VOLVO PENTA

Special IPS Owner Edition: Anode Inspection and Replacement

What Happens When Anodes Don't Work Properly,
Are Installed Incorrectly or Used Beyond Their Useful Life?

While corrosion can occur anywhere on earth, the marine environment, where we boaters combine water, metal, electricity and salt, is one of its very favorite places to appear.

There is nothing mysterious about corrosion. It is simply an electrochemical reaction that happens when electrons flow between different metals that are connected or grounded through water. As it happens, the electrical action causes one of the two metals to be eaten away. The process is greatly accelerated in salt, brackish or polluted water, or water with a high mineral content.

The softest metals (or, to be more precise the "less noble" metals) are the first ones to erode. That is why anodes are designed to be made of material which is the least noble and first to erode on the boat. If an anode is past its useful life, corrosion begins to work its way up the "noble" chain. After a sacrificial anode, the next metals to erode are brass and aluminum. Unchecked, corrosion can start out as cosmetic damage on drive housings and propellers and eventually lead to catastrophic failure. On Volvo Penta IPS drives, we have seen unchecked corrosion damage sealing surfaces, allowing water to enter the drive and result in total drive failure and expensive repairs.

The good news is that corrosion damage is 100% preventable! Regular anode inspection and replacement is preventative maintenance and should be as much a regular part of the boating experience as filling up your fuel tank. Follow the simple steps below to protect your investment, and maximize your leisure time on the water with friends and family.

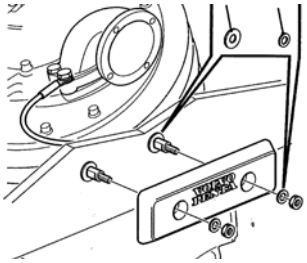
1. Use Only Genuine Volvo Penta Anodes. After-market anodes comprised of different, sub-standard alloy mixtures do not offer sufficient corrosion protection for IPS drives. Boat owners may observe that the aftermarket anodes last longer and therefore believe they offer a better value. In reality, because they are a different material, they don't sacrifice as designed for the IPS product, resulting in drive corrosion.

2. Check Your Anodes As Often As Possible. The rate of anode erosion will vary dramatically depending upon water temperature, water quality, salinity and tidal flow. And those are just the natural causes. Leaking current from marinas and/or other boats, continuous use of shore power, unpainted drives and other factors make anode longevity predictions impossible. Since it is hard to know exactly the elements that you are up against (or will change depending upon your

boat's location and time of the year), it is essential to inspect the anodes frequently to minimize the opportunity for corrosion.

- Transom Mounted Anode

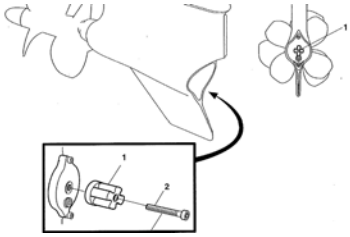
Volvo Penta has instructed boat builders to install the transom mounted anode so that the anode is spaced (sticks out) about one inch from the transom of the boat. (Anodes that are flush mounted and touching the transom or bottom paint may not adequately protect the drives and can erode too quickly). Transom anodes should be replaced when the surface has eroded by about one-third.



Transom anode replacement
Volvo Penta Part No. 40005875

- Exhaust Outlet Anode

Exhaust anodes are mounted just inside the drive's exhaust port. Instruct your cleaning crews and divers to inspect your anodes on each dive. Exhaust anodes need more than just a visual check. This anode is likely to hold its machined shape even if the sacrificial material is eaten away on the inside. Therefore, your diver needs to tap the exhaust outlet anode with a dowel or small piece of wood to check its integrity. An eroded anode will disintegrate under the blow, and you will know it is (past) time to replace it.



Drive anode replacement
Volvo Penta Part No. 3593981

The owner's manual recommendations for frequency of anode inspection are just that: recommendations. You are in the best spot to know the elements your boat is up against and to protect your investment. Protective paints, Volvo Penta's Active Corrosion Protection System, sacrificial anodes and other means help tremendously, but corrosion cannot be eliminated. Only diligent inspection and frequent replacement of spent anodes using Genuine Volvo Penta anodes will provide your boat the protection it needs and deserves against natural and man-made elements that contribute to corrosion damage.