



How to Repair your instrument gauges

A broken gauge might seem minor, but can be enough to derail your cruise. They're not hard to troubleshoot, says Rubicon 3's Bruce Jacobs

Every boat has a number of gauges for water, fuel and waste tanks. Every so often one of them will stop working properly – giving either a false reading or no reading at all. That's not a significant breakage in itself, but enough to stand you into danger if you unexpectedly run out of fuel. With a bit of knowledge, it is an easy enough problem to troubleshoot and fix. The problem can only be one of three things: power to the gauge, resistance in the sender, or a break in the circuit. Here's what to look for.

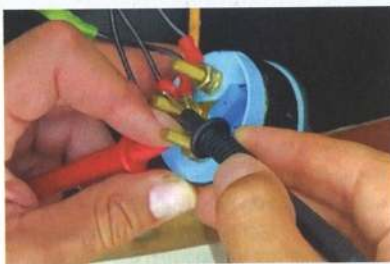
IDENTIFY WIRES

1 Working with your electrical system, switch off the instrument circuit before you do anything. Held in place by friction or a screw collar, remove the gauge from its mounting. The exact configuration of the wires varies from brand to brand, but the principle is the same and there'll be either three or four wires on the back, attached to terminal posts.

These are: a positive DC feed



in, marked 'I'; a negative, marked GND for 'ground' (this may have two wires to link several gauges to the negative); the sender, marked 'S', which receives information from the sensor. Some gauges will also have a fourth terminal for power to a backlight. Note that it's crucial you never touch a positive wire to the sender or you'll break the sender in the tank and probably the gauge as well.



CHECK THE VOLTAGE

2 The first thing we want to do is check that the gauge itself is getting power – if there's no voltage it won't show anything. Set your multimeter to voltage and place the probes on the negative and positive terminals. In a 12V system, it should show something around 13V, depending on the state of charge of your batteries.

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CHECK THE SENDER

3 On top of the tank will be the sender, to which two wires are attached. They may be different colours but it doesn't matter which way round they are. One will go to the sender post on the gauge and the other will go to the negative post on the gauge. Disconnect the wires and unscrew the sender unit – it'll either be a float on a vertical post or a horizontal lever arm. To check the sender alters the resistance, set your multimeter to Ohms and put the probes to the wires. As you slide the float up and down, the resistance should change, though the actual numbers are not important.



CHECK THE GAUGE

4 You can test the gauge by changing the resistance in the circuit. To remove all resistance, ground out the sender by putting a wire from the sender post to the negative, and the needle should jump across its full range as you do so. If it's working, you then know the problem is in the boat's wiring, so have a look for damaged wires or loose connections. Just be careful not to touch the wire to the positive post. Watch the video online at: youtu.be/FkaMUem98GQ

