Troubleshooting and repairing the Oliver 550 instrument cluster

The instrument cluster consists of fuel and temperature meters, and oil pressure and battery lights.

Both lights should come on when the ignition is switched on but the engine is not running. If the lights are not working, simply pull each straight out from the back of the cluster. Check the lamps by applying 12 volts DC to them. If they do not light, replace them. It is now possible to replace them with LEDs, which will pretty much guarantee that you never have to replace them again. The LEDs can be purchased on line for a couple dollars each.

If the lamps test OK, check for corrosion around the base. Ensure the bulb makes contact with both the shell and end contact of its socket. One way to do this is to look for continuity across the wires running to each bulb with an ohmmeter when the bulb is inserted in the socket (measure the resistance between the wires -- should be a few ohms). Alternately, apply 12 volts between the wires and see if the lamp lights. If there is no problem, and they still don’t work in practice, the problem is not in the cluster. Check your wiring. Then check the oil pressure sender. You can check with an ohmmeter that it is closed with the engine off, and opens when the engine runs. Then, with the engine running, check that 12 volts are present on the lead from the voltage regulator to the battery light. If not, there may be a problem with the voltage regulator.

If the meters are not working correctly, especially if neither is working correctly, check that the cluster is satisfactorily grounded by measuring between the cluster case and the tractor frame with an ohmmeter. It should read very close to zero. If not, make it so. One way to do this is to run a wire from one of the cluster retaining screws to ground.

The meters in the cluster are not intended to be serviced (more on this below). However, you can check them with an ohmmeter. Disconnect all wires to the meters. Measure each meter from the positive terminal to the case. It should
read about 120 ohms. Measure between the positive terminal and the sensor terminal. That should also read about 120 ohms. If you read nothing, or a short, that particular meter coil is bad and you will probably have to replace the cluster because internal parts are not available.

Each meter consists of two identical coils that form a “magnetic balance” with a moving needle. One coil is connected between the positive terminal and ground and creates a magnetic “bias” with respect to the needle. The other coil is connected between the positive terminal and grounded through the resistance of the fuel or temperature sensor. My fuel sensor reads about 50 ohms full and 190 ohms empty. The temperature sensor should span about the same range -- measure it at room temperature and in boiling water to test it. If either sensor is bad, you will have to replace it.

The instrument cluster is not meant to be serviced, but it is possible to carefully pry up the chrome bezel from behind to open it up. I used a paint can opener with a sharpened tip to do this. However, there is the very real possibility of further damaging the cluster when opening it. If you do succeed in opening it, the internal parts can be repaired in some cases. For instance, I found one of the tiny copper wires from the bias coil in my fuel meter had broken lose from the positive terminal. I was able to re-solder it and return the meter to functionality. If a coil is shorted or open, you have a bigger problem. The coil can be removed, the wire unspooled, and new wire of the same gauge and same number of turns put back on. But this is a pain staking job fraught with the possibility of failure and/or further damaging the meter. If you are not equipped to deal with the problems, then you are better off purchasing a new cluster.

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