

HA0049

Hydraulic Pump/Motor Troubleshooting Kit

This hydraulic hoist trouble shooting kit allows you to do a field test on the hydraulic pump system to determine if it is performing properly in the field environment. This will also determine whether the problem is in the pump or the power supply to the pump.

The kit consists of the following items:



110V Voltage Tester



Pressure Gauge with Connections

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**Snap-On Battery Tester
Stock # YA201A**

Description: 6V/12V tester for conventional and maintenance-free batteries. Perfo charge test, 125-amp battery load, and starter current draw. Heavy duty insulated clamps with 300-amp jaws.

Recommended 12 Volt DC Tester

A 12 volt battery tester is **NOT** included with this kit because most marine dealers already have a battery tester in their shop that can be used to determine whether a battery is good. The battery tester must be capable of applying a test load on the battery to determine whether it is capable of supplying the necessary power to operate the pump.

If you do not have a tester in your shop, we suggest that you purchase a tester similar to the one pictured.

IMPORTANT: Follow manufacturer's instructions for operation of the voltage meter.

ADDITIONAL TOOLS AND EQUIPMENT YOU MAY CONSIDER TAKING WITH YOU ON A HOIST TROUBLE SHOOTING SERVICE CALL.

- * 100 Ft. 8 Gauge Extension Cord
- * New GFI Cord (Part No. 5310229 for 4000 – 9000 lb. 110 volt pumps)
- * New 2-Button Controller w/Key Switch (Part No. 5310257)
- * Hydraulic Fluid (Part No. 250037- 1 Quart Bio-Degradable Oil)

Initial Testing on the AC/110 Volt System

- * Check to see that the GFI circuit breaker is re-set.
- * Check that the pump cord is connected to the electrical power supply.

Perform the following functions on the hoist, preferably without a load, to determine whether the pump is operating correctly. Performing these functions will determine whether the pendant controller is operating correctly and can be eliminated as the problem.

- * Push the **UP** button on the pendant to see if the hoist will raise.
- * Push the **DOWN** button on the pendant to see if the hoist will lower.
- * **Key Switch Pendants**
Turn the key switch to the **AUTO** position to see if the hoist will go into the continuous **UP** mode, then stop when fully raised.

Earlier Version of pendant with OFF- ON buttons

Push the **ON** button to see if the hoist will go into the continuous **UP** mode, then stop when fully raised.

If the pump does not run at all or perform the above functions properly, it is possible that the pump is not receiving the proper signal through the pendant controller. Disconnect the existing pendant controller and check for any corrosion or bad connections. If corrosion exists, clean all terminal connections and coat with WD40 before reconnecting. If this does not correct the problem, replace the pendant with a new 2-button pendant controller w/key switch (Part No. 5310257) that you know operates correctly. If the pump operates correctly, replace the pendant. If it doesn't, the problem is elsewhere.

Isolating the Micro/mercury Switch Located Inside the Winch Tube

If the pump will not run when the pendant button is pressed or will not shut off when the platform is in the fully raised position, it is possible that the micro switch located inside the winch tube is malfunctioning.

A micro switch located inside the winch tube serves as the automatic shutoff for the hydraulic pump once the hoist plat-

form is fully raised (hydraulic cylinder is fully retracted). **For testing purposes only**, this micro switch can be isolated from the circuit using the following procedure.

NOTE: Once the micro/mercury switch is eliminated from the circuit per the instructions below, the pump will not shut off automatically when the platform reaches the fully raised (hydraulic cylinder fully retracted) position.

1. Locate the wire that is coming out of the hole in the winch tube next to the hydraulic hose ports. Note that on a 110 volt AC pump, the wire is connected to the box on the motor with a molded coupling.
2. Rotate the outer ring on the coupling and disconnect the couplings. Notice that there are two pins located inside the connector portion attached to the box that mate with the wires and connector section from the winch tube.
3. Strip both ends of a 6"-12 or 14 gauge jumper wire. Form the jumper wire into a loop allowing the stripped ends to be positioned so each end will contact a different one of the two pins in the box portion of the connector. The jumper wire will form a complete circuit allowing the pump to be operated without the micro switch in the winch tube.
4. If the pump will operate and perform all of its functions as listed above using the jumper wire, the problem is in the micro switch and it will need to be replaced. To replace the switch requires the disassembly of the winch tube.
5. Determine whether the winch tube has a mercury switch or a micro switch as follows:
 - If the electrical wire coming out of the winch tube has a gray covering, the winch tube has a mercury switch. Contact the Customer Service Department of **ShoreStation** at 1-800-859-3028 for either the repair or replacement options available to you.
 - If the electrical wire coming out of the winch tube has a black covering, the winch tube has a micro switch. The replacement part no. is 5310243.

Symptoms of Low Voltage for AC Motors

1. The motor is not operating up to full RPM and/or capacity.
2. The motor will not run at all.
3. The hoist platform will only raise and will not lower. Lowering the platform requires more voltage than raising because the directional valve used to change the direction of the oil flow is powered by the battery also.

- If the voltage is too low, the directional valve will not open because the motor is drawing all of the power supply.
- The motor will get warm to the touch after one complete cycle of operation. Any heat build-up that is hot to the touch before that period of time may indicate that there is low voltage. Operating the motor with low voltage may cause premature motor failure.

Checking the AC/110 Volt Pump and Electrical Supply to the Pump

How to Operate the 110 Volt Meter



- Raise the hoist platform until it is in the completely raised position. The boat is not required to be on the hoist at this time because we are testing the pump against the bypass in the pump.
- Unplug the power cord on the hydraulic pump from the power source at the hoist. Plug the 110 volt tester into the power source, then plug the hydraulic pump into the tester outlet.
- Press the volt button on the tester. The reading on the tester is the voltage in the line without a load. It should be reading between 110 and 120 volts.
- Press the **UP** button on the pendant controller for the pump. This will cause the pump to draw full current load because it is pumping against the bypass in the pump. While the pump is running check the volt reading on the meter. It must read a minimum of 110 volts.
- If the meter reads less than the required 110 volts, the power source is inadequate and needs to be changed for the pump to operate properly.
- If the meter reads 110 volts or higher the electrical supply to the pump is sufficient.
- If a problem exists, it may be in the pump.

Cause for Potential Low Voltage Problem

- Check the wiring starting at its source (Breaker Box) to the hoist and compare to the recommended wire length and wire size listed in the chart below.

Wire Gauge	Wire Gauge
Length (Feet)	
50'	14 ga.
75'	12 ga.
100'	10 ga.
150'	8 ga.
200'	8 ga.
250'	6 ga.
300'	6 ga.

- If the wiring length and gauge do not meet or exceed those specified in the above chart, contact your local electrician.

Items to Check if the Voltage Reading is Ok

IMPORTANT

The voltage **MUST** always be checked with the pump running and lifting either the fully-rigged boat that it will normally be carrying or against the bypass in the pump. **The voltage reading should never fall below 110 volts during the test.**

- If the voltage reading is good, check the GFI to make sure that it is not defective. Test by replacing the GFI with one you know operates correctly. Note that the replacement GFI cord must meet or exceed the gauge requirement and lengths specified in the above wiring chart. Use another power source that is not GFI protected for test purposes only to make sure the GFI is not the contributing factor to the problem.
- If the above conditions do not correct the problem, contact your local electrician to check the power source.
- If the power source is good and the GFI tests OK, the problem may be in the pump. Identify what pump you have by the description given at the end of these instructions. For further assistance on servicing the pump, contact the person identified under the appropriate pump manufacturer's information.

INITIAL TESTING TO PERFORM ON A 12 VOLT DC SYSTEM

Perform the following functions on the hoist, preferably without a load, to determine whether the pump is operating correctly. Performing these functions will determine whether the pendant controller is operating correctly and can be elimi-

nated as being the problem.

- * Push the **UP** button on the pendant to see if the hoist will raise.
- * Push the **DOWN** button on the pendant to see if the hoist will lower.
- * **Key Switch Pendants**
Turn the key switch to the **AUTO** position to see if the hoist will go into the continuous **UP** mode, then stop when fully raised.

Earlier Version of pendant with OFF- ON buttons

Push the **ON** button on the earlier versions of the pendant to see if the hoist will go into the continuous **UP** mode, then stop when fully raised.

If the pump does not run at all or perform the above functions properly, it is possible that the pump is not receiving the proper signal through the pendant controller. Disconnect the existing pendant controller and check for any corrosion or bad connections. If corrosion exists, clean all terminal connections and coat with WD40 before reconnecting. If this does not correct the problem, replace the pendant with a new 2-button pendant controller (Part No. 5310257) that operates correctly. If the pump operates correctly, replace the pendant. If it doesn't, the problem is elsewhere.

Isolating the Micro/mercury Switch Located Inside the Winch Tube

If the pump will not run when the pendant button is pressed or will not shut off when the platform is in the fully raised position, it is possible that the micro switch located inside the winch tube is malfunctioning.

A micro switch located inside the winch tube serves as the automatic shutoff for the hydraulic pump once the hoist platform is fully raised (hydraulic cylinder is fully retracted). **For testing purposes only**, this micro switch can be isolated from the circuit using the following procedure.

NOTE: Once the micro/mercury switch is eliminated from the circuit per the instructions below, the pump will not shut off automatically when the platform reaches the fully raised (hydraulic cylinder fully retracted) position.

1. Locate the wire that is coming out of the hole in the winch tube next to the hydraulic hose ports. Note that on a 12 volt DC pump the wire is connected to a wire harness that has a mating plug on it.
2. Rotate the outer ring on the coupling and disconnect the wires. Notice that there are two pins located inside the connector portion attached to the wire harness that mate with the wires from the winch tube.
3. Strip both ends of a 6"-12 or 14 gauge jumper wire. Form the jumper wire into a loop allowing the stripped ends to be positioned so each end will contact a different one of the two pins in the box portion of the connector. The

jumper wire will form a complete circuit allowing the pump to be operated without the micro switch in the winch tube.

4. If the pump will operate and perform all of its functions as listed above using the jumper wire, the problem is in the micro switch and it will need to be replaced. To replace the switch requires the disassembly of the winch tube.
5. Determine whether the winch tube has a mercury switch or a micro switch as follows:
 - If the electrical wire coming out of the winch tube has a gray covering, the winch tube has a mercury switch. Contact the Customer Service Department of **ShoreStation** at 1-800-859-3028 for either the repair or replacement options available to you.
 - If the electrical wire coming out of the winch tube has a black covering, the winch tube has a micro switch. The replacement part no. is 5310243.

Symptoms of Low Voltage or Bad Connections for DC Motors

1. The motor is not operating up to full RPM and/or capacity.
2. The motor will not run at all.
3. The motor will only click instead of run.
4. The hoist platform will only raise and will not lower. Lowering the platform requires more voltage than raising because the directional valve used to change the direction of the oil flow is powered by the battery also.
5. If the voltage is too low, the directional valve will not open because the motor is drawing all of the power supply.
6. The motor will get warm to the touch after one complete cycle of operation. Any heat build-up that is hot to the touch before that period of time may indicate that there is low voltage. Operating the motor with low voltage may cause premature motor failure.
7. Re-charge the battery to bring it back up to full charge. If the battery holds a full charge, raise and lower the platform without the boat on it. If it operates OK, then place the boat on the platform and repeat another cycle. **DO NOT cycle more than once with the full load without allowing the motor to cool. Over heating the motor could occur causing damage to the motor. If two complete cycles are performed back to back, wait 10-15 minutes for the motor to cool down to ambient temperature before you run another cycle.**

8. Replace the battery with a deep cycle battery that meets the specifications as listed below.

ShoreStation recommends that the battery used to power the 12 volt DC hydraulic pump must meet or exceed the following specifications to operate the pump properly.

The specifications are:

Marine Deep Cycle Battery
700 Cranking Amps
160 Reserve Capacity Minutes

Any battery that does not meet the above specifications may give you unsatisfactory results.

Checking a 12 Volt Battery for the DC Hoist

We recommend that you use a 12 volt battery tester that has a built-in load device, so the battery can be checked under a specified load. This is the best way to determine whether the



Test the battery as follows:

1. Attach the leads from the battery tester to the battery terminals (**Red-Positive, Black-Negative**).
2. Using the load that is built into the battery tester, apply the load to the battery. The test gauge will indicate to you whether the battery is charged and the cells are good. The voltage range on a good battery is from 10.5 to 12.5 volts. The tester will indicate this as well.
3. Check all battery terminal connections and ground wire attaching points to make sure they are clean and tight, so that they form a good connection. Attach the black (Negative) clamp from the tester to the bolt on the pump where the ground wire is attached. Run the load test again. This will test all battery terminals and connections.

4. If the test is not satisfactory, there is a bad connection somewhere in the circuit. Recheck all connections in the system to make sure they are clean of all corrosion or paint that may be at the connection points. Retighten all connecting bolts so that a positive connection is being formed between the wire terminals.
5. If the voltage range is between 10.5 and 12.5 volts, all connections are good and the power to the pump motor should be sufficient to operate the hydraulic pump.

Items to Check If the DC Voltage Reading is OK

1. The motor may be burned out. Please contact your distributor for pricing and availability.
2. The motor solenoid on a 12 volt DC system may be burned out. Please contact your distributor for pricing and availability.
3. Identify the pump you have by the description given at the end of these instructions. For further information on servicing the pump, contact the service person identified for the appropriate pump manufacturer.

HYDRAULIC OIL PRESSURE

How to Operate the Pressure Gauge



The pressure gauge is used to determine whether the output pressure of the hydraulic pump was properly adjusted when it was assembled. (Proper setting is 2450 PSI.)

WARNING: Do not use pressure gauge to test hydraulic system pressures greater than 3,000 lbs.

Check the bypass pressure as follows:

ShoreStation has supplied some 12 volt DC hydraulic pumps with a non-adjustable bypass valve installed at the factory and pre-adjusted to 2450 PSI. These pumps were manufactured by **Monarch**. It can be identified by the nameplate on the motor. The motor on this unit is painted black. All other hydraulic pumps have an adjustable bypass valve that can be adjusted as indicated in the following steps.

1. Lower the hoist platform and remove the boat from the hoist. Doing so will remove most of the internal pressure inside the system so the gauge can be connected in the line. The pressure will be checked by retracting the hydraulic cylinder to its fully retracted position (raised platform).
2. **ShoreStation** has built hydraulic hoists using two different types of switching systems located inside the winch tube. Use Step A or B below to determine which hose needs to be disconnected to perform the pressure test.



- A. If the winch tube being tested has a gray colored electrical cord coming out of the hole in the winch tube located next to the two hydraulic hose ports, disconnect the bottom hose from the hydraulic pump.
 - B. If the winch tube being tested has a black colored electrical cord coming out of the hole in the winch tube located next to the two hydraulic hose ports, disconnect the top hose from the hydraulic pump.
3. Once the hose has been disconnected couple the pressure gauge to the hydraulic pump port that the hose was just removed from by using the proper coupling on the gauge. Attach the hose just disconnected to the other gauge coupling.
 4. Press the pendant **UP** button. The pump will continue to raise the platform until it is in the fully raised position. The pump will then pump oil through the bypass indicating the total amount of pressure the pump is generating. Continue to press the **UP** button until a stable pressure reading is established. The output pressure of the pump should be 2400-2450 PSI.
 5. If the pressure reading is less than the 2400-2450 PSI, adjust as follows:
 6. Locate the silver hex shaped cap nut located on the inside of the 1-1/4" square pump block mounted between the motor and the oil reservoir of the pump assembly. Remove the cap nut by turning it counter-clockwise. There is also a rubber seal ring that keeps the

oil from leaking around this nut base that may come loose when the nut is loosened. Be careful not to lose or drop either in the water while removing.

7. Notice that the stud bolt on which the cap nut just removed was threaded onto has a screw driver slot machined into the end of it. Turning this stud clockwise with a flat screw driver will increase the output pressure while turning the stud counterclockwise will reduce the output pressure.
8. Turning the stud approximately 1/4 turn will change the output pressure about 300 PSI. Turn the stud in the proper direction to achieve the desired pressure.
9. Recheck the output pressure by running the pump as established earlier in Steps 3 & 4. Continue to turn the stud the correct direction and rechecking the output pressure until the 2400-2450 PSI has been achieved.
10. **NOTE: Pressure settings greater than 2450 PSI are NOT RECOMMENDED. Settings greater than 2450 PSI will create extreme internal pressure in the hydraulic system causing the hoses to burst and other hydraulic component parts to fail.**
11. Once the desired pressure has been achieved, reinstall the cap nut removed in Step 6 to lock the pressure setting in place.
12. Recheck the pressure output a final time to make sure the stud did not turn as the cap nut was being reinstalled.
13. Once the pressure is set, lower the platform until the platform is in the water. Doing so may remove most of the internal pressure that is inside the system. Remove the pressure gauge from the pump installed to check the pressure. Reattach the hose to the pump. If there is any internal pressure against the check valve either inside the coupler or the coupling on the end of the hose, it has to be released before the coupling can be made. This pressure can be released by tapping the **DOWN** button lightly just to remove enough pressure for the coupling to be made. Allowing the system to set for a while will also allow the pressure to bleed off internally. The valve in the coupling on the end of the hose can also be tapped slightly to release the internal pressure. If this procedure is done, the coupling must be placed in a container or wrapped with a rag before the valve is tapped lightly with a hammer so that the oil under pressure is not expelled and sprayed on the surroundings.
14. Adjustment is complete.

After you have performed the above tests and your problems appear to be isolated to the pump, we suggest that you contact the customer service department of the appropriate pump manufacturer for assistance.

For all 110 Volt AC Powered Pumps and 12 Volt DC Powered Pumps with Gold Motor Housings

Contact: **Force America**
30 North 25th St.
Fort Dodge, Iowa 50501
Phone No. 515-573-8129
Direct: 888-229-3730
Fax: 515-955-2019
www.forceamerica.com
Toll Free: 1-800-362-2994

Tom Kauffman Sales/ Service Specialist
Direct Dial No. 888-845-5879
515-574-0318
800-362-2994 Ext. 318

For all 12 Volt DC Powered Pumps with Black Motor Housings

Contact: **Monarch Hydraulics, Inc.**
P. O. Box 1764
Grand Rapids, MI 49501-1764
Phone No. 616-458-1306
Fax: 616-458-1616
www.monarchhyd.com

Daniel Ferguson
Phone: 815-222-5886
Fax: 815-885-4562

POTENTIAL PROBLEMS RELATED TO THE PUMP

The appropriate manufacturer can help you diagnose other potential problems which include, but are not limited to, the following examples:

1. Check the oil level in the reservoir to make sure it has adequate oil to operate the hydraulic cylinder through its complete stroke. The oil level must be checked when the platform is fully raised. When raised, the oil level in the reservoir is 1-2" from the top of reservoir. Oil is available from **ShoreStation** in quarts.
2. The solenoid on the directional valve that changes the direction of the oil flow to raise or lower the platform may be burned out. The directional valve may not be receiving enough voltage to make it open.
3. The directional valve may have contaminants lodged in the valve causing it to not open and close properly. If the valve is stuck with contaminants, even a fully powered solenoid may not be able to open it. The valve must be cleaned of all contaminants to operate properly. If the directional valve is still not functional after this cleaning, the valve will need to be replaced.
4. If the problem appears to be in the hydraulic pump, the pump will need to be replaced. Check the purchase date on the hoist to determine if it is still under warranty. If it is past the warranty date, it is the customer's responsibility to have it replaced or repaired. Please contact your distributor for pricing and availability on this pump.

