ENERPAC
Hydraulic Technology Worldwide

Service Instructions

PA-133, 7001 REPAIR PROCEDURE

L1833 Rev. B 02/06 **Refer to Repair Parts Sheet L1252**

SERVICE INSTRUCTIONS: These Service Instructions are intended to be used by qualified personnel at Authorized Enerpac Service Centers. Users of Enerpac equipment should see the pump Instruction Sheet (L761) for installation, operation, and maintenance information.

TOOLS AND EQUIPMENT NEEDED:

- PA-133K1R complete repair kit or individual kits for each section
- 100 psi 9 cfm air supply
- open or box end wrenches 10,000 psi pressure gauge o-ring pick
- screwdriver
- ENERPAC hydraulic oil
- 10,000 psi 10 ton s/a cylinder
- 10,000 psi pressure gauge
- lightweight grease
- L-1252 repair sheet
- 10,000 psi hose
- o-ring pick
- allen wrenches
- torque wrenches

TROUBLESHOOTING AND TESTING:

NOTE: Procedure #1 to be used for pump priming only.

1. Connect the pump to the air supply and hydraulic hose, gauge and cylinder.

   Make sure the reservoir on the air pump is full.
2. Activate the pump and build pressure in the hydraulic circuit. If the pump fails to build pressure, try operating the pump in the vertical position with reservoir up and air motor down.

   Use as little air pressure as possible so pump cycles only once or twice, slowly. This helps purge air from the pumping chamber. If the pump still does not prime see step #11of the Air Motor Assembly procedure.

   Failure to build pressure may also be the result of worn ball seats or bad seals in the pump body assembly. In this case, teardown and repair of the pump assembly will be necessary.

   ⚠ **Do not exceed maximum rated pressure of 10,500 psi.**

   If relief pressure exceeds the maximum rating, set the relief valve, located on the opposite side of the pump from the swivel assembly, to 10,200-10,500 psi.
3. Cycle pump to maximum pressure 5 to 6 times while observing air motor performance. The motor should reciprocate crisply and quickly.

   If sluggish, the motor may need to be repaired or replaced.
4. Check load holding capability by building pressure to just under the maximum rating. (9500-9800 psi)

   Also check load at 3000 and 6000 psi. For each pressure, check to see that there is not significant pressure drop (100-200 psi) in 5 - 10 seconds.

   If a pressure loss is detected, check the release valve seat and seals or discharge seat and seals.
5. Check output flow at 100 psi of input air pressure. The flow rate can be measured by timing the advancement of the 10 ton cylinder. The correct rate of advancement is 1 inch every 3 seconds under no load and 1 inch every 11 seconds under load.
6. Flow can also be measured by pumping into an open beaker or pan. Correct flow should be 40 cu.in. per minute at zero psi and 10 cu.in. per minute at 9,500 psi. This value should be linear from 0-10,000 psi.

AIR MOTOR TEARDOWN

Refer to figure 1 on the Repair Parts Sheet.

1. Remove the base plate (figure 1, item #27) and screws (item #28) with the 5/32" allen wrench.
2. Hold the motor down firmly and loosen/remove the v-retainer (item #14).

   ⚠ **When the clamp is removed, the motor will be pushed away from the pump body with up to 50 lbs. of force generated by the piston return spring.**
3. Remove and inspect the spring (item #16), washer (item #15), and plunger (item #18) for excessive or uneven wear.
4. Pull air piston out of the open end of the air motor.
5. Remove and inspect air piston (item 54).

AIR MOTOR ASSEMBLY

Refer to figure 1 on the Repair Parts Sheet.

1. Grease the air piston (item #54) and u-cup (item #55) and gently push into the cylinder bore.
2. Position the pump body (figure 1, item #20) so that the motor assembly can be fastened from the top side and secure in a vise. Fill pump body with oil (pump will prime easier).Place the spring (item #16) washer (item #15) and plunger (item #18) into position.
3. Place the motor assembly over the pump body assembly and push down firmly to compress the spring while rotating slightly to allow the plunger to slide into the hydraulic cylinder body. Align the tab on the air motor to fit into the slot on the pump body.
4. Attach the v-retainer (item #14) so that the screw housing faces the slot opening on the base plate (item #27). Tighten to 30-40 in-lbs.
5. Assemble the base plate and screws (item #28). Insert swivel coupler (item #4), o-ring (item #5), and retainer ring (item #3) into place. Test the pump by cycling to maximum pressure several times.

HYDRAULIC BODY TEARDOWN

Refer to figures 1 through 5 on Repair Parts Sheet.

1. Remove the fill plug (item #26) and drain the oil from the reservoir.
2. The air motor assembly (item #21) and base plate must be removed from the pump at this time. Follow steps 1 and 2 of the air motor teardown instructions.
3. Loosen and remove the relief valve assembly (item #23) and the coupler assembly (item #10). These two steps will allow the treadle (item #1) to be removed from the pump body (item #20). Place the loose hardware (items #12 & #13) aside.
4. Remove the reservoir assembly (item #25) by loosening the four 1/8" allen head screws (item #2) and pulling the reservoir away from the hydraulic body. Inspect the bladder for tears or holes. If defective, replace the reservoir assembly (item #25).
5. With a 1" wrench remove the release assembly (item #6). Also remove the ball (item #7), spring (item #29), ball seat (item #4), both gaskets (items #5 & #8), and o-ring (item #3).
6. With a 7/8" wrench remove the hydraulic cylinder assembly (item #17) and ball (item #7).
7. Remove the oil filter (item #9).
8. This will leave the hydraulic body containing three seats and gaskets. Remove the seats (items #19 & #24), gaskets (item #5),and the spring under the release seat (item #29).
9. **Follow figures 2,3,4 & 5 while replacing all the soft seals and service items included in the repair kits for each individual assembly item.**

HYDRAULIC BODY ASSEMBLY

Refer to figures 1 through 6 on the Repair Parts Sheet.

NOTE: Before assembling the seats (figure 1, items #4, #19, & #24), pre-coin at 200 psi on a 10 ton press. After replacement of all kit parts on individual items is complete, begin to re-assemble the pump.

1. Apply grease to the ridged side of the seat (item #19) and position the gasket (item #5) into place so that the grease keeps the gasket in place. Drop the seat and gasket into the port hole for the hydraulic cylinder, gasket first. Drop the ball in (item #7) and position it on the seat.
2. Thread the rebuilt hydraulic cylinder (item #17) into the hole and torque to 25 ft-lbs.
3. Place a new spring (item #29) into the release assembly port on the hydraulic body with the large diameter down. Make sure the spring is pushed into the housing as far as it can go.
4. Position the gasket (item #5) with grease on the release assembly (item #6) and insert the seat (item #4). Place the ball (item #7) onto the seat with grease to hold the ball in position when inverted.
5. Drop the large gasket (item #8) into the release port and replace and grease the o-ring (item #3) in the groove in the port.
6. Thread the release assembly (item #6) (with gasket, seat and ball in place) into the body. Torque to 92-96 ft-lbs.
7. Place a new oil filter (item #9) into the pump body.
8. Hold the reservoir assembly (item #25) and slightly fold the bladder down inside the can. Apply a light film of grease to the upper 1" of the inside of the can.
9. Pull the bladder away from the body and roll the bladder lip down past the groove on the body.
10. Line up the vent hole on the reservoir can to the release body and line up the screw holes in the can with the threaded holes in the body.
11. Lightly set the reservoir assembly on the body and roll the bladder lip down past the groove on the body.
12. Slowly pull the reservoir away from the body until the lip slips into the groove on the body. Feel around the groove to make sure that the bladder lip is fully settled into the groove and evenly push the can back onto the body while lining up the screw holes.
13. Install the four screws (item #2) and snug up.
    DO NOT OVER-TIGHTEN.
14. Grease the seat (item #24) and place the gasket (item #5) in place and position it in the relief valve port.
15. Position the treadle (item #1), and with the ball greased in place on the relief valve assembly (item #23), thread the relief valve through the treadle and into the pump body. Torque to 25 ft-lbs.
16. Place the gasket (item #5) with grease on the seat (item #19) and drop it into the swivel coupler port.
17. Place the guide (item #13) into the coupler port. Make sure it lies flat. Drop the ball (item #12) into the guide.
18. Make sure the spring is in the swivel coupler assembly (item #10), and then screw the swivel assembly through the treadle and into the body. Torque to 25 ft-lbs.
19. Fill the reservoir with oil and turn in the fill plug (item #26). Be sure to tighten only finger tight.
20. Follow steps 11 through 14 of the air motor assembly for attachment of the air motor to the pump body and test the pump.

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