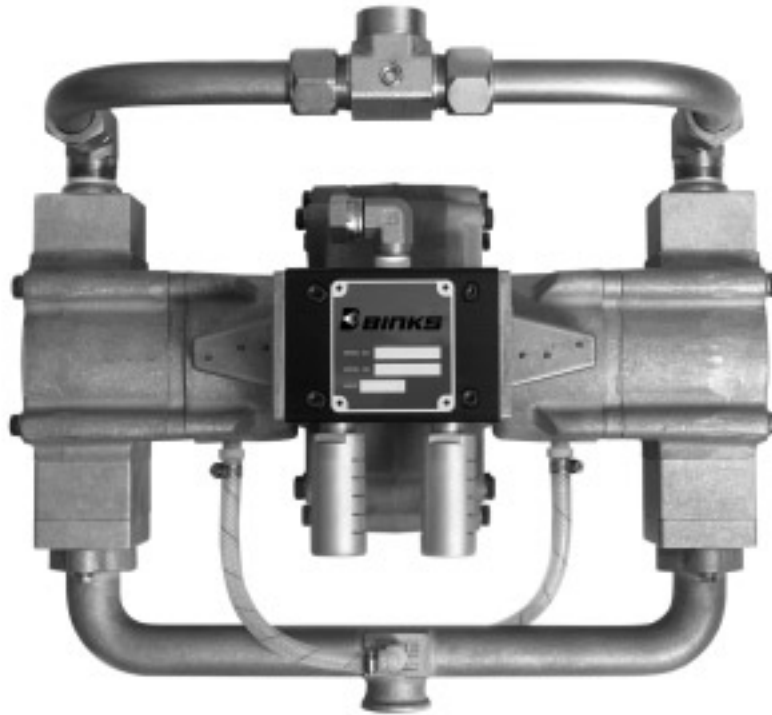




Binks 4.5:1 EXEL AIR POWERED PUMP

POSITIVE PRIME RECIPROCATING HORIZONTALLY OPPOSED 4-BALL PUMP



GENERAL

The Binks Exel Pumps have horizontally opposed positive displacement pistons connected to a common reciprocating air motor piston. The pneumatically driven piston trips pilot valves at the end of its travel producing an air logic signal to shift the spool valve initiating the opposite stroke.

The mechanically tripped pilot valves contain no springs. They are reset by a positive air signal from the exhaust circuit. The spool valve is air piloted and contains two exhaust ports. Both the pilot valves and the spool valve “un-bolt” as a cartridge, but can also be disassembled for repair/service.

There are no external air pilot hoses. The air logic and exhaust ports are completely internal. Simply mounting the spool valve and the pilot valves assures that the logic circuits are connected properly.

The “4-Ball” term refers to the two sets of ball checks. Each “set” has an inlet and outlet check. In practice, the inlets are connected by a common inlet manifold and the outlets are connected with a common outlet manifold.

The “4-Ball” concept primes the pump with the piston always engaging the seal. Unlike some other horizontally opposed piston pumps, the piston *does not* pull free of the displacement chamber piston seal to allow prime. Pulling free of the piston seal for prime is lost motion. No displacement is possible from the time the piston pulls free and then re-enters the seal. The positive displacement 4-Ball concept insures positive prime and increased displacement with less energy demands. This eliminates wasted effort which requires higher air consumption to displace a given volume of fluid.

Covered by U.S. Patent No.
5,094,596/5,415,531

Ratio:1	4.5
GPM (60cy)	6.85
SS Model	41-17045
Alum. Model	41-27045
Max WP (PSI)	450
(Bar)	31

! WARNING



**HIGH PRESSURE CAN CAUSE SERIOUS INJURY IF EQUIPMENT IS INSTALLED OR USED INCORRECTLY—
READ, UNDERSTAND, AND OBSERVE ALL WARNINGS AND INSTRUCTIONS IN THIS MANUAL.**

**INSTALL, OPERATE OR SERVICE THIS EQUIPMENT ONLY AFTER
ALL INSTRUCTIONS ARE CLEARLY UNDERSTOOD.**

It is the responsibility of the employer to place this information into the hands of the operator.

! WARNING

Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

! CAUTION

Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTE

Important installation, operation or maintenance information.

INJECTION HAZARD

- The sprayer pumps coatings at high pressure. If you spray yourself or anyone else at close range, the stream of material can puncture the skin and cause great harm (possible amputation).
- NEVER** point the spray gun at yourself or anyone else. The tip guard provides some protection against injection injuries, but is mainly a warning device. **NEVER** remove the tip guard. **NEVER** point the spray gun at your hands, fingers, or body. **ALWAYS** keep the spray gun trigger safety catch locked in the **OFF** position when not in use.
- DO NOT** cover the tip guard and attempt to “blow back” fluid. This is not an air sprayer.
- If injury occurs, see your doctor immediately! **DO NOT TREAT THIS AS A SIMPLE CUT.** Inform your doctor specifically of what fluid was injected.

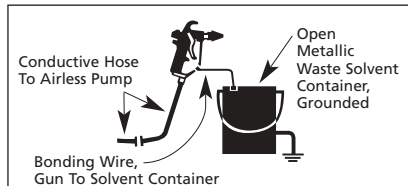
AVOID STATIC SPARKING

Static electricity charge builds up by high velocity liquid flowing through a hose during flushing, cleaning, or spraying operations. Proper grounding of the airless system safely dissipates this charge.

All high pressure airless systems must be grounded to avoid dangerous static sparking, explosion, or fire when spraying or flushing with flammable liquids.

- Use Binks **NO-WIRE** conductive hose in all airless spraying operations. Be sure gun and hose have continuity. Check continuity weekly with ohmmeter. Overall (end to end) resistance of unpressurized hose must not exceed 29 megohm (max.) for any coupled length or combination of hose lengths.
- Make sure the pump is grounded. **NEVER** operate the unit when it is on a non-grounded platform.

- When flushing or cleaning with a combustible solvent, always use an open metallic container for receiving the waste solvent. Ground the solvent receptacle.
- Bond the spray gun to the waste container with a grounding wire. Be sure there is good metal to metal contact.
- ALWAYS** remove spray tip when flushing the system. Operate the pump at the lowest possible pressure.



GENERAL WARNINGS

- NEVER** leave a pressurized sprayer unattended.
- DO NOT** use fluids, coatings, or chemicals that are not compatible with nylon hoses.
- Periodically inspect all hoses for leaks and/or abrasions and tighten all connections before use. **DO NOT ATTEMPT TO REPAIR** a defective hose. **REPLACE** it with another conductive hose.
- Follow all warnings and precautions of the coating and solvent manufacturers.
- ALWAYS** relieve pressure in the system by turning bypass valve to **BYPASS** or triggering spray gun before disassembly of any component parts.

REPLACEMENT PARTS

The pump is designed to use authorized parts only. When using this pump with parts that do not comply with the minimum specifications and safety devices of Binks, the user assumes all risks and liabilities.

AIR/HYDRAULIC AND LUBE REQUIREMENTS

! WARNING

**EXCESSIVE AIR/HYDRAULIC PRESSURE
Can cause personal injury, pump damage or property damage.
Do not exceed maximum inlet air/hydraulic pressure as stated on motor model plate.**

Air Operated Pumps

- Filtered and oiled air will allow the pump to operate more efficiently and yield a longer life to operating parts and mechanisms.
- Use an air regulator on the air supply to control the pump cycle rate. This will help to prolong the life of the pump.
- Supply the air lubriator with a good grade of SAE 90 wt. non-detergent oil and set the lubricator to a rate not to exceed one drop per minute.

Hydraulic Operated Pumps

Hydraulic motors will require normal maintenance. Do not allow contaminants to enter the hydraulic motor.

TRANSPORT AND STORAGE

- Store in a dry place; do not remove product from box during storage.
- Do not remove protection caps from inlet and outlet prior to installation.
- Do not drop or damage box; handle with care.

INSTALLATION

1. Mount the pump as required for the application. (For example: Wall mount, floor mount, ram, etc.)
2. **AIR OPERATED PUMPS:** Exhaust silencer kits are available for these pumps. Mount exhaust silencers or pipe exhaust away as required to a safe location. Install a ground wire to the air motor ground lug.
3. Connect fluid hose to pump outlet. In most cases, a pipe sealant should be used on thread connections. Tighten all fittings.

FLUSHING

NOTE

Flush the pump with a solvent compatible with the material to be pumped.

1. Turn the motor inlet regulator pressure control knob to "0" (zero) pressure setting.
2. Immerse lower pump end or fluid hose into a bucket of solvent.
3. Turn the motor inlet regulator pressure control knob and allow pump to cycle.
4. Circulate solvent through pump until it is thoroughly cleaned.

START-UP

1. Turn the motor inlet regulator pressure control knob until 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 device.
3. Turn off dispensing device and allow pump to stall. Re-check the fittings and tighten as necessary.
4. Open dispensing device and allow pump to restart.
5. Adjust the motor inlet regulator as required to obtain desired operating pressure and flow.

SHUTDOWN

1. it is good practice to periodically flush the entire pump system with a solvent that is compatible with the material being pumped, especially if the material being pumped is subject to "settling-out" when not in use for a period of time.
2. **AIR OPERATED PUMPS:** Disconnect the air supply from the pump if it is to be inactive for a few hours.

SERVICE

1. Keep good records of service activity and include pump in preventive maintenance program.
2. Check the material and air/hydraulic hoses for any weakness, and replace if necessary.

MULTIPLE PUMP SETUPS

The Binks Exel Pump is a super-quiet pump that exceeds OSHA requirements. However, multiple pump installations can contaminate the atmosphere within a closed room, especially when using a lubricator.

It is important when using multiple pumps that each pump exhaust port be hoses to a common exhaust plenum tube and piped to atmosphere *outside* of the room with provisions for salvaging the lubricant oil. Breathing of oil laden exhaust air must be avoided as a health hazard. If there is any exposure, or if any doubt exists concerning the exhaust conditions, seek medical and/or technical help immediately.

There is generally no lubrication required other than the o-ring lubricant which is applied during assembly or repair. If a lubricant is used, do not exceed one drop per 30 cycles (or one drop each 14 cubic feet of air used).

NOTE

Important: Using an unapproved oil will void any and all warranties. Use Binks Part #207-11155 Pneumatic Powered Lubricant.

WARNING



Models 41-27045 and 41-27120 Exel Pumps are constructed with components of aluminum alloy and SHOULD NOT be used with any Halogenated Hydrocarbon solvents.

HALOGENATED HYDROCARBON SOLVENTS CAN CAUSE AN EXPLOSION WHEN IN CONTACT WITH ALUMINUM COMPONENTS OF A PRESSURIZED OR CLOSED FLUID SYSTEM (PUMPS, HEATERS, FILTERS, etc.)

The same possibility of an explosion is possible with the galvanized coatings in pressure tanks. The possibility of a non-flammable explosion increases greatly at high operating temperatures.

The explosion could be of sufficient strength to cause bodily injury, death, and substantial property damage.

Cleaning agents, coatings, or adhesives may contain HALOGENATED HYDROCARBON SOLVENTS. CHECK WITH YOUR SOLVENT AND PAINT SUPPLIER.

If you are now using a Halogenated Hydrocarbon Solvent in a pressurized fluid system with aluminum components or galvanized wetted parts, the following steps should be taken immediately:

1. Remove all pressure; drain and disconnect the entire system.
2. Inspect and replace all corroded parts.
3. Contact your solvent supplier for a NON-HALOGENATED SOLVENT to flush and clean the system of all residues.

HALOGENATED Solvents are defined as any hydrocarbon solvent containing any of the following elements:

CHLORINE	"CHLORO" (Cl)
BROMINE	"BROMO" (Br)
FLUORINE	"FLUORO" (F)
IODINE	"IODO" (I)

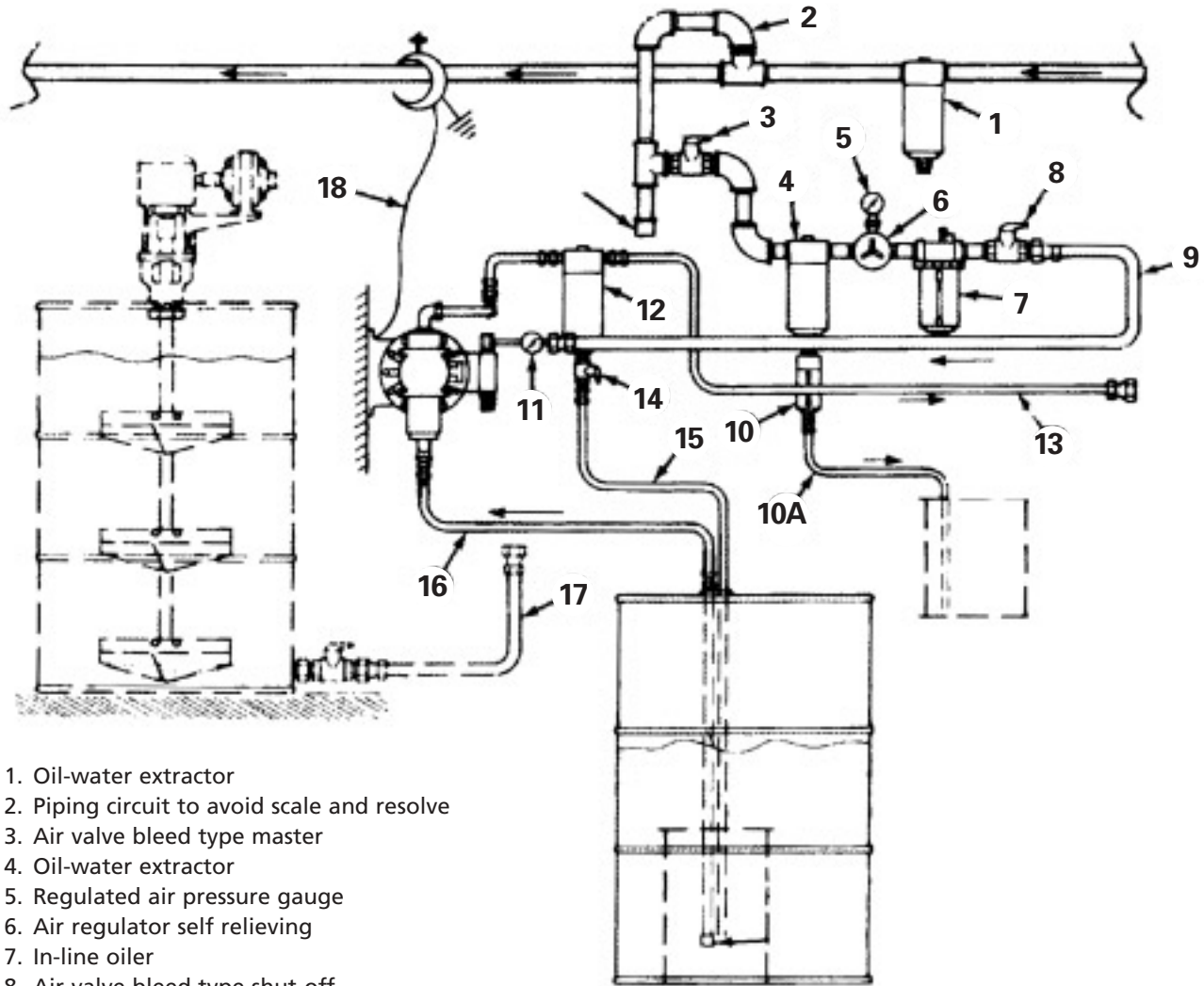
Of those listed, the Chlorinated Solvents will most likely be the type used as a cleaning agent or solvent in an adhesive or coating. The most common are:

METHYLENE CHLORIDE
1,1,1, TRICHLORETHANE
PERCHLORETHYLENE

Although stabilizers have been added to some of the solvents to reduce their corrosive effect, **we are aware of none that will prevent these solvents from reacting under all conditions with aluminum components or galvanized coatings.**

Previous use of the solvents under pressurized conditions, without incident, does not necessarily indicate that it can be considered safe.

TYPICAL INSTALLATION: Binks 4.5:1 EXEL AIR POWERED PUMP



1. Oil-water extractor
2. Piping circuit to avoid scale and resolve
3. Air valve bleed type master
4. Oil-water extractor
5. Regulated air pressure gauge
6. Air regulator self relieving
7. In-line oiler
8. Air valve bleed type shut-off
9. Grounded air supply line
10. Automatic drain
- 10A. Automatic drain-away hosing
11. Pump protector device
12. Outlet filter
13. Grounded fluid line
14. Pressure relief-drain valve
15. Pressure relief-drain hosing
16. Siphon tube hosing with spring guard (optional)
17. Hosing/piping from gravity supply (optional)
18. Ground wire connected to ground source

The general arrangement of a typical installation as depicted in the diagram is advisory only. Your particular installation may require siphon pressure or gravity feed supply to the pump; and the mounting of the pump to a vertical surface or wall may require reinforcement back-up. Please contact your Binks Representative for assistance in planning your system. Be sure that you comply with all federal, state, and local codes before installation.

Be sure to mount the pump securely and to position the pump above the floor at a convenient height to allow for maintenance, visual observation, and periodic inspection.

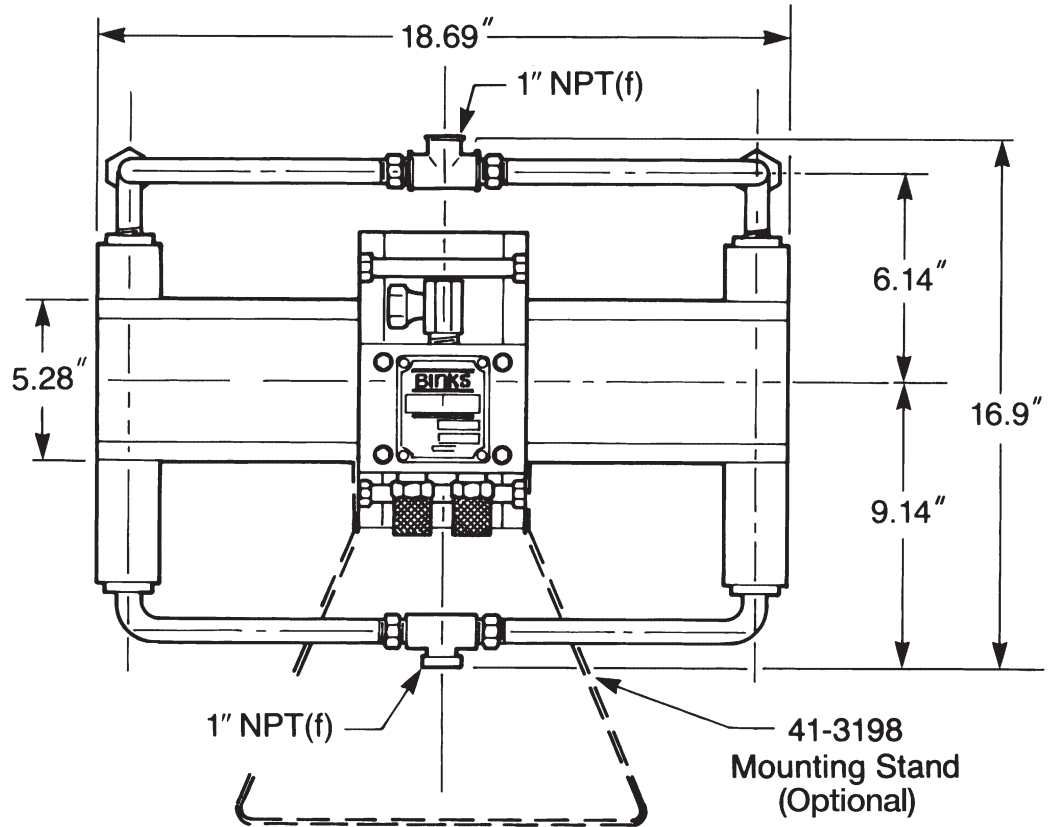
Use a compatible thread compound on all tapered male pipe threads to guard against leakage and to lubricate threads for assembly.

The wall mount bracket is included with all Exel pumps. Pump geometry positions air valve and outlet manifold to one side, allowing wall mounting without the need for a shelf.

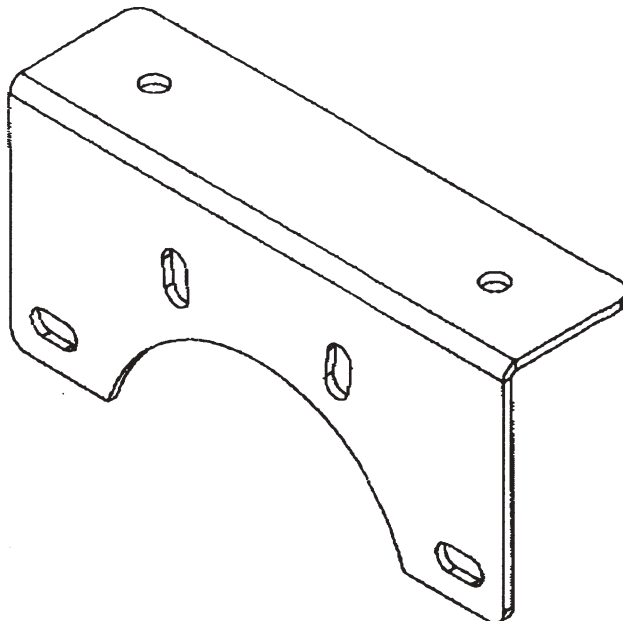
Drum cover, shelf, cart, or stand-pipe mounting is accomplished using the optional base mounting bracket's (41-3198) 4-hole pattern. The center clearance hole will easily accommodate a 1" pipe.

OPTIONAL INSTALLATIONS: Binks 4.5:1 EXEL AIR POWERED PUMP

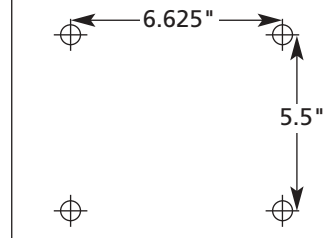
INSTALLATION WITH OPTIONAL MOUNTING STAND 41-3198



WALL MOUNT BRACKET 207-12328



Two brackets provide a wall mount pattern of 5-1/2" (5.5") vertical by 6-5/8" (6.625") horizontal.



FIRE OR EXPLOSION HAZARD: Binks 4.5:1 EXEL AIR POWERED PUMP

NOTE

Ground Wire Kit is included! Use Binks Ground Wire Kit #41-13021

GROUNDING THE PUMP

Installation of the ground wire attachment to a metallic portion of the pump must insure a secure metal-to-metal contact. The ground wire must be 12 gauge minimum. A clamp must be attached to a true earth ground and an instrument test must be done to verify a ground. Mounting is the *user's* responsibility.

SAFETY CONSIDERATIONS

The Exel Pump has no exposed moving parts that can create possible hazards to personnel. However, there are some safety points to consider:

1. Exhausting air from a motor cycling *with the mufflers removed* can exceed OSHA limits. Thus, *never* operate the pump without proper muffling.
2. Never attempt to loosen or remove fluid hoses, or to disassemble the pump without first performing the pressure relief procedure as listed on page 11.
3. Never perform any disassembly procedure unless the air motor air supply has been turned off, the residual air has been exhausted, and pressure *in the air motor* has been vented. Should air pressure remain within the motor chamber, the motor could cycle at any time.

4. If the manifold is not in place, keep hands and fingers clear of the pump manifold fluid inlet and the individual inlets. The powerful suction can cause serious bodily injury, and any breaks in the skin can allow exposure to the chemicals in the formulation being pumped.
5. Pressure relief procedure must be followed whenever the pump is shut-off for cleaning, servicing, or repairing any part of the air or fluid system. This includes removing/installing or cleaning spray gun tips or nozzles. The pressure relief procedure is as follows:
 - a. Turn off air supply to pump air motor
 - b. Engage gun trigger safety lock
 - c. If system is airless, remove gun nozzle
 - d. Insure the gun is "bonded" to a grounded metal waste container. Suggested/recommended method is a ground wire clamped between the container and the gun. Clamping/holding a metal part of the gun in firm and constant contact with the metal container is another acceptable method. While continuing to ground the gun to the container, disengage the gun safety and trigger the gun to remove the fluid pressure. A ball-valve, installed in the pump's fluid manifold, can also be used as a convenient and effective method of relieving line fluid pressure (also see page 12).

SERVICE: Binks 4.5:1 EXEL AIR POWERED PUMP

NOTE

Nos. in parenthesis () in this section refer to Item Nos. in Parts Lists on pages 9 and 15.

See parts list for available repair kits. Parts included in a kit are marked with a •, ▲ or ■. Use all the parts in the kit for best results. Re-use of used/suspect parts is poor economy.

DISASSEMBLY

1. Follow the Pressure Relief Procedures and Warnings on page 11.
2. Disconnect the air and fluid lines, remove the pump from its mounting, and place it on a shop bench. A vise will be necessary for this procedure.
3. Mount pump using the integral air motor mounting pads. Use all four holes!
4. Remove outlet and siphon manifolds (34) from the pump by loosening/removing the threaded fasteners. During removal, capture the o-ring seals as the siphon manifold drops away from the pump. The upper manifolds are designed with two identical tube halves to provide for the interchangeability of parts. This greatly reduces the parts inventory.
5. Remove the upper ball check block body (23) by removing the four socket head cap fasteners (29) from the exposed cavities. Carefully remove the cage, o-ring and body. Check for damage. It is poor economy to re-use o-rings; they should not be re-used. Remove the check-ball (21) and the seat (19). Again, check for wear or damage and replace if necessary.

NOTE

As with most fluid handling pumps, the Exel seats are reversible, providing for longer life.

6. Inspect the UHMW ball stop in the cage for excessive wear. If there is exposed metal, replace the nylon ball stop to continue the quiet pump operation.
7. Remove the lower ball check housing by removing the four socket head cap screws (28). This assembly is quite similar to the upper ball check assembly. In this case, the ball, seat, and cage are removed as one unit. Care must be taken not to drop the cage or ball from the housing.
8. Remove the fluid piston housing assembly by removing the four hex head screws (54). Gently wiggle the housing until it is free from the seal. Remove the piston seal (17) and set it into the housing. The seal should also be examined for possible damage. Now pry off bolt cover (82) and remove the piston retaining bolt (16) and slide the piston (15) off of the rod (10).
9. Remove the four socket head cap screws (48) that secure the chamber (14) to the air motor cover plate (6). Remove the bellows retaining nut (13) and pull bellows (12) off shaft (10). Slide alignment ring (11) off shaft (10). Remove the brass quad seal retaining ring (9) with a specially keyed wrench part no. 207-11020 (not included). Next, with a hook tool, remove the first quad seals.
10. With an extended hex socket key, remove the pilot valve assembly (42). Remove the three o-ring seals.
11. The disassembly of the pilot valve is necessary on an occasional basis to check for possible wear and damage.
12. Remove the air control valve (52) by removing the four socket head cap screws (53). Careful removal will prevent the possible loss of o-ring seals that may fall out.
13. To disassemble the air control valve, remove the two flat head socket cap screws and covers from each end. All parts are interchangeable left to right. Next, push the entire spool assembly out of the housing.

SERVICE: Binks 4.5:1 EXEL AIR POWERED PUMP

NOTE

The spool rides in a precision bore. Use no metal objects which can mar the surface of the bore.

The spool assembly consists of five split nylon hubs, each with a t-ring. There are also two larger spacers, two small spacers, a rod, and a hex nut at each end to hold the entire assembly together. By removing one hex nut, the spool can be disassembled. As the spool is being disassembled, all parts should be inspected for possible wear.

14. The air motor cover plate (6) is held to the air motor with ten hex head cap screws. With the screws removed, the cover plate can then be slid off the piston rod (10). Be careful not to damage the o-ring seal (5) during the procedure. For best results, the o-ring can be resealed in the air motor housing for safe keeping. Next, remove the nylon spacer (8) and the second quad seal.
15. Pull or push the air piston assembly (2, 3, 4, 10) at a slight angle from the air cylinder (1). Inspect quad-ring (3) for wear or damage or replace.

RE-ASSEMBLY

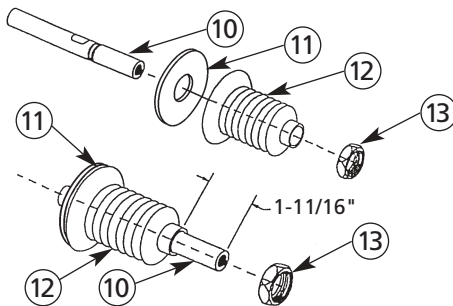
1. Before installing o-rings, lubricate with factory approved grease or petroleum jelly on air logic assembly parts only. This will ensure a good seat and help to protect o-rings. Lube quad-ring (3) with approved grease and carefully install around the air motor piston (2). Insert piston assembly (2, 3, 4, 10) at a slight angle into the air motor cylinder (1), then straighten. Carefully install the cover plate o-ring in the groove. Be sure that it is seated firmly. The bolts should be tightened snugly. Do not over tighten. Install quad ring seal (7), the nylon spacer (8), the outer quad seal, and the brass retaining ring (9). Be sure to seat the entire set, then hand thread the brass ring part way. Then snug the seat with the specially keyed wrench.

BELLOWS RE-ASSEMBLY

- 1.) 207-11947 PISTON ROD (10)
- 2.) 207-11948 BELLOWS SEAL (12)
- 3.) 207-12080 RETAINING NUT (13)

INSTALLATION:

Slide alignment ring (11) over shaft (10) and then install the bellows seal (12) over the piston rod shaft (10) 1-11/16 inches (1.687") from end of shaft as shown. Grasp the bellows seal with your left hand and hold firmly while starting and tightening retaining nut (13) until tight. Using a 1" deep socket continue to tighten nut to approximately ten (10) ft.-lbs. of torque.



NOTE

Bellows seal becomes self-threading by the nut (13). After install, nut should have 1/8" space between first convolution on bellows.

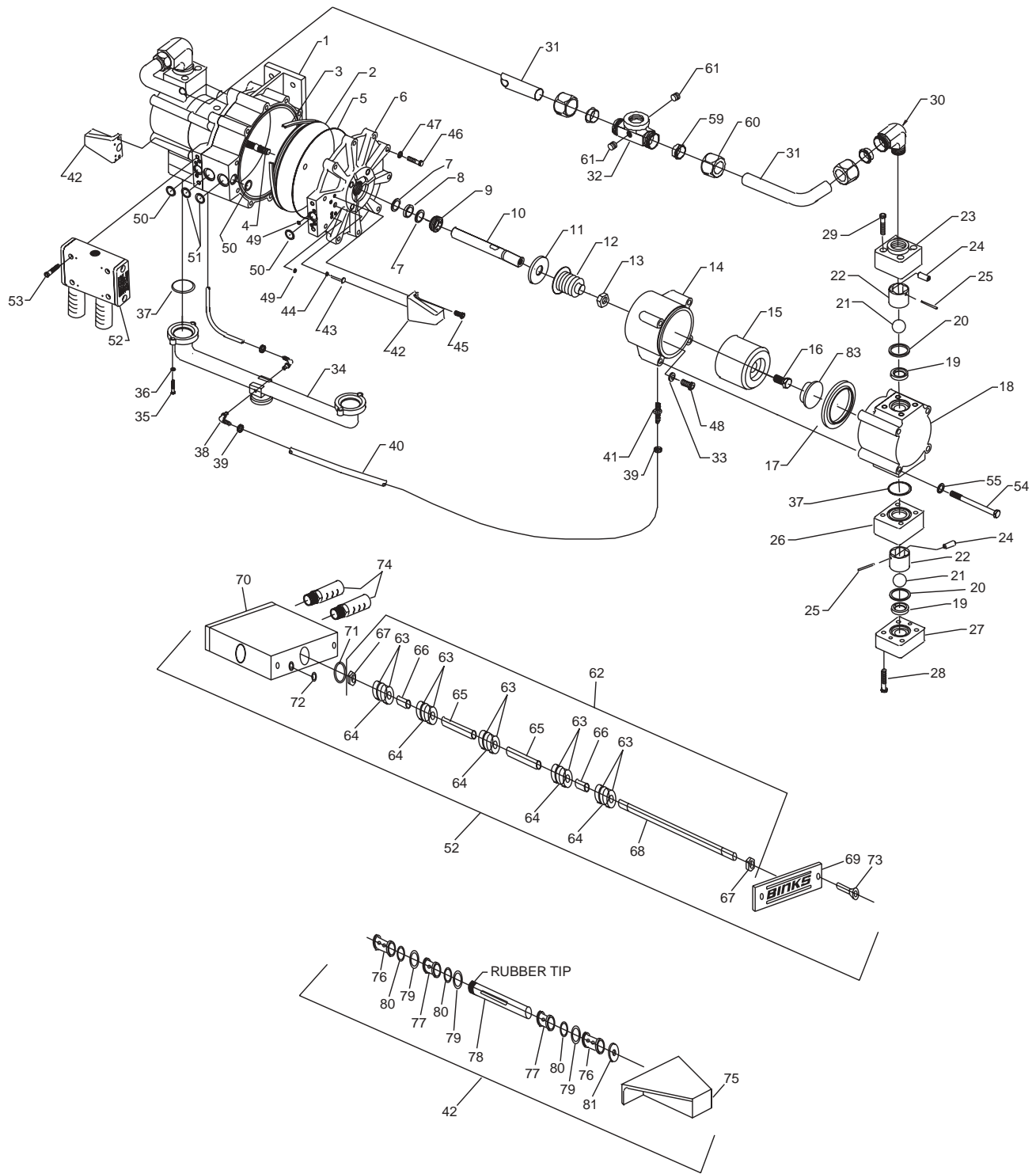
2. Insert the pilot valve push rod (43) making sure that it is seated properly. After packings are pre-lubricated with petroleum jelly, install the o-rings (49).
3. To install the pilot valve, begin by inserting the wave washer into the housing. Next, insert the first large spool. Then insert one large and one small o-ring. Next, install the first small spool and one large and small o-ring. Next install the second small spool and the last large and small o-rings. The poppet is designed with three precision by-pass slots to allow the air to pass from one end of the chamber to the other. The poppet's rubber tip should be installed toward the opening in the housing. Finally, insert the second larger spool.
4. Install the pilot valve (42) using the two socket head cap screws (45).
5. Assemble the air control valve (52). Be sure to pre-lubricate all parts. If all components have been checked for damage, they can be reassembled. Note that there are five split hubs, five t-rings, two short spacers, and two long spacers that are held together on the rod with the two hex nuts. Assemble the spool and housing block. Next carefully align the end caps so that the ports match exactly. Fasten securely with the flat head socket cap screws.
6. Install the pre-lubricated o-rings into their appropriate ports on the air motor: the pilot valve-ports, the air motor to piston ports, exhaust ports, and finally, the rest of the pilot valve ports.
7. Carefully align the air control valve and secure with four socket head cap screws.
8. Finally, install the mufflers on the air valve assembly. Assembly of the air motor is complete. It is strongly recommended to test run the air motor before proceeding.
9. Slide alignment ring (11) over shaft (10) and then install the bellows seal (12) over the piston rod shaft (10) 1-11/16 inches (1.687") from end of shaft as shown. Grasp the bellows seal with your left hand and hold firmly while starting and tightening retaining nut (13) until tight. Using a 1" deep socket continue to tighten nut to approximately ten (10) ft.-lbs. of torque.
10. Install the chamber (14) making sure that it seats properly over the bellows (12). Next, install the four socket head cap screws (48) with gaskets (33).
11. Install the piston (15) into the static chamber and secure with the retaining bolt (16). Next, snap the bolt cover (82) into the end of the piston. Seat the piston seal (17) into the housing (18) making sure that the lip fits firmly.

NOTE

Lip of piston's seal should face toward pressurized chamber (away from air motor).

- Carefully place the housing with the seal, over the piston. Press firmly until the housing seats on the chamber (14). Install the four hex head cap screws and tighten snugly.
12. Install the upper ball check assembly. Because the seats are reversible they can be installed either side up.
13. Install the o-ring (20), ball cage (22) and assembly housing. Fasten with four socket head cap screws.
14. Assemble the lower ball check housing before installing on to the pump. Begin by assembling the ball cage (22) to the housing block (26). Next, assemble the ball seat and o-ring and install on to the lower check cap (27). Fasten the assembly to the underside of the pump using four socket head cap screws (28).

Binks MODEL 41-27045 EXEL 450 PUMP (ALUMINUM)



INCLUDED, BUT NOT SHOWN: 41-13021 Static Ground Kit

Binks MODEL 41-27045 EXEL 450 PUMP (ALUMINUM)

PARTS LIST

When ordering, please specify **PART NO.**

ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	207-11765-2	CYLINDER AIR MOTOR	1	▲42	207-11308	VALVE ASS'Y., PILOT AIR.....	2
2	207-10731	PISTON, AIR	1	43	207-10753	PUSHROD, PILOT VALVE	2
3	237-237	QUAD-RING	1	44	237-507	SEAL, PUSHROD	2
4	207-10732	STUD, AIR PISTON	1	45	237-31	SCREW, SOCKET HD.	4
5	237-64	O-RING	2	46	237-179	SCREW, HEX HD.	20
6	207-11001	COVER PLATE, AIR MOTOR	2	47	237-155	WASHER.....	20
7	237-236	QUAD-RING	4	48	237-703	SCREW, SOCKET HD.	8
8	207-11711	SEPARATOR, SEAL	2	49	237-542	O-RING.....	12
9	207-11710	BEARING	2	50	237-62	O-RING.....	4
10	207-11947	ROD, PISTON	2	51	237-63	O-RING.....	2
11	207-11949	RING, ALIGNMENT	2	*52	207-11721	VALVE ASS'Y., CONTROL.....	1
12	207-11948	SEAL, BELLOWS.....	2	53	237-539	SCREW, SOCKET HD.	4
13	207-12080	NUT, RETAINING	2	54	237-704	SCREW, HEX HD, 4-1/4"	8
14	207-11950	CHAMBER	2	55	237-559	WASHER.....	8
15	207-11708	PISTON, MATERIAL	2	59	237-786	SLEEVE, FERRULE.....	4
16	237-554	SCREW, HEX HD	2	60	237-787	NUT	4
17	207-11151	SEAL, PISTON.....	2	61	237-338	PLUG, PRESSURE	2
18	207-11702	BLOCK, OUTPUT	2	●*62	207-10997	SPOOL ASM	1
19	207-11301	SEAT, CHECK VALVE	4	●*63	207-10865	HUB	10
20	237-549	O-RING	4	●*64	207-10864	SEAL, T-RING	5
21	237-556	BALL, CHECK VALVE	4	●*65	207-10867-2	SPACER.....	2
22	207-11277	CAGE, BALL	4	●*66	207-10867-1	SPACER.....	2
23	207-11315	BODY, CHECK VALVE	2	●*67	237-580	NUT	2
24	207-11540	SLEEVE, BUMPER.....	4	●*68	207-10866	ROD	1
25	237-639	PIN, CAGE	4	*69	207-10986	CAP, END	2
26	207-11706	BLOCK, CHECK	2	*70	207-12178	BLOCK, VALVE.....	1
27	207-11707	CAP, CHECK	2	*71	237-53	O-RING.....	2
28	237-702	SCREW, SOCKET HD	8	*72	237-542	O-RING.....	6
29	237-540	SCREW, SOCKET HD	8	*73	237-566	SCREW, FL HD	4
30	237-591	ELBOW.....	2	*74	237-536	MUFFLER	2
31	207-11712	TUBE, MANIFOLD	2	▲75	207-11307	HOUSING	1
32	207-11294	TEE, MANIFOLD.....	1	▲76	207-11305	SLEEVE	2
33	237-159	WASHER, NYLON	8	▲77	207-11304	SLEEVE	2
34	207-11704	MANIFOLD, INTAKE	1	▲78	207-11306	POPPET	1
35	237-172	SCREW, HEX HD.	4	▲79	237-544	O-RING.....	3
36	237-153	WASHER.....	4	▲80	237-543	O-RING.....	3
37	237-548	O-RING.....	4	▲81	237-617	WASHER, WAVE	1
38	237-781	ELBOW, 90 DEG MALE	2	82	207-12312	COVER, BOLT	2
39	237-770	CLAMP	4	83	41-13021	STATIC GROUND KIT (NOT SHOWN)	1
40	207-11994	HOSE	2	—	207-11155	PNEUMATIC POWERED LUBRICANT	1
41	237-784	NIPPLE, MALE	2			(Available in 2 oz., 16 oz., and 1 gallon containers)	

● Part of 207-10997 Spool Assy. *Part of 207-11721 Valve Assy. – Control ▲Part of 207-11308 Valve Assy. – Pilot Air

SEAL KITS

When ordering, please specify **KIT NO.**

ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.
KIT NO. 207-11992 SEAL KIT, EXEL 4.5:1 PUMP (S.S. & ALUM.)							
3	237-237	QUAD-RING	1	49,72	237-542	O-RING	18
5	237-64	O-RING.....	2	50	237-62	O-RING.....	4
7	237-236	QUAD-RING	4	51	237-63	O-RING.....	2
8	207-11711	SEPARATOR, SEAL	2	64	207-10864	SEAL, T-RING	5
12	207-11948	SEAL, BELLOWS.....	2	71	237-53	O-RING.....	2
17	207-11151	SEAL, PISTON.....	2	79	237-544	O-RING.....	6
20	237-549	O-RING	4	80	237-543	O-RING.....	6
37	237-548	O-RING.....	4	81	237-617	WASHER, WAVE	2
44	237-507	SEAL, PUSHROD	2	82	207-12312	COVER, BOLT	2
KIT NO. 41-37042 SEAL KIT, AIR CONTROL VALVE				KIT NO. 41-37043 SEAL KIT, PILOT VALVE			
64	207-10864	SEAL, T-RING	5	79	237-544	O-RING	3
71	237-53	O-RING.....	2	80	237-543	O-RING.....	3
72	237-542	O-RING.....	6	81	237-617	WASHER, WAVE	1

SPECIFICATIONS & OPERATION: Binks 4.5:1 EXEL AIR POWERED PUMP

Simplified EXEL Pump cross-section illustrates the centered air motor with dynamic chamber, opposed displacement pistons and Four-Ball Check Principle.

SPECIFICATIONS

Ratio: 4.5:1

Maximum Recommended Cycle Rate:
60 cycles per minute

Capacity/Displacement: 6.85 GPM
(see chart)

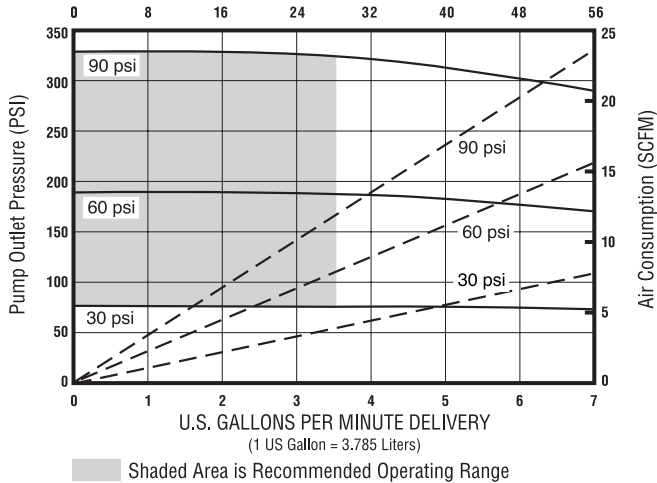
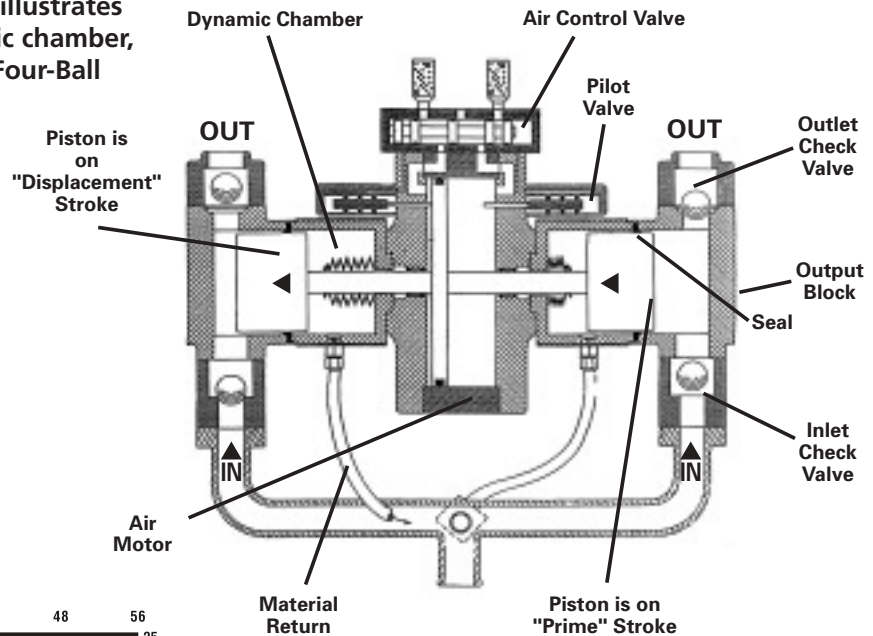
Maximum Air Input Pressure: 125 PSI

Inlet Size, Air: 1/2 NPT(f)

Inlet Size, Fluid: 1 NPT(f)

Outlet Size, Fluid: 1 NPT(f)

Air Requirement at 60 cycles per
minute and 100 PSI: 28.0 CFM



dB (A) noise Levels:

Air motor tested at 100 psi, 30 cycles per minute, (loaded)

Distance from pump	dB (A)
Background	70
25 feet	73
10 feet	78
6 inches	87

OPERATION

The Exel "Dynamic" Pump incorporates polypropylene bellows and should not be pressure fed or even gravity fed. Pressure fed Exel Dynamic Pumps will experience bellows failure.

The bellows are located inside the Dynamic chambers and act as a seal to the air motor. The Dynamic chambers are next to the pumping chambers. Together, they sandwich the piston seals. With each cycle the Dynamic chamber draws in material from the intake manifold via a 1/4" poly hose. The next stroke returns the material back to the manifold. This action washes and lubes the back side of the piston seal and keeps it clean and cool for a longer seal life. When normal seal wear occurs, material leaking past the piston seal

migrates into the Dynamic chamber. The chamber then returns the leaked material back to the inlet manifold.

When the piston seals become completely decayed the operator will notice a drop in performance and some aeration of material. (cavitation due to material rushing past the worn out seal) Even if a bellows ruptures, the Dynamic chamber would rather suck in air than expel material. If a Dynamic pump were left unattended while pumping costly material and complete seal/bellows failure were to occur, it would spill only a small amount of material. It would then begin sucking air, the cycling would increase, and with a Binks pump protector (Part #41-11150) would shut down automatically. The maximum material lost is equal to

the volume of one stroke. As long as the pump is *not* pressure fed or gravity fed, no further material loss would occur.

In the event that an Exel Dynamic must be pressure fed, simply disable the Dynamic feature by removing the two hoses (40) from the bottom of the Dynamic chambers. You must also remove the two elbows, part number 237-781 (38), from the lower manifold and use 1/4" NPT plugs in their place. The Dynamic chambers are now changed to Static chambers. The pump may now be pressure fed. However, when piston seals begin to decay, normal weeping will appear at the bottom of the Static chambers. A new hose can be attached to guide weeping material away.

OPERATION: Binks 4.5:1 EXEL AIR POWERED PUMP

Pressure Relief Procedure

⚠ WARNING

To reduce the risk of serious bodily injury from moving parts, fluid injection, and splashing in the eyes or on the skin, always follow this procedure whenever the pump is shut off; when checking, repairing, or servicing any part of the system; when installing or changing spray nozzles; and whenever spraying is stopped.

- *1. Engage the spray gun safety latch or dispensing valve lock-out control.
2. Turn off the air supply.
- *3. Disengage the spray gun safety latch or dispensing valve lock-out control.
- *4. Hold a metal part of the gun or valve firmly in contact with a grounded metal (only) waste container. Now trigger the gun to relieve fluid pressure.
- *5. Engage spray gun safety latch again.
6. Open the pump drain valve (required in system); use the container to capture the drainage.
7. Allow the drain valve to remain open until you are ready to spray again.

*Follow procedure literature supplied with the spray gun or dispensing valve.

If you have reason to suspect that the spray nozzle or hose is clogged or that all residual pressure cannot be fully relieved after following the above steps, VERY SLOWLY loosen the hose end coupling with a wrench and relieve pressure *gradually*, then loosen completely. If the nozzle or hose obstruction cannot be cleared completely, or is suspect, replace the nozzle or hose. Do not reuse.

Pump Flush Before Installation

⚠ WARNING

To reduce the risk of fluid injection injury, static sparking, and splashing, read and follow the safety instructions appearing on page 2 of this parts sheet.

The pump was factory tested with lightweight oil. Some residue is left in to protect the pump parts. If this could contaminate the fluid you are pumping, flush it thoroughly with a compatible solvent. To start the pump, follow the procedure in the following section, **Start and Adjust Pump**.

Start and Adjust Pump

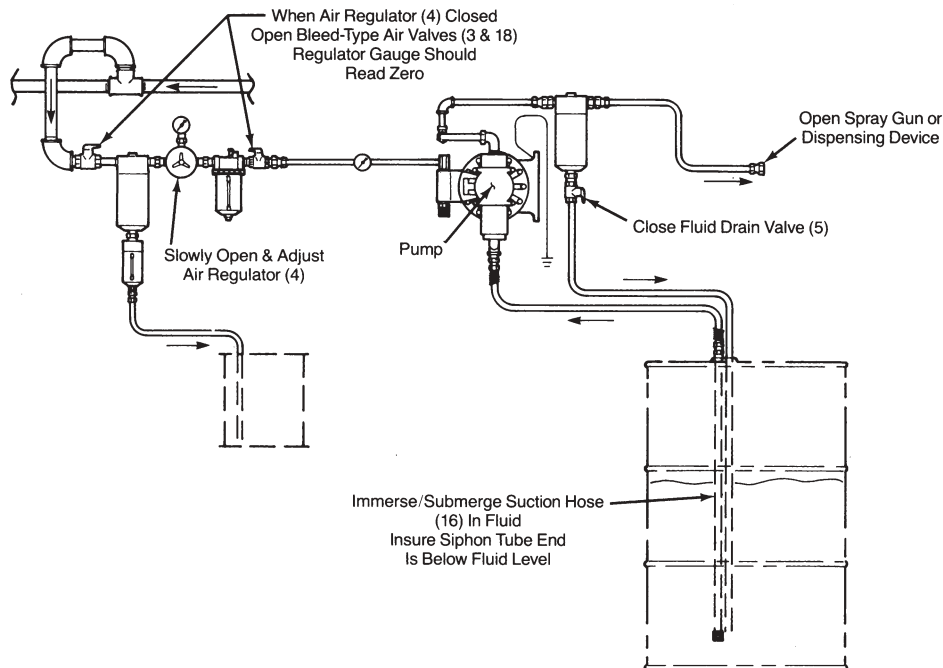
Numbers in Parenthesis () refer to drawing below.

NOTE

Check all fittings. Be sure they are tight. Be sure to use teflon tape thread sealant, which is compatible with all fluids, on all male pipe threads.

1. Place the suction hose (16) in the fluid to be pumped.
2. Close the fluid drain valve (5).
3. With the air regulator (4) closed, open both bleed-type air valves (3) & (18).
4. Open the fluid control device while continuing with the following steps.
5. Slowly open the air regulator (4). Adjust it about 5 PSI (.3 bar) at a time until the pump runs smoothly.
6. Cycle pump slowly until all air is purged out of the lines (fluid flowing in a steady stream from the fluid outlet) until the pump is primed.
7. If you are purging:
 - a. Slowly cycle pump enough to thoroughly clean both the pump and hoses.

(Continued on next page)



OPERATION & MAINTENANCE: Binks 4.5:1 EXEL AIR POWERED PUMP

- b. Close the gun or fluid control dispensing device and air regulator (4).
 - c. Back off air regulator until gauge reads zero.
 - d. Remove the section hose (8) from the solvent and place it in the fluid to be pumped.
8. If you are going to place the pump in service:
- a. Start the pump. Be sure the suction hose is in the supply container and that the tube end is below the fluid level.
 - b. If you are using the pump to spray, follow the Pressure Relief Procedure Warning on page 11, then trigger the gun into a grounded metal waste container to prime the hose and install a spray tip in the gun. Adjust the pump pressure just enough to completely atomize the fluid. Higher pressures are unnecessary and only cause premature nozzle and pump wear.

- c. A pump in a dead-end system will cycle upon demand only.
- d. A pump in a circulating system runs continuously and speeds up or slows down as supply demands.

CAUTION

NEVER allow the pump to run dry of fluid. A dry pump can accelerate to a high cycle speed, possibly damaging itself. If pump accelerates quickly, or is running too fast, stop it immediately. If the supply is empty and air has been pumped into the lines, refill the container and again prime the pump and lines. If pump is damaged or needs repair, flush the pump and leave filled with a compatible solvent. Be sure to eliminate all air from the system. A Pump Protector Valve is available.

9. If you are removing the pump from service or the pump is to remain idle for an extended period:
- a. Flush the pump thoroughly before shutting down, especially if pumping a material that will react to time or heat.

- b. Remove the siphon hose from the supply container and cycle the pump to force fluid out of the system. Prime the pump with a compatible solvent and shut off the air supply.
- c. Follow the Pressure Relief Procedure Warning on page 11. Also, follow the MAINTENANCE instructions below.

MAINTENANCE

CAUTION

Never run this pump dry (without material) for prolonged periods of time. Running the pump dry creates heat and friction, which could damage some of the internal parts, causing pump failure. Improper operation of the pump will void your warranty.

WARNING

To reduce the risk of fluid injection, static sparking, and splashing, read and follow Flushing Safety under FIRE OR EXPLOSION printed earlier in this part sheet.

Flush the Pump with a Compatible Solvent

1. Flush often enough to extend life of piston seal and to prevent fluid from drying in the pump with possible damage.
2. ALWAYS flush before storing.
 - a. If you are pumping water-based fluid, first flush the pump with Binks Pump Purj (follow label instructions). Residual Pump Purj will prevent rust from forming. Mineral spirits or a compatible, oil-based solvent is another possibility.

- b. Leave the Binks Pump Purj in the pump to protect the pump parts from corrosion.
3. For maximum protection, be sure to eliminate all air from the system.

Tighten Threaded Connections

1. Check all hoses before each use for wear or damage and replace as necessary. Be sure all threaded connections are tight.
2. Check and tighten all threaded connections, including manifold screws, clamps, plugs, and valve screws at least every six months.

Check and Service the Lubricator, Regulator, and Filter

1. Follow service instructions supplied with air control components.
2. Do not use other than specified oil for the oiler. Certain private label products with exotic solvent blends will damage internal air motor seals and parts. For long motor life, use an airline oiler with part no. 207-11155-1 or Shell tellus #32, preferably non-detergent grade. To reduce icing due to excessive water in the air supply, use ethylene glycol anti-freeze.

TROUBLESHOOTING: Binks 4.5:1 EXEL AIR POWERED PUMP

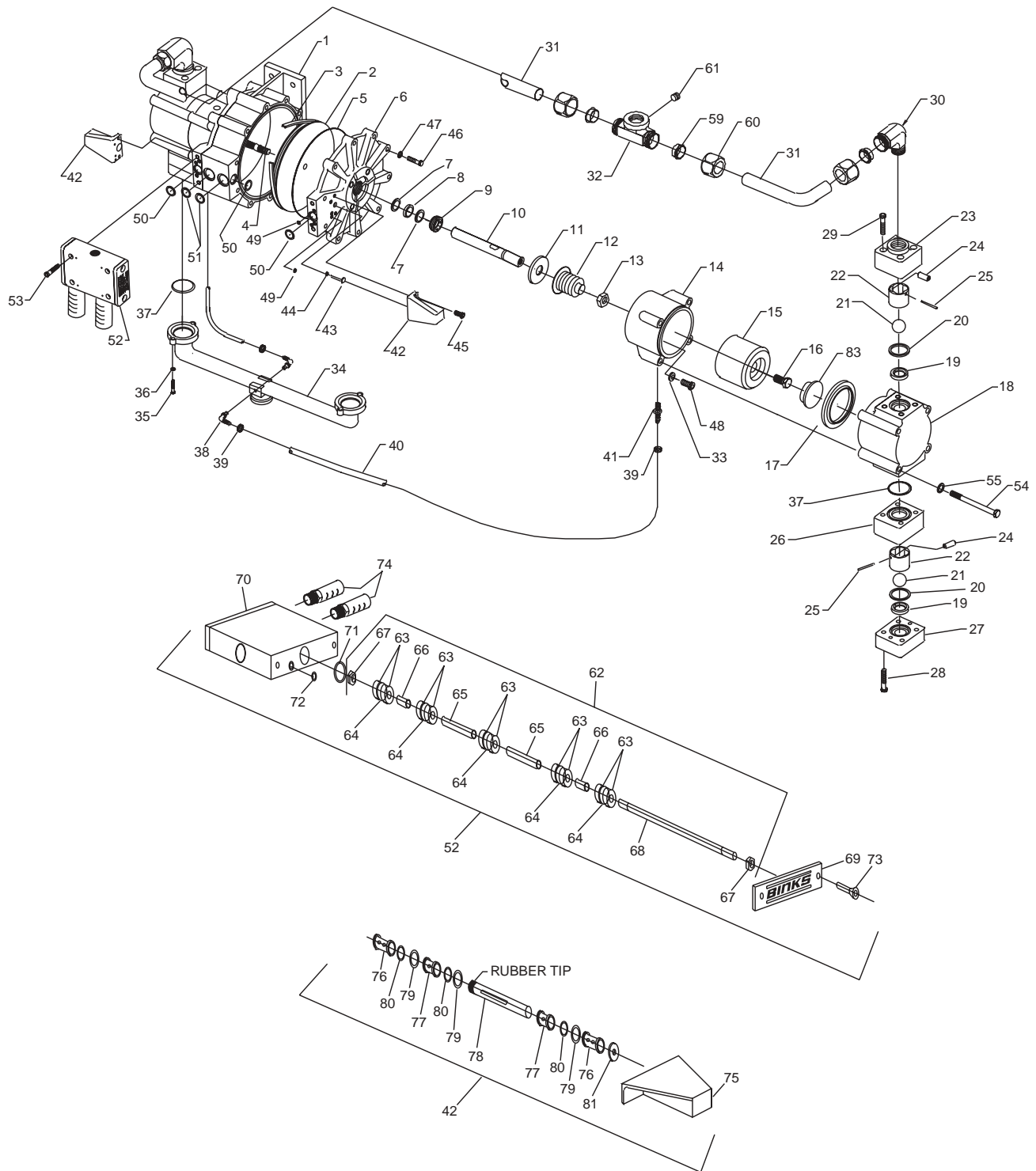
⚠ WARNING

Component rupture can cause serious bodily injury. NEVER exceed 125 psi (8 bar) air supply pressure to the pump. Read the warning section printed earlier in this part sheet. BEFORE DISASSEMBLING THE PUMP, check and consider all probable causes and follow Pressure Relief Procedure on page 11.

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	TEST PROCEDURE	REMEDY
Pump will not prime	Air is getting into the intake housing: a. Defective o-ring on intake manifold. b. Suction hose/tube not sealed.	No test is possible. Best economy is to assume o-ring is faulty.	Replace o-ring. Tighten connections.
	Worn piston Seals.		Replace piston seals.
	Foreign matter in ball checks or bad ball checks.		Inspect, clean and/or replace balls and seats.
Pump will not run	Air supply is turned off.	Visually observe. Start nearest the pump to ascertain/locate all valves.	Turn air supply on.
	Fluid valve is turned off.	Visually observe. Start nearest the pump to ascertain/locate all valves.	Turn fluid supply on.
	Air pressure regulator adjustment too low.	Recommended minimum air pressure regulator 20 psi (1.95 bar), depending on fluid being pumped.	Increase air pressure regulator adjustment.
	Pilot valve assemblies inoperable. Needs servicing.	Switch/interchange pilot valves to isolate faulty pilot valve.	Repair or replace pilot valve assembly.
	Air piston seal worn.	Check for constant exhaust air when pump is not running.	Repair or replace air control valve.
	Air control valve defective.	Constant exhaust noise.	Replace seal.
Pump runs but does not maintain constant pressure	Air in fluid line.	Check for spitting at fluid outlet.	Bleed fluid line until constant flow is obtained.
	Air line undersized; too long or restrictive fittings; hose is crimped.		Install larger air line, minimum size 1/2". Correct fitting sizes rectify hose path.
	Obstructed or worn ball and seat.	Pump fast cycles on one end of stroke. Indicates that side is bypassing.	Remove, clean, and inspect/reverse seat, ball, and ball cage. Replace if suspect or worn.
	Worn piston seals.		Replace piston seals.
Air exhaust noise at junction of static chamber and air motor on pump prime stroke	Worn/failed air motor shaft seal(s). Worn/failed/loose air motor shaft seal components.	Stall pump on prime stroke to isolate noise. If noise stops on opposite stroke, only that seal is faulty.	Disassemble pump as required to replace all seal components on BOTH sides.
	Worn fluid piston and/or seal.	Pump fast cycles on one end of stroke. Indicates that side is bypassing.	Replace piston and/or seal.
	Air control valve mufflers plugged.	Check for slow air flow at muffler.	Remove and clean mufflers or replace.
	Air control valve dirty or worn.		Repair or replace air control valve.
	Failed/worn seals.		Repair or replace seals.
	Excessive or lack of lubrication.	Pump reacts slowly.	Adjust lubrication.
	Dirty air passages.	Check for sluggish air control valve operation.	Clean air passages; Service air line filter and/or control valve filter.

Binks MODEL 41-17045 EXEL 450 PUMP (STAINLESS STEEL)



INCLUDED, BUT NOT SHOWN: 41-13021 Static Ground Kit

Binks MODEL 41-17045 EXEL 450 PUMP (STAINLESS STEEL)

PARTS LIST

When ordering, please specify PART NO.

ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	207-11765-2	CYLINDER AIR MOTOR	1	▲42	207-11308	VALVE ASS'Y., PILOT AIR.....	2
2	207-10731	PISTON, AIR	1	43	207-10753	PUSHROD, PILOT VALVE	2
3	237-237	QUAD-RING	1	44	237-507	SEAL, PUSHROD	2
4	207-10732	STUD, AIR PISTON	1	45	237-31	SCREW, SOCKET HD.	4
5	237-64	O-RING	2	46	237-179	SCREW, HEX HD.	20
6	207-11001	COVER PLATE, AIR MOTOR	2	47	237-155	WASHER.....	20
7	237-236	QUAD-RING	4	48	237-805	SCREW, SOCKET HD., S.S.	8
8	207-11711	SEPARATOR, SEAL	2	49	237-542	O-RING	12
9	207-11710	BEARING	2	50	237-62	O-RING	4
10	207-11947	ROD, PISTON, S.S.	2	51	237-63	O-RING	2
11	207-11949	RING, ALIGNMENT	2	*52	207-11721	VALVE ASS'Y., CONTROL.....	1
12	207-11948	SEAL, BELLOWS.....	2	53	237-539	SCREW, SOCKET HD.	4
13	207-12080	NUT, RETAINING, S.S.	2	54	237-704	SCREW, HEX HD, 4-1/4"	8
14	207-11945	CHAMBER, DYNAMIC, S.S.	2	55	237-559	WASHER.....	8
15	207-11708	PISTON, MATERIAL, S.S.	2	59	237-833	SLEEVE, FERRULE, S.S.	4
16	237-739	SCREW, HEX HD, S.S.	2	60	237-832	NUT, S.S.	4
17	207-11151	SEAL, PISTON.....	2	61	237-774	PLUG, PRESSURE, S.S.	1
18	207-11715	BLOCK, OUTPUT, S.S.	2	●*62	207-10997	SPOOL ASM	1
19	207-11301	SEAT, CHECK VALVE, S.S.	4	●*63	207-10865	HUB	10
20	237-549	O-RING	4	●*64	207-10864	SEAL, T-RING	5
21	237-556	BALL, CHECK VALVE, S.S.	4	●*65	207-10867-2	SPACER.....	2
22	207-10953	CAGE, BALL, S.S.	4	●*66	207-10867-1	SPACER.....	2
23	207-11620	BODY, CHECK VALVE, S.S.	2	●*67	237-580	NUT	2
24	207-11540	SLEEVE, BUMPER, UHMW	4	●*68	207-10866	ROD	1
25	237-639	PIN, CAGE, S.S.	4	*69	207-10986	CAP, END	2
26	207-11744	BLOCK, CHECK, S.S.	2	*70	207-12178	BLOCK, VALVE.....	1
27	207-11745	CAP, CHECK, S.S.	2	*71	237-53	O-RING	2
28	237-702	SCREW, SOCKET HD	8	*72	237-542	O-RING	6
29	237-540	SCREW, SOCKET HD	8	*73	237-566	SCREW, FL HD	4
30	237-743	ELBOW, S.S.	2	*74	237-536	MUFFLER	2
31	207-11712	TUBE, MANIFOLD, S.S.	2	▲75	207-11307	HOUSING	1
32	207-11785	TEE, MANIFOLD, S.S.	1	▲76	207-11305	SLEEVE	2
33	237-159	WASHER, NYLON	8	▲77	207-11304	SLEEVE	2
34	207-11719	MANIFOLD, INTAKE, S.S.	1	▲78	207-11306	POPPET	1
35	237-172	SCREW, HEX HD.	4	▲79	237-544	O-RING	3
36	237-153	WASHER.....	4	▲80	237-543	O-RING	3
37	237-548	O-RING	4	▲81	237-617	WASHER, WAVE	1
38	237-781	ELBOW, 90 DEG MALE, NYLON	2	82	207-12312	COVER, BOLT	2
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SEAL KIT, AIR CONTROL VALVE				SEAL KIT, PILOT VALVE			
64	207-10864	SEAL, T-RING	5	79	237-544	O-RING	3
71	237-53	O-RING	2	80	237-543	O-RING	3
72	237-542	O-RING	6	81	237-617	WASHER, WAVE	1

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