



# Galvanic Corrosion - More Shocking!

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When I wrote about electric shock drowning, I was also setting the table for a related and more common problem, called galvanic corrosion. The same forces that could translate into ESD, will definitely create an environment in which your boat's metals can "melt away."

## What Is Galvanic Corrosion?

When two dissimilar metals are in contact with each other, the basic requirement for galvanic corrosion is in place. For example, a bronze propeller and a stainless steel drive shaft; or stainless steel screws holding an aluminum trim tab in place; or just the grounding strap on a boat, connecting all the various metals. But more than contact is required. An "electrolyte" has to be present - a substance to conduct electricity between the two dissimilar metals. And an excellent electrolyte is seawater. What happens is that the more "noble" metal (bronze, for example) destroys the less noble metal (aluminum, for example) by dissolving it, ion by ion. This is galvanic corrosion.

At the marina, every boat is connected to the green AC grounding wire of the marina and to its own boat grounding system, engine and underwater running gear. The water of the marina com-

pletes the circuit from all boats to all boats!

It is best to protect your boat with zincs, the least noble metal available, so that the zinc is "sacrificed" at the expense of all other metals. Zincs should be placed on the running gear struts, on the transom (in the water) and on any internal part that is in contact with seawater - like a raw water cooling system. However, if you have plenty of zincs and the boat next to yours doesn't, your zincs will be forced to protect both boats simultaneously, until they "melt" away - exposing you and your less diligent neighbor to the full onslaught of galvanic corrosion.

## What Can I Do?

You could disconnect the AC green ground wire from the boat's ground point. This will break the circuit and fully halt the corrosion cycle. However, this is a very dangerous condition. Electricity can "jump" from your AC system to your DC system simply by the wires of the two systems being in proximity to each other. Out through your engine block to your running gear and into the water. See last week's column on "Drowning - Shocking!" Clearly, that danger is far higher than worrying about a prop dissolving before your eyes!

So, a Galvanic Isolator would do very nicely! It connects to the green ground wire and blocks the flow of ions between your boat and everybody else's. The Galvanic Isolator also has a "trip" system that stops the low-voltage galvanic action from occurring, but will ground any dangerous AC power build-up. The better Galvanic Isolators allow low levels of AC to pass through, preventing stray AC current from paralyzing

a nearby swimmer. So, don't go swimming at the marina and maintain that green grounding wire in good condition. The life you save may be your own.

If you are interested in being part of USCG Forces, email me at [USCGAUX2006@aol.com](mailto:USCGAUX2006@aol.com) or go direct to MaryJo Cruickshank, who is in charge of new members matters, at [FSO-PS@emcg.us](mailto:FSO-PS@emcg.us) and we will help you "get in this thing..."

January 2007 - Moriches Inlet					
The Time Offsets mentioned in the column are as follows:					
Tidal Time Offsets from Moriches Inlet:	USCG Station	Potunk Point	Mastic Beach	Smith Pt Bridge	
High Tide	+45 min	+4.5 hrs	+4.5 hrs	+4.5 hrs	+3 hrs
Low Tide	+2 hrs	+5 hrs	+5 hrs	+5 hrs	+4 hrs
Day	High	Low	High	Low	High
Wed 17	05:08 AM / 3.13	11:32 AM / -0.11	05:34 PM / 2.49	11:29 PM / -0.07	
Thu 18	05:53 AM / 3.30	12:19 PM / -0.26	06:19 PM / 2.64		
Fri 19		12:18 AM / -0.20	06:37 AM / 3.42	01:04 PM / -0.39	07:03 PM / 2.77
Sat 20		01:06 AM / -0.29	07:22 AM / 3.47	01:47 PM / -0.48	07:49 PM / 2.87
Sun 21		01:53 AM / -0.33	08:08 AM / 3.44	02:29 PM / -0.52	08:38 PM / 2.95
Mon 22		02:40 AM / -0.30	08:57 AM / 3.33	03:11 PM / -0.50	09:30 PM / 3.00
Tue 23		03:30 AM / -0.20	09:50 AM / 3.16	03:56 PM / -0.40	10:24 PM / 3.04
Wed 24		04:25 AM / -0.06	10:44 AM / 2.95	04:44 PM / -0.26	11:19 PM / 3.05
Thu 25		05:31 AM / 0.10	11:41 AM / 2.74	05:41 PM / -0.11	
Fri 26	12:15 AM / 3.04	06:44 AM / 0.18	12:40 PM / 2.55	06:47 PM / 0.02	
Sat 27	01:13 AM / 3.00	07:56 AM / 0.17	01:43 PM / 2.42	07:53 PM / 0.07	
Sun 28	02:16 AM / 2.98	09:00 AM / 0.10	02:51 PM / 2.38	08:55 PM / 0.06	
Mon 29	03:22 AM / 3.00	09:57 AM / -0.00	03:56 PM / 2.44	09:52 PM / 0.01	
Tue 30	04:23 AM / 3.07	10:50 AM / -0.10	04:55 PM / 2.56	10:45 PM / -0.05	
Wed 31	05:16 AM / 3.14	11:40 AM / -0.18	05:45 PM / 2.68	11:35 PM / -0.10	