

Maintenance and Repair Manual
PremAire® Cadet Escape Respirator
Ultra Elite® Facepiece



Order No.: 10105223/02
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CR 800000035908

 **WARNING!**

Read this manual carefully before servicing the device. The device will perform as designed only if it is used and maintained in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed and persons who rely on this device for their safety could sustain serious personal injury or death.

Please read and observe the WARNINGS and CAUTIONS inside. For any additional information relative to use or repair, call 1-800-MSA-2222 during regular working hours.

For alternate languages, please refer to part number 10168038.

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1 Description

1.1 Parts List and Replacement Parts

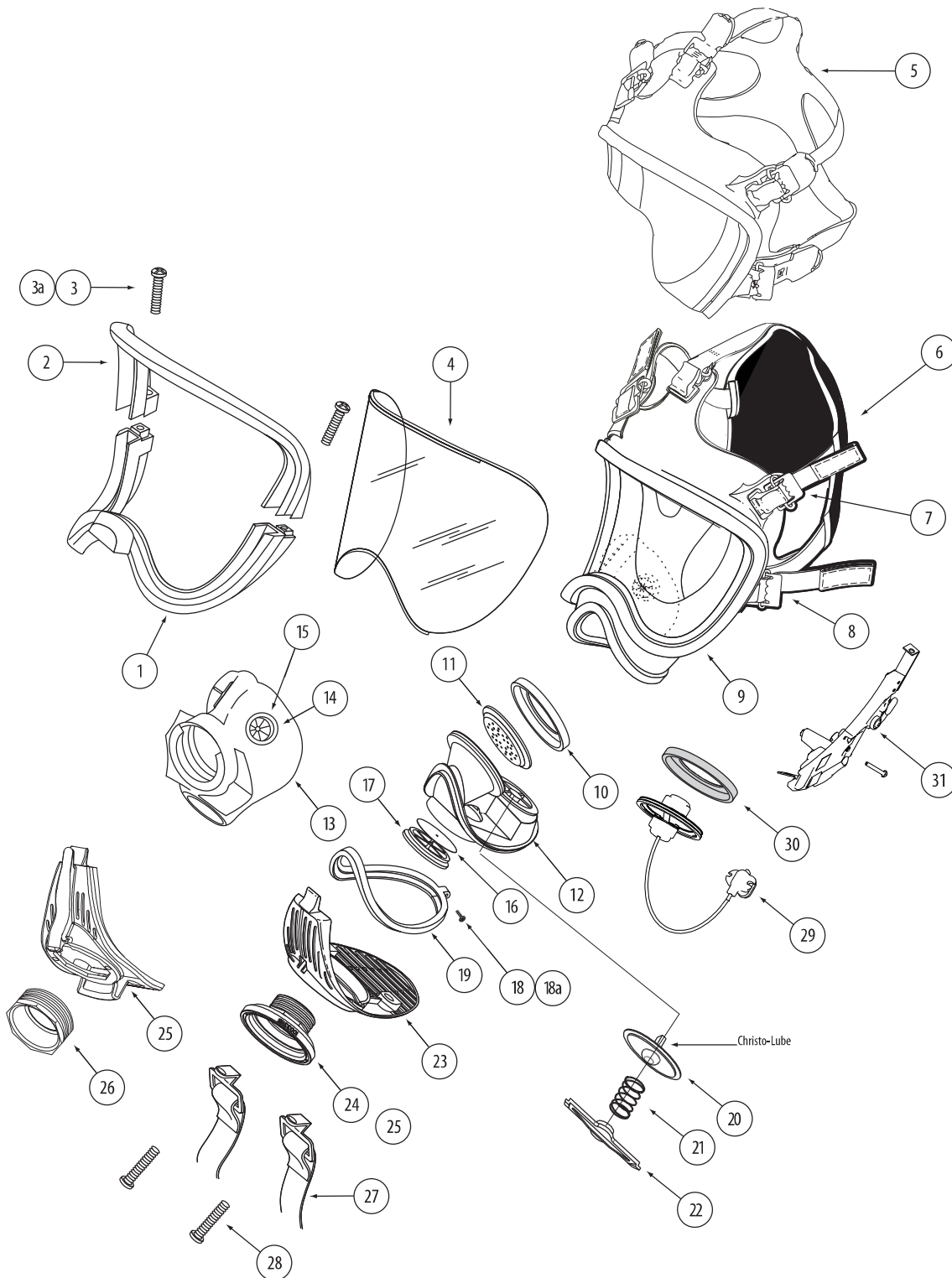


Fig. 1 Exploded View

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Parts List

Item	Description	Part Number
1	Lower Lens Ring	804805
2	Upper Lens Ring	804804
3	Screw (2 Req'd)	636955
3a	Screw Kit (2 x 636955)	804806
4	Lens	491132
5	Hycar [®] Head Harness	817262
6	Speed-ON [®] Head Harness Assembly	10031102
7	Buckles (3 Req'd.)	494297
8	Buckle Assembly with D-Ring (2 Req'd.)	804807
	Hycar Facepiece Blank (Small)	10048814
9	Hycar Facepiece Blank (Medium)	10048813
	Hycar Facepiece Blank (Large)	10048815
10	Speaking Diaphragm Retainer	804808
11	Speaking Diaphragm	804809
12	Component Housing with Exhalation valve	815605
13	Nosecup Assembly w/ valves, Small/Medium	491121
	Nosecup Assembly w/ valves, Medium	491123
14	Valve Disc (2 Req'd.)	804823
15	Valve Seat (2 Req'd.)	804822
16	Inlet Valve Disc	804813
17	Valve Spider	805011
18	Screw	636956
19	Screw Kit	804812
19a	Component Housing Ring	804811
20	Exhalation Valve	490133
21	Spring	814459
22	Spring Retainer	490128
23	Component Housing Cover (Push-to-Connect)	489224
24	Push-To-Connect Adapter	10033115
25	Component Housing Cover (Slide-to-Connect)	10034500
26	Slide-To-Connect Adapter	10018621
27	Neck strap	804829
28	Screw (2 Req'd.)	10033208
29	ClearCommand Communication System Microphone	10024076
30	Speaking Diaphragm Retainer (CC)	10023505
31	ClearCommand Communication System Mounting Bracket	10057484
	Snoop Leak Detector	600920
	Christo Lube Lubricant	604070

Replacement Parts

Ultra Elite Facepiece (Complete)

	Description	Part Number
Push to Connect	Small	10084690
	Small, ClearCommand® Communication System-ready	10084822
	Medium	10084824
	Medium, ClearCommand Communication System-ready	10084826
	Large	10084828
	Large, ClearCommand Communication System-ready	10084830
Slide to Connect	Small	10084689
	Small, ClearCommand Communication System-ready	10084821
	Medium	10084823
	Medium, ClearCommand Communication System-ready	10084825
	Large	10084827
	Large, ClearCommand Communication System-ready	10084829

Component Housing Assembly

Description	Part Number
Component Housing Assembly (Complete)	10195302
Speaking Diaphragm Retainer	804808
Speaking Diaphragm	804809
Component Housing w/ Exhalation valve	815605
Inlet Valve Disc	804813
Valve Spider	805011

Exhalation Valve Retaining Bar Kit

Description	Part Number
Exhalation Valve Retaining Bar Kit	818107
Spring	490133
Spring Retainer	490128

Nosecup Assembly (with valves)

Description	Part Number
Small/Medium	495188
Large	495189

2 Disassembly

2.1 Removing the Head Harness

The center strap of the head harness is stitched permanently to the buckle.

To replace the harness:



- (1) Remove the center strap and buckle.
 - a) Grasp the facepiece lug with one hand and the buckle with the other.
 - b) Lift the metal buckle while stretching the facepiece lug.

- (2) Remove the temple and jaw straps.
 - a) Extend each strap so that the end tab is at the buckle.
 - b) Unlace the straps.

Note: To remove the head harness with buckles, repeat Step 1 on each buckle.

2.2 Removing the Lens and Lens Ring



Remove the adapter assembly and component housing cover. (See section 2.4 "Removing the Component Housing Cover".)



- (1) Remove the screws from the top and bottom lens rings.



- (2) Remove the lens rings.



- (3) Fold the flange back and pull the lens out of the groove.

2.3 Removing the Nosecup



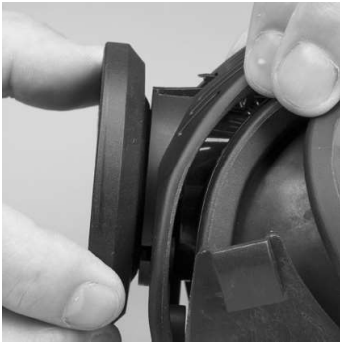
- (1) Remove the nosecup.

2.4 Removing the Component Housing Cover



- (1) Remove the two component housing cover screws, if present, and neck strap. If present, remove the push-to-connect adapter assembly.

Note: If necessary, use a small slot head screwdriver to disengage the cover.

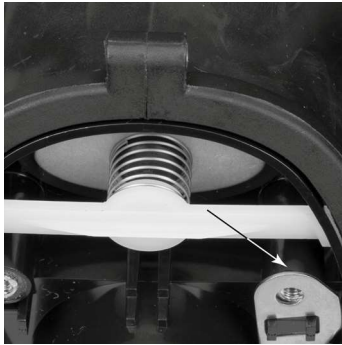


- (2) Unscrew and remove the push-to-connect adapter.



- (3) Remove the component housing cover.

2.5 Removing the Spring, Spring Retainer, and Exhalation



- (1) Remove and discard the spring retainer.
 - a) Slide one end of the retainer out of the slot.
 - b) Carefully push the center of the retainer and release the other end.

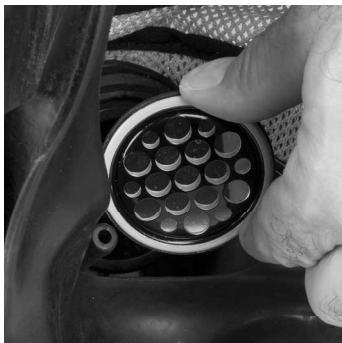
Note: Be careful not to damage the slots, valve, or valve seat. If the slots, valve, or valve seat are damaged, replace the component housing.

- (2) Inspect the slots in the component housing for damage or distortion. If damage or distortion is present, replace the component housing.
- (3) Remove the exhalation valve.

2.6 Removing the Speaking Diaphragm



- (1) Unscrew and remove the speaking diaphragm retaining ring.



- (2) Carefully remove the speaking diaphragm.

2.7 Disassembling the Component Housing

2.7.1 Removing the Adapter Assembly



- (1) If present, remove the inlet adapter.

Note: Use a large adjustable wrench to unscrew the inlet adapter. You can use a piece 1" PVC pipe wrapped with a few winds of electrical tape to prevent the inlet adapter from deforming.

2.7.2 Removing the Inlet Gasket and Disc Valve



- (1) Remove the spider gasket.



- (2) Disassemble the spider gasket.
 - a) Stretch the disc off of the stem.

3 Reassembly



Flow test the facepiece on the PosiChek3 after reassembly.

3.1 Assembling the Component Housing

Install the valve spider (P/N 805011) and disc valve, speaking diaphragm (P/N 804809), push-to-connect adapter assembly (P/N 10033115), and slide-to-connect adapter assembly (P/N 10018621).

3.2 Removing the Inlet Gasket and Disc Valve

Inlet Valve Disc P/N 804813

Valve Spider P/N 805011



(1) Gently stretch the valve disc over the stem.



(2) Insert the gasket so that the groove captures the housing rim.



(3) Reinstall the adapter assembly.

Note: Ensure that the groove captures the component housing rim. Flex the gasket spider as needed to fully capture the rim. When installed correctly, the gasket lays flat and all of the spokes are straight.

3.3 Installing the Slide-to-Connect Adapter Assembly



- (1) Screw the adapter into the component housing.
 - a) Ensure that the corners of the top flat align with the notches.



Note: You can use a piece 1" PVC pipe wrapped with a few winds of electrical tape to prevent the inlet adapter from deforming while tightening.

3.4 Installing the Speaking Diaphragm

Speaking Diaphragm P/N 804809

Retaining Ring P/N 804808



- (1) With the gasket forward (perforations facing the wearer) place the diaphragm in the component housing.



- (2) Install the retaining ring and firmly hand-tighten.

3.5 Installing the Component Housing

With Exhalation Valve P/N 815605

Snoop Leak Detector P/N 600920



- (1) Slide the housing into the front of the facepiece.
 - a) Starting at the top (narrow end) of the housing, work the housing into the groove.

Note: Ensure that the housing is captured completely by the groove and that the centerline marks are aligned.



- (2) Insert the narrow end of the housing ring between the lower lens ring and facepiece housing.



- (3) Align the component housing ring center mark with the facepiece centerline. Lubricate with Snoop (P/N 600920) as needed.

- (4) Start at the narrow end and work the housing ring onto the facepiece.
 - a) Work down both sides until the ring completely captures the facepiece rubber. Lubricate with Snoop as needed.
- (5) Moisten the mating surfaces of the facepiece and housing ring with Snoop.

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- (6) Check by gently squeezing the ring ends together. Bulges or wrinkles indicate that the rubber is not completely captured.
 - a) Rework the ring until there are no bulges or wrinkles.

⚠ WARNING!

Bulges or wrinkles indicate that the facepiece rubber is not seated properly. Reinstall the ring so that there are no bulges or wrinkles. Failure to follow this warning can cause the facepiece to leak and result in serious personal injury or death.



- (7) Use a Phillips screwdriver to tighten the component housing ring screw.
 - a) Make sure the facepiece rubber does not extrude between the component housing ring ends.

Note: On models equipped with ClearCommandCommunication System mounting brackets, install the mounting bracket and screw provided. (See section 4.3 "Installing the ClearCommand Communication System Mounting Bracket" for instructions.)

3.6 Installing the Exhalation Valve, Spring and Spring



- (1) Lightly lubricate the exhalation valve stem with Christo-Lube.
 - a) Insert the exhalation valve post into the slot.



(2) Place a new spring on the valve.



(3) Insert a new spring retainer.



(4) Ensure spring retainer is secure.
 a) Make sure the retainer is fully engaged in the slots.
 b) Ensure that the spring is centered on the exhalation valve.

Note: If the retainer cannot be secured, replace the component housing.

⚠ CAUTION!

If facepiece rubber extrudes between the component housing ring ends, loosen the ring, adjust, and reassemble.

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3.7 Installing the Component Housing Cover

Component Housing Ring P/N 804811

Component Housing Cover (Push-to-Connect) P/N 489224

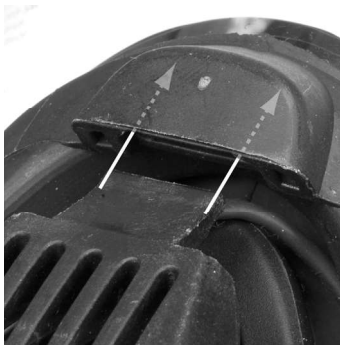
Push-to-Connect Adapter P/N 10033115

Install the ClearCommand Communication System and HUD mounting brackets. (See section 4.3 "Installing the ClearCommand Communication System Mounting Bracket" for instructions.)

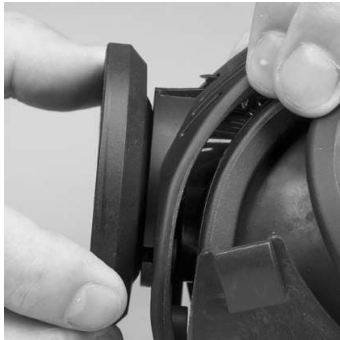


Verify that the exhalation valve is installed.

- (1) Place the component housing cover over the adapter assembly.



- (2) Insert the tab on the cover into the slot in the lens ring.



- (3) Screw the push-to-connect adapter into the component housing.



Note: If necessary, use a small slot head screwdriver to engage the cover.



- (4) Place the neck strap brackets into the sockets.
 - a) Install Phillips screws and tighten.

3.8 Installing the Nosecup

Nosecup Assembly w/ Valves, Small/Medium P/N 491121

Nosecup Assembly w/ Valves, Medium P/N 491123



- (1) Stretch the nose cup over the exhalation valve flange.



- (2) Stretch the nose cup over the retaining ring.

Note: Ensure that the nosecup fully engages the retaining ring.

3.9 Installing the Lens and Lens Ring

Lens Assembly P/N 491132

Lower Lens Ring P/N 804805

Upper Lens Ring P/N 804804

Snoop P/N 600920



- (1) Remove dirt, lens fragments, or debris from the groove.



- (2) Lubricate the groove with Snoop (P/N 600920) or properly mixed Confidence Plus cleaner sanitizer solution.

CAUTION!

Keep the lens cover (P/N 10093932) on new lenses until facepiece assembly is complete.

- (3) Align the lens centerline marks (top and bottom) with the facepiece centerline marks.

Note: Verify proper lens selection. NFPA approved lenses bear the Identification Mark "X" at the top center of the lens.



- (4) Insert the top of the lens into the groove.

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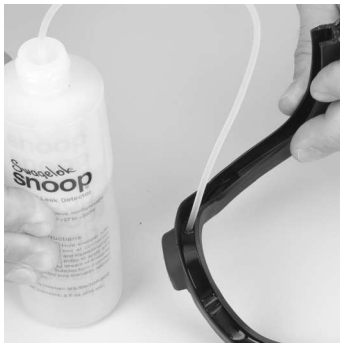
- (5) Work the groove around the lens to seat the lens.



Note: The bottom lens center line mark must line up with the bottom facepiece center line mark.



- (6) Moisten the mating surfaces of the facepiece and lens ring with Snoop (P/N 600920).



- (7) Lubricate the lens ring with Snoop (P/N 600920).

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(8) Install the lens ring.

(9) Press the ring halves together to mate the ends.

(10) Install a screw on each side.

a) If the screws do not go in easily, pull them out and try again. Avoid cross threading.

(11) Alternate tightening the left and right screws to seat the ring evenly.

(12) Don the facepiece.

(13) Cycle exhalation valve by inhaling and exhaling six times.

(14) Check the face-to-facepiece seal. (See **AirHawk II Air Mask Operation and Instructions P/N 10088650** for instructions.)

⚠ CAUTION!

Do not over tighten. Facepiece rubber must not be visible through the joint. If the facepiece rubber is visible, reassemble.



3.10 Installing the Head Harness

Hycar Head Harness P/N 817262

Cloth Head Harness P/N 10031102



- (1) Install the crown buckle.
 - a) Insert the long tab of the lug into the D-ring.

- (2) Pull the entire lug through.

Note: Repeat steps 1 and 2 to install temple, and jaw buckles. (See Kit P/N 817088, **Head Harness Installation** instructions to attach the harness.)

4 ClearCommand Communication System



If upgrading from a speaking diaphragm to the ClearCommand Communication System, remove the speaking diaphragm. (See section 2.6 "Removing the Speaking Diaphragm" for instructions.)

4.1 Removing the ClearCommand Communication System



- (1) Use a Phillips screwdriver to remove the lens ring screw.

- (2) Use a Phillips screwdriver to remove the component housing ring screw.

- (3) Remove the component housing cover. (See section 2.4 "Removing the Component Housing Cover" for instructions.)

- (4) Slide the bracket off of the facepiece.



- (5) Use a small Phillips screwdriver to disconnect the ClearCommand microphone from the mounting bracket.



- (6) Remove the nosecup.



- (7) Unscrew and remove the speaking diaphragm retaining ring.

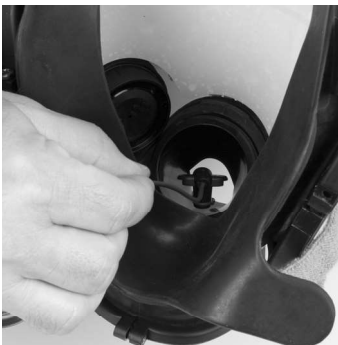


- (8) Remove the ClearCommand microphone.

4.2 Installing the ClearCommand Microphone

ClearCommand Microphone P/N 10024076

Retaining Ring P/N 10023505



- (1) Thread the cable through the component housing.



- (2) With the gasket forward place the microphone into the component housing.



(3) Install the retaining ring and firmly hand-tighten.



(4) Reinstall the nosecup. (See section 3.8 "Installing the Nosecup" for instructions.)

(5) Route the microphone cable over the component housing retaining ring center line.



(6) Assemble the component housing cover. (See section 3.7 "Installing the Component Housing Cover" for instructions.)

(7) Use a small Phillips screwdriver to connect the ClearCommand microphone to the mounting bracket.



(8) Use a Phillips screwdriver to tighten the component housing ring screw.

4.3 Installing the ClearCommand Communication System Mounting Bracket

ClearCommand Communication System Mounting Bracket P/N 10024077

- (1) Remove the component housing cover.
(See section 2.4 "Removing the Component Housing Cover" for instructions.)
- (2) Slide the bracket onto the facepiece.



- (3) Align the upper tab to the screw holes in the upper lens ring.
 - a) Insert a screw. Use a Phillips screwdriver to tighten the lens ring screw.



- (4) Use a Phillips screwdriver to tighten the component housing screw.



- (5) Install the component housing cover.
(See section 3.7 "Installing the Component Housing Cover" for instructions.)

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5 Cleaning and Disinfecting

Confidence Plus® Cleaning Solution P/N 10009971

In general, only the facepiece requires cleaning and disinfecting after each use.

5.1 Cleaning the Head Harness

Machine wash in warm water (maximum 110 °F/43 °C) with a mild detergent.

Allow to air dry.

Do not dry clean.

Do not bleach or use abrasive cleaners.

Do not fold or store when wet.

Cleaning and Desinfecting

Depending on cleaning policy, either a designated person or the user should clean the respirator after each use. ANSI standards suggest user training in cleaning procedures.

Use MSA Confidence Plus Cleaning Solution. It cleans and disinfects in one operation, retains germicidal effectiveness in hard water to inhibit bacteria growth, and will not deteriorate rubber, plastic, glass, or metal parts.

CAUTION!

Do not use cleaning substances that can attack the apparatus. Do not use alcohol as a germicide because it may deteriorate rubber parts. Cleaning agent residue may irritate the wearer's skin. Rinse thoroughly to remove all traces of cleaning solution.

- (1) Follow instructions to mix Confidence Plus Cleaning Solution or similar germicidal cleaner.
- (2) Disconnect the second stage regulator.
- (3) Loosen the thumbscrew and remove the HUD.
- (4) Remove the ClearCommand Communication System.
- (5) Wash thoroughly with soft brush or sponge.
- (6) Submerge in a germicidal solution for the manufacturer's recommended time.
- (7) Thoroughly rinse the facepiece and components in clean, warm (110 °F/43 °C) water.
- (8) Clean the exhalation valve by pressing the stem with a blunt object and flushing with clean water.
- (9) Allow the facepiece to thoroughly air dry away from direct sunlight.



Do not force dry with heat.

6 Troubleshooting

Exhalation valve Opening Pressure Test

- 1.5-2.5 IWC passes
- If exhalation valve opens at too low of a pressure (under 1.5 IWC), replace exhalation spring and retaining bar P/N 818107.
- If exhalation valve opens at too high of a pressure (over 2.5 IWC) retest as the valve may have been stuck due to debris or other foreign matter. If the exhalation resistance still fails, clean the facepiece. If still failing, replace spring and retaining bar P/N 818107 and apply Christo-Lube to only the rectangular plastic stem of the exhalation valve.

Facepiece Leak Test

- Reposition facepiece on PosiChek3 head form and tighten to ensure good seal.
- Inspect speaking diaphragm membrane for holes.
- Inspect rubber material and other facepiece components for physical damage.
- Inspect sealing surface of exhalation valve to the component housing. Clean any debris.

