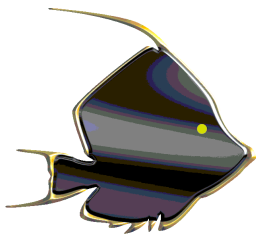


# Setup, Use and Care Guide

## Gates TRV950/PDX10 Housing



**GATES**  
**UNDERWATER PRODUCTS**

Dear Gates Customer,

Welcome to the Gates family! You now own one of the finest underwater housings available, and we thank you for choosing Gates! For over 33 years Gates has crafted the most **reliable, durable** and **dependable** housings to suit many needs, from recreational diving to treasure hunting, marine research and Hollywood productions to U.S. Navy programs.

You see, at Gates, your selection of our product is only the beginning. We are here to service you, the customer, for as long as you own our product. Our Customer Service is second to none. We'll make every reasonable effort to support you wherever your adventures land you, including remote corners of the globe. Anytime you need advice, parts, overhaul, repair, or just want to chat, Gates will take care of you promptly and to your satisfaction.

**Please read through all the documentation** contained in this package to familiarize yourself with a Gates housing **before** diving. It contains important and valuable information so your new housing easy to learn and use. Soon you'll be capturing images and showing your friends and colleagues the splendor of the undersea realm.

**Complete and return the warranty card** enclosed in this package to activate your *2-year warranty*. You'll receive 2 years of warranty coverage for your investment and unprecedented peace of mind, only from Gates.

Gates wishes you the greatest success in your diving adventures. May you capture the memories of a lifetime and the envy of your friends. And remember.....

**Don't take a chance...Take a Gates!**

Sincerely,

**John Ellerbrock**  
President and General Manager

**Gates Underwater Products, Inc**

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# Gates Housing Setup and Use

## For Sony TRV950 & PDX10

**Congratulations** on owning a new **Gates housing!** You've selected a product that will provide years of value and reliable service. This housing was custom designed for the TRV950/PDX10 camera for a compact and easily transportable package. Please read through this entire guide to familiarize yourself with the Gates TRV950/PDX10 housing. The following easy setup guidelines will explain how to prepare and use your camera and housing so you'll get the best results from your video endeavors.

### First Time Use

Every Gates housing is pressure tested before leaving the factory to assure a watertight seal. As a precaution, however, it's a good idea to first use the housing **without** your Sony TRV950/PDX10 inside. Rough or abusive handling during shipment could have caused unnoticed damage after leaving the factory. In addition, you can get a good feel for the use of an underwater housing without worrying about getting a good shot. You can simply concentrate on the technique of holding the housing in position while fine tuning your buoyancy.

After removing the housing from its shipping container or Gates Pak, carefully inspect for any damage that may have occurred during shipment. If you discover any, contact Gates or your dealer immediately for assistance.

### Preparing the TRV950/PDX10 Camera

Your Sony TRV will need some preparation before placement into the housing.

- ✓ Remove lens hood and cap from camera.
- ✓ Install manual focus gear onto focus ring of camera lens. This is done by sliding the focus gear over the front of the camera and onto the camera focus ring. The gear teeth will be offset toward the front. The focus gear will stop and set into position.
- ✓ Install a tape, Memory Stick, and charged battery.

✗ **CAUTION:** To remove the focus gear, place your thumbs on opposite sides of the lens barrel, then gently pull the focus gear off with your index fingers while pushing on the barrel.

- ✓ Place the auto lock switch on back of camera in center position. This will allow changes to manual settings.
- ✓ Tighten the hand strap to its shortest position, and tuck the 'tail' back into the hand strap.

✗ **CAUTION:** Failure to perform this step may result in the hand strap becoming caught in the housing seal and accidental flooding.


- ✓ Next to the Camera/Memory/Off/VCR switch is a lock. If you wish, place this into the 'off' position. You can then switch to "Memory" mode for capturing underwater still

photos to the Memory Stick. In the “off” position, the switch will be prohibited from entering this mode. (Note about the TRV950/PDX10: the camera will capture full 1.33 megapixel digital still images *only* to the memory stick. If you capture a photo while in ‘camera’ mode, the still image is placed onto tape for 7 seconds, but in a much lower resolution. So, if you expect to capture 1.3 Megapixel digital still images, they are best placed on the Memory Stick)

- ✓ The PDX10 will require removal of the entire microphone assembly as well. Refer to you owners manual for instructions.

### ***Preparing the Housing***

- ✓ Three stainless steel safety latches secure the housing halves. They have a positive locking feature, so to open them you must first depress the center bar release while lifting the rear lever. Depress the bar and lift the rear lever on the top latch, then undo it from its catch hook. Release the two side latches in a similar fashion.
- ✓ Separate the rear half of housing from the front.

 **Note:** Your Gates housing was shipped from the factory with the large orange o-ring installed between the housing halves. This is done so you can observe proper and correct installation of this o-ring. It is recommended you ***remove this o-ring for future shipment or air travel*** to allow for air pressure changes.

- ✓ Remove the camera the mount plate from the housing. Note the positioning of the mount plate for later installation with the TRV950/PDX10 camera attached.
- ✓ Mount the camera to mount plate using supplied screw, which fastens to the tripod mount on the bottom of the camera. Note also that the camera will seat onto the mount plate with a small tab fitting the rear shoulder strap, just below the battery.
- ✓ Pull all side controls out as far as they will go.

### ***Installing the TRV950/PDX10 Camera Into the Housing***


- ✓ Carefully slide camera on its mount plate into housing until the mount plate stops against the tab. Look to see that the screw hole on the tab aligns with the threaded hole on the mount plate.
- ✓ Install the supplied flat head screw through mounting tab into the mounting plate. Tighten screw snug with medium screwdriver. Be careful not to scratch o-ring sealing surface with the screw driver.
- ✓ When the camera is installed into the front housing half, press in controls until they touch the camera and see that they work properly (refer to the next section for more detail on controls)
- ✓ Pull out zoom, still photo and power on/off controls on the rear half of the housing as far as they will go.

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### **Closing the housing**

- ✓ Carefully inspect o-ring on back half and sealing surface on front half. Make sure they are clean and in good condition.
- ✓ Place back half onto the front half housing. Align holes in back with alignment pins on front. You will 'feel' when the housing halves align and seat together properly.
- ✓ Locate all three latches in place. Close the two side latches at the same time, then close the latch on top last.

 **Caution:** The safety latches must be **closed** and **locked** prior to use to avoid opening underwater.

***It is your responsibility to make sure the latches are secure and locked, and in good condition. DO NOT enter the water with a faulty latch. Gates will replace a damaged or faulty latch free of charge.***

- ✓ Carefully inspect parting line between front and rear housing. If this line is not even all the way around, remove the back and determine the reason. (O-ring out of place, hand strap interference, etc.) *Failure To Do This May Result In A Wet Camera!*
- ✓ Press controls in until they touch camera buttons. Note positioning of the following controls:
  - Zoom control trigger should be up and forward at a 45 degree angle.
  - Photo Lever Trigger should be vertical and pointing up.
  - Cam/Mem/Off Trigger control should be horizontal and pointing to the right.
  - Record/Standby should be pointed forward and slightly up.
  - Program/Shutter Speed and White Balance/Exposure knobs should be pointed directly toward the back of the housing.
- ✓ Power up the camera. Check all controls for the proper operation before entering water.
- ✓ Check the Port. It should be seated flush on the front bulkhead with no uneven gaps. If the port is not seated properly, remove the port and re-install per directions in a subsequent section of this document.

## Controls

Your Gates housing utilizes 100% mechanical controls to provide you the most reliable operation possible. They are all rotational in nature: that is, there are no push buttons that can become sticky or depress under pressure. There are no batteries to change and little maintenance to perform (see 'Housing Care and Maintenance' section).

The housing controls are designed by Gates engineers, to the extent possible, to feel and behave like the camera. With time and use the housing controls will become quite familiar, and you'll find operating them requires similar 'finesse' as the camera controls.

To help familiarize you with the housing controls, Gates recommends reviewing each control individually, how it actuates the corresponding camera control, and actually operating it to get a 'feel' for the control. You can view all front housing controls with the housing open. After reviewing all controls, perform a 'simulated' dive by operating the controls as you would in the water.

One final note about controls: when operating any control *out of water*, you may need to press the control against the housing, into the position it would naturally find while under water pressure. The controls are designed to operate properly in this position.

### Power (Camera/Memory/Off)

This control is easily identified by the **green** color. It has three positions: 'Camera' (for video), 'Memory' (for digital stills captured to a Memory Stick) and 'Off'. The positions are exactly like that found on the camera switch, and you will 'feel' the switch move into each position as it passes the tactile detents.



### Zoom

The Zoom control is **blue** color for easy identification. It operates with a simple up/down motion on the lever trigger. *Note: this control must be returned to the 'neutral' position after setting the desired zoom distance.* Other functions on the camera may not properly operate if the zoom switch is depressed in either 'zoom' or 'telephoto' conditions. If you find that other functions will not operate properly, check that the zoom control is in the 'neutral' position.

### Record/Standby

The Record Standby control is red, and operates by a short downward motion on the lever trigger. Press once to record, press again for Standby. You will 'feel' the record/standby button on the camera actuate through the control as it is depressed. This control will return to its neutral position automatically.



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### Still Photo

This control operates with a short forward motion on the lever trigger, and you should feel the photo button on the camera depress.

A Note about Still Photos: in the 'Camera' mode, depressing the photo button will capture a still image to tape for 7 seconds. In 'Memory' mode, the image will be captured to the Memory Stick. In this mode, the image will be at the full resolution (1.3 megapixel). A still image captured to tape is significantly lower in resolution.

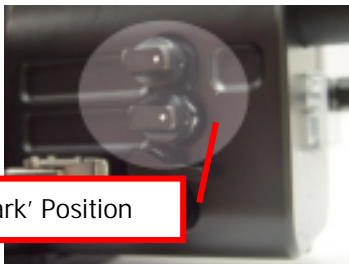


### A/M Focus (Auto/Manual Focus)

This trigger control moves the Auto/Manual focus switch. In the two o'clock position it is in auto focus, and in the four o'clock position, manual focus. To change focus in manual mode, use the manual focus control knob.

### Manual Focus

This knob control is simply rotated either direction to set focus distance. It engages the focus ring gear you installed earlier. When operating properly, you should 'feel the gears mesh as they were designed to provide you tactile feedback when being used.



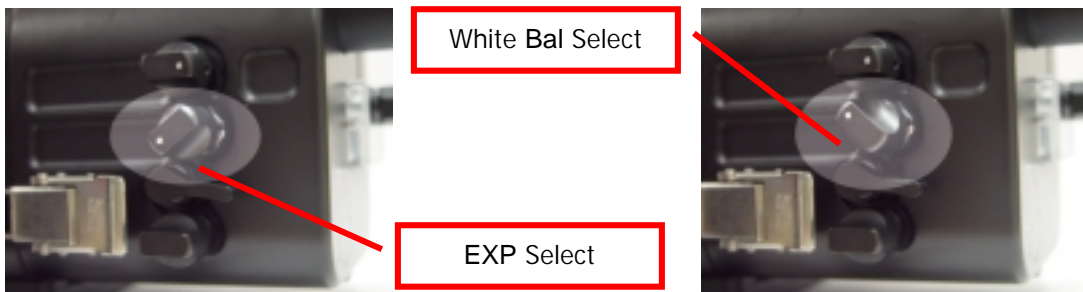
'Park' Position

### Exposure/White Balance/Shutter Speed/Program

These two knobs (see picture) actuate the corresponding four buttons on the camera. The photo at right shows the 'neutral' or 'park' position of the controls. You should return the control to this position when not in use to avoid accidental selection of this function.

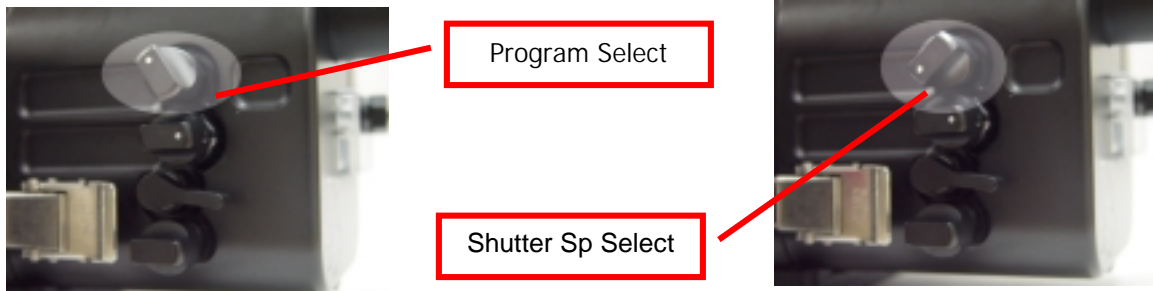
### Exposure / White Balance

This control actuates the Exposure button and the White Balance Button. By rotating the knob to the 7 o'clock position (see photo) actuates the Exposure button, and the 11 o'clock position actuates the White Balance button. After actuating either button, you then use the Exposure Dial to select the appropriate function (refer to your TRV950/PDX10 camera owners manual for more information).



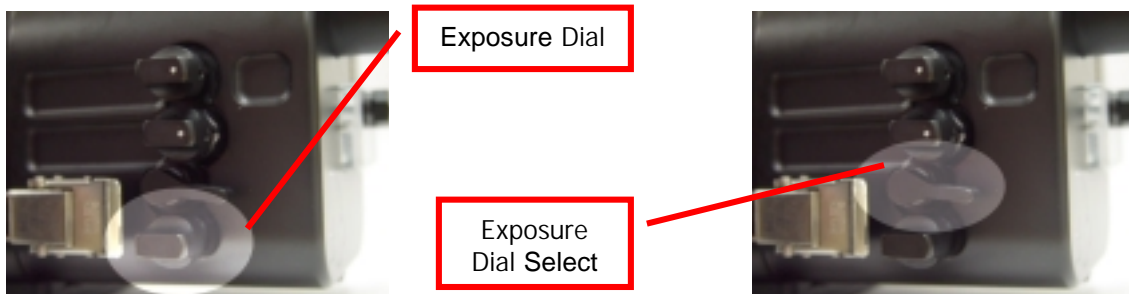
### Program / Shutter Speed

This control also performs two functions. Rotating to the 11 o'clock position actuates the 'Program' button. Rotating clockwise to the 7 o'clock position actuates the Shutter Speed button. After selecting Shutter Speed, use the Exposure Dial to change the shutter speed to your desired setting.



### Exposure Dial

This knob control is simply rotated either direction to rotate the exposure dial up or down.



### Exposure Dial Select

This control pushes the Exposure Dial when you have determined the appropriate setting and wish to actuate the Exposure Dial 'select'. Refer to your TRV950/PDX10 owners manual for more information.


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## Changing Ports

Gates offers several ports for your TRV950/PDX10 housing, which are attached with a bayonet-style mount. Port changes are easy and straightforward:

- ✓ You will see alignment dots on the housing and on the port. When aligned the port is fully engaged and ready for underwater use. Turning the port 90 degrees, or ¼ turn in either direction to the dot faces left or right will allow the port to release from the front of the housing. Gently pull the port directly away from the housing to do so.
- ✓ Before installing the next port, perform an inspection and lubrication of the sealing o-ring. See “O-ring Care and Maintenance” in this Use and Care Guide for specific details.
- ✓ Installing a different port is directly the opposite: insert the port into the front bulkhead of the housing with the alignment dot on the port facing left or right, or ¼ away from the dot on the top of the housing. You may need to gently push the port into the bulkhead, then turn the port until the dot on the port aligns with the dot on the housing. Be sure the port is fully seated and flush with the housing. You should see no gaps between the port and the housing.

 **Caution:** The Port must be fully seated and flush with the housing to avoid accidental flooding.

## Lighting Systems

Your housing comes ready to accept different lighting systems depending on your requirements. The handle is quite versatile and designed to suit most any application.

If you received the NiteRider™ lights with your Gates Pak, you'll find setup instructions in a separate part of this manual. The NiteRider™ system is powerful, lightweight and well suited to the Gates TRV950/PDX10 housing, and perfect for traveling.

For other light systems, the handle assembly has several mounting holes for securing batteries to the bottom of your housing. They will accept many different configurations and are quite versatile. They can be used for other brackets, mounts, arms, etc. The top of each handle also has threaded holes to mount light arms, monitors, brackets, accessories, or virtually anything necessary for shooting your video.

## Housing Care and Maintenance

Proper care of your Gates TRV950/PDX10 housing is important to provide you reliable operation and long life. You'll find all the guidelines in the "Housing Care and Maintenance" pages of this document. You can also find it on Gates web site at [www.gateshousings.com](http://www.gateshousings.com).

## O-Ring Care and Maintenance

Your Gates TRV950/PDX10 housing has 2 serviceable o-rings. One is located between the mating halves of the housing (the large orange one), and the other is located on the base of the Port where it mates with the housing.

Servicing the o-rings is easy, and covered in the "O-Ring Care and Maintenance" pages of this document. You can also find it on Gates web site at [www.gateshousings.com](http://www.gateshousings.com).

**⚡ Caution:** Do not lubricate the large orange o-ring! It is a special silicone o-ring and can be damaged by petroleum-based lubricants.

**⚡ Caution:** *Never* use metal tools or objects for removing o-rings!

Gates wishes you the best for capturing your images with the TRV950/PDX10 housing. We know it will provide years of service to your diving adventures and give you memories of a lifetime. Thanks for choosing Gates, and remember....

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# NiteRider™ Underwater Lighting System Setup and Use

If you purchased the NiteRider™ underwater lights with your Gates housing, you have a versatile and effective addition to your video system. Your NiteRider™ lights are powerful, lightweight and have a long “burn” time. They will provide ample illumination for you nighttime underwater shots as well as excellent daylight fill in. The following instructions will guide you through the easy setup and use.

## Before You Begin

- ✓ This guide addresses assembly of the NiteRider™ lights to your Gates housing. It does not cover operation of the light, as this is covered in the User Manual included with your NiteRider™ light system.
- ✓ The NiteRider™ **Vector 2 light system** consists of two light heads, each with a single 35 watt Halogen bulb, two mounting arms and mount balls, NR4000 NiCad Battery, Y-connector, and chargers. Note that the NiteRider™ battery pack is designed to attach to your weight belt, BC or BC pocket. The NiCad battery is not intended to attach directly to the housing. Note – the Vector 2 lights burn very hot and will quickly burn out if not cooled by water.
- ✓ The NiteRider™ **HID Pro Video light system** consists of two light heads, each with a single 10 watt HID (High Intensity Discharge) bulb, two mounting arms and mount balls, smaller NiMH Battery, Y-connector, and chargers. Please note - although the NiMH battery has a clip allowing it to be attached to your weight belt, etc, it can also be mounted below the camera housing with our optional mounting bracket. These two NiteRider™ systems also feature a detachable cable, allowing you to separate the battery pack from the housing after a dive. This connector can be separated and re-connected underwater, too, (when turned off).

 **Caution:** *Do not* turn on your NiteRider™ Vector 2 halogen lights out of the water.

## Light Arm Mounting link(s)

Your NiteRider™ light system comes with a light arm mounting link(s) that will mount to the handle of your Gates housing. The mounting links resemble a single link of the arm, but with a threaded bolt attached.

- ✓ To install the mounting links onto your Gates housing, simply **thread them into the top of the handles** on your Gates housing. Screw them in until fully seated, and tighten them snugly, but do not overtighten.

## Light Arm Attachment

Notice the attachment arms consist of locking, movable links that provide a flexible arm for easy positioning of your light beam. Each link can be separated and re-assembled easily. This allows easy attachment of the arm to your housing.

- ✓ With one hand firmly on the handle of your Gates housing, grasp the light arm at the end that will attach to the housing. The light arm will mate to the link you just installed in the previous step. **Firmly press them together** until they “snap” and lock together. You may need to apply some effort, but they will lock securely.

## Removing the Light Arms

- ✓ When you are ready to separate the arms, grasp the handle of your Gates housing and the light in the same way you did to assemble them. **DO NOT PULL the links apart.** Rather, **bend the light arm sideways** until the arm and mounting link separate.
- ✓ You can connect and remove the light arms at your pleasure. They are quite durable and will withstand many cycles of assembly and removal.

Gates wishes you the best capturing your memories with one of our products. We know it will provide years and years of service to your diving adventures and give you memories of a lifetime. Thanks for choosing Gates, and remember....

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## **Gates Housing Care and Maintenance**

**Congratulations** on your new ownership of a Gates housing, the worlds most reliable underwater housing! It is manufactured from “bulletproof” machined aluminum, given a type II “hard” anodized coating for durability, and then finished with a dichromate or clear sealing process to lock out corrosion. Reliable mechanical controls, preferred by the pros, are standard. Positive locking safety latches hold the mating halves securely in place, too, so your equipment stays protected and dry. You can get virtually a lifetime of memories from your Gates housing.

It is important to understand that while your housing is very durable, designed to withstand the rigors of diving operations and the harsh salt-water environment, *it is your responsibility* to care and maintain your Gates housing and protect your investment. A few easy, common sense steps are outlined here to guide you in appropriate care. Regular attention will assure continued proper operation of your Gates housing, and indeed is *required by the warranty agreement*. Failure to take proper care of a Gates housing voids this agreement, so be sure to read through this entire section prior to operating your new Gates housing.

### **First Time Use**

Every Gates housing is pressure tested before leaving the factory to assure a watertight seal. As a precaution, however, it's a good idea to first use the housing **without** your Sony TRV950/PDX10 inside. Rough or abusive handling during shipment could have caused unnoticed damage after leaving the factory. In addition, you can get a good feel for the use of an underwater housing without worrying about getting a good shot. You can simply concentrate on the technique of holding a housing in position while fine tuning your buoyancy.

**Follow all the guidelines** as described below to prepare, execute and finish a dive. Then, dry the outside of the housing, open it up, and look for any leakage. Water that has seeped in is usually quite visible. Also feel the inside for any moisture by running you finger across interior surfaces near the port openings, windows and housing mating surfaces. If you feel or observe any water that has penetrated, contact your Gates reseller or Gates directly.

### **Preparing to Dive**

Each time you prepare to enter the water with your Gates housing there are several important checks to make.

- **Install the camcorder/camera** inside the housing per the instructions you received with the housing. Make sure it is secured firmly to the housing and will not move around during use.
- **Check all the o-rings.** Follow the guide called “O-Ring Care and Maintenance” from Gates that was included with your housing.

- **Move all the controls.** They should rotate freely without binding or roughness.
- Close the housing. See that the halves are **mated and aligned** properly. Close the safety latches into their locked position.
- **Check the port** for proper installation (if it has been removed). The port should be *flush to the housing* and the dots on the port and housing aligned.
- **One final check** should be made to look for anything unusual. This could be a pinched o-ring, or misaligned port.

## During the Dive

When you enter the water and during the dive, some important tips to remember:

- **Detecting a leak** -- Contrary to popular belief, a leaking housing will *NOT* spew a stream of bubbles to flag a leak. Water will be forced inside, but air will not escape. Look inside the housing from any viewport as you carefully submerge the housing. A good way to do this is hold the camera lens down as you look inside. If there is any water whatsoever, it will pool at the lens, telling you to exit the water post haste.
- **Optional Audio Moisture Detector Alarms** are available for most Gates housing models. If you hear the loud, annoying buzz it creates during your dive, immediately and safely exit the water and examine your housing.
- **Severe impacts** to rocks, coral or anything solid should naturally be avoided. Your Gates housing is designed to withstand these incidents, but rough or abusive handling could compromise the integrity of the seals. Should you encounter a heavy impact or other extreme conditions, look immediately for leaks. It is highly recommended you exit the water and thoroughly inspect your equipment after such an event.

## After the Dive

As you may know, salt water is highly corrosive when left in contact with metal. It can quickly turn iron into rust, and aluminum into aluminum oxide. Even though your Gates housing comes anodized and sealed for protection against salt water, even the best protection can be compromised when left exposed to salt water for extended periods of time, and indeed a deep scratch or dent can expose aluminum, making it susceptible to salt water corrosion. *This is bad.*

Once again, some easy steps can prevent any problems due to corrosion.

- When you are finished diving, completely **submerge or rinse your sealed housing immediately in fresh water**. If you cannot do so directly, then as soon as possible after the dive. Soaking your housing in fresh water is not necessary – a thorough rinse will suffice.
- If you submerge your housing in a dip tank, take care that other cameras and equipment do not adversely contact the housing. Many floods have occurred due to carelessness in the rinse tank.
- If you open the housing to change batteries, tapes, film, etc. between dives, **thoroughly dry the housing before opening**. Use compressed air whenever possible to blow away water from the mating surface area and avoid any drips inside when the housing is opened. Do the same around the port if you intend to remove or change it.

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- When you are ready to close the housing again for another dive, start with “Before you Dive” guidelines above.

## Storing a Gates Housing

When the dives are over and it's time to store your Gates housing, there are several significant actions to take.

- **Dry the housing completely** with a towel. Remove ports, handles, and accessible o-rings. Then use compressed air to blow out water around seals, mating parts, ports, etc. **Remove every visible trace of water.** Do the same with the accessories and other parts you used underwater or that were exposed to salt water, or even salt air during your diving adventures.
- **DO NOT store your housing in the travel case.** Water that may have absorbed into the foam will return to attack the housing over extended periods of time. Rather, put your housing on a shelf, preferably in a cool, dry place where it is exposed to the air. Leave your travel case cracked open to allow air circulation.
- Be sure to **leave the housing open when stored** to allow air to circulate inside as well. Do the same with any battery cases, video monitor cases, etc.
- If the housing will be stored for some time, **remove the 9V battery** from the optional water alarm, if you have one.

Gates wishes you the best capturing your memories with one of our products. We know it will provide years and years of service to your diving adventures and give you memories of a lifetime. Thanks for choosing Gates, and remember....

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## O-Ring Care and Maintenance


If you're like many owners of underwater video or camera equipment, you may wonder: just how does one provide proper care to the o-ring seals that keep water safely away from my expensive electronics? This is an excellent question. The answer seems to pervade the world of SCUBA, passing from mouth to mouth, but there seems lacking a consolidation that brings all that useful advice together. Well, this brief guide will help de-mystify o-rings, their proper care, and provide a good useful summary information.

### ***What is an O-Ring?***

An o-ring is really quite simple, resembling a thick rubber band. They are almost always round, or "O"-shaped, but can be rectangular, oval, trapezoidal, or any shape required to establish a watertight seal. In all cases, O-rings are manufactured to precision tolerances required to hold a pressure seal on your housing. O-Rings are made of an elastomeric material, which is a fancy way of saying they can stretch and deform. They can be made of natural rubber, latex, silicone, viton, buna, or many other stretchy materials. This is an important feature of o-rings as it provides the means by which a watertight seal is formed.

### ***How Do I Care for O-Rings?***

As you may have reasoned, o-rings must be free of dirt and debris to work. Any foreign material that compromises the o-ring being squeezed into the o-ring groove will allow water to enter. *This is bad.* Fortunately, it's very easy to maintain the integrity of this seal by simply inspecting, cleaning and lubricating the o-rings when required.


 **Caution:** Your Gates housing contains *two types* of o-rings: one large *orange* o-ring and one or more *black* o-rings. The following instructions apply to both types of o-rings except for lubrication—***Do Not Lubricate the orange o-ring!*** It is a special silicone o-ring and can be damaged by petroleum based lubricants.

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## **Inspection**

Begin by ***carefully inspecting the o-rings***. As a matter of habit you should inspect your equipment o-rings *before every use*. Once you gain experience, this step will be quick and easy.

 **Caution:** **Never** use metal tools or objects for removing o-rings! These devices can easily damage the surface of the o-ring, the groove, or both.

- ✓ ***Only if necessary, remove the o-rings*** from the recessed groove where they may be stretched or secured.
- ✓ One at a time, ***run each o-ring between your fingers and feel for any dirt or foreign material***. You should also feel a thin film of silicone lubrication on the o-ring surface of the ***black o-rings only***. This helps keep the o-ring flexible and readily able to seal the o-ring groove of the mating surfaces. If you feel dirt or grittiness, clean the o-ring.
- ✓ Next, under good lighting, ***closely examine the o-ring surface***, especially if you felt imperfections on the surface during the previous step. There should be no nicks, scratches, tears, or scars. Pull slightly on the o-ring as you rotate it through your hands to illuminate any cracks. The surface should be smooth and clean. If not, replace it with a new o-ring.
- ✓ ***Carefully inspect the recessed groove as well***. There should be no foreign material here, either. Dirt, hair, sand or any “gritty” feeling stuff means you’ll need to clean ***both*** the o-ring and groove.

## **Cleaning**

For o-ring cleaning you’ll need a lint-free cloth and Q-Tips.

- ✓ Holding the cloth in your hand, grab the o-ring and gently pull it through the cloth. Pull the entire loop through several times until all the foreign material has been removed and the silicone lubricant (on non-silicone o-rings) is gone. Once again inspect the o-ring under good lighting as described above, since imperfections may be seen more easily without the silicone lubricant coating.
- ✓ Using a Q-Tip or the lint-free cloth, thoroughly clean the recessed groove. Press the Q-Tip deeply into the groove to access corners and remove residual silicone.

## Lubrication

⚡ **Caution:** The **large orange o-ring** on your Gates housing requires no lubricant. It is a special silicone o-ring and can be damaged by petroleum based lubricants. **Do not lubricate!**

Now you're ready to lubricate the **black** o-rings. For this you'll need pure silicone lubricant or silicone grease (available at dive shops).

- ✓ Put a generous amount of silicone between your thumb and forefinger, then run the entire loop of the black o-ring between your fingers several times. You need to coat the entire surface of the o-ring with a film of lubricant. **The lubricant film should be thin, uniform and completely cover the o-ring.**
- ✓ **Place or stretch the o-ring back into its recessed groove** and be sure it's well seated. Give the o-ring one last look for hair or other dirt that may have fallen on your work.

## A Few Final Tips

- ✓ If you don't need to service an o-ring, *don't*. A sealed o-ring will remain so unless disturbed, such as when cleaning. A good example is a Port: there is no need to service a Port o-ring between dives if it is not removed or changed.
- ✓ Some o-rings are inaccessible, such as those inside the shaft of a mechanical control (called a gland). These o-rings require little maintenance. You need only lightly lubricate the shaft of the control (inside and outside) with silicone lubricant periodically, about every 20<sup>th</sup> use. After applying, move the control in and out several times to distribute the lubricant.
- ✓ Every two years Gates recommends a complete overhaul of o-rings regardless of the amount your equipment gets used.



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