

SERVICE INSTRUCTIONS: These *Service Instructions* are intended to be used by qualified personnel at **Authorized Enerpac Service Centers**. Users of Enerpac equipment should refer to the pump *Instruction Sheet* for installation, operation and maintenance information.

YOU MAY REQUIRE:

- ✓ Repair Parts Sheet L-1704
- ✓ Pump Repair Kit PAT1102K-1
- ✓ Release Valve Repair Kit DA4836900K-1
- ✓ Hydraulic hand pump
- ✓ Vise with soft jaws
- ✓ Allen wrenches
- ✓ Box end wrenches
- ✓ 1/4" and 5/16" nut driver
- ✓ Vise-grips
- ✓ Torque wrench
- ✓ Snap-ring pliers
- ✓ O-ring pick
- ✓ Needle nose pliers
- ✓ Pipe thread sealer
- ✓ Solvent and soft brush
- ✓ Enerpac hydraulic oil

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■ DISASSEMBLY



Make certain that pump is disconnected from air supply before disassembling.

CAUTION: DO NOT attempt to remove or otherwise service the Air Button Assembly, Item 21 in Figure 2B of Repair Parts Sheet L-1704. The Air Button Assembly is a non-serviceable part. Removal will damage the sealing surfaces molded in the reservoir cover.

■ Remove Treadle

Refer to Repair Parts Sheet L-1704, Figure 2.

1. Remove two shoulder bolts (item 34) and remove treadle (item 33). (3/16" allen wrench required.)

■ Remove Reservoir

Refer to Repair Parts Sheet L-1704, Figure 3.

1. Remove reservoir cover and gasket (items 13 and 15), by removing twelve screws (item 12) using a 1/4" nut driver. Set reservoir and gasket off to the side.

■ Remove Muffler Cover and Pad

Refer to Repair Parts Sheet L-1704, Figure 2C.

1. Separate muffler cover and pad (items 40 and 39) from reservoir cover by removing two screws, (item 38) with a 5/16" nut driver.

NOTE: The muffler pad will have oil on it from the air supply. To check for air motor leaking oil, run the pump with the muffler off and hold a piece of white paper towel over the exhaust port. If the towel turns blue from oil then there is a leak.

■ Remove Inlet Filter

Refer to Repair Parts Sheet L-1704, Figure 2.

1. Remove inlet filter (item 19) from the plastic intake tube, (item 18), but do not remove the inlet tube.

CAUTION: Use special care to not knock the inlet tube out of the cylinder while repairing air pump.

■ Remove Retaining Pin

Refer to Repair Parts Sheet L-1704, Figure 2B.

1. Remove retaining pin (item 26) by bending the arms of the pin straight using a needle nose pliers.

■ Remove Mounting Bracket Screws

Refer to Repair Parts Sheet L-1704, Figure 1.

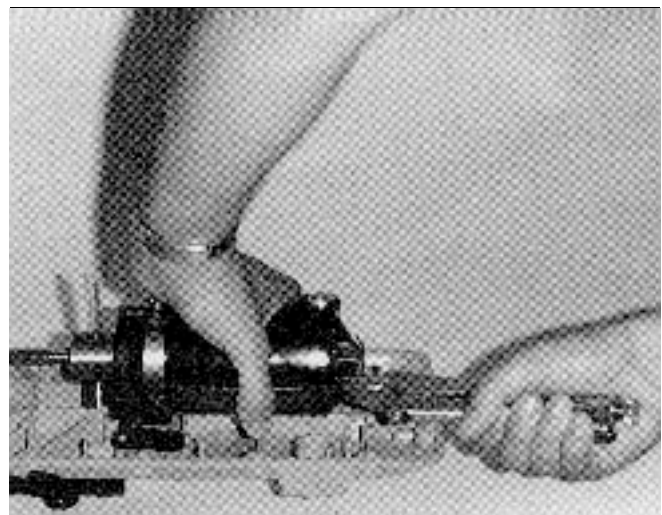
1. Remove four mounting bracket screws (item 1).

NOTE: The spring clips (item 45), shown in figure 2, may require removal from the air motor to gain access to the screws on the mounting bracket.

Remove spring clips as follows:

Compress spring clip to be removed while using a vise-grips on the curved end of the clip to bend clip up and away from the air motor. (Refer to the following illustration.)

NOTE: Be careful not to destroy tabs on air motor.



■ Secure Cover Assembly

Refer to Repair Parts Sheet L-1704, Figure 4.

1. Secure cover assembly in a vise vertically by clamping on the sides of the valve block (item 10).

■ Remove Air Motor Assembly

Refer to Repair Parts Sheet L-1704, Figure 2A.

1. If the air motor assembly cannot be removed simply by pulling on it, then remove the plastic plug (item 46), and lightly tap on the high pressure tube (item 1) with a brass or aluminum drift.

CAUTION: When tapping the motor assembly, be careful not to let the assembly fall out. Possible damage to air motor could occur and/or the intake tube could be damaged. Also be careful not to damage the bore of the valve manifold block.

2. Remove the air motor assembly (item 36), shown in figure 2, by loosening the hose clamp.

WARNING: The air motor has a spring load on it. Be careful not to let the air motor fly off while loosening the clamp.

NOTE: The air motor is not serviceable beyond this point. Replace entire assembly if required. Inside of air motor should be free of hydraulic oil. If hydraulic oil is present, this represents either a leaking piston u-cup (item 5) or o-ring (item 27) or mounting bracket gasket (item 43, Fig. 2A).

3. Remove plunger, spring washer, spring and rubber washer (items 2, 6, 7 and 44).
4. Clamp hydraulic cylinder (item 9) in a vise. Remove pressure tube assembly (item 1) by inserting a punch (or similar object) in the cross hole and unscrewing tube from cylinder.
5. Remove ball, ball guide and spring (items 10, 11 and 13) from cylinder.

NOTE: The pressure tube is not serviceable beyond this point. If outlet ball seat is leaking, a new tube assembly must be ordered. If the inlet seat is bad, a new cylinder must be ordered as the seat is not repairable.

NOTE: Under normal circumstances there should be no need to remove the cylinder (item 9) from the mounting bracket (item 8) shown in figure 2. If disassembly is required, the intake tube (item 18) must be removed. Follow sidebar instructions (figure 2A) in repair parts sheet for re-installation of intake tube.

NOTE: Bearing retainer (item 3) is staked in place and the stake mark must be drilled out prior to removing the bearing retainer.

6. Remove bearing retainer, back-up bearing and u-cup (items 3, 4 and 5) from cylinder (item 9).

■ Remove Filter

Refer to Repair Parts Sheet L-1704, Figure 2B.

1. Remove two screws (item 12), shown in figure 3, and stamped bracket (item 23). The swivel coupler (item 24) is secured to the bracket by a retaining ring. It is not necessary to remove the coupler from the bracket to change the o-ring (item 29).
2. Remove filter (item 37) from cover.

■ Remove Ball and Spring, and Breather Assembly

Refer to Repair Parts Sheet L-1704, Figure 3.

1. Remove disc (item 7) from cover.
2. Remove retaining ring, ball and spring (items 4, 8 and 9) from cover (item 13).
3. Remove breather assembly (item 3) from cover by pulling straight out.

■ Disassemble Release Valve Assembly

Refer to Repair Parts Sheet L-1704, Figure 4.

NOTE: The release mechanism can be removed without removing the valve block from the cover. (The block must still be clamped securely in a vise.)

1. Separate release valve block from cover by removing four screws (item 11).
2. Clamp valve block securely in vise. Remove release guide assembly (item 18) from block.
3. Remove the ball seat, two copper gaskets, ball, spring and ball guide (items 6, 7, 8, 9, 17 and 19) from the bore of the valve body.
4. Pry plastic cap (item 3) off of the spring washer (item 2).
5. Compress spring (item 5) by pushing down on the spring washer and remove the retaining ring (item 1).
6. The release plunger (item 4) can now be removed from the release guide assembly (item 18).

■ ASSEMBLY

■ Assemble Release Valve Assembly

Refer to Repair Parts Sheet L-1704, Figure 4.

1. Install new o-rings (items 13 and 14) and new back-up washers (items 12 and 15) onto the release plunger (item 4).

NOTE: Make certain that the back-ups are located to the outside of the o-rings (closest to both ends of the plunger).

2. Lightly grease o-rings and insert the release plunger into release guide assembly (item 18).
3. Install new spring (item 5) over plunger and secure with spring washer and new retaining ring (items 2 and 1). Snap new cap (item 3) onto spring washer.
4. Replace o-ring (item 16) located in the bore of the valve block (item 10). Lightly grease o-ring after installation.
5. Place copper gasket (item 8) into valve block.
6. Install new spring and new ball guide (items 17 and 19) into the valve block.

NOTE: New ball seat must be "coined" prior to installation. Coin seat at 250 psi with an Enerpac 10 ton press.

7. Hold new copper gasket (item 7) and new ball seat (item 6) to release guide (item 18) using a small amount of grease to hold them in place while installing the assembly into the valve block. (NOTE: Use DS/ES grease only.) Use grease to hold new ball (item 9) to the ball seat (item 6).
8. Install the completed release guide assembly into the valve block. Make certain that ball is centered in the seat. Torque the assembly to 72-78 ft.-lbs. (lubricated torque).

■ Assemble Release Valve Assembly to Cover

Refer to Repair Parts Sheet L-1704, Figure 1.

NOTE: Make certain that all old gasket material is removed from the valve block before proceeding.

1. Place gasket (item 6) onto release valve block. Remove the paper backing from gasket and position on the valve block using two of the screws (item 8) for guides. Attach release valve block to cover using four screws (item 8). Torque screws to 17-19 in.-lbs. using a cross pattern.

■ Install Ball and Spring, and Breather Assembly

Refer to Repair Parts Sheet L-1704, Figure 3.

1. Install new ball and spring (items 8 and 9) into cover (item 13). Secure with new retaining ring (item 4). Cover assembly with disc (item 7).

NOTE: Make certain that spring is completely under retaining ring and that retaining ring is fully seated against stops in cover.

2. Replace o-rings (items 5 and 6) on breather assembly (item 3). Install breather assembly into cover (item 13).

NOTE: Make certain that the o-rings are in the proper grooves. Do not reverse items 5 and 6. Also make certain that the o-rings are lubricated.

■ Install Filter

Refer to Repair Parts Sheet L-1704, Figure 2B.

1. Place new o-ring (item 29) on swivel coupler (item 24). Place new filter (item 37) cone end first into swivel coupler. Attach swivel coupler to cover using stamped bracket (item 1) and screws (item 12), shown in figure 3. Torque screws to 17-19 in.-lbs.
2. Replace o-rings (item 32) on elbow (item 25). Secure elbow to air motor using retaining ring (item 20).

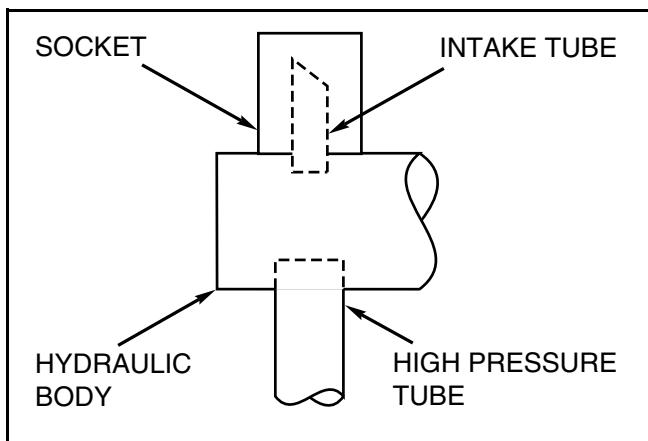
■ Assemble Air Motor Assembly

Refer to Repair Parts Sheet L-1704, Figure 2A.

1. Place new ball, ball guide and spring (items 10, 11 and 13) into cylinder (item 9). The spring should fit into the ball guide with a very light press fit.
2. Replace copper gasket (item 12) in bore of cylinder.
3. Replace o-rings and back-up rings (items 30 and 31) on high pressure tube (item 1). Make certain that back-ups are located to the outside of the o-rings.
4. Torque the pressure tube into the cylinder to 31-35 ft.-lbs. with lubricated threads.
5. Install new u-cup, back-up bearing and bearing retainer (items 5, 4 and 3).

NOTE: Torque bearing retainer to 16-18 in.-lbs. Stake retainer in one place.

6. With cylinder clamped securely in a vise (vertical position), fill the hydraulic piston cylinder bore with oil. Be careful not to overfill. Overfilling will allow oil to flow inside the air motor and out the exhaust.
7. Remove the white plastic piston from inside the air motor. Wipe the inside of the air motor clean. Grease the inside of the air motor with DS/ES grease and re-install air piston.
8. Place spring, spring washer, rubber washer and plunger (items 7, 6, 44 and 2) over the cylinder.
9. Install new o-ring (item 27) onto mounting bracket. (Make certain to lubricate o-ring.) Place air motor over spring and plunger. Carefully compress spring by pushing on the air motor. **Make certain that tab on air motor aligns with slot in bracket.** The aluminum plug in the air motor should be facing the same side as the intake tube.
10. Use clamp (item 47) to secure motor to bracket. Make certain that screw on clamp is facing same side as intake tube. Torque clamp screw to 30-40 in.-lbs.
11. Install new gasket (item 43) onto groove in cover. Make certain that all old gasket material is removed prior to installation of the new gasket. Remove the backing from the gasket and stick it to the cover. Make certain that gasket is centered over groove in cover.
12. Using DS/ES grease, lubricate the o-rings on the high pressure tube. Attach the complete assembly to the cover. This may require light tapping. Clamp the release valve block in a vise. Use a rubber mallet to tap into place. A long socket can be used over the intake tube if the tube is still intact. (Refer to the following illustration.) Torque four screws (item 1) to cover as shown in figure 1.



■ Install Retaining Pin

Refer to Repair Parts Sheet L-1704, Figure 2B.

1. Secure elbow to cover with new retaining pin (item 26). Bend legs of pin partially closed to prevent pin from backing out.

■ Install Spring Clips

Refer to Repair Parts Sheet L-1704, Figure 2.

1. If spring clips (item 45) were removed from air motor, re-install at this point.

■ Install Inlet Filter

Refer to Repair Parts Sheet L-1704, Figure 2.

1. Slide inlet filter (item 19) onto plastic intake tube (item 18).
2. Install plastic cap plug (item 46) into valve block.

■ Install Muffler Cover and Pad

Refer to Repair Parts Sheet L-1704, Figure 2C.

1. Install muffler cover and pad (items 40 and 39) to cover using two screws (item 38). Torque screws to 17-19 in.-lbs. Make certain that pad is folded as shown in figure 2C.

■ Install Reservoir

Refer to Repair Parts Sheet L-1704, Figure 3.

1. Place gasket (item 15) on reservoir. Position large notch in gasket toward sight glass and align with fill port.
2. Position cover assembly on reservoir such that the air inlet end of cover is toward the sight glass end of reservoir.
3. Using twelve screws (item 12) fasten cover assembly to the reservoir. First snug all screws, then moving around the cover in one direction torque every other screw to 17-19 in.-lbs. Then torque the remaining screws to the same amount.

■ Install Treadle

Refer to Repair Parts Sheet L-1704, Figure 2.

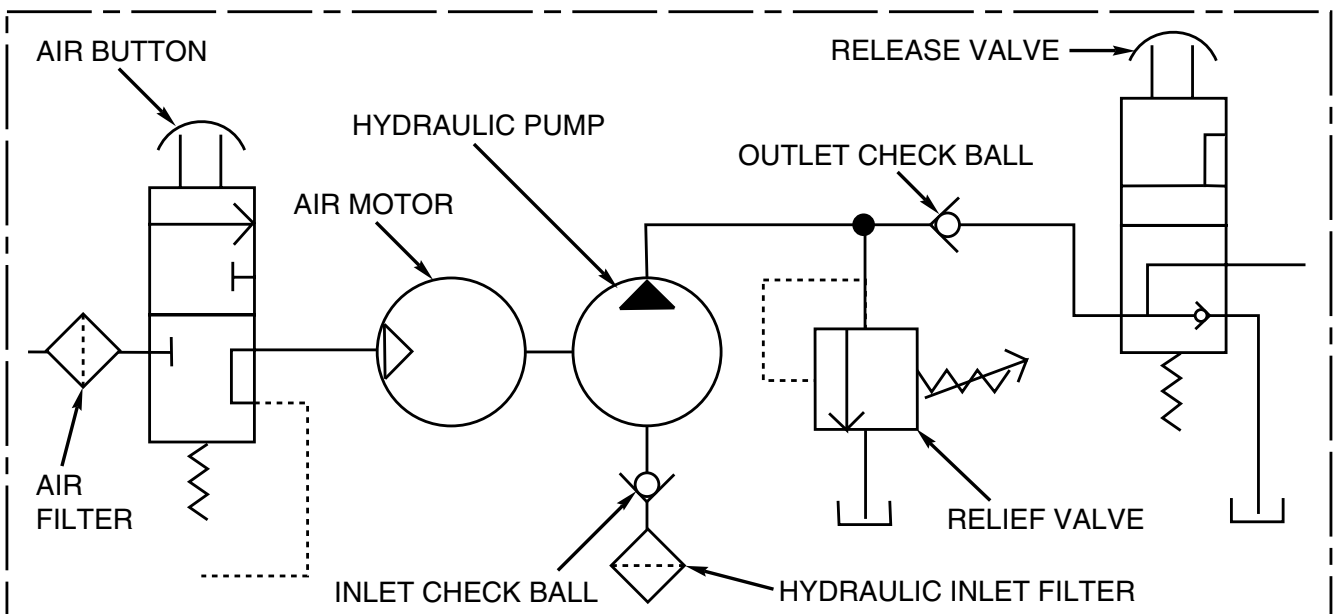
1. Install treadle (item 33) to pump using two shoulder bolts (item 34). Torque shoulder bolts to 6-8 ft.-lbs.

■ TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
<p>Drift—pump will not hold load.</p> <p>Allowable drift is 10% in the first 10 seconds and 200 psi for the next 30 seconds. Usually at 10 to 20% of the relief valve setting.</p> <p>Test to be performed with a trapped fluid volume of 18 cu. in. ±10%. (Fluid volume is approximately equal to an RC106 with a 6 foot hose.)</p>	<p>1. Coupler leaking (outlet thread joint) - also check complete system for any external leakage.</p>	<p>1. Repair leak at coupler and/or any other leakage in the system.</p>
	<p>2. Bad release seat.</p>	<p>2. Replace release assembly.</p>
	<p>3. Release assembly improperly torqued (could be under or over-torqued).</p>	<p>3. If over-torqued, check for damage to valve block and seat. Proper torque is 72-78 ft.-lbs. (lubricated torque).</p>
	<p>4. Copper gaskets not aligned properly.</p>	<p>4. Align gaskets as instructed in the Release Valve Assembly Instructions on page 4.</p>
	<p>5. No spring under release ball.</p>	<p>5. Check by removing coupler and flushing out grease if necessary. Using a flashlight, check to make certain that spring is in place.</p>
	<p>6. Release ball jammed into spring.</p>	<p>6. Check to make certain that ball is not jammed into spring and that ball guide is in place.</p>
	<p>7. Leakage at pressure tube area</p> <p>A. Bad outlet ball seat.</p> <p>B. Bad hex plug seal.</p> <p>C. Bad o-ring seals.</p> <p>D. Contamination on seat or ball.</p> <p>E. Star retainer is loose.</p>	<p>7. Correct as follows:</p> <p>A. Replace if worn.</p> <p>B. Replace hex plug seal.</p> <p>C. Replace o-ring seals.</p> <p>D. Clean seat and ball.</p> <p>E. With tube removed from hydraulic body, check by carefully pushing lightly on outlet ball. Make certain that spring returns the ball to its seat.</p>
	<p>8. Leakage at outlet ball</p>	<p>8. Test as follows:</p> <p>A. Remove pressure tube from the hydraulic cylinder.</p> <p>B. Insert tube into valve manifold.</p> <p>C. Back pressure manifold using a hand pump.</p> <p>D. Check for oil leaking past the outlet ball.</p>
<p>No Flow or Pressure</p>	<p>1. Check for prime.</p>	<p>1. Lift cover and check oil flow from the return to tank port. This is done by depressing the air button while the treadle is in the release position.</p> <p>NOTE: If cover is removed from reservoir a new gasket must be used.</p> <ul style="list-style-type: none"> - No oil flow means the pump is not primed. - Oil flow without the treadle in the release position indicates that the release is bad. (Refer to Drift problems and check for missing ball. <p>Re-prime unit by removing the relief valve and filling the cylinder with oil. Fill the cylinder to the bottom of the threads. Replace the relief valve.</p>

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Pump is autocycling (air button seals are leaking)	1. Leakage at air button seals.	1. Test as follows: A. With cover removed from reservoir, pressurize valve to 100 psi. B. Submerge valve in water or pour water into cavity at valve and check for bubbles. If bubbles are present, the cover with air button must be replaced. The air button assembly is a non-serviceable part.
	2. Check for the inlet ball being either stuck or glued to the seat.	2. "LIGHTLY" press on inlet ball to ensure movement. Be careful not to damage the inlet seat. NOTE: Check that the inlet tube is properly glued to cylinder. Be certain to reinstall the inlet filter when finished.
	3. The hydraulic piston is not in the cylinder bore.	3. Remove air motor from hydraulic body. Check to make certain that the hydraulic piston was operating in the cylinder bore. Check for marks in the air motor wall or on the edge of the mounting bracket where the piston would have been contacting if not operating in the cylinder bore. NOTE: When priming the pump, if the piston is not in the cylinder bore, the oil will run into the air motor and out the exhaust port of the mounting bracket. NOTE: If the air motor "stalls" (does not cycle) after reassembling pump, check to make certain that the white air piston is installed in the air motor. Also check that the black grommet did not fall off the stem in the top of the air motor.

Hydraulic Schematic - Turbo Air Pump



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