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# Installation, Operation and Maintenance Manual



## Stancor S & P Series Dewatering Pumps



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## Safety Guidelines:

This instruction manual provides you with the information required to safely own and operate your product.

Retain these instructions for future reference.

The product you have purchased is of the highest quality workmanship and material, and has been engineered to give you long and reliable service. This product has been carefully tested, inspected, and packaged to ensure safe delivery and operation. Please examine your item(s) carefully to ensure that no damage occurred during shipment.

If damage has occurred, please contact the place of purchase. They will assist you in replacement or repair, if required.

**READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR SERVICE YOUR PRODUCT. KNOW THE PRODUCT'S APPLICATION, LIMITATIONS, AND POTENTIAL HAZARDS. PROTECT YOUR-SELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!**



### **WARNING: RISK OF ELECTRIC SHOCK.**

To reduce the risk of electric shock, be certain that the pump is connected only to a properly grounding type circuit.

When a pump is in a basin, do not touch motor, pipes or water until the power supply is disconnected.

If your installation has water or moisture present, do not touch wet area until all power has been turned off.

Failure to follow this warning can result in fatal electrical shock.

The flexible jacketed cord assembly mounted to the pump must not be modified in any way, with the exception of shortening the cord to fit into a control panel.

Any splice between the pump and the control panel must be made within a junction box and mounted outside of the basin, and comply with the National Electrical Code.

Do not use the power cord for lifting the pump.

The equipment grounding lead is the conductor with a green or green with yellow stripes insulation.

Read all instructions and Safety Guidelines thoroughly. Failure to follow the guidelines and instructions could result in serious bodily injury and/or property damage.

**DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.**

During normal operation this pump is immersed in water. Also, during rain storms, water may be present in the surrounding area of the pump. Caution must be used to prevent bodily injury when working near the pump. Electrical power should be disconnected prior to touching, servicing or repairing the pump.

Do not run the pump in a dry basin. If the pump is run in a dry basin, the surface temperature of the pump will rise to a high level. This high temperature could cause skin burns if the pump is touched and will cause serious damage to your pump.

## Description:

The "P", "S" and "SX" series are submersible electric, centrifugal pumps. They are manufactured to be rugged, portable and easily moved by two men or a small truck crane. The seal housing contains lubrication oil for the mechanical seals.

These pumps are capable of operating with the motor housing partially exposed for limited periods of time, providing sufficient motor cooling and seal lubrication. However, for the best cooling and longest motor life, the liquid level being pumped should normally be above the top of the motor housing.

## Versions:

This line of pumps are manufactured for use as a standard dewatering pump or as an "MSHA Approved" explosion proof dewatering type for use in gassy mines as approved by MSHA.

## Capacity:

All models are available in two executions, High Volume (HV) or High Head (HH). By converting a pump from HV to HH execution (or vice versa) the pump can be used within a broader field of head and flow conditions.

## Motor Protection:

The pump has a built-in contactor with overload relay. Furthermore there are two thermal protection contacts in the stator windings. The thermal protection contacts open at **130°C (265°F)** and the motor stops.

**A Stancor control box, or approved equal must be used to support warranty claims.**

## Power Supply Cable\*:

Stancor uses CSA, UL, and MSHA approved submersible cable as standard on all models. Standard length is 50 feet, custom lengths and gauges are available. When replacing pump cable always use Stancor approved cable to ensure the integrity of the sealing gland.

**\*MSHA Approved Pumps must use MSHA Approved cable!**

## Application:

Clear or abrasive laden water.

## Temperature of Water:

Temperature of water pumped should not exceed 104°F (+ 40°C).

## Depth of submersion:

The operating depth should not exceed 82 feet (25 meters). In certain cases, however, the pump may be able to work at greater submersion depths, please contact the factory for special directions.

## Material Specifications:

Motor housing and top cover are made of aluminum. Discharge connection, impellers strainer, shaft and all external hardware is stainless steel. Wearing parts are made of especially wear resistant synthetic rubber. Other materials of construction may be available for special applications, please consult factory.

Other materials of construction may be available for special applications, please consult factory.

## Principle of Operation:

The impeller draws water through the strainer. The vanes of the impeller impart energy to the water forcing it through the diffuser and along the wall of the motor housing to the outlet at the discharge hose connection. The motor is effectively cooled by the water flow.

## Handling:

Lift the pump by its handle.

**Never by the motor cable, severe personal injury may occur as well as damage to the pump assembly.**

## Location:

Make sure that the pump is not digging itself into sand or clay. Place the pump on a firm base or suspend it by the handle in some way above the bottom of the pit, ditch etc. Such a location will prevent unnecessary wear on the wear parts.

## In Cold Weather:

The pump will not freeze as long as it is running or is fully submerged in water. If the pump is taken out of water and is stored at low temperature the impeller may freeze. Therefore, keep the pump submerged in water and let it thaw before it is started up again. Never use a blow torch for thawing because the rubber coated parts and the O-rings inside the pump may become damaged.

## Cleaning:

Thoroughly flush the pump with clear water if it has been pumping clay, cement or abrasive laden water. The contaminants may solidify and lock the impeller or block the flow passages, with a resultant loss of performance.

## Storage:

After flushing and draining, store the pump in a dry place if the pump is not to be run for long periods of time.

## Accessories:

If one pump is not sufficient for reaching the head required or the water flow volume desired, several pumps can be connected in series or parallel connected.

### Series Connection of Pumps

By connecting the discharge on one pump to the inlet of another pump by means of an accessory adaptor, the pumps can be series "staged". Two or more pumps can be used in this manner. The volume output will be equivalent to one pump but their combined head will be the sum of the heads of the total number of pumps used.

### Parallel Connection Pumps

When pumps are parallel connected, two or several pumps are connected to a common discharge pipe. Between each pump and the common discharge pipe there is a non-return valve that can be shut off. The water flow volumes of each of the pumps will be added together, but the maximum head will equal that of a single pump.

### HH/HV Conversion Kit

A conversion kit to change a high volume pump to a high head pump (high head kit) or vice versa (high volume kit) is available. The kit comprises impeller, impeller disc and diffuser(s) as well as necessary mounting parts. Parts and quantities are specified in the spare parts list (compare designations HV and HH)

## Protection against corrosion/erosion

The pumps can be equipped with zinc anodes to prevent galvanic corrosion when used in brackish or salt water. The protection adds considerably to the life of the pump in corrosive surroundings, but is not permanent and regular maintenance is therefore necessary. The zinc anodes are fastened with bolts onto the strainer of the pump and can be fitted to all pump models.

Hardcoat/Teflon® is also available for applications that require an abrasive resistant finish. Consult factory for specific applications.

## Operation:

**Check that the power is off and line disconnected before working on pump.**

### Electrical Connections:

Check that the line voltage corresponds to the rated voltage marked on the data plate of the pump. The pump can be supplied with various motors either for 230, 460, 575 or 950 volts 60 Hz.

**Other voltages and Hz can/may be supplied by special request. Contact an authorized distributor or Stancor for assistance. Always have the pump serial number available.**

### How to Change Voltage Connections:

Stancor uses motors wound for a specific single voltage only.

**No changes can be made to the motor winding leads to connect to an alternate voltage.**

When a pump motor connected for 460 volts is going to be used for 230 volts, the stator must be changed and the overload relay (item 92) must be replaced. Contact an authorized repair facility or Stancor for assistance.

**Certain custom applications may have dual voltage motors, consult factory for assistance.**

## Before starting:

Check that the oil is clean and at the specified level.

Remove the fuses or open the circuit breaker and check that the impeller can be rotated by hand.

Check that the monitoring equipment (if any) works.

Check the direction of rotation. See Checking Direction of Motor Rotation (Figure 1).

All electrical work shall be carried out under the supervision of an authorized electrician.

Local codes and regulations shall be complied with.

Check that the supply voltage and frequency agree with the specifications of the pump data plate.

**Under no circumstances may the starter equipment be installed in the pump pit.**

Install the motor cable and the control cable as illustrated in the wiring diagrams. Make sure that the fuses or circuit breakers are of the properly sized for the pump amperage.

**The starting surge with the direct-on line start can be up to six times higher than the rated current.**

Fuse amperage / circuit breaker settings and cable shall be selected in accordance with local rules and regulations.

**With long cables, the voltage drop in the cable must be taken into consideration, since the motor's rated voltage is the voltage that is measured at the terminal board in the pump.**

The overload protection (motor protection breaker) shall be set to the motor's rated current as given on the data plate.

## Checking Direction of Motor Rotation:

Suspend, tilt or lay down the pump and start it. When it starts a heavy kick should be felt and seen in a **counter clockwise direction** (direction of arrow cast into the pump top cover) if the motor is correctly connected. See figure 1.

If the kick appears in the opposite direction, clockwise, reconnect by switching two of the power cable leads in the control box (three phase only).

**Check that the power is off before working on the pump.** Check the direction of motor rotation after every new connection is made, after a phase failure or a motor replacement.

**If the motor rotates in the wrong direction, the pumping capacity is decreased and the motor will be overloaded due to impeller flow dynamics. It is very difficult to determine the direction of rotation by watching the discharge flow of water or through pump amp draw readings!**

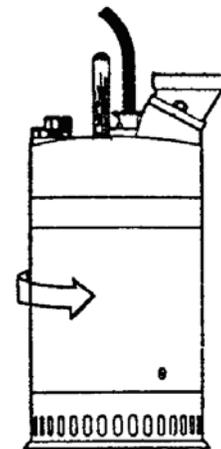


Figure 1- Start Rotation

## Pump installation:

Run the cables so that they do not have any sharp bends and are not pinched.

Connect the discharge connection and motor cable. See "Electrical connection".

Check for proper rotation

Lower the pump into the sump.

Place the pump on a base which will prevent it from sinking into a soft sump bottom.

Alternatively, the pump can be suspended by its handle just above the sump bottom.

## Care and Maintenance:

**Before starting work on the pump, make sure that the pump is isolated from the power supply and cannot be energized.**

### Inspection:

Regular inspection and preventive maintenance ensure a more reliable operation. The pump should be inspected after 2,000 hours of operation, more frequently under severe operating conditions. Under normal operating conditions, the pump should have a major overhaul in a service shop at least once a year.

This requires special tools and should be done by an authorized service facility.

When the pump is new or when the seals have been replaced, inspection is recommended after one week of operation.

### Service contract:

Stancor or its agents may offer service agreements in accordance with a preventive maintenance plan. For further information, please contact your Stancor representative.

<b>Regular Inspection:</b>	<b>Weekly</b>	<b>Monthly</b>	<b>Bi-monthly</b>	<b>Semi-annually</b>	<b>Annually</b>
Measure insulation resistance. Reference insulation resistance = 1MΩ or greater. <sup>1</sup>	•				
Measure operating current. Compare with rated current	•				
Measure supply voltage. Compare with allowable range (within ±5% of rated voltage).	•				
Pump inspection. A noticeable drop in performance may indicate wear in the impeller, etc., or clogging of the strainer, etc. Remove the clogged debris, and replace any worn parts.		•			
Seal inspection. Check the seal every 2 months or every month depending on liquid pumped.		•	•		
Oil inspection. Check the oil every six months or after 2,000 hours of use, whichever comes first.				•	
Change oil. Change the oil every 12 months or after 4,000 hours of use, whichever comes first.					•
Change mechanical seal. <sup>3</sup>					•
Overhaul. This should be carried out even if there are no problems with the pump. The frequency depends on how continuously the pump is in use. <sup>4</sup>					•

<sup>1</sup> If the insulation resistance has become noticeably lower than the previous inspection, an inspection of the motor will be necessary

<sup>2</sup> See Lubricant Inspection and Lubricant Change in this section

<sup>3</sup> Specialized know-how is required for inspecting and replacing the mechanical seal. Consult with your nearest dealer or Stancor representative

<sup>4</sup> Consult with your nearest dealer or Stancor representative regarding overhauls.

## Troubleshooting:

### General Check:

#### Pump won't start

##### Cause may be:

Power failure (zero line voltage) or incorrect line voltage  
Blown fuse or circuit breaker  
Damaged power supply cable  
Blocked impeller, turn off power, disconnect pump, check that the impeller is free to turn by hand  
Phase failure

#### Poor performance not pumping full capacity or head.

##### Cause may be:

Choked discharge hoses or water passages.  
Worn impeller (15), impeller disc (12) or diffusor (19).  
Discharge hose damaged, kinked or too long.  
Impeller rotates in wrong direction.

#### If water in top cover (electric chamber)

##### Cause may be:

Cable rubber sheathing is damaged, so water leaks in between the cores.  
Cable entry (6) not tight enough, or the underlying grommet (24) damaged.  
Damaged O-rings or seal faces between top cover (4) and motor housing (3) or between top cover and connection cover (10).

#### If water or oil in motor housing

##### Cause may be:

Damaged seals (67) and (112) inspect the seals and replace them with new ones if necessary.  
Damaged O-rings or seal faces between top cover (4) and motor housing (3) or between connection cover (10) and top cover.  
If water or oil is found in the motor housing the pump has to be disassembled for overhaul.

#### Water in oil housing

##### Cause may be:

Damaged seals (67) and (112) inspect the seals and replace them with new ones if necessary.  
Damaged O-rings between motor housing (3) and oil housing cover (16), motor housing and top cover (4), or between connection cover (10) and top cover.  
Damaged Dubo-rings (55) or "oil" inspection screws not tightened.

Have a qualified pump-mechanic correct any faults or please contact your representative's service center for prompt pump service.

## Routine Overhaul:

### Seal Housing Oil:

If the pump or the pump shaft seals are new the seals should be inspected after two weeks of continuous operation.

Then check the seals every second month if the pump has been working in relatively clean water. If the water is severely contaminated and contains abrasive particles the seals should be inspected once every month. Inspection of seals should be done in conjunction with re-placement or adjustment of impeller and diffuser, see Inspection of Seals.

### Inspection of Seals:

Lay the pump horizontally, with the two oil inspection/fill ports facing the 12:00 o'clock and 10:00 or 2:00 o'clock position. Remove the screws (76) and dubo rings (55). Turn the pump so that one of the "Oil" holes will allow some oil to drain and collect it in a vessel. If the oil is clean and free from moisture or contaminants the seals are intact.

If the color of the oil is light yellow-grey and slow-flowing (like a milkshake) or if there is a noticeable trace of water, the seals should be inspected and the oil replaced. Check then the oil again within an operation period of two weeks.  
Use oil in accordance with the recommendation below.

Check that the Dubo-rings (55) on the "Oil" screws are not damaged. Tighten the "Oil" screws firmly. The oil compartment should be filled with 4 pints (2.3 liters) freeze-proof motor oil SAE 10w-30. The following oils are recommended:  
Citgo Superguard SAE-10W-30 or equal.

If the pump is going to be used for fluids which must not become contaminated, for example for pumping drinking water — use a tasteless and odorless oil such as MOBIL Oil Whiterex 332.

**THE NYLON DUBO SEALS ARE A ONE TIME USE PARTS AND MUST BE REPLACED EVERY SINGLE TIMES THE SCREWS ARE UNTIGHTENED OR THEY WILL NOT SEAL PROPERLY.**

## Check of Insulation, Motor Resistance:

In conjunction with an overhaul, the insulation resistance of the stator windings should be checked. Remove connection cover (10) and disconnect stator leads from the contactor assembly and terminal. When testing with a 500 volts D.C. "megger" the resistance should exceed 1 Meg Ohm between each of the phases and the phases to the motor housing as well as between the phases and the thermal protection contacts. When the resistance of the windings is measured, the resistance should be equal in all windings.

**Do not "megger" through the thermal sensors leads.**

The following resistance values are valid at a temperature of +68°F (+ 20°C) for stator assemblies.

Pump Model	Voltage			
	230V	460V	575V	950V
<b>S150 P20CE</b>	8.80	17.51	26.53	N/A
<b>S500 P30CE</b>	1.29	3.87	6.42	N/A
<b>S750 P40CE</b>	1.10	2.20		N/A
<b>S1000 SX1000</b>		1.20	2.00	N/A
<b>S1500 P60CEM</b>	0.50	0.78	1.23	3.90
<b>S2000 SX2000</b>	0.14	0.56	0.81	3.21
<b>S3000 P70CE</b>	0.09	0.30	0.50	0.44
<b>S4500 SX4500</b>	N/A	0.22	0.37	1.12
<b>S6000-2P SX6000-2P</b>	N/A	0.10	0.12	
<b>S6000-4P SX6000-4P</b>	N/A	0.20		
<b>S7500 SX7500</b>	N/A			

## Bearing Lubrication:

### Upper Bearings

All pump models upper bearings are sealed bearings and do not require maintenance.

### Lower Bearings

All pump models except S4500 (SX4500), S6000 (SX6000) and S7500 (SX7500) lower bearings are sealed bearings and do not require maintenance.

Stancor Model S4500 (SX4500), S6000 (SX6000) and S7500 (SX7500) use two angular contact ball bearings.

**These must be packed 2/3 full with grease (Chevron SRI-NLGI 2) or equivalent prior to installation, no further maintenance is required. See ball bearing replacement for more details**

## Inspection of Wear Parts–Adjusting:

Check that impeller (15), diffuser (19) and impeller disc (109) (for HH models) are not worn out. Relatively generous wear of the impeller vanes and the rubber coating of the diffuser can be allowed, but this will of course result in decreased pump capacity.

HV & HH configuration: If the lip area of the seal housing is damaged or if the face of the seal housing has been worn more than 1/16" (1.5 mm) at the periphery, the seal housing should be replaced with a new one.

By adjusting at regular intervals the life of impeller and diffuser will be considerably increased. This is due to the fact that these parts will wear relatively quickly when the clearance between impeller and diffuser is large — a small clearance (well adjusted pump) means that these wear parts will last a considerably longer period of time as they are operating with higher efficiency.

Adjustment of the diffuser can be carried out by tightening nuts (53), cross-wise gradually, at the lower side of the diffuser in such a way that the impeller lightly touches the diffuser. The diffuser is locked by tightening inner nut (53) against outer nut (53) by means of using two 19 mm wrenches. In order not to change the position of the diffuser, hold the inner nut in a firm grip when the outer one is tightened. Check that impeller can be easily rotated by hand. When replacing a worn out impeller the impeller disc should also be replaced with a new one, see also Wear Parts Replacement (High Volume or High Head).

## Power Supply Cable Replacement:

If the cable has been damaged it must immediately be replaced. The cable is reconnected in the following way: Loosen and remove screws (52) and remove cable clamp (7). Remove screws (154) Remove screws (45) and lift off connection cover (10). Pull out the cable from connection cover and cable entry (6). Check that rubber bushing (24), washers,(101/78) and cable clamp (7) are undamaged.

Split the outer sheathing of the cable so that the length of the yellow (MSHA ground check), and green ground leads are 8" and the length of the other leads is 5". Put the cable entry (6), washer (101), rubber bushing (24), washer (78) and connection cover (10) on to the cable. Connect the ground leads (green) to ground connection (51) inside the pump top and the yellow (**MSHA ground check**) to its respective location. The power leads should be connected to their connections on the contactor (see wiring diagram).

**Tighten all connections firmly.**

Coat O-rings (30) on connection cover (10) with Vaseline or silicone assembly lubricant. Mount connection cover using the three hex bolts (45) and lockwashers (94), **being careful to orient the cover so the two cast bosses line up with the indentations in the top cover and the bolt holes are in alignment.** Then push the cable as far as possible down through the connection cover to full stop at the contactor mounting plate. Then slide washer (78), rubber bushing (24) and washer (101) along cable into socket for bushing. Slide cable entry (6) against the washer and hold firmly while pulling cable back approx. 1-1/2".

\*Tighten screws (154), so that the flange of the cable entry (6) is within 1/8" to 1/4" of the connection cover.

Mount cable clamp (7) and firmly tighten it with screws (52). Check that the cable clamp is in contact with the cable entry.

**\*MSHA PUMPS REQUIRE SAFETY LOCKWIRE (79) BETWEEN BOLTS (152) (52), AND THE 1/8" TO 1/4" TOLERANCE BE MAINTAINED BETWEEN (6) (10).**

Mount cable clamp (7) and firmly tighten it with screws (52). Check that the cable clamp is in contact with the cable entry.

## Wear parts replacement high volume:

### Two piece diffuser and wear plate:

#### Disassembly:

Place the pump on a bench with the strainer outward. Loosen nuts (23) holding strainer (14). Pull off strainer and remove washers (108) as well as spacers (107). Loosen nuts (53) holding diffuser (19). Use two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are loosened. **See pic #4.** Remove the diffuser. With the diffuser on a work bench remove the three nyloc nuts (23) and washers (54) securing the diffuser inlet (154) to the diffuser (19) evenly pry out diffuser inlet and inspect for wear, replace if worn, remove the three studs (42) securing inlet, and save to install on new diffuser (19). Remove impeller (15) by loosening the impeller nut (77) and removing washers (71) and sleeve (83). Inspect shaft for burrs and clean. Apply a light coat of oil to the shaft and gently slide the impeller off the shaft, being careful to save the key (164). Remove the shim (167).

#### Assembly:

With the pump lying horizontally on the bench, inspect the shaft for any burrs and the keyway is clear of any debris, clean and dress as necessary. Place a light coating of oil on the shaft. Install shim (167) to allow clearance behind the impeller so as not to hit oil housing cover (16). Install key (164), slide the impeller (15) on the shaft, being careful to align with the key. Install spacer (83), washers (71), and impeller nut (77). Tighten securely while holding the impeller with suitable tool. Fit the diffuser inlet (154) to the diffuser (19) using the three studs (42) washers (54) and Nyloc nuts (23). Mount new diffuser (19) on studs (41). Put on washers (54) and nuts (53) and tighten them evenly until the impeller vanes will be located about .039" (1 mm) from the diffuser. Adjust the position of the diffuser accurately by cautiously tightening the inner nuts so that the impeller vanes will smoothly and lightly touch the full surface of the diffuser. Tighten outer nuts (53) (use the two 19 mm wrenches) while securing the inner nut (53) in a firm grip so that the position of the diffuser will not be changed. Check that the impeller can be rotated by hand. Reinstall spacers and strainer.

## One piece diffuser and wear plate:

#### Disassembly:

Place the pump on a bench with the strainer outward. Loosen nuts (23) holding strainer (14). Pull off strainer and remove washers (108) as well as spacers (107). Loosen nuts (53) holding diffuser (19). Use two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are loosened. **See pic #4.** Remove the diffuser. Remove impeller (15) by loosening the impeller nut (77) and removing washers (71) and sleeve (83). Inspect shaft for burrs and clean. Apply a light coat of oil to the shaft and gently slide the impeller off the shaft, being careful to save the key (164). Remove the shim (167).

#### Assembly:

With the pump lying horizontally on the bench, inspect the shaft for any burrs and the keyway is clear of any debris, clean and dress as necessary. Place a light coating of oil on the shaft. Install shim (167) to allow clearance behind the impeller so as not to hit oil housing cover (16). Install key (164), slide the impeller (15) on the shaft, being careful to align with the key. Install spacer (83), washers (71), and impeller nut (77). Tighten securely while holding the impeller with suitable tool. Mount new diffuser (19) on studs (41). Put on washers (54) and nuts (53) and tighten them evenly until the impeller vanes will be located about .039" (1 mm) from the diffuser. Adjust the position of the diffuser accurately by cautiously tightening the inner nuts so that the impeller vanes will smoothly and lightly touch the full surface of the diffuser. Tighten outer nuts (53) (use the two 19 mm wrenches) while securing the inner nut (53) in a firm grip so that the position of the diffuser will not be changed. Check that the impeller can be rotated by hand. Reinstall spacers and strainer.

## Wear Parts Replacement High Head:

### Single impeller versions:

#### Disassembly:

Place the pump on a bench with the strainer outward. Loosen nuts (23) holding strainer (14). Pull off strainer and remove washers (108) as well as spacers (107). Loosen nuts (53) holding diffuser (19). Use two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are loosened. **See pic #4.**

Remove the diffuser. Remove impeller (115) by loosening the impeller nut (77) and removing washers (71) remove the impeller spacer (83) from the shaft. Inspect shaft for burrs and clean. Apply a light coat of oil to the shaft and gently slide the impeller off the shaft, being careful to save the key (164). Remove the shim between the impeller and the lower seal assembly. Remove the sealing ring (157) from the studs (41).

#### Assembly (Single impeller versions):

With the pump lying horizontally on the bench, inspect the shaft for any burrs and the keyway is clear of any debris, clean and dress as necessary. Place a light coating of oil on the shaft. Install shim (167) to allow clearance behind the impeller so as not to hit oil housing cover (16). Install key (164), slide the impeller (15) on the shaft, being careful to align with the key.

#### See pic #1.

Check that impeller can be rotated by hand. Mount the sealing ring (157) over the studs. Mount the diffuser (19) on studs (41). **See pic #2.**

Push down the diffuser as far as possible towards the upper impeller. Put washers (54) and nuts (53) on the screws. Adjust the position of the diffuser by tightening the inner nuts cross-wise gradually so that the impeller vanes will go into contact with the diffuser evenly all over. Tighten the nuts by the use of the two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are tightened. The clearance between the diffuser and impeller should be about .012" (0.30 mm). Check that impellers can be easily rotated by hand. Reinstall spacers and strainer.

### Two Impeller Versions:

#### Disassembly:

Place the pump on a bench with the strainer outward. Loosen nuts (23) holding strainer (14). Pull off strainer and remove washers (108) as well as spacers (107). Loosen nuts (53) holding diffuser (13). Use two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are loosened. **See pic #4.**

Remove the diffuser. Remove washers (54) from the studs (41). Remove lower diffuser. Remove impeller (115) by loosening the impeller nut (77) and removing washers (71) and shim (166) (if necessary). Inspect shaft for burrs and clean.

Apply a light coat of oil to the shaft and gently slide the

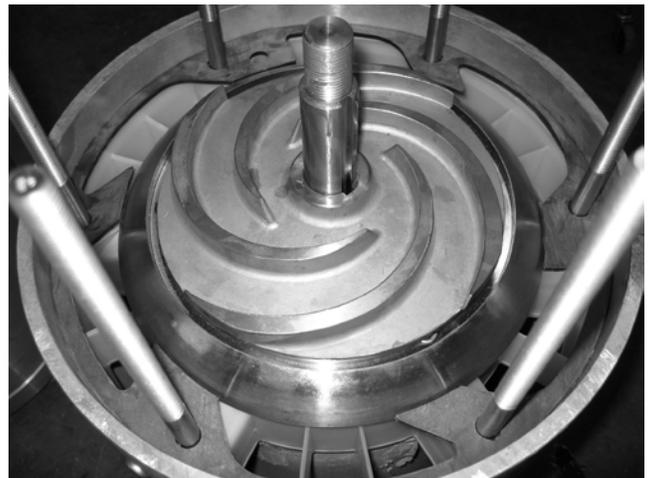
lower impeller off the shaft, being careful to save the key (164).

Remove lower impeller disc (109) by removing the four Allen head bolts (96) and corresponding lock washers (96A). Remove the impeller spacer (83) from the shaft and any shims/washers (54) and (57) from the studs.

Loosen nuts (53) and remove, by the use of two 19 mm wrenches by holding the inner nuts in a firm grip while the outer ones are loosened, remove washers (54) from the studs. Remove upper diffuser (19). Apply a light coat of oil to the shaft and gently slide the upper impeller off the shaft, being careful to save the key (164). Remove the shim between the upper impeller and the lower seal assembly. Remove the sealin

#### Assembly (two impeller versions):

With the pump lying horizontally on the bench, inspect the shaft for any burrs and the keyway is clear of any debris, clean and dress as necessary. Place a light coating of oil on the shaft. Install shim (167) to allow clearance behind the impeller so as not to hit oil housing cover (16). Install key (164), slide the impeller (15) on the shaft, being careful to align with the key. **See pic #1.**



**Pic #1**

HH pump showing upper impeller (15), studs (41) and sealing ring (157)

Check that impeller can be rotated by hand. Mount the sealing ring (157) over the studs. Mount the upper diffuser (19) on studs (41). **See pic #2.** Push down the diffuser as far as possible against the upper impeller. Put washers (54) and nuts (53) on the screws. Adjust the position of the upper diffuser by tightening the inner nuts cross-wise gradually so that the impeller vanes will go into contact with the diffuser evenly all over. There-after loosen inner nuts (53) 1 /6 of a revolution, that is, one hexagon side of the nut.

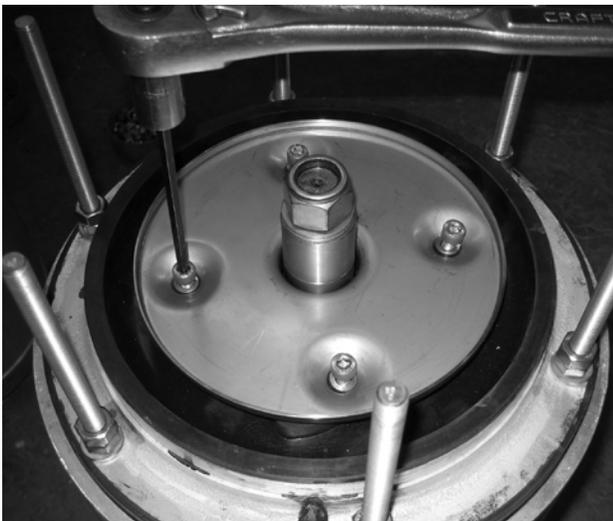
The clearance between the upper diffuser and upper

impeller should be about .012" (0.30 mm). Tighten the nuts by the use of the two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are tightened. Check that impellers can be easily rotated by hand. **See pic #4**



**Pic #2**  
High head upper diffuser installation

Assemble the impeller disc (12) to the upper diffuser using the four Allen head bolts (96) and corresponding lock washers (96A). Apply thread locking material (ie. Loctite®) to threads prior to assembly. **See pic #3.** Inspect for excessive wear and install the impeller spacer (83) on the shaft. Insert the key into the keyway and slide the lower impeller (115) on the shaft. Check that the impeller rotates without hitting the diffuser disc, add shims as necessary behind impeller to maintain minimal clearance (.005"-.010")



**Pic #3**  
Lower impeller diffuser disc installation  
(HH two impeller version)

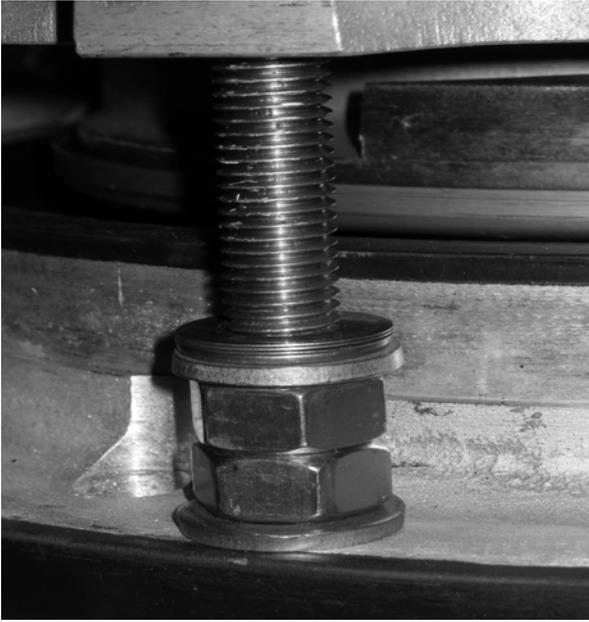
Mount lower diffuser (13) on studs (41). Put washers (54) and inner nuts (53) on these screws. Tighten the nuts cross-wise gradually so that the lower diffuser will contact evenly all over the lower impeller. When the lower impeller slightly touches the lower diffuser the clearance between its upper side and the lock nuts for the upper diffuser, has to be measured on all the 6 studs. Check that impellers can be easily rotated by hand. Mark the position of the lower diffuser so that it can be mounted later in exactly the same position as the present one.



**Pic #4**  
Using two 19 MM wrenches on diffuser nuts

Loosen and remove nuts and washers that are holding the lower diffuser, and remove lower diffuser. Place washers (54 and 57) as required by previous measurement on the studs, in order to obtain the clearance .012" (0.30 mm). **See pic #5.**

Mount again the lower diffuser, in position according to the marking, and mount washers (54) and nuts (53). Tighten the nuts by the use of the two 19 mm wrenches and hold the inner nuts in a firm grip while the outer ones are tightened. Check that impellers can be easily rotated by hand. Reinstall spacers and strainer. **See pic #6**



**Pic #5**

Close up of shims for setting clearance on lower impeller, HH version.

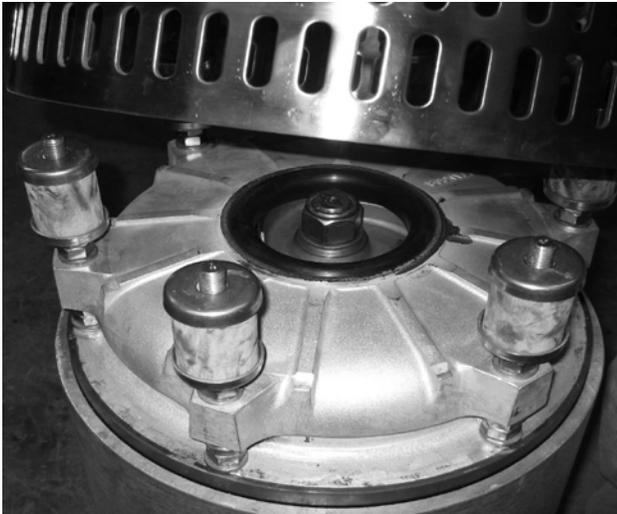
**CARE SHOULD BE USED WHEN SETTING IMPELLER CLEARANCES!**

**PUMP PERFORMANCE CAN BE DRASTICALLY ALTERED IF TOLERANCES ARE NOT ADHERED TO.**

**EXCESSIVE CONTACT BETWEEN IMPELLER AND DIFFUSER WILL LEAD TO PREMATURE WEAR AND/OR HIGH AMP DRAW!**

**AFTER COMPLETION OF ANY SERVICE PROCEDURE THE PUMP SHOULD BE TESTED FOR ELECTRICAL AND HYDRAULIC PERFORMANCE IN COMPLIANCE WITH FACTORY STANDARD SPECIFICATIONS.**

**FOR INFORMATION PERTAINING TO A COMPLETE REBUILDING OF THE PUMP CONTACT YOUR LOCAL DISTRIBUTOR OR STANCOR. FOR ASSISTANCE AND REQUEST A FULL SERVICE MANUAL.**



**Pic #6**

Completed HH (2) impeller installation

**PICTURES ARE ILLUSTRATIVE ONLY AND DO NOT NECESSARILY SHOW THE CONFIGURATION OF PRODUCTS MANUFACTURED AT ANY GIVEN POINT OF TIME. PRODUCTS MUST BE USED IN CONFORMITY WITH SAFE PRACTICE AND APPLICABLE STATUTES, REGULATIONS, CODES AND ORDINANCES. SPECIFICATIONS OF PRODUCTS AND EQUIPMENT SHOWN HEREIN ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT PRIOR NOTICE.**

## Appendices:

### List of Parts:

S150	DS-A18-023
S500 HH & HV	DS-A18-024
S750 HH & HV	DS-A18-025
S1000 HH & HV	DS-A18-063
S1500 HH & HV	DS-A18-067
S2000 HH & HV	DS-A18-066
S3000 HH & HV	DS-A18-064
S4500 HH & HV	DS-A18-065
S6000 HV	DS-A18-071
S6000 HH	DS-A18-098
S6000 MR	DS-A18-101
S7500 HH	DS-A18-041

### Exploded Views/Cross Section Drawings:

S150	DS-A18-005
S500 HH & HV	DS-A18-010
S750 HH & HV	DS-A18-016
S1000 HH & HV	DS-A18-021
S1500 HH & HV	DS-A18-068
S2000 HH & HV	DS-A18-055
S3000 HH & HV	DS-A18-064
S4500 HH & HV	DS-A18-065
S6000 HV	DS-A18-080
S6000 HH	DS-A18-099
S6000 MR	DS-A18-102
S7500 HH	DS-A18-042

### Wiring Diagrams:

Pump Model	Phases	Voltage	Document #
S150	3	230-460-575	DS-A18-040
S500	3	230-460-575	DS-A18-043
S750	3	230-460-575	DS-A18-044
S1000	3	230-460-575	DS-A18-076
S150	3	230-460-575	DS-A18-078
S3000	3	230-460-575	DS-A18-107
S7500	3	230-460-575	DS-A18-108
S1500	3	230-460-575	DS-A18-109
S2000	3	230-460-575	DS-A18-110
S4500	3	230-460-575	DS-A18-111
S6000	3	230-460-575	DS-A18-112
S150	1	115	DS-A18-078
S150	1	230	DS-A18-113
S500/S750	1	230	DS-A18-114

## Appendices:

### Technical Data:

S150	DS-A18-001
S500 HH & HV	DS-A18-006
S750 HH & HV	DS-A18-011
S1000 HH & HV	DS-A18-017
S1500 HH & HV	DS-A18-051
S2000 HH & HV	DS-A18-052
S3000 HH & HV	DS-A18-029
S4500 HH & HV	DS-A18-053
S6000 HV	DS-A18-072
S6000 HH & MR	DS-A18-060
S7500 HH	DS-A18-035

### Specifications:

S150	DS-A18-002
S500 HH & HV	DS-A18-007
S750 HH & HV	DS-A18-012
S1000 HH & HV	DS-A18-018
S1500 HH & HV	DS-A18-059
S2000 HH & HV	DS-A18-028
S3000 HH & HV	DS-A18-075
S4500 HH & HV	DS-A18-027
S6000 HV	DS-A18-073
S6000 HH & MR	DS-A18-061
S7500 HH	DS-A18-036

# Notes



**STANCOR, LP.**

515 FAN HILL ROAD MONROE, CT 06468 203-268-7513 FAX 203-268-7958

[WWW.STANCORPUMPS.COM](http://WWW.STANCORPUMPS.COM)