

**HYDRASUB 20/25** is a compact, lightweight, hydraulically driven submersible pump with high flow capabilities. This self-priming pump is made with a high strength aluminum alloy that is anodized for corrosion resistance. This pump features a stainless steel impeller, ball bearing, and a gerotor type hydraulic motor. HYDRASUB 20/25 may be used to pump out underground vaults and pits.



**GENERAL SAFETY INFORMATION:**

THE FOLLOWING WARNINGS ARE USED TO NOTIFY AND ADVISE THE USER OF THIS PRODUCT OF PROCEDURES THAT MAY BE DANGEROUS TO THE USER OR RESULT IN DAMAGE TO THE PRODUCT.

THIS BULLETIN MUST BE READ COMPLETELY BEFORE INSTALLING, OPERATING, OR SERVICING, THE PUMP.

- **DO NOT** perform service or maintenance when the pumping system is pressurized.
- **DO NOT** continue to operate the pumping system when a known leak exists.
- **DO NOT** operate beyond the pressure or temperature limits stated in the product literature. See Form 8107/8108.
- **DO NOT** operate the pump in a manner that it was not intended to be used.
- **DO NOT** use in explosive atmospheres or pump volatile liquids.

**INSTALLATION:**

**HYDRAULIC OIL SYSTEM REQUIREMENTS:**

The hydraulic power supply must be capable of delivering a controlled flow rate of 5-9gpm for Model 20 and 8-14gpm for Model 25. The operating oil pressure will vary upon the flow rate load of the pump from 700 to 2100 psi. A maximum relief valve setting of 2400psi is recommended.

A hydraulic supply system where the flow rate is controlled is referred to as an "open center system." This is the most accurate system to assure that the flow rate does not exceed the maximum limit.

A "closed center system" will have a variable oil flow rate based upon the hydraulic pressure that is a set value. If a closed center system is used, the maximum pressure developed must not exceed 1700 psi, and the pump must always have a supply of water to pump to protect it from running into an over speed condition unless the oil flow rate is limited to less than the maximum.

The maximum return pressure or backpressure is 100psi. Higher pressures will result in reduced seal life. Do not install down stream loads or valves. Always allow the return to go directly back to the tank.

Supplemental oil cooling may be required to keep the oil temperature below 175°F. Suitable filtration is required (25 micron recommendation) to clean the oil of contaminants that may accelerate wear.



**WARNING**

**NEVER OPERATE THE PUMP WITH UNSECURED HOSES AND HYDRAULIC LINES. SEVERE INJURY MAY OCCUR FROM IMPACT, IMPINGEMENT, OR LIQUID BLAST.**

**COLD WEATHER OPERATION MAY REQUIRE PREHEATING THE OIL OR BYPASSING THE OIL IN THE POWER SUPPLY TO PREHEAT IT UNTIL THE OIL REACHES A TEMPERATURE OF 50°F.**



**MP PUMPS, INC.**

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**FORM 3069A (05-04)**

### **CONNECTING TO THE POWER SOURCE:**

The pressure and return ports are noted on the pump casting closest to the hydraulic motor connection. Connecting the ports in opposite orientation will result in damage to the hydraulic motor components and lip seal. The Model 20 uses SAE #8 hydraulic o-ring connections with a minimum hose size of .50 inches. The Model 25 uses SAE #10 hydraulic o-ring connections with a minimum hose size of .625 inches. Hose should be rated for operating at 2500psi or greater.

### **CONNECTING TO THE PUMP DISCHARGE:**

Model 20 has a 2" cam and groove connection, and Model 25 has a 2.5" cam and groove. Attach a suitable length of hose and lock the connector using a safety lock or wire. Do not install a discharge valve or nozzle. The outlet must not be restricted or reduced.

### **LOWERING THE PUMP INTO THE HOLE:**

The pump can be lowered into the hole after all connections are made to the pump. A rope or cable can be attached to the handle or the pump can be lowered by the hose and hydraulic lines to rest onto a solid floor or base. If the pump is to be suspended, support cables must be used to secure the pump from rotating and support the weight of the discharge hose when it is full of water. Never suspend a pump by using the hoses to hold the pump. For best optimum pumping performance, keep the pump in an upright position. The discharge hose must be secured at the end and at the point where the hose exits the hole. Avoid kinks and sharp bends to the hydraulic lines.

### **OPERATION:**

Energize the hydraulic power source. Check and adjust the oil flow rate if necessary. Check the discharge hose for kinks and make sure that they are securely restrained. If adjustments to the hoses are required, shut down the power, adjust, and then restart. **Adjusting the discharge hose during operation may result in injury to the operator.** When pumping solids, set the pump for maximum flow to keep the solids suspended and expelled through the discharge hose. Accumulating solids within the discharge will reduce the flow and may cause accelerated wear to the pump if solids backup into the pump housing. It may also require periodic maintenance to clear the discharge hose. The pump will clear all liquid to within .75 inches of the pump base. Periodically clear debris that may accumulate around the pump inlets. The pump is capable of pumping any solid material that will fit through the strainer opening. Maintaining a low level can be accomplished with the pump operating in air. When evacuating to depths over 30 feet, a check valve at the pump discharge may be used to keep the water from flowing backwards when the pump has cleared to a low level and is pumping in air. When pumping is completed, shut off the hydraulic supply before removing the pump from the hole. The pump may remain in the hole after use for long periods of time if intermittent use is required.

### **REPAIR:**

Normal rebuild service may be required to replace the lip seals after 3,000-6,000 hours of operation. The pump will require complete disassembly. Any wear to the hydraulic motor parts will require complete replacement of the hydraulic motor assembly. Visible wear to the pump parts is not as critical as the motor components.

HYDRASUB pumps do not require any adjustments or special clearance settings when assembling or rebuilding.

### **DISASSEMBLY:**

**(See exploded view and parts description)**

1. Remove the five cover plate screws and remove the cover.
2. Remove the three screws that hold the suction flange, and remove the suction flange.
3. Remove the two handle screws and remove the handle.
4. Remove the four hydraulic motor screws and remove the hydraulic motor cover, gerotor element with drive pin, and the thrust plate.
5. Secure the impeller and unthread the impeller from the shaft using a wrench on the flats at the ball bearing. The thread is a left hand thread that requires opposite rotation for removal.
6. Remove the shaft and bearing assembly by first removing the retaining ring, then apply pressure to slide the shaft and bearing out of the motor side of the pump housing.
7. Remove the two lip seals by pushing the seals out through the motor side of the pump body.

### **INSPECT THE PUMP PARTS:**

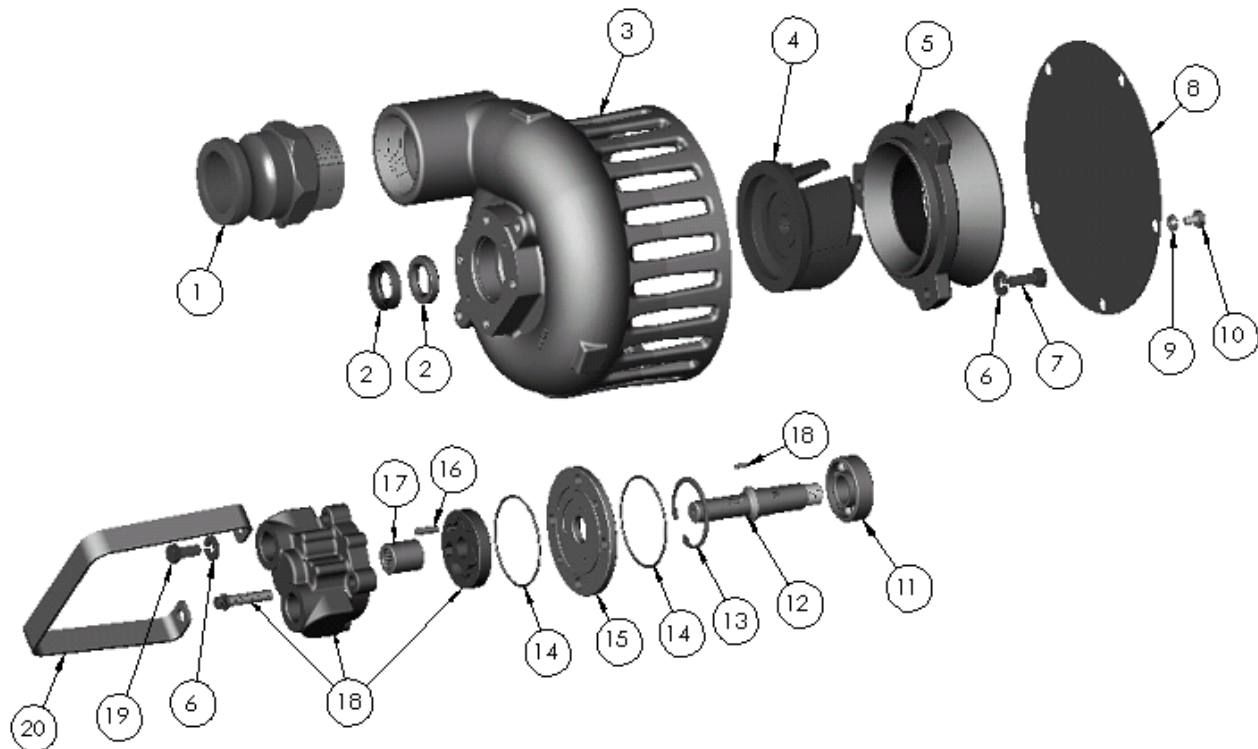
Clean all foreign material off the parts. **DO NOT** use abrasive cleaning methods on the hydraulic parts or shaft.

Check the motor shaft for wear at the lip seal surface. If it has grooves greater than .003 inches deep, the shaft should be replaced.

Check the hydraulic motor parts for wear. Any appearance of displaced metal or surface smearing will require replacing all of the motor parts.

Check the impeller blade surface between the impeller and the suction flange. If the surfaces are severely worn, or the impeller blades are bent, replace each item.

Clean the parts that are to be reused using a solvent or mild cleaner. Remove abrasive material. Cleanliness of the hydraulic motor parts is very important.



ITEM	PRT. NO.	QTY.	DESCRIPTION	ITEM	PRT. NO.	QTY.	DESCRIPTION	ITEM	PRT. NO.	QTY.	DESCRIPTION
1	34022	1	2" COUPLING	8	33716	1	COVER PLATE	15	33724	1	THRUST PLATE
2	33718	2	LIP SEAL	9	33564	5	1/4" LOCKWASHER	16	33740	2	DOWEL PIN
3	33713	1	HOUSING	10	30551	5	1/4-20 X 3/8" CAPSCREW	17	29046	1	NEEDLE BEARING
4	30711	1	IMPELLER SS	11	27556	1	BALL BEARING	18	33897	1	HYD. MOTOR
5	33715	1	SUCTION FLANGE	12	33720	1	SHAFT	19	30320	2	5/16-18 X 1/2" CAPSCREW
6	21238	5	5/16" LOCKWASHER	13	33742	1	RETAINING RING	20	33778	1	HANDLE
7	21242	3	5/16-18 X 7/8" CAPSCREW	14	34054	2	QUAD RING				

## REASSEMBLY:

- Press the new lip seals into the pump housing using a suitable bushing or socket. A light lubricant may be used to aid the assembly. The proper assembly is to install the seals back to back, installing one seal at a time.
- Press the new ball bearing onto the shaft by pressing against the inner face of the bearing until it is seated against the shaft shoulder. The first lip seal should be installed open face down and flat side facing out. The second lip seal should be installed flat side in.
- Lubricate the impeller side of the shaft with oil. Push the shaft/bearing into the body using care to align the shaft at the center of the lip seal until it is at the bottom of the shoulder in the body. Install the snap ring to secure the shaft assembly.
- Secure the shaft with a wrench on the flats of the shaft and thread the impeller onto the shaft (note left hand thread). Tighten the impeller until it shoulders onto the shaft.
- Place new quad rings onto the thrust plate. Use a small amount of grease to hold the quad rings from moving out of position. Place the thrust plate over the shaft with the kidney slot up away from the bearing. Kidney should be on the pressure side of the motor.
- Place the drive pin onto the shaft slot and hold it in position with a screwdriver while sliding the gerotor over the shaft and stopping at the thrust plate. Line up the gerotor and thrust plate.
- Install the cover onto the shaft; some sideways movement of the gerotor is necessary. The dowel pins should go through the thrust plate and into the body. Do not force this assembly by using a hammer or press, it will slide together when it is in position.
- Install the four motor cover screws and torque to 17-ft.lbs in a cross pattern with the first torque @ 10-ft.lbs.
- Install the suction flange and screws.
- Install the handle and screws.
- Check for free rotation by rotating the impeller by hand. If it does not rotate, remove the motor cover, clean the motor parts, and reassemble. Dust and dirt granules will impede motor rotation.
- Install the cover plate using five screws and lockwashers.

# TROUBLESHOOTING

If problems develop, use the chart below to service the pump.

Pump will not start	No hydraulic flow and pressure	Turn power on. Check to make sure the oil flow range (5-9gpm / 8-14gpm), and 2000psi oil pressure are ok.
	Hydraulic motor	Repair or replace as needed.
	Couplers	Check to make sure the couplers are completely connected and not defective. If defective, replace.
	Hydraulic connection	Connected backwards. Reinstall in proper direction.
Poor pump performance	Hydraulic oil flow is low	Turn power on. Check to make sure the oil flow range (5-9gpm / 8-14gpm), and 2000psi oil pressure are ok.
	Pump is too deep in sediment	Place pump on solid support.
	Pump intake is plugged	Make sure debris has not wrapped around base of pump.
	Discharge hose is twisted or kinked	Make sure the hose is straight.
	Discharge hose is too small	Make sure hoses are 2" dia. Model 20, and 2-1.2" dia. Model 25.
	Lift is too high for power supply	Maximum lift is 70ft Model20, and 95 ft. Model 25.
	Pump not sufficient for application	Make sure pump specs are sufficient for application.
	Damaged or worn impeller	Replace as required.



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