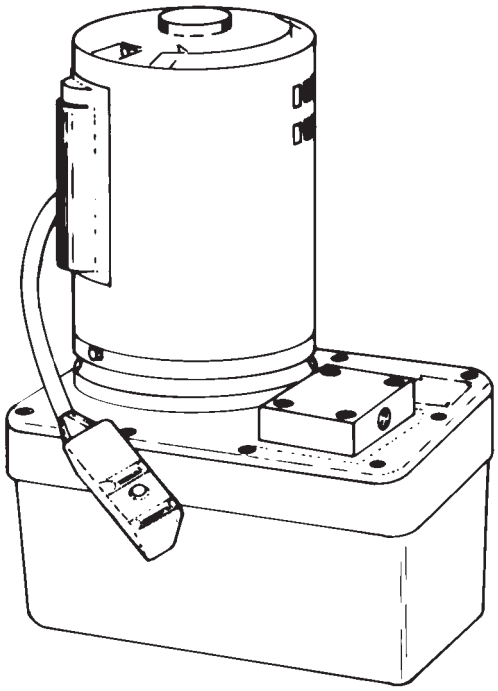
Hydraulic Technologies
655 Eisenhower Drive
Owatonna, MN 55060-0995 USA
Phone: (507) 455-7000
Tech. Serv.: (800) 533-6127
Fax: (800) 955-8329
Order Entry: (800) 533-6127
Fax: (800) 283-8665
International Sales: (507) 455-7223
Fax: (507) 455-7063

Form No. 102468

Operating & Maintenance Instructions For:

99150

ELECTRIC TWO-STAGE HYDRAULIC PUMP



This hydraulic power unit is manufactured and assembled to exacting tolerances. Read and carefully follow the operating instructions before installation and use of this pump. In return the pump will perform in a safe, trouble-free manner.

NOTE:

- **Inspect the pump upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.**
- **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.
- Unplug the electric motor before breaking any hydraulic connection in the system.
- Should a hydraulic hose ever burst or rupture, immediately shut off the pump. *Never attempt to grasp a leaking hose under pressure with you 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'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 (Example: 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.

WARNING — Pump

- Close the oil fill plug to prevent leakage when transporting the pump.
- Do not exceed the rated capacity of 10,000 PSI.
- Do not tamper with the internal high pressure relief valve.

WARNING — Cylinder

- Do not exceed the cylinder's rated capacity.
- Do not set poorly balanced or off-center loads on the cylinder.

WARNING — Power Supply

- Do not use an ungrounded (two-prong) extension cord.
- Avoid conditions which could create an electrical hazard.
- If the power cord is damaged or wiring exposed, replace or repair immediately.
- Your line voltage must be the same as the voltage your pump is wired for (Example: 110/115 volt pump plugged into 110/115 volt power source).

SET-UP AND OPERATION

Electrical Hook-up

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.**
- **All voltage must be wired for CCW rotation when viewed from the lead end of the motor.**
- **Changing the voltage on this unit is an involved, and if improperly performed, hazardous procedure. Consult the manufacturer for specific information before attempting any rewiring.**
- The electric motor is a single phase, 60 cycle motor and can be wired for 115 or 230 volt. The standard unit is prewired for 115 volts. To rewire the motor to another voltage, see diagram on motor nameplate and electrical schematic section in Parts List No. 100521.

Hydraulic Connections

IMPORTANT:

- Clean the areas around the oil ports of the pump and hydraulic cylinders.
- Inspect all threads and fittings for signs of wear or damage and replace as needed. Clean all hose ends, couplers, or union ends.
- Remove the plastic thread protectors from the hydraulic oil outlets.
- Seal all pipe connections with Bakerseal. 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 pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

1. Remove the pipe plug from the pressure/return port located on the manifold block (see Figure 1).
2. Apply Bakerseal or Teflon tape to any external threads and install hydraulic hose into manifold and cylinders.

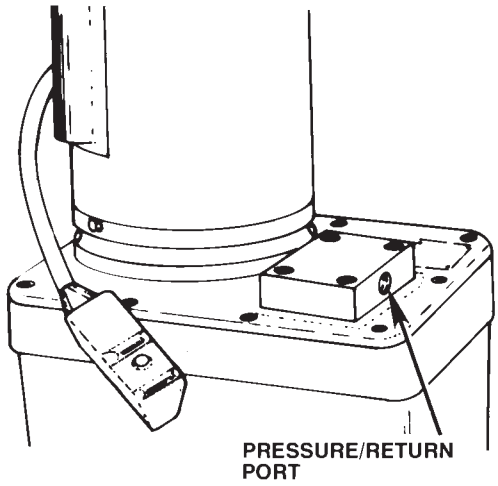


FIGURE 1

Filling the Reservoir

NOTE: The pump is shipped without oil in the reservoir. A premeasured amount of 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. Add the premeasured amount of oil to the pump reservoir. Replace filler cap and check to see the breather-hole in the cap in open.

Pump Operation – Automatic Valve

1. Check to be sure all hydraulic connections are tight.
2. Activate the pump and cylinder(s) by pressing the Advance/Retract button on the remote switch (see Figure 2). Fully extend and retract the cylinder(s) several times to expel any air in the hydraulic system.

NOTE: This pump is equipped with an automatic valve built into the unit. It is intended for use with single-acting (spring-return) cylinders only. The cylinders will retract automatically when the Advance/Retract button is released.

3. With all cylinders retracted, recheck the oil level. If additional oil is needed, use only an approved hydraulic oil (215 SSU @ 100°F) such as OTC 16355.
4. Pump is now ready for regular operation.

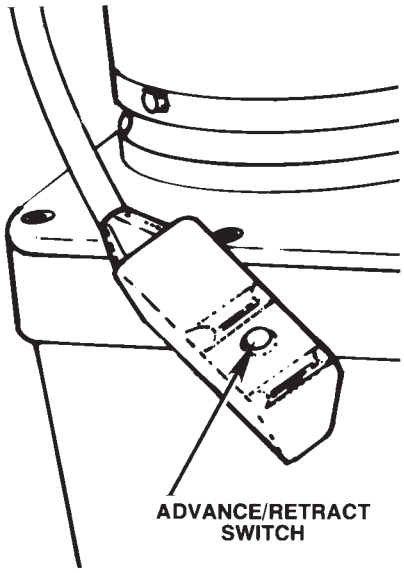


FIGURE 2

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 had 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 hydraulic cylinder(s) used with this pump, the oil level is considered adequate when the reservoir is 1/2 full. Maximum capacity is 1-1/2" from the bottom of the filler plug with all cylinders retracted.
- When adding oil, use an approved, high-grade hydraulic oil (215 SSU @ 100°F) such as OTC 16355. 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 an approved, high-grade hydraulic oil (215 SSU @ 100°F) such as OTC 16355. The frequency of oil changes will depend upon the general working conditions, severity of use, and overall cleanliness and care given the pump. Three hundred hours of use under general shop conditions is considered as 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 ten 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 (see Figure 3).

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 ten 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. With the remote switch, activate the automatic valve to the advance position and run the pump for several minutes. Disconnect the motor and pump assembly, drain and clean the inside of the motor reservoir.
5. Refill the reservoir with one gallon of an approved, high-grade hydraulic oil such as OTC 16355. Replace the pump and motor assembly (with gasket) onto the reservoir. Thread in the ten screws, tighten securely and evenly.

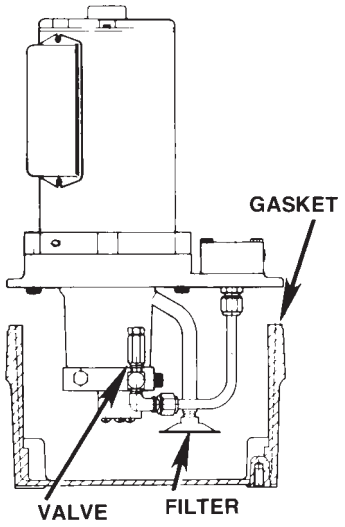


FIGURE 3

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 an approved, high-grade hydraulic oil such as OTC 16355 in this pump. Change as recommended (every 300 hours).
- Periodically lubricate the electric pump motor (2 places) as shown in Figure 4.

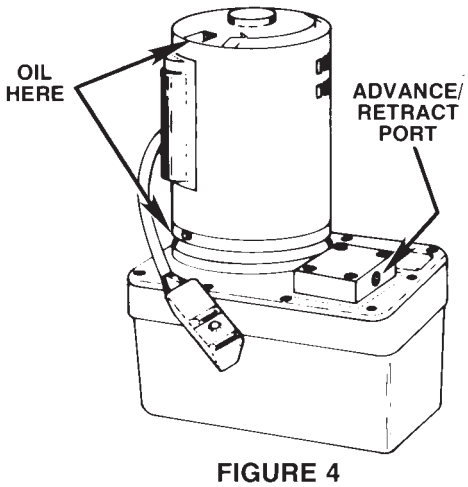


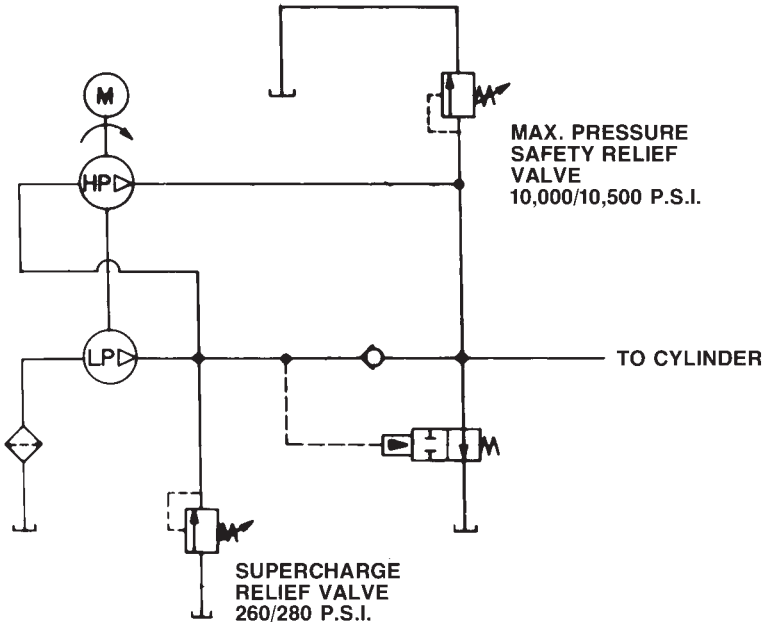
FIGURE 4

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 No. 100521 and the hydraulic schematic below when using this troubleshooting guide.

HYDRAULIC SCHEMATIC



PROBLEM	CAUSE	SOLUTION
Motor does not run	1. Unit is not plugged in. 2. No supply voltage. 3. Broken lead wire or defective power cord plug. 4. Defective motor.	1. Plug in unit. 2. Check line voltage. 3. Replace defective parts. 4. Replace or repair motor.

PROBLEM	CAUSE	SOLUTION
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 approximately 1/2 full, minimum, to within 1-1/2" from the top, maximum.
	2. Pump needs to be primed.	2. Prime.
	3. Air in system.	3. Bleed the system.
	4. Air leak in suction line.	4. Check and tighten the suction line.
	5. Dirt is in pump or filter is plugged.	5. Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned.
	6. Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary).	6. Change to lighter oil.
	7. Relief valve or low pressure unloading valve out of adjustment.	7. Readjust as needed.
	8. Sheared drive shaft key(s).	8. Replace.
	9. Motor rotating in wrong direction.	9. Reverse polarity.
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. Check the external pressure regulator, then check the relief valve setting.	3. Lift the pump from the reservoir but keep the filter immersed in oil. Note the pressure reading when the relief valve begins to open up. If functioning normally, it should start to leak off at relief valve pressure.
	4. Inspect the pump for internal leakage.	4. 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 (Item 13, Sheet 3 of 4, Parts List No. 100521) may be leaking. Remove all parts. Check the end plate body for any damage to the seat area. Clean and reseat if necessary. Inspect the ball for damage and replace if necessary, then reassemble.
	5. Sheared key(s).	5. Replace
	6. High pressure pump inlet or outlet ball checks in the pump are leaking.	6. Reseat or replace valve head.

PROBLEM	CAUSE	SOLUTION
Automatic valve will not build full pressure.	1. Pilot pressure is too low. 2. Defective or oversize seat on automatic valve. 3. One or more rollers in the low pressure pump are short. The pilot pressure will be erratic. This causes the valve to open partially, letting pressure into the reservoir past the ball seat.	1. Increase pilot pressure. 2. Replace ball and seat. 3. Replace the roller.
Electric motor cuts out.	1. Extension cord is too long and/or not of sufficient gauge. 2. Faulty motor. 3. Overheated motor can trip circuit breaker in shop power panel.	1. Replace. 2. Replace or repair. 3. Allow motor to cool, reset circuit breaker located in shop power panel.
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. 2. Relief valve not properly set.	1. Calibrate gauge. 2. Reset the relief valve.
Automatic valve will not release pressure.	1. Sticking piston. 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.	1. Remove, clean and polish. 2. Seat the ball check. Inspect and replace any faulty components.