

STA-RITE®

"LT" SERIES CENTRIFUGAL PUMPS

O W N E R ' S M A N U A L

INSTALLATION, OPERATION & PARTS

MODELS

| | |
|------------|---------|
| 1/6 HP | LT1/6L |
| 1/2 HP | LTACL |
| 3/4 HP | LTADL |
| 3/4-1/8 HP | LTAYDRL |

This manual should be furnished to the end user of this pump; its use will reduce service calls and chance of injury and will lengthen pump life.

Sta-Rite Pool/Spa Group

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Union City, TN • Delavan, WI • Mississauga, Ont. • Murrieta, CA

'LT' SERIES CENTRIFUGAL PUMP

To avoid unneeded service calls, prevent possible injuries, and get the most out of your pump, READ THIS MANUAL CAREFULLY!

The Sta-Rite 'LT' Series pump:

- **Is designed to circulate water in above ground swimming pools, and in spas, hot tubs, and solar systems.**
- **Is an excellent performer; durable, reliable, with non-clogging impeller.**

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IMPORTANT SAFETY INSTRUCTIONS

Always follow basic safety precautions with this equipment, including the following.

▲ 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.

SAVE THESE INSTRUCTIONS

READ AND FOLLOW SAFETY INSTRUCTIONS!

▲ This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

▲ DANGER warns about hazards that **will** cause death, serious personal injury, or major property damage if ignored.

▲ WARNING warns about hazards that **can** cause death, serious personal injury, or major property damage if ignored.

▲ CAUTION warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.

NOTICE indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

▲ WARNING **Incorrectly installed or tested equipment may fail, causing severe injury or property damage.**
Hazardous pressure Read and follow instructions in owner's manual when installing and operating equipment. Have a trained pool professional perform all pressure tests.

1. Do not connect system to a high pressure or city water system.
2. Use equipment only in a pool or spa installation.
3. Trapped air in system can cause explosion. BE SURE all air is out of system before operating or testing equipment.

Before pressure testing, make the following safety checks:

- Check all clamps, bolts, lids, and system accessories before testing.
- Release all air in system before testing.
- Tighten Sta-Rite trap lids to 30 ft. lbs. (4.1 kg-m) torque for testing.
- Water pressure for test must be less than 25 PSI (7.5 kg/cm²).
- Water Temperature for test must be less than 100° F. (38° C).
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation. Remove trap lid and retighten hand tight only.

NOTICE: These parameters apply to Sta-Rite equipment only. For non-Sta-Rite equipment, consult manufacturer.

▲ CAUTION Motor normally operates at high temperature and will be too hot to touch. It is protected from heat damage during operation by an automatic internal cut off switch. Before handling pump or motor, stop motor and allow it to cool for twenty minutes.

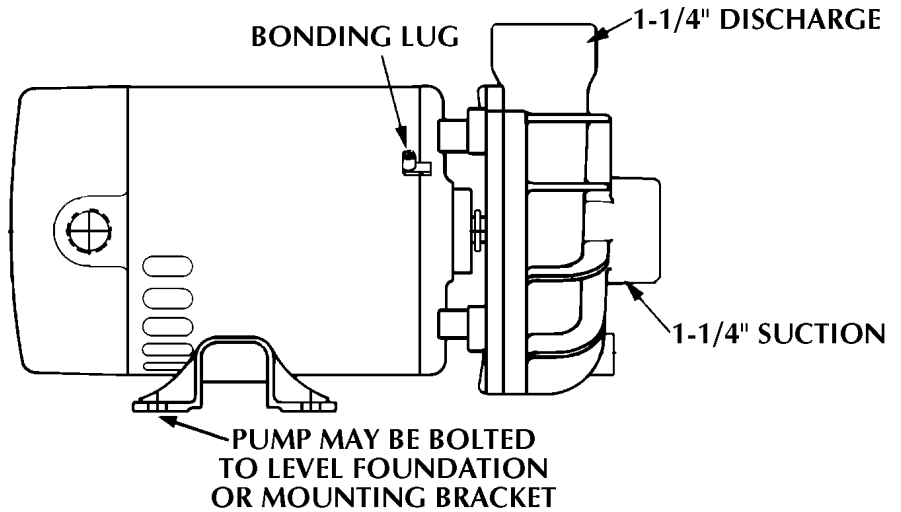


FIGURE 1

INSTALLATION

Only qualified, licensed personnel should install pump and wiring.

Pump mount must:

Be solid - Level - Rigid - Vibration free. (To reduce vibration and pipe stress, bolt pump to mount.)

Allow pump suction inlet height to be as close to water level as possible.

Allow use of short, direct suction pipe (To reduce friction losses).

Allow for gate valves in suction and discharge piping.

Have adequate floor drainage to prevent flooding.

Be protected from excess moisture.

Allow adequate access for servicing pump and piping.

NOTICE: Use Teflon tape or Plasto-Joint Stik¹ for making all threaded connections to the pump. Do not use pipe dope; pipe dope will cause stress cracking in the pump.

NOTICE: Pump suction and discharge connections have molded in thread stops. DO NOT try to screw pipe in beyond these stops.

Teflon Taping Instructions:

Use only new or clean PVC pipe fittings.

Wrap male pipe threads with one to two layers of Teflon tape. Cover entire threaded portion of pipe.

Do not overtighten or tighten past thread stop in pump port!

If leaks occur, remove pipe, clean off old tape, rewrap with one to two additional layers of tape and remake the connection.

NOTICE: Support all piping connected with pump!

¹Lake Chemical Co., Chicago, Illinois

Piping:

Use at least 1-1/4" (32mm) IPS PVC. Increase size if a long run is needed.

To avoid strains on the pump, support both suction and discharge pipes independently. Place these supports near the pump.

To avoid a strain left by a gap at the last connection, start all piping at the pump and run pipe **away** from the pump.

Never use a suction pipe smaller than pump suction connection.

To avoid airlocking, slope suction pipe slightly upward toward the pump.

NOTICE: To prevent flooding when removing pump for service, all flooded suction systems **must** have gate valves in suction and discharge pipes.

Fittings:

Fittings restrict flow; for best efficiency use fewest possible fittings.

Avoid fittings which could cause an air trap.

Pool fittings must conform to International Association of Plumbing and Mechanical Officials (IAPMO) standards.

Use only non-entrapping suction fitting or double suction.



ELECTRICAL

- ⚠ Ground motor before connecting to electrical power supply. Failure to ground motor can cause severe or fatal electrical shock hazard.
- ⚠ Do not ground to a gas supply line.
- ⚠ To avoid dangerous or fatal electrical shock, turn OFF power to motor before working on electrical connections.
- ⚠ Ground Fault Circuit Interrupter (GFCI) tripping indicates an electrical problem. If GFCI trips and will not reset, have a qualified electrician inspect and repair electrical system.
- ⚠ Exactly match supply voltage to nameplate voltage (115 Volt single phase only). Incorrect voltage can cause fire or seriously damage motor and voids warranty. If in doubt consult a licensed electrician.

Voltage

Voltage at motor must be not more than 10% above or below motor nameplate rated voltage or motor may overheat, causing overload tripping and reduced component life. If voltage is less than 90% or more than 110% of rated voltage when motor is running at full load, consult power company.

Grounding/Bonding

Install, ground, bond and wire motor according to local or National Electrical Code requirements.

Permanently ground motor. Use green ground terminal provided under motor canopy or access plate (See Figure 2); use size and type wire required by code. Connect motor ground terminal to electrical service ground.

Bond motor to pool structure. Use a solid copper conductor, size No. 8 AWG (8.4 sq. mm) or larger. Run wire from external bonding lug (see Figure 2) to reinforcing rod or mesh.

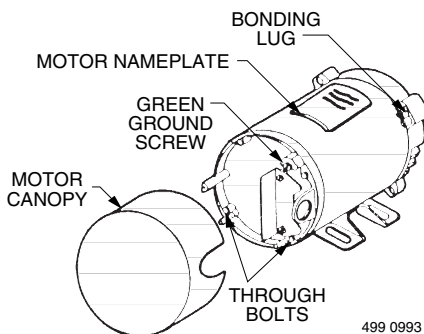


Figure 2 – Typical ground screw and bonding lug locations.

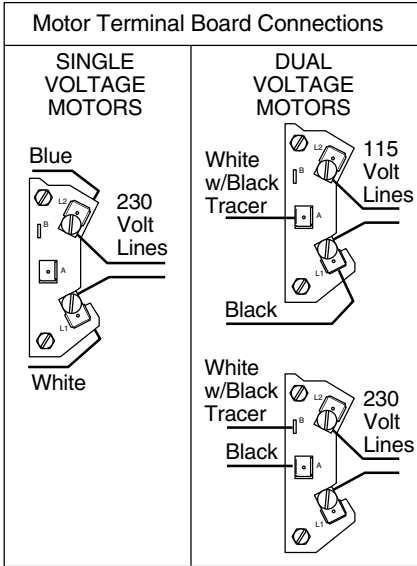


Figure 3A – Wiring hook-up diagram.

Connect a No. 8 AWG (8.4 sq. mm) solid copper bonding wire to the pressure wire connector provided on the motor housing and to all metal parts of the swimming pool, spa, or hot tub and to all electrical equipment, metal piping or conduit within 5 feet (1.5 m) of the inside walls of swimming pool, spa, or hot tub.

Wiring

Pump must be permanently connected to circuit. Table I gives correct wire and circuit breaker sizes for the pump alone. If other lights or appliances are also on the same circuit, be sure to add their amp loads to pump amp load before figuring wire and circuit breaker sizes. (If unsure how to do this or if this is confusing, consult a licensed electrician.) Use the load circuit breaker as the master on-off switch.

Install a Ground Fault Circuit Interrupter (GFCI) in circuit; it will sense a short-circuit to ground and disconnect power before it becomes dangerous to pool users. For size of GFCI required and test procedures for GFCI, see manufacturer’s instruction.

In case of power outage, check GFCI for tripping (which will prevent normal pump operation). Reset if necessary.

NOTICE: If you do not use conduit when wiring motor, **be sure** to seal wire opening on end of motor to prevent dirt, bugs, etc., from entering.

⚠ Values given in table below are for PUMP ONLY. If additional accessories are installed on pump motor circuit (heater, blower, etc.), include their amverage draw when figuring wire and circuit breaker sizes.

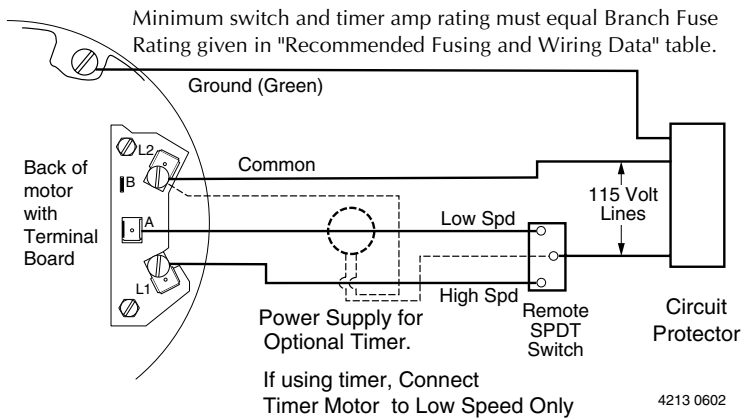


Figure 3B – Remote switching for 115V 2-Speed pumps. Timer supply should be unswitched.

TABLE I - RECOMMENDED FUSING AND WIRING DATA – 60 Cycle Motors

| Pump Model | Motor HP | Branch Fuse Rating Amps* | Max Load Amps | Voltage/Hz/Phase | Serv. to Motor - Dist. in Ft. (M) | | |
|------------|----------|--------------------------|---------------|------------------|-----------------------------------|-------------------|-------------------|
| | | | | | 0-100' (0-30M) | 101-200' (30-60M) | 201-300' (60-90M) |
| LT1/6L | 1/6 | 15 | 4.5 | 115/60/1 | 14(2) | 14(2) | 14(2) |
| LTACL | 1/2 | 15 | 8.4 | 115/60/1 | 14(2) | 12(3) | 10(5.5) |
| LTADL | 3/4 | 15 | 11.4 | 115/60/1 | 14(2) | 10(5.5) | 8(8.4) |
| LTAYDRL | 3/4-1/8 | 15 | 10.0-3.0 | 115/60/1 | 14(2) | 12(3) | 10(5.5) |

* Branch Short Circuit Protection (Non Time-Delay Fuse).

⚠ CAUTION

OPERATION

NEVER run pump dry. Running pump dry may damage seals, causing leakage and flooding. Fill pump with water before starting motor.

⚠ Do not add chemicals to spa system directly in front of pump suction. Adding undiluted chemicals may damage pump and voids warranty.

Open gate valves before starting system.

Pump will prime itself when used in flooded suction system.

Be sure to release all air from filter and piping system; see spa/filter owner's manual.

On 2-Speed models, low speed is used for filtration and heating; high speed provides therapy jet action.

⚠ Do not block pump suction. To do so with body may cause severe or fatal injury. Small children using spa must ALWAYS have close adult supervision.

- Tub should have dual suction outlets to prevent body or hair entrapment.
- Use only tub suction fittings certified to meet ASME/ANSI standard A112.19.8M-1987.

NOTICE: Do not block pool return or spa jets! To do so may flood area causing damage to equipment and water damage to surrounding area.

Spa or Tub Water:

Keep water level at least two inches above bottom of skimmer opening when system is not in use. Failure to do so can allow air to enter system, causing pump to lose its prime.

Keep water temperature at 104°F (40°C) or below.

Age or health conditions may require a lower temperature; consult a physician for more information.

If in doubt, start at a lower temperature and gradually increase it according to your experience.

Keep an accurate thermometer in bath; check it before getting in.

⚠ Do not use or allow the use of the spa by anyone using alcohol or drugs. The effects of hot water, alcohol and/or drugs can cause dizziness and falling, loss of consciousness, or heart attack.

⚠ A long bath in hot water may cause hyperthermia (too much heat in the body) which can be fatal. Some symptoms of hyperthermia are:

- Nausea
- Dizziness
- Fainting

If these symptoms appear while in the spa, **GET OUT AT ONCE!**

Cool the body at once with cold towels or a cool shower.

Call a doctor if symptoms do not go away.





Draining Pump

⚠ WARNING To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before draining pump.

Storage/Winterizing:

⚠ WARNING Explosion hazard. Purging the system with compressed air can cause components to explode, with risk of severe injury or death to anyone nearby. Use only a low pressure (below 5 PSI), high volume blower when air purging the pump, filter, or piping.

NOTICE: Allowing pump to freeze will damage pump and void warranty!

NOTICE: Do not use anti-freeze solutions (except propylene glycol) in your pool/spa system. Propylene glycol is non-toxic and will not damage plastic system components; other anti-freezes are highly toxic and may also damage plastic components in the system.

Drain all water from pump and piping when expecting freezing temperatures or when storing pump for a long time (see instructions below).

Keep motor dry and covered during storage.

To avoid condensation/corrosion problems, **do not** cover pump with plastic.

For outdoor/unprotected installations:

1. Gravity drain system as far as possible.
2. Protect areas which retain water with non-toxic propylene glycol antifreeze ("RV antifreeze").
3. Enclose entire system in a weatherproof enclosure.
4. To avoid condensation/corrosion damage, allow ventilation; do not wrap system in plastic.
5. Use a 40% propylene glycol/60% water solution to protect pump to -50 degrees F (-46 degrees C).

Startup For Winterized Equipment

1. Remove any temporary weather protection placed around system.
2. Follow filter manufacturer's instructions for reactivation of the filter.
3. Inspect all electrical wiring for damage or deterioration over the shutdown period. Have a qualified serviceman repair wiring as needed.
4. Inspect and tighten all watertight connections.
5. Open all valves in suction and return piping.
6. Remove any winterizing plugs in piping system.
7. Drain all antifreeze from system.
8. Close all drain valves and replace all drain plugs in piping system.
9. Prime pump according to instructions on Page 7.

PUMP SERVICE

⚠ WARNING To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before working on pump or motor.

No lubrication or regular maintenance is needed beyond reasonable care and periodic cleaning.



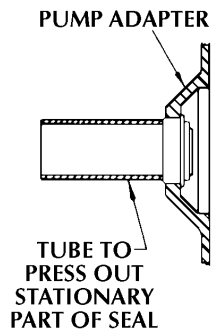


Figure 4

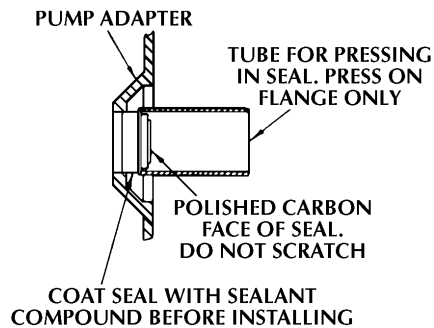


Figure 5

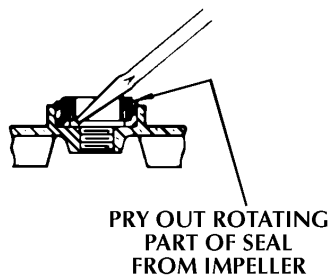


Figure 6

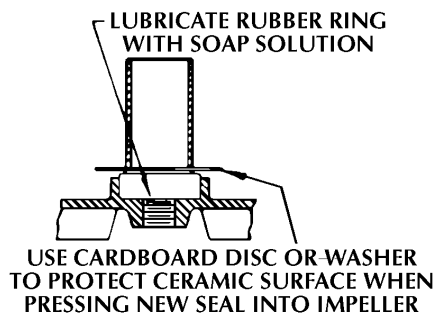


Figure 7

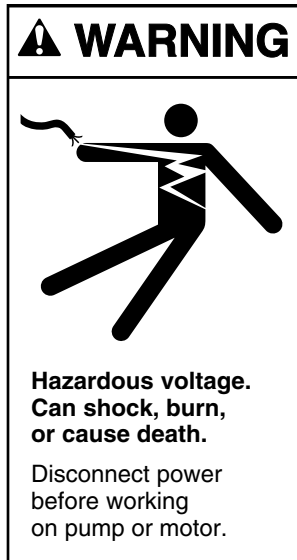
If shaft seal is damaged, repair as follows:

Removing Old Seal

1. Disconnect power to pump motor.
2. Drain water to below level of suction and discharge piping and disconnect pipes from pump body.
3. Remove nine capscrews, Key No. 10, Page 11, from pump body, Key No. 8.
4. Remove pump body from seal plate, Key No. 3. Use care to not damage gasket, Key No. 4, when opening pump body. If damaged, replace.
5. Remove cover from end of motor to expose shaft and electrical components.
6. Place a 7/16" open end wrench on flats of motor shaft at cover end below centrifugal switch mechanism. Hold shaft, and when looking at impeller, turn impeller clockwise and remove from shaft.
7. Unscrew four through-bolts under motor cover to remove seal plate from motor.
8. Drive stationary part of shaft seal out of seal plate using rigid tubing or pipe as shown in Figure 4.
9. Clean seal plate cavity and motor shaft.

Installing New Seal

1. Coat seal cup with Sealastic #732 RTV sealant before pressing seal into seal cavity. Press into place with a tube or pipe of correct diameter to press on seal cup rim only, as shown in Figure 5.
2. Pry loose the ceramic seal seat in back of impeller, using screwdriver between seat and cavity in impeller as shown in Figure 6. Clean cavity from which seat was removed.
3. Lubricate O-Ring on seal seat with liquid soap solution. Press seat into impeller cavity with polished face up as shown in Figure 7. Use cardboard disc or large washer to protect surface of ceramic seat of new seal. BE SURE you do not scratch or nick seal surface.
4. To Reassemble pump, reverse steps one through seven. See Exploded View, Page 11.



TROUBLESHOOTING GUIDE

⚠ Read and understand safety and operating instructions in this manual before doing any work on pump!

⚠ Only qualified personnel should electrically test pump motor!

Pump does not operate:

1. Check GFCI for proper operation according to GFCI manufacturer's instructions.
2. Check for plugged impeller. Follow disassembly/assembly instructions under "Pump Service", Page 8.
3. Consult dealer/installer or service representative.

Inadequate circulation or jet action:

1. Check for blocked fittings. Block fittings will cause poor flow and poor jet action.
2. Consult dealer/installer or service representative.

Excessive air in system - pump loses prime:

1. Make sure water level is at least 2" (51mm) above top of jets with system not operating.
2. Make sure there are no leaks in suction piping.
3. Make sure there is no vortex (whirlpool) at the suction.
4. Consult dealer/installer or service representative.

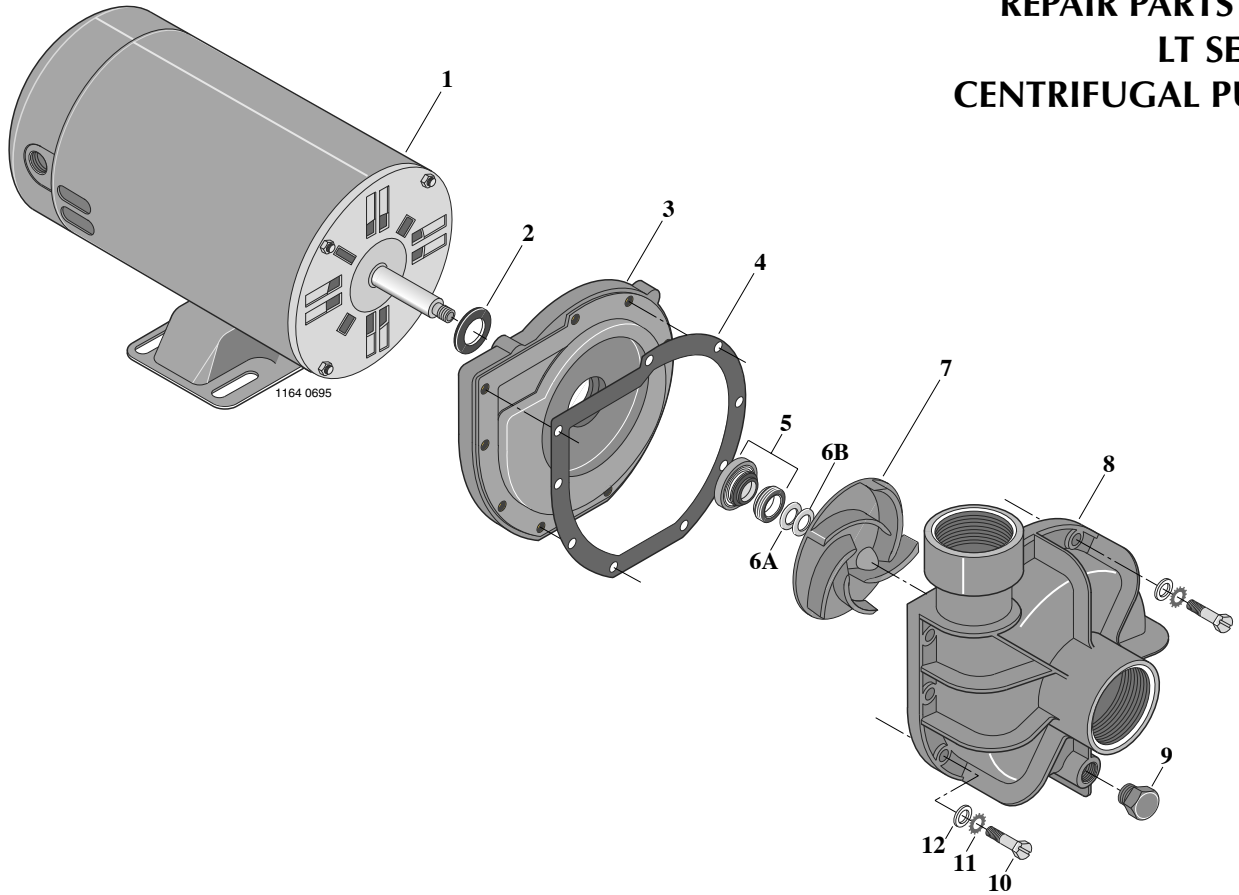
Circuit breaker in home panel trips repeatedly:

1. Breaker must be of adequate capacity.
2. For GFCI breaker: test according to GFCI manufacturer's instructions.
3. Be sure no other lights and appliances are on circuit.
4. Consult dealer/installer or service representative.

Mechanical troubles and noise:

1. If pump suction and discharge piping are not adequately supported, pump assembly will be strained. See "Installation", Page 4.
2. Do not mount pump on a wooden platform! Securely mount on a concrete platform for quietest performance.
3. Air leak in suction line (bubbles in water returning to pool). Repair leak. Tighten trap lid.
4. Foreign matter (gravel, metal, etc.) in pump impeller. Disassemble pump, clean impeller, follow "Pump Service" instructions on Page 8 for reassembly.
5. Cavitation.
Improve suction conditions by increasing pipe size, decreasing number of fittings. Increase discharge pressure (reduce flow by throttling discharge gate valve).

REPAIR PARTS LIST LT SERIES CENTRIFUGAL PUMP



| Key No. | Description | Qty. | Model Number | | | |
|----------------------|-------------------------------|------|----------------|---------------|---------------|-------------------|
| | | | LT1/6L ½ HP | LTACL ½ HP | LTADL ¾ HP | LTAYDRL ¾-½ HP |
| 1 | Motor 115V/60H/1 Ph.* | 1 | A800A16L | A800CLL | A800DLL | A800DLL-Y |
| 2 | Slinger | 1 | C69-7 | C69-7 | C69-7 | C69-7 |
| 3 | Seal Plate | 1 | C1-84P2 | C1-84P2 | C1-84P2 | C1-84P2 |
| 4 | Gasket | 1 | C20-31B | C20-31B | C20-31B | C20-31B |
| 5 | Shaft Seal | 1 | U109-68SS | U109-68SS | U109-68SS | U109-68SS |
| 6A | Shim (.010 Thick) As Required | 2 | C43-21D | C43-21D | C43-21D | C43-21D |
| 6B | Shim (.029 Thick) As Required | 2 | C43-22D | C43-22D | C43-22D | C43-22D |
| 7 | Impeller | 1 | C5-151P2 | C5-151P1 | C5-175P | C5-175P |
| 8 | Volute | 1 | C101-247P | C101-247P | C101-247P | C101-247P |
| 9 | Pipe Plug, ¼" NPT | 1 | WC78-40T | WC78-40T | WC78-40T | WC78-40T |
| 10 | Capscrew, 10x5/8" | 9 | U30-871SS | U30-871SS | U30-871SS | U30-871SS |
| 11 | Lockwasher | 9 | U43-22SS | U43-22SS | U43-22SS | U43-22SS |
| 12 | Washer, Flat | 9 | U43-113SS | U43-113SS | U43-113SS | U43-113SS |
| SERVICE PARTS | | | | | | |
| | Seal and Gasket Kit | 1 | PP1075 | PP1075 | PP1075 | PP1075 |
| | Overhaul Kit | 1 | PP1080 | PP1081 | PP1082 | PP1082 |
| | Adapter, Union - 1-1/2" Slip | 1 | U11-183P | U11-183P | U11-183P | U11-183P |
| | Collar, Union | 1 | U11-182P | U11-182P | U11-182P | U11-182P |
| | O-Ring, Union | 1 | U9-226 | U9-226 | U9-226 | U9-226 |
| | Adapter, Union - 1-1/4" MPT | 1 | U11-186P | U11-186P | U11-186P | U11-186P |

* For SK110 or SK220 Series Cabinet Spa, order Motor No. C218-221E.

NOTE: Includes quick disconnect Union Assemblies. Part No. U111-186p (2).
Contains 2 each of - U11-182P1, U11-183P1, U11-186P and U9-226.

STA-RITE LIMITED WARRANTY

Pumps, filters, skimmers, underwater lights (except bulbs), accessories and fittings manufactured by Sta-Rite are warranted to be free of defects in material and workmanship for one (1) year from date of installation.

Product specific warranties: **Year from date of installation**

| | |
|---|---------------------------------------|
| <i>HRPB, DEPB, System 3, System 2 and Posi-Clear</i> | |
| Tanks | 10 years |
| Internal filter components and valves | 1 year |
| <i>Max-E-Therm - Pool/Spa Heaters</i> | |
| Heater Enclosure only (Upper RH & LH; lower enclosure; and control board enclosure)... | 10 years |
| <i>Automatic Pool Cleaners including Hose</i> | |
| | 2 years |
| <i>Cristal-Flo filters - Tanks</i> | |
| | 10 years pro-rated* |
| Valve and internal components. | 1 year |
| <i>Posi-Flo II - Tanks</i> | |
| | 10 years |
| Elements | 1 year |
| <i>PRC Cartridge -</i> | |
| Filter Tanks | .5 years pro-rated (1st 2 years full) |
| Elements | 1 year |
| <i>System 2 Above Ground Systems - Tanks</i> | |
| | 10 years |
| Pumps / Platform and Internals | 1 year |
| <i>Pumps</i> | |
| | 1 year |
| When equipped with A.O. Smith 2-compartment motors (Does not include pumps sold as part of a systems package) | 2 years |
| <i>Traps / In-Line Strainers</i> | |
| | 1 year |
| <i>Vertical Commercial Filter - Tanks</i> | |
| | 10 years |
| Internals | 1 year |
| <i>Horizontal Commercial Filter</i> | |
| Tanks | .5 years |
| (Years 6-9, Prorated declining 20%/year, Yr. 10 - 10%) | |
| Internals | 1 year |

* Full warranty coverage is in effect for one year after installation. The pro-rated warranty covers the *tank only* during the 2nd through 10th year after installation. The amount covered decreases by 10% each year. (ie., 2nd year 90% covered, 3rd year 80% covered, etc.).

The foregoing warranties relate to the original consumer purchaser ("Purchaser") only. Sta-Rite shall have the option to repair or replace the defective product, at its sole discretion. Purchasers must pay all labor and shipping charges necessary to replace the product covered by this warranty. Requests for warranty service must be made through the installing dealer. This warranty shall not apply to any product that has been subject to negligence, misapplication, improper installation or maintenance, or other circumstances which are not in Sta-Rite's direct control.

This warranty sets forth Sta-Rite's sole obligation and Purchaser's exclusive remedy for defective products.

STA-RITE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR CONTINGENT DAMAGES WHATSOEVER.

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

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusion 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.

Supersedes all previous publications.

Sta-Rite Industries
293 Wright St., Delavan, WI 53115

▲ Retain Warranty Certificate (upper portion) in a safe and convenient location for your records.

DETACH HERE: Fill out bottom portion completely and mail within 10 days of purchase/installation to:

▼ Sta-Rite, Attn: Warranty Dept., 293 Wright St., Delavan, WI 53115

STA-RITE®



Warranty Registration Card

Name _____

Years pool has been in service less than 1 1-3 3-5 5-10

Address _____

Purchased from:
Company name _____

City _____ State _____ Zip _____

Address _____

Purchase Date _____

City _____ State _____ Zip _____

Product Purchased _____

New installation Replacement

Please send me more information on these other products from Sta-Rite.

Type of Pool Inground Vinyl Fiberglass Gunite

Pumps Filters Automatic Pool Cleaners
 Maintenance Equipment Test Strips
 Heaters

Size of Pool _____

