

# OPERATOR'S MANUAL

61685-XD

INCLUDING: SERVICE KITS, GENERAL DESCRIPTION & TROUBLESHOOTING  
ALSO INCLUDE MANUALS: 6641X-X AIR MOTOR MANUAL, FORM 3637-2 GENERAL INFORMATION SHEET.

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(REV. A) IPP/PSE

3" AIR MOTOR  
17:1 RATIO  
2 1/4" STROKE

## 61685-XD BASIC PUMP



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.
- 61343 for repair of Lower Pump section.

### GENERAL DESCRIPTION

This model is designed for delivery of medium viscosity fluids such as rust proof material, gear oil or transmission fluids. Material dispensing accessories and supply lines and fittings must be capable of withstanding pressures developed by pump.

- The ARO 17:1 ratio basic pump assembly consists of a 3" air motor 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 17:1 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 2,550 p.s.i. (175.8 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.

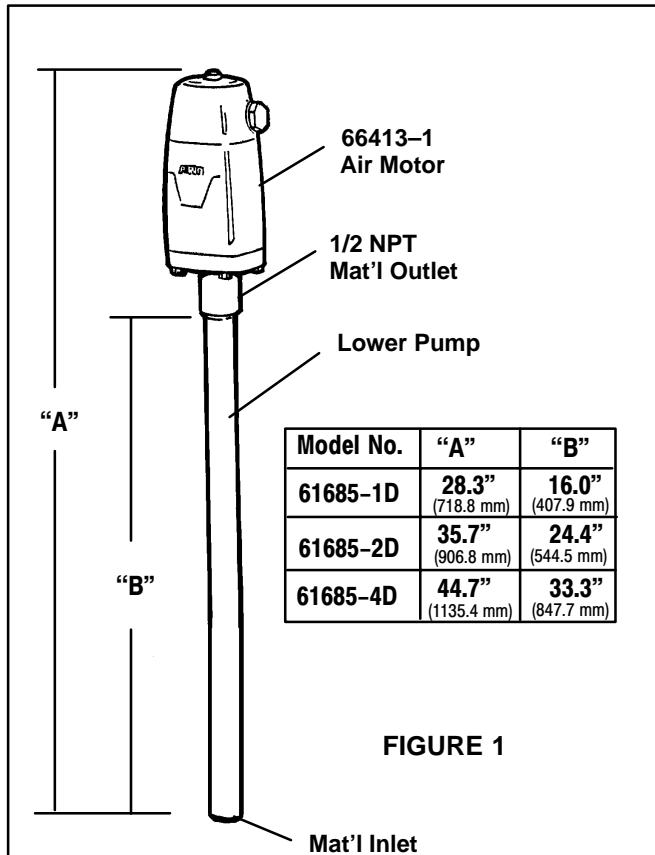


FIGURE 1

### OPERATING AND SAFETY PRECAUTIONS

- HEED ALL WARNINGS.
- DO NOT EXCEED MAXIMUM WORKING PRESSURE OF 2,550 PSI (175.8 BAR) AT 150 PSI (10 BAR) AIR INLET PRESSURE.

**WARNING : HIGH PRESSURE DEVICE.** Improper usage of this equipment could result in serious injury. The possibility of injection into the flesh is a potential hazard. Never allow any part of the human body to come in front of or in direct contact with the material outlet. An injection injury can be serious. If injection should occur, contact a qualified physician immediately for treatment.

**COMPONENTRUPTURE.** This pump is capable of producing high material pressure as stated on pump model plate.

- Be sure material hoses and other components are able to withstand fluid pressures developed by this pump.
- Do not operate pump continuously at speeds in excess of 75 cycles per minute.
- Disconnect air line from pump air motor when system sits idle for long periods of time.
- Materials and solvents being pumped by this pump must be compatible with the parts of this pump that come in contact with the material and solvent.

**WARNING : PREVENT STATIC SPARKING.** If static sparking occurs, fire or explosion could result. Pump, dispensing valve and containers must be grounded when handling inflammable fluids such as petroleum products, paints, lac-

quers, etc. and wherever discharge of static electricity is a hazard.

- Use grounded hoses (static wire) and be sure the object is grounded if it can produce a static charge.
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## AIR AND LUBE REQUIREMENTS

**WARNING HAZARDOUS PRESSURE.** Do not exceed maximum inlet air pressure of 150 psi (10 bar). Operating pump at higher pressure may cause pump damage and/or personal injury and/or property damage.

- Refer to general information sheet for additional safety precautions and important information.
- Excessive air pressure will shorten the life of the pump.
- For maximum operating efficiency, the following air supply specifications should be maintained to this pump.
  - AIR PRESSURE - Up to 150 P.S.I. (10 Bar)
  - AIR FILTRATION - 50 micron
  - LUBRICATED AIR SUPPLY
  - AIR INLET SIZE - 1/4" NPTF
- Filtered and oiled air will allow the pump to operate more efficiently and yield a longer life to operating parts and mechanisms.
- Lack of or an excessive amount of lubrication will affect the performance and life of this pump. Use the recommended lubricants.
- **DAILY:** Fill air line lubricator with a good grade of S.A.E. NO. 90 W non-detergent gear oil, adjust to 1 to 2 drops per minute.
- If pump is to be inoperative for more than a few hours at a time, disconnect air supply and relieve all pressure from the system.

It is recommended that an oiler be installed in the airline as close as possible to the pump. This increases the service life of the pump by reducing wear of the air motor's internal parts.

## INSTALLATION

### FLUSH PUMP

1. Connect fluid hose to pump outlet and be sure all fittings are tight.
  2. Turn air regulator knob counter-clockwise until it turns freely.
  3. Pump has been tested in oil and a small amount remains for protection against rusting. Immerse lower pump end in compatible solvent.
  4. Connect air hose coupler to connector on FRL.
  5. Turn air regulator knob clockwise until air motor starts operating.
  6. Flush pump with oil.
  7. Disconnect air supply from air motor.
- CAUTION: Solvent used for flushing may not be compatible with material being 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

1. Turn air regulator knob clockwise until air motor starts to cycle.
2. Allow pump to cycle slowly until it is primed and all air is purged from the fluid hose or dispensing valve.
3. Turn off dispensing valve and allow pump to stall-check all fittings for leakage.
4. Change air regulator setting until desired pressure and flow is obtained.
5. Inspect airline filter, open petcock to flush moisture or residue from bowl.
6. 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. 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.
- Refer to disassembly procedures of air motor for correct breakdown.
- 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.

## PUMP DISASSEMBLY

NOTE: All threads are right hand.

CAUTION: DO NOT mar finish on (3) tube.

1. Clamp pump assembly in a vise on the air motor base assembly.
2. Place a strap wrench around (3) tube and loosen by turning counterclockwise. If the wrench slips on the (3) tube, wrap a piece of 400 sand paper around (3) tube and under strap wrench. (Note: Pipe wrench will damage the finish of the tube.)
3. After the (3) tube has been pulled down to expose the (4) rod and (1) cotter pin, remove cotter pin and unscrew the (4) rod from the air motor piston rod.
4. Remove the (12) ball seat.
5. Remove the (11) ball from the (12) ball seat.
6. Remove the (13) "o" ring from the (12) ball seat
7. Remove (10) ball guide from (3) tube.

# LOWER PUMP

## PARTS LIST

ITEM	DESCRIPTION	QTY	PART NO.
1	Cotter Pin	1	Y15-23
2	Gasket	1	76976
3	Tube (61685-1D)	1	77905-11
	Tube (61685-2D)	1	77905-12
	Tube (61685-4D)	1	77905-14
4	Rod (61685-1D)	1	77839-1
	Rod (61685-2D)	1	77839-2
	Rod (61685-4D)	1	77839-4
5	Pin (1/8" Diameter)	1	Y122-85
6	Collar Piston Stop	1	77192
✓7	Piston	1	61308
✓8	Washer	1	76968
✓9	Nut (3/8-24)	1	Y109-624
10	Ball Guide	1	77904
11	Ball (1" Diameter)	1	Y16-32
■12	Ball Seat	1	76966
✓13	"O" Ring (1 7/16" OD)	1	Y325-124

Parts so marked ✓ are included in 61343 service kit.

### LUBRICATION / SEALANTS

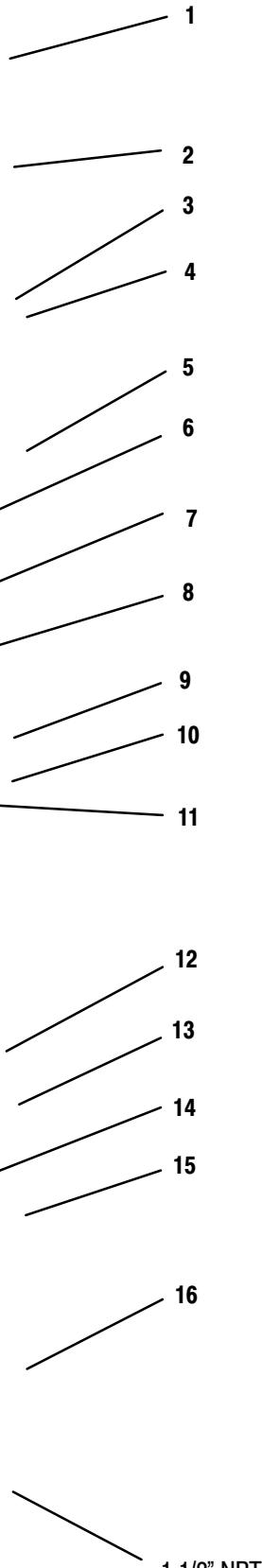
Apply grease to all O-rings, & mating parts.

## PUMP ASSEMBLY

Assemble with new service parts.

1. Place (4) rod assembly in a vise and install (7) piston assembly (lips up), (8) washer, (9) nut and tighten.
2. Remove (4) rod assembly from vise.
3. Place air motor assembly in vise by clamping onto the machined flats on the air motor base.
4. Install (2) gasket in throat of air motor base.
5. Thread (4) rod assembly into piston rod of air motor until the hole in the piston rod of the air motor aligns with the hole in (4) rod assembly. Place (1) cotter pin in the aligned hole of these two assemblies. NOTE: This thread assembly of the air motor piston rod and (4) rod assembly is a loose fitting thread assembly for alignment purposes.
6. Apply a liberal amount of grease or lubricant on (7) piston assembly.
7. Slide (3) tube over (4) rod assembly with exterior threaded end first or toward the air motor.
8. Screw (3) tube into the air motor base and tighten with a strap wrench.
9. Grease and install (13) "o" ring onto the (12) ball seat.
10. In the bottom of (3) tube, insert (10) ball guide, (11) ball and (12) ball seat assembly. Tighten by using the provided wrench flats on (12) ball seat.

FIGURE 2



"Smart Parts" Keep these items on hand in addition to the Service Kits for fast repair and reduction of down time.

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## TROUBLE SHOOTING

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**No Material. (Stalled Pump.)**

- Obstructed Material Line. Disconnect air supply. Relieve all fluid pressure in pump. Remove Obstruction in system.

**No Material (Pump Continually Cycles.)**

- Empty material supply. Shut down system. Replenish material supply.

**Material on one stroke only. (Fast Upstroke.)**

- Item (7) cup packing is worn. Remove the cup packing. Replace cup packing.

**Material on one stroke only. (Fast Downstroke.)**

- Item (11) ball in (12) seat is not properly seating. Remove the seat. Clean and inspect ball and seat. If either is damaged. replace with new parts.

