

Maintenance Instructions Parts List S6T and S6TDI Pump with Series 2 Bearing Housing



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IMPORTANT SAFETY INFORMATION



SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

ADANGER

Immediate hazards which, if not avoided, WILL result in severe injury or death.

AWARNING

Hazards which, if not avoided, COULD result in severe injury or death.

ACAUTION

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.

AWARNING

Before operating this tool, see the safety information and operating instructions in the Operation Manual.

AWARNING

Do not operate the pump if the impeller blades are exposed. After assembly, install the inlet screen before operating the pump.

Failure to observe this warning could result in severe injury or death.

AWARNING

Do not inspect, adjust, or clean tool when it is connected to a power source. Accidental startup could result in serious injury.

Skin injection hazard:

AWARNING



Oil under pressure easily punctures skin causing serious injury, gangrene or death. If you are injured by escaping oil, seek medical attention immediately.

- Do not use fingers or hands to check for leaks.
- Do not hold hose or couplers while operating the power source.
- Depressurize the hydraulic system before servicing.



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IMPORTANT SAFETY INFORMATION

AWARNING



Wear eye protection when operating or servicing this tool.

Failure to wear eye protection could result in serious eye injury from flying debris or hydraulic oil.

AWARNING

Do not exceed the maximum hydraulic flow, pressure relief or back pressure listed in the Specifications and Parts manual.

Failure to observe this warning could result in severe injury or death.

AWARNING

Do not disconnect tool, hoses, or fittings while the power source is running or if the hydraulic fluid is hot. Hot hydraulic fluid could cause serious burns.

ACAUTION

Hydraulic oil can cause skin irritation.

- Handle the tool and hoses with care to prevent skin contact with hydraulic oil.
- In case of accidental skin contact with hydraulic oil, wash the affected area immediately to remove the oil.

Failure to observe these precautions may result in injury.

IMPORTANT

Do not reverse hydraulic flow. Operation with hydraulic flow reversed can cause tool malfunction. Connect the supply (pressure) hose and return (tank) hose to the proper tool ports.

IMPORTANT

Procedure for disconnecting hydraulic hoses, fittings or components:

- Move the flow lever on the hydraulic power source to the OFF position.
- 2. Stop the power source.
- Follow the sequence under Disconnecting Hoses to prevent pressure buildup. In case some pressure has built up, loosen hoses, fittings or components slowly.



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PUMP SAFETY PRECAUTIONS

Pump operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the pump and hose. These safety precautions are given for your safety. Review them carefully before operating the pump and before performing general maintenance or repairs. Supervising personnel should develop additional precautions relating to the specific work area and local safety regulations. If so, place the added precautions in the space provided in this manual.

All Hydra-Tech submersible pumps will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual and any stickers and tags attached to the pump and hoses before operation. Failure to do so could result in personal injury or equipment damage.

- Operator must start in a work area without bystanders. The operator must be familiar with all prohibited work areas such as excessive slopes, dangerous terrain conditions, and confined spaces.
- Establish a training program for all operators to ensure safe operations.
- Do not operate the pump unless thoroughly trained or under the supervision of an instructor.
- Always wear safety equipment such as goggles, head protection, hearing protection, and safety shoes at all times when operating the pump.
- Do not inspect or clean the pump while the hydraulic power source is engaged. Disconnect both hydraulic hoses before attempting to clean or inspect the pump. Accidental engagement of the pump can cause serious injury.
- Do not operate this pump without first reading the Operating Instructions.
- Do not install or remove this pump while the hydraulic power source is connected. Accidental engagement of the pump can cause serious injury.
- Never operate the pump near energized transmission lines. Know the location of buried or covered services before starting work.
- Do not wear loose fitting clothing when operating the pump. Loose fitting clothing may get entangled with the pump and cause serious injury.
- Supply hoses must have a minimum working pressure rating of 3000 psi/ 206 bar or higher depending on model.
- The hydraulic circuit control valve must be in the "OFF" position when coupling or uncoupling the pump. Wipe all couplers clean before connecting. Failure to do so may result in damage to the quick couplers and cause overheating. Use only lint-free cloths.
- Be sure all hose connections are tight.
- Do not operate the pump at oil temperatures above 140° F/60° C. Operation at higher oil temperatures can cause operator discomfort and may cause damage to the pump.
- Do not operate a damaged, improperly adjusted, or incompletely assembled pump.
- To avoid personal injury or equipment damage, all pump repair, maintenance and service must only be performed by authorized and properly trained personnel.
- Do not exceed the rated limits of the pump or use the pump for applications beyond its design capacity.
- Always keep critical pump markings, such as labels and warning stickers legible.
- Always replace parts with replacement parts recommended by Hydra-Tech Pumps.
- Check fastener tightness often and before each daily use.
- NEVER put your hands or any other body part into the volute or discharge outlet while the pump is running. Do not operate pump without the strainer and discharge lines in place.
- Do not lift the pump by pulling on the hydraulic hoses. Use a suitable line or chain fastened to the pump handle or lifting point. Always use appropriate lifting equipment to locate or move the pump.
- Do not point water discharge toward bystanders or property.
- DO NOT PUMP FLAMABLE LIQUIDS.

OPERATION

PREOPERATION PROCEDURES

CHECK HYDRAULIC POWER SOURCE

- 1. Using a calibrated flow meter and pressure gauge, make sure the hydraulic power source develops flow and pressure that is appropriate for the pump.
- 2. Make certain that the hydraulic power source is equipped with a relief valve set to open at 10% above rated operating pressure.
- 3. Make certain that the power source return pressure does not exceed 100 psi/7 bar.
- 4. Make sure the pump inlet is clear of debris. Remove any obstruction before connecting the hydraulic hoses.

CONNECTING HYDRAULIC HOSES

- 1. Wipe all hose couplers with a clean lint free cloth before making connections. Do not connect pressure to the return port. Motor shaft seal limit Is 100 psi/7 bar.
- 2. Connect the hoses from the hydraulic power source to the couplers on the pump or pump hoses. It is a good practice to connect return hose first and disconnect it last to minimize or avoid trapped pressure within the pump motor.

Note: If uncoupled hoses are left in the sun, pressure increase inside the hoses might make them difficult to connect. Whenever possible, connect the free ends of the hoses together.

3. Make sure the hydraulic hoses are connected to ensure that the flow is in the proper direction. The female coupler on the submersible pump is the inlet (pressure) coupler.

PUMP OPERATION

- 1. Observe all safety precautions.
- 2. Attach discharge hose to the pump outlet. For best performance, keep the discharge hose as short as possible and lay it out to avoid sharp bends or kinks.
- 3. Attach a chain or cable to the pump's handle or lifting point. Use suitable lifting equipment to lower the pump into the liquid to be pumped. Do not raise or lower the pump by its hoses or couplers to avoid damage to the hoses or couplers. Never point the discharge hose at bystanders or property.
- 4. Turn on the hydraulic power source. Watch for solids in the liquid being pumped. If solids or semi-solids are excessive, the discharge flow might decrease. If this happens, stop the pump and check for the cause of the problem. Under some conditions, the liquid being pumped might be slowed enough so that it can no longer push particles in the liquid. If this happens, particles can accumulate in the pumping chamber, causing further restriction and damage. The impeller then acts as a "grinding wheel: which causes accelerated pump wear.

Reduced liquid flow can be caused by the following:

- The pump sinks into solids at the bottom of the hole blocking the inlet.
- The end of the discharge hose is too high, causing an excessive lift height for the column of liquid being pushed by the pump. This slows the flow of liquid to a level where it can no longer carry solids. Kinks in the discharge line will reduce flow and increase demand on the power unit.
- The flow and pressure of hydraulic fluid to the pump is too low, which reduces impeller speed. A 20 percent decrease in hydraulic fluid flow can reduce pump performance by 50 percent. When operating at reduced hydraulic flow and pressure, keep the end of the discharge line as low as possible.

Note: It will not damage the pump to operate it "dry."

- 5. The pump must maintain a minimum impeller speed in order to move semi-solid particles through the pump. While pumping liquids containing large semi-solids, monitor the flow from the outlet of the discharge hose. If it begins to slow, turn off the hydraulic power source and lift the pump from the work area. Disconnect the hydraulic hoses and clean at the water hose and the pumping chamber. Pumping liquids with a solids to liquid ratio greater than 30 per cent solids to 70 percent liquid will cause accelerated impeller wear.
- 6. When pumping is complete, set the hydraulic control valve to the "OFF" position. Lift the pump from the work area using the chain or cable to avoid damage to the hoses or couplers.
- 7. To maintain optimum performance, it is good practice to periodically inspect the impeller and wear components for wear or damage. This is especially important following the pumping of liquids containing sharp, abrasive solids. ALWAYS DISCONNECT THE HYDRAULIC HOSES BEFORE ATTEMPTING INSPECTION OF THE IMPELLER.

COLD WEATHER OPERATION

If the pump is to be used during cold weather, preheat the hydraulic fluid at low power source speed. When using the normally recommended fluids, fluid should be at or above 50°F/10° C (400 ssu/82 centistokes) before use. Damage to the hydraulic system or pump motor seals can result from use with fluid that is too viscous or thick.

EQUIPMENT PROTECTION & CARE

- Make sure all couplers are wiped clean before connection.
- The hydraulic circuit control valve must be in the "OFF" position when coupling or uncoupling the pump. Failure to do so may result in damage to the quick couplers and cause overheating of the hydraulic system.
- Make sure the circuit PRESSURE hose (with male quick disconnect) is connected to the "IN" (female quick disconnect) port on the submersible pump. The circuit RETURN hose (with female quick disconnect) is connected to the opposite port. Do not reverse circuit flow. This can cause damage to internal seals.
- Always replace hoses, couplings and other parts with replacement parts recommended by Hydra-Tech Pumps. Supply hoses must have a minimum working pressure rating of 3000 psi/206 bar.
- Do not exceed the maximum rated flow or pressure for the submersible pump (refer to Specifications in this manual for correct flow rate and pressure). If specifications are exceeded, rapid failure of the internal seals will result.
- Always keep critical labels and markings, such as warning stickers and tags legible.
- Pump repair should be performed by experienced personnel only.
- Make certain that the recommended relief valves are installed in the pressure side of the system.

9/28/09

Operational Note

S6T and S6TDI Pump



This pump is designed to operate with hydraulic <u>input flows to 30 GPM and a maximum pressure of 2900 PSI</u>. Hydraulic circuits must be open center, single direction and have an unrestricted return flow from the hydraulic motor to the oil reservoir.

Operating this unit at pressures or flows in excess of those listed above or connecting this unit to a closed center or reversing circuit will cause damage to the unit and will void the warranty!

Please review the enclosed hydraulic schematic(s). If you are not sure if the hydraulic power source being used to drive this pump is properly sized or connected, call Hydra-Tech Pumps.

Please read and understand this manual BEFORE you attempt to operate this pump.

Maintenance Instructions

S6T and S6TDI PUMP

Preventive Maintenance:

- 1. Always be sure to use only clean, filtered hydraulic oil to drive the hydraulic motor. Your hydraulic system should have a filter rated at 10-micron filtration.
- 2. When connecting the hydraulic hoses to the pump, be sure to keep hose connections clean.
- 3. Use hydraulic oils with anti-wear additives such as these recommended oils or their equivalent:

Pennzoil AW46 Hydraulic Oil Texaco Rando HDAZ

Shell Tellus Hydraulic Oils
Mobil D.T.E. 20 Series
Chevron EP Hydraulic Oils
Exxon Univis N Hydraulic Oils

Note: When using this equipment in environmentally sensitive areas we recommend using biodegradable oil such as Chevron Clarity or Exxon Univis Bio 40.

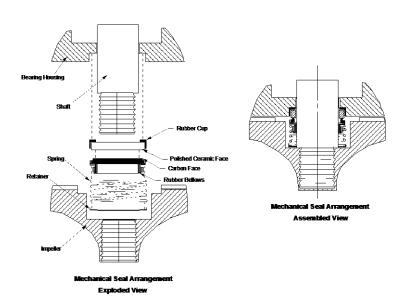
- 4. Check oil level in the bearing housing every 250 hours. The level should be at the spill point of the fill plug (#15 upper). Do not overfill!
- 5. Change oil in the bearing housing every 1000 hours. Use approximately 16 ounces of clean hydraulic oil or non-detergent 10W or 20W motor oil. (See Note @ 3. above)
- 6. Slight discoloration of the oil in the bearing housing is normal. This is due to the wearing of the carbon face seal.
- 7. Presence of water or emulsified oil in the bearing housing indicates immediate need for seal replacement and inspection of bearings.

Disassembly:

- 1. Hydraulic motor (#4). Because of its extremely long life, close tolerances, high efficiency and the relatively low cost of a new motor, it is more economical to replace than to rebuild.
- 2. Remove (8) bolts (#7 and 14) holding the lifting bracket (#6) and bearing housing (#13) to the volute (#28) and lift the complete drive assy. out of the volute.
- 3. Check the volute wear ring (#26) for wear. If worn excessively (deeply grooved), remove ring by using a puller or by tapping ring upward from inside the volute. Replace the ring if required.
- 4. Check condition of "O" rings (#20 and #27) and replace if necessary.
- 5. Remove (4) bolts (#5) holding hydraulic motor to bearing housing and remove motor. Inspect "O" ring (#8).
- 6. Place a drain pan on flat surface and turn bearing housing (#13) upside down to drain oil from housing (or remove drain fill / drain plugs (#15) to drain)
- 7. Secure the shaft from turning by locking it with shaft retaining tool. (Part #0609001) or suitable alternative tool.
- 8. Remove impeller locking screw (#25) and retaining washer (#24) and unscrew impeller (#23) counter-clockwise.
- 9. Inspect impeller for wear and inspect wear plate (#21) for excessive wear. Replace if severely worn.
- 10. Remove shaft seal assembly (#22) and inspect for wear. Seal should be replaced whenever disassembling for repair.
- 11. Remove snap ring (#9) and remove shaft (#11) and bearings (#10) as an assembly by pressing out of housing from the bottom upwards.
- 12. Visually inspect shaft, bearings, O rings (#12), and inside of bearing housing. Replace if any of these show signs of wear.
- 13. If bearing replacement is necessary, use adequate bearing puller or press. Do NOT use heat to remove bearing from shaft.

Assembly:

- 1. Install (4) O rings (#12) into bearing housing grooves and lightly lubricate with white grease or rubber lube.
- 2. If required, press bearings onto shaft. Lubricate bearing surfaces with oil
- 3. Install shaft and bearing assy. into bearing housing. Push down by hand or lightly tap the shaft assy. into place.
- 4. Install the snap ring (#9) into the housing just above the upper bearing. The shaft should rotate freely by hand.
- 5. Attach the wear plate (#21) to the bearing housing and secure with 3 bolts (#18) and 1 vent bolt (#19)
- 6. Install the mechanical seal (#22). Be sure the seal is kept <u>extremely</u> clean at all times. Be careful not to scratch sealing surfaces. Install the stationary ceramic seal seat into the rubber boot carefully to be sure rubber is seated properly. Lubricate the rubber boot and press the stationary part of the seal into the cavity on the bottom of the bearing housing. Install the rotating seal cartridge onto the shaft carefully using oil to lubricate the carbon face and the rubber bellows. Be sure carbon face of cartridge contacts smooth side of ceramic seat. (See Illustration)



7. Install the impeller (#23) slowly to be sure it contacts the seal evenly and applies pressure properly to seat the seal assembly. Tighten the

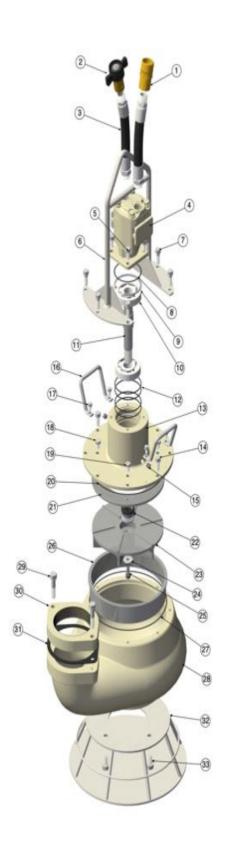
- impeller snugly by hand and use an adjustable wrench to firmly tighten into place.
- 8. Install retaining washer (#24) and locking screw (#25) and tighten to 40 Lb-Ft torque.
- 9. Install O ring (#27) onto wear ring (#26).
- 10. Apply anti-seize compound to the outside surface of the wear ring and slide the wear ring into the volute (#28).
- 11. Install O ring (#20) onto the outside diameter of the wear plate.
- 12. Install the complete drive assy. (bearing housing with shaft and impeller) in to the top of the volute. Install 2 bolts (#14) to keep the unit together but do not tighten at this time.
- 13. Install lower oil drain plug (#15). Leave upper plug out for now.
- 14. Install strainer base (#32) and attach with 4 bolts (#33). Tighten to 60 Lb-Ft torque.
- 15. Install flange gasket (#31) and discharge flange (#30) and secure with 2 bolts (#29). Tighten to 60 Lb-Ft torque.
- 16. Make sure the pump is standing upright on the strainer base.
- 17. Slowly pour lubricating oil (approximately 16 oz.) into the opening in top of the bearing housing (onto the shaft and bearings) until oil appears to spill out of the upper oil-plug hole. Stop filling with oil and install the oil plug. (See the Preventive Maintenance section above for proper oil to be used)
- 18. Install the O ring (#8) onto the hydraulic motor pilot and install the hydraulic motor (#4) onto the bearing housing and secure with 4 bolts (#5). (See the parts illustration for proper motor orientation).
- 19. Install the lifting bracket (#6) and attach with 6 bolts (#7). Tighten these bolts and 2 bolts (#14) at this time. Tighten to 40 Lb-Ft torque.

- 20. Install the pigtail hoses (#3) with quick-disconnect couplings (#1 and 2) onto the hydraulic motor and tighten into place. (See the parts illustration for the proper orientation of the quick-disconnect couplings).
- 21. Install handles (#16 if equipped) onto the bearing housing and attach with 4 bolts (#17). Tighten to 15 Lb-Ft torque.

NOTES:

Anti-seize lubricant should be used on all fasteners when reassembling pump (not on bearings or seals!).

Before submersing pump, test run on dry land. Check for proper rotation of impeller. (Counter-clockwise looking into volute inlet) If connected wrong, the pump will run backwards and pump water, though at noticeably lower volumes.



PARTS LIST S6T and S6TDI Pump With Series 2 Bearing Housing (Always mention serial # of unit when ordering parts)

| Item | Part # | Description |
|------|--------------|--|
| 1. | PP0000\0182 | 1" Threaded Quick Disconnect Hose Coupler (Male) |
| | | Pressure side |
| 2. | PP0000\0184 | 1" Threaded Quick Disconnect Hose Coupler (Female) |
| | | Return side |
| 3. | CH0000\0146 | Pigtail Hose Assembly 1" (2 req.) |
| 4. | PP0000\0291 | Hydraulic Motor |
| 5. | PP0000\0155 | Hex Bolt, 1/2" x 1-1/4", w/lock-washer 0153 (4 req.) |
| 6. | PP0000\0290 | Lifting Bracket |
| 7. | PP0000\1116 | Hex Bolt, 1/2" x 1-1/2", w/lock-washer 0153 (6 req.) |
| 8. | PP0000\0156 | O-ring |
| 9. | PP0000\0157 | Snap-ring |
| 10. | PP0000\0158 | Bearing, upper or lower (2 req.) |
| 11. | SP0047\0159 | Shaft |
| 12. | PP0000\0156 | O-ring (4 req.) |
| 13. | FC0133\0151A | Bearing housing (Aluminum) |
| - | FC0027\0227 | Bearing housing (Ductile Iron) |
| 14. | PP0000\1116 | Hex Bolt, 1/2" x 1-1/2", w/lock-washer (2 req.) |
| 15. | PP0000\6711 | Fill / Drain Plug (2 req.) |
| 16. | PP0000\2164 | Handle (2 req.) if equipped |
| 17. | PP0000\9318 | Hex Bolt, 3/8" x 3/4", w/lock-washer 9315 (4 req.) if equipped |
| 18. | PP0000\0166 | Hex Bolt, 1/2" x 3/4", stainless (3 req.) |
| 19. | SP0002\0287 | Vent Screw (1 req.) |
| 20. | PP0000\0168 | O-ring, wear plate |
| 21. | PP0000\0167 | Wear plate |
| 22. | PP0000\0169 | Seal Assembly (Carbon / Ceramic) Std. |
| | PP0000\3169 | Seal Assembly (Silicon Carbide) Opt. |
| 23. | PP0000\0160 | Impeller |
| 24. | PP0000\0173 | Cone Washer |
| 25. | PP0000\0174 | Impeller Locking Screw, 1/2" x 1-1/4", stainless |
| 26. | FC0018\0171 | Wear ring |
| 27. | PP0000\0168 | O-ring, wear ring |
| 28. | FC0015\0165 | Volute (Aluminum) |
| - | FC0125\0224 | Volute (Ductile Iron) |
| 29. | PP0000\0175 | Hex head bolt, 5/8" x 3", w/lock-washer 0176 (2 req.) |
| 30. | FC0001\0170 | Discharge flange |
| | FC0028\0228 | Discharge flange (Ductile Iron) |
| 31. | PP0000\0177 | Gasket, discharge flange |
| 32. | PP0000\0293 | Strainer Base |
| 33. | PP0000\0179 | Hex Bolt, 5/8 x 1", w/lock-washer 0176 (4 req.) |

Optional Parts Not Illustrated S6T and S6TDI Pump

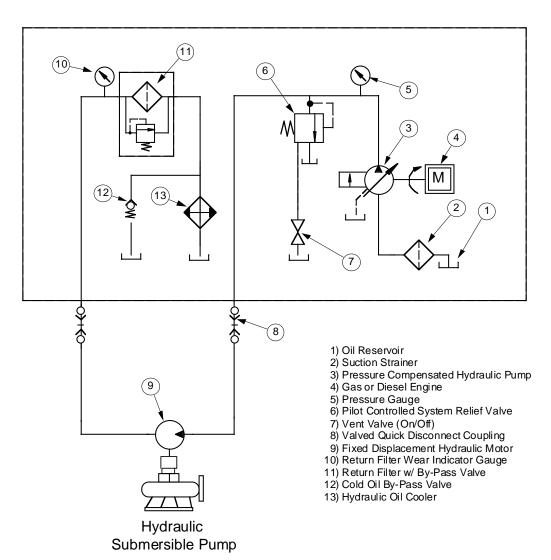
Part # Description

| PP0000\0183 | Dust cover for 0182 Quick-disconnect Coupling |
|--------------|---|
| PP0000\0185 | Dust cover for 0184 Quick-disconnect Coupling |
| SP0048\0181 | Silt Jetting Ring |
| SP0001\9001 | Shaft Securing Tool |
| PP0000\10099 | 6" Cam-lock Male Fitting (Part "F" Aluminum) |
| PU0256\1239 | Motor Seal Kit |
| PP0000\1139 | Motor Lip Seal |

TYPICAL HYDRAULIC SCHEMATIC

for Hydraulic Submersible Pump with Engine Driven Power Unit

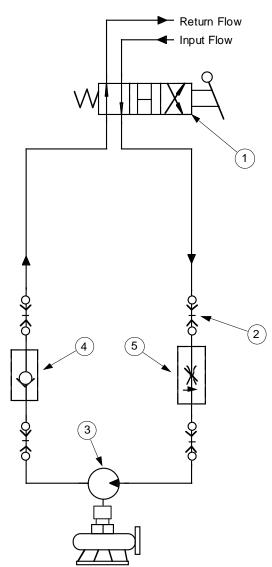
(Pressure Compensated Hydraulic Pump)



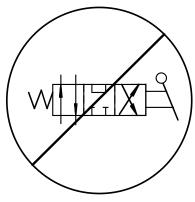


TYPICAL HYDRAULIC SCHEMATIC

for Customer Supplied Hydraulic Power Source



Hydraulic Submersible Pump



Do Not use Closed Center Valves

Return flow from the hydraulic motor must be allowed to return to the oil reservoir to enable the pump impeller to gradually slow to a stop. Blocking this flow will cause damage to the hydraulic motor and pump seal!!

- Way Open Center Directional Valve
 (Must by operated in forward direction only or use check valve (4) to prevent reversing)
- 2) Valved Quick Disconnect Coupling
- 3) Hydraulic Motor Driving Submersible Pump
- 4) Check Valve (Recommended)
- 5) Flow Control (Recommended if the hydraulic flow is greater than the flow required by submersible pump)





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Hydra-Tech Pumps Limited Warranty Submersible Pumps Only

Hydra-Tech Pumps warrants to the original purchaser only that this product is free from defects in material and workmanship, and agrees to repair or replace, at Hydra-Tech's option, any submersible pump part found to be defective within **24 months from the date of purchase.**This warranty is not transferable.

THIS WARRANTY DOES NOT COVER DAMAGES RESULTING FROM CARELESS HANDLING, IMPROPER INSTALLATION, LACK OF SERVICE, INCORRECT POWER OR FAULTY APPLICATION SUCH AS PUMPING ABRASIVES, CORROSIVES, OR FLUIDS IN EXCESS OF 160 DEGREES F. WARRANTY COVERAGE IS NORMALLY NOT AVAILABLE FOR WEAR ITEMS SUCH AS: Wear Rings; Wear Plates; Impellers, and Mechanical Seals.

Any modification or alteration of this equipment will void the warranty. Any claim for warranty damage must be accompanied by digital photos of the defective part or parts, the serial number from the equipment, and a detailed description of the defect and possible causes. All warranty claims should be emailed to httpump@hydra-tech.com or mailed to Hydra-Tech Pumps, 167 Stock Street, Nesquehoning, Pennsylvania 18240 USA.

Submersible Pumps judged by Hydra-Tech Pumps to have been defective in workmanship or materials when shipped from the factory and within the warranty period will be either repaired or replaced at Hydra-Tech's option free of charge including motor freight both ways, within the continental United States.

HYDRA-TECH MAKES NO WARRANTY EXPRESSED OR IMPLIED INCLUDING WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE EXCEPT AS STATED ABOVE. HYDRA-TECH SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING CONSEQUENTIAL DAMAGES ARISING OUT OF ANY BREACH OF WARRANTY AND WHETHER OR NOT ARISING OUT OF OR BASED ON HYDRA-TECH'S NEGLIGENCE, WHETHER ACTUAL OR IMPLIED, AND FOR DAMAGES TO ANY PROPERTY OR PERSON ARISING OUT OF THE PURCHASE OR THE USE, OPERATION OR MAINTENANCE OF THE EQUIPMENT. HYDRA-TECH SHALL NOT BE RESPONSIBLE FOR REPAIRS OR ALTERATIONS MADE BY OTHERS.

No person is authorized to make any representations or warranties on behalf of Hydra-Tech and no other person is authorized to alter or extend any of the conditions contained in this warranty.

December 2016

