OPERATOR'S MANUAL

INCLUDING: SERVICE KITS, GENERAL DESCRIPTION & TROUBLESHOOTING
ALSO INCLUDE MANUALS: 6641X–X AIR MOTOR

662007–E
662008–E

RELEASED: 12–13–85
REVISED: 8–16–94
(REV G) IPP/PSE

3" AIR MOTOR
5:1 RATIO
2 1/4" STROKE

662007–E
662008–E
BASIC PUMP

IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- 637066–B for repair of Air Motor section.
- 637067–B for repair of Lower Pump (see figure 2).

GENERAL DESCRIPTION

This model is designed for high volume delivery of low viscosity fluids such as motor oil, gear oil or transmission fluids. The model covered by this manual includes a bung adapter, coupler, connector, outlet swivel and material and air supply hoses. Material dispensing accessories and supply lines and fittings must be capable of withstanding pressures developed by pump.

- The ARO 5:1 ratio basic pump assembly consists of a 3" air motor, spacer section and ball check lower pump end.
- The ball check design provides for easy priming of the lower foot valve. Material is delivered to the pump discharge outlet on both the up and down stroke.

RATIO x REGULATED AIR PRESSURE TO AIR MOTOR = MAXIMUM FLUID PRESSURE.

- The 5:1 ratio is an expression of the relationship between the air motor area and the lower pump end area. When 150 p.s.i. (10 bar) air pressure is supplied to the air motor, the lower pump end will develop a maximum of 786 p.s.i. (54 bar) fluid pressure (at no flow) – as the fluid control is opened, the flow rate will increase as the air motor cycle rate increases to keep up with the demand.

PUMP DATA

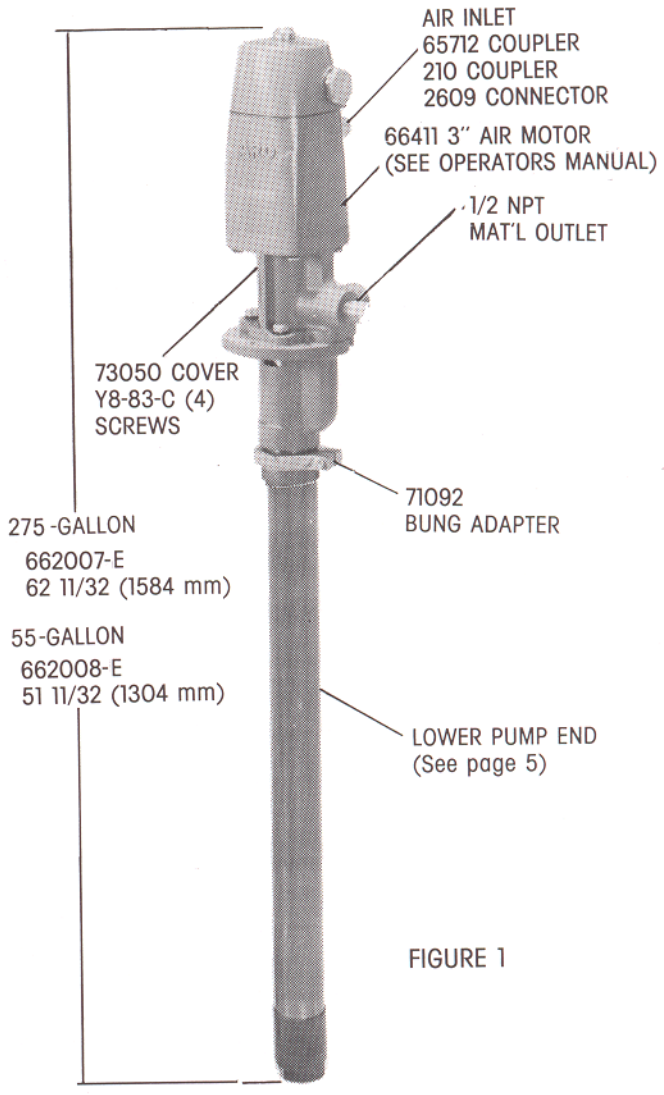

FIGURE 1

INCLUDED BUT NOT SHOWN:
75366 SWIVEL

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OPERATING AND SAFETY PRECAUTIONS

- HEED ALL WARNINGS AND CAUTIONS.
- Use ARO replacement parts to assure compatible pressure rating.
- **WARNING:** DO NOT EXCEED MAXIMUM INLET AIR PRESSURE OF 150 PSI (21 BAR). OPERATING PUMP AT HIGHER PRESSURE MAY CAUSE PUMP DAMAGE AND/OR PERSONAL INJURY AND/OR PROPERTY DAMAGE.
- **WARNING:** WHEN USING PUMP IN A LOCATION WHERE SURROUNDING ATMOSPHERE IS CONDUCIVE TO SPONTANEOUS COMBUSTION OR WHEN PUMPING, FLUSHING OR RECIRCULATING INFLAMMABLE SUBSTANCES (E.G., PAINTS, SOLVENTS, LACQUERS, ETC.), FAILURE TO SAFEGUARD AGAINST STATIC SPARK, OPEN FLAME, HEAT AND IMPROPER VENTILATION COULD RESULT IN EXPLOSION AND/OR FIRE CAUSING SEVERE PERSONAL INJURY OR DEATH AND/OR PROPERTY DAMAGE.
- Safety precautions should include:
  - Use of static wire hoses.
  - Proper grounding of pump, dispensing valve or device, hoses, any object to which material is being transferred, and containers. After grounding, periodically check to verify continuity of electrical path to ground. Test with ohmmeter from each component (i.e., hoses, pump, clamps, container, spray gun, etc.) to ground to insure continuity. Ohmmeter reading shown should be 10 ohms or less. Consult local electric codes for specific grounding requirements.
  - Proper ventilation of area where pump and containers are located.
  - Keeping inflammables away from heat, open flames and sparks.
  - Keeping containers closed when not in use.
  - Secure pump, connections and all contact points to avoid vibration and generation of contact or static spark.
- **WARNING:** DO NOT SERVICE OR CLEAN PUMP, HOSES OR DISPENSING VALVE WHILE THE SYSTEM IS PRESSURIZED AS SERIOUS PERSONAL INJURY COULD RESULT. First disconnect air line, then relieve pressure from system by opening dispensing valve or device and/or carefully and slowly loosening and removing outlet hose or piping from pump.
- **CAUTION:** Be sure material hoses and other components are able to withstand fluid pressures developed by this pump. Check all hoses for damage or wear. Be certain dispensing device is clean and in proper working condition.
- **CAUTION:** Disconnect air line from pump when system sits idle for long periods of time.
- **CAUTION:** Verify the chemical compatibility of the pump wetted parts and the substance being pumped, flushed or recirculated. Consult ARO Form 8677-P, Fluid Compatibility Guide, for information on chemical compatibility.
- **CAUTION:** BE CERTAIN ALL THE OPERATORS OF THIS EQUIPMENT HAVE BEEN TRAINED FOR SAFE WORKING PRACTICES, UNDERSTAND ITS LIMITATIONS, AND WEAR SAFETY GOGGLES/EQUIPMENT WHEN REQUIRED.
- **CAUTION:** The pump should not be used for the structural support of the piping system. Be certain system components are properly supported to prevent stress on the pump parts.
- **CAUTION:** Do not allow pump to operate for long periods of time when out of material. This may cause unnecessary wear or damage to the pump.
- DO NOT EXCEED MAXIMUM WORKING PRESSURE OF 786 PSI (54 BAR) AT 150 PSI (10 BAR) AIR INLET PRESSURE.

AIR AND LUBE REQUIREMENTS

- Excessive air pressure will shorten the life of the pump. **DO NOT OPERATE THE PUMP ABOVE THE MAXIMUM RATED PRESSURE.**
- For maximum operating efficiency and to yield the longest life of parts and mechanisms, the following air supply specifications should be maintained for this pump.

- **MAXIMUM AIR PRESSURE – 150 PSI (10.3 Bar)**
- **AIR FILTRATION – 50 Micron**
- **LUBRICATED AIR SUPPLY**
- **AIR INLET SIZE – 1/4" NPT**

- Lack of or an excessive amount of lubrication will affect the performance and the life of this pump. Use only recommended lubricants.
- DAILY – Fill the air line lubricator reservoir with a good grade of S.A.E. NO. 90W non-detergent gear oil, adjust to a rate of 1 to 2 drops per minute.
- If the pump is to be inoperative for more than a few hours at a time, disconnect the air supply and relieve all pressure from the system.
- It is good practice to install the air line lubricator as close as possible to the pump. This increases the service life of the pump by reducing wear of the motor's internal parts.

INSTALLATION

FLUSH PUMP

__Connect fluid hose to pump outlet. Be sure all fittings are tight.
__Turn air regulator knob counter-clockwise until it turns free.
__Pump has been tested in oil and a small amount remains for protection against rusting. Immerse lower pump end in compatible solvent.
__Connect air hose coupler to connector on FRL.
__Turn air regulator knob clockwise until air motor starts.
__Flush pump until oil is removed.
__Disconnect air supply to air motor.

- **CAUTION: Solvent used for flushing may not be compatible with material to be pumped. If this is the case, flush again with a compatible solvent.**

- If pump is to be inoperative for an unspecified period of time, disconnect air and relieve all pressure.
- If pump does not function properly, disconnect air and relieve all pressure. Refer to Trouble Shooting.

OPERATING INSTRUCTIONS

__Turn air regulator knob clockwise until air motor starts to cycle.
__Allow pump to cycle slowly until it is primed and all air is purged from the fluid hose or dispensing valve.
__Turn off dispensing valve and allow pump to stall – check all fittings for any leakage.
__Change air regulator setting until desired pressure and flow is obtained.
__Inspect airline filter, open petcock, to flush moisture or residue from bowl.
__Pump is recommended to operate between 30 PSI and 150 PSI (not to exceed 75 cycles per minute).

MAINTENANCE

The basic pump consists of two major components: 1. Air Motor, 2. Lower Pump End. The air motor is connected to the lower pump end. The air motor is removable and is to be serviced separately. Refer to air motor manual for service and parts.

- Periodically flush entire pump system with a solvent that is compatible with the material being pumped.
- Disassembly should be done on a clean work bench with clean cloths to keep parts clean.
- If replacement parts are necessary, consult drawing containing parts for identification.
- Before assembling, lubricate parts where required. When assembling "O" rings or parts adjacent to "O" rings, care must be exercised to prevent damage to "O" rings and "O" ring groove surfaces.

REF.	DESCRIPTION	(QTY)	PART NO.
1	Piston		73047
2	Packing Nut		76576
✓3	Packing		76577
✓4	"O" Ring		Y179-17
5	Spacer		76578
✓6	Packing		76579
✓7	Spacer		73332-2
8	Base		73035-1
9	Nut	(2 req'd.)	Y11-108-C
✓10	Seal		90125–1
11	Follower		75678
12	Ball		Y16-32
✓13	Cup		75680
14	Washer		75682
15	Seat		75681
16	Ball Stop		73038
17	Ball		Y16-236
18	Seat		73037
19	Screw	(3 req'd)	Y6-64-C
20	Washer	(3 req'd)	Y14-616
A	Tube (662007-E)		73939
	Tube (662008-E)		73938
B	Rod (662007-E)		73313
	Rod (662008-E)		75677
✓	Indicates Parts included in Lower Pump end Service Kit		637067-B

PUMP DISASSEMBLY

NOTE: All threads are right handed.
CAUTION: Do not mar finish on (A) tube.

__Clamp pump assembly in a vise on either the motor base assembly, or material outlet assembly or air inlet assembly. (see page 3).
__Remove four Y8-83-C screws and 73050 cover. (see page 3).
__Remove three (19) screws and three (20) washers.
__Separate motor assembly from lower pump assembly by pulling down on the lower pump assembly exposing the connector adapters between motor piston rod and material rod.
__Uncouple the motor piston rod from (1) plunger by placing a wrench on the machined flats of (1) plunger and unscrewing 75674 retainer.
__Remove (4) "O" ring.
__Clamp the lower pump assembly in a vise on the (8) pump base. CAUTION: Do not overtighten.
__Loosen (A) tube off (B) piston rod assembly.
__Remove (10) gasket from inside (8) pump base.
__Remove (1) piston and (B) piston rod assembly.
__Vise on machined flat of (1) piston, loosen (9) nut and remove (B) piston rod assembly.
__Vise on machined flat of (11) cup follower, unscrew and remove (15) inner check seat from (11) cup follower on the (B) piston rod assembly and remove (12) ball, (14) washer (13) cup.
__Vise (8) pump base. Remove (2) packing nut, (3) packing wiper, (5) spacer, (6) packing and (7) spacer.
__Unscrew (18) seat from (A) tube and remove (16) seat and (17) ball.

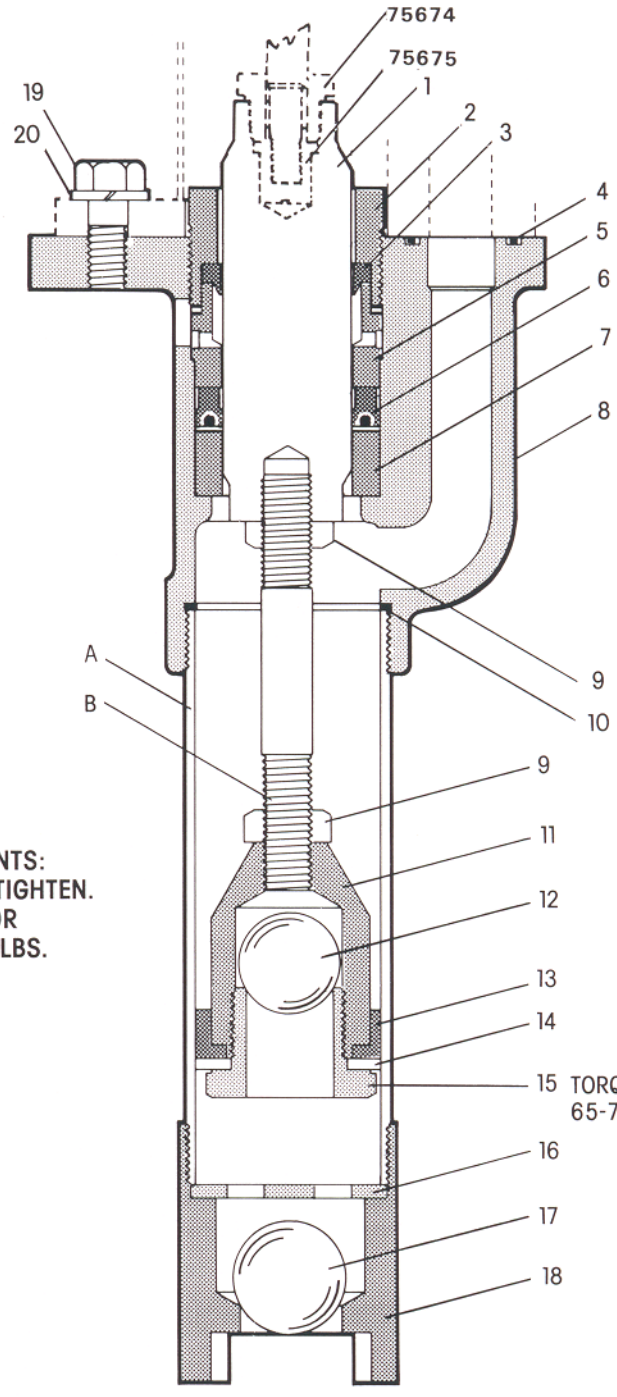
PUMP ASSEMBLY

Assemble with new service parts.

__Install (17) ball and (16) ball stop into (18) seat. Screw (18) seat onto (A) tube and tighten.
__Vise (8) pump base. Push (7) spacer, (6) packing and (5) spacer to bottom of chamber. Screw (2) packing nut with (3) wiper into (8) pump base and tighten.

NOTE: Care must be taken in assembly of (1) piston plunger so that (6) packing is not damaged.

__Push (1) piston down through the top of the (8) pump base, being sure not to damage packing.
__Assemble (13) cup, (14) washer, (12) ball, and screw (15) inner seat on (11) cup follower.
__Replace (10) gasket in (8) pump base.
__Vise on machine flats of (1) piston and screw (B) piston rod assembly into (1) piston and tighten (9) nut.
__Apply grease or lubricant to (13) cup and slide (A) tube over (B) piston rod assembly and screw (A) tube into (8) pump base and tighten.
__Install (4) "O" ring into (8) pump base.
__Couple the motor piston rod to the (1) plunger by placing a wrench on the machined flats of (1) plunger and assemble 75674 retainer and tighten.
__Align holes and install three (20) washers and three (19) screws and tighten.
__Install 73050 cover and fasten with four Y8-83-C screws (see page 3).



TORQUE REQUIREMENTS:
NOTE:DO NOT OVERTIGHTEN.
(9) NUT, (A) TUBE OR
(18) SEAT 60-70 FT-LBS.

FIGURE 2

• PROBLEM
__Cause, solution.

• Little or no material delivery.
__Always check air supply. Check for kinked or restrictive air hose or other factors which may limit air supply.
__Check for kinked or restrictive material delivery hose.
__Check for plugged or malfunctioning dispensing device.

WARNING: REFER TO OPERATING AND SAFETY PRECAUTIONS CONCERNING SERVICE UNDER PRESSURE. (Page 2.)

__Be sure to eliminate any possible non-pump problems before suspecting pump malfunction and continuing.

• Pump problems will typically occur in one of two areas:
1. The Air Motor Section.
2. The Lower Pump Section.

__Determine which section is affected.

Air Motor Problems

• Air leakage out of the main exhaust.
__Refer to Air Motor Operator's Manual.

• Air leakage out of the pilot exhaust hole.
__Refer to Air Motor Operator's Manual.

• Air leakage around Air Motor piston rod.
__Refer to Air Motor Operator's Manual.

• Air leakage out of the pilot exhaust hole.
__Refer to Air Motor Operator's Manual.

• Continual leakage out of the bleeder hole in the head ass'y.
__Refer to Air Motor Operator's Manual.

Lower Pump End Problems

• No material at outlet. (Pump continually cycles.)
__Check material supply, disconnect the air supply and replenish the material, reconnect the air.

• Material on one stroke only. (fast downstroke.)
__The (17) ball may not be seating in the (18) foot valve. (See lower pump end instructions.) Remove the ball from the foot valve, clean and inspect the ball and foot valve seat area. If either ball or foot valve are damaged replace them as necessary.

• Material on one stroke only. (fast upstroke.)
__Check for worn or damaged (13) seals. Replace the seals as necessary.

FIGURE 3

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