



**DIATOM FILTER  
MODEL D-1  
INSTRUCTION MANUAL**



**This manual was compiled for the purpose of instructing you on the operation and care of your Diatom D-1 Filter. Follow the operating instructions for the longest and best possible service from your filter. Thank you for your purchase.**

The "Diatom" is a high-speed auxiliary filter designed to filter aquarium water to an extremely pure state. It can replace "outside" or "under-gravel" filters. Used properly, your Diatom Filter will eliminate the need to "tear down" or disassemble your aquarium to clean it.

The Diatom D-1 Filter is extremely fast and will filter out particles as small as one micron (one millionth of a meter). Therefore, it is a tremendous aid in the treatment and prevention of aquarium diseases caused from microorganisms such as "Ick," velvet, tail and fin rot, fungus, flukes, fish lice, etc. Since almost all aquarium disease parasites are larger than one micron, they are easily entrapped by the filter powders and thus eliminated from the aquarium.

**ATTENTION:** It has been proven that the Diatom is an effective treatment and cure for parasite diseases such as Ichtheoptrisis (free-swimming parasites). Also, it has been proven under controlled experiments by constant filtration of the aquarium through the life cycle of the parasite, that many diseases are caused from parasites and live and reproduce on or in the fish itself and does not become "free swimming," and therefore cannot be filtered out. Removing the fish from the aquarium, treated with proper medication, then returning it to the aquarium may be the best treatment for these types of disease. This usually causes the parasites to drop from the fish or otherwise seek a better host on which to feed. Once they are loose in the water, the filter may quickly entrap them. It usually takes only two or three treatments of this type, and your aquarium is free of the disease. When using the Diatom Filter as treatment on "sick" tanks, it is advisable to back-flush with hot water before moving to another tank.

Most diseases "show-up" or strike hardest on new fish that are introduced into an aquarium before the fish has a chance to adapt itself to the change in water. Often the disease is brought in with new fish. Sometimes a rapid change in temperature or a change in the chemistry of the water may weaken the fish and they become easy prey to protozoa parasites. Remember, where there are no protozoa parasites, there can be no protozoa parasite diseases! Run your Diatom D-1 Filter a few hours each day for several days after one of these conditions has occurred, and you will eliminate these outbreaks of fish-killing parasite diseases.

Follow the directions closely on the operation of your "Diatom" system and it will be invaluable in keeping a parasite-free, clean, well-balanced and healthy aquarium.

The castings are constructed of Cycloc plastic and are braced at all points of stress. The motor and main castings are assembled in the factory so the motor shaft and the shaft seal are in perfect alignment and locked in position with great care. The impeller is installed with a clearance of 1/16 inch between the shaft seal and the top of the filter bag insert. If for any reason you must take these components apart, great care must be taken in putting them back together to prevent leakage or damage to the Double Lip shaft seal. Be sure to lubricate inside the seal with P-31 grease before reassembling. The flat side of the impeller is recessed to allow clearance for the seal.

DIATOM FILTER POWDER WILL NOT CHANGE THE PH OF WATER OR REMOVE MEDICINES. This fact allows you to treat your fish while running your filter. While the unit will filter out un-dissolved minerals, it will not remove dissolved salts, or medicines in solution.

We must CAUTION you to use only Diatom Filter Powder in your Diatom D-1 Filter. While it is true that some grades of diatomaceous swimming pool powders would operate in the Diatom D-1 Filter, some contain amounts of chlorine and could spell instant death or permanent gill damage to tropical fish.

We are sure you will find the Diatom D-1 Filter to be very valuable and versatile tool once you have mastered its operating principles. For instance: a small bag of water softening material placed inside the jar will aid you in controlling water hardness; or to correct yellow water we suggest you use our SUPER-CHAR, a highly activated carbon for use in your Diatom D-1 Filter.

## We want you to know...

Because the “Diatom” is an entirely new concept in aquarium filtration you will probably have many questions, which we will attempt to answer for you on these pages:

We have tried to include enough hose and connections to fit the most popular aquariums.

For those of you who have exceptionally larger tanks or tanks of odd dimensions, some of the parts may need adaptation, such as U-tubes and XL-11 hoses in different lengths. We have tried also to include everything necessary to get the unit operating without having to buy anything extra. When you have the unit assembled and operating for the first time the flow from the filter should be about 375 gallons per hour. If your aquarium has been set up for some time, however, the flow will quickly diminish as the filter collects microscopic particles, it would not be plugging.

At a first glance it may appear that the filter bag has compressed against the plastic woven material inside of it and restricted the flow. This, however, is not the case as this material has been tested under many times the pressure involved without restriction. Therefore, any restriction is in the “Diatom” Powder or the filter bag itself. You can increase the life of your powder charge by turning your filter off, allow powder to fall off and then start again and powder will recoat in a different manner, therefore increasing your flow. Once you have filtered out the water to micron purity the unit will run much longer without having to be back flushed.

Each grain of the Diatom powder, if viewed through a powerful microscope, looks very much like one-half of a coconut shell with very tiny holes in it. Most of the holes in these tiny particles are less than one micron (one millionth of a meter) in size. When the filter is running properly with a full charge of Diatom powder, water is being forced through a layer of many thousands of these Diatom skeletons. This is why the unit is so effective in filtering out microscopic parasites and algae. As the flow dwindles to a trickle, you may notice that small bubbles of air start coming from the unit, or a small amount of air may collect in the pump housing. This is partly due to the speed of the impeller (3,000 revolutions per minute) and to the fact that the unit is drawing a partial vacuum of about 13 inches of mercury on the water as it passes through the filter powder. These conditions actually cause dissolved gases to be liberated from the water as it passes through the high-speed impeller.

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# Important Safeguards

**Warning:** To guard against injury basic precautions should be observed, including the following.

## 1) Read and follow all safety Instructions.

2)

2) **Danger-** To avoid possible electric shock, special care should be taken since water is employed in the use of aquarium equipment. For each of the following situations, do not attempt repairs yourself, return the appliance to an authorized service or discard the appliance.

- A) If the appliance falls into the water, DON'T reach for it! First unplug it and then retrieve it. If electrical components of the appliance get wet, unplug the appliance immediately (Non-Immersible equipment only).
- B) If the appliance shows any sign of abnormal water leakage, immediately unplug it from the power source (Immersible equipment only).
- C) Carefully examine the appliance after installation. It should not be plugged in if there is water on parts not intended to be wet.
- D) Do not operate any appliance if it has a damaged cord or plug, if it is malfunctioning or if it is dropped or damaged in any manner.
- E) To avoid the possibility of the appliance plug or receptacle getting wet, position aquarium stand and tank to one side of a wall-mounted receptacle to prevent water from dripping onto the receptacle or plug. A "drip loop," shown in Figure 1 should be arranged by the user for each cord connecting and aquarium appliance to a receptacle. The "drip loop" is that part of the cord below the level of receptacle or the connector if an extension cord is used, to prevent water traveling along the cord and coming in contact with the receptacle.  
If the plug or receptacle does get wet, DON'T unplug the cord. Disconnect the fuse or circuit breaker that supplies power to the appliance. Then unplug and examine for presence of water in the receptacle.

3) Close supervision is necessary when any appliance is used by or near children.

4) To avoid injury, do not contact moving parts or hot parts such as heaters, reflectors, lamp bulbs, etc.

5) Always unplug an appliance from an outlet when not in use, before putting on or taking off parts, and before cleaning. Never yank cord to pull plug from outlet. Grasp the plug and pull to disconnect.

6) Do not use an appliance for anything other than intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.

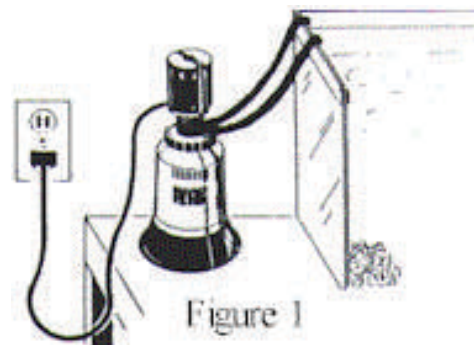
7) Do not install or store the appliances where it will be exposed to the weather or to temperatures below freezing.

8) Make sure an appliance mounted on a tank is securely installed before operating it.

9) Read and observe all the important notices on the appliance.

10) If an extension cord is necessary,  
A cord with a proper rating should be used.  
A cord rated for less amperes or watts than  
The appliance may overheat. Care should be  
Taken to arrange the cord so that it will not  
Be tripped over or pulled.

11) This appliance has a polarized plug  
(One blade is wider than the other). As a



safety feature, this plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. Never use with an extension cord unless plug can be fully inserted. Do not attempt to defeat this safety feature.

12. SAVE THESE INSTRUCTIONS

## PARTS IDENTIFICATIONS FOR DIATOM D-1 FILTER

Place all of the parts in front of you and check to see if all required parts are present by using the following parts list: REF

Box Qty. D-1FILTER MODEL Pump Assembly (Contains P-1 motor, P-2 main casting, XL-3 left hand threaded impeller, P-9 jar gasket, P-13 jar ring, P-16 shaft seal, P-23 mounting plate)

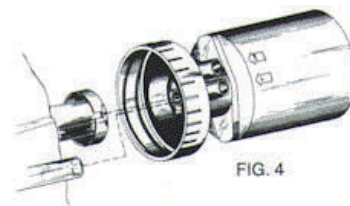
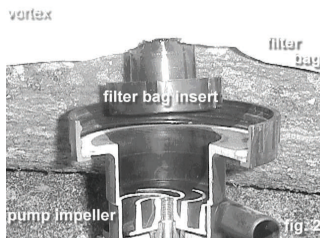
See page 11 for diagram.

Reference No.	Quantity Included	Description
P - 10	1	Two Quart Chamber Base
P- 4	1	Filter Bag
XL - 11	2	Four Foot Section Hoses
P- 5	1	Turbulence Tube
XL - 15	1	Plastic Hose Clamp
P - 14	1	Filter Charge
P - 24	2	Strainer Plates
P - 24	2	Strainer Screens
P - 25	2	Cap Plugs
P - 26	2	Eight Inch Tubes
XL - 12	2	“U” Tubes
P - 6	8	Rubber Hose Clamps

## ASSEMBLING YOUR DIATOM D-1 FILTER

1. To insert the P-4 filter bag into the main casting: the small hole in the round- shaped insert should be in line with the turbulence connector port for best operation. The hole allows air to escape from the jar when the unit is filling with water. Its location on the outer edge of the insert dictates that it is in a position of constant pressure during the re-circulating or starting phase of the filter and also while the filter is in operation. Force the filter bag insert into the impeller cavity as far as it will go, until firmly seated, approximately 1 inch into main casting. (Fig. 2)

2. Install the P-5 turbulence tube by forcing one end over the turbulence tube connector port on the bottom of the main casting. (Fig. 4)



3. Fill the chamber base ½ full with water.
4. Securing the casting assembly to the jar: be sure that none of the filter bag is caught between the rubber seal and the jar.

The Diatom D-1 Filter has a flat P-9 gasket seal. Align the pump assembly with the gasket on the jar lip and tighten the jar ring. (Fig. 7)

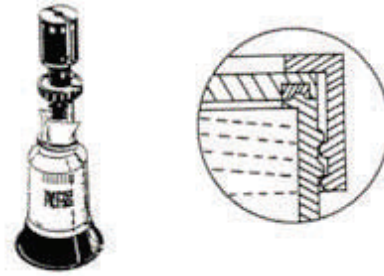


Fig. 7

### TO REMOVE HOSE KINKS

If your hose has become kinked during shipping or storage, follow these quick and easy directions to correct the situation:

- (A) Run about two inches of the hottest water possible into a sink, laundry tub, or bathtub.
- (B) Connect one end of your hose to your faucet and submerge the rest.
- (C) Turn on the hot water to a trickle and position the hose to remove the kinks as it starts to soften. When all of the kinks have been removed, turn off the hot water and turn on the cold. This will quench the hose to its original shape.

### ASSEMBLING THE INTAKE AND EXHAUST TUBES

5. You should have two-four foot section of the XL-11 hoses to make the intake and exhaust hoses. Place one of the P-6 rubber hose clamps on each end of the hoses. (fig 9) Slip one end of the hose over the in port on the main casting. Note: OUT & IN ports are marked on motor. The **GLUED** XL-12 “U”-tubes now connects to the other end of the **INTAKE** hose. Take the other hose and place one of the P-6 hose clamps on one end, then slip XL-15 plastic hose clamp over the opposite end. Place one end of the hose over the out port on the main casting. The **UN-GLUED** XL-12 “U” tube now connects to the other end of the **EXHAUST** hose (fig. 10)
6. Install the P-26 tubes and the P-24 strainer assemblies. Note: The P-24 strainer assemblies may be mounted either vertically or horizontally depending on the position you prefer. Use the P-25 cap plug to plug the open hole so that none of the inhabitants of the aquarium will be sucked into your Diatom Filter. **NOTE: If U-tubes are on backwards, it may take in air that creates bubbles and can cause you to loose your siphon.**

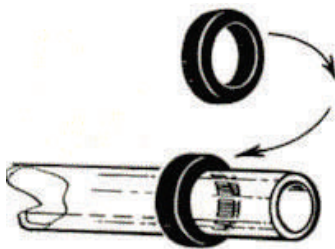


FIG. 9

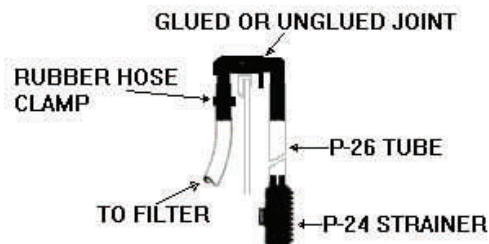


FIG 10

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## STARTING YOUR DIATOM D-1 FILTER

7. With both the intake and exhaust hoses in your aquarium and having your Diatom Filter at least half full of water. Turn the D-1 Diatom Filter upside down, and start the motor for a few seconds until you can see that the intake hose has filled with water. Return the D-1 Diatom Filter to the upright position and turn the motor off. At this point you will have forced the unit to start a siphon. Hoses **must** run upward toward aquarium.
8. Turn your D-1 Diatom Filter back on. Submerge a plastic Container such as the one in Fig. 15, into the aquarium And put the intake and exhaust tubes into the container.
9. Lift the container with the two tubes inside high enough to allow you to hook the container's handle over the lip of the aquarium. (Fig. 16) Care should be taken not to allow the intake tube to suck air during this operation.
10. As you can see, at this point you are running the filter only on the water in the small container. You may add the Diatom Powder directly into the container while the filter continues to run. (Fig. 17) A minimum charge for the Diatom D-1 Filter is about one cup of Diatom powder. If you are using super char, now is the time to add it. Part #SC-1.

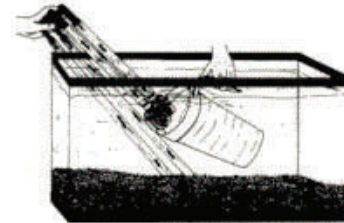


FIG. 15

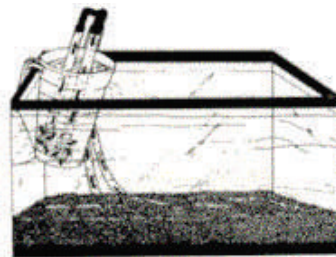


FIG. 16

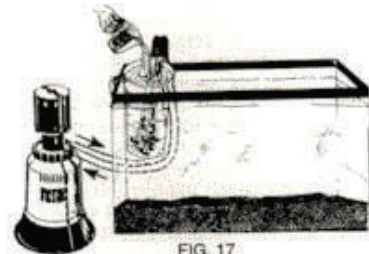


FIG. 17

11. When all of the Diatom powder has been absorbed into the Diatom Filter and the water in the small container is running clear, you may unhook the handle from the aquarium and carefully lower the container out from under the pickup tubes.

The strainer may be removed from the end of the exhaust downspout and the "jet" action of the exhaust water can be used to "agitate" the gravel to aid in cleaning. Do not rum with the strainer off the intake. Once you have filtered your aquarium to the desired clarity turn the Diatom D-1 Filter off.

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## RE-STARTING YOUR DIATOM D-1 FILTER WITH A CHARGE OF DIATOM POWDER

To restart your Diatom D-1 Filter after it has been turned off for any length of time, the Diatom Filter Powder will have fallen off the filter bag and settled to the bottom of the jar. You will have to crimp off the exhaust hose and allow the Diatom filter to run for about two minutes to recoat the filter bag before releasing flow. Be sure that all the Diatom powder on the bottom of the jar is shaken loose during the starting period before you release the clamp; the Diatom powder is the filter not the bag.

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## BACK-FLUSHING YOUR DIATOM D-1 FILTER CLEAN

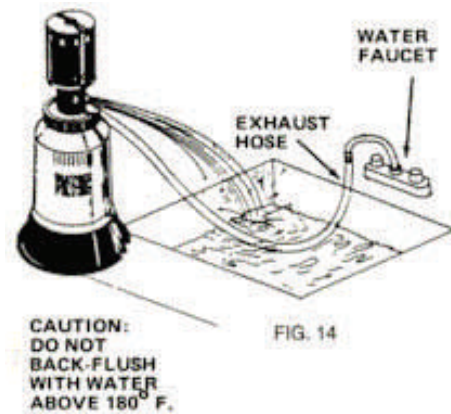
When the flow from the exhaust tube is weak or the Diatom Filter is visibly dirty, it is time to clean and recharge the unit with a new charge of D-1 Diatom Filter Powder.

- (A) Remove the D-1 Diatom Filter from the aquarium to a suitable laundry tub, sink, etc.
- (B) Remove both hoses and drain about half the water from the Diatom Filter.
- (C) Block the intake and exhaust ports with your fingers, or use the P-25 cap plugs from your P-24 strainer.
- (D) Shake up and down vigorously several times to dislodge any Diatom Filter Powder that may be on the outside of the P-4 filter bag.
- (E) Connect a hose from the water faucet to the exhaust port on the Diatom Filter and turn the water on. (The optional P-11-A or P-11-B snaps adapter is recommended for this.) (Fig. 14)
- (F) Shake the Diatom Filter periodically as incoming water forces the dirty water out to make sure all of the waste material is flushed clean.

**Caution:** Do not exceed (5lbs. Per square inch) internal pressure!

All fish secrete a slime to help protect them from their environment and this slime also becomes an important factor in the operation of the filter. After each time you back-flush the unit and recharge it properly, the flow should be very close to what it was when the filter was new. If so, good, however, sooner or later you will find that the fish slime has passed through the Diatom Powder and collected on the bag itself in such a way as to almost stop the flow of water completely. When this occurs, simply remove the filter bag from the unit and check by running water into it from a faucet. If the bag fills up completely, it is a sure sign that the slime has it plugged. Sterilize it with a light chlorine bleach solution and spray clean with fresh water. This will loosen and dissolve the slime and the filter will again flow like new.

\*\*\*Solution: 10 parts water one part bleach



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## SWITCHING TANKS AND RECHARGING

- (A) After you have assembled your Diatom Filter you may charge it in the following manner. With both the intake and exhaust hoses in the aquarium and having the Diatom Filter at least half full of water turn the Diatom Filter upside down, start the motor for a few seconds or until you can see that the intake hose had filled with water. Return the Diatom filter to the upright position and turn the motor off. This will force the unit to start a siphon. Hoses must run upward toward the aquarium.
- (B) Submerge a plastic container such as the one in Fig. 15, into the aquarium and put the intake and exhaust tubes into the container.

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## GENERAL DIATOM FILTER MAINTENANCE

- \* Oil your Diatom motor every three to four months of normal use with part P-30 lubricant.
  - \* When filter is not in use, clean thoroughly and store in a dry condition. (Otherwise entrapped particles will cause bacteria, explosion, and offensive odor.)
  - \* The filter bag and plastic parts can be cleaned with a mild bleach solution of one part bleach to ten parts water, to remove any slime deposits collected during use. Rinse with fresh water then allow the parts to completely dry before storing your Diatom D-1 Filter.
  - \* Your filter bag should not be scrubbed or machine-washed, because it will destroy the polyester fabric woven layer that restrains the Diatom powder.
  - \* To repair small cracks in plastic parts, use acetone as solvent glue-allow 12 hours to set.
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## TROUBLESHOOTING GUIDE

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PROBLEM	PROBLEM CORRECTION
1. Motor runs but does Not pump water.....	*Check for air trapped in housing, check for broken impeller or bag insert not in properly.
2. Filter powder continue To come through into..... Aquarium	*Bag insert not properly in Place, check filter bag for Holes or open seams.
3. Filter powder does not coat Evenly and water flow..... Is not good.	*Bag is plugged where powders do not coat, remove and clean or replace.
4. Intake hose collapses.	*Check for plugged or restricted slots in intake strainer.
5. Algae growing in Filter jar and on bag. ....	* Place filter in dark area or cover with something to eliminate light.
6. Motor noisy and air coming out exhaust hose-flow good.	*Check impeller for gravel or check intake hose and fitting for air leaks.
7. Water leak at exhaust "U" tube. ....	*Check hose clamps and "U" tube for casting lines.
8. Water hazy or Smokey, filter ..... Flow is good but Aquarium will not clear	*Probably a bacteria or Amoeba form of life, usually after new water is put into the aquarium, and is too small for the filter to take out. Condition will correct itself in a few days.
9. Air collects in pump Housing and breaks..... Pump prime.	*Exhaust hose does not lead off upward angle to eliminate air from system, keep intake downspout away from stones and And bubble. * Disconnect from power momentarily and allow the air to escape.
10. Water leaks from around jar top area. ....	* "O" -ring has filter powder or part of the filter bag under it Remove, clean and lubricate with silicone grease or Vaseline Before reinstalling. Be sure Filter bag clears jar mouth and Seal.

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11. Water leaking between motor .....  
And main casting.
12. No oil ports .....

\*P-16 seal worn out or has been forced off center-replace or relocate. Lubricate with P-31 grease before reassembling.

\*hold motor upside down and put a few drops of p-30 oil on the motor shaft and let it run down in the motor. There is an oil retainer ring that holds a couple of drops for the bearing.

## INSTRUCTIONS FOR REPLACEING THE JAR RING ON DIATOM D-1 FILTER MODEL

1. To replace the jar ring it is "NOT" necessary to remove the main Casting from the D-1 motor.
2. Remove the old jar ring from the casting.
3. Heat the new jar ring to about 150 degrees Fahrenheit by running hot tap water over it.
4. Hold the jar ring against the side of the main casting. (Fig. 18)  
With the jar ring still hot, you will be able to force it over the rim of the casting into its proper position

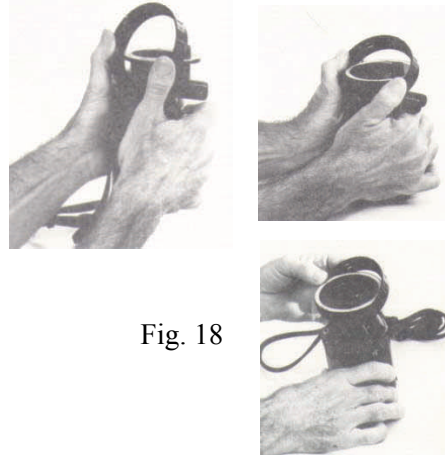


Fig. 18

## INSTRUCTIONS FOR DISASSEMBLING PUMP ASSEMBLY TO REPLACE CASTINGS ON WORN PARTS

1. Remove the XL-3 reverse thread impeller by inserting a pointed object into either the shaft armature or fan blades to Hold the armature from turning when unscrewing the impeller.

**Note:** Impeller unscrews clockwise and may require force in order to break threads loose. (Fig. 22, Fig. 23)

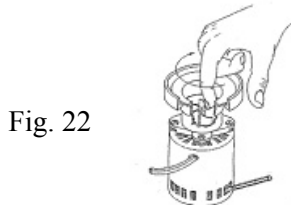
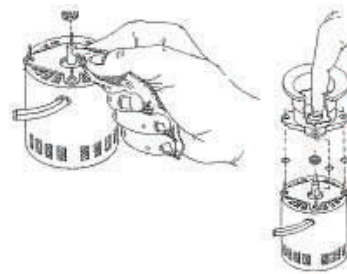


Fig. 22



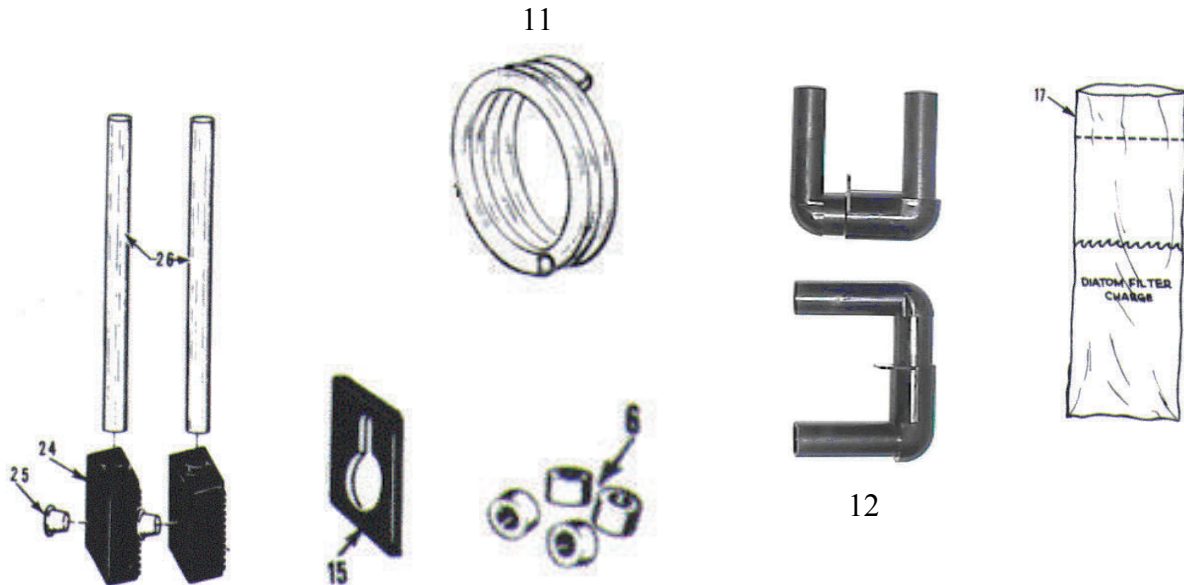
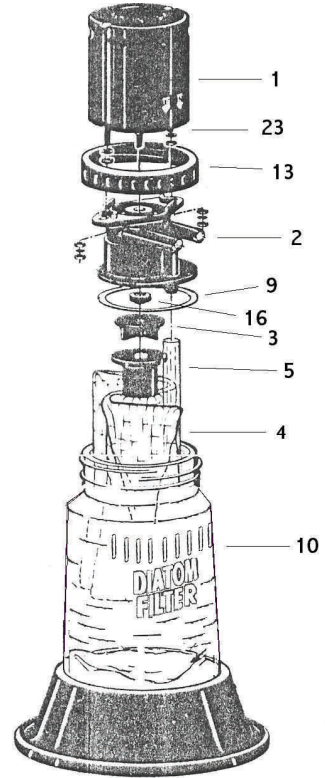
Fig. 23

2. Unscrew the three nuts holding the main casting in place. Next remove flat washers and lift main casting off motor, remove the three star washers and set them aside with flat washers and nuts.
3. Remove felt washer and wipe shaft dry of oil and grease.  
Sand shaft lightly with medium grit sandpaper to remove old seal residue. Re-oil felt washer and replace over shaft.
4. When replacing a main casting the P-16 shaft seal should Also be replaced to insure a proper seal. Glue in a new seal Using any brand automotive gasket shellac and allow overnight drying.
5. Grease the P-16 shaft seal with Diatom Filter Shaft Seal lubricant part 31, by filling the center of the seal with grease. Replace the three star washers on motor, hold one finger over the inside of the seal and press the casting over the motor shaft in line with mounting studs. Wipe out any excess grease from inside of casting, replace the flat washers and nuts. Center the casting and tighten lightly.



## DIATOM FILTER MODEL D-1 PARTS LISTING EXPLODED VIEW

Reference No.	Part No.	Description
1	P-1	Motor w/special hardened shaft.
2	P-2	Main casting w/P-13, P-9, P-16
3	XL-3	Impeller
4	P-4	Filter bag
5	P-5	Turbulence tube
6	P-6	Hose clamp
9	P-9	Jar gasket
10	P-10	Chamber base
11	XL-11	Hose
12	XL-12	"U" tubes
13	P-13	Jar ring
15	XL-15	Plastic clamp
16	P-16	Shaft seal
17	P-17	Mixing bag
23	P-23	Motor mounting plate
24	P-24	Strainer (w/P-25)
25	P-25	Cap plug
26	P-26	Intake and Exhaust tube



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## SPECIFICATIONS

Pump capacity—400 gallons per hour with one-foot head. Filtering capacity will vary with the length and size of hose attached and the amount of diatom powder used. Standard units average between 300 and 350 gallons per hour starting flow. It is important for the user to understand the difference in the size of the “parasites” which are harmful to fish and the much smaller “bacteria” which can be very beneficial to the aquarium. “Bacteria” are generally not considered to be free swimmers and reside mostly in and on the bottom material. The Diatom is effective only on free swimming or floating particles larger than one micron in size. When using the Diatom as a treatment by continuous filtration, you should take care not to “overwork” or tire the fish by too much current over a long period of time. Our starter recharge control valve (part P-29) allows for maximum filtration with very good control over outlet flow.

### LIMITED WARRANTY The D-1 Diatom Filter

Is guaranteed against original defects in material and workmanship for a period of six months. We do not authorize dealers to make adjustments other than the sale of replacement parts. In the event that the unit fails to operate properly, return to factory with original sales slip and \$8.50 to cover the cost of postage and handling. If, after factory inspection, it is found that the unit has been abused, or other than 20 wt. Motor oil has been used; you will be notified as to the cost of repair. You can service and maintain this unit for many years. Refer to the Service Instruction and Parts List.

**If MAJOR REPAIRS ARE REQUIRED, SEND ONLY THE PUMP ASSEMBLY TO THE FACTORY, DO NOT SEND JAR-HOSES-BEG-ETC.**

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