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Congratulations and thank you for your purchase of an Essex waterhousing. Spend a few minutes reading these instructions to make sure that you have the knowledge that you need to keep your waterhousing in tip-top condition.

It is also prudent to practice sealing the housing without the camera inside; and then subjecting the housing to the dunk test. You must learn what the main o-ring seal looks like when it is properly sealed and you must also learn how snug to tighten your wing nuts in order to create that seal. (Essex Surfhousings LLC cannot be held liable for any water damage caused to your camera and lens.)

Loading the camera in to the water housing:

1. Place the waterhousing in front of you with the pistol grip pointing down.

2. Remove the front port and set it aside on a clean, dry surface. (Be careful not to scratch the bottom surface of the port.)

3. Make sure that the cameras settings are set the way you want.
   ISO? Auto focus mode? Exposure mode? Is there film or a CF card in the camera? (A few minutes spent double-checking that the camera settings are programmed the way you want before you close up the housing, will save you a long swim out to the lineup and back to the beach!)

4. The 30D, 40D, Mark 2 and Mark 3 housings need to have the rubber eyecup from the camera.

5. Pull any control shafts all the way out, so that the body of the camera will clear the shafts while being inserted in to the shell of the housing.

6. Gently place the camera in to the housing making sure that the connecting cord coming from the pistol grip is nested in the shallow depression in the bottom of the housing. If the camera doesn't want to easily drop in to the

housing because it is pinching the cord, this means the cord isn't nested in the shallow depression. Remove the camera and try again with the connecting cord properly nested. Never force anything.

7. The electronic connecting cord should wrap clockwise around the lens and plug right in to the connector on the camera. For Canon housings, lift the camera up out of the shell of the housing just enough to plug the connector in to the side of the camera. (The Canon Mark 2 housings require that you remove the rubber dust cover for the remote socket and the sync socket from the camera for proper fit.) For Nikon housings, the connector plugs right in to the front of the camera body. Be certain that the cord will not be "pinched" by any shims on the front port.

8. If using a lens with a zoom or a focus gear, make sure that the gear is in its correct position on the lens.

9. Place the appropriate lens port on the housing, making sure that the drive gear on the port meshes with the lens gear. You can throw the zoom lever or focus lever to insure that the drive gear is engaging the lens gear and that the lens gear is situated on your lens correctly.

10. Place a wing nut barely ***FINGER TIGHT*** on to the left and right side studs. Place two more wing nuts on the lower right and upper left studs and then finish up with the two remaining studs. At this point you should see that the Plexiglas is beginning to compress the main o-ring, which in turn is beginning to form a solid black line.

11. Notice that we placed the wing nuts on in a pattern similar to tightening the lug nuts on a cars tire. ***THIS IS IMPORTANT, FOLLOW THIS PATTERN!***

12. Now repeat the pattern, turning each wing nut about ***1/8th*** of a turn. (About 45°) Left and right studs, then the lower right and upper left studs, again turning about ***1/8th*** (45°) of a turn. Finish up with the two remaining studs. Repeat this a third time and you should just be barely turning the wing nuts. (We call this the "three-step 1/8th turn" rule) The wing nuts should feel snug and tight. ***DO NOT TIGHTEN GORRILLA STYLE!!!! YOU WILL ONLY DO MORE HARM THAN GOOD.***

13. The wing nuts need to be tightened snugly and securely so that you have a nice **solid black line** all the way around the main o-ring. If you follow the "three step" rule above, you should be good to go.

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Unloading the water housing:

1. If possible, rinse the housing with fresh water.

2. Dry your hands and the outside of the water housing and place the housing on a proper work surface such as a dry towel.

3. Remove the wing nuts by following the pattern and loosening the wing nuts slowly. (Remember the "Three-step 1/8th turn rule)

4. Stash your wing nuts in a film canister so they don't get lost in the sand.

5. Remove the front port and place off on the side remembering not to scratch the bottom of the front port.

6. Dry any water drops from the bottom of the front port and the flange / main o-ring area on the housing.

7. If equipped, pull any control shafts out of the way so that the camera body will clear the shafts.

8. Remove the camera from the shell of the housing by lifting the camera by the lens. (Angle the camera if needed to clear any control shafts) Unhook the remote cord and place it back inside the housing.

9. Reload film into the camera or change out CF card.

10. Load the camera back in to the water housing, following the proper procedures.

Attaching the Pistol Grip / Pole Grip

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The Pistol grip and Pole grip are held on to the shell of the housing via four stainless steel machine screws. The receiving threads in the shell of the housing have an exclusive screw-lock capability that prevents the screws from vibrating loose.

To remove:

1. Use a Phillips head screwdriver and loosen the four screws.
2. As you remove the grip, carefully pull the connecting cord out from the shell of the housing.
3. While the Pistol grip is not attached to the housing, make sure that the connecting cord is not pinched, bent or otherwise damaged at the location where it enters the grip.

To attach:

1. Make sure that the o-ring on the bottom of the housing is free of any sand, dirt or debris.
2. Lightly coat the o-ring with silicone grease.
3. Feed the connecting cord through the hole and position the grip.
4. Start one of the machine screws but do not tighten completely. You will want to leave the screws loose so you have some wiggle room to start the other screws.
5. Once all four screws have been started, you may then tighten the screws. The screws need to be tight and snug but avoid over tightening them.
6. Once the flat base of the Pistol / Pole grip comes in to contact with the flat base of the housing, the seal is made. Overtightening the screws will only damage the threads.
7. If you have any doubts about how you assembled the grip to the housing, test dunk your housing without the camera.

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Positioning the Lens gear

We will describe the method for placing the lens gear on a zoom ring of a lens. If placing the lens gear on the focus ring, the technique is essentially the same.

1. Place the camera with lens in to the housing.
2. Place the port on the housing without the lens gear on the lens.
3. Notice where the drive gear on the port sits in relation to the lens. This point of contact is your landmark. (Some front ports will have the contact point at about the 4 o'clock position and other ports will have the contact point at the 6 o'clock position.)
4. Rack the zoom ring back and forth and leave it racked all the way to your left
5. Fit the lens gear on to the zoom ring of the lens. Because the lens is racked all the to your left, the lens gear will be placed on the lens so that it starts at the contact point and goes to the left. (Make sure to leave about 2-3 extra teeth on either side of the zoom range.)
6. Before placing the front port on the housing, position the lever of the drive gear opposite of the location of the lens gear. If the lens gear is on the left side of the lens, position the drive gear lever to the right. (Remember that when two gears mesh, each rotates in opposite directions.)
7. While looking down at the lens, slowly place the front port on to the housing. You may need to jiggle the zoom lever slightly in order for the teeth of the gears to mesh.
8. Once the port is on the housing, move the zoom lever through its range of motion to insure proper alignment and a smooth zooming.
9. You may have to readjust your lens gear on the lens, the position of the zoom lever etc..... in order to get it all working smoothly.

The zoom gear is designed so that it has two or three extra teeth on each end of the zoom range when aligned properly on the lens. This is so you can rack your zoom back and forth and not have to

worry about the lens gear teeth coming out of contact with the drive gear. You can also play with the positioning of the zoom lever in relation to the housing to suit your personal tastes. Once you have placed the lens gear on the lens a few times, the positioning of the gears will fall in to place rather easily and will become second nature.

The 2-stage Auto focus / Shutter release switch

In the old days of shooting with Nikon FM2's and other SLR's, a manual lever penetrated the side of the housing and actuated the shutter release on the motor drive and most housings of that era were built with a side handle because of this limitation. Of course, you held and fired the camera with the right hand while your left hand was used to focus. In the eighties, cameras were starting to become the electronic marvels that they are today and most manufacturers offered a remote control cord that attached to either the motor drive or the camera body. Auto focus was in it's infancy but a few housing manufacturers saw that they could start to incorporate this feature of a remote cord and thus, the handle of the housing could be moved to a different location. The pistol grip is a result of this innovative thinking and design. With the advent of auto focus lenses, the trick was to then build a 2-stage switch that mimicked the feel and operation of the motor drive or cameras built in switch. Few have succeeded in this endeavor, as it requires a sophisticated solution to the problem.

After many years of research, Essex waterhousings developed a 2-stage switch that effectively mimics the feel of a modern day SLR camera. The following tips should help you get the most out of your 2-stage switch.

- When slight pressure is applied to the switch, you will feel a small click and you will be in Auto focus mode. As long as pressure is being applied to the switch, the camera will continue to Auto focus. (The camera needs to be set to a "Continuous" Auto Focus mode. Other modes may achieve focus and stop focusing once the focus has been achieved.)

- When more pressure is applied to the switch, this will result in the firing of the Shutter Release. If the cameras motor drive setting is set to anything other than single shot, then as long as pressure is applied to the switch, the camera will continue to release the shutter.

1. Practice focusing.
    - Set the camera up in the housing and practice focusing in order to get a feel for the two-stage switch. You can focus on cars coming down the street or kids playing at the park. You can also experiment with the different AF modes that your camera offers to get a feel for which mode will work the best when you are out in the lineup.
2. Shoot, shoot and shoot.
    - Don't be bummed that it is not perfectly sunny out when you want to shoot. Even overcast weather can make for extremely moody and artsy photos.
    - You can't get the shot from the beach!!

Waterhousing Maintenance:

The following maintenance procedures will insure that your waterhousing continues to operate, as it should.

- After every session, rinse the camera with copious amounts of fresh water before you unload the camera.

- Use a soft terry cloth towel to dry the housing before you unload the camera and always set the housing and the port on a soft towel when loading or unloading the camera.

- At the end of the day, the front port can be washed with lukewarm water and a small amount of dishwashing soap. Use a soft sponge to gently wash the Plexiglas, (Do not use a kitchen sponge that has the pot scrubber scouring pad attached to one side!) After rinsing, towel the front port dry.

- The outer shell of the housing can be washed with lukewarm water, dishwashing soap and a soft sponge too. Hold the shell of the housing so that no water gets into the inside of the housing. Hold the shell so that the water flows over the back of the housing and runs down the side. You may need to coil up the connector cord and hold it up inside the housing to keep water from coming in to contact with the cord. **Do not wash the inside of the housing!** Avoid getting any water near the area where the connecting cord enters the Pistol Grip. Water can be drawn via capillary action in to

- the switch chamber of the Pistol Grip. If this happens, damage to the two-stage switch will occur and the switch will eventually malfunction. After rinsing, towel the shell of the housing dry.

- Give the main o-ring seal a light coating of silicone grease. Use just enough silicone grease to make the o-ring feel slick. Gobs of silicone grease are not needed and just create a mess.

- Keep the control shafts lubricated with a small amount of silicone grease.

- Treat the housing as you would an expensive camera or lens.

WARNING!

Certain chemicals may damage your Plexiglas front port.

The following chemicals may cause Crazing, Cracking or dissolving of Plexiglas and should be avoided:

- Acetone
- Aromatic Solvents
- Benzene
- Butyl Alcohol
- Lacquer Thinner
- Toulene
- Lysol Brand Disenfectant
- Turpentine
- Xylene
- Clorinated Solvents
- Ammonium Based Cleaners (i.e. Windex and similar)

Novus Plastic Polish is our recommended cleaner and polisher for Plexiglas.

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Water drops and how to avoid them!

Water drops on the front lens piece are the curse of any good photograph as they will not only be unsightly, but they will cause an otherwise sharp photograph to become soft and blurry. What is the best way of keeping water drops off of your lenspiece? First, a little understanding of water drops and how they are caused.

- Water drops are caused by surface tension. If a surface such as a Plexiglas front lens piece is perfectly clean and smooth, then there is no surface tension and hence, the water will "sheet" off and leave no drops behind. This is why many water photographers will wax and shine their front lens pieces before going out in to the water. They want to create as little surface tension as possible and the wax gives them a good head start.

- Once you are in the water, the effectiveness of the wax job will soon diminish. This is caused by the salt content of the water along with the dirtiness of the water. We've all seen on our cars, water spots left behind after drops of water have dried up. Water spot contains trace mineral elements present in the water along with whatever dirt or grime that was in the water. A dried up water spot provides a foothold, or rather a place of tension that water can hang on to.

- When you are in the water and getting ready to shoot, pull the housing up out of the water and ideally you will see the water sheet right off of the lenspiece without any water drops left behind. If this is the case,

then you are good to go. If not, then your lenspiece has surface tension and it must be cleaned.

- A technique that I use while in the water is to hold the housing so that the lenspiece is half in and half out of the water. Using your free hand, dig at the crook of your nose or the inside of your ear with your index and middle fingers. You want to get a little bit of body oil or earwax on your fingers. Next, rub at the lenspiece with your fingers in an up and down motion, moving from side to side. Dunk the housing and pull it out of the water and you should be rewarded by seeing the water sheet off of the lenspiece fairly quickly. If it doesn't, get some more wax or oil on your fingers and try again.

- Depending on the cleanliness of the water, you may have to clean the lenspiece every five minutes or maybe only every fifteen minutes. In between sets is a good time to be cleaning the lenspiece and getting it ready for the next shot.

- If you are swimming in the lineup and you have the lenspiece clean, you can keep the housing underwater and pull it out when it is time to shoot. The water should sheet right off.

- If you are on a bodyboard, you can keep the housing underwater or you can keep it above water, ready to go. If you keep it above water, be cognizant of any spray, mist or water drops from breaking waves that might mess up the lenspiece.

- Remember, water that dries on the front lenspiece will leave behind a water spot, which in turn increases surface tension thus leading to water drops.

Suggested items to have on hand

1. **Silicone grease.**

   This is waterproof grease that can be found in the Plumbing section of your local hardware store. It is a clear grease and it should not be confused with silicone spray. It is used sparingly on the main o-ring and on any o-rings in the control glands. For the main o-ring, rub a little grease sparingly on the entire o-ring. You want to give the o-ring a light coating of grease. For control glands, introduce a little bit of grease at the point where the stainless steel shaft enters the control gland. Push and pull or rotate the stainless steel shaft in order to get the grease in to and around the shaft.

2. **Car wax and clean hand towels**

   Many photographers will wax and buff the front lens piece before they go out in to the water. This is a good idea, as a clean lens piece will not hold water drops. Once you have been in the water for any length of time, the front lens piece will need to be cleaned every ten minutes or so. Use your fingers to rub at the lens piece while holding it half in and half out of the water. Dunk the housing and pull it out of the water and you should see the water sheet off of the lens piece. If it doesn't, you need to repeat the previous steps. Everybody has a different system, experiment and find one that works for you.

3. **Spare wing-nuts and a wrist leash**

   Always keep a stash of spare wing nuts handy. The wing nuts are stainless steel, size 10/24. (Available at your local hardware store)

Use a wrist leash!! At the base of the handle is a hole that you can use to tie off a wrist leash. It is a good idea to always wear the leash while taking pictures. What the ocean wants, the ocean gets.

4. A Pelican case or other camera bag

Treat your camera housing like the expensive piece of equipment that it is. Dedicate a special case to hold your housing and always keep it wrapped up in a clean towel or other type of soft cloth to keep the housing and the port from being damaged during transport.

5. Plexiglas cleaner and polish

At your local Plexiglas supply store, you can buy a product called “Brillianize”. This is a Plexiglas cleaner and polisher that should be used on all Plexiglas parts. Remember that Plexiglas is a soft material and that it will scratch. Polish our front lenspiece with a nice soft piece of cotton t-shirt or cheesecloth such as the type that is supplied with Brillanize.

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Glossary

- Camera housing:

  A term for an underwater camera case, which includes the shell of the housing and the front port. *See also Water housing and or Housing.*

- Connecting cord:

  The electronic cord that connects the two-stage switch in the pistol grip in the housing to the camera. Nikon cameras use the Nikon 10-pin connecting cord and it plugs in to the front of the camera at about two o'clock in relation to the lens. Canon cameras use the Canon 3-pin connector and it connects to the side of the camera at about the three o'clock position in relation to the lens.

- Control Gland:

  A fitting that holds an o-ring and which a control shaft can pass through, thus making a penetration of the housing wall or a front port. Control glands can be made out of either metal or Plexiglas.

- Control shaft:

  A stainless steel shaft, either 1/8" or ¼" in diameter that is used in conjunction with a control gland. A control shaft can have a gear attached to it or it can be designed to a specific shape to interface with a camera control.

- Direct drive Control shaft:

  A MW handmade exclusive design feature. The control shaft is bent at a
  90-degree angle to form the lever for the drive gear. This precludes having a lever attached to the shaft by a setscrew, which may eventually slip on the control shaft.

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- Dome port:

  A front port that has a dome instead of a flat lens piece for the lens to look through. Typically used with extreme wide-angle lenses.

- Drive gear:

  A gear that is installed on a front port and which “drives” a lens gear.

- Flange:

  The perimeter of the shell of the housing. The flange is perfectly flat and holds the main o-ring seal and the studs.

- Focus lever:

  The lever that is used to turn the drive gear to facilitate focusing of the lens. Part of the “Direct Drive control shaft” system. *See also Zoom lever*

- Front port:

  The front half of the housing. Usually made out of Plexiglas and built to accommodate a particular lens. Some front ports can hold a range of lenses.

- Housing:

  A term for an underwater camera case, which includes the shell of the housing and the front port. *See also Camera housing and or Water housing.*

- Lens gear:

  A gear that is attached to a lens. Used for either manual focusing or zooming of the lens.

- Lens piece:

  The piece of Plexiglas that the lens actually looks through.

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- Main O-ring:

  A 1/8” diameter O-ring that comprises the main seal for the housing. Installed in a groove on the flange. *See also “O-ring”*

- O-ring:

  A donut shaped ring made out of Buna-N neoprene. Used in control glands and on the main seal for the housing. *See also “Main O-ring”*

- Pistol Grip:

  A grip that is situated on the bottom of a housing and is shaped like a pistol grip, or actually uses a pistol grip.

- Set screw:

  A small stainless-steel screw that secures either a gear or a lever to a control shaft. Quality set screws will be made of stainless steel and will have a brass tip that compresses and molds itself to the control shaft when tightened. This helps to prevent any slippage of the gear or lever on the control shaft.

- Shell (of housing):

  The main body of an underwater camera case. The shell holds the camera body and has a main o-ring and studs installed on it along with other controls.

- Shims:

  Blocks of Plexiglas padded with a closed cell foam attached to the bottom of a front port. Used to keep the camera from moving and shifting while in the housing.

- Studs:

  Stainless-steel pan-head bolts that are installed on the flange of the housing and which accept the front port.

- Water housing:

  A term for an underwater camera case, which includes the shell of the housing and the front port. *See also Camera housing and or Housing.*

- Zoom lever:

  The lever that is used to turn the drive gear to facilitate zooming of the lens. Part of the “Direct Drive control shaft” system. *See also Focus lever*

- Zoom range:

  The range of lens rack for a zoom lens, from one. *See also Focus range:*