

PremAire[®]

System

USERS MAINTENANCE INSTRUCTIONS



WARNING

THIS MANUAL MUST BE READ CAREFULLY BY ALL PERSONS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any complex piece of equipment, the PremAire from MSA will perform as designed only if used and serviced according to the instructions. OTHERWISE, THE PRODUCT COULD FAIL TO PERFORM AS DESIGNED, AND PERSONS WHO RELY ON THE PRODUCT COULD SUSTAIN SERIOUS PERSONAL INJURY OR DEATH.

This PremAire is certified by the National Institute of Occupational Safety and Health (NIOSH).

The warranties made by MSA with respect to the product are voided if the product is not used and serviced according to the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the WARNINGS and CAUTIONS inside. We encourage our customers to write or call for a demonstration of this equipment prior to use, or for any additional information relative to use or repairs. During regular working hours, call 1-800-MSA-2222.



Be Sure.
Choose MSA.

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

INTRODUCTION

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IMPORTANT NOTICE

Note: A thorough understanding of the PremAire System and PremAire Cadet is essential before attempting to service or maintain this apparatus. A user's instruction manual is supplied with each new apparatus. Refer to the user's instructions for specific user information, such as NIOSH Approval Information, donning and doffing, or cleaning and disinfecting.

1. This PremAire Supplied Air Respirator (SAR) will perform as designed only if used and maintained according to the manufacturer's instructions. You must read and understand these instructions before trying to use or service this product. We encourage our customers to write or call for information on this product before using it.
2. If the PremAire does not perform as specified in this manual, it must not be used until it has been checked by authorized personnel.
3. Do not alter, modify, or substitute any components without the approval of the manufacturer. Such alterations will void the NIOSH approval.
4. Inspect the PremAire regularly and maintain it according to the manufacturer's instructions. Repairs must only be made by properly trained personnel. Any additional repairs NOT covered by this manual.

ANSI Standard Z88. 5, Practices for Respiratory Protection for the Fire Service; and, ANSI Standard Z88. 2, Practices for Respiratory Protection. Both publications are available from the American National Standards Institute.

OSHA Safety and Health Standards (29 CFR 1910) (see specifically Part 1910. 134), available from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

MAINTENANCE

The maintenance procedures authorized in this manual need no special training, although the user must have a thorough

understanding of the apparatus. All maintenance procedures are for prior or current designs, unless specified. Additional, advanced training is available. Contact your MSA representative for details.

⚠ WARNING

This manual is intended for use with PremAire System MMR respirators only. This includes the PRemAire Cadet. Do not use the procedures in this manual for maintaining self-contained breathing apparatus (SCBA) regulators. Air-line regulators are designed for pressures up to 100 psig. Their use with an air source in excess of 100 psig may result in air-line regulator rupture, causing serious personal injury or death.

⚠ CAUTION

Do not attempt repairs beyond those specified in this manual. Only trained and certified personnel, authorized by MSA, are permitted to maintain and repair this apparatus. Breathing apparatus must not be repaired beyond manufacturer's recommendations. OSHA 29 CFR Part 1910.134, Par. (f) (4) clearly defines these requirements.

⚠ WARNING

Do not attempt repairs beyond those specified in this manual. Only trained or certified personnel, authorized by MSA, are permitted to maintain and repair this apparatus. Apparatus must not be repaired beyond the manufacturer's recommendations. 29 CFR Part 1910.134, Par. (f) (4) makes these requirements clear:

Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Regulators shall be returned to the manufacturer or to a trained technician for

INTRODUCTION

adjustment or repair. Failure to follow this warning may result in serious personal injury or death.

⚠ WARNING

Do not inspect the apparatus before cleaning if there is a danger of contacting hazardous contaminants. Clean and sanitize first, then inspect. Failure to follow this precaution may cause inhalation or skin absorption of the contaminant and result in serious personal injury or death.

GENERAL NOTES

The inspection and maintenance procedures authorized in this manual are classified User Maintenance. Additional, advanced training is available. Contact your MSA representative for details. Refer to the appropriate Illustrated Parts List.

IMPORTANT

You must read and understand the General Notes, Warnings, and Cautions below before performing Disassembly and Repair. General Notes is a collection of procedures common to many repairs.

Details for each procedure are listed. Details are not repeated each time the procedure is done. Instead, a reference to the General Note appears in the text.

⚠ CAUTION

Do not attempt repairs beyond those specified in this manual. Apparatus must not be repaired beyond the manufacturer's recommendations. Apparatus must be returned for any additional repairs not covered by this manual.

Note 1: Lubricate all designated O-rings with a very thin film of Christo-Lube lubricant (P/N 604070) before they are installed. Christo-Lube lubricant is compatible with brass and aluminum.

Note 2: Pipe-sealing tape is used on fittings with tapered threads. Wrap 1 to 1-1/2 turns of tape in a clockwise direction (looking into the threaded end of the fitting). Start at the second thread. Do not put tape on the first thread. Pieces of tape can break off and reduce air flow. Apply a thin film of Christo-Lube lubricant to the outer surface of the tape before threading the part into another component.

⚠ CAUTION

Do not over-tighten parts or you may damage the part or the fitting threads.

Note 3: All repair procedures assume that the air source is fully closed and depressurized.

LEAK TESTING

Leak Testing should be performed when the apparatus fails any of the inspection steps; following disassembly; or, as part of a regularly-scheduled maintenance procedure. The apparatus must hold system pressure without leaks to provide adequate protection. The component leak test procedure is the first step in trouble-shooting. These tests ensure that you do not have a leak. Leak testing quickly identifies components which need repair or replacement. Use P/N 600920 leak test solution, or prepare a soapy water solution. Be sure to use enough soap to produce bubbles.

⚠ WARNING

Do not tighten fittings or connectors when the system is pressurized. Close the source or cylinder valve. Be sure nothing blocks the regulator outlet. Relieve pressure from the system by slowly opening the bypass valve. Failure to follow this precaution may cause fittings or connectors to rupture, resulting in serious personal injury or death.

SECOND STAGE REGULATOR

1. Grasp the mask-mounted regulator and push the shut-off button IN.



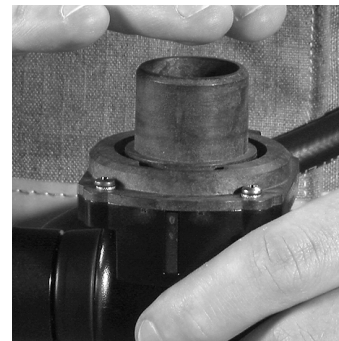
Note: Shut-off button may be stored IN.

2. Check that the red bypass knob is fully closed (clockwise).



3. Connect a pressurized air-supply to manifold inlet.

4. No air should flow from the regulator. If it does, repeat steps 1 and 2.



5. Check for bypass operation. Grasp the red knob and turn it 1/4 turn (counter-clockwise) until it locks in. Listen for air flow, then turn it OFF. Close cylinder valve or air source fully.



SECOND STAGE HOSE

Apply leak test solution to both hose end and fittings at each joint. If bubbles appear, see Second Stage Hose section.

MANIFOLD BLOCK

1. Apply leak-test solution to hose connections and quick-disconnect fittings at the manifold inlet and the manifold mask-mounted regulator outlet.
2. If bubbles appear at any of these joints, the leak must be corrected. See repair instructions.
3. Crack the bypass valve slowly to bleed off pressure.

⚠ WARNING

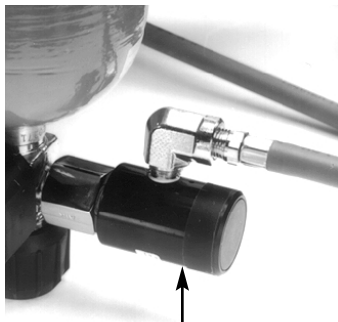
If the function or connection fails, do not use the apparatus. The apparatus must be checked and corrected for proper operation by an MSA trained or certified repairperson before using. Failure to follow this precaution may result in serious personal injury or death.

LEAK TESTING

EMERGENCY-ESCAPE CYLINDER FIRST-STAGE REGULATOR

Note: Return the regulator to an MSA Repair Center where indicated for Disassembly and Repair.

1. Open the cylinder valve fully.



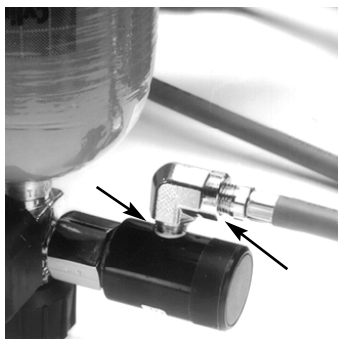
2. Apply leak test solution to the first-stage regulator cap. If bubbles appear. Return to an MSA Repair Center.



3. Apply leak test solution to the connection between the first-stage regulator and the cylinder valve outlet. If bubbles appear, securely tighten the regulator coupling to the cylinder valve outlet.



4. Apply leak test solution across the vent holes in the regulator body. If bubbles appear. Return to an MSA Repair Center.



5. Apply leak test solution to the elbow and hose joint, and the full length of the hose to the manifold. If bubbles appear, see repair instructions.

EMERGENCY-ESCAPE CYLINDER VALVE

⚠ WARNING

Close the emergency-escape cylinder valve. Be sure nothing blocks the mask-mounted regulator outlet. Depressurize the first-stage regulator and hose assembly. Failure to follow this precaution may cause fittings or connectors to rupture, resulting in serious personal injury or death.

Outlet Port (coupling nut connection)

1. Be sure that the cylinder is FULL and the valve hand-wheel is completely closed.

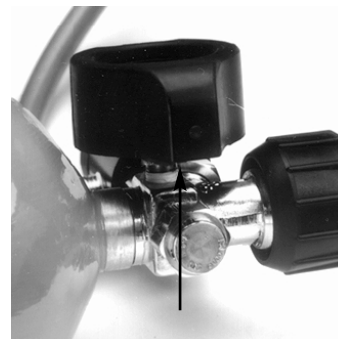


2. Draw a bubble of leak test solution across the valve outlet port. Use your fingers to cover the two bleed holes on the threads.

3. If the bubble expands, there is an air leak through the valve. Return to an MSA Repair Center.

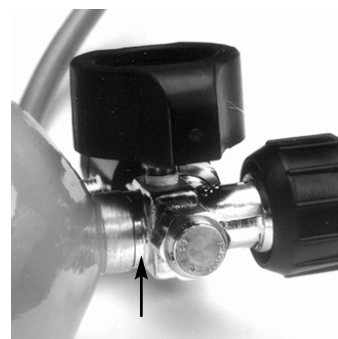
Pressure Gauge

1. Apply leak test solution to the pressure-gauge fitting. If bubbles appear. Return to an MSA Repair Center.



Cylinder Neck

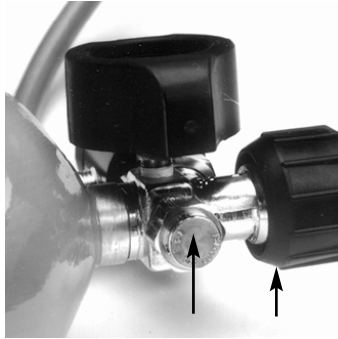
1. Apply leak test solution to the cylinder neck. If bubbles appear, the cylinder must be taken out of service. Return to an MSA Repair Center.



LEAK TESTING

Cylinder Handwheel and Safety Plug

1. Apply leak test solution the cylinder handwheel and safety plug. If bubbles occur at the cylinder handwheel or at the safety plug. Return to an MSA Repair Center.



After All Components are Leak Tested

1. Be sure the air source is completely closed.
2. All repair procedures assume that the air source assembly is disconnected from the manifold.
3. Be sure that nothing blocks the regulator outlet. Open the bypass valve to relieve pressure in the system.
4. Use a clean, lint-free cloth to wipe all components of PremAire Respirator dry.

DISASSEMBLY AND REPAIR

1. Be sure the air source is completely closed.
2. All repair procedures assume that the air source assembly is disconnected from the manifold.
3. Be sure that nothing blocks the regulator outlet. Open the bypass valve to relieve pressure in the system.
4. Close the bypass valve fully.

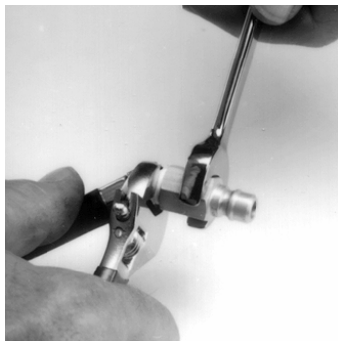
⚠ WARNING

Do not disconnect the air source when pressure is shown on the air source gauge. Always be sure that you have released all pressure from the regulator. Removing the coupling nut with the regulator pressurized may result in serious personal injury or death.

REMOVING THE SECOND PRESSURE HOSE FROM THE MANIFOLD

1. Disconnect the quick-disconnect hose from the manifold.

2. Remove the quick-disconnect plug, use an adjustable wrench on the hose fitting and a 5/8" wrench on the quick-disconnect plug. Turn counter-clockwise to unthread.



3. Remove any Teflon tape debris from the quick-disconnect plug.
4. To replace quick-disconnect plug, first wrap 1-1/2 turns of Teflon tape in a clockwise direction around the threads (looking into the threaded end of the hose fitting). Begin wrapping at the second thread from the end. Do not put tape on the first thread as small pieces could break off in the air stream and affect the flow performance of the regulator.
5. Thread the parts together hand-tight, then wrench tighten an additional 1-1/2 turns. Do not overtighten.

REPLACING THE SECOND STAGE PRESSURE HOSE AND TWO O-RINGS.

1. The hose assembly and o-rings must be replaced if the hose is frayed or cracked, or shows other signs of damage.

2. Use the 7/16 wrench to remove the handwheel locknut. Remove the bypass handwheel assembly.



Note: Retaining-ring pliers must be set up for an external retaining ring (position #1).

3. Using retaining-ring pliers, remove the exposed retaining ring.

4. Pull the hose assembly off the bypass sleeve.



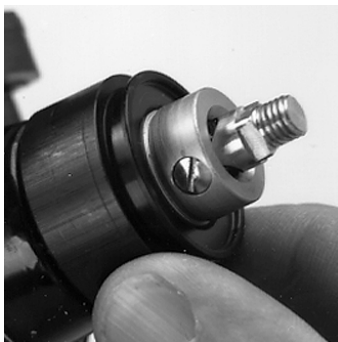
5. Using the o-ring removal tool, remove and discard the two o-rings.
6. Remove the intermediate-pressure hose from the manifold.

DISASSEMBLY AND REPAIR

INSTALLING A NEW SECOND STAGE INTERMEDIATE-PRESSURE HOSE

1. Place a thin film of Christo-Lube lubricant on the new o-rings. Place transparent tape over the bypass guide screws to protect the o-rings. Slide the new o-rings in place, using care not to nick them. Be sure to remove all transparent tape.

2. Position the swivel with its grooved end away from the regulator housing. Push the swivel end of the hose over the bypass sleeve and onto the o-rings until the swivel contacts the retaining ring.



3. Place a new retaining ring in the groove on the bypass sleeve.



4. Place a thin film of Christo-Lube lubricant in the groove on the hose swivel, where the rubber rim of the handwheel fits.

5. Place the bypass handwheel on the slide, making sure to line up its square hole with the square on the slide.



6. Place a single drop of Loctite #222 thread sealant on the exposed threads of the bypass slide.

7. Use the 7/16 wrench to thread the handwheel locknut on the slide.



8. To install the second stage pressure hose into the quick-connect manifold.
9. Pressurize the system and leak-test the hose.

MANIFOLD

Pipe Plugs

Inspect the manifold ports. Replace any pipe fitting that is damaged, worn or leaking using the following procedures.

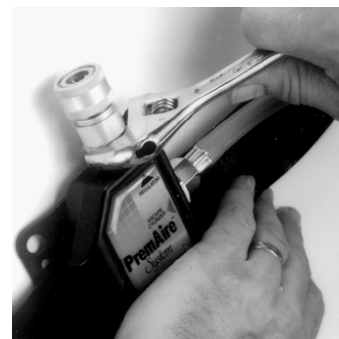
1. Remove the pipe plug with the 1/4" Allen socket.



2. Clean the port(s) to remove any Teflon tape residue from the threads.
3. Replace the pipe plug first, wrapping it with Teflon tape. (See General Notes #2)
4. Insert plug(s) in the manifold port(s) and thread the parts together hand-tight, then wrench tight an additional 1-1/2 turns. Do not overtighten.

Manifold Port

1. Remove the quick-disconnect socket from the manifold with an adjustable wrench.



DISASSEMBLY AND REPAIR

2. To replace quick-disconnect socket, first wrap with Teflon tape (See General Notes #2).
3. Thread the socket into the manifold port and hand-tighten, then wrench tighten an additional 1-1/2 turns using the adjustable wrench. Do not overtighten.

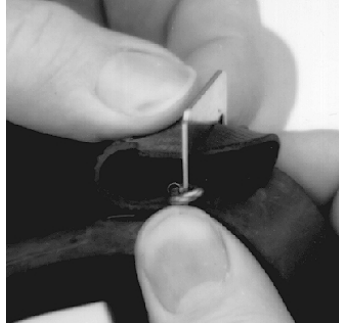
ULTRAVUE FACEPIECE REPAIR

FACEPIECE FIT CHECK

Refer to Users Manual P/N 496958.

REMOVING THE FACEPIECE RUBBER HEAD HARNESS

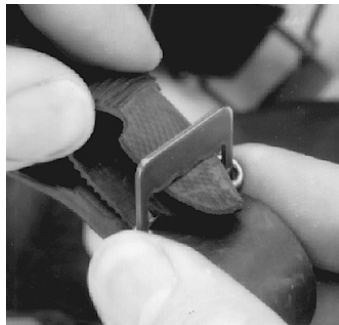
1. Lay the facepiece on a table or other flat surface.
2. Pull the back of each buckle away from the head harness and pull slightly so the head harness end-tab is at the buckle.



3. Fold the end-tab sides together, then pull each end-tab through its buckle.

INSTALLING A NEW RUBBER HEAD-HARNESS

1. Lay the new head harness flat. The MSA logo is right-side up. Each strap is labeled.
2. Pick the head harness up by the strap labeled "FRONT."
3. Fold the end-tab sides together.
4. Push the end-tab under the wire roller.
5. Pull the wire roller down against the strap.



6. Re-fold the end-tab and push it through the buckle again, this time passing over the wire roller.

7. Repeat the previous steps for each remaining strap.

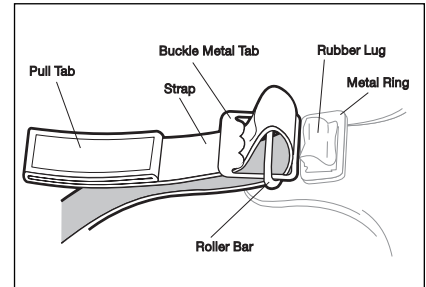


8. Check that the installed head harness is not twisted.

SPEED-ON HARNESS

1. Thread the crown, temple, and neck straps into the buckles as follows:
 - a. With folded side down, thread the strap into the bottom section of the buckle under the roller bar.
 - b. Push roller bar down and thread the end through the top section of the buckle.
 - c. Adjust so that the pull tab extends beyond the buckle metal tab.

Note: It is important to have the folded side of the elastic strap face up, in order for the strap to lay flush against the head when it is pulled tight.



- d. Check that the installed harness straps are not twisted.

Note: Neck location buckles have an extra D-ring which is not involved in installation.

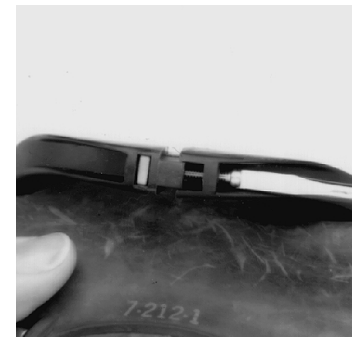
CLEANING THE SPEED-ON HARNESS:

Machine wash in warm water (maximum 120 degrees F) with a mild detergent. Dry by squeezing excess water from harness and hanging in open air. Do not dry clean. Do not bleach or use abrasive cleaners. Do not fold or store when wet.

REPLACING THE LENS AND RING

1. Remove the facepiece lens.

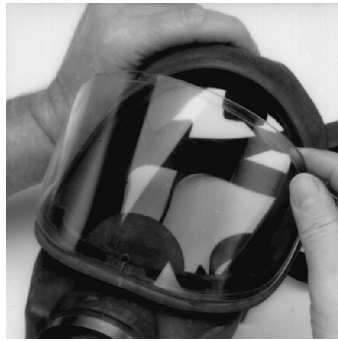
- a. Loosen and remove the screw from each side of the lens retaining ring.



- b. Remove both retaining ring halves.

ULTRAVUE FACEPIECE REPAIR

- c. Fold the facepiece flange back and pull the lens out of the groove.

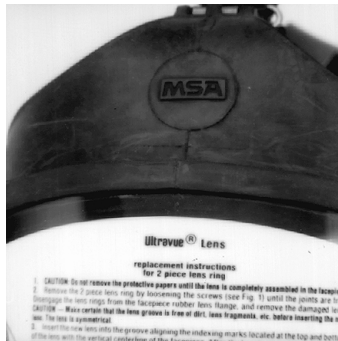


CAUTION

The protective papers on the new lens should not be taken off until the lens is completely assembled in the facepiece.

- 2. Installing a new facepiece lens.

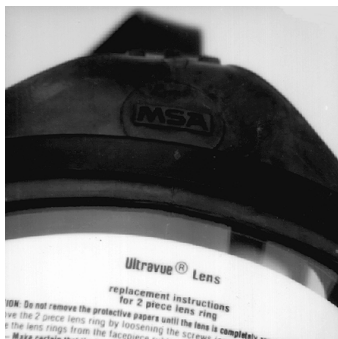
- a. Remove any dirt, lens fragments, or other debris from the groove. Line up the lens centerline marks (top and bottom) with the facepiece centerline marks.



Note: The protective papers on the lens should not be taken off until the lens is completely assembled in the facepiece.

Then insert the lens into the groove. Work the facepiece flange around the lens to seat the lens fully in the groove.

- b. Line up the lens ring centerline with the facepiece flange centerline mark. Press the ring half in place. Mount the other ring half in the same way.



- c. Press the ring halves together at the top and bottom of the facepiece so that the ends mate.
- d. Install a screw on each side.
- e. Start the screws; they should thread easily. If not, remove and reinstall the screws to avoid cross-threading. Maintain hand pressure on both ring halves.
- f. As the ring halves come together, alternate tighten-

ing the left and right screws to be sure the ring seats thoroughly on the flange.

CAUTION

Do not over-tighten. Rubber must not show between the lens ring ends at the joint. If this occurs, reassemble.

- g. Remove all lens protective papers from the new lens.
- h. Don the facepiece and repeat the Facepiece Fit Check. Follow the steps in the Facepiece Fit Check.

SPEAKING DIAPHRAGM HOUSING

- 1. Loosen the screw on the band clamp. Remove the clamp and pull the assembly out of the facepiece.



- 2. Reassemble the Speaking Diaphragm Housing.
 - a. Slide the band clamp on.

- b. Slide the inlet assembly into the facepiece. Check that the air ducts in the housing are lined up with the ducts in the facepiece.



- c. Be sure that the inlet assembly is pressed completely into the facepiece.

- d. The band clamp must be positioned so that the screw is at the 5 or 7 o'clock position. The screw head must be to the left so that it will not rub the facepiece rubber.



- e. Tighten the band clamp until the speaking diaphragm assembly is secured. Be sure that the

ULTRAVUE FACEPIECE REPAIR

band clamp does not pull the facepiece rubber away from the assembly. Do not over-tighten. If the facepiece rubber “bulges” out through the slots in the clamp, the clamp is too tight and must be loosened and retightened.

3. Don the facepiece and follow the steps in the Facepiece Fit Check. (See Users Manual P/N 496958)

REPLACE THE SPEAKING DIAPHRAGM.

1. Using the spanner wrench (P/N 461828), unscrew and remove the retainer ring from the facepiece.



2. Turn the facepiece upside down and shake out the metal speaking diaphragm.
3. Check the speaking diaphragm for damage. Replace it if it is worn or damaged.
4. Check the speaking diaphragm gasket or O-ring. Replace the gasket or O-ring if either is worn or damaged.

WARNING

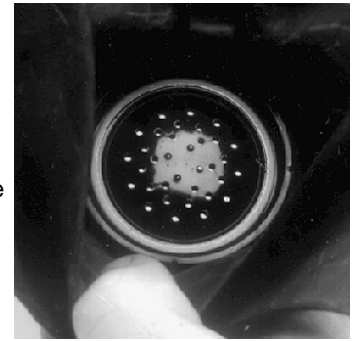
The flat gasket (used on old-style facepieces) and the O-ring (used on the new design) are NOT interchangeable. Replace the gasket with the P/N 83630 gasket only. Replace the O-ring with the P/N 629935 O-ring only. Failure to observe this precaution may cause inhalation of contaminant and result in serious respiratory injury or death.

REASSEMBLE THE SPEAKING DIAPHRAGM.

1. Place the gasket or O-ring in the speaking diaphragm housing groove.



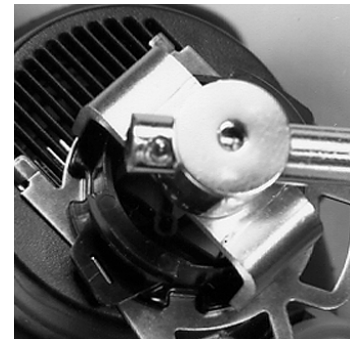
2. Place the speaking diaphragm in the housing so that the outer lip rests on the gasket or O-ring. Be sure that the crimped side of the speaking diaphragm is facing toward you.



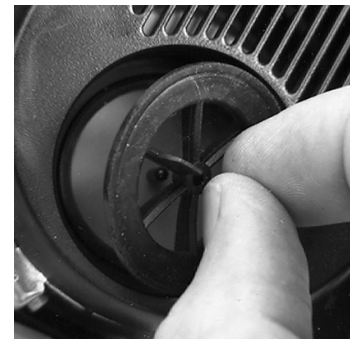
3. Replace the retainer ring and tighten, using the spanner wrench.
4. Don the facepiece and check the facepiece fit.

INHALATION DISC VALVE

1. Use the spanner wrench (P/N 496317). Press the adapter slip nut in. Turn the wrench counter-clockwise (left) to unthread the adapter.



2. Lift the neckstrap retaining ring off the housing. Note how the “fingers” line up in the housing.



3. Lift the spider gasket out of the housing, using the tab.

4. Remove the valve disc from the speaking diaphragm housing. If you cannot grasp the disc with your fingers, use a blunt object to lift one edge, then remove the disc. Be careful not to tear the soft disc.



ULTRAVUE FACEPIECE REPAIR

5. Inspect the disc for tears or punctures. The disc should be very soft and pliable. Install a new disc if it is damaged or hardened.
6. Reassemble the inhalation disc valve, spider gasket, and adapter.
 - a. Press the valve disc onto the pin in the speaking diaphragm housing.
 - b. Carefully tuck all edges of the disc under the housing lip.
 - c. Replace the spider gasket (tab up) and press it on the pin. Work the groove into place to secure the gasket.



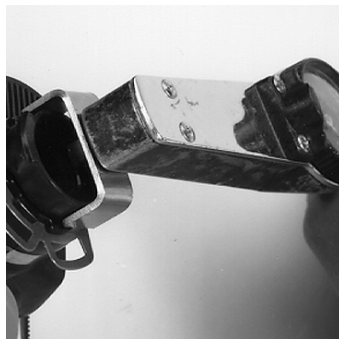
- d. Place the neckstrap retaining ring on the housing. Line up the "fingers" with the housing.

- e. Place the locking ring on the adapter.
- f. Insert the adapter assembly through the hole in the retaining ring. Start to thread the adapter slip nut into the speaking diaphragm housing.

- g. Turn the adapter so that the bayonets are horizontal. Hand tighten the slip nut until the two adapter "wings" lock into the two large tabs in the retaining ring. Make sure that each of the two large tabs on the retaining ring are fully seated in both of the slots on the adapter "wings."



- h. Using the spanner wrench, tighten the adapter slip nut until the slip nut locks into the spring finger on the retaining ring. Continue to tighten the slip nut so that the adapter seals against the spider gasket. The slip nut should be tightened 12 to 27 in-lb.



- i. Verify each of the following features:
 - The adapter bayonets are locked into a horizontal

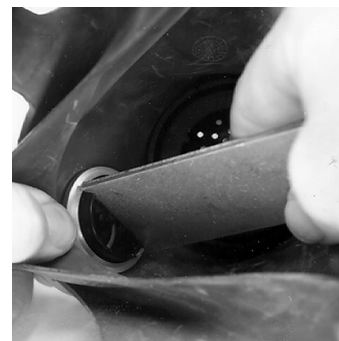
orientation and can NOT be rotated;

- The slip nut is threaded completely into the facepiece and locked securely; it can NOT be rotated;
- The metal retaining ring is locked into position and can NOT be rotated;
- There is no loose play in the assembly of parts.

PRESSURE DEMAND EXHALATION VALVE

1. Temporarily fold the headstraps back over the front of the facepiece lens.
2. Pull the facepiece chin cup out so that you can see the inside of the exhalation valve.

3. Use the facepiece spanner wrench to loosen the valve retaining nut.



4. Unscrew and remove the retaining nut. Then, grasp the valve cover and gently pull the valve out from the underside of the facepiece.

Note: The pressure demand exhalation valve is replaced as a unit. No replacement parts are available. All components of each valve must be maintained as a unit. When cleaning the valve, do not interchange parts.

5. Installing the pressure demand exhalation valve in the facepiece:
 - a. Inspect the facepiece rubber for tears or cracks. Replace the facepiece if it is damaged. Clean the area around the facepiece mounting hole if necessary.

Note: Rub a small amount of Never-Seez (P/N 29527) on the valve threads.

- b. Line up the exhalation valve threads with the facepiece mounting hole. Place one hand inside the facepiece and stretch the hole slightly.
- c. Push the valve threads into the facepiece. Use a "threading" motion to insert the valve until the valve body rests against the facepiece rubber.

Note: The "MSA" logo on the exhalation valve cover does not have to be aligned to any special position.

- d. Pull the facepiece chin cup back so that you can see the valve, then thread the retaining nut on.

ULTRAVUE FACEPIECE REPAIR

- e. Tighten the retaining nut, using the spanner wrench (P/N 461828). Reposition the facepiece headstrap.
6. Inspect the exhalation valve.
7. Visually inspect the spring to see that it is located properly in its socket.

⚠ WARNING

Do not store the facepiece with the headstraps stretched over the lens. Doing so may distort the sealing surface and affect the facepiece seal.

8. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Facepiece Fit Check.

ULTRA ELITE FACEPIECE REPAIR

REPLACING THE RUBBER HEADSTRAP

Note: To replace the standard rubber headstrap (the one with rollers and end-tabs).

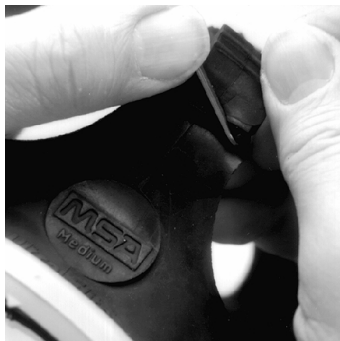
To replace the standard rubber headstrap if the buckle assemblies are damaged, or to install the Speed-ON Harness, see Installing Speed-ON Harness.

1. To remove a damaged rubber headstrap from the facepiece, lay the facepiece on a table or other flat surface.
 - a. Grasp the facepiece lug with the thumb and forefinger of one hand. Grasp the headstrap metal buckle with the thumb and forefinger of the other hand.



- b. Lift the metal buckle with your thumb as you stretch the facepiece lug.

- c. Turn the facepiece and switch hands to lift on the other side of the metal buckle.
 - d. Pull the facepiece lug out of the metal buckle.
 - e. Repeat steps a through d for each remaining strap.
 - f. If you removed the headstrap to install the Speed-ON Harness, go to Installing the Speed-ON Harness on this page.
2. To install a new rubber headstrap, lay the new headstrap flat. The MSA logo should be right-side up. Each strap is labeled. Pick the headstrap up by the strap labeled "Front."
 - a. Insert the facepiece lug into the metal buckle.
 - b. Hold the buckle down against the facepiece lug with the thumb and forefinger of one hand while gripping the end of the lug with the thumb and forefinger of the other hand.



- c. Pull the buckle and lug in opposite directions while twisting them from side to side to work the buckle down until it snaps in place over the lug.

- d. Repeat steps a through c for each remaining strap. Check that the installed headstrap is not twisted.

3. Don the facepiece and check the face-to-facepiece seal. Follow the Check Facepiece Fit procedure.

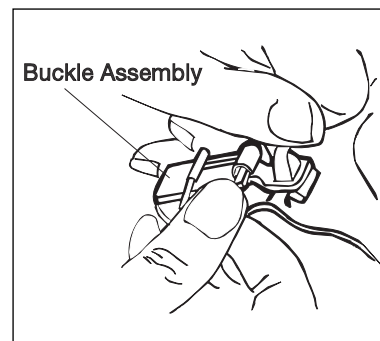
REMOVING THE SPEED-ON™ HARNESS

1. To remove a damaged Speed-ON Harness from the facepiece, lay the facepiece on a table or other flat surface.
2. Follow Replacing the Rubber Headstrap, steps 1a-d for each of the top three straps.
3. To remove the bottom buckles, pull the back of the buckle away from the rubber strap and pull slightly so the rubber harness end-tab is at the buckle.
4. Fold the end-tab sides together, then slide each tab through its buckle.
5. Repeat steps 3 and 4 for the other buckle.

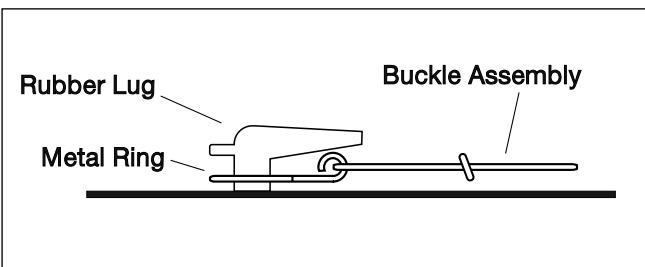
INSTALLING THE SPEED-ON™ HARNESS

1. Install the harness strap buckles to the facepiece rubber lug at the crown and temple locations.

- a. Insert the long tab end of the rubber lug into the metal ring.
- b. Pull the entire rubber lug through the metal ring.



2. Refer to Kit 817088 Head Harness Installation instructions to attach the harness.



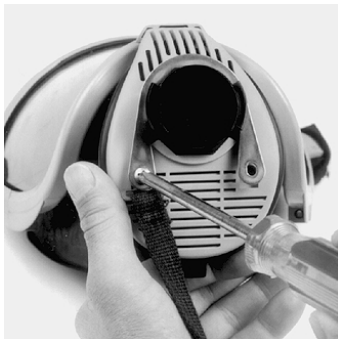
CLEANING SPEED-ON HARNESS

Machine wash in warm water (maximum 120 degrees F) with a mild detergent. Hang the harness in an open area to air-dry. **Do not dry clean.** Do not bleach or use abrasive cleaners. Do not fold or store when wet.

ULTRA ELITE FACEPIECE REPAIR

REMOVING THE COMPONENT HOUSING COVER

1. Remove the two component housing cover screws and spacers. Remove the neckstrap.



2. Remove the locking ring.

3. Lift up on the cover release hook, located forward of the adapter assembly opening. Once the release is lifted, you can remove the cover by pulling it away from the housing. You must tilt the cover and work it over one adapter bayonet at a time.



4. Unthread and remove the adapter assembly.

⚠ CAUTION

Be careful that you do not damage internal parts of the component housing assembly (exhalation valve, spring, retainer, or speaking diaphragm) once the cover is removed.

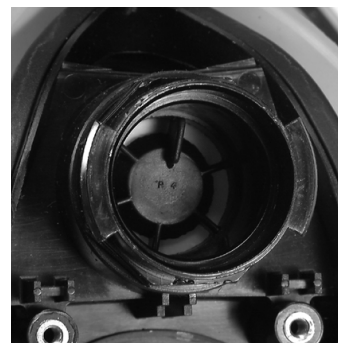
INSTALLING THE ADAPTER ASSEMBLY, LOCKING RING, AND COMPONENT HOUSING COVER

1. Holding the adapter assembly in your hand, rotate the slip nut so that the octagon flange on the slip nut lines up with the octagon flange on the adapter.



2. Thread the adapter assembly into the facepiece. Using the spanner wrench, torque the adapter to 12-27 in-lbs. If necessary, continue to torque until the top flat on the octagon is horizontal.

3. The bayonets must be in a horizontal orientation.



4. If the bayonets are not horizontal, remove the adapter assembly and turn the slip nut. Reinstall the adapter assembly so that the bayonets are horizontal when the adapter assembly is torqued 12-27 in-lbs.

INSTALLING THE COMPONENT HOUSING COVER

1. Place the component housing cover over the adapter assembly. Tilt and rotate the cover to work it over one bayonet at a time.
2. Insert the tab on the cover into the slot in the lens ring.

3. Press in on the front of the cover until the cover hook snaps into place.



4. Install the locking ring by sliding it into the groove on the adapter. (Do not slide it into the space between the slip nut flange and the adapter flange.)
5. Place the neckstrap brackets and the spacers in the cover sockets under the locking ring. Install the Phillips screws and tighten.
6. Verify each of the following features:
 - a. The adapter bayonets are locked into a horizontal position and can NOT be rotated.
 - b. The slip nut is threaded completely into the facepiece and locked securely. It can NOT be rotated.
 - c. The metal locking ring is locked into position and can NOT be rotated.
 - d. There is no loose play in the assembly of parts.
7. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check procedures.

ULTRA ELITE FACEPIECE REPAIR

REMOVING THE FACEPIECE LENS AND RING

⚠ CAUTION

The protective papers on the lens should not be taken off until the lens is completely assembled in the facepiece.

Note: Remove the component housing cover and adapter assembly.

1. Using a Phillips screwdriver, loosen and remove the screw from each side of the facepiece lens retaining ring.



2. Remove the upper and lower lens retaining rings.
3. Fold the facepiece flange rubber back and pull the lens out of the groove.

INSTALLING THE FACEPIECE LENS AND RING.

1. Remove any dirt, lens fragments, or other debris from the groove. Line up the new lens centerline marks (top and bottom) with the facepiece centerline mark. Insert the top of the lens into the groove. Work the facepiece rubber flange around the lens to fully seat the lens in the groove. When installed correctly, the bottom lens centerline mark lines up with the bottom facepiece centerline mark.
2. Moisten the facepiece lens groove and the inside of the component housing ring.

3. Install the bottom ring. Insert the tab at the top of the component housing into the slot at the bottom center of the lower lens ring. The tab should snap into place.



4. Line up the top lens ring center-line with the facepiece rubber flange centerline mark. Press the ring into place.
5. Press the ring halves together at the top and bottom of the facepiece so that the ends mate.
6. Install a screw on each side. Start the screws. They

should thread easily. If not, remove and reinstall the screws to avoid cross-threading. Keep hand pressure on both ring halves.

7. As the ring halves come together, alternate tightening the left and right screws to be sure the rings seat completely on the rubber flange.

⚠ CAUTION

Do not over-tighten. Rubber must not show between the lens ring ends at the joint. If this happens, reassemble.

8. Remove all lens protective papers from the new lens.
9. Reinstall the adapter assembly and the component housing cover.
10. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check procedure.

⚠ CAUTION

Do not use a cover lens in a high-temperature environment. High temperatures may distort the cover lens. Or, moisture trapped between a cover lens and the facepiece lens may condense and distort vision. Always remove the cover lens before donning the facepiece.

REMOVING THE COMPONENT HOUSING ASSEMBLY

Note: Remove the component housing cover and the adapter assembly.

1. Using a small Phillips screwdriver, remove the component housing ring screw. Grasp the ring with the thumb and forefinger of each hand. Gently spread the ring halves apart at the bottom.



2. When the facepiece rubber is out of the ring groove, lift the ring up away from the facepiece. You may need to pull the housing down slightly to allow enough room to remove the ring from between the housing and the lower lens ring.

ULTRA ELITE FACEPIECE REPAIR

3. Remove the facepiece rubber from the component housing and pull the housing and nose-cup (if installed) out of the facepiece.



INSTALLING THE COMPONENT HOUSING ASSEMBLY

1. Slide the housing into the front of the facepiece.

2. Starting at the top (narrow end) of the housing, place the housing in the facepiece groove. Work the rubber all the way around the housing. Check that the housing is completely captured inside the groove and centerlines are lined up.



3. Moisten the facepiece housing area and the inside of the housing ring.
4. Insert the narrow end of the ring into the space between the lower lens ring and the facepiece housing area.



5. Line up the component housing ring mark with the facepiece centerline.

6. Starting at the top, work the housing ring down on the facepiece to capture the facepiece rubber in the ring groove. Work your way down each side of the ring until the facepiece rubber is completely captured inside the ring.



7. Gently squeeze the ring halves together at the bottom of the housing. Watch the facepiece rubber at the top as you do this. If you see any bulges or wrinkles in the facepiece rubber, it is not captured in the groove. Rework the ring around the facepiece rubber until there are no bulges or wrinkles.

⚠ WARNING

Bulges or wrinkles mean that the facepiece rubber is not seated correctly in the ring. Reinstall the ring to seat it correctly. Failure to follow this precaution may cause the facepiece to leak and result in serious personal injury or death.

8. When the housing ring appears to be seated, grasp the outside of the ring and the inside of the housing at the top between your thumb and forefinger and squeeze them together. Then do the same with the ring halves at the bottom.

9. Install the screw and tighten using a small Phillips screwdriver.



⚠ CAUTION

Rubber must not extrude between the component housing ring ends at the joint. If this happens, reassemble.

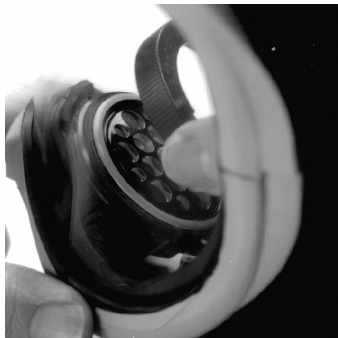
10. Reinstall the adapter assembly and the component housing cover.
11. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check procedure.
12. Reinstall the nose cup or air baffle (if used) in the facepiece.

ULTRA ELITE FACEPIECE REPAIR

REPLACING THE SPEAKING DIAPHRAGM

1. Remove the baffle and nosecup (if installed) from inside the facepiece.

2. Unscrew and remove the speaking diaphragm retaining ring.



3. Turn the facepiece upside down and shake out the metal speaking diaphragm and gasket assembly.
4. Check the speaking diaphragm and gasket assembly for damage. Replace it if it is worn or damaged.
5. Be sure that the gasket is on the diaphragm assembly. Place the diaphragm in the retaining ring. Be sure that the gasket side of the speaking diaphragm will be facing the component housing.
6. Replace the retaining ring and hand tighten.
7. Reinstall the nosecup or air baffle (if used) in the facepiece.
8. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check procedure.

REPLACING THE INLET GASKET AND DISC VALVE

1. Remove the component housing cover and the adapter assembly.
2. Remove the disc from the gasket and inspect both for wear. The disc should be very soft and pliable. Install

a new disc valve if it is damaged or hardened.

3. To install the inhalation disc valve:
 - a. Gently stretch the hole in the center of the disc valve over the gasket stem.
 - b. Note that the inlet gasket has a groove around it.

- c. With the pull-tab facing you, insert the gasket into the facepiece at an angle so that its groove captures the housing rim. The lower lip on the gasket must be placed under the rim in the component housing.



Note: You may have to bend the gasket slightly to work the groove under the rim all the way around. When installed correctly, the gasket will lay flat in the housing, and none of the spokes will be bent.

4. Reinstall the adapter assembly, locking ring, and component housing cover.
5. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check procedure.

CYLINDER DISASSEMBLY AND REPAIR

INSTALLING AIR LINE FILTER

(Reference illustrated Parts List P/N 800000)

Note: After all procedures of installation or repairs, the apparatus must be leak tested.

1. Make sure system is not pressurized.
2. Unthread the adapter P/N 53858 or check valve P/N 630326 from the manifold (if necessary).
3. Wrap 1-1/2 turns of Teflon tape (in clockwise direction looking into the threaded end of the fitting) to the male thread of the filter assembly, beginning at the second thread. **Do not wrap tape on the first thread. Pieces of tape can break off and reduce air flow to the respirator.**
4. Clean any residual Teflon tape from the manifold port.
5. Thread the filter assembly and hand tight into the manifold main inlet port.

Note: The arrow on check valve must point toward the manifold.

6. Remove any pieces of Teflon tape from the adapter or check valve (just removed) and rewrap with new Teflon tape as above.
7. Thread the adapter or check valve into the filter assembly hand tight.
8. Wrench tighten all fittings in additional 1-1/2 turns. **Do not overtighten.**
9. If unit is equipped with dual supply mode, add an additional filter assembly to the dual supply port of the manifold in the same manner.

⚠ CAUTION

The air entering this filter must be quality verification level (Grade) "D" or better. This filter removes only particulates from the air. It does not effect the air classification.

CLEANING FILTER

1. Make sure system is not pressurized.
2. Disconnect air supply hose.
3. Using two 3/4" wrenches, unthread the two parts of the filter assembly body where the two hexes meet.
4. Remove filter element from body and back flush with air nozzle.

⚠ CAUTION

Wear appropriate eye protection during back flush operation.

5. If required filter replacement kit (P/N 811984) is available which includes new sintered bronze filter element and gasket.
6. Replace filter element. Make sure gasket is in place

- and reassemble two body parts with new o-ring.
7. Wrench tighten with two 3/4" wrenches.
8. Reconnect air supply hose.

INSTALLING QUICK-CONNECT

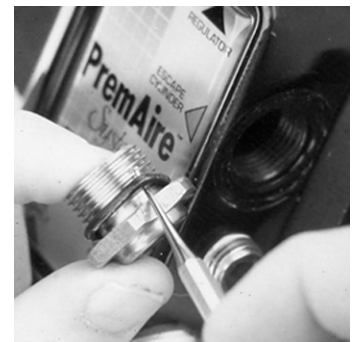
Thread the quick-disconnect plug hand-tight on the other end of the check valve. Wrench tighten an additional 1-1/2 turns using the adjustable wrench. Do not overtighten.

EMERGENCY-ESCAPE CYLINDER PORT PLUG

1. To remove the port plug (or plunger housing if applicable), use the open-end wrench.



2. Inspect the O-ring on the port plug. Replace if frayed or damaged.



3. Apply a thin film of Christo-Lube lubricant on the O-ring.
4. Thread the plug (or housing) into the port. Securely tighten with adjustable wrench. Do not overtighten.

EMERGENCY-ESCAPE CYLINDER HOSE DISASSEMBLY AND REPAIR

All repair procedures assume that the first-stage regulator is disconnected from the cylinder. Before removing the regulator from the cylinder:

1. Be sure that the cylinder valve is completely closed.
2. Connect the mask-mounted regulator hose to the manifold.
3. Be sure that nothing blocks the regulator outlet. Allow any trapped air to bleed from the respirator.

CYLINDER DISASSEMBLY AND REPAIR

REMOVING THE EMERGENCY-ESCAPE CYLINDER HOSE

1. Using an adjustable wrench on hose end-fitting and a 3/4" open-end wrench on the elbow, unthread the hose from the elbow.



2. Disconnect the other end of the cylinder hose from the manifold plunger housing using an adjustable wrench. When nut is loose, pull firmly on the hose to break the O-ring connection.

REPLACING ESCAPE CYLINDER HOSE

1. To replace hose, wrap with Teflon tape. See note #2.



2. Thread the hose end fitting into the elbow hand-tight, then wrench-tighten. Do not overtighten.
3. On the opposite end of the hose, lubricate the small O-ring on the end-fitting with a thin film of Christo-Lube.
4. Thread the hose end-fitting onto the plunger housing in the manifold. Securely tighten using the adjustable wrench. Do not overtighten.

INSTALLING THE PLUNGER VALVE AND PLUNGER HOUSING

1. First remove the plug from the "Escape Cylinder" port using the open-end wrench. Check the o-ring seat in the manifold to make sure it is clean and undamaged.

2. Remove and discard the plastic cap from the plunger housing. Slide the plunger valve from the housing and inspect the o-rings.



3. Apply a thin film of Christo-Lube lubricant to the o-rings and slide the plunger valve back into the housing.



4. Apply a thin film of Christo-Lube lubricant to the o-ring on the plunger housing. Thread the housing into the "Escape Cylinder" port. Thread the housing in handtight, then wrench-tighten to securely seat the o-ring.

EMERGENCY-ESCAPE CYLINDER CARRIER AND HARNESS ASSEMBLY REPAIR

Replacing the Shoulder Strap Assembly

1. Disconnect the shoulder harness snaphooks from the carrier assembly.

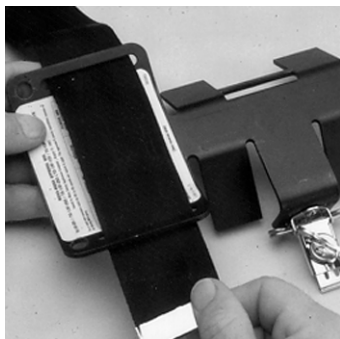


2. Install new shoulder strap assembly by attaching snaphooks to the carrier assembly.

CYLINDER DISASSEMBLY AND REPAIR

Replacing the Waist-Strap

1. Unthread the waist-strap from the buckle. Pull strap through the cylinder carrier bracket slots. Slide strap through second stage regulator holder. Note the path of the strapping.



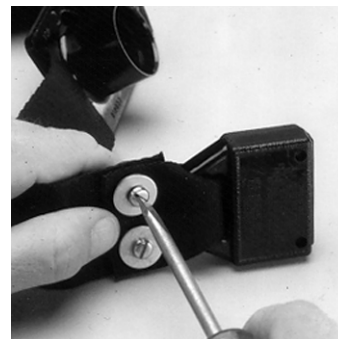
2. Thread the new strap through the second stage regulator holder, then through cylinder carrier bracket, then through the belt buckle.

REPLACING THE OPTIONAL FHR OR NYLON WAIST-STRAP ASSEMBLY

1. Remove the screws, washers, tee nuts and second stage holder, then remove waist-strap from cylinder carrier.

Note: Before installation of new waist belt, apply Loctite 222 to screw threads.

2. Install new waist-strap through the second stage holder by orienting the strap and replacing the screws, washers and tee nuts.



TROUBLESHOOTING

The troubleshooting hints listed on this page applies to all configurations of the PremAire Supplied-Air Respirator System

TROUBLE	PROBABLE CAUSE	REMEDY
Regulator has low-flow performance	<p>Air-supply valve not fully open, or pressure at wrong setting.</p> <p>Second-stage inlet filter may be plugged.</p> <p>Second-stage regulator may require adjustments.</p> <p>Cylinder valve or air course not fully opened.</p>	<p>Be sure air source valve handwheel is fully open and that inlet pressure is between 60-100 psig.</p> <p>Remove the regulator service and return to MSA Repair Center</p> <p>Return to MSA Repair Center</p> <p>Fully open cylinder valve handwheel.</p>
Air leaking at second stage regulator.	<p>Swivel O-rings leaking.</p> <p>Facepiece connection leaking.</p>	<p>Disconnect the regulator hose assembly. Inspect replace the O-rings. See repair instructions.</p> <p>Remove the regulator and inspect or replace the O-ring and spider gasket within the Quick-Disconnect Adapter (P/N 635796). See repair instructions of inhalation check valve and spider gasket.</p>
Air leaking from manifold	<p>Manifold port(s) not plugged</p> <p>O-ring missing from "ESCAPE CYLINDER" port or incorrectly installed.</p>	<p>Check all manifold ports to make sure they are plugged.</p> <p>Check "ESCAPE CYLINDER" port for leakage. Disassemble and check to make sure O-ring is present and not damaged. See leak test instructions and repair instructions.</p>
High-pressure hose is leaking.	If leak is from the end-fittings, O-rings may need to be replaced.	See leak test instructions and repair instructions.
Emergency-escape cylinder empties too quickly.	<p>Plunger valve leaking air back to vortex tube.</p> <p>Cylinder valve or air source open during air-line use.</p> <p>Leak at First Stage Regulator</p>	<p>Disassemble the cylinder connection. Remove the plunger from the plunger housing and inspect the O-rings. Clean or replace as necessary.</p> <p>Close cylinder valve while breathing from air-supply hose.</p> <p>⚠ WARNING</p> <p>Failure to close the cylinder valve during use will deplete the compressed gas supply, leaving none for escape. Failure to follow this procedure may result in serious personal injury or death.</p> <p>See leak test instructions.</p>
Emergency-escape cylinder pressure gauge indicates low pressure.	<p>Cylinder temperature may be very cold.</p> <p>Cylinder may need recharging.</p> <p>Gauge needle may be stuck.</p> <p>Cylinder valve assembly may have leaks.</p>	<p>Bring cylinder indoors and let it sit until it equals room temperature (approx. 68°F), then recheck pressure gauge.</p> <p>⚠ WARNING</p> <p>DO NOT attempt to heat cylinder. Attempting to do so may cause the cylinder to rupture, resulting in serious personal injury or death.</p> <p>Recharge cylinder.</p> <p>Tap lightly on the gauge lens. If gauge reading does not change, check to be sure indicator needle is not bent or damaged. If operation or accuracy of gauge is still doubtful, do not use. Return to repair center</p> <p>Conduct a thorough leak test on cylinder valve ass'y. See leak test instructions.</p>
Respirator will not function with emergency-escape cylinder.	Plunger valve not functioning.	Disassemble the cylinder plunger housing. Remove the plunger valve and inspect the O-rings. Replace if necessary. See Emergency-Escape Cylinder instructions.



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