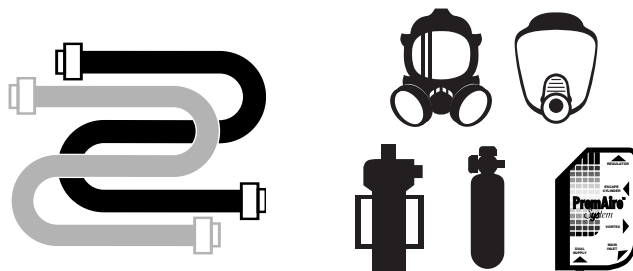


# PremAire®

## INSTRUCTIONS FOR DUAL-SUPPLY MODE OF OPERATION

*System*



### **⚠ WARNING**

This manual must be read carefully by all persons who have who will have the responsibility for using or servicing the product. Like any complex piece of equipment, the Dual-Supply 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.

The warranties made by MSA with respect to the product are voided if the product is not installed, used, and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the WARNINGS and CAUTIONS inside. For any additional information relative to use or repair, write or call 1-800-MSA-2222 during regular working hours.

See separate Inserts for NIOSH Approval Information  
(P/N 10032763/818364/10032761)

# MSA

For More Information, call 1-800-MSA-2222 or Visit Our Website at [www.MSAnet.com](http://www.MSAnet.com)

**MSA**  
The Safety Company

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

# INTRODUCTION

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## NIOSH APPROVAL INFORMATION CAUTIONS AND LIMITATIONS

- A- Not for use in atmospheres containing less than 19.5 percent oxygen.
- B- Not for use in atmospheres immediately dangerous to life or health.
- C- Do not exceed maximum use concentrations established by regulatory standards.
- D- Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.
- E- Use only the pressure ranges and hose lengths specified in the User's Instructions.
- G- If airflow is cut off, switch to filter and/or cartridge or canister and immediately exit to clean air.
- H- Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridges and canisters are replaced before breakthrough occurs.
- I- Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.
- J- Failure to properly use and maintain this product could result in injury or death.
- L- Follow the manufacturer's User's Instructions for changing cartridges, canisters, and/or filters.
- M- All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.
- N- Never substitute, modify, and, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.
- O- Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
- P- NIOSH does not evaluate respirators for use as surgical masks.
- S- Special or critical User's Instructions and/or specific use limitations apply. Refer to User's Instructions.

## S - SPECIAL OR CRITICAL USER INSTRUCTIONS

1. This approval applies only when the respirator is supplied with respirable air through 8 to 300 feet of air-supply hose within the pressure range of 60 to 100 psi

2. An adequate respiratory protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance. [See OSHA regulations, Title 29 CFR 1910.134.
3. The program administrator and respirator users must read and understand these instructions before trying to use or service this product.
4. The PremAire Supplied-Air Respirator System will perform as designed only if used and maintained according to these instructions.
5. This respirator may be used only after proper instruction and training in its use as specified in OSHA regulations Title 29 CFR 1910.134.
6. Inspect the respirator regularly and maintain it according to the instructions. Repairs must only be made by properly trained personnel.
7. Use only with an air source that meets ANSI (Compressed Gas Association) specifications. The air delivered to the respirator's air-supply hose must be respirable and of a purity equal to at least Quality Verification Level (Grade) D Air of the Compressed Gas Association Commodity Specification for Air G-7.1. Air pressure and flow rates must be within the NIOSH approved ranges for the device.
8. Use strictly in accordance with instructions, labels and limitations pertaining to this device.
9. This device may not provide a satisfactory face seal with certain physical characteristics (such as beards or sideburns) as outlined in ANSI Z88, resulting in leakage in connection with the facepiece, which voids or limits the protection. If such a condition exists, the user assumes all risks of death or serious bodily injury, which may result.
10. Do not use the PremAire System for firefighting.
11. Do not use the PremAire System for underwater applications.
12. Thoroughly check out the respirator on receipt and

# INTRODUCTION

prior to use.

13. Do not use compressed oxygen with the PremAire System.
14. Unless equipped with a pressure-demand facepiece and the Escape-Cylinder option, the PremAire Respirator **MUST NOT** be used and relied upon for respiratory protection when the atmosphere contains concentrations of contaminants which are unknown or IDLH.
15. Users must wear suitable protective clothing and precautions must be taken so that the respirator is not worn in atmospheres that may be harmful to the device.
16. Never alter or modify this device, except as directed by MSA during installation of NIOSH approved kits. Use only MSA replacement parts. If other than the proper MSA parts are used, the NIOSH approval will be voided.
17. Use only the listed hose lengths and air-pressure range specified in these instructions.

## **⚠ WARNING**

**Particles and contaminants can enter an air-line respirator system when air-supply hoses are disconnected and/or reconnected in a contaminated atmosphere. This could result in serious injury or death depending on the toxicity of the contaminant involved. It is the responsibility of the user to determine the potential risk and to take the necessary precautions which may include a requirement that NO disconnection or reconnection of air-supply hoses be permitted in a contaminated atmosphere. If in doubt do NOT disconnect and/or reconnect. Failure to follow this warning can result in serious personal injury or death.**

18. When using Ultra Elite or Ultravue facepieces at temperatures below 32°F nose cups are required. When using an Advantage 4000 Facepiece a nose cup must be used at all times.
19. PremAire Respirators equipped with the Dual-Supply option are not designed as an emergency-escape device. Thus, the respirator must not be used in environments containing less than 19.5 percent oxygen, or in atmospheres classified as Immediately Dangerous to Life or Health (IDLH), unless equipped with an emergency-escape air cylinder.

## PREMAIRE RESPIRATOR SYSTEM SYMBOLS

Symbols are used to direct you to other instructions, warnings, and guidelines that apply to the type of option(s). It is important that you familiarize yourself with these symbols, along with the corresponding instructions before attempting to operate the respirator.



**Dual-Supply  
Capability  
(P/N 497230)**



**Pressure-Demand  
Supplied-Air  
Respirator  
(P/N 496958)**



**Duo-Twin  
Capability  
(P/N 818370)**



**Vortex Tube  
Capability  
(P/N 497231)**



**Escape Cylinder  
Capability  
(P/N 800808)**



**Advantage 4000**



# DESCRIPTION

## DESCRIPTION

With MSA's exclusive Dual-Supply option for PremAire Respirators, workers can increase their mobility in another fashion. The Dual-Supply option lets workers connect from one pressurized continuous air source to another without losing continuity of air flow. The advantage is improved mobility because the worker is not bound by the limits of only one air line throughout the work period. The PremAire System can do this because the manifold has two air-supply inlets: a "MAIN" inlet and a "DUAL-SUPPLY" inlet.

With the Dual-Supply option installed, the user may switch between multiple air sources. For example:

A worker may enter an atmosphere with an air-supply hose connected to the "MAIN" inlet. When the length of air-supply hose has reached its maximum limit, the worker can then use the "DUAL-SUPPLY" inlet and plug into a second approved air source, such as another air line located nearby, and disconnect from the first. This technique is known as "leap frogging" because it gives the worker the ability to move from station to station without disrupting the supply of air. This capability can be applied in situations where a worker must climb up vertical levels of scaffolding, providing that additional air sources are located along the way. Or it can be used when moving from room to room within a facility.

Applications where this feature can be used include hazardous material disposal and remediation sites where heavy equipment operators work. The operator can enter a toxic area using the cylinder transport system, and then connect to an air-supply hose attached to a large air tank mounted on a bulldozer or backhoe. Upon completion of

work, the worker can exit the area using a reverse procedure. For information on the TransportAire System and auxiliary cylinders, contact MSA or an authorized MSA distributor.

**Note:** When used with the TransportAire System, be sure to read all instructions, precautions, and warnings that are supplied with the system and cylinders.

For use in IDLH environments, the Dual-Supply option can be coupled to PremAire Respirators equipped with an emergency-escape air cylinder. Escape cylinders must only be used for emergency egress purposes.

The Dual-Supply option may also be used in conjunction with the PremAire Respirator vortex tube cooling system, providing that a continuous air-supply source (such as an air compressor) is used. The TransportAire System must not be used with vortex tubes, as the cooling system would exhaust the cylinder air supply at a higher than normal rate.

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## OPERATING PRINCIPLES

Like all PremAire Respirator configurations, the Dual-Supply option supplies air to the mask mounted regulator (MMR) to provide respirable air to the user in a pressure-demand mode. The Dual-Supply option works on the same principle as the PremAire Supplied-Air Respirator. Whether a worker is using the "MAIN" inlet of the manifold, the "DUAL-SUPPLY" inlet or both inlets simultaneously, the respirator will provide respiratory protection as long as the user remains connected to one of the two air sources.



# RESPIRATOR USE

## PREPARING RESPIRATOR FOR USE

### To check for leaks:

1. Disconnect the mask mounted regulator from the facepiece.
2. Connect the quick-disconnect on the dual-supply air-line to the air source and pressurize within the NIOSH approved range of 60-100 psi using Ultra Elite or Ultravue Facepieces. When using an Advantage 4000 Facepiece ensure the pressure range is between 70 to 100 psi.
3. Place palm of hand over mask mounted regulator outlet to block air flow from the regulator.
4. Apply leak test solution to all threaded joints. If bubbles indicate a leak, shut off air supply and vent all pressure from the system. Then tighten the joint(s) where leakage was indicated. Test again.

### Inspecting Check Valves

Inspect the check valves to ensure the “flow” arrows point toward the PremAire manifold. If they do not, disassemble and reverse the position of both check valves (one connected to the “MAIN” inlet and one connected to the “DUAL-SUPPLY” inlet or extension hose).

### WARNING

**For dual-supply operation, two check valves must be in place: one connected to the “MAIN” inlet of the manifold and one to the “DUAL-SUPPLY” inlet. If only one check valve is used, breathing air may exit the “unchecked” port and not reach the user, resulting in serious personal injury or death.**





# OPERATING PRINCIPLES

## AIR-SUPPLY HOSE AND PRESSURE GAUGE

The PremAire System can be used with a wide range of MSA air-supply hoses, which can be interconnected up to a maximum length of 300 feet. A maximum of 12 sections of air-supply hose may be used in making up the maximum 300 feet working length of hose. MSA also offers an inlet pressure-gauge assembly that enables a user to check pressure at the inlet of the MSA air-supply hose, assuring that the air pressure is within the NIOSH approved range. The gauge is supplied with quick-disconnect fittings to accommodate your particular air-line system.

### ⚠ WARNING

**MSA air-supply hoses have various temperature limitations. Do NOT use the PremAire System whenever ambient or inlet-air temperatures exceed the limits specified below for each hose material. Failure to follow this warning can result in serious personal injury or death.**

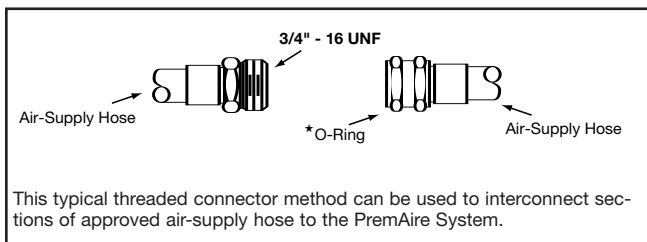
HOSE MATERIAL	RECOMMENDED LIMITS
Polyvinyl Chloride	32°F/120°F
Neoprene	-25°F/212°F
Nylon	-20°F/180°F

## INLET PRESSURE GAUGE

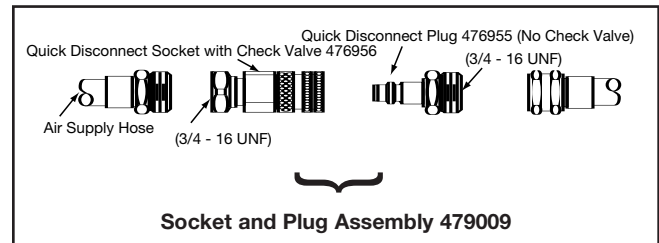
To ensure accurate readings, the inlet pressure-gauge assembly must be installed at the air source.

## INTERCONNECTING AIR-SUPPLY HOSES

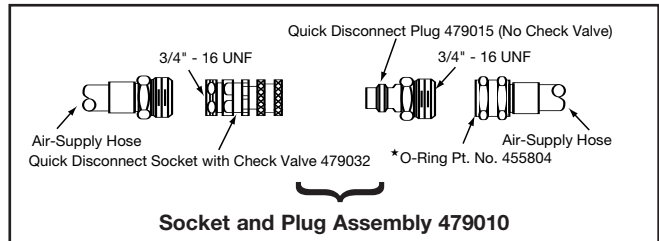
MSA air-supply hoses can be interconnected up to a maximum length of 300 feet without voiding the NIOSH approval. MSA offers both threaded and locking-type quick disconnects.



## CEJN - Chrome



## SNAP-TITE — Aluminum



Locking quick-disconnects easily connect by pushing the plug and socket together. To separate, push the plug and socket together, then pull the sleeve from the plug.

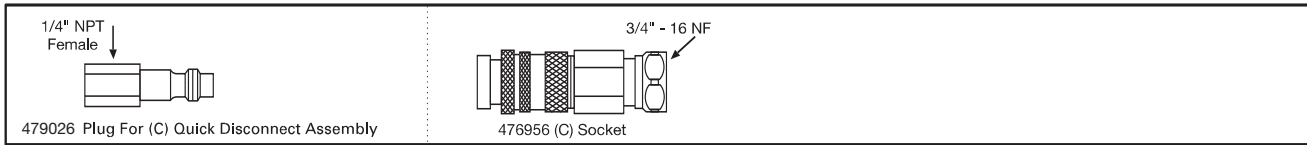
### ⚠ WARNING

**Hoses must only be interconnected with either the threaded connector (3/4 16 UNF) or the locking-type quick-disconnects listed above. Do NOT use non-locking quick-disconnects to interconnect air-supply hoses. Failure to follow this warning can result in serious personal injury or death.**

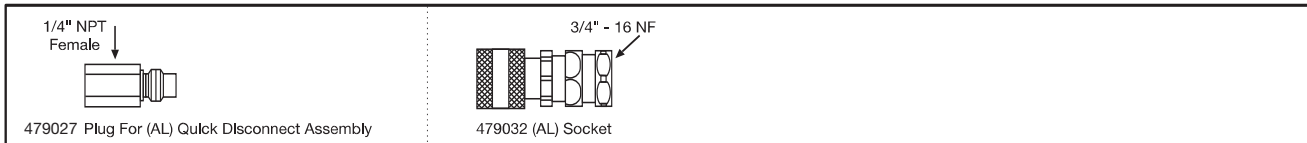
# Quick Disconnects Table Chart

## LOCKING TYPES

### CEJN — Chrome (C)

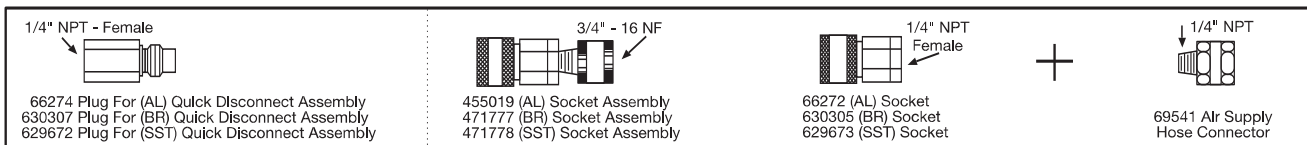


### SNAP-TITE — Aluminum (AL)

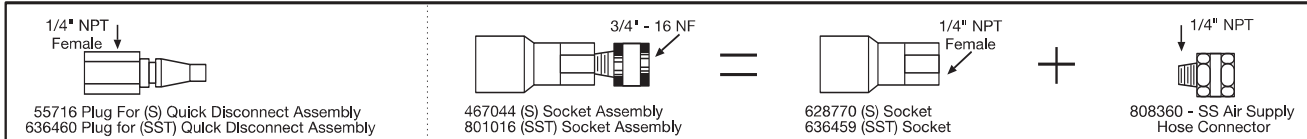


## NON-LOCKING TYPES

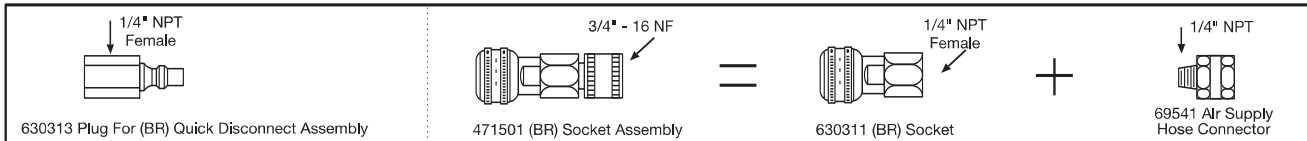
### SNAP-TITE — Aluminum (AL) Brass (BR) Stainless Steel (SST)



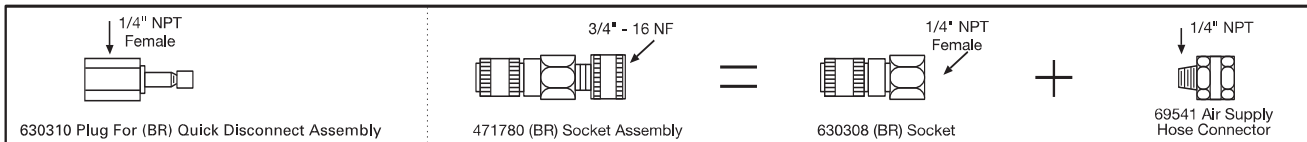
### FOSTER — Steel (S) Stainless Steel (SST)



### HANSEN — Brass (BR)

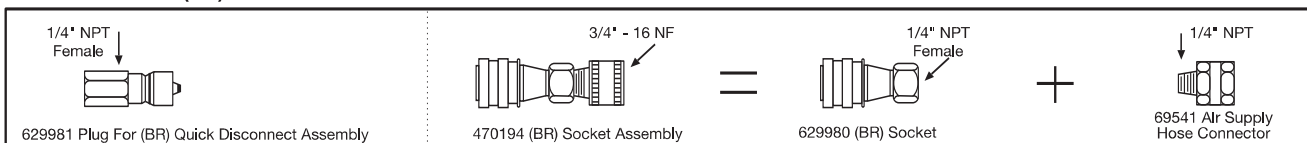


### DUFF-NORTON — Brass (BR)

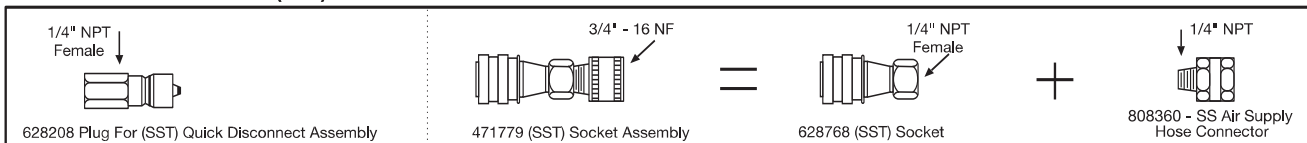


## NON-LOCKING TYPES — WITH CHECK VALVE IN PLUG

### FOSTER — Brass (BR)



### HANSEN — Stainless Steel (SST)



# DUAL-SUPPLY OPERATION

## CHECKING DUAL-SUPPLY OPERATION

1. Connect an approved, pressurized air-supply hose to the "MAIN" inlet of the PremAire manifold.
2. Don the respirator facepiece.
3. Connect a second, pressurized air-supply hose to the "DUAL-SUPPLY" inlet of the manifold and disconnect from the primary air source.

**Note:** The air-supply hoses must be connected to two different air sources.

4. After connecting the second air-supply hose to the manifold, breathe through the facepiece to ensure the respirator is providing proper air flow. If there is a problem with the air flow, check the system's inlet pressure.

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## CHECKING INLET PRESSURE

Like all PremAire Respirators, units equipped with the Dual-Supply option require an inlet pressure of 60 to 100 psi using Ultra Elite and Ultravue Facepieces. When using an Advantage 4000 Facepiece ensure the pressure range is between 70 to 100 psi. Before use, it is important to check the inlet pressure to see that it is within the NIOSH-approved range.

## ADJUSTING INLET PRESSURE

Connect the quick-disconnect on the dual-supply airline to the air source and pressurize within the NIOSH approved range of 60-100 psi using Ultra Elite or Ultravue Facepieces. When using an Advantage 4000 Facepiece ensure the pressure range is between 70 to 100 psi.

### CAUTION

**Stop operation immediately if the system pressure cannot be brought within this range. Inspect the system for restrictions, such as a partially-closed valve or a clogged airline filter.**



# USING THE RESPIRATOR

## USING DUAL-SUPPLY CAPABILITY

### To use the “leap-frogging” technique:

1. Connect an air-supply hose, pressurized by an approved air source, to the “MAIN” inlet of the PremAire manifold.
2. Enter the work area.
3. When the first length of air-supply hose has reached its maximum limit, connect to a second air-supply hose (pressurized by a different, approved air source) using the “DUAL-SUPPLY” inlet of the manifold. Only after the second air-supply hose has been connected can a worker disconnect from the first air line.



# CLEANING AND DISINFECTING

## CLEANING AND DISINFECTING

Respirators should be cleaned and disinfected after each use. The facepiece should be cleaned and disinfected after every use. MSA recommends using Confidence Plus® Cleaning Solution (P/N 10009971). Refer to the label for user instructions. ANSI suggests that users be trained in cleaning procedure.

### CAUTION

- **Cleaning and disinfecting at or below 110°F temperature will avoid possible overheating and distortion of parts which would require replacement.**
- **DO NOT use any cleaning substances that can or might attach any part of the apparatus.**
- **DO NOT use alcohol because it may deteriorate rubber parts.**
- **If not rinsed thoroughly, cleaning agent residue may irritate the wearer's skin.**

## PREPARATION

**Note:** Do not force-dry the parts by placing them in a heater or in direct sunlight. The rubber will deteriorate. When the facepiece is thoroughly dry, store the facepiece in the plastic bag that it was shipped in.

**Note:** Ensure second stage regulator is free of water, dirt, or debris.

1. In general, only the facepiece requires cleaning and disinfecting after use. If the apparatus is soiled or has dirt accumulation, use a damp sponge with mild soap solution or use a soft/medium bristle brush to remove deposits that may interfere with normal operation of:
  - a. Manifold (manifold parts and label)
2. Inspect the entire apparatus as you reassemble it. Follow the Inspection Instructions.
3. Thoroughly dry the facepiece and regulator after cleaning and disinfecting. The facepiece can trap water, which could enter the regulator.





# INSPECTION

## INSPECTION

Inspect the respirator by sight and sound for normal operations after it has been cleaned and disinfected. When any part shows evidence of damage, wear, or any other adverse condition explained in this section, it must be replaced and the condition corrected before the respirator can be used again.

**Note:** Replacement or repairs shall be done only by qualified persons, using only MSA parts designed for the respirator. No attempt shall be made to make adjustments or repairs beyond the manufacturer's recommendations. Parts shall not be interchanged among devices of different manufacturers. MSA authorizes levels of maintenance and repair for the PremAire Respirator System. (See user's maintenance manual P/N 10017251.)

If there is no MSA Service Center in your area, return the unit to MSA for service. Call 1-800-MSA-2222 for instructions.

### WARNING

**DO NOT inspect the respirator before cleaning if there is danger of contacting hazardous contaminants. Clean and disinfect first, then inspect. Failure to follow this warning can result in inhalation or skin absorption of the contaminant and cause serious personal injury or death.**

Inspect the entire apparatus after it is cleaned and disinfected. ANSI Standards Z88.2 and Z88.5, describe three levels of inspection procedures which are to be performed. Refer to these documents, or to an inspection program prepared by a health professional in establishing an inspection program. Detailed repair procedures are located in PremAire User's Maintenance Instructions.

### WARNING

**If any of the following inspections do not function properly, the apparatus must be removed from service. Failure to follow this warning can result in serious injury or death.**

## COMPONENT INSPECTION

### (After Each Use and Monthly)

1. Don the respirator following the instruction procedures. These steps make up the Functional Test.
2. If all steps are performed successfully, remove the respirator and inspect it following the steps below.
3. Facepiece
  - a. Inspect the facepiece for rubber deterioration, dirt, cracks, tears, holes, or tackiness.
  - b. Check the harness headstraps for breaks, loss of elasticity, or missing buckles and straps. Check the strap serrations for signs of wear.
  - c. Inspect the lens for cracks, scratches, and a tight seal with the facepiece rubber.
  - d. The exhalation valve must be clean and operate easily. The valve must move off the seat and return when released.
  - e. Inspect the facepiece coupling for damage. When using Ultra Elite or Ultravue Facepieces, be sure the spider gasket, O-ring, and valve disc are present.
4. Harness
  - a. Inspect all harness components for cuts, tears, abrasions, or signs of heat or chemical-related damage. Check that the tee nuts, washers, and screws, if any, are secure.
5. Record Keeping
  - a. Following inspection, the date and initials of the designated person should be recorded on an inspection tag. A more detailed record of the operations performed can be noted on an inspection and maintenance log. Inspection tags and inspection and maintenance logs are available from MSA. When the inspection data has been recorded, the apparatus is stored in a ready position.



# FUNCTIONAL CHECKS

## FUNCTIONAL CHECKS

### (After Each Use and Monthly)

1. Check that the regulator works properly. The regulator outlet should be sanitized before and after testing.
  - a. Check that the cylinder valve and second stage shut-off are closed and that the system is not pressurized.
  - b. Gently inhale through the regulator outlet and hold your breath for about 10 seconds. If the negative pressure is maintained, there is no leakage.
  - c. Gently exhale through the regulator outlet for about 10 seconds. If the positive pressure is maintained, there is no leakage.
  - d. Do not use the apparatus if airflow through the regulator is detected in either test. Return the regulator to a certified repairperson.
2. Inspect the Second Stage Shut-Off.
  - a. With the regulator pressurized, operate each valve to be sure it operates. Venting of pressure relief valves (or a continuing flow of air through the regulator when the user is not inhaling) indicates that the regulator needs to be repaired.

- b. Listen to the regulator. Any unusual sounds, such as whistling, chattering, clicking, or rattling mean that the regulator should be checked further.
- c. If any of these symptoms occur, the apparatus must be removed from service. Return the regulator to a certified repairperson.

### **WARNING**

**DO NOT disconnect when pressurized. Release all pressure from the regulator by opening the bypass valve. Removing the regulator when pressurized may result in serious personal injury, death, or damage to equipment.**

For More Information, call 1-800-MSA-2222 or Visit Our Website at [www.MSAnet.com](http://www.MSAnet.com)



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