

**SUBJECT:** SCBA MAINTENANCE**SECTION:** 202.06**REVISED:** OCTOBER 29, 2007**PAGE(S):** 12

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## PURPOSE

To provide proper respiratory protection through the utilization of self-contained breathing apparatus, SCBA.

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## POLICY

It is the policy of the Reading Fire Department, that all personnel expected or likely to respond to, and function in, areas of atmospheric contamination and/or suspected areas of oxygen depletion, shall be equipped with, and trained in, the proper use and maintenance of the SCBA.

- A. Fire Department personnel shall utilize SCBA's which are of the approved, positive pressure type.
- B. Fire Department personnel shall utilize SCBA's as part of the overall protective clothing system.
- C. Only pure, compressed air of minimum GRADE D shall be used to fill the air cylinders of the Fire Department's SCBA's. Said cylinders shall be filled and maintained in accordance with Department policy (See Pressure Vessel Maintenance).
- D. SCBA air cylinders shall be pressurized from the cascade system to no more than 4500 psi.
- E. Fire Department SCBA's shall be inspected weekly and briefly operated (Pressure Vessel Maintenance).
- F. SCBA's or their component parts which are observed to be worn, defective, damaged or inoperable, shall be removed from service, marked as such, and a suitable replacement provided (Safety Procedures for SCBA in Book 3).
- G. SCBA's and their spare cylinders shall be secured to the Fire Department apparatus and vehicles in such a manner so as to be readily available for quick operations, yet shall be secured well enough to prevent injuries to personnel or accidental damage to apparatus and/or equipment.

- H. Department policy shall be to provide a minimum of one (1) spare air cylinder for each member assigned to a particular piece of fire apparatus or emergency vehicle.
- I. SCBA's in need of repair shall be tagged and marked clearly as "out of service" (Safety Procedures for SCBA in Book 3). Repairs shall be made by qualified repair technicians and properly tested prior to returning the unit to service.
- J. The Fire Department shall provide annual, standardized training for its members in the use and maintenance of SCBA.
- K. The Fire Department shall provide annual, qualitative fit testing for its members to assure proper facepiece fit and seal.

## **OBJECTIVE**

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To provide policy and guidelines relative to the use of SCBA.

## **CHECKS AND MAINTENANCE**

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All in-service SCBA's shall be inspected for regular operation during routine cleaning after each use or minimally, at least weekly.

- A. Visually inspect the complete respirator for worn or aging rubber parts, worn or frayed harness webbing or damaged components.
- B. Check the latest cylinder hydrostatic test date to ensure it is current; that is, within five (5) years for composite fiber wrapped cylinders. The date of the first hydrostatic test is also the date of manufacture and is marked on the cylinder.
- C. Visually inspect the cylinder for physical damage such as dents or gouges in metal or in composite wrapping. Cylinders which show physical damage or exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, pressure gauge lens melted or elastomeric bumper distorted, and cylinders which show evidence of exposure to acid or other corrosive chemicals such as cracks running lengthwise along the cylinder or the composite wrapping, peeling of the outer layers of the composite wrapping and/or bulging of the cylinder wall, shall be removed from service, tagged clearly as "out of service", emptied of compressed air and referred to the Shift Supervisor or SCBA technicians for repairs.
- D. Check cylinder pressure gauge for "FULL" indication. If cylinder pressure is less than 4000 psi., replace with a fully charged cylinder.

- E. Check to ensure reducer hose coupling is hand tightened to the cylinder valve outlet.
- F. Visually inspect all PAK-ALERT SE distress alarm enclosures, lenses, and wire conduits for cracks, wear or other damage.
- G. Check the PAK-ALERT SE distress alarm manual alarm feature by pressing the manual alarm button, located on the front of the control console. The manual alarm shall begin sounding a loud, almost continuous three (3) tone chirp accompanied flashing of the red signal light on the control console. Reset the manual alarm by pressing twice on the reset button located on the side of the control console. Unit will sound three (3) chirps and the green light will flash. Turn the unit off by pressing the reset button twice again. Unit will sound a two (2) tone chirp and the green light will go out.
- H. Check that the breathing regulator purge valve (red knob on regulator) is closed (full clockwise and pointer on knob upward).
- I. Fully depress the center of the air saver/donning switch on the top of the regulator and release.
- J. Slowly open the cylinder valve by fully rotating knob counterclockwise. VIBRALERT alarm shall actuate and then stop. The Bell alarm may ring once. The PAK-ALERT SE distress alarm shall sound three (3) quick chirps and the light on the control console shall begin flashing green about once a second. The three (3) chirps will sound approximately the same time the VIBRALERT in the mask mounted regulator actuates briefly.
- K. Check for pre-alarm reset of the PAK-ALERT SE distress alarm: leave the respirator motionless until pre-alarm condition occurs. Within eight (8) seconds, move the respirator to activate the sensor module. The PAK-ALERT SE distress alarm shall reset. The red flashing light shall be replaced by a green flashing light and the ascending/descending tone shall stop.
- L. 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.
- M. Remove facepiece from face. Air shall freely flow from the facepiece.
- N. Fully depress the center of the air saver/donning switch on the top of the regulator and release. The flow of air from the facepiece shall stop. Examine the complete respirator for air leaks. There shall be no leakage of air from any part of the respirator.

- O. Rotate purge valve ½ turn counterclockwise (pointer on knob downward). Air shall freely flow from the regulator.
- P. Rotate purge valve ½ turn clockwise to full closed position (pointer on knob upward). Air flow from regulator shall stop.
- Q. Push in and rotate cylinder valve clockwise to close. When cylinder valve is fully closed, open purge valve slightly to vent residual air pressure from the system. As the residual air pressure vents from the system, the remote pressure gauge needle will swing from “FULL” and move towards “EMPTY.” Close the purge valve when the gauge needle crosses the “1/4” mark but before the beginning of the red “EMPTY” band. The VIBRALERT end of service indicator alarm shall actuate. The Bell end of service indicator alarm shall ring one or more times. After verifying that both end of service alarms are functioning, open the purge valve slightly to vent the remaining residual air pressure from the system. All alarms shall cease operation when the system pressure drops to zero. When air flow stops completely, return purge valve to the fully closed position (pointer on knob upward).
- R. Turn PAK-ALERT SE distress alarm off by depressing the reset button on the control console twice. The green flashing light will go out and a fifteen second beep sequence will be heard from the sensor module as residual air pressure bleeds off. When air has bled completely from the system, unit will sound a two (2) tone chirp. The PAK-ALERT SE distress alarm is now in the “OFF” condition.

## PREPARATION FOR USE

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- A. If a carrying case is used for storage, proceed as follows: Place the carrying case on the ground or a level surface and open the lid. Check the cylinder gauge for “FULL” indication of at least 4000 psi. If not at least 4000 psi, replace the cylinder before use. A gauge indication of less than 4000 psi may indicate an air leak in the cylinder and valve assembly or a malfunction of the gauge assembly. Ensure that the cylinder is firmly locked in position by the cylinder retention assembly. Stand at the top of the cylinder end (cylinder valve away from you), lean forward, position and spread out the shoulder straps, and grasp the backframe with both hands, one on each side of the cylinder. Do not grasp the pressure reducer. Swing the respirator straight up and over the head, keeping the elbows close to the body. Rest the respirator on your back while slightly bent over. Ensure that the shoulder straps slide along your arms and fall into place on the shoulders. Straighten up as you pull down on the side straps to adjust the harness to fit your body.

If a storage bracket is used, proceed as follows: Check the cylinder gauge for “FULL” indication of at least 4000 psi. If not at least 4000 psi., replace the

cylinder before use. A gauge indication of less than 4000 psi. may indicate an air leak in the cylinder and valve assembly or a malfunction of the gauge assembly. Ensure that the cylinder is firmly locked in position by the cylinder retention assembly. Follow the instructions of the bracket manufacturer for placing arms through the shoulder straps and freeing the respirator from the bracket.

- B. Connect the waist belt buckle and adjust by pulling forward on the two (2) side-mounted belt ends.
- C. Readjust the shoulder straps to ensure the weight is carried on the hips.
- D. Fully depress the center of the air saver/donning switch on top of the regulator and release. The regulator may be, but does not have to be, installed in the facepiece at this time. (See step F below).
- E. Slowly open the cylinder valve fully by turning the valve knob counterclockwise until it stops (approximately 2 1/2 full turns of the knob). The VIBRALERT end of service indicator alarm will actuate and then stop. The Bell end of service indicator alarm may ring once. The PAK-ALERT distress alarm will actuate when the cylinder valve is opened and will sound three (3) quick audible chirps accompanied by a green flashing on the PAK-ALERT control console.

If the air saver/donning switch has not been depressed prior to opening the cylinder valve, the VIBRALERT alarm will not actuate due to the air flowing freely from the facepiece.

- F. The user of the respirator is now in a “standby” condition. The respirator is in place on the user’s body but the facepiece is not donned (sealed to the face) and the respirator is not being used. The regulator is retained in the facepiece by a 1/4 turn port and is locked in the facepiece retainer with a lock tab. To detach the regulator from the facepiece while in a “standby” condition, place your right hand over the cover with your thumb on the lock tab. Pull the lock tab toward the cover and rotate the regulator 1/4 turn clockwise (viewed from inside the facepiece). When the red purge valve is in the 12 o’clock position, remove the regulator from the facepiece. The regulator holder which attaches to the user’s belt or a neck strap are available for use during the “standby” condition.

## USE OF THE RESPIRATOR

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If the regulator is not attached to the facepiece, be sure the regulator gasket is in place around the outlet port of the regulator and not damaged. With the red purge valve in the 12 o’clock position, align the two flats of the outlet port with the corresponding flats in the facepiece and insert. Rotate the regulator counterclockwise (viewed from inside the facepiece) so that the purge valve knob is situated on the left

side of the facepiece. The lock tab on the mask-mounted regulator will lock into the facepiece retainer with a “click.” If properly engaged, the regulator will not rotate.

To begin use of the respirator, don the facepiece (ie., place the facepiece on the face and obtain a proper seal) as follows:

- A. Examine the facepiece assembly to be certain the nose cup inhalation valves are installed, the nose cup is correctly positioned inside the facesal chin cup, and the nose cup is properly seated between the flanges of the voicemitter ducts.
- B. Adjust the headstraps to the full outward position.
- C. Hold the head harness out of the way with one hand while placing the facepiece on the face with the other hand. Ensure that the chin is properly located in the chin pocket of the facepiece.
- D. Pull the head harness over the head and ensure that the straps are lying flat against the head and neck with no twists.
- E. Tighten the neck straps by pulling the two lower strap ends toward the rear of the neck.
- F. Stroke the head harness down the back of the head using one or both hands. Retighten the neck straps.
- G. Adjust the temple straps by pulling the two upper strap ends toward the rear of the head. Use caution pulling the temple straps as overtightening may cause discomfort.
- H. Retighten the neck straps if required. **NOTE:** On subsequent use by the same wearer, release and retightening of the temple straps may not be required.
- I. With the facepiece sealed to the face, inhale sharply to actuate the respirator. Air will then be supplied during inhalation. **NOTE:** If air is not supplied on the first inhalation, check that the cylinder valve is fully open, the remote gauge indicates pressure in the cylinder, and the facepiece is sealed to the face.
- J. Proceed with use of the respirator in accordance with respiratory protection program SOG's.

Every entry into a contaminated or unknown atmosphere should be planned to ensure that there is sufficient air supply to enter, carry out the tasks required and return to a safe breathing area. The user should check the remote reading pressure gauge periodically to determine the rate of air consumption. In any event, the user must be certain to allow sufficient air for egress from the contaminated area. If entry is attempted after the air has been partially

consumed (cylinder less than full), the user must be certain that the remaining air will be sufficient for safety.

If any end of service indicator alarm, the VIBRALERT alarm or the Bell alarm actuates either individually or in conjunction with another end of service alarm, leave the area requiring respiratory protection **IMMEDIATELY**. When in a safe area where you are certain that respiratory protection is not required, terminate the use of the respirator (see TERMINATION OF USE, 7.08 below) and determine the cause of the alarm. Where the cause of the alarm activation is determined to be a depleted air supply cylinder, replace the cylinder in accordance with the CYLINDER REPLACEMENT PROCEDURE, 7.10 below. **DO NOT** resume the use of a respirator where an end of service alarm has actuated for an unknown reason. Remove such a respirator from service and tag it for repair by authorized personnel.

## TERMINATION OF USE

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To doff the facepiece (ie., remove the facepiece and terminate respiratory protection), proceed as follows:

- A. Leave the contaminated area or be certain that respiratory protection is no longer required.
- B. Loosen the neck straps by simultaneously lifting the lower buckle release levers outward (away from the head) and lifting the facepiece away from the face. The buckle release levers are the “U-shaped” extensions of the facepiece buckle assemblies.
- C. To stop the flow of air from the facepiece, fully depress the air saver/donning switch on top of the regulator and release. **NOTE:** With the air saver/donning switch activated, the purge valve and VIBRALERT will function normally. If the purge valve has been adjusted to produce a flow, or if the VIBRALERT and/or Bell alarm is in operation, the air will continue to be depleted from the respirator cylinder until the cylinder valve is closed.
- D. Remove the facepiece by pulling it up and over the head. **NOTE:** The PAK-ALERT distress alarm will remain activated until the cylinder valve has been closed and all air pressure has been bled from the respirator.

- E. To resume use of the respirator, repeat the facepiece donning procedure (see 7.07, USE OF RESPIRATOR) above. If respirator use is resumed, the user must make certain that the remaining air supply in the cylinder is sufficient to accomplish the purpose for which respirator use has resumed. It is recommended that, whenever practical, partially depleted cylinders be replaced with full cylinders before respirator use is resumed. **NEVER** resume use of a respirator where the termination of use has occurred because of the activation of an end or service indicator alarm without first determining and correcting the reason for the end of service indicator alarm.
- F. When respirator operations are completed and only when in a safe breathing area, check that the cylinder valve is closed, and vent the residual air from the respirator by opening the purge valve. To turn off the PAK-ALERT SE distress alarm, depress the reset button twice (press, release, and press again). The green flashing light will go out and a fifteen second beep sequence will be heard from the sensor module as residual air pressure bleeds off. When air has bled completely from the system, the unit will sound a two (2) tone chirp. The PAK-ALERT SE distress alarm is now in the "OFF" condition. Slightly loosen the shoulder straps by lifting ends of shoulder strap slide buckles up, release the waist belt by pressing release button in center of waist belt buckle, and remove the unit from your back. Proceed in accordance with the requirement for the respiratory protection program: See CYLINDER REPLACEMENT and STANDBY INSPECTION, CLEANING AND STORAGE below.

## EMERGENCY OPERATIONS

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The respirator is automatic in function requiring only the opening of the cylinder valve and the proper donning of the facepiece to place into use and the closing of the cylinder valve at the end of use. In the event of a malfunction or a suspected malfunction, implement the appropriate emergency procedure listed below:

- A. Should the VIBRALERT or the Bell alarm activate during use, even if the air supply has not been depleted to approximately 25% of the full rated capacity (approximately 1100 psi.), **LEAVE THE CONTAMINATED AREA AT ONCE.** **NOTE:** Actuation of the VIBRALERT before the air supply is depleted to approximately 25% of full rated capacity may indicate a failure of the primary reducer path in the pressure reducer. Activation of any end of service indicator alarm before the remote air supply gauge indicates approximately 25% or less of full capacity could indicate a malfunctioning remote air supply gauge or failure of the end of service indicator alarm. **LEAVE THE AREA REQUIRING RESPIRATORY PROTECTION IMMEDIATELY ON THE ACTIVATION OF ANY ALARM.**
- B. Should the air supply be partially or completely cut off during use, fully open the purge valve (red knob on regulator) by turning counterclockwise, (pointer on knob

downward) and check to be certain the cylinder valve is fully opened (turned fully counterclockwise). LEAVE THE CONTAMINATED AREA AT ONCE AFTER OPENING THE PURGE VALVE.

- C. Should the air supply begin to flow freely into the facepiece during use, fully open the purge valve (red knob on regulator) by turning counterclockwise (pointer on knob downward), partially close the cylinder valve by pushing in and rotating clockwise to regulate and conserve the flow of air to satisfy the requirements of the user. **DO NOT** close the cylinder valve completely. LEAVE THE CONTAMINATED AREA AT ONCE AFTER PARTIALLY CLOSING THE CYLINDER VALVE.
- D. In the unlikely event of the blockage of air flow or sudden and complete loss of the system air supply such that there is total irreversible loss of respiratory protection, LEAVE THE CONTAMINATED AREA AT ONCE USING ALL PRECAUTION AND FOLLOW EMERGENCY PROCEDURES PRESCRIBED BY USER ESTABLISHED RESPIRATORY PROTECTION PROGRAM.

If any of the above procedures are implemented during use, REMOVE THE RESPIRATOR IN A SAFE AREA, tag the respirator and hold it for service and repair by Authorized Personnel.

## CYLINDER REPLACEMENT PROCEDURE

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Depleted or partially depleted SCBA cylinders should be replaced with full cylinders as soon as possible. The cylinder replacement procedure can be carried out by the user of the respirator provided the user removes the backframe assembly and places it on solid support. Cylinder replacement may be performed while the user is wearing the backframe assembly, if the user is assisted by a second individual. To replace a depleted or partially depleted cylinder, proceed as follows:

- A. Leave the area requiring respiratory protection and be certain that respiratory protection is no longer required.
- B. Doff the facepiece (See TERMINATION OF USE) described above.
- C. Push in and rotate cylinder valve knob clockwise and completely close the cylinder valve.
- D. Release residual air pressure in the respirator system by opening the purge valve slightly. When the flow of air from the facepiece stops, close the purge valve fully. NOTE: The PAK-ALERT SE distress alarm shall remain active unless reset using the procedures described in TERMINATION OF USE above. Remove the respirator (See TERMINATION OF USE) described above or have an assistant perform the following steps:

- E. Unthread the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.
- F. Disengage the cylinder latch by pressing on the white thumb release while lifting on the end of the latch.
- G. 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.
- H. Replace with a fully charged cylinder and valve assembly of the same pressure rating. Slide the top of the cylinder upward under the strap.
- I. Engage the cylinder hanger in the hook at the bottom of the backframe.
- J. Secure the cylinder in place by pushing the latch toward the backframe to lock the cylinder latch and fully engage the cylinder latch assembly.
- K. Inspect the high pressure coupling to be certain the nipple seal is present and undamaged. If the gasket (o-ring) is present and undamaged, align the high pressure coupling to the cylinder and tighten by hand.
- L. The respirator is now ready for continued use.

## **STANDBY INSPECTION, CLEANING AND STORAGE**

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*RESPIRATOR:* Clean the respirator after each use as follows:

- A. Inspect the respirator for worn or aging rubber parts, worn or frayed harness webbing or damaged components.
- B. Remove the mask-mounted regulator from the facepiece (See PREPARATION FOR USE).
- C. Any dirt accumulations on the respirator cylinder, backframe or harness assembly can be removed by damp-sponging with a solution of warm water (110 degree F maximum) and mild soap or detergent. Wipe the newly cleaned areas with a clean water sponge to rinse.
- D. Allow the respirator, backframe and harness assembly to thoroughly dry before placing the unit in storage.

*FACEPIECE:* The nosecup is designed to be an integral part of the facepiece assembly and does not need to be disassembled for cleaning and disinfecting. Carefully wash the facepiece assembly after each use as follows:

- A. Wash with a solution of warm (110 degree F) water and a mild soap or detergent. Thoroughly rinse in clean water and shake excess water off.
- B. Disinfect using Scott Multi-Wash Mini solution supplied in spray bottles. Spray the solution around the outlet port on the exterior of the facepiece and all interior components of the facepiece. Allow the Multi-Wash Mini solution to remain on the components of the facepiece for a minimum of ten (10) minutes.
- C. Thoroughly rinse the facepiece in clean water, shake the excess water off and either dry with a clean, lint free cloth or hang to dry. Assure that the two (2) inhalation valves, one on each side of the nosecup, are in place prior to placing the facepiece back into storage.

*MASK-MOUNTED REGULATOR:* Clean the regulator after every use as follows:

- A. The regulator may be cleaned by damp-sponging the exterior of the regulator with a solution of warm (110 degree F) water and a mild soap or detergent. Wipe the newly cleaned areas with a clean water sponge to rinse. Do not submerge the regulator in liquid. NOTE: Regulators requiring additional cleaning must be removed from service and tagged for disassembly, cleaning and reassembly by qualified personnel.
- B. Disinfect using Scott Multi-Wash Mini solution supplied in spray bottles. Spray the solution around the exterior of the regulator and Teflon gasket on the sealing surface of the regulator. Allow the Multi-Wash Mini solution to remain on the components of the regulator for a minimum of ten (10) minutes.
- C. Wipe the disinfected areas with a clean water sponge to rinse. Allow the regulator to thoroughly dry before placing the regulator back in storage.

NOTE: If any damage or deterioration is noted to any component of the respirator assembly, remove the respirator from service and tag for repair by Authorized Personnel.

## **RESPONSIBILITY**

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- A. The Fire Chief has the overall responsibility for providing a proper respiratory protection system within the Department.
- B. The Logistics Officer is responsible for the overall management of the respiratory protection system, insuring that the SCBA's are properly maintained and repaired, and that an adequate number of SCBA's are available for use by Department personnel.

- C. The Training Officer is responsible for insuring that the Fire Department minimum training standards are met by all personnel relating to the use of SCBA's and that there is adequate, regular and standard SCBA training provided to each Department member. In addition, the Training Officer is responsible for insuring that all Fire Department personnel receive annual fit testing of SCBA facepieces.
- D. Shift Supervisors are responsible for insuring that the proper use, maintenance and training relative to SCBA's is carried out by the personnel assigned to their respective units.
- E. Incident Commanders have the overall responsibility at emergency incidents for insuring that proper respiratory protection is both provided to and utilized by Fire Department Personnel.
- F. All Department members are directly responsible for their personal safety and shall utilize and maintain SCBA in accordance with this policy.