



SERIES 'N' NORYL® CHEMICAL PUMP

OPERATION AND
SERVICE GUIDE
O-1000B
JAN. 1998

Refer to Bulletin P-104 and Parts List P-9800.

! SAFETY PRECAUTIONS BEFORE STARTING PUMP

1. Read operation and service guide for pump and instructions supplied if chemicals are to be used.
2. Refer to a chemical resistance guide for compatibility of materials in pump with solution to be used.
3. Note temperature and pressure limitations:
 - a. 60 PSI discharge pressure
 - b. 180°F for Noryl plastic
4. Always close valves slowly to avoid hydraulic shock.
5. Make sure that all fittings, hose clamps and connections are properly tightened. The pump connections are designed for flexible hose only.

! IMPORTANT

1. The pump is constructed of Noryl plastic. All fasteners, motor shaft and mechanical seal metal parts are stainless steel.
2. Record all model and serial numbers for future reference. Always specify model number and serial number when ordering parts.
3. Pump flow curves are based upon pumping water. Increased motor horsepower may be necessary for pumping other liquids or reduced motor horsepower may be permissible when pumping at higher discharge head. Refer to pump curve.
4. Impellers are designed to offer maximum pump output and the motors are sized for non-overloading at maximum flow conditions. Impellers may be trimmed to reduce flow and discharge head, if desired. See Parts List P-9800 for impellers of various diameters.
5. Review Parts List P-9800 and maintain an emergency inventory of replacement items to assure that pump is returned to service with the least delay.
6. The pump should be mounted in a dry and accessible location allowing sufficient clearance for air circulation for motor cooling.
7. When recirculating, use syphon breaker to prevent solution loss due to malfunction.

PRE-START-UP

1. Verify that operating temperature is not in excess of pump design temperature of 180°F maximum for Noryl.
2. Mechanical seal components which contact the liquid are the carbon face, ceramic face, ethylene-propylene or Buna seat cup, bellows, spring and spring holder. Verify materials and solution compatibility. See Parts List P-9800 for seal material.
3. Connect electrical supply to motor starter. If starter is furnished, verify that starter and motor are wired for the correct operating voltage and correct overload heaters. It is recommended that a motor starter be installed for overload protection if one was not provided with the pump assembly.

4. **! Wire for counterclockwise rotation when facing the pump suction. DO NOT start a motor to check rotation before liquid is in the pump body. Dry rotation of the mechanical seal can cause immediate failure of the seal components. Check pump rotation only with liquid in the pump. If pump rotation is incorrect, the motor should be stopped and properly wired. Incorrect rotation is indicated by a reduction in flow rate.**
5. All units are factory tested to meet published or specified flow rates and to confirm that the seal assembly functioned properly at time of shipment.
6. Install a strainer on the pump suction to prevent foreign material from entering the pump and possibly causing impeller damage.

START-UP

1. If pump is installed with a liquid head at the suction line, it will not be necessary to prime the pump. It is only necessary to make sure that liquid is in the suction line and pump body before energizing the motor.
2. If the pump is installed without a positive suction head, proper priming procedure should be followed. It is absolutely necessary that the suction line and pump be completely filled with liquid. Liquid for priming may be introduced through the suction hose. Fill hose to overflowing, place hand over open end of hose and submerge into tank. Start motor and wait a few moments before removing hand. If a valve is used on the discharge line, keep it closed until motor has been run momentarily. Open the valve slowly, eliminating all air in the line.

LONG-COUPLED ASSEMBLY

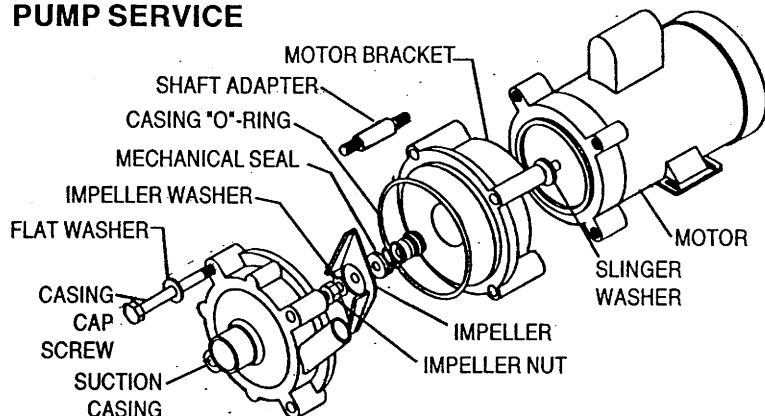
1. Pump is shipped assembled and mounted to bearing pedestal.
2. Pedestal and pump assembly are reversed on channel base for protection during shipping. Relocate to proper position.
3. Mount motor to channel base, shim to proper height. Center line of bearing pedestal to top of channel base is 4.17".
4. Align motor and coupling to bearing pedestal shaft. Check for concentricity and true alignment by rotating coupling by hand. Tighten coupling washer.
5. Securely bolt bearing pedestal and motor.
6. Double check pump - coupling - motor alignment. Adjust and correct if necessary.
7. Refer to above for safety and start-up procedure.

MOTOR WITH TITANIUM SHAFT ADAPTER

1. Models with -T suffix in Model No. have a titanium shaft adapter threaded into the "C" face motor.

2. Adapter is usually furnished with the V(M2) mechanical seal assembly.
3. To replace shaft adapter, refer to Pump Service. The shaft adapter is removed in same manner as the impeller.

PUMP SERVICE

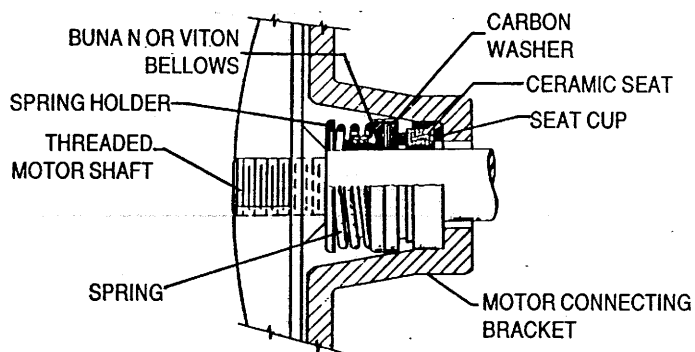


1. TO REMOVE SUCTION CASING

- a. Remove hoses.
- b. Remove four casing cap screws, washers and suction casing by pulling forward.

2. TO REPLACE IMPELLER

- a. Remove suction casing as outlined in Section 1.
- b. Remove impeller nut and washer from motor shaft threaded end by removing plug from end of ODP motor and preventing shaft from turning by holding with screwdriver in shaft slot. TEFC motor shaft can be held with screwdriver on motor fan.
- c. Unscrew impeller from motor shaft and replace part.



3. TO REPLACE MECHANICAL SEAL

DISASSEMBLY

1. Remove suction casing and impeller as outlined in Sections 1 and 2.
2. Remove spring from mechanical seal.
3. Pry under rubber bellows of seal with small screwdriver to loosen its grip on the motor shaft.

4. Use the motor bracket to pull the mechanical seal off the shaft.
5. Remove the ceramic seat from the cavity in the motor bracket.

ASSEMBLY

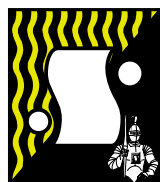
1. Wipe the lapped sealing face of the ceramic seat with a soft tissue. Lubricate the elastomer cup with clean water or glycerine. Press the assembly into the seat in the motor bracket. Lapped face should be away from seat bottom.
2. Assemble the motor bracket over shaft and onto the ring on the motor "C" face.
3. Clean and lubricate rotating parts of mechanical seal per above and assemble on motor shaft.
4. Assemble spring and spring holder on motor shaft.
5. Compress seal spring with end of screwdriver while threading impeller on motor shaft. After engaging several threads, remove screwdriver.
6. Place screwdriver in motor shaft slot and tighten impeller until it shoulders on motor shaft.
7. Assemble nut and washer on impeller. Replace plug in end of ODP motor.
8. Mount suction casing in position and tighten cap screws to a maximum of 5 ft.-lbs. torque.

TO REPLACE MOTOR

1. Follow steps as outlined in previous sections.

TROUBLESHOOTING

1. **MOTOR STOPS** - Check for correct voltage, wiring and proper overload heaters in motor starter. Take an ammeter reading at operating conditions and compare to value shown on motor nameplate. Measured value should be equal to or less than rated value. Check for friction free rotation of pump by manually turning fan blade.
2. **PUMP DOES NOT DELIVER CORRECT FLOW** - Check suction strainer and pump inlet to be sure both are not plugged with debris. Compare required flow conditions to original specifications and pump curve which is based on water.
3. **FREQUENT SEAL FAILURE** can be caused by the following: Abrasives in solutions, crystallization on seal components, chemical attack on seal components (see available alternatives), improper priming and pump operation while dry.
4. **PUMP SUCKING AIR** - Undersized suction piping causing cavitation and vibration, worn motor bearings or bent pump shaft may also be causes of failure. Always flush pump with clean liquid after pumping solutions that could crystallize during pump shut-down.



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