

Heaven, Hell and Shorepower

by Jay Stormer
SAMS-AMS, NAMS-CMS

After a particularly hot day, Gen. Phil Sheridan [military governor of Texas after the Civil War] said: "If I owned both hell and Texas, I would rent out Texas and live in hell."

In recent years, however, Texas has benefited from the ubiquitous availability of air conditioning in homes, offices, cars, and even boats. Hell apparently has not been similarly outfitted, so a lot of us have become "Texans-by-choice," with an addiction to the electric sea breeze.

But, there is one snag that can turn your bit of heaven-on-the-water into something like the fiery pit of hell.

Your air conditioner sucks up a huge amount of power (check last summer's electric bills).

On land, the electric power is provided through permanent connections made in a weather-tight enclosure by a licensed electrician. On a boat, the power is supplied through a shorepower cord. This cord is temporarily connected, often by someone who is "electrically challenged"; left out in the sun and rain; occasionally, bathed in salt water; and rarely given much thought.

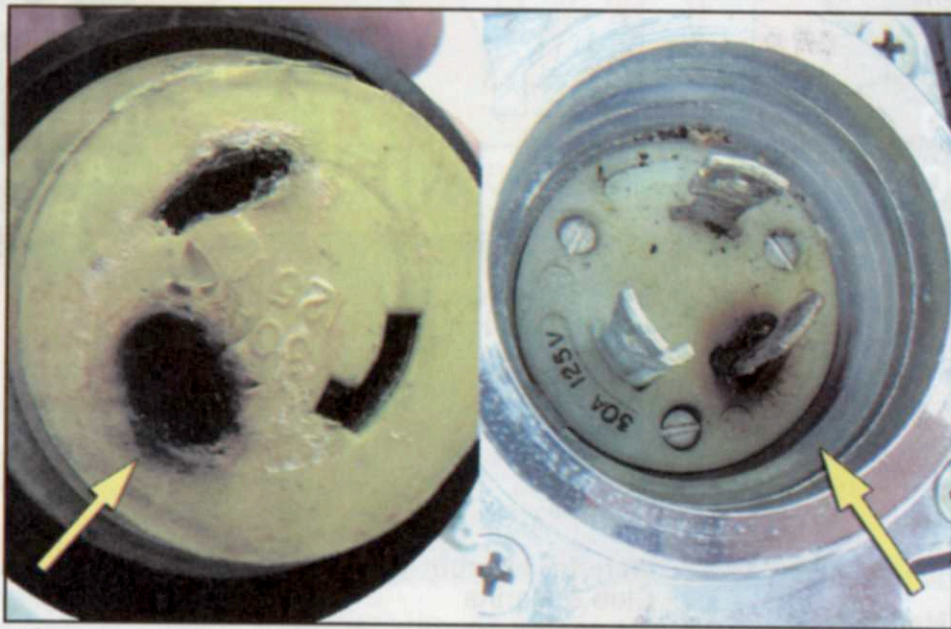
The consequences of cluelessness

can range from an uncomfortably sweaty night when the air conditioner quits, to snuffing-out in a blaze of glory when the boat catches fire. However, you don't have to be an electrical wizard to prevent this. A few simple rules consistently followed will suffice.

Let's assume that the boat's electrical system, air conditioning, and the marina wiring were installed to accepted standards and codes (unfortunately, not always the case). The most vulnerable part of the system is the boat end of the shorepower

wires behind the inlet connector and, perhaps ultimately, igniting other things in the vicinity. This can take place without the circuit breaker tripping. At 120 volts with a 30-amp breaker, it would take a resistive load of 3600 watts (roughly equivalent to running three burners on an electric stove simultaneously) to trip the circuit breaker. A lot of damage can be done well before the resistance in your connection reaches this level and trips a breaker.

This problem is very common. Four of five boats I surveyed this



This power cord and boat inlet connection show a moderately advanced case of resistance heating, which is burning and discoloring the plastic insulation around the male prong and female socket for the "hot" conductor. It is replacement time for these.

er cord and the mating shorepower inlet, which is generally installed on the exterior of the boat. Failure to use and maintain the cord and inlet properly will result in wear, pitting, and corrosion of the connecting prongs and sockets, and the connection will develop a high electrical resistance.

The power lost to this resistance will be converted to heat, burning or melting the insulation, shorting the

month show some sign of resistance heating of the shorepower connections. However, it is not something that comes on quickly. It takes awhile to develop, and there are some easily recognizable signs to help you avoid the worst-case scenarios.

There has to be a large current draw through the high-resistance connection over a period of time to allow the heat to build up. We are focusing on air conditioning here, but any equipment that draws a large amount of electrical current over a period of hours or days may create the same problem. Up in Yankee-land, it occurs with the use of electrical heaters, rather than air conditioning.

Here's the first rule: Look carefully at the boat end of your shorepower cord and the inside of the inlet fitting.



When plugging in, the black plastic threaded ring (sealing collar at arrow) should be screwed down tightly. This seals the lip on the cord connector against the inlet ring protecting the connection from moisture and movement. The inlets with screw-type covers, as shown here, protect the inlet from spray and salt better than the spring-loaded plastic type when under way.

Do this every time you make the connection. If you leave the boat connected as a "dockside condo," do it at least every month during air-conditioning season. Look for any sign of heating such as a brownish coloring or blackening of the insulation around the male pins in the inlet fitting, or discoloration or enlargement of the sockets in the cord end. If you see this, **REPLACE THE FITTINGS** and the cord! I know they are expensive, but so are funerals.

Replacing the fittings at the first sign of a problem may actually save money in the long run. The damage is usually worse inside and behind the inlet connector, where you can't see it. Replacing these is a fairly easy job, so long as it has not progressed to the point of burning or melting the insulation from the boat wiring. Replacing internal boat wiring is not so easy or cheap.

Rule No. 2: Before disconnecting the shorepower cord, always turn off all 120-volt equipment on the boat, switch off the main circuit breaker, and switch off the breaker on the

pier. Of course, if the boat has an A/C generator, the electrical load can be shifted to it. But you still need to open the breakers, to make sure there is no current running through the inlet connection when it is pulled apart. If there is any current to the connection, it may cause an arc or spark. (Remember the spark you see at home when you pull an appliance plug out of a wall socket while the appliance is on.) This sparking will damage the plating on the connectors, and allow pitting and corrosion to develop more easily.

Rule No. 3: Before plugging in the shorepower, make sure the breakers are both switched "off" (for the same reasons as when disconnecting).

Rule No. 4: After plugging in, make sure the connector is fully seated and turned so that it locks. Then, make sure the sealing collar on the cord is screwed down tight on the inlet threads. This should both seal the connection and prevent any movement between the cord fitting and the inlet.

Rule No. 5: Don't let the power



On this boat, the dual 30-amp shore-power cords are hanging from the inlet. This puts quite a strain on the connection, especially as the boat moves relative to the finger pier. A line should be secured from the rail to each cord (at the arrow) to take the weight and strain off the connection.

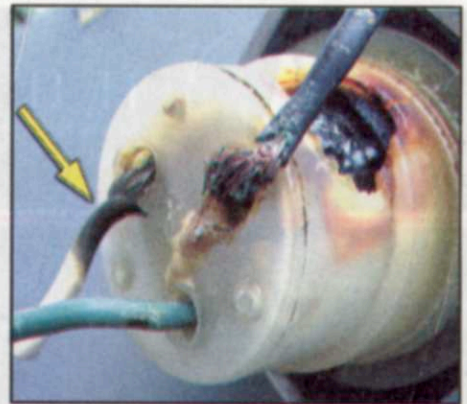
cord hang from the boat connection. Tie a piece of line around the cord and secure the line to a cleat, rail or lifeline. The line will take the strain of supporting the cord as the boat moves, or when the mate (or, more likely, the captain) trips over it. Make sure there is enough slack in the cord so that the cord isn't strained when the boat moves up and down with the tide, or side to side with the wind.

Rule No. 6: If the end of the shore-power cord should fall into the water, DO NOT plug it in. Thoroughly wash out the end with fresh water and let it dry before connecting.

These suggestions will prolong the life of the connections, but remember that the cords and connectors are not permanent. They are consumable, deteriorate, and have to be replaced periodically like many other things on boats.

Stay cool! ⚓

Jay Stormer is a NAMS Certified Marine Surveyor and SAMS Accredited Marine Surveyor doing business as Dixieland Marine. He and his wife Jane have cruised over 12000 miles on their Pearson 365 sloop.



The insulation is burning off the wires at the back of this boat inlet connector. This can easily be seen by the discoloration on the white wire at the arrow. A large hole also has been burned in the side of the connector (below black wire on upper right).

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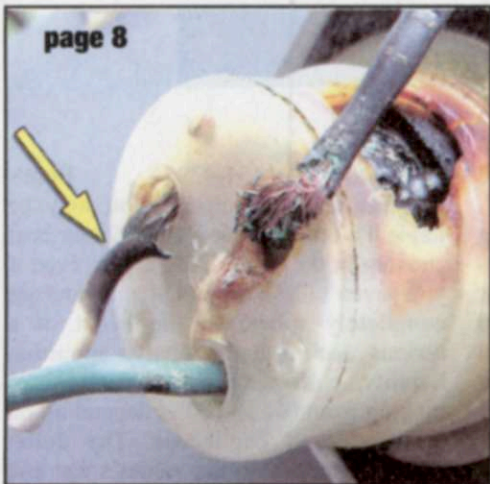
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**HEAVEN, HELL AND
SHOREPOWER**



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YACHTING TEXAS STYLE

Volume 25 Number 2

May 2005

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Here are some suggestions for prolonging the life of shorepower connections and avoiding a common problem that can turn your bit of heaven-on-the-water into something like the fiery pit of hell, or worse. *by Jay Stormer*

13 Wuffo Veracruz?

His decision to singlehand the regatta to Veracruz had not been arrived at lightly, and the sailor's contingency planning had been thorough. Still, as many will remember, Mother Nature and the Gulf of Mexico presented frightful challenges during the 2004 *Regata de Amigos*. *by Olaf E. Roennspiess*

30 Cruising in the Comfort Zone

After some boat repairs and placing equipment orders, the first-time Texan cruisers depart Isla Mujeres' Marina Paraiso, with *Rose of Sharon* headed for Belize. Her crew found the Mexican coastline anchorages idyllic, but were eager to begin their island adventures. *by Sharon A. Kratz*



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About the cover...

This month, members of the Gulf Coast Yacht Brokers Association offer new, used and repo'd vessels for sale at Clear Lake and Freeport locations.

— Photo by Mike DuBois

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