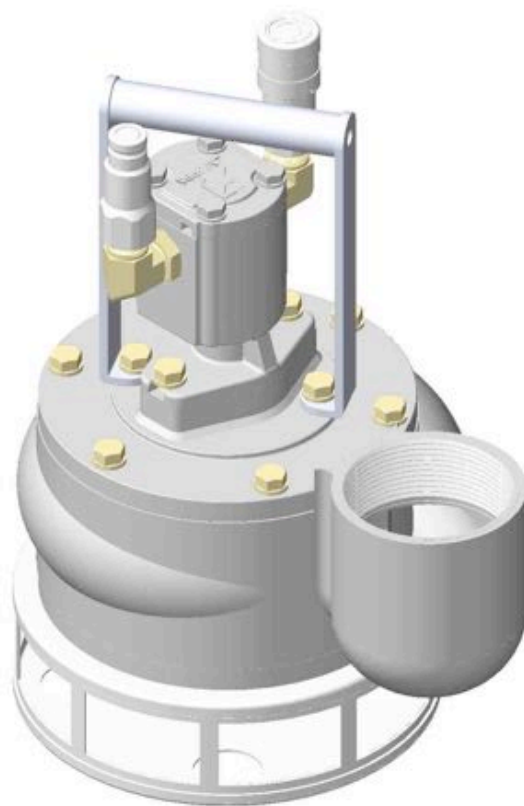




Maintenance Instructions  
Parts List

S3TAL and S3TDI Pump



167 Stock Street, Nesquehoning, PA 18240 Phone: 570-645-3779 Fax: 570-645-4061

Website: [www.hydra-tech.com](http://www.hydra-tech.com)

E-Mail: [htpump@hydra-tech.com](mailto:htpump@hydra-tech.com)

## 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.

#### **⚠ DANGER**

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

#### **⚠ WARNING**

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

#### **⚠ CAUTION**

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

#### **⚠ WARNING**

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

#### **⚠ WARNING**

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.

#### **⚠ WARNING**

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

#### **⚠ WARNING**



Skin injection hazard:

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.




**HYDRA-TECH  
PUMPS**

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## IMPORTANT SAFETY INFORMATION

	<p><b>⚠ WARNING</b></p> <p>Wear eye protection when operating or servicing this tool.</p> <p>Failure to wear eye protection could result in serious eye injury from flying debris or hydraulic oil.</p>
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<p><b>⚠ WARNING</b></p> <p>Do not exceed the maximum hydraulic flow, pressure relief or back pressure listed in the Specifications and Parts manual.</p> <p>Failure to observe this warning could result in severe injury or death.</p>
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<p><b>⚠ WARNING</b></p> <p>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.</p>
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<p><b>⚠ CAUTION</b></p> <p>Hydraulic oil can cause skin irritation.</p> <ul style="list-style-type: none"><li>• Handle the tool and hoses with care to prevent skin contact with hydraulic oil.</li><li>• In case of accidental skin contact with hydraulic oil, wash the affected area immediately to remove the oil.</li></ul> <p>Failure to observe these precautions may result in injury.</p>
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<p><b>IMPORTANT</b></p> <p>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.</p>
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<p><b>IMPORTANT</b></p> <p>Procedure for disconnecting hydraulic hoses, fittings or components:</p> <ol style="list-style-type: none"><li>1. Move the flow lever on the hydraulic power source to the OFF position.</li><li>2. Stop the power source.</li><li>3. Follow the sequence under Disconnecting Hoses to prevent pressure buildup. In case some pressure has built up, loosen hoses, fittings or components slowly.</li></ol>
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# HYDRAULIC POWER UNIT SAFETY PRECAUTIONS

Hydraulic Power Unit operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the power unit 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 hydraulic power units 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 power unit 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 power unit 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 power unit.
- Do not inspect or clean the hydraulic pump or hydraulic tool while the hydraulic power source is engaged. Disconnect both hydraulic hoses before attempting to clean or inspect the pump or hydraulic tool. Accidental engagement of the power unit can cause serious injury.
- Always disconnect the battery cable before attempting any repair.
- Do not operate this power unit without first reading and understanding the Operating Instructions.
- Never operate the power unit near energized transmission lines. Know the location of buried or covered services before starting work.
- Do not wear loose fitting clothing when operating the power unit. Loose fitting clothing may get entangled with the power unit and cause serious injury.
- Supply hoses must have a minimum working pressure rating of 3000 psi/204 bar.
- The hydraulic circuit control valve must be in the "OFF" position when coupling or uncoupling the hydraulic hoses. 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 power unit at oil temperatures above 140° F/60° C. Operation at higher oil temperatures can cause operator discomfort and may cause damage to the equipment.
- Do not operate a damaged, improperly adjusted, or incompletely assembled power unit.
- To avoid personal injury or equipment damage, all power unit repair, maintenance and service must only be performed by authorized and properly trained personnel.
- Do not exceed the rated limits of the power unit or use the power unit for applications beyond its design capacity.
- Always keep critical power unit 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 area near the cooling fan and belts while the power unit is running.
- Only lift the power unit by the lifting bracket and be sure the lifting equipment is suitable for the rated weight of the power unit. Do not lift with hydraulic hoses attached.
- Do not touch the engine, exhaust piping, or muffler – these surfaces are hot and will burn you. Keep any flammable material away from these surfaces.
- When moving power units mounted on trailers always insure that the towing vehicle is suitable for the weight of the power unit. Always insure that the safety chains are securely fastened to the tow vehicle and the trailer lights are operating properly.
- **DO NOT OPERATE THIS POWER UNIT NEAR FLAMMABLE LIQUIDS OR FLAMMABLE VAPORS OR GASES.**

# POWER UNIT OPERATION

## PREOPERATION PROCEDURES

### CHECK HYDRAULIC EQUIPMENT BEING OPERATED

1. Make sure the power unit hydraulic flow and pressure are appropriate for the equipment being powered. Flow and/or pressure in excess of the maximum rated flow of the equipment will damage the equipment.

### 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.  
2. Connect the hoses from the power unit to the couplers on the equipment being operated. 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.

## POWER UNIT OPERATION OVERVIEW

1. Observe all safety precautions.
2. Fill hydraulic reservoir to sight glass with specified hydraulic fluid. Use only biodegradable oil in any environmentally sensitive area.
3. Check engine fluid levels and fill engine fuel tank.
4. Connect hydraulic hoses from the power unit to the equipment being operated. **Be sure to completely connect the hydraulic couplings or damage will result to the hydraulic system.** Insure that the pressure and return hoses are connected to the correct port. Always be sure the connections are clean before assembling.
5. Turn hydraulic control valve counter-clockwise until the handle rotates freely. This de-energizes the hydraulic system to permit easy starting of the engine and also allows the operator to turn off the pump without stopping the engine.
6. Insure that any equipment being powered by the power unit is turned off so it will not start unexpectedly.
7. Start the engine and allow it to warm up for a few minutes before engaging the hydraulic system.
8. Turn the hydraulic control valve clockwise until it stops. This energizes the hydraulic system. **Do not attempt to use the hydraulic control valve to regulate hydraulic pressure – this valve is on/off only.**
9. Engine speed may be adjusted to provide appropriate flow to the equipment being operated. **Never exceed recommended operating pressure!**
10. To stop the power unit you must first de-energize the hydraulic system (turn hydraulic control valve counter-clockwise).
11. To stop the hydraulic power unit slow the engine down before stopping the engine.
12. Always recheck the level of the hydraulic fluid. Filling the hydraulic hoses during initial start-up will cause the hydraulic fluid level to drop slightly.

## **COLD WEATHER OPERATION**

If the power unit is to be used during cold weather, preheat the hydraulic fluid by operating the power unit at low 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 equipment 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 hydraulic hoses. 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 and RETURN hose are connected correctly. Do not reverse circuit flow. This can cause damage to internal seals of equipment being powered.
- 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/204 bar.
- Do not exceed the rated flow or pressure (refer to Specifications in this manual for correct flow rate and pressure). If specifications are exceeded, rapid failure of the internal seals may result.
- Always keep critical labels and markings, such as warning stickers and tags legible.
- Power Unit repair should be performed by experienced personnel only.
- Make certain that the recommended relief valves are installed in the pressure side of the system.

## Operating Instructions

### S3T and S3TDI Pump

1. Connect this pump to an open center hydraulic power source rated at a maximum flow of 8 G.P.M. (30 LPM) at 2500 P.S.I. (170 Bar). If you are connecting to a larger power source or are using a bi-directional control valve, a flow control and/or check valve may be required. **Over-speeding or reversing flow to this pump will cause damage to the unit and will void warranty.**
2. Always be sure to use only clean, filtered hydraulic oil to drive the hydraulic motor. Your hydraulic system should have a filter and it should be rated at 10 micron.
3. When connecting hydraulic hoses to the pump, be sure to keep hose connections clean.
4. 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, Terresolve EnviroLogic 146, or Exxon Univis Bio 40.**

**Note: When using this equipment in high temperature environments we recommend using Dexron Automatic Transmission fluid.**

## MAINTENANCE INSTRUCTIONS

### S3T and S3TDI Pump

#### GENERAL:

The only routine maintenance required under normal use is to check oil in seal cavity in top cover (#10). This oil is to be 20W hydraulic oil (approx. 1 oz. of Pennzoil AW46 or equivalent or **Dexron Automatic Transmission fluid**). Change oil every 200 hours of operation. If no oil is present or oil is emulsified, shaft seal may need replacement.

#### **Further maintenance may be required if:**

- (a) Pump discharge volume is inadequate.
- (b) Oil leakage from pump is present.

#### **If maintenance is necessary, follow this procedure:**

1. Remove six 3/8" bolts (#11) From top cover.
2. Remove top cover and motor assembly from volute (#3).
3. Check condition of "O" ring (#9) and replace if necessary.
4. Check for debris in the volute.
5. Check wear ring (#4). Replace if wear is excessive.
6. Hold impeller (#7) securely and remove socket head retaining screw (#5) and cone washer (#6) from impeller end.
7. Using a 5/16" hex key wrench, or hex key socket with impact wrench, unscrew impeller (#7) (right hand threads).
8. Check impeller for wear and replace if necessary.
9. Remove 2 bolts (#21) from handle (#20) and remove.
10. Remove mechanical seal assy. (#8)
11. Remove 2 motor mounting bolts (#15) from top cover and carefully remove the hydraulic motor (#14).



12. Inspect "O" ring (#13) and replace if necessary.
13. Check top cover (#10) for wear and replace if wear is extreme.
14. Do not disassemble the hydraulic motor (#14). If the hydraulic motor needs service, it should be performed by a qualified Hydra-Tech service representative or replaced.
15. To re-assemble pump, reverse order of disassembly.
16. Fasten motor to top cover making sure the "O" ring (#13) is in place.
17. Install new shaft seal (#8) keeping the parts extremely clean and using clean grease to aid in installation.
18. Screw impeller onto shaft and lightly tap on vane to tighten.
19. Install cone washer and socket head screw and tighten while holding impeller firmly.
20. Install drive assembly into volute making sure "O" ring (#9) is in place. Install six 3/8" bolts (#11) for top cover to volute.
21. Install handle.
22. Fill oil chamber in top cover (approx. 1 oz./30mL) and install oil plug (#12).
23. Connect hydraulic hoses to power unit and test spin pump before using to check for leaks.

Hydraulic Motor Shaft

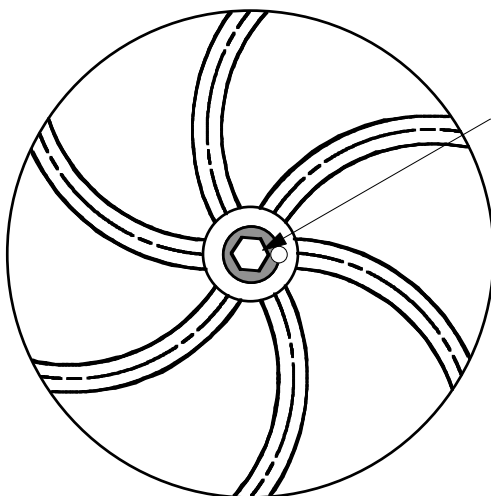
Retaining Washer

Motor Shaft threads into  
impeller and stops at insert

Locking Screw

5/16" Hex Tool

Air Impact Wrench



Insert is locked and pinned to impeller and becomes part of impeller.

Use 5/16" Hex tool and impact wrench to remove impeller from motor shaft (unscrew counter-clockwise).

Impeller Removal- S3T,S3TR,S3TC Pumps

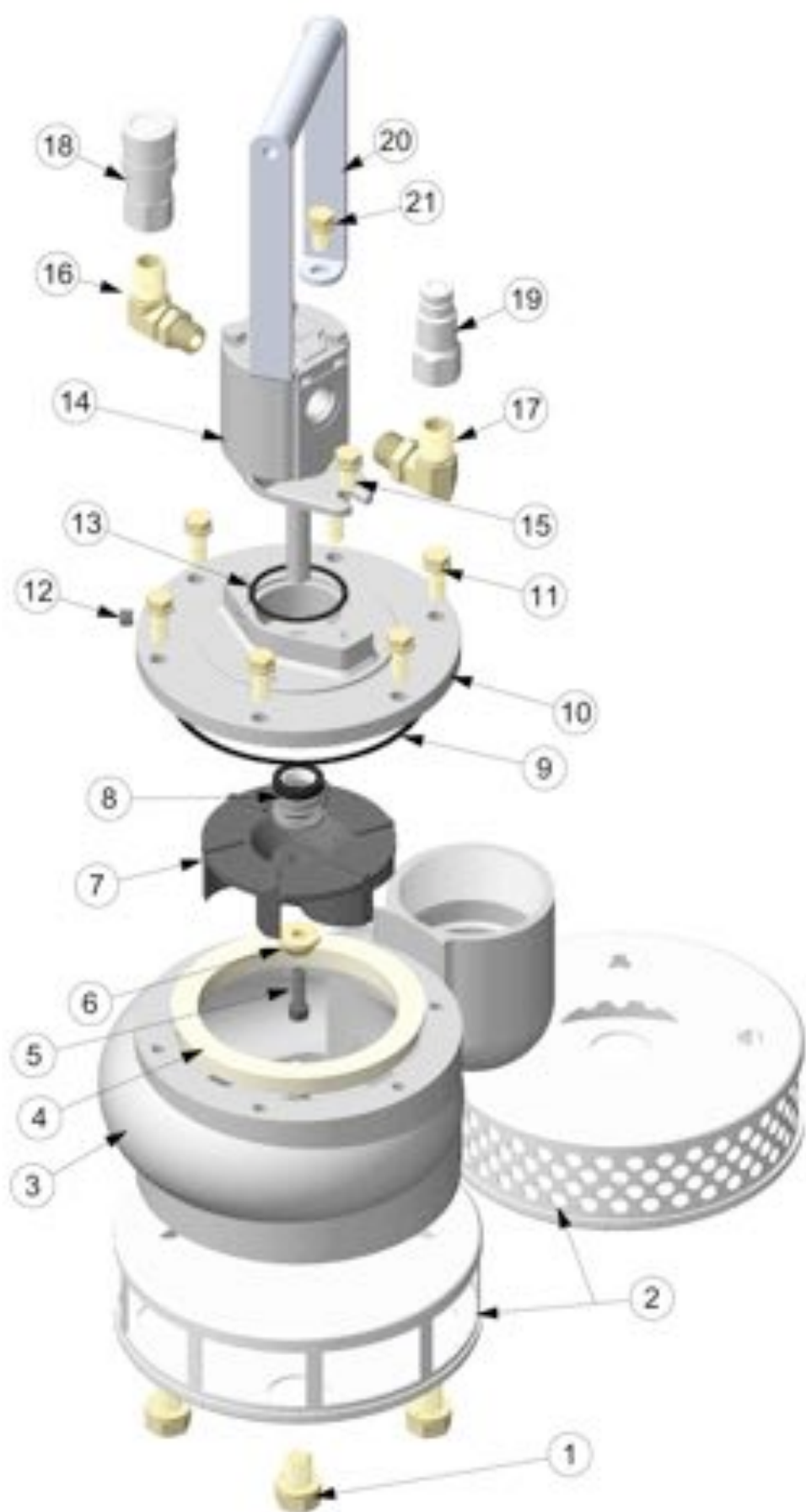


7/30/05

K.R. 

Scale: 1" = NTS

Drawing#507301



## PARTS LIST

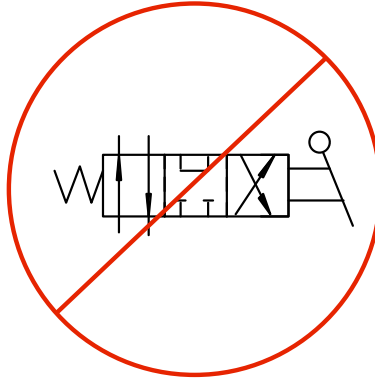
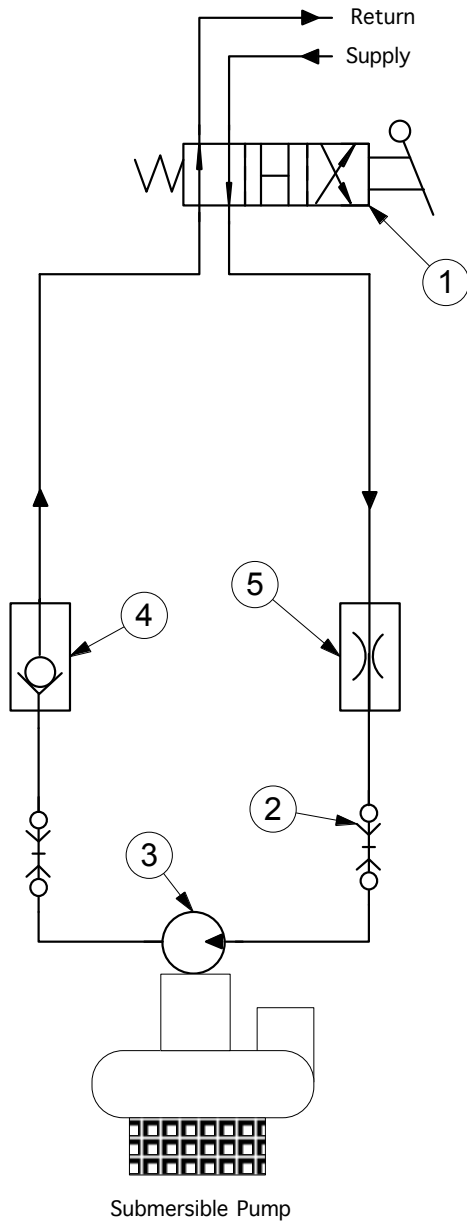
### S3T and S3TDI Pump Always mention serial # of unit when ordering parts

Item	Part #	Description
1.	9300 9301	Hex Head Bolt (4 req.) Lock-washer (4 req.)
2.	9302 9295	Strainer/Trash (Standard) Strainer/Water with Plugs (Optional)
3.	9303 9488	Volute (Aluminum) Volute (Ductile Iron)
4.	9305	Wear Ring
5.	9307	Impeller Retaining Screw, Socket Head
6.	9308	Cone Washer
7.	9309	Impeller
8.	9311 9527	Shaft Seal Assembly (Mechanical Seal) Viton (Optional)
9.	9312 9312V	"O" Ring, Top Cover Viton (Optional)
10.	9313 9490	Top Cover (Aluminum) Top Cover (Ductile Iron)
11.	9314 9315	Hex Head Bolt (6 req.) Lock-washer (6 req.)
12.	9317	Oil Plug
13.	9316 9316V	"O" Ring, Motor Viton (Optional)
14.	9324 9324A 9324P	Hydraulic Motor (Dan) Hydraulic Motor (Cas) Hydraulic Motor (Par)
15.	9318 9315	Hex Head Bolt (2 req.) Lock-washer (2 req.)
16.	9323M	Male Elbow (Pressure Side)
17.	9325M	Male Elbow (Return Side)
18.	9321	Hydraulic Coupling, Female H.T.M.A.
19.	9320	Hydraulic Coupling, Male H.T.M.A.
20.	9319	Handle
21.	9318 9315	Hex Head Bolt (2 req.) Lock-washer

### Accessories (Not Illustrated)

Part #	Description
9204	Flow Control (6 GPM) 1/2" NPT
9226	Flow Control (8 GPM) 1/2" NPT
9208	Check Valve, 1/2" NPT (prevents reverse flow)

## TYPICAL HYDRAULIC SCHEMATIC FOR CUSTOMER SUPPLIED HYDRAULIC POWER SOURCE



### 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!!

- 1) 4 Way Open Center Directional Valve  
(Must be 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 Hydraulic Flow is Greater than Flow Required By Sub. 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 [htpump@hydra-tech.com](mailto:htpump@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.

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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

