

Vacuum Test Gauge Instructions

TO DETERMINE SYSTEM VACUUM LEAK RATE AND TIME BETWEEN PUMP CYCLING

1. Turn off water to toilet.
2. Open the toilet's flush ball and insert the rubber plug into the 1" orifice in the bottom of the base. The vacuum pump will be running.
3. After the vacuum pump shuts off, allow the gauge to stabilize for a minute.
4. Record the vacuum reading to the nearest two-tenths of an inch. (.2")
5. Keeping the rubber plug in the 1" orifice, wait 30 minutes, and then record a second reading.
6. Subtract the two readings and record the drop in vacuum.

Drop in Vacuum (30 min.)	Time Between Pump Cycles
.4" Hg (not acceptable)	2.5 hours
.3" Hg* (acceptable)	3.3 hours
.2" Hg (good)	5.0 hours

* Maximum acceptable leak rate.

TO IDENTIFY VACUUM LEAK LOCATION IN VACUUM GENERATOR SYSTEM

1. Turn off water to toilet.
2. Open the toilet flush ball and insert rubber plug into 1" orifice in the bottom of the base (fig. A). If there is no vacuum leak at this point, the leak is above the 1" orifice in the base:
 - Check for a crack in the base, funnel, or flush ball.
 If there is a vacuum leak, go to next step.
3. Remove inlet hose to vacuum generator and insert rubber plug in the inlet fitting (fig. B).
 - If there is no vacuum leak at this point, the leak is between the toilet and the vacuum generator:
 - Check the hose and clamps between the toilet and the vacuum generator.
 - If there is a vacuum leak:
 - Check duckbill valves for foreign objects or cuts.
 - Check spin nut and fitting between pump and vacuum tank.

TO IDENTIFY VACUUM LEAK LOCATION IN VACUUM TANK/VACUUM PUMP SYSTEM

Before starting vacuum tests, determine the amount of time between pump cycles or the amount of vacuum drop within a specific time span.

PART 1

1. Remove vacuum hose from inlet on vacuum tank (fig. D).
2. Insert rubber plug in tank inlet.
3. Note vacuum reading, then determine time between pump cycles.
 - If time between pump cycles increases or no vacuum drop is recorded on test gauge, the leak is before the vacuum tank. Go to Part 2.
 - If time between pump cycles remains the same or a vacuum drop is recorded on test gauge, go to Part 4.

PART 2

1. Reinstall vacuum hose on vacuum tank inlet.
2. Remove hose from toilet outlet (fig. C).
3. Insert rubber plug into open end of hose.
 - If time between pump cycles increases or no vacuum drop is recorded on test gauge, go to Part 3.
 - If time between pump cycles remains the same or a vacuum drop is recorded on test gauge, the leak is in the hose between the toilet and vacuum tank. Retighten connections or replace hose as necessary.

PART 3

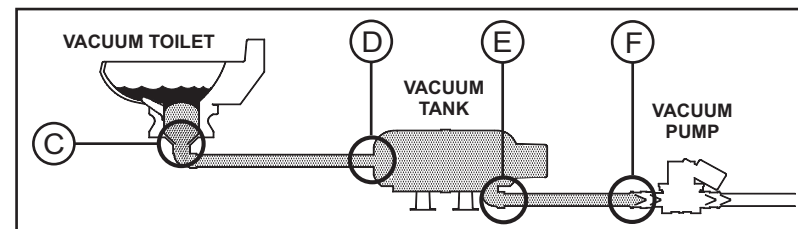
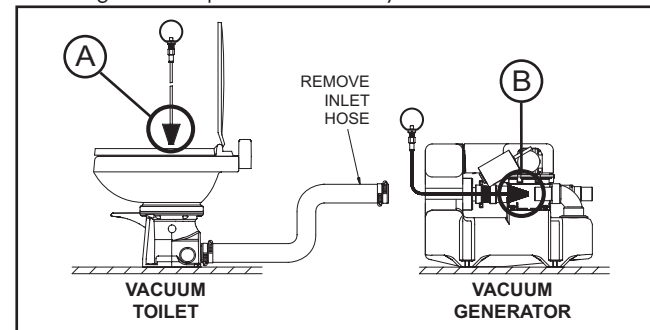
1. Reinstall vacuum hose on toilet outlet.
2. Turn off incoming water and prop open flush valve in toilet.
3. Insert rubber plug into 1" orifice in the bottom of the base (fig. A).
 - If time between pump cycles increases or no vacuum drop is recorded on test gauge, the vacuum leak is in the toilet seals or rotor shaft.
 - If time between pump cycles remains the same or a vacuum drop is recorded on test gauge, the leak is in the toilet outlet fittings or funnel. Replace funnel, or repair/replace fittings as necessary.

PART 4

1. Reinstall vacuum hose to vacuum tank inlet.
2. Shut off power to vacuum pump.
3. Remove hose from vacuum tank outlet (fig. E).
4. Insert rubber plug into vacuum hose.
5. Turn on power to vacuum pump.
6. Shut off vacuum pump at about 10 in. Hg on test gauge.
 - If no vacuum drop is recorded, the leak is in the vacuum tank. Tighten or reinstall fittings as necessary.
 - If a vacuum drop is recorded, go to Part 5.

PART 5

1. Reinstall vacuum hose to vacuum tank outlet.
2. Remove hose from inlet on vacuum pump (fig. F).
3. Insert rubber plug into inlet of pump.
4. Turn on power to vacuum pump.
5. Shut off vacuum pump at about 10 in. Hg on test gauge.
 - If a vacuum drop is recorded, inspect the valves and fittings in the pump. Tighten or replace as necessary.
 - If no vacuum drop is recorded, inspect hose between vacuum tank and pump. Tighten or replace as necessary.



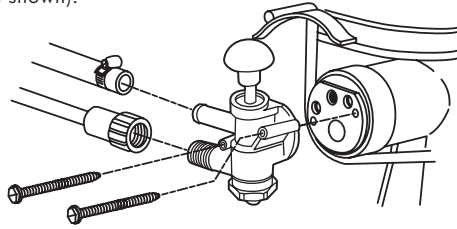
Water Valve Installation Instructions

TO REMOVE OLD VALVE

1. Turn off water supply.
2. Remove pedal and pedestal covers (if applicable to toilet model).
3. Remove supply line and outlet hose from water valve.
4. Unscrew both hex screws from sides of water valve.

TO INSTALL NEW VALVE

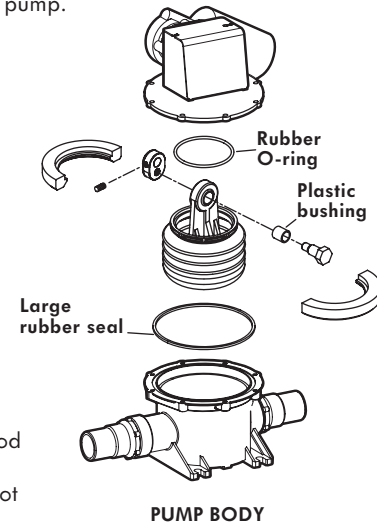
1. Lubricate plastic mushroom cap with petroleum jelly or silicone grease.
2. The new valve has a 1/2-inch MPT inlet. An adapter (purchased separately) will be required to connect a flared-end water supply line (see adapter chart below).
3. Cut off flared end of incoming water supply line with tubing cutter or hacksaw. Remove the flare nut.
4. Square the end of the water supply line and de-burr the outside and inside edges.
5. Install adapter to water supply line ("grabber"-type shown). Make certain adapter is attached securely.
6. Install new water valve to toilet base with two hex screws.
7. Attach water supply line to water valve. Tighten 1/4 to 1/2 turn beyond hand-tight.
8. Attach outlet hose to water valve, securing it with hose clamp. Make sure hose clamp does not interfere with operation of flush lever or water valve.
9. Reinstall pedestal and pedal covers.



Size/Type of Inlet Water Line	SeaLand Adapters	Quest® Adapters	Fast & Tite® Adapters Polyprop Nylon
3/8"OD rigid copper, plastic	230362	QBFNCR1	P6FC8 N6FC8
1/2"OD rigid copper, plastic	230640	QBFNCR2	P8FC8 N8FC8
5/8"OD rigid copper, plastic	230666	-	P10FC8 N10FC8
1/2"ID flexible hose	230193	-	-
5/8"ID flexible hose	230192	-	-

Vacuum/Discharge Pump Repair Kit Instructions

1. Flush a substantial amount of soapy water through the pump.
2. Turn off electrical power to pump.
3. Remove pump cover (2 phillips head screws).
4. Remove motor bracket from pump (4 - 5/16" hex head bolts).
5. Remove brass shoulder bolt (1 - 3/4" hex head bolt).
6. Remove pump top closure bolts (8 - 5/16" hex head bolts).
7. Remove top closure.
8. Remove large rubber seal from the pump body. Clean seal groove.
9. Remove rubber O-ring from bellows. Clean O-ring seat.
10. Replace O-ring and seal, and lubricate them with liquid soap.
11. Replace plastic bellows bushing. Lubricate inside of bushing with grease after inserting in the connecting rod hole.
12. Carefully press top closure back in place. Be sure to not pinch the rubber O-ring.
13. Reassemble pump by reversing the procedure above.
14. Operate pump and check for water leaks.



Bowl Seal Kit Installation Instructions

TO REMOVE OLD SEALS

1. Turn off water supply.
2. Press flush pedal and drain water from toilet bowl.
3. Remove pedal and pedestal covers (if applicable).
4. Loosen stainless steel band and remove plastic half clamps that hold china bowl and plastic base together. CAUTION: Do not let china bowl fall off base.
5. Tilt china bowl forward, grasp vacuum breaker attached to back of toilet, and pull it out of toilet. Set toilet bowl aside.
6. Remove old seals. Inspect flush ball for nicks, scratches or mineral build-up. Clean or replace as necessary.

TO INSTALL NEW SEALS

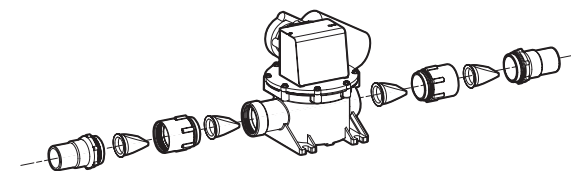
1. Spray top surface of thick bowl seal and bottom surface of thin ball seal with silicone spray. NOTE: Silicone spray should not contain petroleum distillates.
2. Place thin seal on flush ball with THIS SIDE UP showing. Align notch on edge of seal with pin on edge of base.
3. Place thick bowl seal on top of ball seal with notch on edge aligned with pin on base. CAUTION: Seals on VacuFlush toilets must be positioned so that drain holes in seals are NOT ALIGNED.
4. Put china bowl back on base, aligning notch with pin on base, and centering the bowl outlet over the flush ball. Reattach vacuum breaker to back of toilet, pushing it all the way into the rubber gasket.
5. Reinstall plastic half clamps under loosened steel band, making sure tabs interlock on front of toilet. There will be a small gap at the rear of the toilet.
6. Tighten stainless steel band clamp to 65 in.-lbs. of torque.
7. Turn on water supply.
8. Reinstall pedestal and pedal covers (if applicable).



SeaLand Duckbill Valve Installation Instructions



1. Flush a substantial amount of soapy water through the pump.
2. Turn off electrical power to pump.
3. Remove both suction (inlet) and discharge (outlet) hoses from the pump.
4. Remove both valve nipples and valve adapters from suction (inlet) and discharge (outlet) sides of the pump.
5. Replace old duckbill valves (two required for each side). See S-Series Pump Diagram for correct valve orientation.
6. Tighten valve nipples and adapters one-half turn beyond hand-tight. NOTE: Overtightening will cause valve distortion and early failure.
7. Install both suction and discharge hoses and secure with hose clamps.
8. Turn on electrical power and flush water through system to prime pump. Check system for leaks.



S-SERIES VACUUM PUMP