

Arri Mini Underwater Housing

Setup, Use, and Care Guide

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Photos by John Ellerbrock / Gates Underwater Products

This manual and current revision is available in 8.5 x 11 size and full color at:

<http://www.gateshousings.com/documentation.html>

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1: Introducing the Arri Mini Underwater Housing

Congratulations on owning a new Gates product: the Arri Mini Underwater Housing. You've selected an underwater imaging tool that will provide years of value and reliable service. We designed the Arri Mini Underwater Housing specifically for the Arri Alexa Mini camera.

Please read through this entire guide to learn about the Arri Mini Housing so you can get the most out of this imaging tool. In this section, we'll introduce you to the features of the housing so you can get started.

Features

Arri Mini Housing has several key features:

- Lens flexibility.** The Arri Mini Housing can accommodate a variety of different PL mount lenses with no change to control locations. Focus, Iris, Zoom remain in the same location regardless of optics used.
- Cinema-grade design.** Lens choice and control access are just two of the many features designed into the Arri Mini Housing. A/R coated glass optics, optional HD-SDI surface feed, and Seal Check are a few of the items any professional will appreciate.

Warranty Disclaimer

Like any tool the Arri Mini Underwater Housing requires knowledge and understanding to be effective.

Your responsibility is to learn the proper setup, use and care of the Arri Mini Housing. Because we can only provide you with the information necessary to do so, Gates does not warrant the contents of your housing (e.g. your camera and lenses) under any circumstance.

We warrant the Arri Mini Housing as an image acquisition tool for a period of 2 years. The Seal Check unit is warranted for 1 year. Optics (Dome and Flat ports) are warranted for a period of 1 year or 100 hours salt water contact, whichever comes first.

Gates does not warrant optical performance or image quality.

If you have any questions about the setup, use and care of the Arri Mini Housing, contact Gates directly. Details are in section 2.

Arri Items Required

The following items are required to operate the Arri Mini Camera Housing and are not included with the camera housing:

- Arri Alexa Mini Camera.**
- GPB-1 GPIO Box.**
- CFast 2.0 Memory Card (consult Arri documentation for supported brands / capacity).**
- Arri Alexa Mini Viewfinder (For camera setup only. Not required to operate camera housing).**

Unpacking Arri Mini Housing

After you remove the Arri Mini Housing from its shipping container, carefully inspect it for missing parts or damage that may have occurred during shipment. If you discover any discrepancies, contact Gates or your dealer immediately for assistance.

Standard Parts

- Arri Mini Underwater Housing.**
- Camera Bridgeplate and Mount.**
- Lens Gear Drives (2x Clockwise and 1x Counter Clockwise).**
- Universal set of Guide Bars and drive shafts.**
- Hard Sided Rolling Case(s).**
- Seal Check system.**
- Tool Kit with case.**
- Various assembly and spare parts for the Arri Mini Housing including bolts and set screws.**
- Light Bracket.**
- Spare O-Ring Kit.**
- Lanyard Handle.**
- Lanyard Mounts.**
- Trim Weights (quantity dependent on configuration).**
- Port(s) of choice (Dome, either glass or acrylic, or Flat) and shade.**
- GPIO / Record Cable.**
- Focus / Iris Silicone Marker Rings.**
- External Monitor Housing System with Shade Extension.**

Optional Parts

- Water Alarm.**
- HD-SDI surface feed bulkhead connector and cable.**
- Stackable Lens Gear Knob Extensions.**
- Light System.**
- Tripod Adapters.**
- Crane Mounts.**
- Hydrophone.**
- Microphone.**
- Comm. Input.**
- Port ring(s) of choice for your lens (as needed).**
- Electronic Remote Lens Control.**
- Surface Control Cable.**
- Surface Feed Power.**
- Extended Battery Shell (For double stacked batteries).**

2: Cautions

- ▶ **TRANSPORT. NEVER** ship or transport your camera inside the Arri Mini Housing. The housing was not designed for this purpose and severe damage may result.
- ▶ **USER RESPONSIBILITY.** This Setup, Use and Care guide contains important detailed procedures for setup and use of the Arri Mini Housing. It is the user's responsibility to read, understand and employ these procedures. Failure to do so can result in poor or non-operation of the housing and may void your warranty.

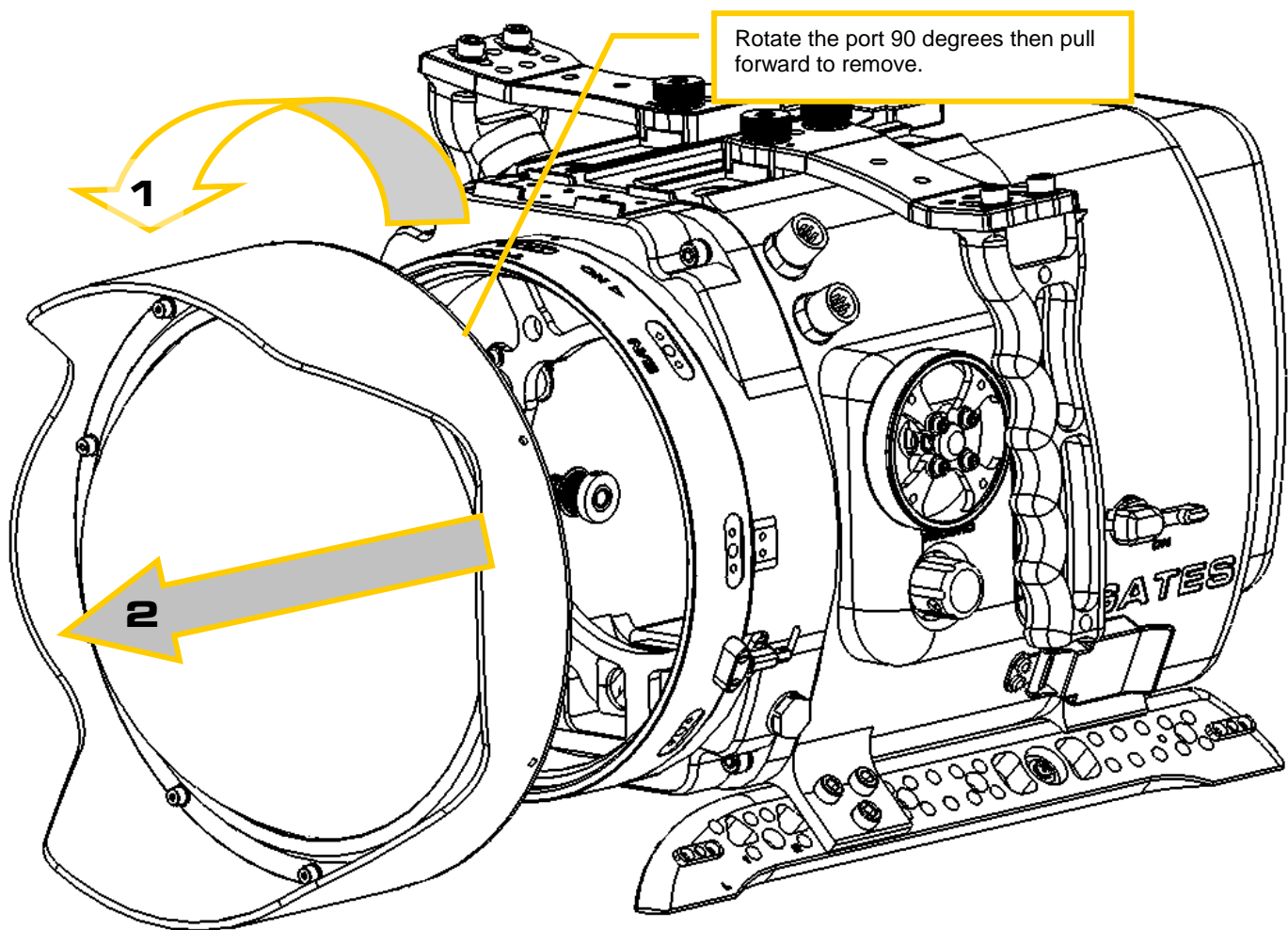
Contact Gates if you have questions this manual or using the Arri Mini Housing.

3: Arri Mini Housing Setup

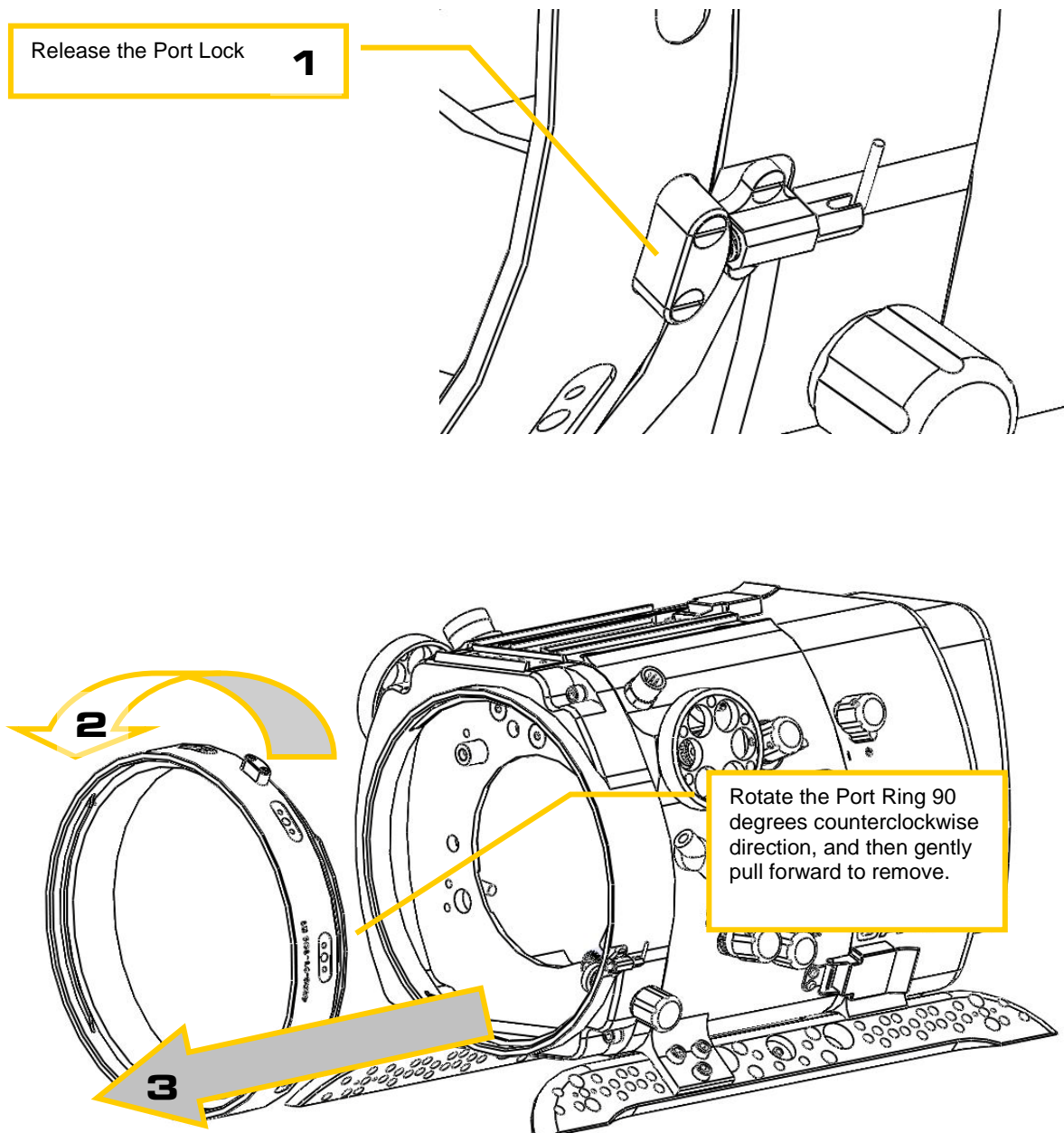
Arri Mini Housing Preparation

- **Port.** Remove the Port by rotating 90 degrees while facing the front of the housing. Pull the port away from the Port Ring.

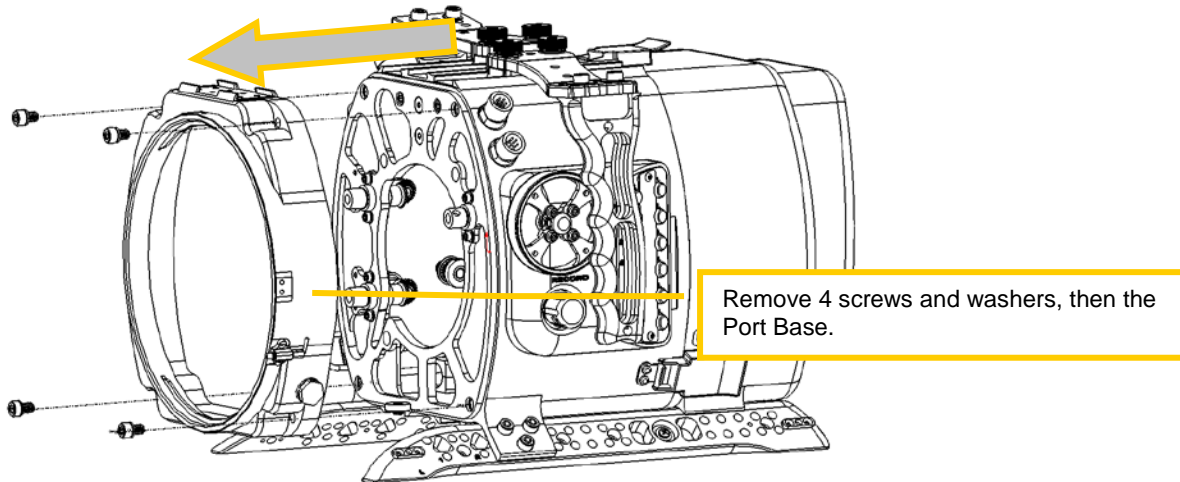
- ▶ **TIP:** Liberal lubrication of the Port o-ring allows easier rotation during installation/removal.



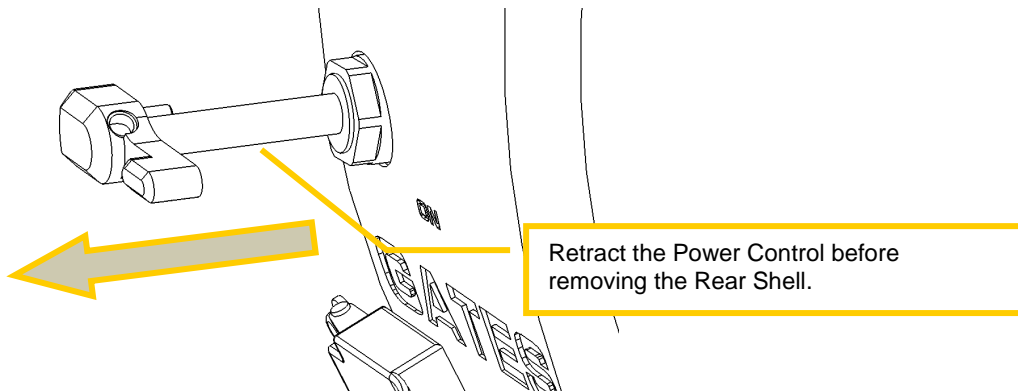
- Port Lock.** Release the Port Lock on the lower left side of the housing.
 - Port Ring.** Remove the Port Ring by rotating 90° CCW and pulling forward.
- ▶ **NOTE: Some lenses do not require a Port Ring.**



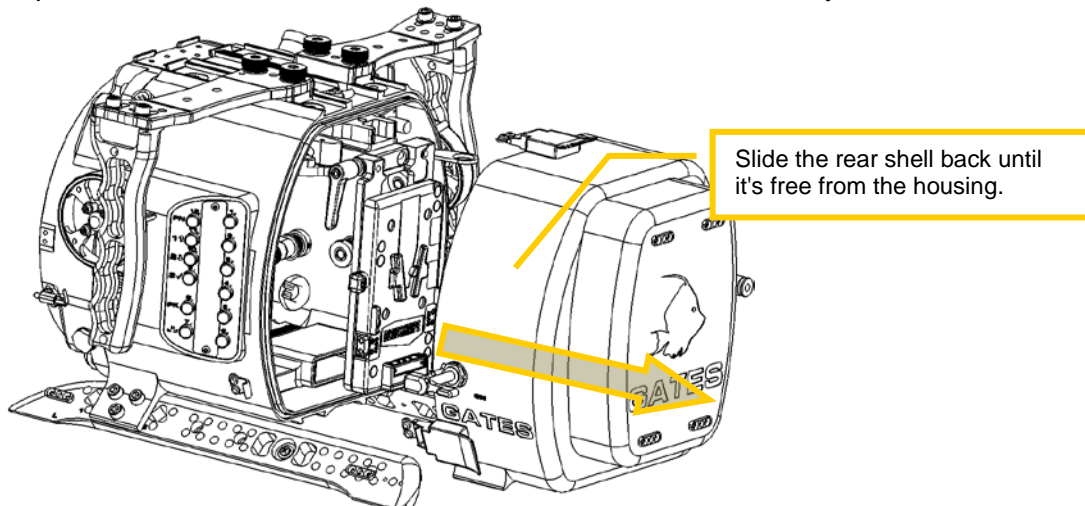
- **Port Base.** Remove 4 screws/washers, then the Port Base.



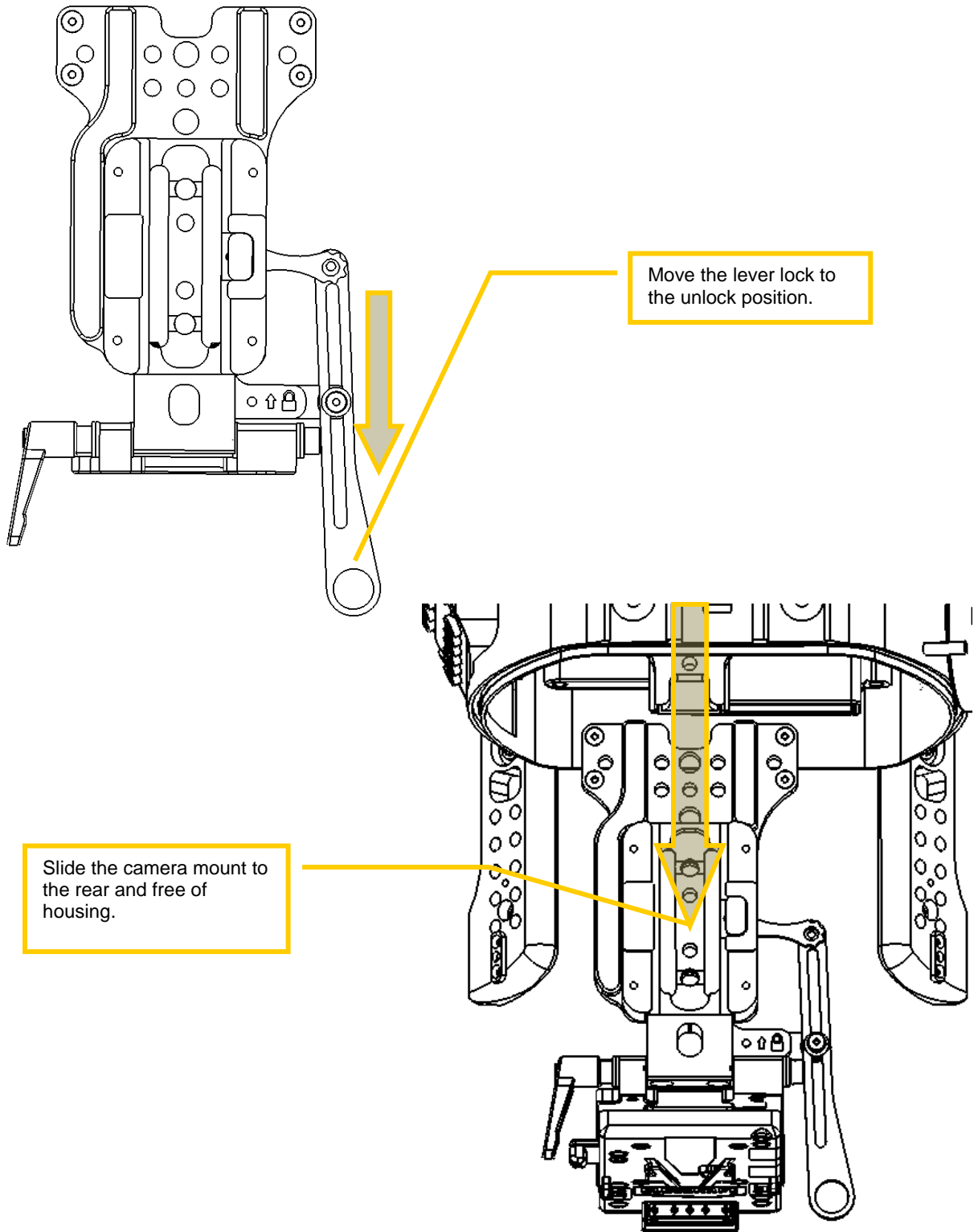
- **Pull out the Power Trigger.** The Power Trigger is located on the left side of the Rear Shell. It must be fully retracted in order for the rear shell to be removed without obstruction.



- **Rear Shell removal.** Release three (3) latches by depressing the lock and pulling up on the latch. Once released the rear shell will remove freely.

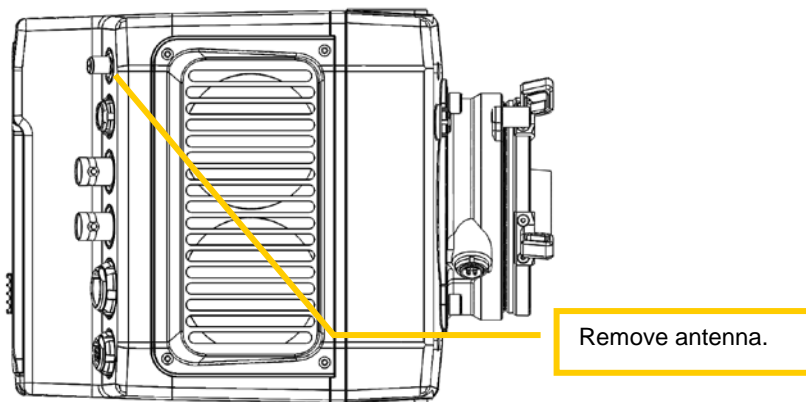


- **Camera Bridgeplate Removal.** Move the lever lock to the unlock position. Slide the camera mount to the rear and free of the housing.



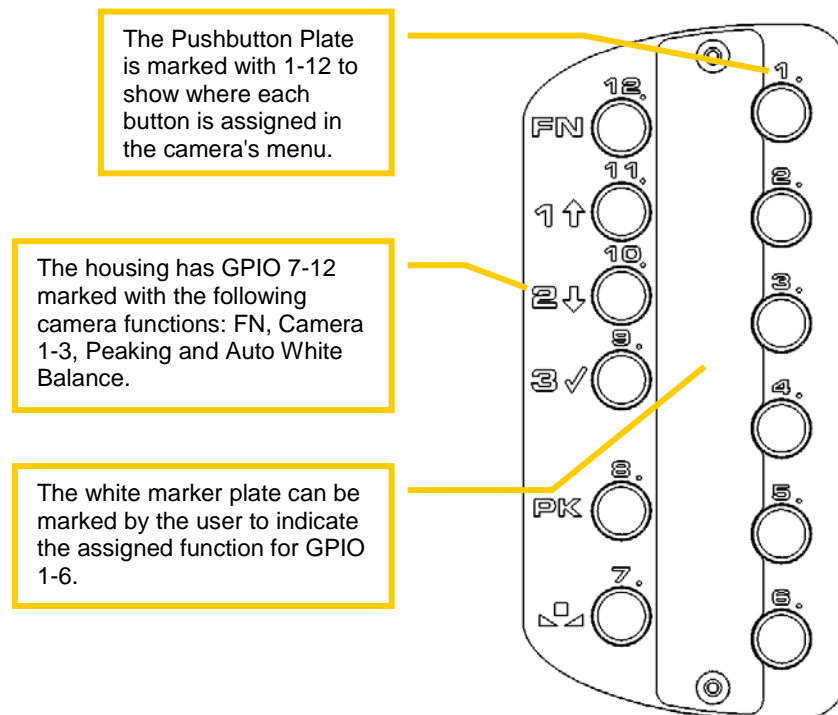
Arri Mini Camera Preparation

- Camera Basics** Strip down the Arri Mini camera to the bare camera body. Remove the following items:
 - Any additional mounts or brackets
 - Camera Lens
 - Antenna



GPIO Assignable Setup

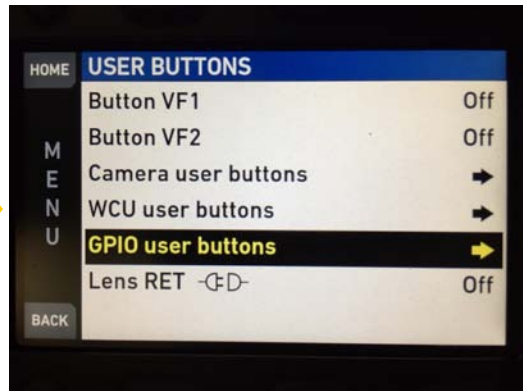
- The Arri Mini Housing** has 12 assignable GPIO buttons located on the side of the housing. Use your Arri Viewfinder to assign the desired function to each button. Please refer to your Arri Mini manual for a list of assignable functions.



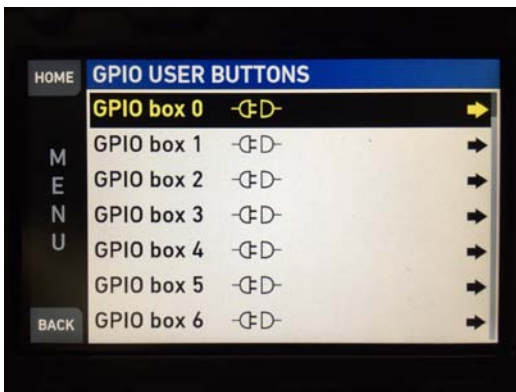
- **Use your Arri Viewfinder** to configure the camera's assignable buttons. The pictures bellow illustrate how to setup the user assignable functions.



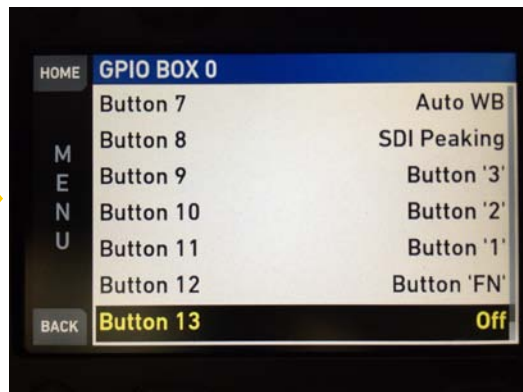
Enter Menu and select **User buttons**.



Select **GPIO user buttons**.



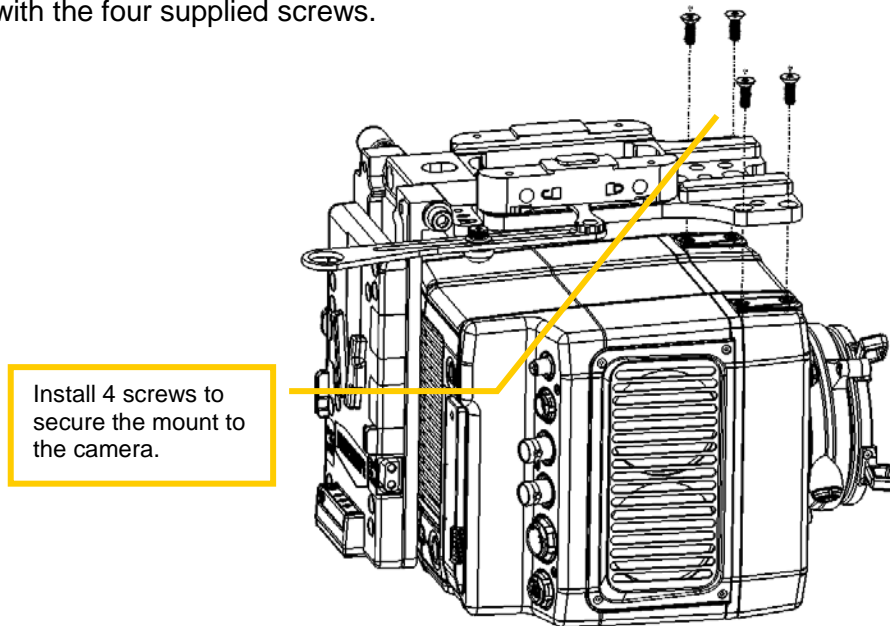
Select **GPIO box 0**.



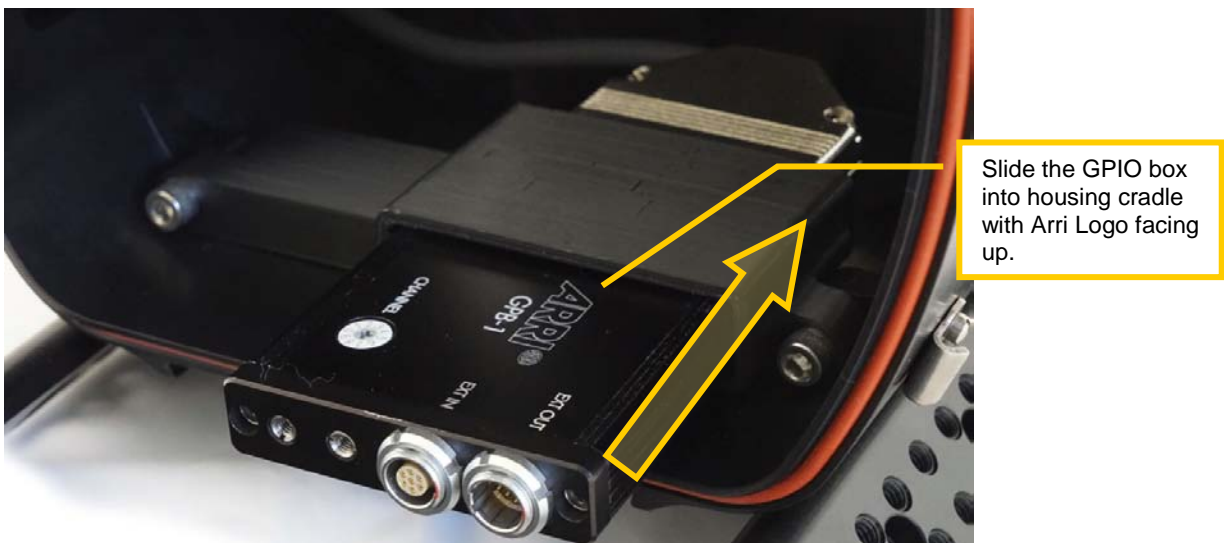
Configure assignable 1-6 as desired. Assignable 7-12 should be setup as shown above to match functions pre-marked on the housing.

Camera Installation

- **Camera Bridgeplate Installation.** Mount the Arri Mini camera to the Bridgeplate Adapter with the four supplied screws.



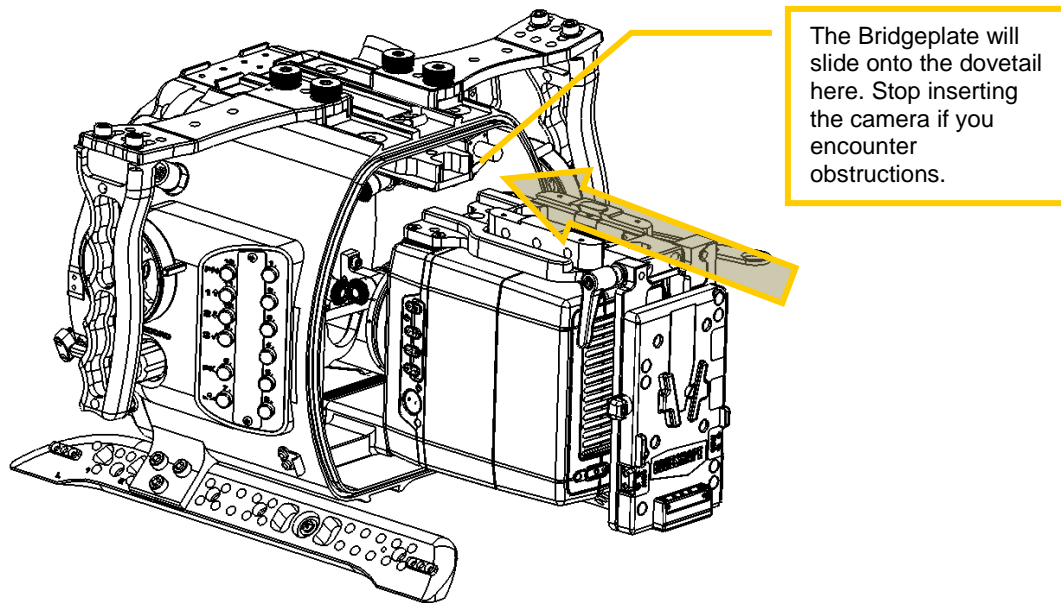
- **Install GPIO box.** Slide the GBP-1 GPIO box into the housing cradle as shown below. Install the GBP-1 with the Arri logo face up so the connectors can mate properly.



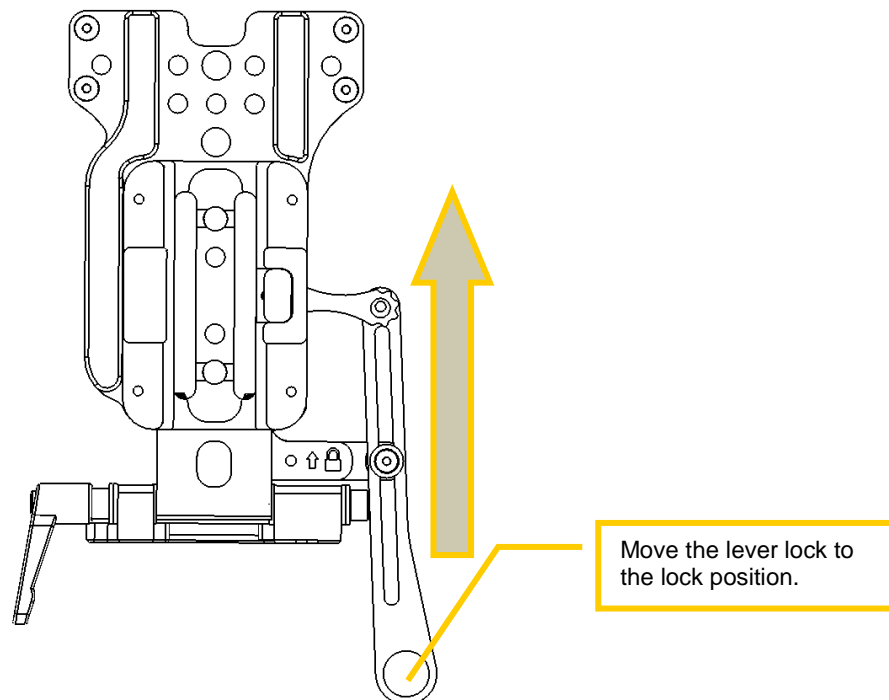
- **Insert the Monitor Cable into the housing.** Refer to the Monitor Mount / Video Connections section of this manual for details.

- **Insert Camera into housing.** Gently slide the camera fully forward on the housing dovetail. The camera should move into the housing without obstruction.

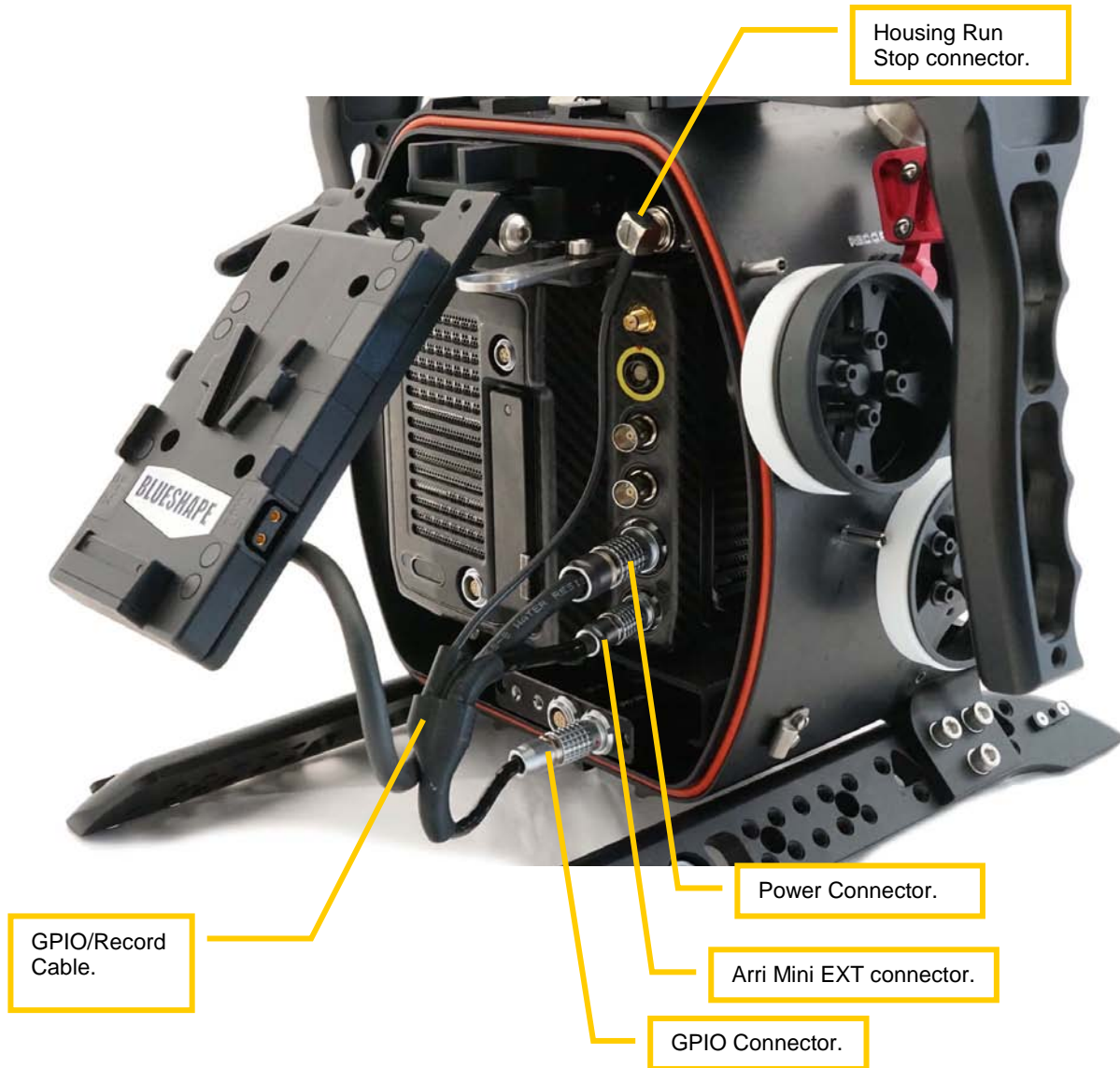
CAUTION: AVOID OBSTRUCTIONS. The camera should insert freely without obstruction. **Stop** if an obstruction or resistance is encountered. Remove the camera and find the obstruction before trying again.



- **Lock the camera** into position with the locking lever.



- ❑ **Connect the GPIO/Record cable** The 3 way GPIO cable connects the GPIO box to the Arri Mini EXT connector. It also connects to the housing's run stop switch.
- ❑ **Connect the Power Cable** to the cameras power input.



Lens Gear Drives (LGD's)

- **General Notes.** This section addresses the installation of three LGD's – 1 x CCW (Counter Clock Wise) and 2 x CW (Clock Wise). These designators are applied because two LGD's point in a CW direction and the other in a CCW direction, The LGD's are marked CCW and CW.
You will install guide bars and drive shafts that match the lens of your choice. Information on which guide bars, drive shafts and port rings to use for your lens is available on the support page at <http://www.gateshousings.com/>.

The Arri Mini includes three LGD's – 2x CCW and 1x CW.



- **Secure Guide Bars.** Insert the guide bars by threading them into the front bulkhead. Tighten firmly by hand – no tools are required but wrench flats are provided on the guide bars should this be necessary.
- **Install Drive Shafts.** These are ¼" black delrin and have a flat spot milled into one end. This end inserts into the drive coupler at the face of the front bulkhead. Secure gently with the set screw on the coupler. Do not overtighten.

Insert the drive shaft into the coupler. One end of the shaft will have a small flat spot. Align this with the set screw, and tighten gently. Do not over tighten.

Note: Different Gates housing shown.



Thread the Guide Bar into the front shell and tighten by hand.

- **LGD's mounting.** Install the LGD's in their proper orientation with pivot gear screws facing forward. Slide it onto the guide bar and drive shaft, then line up the LGD with the lens gear you wish it to access.

The sequence of tightening screws on the LGD's is important.

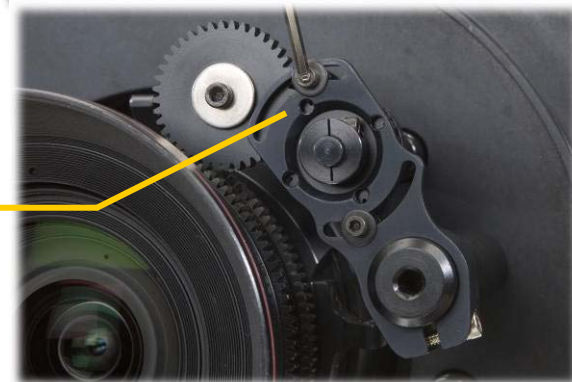
- **Step 1.** Tighten the LGD mount screw securing it to the guide bar. **Critical:** the drive shaft/gear hub must be centered with the opening on the bracket.

Center the drive shaft/gear hub to the bracket. Tighten the screw and secure the LGD to the guide bar.



- **Step 2.** Pivot the larger gear onto the lens gear such that it makes intimate contact. Carefully observe that the gear is still properly aligned and the drive shaft/gear hub is centered with the LGD bracket (see photo). Tighten the two pivot screws gently to secure it in position.

With the drive shaft/hub centered, pivot the larger gear to make intimate contact with the lens gear. Gently tighten 2 pivot screws.



- **Step 3.** Firmly tighten the screw that couples the drive gear hub to the drive shaft.

Couple to Drive Shaft .



- ▶ **TIP.** The gear hub / drive shaft coupling acts like a clutch – the drive shaft will 'slip' when reaching the end of travel in either direction. Tightening the screw more will allow less slip. Adjust this amount of slip at your discretion.
- **Set the focus/iris indicators.** The left and right side Gear Controls have silicone bands. The white silicone can be marked to indicate focus / iris position.
- **Verify Operation.** Once positioned and secured, check operation of the Focus, Iris and Zoom controls. They should rotate freely – but with slight resistance – in both directions and through the entire range of travel. If not, repeat steps 1-3.

Water Alarm (optional)

If you have the optional water alarm installed there are three alarm conditions to know:

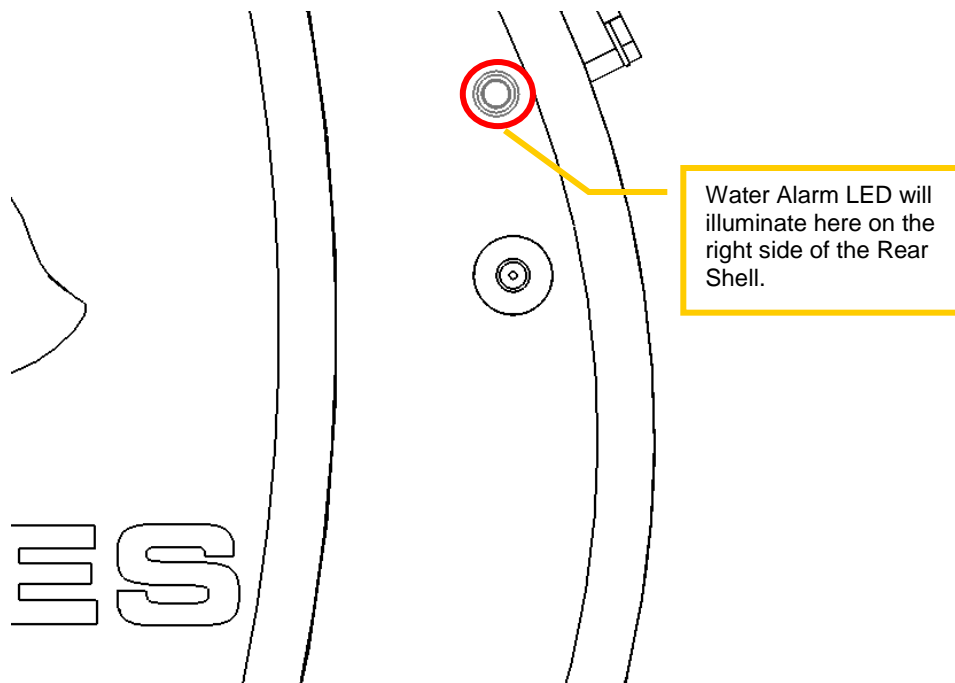
<i>Condition</i>	<i>LED</i>	<i>Siren</i>
New Battery (Insertion)	Bright Intense blink while siren plays	Ascending tones played 4 times
Water Intrusion	Bright Intense Blink	Grating Warble sound. Alarm will sound for duration of detection.
Low Battery	Low Intensity fast blink	Descending tones played 8 times pausing approx. 20 seconds between.

The alarm can be tested by shorting the detection contacts that lead to the water alarm transducer. The water detection condition will activate for 6 seconds. If the battery is drained the low battery condition will sound.

The water alarm requires a single 6V battery like Radio Shack model 23-469 or A544.

Your battery should be removed when stored (e.g. between dive trips). Check the battery prior to every dive to ensure proper operation. Change when indicated.

CAUTION: You must wait a minimum of 30 seconds between battery insertions to allow the unit to fully discharge.



Check Operation

At this point check operation of the system before closing the shell and installing the Port Base, Port Rings and Ports.

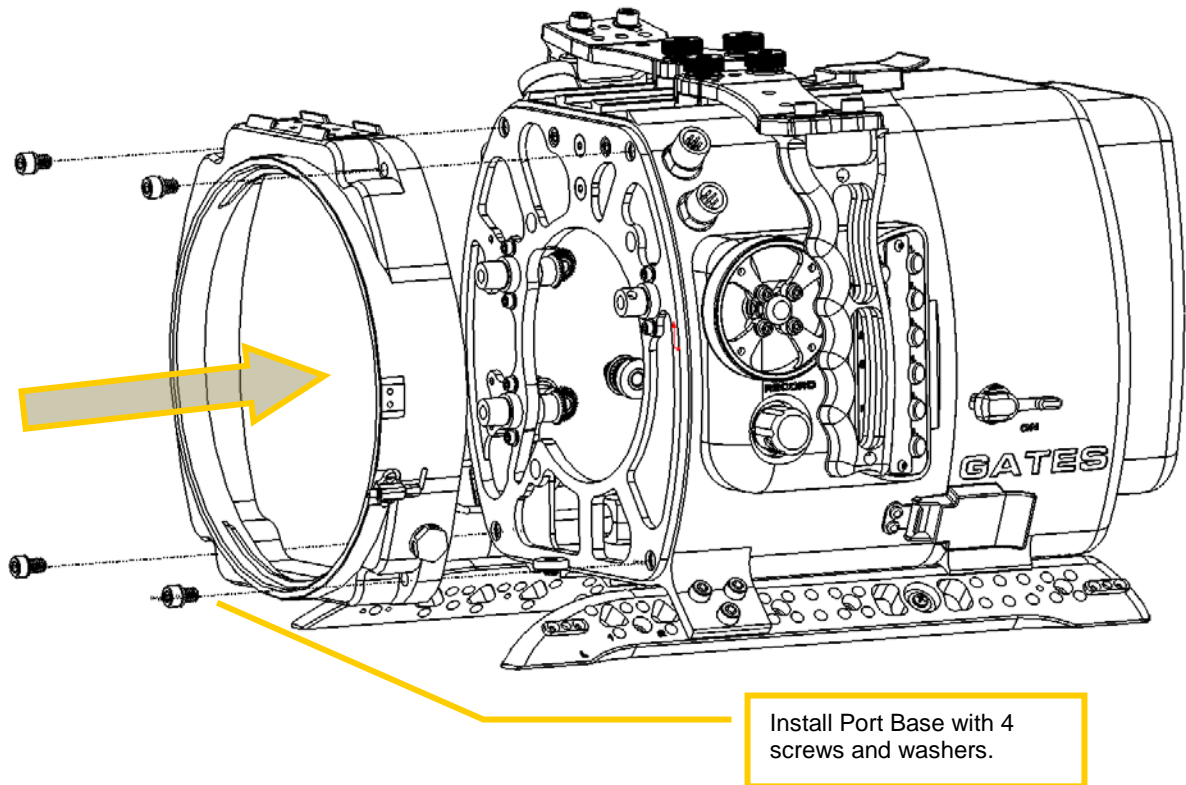
Power on the camera and check the following:

- Clear Image** on external monitor.
- Clean Image** with no dust, fog or other impediments to image quality.
- Focus, Iris and Zoom gear controls** are smooth and operational.
- Other Controls.** Cycle through all controls to confirm operation.
- Power down.** With all functions verified power down the camera.

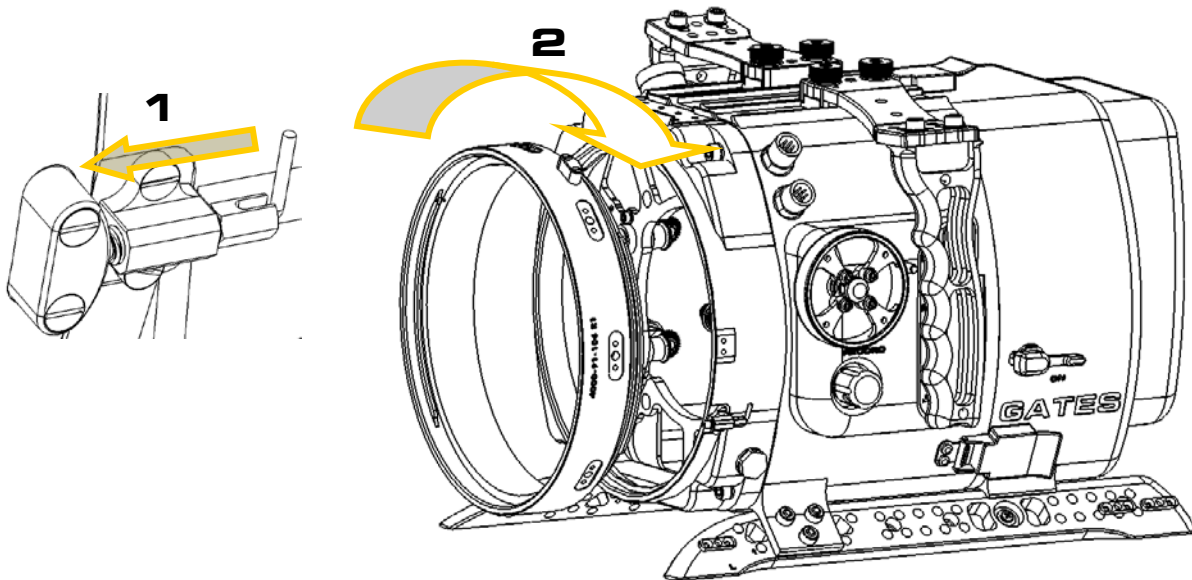
Port Base, Port and Port Rings

- **Inspection.** Before installing the Port Base, Port and Port Rings, visually inspect the o-rings for dirt or other foreign matter that may compromise the seals. Do the same with the Front Shell face (where the Port Base mates) and Port bore where the o-rings seal. **See the separate document “Housing Care and Maintenance Guide” for more details.**
 - ▶ **CAUTION: Do Not lubricate** the orange Port Base o-ring. It is silicone material and lubricant may cause damage. Only the BLACK and YELLOW o-rings are safe to lubricate.

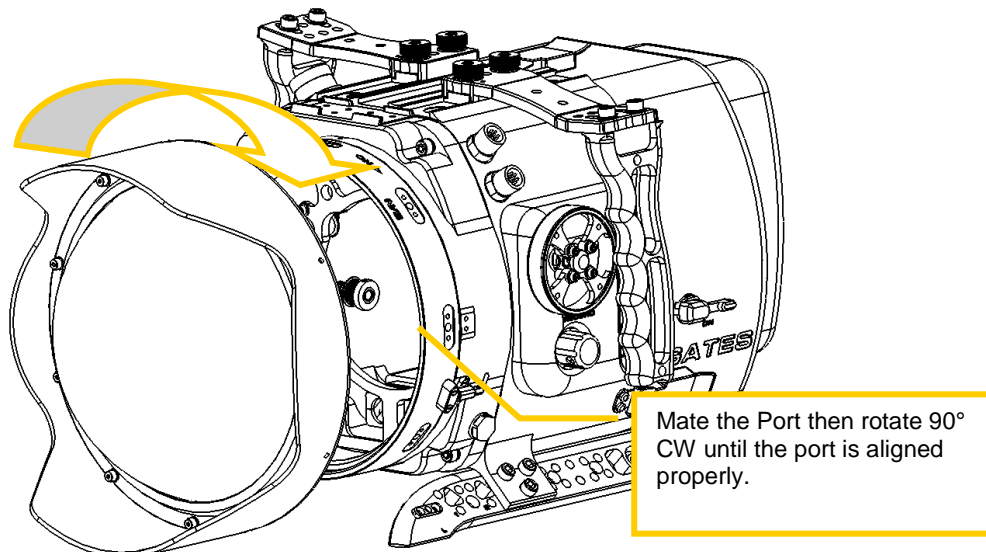
- **Install the Port Base.** Position the Port Base over the entire lens / LGD's and secure to the front shell with 4 screws/washers. Tighten the 4 screws firmly.



- Lubrication.** Lubricate the yellow Port o-ring with silicone grease. Also liberally lubricate the Port bore. This will greatly aid installation of the Port.
- ▶ **TIP:** Liberal lubrication of the Port and Port Ring o-ring allows easier rotation during installation/removal.
- Install the Port Ring (if needed).** Place the Port Ring Lock into the lock position, then carefully mate the Port Ring to the Front Shell. Rotate 90 degrees CW to its normal position where it will lock.

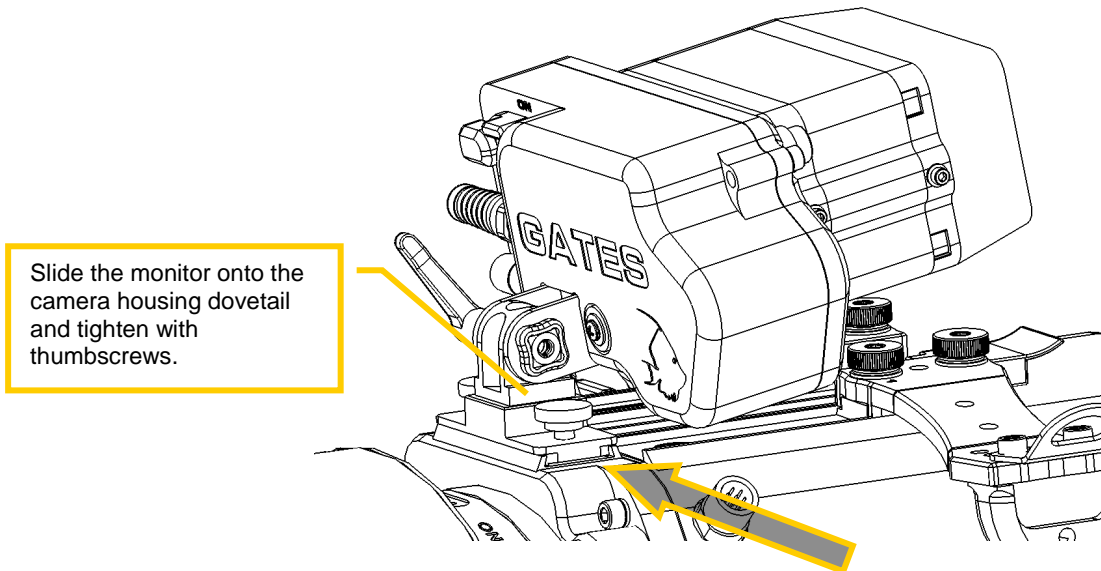


- Install the Port.** The Port will mate with the Port Ring and then rotate 90 degrees clockwise to its normal position.
- Verify seals.** Inspect the Port Base, Port Rings and Port are fully seated with no gaps.

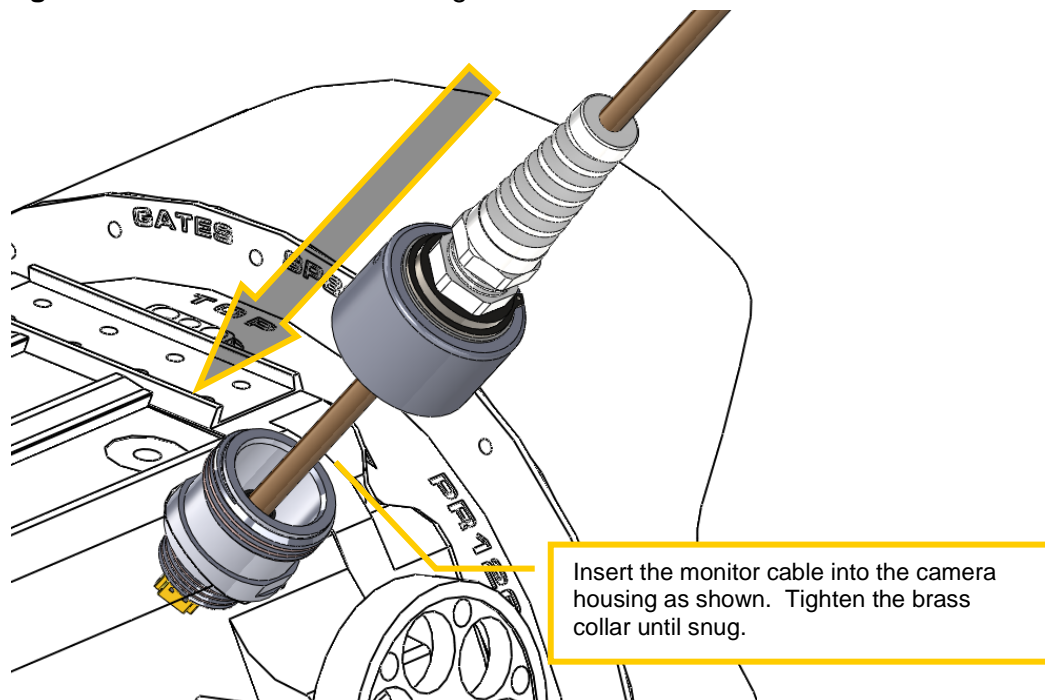


Monitor Mount / Video Connections

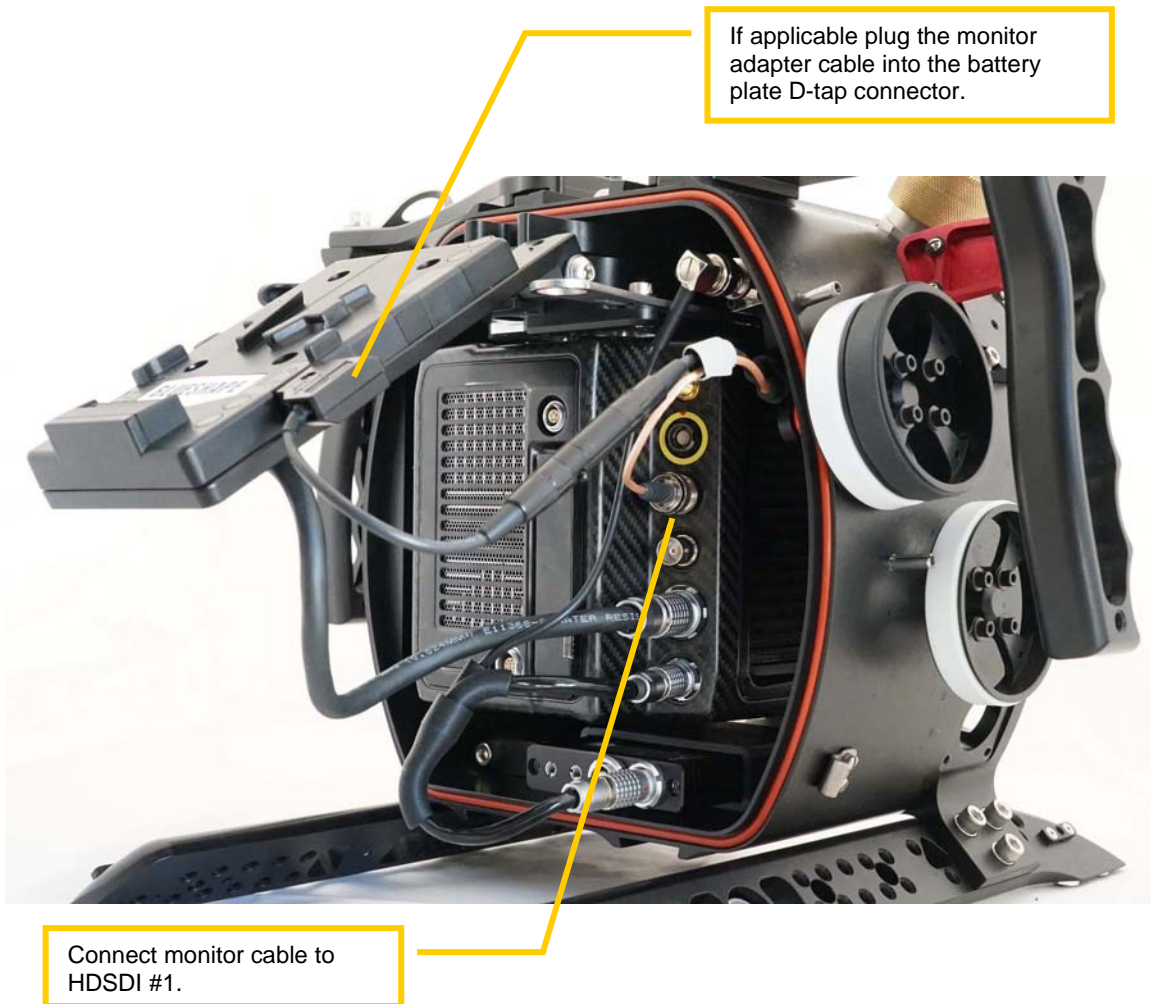
- **Mount the monitor housing .** Secure the monitor to the top of the main shell, as shown and tighten the thumbscrews to secure.



- **Insert the Monitor Cable into the Arri Mini Housing.** Refer to the illustration. The Starlite monitor cable is a 'pass through' type that inserts into bulkhead opening on the upper right side of the housing. Insert the cable connectors and route to the rear of the housing to the position shown in the next illustration.
- **Tighten the brass collar until snug.**

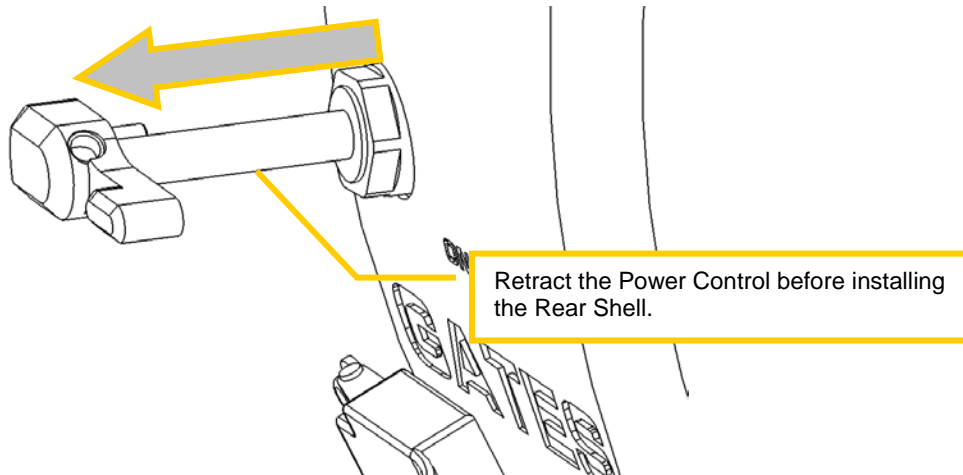


- ❑ **Connect the HDSDI cable from the monitor** to the cameras SDI 1 output.
- ❑ **Connect the Monitor Power Cable** (if applicable) into the V-Lock Plate's D-tap power output. If your monitor requires an external power source, a D-tap adapter cable will be supplied with the monitor housing.

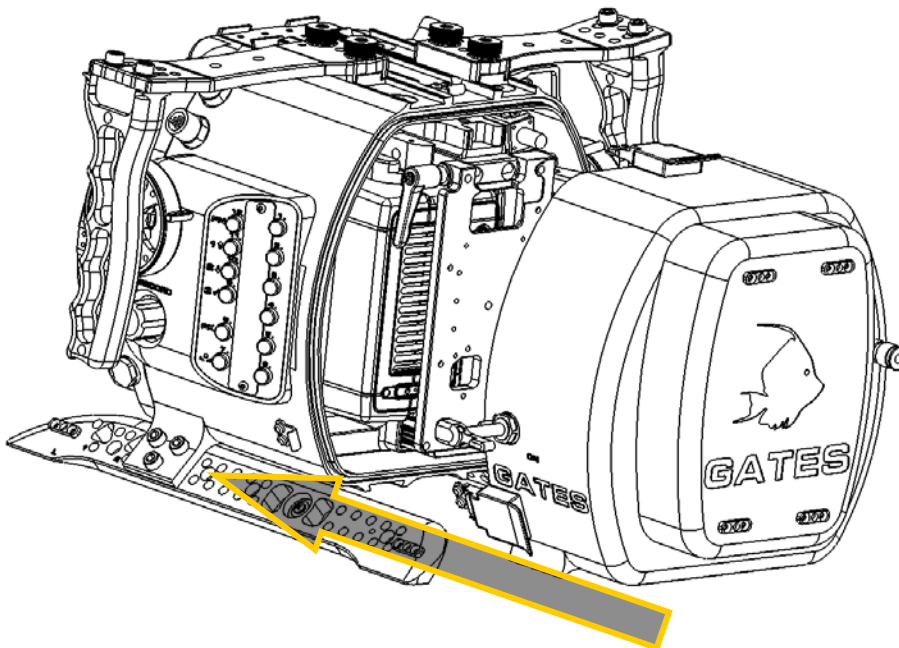


Housing Closure

- Pull out the Power Trigger.** The Power Trigger on the side of the housing must be pulled out in order for the rear shell to be installed freely.

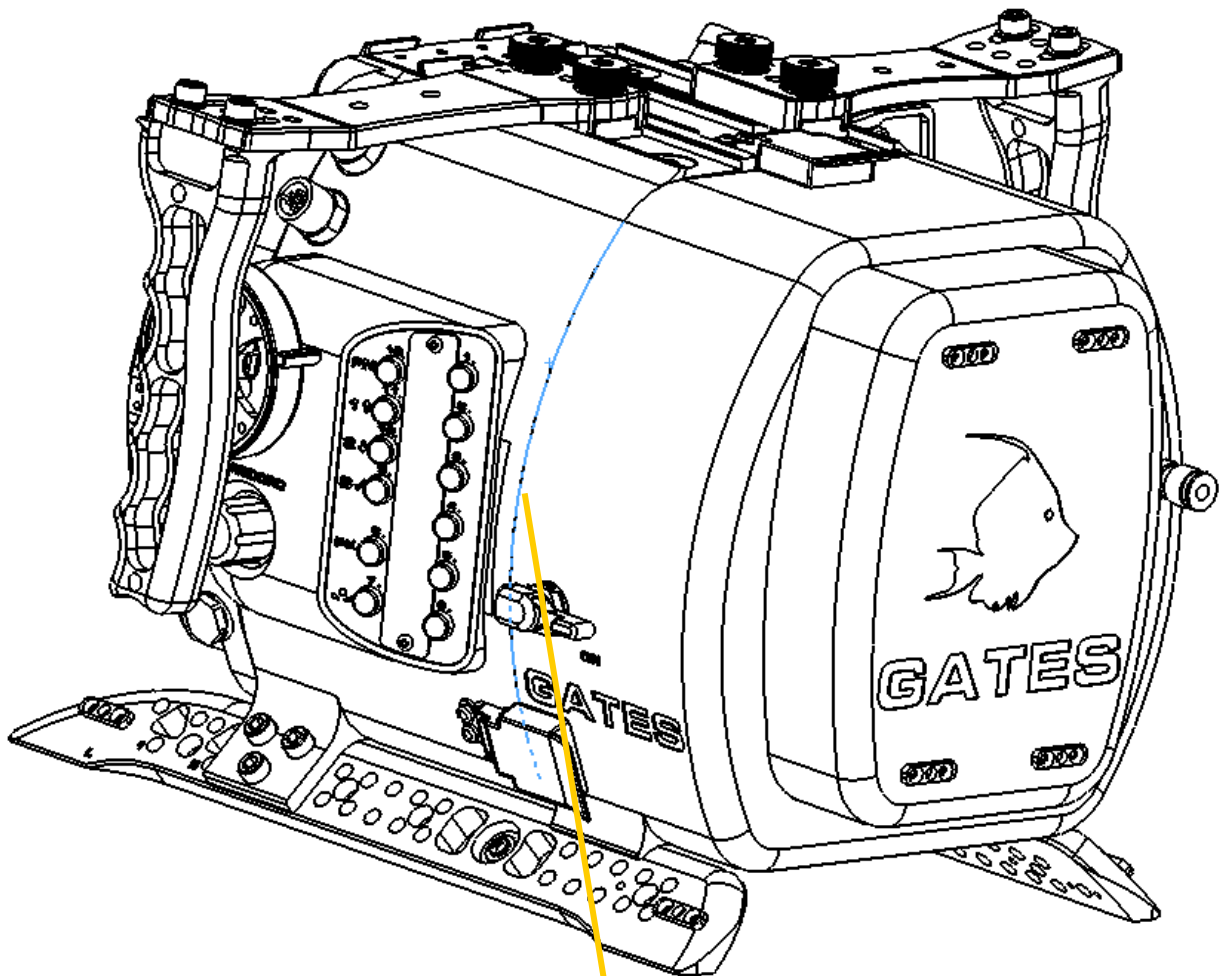


- General.** The Rear Shell slides from the rear, over the camera and mates with the Mid Shell. If there is obstruction at any time during this process – stop! – remove the shell and locate the obstruction.
- Mate the shell.** Position the shell at the rear and gently move forward over the camera to mate with the Mid Shell.
- CAUTION: AVOID OBSTRUCTIONS.** The Rear Shell should slide freely, without obstruction. If obstructions or resistance are encountered, stop. Remove the camera, find the cause of the obstruction, and try again.



- **Latches.** Once properly mated, secure the 3 latches. Verify that the two shells are mated evenly and consistently around the sealing line of the housing.

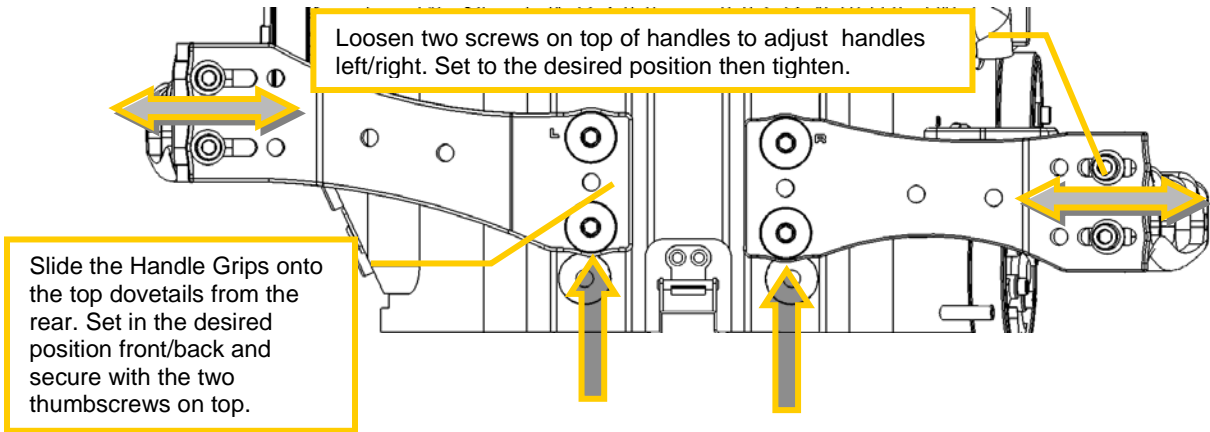
▶ **CAUTION.** Faulty Latches can lead to a wet camera! Replacements for faulty latches are available at no charge from Gates.



Mate the Rear Shell to the Mid Shell. Close and lock three (3) latches and verify they mating surface is even and consistent .

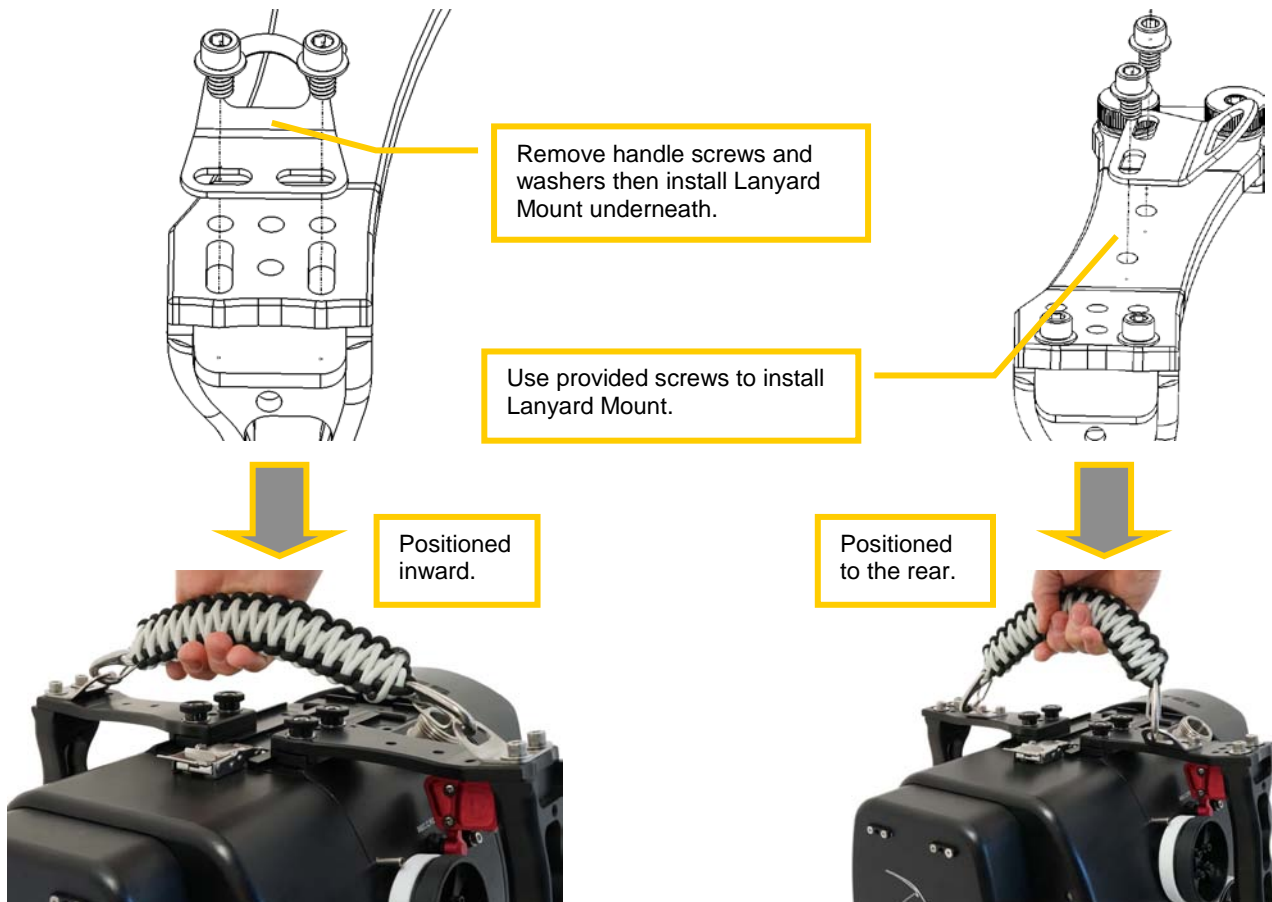
Adjustable Handle Grips

The Arri Mini housing has adjustable handle grips. These are inserted onto the housing from the rear and set with the two top thumbscrews. Each handle grip is adjustable forward/back and left/right.



Carry Handle/Lanyard Mounts

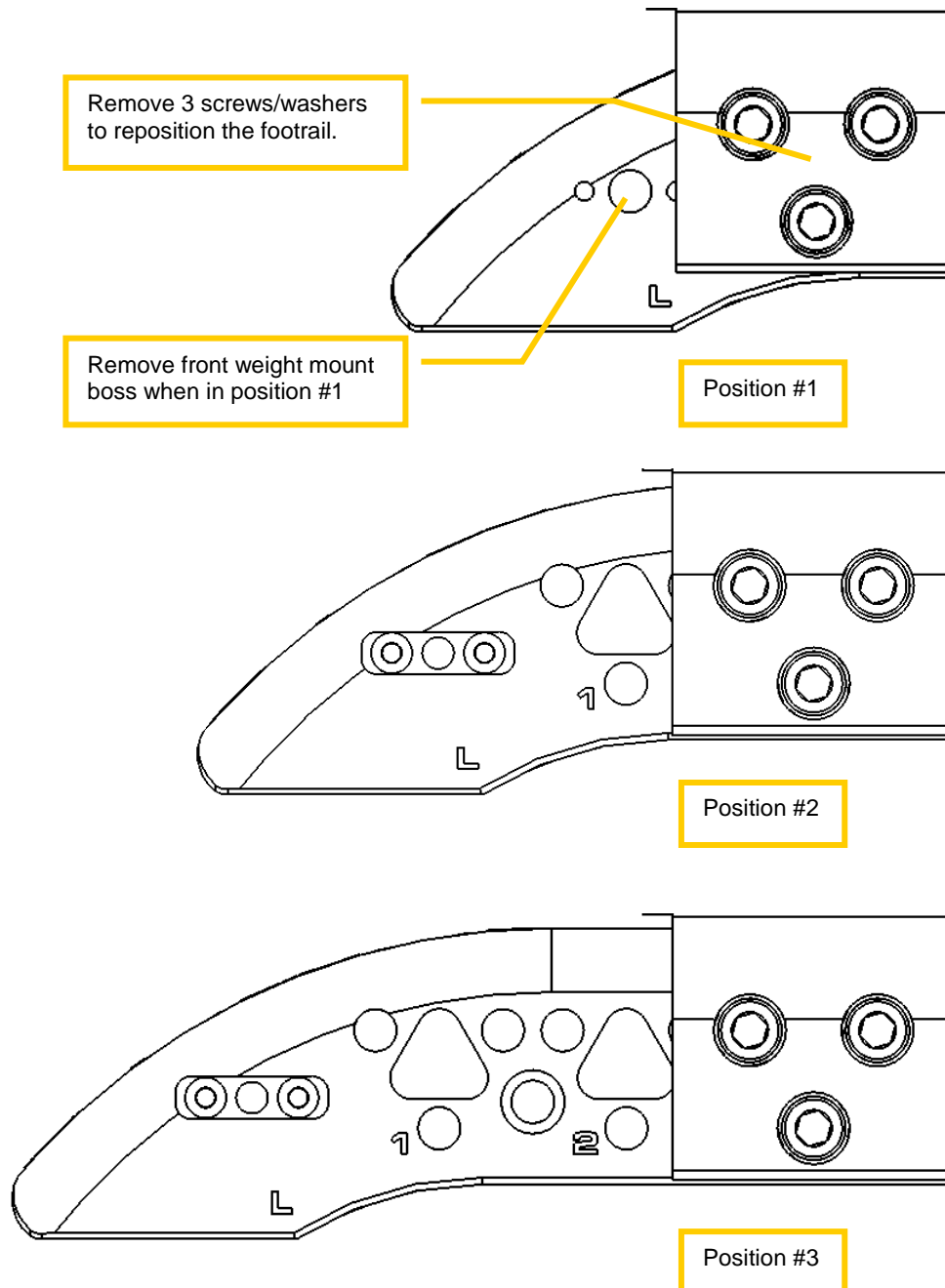
The housing handles have attachment points for Lanyard Mounts. The provided Lanyard Mounts can be positioned inward or to the rear. These mounts allow the included carry handle to be clipped on as shown below.



Footrail Adjustments

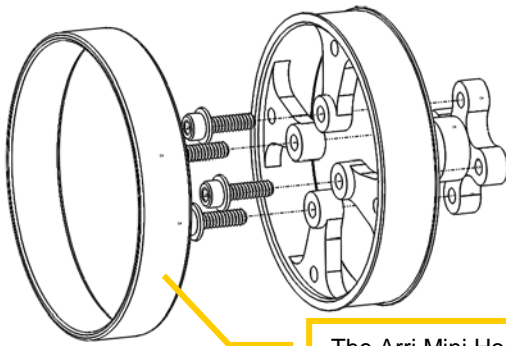
The Arri Mini Housing footrails can be set in three different positions. Changing the footrail position may be necessary for clearance or balance depending on the configuration.

Place the housing on a flat surface before tightening. This will prevent the housing footrails from sitting uneven. Failure to do so may cause the housing to rock when at rest.

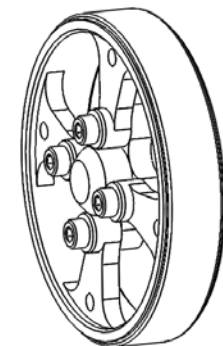


Lens Knobs

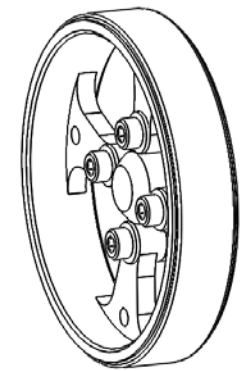
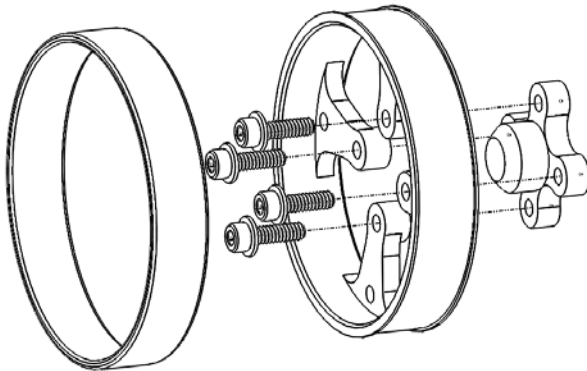
The Arri Mini Housing has 3 way adjustable Lens Knobs. They can be configured close, far or double stacked on the housing. Refer to the drawings below on how to configure the knobs to fit your application.



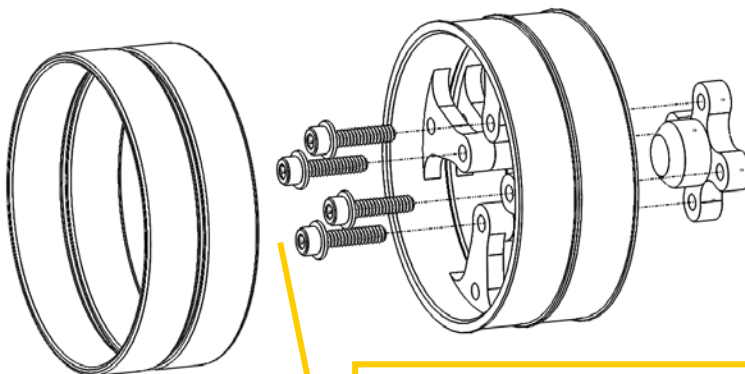
The Arri Mini Housing comes with black and white silicone bands. The white bands can be marked and erased to indicate lens position.



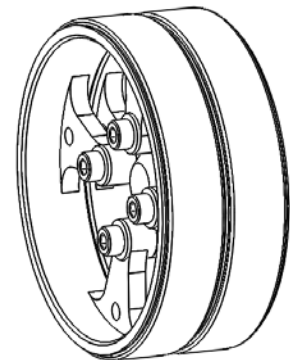
Close to housing.



Far from housing.



Double stacked lens knobs use 2 silicone bands and longer 5/8" screws (included). Additional lens knobs and silicone bands are available through your Gates dealer.



Double stacked.

Seal Check

- Seal Check Manual.** Follow the procedures in the Seal Check manual for verifying integrity of the housing.
- Seal Check both Housing and external monitor.** The external monitor also has a Seal Check fitting. After drawing a vacuum on the camera housing, note the vacuum level on the gage.

Next, move the Seal Check hose to the external monitor. Draw a vacuum close to that of the camera housing. Remove and plug the Seal Check fitting on the external monitor.

Move the Seal Check hose back to the camera housing and start the monitoring process.

Why do this? The LCD cable is water blocked but not air-blocked. After drawing vacuum on the external monitor air passes from there to the camera housing until the vacuum is equalized. By drawing a vacuum on the external monitor, very little air must pass between the housings so the 'settling' process and determination of housing integrity takes far less time.

- ▶ **CAUTION. ENSURE THE FITTING PLUG IS INSTALLED PRIOR TO SUBMERSION! FAILURE TO DO SO WILL RESULT IN A FLOOD.**

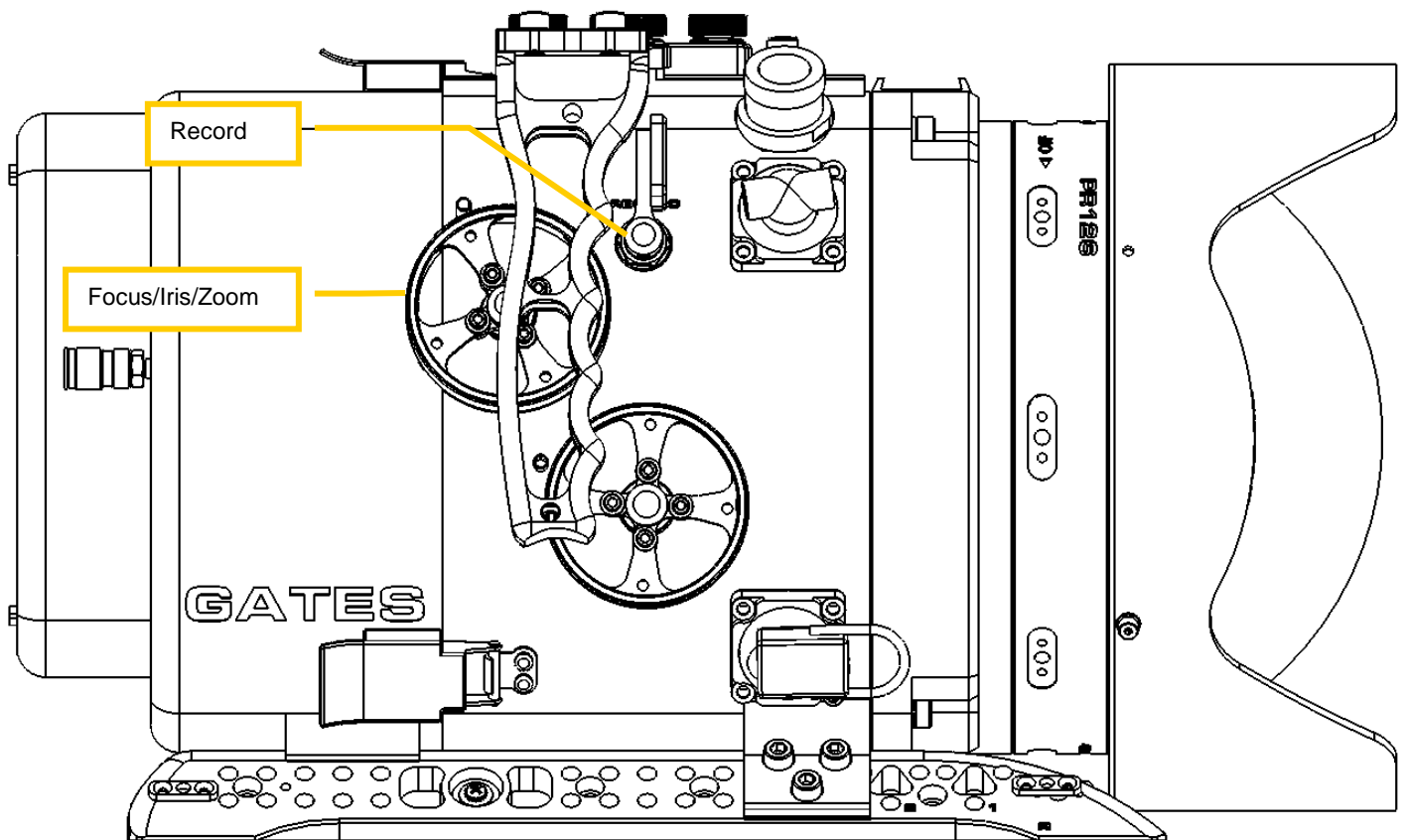


Final Checks

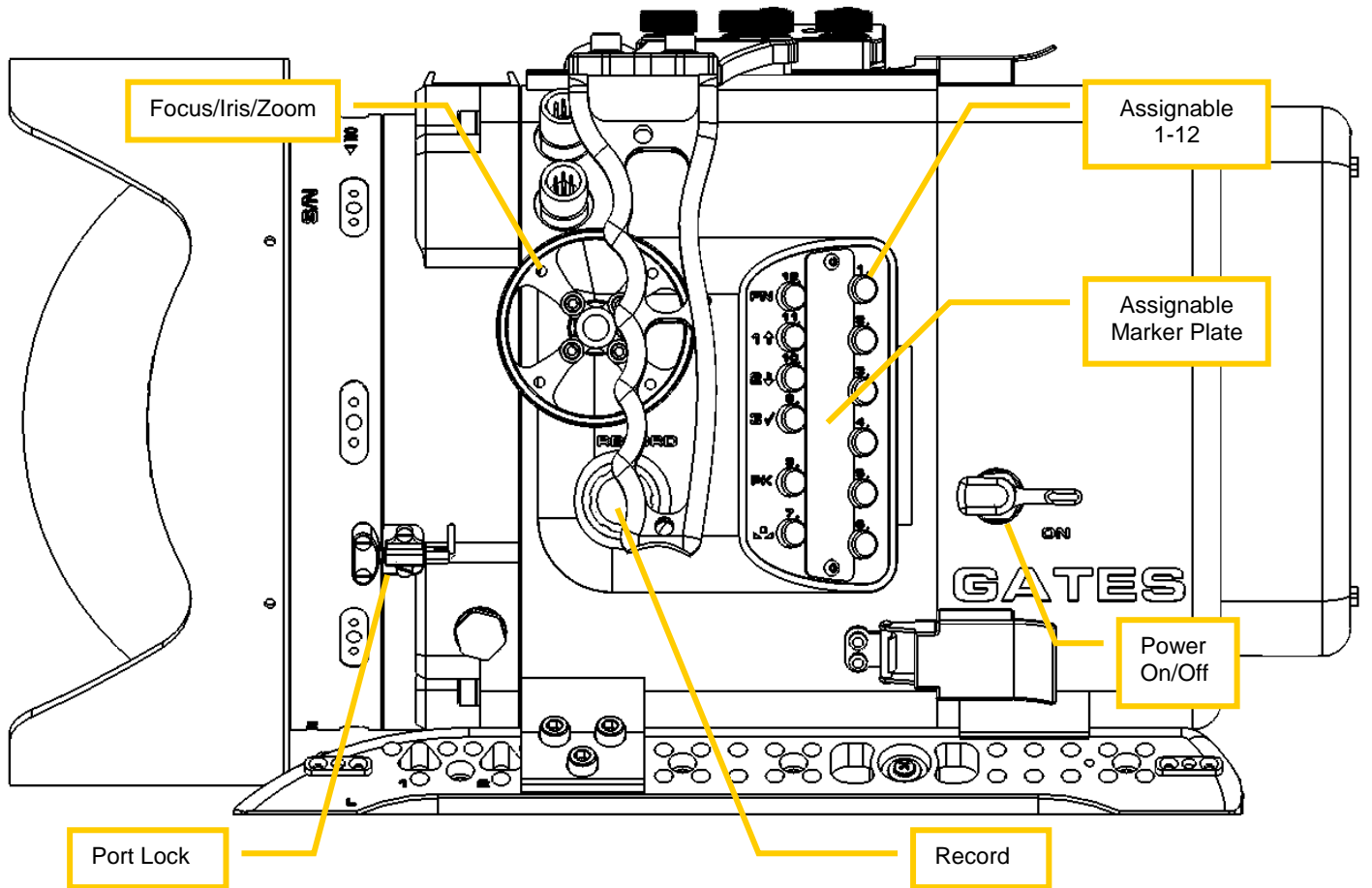
- Visual Inspection.** Look closely at all seal mates – Port, Port Ring, Port base and main housing seal – for uneven gaps. Look over the housing one final time.
- Verify operation.** As a final check, power on the camera and verify all controls are functioning normally. If you have the optional HD-SDI surface feed cable ensure an image is present at the surface end.

4: Arri Mini Housing Operation

Right Side Controls



Left Side Controls



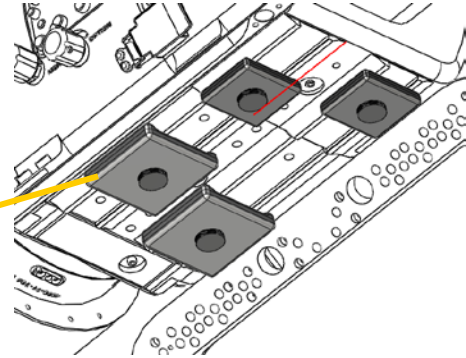
Buoyancy Adjustment

The Arri Mini Housing features adjustable buoyancy and trim. 4 and 8 oz trim weights can be secured to the housing to adjust buoyancy and trim precisely to your liking.

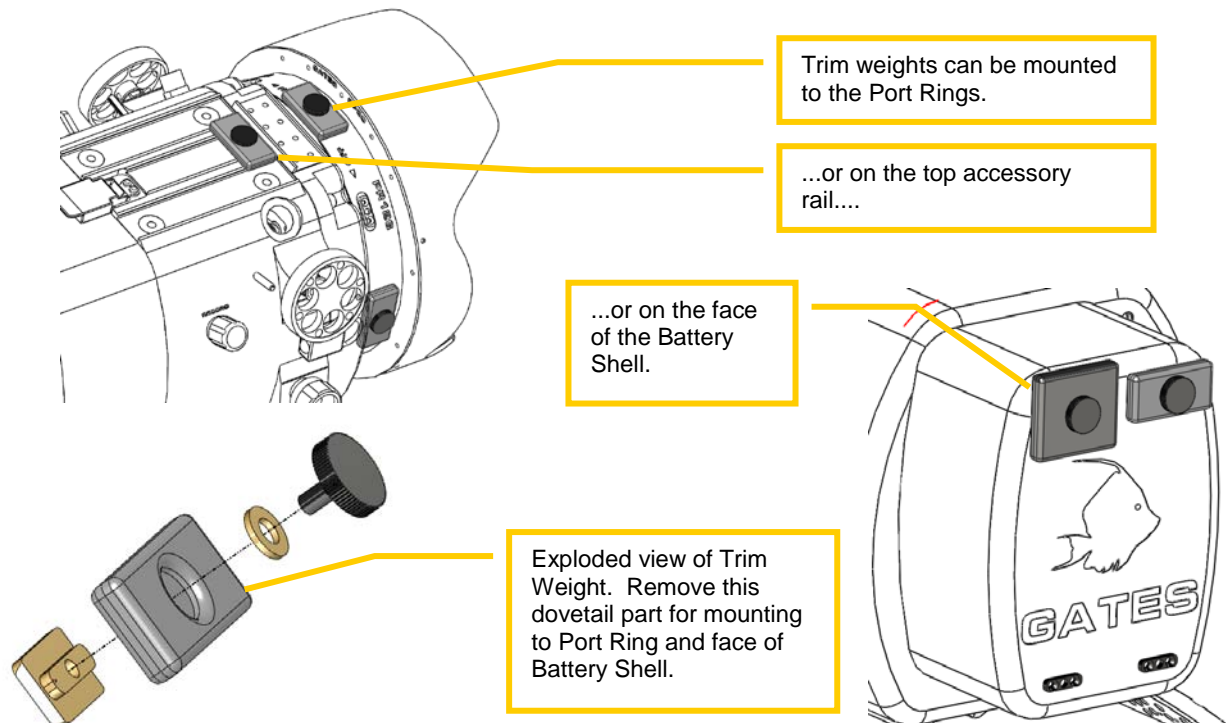
Three general locations are available to add/remove and adjust trim weights.

- Shell Base.** The base of the Mid and Rear Shells have accessory rails for 4 and 8 ounce weights. They are secured and adjusted forward and aft for trim.

4 and 8 oz trim weights
secured to the bottom rails.



- Top accessory rails.** The top of the shell has three rails (used for handles and monitor) that can accommodate 4 and 8oz weights.
- Port Ring.** The top and sides of the Port can also accept 4 and 8oz weights. To do so, unthread the thumbscrew from the base, and then mount directly to the small boss on the Port Ring.
- Battery Shell.** Trim weights can be mounted on the back face of the Battery Shell, as shown below.



Accessories

HD-SDI Surface Feed Cable (optional)

If you have the HD-SDI option installed, there are three steps:

- Camera connection.** See the previous section [Video Connections](#) for details connecting the HD-SDI surface feed to the camera inside the housing.
- Housing Cable Connection.** Refer to the photo. Connect the surface cable to the HD-SDI bulkhead connection on the housing.
- Refer to the HD-SDI Addendum document for further information.

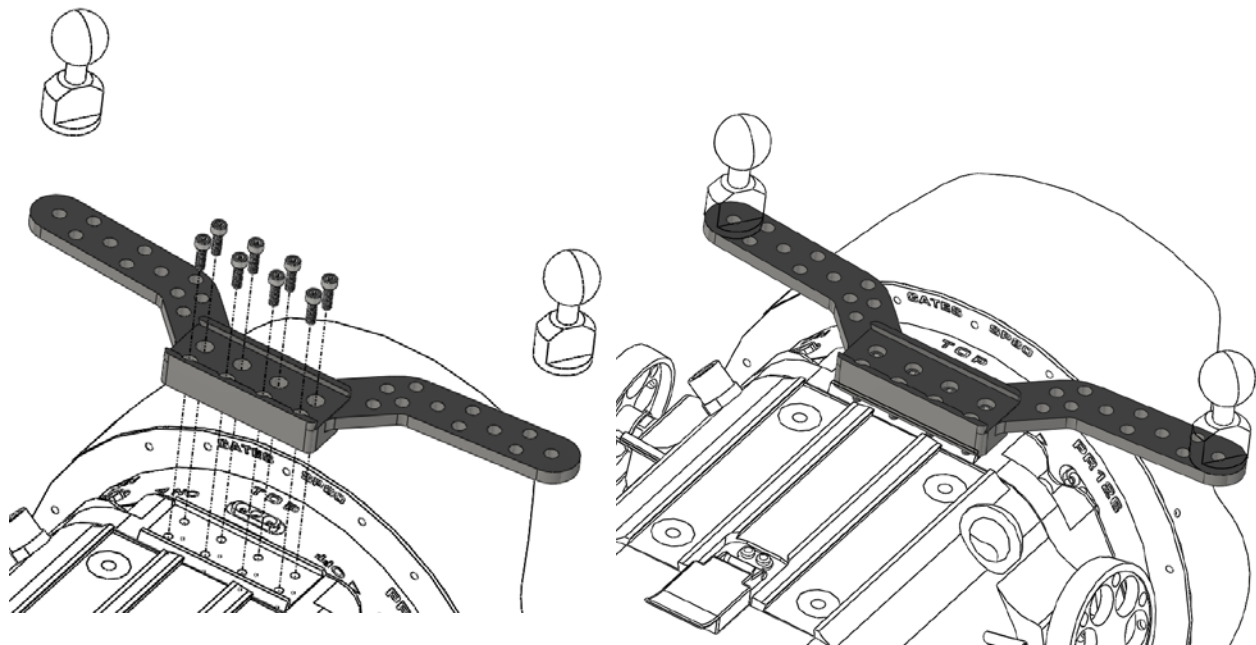
HD-SDI Surface Feed
cable (optional)

Note: DEEP EPIC housing
shown



Light Bar

The Light Bar is a convenient method to mount lights forward and to the outside edges of the housing. It accepts a wide variety of [Ultralight Controls Systems](#) ball mounts and bases. If your application requires a Light Bar, install it with the included screws as shown below.

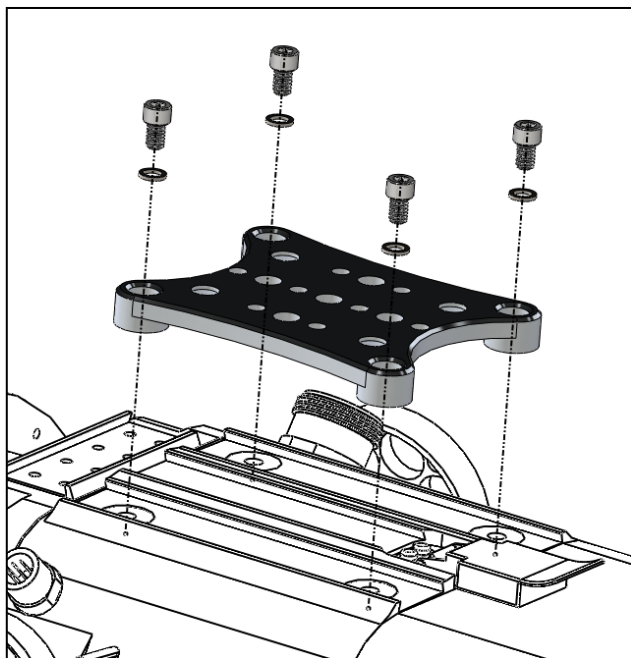


Tripod Adapter / Crane Mount (optional)

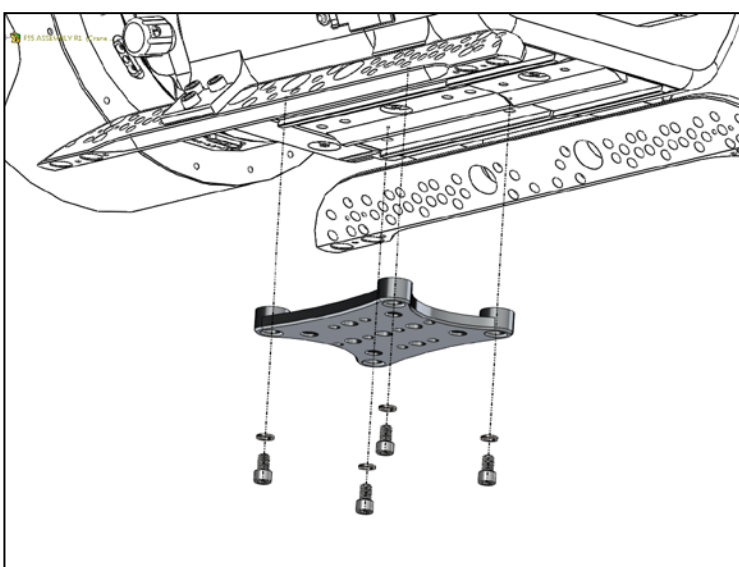
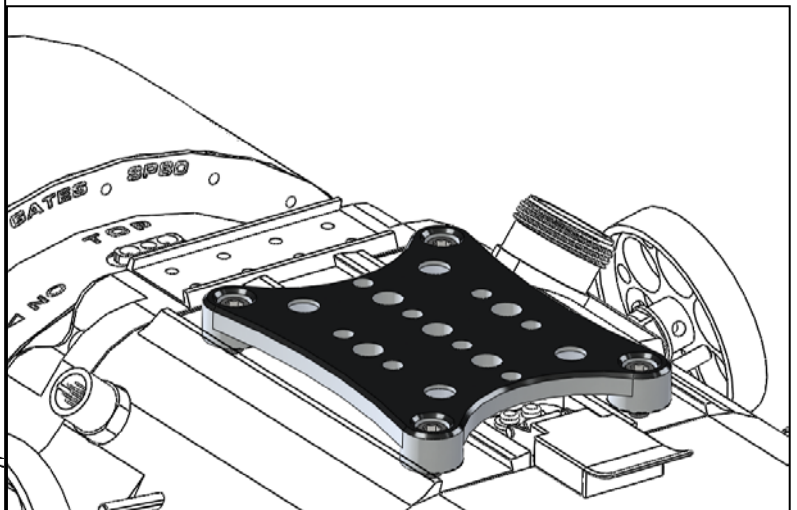
The Tripod Adapter / Crane mount serves a dual purpose:

- As a Tripod Adapter, it provides 1/4-20 and 3/8-16 mount holes for your tripod. It also is specifically designed to accept an Arri standard dovetail clamp. ([WC Dovetail Clamp](#))
- As a Crane Mount, allows securing the Arri Mini Housing to a Jib or Boom.

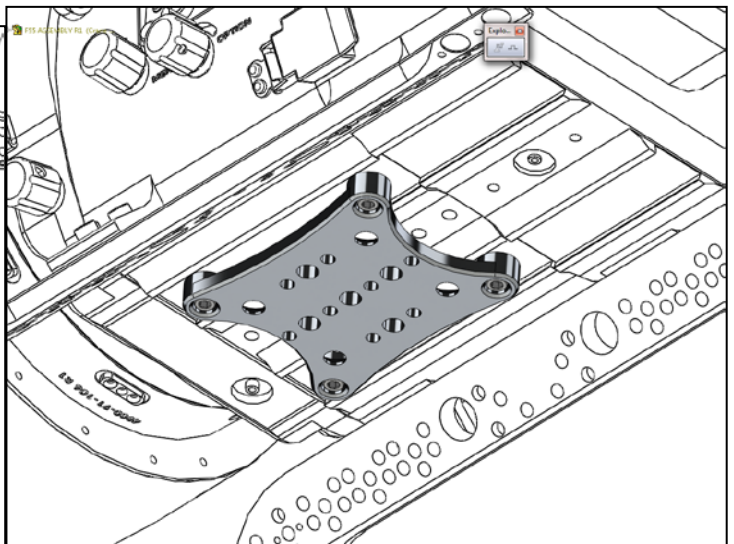
See the illustration below for mount point details.

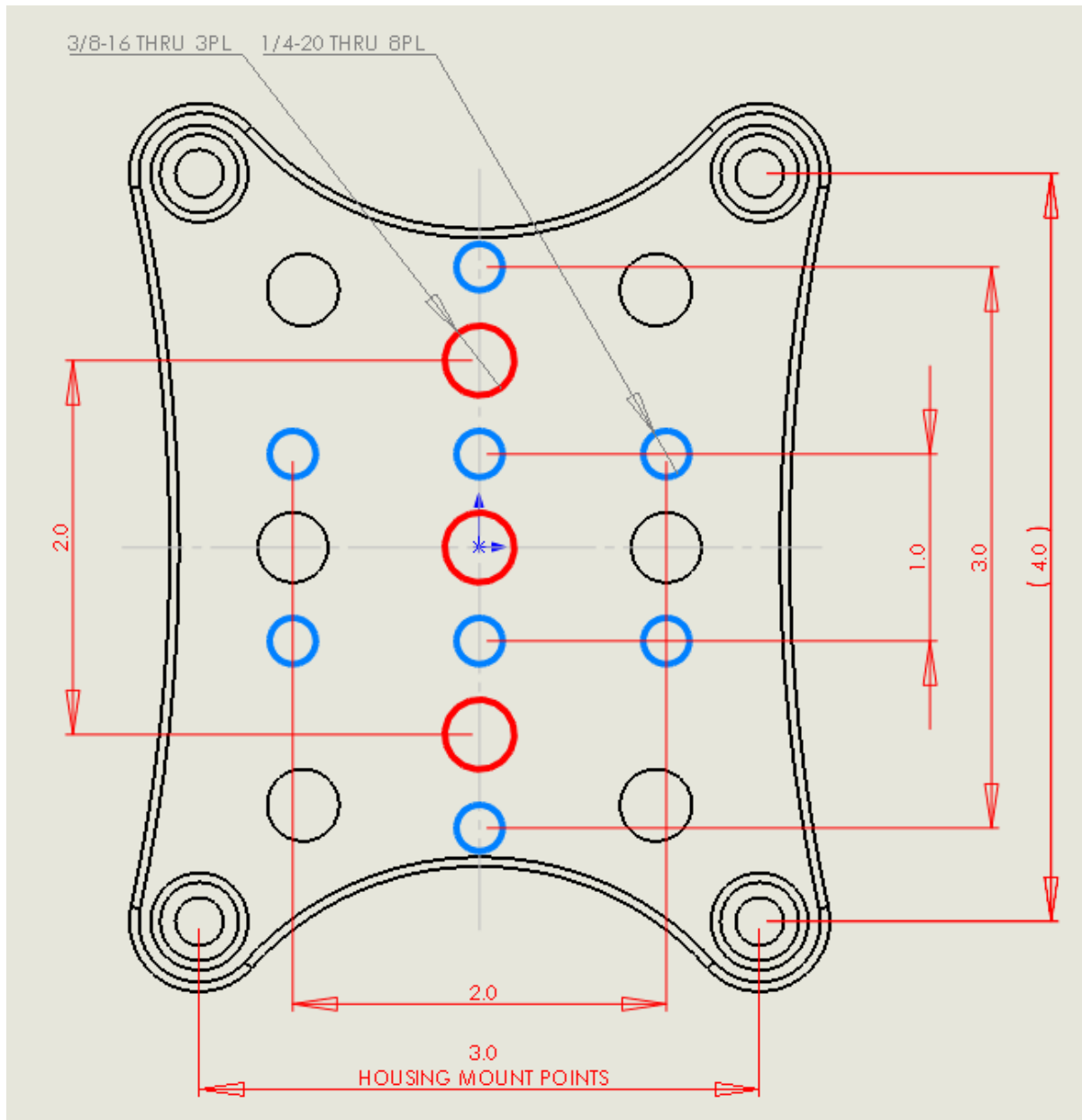


Crane Mount



Tripod Mount





Port Options

At this time of publication Gates SP80 Dome and FP80 Flat Port options are available for the Arri Mini Housing. When choosing a Port consider the following tradeoffs and limitations.

- ▶ **NOTE:** The optical interaction between any given lens and a Dome or Flat Port is unpredictable. Distortions and aberrations can occur with either port. As such, Gates does not warrant optical performance or image quality.

Gates endeavors to collect data from the field and our own testing as a resource to customers, but you should always characterize your lens of choice for use underwater.

Dome Port

- Optical material:** Optical-grade acrylic or anti-reflective coated glass.
- Purpose:** Wide to super wide imaging.
- Advantages:**
 - Retains FOV.** Corrects for field of view distortions inherent in Flat Ports.
 - Wide FOV capable.** Up to 180 degree fisheye are possible depending on the camera lens capability.
- Disadvantages:**
 - Little or no zoom.** Domes inherently limit zoom through and varies with camera lens employed.



Flat Port

- Optical material:** Optical-grade acrylic or anti-reflective coated glass.
 - Purpose:** Medium to macro imaging.
 - Advantages:**
 - Zoom through.** Flat Ports retains the zoom capability of a lens.
 - Macro.** Flat Ports are excellent for macro shots and/or the use of close up diopters to capture small subjects.
 - Disadvantages:**
 - No wide shots.** By their nature, Flat Ports do not allow wide shots.
 - Loss of FOV.** Like a SCUBA mask, Flat Ports decrease FOV by 25%.
- **NOTE:** The optical interaction between any given lens and a Dome or Flat Port is unpredictable. Distortions and aberrations can occur with either port. As such, Gates does not warrant optical performance or image quality.

Gates endeavors to collect data from the field and our own testing as a resource to customers, but you should always characterize your lens of choice for use underwater.



Lighting Systems

The Arri Mini Housing has provisions to utilize a variety of lighting systems. Ball mounts for the light arms may be located in several locations on Arri Mini Housing: a) threaded into the top of the Handle Grips; b) on the Foot Rails; or c) onto accessory mounts that slide onto the same dovetail slots as the handle grips. There is also a Light Bracket included with the housing for additional mount points.

Controlling Reflections

While it is unlikely, you may encounter reflections from within the port area of Arri Mini Housing from anything shiny.

To control such reflections Gates recommends two easy measures:

- Blackening the shiny area** with a black permanent marker; or
- Install a mask over the lens, as shown in the photo.** This measure is rarely needed, but if necessary black neoprene makes an excellent, flexible masking material. Cut to your specific lens and cut the outer ring diameter to fit the port.

Note: Lens masks are not provided by Gates.



Travel / Transport

The Arri Mini Housing requires several preparations for travel.

- ▶ **CAUTION: No Camera.** DO NOT transport your Arri Mini camera inside the housing. Severe damage may result.
- ▶ **CAUTION: No Trim Weights.** DO NOT transport the Arri Mini Housing with trim weights installed. Severe damage may result.
- Secure Camera Mount.** The Camera Bridgeplate must be well secured. Install and tighten with the lever for travel.
- Protect connectors.** Cover any housing-to-camera connectors to protect them from damage during transit.
- Packing.** Ensure the complete system is packed well in transport case(s).

5: Arri Mini Housing Maintenance

O-Ring Care and Maintenance

Your Gates housing has 3 serviceable o-rings:

- Housing Main Seal (ORANGE);
- Port (YELLOW); and
- Port Base (ORANGE).

Servicing the o-rings is easy and covered in the “Housing Care and Maintenance” document in this package. It can also be found on the Gates website at 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. Only the BLACK and YELLOW o-rings are safe to lubricate.**

- ▶ **CAUTION: Never use metal tools or objects for removing o-rings!**

6: Customer Support

Should you have any questions about the Arri Mini Housing and its operation, please contact Gates at the numbers below.

Email: Customer.svc@GatesHousings.com

Web: www.GatesHousings.com

Phone: 858.391.0052

Fax: 858.391.0053