



Operator's Manual

MANAPS-2 Rev C 5/06/07

Silvan Diaphragm Pumps

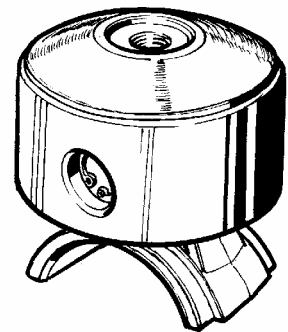
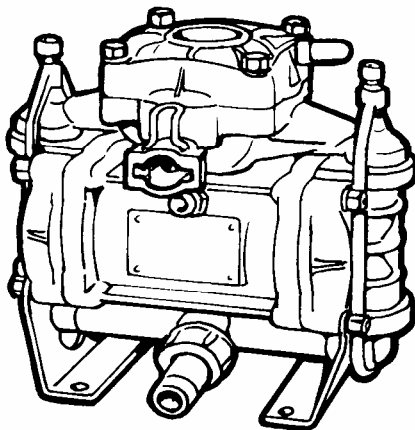
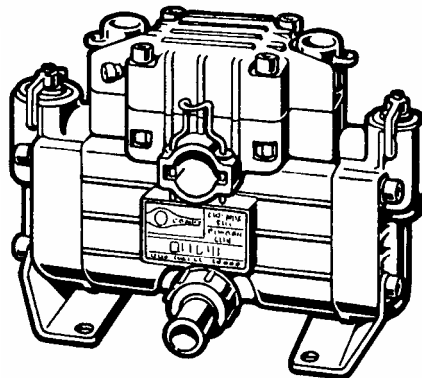
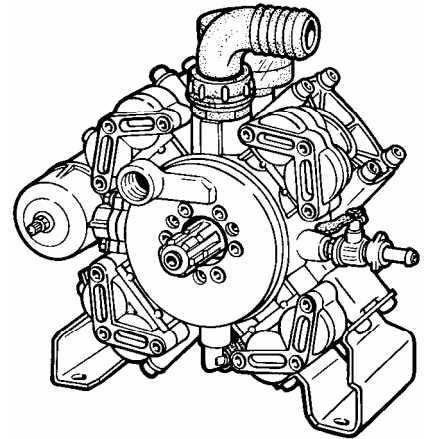
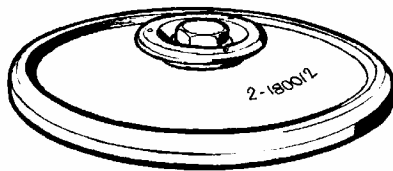
BP 20/15, 75/15, 60/20, 125/20, 151/20, 171/20, 265/20, 305/20

MP 20, 30, 40

P48

APS 31, 41, 71, 96, 101, 121, 145, 166

IDS 2200, 2600



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PUMP DETAILS

Record the details of your pump and the supplying Silvan dealer here for future reference when discussing service, ordering parts or making a warranty claim.

PUMP MODEL NO. _____

PUMP SERIAL NO. _____

ENGINE MODEL. _____ (If Fitted)

ENGINE SERIAL NO. _____ (If Fitted)

SELLINGDEALER _____

ADDRESS _____

TELEPHONE _____

CONTACT NAME _____

DATE OF PURCHASE _____



New Product Warranty

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

Honda Engine Warranty (If supplied)

A separate Honda engine manufacturers manual and warranty policy may be supplied if the pump has been purchased with an Honda engine attached.

Any engine problem should be reported to your Silvan dealer in the first instance, however, any authorised Honda servicing dealer can carry out warranty repairs on the engine provided all the details of the purchase and engine are supplied.

Safety Information



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

Whilst your pump has been designed and manufactured to incorporate all necessary safety features it is essential that any person who operates or works on the machine is aware of the safety precautions that should be exercised.

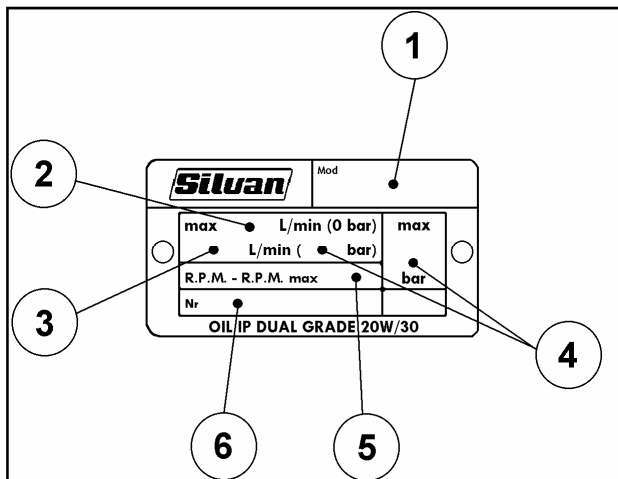
- ▲ The pump is designed and manufactured solely for the purpose of applying agricultural chemicals to crops. Under no circumstances should it be used for any other purpose.
- ▲ Before using this pump carefully read and ensure you understand the contents of this manual and any other manual supplied with the pump, sprayer or machine that the pump is fitted to.
- ▲ Before operating the pump read all the safety warnings which are carried on various parts of the machine.
- ▲ Never allow an inadequately trained person to attach or operate the pump.
- ▲ Do not operate the pump whilst wearing loose clothing, unrestrained long hair, jewellery or anything which could become entangled in rotating components or limit your vision.
- ▲ Do not operate the pump at speeds greater than 540 PTO rpm.
- ▲ Do not operate the pump without all the tractor and sprayer or machine safety shields in place. Carefully check that PTO and driveline shields are correctly installed if used.
- ▲ Disconnect the tractor PTO or power supply before performing any operation on the pump.
- ▲ 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.
- ▲ Do not pump flammable liquids or gases.
- ▲ Children must be kept clear of the pump.

Specification

PUMP TYPE	No OF DIAPHRAGM	DELIVERY l/min	PRESSURE		POWER (HP)	Max RPM	WEIGHT Kg.
			bar	p.s.i			
BP 20/15	2	18.7	15	215	0.83	550	7
BP 60/20	2	58	20	290	3.3	550	10
BP 75/15	3	68	15	215	2.68	550	10
BP 125/20	3	117	20	290	6.8	550	13
BP 151/20	4	138	20	290	7.8	550	24
BP 171/20	4	152	20	290	9.38	550	24
BP 265/20	6	252	20	290	14.3	550	55
BP 305/20	6	296	20	290	15.8	550	55
MP 20	2	19	30	435	1.6	550	7
MP 30	2	29	30	435	2.3	550	7
MP 40, MP40AP	3	39	30	435	3.2	550	9
P 48, P 48 AP	2	51	30	435	4.1	550	13
APS 31	3	25	40	580	2.7	550	10
APS 41	3	38	40	580	4.1	550	10
APS 71	3	68	40	580	7.4	550	18
APS 96	4	89	40	580	9.5	550	22
APS 101	3	97	50	725	12.3	550	38
APS 121	3	115	50	725	14.5	550	38
APS 145	4	141	50	725	18.0	550	48
APS 166	5	163	50	725	20.5	550	56
IDS 2200	6	208	50	725	25.8	550	76
IDS 2600	6	249	50	725	32.1	550	76

Pump Identification

On receiving the pump the following data is found on the name plate.



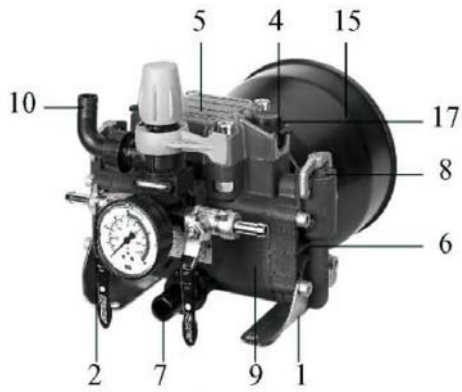
1. Pump Type
2. Maximum Delivery (at 0 Bar)
3. Delivery at Maximum Pressure
4. Maximum Pressure Permitted in Pump
5. Maximum RPM
6. Manufacture's Serial No

Component Identification

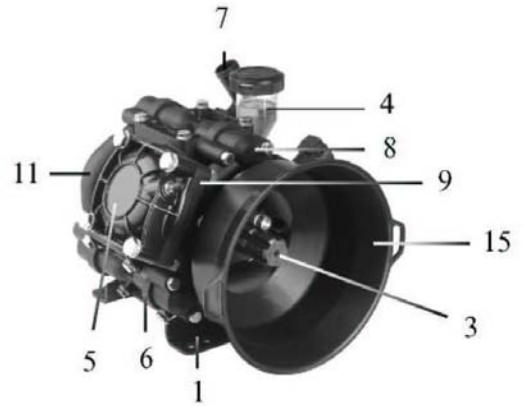
Refer to the diagrams on the following pages for the position of the various components relating to your pump.

1. Mounting Base
2. Ball Valve 3/8"
3. Input / Output shaft
4. Oil Reservoir
5. Pressure Accumulator
6. Pump Head
7. Inlet Hose Barb
8. Inlet Valve Cap
9. Pump Crankcase
10. Bypass Coupling
11. Inlet Manifold
12. Delivery Manifold
13. Oil Level Cap
14. Safety Valve
15. Pump Shaft Protection
16. Delivery Coupling
17. Oil Cap
18. Identification Label

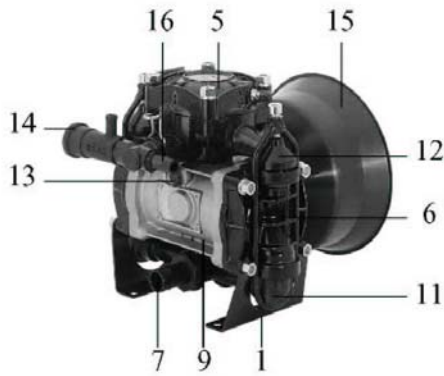
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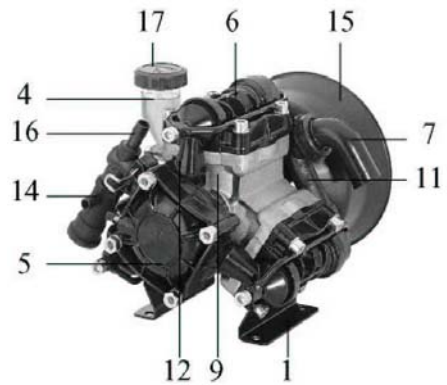
BP 20 / 15



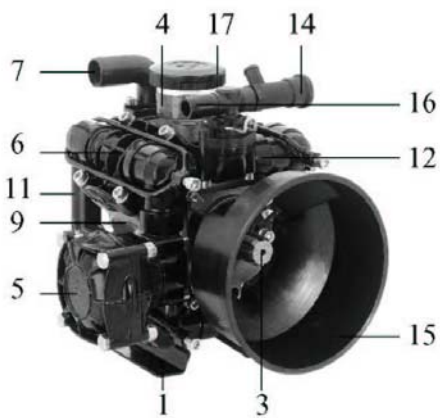
BP 75 / 15



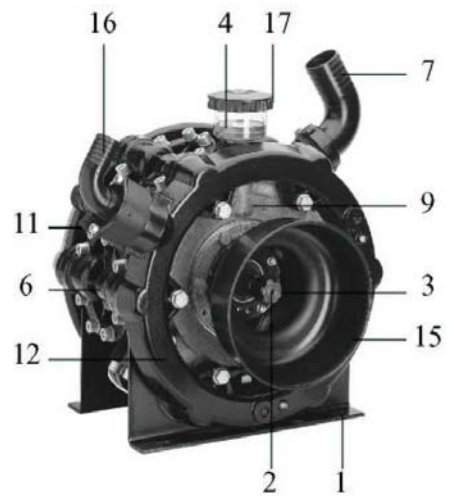
BP 60 / 20



BP 125 / 20



BP 151 / 20, BP 171 / 20

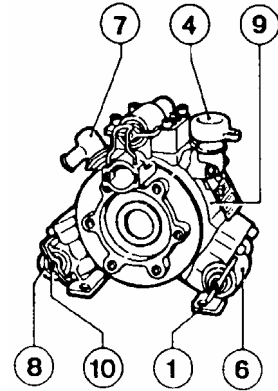


BP 265 / 20, BP 305 / 20

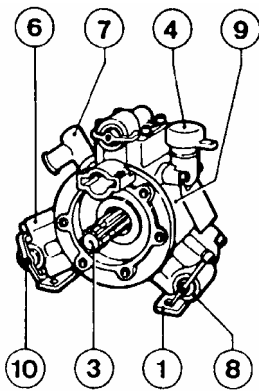
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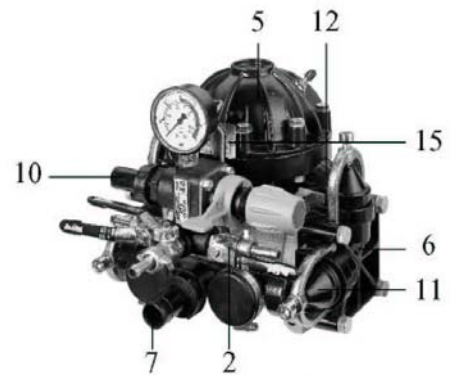
MP20 , MP30



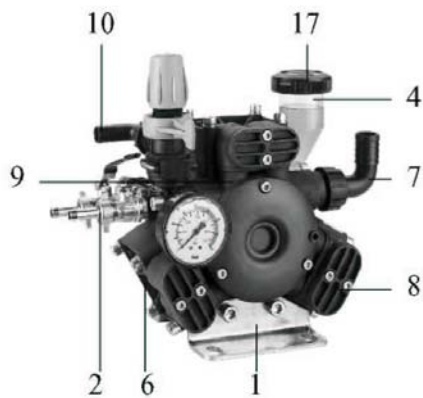
MP40



MP40AP



P48

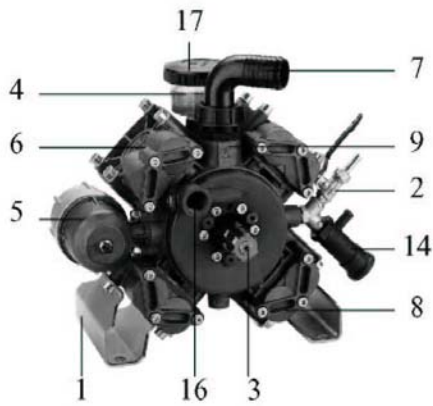


APS 31, APS 41

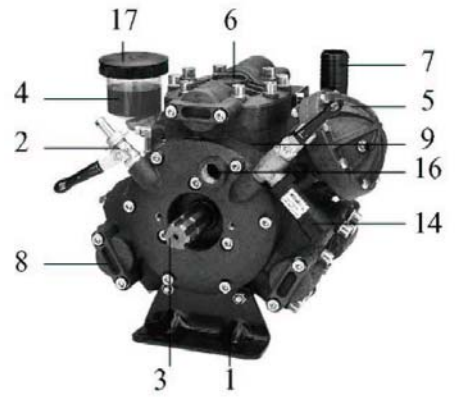


APS 71

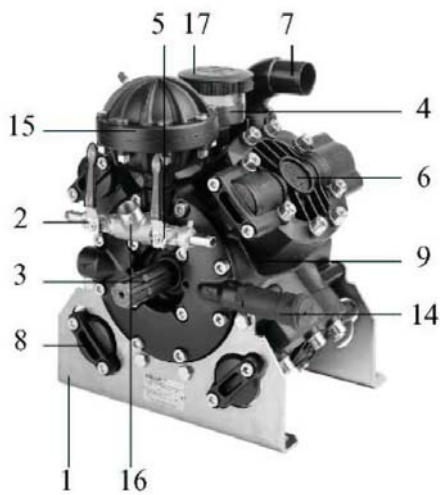
Identification



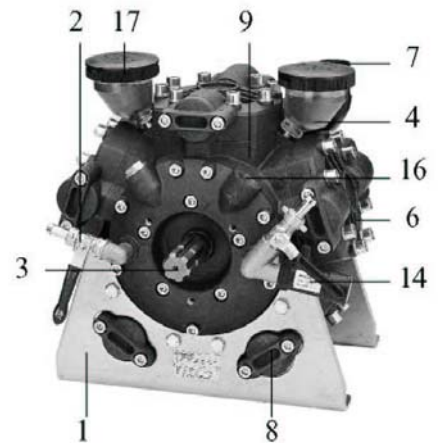
APS 96



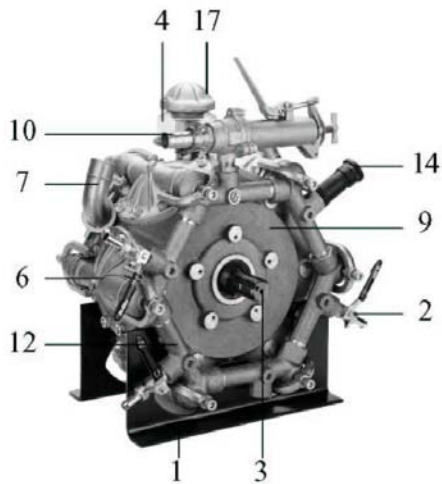
APS 101, APS 121



APS 145



APS 166

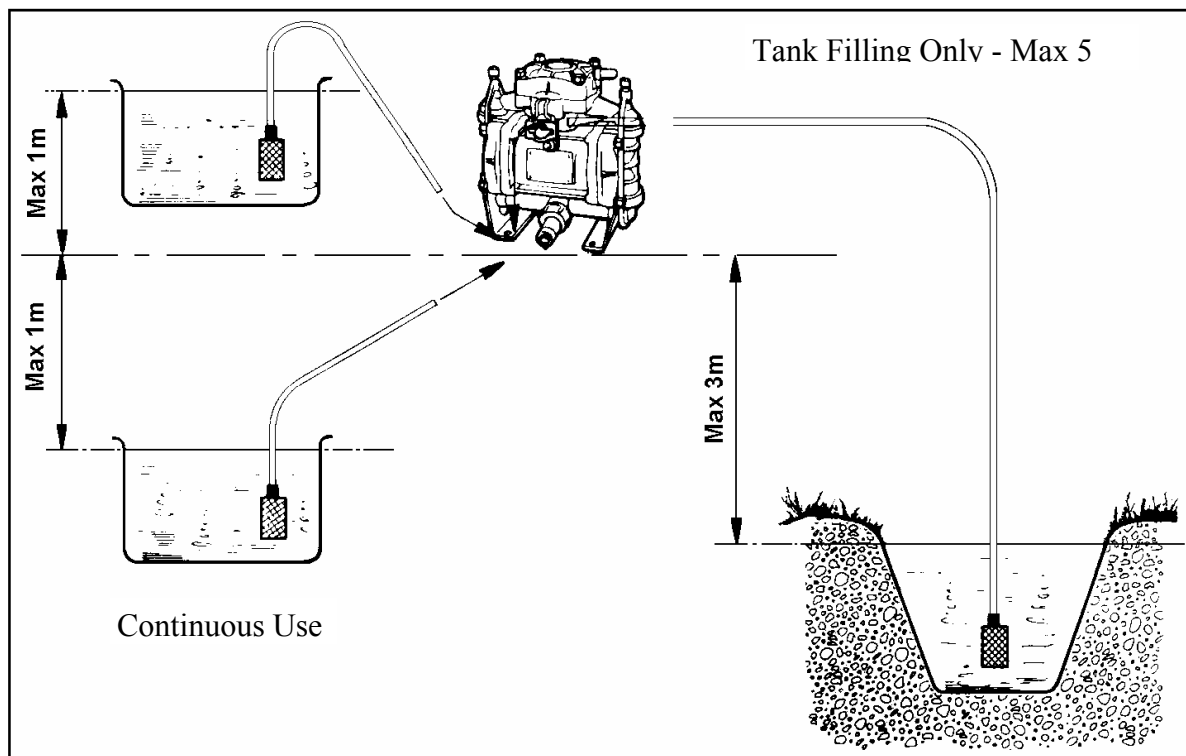


IDS 2200, IDS 2600

Installation

When a dealer or an owner installs a pump, the following guidelines must be met:

1. The suction hose from the tank to the pump must be equal to, or greater than the outside diameter of the pump inlet connector (7).
2. The pump suction hose should be wire reinforced to prevent collapse and firmly hose-clamped at the connection.
3. The suction line from the tank to the pump should be kept as short as possible and must have a minimum of bends.
4. A suction filter must be fitted between the tank and the pump.
5. The filter strainer should be approximately 50 mesh. The minimum filter area should be 250cm^2 per 100 l/min rated delivery of the pump. eg. BP60/20 has a rated delivery of 58.2 l/min therefore the minimum filter area would be $250/100 \times 58.2 = 145.5\text{cm}^2$.
6. The suction hose between the tank and the filter should have a shutoff valve installed, to allow the strainer to be cleaned without emptying the tank. The parts of this valve must not be smaller than the OD of the pump inlet connector.
7. The maximum suction lift should be no more than 1m for continuous operation and 3m for a maximum of 5 min during tank filling.
8. Do not connect pump suction to mains feed, the maximum inlet pressure is 1m (1.5psi)



Operation

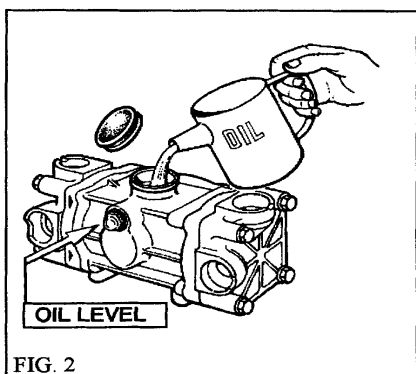
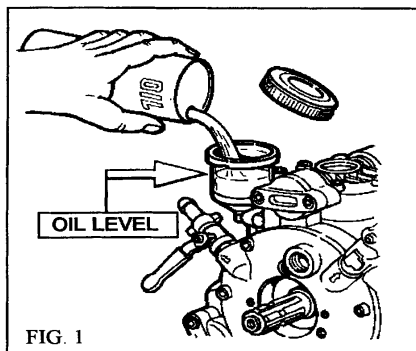
This pump has been designed and constructed solely to pump agricultural liquid chemicals, normally used for pest, weed and fungus control.

It must not be used to pump:

- Liquids with a density and viscosity greater than water.
- Chemical products if the compatibility with the materials of the pump is not known.
- Sea water or other salty concentrations.
- Water with a temperature above 40°C and less than 5°C.
- Any type of varnish.
- Solvents and thinners for any type of varnish.
- Any type of fuel or lubricant.
- Liquids containing granules or floating solid parts.
- Chlorine.
- For special liquids please contact Silvan service department.

Pre Operational Checks

1. Check the oil level while the pump is standing still and sitting horizontally. The oil must reach the level indicated on the sight glass (fig 1) or be visible on the oil level plug (fig 2) depending on the pump model. Top up with SAE 20W/30 oil if necessary.



2. Adjust the air pressure in the pressure accumulator if fitted (fig 3) in accordance with the operating pressure used to spray. Adjust according to Table A. The pressure can be measured using a car tyre pressure gauge.

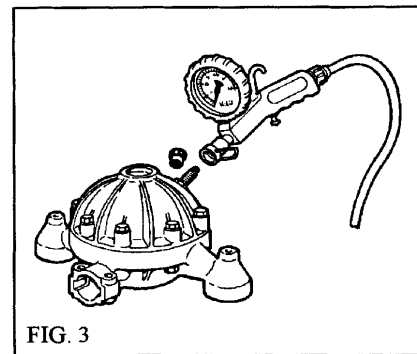


TABLE A

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

Start Up

1. Ensure the control valve is in the bypass position and any taps not being used are in the closed position. For details of the control valve operation you need to refer to the operation manual pertaining to the control valve that will be fitted to your pump.
Repeat this procedure each time the pump has been emptied of liquid ie. Run dry.
2. Bring the pump to operating speed of between 400 and 540 Rpm.
3. Switch off the bypass and bring the pump to operating pressure for the particular application using the pressure regulator.
4. Check the oil level during the first hours of operation and top up if necessary.

Shutdown

Flush the pump after use by running clean water for a few minutes
If there is a risk of freezing run the pump dry for a few minutes to remove all liquid from the pump.

Maintenance

- ▲ Disconnect the tractor PTO or power supply before performing any operation on the pump.

Oil

The level and condition of oil should be frequently checked (eg. each time the tank is filled) as it affects the operation of the pump and the condition and life of the diaphragm. It is advised to replace the oil every 300 hours of work or annually, whichever occurs first and at anytime the diaphragms are replaced.

Oil Level

When the pump is stationary the oil level must correspond to the reference indicator found on the oil sight glass (fig 2) or oil level cap (fig 1) depending on the type of pump. The oil level may vary when the diaphragm pump is working: As the pump is started the oil level will initially drop and then return to functioning level when the liquid begins to pump.

During operation pay attention to any drop in the oil level:

a) If this happens during the first few hours of operation it is normal and it is sufficient to top up with SAE 20W/30 type oil as in fig. 1. For pumps BP 60/20 and P48 where the oil sight glass is not present, remove the pressure accumulator assembly (fig 3). When remounting the manifold tighten the connecting plate screws to a torque of 17 Nm

b) If this happens after many hours of operation and continues after 1 or 2 top ups, it is a symptom of diaphragm swelling caused by restricted suction (dirty filter, collapsed suction hose or chemical attack to diaphragm). In this case check the filter and suction system and/or refer to your Silvan dealer to check the diaphragm.

Diaphragm Failure

If the oil becomes white (water present in oil), it may be a symptom of breakage of one or more diaphragms. It is necessary to stop work and inspect the condition of the diaphragms. If broken, it is necessary to replace the complete set.

Continued use with water in the oil will cause serious damage to internal parts of the pump. If it is not possible to replace broken diaphragms within one day of failure, empty

the crankcase of water and pour in oil or diesel oil to stop rust from forming on the internal components.

Suction

The suction system must be inspected to ensure:

1. There are no suction air leaks. Check for entry of air caused by:

- entry of air caused by hose wear;
- loose fittings;
- worn joints;

2. There are no small leaks or drips when the pump is stationary. If this occurs it means air will enter the pump when in operation.

3. The filter is be kept clean with frequent inspections (after every tank load) especially if powder based products are used.

Pump Mounting

Periodically check, especially when there is vibration during use that the pump mounting bolts on the machine frame are tightened and if necessary re-tighten.

Pressure Accumulator

Check the inflation of the pressure accumulator, if fitted, according to Table A especially if there are vibrations on the delivery hose and/or the pressure gauge.

Freezing Conditions

If frosts or freezing conditions are likely to occur then drain all water from the pump to ensure the pump is not damaged by freezing water expanding inside the pump.

Diaphragm Replacement

At the end of every season it is advised to check the condition of the diaphragms and replace if worn or distorted. If the pump heads and/or diaphragms are removed the retaining bolts should re-tensioned according to the Silvan Torque Specifications chart.

Inlet and Outlet Valves

Periodically check (every 300 hours under normal working conditions) the condition of the inlet and outlet valves. The check must be more frequent if sandy liquid or abrasive liquids are used. They must also be carried out if changes of pressure, irregular functioning and strange noises are apparent.



Lubrication and Maintenance

Maintenance Program Chart

MAINTENANCE INTERVALS

OPERATION	Every 8 hours	Every 50 hours	Every 300 hours	End of Season
CHECK LEVEL OIL	X			
CHECK PRESSURE ACCUMULATOR		X		
CHECK SUCTION FITTINGS		X		
CHECK AND CLEAN SUCTION FILTER	X			
CHECK PUMP MOUNTING		X		
CHECK DIAPHRAGM				O
CHANGE OIL			O(1)	O(2)
CHECK INLET/OUTLET VALVES			O	
CHECK TIGHTENING OF PUMP BOLTS				O

Note: X operation to be carried out by the operator
 O operation to be carried out by specialised technician
 (1) Every 300 hours or annually, whichever occurs first.
 (2) To be carried out same at same time as diaphragm change

Trouble Shooting

<p>Pump does not prime</p> <ul style="list-style-type: none"> • No liquid in tank or not covering suction inlet. • Suction filter blocked. • Suction filter stop valve closed. • Suction filter bowl loose or missing O-ring. • Suction line loose allowing pump to suck air • Control lever not in by-pass position. • Pump valve springs broken or valves worn. <p>Pump does not reach correct pressure</p> <ul style="list-style-type: none"> • Pump not operating at full 540 rpm. • Suction filter blocked. • Suction filter stop valve partly closed • Pressure regulator not correctly adjusted • Pressure regulator valve and seats worn. • Pressure gauge faulty • Pump diaphragms ruptured (pump oil grey or milky). 	<ul style="list-style-type: none"> • Worn nozzles or capacity of nozzles greater than capacity of the pump. • Worn pump inlet / outlet valves <p>Pump and hoses vibrating.</p> <ul style="list-style-type: none"> • Pump surge chamber pressure incorrectly adjusted or surge diaphragm ruptured. • 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. <p>Water in Oil</p> <ul style="list-style-type: none"> • Broken diaphragms
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NOTES



NOTES

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