

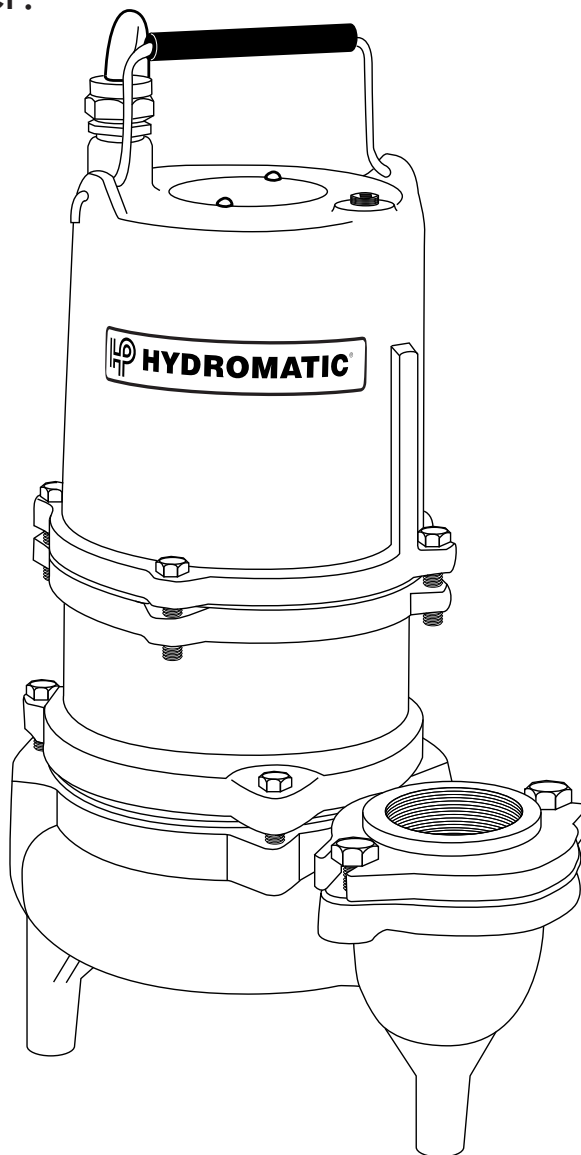


**HYDROMATIC®**

# SKHS Series

## Submersible High Head Sewage Ejector

Available Horsepower:  
1/2, 1, 1-1/2, 2



NOTE! To the installer: Please make sure you provide this manual to the owner of the pumping equipment or to the responsible party who maintains the system.

W-03-379 (Rev. 6/30/09)



**Pentair  
Water™**

## General Information

Thank you for purchasing your Hydromatic® pump. To help ensure years of trouble-free operation, please read the following manual carefully.

### Before Operation:

Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

### Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often.

**WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.**

## Pump Warning

To reduce risk of electrical shock:

### 1. Risk of Electrical Shock:

This pump has not been investigated for use in swimming pool areas.

### 2. Risk of Electrical Shock:

Connect only to a properly grounded receptacle.

Septic tank to be vented in accordance with local plumbing codes.

Do not smoke or use sparkable electrical devices or flame in a septic (gaseous) or possible septic sump.

If septic sump conditions exist and if entry into sump is necessary, then (1) provide proper safety precautions per OSHA requirements and (2) do not enter sump until these precautions are strictly adhered to.

Do not install pump in location classified as hazardous per N.E.C., ANSI/NFPA 70 - 1999.

Failure to heed above cautions could result in injury or death.

## Installation Instructions

These important instructions must be followed for satisfactory performance of your pump. Before installation, check your local electrical and plumbing codes.

1. Provide proper pit on sewage tank. Run time minimum is two minutes. For maximum pump life three minutes is recommended.
2. Make sure sump is free of string, cloth, nails, gravel, etc. before installing pump.
3. Do not set pump directly on the bottom of sump if it is not solid. Raise the pump by placing bricks or concrete blocks underneath it.

4. Use steel or plastic pipe for all connecting lines between pump and sewer outlet.

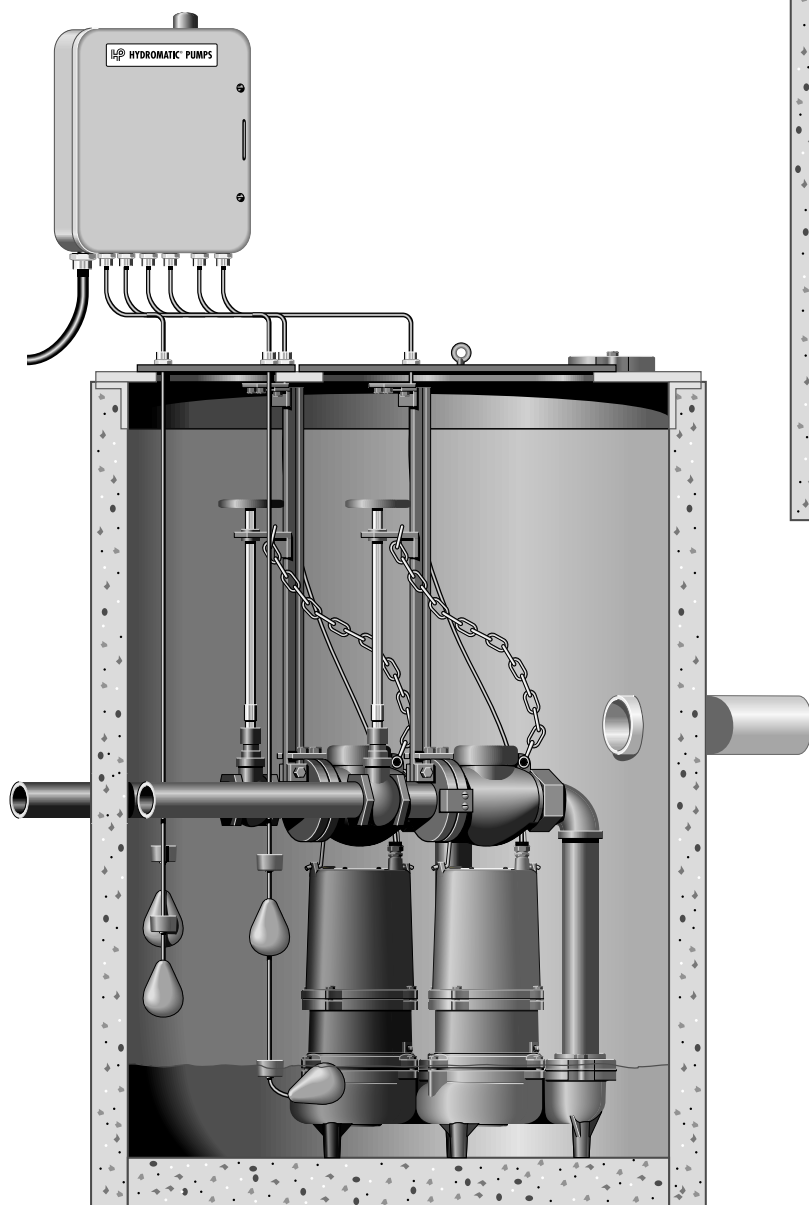
Note: Some city regulations do not allow installing a pump with plastic pipe. Check local regulations.

5. In applications where the pump may sit idle for months at a time, it is recommended that the pump(s) be cycled every month to ensure the pumping system is working properly when needed.
6. A Hydromatic check valve should be installed in discharge pipe.
7. An audible alarm system for high water conditions should be installed in every pump for maximum protection. Contact your Hydromatic distributor for proper control panel.

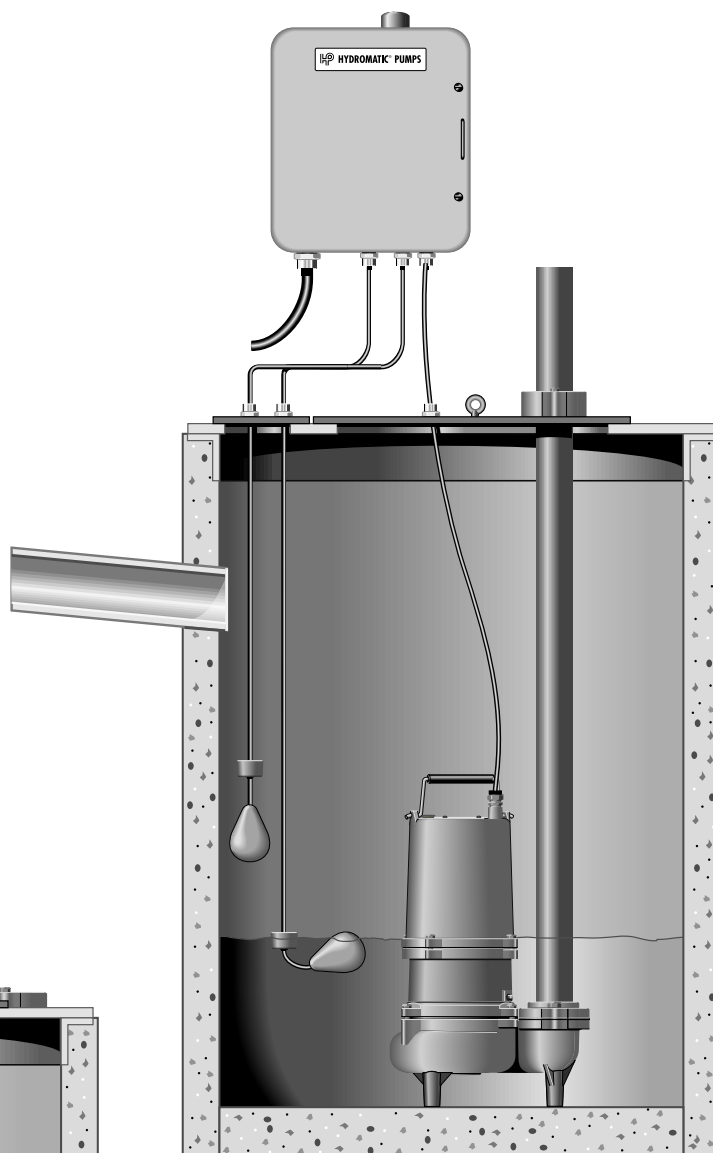
**NOTE: Wire pump(s) and panel to comply with local and state codes.**

8. Use pump partially or completely submerged for pumping waterlike liquids (temperature to 140°F). The SKHS Series will pump solid materials up to 2" (spherical) in diameter. This pump has not been investigated for use in swimming pool areas.
9. **CAUTION:** Do not pump flammable liquids. Strong chemicals or salt water should not be pumped without consulting your Hydromatic distributor for proper seals and coatings.

# Pump Installation



**Duplex SKHS Series**



**Simplex SKHS Series**

# Pump Servicing

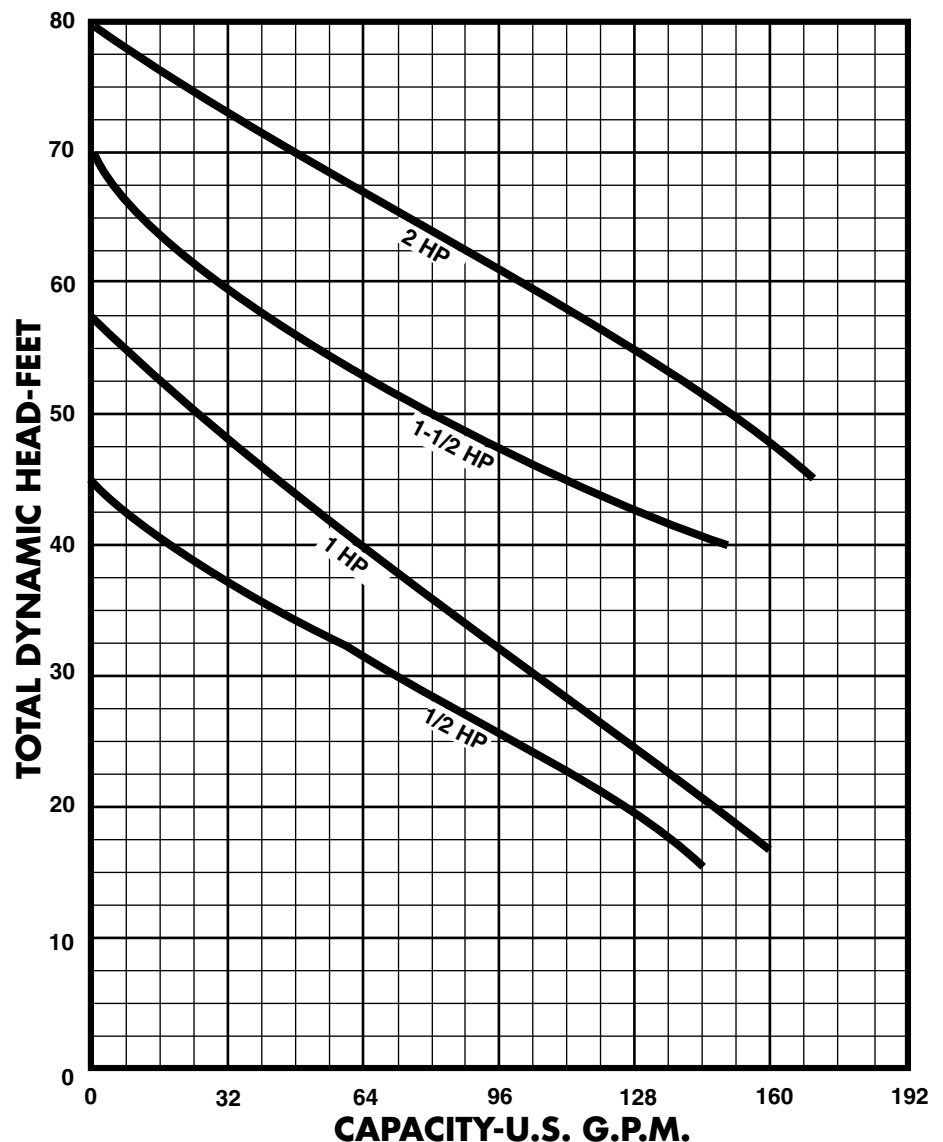
Read the following instructions carefully before replacing any parts. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation. Only competent electrician should make the installations.

Before removing the pump from its installation for repairs, check first to see if the trouble is caused by:

1. Miswiring of the pump into the terminal block.
2. Miswiring of the float level controls into the panel.
3. Miswiring inside the control panel.
4. Tripped circuit breaker. If the breaker is manually reset and then trips off again, the problem could be:
  - a. short circuit in motor or control panel
  - b. water in the motor housing
  - c. insufficient amp capacity of wiring or breakers, or low voltage supply
  - d. improper panel wiring
5. Tripped overload. If overload is manually reset and then trips off again, the problem could be:
  - a. pump or piping clogged
  - b. pump motor or bearings may be defective
  - c. start capacitor in motor may have failed
  - d. pump may be miswired to terminal block head lower than rating, pumping too much liquid
6. Air locked pump. Disconnect piping at union and run until all air bubbles are expelled.
7. Wrong impeller rotation. The rotation should be counterclockwise when looking at the impeller. Correct improper rotation on three phase pumps by reversing any two line leads. No rotation check is necessary on single phase pumps.
8. Closed discharge gate valve.
9. Plugged impeller or pipeline.
10. Discharge head may be too high. Check elevation against design point of pump.
11. Floats not hanging free in the sump.
12. Malfunctioning floats.

**WARNING: Be certain power to pump is off! Disconnect pump power cord from terminals and remove pump from sump.**

1. Clean any dirt or trash from the outside of the pump before dismantling.
2. Check for an obstruction in the impeller by looking through the suction hole of the pump. The shaft should turn freely if unobstructed. Keep fingers, clothing or any



material from suction inlet. Serious injury may occur if pump is connected to power source.

3. Obtain an ohmmeter to test for burned or broken wires or for defective stator winding. Set ohmmeter scale pointer to RX1 scale and check the meter by putting both meter leads together and adjusting the needle knob until the meter reads zero. If the meter cannot be adjusted to zero, the batteries need to be replaced.

For three phase pumps, attach one meter lead to the white cord wire of the power cord and the other meter lead to the black cord wire. This reading should equal the resistance of one phase (see winding resistance chart). Repeat the above procedure for white and red wires and red and black wires. Each of the three separate readings should read approximately the same. If no resistance is obtainable for any of the three phases, either a wire is broken, there is a bad connection, or the winding is defective. Skip steps 5 and 8 if resistance is OK. Disconnect from power supply.

Remove plug (#24) from top of motor housing and pour oil into container, preferably clear, so that oil can be observed.

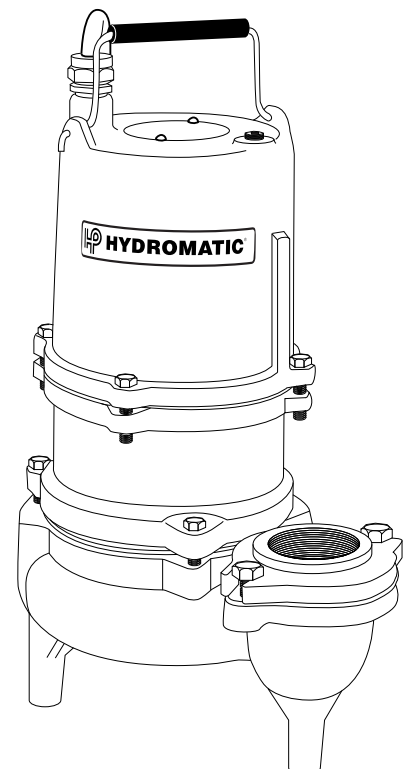
1. If oil is clear, it will indicate motor is not burned and there has been no water leak into the motor. If oil is cloudy, it will indicate water in motor, or, if oil is black, it will indicate a burned stator.
2. After draining oil, carefully remove the hex head cap

screws (#5) from the motor housing (#3). Carefully lift off the motor housing (#3), exposing the capacitor (1 $\phi$  only) and the motor assembly.

3. On single phase (one phase) units, check capacitor using ohmmeter. With ohmmeter scale set at R X 1000, attach meter leads to capacitor. The meter needle should go to zero and come back slowly. If it does not, the capacitor should be replaced.
4. Disconnect power cord leads and unscrew the green ground lead from top of motor.
5. On three phase units, carefully loosen the power cord assembly (#1) from the motor housing (#3). With power cord loose, remove the four wire nuts and screws (#2) and carefully lift off the motor housing (#3) and the motor assembly.
6. Unscrew wire nuts (#2) and remove the power cord (#1) from the pump. Using the spade terminals coming from the motor (#4) check the winding resistance with an ohmmeter.
7. Attach one meter lead to the motor terminal T1 and the other meter lead to motor terminal T4. See Winding Resistance Chart for appropriate resistance reading. If no resistance is obtainable for either the start or main winding, either there is a bad connection or the winding is defective.
8. For three phase pumps, remove hex head cap screws (#5) from the motor housing (#3) and lift up until all wire nut connections (#2) are

outside the motor housing (#3). Unscrew wire nuts and remove the motor housing (#3) from the pump.

9. Twist the three power leads of one end of the power cord together. Then at the other end, with an ohmmeter, check any two leads. Also check the third lead with either of the first two. If a zero reading is indicated for any wire, the wire is broken and a new power cord assembly must be ordered.
10. Set ohmmeter scale pointer to R X 100K scale. Connect one meter lead to one lead of the stator and touch the other meter lead to the motor housing (#14). If the resistance to ground is less than 500,000 ohms, there is moisture in the winding or leakage through stator insulation. The stator must be dried out and then rechecked on the ohmmeter. If the resistance is still less than 500,000 ohms after drying, the



stator must be replaced. A zero reading indicates a direct short, and the stator will have to be replaced.

11. If the winding is grounded, remove the pipe plug (#24) in the top of the pump and drain the oil into a glass container. A milky appearance to the oil will indicate that water has entered through worn or damaged seals or O-rings. If this is the case, the mechanical seals and all O-rings will have to be replaced. If no apparent moisture is seen, the stator must be checked with a high pot tester. Using a voltage of 1500 volts for 115 volt motors and 2000 volts for 230 volt motors, touch one probe to the white lead and the other probe to the stator laminations for only one second. Buzzing will indicate arcing is occurring at a breakdown of insulation or a small amount of moisture is present. The stator will then have to be dried out or replaced.

The high pot test is very destructive, so each time the same stator is checked, the voltage should be lowered about 250 volts. If not, you may cause the stator to short by breaking down the insulation.

**CAUTION: Due to the high voltage, use extreme care when using the high pot tester. A dangerous shock can be avoided with careful handling of the test probes.**

12. Repeat step 3, this time attaching the meter leads to the stator wires. If a zero reading is obtained, the winding is defective and the stator must be replaced.

13. Unscrew the hex head cap screws (#16) and remove the volute (#11).

14. Remove the impeller (#16) on single phase pumps by first holding the rotor shaft with a screwdriver and then tapping the impeller off the shaft carefully with a plastic or rubber hammer. Note that threads are right-hand. If pump is three phase, remove the impeller washer (#14) and impeller screw (#15) before unscrewing the impeller as above.

15. The impeller should spin free. The impeller holds the rotation carbon ring of the lower mechanical seal (#7) against the stationary ceramic seat by compressing a stainless steel spring.

16. Remove the flat head machine screws (#13) from the clamp ring (#12) and lift the adapter housing (#6) from the bearing seal plate (#20).

17. Remove the four hex head bolts from motor shell and lift the motor (#4) from the seal plate (#20). A screwdriver can be inserted under the stator shell in order to remove the stator.

18. Bump the end of the shaft with a plastic hammer. This will push the rotor and shaft and also push the lower bearing from the seal plate (#20). Now remove the shaft, rotor, and bearing assembly (#A4) from the ceramic seat and rubber sleeve of seal (#7) from the seal plate (#20).

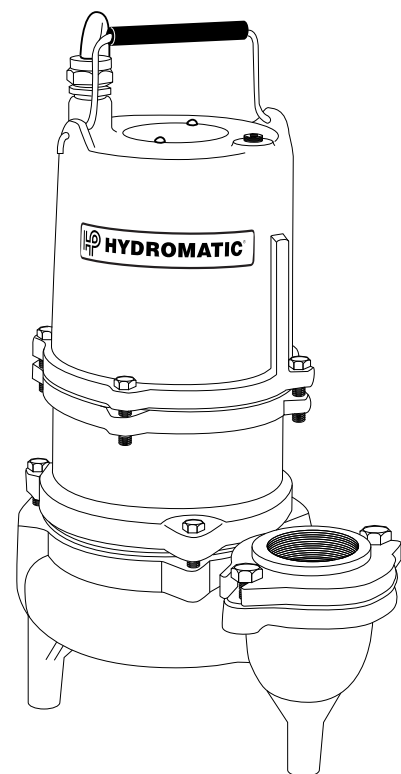
19. If water was found in the oil, the mechanical seal (#7) must be replaced.

20. Turn the bearing by hand; if it feels rough when turned or

looks rusted, it should be replaced. Obtain a bearing puller to remove the bearing. If a puller cannot be placed over the bearing, remove the outer face by cracking in a vise. Now the outer face and balls can be removed, allowing the inner face to be pulled.

### Reassembly:

1. Thoroughly clean the seal plate (#20), particularly the seal and bearing pockets. All sand and dirt must be removed.
2. If the seal (#2) was removed as in step 14, coat the replacement seal with O-ring lube and use a plastic pusher to press it into the seal plate (#20). Make sure the rubber ring goes in first. Do not use any sharp objects that may damage the seal.
3. Push the shaft, rotor and ball bearing assembly into the seal plate (#20), being careful not to chip the ceramic of the stationary seal half. Make sure the rubber ring goes in first.



4. Replace the motor (#4) if it is visibly burned or if the ground resistance test (step 3) or the winding resistance test has failed. Replace the four motor bolts.
5. Remove the old O-ring (#19), regardless of condition, and replace. Place the new O-ring over the seal plate (#20) shoulder.
6. Clean the adapter housing (#6) thoroughly, then position it onto the seal plate (#20). Coat the rubber ring on the rotating seal half with O-ring lube and press the seal onto the shaft with the rubber ring facing the impeller.
7. Clamp ring (#12) over the bearing/seal plate (#20) and use the flat head machine screws (#13) to fasten down.

**CAUTION: Mixing old and new seal parts will cause immediate seal failure. When replacing seal, use a complete new seal only. Place seal spring and washer seat over motor shaft and the impeller on the shaft. On three phase pumps, replace pin impeller washer (#14) and screw (#15).**

8. Turn impeller (#16). It should turn freely with no drag.
9. Set the seal housing and adapter housing assembly onto the volute case (11) and secure with three hex head screws (18).
10. Reach in the eye of the volute (11) and turn impeller (16) again. It should turn freely with no drag.
11. If necessary to replace the power cord assembly (1) refer to the wiring diagrams in this manual. Secure wires together with wire nuts (#2) only.

12. First slip the power lead wires through the holes in the motor housing (#3) assembly. Coat the cord grip threads with pipe dope or apply Teflon® tape and screw the new power cord assembly (#1) into the motor housing (#3). Tighten down the knurled nut with either pliers or a pipe wrench. Place the ground screw through the terminal of the green ground wire and tighten into the top of the motor housing (#4). Referring to wiring diagrams in this manual, secure wires together with wire nuts (#2).

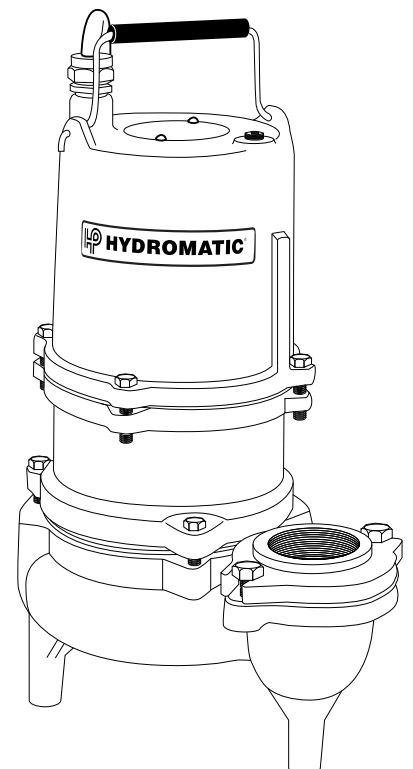
Do not tape leads together as the hot oil will deteriorate the tape and cause motor failure.

Secure motor housing (#3) to adapter (#6) by using four hex head screws (#5).

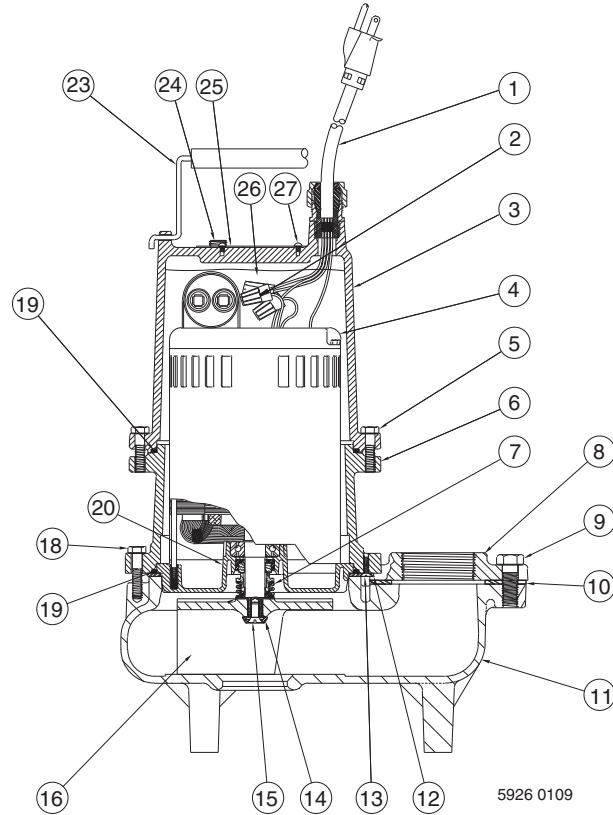
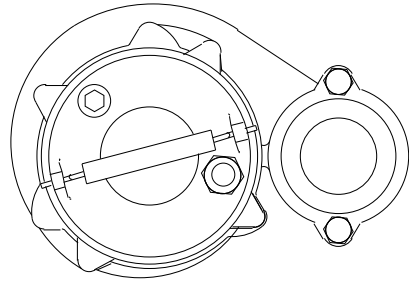
13. Before filling the motor housing with oil, an air test should be performed. Apply 7 to 8 pounds of air pressure in the 1/4" NPT tap (#24) on the top of the motor housing. (Note: Too much pressure will damage the seal.) Then submerge the pump in water and check for leaks. If a leak occurs, isolate where it is coming from and correct the problem by replacing the sealing part. If there are no leaks, fill the motor and seal housing with high grade transformer oil to at least one inch below top of housing.

Do not fill the motor housing completely; allow air space for expansion. Replace oil plugs (24).

14. Connect power cord wires to terminals, connect power, and check pump running. Motor should run smoothly and be free of vibration. Replace pump back into pit.

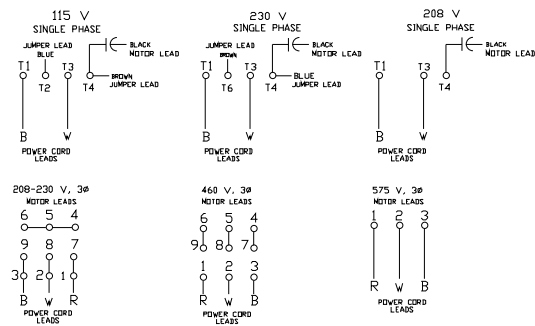


# SKHS50 Parts List



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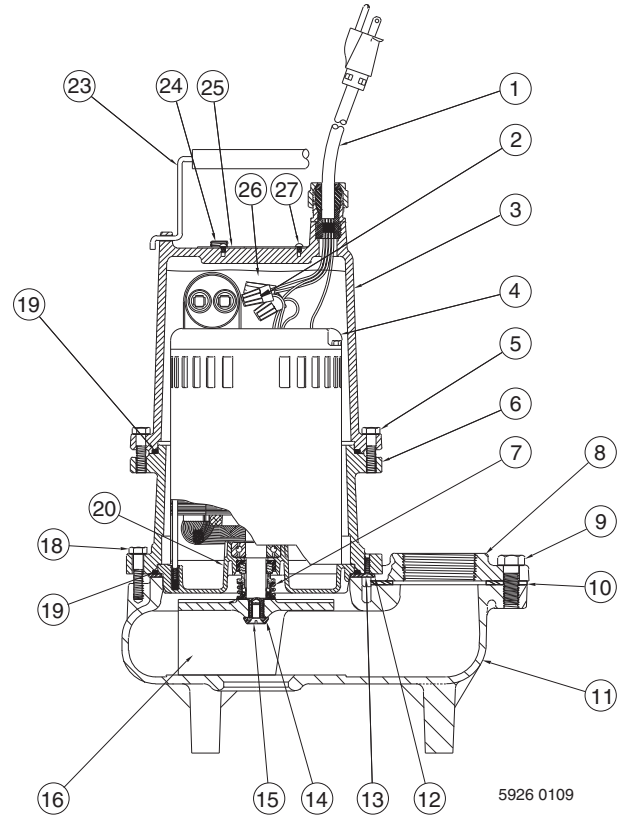
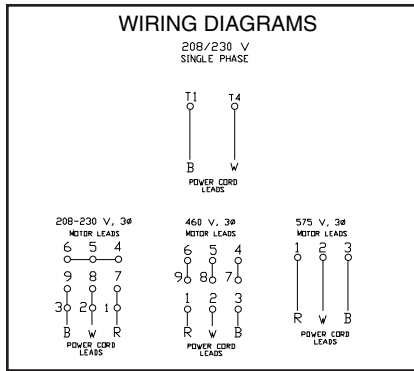
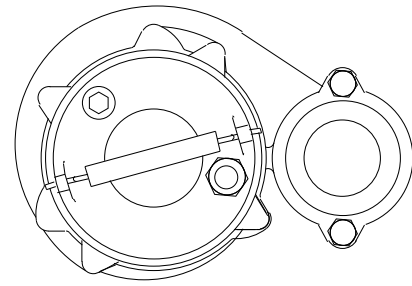
## WIRING DIAGRAMS



Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	POWER CORD ASSY.	13216-001-5 (115V/1 PH.-20')	1	13	SCREW-FLAT HEAD	984-001-1	3
1	POWER CORD ASSY.	13216-020-5 (208-230V 1 PH.-20')	1	14	IMPELLER WASHER	518-002-1	1
1	POWER CORD ASSY.	13216-089-5 (ALL 3 PH.-20')	1	15	SCREW-FLAT HEAD	111-008-1	1
2	CONNECTOR-WIRE	73-001-1 (ALL 3 PH.)	4	16	IMPELLER	4781-105-2	1
3	MOTOR HOUSING	56-023-2	1	18	SCREW-HHC	101-010-1	3
4	MOTOR	14958-000-1 (115V 1 PH.)	1	19	O-RING	77-003-1	2
4	MOTOR	14958-001-1 (230V 1 PH.)	1	20	BEARING/SEAL PLATE	6846-000-2	1
4	MOTOR	14958-002-1 (208/230/460V 3 PH.)	1	21	FLOAT SWITCH ASS'Y	14595-120-1 (115V 1 PH.) 20'	1
4	MOTOR	14958-003-1 (575V 3 PH.)	1	21	FLOAT SWITCH ASS'Y	13967-025-1 (208/230V 1 PH.) 20'	1
4	MOTOR	14958-004-1 (208V 1 PH.)	1	23	HANDLE ASS'Y	60-000-5	1
5	SCREW-HHC	19100A012	4	24	PIPE PLUG	14981-001-1	1
6	ADAPTER	12709-000-2	1	25	NAMEPLATE	13425-004-1 (ALL 1 PH.)	1
7	SEAL-TYPE 21	22447A000	1	25	NAMEPLATE	13425-003-1 (ALL 3 PH.)	1
8	DISCHARGE FLANGE	208-000-2	1	26	OIL	—	0.7
10	FLANGE GASKET	324-001-1	1	27	DRIVE SCREW	4580-001-1	2
11	VOLUTE CASE	6818-002-2	1	NOT SHOWN	SEALANT	14801-010-1	EX.
12	CLAMP RING	5677-000-3	1				



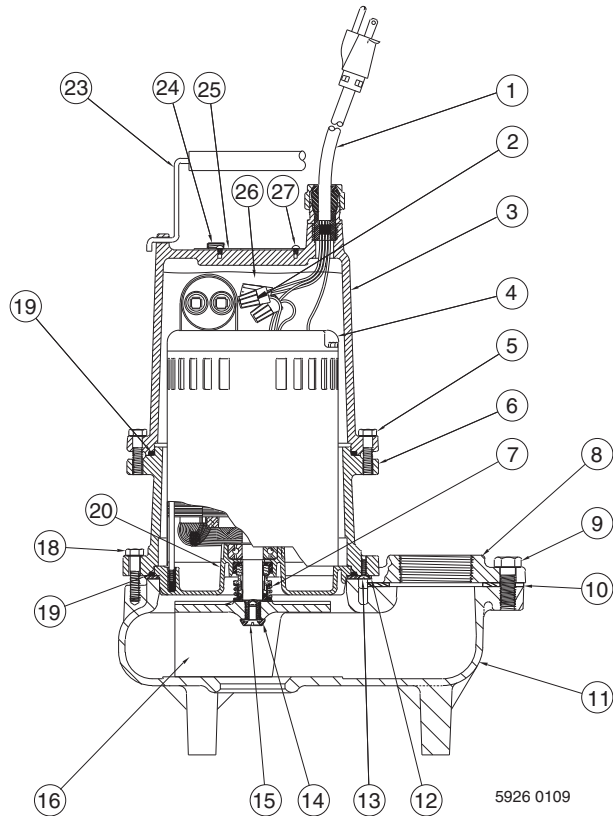
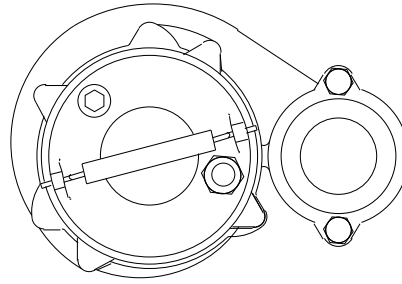
# SKHS100 Parts List



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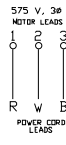
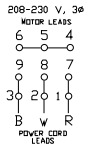
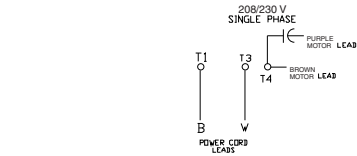
Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	POWER CORD ASSY.	13216-018-5 (208-230V 1 PH.-20')	1	13	SCREW-FLAT HEAD	984-001-1	3
1	POWER CORD ASSY.	11644-089-5 (ALL 3 PH.-20')	1	14	IMPELLER WASHER	518-002-1	1
2	CONNECTOR-WIRE	73-001-1 (ALL 3 PH.)	4	15	SCREW-FLAT HEAD	111-008-1	1
3	MOTOR HOUSING	56-023-2	1	16	IMPELLER	4781-107-2	1
4	MOTOR	14958-008-1 (208V 1 PH.)	1	18	SCREW-HHC	101-010-1	3
4	MOTOR	14958-005-1 (230V 1 PH.)	1	19	O-RING	77-003-1	2
4	MOTOR	14958-006-1 (208/230/460V 3 PH.)	1	20	BEARING/SEAL PLATE	6846-000-2	1
4	MOTOR	14958-007-1 (575V 1 PH.)	1	21	FLOAT SWITCH ASS'Y	13967-025-1 (208/230V 1 PH.)	1
5	SCREW-HHC	19100A012	4	23	HANDLE ASS'Y	60-000-5	1
6	ADAPTER	12709-000-2	1	24	PIPE PLUG	14981-001-1	1
7	SEAL-TYPE 21	22447A000	1	25	NAMEPLATE	13425-069-1	1
8	DISCHARGE FLANGE	208-000-2	1	26	OIL	—	0.7
9	SCREW-HHC	19103A052	2	27	DRIVE SCREW	4580-001-1	2
10	FLANGE GASKET	324-001-1	1	NOT SHOWN	SEALANT	14801-010-1	EX.
11	VOLUTE CASE	6818-002-2	1				
12	CLAMP RING	5677-000-3	1				

# SKHS150 Parts List



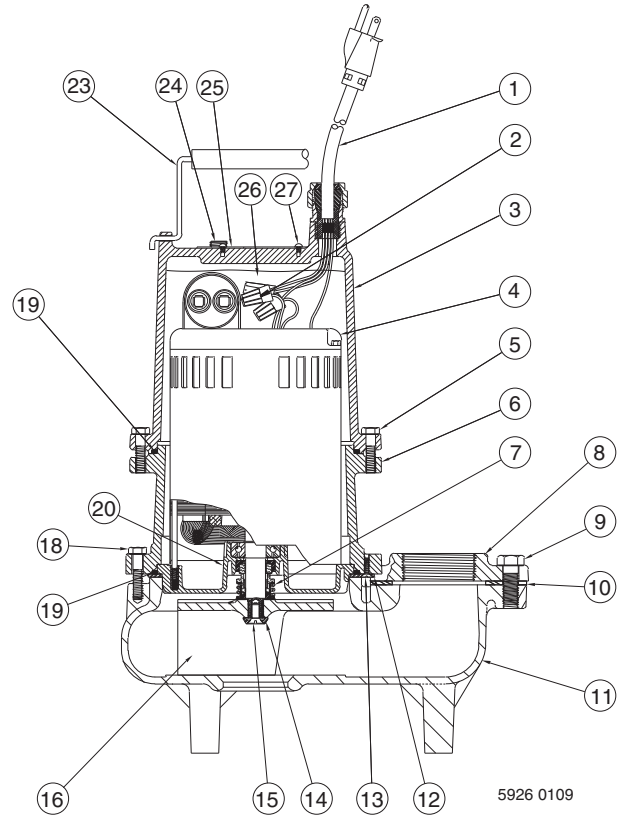
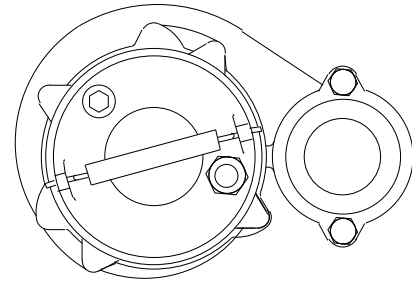
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## WIRING DIAGRAMS

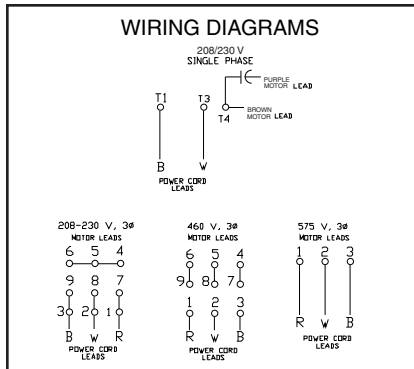


Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	POWER CORD ASSY.	13216-018-5 (208-230V 1 PH.-20')	1	13	SCREW-FLAT HEAD	984-001-1	3
1	POWER CORD ASSY.	11644-089-5 (ALL 3 PH.-20')	1	14	IMPELLER WASHER	518-002-1	1
2	CONNECTOR-WIRE	73-001-1 (ALL 3 PH.)	4	15	SCREW-FLAT HEAD	111-008-1	1
3	MOTOR HOUSING	56-023-2	1	16	IMPELLER	4781-111-2	1
4	MOTOR	14958-101-1 (230V 1 PH.)	1	18	SCREW-HHC	101-010-1	3
4	MOTOR	14958-102-1 (208/230/460 3 PH.)	1	19	O-RING	77-003-1	2
4	MOTOR	14958-103-1 (575V 3 PH.)	1	20	BEARING/SEAL PLATE	6846-000-2	1
4	MOTOR	14958-104-1 (208V 1 PH.)	1	21	FLOAT SWITCH ASS'Y	14595-020-1 (208/230V 1 PH.)	1
5	SCREW-HHC	19100A012	4	23	HANDLE ASS'Y	60-000-5	1
6	ADAPTER	12709-000-2	1	24	PIPE PLUG	14981-001-1	1
7	SEAL-TYPE 21	22447A000	1	25	NAMEPLATE	13425-069-1	1
8	DISCHARGE FLANGE	208-000-2	1	26	OIL	—	0.7
9	SCREW-HHC	19103A052	2	27	DRIVE SCREW	4580-001-1	2
10	FLANGE GASKET	324-001-1	1	NOT SHOWN	SEALANT	14801-010-1	EX.
11	VOLUTE CASE	6818-002-2	1				
12	CLAMP RING	5677-000-3	1				

# SKHS200 Parts List



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Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	POWER CORD ASSY.	13216-018-5 (208-230V 1 PH.-20')	1	13	SCREW-FLAT HEAD	984-001-1	3
1	POWER CORD ASSY.	11644-089-5 (ALL 3 PH.-20')	1	14	IMPELLER WASHER	518-002-1	1
2	CONNECTOR-WIRE	73-001-1 (ALL 3 PH.)	4	15	SCREW-FLAT HEAD	111-008-1	1
3	MOTOR HOUSING	56-023-2	1	16	IMPELLER	4781-112-2	1
4	MOTOR	14958-105-1 (208/230V 1 PH.)	1	18	SCREW-HHC	101-010-1	3
4	MOTOR	14958-106-1 (208V 3 PH.)	1	19	O-RING	77-003-1	2
4	MOTOR	14958-107-1 (230/460V 3 PH.)	1	20	BEARING/SEAL PLATE	6846-000-2	1
4	MOTOR	14958-108-1 (575V 3 PH.)	1	23	HANDLE ASS'Y	60-000-5	1
5	SCREW-HHC	19100A012	4	24	PIPE PLUG	14981-001-1	1
6	ADAPTER	12709-000-2	1	25	NAMEPLATE-1PH.	13425-069-1	1
7	SEAL-TYPE 21	22447A000	1	26	OIL	—	0.7
8	DISCHARGE FLANGE	208-000-2	1	27	DRIVE SCREW	4580-001-1	2
9	SCREW-HHC	19100A052	2	NOT SHOWN	SEALANT	14801-010-1	EX.
10	FLANGE GASKET	324-001-1	1				
11	VOLUTE CASE	6818-002-2	1				
12	CLAMP RING	5677-000-3	1				

## LIMITED WARRANTY

HYDROMATIC warrants to the original consumer purchaser ("Purchaser" or "You") of HYDROMATIC Sump Pumps, Effluent Pumps, Sewage Pumps (other than 2-1/2"), and Package Systems, that they will be free from defects in material and workmanship for the Warranty Period of 36 months from date of manufacture.

Our warranty will not apply to any product that, in our sole judgement, has been subject to negligence, misapplication, improper installation, or improper maintenance. Without limiting the foregoing, operating a three phase motor with single phase power through a phase converter will void the warranty. Note also that three phase motors must be protected by three-leg, ambient compensated, extra-quick trip overload relays of the recommended size or the warranty is void.

Your only remedy, and HYDROMATIC's only duty, is that HYDROMATIC repair or replace defective products (at HYDROMATIC's choice). You must pay all labor and shipping charges associated with this warranty and must request warranty service through the installing dealer as soon as a problem is discovered. No request for service will be accepted if received after the Warranty Period has expired. This warranty is not transferable.

EXCEPTIONS: Hydromatic Special Application Pumps, Battery Back-Up Sump Pumps, Filtered Effluent Pumps, Grinder Pumps, and 2-1/2" Sewage Pumps are warranted for a period of 12 months from date of purchase or 18 months from date of manufacture, whichever comes first.

HYDROMATIC SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING WARRANTIES SHALL NOT EXTEND BEYOND THE DURATION EXPRESSLY PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on the duration of an implied warranty, so the above limitations or exclusions may not apply to You. This warranty gives You specific legal rights and You may also have other rights which vary from state to state.

This warranty supersedes and replaces all previous warranty publications.

### HYDROMATIC

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– Your Authorized Local Distributor –



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Pentair Water

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