



**RARITAN**  
Engineering Company, Inc.

## crown head

### INSTALLATION AND MAINTENANCE INSTRUCTIONS

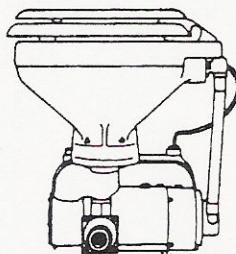
#### I. DESCRIPTION

The Raritan CROWN HEAD is an electric toilet designed for marine use. It draws in seawater through a self priming pump, flushes the toilet bowl, then draws out the flush water and waste through a combination discharge pump and macerator. A built-in provision adds a solution of Raritan Concentrate to the incoming flush water to reduce odor and minimize staining of the bowl.

The CROWN HEAD is available in two models: Standard and Deep Draft. The Standard model is designed for installations above the waterline only. For all other installations, the Deep Draft model is recommended. Two toilet bowl and seat sizes are available: Standard Marine Size and Household Size (Hi-Boy). Bowls are interchangeable.

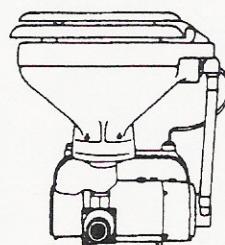
#### II. CERTIFICATION

The CROWN HEAD does not by itself comply with the requirements of the Clean Water Act of 1970. It may however be legally used together with any certified treatment system such as the LECTRA/SAN® or with a holding tank. Outside the three-mile limit, or overseas where strict sanitation laws are not in force, it may be used for direct overboard discharge.



**Household Size:**

17 3/4" High  
19 1/2" Long  
14 1/2" Wide



**Standard:**

17 1/8" High  
17" Long  
13 3/4" Wide

Base with shroud installed is 6 1/4" x 11" x 13 1/4"

#### III. INSTALLATION

##### A. Mounting the CROWN HEAD

Mount the CROWN HEAD on solid deck construction using the supplied rubber mounting strips between the base plate and the deck. Be sure fasteners are heavy enough to handle the weight of the head in rough seas. We recommend that stainless steel fasteners be used throughout the installation. Be sure

to allow space to the side and rear of the unit for connecting hoses. In extremely close quarters where the hull configuration interferes with the mounting, where space is at a premium, or where routing of hoses or wiring may be difficult, the bowl can be rotated 90 degrees in either direction but the hose (CH42) between the inlet pump and the rear of the bowl will have to be replaced with a longer hose; contact Raritan Customer Service for ordering instructions.

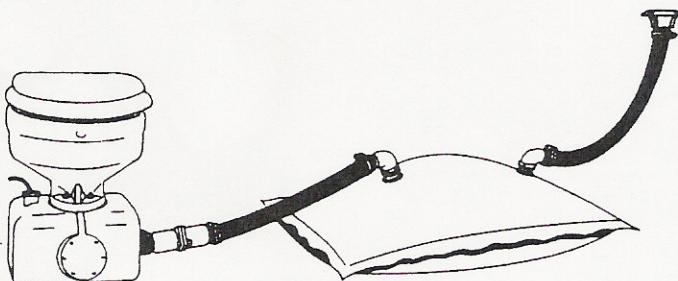
##### B. Plumbing the CROWN HEAD

1. A  $\frac{3}{4}$ " seacock for inlet water, located in an accessible area, is required. If direct discharge (where permitted), a treatment unit, or a holding tank bypass is being used, a  $1\frac{1}{2}$ " discharge seacock in an accessible area is also required. Inlet and outlet through-hulls should be as far apart as practical; preferably more than three feet, and on opposite sides of the keel, to prevent the possibility of discharge being drawn back into the inlet. With  $\frac{3}{4}$ " I.D. reinforced hose, connect the seacock to the inlet water connection on the rear of the head. Fasten hose with stainless steel hose clamps or equivalent; double - clamp joints below the water-line where possible. Avoid sharp bends and 90 degree ells in the hose as these will reduce water flow. Discharge hose should be  $1\frac{1}{2}$ " I.D. fabric-reinforced rubber hose with a smooth interior. Avoid plastic hose, particularly the ribbed type, as sewage odor can be transmitted into the cabin area by some types of plastic hose. Using the  $1\frac{1}{2}$ " I.D. discharge hose, join the head's discharge fitting to either the holding tank or treatment system (see 2., or 3., following); or the discharge through-hull fitting, where permitted. If the head is mounted at or below the waterline, we recommend that a vented loop be installed in the discharge line with the top of the loop at least 4" above the waterline when the boat is at its greatest angle of heel. The vent fitting at the top of the loop should be connected with small diameter hose to a fitting that allows the line to vent outside cabin areas. Fasten securely with stainless steel hose clamps or equivalent; double-clamp all joints below the water-line where possible. See manufacturer's instructions for holding tank or treatment system hookup.

##### 2. The Deep Draft Crown Head in Conjunction With a Holding Tank:

We recommend that holding tanks be installed with the top of the tank at the same level or below the discharge fitting of the CROWN HEAD. In cases where this is not possible, a vented loop should be installed

with the top of the loop higher than the holding tank, to preclude backflow into the head. As an alternative, Raritan can supply an in-line check valve\* to protect against backflow.



Recommended connecting hose is 1½" I.D. fabric-reinforced laminated rubber with a smooth interior (see B., 1., earlier). Use stainless steel hose clamps or equivalent for all connections; double-clamp joints below the waterline, where possible, for safety.

"Y" valves are frequently used when plumbing discharge lines because of the many hookup combinations they allow. They add convenience to periodic maintenance operations, allowing head, holding tank, treatment system, discharge pump, etc. to be bypassed or diverted while being serviced. They are easy to use and easy to maintain. The following combinations might be considered:

a. Use of a "Y" valve in the inlet to the holding tank to divert the waste around the holding tank to a through-hull discharge fitting (for use outside the three-mile limit or when servicing the holding tank).

b. Use of a "Y" valve in the discharge line from the holding tank to allow deck pumpout inside the three-mile limit and overboard pumpout outside the three-mile limit.

c. Use of a "Y" valve in a three-way position to combine a., and b., above.

Raritan or its dealers can supply 1½" "Y" valves\* for above applications. Instructions included with Raritan "Y" Valves explain the above applications in more detail.

**CAUTION:** "Y" valve bypasses may not be used within U.S. tidal waters (inside the three mile limit). If "Y" valves are installed, they must be in a closed and secured position while inside the three mile limit.

### 3. The Deep Draft Crown Head in Conjunction With a LECTRA/SAN® System:

We recommend that the Deep Draft model CROWN HEAD be used in conjunction with the LECTRA/SAN® system. If a standard model CROWN HEAD is already installed, a factory remanufactured Deep Draft model can be purchased on an exchange basis. The motor and pump assembly from the Standard model CROWN HEAD can also be returned to the factory for conversion to a Deep Draft model.

When connecting to a LECTRA/SAN® system, it is best to mount the treatment unit at the same level or beneath the discharge fitting of the CROWN HEAD. If necessary, the treatment unit can be mounted somewhat above the discharge fitting of the CROWN HEAD, but it reduces the flushing efficiency of the head. All connecting hoses should be 1½" I.D. fabric-reinforced laminated rubber with a smooth interior, (see B., 1., earlier). Use stainless steel hose clamps or equivalent

for all connections and double-clamp joints below the waterline where possible, for safety.

If using the optional salt feed system with the LECTRA/SAN®, note the following:

Be sure to remove and discard the ball and spring from the inlet water pump. Replace plug. Add T-check valve included with the LECTRA/SAN® to inlet water line between seacock and inlet pump, as described in the LECTRA/SAN® manual. The LECTRA/SAN® system comes complete with a comprehensive manual that should be studied thoroughly before commencing the installation.

For convenience, flexibility and ease of servicing, the installer may wish to include a "Y" valve in the installation (see remarks in III., B., 2.).

### C. Electrical

The CROWN HEAD should be wired to a separately fused circuit with no other accessories on that circuit. Fuses or manual reset circuit breakers should be provided either in the power distribution panel or directly in the power supply lines. Recommended minimum wire sizes and fuse or circuit breaker ratings are shown in the accompanying chart. **NOTE:** If wire is too small, the head will not operate properly; never "skimp" on wire size to cut costs of the installation. When measuring the length of wire runs, include the distance from the batteries to the head AND BACK to the batteries.

#### RECOMMENDED MINIMUM WIRE SIZE

LENGTH OF WIRING	12V STD	12V DD	24 & 32V STD	24V DD	32V DD	115V AC/DC
0 - 15'	#8 AWG	#6 AWG	#12 AWG	#10 AWG	#10 AWG	****
0 - 20'	****	****	****	****	****	#14 AWG
16 - 20'	#6 AWG	#4 AWG	#10 AWG	#8 AWG	****	****
16 - 50'	****	****	****	****	#8 AWG	****
21 - 50'	#4 AWG	#2 AWG	#8 AWG	#6 AWG	****	#12 AWG
FUSE SIZE (AMP)	40	60	20	25	25	10

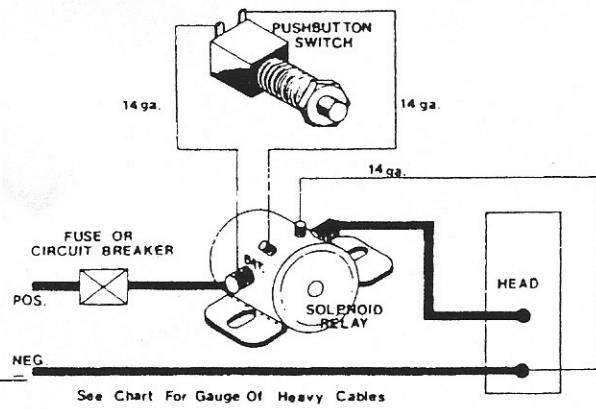
**NOTE:** Certain series CROWN HEADS use a polarized motor with permanent magnet fields. Units using this motor will have terminals marked POS and NEG. In addition, indicators (+) and (-) are cast into the metal housing near each terminal. The installer must insure that the lead from the battery (or power panel) is connected through a suitable fuse or circuit breaker to the POS terminal on the motor, and the ground lead from the power source is connected to the NEG terminal on the motor. Units for 115 volt use, with terminals identified POS and NEG, are DC only; a special rectifier/switch assembly is required to operate the head on 115 volts AC. This assembly\* is available from Raritan dealers or from the factory.

A momentary switch and heavy-duty solenoid relay combination is recommended for 12, 24, and 32 volt units; the relay takes the heavy electrical load from the switch contacts and the momentary switch allows the motor to run only while the contact is held. We DO NOT recommend toggle-type switches that remain on until turned off; forgetting to turn off the switch can cause overheating of the CROWN HEAD motor. If fully automatic operation is desired, Raritan or our dealers can supply a RARI-TIME "off-delay" timer to be added to the installation. This enables the flush to be pre-set anywhere from 0-30 seconds, eliminating the requirement to hold the switch while flushing. Push-button switches\*, solenoid relays\* and RARI-

\* See Parts List at the end of this manual for Part Numbers and Ordering Instructions.

TIME timers\* are available from your Raritan dealer or factory-direct. Be sure to specify voltage when ordering (12, 24 or 32 Volts, DC only). RARI-TIME timers were designed to be used together with the Raritan CDS solenoid relay, but they can be adapted for use with many other style relays. Installation instructions are included with each timer.

Typical wiring diagram, including switch and relay:



A double-pole single-throw momentary switch should be used with all 115 Volt AC/DC CROWN HEADS. Raritan or its dealers can supply this switch\* on order. A relay is not required for 115 Volt AC/DC units.

All 115 Volt CROWN HEADS must have the motor unit grounded, and we strongly recommend that other voltages, likewise be grounded. The ground wire may be connected to one of the base mounting screws under the motor unit. If grounding is not provided in the installation, shock hazard or possible electrolysis damage could result. CROWN HEADS that do not have the positive and negative motor terminals identified utilize wound fields and will work correctly regardless of which battery lead is connected to which motor terminal.

#### IV. OPERATION OF THE CROWN HEAD

##### A. Initial Startup

After completing the plumbing and the wiring, double-check to be sure all is done correctly. If using a CROWN HEAD with factory marked electrical terminals (POS and NEG), be sure the positive wire from the battery or power source connects (through relay or switch) to the positive terminal on the head. Likewise, the ground from the battery or power source should connect to the NEG terminal.

Check to be sure inlet water seacock is open. If using a treatment system or connecting for direct overboard discharge, be sure discharge seacock is open. If connecting to a holding tank, be sure the holding tank's vent is open. Remove the cap from the reservoir at the bottom of the head and pour in 2 oz. of Raritan Concentrate (1 vial). Fill the remainder of the reservoir with fresh water and replace the siphon and siphon cap. **WARNING: USE ONLY RARITAN CONCENTRATE AS AN ADDITIVE IN THE CONCENTRATE TANK. OTHER PRODUCTS MAY CAUSE UNFAVORABLE CHEMICAL REACTIONS OR MAY CAUSE DAMAGE TO THE INTERNAL PARTS OF THE HEAD, HOLDING TANK, OR TREATMENT SYSTEM.** If Raritan Concentrate is not available, temporarily fill the reservoir with fresh water until Concentrate can be acquired.

If the head is a Deep Draft model, pour about one quart of water into the bowl; this will wet the discharge impeller and reduce drag on the motor. If the head is a Standard model, this will not be necessary. Depress the switch to activate the head. Water should run into the bowl within 20 seconds. If water flows into the bowl, allow the motor to run approximately 30 more seconds, then release the switch. Depress the button again; the head should now flush normally. If head does not flush correctly, refer to Troubleshooting Section.

##### B. Normal Operation

The CROWN HEAD motor is not rated for continuous duty and should never be operated for longer than 2 minutes at a time. The boat operator should caution guests, and especially children, that the head should not be "played with". Paper towels and stringy materials, hard materials or rubber products should never be put into the head. No special toilet tissue is required with the CROWN HEAD but observe the above cautions.

Normal operation of the CROWN HEAD is very simple. Simply depress the push button and hold it until the bowl is clear, plus about 5 additional seconds to clear the connecting lines. If a LECTRA/SAN® System is installed in conjunction with the CROWN HEAD, turn the knob of the LECTRA/SAN® control to the "Start Flush" position BEFORE FLUSHING THE HEAD. Then simply depress the button until the bowl and lines are clear. The LECTRA/SAN® system will go through its treatment cycles and shut off automatically. If the green indicators are lit upon entering the head compartment, wait until they are off before restarting the LECTRA/SAN® and flushing the head.

##### V. MAINTENANCE

Little maintenance is required for the CROWN HEAD. The Concentrate tank must be refilled when empty; occasional inspection should be made to insure the tank has not run dry.

Periodic visual inspection should be made to determine if any leaks are present.

A semi-annual check should be made to insure all wire terminals are clean and corrosion-free.

##### VI. WINTERIZATION

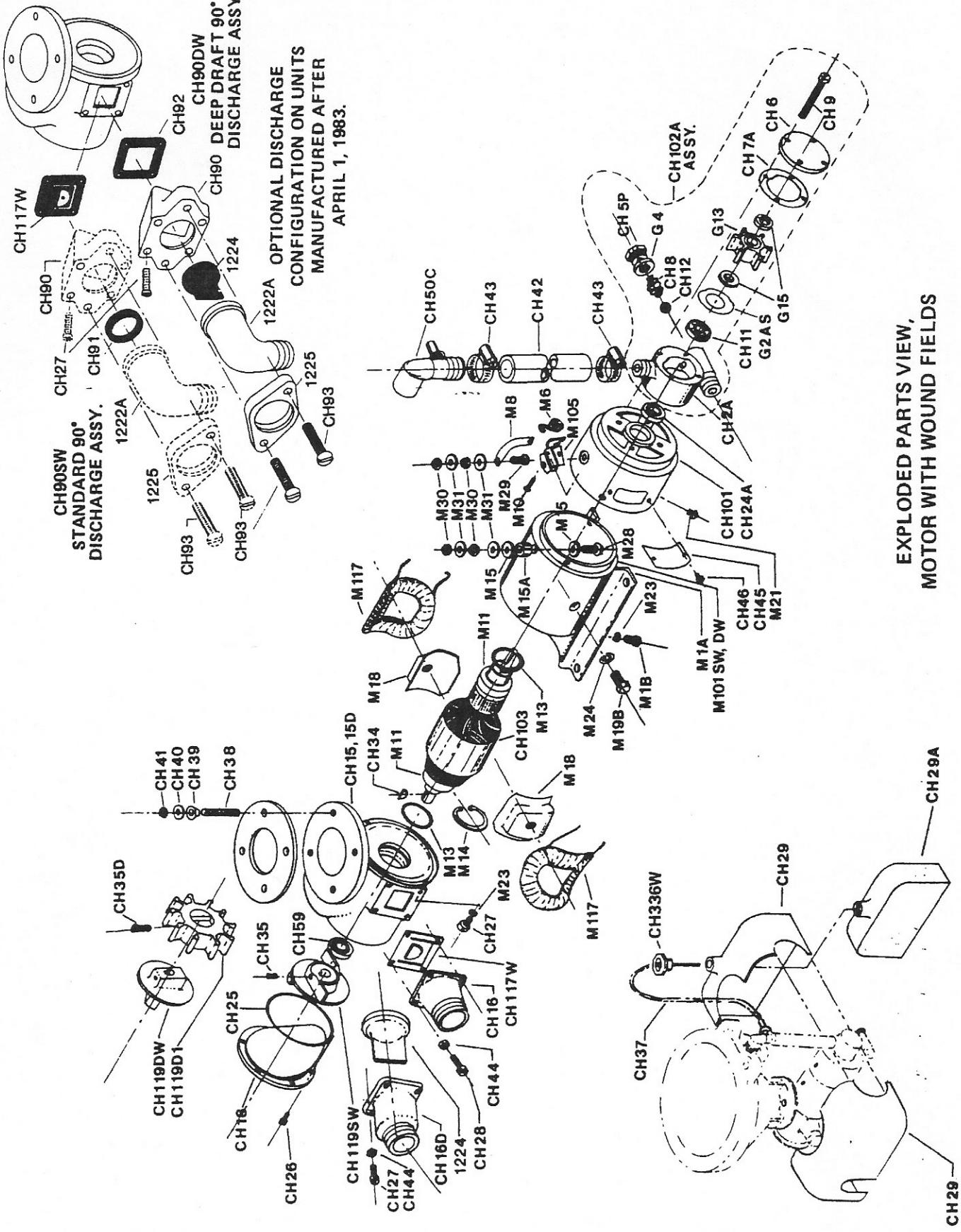
A major cause of failure for marine heads is improper winterization. These simple steps for correct winterization will prolong the life of the CROWN HEAD.

- A. Close inlet seacock and disconnect inlet line from the rear of the CROWN HEAD.
- B. Run the motor until all water possible has been pumped out of the unit.
- C. Remove hose between bowl and inlet pump at pump (bottom) end.
- D. Disconnect discharge hose and close discharge seacock (if used).
- E. Remove front cover (CH18) to allow any remaining water to be removed.
- F. Drain and rinse out the Concentrate tank and siphon assembly.
- G. Holding tank and/or certified treatment system will then have to be independently winterized. See manufacturer's instructions.

\* See Parts List at the end of this manual for Part Numbers and Ordering Instructions.

## VII. TROUBLESHOOTING THE CROWN HEAD

Problem	Possible Cause	Solution
A. POOR PUMPOUT, ESPECIALLY SOLIDS.	A1. Clogged Discharge Line. A2. Too many bends or ells in discharge line. A3. Clogged vented loop. A4. Mineral buildup in hoses and fittings. A5. Low Voltage.	A1. Be sure Discharge Seacock is open. Clear line - remove clog. A2. Replumb to eliminate bends and ells. A3. Clean vent. A4. Manually clean affected parts. A5. Check voltage at head while running. If less than nominal voltage of head (12, 24, 32, 115V): Check condition of batteries, electrical system and connections. Check terminals and wire connections for corrosion (heat at terminals and junctions indicates a bad or corroded connection). Check gauge of wire to be sure it is not undersize. It should follow recommendations listed under Section III., C.
B. POOR WATER FLOW, ESPECIALLY AT FRONT OF BOWL (OR NO WATER FLOW).	B1. Low Voltage. B2. Restriction in inlet line.  B3. Check Ball Stuck.  B4. Pump Sucking Air.  B5. Inlet pump impeller broken loose from center bushing.	B1. See A5, above. B2. Be sure seacock is open. Clear line - remove clog. B3. Remove inlet hose and poke eraser end of pencil into inlet nozzle of pump to free check ball. B4. Check all connections from inlet through-hull to inlet pump to be sure no air leaks are present. B5. Replace impeller.
C. FOUL ODORS FROM HEAD AREA.	C1. "Marine life" lodged in rim of bowl.  C2. Improper connecting hose on discharge side.  C3. Sewage Remaining in discharge hose.  C4. Concentrate Reservoir empty.	C1. Remove and flush bowl with pressure hose to remove all material. Install strainer in inlet line to avoid reoccurrence. Fill reservoir with Raritan Concentrate and use regularly. C2. Replace plastic hose with reinforced laminated rubber hose with smooth interior. C3. Flush head long enough to insure material has passed out of hose. Replace plastic hose with rubber. See C2., above. C4. Refill with Raritan Concentrate.
D. BOWL FILLS UP WHILE BOAT IS UNDER WAY.	D1. Pressure buildup at Seacock(s).	D1. Close inlet, then discharge seacock to find which one is causing problem. If inlet, replace check ball & spring. If outlet, replace Joker/flapper valve. If problem continues, install a rubber flap over seacock, hinged at leading edge.
E. CONCENTRATE TANK DOES NOT EMPTY (OR OVERFLOWS).	E1. Check valve Malfunctioning.	E1. Remove and rinse check valve in warm water and reinstall. If problem continues replace valve.
F. WATER LEAKING FROM UNDER END BELL (CH15, 15D).	F1. Leaking Bowl Gasket. F2. Leaking macerator Shaft Seal. F3. Leaking Front Cover.  F4. Leaking pump seal.  F5. Leaks at hoses.	F1. Tighten (4) bowl mounting nuts. F2. Return to factory for repairs or exchange. F3. Remove front cover (CH18) and inspect "O" ring for damage. Replace "O" ring if necessary using Super-Lube or waterproof grease to reassemble. F4. Remove and rebuild inlet pump (CH102A). F5. Check all connections to be sure clamps are tight.
G. LOUD NOISES COMING FROM UNIT.	G1. Object jammed in macerator. G2. Motor bearings damaged by macerator seal leak.	G1. Remove front cover and remove object. G2. Return to factory for repair or exchange.
H. ERRATIC MOTOR OPERATION/ SLUGGISH RUNNING.	H1. Worn motor brushes.  H2. Brushes hanging up.  H3. Motor Bearings damaged by macerator seal leak.	H1. Replace brushes NOTE: Units using permanent magnet motors do not have accessible brushes; return to factory for servicing. H2. Tap unit gently while running. If unit speeds up: Turn off power, remove brush covers on sides of motor. Grasp brush "pigtail" with pliers and move brush till it moves freely in its channel (See note at H1). H3. Send motor unit to factory for repair or exchange.



**CROWN HEAD PARTS LIST**
*(Quantities are 1 unless otherwise indicated)*

PART NO.	DESCRIPTION		
1118	Lockwasher (6)	CH336W	Siphon Assy, New Style, Complete (Threaded)
1222A	90° Discharge	CHM12V	Motor, 12V
1224	Joker Valve (Deep Draft Units)	CHM24V	Motor, 24V
1225	Discharge Flange	CHM32V	Motor, 32V
1226B	Bowl Mounting Nut (4)	G2AS	Impeller Wear Plate
1239	Bowl Mounting Washer (4)	G4	Plug Washer
1240	Rubber Grommet (Bowl)	G13	Pump Impeller
1341	Discharge Screw (2)	G15	Impeller Washer (2)
CH2A	Pump Body	M1A	Base Plate
CH5P	Pump Plug	M1B	Base Mounting Screw (4)
CH6	Pump Cover Plate	M6	Brush Spring (2)
CH7A	Pump Gasket	M8	Ground Strap
CH8	Check Valve Spring	M10	Brush Plate Screw (4)
CH9	Pump Screw (4)	M11	Ball Bearing (2)-Included in CH103W Assy.
CH11	Pump Shaft Seal	M13	Bearing "O" Ring (2)
CH12	Check Ball	M14	Snap Ring
CH15	End Bell (Standard)	M15	Fiber Flat Washer, $\frac{1}{4}$ " (2)
CH15D	End Bell (Deep Draft)	M15A	Insulator Sleeve
CH15S	End Bell (Standard, PM Motor)	M18	Pole Shoe (2)
CH15DD	End Bell (Deep Draft, PM Motor)	M19B	Pole Shoe Cap Screw (2)
CH16	Opt. Outlet Connection (Standard, bronze)	M21	Dome Mounting Screw (4)
CH16D	Opt. Outlet Connection (Deep Draft, bronze)	M23	Lock Washer (8); (4 on PM Motor Unit)
CH18W	Front Cover (with "O" Ring)	M24	Lock Washer (2)
CH24A	Dome Assembly Seal	M28	Terminal Screw (Housing)
CH25	"O" Ring (Front Cover)	M29	Terminal Screw (Dome)
CH26	Front Cover Screw (6)	M30	Terminal Nut (4); (2 on PM Motor Unit)
CH27	Mounting Screw (8); (4 on PM Motor Units)	M31	Terminal Washer (4); (2 on PM Motor Unit)
CH28	Discharge Mounting Screw (4)	M105	Motor Housing Assy. w/Std. Fields (Spec. Volt.)
CH29	Shroud (2 pieces)	M117	Motor Housing Assy. w/DD Fields (Spec. Volt.)
CH29A	Bottle (Concentrate Reservoir)		Brush Assembly (2), Specify DC or AC Input
CH29A1W	Siphon Assy. Complete w/bottle, cap & siphon		Field Coil Assy. (Spec. STD or DD and Volt.)
CH34	Woodruff Key		
CH35	Allen Set Screw	1234	Bowl Gasket (Fits all Raritan Heads)
CH35D	Impeller Screw	1236AW	Spud Assembly
CH37	Siphon Tube	1237W	Standard Bowl, Round Top Rim (White Only)
CH37C	Siphon Check Valve (not shown)	1238A	Seat & Cover for Standard Bowl (White Only)
CH38	Bowl Stud (4)	1244W	Hi-Boy Bowl (Household-Size), Oval Top Rim Available in White, Blue, Yellow or Almond.
CH42	Hose	1245	Seat and Cover for Hi-Boy Bowl (Spec. Color)
CH43	Hose Clamp (2)	CDS	Continuous-Duty Solenoid Relay; 12, 24, 32V
CH44	Fiber Washer, # 10 (4)	CH43	Hose Clamp for $\frac{3}{4}$ " I.D. Hose
CH45	Brush Cover Plate (2)	CH104	Rectifier/Switch Assembly for 115V DC-only units.
CH46	Cover Plate Screw (4)	CHDPS115V	Double Pole Single Throw Momentary Switch w/Face Plate (for 115V AC/DC units)
CH50CW	Bowl Elbow w/Siphon Inlet	CHTT9	Hose Clamp for $1\frac{1}{2}$ " I.D. Hose
CH51	Base Screw (6)	CON	Raritan Concentrate (Carton of (12) 2 oz. vials)
CH52	Rubber Mounting Strip (2) (not shown)	PBS	Push Button Switch
CH53	Pump Mounting Screw (4)	RHT4	In-line Check Valve for $1\frac{1}{2}$ " I.D. Hose
CH55	Base	RT	RARITIME Off-Delay Timer (Specify 12, 24 or 32V)
CH57	Slinger	SL	Super-Lube General Purpose Grease, 1 oz. tube
CH58	End Bell Screw (4)	VCAP	White Vinyl Cap for Bowl Mounting Nuts
CH59	Macerator Shaft Seal	YV	$1\frac{1}{2}$ " "Y" Valve
CH90	Discharge Adapter	CHRK	Repair Kit, Crown Head Standard
CH90DW	Deep Draft 90° Discharge Assembly	CDRK	Repair Kit, Crown Head Deep Draft
CH90SW	Standard 90° Discharge Assembly		
CH91	Gasket (for Standard Units)		
CH92	Gasket (for Deep Draft Units)		
CH101	Dome Assembly (specify DC or AC Input)		
CH102A	Inlet Pump Assembly, Complete		
CH102W	Inlet Pump Assembly, Complete - PM		
CH103W	Motor Armature Assembly (Specify Voltage)		
CH117W	Flapper Valve (Standard Units)		
CH119D1	Macerator Impeller (Deep Draft)		
CH119DW	Macerator Assembly (Deep Draft)		
CH119SW	Macerator Assembly (Standard)		

**MISCELLANEOUS**

PART NO.	DESCRIPTION
1234	Bowl Gasket (Fits all Raritan Heads)
1236AW	Spud Assembly
1237W	Standard Bowl, Round Top Rim (White Only)
1238A	Seat & Cover for Standard Bowl (White Only)
1244W	Hi-Boy Bowl (Household-Size), Oval Top Rim Available in White, Blue, Yellow or Almond.
1245	Seat and Cover for Hi-Boy Bowl (Spec. Color)
CDS	Continuous-Duty Solenoid Relay; 12, 24, 32V
CH43	Hose Clamp for $\frac{3}{4}$ " I.D. Hose
CH104	Rectifier/Switch Assembly for 115V DC-only units.
CHDPS115V	Double Pole Single Throw Momentary Switch w/Face Plate (for 115V AC/DC units)
CHTT9	Hose Clamp for $1\frac{1}{2}$ " I.D. Hose
CON	Raritan Concentrate (Carton of (12) 2 oz. vials)
PBS	Push Button Switch
RHT4	In-line Check Valve for $1\frac{1}{2}$ " I.D. Hose
RT	RARITIME Off-Delay Timer (Specify 12, 24 or 32V)
SL	Super-Lube General Purpose Grease, 1 oz. tube
VCAP	White Vinyl Cap for Bowl Mounting Nuts
YV	$1\frac{1}{2}$ " "Y" Valve
CHRK	Repair Kit, Crown Head Standard
CDRK	Repair Kit, Crown Head Deep Draft

## VII. TROUBLESHOOTING THE CROWN HEAD

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A. POOR PUMPOUT, ESPECIALLY SOLIDS.	A1. Clogged Discharge Line. A2. Too many bends or ells in discharge line. A3. Clogged vented loop. A4. Mineral buildup in hoses and fittings. A5. Low Voltage.	A1. Be sure Discharge Seacock is open. Clear line - remove clog. A2. Relubricate to eliminate bends and ells. A3. Clean vent. A4. Manually clean affected parts. A5. Check voltage at head while running. If less than nominal voltage of head (12, 24, 32, 115V): Check condition of batteries, electrical system and connections. Check terminals and wire connections for corrosion (heat at terminals and junctions indicates a bad or corroded connection). Check gauge of wire to be sure it is not undersize. It should follow recommendations listed under Section III., C.
B. POOR WATER FLOW, ESPECIALLY AT FRONT OF BOWL (OR NO WATER FLOW).	B1. Low Voltage. B2. Restriction in inlet line. B3. Check Ball Stuck. B4. Pump Sucking Air. B5. Inlet pump impeller broken loose from center bushing.	B1. See A5, above. B2. Be sure seacock is open. Clear line - remove clog. B3. Remove inlet hose and poke eraser end of pencil into inlet nozzle of pump to free check ball. B4. Check all connections from inlet through hull to inlet pump to be sure no air leaks are present. B5. Replace impeller.
C. FOUL ODORS FROM HEAD AREA.	C1. "Marine life" lodged in rim of bowl.  C2. Improper connecting hose on discharge side.  C3. Sewage Remaining in discharge hose.  C4. Concentrate Reservoir empty.	C1. Remove and flush bowl with pressure hose to remove all material. Install strainer in inlet line to avoid reoccurrence. Fill reservoir with Raritan Concentrate and use regularly.  C2. Replace plastic hose with reinforced laminated rubber hose with smooth interior.  C3. Flush head long enough to insure material has passed out of hose. Replace plastic hose with rubber, See C2., above.  C4. Refill with Raritan Concentrate.
D. BOWL FILLS UP WHILE BOAT IS UNDER WAY.	D1. Pressure buildup at Seacock(s).	D1. Close inlet, then discharge seacock to find which one is causing problem. If inlet, replace check ball & spring. If outlet, replace Joker/flapper valve. If problem continues, install a rubber flap over seacock, hinged at leading edge.
E. CONCENTRATE TANK DOES NOT EMPTY (OR OVERFLOWS).	E1. Check valve Malfunctioning.	E1. Remove and rinse check valve in warm water and reinstall. If problem continues replace valve.
F. WATER LEAKING FROM UNDER END BELL (CH15, 15D).	F1. Leaking Bowl Gasket. F2. Leaking macerator Shaft Seal. F3. Leaking Front Cover.  F4. Leaking pump seal.  F5. Leaks at hoses.	F1. Tighten (4) bowl mounting nuts. F2. Return to factory for repairs or exchange. F3. Remove front cover (CH18) and inspect "O" ring for damage. Replace "O" ring if necessary using Super-Lube or waterproof grease to reassemble. F4. Remove and rebuild inlet pump (CH102A). F5. Check all connections to be sure clamps are tight.
G. LOUD NOISES COMING FROM UNIT.	G1. Object jammed in macerator. G2. Motor bearings damaged by macerator seal leak.	G1. Remove front cover and remove object. G2. Return to factory for repair or exchange.
H. ERRATIC MOTOR OPERATION/ SLUGGISH RUNNING.	H1. Worn motor brushes.  H2. Brushes hanging up.  H3. Motor Bearings damaged by macerator seal leak.	H1. Replace brushes NOTE: Units using permanent magnet motors do not have accessible brushes; return to factory for servicing. H2. Tap unit gently while running. If unit speeds up: Turn off power, remove brush covers on sides of motor. Grasp brush "pigtail" with pliers and move brush till it moves freely in its channel (See note at H1). H3. Send motor unit to factory for repair or exchange.

## ORDERING INFORMATION

Identify your particular unit from the two exploded parts views, and note the part number and description of the part you require.

If your local Raritan Dealer or Distributor does not have the part you require in stock, you may request that the part be ordered for you. If faster service is required, any Raritan part may be ordered factory direct. Call our Millville, NJ office (1-609/825-4900) or our Ft. Lauderdale, FL office (1-305/ 525-0378), ask for the Sales Department and order by part number, quantity required, model and voltage, if applicable. Payment is via check or money order in advance (shipment upon receipt of payment), VISA, Mastercard or COD. If you are unable to determine specifically what part(s) you require, our Customer Service Department will be happy to assist you.

Units that require extensive repairs may be returned to the Millville, NJ or Ft. Lauderdale, FL office, see NOTE below. They will be either repaired or exchanged for a factory remanufactured unit. Call our Customer Service Department for shipping and authorization instructions. When returning a unit for repair or adjustment, always be sure to include your name, return address, and a phone number, along with instructions and a brief description of the problem with the unit. Be sure this information is inside the carton to insure correct and expeditous handling.

**NOTE:** Raritan reserves the right to return freight collect, any material that is not of our manufacture or distribution, or any material that is in a condition that makes it impossible to repair or unfit to handle. Raritan also reserves the right to charge for the cleaning and disinfecting of a unit regardless of whether or not the unit is covered by Raritan's Limited Warranty.

### SAVE THESE INSTRUCTIONS

To order replacement parts or to request additional information or assistance,  
contact Raritan Customer Service at:

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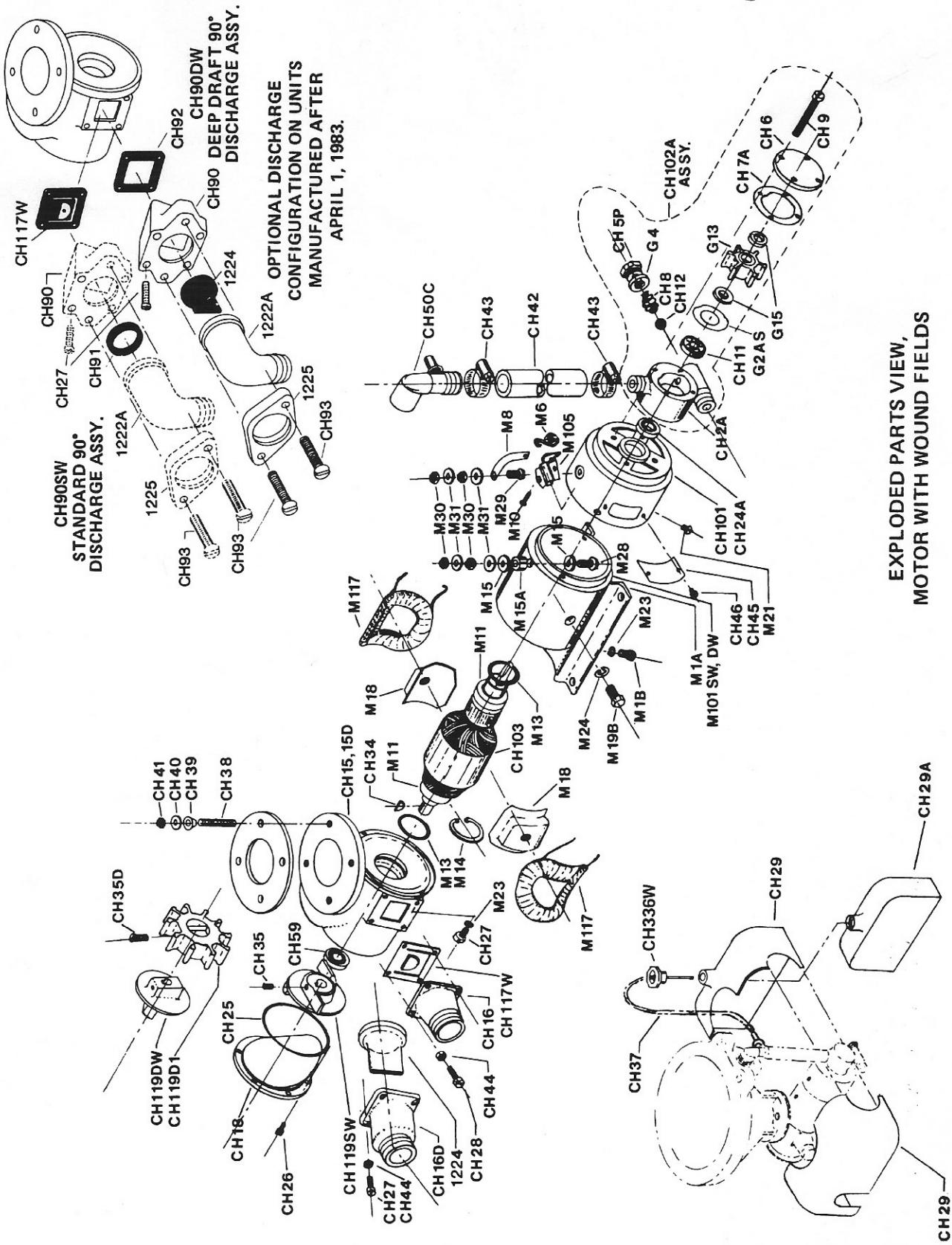
**RARITAN**  
Engineering Company, Inc.

530 Orange Street, P.O. Box 1157, Millville, NJ 08332 USA  
Telephone: 609-825-4900 FAX: 609-825-4409  
TWX: 510-687-7545 RARITAN MIVE

Southern Office and Plant:  
3101 SW Second Avenue, Fort Lauderdale, FL 33315 USA  
Telephone: 305-525-0378 FAX: 305-764-4370

## **crown head - Motor with Wound Fields**

mfg. prior to 1988



**RARITAN**  
Engineering Company, Inc.

530 Orange Street, P.O. Box 1157, Millville, NJ 08332 USA  
Telephone: (609) 825-4900 FAX: (609) 825-4409  
Southern Office and Plant:  
3101 SW Second Ave., Fort Lauderdale, FL 33315 USA  
Telephone: (954) 525-0378 FAX: (954) 764-4370

## PARTS LIST FOR CROWN HEAD

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
1118	Lockwasher (4)	G2AS	Impeller Wear Plate
1222A(1222AW)	90° Discharge	G4	Plug Washer
1224(C253)	Joker Valve	G13	Pump Impeller
1225	Discharge Flange (1222AW [90°] or 1222B [straight])	G15	Impeller Washer (2)
1226B	Bowl Mounting Nut (4)	M1A	Base Plate
1239	Nylon Bowl Mounting Washer (4)	M1B	Base Mounting Screws (4)
1341(1115)	Discharge Screw (2)	M6	Brush Spring (2)
CH2A(CH2)	Pump Body (w/shaft seal)	M8	Ground Strap
CH5P	Pump Plug	M10	Brush Plate Screw (4)
CH6	Pump Cover Plate	M11	Ball Bearing (2) - incl. in CH103W Assembly
CH7(CH7A)	Pump Gasket	M13	Bearing "O" Ring (2)
CH8	Check Valve Spring	M14	Snap Ring
CH9	Pump Screw	M15(F069)	Fiber Flat Washer, 1/4" (2)
CH11	Pump Shaft Seal	M15A	Insulator Sleeve
CH12	Check Ball	M18	Pole Shoe (2)
CH15	End Bell (Standard)	M19B	Pole Shoe Cap Screw (2)
CH15D	End Bell (Deep Draft)	M21	Dome Mounting Screw (4)
CH15S	End Bell (Standard, PM Motor)	M23	Lockwasher (8)
CH15DD	End Bell (Deep Draft, PM Motor)	M24	Lockwasher (2)
CH16	Opt. Outlet Connection (Std, bronze)	M28	Terminal Screw (Housing)
CH16D	Opt. Outlet Connection (DD, Bronze)	M29	Terminal Screw (Dome)
CH18W	Front Cover (w/"O" ring)	M30	Terminal Nut, Brass (4)
CH24A	Dome Assembly Seal	M31	Terminal Washer, Brass (4)
CH25	Front Cover "O" Ring	M101SW	Motor Housing Assembly w/std. field (specify voltage)
CH26	Front Cover Screw (6)	M101DW	Motor Housing Assembly w/DD (specify voltage)
CH27	Mounting Screw (4)	M105	Brush Assembly (2), specify DC or AC input
CH28	Discharge Mounting Screw (4)	M117	Field Coil Assembly (specify std. or DD and voltage)
CH29	Shroud (2 pcs.)		
CH29A	Bottle (Concentrate Reservoir)		
CH29B	Shroud Screw (2)		
CH29A1W	Shroud Assembly w/bottle, cap & siphon		
CH34	Woodruff Key		
CH35(Fl49VT)	Allen Set Screw (2)		
CH35D	Impeller Screw		
CH37	Siphon Tubing		
CH37C(CH37E)	Siphon "Check Valve"		
CH38	Bowl Stud (4)		
CH42	Hose		
CH43(CH43P)	Hose Clamp (2)		
CH44	Fiber Washer, #10 (4)		
CH45	Brush Cover Plate (2)		
CH46	Cover Plate Screw (4)		
CH50CW	Bowl Elbow w/Siphon Inlet		
CH51	Base Screw (4)		
CH52	Rubber Mounting Strip (2) not shown		
CH53	Pump Mounting Screw (4)		
CH55	Base		
CH57	Slinger		
CH58	End Bell Screw (4)		
CH59	Macerator Shaft Seal		
CH90	Discharge Adapter		
CH90DW	Deep Draft 90° Discharge Assembly		
CH90SW	Standard 90° Discharge Assembly		
CH91	Gasket (for Standard Units)		
CH92	Adapter Gasket (for Deep Draft units)		
CH101	Dome Assembly (specify DC or AC Input)		
CH102A	Inlet Pump Assembly, Complete		
CH102W	Inlet Pump Assembly, Complete - PM		
CH103W	Motor armature Assembly (Specify Voltage)		
CH117W	Flapper Valve (Standard Units)		
CH119D1	Macerator Impeller (Deep Draft)		
CH119DW	Macerator Assembly (Deep Draft)		
CH119SW	Macerator Assembly (Standard)		
CH336W	Siphon Assy, New Style, Complete (Threaded)		
CHM12	Motor, 12V		
CHM24	Motor, 24V		
CHM32	Motor, 32V		
		G2AS	Impeller Wear Plate
		G4	Plug Washer
		G13	Pump Impeller
		G15	Impeller Washer (2)
		M1A	Base Plate
		M1B	Base Mounting Screws (4)
		M6	Brush Spring (2)
		M8	Ground Strap
		M10	Brush Plate Screw (4)
		M11	Ball Bearing (2) - incl. in CH103W Assembly
		M13	Bearing "O" Ring (2)
		M14	Snap Ring
		M15(F069)	Fiber Flat Washer, 1/4" (2)
		M15A	Insulator Sleeve
		M18	Pole Shoe (2)
		M19B	Pole Shoe Cap Screw (2)
		M21	Dome Mounting Screw (4)
		M23	Lockwasher (8)
		M24	Lockwasher (2)
		M28	Terminal Screw (Housing)
		M29	Terminal Screw (Dome)
		M30	Terminal Nut, Brass (4)
		M31	Terminal Washer, Brass (4)
		M101SW	Motor Housing Assembly w/std. field (specify voltage)
		M101DW	Motor Housing Assembly w/DD (specify voltage)
		M105	Brush Assembly (2), specify DC or AC input
		M117	Field Coil Assembly (specify std. or DD and voltage)

## MISCELLANEOUS RELATED PARTS

<u>Part No.</u>	<u>Description</u>
1234	Bowl Gasket (fits all Raritan toilets)
1236	Bowl Spud Assembly
1237	Standard Bowl, Round Top rim (white only), incl. 1236AW
1238A	Seat and Cover for Std Bowl (white only)
1244W	Hi-Boy Bowl (household size), Oval Top Rim (available in white or almond - other designer colors, contact factory), incl. 1236AW
1245	Seat and Cover for Hi-Boy Bowl (specify color - see 1244W)
CDS	Continuous Duty Solenoid Relay (insert required voltage at* - 12, 24, or 32 volts)
CH43	Hose Clamp for 3/4" I.D. Hose
CH104	Rectifier/Switch Assembly for 115V DC only
CHDPS115V	Double Pole Single Throw Momentary Switch w/face plate (for 115V AC/DC units)
CHTT9	Hose Clamp for 11/2" I.D. Hose
CON	Raritan Concentrate, Carton of (12) 2 oz. vials
PBS	Pushbutton Switch
RHT4	Inline Check Valve for 11/2" I.D. Hose
RTC*	Raritan Off-delay Timer (insert required voltage at* - 12, 24, or 32 volts only)
SL	Super-Lube General Purpose Waterproof Marine Grease, 1/2 oz. tube
VCAP	White Vinyl Cap for Bowl Mounting Nuts
YV	"Y" Valve for 11/2" I.D. Hose
CHRK	Overhaul Kit, Crown Head Standard
CDRK	Overhaul Kit, Crown Head Deep Draft
CSRK	Overhaul Kit, Centrifugal Discharge Series
SH	11/2" Discharge Hose