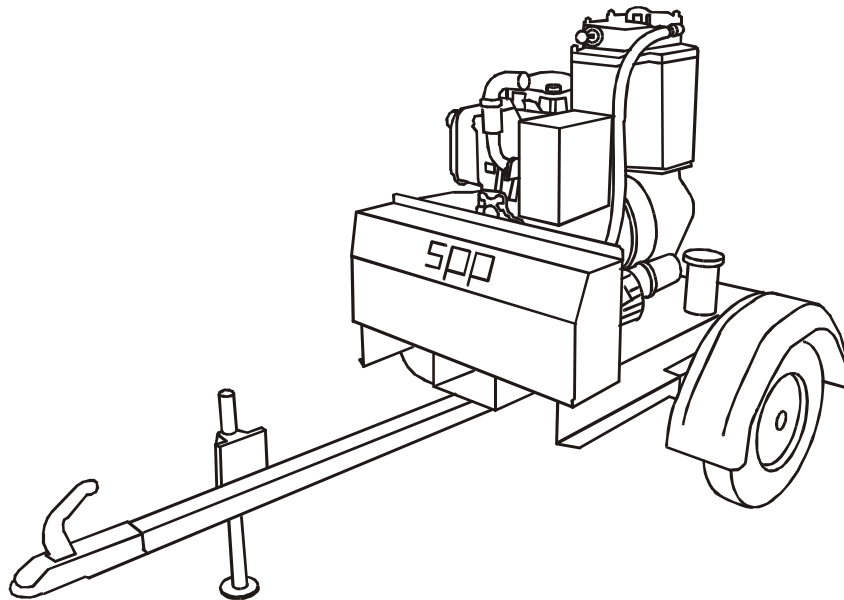


**AUTOPRIME  
ACE RANGE  
DIESEL DRIVEN  
MOBILE PUMPS**



<p>SPP Pumps Limited Crucible Close Mushet Industrial Park Coleford, Glos ENGLAND GL16 8PS</p>	<p>Telephone: <b>++44(0) 1594 832701</b></p>	<p>Document No: W72-019E Revision No: 4 Revision Note No: R 39552</p>
	<p>Fax: <b>++44(0) 1594 836300</b></p>	<p>Date Issued. August 2012 Produced at SPP Pumps Limited, Coleford, England</p>

We **SPP Pumps Limited**

Pump Model	Sound Level (dB)	
	Measured	Guaranteed LWA
ACE80	106	109
ACE100	106	109

Of Crucible Close  
Mushet Industrial Park  
Coleford  
Gloucestershire  
England  
GL16 8PS

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

Declare that:

Equipment: **MOBILE DIESEL DRIVEN CENTRIFUGAL PUMPS**  
Model/Type: **ACE80 & ACE100**  
Serial Number: As shown on the Pump Nameplate

in accordance with the following Directives:

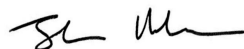
- 2004/108/EC** The Electromagnetic Compatibility Directive and its amending directives
- 2006/42/EC** The Machinery Directive and its amending directives
- 2000/14/EC** The Noise Emissions Directive and its amending directives

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: 12 February 2010

**W72-019E**

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 ACE 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 2 wheel road trailers but can also be supplied skid mounted, or as a pump unit for customer's to mount on a suitable chassis or foundations.

ACE pumps are primed by a 25cfm vacuum pump and are driven by a close coupled, air-cooled diesel engine.

This Handbook covers the following pumps:

**ACE80** – An automatic priming mobile pump driven by a Hatz 1D90 diesel engine mounted on a fuel tank and road trailer or skid. This unit is fitted with 3" Bauer hose connections.

**ACE100** – An automatic priming mobile pump driven by a Hatz 1D90 diesel engine mounted on a fuel tank and road trailer or skid. This unit is fitted with 4" Bauer hose connections.

## 2. SERIAL NUMBER

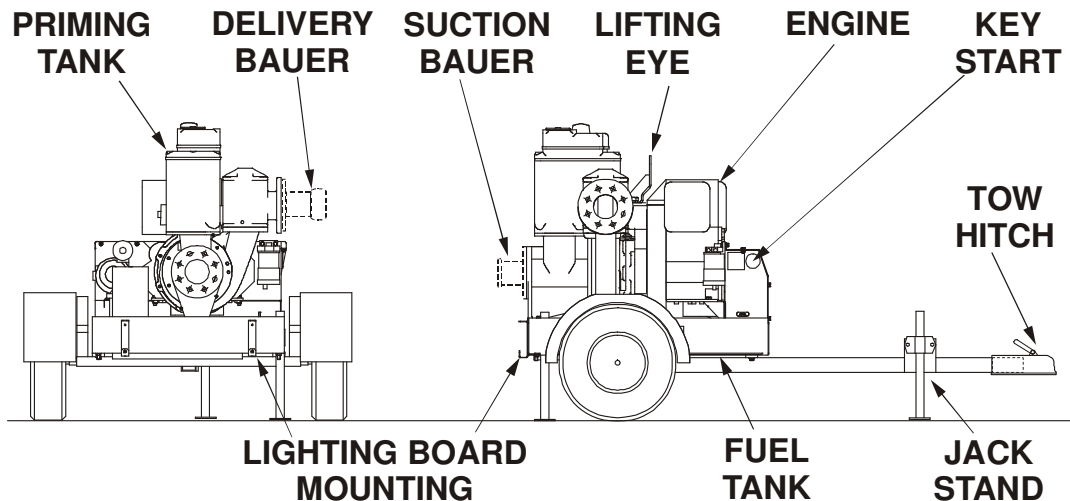
The serial number plate is attached to the unit on the side of the priming tank.

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.

	<b>SPP Pumps Limited</b>	
	Crucible Close, Musher Industrial Park, Coleford, Gloucestershire, ENGLAND, GL16 8PS	
	Tel: +44(0)1594 832701	
	Fax: +44(0)1594 836300	
		Year
		Weight kg
	Serial No.	

ACE Range Pump Components



### 3. SAFETY PRECAUTIONS

#### 3.1 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.

#### 3.2 Pump Safety Precautions



**ATTENTION**

apply to all the following:-

- 2.2.1 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.
- 2.2.2 Never insert anything into the pump casing whilst the pump is running with the suction and delivery hoses disconnected.
- 2.2.3 Collapsible hoses must not be used on the suction side of the pump
- 2.2.4 Where the standard Bauer connections are not used, use all pump flange holes to fit suction and delivery hose connections.
- 2.2.5 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.
- 2.2.6 Always lift pump sets vertically by the lifting eye. Check the condition of the lifter bracket at regular intervals.
- 2.2.7 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.
- 2.2.8 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.
- 2.2.9 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.

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

### 4. HANDLING & TRANSPORT

#### 4.1 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.**

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

#### 4.2 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.

#### 4.3 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.

## 5. OPERATING INSTRUCTIONS

### 5.1 Before Starting

- 5.1.1 Read this Handbook carefully.
- 5.1.2 Level the unit and jack or chock to prevent movement in use.
- 5.1.3 Check the engine fuel and lubricating oil levels. Top up as necessary.
- 5.1.4 Check the mechanical seal oil level using the dipstick fitted to the filler plug.
- 5.1.5 Check the vacuum pump drive belt is correctly tensioned.
- 5.1.6 Starting:- Ensure that the battery is charged and ready for use.
- 5.1.7 Check that air inlets are unobstructed and that the cylinder vanes are free from debris.
- 5.1.8 Check that the discharge non-return valve is seating properly and that there is no debris in the ball chamber that may prevent correct operation.
- 5.1.9 Select and fit a suitable strainer for the job in hand. Note that most 'off the shelf' strainers are for general purpose use. As such they may not protect the pump against oversize solids. For applications where stones, etc., may be drawn in, then a strainer with holes slightly smaller than the pump handling capacity must be employed. Refer to the Technical Data section for details.
- 5.1.10 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.
- 5.1.11 Check that the surge control valve is fully screwed in. This is the large indented nut surrounding the surge control valve knob on the top of the priming tank.

### 5.2 Starting

- 5.2.1 Read the manufacturer's instructions for the Hatz engine in conjunction with the following:
- 5.2.2 Push the decompressor lever(s) to the 'Run' position.
- 5.2.3 Turn the keyswitch to the 'Start' position
- 5.2.4 Release the keyswitch once the engine has fired and got away.

### 5.3 After Starting

- 5.3.1 The pump will prime automatically once the suction hose is submerged. If the pump fails to prime refer to the fault finding guide. (Section 8)
- 5.3.2 If the pump continually snores, gradually release the surge control valve until the vibrations reduce.

### 5.4 Stopping

- 5.4.1 Read the manufacturer's instructions for the Hatz engine in conjunction with the following:-
- 5.4.2 Turn the keyswitch to the 'Off' position.
- 5.4.3 Open the volute cock to drain the volute. Close after draining is complete. This must be done before removing the suction and delivery hoses.
- 5.4.4 When you take the pipes off there is a chance that there will still be water in the pipes so caution is advised.

## 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. Check for vibration. Check the mechanical seal 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.
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

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

## 7. MAINTENANCE INSTRUCTIONS

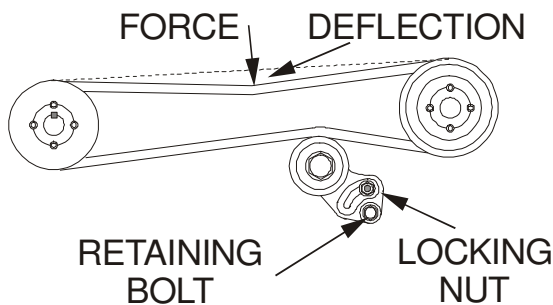
### 7.1 Mechanical Seal Oil Reservoir

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

### 7.2 Drive Belt Adjustment

7.2.1 Remove guard.

7.2.2 Slacken the locking nut and the retaining bolt, rotate the tensioner to adjust the tension of the belt. Tighten the locking nut and the retaining bolt and check the tension thus:



Belt Tensioning

7.2.3 V Belt tension is correct when the deflection is 4mm with a force of 1.5kg applied at the centre of the longest run.

**Note: DO NOT OVERTIGHTEN BELTS UNDER ANY CIRCUMSTANCES.**

### 7.3 Mechanical Seals

7.3.1 Ensure that the coolant/lubricant level is maintained. It is imperative that the seals

are never run dry. Immediate seal failure will result.

7.3.2 Any contamination of the fluid should be investigated immediately. Should a large loss of fluid be experienced then the pump must be stopped immediately.

7.3.3 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.

### 7.4 Mechanical Seal Removal

7.4.1 Remove the Tee piece and priming tank, place oil tray under mechanical seal oil drain plug to drain oil.

7.4.2 Remove the non-return valve and volute to access the impeller. Unscrew impeller anti-clockwise with the aid of a mallet until undone, note the number of shims fitted behind and retain for reuse.

7.4.3 Once the impeller is removed, remove the rotating part of the primary mechanical seal and remove rear wear plate. Then press the seat out of the back wearplate.

7.4.4 Remove the circlip and washer off the shaft. Then remove the secondary mechanical seal and engine adaptor plate. Then press out the seat.

7.4.5 Check the condition of the 'O'-rings and replace if necessary.

### 7.5 Mechanical Seal Assembly

- 7.5.1 Assemble the engine adaptor plate on to the engine and press the stationary seat in to the plate ensuring not to damage the face. Replace the rotating part of the seal preferably with SPP tool no 22743 and push it up until the circlip groove is exposed behind the seal. Replace the circlip washer and circlip and ensure the mechanical seal is securely in place and against the washer.
- 7.5.2 Assemble the back wear plate onto the engine adaptor and press the mechanical seal seat into the wear plate. Replace the rotating part of the seal so that the faces meet. Assemble the impeller with the reused shims and tap with a mallet to tighten.
- 7.5.3 Assemble the non-return valve and volute. Ensure that the impeller still moves without touching the wearplate. Measure the clearance between the wearplates and the impeller and if they do not fall within the range specified in the table in Section 9, then shim as necessary to avoid loss of efficiency.
- 7.5.4 Replace the Tee piece and priming tank and tighten mechanical seal oil plug. Add oil as indicated on dipstick

### 7.6 Non-Return Valve

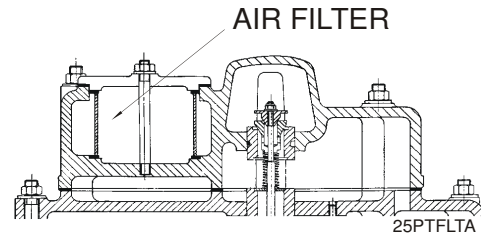
- 7.6.1 A ball type non-return valve is fitted to the pump discharge.
- 7.6.2 The ball should be regularly checked for freedom of movement and absence of debris by inspection through the discharge.
- 7.6.3 The correct seating of the ball can be checked through the delivery flange of the valve body. The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

### 7.7 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 Vacuum Pump Air Filter

- 7.7.1 Air filters are located in the valve cover of the primary tank and should be checked regularly for cleanliness, distortion or damage see the figure below. Replace if distorted or damaged.

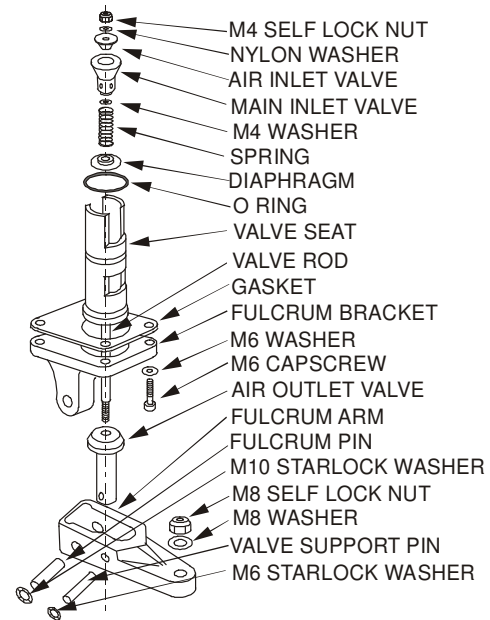


Air Filter Location

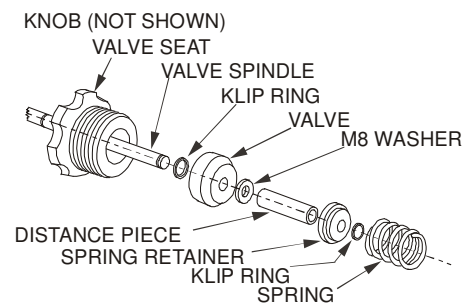
- 7.7.2 To remove the air filter undo the central nut holding the air filter cover and remove to expose the filter element.

### 7.9 Valve Gear

The valve assemblies are shown below. The valves, seats and pins 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.



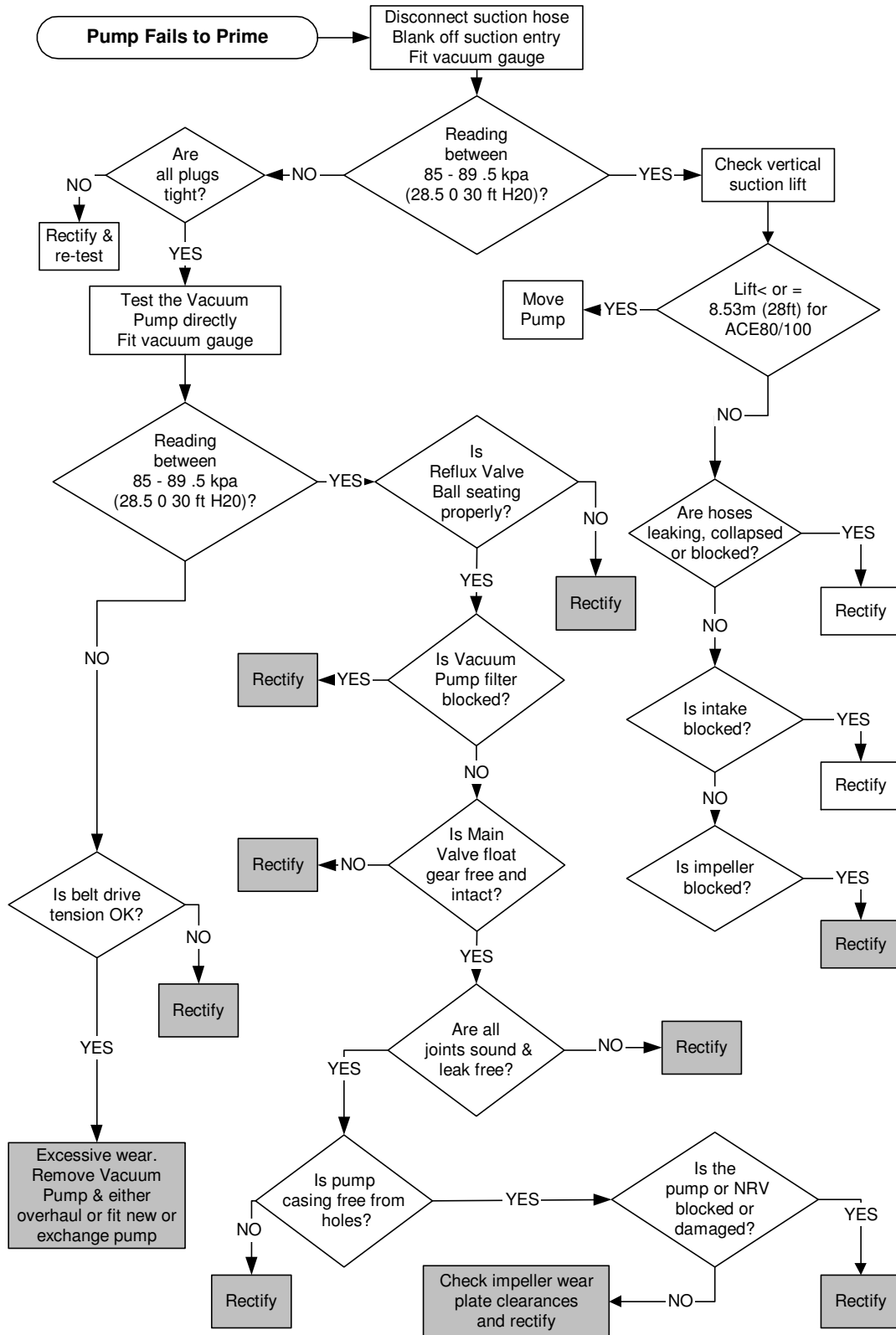
Main Valve Assembly



Surge Control Valve Assembly



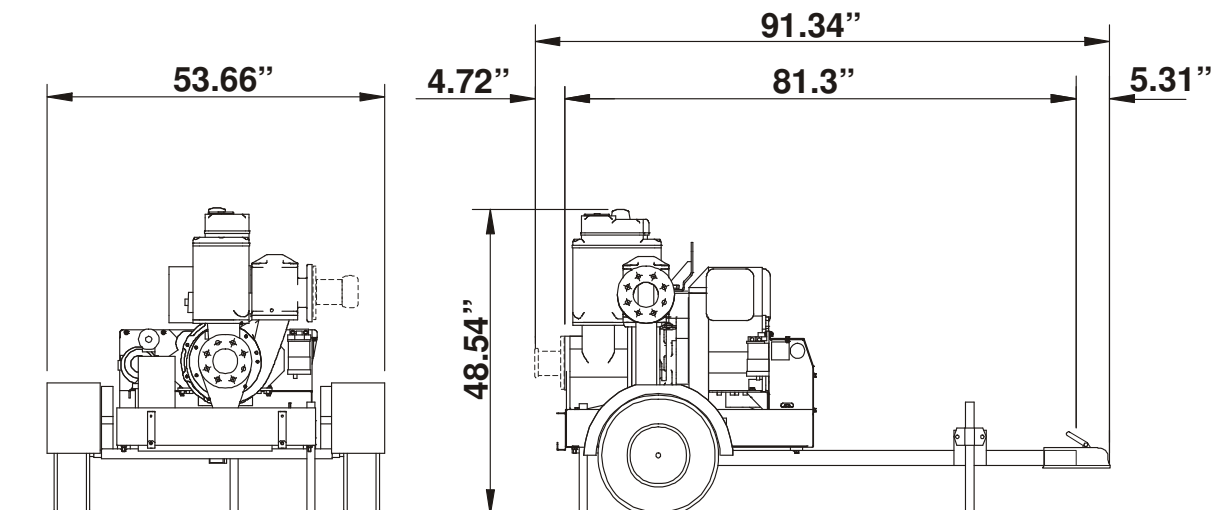
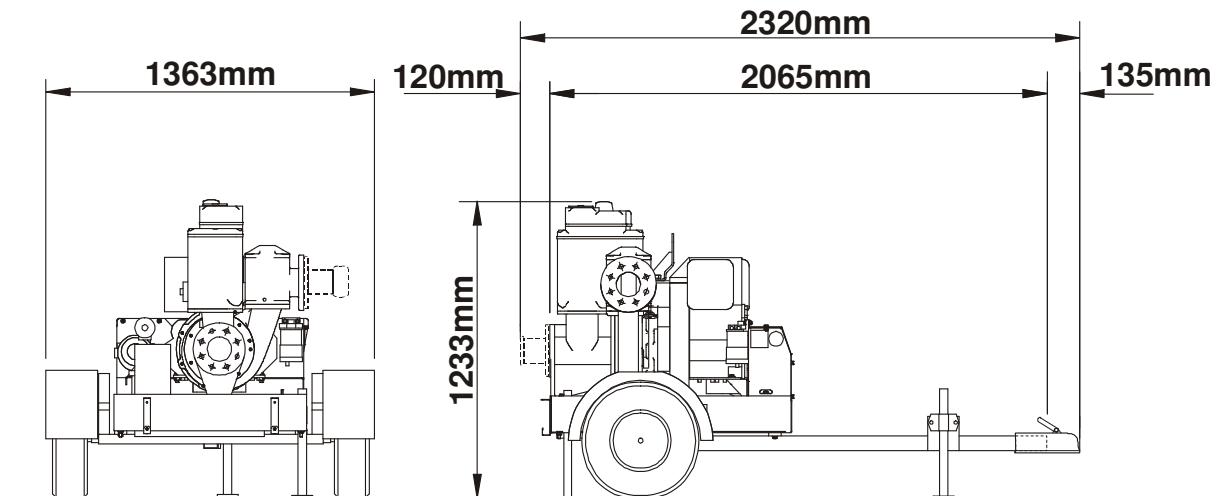
## 8. FAULT FINDING GUIDE



ACE80-100 Fault Finding Chart

## 9. TECHNICAL DATA

CHARACTERISTICS	ACE80/100	ACE80/100
Vacuum Pump	25 ft <sup>3</sup> /min	25 ft <sup>3</sup> /min
Solids Handling Capability	40 mm Diameter	1.5" Diameter
Engine Type	Hatz 1D90 Air cooled	Hatz 1D90 Air cooled
Fuel Tank Capacity	55 Litres	14.5 Gal (US)
Approx. Running Time On Full Tank	24 Hours	24 Hours
Impeller Back Plate Clearance	0.5 - 1.5mm	0.019 - 0.059"
Impeller Front Plate Clearance	0.38 - 0.5mm	0.015 - 0.019"
Mechanical Seal Coolant/Lubricant	Mobil Velocite Oil No. 6, Texaco Rando HD10 Or equivalent	
Weight Dry (No fuel in tank)	420 Kg	925 lbs
Weight (With full fuel tank)	470 Kg	1036 lbs
Hitch Weight Dry	32 Kg	70 lbs
Towing Hitch Types	Towing Eye or Ball Hitch	
Flange Drilling	PN16 is standard, ANSI flange drilling is optional	



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:

<b>SPARES &amp; SERVICE</b>	<b>Telephone:</b>	<b>**44 (0) 1189 323123</b>
<i>For spare parts, supply only.</i>	Ask for -	<b>Spares Dept.</b>
<i>For breakdowns, spare parts and on-site fitting, pump installation and commissioning, and service contracts.</i>	Ask for -	<b>Service Dept.</b>
<i>For breakdowns outside office hours.</i>	Telephone :	<b>**44 (0) 1491 201613</b>
Spares & Service Office SPP Pumps Limited 1420 Lakeview Arlington Business Park Reading, Berkshire RG7 4SA ENGLAND	General Fax line:	<b>**44 (0) 1189 323302</b>
	Direct Fax line:	<b>**44 (0) 1189 303259</b>

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.

### ENGINE OPERATORS HANDBOOK

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

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*Your Local Supplier's contact details may be shown here:*