CORROSION SURVEY

DATE:_____

Name of boat_____

Style and make of test equipment_____

Highest voltage metal in underwater system_____

(Metal voltage (in seawater) : -Aluminum 625, Steel 425, Bronze 200, SS Steel 50/450)

Read test zinc beside boat - voltage is_____

All immersed metal is electrically connected (bonded) and the voltage is_____

Disconnect batteries - bonding system voltage is_____

Pull shore cord - bonding system voltage is_____

Dock A.C. ground reading is_____

Connect shore cord - bonding system voltage is_____

All D.C. equipment operated and no voltage change_____

All A.C. equipment operated and no voltage change_____

ZINC SAVER TEST

Disconnect wires on one side of the installed unit:

Read continuity between wires still connected to disconnected wires. There should be no circuit.

Continuity:_____: No continuity:_____

Read continuity across zinc saver. Change leads and read opposite direction. Both readings should be approximately the same both ways + or - 15%. Readings will vary between styles of meters.

Continuity - left to right_____right to left_____

BONDING CONTINUITY TEST (OUT OF WATER)

Read from zinc to all protected metal parts in bonding system

All parts connected - no resistance_____

Read from zinc(s) to all bolted and associated metal parts of I/O or outboard motor

All parts connected - no resistance_____

Use digital or 50,000 Ohms sensitive analog continuity meter + or - 30 Ohms acceptable

YACHT CORROSION CONSULTANTS

PORTABLE - ANALOG CORROSION TEST METER

YACHT CORROSION CONSULTANTS
2970 Seaborg Ave.
Ventura, CA 93003
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OWNERS MANUAL & INSTALLATION GUIDE

PORTABLE CORROSION TEST METER INSTRUCTIONS

TO CHECK THE ACCURACY OF YOUR PORTABLE CORROSION TEST METER GET A SMALL PIECE OF ZINC (PREFERABLY MILITARY SPEC) IE: PENCIL ZINC ETC.. READ THE ZINC WITH YOUR TEST METER IN A SOLUTION OF 2 TO 3 TABLESPOONS SALT IN A GLASS OF ROOM TEMPERATURE WATER.

THE VOLTAGE SHOULD BE IN THE 910 - 1020 RANGE. IN THE FUTURE, IF YOU ARE WONDERING ABOUT THE ACCURACY OF YOUR METER, YOU CAN CHECK IT WITH THE SAME PIECE OF ZINC AND KNOW THE METER IS ACCURATE.

ONE CAN ALSO ESTIMATE THE CONDUCTIVITY OF BRACKISH WATER OR FRESH WATER. IF THE SALT WATER TEST IS 960 AND THE WATER BESIDE YOUR BOAT READS 650, THE WATER IS MUCH LESS CONDUCTIVE THAN NORMAL SALTWATER AND YOUR ENTIRE RELATIVE NOBEL SCALE WILL SHIFT CORRESPONDINGLY. 650 DIVIDED BY 960 EQUALS 33%, THE ENTIRE SCALE SHIFTS 33% FROM THE SALTWATER READINGS.

NOTE: IF YOU BOUGHT OUR ANALOG CORROSION TEST METER AND ARE WORKING WITH FRESH WATER, CALL US AND WE WILL SEE ABOUT AN EXCHANGE FOR OUR PORTABLE DIGITAL CORROSION TEST METER.

TO CORROSION SURVEY

We are at the boat (fiberglass with twin I/O's). The vessel side voltage of our test zinc is recorded on the corrosion survey checklist - (see also blank corrosion survey sheets in the Corrosion Workbook). Mark each immersed metal's voltage on an outline of a boat (as shown in Corrosion Workbook) . If the bonding system is sound, all readings are the same. If the voltage of the bonding system is in the normal Noble scale voltage range, the metal is not being protected. The normal 'FREELY ERODING' voltage in sea water for Bronze - 200, Steel - 425, Aluminum - 625. The voltage must be at least 200 millivolts above the metal's Noble scale 'FREELY ERODING' or normal position on the scale to be protected.

EXAMPLE

The normal reading of Aluminum in sea water is approximately 625.

Protection for a metal is at least 200 above its freely eroding voltage or approximately 825 on Aluminum.

Place enough zinc in contact or wired ti the Aluminum so that the voltage is above 925 or so. The voltage should stay above 825 for many months. You can hang a zinc over the side as long as it is electrically connected to the metal you wish to protect.

Aluminum and Steel can be damaged by overvoltage (approx 1500 in seawater). Zinc, which Noble scale reading is 1050 cannot hurt Steel or Aluminum. Impressed current systems can.

With the Portable Corrosion Test meter connected to the I/O; Disconnect the batteries. Do not just turn off the master switch, there might be equipment wired around the switch.

Verify that the bonding system voltage does not change. Reconnect the batteries - verify voltage.

Disconnect shore power - verify that the voltage does not change. If the voltage rises, it means the boats ground is connected to the shore power (as it should be) and there is no galvanic isolator or isolation transformer in the system.

See our widely used product call 'ZINC SAVER' . It keeps the safety A.C. ground while breaking the galvanic connection. The ZINC SAVER' has been tested to pass all requirements by us, several major boat companies and TERRALABS, an independent testing laboratory.

Another way to test if you are losing zinc through the A.C. ground wire is to disconnect the A.C. cord from the side of the boat - place a milliammeter in line from the boat receptacle ground to the A.C.. cord ground and read the milliamp current flow. That is the amount of zinc you are supplying to other boats and the dock metal.

Reconnect the shore power - verify bonding system voltage.

Your boat is now galvanically sound. The bonding complete - the voltage is over freely eroding by 300 or more for sufficient protection for the boating season and you are not supplying your zinc (or your valuable boat metal) to other boats and the dock.

If a part corrodes and the zinc voltage is correct. Check with a digital continuity meter from the zinc(s) to the part. Resistance of over 30 ohms is a problem Most I/O companies have a jumper kit.

STRAY CURRENT

With the Portable Corrosion Test Meter connected to the bonding system or I/O: Read the voltage.

Turn the A.C. & D.C. breakers on and off.

Check for and operate equipment that bypasses the breakers; i.e.: bilge pumps, emergency radios, etc.

Make sure equipment operates; i.e.; water heater with hot water in it will not operate - turn on hot water until it gets cold.

Any permanent change of over 10 millivolts (40 on digital) while a breaker is on is a stray current problem on that particular circuit.