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Replacing Seals on Purasan Type I Marine Sanitation Device

I installed a Purasan Type I Marine Sanitation Device, made by Raritan, in the summer of 2007. In our 1982 DeFever 41, I had to install it in the bilge next to the shaft.

A few weeks ago I noticed slight leakage of discharge seeping from the top of the Purasan treatment box. The leak was traced to a small slot at the base of the macerator motor on top of the second (discharge) chamber. Great, just what I needed. Time to repair the treatment tank!

The Purasan treatment tank utilizes two chambers, an entry chamber and a discharge chamber. Each chamber has a macerator mixer motor mounted on top of the treatment box. The macerator motor spins a shaft that enters the treatment chamber and is protected by special seals manufactured by Raritan. Two seals cost about $40 plus shipping from Raritan. Raritan part # 31-102, motor shaft seal.

To change the seals, you need to remove the top of the treatment box. That's where the fun begins. Be sure you do this job in a well ventilated area.

The tools you will need to perform this job are as follows:

5/16" wrench

5/16" nut driver

5/16" socket on a ¼" socket drive with small extension

3/8" wrench

3/8" socket

7/16" wrench

slotted screw driver

hammer or rubber mallet

small tube of silicon glue

Did I mention rubber gloves?

Roll of paper towels

bottle of white vinegar

First, run fresh water through the toilet system about ten times to reduce the anticipated odor. Next pour white vinegar into the toilet bowl and flush.

Now shut off the power to the Purasan system, close the discharge through hull sea cock, and open the windows and doors to allow ventilation. If you have a fan, set it up to blow over the work area.

Follow the Purasan manual for winterization of the treatment tank. Basically, you remove the crossover lid. Use a drill pump with a long tube that will be inserted into each side of the tank. Pump out into a bucket. Discard the waste in the bucket into the toilet at your marina. Do not throw it overboard.

Disconnect the discharge hose, drain it, then plug the hose with a few rolled up paper towels. Do the same with the discharge outlet on top of the treatment box.

I disconnected all the wires connected to the treatment tank. You need to remove all the wires connected to the ground and the positive terminals. (You do not need to remove any of the control wires that terminate in the

black control box.). You will use your 7/16" wrench here. I removed the +12 volt positive connections first, and used some household string to run through the ring terminators to keep them grouped together.

Next I removed the wires from the negative ground terminal on the treatment box. Again I used string to tie these wires all together and keep them separated from those that connect to the +12 volt terminal.

At this point, all the electrical wires should be disconnected from the top of the treatment tank and the discharge hose should be disconnected.

TO REMOVE THE TANK TOP PROCESS:

The next phase is to begin the tank top.

Using a small Phillips head screwdriver, remove the four screws that hold the cover on the black control circuit box.

Now remove the two 5/16" head screws in the bottom of the black box that hold down the treatment tank lid. Loosen and remove the locknuts underneath the screws with a 3/8" wrench.

Once these nuts are removed, lift out the two screws. The black control box is now free to be moved out of the way. No need to disconnect any of the wires.

There are a total of eighteen of these 5/6" head slotted screws to remove around the tank lid. Only sixteen more to go. I used the ¼' ratchet wrench with an extension and a 3/8" socket on the underside to loosen each of the nuts. However, some of the screws were longer than others and my 3/8" socket couldn't reach the nut. (There did not appear to be any reason why some of these were longer than others. I concluded it was a matter of supply in the production line). Therefore, you will use the 3/8" wrench as well as the rachet wrench. On the top side, I used the 5/16" nut driver on the screw head as that holds much better than a slotted screw driver. It spins the bolt better also.

After you have removed all eighteen screws and nuts that hold the treatment tank lid on the tank, you will next need your rubber mallet or hammer. First, see how lucky you are and try to pry the lid up at various locations around the box. If it doesn't budge, then use the hammer. Start by gently tapping the underside of the lid UPWARD. You are working against a rubber seal that doesn't have any glue but is nonetheless sandwiched between the lid and the box. Once you break open the marriage of the lid and the seal or the seal and box, then you can work around the rest of the lid. It may take you 30 minutes or more to get this lid loose, so be patient. Hitting it too hard only runs the risk of fracturing the plastic….and its not worth it. Keep tapping gently but firmly.

Get your rubber gloves on.

Once you have the lid free and off the box, you may want to pour more vinegar into the input side of the treatment box to reduce the odor.

Lift the lid off and roll it over upside down. Remove the macerator mixer blade on each motor shaft. This will require a screw driver. I wrapped each mixer blade with a few paper towels and grabbed around them with my left hand and loosened the screw with my right hand.

You will see two globs of silicon glue under the macerator motor on the bottom of the lid. Pull off the silicon glue globs and throw them away. That reveals two screws that hold the macerator motor in place. Remove each screw but hold the motor in your other hand as they become free. Pull the motor off the lid and the shaft out of the lid. Using a clean paper towel, thoroughly clean the area on the bottom of the lid where the two screws were so that you can properly apply new silicon to a clean surface when done. The silicon is only to keep the screws from getting corroded.

The seal you will be replacing is in the top of the lid where the shaft enters the lid. Pull out the old seal from the side with a screw driver.

Using the "Super Grease" provided by Raritan in the new seal package, grease the edge of the hole where the seal inserts. Push in the new seal with the metal band facing towards the tank. Next use the rest of the tube of super grease around the top of the seal where the motor will mate up to it. I put some grease on the shaft where the shaft will be rubbing the seal. Reassemble by pushing the shaft back into the lid through the new seal. Reinstall the two screws that hold the motor in place.

Repeat this process for the other motor and replace that seal too, even if its not leaking. Its definitely better to spend that $20 now, even if you don't think its necessary, than to have to take this treatment tank apart again!

Next apply a very generous gob of new silicon glue to the screw heads that hold the motors so it will dry as you saw the original globs. You can't use too much for this job but you can possibly not apply enough. So be generous. Be sure the entire screw head is completely covered in silicon glue.

Go take a 30 minute break while the silicon glue dries.

Reassemble the lid. In order to ensure the rubber gasket aligned properly, place the gasket onto the upside down lid, then thread the eighteen screws into the lid holes and through the gasket. Each one was snug enough to hold the gasket in place. Turn it over and place on the treatment tank. Tighten each nut only until snug until they are all on. Then go back and tighten them down gradually, each one opposite the other side of the box. Repeat until all are tightened sufficiently.

Reconnect your discharge plumbing hose, electrical wires, and check everything over.

Follow the Purasan manual for recommissioning after winterization. Basically you remove the crossover lid and will fill each side of the treatment box with water. The minimum amount of water to be in the box is three gallons. I used a funnel and filled it until I could see it was full. Put the cap back on the crossover. Apply power.

You should be ready to run again. Turn the power back on and give it a try.

Happy flushing !

Ralph Yost #3366

1982 Defever 41 -SAY GOOD-BYE