

WARNING

There are hazards associated with backcountry travel and the use of water filters. Drinking untreated water can result in exposure to harmful microorganisms and an increased risk of gastrointestinal illness. Using this filter improperly increases your risk of exposure to harmful microorganisms and increases your risk of gastrointestinal illness. Reduce your chances of becoming sick by following the warnings and instructions in this manual and educating yourself.

YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY AND THE SAFETY OF THOSE IN YOUR GROUP. PLEASE USE GOOD JUDGMENT.

Never use the MiniWorks EX to filter seawater or chemically contaminated water, such as water from mining tailing ponds or near large agricultural operations. The MiniWorks EX does not make drinkable water from these sources and does not remove all viruses, chemicals and radioactive materials, or particles smaller than 0.2 microns.

Keep the Inlet Hose and other potentially contaminated parts away from filtered water to prevent cross contamination.

READ, UNDERSTAND, AND FOLLOW ALL instructions and warnings in this manual before using this filter. Failure to follow warnings and instructions may result in gastrointestinal illness.

IMPORTANT

Read and understand this entire manual carefully before assembling or using this water filter. Keep this manual for future reference. If you do not understand this manual or have any questions, please call Cascade Designs at 1-800-531-9531.

INSTRUCTION MANUAL



ENG

MINIWORKS® EX



For product information and service contact
Cascade Designs, Inc.
 4000 First Avenue South, Seattle, WA 98134 USA
 1-800-531-9531 or 206-505-9500
 www.msrgear.com
 info@cascaledgedesigns.com



Printed on recycled paper containing 30% post-consumer waste.

31-966_EN

TIPS

Ceramic Element

Clean the element whenever flow is noticeably reduced to maintain 1l/min. output. Avoid excessive or uneven rubbing during cleaning because it may cause surface grooves. Measure the element for wear after each cleaning.

CAUTION: Handle the element carefully to avoid damage or breakage. On extended trips, bring along a spare element.

Water Collection and Preparation

Use the cleanest, clearest water available.

Avoid filtering silty, cloudy, muddy, or glacial stream water or tea-colored water that contains visible tannins because these sources will quickly clog the filter.

If clear water is not available, then let particles settle before filtering. If possible, fill a container with water and let it stand until particles have settled to the bottom. Filter mid-container water and discard bottom sediments. Alternatively, collect and strain water through a bandana or coffee filter to remove particles.

To treat water with suspected waterborne viruses, use an approved disinfectant/purifier and follow the manufacturer's recommendations for use. To see MSR's purification options visit www.msrgear.com. Further information on disinfectant use can be found on the Centers for Disease Control website: www.cdc.gov.

Operation

To maximize pumping performance, air must exist in the Housing and should be visible through the clear gray shell when not pumping.

The Clean Side Cover can be threaded onto a Nalgene bottle cap to keep it and the cap clean when filtering water.

In swift water, place a small rock on the Inlet Cage to keep it submerged below the water surface.

LIMITED LIFETIME WARRANTY/LIMITATIONS OF REMEDIES AND LIABILITY USA and Canada

“Owner”, under intended use and maintenance, warrants the enclosed “Product”, to be free from defects in materials and workmanship for the life of the Product. No warranty against defects in materials and workmanship will apply if Product is (i) altered in any way, (ii) used for purposes inconsistent with Product's intended purpose or design, or (iii) improperly maintained. Warranty will further more be voided where Owner/user (i) failed to follow Product instructions or warnings or (ii) subjected Product to misuse, abuse, or neglect.

During the warranty period, original Product parts determined by Cascade to be defective in materials or workmanship will be repaired or replaced as Owner's sole remedy. Cascade reserves the right to replace any discontinued product with a new product of comparable value and function. A returned product deemed irreparable becomes the property of Cascade and will not be returned.

EXCLUDING THE LIMITED WARRANTY PROVIDED ABOVE, CASCADE, ITS AFFILIATES AND THEIR SUPPLIERS, TO THE MAXIMUM EXTENT PERMITTED BY LAW, MAKE NO WARRANTIES, EXPRESSED OR IMPLIED, AND DISCLAIM ALL WARRANTIES, DUTIES AND CONDITIONS, WHETHER EXPRESSED, IMPLIED OR STATUTORY, WITH RESPECT TO THE PRODUCT, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, AGAINST LATENT DEFECTS, FITNESS FOR A PARTICULAR PURPOSE, OR CORRESPONDENCE TO DESCRIPTION.

Warranty Service. To obtain service under this warranty, the warranty-eligible Product must be presented to a Cascade authorized dealer. In the United States and Canada, warranty service may also be obtained by calling 1-800-531-9531 [MT, 8:00-4:30, PDT].

TROUBLESHOOTING

Problem	Cause	Solution
Clogged filter	Collected particles	Clean Ceramic Element
Little/no water flow	Collected particles	Clean Ceramic Element
Decreased flow rate	Collected particles	Clean Ceramic Element
Limp Handle (PULL stroke)	Debris under Umbrella Valve	Clean surface under Umbrella Valve
Limp Handle (PUSH stroke)	Debris in Relief Valve	Clear Relief Valve Assembly
	Loose Inlet Hose Barb	Tighten Inlet Hose Barb
	Missing Relief Valve part	Check parts and placement in Relief Valve Assembly
	Broken Ceramic Element	Replace Ceramic Element <i>WARNING: Never use filter if Ceramic Element is broken or damaged.</i>
	Missing Lower End Cap O-ring	Replace Lower End Cap O-ring <i>WARNING: Never use filter if Lower End Cap O-ring is missing.</i>
Dragging Handle (PULL stroke)	Dry Piston O-ring	Lubricate Piston O-ring
	Kinked/blocked Inlet Hose	Clear Inlet Hose
	Clogged Inlet Foam	Clean Inlet Foam
Dragging Handle (PUSH stroke)	No Airspring in Housing	Empty water from Housing and resume pumping (See Step 1)
	Collected particles	Clean Ceramic Element
	Dry Piston O-ring	Lubricate Piston O-ring
Leaking Piston O-ring seal	Cracked/worn Piston O-ring	Replace Piston O-ring

Please refer to Filter Cleaning and Maintenance section for more information.

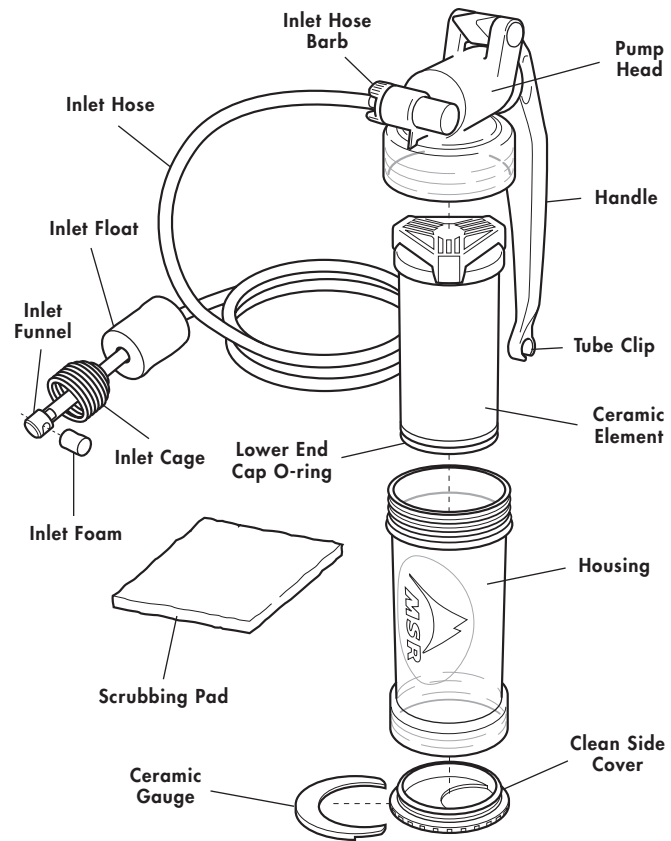
SPECIFICATIONS

Kit Contents	MiniWorks® EX Water Filter Instruction Manual Scrubbing Pad Storage Sack
Weight	16 oz. / 456 g
Dimensions	7.5 x 2.75 in. / 19 x 7 cm
Flow Rate	1 liter per min.
Ceramic Element Life	Up to 2000 liters (depends on water conditions) 30 to 60 estimated cleanings (depends on force used to clean cartridge)
Pump Assembly Life (excluding Ceramic Element)	~10 years (depends on environmental conditions, frequency of use, etc.)
Patents	US – Patent No. 5,266,196 / 5,925,309 US – Patent No. 5,558,762 / 5,656,220 UK – GB Reg. Design No. 2011749 Germany - Patent No. M9008212 Australia - Design Patent No. 114171 Other Patents Pending

Cascade Designs, Ltd.
 Dwyer Road, Midleton, County Cork, Ireland
 (+353) 21-4621400
www.msrgear.com

Cascade Designs, Inc.
 4000 First Avenue South, Seattle, WA 98134 USA
 1-800-531-9531 or 206-505-9500

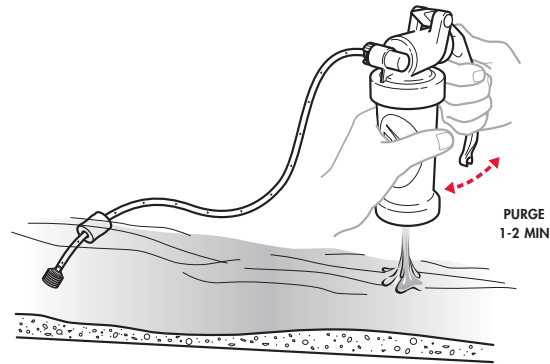
KNOW YOUR MSR® MINIWORKS® EX FILTER



MINIWORKS® EX OPERATING INSTRUCTIONS

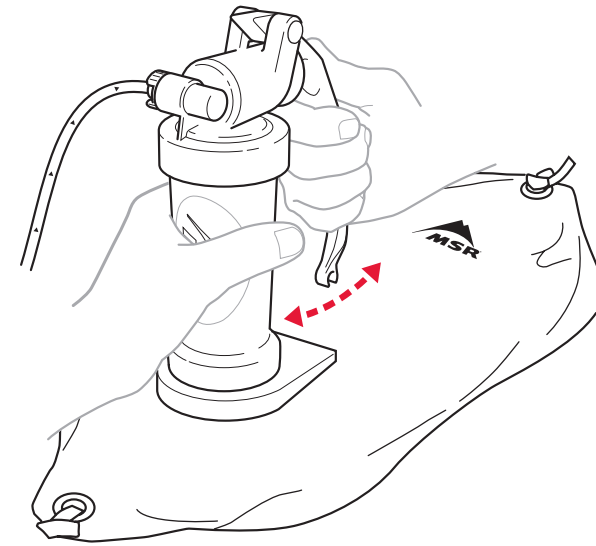
1 PREPARE FILTER

1. Unscrew the Clean Side Cover from the Housing.
2. Connect open end of Inlet Hose to Inlet Hose Barb.
Before first use, pump 1-2 liters of water through filter (1-2 minutes) to purge residual carbon dust before attaching to a clean water container.
3. Put Inlet Cage under water.
↳ Adjust Inlet Float to keep Inlet Cage between bottom sediments and water surface.
4. Begin pumping until water enters Pump Head and flows out of Housing.
↳ NOTE: Airspring design provides best performance when air is visible in Housing. Do not invert filter to purge air out.



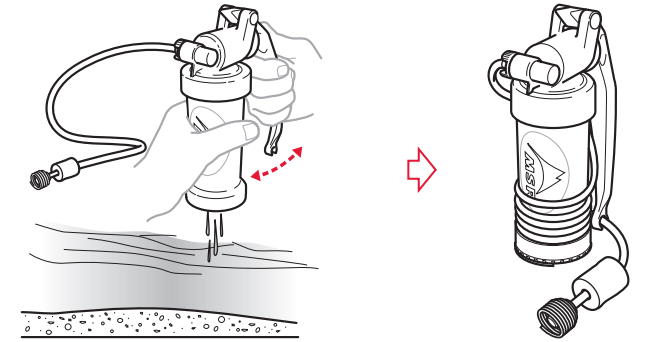
2 FILTER WATER

1. Place a clean container under the filter OR attach an MSR® Dromedary™ Bag onto the bottom of the filter.
2. Begin pumping until water enters Pump Head, fills Housing, and begins to flow out of filter.
3. Pump the Handle to filter water (about 70 to 80 strokes/minute for optimal performance).



3 PACK AND STORE FILTER

1. Remove Inlet Cage from water.
2. Pump the Handle to purge filter of any remaining water.
3. Rinse and air dry Ceramic Element completely (3-5 days) before storage.
4. Attach Clean Side Cover onto the bottom of the filter to prevent contamination.
5. Wind Inlet Hose around Housing.
↳ Secure Inlet Hose with Tube Clip on Handle.
↳ Place filter inside Storage Sack.



⚠ WARNING

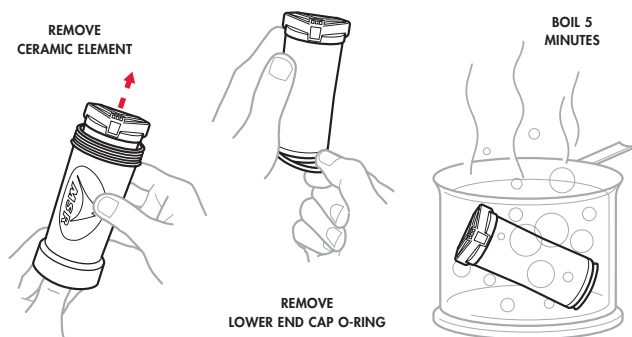
Always wash and dry filter parts thoroughly before long-term storage to prevent the growth of mold, mildew, and bacteria. Never use a dishwasher to wash parts because the high heat may damage or melt them.

4 STERILIZE CERAMIC ELEMENT

Sterilize the Ceramic Element if the filter has been used for more than seven consecutive days. Also, sterilize it before or after long-term storage, especially if Ceramic Element was stored wet.

1. Remove Ceramic Element from Housing.
2. Remove Lower End Cap O-ring.
3. Place Ceramic Element in large pot. Cover the Ceramic Element completely with water (room temperature) and allow room for the water to reach a rolling boil without spilling over.
4. Bring water to a boil and allow element to remain in rolling boil for 5 minutes.
5. Turn off stove and allow water to cool before removing element.
6. Air dry Ceramic Element completely (3-5 days).
7. Wash and dry completely all other filter parts.
8. Reassemble filter.

IMPORTANT: Remember to reinstall Lower End Cap O-ring.

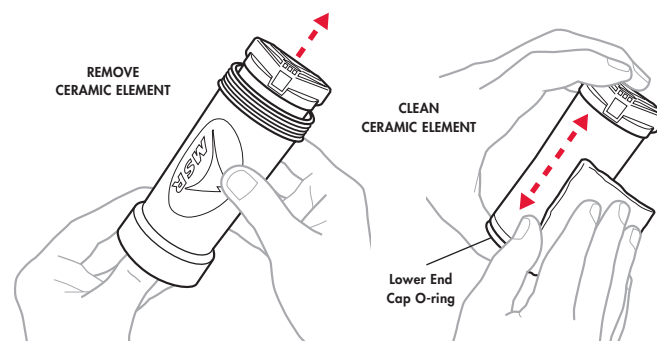


FILTER CLEANING AND MAINTENANCE

The MiniWorks EX requires regular cleaning and maintenance to function properly. Cleaning and maintenance depends on frequency of use and water quality. The Ceramic Element will clog gradually during use, especially when filtering from glacial streams or cloudy water. If necessary, replacement parts can be found in the MSR Water Filter Maintenance Kit, purchased separately from a local or online MSR dealer.

CLEANING THE CERAMIC ELEMENT - AFTER EACH USE

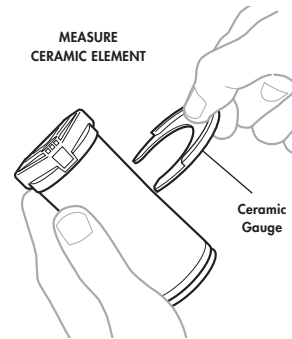
1. Unscrew Pump Head from Housing.
2. Unscrew Clean Side Cover from Housing.
3. Hold Housing and push Ceramic Element out from bottom.
4. Wet Scrubbing Pad with clean water and gently rub the element. Use even, uniform strokes to clean around the element.
5. Rinse Ceramic Element with clean water and reassemble filter.
WARNING: Check installation of Lower End Cap O-ring to ensure element is sealed in the Housing.



MEASURING THE CERAMIC ELEMENT

NOTE: MSR recommends measuring the Ceramic Element after each cleaning.

1. Remove Ceramic Gauge from Clean Side Cover.
2. Remove Ceramic Element from Housing. (See "Cleaning the Ceramic Element.")
3. Gently lay gauge on surface of Ceramic Element and slide along its length. (DO NOT FORCE gauge over element. Permanent damage can occur.)
4. Replace Ceramic Element if gauge fits easily over Ceramic Element at any point. (See "Replacing the Ceramic Element.")

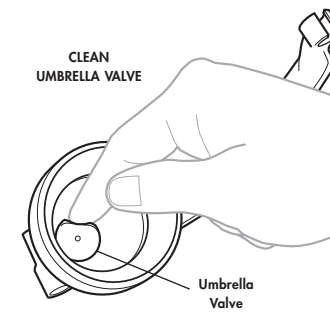


REPLACING THE CERAMIC ELEMENT

Follow removal and reinstallation steps in "Cleaning the Ceramic Element."

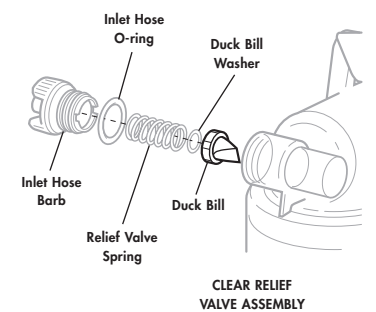
CLEANING THE UMBRELLA VALVE

1. Unscrew Pump Head.
2. Pinch and pull gently to remove Umbrella Valve.
3. Rinse Pump Head and Umbrella Valve thoroughly with clean water.
4. Press Umbrella Valve firmly back into place and reassemble.



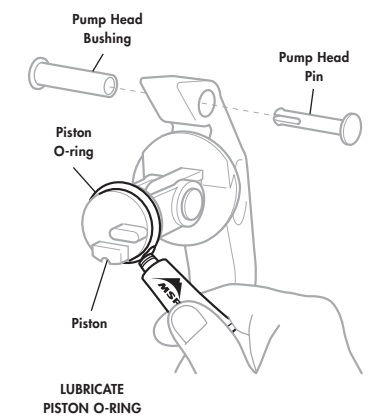
CLEARING THE RELIEF VALVE ASSEMBLY

1. Unscrew Inlet Hose Barb from the Pump Head.
2. Rinse Duck Bill and reassemble. Ensure sequence of Inlet Hose Barb, Inlet Hose O-ring, Relief Valve Spring, Duck Bill Washer, and Duck Bill.



CLEANING THE INLET FOAM

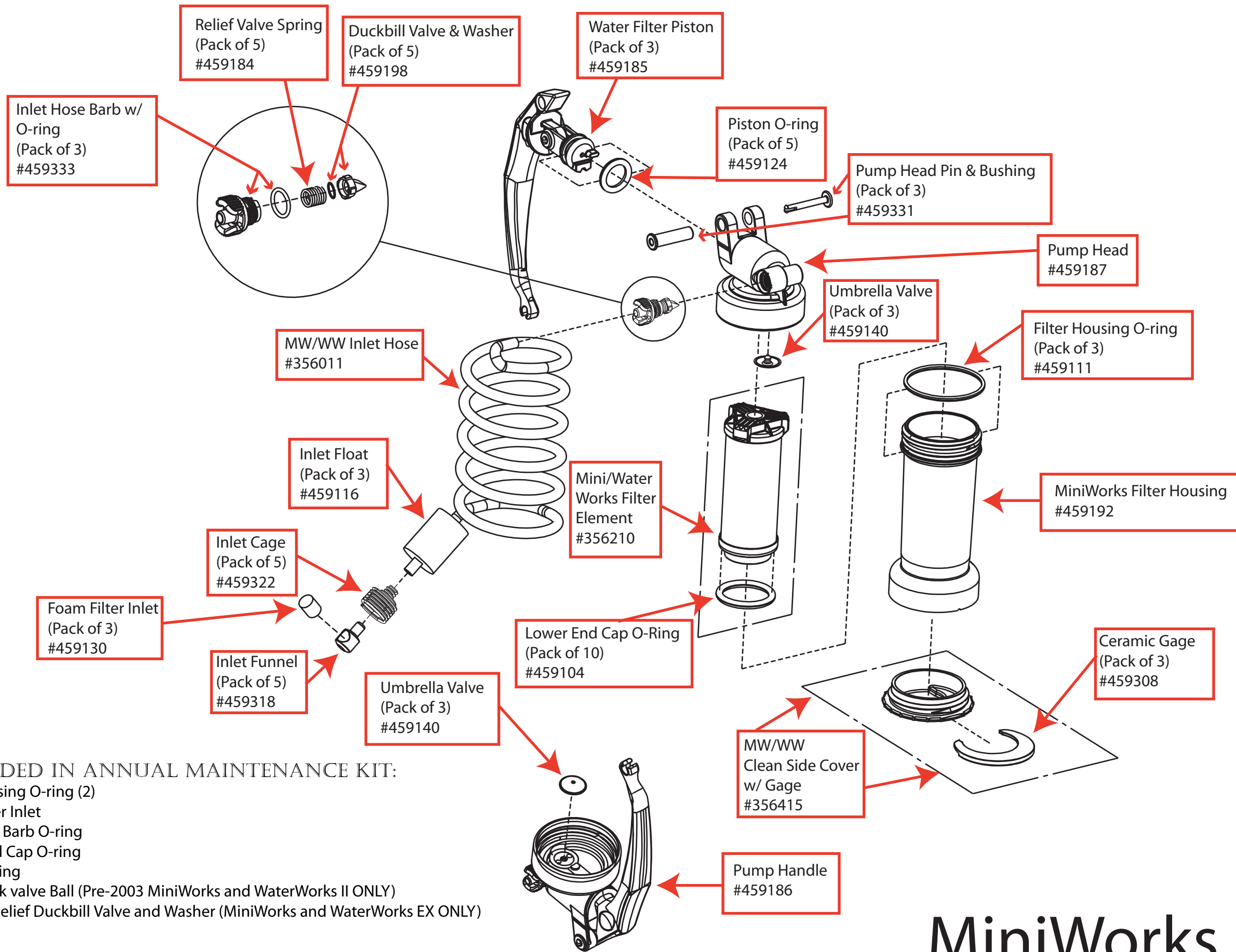
1. Slide Inlet Cage up the Inlet Hose.
2. Remove Inlet Foam from the Inlet Funnel.
3. Rinse foam in clear water and reinstall parts.



LUBRICATING THE PISTON O-RING

1. Pull out Pump Head Pin and Pump Head Bushing.
2. Remove Handle and Piston.
3. Lubricate Piston O-ring and reassemble. Use MSR Silicone Lubricant, lip balm or petroleum jelly.

LUBRICATE PISTON O-RING



INCLUDED IN ANNUAL MAINTENANCE KIT:
 Filter Housing O-ring (2)
 Foam Filter Inlet
 Inlet Hose Barb O-ring
 Lower End Cap O-ring
 Piston O-ring
 Inlet Check valve Ball (Pre-2003 MiniWorks and WaterWorks II ONLY)
 Pressure Relief Duckbill Valve and Washer (MiniWorks and WaterWorks EX ONLY)

MiniWorks EX