

2 MAINTENANCE AND REPAIR

2.1 MAINTENANCE SCHEDULE

Regular maintenance should be performed on a weekly basis (approximately every 50 hours) to prevent and resolve potential problems and major repairs.



CAUTION: Verify the Sea Cock Valve is closed and the main electrical power source is OFF, LOCKED and TAGGED FOR MAINTENANCE prior to performing maintenance on the BWD System.

2.1.1 Standard System Checks

Inspect the following hardware for tightness: fasteners, brackets, screws, nuts and bolts. Pay special attention to the hardware on the High Pressure Pump and the Electric Motor as they experience increased vibration and are more likely to come loose.

Inspect the level of the crankcase oil on the back of the High Pressure Pump. Verify the minimum oil level is at the center of the sight glass. The maximum oil level is at the top of the sight glass. If refilling oil, only use BWD High Pressure Pump Oil.

Clean salt water and/or salt deposits from the system with a damp rag.

Inspect the BWD System for fluid leaks. Look for oil leaks and/or water leaks anywhere in the system.

Inspect all tubing and hoses for wear and abrasions. Verify no tubes or hoses come into contact with heated or abrasive surfaces.

2.1.2 Component Checks

The maintenance schedule of components depends on the regularity of usage, intake water quality, length of time the BWD System is exposed to water, the total operational time and the manner of installation. Therefore, it is impossible to establish an exact timetable for maintenance. The table below provides a guideline for scheduling component maintenance.

| Component | Maintenance | Time Intervals | |
|---------------------------|---|--|--|
| | | Continuous | Intermittent |
| Sea Strainer | Inspect/Clean screen and housing | Weekly | 100 hours |
| Booster Pump | Replace seal | 2000 hours/if seal leaks | 2000 hours/3 months/if seal leaks |
| Plankton Filter | Inspect/Clean | Weekly | 100 hours |
| Pre-Filter | Replace element(s) | Low pressure <10 psi (0.68 BAR), or replace when blockage occurs | Low pressure <10 psi (0.68 BAR), or replace when blockage occurs |
| Standard HP Pump | Change oil Replace seal kit Replace valve kit | 500 hours 2000 hours/as req 2000 hours/as req | 500 hours 2000 hours/as req 2000 hours/as req |
| R.O. Membrane | Clean element | Annually | 3-5 years, when ppm exceeds 700-1000 |
| Salinity Probe | Clean probes | 3 months | 3 months |
| Charcoal Filter | Replace element | Monthly, depends on usage | |
| Ph Neutralizing Cartridge | Replace cartridge/ | 2000 hours | When calcium carbonate within cartridge has dissolved. |
| U.V. Sterilizer | Replace lamp/ Clean quartz sleeve | 3 months | 3 months or every 4400-8000 hours |

| Component | Maintenance | Time Intervals | |
|------------------------------------|-----------------|----------------|--|
| | | Continuous | Intermittent |
| Fresh Water Flush Charcoal Element | Replace element | | 3-4 months or when a sulfurous odor is present |
| Salinity Probe | Clean element | | Annually |

2.2 COMPONENT MAINTENANCE AND REPAIR DETAILS

2.2.1 Inlet Thru-Hull Fitting

Keep the Inlet Thru-Hull Fitting clear of debris and/or biological growth. Clogging of the Inlet Thru-Hull Fitting may result in low feed pressure causing an automatic shutdown.

2.2.2 Inlet Sea Cock Valve

Keep the packings and connections of the Inlet Sea Cock Valve tight and properly sealed. As required, clear the Inlet Sea Cock Valve of any debris and/or replace the seal and seat, or the entire valve.

2.2.3 Sea Strainer

Keep the mesh screen of the Sea Strainer clear of debris. Clogging of the mesh screen will result in low feed pressure causing an automatic shutdown.

Standard:

1. Remove the bowl by turning the bowl counter-clockwise, then remove the mesh screen and the flat sealing gasket from the bowl. Be careful not to damage either upon removal.
2. If you are *cleaning* and *re-installing* the current mesh screen and/or the flat sealing gasket:
 - Gently wipe the flat sealing gasket with a damp cloth.
 - Apply a light and even coat of O-ring Lubricant on the flat sealing gasket.
 - Rinse the mesh screen with non-chlorinated product water and verify it is clear of debris.
 - Place the lubricated flat sealing gasket back into the bowl then place the mesh screen back into the bowl.
3. If you are *replacing* the mesh screen and/or the flat sealing gasket:
 - Apply a light and even coat of O-ring Lubricant on the flat sealing gasket.
 - Place the new lubricated flat sealing gasket into the bowl.
 - Place the new mesh screen back into the bowl.
4. Reattach the bowl and hand tighten the bowl (clockwise) just enough to seal water in and to keep air out.

2.2.4 Booster Pump

The ceramic seal of the Booster Pump must be replaced approximately every 2000 hours or if there are signs of leakage.

Disassemble the Boost Pump:

1. Remove the 7 bolts holding the volute to the motor bracket.
2. Remove the impeller:
 - Hold the motor shaft in place with a large screwdriver.
 - Grasp the impeller with your free hand and turn the impeller counter-clockwise.
 - Remove the impeller by grasping it with your hand and turning the impeller counter clockwise.
3. Remove the old ceramic seal from the motor shaft.

Replace Ceramic Seal:

1. Wipe the motor shaft and the motor bracket with a damp cloth to remove any corrosion or salt deposits.
2. Place the new ceramic seat onto the motor shaft. Making sure the polished side is toward the end of the motor shaft.
3. Gently tap the ceramic seat into place evenly using a plastic tool.
4. Lubricate the motor shaft with light oil.
5. Slip the rotating portion of the seal over the motor shaft with the carbon element toward the ceramic.

Reassemble the Booster Pump:

1. Slide it onto the motor shaft as far as possible.
2. Apply blue Loctite to the motor shaft threads.
3. Hold the motor shaft and place the volute back on the motor bracket.
4. Re-install the 7 bolts to attach the volute to the motor bracket. Tighten the bolts evenly.
5. Thoroughly prime the Booster Pump.

2.2.5 Electric Motor

Lubricate the Electric Motor's front and rear shaft bearings every 6 months. Apply three pumps of high temperature motor bearing lubricant into each grease jerk. Use a polyurea based grease such as Chevron SRI or Shell Dolium R. DO NOT USE LITHIUM OR SILICON BASED GREASE.

2.2.6 Plankton Filter

Keep the Plankton Filter Element of the Plankton Filter clear of debris.

1. Remove the filter housing by turning it counter-clockwise, then remove the Plankton Filter Element and the O-ring from the bowl. Be careful not to damage either.
2. If you are *cleaning* and *re-installing* the current Plankton Filter Element and/or the O-ring:
 - Gently wipe the O-ring with a damp cloth.
 - Apply a light and even coat of O-ring Lubricant on the O-ring.
 - Clean the Plankton Filter Element with a bristle brush and water spray.
 - Place the lubricated O-ring back into the bowl then place the Plankton Filter Element back into the bowl.
3. If you are *replacing* the Plankton Filter Element and/or the O-ring:
 - Apply a light and even coat of O-ring Lubricant on the O-ring.
 - Place the new lubricated O-ring into the bowl then place the new Plankton Filter Element back into the bowl.
4. Reattach the filter housing and hand tighten it (clockwise) just enough to seal water in and to keep air out.

2.2.7 Pre-Filter Element

Keep the Pre-Filter Elements clear of debris. Clogging of the Pre-Filter Elements will result in low feed pressure causing an automatic shutdown.

Standard:

The following steps should be performed on each individual Pre-Filter Element. The first Pre-Filter Element is replaced with a 10/20 element, the second Pre-Filter Element is replaced with a 10/05 element.

1. Remove the filter housing by turning it counter-clockwise, then remove the Pre-Filter Element and the O-ring from the filter housing. Take care not to spill the feed water from the bowl. Be careful not to damage the O-ring upon removal. Discard the used Pre-Filter Elements.
2. Apply a light and even coat of O-ring Lubricant on the O-ring.
3. Place the new lubricated O-ring into the filter housing.
4. Place the new Pre-Filter Element back into the filter housing.
5. Reattach the filter housing and hand tighten it (clockwise) just enough to seal the O-ring.

Commercial:

1. Open the Air Bleed Valve on top of the housing to allow the filter to drain.
2. If installed, open the Drain Valve located near the bottom of the housing.
3. After the water and residue have drained from the housing, unscrew the lid clamp.

4. Remove the lid and the attached O-ring.
5. Remove the Pre-Filter Element and discard it.
6. Clean the assembly with a damp cloth.
7. Insert a new Pre-Filter Element into the housing.
8. Apply a light and even coat of Parker O-ring Lubricant on the O-ring.
9. Hand-tighten the lid and the lid clamp. Do not over tighten the lid clamp.
10. Close the Drain Valve.
11. Close the Air Bleed Valve.

2.2.8 Low Pressure Gauge

Keep the Low Pressure Gauge orifice clear of debris. If the Low Pressure Gauge fails to register, the orifice may be clogged with debris. Clear the orifice of debris using a thin wire.

2.2.9 Low Pressure Switch

The Low Pressure Switch contains one normally open contact. As the booster pump builds pressure on the Pre-Filtration section the Low Pressure Switch closes at 4 ± 2 psi. After the Low Pressure Switch closes, the system then remains in operation.

The Low Pressure Switch opens and shuts the system off as pressure decreases below 4 ± 2 psi. The internal switching mechanism is very sensitive and in field adjustment of the Low Pressure Switch is NOT recommended.

2.2.10 High Pressure Pump

High Pressure Pump Hardware Maintenance:

Regularly verify High Pressure Pump hardware is not loose. If loose, re-torque to the specifications listed below.

| Description | Thread | Tool Size | Torque | |
|--------------------------|--------|----------------|--------|----|
| | | | ft-lbs | Nm |
| Outer Bearing Case Screw | M6 | M10 Hex/Phil | 4.0 | 6 |
| Inner Bearing Case Screw | M6 | M10 Hex/Phil | 4.0 | 6 |
| Manifold Screw | M8 | M6 Allen | 9.4 | 13 |
| Plunger Rod Nut | M6 | M10 Hex | 4.4 | 6 |
| Bubble Oil Gauge | M28 | Oil Gauge Tool | 3.6 | 5 |

High Pressure Pump Valve Maintenance:

Regularly verify the High Pressure Pump Valve pump O-rings are in good condition. Replace the valve plug O-ring if there is any evidence of cuts, abrasions or distortions.

Disassembly of the Discharge Valve Assembly:

1. Disconnect all plumbing.
2. Use a M6 allen wrench to remove the six (6) socket head screws from the manifold. Remove the outer screws first, working towards the center screws.
3. Using a soft mallet, tap the back side of the Discharge Manifold from alternate sides to maintain alignment and avoid damage to the plungers.
4. Gradually lift the manifold while being pulled away from the crank case.
5. The adapter spacers may stay with either the Discharge or Inlet Manifold. By inserting two opposing screwdrivers between spacer and manifold, they can be easily pried out of the Discharge Manifold. If they are in the Inlet Manifold, gently work them up and down as they are pulled away from the Inlet Manifold.
6. The valve assemblies are in the Discharge Manifold ports and will fall out when the manifold is turned over. A complete valve assembly includes: a retainer, a spring, a valve, and a seat.

Re-Assembly of the Discharge Valve Assembly:

1. Be sure to examine adapter spacer O-rings and replace if worn. Lubricate and install O-rings and back up rings on both front and rear of the adapter spacer.
2. Examine the valve retainers for scale buildup or wear and install into each Discharge Manifold port with tab down into the manifold chamber.
3. Replace worn or damaged springs and place into retainers.
4. Examine valve and seats for pitting, grooves or wear and replace as needed.
5. Place valves over springs with concave side *down*.
6. Place valve seats on valves with concave side *down*.
7. Lubricate the outer diameter of the adapter spacer and insert the smaller ID into Discharge Manifold ports. Snap into position. Be sure not to cut or pinch O-rings.
8. Guide the Discharge Manifold with spacers over plunger rod ends and press into Inlet Manifold.
9. Replace socket head screws and torque per the table at the beginning of Section 2.2.10. Torque per the sequence shown below.

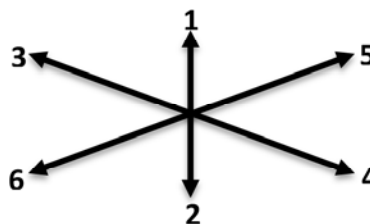


Figure 1 2SF Torque Sequence

Disassembly of the Seal Assembly:

1. Remove the Inlet Valve Assembly from the exposed plunger rod ends, including cotterpin, nut, washer, spring, spacer, and Inlet Valve.
1. Grasp the Inlet Manifold from the front and the bottom and pull to remove from plunger rods.
2. Examine the Low Pressure Seal before removing them from the Inlet Manifold. If worn, insert a screwdriver into ID of the seal and pry out from the backside of the Inlet Manifold.
3. Press the ceramic plunger from the *backside* of the Inlet Manifold.
4. Remove seal retainers from crankcase by grasping tab with pliers and pulling out.
5. Examine ceramic plunger, low pressure seals, V-packings for scoring, cracks and wear and replace.
6. Examine the sleeve for grooves or scale buildup and replace as needed. Grasp the sleeve and pull from the plunger rod.
7. Examine the O-ring and back-up ring under the sleeve for cuts or wear and replace.
8. Examine the barrier slinger for wear and replace as needed.

Re-Assembly of the Seal Assembly:

1. With Inlet and Discharge Manifold removed, examine seal retainers and replace if worn or damaged. Install on plunger rod and press into crankcase with tab *out*.
2. Place Inlet Manifold on work surface with crankcase side *up*.
3. Lubricate new low pressure seals and press into position with garter spring *down*. Be certain the seal is seated squarely on the shoulder in the Inlet Manifold chamber.
4. Place Inlet Manifold on work surface with crankcase side *down*.
5. On the Model 4SF place new female adapter into Inlet Manifold chamber with V-groove facing *up*.
6. Lubricate ceramic plungers and new high pressure seals.
7. Install the sleeve with the tapered end facing out. Gently press towards the plunger rod ends and slowly press into crankcase.
8. Install the plungers onto the plunger rods. Press into position using the larger ID end valve spacer.
9. Examine Inlet Valve and replace if worn.
10. Examine spacers for wear and replace as needed. Install spacer on each plunger rod with smaller OD towards Inlet Valve.
11. Examine springs for damage and replace as needed. Place on plunger rods.
12. Install washers with concave side towards Inlet Manifold.
13. Install nuts per the table at the beginning of Section 2.2.10.
14. Install *new* cotterpins.

Removal of High Pressure Pump Manifold and Seals:

Required Tools: seal insertion tool.

1. Remove the manifold bolts and locking washers.
2. To separate the manifold from the crankcase, grasp the manifold with both hands and pull straight off.
3. Normally the seal assemblies remain in the manifold, however part of the assembly may remain on the plunger, CAREFULLY slide off these pieces.
4. To remove the seals, insert a slide hammer/extraction collet into the seal. Tighten and pull up on the slide hammer weight. The seal assembly should come completely out.
5. Thoroughly clean the seal cavity.
6. Inspect the seal cavity for signs of damage.

2.2.11 High Pressure Hose

The High Pressure Hose is not adjustable or repairable. If the High Pressure Hose is damaged or worn out, replace it with a new one.

Never use Teflon tape or pipe sealant on the flare surface or on the swivel nut threads.

Required Tools: 2 open end wrenches.

1. Hold the male flare fitting of the High Pressure Hose with one wrench while loosening the female swivel nut with the other wrench and remove the old High Pressure Hose.
2. Connect the new High Pressure Hose and hold the male flare fitting with one wrench while tightening the female swivel nut clockwise to finger tight.
3. Using a wrench, tighten the High Pressure hose connection 90 degrees to obtain a metal-on-metal seal.

2.2.12 RO Membrane Element

RO Membrane Element Removal

N NOTE: It is highly recommended to replace all O-rings (4 brine O-rings, 2 product water O-rings) within the High Pressure Vessel Assembly each time the RO Membrane Element is removed or replaced. Ensure all necessary O-rings are on hand prior to opening the High Pressure Vessel. One O-ring kit is required for each High Pressure Vessel Assembly.

The Pressure Vessel has a side port configuration, requiring removal of the port fittings prior to End Plug removal.

1. Disconnect the High Pressure Hose from the inlet end of the High Pressure Vessel Assembly.
2. Membranes are only installed and removed from the inlet side of the High Pressure Vessel Assembly.
3. Using a 5/16" Allen wrench remove the 3 Socket Head Cap Screws from the 3-piece segment ring located at the end of the High Pressure Vessel.
4. Push inward on the End Plug and remove the 3-piece segment ring.
5. Remove the Port Retainer.

6. Remove the High Pressure Port.
7. Insert all 3 of the Socket Head Cap Screws back into the End Plug. These Socket Head Cap Screws are used as a handle to remove the End Plug. Grasp one or more of the Socket Head Cap Screws with a pair of pliers and pull outward to remove the End Plug. There is some resistance due to the Brine O-rings exerting friction against for Vessel wall.
8. After the End Plug is removed, the RO Membrane Element End and Product Water Tube are exposed within the Vessel.



CAUTION: The surface of the Product Water Tube must be scratch free. Never use pliers or other grabbing tools on or near the Product Water Tube.

9. With the End Plug removed from the High Pressure Vessel, the RO Membrane Element is now visible in the exposed end of the High Pressure Vessel. With your fingers, grasp the Product Water Tube and pull outward. If resistance is met then cup the open end of the High Pressure Vessel with one hand and shake downward to dislodge the RO Membrane Element. Do not drop the RO Membrane onto a hard surface as the Product Water Tube may be damaged.
10. Run a rag through the High Pressure Vessel to remove any biological film or debris from the High Pressure Vessel.

Inspection and O-ring Replacement:

1. Inspect each End Plug assembly and its High Pressure Fittings for signs of wear. Inspect the O-rings in the High Pressure Port fittings and replace them if they show signs of wear.
2. Remove the 2 brine O-rings and one Product Water O-ring with O-ring lubricant. Place them on to the End Plug.

Installation/Replacement of the RO Membrane Element:

A new RO Membrane Element comes complete with a “U” cup Brine Seal at one end of the RO Membrane Element. This Brine Seal must be at the inlet end of the High Pressure Vessel.

1. Insert the downstream end (the end without a brine seal) of the RO Membrane Element into the upstream inlet end of the High Pressure Vessel.
2. Slide the RO Membrane Element into the high Pressure Vessel, past the Brine Seal, until the RO Membrane Element Product Water Tube is 4 inches past the end lip of the High Pressure Vessel.
3. Insert the End Plug with new attached O-rings into the High Pressure Vessel while aligning the High Pressure Port and Product Water port to the respective holes in the High Pressure Vessel. Continue pushing inward on the End Plug until its exposed end travels just past the Segment Ring Groove in the Pressure Vessel. Ensure that the ports of the End Plug are aligned with the port holes of the High Pressure Vessel.
4. Insert the high Pressure Port Fitting with attached O-rings into the High Pressure Port.
5. Replace the Port Retainer.
6. Clean the threads of the Product Water Port Nipple and apply three wraps of new Teflon sealing tape to the threads. Screw the Product Port Nipple into the Product Port clockwise until only 2 or 3 threads are exposed from the End Plug. Do not use a wrench or over tighten.

7. Insert the 3-piece Segment Ring Set into the Segment Ring Groove of the High Pressure Vessel. Align the Segment Ring Set with the tapped holes in the End Plug for insertion of the 3 Socket Head Cap Screws. Attach the 3 Socket Head Cap Screws and tighten.
8. Reconnect the Plastic Product Water Tube. Screw the hex nut clockwise finger tight.
9. Connect the high Pressure Hose to both the leading end and the discharge end of the High Pressure Vessel Assembly. Do not over tighten the female swivel nut.

2.2.13 High Pressure Switch

When the high pressure is below 925 ± 50 psi the high pressure switch remains open and allows the BWD System to operate. If the high pressure exceeds 925 ± 50 psi the switch will close and the BWD System shuts down.

The internal switching mechanism is very sensitive and in field adjustment of the High Pressure Switch is NOT recommended.

If in field adjustment is *absolutely necessary*:

Required Tools: 3/16" hex wrench.

1. Fully open the Back Pressure Regulator.
2. Start the BWD System by pressing the START button on the Touch Pad.
3. Expose the calibration screw by removing the cap located in the center top of the High Pressure Switch.
4. Increase or decrease the set point by turning the calibration screw 45 degrees (maximum) at a time as necessary.
 - A clockwise turn increases set point.
 - A counter-clockwise turn decreases the set point.
5. Check the setting by slowly increasing the pressure while observing the High Pressure Gauge at the point of shutdown.
 - The system should shutdown at 925 ± 50 psi.
 - If the BWD system shuts down below 900 psi or above 1000 psi, repeat the adjustment until the High Pressure Switch is calibrated.
6. After the High Pressure Switch is properly calibrated, replace the calibration screw cap.

2.2.14 High Pressure Gauge

Keep the High Pressure Gauge orifice clear of debris. If the High Pressure Gauge fails to register, the orifice may be clogged with debris. Clear the orifice of debris using a thin wire.

2.2.15 Flow Meter

Keep the Flow Meter clear of biological growth. The Flow Meter is clear and light penetrates it, allowing biological growth to thrive.

1. Remove the top access fitting, the guide rod, the float and O-ring bumpers and the tube stops.

2. Clean the interior of the tube with a bottlebrush, a soft rag or a cotton swab.
3. Reassemble the Flow Meter.

2.2.16 Salinity Probe

Clean the Salinity Probe annually.

1. Unscrew the probe from its housing.
2. Using a soft brush, scrub the probe to remove any built up debris.
3. Remove old Teflon tape from the male pipe threads and clean the threads.
4. Wrap fresh Teflon tape on the male pipe threads.
5. Reinstall the probe and tighten just to hand-tight. Do NOT over tighten.

2.2.17 Charcoal Filter

Replace the Charcoal Filter every 3 to 4 months unless a sulfurous (rotten egg smell) is present in the product water. The Charcoal Filter is NOT cleanable.

1. Remove the filter housing by turning it counter-clockwise, and then carefully remove the Charcoal Filter Element and the O-ring from the bowl. Discard the used Charcoal Filter.
2. Clean the filter housing with a mild detergent and rinse thoroughly.
3. Gently wipe the O-ring with a damp cloth.
4. Apply a light and even coat of Parker O-ring Lubricant on the O-ring.
5. Place the lubricated O-ring back into the filter housing.
6. Rinse the new Charcoal Filter Element with fresh water to remove any excess carbon fines.
7. Place the new Charcoal Filter Element into the bowl.
8. Reattach the filter housing and hand tighten it (clockwise) just enough to seal water in and to keep air out.

2.2.18 UV Sterilizer



CAUTION: The following safety requirements are mandatory. Failure to comply with the safety requirements listed below may cause damage to the UV Sterilizer component or bodily injury.

- UV light exposure can cause severe burns and skin/eye damage. Never look directly at the light when the blue UV lamp is ON. Never operate the UV lamp outside of the stainless steel cabinet.
- Properly ground UV unit. Failure to do so may result in a severe electrical shock hazard.
- Provide watertight piping and compression nut seals. Failure to do so may result in electrical damage to the components and/or a severe electrical shock hazard.
- Always verify the main electrical power source is OFF, LOCKED, and TAGGED FOR MAINTENANCE prior to servicing the UV unit. The UV lamp and electrical components operate at high voltage levels. Servicing a UV unit without shutting of the main power source is a severe electrical shock hazard.

- Only qualified personnel should service the UV unit.
- Remove all pressure before servicing the UV unit.
- Never operate the UV unit for more than 30 minutes without water flow. The temperature of the water exposed to UV light will rise. High water temperature may cause damage to the UV unit.
- Do not exceed 3 “Start/Stop” cycles per a 24-hour period. Exceeding 3 cycles will create undue thermal stress on the lamp filament and cause premature failure of the UV lamp.

General UV Unit Maintenance:

Keep the exterior surfaces of the UV Sterilizer clean and dry. Use a soft cloth and soapy water (or any stainless steel cleaner) to clean the exterior surfaces at least once a month, or more often if necessary. Keep the interior of the ballast box free of debris. Remove any debris from the interior of the ballast box using a vacuum.

Quartz Sleeve Maintenance:

Over time, debris in the water will settle onto the quartz sleeve and will eventually block the UV rays from penetrating into the water. Frequency of quartz sleeve cleaning will depend on the specific type of feed water and the duty cycle of the unit; determine the cleaning schedule based on those factors.

Inspect the quartz sleeve 30 days after commissioning to assess the amount of contamination collected over the 30-day period. Use these findings to assist in determining the cleaning schedule.

Failure to perform proper quartz sleeve maintenance may reduce the efficiency of the UV lamp to adequately treat water.

Clean-in-Place (CIP) is sometimes effective in removing debris from the quartz sleeve. Conduct a CIP cleaning test to determine its effectiveness. If CIP cleaning is not effective, then manual cleaning or replacement is required.

Perform the following steps to manually clean the quartz sleeve.

1. Turn off the water source to the UV unit.
2. Disconnect the power source to the UV unit.
3. Drain the UV treatment chamber.
4. Remove the ballast cover.
5. Remove the rubber boot and carefully pull out the UV lamp through the compression nut pass-through.
6. Use a channel lock to remove the compression nuts.
7. Carefully remove the quartz sleeve.
8. Wash the quartz sleeve with mild soapy water and rinse with clean hot water.

Leak Checks:

Visually inspect the UV unit exterior for signs of leaks. If any signs of leakage are present the source must be located and repaired.

Perform the following steps to repair leaks.

1. Shut off the main electrical power source. Verify it is OFF, LOCKED, and TAGGED FOR MAINTENANCE to prevent accidental power up.
2. Depressurize the UV unit.
3. Remove ballast box cover and remove the rubber boot.
4. Locate which end of the sleeve is leaking.
5. Use a channel lock nut to loosen and remove the compression nut.
6. Remove the old quartz sleeve O-ring without pulling the quartz sleeve out.
7. Lubricate the quartz sleeve tip with clean water and install a new quartz sleeve O-ring. Ensure the O-ring has all-around contact with the cylinder pass through.
8. Replace and tighten the compression nut.
9. Refill the treatment chamber and verify there are no longer any signs of leakage.

Performance Verification:

Periodically test the UV unit to verify its efficiency. Perform the Post-UV Test in accordance with standard testing methods.

Water Sampling Procedure:

N NOTE: Most unsatisfactory Post-UV Test results are due to improper sample-taking technique. Perform the following steps as specified to ensure a valid water sample is procured.

1. Use sterile sample bottles obtained from a reliable laboratory that has been autoclaved and kept in a bag intended for this procedure.
2. Use a temporary tube to direct water from the UV unit to a container or drainage.
3. Pressurize the UV unit and flush the unit with the sample valve fully opened for 3.5 minutes. Valve orifice should not exceed 1/4" or 6mm.
4. After flushing for 3.5 minutes, reduce valve opening to 50% and flush for 3 minutes.
5. Open the sample bottle and keep the inside of the cap facing down.
6. Fill the sample bottle and avoid breathing directly into the bottle or touching the inside of the bottle, cap or neck.
7. Immediately cover and secure the cap after filling the sample bottle.
8. Label the sample bottle and place in a clean plastic bag.
9. Take sample bottle to the laboratory as soon as possible.

N NOTE: Sample processing must begin within 3 hours after sample collection and must comply with accepted standard methods.