

# ENERPAC<sup>®</sup>

A UNIT OF APPLIED POWER INC. 

## Service Instructions

### 3 and 4-Way Manual Directional Valves

L- 1793 08/92

Refer to Repair Parts Sheet L-1257

**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 valve *Instruction Sheet* for installation, operation, and maintenance information.

#### YOU MAY NEED:

- ✓ Repair Parts Sheet L-1257
- ✓ Repair Kit VM4K3
- ✓ 10,000 psi pump
- ✓ hydraulic cylinder rated to 10,000 psi
- ✓ 0-15,000 psi pressure gauge
- ✓ high pressure hose (10,000 psi rating)
- ✓ allen wrenches
- ✓ screw driver
- ✓ o-ring pick
- ✓ roller bearing grease
- ✓ Enerpac hydraulic oil

## DISASSEMBLY

1. Remove handle (item 3) by loosening screw (item 1) at the top of the valve. Take out screw and washer (item 2).
2. Remove disc (item 4), ball (item 5) and spring (item 6) from valve body.
3. Loosen 4 bolts (item 7) holding valve to base manifold (item 27).
4. Turn valve body over and remove 2 screws (item 24) that hold valve body together.
5. Lift out shear seals, back-up washers, and o-rings (items 18, 19 and 20).
6. Remove spring guides (item 21) and springs (item 22) from valve body (item 23).

## ASSEMBLY

1. Assemble shaft (item 13), disc (item 16) and spring pin (item 17). Disc part numbers will vary according to which valve is being assembled. Add o-ring (item 15) and backup washer (item 14). The o-ring should be closest to the disc.
2. Assemble bearing plate (item 11) into bore of valve cap (item 9). Then add needle thrust bearing (item 12). Lightly grease thrust bearing before installation. Insert shaft and disc assembly into cap (item 9).
3. Check each shear seal (item 18) for any nicks or burrs.
4. Insert one spring (item 22) into each hole of valve body (item 23) except the hole where valve body is marked "tank" on side of casting.
5. Place one spring guide (item 21) over each spring to be installed with counterbored side up. On each shear seal, assemble two backup washers (item 19) and one o-ring (item 20). Put the o-ring between the backup washers. Lightly grease each shear seal assembly and install into body (item 23).
6. Install a lightly greased o-ring (item 10) into valve cap (item 9).
6. Carefully position body assembly over cap assembly and secure with 2 socket head cap screws (item 24). Lightly grease 4 o-rings (item 25) and put them into valve body.

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7. Insert spring (item 6) into hole counterbores. Add 7/32" diameter ball (item 5) and detent disc (item 4) on top of spring (apply spot-of-grease to ball).
8. Assemble handle (item 3) so that it is over the word "tank" marked on the side of the body (item 23). Add washer (item 2) and truss head screw (item 1) and tighten. Operate handle to verify positive detent action of the handle.
9. Secure valve to base manifold (item 26) using 4 bolts (item 7). Torque to 28 to 34 ft-lbs.

## ■ TEST PROCEDURE

To test a "VC" remote valve, connect it between a pump and a cylinder. To test a "VM" manifold mount valve, mount the valve on an electric pump. Use a single-acting cylinder to test 3-way valves and a double-acting cylinder to test 4-way valves.

1. Connect the advance port of a 10,000 psi pump with a 0-15,000 psi gauge to the valve port marked "press".
2. Connect a hose from the reservoir of the hydraulic pump to the "tank" port of the remote valve.
3. Next, with "tank" port facing you, attach a hose with a 15,000 psi gauge to the "cylinder" port located to the left of the "tank" port. Couple the other end of the hose to the advance port of the cylinder.
4. The remaining valve port is plugged on 3-way manual valves. For 4-way valves, attach a hose with a 15,000 psi pressure gauge to the remaining port and couple the other end of the hose to the retract port of the cylinder.
5. Operate pump to supply oil to the valve being tested. Place valve handle in "advance" position. Cylinder should advance without hesitation and pressurize to 5,000 psi. If cylinder does not advance smoothly, remove air from system and restart test.
6. Stop pump. Pressure should remain steady.
7. Continue to pressurize the system to 10,000 psi and stop pump. After pump is stopped, there should be no more than a 100 psi drop in pressure in 15 seconds.
8. Move the valve handle to "retract" position. If you are testing a 3-way valve, the cylinder should retract without hesitation while the pump is running. If you are testing a 4-way valve, the cylinder should retract and pressurize to 10,000 psi with no more than a 100 psi drop in pressure in 15 seconds.

### TO PROTECT WARRANTIES, USE ONLY ENERPAC HYDRAULIC OIL.

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