6/3 SELF CONTAINED BREATHING APPARATUS (SCBA)

6/3 SELF CONTAINED BREATHING APPARATUS - GENERAL (SCBA)

-01. SELF CONTAINED BREATHING APPARATUS

Self Contained Breathing Apparatus includes those apparatus in which the wearer carries their own air supply that is entirely independent of the outside atmosphere. Compressed air is contained in a cylinder. High pressure air (up to 5,000 psi) is reduced down by the first and second stage regulator to a breathable pressure. Exhaled air is exhausted via the exhalation valve on the mask. The air cylinder is attached to the backpack which contains both regulators. The mask is carried in a pocket on the member's turnout coat.

The LAFD uses the Sperian Warrior SCBA. The Warrior SCBA is designed to provide the wearer with respiratory protection while working in hazardous atmospheres. This unit may be used for entry into and escape from hazardous or oxygen deficient atmospheres. This unit will NOT provide protection against gasses, mists or vapors which are skin absorbed (e.g. hydrocyanic acid).

.01 DESCRIPTION

The SCBA consists of 10 major component groups:

1. Backpack Harness and Air Cylinder
2. First Stage Regulator
3. Heads-up Display (HUD)
4. Second Stage Regulator
5. Air Pressure Gauge with PASS Device
6. Buddy Breathing System with "Y" Block
7. Facepiece
8. Voice Amplification Systems (VAS)
9. Firefighting Hood
10. Escape Filter Cartridge
.02 BACKPACK AND AIR CYLINDER

The backpack consists of a lightweight aluminum back plate with an aluminum hip plate that both swivels and hinges on the backplate. The backpack has three integrated carrying handles with carabiner attachment points rated at 1000 lbs. The cylinder is attached by a stainless steel band, and has a release latch on the right hand side (when looking at the cylinder with the valve pointing down), and an adjustment latch on the left hand side. The warrior harness is made of Kevlar straps. The pressure gauge, mounted on the right shoulder strap, is integrated with the pass device. The gauge indicates the cylinder pressure once the cylinder valve has been opened. The intermediate pressure hose is mounted over the left shoulder, and includes an electrical/ pneumonic quick connector in line, which allows easy removal of the second stage regulator from the SCBA (only to be used by Rescue Maintenance). Connection of the quick connect automatically connects the electronics required for the Heads Up Display (HUD). The backpack is designed to transfer 60% of the load to hips for less shoulder fatigue. The backpack harness and cylinder weight approximately 30.25 lbs. The air cylinder is mounted low for unrestricted head and neck movement.

Battery pack located right lower side of harness use only 4 Duracell "C" size batteries only. These batteries power all electronics except for the VAS. Amber LED's located on PASS device and backpack indicates battery status. A LED flash every 10 seconds indicates good battery. The LED flashes every 2 seconds indicating adequate battery charge. No LED flashing indicates a dead battery. The RIC / Universal Air connection (UAC) is located on the left lower side of backpack harness.

To replace the batteries, first remove the protective rubber cap, then remove the slotted battery cap located on the lower right hand side (when looking at the cylinder with the valve pointing down) of the backpack, using a coin, a large, flat blade screwdriver, or the male end of the waist strap buckle; remove the old batteries; install new batteries in the orientation shown on the lower cover just above the battery cap area; and replace the cap. Screw the cap down until the amber light on the battery status indicator on the HUD transducer module begins to flash. Reinstall the protective rubber cap.

The Warrior SCBA is designed to allow full freedom of motion when bending, stooping and crawling, etc.

The air cylinder utilizes an aluminum composite carbon fiber construction overwrapped with a fiberglass epoxy matrix and has a maximum working pressure of 4,500 psi. A pressure indicator, built into the cylinder valve, indicates the pressure of air currently in the cylinder. The gauge is graduated in 1000 psi increments ranging from 0 to 6000 psi. A cylinder that is full (bottle range 4000-5000 psi) is identified on the gauge in green. There are 2 sizes of air cylinders; 45 minute and 60 minute. When full, the cylinders contain 65.6 and 87 cubic feet of air respectively and will provide air supply time of 45 minutes (65.6 cu. ft.) or 60 minutes (87 cu. ft.) at a user rate of 40 liters per minute. Actual air supply time will vary, depending on demands of the user, and will frequently be less.

The air cylinder is hydrostatically tested every 5 years. Once tested, the vendor places a decal on the cylinder identifying year and month of test. The department designator for newer bottles is "LFD" imprinted on the 2 inch luminescent band.
.03 FIRST STAGE REGULATOR

The first stage regulator contains:

- A pressure reducer.
- Primary low air alarm activation and adjustment mechanisms
- Intermediate pressure connection to the second stage regulator and audible alarm.
- High pressure connections to the HUD transducer, remote pressure gauge, and the universal air connection.

The first stage regulator lowers cylinder air pressure to a nominal 115 psi. The relief valve activates to protect the system when the regulator pressure exceeds 200 to 225 psi.

The first stage regulator is connected to a low pressure "warbling" whistle alarm. This alarm is located at the upper left corner of the backpack, protected by an impact and thermal resistant enclosure. This low pressure SCBA audible alarm activates at 1035 to 1215. The audible alarm will continue to sound until the air pressure drops below 200 psi.

.04 HEADS UP DISPLAY (HUD)

The HUD is mounted on the second stage regulator. When the second stage regulator is installed in the facepiece, the display can be seen through openings in the facepiece nozzle cover. When the cylinder valve is opened, the HUD will activate automatically, and will indicate the air pressure remaining in the cylinder. The display consists of four green LEDs, representing Full, 3/4, 1/2, and 1/4. At full cylinder pressure, all four LEDs are illuminated. As the air pressure in the cylinder decreases, the LEDs turn off one at a time, thereby indicating the air pressure status. When the pressure drops below 50% of cylinder capacity, the LED representing 1/2 cylinder capacity starts to flash, and continues to flash for a short time (approximately 20 seconds) before returning to continuously lit. When the pressure drops to 1/4 (25%) of cylinder capacity, the last green LED turns red and begins to flash, thereby giving the user a visual alarm of low pressure in addition to the audible alarm located at the upper left of the backpack. The 1/4 LED will turn red and begin to flash between 1035 and 1215 psi. When the pressure drops to 10% of cylinder capacity, the red LED begins to flash noticeably faster and continues flashing in this manner until air pressure drops below approximately 200 psi, at which time the display will turn off. No lighted LEDs represents zero air pressure.

An external red LED, mounted on the front of the HUD module, warns others of the user's low air status by flashing at the same time the 1/4 LED is flashing inside the HUD module. The external red LED flashes noticeably faster when the pressure drops to 10% of the cylinder capacity. A red LED at the upper right of the backpack performs the same functions.

There are three battery status indicators amber LEDs on the Sperian Warrior SCBA.

- HUD - on the bottom right side
- Backpack - on the top right
- PASS device

The HUD LED is located on the bottom right side. It will illuminate amber continuously indicating low battery. When the SCBA is in storage (the cylinder valve is not opened), the amber LED on the Backpack and PASS device will flash once every 10 seconds to indicate a usable battery condition. The amber LED flashes every two seconds to
.05 SECOND STAGE REGULATOR

The pressure demand second stage regulator is mounted on the facepiece by the Sperian AIR KLIC system. The mechanism automatically locks in place when the regulator is pushed into the AIR KLIC, and is detached when both of the release buttons are pressed. To prevent inadvertent airflow, the regulator will not operate until the first breath on mechanism is activated or the manual override button on the front of the regulator is pressed. Pressing the shutoff button can stop the flow of air. A large red knob on the right side of the regulator controls an adjustable bypass valve. Turn this knob counterclockwise provides a constant flow of air.

.06 AIR PRESSURE GAUGE WITH PASS DEVICE

The air pressure gauge and PASS device (IntelliPASS) is routed over the right shoulder strap. It contains a luminescent gauge for low light viewing and has an analog readout from empty "E" to full "F" using " 1/4, 1/2, 3/4, and F". The PASS device is activated when cylinder valve is opened. Ascending tone and green flashing LED lights indicate activation. Depress the red "ALARM" button for 1 to 2 sec. to put into full alert. Two slow depressions of the yellow "Reset" button on the side of the gauge will shut off alarm. Test is indicated by a descending tone. After air is bled from the system two additional depressions of the yellow reset button will shut off the IntelliPASS system. No manual activation of the PASS other then red button or opening cylinder. Lack of movement for 20 seconds will activate the staged alarm with LED lights alternating green and red. Volume increases every 5 seconds of inactivity with full alarm being reached at 30 to 45 seconds. In full alarm alert the LED lights flash red and alarm tones alternate between front and rear mounted alarm speakers. Minimum requirement is 95 decibels. Warrior provides between 97 and 103 decibels in full alarm.

.07 BUDDY BREATHING SYSTEM

Intended for emergency air supply to a firefighter who has become lost, trapped or disoriented and has become low on air. The buddy breather system consists of 39 inch intermediate pressure hose with a "Y" block male and female quick connect fitting. A storage pouch is located on the left hip belt. When connected, the SCBA with higher pressure will supply both breathers until the higher psi bottle is exhausted, then switches to lower psi bottle.
.08 FACEPIECE

The Warrior SCBA includes a CBRN TwentyTwenty Plus facepiece. The butyl rubber facepiece has a special wide lip sealing surface and five point silicone headstrap harness or nomex headnet harness. The lens is treated with an abrasion resistant coating on the outside surface of the lens, and a permanent anti fog coating on the inside of the lens. The nozzle houses a removable nose cup, speaking diaphragm, and exhalation valve. The AIR KLIC is threaded into the nozzle by a ratchet mechanism to prevent leakage and provide a secure mount for the second stage regulator.

.09 VOICE AMPLIFICATION SYSTEM (VAS)

The voice amplification system attaches to the right side of the facepiece and allows user to choose push-to-talk or hand free operation. One depression yields push to talk feature or two consecutive depressions yields hands free continuous use. Depressing the button two additional times will turn unit off. Red LED visible from inside when in use. Blinking amber LED indicates low battery. The VAS requires three AAA batteries.

.09 FIREFIGHTING HOOD

The firefighting hood is designed to provide protection from elevated temperatures to the ears, face and neck of the wearer. The firefighting hood shall be donned prior to putting on the turnout coat. After the turnout coat is buttoned and snapped, the hood can be pulled down around the collar when facepiece is not worn.

All members "shall" pull the hood into proper wearing position when actively engaged in firefighting activities, including exposure protection, ventilation operations, automobile fires, dumpster fires and any other fire fighting activity where extra protection is required. The firefighting hood "shall" be worn any time the SCBA facepiece is donned. (See facepiece donning section)

At brush and grass fires, the firefighting hood may be worn in place or in conjunction with the helmet shroud for added protection.

The firefighting hood shall be inspected daily and after each use. Always make sure a dry hood is available for use. After a fire, wash the hood with warm water and mild detergent to remove normal accumulation of dirt and fire particles. Hang dry only and do not use bleach.
.10 ESCAPE FILTER CARTRIDGE

The escape filter cartridge is a single-use, air-purifying respirator designed to protect your respiratory system from the effects of smoke and toxic gases (including carbon monoxide) for up to 15 minutes during an escape from an emergency situation after your Self Contained Breathing Apparatus fails or runs out of air. The escape filter cartridge is a "one time use only" device and should be used only for purposes of fleeing or escaping emergency situations after your SCBA fails or runs out of air. Do not use your escape filter cartridge to enter emergency situations or to rescue others or recover property or to extend the time in which you remain inside of an emergency situation. Once you have securely connected the escape filter cartridge to your facepiece in place of the second stage regulator you should flee or escape the emergency situation immediately. Do not reuse your escape filter cartridge, even if it was worn for less than 15 minutes. The escape filter cartridge is not intended for use in an oxygen deficient environment. It does not generate breathable air for you. The escape filter cartridge instead filters the air in your environment to remove certain contaminants typically produced in home or office fires.

The escape filter cartridge is intended for use only in the most extreme of circumstances when no other alternative is available. Escape canister are carried in front pouch on turnout coat. The filter is designed for "one time use only". Do not remove the filter until you are in a safe environment or another means of fresh air becomes available (buddy breathing, etc.). If the filter is deployed, the member must forward an F-225 to the Emergency Services Bureau outlining the circumstances requiring its use, with an F-80 attached for replacement. Practice "re-usable" escape filters (red in color) are available for drill purposes from the Battalion office.

-02. DONNING THE SELF CONTAINED BREATHING APPARATUS

.01 BACKPACK

Several effective methods of donning the breathing apparatus backpack are currently utilized throughout the Department. The following techniques descriptions are not meant to limit members to these particular methods.

Apparatus Mounting Bracket Method

If the SCBA is mounted in the bracket on the apparatus, don the unit by placing your LEFT arm through the LEFT shoulder strap and your right arm through the right shoulder strap. Grasp shoulder straps and pull away from bracket.

Over the Head Method
Place the cylinder on the ground with the cylinder valve away from user. Grasp the cylinder with both hands and lift overhead. Release grasp and let your arms slip through the shoulder harness. Adjust shoulder straps.

**Double Shoulder Strap Method**

Place the cylinder on the ground with cylinder valve away from user. With hands palm down, grasp the right shoulder strap with right hand and left strap with left hand. Lift the unit to your back by turning your body as you lift, swinging one arm over your head as if donning a coat. Let your arms slip through the shoulder straps and adjust straps. For safety of personnel and the unit, avoid swinging in a wide arc.

To adjust the unit, bend forward and pull the shoulder adjustment straps until the back support/waist strap rests in the small of your back.

Fasten the waist buckle. Bend slightly forward and grasp the left waist adjustment strap with left hand and right strap with right hand. Pull forward till snug. Re-adjust shoulder straps for comfort and to transfer the weight to the back support/waist strap.

Open the cylinder valve and check the pressure reading on the pressure gauge.
.02 DONNING THE FACEPIECE

1. With one hand, brush hair back to clear the forehead area. With the other hand, grasp the facepiece at the regulator connection and place mask on face, putting the chin into the chin cup first.
2. Pull the facepiece harness/headnet over the head. Tighten harness/headnet straps.

NOTE
Since all LAFD members are issued a personal facepiece, it is recommended that the adjustment straps at top and top/side of the mask be pre-adjusted, leaving the lower straps closest to the chin adjustable to facilitate quick donning and doffing. This can be accomplished by properly donning the facepiece, adjusting headnet or spider straps, then removing the facepiece by loosening only the lower adjustment straps.

3. Check for a proper seal by covering the regulator quick-connect port with the palm of your hand and inhale. The mask should seal against user's face. No leakage of air should occur.
4. Reach to the back of head and grasp the aperture of the firefighting hood with both thumbs. Pull the hood over your head. Ensure that the aperture of the hood overlaps the rubber face seal, adjustment straps, handi talkie speaker and retention tongue at the base of the facepiece. Running you thumbs and index fingers around the entire facepiece opening may assist this process. When the hood is donned properly, no facial skin surface will be exposed.
5. Position the helmet on the head and tighten the chinstrap.
6. Simultaneously squeeze both blue "air klic" release buttons on second stage regulator and remove from waist mounted holster.
7. Attach the second stage regulator to the quick-connect fitting on the mask. A click will sound when a positive connection is made. Do not depress blue release buttons while connecting regulator to the facepiece.
8. Air pressure will be delivered upon the user's first inhalation or by depressing the manual override button.
.03 REMOVING (DOFFING) THE SCBA

1. When in fresh air, depress the shut-off button and quickly squeeze both blue "air klic" release buttons on the second stage regulator and remove.

   REPLACE REGULATOR IN HOLSTER TO PREVENT DEBRIS FROM COMPROMISING QUICK-CONNECTION.

2. Remove helmet and firefighting hood.
3. Remove facepiece by pushing forward on the, chinstrap buckle tabs and lift facepiece off.
4. Close air cylinder valve and bleed residual system pressure using either the bypass valve or manual override.
5. Turn off PASS.
6. Buckle waist strap. Loosen the shoulder/straps by grasping the shoulder strap buckle with thumbs, pulling forward and away from chest.
7. Immediately replace depleted air cylinder.
8. Follow procedures for inspection and maintenance after use, when practical. Minimally, ensure the SCBA is ready for use.

.04 CYLINDER REPLACEMENT / BAND ADJUSTMENT

Cylinder Removal and Reinstallation

1. Removal
   A. Close the cylinder valve by rotating the shutoff handwheel clockwise.
   B. Relieve the hose pressure by opening the second stage regulator bypass valve (red knob) and listening for system depressurization.
   C. Remove the CGA handwheel from the cylinder valve by rotating the black handwheel counterclockwise.
   D. Remove the tank band as follows:
      • Loosen the tank band by pressing upward on the release latch on the right hand side of the SCBA with your thumb and flipping the cam-over buckle away from the backplate.
      • Remove the cylinder by sliding it upward beyond the tank band.

2. Installation
   A. When installing a cylinder of the same diameter or smaller diameter;
      • With the cam-over buckle on the right side flipped up, slide the cylinder into the tank band with the cylinder valve pointing downward until the dome of the cylinder rests on the two bumpers on the lower cover.
      • With the cam-over buckle on the right side fully flipped up, adjust the tank band snug against the cylinder by pulling out the adjustment buckle on the left side of the SCBA and pushing the tank band down toward the backplate.
      • Push the adjustment buckle back so that it is flush with the cylinder and the teeth of the adjustment buckle are engaged with the tank band.
      • Flip the cam-over buckle down toward the backplate until the release latch snaps over the buckle, locking it in place. The cylinder should be tightly held in place.
   B. If changing to a larger size cylinder:
      • With the cam-over buckle on the right side fully flipped up, release the adjustment buckle on the left side of the SCBA by pulling it out away from the cylinder.
      • In order to disengage the teeth of the adjustment buckle from the tank band, it may be necessary to gently push the tank band against the cylinder.
• Grasp the tank band toward the left side and pull it away from the backplate until it is open enough to slide the larger cylinder into.
• With the cam-over buckle on the right side still flipped up, slide the cylinder into the tank band with the cylinder valve pointing downward until the dome of the cylinder rests on the two bumpers on the lower cover.
• Adjust the tank band snug against the cylinder by pulling out the adjustment buckle on the left side of the SCBA and pushing the tank band down toward the backplate.
• Push the adjustment buckle back so that it is flush with the cylinder and the teeth of the adjustment buckle are engaged with the tank band.
• Flip the cam-over buckle down toward the backplate until the release latch snaps over the buckle, locking it in place. The cylinder should be tightly held in place.

-03. EMERGENCY BREATHING PROCEDURES

.01 GENERAL
Emergency Breathing Procedures, "Buddy Breathing", allows one member without air to share breathing air directly from another member's air supply.

.02 PROCEDURE
1. Member out of air removes buddy breathing hose located in left hip pouch. Donor member removes their buddy breathing hose and hands it to member out of air. Out of air member completes connection of their buddy breathing hose to donor buddy breathing "Y" block. Leverage to facilitate coupling and uncoupling with gloved hands. Members must practice with gloved hands to ensure proficiency in this procedure. No air can be drawn through the regulator while low pressure hose is disconnected.
2. Member supplying donor air immediately leads toward a safe area.

-04. INSPECTION AND MAINTENANCE

.01 GENERAL
The SCBA is the most critical piece of fire fighting equipment used. The SCBA shall be inspected for defects daily and immediately after each use. Utmost care shall be exercised in the maintenance, cleaning, storage, and transportation of SCBA equipment. Most damage and defects are caused by foreign matter or careless handling. Repairs by members are limited to replacement of batteries and the "o" ring nipple connection on first stage regulator to air cylinder connection. All other repairs or adjustments must be performed at the Rescue Maintenance Unit by certified repair personnel.

.02 INSPECTION
1. Facepiece: The facepiece skirt and headstrap/headnet should be inspected for tears, pliability and deterioration. All parts, especially the lens and second stage regulator connection, should be cleaned and free of dirt and dust. Examine the facepiece buckles for tears at skirt attachment, proper function and ensure they are free of rust. Check the facepiece for leaks and proper exhalation valve function. Exhalation should be smooth, with no sticking of the exhalation valve. Check the rim for cracks. Check VAS for damage and ensure proper operation. If red LED light is flashing or not illuminating replace batteries.
2. Low and high pressure hoses: Check the hoses for holes, cuts, tears, rust or corrosion. Check quick-connect couplings for proper function.
3. Compressed air cylinder: Examine the exterior of the cylinder for nicks, cuts gouges, delamination and heat damage. If the cylinder is damaged, evacuate the air pressure and send it in for testing. Check air pressure indicators on each side of the cylinder valve. The psi should read within 500 lbs of each other. If the air
cylinder gauge reads less than 4000 psi as indicated on the digital pressure readout, replace with a fully charged cylinder. DO NOT EXPOSE THE FIBERGLASS WRAP TO CHEMICAL CONTACT.

4. **Backpack**: Check for excessively frayed straps and pads, defective or corroded buckles, defective stitching and cracks in the backpack polymer. Ensure cylinder band is fastened and cylinder is secure in the backpack.

5. **PASS and HUD**: There are three battery status indicators amber LEDs on the Sperian Warrior SCBA. HUD in located on the bottom right side. Backpack indicator LED is located on the top right of backpack. PASS indicator LED is located on the pass device itself. A LED flash every 10 seconds indicates good battery. A LED flash every 2 seconds indicates a low battery. The HUD LED is located on the bottom right side. It will illuminate amber continuously indicating low battery. When the SCBA is in storage (the cylinder valve is not opened), the amber LED on the Backpack and PASS device will flash once every 10 seconds to indicate a usable battery condition. The amber LED flashes every two seconds to indicate a low battery condition, and will cease flashing altogether to indicate a dead battery. The HUD LED will only illuminate only if battery is low. Battery pack located right lower side of harness use only 4 Duracell “C” size batteries only. These batteries power all electronics except for VAS. Amber LED's located on PASS device and backpack indicates battery status. To replace the batteries, first remove the protective rubber cap, then remove the slotted battery cap located on the lower right hand side (when looking at the cylinder with the valve pointing down) of the backpack, using a coin, a large, flat blade screwdriver, or the male end of the waist strap buckle; remove the old batteries; install new batteries in the orientation shown on the lower cover just above the battery cap area; and replace the cap. Screw the cap down until the amber light on the battery status indicator on the HUD transducer module begins to flash. Reinstall the protective rubber cap.

6. **Second stage regulator**: Check for heat damage or cracks to housing or cover. Check knobs and buttons for proper operation. Test release buttons for positive lock onto facepiece.

.03 **READINESS**

Daily at relief and after each use, ensure the SCBA is ready for use: The following is a recommended procedure to follow:

1. Check air cylinder pressure.
2. Check tightness of first stage to air cylinder connection.
3. Open air cylinder valve slowly. Listen for audible bell as system is pressurized. The PASS will also flash/audibilize.
4. Ensure that the needle on the pressure gauge reads in the green (FULL) zone.
5. Don facepiece and perform seal and exhalation valve check.
6. Attach second stage regulator to facepiece.
7. Ensure “first breath” activation provides positive pressure with no excessive “free-flow” of air past the face seal. Depress shut-off button and remove regulator from mask and replace in holster. Check the Heads-Up Display (HUD) to ensure that the display reads full cylinder pressure (all four green LEDs lit)
9. Check air pressure indicated on pressure gauge for approximately 20 seconds, watching for a drop in PSI. A drop in PSI indicates a leak in the system. The "0" ring at the regulator and air cylinder connection is the only repair made by non-certified members.
10. Slowly open the bypass valve. As the PSI drops, observe the pressure gauge to insure "warbling” whistle alarm activates at 1035 to 1215. The audible alarm will continue to sound until the air pressure drops below 200 psi.
11. Test PASS alarm by pushing the red button and checking both audible and visual signals for proper audible/visual alarm functions.
12. Check battery indicator LEDs ensuring that they do not indicate a low battery status.
13. Check backpack harness and air cylinder.

.04 CLEANING

The SCBA has multiple components. All components are waterproof and tested to withstand fireground exposure. Care, however, should be given when cleaning components.

**Facepiece**

1. Make a cleaning solution of warm water and a mild detergent.
2. Immerse the facepiece top first in the solution until the exhalation valve is covered.
3. Agitate the facepiece and gently clean with a soft brush.
4. Thoroughly rinse the facepiece in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the exhalation valve.
5. Disinfect the facepiece in a warm suitable sanitizing solution, such as a "hypochlorite solution" (two [2] tablespoons of chlorine bleach per gallon of water), for two (2) to three (3) minutes. Rinse thoroughly with fresh warm water.
6. Allow the facepiece to drip dry. Warm air may be used to speed up drying.
7. Hold the facepiece firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.

**Second Stage Regulator**

Cleaning of the second stage regulator is critical. After a fire, debris may lodge in the holster and cause contamination when the regulator is re-holstered. The regulator should be submersed only in extreme cleaning circumstances. The following is a recommended guide for cleaning:

1. Make a cleaning solution of warm water and a mild detergent.
2. Have a bucket of fresh water available for rinsing.
3. Install the second stage cleaning cap
4. With the regulator facing downward, clean the exterior surfaces with a soft brush.
5. With the regulator facing downward, immediately rinse the exterior with fresh water. Scrub excess soap away with the brush. Remove the second stage cleaning cap. If water enters the second stage regulator while cleaning, flow the regulator and bypass to expel all moisture.
6. Using a damp, lint-free cloth, clean the interior of the outlet tube.

**Back Pack**

With the second stage regulator mounted in the holster, rinse off the backpack under low water pressure, as needed.
-05. TROUBLESHOOTING

This section is intended to provide advice for emergency operation considerations and troubleshooting.

.01 TROUBLESHOOTING

1. PROBLEM: Restricted or interrupted airflow.
   a. IMMEDIATELY exit to a safe area.
   b. Check that air cylinder valve is fully opened
   c. Open the bypass valve until the desired airflow is achieved.
   d. Place out of service, tag (F-175) and send to Rescue Maintenance.

2. PROBLEM: First-Breath-On failure.
   a. IMMEDIATELY exit to a safe area.
   b. Press manual override button to start airflow.
   c. Place out of service, tag (F-175) and send to Rescue Maintenance.

3. PROBLEM: Free flow of air or "blow-by" the face seal.
   a. Exhale forcefully.
   b. Check facepiece seal.
   c. If free flow continues, open and close the bypass.
   d. If problem still persists, IMMEDIATELY exit to a safe area.
   e. Place out of service, tag (F-175) and send to Rescue Maintenance.

4. PROBLEM: Relief valve operates (i.e. major air leak within system)
   a. IMMEDIATELY exit to a safe area.
   b. Close air cylinder valve, then manually regulate airflow with cylinder valve.
   c. Place out of service, tag (F-175) and send to Rescue Maintenance.

-06. LESSONS LEARNED

.01 GENERAL

When situations call for quick thinking and cool-headedness on the part of the wearer, previous training and knowledge of the equipment will help the wearer to react properly. Familiarity with the following lessons learned will be helpful.

1. At emergencies requiring the use of breathing apparatus, members shall work in pairs.
2. When using breathing apparatus, if excessive resistance to breathing is encountered or a SCBA problem occurs, notify your partner and exit IMMEDIATELY along with your partner to a safe area.
3. If nauseated and you have to vomit, then pull facepiece to the side and vomit. Immediately replace facepiece and open bypass or manual override button to purge toxic air from inside the mask.
4. When entering a structure, keep in mind that you may have to make a hasty retreat under emergency conditions. Notice means of egress as you proceed into the structure such as windows, doors, etc. Following the hose will get you out. Consider working as a team to pull slack hose taunt, then exiting as a team.
5. When it is necessary to retreat to a safe area, ALWAYS let your partner know what you intend to do. DO NOT SEPARATE!
6. No breathing apparatus offers complete protection in atmospheres containing gases such as hydrocyanic acid, hydrogen cyanide or methyl bromide. The SCBA and turnout equipment will not protect the user from gases that can be absorbed through the skin. DO NOT ENTER UNTIL THOROUGHLY VENTILATED.
7. When full, the 45-minute air cylinder has 1800 liters of air supply. The cylinder is rated 45 minutes based on a user rate of 40 liters per minute. The actual duration of air supply depends on user demands, and will frequently be less. During high demands, it is possible to use 100 liters per minute, reducing cylinder duration to 18 minutes total. Periodically check HUD and pressure gauge for remaining air pressure. During "Emergency Traffic" events remember to control your breathing to conserve air supply.

-07. RAPID INTERVENTION COMPANY (RIC) SCBA KIT

The Rapid Intervention Company (RIC) SCBA Kit was designed to offer a complete, well organized, portable SCBA rescue package to provide fire victims, both uniformed and civilian, with respiratory protection should the need arise.

.01 DESCRIPTION

The Rapid Intervention Company SCBA Kit consists of eight components:

1. Nylon bag with sling and carrying handles.
2. 60 minute air cylinder
3. First stage pressure reducer with 10 feet of intermediate pressure hose
4. Second stage regulator
5. Facepiece
6. Pelican
7. 150 feet drop bag line
8. Flashlight with integrated holder

NYLON BAG: The nylon bag is constructed of heavy duty ballistic nylon with Kevlar seams and straps to form a "sling" reinforcement. A removable shoulder strap may be utilized to secure the bag to a victim for easier extrication. An integrated flashlight holder, rope pouch, facepiece/escape filter pouch, reflective striping and multiple "D" rings are included on the bag.

AIR CYLINDER: A 60 minute SCBA cylinder is utilized in the RIC SCBA Kit.

FIRST STAGE PRESSURE REDUCER WITH 10 FEET OF INTERMEDIATE PRESSURE HOSE: The first stage reducer combines a pressure regulator without a bell alarm. Included is 10 feet of intermediate pressure hose with male/female "Y" block and UAC fitting. This pressure hose will mate to a downed firefighter's SCBA
SECOND STAGE REGULATOR: A second stage regulator is included in the event a downed firefighters regulator is missing, inoperable or unable to be used.

FACEPIECE: A facepiece is included in the event a downed firefighter's facepiece is missing, inoperable, or unable to be used, or the victim does not have a facepiece.

ROPE: 150 feet of drop bag line with spring clip is available for rescue operations.

FLASHLIGHT: An intrinsically safe flashlight secured by an integrated flashlight holder may be used hands free or removed from the kit for use. Uses 3 "C" size batteries.

ASSIGNMENT: The RIC SCBA Kit will be assigned to all Truck Companies, Hazardous Materials Companies and Urban Search and Rescue apparatus.

.02 USE OF RIC SCBA KIT

The RIC SCBA Kit is primarily designed for the rescue of a downed firefighter whose air supply has been exhausted or whose SCBA is not functioning properly. During all rapid intervention operations companies assigned the task of RIC or backup RIC shall ensure that the RIC SCBA Kit is available and ready for immediate deployment and use. It must be remembered that the "R" in RIC means "RAPID". If a downed firefighter's SCBA is functioning properly, do not attempt to augment his/her SCBA with the RIC SCBA Kit. The RIC SCBA Kit is only to be used in the event the downed firefighter is low on air, out of air, or if their SCBA is inoperable or not functioning properly. The best chance for survival of a downed firefighter is rapid removal from the hazardous area to a safe location.

The RIC SCBA kit can be used in several different circumstances:

1. The 10 feet of intermediate pressure hose on the RIC SCBA Kit can be connected directly to a downed firefighter's UAC fitting or buddy breathing hose.
2. The RIC SCBA Kit Second Stage Regulator can be attached directly to a downed firefighter's facepiece.
3. The RIC SCBA Kit mask and regulator can be placed on a downed firefighter or civilian victim.

.03 INSPECTION AND MAINTENANCE

The SCBA RIC kit shall be inspected on a daily basis and after each use. Utmost care shall be exercised in the maintenance, cleaning, storage and transportation of SCBA equipment. Repairs by members are limited to replacement of batteries and the "O" ring nipple connection located on the first stage regulator to air cylinder connection. The Rescue Maintenance Unit must perform all other repairs or adjustments.
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