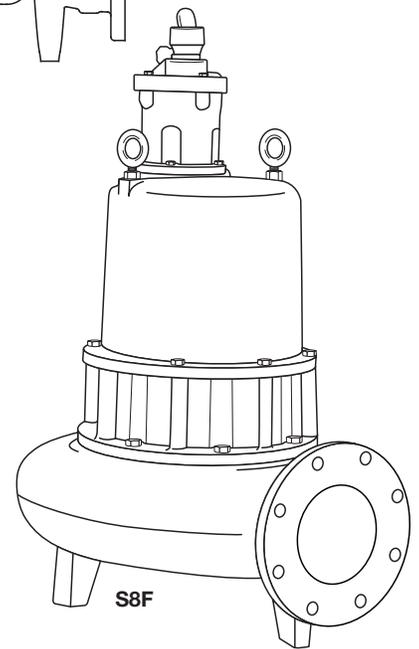
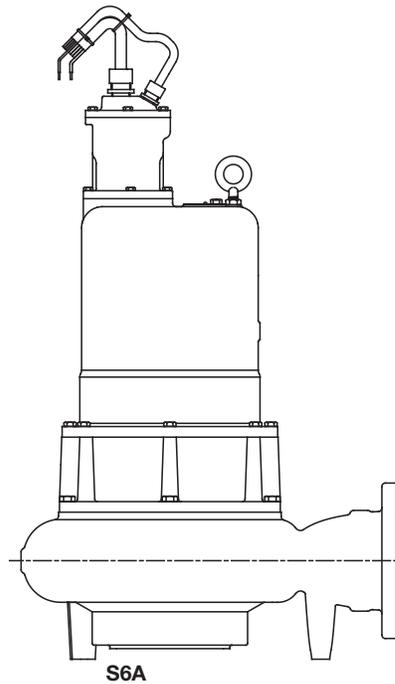
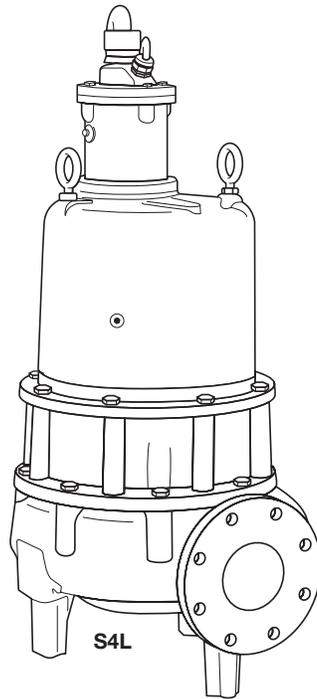




HYDROMATIC®



MODELS S4L, S4B,
S4K, S4Q, H4Q, S4LRC,
S6A, S6L and S8F
**SUBMERSIBLE
SOLIDS HANDLING PUMP**

INSTALLATION AND SERVICE MANUAL

For use with product built with GE® motor.



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

General Information

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

Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

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.

CALIFORNIA PROPOSITION 65

WARNING:

▲ WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Pumps Not Operating or in Storage:

Pumps with carbon ceramic seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

Seal Failure:

An electrode probe is installed in the seal chamber so if any water enters the chamber through the first seal, the electrode will be energized and a signal will be transmitted to the sensing unit at ground surface causing a red light to flash. The electrode probe is installed in all units, but the sensing unit is supplied at extra cost and must be ordered.

In operation the seal failure unit indicates only that there is some water in the seal chamber. The pump will continue to

operate without damage, but the seal should be checked immediately after failure is indicated.

The sensing unit is recommended on all installations as good insurance against motor failure.

Pump:

The submersible pumps are supplied for 3 phase and for 200, 230, 460 or 575 volts. Power cable is supplied with separate wire for ground. Be sure green wire is connected to a good ground such as water pipe or ground stake.

Heat Sensors:

All motors have heat sensor units embedded in the motor winding to detect excessive heat. The heat sensors are set to trip at 105°C, so will not operate if dangerous heat occurs. The sensors automatically reset when motor cools to safe temperature.

The sensors are connected in series with the motor starter coil so that the starter is tripped if heat sensor opens. The motor starter is equipped with overload heaters so all normal overloads are protected by the starter.

IMPORTANT: If Hydromatic® electrical starting equipment is not supplied, the heat sensor circuit must be connected in series with the starter coil or warranty is void.

Sump Level Control:

Sump level is controlled by Hydromatic float switch controls. The float is held in position in the sump by a weight attached to the power cord above the float. The cord supports the float and is adjusted for height from the surface.

Typical duplex systems use three controls: one set at turn-off, one set at turn-on for one pump, and one set for turn-on for two pumps. Pumps alternate operation on each successive cycle.

Two pumps operate together only if sump level rises to the third or override control. The override control also brings on the second pump in case of failure of the first pump. Extra floats with appropriate controls can be supplied for alarm functions. Triplex systems use four controls: one set at turn-off, one set at turn-on for one pump, one set at turn-on for two pumps, and one set at turn-on for three pumps. Pumps alternate each successive cycle.

Three pumps operate together only if sump level rises to the fourth control (second override). This control also brings on the third pump in case of failure of either or both of the first two pumps.

Alarm Controls:

The alarm level is usually set above the override level so the alarm will signal only if the override level is exceeded. However, some engineers prefer to have the alarm level set below the override level as it is possible for one pump to fail and the other pump to operate on the override level with the sump level never reaching the alarm level. This is particularly true in cases of low inflow capacity.

Electrical Control Panel:

It is recommended that the Hydromatic control panel be used with all pumps as proper starter heaters and connections for heat sensor wires are furnished.

The electrical equipment includes a main circuit breaker for each pump, a magnetic starter with overload protection for each pump, an H-O-A switch and run light for each pump, an electric alternator and a transformer to provide appropriate control circuit and alarms.

Overload Heaters:

Starters with 3 leg overload protection must be supplied. The heaters must be sized in accordance with the nameplate amps on the motor housing. The amp draw on these submersible motors is slightly higher than a corresponding horsepower surface motor so heaters must be sized by the nameplate rating.

IMPORTANT: Be sure the heat sensor wires are connected in series with the starter coil circuit.

Pump Installation

Installing Pump in Sump:

Before installing pump in sump lay it on side and turn impeller manually. Impeller may be slightly stuck due to factory test water so it must be broken loose with small bar or screwdriver in edge of vanes. The impeller should turn freely.

Clean all trash and sticks from sump and connect pump to piping.

A check valve must be installed on each pump. A gate or plug valve in each pump discharge line is also recommended. This valve should be installed on the discharge side of the check valve so if necessary to service the check valve, the line pressure can be cut off. Single pump systems are sometimes installed without a check valve where it is desirable to self-drain the discharge line to prevent freezing. This can be done only with short discharge lines; otherwise water will return to the sump and cause short cycling of the pump.

NEMA 4 Junction Box (Optional):

A NEMA 4 junction box should be used to make power and control connections. The Hydromatic® NEMA 4 junction box is provided with compression connectors for sealing all wires. No sealing compound is needed to make connections waterproof.

Wiring diagrams are provided with panel for making connections. The size wire to use from panel to sump depends on motor size and distance in feet.

Be sure each wire is checked out so that wrong connections will not be made.

Installing Float Switch Controls:

The controls are supported by a mounting bracket that is attached to sump wall or cover or to the NEMA 4 junction box.

Cord snubbers are used to hold the cord in place. Control lever can be changed at any time by loosening the snubber and readjusting cord length.

In either simplex or duplex system the lower or turn-off control is set just above the top of volute so that the volute will always be submerged during the pumping cycle. The second or turn-on control is set about 24 inches above the lower turn-off control.

More distance between turn-on and turn-off controls can be used, but sewage may become septic and excessive solids may collect for the pump to handle. A frequent pumping cycle is recommended for best operation.

If an alarm system is used, this control is usually set about 6 inches above the override control.

Making Electrical Connections:

All electrical wiring must be in accordance with the local codes, and only competent electricians should make the installations. Complete wiring diagrams are glued to the inside cover of the panel. All wires should be checked for grounds with an ohmmeter or Megger after the connections are made. *This is important, as one grounded wire can cause considerable trouble.*

IMPORTANT: If equipment is not properly wired and protected as recommended, the warranty is void.

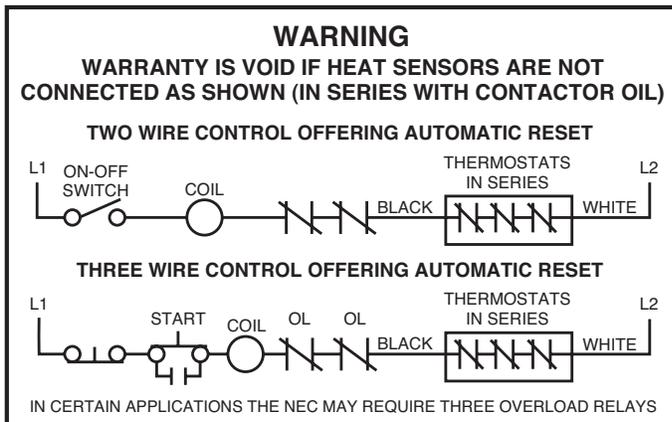
Heat Sensors and Seal Failure Connections:

Be sure that heat sensor wires are connected in series with the starter coil. Connections are provided on the terminal strip.

Pump Operations

Starting System:

1. Turn H-O-A switch to Off position, then turn on main circuit breakers.
2. Open all discharge valves and allow water to rise in sump pump.
3. Turn H-O-A switch to Hand position on one pump and notice operation. If pump is noisy and vibrates, rotation is wrong. To change rotation interchange any two line leads to motor on 3ø only. Do not interchange main incoming lines. If duplex system, check second pump in the same manner.
4. Now set both H-O-A switches to Auto position and allow water to rise in sump until one pump starts. Allow pump to operate until level drops to turn-off point.
5. Allow sump level to rise to start other pump. Notice run lights on panel; pumps should alternate on each successive cycle of operation.



NUMBER OF CONDUCTORS REQUIRED BETWEEN CONTROL PANEL AND NEMA 4 JUNCTION BOX

Power lines and control wires can be carried in conduit or can be underground buried cable.

System Type	Number of Control Wires	Number of Power Lines	Number of Ground Wires #8	HEAT SENSOR & SEAL FAILURE	
				Number of Sensor Wires	Number of Ground Wires
Simplex	3	3	1	3	1
Simplex with Alarm	5	3	1	3	1
Duplex	5	6	1	6	2
Duplex with Alarm	7	6	1	6	2

6. Turn both H-O-A switches to Auto position and allow sump to fill to the override control level.
7. Turn both switches to Auto position and both pumps should start and operate together until level drops to turn-off point.
8. Repeat this operation cycle several times before leaving the job.
9. Check voltage when pumps are operating and check the amp draw of each pump. Check amps on each wire as sometimes a high leg will exist. One leg can be somewhat higher, 5 to 10%, without causing trouble. For excessive amp draw on one leg, the power company should be consulted.

Phase Converters:

Phase converters are generally not recommended, but in cases where only single phase current is available phase converter can be used. Be sure to size the phase converter large enough for the amp draw specified on the motor nameplate, not necessarily by motor horsepower. The warranty on all three phase submersible motors is void if operated with single phase power through a phase converter and 3 leg ambient compensated extra-quick trip overload protectors are not used.

Pump Maintenance

As the motors are oil filled no lubrication or other maintenance is required.

Generally these pumps give very reliable service and can be expected to operate for years on normal sewage pumping without failure.

Lightning:

In some areas where considerable lightning occurs, it is recommended that a lightning arrestor be installed at the control panel.

Lightning arrestors are good insurance against damage to an expensive motor.

Field Service on Motor:

All submersible motors out of warranty can be serviced in the field by any reliable motor service shop. Any pump in warranty must be returned to the factory for service or repaired at an authorized Hydromatic® service center. Charges will not be allowed if in warranty pump

is not taken to an authorized Hydromatic service center.

When field service is performed on a pump, these instructions should be carefully followed.

Replacing Stator:

1. If stator only is damaged, it may not be necessary to completely dismantle pump as stator and housing can be lifted from pump without disturbing seals or bearings.
2. Drain all oil from upper housing, remove drain plug in bottom of stator housing and remove plug in top of housing to allow air to enter.
3. After chamber is drained, remove hold-down bolts and lift off. Use care in lifting as the seal failure connecting wire must be disconnected before housing is completely removed.
4. Set assembly on bench and remove connection box. When box is lifted off, connection wires to motor will be exposed. These wires will probably be burned, but each wire is tagged with a metal marker giving wire number. Cut the wires.

If the leads to the connection box are burned, a complete new connection box with new wire must be used. The wires are potted in with sealing compound and a new unit must be obtained from the factory.
5. The stator is held in the housing with a bolted-in end ring and an outside locking screw.
6. After the ring is removed, turn housing upright and bump on hardwood blocks. This should jar the stator loose and allow it to drop out.
7. Thoroughly clean housing before replacing new stator. Replace stator and make all wire connections to connection box before replacing housing on pump. This is important as leads must be tucked behind the windings by using hands up through rotor core.

IMPORTANT: Use only compression type insulated connectors on the wires.

Do not tape leads as oil will deteriorate the tape and cause damage to stator and bearings.

8. Check top bearing. If clean and does not turn rough, bearings can be reused and it is not necessary to completely dismantle pump to change bearings. If bearings are damaged with dirt or heat, they must be replaced. Remember to reinstall the upper bearing load spring.
9. Before replacing stator housing, be sure outside lock screw is in place and that O-ring is used under head of bolt. A leak here can cause a motor failure.
10. Replace stator housing onto the seal chamber and bolt in place. Be sure the seal failure wire is connected before the housing is assembled.

Be sure back-off screws have been loosened so that parts can come metal to metal. Be sure O-ring seal has been replaced. If O-ring is nicked or cut, replace with new rings. This applies to all O-rings used in assembly.
11. After all leads are reconnected in the connection box, make a high voltage ground test on each wire. The only wire that should show ground is the green power lead and the ground lead in the auxiliary control cable.
12. For safety, complete pump should be air checked under water for leaks. Lay pump on side for this oil filling with oil fill hole upright. Do not completely fill; leave oil about 1 inch below plug hole. Use only Hydromatic submersible oil in this chamber. Replace plug; use Permatex on threads. Install air valve in top plug opening of motor housing and charge housing with about 10 psi of air. Be sure air is dry. Do not use air line where water may be trapped in the line. Submerge complete unit under water and check for leaks.
13. Refill motor chamber with oil. Use Hydromatic special submersible oil. Fill chamber until oil covers top of windings. Leave air space in top for expansion. Use Permatex on plug threads.

Replacing Seals and Bearings:

1. Drain all oil from motor chamber and seal chamber as described.
2. Remove motor housing as described.
3. Remove bolts that hold seal chamber to pump housing. Use back-off screws to break loose. With hardwood block, tape end of impeller to loosen from shaft. When free, remove impeller from shaft.
4. Lift rotating assembly (rotor, shaft and impeller) from pump case and place horizontally on bench.
5. Remove screw and washer from end of shaft and then screw socket head bolt back into shaft. Using a screwdriver on opposite sides behind impeller, apply force then tap on end of socket bolt to break impeller loose from taper shaft.
6. Remove key and pry on each side of shoulder of shaft sleeve to remove. Seal should come off with sleeve. If sleeve is not free, leave in place and push off when seal plate is removed.
7. To remove seal plate, take out socket head flat screws and using screws in back-off holes, pry plate loose. This will also force seal off if not already removed.
8. Remove snap ring that holds upper seal. Pull seal if it is free. If not free, it can be forced off when shaft is removed.
9. Remove bolts that hold bearing housing in place. Set assembly in upright position and bump end of shaft on hardwood block. This will push the bearing from the housing and will force upper seal from shaft.
10. Use bearing puller to remove bearings. Replace with new bearings. Press only on inner face of bearing when replacing. Pressing on outer face can damage the bearing.
IMPORTANT: Do not use any of the old seal parts. Replace with all new seals.
11. Thoroughly clean all castings before replacing seals. One grain of dirt between the seal faces can cause failure.

12. Examine all O-rings for nicks before using.
13. Be sure key is in place in notch of shaft sleeve to prevent sleeve from turning.
14. Use Loctite® on socket head locking screw in end of shaft.
15. Before refilling chamber with oil, air test as described above and then refill both chambers with oil.
16. Always check all leads with high voltage or with Megger for grounds before operating the pump.

Pump Troubleshooting

Below is a list of common problems and the probable causes:

Pump will not start.

1. No power to the motor. Check for blown fuse or open circuit breaker.
2. Selector switch may be in the Off position.
3. Control circuit transformer fuse may be blown.
4. Overload heater on starter may be tripped. Push to reset.

Pump will not start and overload heaters trip.

1. Turn off power and check motor leads with Megger or ohmmeter for possible ground.
2. Check resistance of motor windings. All 3 phases should show the same reading.
3. If no grounds exist and the motor windings check OK, remove pump from sump and check for clogged or blocked impeller.

Pump operates with selector switch in Hand position but will not operate in Auto position.

1. This indicates trouble in the float level control or the alternator relay.
2. Check control panel for trouble.

Pump runs but will not shut off.

1. Pump may be air locked. Turn pump off and let set for several minutes, then restart.
2. Lower float control may be hung-up in the closed position. Check in sump to be sure control is free.
3. Selector switch may be in the Hand position.

Pump does not deliver proper capacity.

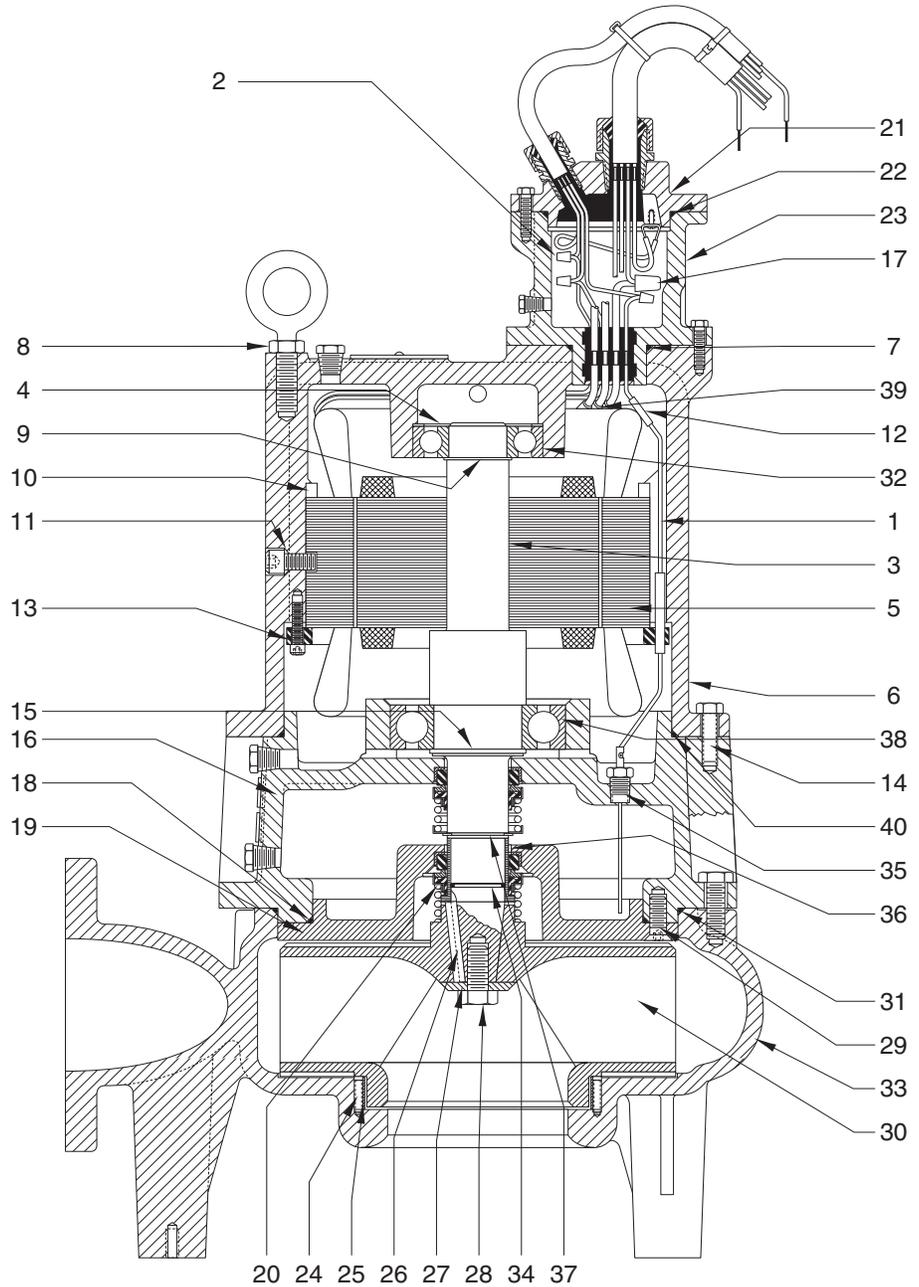
1. Discharge gate valve may be partially closed or partially clogged.
2. Check valve may be partially clogged. Raise level up and down to clear.
3. Pump may be running in wrong direction. Low speed pumps can operate in reverse direction without much noise or vibration.
4. Discharge head may be too high. Check total head with gauge when pump is operating. Total head is discharge gauge pressure converted to feet plus vertical height from water level in sump to center line of pressure gauge in discharge line. Gauge should be installed on pump side of all valves. Multiply gauge pressure in pounds by 2.31 to get head in feet.
5. If pump has been in service for some time and capacity falls off, remove pump and check for wear or clogged impeller.

Motor stops and then restarts after short period but overload heaters in starter do not trip.

1. This indicates heat sensors in the motor are tripping due to excessive heat. Impeller may be partially clogged giving a sustained overload but not high enough to trip overload heater switch.
2. Motor may be operating out of liquid due to a failed level control.
3. Pump may be operating on a short cycle due to sump being too small or from water returning to sump due to a leaking check valve.

S4L Parts List For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	060000035	Wire & Terminal Assy. – (Prior to 5/1/78)	1
	060000211	Wire & Terminal Assy. – (Present)	1
2	005570001	Wire Connector	3
3	RTF	Rotor & Shaft	1
4	000640051	Bearing Spring	2
5	RTF	Stator	1
6	025970022	Motor Housing for Use with 20 hp & Below	1
	048320012	Motor Housing for Use with 25 hp & Up	1
7	001500071	O-Ring	SC 1
8	011240021	Jam Nut	2
9	009750051	Retaining Ring	1
10	076650011	Spacer for Stator – 3 to 15 hp, 1150 RPM	1
11	008340021	O-Ring	SC 2
12	12672A001	Wire Connector	3
13	026030003	Stator Ring	1
14	005680061	Bolt	8
15	009750081	Retaining Ring	1
16	025950032	Housing Seal (Present)	1
17	008530001	Wire Conn. – 200V, 10/4 Cord	3
	024940001	Wire Conn. – 200V, 8/4 Cord	3
	024940001	Wire Conn. – 230V	4
	008530001	Wire Conn. – 460V, 10/4 Cord	6
	024940001	Wire Conn. – 460V, 8/4 Cord	3
	008530001	Wire Conn. – 460V, 8/4 Cord	3
18	001500401	O-Ring	SC 1
	025960002	Seal Plate – (Prior to 3/1/74)	1
	025960032	Seal Plate – (Present)	1
20	019570001	Shaft Seal – Ceramic	SC 1 or 2
	019570021	Shaft Seal – Opt. Carbide (Bottom Seal Only)	C 1
21	RTF	Cord Cap Assy.	1
22	001500121	O-Ring	SC 1
23	062370005	Conn. Box Assy. – 230/460V	1
	062370015	Conn. Box Assy. – 200/575V	1
24	000130041	Set Screw	2
25	042890023	Wear Ring Brz.	1
26	028550011	Key	1
27	019450001	Shaft Holding Washer – (Up to 25 hp)	1
	001560111	Shaft Holding Washer – (25–35 hp)	1
28	005700181	Capscrew (Up to 25 hp)	1
	048340001	Imp. Nut (25–35 hp)	1
29	029210011	Flat Hd. Screw	4
	025940242	Impeller – 8.38" Diameter	1
30	025940232	Impeller – 8.81" Diameter	1
	025940022	Impeller – 9" Diameter	1
	025940032	Impeller – 9.25" Diameter	1
	025940042	Impeller – 9.5" Diameter	1
	025940192	Impeller – 9.81" Diameter	1
	025940062	Impeller – 10" Diameter	1
	025940162	Impeller – 10.38" Diameter	1
	025940082	Impeller – 10.5" Diameter	1
	025940102	Impeller – 11" Diameter	1
	025940202	Impeller – 11.38" Diameter	1
	025940182	Impeller – 11.63" Diameter	1
	025940002	Impeller – 11.88" Diameter	1
31	001500261	O-Ring	SC 1
32	08565A026	Upper Bearing	1
33	089190015	Volute	1
34	05876A007	O-Ring	SC 1
35	084720035	Sensor Assy. (Present)	1
36	026020003	Sleeve	SC 1

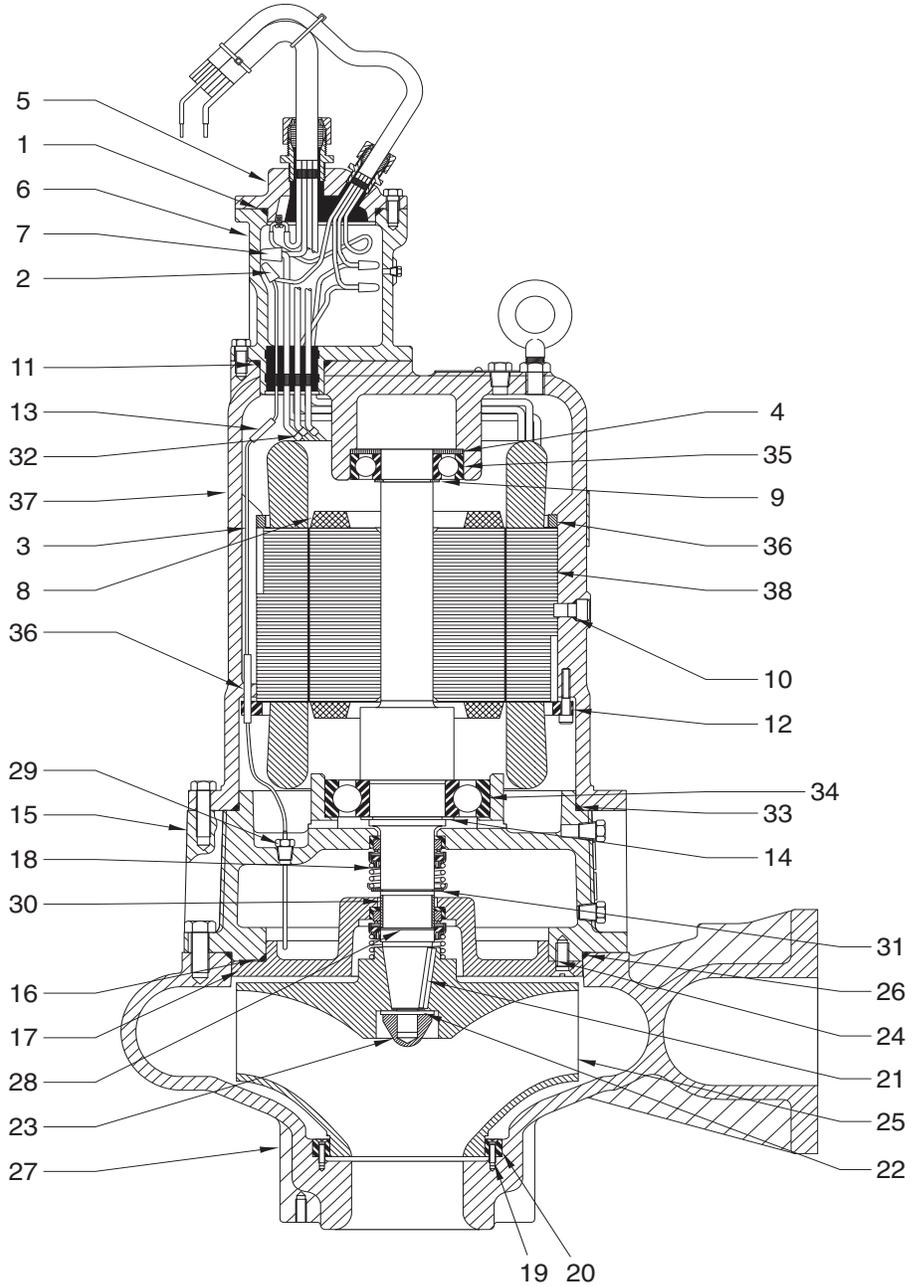


Ref. No.	Part No.	Part Description	Qty.
37	009750061	Snap Ring	1
38	000650261	Lower Bearing (Present)	1
39	010060011	Wire Conn. 230/460V	9
	010060011	Wire Conn. 200/575V	3
40	001500251	O-Ring	SC 1
–	076650001	Spacer for Stator – 10 to 20 hp, 1750 RPM	1
–	517000197	Seal Kit	
–	517003197	Carbide Seal Kit	

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

S4B Parts List For use with product built with GE® motor.

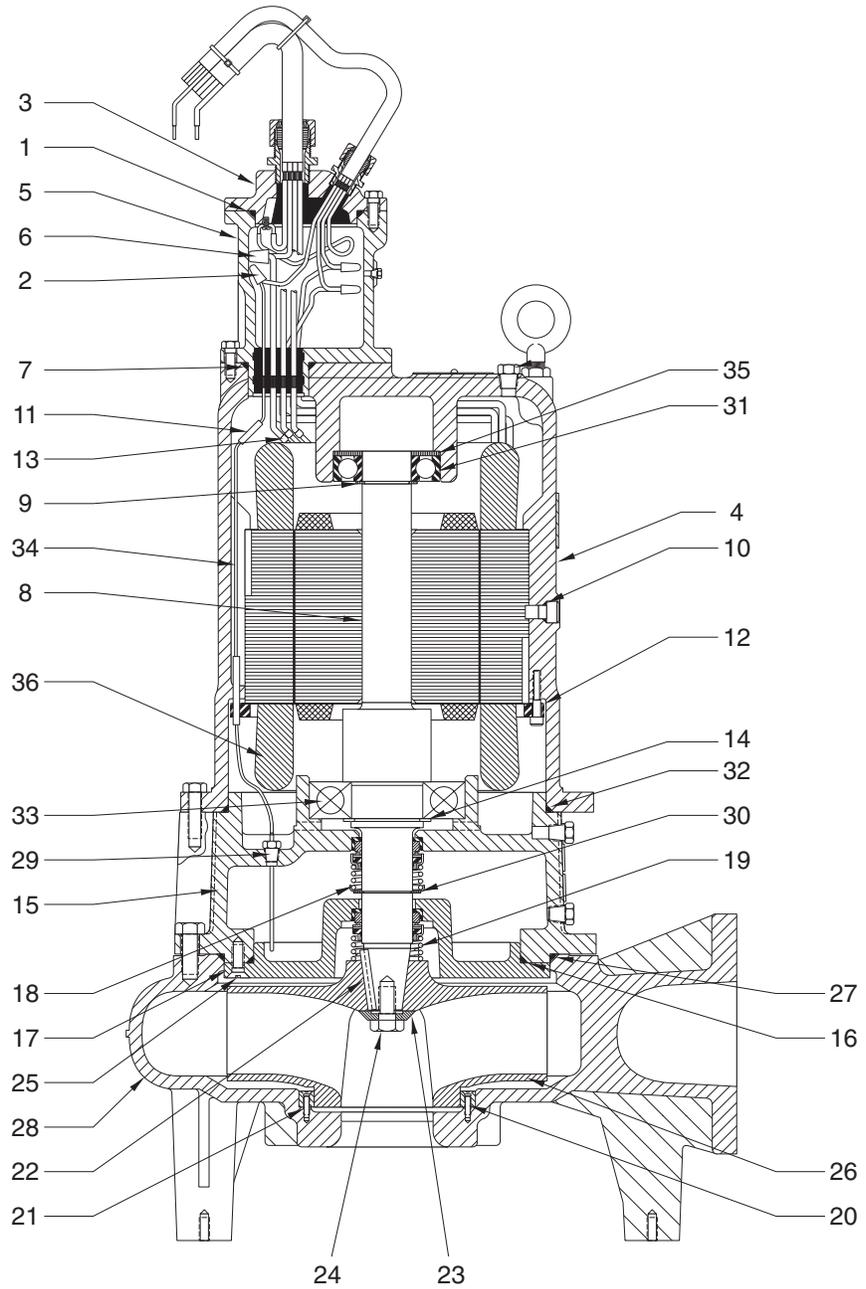
Ref. No.	Part No.	Part Description	Qty.
1	001500121	O-Ring	SC 1
2	005570001	Connector	3
3	060000211	Wire & Terminal Assy.	1
4	000640051	Bearing Spring	2
5	RTF	Cord Cap Assy. – 35'	1
6	062370005	Conn Box Assy. – 230/460	1
	062370015	Conn Box Assy. – 200/575	1
7	024980041	Wire Connector – 200, 4-3 cord	4
	024940001	Wire Connector – 230/460, 6-3 cord	4
	008530001	Wire Connector – 575, 8-4 cord	3
	024980051	Wire Connector – 230, 4-3 cord	4
	008530001	Wire Connector – 460, 8-4 cord	3
	024940001	Wire Connector – 460, 8-4 cord	3
	024940001	Wire Connector – 460/575, 6-3 cord	3
	008530001	Wire Connector – 460/575, 6-3 cord	3
	008530001	Wire Connector – 200, 10-4 cord	3
8	RTF	Rotor and Shaft	1
9	009750051	Retaining Ring	1
10	008340021	O-Ring	SC 2
11	001500071	O-Ring	SC 1
12	026030003	Stator Ring	1
13	002820011	Wire Connector	3
14	009750081	Retaining Ring	1
15	025950032	Seal Housing	1
16	001500401	O-Ring	SC 1
17	025960032	Seal Plate	1
18	019570001	Seal – Ceramic (Std.)	SC 1 or 2
	019570021	Seal – Carbide (Opt.)	C 1
19	008290061	Mach Screw	3
20	136900003	Wear Ring, Bronze	1
21	028550011	Key	1
22	001560111	Shaft Holding Washer – 25 hp & Up	1
	019450001	Shaft Holding Washer – 20 hp and Below	1
23	005700181	Impeller Nut – Up to 25 hp	1
	048340001	Impeller Nut – 25 hp & Up	1
24	029210011	Flat Hd Screw	4
25	136920012	Impeller – 12" Diameter	1
	136920052	Impeller – 11" Diameter	1
	136920092	Impeller – 10" Diameter	1
	136920102	Impeller – 9.5" Diameter	1
	136920132	Impeller – 9" Diameter	1
26	001500261	O-Ring	SC 1
27	136910002	Volute	1
28	001500031	O-Ring	SC 1
29	084720035	Sensor Assy.	1
30	026020003	Sleeve	SC 1
31	009750061	Snap Ring	1
32	010060011	Wire Connector – 230/460	9
	010060011	Wire Connector – 200/575	3
33	001500251	O-Ring	SC 1
34	000650261	Lower Bearing	1
35	000650061	Upper Bearing	1
36	076650011	Spacer – 3–15 hp, 1150 RPM	1
	076650001	Spacer – 10–20 hp, 1750 RPM	1
	076650061	Spacer – 3–5 hp, 870 RPM	1
37	048320012	Motor Housing – 10274 Series	1
	025970022	Motor Housing – 10272 & 10273 Series	1
38	RTF	Stator	1
-	517000197	Seal Kit	
-	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

S4K Parts List For use with product built with GE® motor.

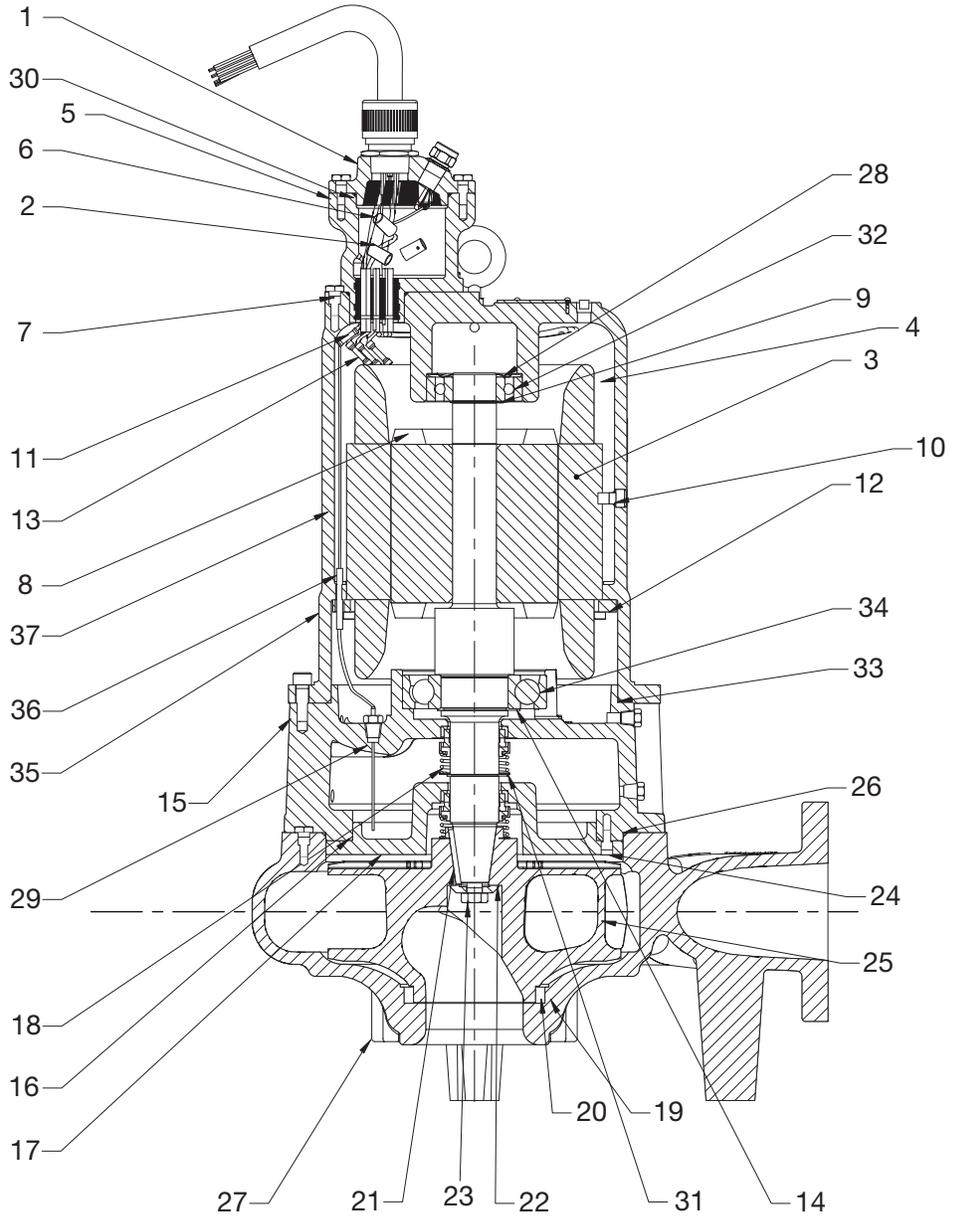
Ref. No.	Part No.	Part Description	Qty.
1	001500121	O-Ring	SC 1
2	005570001	Connector	3
3	RTF	Cord Cap Assy. – 35'	1
4	025970022	Motor Housing – 20 hp	1
	048320012	Motor Housing – 25–40 hp	1
5	062370005	Conn Box Assy. – 230/460	1
	062370015	Conn Box Assy. – 200/575	1
6	008530001	Wire Conn. – 25–40 hp, 460/3/60	3
	008530001	Wire Conn. – 20 hp, 575/3/60	3
	024940001	Wire Conn. – 20 hp, 230/460	4
	024940001	Wire Conn. – 25–40 hp, 460/3/60	3
	024940001	Wire Conn. – 25–30 hp, 575/3/60	3
7	001500071	O-Ring	SC 1
8	RTF	Rotor & Shaft	1
9	009750051	Retaining Ring	1
10	008340021	O-Ring	SC 2
11	002820011	Wire Connector	3
12	026030003	Stator Ring	1
13	010060011	Wire Conn. – 200/230/460, 25 & 40 hp	9
	010060011	Wire Conn. – 200, 20 hp	3
	010060011	Wire Conn. – 575, 20–30 hp	3
14	009750081	Retaining Ring – (15–20 hp)	1
	009750251	Retaining Ring – (25–40 hp)	1
15	025950032	Housing Seal – (15–20 hp)	1
	025950042	Housing Seal – (25–40 hp)	1
16	001500401	O-Ring	SC 1
17	025960032	Seal Plate	1
18	019570001	Upper Seal – Ceramic	SC 1
19	019570001	Lower Seal – (Ceramic) Std.	S 1
	019570021	Lower Seal – (Carbide) Opt.	C 1
20	008290061	Flat H. Screw	3
21	136900003	Wear Ring (Bronze)	1
22	028550081	Key	1
23	019450001	Imp Washer	1
24	005700181	Impeller Bolt	1
25	029210011	Flat Hd. Screw	4
26	137200122	Impeller – 9.25" Diameter	1
	137200072	Impeller – 10.5" Diameter	1
	137200052	Impeller – 11" Diameter	1
	137200012	Impeller – 12" Diameter	1
27	001500261	O-Ring	SC 1
28	137190002	Volute	1
29	084720035	Sensor Assy.	1
30	009750061	Retaining Ring	1
31	000650061	Upper Bearing	1
32	001500251	O-Ring	SC 1
33	000650261	Lower Bearing – (15–20 hp)	1
	000650321	Lower Bearing – (25–40 hp)	1
34	060000211	Wire & Terminal Assy.	1
35	000640051	Bearing Spring	2
36	RTF	Stator	1
–	517000657	Seal Kit	S 1
–	517003657	Carbide Seal Kit	C 1



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

S4Q Parts List For use with product built with GE® motor.

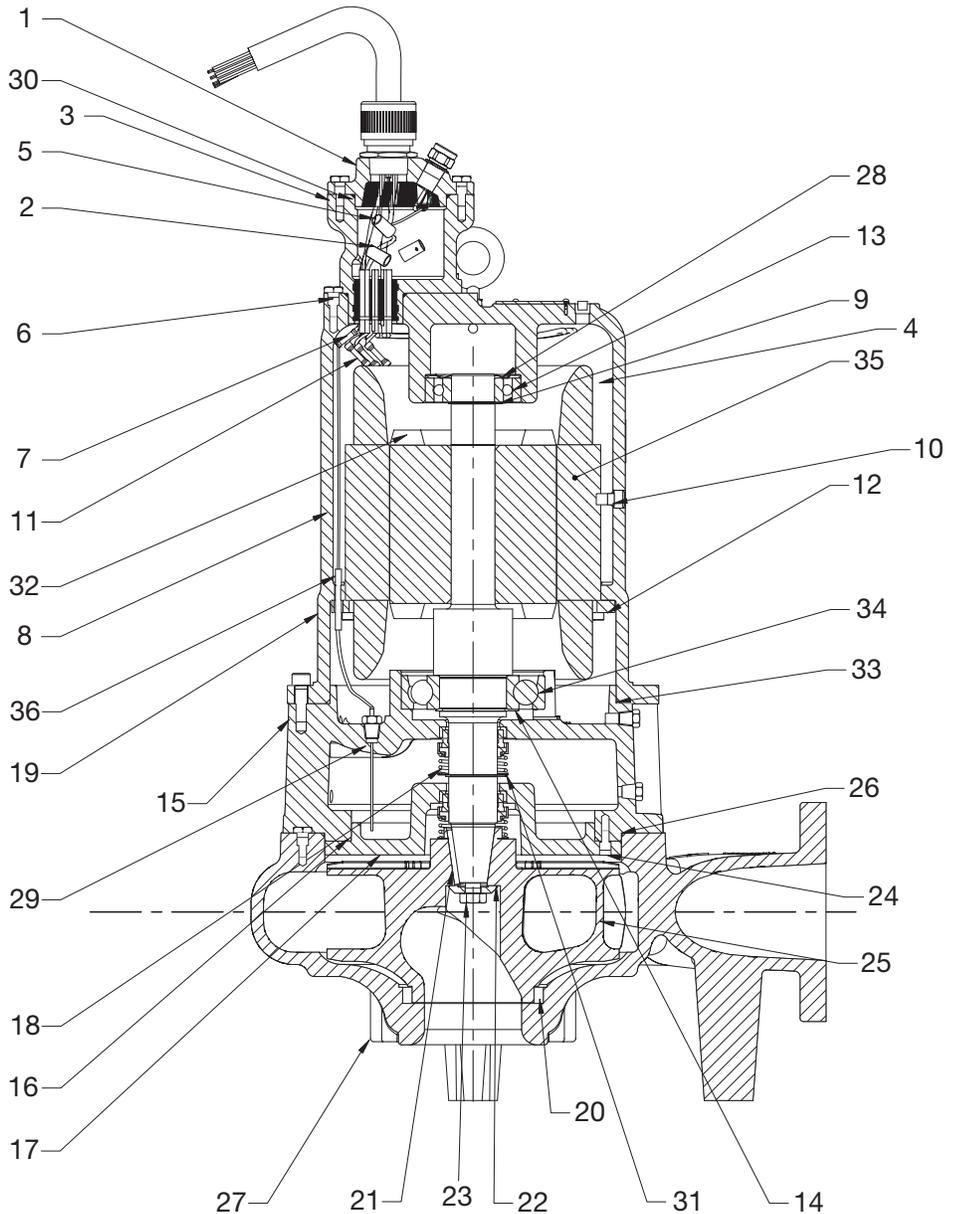
Ref. No.	Part No.	Part Description	Qty.
1	RTF	Cord Cap Assy. - 30'	1
2	005570001	Connector	3
3	RTF	Stator	1
4	076650001	Spacer - 10-20 hp, 1750 RPM	1
5	062370005	Conn Box Assy. - 230/460	1
	062370015	Conn Box Assy. - 200/575	1
6	024980041	Wire Connector - 200 4-3, cord	4
	024940001	Wire Connector - 230/460, 6-3 cord	4
	008530001	Wire Connector - 575, 8-4 cord	3
	024980051	Wire Connector - 230, 4-3 cord	4
	008530001	Wire Connector - 460, 8-4 cord	3
	024940001	Wire Connector - 460, 8-4 cord	3
	024940001	Wire Connector - 460/575, 6-3 cord	3
	008530001	Wire Connector - 460/575, 6-3 cord	3
	008530001	Wire Connector - 200, 10-4 cord	3
7	001500071	O-Ring	SC 1
8	RTF	Rotor and Shaft	1
9	009750051	Retaining Ring	1
10	008340021	O-Ring	SC 2
11	002820011	Wire Connector	3
12	026030003	Stator Ring	1
13	010060011	Wire Connector - 230/460	9
	010060011	Wire Connector - 200/575	3
14	009750081	Retaining Ring	1
15	025950032	Seal Housing	1
16	001500401	O-Ring	SC 1
17	025960032	Seal Plate	1
18	019570001	Seal - Ceramic (Std.)	SC 1 or 2
	019570021	Seal - Carbide (Opt.)	C 1
19	008290061	Mach Screw	6
20	136900013	Wear Ring	1
21	028550011	Key	1
22	001560111	Shaft Holding Washer - 25 hp & Up	1
	019450001	Shaft Holding Washer - 20 hp and Below	1
23	005700181	Impeller Nut - Up to 25 hp	1
	048340001	Impeller Nut - 25 hp & Up	1
24	029210011	Flat Head Screw	4
25	141250012	Impeller - 12" Diameter	1
	141250052	Impeller - 11" Diameter	1
	141250092	Impeller - 10" Diameter	1
	141250112	Impeller - 9.5" Diameter	1
	141250132	Impeller - 9" Diameter	1
26	143310001	Gasket	2
27	136910022	Volute	1
28	000640051	Bearing Spring	2
29	084720035	Sensor Assy.	1
30	001500121	O-Ring	SC 1
31	009750061	Snap Ring	1
32	000650061	Upper Bearing	1
33	001500251	O-Ring	SC 1
34	000650261	Lower Bearing	1
35	060000215	Wire & Terminal Assy.	1
36	012720013	Insulating Tubing	1
37	048320012	Motor Housing - 10274 Series	1
	025970022	Motor Housing - 10272 & 10273 Series	1
-	141240003	Wear Ring Adapter	1
-	141240013	Adapter Plate	1
-	517000197	Seal Kit	
-	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

H4Q Parts List For use with product built with GE® motor.

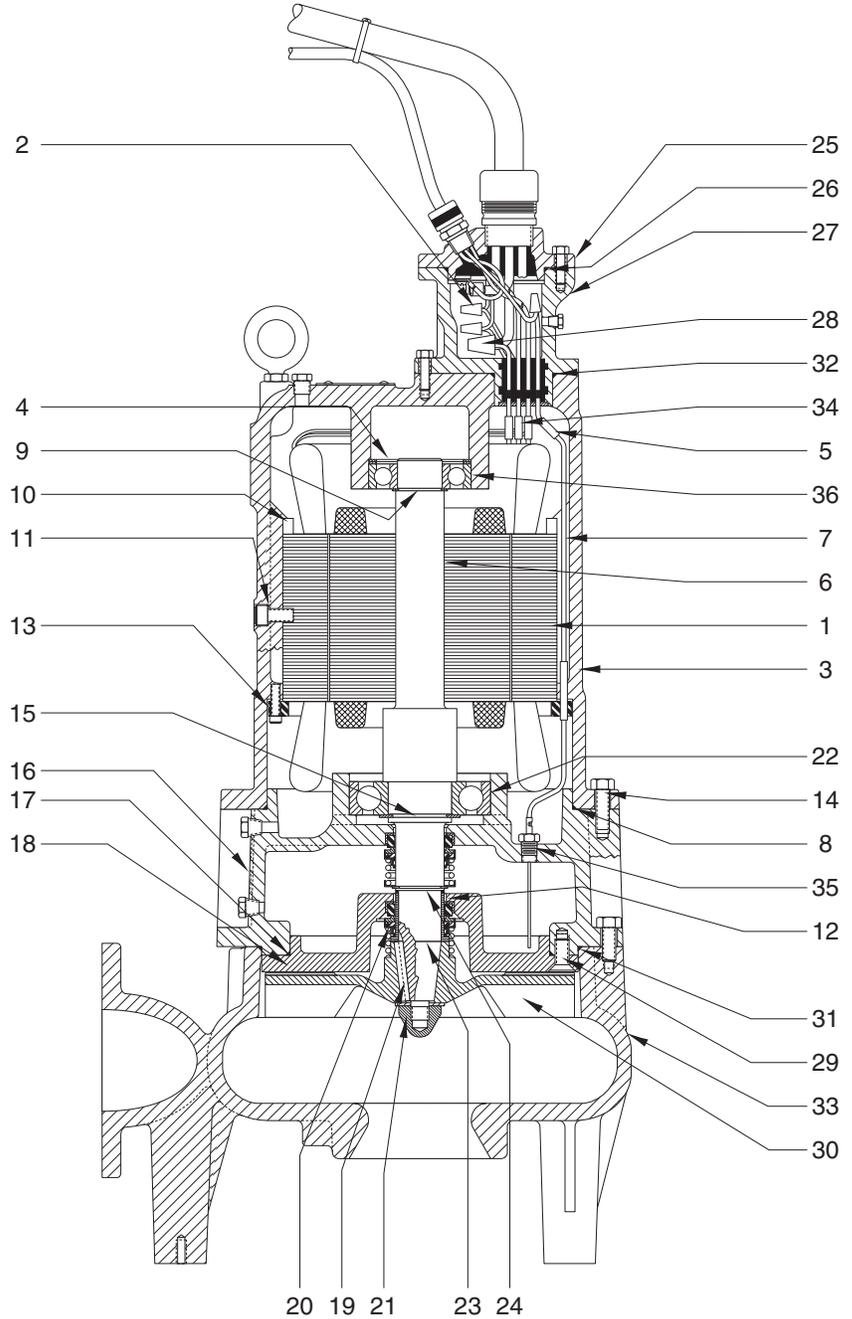
Ref. No.	Part No.	Part Description	Qty.
1	RTF	Cord Cap Assy. - 35'	1
2	005570001	Connector	3
3	062370005	Conn Box Assy. - 230/460	1
	062370015	Conn Box Assy. - 200/575	1
4	076650001	Spacer - 10-20 hp, 1750 RPM	1
5	024980041	Wire Connector - 200, 4-3 cord	4
	024940001	Wire Connector - 230/460, 6-3 cord	4
	008530001	Wire Connector - 575, 8-4 cord	3
	024980051	Wire Connector - 230, 4-3 cord	4
	008530001	Wire Connector - 460, 8-4 cord	3
	024940001	Wire Connector - 460, 8-4 cord	3
	024940001	Wire Connector - 460/575, 6-3 cord	3
	008530001	Wire Connector - 460/575, 6-3 cord	3
	008530001	Wire Connector - 200, 10-4 cord	3
	6	001500071	O-Ring
7	002820011	Wire Connector	3
8	048320012	Motor Housing - 10274 Series	1
	025970022	Motor Housing - 10272 & 10273 Series	1
9	009750051	Retaining Ring	1
10	008340021	O-Ring	SC 2
11	010060011	Wire Connector - 230/460	9
	010060011	Wire Connector - 200/575	3
12	026030003	Stator Ring	1
13	08565A026	Upper Bearing	1
14	009750081	Retaining Ring	1
15	025950032	Seal Housing	1
16	001500401	O-Ring	SC 1
17	025960032	Seal Plate	1
18	019570001	Seal - Ceramic (Std.)	SC 1 or 2
	019570021	Seal - Carbide (Opt.)	C 1
19	060000215	Wire & Terminal Assy.	1
20	136900033	Wear Ring	1
21	028550011	Key	1
22	001560111	Shaft Holding Washer - 25 hp & Up	1
	019450001	Shaft Holding Washer - 20 hp and Below	1
23	005700181	Impeller Nut - Up to 25 hp	1
	048340001	Impeller Nut - 25 hp & Up	1
24	029210011	Flat Head Screw	4
25	151510002	Impeller - 12" Diameter	1
	151510022	Impeller - 11" Diameter	1
	151510042	Impeller - 10" Diameter	1
	151510052	Impeller - 9.5" Diameter	1
	151510062	Impeller - 9" Diameter	1
26	001500261	O-Ring	1
27	151520015	Volute	1
28	000640051	Bearing Spring	2
29	084720035	Sensor Assy.	1
30	001500121	O-Ring	SC 1
31	009750061	Snap Ring	1
32	RTF	Rotor and Shaft	1
33	001500251	O-Ring	SC 1
34	000650261	Lower Bearing	1
35	RTF	Stator	1
36	012720013	Insulating Tubing	1
-	517000197	Seal Kit	
-	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 Fill oil to above motor windings

S4LRC – 1750 RPM Parts List For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	RTF	Stator	1
2	000730011	Wire Connector	3
3	025970022	Motor Housing – 20 hp & below	1
	048320012	Motor Housing – 25 hp & above, 15 hp, 1150 RPM	1
4	000640051	Bearing Spring – (None Required Prior to 2/14/78)	2
5	002820011	Wire Connector	3
6	RTF	Rotor & Shaft	1
7	060000035	Wire & Terminal Assy. – (Prior to 5/1/78)	1
	060000211	Wire & Terminal Assy. – (Present)	1
8	001500251	O-Ring	SC 1
9	009750051	Retaining Ring	1
10	076650011	Spacer for New Style Stator – 3 to 15 hp, 1150 RPM	1
	076650001	Spacer for New Style Stator – 10 to 20 hp, 1750 RPM	1
11	008340021	O-Ring	SC 2
12	026020003	Sleeve	SC 1
13	026030003	Stator Ring	1
14	005680061	Bolt	8
15	009750081	Retaining Ring	1
16	025950032	Housing Seal (Present)	1
17	001500401	O-Ring	SC 1
18	025960002	Seal Plate – (Prior to 3/1/74)	1
	025960032	Seal Plate – (Present)	1
19	028550011	Key	1
20	019570001	Shaft Seal – Ceramic	SC 1 or 2
	019570021	Shaft Seal – Opt. Carbide (Bottom Seal Only)	C 1
21	019450001	Shaft Holding Washer – (Up to 25 hp)	1
	001560111	Shaft Holding Washer – (25–35 hp)	1
22	000650261	Lower Bearing (Present)	1
23	001500031	O-Ring	SC 1
24	009750061	Snap Ring	1
25	RTF	Cord Cap Assy. – 35'	1
26	001500121	O-Ring	SC 1
27	062370005	Conn. Box Assy. – 230/460V	1
	062370015	Conn. Box Assy. – 200/575V	1
28	008530001	Wire Connector – 200V, 10/4 Cord	3
	024940001	Wire Connector – 200V, 8/4 Cord	3
	024940001	Wire Connector – 230V	4
	008530001	Wire Connector – 460V, 10/4 Cord	6
	024940001	Wire Connector – 460V, 8/4 Cord	3
	008530001	Wire Connector – 460V, 8/4 Cord	3
	008530001	Wire Connector – 575V, 10/4 Cord	3
	024940001	Wire Connector – 575V, 8/4 Cord	3
29	029210011	Flat Head Screw	4
30	069580002	Impeller – 12" Diameter	1
	069580012	Impeller – 11.5" Diameter	1
	069580192	Impeller – 11.25" Diameter	1
	069580142	Impeller – 10.31" Diameter	1
	069580042	Impeller – 10" Diameter	1
	069580132	Impeller – 9.25" Diameter	1
	069580122	Impeller – 8.63" Diameter	1
	069580112	Impeller – 7.88" Diameter	1
31	001500261	O-Ring	SC 1
32	001500071	O-Ring	SC 1
33	107830002	Volute	1
34	010060011	Wire Conn. – 230/460V	9
	010060011	Wire Conn. – 200/575V	3
35	084720035	Sensor Assy. (Present)	1
36	000650061	Upper Bearing	1
–	517000197	Seal Kit	
–	517003197	Carbide Seal Kit	



Notes: S – Parts in Seal Kit C – Parts in Carbide Seal Kit RTF – Refer To Factory
Fill oil to above motor windings

S4LRC – 3450 RPM Parts List For use with product built with GE® motor.

Part No.	Part Description	Qty.
19101A010	Screw – HHC 3/8-16 x 1"	8
021500121	O-Ring – 1/8	1
041500071	O-Ring – 1/8	1
002820011	Connector – Wire	3
000650061	Bearing – Ball	1
060000211	Wire w/Terminal	1
012720013	Tubing – Insulating	1
048320012	Housing – Motor	1
000650261	Bearing – Ball	1
19103A043	Screw – HHC 1/2-13 x 1-1/2"	8
001500251	O-Ring – 1/8	1
084720035	Seal Failure Assembly	1
19105A033	Screw – HHC 5/8-11 x 1-1/2"	8
001500261	O-Ring	1
029210011	Screw – HHC 1/2-13 x 1-1/4"	4
107830002	Volute Case	1

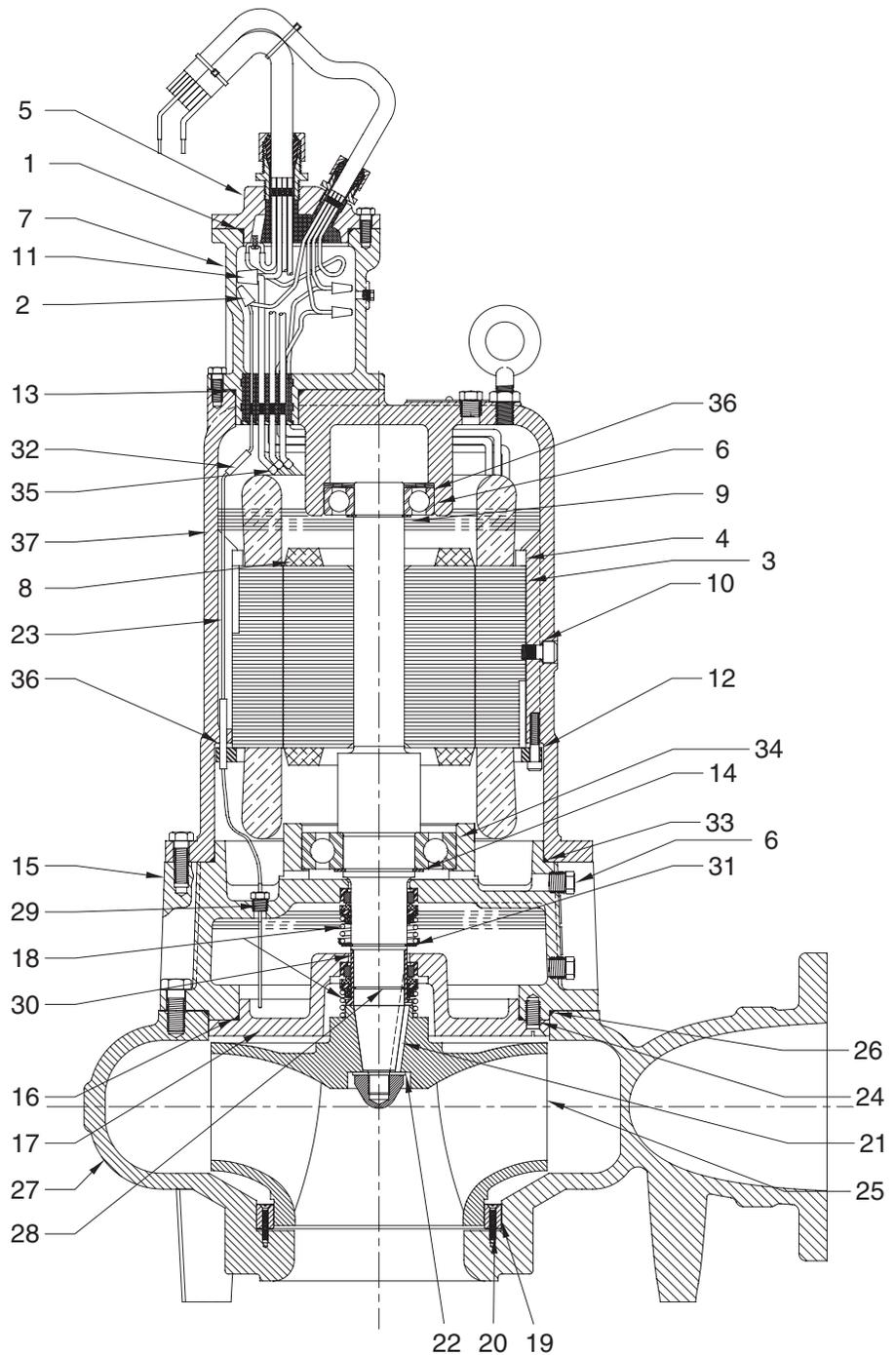
Part No.	Part Description	Qty.
009750061	Ring – Retaining	1
05876A007	O-Ring – 1/16	1
048340001	Nut – Impeller	1
001560111	Washer – Flat	1
028550031	Key – Square 3/8	1
025960032	Plate – Seal	1
001500401	O-Ring – 1/8	1
025950032	Housing – Bearing/Seal	1
009750081	Ring – Retaining	1
026030003	Ring – Stator Retaining	1
008340021	O-Ring – 3/32	1
009750051	Ring – Retaining	1
000640051	Spring – Bearing Adj.	2
011240021	Nut – Hex 5/8-11	2
016640021	Plug – Pipe 3/8	3
000730011	Connector – Wire	3

Part No.	Part Description	Qty.
RTF	Stator	1
RTF	Rotor/Shaft	1
010060011	Connector – Splice, 460V	9
010060011	Connector – Splice, 575V	3
062370005	Box – Connection, 460V	1
062370015	Box – Connection, 575V	1
076650011	Spacer – 50"	1
024930001	Connector – Wire, 460V	3
148630002	Impeller – 8.31" Dia.	1
148630022	Impeller – 7.00" Dia.	1
148630032	Impeller – 6.00" Dia.	1
RTF	Cord Cap Assy. 35'	1
024940011	Connector – 40–50 hp, 60 hp, 575V	3
024980051	Connector – 60 hp, 460V	3
019570001	Seal – Type 21 Ceramic	1
019570021	Seal – Type 21 Carbide (Optional)	1
026020003	Sleeve – Shaft	1

Notes: RTF — Refer To Factory
Fill oil to above motor windings

S6A Parts List For use with product built with GE® motor.

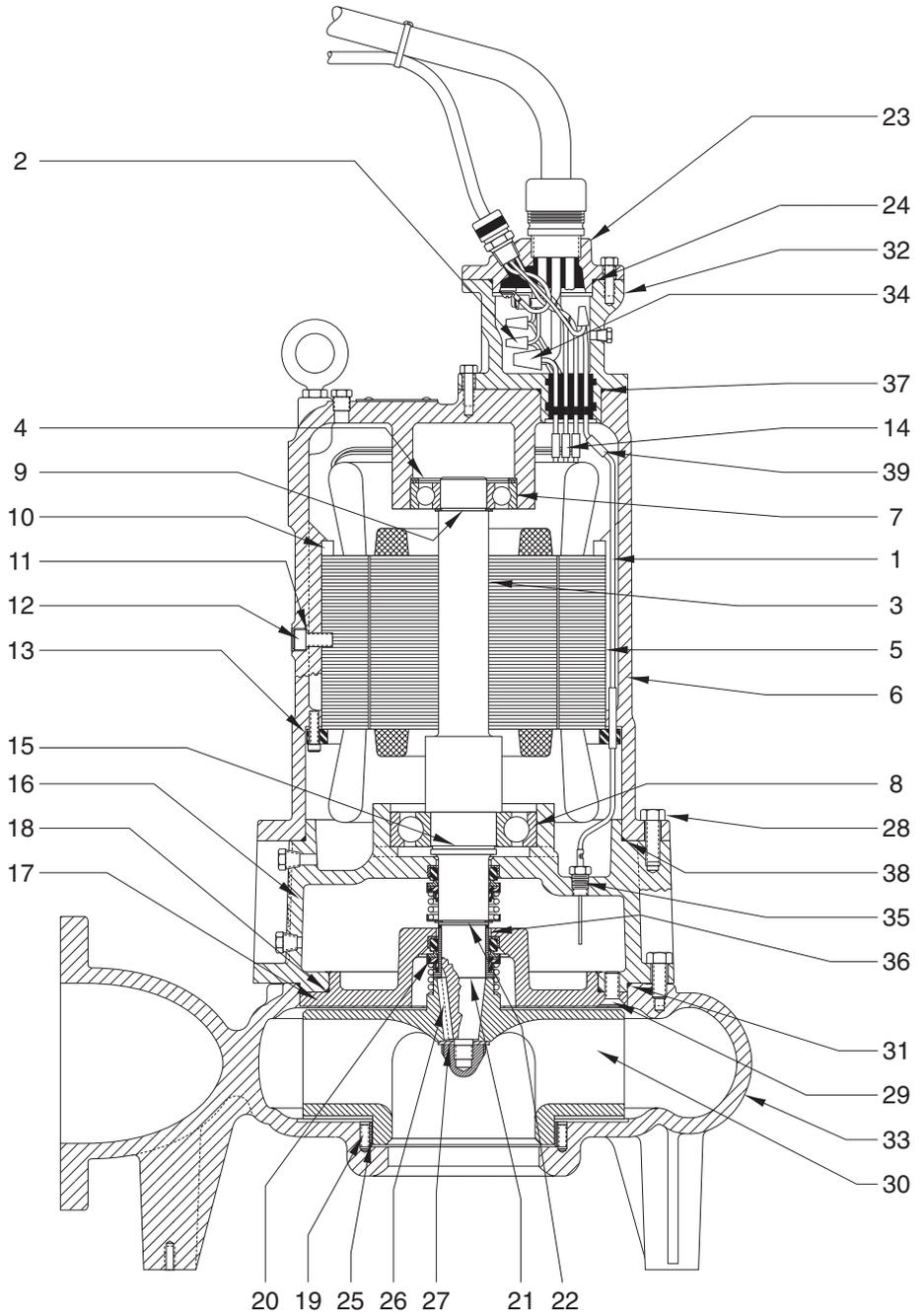
Ref. No.	Part No.	Part Description	Qty.
1	001500121	O-Ring	SC 1
2	005570001	Connector	3
3	RTF	Stator	1
4	076650011	Spacer – 3–15 hp, 1150 RPM	1
	076650001	Spacer – 10–20 hp, 1750 RPM	1
	076650061	Spacer – 3–5 hp, 870 RPM	1
5	RTF	Cord Cap Assy. – 35'	1
6	000650061	Upper Bearing	1
7	062370005	Conn. Box Assy. – 230/460V	1
	062370015	Conn. Box Assy. – 200/575V	1
8	RTF	Rotor and Shaft	1
9	009750051	Retaining Ring	1
10	008340021	O-Ring	SC 2
11	024980041	Wire Connector – 200V, 4/3 cord	4
	024940001	Wire Connector – 230/460V, 6/3 cord	
	008530001	Wire Connector – 575V, 8/4 cord	3
	024980051	Wire Connector – 230V, 4/3 cord	4
	008530001	Wire Connector – 460V, 8/4 cord	3
	024940001	Wire Connector – 460V, 8/4 cord	3
	024940001	Wire Connector – 460 & 575V, 6/3 cord	
	008530001	Wire Connector – 460 & 575V, 6/3 cord	
	008530001	Wire Connector – 200V, 10/4 cord	3
12	026030003	Stator Ring	1
13	001500071	O-Ring	SC 1
14	009750081	Retaining Ring	1
15	025950032	Seal Housing	1
16	001500401	O-Ring	SC 1
17	025960032	Seal Plate	1
18	019570001	Shaft Seal – Ceramic (Std.)	SC 1 or 2
	019570021	Shaft Seal – Carbide (Opt.) (Lower Only)	C 1
19	008290091	Machine Screw	4
20	136950003	Wearing Ring, Bronze	1
21	028550011	Key	1
22	001560111	Shaft Holding Washer – (25 hp & Up)	1
	019450001	Shaft Holding Washer – (20 hp & Below)	1
23	060000211	Wire & Terminal Assy.	1
24	029210011	Flat Head Screw	4
25	136940052	Impeller – 11" Diameter	1
	136940072	Impeller – 10.5" Diameter	1
	136940092	Impeller – 10" Diameter	1
	136940112	Impeller – 9.5" Diameter	1
	136940132	Impeller – 9" Diameter	1
26	001500261	O-Ring	SC 1
27	136930012	Volute	1
28	05876A007	O-Ring	SC 1
29	084720035	Sensor Assy.	1
30	026020003	Sleeve	SC 1
31	009750061	Snap Ring	1
32	002820011	Wire Connector	3
33	001500251	O-Ring	SC 1
34	000650261	Lower Bearing	1
35	010060011	Wire Connector – 230/460	9
	010060011	Wire Connector – 200/575	3
36	000640051	Bearing Spring	2
37	048320012	Motor Housing – (10274 Series)	1
	025970022	Motor Housing – (10272 & 10273 Series)	1
–	517000197	Seal Kit	
–	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

S6L Parts List For use with product built with GE® motor.

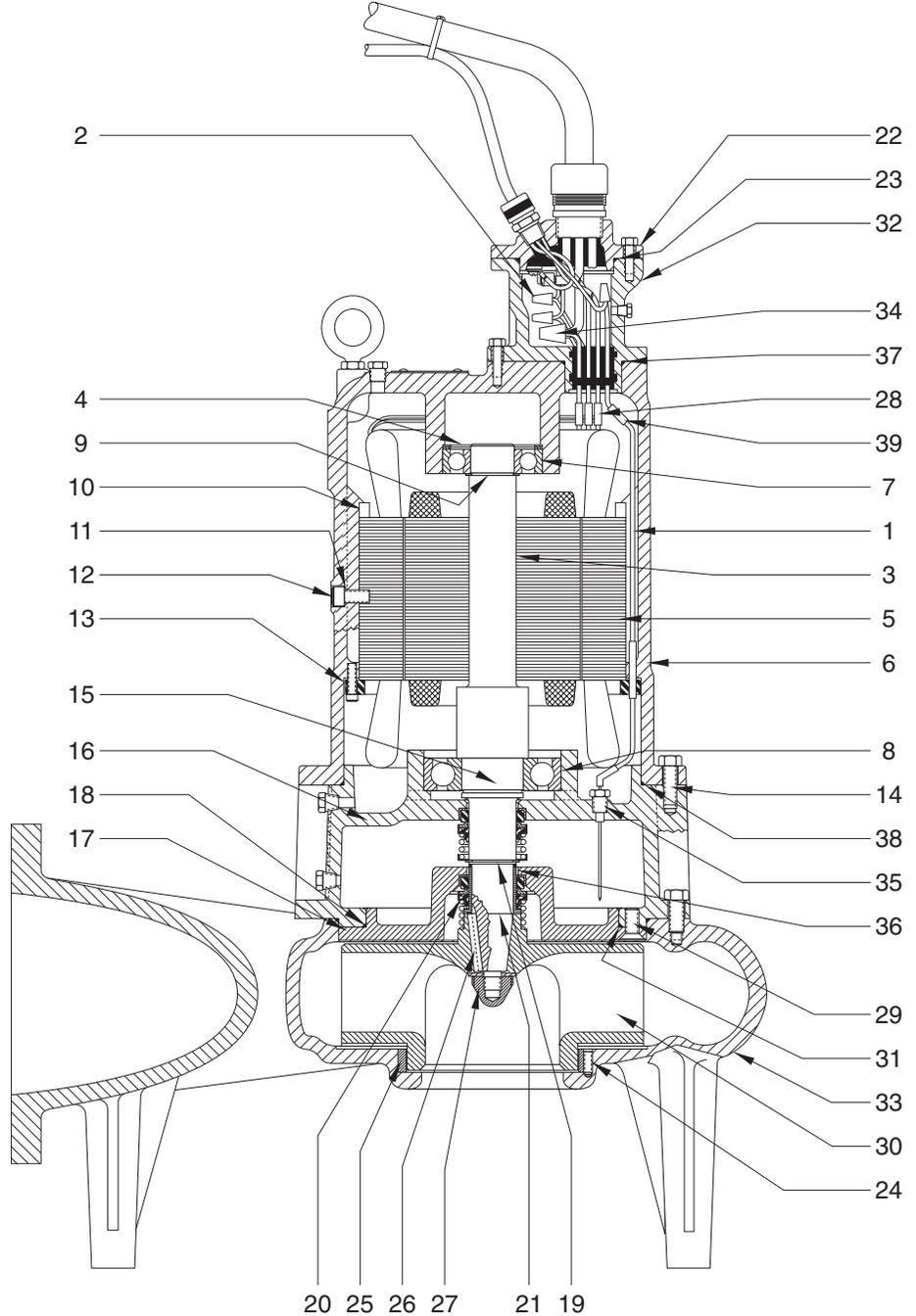
Ref. No.	Part No.	Part Description	Qty.
1	060000035	Wire & Terminal Assy. – (Prior to 5/1/78)	1
	060000211	Wire & Terminal Assy. – (Present)	1
2	000730011	Wire Connector	3
3	RTF	Rotor & Shaft	1
4	000640051	Bearing Spring	2
5	RTF	Stator	1
6	025970022	Motor Housing – 20 hp & Below	1
	048320012	Motor Housing – 25 hp & Above, 15 hp, 1150 RPM	1
7	08565A026	Upper Bearing	1
8	000650261	Lower Bearing (Present)	1
9	009750051	Retaining Ring	1
10	076650011	Spacer for Stator – 5 to 15 hp, 1150 RPM	1
	076650001	Spacer for Stator – 10 to 20 hp, 1750 RPM	1
11	008340021	O-Ring	SC 2
12	005680011	Screw Cap	2
13	026030003	Stator Ring	1
14	010060011	Wire Conn. – 230/460V	9
	010060011	Wire Conn. – 200/575V	3
15	009750081	Retaining Ring	1
16	025950032	Housing Seal	1
17	025960032	Seal Plate	1
18	001500401	O-Ring	SC 1
19	000130041	Set Screw	2
20	019570001	Shaft Seal – Ceramic	SC 1 or 2
	019570021	Shaft Seal – Opt. Carbide (Bottom Seal Only)	C 1
21	05876A007	O-Ring	SC 1
22	009750061	Snap Ring	1
23	RTF	Cord Cap Assy. – 35'	1
24	001500121	O-Ring	SC 1
25	042890023	Wear Ring, Bronze	1
26	028550011	Key	1
27	019450001	Shaft Holding Washer – (Up to 25 hp)	1
	001560111	Shaft Holding Washer – (25–35 hp)	1
28	005680061	Bolt	8
29	029210011	Flat Head Screw	4
30	025940002	Impeller – 11.88" Diameter (11-7/8)	1
	025940122	Impeller – 11.50" Diameter	1
	025940102	Impeller – 11.00" Diameter	1
	025940082	Impeller – 10.50" Diameter	1
	025940162	Impeller – 10.38" Diameter (10-3/8)	1
	025940212	Impeller – 10.18" Diameter	1
	025940192	Impeller – 9.81" Diameter	1
	025940042	Impeller – 9.50" Diameter	1
	025940032	Impeller – 9.25" Diameter	1
	025940242	Impeller – 8.37" Diameter	1
31	001500261	O-Ring	SC 1
32	062370005	Conn. Box Assy. – 230/460V	1
	062370015	Conn. Box Assy. – 200/575V	1
33	089180015	Volute	1
34	008530001	Wire Conn. – 200V, 10/4 Cord	3
	024940001	Wire Conn. – 200V, 8/4 Cord	3
	024940001	Wire Conn. – 230V	4
	008530001	Wire Conn. – 460V, 10/4 Cord	6
	024940001	Wire Conn. – 460V, 8/4 Cord	3
	008530001	Wire Conn. – 460V, 8/4 Cord	3
	008530001	Wire Conn. – 575V, 10/4 Cord	3
	024940001	Wire Conn. – 575V, 8/4 Cord	3
35	084720035	Sensor Assy.	1
36	026020003	Sleeve	SC 1
37	001500071	O-Ring	SC 1
38	001500251	O-Ring	SC 1
39	12672A001	Wire Connector	3
–	517000197	Seal Kit	
–	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

S8F Parts List For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	06000211	Wire & Terminal Assy. – (Present)	1
2	000730011	Wire Connector	3
3	RTF	Rotor & Shaft	1
4	000640051	Bearing Spring	2
5	RTF	Stator	1
6	025970022	Motor Housing – (20 hp and Below)	1
	048320012	Motor Housing – (25 hp and Above)	1
7	08565A026	Upper Bearing	1
8	000650261	Lower Bearing	1
9	009750051	Retaining Ring	1
10	076650011	Spacer for Stator – 3 to 15 hp, 1150 RPM	1
	076650001	Spacer for Stator – 10 to 20 hp, 1750 RPM	1
11	008340021	O-Ring	SC 2
12	005680011	Screw Cap	2
13	026030003	Stator Ring	1
14	002390071	Bolt	8
15	009750081	Retaining Ring	1
16	025950032	Housing Seal	1
17	025960032	Seal Plate – (Present)	1
18	001500401	O-Ring	SC 1
19	009750061	Snap Ring	1
20	019570001	Shaft Seal – Ceramic	SC 1 or 2
	019570021	Shaft Seal – Opt. Carbide (Bottom Seal Only)	C 1
21	001500031	O-Ring	SC 1
22	RTF	Cord Cap Assy. – 35'	1
23	001500121	O-Ring	SC 1
24	000130041	Set Screw	2
25	042890023	Wear Ring, Bronze	1
26	028550011	Key	1
27	019450001	Shaft Holding Washer – (Up to 25 hp)	1
	001560111	Shaft Holding Washer – (25–35 hp)	1
28	010060011	Wire Conn. – 200/460V	9
	010060011	Wire Conn. – 200/575V	3
29	029210011	Flat Head Screw	4
30	025940122	Impeller – 11.50" Diameter	1
	025940202	Impeller – 11.38" Diameter	1
	025940112	Impeller – 11.25" Diameter	1
	025940272	Impeller – 10.85" Diameter	1
	025940082	Impeller – 10.50" Diameter	1
	025940162	Impeller – 10.38" Diameter	1
	025940072	Impeller – 10.25" Diameter	1
	025940212	Impeller – 10.18" Diameter	1
	025940302	Impeller – 9.63" Diameter	1
	025940042	Impeller – 9.50" Diameter	1
	025940032	Impeller – 9.25" Diameter	1
	025940242	Impeller – 8.38" Diameter	1
31	001500261	O-Ring	SC 1
32	062370005	Conn. Box Assy. – 230/460V	1
	062370015	Conn. Box Assy. – 200/575V	1
33	089260025	Volute Base w/Wear Ring	1
34	008530001	Wire Conn. – 200V, 10/4 Cord	3
	024940001	Wire Conn. – 200V, 8/4 Cord	3
	024940001	Wire Conn. – 230V	4
	008530001	Wire Conn. – 460V, 10/4 Cord	6
	024940001	Wire Conn. – 460V, 8/4 Cord	3
	008530001	Wire Conn. – 460V, 8/4 Cord	3
	008530001	Wire Conn. – 575V, 10/4 Cord	3
	024940001	Wire Conn. – 575V, 8/4 Cord	3
35	084720035	Sensor Assy.	1
36	026020003	Sleeve	SC 1
37	001500071	O-Ring	SC 1
38	001500251	O-Ring	SC 1
39	002820011	Wire Connector	3
–	517000197	Seal Kit	
–	517003197	Carbide Seal Kit	



Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory
 — Fill oil to above motor windings

STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

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