

OPERATOR'S MANUAL

650439-X

SPECIFICATIONS, SERVICE KITS, GENERAL INFORMATION, TROUBLESHOOTING
INCLUDE MANUALS: 6720X-X LOWER PUMP END (PN 97999-788) &
S-632 GENERAL INFORMATION MANUAL (PN 97999-624)

RELEASED: 8-28-98
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(REV. A)

4-1/4" AIR MOTOR
2:1 RATIO
6" STROKE

650439-X4X FOUR BALL PUMP SERIES 300 SERIES STAINLESS STEEL



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

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- **61268 for repair of Air Motor section.**
Service Note: The Air Motor Service / Parts Manual is not shipped with the pump but it is included with each service kit. If this Service / Parts Information is needed, request the Air Motor Operator's Manual from ARO (manual 6544X-X, PN 97999-064).
- **637317-X4B for repair of Lower Pump section.**
Refer to the chart on page 2 for description of -X4X options.

SPECIFICATIONS

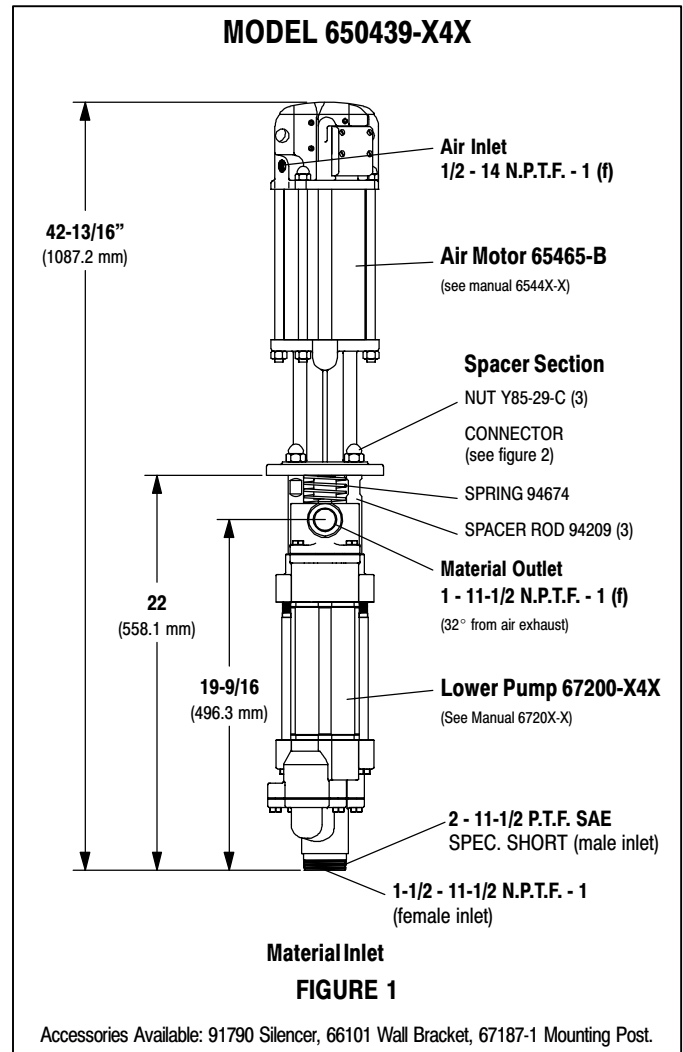
Model Series (Refer to option chart)	650439-X4X
Type	Air Operated, Four Ball
Ratio	2:1
Air Motor	65465-B
Motor Repair Kit	61268
Motor Diameter	4-1/4" (10.8 cm)
Stroke	6" (15.2 cm)
Air Inlet	1/2 - 14 N.P.T.F. - 1 (f)
Air Exhaust	1-1/4 - 11-1/2 N.P.T.F. - 1 (f)
Lower Pump End Series	67200-X4X
Lower Pump Repair Kit	637317-X4B
Material Inlet	1-1/2 - 11-1/2 N.P.T.F. - 1 (f) & 2 - 11-1/2 P.T.F. SAE Spec Short (m)
Material Outlet	1 - 11-1/2 N.P.T.F. - 1 (f)
Weight	68 lbs (30.8 kgs)

PERFORMANCE

Air Inlet Pressure Range	30 - 150 p.s.i. (2.1 - 10.3 bar)
Fluid Pressure Range	60 - 312 p.s.i. (4.1 - 21.5 bar)
Max. Rec'd Cycles / Minute	60
Displacement In³ Per Cycle	82.1
Volume / Cycle	45.5 oz. (1344 ml)
Cycles Per Gallon	2.8
Flow @ 60 Cycles / Minute	21.3 g.p.m. (80.6 l.p.m.)
Noise Level @ 60 Psi - 40 Cpm	81.8 db(A) *

* The pump sound pressure level has been updated to an Equivalent Continuous Sound Level (L_{Aeq}) to meet the intent of ANSI S1. 13-1971, CAGI-PNEUROP S5.1 using four microphone locations.

PUMP DATA



IMPORTANT

This is one of the four documents which support the pump. Replacement copies of these forms are available upon request.

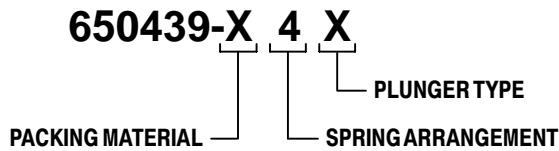
- 650439-X MODEL OPERATOR'S MANUAL
- GENERAL INFORMATION - INDUSTRIAL PISTON PUMPS
- 6720X-X LOWER PUMP END OPERATOR'S MANUAL
- 6544X-X AIR MOTOR OPERATOR'S MANUAL

ARO

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INGERSOLL-RAND
FLUID PRODUCTS

PUMP OPTION DESCRIPTION CHART



PACKING MATERIAL (PACKINGS ARE UPPER AND LOWER UNLESS NOTED)	
7 Glass Filled Teflon (Upper) Virgin Teflon (Lower)	P UHMW-PE / Teflon Staggered (Upper) UHMW-PE (Lower)
C UHMW-PE	R Teflon / UHMW-PE Staggered (Upper) Virgin Teflon (Lower)
F UHMW-PE / Leather Staggered (Upper) UHMW-PE (Lower)	
SPRING ARRANGEMENT	
4 Multiple Wave Spring	
PLUNGER TYPE	
B HD SS W / Ceramic Coating	3 HD SS W / Hard Chrome Plating

GENERAL DESCRIPTION

PUMP CONNECTION – UPPER / LOWER

⚠ WARNING HAZARDOUS PRESSURE. Do not exceed maximum operating pressure of 312 p.s.i. (21.5 bar) at 150 p.s.i. (10.3 bar) inlet air pressure.

NOTE: All threads are right hand.

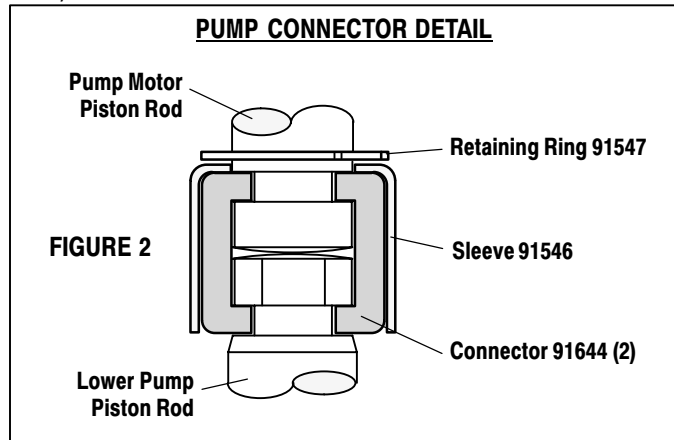
$$\frac{\text{PUMP RATIO X}}{\text{INLET PRESSURE TO PUMP MOTOR}} = \frac{\text{MAXIMUM PUMP FLUID PRESSURE}}{\text{PUMP MOTOR PRESSURE}}$$

Pump ratio is an expression of the relationship between the pump motor area and the lower pump end area. EXAMPLE: When 150 p.s.i. (10.3 bar) inlet pressure is supplied to the motor of a 2:1 ratio pump it will develop a maximum of 300 p.s.i. (20.7 bar) fluid pressure (at no flow) – as the fluid control is opened, the flow rate will increase as the motor cycle rate increases to keep up with the demand.

1. Lay the pump assembly on a workbench.
2. Remove the three nuts from the three spacer rods (figure 1).
3. Pull the air motor from the lower pump end until motor piston rod is in the “down” position and lower pump end rod is in “up” position.
4. Using e-ring pliers, slide the retaining ring up far enough to allow the sleeve to move upward and release the two connectors (figure 2).

⚠ WARNING Refer to general information sheet for additional safety precautions and important information.

- The Four-Ball pumps are primarily designed for the high volume transfer of light and medium viscosity fluids. Stainless Steel construction offers compatibility with a wide range of fluids. The lower pump is designed for easy priming and the double acting feature is standard in all ARO industrial pumps. Material is delivered to the pump discharge outlet on both the up and down stroke.
- The motor is connected to the lower pump end by a spacer section. This allows for lubrication of the upper packing gland and prevents motor contamination because of normal wear and eventual leakage through the material packing gland. Be sure the solvent cup is adequately filled with lubricant to protect the upper packings and insure longest service life.



TROUBLE SHOOTING

Pump problems can occur in either the Air Motor Section or the Lower Pump End Section. Use these basic guidelines to help determine which section is affected.

If the pump will not cycle.

- Be certain to first check for non-pump problems including kinked, restrictive or plugged inlet / outlet hose or dispensing device. Depressurize the pump system and clean out any obstructions in the inlet / outlet material lines.
- Refer to the motor manual for trouble shooting if the pump does not cycle and / or air leaks from the air motor.

If the pump cycles but does not deliver material.

- Refer to the lower pump end manual for further trouble shooting.

REASSEMBLY

1. Align the pump motor with the lower pump end.
2. Install the two connectors and retain with the sleeve, slide the retaining ring back into position.
3. Reinstall the spacer rods to the pump motor.
4. Bring the motor and lower pump together and retain with the three nuts.