



Part No. SK 816008
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MODELS 90, 91, and 94 MANUAL AQUEOUS PARTS WASHERS Support Manual



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1.0 INTRODUCTION

Read this entire manual carefully before you use this equipment. This manual will provide you with important information about the equipment and will instruct you on how to use it safely.

Complete safety in the workplace is dependent upon proper handling and usage of this equipment, and the proper handling and usage of the cleaning chemistry you use in it. It is important that you carefully follow all Safe-Use Instructions, all operational directions and procedures provided in this manual and carefully follow all instructions on the Material Safety Data Sheet(s) (MSDS) and on all the labels.

NOTE: The MSDS for the cleaning chemistry will contain detailed information regarding its use, health hazards, first aid, shipping, handling, storage as well as emergency and environmental information.

2.0 PRODUCT DESCRIPTION

The Aqueous Sink-on-a-Drum parts washers (Models 90 and 94) include a sink with a lid and fusible link which closes in the event of a fire. The sink is mounted on a 30-gallon drum that contains water-based cleaning solution. The system also includes an HPM (heater pump module) that pumps heated cleaning solution through a flexible nozzle or a flow-through brush assembly. The sink-on-a-drum style parts washer is available in two sizes with the Model 90 using a large stainless steel sink while the Model 94 uses a small painted sink. The Aqueous Vat Parts Washer Model 91 is a large, insulated parts washing tank.

These parts washers are designed as customer workplace devices. Typical applications include automotive repair shops, service stations and manufacturing maintenance and repair facilities for cleaning parts and/or assemblies using a water-based cleaning solution.

2.1 Applications

Industry:	Automotive or Industrial	
Parts/hour:	1 to 50	
Parts size:	Small (~1 lb)	Medium (1-20 lbs)
Parts soil:	Light (oils, dusts)	Medium (grease)
Cleanliness:	General cleaning	Maintenance parts

Do NOT add any chemistry to this unit including developers and gasoline. Do NOT use to clean products dirtied with sulfur-based contaminants or industrial paints.

2.2 Definitions

TERM	DESCRIPTION
GFCI	The abbreviation GFCI stands for “Ground Fault Circuit Interrupter”. It is a safety device designed to cut the electrical power in the circuit if there is any electrical current leakage to ground.
Impeller	The portion of the pump that spins on a shaft to move the fluid.
Thermistor and Thermistor Tee	The sensing probes in the fluid monitoring temperature. The two thermistors in the SK #2387 are just behind the pump connected to a clear plastic tee.
Volute	The portion of the pump that covers the impeller and where the flexible discharge hose screws on.

2.3 Heater Pump Controller (HPC) & Heater Pump Module (HPM)

The HPC models are obsolete, but can continue to be used until they malfunction. These units are ETL listed in the U.S. and Canada and include:

- (SK #2370)
- (SK #2370.1)
- (SK #4760)
- (SK #2383)

The HPM Thermawave 507 (SK Part #2387) is the current model. This model is ETL listed in the U.S. and Canada. It is identifiable by its gray metal or plastic control box.



(SK #2370)



(SK #2370.1)



(SK #2383)



(SK #2387)
Metal box



(SK #2387)
Poly box

3.0 SPECIFICATIONS

3.1 Technical Specifications

	Model 90	Model 94	Model 91
Dimensions			
Width:	36" (91.4 cm)	31" (78.7 cm)	51" (129.5 cm)
Depth:	26" (66.0 cm)	20" (50.8 cm)	24" (61.0 cm)
Height at sink:	36" (91.4 cm)	36" (91.4 cm)	36" (91.4 cm)
Height with lid open:	64" (162.6 cm)	56" (142.2 cm)	65" (165.1 cm)
Sink depth or freeboard:	8" (20.3 cm)	7" (17.8 cm)	11" (27.9 cm)
Weight Capacity			
Weight of unit (empty)	88 lbs (40.0 kg)	67 lbs (30.4 kg)	275 lbs (125.0 kg)
Maximum weight of parts	25 lbs (11.4 kg)	25 lbs (11.4 kg)	250 lbs (113.6 kg)
Electrical			
Grounded outlet requirements	120V, 15A, 60hz	120V, 15A, 60hz	120V, 15A, 60hz
Total nominal usage	10.5A	10.5A	10.5A
Bulb wattage	40W	40W	40W
Heater wattage	1000W	1000W	1000W
Temperature			
Operating temperature	120°F (48.9°C)	120°F (48.9°C)	120°F (48.9°C)
Maximum ambient	104°F (40°C)	104°F (40°C)	104°F (40°C)
Miscellaneous			
Operation type	Manual	Manual	Manual
Range of pH	~9 to 10.5	~9 to 10.5	~9 to 10.5
Machine color	Blue and silver	Blue	Blue and silver
NRTL listings	cETLus	cETLus	cETLus
Flowrate	1 to 2 gpm	1 to 2 gpm	1 to 2 gpm
Pressure (maximum)	2 psi maximum	2 psi maximum	2 psi maximum
Sock filter rating	400 micron	400 micron	N/A

3.2 Site Requirements

Floor space width:	36" (91.4 cm) for sinks, 52" (132.1 cm) for vat
Floor space depth:	28" (71.1 cm) minimum
Height clearance:	66" (167.6 cm) minimum
Power requirement:	120V, 15A, 60Hz, <u>dedicated circuit</u>
Distance to outlet:	12' cord, must be within eight feet of outlet
Work area:	Sufficient lighting and floor should be level and smooth

4.0 INSTALLATION

4.1 Tool Requirements

The following tools are recommended for installing the equipment at the customer location:

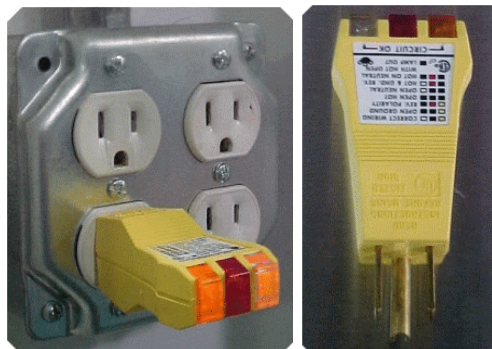
- Two-wheel hand/drum truck
- Drum bolt-ring open-end with 15/16" socket wrench on other end
- Standard, straight blade screwdriver
- Phillips screwdriver
- Pliers
- Safety blade
- Outlet tester

4.2 Unpacking

Carefully remove all components of the equipment from their respective packaging and shipping materials. Thoroughly inspect all components for any damage. If there is damage, complete a [Quality Non-Conformance \(QNC\)](#) form.

4.3 Pre-Installation

Before installing the Model 90, 94, or 91 at the customer site, use the outlet tester, (SK p/n 250421, Grainger p/n 3T885; Ideal brand p/n 61-035) and verify that the receptacle intended for use is safe and properly wired. Notify the customer if the tester identifies any wire conditions that are not correct as indicated on the tester's label, and ask that the receptacle be repaired or use an alternate location. Failure to follow this step may cause damage to the HPM.



4.4 Assembly

Model 90 and 94 Sink-On-A-Drum Installation

1. Place a 30-gallon drum with aqueous solution into its location at the customer site.
2. Place the HPM into the drum.
3. Attach the half-moon to the HPM.
4. Place sink assembly onto the drum.
5. Install the spigot, hose, and brush assembly (SK #4791) through the back of the sink.

6. Connect the hose assembly from the sink to the hose from the pump.
7. Install the lamp assembly. (During repairs of HPM units, avoid reusing the existing lamp to assure integrity of assembly)
8. Install a 40-watt bulb and clear lamp cover.
9. Plug the unit into the customer's receptacle, turn it on and check for normal operation. Wait for a few moments to confirm that the heater is raising the fluid temperature.

Model 91 Vat Installation

1. Place the vat into its location at the customer site.
2. Fill the reservoir with 50 gallons of aqueous solution.
3. Place the HPM into the vat on the side panel compartment.
4. Connect the discharge hose from the pump to the fitting on the partition wall assembly.
5. Place the partition wall assembly into the vat on the left side.
6. Connect the hose assembly from the vat to the quick connect fitting on the partition wall assembly.
7. Install the lamp upright bracket onto the back panel of the vat.
8. Install the lamp assembly onto the upright bracket. (During repairs of HPM units, avoid reusing the existing lamp to assure integrity of assembly)
9. Install a 40-watt bulb and clear lamp cover.
10. Plug the unit into the customer's receptacle, turn it on and check for normal operation. Wait for a few moments to confirm that the heater is raising the fluid temperature.

5.0 TROUBLESHOOTING GUIDE

TOP ISSUES THAT CAN BE RESOLVED AT THE CUSTOMER

- | | |
|--------------------------------------|----------------------------------------------|
| 1. Check customer outlet for power | Use Outlet Tester to confirm proper wiring |
| 2. Circuit breaker switches are off | Turn them on |
| 3. Pump pulsing on and off | Add 5 gallons water, press Test, press Reset |
| 4. Pump "hums" but does not flow | Check for debris at the impeller |
| 5. Pump rattling | Replace pump assembly (magnet issue) |
| 6. Lamp flashing (nuisance tripping) | Press GFCI Test, wait 5 sec, Press Reset |

The above steps have resolved more than 95% of field issues.

Your primary line of defense with the SK #2387 HPM is the troubleshooting label that comes in every kit. Apply this label to the sink or vat and inform the customer about these simple troubleshooting tasks.

2007 to Present Poly Box SK #2387



Problem	Possible Solutions
Lid is damaged	<ul style="list-style-type: none"> • Check for obstructions • Do NOT replace lids with UL logo, instead replace the entire machine. • If the ETL or UL logo is on the sink, replace the lid and reinstall the lamp. Reuse the fusible link assembly if it is in suitable condition.
Fusible Link Damage	<ul style="list-style-type: none"> • Make sure that the lid moves freely without obstruction and that the standpipe for the Model 90 (SK #2244) or the Model 94 (SK #2144) is in place and the locknut is tight. • If the standpipe is loose, tighten the locknuts SK #5515 using an adjustable wrench. • Remove any broken pieces of the old fusible link and replace it with a new one. (Refer to instructions provided with the fusible link SK #2385)
No Power	<ul style="list-style-type: none"> • Reset the PUMP, LAMP, and HEAT circuit breakers on the control box. • The Ground Fault Circuit Interrupt (GFCI) breaker has tripped. Press the GFCI Reset button. • Check if the electrical outlet is functioning properly by plugging in an appliance that is known to work or by using an outlet tester.
Pump Doesn't Work	<ul style="list-style-type: none"> • Check the PUMP circuit breaker ON/OFF position. • Check power cord connection. • Check if the electrical outlet is functioning properly by plugging in an appliance that is known to work or by using an outlet tester.
Pump Pulsates or No Solution	<ul style="list-style-type: none"> • Check for low solution level by removing the crumb cup and strainer basket in the sink. Add five gallons of water if low. <ul style="list-style-type: none"> - Press the GFCI Test button. - Wait five seconds for programming to reset. - Press the GFCI Reset button. • Check hoses for blockage or crimp. Check that sink is not sitting on the hose from the pump and route through half-moon. • If the hose and brush assembly is still clogged or damaged, use a wrench to replace it. Make sure to point the spigot into the sink before checking for operation. • If the pump still seems clogged or broken, refer to Section 6.2
Lamp Doesn't Turn On	<ul style="list-style-type: none"> • Check the LAMP circuit breaker ON/OFF position. • Try turning unit on and off again. (Momentary switch always points down) <ul style="list-style-type: none"> - Flip the On/Off switch on the lamp. - Push the Start/Stop button on the control box. • Check power cord connection. • Ensure the electrical outlet is functioning properly. • Replace bulb (do not use anything greater than a normal 40-watt bulb).
Light and/or LED Flashing	<ul style="list-style-type: none"> • If the unit is flashing for the first time, it may have read a fault code due to electrical spike. Follow this procedure to reset it. <ul style="list-style-type: none"> - Press the GFCI Test button. - Wait five seconds for programming to reset. - Press the GFCI Reset button. • If the flashing is persistent after resetting, replace the unit.
Drainage Issue	<ul style="list-style-type: none"> • Remove debris from crumb cup and/or strainer basket and dispose according to local regulations. • Replace filter sock.

Unit Leaks	<ul style="list-style-type: none"> • Check for a loose hose that may be leaking on the floor and re-route if necessary • If the drum or vat is leaking, replace them as soon as possible.
Half Moon	<ul style="list-style-type: none"> • If the tabs are broken or the half moon is lost, replace it with SK #232037
Lamp Damage	<ul style="list-style-type: none"> • If the lamp lens is cracked or broken, replace lens assembly (SK #232044) • If the switch tubing has fallen off, slide tubing over switch and re-crimp with locking pliers. Machine is still operable without this extension switch, but should be replaced as soon as possible. • If the cord is damaged (cut or worn), replace lamp assembly (SK #232045) by unscrewing the quick connect and two screws/nuts on the lid. Confirm the lamp works with a functional bulb.
Control Box Damage	<ul style="list-style-type: none"> • If the control box or GFCI are damaged, the entire SK #2387 must be replaced. Do NOT open the control box in the field!

6.0 REPAIR PROCEDURES - LEVEL 1 and 2

Before any repairs are made to the equipment, make sure to unplug or disconnect all sources of electrical power.

- **Level One Repairs** are simple repairs that can be performed by most employees.
- **Level Two Repairs** are more difficult repairs that must be performed by qualified, designated individuals.
- **Level Three Repairs** are defined in the Listing Refurbishment procedures. **They cannot be done in the field and are not included in this manual.** Items such as wiring modifications or similar electrical repairs not identified herein are prohibited from field repair.

Note: All repairs must be completed using approved Safety-Kleen parts.

Note: No modifications/changes (repairs), except for those listed in this manual, may be made without written approval from the Safety-Kleen R&D group.

6.1 Tool Requirements

Refer to the [Vehicle Route Readiness Checklist](#) for a list of tools that an individual will need to complete repairs to Safety-Kleen equipment.

6.2 Pump Doesn't Work

Identification

No solution flow when pump is turned on.

Diagnosis

Pump will not turn on

1. Make sure the machine is plugged into a working electrical outlet.
2. Plug in an Outlet Tester to ensure power is present at the outlet. **Do not make any repairs to a customer's electrical outlet.**

3. Ensure the pump cord is connected to the control box (top rear)
4. With the unit plugged in, push the GFCI “Reset” button and check for the red indicator light. If there is no light, return the SK #2387 for GFCI replacement.
5. Make sure that the pump circuit breaker “on/off” switch is on. Check for pump operation again by pressing the black push button or lamp switch.
 - If the GFCI or pump circuit breaker trips unplug the pump cord from the control box, press the GFCI “Reset” button, and switch the pump circuit breaker to the “on” position.
 - If the GFCI or pump circuit breaker trips again, the control box or GFCI is faulty. Replace the unit.
6. Plug the pump electrical cord back into the control box (disconnected in step 5). If the GFCI or pump circuit breaker trips, replace the pump.



Pump is running, but there is no solution flow, or pump is surging

1. If the pump is running, but no fluid is passing or pump is surging, check to make sure that there is enough fluid in the drum.
 - Add 5 gallons of water, if necessary
 - Press the GFCI Test button, wait 5 seconds and then press the GFCI Reset button
2. Check hoses for a blockage or crimp.

Level One Repairs

Freeing the Impeller:

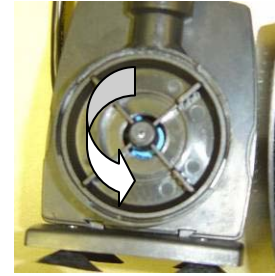
1. Remove the sink assembly so that the HPM can be removed from the drum. Place it on an absorbent wipe and on a flat hard surface. **NOTE: BE CAREFUL, HEATER MAY BE HOT.**
2. Loosen the pump retaining screw and pump bracket, if present.



3. Slide the pump from the main bracket.



4. Remove the volute by turning it counterclockwise. Be careful not to crack the ceramic shaft!



5. Remove the impeller. Thoroughly clean the debris from the impeller, impeller well, and volute.
6. Reassemble all parts in the order they were removed.
Note: The pump shaft must be centered in the bushings, in both the pump (at the bottom of the impeller well) and on the volute.

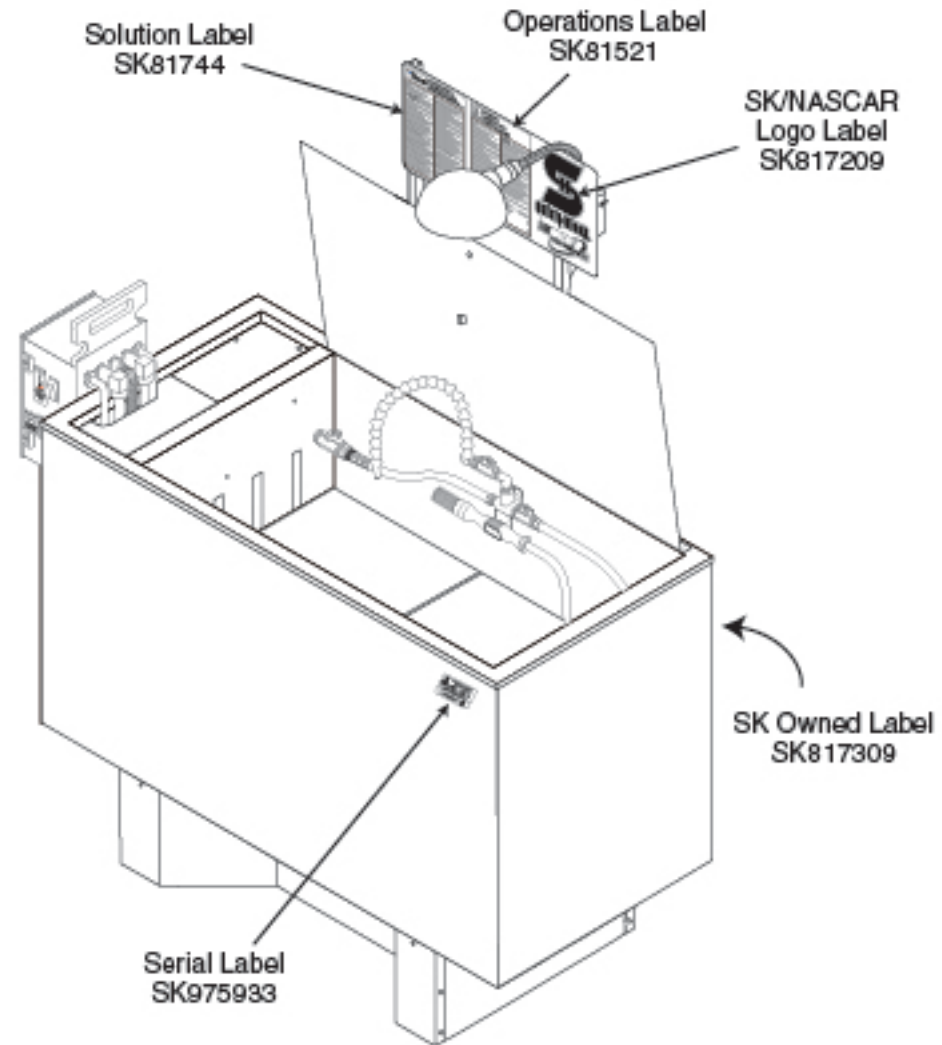
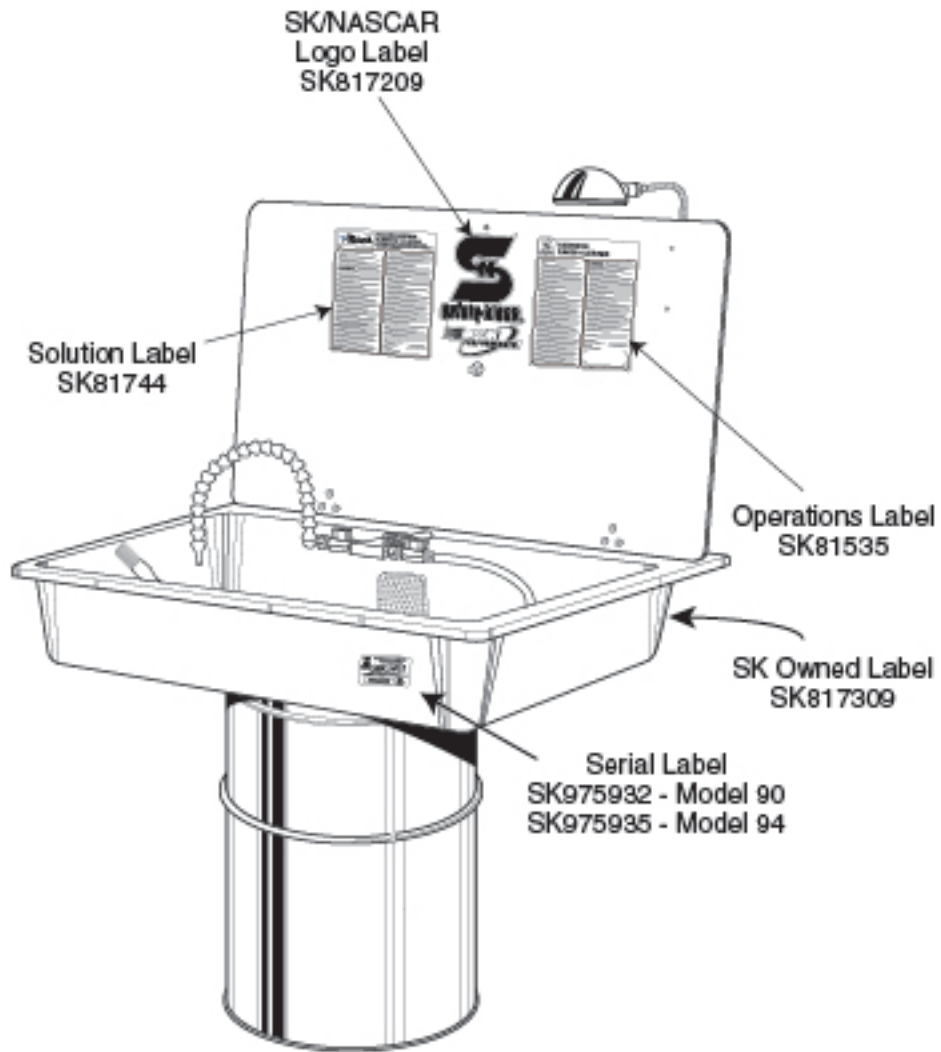


7. Slide the pump into the main bracket. Ensure the pump retention bracket is secured. Reconnect the pump electrical quick connect. Retest pump.
8. If the unit will not pump fluid after cleaning the impeller, replace the pump. If it does work, reattach the retaining bracket with one screw.

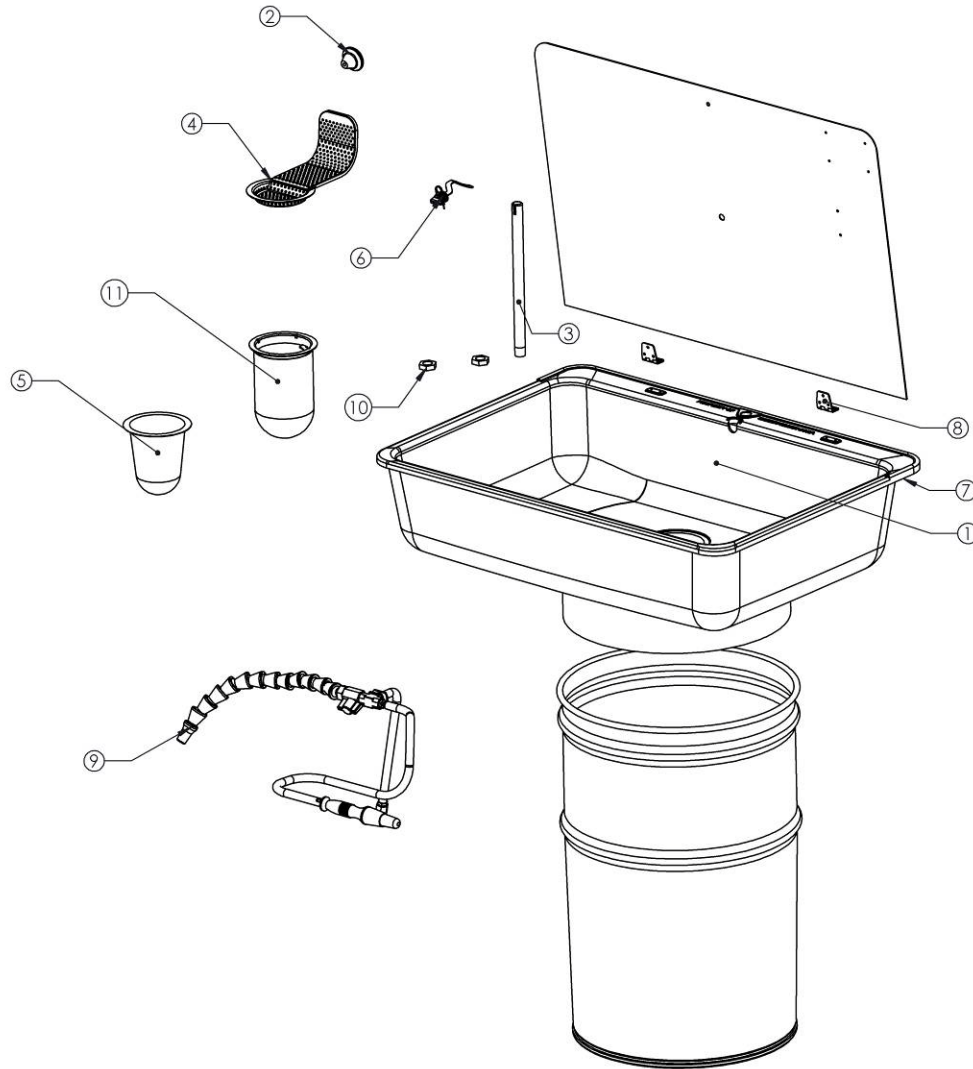


Note: Return defective pump assemblies to your local DC for return to the manufacturer and a warranty claim.

Label Placement: Models 90 / 94, and 91

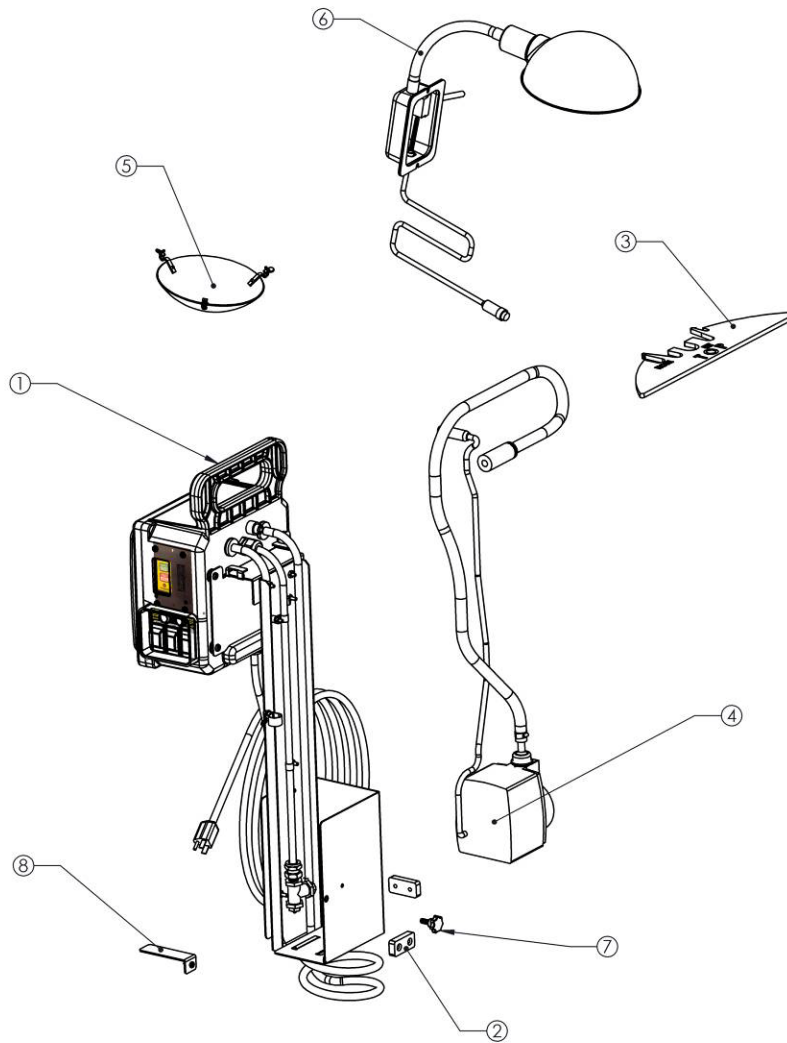


REV.	REVISION	APPD	DATE
1	Release	BLT	01-31-2011



Parts List				
ITEM	MODEL 90 P/N	MODEL 91 P/N (NOT SHOWN)	MODEL 94 P/N	DESCRIPTION
1	1170	1199	1260	Sink/Vat Assembly
2	1460	1460	1460	Knob, Lid
3	2144	N/A	2218	Stand Pipe
4	2275	N/A	2285	Crumb Cup
5	2348	N/A	2348	Filter Screen
6	2385	2385	2385	Fusible Link Assembly
7	N/A	N/A	4740	Plastic Liner (Not Shown)
8	4758	N/A	4758	Hinge, Lid
9	4791	4791	4791	Hose and Brush Assembly
10	5515	N/A	5515	Lock Nut, Cast Iron, 1/2"
11	231084	N/A	231084	Sock Filter

REV	REVISION	APPD	DATE
1	Release	BLT	01-20-2011



Model 2387 Parts List		
ITEM	PART NUMBER	DESCRIPTION
1	2387	HPM Assembly
2	232027	Magnet, Ceramic, Grade 5
3	232037	Half Moon
4	232042	Pump Assembly
5	232044	Lens Assembly
6	232045	Lamp Assembly
7	232101	Knob, 1/4-20 X 1/2
8	232136	HPM Pump Retention Bracket Assembly