

AJAX

PUMPS

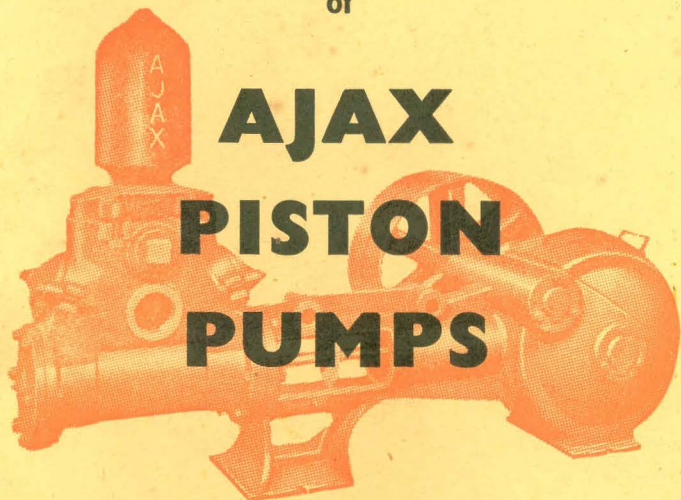
FOR ALL
PURPOSES

McPherson's
Limited

MELBOURNE SYDNEY BRISBANE ADELAIDE PERTH

A. E. KEATING PTY. LTD.
MELBOURNE

Installation, Operation and
Maintenance Instructions
and
SPARE PARTS LIST
of



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PISTON
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LOCATION:

Instal the pump as near the source of supply as possible. Never exceed the recommended distance and height from the lowest level of the source of supply. A dry place should be chosen for the installation of a motor driven unit. Allow sufficient space in front of the pump for withdrawing the plunger rod and liner.

FOUNDATION:

This should be sufficiently substantial to support the pump and prevent movement.

PIPE SUPPORT:

All piping should be supported independently near the pump. Pipes must register with the pump connections without being strained into position.

SUCTION PIPE:

The suction line in particular must be airtight, as even a small leak may impair the operation of the pump. The pipe should never be smaller than the pump connection, and may, with advantage, be a size larger. Avoid abrupt changes in pipe diameters. The suction line must be as short and direct as possible. Avoid sharp turns, use bends rather than elbows.

When laying the line a uniform grade should be maintained, rising toward the pump the whole way. Particular care should be taken to avoid humps or depressions in the pipeline, otherwise air may be trapped in the pipe. This would greatly reduce the flow. It is important to avoid these air pockets whether the pump is above or below the supply level. Ensure

that the end of the suction line is always well below the surface of the water; when the pump is operating, check to see that a vortex does not form.

FOOTVALVE:

If a footvalve is used, it should have an area at least $1\frac{1}{2}$ times that of the suction pipe. If a strainer is used, it should have a clear area 3 to 4 times that of the suction pipe.

DELIVERY PIPE:

The size of the delivery pipe should be selected so that the friction head is not excessive. If delivery pipe is too small, frictional head is very greatly increased, consequently more power is required to drive the pump. Avoid sharp turns, use bends rather than elbows. A check valve should be installed between the pump and delivery line to protect the pump from injury due to water hammer and to enable the pump to be examined without draining the delivery line. It is advisable for delivery piping to rise all the way to the point of discharge.

Unions or flanges should be used to connect the piping to the pumps, so that the pipes can be disconnected, if necessary, without disturbing the whole installation. A relief valve should be fitted to delivery line near pump.

AIR CHAMBER:

An Air Chamber is fitted to the pump to prevent knocking or water hammer in the delivery line, and will be found to function effectively when the pump is operating

against low or medium heads. When the pump is operating against high heads, the air trapped in the chamber will be compressed to such an extent that it will lose its value as a cushion, and it is necessary to admit additional air to the chamber by means of a snifter valve. This valve can be obtained from the suppliers of the pump, and is fitted to the cylinder head after removing the tapered plug.

SNIFTER VALVE:

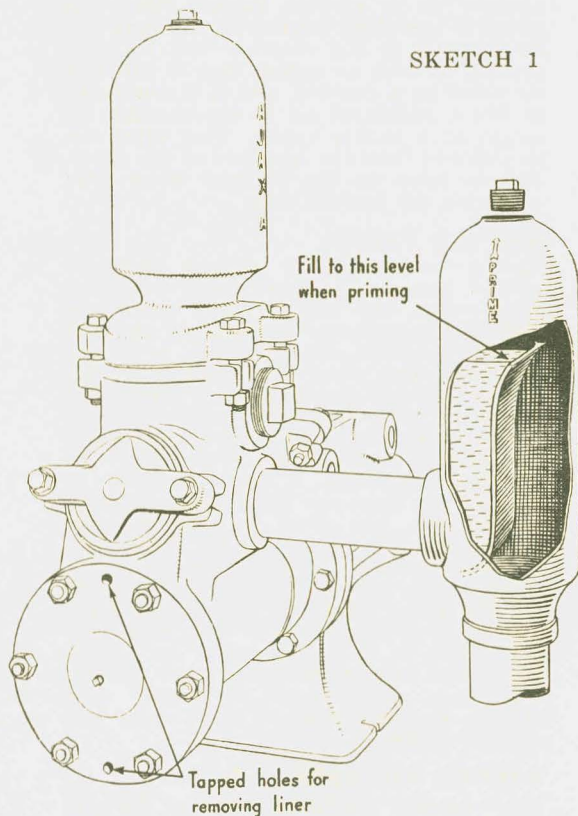
During the initial few minutes operation of the pump, after the pump has filled with water, the snifter valve should be opened by turning the knurled cap out two turns. This allows air to be drawn into the pump. Most of this air will enter the air chamber and be trapped there. The pump will stop "knocking" when sufficient air has been drawn into the chamber and the snifter valve may be closed. While the pump is operating a little air will be absorbed by the water being pumped and so air will be lost from the air chamber. Additional air will be needed from time to time to replace this lost air.

A little experience will soon show how much air the pump needs to keep it operating smoothly. This experience will also show whether it is more convenient to operate the snifter valve as described when starting the pump, or to leave it always open slightly so that it draws a small continuous stream of air.

VACUUM CHAMBER:

This chamber should be fitted to the suction line as close to the pump as possible. If the pump is left standing for a long time, it may be necessary to prime it by

SKETCH 1



filling the vacuum chamber to the top of the baffle, as shown in Sketch 1. It is not necessary to fill the whole suction line with water. Replace the plug on top of the chamber carefully, and ensure that it is airtight.

VALVES:

Valves may be inspected by removing the valve covers for the suction valves and the air chamber for the delivery valves. The valves can be removed from the pump by unscrewing the valve stem with the special spanner provided. Valves should not be disturbed unless trouble is suspected, and if the rubbers are disturbed, they should be removed from the pump and rubbed against a piece of emery paper supported on a flat surface until they are perfectly flat.

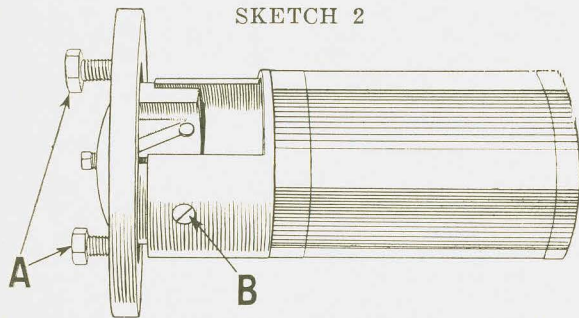
LINER:

To remove the liner, unscrew the nuts on the Cylinder Head, then insert two Set Screws (A) in the tapped holes provided (see Sketch 1). Tighten both screws evenly, and the cylinder head and liner will be withdrawn. The liner can be removed from cylinder head by withdrawing the small studs (B) (see Sketch 2). When replacing the liner, see that the cut out portion is on top.

PLUNGER:

To change plunger cups, first turn the pump by hand until the plunger is in its most forward position. Then remove cylinder head and liner, and, with the box spanner provided, unscrew the nut and locknut on the end of the plunger rod. The

SKETCH 2



cups and plates can then be taken out, and the cups changed.

To withdraw the complete plunger rod, first remove the cylinder head and liner. Slacken the gland nut and the plunger rod crosshead locknut. Unscrew the plunger rod from the crosshead, remove the locknut and deflector, and withdraw the rod through the cylinder.

When the plunger is being replaced in the pump, it may be found more convenient to insert it in the liner before fitting it to the pump. The assembly of plunger, liner and cylinder head may then be fitted to the pump.

If the pump has been standing for some time, the plunger leathers may become hard and dry. This will greatly impair the operation of the pump. The leathers should be removed from the pump and soaked in castor or neatsfoot oil, or, if this is not available, water, for some hours. They should then be worked with the fingers until the flange is soft, and replaced in the pump.

GLAND:

This should be just tight enough to permit a slow drip from the gland when the pump is operating. If the gland is too tight, the pump will use excessive power and the plunger rod will wear rapidly. Graphited square greasy hemp packing should be used.

SPEED:

If the pump is operating under difficult suction conditions, the speed should be reduced to 40, 30 or, if necessary, fewer strokes per minute.

LUBRICATION:

Provided that the sump is kept filled with oil, lubrication is quite automatic. Oil level in the sump when the pump is stationary should never fall below the mark on the outside of the casing. Use medium heavy oil as recommended on pump style plate. Approximate quantities of oil required to fill pump are:—

A2: 2 pints A3: 4 pints A4: 10 pints
A5: 10 pints A6: 16 pints

FROST:

Pump should be drained in cold weather, to prevent fractures due to frost.

MAINTENANCE KITS:

Maintenance Kits for Ajax Piston Pumps can be obtained from your pump supplier. These kits contain the replacement valves, valve springs, piston cups, gland packing and all gaskets needed to carry out the normal maintenance of your pump. A maintenance kit kept with your pump ensures that you always have on hand the parts necessary to avoid a pump stoppage.

EMERGENCY HINTS

NO WATER DELIVERED:

Check suction line fittings for blockages or leaks. Check plunger cups and valves for excessive wear. Suction lift may be excessive.

UNEVEN FLOW:

See that air chamber is not water logged. Check plunger cups for wear; see that the surface of the cup is not scored. Check valves, if face of rubber is worn or deformed, rub valve face against emery cloth supported on a flat surface until face is perfectly flat. See that no foreign matter is preventing valve from seating.

FALLING OFF OF CAPACITY OR PRESSURE:

Check suction line and vacuum chamber plug for leaks. Check liner and plunger cups for wear. Check plunger cups for softness (see paragraphs under PLUNGER). Check speed of pump. Check valves.

PUMP KNOCKS:

Check air chamber; if necessary, fit snifter valve (see page 4). Check valves. If pump still knocks, reduce speed.

GLAND LEAKS EXCESSIVELY:

Tighten gland, repack if necessary. Check plunger rod for wear.

PARTS LIST

Letter "C" indicates that part will be supplied complete.

See diagram at back of Book

No.	Part Name.
1c	Base, with Plugs.
2	Gear Case Cover.
3c	Gear, with Setscrew.
4c	Gear Shaft Bearing, with Gasket.
5c	Pinion Shaft Long Bearing, with Gasket.
6c	Pinion Shaft Short Bearing, with Gasket.
7c	Connecting Rod, with Bush.
8	Crosshead.
9c	Fast Pulley, with Setscrew.
10c	Loose Pulley, with Greaser.
11c	Keeper Plate, with Setscrews.
12c	Cylinder Body, with Studs and Plugs.
13c	Cylinder Head, with Liner Studs, Plugs and Gasket.
14c	Stuffing Box, with Gland Nut and Gasket.
15c	Air Chamber, with Plug.
16c	Valve Cover, with Gasket.
17	Gland Nut.
18c	Vacuum Chamber, with Plug.
21	Gland Sleeve.
22	Connecting Rod Bush.
23	Cylinder Liner.
24	Cylinder Liner Studs.
25c	Deflector, with Screw.
26	Valve Spring.
27	Valve Plate.
28	Valve Seat.
29	Valve Stud.
30c	Piston Rod, with Nuts.
40	Gear Shaft.
41c	Pinion Shaft, with Keys (A2 and A3, with Pinion shrunk on).
42c	Crosshead Pin, with Split Pin.

PARTS LIST (Cont.)

No.	Part Name.
43c	Pinion (A2 and A3, shrunk on shaft).
48c	Pulley Collar, with Setscrew.
61	Valve Cover Bolt.
62	Loose Pulley Grease Cup.
63	Stuffing Box Setscrew (A4 and A5 only).
63	Stuffing Box Stud (A6 only).
64	Bearing Setscrew.
65	Keeper Plate Setscrew.
66c	Gear Setscrew, with Locknut.
67	Fast Pulley Setscrew.
68	Cylinder Head Stud (A6 only).
69	Cylinder Head, Stuffing Box or Valve Cover Nut.
70	Piston Rod Locknut.
71	Gear Setscrew Locknut.
72	Valve and Plunger Spanner.
73	Pinion Shaft Woodruff Key (not on A2 or A3).
74	Cylinder Head Stud or Bolt.
75	Stuffing Box Stud or Bolt.
76	Base Plug.
77	Cylinder Plug.
78	Pipe Connection Plug.
79	Air and Vacuum Chamber Plugs.
80	Crosshead Split Pin.
83	Valve Cover Gasket.
84	Cylinder Gasket.
85	Bearing Gasket.
89	Valve Rubber.
90	Piston Cup.
91	Gland Packing.
92	Piston Rod Locknut.
95	Vacuum Chamber Pipe Connection.
101	Centre Plate.
102	Piston Plate.
Pc	Plunger Complete.
Vc	Valve Complete.