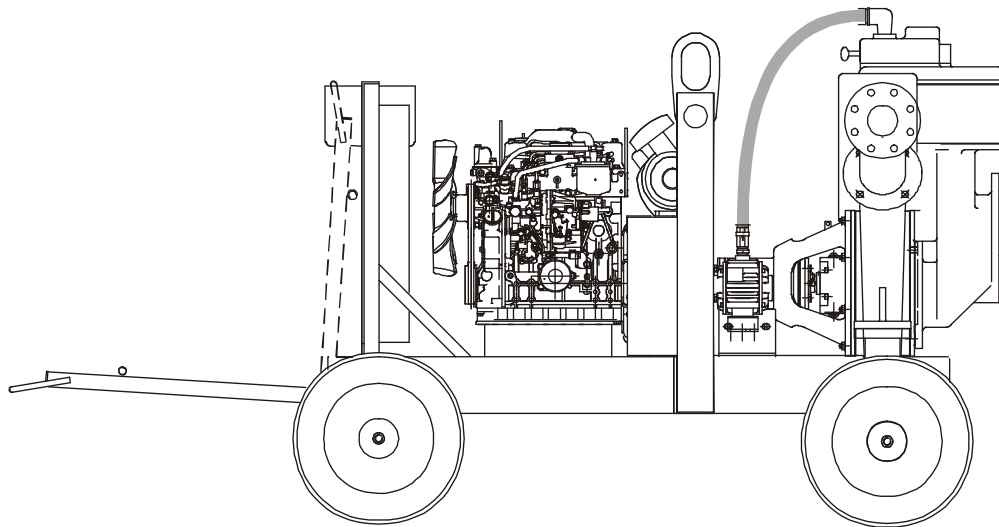


**AUTOPRIME
AL RANGE
DIESEL DRIVEN
MOBILE PUMPS**



SPP Pumps Limited Crucible Close Mushet Industrial Park Coleford, Glos ENGLAND GL16 8PS	Telephone: +44 (0)1594 832 701	Document No: W72-025E Revision No: 3 Revision Note No: Windchill
	Fax: +44 (0)1594 836 300	Date Issued: Aug 2012 Produced at SPP Pumps Limited, Coleford, England

We **SPP Pumps Limited**

Pump Model	Sound Level (dB)	
	Measured	Guaranteed LWA
AL100 & AL100M	103	106
AL150 & AL150M	103	106

Of Crucible Close
Mushet Industrial Park
Coleford, Glos
GL16 8PS
ENGLAND

2000/14/EC- Guaranteed sound power level.
The conformity assessment procedure followed was
in according with ANNEX V of the Directive

Declare that:

Equipment: **DIESEL DRIVEN CENTRIFUGAL PUMPS**
Model/Type: **AL100 & AL100M, AL150 & AL150M**
Serial Number: As shown on the Pump Nameplate

in accordance with the following Directives:

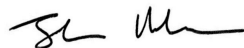
- 2004/108/EC** The Electromagnetic Compatibility Directive and its amending directives
- 2006/42/EC** The Machinery Directive and its amending directives
- 2000/14/EC** The Noise Emissions Directive and its amending directives

have been designed and manufactured to the following specifications:

- EN 809:1998+A1:2009** Pump and pump unit for liquids – common safety requirements
- EN 12162: 2001** Liquid pumps – Safety requirements – Procedure for hydrostatic testing.
- EN 292-2: 1991** Safety of Machinery- Basic concepts, general principles for design.
- EN 61000-6-4: 2001** Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environment.
- EN 61000-6-1: 2001** Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments.
- EN 3744: 1995** Acoustics- Determination of sound power levels of noise sources using sound pressure- Engineering method in an essentially free field over a reflecting plane

We hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The units comply with all essential requirements of the Directives

Signed:



Name: John Hollins

Position: Engineering Manager - Authorised to sign on behalf of SPP Pumps Limited
Mushet Industrial Park, Coleford, Gloucestershire, England, GL16 8PS

Date: August 2012

W72-025E

A copy of this certificate has been submitted to the European Commission and UK Authority

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1 INTRODUCTION

The purpose of this handbook is to provide operating guidelines and routine maintenance instructions for the **SPP AUTOPRIME AL Range** of mobile diesel engine driven pumps.

Instructions and statements contained within this handbook are given with our best intentions and are correct at the time of compilation. They are subject to alteration at any time.

These pumps are most commonly supplied mounted on 4 wheel site trailers but can also be supplied mounted on 2 wheel road trailers or skid mounted.

AL pumps are primed by a vacuum pump through a mechanical priming system and are driven by a water-cooled diesel engine.

The M series pumps are supplied with a high performance impeller.

This Handbook covers the following pumps:

AL100 and 100M – An automatic priming mobile pump driven by an Isuzu 3CD1 diesel engine mounted on a fuel tank chassis on site or road trailer or on a skid. This unit is fitted with 4" Bauer hose connections.

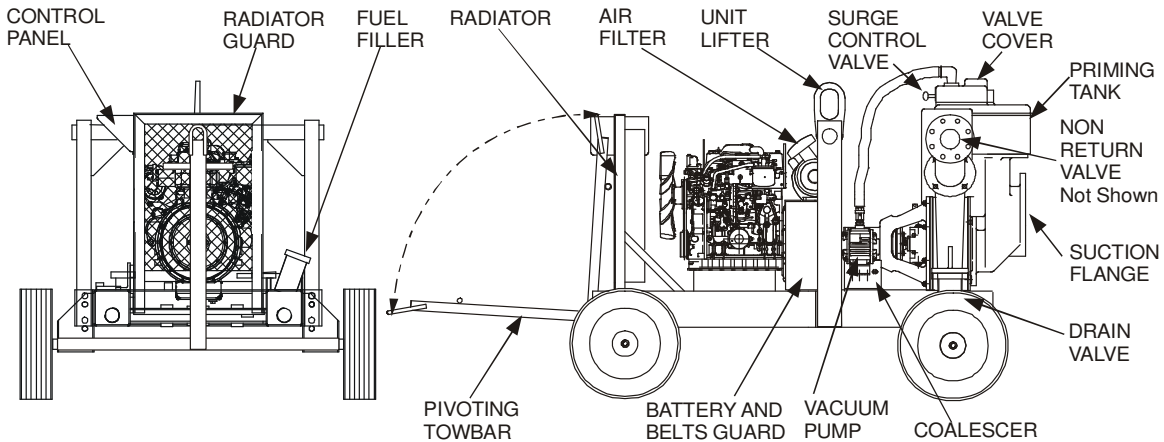
ACE150 and 150M – An automatic priming mobile pump driven by a Isuzu 4LE1 diesel engine mounted on a fuel tank chassis on site or road trailer or on a skid. This unit is fitted with 6" Bauer hose connections.

SERIAL NUMBER

The serial number plate is attached to the unit on the side of the priming tank.

This serial number must be quoted in any enquiry for spares or service.

Where required, a trailer registration plate is fitted to the front of the unit as required by local regulations and the VIN number is stamped on the fuel tank.



AL 100 & 150 MAIN COMPONENTS

	SPP Pumps Limited Reading, RG31 7SP ENGLAND			Type	
				Nett	kg
Tel: ++44(0)118 932 3123 Fax: ++44(0)118 932 3302		Serial No.			

AL RANGE NAMEPLATE

2 SAFETY PRECAUTIONS

2.1 Safety Symbols

Safety instructions within this manual are marked with the following symbols:



This symbol refers to general mechanical aspects of safety.



This symbol refers to electrical safety.

ATTENTION

This symbol gives warning of a hazard to the pump itself, which in turn could cause a risk to personal safety.

2.2 Pump Safety Precautions



ATTENTION

apply to all the following:-

1. Hot surfaces and moving parts are guarded to protect you. If these guards are removed for maintenance, they must be replaced before starting the pump.
2. Never insert anything into the pump casing whilst the pump is running with the suction and delivery hoses disconnected.
3. Collapsible hoses must not be used on the suction side of the pump
4. Where the standard Bauer connections are not used, use all pump flange holes to fit suction and delivery hose connections.
5. Do not lift with fork of fork lift truck under the fuel tank. Never lift with suction or delivery hoses attached. The increased weight of these items may cause lifting gear failure.
6. Always lift pump sets vertically by the lifting eye. Check the condition of the lifter bracket at regular intervals.
7. Check the type of liquid being pumped before working on pump ends. Residues could be hazardous to your health. If in doubt flush out with clean water before work commences.
8. Personnel working on the pump unit must always wear clean correctly fitting clothing and safety footwear. Clothing impregnated with oil or fuel can constitute a health hazard through prolonged contact with the skin and may also constitute a fire hazard.
9. Always allow adequate ventilation for diesel

engines. Be aware of fire risks from items such as exhaust pipes and silencers. Never place flammable items around the unit.

10. When working near to the pump or in a confined space with the pump running personal ear protection is recommended.

3 HANDLING & TRANSPORT

3.1 Lifting

The central lifting eye is designed for lifting only the pump unit as supplied by SPP Pumps Limited. Due to the additional weight of skid-mounted units, these may be fitted with alternative lifting points and fork-lift truck slots on the skid.



The central lifting eye is suitable only for vertical lifting and must not be used to pull the unit sideways.

1. Check the condition of the central lifting eye or bracket before use.
2. Do NOT use a lift truck with forks under the fuel tank and do NOT lift with the hoses attached.
3. Never allow the unit to be subject to a 'snatch' loading.
4. Control the unit while lifting to prevent swinging and keep personnel away from the area below the unit and the immediate area.

3.2 Road Trailer Version

There is provision for a lighting board to be fitted to the rear of the unit. Place the lighting board in the two brackets and insert pins to retain the lighting board in place.

3.3 Trailer or Wagon Carriage



Transportation on a trailer or wagon will require the unit to be roped or strapped down. On the road trailer mounted units, set the unit level with the front and rear prop stands lowered and clamped. Place ropes or straps over the chassis to hold the unit in place. Do NOT place ropes or straps over the engine or the pump unit and ensure that ropes or straps do not come into contact with controls, switches, taps or other vulnerable parts.

4. OPERATING INSTRUCTIONS




4.1 Starting

1. Read this the safety and operating instructions on the pump and in this handbook carefully.
2. Position the pump set on level ground and chock in place to prevent movement in use.
3. Connect suction and delivery hoses making sure that there are no sharp bends in the lines. Where the hoses pass over sharp edges or abrasive surfaces ensure that they are protected by suitable means to prevent chafing. Ensure that the suction hose end is fully submerged.

ATTENTION

7. Select and fit a strainer to the suction hose end with holes smaller than:

AL100 44mm Diameter
AL150 50mm Diameter

8. Ensure that the strainer and suction hose end is fully submerged.
10. Check for sufficient fuel using the fuel tank gauge.
11. Check for sufficient engine lubricating oil using the dipstick.
12. Check for sufficient engine coolant
13. Ensure the engine is cold and remove the radiator filler cap. The correct level is when coolant is just visible at the base of the filler neck.

14. Check that oil is present in the pump seal reservoir.

15. Ensure that the batteries are charged and ready for use.

16. Where fitted, ensure that the battery isolation switch is in the ON position.
17. Check the air filter monitor (LH below engine air cleaner). If reading is greater than 12" remove filter and clean.
18. Check coalescer oil level on the dipstick and ensure dipstick is fully tightened.
19. Ensure drain cocks in the discharge line and volute are closed.

4.2 Control Panel

AL100 and AL100M Control Panel



The AL100 control panel comprises:

- a) Four position key-switch (Off, 1, Heat, Start)
- c) An hours run meter.
- d) Eight warning indicator lamps (All are red except where shown)
 1. High engine temperature – Engine will shutdown on high engine temperature.
 2. Emergency Stop – Flashes and shutdown when circuit is broken.
 3. Spare.
 4. Preheat (Amber for 4 secs.) information only.
 5. On / off indicator (Green) – Flashes on shutdown.
 6. Battery Charge – Shutdown on loss of charging.
 7. Engine oil pressure – Shutdown on loss of oil pressure.
 8. Preheat (Amber for 16 secs.) information only.


AL150 and AL150M Control Panel



The AL150 panel comprises:

- a) Four position key-switch (Off, 1, Heat, Start)
- c) An hours run meter.

- d) Five warning indicator lamps
- 1 On / off indicator
 - 2 Engine oil pressure
 - 3 High engine temperature
 - 4 Not Used
 - 5 No Charge

 1 Turn the ignition switch to the '1' position. The 'ON' indicator will show green and all warning lights will flash, indicating that all circuits are healthy.

2 Switch **OFF**.

3 Turn the key-switch directly to the 'Heat' position and hold for 6 to 10 seconds. Note that the timer will cut out the heater after 16 seconds.

4 Turn the key-switch on to the 'START' position for a maximum of 16 seconds. Release the key switch once the engine has fired and is running.

5 If the engine fails to start, wait 20 seconds and repeat steps 5 and 6.

4.3 After Starting

The pump will prime automatically once the suction hose is submerged.

4.4 Stopping

1. Turn the key-switch to the 'OFF' position. The unit will stop and the key can be removed.
2. Open the discharge cock to drain the discharge line. Close after draining is complete.
3. Open the volute cock to drain the volute. Close after draining is complete.
4. Remove the key to prevent unauthorised use.

4.5 Emergency Stop (Where fitted)

1. While the pump is running, if the pump has to be stopped quickly, an emergency stop button may be provided. When pressed the engine and pump will stop.
2. To reset the emergency stop, turn off the key-switch and turn the emergency stop button to release it. The pump is now ready

for starting again.

4.6 Battery Isolation Switch (Where fitted)

1. A battery isolation switch may be specified for additional security and for ease of maintenance. This is located adjacent to the control panel.
2. When the unit is to be stored or is not required for immediate use, turn the isolating switch to the OFF position.
3. When the pump is required for use turn the battery isolation switch to the ON position.

5. Problem Solving by Operator



In all the cases below, **STOP** the pump before attempting to correct the problem.

5.1 Engine running but not pumping:

Check suction pipe for leaks, ensure all hose fittings are air tight.

Check for blockage of the strainer, and clear any debris.

Check for damage to the suction hose both externally and internally, replace damaged hose.

5.2 Pumping reduced with surging:

Check that the impeller is clear of debris and remove debris, if present.

Check the non-return valve is clear.

5.3 Pump fails to prime after starting:

Check suction hoses for leaks and ensure all hose fittings are air tight.

Check that volute drain cock is closed.

Check that the non-return valve is free of debris and can seal when closed.

5.4 Engine stops:

Check engine fuel level, and refuel if necessary.

Check warning indicator lamps and correct any faults indicated.

6. PUMP MAINTENANCE CHART

For engine maintenance periods refer to the engine operators handbook supplied with this manual.

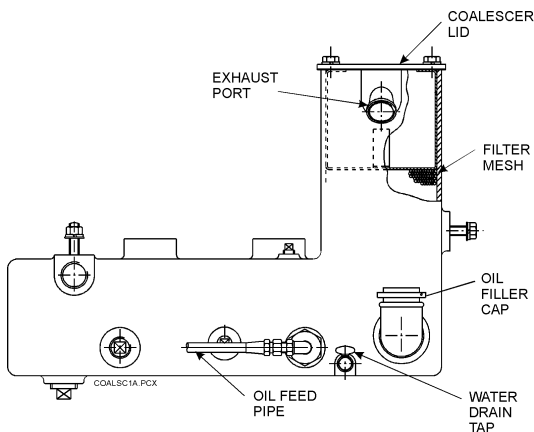
PERIOD	TASK
Daily	Visually check for leaks and vibrations Check for vibration. Check the mechanical seal oil level and top up as required. Drain any water from coalescer, check oil level and top up as required
Weekly or 100 hrs	Check all fastener security. Check the condition of the lifter bracket/frame and check the security of attachment to the unit. Check tension of vacuum pump drive belt.
Monthly or 500 hrs	Change coalescer sump oil Clean coalescer sump oil filter mesh Remove front cover and check pump internals for wear Check valve gear - clean or renew standard filter element. Check high capacity filter element. Grease the pump bearings
6 monthly or 1500 hrs	Check reflux ball is sealing on its seat. Check and if necessary renew vacuum pump drive belt. Dismantle and clean valve gear, tank, connecting pipes and priming tank. Change mechanical seal oil.
Annually or 6000 hrs	Check vacuum pump blade condition Check bearing condition Renew coalescer filter mesh

The above schedule is given for guidance but site operating conditions may override the suggested maintenance intervals

7. MAINTENANCE INSTRUCTIONS

7.1 Coalescer Maintenance

1. Check the oil level in the coalescer tank and drain any water daily. The top of the oil should be level with the underside of the filler cap. Water is removed by means of the drain tap fitted to the side of the coalescer sump.



Coalescer detail

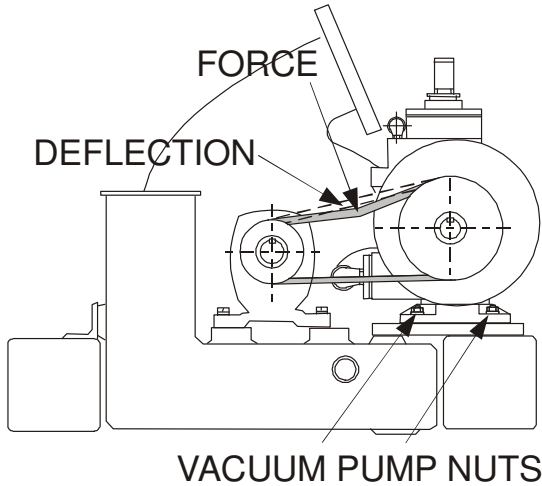
2. The filter mesh is accessed by removing the coalescer lid and must be cleaned regularly by washing in petrol or a similar spirit. When refitting ensure filter mesh is below exhaust port. The oil feed pipe should be cleaned in a similar manner and blown through with an air line.

7.2 Mechanical Seal Oil Reservoir

Maintain the oil level between the maximum and minimum levels marked on the dipstick.

7.3 Drive Belt Adjustment

1. Remove the drive belt guard.
2. Slacken the nuts that secure the vacuum pump, move the vacuum pump to give the required belt tension and tighten the nuts. Check the tension again and readjust, if necessary.
3. V Belt tension is correct when the deflection is 4mm with a force of 1.5kg applied at the centre of top run.



Belt Tensioning

Note: DO NOT OVERTIGHTEN BELTS UNDER ANY CIRCUMSTANCES.

7.4 Mechanical Seals

1. Ensure that the coolant/lubricant level is maintained. It is imperative that the seals are never run dry. Immediate seal failure will result.
2. Any contamination of the fluid should be investigated immediately. Should a large loss of fluid be experienced then the pump must be stopped immediately.
3. Replacement of the seals is considered a workshop operation where higher standards of cleanliness can be maintained and the specialised tooling required is more readily available.

7.5 Non-Return Valve

1. A ball type non-return valve is fitted to the pump discharge.
2. The ball should be regularly checked for freedom of movement and absence of debris by inspection through the discharge.
3. The correct seating of the ball can be checked through the delivery flange of the valve body. The valve body should be removed to check the seat for damage or wear.

7.6 Pump Bearings

1. The pump ends employ grease lubricated bearings which will give long service life provided they are:-
 - a) Correctly lubricated at regular intervals
 - b) Cleaned and, if removed, refitted with care
 - c) Serviced with clean tools and in a clean area.
2. The early stages of bearing failure can be detected by noting either unusual vibration,

bearing housing temperature rise or unduly noisy operation. If any of these signs are notice, the pump should be stopped and the cause investigated.

3. Greased bearings are pre-packed with lubricant during pump manufacture. Shrinkage and normal loss of grease necessitates re-lubrication at regular intervals. These intervals will largely be determined by site conditions. The recommendations given below are therefore for guidance only.

Radial Bearing Non drive end (NDE)	Radial & Thrust Bearing Drive end (DE)
4 months 3000 hrs	4 weeks 750 hrs

4. The table is based on running speeds of 1450rpm with a bearing temperature not exceeding 70°C. Reduce the interval by half for every 15°C above 70°C.
5. Clean both the grease fittings and grease gun nozzle before use. For a hand grease gun apply 2 or 3 strokes to each nipple.
6. Overfilling can be as harmful to bearings as under-lubrication. Compaction of grease leads to it being churned by the rolling action of the bearings. This leads to overheating, breakdown of the lubricant and bearing failure.
7. Immediately after re-lubrication it is normal for the temperature of the bearing housing to rise in service. The temperature should soon drop to normal after a short period of running. If the temperature remains elevated or continues to rise, temporarily remove the grease nipples and allow any excess grease to escape.

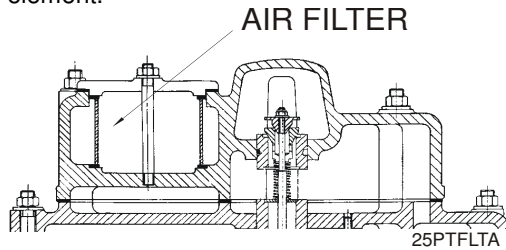
7.7 Vacuum Pump

Vacuum pump overhaul is beyond the scope of this manual. Should the vacuum pump be suspect then it is recommended that an exchange unit is fitted and the suspect unit returned to the manufacturers for examination.

7.8 Standard Vacuum Pump Air Filter

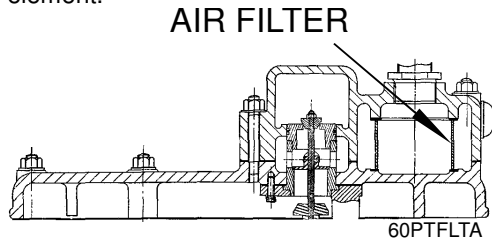
Standard air filters are located in the valve cover of the primary tank and should be checked regularly for cleanliness, distortion or damage (see Figure 7-5, Figure 7-6, Figure 7-7). Replace if distorted or damaged

Remove the four screws holding the filter cover and remove to expose the air filter element.



Air filter 25cfm units

Undo the central nut holding the air filter cover and remove to expose the filter element.

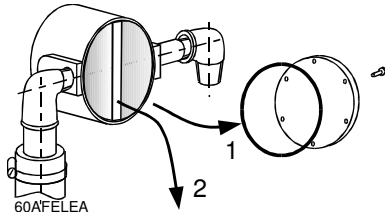


Air filter 60cfm units

Undo the six nuts holding the top cover and remove the top cover complete to expose the air filter element.

7.9 High Capacity Air Filter

25cfm and 60cfm vacuum pumps have the option of a high capacity air filter which is located externally as shown in Figure 7-8. The high capacity filter is fitted in lieu of the standard element.



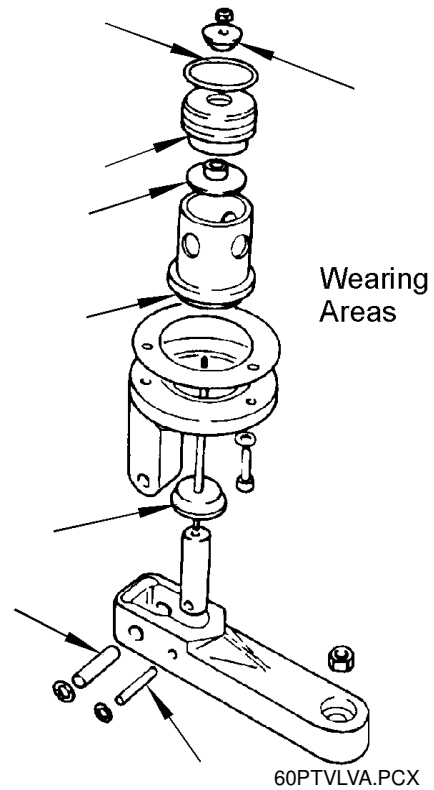
High capacity air filter

Undo the screws holding the retaining cover and remove (1) the cover to inspect the filter. The element pulls out (2). Note that the orientation of the unit should be as shown so that any debris from the filter falls away from the outlet connection when the unit is opened. It can then be easily swept out with little chance of it entering the outlet. Replace the cover O ring when the filter is changed.

7.10 Valve Gear

The main valve assembly is shown below. The areas arrowed should be checked regularly for wear or damage. Worn parts

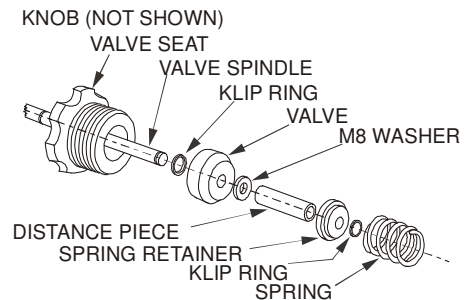
should be replaced. The main valve is located on the underside of the top cover.



25 & 60cfm main valve assembly

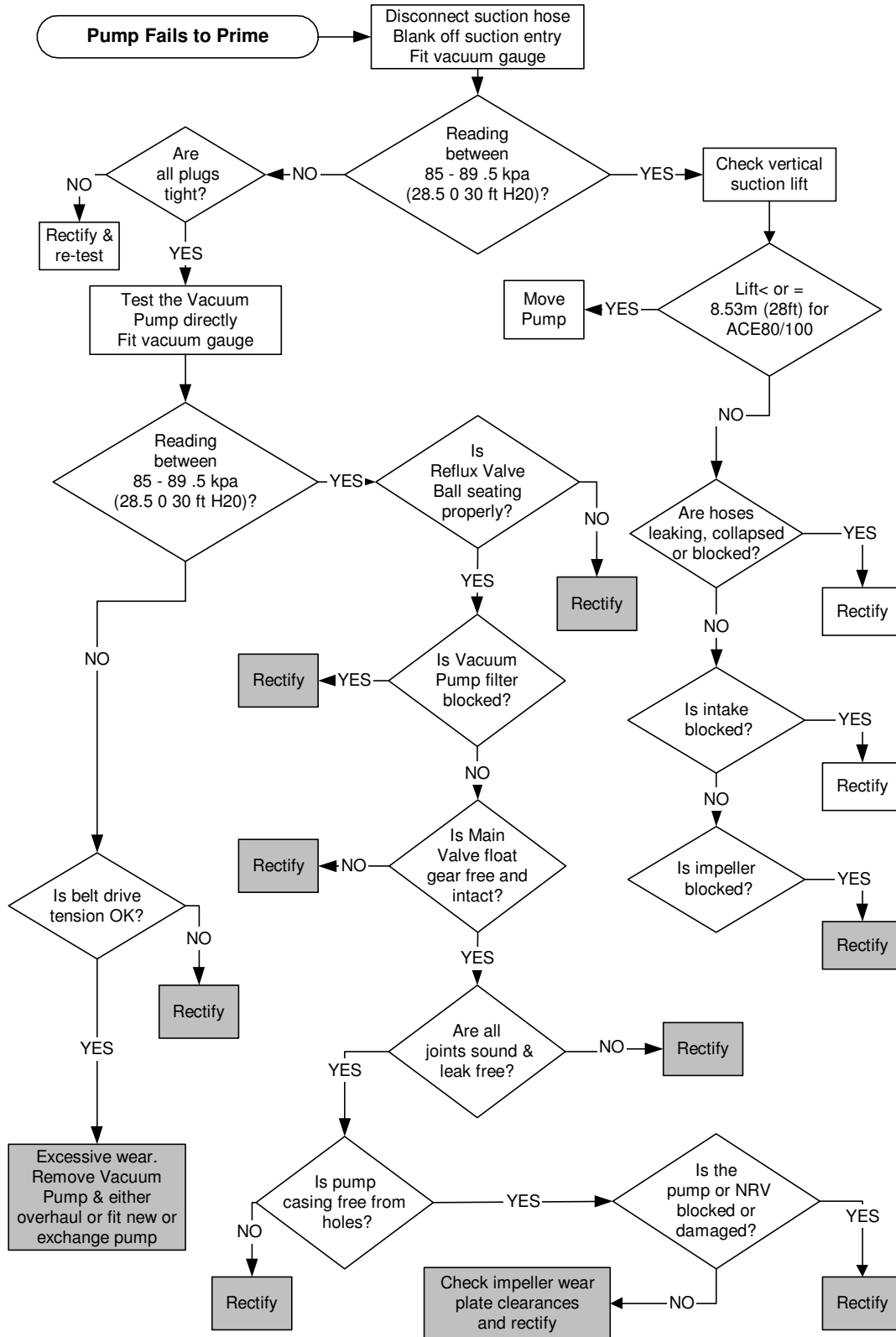
7.11 Surge Control Valve

On 25 and 60cfm priming tanks a surge control valve is fitted. This should be checked regularly for signs of wear or damage. Components arrowed in the figure below are vulnerable to wear and should be replaced if worn excessively. The valve seat should be greased to prevent seizure.



Surge Control Valve Assembly

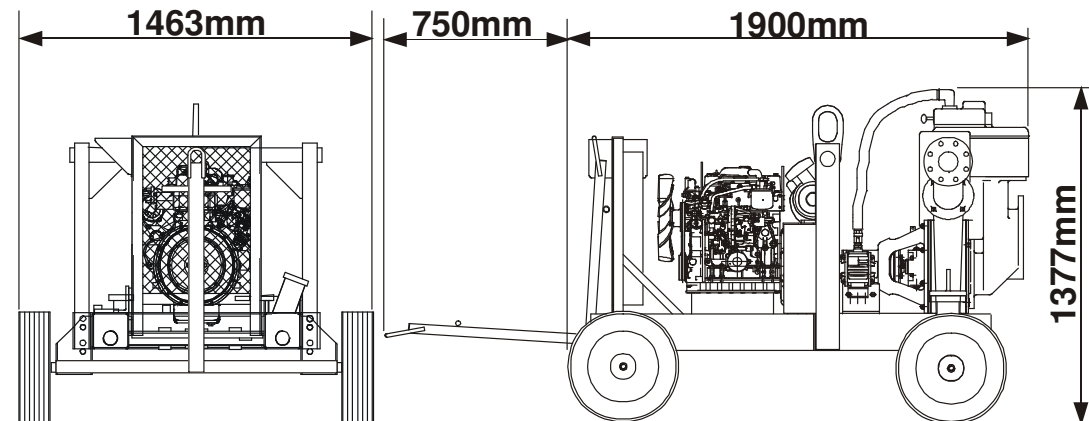
8. FAULT FINDING GUIDE



ACE80-100 Fault Finding Chart

9. TECHNICAL DATA

CHARACTERISTICS		AL100 & AL100M	AL150 & AL150M
Vacuum Pump		25 cfm	60 cfm
Solids Handling Capability		44mm Dia.	50mm Dia.
Engine Type		Isuzu 3CD1 Water cooled	Isuzu 4LE1 Water cooled
Fuel Tank Capacity		76 Litres	
Approx. Running Time On Full Tank		22 Hours	
Impeller Back Plate Clearance		0.30 to 0.60 mm	0.012 to 0.024"
Impeller Front Plate Clearance		0.40 to 0.60 mm	0.015 - 0.024"
Mechanical Seal Coolant/Lubricant		Mobil Velocite Oil No. 6, Texaco Rando HD10 Or equivalent	
Bearing Lubricant		Grease: Texaco Multifak All Purpose EP2 or equivalent to DIN 51825: KP2\K-30	
Vacuum Pump Oil	above 30°C	Texaco Regular Motor oil 30 or equivalents conforming to API CC 5F, CCMC G2.D1, MIL-L-2104B or MIL-L-46152B *	
	below 30°C	Texaco Ursatex 10W-30 or equivalents conforming to API CC 5F, CCMC G2.D1, MIL-L-2104B or MIL-L-46152B *	
Weight Dry (No fuel in tank)		900 Kg	
Weight (With full fuel tank)		970 Kg	



AL100 & 100M OVERALL DIMENSIONS

Note - These dimensions are approximate and may vary to suit the selected customer options.

10. SPARES & SERVICE

SPP Pumps operate a comprehensive Spares and Service support network throughout the world, and can be contacted as follows:

SPARES & SERVICE

For spare parts, supply only.

For breakdowns, spare parts and on-site fitting, pump installation and commissioning, and service contracts.

For breakdowns outside office hours.

Spares & Service Office

SPP Pumps Limited

Theale Cross

Reading, Berkshire

RG31 7SP

ENGLAND

Telephone:

+44 (0)1189 323 123

Ask for -

Spares Dept.

Ask for -

Service Dept.

Telephone :

+44 (0)1189 323 123

General Fax line:

+44 (0)1189 323 302

Direct Fax line:

+44 (0)1189 303 259

Copies of this manual are available from the SPP Pumps Limited Spares & Service Department by quoting the manual reference number and the relevant revision number.

11. ENGINE OPERATORS HANDBOOK

The specific engine operator's handbook from the manufacturer is included within the pump documentation pack.