

# OCEANIC<sup>®</sup> Mako<sup>1</sup><sup>™</sup>



## *owner's guide*

**⚠ WARNING: This owner's guide contains important information, warnings, and precautions. Do not attempt to use the Mako before reading this manual in its entirety.**

# INTRODUCTION

Congratulations! You have purchased the finest Dive Propulsion Vehicle available to today's recreational diver. A new dimension of freedom awaits you that cannot be experienced by divers who rely solely on fins to move about underwater.

To obtain maximum enjoyment from your Mako, however, it is very important to first read the entire contents of this manual before attempting to use it. Along with instructions to prepare your Mako for its first use and future pre-operational checks, this manual also provides instructions for regular maintenance, correct use underwater, and general instructions for DPV diving.

You will find a maintenance log that you can use to record all chargings, inspections, and services performed. Don't forget - your Mako requires a complete inspection on an annual basis by an Authorized Oceanic Dealer, regardless of its warranty status. If you do not know the name or location of an Authorized Oceanic Dealer near you, contact Oceanic Customer Service at 510/562-0500 or email [service@oceanicusa.com](mailto:service@oceanicusa.com), or visit our web site. <http://www.oceanicusa.com>

The Mako is manufactured with pride in the USA, using the finest materials and components available. Given proper use and maintenance using the procedures outlined in this manual, it will provide you with many years of reliable service.

As you embark on your excursions, remember that with the added freedom that the Mako can provide comes added responsibility. You alone are responsible for your safety and the safety of those who dive with you.



**WARNING: Use of the Mako Diver Propulsion Vehicle (DPV) requires special instruction which is not available from another source besides this manual. Failure to read these instructions in their entirety and to follow the procedures given for the correct operation and maintenance of the Mako may likely result in serious damage to the vehicle, and/or serious injury to the user, or death.**

**Be a RESPONSIBLE DIVER at all times!**



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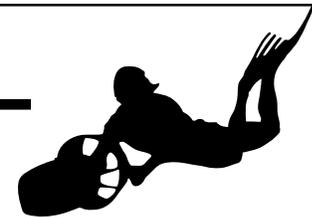
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\*The Owner's Maintenance Log may be duplicated for personal use only - not for resale.

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**IMPORTANT:** Have you registered your warranty card through the Authorized Dealer where you purchased your Mako? If not, or if you did not receive a warranty card, contact your Authorized Oceanic Dealer or Oceanic Customer Service (information on back cover).

# GETTING STARTED

Before proceeding to the next section, take the time to familiarize yourself with the Mako's various components, as shown in Figure 1.

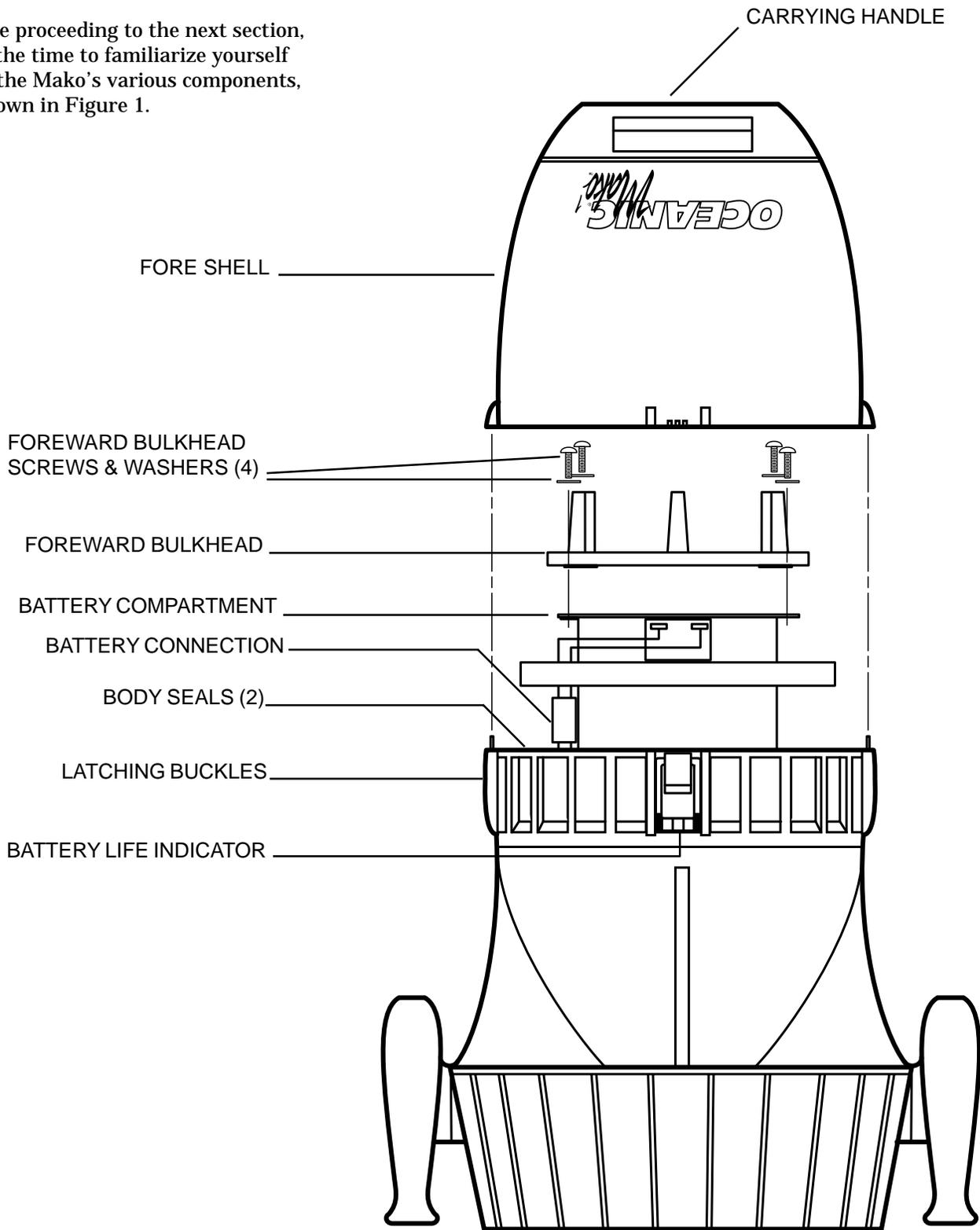
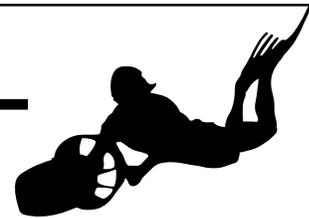


FIG. 1 - Mako Diver Propulsion Vehicle Illustration

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## MAKING YOUR MAKO "DIVE READY"

**IMPORTANT:** Be sure to save the original shipping carton, to use for transporting the Mako to your Authorized Oceanic Dealer or Oceanic Customer Service department whenever service may be required in the future.

### Initial Battery Installation

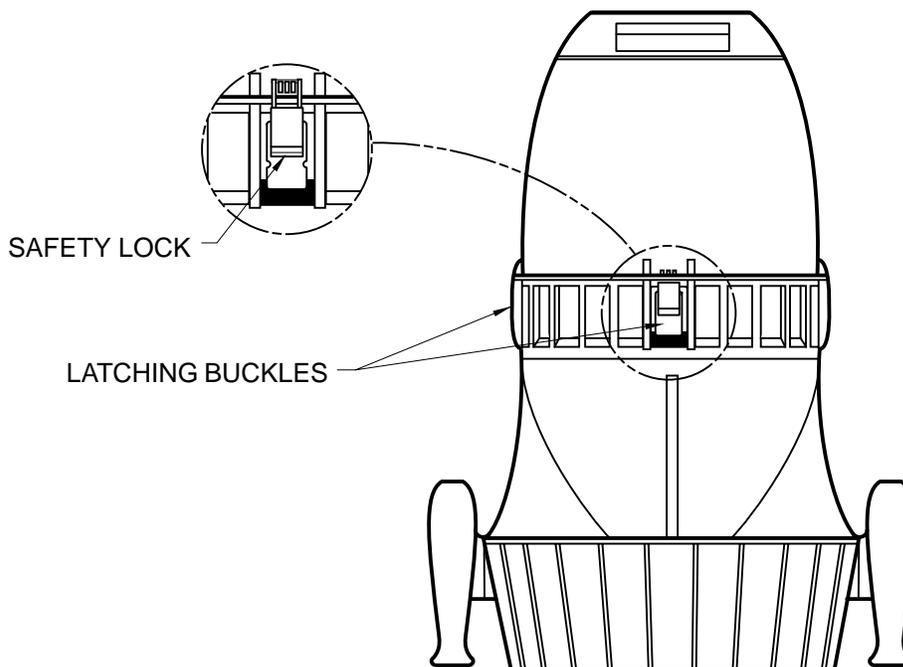
**NOTE:** All vehicles are delivered to the Authorized Oceanic Dealer with their batteries packaged separately. The batteries must be properly charged and installed according to the following procedures before their first use.

**NOTE:** To release each latching buckle, it will be necessary to hold the safety lock depressed, using your thumb (Fig. 2).

1. To remove the vehicle from its packaging, remove the top piece of protective foam and set aside. Grasp the vehicle by the carrying handle at the end of the fore shell and lift the vehicle straight up and out of the carton. Set down gently on the propellor shroud. DO NOT attempt to drop it out of the carton, or lift the carton off and away from the vehicle.
2. To remove the fore shell from the main housing, stand the vehicle upright on its shroud in a clean, dust free area, with the rubber bezel and carrying handle facing up.
3. Release two of the four latching buckles which are opposite of each other first, and then release the other two. Each pair should be opened simultaneously to relieve pressure equally on both sides of the shell.



**CAUTION: DO NOT open the vehicle in an environment where sand, moisture, or salt air may be present. Doing so may cause serious damage to the o-ring seals, electric motor, and other components.**



**FIG. 2 - Latching Buckle Mechanism**

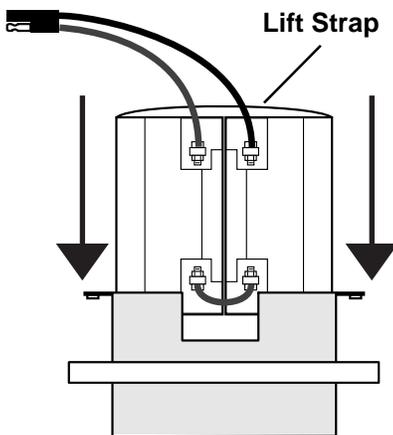
## GETTING STARTED

4. Using firm, steady force, lift the fore shell straight up and off the main housing, while holding the main housing secure if necessary. DO NOT use impact or rock the fore shell back and forth to loosen from the main housing.
5. Place the fore shell on a clean, flat surface where it is not in danger of falling over, standing up on its rubber bezel.



**CAUTION: DO NOT place the fore shell on its side or standing on its open end, which contains a delicate seating surface for the main seal o-ring. Contamination of or damage to this sealing surface will allow water to enter the unit, which may cause irreparable damage to the electric motor and other components.**

6. Remove the four (4) screws (with washers) which hold the forward bulkhead attached to the battery case. Lift the bulkhead straight up and off, and set aside. (See Fig. 1.)
7. The batteries are held together by a nylon lift strap. To remove them from their packaging, grasp the center of the strap and lift the batteries straight up and out.
8. If necessary, turn the batteries to position them directly above the battery compartment with the terminals connected to the battery leads facing up and aligned with the opening in the top center of the battery compartment. The single wire that connects the two batteries must be facing directly down (Fig. 3)
9. Carefully lower the batteries into place inside the metal compartment.



**FIG. 3 - Battery Position**

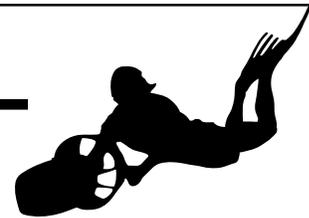


**CAUTION: DO NOT connect the battery leads to the motor leads until the unit has first been fully charged. Complete the reassembly of the forward bulkhead before charging.**

10. Place the forward bulkhead directly on top of the battery compartment, positioned with the openings for the four screws aligned exactly with the battery compartment. Install each of the four screws with washers, and rotate among each of them to tighten equally until snug.

**You may now begin charging the vehicle, beginning with step 5 in the following procedure. If you will not be using the vehicle immediately, it is recommended that you fully charge the batteries to 100% of their capacity, and store the unit with the batteries disconnected. (See Warnings and Precautions.)**

# OWNER'S GUIDE



## BATTERY CHARGING PROCEDURE

### Fore Shell Removal

NOTE: To release each latching buckle, it will be necessary to hold the safety lock depressed, using your thumb (Fig. 4).

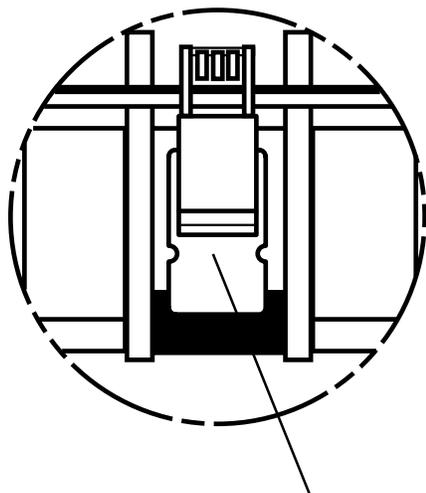


FIG. 4 - Safety Lock

1. If the fore shell has not been removed, stand the vehicle upright on its shroud in a clean, dust free area, with the carrying handle of the fore shell facing up (Fig. 4)



**CAUTION: DO NOT open the vehicle in an environment where sand, moisture, or salt air may be present. Doing so may cause serious damage to the o-ring seals, electric motor, and other components. If the vehicle is wet, be certain to wipe completely dry before opening - particularly around the area of the housing seals and latching mechanisms.**

2. Release two of the four latching buckles which are opposite of each other first, and then release the other two. Each pair should be opened simultaneously to relieve pressure equally on both sides of the shell.
3. Using firm, steady force, lift the fore shell straight up and off the main housing, while holding the main housing secure if necessary. **DO NOT** use impact or rock the fore shell back and forth to loosen from the main housing.
4. Place the fore shell on a clean, flat surface where it is not in danger of falling over, standing vertically on its rubber bezel.



**CAUTION: DO NOT place the fore shell on its side or standing on its open end, which contains a delicate seating surface for the main seal o-ring. Contamination of or damage to this sealing surface will allow water to enter the unit, which may cause irreparable damage to the electric motor and other components.**

5. Examine the internal cavities of the fore shell and main housing to ensure that they are perfectly dry, and there is no evidence that moisture has entered the vehicle.



**WARNING: If there is any evidence that moisture has entered the vehicle, DO NOT attempt to reassemble or operate it. Instead, take it directly to your nearest Authorized Oceanic Dealer as soon as possible. DO NOT store the vehicle reassembled until the unit has received a factory authorized inspection and service.**

6. Determine what the voltage supply is for the electrical outlet you will be using to charge the unit (either 110 or 220 volts), and set the voltage switch of the charging unit to the appropriate setting.



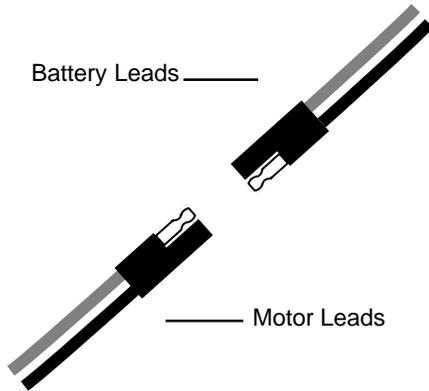
**CAUTION: Failure to properly set the voltage setting of the charger to match the voltage of the electrical supply will result in serious damage to the charger, and possibly to the batteries as well.**

# GETTING STARTED

- After inspecting the electrical cord to ensure it is undamaged, plug it into the outlet.



**WARNING: DO NOT attempt to use the charger if the cord appears to be spliced, altered, or damaged in any way. Doing so may result in an electrical short, causing damage to the vehicle, or electrical shock, causing personal injury or death.**



**FIG. 5 - Power Leads**

- If the battery leads are connected to the motor leads, firmly grasp both connectors and pull apart to disconnect. Lay the motor leads to one side (Fig. 5).
- Connect the battery leads to the charging connector.



**CAUTION: DO NOT connect the charger to the motor leads connector. Doing so may cause permanent damage to the motor and the charger.**

- Depress the power switch to the “ON” position. This should cause the “Power On” and “High Rate” indicator lights to appear.
- After 4 hours of charging, the batteries will be charged to 90% of their total capacity, and the “High Rate” indicator light will turn off. 24 hours of continuous charging is required to charge the batteries to their full capacity, however.

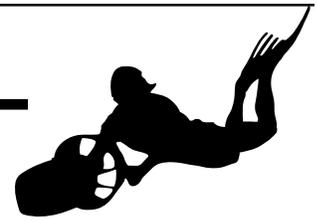


**CAUTION: The charger contains a built-in charge sensor which automatically reduces the charge rate when the batteries are fully charged to prevent overcharging. Once fully charged, however, the batteries and charger should not be left plugged into an electrical source any longer than necessary.**

**NOTE: Recommended ambient temperature for charging is between 34° and 100°F (2° - 38°C). The charger case will get very warm to the touch during the high rate phase of the charge cycle. This is normal. As the batteries become more fully charged, the case temperature will drop.**



# OWNER'S GUIDE



## PRECAUTIONS AND WARNINGS:

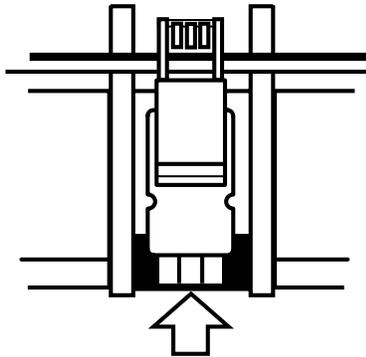


FIG. 6 - Battery Indicator

1. **DO NOT** block the vents of the charger case, or charge the vehicle in a closed area. This will cause an extreme buildup of heat, which will result in damage to the charger and the batteries.
2. Avoid exposing the vehicle to heat exceeding 100°F, such as in the trunk of a car, furnace rooms, engine rooms, etc. Prolonged exposure to heat will shorten the life of the batteries and possibly damage them.
3. The battery life indicator should be continuously monitored whenever the vehicle is in use or the batteries are being discharged. Immediately **STOP** operating the vehicle or discharging the batteries any further whenever the flashing red battery indicator light appears (Fig. 6). If the vehicle is in operation underwater when this light appears, abort the dive and surface to re-charge the batteries as soon as possible. Swim the vehicle to the surface, and **DO NOT** continue to operate.
4. **DO NOT** use any chargers other than a genuine Oceanic charger to recharge your vehicle. Doing so may cause severe damage to the batteries, and will void the warranty.
5. **DO NOT** expose the charger to moisture, salt air, sand, or dust. Keep it clean and dry at all times.
6. **DO NOT** smoke or allow an open spark or flame near the batteries at any time.
7. **DO NOT** charge the batteries if they are frozen. Remove the fore shell and allow the unit to warm to room temperature (approximately 70°F or 21°C) for at least one hour.
8. **DO NOT** attempt to operate a unit which has been only partially charged to less than 90% capacity. Whenever possible, the batteries should be charged to their total capacity for a full 24 hours before using the vehicle.
9. **DO NOT** store the vehicle in a discharged state. Prior to storage, it is important to ensure that the batteries are charged to 100% capacity, and that the unit has stood open for a full hour afterwards to allow any hydrogen gas to vent completely.
10. **DO NOT** store the vehicle with the battery connected to the motor. Prior to storage for any length of time, it is critical to ensure that the power leads have been disconnected.
11. If moisture has entered the vehicle, **DO NOT** attempt to operate or store it with the housing and fore shell assembled. Take the vehicle to your Authorized Oceanic Dealer immediately, where it should receive a factory authorized inspection and service.



**Disconnect power before storage!**

# GETTING STARTED

## REASSEMBLY PROCEDURES

1. Depress the power switch of the charging unit to the "OFF" position.
2. Unplug the electrical cord from the outlet.
3. Disconnect the battery leads from the power leads of the charging unit.
4. Reconnect the motor leads to the battery only if the vehicle is intended to be used immediately .



**CAUTION: ALWAYS store the vehicle with the battery disconnected.**

5. Wait at least 30 minutes before proceeding further, to allow the batteries to finish discharging the hydrogen gas which can be produced during the charging cycle.
6. Closely examine the o-ring sealing surfaces of both the fore shell and the main housing, to ensure that they are perfectly clean, dry, and free of any scratches, distortion, or other damage.
7. Remove both body seal o-rings from the main housing and dress them with a very light film of silicone grease. Remove any visible excess by running the o-ring between thumb and forefinger.

**NOTE: It is very important that these o-rings remain clean and free of any grit or debris prior to installation. Avoid applying excessive amounts of silicone grease, as this will attract grit and other debris that may interfere with the o-ring seal.**

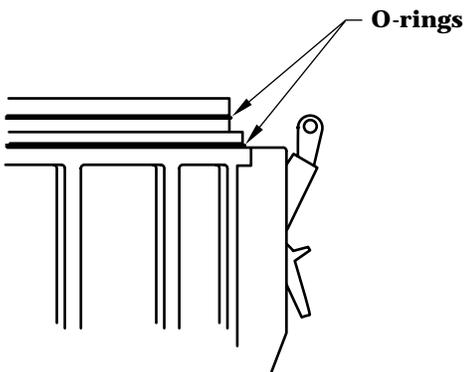


**CAUTION: Aerosol spray silicone is to be strictly avoided. DO NOT attempt to use it as a substitute for silicone grease, or use it anywhere else on or near the vehicle.**

8. To install the larger diameter body seal o-ring onto the lower sealing surface of the main housing, lay one side of the o-ring in place and hold secure while gently stretching the rest of the o-ring over the main housing and onto the sealing surface (Fig. 7).



**CAUTION: DO NOT twist or roll the o-ring down onto the housing, as this will cause improper seating.**



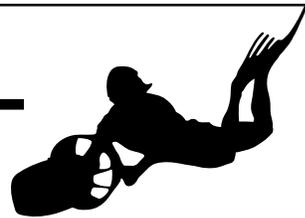
**FIG. 7 - Housing O-rings.**

9. Use the same procedure to install the smaller diameter o-ring onto the upper sealing surface of the main housing.
10. Look inside the fore shell and main housing to ensure that no moisture, dust, or other debris has entered. If found to be dry and clean, hold the fore shell above the housing and turn if necessary to ensure the carrying handle at the nose of the shell is facing up, even with the top of the main housing.

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## OWNER'S GUIDE

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11. Align the latch ends of the fore shell with the buckles of the housing and carefully lower the fore shell into place until it is resting evenly over the top of the main housing. Fit the roller of each buckle into each latch end before securing any of the buckles.
12. When every buckle is correctly positioned, press two latches on opposite sides of the housing shut. Check to ensure that the housing and fore shell are mated evenly and the lower o-ring appears evenly seated between them before shutting the remaining two latches. This is necessary to prevent crimping of the o-ring seal.
13. When all four buckles are secured, check the o-ring once again, which should be visible through a thin gap between the fore shell and main housing, to ensure that it is not crimped, and that it is evenly seated.

**Your Mako should now be fully charged and reassembled. A Pre-Operational check must be performed as outlined in the next section before it can be considered "Dive Ready."**



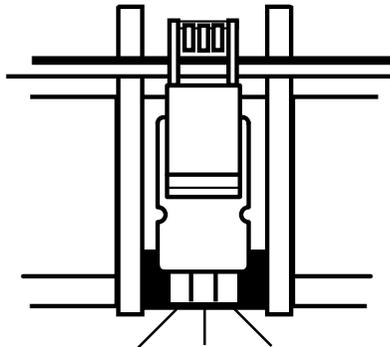
**Be a -  
RESPONSIBLE DIVER  
at all times.**

# PRE-OPERATIONAL CHECKS

## PRE-OPERATIONAL CHECKS

**It is important to check the following each time before using the Mako:**

### Batteries



Green Yellow Red  
**FIG. 8 - Battery Indicator**

1. Batteries should be fully charged to at least 90% capacity before each use. (Refer to the charging procedure for instructions.)
2. To check the battery life indicator on the vehicle, depress the activation trigger while the unit is standing on its shroud, and examine the battery life indicator which is located at the top center of the main housing, just below the seal. Release the trigger within ten seconds. **DO NOT** attempt to use the vehicle if the indicator light does not show a steady green (Fig. 8). Charge the vehicle according to the procedures outlined in the section titled, **Getting Started**.



**CAUTION: DO NOT allow the motor to run for more than 10 seconds out of the water. Doing so may cause damage to the propellor shaft seal. Keep hands, feet, and other objects away from the moving propellor.**

### Housing

1. Check all areas of the main housing and fore shell - especially near the seal - to ensure that they are clean and free of any signs of damage.
2. Examine the o-ring seal around its entire circumference, to ensure that it is properly seated and does not appear to be crimped or extruding out between the fore shell and the main housing.
3. Check all four latching buckles to ensure they are securely fastened.

### Trigger Mechanisms

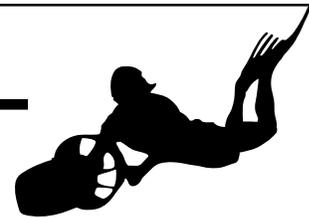
1. Stand the vehicle on its shroud, with the nose facing up. Depress the trigger in each handle and release.



**CAUTION: DO NOT allow the motor to run for more than 10 seconds out of the water. Doing so may cause damage to the motor seal. Keep hands, feet, and other objects away from the moving propellor.**

2. Check to ensure that each trigger moves smoothly inside the handle, and returns completely to the OFF position when released. If trigger movement is not smooth, examine closely to check for any signs of sand or other debris inside the handle which may be obstructing the trigger's movement.
3. If sand or debris is found, flush out with a pressurized stream of water, or low pressure air. If necessary, you may use a blunt, non-metallic instrument to dislodge the debris. Use water to flush out the handle and trigger assembly again to remove any hidden debris that might remain and repeat step 1.

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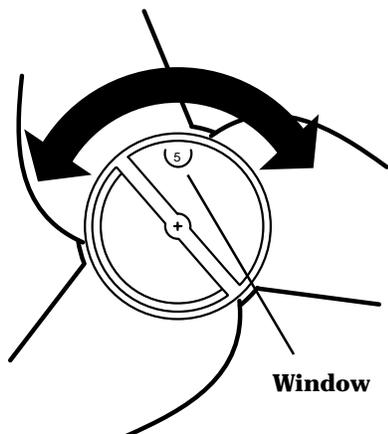


**CAUTION: DO NOT attempt to operate the vehicle if any abnormal noises are heard while the motor is running. Return the vehicle to your nearest Authorized Oceanic Dealer, where it should receive a factory authorized inspection and service.**

## Propellor Adjustment

The Mako's variable pitch propellor allows you to choose whether to run the vehicle at a slower speed that will provide a longer running time, or at faster speeds that will shorten the running time. Although the range of the vehicle will remain approximately the same, you may wish to consider other factors, such as air consumption, No-Decompression bottom time, currents etc.

Unless you are really in a hurry with a lot of ground to cover, you may find it more relaxing and less fatiguing to operate the vehicle at a lower pitch setting. More on this will be covered in the section titled, Operating the Mako Underwater.



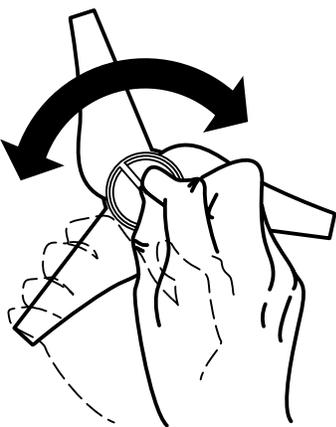
**FIG. 9 - Prop Adjustment**

1. You select the desired pitch of the propellor by turning the adjustment knob located at its center. First, sight through the grooved slot at the outer edge of the knob to find the numbered pitch settings (1 through 9). You may need to rotate the propellor until the number comes into view. (Fig. 9).



**WARNING: DO NOT touch the activation triggers on either of the side handles while adjusting the propellor pitch, or allow them to otherwise be depressed. The motor must not be activated while performing this procedure.**

2. To set the knob more precisely, hold the propellor secure with one hand while turning the knob with the other (Fig. 10). To select a higher setting with increased pitch, turn the knob clockwise. Turn it counter-clockwise to select a lower setting with less pitch.



**FIG. 10 - Precise Setting**

**Your Mako is now dive ready. Before using the vehicle, however, you must first familiarize yourself with the following sections which explain its operation, and special instructions for diving with a Diver Propulsion Vehicle.**



# OPERATING THE MAKO UNDERWATER



## OPERATING PRECAUTIONS AND WARNINGS

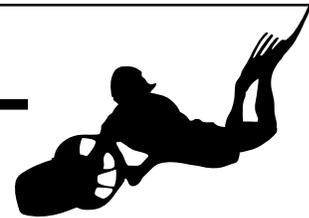


**WARNING:** The Mako Diver Propulsion Vehicle is intended for use only by trained SCUBA divers who have received open water certification by a recognized training agency, and have maintained proficiency in their diving skills by remaining recently active in the sport. Knowledge of safe diving practices is therefore essential to safe operation.

1. **DO NOT** descend faster than 75 feet (25 meters) per minute, or exceed any rate of descent which allows you to clear your ears and sinuses comfortably.
2. **DO NOT** operate the vehicle at a depth greater than 130 feet (39 meters).
3. **DO NOT** operate the vehicle while ascending. When you are ready to ascend, turn the vehicle off and swim it to the surface, being careful not to exceed a safe rate of ascent.
4. **DO NOT** allow straps, hoses, hair, hands, or other objects to enter the propellor shroud.
5. **DO NOT** continue to operate the vehicle when the low battery indicator appears, flashing red. Cease operation immediately and swim the vehicle back to your exit point. Continued operation is very harmful to the batteries.
6. **DO NOT** operate the vehicle out of the water. Doing so will damage the rotary propellor shaft seal, resulting in leakage.
7. **DO NOT** attempt to operate the vehicle before completing all steps outlined in the section titled, Pre-Operational Checks.
8. **DO NOT** operate the vehicle while swimming through kelp, sea grass, or other vegetation which may foul the propellor.
9. **DO NOT** leave the Mako unsupervised in the presence of children.



# OWNER'S GUIDE



## RECOMMENDED WATER ENTRY PROCEDURES

**It is very important to understand how to properly handle your vehicle while entering and exiting the water. The preferred method to enter the water from a boat or dock is as follows:**

### Entering and Exiting the Water From a Boat or Dock

1. Before entering the water, arrange for a divemaster or someone else to assist you by lowering the vehicle to you after you are already in the water. If necessary, tie a tether line through the handle of the vehicle, using a knot that will hold it secure without slipping, but which can also be easily untied, such as a bowline.
2. Enter the water with your regulator in your mouth and wait for the vehicle to be lowered to you. DO NOT remain directly below the vehicle while it is being lowered, but position yourself slightly off to one side.
3. When the vehicle has been lowered into the water, hold it by the carrying handle in the fore shell while untying the tether, if one is attached. DO NOT take hold of the vehicle by the side handles, as the motor may be accidentally activated.
4. When you are ready to begin your dive, turn the vehicle around so that the prop shroud is directly in front of you. Hold handles securely on both sides, below the activation triggers, until you are ready to move forward.
5. When exiting the water, ask for assistance as before, and hold the vehicle secure by the carrying handle until the tether line is passed down, if one is needed. Tie the vehicle on securely, or otherwise pass up before exiting the water yourself. DO NOT remain directly below the vehicle while it is being pulled from the water, but position yourself off to one side.

### Entering and Exiting the Water From Shore



**CAUTION: Beach diving with the Mako is not recommended in conditions where entry or exit through moderate to heavy surf may be necessary. It is very important to protect your Mako from coming in direct contact with sand or gravel, which may cause damage to the propellor shaft seal, the trigger mechanisms in the side handles, and the o-ring seals.**

1. When entering the water from shore, hold the vehicle securely by the carrying handle in the fore shell, and carefully walk backwards. When you are in water that is waist-deep, you may turn around and take hold of the vehicle by the side handles and begin operation immediately, provided that vegetation such as kelp or sea grass is not present.

# OPERATING THE MAKO UNDERWATER

2. To exit the water, be sure to make your final ascent before reaching the surf line. Cease operation of the vehicle and hold it securely by the carrying handle. Walk carefully backwards out of the water and continue carrying the vehicle until you are able to set it down on a blanket or tarp where it will be protected from any contact with sand or gravel. **DO NOT** attempt to swim the vehicle completely onto the shore under power.

## How to Ride



Side View



Top View

**FIG. 11 - Cruising Position**

To obtain maximum performance from your vehicle, it is essential that you position yourself correctly in order to minimize drag and fatigue and maximize comfort. The ideal cruising position is shown in Figure 11.

1. The vehicle should be held so that it is parallel to and slightly below your body. This allows the turbulence from the propellor to pass freely beneath you.
2. Your arms should be slightly bent at the elbows so that the shroud is below you as you look directly downward.
3. The side handles which contain the trigger mechanism should be held firmly with both hands while operating the vehicle.



**WARNING: DO NOT attempt to operate the vehicle with only one hand. Doing so will result in a loss of control.**



**FIG. 12 - Fatiguing Position**

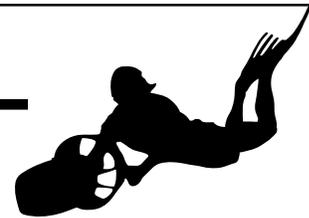
4. Keep your legs straight, your fins together, and your toes extended. Remember, there will be very little benefit gained by kicking while operating the vehicle, but fins should be worn in the event of a low battery situation.
5. **DO NOT** hold the vehicle ahead of your body, which will cause excessive strain to your arms, and fatigue (Fig. 12).
6. **DO NOT** hold the vehicle directly in front of you, where you will feel propellor turbulence. Your body will block the thrust, reducing speed and efficiency. This position will also cause fatigue to your arms, and you will be chilled by the prop wash (Fig. 13).

Practice achieving and maintaining the correct position. You will notice a pronounced increase in speed and comfort.



**FIG. 13 - Prop Wash**

# OWNER'S GUIDE



## Changing Direction

Turning is very easy to do - just point the vehicle in the direction you would like it to go, and turn your body slightly to the same side to allow it to follow. When you get the hang of it, try a barrel roll or two.



**WARNING: DO NOT use the vehicle to ascend. Doing so will invariably cause you to exceed the safe ascent rate. Following bottom topography as you normally would while swimming without the Mako is permissible, but be very careful to monitor your depth gauge to avoid rapid ascents of any duration.**



**WARNING: DO NOT continue descending if you experience discomfort in your ears or sinuses. If necessary, ascend slightly to equalize first before continuing to descend.**

## Selecting Optimum Propellor Pitch Underwater

The pitch of the propellor can be adjusted at any time underwater as described in the Pre-Operational Check procedures, provided that the activation triggers in both side handles have been released, and the motor is turned off.

The best combination of speed, run time, range, and comfort is usually achieved at a setting between 3 and 5, but this will vary depending on your size, weight, and the drag created by your equipment. Presumably, you will be diving with a buddy who is also using a Dive Propulsion Vehicle, to avoid diving alone. Unless your buddy is the same weight and size as yourself, and wearing similar equipment with the same amount of drag, you will probably need to adjust the pitch of your vehicles accordingly to achieve the same cruising speed. This can easily be done, using the Mako's variable pitch feature.

For example, a diver weighing 180 pounds with a large, high drag, game bag attached to his or her BC may need to set his or her propellor to a pitch setting of number 5 in order to match the speed of another diver who weighs only 140 pounds, is wearing very low drag equipment, and is using a pitch setting of number 3. It is very important to remember, however, that there will be a difference in the running time provided by the batteries, and the dive should be planned according to the shorter battery life of the heavier diver.

**NOTE:** Higher settings may be preferred if you are swimming against a strong current, but always remember that this will shorten the running time of the batteries.

# OPERATING THE MAKO UNDERWATER

## Monitoring the Battery Indicator

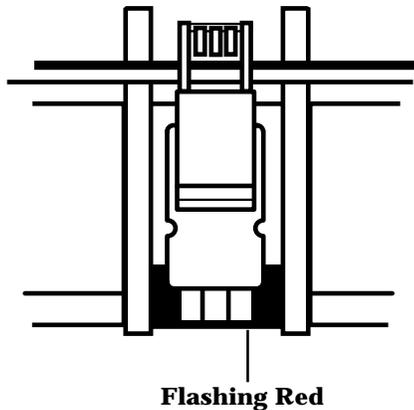


FIG. 14 - STOP Operation

## What To Do If Your Vehicle Becomes Inoperative

For easy viewing, the battery life indicator is located in the center of the top surface of the main housing, and should be continuously monitored whenever the vehicle is in use; no less often than you check your depth and pressure gauges.

Each dive should be pre-planned according to no-decompression limits, anticipated air consumption, and anticipated battery running time. Whenever the yellow battery indicator light appears, however, you should immediately begin your return to the boat or exit point, and discontinue operation of the vehicle when the red low battery indicator appears.

**⚠ WARNING: Immediately STOP operating the vehicle whenever the flashing red battery indicator light appears (Fig. 14). If the vehicle is in operation underwater when this light appears, abort the dive and make a safe controlled ascent to the surface to re-charge the batteries as soon as possible. Swim the vehicle to the surface, and DO NOT continue to operate.**

If your vehicle becomes inoperative underwater for any reason, you must safely return to the surface as soon as possible to examine the cause. DO NOT attempt to operate the vehicle any further.

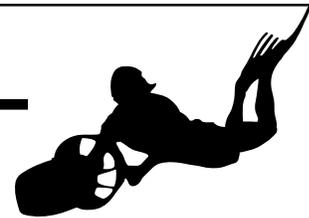
To exert the least amount of effort while swimming with an inoperative vehicle, it is recommended to hold it in its normal use position, being extremely careful to avoid depressing the activation triggers in either of the side handles. While making your final ascent to surface, hold the vehicle by the carrying handle in the top of the fore shell - especially when it is necessary to hold onto a line or decompression bar with one hand.

If the propellor has been fouled by an obstruction, the Mako's safety clutch will automatically disengage, and a loud clicking sound will be heard while the motor remains activated. When the obstruction is removed, the clutch may be re-engaged by depressing the activation switch briefly several times. When the clicking sound is no longer heard, the clutch has been re-engaged.

**⚠ CAUTION: If a loud clicking sound is heard, indicating that the safety clutch has disengaged, immediately release the activation triggers in both of the side handles to stop the motor, and safely return to the surface to remove the obstruction. DO NOT attempt to remove the obstruction underwater.**

**⚠ WARNING: If air can be seen leaking from the Mako's housing, indicating that water has entered, the vehicle should be considered inoperative and returned to the surface immediately using the procedures described above. As soon as possible, remove the fore shell to open the housing and DO NOT re-seal until the vehicle has received factory authorized service by an Authorized Oceanic Dealer.**

# OWNER'S GUIDE



## MAINTAINING YOUR MAKO

### Battery Maintenance

The Mako's batteries should be fully charged within 24 hours following each use, or immediately following use if the red (low) battery indicator appears, following the procedures outlined in the section titled, **Getting Started**. The charger should be kept in a waterproof container between uses to prevent exposure to moisture or salt air.

If properly stored and maintained, the Mako's batteries can be re-charged up to 250 times before requiring replacement. After 250 charging cycles, however, it becomes extremely important that the batteries are replaced with new by your Authorized Oceanic Dealer before the vehicle is used or stored, due to the higher levels of hydrogen gas that can be emitted by an older, deteriorated battery. It is therefore important to maintain an accurate log of all maintenance performed, including battery charge cycles, storage intervals, and Annual Inspections and other services performed by your Authorized Oceanic Dealer or the Oceanic factory.

**NOTE: A Maintenance Log is provided in the back of this manual for your convenience.**

### Post-Dive Maintenance

Like any other piece of diving equipment, your Mako should be rinsed with fresh water after every dive, particularly in the areas of the side handles, latching buckles, and the propellor hub. Ideally, it is recommended that you first immerse the vehicle in a large tub of fresh water and allow it to soak for several hours before giving it a final rinse.

**⚠ CAUTION: DO NOT expose any parts or components of the Mako to petroleum based substances (such as gasoline or oil), alcohol, toluene, methyl-ethylketone, acetone, strong detergents, or fluorocarbons (aerosol sprays). These substances are known to cause stress cracks and crazing to the thermoplastic materials from which many of the Mako's components are made.**

### Storage

Prior to storage, it is important to ensure that the batteries are charged to 100% capacity, and that the unit has stood open for a full hour afterwards to allow any hydrogen gas to vent completely. Before assembling the fore shell onto the main housing, it is extremely important to disconnect the motor from the battery. The vehicle should be stored standing upright on its propellor shroud.

**⚠ WARNING: DO NOT store the vehicle in a discharged state, or with the batteries connected to the motor.**

### Annual Dealer Inspections

**Regardless of warranty status, it is also very important to bring the Mako to your Authorized Oceanic Dealer on an annual basis for a complete, factory authorized inspection to determine what service may be needed, if any. Be sure to record the date of this inspection in your Maintenance Log, along with the name of the Authorized Oceanic Dealer where the inspection was performed.**

## DPV DIVING - A SPECIALTY ACTIVITY

The Mako was designed to broaden your enjoyment of the underwater environment, providing you with freedom you've only dreamed of before. With it, you will be able to move with increased speed and cover up to two miles underwater on a single dive, with very little exertion. Consequently, you'll also use less air - as much as 50% less! Like any accessory item, however, using the Mako does not relieve you from your responsibility to remember and obey the fundamental rules of safe diving.

### Additional Rules For Dive Planning

**“PLAN YOUR DIVE AND DIVE YOUR PLAN.”** Sound familiar? It was taught to you in your first open water class, and applies to every dive you will ever make, regardless of what devices or accessories you bring along with you. When you use a Diver Propulsion Vehicle, this rule becomes doubly important. A popular rule among cave divers, which also applies to DPV diving, is to plan your dive using 1/3 of your air supply to reach your destination, 1/3 to return, and keep 1/3 for reserve. **Keep in mind, though, that you will be using much less air than you have grown accustomed to, and no-decompression limits will often become the more limiting factor for planning your dive while using the Mako.**

In addition to planning the depth and duration of your dive according to the limitations of air consumption and nitrogen absorption, however, you must now also pay attention to the limiting factors of battery life and running time. This becomes especially critical whenever you are diving in conditions where currents may exist.

### Diving In Currents

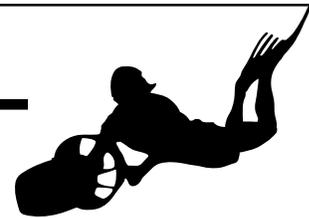
Picture yourself diving in a moderate current that is running slightly over one knot. Ordinarily, you would know better than to start your dive swimming in the direction of the current, knowing what an ordeal returning against it would be. But there's something in that direction that you would love to check out, and you have plenty of air to make it there and back. You've got the Mako with you, and it can tow you back against that current with ease. That rule about starting your dive against the current and returning with it was only written for ordinary divers who can't afford vehicles, so what the heck - why not go for it?

Before you take off, though, STOP and think about what a *drag* it would be if your Mako's low battery indicator appeared, flashing red, or if something else disabled the vehicle while you were several hundred yards down-current from the boat or shore. In a current of any measurable speed, you may find it impossible to swim back while holding onto the vehicle, and your only choice will be to let it go before you drift any further down-current.



**WARNING: ALWAYS begin your dive travelling against the current, and immediately begin your return to the boat or exit point whenever the yellow battery indicator light appears.**

# OWNER'S GUIDE



## EQUIPMENT SUGGESTIONS

Because the Mako's performance can be greatly affected by excessive drag, it is important to streamline your diving equipment as much as possible. The following suggestions may help you go a little faster, and farther, while diving with your Mako:

### Exposure Protection

You will be moving much faster underwater and expending less energy, and will therefore require additional exposure protection than you are currently using. Whenever water temperatures permit, however, a wet suit is generally preferred over a dry suit, due to its snugger, more streamlined fit. Of course, always be sure to tuck your boots under your wet suit, and wear your gloves over the cuffs of your sleeves.

### Mask

Select a smaller, low volume mask, but be sure that it provides a good seal and fits your face comfortably. Avoid larger masks, which may feel less comfortable and seat poorly when they are worn in strong currents.

### Buoyancy Compensator

Generally, a single bladder design is much more streamlined when deflated, compared to most "double bag" designs. Most Oceanic BCs are of single bladder construction. Newer models which are made with **BioFlex**<sup>®</sup>, a revolutionary, expandable material, offer the maximum amount of lift when inflated, and the minimum possible amount of drag when deflated.

### Instrument Console

If you use a gauge console that is attached to a high pressure hose, be sure to keep it closely secured to your BC in such a way to prevent it from dangling freely. This is also important to avoid fouling the propellor. If you would to eliminate your high pressure hose, consider an Oceanic **DataTrans** or **DataTrans Plus** integrated hoseless diving computer that receives tank pressure information from a small radio frequency transmitter that is connected to your regulator first stage.

### Regulator

Like a gauge console, it is important to closely secure an octopus to your BC in such a way to prevent it from dangling freely. If you would to eliminate your octopus hose, consider an Oceanic **Air XS** or **In-Line SlimLine**.

It is also important to use second stages which will not "self purge" in strong currents, as some high performance designs have a tendency to do. The side breathing Oceanic **Omega II**, for instance, is designed with a control diaphragm that faces towards the diver, rather than straight ahead towards an oncoming current. The very popular **Delta** may also be adjusted to maintain consistent performance when a strong current is encountered. Either of these top-rated models will perform excellently while cruising at any speed with your Mako.

Be a **RESPONSIBLE DIVER** at all times!



# TECH SPECS AND TROUBLESHOOTING

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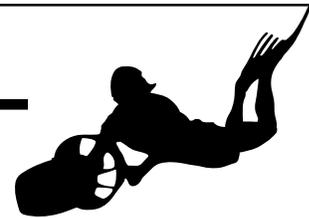
## TECHNICAL SPECIFICATIONS

<b>LENGTH</b> .....	25 inches
<b>WEIGHT</b> .....	54 lbs
<b>SPEED</b> .....	1.5-2.7 mph*
<b>RUNNING TIME</b> .....	40-120 min
<b>CHARGING TIME</b> .....	4 hrs. = 90% or 16 hrs. = 100%
<b>STATIC THRUST</b> .....	15-50 lbs
<b>SERVICE INTERVAL</b> .....	Every 250 charging cycles
<b>BATTERIES</b> .....	(2) 12 V, 17AH, Sealed, Rechargeable
<b>RANGE</b> .....	Approximately 3 miles*
<b>MAXIMUM OPERATING DEPTH</b> .....	180 fsw
<b>MOTOR</b> .....	Permanent Magnet Direct Drive, 750 RPM
<b>BODY</b> .....	Advanced High-Impact Xenoy®

\*Based on average diver

*Xenoy® is a registered trademark of General Electric Company.*

# OWNER'S GUIDE



## TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	TREATMENT
MOTOR DOES NOT RUN	1. Batteries are discharged.	1. Recharge batteries immediately.
	2. Batteries are not connected to motor.	1. Check battery connection.
	3. Damaged reed switch.	1. Test other trigger. 2. Return to Authorized Oceanic Dealer for service.
	4. Damaged Relay.	1. Return to Authorized Oceanic Dealer for service.
	5. Loose Connection.	1. Return to Authorized Oceanic Dealer for service.
MOTOR RUNS, BUT PROPELLOR DOES NOT TURN	1. Propellor is obstructed.	1. Remove obstruction, and briefly depress the activation trigger several times as needed to engage the clutch.
	2. Safety clutch will not engage.	1. Return to Authorized Oceanic Dealer for service.
MOISTURE HAS ENTERED THE VEHICLE	1. Housing o-rings are worn or damaged.	1. Return to Authorized Oceanic Dealer for service.
	2. O-ring seating surface of housing or fore shell is damaged.	1. Return to Authorized Oceanic Dealer for service.
	3. Rotary propellor shaft seal is damaged.	1. Return to Authorized Oceanic Dealer for service.



**WARNING: DO NOT attempt to disassemble or repair the internal components of your Mako. Doing so will void the warranty, and may cause injury or death. Any service or repairs, other than replacement of the main seal o-rings or recharging of the batteries, should be performed exclusively by an Authorized Oceanic Dealer, or by the Oceanic factory.**

**IMPORTANT: Be sure to save the original shipping carton, to use for transporting your Mako to an Authorized Oceanic Dealer or to the factory whenever service may be required in the future.**

## **ADJUSTABLE CRUISE SEAT**

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The Mako adjustable cruise seat eliminates arm fatigue by automatically positioning the diver for maximum efficiency and range, and allows one handed operation.

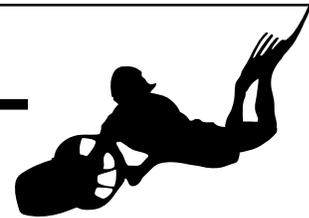
### **Instructions**

To attach the adjustable cruise seat to your Mako diver propulsion vehicle, clip each strap end onto the tow bar brackets.

The cruise seat length may be adjusted to accommodate divers of different sizes. To shorten or lengthen the seat, loosen the 1" nylon webbing threaded through the 1" tri-glide and slide the tri-glide (toward the vehicle to shorten; or away from the vehicle to lengthen) to the desired position. Excess webbing should be looped back through the tri-glide for added security.

For optimal efficiency and comfort, the cruise seat should be adjusted to attain proper diver positioning as shown on page 16. Arms should be slightly bent at the elbow and the diver's head should be above and slightly behind the shroud.

# OWNER'S GUIDE



## WARRANTY LIMITATIONS & CONDITIONS

### LIMITED ONE-YEAR WARRANTY

Oceanic guarantees, to the original purchaser only, that the Mako purchased is free of defects in material and/or workmanship under normal recreational scuba use for a period of one (1) year from the date of consumer purchase from an Authorized Oceanic Dealer, provided proper care and maintenance have been performed as prescribed by the owner's guide or instruction card included with the equipment. Should this Mako prove to be defective for any reason (other than those listed as limitations below) the Mako will be serviced or replaced at Oceanic's sole discretion at no charge (excluding shipping and handling).

- This warranty shall be void if the registration card is not completed and sent to Oceanic within 30 days of purchase.
- This warranty shall be void if the equipment has been tampered with by a person (or persons) not authorized by Oceanic to perform service.
- This warranty is nontransferable and extends to the original purchaser only and is void if the equipment was purchased from anyone other than an Authorized Oceanic Dealer.
- This warranty applies specifically to the fore shell, main housing, trigger mechanisms, motor, clutch, drive unit, propellor, propellor shroud, propellor shaft, rotary seal, and tail cone assembly.
- This warranty does not apply and may be rendered completely void in the event of accidental damage, abuse, battery leakage, over-charging of batteries, deep discharge of batteries and resulting damage, flooding due to neglect, tampering, lack of care and maintenance, improper storage, or unauthorized service.

### CORRESPONDENCE

All correspondence regarding the Mako covered by this warranty agreement or in direct reference to this warranty should be accompanied by a copy of the original sales receipt and a copy of the owner's portion of the warranty card.

### LIMITATIONS

Warranty does not extend to cover damage from accident, abuse, tampering, lack of maintenance, theft, or loss. Service or modifications by any person or persons other than an Authorized Oceanic Dealership voids the warranty.

Oceanic will not be responsible for recovery or replacement of the product in the event of loss or theft. Oceanic, its Authorized International Distributors, and Authorized Dealers make no other warranties, either expressed or implied, orally, or in writing, with respect to any other warranty coverage except those expressly stated within the preceding paragraphs.

Oceanic will not be held responsible for any agreements orally or in writing with the exception of those expressly included in this warranty statement. The warranty registration card and the terms contained therein supersede all statements contained in any and all owner's guides, instruction cards, or other equipment literature or catalogs.

In no event will Oceanic, its Authorized International Distributors, and Authorized Dealers be held responsible or liable for any personal injuries resulting from the use of the Mako, or for any other damages, whether direct, indirect, incidental, or consequential; even if Oceanic has been advised of such damages.

### 90-DAY WARRANTY FOR BATTERIES & CHARGER

The Mako's batteries or charging unit, which are covered by a separate, 90-Day warranty against defects. Warranty does not extend to damage to the MAKO caused by battery leakage.







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