below.

900mm Fan adjustments

1. Air Gap The volume and velocity of the airflow can be regulated by adjusting the gap between the fan cowl and the mounting plate for the spray nozzles. Moving the cowl inward reduces the gap and increases the air velocity which is best suited to vines and similar close plantings. Moving the cowl outward reduces the air velocity but increases the volume which is more suited to tree crops such as citrus fruits.

The fan cowl slides on two bars at its base and the air gap is regulated by a threaded rod and adjusting nuts at the top.

Installation



ADJUSTMENTS FOR 900mm FAN

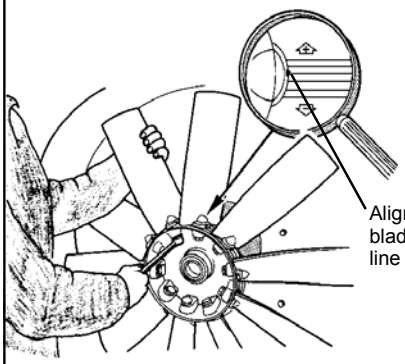
To adjust the gap, loosen the two grub screws on the underside of the cowl which clamp onto the slide bar at each side using a 5mm allen key. Loosen the nuts on the top threaded rod and move the cowl to the desired position. The minimum gap is 100mm and the maximum is 140mm. After adjusting, securely tighten the upper nuts and the lower locking screws.

2. Air Wedges Two air wedges are located on the forward face of the fan cowling at the 10 o'clock and 2 o'clock positions. Removing the wedges increases the air flow to the upper area of the tree canopy in crops such as apples and citrus fruits. To remove the wedges, first remove the two 6mm attaching bolts on each wedge.

3. Airflow Adjusters An airflow adjuster is located at the base of the fan on either side to influence the direction of airflow. When angled upwards the adjusters direct the airflow upwards to suit free growing trees and taller crops. In the horizontal position the adjusters direct the air more laterally for spraying vines and small to medium height crops.

The adjusters are positioned by removing the outer attaching bolt, pivoting them to the required location and reinstalling the outer bolt.

4. Blade Pitch The pitch angle of the fan blades can be adjusted to match the power output of the tractor if required. The larger the pitch angle the greater the volume of air that will be displaced and the higher the tractor power that will be required.



ADJUSTING PITCH OF 900mm FAN BLADES

Normally when there is sufficient tractor power the fan should be operated at full pitch and if a lower volume of air is required the fan gearbox should be set in the low speed position.

If power is limited, then the blade pitch should be set so that the power absorbed by the fan in the high speed setting will leave sufficient tractor power to tow the sprayer over the particular terrain at the required spraying speed with a full tank and the pump running at spraying pressure.

WARNING Before adjusting the fan pitch ensure that the tractor engine is switched off, the PTO is disengaged and the fan gearbox is in neutral.

Unscrew the self tapping screws and remove the fan mesh guard. If the sprayer is fitted with the optional airblast straightening vanes, unbolt the vane assembly. Then prise the plastic hub cover from the centre of the fan.

Loosen the nut on each fan blade and turn the blade so that its location mark lines up with one of the annular lines on the hub, as shown in the diagram above. Each line adjusts the fan power consumption by approximately 3.75 kW when operating in the high speed setting, as shown in the chart below. Ensure that all blades are set to the same annular line. The pitch should not be adjusted past the fifth annular line as settings beyond this point will not increase the air flow.

Annular Mark		Approx. Power (kW)
Minimum Power	1	15
	2	18.75
	3	22.5
	4	26.25
Maximum Power	5	30

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Installation

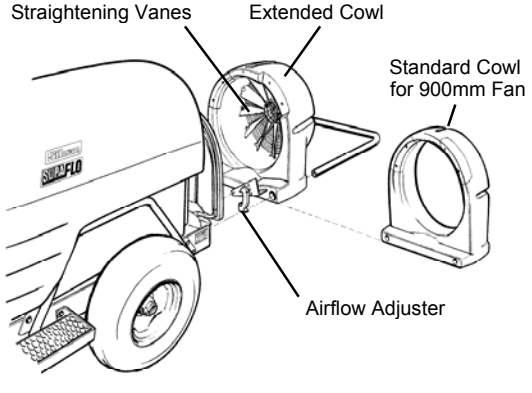
Retighten the nuts on the fan blades to a torque of 125 Nm. Ensure that the washers are not removed from their respective blades as these are used to adjust the balance of the fan. If the blades or washers are removed or replaced the fan should be rebalanced by your Silvan dealer.
Refit the hub cap, air straightening vanes (if fitted) and safety mesh after adjusting the fan blades. Do not overtighten the self tapping screws as this may strip the thread in the plastic.

1000mm Fan Adjustments

The only adjustment that can be made to the 1000mm fan is to vary the angle of the Airflow Adjusters as described previously for the 900mm fan.

Airblast Straightening Vanes

These are stationary vanes which are installed at the rear of the fan cowling to improve the alignment and uniformity of the airblast. They impart a clockwise rotation to the incoming air to counteract the directional bias in the airblast which results from the anti-clockwise rotation of the fan. With the vanes installed the airblast is more symmetrically distributed about the centreline of the sprayer which provides more uniform crop coverage for critical spraying conditions.
The straightening vanes are standard with the 1000mm fan.
They can be supplied as an option for the 900mm fan and when fitted a longer cowling is also supplied to provide space for the the stationary vanes. The previously described fan adjustments are still applicable when the airblast straightening vanes are fitted.



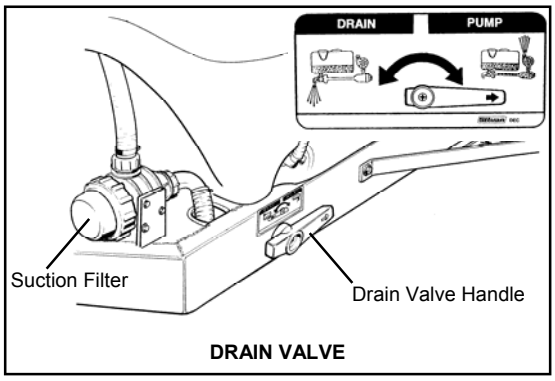
AIRBLAST STRAIGHTENING VANES

Operation

Starting the Sprayer

Before starting the sprayer for the first time grease all lubrication points including the PTO shafts. Check that the oil level in the diaphragm pump is level with the mark in the viewer and if necessary top up with SAE 20W-50 multigrade engine oil. Ensure that the gearbox oil level is correct. Refer Maintenance section for details.
First conduct a trial using clean water only (no chemicals) to familiarise with the controls and to check that all systems are functioning correctly without leakage.

Before filling the tank check that the drain valve located in front of the LH step is in the "Pump"' position, ie. red handle facing rearward. Fill the tank through the rear top opening after checking that the basket strainer is in place and clean. Close and rotate the lid to secure it after filling.



DRAIN VALVE

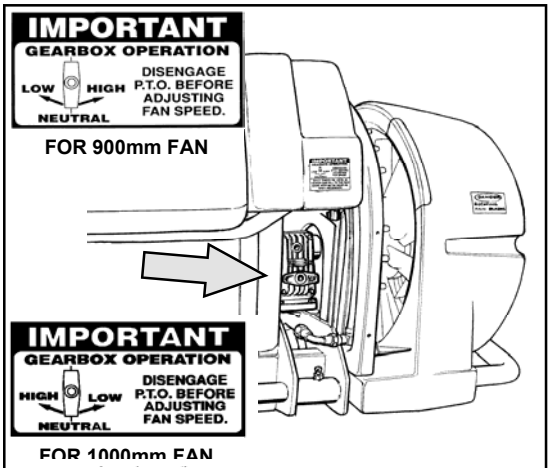
Check that the fan gearbox is engaged and the required speed is selected. Never engage the fan drive with the tractor engine running or the PTO engaged.

The gearbox speed selector is located at the LH rear side of the sprayer as shown in the diagram. Different gearboxes are used for the 900mm and 1000mm fans and they have the High and Low speed positions in opposite directions. Refer to the instruction decal fitted adjacent to the selector to identify the fan speed positions for your sprayer.

Moving the gearbox lever to the high position produces maximum airflow. The low position produces less airflow and can be used to protect the crop canopy from damage. The neutral position enables the pump to be operated without the fan for hand spraying or similar operations.
The fan incorporates a centrifugal clutch which protects the gearbox and driveline if the PTO is engaged rapidly. The sprayer should always be operated at 540 PTO rpm to ensure correct operation of the centrifugal clutch and to prevent its premature wear.

Flip the required number of spray nozzles to the open position, as shown in the diagram on page 16. Refer to the Calibration section of this manual for information on nozzles and jet selection.
Before engaging the PTO, set the controls to place the pump into by-pass mode and close the outlet valves to the spray nozzles on either side of the sprayer. Refer to the next section for information about operating the various types of controls.

Engage the PTO slowly and allow the sprayer to run in by-pass mode. Once the pump is primed increase the tractor speed to 540 PTO rpm.
Set the controls so that the pump is running in pressure mode then adjust the pressure to that required for spraying with the regulator knob whilst observing the gauge. On all control systems rotating the knob in a clockwise direction increases pressure and rotating it anti-clockwise decreases pressure.
The pump is designed to operate up to 50 Bar (725 psi). The pressure used for spraying may be varied between 10 Bar (145 psi) and the pump's maximum pressure depending upon the application rate - refer to the Calibration section.
When familiar with the operation of the controls conduct a trial spraying run using water to verify that the sprayer is functioning correctly and is set up for your application. In particular, observe the airflow direction, measure the nozzle output rate and check that the system is free from any leaks. Chemicals can now be added to the tank.



GEARBOX ENGAGEMENT LEVER

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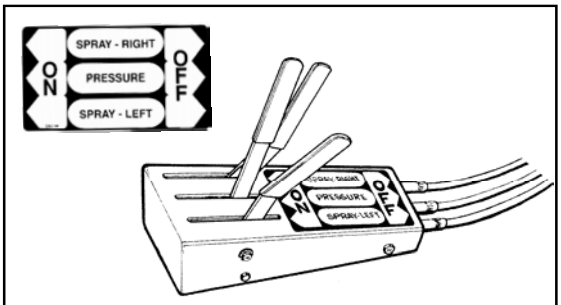
Operation

Operation of Controls

1. Cable Control System

The central lever changes the pump between by-pass and spraying mode and the outer levers operate the valves which direct pressurised fluid to the left and right sections of the spraybar.

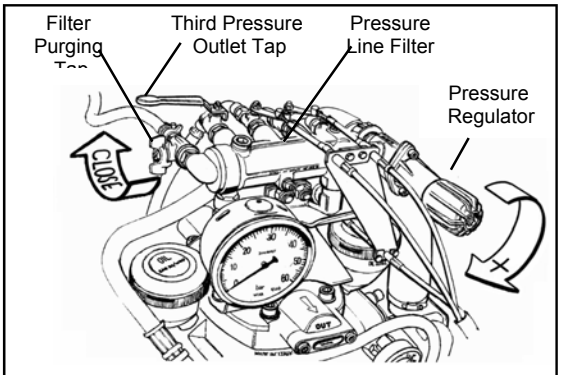
Moving the central lever to “Off” places the pump into by-pass mode and its output is recirculated to the tank. Moving the lever to “On” places the pump into pressure mode and its output is directed to the spraybar.



CABIN CONTROLS FOR CABLE SYSTEM

Spraying pressure is adjusted manually with the rotary control knob on the valve bank. Rotating the knob clockwise increases pressure and rotating it anti-clockwise decreases pressure.

Moving either, or both, the outer levers to “On” starts spraying. Moving one lever directs pressurised liquid to either the left or right side. Moving both directs liquid to both sides. Once the outer levers have been positioned, spraying can be stopped and started with the central lever.



CABLE SYSTEM PRESSURE CONTROL VALVE

To shut the sprayer down move the central lever to “Off”, reduce engine speed and disengage the tractor PTO.

The control valve is fitted with an integral filter on the pressure output side. The filter can be cleaned by opening the red tap at the end of the filter body to flush any foreign material back to tank. Ensure the tap is closed when spraying.

The third outlet on the control valve can be used to connect a spray gun or other device. It is operated by the hand lever and is open when the lever is in line with the direction of flow and closed when the lever is across the flow.

2. Single Lever Control Unit

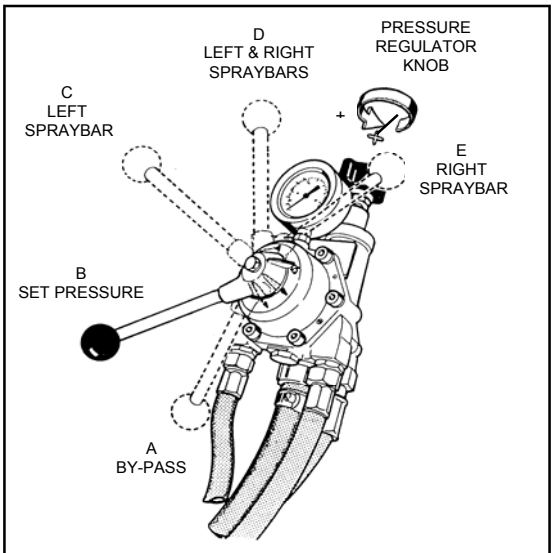
The Pentomatic unit provides convenient single lever control of spraying operations by moving the lever to one of its five positions. The lever can be rotated through 360^0 in either direction.

Position A opens the by-pass and directs all fluid flow to the tank.

Position B is selected when setting the spraying pressure. Turning the pressure regulator knob clockwise increases pressure and turning it anti-clockwise reduces pressure.

Positions C, D or E direct fluid to the left spraybar, both bars or the right spraybar, respectively.

Always move the lever to the by-pass position before engaging the PTO. Once the PTO is running and the pump is primed, pressure can be adjusted by moving the lever to the pressure position and turning the regulator knob.



PENTOMATIC SINGLE LEVER CONTROL UNIT

Operation

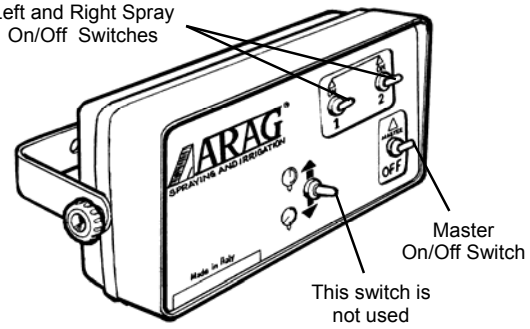
Spraying is started by moving the lever to the required spraybar position to direct pressurised fluid to the left, right or both sides of the sprayer.

To stop spraying return the lever to the by-pass position before disengaging the PTO.

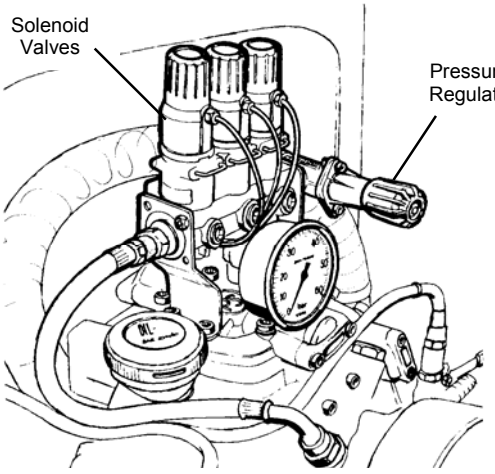
3. Electric Controls
The system consists of a bank of three electric valves which are operated by the switches of the cabin control.

The Master switch activates the valve which changes the pump between by-pass and pressure or spraying mode. The pump is in pressure mode when the Master switch is moved up to “Master” and in by-pass mode when the switch is moved down to “Off”.

The upper pair of switches, marked 1 and 2, activate the valves which stop and start spraying on the left and right sides of the sprayer, respectively. Spraying occurs when the switches are up or in the “On” position.



ELECTRIC CABIN CONTROL BOX



ELECTRIC CONTROL VALVES

Spraying pressure is adjusted manually with the rotary control knob on the valve bank in the same way as the cable control system.
Once the left and right spraybar switches have been positioned, spraying can be stopped and started using the Master switch.
To shut the sprayer down move the Master switch to “Off”, reduce engine speed and disengage the tractor PTO drive.

Adding Chemicals
The inductor system enables either powdered or liquid chemicals to be safely and conveniently added to the sprayer in concentrated form and mixed within the tank.

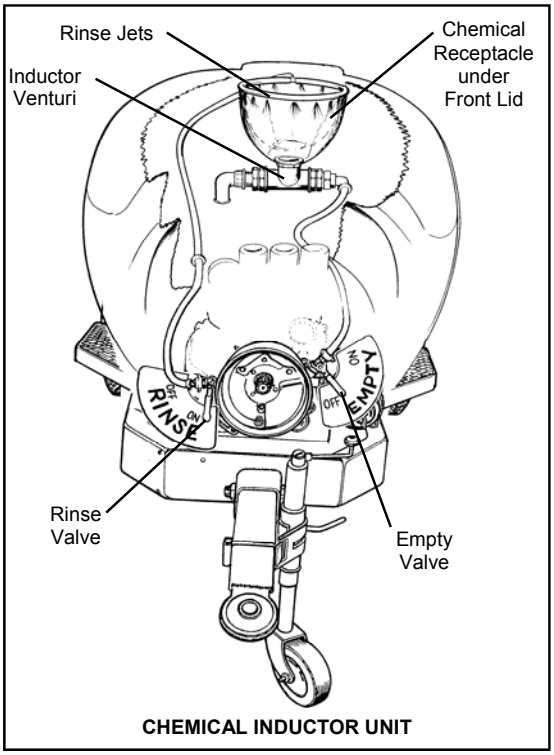
WARNING

Before adding chemicals to the sprayer read and follow the chemical manufacturer’s instructions and wear the recommended protective clothing.

The chemical receptacle is located under the front lid of the tank and has a maximum capacity of 30 litres.

The inductor valves are located at the front of the sprayer on either side of the pump as shown in the diagram below.

The “Empty” valve directs pressurised liquid to



CHEMICAL INDUCTOR UNIT

Silvan

Operation

the venturi beneath the receptacle which creates suction to empty the chemicals into the tank.

The “Rinse” valve directs pressurised water to the top of the receptacle to wash any chemical residue into the tank after filling.

Refer to the chemical manufacturer’s instructions to determine the quantity of chemical that needs to be added to the tank to achieve the correct strength of solution.

Fill the sprayer with about 500 litres of water through the rear tank opening and engage the PTO with the tractor running slowly until the pump is primed, then increase to 540 PTO rpm.

Set the sprayer control so that the pump is in by-pass mode then open the inductor “Empty” valve to commence the venturi action. Open the front lid of the tank, pour the chemicals into the receptacle and allow the suction to empty them into the tank. It is preferable, but not essential, to close the lid whilst the chemicals are emptying into the tank.

When the receptacle is empty, open the “Rinse” valve to wash any residue into the tank.

After adding the chemicals close both inductor valves and the lid over the chemical receptacle.
Complete filling the tank with water through the rear opening whilst still running the sprayer so that the by-pass flow and the mechanical agitator will thoroughly mix the solution.
Note: This is the only operation permitted with the sprayer running while the operator is off the tractor.

Emptying the Sprayer

At the end of each day partly fill the tank with water and run this through the pump, spray lines and nozzles to purge them of chemicals.

Rinse the tank through the rear lid and empty with the drain valve to remove powdered material. Never leave chemicals in the tank which could settle to the bottom and break into lumps that may block the suction filter.

Dispose of unused chemical mix, rinse water and empty containers as recommended by the chemical manufacturer or government authority.

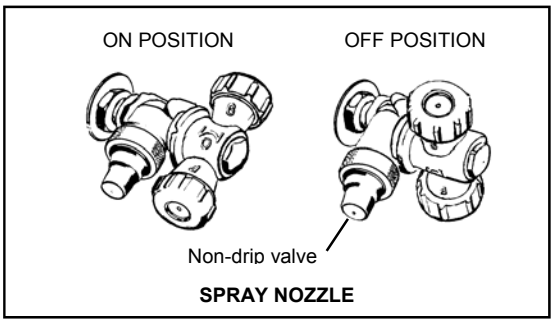
Clean Water Tank

The 40 litre clean water tank fitted at the rear of the main tank can be filled through its top opening. A discharge tap is fitted to the either side of the tank for convenient access.
This tank is intended to provide water for personal washing purposes only.
Under no circumstances should water in the fresh water tank ever be used for drinking.

Spray Nozzles

The spray nozzles have an outlet at each end but only the jet which is flipped to the outward facing position is “on”. This facilitates easy changing between jets of different sizes, for example, when requiring application rates to suit concentrate and dilute spraying.

Individual nozzles can be turned off when not needed by flipping the nozzle 90 degrees so that neither of its jets is facing outwards.



SPRAY NOZZLE

Nozzle direction can be adjusted +/- 15 °. By loosening the attaching nut and angling the nozzle, greater adjustments can be made.

The nozzles include a non-drip valve which closes when the pressure drops below 1 Bar.

The above features enable the spray pattern to be regulated to achieve the required coverage and minimise the wastage of chemicals.

The nozzles incorporate ceramic jets, stainless steel swirl plates and stainless steel mesh strainers, separated by neoprene gaskets. The nozzle’s output at a particular pressure can be varied by fitting different combinations of jet and swirl plate, refer to the Single Nozzle Output Chart on page 20.

Ceramic jets are sized according to the diameter of the central hole in millimetres.

The purpose of the swirl plate is to create a conical spray pattern. They either have a closed centre, identified as CC, or a central hole which is sized in millimetres.

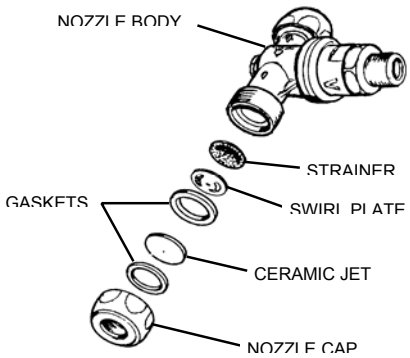
Closed centre swirl plates are fitted for low spraying outputs. At higher outputs, swirl plates with a central hole are needed to fill the centre of the conical spray pattern and when fitted they

should be one size smaller than the ceramic jet.

Operation

Ceramic jets and swirl plates normally have a long wear life and require little maintenance other than regular checking and cleaning of strainers.

The spray pattern should be observed periodically against a dark background to detect signs of wear which will be indicated by a streaky or broken pattern. If worn jets are detected then the full set of jets, swirl plates and gaskets should be replaced.



NOZZLE COMPONENTS

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Calibration

Nozzle Selection and Calibration Checking
Chemical application rates and hence nozzle selections will vary greatly depending on the crop type, stage of crop development and the regional area. Information on application rates should be available from your chemical supplier.

Nozzle selection can be made by following the four simple steps shown below. The final step, checking the calibration after nozzle selection, is essential for spraying efficiency as it ensures that a known amount of spray is applied per hectare.

STEP 1 ***Operating Factors***
First establish the following factors.
a) **Application rate (l/ha)** in litres per hectare.

b) **Travel speed (km/hr)** The speed indicated by your tractor can be checked by timing the sprayer over a measured distance. The timing should be done in seconds over 100 metres with the PTO engaged and water in the tank to simulate real spraying conditions. In hilly terrain the sprayer should be timed driving up and down the hill and the two times averaged. The speed can be calculated according to the following formula.

$$\text{Speed (km/hr)} = \frac{360}{\text{Time in seconds for 100 m}}$$

c) **Row width (m)** The distance between rows measured in metres. For single sided spraying use half the row width.

d) **Spray pressure (Bar)** A pressure of between 20 and 30 Bar is usually selected. Lower spray pressures will produce larger droplets which are generally less effective than the smaller droplets produced at higher pressures.

STEP 2 ***Total Output Required***
Calculate the total spray output required in litres per minute using the formula shown below, or the Spraying Output Chart on the following page.

$$\text{Total output (l/min)} = \frac{\text{Application rate (l/ha)} \times \text{Speed (km/hr)} \times \text{Row width (m)}}{600}$$

Check that the calculated output does not exceed the rated capacity of the pump, refer to the footnotes on the Standard Jet Set Charts. If it does, reduce the travel speed or application rate.

STEP 3 ***Nozzle Selection***

a) For many applications a nozzle set selected from the Standard Jet Set Chart will be suitable, refer page 22 for sprayers with a 900mm fan and page 23 for 1000mm fan. Single sided spraying will produce half the volume shown on the chart.

Several jet sets may give the required output but provide different spray patterns, ie. a uniform pattern or one with more volume in the upper portion. The charts show the proportion of output discharged from each nozzle in a standard set.

b) For special applications the jet and swirl plate combination for each individual nozzle can be selected by calculating the requirements for one side of the sprayer, as follows, then copying the pattern on the other side.

Decide on the number of nozzles to be used on one side and the percentage of spray required from each nozzle (the total should be 100%).

Calculate the individual nozzle flow rates by halving the total output from Step 2, to obtain the output for one side, then multiply this by the percentage output required from each nozzle.

$$\text{Output per side (l/min)} = \frac{\text{Total output (l/min)}}{2}$$

$$\text{Nozzle output (l/min)} = \frac{\text{Nozzle percentage (\%)} \times \text{Output per side (l/min)}}{100}$$

Use the Single Nozzle Output Chart on page 20 to select the jet and swirl plate combination which is the closest match to the required nozzle output at the chosen pressure.

Add up the flow rates of the individual jets to check whether the total output per side matches the required value. Small variations can be corrected by increasing pressure to increase the output or reducing pressure to reduce output.

STEP 4 ***Calibration Checking***
After installing the selected jets, test the sprayer with water to confirm the application rate.

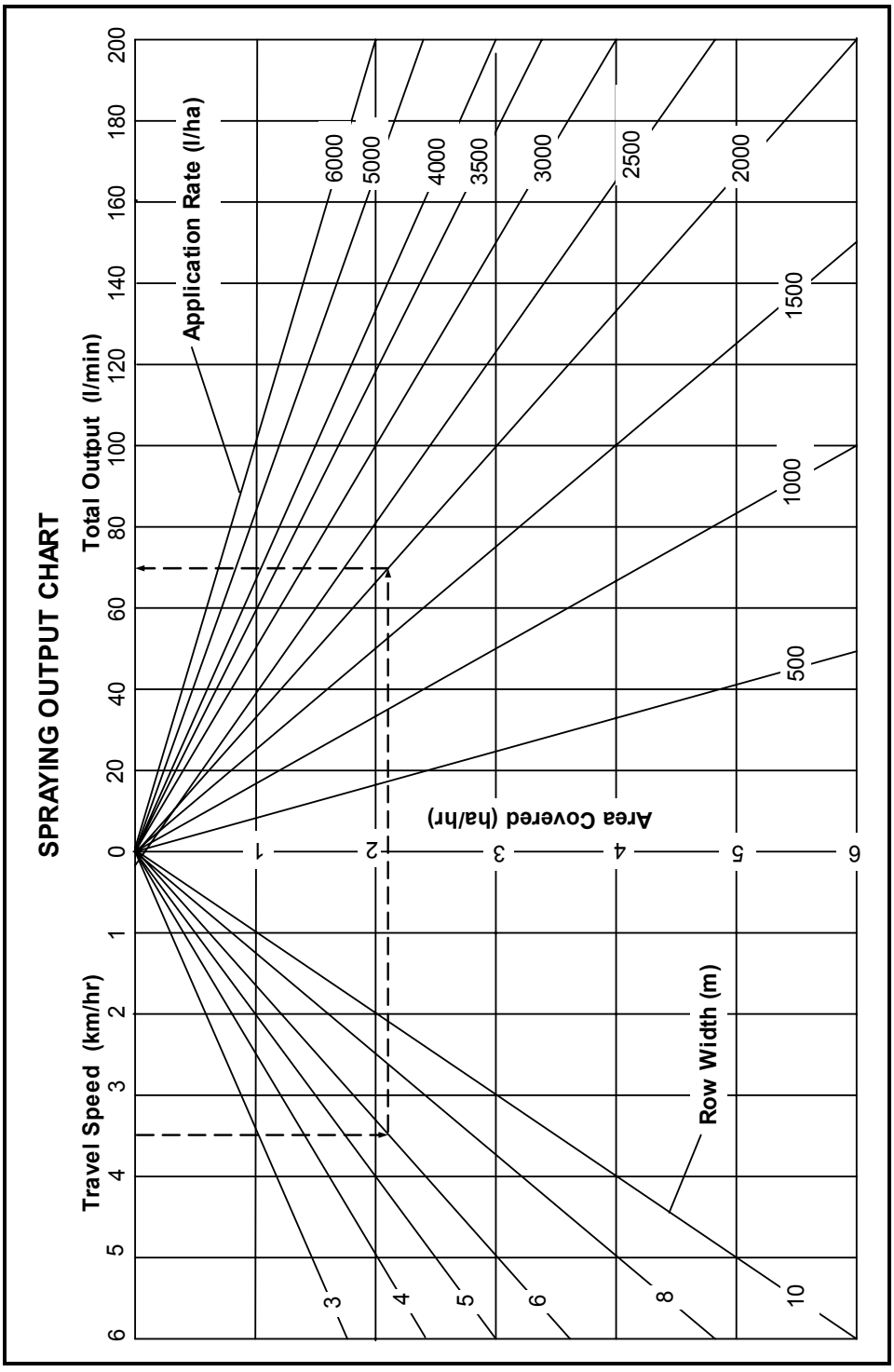
Fill the tank to the brim or a specific mark then run the sprayer for a measured time at operating pressure and with nozzles spraying. A run time of 2 minutes should be sufficient.

Measure the volume of water, in litres, required to refill the sprayer to the brim or the specific mark chosen then divide this volume by the time of the test run, in minutes.

$$\text{Output (l/min)} = \frac{\text{Volume to refill (litres)}}{\text{Time (min)}}$$

Verify that the measured output matches the value calculated at Step 2. For small variations increase the spraying pressure to increase the output or reduce the pressure to reduce output.

Calibration



To use the chart draw a vertical line down from the Travel Speed axis, at the speed you will be using for spraying, until it intersects the diagonal line for the Row Width of your crop. From this point draw a horizontal line to intersect the diagonal line for the Application Rate that you have chosen, then draw a vertical line up to the Total Output axis to show the total litres/min you will need to use.
The dotted arrows on the chart show an example using 3.5 km/hr Travel Speed with a Row Width of 6m and 2,000 l/ha Application Rate. The point at which the final vertical line intersects the Total Output axis shows that the required total output rate is 70 l/min.

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Calibration

Single Nozzle Output Chart

The chart below is used to select the Jet and Swirl Plate combination to use in each individual nozzle when an application rate or distribution pattern is required that cannot be achieved with one of the Standard Jet Sets. For the method of using the chart refer to the procedure in Step 3b) on page 18 and the Nozzle Selection Example below.

SINGLE NOZZLE OUTPUT CHART

JET SIZE	SWIRL PLATE	OUTPUT - IN LITRES PER MINUTE						
		10 Bar	**15 Bar**	**20 Bar**	**25 Bar**	**30 Bar**	**40 Bar**	**50 Bar**
0.8	CC	0.9	1.0	1.2	1.3	1.4	1.6	1.9
1.0	CC	1.3	1.5	1.7	1.9	2.1	2.4	2.7
1.2	CC	1.7	2.0	2.3	2.6	2.8	3.2	3.5
1.5	CC	2.3	2.7	3.1	3.3	3.6	4.0	4.3
1.8	CC	2.7	3.2	3.6	4.1	4.5	5.0	5.5
2.0	CC	3.4	3.8	4.3	4.7	5.1	5.7	6.3
2.2	CC	3.8	4.1	4.6	5.1	5.6	6.6	7.4
2.5	CC	3.9	4.7	5.4	6.0	6.6	7.7	8.5
1.0	1.0	1.6	1.9	2.2	2.4	2.6	3.0	3.4
1.2	1.0	2.5	3.0	3.4	3.8	4.1	4.7	5.4
1.5	1.2	3.6	4.2	4.8	5.3	5.8	6.9	7.7
1.8	1.5	5.0	5.9	6.7	7.4	8.0	9.5	10.6
2.0	1.8	6.2	7.8	8.7	9.6	10.4	11.8	13.2
2.2	2.0	7.4	8.7	9.9	11.2	12.5	14.3	16.4
2.5	2.2	8.8	10.5	12.1	13.5	14.7	16.2	17.5

Nozzle Selection Example

STEP 1 **Nominate the Operating Factors**

a) Required application rate = 2500 l/ha
b) Chosen speed = 5 km/hr
c) Row width = 6.1 m
d) Spray pressure = 25 Bar

STEP 2 **Calculate the Required Total Output**

Total spray output needed (l/min) =

$$\frac{\text{Application Rate (l/ha) x Speed (km/h) x Row width(m)}}{600}$$

$$= \frac{2500 \times 5 \times 6.1}{600} = 127 \text{ l/min}$$

STEP 3 **Select the Jet Set**

a) Standard Jet Sets from the Charts

For a standard type of operation the Standard Jet Set Chart (for the sprayer's fan size) can be used to select a jet set giving the closest match to the calculated total output at the required pressure.

Several jet sets may give the required output but provide different spray patterns, ie. a uniform pattern or one with more volume in the upper portion. The charts show the proportion of output discharged from each nozzle in a standard set.

900mm Fan - refer chart on page 22

The chart shows that 127 l/min can be achieved using Standard Jet Set M1 at a pressure between 20 and 22 Bar.

1000mm Fan - refer chart on page 23

i) Without the Two Sided Conveyor fitted the chart on page shows that 127 l/min can be achieved by using Standard Jet Set M1P at a pressure slightly over 24 Bar.

ii) With the Two Sided Conveyor fitted and the upper 4 jets in the fan cowl closed, the right hand section of the chart shows that 127 l/min can be achieved by using Standard Jet Set C3 at a pressure slightly over 22 Bar.

b) Non-Standard Jet Sets

For a non standard application, decide on the number of nozzles to be used and the proportion of spray required from each, as a percentage of the total output from one side of the sprayer.

List these in Nozzle Selection Calculation table similar to those shown opposite, or use one of the blank tables provided on page 26. Halve the Total Output from Step 2 to determine the output from one side of the sprayer.

Calibration

Output per side (l/min) = $\frac{\text{Total output (l/min)}}{2}$

= $\frac{127}{2}$ = 63.5 l/min say 64 l/min for convenience

Calculate the output required from each nozzle as shown on the following calculation tables. For this example separate tables for sprayers with either a 900mm Fan, a 1000mm Fan, or a 1000mm Fan and Two Sided Conveyor are shown.

Using the Single Nozzle Output Chart from the previous page select the closest matching jet and swirl plate combination for each nozzle and list it in the calculation table.

Total the outputs from the individual nozzles and check whether it matches the required output from one side of the sprayer. Small variations may be corrected by operating at a slightly higher pressure to increase output or a slightly lower pressure to reduce output.

NOZZLE SELECTION CALCULATION
900mm Fan

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at 25 Bar
1	10	64 x 10/100 = 6·4	2·5/CC	6·0
2	10	64 x 10/100 = 6·4	2·5/CC	6·0
3	20	64 x 20/100 = 12·8	2·5/2·2	13·5
4	20	64 x 20/100 = 12·8	2·5/2·2	13·5
5	15	64 x 15/100 = 9·6	2·0/1·8	9·6
6	10	64 x 10/100 = 6·4	2·5/CC	6·0
7	10	64 x 10/100 = 6·4	2·5/CC	6·0
8	5	64 x 5/100 = 3·2	1·5/CC	3·3
Total	100	**Total Output per Side (l/min)**		**63·9**

NOZZLE SELECTION CALCULATION
1000mm Fan

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at 25 Bar
1	5	64 x 5/100 = 3·2	1·5/CC	3·3
2	10	64 x 10/100 = 6·4	2·5/CC	6·0
3	20	64 x 20/100 = 12·8	2·5/2·2	13·5
4	20	64 x 20/100 = 12·8	2·5/2·2	13·5
5	15	64 x 15/100 = 9·6	2·0/1·8	9·6
6	10	64 x 10/100 = 6·4	2·5/CC	6·0
7	10	64 x 10/100 = 6·4	2·5/CC	6·0
8	5	64 x 5/100 = 3·2	1·5/CC	3·3
9	5	64 x 5/100 = 3·2	1·5/CC	3·3
Total	100	**Total Output per Side (l/min)**		**64·5**

NOZZLE SELECTION CALCULATION
1000mm Fan with Two Sided Conveyor

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at 25 Bar
Con 1	5	64 x 5/100 = 3·2	1·5/CC	3·3
Con 2	5	64 x 5/100 = 3·2	1·5/CC	3·3
Con 3	10	64 x 10/100 = 6·4	2·5/CC	6·0
Con 4	10	64 x 10/100 = 6·4	2·5/CC	6·0
Con 5	10	64 x 10/100 = 6·4	2·5/CC	6·0
Con 6	10	64 x 10/100 = 6·4	2·5/CC	6·0
Con 7	10	64 x 10/100 = 6·4	2·5/CC	6·0
1	Closed			
2	Closed			
3	Closed			
4	Closed			
5	10	64 x 10/100 = 6·4	2·5/CC	6·0
6	10	64 x 10/100 = 6·4	2·5/CC	6·0
7	10	64 x 10/100 = 6·4	2·5/CC	6·0
8	5	64 x 5/100 = 3·2	1·5/CC	3·3
9	5	64 x 5/100 = 3·2	1·5/CC	3·3
Total	100	**Total Output per Side (l/min)**		**61·2**

STEP 4 **Verify the Selection**
Install the selected jets and swirl plates on either side of the sprayer in the positions listed in the calculation table.

Conduct a test with water to verify the actual output as described on page 18. Small variations from the required output may be corrected by adjusting the pressure.

In the preceding examples the jet/swirl plate combinations chosen for the 900mm Fan and 1000mm Fan give total outputs of 63.9 l/min and 64.5 l/min, respectively, which is very close to the required 64 l/min so only very little pressure adjustment may be needed.

In the example for the 1000mm Fan with Two Sided Conveyor the jet/swirl plate combinations chosen only produce 61.2 l/min total output at 25 Bar so the pressure will need to be increased to achieve the required 64 l/min. After adjusting the pressure conduct a further trial with water to verify the result.

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Calibration

Using the Standard Jet Set Charts

The chart below is for the 900mm fan and the chart on the next page is for the 1000mm fan. They are used to select a full set of jets and swirl plates which will give the required Total Output previously calculated in Step 2 on page 18 or by using the Spraying Output Chart on page 19.

In the bottom section of the charts locate the required total output (or nearest equivalent) at the selected pressure. The same column in the upper section of the chart shows the jet and swirl plate sizes to be fitted at each nozzle position. Adjust the pressure if necessary to achieve the exact output. For single sided spraying halve the output. Outputs in the shaded area may exceed the capacity of the pump and if so cannot be used, refer to the footnotes on the charts.

Several jet sets may give the required output at a pressure near to that chosen. However, the spray patterns from these sets may vary. The mid section of the chart identifies the pattern by showing the output percentage from each nozzle.

STANDARD JET SET CHART (900mm FAN)

JET POSITION Top Down	JET SET NUMBER and JET/SWIRL PLATE SIZES 2.0/1.8 = 2.0mm Jet over a 1.8mm Swirl Plate CC = Closed Center Swirl Plate												
	M00	**M0**	**M1**	**M1P**	**M2**	**M2P**	**M3**	**M3P**	**M4**	**M5**	**M6**	**M7**	**M8**
1	2.0/1.8	2.0/1.8	1.8/1.5	1.0/1.0	1.5/1.2	1.0/1.0	1.2/1.0	0.8/CC	1.2/CC	1.0/CC	0.8/CC	0.8/CC	CLOSED
2	2.0/1.8	2.0/1.8	2.0/1.8	1.5/1.2	1.8/1.5	1.0/1.0	1.5/1.2	1.0/1.0	1.5/CC	1.0/CC	1.0/CC	0.8/CC	0.8/CC
3	2.5/2.2	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.5/CC	1.0/CC	1.0/CC	0.8/CC	CLOSED
4	2.5/2.2	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.5/CC	1.0/CC	1.0/CC	0.8/CC	0.8/CC
5	2.2/2.0	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.2/CC	1.0/CC	1.0/CC	0.8/CC	0.8/CC
6	2.2/2.0	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	1.2/1.0	1.2/CC	1.0/CC	0.8/CC	0.8/CC	CLOSED
7	2.0/1.8	2.0/1.8	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	1.2/1.0	1.0/1.0	1.2/CC	1.0/CC	0.8/CC	0.8/CC	0.8/CC
8	2.0/1.8	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	1.2/1.0	1.0/1.0	1.0/1.0	1.0/CC	1.0/CC	0.8/CC	0.8/CC	CLOSED
JET POSITION	**PROPORTIONAL OUTPUT FROM EACH NOZZLE** From one side of Sprayer when fitted with above Jet Set at 25 Bar. May vary slightly at other pressures.												
1	10.9%	12.1%	11.2%	4.5%	10.7%	5.8%	10.9%	4.6%	11.7%	12.5%	10.2%	12.5%	0.0%
2	10.9%	12.1%	14.6%	9.7%	14.9%	5.8%	15.1%	8.5%	14.9%	12.5%	14.8%	12.5%	25.0%
3	15.4%	14.1%	14.6%	17.6%	14.9%	17.9%	15.1%	18.8%	14.9%	12.5%	14.8%	12.5%	0.0%
4	15.4%	14.1%	14.6%	17.6%	14.9%	17.9%	15.1%	18.8%	14.9%	12.5%	14.8%	12.5%	25.0%
Upper 4 Jets	**52.6%**	**52.4%**	**55.0%**	**49.4%**	**55.4%**	**47.4%**	**56.2%**	**50.7%**	**56.4%**	**50.0%**	**54.6%**	**50.0%**	**50.0%**
5	12.8%	14.1%	14.6%	17.6%	14.9%	17.9%	15.1%	18.8%	11.7%	12.5%	14.8%	12.5%	25.0%
6	12.8%	12.1%	11.2%	13.6%	10.7%	12.8%	10.9%	13.5%	11.7%	12.5%	10.2%	12.5%	0.0%
7	10.9%	12.1%	11.2%	9.7%	10.7%	12.8%	10.9%	8.5%	11.7%	12.5%	10.2%	12.5%	25.0%
8	10.9%	9.3%	8.0%	9.7%	8.3%	9.1%	6.9%	8.5%	8.5%	12.5%	10.2%	12.5%	0.0%
Low er 4 Jets	**47.4%**	**47.6%**	**45.0%**	**50.6%**	**44.6%**	**52.6%**	**43.8%**	**49.3%**	**43.6%**	**50.0%**	**45.4%**	**50.0%**	**50.0%**
PRESSURE Bar	**TOTAL OUTPUT - LITRES PER MINUTE** From both sides of Sprayer when fitted with above Jet Set on each side. Halve for single sided spraying.												
10	114	104	87	72	67	54	47	38	30	25	17	14	7
12	125	114	95	79	73	59	51	41	33	28	19	15	8
14	135	123	103	85	79	63	56	45	35	30	20	16	8
16	145	132	110	91	84	68	59	48	38	32	22	18	9
18	153	140	116	97	89	72	63	51	40	34	23	19	9
20	162	147	123	102	94	76	66	53	42	36	24	20	10
22	170	154	129	107	99	79	70	56	44	37	25	21	10
24	177	161	134	111	103	83	73	59	46	39	26	22	11
26	184	168	140	116	107	86	76	61	48	41	27	22	11
28	191	174	145	120	111	90	79	63	50	42	29	23	12
30	198	180	150	125	115	93	81	66	52	44	30	24	12
32	205	186	155	129	119	96	84	68	54	45	30	25	12
34	211	192	160	133	123	99	87	70	55	47	31	26	13
36	217	197	165	137	126	102	89	72	57	48	32	26	13
38	223	203	169	140	130	104	92	74	58	49	33	27	14
40	229	208	174	144	133	107	94	76	60	51	34	28	14
42	234	213	178	147	136	110	96	78	61	52	35	29	14
44	240	218	182	151	140	112	99	79	63	53	36	29	15
46	245	223	186	154	143	115	101	81	64	54	37	30	15
48	251	228	190	158	146	117	103	83	66	55	37	30	15
50	256	233	194	161	149	120	105	85	67	57	38	31	16

Total Output exceeds the capacity of the APS-166 pump in the complete shaded area, the IDS-2200 pump in the shaded area to the left of the bold line and the IDS-2600 pump in the shaded area to the left of the double line.

Calibration

Jet Selection with Two Sided Conveyor Fitted (applicable to 1000mm fan only)
With the optional conveyor fitted, spray is discharged through the main spraybars in the fan cowl plus an additional, upper spraybar in each side of the conveyor. These additional conveyor spraybars are each fitted with 7 jets, numbered Con 1 to Con 7 in the chart below.

For most spraying applications with the conveyor fitted, the upper 4 jets of the spraybars in the fan cowl should be closed. The WITH TWO SIDED CONVEYOR section of the chart relates to this configuration.

Depending on crop height, it may be desirable to turn off other nozzles to achieve the best pattern; if so calibrate as in Step 3(b) on page 18. The conveyor may be used for single sided spraying by closing all jets on one side.

STANDARD JET SET CHART (1000mm FAN)

WITHOUT TWO SIDED CONVEYOR								WITH TWO SIDED CONVEYOR			
JET POSITION Top Down	JET SET NUMBER M00	M0	M1	M1P	M2	M2P	M3	JET POSITION Top Down	JET SET NUMBER C1	C2	C3
	Jet/Swirl Plate Sizes								Jet/Swirl Plate Sizes		
								Con 1	1.8/1.5	1.8/1.5	1.5/1.2
								Con 2	1.8/1.5	1.8/1.5	1.5/1.2
								Con 3	2.0/1.8	1.8/1.5	1.5/1.2
								Con 4	2.0/1.8	1.8/1.5	1.5/1.2
								Con 5	2.0/1.8	1.8/1.5	1.8/1.5
								Con 6	2.0/1.8	1.8/1.5	1.8/1.5
								Con 7	2.0/1.8	1.8/1.5	1.8/1.5
1	2.0/1.8	2.0/1.8	1.8/1.5	1.0/1.0	1.5/1.2	1.0/1.0	1.2/1.0	1	Closed	Closed	Closed
2	2.0/1.8	2.0/1.8	2.0/1.8	1.5/1.2	1.8/1.5	1.0/1.0	1.5/1.2	2	Closed	Closed	Closed
3	2.5/2.2	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	3	Closed	Closed	Closed
4	2.5/2.2	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	4	Closed	Closed	Closed
5	2.5/2.2	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	5	1.8/1.5	1.8/1.5	1.5/1.2
6	2.2/2.0	2.2/2.0	2.0/1.8	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	6	1.8/1.5	1.8/1.5	1.5/1.2
7	2.2/2.0	2.0/1.8	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	7	1.8/1.5	1.8/1.5	1.5/1.2
8	2.0/1.8	2.0/1.8	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	1.2/1.0	8	1.8/1.5	1.5/1.2	1.2/1.0
9	2.0/1.8	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0	1.2/1.0	1.0/1.0	9	1.5/1.2	1.5/1.2	1.2/1.0
PROPORTIONAL OUTPUT FROM EACH NOZZLE From one side of Sprayer when fitted with above Jet Set at 25 Bar. May vary slightly at other pressures.											
								Con 1	7.6%	8.7%	7.9%
								Con 2	7.6%	8.7%	7.9%
								Con 3	9.8%	8.7%	7.9%
								Con 4	9.8%	8.7%	7.9%
								Con 5	9.8%	8.7%	11.1%
								Con 6	9.8%	8.7%	11.1%
								Con 7	9.8%	8.7%	11.1%
1	9.5%	10.6%	9.8%	3.7%	9.3%	5.1%	9.4%	1	Closed	Closed	Closed
2	9.5%	10.6%	12.7%	8.3%	13.1%	5.1%	13.2%	2	Closed	Closed	Closed
3	13.3%	12.4%	12.7%	15.0%	13.1%	15.6%	13.2%	3	Closed	Closed	Closed
4	13.3%	12.4%	12.7%	15.0%	13.1%	15.6%	13.2%	4	Closed	Closed	Closed
5	13.3%	12.4%	12.7%	15.0%	13.1%	15.6%	13.2%	5	7.6%	8.7%	7.9%
6	11.1%	12.4%	12.7%	15.0%	13.1%	15.6%	13.2%	6	7.6%	8.7%	7.9%
7	11.1%	10.6%	9.8%	11.5%	9.3%	11.2%	9.4%	7	7.6%	8.7%	7.9%
8	9.5%	10.6%	9.8%	8.3%	9.3%	8.0%	9.4%	8	7.6%	6.3%	5.7%
9	9.5%	8.2%	7.0%	8.3%	6.7%	8.0%	6.0%	9	5.4%	6.3%	5.7%
PRESSURE Bar	**TOTAL OUTPUT - LITRES PER MINUTE** From both sides of Sprayer when fitted with above Jet Set on each side. Halve for single sided spraying.										
10	132	119	99	84	73	64	54		129	114	90
20	182	162	137	116	103	86	73		177	153	121
22	191	170	143	122	107	89	76		185	160	126
24	199	178	149	126	112	93	80		193	166	131
26	207	185	154	131	116	96	83		200	172	136
28	215	192	159	135	120	100	85		206	178	141
30	221	199	164	139	123	102	88		212	183	146
40	249	228	189	161	146	121	103		246	218	175
50	276	258	211	180	163	135	116		275	243	202

Total Output exceeds capacity of APS-166 pump in the shaded area, exceeds the IDS-2200 pump in the shaded area below the single bold line, and exceeds the IDS-2600 pump in the shaded area below the double line.

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Calibration

Nozzle Sets for Typical Spraying Applications

The nozzle sets in the following four examples are suitable for typical applications when spraying grapes, orchard fruits at either low or high spraying volume, or citrus fruits.

1. Grapes - using sprayer fitted with 900mm fan

Application rate	600 l/ha
Travel speed	5 km/hr
Row width	3.0 m
Spraying pressure	25 Bar

$$\text{Total output (l/min)} = \frac{\text{Application rate (l/ha) x Speed (km/hr) x Row width (m)}}{600}$$

$$= \frac{600 \times 5 \times 3}{600} = 15 \text{ l/min}$$

NOZZLE SET FOR TYPICAL LOW VOLUME ORCHARD SPRAYING APPLICATION (1000 l/ha) SPRAYER FITTED WITH 900mm FAN								
Nozzle Position From top down	1	2	3	4	5	6	7	8
Jet/Swirl Plate Size	0.8/CC	1.0/1.0	1.5/1.2	1/.5/1.2	1.5/1.2	1.2/1.0	1.0/1.0	1.0/1.0

To provide a substantially horizontal spray pattern to suit vines, the jets in positions 1, 2 and 8 are closed by flipping the nozzles through 90 degrees so that neither of the jets is facing outwards, refer diagram on page 16.

The fitment of the same sized 0.8 jet and closed centre swirl plate (CC) in each of the nozzle positions from 3 to 7 will produce a uniform density within the spray pattern.

2. Orchard Fruits - Low Volume Spraying - using sprayer fitted with 900mm fan

Application rate	1000 l/ha
Travel speed	5 km/hr
Row width	6.1 m
Spraying pressure	20 Bar

$$\text{Total output (l/min)} = \frac{\text{Application rate (l/ha) x Speed (km/hr) x Row width (m)}}{600}$$

$$= \frac{1000 \times 5 \times 6.1}{600} = 51 \text{ l/min}$$

NOZZLE SET FOR TYPICAL GRAPE SPRAYING APPLICATION (600 l/ha) SPRAYER FITTED WITH 900mm FAN								
Nozzle Position From top down	1	2	3	4	5	6	7	8
Jet/Swirl Plate Size	Closed	Closed	0.8/CC	0.8/CC	0.8/CC	0.8/CC	0.8/CC	Closed

This arrangement is the Standard Jet Set M3P for the 900mm fan. It will produce a spray pattern with approximately 70% of the output discharging from the four centre jets Nos. 3,4,5 and 6. Refer to the Standard Jet Set chart on page 22 for full details of the output at various pressures and the percentage of the output discharged from each nozzle.

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Calibration

3. Orchard Fruits - High Volume Spraying - using sprayer fitted with 1000mm fan

Application rate	2200 l/ha
Travel speed	5 km/hr
Row width	6.1 m
Spraying pressure	25 Bar

$$\text{Total output (l/min)} = \frac{\text{Application rate (l/ha) x Speed (km/hr) x Row width (m)}}{600}$$

$$= \frac{2000 \times 5 \times 6.1}{600} = 112 \text{ l/min}$$

NOZZLE SET FOR TYPICAL HIGH VOLUME ORCHARD SPRAYING APPLICATION (2000 l/ha) SPRAYER FITTED WITH 1000mm FAN									
Nozzle Position From top down	1	2	3	4	5	6	7	8	9
Jet/Swirl Plate Size	1.5/1.2	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2	1.2/1.0

This arrangement is the Standard Jet Set M2 for the 1000mm fan. To achieve the required output, the spraying pressure will need to be set at 24 Bar, rather than 25 Bar. It will produce a spray pattern which is biased towards the upper section to provide good coverage of the overhead canopy. Approximately 60% of the output is discharged from the top five jets. Refer to the Standard Jet Set Chart on page 23 for full details of the output at various pressures and the percentage of the output discharged from each nozzle.

4. High Volume Application - using sprayer fitted with 1000mm fan and Two Sided Conveyor

Application rate	6000 l/ha
Travel speed	2 km/hr
Spraying Pressure	25 Bar
Row width	8.2 m

$$\text{Total output (l/min)} = \frac{\text{Application rate (l/ha) x Speed (km/hr) x Row width (m)}}{600}$$

$$= \frac{6000 \times 2 \times 8.2}{600} = 164 \text{ l/min}$$

NOZZLE SET FOR HIGH VOLUME SPRAYING APPLICATION USING TWO SIDED CONVEYOR (6000 l/ha) SPRAYER FITTED WITH 1000mm FAN									
Conveyor Nozzle Position From top down	Con 1	Con 2	Con 3	Con 4	Con 5	Con 6	Con 7		
Jet/Swirl Plate Size	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5	1.8/1.5		
Fan Cowl Nozzle Position From top down	1	2	3	4	5	6	7	8	9
Jet/Swirl Plate Size	Closed	Closed	Closed	Closed	1.8/1.5	1.8/1.5	1.8/1.5	1.5/1.2	1.5/1.2

This arrangement is the Standard Jet Set C2. To achieve the required output, the spraying pressure will need to be set slightly under 24 Bar, rather than 25 Bar. It will produce a spray pattern with a bias towards the upper section. Refer to the Standard Jet Set Chart on page 23 for full details of the output at various pressures and the percentage of the output discharge from each nozzle.

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Calibration

Calibration Worksheets

These worksheets can be used to record the results of nozzle selection calculations and calibration tests that you carry out on your sprayer. They can then be used for future reference when similar spraying operations are conducted.

The worksheets are suitable for use on sprayers equipped with 900mm or 1000mm fans or a 1000mm fan with Two Sided Conveyor.

NOZZLE SELECTION CALCULATION

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at ___ Bar
Con 1				
Con 2				
Con 3				
Con 4				
Con 5				
Con 6				
Con 7				
1				
2				
3				
4				
5				
6				
7				
8				
9				
Total	100	**Total Output per Side (l/min)**		

NOZZLE SELECTION CALCULATION

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at ___ Bar
Con 1				
Con 2				
Con 3				
Con 4				
Con 5				
Con 6				
Con 7				
1				
2				
3				
4				
5				
6				
7				
8				
9				
Total	100	**Total Output per Side (l/min)**		

NOZZLE SELECTION CALCULATION

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at ___ Bar
Con 1				
Con 2				
Con 3				
Con 4				
Con 5				
Con 6				
Con 7				
1				
2				
3				
4				
5				
6				
7				
8				
9				
Total	100	**Total Output per Side (l/min)**		

NOZZLE SELECTION CALCULATION

Nozzle No. from top	% Flow each nozzle	Nozzle Output (l/min) = Flow per side x % / 100	Jet/Swirl Size	Output (l/min) at ___ Bar
Con 1				
Con 2				
Con 3				
Con 4				
Con 5				
Con 6				
Con 7				
1				
2				
3				
4				
5				
6				
7				
8				
9				
Total	100	**Total Output per Side (l/min)**		

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Calibration

Date of Test: ________________

Application Rate: ________________ litres/ha

Speed of Travel: ________________ km/hr

Row Spacing: ________________ metres

$$\text{Output (l/min)} = \frac{\text{Application Rate x Speed x Row Width}}{600}$$

$$= \frac{\quad \times \quad \times \quad}{600}$$

= litres/min

Standard Jet Set (from chart): ________________
or
Individually Selected jet/swirl plate combinations:

Con 1	Con 2	Con 3	Con 4	Con 5	Con 6	Con 7
/	/	/	/	/	/	/

1	2	3	4	5	6	7	8	9
/	/	/	/	/	/	/	/	/

Pressure setting: ____________ Bar

Measured Output: ____________ litres/min
(from test run)

Date of Test: ________________

Application Rate: ________________ litres/ha

Speed of Travel: ________________ km/hr

Row Spacing: ________________ metres

$$\text{Output (l/min)} = \frac{\text{Application Rate x Speed x Row Width}}{600}$$

$$= \frac{\quad \times \quad \times \quad}{600}$$

= litres/min

Standard Jet Set (from chart): ________________
or
Individually Selected jet/swirl plate combinations:

Con 1	Con 2	Con 3	Con 4	Con 5	Con 6	Con 7
/	/	/	/	/	/	/

1	2	3	4	5	6	7	8	9
/	/	/	/	/	/	/	/	/

Pressure setting: ____________ Bar

Measured Output: ____________ litres/min
(from test run)

Date of Test: ________________

Application Rate: ________________ litres/ha

Speed of Travel: ________________ km/hr

Row Spacing: ________________ metres

$$\text{Output (l/min)} = \frac{\text{Application Rate x Speed x Row Width}}{600}$$

$$= \frac{\quad \times \quad \times \quad}{600}$$

= litres/min

Standard Jet Set (from chart): ________________
or
Individually Selected jet/swirl plate combinations:

Con 1	Con 2	Con 3	Con 4	Con 5	Con 6	Con 7
/	/	/	/	/	/	/

1	2	3	4	5	6	7	8	9
/	/	/	/	/	/	/	/	/

Pressure setting: ____________ Bar

Measured Output: ____________ litres/min
(from test run)

Date of Test: ________________

Application Rate: ________________ litres/ha

Speed of Travel: ________________ km/hr

Row Spacing: ________________ metres

$$\text{Output (l/min)} = \frac{\text{Application Rate x Speed x Row Width}}{600}$$

$$= \frac{\quad \times \quad \times \quad}{600}$$

= litres/min

Standard Jet Set (from chart): ________________
or
Individually Selected jet/swirl plate combinations:

Con 1	Con 2	Con 3	Con 4	Con 5	Con 6	Con 7
/	/	/	/	/	/	/

1	2	3	4	5	6	7	8	9
/	/	/	/	/	/	/	/	/

Pressure setting: ____________ Bar

Measured Output: ____________ litres/min
(from test run)

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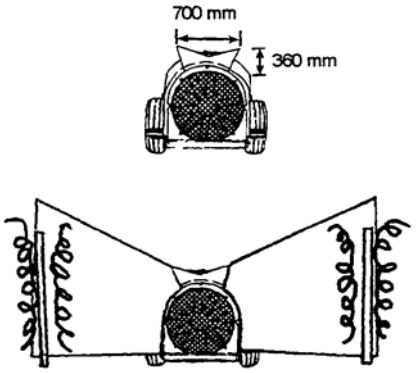
Optional Equipment

Directional Conveyors

The Directional Conveyors described below are designed to increase penetration and coverage by concentrating the airblast directly at the target.

Double Sided Adjustable Vineyard Deflector (for 900mm Fan)

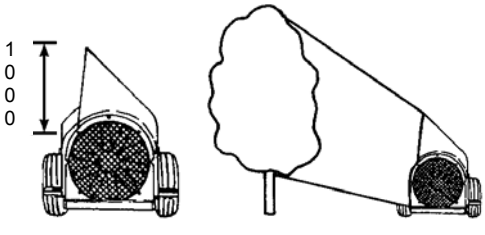
This attachment uses the existing nozzles of the sprayer and provides an economical method for directing all the available airblast at the crop on both sides of the row. It is ideal for vines and low height trellised crops. The conveyor is fitted with an adjustable internal flute to regulate the direction of the airflow to suit the target.



DOUBLE SIDED ADJUSTABLE VINEYARD DEFLECTOR

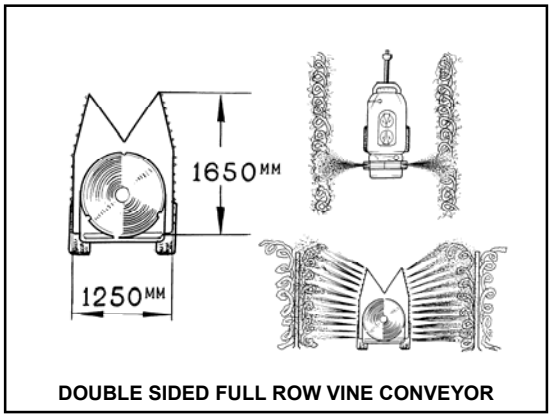
Single Sided Conveyor (for 900mm Fan)

This fibreglass conveyor is for single sided spraying of tall, dense tree crops such as citrus fruits, avocados, mangoes or nuts. It includes a stainless steel spraybar fitted with 7 flip-over nozzles and adjustable internal flutes to direct the airblast for maximum penetration.



SINGLE SIDED CONVEYOR

Double Sided Full Row Vineyard Conveyor (for 1000mm Fan)



DOUBLE SIDED FULL ROW VINE CONVEYOR

This attachment directs air in a concentrated, controllable stream to both sides of the row for vines, trellised apples or any dense bushy plants such as berries and passionfruit.

The conveyor incorporates stainless steel spraybars fitted with 12 flip-over nozzles per side enabling the spray pattern to be regulated for efficient coverage. The air outlets include adjustable flaps so the airblast can be directed for maximum crop penetration.

Hydraulically Operated Citrus Tower

The Citrus Tower is used to direct spray into the upper foliage of citrus or tall trees and can be fitted to sprayers with either a 900mm or 1000mm fan. It is normally ordered as a factory fitted option but can be retrofitted.

The unit consists of a frame, mounted at the rear of the sprayer immediately ahead of the fan, and a pivoting arm that is fitted with six adjustable spray nozzles, three to each side.

The arm can be raised to any height within its arc of travel by an hydraulic cylinder that is controlled from the tractor cabin using the tractor's remote hydraulic control lever. The six nozzles can be individually adjusted to provide the required spray pattern and application rate.

Full operating instructions are provided with the Tower.

Optional Equipment

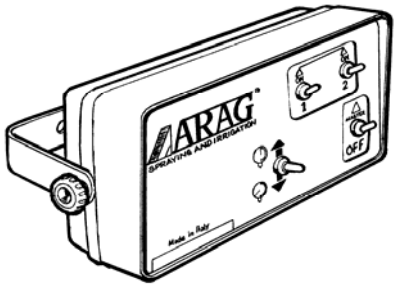
Electric Controls

An electric control system can be installed on sprayers fitted with an APS-166 or IDS-2200 pump, in lieu of the standard controls. As this entails changing the valve block as well as the control unit it is an option which is normally factory fitted when the sprayer is ordered.

The system is the same as that fitted as standard on sprayers equipped with an IDS-2600 pump. It consists of a cabin mounted control box and a bank of three electric solenoid valves. A wiring loom with a quick release coupling is used to connect the control box to the solenoid valves.

The pressure/by-pass mode of the pump and the on/off operation of the left or right spraybars can be controlled from the tractor cabin. Spraying pressure is adjusted manually by a screw type regulator mounted on the valve block.

For further details refer to the sections headed Electric Controls in the Installation and Operation sections of this manual.



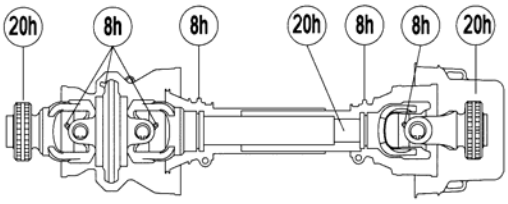
ELECTRIC CONTROL CABIN BOX

Wide Angle PTO Shaft

This shaft is fitted with a constant velocity joint at one end, which incorporates two universal joints, and a standard single universal joint at the other end. The constant velocity joint makes the shaft capable of operating at much greater angles than a standard PTO shaft.

A wide angle PTO shaft should only be needed if the tractor drawbar prevents correct alignment of the regular PTO shaft, refer Installation section.

When lubricating a wide angle PTO shaft ensure that all three universal joints are greased, as shown in the diagram. All other grease points on the shaft and the lubrication intervals are the same as a standard PTO, refer to the Lubrication and Maintenance section.



LUBRICATION OF WIDE ANGLE PTO SHAFT

Extended Drawbar

The extended drawbar is 30 cm longer than the standard drawbar and may be necessary when the sprayer is attached to a very large tractor to provide sufficient clearance from the tractor tyres when turning.

The extended drawbar may also be needed if a wide angle PTO is installed to provide clearance for the larger universal joint depending upon the particular tractor used.

Airblast Straightening Vanes

(900mm Fan only)

These are stationary vanes installed at the rear of the fan to improve the alignment of the airblast and provide more uniform crop coverage. They impart a clockwise rotation to the incoming air to counteract the anti-clockwise rotation of the fan and make the airblast more symmetrical about the centreline of the sprayer. A longer cowling is supplied to provide space for the vanes.

Air straightening vanes are standard on the 1000mm fan.

High Pressure Filters

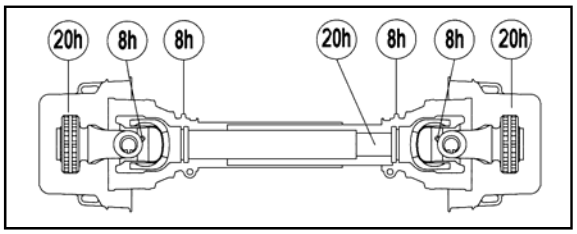
Optional high pressure filters may be fitted to the sprayer between the pump and the spray nozzles. This provides added protection against nozzle blockage.

Silvan

Lubrication and Maintenance

Start Up Inspection
During the first few days of operation, before starting each day check that all hardware is tight and tighten all hose clamps. Inspect the unit for leaks while running .

PTO Shaft to Tractor
Grease the PTO shaft with multi-purpose grease at the time intervals shown below. This is the amount of lubrication recommended for normal operation. More frequent inspection and lubrication may be needed under very dusty conditions.



Every 20 hours slide the PTO shaft apart, clean the telescopic tubes with kerosene and apply multi-purpose grease to the sliding surfaces, then reassemble. This is most important in dusty conditions.

Internal PTO Shaft
Grease the universal joints on the internal PTO shaft, which is connected between the rear of the pump and the fan drive at the rear of the sprayer, with multi-purpose grease every 350 hours.

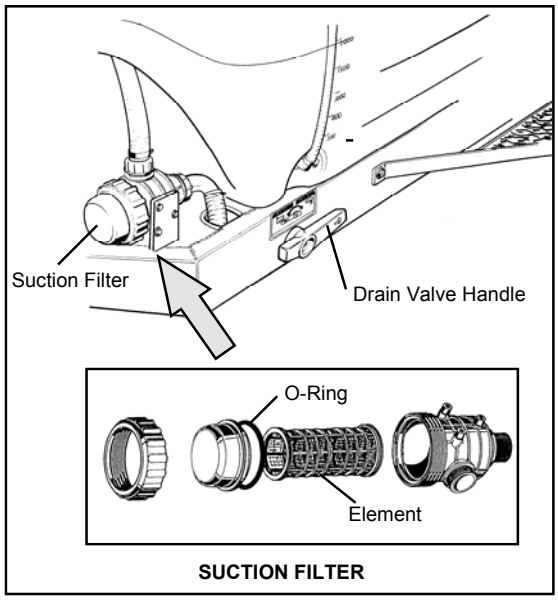
The telescoping sections of this internal shaft do not require regular greasing as the shaft length is constant and the sections do not slide in operation. Check that the shaft is free to slide during the annual general inspection.

Pump
Check the oil level in the viewer daily and if necessary top up with SAE 20W-40 multigrade engine oil. The oil must reach the mark on the side of the oil level viewer.

Gearbox
Check the oil level every 50 hours and if required top up with SAE 85W-140 gear oil. The level should be halfway up the viewer on the side of the gearbox.

Filters
Clean all filters regularly. The best method is to wash them with a soft bristle brush. Check for any tears or holes and replace if damaged.
Check and if necessary clean the tank lid basket strainer before each fill.

Always clean the suction filter before each tank refill and at the end of the day. Turn the handle of the drain valve to the vertical position to close off the connections to the pump and drain outlet before removing the suction filter. Then unscrew the ring securing the filter cover and remove the element. Ensure the O-ring is in good condition when refitting.



SUCTION FILTER

On sprayers fitted with a cable control system flush the pressure line filter daily. Open the red tap at the end on the filter housing on the control valve and run the pump for a few minutes to purge any foreign material from the element.

Tank, Pump and Spray Lines
At the end of each day run clean water through the pump, spray lines and nozzles to purge them of chemicals. Rinse out the tank to remove any powdered material.

In the case of frost or freezing conditions run the pump dry to prevent water freezing in it or the spray lines and damaging components.

Never leave chemicals in the tank that may settle to the bottom, harden and break into lumps as this may block the suction filter.

Dispose of unused chemical, chemical mix, rinse water and chemical containers as recommended by the chemical manufacturer or the relevant government authority.

Caution Do not use a high pressure washer to clean around fan bearings, pump seals or electrical valves if fitted.

Lubrication and Maintenance

Tyres
Inspect the tyres regularly and inflate to 250 kpa (35 psi) if necessary.

Diaphragm Pump (annually)
Drain the oil from the pump annually, or at the end of each spraying season. Refill with SAE 20W-50 multi-grade engine oil.

Remove the pump heads, carefully inspect the diaphragms and replace if necessary. Also check the inlet and outlet valves, seats and springs for wear, damage or chemical corrosion and replace as necessary.

Check the air pressure in the surge chamber if fitted at the side of the pump. The air pressure behind the surge chamber's diaphragm smooths out the pulsations in fluid flow and should be set in accordance with the spraying pressure being used - refer chart below.

Adjust the pressure at the valve fitting on the chamber using using a compressed air hose fitted with a tyre valve connection and a reliable pressure gauge.

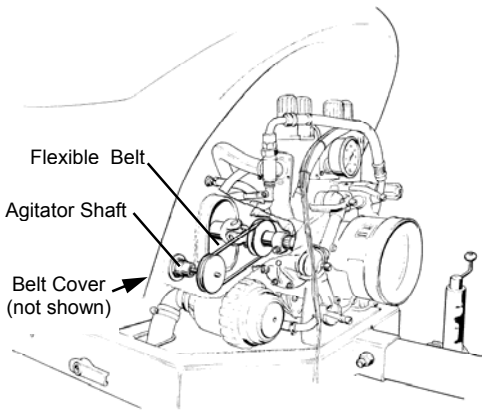
Refer to the pump instruction manual for further details on the above maintenance operations.

Spraying pressure (Bar)	2 - 5	5 - 10	10 - 20	20 - 50
(psi)	29 - 73	73 - 145	145 - 290	290 - 725
Surge air pressure (Bar)	2	2 - 5	5 - 7	7
(psi)	29	29 - 73	73 - 102	102

Agitator Drive Belt
The two propeller agitators are driven directly from the internal PTO shaft by flexible tubular belts which are self tensioning. The front agitator is driven from the front of the main tank and the rear agitator is driven from the rear.

To check whether the agitators are driving correctly observe them through the rear opening on top of the tank, while the sprayer is running and the tank is empty. If either agitator is not revolving steadily it probably indicates that its drive belt has stretched and requires shortening.

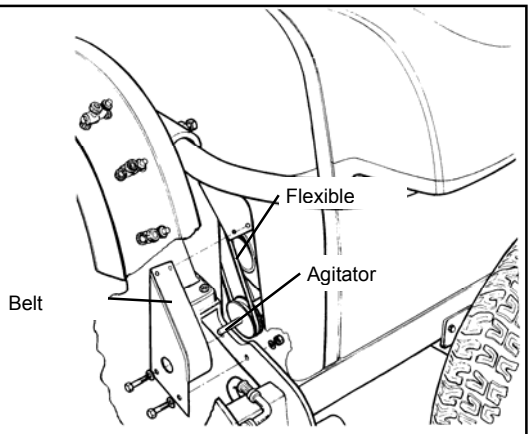
To access either drive belt it is necessary to first remove the safety cover. The cover over the front belt is located at the RH front corner of the tank, behind the pump, and the cover over the rear belt is attached by four bolts at the RH rear corner of the tank.



FRONT AGITATOR DRIVE BELT

To shorten the belt, remove it from the pulleys and cut it at either side of the join, adjacent to the ends of the connector piece. Shorten the belt to an overall length of 730 mm. Remove the connector from the cut out section and use it to rejoin the shortened belt.

After adjustment, refit the belt and reinstall the belt cover. Run the sprayer with the tank empty and observe the agitator through the rear opening on top of the tank to ensure that it is running correctly.



REAR AGITATOR DRIVE BELT

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Lubrication and Maintenance

Wheel Hubs
Remove the wheel hubs annually and check that the bearings and seals are in good condition. Repack the bearings with multi-purpose grease as required.

Adjust the wheel bearings by tightening the axle nut, then backing it off by approximately 1/6 turn before installing the cotter pin. Check that the hubs are free to rotate without any end play.

Annual Inspection (or 350 hours)
At the end of each season or every 350 hours inspect the sprayer for any signs of damage, corrosion or leakage.

Replace any parts that are affected by chemical contamination.

Check that all bolts are securely tightened, including the tank mounting bolts, axle U-bolts and wheel nuts. Check that all hose connections are tight.

Trouble Shooting

Pump does not prime
- No liquid in tank or not covering suction inlet.
- Suction filter blocked.
- Suction filter bowl loose or missing O-ring.
- Suction line loose allowing pump to suck air.
- Controls not in by-pass position.
- Pump valve springs broken or valves worn.
- Drain valve handle not in “Pump” position.

Pump does not reach correct pressure
- Pump not operating at full 540 rpm.
- Suction filter blocked.
- Pressure regulator not correctly adjusted
- Pressure regulator valve and seats worn.
- Pressure gauge faulty
- Pump diaphragms ruptured (pump oil grey).
- Worn nozzles or capacity of nozzles greater than capacity of the pump.
- Chemical filler Rinse or Empty valves left open.
- Pressure filter flushing valve left open. (cable control system only)

Fan noisy and/or vibrating
- Gearbox bearings worn.
- Fan damaged or out of balance.
- Tractor PTO incorrectly installed.
- Hitch point and PTO geometry not correct.

Driveshaft noisy
- PTO shaft not secured properly to shafts.
- Universal joint crosses worn.
- Hitch point and PTO geometry not correct.

Airblast reduced
- Fan mesh blocked with leaves or debris.
- Not operating at full speed of 540 rpm.
- Fan gearbox not in gear.
- Fan clutch worn or slipping.

Poor tank agitation
- Chemical left in tank whilst not operating.
- Chemical incorrectly mixed before filling.
- Mechanical agitator belt loose and/or slipping

Pump and hoses vibrating.
- Pump surge chamber pressure incorrectly adjusted or surge diaphragm ruptured if fitted.
- Air entering the suction line through loose or damaged fittings.
- Pump valves or valve springs worn or damaged.
- Worn nozzles or capacity of nozzles greater than capacity of the pump.
- Air trapped in filter or suction lines.

SILVAN AUSTRALIA PTY. LTD.
ABN 48 099 851 144

VICTORIA (HEAD OFFICE)
89 Lewis Rd.
Wantirna South 3152
Telephone:+61 (03) 9887 2788
Facsimile:+61 (03) 9887 1035
www.silvanaust.com

SILVAN NEW ZEALAND PTY. LTD.
ABN 92 626 598

22 Sunshine Ave,Te Rapa
Hamilton, 2001
New Zealand

Telephone: +64 (07) 849 6030
Facsimile: +64 (07) 849 6070
www.silvannz.co.nz