

Aquatic Plant Harvester

Operation & Safety Manual



AQUARIUS
S Y S T E M S

Operation & Safety Manual

ONLY TRAINED AND AUTHORIZED PERSONEL TO USE THE FOLLOWING POINTS

PREFACE

All harvester operators and maintenance personnel **MUST** read this entire Operation & Safety Manual. To prevent accidents, each person **MUST** be thoroughly familiar with the harvester, know the proper safety procedures, practice operating the harvester, and above all, **USE COMMON SENSE**. Some points may be repeated several times throughout this manual, this is to make sure that the proper procedure is understood.

If questions come up which are not answered in this manual, please do not hesitate to contact a representative of D & D Products and Aquarius Systems. We always enjoy hearing from our customers, and we are happy to provide you with clear and concise answers to any questions. If in doubt, **ASK**.

INTRODUCTION



You are about to become the proud skipper of a very complex work boat, namely, an Aquarius Systems Aquatic Plant Harvester. The success of your aquatic plant removal program depends upon how well the equipment performs its harvesting function. If properly maintained and operated within its limits, the harvester will perform as intended. As the operator, it is your responsibility to see to it that the harvester is “properly maintained and operated within its limits.”

An aquatic plant harvester is a very safe machine when used correctly. However, any vehicle, including this harvester has operational hazards and can be dangerous if operated in a reckless manner, so it is important to read this manual and be completely familiar with your machine.

EQUIPMENT OPERATION

The operator is responsible for the actual day-to-day operation of the harvester. While the basic operation procedures are readily understood certain techniques, which apply to cutting, loading, storing, and unloading, are a skill that must be learned. In general, this can be accomplished in as little as a few days and will improve with time and experience.

NAVIGATING YOUR LAKE

The harvester is designed to withstand occasional minor impacts. However, continually hitting the lake bottom or submerged objects such as tree stumps, pier stakes, raft anchors, rocks, etc. may cause serious damaged to the cutter head and conveyor system. While cutting in shallow waters where water clarity is poor, do not attempt to cut at the maximum depth, as this makes it nearly impossible to detect obstacles. Harvesting equipment is expensive, and repairs can be costly and time consuming. It is best to harvest no deeper than visibility allows and spare the equipment undue damage.

If you are cutting in shallow water and suspect that you might be very near the bottom of the lake, there is one tell tale sign to look for – BUBBLES. If the cutter head is getting too close to the bottom, you will start to see lots of little air bubbles coming up just in front of the cutter bar. Pull the cutter head up right away! Adjust the cutter head to a safe depth or return to deeper water where the harvester is most effective. If you should start to take on mud or sludge from the lake bottom, reverse the input conveyor and dump the material back in the lake! This material is very heavy and may cause the harvester to begin loading unevenly – **NEVER TAKE MUD ON BOARD!**



In time, you will come to know the topography of your lake and which areas to avoid. You may want to consult locals in determining what areas might contain hidden hazards. If a survey of the lake has been done recently, ask to see any maps or photos that tell the story of your lake bottom. Always remain alert and be prepared to handle an unexpected obstruction.

When you must cut in areas known to contain obstructions, do not attempt to cut at maximum speed. **SLOW DOWN!** Take your time and cut at a speed which allows you to maintain complete control of the harvester. **Use extreme caution when harvesting near boats, rafts, piers, seawalls, etc.** A small gust of wind can easily push the harvester into these objects, causing damage to one or both. **NEVER harvest in areas where people are swimming!**



LOADING THE HARVESTER



Always keep the No. 3 discharge conveyor in its lowest position, except when discharging a load. Pay close attention to the way in which the harvested plant material is loading onto the harvester. If you are harvesting particularly heavy plant material, it may be necessary to take on smaller amounts and unload the equipment more frequently. In any event, it is very important that the harvester be loaded evenly to maintain the machine's balance. If the machine begins to list or lean to one side, it will continue to harvest deeper and load heavier on that side, making the problem increasingly worse.



The pinstripes on the side of your machine will help you determine the harvester's stability under load. **NEVER, under any circumstances, should you load the machine so heavy that water comes over the top of the barge.** If there is water coming over one side or even one corner of the barge, a serious listing situation has developed, and it should be handled very carefully.

If you notice that the harvester has a slight list with a partial load on it, it is best to discharge that load and start new. If the harvester is in a severe listing attitude with a full or almost full load on it, the situation has become dangerous and should be handled very precisely. This will be discussed under SAFETY PRECAUTIONS.

UNLOADING THE HARVESTER



Whenever you are unloading into a transport barge, shore conveyor, or trailer conveyor, it is important to maintain the harvester's balance. To do so, lower the No. 1 input conveyor below the surface of the water. Once you are aligned with the transport, shore conveyor or trailer conveyor, raise the No. 3 discharge conveyor to hitch. Lowering the No. 1 input conveyor into the water serves as a keel and helps to stabilize the machine.

MACHINE CLEANING



It is important that the harvester be kept clean and orderly at all times. Do not leave ropes or lines lying loose on the operator's platform – these could entangle the operator or fall overboard and get caught up in the paddle wheels or cutters. Keep the operator's platform free of oil, grease, and other slippery substances. Keep all areas clear of loose objects.



As weeds are cut and conveyed onto the harvester, they tend to build up in certain places. These areas include on the bow of the harvester just in front of the No. 2 storage hold conveyor; on the support bars under the No. 1 input conveyor; and on the deck under the No. 3 discharge conveyor. This accumulated plant material will cause damage to the conveyor mesh and frames if not removed regularly. Pay close attention to these areas while operating. It may be necessary to clean the harvester after three or four loads, or just once a day.

Weeds may also tend to build up in the two corners of the horizontal cutter bar. To clean these, raise the cutter head so that the horizontal cutter bar is just below the surface of the water. Reverse both Paddle Wheels for 10 seconds or as needed. This will make water flow toward the front of the machine and swirl around the cutter head. As it does this, the weeds should come loose and be carried forward. Now lower the #1 input conveyor and move forward to retrieve the weeds you have just loosened. **If you find it necessary to leave the operator's platform to loosen these weeds manually, TURN THE ENGINE OFF AND REMOVE THE IGNITION KEY FIRST! NEVER leave the operator's platform if the engine is still running and NEVER attempt to service any part of the harvester with the engine on.**



PERSONAL ATTIRE



Personal Floatation Devices are important potential life saving devices that are required on board the watercraft. Make sure when selecting a PFD that is E.U. approved to EN12402-3:2006 and is designed for a person of your size and weight. Even if not required to be worn, PFDs should be stowed in a location that is readily accessible.

In addition to a wearable PFD, one Type IV throwable device (e.g., cushions, ring buoys), which should be immediately available, is also required on all vessels 16 feet (4.87 m) or larger.



Operators should wear clothing which provides protection from sun exposure and the elements. NEVER wear loose or dangling clothing that might get caught in moving parts, and long hair should be pulled up and kept out of the way. Nonslip footwear such as Aquasocks™ are also recommended.

Sunglasses are a must! There are several brands of Polarized glasses on the market which filter harmful UV rays. These will improve your ability to see into the water and protect your eyes from the harsh glare of the sun reflecting off the surface. These sunglasses can be rather expensive, so it is wise to attach a neck strap to avoid losing them in the water!



Sunscreen can block UVB rays, the rays known to cause sunburning and skin cancer. Broad-spectrum protection protects against UVA and UVB rays and is best at an SPF30 or higher. When possible, wear long-sleeved shirts and long pants, which can provide protection for UV rays. For the most protection, wear a hat that has a wide brim all the way around to shade your face, ears and neck.

If you are underdressed in cold air, wind rapidly sucks away body heat. The trick to protecting yourself from heat loss is wearing multiple layers. Your outer layer should be wind- and waterproof yet able to allow perspiration moisture to pass out the garment, keeping the inner layers drier.



Exposure to high levels of noise is tiring and annoying and can cause permanent hearing loss. Wearing ear protection is a must!

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OPERATING PRECAUTIONS



Careless operation of powered equipment creates hazards that can lead to personal injury and property damage. Therefore, it is important to follow these precautionary measures:



1. Never allow an inexperienced person to operate harvesting equipment unsupervised.



2. Operators must wear personal flotation devices while operating this equipment. There should always be at least one flotation device for each person aboard.



3. Operators must be well rested and alert at all times. Operating under the influence of alcohol or other drugs must NEVER be tolerated – and is illegal!



4. Operators and maintenance personnel must not wear loose clothing and long hair must be restrained while working on or around the harvesting equipment. These may become entangled in machine parts and cause serious injury.



5. All guards and shields must be maintained in proper working order. Cutter bar guards must be in place AT ALL TIMES when machine is not in use. The engine must be off, and the ignition key removed before cutter bar guards are installed.



6. Operators must never attempt to retrieve fish, debris, or other materials from the load while the equipment is in operation.



7. Never attempt to remove obstructions from conveyors, discharge chutes, cutter bars, or any other moving parts while the machine is in use. **TURN THE ENGINE OFF AND REMOVE IGNITION KEY BEFORE ATTEMPTING TO SERVICE ANY PART OF THE HARVESTER.**



8. While operating, keep a safe minimum distance between you and anyone else using the water. Be especially careful of swimmers, children, other boats, and water skiers.



9. Never attempt to start the engine with the paddle wheels or any other system turned on. All switches and levers must be in the neutral position.



10. Never spin the harvester with the No. 1 input and No. 3 discharge conveyors raised. These conveyors must be down, and turns must be executed slowly and with complete control. This will cause the machine to possibly tip over, due to higher center of gravity.



11. A fully charged fire extinguisher must be readily available at all times.



12. The operator must always cut and harvest the load in an even balanced manner. Loading the harvester unevenly will cause a list and could result in a very dangerous situation including rolling the machine.



13. Harvesting equipment is never to be used for dredging purposes. Do NOT attempt to pick up mud, silt, or rocks. If unwanted material starts coming up the No. 1 input conveyor, it must be discharged immediately by reversing the No. 1 input conveyor.



14. Do NOT mount large tools or storage boxes on the operating platform. Carry only the tools necessary to service the harvester in an emergency. Major repair work should be done while the harvester is docked. Excessive weight located above the center of gravity will decrease load capacity and create a dangerous situation.



15. NEVER OVERLOAD HARVESTING EQUIPMENT! Standard harvesters are painted light blue with a wide pinstripe of yellow/black/yellow on the side. Even if your harvester is a different color, it will still have a wide, two tone pinstripe. This pinstripe indicates how heavily the harvester can be loaded. With a standard load, the pinstripe may be at the level of the water's surface. If the pinstripe is completely submerged and water is coming over the top of the barge, the machine is overloaded. If at any time there is water coming over the top of the barge, the harvester is unstable and in serious danger. DISCHARGE THE LOAD INTO THE LAKE IMMEDIATELY!



16. Do not vary the hydraulic relief valve settings from those outlined on the FACTORY SPECIFICATIONS sheet. Relief valves provide protection to the operator and the equipment. Too much pressure can put undue strain on hydraulic components and wear them out quickly.



17. Never tamper with the governor settings of the harvesting equipment, especially to gain more power. These are preset at the factory within safe operating limits. Over powering the equipment will not only shorten the life of the machine, but can also be very dangerous. Refer to the FACTORY SPECIFICATIONS sheet in the HYDRAULICS section of this manual for proper settings.



18. BATTERIES – Use extreme caution when handling the 12-volt battery. It is filled with acid that can eat through clothing and burn skin and eyes. Batteries also give off highly flammable hydrogen gases while being charged. Avoid starting the engine until these gases have cleared the area. Refer to the BATTERY GUIDE in the MECHANICS section of this manual.



19. BURNS – Do not touch or work around a hot engine or exhaust parts. *Allow the engine to cool sufficiently before attempting to service or make adjustments.*



20. ELECTRICAL SHOCK – Do not touch electrical and ignition systems. While electrical shock from the ignition system may not be strong enough to cause injury, reaction to the shock may cause you to pull away, injuring yourself in some other way.



21. NOISE – All harvester engines are furnished with a muffler system. Do not operate the harvester without a muffler or with a faulty exhaust system. Exposure to excessive noise is tiring and annoying and can lead to hearing impairment. Use hearing protection when operating this vessel.



22. STORMS – If a storm blows in while the harvester is working, get off the water immediately – lightning kills!



23. IMPORTANT: In the event of an impending capsizing, follow these specific steps:

- a) Stop the paddle wheels immediately.
- b) Lower the No. 1 input conveyor to its maximum depth – it will act as a keel, lowering the center of gravity
- c) Carefully discharge the load into the lake as soon as possible
- d) Should all of this occur during heavy winds and rough seas, keep the No. 1 input conveyor lowered, but try to keep it pointing into the wind
- e) If your harvester has an operator's cab, do not stay inside the cab if you feel a capsizing is inevitable
- f) If the harvester does capsize, jump clear of the danger, but do not leave the area as the harvester will not sink; once it is upside down, you can climb on the bottom and wait for help to arrive.

SUMMARY

- Discuss all operating conditions, potential operating situations, and emergency procedures with your supervisor prior to operating the harvester. Be prepared for any emergency situation and remain calm should one occur.
- Keep the No. 3 discharge conveyor in its lowest position at all times while harvesting, except when transferring or discharging a load into another machine. While transferring a load, the #1 input conveyor must always be lowered to the maximum depth possible before raising the #3 discharge conveyor. This is very important in maintaining a lower center of gravity.
- Always load the harvester evenly and balanced. If the harvester begins to list or lean to one side, stop the harvester immediately and lower the No. 1 input conveyor to its maximum depth, while keeping the No. 3 discharge as low as possible. If you are still unable to stabilize the load and the harvester remains unsteady, **DISCHARGE THE LOAD INTO THE LAKE IMMEDIATELY!** The load can be retrieved once you have corrected the problem – your first concern **MUST** be to stabilize the machine as soon as possible!
- **IMPORTANT:** If the harvester is seriously listing or leaning to one side, **DO NOT OPERATE THE PADDLE WHEELS!** Operating the paddle wheels will cause the listing side of the machine to “dig” into the water even further. This may accelerate a capsizing situation.

