INSTRUCTION MANUAL

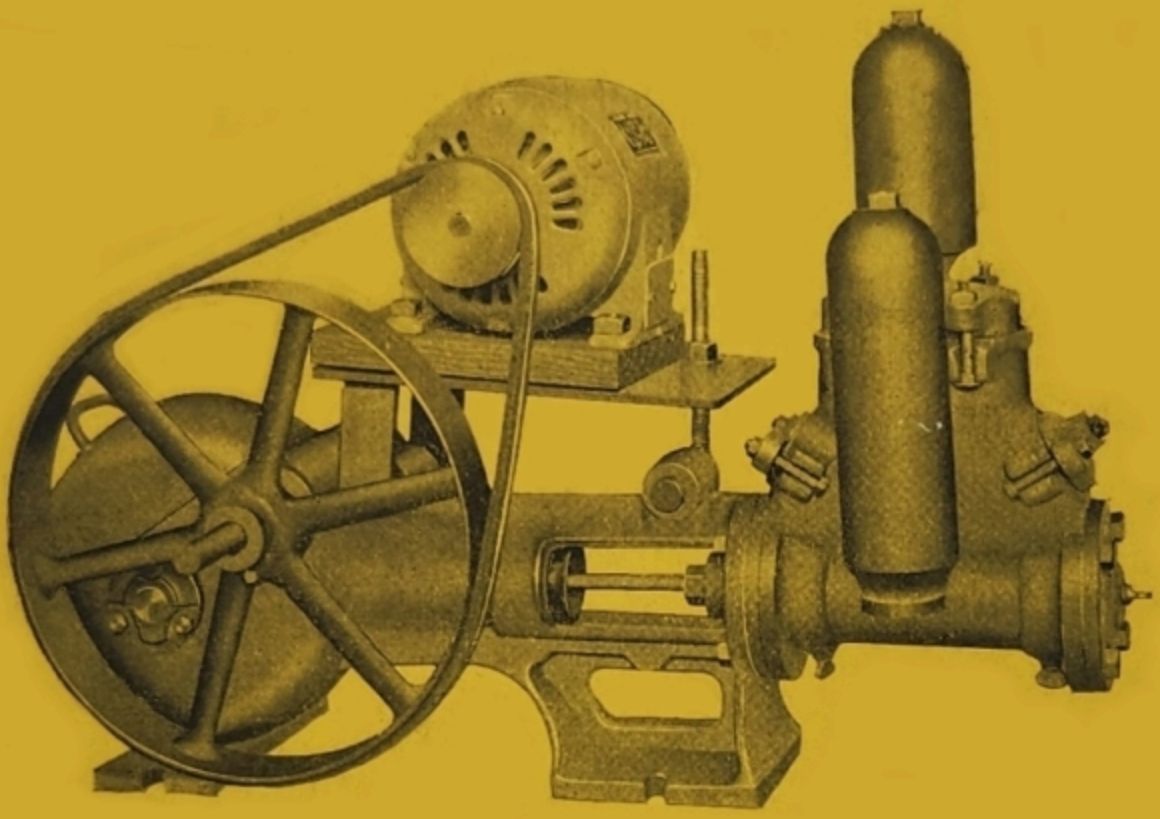
Boothmac

QUALITY BUILT

Figs. 912-931-720-720H-360 D.A. Pumps

BULLDOZER SERIES

and Automatic Pressure Water Systems



BOOTH MACDONALD & CO. LTD

HEAD OFFICE: BOX 99, CHRISTCHURCH

AREA OFFICES: Penrose, Hamilton, Palmerston North, Wellington, Invercargill.

Agents throughout New Zealand

INSTRUCTION MANUAL

IMPORTANT: Read carefully — keep this Manual near your Pump for future reference.

BOOTHMAC FIGS. 912, 931, 720, 720H AND 360 D.A. PUMPS AND AUTOMATIC PRESSURE WATER SYSTEMS

SECTION I.

THIS MANUAL is provided to help users of Boothmac Bulldozer Water pumps and pressure systems to understand their operation and maintenance.

Boothmac pumps and pressure systems are produced in a modern engineering works equipped with the latest types of machine tools and using the most advanced methods of production.

The materials used are the best of their respective kinds and every care and attention, including inspection during processing is taken to ensure a product that is reliable and efficient.

WARNING

WHEN INSPECTING YOUR PUMP CUT OFF THE ELECTRIC POWER AT THE SWITCHBOARD — IF DISMANTLING THE PUMP HEAD REMOVE THE BELT ALSO.

WARRANTY SERVICE

Boothmac Bulldozer Water Pumps and Automatic Pressure Outfits carry *a warranty of* 6 *months* from the date of delivery of new pump or pressure system to customer during which time any part or parts proved faulty through workmanship or materials will be replaced free of charge. The terms of the warranty cover the free replacement of actual faulty parts only, claimed as such during the warranty term applying to the particular pump or pressure outfit concerned. The faulty part or parts should be forwarded to the nearest Boothmac Area Office or District Agent when claim is made.

INSTALLATION

All Boothmac Bulldozer Pumps and Pressure Systems are factory tested for suction and pressure and mechanical efficiency before despatch.

Advice on installation is given on pages (4 and 5) in this manual and before carrying out the work the instructions should be carefully studied.

The Company is not responsible for unsatisfactory performance of the pump or pressure system if installed inaccurately and under conditions unsuitable to the specified capacity of pump.

The Boothmac Bulldozer Pump performance specifications are obtained with clean, clear water with suction pipe rising directly from the water to the pump not less than 20 ft. and pumped at rated catalogue pressure. It should be noted that output of pump varies according to the head or pressure, reducing as the pressure increases—*Do not operate pump beyond its specified capacity.*

Our experience of over 70 years in pumping applications is available free of charge. Expert advice is freely given on any pumping problem large or small.

ELECTRICAL EQUIPMENT

Booth Macdonald and Co. Ltd. do not produce electrical equipment but purchase it for assembly on to pumps and pressure systems. The electrical equipment purchased by the Company is believed to be of the best and most reputable make for the purpose used. Failure of electrical equipment including motors should be referred to your local electrician or local power authority. Advice on electrical equipment is included in this manual on pages 7 and 8.

SERVICE

Service is readily obtainable and pumping troubles are quickly overcome by reference to the Boothmac Area Office or Agent. As most of this servicing is urgent and requests come by telephone, quick attention can be had if details of the trouble are clearly conveyed and if, where spare parts are required, *exact description by name and part number are given.* These are obtained by referring to pages 10 and 16 of this manual so always KEEP THIS MANUAL IN A HANDY PLACE.

Much trouble can arise from simple affectations and this Manual will help you to understand your pump in order that you can make simple repairs and adjustments so it should receive your careful study. Help yourself where you can but do not attempt repairs and adjustments that are beyond you—call in the expert and above all things *do not touch or tamper with electrical equipment.*

SECTION II.

SPECIFICATIONS

CAPACITY:—

	912	931	720	720H	360
	G.P.H.	G.P.H.	G.P.H.	G.P.H.	G.P.H.
Nominal Output	400	180	720	720	360
Max. Head (Feet)	233′	575′	233′	400′	515′
Max. Press. (Sq. inch)	100lbs	250lbs	100lbs	175lbs	250lbs

DIMENSIONS:—

Bore	2½″	1¼″	3″	3″	2½″
Stroke	3″	3″	4″	4″	4″
Inlet Size	1¼″	1″	1½″	1½″	1½″
Outlet Size	1¼″	¾″	1½″	1½″	1½″
Pulley Diam.	15″	15″	15″	15″	15″
Shaft Diam.	⅞″	⅞″	1″	1″	1″
Pulley R.P.M.	60	60	60	60	60

POWER:—

HEAD IN FEET

Up to	25′	25/75′	75/150′	150/230′		
H.P. 912	¼	½	¾	1		
	100′	100/200′	200/300′	300/400′	400/500′	500/575′
H.P. 931	1/3	½	¾	1	1¼	1½
	25′	25/50′	50/75′	75/100′	100/150′	150/200′	200/230′
H.P. 720	1/3	½	¾	1	1½	1¾	2
	250′	250/300′	300/350′	350/400′	400/450′	450/500′
H.P. 720H	2¼	2½	3	3	—	—
H.P. 360	1½	2	2	2½	3	3

SPACE DIMENSIONS (Overall):—

	912	931	720	720H	360
Height	24″	18″	28″	28″	28″
Length	36″	34″	46″	46″	46″
Width	15″	15″	16″	16″	16″
Weight (Less Motor)	182lbs	156lbs	336lbs	336lbs	336lbs

SECTION III.

ADVICE ON INSTALLATION

1. Check capacity of well before purchasing pump to see that flow into well at least equals draw off of pump and that this amount of water will be available during the driest periods. There may be some local history in this respect. If well is driven or sunk by a well borer obtain his certificate as to well capacity.

2. Ensure that sand is not present in the well or water supply. Plunger pumps will not cope with sand entrained water and if sand is passed through the pump serious damage will occur as well as constant trouble and maintenance.

3. If sand is present fit a sand trap at the intake of the suction pipe or at the pump intake. Ensure there is no chance of foreign matter entering suction pipe. Sand causes suction troubles by scouring the pump cylinder and plunger rod and getting under valve surfaces.

4. While normal lift is about 25ft. avoid lifting water to the pump beyond 20ft. from water level to pump intake and see that the intake at foot of suction pipe is adequately below water level to allow for any temporary reduction in water level through dry weather periods.

5. Always fit an efficient foot valve to the suction pipe.

6. Avoid long suction pipes i.e. where the pump may be placed at some distance from the well. If long suction pipes are unavoidable make use of intermediate hanging flap valves on the suction line at suitable intervals.

If "water hammer" occurs on a long suction line an extra suction chamber should be fitted alongside the pump on the suction pipe.

("Water hammer" is identified as a fairly rapid succession of thumps and can occur in any water pipe system where the flow of water is suddenly stopped as with valves or taps).

"Water hammer" should not be confused with "valve hammer" caused on the suction side by having too small a suction pipe, blockage of the pipe or too small a foot valve.

On a long suction line the diameter of the suction pipe should be increased. ("Valve hammer" can be identified by the heavy thumping of the inlet valves).

7. Before fitting foot valves, flap or check valves on suction line, see they are working properly, are well seated and well finished.

8. See all screwed and other joints on the suction line are well made and fitted. The smallest "pin hole" will cause suction trouble and prevent lift of water.

9. Do not use a suction pipe smaller than that allowed for on the pump. A small pipe will cause "water starvation", valve hammer and low pumping efficiency. See foot valves are of adequate size.

10. Use pipe bends and not elbows where change of pipe direction is necessary on suction line.

11. See that pump pulley rotates in the correct direction as indicated by arrow on pump crankcase.

PRESSURE SYSTEMS:

1. Arrange installation so that both pump and pressure tank are accessible for adjustment and maintenance and gauges are easily read.

2. Fit a drain pipe to hole at bottom of pressure tank with a high pressure cock so that when discharging tank, water can be conveniently led away.

3. Use a ground spherical faced (Mac) union to join pump pipe to tank.

4. Fit a high pressure cock to service outlet of tank.

5. The pressure system functions merely by pumping water into the tank until the maximum pressure fixed by the pressure switch is reached. At this stage the water can be let out of the tank through the service pipe and the air pressure cushion forces the water level down to the minimum setting when the switch automatically sets the pump working.

6. Pumps should not be loaded unduly when using a pressure tank so the pressure switch should be adjusted to give the service that is actually required. This will give longer life to the pump.

SECTION IV.

ADVICE ON MAINTENANCE

1. The pump is designed to be self lubricating from oil supplied to the sump forming an oil bath. The movement of the crank splashes the oil and bathes the cross head and side bearings in oil which runs through the oilways provided in the various moving parts. Check oil level periodically say weekly, but not less than fortnightly. Do not overfill sump as this will cause oil to run out of bearing causing a mess and on to pulley and belt. Change oil occasionally as appears necessary.

2. Do not permit excessive drip from pump gland. If this occurs tighten gland sufficiently to overcome drip but not too tightly. An excessively tightened gland will absorb power and cause undue wear of the plunger rod which in turn will cause suction trouble. In the course of time gland packing will harden or become compressed beyond usefulness; it then needs renewing. It is advisable to remove all old packing rather than add new to old. Do not renew packing on a worn plunger rod; have the rod replaced also.

3. If pump is pumping water satisfactorily do not tinker with valve or head system but if water failure occurs follow directions as set out in "Pumping Failure".

4. In the course of time and if there is evidence of mechanical noise in the pump indicating wear have the pump examined by an expert on pump fitting. It is cheaper to have the odd worn component replaced than a complete pump.

Spare parts precisely made are always available from Booth Macdonald and Co. Ltd., or their agents.

5. Sometimes a small fault can be very costly. The owner pays for expert's time, travelling time, vehicle mileage, etc. The actual job may be worth in time taken only a few shillings but the other items can be very costly. If these instructions are carefully studied and the spare parts list kept secure and handy the

(Continued on page 6).

owner could save a lot of expenditure if trouble does occur by making adjustments himself. Proper installation and maintenance should give a trouble free pump for several years.

6. When adjusting or repairing pump, cut off motor power and remove belt from pulleys.

HOW TO SERVICE THE VALVES.—Fig. 912-(720 Pumps).

Access to the rubber delivery valves is obtained by removing the air chamber. The valves are thus exposed and the valve posts can be unscrewed and the valve assembly withdrawn. Clean the valves and valve seats and replace.

The suction valves are got at by removing the valve cover plates.

Fig. 931.—(360-720H Pumps).

Remove air chamber. This exposes the delivery valves. Lift out delivery valves. The suction valves will then be disclosed directly underneath the delivery valves and can also be lifted out. If mating surfaces are scored these can be "ground in" with suitable grinding paste without removing valve seats which are a press-in fit.

Renew any worn or broken parts and return the assembly to its proper position. The valve assemblies are interchangeable.

If the gaskets are not in good condition, renew them. Make sure that a good snug joint is made by tightening up the bolts evenly all round.

HOW TO REPACK THE STUFFING BOX

To remove the old packing, it will be necessary to dig it out with a wire or hook. Do not mar or scratch the piston rod.

Put in the new greasy hemp packing, pressing in each coil round the rod. Replace the packing nut.

Run the pump for two or three days, allowing the packing to become thoroughly water-soaked. Then tighten the nut. A very slight leak is desirable here. Gland should only be tightened when leakage becomes obviously excessive. Be careful not to screw this nut too tight as this will cause an overload on the motor.

WATER BAFFLE

If by accident this is broken, have it promptly replaced in order to avoid any water getting into the eccentric compartment. Keep water overflow holes from gland compartment open.

PRESSURE TANK :

This requires little maintenance. Discharge water from tank once or twice a year to get rid of stale water and sediment that may accumulate at the bottom of the tank.

Periodically check water level when tank is full and as there is always a tendency to lose air rather than gain it, air capacity is increased by opening the Air Valve regulator on the pump end.

(Continued on Page 7.)

This allows of a small intake of air at each stroke of the pump and soon brings the water level to the correct height. The larger the air volume in the tank at a given pressure, the greater the draw-off without the pump in action; therefore a very small air volume will cause the pump to cut in and out far too frequently which must be avoided.

Sometimes incoming water to the pump contains air and this separates in the tank occasionally causing complete exhaustion of water from the tank causing pumping difficulties. The best way to deal with this is to open the drain cock and exhaust all air and then let the pump fill the tank again normally.

Do not interfere with pressure switch settings. Adjustment to this is the expert's job.

MANUAL—AIR VOLUME REGULATION.—Check water level in tank, regularly, and maintain level to the mark indicated on water gauge.

WATER LEVEL TOO HIGH (at cut out pressure).—This indicates insufficient air in the tank. *Turn Thumbscrew to LEFT.* A full turn from closed will open valve to nearly full open. A half turn from closed will open valve rather more than half open.

WATER LEVEL TOO LOW (at cut out pressure). This indicates that there is too much air in the tank. *Turn Thumbscrew to Right* to shut off air supply, but do not screw valve hard into seat.

SECTION V.

ADVICE ON ELECTRICAL EQUIPMENT

The fractional horsepower electric motor should always be looked upon as a more or less delicate mechanism that will not suffer maltreatment. 3 Phase Motors are more rugged in construction and give very little trouble. However, circumspection must be used with regard to their usage and maintenance.

The pump is too frequently blamed for causing motor breakdowns and consequent hold up in water supply when the condition of the motor or power supply is the real cause.

All electric motors should have adequate overload protection at least on the switchboard if not also incorporated in the motor.

In country areas owing to the possibility of periods of low voltage during the day F.H. motors should have slightly greater capacity than the nominal power required, e.g. nominal power ¼ H.P. use 1-3rd H.P.

For pumps, split phase motors should be avoided, the most reliable being capacitor (condenser) start. There are many makers of this type and we do not recommend any particular brand or make.

Many motors made to-day have grease packed bearings or bearings of materials that do not require lubricant applied during the life of the motor but there are still motors which, fitted with lubricators, require occasional application of light oil. Care must be taken to see that these motor bearings are not over oiled because the excess oil will travel along the rotor and cover the rotor and

(Continued on page 8).

stator and attract or hold dust particles and cause sluggishness and heat in the motor. This oil also gets into the starting mechanism of the motor creating a film between the contacts resulting in too slow a start to fling out the centrifugal switch from the starting coils resulting in a burnt-out motor. Sometimes excessive oil in this regard will prevent the motor from starting by creating resistance between starting mechanism contacts.

Prevention is better than cure and owners should be fully informed about the electric motor and to follow maker's printed instructions.

Some owners claim from the Company motor repair costs of replacement. They must accept that this Company cannot be held responsible for damage or defective motors even though it may supply them. If the buyer objects to such a stipulation he should provide his motor. Any overload or stoppage of pump through mechanical or hydraulic fault while pumping should not detrimentally affect the motor which is, or should be, protected by overload device. Correct electrical installation is the responsibility finally of the local electric power authority who will, or should, see that correct protective devices are installed. Every electrical breakdown should be referred to the local power authority by the owner in all cases.

Always see that belts, especially Vee Belts, are not too tight as this will cause undue bearing loads.

Variations in power supply can cause a lot of personal irritation and undue service calls especially with automatic installations in rural areas. Where there is adequate motor protection low voltage will cause power cutout. Low voltage in rural lines is caused by a periodical cut-in of heavy power consumers such as electric stoves and water heaters and large electric motors. Owners should be warned of this possibility and to use patience at such times. The local power authority should be the recipient of such complaints not the supplier of the pumping equipment.

Fitting heavier fuses or higher capacity protection to try and overcome this trouble is doubly dangerous to the motor at time of low voltage.

Keep motor free from dampness.

SECTION VI.

ADVICE ON PUMPING FAILURE

When the pump fails to pump water observe the following if the pump is mechanically sound.

1. Check well for water supply. For some reason the supply to the well may have fallen off.

2. Check gland to see whether air is being sucked through; if so tighten or renew packing.

3. If water is available in the well examine the valves and check them for freedom of matter under valves and that these are lifting and falling freely. Pipe scale is a mischief maker. Examine

(Continued on page 9).

gaskets to see there is no deterioration of material or damage.

4. If valves are alright remove pump end and check plunger to see if rod nut has come adrift or if leathers or sleeve have become overworn.

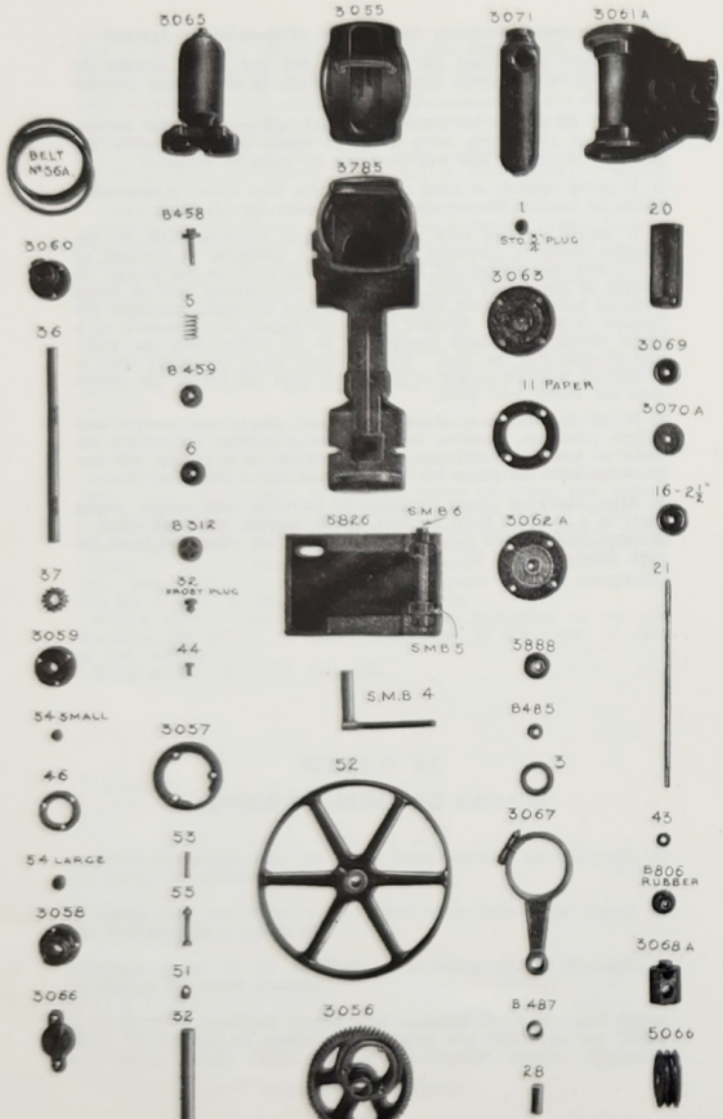
5. Check all gaskets for deterioration and tightness and also suction pipe joints and piping using a lighted match or candle while the pump is operating, this will show up air holes or cracks.

6. If pump appears in good order examine foot valve, or any other valve on suction line or check suction pipe for blockage.

7. If pump is used with a pressure tank examine tank to see whether there is excessive air causing a complete evacuation of water and the compressed air thus passing back to the pump. It should be noted that some water is air impregnated and on being pumped into a pressure tank separates and gradually increases the volume in the tank. Another reason for excess air is because of a worn plunger rod gland causing air to be sucked into the water and passing into the tank. With pressure tanks see water level is at correct working height at maximum draw off before the switch cuts the pump into work.

8. If all the foregoing examinations and checks are correct and failure continues, examine the pump head castings for suction air leaks as sometimes although rarely, a defect in a casting will not show up until the pump has been in work for a period of time.

9. After checking pump, re-assemble correctly and prime, seeing there is a freedom from air lock in the suction pipe and where a pressure tank is used water and air pressure are exhausted from the tank before starting up.


3065
3055
3071
3061A
BELT No 56A
3785
B458
1
STD ¾" PLUG
20
3060
5
3068
3069
36
B459
11 PAPER
6
3070A
B 51R
5826
S.M.B 6
3062 A
16 - 2½"
37
32
FROST PLUG
21
3059
44
S.M.B 5
5888
S.M.B 4
B485
54 SMALL
3057
3
46
52
3067
43
53
B806
RUBBER
54 LARGE
55
3058
3068 A
51
3066
52
3056
B 487
5066
28

DESCRIPTION OF PARTS — FIG. 912 PUMP

(See Illustrations on Page 10)

List No.	No. Reqd.	Description
1	2	Plug for Air Chamber.
3	4	Gasket for Air Chamber and Cap over Valves.
* 5	4	Valve Springs.
6	4	Valve Rubber.
11	3	Gasket for Cylinder Head (Paper).
16	2	2½" Plunger Leather.
20	1	Cylinder Liner.
21	1	Pump Rod.
* 28	1	Crosshead Pin.
* 32	1	Shaft for Gear and Eccentric.
* 36	1	Shaft for Pinion and Pulleys (Fast Pulley Only).
* 36	1	Shaft for Pinion and Pulleys (Fast and Loose Pulley Only).
* 37	1	Pinion.
* 44	3	Set Screw for Eccentric Cover.
* 46	10	Bearing Packing.
* 51	1	Packing for Connecting Link.
* 52	1	15" x 2" x ¾" Solid Pulley.
53	1	Water Spreader.
54	2	Plug for Bearing, Small and Large.
55	1	Bolt for Connecting Rod.
B312	4	Valve Seat.
B458	4	Valve Post.
B459	4	Valve Plate.
*B485	1	Packing Gland.
*B487	1	Connecting Rod Bush.
*B806	1	Water Deflector (Rubber).
*3055	1	Lid with No. 45 Handle.
*3056	1	Gear and Eccentric.
*3057	1	Retaining Ring for Eccentric.
*3058	2	Gear and Eccentric Shaft Bearing.
*3059	1	Pinion Shaft Bearing (Short).
*3060	1	Pinion Shaft Bearing (Long).
3061A	1	Cylinder Body Only.
*3062A	1	Head for Cylinder (Front).
*3063	1	Head for Cylinder (Rear).

* Denotes Parts Common to Fig. 912 and Fig. 931, Pumps

(Continued on Page 12.)

DESCRIPTION OF PARTS—FIG. 912 PUMP (Contd.)

(See Illustrations on Page 10).

List No.	No. Reqd.	Description
3065	1	Air Chamber.
3066	2	Cap over Valves.
*3067	1	Connecting Rod with B487 Bush.
*3068A	1	Crosshead.
3069	2	Bucket Plate—Inner.
3070A	1	Bucket Plate between Leathers.
3071	1	Air Chamber—(Suction).
*3785	1	Gear and Eccentric Case.
*3888	1	Packing Nut.
5170	1	Spanner (Not Illustrated).

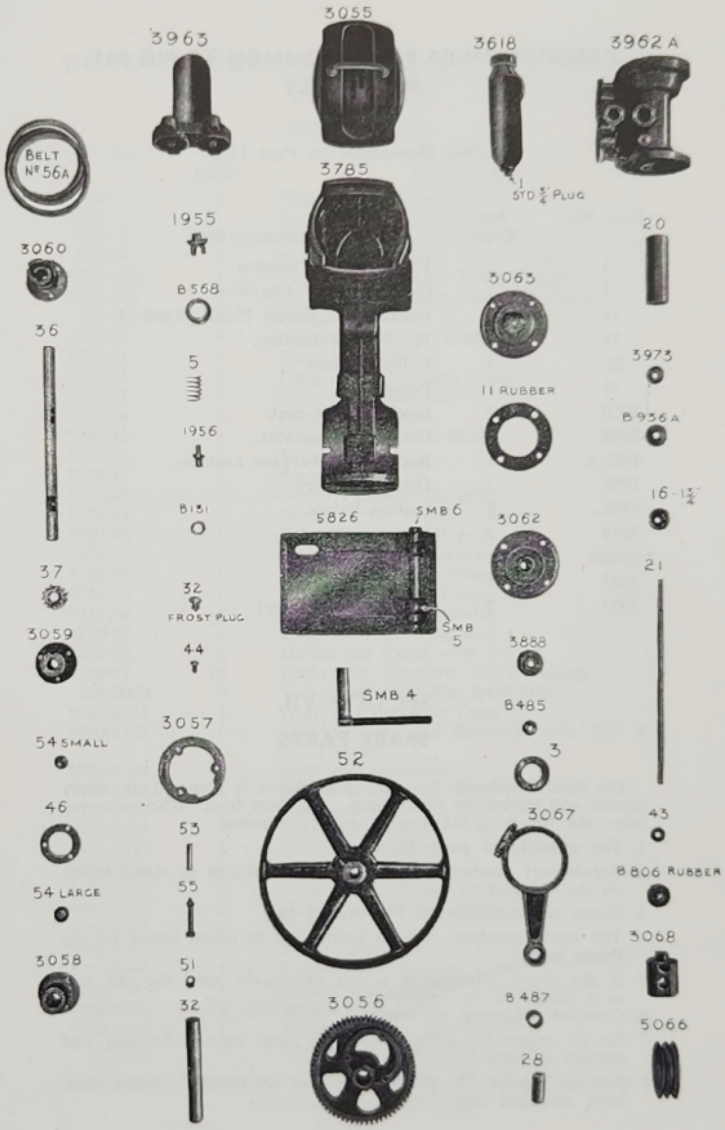
* Denotes Parts Common to Fig. 912 and Fig. 931, Pumps

MOTOR BASE FOR FIG. 912 AND 931 PUMPS

SMB4	1	"L" Adjusting Srew.
SMB5	2	Collar.
SMB6	1	Shaft.
5826	1	Motor Base Bare.

"V" SHEAVES

5066	3 9/16" 2A "V" Sheave.
5066	4¼" 2A "V" Sheave.
56A	"V" Belt.



See Page 14 for Parts Common to Fig. 931 Pump Only.

DESCRIPTION OF PARTS COMMON TO FIG 931, PUMP ONLY

(See Illustrations on Page 13)

List No.	No. Reqd.	Description
1	2	Plug for Air Chamber.
3	2	Gasket for Air Chamber.
11	3	Gasket for Cylinder Heads (Rubber).
16	2	1¼" Plunger Leather.
20	1	Cylinder Liner.
21	1	Pump Rod.
B131	2	Suction Valve Seat.
B568	2	Delivery Valve Seat.
B936A	1	Bucket Plate between Leathers.
1955	2	Delivery Valves.
1956	2	Suction Valves.
3618	1	Vacuum Chamber.
3962A	1	Cylinder Body.
3963	1	Air Chamber.
3973	2	Bucket Plate (Inner).

SECTION VII.

SPARE PARTS

The local Boothmac Area Office or Agent is prepared to supply repairs and service for your pump. See them first. When ordering parts, the following information will be required.

1. The quantity of parts desired.
2. Repair part number if any. This is found cast in raised letters on the old part.
3. Name or description of the desired part.
4. The pump number. This is found cast in raised letters on the Pump Body.
5. If the above information is not obtainable, send the old part as a sample to be duplicated.
6. Complete Shipping instructions.
7. On all orders for pulleys state the bore, outside diameter and number of belts if for V belt drive.
8. For all repairs for pressure switches or motors contact your local electrical engineer.

DESCRIPTION OF PARTS—Figs. 720, 720H, 360 and 1440 PUMPS

(Not Illustrated)

List No.	No. Reqd.	Description
*720- 1	1	Plug for Air Chamber.
*720- 3	2	Gasket for Air Chamber.
720- 5	4	Valve Spring (Use No. 5-912).
720- 6	4	Suction Valve (Use No. 6-912).
*720--11½	1	Gasket for Cylinder Head (Paper).
*720-11¾	1	Gasket for Cylinder Head (Rubber).
720-16	2	Plunger Leathers, 3″.
720-20	1	Cylinder Liner, 3″ (Tubing).
*720-21	1	Pump Rod (Brass).
*720-21	1	Pump Rod (Stainless Steel).
*720-21	1	Pump Rod Shafting.
*720-28	1	Cross Head Pin.
*720-32	1	Gear and Eccentric Shaft.
*720-36	1	Pinion Shaft.
*720-37	1	Pinion.
*720-42	1	Gland Packing—(Zenith).
*720-44	3	Set Screw for Eccentric Cover.
*720-46	1	Bearing Packing (Paper).
*720-51	1	Packing for Connecting Link.
*720-52	1	Pulley—15″ x 3½″ (Standard).
*720-53	1	Plug for Bearing (Long).
*720-54	1	Plug for Bearing (Short).
*720-55	1	Bolt for Connecting Rod.
*720-56	2	Gasket for Cover over Valve.
*720-57	10	Gasket for Eccentric Shaft Bearing.
720-B458	4	Valve Post (Use No. B458-912).
*720-5331	1	Gear and Eccentric Case.
*720-5332	1	Lid for Gear and Eccentric with No. 45 Handle.
*720-5333	1	Gear and Eccentric.
*720-5334	1	Retaining Ring for Eccentric.
*720-5335	2	Gear and Eccentric Shaft Bearing.
*720-5336	1	Connecting Links.
*720-5337	1	Cross Head Slide.
*720-5338	1	Cylinder Body.
*720-5339	1	Head for Cylinder Front.
*720-5340	1	Head for Cylinder Rear.
*720-5341	1	Packing Nut.
*720-5343	1	Pinion Shaft Bearing, Long.
*720-5344	1	Pinion Shaft Bearing, Short.
*720-5345	1	Bucket Plate between Leathers, 3″.
*720-5346	1	Bucket Plate Inner.
*720-5349	1	Water Deflector (Rubber).
*720-5350	1	Delivery Air Chamber.

* Denotes Parts Common to 720, 720H, 360 and 1440 Pumps.

(Continued on Page 16.)

DESCRIPTION OF PARTS—(Continued)
Figs. 720, 720H, 360 and 1440 PUMPS

(Not Illustrated)

List No.	No. Reqd.	Description
*720-5351	1	Suction Air Chamber.
720-5354	4	Valve Plate (Use B459 for Fig. 912).
720-5355	4	Valve Seat.
720-5358	1	Packing Gland Chest.
*720-5412	2	Cap for Valve Chest.
*720-5460	1	Bush for Connecting Rod.

* Denotes Parts Common to Figs. 720, 720H, 360 and 1440 Pumps.

FIG. 720H. BULLDOZER PUMP

720- 60	4	Valve Spring.
720-5473	4	Valve Seat.
720-5474	4	Valve.
720-5475	4	Valve Guide.

(ALL OTHER PARTS ARE COMMON TO FIG. 720 PUMP.)

FIG. 360. BULLDOZER PUMP

360- 16	2	Plunger Leather 2¼".
360- 61	1	Cylinder Liner.
360-5352	1	Bucket Spacer Plate 2¼".
360-5353	2	Bucket Inner Plate 2¼".
360-5473	4	Valve Seat.
360-5474	4	Valve.
360-5475	4	Valve Guide.
360-5618	1	Cylinder Body.

(ALL OTHER PARTS ARE COMMON TO FIG. 720 PUMP.)

FIG. 1440. BULLDOZER PUMP

62	1	Gear and Eccentric Shaft.
63	1	Pinion Shaft.
66	1	Stud.
5627	1	Pinion Bearing L.H. (Short.
5687	1	Pinion Bearing R.H. (Short).
5720	2	Manifold.
5721	2	Elbow for Vacuum Chamber.
5722	2	Manifold Connector.
5756	1	Delivery Air Chamber.
5801	1	Manifold Distance Piece.
5803	2	Head for Cylinder (Rear).
5804A	2	Head for Cylinder (Front).

(ALL OTHER PARTS ARE COMMON TO FIG. 720 PUMP.)

N.B.—Where No. Required per pump is shown on the 720 list and parts are common to both 720 and 1440 pumps, the No. Required for 1440 pump will be double the 720 list.

BOOTHMAC'S

HAVE THE RANGE OF PUMPS

TO SUIT YOUR NEEDS

(Surface or Deep Well)

Fig. 78—Tube Well Cylinder Pumps

Fig. 79—No. 4 Union Bolt Hand Pump

Fig. 300—Horizontal—Surface Pumps—1½" Bore

Fig. 155 Horizontal—Surface Pumps—1¼" Bore

Skim Milk Pumps

Fig. 360—Bulldozer Pumps

Fig. 500—Deep Well Head

Fig. 720—Bulldozer Pumps

Fig. 720H—Bulldozer ,,

Fig. 912—Bulldozer ,,

Fig. 931—Bulldozer ,,

Fig. 1440—Bulldozer ,,

Automatic Pressure Outfits

(To suit individual requirements)

For Surface and Deep Well applications.

PRINTED AT THE PEGASUS PRESS CHRISTCHURCH