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LINKAGE TURBOMISER

MANTURB-5

OCTO



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...ed out by Silvan dealers. If any warranty repairs are required on Silvan products, the product be returned to the place of purchase. It is good practice to keep a record of equipment and after the warranty period.

...ains the extent and limitations of your Warranty coverage on Silvan Products.

Items that cannot be excluded under the Australian Consumer Law. You are entitled to a major failure and for compensation for any other reasonably foreseeable loss or to have the goods repaired or replaced if the goods fail to be of acceptable quality due to a major failure.

...e from defects in materials and workmanship for the warranty period of 12 months delivered to the consumer.

...dealer, who in turn warrants the original purchaser (consumer) of each new Silvan product, to replace the product, or, pay the cost of repair or replacement, as determined by Silvan if any defective or malfunctioning parts in accordance with the warranty limitations

...any other rights and remedies available to consumers under the law.

...ly from defects in workmanship or material under normal use and service.

...misuse, use of incompatible chemicals, exceeding machine specifications including overloading, negligence, accidental damage or failure to perform recommended maintenance as detailed in the Owner/Operator Manual applicable to the product.

...use of a product after initial failure

...repaired by other than an authorised Silvan service outlet in a way which, in the sole opinion of Silvan, adversely affect its performance or reliability.

...ance items such as diaphragms, batteries, V belts and ground engaging components,

...if purchase at your cost and within the warranty period along with evidence of the purchase receipt. If the supplier cannot be contacted then contact Silvan as below and we can direct you on how to make a warranty claim.

Warranty

...ct qualifying under this warranty will be performed by any authorised Silvan service outlet. Following the delivery of the product, at the cost of the owner, to the service outlet, the product will be repaired or replaced depending on the extent of the problem at the discretion of the authorised Silvan dealer.

...equipment to primary producers. A leader in the design of agricultural sprayers, Silvan was established in 1962 and has grown to become the largest manufacturer and supplier of agricultural equipment in Australia. At Silvan we are extremely proud of our reputation for reliability and value by quality service. Your investment in a Silvan sprayer is an investment in quality.

This manual covers the Linkage Mounted Turbomiser range of sprayers which are used in vineyards, berries, field crops, nurseries and trellis crops by means of a high speed turbine fan and a range of spray heads to suit particular crops. The Turbomiser range of sprayers uses air shear technology to create spray streams of fine droplets to efficiently cover the target crop for maximum chemical protection.

The main spraying system uses a PTO driven turbine fan in a cowling and a chemical solution to the spray heads where it is atomised by air shear venturi action. The fan and spray head then takes the spray mixture into the canopy. An optional electronic controller can be fitted to provide a consistent chemical application rate and to control the operating functions.

The linkage Turbomiser range of sprayers is designed and manufactured to provide high performance and safety and incorporates many innovative features. To ensure the best performance and safe operation of your sprayer, you need to read this manual and become familiarise yourself with all aspects of the sprayer's operation, maintenance and safety.

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

The wording of the safety decals are shown below and the locations are shown on the next page.

It is important that all operators read and follow the information given on all safety decals.

kept clean and legible at all times. If any are missing or unreadable they should be replaced with new decals from your Silvan dealer under the part numbers shown.



95009



P/N 95001



P/N 95057



P/N 95098

WARNING

READ THE OPERATORS INSTRUCTION MANUAL BEFORE ATTACHING OR USING THIS PRODUCT.

REFER TO YOUR VEHICLES OPERATION MANUAL FOR THE MAXIMUM LOAD LIMITS AND OPERATING PROCEDURES.

DO NOT EXCEED SPECIFIED SAFE LOAD CAPACITY AND TOWING CAPACITIES.

STABILITY OF THE VEHICLE CAN BE AFFECTED BY THE

IMPORTANT: This is to be completed and returned to Silvan within 10 working days of installation. Failure to do so may result in a limited warranty period.

PRODUCT DETAILS	OPTIONAL EQUIPMENT
Model Description:	<input type="checkbox"/> Hose Reel
Silvan Serial No.:	<input type="checkbox"/> Controller
Pump Model & Serial No.:	<input type="checkbox"/>
Original Equipment	
Manufacturer's Serial No's:	

PRE-DELIVERY CHECKS As Applicable	Tick when passed
All equipment correctly supplied in good order. Owner's Kit supplied.	
PUMP Check diaphragm pump oil level and gearbox if fitted to motorised unit. Check surge chamber pressure suits operation pressure if fitted. Check pump feet are secure. Check pressure switch operates if fitted (12 Volt Models).	
FILTRATION Check lid strainer and suction filter element. Check suction filter O-ring for correct position.	
HOSING Check hoses for kinks or damage. Check clearance from wear points. Check hose clamps and fittings are tight.	
ELECTRIC CONTROLS Connect to 12 volt supply and check operation.	
TANK Check for sealing of all outlets. Clean contaminants from tank. Check lid for correct sealing. Check mounting points are correct and tight.	
BOOM OPERATION Ensure boom height control operates correctly.	
ENGINE Check lubrication level and top up if necessary. Operate engine and ensure it starts and runs correctly.	
MISCELLANEOUS Lubricate all grease points as per Operator's Manual. Check all safety guards are secure and safety decals are in place. Check all operational equipment supplied for completeness and fitment.	

OPERATION and INSTALLATION CHECKS
OPERATION Fill tank with water above all fittings and check for leaks. Check folding operation of boom. Check optional equipment fitted for correct operation. Attach to vehicle, ensure control valve is in by-pass position. Start motor and adjust pump to maximum operating pressure. All optional equipment fitted and operating correctly.
INSTALLATION Has pre-delivery check been carried out? Has the PTO shaft been installed and engaged? Are all safety covers and safety decals in place? Has the customer received and read the Operator's Manual?
Has the customer been fully instructed by the dealer in the actual working and transport conditions? Has the customer been fully instructed in calibration? Is the customer satisfied with the sprayer's performance? Is the customer fully instructed in the sprayer's safety requirements? Does the customer fully understand the Silvan Manual?

IMPORTANT
By signing this Pre-delivery, Installation and Operation Checklist, the Customer acknowledges that they are responsible for the safe operation of the sprayer. The Customer undertakes that they will read and follow the instructions required to operate the sprayer in all circumstances.

Customer Name:
Address:
Email:
Date of installation:
Customer Signature:
Subscribe me to the Silvan Newsletter

In signing, the dealer meets his obligation to provide a warranty start-up as a servicing dealer.

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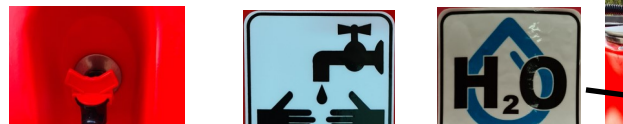
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ned.
t liquid flow not turned off.
lines.
between nozzle and calibration disc assembly.
ing
urned off.

ked.
heads turned on
tted to the spray head, may be blocked or fitted in the wrong flow direc-

t not operating.
n of tank blocked.
g
led.
r power supply.



all necessary
that any person
the machine is
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pplying agricultural
no circumstances
other purpose.

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ely trained person to
yer.

er whilst wearing
ed long hair, jewel-
uld become entan-
nts or limit your vi-

on a tractor fitted

on a tractor that is not fitted with a sound
proofed cabin.

- Ensure the PTO power output and lifting capacity of the tractor match the power requirement and loaded mass of the sprayer, as stated in the Specifications section of this manual. 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 operate the sprayer without all the tractor and sprayer safety shields in place. Carefully check that the PTO and driveline shields are correctly installed.
- Never allow anyone to ride on the sprayer or tractor.
- Do not operate at more than 540 PTO rpm.
- Water is loaded into the tank through the smaller lid with strainer. Chemical is loaded via the larger lid with in-built chemical mixer
- The hand wash is filled separately through the lid on the opposite side of the tank to the chemical fill.

Pump does not prime

- Insufficient liquid in tank to cover suction inlet.
- Suction line loose allowing pump to suck air.
- Manual pressure regulator fully shut.
- Section valves shut.

Fan noisy and/or vibrating

- Bearings worn.
- Fan damaged or out of balance.
- Tractor PTO incorrectly installed.

Over-run clutch noisy

- Clutch requires greasing.
- Clutch pawls worn.

Drive shaft noisy

- PTO shaft not secured properly to shafts.
- Incorrect hitch point and PTO geometry.
- Universal joint crosses worn.

Pump does not reach correct pressure

- PTO not operating at full 540 rpm.
- Pump drive belt loose and/or slipping.
- Pump impeller badly worn.
- Manual pressure regulating valve not correctly adjusted.
- Pressure gauge faulty or line blocked.
- Tap for chemical washer in large filter basket left on.

Pump leaking liquid

- Mechanical seal worn or damaged.

Air speed or volume reduced

- Fan mesh blocked with leaves or debris.
- PTO not operating at full 540 PTO rpm

oints, usually only two, the over-run clutch next to the input shaft spline
, annually or as directed by maintenance decals.



cal manufacturer's label and safety instructions for safe handling procedures, correct method of use and required protective clothing and equipment. Always use the recommended personal protective clothing and equipment.

- Always wear gloves when carrying out any adjustments to the sprayer.
- Ensure that all operators and associated personnel are familiar with the legal regulations and codes of practice that apply to the safe use, storage and disposal of spray chemicals
- Apply the parking brake, switch off the tractor engine and remove the key before performing any service work on the sprayer. Ensure the sprayer is properly supported and restrained before performing maintenance work.
- Do not stand near or perform adjustments on the fan or spray nozzles without first stopping the tractor engine and removing the key to ensure the sprayer can not inadvertently be started.
- Relieve all hydraulic pressure before disconnecting hoses. Oil escaping under pressure can penetrate the skin, causing serious injury. Seek medical advice immediately if injured by escaping oil

ity of the tractor hydraulic lift arms are compatible with the weight and
r with full tanks and the spray head to be used for the crop. See Specifica-
his manual.

he tractor must exceed the power absorbed by the sprayer under all condi-

he tractor must be carried out on a level surface with any bystanders well

ontal adjustment system.

ey are wider than the sprayer attachment pins.

ust the lift arms until the ball ends are level with the sprayer pins.

he pins and lock with the spring clips.

to the sprayer with the pin provided and secure with the "R" clip.

length if required and attach it to the tractor with its pin and spring clip.

ut into tension with its adjustment.

he sprayer until the two PTO stub shafts are level

ust the top link until the sprayer is vertical.

adjustment of the lift arms to prevent any sideways movement of the spray-

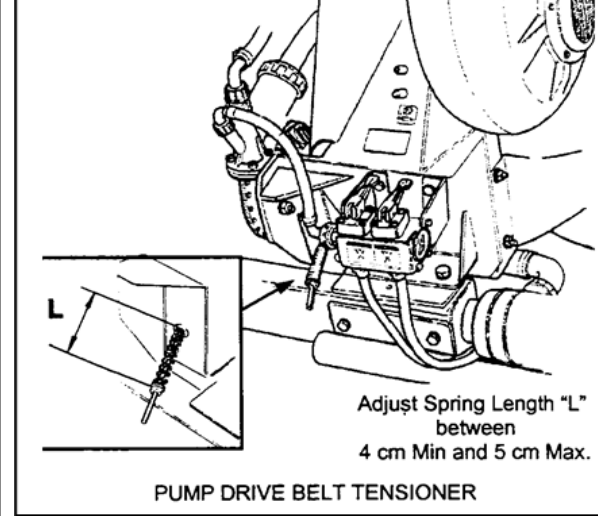
e aligned both horizontally and vertically.

prayer frame should be level.

STOP THE TRACTOR AND REMOVE THE KEY BEFORE FITTING THE PTO SHAFT.

**ENSURE NO PERSON IS ABLE TO REACH THE HYDRAULIC LIFT CONTROLS OF
TRACTOR. NEVER STAND TOO CLOSE TO THE SPRAYER WHERE INJURIES
COULD OCCUR IF IT SUDDENLY LOWERED.**

om the tractor, reverse the above procedure.



Fan Shaft Bearings

Check the oil level in the fan bearing housings daily and if necessary top up with oil using the dipstick assembly. Clean the dipstick and re-insert it, then remove and check the oil level. The oil level should be between the two marks on the dipstick. If necessary add oil to bring the level up to the top mark. Install the dipstick and push in securely.

Change the oil annually. Remove the drain plug from the tube beneath the fan housing to allow the oil to drain freely. Replace the drain plug and fill with SAE 90 oil. Check the oil level with the dipstick. Requires approximately 160ml of oil.



Turbomiser Sprayer is used to apply agricultural, vegetable and vine spray. The airflow generated by a fan is used to distribute the spray. A variety of spray heads are available to suit various crops.

- Maximum pressure 4.5 Bar
- Power absorbed 2.5 kW

Fan and Drive

- Quality PTO shaft direct to lower fan pulley.
- Poly-vee belt with over-run clutch to fan.
- "SPZ" section vee belt to pump.

	Fan Type			
	P42	P45	P50	P55DS
Fan Diameter (mm)	450	450	500	550
Fan Speed (rpm)	4000	4500	4000	3700
Air Volume (m ³ /hr)	4000	5400	7550	14000
Air Speed (m/s)	228	188	175	170

UV stabilised polyethylene tank lid with basket strainer. 250mm diameter with

- Wire mesh safety screen over fan

Spraying Controls

- Cab-mounted control box with left/right electric section control valves.
- Manual pressure regulator on front of tank.
- 100mm dia. 0-6 Bar pressure gauge on front of tank.
- Rotary distribution plate with 15 settings to calibrate fluid flow to each group of spray nozzles.

Nozzles

- Low volume "air shear" type. Positioned in the air stream of the spray head.

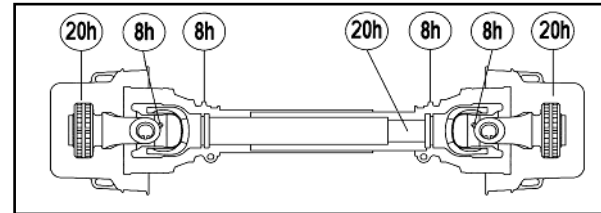
belt driven from fan

Start Up Inspection

During the first few days of operation, before starting each day check that all hose clamps are tight. 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. Regular lubrication is recommended for normal operation. More frequent inspection and lubrication is needed under very dusty conditions.



Every 20 hours slide the PTO shaft apart, clean the telescopic tubes with kerosene, apply grease to the sliding surfaces, then reassemble. This is most important for normal operation.

Filters

Clean all filters regularly. The best method is to wash them with a soft brush and water. Check for tears or holes and replace if damaged.

Check and if necessary clean the basket strainer under each tank lid before use. Always clean the pressure filter before each tank refill and at the end of the day. Turn the valve to position D (see pages 16/17) then unscrew the filter cover to remove the filter. Ensure the O-ring is in good condition when refitting. Return Three way valve to position A before resuming spraying.

Tank, Pump and Spray Lines

At the end of each day run clean water through the pump, spray heads and lines to flush out chemicals. Rinse out the tank to remove any powdered material.

Never leave chemicals in the tank that may settle to the bottom, harden and block the filter or cause pump damage.

Dispose of unused chemical, chemical mix, rinse water and chemical containers properly. Do not pour into drains or waterways.

of the standard control- box, the optional Bravo 180S Automatic Spray programmed application rates to be selected and maintained whilst operation which can be used to increase the efficiency of spraying. Using a valve bank, an electric pressure regulating valve and a speed sensor the contain the pre-set application rate if speed changes during operation.

and started, pressure can be regulated and the discharge can be directed to the spray nozzle whilst operating. Any of the pre-programmed application rates can be selected and the controller will maintain the rate if ground speed varies by making

provides a read out of ground speed, application rate, flow in litres/minute, total volume used and remaining in the tank. The built in memory retains the application rate when the sprayer is switched off.

and operation manual is provided with the controller.



Filteration

- Basket strainers in fill lids (32 mesh)
- Pressure filter on pump - 50 mesh (blue)

Chassis

- Heavy duty galvanised steel chassis.
- P42 and P45 have Cat 1 lift pins
- P50 and P55 have Cat 2 lift pins.
- Lift pins can be fitted in two positions to suit tractor hydraulic lift arms.

Optional Equipment

- Bravo 180S automatic spray rate controller.
- Range of spray heads to suit different crops.

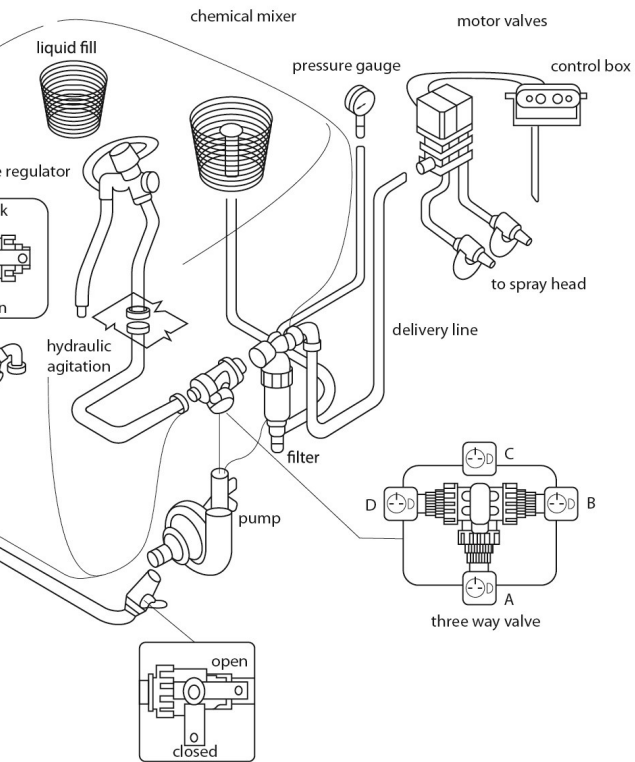
Dimensions and Weights

(not including spray head)

Fan	Tank Size	Tot Width (mm)	Tot Height (mm)	Length (mm)	Weight Empty	Weight Full
P42	400L	1120	1180	1380	200	618
P45	400L	1120	1180	1380	207	625
P50	600L	1450	1230	1450	244	862
P55DS	600L	1450	1230	1450	250	868

Tractor PTO HP Requirement

PTO Power Required		
Fan	kW	HP
P42	13	17.5

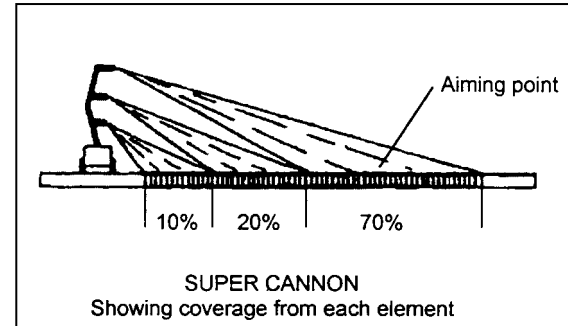


Super Cannon and Turntable

The Super Cannon enables efficient coverage of vegetable, nurseries, row and area crops. It consists of a large top cannon to cover approximately 70% of the target furthest from the sprayer, a middle cannon covering about 20% of the spray area in the middle region and a fish tail diffuser covering the remaining 10% of the area close to the sprayer, as shown below.

To achieve the necessary fluid flow the top cannon is supplied through two fluid taps. The top cannon and bottom diffuser are supplied by one common distributor.

The head is adjusted so that the large cannon is aimed at a position just above the target. The top cannon is aimed under 70% of the distance from the sprayer to the edge of the treated width. The fish tail diffuser should then be adjusted to aim at their portions of the target. When the correct angle is set, continuous coverage is achieved.



The turntable, if fitted, should be rotated to angle the Super Cannon to accommodate the sprayer's forward speed and any breeze. The spray stream will be most effective in a light breeze following breeze.

When the correct combination of vertical adjustment and windward angle is achieved, the crop will become visibly more uniform and a downward, rolling effect in the spray is observed through the crop right to the edge of the treated width.

Once the air direction has been set the fluid flow can be regulated. The flow should be reduced at the tap until an even, fine spray pattern is achieved. The top cannon covers the large area, the small cannon which has a greater area to cover. The fluid taps on the top cannon should be adjusted to provide an even output to the outside fluid streams with slightly more flow to the centre fluid streams. When calibrating the Super Cannon the width measurement

be sprayed with the Vineyard head, the Hi Low Orchard head or the Turbo Tower Head.

for spraying palmette and trellis grown trees in protected situations such as used with four trumpets (five trumpets on fan size P55) in each of the up- ch should be angled back to reduce shingling.

per and lower diffusers should cross but not clash. Raising the upper diffusers may assist coverage of tall crops.

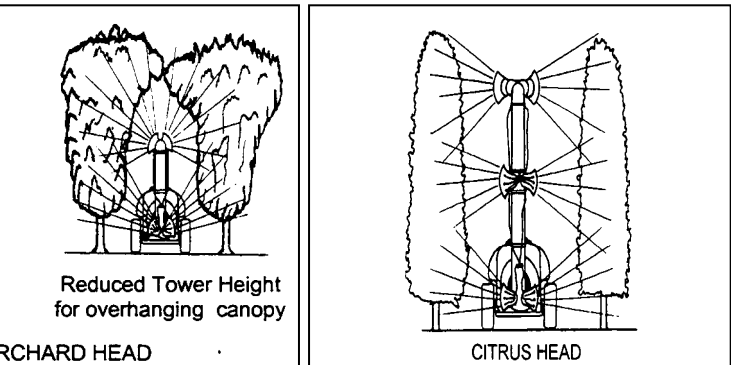
Turbo Tower Head (Citrus Head)

fish-tail diffusers with the upper units mounted on an air tower. The Turbo Tower Head is fitted to Turbomiser models fitted with the larger P55 fan, where the additional penetration and enables a higher travel speed.

Mounted vertically to give even coverage across the whole target. In operation, the fluid flow should be regulated with the individual taps on the fluid lines from each diffuser and across the whole head.

When spraying low, it may be necessary to reduce the height of the Hi Low head by removing the top diffusers.

The Turbo Tower Head can be used in taller crops, as its intermediate diffusers will ensure adequate coverage of the area of the crop.



Turbomiser sprayers.

The spray tank can be filled through the dedicated liquid fill lid (250mm lid or the larger 355mm lid. A hand wash tank with its lid on the opposite side of the tank can be filled separately. The tap for the hand wash is located on the RH side of the tank. DO NOT USE THIS WATER FOR DRINKING.

The level of liquid in the spray tank is shown by the LH side sightline with float valve. To operate the sprayer the suction valve/drain valve under the rear of the tank is turned long handle facing the tank wall. Chemical solution is drawn from the tank through the suction line to the inlet side of the belt driven centrifugal pump. A filter on the outlet side prevents foreign material entering the delivery lines to the spray heads. The filter has a replaceable element which can be cleaned when the three way valve on top of the pump is turned to Maintenance "D" position.

The manual pressure regulator on the discharge side of the pump is used to control the pressure. Excess fluid from the pump is by-passed through the manual regulator into the tank. The tank contents are agitated.

Pressurised fluid is directed to the electric valve block which includes two or three solenoid valves to direct liquid to the left and right sides of the sprayer.

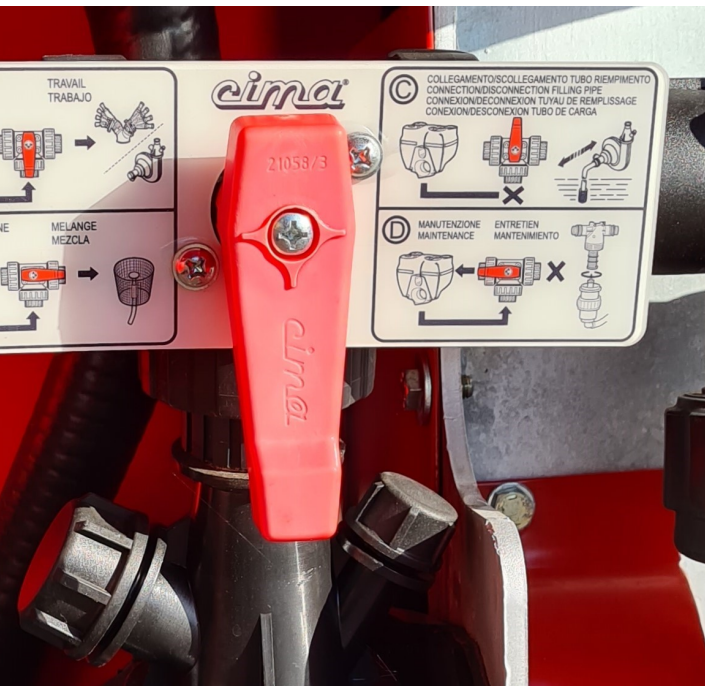
Fluid from the pump can be directed via the bottom of the filter up to the top of the filter basket to assist mixing of chemicals especially wetttable powder formulations. The filter isolates the mixer when spraying commences.

The three way valve on the pump outlet has four positions to enable various functions (see section following).

The tank can be drained through the same three way valve that directs flow to the suction line to the pump. The long side of the handle is turned to the rear of the tank with the protective cap removed to enable the drain function.

outlet, this valve is connected to the filter and through the tank to the bypass agitation line.

four positions to perform various functions.



ally down. Liquid flow from the pump is directed to both the filter and manual pressure regulator. From the filter the flow goes to the section leads. The manual pressure regulator sets the working pressure and any agitation for the tank contents.

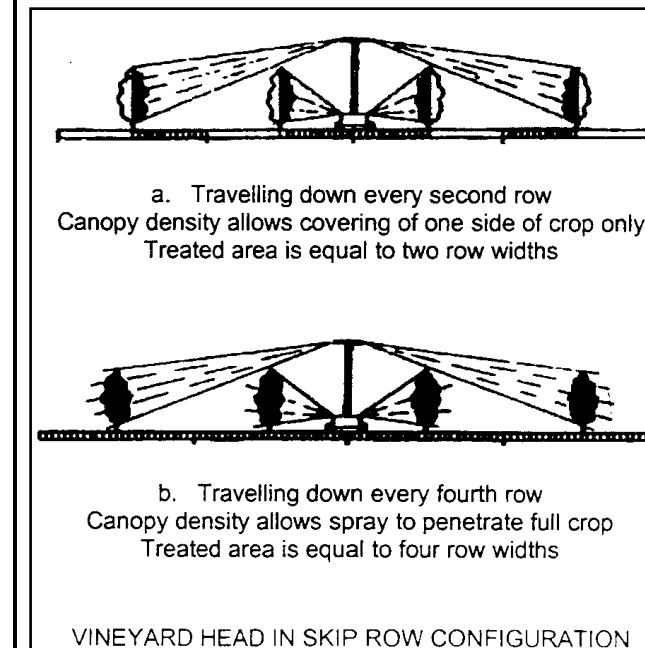
POSITION TO PERFORM THE SPRAYING FUNCTION.

ntally to the right. With the section valves turned OFF all liquid flow from

them vertically so that the spray stream covers the canopy in the skip row. Refer to the unit at operating speed.

To minimise overspray, turn off the fluid flow to any trumpets on the lower canopy targeting the crop and if necessary replace the trumpet with a blanking plug. Fitting 6/50 trumpets to the bottom diffusers will increase the air flow through the canopy to assist targeting of the skip row.

Depending upon the density of the canopy, skip row spraying can be done by travelling down every second row (if density is sufficient to allow spray to cover only one side of the canopy) or every fourth row (where density is lighter and the spray can penetrate the full canopy). Refer to the diagrams below.



Skip Row Calibration

Because skip row spraying covers more than one row for each pass of the sprayer,

a converging spray from multi trumpet diffusers above and below the crop
 e in many vine canopy systems. It can also be used for skip row spraying by
 fusers.

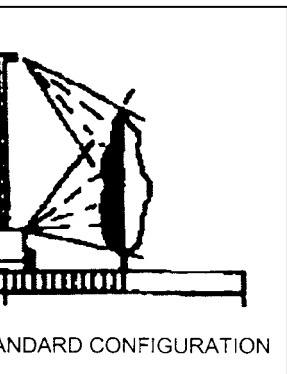
ed back to assist in canopy penetration and to reduce “shingling”, or the
 spray action.

e upper and lower diffusers should be set to achieve a converging air flow
 streams should cross 40 to 50 cms from the centre of the vine body to
 s.

locations which are directed at critical points in the crop will ensure great
 s.

iting, zones may be targeted by using a cannon in the lower diffuser. In
 ns may be used in both the upper and lower diffusers to direct large vol-
 it lines.

cannons only can be used to direct the spray onto the vines from above.



er diffusers are fitted with single cannons to propel the discharge across to
 whilst the lower diffusers use multi trumpets to cover the rows adjacent to



Filter Valve open, flow from pump
 going to chemical mixer.



Filter Valve
 isolated. V
 position v
 in A. WOR

C. CONNECT/DISCONNECT FILLER PIPE

The handle is vertically upwards. This setting isolates the pump from the dis
 when the pump is used to fill the tank from an external water source e.g. da

**NEVER USE THE SPRAYER WITH THE VALVE IN POSITION C. PUMP DAMAGE
 SHORT TIME RUNNING WITH NO OUTLET FLOW FROM THE PUMP.**

D. MAINTENANCE

The handle is pointing horizontally to the left . This setting isolates the filter
 pump to return to the tank through the manual pressure regulator. The filte
 cleaned even with a full tank. Return valve to position **A. WORK** to resume s
 assembled.

MANUAL PRESSURE REGULATOR

calibration discs (see Calibration section in this manual) so that the pump
e to provide the maximum return flow for agitation.



Pressure Regulator.

To increase pressure rotate handle clockwise. To
reduce pressure rotate handle anti-clockwise.

pressure with the spray heads operating.

VINES

er sprayers are fitted as standard with two 12 volt motorised section valves
box. Power for the valves is from a cigarette lighter type plug. The switch
the power supply to open and close the valves. There is a tractor mounting
atch box and when the unit is off the tractor there is a bracket on the front
atch box securely.



assistant observe the penetration and crop coverage.

1. Firstly consider the terrain of the orchard or vineyard and choose a speed
operation.
2. Fill the tank with water and set the calibration discs to give a medium ap
l/ha) to make the spray pattern and coverage easily visible to the observ
3. Choose a speed that you believe is suitable and begin a spraying run wit
behind the machine to check the extent of crop penetration.
4. In vines and trellis fruit crops, the observer should expect to see the spr
the far side of the target if the travel speed is correct. In tree crops the c
see the spray penetrating about 3/4 of the way through the target.
5. If the penetration is greater than described, increase the ground speed a
scribed then reduce the speed and retest. Adjust the speed in small incre
coverage is achieved and note the result for future reference.

VINES

Double Sided 4x4 and 5x5 Heads

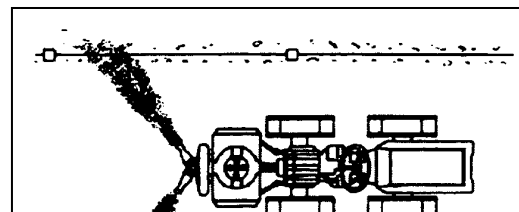
These heads have multi trumpet diffusers and are normally used in overhea
systems.

Set the diffusers at an angle from the rear of the sprayer and direct them ve
tain complete coverage and also to minimise overspray.

Turn off the fluid flow to any trumpets which are not directed at the crop. B
necessary to increase the air flow to the other trumpets to gain proper crop

Observe the spray output from each trumpet and adjust the individual contr
similar output pattern from all trumpets.

The diffusers should be at sufficient distance from the crop to produce some
charge to avoid "stripping" in the cover.



Interchangeable spray heads can be fitted to the Turbomiser sprayer to suit differing methods of cultivation.

It can be used in a variety of ways to optimise the spray pattern by using some, or all, of the following adjustment methods:

1. The spray diffusers can be adjusted to control the direction of discharge. On some models, the diffusers can be rotated.

2. Each nozzle can be adjusted with an individual control tap; or turned off completely to save coverage on areas not requiring coverage. On heads with fishtail diffusers, the flow can be directed to sections of the spray bar within the fishtail.

3. The flow which passes through each outlet of the multiple trumpet diffusers, on 6x5 heads, can be regulated by fitting a different size trumpet. The trumpets are available in different sizes and the size is marked on the body of each trumpet. The standard sizes are 22.5/120, 22.5/150 and 22.5/180. The first number relates to the size of the trumpet (the higher the number the larger the trumpet) and the other numbers signify that the connection is 50 mm in diameter.

4. A trumpet can be stopped by replacing it with a plug-in blanking cap. This will stop the flow of chemical through the remaining un-blanked trumpets.

5. The trumpet diffusers can be replaced by a single cannon to propel the discharge in a more concentrated pattern. The cannon is marked with its size and the size of the diffuser. The usual cannon size is 22.5/120, indicating a 120 mm connection.

6. When working at the rear of the sprayer exercise extreme care and wear the appropriate PPE. The spray pattern should only be adjusted with the sprayer stationary and the tractor PTO disengaged. Stand on the machine to make adjustments.

7. Test the spray pattern in the crop for correct targeting before proceeding with the main application.

8. The spray pattern is an important factor in achieving good crop coverage whilst avoiding overspray.

When starting the sprayer for the first time grease all lubrication points, check the fan pulley and measure the length of the drive belt tension springs as outlined in the manual. Conduct a trial using water only (no chemicals) to become familiar with the machine. Ensure all systems are functioning correctly without any leaks.

NOTE: THE PUMP MUST NEVER RUN DRY OR SIGNIFICANT DAMAGE WILL BE DONE TO THE PUMP OVER TIME.

PROCEDURE.

- Turn section valves OFF at switch box.
- Check the three way valves from the tank to the pump are OPEN.
- Set three way valve on top of pump to A. WORK position.
- Completely open manual pressure regulating valve (rotate anti-clockwise until it stops).
- Open valve from bottom of filter to chemical mixer.
- Tank can be filled through the supplementary fill point adjacent to the main fill point. Do not exceed capacity.
- Start tractor, engage PTO at sufficient rpm to start fan turning, when the fan starts to turn increase rpm to approximately 500 PTO rpm.
- Close manual pressure regulator until approximately 2 Bar appears on the gauge.
- The chemical mixer under the main tank lid will be operating and measure the spray pattern directly into the mixer basket.
- Wear the specified personal protective equipment when handling chemicals to avoid chemical splash.
- When all chemical has been mixed into the tank turn off the valve from the tank to the mixer. The pressure showing on the gauge will increase.
- Fill remainder of tank then close all lids and secure.
- When ready to start spraying increase PTO rpm to 540, turn on section valves and adjust pressure to the level determined during the calibration procedure.
- The pneumatic agitation tap on top of the tank can be opened for extra agitation.
- If as the tank empties foaming of the chemicals becomes excessive close the agitation tap.

NG. Remember to return to position **A. WORK** before spraying.

ies as shown by a drop in pressure or a “fluttering” of the spray stream at
PTO to stop the pump. **THE PUMP MUST NOT RUN DRY.**

nd an amount of clean water can be circulated through the pump, valves,
help flush any remaining chemical residues from the system.

disposed of according to any government and local authority requirements.

ined through the valve under the tank at the rear of the frame.

ective clothing to avoid contact with any chemical residues.

**Try to run the fan at 540 PTO rpm to achieve the air speed required to
y liquid at the air shear nozzles in the spray heads.**

all safety precautions provided by the chemical manufacturer.

protection and all the recommended protective clothing whilst mixing and
chemicals. Take care to avoid spillage of chemicals or mixed solution. Wash

they have come into contact with concentrate or mixed solution.

nd dispose of empty chemical containers as recommended by the chemical
t authority.

**Before adding chemicals read and follow the
chemical manufacturer's instructions and wear
the recommended personal protective clothing.**

Machine Details

Sprayer Model: _____

Head Fitted: _____

No. Disc Assemblies: _____

Spraying Requirements

Application Rate: _____ litres/ha

Speed of Travel: _____ km/hr

Row Spacing: _____ metres

Required Output per Disc Assembly

$$\text{Output per disc (l/hr)} = \frac{\text{Application Rate} \times \text{Speed} \times \text{Row Width}}{10 \times \text{No disc assemblies}}$$

$$= \frac{\quad \times \quad \times}{10 \times \quad}$$

$$= \quad \text{litres/hr}$$

Settings Selected from Chart

Disc Position: _____

Pressure setting: _____ Bar

Verification Test

Date of Test: _____

Run Time: _____ minutes

Refill Volume: _____ litres

Calculated Output: _____ litres/hr
per disc assembly

$$\text{Output per disc (l/hr)} = \frac{\text{Vol. to refill (litres)} \times 60}{\text{Time (min)} \times \text{No disc assemblies}}$$

$$= \frac{\quad \times 60}{\quad} = \quad \text{litres/hr}$$

Machine Details

Sprayer Model: _____

Head Fitted: _____

No. Disc Assemblies: _____

Spraying Requirements

Application Rate: _____

Speed of Travel: _____

Row Spacing: _____

Required Output per D

$$\text{Output per disc (l/hr)} = \frac{\text{Application Rate} \times \text{Speed} \times \text{Row Width}}{10 \times \text{No disc assemblies}}$$

$$= \frac{\quad \times \quad \times}{10 \times \quad}$$

$$= \quad \text{litres/hr}$$

Settings Selected from

Disc Position: _____

Pressure setting: _____ Bar

Verification Test

Date of Test: _____

Run Time: _____ minutes

Refill Volume: _____ litres

Calculated Output: _____ litres/hr
per disc assembly

$$\text{Output per disc (l/hr)} = \frac{\text{Vol. to refill (litres)} \times 60}{\text{Time (min)} \times \text{No disc assemblies}}$$

$$= \frac{\quad \times 60}{\quad} = \quad \text{litres/hr}$$

2 the calculation is:

3

Spraying pressure

On the previous page choose the disc and spraying pressure that gives the out-

put pressure gives 135 l/hr.

pressure using the calibration check outlined on page 22.

5

On the following page can be used to record the results of calibration tests

Turbomiser air shear sprayers use a metering disc at each spray head (or multiple types) to regulate the flow to determine the required application rate.

Chemical application rates and hence metering disc selections will vary greatly by crop type, stage of crop development and the regional area. Information on application rates is available from your chemical supplier.

Disc selection can be made by following four steps shown on the following page. Regular calibration after disc selection, is essential for spraying efficiency by ensuring the correct spray is applied per hectare.

STEP 1 Operating Factors

First establish the following factors:

1. Application rate in litres per hectare (l/ha).
2. Travel speed (km/hr) The speed indicated by your tractor can be checked by timing the tractor over a measured distance. The timing should be done in seconds over 100m with the tractor engaged and water in the tank to simulate real spraying conditions. In hills the timing should be timed driving up and down the hill and the two times averaged together. The result is related according to the following formula.

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

Note: If an automatic spray rate controller is fitted it will automatically maintain the application rate if the speed alters.

3. Row width (m) The distance between rows measured in metres in one pass.
4. Number of disc assemblies operating on the sprayer.
5. Spray pressure (Bar). A spray pressure of between 1 and 3 Bar is usually sufficient. Higher pressures will allow use of larger disc holes which can reduce the chance of blocking the holes with liquid to bypass for tank agitation.

$$c) = \frac{\text{Application Rate (l/ha)} \times \text{Speed (km/h)} \times \text{Row Width (m)}}{10 \times \text{No. of Disc Assemblies}}$$

Spraying Pressure

Start on the next page select the disc setting and spraying pressure that most output per disc which was calculated in Step 2.

Loosening both wing nuts on the disc assembly and rotating the disc until the recess. After setting the position retighten the wing nuts. The same position.

Discs fitted to Turbomiser sprayers are colour coded yellow. The holes in the discs are square and a chamfered edge on the other side. Ensure the square edge faces the direction of the spraying fluid flow.

Refer to the figure chosen from the Disc Output Chart by adjusting the manual pressure regulator in the previous section headed Manual Pressure Regulator.

3. For each disc setting and spraying pressure, test the sprayer with water to confirm the disc output.

Mark a specific mark then run the sprayer at 540 PTO rpm for a measured time at the nozzle spraying. A run time of 2 minutes should be sufficient.

When required to refill the sprayer to the brim or chosen mark, then use the following formula to calculate the output rate per disc assembly.

Use the required output rate that was calculated in step 2.

$$c) = \frac{\text{Volume to refill (litres)} \times 60}{\text{Time (minutes)}}$$

reduce output.

DISC OUTPUT CHART

DISC OUTPUT CHART For Yellow Colour Coded Disc			
Output Volume (Litres/Hour) per Disc Assembly			
DISC SETTING	PRESSURE		
	1 Bar (14.5 psi)	2 Bar (29 psi)	3 Bar (43.5 psi)
1	42	57	72
2	45	63	79
3	51	78	90
4	63	87	110
5	81	117	147
6	87	126	158
7	135	210	270
8	165	234	324
9	213	300	420
10	246	351	486
11	309	453	603
12	390	600	780
13	471	726	945
14	534	810	1080
15	588	882	1134

CALIBRATION EXAMPLE

This example applies to a unit fitted with a spray head which has four disc assemblies. The same procedure would be used for a head with a different number of discs by simply changing the number in the calculation.

STEP 1 Operating Factors

a) Required application rate 200 l/ha