

PANTHER™ NFPA
SELF-CONTAINED BREATHING APPARATUS (SCBA)
30 MINUTE LP SERIES
30/45/60 MINUTE HP SERIES
OPERATION MANUAL



WARNING

DO NOT USE this SCBA until you completely read and understand this instruction manual. You are required to inspect your SCBA prior to putting it into field service. Please refer to the inspection procedures in this manual. DO NOT USE this SCBA unless you are properly trained and this SCBA has been properly maintained. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.

WARRANTY AND LIMITATION OF LIABILITY

LIMITED WARRANTY: SPERIAN warrants this product to be free from defects in materials and workmanship for 12 years from the date of purchase, with the exception of the Analog Gauge with Visual Alarm, which is warranted for 3 years, the compressed air cylinder, which is warranted for 15 years, and the first stage regulator, which is warranted for the life of the product. During these periods, SPERIAN will repair or replace defective parts, at SPERIAN's option.

Freight charges to and from the SPERIAN factory shall be paid by the purchaser.

EXCLUSIONS: NOTWITHSTANDING ANY CONTRARY TERM IN THE PURCHASER'S PURCHASE ORDER OR OTHERWISE, THE ONLY WARRANTY EXTENDED BY SPERIAN IS THE EXPRESSED LIMITED WARRANTY DEFINED ABOVE. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

CONDITIONS: To maintain this warranty, this product must be used, maintained, and inspected as prescribed in the owner's instruction manual, including prompt replacement or repair of defective parts, mandatory flow tests and overhauls, and such other necessary maintenance and repair as may be required. Normal wear and tear; parts damaged by abuse, misuse, negligence, or accidents; and installed accessories which have separate warranties are specifically excluded from this warranty.

LIMITATION OF LIABILITY: No other oral warranties, representations, or guarantees of any kind have been made by SPERIAN, its distributors, or the agents of either of them, that in any way alter the terms of this warranty. **EXCEPT AS HEREIN PROVIDED, SPERIAN SHALL HAVE NO LIABILITY FOR ANY LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, TO ANY PURCHASER OR USER OF THIS PRODUCT ARISING FROM THE SALE, USE, OR OPERATION OF THIS PRODUCT.**


	WARNING
<i>The failure to use and maintain this equipment in strict conformance with the applicable instruction manual may result in serious personal injury, serious illness, or death. The equipment's use in any manner that is not expressly authorized pursuant to the applicable instruction manual may result in severe adverse impacts to human health.</i>	

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I. INTRODUCTION


This manual provides operating instructions as well as cleaning, maintenance, and storage procedures for the SPERIAN Panther' high and low pressure SCBA. **You must read and understand these instructions and be properly trained before using the SCBA in a hazardous atmosphere.**

NOTE

All SPERIAN-certified technicians are required to remain current on new procedures and parts through SPERIAN's published Technical Bulletins, technical manual revisions, and certification seminars.

II. SAFETY PRECAUTIONS

The Warnings, Cautions, and Notes contained in this manual have the following significance:

 WARNING
<i>Maintenance or operating procedures and techniques that may result in serious personal injury, serious illness, or death if not carefully followed.</i>

CAUTION

Maintenance or operating procedures and techniques that may result in damage to equipment and/or minor to moderate personal injury if not carefully followed.

NOTE

Maintenance or operating procedures and techniques or information considered important enough to emphasize.



WARNING

- ***The user is responsible for establishing that this equipment is suitable for the user's application.***
- ***For respiratory protection, this SCBA must be worn and used as specified in SPERIAN's instructions. No protective equipment can provide complete protection from all conditions. Use extreme care for all emergency operations. Do not use SCBA alone for any fire fighting or Hazardous materials operations; additional protective clothing and equipment are required for protection. This SCBA may cease to provide protection if used during excessive heat or flashover conditions harsher than those in which it has been tested. This SCBA must be utilized under suitable thermal protective garments during exposure to excessive heat or flashovers. Users must clean and maintain this SCBA only in accordance with SPERIAN's instructions. Accessories not certified for use with this SCBA may degrade performance, or void NIOSH certification and must not be used without SPERIAN's written consent. The user must read, understand, and follow the accessory installation and operation instructions before using this SCBA in a hazardous environment. Only SPERIAN components shall be used with this SCBA. Failure to comply shall void the warranty and NIOSH and/or NFPA approvals.***
- ***Your SPERIAN respirator has been constructed of materials selected after careful consideration for their performance, safety, and durability. However, all materials have exposure limitations to flame, extremes of heat and cold, or to the more than 15,000 chemicals in use today. No materials exist that can be used safely in all of these environments.***

**WARNING—Continued**

- Our engineers cannot predict what will happen to this equipment in every potential environment. Materials can be chemically attacked if exposed to the wrong environment and may, exhibit excessive corrosion or other forms of damage. Permeation of gases and liquids through the materials could be excessive. Flame or extremes of temperature might cause thermal degradation. Each of these things, or a combination of them, could create conditions in which this SPERIAN equipment would be dangerous to use.
- This respirator will reduce, but will not eliminate the inhalation of contaminants. Before allowing anyone to enter a hazardous environment while wearing SPERIAN equipment, you must conduct safe, scientific tests to determine if the environment could render the equipment unsafe. Results of this testing should be well documented. Seek the help of a certified safety professional or industrial hygienist. **DO NOT USE** this equipment if the user would be endangered in any way through environmentally induced degradation of the materials in the apparatus.
- All persons using this SPERIAN breathing apparatus must be made aware of its limitations. We cannot be responsible for any damage to property, personal injury, or death in which environmental exposure is a contributing factor.
- This respirator does not protect exposed areas of the body. Some contaminants can be absorbed directly through the skin while others may irritate exposed areas.
- Visual indications of material degradation may be identified by charring, blistering, cracking, crazing, pitting, chalking, rust, and significant color changes, all of which can result in a weakened structure, prohibiting extended useful service life.
- Do not wear this respirator if a satisfactory fit, as determined by a qualitative or quantitative fit test, cannot be obtained. See ANSI Z88.2 latest edition and OSHA Respirator Standard (29 CFR 1910.134).
- Beards and sideburns will prevent a good facepiece seal. Do not use this respirator unless you are clean shaven.
- This respirator must be used in conjunction with a written respirator program meeting the requirements of the OSHA Standard for Respiratory Protection, 29 CFR 1910.134, available

**WARNING—Continued**

- from the U.S. Department of Labor, Occupational Safety and Health Administration. The program must include, but not be limited to procedures for evaluating air contaminants and selecting appropriate respirators, procedures for testing the facepiece-to-face fit of respirators, procedures for cleaning, disinfecting, inspecting, maintaining, and storing respirators, procedures for determining if workers are physically and medically capable of wearing respirators, and procedures for training employees in the use of respirators and in recognizing the hazards associated with contaminants in the workplace.
- Do not use this respirator underwater or for abrasive blasting.
- Before use in welding operations, the SCBA must be equipped with a black facepiece, a welding shield, and upper and lower bibs.
- This SCBA is designed for storage in temperatures from -30° F to + 160° F.
- SPERIAN respirators, accessories, and associated equipment should not be used in atmospheres which may contain contaminant concentrations above the lower explosive level (LEL). Intrinsic safety certification of electronic components does not eliminate potential danger from ignition in these atmospheres.
- The pressure within the SPERIAN facepiece remains positive under most working conditions, but as with all SCBAs, negative pressure excursions are possible. Conditions when an SCBA can experience negative facepiece pressures include, but are not limited to: 1) the SCBA is improperly worn, 2) the SCBA is not used in accordance with the instructions, 3) the SCBA is improperly maintained, or 4) the SCBA is over-breathed during heavy work rates. The SCBA will provide reduced protection when operated in a negative pressure mode.
- Some sensitive individuals may experience health problems when exposed to even minute amounts of contaminants. This SCBA will not prevent health problems for those individuals.
- Persons sensitized can have a severe reaction to chemicals at levels well below accepted health levels such as the OSHA Permissible Exposure Limit (PEL), AIHA Threshold Limit Value (TLV), or NIOSH Recommended Exposure Limits (REL). Do not use this

**WARNING—Continued**

SCBA if you have been sensitized from previous exposure or believe that you may be sensitive or allergic to any chemical (e.g., isocyanates, latex, etc.).

- Do not alter or modify this SCBA in any manner. Modifying this SCBA will void NIOSH certification and may create a condition in which the SCBA would not provide the intended protection.
- Some individuals are sensitive to chemicals (e.g., isocyanates, latex, oil mists, etc.) or may have some type of respiratory disorder (e.g., asthma, chronic obstructive airway disease, etc.). If you are sensitive to any chemical or have a respiratory disorder, you may have a severe reaction at contaminant levels well below accepted health levels, such as the OSHA Permissible Exposure Limit WELL AIHA Threshold Limit Value (TLV), or the NIOSH Recommended Exposure Limits (REL). Many chemicals (e.g., isocyanates, mercury, etc.) have no physical warning properties and you cannot taste or smell the contaminants even though they may be present in the facepiece. This SCBA will reduce, but will not eliminate the possibility of contaminants entering the facepiece and causing a severe reaction. Do not use this respirator under these conditions.
- Discontinue use if you experience skin irritation or discoloration.
- You must read, understand, and follow all warnings, instructions, labels, Material Safety Data Sheets (MSDS), etc., for the materials you are using (e.g., paints, hardeners, insecticides, varnishes, etc.). You must also read, understand, and follow all warnings, instructions, etc., listed in the MSDS for any contaminants that may be or are present in the work area.
- **FAILURE TO COMPLY WITH THESE WARNINGS MAY RESULT IN SERIOUS PERSONAL INJURY, SERIOUS ILLNESS, OR DEATH**

III. PARTS LIST (See Figure 1 on Page 4)

ITEM	PIN	DESCRIPTION			
		Facepiece	Size	Color	Nose Cup
1	961090	Classic™	Standard	Blue	Standard
	961096	Classic	Small	Blue	Standard
	968416	Classic	Standard	Black	Standard
	968417	Classic	Small	Black	Standard
	202010	TwentyTwenty®	Small	Blue	Standard
	202011	TwentyTwenty	Small	Blue	Large
	202012	TwentyTwenty	Small	Black	Standard
	202013	TwentyTwenty	Small	Black	Large
	202022*	TwentyTwenty	Medium	Black	Standard
	202023	TwentyTwenty	Medium	Black	Large
	202030	TwentyTwenty	Large	D.Gray	Standard
	202031	TwentyTwenty	Large	D.Gray	Large
	202032	TwentyTwenty	Large	Black	Standard
	202033	TwentyTwenty	Large	Black	Large
	222021	TwentyTwenty Plus	Medium	Blue	Large
	222023	TwentyTwenty Plus	Medium	Black	Large
	222010	TwentyTwenty Plus	Small	Blue	Medium
	222011	TwentyTwenty Plus	Small	Blue	Large
	222012	TwentyTwenty Plus	Small	Black	Medium
	222013	TwentyTwenty Plus	Small	Black	Large
	222020	TwentyTwenty Plus	Medium	Blue	Medium
	222022	TwentyTwenty Plus	Medium	Black	Medium
	222030	TwentyTwenty Plus	Large	D. Gray	Medium
	222031	TwentyTwenty Plus	Large	D.Gray	Large
	222032	TwentyTwenty Plus	Large	Black	Medium
	222033	TwentyTwenty Plus	Large	Black	Large
	222038	TwentyTwenty Plus	Small	Blue	Small
	222039	TwentyTwenty Plus	Small	Black	Small
	222040	TwentyTwenty Plus	Medium	Blue	Small
	222041	TwentyTwenty Plus	Medium	Black	Small
	222042	TwentyTwenty Plus	Large	D.Gray	Small
	222043	TwentyTwenty Plus	Large	Black	Small
2	961793*	Panther Second Stage Regulator			
3	961140*	Intermediate Pressure Line			
4	970410	GaugeNisual Alarm, L.P. (2216 psig)			
	970411	GaugeNisual Alarm, L.P. (3000 psig)			
	970412*	GaugeNisual Alarm, H. P. (4500 psig)			
5	961366	First Stage, Whistle, 2216 psig			
	961372	First Stage, Warbling Whistle, 2216 psig			
	961371	First Stage, Panther Bell, 2216 psig			
	961359	First Stage, Whistle, 3000 psig			
	961364	First Stage, Warbling Whistle, 3000 psig			
	961363	First Stage, Panther Bell, 3000 psig			
	961356	First Stage, Whistle, 4500 psig			
	961358	First Stage, Warbling Whistle, 4500 psig			
6	961357	First Stage, Panther Bell, 4500 psig			
	961250	Panther Backpack, Classic™			
	964800*	Panther Backpack, MightyLight®			

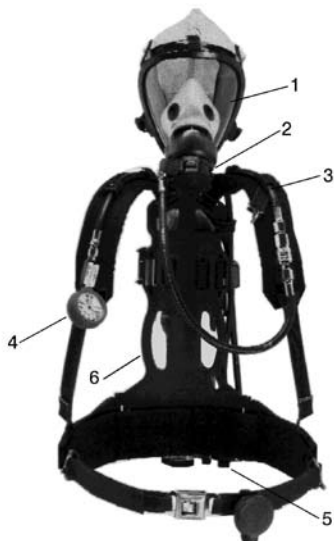


Figure 1. Panther SCBA

CYLINDER/VALVE ASSEMBLY					
		Pressure (Psig)	Duration (minutes)	Wrap	Material
916103	2216	30	Hoop	Glass	
915140	2216	30	none	Aluminum	
915170	2216	30	Full	Glass	
915165	4500	30	Hoop	Glass	
916173	4500	30	Full	Glass	
916140	4500	45	Full	Glass	
915182	4500	60	Full	Glass	
916135	4500	30	Full	Kevlar	
916145	4500	45	Full	Kevlar	
915177	4500	60	Full	Kevlar	
916123	3000	30	Full	Carbon	
917130	2216	30	Full	Carbon	
917131	4500	30	Full	Carbon	
917145	4500	45	Full	Carbon	
917160	4500	60	Full	Carbon	
TwentyTwenty and TwentyTwenty Plus Facepiece Accessories					
962232	Neck Strap Kit				
962244	AIR KLIC Removal Tool				
962900	Kit, APR Adapter, No Nose Cup (For Use with TwentyTwenty Facepiece with Either a Large Nose Cup or a Standard Nose Cup with Slot and For Use with a TwentyTwenty Plus Facepiece with either a Large Nose Cup or a Small or Medium Nose Cup with Slot)				
962911	Kit, APR Adapter, TwentyTwenty, Standard Nose Cup with Slot, and TwentyTwenty Plus, Small or Medium Nose Cup with Slot				
962260	Spectacles, Kit				
962266	Large Nose Cup Kit				
962265	Medium Nose Cup Kit				
962264	Small Nose Cup Kit				
962270*	Headnet™ Kit				
962300	Radio Communication System, TwentyTwenty				
963050	Radio Communication System, TwentyTwenty Plus				
962301	SmallTalk Voice® Amplification System. Twenty Twenty				
963070	SmallTalk Voice Amplification System. TwentyTwenty Plus				
962302	Radio Communication/Voice Amplification System, TwentyTwenty				
963080	Radio Communication/Voice Amplification System, TwentyTwenty Plus				
962303	Remote Push-to-Talk Kit, TwentyTwenty				
963073	TwentyTwenty Plus Radio Communication System with Remote Push-to-Tak Kit				
963074	TwentyTwenty Plus Radio Communication SmallTalk Kit wit Remote Push-to-Talk Kit				

Classic™ Facepiece Accessories	
980003	Spectacles Kit
961600	Radio Communication System w/Amplifier
961609	Radio Communication System w/Mask Mounted PTT
961194	Large Nose Cup Kit
961710	Headnetym Kit, Standard Facepiece
961730	Headnet Kit, Small Facepiece
961087	Neck Strap Assembly
430000	Welding Shield
430005	Lower Bib
430010	Upper Bib
140035	Lens Cover
962912	Kit, APR Adapter, Classic™ Facepiece, Standard Nose Cup
962913	Kit, APR Adapter, Classic™ Facepiece. Large Nose Cup
961608	SmallTalk Voice Amplifier Kit with Standard Nose Cup
961623	SmallTalk Voice Amplifier Kit with Large Nose Cup
961607	SmallTalk Facepiece Modification Kit with Standard Nose Cup
961622	SmallTalk Facepiece Modification Kit with Large Nose Cup
General Accessories	
940118	Protective Mask Bag
140096	Mask Wipes (100 ea.)
951015	Anti-fog Solution (1 oz.)
951016	Anti-fog Solution (16 oz.)
980200	Suit Pass-through Kit
946935	Cylinder Sleeve for 916103
946937	Cylinder Sleeve for 915165
961275	Chest Strap Kit, Classic™ Backpack
961800	Air Line Adapter Kit
930801/02/04/61162/64/70	Air Supply Hoses, 3/8 inch
930810	Foster Coupler Kit
930820	Schrader Coupler Kit
930830	Hansen Coupler Kit
945007	Hansen Coupler Kit, Stainless Steel
961148	Buddy Breather Kit
961531	Supercharge® Kit, L.P. (Whistle)
961529	Supercharge Kit, H.P. (Whistle)
961538	Supercharge Kit, L.P. (Bell)
961537	Supercharge Kit, H.P. (Bell)
961870	Bell Alarm Kit, L.P.
961880	Bell Alarm Kit, H.P.
962600	COMPASS Integrated PASS Device
962820	COMPASS Buddy Breather Kit
962850	COMPASS SAR Attachment Kit
962620	COMPASS and Buddy Breather Kit
962621	COMPASS and Buddy Breather with SAR Attachment Kit
962700	DoublePASS Remote Alarm Module
Fit Testing Accessories, Qualitative	
962900	Kit, APR Adapter, No Nose Cup (For Use with TwentyTwenty and Classic Facepieces
193140	IAA/Banana Oil Fit Test Kit
100100	Organic Vapor Cartridge, Box of 6 (For Use with P/N 193140 Fit Test Kit)
193138	Replacement IAA Solution, 1 oz.
Fit Testing Accessories, Quantitative	
962920	Fit Test Kit, SCBA/APR Adapter (Requires the P/N 962900 Kit, APR Adapter)
962925	Fit Test Kit, Refill
105005	P100 Filters, Box of 10
941899	Probed Lens, Classic Facepiece
962253	Probed Lens, TwentyTwenty Facepiece
962848	Probed Lens, TwentyTwenty Plus Facepiece

* Shown in Figure 1

IV. DESCRIPTION

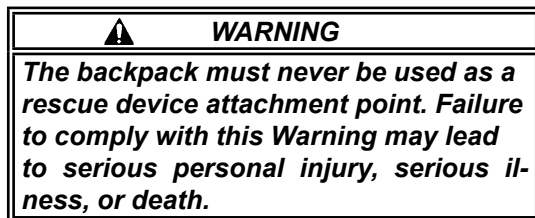
The Panther CBRN SCBA provides the wearer with respiratory protection in hazardous environments, and may be used for entrance into and escape from atmospheres that are immediately dangerous to life or health (IDLH).

NOTE

- The Panther CBRN SCBA meets all requirements of the NFPA 1981 Standard, 1997 Edition, *Open-Circuit Self-Contained Breathing Apparatus for Fire Services*.
- See NFPA 1500, Standard on Fire Department Occupational Safety and Health Program for proper use of SCBAs in the work environment.

A. Backpack and Cylinder

1. The backpack consists of either a contoured, articulated Classic™ aluminum frame (P/N 961250) or the MightyLight® lightweight contoured polymer frame (P/N 964800). Both backpacks are equipped with a built-in carrying handle. The cylinder is attached by a lightweight webbing-style band. The harness is made of replaceable, coated Kevlar®/Nomex® straps. The pressure gauge is mounted on the right shoulder strap, and the intermediate pressure hose is routed over the left shoulder. The gauge indicates the cylinder pressure once the cylinder valve has been opened.
2. The air cylinder is either of a composite construction with an aluminum inner liner overwrapped by a nonmetallic fiber, or of an all-aluminum construction, and has a maximum working pressure of 2216 psig (low pressure) in 30-minute duration, 3000 psig (low pressure) in 30-minute duration, or 4500 psig (high pressure) in 30-, 45-, and 60-minute durations.



B. First Stage Regulator

1. Panther-style First Stage Regulator

- a. The Panther-style first stage regulator includes an over-pressurization relief valve, intermediate pressure hose, and a positive lock quick-disconnect fitting. The first stage lowers cylinder air pressure to approximately 100 psig. The relief valve activates to protect the system when the regulated pressure exceeds 200 to 225 psig.
- b. The Panther-style first stage regulator is equipped with either a whistle, warbling whistle, or bell audible alarm. The low pressure SCBA audible alarm activates at 510 to 598 psig (2216 psig system) or 690 to 810 psig (3000 psig system); the high pressure SCBA audible alarm ac-

tivates at 1035 to 1215 psig (4500 psig system). The audible alarm will continue to sound until air pressure drops below 200 psig.

2. Panther with MARK 2-style Bell Alarm

The MARK 2-style first stage regulator contains a pressure reducer and audible alarm.

- a. The first stage regulator lowers cylinder air pressure to an intermediate pressure of approximately 100 psig. An automatic backup system maintains a safe flow of air in case of a malfunction.
- b. The audible alarm operates in two modes, ringing at a slow rate when the quantity of air in the cylinder has dropped to approximately 25% of capacity, and ringing rapidly when a failure occurs in the first stage system. The low pressure SCBA bell alarm rings at 510 to 598 psig (2216 psig system) or 690 to 810 psig (3000 psig system); the high pressure SCBA bell alarm rings at 1035 to 1215 psig (4500 psig system); the bell alarm will continue ringing until air pressure drops below 200 psig.

C. Gauge Visual Alarm

The gauge/visual alarm is mounted on the right shoulder strap and may be swiveled 360° for easy viewing. When the cylinder valve is opened, the gauge indicates the air pressure remaining in the cylinder. The visual alarm starts flashing when the quantity of air in the cylinder has dropped to approximately 25% of capacity. The low pressure SCBA visual alarm flashes at 510 to 598 psig (2216 psig system) or 690 to 810 psig (3000 psig system); the high pressure SCBA visual alarm flashes at 1035 to 1215 psig. The visual alarm will continue flashing until air pressure drops below 200 psig.

D. 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 the release buttons are pressed. To prevent inadvertent air flow, 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. The flow of air can be stopped by pressing the shutoff button. A large red knob on the right side of the regulator controls an adjustable bypass valve. Turning this knob counterclockwise provides a constant flow of air.

E. Facepiece

The Panther SCBA will include a Classic™ facepiece, a TwentyTwenty® or TwentyTwenty Plus facepiece. The silicone facepiece has a special wide lip sealing surface and five point silicone headstrap harness or optional Headnet™ harness. The lens is treated with an abrasion resistant coating on the inside and outside surfaces 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. An anti-fog wipe is included with the facepiece, and can be applied to the inside surface of the lens for use in cold temperatures.

V. UNPACKAGING

IMPORTANT—READ CAREFULLY

A. Warranty Card

NOTE

The warranty is void unless the warranty card is returned to the factory within 30 days of purchase.

1. Fill in the form with the required information.
2. Mail back the completed warranty registration card immediately.
3. To comply with OSHA and NIOSH, SPERIAN is required to retain the completed warranty registration card.
4. Always refer to the equipment serial number if a claim is made.

B. Remove the SCBA from the Packaging

1. Carrying case
 - a. Remove the carrying case from the box.
 - b. Lift both locking tabs on the case and open it.
 - c. Remove the facepiece from the case.
 - d. Unfasten the Velcro transportation fasteners.
 - e. Lift the SCBA from the case.
2. Carton packaging
 - a. Remove the facepiece from the box.
 - b. Remove the plastic transportation cradle from the box with the SCBA connected to it.
 - c. Cut both of the locking straps that secure the SCBA to the transportation cradle.
 - d. Lift the SCBA from the cradle.

C. Remove the Cylinder Valve Locking Strap

The cylinder valve on the air cylinder has been locked in the closed position to prevent inadvertent opening of the valve during transit. The plastic strap locking the valve must be removed prior to training or use of the SCBA.

1. Use a fingernail clipper or wire cutter to cut the plastic strap.
2. Remove the strap and attached tag.

CAUTION

Exercise extreme care when identifying SCBA components. Engraving may induce stress in materials that, over time, could propagate cracks. Plastic labels, dyno-labels, and stickers may burn, voiding NFPA certification.

VI. OPERATION



WARNING

Wear gloves when handling SCBAs that have been stored in extreme temperatures. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death

NOTE

See NFPA 1500, Standard on Fire Department Occupational Safety and Health Program for proper use of SCBAs in the work environment.

A. Donning

1. Remove the SCBA from its carrying case or stored location.
2. Hand tighten the first stage reducer to the cylinder valve outlet.
3. Ensure that the cylinder valve gauge reads in the green (FULL) zone.



WARNING

Check the cylinder band latch each time; set the cylinder band or strap to match the cylinder. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.

4. Check the latch on the cylinder band and ensure that the cylinder is secure in the backpack.
5. Lay the harness out and straighten each strap. All adjustable straps should be extended to maximum length.
6. There are two methods of donning the Panther: coat-style, one arm at a time; and over the head. Choice of the method of donning is a matter of individual choice or organizational policy. Both methods are described below.

a. Over the Head

- i. Lean the SCBA cylinder against your legs, cylinder on the floor and the harness spread to each side.
- ii. Grasp the cylinder and backpack near the center as shown in Figure 2.



Figure 2. Grasp Cylinder

- iii. Lift the SCBA over your head as shown in Figure 3, and allow it to slide onto your back.

b. Coat Style

- i. Insert your arm through one of the shoulder straps and swing the SCBA onto your back. See Figure 4.
- ii. Insert your other arm through the other shoulder strap.

Both Methods

7. Lean forward and pull the harness adjustment straps until the back support rests in the small of your back. See Figure 5.

NOTE

If the harness adjustment straps are properly tightened, the weight of the SCBA will bear carried on the hips instead of they shoulders. If the harness adjustment straps restrict movement, readjust.

8. If your SCBA is equipped with the optional chest strap (Classic backpack only), buckle it.
9. Take up the slack with the harness adjustment straps. See Figure 6.
10. Fasten the waist belt buckle. Pull forward on the



Figure 3. Over Head



Figure 4. Coat Style



Figure 5. Lean Forward



Figure 6. Shoulder Adjustment Straps

MightyLight® backpack waist straps as shown in Figure 7, or to the sides on the Classic™ backpack waist straps and tighten until very snug.



MightyLight Backpack

Figure 7. Tighten Waist Strap

11. Readjust the harness adjustment straps so that the weight of the SCBA is distributed properly on the hips. Do not overtighten.
12. Tighten the AIR KLIC (the adapter into which the second stage regulator is inserted) in the facepiece by turning it clockwise.
13. Verify that the AIR KLIC is secured by trying to turn it counterclockwise.
14. The loose ends of the waist belt and shoulder straps may be tucked under the waist belt at the discretion of the wearer.



WARNING

- *The AIR KLIC must be held securely in the nozzle by the ratchet mechanism.*
- *If it is necessary to use a respirator that has been stored at a temperature below freezing (32°F or 0°C) prior to using, then DO NOT exhale into the facepiece until the facepiece has been properly donned with the nose cup situated properly on the face and the regulator installed and activated.*
- *If the SCBA is used in temperatures of 0°F and lower, apply anti-fog solution to the inside surface of the facepiece lens.*
- *Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.*

15. There are two methods, depending upon which head harness is used, to secure the Classic™, TwentyTwenty® or TwentyTwenty Plus facepiece to the user. Both methods are described below.
 - a. Standard silicone headstrap:
 - i. Fully loosen the headstraps.

- ii. If your SCBA is equipped with a neck strap, place the neck strap over your head.
- iii. Grasp the lower headstraps as shown in Figure 8.



Figure 8. Grasp Lower Headstraps

- iv. Place your chin in the chin cup and pull the straps over your head.
- v. Center the facepiece and flatten the head-strap hub on the back of your head.
- vi. Tighten the two lower straps. Do not over-tighten.
- vii. Tighten the temple straps (Figure 9), then the top strap, until all the headstraps lay flat on your head.



Figure 9. Tighten Upper Headstraps

- viii. Perform a leak check as described below.

NOTE

When properly adjusted, the headstrap hub should be centered on the back of your head, and the lower straps should be below your ears. Make sure that your chin is properly recessed in the chin cup.

b. Optional Headnet™

- i. Inspection

•**Classic Facepiece**—Ensure that the three locking fabric straps located across the forehead are positioned so that they do not slip out from under the buckles.

•**TwentyTwenty and TwentyTwenty Plus Facepiece**—Ensure that the three locking fabric straps located across the forehead are fully inserted into their slots in the rims and that the locking flaps prevent the straps from pulling out of the slots.

Both Facepieces

- ii. Place your chin in the chin cup, pull the elastic adjustment strap over your head, and tighten by pulling evenly on both sides. See Figure 10.



Figure 10. Adjust Headnet

- iii. Center the facepiece and flatten the Head-net with a wiping motion toward the back of your head.
- iv. Retighten the elastic adjustment straps. Do not overtighten.
- v. Perform a leak check as described below.

CAUTION

Do not adjust the fit of the facepiece with the three locking straps at the top of the Head-net. Use the two bottom straps only.

NOTE

When properly adjusted, the Headnet should be centered on the back of your head, and the lower straps should be below your ears.

B. Leak Check and Exhalation Valve Test



WARNING

•**Do not use this SCBA in a contaminated atmosphere if you do not obtain a satisfactory seal during the leak check. If a seal was not obtained, reposition the facepiece, check the straps, and perform the leak check again.**

•**Do not use this SCBA in a contaminated atmosphere if the exhalation valve is not working properly. Failure to verify that the exhalation valve is functioning properly could result in 1) difficulty in exhaling from the facepiece and/or 2) a reduction in service time due to air flowing out the valve.**

<p>⚠ WARNING—Continued</p> <p>•Failure to obtain a satisfactory seal or test the exhalation valve could allow contaminants to leak into the facepiece, causing illness or death.</p>
--

1. Place the palm of your hand over the AIR KLIC as shown in Figure 11.



Figure 11. Leak Check

2. Inhale and hold your breath for a few seconds. The facepiece should collapse on your face without leaking.
3. If the facepiece leaks, reposition, check the straps, and repeat the leak check.
4. To test the exhalation valve, take a deep breath and hold it. Cover the AIR KLIC again as shown in Figure 11 and exhale.
5. If the exhalation valve is stuck, it will be difficult to exhale. You may also feel a rush of air around the facepiece seal. If the exhalation valve is stuck, exhale sharply to open the valve. If the valve still does not open, clean the valve per the instructions in the repair table on page 23 of this manual.

C. Pressurization

1. Verify that the second stage regulator hose is connected to the quick disconnect fitting on the left shoulder strap.
2. Fully depress the shutoff button on the second stage regulator.
3. Verify that the red bypass knob is in the closed position.
4. Open the cylinder valve (Figure 12) and check the over-the-shoulder gauge/alarm to ensure that the needle reads in the green (FULL) zone.



Figure 12. Open Cylinder Valve

<p>⚠ WARNING</p> <p><i>The audible alarm must sound and the visual alarm must flash as the system is pressurized. If either alarm fails to activate (sound and flash) as you pressurize your SCBA, DO NOT USE the SCBA. Failure of either alarm could result in a failure to realize that the SCBA is near the end of its service life, resulting in death or serious injury.</i></p>

5. Engage the cylinder valve handle locking sleeve by turning it clockwise to prevent accidental valve closure.
6. Remove the second stage regulator from the waist strap regulator holder by pressing the two release buttons.

NOTE

The second stage regulator release buttons must be pressed simultaneously to remove the regulator from the holder.


7. Insert the regulator into the AIR KLIC on the facepiece (Figure 13) and press firmly until you hear both release buttons snap into place.




Figure 13. Insert Regulator

NOTE

- A CLICK will be heard when each AIR KLIC button is properly engaged.
- Do not press the release buttons when installing the regulator.


 WARNING
<p><i>Both release buttons must be properly engaged. Rotate and tug the regulator to ensure that both release buttons are properly engaged in the AIR KLIC. Do not push the release buttons while verifying the engagement of the regulator. Do not press the release buttons unless you intend to remove the regulator from the facepiece. Pressing either release button during or after installation onto the facepiece could result in inadvertent regulator disengagement, causing death or serious injury.</i></p>

8. Take a sharp, deep breath to activate the regulator.
9. Take several breaths to check the flow of air.
10. Quickly open and close the bypass valve to ensure that it is operating properly.

 WARNING
<p><i>The Panther SCBA has a rated service duration of 30, 45, or 60 minutes based on the requirements of the Code of Federal Regulations, Title 42, Part 84, Subpart H. Actual service duration will frequently be less than the rated time, depending on the physical condition and exertion level of the user, initial cylinder pressure, and ambient temperature. When EITHER low air alarm (audible or visual) begins sounding or flashing, PROCEED IMMEDIATELY TO A SAFE AREA. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

D. Emergency Operation

1. PROBLEM: Restricted or interrupted air flow
 - a. Open the bypass valve by turning the red knob on the second stage counterclockwise until the desired constant air flow is achieved.

 WARNING
<p><i>Activating the bypass valve rapidly depletes your air supply. Immediately exit to a safe area. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

- b. IMMEDIATELY exit to a safe area.
- c. Have the SCBA inspected and/or repaired by a certified repair technician before reuse.

2. PROBLEM: First-Breath-On failure

- a. Press the manual override button on the front of the regulator to start air flow.
- b. IMMEDIATELY exit to a safe area.
- c. Have the SCBA inspected and/or repaired by a certified repair technician before reuse.

3. PROBLEM: Free flow

- a. If the regulator will not shut off (free flow) during extremely heavy breathing, exhale forcefully. The regulator should return to normal flow.
- b. If the free flow continues, open and close the bypass once.
- c. If the problem persists, IMMEDIATELY exit to a safe area.
- d. Have the SCBA inspected and/or repaired by a certified repair technician before reuse.


4. PROBLEM: Relief valve operates

- a. Disengage the cylinder valve locking sleeve by pushing in and turning it counterclockwise as far as it will go.
- b. Regulate the amount of air flow by manually throttling the cylinder valve.
- c. Immediately exit to a safe area.
- d. Have the SCBA inspected and/or repaired by a certified repair technician before reuse.

5. PROBLEM: Second stage regulator accidentally disengages from facepiece


- a. Hold your breath. Locate the regulator using the regulator supply hose (the regulator will be free-flowing), and immediately insert the regulator into the facepiece. Resume breathing.
- b. Push the regulator firmly into the facepiece. Ensure that both AIR KLIC buttons are engaged.
- c. Immediately exit to a safe area.
- d. Have the SCBA inspected and/or repaired by a certified repair technician before reuse.

E. Doffing

 WARNING
<p><i>Doff the Panther SCBA only in a safe area. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

1. Depress the second stage regulator shutoff button.
2. Press the two release buttons and remove the regulator from the facepiece.
3. Disengage the cylinder valve locking sleeve by pushing in and turning it counterclockwise.

4. Close the cylinder valve.
5. Press the override button or open the bypass valve on the second stage regulator to vent air from the SCBA.
6. Close the bypass valve.


 WARNING
<p><i>The SCBA must be stored in a cool, dry location with the cylinder valve closed and the air pressure vented from the system. Storing an SCBA with the cylinder valve open and the system under pressure can result in damage to elastomeric materials in the regulator, particularly if the SCBA is stored at temperatures above 160°F (71°C). Damage resulting from improper storage could result in reduced flow or even stop flow conditions, resulting in serious injury, illness, or death.</i></p>

7. Push the second stage regulator into the waist-strap-mounted regulator holder until it clicks.
8. Place your thumbs under the headstrap buckles, loosen the straps, and remove the facepiece.
9. Clip the D-ring from the top facepiece buckle onto the snap hook on the left shoulder strap.
10. Unsnap the waist strap and optional chest strap (Classic backpack), loosen the shoulder straps, and remove the SCBA.
11. Prepare the SCBA for storage.

CAUTION
<p><i>If the unit is to be transported unsecured for long periods of time, the first stage connection to the cylinder valve must be wrench-tight.</i></p>

F. 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 first stage regulator from the cylinder valve by rotating the red or green first stage handwheel counterclockwise.

 WARNING
<p><i>Use extreme care when changing cylinders. DO NOT allow moisture or ice to enter the regulator system. Moisture or ice entering the regulator system may cause the SCBA to freeze up, restricting or stopping air flow to the user, resulting in death or serious injury.</i></p>

- d. Prevent the cylinder from accidentally falling by placing a free hand on the top of the cylinder.
- e. Remove the tank band as follows:
 - i. Panther Classic and MightyLight Backpack
 - a. Loosen the tank band latch by flipping the cam-over buckle toward the user.
 - b. Remove the tank band buckle from the spring-catch mechanism by one of two methods. Either grasp and rotate the tank band buckle up or down as shown in Figure 14, **OR**, Pull on the metal bail as shown in Figure 15.




Figure 14. Grasp and Rotate Tank Band Buckle Up or Down



Figure 15. Pull on Metal Bail


- ii. SIGMA Classic Backpack
 - a. Flip the butterfly handle up.
 - b. Loosen the tank band by rotating the handle counterclockwise.

 WARNING
<p><i>Prevent the metal tank band from springing open to avoid injury. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

- c. Open the tank band by unhooking the lock mechanism.
- f. Rotate the cylinder 90° so that the cylinder valve handwheel faces away from the user

- g. Remove the cylinder by allowing it to rotate around the tank bracket to a horizontal orientation. Lift the cylinder valve free.
- h. Place the cylinder in a safe location and prevent it from accidentally rolling into hazards that may damage the exterior of the cylinder.

2. Installation

 WARNING
<p><i>Use proper lifting techniques to lift the fully charged cylinder to prevent back injury. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

- a. Place cylinder valve handwheel into the tank bracket.

CAUTION
<p><i>Avoid valve damage by preventing the cylinder valve threads from becoming smashed.</i></p>

- b. Lift up until the cylinder rests against the backpack frame.
- c. Rotate the cylinder until the cylinder valve threads face to the user's left side.
- d. Adjust the cylinder band to prevent the cylinder from falling off the backpack as follows:

i. Changing to the same diameter cylinder:

a. Panther Classic and MightyLight Backpack

- 1. Place the metal bail of the tank band buckle into the spring-catch mechanism by pushing down on the spring. The bail should slide on the spring until it is centered underneath the catch.
- 2. Tighten the tank band by flipping the cam-over buckle away from the user.

b. SIGMA Classic Backpack

- 1. Wrap the metal tank band strap around the cylinder as tightly as possible.
- 2. Engage the tank band by hooking the lock mechanism into the slot on the tank band that achieves the tightest fit.
- 3. Tighten the tank band by rotating the butterfly handle clockwise.
- 4. Flip the handle down to prevent accidental opening.

ii. Changing to a different diameter cylinder:

a. Panther Classic MightyLight Backpack

- 1. Adjusting the tank band for a smaller diameter cylinder:

- (a) Place the metal bail of the tank band buckle into the spring-catch mechanism by pushing down on the spring. The bail should slide on the spring until it is centered underneath the catch.

- (b) Adjust the slack in the tank band by pulling the outermost tank band strap through the buckle until the inner strap is almost snug. Readjust as necessary.

- (c) Adjust the slack in the outer strap by sliding the double bar D-ring away from the tank band buckle. The outer strap should lay flat on the inner strap.

CAUTION
<p><i>Avoid excessive cylinder rattle or the potential for the cylinder to fall out from adjusting the tank strap too loose.</i></p>

- (d) Tighten the tank band by flipping the cam-over buckle away from the user.

2. Adjusting the tank band strap for a larger diameter cylinder:


- (a) Slide the double bar D-ring toward the tank band buckle.

- (b) Pull the excess strap through the buckle so that the inner and outer straps are the same length.

- (c) Place the metal bail of the tank band buckle into the spring-catch mechanism by pushing down on the spring. The bail should slide on the spring until it is centered underneath the catch.

CAUTION
<p><i>Avoid excessive cylinder rattle or the potential for the cylinder to fall out from adjusting the tank strap too loose.</i></p>


- (d) Tighten the tank band by flipping the cam-over buckle away from the user.

 WARNING
<p><i>Check the cylinder latch each time the cylinder is installed. Set the cylinder band or strap to match the cylinder. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

b. SIGMA Classic Backpack

- 1. Wrap the metal tank band strap around the cylinder as tightly as possible

2. Engage the tank band by hooking the lock mechanism into the slot on the tank band that achieves the tightest fit.
3. Tighten the tank band by rotating the butterfly handle clockwise.
4. Flip the handle down to prevent accidental opening.

 WARNING
<p><i>Check the cylinder latch each time the cylinder is installed. Set the cylinder band or strap to match the cylinder. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

G. Transportation


methods of transportation include the following:


1. Mounting bracket
 - a. Brackets inside a fire apparatus storage compartment or integrated into a seat should attach to the cylinder only. Securely mount the SCBA and verify that the bracket does not straddle or interfere with the tank band, tank band latch, cylinder valve, or backpack.
 - b. The SCBA mounting position should prevent any part of the SCBA from being slammed in a door or door hinge.
2. SCBA hard case or soft bag for transportation in a car trunk or truck bed.
3. If the above methods are not achievable, secure the SCBA to prevent rolling, sliding, or bouncing, which could cause damage.

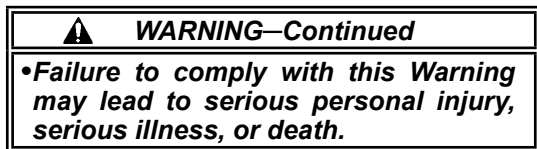
H. Interface Considerations

1. Protective hoods, if used, must be donned after a satisfactory facepiece fit check has been achieved.
2. Ensure that the audible and visual low air alarms and PASS alarm (if used) remain functional by not allowing turnout gear, ice, firefighting equipment, or tools to cover these devices.
3. Do not mount other firefighting tools such that they interfere with the function of the SCBA.

VII. CYLINDER FILLING AND SAFETY

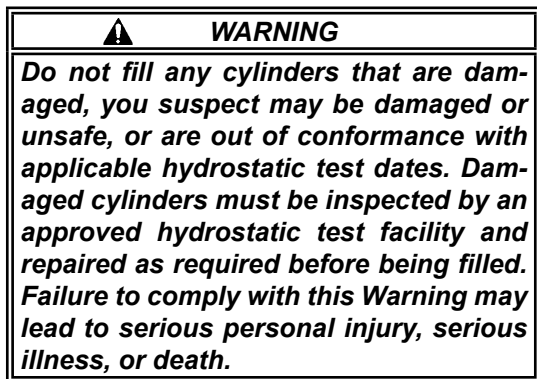
 WARNING
<p><i>•You must read and understand all warnings and instructions provided on the cylinder DOT warning label and in instruction manuals before using the cylinder/valve assembly.</i></p> <p><i>•Only trained personnel may store, fill, service, maintain, handle, use, or</i></p>

 WARNING—Continued
<p><i>dispose of cylinders used with this SCBA. Follow the guidelines of the Compressed Gas Association (CGA) pamphlets P-1, C-1, C-2, C-6, C-6.1, C-6.2, G-7, and G-7.1, as appropriate. Always follow established safety Precautions when recharging cylinders.</i></p> <p><i>•Do not alter cylinders used with this SCBA.</i></p> <p><i>•Fill only to the stamped service pressure. Do not overfill.</i></p> <p><i>•Do not fill a leaking cylinder. Depressurize immediately.</i></p> <p><i>•Do not tamper with the safety Pressure relief device. Rapid depressurization when the safety pressure relief device activates will cause excessive noise. During rapid depressurization, cylinders may become ballistic and cause injury. Stay clear of cylinders when the safety relief valve is activated.</i></p> <p><i>•Do not fill the cylinder if unraveling or charring of composite fibers occurs.</i></p> <p><i>•Do not fill or use the cylinder if you have any doubt about its suitability for recharge. Return it to a certified hydrostatic test facility.</i></p> <p><i>•Do not expose cylinders used with this SCBA to open flame or heat sources which may heat the cylinder to 350°F. Cylinders damaged by fire or heated to 350°F must be destroyed.</i></p> <p><i>•Repainted or refinished cylinders must be hydrostatically tested before reuse.</i></p> <p><i>•Do not fill a composite cylinder if it is not marked as being hydrostatically tested within three (3) years. Do not fill an aluminum cylinder if it is not marked as being hydrostatically tested within five (5) years.</i></p> <p><i>•Do not fill or use composite cylinders older than 15 years. Depressurize and destroy these cylinders. Call SPERIAN before condemning 15 year old carbon fiber cylinders. An extension of service life beyond 15 years may have been approved since the cylinder was manufactured.</i></p> <p><i>•Inspect cylinders before each filling. Remove cylinders from service which have cuts, gouges, dings, bulges, corrosion, etc. A special internal and external visual inspection of cylinders must be completed at least every hydrostatic test. Follow the guidelines of CGA 6.2.</i></p> <p><i>•Do not fill with oxygen.</i></p> <p><i>•Do not use caustic paint strippers or corrosive cleaners.</i></p> <p><i>•Do not remove, obscure, or alter any labels on SCBA cylinders.</i></p>



A. Inspection

After each use and prior to recharging, each air cylinder shall be subjected to a thorough visual inspection:



1. Steel and Aluminum Cylinders

Ensure that no more than five years have elapsed since the last hydrostatic test has been performed, as indicated by the most recent date stamped into the cylinder shoulder. Inspect the exterior of the cylinder for dents, gouges, or rusted areas, and evidence of exposure to high temperature such as darkened or blistered paint, charred decals, melted or distorted gauge lens, etc.

2. Composite Cylinders

Ensure that no more than three years have elapsed since the last hydrostatic test has been performed, and that the cylinder is less than 15 years old. Inspect the exterior of the cylinder for dents, gouges, or cuts which have penetrated and caused separation or unraveling of the composite overwrap. Watch for evidence of exposure to high temperature, such as darkened or blistered paint, charred overwrap or decals, melted or distorted gauge lens, etc.

3. Cylinder Valve

The cylinder valve should also be examined for obvious external damage such as a deformed handwheel, inaccurate or inoperative pressure indicator, damaged threads on the outlet connection, or other evidence of impact or exposure to extreme heat. If internal contamination is suspected, remove the cylinder valve and inspect the interior of the cylinder. The cylinder valve overhaul cycle should be as follows. For steel or all aluminum cylinders, overhaul the valve at every hydrostatic retest (5 year cycle). For composite cylinders, overhaul the valve at every other hydrostatic retest (6 year cycle).

4. Additional Information

- Additional information on cylinder inspection and maintenance can be found in CGA pamphlet C-6, "Standards for Visual Inspection of Compressed Gas Cylinders," CGA pamphlet C-6.1, "Visual Inspection of High Pressure Aluminum Cylinders," or CGA pamphlet C-6.2, "Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders," available from the Compressed Gas Association, Inc. If there is any doubt about the suitability of a cylinder to recharge, it should be returned to a certified hydrostatic retest facility for expert examination and retesting.
- A comprehensive listing of all licensed hydrostatic test stations is available from the Department of Transportation.

B. Filling Procedure

1. Air Purity

Unless safety and health codes in your area specify otherwise, air cylinders should be refilled with compressed air meeting the purity requirements for Type 1, Grade D Gaseous Air as specified by the Compressed Gas Association Commodity Specification for Air, publication G-7.1. The moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume moisture content. UNDER NO CIRCUMSTANCES SHALL AN AIR CYLINDER BE FILLED OR PARTIALLY- FILLED WITH OXYGEN.

2. Maximum Fill Pressure

Determine the service pressure of the cylinder prior to filling. Type 3AA steel cylinders that bear a plus symbol (+) after the latest retest date may be recharged to a pressure 10% greater than the marked service pressure. For example, a cylinder marked 3AA 2015 with a plus symbol after the latest test date may be filled to a pressure of 2216 psig.

Marked Service Pressure	2015 psig
10% of 2015	+ 201 psig
Maximum Fill Pressure	2216 psig

Composite and aluminum cylinders may be filled **only** to the service pressure indicated on the cylinder label. Composite and aluminum cylinders must **never** be filled to a pressure greater than the marked service pressure.

3. Filling Procedure

If filling with the SPERIAN SuperCharge cylinder filling system, follow all warnings, cautions, and procedures contained in the SuperCharge Operation Instructions. DO NOT fill with the Supercharge

unless you thoroughly understand the filling instructions, and all required conditions are met.

- a. The fill station must be constructed and equipped in accordance with applicable state industrial safety codes.
- b. The cylinder may be partially immersed (DO NOT submerge the cylinder valve) in a water bath to minimize the temperature rise that occurs as the cylinder is filled. The fill hose should be equipped with a restraining cable to prevent uncontrolled "whipping" in case of hose failure.
- c. After connecting the fill hose, open the cylinder valve fully. A separate metering valve must be used to control the fill rate. Fill the cylinder slowly, at a rate not exceeding 500 psig per minute. (Use caution if faster recharging rates are used.) After the initial filling, allow the cylinder to cool to room temperature, then "top off" the cylinder to achieve full service pressure.
- d. Use particular care to ensure that an air cylinder is never connected to a source capable of supplying air at a pressure greater than the maximum service pressure of that cylinder.
- e. Close the cylinder valve when the cylinder is full.
- f. Slowly bleed pressure from the filling lines.
- g. Disconnect the filling line.

4. Storage

Air cylinders should be recharged as soon as is practical after use. Cylinders should not be stored partially charged, for two reasons:

- a. If used without recharge, the service duration of the apparatus is reduced.
- b. The safety relief device is designed specifically to protect a fully charged cylinder from the effects of a fire.

For maximum safety, the cylinders should be stored fully charged.

If the cylinder is stored empty and the valve is inadvertently left open, humid atmospheric air may enter the cylinder and result in interior corrosion.

If a self-contained breathing apparatus is to be maintained in "standby" mode, i.e., available for immediate emergency usage, the cylinder pressure gauge should be checked at least once a month to assure that the cylinder is charged to full service pressure. Place the cylinder in a suitable safety sleeve or filling area.


VIII. MAINTENANCE

NOTE

Inspect the Panther SCBA for defects before and after each use, and at least once monthly if not used. Repair as necessary, clean and disinfect after each use, and store properly to

assure that the Panther is maintained in satisfactory working condition. Keep a record of inspection and repair dates and results. Refer to the inspection table in the back of this manual.

A. Facepiece Cleaning

 WARNING
<ul style="list-style-type: none"> • <i>It is the user's responsibility to ensure that the cleaning process chosen provides adequate disinfection or decontamination.</i> • <i>Specialized processes are required to Disinfect and decontaminate a respirator. You MUST follow the instructions of the manufacturer who supplies the disinfecting or decontamination equipment or chemicals.</i> • <i>In the absence of a commercial sanitizing product, the hypochlorite solution described in the steps below will eliminate many, but not all biohazards.</i> • <i>Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i>

CAUTION
<ul style="list-style-type: none"> • <i>DO NOT clean the facepiece with the regulator attached.</i> • <i>You must ensure that the Disinfecting or decontamination or chemicals.</i> • <i>The facepiece lens can be scratched through careless or abusive handling. DO NOT use abrasive cleaners or pads. DO NOT towel dry.</i> • <i>Cleaning or bleaching solutions containing chlorine will damage the Headnet.</i>

NOTE

- Silicone and rubber parts of the face-piece may be cleaned between washings with SPERIAN Mask Wipes, P/N 140096.
- ANSI Z88.2 1992 also provides information and guidelines on the cleaning and sanitizing of respirators.

1. Make a cleaning solution of warm (48°C or 120°F maximum) 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 (48°C or 120°F maximum) suitable sanitizing solution, such as a “hypochlorite solution” (two [2] tablespoons of chlorine bleach per gallon of water), for 2 to 3 minutes. Rinse thoroughly with fresh warm (48°C or 120°F maximum) water. If other sanitizing solutions are used (such as quaternary ammonium or glutaraldehyde), follow the manufacturer’s instructions supplied with the sanitizing compound.
6. Allow the facepiece to drip dry. Warm air may be used to speed up drying.

NOTE

Cleaning solutions containing ammonia or repeated washing will remove the lens anti-fog coating. Recoat with SPERIAN Anti-Fog Solution, P/N 951015 (1 oz.), or P/N 951016 (16 oz.).

7. Hold the facepiece firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.
8. After cleaning, apply three drops of anti-fog solution to the inner surface of the lens and spread with a lint-free cloth. Allow the coating to dry for 15 minutes before using the facepiece.

B. Second Stage Regulator Cleaning

 WARNING
<p><i>Do not allow water or cleaning solutions to enter the breathing system or the regulator. Dirt, dust, or soap residue could degrade regulator performance, causing it to fail, possibly resulting in injury or death. Do not submerge the regulator in water or cleaning solutions. It may be partially submerged only as instructed in step 8 below. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

NOTE

- Always hold the regulator with the outlet facing downward during washing and rinsing.
- The Protective Cleaning Cap, P/N 961170, may be used to seal the Panther second stage regulator to prevent water or contaminants from entering the regulator outlet. See Figure 16.

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, P/N 961170.

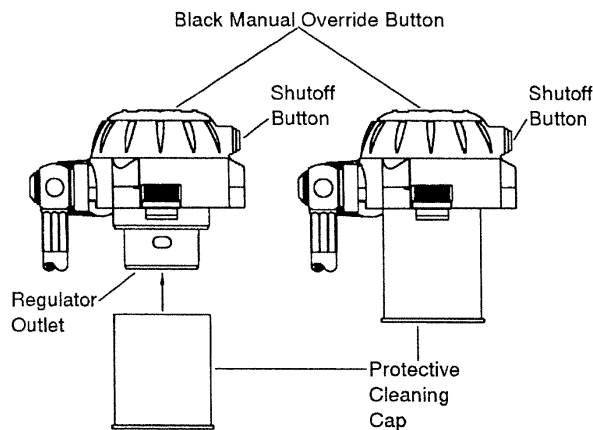


Figure 16. Protective Cleaning Cap

4. With the regulator facing downward, clean the exterior surfaces with a soft brush.
5. With the regulator facing downward, immediately rinse the exterior surfaces 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.
7. Dry with a clean cloth or with low pressure breathing grade (15 psig maximum) clean air.
8. If dirt or debris interferes with the First-Breath-On mechanism, clean it as follows
 - a. Lift the edge of the rubber manual override button cover with a small flat-blade screwdriver and peel it off.
 - b. Place the protective cleaning cap over the outlet tube.
 - c. Hold the regulator with the cover facing downward and rinse in a shallow bucket of fresh water.
 - d. Allow the water to drain, and dry with low pressure Grade D air (15 psig maximum) directed into the venting groove under the shutoff button.
 - e. Reinstall the manual override button cover.


C. Exterior Surfaces Cleaning

CAUTION
<p>• <i>Cleaning or bleaching solutions containing chlorine will damage the Nomex/Kevlar harness.</i></p> <p>• <i>Do not allow cleaning solutions to enter the breathing system.</i></p>

The hoses, backpack harness, frame, and cylinder/valve assembly may be cleaned with a damp cloth or a mild soap and warm water solution. Rinse thoroughly and air dry or wipe with a clean cloth.

D. Inspection (see page 22)

E. Repair (see page 23)

 WARNING
<p><i>Before disassembly, make sure that all air is bled from the lines. Shut off or deplete the air supply to prevent equipment damage or personal injury. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

CAUTION
<p><i>User repair of the Panther SCBA is limited to replacement of components listed on the NIOSH approval label and repairs described in the table on page 23. Disassembly should be performed only to the extent necessary to replace the components. To protect your warranty and the NIOSH certification on the equipment, all other repairs must be done only by SPERIAN-certified technicians. If there are none at your facility, consult your SPERIAN distributor for the repair facility nearest you.</i></p>

NOTE

All SPERIAN-certified Technicians are required to remain current on new procedures and parts through SPERIAN's published Technical Bulletins, technical manual revisions, and certification seminars.

F. Functional Testing (see page 25)


Perform functional tests after cleaning or repair.


G. Cylinder Maintenance and Recharging

Refer to section VII, Cylinder Filling and Safety, for details on the maintenance and recharging procedures for cylinders approved for use with SPERIAN SCBAs.

H. Cold Weather Operation and Maintenance

Operation of the SPERIAN Panther SCBA in cold weather, 32°F (0°C) or colder, requires the user to be aware of the potential problems caused by the combination of moisture and low temperatures.

 WARNING
<p><i>•Moisture entering the regulator system, either from moisture in the cylinder air or by external means, e.g., overspray during fire fighting operations or inclement weather conditions, may cause regulator system freezeup, restricting or stopping air flow to the user. This could result in serious injury or death to the user.</i></p>

 WARNING—Continued
<p><i>•Recharge the cylinders with Grade D or better air conforming to Compressed Gas Association Specification G-7.1. Moisture content, expressed as dew point, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume. Air exceeding this moisture content may cause regulator system freezeup, restricting or stopping air flow to the user. This could result in serious injury or death to the user.</i></p>

NOTE

- Moisture can cause regulator system freezing problems even if the ambient air temperature is above freezing. The air flowing from the SCBA cylinder through the regulator system decreases from cylinder pressure to near atmospheric pressure very rapidly. As this pressure decreases, the air rapidly expands, causing the air and therefore the regulator to cool.
- Although the ambient temperature may be above 32°F (0°C), the temperature inside the regulator system may be considerably lower (below freezing).
- SPERIAN recommends that SCBAs used on a routine basis or SCBAs kept for emergency use be stored at temperatures above 32°F (0°C). SCBAs stored at temperatures below 32°F (0°C) may need to be warmed to at least 32°F (0°C) prior to use if ice has formed on the low pressure alarm, facepiece exhalation valve, AIR KLIC, and/or quick-disconnects.

SPERIAN recommends a "change of season" inspection and increased attention to your preventive maintenance during cold weather conditions. The following recommended inspections and procedures will help prevent cold weather problems; however, cold weather conditions may also cause other problems not listed below.

1. Air Supply

NOTE

Cold weather conditions require very dry air. Moisture entering the SCBA may cause icing and equipment malfunction.

- a. Test compressor(s) for air quality and dew-point prior to the cold season.
- b. Recharge the cylinders with Grade D or better air conforming to Compressed Gas Association Specification G-7.1. Moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume.
- c. Prevent any moisture from entering the SCBA.

- d. Remove ice and water from cylinder valve threads prior to filling in cold weather conditions

2. Facepiece and Exhalation Valve

- a. The facepiece must be protected from moisture during cold weather conditions to reduce ice formation on the facepiece lens, in the AIR KLIC, and in the exhalation valve.
- b. Prior to donning the facepiece in cold weather, visually inspect the lens, AIR KLIC, and exhalation valve for ice.
- c. If ice is present, warm the facepiece to melt the ice. Ice may be melted by placing the facepiece inside outerwear near the body to warm.
- d. Ice in the exhalation valve may be melted by at least six to eight exhalations onto the exhalation valve.
- e. Verify the proper function of the exhalation valve by performing a positive pressure exhalation test and negative pressure leak check as follows.
- f. Don the facepiece (Classic, TwentyTwenty, or TwentyTwenty Plus) as specified in the Donning section of this manual.
- g. Perform a positive pressure exhalation test:
 - i. Take a deep breath, and place your hand over the AIR KLIC.
 - ii. Exhale normally. The exhalation valve must function normally.
 - iii. If the exhalation valve does not function or it is difficult to exhale, remove the facepiece.
 - iv. Exhale on the exhalation valve at least six to eight more times to melt the ice.
 - v. Reposition the facepiece, check the straps, and repeat the test.
 - vi. If the exhalation valve continues to malfunction, remove the facepiece from service.
 - vii. Have the facepiece inspected and/or repaired by a SPERIAN-certified repair technician before reuse.
- h. Perform a negative pressure leak check:
 - i. Place your hand over the AIR KLIC.
 - ii. Inhale and hold your breath for a few seconds. The facepiece should collapse on your face and remain collapsed for several seconds without leaking.
 - iii. If the facepiece leaks, exhale onto the exhalation valve at least six to eight more times. Reposition the facepiece, check the straps, and repeat the leak check.
 - iv. If the facepiece continues to leak, remove it from service.
 - v. Have the facepiece inspected and/or repaired by a SPERIAN-certified repair technician before reuse.
- i. Again, visually check to verify that the facepiece, lens, AIR KLIC, and exhalation valve are ice-free.



WARNING

If it becomes necessary to remove the facepiece when using the SCBA, move to a non-hazardous area first. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.

- j. If the ambient temperature is near or below freezing, place the facepiece and regulator under outerwear to keep it warm in case reuse is necessary.

3. Second Stage Regulator




WARNING

•Ice on the second stage regulator AIR KLIC buttons or the facepiece AIR KLIC adapter may prevent proper engagement of the regulator.
•The user must ensure that the regulator is properly engaged by rotating and tugging the regulator to verify that both release buttons are properly engaged in the AIR KLIC.
•Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.

- a. The second stage regulator must be protected from moisture during cold weather conditions to avoid ice buildup on its exterior surfaces. Ice can interfere with emergency bypass operation or AIR KLIC button function, which can hinder regulator removal from the facepiece or from the regulator receiver.
- b. Visually inspect the external surfaces of the regulator for ice prior to use.
- c. If ice is present, it may be melted by placing the regulator inside outerwear near the body to warm.
- d. Again, visually inspect the regulator for ice, then check the red bypass knob and the AIR KLIC buttons for proper function.
- e. Should ice form on the regulator while the regulator is in the facepiece, it will continue to function properly. When it becomes necessary to remove the regulator, rotate the regulator to break off the ice, then remove the regulator from the facepiece.
- f. If the AIR KLIC buttons are frozen and the regulator cannot be removed, do not force the buttons. Move to a non-hazardous area, depress the regulator shutoff button, and remove the facepiece and regulator as a unit.
- g. If the shutoff button is nonfunctional, turn off the air supply at the cylinder valve.
- h. Remove the facepiece and regulator as a unit.


- i. Warm the facepiece and regulator until the normal function of the AIR KLIC button and/or the shutoff button returns
 - j. Should ice form on the regulator while the regulator is in the regulator receiver, rotate the regulator to break off the ice, then remove the regulator from the regulator receiver.
 - k. If the AIR KLIC buttons are frozen and the regulator cannot be removed from the receiver, do not force the buttons. Unbuckle the waist belt, and place the belt, regulator receiver, and regulator under outerwear next to your body to warm it until the AIR KLIC button functions properly.
4. Backpack (MightyLight and Classic)
- a. Visually inspect the tank band catch, shoulder pad adjustment buckles, and hip wing adjustment points for ice.
 - b. Remove ice by flexing and moving the straps through the adjustment mechanisms.
5. Regulator Receiver
- a. During cold weather operation, keep the regulator receiver cover in place on the regulator receiver to keep out moisture and debris.
 - b. Visually inspect the regulator receiver for ice prior to use.
 - c. Remove ice by warming the regulator receiver, placing it under outerwear near the body to warm.
6. Cylinder Valve
- a. During cold weather conditions, ice can form on the cylinder valve. Ice may interfere with the cylinder ratchet lock mechanism.
 - b. Warm the cylinder valve to melt the ice and return the ratchet lock mechanism to proper working order.

 WARNING
<p><i>Do not use heat above 160°F (71°C) or direct flame to melt ice. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>

NOTE

Remove ice and water from cylinder valve threads prior to filling in cold conditions.

7. Gauge and Alarms

 WARNING
<p><i>DO not use the SCBA if there is ice on the gauge/visual alarm or audible alarm. Malfunction of either alarm could result in a failure to realize that the SCBA is near the end of its service life, causing serious personal injury or death.</i></p>

a. Gauge/Visual Alarm


- i. During cold weather conditions, ice can form on the gauge face and visual alarm LED.
- ii. Verify that the gauge face and visual alarm LED are free from ice.
- iii. there is any ice on the gauge/visual alarm assembly, remove the ice prior to returning the SCBA to service.
- iv. During use, turn the gauge to face the body. Check the gauge and alarm frequently for ice buildup.

b. Audible Alarm

- i. Verify that the audible alarm is vertical above the first stage regulator body.
- ii. During cold weather conditions, ice can form on the audible alarm, rendering the alarm inaudible. Break the ice or melt it with a gloved hand.
- iii. Ice may obstruct the alarm vent holes and the end of the bell piston (if used), interfering with the operation of the SCBA. Melt the ice with a gloved hand.

8. First Stage Regulator

During cold weather conditions, ice may form on the exterior surfaces of the first stage regulator.

 WARNING
<p><i>Use extreme care when changing cylinders. DO NOT allow moisture or ice to enter the regulator system. Moisture or ice entering the regulator system may cause the SCBA to freeze up, restricting or stopping air flow to the user, resulting in death or serious injury.</i></p>

9. Quick-disconnect Fitting, Male Coupling, and Buddy Breather Block Assembly

- a. During cold weather conditions, ice may form on the quick-disconnect fitting, the male coupling, or the buddy breather block assembly.
- b. If the quick-disconnect fitting and the male coupling are connected prior to ice buildup, they will continue to function properly.
- c. If the second stage regulator is not connected at the quick-disconnect fitting, ice formation on either the quick-disconnect fitting or the male coupling can make connection impossible.
- d. Prior to use, visually inspect the quick-disconnect fitting and male coupling for ice.
- e. Remove or melt the ice, then dry the quick-disconnect fitting and male coupling to avoid water entering the regulator

- f. If the SCBA is equipped with a buddy breather, always keep the blue silicone rubber cap installed on the spare quick-disconnect fitting during cold weather conditions when the buddy breather is not in use.

10. Training and Use

- a. Conduct training sessions for cold weather operations using all equipment and accessories which may be used during actual operations.

NOTE

A program for use, training, inspection, record keeping, and maintenance is given in the United States National Fire Protection Association Standard 1404, Fire Department Self-Contained Breathing Apparatus Program.


- b. During cold weather operations, do not place cylinders or SCBAs into wet or snowy areas.
- c. Visually inspect the cylinder to remove ice; clean the threads; and take care to prevent water from entering the cylinder or accumulating on connecting surfaces.
- d. Icing will be accelerated by high air flow conditions. Examples may include, but are not limited to:
 - Bypass usage
 - Facepiece leakage due to improper sealing
 - Allowing the regulator to free-flow when the facepiece is off
 - Improperly maintained equipment
- e. After cleaning, allow the SCBA to dry completely before returning it to storage. Be sure the facepiece exhalation valve is dry before placing the facepiece into storage. Coat the interior surface of the facepiece lens with SPERIAN anti-fog solution, P/N 951015 or 951016.

11. Accessories

Cold weather conditions may have adverse effects on the performance of the SCBA accessories.

- a. Air line hoses can become stiff.
- b. Ice on quick-disconnect couplers can make them difficult or impossible to connect.
- c. Plastic components can become brittle.
- d. Electrical equipment (e.g., radios, PASS devices, and lights) tends to become more difficult to use in cold temperatures, especially if there is ice.
- e. Use SCBA accessories with extreme care in cold weather conditions. Visually inspect them periodically for ice.

I. Storage

 WARNING
<i>The SCBA must be stored in a cool, dry location with the cylinder valve closed and the air pressure vented from the system. Storing an SCBA with the cylinder valve open and the system under pressure can result in damage to elastomeric materials in the regulator, particularly if the SCBA is stored at temperatures above 160°F (71°C). Damage resulting from improper storage could result in reduced flow or even stop flow conditions, resulting in serious injury, illness, or death.</i>

1. Inspect, clean, and repair as required before storing.
 - a. Connect a fully charged air cylinder to the first stage regulator and secure it in the backpack.
 - b. Check that the cylinder valve locking sleeve is in the LOCKED position.
 - c. Check that the bypass is closed.
 - d. Fully loosen the harness adjustment straps and waist strap.
 - e. Fully loosen the facepiece lower head-straps; adjust the top headstraps so that approximately one inch protrudes through the buckles.
 - f. Place the facepiece in a plastic mask bag.
2. After inspection, cleaning, and necessary repair, the SCBA should be stored away from dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals.

J. Overhaul Frequency

The Panther SCBA must be cleaned, tested, and pass an annual performance flow test, utilizing a properly calibrated SPERIAN Portable Test Console or a Biosystems Posi-Chek with the correct software. Maintenance must be performed by a SPERIAN-certified technician. Overhaul must be performed at least every six (6) years by a SPERIAN-certified technician, even with infrequent use. SCBAs subjected to daily or severe service, such as heavy use, extreme temperatures, flame, or exposure to chemicals require more frequent servicing.

A maintenance record must be kept for each SCBA, noting at least:

1. Date of repair
2. Name of repair technician
3. Description of malfunction
4. Course of action taken to correct malfunction
5. Any other data which may be pertinent

All records and test results must be permanently filed for future reference

Refer to the SCBA service manual for instructions for troubleshooting, repair, and overhaul. The overhaul process involves replacement of certain o-rings, lubricants, or other components.

K. Additional Information

If you need assistance or additional information on any SPERIAN product, consult your local distributor or contact:

SPERIAN

3001 South Susan Street Santa Ana, CA 92704

(714) 545-0410 or (888) APR-SCBA

FAX (714) 850-0299

***ALL RETURNED PRODUCTS MUST BE
DECONTAMINATED PRIOR TO SHIP-
MENT. PRODUCTS CONTAMINATED
WITH DANGEROUS SUBSTANCES WILL
BE REFUSED AND RETURNED FREIGHT
COLLECT***

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IX. INSPECTION TABLE

IF ANY OF THE DEFECTS LISTED BELOW ARE FOUND, HAVE THE SCBA REPAIRED BEFORE USE.

COMPONENT	LOOK FOR
FACEPIECE LENS	1. Nicks, scratches, or abrasions which could impair visibility. 2. Deep gouges or cracks which could reduce impact resistance. 3. Anti-fog coating in need of replacement.
FACEPIECE RIMS	1. Deformed, cracked or broken rims. 2. Loose rim screws. (Do not overtighten.)
FACEPIECE SKIRT	1. Cuts, gouges, or punctures. 2. Tears or nicks in the sealing area. 3. Deterioration from age, heat, or contamination.
FACEPIECE HEADSTRAP, BUCKLE STRAPS (TWENTYTWO AND TWENTYTWO PLUS)	1. Abrasions or nicks. 2. Deterioration from age, heat, or contamination.
FACEPIECE BUCKLE (CLASSIC FACEPIECE)▲	1. Crushed, bent, or corroded ▲ 2. Damaged or loose rivets.
FACEPIECE INLET NOZZLE (CLASSIC FACEPIECE)▲	▲ 1. Loose nozzle cover screws. 2. Heat damage to the nozzle body and cover. 3. AIR KLIC not seated and locking pawl not engaged. 4. Dirt and debris in the exhalation module. 5. Exhalation valve sticking closed. (Exhale a few times to test.) 6. Exhalation valve sticking open under positive pressure. (Test with regulator.) 7. Damaged exhalation valve or valve seat.
SECOND STAGE REGULATOR & HOSE	1. Cracks or heat damage to housing or cover. 2. Faulty operation of bypass valve, First- Breath-On, AIR KLIC, or override buttons. 3. Dirt and debris in the outlet port; screen and grill cracked. 4. Hose or fittings corroded, cracked, or leaking. 5. Sticking release and shutoff buttons.
ANALOG GAUGE WITH VISUAL ALARM	1. Gauge lens scratched; pointer deformed or stuck 2. Hose or fittings corroded, cracked, or leaking. 3. LED lens dirty or damaged. 4. Torn rubber boot.
FIRST STAGE REGULATOR & AUDIBLE ALARM	1. Hose and fittings corroded, cracked, or leaking. 2. Loose retaining rings on hose connectors. Loose inlet nipple. 3. Abrasion of hose. 4. Damaged female threads on CGA handwheel. 5. Damaged o-ring or groove on CGA nipple. 6. Loose inlet nipple. 7. Missing o-ring. 8. Dents or heat damage to housing. 9. Dented or deformed bell (bell alarm only). 10. Loose screws securing bell to regulator body (bell alarm only). 11. Debris or water under bell (bell alarm only).
HARNESS FRAME	1. Cylinder band and latch not working properly. 2. Cylinder not secured in frame and band. 3. Bent broken, or cracked frame. 4. Webbing color change; excessive wear or fraying; cuts, nicks, or broken stitching. 5. Inspect stitching for thread unraveling, abrasion, cuts, tears, and chemical or corrosion attack at the top of the shoulder strap, shoulder strap adjustment buckle, and tank band strap. Failure of these connections allows the backpack to fall off. 6. Buckles damaged or corroded. 7. Loose hardware. 8. Plastic crazing, charring, cracking, pitting, blistering, and significant color changes. 9. Bent or broken spring.
AIR CYLINDER & VALVE	1. Dents, gouges, blisters, or cuts. 2. External damage to cylinder valve. 3. Smooth operation of valve handwheel and ratchet collar. 4. Loose screws securing rubber guard on cylinder valve. 5. Condition of threads on valve outlet. 6. Cylinder pressure gauge lens scratched; pointer deformed or stuck. 7. Gauge reading correctly. 8. Hydrostatic test date within three years (composite cylinders) or five (aluminum or steel cylinders).

NOTE

- Inspection guidelines for cylinders are prescribed in pamphlets C-6, C-6.1, and C-6.2 of the Compressed Gas Association. These pamphlets may be obtained from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.
- If there are any items not listed above that appear to be defective, have the SCBA repaired before use

X. REPAIR TABLE

COMPONENT	INSTRUCTIONS
HEADSTRAP, BUCKLE STRAP (TWENTYTWENTY AND TWENTYTWENTY PLUS) REPLACEMENT	<ol style="list-style-type: none"> 1. Remove the old straps. 2. Install new straps.
EXHALATION MODULE (CLASSIC FACEPIECE)▲ (TWENTYTWENTY FACEPIECE)★ (TWENTYTWENTY PLUS FACEPIECE)◆	<ol style="list-style-type: none"> ▲ 1. Turn the exhalation module counterclockwise to remove it from the facepiece. ▲ 2. Carefully pull each leg of the spring retainer until it separates from the exhalation valve housing. ▲ 3. Remove the spring retainer. ▲ 4. Remove the large coil spring. ▲ 5. Remove the diaphragm plate. ▲ 6. Remove and inspect the exhalation diaphragm. ▲ 7. Clean or replace the exhalation diaphragm and seat. ▲ 8. Insert the diaphragm square peg into the exhalation valve seat, ensuring that the exhalation damping spring rests in tension on a flat side of the square peg. ▲ 9. Position the diaphragm plate, large coil spring, and retainer on the diaphragm and snap the three legs of the retainer into place on the housing. ▲ 10. Reinstall the exhalation module in the facepiece. CAUTION—Do not cross-thread and do not overtighten. ★ 11. Remove the valve cover. ★ 12. Remove the retainer/spring/valve assembly from the facepiece. ★ 13. Disassemble the retainer/spring/valve assembly. ★ 14. Clean or replace the valve, stem, spring, retainer, or valve seat. ★ 15. Reassemble the retainer/spring/valve assembly, ensuring the valve diaphragm is correctly positioned on the valve stem and spring. ★ 16. Insert the valve stem into the nozzle. ★ 17. Snap the retainer into the nozzle, ensuring the spring is rotated only 45° clockwise. ★ 18. Replace the valve cover. ◆ 19. Remove the nozzle cover by pressing the ratchet ring with a finger and unscrewing the AIR KLIC. ◆ 20. Remove the valve assembly by squeezing the legs of the spring retainer. ◆ 21. Clean or replace the valve assembly. ◆ 22. Replace the valve assembly by guiding the valve stem into the opening in the nozzle, ensuring that the exhalation damping spring rests in tension on a flat side of the square peg. ◆ 23. Insert the spring retainer legs into the openings on the nozzle. ◆ 24. Reassemble the nozzle cover and AIR KLIC. 25. Fit the facepiece over your face and cycle the exhalation valve by blocking the AIR KLIC opening with your palm and exhaling several times. 26. Perform a leak check as described in OPERATION INSTRUCTIONS, or conduct a facepiece leak test on the SPERIAN Portable Test Console.
NOSE CUP (CLASSIC FACEPIECE)▲ (TWENTYTWENTY AND TWENTYTWENTY PLUS FACEPIECE)★	<ol style="list-style-type: none"> ▲ 1. Unscrew and remove the exhalation module. ▲ 2. Remove the speaking diaphragm with the speaking diaphragm tool, P/N 980019. 3. Gently remove the nose cup from the facepiece. 4. Inspect, clean, or replace the nose cup. ▲ 5. Align the holes in the nose cup and the nozzle, and start the threads of both the speaking diaphragm and exhalation module. ▲ 6. Fully tighten both the speaking diaphragm and the exhalation module. ★ 7. Replace the nose cup on the nozzle, aligning the slot on the nose cup with the tab on top of the nozzle.

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COMPONENT	INSTRUCTIONS
FACEPIECE LENS REPLACEMENT (CLASSIC FACEPIECE)▲ (TWENTYTWENTY FACEPIECE)★ (TWENTYTWENTY PLUS FACEPIECE)◆	<ol style="list-style-type: none"> 1. Use a 5/32 inch Allen wrench to remove the rim nuts and screws. 2. Gently separate the rims from the facepiece. 3. Pull the silicone skirt away from the lens. ▲ 4. Remove the old lens. ▲ 5. Match one corner of the new lens with a corner of the skirt. ▲ 6. Place the lens edge inside the lens channel of the skirt. ▲ 7. Knead the skirt until the silicone fits evenly around the lens edge, and the corners of the skirt match the corners of the lens. ★ 8. Remove the valve cover. ★ 9. Remove the retainer/spring/valve assembly. ★ 10. Remove the nose cup. ★ 11. Using AIR KLIC removal tool P/N 962244, remove the AIR KLIC by depressing the ratchet ring with the tool and unscrewing the AIR KLIC. ★ 12. Remove the nozzle cover. ★ 13. Remove the nozzle. ★ 14. Place the nozzle into the new lens. ★ 15. Place the nozzle cover on the lens. ★ 16. Install KLIC, tightening until the nozzle, lens, and cover are secure. ★ 17. Install the nose cup. ★ 18. Inset the valve stem into the nozzle. ★ 19. Snap the retainer into the nozzle, ensuring the spring is rotated 45° clockwise. ★ 20. Replace the valve cover. ★ 21. Place the lens edge inside lens channel of the skirt, centering the lens so that the facepiece-to-face seal is not distorted. ◆ 22. Remove the nozzle cover by pressing the ratchet ring with a finger and unscrewing the AIR KLIC. ◆ 23. Remove the nozzle by pushing it from the front of the facepiece. Use thumbs to press the locking tabs at the sides of the nozzle. (DO NOT push on the spring retainer.) ◆ 24. Place the nozzle into the new lens. ◆ 25. Reassemble the nozzle cover and AIR KLIC. ◆ 26. Install the nose cup. ◆ 27. Place the lens edge inside the lens channel of the skirt, centering the lens so that the facepiece-to-face seal is not distorted. 28. Install the skirt rims; start the screw on one side; then start the screw on the other side. CAUTION—Do not pinch the silicone between the rims. 29. Alternate tightening each screw until firmly tightened. ★ NOTE—The corners of the skirt should be centered between each rim when in stallation is complete. 30. Perform a leak check as described in OPERATION INSTRUCTIONS.
CLASSIC HARNESS FRAME	<ol style="list-style-type: none"> 1. Remove all hardware with a 1/8" hex key. Hold the socket with a vise grip or slip joint pliers. 2. Mount the appropriate hardware on the new strap. NOTE—Use thread seater, P/N 820454, on the lower strap buckles. Use one drop of thread sealer, P/N 820464, on all other screws. 3. Install the strap on the backpack frame. 4. Reattach hose, hardware, and accessories to the new strap.
MIGHTYLIGHT HARNESS	<ol style="list-style-type: none"> 1. Remove all pneumatic hoses and regulators by unsnapping the fasteners. 2. Remove the straps by unweaving them from the frame and hip wing. NOTE—Unweaving one side at a time leaves the other side as a reference. 3. Remove the tank band spring with needle-nose pliers. 4. Remove the hip wing pin with an arbor press or a punch and hammer. 5. Mount appropriate new hardware. 6. Reattach the hose, hardware, and accessories.
FIRST STAGE CGA O-RING	<ol style="list-style-type: none"> 1. Remove the old o-ring. 2. Ensure that the o-ring seat is undamaged and free of debris. 3. Lightly lubricate a new o-ring with Christolube and install on the o-ring seat.
ACCESSORIES	Each modification, kit and accessory purchased from SPERIAN has installation instructions. Use these instructions for removing and replacing any accessory.

NOTE

Make appropriate entries on equipment record cards.

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XI. FUNCTIONAL TESTING TABLE

COMPONENT	INSTRUCTION
FACEPIECE	<ol style="list-style-type: none">1. Don and adjust the facepiece.2. Block the AIR KLIC opening with the palm of your hand.3. Inhale gently. The facepiece should collapse slightly and hold for a few seconds without leaking.4. Exhale with the AIR KLIC opening covered. The exhalation valve must not stick.
LEAK TEST	<ol style="list-style-type: none">1. Push the shutoff button on the second stage regulator to stop the flow of air.2. Open the cylinder valve to fully pressurize the regulators.3. Close the cylinder valve.4. Observe the gauge/alarm for 15 seconds. Significant needle movement indicates a leak, and the SCBA should not be used.
AUDIBLE AND VISUAL ALARM TEST	<ol style="list-style-type: none">1. Open the cylinder valve to fully pressurize the SCBA.2. Close the cylinder valve.3. Press the shutoff button on the second stage regulator to stop the flow.4. Slightly open and close the bypass valve to stop the gauge pointer at each 1/4 mark for 2 seconds.5. Continue to open and close until the pointer moves slowly to the 1/4 FULL mark.6. The audible and visual alarms should begin when the gauge reaches approximately 1/4 FULL. Activation of the visual alarm (flashing red LED) portion of the Analog Gauge with Visual Alarm may or may not coincide perfectly with the audible alarm (i.e., bell, whistle, etc.) on the SCBA.7. When the audible alarm begins, close the bypass valve.8. Both alarms should continue until the air is almost depleted.9. Bleed all residual air.10. Close the bypass valve.
SCBA FUNCTION TEST	<ol style="list-style-type: none">1. Attach the first stage regulator to a fully charged cylinder.2. Close the second stage regulator bypass valve and depress the gray shutoff button.3. Slowly open the cylinder valve.4. Check that the cylinder valve gauge and gauge/alarm both read in the green zone.5. Attach the second stage regulator to the facepiece and inhale. The regulator should deliver an acceptable flow of air without excessive effort, free flow, or fluttering.6. Slowly open the bypass valve. A steady flow of air should enter the facepiece.7. Depress the shutoff button. Air flow should stop.8. Push the override button. A small burst of air should enter the facepiece and the regulator should activate.9. Close the cylinder valve and bleed all residual air.

NOTE

A program for use, training, inspection, record keeping, and maintenance is given in the United States National Fire Protection Association Standard 1404, Fire Department Self-Contained Breathing Apparatus Program

XII. CAUTIONS AND LIMITATIONS NOTE

NOTE

This section must be read in conjunction with the NIOSH approval label in this user's manual. Failure to observe these cautions and limitations voids NIOSH approval.

1. Air line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA-7.1, Grade D or higher quality.
 2. Use only the pressure ranges and hose lengths specified in the user's instructions.
 3. This respirator contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.
 4. Failure to properly use and maintain this product could result in injury or death.
 5. All approved respirators shall be selected, fitted, used; and maintained in accordance with MSHA, OSHA, and other applicable regulations.
 6. Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration specified by the manufacturer.
 7. Refer to user's instructions and/or maintenance manuals for information on use and maintenance of these respirators.
- Special Use**
8. Special or critical operation instructions and/or specific operation limitations apply. Refer to the user's instructions before donning.
 9. This respirator is approved for use above -30°F, except when used with 945007 quick couplers. When used with 945007 quick couplers, this respirator is approved for use above 0°F. For temperatures of 0°F and lower, use anti-fog solution P/N 951015 or 951016.
 10. When the Air Line Adapter Kit is used, the following requirements apply:
 - a. The device must be supplied with respirable breathing air.
 - b. No more than three (3) lengths of air supply hose shall be used.
 - c. The air supply hose inlet must be supplied with 80 to 125 psig air pressure.
 - d. The length of the air supply hose must be 25 to 300 feet for the 9304 Series hose and 10 to 300 feet for the 9308 Series hose. Do not use the 9304 Series hose with the 9308 Series hose.
 - e. If the air line fails, the SCBA must be activated and the air line disconnected.
 - f. Not more than 20% of rated capacity shall be used during entry.
 11. Use with adequate skin protection when worn in gases or vapors that poison by skin absorption (for example, hydrocyanic acid gas).
 12. Approved only when compressed air container is fully charged with air meeting the requirements of the Compressed Gas Association, G-7.1 for Type 1, Grade D air or equivalent specifications, and having a moisture content, expressed as dewpoint, of -65°F or lower. The container shall be marked "Fill With Compressed Air Only" and shall meet applicable DOT specifications.
 13. Never substitute, modify, add, or omit parts. Use only exact replacement parts on the configuration specified by SPERIAN.
 14. The P/Ns 961537 and 961529 Supercharge is approved in the 60-minute application (TC-13F-287) only when used with a P/N 915177 or 917160 cylinder and valve.
 15. DEATH OR SERIOUS INJURY may result if instructions are not carefully followed.
 16. READ AND UNDERSTAND all instructions, limitations, and other warnings found on the apparatus and in the operation manual.