



BREATHING APPARATUS

SAN FRANCISCO FIRE DEPARTMENT

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Breathing Apparatus
February 2014

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FOREWORD

The goal of this manual is to establish standard operating practices as authorized by the Chief of Department and implemented by the Division of Training.

The purpose of this manual is to provide all members with the essential information necessary to fulfill the duties of their positions, and to provide a standard text whereby company officers can:

- Enforce standard drill guidelines authorized as a basis of operation for all companies.
- Align company drills to standards as adopted by the Division of Training.
- Maintain a high degree of proficiency, both personally and among their subordinates.

All manuals shall be kept up to date so that all officers may use the material contained in the various manuals to meet the requirements of their responsibility.

Conditions will develop in fire fighting situations where standard methods of operation will not be applicable. Therefore, nothing contained in these manuals shall be interpreted as an obstacle to the experience, initiative, and ingenuity of officers in overcoming the complexities that exist under actual fire ground conditions.

To maintain the intent of standard guidelines and practices, no correction, modification, expansion, or other revision of this manual shall be made unless authorized by the Chief of Department. Suggestions for correction, modification or expansion of this manual shall be submitted to the Division of Training. Suggestions will be given due consideration, and if adopted, notice of their adoption and copies of the changes made will be made available to all members by the Division of Training.

Joanne Hayes-White
Chief of Department

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SECTION 1. INTRODUCTION

A self-contained breathing apparatus (SCBA), sometimes referred to as an air pack, a “Scott,” or a “BA” (breathing apparatus) is a device worn by firefighters to provide respiratory protection against inhalation hazards.

Respiratory hazards associated with fires include oxygen-deficient atmospheres, super-heated air and steam, smoke, and the gaseous and toxic byproducts of combustion (e.g., carbon monoxide, hydrogen cyanide, carbon dioxide, formaldehyde, benzene, etc.). Respiratory hazards are also present at non-fire incidents, including, but not limited to, HazMat incidents, confined space incidents, and biological/medical pathogen release incidents.

All of these incidents have one thing in common: they produce an atmosphere that is considered to be immediately dangerous to life and health (IDLH). As defined by the Occupational Safety and Health Administration (OSHA), IDLH means “an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.” The current NIOSH definition of an IDLH atmosphere is one that “poses a threat of exposure to airborne contaminants... that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.”

SCBAs provide the wearer with clean, breathable air. The sealed face-piece helps keep out toxic gases as well as prevent thermal injury that can be caused by inhaling superheated air, especially moist superheated air, at a fire. When used properly, SCBAs enable firefighters to perform their fire suppression and rescue duties with greater safety.

While SCBAs can provide excellent respiratory protection from the hazards described above, it is important to note that SCBAs have limitations. Therefore, an SCBA will not protect the wearer from all toxic materials. HazMat incidents can release substances that can be toxic to firefighters in full structural protective wear.

Additionally, it is not always obvious at the scene of an emergency that the environment is hazardous. Many chemicals can do tremendous harm long before you detect their presence. Most gaseous toxicants are invisible, odorless and tasteless, and they remain in the air long after a fire has gone out and crews have begun overhaul. It is essential that the wearer keep the face-piece donned until an area has been properly ventilated and monitored for safe, breathable air. Remember the three small words that might mean a big difference in your life—LEAVE IT ON!

SECTION 1. INTRODUCTION

Members shall be on air before entering or encountering any IDLH environment. Operating at fires or in confined spaces without respiratory protection is not only foolish, but also is a violation of the Department Rules and Regulations.

Department members shall be thoroughly trained and regularly evaluated on the use and care of the SCBA. Only through training and practice will firefighters become proficient in SCBA use and know what to do in the unlikely event of an SCBA malfunction.

Members, Company Officers, Safety Officers, and Chief Officers shall be responsible for compliance with all rules governing the use of breathing apparatus.

AIR MANAGEMENT ON THE FIRE GROUND

The Rule of Air Management says, “Know how much air you have in your SCBA, and manage that air so that you leave the hazardous environment before your low-air warning alarm activates.”

The Point of No Return

According to NFPA 1404, Standard for Fire Service Respiratory Protection Training, every firefighter needs to understand the concept of the “point of no return.” The point of no return is that point where you’ve pushed into a hazardous environment so far that you cannot safely exit. It is the point where your crew stops being part of the solution and becomes part of the problem. It is imperative that crews remain oriented and know how far they have gone into a hazardous environment and remain aware of the time it has taken them to get there.

There are many factors that affect the point of no return:

- Location and accessibility of entry point
- Size of building, obstructions, other means of egress, etc.
- Physical condition of firefighter
- Type of work being performed

Air Supply Checks

Firefighters need to know the amount of their air supply upon entering an IDLH environment, and they need to check their air supply at reasonable and regular intervals as they proceed. Ideally, air supply checks should be made every five minutes; however, it is often difficult to track time during physically demanding emergency operations. Make air checks a natural habit by checking the remote gauge or heads up display at easy-to-remember intervals, such as:

- Before entry into any IDLH environment
- After/before changing levels/floors of a structure
- Before/after searching a room
- After advancing a charged line down a hallway
- Before opening the nozzle
- Immediately after locating a victim
- After a physically demanding task, such as moving furniture or breaching a door

Officers must maintain awareness of their crew's air supply, physical exertion, and evolving fire-ground conditions. Remember, the entire crew's "in-time" depends on the member with the lowest air supply.

LOW-AIR ALARM

Firefighters often give little thought to their level of air supply until activation of their low-air alarm or Vibralert. Often, they do not even realize their own bell is ringing. The bell soon becomes just another noise, viewed as a nuisance rather than an indication to take action. The low-air alarm is NOT an indication that you have time left to work. **It is the signal that you have reached your emergency reserve of air**, and it is meant just for that: emergencies.

It is important to know that the low-air alarm signals that you have used 75% of your air. In other words, you have only one to seven minutes before the bottle is completely empty, depending on your rate of air use at the time the alarm activates. When that air unexpectedly stops flowing, your mask will suck onto your face and you will be forced to rip it off, breathing in smoke and heated gases—an experience few ever forget. Running out of air in a smoke-filled structure foolishly and unnecessarily risks your health, your life, and the safety of your crew.

It cannot be stressed enough that you must monitor your remote pressure gauge at frequent intervals. If your low-air alarm rings, immediately alert your crew and exit the building with them.

Any alarm activation in an IDLH environment requires immediate-action!

SECTION 2. SCBA AND MANDATORY MASK RULE

- All members responding to a possible fire or hazardous materials incident shall don SCBA prior to entering a building or encountering a hazardous atmosphere.
- SCBA shall be donned by members when they arrive at an incident to perform **firefighting duties**. This includes the investigative stage of that incident.
- Facemasks must be donned before encountering any type of toxic, contaminated, or unknown environment. Rescue operations and outside fire duties should be performed with SCBA donned.
- Members using SCBA in toxic or contaminated areas shall always work in pairs.
- There may be times when SCBA may cause a safety hazard, such as raising ladders, working on peaked roofs, working with heavy tools, or where there is unstable footing. Officers and members should exercise caution when performing such tasks.
- Jumping while wearing an SCBA has caused injury to firefighters in the past. It should be avoided unless an extreme emergency arises. The air cylinder rests high on the user's back. One's head naturally snaps backward when landing and serious head injury may result.
- Members shall continue to use the SCBA until an environment is deemed safe by their immediate superior, a Safety Officer, or a Chief Officer. Remember that an atmosphere may be toxic even after a fire has been extinguished.
- When masks are removed, they shall not be dropped or left in a building or other area where they will be subjected to damage.
- The use of breathing apparatus does not lessen the importance of prompt and proper ventilating procedures.
- It should be stressed that where injuries occur, and where negligence and/or failure to use proper safeguards are observed, the immediate superior and the injured firefighter may be held responsible by the Department.
- When a Form 5020 or Form 3807 Injury Report is submitted for any member suffering from smoke inhalation or any other inhalation injury, a separate General Form report shall accompany the injury report explaining why and how the firefighter was subjected to such an injury.

Members, Company Officers and Chief Officers **shall** be responsible for compliance with this rule.

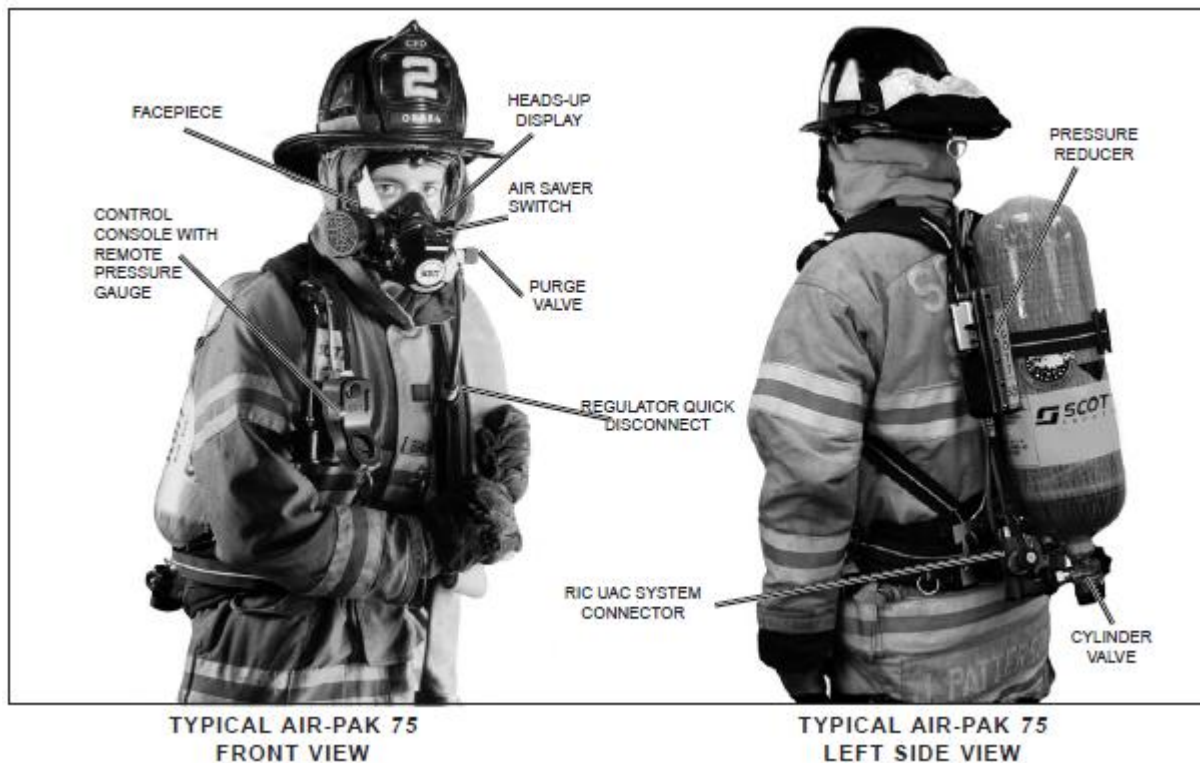
SECTION 3. COMPONENTS

OVERVIEW

As of 2013, the San Francisco Fire Department is using Scott Air-Pak 75 Model 5.5 Pressure Demand Self Contained Breathing apparatus, which is NFPA-1981 (2007 Edition) compliant and includes new features and upgrades not previously present on all Department SCBA. New features included in all Model 5.5 SCBA include:

- 5500-psi air cylinder
- Heads Up Display (HUD) air supply monitor integrated into breathing regulator
- Emergency Breathing Support System (EBSS)
- Rapid Intervention Crew Universal Air Connection System (RIC-UAC)
- Pak-Tracker Locator System

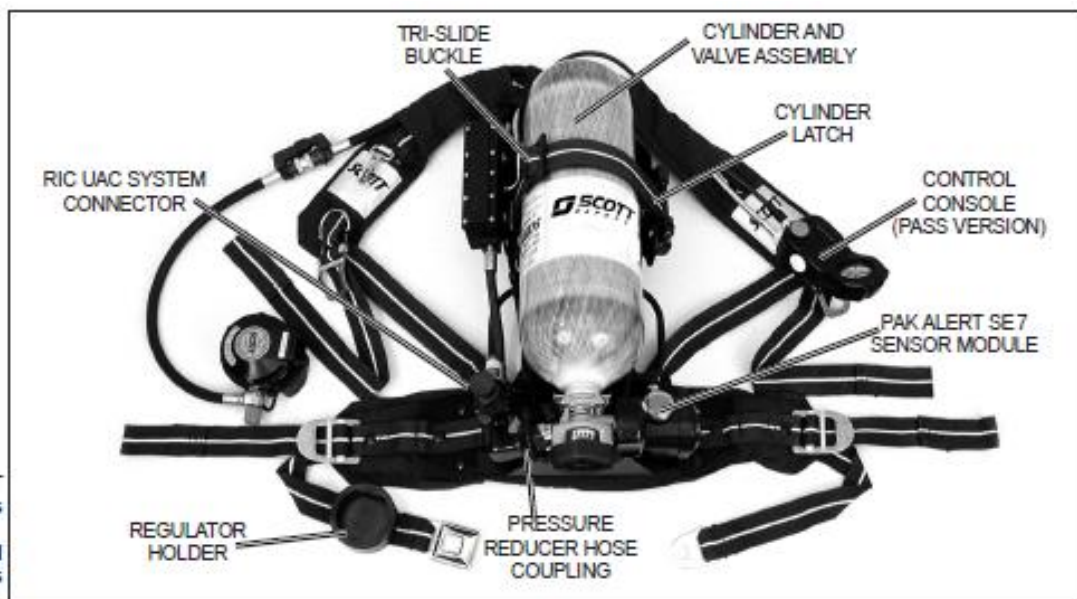
The SCBA is a respirator designed to provide mobility while supplying approximately 45, 60, or 75 minutes of breathable air, depending upon cylinder size. At present, the SFFD utilizes 45-minute cylinders on engines and trucks, 60-minute cylinders on rescue squads, and 75-minute cylinders in RIC bags.



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The basic SCBA consists of

- A back frame and harness assembly, with shoulder straps and waist straps made of Kevlar.
- A cylinder and valve assembly containing breathing air under pressure.
- A dual-path pressure reducer mounted onto the back frame.
- A face-piece-mounted breathing regulator, with a quick-disconnect coupling on the low-pressure hose to enable air supply sharing.
- A universal air connection port for rapid cylinder filling during an emergency.
- A remote-gauge control console, with a personal alarm safety system.
- A full face-piece, with a head harness that secures the face-piece to the face.



TYPICAL AIR-PAK 75 WITH OPTIONS AND ACCESSORIES

SCOTT 5.5 CYLINDER

SCBA air cylinders are filled with filtered, compressed air (not pure oxygen). Each SCBA has two regulators: (1) a first-stage regulator that reduces the cylinder pressure carried to the mask, and (2) a second-stage breathing regulator that reduces the pressure even further, to a level just above standard atmospheric pressure. This air is then fed to the face-piece via a pressure demand valve, providing constant airflow to the face-piece.

Currently, the Department is using Scott 5.5 cylinders with the following features:

- A carbon composite cylinder consisting of an aluminum alloy inner shell with a total overwrap of carbon fiber, fiberglass and an epoxy resin rated for 5500 psig working pressure.
- 45-, 60-, and 75-minute durations based on NIOSH breathing test rates.
- Hydrostatic testing to be performed every five (5) years.
- 15-year life expectancy.

Cylinder Duration Time

Each cylinder is certified by NIOSH and is assigned a “service life” duration time of 45, 60 or 75 minutes, depending on cylinder size. The service life duration time is determined by NIOSH, using a breathing machine designed to simulate an average adult user performing work at a "moderate work rate."

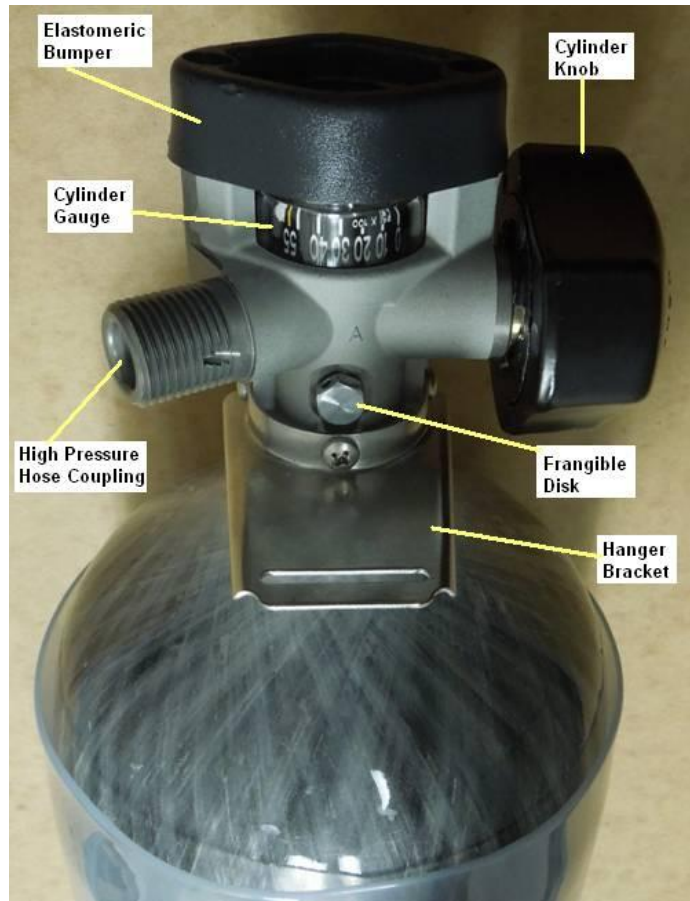
Do **not** expect to obtain the NIOSH-rated service life duration time on each use. The work being performed may be more or less strenuous than that used in the NIOSH test. Where work is more strenuous, the **duration may be less than one-half the NIOSH-rated service life** and the time remaining after the end-of-service indicator alarm actuates may be similarly reduced.

The duration of a cylinder will depend on such factors as:

- The degree of training or experience that the user has with this or similar equipment.
- The physical condition of the user.
- The degree of physical activity involved.
- Whether or not the cylinder is fully charged at the start of work period.
- The degree to which the user's breathing is affected by excitement, fear, or stress.
- The possible presence in the compressed air with carbon dioxide concentrations greater than .04% (normally found in atmospheric air).
- Condition of the respirator.
- Atmospheric pressure. (If used in a pressurized tunnel or caisson the rate of duration will be reduced.)

End-of-service indicator alarms (low-air alarms) are set to actuate when approximately 25% of full cylinder pressure remains in the cylinder. The alarms will continue to operate until the cylinder is nearly depleted but will cease once the cylinder is completely empty.

VALVE ASSEMBLY



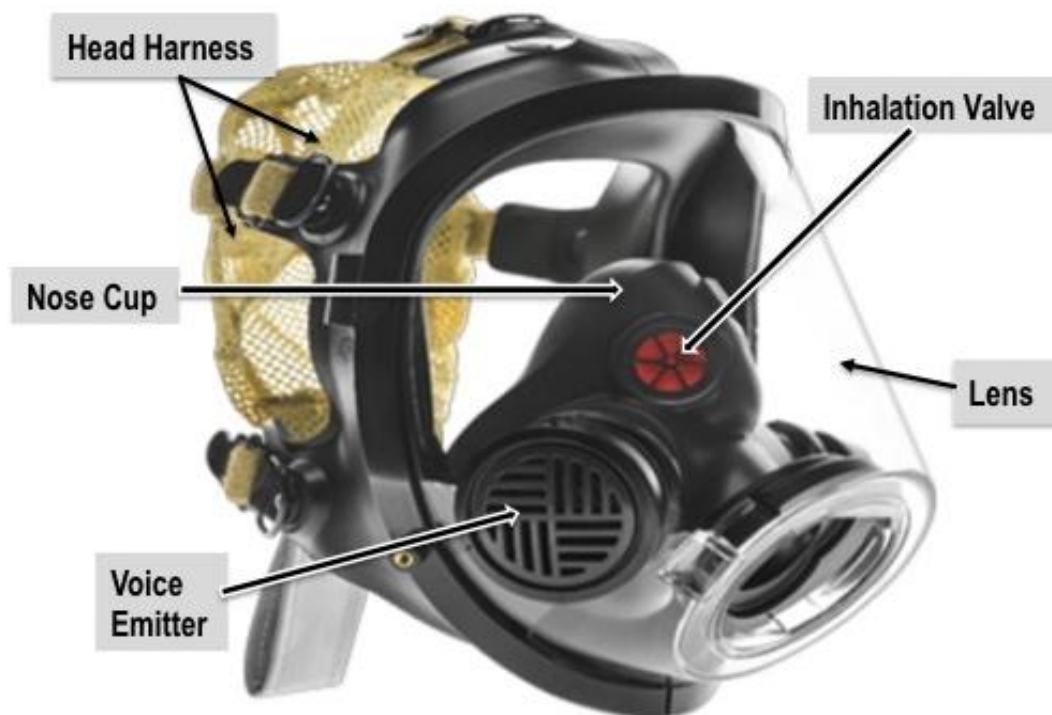
At the top of each SCBA cylinder is a valve assembly. The components of the valve assembly are:

1. **High Pressure Hose Coupling** (threaded valve stem), through which air leaves the cylinder when the cylinder is open.
2. **Cylinder Gauge**, a dual-sided window with values from 0-55 to indicate the amount of pressure in the cylinder (x100).
3. **Elastomeric Bumper**, to provide protection against physical damage to the valve assembly.
4. **Cylinder Knob**, to open and close the cylinder. It uses a spring-loaded “lock open service,” which prevents accidental opening and closing of the cylinder.
5. **Frangible Disk**, a burst disk that protects against bottle overfill/over-pressurization. Once the burst disk ruptures it cannot be resealed and the bottle must be taken out of service.
6. **Hanger Bracket**, to mount and lock the cylinder to the back frame.

FACE PIECE

When the SCBA is in use, the 2013 Edition AV-3000 HT Face-piece (NFPA 1981 compliant) protects the wearer's face and airway against heat and smoke. Its rubber face seal is designed to provide a continuous circumferential seal around the face while allowing the face-piece to flex with facial and head movement. The face-piece is comprised of the following basic components:

1. **Lens**, constructed of high-temperature and radiant-heat resistant (up to 500°F), non-shatter polycarbonate material.
2. **Nose Cup**, with high-visibility inhalation check valves.
3. **Head Harness**, made of Kevlar, includes temple strap, chin strap, and temple strap.
4. **Voice Emitters**, designed to provide the wearer with more intelligible voice communication while the face-piece is worn.



AV-3000 HT Face-piece—Front View

Each Department member is issued their own fit-tested SCBA face-piece. Individual face-pieces should be connected to the breathing regulator of their assigned SCBA at the beginning of each watch and removed at the end of each watch. Department

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members are responsible for securing their SCBA face-piece when off shift. Department members shall bring their issued face-piece to every station detail and when reporting for annual SCBA mask fit testing.

Department members shall mark their ID number on the SCBA face piece assembly. During tri-annual and monthly inspections, the face-piece will be inspected by the Division Chief or Battalion Chief.

According to the General Industry Safety Order 5144—Title 8, California Administrative Code, *“Respirators (SCBA) shall be inspected before each use and shall not be worn when conditions prevent a good gas-tight (face-to-face-piece) seal”*. Such conditions include but are not limited to:

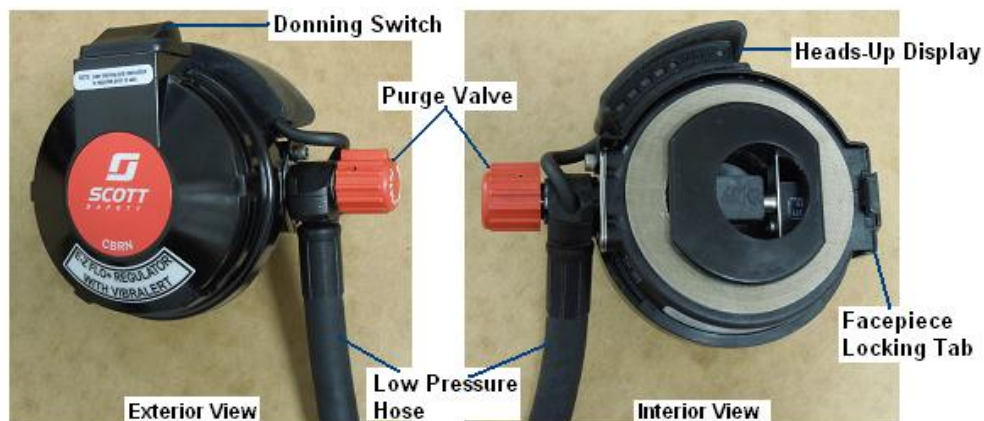
- Facial hair such as growth of beard or sideburns, low hairline that crosses or interferes with the sealing surface.
- Thick or protruding hairstyles such as ponytails or buns that interfere with the smooth and close fit of the head harness to the head.
- Long hair at the forehead or the side of the face that interferes with the sealing surface or gets caught in the head harness buckles.
- Temple pieces on corrective glasses.
- A skull cap that projects under the face-piece.
- Excessive use of cosmetics, including moisturizers, make-up, or aftershave.
- Excessive perspiration.
- The absence of one or both dentures.
- Weight loss or weight gain since last fit testing.
- Anything else which interferes with the face-to-face-piece seal or the fit of the head harness to the head.

BREATHING REGULATOR (WITH VIBRALERT)

The mask-mounted regulator (breathing regulator or regulator) provides respiratory protection while delivering air to the user. The breathing regulator connects to the face-piece at the regulator adaptor port by means of a quarter turn and latches into place with a spring-loaded latch to prevent accidental disengagement of the breathing regulator from the face-piece.



Regulator Mounted to Facepiece

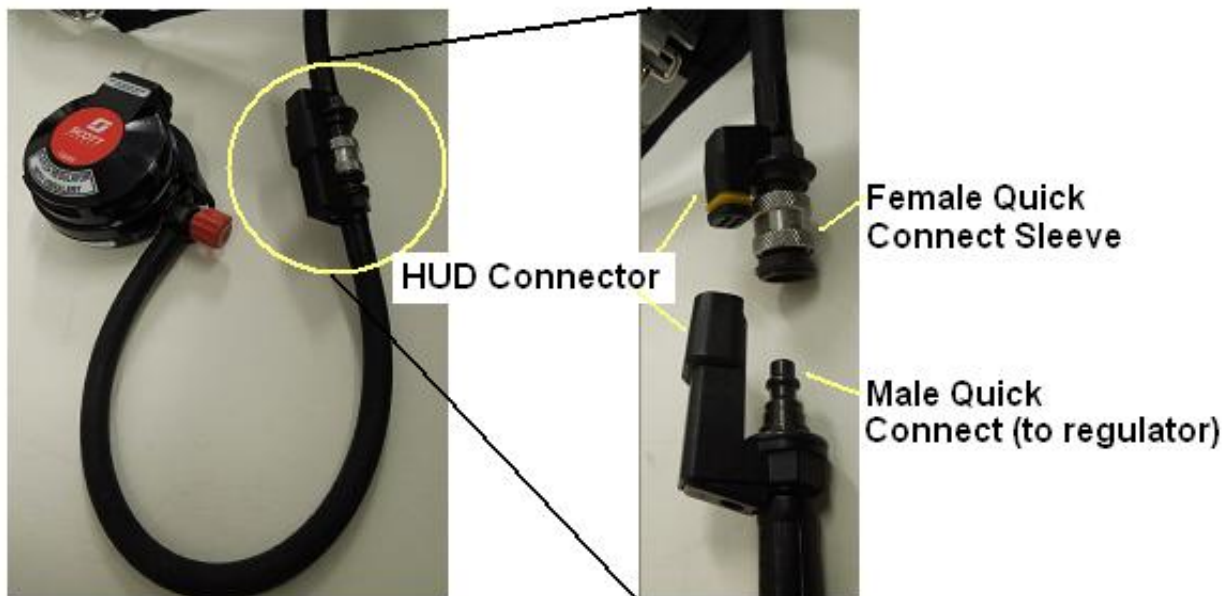


Breathing Regulator

Department breathing regulators utilize a positive-pressure design with demand flow, which means that the regulator maintains a higher pressure inside the mask than outside the mask, even when the pressure drops as the wearer breathes in. Thus, even if the mask leaks slightly, there is a flow of clean air out from the breathing regulator and into the mask, automatically preventing inward leakage of contaminated ambient air, under most circumstances. Note that while positive pressure keeps the surrounding IDLH atmosphere out of a properly fitting face-piece, a damaged or loose face-piece can leak cylinder air at such a rapid rate that **a fully charged SCBA cylinder can be drained in less than three minutes.**

Warning: An impact to the breathing regulator while the cylinder valve is open may cause air to flow from the breathing regulator and rapidly deplete the air remaining in the cylinder.

The breathing regulator is attached to the SCBA assembly by a rubber hose that is equipped with a quick connect/disconnect adapter. The quick connect/disconnect adapter is provided to enable connection to the Emergency Breathing Support System (see EBSS, page 3.15 of this manual) or to the RIT-PAK III (See Appendix A) in low-air emergencies.



Breathing Regulator and Hose with Quick Connects

Vibralert

Contained within the breathing regulator is the Vibralert alarm. The Vibralert will sound and vibrate:

1. As an end-of-service-time indicator (20-25% of cylinder air remaining).
2. To alert the user of a malfunction in the dual-path pressure reducer.
3. When the air cylinder is first opened and air is supplied to breathing regulator.
4. When the cylinder is closed and the system is bled.
5. When the cylinder is not fully open.

In normal operation, the Vibralert sounds and vibrates the breathing regulator and face-piece to warn the user when approximately 20-25% of full cylinder pressure remains (about 1,200 psi). The Vibralert will continue to operate until the cylinder is empty or nearly depleted. Once the cylinder is completely empty, the Vibralert will cease. In areas where more than one SCBA is being used, you can identify your own alarm by sensing the vibrations through your face-piece.

The System has 4 ways to alert members that they are low on air:

- Pressure gauge readings
- Sound from vibralert
- Visual from HUD
- Vibration from vibralert in mask

WARNING: Any activation of Vibralert alarm during SCBA use is an emergency and requires immediate action. The user shall immediately leave the IDLH environment with their partner/crew.

Donning Switch

The donning switch (also known as an air-saver switch) is located on the top portion of the breathing regulator and is covered by a black, rubber housing. When the face-piece is donned and the wearer takes their first inhalation, the donning switch pops up and air begins to flow into the mask.

When depressed, the donning switch prevents rapid loss of air from the cylinder as:

- The face-piece is removed from the face, or
- The breathing regulator is removed from the face-piece.

If the donning switch has not been depressed prior to opening the cylinder valve, air will free-flow from the breathing regulator and the Vibralert alarm will not actuate.

Purge Valve

The breathing regulator is equipped with a red purge knob that, when the cylinder is open, allows air to flow into the face-piece:

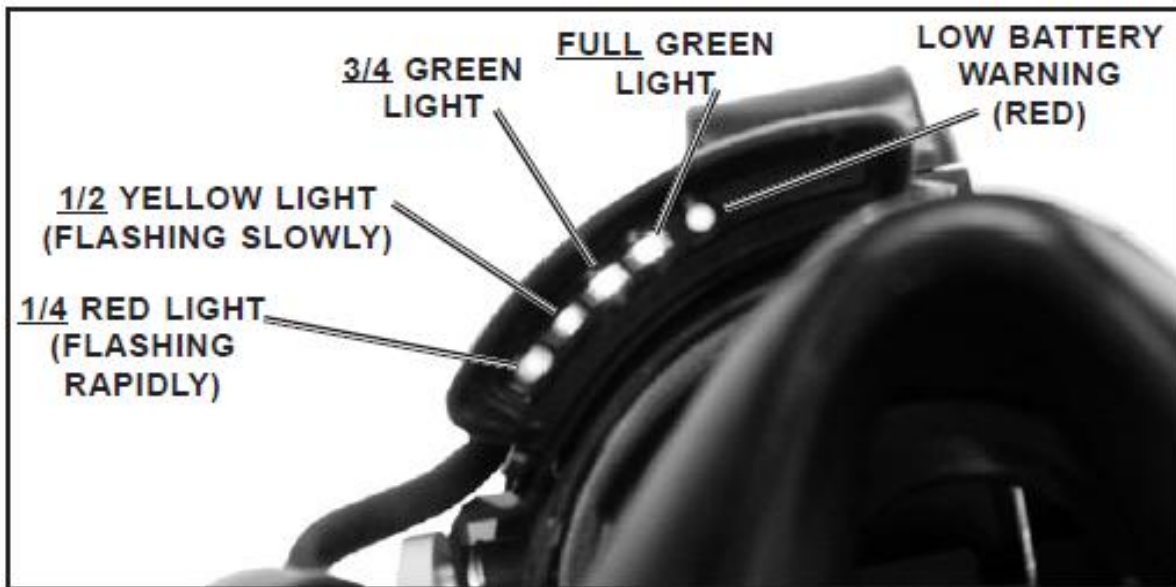
- In an emergency without breathing on the respirator.
- To bleed residual air from the respirator after the cylinder valve is turned off.
- To release air into and clear a fogged up face-piece.

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The face-piece is usually worn with the purge valve in the closed position (pointer on knob points upward, or in the 12-o'clock position) so that there is no free-flow of air from the regulator into the face-piece. The purge valve is opened by turning the knob $\frac{1}{2}$ turn counterclockwise (pointer on knob points downward). Rotation of the knob is limited to 180°. Do not use tools to open or close; use finger pressure only.

HEADS-UP DISPLAY

The heads-up display (HUD) is attached to the breathing regulator and provides a visual display of the user's air supply with four lights that appear just below the face-piece field of vision. These rectangular lights represent cylinder pressure at full, three-quarters, one-half and one-quarter. A separate round, red low-battery light warns the user that the batteries must be replaced. The HUD detects cylinder pressure directly and is totally independent of the Vibralert.



Heads-Up Display Indicator

Heads-up Display Operation

When the cylinder valve is opened, the HUD will initialize and illuminate all five lights for twenty (20) seconds. **Operation of all five lights must be verified every time the respirator is used and with every regular operational inspection.**

If one or more HUD lights do not come on as the cylinder is opened, remove the SCBA from service and tag it for repair by Mobile Air.

If no lights come on as the cylinder is opened, first troubleshoot by ensuring that both the round air hose and the rectangular HUD electrical plug on the regulator hose are properly connected. If the HUD connector on the regulator hose quick connect is properly connected but the lights do not operate as described here, **do not use the breathing regulator**. Remove the SCBA from service and tag for repair by Mobile Air.

After the 20-second initialization, the rectangular indicator lights will show the level of the air supply in the cylinder as outlined in the “Heads-up Display Indicator Light Guide” table, below:

HEADS-UP DISPLAY INDICATOR LIGHT GUIDE		
INDICATOR LIGHTS	MEANING	WHAT YOU SHOULD DO
Two rectangular GREEN lights	Full Cylinder	Continue Using Respirator
One rectangular GREEN light	$\frac{3}{4}$ Cylinder	
One rectangular YELLOW light flashing slowly	$\frac{1}{2}$ Cylinder	
One rectangular RED light flashing rapidly	$\frac{1}{4}$ Cylinder	Leave Hazardous Area <i>Immediately</i>
One round RED light flashing	Battery Low	Change batteries before using SCBA again (<8 hours left to battery life)

The HUD has an automatic brightness control that dims the display in low-light situations and returns the display to full brightness in bright-light situations.

When the batteries require changing, the red, round low-battery indicator at the right of the display will light for twenty (20) seconds and then begin to flash slowly, at once a second. While in low-battery condition, the heads-up display and the distress alarm will continue to operate properly for a period of time somewhat greater than the duration of one cylinder; however, the batteries must be replaced by Mobile Air before the respirator is used again.

VOICE AMPLIFIER

The Epic 3 Voice Amplifier is a line-of-voice projection device that amplifies the SCBA user's voice for strong, local person-to-person communication.

Each company will be issued at least one EPIC 3 Voice Amplifier that is to be attached to the Battalion Chief's or Company Officer's face-piece at the beginning of each shift. The amplifier is meant for person-to-person communication and is not meant for amplification of radio communications. Putting the radio mic directly against the voice amplifier will produce loud radio feedback and make transmissions inaudible. When

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using the radio while the face-piece is donned, place the mic directly against the voicemitter not against the amplifier.

As the amplifier is turned on or off, it emits an audible tone to indicate it has been energized or de-energized, respectively. The amplifier is powered by three AAA batteries, with a battery life of up to 50 hours. The device contains an LED which illuminates green when the device is activated and flashes once per second when a low-battery condition (approximately 10% battery life remaining) is present. In order to conserve battery life, the device automatically powers off approximately 20 minutes after the last time the user speaks.



AV-3000 HT Face-piece with Attached Epic 3 Voice Amplifier

CONTROL CONSOLE WITH INTEGRATED PASS

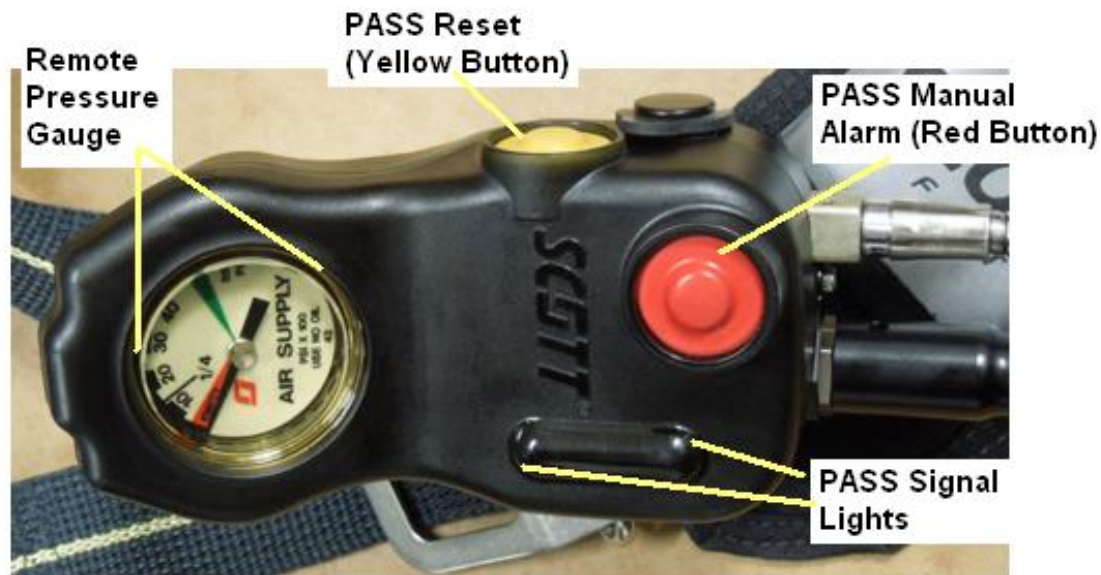
Mounted on the SCBA's right shoulder strap and connected to the pressure reducing regulator is the Control Console with integrated Personal Alarm Safety System (PASS).

When the cylinder valve is opened:

1. The control console and PASS actuate, emitting three audible chirps.
2. The remote gauge needle moves to indicate how much air is in the cylinder (this gauge should read within 100 psi of the cylinder gauge).

3. When the cylinder is opened and the SCBA is charged, the signal-lights panel indicates two conditions:
 - a. A green blinking light indicates the PASS is armed but not in alarm.
 - b. Flashing red lights indicate the PASS is either in pre-alarm or full alarm.

The red and yellow buttons on the face and side of the control console are for manual activation and reset of the PASS, respectively, as is described in the section “PASS Device,” below.



Control Console

The control console also provides a means of checking battery strength of the PASS and Pak-Tracker Transmitter (described on page 3.20) during the daily operational check.

To check battery strength, depress the yellow reset button on the control console while the cylinder valve is closed and the system is unpressurized (control console off). If the battery is in good condition, the PASS signal lights will flash green; if the battery is low, the lights will flash red; if no lights illuminate, the batteries are dead—do not use an SCBA with a dead battery. Any SCBA with low battery strength shall be taken out of service for battery replacement by Mobile Air.

PASS DEVICE

The integrated PASS is an alarm system that constantly monitors the motion of the SCBA back frame and can also be manually activated by the user in an emergency. Its

SECTION 3. COMPONENTS

purpose is to assist in locating an SCBA user who is down, incapacitated, or in need of assistance.

The PASS motion sensor and alarm are located in a black sensor module mounted on the SCBA back frame beneath the air cylinder.

The PASS device is automatically activated (turned on) when the SCBA is pressurized as the cylinder valve is opened. Upon activation, the motion sensor module will sound three (3) quick chirps, and the green light located on the control console will flash. Once it is turned on, the PASS device is in the automatic mode.

As long as the SCBA is pressurized, there must be movement of the SCBA at least every twenty (20) seconds or the PASS will go into pre-alarm for 12 seconds, followed by full alarm as described below. Once in full alarm, the PASS alarm will continue to sound until it is turned off or reset.

Pre-alarm

If a pressurized SCBA remains motionless for more than twenty (20) seconds, the PASS will automatically sound a 12-second pre-alarm warble, and the green flashing light on the control console will change to a flashing red light.

Reset of the pre-alarm is accomplished by either:

1. Movement of the SCBA back frame (shaking the control console will not reset the PASS); OR
2. Manual reset, by pressing and holding the yellow reset button on the side of the control console until three (3) quick audible chirps are heard and the red flashing light on the control console is replaced by the green flashing light.

Full alarm

If the pressurized SCBA remains motionless after the 12-second pre-alarm cycle, the PASS will go into full alarm.

Full alarm is indicated by a loud, almost continuous 3-tone chirp from the sensor module accompanied by the flashing red signal light on the control console. Ten (10) seconds after activation of full alarm, the locator transmitter (see "Pak-Tracker Locator System," below) will begin to transmit the unique ID number for the unit.

To reset the full alarm, press the yellow reset button twice. After the full alarm has been reset, the PASS remains activated in the automatic mode with the green light flashing once per second.

Manual Alarm

If an SCBA user requires immediate assistance, pressing the red manual alarm button located on the front of the control console will immediately sound the full alarm. The manual alarm may be activated at any time, even if the SCBA is not pressurized.

If the manual alarm is activated when the respirator is not pressurized, press the yellow reset button twice to silence the alarm; however, the PASS will remain on, in automatic mode. To turn the unit off, press the reset twice again while the unit is not in alarm mode. Immediately after activation of a manual alarm, the locator transmitter (see “Pak-Tracker Locator System,” below) will begin to transmit the unique ID number for the unit.

Deactivation (Turning Off)

To fully turn off the PASS device,

1. Close the cylinder valve completely.
2. Purge the air from the system by opening the purge valve.
3. Close the purge valve after the air is bled.
4. Press the yellow reset button twice.

If there is pressure left in the system, the green flashing light will continue to flash, while a 15-second beep sequence is heard from the sensor module as the residual air bleeds from the system. As soon as the air has completely bled from system, the unit will sound a quick two-tone chirp and the PASS will become inactive. No lights will be illuminated on the display.

If there is no air pressure in the system when the yellow reset button is pressed twice, there will be no beep sequence, only the quick two-tone chirp.

If air pressure is not purged and the system remains pressurized the PASS alarm will not turn off but will return to the automatic (on) mode, even if the cylinder has been closed.

Low Battery Warning Tone

If the low battery indication (one steady chirp every two seconds with no flashing lights) occurs at any time during operation, do not use the SCBA. Contact Mobile Air immediately to change the batteries.

EMERGENCY BREATHING SUPPORT SYSTEM (EBSS)

Each SCBA is equipped with an Emergency Breathing Support System (EBSS) which is comprised of a 3-foot hose and a manifold with a male and female quick-connect coupling. During a low-air emergency, the EBSS enables two SCBA users to connect together and share cylinder air (a form of “buddy breathing”). **EBSS connections are to be made in low-air or out-of-air emergencies only and are not to be used for suppression activity.**

EBSS connection can be made in two ways:

1. EBSS manifold to EBSS manifold or
2. EBSS manifold to breathing regulator hose at its quick-connect coupling



Emergency Breathing Support System Hose Assembly

When two firefighters are connected together using the EBSS-manifold-to-EBSS-manifold connection, there is no transfer of air from one cylinder to another via the hose-coupling connection—cylinders do not equalize. Rather, **shared air is first drawn from the cylinder with the least amount of air** (the user with the low-air emergency) until that cylinder is drawn down to zero (empty); only after that cylinder is empty is air drawn from the cylinder that has the greater amount of air (the cylinder providing support).

With this in mind, disconnecting the EBSS before exiting an IDLH environment may leave one user with little to no breathable air. It is recommended that, once two EBSS

manifolds are connected together, the user with the least amount of air shut off their cylinder. Shutting down the cylinder enables the low-air user to conserve whatever amount of air they may have had before the connection was made. In the event the EBSS system must then be disconnected before exiting the IDLH environment, the victim can turn their bottle back on again and draw from whatever amount of air they had before they turned off their bottle.

It is also important to understand that because two users are sharing a common supply of air, a cylinder's duration time will be significantly reduced, perhaps even less than one-half the time allotted for a single user. The person offering emergency breathing support must have sufficient air left in their cylinder to support two people (the victim and themselves) for the duration of time required to exit the IDLH environment.

Users engaged in EBSS breathing support *SHALL NOT* continue suppression activity but *must immediately exit* the IDLH environment.

EBSS Use Example

Firefighter 1 and Firefighter 2 are crawling down a hallway in an IDLH environment.

Firefighter 1's mask is knocked off his face and air free flows from his mask. Firefighter 1 is able to put his mask back on properly, but he has lost so much air that the Vibralert has begun sounding.

Firefighter 1 no longer has enough air to exit the IDLH environment.

Firefighter 2 still has sufficient air.

Firefighter 1 and Firefighter 2 connect their EBSS hoses together to share air. Together, they have enough air to exit the IDLH environment.

They immediately exit the IDLH environment together.

Vibralert Activation During EBSS

If the victim's Vibralert has activated while the victim and rescuer are connected by the dual EBSS hoses, the rescuer's Vibralert will also be activated. Once the victim's cylinder is depleted and the air is drawn from the rescuer's cylinder, both Vibralerts will stop. When the cylinder of the rescuer's air supply has sufficiently depleted, both Vibralerts will again be activated.

EBSS Connection and Operation

1. Remove the protective rubber cap from the dual EBSS manifold on the hose.
2. Connect via one of three possible methods:
 - a. Manifold-to-Manifold Connection: Two manifolds may be joined, either male to female or female to male. Connection will immediately begin airflow to both face-pieces without disruption of airflow to either user.
 - b. Breathing Regulator-to-Manifold Connection: The male quick disconnect on the victim's breathing regulator hose can be connected to the female side of the rescuer's dual EBSS manifold. The victim must hold their breath while the connection is being made.

Note: Relief/loaner SCBA may not have a quick disconnect on their breathing regulators or an EBSS hose, thus the EBSS connections cannot be made.
 - c. Victim-to-RIT-Pak III Connection: The victim can receive air either through a manifold-to-manifold or a regulator-to-manifold connection using the low-pressure side of the RIT-Pak III. Connections are made as described in a) and b) above.

Note: Regardless of the means used to supply breathing air, the rescuer providing breathing air support must ensure that the face-piece of the person receiving air (the victim) is properly donned and secure. Failure to do so may result in more rapid loss of air to both users.

3. Test for positive engagement by tugging on the connected couplings.

WARNING:

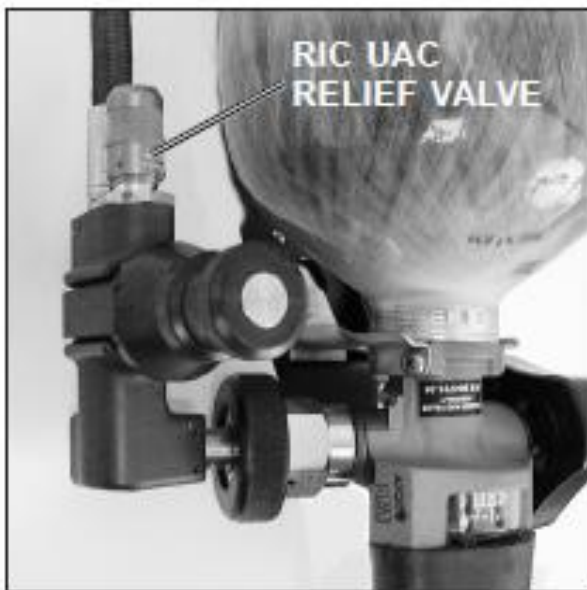
Never supply more than one other person with breathing air using the EBSS. Even with a full cylinder, multiple users can quickly deplete the air supply, leaving insufficient breathing air to escape an IDLH environment.

RIC UNIVERSAL AIR CONNECTION

Department SCBAs are fitted with a Rapid Intervention Crew Universal Air Connection (RIC UAC) system which enables emergency replenishment of a depleted air cylinder from the air cylinder carried in the Department's RIC Bag.

The RIC UAC is not a quick-charge attachment and must not be used for routine recharging or refilling of a cylinder, for “buddy breathing,” or for any other unapproved use.

The RIC UAC is for emergency rescue use only of a firefighter who is incapacitated within a hazardous atmosphere. Before a rescuer connects the RIC Bag’s RIC UAC hose assembly to a depleted cylinder, it is vital that the rescuer make certain there is sufficient air supply in the RIC air cylinder to transfer into the cylinder to be filled. If not, another means of rescue must be considered.



RIC UAC Filling Procedure

To fill a downed firefighter’s (victim’s) cylinder using the RIC UAC system, proceed as follows:

1. Verify that the victim’s cylinder valve is fully open.
2. Remove the dust caps from both the rescuer’s and the victim’s RIC UAC filling hose assembly couplings.
3. Connect the rescuer’s RIC UAC filling hose assembly to the victim’s filling hose assembly by pushing the quick disconnect couplings together until the quick disconnect sleeve “clicks” into place.
4. Slowly open the rescuer’s RIC UAC filling hose assembly valve to pressurize the supply line and begin air flow to the victim’s cylinder.
5. The air from the rescuer’s cylinder will stop flowing when the pressure in the victim’s cylinder equals the remaining supply pressure (pressures will balance/equalize).

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6. Rescuer should continually monitor the pressure gauge on the victim's cylinder while filling.
7. When the pressure gauge on the victim's cylinder equalizes with the gauge on rescuer's cylinder gauge, shut down the supply bottle, and disconnect the air supply source.

RIC UAC Use Example

Firefighter 1 (FF1) has fallen through a floor into an IDLH environment. Trapped and unable to exit the building, FF1 calls a Mayday. At the time of the Mayday, FF1 has 50% cylinder air remaining.

The RIC is deployed. By the time the RIC locates FF1, FF1's cylinder is nearly empty and the Vibralert is sounding.

The RIC connects the RIC cylinder's UAC line to Firefighter 1's UAC port and transfers air to partially refill FF1's cylinder.

FF1 now has a partially filled cylinder from which to draw air while rescue is effected. If FF1 breathes down the remainder of the refilled cylinder, more air can be transferred from the RIC cylinder to FF1's cylinder.

PAK-TRACKER LOCATOR SYSTEM AND SENSOR MODULE WITH “BUDDY LIGHTS”



Integrated Pak-Tracker Locator Transmitter

Pak-Tracker Transmitter

Each SCBA assembly contains an electronic transmitter with its own unique ID number (e.g., T01Tiller, E08Officer, E14EMT, etc.). The transmitter is housed within the sensor module (the motion detector) that is mounted to the bottom of the SCBA back frame and rests at the small of the back when the SCBA is worn. The transmitter is identifiable by two round, red “Pak-Tracker” labels on the sensor module. The transmitter is automatically turned on when the cylinder valve is opened. Whenever the PASS goes into full alarm, the transmitter emits a radio signal that is sent out in all directions, and the buddy lights will blink red. The transmitted signal can be received by the Pak-Tracker Hand-Held Receiver that can be used as a search and rescue tool to help find a down or missing firefighter.

Pak-Tracker “Buddy Lights”

Pak-Tracker Buddy Lights give crews the ability to visually assess the status of SCBA users in their proximity.

Whenever a cylinder is turned on, two green “buddy lights” on the sensor module begin to blink.

Whenever a user’s PASS goes into pre-alarm or full alarm, the buddy lights will blink red.

SECTION 3. COMPONENTS

When a user's cylinder has only $\frac{1}{4}$ air remaining (Vibralert will also sound), sensor module buddy lights will strobe yellow-orange. The yellow-orange buddy lights indicate that the user has reached their emergency reserve of air and that they should immediately exit the IDLH environment.

For a full description of the sensor module buddy lights, see the table below.

SENSOR MODULE "BUDDY LIGHTS" QUICK REFERENCE	
Action	Sensor Module Light Will....
Off/Shut down	Lights OFF
Start up PASS (open cylinder)	Bright light then flash GREEN
Normal operation	Flash GREEN
Respirator low air ($\frac{1}{4}$ cylinder)	Flash ORANGE (alternately)
PASS pre-alarm	Flash RED (alternately)
PASS full alarm	Flash RED (simultaneously)
Press manual alarm (red button) w/unit OFF	Flash GREEN then full alarm flash RED
Press reset (yellow button) from manual alarm	Return to flashing GREEN
Low battery while ON	Flash ORANGE once every 2 seconds

PAK-TRACKER HAND-HELD RECEIVER



Pak-Tracker Hand-held Receiver

The Pak-Tracker Hand-Held Receiver is the tool used to pick-up and track the signal of a Pak-Tracker transmitter in full alarm.

When a PASS is manually activated (i.e., when the red button on the control console of an SCBA user is pressed), the Pak-Tracker receiver immediately registers the signal and displays the unique I.D. transmitted by the SCBA user in alarm on its screen.

If a PASS activates passively (i.e., the SCBA user has remained motionless until the PASS goes into full alarm), the Pak-Tracker receiver registers the signal 10 seconds after the PASS goes into full alarm (a total receiver delay of 42 seconds). This built-in delay affords SCBA users not in distress the opportunity to reset their PASS before an emergency signal is transmitted to the Pak-Tracker receiver.

The receiver is very sensitive and responds to small differences in signal strength. The relative strength of the signal can be used to help guide the search team to the downed firefighter. The relative strength of the transmitter signal detected by the hand-held receiver will vary depending on:

1. The distance from the transmitter to the hand-held receiver.
2. The path the transmitter signal has taken to get to the hand-held receiver.
3. The materials between the transmitter and the hand-held receiver.

Signal strength is denoted on the receiver in three ways:

1. By a colored light display which moves from red (farther from victim) to green (closer to victim);
2. By a number which represents percentage of the signal strength received, from 0 (no signal) to 99 (highest signal); and
3. By an audible beep which moves from low to high as the signal strength increases

NOTE: While the transmitter and receiver are useful tools in search and rescue, they should not be relied upon solely. It is critical that search teams maintain situational awareness, and pay attention to their route of travel as well as their surroundings when conducting searches with the receiver.

As with all electronic devices, the Pak-Tracker transmitter and receiver can be adversely affected by radio waves (also known as Radio Frequency Interference or RFI). Specifically, interference can be caused by Department hand-held radios. Such interference may temporarily give false indications, such as the sudden sounding of the PASS's loud full alarm. In some instances, the lights on the control console may flash without sounding the alarm. In rare circumstances, an alarm that was sounding may stop. If the Pak-Alert exhibits any of these symptoms, move the radio away from the transmitter. Keep the antennas of hand-held radios at least six (6) inches away from the control console and the sensor module when it is transmitting

SECTION 4. SCBA MALFUNCTIONS AND EMERGENCY PROCEDURES

The SCBA is automatic in function. It requires only the opening of the cylinder valve and the proper donning of the face-piece to begin use. Closing the cylinder valve ends use. If there is a malfunction or a suspected malfunction, use one of the emergency procedures listed below.

WARNING: These emergency operation procedures are for emergency use only and are meant to supplement, not replace, the emergency procedures prescribed by SFFD procedures. **If emergency procedures are required, leave the contaminated area with your partner at once.** Use of these procedures will increase the rate of consumption of the air supply and may cause the Vibralert alarm to diminish in intensity or to stop completely.

LOW-AIR ALARM / VIBRALERT ACTIVATION

If the Vibralert actuates before the air supply is depleted to approximately 25% of full rated capacity, it may indicate

- A failure of the primary reducer path in the pressure reducer.
- A malfunctioning remote air supply gauge.
- A failure of the end-of-service indicator alarm.

If any end-of-service time indicator alarm actuates during use (the Vibralert or the heads-up display rapidly flashing red light), even if the air supply has not been depleted to approximately 25% of full rated capacity, **LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE.**

LOSS OR PARTIAL LOSS OF AIR

If the air supply is partially or completely cut off during use,

1. Fully open the red purge valve on the breathing regulator by turning it counterclockwise (pointer on knob downward) and
2. Check to be sure the cylinder valve is fully opened (turned fully counterclockwise).
3. **LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE AFTER OPENING THE PURGE VALVE.**

Warning: Airflow through the breathing regulator when the purge valve is open can exceed 200 liters per minute, and leaving the purge valve open may cause a sudden termination in breathing air. To reduce air consumption, the airflow may be reduced by partially closing the purge valve.

FREE FLOW OF AIR INTO FACE-PIECE

If the air supply begins to flow freely into the face-piece during use,

1. Fully open the red purge valve knob on the breathing regulator by turning it counterclockwise (pointer on knob downward).
2. Conserve air flow by partially closing the cylinder valve to regulate the flow of air to a breathable level but do not close the cylinder valve completely.
3. **LEAVE THE CONTAMINATED AREA WITH YOUR PARTNER AT ONCE AFTER PARTIALLY CLOSING CYLINDER VALVE.**

If any of the above procedures are implemented during use, remove the SCBA when in a safe area and take it out of service for repair by Mobile Air.

SECTION 5. INSPECTION, TESTING AND CLEANING

DAILY INSPECTION

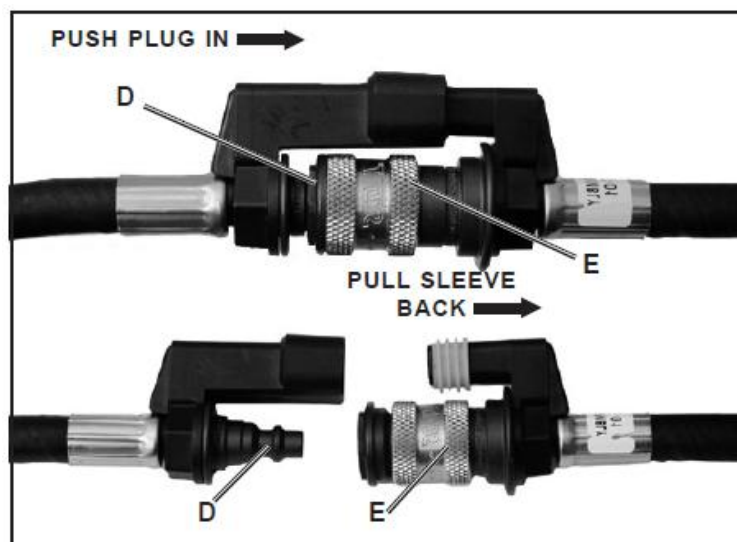
The following procedure shall be used for the daily inspection of the SCBA. All SCBAs shall be inspected daily and after each use. Additionally, Drivers and Tillers are responsible for the daily inspection according to the apparatus checklist. If any malfunction is noted, remove it from service, tag it with Form 3106.1 and notify Mobile Air. No units will be accepted by Mobile Air without an attached Form 3106.1.

1. **Check the cylinder pressure gauge for "FULL"** indication. If the cylinder pressure is less than fully charged, change cylinder.
2. **Visually inspect cylinder** for dents or gouges in metal or in fiberglass wrapping. Cylinders that show exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, gauge lens missing or elastomeric bumper distorted, shall be removed from service and emptied of compressed air.
3. **Check cylinder hydrostatic test date** written on the top of the cylinder to ensure it is current; i.e., within 5 years.
4. **Visually inspect the complete SCBA** for worn or aging rubber parts, worn or frayed harness webbing or damaged components.
5. **Check pressure reducer hose coupling** to ensure it is hand tightened to the cylinder valve outlet.
6. **Inspect the breathing regulator.** Inspect the regulator to ensure that the purge valve swivels only 180°, that the donning switch operates, that the locking spring latch works, that the regulator opening is clear of obstructions and debris and that it has no loose parts inside, and check for the presence of the gasket so that it seals properly when connected to the face-piece.
7. **Inspect breathing regulator hose quick connect and EBSS Dual Manifold couplings.** Inspect both the male and female quick disconnects.
 - a. Inspect the operation of the locking sleeve on the female quick disconnect. If any damage is noted, remove it from service and tag for repair.
 - b. Inspect the condition of the male quick disconnect for signs of wear. Particularly look for wear on the locking ridge as shown on the figure below. If the coating is worn through and bare metal is showing, do not use the regulator assembly (**use of a worn quick disconnect may result in a malfunction, leading to a loss of breathing air**). Remove it from service and tag for replacement.



Inspecting Male Quick Disconnect

- c. Verify that the quick disconnect operates properly.
 - i. While pushing the plug "D" into the socket, pull the locking sleeve "E" back toward the guard. The plug "D" will separate.
 - ii. To reconnect, align the heads-up display plug with the mating connector and push plug "D" into socket until the locking sleeve "E" pops forward. Ensure that both the round air coupling and the rectangular HUD plug are connected. If the HUD is not connected, the HUD will not illuminate.
 - iii. Test for proper engagement by tugging on the coupling. **Failure to check engagement of the coupling may lead to hose separation and loss of breathing air.**



Pull-back Sleeve Quick Disconnect

8. **Check all hoses—rubber and steel-braided.** Check all hoses to ensure they are attached firmly at their connection points. Check for frays, burns, breaks, and exposed wires.
9. **Test PASS and Pak-Tracker battery condition** manually as follows:
 - a. Make sure the PASS distress alarm is in the off condition (cylinder valve closed with no flashing lights)
 - b. Press and hold the yellow reset button on the control console. Observe the FINAL light color in the sequence to determine the status.
 - i. GREEN lights illuminated on the control console and a GREEN-BLUE-GREEN sequence on the back-frame buddy lights indicate sufficient battery power remaining
 - ii. RED lights on the control console and back frame lights indicate that the batteries are low must be replaced before the respirator is to be used again. Call Mobile Air for battery replacement.
 - iii. If NO lights come on, the batteries are dead and must be replaced by Mobile Air. Without batteries, PASS, Pak-Tracker, and HUD will not function.

Note: If a low battery message occurs, ALL batteries should be changed before the respirator is used.

SCBA SHALL BE INSPECTED DAILY AND AFTER EACH USE.

DAILY OPERATIONAL CHECK

When members place their mask on the SCBA they shall do an operational check.

In addition, this check shall be done after replacement/exchange of a cylinder.

1. Check that purge valve is closed (pointer on knob upward).
2. Fully depress donning switch on the top of the breathing regulator and release.
3. Open the cylinder valve fully by rotating the knob counterclockwise (approximately 2½ turns).
 - a) Verify Vibralert actuates and then stops.
 - b) Verify PASS alarm actuates (3 quick chirps).
 - c) Verify heads-up display initializes with all five lights on for 20 seconds, followed by display of cylinder supply level. If the low-battery light at the right end of the display remains lit or begins to flash, the batteries must be replaced by Mobile Air. If one or more lights do not illuminate, call Mobile Air.

SECTION 5. INSPECTION, TESTING AND CLEANING

- d) Verify buddy lights blink green.
 - e) Ensure there are no air leaks at any ports or quick connector coupling, specifically, at the regulator hose quick connect, the EBSS manifold, and the RIC UAC port.
4. Check that the remote pressure gauge is operating properly and that it reads within 10% of the value on the cylinder pressure gauge.
 5. Don the facepiece or hold the facepiece to the face to affect a good seal. Inhale sharply to automatically start the flow of air. Breathe normally from the facepiece to ensure proper operation.
 6. Verify that the HUD display matches the amount of cylinder air on the remote gauge.
 7. Remove facepiece from face. Air shall freely flow from the facepiece.
 8. Fully depress the donning switch on the top of breathing regulator and release. The flow of air from the facepiece shall stop.
 9. Examine the complete respirator for air leaks. There shall be no leakage of air from any part of the respirator.
 10. Check the purge valve.
 - a) Rotate purge valve $\frac{1}{2}$ turn counterclockwise (pointer on knob downward). Air shall freely flow from the breathing regulator.
 - b) Rotate purge valve $\frac{1}{2}$ turn clockwise to full closed position (pointer on knob upward). Air flow from breathing regulator shall stop.
 11. Check the PASS device. (Buddy lights should blink red during alarm activation.)
 - a) Manual activation test: press and hold the red button on the remote control console until alarm sounds. Reset alarm by pressing the yellow button twice.
 - b) Passive activation test: let entire SCBA unit sit undisturbed for 30-50 seconds. PASS alarm should sound. Reset alarm by pressing the yellow button twice.
 12. Check EBSS Accessory Hose
 - a) Verify that the EBSS hose does not interfere with the removal and reinstallation of the cylinder and valve assembly.
 - b) Inspect the pouch to confirm that it is not damaged or missing. Verify that both snaps properly engage and disengage.
 - c) Verify that the protective rubber cap is installed and is not damaged. If the protective cap is missing or damaged, remove the respirator from service and tag for repair.

- d) Remove the protective cap and check that there is no evidence of air flow from the end of the adapter or any sign of leakage from the assembly.
- e) Inspect both the male and female quick disconnects on the EBSS manifold, looking for dirt and debris which might block air flow. Pay special attention to the following:
 - i. Inspect the operation of the external check valve sleeve on the male quick disconnect. If any damage or sticking is noted, do not use the apparatus. Remove it from service and tag for repair.
 - ii. Inspect the condition of the male disconnect for signs of wear. Particularly look for wear on the locking ridge as shown in the picture below.



Dual EBSS Hose Couplings

13. Fully close cylinder. Push in and rotate cylinder valve knob clockwise.
 - a) When cylinder valve is fully closed, open purge valve slightly to bleed residual air pressure from system.
 - b) The Vibralert shall actuate as the pressure drops below 1000 psi.
 - c) When airflow stops, return purge valve to the fully closed position (pointer on knob upward).
14. Deactivate the PASS by pressing the yellow button on the control console twice.

DAILY BATTERY CHECK

SCBA batteries shall be checked daily, as follows:

1. Press and hold the yellow button on the control console/remote gauge.
2. Verify that a light comes on in the small window on the surface of the control console
 - a) A GREEN light indicates FULL battery power.
 - b) A RED light indicates the batteries are going bad and need to be replaced by Mobile Air.
 - c) NO lights indicate that the batteries are dead. Take the SCBA out of service and call Mobile Air to replace the batteries.

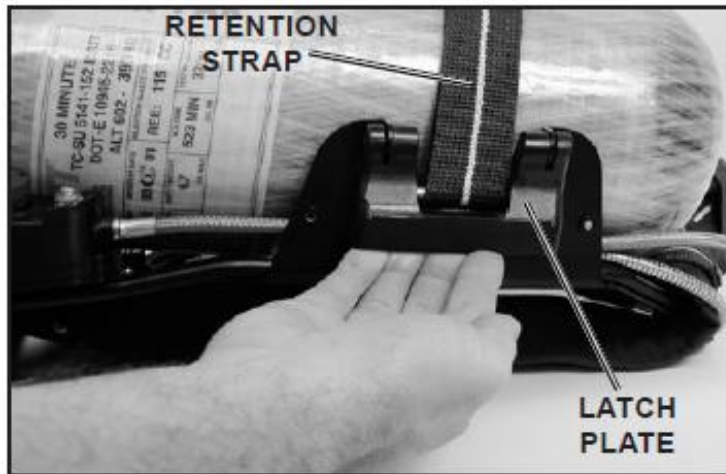
NOTE: When batteries are dead, user will have NO PASS, NO Pak-Tracker transmitter, and NO Heads-up display in their regulator.

CYLINDER EXCHANGE/REPLACEMENT PROCEDURES

Depleted or partially depleted SCBA cylinders must be replaced with full cylinders as soon as possible. The removed cylinder shall be refilled and inspected by Mobile Air or by other authorized personnel. To replace a depleted or partially depleted cylinder, proceed as follows:

1. Leave the IDLH area.
2. Doff the facepiece and SCBA.
3. Completely close the cylinder valve.
4. Release residual air pressure in the respirator system by opening the purge valve. When the flow of air from the breathing regulator has stopped, fully close the purge valve.
5. Turn off the PASS by clicking the yellow button twice.
6. Unthread and disconnect the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.

7. Disengage the cylinder retention strap by gripping the latch plate and lifting on the end of the latch.



Cylinder Retention Strap and Latch Plate

8. Grasp the cylinder below the retention strap, push the locking tab below the valve, then lift the cylinder free from the bottom hook and remove.



Locking Tab Mechanism

9. Replace empty cylinder with a full cylinder of the same pressure rating.
10. Slide the top of the cylinder upward under the retention strap.

11. Engage the cylinder hanger in the hook at the bottom of the back frame.
12. Retighten the retention strap by pushing it back down against the back frame.
Note that if the retention strap is not snug, the latch will “walk” open easily. Make sure strap is tightened so that latch snaps firmly into the closed position.
13. Align and tighten the hose coupling to the cylinder valve (hand tight only).
14. Perform an operational test (as outlined above)
15. If the SCBA passes the operational test, the cylinder is ready for use.

Do Not Leave the Cylinder Valve Open When Cylinder is Empty

CLEANING

Cleaning the Facepiece

Clean the facepiece after each use as follows:

- Inspect the equipment for worn or aging rubber parts, worn or frayed harness webbing or damaged components.

Note: the nose cup is designed to be an integral part of the facepiece and does not have to be disassembled for cleaning.
- Remove breathing regulator from face piece.
- Carefully wash the face piece assembly with warm (110° F maximum) water with a mild soap solution and thoroughly rinse with clean water.
- Allow to completely dry.
- Disinfect the facepiece by one of the following methods:
 - Sponge it with a 70% solution of ethyl, methyl, or isopropyl alcohol, or
 - Submerge it in a hypochlorite solution, made with 2 tablespoons of chlorine bleach in one gallon of water
 - Rinse in cool water and allow to completely dry.
- Connect the breathing regulator to the face piece quarter turn coupling and rotate it until it latches in place. Place on apparatus.
- If damage or deterioration is noted, remove from service, tag (Form 3106.1) and notify Mobile Air.

Cleaning and Disinfecting the Breathing Regulator:

After cleaning the breathing regulator, verify that all moisture has been removed from the breathing regulator as described in the Regulator Check section below.

- Remove the breathing regulator from the facepiece.
- Remove any obvious dirt from the external surfaces, using a damp sponge or soft cloth.
- Inspect the inside of the breathing regulator assembly through the breathing regulator opening. If excessive dirt or soil is present, take the SCBA out of service and report it to Mobile Air for service.
- Depress the donning switch and close the purge valve. Use a recommended sanitizing or disinfecting cleaner in the breathing regulator opening and the immediate area around the opening.
 - Do not submerge past the cover retaining ring, do not allow the swivel joint to be exposed to the liquid
 - Agitate the breathing regulator back and forth briskly to ensure the inside of breathing regulator is in contact with the cleaning solution
 - Rinse by submerging and agitating the breathing regulator in lukewarm rinse water or by holding under gently running tap water.
- Shake excess water out of the breathing regulator.
- Completely air dry the breathing regulator before use. To speed drying, reconnect the breathing regulator to the cylinder, open the cylinder and then open the purge valve for at least five seconds to remove remaining moisture.
- Reattach the breathing regulator to the SCBA hose assembly and check the breathing regulator as follows before next use.
 - With the cylinder open at least one full turn, listen for air flow from the breathing regulator.
 - If air flow is heard, close the cylinder valve regularly and repeat. If air flow is still heard after several attempts, take the unit out of service and report it to Mobile Air.
 - Open the purge valve and observe the air flow from the breathing regulator spray bar. Open and close purge valve to completely expel moisture from breathing regulator.
- Dry the exterior surfaces with a soft, clean, dry cloth or towel.

Cleaning the Quick Connect Couplings

All quick-connect couplings should be cleaned after every incident to prevent build-up of soot, sheet-rock, plaster, and other dirt that frequently accumulates on equipment after incidents.

Couplings should be cleaned by sponging with a mild cleaning solution and then air dried.

DO NOT use shop or station compressed air or any other air containing lubricants or moisturizers to dry out the breathing regulator. Use cylinder air to blow out components.

Coupling sleeves should slide easily, without sticking. **DO NOT** use lubricants, such as WD-40 or grease on couplings or coupling sleeves. If sleeves do not slide readily, take the SCBA out of service and tag it for repair by Mobile Air.

SECTION 6. DONNING AND DOFFING

Full Personal Protective Equipment must be properly worn for intended operational use. Improper use in a hazardous atmosphere may result in personal injury or death.

HOW TO DON THE SCBA

1. Check the cylinder **Pressure Gauge** for **Full** indication.
2. Open **Cylinder** completely (approximately three full turns).
3. Listen for **Vibralert** and **PASS** distress alarm (3 quick chirps). Both actuate then stop.
4. Check **Remote Pressure Gauge** for **Full** indication (should match the **Cylinder Gauge**).
5. Check **Heads-Up Display** to verify that all five lights illuminate.
6. **Don the SCBA** using proper overhead technique. Grasp support member frame at the sides of backpack. Swing SCBA overhead, making sure elbows extend through the loops formed by the shoulder straps.
7. Slide the SCBA down back leaning slightly forward. Pull to secure **Shoulder Straps** and then connect the **Waist Buckle** latch. Cinch the waist belt straps firmly on both sides so that weight is carried on the hips. Readjust Shoulder Straps if needed.
8. **Control your Helmet.** Your Helmet should be on your head with the chinstrap closed and fully extended. Bring the **Facepiece** with **Breathing Regulator** attached up to your face. While holding the facepiece with the left hand (the low pressure hose and breathing regulator are on the left side), use your free hand to remove your helmet. Allow the helmet to hang on your left arm by the chinstrap.
9. Don the **Facepiece.** Make sure the facepiece is up to your face. Place chin in the chin pocket with one hand holding onto the **Breathing Regulator**. Pull the **Head Harness** over the head ensuring the straps are lying flat against the head. Tighten chin straps first then temple straps. Air will be supplied during inhalation.
10. Don your protective **Hood.** (Make sure the hood is carefully tucked in the turnout coat collar prior to the donning procedure). Pull the face opening over your head and secure the hood to cover the facepiece rim. Make sure the hood is not obstructing any vision. No skin of the neck or face should be exposed once the hood is secured.

SECTION 6. DONNING AND DOFFING

11. Secure the **Helmet**. While holding the face piece, slide the helmet back up your left arm and place it on top of your head. If your helmet has a shroud make sure it is down. Tighten the helmet chinstrap.
12. **Face Piece Seal Test**. Once the **Donning Switch** has been activated make sure the facepiece has a good seal. Breathe normally to ensure proper operation. Remember, no leaks.
13. **Positive Pressure Test**. Pull face piece out with finger and listen for free flowing air. Secure face piece.
14. **Purge Valve (Bypass) Test**. Rotate the **Purge Valve** 1/2 turn counterclockwise (pointer knob downward) to open. Air shall flow freely from the breathing regulator. Rotate purge valve clockwise (pointer knob upward) to close.
15. **PASS Distress Alarm Test**. Manually activate the **PASS** by depressing the RED button on the **Control Console (Remote Gauge)** located on the user's right shoulder. The PASS alarm goes into full alarm mode with a bright RED flashing light. Reset the PASS by depressing the YELLOW button twice.
16. **H.U.D. Check**. Verify the HUD displays the proper amount of air in the cylinder (should match remote gauge). Verify that the red, round low-battery indicator light is not flashing.

HOW TO DOFF THE SCBA

1. Loosen chinstrap on **Helmet** while holding the **Facepiece**, then slide helmet down your left arm hanging it by the chinstrap.
2. Remove **Hood**.
3. Fully depress the center of the **Donning Switch** on top of the **Regulator** and release. Airflow will stop.
4. Doff the **Facepiece** (loosen the chin and temple straps), then free the facepiece from the helmet chinstrap.
5. Loosen and disconnect **Waist Buckle Latch**.
6. Loosen from **Shoulder Straps**. Remove the SCBA (do not drop).
7. Completely close air **Cylinder** (push valve inward and turn clockwise until fully closed).
8. Bleed residual air. Open **Purge Valve** and listen for **Vibralert** deactivation.
9. Close Purge Valve.
10. Turn off the **PASS** by depressing the YELLOW reset button twice.
11. Reset all straps to the fully extended position (shoulder, waist, and head harness)

SECTION 7. RELIEF SCBA (LOANER SCBA)

The Department has a cache of relief SCBAs. When a Company's regular SCBA is taken out of service for repair, Mobile Air distributes a "loaner" to be used while the regular unit is serviced.

Some relief SCBAs may not have a 5500-psi capacity cylinder but instead will have 4500 psi which should not affect or diminish the rated service time of the SCBA.

Members shall only use 4500 psi bottles with 4.5 packs.

Additionally, relief SCBA may have either a welded steel wire or solid aluminum back-frame assembly, and some may **NOT** have a regulator hose with a quick connect coupling or an EBSS manifold and therefore cannot be coupled to another user's EBSS manifold in low-air emergencies.

Breathing regulators on relief SCBA may not have an illuminated heads-up display. Without a heads up display, it is essential that the user regularly check the dial gauge on their remote control console to monitor their air supply during an incident.

SECTION 8. APPENDICES

APPENDIX A: THE SCOTT RIT-PAK III

Battalion and Division Chief's buggies are equipped with a Scott RIT-Pak III. The RIT-Pak III is intended for use by a Rapid Intervention Crew ("RIC") as an emergency source of breathing air for a single victim who is being evacuated from an IDLH environment.

Description

The RIT-Pak III is made of a high-visibility, flame- and heat-resistant orange material that can be seen easily. The straps have reflective strips for improved sight in low-light environments.

The skid plate on the bottom of the bag serves three purposes (1) it protects the internal components from damage when dragging; (2) it aids with dragging through various floor types; and (3) it enables a firefighter to easily orient the pack and quickly deploy the rescue air components in an emergency situation.

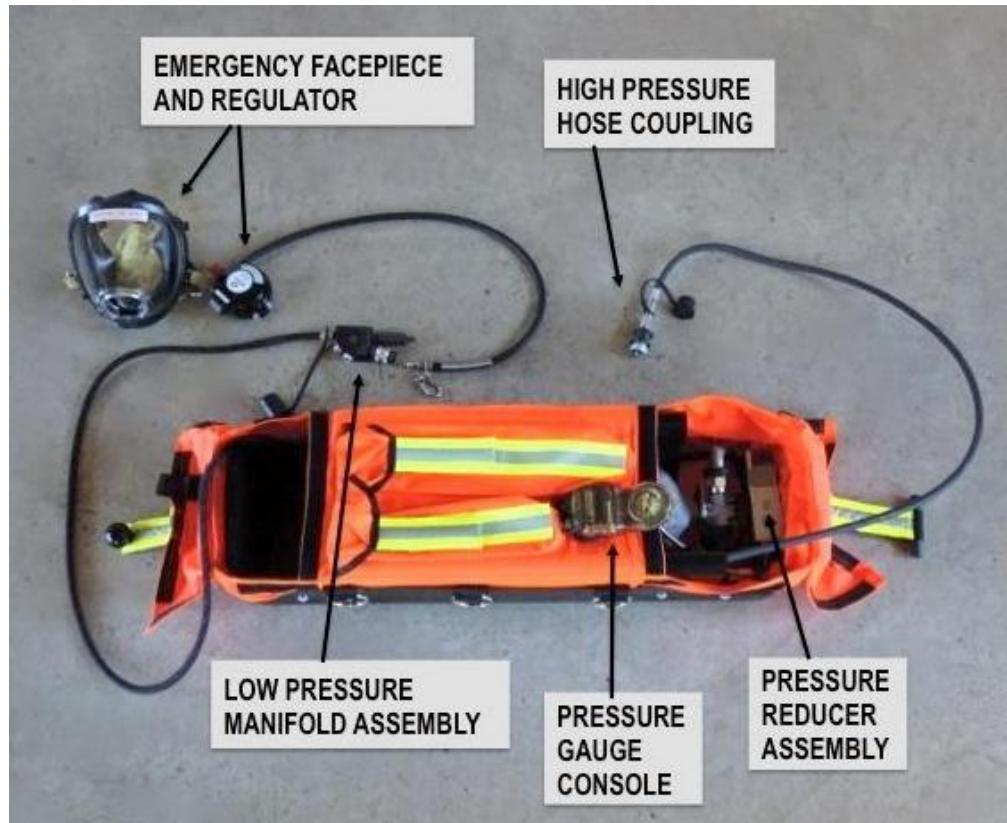
The pack has two main compartments to separate the low-pressure from the high-pressure pneumatics of the system. The straps that open each compartment have tactile grips that aid with orientation.

APPENDIX A: THE SCOTT RIT-PAK III



In addition to the two main compartments at either end of the pack, there are two pockets on the top of the pack. The smaller pocket is designed for tools to be carried to the rescue scene. The larger pocket is designed to hold 75 feet of 3/8" rope. There are 10 D-rings on the perimeter of the bag to enable other gear to be attached to the pack without compromising the integrity of the bag

The portable air supply consists of a 75-minute air cylinder attached to a combination low-pressure/high-pressure supply system.



External Pressure Gauge

Unique to the RIT-PAK III is the external pressure gauge, placed so that the amount of air in the cylinder can be easily determined without opening the pack. The dial pressure gauge is illuminated by a white light positioned to cascade over the gauge face at all times. Additionally, on the face of the gauge is an LED that displays the same pattern used on the head's-up display (HUD) on the Scott Air-Pak SCBA:

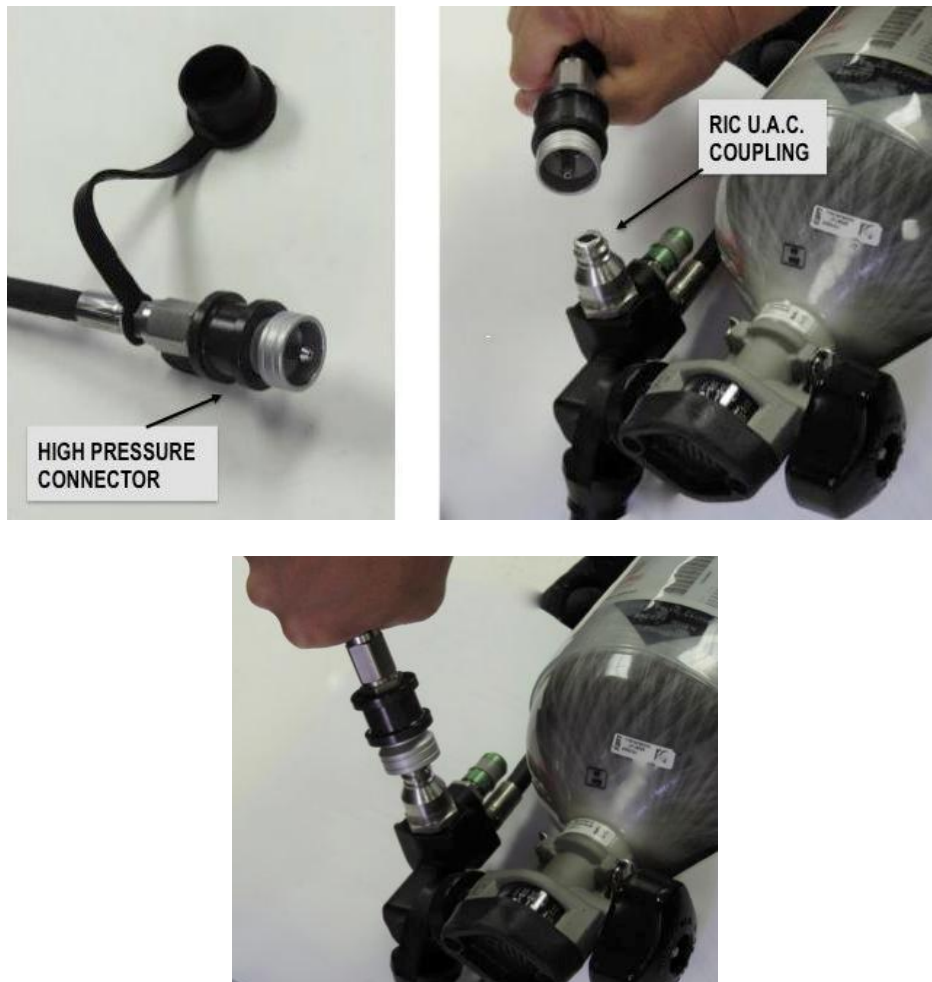
- 2 green lights = more than 75% air remaining
- 1 green light = 50-75% air remaining
- Blinking amber or yellow light = 25-50% air remaining
- Rapidly blinking red light = <25% air remaining

High-Pressure Compartment

The high-pressure side of the pack can be determined by looking at the strap handle; it has a T-bar sewn into it. This T-bar can be felt with gloved hands in low-light environments. Inside this compartment is the cylinder valve, which is used to turn the cylinder on and off. When the cylinder valve is opened, the lights on the external pressure gauge will turn on. The pressure reducer has an audible alarm that will sound when approximately 25% of the cylinder air remaining.

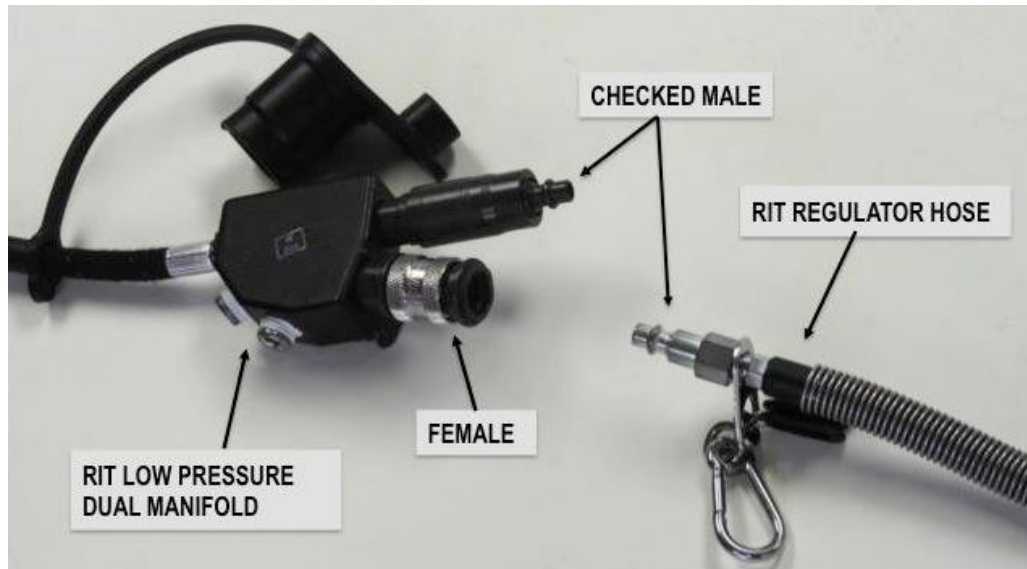
Housed in the high-pressure compartment is a five-foot transfill hose, stored in a tube running along the inside of the pack. The tube enables smooth deployment the transfill hose without its snagging internally. The transfill hose is designed to attach to and transfer air to a victim's cylinder via the RIC-UAC.

When the rubber dust cap is in place, the transfill hose coupling may be used to bleed residual air pressure from the system.



Low-Pressure Compartment

The low-pressure compartment is distinguishable by the ball attached to the strap. It can be easily felt in gloved hands in low-light environments. Inside, is a six-foot low-pressure hose and dual manifold that can be attached to the lid of the compartment for easy access. The dual manifold is equipped with a male and female quick-connect, just like the fittings found on the Dual EBSS system on the SCBA. When a victim is connected to the low-pressure dual manifold on the RIT-Pak III, the victim will be drawing air from the RIT cylinder.



Emergency RIT Facepiece

The RIT facepiece is designed specifically for the RIT PAK III. The facepiece has no nosecup or voice emitters so that rescue workers can clearly see the victim's face. The head harness has a large reflective tab on the back to aid in donning it onto a victim. A large D-ring on the adjustment strap enables gloved hands to secure the facepiece to the victim's face. **The RIT facepiece is NOT approved for a standard SCBA.**

RIT Breathing Regulator

The breathing regulator is attached to the RIT PAK III low-pressure manifold and will supply air on the victim's first breath. It attaches to the facepiece with a quarter turn and

latches into place. **The RIT breathing regulator has no Vibralert in it and is NOT approved for use with a standard SCBA.**

Inspection

The following procedure shall be used to inspect the RIT-PAK III. Inspections shall be conducted daily and before each use.

If any malfunction is noticed, remove the RIT PAK III from service, tag it and report it to Mobile Air for repair.

1. **Inspect the carrying pack** for worn or damaged components. Check that the straps are not damaged and that all buckles and closures are operating properly. Verify that there are no rips in the fabric portion of the bag. Inspect the outer plastic shell for cracks or other damage. Inspect the inner portions of the bag for damage or missing components.
2. **Verify that the cylinder is full.**
3. **Disconnect and inspect the cylinder coupling** on the pressure reducer to be certain that the nipple seal is present and undamaged. If the gasket is present and undamaged, align the coupling with the outlet of the cylinder valve and tighten the coupling to the cylinder valve by hand only. Wrenches shall NOT be used, as damage to the coupling gasket may result.
4. **Inspect the pressure reducer and all low-high pressure pipe and hose connections.** If any pipe or hose connections are found to be loose, remove the unit from service, tag it and report it to Mobile Air for repair.
5. **Fully extend the low-pressure and high-pressure hoses** from their storage compartments.
 - a. **Check the high-pressure air-line hoses** for cracks, cuts, abrasions, or other signs of damage. Check the high-pressure coupling for bent or damaged components and for cleanliness.
 - b. **Check the low-pressure air-supply hose** from the reducer to the dual manifold assembly for cracks, cuts, abrasions, or other signs of damage.
 - i. Check all low-pressure quick disconnect couplings for damage and cleanliness.
 - ii. Inspect both the male and female quick disconnects on the dual manifold.
 1. Pay special attention to the following:
 - a. Inspect the condition of the male quick disconnect for signs of wear, particularly look for wear on the locking ridge. If the coating is worn through and bare metal is

showing, do not use the apparatus, remove it from service, tag it and report it to Mobile Air for repair.

- b. Inspect the operation of the external check-valve sleeve on the male quick disconnect.
- c. If any damage is noted, do not use the apparatus; remove it from service, tag it and report it to Mobile air for repair.

- 2. Inspect the operation of the female quick disconnect: while pushing the plug into the socket, pull the locking sleeve back toward the guard. The plug will separate. To reconnect, push the plug into the socket until the locking sleeve pops forward. Test for proper engagement by tugging on the coupling.

6. **Inspect the emergency facepiece** as follows: inspect the facepiece seal and other rubber components for deformation, wear, damage, or cracks.

- a. Check that all harness anchors are present, firmly attached and do not rotate. Inspect the lens for cracks, gouges, scratches, or any condition that could impair the operation of the facepiece or the user's vision. Inspect the facepiece-regulator port for damage.
- b. Inspect the two support tabs and the facepiece around the mount for cracks and other signs of damage.
- c. Inspect the lens frame bezel for damage such as cracks or distortion. Check that both lens frame bezel screws are present and installed correctly.
- d. Inspect the head harness for correct installation, with all straps oriented correctly. Inspect the head harness for damage or worn components.
- e. If any other facepiece is used with the RIT PAK III, it must be in complete and serviceable condition with no damaged, loose, or worn components.

If any damage is found, remove the facepiece from service, tag it and report it to Mobile Air for repair or replacement.

Always stow the face piece with the head harness straps pulled over the lens. This allows rescuers to easily apply the face piece to a victim without the straps getting in the way.

7. **Inspect the emergency breathing regulator** as follows:

- a. Inspect the breathing regulator for damaged or missing components.
- b. Inspect the gasket on the breathing regulator that seals against the facepiece for rips or damage that may break the seal. Verify that the regulator gasket is properly installed around the outlet port of the regulator.

- c. Verify that the purge valve (the red knob) is not damaged and turns smoothly one-half turn from stop to stop.
- d. Inspect the hose for cuts or damage.
- e. Inspect the condition of the male quick disconnect for signs of wear, particularly look for wear on the locking ridge. If the coating is worn through and bare metal is showing, do not use the regulator assembly. Remove it from service, tag it and report it to Mobile Air for repair.
- f. Insert the regulator into the facepiece port. Rotate the regulator counter-clockwise, as viewed from the inside of the facepiece, until the red purge valve is on the left side of the facepiece. The lock tab on the regulator should lock onto the facepiece retainer with a click. When the lock tab is properly engaged, the regulator should not rotate.
- g. Remove the regulator from the facepiece by pulling back on the regulator retaining latch and rotating the regulator one-quarter turn.
- h. Inspect the gasket on the breathing regulator again for rips or damage that may break the seal.

Operational Test

1. Verify that a **FULL** air cylinder is properly installed and attached to the pressure reducer.
2. Open the cylinder by turning the cylinder valve and verify that the remote pressure gauge console and LED display lights are working properly.
3. Close the cylinder valve and depressurize the system by depressing the rubber boot on the high-pressure transfill hose.
4. Make sure that the hook-and-loop fasteners on all covers are securely sealed and that all straps (e.g., shoulder strap) are installed as needed.

Application

While there are no specific step-by-step instructions to using the RIT-PAK III, training with the PAK is essential for efficient use in a rescue situation.

When a downed firefighter is located, it is essential to determine the amount of air in their SCBA cylinder.

- If it is empty, immediately apply the rescue air system.
- If there is sufficient air remaining in the cylinder, refastening the existing facepiece may be all that is necessary.

Listen to see if the downed firefighter is breathing.

- If they are not breathing, they are in respiratory arrest. Crack open the bypass valve and begin extrication.
- If they are breathing, air can be provided from the RIT-PAK in two ways:
 - ✓ By transfilling air from the RIT-PAK cylinder to the victim's cylinder.
 - Roll the firefighter onto their right side to access the quick-connect UAC valve located at the base of the air cylinder.
 - ✓ By attaching the RIT-PAK III low-pressure manifold to the user's regulator quick-connect coupling (or the RIT Regulator and RIT facepiece).
 - Roll the firefighter onto their right side to access the quick-connect coupling on their left shoulder strap, in line with their regulator hose.

Donning the RIT-PAK facepiece onto the downed firefighter

- With one hand, press the face piece firmly against the face.
- With the other hand, reach over the crown of the head, grab the head harness, and pull it toward you over the head. Start from the neck line and work your way up, tightening the face piece.
- Make sure the face piece is centered on the face, the chin is inside the chin cup, and then finish tightening the straps.
- Ensure air is flowing into the facepiece
 - If the victim is not breathing deeply enough to activate the donning switch, press firmly on the front of the regulator to activate the donning switch to start air flow.
 - Crack open the purge valve slightly to maximize air flow to the victim.

APPENDIX B: MONTHLY CYLINDER HYDROSTATIC TEST REPORT

Each Division, Battalion, Company commander and Bureau Head, if applicable, shall submit through HRMS a monthly Hydrostatic Test Report. All cylinders (including air, acetylene and oxygen) that have reached their next required test date as well as all cylinders that will reach the test date in the next reporting period shall be included in the report.

This report indicates that:

- The company has inspected all cylinders.
- All inspected cylinders are in compliance for the reporting month.
- All non-compliant cylinders were reported to Mobile Air for exchange.

The screenshot shows a web browser window titled "Hydrostatic Test Form - Microsoft Internet Explorer provided by San Francisco Fire Department". The address bar shows a URL starting with "http://10.31.27.231:7777/pls/htmldb/f?p=104:280:1769781787363461:::P280_ID:2577". The browser's Favorites bar shows "Hydrostatic Test Form".

The web application header includes the San Francisco Fire Department logo and the text "San Francisco Fire Department Personnel Scheduling and Planning". Below the header is a navigation menu with tabs: "Employee", "Officer", "Monthly" (selected), "Daily", "Training", and "NFIRS". Under the "Monthly" tab, there are sub-tabs: "Apparatus, Hose & Equip.", "Facility Inspection", "Fuel", "Hazmat", "Hose Houses", "Hydrant & Cistern", "Hydrostatic Test" (selected), "Operations", "Personnel Inspection", and "School Ex".

The "Hydrostatic Test" form contains the following fields and options:

- Form Dt:** 02/28/2013 (with a calendar icon)
- Unit ID:** E05
- ☒ This unit inspected all air and oxygen cylinders this month.
- ☒ All inspected air and oxygen cylinders were in compliance.
- ☐ All inspected air and oxygen cylinders not in compliance were reported to Mobile Air 1.
- Remarks:** A text area with the date "03/01/2013 17:25" entered.

At the bottom of the form, there are "Cancel" and "Apply Changes" buttons. The footer of the browser window shows "User:" and "Language: en-us" on the left, and "Copyright © 2004, All rights reserved." on the right.

The hydrostatic test date is WRITTEN in either black or red marking pen on the top of the cylinder, just below the neck. For example, a cylinder marked 10/16 requires hydrostatic testing by October, 2016 to remain testing compliant.

Mobile Air shall be notified of and will pick up all cylinders that need testing, and they will provide replacement cylinders.

APPENDIX C: CYLINDER REFILL AND SCBA REPAIR PROCEDURES

All cylinders are to be checked for fullness by members performing Daily Apparatus Checks. The complete SCBA shall also be checked at this time.

Requests for cylinder refill, SCBAs repair, or battery replacement should be made to Mobile Air (x3545). Standard requests should be made between 0800 to 1000 hours, unless an SCBA malfunctions or is damaged at an incident or at a drill and is in need of immediate replacement. If Mobile Air is out of quarters, a message should be left on their voice mail or they can be reached after hours at Station 20.

NO equipment will be picked up for repair unless an SCBA Repair Request Tag accompanies the item (Form #3106.1).

Mobile Air generally responds to greater alarm fires to refill and service air cylinders and SCBAs.

Any company who fails to obtain refills at the greater alarm will be required to respond to the nearest station with refilling capabilities and refill their breathing apparatus bottles. Station compressors are adjustable to fill cylinders rated at either 5500 or 4500 psi. When filling cylinders with these compressors, it is essential that the proper fill pressure is selected to prevent over pressurization of the cylinder. Only personnel passed up on using these filling stations should refill cylinders.

Stations where compressors are located are:

- Division of Training, Folsom St. (SCBA Adaptor) and Treasure Island Facilities
- Station 1 (SCBA Adaptor)
- Station 9 (in service in fall of 2013)
- Station 15
- Station 38

Note: The firefighter assigned to Mobile Air will remain with their apparatus while on scene at an incident. Companies shall come to Mobile Air for refills.

Treasure Island Training Facility

Companies who use their SCBAs while attending training at Treasure Island Training Division shall have their SCBA cylinders refilled by a trained member assigned to Treasure Island.

Oxygen

Companies are responsible for refilling their oxygen cylinders. The following stations have been equipped with oxygen cascade refilling systems:

- Station 1
- Station 9
- Station 14
- Station 38
- Station 7
- Station 13
- Station 15

Use of the air compressor, as well as use of ALL other air or oxygen cascade supply systems, is limited to trained and authorized department personnel ONLY.

Safety Filling Practices

In conjunction with the above practices, the following regulations shall be observed when filling ANY cylinder, including SCOTT, SCUBA, or Oxygen.

It is mandatory that the hydrostatic test date written at the top of each cylinder be checked BEFORE each cylinder is filled. If the test date has passed, DO NOT fill the cylinder. Notify Mobile Air for cylinder pick-up.

Fragmentation Safety Tanks provided in stations with permanent fill stations MUST be used when filling cylinders.

APPENDIX D: SCBA REPAIR REQUEST AND FORM 3106.1

Members performing “Daily Morning Apparatus/Equipment Checks” who discover a malfunctioning SCBA must perform the following:

- Immediately remove the SCBA from the apparatus;
- Label the SCBA with SCBA Repair Request Tag; and
- Immediately notify (through company officer) Mobile Air of the problem so that the malfunctioning SCBA may be exchanged with a loaner.

<u>SCBA Repair Request</u>	Company # _____	Date: _____
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Check the appropriate boxes below to report common SCBA malfunctions. If there is not a box that describes the problem you are having, give details of the problem in the remarks section below.

<input type="checkbox"/> Regulator Problem <input type="checkbox"/> Air flow problem - explain below _____ <input type="checkbox"/> Leaks / where? _____ <input type="checkbox"/> Broken Cover _____ <input type="checkbox"/> Hose line leaks / where? _____ <input type="checkbox"/> Donning / doffing switch problem explain below _____ <input type="checkbox"/> Bypass knob problem _____ <input type="checkbox"/> Other _____	<input type="checkbox"/> Gauge Line Leaks <input type="checkbox"/> Where? _____ <input type="checkbox"/> Mask Problem <input type="checkbox"/> Face Piece _____ <input type="checkbox"/> Rubber Seal _____ <input type="checkbox"/> Back Pack Problem - explain below _____
--	---

☐ **Remarks** _____

Officer Name: _____

SCBA units will not be picked up by the Service Squad unless accompanied by this tag.

FORM 3106.1

APPENDIX E: SCBA MALFUNCTION AT INCIDENT AND FORM 3106.2

Members who discover a malfunctioning SCBA while on-scene at an incident must perform the following:

- Notify one's officer of the suspected malfunction whenever it is reasonably possible;
- Immediately remove oneself and one's partner from the "Immediately Dangerous to Life or Health" (ILDH) environment; and
- Doff the malfunctioning SCBA and place it inside the cab of one's apparatus (Please note that NO member is permitted to touch the malfunctioning SCBA once this is exercised).

Once a member performs the above procedures while on-scene at an incident, his/her company officer must immediately notify the Incident Safety Officer. In the event the Incident Safety Officer is unavailable, the Incident Commander will assign a Battalion Chief the responsibility of securing the malfunctioning SCBA prior to the company's departure from the scene.

The Battalion Chief assigned this task must place the malfunctioning SCBA into a biohazard bag and label it with the SCBA Incident Malfunction Tag (Form 3106.2, Orange in color), with the description of the problem documented on this form. The Battalion Chief must then return the malfunctioning SCBA to his/her quarters.

SCBA Incident Malfunction Tag	
User ID #: _____	Co #: _____
Date of Incident: _____	Incident #: _____
Description of reported problem:	

Form 3106.2	_____ Name & ID of member filling out tag

The Battalion Chief must then notify the Department Safety Officer of having performed the above procedures. The Department Safety Officer will then arrange to pick up the malfunctioning SCBA within 24 hours of notification.

The company officer in charge of the malfunctioning SCBA must notify Mobile Air either at the scene or upon his/her return to quarters that a malfunctioning SCBA was discovered and that a loaner is warranted.

The Department Safety Officer will ensure that the malfunctioning SCBA is inspected by the Department's certified technician or by an appropriate outside agency. Once the malfunctioning SCBA is inspected, it will be serviced (if warranted) and returned to the company to which it is assigned.

APPENDIX F: PORTABLE SCOTT COMPRESSOR TRAILER

The Fire Department has a portable Scott compressor on a trailer located at Treasure Island Training Facility.



This unit is capable of filling SCBA & SCUBA bottles. The system has a revolving fill station which allows for two (2) bottles to be filled at a time, while two (2) other bottles are being set up to be filled. The unit also has a high-pressure hose reel located on the front with 250 feet of hose that can be used to fill bottles remote from the unit. (BART/MUNI, High rise).

The 20 horsepower motor, which runs on diesel fuel, powers the compressor and the generator. The unit has a tower light with four 500-watt lights along with several outlets for supplying power.

ONLY members who have been trained and passed up on the operation of this unit may operate it.

APPENDIX G: DRÄGER BG-4 CLOSED-CIRCUIT BREATHING APPARATUS

Dräger BG-4 re-breathers are available for use by SFFD units at prolonged, long-distance incidents.



The Dräger BG-4 is a NIOSH-approved Closed Circuit Breathing Apparatus (CCBA) that provides respiratory protection in IDLH environments for up to four (4) hours. Conventional SCBA's are limited to just one hour or less and do not provide the extended time that is required in critical operations such as search and rescue, hazardous materials clean-up, domestic preparedness, or mine and tunnel rescue. The low profile of the BG-4 makes it easy to use under protective clothing. Every BG-4 is equipped with the Moniton®, a fully electronic alarm, test, and pressure display system that provides continuous information to the user.

The Dräger BG-4 re-breathers shall only be used by trained personnel.

All maintenance on these units will be conducted by trained members from E36, RS1, RS2, and/or Mobile Air.

Dräger BG-4 units are carried on Haz Mat 1 and Mobile Air 1.

APPENDIX H. SCOTT EPIC 3 VOICE AMPLIFIER

This amplifier is to be used with the new AV3000HT Scott masks. Please note the difference between the **Voice Amplifier** and the **Voice Emitter**. The amplifier is the piece of equipment that gets attached over the voice emitter.



Epic 3 Voice Amplifier

The voice amplifier helps officers communicate more clearly with other personnel around him or her in an IDLH environment. **The Voice Amplifier is not intended for use with the portable radio microphone.**



Voice Emitter.

Each Scott mask has 2 voice emitters on it. Use your portable mic here.

The voice emitter on the left side of the mask is to be used in conjunction with the portable radio microphone. **Place the mic one to two inches from the voice emitter to communicate.**

Turning on the Voice Amplifier

Turn the voice amplifier on by pressing the power button for 1 second. You will hear a series of 4 ascending tones and you should see a solid green LED light. This means the unit itself and the amp are both on. If the green LED is flashing, this indicates that the batteries are low and must be changed out right away.

Test the amp by speaking into the microphone port which is located in the D-shaped mount.



Back side of Voice Amp with D shaped mount and locking spring lever.

Turning off the Voice Amplifier

Press and hold the power button down for 3 seconds. (This safeguard is in place to prevent accidentally turning the amplifier off.) You will hear 2 descending tones and the LED will turn off.

Attaching the Voice Amplifier

This voice amplifier is to be attached to the mounting bracket on the voice emitter on the right side of the Scott mask. The amplifier can only be attached in one way. Place the amplifier with the battery compartment facing up. Align the D shaped mount with the d shaped opening. Press it in and turn it $\frac{1}{4}$ turn counter clockwise or towards where your ear would be. You should hear 2 clicks. This means it is locked in place. If you are uncertain whether it is locked in place, attempt to turn the amplifier clockwise. It should not move.



Scott mask with Amplifier attached on right side.

Removing the Voice Amplifier

To remove the amp, press the locking spring lever outward with your thumb and rotate the amplifier $\frac{1}{4}$ turn clockwise.

Regular Operational Inspection

Be sure to regularly inspect your amplifier. Inspect the mounting bracket for damaged or loose components. Insure that it is secured to the facepiece. Inspect the Voice Amplifier for any damage, and missing or loose parts. Check that the locking lever, power button, LED, face mount gasket, speaker cover, and D-shaped mount are all operating properly. Open the battery door and check for corrosion or damage. Insure the seal around the battery door is clean and tight. Close the battery door and tighten the screw.



BOE will provide AAA replacement batteries when needed