

STA-RITE®

SuperMax®

High Performance Pump



Installation and User's Guide

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

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IMPORTANT SAFETY PRECAUTIONS



Important Notice:

This guide provides installation and operation instructions for the SuperMax® Pump. Consult Pentair Water with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the pump.

Attention User: This manual contains important information that will help you in operating and maintaining this pump. Please retain it for future reference.



WARNING — Before installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 831-7133 for additional free copies of these instructions.

Consumer Information and Safety

The SuperMax® pumps are designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and cautions are identified by the “⚠” symbol. Be sure to read and comply with all of the warnings and cautions.



DANGER — Risk of electrical shock or electrocution.



This pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Ensure that the disconnected circuit is locked out or properly tagged so that it cannot be switched on while you are working on the pump. Failure to do so could result in serious injury or death to serviceman, pool users or others due to electric shock.





WARNING — Hazardous Pressure!





This pump produces high pressure. Air can enter the circulation system and become pressurized. Pressurized air can cause equipment lids (pump, filter, valves, etc.) to blow off. Always turn off the pump and relieve pressure before opening lids. Failure to do so could result in serious injury or death to installers, pool users or others and may also cause damage to property.


IMPORTANT SAFETY PRECAUTIONS (continued)


 **WARNING** — Do not operate the pump until you have read and understand clearly all the operating instructions and warning messages for all equipment that is a part of the pool circulating system. The following instructions are intended as a guide for initially operating the pump in a general pool installation, however each installation may have unique conditions where the starting procedure could be different. Failure to follow all operating instructions and warning messages can result in property damage or severe personal injury or death.

 **WARNING** — The pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.



 **WARNING** — To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

 **CAUTION** — This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity and has a maximum dimension of 18 feet (5.49m) and a maximum wall height of 42 inches (1.07m).

 **CAUTION** — For hot tubs and spa pumps, do not install within an outer enclosure or beneath the skirt of a hot tub or spa unless so marked.

General Installation Information

- All SuperMax[®] models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.
- When pump is mounted permanently within 5 ft. of the inside walls of a swimming pool, you **MUST** use a No. 8 AWG or larger conductor to connect to bonding conductor lug.

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Section 1

Introduction

SuperMax® High Performance Pump Overview

The perfect choice for all types of pools, the SuperMax® was specifically designed to be your best choice for a variety of inground pools. Thick walled body parts, a heavy duty 56 square flange motor, and highly engineered hydraulics make this rugged and tested design perfect for any pool, spa, water feature, or fountain. And SuperMax's silent running capability and small footprint allow it to easily drop into a compact equipment pad.

Efficient, Quiet, Rugged, and Versatile

All pumps from Pentair Water Pool and Spa® incorporate innovative hydraulic engineering that has been refined for over 40 years. SuperMax® reflects the latest and best Pentair technology, to move water more efficiently for lower operational costs. Compact, rugged, and easy to maintain, SuperMax® will deliver years of reliable service.



SuperMax® Pump

General Features

- Extremely quiet operation
- Unionized fittings (1.5" and 2") for simple replacement
- Cam and Ramp™ lid for easy cleaning and maintenance
- Heavy-duty, high service factor 56 square flange motor for long life
- Integral volute and pot reduce hydraulic noise
- See-through lid permits easy inspection of strainer basket

Additional Features:

- 115 volt or 230 volt models available
- 1/2 Hp to 2 Hp configurations to accommodate a wide range of applications
- Self-priming for quick, easy start-up
- Every SuperMax® pump is performance and pressure tested prior to shipment to ensure superior quality
- UL/CUL/NSF

Section 2

Electrical Requirements

This section describes how to wire the SuperMax® pump.

Note: Before installing this product, read and follow all warning notices and instructions starting on page ii.

Electrical Requirements and Wiring

When pump is mounted permanently within 5 ft. of the inside walls of a swimming pool, you **MUST** use a No. 8 AWG or larger conductor to connect to bonding conductor lug.

Wiring Installation

⚠ WARNING — Risk of electrical shock or electrocution.



This pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electric shock.

1. Make sure all electrical breakers and switches are turned off before wiring motor.
2. Make sure that the wiring voltage matches the motor voltage (230v or 115v). If they do not match the motor will burn up.
3. Choose a wire size from the Chart 1. When in doubt use a heavier gauge (larger diameter) wire. Heavier gauge will allow the motor to run cooler and more efficient.
4. Make sure all electrical connections are clean and tight.
5. Cut wires to the appropriate length so they don't overlap or touch when connected to the terminal board.

Chart 1.

SUPPLY WIRE SIZES (AWG)						
(Size and Length by Horsepower)						
Hp	115 volts			230 volts		
	50 ft.	100 ft.	150 ft.	50 ft.	100 ft.	150 ft.
1/3	14	14	12	14	14	14
1/2	14	12	10	14	14	14
3/4	12	12	10	14	14	14
1	12	10	8	14	14	14
1½	10	10	8	14	14	12
2	10	8	8	14	12	12
2½	-	-	-	12	12	10
3	-	-	-	12	12	10

Wiring Installation, cont.'d.

6. Permanently ground the motor using the green ground terminal located on the inside of the motor canopy or access plate, see **Figure 1**. Use the correct wire size and type specified by National Electrical Code. Make sure the ground wire is connected to an electrical service ground.
7. Bond the motor to the pool structure in accordance with the National Electrical Code. Use a solid No. 8 AWG or larger copper conductor. Run a wire from the external bonding screw on the motor to the pool bonding structure.
8. Connect the pump permanently to a circuit. Make sure no other lights or appliances are on the same circuit.

NOTE

It is important that the O-ring be kept clean and well lubricated. We recommend a silicone base lubricant for best results.

The Pump Strainer Basket

This unit, sometimes referred to as the 'Hair and Lint Pot', is the unit in front of the volute. Inside the chamber is the basket which must be kept clean of leaves and debris at all times. View basket through the 'See Through Lid' to inspect for leaves and debris.

Regardless of the length of time between filter cleaning, it is most important to visually inspect the hair and lint pot basket at least once a week. A dirty basket will reduce the efficiency of the filter and heater and also put an abnormal stress on the pump motor which would result in a costly repair bill.

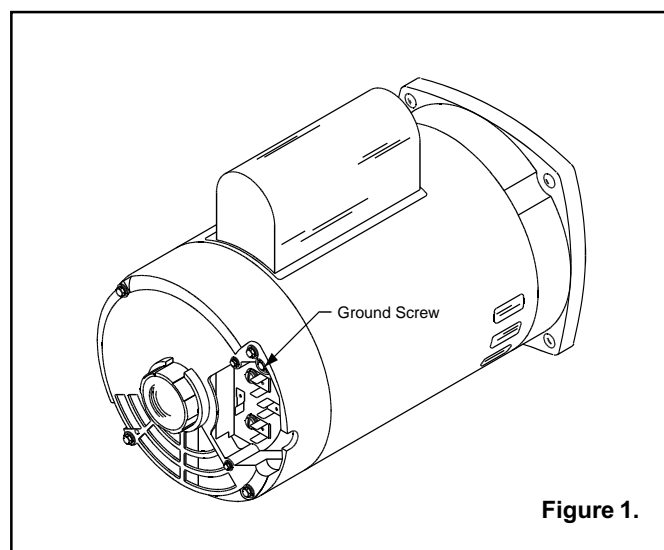


Figure 1.

Section 3

Maintenance

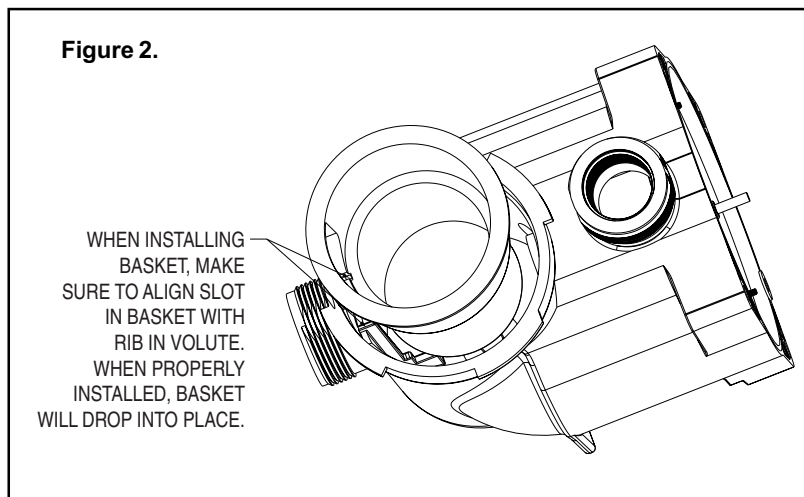
This section describes how to maintain the SuperMax[®] pump.

Cleaning the Pump Strainer Basket

⚠ WARNING — **DO NOT** open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠ CAUTION — To prevent damage to the pump and filter and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

1. Turn off motor.
2. Relieve pressure in the system.
3. Turn the clamp and lid in a counter-clockwise direction until it stops.
4. Turn the clamp and lid set to remove the clamp and lid.
5. Put the debris from the basket into the trash and rinse out the basket. If the basket is cracked, it should be replaced.
6. Replace the basket. Make sure to align the slot in the basket with the rib in the volute, see [Figure 2](#).
7. Fill the pump pot and volute up to the inlet port with water.
8. Clean the cover, cover O-ring, and sealing surface of the pump pot. Grease the O-ring with Teflon[®] or silicone.



Cleaning the Pump Strainer Basket, cont'd.

9. Reinstall the lid by placing the clamp and the lid on the pot; see **Figure 3**.
 - a. Make sure the lid O-ring is properly placed. Seat the clamp and lid then turn clockwise until the handles are horizontal; see **Figure 4**.
10. Turn the power “ON” at the house circuit breaker. Reset the pool time clock to the correct time.



WARNING — THIS FILTER OPERATES UNDER HIGH PRESSURE.



When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to blow off which can result in severe injury, death, or property damage. To avoid this potential hazard, follow these instructions.

11. Open the manual air relief valve on top of the filter.
12. Stand clear of the filter. Start the pump.
13. Bleed air from the filter until a steady stream of water comes out. Close the manual air relief valve.

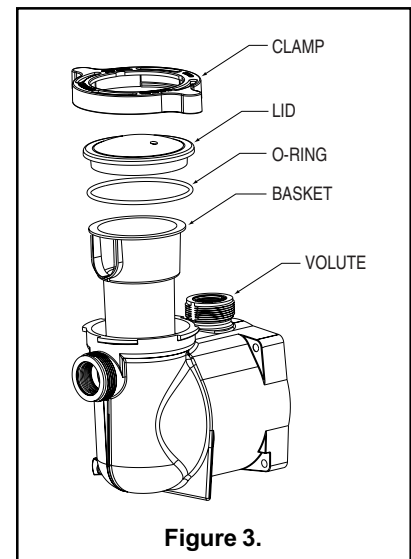


Figure 3.

Winterizing

1. If the air temperature drops below 35° F., the water in the pump can freeze and cause damage. Freeze damage is not warrantable.
2. To prevent freeze damage follow the procedures listed below:
 - a. Shut off electrical power for the pump at the house circuit breaker.
 - b. Drain the water out of the pump case by removing the two thumb-twist drain plugs from the case. Store the plugs in the pump basket.
 - c. Cover the motor to protect it from severe rain, snow and ice.
 - d. Do not wrap the motor in plastic. It will cause condensation and rust on the inside of the motor.

Care of Electric Motor

1. Protect from heat.
 - a. Shade the motor from the sun.
 - b. Any enclosure must be well ventilated to prevent overheating.
 - c. Provide ample cross ventilation.
2. Protect against dirt.
 - a. Protect from any foreign matter or splashing water.
 - b. Do not store (or spill) pool chemicals near the motor.
 - c. Avoid sweeping or stirring up dust near the motor while it is operating.
 - d. If a motor has been damaged by dirt it voids the motor warranty.
3. Protect against moisture.
 - a. Protect from splashing pool water and lawn sprinklers.
 - b. Protect from the weather.
 - c. If a motor has become wet - let it dry before operating. Do not allow the pump to operate if it has been flooded.
 - d. If a motor has been damaged by water it voids the motor warranty.

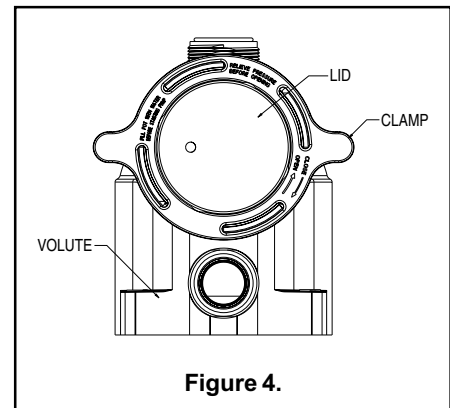


Figure 4.

NOTE

- **DO NOT** wrap motor with plastic or other air tight materials. The motor may be covered during a storm, for winter storage, etc., but never when operating, or expecting operation.
- When replacing the motor, be certain that the motor support is correctly positioned to support the size of motor being installed.

Section 4

Servicing

This section describes how to service the SuperMax® pump.

⚠ WARNING — Risk of electrical shock or electrocution.



This pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electric shock.

Read all servicing instructions before working on the pump.

⚠ WARNING — DO NOT open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.



Pump Disassembly

1. All moving parts are located in the rear sub-assembly of this pump.
Tools required:
 - a. 1/4 inch socket or open end wrench.
 - b. 3/8 inch socket or open end wrench.
 - c. 9/16 inch open end wrench.
 - d. Flat blade screwdriver.
2. To remove and repair the motor sub-assembly perform the following procedures:
 - a. Turn off the pump circuit breaker at the main panel.
 - b. Drain the pump by removing the drain plugs.
 - c. Remove the 4 bolts that hold the main pump body (strainer pot/volute) to the rear sub-assembly.
 - d. GENTLY pull the two pump halves apart, removing the rear sub-assembly.
 - e. Remove the three hex head screws holding the diffuser in position.

⚠ CAUTION — Be sure not to scratch or mar the polished shaft seal faces; seal will leak if faces are damaged.

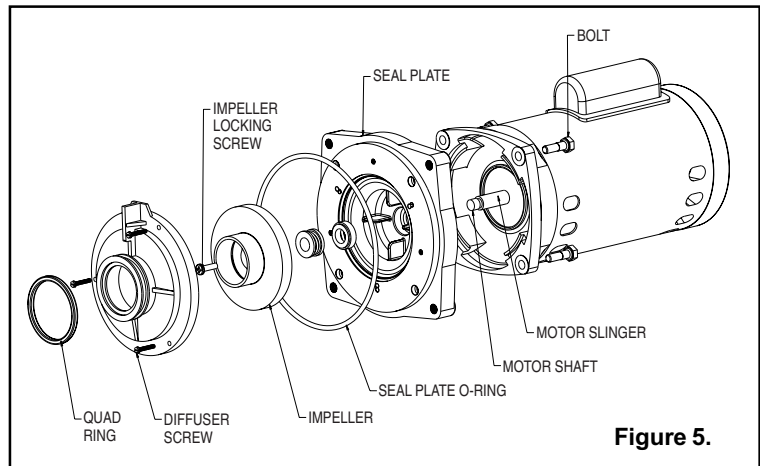
- f. Hold the impeller securely in place and remove the impeller lock screw by using a flat blade screwdriver or wrench. The screw is a left-handed thread and loosens in a clockwise direction.
- g. Remove the shaft cap located at the back of the motor and hold the shaft secure with a 1/2 inch (Century®) or 7/16 inch (Franklin) open-end wrench. On A. O. Smith motors, remove the motor canopy, move the capacitor to one side and hold the shaft with a 7/16 inch open-end wrench.

Pump Disassembly, cont'd.

- h. To unscrew the impeller from the shaft, twist the impeller counter-clockwise.
- i. Remove the four bolts from the seal plate to the motor using a 3/8 inch wrench.
- j. Place the seal plate face down on a flat surface and tap out the ceramic seal.
- k. Clean the seal plate, seal housing, and the motor shaft.

Pump Reassembly/Seal Replacement; see Section 7, Technical Data, and Figure 5

1. When installing the replacement seal into the seal plate, use soapy water to wet the rubber boot before pressing it into the seal plate.
2. Remount the seal plate to the motor.
3. Before installing the rotating portion of the seal on the motor shaft, wet the motor shaft with soapy water and slide the seal onto the motor shaft. Ensure that the carbon face contacts the ceramic face of the stationary seat. Press the seal into the seal plate with your thumbs and wipe off the ceramic with a clean cloth.
4. Grease the motor shaft thread and screw impeller onto the motor shaft.
5. Screw in the impeller lock screw (counter-clockwise to tighten).
6. Remount the diffuser onto the seal plate. Make sure the plastic pins and holding screw inserts are aligned.
7. Grease the diffuser quad ring and seal plate o-ring prior to reassembly.
8. Grease the bolt threads, assemble the motor sub-assembly to the strainer pot-pump body by using the two through bolts for proper alignment. Do not tighten the through bolts until all 4 bolts are in place and finger tightened.
9. Fill the pump with water.
10. Reinstall the pump lid and plastic clamp; see SECTION 3, Maintenance.
11. Reprime the system.



The Shaft Seal

1. The Shaft Seal consists primarily of two parts, a rotating member and a ceramic seal.
2. The pump requires little or no service other than reasonable care, however, a Shaft Seal may occasionally become damaged and must be replaced.

CAUTION — The polished and lapped faces of the seal could be damaged if not handled with care.

CAUTION — In mild climate area, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.

Section 5

Restart Instructions

If the SuperMax[®] pump is installed below the water level of the pool, close return and suction lines prior to opening hair and lint pot on pump. Make sure to reopen valves prior to operating.

⚠ CAUTION — **DO NOT** run the pump dry. If the pump is run dry, the mechanical seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced. **ALWAYS** maintain proper water level in your pool (half way up skimmer opening). If the water level falls below the skimmer opening, the pump will draw air through the skimmer, losing the prime and causing the pump to run dry, resulting in a damaged seal.

NOTE

Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal.

Priming the Pump

1. The pump strainer pot must be filled with water before the pump is initially started. Follow these steps to prime the pump.
 - a. Remove the pump lid plastic clamp. Remove the pump lid.
 - b. Fill the pump strainer pot with water.
 - c. Reassemble the pump cover and plastic clamp onto the strainer pot. The pump is now ready to prime.
 - d. Open the air release valve on the filter, and stand clear of the filter.
 - e. Turn on the switch or time clock.
 - f. When water comes out of the air release valve, close the valve. The system should now be free of air and recirculating water to and from the pool.
2. For 2-speed pumps:
 - a. Pump should run on high-speed for priming.
 - b. The pump should not run longer than 8 minutes before priming is achieved.

Section 6

Troubleshooting

Use the following troubleshooting information to resolve possible problems with your SuperMax® pump.

WARNING — RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.

Improperly installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.



1. If you are not familiar with your pool filtering system and/or heater:
 - a. **Do NOT** attempt to adjust or service without consulting your dealer, or a qualified pool technician.
 - b. Read the entire Installation & User's Guide before attempting to use, service or adjust the pool filtering system or heater.

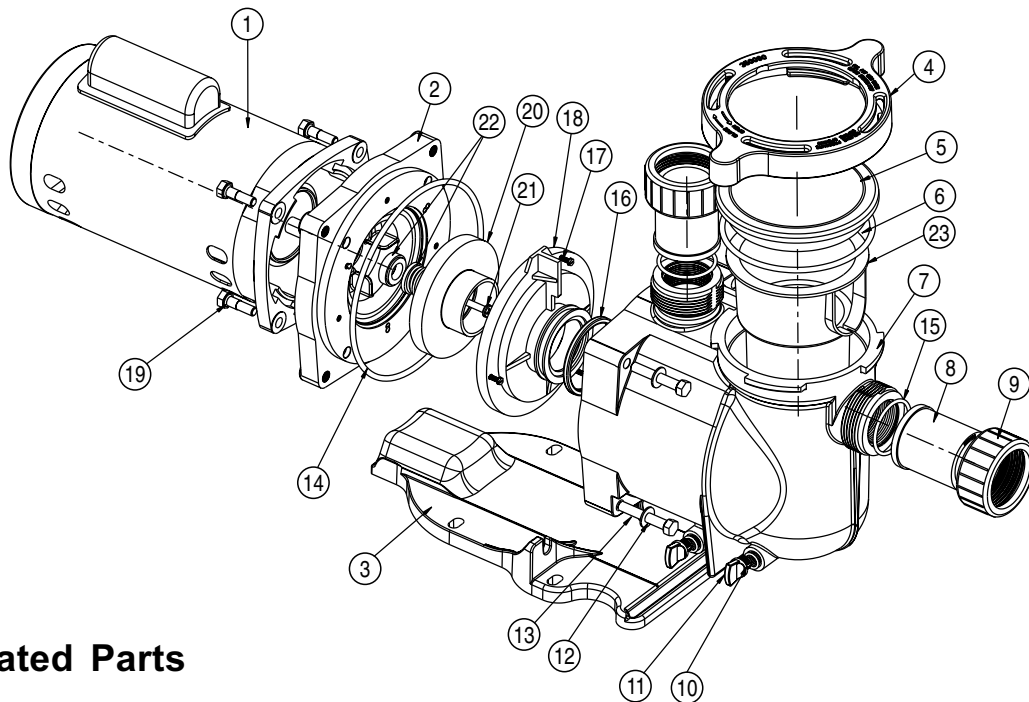
Note: Turn off power to unit prior to attempting service or repair.

Problems and Corrective Actions

<i>Problem</i>	<i>Corrective Action</i>
FAILURE TO PUMP Pump Will Not Prime — to much air	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and make sure lid gasket is in place. Check water level to make sure skimmer is not drawing air.
Pump Will Not Prime — not enough water Pump strainer clogged Pump strainer gasket defective	Make sure suction lines, pump strainer, and pump volute are full of water. Make sure valve on suction line is working and open, (some systems do not have valves). Check water level to make sure water is available through skimmer. Clean pump strainer pot. Replace gasket.
REDUCED CAPACITY and/or HEAD Air pockets or leaks in suction line Pump Will Not Prime — to much air	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and make sure lid gasket is in place. Check water level to make sure skimmer is not drawing air.
Clogged impeller	Turn off electrical power to the pump. Remove the clamp that holds the volute to the seal plate. Slide the motor and seal plate away from the volute. Clean debris from impeller. If debris cannot be removed, complete the following steps. <ol style="list-style-type: none"> (1) Remove left hand thread anti-spin bolt and O-ring. (2) Remove, clean and reinstall impeller. (3) Reinstall anti-spin bolt. Reinstall diffuser and quad ring. Reinstall motor and seal plate into volute. Reinstall clamp around seal plate and volute and tighten securely.
Pump strainer clogged	Clean suction trap.

Section 7

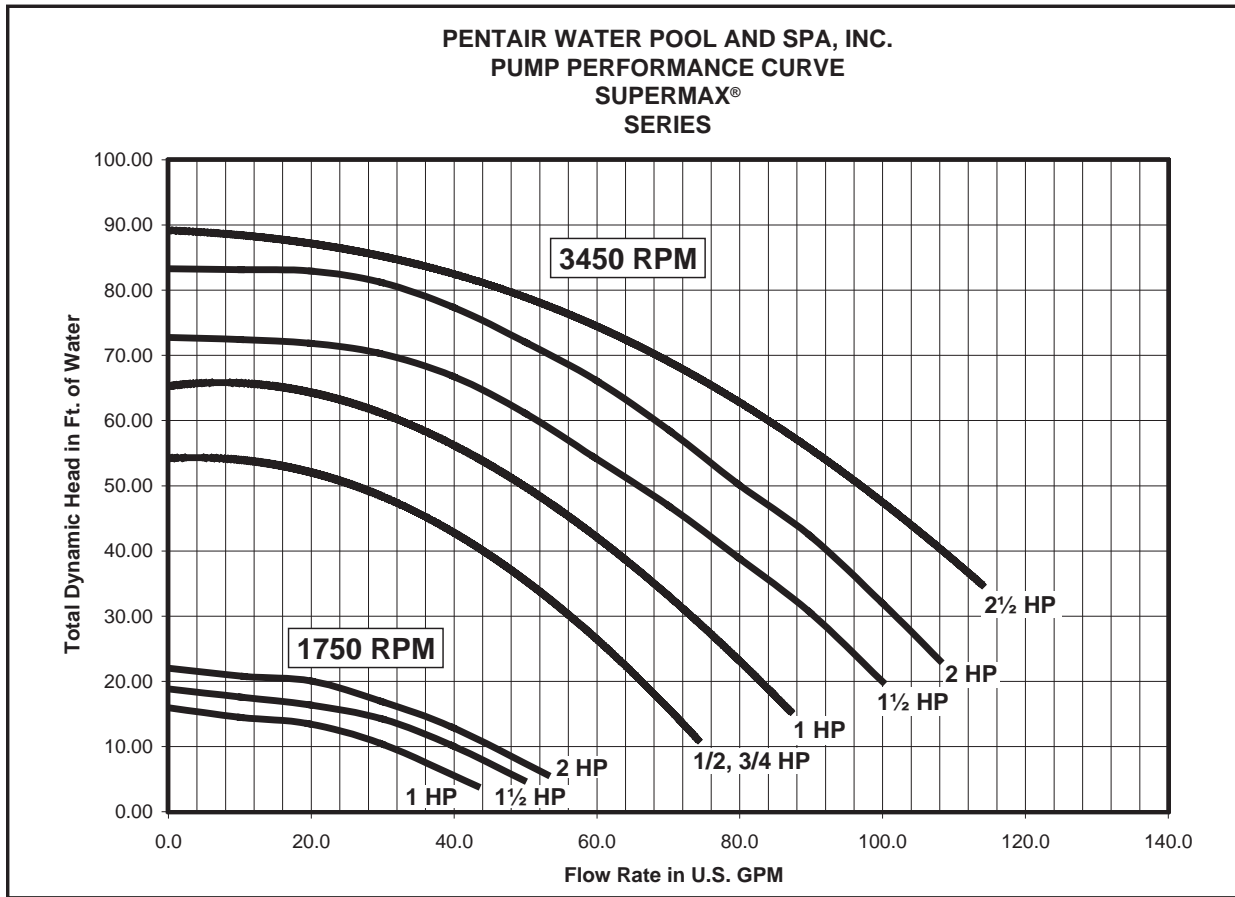
Technical Data



Illustrated Parts

Item No.	Part No.	Description	Item No.	Part No.	Description
SINGLE SPEED SUPERMAX MOTORS			13	072184	WASHER 3/8 in. S/S, 4 req.
1	355371S	½, ¾ HP — (Black)	14	355619	O-RING SEAL BRACKET
1	355339S	1 HP — (Black)	15	350099	O-RING ADAPTER #2-226, 2 req.
1	355340S	1½ HP — (Black)	16	355030	SEAL DIFFUSER
1	355342S	2 HP — (Black)	17	355334	SCREW #8-32 HEX WASHER HD, 3 req.
1	355702S	2½ HP — (Black)	18	355617	DIFFUSER - ½ HP
DUAL SPEED SUPERMAX MOTORS			18	355617	DIFFUSER - ¾ HP
1	355232S	1 HP — (Black)	18	355617	DIFFUSER - 1 HP
1	355376S	1½ HP — (Black)	18	355618	DIFFUSER - 1½ HP
1	355377S	2 HP — (Black)	18	355618	DIFFUSER - 2 HP
ENERGY EFFICIENT SUPERMAX MOTORS			18	350170	DIFFUSER - 2½ HP
1	355391S	½, ¾, 1 HP — (Black)	19	354290	HEX HEAD SCREW 3/8 - 16, 4 req.
1	355392S	1½ HP — (Black)	20	355043	IMPELLER ½ HP
1	355393S	2 HP — (Black)	20	355043	IMPELLER ¾ HP
1	355394S	2½ HP — (Black)	20	355067	IMPELLER 1 HP
2	355612	SEAL PLATE	20	355074	IMPELLER 1½ HP
3	351094	BASE	20	355086	IMPELLER 2 HP
4	351090	CLAMP, RAMP & CAM	20	355093	IMPELLER 2½ HP
5	350091	LID	20	355067	IMPELLER 1 HP, 2-SPD
6	357255	O-RING, LID #2-357	20	355074	IMPELLER 1½ HP, 2-SPD
7	351089	VOLUTE	20	355086	IMPELLER 2 HP, 2-SPD
8	350093	ADAPTER, 2 req.	21	355389	SCREW, IMPELLER LOCKING
9	270141	NUT, 2 req.	22	354545	SEAL SET
10	192115	O-RING DRAIN PLUG, 2 req.	23	355667	BASKET, LARGE
11	357161	DRAIN PLUG, 2 req.	24	351157	SUPERMAX® UNION KIT (2 UNIONS, 2 ADAPTERS, 2 O-RINGS PER KIT)
12	355621	SCREW ¾-16 X 2¼ HEX HD, 4 req.			

Pump Curve



SAVE THESE INSTRUCTIONS

NOTES

STA-RITE®

