POWER TEAM
HYDRAULIC TECHNOLOGIES

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Form No. 102536

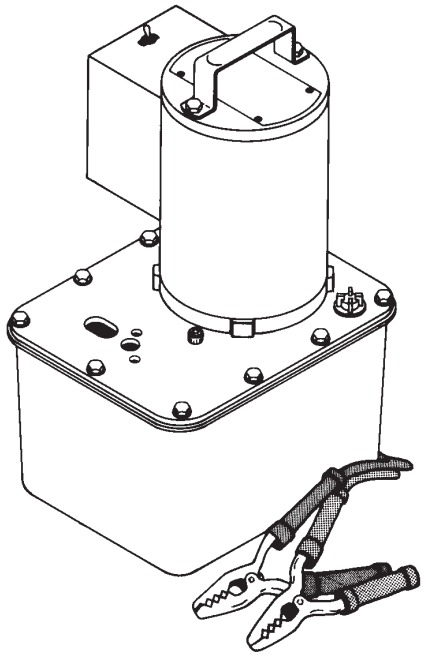
Operating Instructions for:

PE172-DC
PE174-DC

TWO STAGE
HYDRAULIC PUMP

NOTE:

- **Inspect the pump upon arrival.**
- **Read and carefully follow these instructions. Most problems with new equipment are caused by improper operation or installation.**
  IMPORTANT: Included in the literature bag are four (4) Self-Tapping Screws (#209799). These screws are specifically required for attaching the plastic reservoir to the press or work station.



SAFETY PRECAUTIONS

⚠ WARNING:

General Operation

- **All WARNING statements must be carefully observed to help prevent personal injury.**
- **Before operating the pump, all hose connections must be tighten with the proper tools. Do not overtighten. 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.**
- **Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump and shift the control valve twice to release all pressure. Never attempt to grasp a leaking hose under pressure with your hands. The force of escaping hydraulic fluid could cause serious injury.**
- **Do not subject the hose to any potential hazard such as fire, extreme heat or cold, sharp surfaces, heavy impact. Do not allow the hose to kink, twist, curl, or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear because any of these conditions can damage the hose and result in personal injury.**
- **Do not use the hose to move attached equipment. Stress may damage the hose and cause personal injury.**
- **Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as creosote-impregnated objects and some paints. Consult the manufacturer before painting a hose. Never paint the couplers. Hose deterioration due to corrosive materials may result in personal injury.**

Issue Date: Rev. 1-20-95

Pump

- **Do not exceed the PSI hydraulic pressure rating noted on the pump nameplate or tamper with internal high pressure relief valve. Creating pressure beyond rated capacities may result in personal injury.**
- **Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when cylinders are retracted.**

Cylinder

- **Do not exceed rated capacities of the cylinders. Excess pressure may result in personal injury.**
- **Do not set poorly-balanced or off-center loads on a cylinder. The load may tip and cause personal injury.**

Electrical Supply:

- **Avoid conditions which could create an electrical hazard.**
- **If the battery cable is damaged or wiring exposed, replace or repair immediately.**

SET-UP AND OPERATION

Electric Motor

⚠ WARNING:

- **Any electrical work must be done by a qualified electrician.**
- **Disconnect the power supply before removing the motor casing cover or performing repairs or maintenance.**

1. The 12 volt motor must be wired for counterclockwise (CCW) rotation when viewed from the lead end of the motor.

Hydraulic Set-Up

1. Clean the areas around the oil ports of the pump and hydraulic cylinders.
2. Inspect all threads and fittings for signs of wear or damage and replace as needed. Clean all hose ends, couplers, or union ends.
3. Remove the plastic thread protectors from the hydraulic oil outlets. Connect the hose assembly to the valve and couple the hose to the cylinder.

IMPORTANT: Seal all external pipe connections with a high-quality, nonhardening thread sealant, such as Power Team HTS6. Teflon tape can be used to seal hydraulic connections if only one layer of tape is used.Apply the tape carefully, two threads back, to prevent it from being pinched by the coupler and broken offinside 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.

Filling the Reservoir

NOTE: The pump is shipped without oil in the reservoir. Oil is included in a separate container.

1. Thoroughly clean the area around the filler cap with a clean cloth to prevent contamination of the oil by foreign particles.
2. Remove the filler cap and insert a clean funnel with filter. Fill reservoir to 1" from the top with oil provided (all cylinders must be retracted). Replace filler cap and check to see that breather-hole in the cap is open.

NOTE: To prevent foaming oil, reduce the oil level to 2" below the cover plate.

Note: Shaded areas reflect last revision(s) made to this form.

Operating Instructions

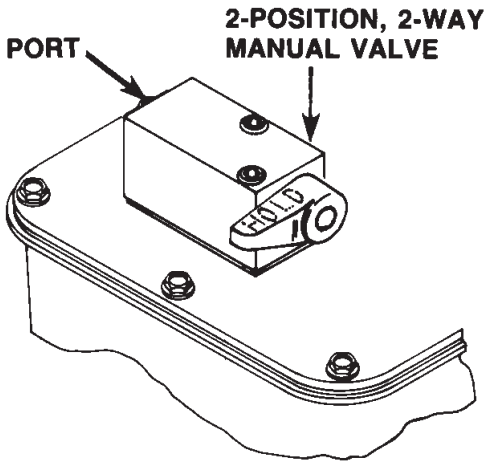
Valve Operation

2-Position, 2-Way Manual Valves used with Single-Acting Cylinders

1. To build pressure, turn the valve control handle counterclockwise (CCW).
2. Activate the pump unit.
   NOTE: Oil will advance the cylinder when the unit is activated.
3. When the cylinder has advanced to the desired position, turn the motor OFF.
4. To retract the cylinder, turn the valve control clockwise (CW).

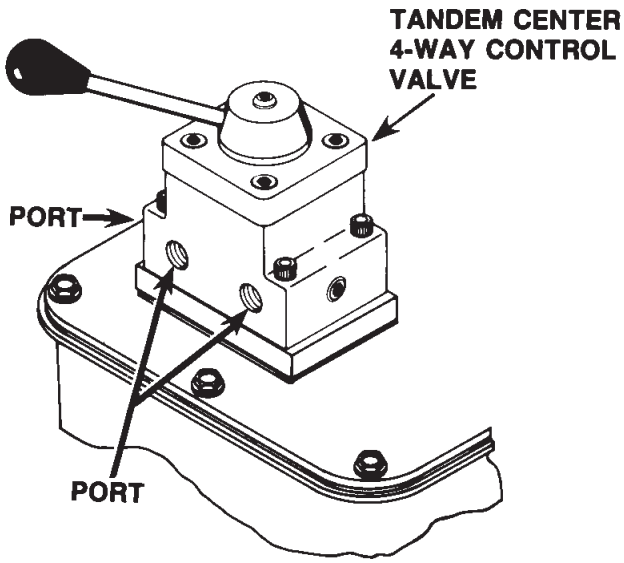
NOTE: The valve works the same as a manifold if the pump is operated with the valve in the RELEASE position. In this position, the cylinder will advance when the pump is running and retract when the motor is stopped.

When the valve is in the HOLD position, the cylinder will advance when the pump is running and hold when the motor is stopped. The cylinder can be retracted by moving the valve to the RELEASE position.



Tandem Center 4-Way Control Valve used with Double-Acting Cylinders

1. Position the valve control lever in the NEUTRAL or hold position.
2. Activate the pump unit.
3. Advance the cylinder by shifting the valve control lever to the ADVANCE position.
4. When the cylinder has advanced to the desired position, turn the motor OFF.
   NOTE: The cylinder will momentarily lose pressure during the shifting process.
5. Retract the cylinder by shifting the valve control lever to the RETRACT position.



PREVENTIVE MAINTENANCE

⚠ WARNING:

- **Disconnect the pump from the power supply before performing maintenance or repair procedures.**
- **Repairs and maintenance are to be performed in a dust-free area by a qualified technician.**

Bleeding Air from the System

After use, air may accumulate in the hydraulic system if the reservoir oil level has been permitted to get too low. This air will cause the cylinder to respond in an unstable or slow manner. To remove the air:

1. Position hydraulic cylinder(s) on their sides with the couplers located upward and at a lower level than the pump.
2. Remove any load from the cylinder(s) and cycle the hydraulic system through several cycles (fully extend and retract the cylinders).

Hydraulic Fluid Level

- Check the oil level in the reservoir after each 10 hours of use.
- Due to the very limited amount of oil required by the typical hydraulic cylinder(s) used with this pump, the oil level is considered adequate when the reservoir is partially full. Maximum capacity is when the oil is within 1" of cover plate with all cylinders retracted.
- When adding oil, use Power Team hydraulic oil (215 SSU @ 100°F). Clean the area around the filler plug, remove plug, and insert a clean funnel with filter. The cylinders must be fully retracted and the power supply disconnected.
- Drain, flush, and refill the reservoir with Power Team hydraulic oil. The frequency of oil changes will depend upon the general working conditions, severity of use, and overall cleanliness and care given the pump. Under general shop conditions 300 hours of use is considered a standard change interval.

Draining and Flushing the Reservoir

IMPORTANT: Clean the pump exterior before the pump interior is removed from the reservoir.

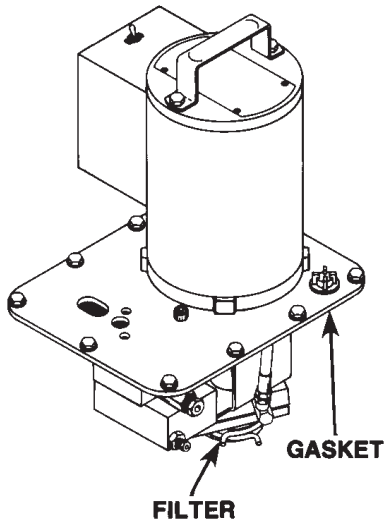
1. Remove the nine screws that fasten the motor and pump assembly to the reservoir.

IMPORTANT: Do not damage the gasket or bump the filter or pressure regulating valves when lifting the pump and motor off the reservoir.

2. Clean the inside of the reservoir and refill with a suitable nonflammable flushing oil. Rinse the filter clean.
3. Place the pump and motor assembly back onto the reservoir and secure with four of the nine screws. Assemble the screws in opposite corners of the housing.

IMPORTANT: Connect a hose to the advance/retract port of the pump manifold. Place the other end of the hose into the oil filler plug hole.

4. Run the pump for several minutes. Then disconnect the motor and pump assembly, and drain and clean the inside of the pump reservoir.
5. Refill the reservoir to 1" from the top with Power Team hydraulic oil. Replace the pump and motor assembly (with gasket) onto the reservoir. Thread in the nine screws, tighten securely and evenly.



Maintenance and Cleaning

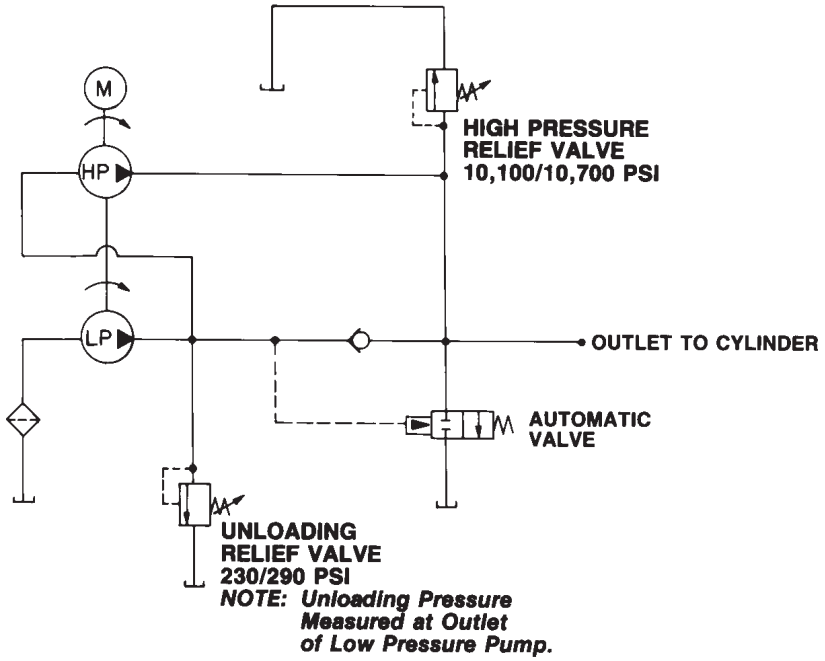
- Keep the pump's outer surface as free from dirt as possible.
- All unused couplers are to be sealed with thread protectors.
- Keep all hose connections free of dirt and grime.
- Be sure the breather hole in the filler cap is clean and unobstructed at all times.
- Equipment connected to the pump must be kept clean.
- Use only Power Team hydraulic oil in this pump. Change as recommended (every 300 hours).
- Periodically lubricate the electric pump motor.

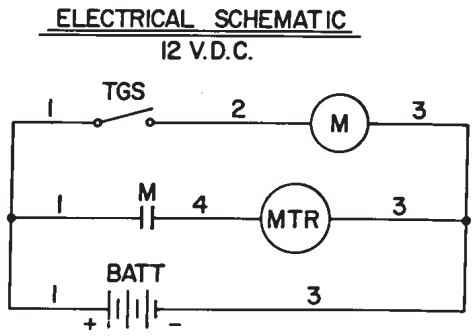
TROUBLESHOOTING GUIDE

NOTE:

- **To prevent injuries, any repair work or troubleshooting must be done by qualified personnel familiar with this equipment.**
- **Use the proper gauges and equipment when troubleshooting.**
- **Depending on the pump version, it is often best to check for leaks by using a hand pump and applying pressure to the suspect area without the motor running. Watch for leaking oil and follow it back to its source.**
- **Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or if it is in the cylinder or tool.**
- **Refer to Parts List #100660 and the hydraulic schematic when using this troubleshooting guide.**

HYDRAULIC SCHEMATIC





PROBLEM	CAUSE	SOLUTION
Motor does not run	(1) No power supply.	(1) Connect battery cable. Check line voltage.
	(2) Broken lead wire or defective battery cable.	(2) Replace defective parts.
	(3) Defective motor.	(3) Replace or repair motor.
Foaming oil	(1) Oil being splashed by counter weight.	(1) Lower oil level to approximately 2" below top of cover plate.

PROBLEM	CAUSE	SOLUTION
Pump will not build full pressure	(1) Faulty pressure gauge.	(1) Calibrate gauge.
	(2) Check for external leakage.	(2) Seal any faulty pipe fitting with pipe sealant.
	(3) Inspect the pump for internal leakage.	(3) Same procedure as above but look for leaks around the entire inner mechanism. If there are no visible leaks, the lo-to-hi pressure ball check may be leaking. Remove all parts. Inspect the check body for any damage to the seat areas and relace. Clean and reseat if necessary. Inspect the ball for damage and replace if necessary, then reassemble.
	(4) Sheared key(s).	(4) Replace.
	(5) High pressure pump inlet or outlet ball checks in the pump are leaking.	(5) Reseat or replace valve head.
Pump is not delivering oil or delivers only enough oil to advance cylinder(s) partially or erratically	(1) Oil level too low.	(1) Fill reservoir to just below the counterweight (approx. 1 gallon).
	(2) Air in system.	(2) Bleed the system.
	(3) Dirt is in pump or filter is plugged.	(3) Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned.
	(4) Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary).	(4) Change to lighter oil.
	(5) Relief valve or low pressure unloading valve out of adjustment.	(5) Readjust as needed.
	(6) Sheared drive shaft key(s).	(6) Replace.
	(7) Motor rotating in wrong direction.	(7) Reverse polarity.
Automatic valve will not build full pressure	(1) Pilot pressure is too low.	(1) Adjust pilot pressure.
	(2) Defective or oversize seat on automatic valve.	(2) Replace ball and seat.
Automatic valve will not release pressure	(1) Sticking piston.	(1) Remove, clean and polish.
	(2) High pressure oil is leaking past the lo-to-hi pressure check. This oil leaks back to the piston in the automatic valve keeping the piston closed.	(2) Seat the ball check. Inspect and replace any faulty components.
Cylinder(s) will not retract	(1) Check the system pressure; if the pressure is zero, the control valve is releasing pressure and the problem may be in the cylinder(s), mechanical linkage connected to cylinder(s), or quick-disconnect couplings.	(1) Check the cylinders for broken return springs and check couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because one check does not stay open in the coupled position.
Pump delivers excess oil pressure	(1) Check pressure gauge.	(1) Calibrate gauge.
	(2) Relief valve not properly set.	(2) Reset the relief valve.