



Dragonfly Service Tips

Preventative Maintenance and Mechanical Troubleshooting

Airboats are very high maintenance vessels. Due to the remote areas of operation, some mechanical aptitude could prevent an overnight stay in a desolate area. The following is a list of tools and spare parts that are recommended to be on board, in addition to safety gear, prior to any trip. Also included are items to help in case your airboat gets stuck on dense vegetation, tussocks, high ground, etc.

Tools	
Regular pliers	Spark plug socket 7/8 inch
Channel locks	Sandpaper (fine grain)
Vise grips	Fingernail file/point file
Lon-nose (needle-nose) pliers	Feeler gauges
Cutting pliers	Test light
Phillips and slot-head screw drivers	Jumper cables
Combination wrenches to 3/4 inch	Electrical tape/duct tape
Adjustable wrench to 1.5 inches	Tie wire, hose clamps
Set of shallow and deep sockets to 3/4 inch in 3/8 drive	Fuses
3/8 drive ratchet	
Tools to help get you un-stuck	
Come-along	Cable (at least 30 feet)
Winch	Hurricane stakes with 4' pipe or pry bar to anchor stake
Shovel	Push Pole
Machete	Hand saw
Gloves	
Spare Parts	
Alternator belt	Engine coolant
Spark plugs	Extra engine oil
Assorted nuts, bolts, and washers, including Alternator bolt.	Other parts as necessary for your particular boat
Stainless steel throttle cable and crimping	

CAUTION! Avoid entering the propeller cage to make repairs in water of sufficient depth for the boat to sink.

General Preventive Maintenance

Newer engines follow manufacturer guidelines, etc.

One of the most important and perhaps the most overlooked maintenance procedures is to keep equipment clean. At least once a week, all equipment should be thoroughly washed down. By doing this, there is an opportunity to look the equipment over and inspect it for possible loose parts or cracked pieces that might detach and strike the propeller, causing damage. One other important feature of keeping the engine clean is that it will run cooler. This is possible because the surrounding air will be able to get to the engine and eliminate some of the heat.

After washing, all grease fittings should be lubricated and all moving parts should be oiled. Grease fittings should be greased at least after every 50 hours of operation, this will add years to the life of the equipment. Grease fittings on trailer wheels should be watched closely, checking for splattered grease which may indicate damaged bearings.

Aircraft and Automotive

- **Exhaust System**

Check for leaks – leaks between the exhaust manifold and cylinder may cause engine damage.

Check flex pipe – examine for corrosion and replace as needed. Check mounting points.

- **Propeller**

Wood: Wash and wax, check for cracks and dings. Return to the propeller shop for refurbishing when signs of wear, cracks, etc are evident. When airboat is not in use, store prop in a flat position. This assures that water will not collect in the tips of the prop and cause wood rot. Check mounting bolts for tightness.

Composite: Check with manufacturer. Repaint chips on blades with enamel paint. Check metal blade edges for damage. Check blade pitch. Check mounting blades.

- **Oil**

Check level before starting and change oil and oil filter according to manufacturer, or at least every 50 hours. Maintain exterior of oil cooler free from debris. *Aircraft:* Use only aircraft engine oil, check and clean oil screen at every oil change, and check and change oil lines as needed. Aircraft engine oil temperature should run between 150f – 180f. Aircraft engine oil pressure should run at least 25 psi during idle and at least 50 psi during operation. *Automotive:* Automotive engine oil pressure should run at least 15 psi during idle, and at least 35 psi during operation.

- **Batteries**

The terminals of a battery must be kept tight and free of corrosion. Loose terminals can cause a battery to fail or to charge improperly, and can cause loss of energy just when it is most needed to start an engine. In the worst case scenario they can cause sparking which could cause an explosion in the presence of vapors. Batteries should be firmly secured in airboats and away from all gas containers. Battery terminals must be covered against accidental short circuits, and if it is necessary to work on a battery, eye protection must be worn. Engine heat can result in the loss of electrolyte in the battery, which reduces battery capacity and can cause failure. If there seems to be low energy in the airboat battery, the electrolyte should be checked.

- **Starter and bendix**

Keep Bendix lubed with lithium grease. Check for cracks on the starter mounting brackets and bolts for tightness.

Aircraft Engine

- **Engine:**

Air-cooled, no radiator. Keep all exterior engine components free of excessive grease, oil, dirt, debris and other material that would affect the cooling of the engine. Inspect for possible loose parts or cracked pieces that may detach and strike the propeller. Aviation fuel is recommended, but when not used or available use high octane automotive fuel.

- **Magnetos:**

No distributor, dual ignition. Occasionally spray with a moisture displacing solvent (CRC or WD-40). Also, check spark plug wires for cracks in insulation and replace as necessary.

- **Alternator:**

Keep battery terminals clean and tight. Check belts for wear and replace as necessary. Check mounting brackets for cracks and bolts for tightness.

- **Updraft Carburetor:**

Keep intake clean from dirt and debris. Drain water from carburetor. Check fuel lines for leakage, cracks, excessive wear and replace as necessary. Ensure all clamps are tight.

- **Fuel Pump:**

Mechanical pumps require no maintenance. Electric pumps may require periodic cleaning of the internal strainer.

- **Fuel filter/Water Separator:**

Periodically change cartridge.

Automobile Engine

- **Engine:**

Liquid cooled. Keep all exterior engine components free of excessive grease, oil, dirt, debris and other material that would affect the cooling of the engine. Inspect for possible loose parts or cracked pieces that may detach and strike the propeller.

- **Distributor:**

Occasionally spray with a moisture displacing solvent (T-9, CRC or WD-40) Also check spark plug wires for cracks in insulation and replace as necessary. If applicable to your engine, check distributor points to see if they are opening and closing when the engine is cranked. Check for corrosion, use fine sand paper or a fingernail file to keep clean

- **Alternator:**

Keep battery terminals clean and tight. Check belts for wear and replace if necessary. Check mounting brackets for cracks and bolts for tightness.

- **Carburetor:**

Check the carburetor breather for dirt and debris and clean as necessary. Check fuel lines for leakage, cracks, excessive wear and replace as necessary. Ensure all clamps are tight. Check accelerator linkage. Cover carburetor when not in use to preclude rainfall collecting in carburetor.

- **Fuel Pump:**

Mechanical pumps require no maintenance. Electric pumps may require cleaning of the internal strainer.

- **Radiator:**

Check fluid levels before starting engine. Change fluid per manufacturer recommendations. Flush system yearly to prevent rust buildup. Check hoses for cracks, leaks, and weak points. Ensure all hose clamps are tight. Check radiator fan belts for wear and replace as needed. Check radiator cap for leaks and proper pressure. Automotive engines should run between 150 F and 180 F.

- **Water Pump:**

While engine is running, check for leaks. Replace if necessary. Ensure that thermostat is functioning properly.

- **Fuel Filter/Water Separator:**

Periodically change cartridge.

- **Reduction Belt Drive:**

Belt: Tighten as needed (see page 16 for details) Grease bearings every 30 hours, but do not over grease. *Gear:* Check oil level for the gear and listen for unusual noises. Use 75-80 weight gear oil.

Airboat Hull

- **Aluminum or fiberglass:**

Wash regularly to keep free of dirt and oil. Keep interior of hull free of debris, grease, and oil. A dirty hull is a fire and environmental hazard. Check for leaks

- **Polymer:**

Check to see if the material is attached properly. Look for cracks, repair as necessary

- **Grass Rake:**

Repair any damage

- **Engine Stand:**

Check for cracks and keep painted. Check condition of motor mounts; repair as necessary.

- **Steering:**

Keep fittings lubricated. Check cable operation and mounting brackets

- **Bow Attachment:**

Check to ensure it is secure and not rusting.

Trailer Maintenance

- Refer to DSL Boating Policy

Troubleshooting Airboat Engines

Preventive maintenance will eliminate most mechanical troubles, but not all of them. Equipment may occasionally malfunction, while on the waterways. Therefore, field troubleshooting is of great importance. When performing maintenance and mechanical troubleshooting in the field, safety should be the top priority for all employees. In no way should the health and safety of airboat operators be compromised during field troubleshooting.

Remember:

- If an airboat is skipping or missing, the airboat should not be operated. Running an engine that is skipping will cause over-heating and lead to costly repairs. The engine should never be run wide open, or at high RPM's for long periods of time. This will also cause over-heating.
- If an operator experiences extreme sudden vibration, the airboat should be shut down immediately.

The battery should then be disconnected and the operator should look for prop damage and any loose or sheared prop bolts. Operators should hold the prop by one end and try to move it from front to rear to see if it moves. Do not operate the airboat until the problem is solved. It could be very dangerous. (Caution: Under no circumstances should aircraft engines be fully turned.

Turning will cause the engine to turnover due to static build-up).

- Before attempting to repair electrical faults, check closely for gas fumes, specifically in the bilge area. Eliminate any vapors. If fumes persist, locate and repair leak. If no problems were found upon completion of inspection, the airboat operator should radio for mechanical assistance.
- Fire extinguishers should be checked monthly (indicate on the tag), to ensure the extinguisher has the proper amount of pressure. Check the seals to ensure that they are intact. Check the nozzle to insure that there is no powder or obstructions in it; if there is, replace the extinguisher. Occasionally, invert the extinguisher and hit the base with the palm of your hand to insure that the powder has not packed and caked due to vibration. It is a known fact that caking of dry extinguisher agent is a major cause of failure of dry chemical extinguishers. All fire extinguishers should be taken in for annual checks.

The following are some tips for correcting breakdowns or problems in the field:

- **Engine will not turn over**
 - ③ Check battery switch and cables
 - ③ Check operation of starter switch with test light
 - ③ Attempt jumping across solenoid

- **Engine turns over but does not start**

An engine that turns over, but will not start, is usually an indication that there is a lack of ignition (spark) or lack of fuel

Aircraft – Check to see if magneto switches are on, remove plate from magnetos to see if points are firing. If not, file or replace points.

- ③ Depress accelerator until gas drips from carburetor. If no fuel appears, break down carburetor and remove accelerator pump and oil leather plunger, replace and try again
- ③ *Automotive* – Check spark plug firing; remove a spark plug, reconnect the plug wire and ground the plug housing on the engine. Turning the engine over will produce a visible spark and/or an audible snap if the plug is firing. If a spark does not occur, check all wire connections on the coil and distributor cap.
- ③ Check to see if fuel pump is on
- ③ Check fuel filter, replace if clogged
- ③ Check fuel lines, and fittings
- ③ Drain water from carburetor
- **Engine starts, but loud grinding noise comes from starter**
 - ③ Check bendix gear for proper operation
 - ③ Spray bendix with T-9, WD-40 or CRC
 - ③ Give starter a light tap
- **Starter engages, but engine does not turn over – you hear clicking noise**
 - ③ Grease and oil bendix gear and shaft
 - ③ Give starter a light tap
- **Engine runs, but you hear a whistling noise**
 - ③ Check intake manifold gaskets. Replace blown gaskets. Do not operate with a blown gasket as it may cause engine damage
- **Engine runs rough or suddenly quits**
 - ③ Check, fuel supply, fuel filters, fuel water separator, and spark plugs
 - ③ Check propeller
- **Engine is overheating**
 - ③ *Automotive* – Check radiator fluid level, and hoses for leaks. Check water pump for leaks and thermostat.
 - ③ *Aircraft* – Check oil cooler for debris, and check engine oil level.