

# INSTRUCTION MANUAL

## Air Operated 5:1 Oil Ratio Pump

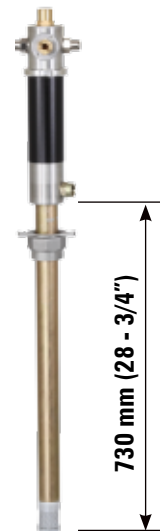
**Congratulations on purchase of this World Class Air Operated Oil Ratio Pump !**

- World-class Industrial Oil Dispensing pumps with guaranteed performance & hassle free operation
- Pumps are designed to work in tough conditions & are ideal for use with high viscosity oils (up to SAE 240) for transferring over short & long distances (up to 50 metres), mostly used with Trolley mounted kits both with & without Hose Reels, as well as with fixed systems for centralized distribution
- All metal construction, fully CNC machined with hardened wear resistant moving parts
- Reciprocating piston operated 2-1/2" (63 mm) dia. Air Motor
- Stub Pumps are supplied with Non Return Valve threaded 1" (F) for use on the bottom of the Suction Tube. Other pump lengths have a built in Strainer at pump inlet to keep contaminants away
- Pumps are double acting with discharge up to 18 LPM (4.76 GPM). Air Consumption: 250 LPM (66 GPM)
- Available in three different sizes - Stub, 16 Gal & 55 Gal version

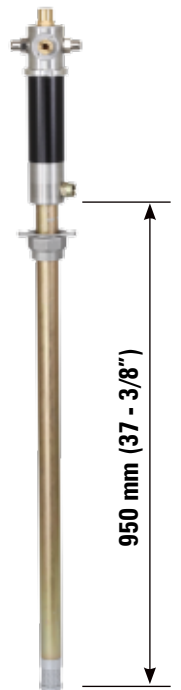
**Stub Version**  
**OP/S/51B**  
5235



**16 Gal Version**  
**OP/T2/51B**



**55 Gal Version**  
**OP/T3/51B**  
5435



### PUMP CONSTITUENTS

1. Pump Assembly
2. Bung Nut



**Fig. 1**

# Contents

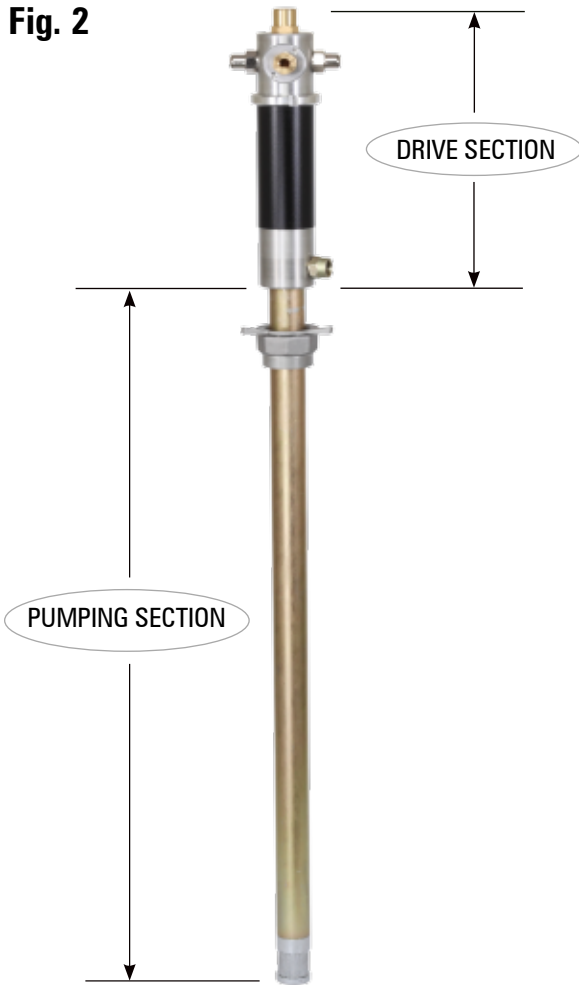
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## PUMP CONSTRUCTION

Fig. 2



The pump is made up of two sections as below :-

- **DRIVE SECTION:-** It consists of an Air Motor Assembly driven by compressed air. The piston diameter of the air motor is 2.5" / 63 mm. The motor consists of an air cylinder with piston and one reciprocal valve with a nylon slider. The valve directs the compressed air alternately to the top or bottom of the piston, thus producing a reciprocating motion of the piston rod.
- **PUMPING SECTION:-** It consists of a pump in which a piston lifts media through Non Return Valves by reciprocating inside the suction tube. Media is discharged with pressure (from the outlet located at bottom of Air Motor) into the delivery hose / pipe.

### NOTE

- **AIR MOTOR** of this pump starts automatically when the dispensing gun / tap is opened. When the dispensing gun / tap is closed, air motor builds up a back-pressure and stops operating the pumping section.
- **PRESSURE RATIO** of the pump states the ratio of the output fluid pressure to the incoming air pressure. Since the pressure ratio is 5:1, we achieve an output media pressure up to 750 PSI (50 BAR) when the incoming air pressure is 150 PSI (10 BAR).

## GETTING STARTED

Before installing the pump, make sure the following are available:

- **AIR SUPPLY:** An FRL (Filter-Regulator-Lubricator) unit must be used in the Air supply, before it is connected to the pump.  
Set the regulator to 6 BAR (90 PSI) or any required inlet pressure, but never more than 150 PSI (10 BAR) or less than 30 PSI (2 BAR).  
When not in use & at the end of each day, air supply to the pump must be switched off.
- **DISCHARGE HOSE:** It is recommended to use a hose with ½" I.D., with a Working Pressure of not less than 400 PSI (28 BAR). Burst Pressure must be atleast 1000 PSI (70 BAR) or more. Using a smaller I.D. hose will cause higher pressure loss.
- **DISPENSING GUN:** Based on the application, you may use a gun that is compatible with media being dispensed.
- **THREAD SEALANT:** Apply thread sealant on all threaded connections to ensure leak-proof operation.

## PUMP INSTALLATION & OPERATION

1. Slide out the Bung from Suction Tube & screw it into the 2" opening on the drum.
2. Loosen the ring nut on Bung & carefully insert the pump Suction Tube through it. Once the Suction Tube touches the bottom of drum, tighten the ring nut.
3. Connect the appropriate hose and dispensing gun to the pump outlet. Use a thread sealant to avoid any leakage.
4. With the air supply turned off, connect the air line into the air inlet on the pump. Remove the vent plug on drum to create the required venting for pump operation.
5. Partially open the on/off air valve (It helps in creating initial vacuum when filling a totally dry pump). Pump will start operating automatically until it gets primed. Pump is said to be **Primed** when media is available at the pump outlet, making the pump ready to use. Once primed, the air motor will stop. Open the on/off air valve fully.
6. Operate the dispensing gun, which will actuate the air motor & pump will start dispensing.

# MAINTENANCE & REPAIR

(Refer to Exploded View - Page 10)

## General Precautions

- Before performing any service operation, always shut off the air supply and release the system pressure i.e. let the media out so that the pressure decreases. When storing the pump assembly out of the drum, cover the Filter Tube (62) with Filter Cap (63).
- Be careful not to damage any parts when dismantling. While removing shafts which do not have key flats, use a Pipe wrench, Strap wrench or the like. The easiest way to remove such a shaft is to grip it in a vice with aluminium or copper jaws, clamp the shaft in a hand-drill chuck and then turn the chuck by hand.
- Be careful when fitting O-rings and seals. Always lubricate them with oil before fitting. They must never be threaded over sharp edges when being fitted. Lubricate all moving parts with oil.
- When troubleshooting, be on a lookout for dirt in valves / ball seats, scratches in sealing surfaces & damage in O-rings / seals / gaskets.

## Recommended Tools



A Soft - Jaw vice  
(Aluminum or Copper Jaws)



Threaded Pipe  
1/2" (M)



Adjustable Caliper Wrench



Wide Jaw Plumbing Plier



Combination Wrench  
Size 10, 12, 13,14,  
19, 21, 25 & 28 mm



Phillips Screwdriver



Adjustable C Hook Wrench  
Size 1-1/4" to 3"



Tweezer



Soft Faced Plastic Mallet



Ball Pein Hammer



Pin Punch  
Size 3 mm

## Air Motor Kit Replacement (Refer to Table 4 - Page 15)

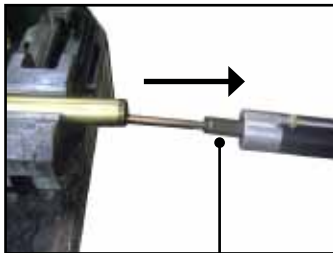
1. Pull out Filter Cap (63) by hand. Hold Barrel (58) in a soft-jaw vice.



2. Tighten a 1/2" male threaded pipe into the outlet adapter (46) & unscrew Air Motor Assembly anticlockwise.



3. Pull Air Motor slightly to get access to Motor Shaft (48).



**Motor Shaft**

4. Support Motor Shaft (48) on a V block & insert a pin punch (size 3 mm) vertically into the pin hole of Motor Shaft (48).



**Pin Hole**

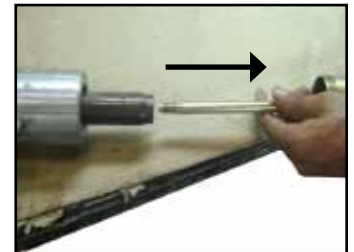
5. Tap lightly with a hammer to drive out upper Slotted Spring Pin (49) taking care not to bend Piston Rod (50).



**Motor Shaft**

**Piston Rod**

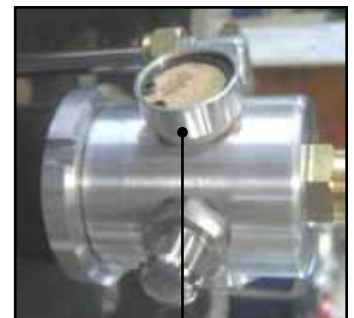
6. Unscrew Piston Rod (50) & separate it from Air Motor Assembly.



7. Hold Barrel (58) in a soft-jaw vice. Pull Piston Rod (50) so that Piston (52) also comes out of barrel.



8. Hold Cylinder (36) of Air Motor Assembly in a soft-jaw vice. Unscrew Exhaust valve (27) with a wide jaw plier. Remove Circlip (24) to remove O Ring (26).



**Exhaust Valve**



9. Loosen both Coupling Nuts (2) using wrench (size 21 mm).

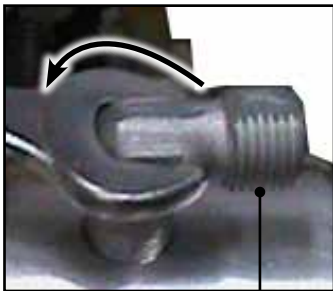


10. Remove Bend Pipe (1) along with both Coupling Nuts (2) & Sealing Rings (3).



**Bend Pipe**

11. Unscrew both Bends (4) using wrench (size 13 mm).



**Bend**



12. Unscrew Inlet Cover Adapter (23) using wrench (size 25 mm). Connect a caliper wrench into the holes on inlet Cover (22). Unscrew it anticlockwise.



**Inlet Cover**

13. Unscrew both Pushers (12) using wrench (size 25 mm) or a pneumatic wrench with 25 mm socket.



14. Remove both Pushers (12), Springs (11), Pusher Nuts (9) & Pusher Buttons (8).



**Pusher Button**

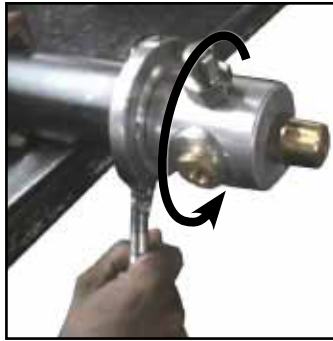
15. Remove Guide (5) using a wrench (size 28 mm) or a pneumatic wrench with 28 mm socket.



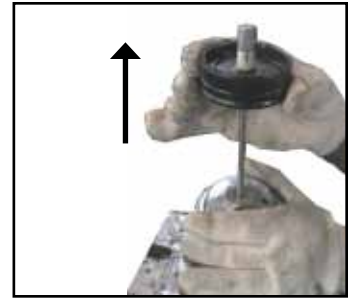
**Guide**



16. Tap around Clamping Ring (34) with a plastic hammer. Loosen Clamping Ring (34) using an **Adjustable C Hook Wrench (Size 1-1/4" to 3")**. Turn it anticlockwise.



19. Pull out Rubber Plunger (38).



17. Tap around Housing (7) of Air Motor with plastic hammer. Hold Housing (7) in the Soft-jaw vice. Tighten a 1/2" male threaded pipe into the outlet adapter (46) & unscrew anticlockwise to disconnect Housing (7) from Cylinder (36) & Shaft Body (41).



20. Hold Stopper (39) with a wrench (size 10 mm) & unscrew Slider (19) anticlockwise with a wrench (size 12 mm). Disconnect Plunger Rod (29). Remove Slider (19) from top of the Housing (7).

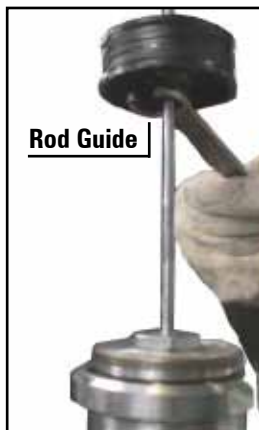


**Hold the Stopper**

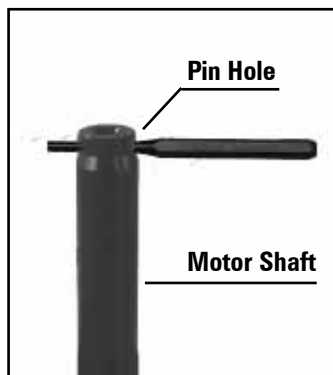
18. Hold Plunger Rod Guide (37) with a wrench (size 19 mm). Unscrew Motor Shaft (48) by turning it anticlockwise with a pin punch (size 3 mm).



**Turn the Slider**



**Rod Guide**



**Pin Hole**

**Motor Shaft**

21. Unscrew Housing Rod Guide (33) anticlockwise with a wrench (size 28 mm) or a pneumatic wrench with 28 mm socket.



22. Open the two Screws (18) with a Philips screwdriver & remove Clip (17).

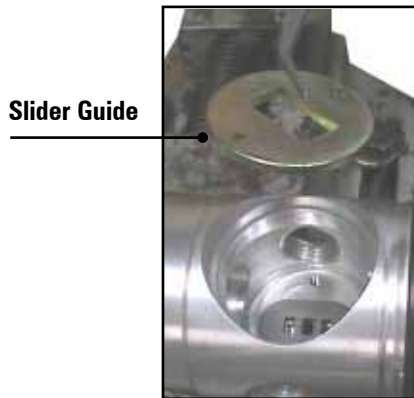


Clip

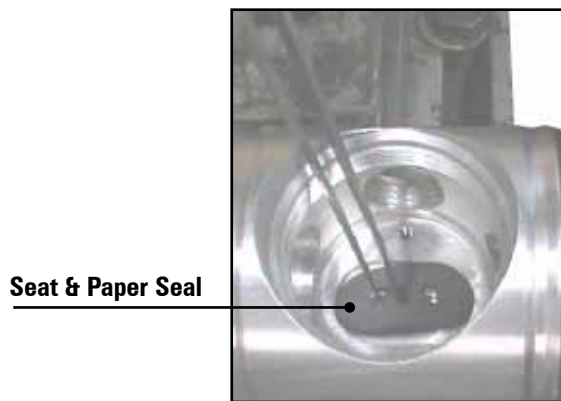
23. Use a Tweezer & remove Nylon Slider (16), Slider Guide (15), Seat (14) & Paper Seal (13). Clean the bottom surface thoroughly.



Nylon Slider

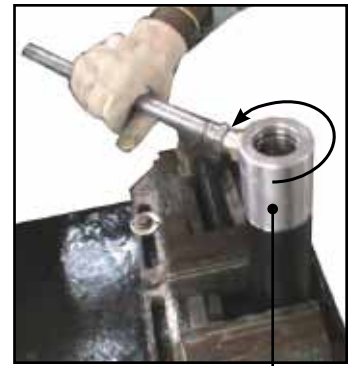


Slider Guide



Seat & Paper Seal

24. Tap around joint of Cylinder (36) & Motor Shaft Body (41) with a plastic hammer. Hold Cylinder (36) of Air Motor in in the Soft-jaw vice. Tighten the 1/2" male threaded pipe into the outlet adapter (46) & remove Motor Shaft Body (41) by turning it anticlockwise.



Motor Shaft Body

25. Remove both Big Seals (42) & Small Seal (43) from Motor Shaft Body (41). **Do not remove the Turcite washer (44) as it only guides the shaft movement (It is not for sealing purpose).**





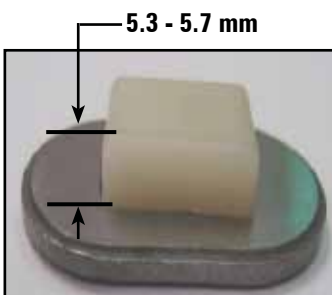
26. Replace the Air Motor Kit (KIT/T3/51B) as mentioned in Table 4 - Page 15, by following the steps 1-25 in reverse order taking care of the points below:

- **Ensure all mating surfaces are clean before reassembly. Apply minor oil on all mating surfaces, O Rings & moving parts before reassembly.**



Apply oil on paper seal

- **Ensure that height of Nylon Slider (16) is approx. 5.3 - 5.7 mm. Also, hollow portion of Nylon Slider should rest evenly on top of Seat (14).**



- **When fitting Pushers (12), see through Inlet Cover (21) & ensure Pusher Buttons (8) are installed in centre position. Also ensure that Clip (17) is tight & Nylon Slider (16) moves smoothly.**

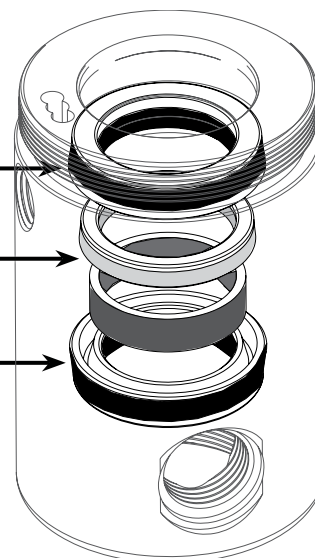


- **When fitting, apply locking fluid on threads of Guide (5), Bends (4), Stopper (28), Stopper (29), Housing Rod Guide (33) & Barrel (58) to avoid any leakage.**



- **Seals of Motor Shaft Body (41) should be installed as shown. Apply some oil on Seal before installation.**

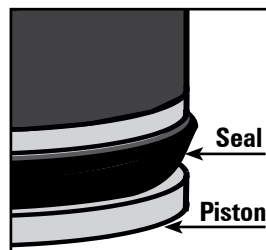
Lip of upper Big Seal (42) facing downwards  
 Lip of Small Seal (43) facing downwards  
 Lip of lower Big Seal (42) facing upwards



- **Lip of Oil Seal (56) must face upwards, when mounted on Piston (52). Apply some oil on Seal before installation.**



Apply oil

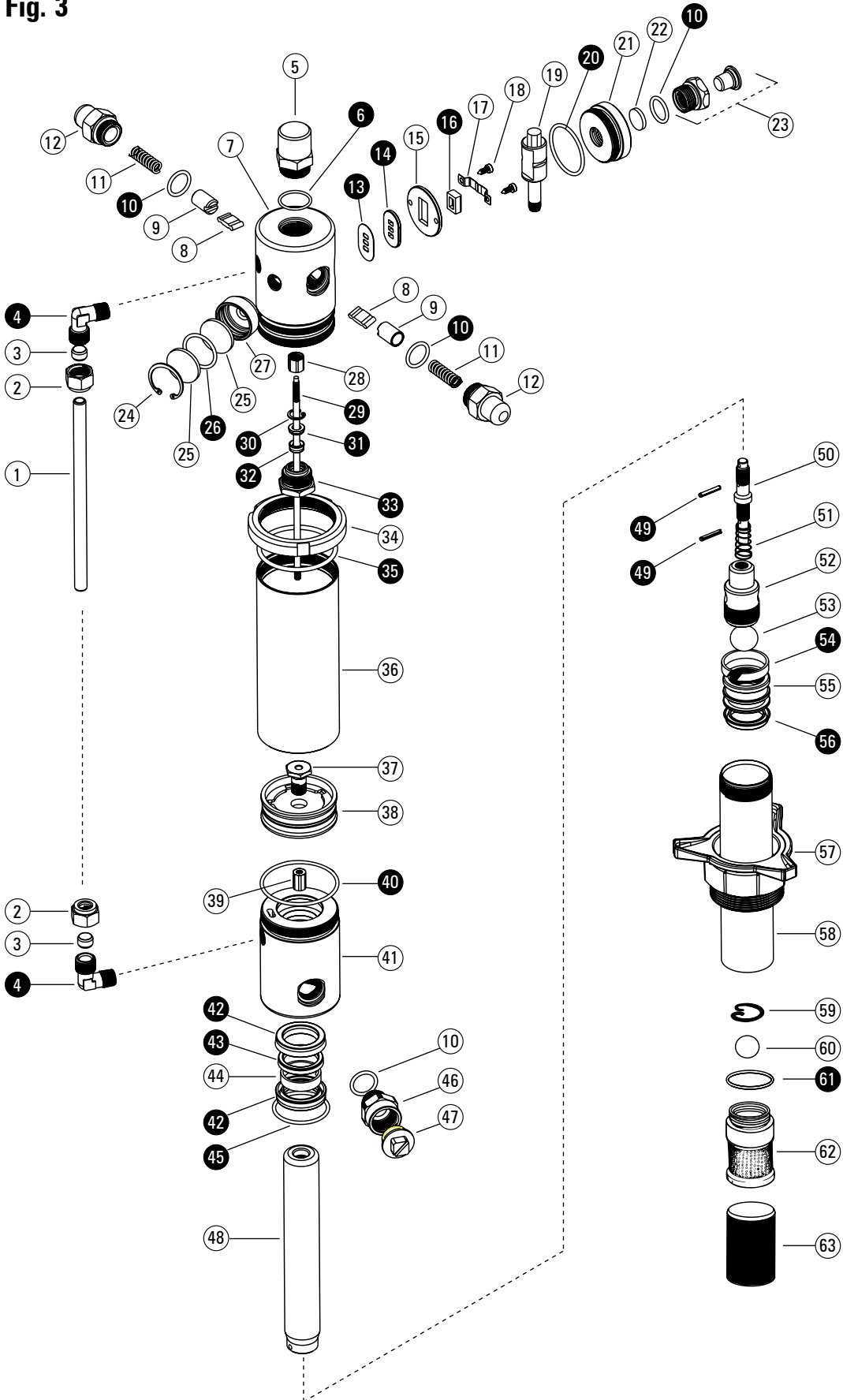


- **While pushing Piston Rod (50) into Barrel (58), apply some oil on all parts & keep Slitted Washer (54) pressed evenly around Piston (52).**



# EXPLODED VIEW

Fig. 3



**KIT/T3/51B**

**CORRECT FITMENT OF PISTON (55)**

- Slitted Washer (54) should be pressed evenly around Piston (52)
- Conical part of Seal (56) must face downwards

**Apply thread sealant on the threads of Guide (5), Bends (4), Stopper (28), Stopper (29), Housing Rod Guide (33) & Barrel (58)**

**NON RETURN VALVE IN STUB PUMP ONLY**

**PARTS LIST****Table 1**

REFERENCE NO. FROM EXPLODED VIEW	DESCRIPTION	QUANTITY
1	Bend Pipe	1
2	Coupling Nut	2
3	Sealing Ring	2
4	Bend	2
5	Guide	1
6	O Ring (Metric)	1
7	Housing	1
8	Pusher Button	2
9	Pusher Nut	2
10	O Ring	4
11	Pusher Spring	2
12	Pusher	2
13	Paper Seal	1
14	Seat	1
15	Slider Guide	1
16	Nylon slider	1
17	Clip	1
18	Self Tapping Screw	2
19	Slider	1
20	O Ring	1
21	Inlet Cover	1
22	Filter	1
23	Air Inlet Adapter	1
24	Circlip	1
25	Filter (B)	2
26	O Ring	1
27	Exhaust Valve	1
28	Stopper	1
29	Plunger Rod	1
30	Circlip	1
31	Seal	1
32	Bush	1
33	Housing Rod Guide	1
34	Clamping Ring	1
35	O Ring (Metric)	1
36	Cylinder	1
37	Plunger Rod Guide	1
38	Rubber Plunger	1
39	Stopper	1
40	O Ring	1
41	Shaft Body	1
42	Big Seal	2
43	Small Seal	1
44	Turcite Washer	1

REFERENCE NO. FROM EXPLODED VIEW	DESCRIPTION	QUANTITY
45	O Ring	1
46	Outlet Adapter	1
47	Outlet Cap	1
48	Motor Shaft	1
49	Slotted Spring Pin	2
50	Piston Rod	1
51	Piston Spring	1
52	Piston Coupler	1
53	Ball (5/8")	1
54	Slitted Washer	1
55	Piston	1
56	Oil Seal	1
57	Bung	1
58	Barrel	1
59	Circlip	1
60	Ball (7/8")	1
61	O Ring	1
62	Filter Tube	1
63	Filter Cap	1
64	Body (Non Return Valve)	1

**TROUBLESHOOTING**  
**(Refer to Exploded View - Page 10)**

**Table 2**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Pump operates, but does not dispense media at all	Media viscosity is too high	Make sure that media used has a viscosity of SAE 240 or lower
	Drum is Empty	Media level inside the drum may be too low. Refill drum
	Pump inlet is blocked	Remove suction tube & clean strainer at pump inlet
	Air Inlet Pressure is too less	Increase air pressure. It must be at least 30 PSI (2 BAR)
Pump not working / less discharge	Air Inlet pressure is too less	Increase air pressure. It must be at least 30 PSI (2 BAR)
	Nylon Slider (16) is jammed / overtight	<ol style="list-style-type: none"> <li>1. Check for any build-up edge on Clip (17) &amp; tighten it again. Make sure the movement of Nylon Slider (16) is neither very loose nor very tight</li> <li>2. If needed, replace Nylon Slider (16). Also replace the Paper Seal (13) &amp; Seat (14) to ensure the best fitting</li> </ol>
	Plunger (38) / Plunger Rod (39) / Piston Rod (50) / Piston (52) jammed.	<ol style="list-style-type: none"> <li>1. Remove suction tube. Disconnect Air Motor Assembly from Pumping Section by removing the upper Slotted Spring Pin (49) from Motor Shaft (48)</li> <li>2. Supply input air to Air Motor. If it works properly without the barrel assembly, then the problem lies with the pumping section. Otherwise check the Air Motor for smooth movement</li> <li>3. After locating the faulty section, check the respective Piston / Plunger &amp; the associated washers &amp; seals for any overlap or wear &amp; tear. Replace the defective parts from Repair Kit</li> <li>4. Ensure to replace the moving parts having close tolerances (such as Nylon Slider (27), Paper Seal (13) &amp; Seat (14) as a SET to ensure the best fitting</li> </ol>
Pump continues to operate even after the trigger of dispensing gun has been released	Air Leakage in the pump assembly	<p>Check all the connections to ensure they are air tight. Use thread sealant.</p> <p>Check O rings &amp; seals for damage. Replace the defective parts from Repair Kit</p>
Media comes through the air Exhaust Valve (27)	Media leaks into the Air Motor	Check O Ring (45), Seals (42), (43), Oil Seal (56) & Slitted Washer (54) for wear & tear. Replace the damaged parts from Repair Kit
Air passes directly from inlet to the outlet & pump does not work	Nylon Slider (16) is jammed / overtight	<ol style="list-style-type: none"> <li>1. Check for any build-up edge on Clip (17) &amp; tighten it again. Make sure the movement of Nylon Slider (16) is neither very loose nor very tight</li> <li>2. If needed, replace Nylon Slider (16). Also replace the Paper Seal (13) &amp; Seat (14) to ensure the best fitting</li> </ol>
Discharge suddenly stopped while the pump was running	Seals / O Rings Damage	Check all seals / O Rings & replace the damaged parts from Repair Kit
	Chip / Other foreign particles get clogged at dispensing gun / discharge outlet	Clean all foreign particles / chips
	Clogging of Filter Tube (62) / Non Return Valve Body (64)	Open, clean it & reassemble it properly



**REPLACEMENT & SERVICE PARTS PROGRAM**  
**(Refer to Exploded View - Page 10)**

**Table 3**

**REPLACEMENT PARTS PROGRAM**

<b>REFERENCE NO. FROM EXPLODED VIEW</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>QUANTITY</b>
57	BUNG/OP/42	Bung	1

# SERVICE PARTS PROGRAM

Replace Component No. 13, 14 & 16 as a SET.

Component No. 30, 31 & 32 are pre-assembled into Component 33

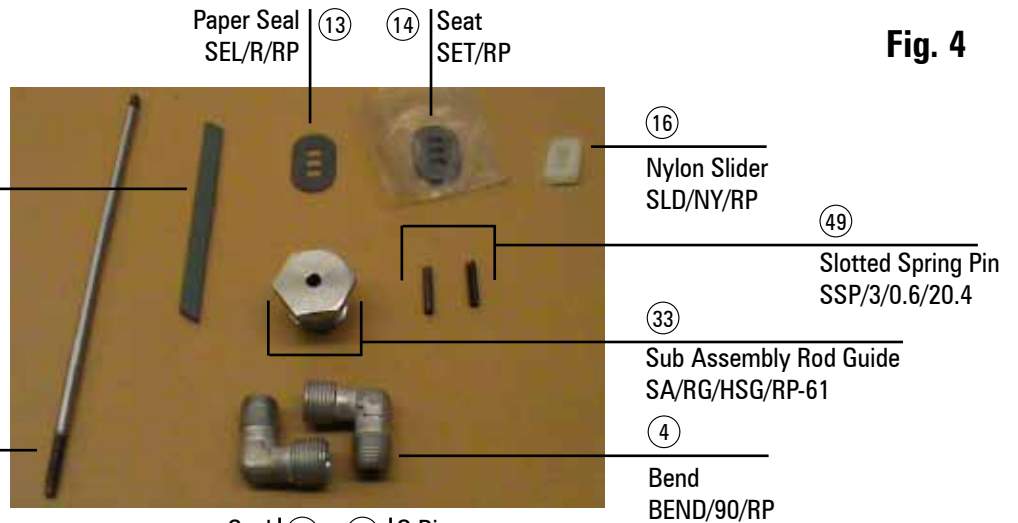


Fig. 4

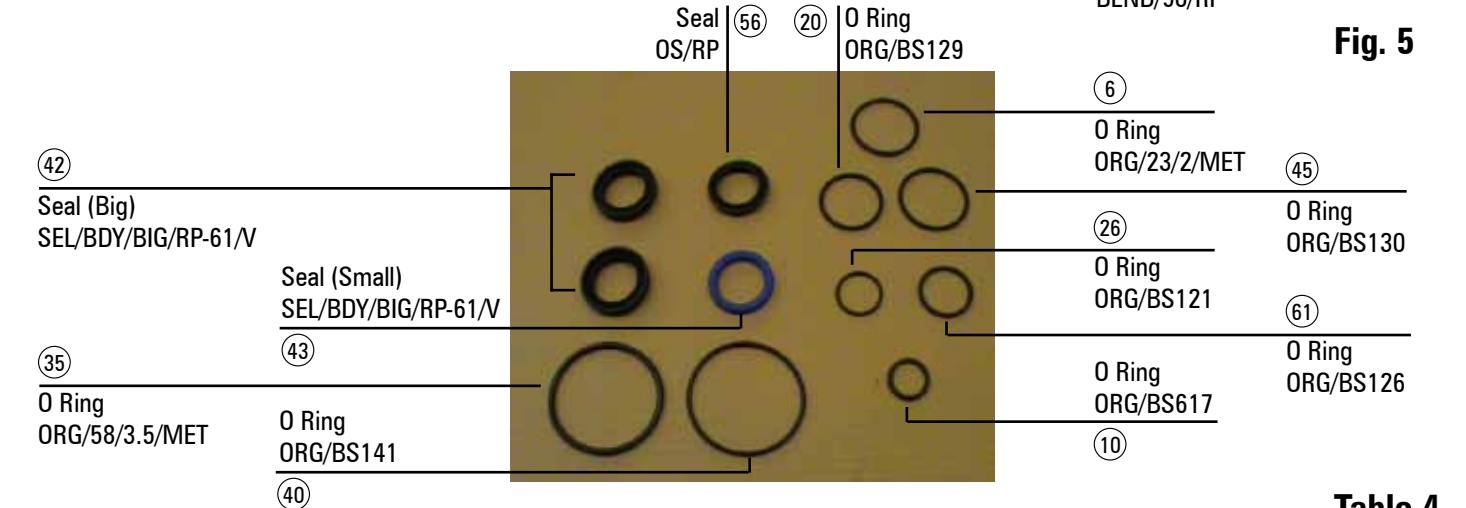


Fig. 5

Table 4

KIT PART NO.	KIT DESCRIPTION	CONSTITUENT NO.	PART DESCRIPTION	REF. NO.	QTY PER KIT
KIT/T3/51B	AIR MOTOR KIT	BEND/90/RP	Bend	4	2
		ORG/23/2/MET	O Ring	6	1
		ORG/BS617	O Ring	10	3
		SEL/P/RP	Paper Seal	13	1
		SET/RP	Seat	14	1
		SLD/NY/RP	Nylon Slider	16	1
		ORG/BS129	O Ring	20	1
		ORG/BS121	O Ring	26	1
		ROD/PGR/RP-61	Plunger Rod	29	1
		SA/RG/HSG/RP-61	Sub Assembly Rod Guide (includes 30,31,32)	33	1
		ORG/58/3.5/MET	O Ring	35	1
		ORG/BS141	O Ring	40	1
		SEL/BDY/BIG/RP-61/V	Seal (Big)	42	2
		SEL/BDY/SM/RP-61/V	Seal (Small)	43	1
		ORG/BS130	O Ring	45	1
		SSP/3/0.6/20.4	Slotted Spring Pin	49	2
		WSR/TU/RP	Slitted Washer (Turcite)	54	1
		OS/RP	Seal	56	1
ORG/BS126	O Ring	61	1		

## SPECIFICATIONS\*

**Table 5**

<b>Flow Rate</b>	Up to 18 LPM (4.76 GPM)
<b>Working Pressure</b>	2-10 BAR (30-150 PSI)
<b>Maximum Air Inlet Pressure</b>	10 BAR (150 PSI)
<b>Maximum Media Outlet Pressure</b>	50 BAR (750 PSI)
<b>Air Inlet Connection</b>	1/4" (F)
<b>Pump Inlet on Stub Pumps only</b>	1" (F)
<b>Pump Outlet Connection</b>	1/2" (F)
<b>Air Consumption</b>	250 LPM (66 GPM)
<b>Noise Level</b>	81 db

\* Pump is available in three different sizes - Stub, 16 Gal & 55 Gal version

### **WARNING**

- Always wear protection gear like safety goggles, gloves, apron, and ear plugs while operating the pump
- Never let any body part come in front of, or in contact with the control outlet
- Always cut off air supply after use, so that media cannot leak in case any of the pump component fails
- Before switching the air supply on, check hoses for any sign of wear, leak or loose fittings. Replace as necessary
- Do not smoke near the pump. Do not use the pump near a source of spark / open flames
- When changing the working fluid, at least 1 litre of new fluid should be discarded to avoid mixing of fluids
- Pump should NOT be operated for more than 4 hrs continuously
- Pump must be supplied with CLEAN & DRY compressed air via an FRL unit
- Before attempting any maintenance or repair of this product, disconnect air supply and then operate dispensing gun to release fluid pressure
- Use only genuine factory parts for repair

### **WETTED COMPONENTS**

Steel, Brass, Aluminum, Hi Nitrile Rubber, Polyurethane, Turcite

### **RECOMMENDED USE**

ATF, Engine Oil, Gear Oil, Hydraulic Oil, High viscosity oils (up to SAE 240), Diesel, Kerosene

### **DO NOT USE WITH**

Corrosive Fluids, Solvents, Acid, Alkalis, Antifreeze, waste oil or any other media not compatible with the pump components