

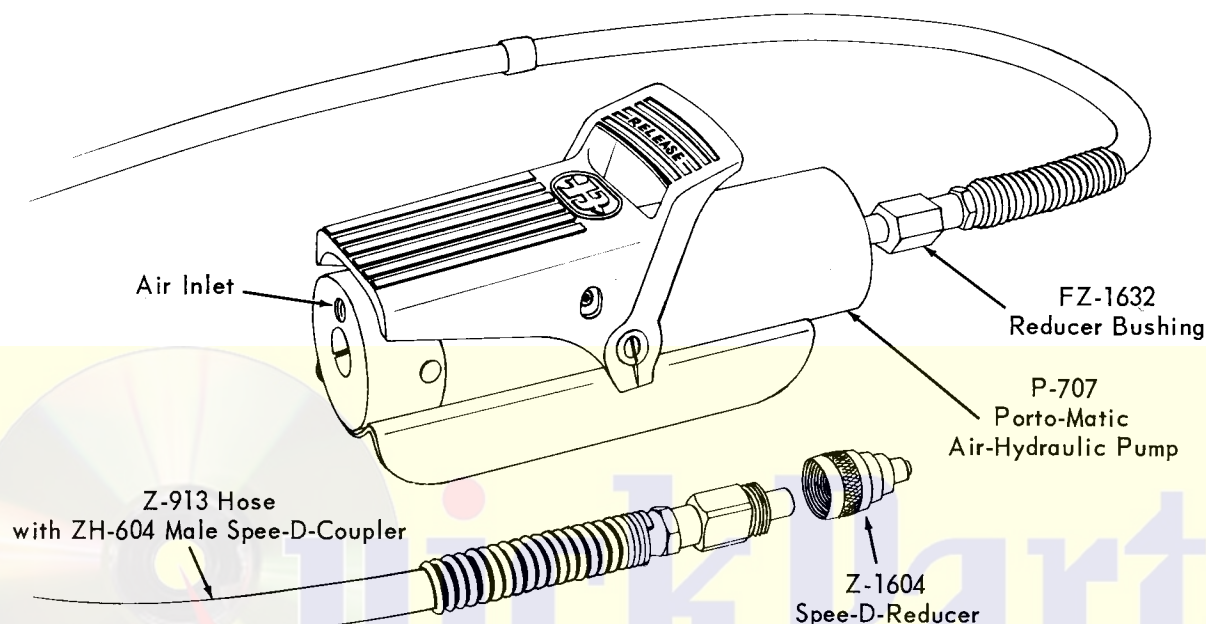
Porto-Power

REPAIR EQUIPMENT

Master Copy

instructions & repair parts

MODEL S-202 PORTO-MATIC AIR-HYDRAULIC PUMP SET



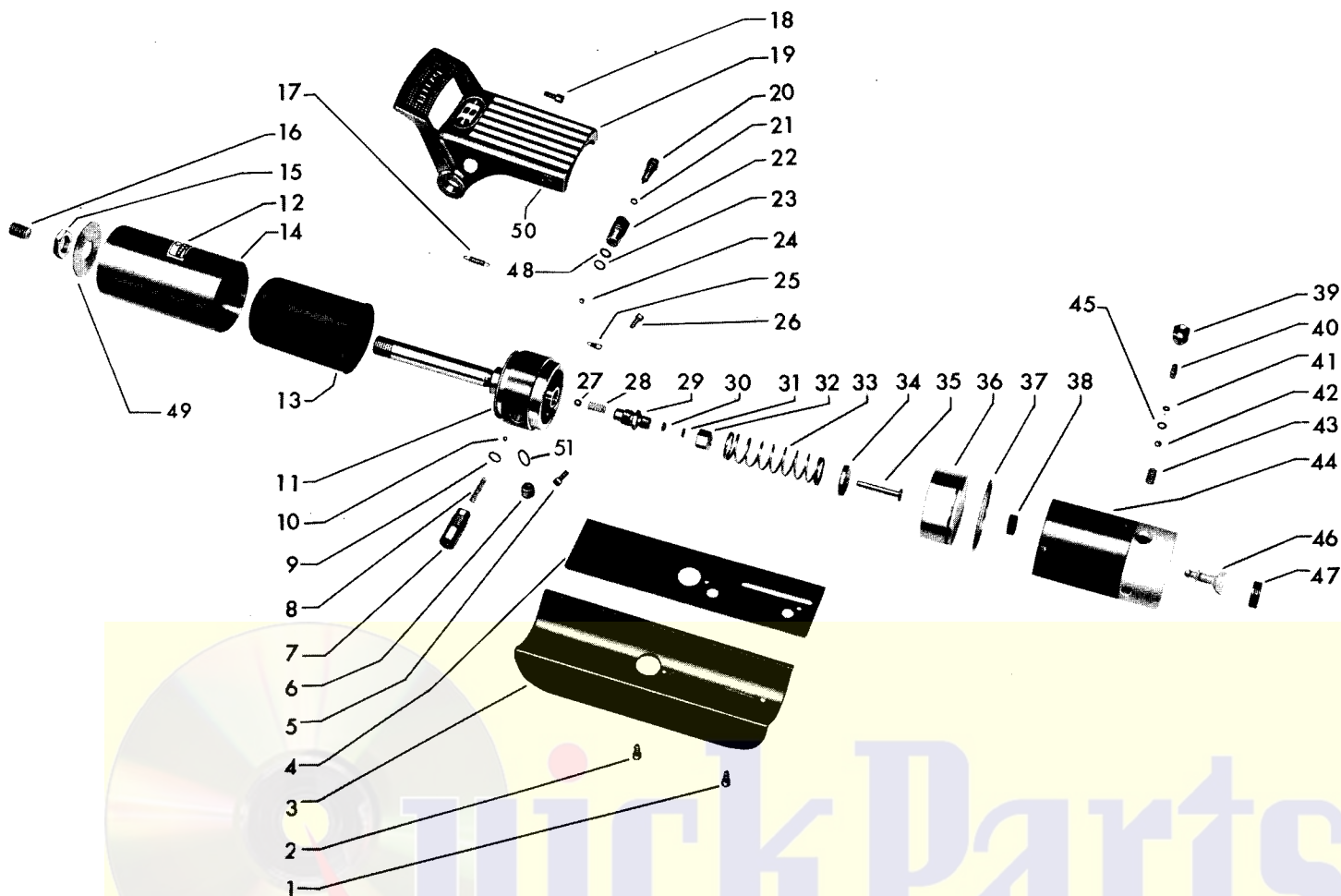
Your new Blackhawk Porto-Matic Pump is a precision built tool which will last indefinitely if used correctly and given proper care. A few minutes of your time spent in reading these instructions will be a wise investment. It will help you protect your fine new Blackhawk equipment.

The S-202 Porto-Matic Pump Set includes all items shown above.
The P-707 Pump is filled with oil, ready to use. Here's all you do:

1. Connect the Z-913 10-ton Hydraulic Hose to Porto-Power Bantam or 10-ton Ram. Z-1604 Spee-D-Reducer also required for Bantam Rams. (When P-707 pump is shipped alone, a shipping pipe plug is inserted in the oil hose inlet. Remove plug and connect FZ-1632 reducer bushing and Z-913 hose to pump.)
2. Connect air supply line carrying 60 to 180 P.S.I. to the Porto-Matic air inlet (pump is tapped $\frac{1}{4}$ NPT to accept standard air supply connector fittings) marked "AIR IN".
3. Depress the foot treadle to open the throttle valve and start pump. Hear it work! The exhaust air creates a slight puffing noise while running. This increases in intensity proportional to the pressure output of the pump until at high pressure the exhaust sounds like small balloons bursting. The operator can soon control the output level he wants by listening to the exhaust. Output pressure can be readily controlled by regulating the air supply pressure.
4. Pump will stop and hold the load when the treadle is not depressed or if air supply is cut off accidentally.
5. To release the oil back into the pump reservoir, depress the portion of the treadle marked "release". The treadle is spring loaded to return automatically to the "hold" position. Should it be bumped accidentally, it will not continue to release.
6. To adjust retracting speed: Loosen clamp screw on treadle leg and back out release valve screw about one to two turns counterclockwise. Bring pump to pressure, turn release valve screw to the right (clockwise) until resistance is felt, depress release end of treadle to desired position and tighten clamp screw. Further motion of treadle toward release will open release valve. Check and readjust until desired flow rate is obtained.
7. The reservoir is a flexible rubber container and should be filled completely to eliminate all air from the oil circuit. To fill the reservoir, turn the pump upside down and remove the pipe plug in the center of the base, hold the hydraulic hose (reservoir end) low and fill completely using Blackhawk LX-21 Hydraulic Oil. Then replace pipe plug and tighten securely. Keep oil clean. Dirt can cause leaky valves and wear on parts.
8. This pump is an automatic tool and, to prevent accidental operation, should be disconnected from the air supply when it is not being used.
9. To insure longer service life for your pump, a small quantity of oil should be blown into air inlet when pump will be idle for extended periods, and once a month in normal service. No. 30 motor oil is ideal for this purpose.

CAUTION: Do not use P-707 with EK-10 Pull-Dozer®. Extreme power may damage verticle beam.

EXPLODED VIEW DRAWING OF P-707 PORTO-MATIC AIR-HYDRAULIC PUMP



PARTS LIST FOR P-707 PORTO-MATIC AIR-HYDRAULIC PUMP

Item No.	Part No.	Description	Item No.	Part No.	Description
1	B733.087	Screw	26	B733.087	Screw
2	B733.087	Screw	27	S1.16	Ball Valve (inlet)
3	B748.005	Base	28	B726.110	Spring
4	B716.037	Gasket	29	B730.050	Plunger Body
5	B733.087	Screw	30	B709.503	Pump Plunger Seal
6	CB9.185-2	Plug (reservoir fill)	31	B712.562	Backup Ring
7	B722.302	Treadle Bearing Screw	32	B705.021	Nut
8	B723.110	Spring	33	B704.110	Spring
9	B710.503	Seal (treadle bearing screw)	34	B703.108	Washer
10	1.16	Ball Valve (discharge)	35	B702.040	Hydraulic Piston
11	B880.900	Hydraulic Body and Tube Assembly	36	B729.578	Air Piston
12	B840.026	Decal	37	B713.491	Piston Ring
13	B708.025	Reservoir	38	B742.808	Exhaust Valve
14	B725.162	Reservoir Cover	39	B728.035	Gland Nut (throttle)
15	B724.123	Nut	40	B727.395	Stem (throttle)
16	B714.245	Plug (shipping)	41	B744.503	Seal (throttle stem)
17	B720.110	Spring (treadle)	42	S1.16	Ball Valve (throttle)
18	B715.087	Treadle Clamp Screw	43	B936.110	Spring (throttle)
19	B747.218	Treadle	44	B745.900	Air Cylinder Assy.
20	B706.010	Release Screw	45	B860.066	Washer (throttle seal)
21	B711.503	Seal (release screw)	46	B741.579	Stem (servo-valve)
22	B719.011	Release Valve Nut	47	B743.006	Servo-Valve Plug
23	B710.503	Seal (release nut inner)	48	B839.503	Seal (release nut outer)
24	1.16	Ball Valve (release)	49	B754.026	Nameplate
25	B721.558	Clip	50	B841.026	Caution Decal
			51	B159.167	Gasket (Fill Plug)

P-707 PORTO-MATIC SERVICE INSTRUCTIONS

CAUTION: Disconnect air supply and hydraulic tool before attempting any disassembly.

Should maintenance be required follow this Disassembly Procedure for Cleaning or Repair.

To clean throttle valve:

1. Remove throttle valve gland nut (39), ball (42), spring (43), and washer (45).
2. Remove stem (40) from gland nut (39).
3. Clean all parts and reassemble in reverse order. Tighten gland nut gently. If nut (39) has been tightened excessively, washer (45) may be cut into two rings. The inner ring can still be used. The outer ring may be discarded.

To remove and disassemble air motor:

1. Remove two screws (1) and (2) holding the base (3) to the motor and remove base (3) and gasket (4). If base sticks in place, pry it loose with a screw driver using filler plug (6) as fulcrum.
2. Remove screw (5), clip (25), and treadle spring (17).
3. Remove screw (26) while holding motor to prevent spring (33) from separating motor and pump.
4. Holding unit upright (motor above pump) lift motor off and remove spring (33). Now reinsert hydraulic plunger (35) into body (29) to prevent escape or contamination of oil.
5. Withdraw air piston (36) from motor (may be driven by low air pressure placing hand over open end of cylinder to retain piston, or withdrawn by pulling on internal ribs with fingers or pliers).
6. Remove servo valve plug (47).
7. Exhaust valve can be removed with hooked wire or fingers [being careful not to damage valve (38) or stem (46)] by lifting on one side of valve.
8. Remove stem (46) and throttle valve gland (39) for complete disassembly.
9. Reassemble in reverse order. Tighten throttle valve gland gently and screws (1, 2, & 5) and (26) to approximately 30 lb. inches.

NOTE: Apply a good grade of pipe compound to the threads of throttle valve gland (39) and servo plug (47) before reassembly.

To clean or service hydraulic valves:

1. For access to high pressure outlet valve: Remove treadle bearing screw (7) using $\frac{5}{8}$ inch wrench, remove spring (8) and ball valve (10). Reinstall to 10 lb.-ft. torque.
2. For access to release valve: Remove treadle bearing screw (7), spring (8) and ball (10) — (as in "1" above). Loosen treadle clamp screw (18), unhook spring (17)

from treadle (19), slide treadle off of release screw and remove from pump. Remove release valve gland nut (22) and ball valve (24). To adjust retracting speed: Loosen clamp screw on treadle leg and back out release valve screw about one to two turns counterclockwise. Bring pump to pressure, turn release valve screw to the right (clockwise) until resistance is felt, depress "release" end of treadle to desired position and tighten clamp screw. Further motion of treadle toward release will open release valve. Check and readjust until desired flow rate is obtained.

3. For access to inlet valve: Remove air motor assembly as previously described, remove hydraulic plunger body (29), spring (28), and ball valve (27). Reinstall in reverse order, and tighten plunger body (29) to 30-40 lb.-ft. torque. Be sure all parts are clean before reassembling to insure proper sealing.
4. For access to pump plunger seal: Remove air motor assembly, remove nut (32), remove seal (30) and backup ring (31). Install new backup ring with hide (colored) side next to nut (32). Reinstall in reverse order and tighten nut (32) to approximately 10 lb.-ft.

NOTE: O-Ring seals must be replaced if damaged. Make certain they are installed properly.

NOTE: Do not remove oil discharge tube from hydraulic body as this is factory assembled high-pressure fit.

To replace reservoir:

1. Drain oil from pump.
2. Remove hydraulic hose and adaptor FZ-1632 from pump, remove nut (15) and withdraw reservoir cover. This can be facilitated by first removing base (3). Cover can be withdrawn by prying with narrow blade screwdriver between hydraulic body (11) and cover (14), being careful to avoid damage to reservoir.
3. Reservoir (13) can now be stripped from the pump.
4. To replace reservoir — wipe all surfaces dry and pull reservoir over oil discharge tube about 3 inches. Now pull back toward the end of the tube to invert the neck of the reservoir, fit reservoir bead into groove on hydraulic body (11) and LIGHTLY lubricate outside of reservoir in the region of the bead (for about $\frac{1}{2}$ inch), replace reservoir cover (14) and nut (15). Tighten nut (15) just enough to seat cover (14) against the hydraulic body (11) do not rotate cover during assembly as reservoir may become twisted. Replace base, and hose and fill completely with Blackhawk LX-21 Hydraulic Oil. Approximately 28 cubic inches of oil are required to refill pump and 6 ft. hose.

TROUBLE SHOOTING CHART – P-707 PORTO-MATIC AIR-HYDRAULIC PUMP

Refer to Service Instruction Sheet for Part Identification

Condition	Possible Cause	Remedy
Air motor fails to cycle	<ol style="list-style-type: none"> 1. Air pressure too low. 2. Air orifice restricted. 3. Servo valve plug (47) loose. 4. Base gasket leaking. 5. Air exhaust valve (38) leaking. 6. Air exhaust valve (38) stuck. 7. Air piston (36) jammed. 8. Hydraulic piston (35) jammed. 9. Air piston (36) broken. 10. Clogged from long storage. 	<p>Check air supply for desired pressure.</p> <p>Remove air line fitting and clean orifice.</p> <p>Remove – apply pipe compound and tighten.</p> <p>Tighten base screws (1 & 2) or replace gasket (4) if damaged.</p> <p>Clean – replace if worn or damaged.</p> <p>Remove and clean valve (38) and stem (46) – lubricate and reinstall.</p> <p>Disassemble motor – remove and clean piston (36).</p> <p>Disassemble motor from pump – clean – replace if scored – refill with LX-21 oil.</p> <p>Replace with new piston.</p> <p>Add small quantity of No. 30 oil through air inlet. Plug exhaust ports with thumb and forefinger, and turn on air. Release ports suddenly after air pressure has built up.</p>
Air motor cycles slowly	<ol style="list-style-type: none"> 1. Air orifice partly restricted. 2. Gummy valve (38-46) or Piston (36). 3. Air pressure too low. 	<p>Remove air line fitting and clean orifice.</p> <p>Clean and lubricate.</p> <p>Increase, but do not exceed 180 P.S.I. 60 to 120 P.S.I. is normal.</p>
Air motor cycles but fails to pump	<ol style="list-style-type: none"> 1. Release valve (24) not closing. 2. Air in reservoir (13) or in system. 3. Dirt under valves (10, 24 or 27). 	<p>Adjust release screw (20). (See operating instructions, page 1.)</p> <p>Fill with LX-21 and bleed out all air.</p> <p>Clean and fill with clean LX-21 oil.</p>
Pumps but fails to hold pressure	<ol style="list-style-type: none"> 1. Leak in system (hose or ram). 2. Release valve (24) not closing. 3. Dirt under valves (10, 24 or 27). 	<p>Locate and repair.</p> <p>Adjust release screw (20). (See operating instructions, page 1.)</p> <p>Clean and fill with clean LX-21 oil.</p>
Pumps but fails to release	<ol style="list-style-type: none"> 1. Release valve (24) not opening. 	<p>Adjust release screw (20). (See operating instructions, page 1.)</p>
Air motor fails to shut-off	<ol style="list-style-type: none"> 1. Throttle valve (42) leaking. 2. Washer (45) damaged. 	<p>Remove – clean – reinstall.</p> <p>Replace.</p>
Oil blowing out air exhaust	<ol style="list-style-type: none"> 1. Pump plunger seal (30) leaking. 2. Pump plunger body (29) loose. 	<p>Replace seal (30) and backup (31).</p> <p>Tighten to 30-40 lb.-ft. torque.</p>
Oil leaking from unit	<ol style="list-style-type: none"> 1. Reservoir fill plug (6) loose. 2. Release valve gland (22) loose or seal (48) damaged. 3. Reservoir (13) damaged. 4. Line fittings loose. 5. Treadle bearing screw (7) loose. 	<p>Apply pipe compound and tighten.</p> <p>Replace seal if damaged and tighten to 10 lb.-ft.</p> <p>Replace with new reservoir.</p> <p>Tighten.</p> <p>Tighten to 10 lb.-ft.</p>

Guarantee

Blackhawk guarantees its Lifting Equipment and Porto-Power Repair Tools against defects in workmanship and material for 90 days from date of delivery to the user. Only exception is chain, which follows the trade custom of its manufacturers and cannot be guaranteed.

When question of warranty arises, the user should send his unit to the nearest Blackhawk Franchised Service Depot for inspection, transportation to be prepaid and evidence of delivery date furnished. Contact Blackhawk Mfg. Co., Milwaukee, Wis., for list of Franchised Service Depots.

If the difficulty comes under the terms of our guarantee, the Franchised Service Depot will *repair or replace parts affected* and return prepaid. Our guarantee does not cover ordinary wear and tear, abuse, misuse, overloading, altered products or use of improper fluid.

Franchised Service Depots



For quality workmanship with genuine Blackhawk parts select a Franchised Blackhawk Service Depot for your repair work. Only repairs performed by a franchised service depot displaying this official franchise service depot sign are backed with full factory guarantee. The Classified Section in your Phone Book lists your nearest Franchised Service Depot.

BLACKHAWK MFG. CO.

MILWAUKEE 46, WISCONSIN

