



207-729-8500

We have prepared this guide as a service to our customers with some electrical troubleshooting experience. It should help you gain a little insight into how the thruster works and hopefully point you in the right direction.

### **QL Bow and Stern Thrusters Basic Electrical Troubleshooting**

All QL bow thrusters use similar wiring of the controls.

The drive motor is a DC 12 or 24 series wound that is designed to draw a high current and to run in short bursts.

There is a large reversing solenoid with two separate coils that are used to run the motor forward or reverse.

The control circuit board is used to protect the thruster against damage from switching directions too quickly and provides some protection against over heating and low voltage.

Here are a few steps to take in troubleshooting basic thruster electrical problems.

#### ***With the power disconnected***

Remove the cover over the thruster terminals.

Check the condition of all the terminals, switches and fuses in the main power circuit to the thruster. Terminals should be tight and clean and not discolored by heat or show signs of burning.

Check the condition of the solenoid for damaged contacts.

Check for loose or damaged conductors on the cable wiring to the control circuit box.

#### ***Turn the power back on***

Measure the voltage on the main power terminals.

Measure the voltage on terminals 1 and 4 on the control circuit box.

The voltage should be a good solid reading 12.5/25 VDC or 14/28 volts if there is a battery charger or engine running.

Test the thruster with the joystick or switch. Remember the control circuit will prevent reversing directions too rapidly.

If there is no response using the joystick or switch wire a short jumper wire or test leads to terminals 5, 6 and 7 on the control circuit. Momentarily connect the wire attached to terminal 5



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(common) to terminal 6 – the motor should run in one direction. Test the other direction by momentarily connecting the wire on terminal 5 to terminal 7.

If the motor runs both directions with the jumper wires but not with the joystick (or switch) then there is a problem with joystick control or the connecting wiring.

If the motor fails to run with the jumper wires on the control box the next step is to test is to carefully power the solenoid coils directly. The wires to the contactor solenoids are connected to terminal 2 and 3 on the control circuit box. Remove the wires from terminal 2 and 3. Connect a test lead to terminal 1 (12/ 24V supply) Momentarily connect to the power test lead to one of the solenoid wires – the relay should energizes and the motor should run in one direction. Allow the motor to come to a complete stop and then test the opposite direction with the other solenoid wire.

If the motor runs in both directions OK then there is a problem with the control circuit board and it needs to be replaced.

If it runs in one direction but not the other there may be problem with the contactor or the wiring to the solenoid.

If the motor fails to run in either direction but the solenoid contacts pull in strongly test the power supply by connecting a voltmeter on the main power terminals. Power one of the solenoid contacts. When relay contact close observe the voltage.

If it falls below 10 volts then there may be a problem with the main power supply – batteries may be weak or there may be poor connections or terminals.

If the battery voltage remains high and the motor does not run then there is a problem with the motor brushes or the internal windings.

These tests don't cover every possible situation but should help identify many of the more common problems encountered with the thruster controls.

If you are successful in pinpointing a problem, we will be happy to sell you replacement parts. Please call us at: 207-729-8500.

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