FireHawk™ Air Mask

OPERATION AND INSTRUCTIONS

⚠ WARNING

THIS MANUAL MUST BE CAREFULLY READ AND FOLLOWED BY ALL PERSONS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THIS AIR MASK. This air mask will perform as designed only if used and serviced according to the instructions; OTHERWISE IT COULD FAIL TO PERFORM AS DESIGNED, AND PERSONS WHO RELY ON THE air mask COULD SUSTAIN SERIOUS PERSONAL INJURY OR DEATH.

This Self-Contained Breathing Apparatus (air mask) is certified by the National Institute of Occupational Safety and Health (NIOSH).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:
(1) This device may not cause harmful interference and (2) this device must accept any interference that may cause undesired operation.

⚠ WARNING

Do not use a 2216psi Air Cylinder on a 3000psi operating system. Such a configuration is not approved by NIOSH. Failure to follow this warning may result in serious personal injury or death.

Changes and modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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.

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

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

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INTRODUCTION

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NIOSH APPROVAL INFORMATION
CAUTIONS AND LIMITATIONS

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.
E- Use only the pressure ranges and hose lengths specified in the User's Instructions.
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.
M- All approved respirators shall be selected, fitted, used and maintained in accordance with MSHA, OSHA and other applicable regulations.
N- Never substitute, modify, add or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.
O- Refer to Users Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
S- Special or critical User's Instructions and/or specific use limitations apply. Refer to user instructions before donning.

S - SPECIAL OR CRITICAL USER'S INSTRUCTIONS

Approved for use at temperatures above -25°F. Approved only when the compressed-air container is fully charged with air meeting the requirements of the Compressed Gas Association Specification G-7 for quality verification level (grade) D air or equivalent specifications. The cylinder shall meet applicable DOT specifications.

When equipped with the cylinder charging system transfilling coupling on the 7-1215-1 pressure gauge and hose assembly, the apparatus must also be equipped with the 803534 first stage regulator and Audi-Larm Assembly.

⚠ WARNING

Do not install a Quick-Fill System and 3000psi URC Assembly on the same air mask. Combining these assemblies on the same air mask will not allow the relief valve in the 3000psi URC Assembly to open as designed. Failure to follow this warning can result in serious personal injury or death.

Approval is maintained while transfilling air only if MSA Quick-Fill System Hose Assembly 485331 or 485332 is used. Include 488703 cylinder charging system hose if using with encapsulated suit. A Quick-Fill System equipped apparatus is not approved for use with the 7-1008-1 cylinder and valve assembly.

When NightFighter™ Heads-Up Display System is used as a gauge (Not in conjunction with standard pneumatic Gauge) continuous operations mode must be used to maintain NIOSH approval.

Do not alter this unit. Altering will void the Intrinsic-Safety rating and may affect the Intrinsic-Safety of the device. Misuse or abuse of the NightFighter Heads-Up Display System, or the equipment to which it is attached, or using this equipment in a manner or situation not intended by the manufacturer, may result in damage to the NightFighter Heads-Up Display System, or equipment connected to the NightFighter Heads-Up Display System, may result in personal injury or death to user or persons dependent on the user.

Always inspect the NightFighter Heads-Up Display System for damage before use. If damage is found, immediately remove the device from service.

Note: The NightFighter Heads-Up Display System must be used with an Ultra Elite® Facepiece.

Note: The FireHawk M7 HUD may be used in place of the NightFighter Heads-Up Display system.

Firehawk MMR Dual Purpose Conversion Kits (Foster Quick-Connect Type Connection P/N 10026540, Foster Threaded Type Connection P/N 10026541 or Hansen Quick-Connect Type Connection P/N 10026542, Hansen Threaded Type Connection P/N 10026543) when installed on an MMR Air Masks are approved for use as a combination apparatus. When installed on an air mask, that air mask becomes a combination-type apparatus for respiratory protection during entry into and escape from oxygen-

deficient atmospheres, gases, and vapors when not more than 20 percent of the cylinder's rated capacity is used during entry.

Air Hose: When used as a combination apparatus, the device shall be supplied with respirable air through air supply hose with a minimum length of 8 feet and maximum length of 300 feet within the pressure range of 85-90psig. A maximum of 12 sections of straight or uncoiled air supply hose may be used in making up the working length of hose. When using coiled hose, a maximum of 6 sections may be used and each section is considered to be 50 feet long. Hose sections vary from 8 feet to 100 feet lengths. The air-line connection to the apparatus is to be made through approved Quick-Disconnects only. The purity of the air supply is the responsibility of the user. The respirator is approved only when the air supplied meets the requirements of the Compressed Gas Association Specification G-7. 1989 quality verification level (Grade) D for Gaseous Air.

⚠ WARNING

Do not Transfill (be a Donor) using a 3000psi URC Assembly. The 3000psi URC Assembly has a check valve that does not allow cylinders to Transfill (be a Donor). Failure to follow this warning can result in serious personal injury or death.

⚠ WARNING

Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly can not be used for filling a 3000psig cylinder. Failure to follow this warning can result in serious personal injury or death.

Use with adequate skin protection when worn in gases and vapors that poison by skin absorption (for example: hydrocyanic-acid gas). In making renewals or repairs, parts identical with those furnished by the manufacturer under the pertinent approval shall be maintained. NIOSH Approval Information for non CBRN approved respirators is included as a supplement to these instructions (P/N 10024128).

Approval for use against CBRN chemical warfare agents is maintained only when using approved components and following instructions listed on the NIOSH approval supplement (P/N 10044165).

IMPORTANT NOTICE FOR RESPIRATORY PROTECTION PROGRAM ADMINISTRATORS

1. An adequate respiratory protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, proper facepiece sizing and fit testing, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance. [See OSHA regulations, Title 29 CFR, Part 1910. 134 (c).]
2. This air mask may be used only after proper instruction and training in its use as specified in NFPA-1500 and OSHA regulations Title 29 CFR, Part 1910. 134.
3. This air mask must be secured by a positive mechanical means if stowed within an enclosed seating area of fire department vehicles, or in a compartment with a positive latching door. The method of holding the air mask in place must be designed to minimize injury to persons in the vehicle in the event of accident, rapid deceleration, or acceleration.
4. Do not mark the air mask, i.e., with stamps, labels, paint, or other method. Use of such markings may interfere with apparatus use or may constitute a flammability hazard.
5. Be sure that no other equipment interferes with the air mask facial seal, or with the user's hands, or other necessary means of mobility. For more information on self-contained breathing apparatus use and performance standards, please consult the following publications:

NFPA Standard 1500, Fire Department Occupational Safety and Health Programs (Chapter 5) and NFPA 1981 Standard, on Open-Circuit air mask's for Fire Service. Above publications are available from the following: National Fire Protection Association, Batterymarch Park, Quincy, MA 22269.

ANSI Standard Z88.5, Practices for Respiratory Protection for the Fire Service; and, ANSI Standard Z88.2, Practices for Respiratory Protection. American National Standards Institute, 1430 Broadway, New York, NY 10018.

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. Compressed Gas Association, Inc., 1725 Jefferson Davis Hwy., Suite 1004, Arlington, VA 22202.

The NightFighter Heads-Up Display System is approved intrinsically-safe and conforms to UL/ANSI 913 for use in Class I, Div. I, Groups A thru D hazardous locations, temperature rating T1.

The FireHawk M7 HUD may be used in place of the NightFighter Heads-Up Display System Receiver.

INTRODUCTION

The FireHawk M7 HUD is approved intrinsically safe and conforms to UL/ANSI 913 in Class I, Div. 1, Groups C & D, temperature rating T1.

Note: The Nightfighter Heads-Up Display System has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency and, if not installed in accordance with instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

⚠ WARNING

1. **Read and follow all NIOSH and other approval limitations.**
2. **Do not use this carrier and harness assembly as a vertical raising or lowering device.**
3. **Do not use the air mask as an underwater device.**
4. **This system must be supplied with respirable [Quality Verification Level (Grade) D, see ANSI/CGA G-7.1-1989] or higher quality air; and a dew point not to exceed -65°F (24ppm v/v) [Compressed Gas Association Specification G-7.1 for Quality Verification Level (Grade) D Gaseous Air].**
5. **This device may not seal properly with your face if you have a beard, gross sideburns or similar physical characteristics (see NFPA-1500 and ANSI Z88.2). An improper facial seal may allow contaminants to leak into the facepiece, reducing or eliminating respiratory protection. Do not use this device if such conditions exist. The face-to-facepiece seal must be tested before each use. Never remove the facepiece except in a safe, non-hazardous, non-toxic atmosphere.**
6. **Return to a safe atmosphere immediately if discoloration, crazing, blistering, cracking, or other deterioration of the lens material is observed.**
7. **Users must wear suitable protective clothing and warnings must be taken so that the air mask is not exposed to atmospheres that may be harmful.**
8. **Take into account the following factors which may affect the duration or the service life.**
   a. **the degree of physical activity of the user;**
   b. **the physical condition of the user;**
   c. **the degree that the user's breathing rate is increased by excitement, fear, or other emotional factors;**
   d. **the degree of training or experience which the user has had with this or similar equipment;**
   e. **whether or not the cylinder is fully charged;**
   f. **the presence in the compressed air of carbon dioxide concentrations greater than the .04% level normally found in atmospheric air;**
   g. **the atmospheric pressure; if used in a pressurized tunnel or caisson at 2 atmospheres (15psi gauge) the duration will be one-half as long as when used at 1 atmosphere; at 3 atmospheres the duration will be one-third as long;**
   h. **the condition of the apparatus.**

Failure to follow this warning can result in serious personal injury or death.

⚠ WARNING

- **Do not use a 2216psi Air Cylinder on a 3000psi operating system. Such a configuration is not approved by NIOSH.**
- **Do not Transfill (be a Donor) using a 3000psi URC Assembly. The 3000psi URC Assembly has a check valve that does not allow cylinders to Transfill (be a Donor).**
- **Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly can not be used for filling a 3000psig cylinder.**
- **Do not install a Quick-Fill System and 3000psi URC assembly on the same air mask. Combining these assemblies on the same air mask will not allow the relief valve in the 3000psi URC Assembly to open as designed.**

Failure to follow the above warnings can result in serious personal injury or death.

BEFORE USE

Thoroughly inspect this air mask on receipt and before use. This air mask is to be used only by trained and qualified personnel. Read and understand these instructions before attempting to use this equipment. If you have any questions, call toll free 1-800-MSA-2222.

DESCRIPTION

DESCRIPTION

The air masks from MSA are pressure-demand, self-contained breathing apparatus (air mask) with NightFighter Heads-Up Display System, URC Assembly (Universal Rescue Connection), and Pressure Gauge certified by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres immediately dangerous to life or health:

``Immediately dangerous to life or health" means conditions that pose an immediate threat to life or health or conditions that pose an immediate threat of severe exposure to contaminants, such as radioactive materials, which are likely to have adverse cumulative or delayed effects on health [Title 42 CFR, Part 84.2, (Q)].

⚠ WARNING

DO NOT use this carrier and harness assembly as a vertical raising or lowering device. Failure to follow this warning can result in serious personal injury or death.

MMR breathing apparatus consists of the following major sub-assemblies.

- first stage regulator
- second stage regulator
- air cylinder and valve
- Audi-Larm™ Audible Alarm with URC Assembly
- carrier and harness
- facepiece
- NightFighter Heads-Up Display System/ICM Unit Gauge

FIRST STAGE REGULATOR

The PR14 First Stage Regulator incorporates a downstream design and dual springs to provide maximum reliability. The regulator incorporates a large, easily replaceable, sintered filter to capture particulates that may be in the air stream.

SECOND STAGE REGULATOR

This is a pressure-demand regulator, which keeps a positive pressure in the facepiece all the time. A slide button (top release button) on top of the regulator stops air flow. To stop airflow, push the button IN. To restart the regulator, inhale sharply. The regulator attaches to the facepiece with a push to connect connector. The regulator delivers large flow rates accurately and quickly.

DUAL-PURPOSE

The Firehawk MMR is used as a combination apparatus. It is approved by NIOSH for use as a half-hour or one hour, pressure-demand, self-contained breathing apparatus for entry or escape from oxygen deficient atmospheres, gases, or vapors.

The Firehawk MMR is a self-contained breathing apparatus rated for 30, 45, or 60 minute service duration. It is also a supplied-air respirator utilizing a supply of air from a stationary cylinder or compressor.

The Dual-Purpose Conversion Kit supplies the parts necessary to modify a Firehawk MMR Air Mask so that it can function as either a self-contained breathing apparatus (air mask) or as an air-line, air-supplied respirator.

When used as a combination apparatus, the device shall be supplied with respirable air through 8 to 300 feet of airsupply hose from MSA, within a pressure range of 85- 90psig.

⚠ WARNING

Particles and contaminants can enter a supplied-air respirator system when air supply hoses are disconnected and/or reconnected in a contaminated atmosphere. Failure to follow this warning can result in serious personal 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 warnings, 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.

⚠ WARNING

DO NOT install or attempt to use any hose assembly or fitting other than those supplied by MSA for the Firehawk MMR Dual-Purpose. Failure to follow this warning can result in serious personal injury or death.

AIR CYLINDER AND VALVE

Capacity Cubic Ft.	Pressure psig	Rated Svc* Life (Min.)
45	4500	30
88	4500	60
45	2216	30
45	2216	30
60	3000	30
66	4500	45

*as approved by NIOSH

The air cylinder and valve consists of a tank and a cylinder valve assembly. The cylinder valve includes a valve

body, cylinder valve inlet tube, handwheel, safety disc (burst disc), and pressure gauge. The pressure gauge shows the air pressure in the cylinder continuously. The gauge is calibrated in 100psig increments. For example, a gauge reading of 20 is read as 20 x 100 or 2,000psig. A handwheel is used to open and close the cylinder valve.

AUDI-LARM AUDIBLE ALARM WITH URC ASSEMBLY

The Audi-Larm Audible Alarm rings when there is approximately 25% of the air mask's rated service time remaining. The alarm also rings when the cylinder valve is first opened, providing an audible indication that the alarm is properly "cocked". A high pressure hose delivers air at cylinder pressure from the alarm to the first stage regulator.

Cylinder	Approx. Remaining Service Time
30-min. 2216 psig	7 min.
30-min. 4500 psig	7 min.
45-min. 4500 psig	11 min.
60-min. 4500 psig	14 min.
30-min. 3000 psig	10 min.

URC ASSEMBLY

⚠ WARNING

DO NOT use a 2216psi air cylinder on a 3000psi operating system. Such a configuration is not approved by NIOSH. Failure to follow this warning can result in serious personal injury or death.

This air mask may be equipped with an Audi-Larm body that includes a URC (Universal Rescue Connection) Assembly. The URC Assembly is a male quick-fill inlet for use by Rapid Intervention Crews for emergency filling of air mask. Also included with the URC Assembly is a pressure relief valve for protection of the cylinder burst disc. The URC Assembly may also be used for transfill operations.

CARRIER AND HARNESS

⚠ WARNING

DO NOT use this carrier and harness assembly as a vertical raising or lowering device. Failure to follow this warning can result in serious personal injury or death.

The carrier consists of a backplate, a cylinder band with latch to hold the cylinder, and a harness, consisting of shoulder pads, chest strap (optional), adjustable pull-straps, waist-strap, and belt mounted regulator retainer.

FACEPIECES

The facepiece is available in three sizes.

The facepiece lens is super-hardcoated to give the clear polycarbonate lens superior abrasion and chemical protection. This process gives the clear polycarbonate lens superior abrasion and chemical protection.

The facepiece has a low-resistance, pressure-demand exhalation valve designed for easy cleaning. An inhalation check valve in the inlet housing keeps moisture and contaminants out of the mask mounted regulator. The facepiece has a speaking diaphragm for clear, short-range communication. The facepiece is stocked with nose cup and SpeeD-ON® Head Harness. This harness is made of flame and heat resistant (FHR) materials and features a five-point suspension. A five-point adjustment rubber head harness is also available.

NIGHTFIGHTER HEADS-UP DISPLAY SYSTEM/PRESSURE GAUGE/ICM UNIT 2000/ICM UNIT 2000 PLUS GAUGE

The NightFighter Heads-Up Display System/Pressure Gauge/ICM Unit 2000/ICM Unit 2000 Plus are multi-mode, battery-powered, low pressure warning devices which gives audible and visible warning that air cylinder pressure has reached a pre-set level (approximately 25% of service time is remaining).

NIGHTFIGHTER HEADS-UP DISPLAY SYSTEM

- The NightFighter Heads-Up Display System allows a user to clearly and easily see air cylinder volume while wearing the air mask.
- The NightFighter Heads-Up Display System allows a user to transfer the receiver from Ultra Elite Facepiece to another Ultra Elite Facepiece.

Note: The NightFighter Heads-Up Display System can only be used with an Ultra Elite Facepiece.

Note: The FireHawk M7 HUD may be used in place of the NightFighter Heads-Up Display System Receiver.

- The NightFighter Heads-Up Display System consists of three (3) separate assemblies:
  - Bracket assembly attached to an Ultra Elite Facepiece.
  - Receiver mounted on the bracket assembly.
  - Transmitter assembled to the gauge line. (See Installation Instruction P/N 10035581).
- The NightFighter Heads-Up Display System's Receiver shows the user the air cylinder volume in one quarter cylinder increments, from a full cylinder to an empty cylinder, by a LED light logic pattern.
- The NightFighter Heads-Up Display System's

DESCRIPTION

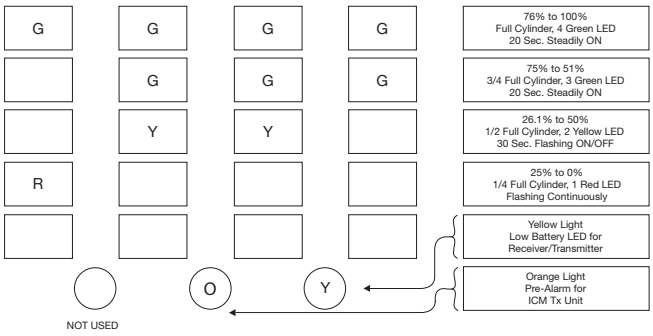
Transmitter is assembled to the gauge line hose. The transmitter or ICM Tx Unit sends a signal to the receiver (on the facepiece) of the air cylinder content.
- The NightFighter Heads-Up Display System's Receiver has seven (7) LED light patterns. (See Chart).
- The NightFighter Heads-Up Display System's Receiver has a light sensor for that automatically adjusts the brightness of the LED based on to the ambient light levels measured outside of the facepiece.
- The NightFighter Heads-Up Display System's Receiver will indicate a low battery by a Yellow LED light for the receiver and transmitter. (See Chart).
- The NightFighter Heads-Up Display System operates using two (2) standard AAA alkaline batteries in the transmitter, or four (4) standard AA alkaline batteries if the ICM Tx Unit is installed, and two (2) standard AA alkaline batteries in the receiver. The NightFighter Heads-Up Display System notifies the user when the batteries need to be replaced.
- The FireHawk M7 HUD operates using three standard AAA alkaline batteries and notifies the user when the batteries need to be replaced.

Note: Only FireHawk M7 HUDS that are marked “interchangeable” on the bottom side are compatible with this system.

⚠ WARNING

- **Use only Duracell MN2400, Energizer E92, or Eveready A92 AAA alkaline batteries in the TRANSMITTER. Use of other batteries, or a combination of batteries from different manufacturers, will affect performance of the unit and will void the intrinsic safety approval.**
- **Use only Duracell MN1500 or Energizer E91 AA alkaline batteries in the NightFighter Heads-Up Display System RECEIVER. Use of other batteries, or a combination of batteries from different manufacturers, will affect performance of the unit and will void the intrinsic safety approval.**
- **In older versions of the NightFighter RECEIVER containing AAA alkaline batteries use only Duracell MN2400, Energizer E92, or Eveready A92. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of the unit and will void the intrinsic safety approval.**
- **Use only Rayovac 824 LR03, Rayovac Ultrapro LR03, Energizer E92, Energizer Industrial EN92, Duracell MN2400, or Duracell Procell PC2400 alkaline batteries in the FireHawk M7 HUD. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of unit and void the Intrinsic Safety Approval.**

Failure to follow this warning can result in serious personal injury or death.



Note: With system pressurized, quick press of the Operation Button on the transmitter or mode button (green) on the ICM Tx Unit will show current pressure for ONLY 10 seconds.

- The LED lights in the receiver will automatically adjust for the brightness outside of the facepiece.
- The receiver will indicate a Yellow LED light, after going through the start up sequence, if a low battery condition is detected in the receiver, transmitter, or ICM Tx Unit. (See Low Battery Warnings).

Low Battery Warnings

Note: There are different low battery warnings.

- If there is a low battery in the receiver, single Yellow LED flash.
- If there is a low battery in the transmitter or ICM Tx Unit, double short Yellow LED flashes.
- If there are low batteries in the receiver and transmitter or ICM Tx Unit, the Yellow LED will alternate single and double flashes.

The receiver will show air cylinder volume in 25% tank increments from full to empty. (See Chart).

ICM TX UNIT

The ICM Tx Unit attached to the air mask gauge hose. See ICM Tx Unit Installation Instructions for proper installation procedures.

The ICM Tx Unit is a multi-mode battery-powered, digital pressure gauge, and serves as the transmitter for the NightFighter Heads-Up Display System.
Note: The ICM Tx Unit does NOT have an audible low pressure warning indicating that the cylinder has reached 25% service life.

Follow the procedures for the ICM Tx Unit outlined in the ICM Tx Unit and NightFighter Heads-Up Display System Operation and Maintenance Instructions (P/N 10058881).

DESCRIPTION

The ICM Tx Unit turns on automatically when the user opens the air mask cylinder valve. The GREEN lighten the unit flashes to signal that is activated and operating.

The ICM TX Unit has three control buttons.

The RESET/OFF yellow button resets the device from the full alarm mode. It also shuts the unit off after the cylinder valve is closed and all air pressure is bled from the unit.

The center opaque (alarm) button activates the full alarm mode by pressing and holding the button, with or without air pressure.

The ICM Tx Unit mode button (green) will change the digital display window. See the During Use section.

The complete instructions on using the ICM Tx Unit, refer to the ICM Tx Unit and NightFighter Heads-Up Display System Operation and Maintenance Instructions (P/N 10058881).

ICM UNIT 2000 PLUS/ICM UNIT 2000

The ICM Unit 2000 Plus and ICM Unit 2000 Gauge attaches to the air mask gauge hose. See installation instructions for proper installation procedures.

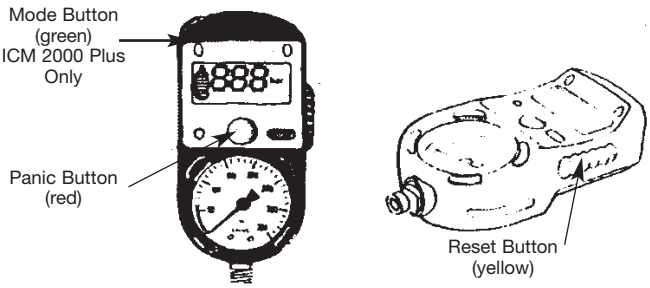
The ICM Unit 2000 Plus and ICM Unit 2000 Gauge are also multi-mode, battery-powered, low pressure warning devices which give audible and visible warning that air cylinder pressure has reached approximately 25% of service life. There are two warning indicators:

- The pressure gauge face and the digital display blink
- An audible alarm repeats single tone bursts

Follow the procedures for the NightFighter Heads-Up Display System and ICM Unit 2000/ICM Unit 2000 Plus Gauge.

The ICM Unit 2000 Plus and ICM Unit 2000 Gauge turns on automatically when the user opens the air mask cylinder valve. The GREEN light on the unit flashes to signal that it is activated and operating.
The ICM Unit 2000 Plus Gauge has 3 control buttons. The ICM Unit 2000 Gauge has 2 control buttons.

The RESET/OFF yellow button resets the device from the full alarm mode. It also shuts the unit off after the cylinder valve is closed and all air pressure is bled from the unit.
The center red (alarm) button activates the full alarm mode with or without air pressure.



The ICM Unit 2000 Plus Gauge mode button (green) will change the digital display window. See the During Use section for details.

DONNING

DONNING THE AIR MASK

1. Remove the facepiece from the case.

⚠ WARNING

Do not use a cover lens in a high-temperature environment, such as firefighting. 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. Failure to follow this warning can result in serious personal injury or death.

2. Check that the cylinder is fully pressurized.
3. Testing the NightFighter Heads-Up Display System and ICM Unit Gauge.

Note: The NightFighter Heads-Up Display System Receiver and Transmitter or ICM Tx Unit must be no more than 15 inches apart, otherwise the receiver's LED lights may not function.

⚠ WARNING

Test the NightFighter Heads-Up Display System or ICM Gauge for damaged parts before each use of the air mask. Do NOT use this device unless it passes all operational tests indicated below. Failure to follow this warning can result in serious personal injury or death.

4. Open air mask cylinder valve fully to pressurize the NightFighter Heads-Up Display System, then close the cylinder valve.
5. Looking through the facepiece lens at the LED panel, all LED's must illuminate at the top of the receiver.

The receiver must go through all LED light patterns when system is pressurized.

NightFighter Heads-Up Display System Start-Up Sequence:

- Four Green LED's for 20 seconds, Steadily ON
- Three Green LED's for 20 seconds, Steadily ON.
- Two Yellow LED's for 30 seconds, Flashing.
- One Red LED flashing.
- Yellow LED for Low Battery.

CONTINUOUS OPERATIONS MODE

Note: Continuous Operations Mode can only be used when system is pressurized.

Push Operation Button on the transmitter or mode button (green) on the ICM Tx Unit and hold button in for 3 seconds. Once LED lights come on release button.

Receiver will show last air cylinder content reading. LED lights will stay on to show air cylinder content drop.

⚠ CAUTION

In this Continuous Operations Mode, the LIFE of the batteries will be shortened.

Turning Continuous Operations Mode OFF

- The Continuous Operations Mode will deactivate if low battery condition is present.
- Push Operation Button on the transmitter, holding the button in for 3 seconds. Release button once LED lights go off.
- Receiver will show last air cylinder content reading. LED lights will go to Automatic Intermittent Mode showing only air cylinder content drop in the percentage mode.

Note: The NightFighter Heads-Up Display System will automatically turn itself OFF approximately 60 seconds after the apparatus is depressurized. (The signal Red LED light will flash at this time).

ICM UNIT GAUGE

The PASS function uses RED and GREEN light-emitting diodes (LEDs) to display its status visually:

GREEN LEDs start to flash when the cylinder valve is opened and shows that the device is operational.

RED LEDs flash slowly when the device is in pre-alarm; LEDs flash rapidly when the device is in full alarm.

⚠ CAUTION

DO NOT use a partially full cylinder. If the cylinder is not full, the service time is reduced accordingly.

- Reach inside the right shoulder straps and grasp the redundant alarm and pressure gauge, slide left arm through left shoulder straps.
- Bend forward slightly, rest it on your back.
- Attach the chest strap (optional).
- Fasten the waist-strap and pull it tight for a snug fit.
- As you straighten up, pull the shoulder strap tabs out. Hike the unit up for a comfortable fit.
- The shoulder straps and waist-strap ends must be tucked in and lay flat across the body.

USING THE NIGHTFIGHTER HEADS-UP DISPLAY SYSTEM, ICM UNIT GAUGE, AUDI-LARM ALARM, AND URC ASSEMBLY

1. Grasp the mask mounted regulator and push the slide button.

2. Ensure that the Audi-Larm coupling nut is hand-tight (no-tools).

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

⚠ WARNING

DO NOT use an air mask with a loose Audi-Larm coupling nut. Using an air mask with a loose coupling nut can cause o-ring failure which can result in sudden loss of cylinder pressure. Always hand-tighten the coupling nut before using the air mask. Failure to follow this warning can result in serious personal injury or death.

4. Reach behind and open the cylinder valve fully. Listen for the audible alarm with URC Assembly to ring briefly as pressure in the system increases.

⚠ CAUTION

Listen for any hiss or pop sounds from the Audi-Larm Alarm with URC Assembly, if heard do not use the air mask. Return it to an MSA trained or certified repairperson. Failure to follow this warning can result in serious personal injury or death.

5. As the pressure rises from 50 to 200 psig, both visible and audible alarms activate automatically, indicating that the alarms are functional and "cocked." When the system is fully pressurized, the alarms enter the Monitor (normal) Mode.

⚠ WARNING

Use only Rayovac 824 LR03, Rayovac Ultrapro 4R03, Energizer E92, Energizer Industrial EN92, Duracell MN2400, or Duracell Pro Cell MN2400 alkaline batteries in the FireHawk M7 HUD. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of unit and void the Intrinsic Safety Approval.

⚠ WARNING

If the alarm with URC Assembly fails to ring, ICM Unit Gauge or NightFighter Heads-Up Display System fails to light and tone, do not use the apparatus. The air mask must be checked and corrected for proper operation by an MSA trained or certified repairperson before using. Failure to follow this warning can result in serious personal injury or death.

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

7. Check the Pressure Gauge, NightFighter Heads-Up Display System, ICM Unit and Cylinder Gauges. It should be within 110psig for 2216psig; 150psig for 3000psig; 225psig for 4500psig.

⚠ CAUTION

If your readings do not agree with these cylinder values, do not use the air mask. Return it to an MSA trained or certified repairperson.

DONNING

8. Check for bypass operation. Grasp the red knob and turn it counter-clockwise. Listen for airflow, and then turn it OFF. Close cylinder valve fully.

9. Check for air leaks. Open cylinder valve fully to pressurize system, then close the cylinder valve and watch the Pressure Gauge, NightFighter Heads-Up Display System or ICM Unit Gauge.

⚠ CAUTION

If the needle drops more than 100psi in 10 seconds, do not use the air mask. The air mask must be repaired; otherwise, reduced service life may result.

10. Crack the bypass valve slowly to bleed off pressure until the NightFighter Heads-Up Display System or ICM Unit Gauge drops below:
    530psig-approximately (low pressure system)
    750psig-approximately (3000psi system)
    1175psig-approximately (high pressure system)

The NightFighter System will illuminate; ICM Gauge and Audi-Larm Alarm with URC Assembly will sound.

Note: The NightFighter Heads-Up Display System will automatically turn itself OFF, approximately 60 seconds after the apparatus is depressurized. (A single Red LED light will flash at this time).

11. When the pressure falls below 200psig, turn the ICM Unit Gauge off.

⚠ WARNING

If the Audi-Larm Alarm with URC Assembly fails to ring, ICM Unit Gauge or NightFighter Heads-Up Display System fails to light or tone, or fails to continuously ring to 200psig, do not use the apparatus. The air mask must be checked and corrected for proper operation by an MSA trained or certified repairperson before using. Failure to follow this warning can result in serious personal injury or death.

Note: Before donning, check that the regulator sealing ring is seated properly in its groove, and that it is not torn, gouged, or nicked.

DONNING THE FACEPIECE WITH THE SPEED-ON HEAD HARNESS

1. Place neckstrap, if present, around your neck so that the facepiece lens is against the body.

2. Loosen all the harness straps. Grip the bottom straps.

3. Insert chin well into the lower part of facepiece, then pull the harness back over head.

4. Pull the back of harness downward until centered at the back of the head.

5. Tighten the two lower straps first by pulling them straight back, not out. Tighten the facepiece until the mask is snug against the face.

DONNING

6. Tighten the two side temple straps in the same manner as described above. Ensure that the face-piece tabs are not tucked under the face seal.

7. The top strap is not adjustable on some models. Make sure the back of the harness is centered on the back of the head and the face-seal is providing uniform pressure on the face at all points. Readjust straps if needed.

FACEPIECE FIT CHECK

Note: Check the inhalation valve, inhale. If you do not receive sufficient flow of air, do not use facepiece. The facepiece must be repaired or replaced.

1. To check for facepiece fit, hold the palm of your hand over the inlet facepiece adapter and inhale. Hold your breath at least 10 seconds. The facepiece should collapse and stay collapsed against your face. If it does not, re-adjust the face-piece and test again. **If this does not correct the leak, do not use the facepiece.**

2. Test the exhalation valve, take a deep breath and hold it. Block the inlet facepiece adapter with the palm of your hand and exhale. If the exhalation valve is stuck, you may feel a heavy rush of air around the facepiece. You may need to exhale sharply to open the valve. If this does not release the valve, do not use the face-piece.

⚠ WARNING

This device may not seal properly with your face if you have a beard, gross sideburns or similar physical characteristics (see NFPA-1500 and ANSI Z88.2). An improper facial seal may allow contaminants to leak into the facepiece, reducing or eliminating respiratory protection. Do not use this device if such conditions exist. The face-to-facepiece seal must be tested before each use. Never remove the facepiece except in a safe, non hazardous non-toxic atmosphere. Failure to follow this warning can result in serious personal injury or death.

3. Open the cylinder valve fully. Push in on the slide button to stop air flow.

4. Listen for any sound of hissing or popping from the Audi-Larm Alarm with URC Assembly. If heard, return the air mask to an MSA trained or certified repairperson.

INSTALLING THE SLIDE MASK MOUNTED REGULATOR

1. Grasp regulator and orient regulator so that red bypass knob is pointing to the right and slide button is on top.

2. Slide regulator onto rail (fast track) of facepiece cover. Slide regulator down the rail cover until regulator stops.

3. Insert regulator into facepiece adapter by pushing inward.

4. Check proper engagement by pulling on the regulator to ensure regulator is securely attached to facepiece adapter.

⚠ WARNING

Do not use the air mask unless the regulator is connected properly. A regulator that is not installed correctly can separate from the facepiece unexpectedly. Return the air mask to an MSA trained or certified repairperson to correct the condition. Failure to follow this warning can result in serious personal injury or death.

5. Inhale sharply to start the airflow.
   a. Check the bypass again by turning the red knob counter-clockwise until you feel increased airflow. Close the bypass.

⚠ WARNING

There must be a continuous flow of air when the bypass knob is opened. If not, do not use the apparatus. The air mask must be checked and the condition corrected by an MSA trained or certified repairperson before it can be used. Failure to follow this warning can result in serious personal injury or death.

Note: If the air mask passes all tests, the unit is ready to use. Remember, you must perform these tests every time before you enter the hazardous atmosphere. If the unit fails to meet any of the tests, the condition(s) must be corrected before using the apparatus.

INSTALLING THE FIREHAWK PUSH-TO-CONNECT MASK MOUNTED REGULATOR

1. Grasp regulator and insert regulator into facepiece adapter by pushing inward. Check proper engagement by pulling on the regulator to ensure regulator is securely attached to facepiece adapter.

⚠ WARNING

Do not use the air mask unless the regulator is connected properly. A regulator that is not installed correctly can separate from the facepiece unexpectedly. Return the air mask to an MSA trained or certified repairperson to correct the condition. Failure to follow this warning can result in serious personal injury or death.

2. Inhale sharply to start the airflow.
3. Check the bypass again by turning the red knob counter-clockwise until you feel increased air flow. Close the bypass.

⚠ WARNING

There must be a continuous flow of air when the bypass knob is opened. If not, do not use the apparatus. The air mask must be checked and the condition corrected by an MSA trained or certified repairperson before it can be used. Failure to follow this warning can result in serious personal injury or death.

Note: If the apparatus passes all tests, the unit is ready to use. Remember, you must perform these tests every time before you enter the hazardous atmosphere. If the unit fails to meet any of the tests, the condition(s) must be corrected before using the apparatus.

USING THE AIR MASK

Periodically check the pressure indicated on the NightFighter Heads-Up Display System or ICM Unit pressure gauge. It continually displays the cylinder pressure. When the needle reaches the red zone, the Audi-Larm Alarm with URC Assembly will begin ringing and NightFighter Heads-Up Display System or ICM Unit Gauge will begin to light or tone. When the bell starts ringing or when the pressure reaches approximately 25% of the rated service pressure, return to fresh air.

NightFighter Heads-Up Display System, ICM Unit Gauge, and Audi-Larm Alarm with URC Assembly activate when cylinder pressure drops below approximate values:

530psig-approximately for low pressure
750psig-approximately (3000:psi system)
1175psig-approximately for high pressure

When the NightFighter Heads-Up Display System, ICM Unit Gauge or Audi-Larm Alarm activates, immediately return to fresh air.

Note: Apparatus service life is reduced greatly when the bypass is used.

PRECAUTIONS DURING USE

Periodically check the pressure indicated on the remote gauge.

- Reduced air flow: Immediately open the bypass. Immediately return to fresh air.
- Air mask free-flows: Immediately return to fresh air.
- Audi-Larm Alarm with URC Assembly Rings: Immediately return to fresh air.
- NightFighter Heads- Up Display System Low Volume Indicator Lights and Flashes: Immediately return to fresh air.
- ICM Unit Gauge Lights and Flashes: Immediately return to fresh air.

⚠ WARNING

Do not use a 2216psi Air Cylinder on a 3000psi operating system. Such a configuration is not approved by NIOSH. Failure to follow this warning can result in serious personal injury or death.

REMOVING THE air mask

REMOVING THE AIR MASK DISCONNECTING THE SLIDE REGULATOR

1. Grasp top of regulator.

2. Push the release buttons and pull regulator down and out of facepiece adapter.

Note: Regulator can hang on cover rail in a stand-by mode.

3. Slide regulator up cover rail until regulator slide button is free of cover rail.

4. Close the cylinder valve fully. Open the bypass to release system pressure. Close the bypass.

5. When the pressure falls below 200psig, turn the NightFighter Heads-Up Display System or ICM Unit Gauge off.

Note: The NightFighter Heads-Up Display System will automatically turn itself OFF, approximately 60 seconds after the apparatus is depressurized. (The single Red LED light will flash at this time).

6. Stow the regulator with slide button at bottom in the stand-by belt mount when it is not in use.

7. To remove the facepiece, fully loosen the harness straps and pull the facepiece up and away from your face.

8. To remove the carrier harness, press the belt buckle release button IN.
9. Disconnect the chest strap (if used).
10. To loosen the shoulder straps, grasp the release loops. Push them out and away from your body.
11. Slip your right arm out of the shoulder pad first, then remove the harness.

Note: Be sure to replace the cylinder with a full one. Complete Inspection and Cleaning and Disinfecting Procedures outlined in this manual. Ensure complete apparatus is clean and dry. Ensure that facepiece head harness straps and harness adjustment straps are fully extended. Place the complete apparatus in the storage case or suitable storage location so it can be reached easily for emergency use. (See storage instructions.)

DISCONNECTING THE FIREHAWK PUSH-TO-CONNECT REGULATOR

1. Grasp top of regulator.
2. Push the release buttons and pull regulator out of facepiece adapter.
3. Close the cylinder valve fully. Open the bypass to release system pressure. Close the bypass.
4. When the pressure falls below 200psig, turn the ICM Unit Gauge off by pressing the alarm switch 2 times in rapid succession.

REMOVING THE air mask

Note: The NightFighter Heads-Up Display System will automatically turn itself OFF, approximately 60 seconds after the apparatus is depressurized. (The signal Red LED light will flash at this time). An extended single tone will sound indicating the unit has been turned off.

5. Stow the regulator in the stand-by belt mount when it is not in use.
6. To remove the facepiece, fully loosen the harness straps and pull the facepiece up and away from your face.
7. To remove the carrier harness, press the belt buckle release button IN.
8. Disconnect the chest strap (if used).
9. To loosen the shoulder straps, grasp the release loops. Push them out and away from your body.
10. Slip your right arm out of the shoulder pad first, then remove the harness.

Note: Be sure to replace the cylinder with a full one. Complete Inspection and Cleaning and Disinfecting Procedures outlined in this manual. Ensure complete apparatus is clean and dry. Ensure that facepiece head harness straps and harness adjustment straps are fully extended. Place the complete apparatus in the storage case or suitable storage location so it can be reached easily for emergency use. (See storage instructions.)

CHANGING THE CYLINDER WITH BAND AND LATCH

⚠ WARNING

Be careful not to drop cylinder or bump valve knob. An unsecured cylinder can become an airborne projectile under its own pressure if the valve is opened even slightly. Failure to follow this warning can result in serious personal injury or death.

1. Be sure there is no pressure in the system before replacing a cylinder. Disconnect the Audi-Larm Alarm with URC Assembly coupling nut.

2. Lift and turn the latch wing to loosen the cylinder clamp.
3. Slide out the empty cylinder and install one that is fully charged. Be sure that the adjustable cylinder band and latch is in the proper slot before you insert a new cylinder. Make sure that the lock tab on the carrier is fully engaged in the appropriate cylinder band slot position.
4. Slide the fully charged cylinder into the carrier, with gauge facing out, turn the latch wing clockwise to tighten fully. Fold over the latch wing toward backplate, locking latch wing in place.

Note: Be sure to tighten the latch wing fully each time a cylinder is installed.

5. To check that the cylinder is secure, place one hand on the backplate and grasp the cylinder valve with the other. Try to pull the cylinder and valve down and out away from the carrier. Make sure that the band and latch holds the cylinder securely in the carrier.

Note: If the cylinder feels loose, re-check that the band and latch is in the proper slot; that the lock tab is fully engaged in the slot; and that the latch wing is fully tightened and flipped over with the label side OUT. Do not use the air mask if the cylinder is not held securely in the carrier.

6. Check that the O-ring is inside the Audi-Larm Alarm with URC Assembly coupling nut. If the O-ring is damaged it must be replaced before the alarm is used.
7. Thread the Audi-Larm Alarm with URC Assembly coupling nut to the cylinder valve and hand-tighten (no tools).

CHANGING THE CYLINDER WITH BUCKLE AND STRAP

⚠ WARNING

Be careful not to drop cylinder or bump valve knob. An unsecured cylinder can become an airborne projectile under its own pressure if the valve is opened even slightly. Failure to follow this warning can result in serious personal injury or death.

1. Be sure there is no pressure in the system before replacing a cylinder. Disconnect the alarm with URC Assembly coupling nut.
2. Lift over center buckle to loosen the cylinder strap.
3. Slide out the empty cylinder and install one that is fully charged. Be sure that the adjustable cylinder buckle is properly installed.
4. Slide the fully charged cylinder into the carrier, with gauge facing out. Close the over center buckle to tighten the cylinder strap.

5. To check that the cylinder is secure, place one hand on the back plate and grasp the cylinder valve with the other. Try to pull the cylinder and valve down and out away from the carrier. Make sure that the strap and buckle hold the cylinder securely in the carrier.

NOTE: If the cylinder feels loose, re-check that the strap and buckle are properly adjusted. Open cylinder buckle. Tighten cylinder strap by pulling on top (outer) strap. It will be necessary to reposition the black plastic slide during adjustment. Tighten cylinder strap until cylinder buckle is approximately 45 degrees from vertical. Close the cylinder buckle. Do not use the air mask if the cylinder is not held securely in the carrier. **DO NOT over-tighten the cylinder strap; otherwise it will damage the center buckle assembly.**

6. Check that the O-ring is inside the Alarm with URC Assembly coupling nut. If the O-ring is damaged it must be replaced before the alarm is used.
7. Thread the alarm with URC Assembly coupling nut to the cylinder valve and hand-tighten (no tools).

CHARGING CYLINDERS

A lightweight air mask cylinder can become airborne solely under the thrust of air from an inadvertedly opened cylinder valve. If a cylinder is removed from a horizontal shelf by grasping the handwheel, the weight of the cylinder can cause the cylinder to rotate downward causing the valve to open slightly.

⚠ WARNING

- **Never carry a cylinder by the handwheel.**
- **Avoid dropping the cylinder or bumping the handwheel.**
- **Use the handwheel only to open and close the cylinder valve.**

A valve could partially open causing the cylinder to become an airborne projectile under its own pressure and result in serious personal injury or death.

⚠ WARNING

1. **Remove from service if cylinder shows evidence of exposure to high heat or flame: e.g., paint turned to a brown or black color, decals charred or missing, gauge lens melted, or elastomeric materials distorted.**
2. **Use this device only after receiving proper training in its use. Use in accordance with this label and MSA apparatus instructions.**
3. **To maintain NIOSH approval, container must be fully charged with respirable air meeting the requirements of the Compressed Gas Association specification G-7.1 1989 for Quality Verification Level (grade) D air or equivalent specification.**
4. **Do not use unless the cylinder is filled to the full pressure approved.**
5. **Do not alter, modify, or substitute any components without approval of the manufacturer.**
6. **Inspect frequently. Maintain according to manufacturer's instructions. Repair only by properly trained personnel.**

Failure to follow these warnings can result in serious personal injury or death.

SAFETY PRECAUTIONS FOR MSA SELF-CONTAINED BREATHING APPARATUS CYLINDERS

Breathing apparatus cylinders should be fully recharged as soon as possible after use.

Cylinders should not be stored partially charged for two reasons:

1. If used partially charged, the duration of the apparatus is reduced.
2. The pressure relief device is only designed to protect a fully charged cylinder from the effects of a fire.

For maximum safety, the cylinders should be stored full or at a pressure above ambient but less than 100psig.

Prior to recharging, cylinders must be examined externally for evidence of high heat exposure, corrosion, or other evidence of significant damage.

Additional information of value when performing external and internal inspections of cylinders may be found in the latest editions of CGA Publication C-6: "Standards for Visual Inspection of Steel Compressed Gas Cylinders", CGA Publication C-6.1: "Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders", and/or CGA Publication C-6.2: "Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders" available form the Compressed Gas Association, Inc., 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102.

If there is any doubt about the suitability of the cylinder for recharge, it should be returned to a certified hydrostatic test facility for expert examination and testing.

Always check to be sure the retest date is within the prescribed period and that the cylinder is properly labeled to indicate its gaseous service. New labels are restricted items which are not available except through certified hydrostatic test facilities.

When replacing cylinder valves or after the retesting of cylinders, make sure the proper cylinder valve, burst disc, and O-ring are installed prior to cylinder recharging. Establish the service pressure of the cylinder. Type 3 AA (steel) cylinders that bear a plus (+) sign after the latest retest date may be recharged to a pressure, i.e. a cylinder stamped 3AA2015 with a plus (+) sign after the test date

may be recharged to 2216psig. (this applies to steel cylinders only). Steel cylinders without the plus (+) sign stamped after the latest test date must be removed from service. All other cylinders which are not 3AA type shall be filled to the designated service pressure only (as found on the DOT approval or stamping). For cylinders manufactured under a U.S. DOT exemption (i.e., DOT-E-#####), the exemption should be consulted and is available from the Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, U.S. Department of Transportation, 400 7th Street, SW, Washington, D.C. 20590-0001.

Appropriately connect the cylinder to the filling system and refill. Terminate the filling when the pressure reaches the service pressure and allow the cylinder to cool to room temperature. If necessary, top-off the cylinder such that the service pressure is attained with the cylinder at a temperature of 70°F. Close the valves on the cylinder and the filling system and remove the cylinder. Apply a leak solution to determine if there is any leakage between the cylinder and the valve. If there is no leakage, the cylinder is ready for use.

STORAGE

Do not store the apparatus or spare cylinders within or near an area where the apparatus can or might be exposed to any substances that will or might attack any part of the apparatus, causing the apparatus NOT to perform as designed and approved.

⚠ WARNING

Be careful not to drop cylinder or bump valve knob. An unsecured cylinder can become an airborne projectile under its own pressure if the valve is opened even slightly. Failure to follow this warning can result in serious personal injury or death.

Do not store the alarms for extended periods with the batteries installed. Do not store the apparatus with an empty or partly filled cylinder. Always install a fully-charged cylinder so that the apparatus is ready for use. Complete Inspection and Cleaning and Disinfecting Procedures outlined in this manual. Ensure the complete apparatus is clean and dry. Ensure the facepiece head harness adjustment straps are fully extended. Place the complete apparatus in the storage case or suitable storage location so it can be easily reached for emergency use.

To store the NightFighter Heads-Up Display System components, be sure that the unit is in the OFF (LED is not illuminated) position. For prolonged storage, remove the batteries to prevent battery corrosion. Store units in a cool, dry place.

BATTERY REPLACEMENT

In continuous service, battery life will vary depending on user conditions. The battery is not rechargeable.

⚠ WARNING

Use only Duracell MN2400, Energizer E92 AAA alkaline batteries in the TRANSMITTER. Use of other batteries, or a combination of batteries from different manufacturers, will affect performance of the unit and will void the intrinsic safety approval. Failure to follow this warning can result in serious personal injury or death.

1. Unfasten the transmitter shroud strap(s).
2. Slide the shroud off the transmitter to expose the battery door screws.
3. Loosen the screws to open the battery door.
4. Insert two AAA batteries according to the battery orientation noted inside the compartment.
5. Close the battery door and tighten the screws.
6. Slide shroud cover and transmitter and fasten the strap(s).

⚠ WARNING

- **Use only Duracell MN1500 or Energizer E91 AA alkaline batteries in the NightFighter Heads-Up Display System RECEIVER. Use of other batteries, or a combination of batteries from different manufacturers, will affect performance of the unit and will void the intrinsic safety approval. Failure to follow this warning can result in serious personal injury or death.**
- **In older versions of the NightFighter RECEIVER containing AAA alkaline batteries use only Duracell MN2400, Energizer E92, or Eveready A92. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of the unit and will void the intrinsic safety approval.**
- **Use only Rayovac 824 LR03, Rayovac Ultrapro 4R03, Energizer E92, Energizer Industrial EN92, Duracell MN2400, or Duracell Pro Cell MN2400 alkaline batteries in the FireHawk M7 HUD. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of unit and void the Intrinsic Safety Approval.**

Failure to follow this warning can result in serious personal injury or death.

1. Loosen the screws to open the battery door in the receiver.
2. Insert two AA batteries according to the battery orientation notes inside the receiver compartment.
3. Ensure the battery cover gasket is free of debris and not damaged or missing.
4. Close the battery door and tighten the screws.

REMOVING THE air mask

Replacing the Batteries in the FireHawk M7 HUD

⚠ WARNING

Replace the batteries in the FireHawk M7 HUD when the low battery LED flashes. Use only recommended battery types. Change the batteries in a non-hazardous area only. Failure to follow this warning can result in serious personal injury or death.

1. Unthread the battery cap (counter-clockwise) on the FireHawk M7 HUD battery tube.
2. Remove the battery cartridge from the FireHawk M7 HUD.
3. Remove the batteries and discard.
4. Inspect the battery cartridge for signs of damage such as corrosion on the battery terminals or cracks in the cartridge. If the battery cartridge is damaged, replace the cartridge immediately.
5. Insert three AAA alkaline batteries in the appropriate locations on the cartridge. Follow the notations on the cartridge to ensure proper battery orientation.
6. Insert the battery cartridge into the battery tube on the FireHawk M7 HUD.
7. Before installing the battery cap, verify that the o-ring is in place and free of damage and debris. If the o-ring is missing or damaged, replace o-ring. Failure to do so may allow moisture or contaminants into the battery tube and cause the device to not function properly.
8. Thread the battery cap on to the battery tube of the FireHawk M7 HUD (clockwise). Hand-tighten cap until snug. Do not over-tighten battery cap.
9. As the battery cap makes contact with the battery cartridge, verify that the FireHawk M7 HUD display turns on and goes through its start up sequence before turning off. The yellow LED should not be flashing.

Battery Disposal/Recycling

Dispose of or recycle batteries in accordance with all applicable federal, state, and local regulations.

⚠ WARNING

Do not dispose of the battery in fire. It may explode. Failure to follow this warning can result in serious personal injury or death.

NOTES

COLD WEATHER OPERATION

SUGGESTED PROCEDURES FOR COLD WEATHER OPERATION

Moisture can cause problems in the air mask if it freezes. However, moisture can cause freezing problems even if the surrounding air is above freezing. This is due to air flowing from the cylinder through the regulator drops from cylinder pressure to close to atmospheric pressure very quickly. As it does so it expands, causing the air and the regulator to become colder. Although the surrounding temperature may be warmer than 32°F, the temperature inside the regulator may be lower. Any water inside could turn to ice and restrict airflow.

1. To keep moisture from entering the mask mounted regulator. Stow the regulator in the stand-by belt mount.
2. Use the neck strap. The neck strap keeps the facepiece upside down on the user's neck. Water does not collect in the facepiece. If not used correctly, the facepiece can act as a funnel, catching and directing water into the regulator.
3. When the air mask is away from heat, water spray can freeze on the regulator surface. Ice can build up and freeze the shut-off button, bypass valve, and the release tabs. Before entering or re-entering a hazardous atmosphere, make sure the shut-off button, release tabs, and bypass valve are ice-free and operating properly. Periodically, check the bypass to be sure it is ice-free.
4. Moisture can enter through the cylinder valve or coupling nut when cylinders are replaced on the air mask. When replacing cylinders, be careful to prevent moisture or contamination from entering the system. Remove any ice from these fittings. Wipe the coupling nut threads and cylinder valve threads dry before disconnecting the cylinder. Water can contaminate the system and freeze.
5. NIOSH certification requires a nosecup at temperatures below 32°F. The nosecup reduces lens fogging and must be used whenever freezing conditions are encountered.
6. During cleanup at the station, be careful to keep water from entering the facepiece or mask mounted regulator when washing fire trucks at the station.
7. Thoroughly dry the facepiece and mask mounted regulator after cleaning and disinfecting. Follow Confidence Plus® Cleaning Solution instructions.

NOTES

QUICK-FILL SYSTEM OPERATION

QUICK-FILL SYSTEM OPERATION

The Quick-Fill System may be used for transfill operations as described in this manual. Only qualified, trained personal Standard Operating Procedures should be developed for use of the Quick-Fill System, unless using a 3000psi apparatus. The 3000psi apparatus can not be used with Quick-Fill system.

⚠ WARNING

- **The 3000psi Air Mask is NOT compatible with a 2216psi air mask Cylinder.**
- **Do not use the Quick-Fill System with 3000psi Air Masks.**
- **Do not install a Quick-Fill System on a 3000psi Air Mask. This combination will not allow the relief valve in the 3000psi URC Assembly to open as designed.**
- **The Quick-Fill System is not to be used as a "Buddy Breather" such that two (2) users are sharing the air supplied by one (1) approved air mask cylinder simultaneously; doing so will void NIOSH approval.**

Failure to follow the above warnings can result in serious personal injury or death.

The Quick-Fill System must be used only by qualified, trained personnel who have carefully read and understood these instructions, cautions, and warnings. NIOSH approvals of air mask from MSA are maintained while transfilling air ONLY if appropriate Quick-Fill System hose assemblies from MSA are used. Quick-Fill System hose assemblies and fittings are rated for a maximum working pressure of 4500psig.

NIOSH approval is maintained only when using the following Hose Assemblies: 485331, 802687, 802688, 802689, 802690, and 48332, for filling cylinders in IDLH atmospheres.

⚠ WARNING

For transfilling operations using the Quick-Fill System, do not use any transfilling hose assembly or fittings other than those supplied by MSA specifically for the Quick-Fill System. Use of any other transfilling hose assembly and/or fitting can result in serious personal injury or death, and will void NIOSH approval.

⚠ WARNING

- **Do not Transfill (be a Donor) using a 3000psi URC Assembly. The 3000psi URC Assembly has a check valve that does not allow cylinders to Transfill (be a donor).**
- **Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly can not be used for filling a 3000psig cylinder.**
- **Do not lubricate the Quick-Fill fittings. Do not permit oil, grease, or other contaminants to come in contact with the Quick-Fill fittings. The Quick-Fill hose assemblies and fittings are designed to be used with Quality Verification Level (Grade) D or better air as defined by ANSI/CGA G-7.1.TRANSFILLING AIR FROM A SECONDARY AIR SOURCE.**

Failure to follow the above warnings can result in serious personal injury or death.

QUICK-FILL SYSTEM OPERATION

⚠ WARNING

- **Do not connect a Quick-Fill System equipped Low Pressure air mask to an unregulated secondary air source with a pressure greater than 2216psig. The Quick-Fill System equipped low pressure air mask is rated for a maximum working pressure of 2216psig. As an additional safety feature, the air mask has a pressure relief valve which automatically vents at 2525psig.**
- **Do not connect a High Pressure air mask to a secondary air source with a pressure greater than 4500psig. The high pressure air mask is rated for a maximum working pressure of 4500psig.**

Failure to follow the above warnings can result in serious personal injury or death.

PRECAUTIONS FOR USING QUICK-FILL SYSTEM

1. The Quick-Fill System can only be used to fill approved air mask cylinders.
2. The Quick-Fill System is not to be used as a "Buddy Breather" such that two (2) users are sharing the air supplied by one (1) air mask cylinder simultaneously doing so will void NIOSH approval.
3. The user is responsible for the air source, which must meet the requirements of Compressed Gas Association Specification ANSI/G-7.1, Quality Verification Level (Grade) D Gaseous Air or better, with a moisture dew point of not greater than -65°F (24ppm water vapor, normal). Pressures at the inlet of the Quick-Fill System hose must not exceed that of the air mask (2216psig or 4500psig).
4. Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly cannot be used for filling a 3000psig cylinder.
5. The user also is responsible for connecting the Quick-Fill hose to an appropriate secondary air source.
6. The cylinder must be inspected for damage before charging.
7. If filling cylinders in fresh air using the Quick-Fill System topping off the cylinder is recommended after the cylinder has cooled from initial fill. Topping off a cylinder after it has cooled will ensure proper service time.

FILLING INSTRUCTIONS FOR QUICK-FILL SYSTEM

A secondary air source stores compressed breathing air until needed to refill air mask air cylinders. When transfilling the secondary air supply pressure must be greater than the air mask cylinder pressure. Examples of air sources include: cascade air cylinder refilling systems; high pressure compressor systems with a fixed reservoir; or a portable air system such as MSA RescuAire System.

Order MSA P/N	Description
485391	Male stainless steel quick-disconnect with SAE-10 thread, complete with dust cover (for use as a fitting for customized refilling systems).
	25-FOOT QUICK-FILL HOSES Note: Female quick-disconnect fittings include dust covers.
485532	With two female quick-disconnects
487906	With a female quick-disconnect on one end and a SAE-4 fitting on the other.
487907	With a female quick-disconnect one end and a CGA-347 (4500 psig) outlet on the other.
487908	With a female quick-disconnect on one end and a CGA-346 (2216 psig) outlet on the other.
487909	With a female quick-disconnect on one end and a CGA-347 (4500 psig) coupling nut on the other.
487910	With a female quick-connect on one end and a CGA-346 (2216 psig) coupling nut on the other.

1. To connect the quick-fill hose to the secondary air supply.
   a. Turn the air supply on.

⚠ CAUTION

If there are leaks from either female fitting, or along the hose, depressurize the hose and correct the problem. Such leakage can result in increased fill time.

2. Attach the quick-fill hose to the shoulder mounted quick-fill fitting.
   a. Remove the rubber dust cap from the male quick-fill fitting. Be sure that the cylinder valve is fully opened.
   b. Remove the rubber dust cap from the female fitting on the quick-fill hose.
   c. Push the female fitting of the hose onto the male quick-fill fitting until it snaps in place. Pull on the hose to be sure the connection is secure. Filling

immediately begins when the female fitting fully engages with the male fitting.

d. After approximately 45-60 seconds, the pressure between the secondary air supply and the air mask cylinder will be equal.

Note: If the secondary air supply does not have a sufficient volume of air, the air mask cylinder will not reach maximum service pressure.

3. Compare the cylinder pressure gauge or FireHawk M7 Control Module reading to the secondary air supply pressure gauge reading. If the readings are the same, pressure is equal.
4. To disconnect the quick-fill hose after transfilling, pull the gray sleeve back. The hose fitting and the male fitting will separate. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
5. Immediately install the dust cover on the male fitting.
6. The air mask cylinder is ready for service if the cylinder pressure gauge needle is on the corresponding color band.

Note: If the secondary air source does not have a sufficient volume of air, the air mask cylinder will not reach full service pressure. After approximately 45-60 seconds, pressure between the secondary air source and the air mask cylinder will be equal.

⚠ CAUTION

Cylinder temperature will increase by approximately 45°F. The pressure gauge may show FULL immediately after transfilling, but cylinder pressure may decrease by as much as 190psig after the cylinder cools to room temperature. Actual service time may be reduced accordingly.

3. Compare the air mask pressure gauge or ICM Unit reading to the secondary air source pressure gauge reading. If the readings are the same, pressure is equal.
4. To disconnect the Quick-Fill System hose after transfilling, pull the gray sleeve back. The hose fitting and the male fitting will separate. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
5. Immediately install the dust cover on the male fitting.
6. The air mask cylinder is ready for service if the cylinder pressure gauge is on the corresponding color band.

TRANSFILLING BETWEEN AIR MASKS FROM MSA (EMERGENCY BREATHING SYSTEM)

Note: The air mask with the higher pressure reading is the donor. The air mask with the lower pressure is the receiver. Transfilling between users of air mask should be performed only during life-threatening emergencies or simulated training exercises. Both donor and receiver must return to fresh air immediately following the procedure.

⚠ WARNING

Do not transfill if the donor's audible alarm is ringing or NightFighter Heads-Up Display /ICM Unit Gauge are flashing. Failure to follow this warning can result in shorter escape time to return to fresh air, causing serious personal injury or death.

The audible alarm begins ringing and NightFighter Heads-Up Display begins flashing to indicate that the pressure in the cylinder has been reduced to 25% of its rated working pressure. Remaining service time must be used for escape to fresh air. If the donor's audible alarm begins ringing or NightFighter Heads-Up Display /ICM Unit Gauge begins flashing during transfilling, the donor should disconnect and preserve his escape time.

1. If the donor's alarm is not ringing or NightFighter Heads-Up Display /ICM Unit Gauge are not flashing and you have sufficient air to transfill air to a receiver, (greater than1000psig for Low Pressure air mask and greater than 2000psig for High Pressure air mask), follow these steps.
   a. Remove the 3 foot emergency transfill hose from its protective pouch.
   b. Remove the rubber dust cover from both female fittings on the Quick-Fill System hose assembly.
   c. Remove the rubber dust cover from the male Quick-Fill System fitting.
   d. Push the female fittings on to the male fittings until they click in place. Pull on the hose to be sure it snapped in place.

⚠ WARNING

If serious leakage is noticed from either of the two female fittings, or anywhere along the hose, disconnect the female fittings and return to fresh air immediately. Failure to follow this warning can result in serious personal injury or death.

   e. After approximately 30-60 seconds, pressure between the air mask cylinders will be equal.
   f. Disconnect the Quick-Fill System hose from the air mask by pulling the gray sleeve back on both ends. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
   g. Immediately install the dust cover on the Quick-Fill System male fitting. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal.

QUICK-FILL SYSTEM OPERATION

QUICK-FILL FITTING LEAKAGE

1. When transfilling in fresh air and the dust cover will not stay on the male fitting because air is leaking, correct the condition before using the air mask.
2. When transfilling in a contaminated atmosphere and the dust cover will not stay on the male fitting because air is leaking:
   a. Immediately reconnect the quick-fill hose to seal off the leak and return to fresh air.
   b. If the hose will not reconnect, reach behind and close the cylinder valve. Air pressure in the regulator will drop, and the leak will slow down.
   c. Quickly replace the protective dust cap on the male fitting. This will form a redundant seal.
   d. Open the cylinder valve and return to fresh air immediately. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal.

QUICK-FILL SYSTEM HOSE STORAGE

1. Preparing the Quick-Fill System hose for storage:
   a. Press in on the center of the quick-disconnect dust cap to release any pressure in the quick-fill hose.
   b. Roll up the hose and place it in its protective pouch.

URC ASSEMBLY OPERATION

URC ASSEMBLY OPERATION

The URC (Universal Rescue Connection) Assembly is a male quick-fill inlet for use by Rapid Intervention Crews for emergency filling operations. The system also includes an automatically resetting pressure relief valve. The air mask can also be equipped with a shoulder mounted quick-fill system, unless using a 3000psi URC Assembly, the 3000psi URC Assembly can not be used with Quick-Fill System.

⚠ WARNING

- **The URC Assembly is not to be used as a "Buddy Breather" such that two (2) users are sharing the air supplied by one (1) approved air mask cylinder simultaneously; doing so will void NIOSH approval. Failure to follow the above warnings can result in serious personal injury or death.**
- **The URC Assembly must be used by trained Rapid Intervention Crews only using procedures developed for rapid intervention.**

Failure to follow the above warnings can result in serious personal injury or death.

Note: The URC Assembly may be used for transfill operations as described in this manual. Standard operating procedures should be developed for use of the URC Assembly or Quick Fill System.

⚠ WARNING

Do not install a Quick-Fill System and 3000psi URC assembly on the same air mask. Combining these assemblies on the same air mask will not allow the relief valve in the 3000psi URC Assembly to open as designed. Failure to follow this warning can result in serious personal injury or death.

The URC Assembly must be used only by qualified, trained personnel who have carefully read and understood these instructions, cautions, and warnings. NIOSH approvals of air mask from MSA are maintained while transfilling air ONLY if appropriate Quick-Fill hose assemblies from MSA are used. URC Assembly or Quick-Fill hose assemblies and fittings are rated for a maximum working pressure of 4500psig.

NIOSH approval is maintained only when using the following Hose Assemblies:
485331, 802687, 802688, 802689, 802690, and 48332, for filling cylinders in IDLH atmospheres.

⚠ WARNING

- **Do not Transfill (be a Donor) using a 3000psi URC Assembly. The 3000psi URC Assembly has a check valve that does not allow cylinders to Transfill (be a donor). Failure to follow this warning can result in serious personal injury or death.**
- **Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly can not be used for filling a 3000psig cylinder.**
- **Do not lubricate the URC Assembly fittings. Do not permit oil, grease, or other contaminants to come in contact with the Quick-Fill fittings. The Quick-Fill hose assemblies and fittings are designed to be used with Quality Verification Level (Grade) D or better air as defined by ANSI/CGA G-7.1.TRANSFILLING AIR FROM A SECONDARY AIR SOURCE.**

Failure to follow the above warnings can result in serious personal injury or death.

⚠ WARNING

For Filling Operations using the URC Assembly, do not use any transfilling hose assembly or fittings other than those supplied by MSA specifically for the URC Assembly or Quick-Fill System. Use of any other transfilling hose assembly, fitting, or cylinder can result in serious personal injury or death, and will void NIOSH approval.

⚠ WARNING

Do not connect a High Pressure air mask to a secondary air source with a pressure greater than 4500psig. The high pressure air mask is rated for a maximum working pressure of 4500psig. Failure to follow the above warnings can result in serious personal injury or death.

PRECAUTIONS FOR USING URC ASSEMBLY

1. The URC Assembly can only be used to fill approved air mask cylinders.
2. The URC Assembly is not to be used as a "Buddy Breather" such that two (2) users are sharing the air supplied by one (1) air mask cylinder simultaneously doing so will void NIOSH approval.
3. The user is responsible for the air source, which must meet the requirements of Compressed Gas Association Specification ANSI/G-7.1, Quality Verification Level (Grade) D Gaseous Air or better, with a moisture dew point of not greater than -65°F (24ppm water vapor, normal). Pressures at the inlet of

the Quick-Fill System hose must not exceed that of the air mask (2216psig or 4500psig).
4. Using the 3000psi URC Assembly to fill cylinders, the cylinder can only be filled to 2216psig. If the pressure exceeds 2216psig a relief valve in the URC Assembly will vent at approximately 2525psig. or as low as 2400psig. A 3000psig cylinder can only be filled to 3000psig by using a secondary air source; the 3000psi URC Assembly can not be used for filling a 3000psig cylinder.
5. The user also is responsible for connecting the Quick-Fill hose to an appropriate secondary air source.
6. The cylinder must be inspected for damage before charging.
7. If filling cylinders in fresh air using the URC Assembly topping off the cylinder is recommended after the cylinder has cooled from initial fill. Topping off a cylinder after it has cooled will ensure proper service time.

FILLING INSTRUCTIONS FOR USING THE URC ASSEMBLY

A secondary air supply stores compressed breathing air until needed to refill air mask air cylinders. When transfilling, the secondary air supply pressure must be greater than air mask cylinder pressure. Examples of air supplies include: cascade air cylinder refilling systems; high pressure compressor systems with a fixed reservoir; or a portable air system such as the RescueAire™ System.

⚠ WARNING

DO NOT connect a high pressure air mask to a secondary air supply with a pressure greater than 4500 psi. The high pressure air mask is rated for a maximum working pressure of 4500 psi. Failure to follow the above warnings can result in serious personal injury or death.

Note: Rapid Intervention Crews should use a separate air supply such as MSA's RescueAire portable air supply system to fill the air mask in an IDLH atmosphere.

1. Connect the quick-fill hose to the secondary air supply.
   a. Turn the air supply on.

⚠ CAUTION

If there are leaks from either female fitting, or along the hose, depressurize the hose and correct the problem. Such leakage can result in increased fill time.

2. Attach the quick-fill hose to the URC Assembly.
   a. Remove the rubber dust cap from the male inlet fitting on the URC Assembly. Be sure that the cylinder valve is fully opened.
   b. Remove the rubber dust cap from the female fitting on the quick-fill hose.
   c. Push the female fitting of the hose onto the male fitting of the URC Assembly until it snaps in place. Pull on the hose to be sure the connection is secure. Filling immediately begins when the female fitting fully engages with the URC Assembly.
   d. After approximately 45-60 seconds, the pressure between the secondary air supply and the air mask cylinder will be equal.

⚠ WARNING

If serious leakage is noticed from either of the two female fittings, or anywhere along the hose, disconnect the female fittings and return to fresh air immediately. Failure to follow this warning can result in serious personal injury or death.

Note: If the secondary air supply does not have a sufficient volume of air, the air mask cylinder will not reach full service pressure.

3. Compare the cylinder pressure gauge or the FireHawk M7 Control Module reading to the secondary air supply pressure gauge reading. If the readings are the same, pressure is equal.
4. To disconnect the quick-fill hose after transfilling, pull the gray sleeve back. The hose fitting and the URC Assembly will separate. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
5. Immediately install the dust cover on the URC Assembly.
6. The air mask cylinder is ready for service if the cylinder pressure gauge needle is on the appropriate color band.

TRANSFILLING BETWEEN AIR MASKS

Note: The air mask with the higher pressure reading is the donor. The air mask with the lower pressure is the receiver. Transfilling between users of air mask should be performed only during life-threatening emergencies or simulated training exercises. Both donor and receiver must return to fresh air immediately following the procedure.

The audible alarm begins ringing and heads-up display system begins flashing to indicate that the pressure in the cylinder has been reduced to 25% of its rated working pressure. Remaining service time must be used for escape to fresh air. If the donor's audible alarm begins ringing or Heads-Up Display System beginsflashing during transfilling, the donor should disconnect and preserve his escape time.

URC ASSEMBLY OPERATION

1. If the donor's alarm is not ringing and FireHawk M7 HUD/FireHawk M7 Control Module are not flashing and you have sufficient air to transfill to a receiver, (greater than 1000 psi for 2216 psi air masks and greater than 2000 psi for 4500 psi air masks), follow these steps.
   a. Remove the 3 foot emergency transfill hose from its protective pouch.
   b. Remove the rubber dust cover from both female fittings on the transfill hose assembly.
   c. Remove the rubber dust cover from the URC fitting.
   d. Push the female fittings on to the male fittings until they click in place. Pull on the hose to be sure it snapped in place.
   e. After approximately 45-60 seconds, pressure between the air mask cylinders will be equal.
   f. Disconnect the transfill hose from the air mask by pulling the gray sleeve back on both ends. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
   g. Immediately install the dust cover on the URC fitting. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal.

⚠ WARNING

If serious leakage is noticed from either of the two female fittings, or anywhere along the hose, disconnect the female fittings and return to fresh air immediately. Failure to follow this warning can result in serious personal injury or death.

URC ASSEMBLY LEAKAGE

1. When transfilling in fresh air and the dust cover will not stay on the male fitting because air is leaking, correct the condition before using the air mask.
2. When transfilling in a contaminated atmosphere and the dust cover will not stay on the male fitting because air is leaking:
   a. Immediately reconnect the quick-fill hose to seal off the leak and return to fresh air.
   b. If the hose will not reconnect, reach behind and close the cylinder valve. Air pressure in the regulator will drop, and the leak will slow down.
   c. Quickly replace the protective dust cap on the male fitting. This will form a redundant seal.
   d. Open the cylinder valve and return to fresh air immediately. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal.

NOTES

CLEANING AND DISINFECTING

CLEANING AND DISINFECTING

Depending on the cleaning policy adopted, either a designated person or the user should clean each device after each use. ANSI standards suggest that users should be trained in the cleaning procedure. Confidence Plus Cleaning Solution (P/N 10009971) from MSA is recommended. It cleans and disinfects in one operation. It retains its germicidal efficiency in hard water to inhibit the growth of bacteria. It will not deteriorate rubber, plastic, glass, or metal parts. Refer to label for user instructions.

⚠ CAUTION

DO NOT use any cleaning substances that can or might attack any part of the apparatus.

⚠ CAUTION

Alcohol should not be used as a germicide because it may deteriorate rubber parts.

⚠ CAUTION

If not rinsed thoroughly, cleaning agent residue may irritate the wearer's skin.

1. Preparing Solution
   a. Follow the instructions with the Confidence Plus Cleaning Solution.
   b. If the Confidence Plus Cleaning Solution is not used, wash in a mild cleaning solution, rinse thoroughly, and submerge in a germicide solution for the manufacturer's recommended time.
2. Clean and Disinfect the Facepiece
   a. Remove the mask mounted regulator from the facepiece.
   b. Unthread the thumb screw of NightFighter Heads-Up Display System receiver and slide the receiver from facepiece bracket.
   c. Thoroughly wash the facepiece (and nosecup) in the cleaning solution. A soft brush or sponge can be used to clean the soiled facepiece.
   d. Rinse the facepiece and components in clean, warm (110°F) water (preferably running and drained).
   e. Clean the pressure-demand exhalation valve by pressing in on the stem with a blunt object and flushing with clean water.
   f. Allow the facepiece to air dry. Do not dry the parts by placing them near a heater or in direct sunlight. The rubber will deteriorate.
   g. Operate the exhalation valve by hand to be sure it works properly.

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.

3. In general, only the facepiece requires cleaning and disinfecting after each use. If the apparatus is soiled (i.e. heavy smoke residue or dirt accumulation) use a sponge damp with mild soap solution or use a soft/medium bristle brush to remove deposits that may interfere with normal operation of:
   a. Harness (straps and buckles)
   b. Cylinder carrier (band and latch assembly)
   c. Cylinder (handwheel, gauge, outlet connection)
   d. Audi-Larm Alarm with URC Assembly (bell or coupling nut connection)
   e. NightFighter Heads-Up Display System/Pressure Gauge/ICM Unit Gauge
   f. MMR remote gauge lens
   g. First stage regulator
   h. MMR second stage regulator. Cover outlet of the MMR second stage regulator to prevent water, dirt, or debris from entering.
4. Inspect the entire apparatus as you re-assemble it. Follow the Inspection Instructions.
5. Re-attach NightFighter Heads-Up Display System Receiver
   a. Slide receiver onto facepiece bracket.
   b. Finger-tighten thumb screw.
6. Thoroughly dry the facepiece and regulator after cleaning and disinfecting. The facepiece can trap water, which could enter the regulator.

NOTES

INSPECTION

Inspect the entire air mask after it is cleaned and disinfected. NFPA-1500, as well as 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 Users Maintenance Instructions. (P/N 10024089)

⚠ WARNING

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

⚠ WARNING

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

COMPONENT INSPECTION (AFTER EACH USE AND MONTHLY)

1. Don the air mask following the instruction procedures. These steps make up the Air Mask Functional Test.
2. If all steps are performed successfully, remove the air mask 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 or straps. Check the straps 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. Also check to be sure the spider gasket and valve disc are present.
   f. Inspect the NightFighter Heads-Up Display System receiver module. Look for cracks or other signs of damage which could allow contaminants to enter the module housing.
   g. Inspect the facepiece rubber behind the NightFighter Heads-Up Display System or Clear Command bracket for holes or tears.
4. Cylinder Gauges
   a. Be sure you can see both gauge needles and face clearly through the lens. Also be sure the gauge stem is not bent.
   b. Inspect the gauge hose for any visible damage.
5. Audible Alarm with URC Assembly/NightFighter Heads-Up Display System/ICM Unit Gauge
   a. Check that the alarm rings briefly and the NightFighter Heads-Up Display System flashes or ICM Unit Gauge tones when the cylinder valve is opened. This test assures that the alarms are operating.
   b. Check that the bell is in the proper alignment and on tightly.
   c. If the bell is loose, remove the alarm from service.
   d. Unscrew the Audi-Larm Alarm with URC Assembly coupling nut from the cylinder valve. Inspect the coupling nut for thread damage. Also be sure there is an O-ring, and that it is not damaged. Replace the insert O-ring if it is damaged.
   e. Check Audi-Larm Alarm with URC Assembly and URC Assembly relief valve for any damage.
   f. Check relief valve label for damage. Check for missing or lose label. Ensure that relief valve ports are showing. If any damage, remove air mask from service and replace relief valve.
6. High Pressure Hose
   Check the high pressure hose between the alarm and the first stage regulator. Look for cuts or severe abrasions. If present, replace the hose. The hose fitting should be tight.
7. Quick-Connect Second Stage Intermediate Hose.
   Inspect rubber washer for deterioration, dirt, cracks, tears, or tackiness.
8. Cylinder
   Breathing apparatus cylinders should be recharged as soon as possible after use. Cylinders should not be stored partially charged for two reasons:
   - If used without recharge, the service life of the apparatus is reduced.
   - The cylinder burst disc vents excess pressure if a full cylinder is over exposed to fire or heat. If the cylinder is not full, it may be damaged before the burst disc vents.

It is also essential that the required inspections and tests be performed on all air mask cylinders in accordance with Department of Transportation (DOT) regulations. DOT regulations require that composite cylinders be retired from service after the fifteenth year. Please note this does not include cylinder valve assembly which may be reused. Steel and aluminum cylinder service life is indefinite if proper inspection and hydrotest procedures are followed and they indicate that the cylinder may remain in service. Please contact your MSA distributor or sales associate if you have questions or if you need additional information regarding this policy.

Note: ANSI Z88.5 recommends checking cylinder pressure weekly. For maximum safety the cylinders should be stored full or empty (pressure above ambient but less than 100psig).

a. If the cylinder is less than FULL, recharge it before storing it. Cylinder air must be at least CGA Quality Verification Level (Grade) D respirable air.
b. Inspect the cylinder valve for signs of damage. The valve may be opened slightly to be sure it operates properly. Be sure to fully close the valve.
c. Inspect the cylinder body for cracks, dents, weakened areas, corrosive agents causing the fibers to break or peel, or signs of heat-related damage. If the cylinder is damaged return it to an MSA Service Center. Call 1-800-MSA-2222 for instructions.
d. Check the hydrostatic test date on the cylinder approval sticker located on the cylinder neck. Composite cylinders must be tested every three years. Stealth cylinders (carbon) must be tested every five years. Steel cylinders must be tested every five years.

9. Harness
   a. Inspect all harness components for cuts, tears, abrasions, or signs of heat or chemical-related damage.
   b. Check that the tee nuts, washers, and screws, if any, are secure.
10. Carrier
    a. Inspect the cylinder band and latch to be sure it holds the cylinder securely. Operate the latch wing to be sure that it opens and closes properly and that it holds the cylinder securely If the cylinder band and latch is locked, the latch wing should not turn.
    b. Inspect back plate for cracks, weakened areas or signs of heat or chemically related damages.
11. PR14 First Stage Regulator
    a. Inspect the regulator mounting bracket for cracks, weakened areas, or signs of heat or chemical-related damage.
    b. Inspect the regulator mounting bracket screws to verify that they are secure.
    c. Inspect the regulator mounting bracket to verify that it holds the regulator securely.
    d. Inspect the regulator seal ring to verify that it is present and properly seated. Inspect the seal ring for rubber deterioration, dirt, cracks, tears, holes, or tackiness.
    e. Inspect the pressure relief valve. Verify that the relief holes are clear and free of debris or other contamination. Verify that the pressure relief valve is properly secured.
    f. Inspect the hose connections. Verify that the hoses are properly secured.
12. Record Keeping
    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 breathing apparatus is stored in a ready position.

FUNCTIONAL TESTS

FUNCTIONAL CHECKS
(AFTER EACH USE AND MONTHLY)

1. Check that the regulator and facepiece can hold a negative pressure.
   a. Close the cylinder valve.
   b. Hold the facepiece against your face to create an effective seal.
   c. Attach the regulator to the facepiece and inhale until the facepiece begins to collapse against your face. Hold your breath for about 10 seconds. The negative pressure should be maintained and the facepiece should remain collapsed against your face for the entire 10 seconds.
   d. Do not use the apparatus if negative pressure cannot be maintained in the facepiece. Return the regulator and facepiece to a certified repairperson.
2. Check second stage regulator operation.
   a. Push the regulator release buttons.
   b. Verify that the regulator bypass knob is fully closed (clockwise).
   c. Slowly open the cylinder valve to pressurize the air mask. Verify that the cylinder valve is completely opened.
   d. Check the pressure gauge to verify that the cylinder is full. Regulator functional checks must be conducted with a full cylinder.
   e. Open the regulator bypass knob (counter-clockwise). Verify that air flows from the regulator. Close the bypass knob (clockwise).
   f. Attach the regulator to the facepiece. Verify proper regulator attachment by pulling on the regulator.
   g. Don the facepiece or hold the facepiece against your face to create an effective seal.
   h. Inhale sharply to start air flow. Breathe normally. Verify proper regulator response. The regulator should not make any unusual sounds including: whistling, chattering, or popping.
   i. Remove the facepiece from the face. Verify that air flows freely. Push the regulator release buttons. Verify that air flow stops.
   j. If the regulator fails to meet any of the above checks, remove the apparatus from service. Return the regulator to a certified repairperson.
3. NightFighter Heads-Up Display System and Audible Alarm with URC Assembly
   a. MSA recommends that the function of the Audi-Larm Alarm with URC Assembly, ICM Unit and NightFighter Heads-Up Display System warning device be checked by observing the Pressure Gauge or ICM Unit Gauge at which the alarms ring and tone. This test should be performed with a minimum cylinder pressure of 1,200psig for the Low Pressure air mask, 1800psig for 3000psi system and 2,000psig for the High Pressure air mask.
   b. Pressurize the system by opening the cylinder valve for a moment and then closing it. The alarms should ring or tone, indicating they are cocked and armed.
   c. Open bypass slowly.
   d. Watch the drop in pressure on the Pressure Gauge or ICM Unit gauge and the point at which the Audi-Larm Alarm with URC Assembly begins to ring and the NightFighter Heads-Up Display System Receiver begins to flash. Nominal gauge readings at which the alarm should start to ring and tone or flash are listed below.
      530psig-approximately (low pressure system)
      750psig-approximately (3000psi system)
      1175psig-approximately (high pressure system)
   e. The alarms should continue until the air pressure is approximately 200psig or less. If the Audi-Larm Alarm with URC Assembly, ICM Unit Gauge or NightFighter Heads-Up Display System does not function properly, the apparatus must be removed from service.
4. Audi-Larm Alarm with URC Assembly Body
   a. Check that the bell is on tightly and is in the proper alignment.
   b. Check URC Assembly and relief valve for damage or leaks.
   c. Close the cylinder valve completely. Be sure that nothing blocks the regulator outlet.

⚠ WARNING

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the regulator gauge. Release all pressure from the regulator by opening the bypass valve. Removing the coupling nut with the regulator pressurized can result in serious personal injury, death, or damage to equipment.

   d. Open the bypass valve slowly to release trapped air. Close bypass valve.
   e. Unscrew the Audi-Larm coupling nut from the cylinder valve. It is hand-tight and should not require tools.
   f. Inspect the coupling nut for thread damage. Also be sure there is an O-ring and that it is not damaged.
   g. Replace the O-ring if it is damaged.
   h. Reconnect the Audi-Larm coupling nut. Ensure that the Audi-Larm coupling nut is hand-tight (no-tools).

⚠ WARNING

DO NOT use an air mask with a loose Audi-Larm coupling nut. Using an air mask with a loose coupling nut can cause o-ring failure which can result in sudden loss of cylinder pressure. Always hand-tighten the coupling nut before using the air mask. Failure to follow this warning can result in serious personal injury or death.

5. Inspect the Quick-Fill and/or URC fitting for tightness. Perform this inspection on a monthly basis.

- Close the air mask cylinder valve and relieve the pressure from the regulator.
- Use a fine-tip ink marker and a ruler or straight edge

to draw a line on the male coupling. The line should extend across the joint (indicated by the arrow) and across the hex flats of the coupling and onto the adjacent air mask housing.

- Attach the dust cover to the coupling.
- Grasp the dust cover by hand and using maximum effort attempt to loosen the coupling at the joint by turning the dust cover counterclockwise. Do not use tools.

- If the line drawn on the coupling lines up, the coupling is sufficiently tight and the air mask may be returned to service.

- If the coupling loosens or if the line does not line up across the joint (indicated by the arrow)…

- …or at the joint where the coupling attaches to the air mask, remove the air mask from service until a replacement coupling is installed.

FLOW TEST AND OVERHAUL REQUIREMENTS

FLOW TEST AND OVERHAUL REQUIREMENTS

Your air mask Regulator and Audi-Larm Alarm Assembly must be flow tested and overhauled at specific time intervals. These Maintenance Procedures must be performed by a trained repairperson or at a Certified Service Center. Contact your MSA sales representative or call the MSA Customer Service Center at 1-877-MSA-3473. They will supply the information you need to meet these requirements.

Annual flow tests are stated as a requirement in NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (air mask), 2002 Edition*, which further emphasizes their importance. Although this standard relates to air mask used in the fire service, MSA requires that a flow test be performed at least annually on all fire service and non-fire service air mask and combination respirators that use a pressure demand regulator.

The required replacement/overhaul schedule for self-contained breathing apparatus from MSA is based on apparatus usage on an individual basis. The frequency required for air mask overhaul depends upon how often the apparatus is used. MSA breathing apparatus must be overhauled based on the actual level of usage of the air mask, rather than on time alone.

Overhaul is covered in the Regulator and Audi-Larm Disassembly and Repair sections and includes installation of the Regulator and Audi-Larm overhaul kits. MSA breathing apparatus must be flow tested every year using an MSA approved flow test device. The following table summarizes MSA's required frequency for overhaul and flow testing:

Average air mask Usage	CBRN Firehawk Overhaul Frequency	Regulators and Audi-Larm Overhaul Frequency	Flow Test Frequency
1 cylinder per day or greater	Every 1 year	Every 3 years	Every year
1 cylinder every other day	Every 3 years	Every 8 years	Every year
1 cylinder per week or less	Every 10 years	Every 15 years	Every year

A decision to retire apparatus should be based on a air mask's performance data and whether that data meets the specified level of performance as defined in maintenance requirements from MSA.

*The unit of air mask use is defined as the consumption of one 30 min. cylinder of air. Example: If three cylinders of air are used, the air mask would be considered to have been used three times.

If an assessment of the air mask's usage can not be estimated or determined, then the air mask shall be overhauled every three years.

Mine Safety Appliances Company

SCBA Lifetime Warranty
and Terms of Sale

1. **Express Warranty**—Air Masks and/or components furnished under this order carry a Lifetime Warranty against material defects and/or faulty workmanship, with the exception of those components specifically identified herein. MSA shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from abuse, misuse, or normal wear and tear of the product. No agent, employee or representative of MSA may bind MSA to any affirmation, representation or modification of the warranty concerning the goods sold under this contract. MSA makes no warranty concerning components or accessories not manufactured by MSA, but will pass on to the Purchaser all warranties of manufacturers of such components. *THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTEES, EXPRESS, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF: MSA SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.*

Product Description	Warranty Period	Routine Air Mask Maintenance
Air Mask (less Cylinder)	Lifetime	MSA requires that the air mask be maintained as specified in the Operations and Instructions Manual; however, the warranty coverage is for material defects and/or faulty workmanship only, and is not dependent on performing routine maintenance. The material and labor costs of overhaul procedures and other routine maintenance are the responsibility of the purchaser and are not covered by the warranty.
Air Mask Cylinder	Until end of service life as controlled by gov't. reg/DOT	
Air Mask Replacement Parts	Lifetime	
Air Mask Critical Repair Parts	Lifetime	

2. **Exceptions**—The products below are excluded from MSA's Lifetime Warranty:

Product Description	Exception	Warranty Period
Facemask Blank, Breathing Tube, Harness, & Nose Cup	Rubber Product	5 Year Limited/Age Deterioration
Electronic Speech Communication	Manufacturer's Warranty	1 Year
Redundant Alarm		
DragonFly™ Pass		
NightFighter™ Heads-Up Display System	MSA Limited Warranty	
ICM® Unit 2000 & ICM® Unit 2000 Plus	MSA Limited Warranty	2 Years
Non-Rechargeable Batteries	Expendable and/or Consumable Parts	N/A

3. **Exclusive Remedy**—It is expressly agreed that the Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of MSA, or for any other cause of action, shall be the repair and/or replacement, at MSA's option, of any equipment or parts thereof, that after examination by MSA are proven to be defective. Replacement equipment and/or parts will be provided at no cost to the Purchaser, F.O.B. Purchaser's named place of destination. Failure of MSA to successfully repair any nonconforming product shall not cause the remedy established hereby to fail of its essential purpose.

4. **Exclusion of Consequential Damages**—Purchaser specifically understands and agrees that under no circumstances will MSA be liable to Purchaser for economic, special, incidental, or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of the non-operation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct or any other cause of action against MSA.

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NOTES

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MSA
The Safety Company

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