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## T112 (1:1 Ratio) and T312 (3:1 Ratio)

### Air Operated Oil Pumps

#### INSTRUCTION MANUAL

#### INTRODUCTION

Thank you for purchasing a Macnaught T112 (1:1 Ratio) or T312 (3:1 Ratio) air operated oil pump. Your double action piston type stubby pump is designed to dispense lubricating oils (eg: engine oils, hydraulic and gear oils). The T112 (1:1 Ratio) is the ideal pump for transferring fluids over short distances (up to 10 metres). The T312 (3:1 Ratio) is the ideal pump for use in bulk tanks or drums through pipelines, hose reels and hose end oil delivery guns (with or without a flow meter) over distances of up to 30 meters (including hose reels).

The T112 and T312 are supplied with a standard 2" BSP adjustable bung adaptor which is suitable for most tanks and drums. The fluid inlet of the pump is tapped 1" BSP female (or 1" NPT for USA/Canada) so you have the choice of either supplying your own threaded suction tube or you can purchase the optional Macnaught telescopic suction tube kit (TB25s), which is suitable for drums or tanks up to 1.2 metres (48") deep.

Macnaught manufacture a full range of accessories to suit air operated oil pumps, please consult your local Macnaught reseller for more information.

With your appropriate care combined with the Macnaught Guarantee of dependable after sales service, (provided by our worldwide distribution network), you will be assured of continuous safe, efficient and reliable product operation.

**Please read and retain this instruction manual to assist you in the operation and maintenance of this quality product.**

#### GENERAL INFORMATION

This manual assists you in operating and maintaining your new T112 or T312 oil pump. The information contained will help you ensure many years of dependable performance and trouble free operation.

Please take a few moments to read through this manual before installing and operating your new oil pump. If you experience problems with the product, refer to the Maintenance and Trouble Shooting sections of this manual. If you require further assistance please contact your local Macnaught Distributor, Authorised Macnaught Service Centre or Macnaught P/L.

T112 (1:1 Ratio)



T312 (3:1 Ratio)



#### IMPORTANT INFORMATION



**Read this information carefully before use!**

Your safety is important to us. Please read, understand and follow all safety instructions listed below. Some of these instructions alert you to the potential for personal injury. 'Cautions' listed throughout the manual advise of potential practices or procedures which may cause damage to your equipment.


Make sure all operators have access to adequate instructions about safe operating and maintenance procedures.

Do not exceed the maximum recommended air-inlet pressure of 1035 kPa/ 150 psi/ 10.3 bar. The pump requires a minimum air inlet pressure of 400 kPa/ 60 psi /4 bar and we recommend that you operate the unit at 690 kPa/ 100 psi/ 6.9 bar.

Do not hit unit if it fails to operate. Refer to 'Trouble Shooting Guide' or return unit to your nearest Authorised Service Centre.

Use suitable thread sealant (eg Teflon tape) on all screwed fittings, but do not over-tighten (to avoid component damage).

This pump has been fitted with a pressure release valve. This unique feature will protect both the pump and the system against damage created by excessive pressure, possibly caused by thermal expansion.

 **Never allow any part of the human body to come in front of/ or in direct contact with a material outlet. Never point the nozzle of the gun at yourself or anyone else.**

**Most accidents occur because of a component rupture. Be certain that any and all system components will withstand the pressures being developed. Never exceed the pressure rating of any component installed in the system.**

**Weak, worn or damaged hoses are also a hazard. Before each use check hose for signs of wear, leaks or loose fittings. Tighten all fluid connections regularly and replace weak or damaged hose. Your personal safety and well being are at stake.**

## **WARNING**

**Before attempting any repairs or maintenance of this product disconnect air supply and release oil line pressure by squeezing hand piece/gun trigger.**

## **ASSEMBLY**

- 1) Measure the depth of the drum/tank and attach appropriate length of 1" BSP (1" NPT USA/Canada) threaded pipe to the inlet of the pump (or use a Macnaught suction tube kit TB25s)
- 2) Remove the bung adaptor assembly from the pump and screw into drum/tank opening. Carefully lower the pump through bung adaptor and tighten the clamp screw located at the clamp sleeve.

Note: There is a wire mesh strainer located in the brass air inlet. It is recommended that a micro-fine (5 micron) in-line air filter is fitted to the air inlet to ensure maximum efficiency of this pump

- 3) Before connecting the air supply, the user should add a 'stop' compressed air cock.

**Note:** The air cock must be a ¼ turn type (allowing quick closure ) and should be located close to the body of the pump and be easily recognised.

## **OPERATION**

- 1) Ensure that the drum or tank is 'vented'.
- 2) Partially open the on/off air valve. The pump will prime automatically.
- 3) Open the oil delivery outlet/nozzle. The pump will automatically start.
- 4) Adjust on/off air valve to regulate the flow. Close delivery outlet/nozzle to stop flow.

**Caution! Do not run the pump dry.** Remember to switch air supply off if not using the pump for an extended period e.g. at the end of each working day.

## **MAINTENANCE**

Before carrying out any maintenance disconnect the air supply and release the fluid pressure in the system.

Inspect your oil pump weekly for any signs of damage. Replace any suspect or damaged parts/components as required.

Every 2 weeks (or sooner if the pump is used every day) apply a few drops of light oil to the air inlet of the pump. (Sewing machine oil is ideal).

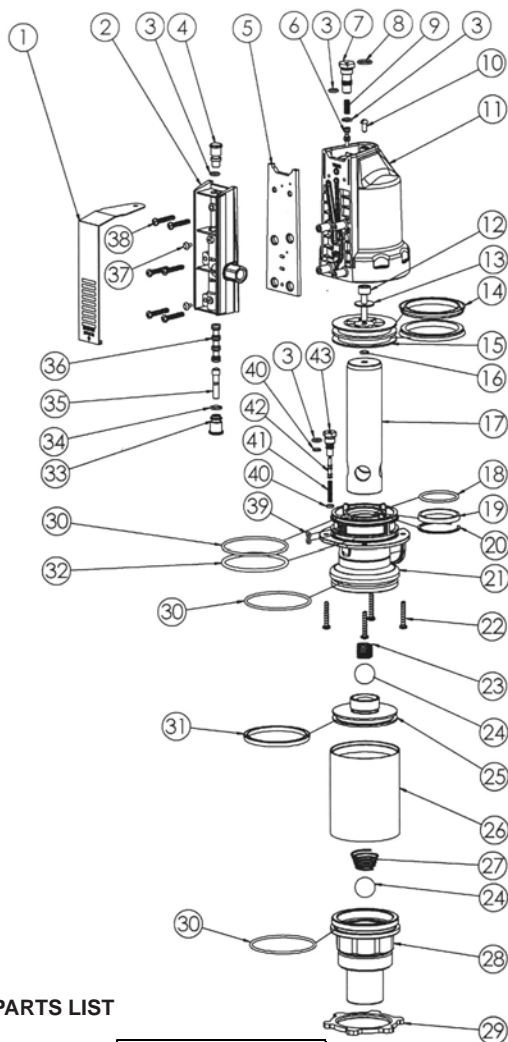
## **PUMP DISASSEMBLY**

- 1) Remove oil hose from the pump unit.
- 2) Withdraw pump from the oil drum/tank. Use a clean bench to carry out maintenance.
- 3) Remove the 4 screws (22) holding cylinder (11) to the bottom adaptor (21). Lever the cylinder off the bottom adaptor. There is a slot above the pump outlet.
- 4) Remove the cover screw (10) and valve body cover (1).
- 5) Remove the 6 screws holding the valve body (2) to the cylinder (11). Remove the valve body assembly and valve gasket (5).
- 6) Pull out the 2 brass pins holding the end plugs to the valve body. Lever out the end plugs at either end of the valve body.
- 7) Gently push the spool valve out of the valve body. Be careful not to damage any o-rings when removing.
- 8) Remove the top (long) poppet valve assembly and o-rings located on top of the cylinder and the bottom (short) poppet valve assembly located on top of the bottom adaptor.
- 9) Hold hex section foot valve horizontally in a vice. Hold the air piston firmly and unscrew Allen head screw (12). Remove screw, washer, o-ring and air piston and from the piston rod.
- 10) Carefully unscrew the foot valve and pump cylinder assembly from the bottom adaptor.
- 11) Withdraw the plunger and piston rod assembly from the bottom adaptor.
- 12) Clean and carefully inspect all parts for wear or damage. Replace any suspect, worn or damaged parts.

## **PUMP REASSEMBLY**

- 1) Ensure that all parts have the correct orientation. If parts are assembled upside down, the pump will not work. Check the parts diagram for correct orientation.
- 2) Apply thread sealant (Loctite or similar) to pump cylinder thread (26) when reassembling the unit.
- 3) Assembly of the pump is a reversal of the disassembly procedure.
- 4) Ensure that all o-rings, particularly in the valve body (2) and the top and bottom poppet valves areas sit square.
- 5) Apply light grease (eg Petroleum Jelly) to the o-rings on the bottom adaptor and air piston seals before fitting the cylinder to the bottom adaptor .
- 6) Fit the pump to your oil drum/tank and reconnect the oil hose and air supply. Open dispensing nozzle to ensure correct operation.

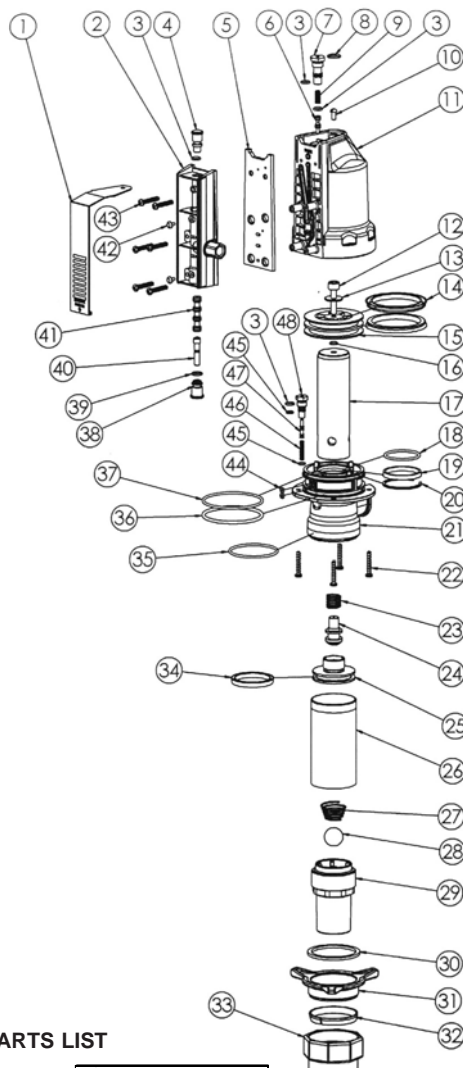
## PARTS DIAGRAM FOR T112



T112 PARTS LIST

ITEM	PART No.	Nb. off	EXISTING PART/SET No.	MT. REF	DESCRIPTION
			<b>T112- 1K (MT A)</b>		<b>MAJOR REPAIR KIT</b>
1	TK005	1	TK005s incl x N66		EXHAUST SCREEN
2	PA39	1	PA39s incl x PA38		VALVEBODY
2	PA39	1	PA30s		VALVEBODY (COMPLETE ASSY)
3	BS011	3	PA97s incl PA16, BS012, PA94	A	ORING
4	PA93	1		A	VALVERLUG - TOP
5	PA38	1	order PA39s	A	VALVE GASKET
6	PA45	1		A	ROFET PISTON ASSY - UPPER
7	PA31	1	PA47s incl 2 x BS011		UPPER ROFET VALVE
8	BS013	1		A	ORING
9	PA8	1		A	ROFET SPRING
10	N66	1	order TK005s		EXHAUST SCREEN SCREW
11	TK022	1	TK022s		AIR CYLINDER
12	N64	1			SOCKET HEAD CAP SCREW
13	N129	1	PA26s		WASHER
14	PA25	2		A	CLIP SEAL
15	PA3	1		A	AIR PISTON
16	PA49	5		A	ORING
17	TH004	1	TH004s		PISTON ROD
18	BS128	1		A	ORING
19	TH001	1	TH006s (ESP)		A SEAL - AIR
20	N251	1	TH013s (NPT)	A	ORCLIP (INTERNAL)
21	TH006	1			BOTTOM ADAPTOR
22	N88	4	PA2s incl 6 x N87		CYLINDER BASE SCREW
23	TE3	1			FLINGER SPRING
24	N418	2	TH003s incl TH002		STEEL BALL
25	TH003	1			FLINGER
26	TH008	1			SUCTION TUBE
27	TE8	1	TH001s (ESP) incl N418		ROOT VALVE SPRING
28	TH001	1	TH003s (NPT) incl N418		ROOT VALVE
29	TH011	1			NUT - BUNG
30	BS147	3		A	ORING
31	TH002	1		A	FLINGER SEAL
32	BS231	1		A	ORING
33	PA16	1		A	END PLUG
34	BS012	1	PA97s incl PA12, BS011, 2 x PA15		ORING
35	PA95	1			RESET BUTTON
36	PA34	1		A	VALVE SPOOL ASSEMBLY
37	PA15	2	order PA15s		END PLUG PIN
38	N87	6	PA2s incl 4 x N88		SCREW (VALVEBODY)
39	BS006	4		A	ORING
40	BS009	2		A	ORING
41	TH012	1	TH007s incl BS011		LOWER ROFET SPRING
42	TH005	1		A	LOWER ROFET PISTON ASSY
43	TH007	1			LOWER ROFET VALVEBODY

## PARTS DIAGRAM FOR T312



T312 PARTS LIST

ITEM	PART No.	Nb. off	EXISTING PART/SET No.	MT. REF	DESCRIPTION
			<b>T312-1K (MT A)</b>		<b>MAJOR REPAIR KIT</b>
1	TK005	1	TK005s incl x N66		EXHAUST SCREEN
2	PA39	1	PA39s incl x PA38		VALVEBODY
2	PA39	1	PA30s		VALVEBODY (COMPLETE ASSY)
3	BS011	3	PA97s incl PA16, BS012, PA94	A	ORING
4	PA93	1		A	VALVERLUG - TOP
5	PA38	1	order PA39s	A	VALVE GASKET
6	PA45	1		A	ROFET PISTON ASSY - UPPER
7	PA31	1	PA47s incl 2 x BS011		UPPER ROFET VALVE
8	BS013	1		A	ORING
9	PA8	1		A	ROFET SPRING
10	N66	1	order TK005s		EXHAUST SCREEN SCREW
11	TK022	1	TK022s		AIR CYLINDER
12	N64	1			SOCKET HEAD CAP SCREW
13	N129	1	PA26s		WASHER
14	PA25	2		A	CLIP SEAL
15	PA3	1		A	AIR PISTON
16	PA49	5		A	ORING
17	TK002	1	TK002s		PISTON ROD
18	BS128	1		A	ORING
19	TK001	1	TK006s (ESP)		A SEAL - AIR
20	N251	1	TK013s (NPT)	A	ORCLIP (INTERNAL)
21	TK006	1			BOTTOM ADAPTOR
22	N88	4	PA2s incl 6 x N87		CYLINDER BASE SCREW
23	TE3	1			FLINGER SPRING
24	TE47A	1	TK008s incl TH011		PISTON VALVE
25	TK009	1			FLINGER
26	TK015	1			SUCTION TUBE
27	TE8	1	TK004s (ESP)		ROOT VALVE SPRING
28	N418	1	TK004s (NPT)		STEEL BALL
29	TK004B	1			ROOT VALVEBODY
30	TK023	1		A	GASKET
31	TK026	1	TK024s		STAR NUT
32	TK003	1			CLAMPING
33	TK024	1			BUNG NUT
34	TK011	1		A	FLINGER SEAL
35	BS138	1		A	ORING
36	BS231	1		A	ORING
37	BS147	1		A	ORING
38	PA16	1		A	END PLUG
39	BS012	1	PA97s incl BS011, PA12 2 x PA15		ORING
40	PA95	1			RESET BUTTON
41	PA34	1		A	VALVE SPOOL ASSEMBLY
42	PA15	2	order PA15s		END PLUG PIN
43	N87	6	PA2s incl 4 x N88		VALVEBODY SCREW
44	BS006	4		A	ORING
45	BS009	2		A	ORING
46	TH012	1	TH007s incl BS011		LOWER ROFET SPRING
47	TH005	1		A	LOWER ROFET PISTON ASSY
48	TH007	1			LOWER ROFET VALVEBODY

## TROUBLE SHOOTING GUIDE

PROBLEM	CAUSE	REMEDY
1) The air leaks continuously from the exhaust screen (1).	Damaged or worn air piston cup seals (14) or air piston (15).	Replace the cup seals and piston.
2) The air motor does not operate or cycle when the reset button is pressed.	The lower poppet spring is fatigued.	Replace the bottom poppet spring.
3) The air motor does not operate, but will cycle when the reset button is pressed.	a) The spool valve is jammed in the valve body.	a) Push the reset button. 1) If the motor starts, disconnect the air line and apply 3 or 4 drops of light oil to the air inlet of the pump. 2) If the motor does not start, replace the spool valve, and clean the valve body bore Note: When re-assembled, apply 3 or 4 drops of light oil to the air inlet of the pump.
	b) The top poppet spring is fatigued.	b) Replace the top poppet spring.
4) The air motor cycles much faster than normal but fails to pump oil.	a) The suction tube is not fitted correctly. (ie. sucking air).	a) Re-seal the suction tube to the pump with thread sealant.
	b) The piston valve is not seating properly.	b) Check that the piston valve is seating correctly, or replace if damaged.
5) The air motor runs slower than normal.	a) The air pressure is too low.	a) Increase the air pressure to specifications (See below)
	b) The air strainer is partially blocked.	b) Clean air strainer.
6) The air motor cycles intermittently when not using the pump.	The ball in the foot valve is not seated properly.	Check that the footvalve ball is seating correctly. (Clean if necessary)

## SPECIFICATIONS

	T112 ( 1:1 Ratio )	T312 ( 3:1 Ratio )
Air Motor (Size)	72mm ( 2.75" )	72mm ( 2.75" )
Air Inlet	1/4" (F) NPT	1/4" (F) NPT
Pump Oil Inlet	1" (F) BSP or NPT	1" (F) BSP or NPT
Pump Oil Outlet	3/4" (F) BSP or NPT	3/4" (F) BSP or NPT
Bung A adaptor	2" (M)	2" (M)
Wetted Materials	Aluminium, Nitrile, Zinc Plated Carbon Steel	Aluminium, Nitrile, Zinc Plated Carbon Steel, Brass
Fluid	Automatic transmission fluid, Engine oil, Gear oil and Hydraulic oil	Automatic transmission fluid, Engine oil, Gear oil and Hydraulic oil
Maximum Air Pressure	1035 kPa / 150 psi / 10.3 bar	1035 kPa / 150 psi / 10.3 bar
Minimum Air Pressure	400 kPa / 60 psi / 4 bar	400 kPa / 60 psi / 4 bar
Air Consumption	Typical System Application .3m <sup>3</sup> 10cfm/min	Typical System Application .27m <sup>3</sup> 9cfm/min
Output (Free Flow at Pump)	27 ltr / min of SAE 10 oil @ 120 psi	15 ltr / min of SAE 10 oil @ 120 psi
Maximum Static Head	100 Mtr	300 Mtr
Dimensions	108mm x 131mm x 385mm	108mm x 131mm x 360mm
Net Weight	3kg	3kg

  
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### macnaught warranty



1. Macnaught Pty Ltd ("Macnaught") warrants that all products manufactured by Macnaught and/or supplied by Macnaught under the "Macnaught" brand, excluding M-Series positive displacement meters ("Meters") and components subject to wear, will be free from any defects caused by faulty materials or workmanship ("Warranty") for a period of 5 years from the date of purchase of the product.

2. For products (excluding Meters) which carry the "Macnaughtdesign" endorsement, an additional Warranty period of 5 years applies to all mechanical components (excluding electronic and electrical components), giving a total Warranty period of 10 years.

3. For Meters, the Warranty period is 12 months from the date of purchase of the product.

4. For components contained in all products which are usually subject to wear from normal operation of the products (such as o-rings, seals, springs, hoses and batteries), the Warranty period is 12 months from the date of purchase of the relevant product.

5. For products and components which are not manufactured by Macnaught and are supplied by Macnaught under a brand name other than "Macnaught", the Warranty period is the longer of 12 months from the date of purchase of the relevant product and the period of the manufacturer's warranty.

6. The warranties contained in clauses 1, 2, 3, 4 and 5 above are conditional on the purchaser, during the relevant Warranty period:

- delivering to Macnaught a detailed notice setting out full details of any defect in any product and details of the date and place of purchase (together with copies of purchase receipts and/or other supporting documents), and
- at the purchaser's own cost, returning the defective product to the nearest authorised Macnaught service centre.

7. Subject to compliance by the purchaser with clause 6, Macnaught shall, at its option, repair or replace any product or component found defective by its inspection by reason of faulty materials or workmanship of Macnaught.

8. This Warranty does not cover the failure of products, parts or components which, in the sole judgment of the Macnaught, arises other than from faulty materials or workmanship of Macnaught, including misuse, abrasion, corrosion, negligence, accident, substitution of non-Macnaught parts, unauthorised modification, improper use, storage or handling, faulty installation or tampering by the purchaser or any third party.

9. If Macnaught's inspection discloses no defect in material or workmanship, repair or replacement and return (at Macnaught's sole option) will be made at customary charges, which will be advised to the purchaser.

10. Macnaught's liability and the purchaser's rights under this Warranty shall be limited to the repair or replacement of defective products or components and particular, shall not extend to any direct, special, indirect or consequential damage or losses of any other warranties.

11. The foregoing Warranty supersedes, voids and is in lieu of any other warranties.

This Warranty does not form part of, nor does it constitute, a contract between Macnaught and the end-user or purchaser. It is additional to any warranty given by the seller of the products. This Warranty does not exclude, limit, restrict or modify the non-excludable rights or remedies conferred upon the end-user or purchaser, or the non-excludable duties or liabilities imposed on the seller or Macnaught, by Part V, Division 2, 2A, and Part VA of the Trade Act 1974 (Commonwealth) or other rights conferred on the end-user or purchaser or duties or liabilities imposed upon Macnaught.