# Alternating Current/Reverse Polarity

By Don Casey
Revised by BoatUS editors in April 2012

Since alternating current, by definition, flows in one direction then the other, what is meant by polarity when applied to an AC shorepower connection? And why is polarity so important on a boat? Even though the current flow reverses, the "hot" wire is connected to the generator at the power plant and the "neutral" wire is connected to ground there. That means the electricity flows to us through the hot wire. All switches and circuit breakers must be in this side of the circuit to disconnect the load from the power.

Now suppose connections to the dockside receptacle are reversed. That puts all the AC breakers on the boat in the neutral side of the circuit. An overload might still trip the breaker, but since the breaker is in the neutral side, the circuit is unprotected from a short. Current will continue to flow until the circuit burns open. A fire aboard is the likely consequence.

Reversed polarity also presents a serious shock risk. Turning off a breaker appears to remove power from the circuit because it turns off all appliances connected to that circuit. But with reversed polarity you have disconnected the appliance from ground, not from power. The circuit is still live!

If your AC switch panel does not have a polarity tester, buy a plug-in tester and use it. Most also detect an open grounding wire and other dangerous conditions.