norweco®

HYDRO-KINETIC® BIO-FILM REACTOR

SERVICE INSTRUCTIONS

Regular service inspections by a qualified technician help insure proper system operation and also promote a strong relationship with the owner and local health officials. The frequency of service for each Hydro-Kinetic Bio-Film Reactor will vary according to many factors, including the rate of daily flow and the wastewater strength. In order to insure high quality effluent, it is essential that the settled solids in the Hydro-Kinetic Bio-Film Reactor are pumped to the pretreatment chamber of the upstream treatment system during service. Pay close attention to the amount of solid materials being filtered and retained in the Hydro-Kinetic Bio-Film Reactor. If the media or Reactor Elements have become completely obstructed, suggest to the owner that more frequent service visits are needed. All of the equipment and tools used during service are contained in the Service Cart and Tool Kaddy, allowing the Reactor Elements to be cleaned at the installation site or returned to your facility. If the Reactor Elements are returned to your facility for cleaning, you will need a supply of exchange Reactor Elements.

BEFORE YOU LEAVE FOR A SERVICE INSPECTION

- Be sure you have a complete list of other service needs in the area you are going to work.
- Check to see that you have detailed directions to each installation.
- Be sure your service vehicle is fully stocked.

WHEN YOU ARRIVE AT THE SITE

- Meet the owner. Introduce yourself and give them your business card.
- Explain the service inspection program and outline what you will do. Mention that your services are included in the maintenance contract at no extra charge.
- Ask for permission to inspect the entire treatment and disposal system, including any components that may be located indoors.
- Make sure the owner has a copy of previous Service Inspection Record Cards.
- Ask if there are any questions concerning the system or its operation.

EQUIPMENT REQUIRED FROM THE TOOL KADDY

- ❑ water hose and spray nozzle
- ❑ service pump and hose
- ❑ outlet blocking tool (if using a Norweco system)
- ❑ universal tool
- ❑ hook tool (if removing Reactor Elements)
- ❑ rubber gloves
- ❑ safety face shield or goggles

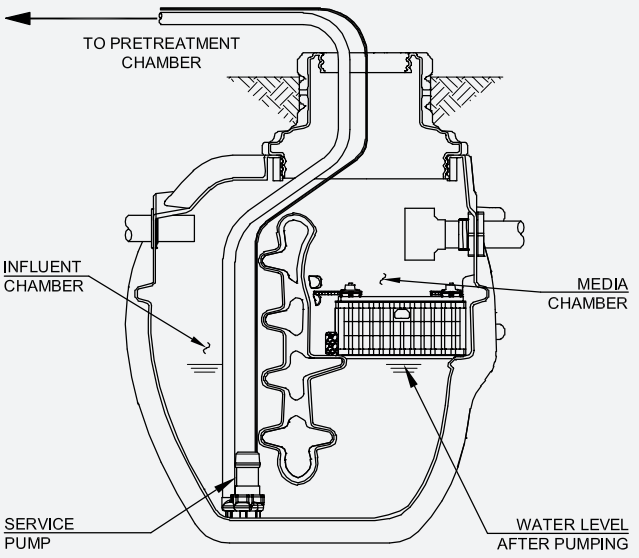
SERVICING THE HYDRO-KINETIC BIO-FILM REACTOR

A fresh water supply is required for cleaning and servicing the Hydro-Kinetic Bio-Film Reactor.

1. Routine service to the upstream wastewater treatment system should be performed prior to servicing the Hydro-Kinetic Bio-Film Reactor.

2. Block the outlet of the upsteam treatment system prior to pumping the Hydro-Kinetic Bio-Film Reactor. This will prevent loss of liquid from the upstream treatment tank during service to the Hydro-Kinetic Bio-Film Reactor.

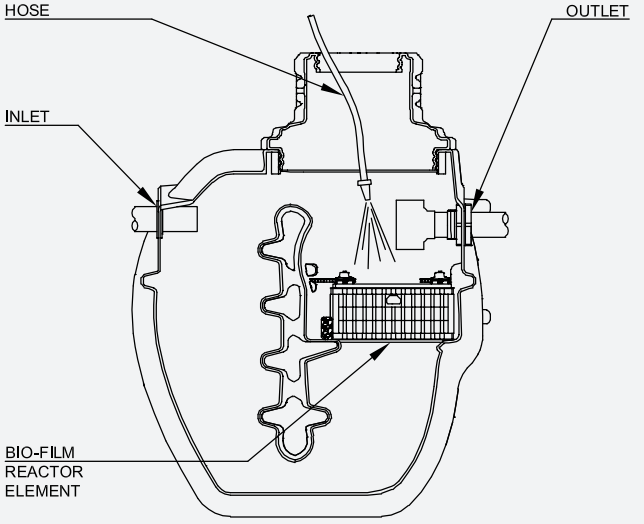
3. Remove the access covers from the upstream treatment system and the Hydro-Kinetic Bio-Film Reactor. Check the condition of the Bio-Film Reactor and the liquids in the tank for color and odor. Note the condition of the system on the Service Inspection Card.



PUMP BIO-FILM REACTOR CONTENTS

4. Place the intake of the service pump at the bottom of the influent chamber. Place the opposite end of the hose into the pretreatment chamber opening of the upstream system. Pump the contents from the bottom of the Hydro-Kinetic Bio-Film Reactor until the accumulated solids are completely withdrawn and the water level is below the bottom of the Reactor Elements. Approximately 200 gallons will be removed.

HYDRO-KINETIC® BIO-FILM REACTOR SERVICE INSTRUCTIONS (CON'T)



SPRAY MEDIA

5. Use a water hose and spray nozzle to rinse off the Reactor Elements and media. Continue spraying until all sludge has been flushed from the media. Rinse away debris that has accumulated on the media chamber walls.

6. Rinse away debris that has accumulated on the outlet tee. Continue spraying until all sludge has been flushed from the outlet tee.

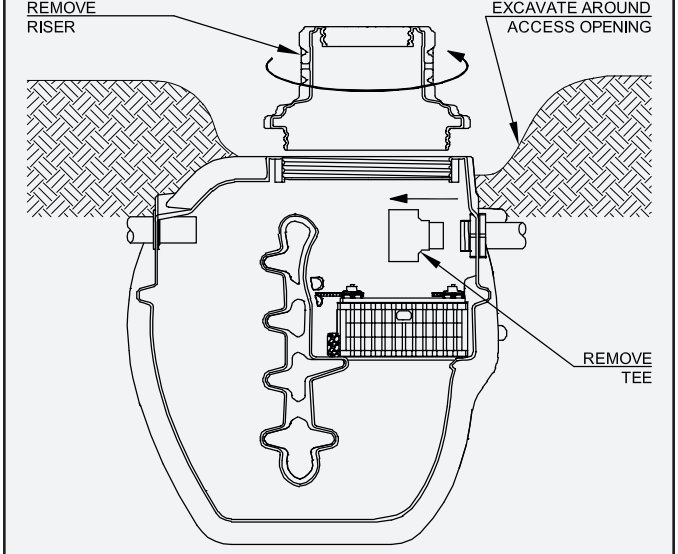
7. If necessary, use water to wash away any debris from the inside of the access riser, access cover and surrounding grass or landscaping.

8. Reinstall the pretreatment chamber and Hydro-Kinetic Bio-Film Reactor access covers. Clean and store all tools.

9. Unblock the outlet of the upstream treatment tank and allow the Hydro-Kinetic Bio-Film Reactor to refill to normal operating level. Add water if necessary. Be sure to never leave the Hydro-Kinetic Bio-Film Reactor empty after pumping. **CAUTION: Failure to unblock the outlet of the upstream treatment tank will cause system failure and potential flooding and will void the limited warranty.**

REMOVAL OF REACTOR ELEMENTS

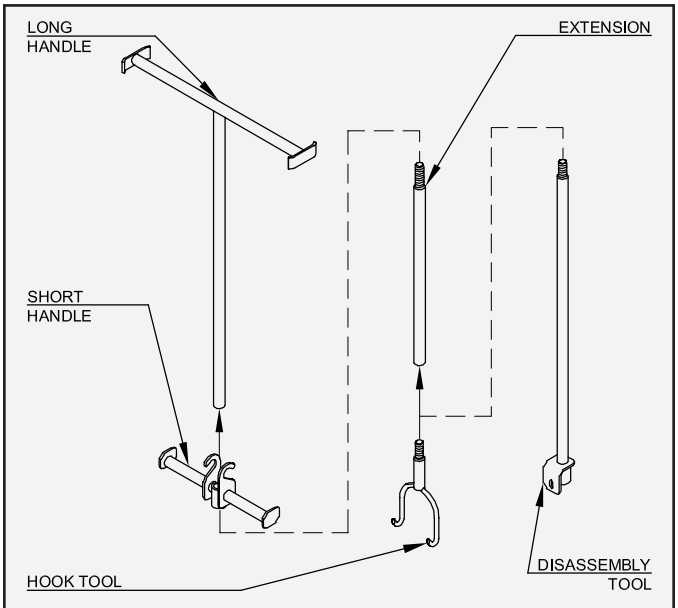
In the unlikely event that the Reactor Elements cannot be adequately cleaned using normal maintenance spraying, removal of the Reactor Elements from the Hydro-Kinetic Bio-Film Reactor may become necessary. Exchange Reactor Elements should be kept in your service stock should replacement of a Reactor Element be required during service.



REMOVE ACCESS RISER

1. Block the outlet of the upsteam treatment system. Excavate to the top of the Bio-Film Reactor to expose the base of the access riser. Remove the access riser by unthreading it from the tank and set it aside.

2. Pump water level to below the Reactor Elements. Remove the outlet tee by hand. It is not glued in place.



UNIVERSAL TOOL

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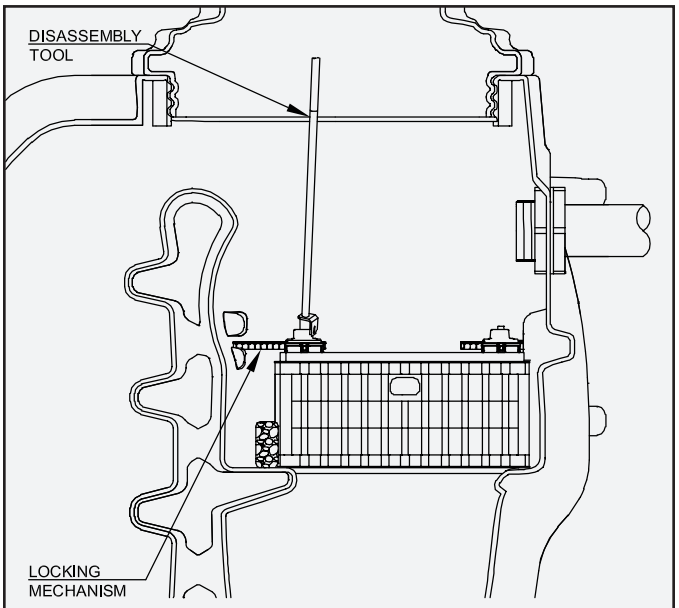
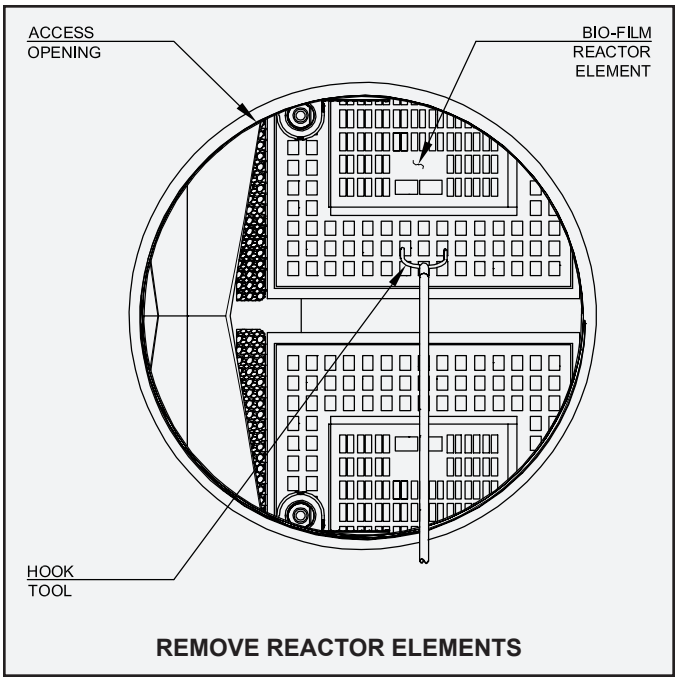


TURN LOCKING MECHANISMS

3. Use the disassembly tool to turn the locking mechanisms inward on each of the Reactor Elements until they clear the locking ledge. A 12" threaded universal tool extension is available to allow for easier access to the Reactor Elements.

4. Thread the removal hook tool to the shaft of your universal tool. Insert the hook tool into the center of the access opening. Secure the hooks under the second row of openings located on the top of either Reactor Element.

5. Lift the first Reactor Element from its position by imparting an upward force. Remove the second Reactor Element using the same method.

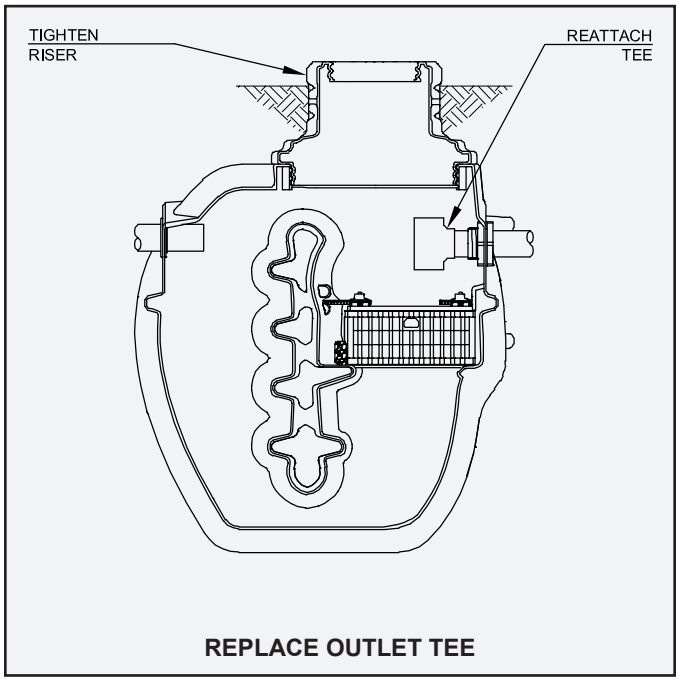


REMOVE REACTOR ELEMENTS

6. Place the Reactor Elements in the service bag provided with your Tool Kaddy to return to your shop for cleaning. Install new or refurbished Reactor Elements in the Hydro-Kinetic Bio-Film Reactor using the hook tool.

7. Using the disassembly tool, turn the locking mechanisms outward on both Reactor Elements until they are secure under the locking ledge. Reinstall the outlet tee.

8. Unblock the outlet of the upstream treatment tank. Refill the Bio-Film Reactor to normal operating level. Replace the access riser and backfill the excavation. Be sure to slope grade away from the riser.



REPLACE OUTLET TEE

EFFLUENT DISPOSAL SYSTEM CHECK

1. Determine if the effluent from the Bio-Film Reactor is going to an outlet for surface and/or subsurface discharge, or if it is being disposed of onlot. Inspect the condition of the effluent disposal system and make the appropriate notations on the Service Inspection Card.

2. Locate the point of discharge closest to the outlet. A free-falling "grab" sample of effluent can be collected after the point of discharge has been thoroughly cleaned. Take note of effluent color, odor and any suspended particles. Mud in the effluent disposal line or at its outlet can be a sign of a crushed or broken line and should be reported to the owner. Foaming, odor or sediment indicates the system has not been providing adequate treatment. Recheck the entire system to insure all components are functioning properly.

   NOTE: An effluent "grab" sample allows a visual assessment and should only be used in conjunction with routine service and/or trouble-shooting procedures to accurately evaluate system operation. A "composite"

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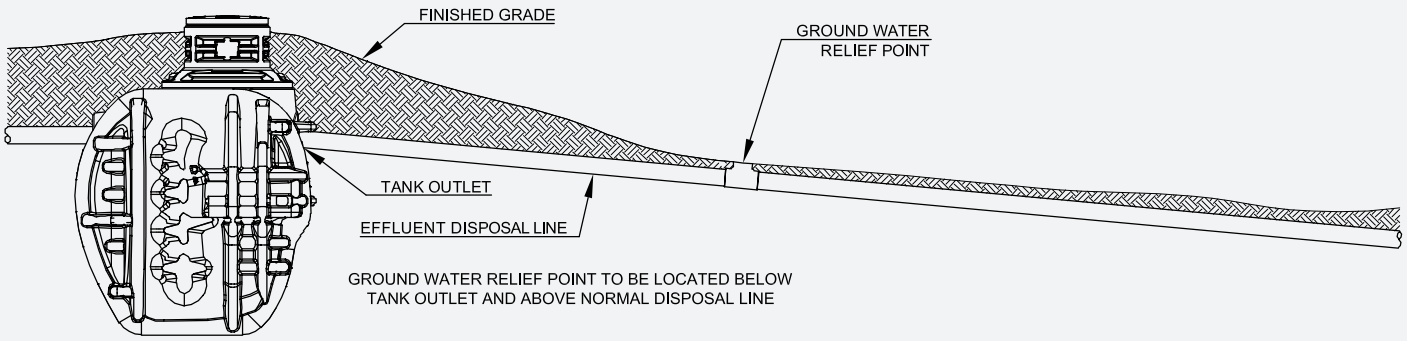

EFFLUENT DISPOSAL

sample, collected over 24 hours of system operation, preserved and transported using USEPA established procedures, is necessary if laboratory analysis of the effluent is to be performed. Laboratory analysis of an effluent "grab" sample can lead to misleading conclusions about system operation and should not be conducted. For additional information about effluent sampling refer to the Norweco Technical Bulletin titled EFFLUENT SAMPLING TECHNIQUES.

3. Although the effluent may be discharged and/or disposed of in several acceptable fashions, there should always be a ground water relief point installed in the effluent line. It should be at a point no higher than the outlet invert of the Hydro-Kinetic Bio-Film Reactor. It will prevent flooding in cases where the disposal line is submerged or saturated with ground water. Locate the ground water relief point and be sure that it is free of obstructions.

4. Note the condition of the plant effluent and disposal system on the Service Inspection Record Card.

BEFORE YOU LEAVE THE FACILITY

1. Make sure the access cover has been reinstalled and secured with the bolts provided.

2. Make sure that both sides of all three Service Inspection Cards are properly and completely filled out, including any specific notes or special services that your inspection indicates are needed.

3. Leave the top section of the Service Inspection Card with the owner and provide a brief verbal explanation of the condition of the system. Advise when to expect your next routine visit and provide your business card with office phone number, should the owner have any questions.

4. Point out the advantages of a continued service policy if the current Hydro-Kinetic Bio-Film Reactor service policy is nearing expiration. If the owner is not home, leave the top section of the service card at the owner's door.

CONTINUING SERVICE PROVIDES THE OWNER WITH THESE ADVANTAGES

- Travel and labor costs during service inspections are provided at no charge to the owner.
- Special service calls that may be necessary during the program are performed at no charge to the owner.
- Owner's investment, property and the environment are fully protected.
- Guaranteed response to emergency service requests is made within forty-eight hours.
- Local health department is automatically notified of system condition by the distributor/dealer.
- Owner has an up-to-date, written record of the condition of the Hydro-Kinetic Bio-Film Reactor and the entire wastewater treatment and disposal system.
- Owner is continuously informed of the treatment quality provided by the system.
- Routine maintenance of the Bio-Film Reactor is performed by factory-trained service technicians; no owner maintenance is required.
- Owner can expect the highest level of treatment performance, protection and system life due to regular, qualified service visits.

PROGRESS THROUGH norweco® **SERVICE SINCE 1906**

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