

POWERFUL SOLUTIONS. GLOBAL FORCE.

Repair Parts Sheet

HPT-1500 and HPN-2000 **Hydraulic Hand Pumps**

L2742 Rev. D 06/15

For Date Codes Beginning with the Letter "A"

To Protect Your Warranty, Use Only ENERPAC Hydraulic Oil.

Enerpac recommends that all kit components be installed to insure optimum performance of the repaired product.

Index:
English1-9
FrançaisN/A
Deutsch N/A
ItalianoN/A
Español N/A
Nederlands N/A
Portuguese N/A
FinnishN/A
Norwegian N/A
SwedishN/A
中文 N/A
日本語N/A



Repair Parts List (Refer to figures 1 through 8)							
Item	Part Number	Qty.	Description	Item	Part Number	Qty.	Description
1	(not available)	1	Pump Base	40	DA1177349	2	Retaining Ring
6	★ DA4416290	1	Valve Seat	41	CR581061	1	Cross Pin
7	★ A8050110	1	Spring	42	CR339040	1	Clip
8	★ B1011016	1	Check Ball, 3/8"	43	CL918900SR	1	Beam and Handle Assembly
11	DA4345107	1	Tie Rod	44	CM927061	1	Locking Pin
12	DC7688071	1	Valve Disc	45	★ CM928044	1	Push-on Ring
13	★ B1135517	1	Gasket, Square Ring	46	Y267110	1	Spring
14	★DA3729900SR	1	Filter Assembly	47	★†DA6944110	1	Spring
15A	◆ DC1057025	1	Reservoir	48	★†B1003016	1	Check Ball, 1/8"
15B	♦ B1047121	2	Nut	49	DA5255026	1	Decal, Model No.
15C	◆ DC663338	1	Foot	50	CR59026	1	Decal, Enerpac
15D	◆ F866028	2	Machine Screw	53	CN780026	1	Decal, Vent/fill cap
16	DA4528040	1	Plunger	54	DC7812026	1	Decal, "Warning, 1500
							Bar"
17	★ DA4529566	1	Backup Ring		DC7811026	1	Decal, "Warning, 2000
							Bar"
18	DA4530186	1	Spacer	60	DC7831900SR	1	Safety Relief Valve, 1500 Bar
19	DA4344039	1	Bushing		DC7483900SR	1	Safety Relief Valve, 2000 Bar
20	★ DA4531249	1	Retaining Ring	61	★ DC7687108	1	Gasket
21	DA4532186	1	Gasket, Nylon	63	CR210900W	1	Bypass Valve Assy
22	★†DC4308059	1	Pin	64	★ S3037	1	Gasket
23	★ B1009803	1	O-Ring	65	★ A8044110	1	Spring
24	CB180040	1	Piston	66	★ B1005016	1	Check Ball, 3/16"
25	★ B1257503	1	O-Ring	67	∎ (not available)	1	Block
26	★†F100016-6	1	Check Ball, 6 mm	71	∎€F73232	2	Sleeve
27	★†B1007503	1	O-Ring	72	∎)F157021	2	Gland Nut
28	★†DA4534628	1	Setscrew	73	∎DC7825223SR	1	Gauge
29	★†DA4535167	1	Gasket	74	∎DA6686268	1	Tube
30	†DC4383900SR	1	Release Housing (incl. item 31)	75	■ ▶ ▲ DC7806689	1	Guard
31	†DC4452900	1	Release Spindle/Knob	76	■ ▶ ▲ DC7807689	1	Guard Cover
33	★♦CU293167	1	Gasket	78	■ CBE425028-1A	3	SHCS
34	★♦CL341055	1	Acorn Nut	79	■ CBE1040120-1D	3	NUT, Hex M4
35	CN823020	1	End Cap	80	∎DC7808038	1	Adapter
36	★♦B1291503	1	O-Ring	81	DC7495034	1	Coupler, Female (1500 bar)
37	CN766950SR	1	Vent/Fill Cap Assembly		DC7708034	1	Coupler, Female (2000 bar)
39	CR214061	1	Beam Pin				

★ Items included in Pump Repair Kit, P2282K1.

♦ Items included in Reservoir Assembly Kit, DA8384900SR.

t Items included in Release Housing and Spindle Kit, DC4383900SR. ▲ Items included in Gauge Guard Kit, DC7806689SR.

Items included in 1500 Bar Gauge Assy, DC7809900SR.

Items included in 2000 Bar Gauge Assy, DC7810900SR.



Figure 1, Exploded View, Pump Assembly





Figure 2, Release Valve Assembly

Figure 3, Gauge and Coupler Assembly

BEFORE YOU BEGIN

- 1. Avoid sharp edges. Cover threaded areas as required.
- 2. Unless specified, do not use sharp-edged tools.
- 3. Ensure that the work area is clean and dry.
- 4. Before repairing the pump, see troubleshooting guide at the end of this document to help identify possible pump malfunctions.
- 5. Be sure the proper tools and supplies before beginning any disassembly procedures. See the Tools and Supplies section of this procedure.

WARNING: Be certain that hydraulic pressure is completely relieved (0 psi/bar) and that all hoses are removed from the pump. Never attempt to service the

pump while it is pressurized.



CAUTION: Standard safety procedures are to be followed during disassembly and reassembly procedures to minimize any possibility of injury.

TOOLS AND SUPPLIES

Be sure that the following tools and supplies are available BEFORE beginning disassembly or reassembly procedures:

- Calibrated torque wrenches
- Allen wrenches
- O-ring pick
- Rubber mallet
- Small hammer and punch
- 5 ton [44 kN] press
- Diamond hone tools (See Figure 9 for fabrication instructions)
- Roller bearing grease
- Loctite 222MS, 242 and 242MS thread locking compound
- Enerpac hydraulic oil

REPLACEMENT PARTS

To ensure optimum performance, it is recommended that the following items be replaced with new parts during reassembly: 3/8" check ball (item 8), backup ring (item 17), spacer (item 18), O-ring (item 23), O-ring (item 25), 6 mm check ball (item 26), O-ring (item 27), gasket (item 29), 1/8" check ball (item 48), gasket (item 64) and 3/16" check ball (item 66).

Replace other parts as required if worn or damaged, or if troubleshooting procedures indicate that replacement is necessary. See page 2 for parts list. If parts are included in a kit, it is strongly recommended that all kit parts applicable to your pump model be installed.

DISASSEMBLY

Disassemble the pump as described in the following steps. Refer to Figures 1, 2 and 3 for numbered callouts in parenthesis (item . . .).

- 1. Fully open the pump release valve to relieve any trapped pressure. Be sure that pressure gauge indicates zero (0) psi/bar.
- Open the vent/fill cap (item 37). Drain all oil into a suitable container. Dispose of used oil in accordance with applicable laws and regulations.

- 3. Remove acorn nut (item 34), gasket (item 33) and end cap (item 35) from reservoir (item 15A).
- Remove the reservoir (item 15A) and square ring gasket (item 13) from the pump base (item 1). The vent/fill cap (item 37) will be removed with the reservoir.
- 5. Unscrew tie rod (item 11) from the pump base (item 1).
- 6. Remove retaining rings (item 40) from beam pin (item 39) and cross pin (item 41).
- 7. Remove cross pin (item 41) from handle assembly (item 43) and clip (item 42). Remove clip (item 42) from plunger (item 16).
- Remove beam pin (item 39) from handle assembly (item 43). Remove handle assembly (item 43) from pump base (item 1).

Important: In the following steps, handle machined parts with care so that they are not damaged during disassembly.

- 9. Remove plunger, (item 16), piston (item 24), retaining ring (item 20) and nylon gasket (item 21) as an assembly.
- 10. Remove O-ring (item 25).
- 11. Unscrew bushing (item 19). Remove backup ring (item 17), spacer (item 18) and O-ring (item 23) from the bore.
- 12. Remove the filter assembly (item 14) by pulling it straight out of the valve disc (item 12). Remove any debris from the filter screen. Replace if damaged or clogged.
- 13. If necessary, remove the bypass valve assembly (item 63) and gasket (item 64) from the valve disc (item 12).
- 14. Remove the square ring gasket (item 13) from around the valve disc (item 12).

Note: Check ball (item 8) and spring (item 7) may drop out when valve disc (item 12) is removed in the next step.

- 15. Remove the valve disc (item 12), gasket (item 61), 3/8" check ball (item 8) and spring (item 7) from the pump base (item 1).
- 16. If necessary, remove the safety relief valve (item 60) from the pump base (item 1).
- 17. Remove the valve seat (item 6), 3/16" check ball (item 66) and spring (item 65) from the pump base (item 1).
- Remove setscrew (item 28) from release housing (item 30). Remove release spindle (item 31) and O-ring (item 27) as an assembly.
- 19. Remove release housing (item 30) and O-ring (item 29) from pump base (item 1).
- 20. Remove pin (item 22), spring (item 47) and 6 mm check ball (item 26) from the release spindle hole. **Note:** an oil film may retain these parts.
- 21. If necessary, remove gauge and coupler assembly components (items 67-81) from the pump base (item 1).
- 22. If necessary, remove push-on ring (item 45), spring (item 46) and locking pin (item 44).
- 23. If necessary, remove machine screws (item 15D), foot (item 15C) and nuts (item 15B).

REASSEMBLY

Reassemble the pump as described in the following steps. Refer to Figures 1 through 4 for numbered callouts in parenthesis (item . . .). Refer to other figures as indicated.

Important: Lubricate all components with Enerpac hydraulic oil before assembly.

- Flush the interior of the pump base (1). This area must be 1. clean and free of dirt, chips, shavings or debris.
- Using a 5 ton [44 kN] press, use check balls (items 8 and 66) 2 to coin the ball seats:

a. Using a new 3/8" check ball (item 8), coin the ball seat located on valve disc (item 12). Apply a coining force of 410-430 psi [28-29 bar].

b. Using a new 3/16" check ball (item 66), coin the ball seat located on the valve seat (item 6). Apply a coining force of 410-430 psi [28-29 bar].

- 3. Position the pump base (item 1) so that the main (reservoir) opening is facing up.
- Place spring (item 65) large end down into hole (Location 4. "B", Figure 5). Place the 3/16" check ball (item 66) onto end of spring (item 65).
- 5. Thread the valve seat (6) into hole (Location "B", Figure 5). Be sure that spring (65) and 3/16" check ball (66) remain in place. Torque to 25-30 ft-lbs [34-40 Nm].
- 6. If it requires replacement, install a new safety relief valve (item 60) into tapped hole (Location A, Figure 5). Torque to 30-35 ft-lbs [40-47 Nm].



WARNING: The safety relief valve is factory set to prevent over pressurization of the pump. Do not attempt to readjust or disable the safety relief valve. Serious personal injury and/or equipment damage could result.

Important: The safety relief valve (item 60) is color coded with BLACK ink for HPT-1500 models and with RED ink for HPN-2000 models. Be certain to use the correct valve for your pump model. Refer to parts list on page 2 for part numbers.

- Place spring (item 7) inside valve seat (6). 7.
- Place 3/8" check ball (item 8) on top of spring (item 7). 8.
- Inspect the valve disc gasket (item 61). If nicks, cuts or other 9. damage is present, replace the gasket as described in steps a through c:

a. Remove the old valve disc casket (item 61) from the valve disc (item 12). Be sure the valve disc surface is clean and free of any adhesive residue.



Figure 4, Inlet Check Valve and Valve Disc



Figure 5, End View of Pump with Valve Disc Removed

- b. Remove adhesive backing from new gasket (item 61).
- c. Align holes. Place the gasket glue side down onto the valve disc (item 12).

Note: During the following step, align matching holes in valve disc (item 12) with safety relief valve (item 60) and valve seat (item 6). Be sure that 3/8" check ball (item 8) and spring (item 7) remain in place as valve disc (item 12) is installed.

- 10. Place the valve disc (item 12) into the pump base main opening with the gasket side down. Using a rubber mallet, lightly tap the valve disc (item 12) into the opening until it is fully seated.
- 11. Install new gasket (item 64) and bypass valve (item 63) on the valve disc (Location "D", Figure 6) Torque to 60-70 in-lbs [6.8-7.9 Nm].

Important: The bypass valve (item 63) is factory set at 200-250 psi [13.8-17.2 bar]. DO NOT attempt to readjust the setting.

12. Using a rubber mallet, lightly tap the filter assembly (item 14) into the oil inlet port (Location "C", Figure 6) on the valve disc (item 12). Important: Before installation, be sure the filter assembly is clean and free of debris.



Figure 6, End View of Pump with Valve Disc Installed



Figure 7, Plunger Assembly Components

- 13. Place square ring gasket (item 13) into the groove between the valve disc (item 12) and the pump base main opening.
- 14. Slide tie rod (item 11) through the center hole of the valve disc (item 12) and into the tapped center hole of the pump base (item 1). Tighten hand tight.
- 15. If removed, secure foot (item 15C) to reservoir (item 15A) with machine screws (item 15D) and nuts (item 15B).
- 16. Place reservoir (item 15A) onto pump base (item 1). While installing reservoir, position chain of vent/fill cap (item 37) around tie rod (item 11). Tap reservoir into place using a rubber mallet.
- 17. Install O-ring (item 36) in groove on end cap (item 35).
- 18. Place end cap (item 35) on reservoir (item 15A). Secure with gasket (item 33) and acorn nut (item 34).
- 19. Position pump flat on table, so that the plunger bore is facing up.
- 20. If removed, insert locking pin (item 44) through hole in pump base (item 1). Assemble spring (item 46) and push-on ring (item 45) onto locking pin (item 44).
- 21. Place **new** O-ring (item 25) into the groove at the top of the plunger bore.
- 22. Place **new** spacer (item 18), **new** O-ring (item 23) and **new** backup ring (item 17) into the hole at the bottom of the plunger bore.
- 23. Thread bushing (item 19) into the hole at the bottom of the plunger bore. Using a hand torque wrench, tighten the bushing to 30-35 ft-lbs [40-47 Nm].
- 24. Assemble piston (item 24), plunger (item 16) nylon gasket (item 21) and retaining ring (item 20). See Figure 7.

- 25. Apply hydraulic oil to the plunger bore. Grease the piston end and place the plunger assembly (items 16, 20, 21 and 24) into the bore.
- 26. Place clip (item 42) onto top of plunger (item 16).
- 27. Place cross pin (item 41) through holes in handle assembly (item 43).
- Apply grease (roller bearing quality) to contact surfaces of cross pin (item 41) and clip (item 42). Slide handle assembly (item 43) into place on pump, ensuring that cross pin engages with clip.
- 29. Place beam pin (item 39) through holes in handle assembly and pump base (item 1).
- 30. Secure beam pin (item 39) and cross pin (item 41) with retaining rings (item 40).
- 31. Tip the pump on its side, so that the release spindle hole is facing up.

Note: Steps 32 and 33: If using a **new** pump base (item 1), coin the ball seats using a hammer and punch (as described in step 32) and a press (as described in step 33).

If the **old** pump base is being re-used, re-coining of ball seats is not necessary. Instead, clean-up each seat using the correct diamond hone tool. See Figure 9 for diamond hone tool sizes and fabrication details.

Important: To prevent damage to ball seat in the following step, do not strike the check ball (item 48) with great force.

- 32. Place a **new** 1/8" check ball (item 48) into the release spindle hole. Using a small hammer and punch, lightly tap the check ball (item 48) to coin the ball seat. Or, use diamond hone tool DT-1560-1 to clean-up seat.
- 33. Using a **new** 6 mm check ball (item 26), coin the release spindle ball seat. Apply a coining force of 800-820 psi [55-56 bar] using a 5 ton [44 kN] press. Or, use diamond hone tool DT-1560-5 to clean-up seat.



Figure 8, Release Valve Components



Figure 9, Fabrication Details - Diamond Hone Tools

- 34. Place spring (item 47) and **new** 6 mm check ball (item 26) into the release spindle hole. Install **new** gasket (item 29) flat side down.
- 35. Thread the release housing (item 30) into the release spindle hole. Torque to 25-30 ft-lbs [34-40 Nm].
- 36. Place pin (item 22) into release housing (item 30). Install new O-ring (item 27) on release spindle (item 31). Thread the release spindle (item 31) into the release housing (item 30) but do not tighten.
- 37. Apply Loctite 222MS to threads of setscrew (item 28). Install and hand tighten setscrew.
- 38. Position pump flat on table, so that the pump reservoir is horizontal and the handle is facing up.
- 39. If removed, assemble gauge and coupler components as described in steps a through d:

a. Slip gland nuts (item 72) over tube (item 74). Thread sleeves (item 71) onto both ends of tube, leaving two or three threads exposed at each end.

b. Apply Loctite 242 to threads on gland nuts (item 72). Thread the gland nuts into ports on pump base (item 1) and gauge block (item 67). Torque to 25-30 ft-lbs [34-40 Nm].

c. Install gauge (item 73), adapter (item 80) and coupler (item 81) to gauge block (item 67).

d. If removed, install guard (item 75) and guard cover (item 76). Secure with capscrews (item 78) and hex nuts (item 79). Apply Loctite 242MS to threads of capscrews (item 78) before installing. Torque to 6-10 ft-lbs [8-13 Nm].

40. Fill the pump reservoir with Enerpac hydraulic oil. Note: The HPN and HPT Series pumps have a usable oil capacity of 155 cu. in [2540 cm³]. Oil level should be up to the indicator mark on the end cap. DO NOT overfill.

DIAMOND HONE TOOLS

Diamond hone tools are used to smooth and deburr the ball seat surfaces during pump reassembly procedures. There are four different diamond hone tool sizes:

- DT-1560-1 Used on ball seat for 1/8" check ball (item 48).
- DT-1560-3 Used on ball seat for 3/16" check ball (item 66).
- DT-1560-5 Used on ball seat for 6 mm check ball (item 26).
- DT-1560-9 Used on ball seat for 3/8" check ball (item 8).

These tools can be purchased from Continental Diamond Tool Corporation or may be fabricated by a qualified source, Refer to Figure 9 for additional information.

Use each diamond hone tool as described in the following steps:

- 1. Clean the ball seat surface. Remove any oil or debris.
- 2. Be sure that the mating surface of the diamond hone tool is clean.
- 3. Gently apply diamond hone tool to seat, rotating it back and forth. At first, there will be a "rough" feel. Continue to apply gentle pressure and rotation until the roughness is gone.
- 4. Clean the ball seat surface after using the diamond hone tool.

Important: Always install a **new** check ball of the proper size after using the diamond hone tool. DO NOT reuse an old check ball.

TESTING

- 1. Verify that the gauge and coupler assembly is installed on the pump (items 67 through 81). This assembly must be installed before pump testing begins.
- 2. Open reservoir vent/fill cap and check the oil level. If oil level is low, add oil until the oil level is up to the indicator mark on the end cap. DO NOT overfill. Use only Enerpac oil.
- Reinstall the vent/fill cap and turn it to the VENT position. 3.
- Attach a hose with one open end to the pump coupler. Place 4 the open end in a container. The container will be used to catch purged oil in step 6.
- 5. Close the release valve by turning the release spindle knob clockwise.

Important: The release valve is designed to close with hand pressure only. Use of tools to close valve can result in damage to the valve and/or valve seat.

- 6. Operate the pump handle (using full strokes) six or more times as necessary to purge any contaminants from the pump mechanism.
- 7. Remove hose from pump coupler. Dispose of used oil in accordance with applicable laws and regulations.
- 8. Recheck oil level as described in step 2. Add oil if low. Reinstall the vent/fill cap and turn it to the VENT position.



WARNING: Do not stand directly over the pump handle. It is possible for the pump handle to "kick back." Keep your body to the side of the pump and away from the line of force of the handle.



WARNING: Keep away from opening of coupler (item 81) during pump testing. A high pressure oil stream can penetrate the skin. Serious personal injury could result if leakage of coupler occurs while the pump is under pressure.

- While watching the pressure gauge, operate the pump handle 9. to build pressure. Continue until the gauge indicates 10,000 psi [689 bar].
- 10. Check for drift. The maximum allowable drift (pressure drop) is 250 psi [17.2 bar] in 10 seconds, from a steady state pressure condition.

Note: if pressure drop is within allowable limits, continue on to steps 11 through 14.

- 11. While watching the pressure gauge, operate the pump handle to build additional pressure:
 - Model HPT-1500 pressurize pump to 21,600 psi [1489 bar].
 - Model HPN-2000 pressurize pump to 27,000 psi [1861 bar].
- 12. Visually inspect pump for leakage or other obvious problems while it is under pressure.
- 13. Continuously monitor the pressure gauge. The maximum allowable drift (pressure drop) is 250 psi [17.2 bar] in 10 seconds.
- 14. If pump fails to hold pressure, refer to Step 1 of the Troubleshooting section for possible causes.

Problem	Probable Cause	Remedy				
1. Pump does not hold pressure.	a. Release spindle knob not tight.	Check that release spindle knob is tight. When the knob is firmly tightened by hand, the valve is closed. DO NOT use tools!				
	b. Low or no oil in reservoir.	Fill reservoir with Enerpac oil.				
	c. Leakage from hose, fittings, coupler or gauge assembly.	Check for leaks. Tighten and/or replace fittings. Note: Refer to Figure 3 for Loctite locations.				
	d. Leakage at release valve check ball (item 26).	Replace check ball (item 26) and use diamond hone tool DT-1560-5 to clean-up seat. See Figure 9 for tool fabrication details.				
2. Pump loses pressure and the handle rises.	a. Leakage at outlet check ball (item 48).	Inspect spring (item 47), check ball (item 48) and ball seat for obvious wear, corrosion or damage. Replace check ball (item 48) and use diamond hone tool DT-1560-1 to clean-up seat. See Figure 9 for tool fabrication details.				
Note: Refer to parts list on page 2 for numbered items in parenthesis (item). Also see figures 1 through 8.						

TROUBLESHOOTING

TROUBLESHOOTING (Continued)

Problem	Probable Cause	Remedy		
3. Pump does not build pressure.	a. Low or no oil in reservoir.	Fill reservoir with Enerpac oil.		
	b. Oil filter screen clogged with debris.	Flush pump. Replace filter assembly (item 14). Drain old oil from reservoir and refill with Enerpac oil.		
	c. Damaged sealing components on the pump plunger assembly.	Inspect and replace sealing components (items 17, 18, 21, 23 and 25) as required.		
	d. Leakage at small inlet check ball (item 66).	Inspect spring (item 65), check ball (item 66) and valve seat (item 6) for obvious wear corrosion or damage. Replace check ball (item 66) and use diamond hone tool DT-1560-3 to clean-up seat. See Figure 9 for tool fabrication details.		
	e. Leakage at large inlet check ball (item 8).	Inspect spring (item 7), check ball (item 8) and ball seat on valve disc (item 12) for obvious wear, corrosion or damage. Replace check ball (item 8) and use diamond hone tool DT-1560-9 to clean-up seat. See Figure 9 for tool fabrication details.		
	f. Gasket (item 64) leaking.	Inspect gasket (item 64). Replace if worn or damaged.		
	g. Bypass valve (item 63) damaged.	Replace bypass valve (item 63). Important: Bypass valve on HPN and HPT series pumps is factory set. DO NOT attempt to readjust.		
	h. Safety relief valve (item 60) damaged.	Replace safety relief valve (item 60). Important: Safety relief valve on HPN and HPT series pumps is factory set. DO NOT attempt to readjust.		
4. Pump does not create flow.	a. Low or no oil in reservoir.	Fill reservoir with Enerpac oil.		
	b. Pump not vented.	Open vent/fill cap.		
	c. Couplers not properly connected.	Correctly connect the couplers.		
	d. Oil filter screen clogged with debris.	Flush pump. Replace filter assembly (item 14). Drain old oil from reservoir and refill with Enerpac oil.		
	e. Debris in pump.	Inspect all components for contamination, then flush.		
Note: Refer to parts list on page 2 for	numbered items in parenthesis (item). Also see	figures 1 through 8.		

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