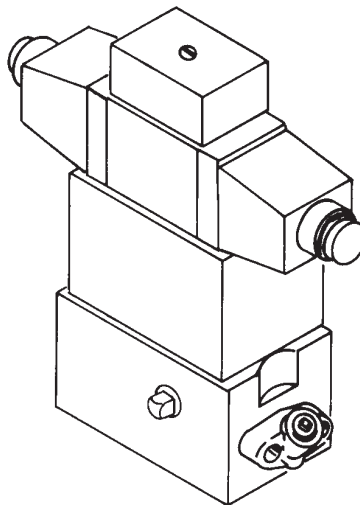


**3 POSITION, 3-WAY – SOLENOID CONTROLLED-PILOT OPERATED
DIRECTIONAL VALVE****Max. Capacity: 10,000 PSI**

NOTE: Read and carefully follow these instructions. Most problems with new equipment are caused by improper operation or installation.

SAFETY PRECAUTIONS**WARNING — Hydraulic Hose**

- Before operating the pump, make sure all hose connections are tight — use the proper tools to tighten connections.
- Do not overtighten the connections. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- When disconnecting a hydraulic line, fully retract the cylinder and shut off the pump motor before breaking the hydraulic connection.
- Should a hydraulic hose ever burst or rupture, immediately shut off the pump. *Never attempt to grasp a leaking hose under pressure with your hands. The force of the escaping hydraulic fluid could cause serious and permanent injury.*
- Avoid any conditions which could damage the hose and impair the pump or valve's performance. Never allow the hose to kink, twist, curl or bend so tightly that the oil flow within the hose is blocked or reduced. This could damage the hose and possibly result in serious injury to persons working in the immediate vicinity.
- Do not subject the hose to any potential hazard (ex: fire, extreme heat or cold, heavy impact or sharp surfaces) which might rupture or weaken the hose.
- Do not use the hose to lift or move the equipment connected to it.
- Periodically inspect the hose for signs of wear. *Never use a defective hose with any pressurized equipment.*
- Always consult the manufacturer before painting the hose(s). Never paint the couplers!
- Hose material and coupler seals must be compatible with the hydraulic fluid used.
- Avoid contact with creosote-impregnated timber or fabrics.

SPECIFICATIONS

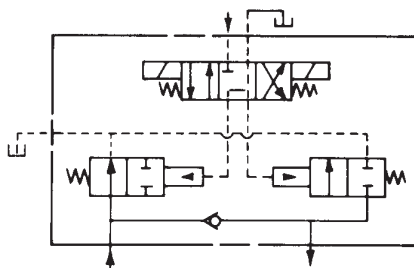
OPERATION

Neutral (Hold): When neither solenoid is energized, oil from pump is directed back to tank and oil from cylinder is checked in the cylinder.

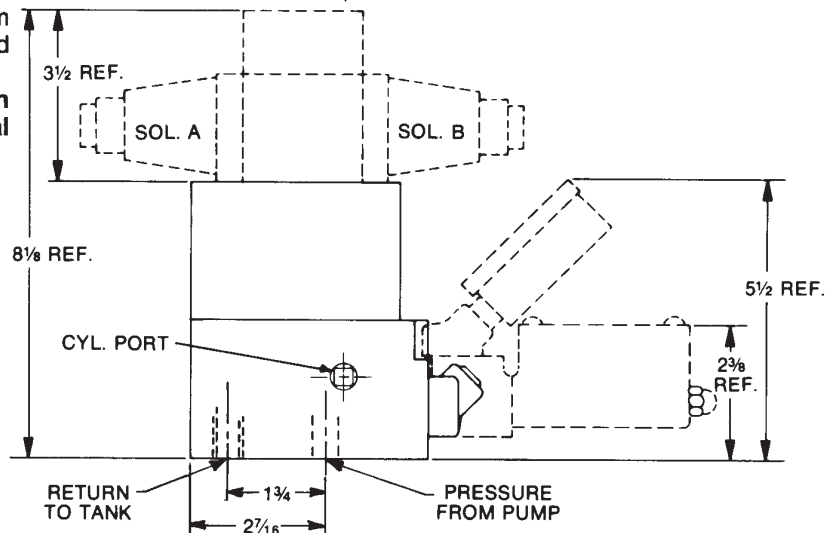
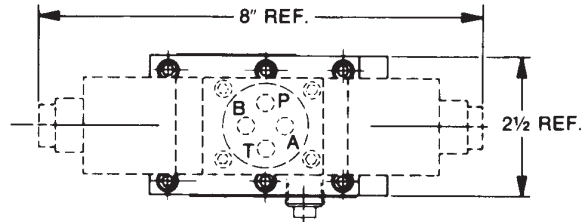
Advance: When solenoid "B" is energized, oil from pump is directed thru pressure port to cylinder.

Return: When solenoid "A" is energized, oil from the pump and from the cylinder is directed back to tank.

NOTE: Pressure holds without loss when shifted from cylinder port to the neutral (Hold) position.



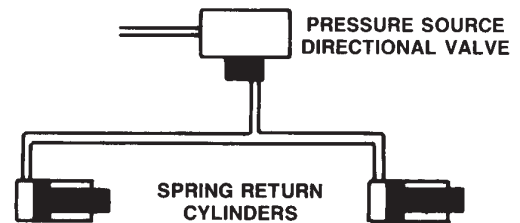
HYDRAULIC SCHEMATIC



BASIC APPLICATION

The application illustrated represents a typical set-up using the directional valve and multiple single acting cylinders (one single acting cylinder may also be used). If a different set-up or cylinder is being considered, call the OTC Technical Services at (507) 451-5860 to avoid any potential problems with the set-up being considered.

IMPORTANT: Seal all external pipe connections with a high quality, nonhardening pipe sealant. Teflon tape may also be used to seal hydraulic connections, provided only one layer of tape is used. Apply the tape carefully to prevent it from being "pinched" by the coupler and broken off inside the system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.



CYLINDERS CLAMP OR UNCLAMP SIMULTANEOUSLY

PILOT OIL LINE/ACCUMULATOR

IMPORTANT: If this 3-way, pilot operated directional valve is to be used with any of the hydraulic pumps listed in the Pump Series Chart shown to the right, an accumulator must be installed in the pump and a heavier spring must be installed in the pump outlet check valve. The spring will enable the pump to create the additional pilot oil pressure needed to properly operate this valve. The spring and any additional parts needed for this conversion are included with this valve. See next page.

PUMP SERIES CHART

PUMP SERIES	CHECK VALVE SPRING REQ'D
PQ20	Part No. 16669
Y26 4080 Y60 PE55 Y70 PE90 4060 PE120 4070	Part No. 10362

PUMP DISASSEMBLY/ACCUMULATOR AND CHECK VALVE SPRING INSTALLATION

WARNING

- Before beginning disassembly of any pump, make certain all pressure is relieved and all power disconnected.
- The following procedure should be performed only by a qualified technician familiar with this type of equipment.

DISASSEMBLY/REASSEMBLY

NOTE: The following disassembly steps are for the following hydraulic pump model series only: Y26, Y60, Y70, PE55, PE90, PE120, 4060, 4070, or 4080. Disassembly steps for the PQ20 series are listed separately on the following page.

1. Clean the outside of the pump and reservoir thoroughly before removing the cover from the reservoir.
2. Remove the motor from the pump. Keep the mounting hardware for reassembly.
3. Remove the basic pump assembly and cover from the reservoir. Do not allow contamination to enter the reservoir.
4. Disconnect fittings "A" and "B" and remove the 3/8" tube assembly and adapter. See Figure 1.
5. Remove the connector from the check valve to locate and remove the spring. See Figure 2.
6. Replace the existing spring (see Figure 3, Inset item "E") with the supplied Spring, (Part Number 10362. [.047" dia. wire X 3/4" lg.]) Reinstall the connector.

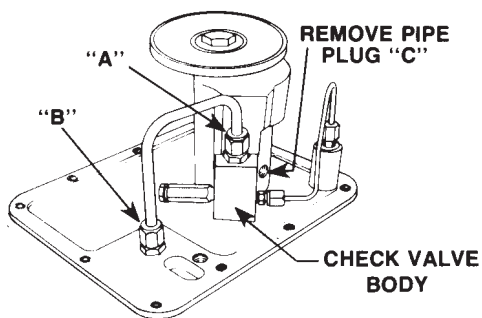


FIGURE 1

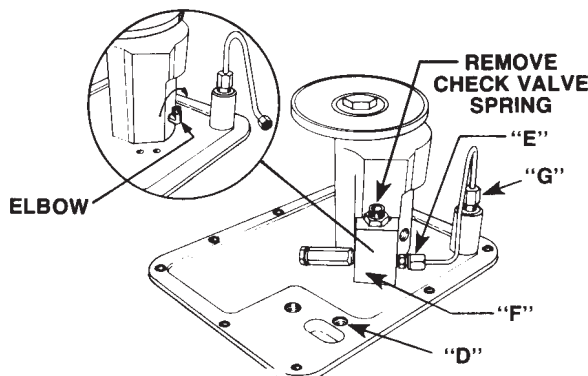


FIGURE 2

7. Remove the pipe plug (Figure 1, Item "C") from the pump body.
8. Disconnect the small oil line (Figure 2, Item "E") at the check valve and loosen the other end of the oil line at the pressure regulator "G".
9. Remove the two socket head screws that secure the check valve body "F" to the reservoir cover from the top and remove check valve assembly.
10. Assemble the elbow into the threaded hole from which pipe plug 'C' was removed. See Figure 2 inset for correct elbow position.

IMPORTANT: Seal all external pipe connections with a high quality, nonhardening pipe sealant. Teflon tape may also be used to seal hydraulic connections, provide only one layer of tape is used. Apply the tape carefully to prevent it from being "pinched" by the coupler and broken off inside the system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

11. Reattach the check valve assembly to the pump and plate. Torque the two socket head screws to 180 in/lbs.
12. Insert the pipe nipple provided into the threaded hole (Figure 2, Item "D") located in the valve pad on the cover.

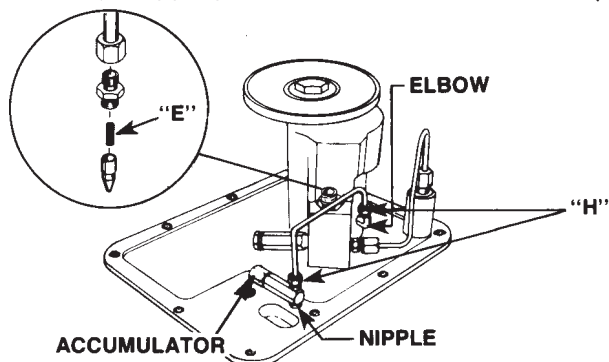


FIGURE 3

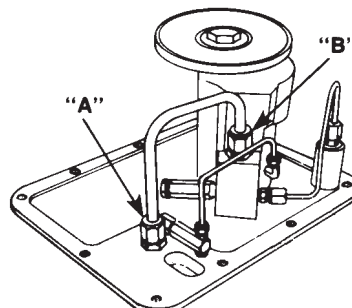


FIGURE 4

13. Screw the accumulator onto the pipe nipple. Position the accumulator as shown in Figure 3.
14. Assemble the $\frac{3}{16}$ " tube assembly as shown in Figure 3. Tighten the fitting nuts "H" securely but do not over tighten.
15. Reinstall the $\frac{3}{8}$ " tube assembly. Check to ensure that fittings "A" and "B" shown in Figure 4 are secure.
16. Position the motor coupler and reattach the motor to the reservoir cover.
17. Reattach the basic pump assembly to the reservoir assembly.

DISASSEMBLY/REASSEMBLY FOR PQ20 SERIED PUMPS

NOTE: The following disassembly steps are for the PQ20 series pumps only.

1. Clean the outside of the pump and reservoir thoroughly before removing the cover from the reservoir.
2. Carefully remove the basic pump assembly and cover from the reservoir to prevent contamination from entering the reservoir.
3. Disconnect fittings "A" and "B" and remove the tube assembly. See Figure 5.
4. Remove the outlet check valve body from the connector to expose the poppet.

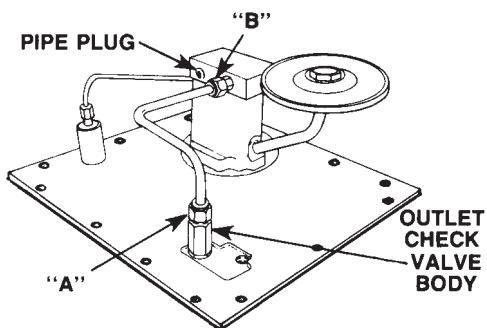


FIGURE 5

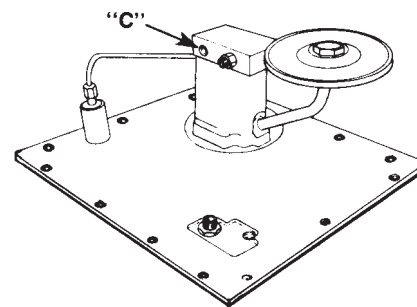


FIGURE 6

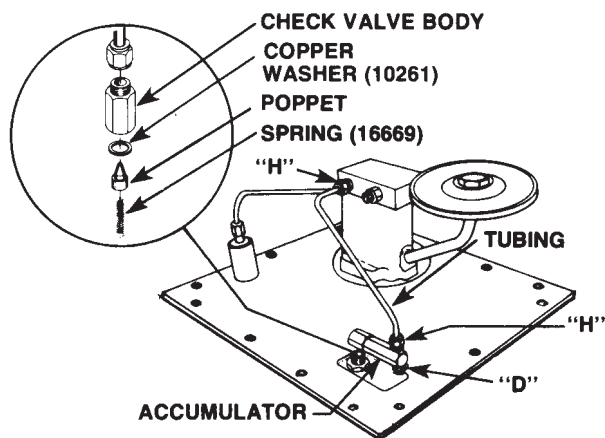


FIGURE 7

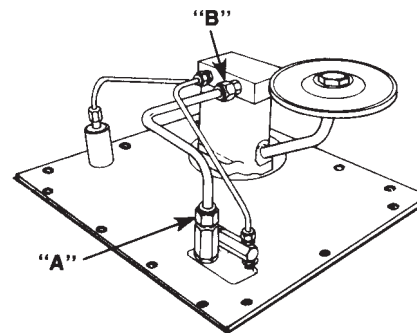


FIGURE 8

5. Remove the poppet (see Figure 7 Inset) and insert the supplied Spring, (Part Number 16669, [.032" dia. wire \times 1 $\frac{1}{4}$ " lg.]) in the poppet. Replace the copper washer with the supplied Copper Washer, Part Number 10261.
6. Reassemble the poppet, new copper washer, spring and valve body as shown in Figure 7 Inset and tighten securely.
7. Reinstall the tube assembly. Check to ensure that fittings "A" and "B" shown in Figure 8 are tightened securely.
8. Remove the pipe plug (Figure 6, Item "C") from the pump body.
IMPORTANT: Seal all external pipe connections with a high quality, nonhardening pipe sealant. Teflon tape may be used to seal hydraulic connections provided only one layer of tape is used. Apply carefully to prevent the tape from being "pinched" by the fitting and broken off inside the system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision fit parts.
9. Assemble the adapter into the threaded hole that the pipe plug was removed from. (See Figure 7.)
10. Insert the pipe nipple (Figure 7, Item "D") into the threaded hole located in the valve pad on the cover plate.
11. Position the accumulator as shown in Figure 7 and screw the accumulator onto the pipe nipple.
12. Assemble the $\frac{3}{16}$ " tube assembly as shown in Figure 7. Tighten the fitting nuts "H" securely but do not over tighten.
13. Reattach the basic pump assembly to the reservoir assembly.