

**APOLLO SUPPLIED-AIR RESPIRATOR
Helmet Model 60
High Pressure 65 psi to 100 psi
O. M. 10533**

**MC FILE NUMBER: 690-0985
DATE OF ISSUE: September, 1985
REVISION: R, 07/08**

 WARNING

Do not proceed with these instructions until you have READ the orange cover of this MANUAL and YOU UNDERSTAND its contents. *

These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.

***If you are using a Clemco Distributor Maintenance and Part Guide, refer to the orange warnings insert preceding the Index before continuing with the enclosed instructions.**

Electronic files include a Preface containing the same important information as the orange cover.

NOTICE

This supplied air respirator conforms to all NIOSH specifications and standards and carries NIOSH approval. As manufactured, this respirator complies only with those foreign approvals that accept NIOSH certification. Specifically, it has not been manufactured to European CE standards and does not carry the European CE-mark.

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1.0 INTRODUCTION

1.1 Scope of manual

1.1.1 This manual covers setup, operation, maintenance, and replacement parts for Clemco Apollo HP (high pressure) Series Supplied-Air Respirator: Model 60 HP.

1.1.2 Read this entire manual and all accessory manuals before setting-up or using the respirator. The following Clemco manuals are available for accessories that may be used with the Apollo HP Respirator. They are available on our web site www.clemcoindustries.com. Refer to Figure 1 for a typical set-up.

Description	Manual No.
CAT Cool-Air Tube.....	08956
Clem-Cool Air Conditioner	23837
CCT Climate Control Tube.....	08850
CPF Inline Particulate Air Filter.....	04143
CMS-1 Carbon Monoxide Monitor	23301
CMS-2 Carbon Monoxide Monitor	22925

1.2 Safety Alerts

1.2.1 Clemco uses safety alert signal words, based on ANSI Z535.4-1998, to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:



This is the safety alert symbol. It is used to alert the user of this equipment of potential personal injury hazards.

Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

⚠ CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

⚠ WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

1.3 NIOSH Approval Number 19C-130

1.3.1 The Clemco Apollo Supplied-Air Respirator is approved by the National Institute of Occupational Safety and Health (NIOSH).

1.3.2 The NIOSH label shown below lists the Apollo respirator approval number. An X on the approval line indicates which components are approved for the specific respirator. Do not use any non-approved components with this respirator.

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TYPE C AND CE CONTINUOUS FLOW SUPPLIED-AIR RESPIRATOR IS APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

TC#	Protection ¹	Part No.	Respirator Components										Cautions and Limitations ²				
			Helmets		Alternate Regulators				Hose Air Lines								
			Apollo 60	Apollo 600	CAT	CCT	Clem-Cool A/C	CFC/High Pressure	CFC/Low Pressure	ACV	Yellow 3/8" x 25 FL	Yellow 3/8" x 50 FL		Yellow 3/8" x 100 FL	Black 1/2" x 100 FL	Black 1/2" x 50 FL	
19C-338	CF/SA	20HP															ABCDEJM NOS
19C-339	CF/SA	20LP			x												ABCDEJM NOS
19C-130	CF/SA	60/600HP	x	x		x	x	x	x	x	x	x	x	x			ABCDEJM NOS
19C-358	CF/SA	60/600LP	x	x							x					x	ABCDEJM NOS

1 PROTECTION
CF - Continuous Flow SA - Supplied -air

2 CAUTIONS AND LIMITATIONS
 A- Not for use in atmospheres containing less than 19.5 percent oxygen.
 B- Not for use in atmospheres immediately dangerous to life or health.
 C- Do not exceed maximum use concentrations established by regulatory standards.
 D- Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.
 E- Use only the pressure ranges and hose lengths specified in the user's instructions.
 J- Failure to properly use and maintain this product could result in injury or death.
 M- All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.
 N- Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.
 O- Refer to users instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
 S-Special or critical users instructions, and/or specific use limitations apply. Refer to instruction manual before donning.

 **WARNING**

NIOSH approval applies only when this supplied-air respirator is used as a complete system. Do not make any non-approved modification, deletion, or substitution. Non-approved components void the NIOSH approval and may permit ingress of toxic and hazardous dust, resulting in toxic poisoning and respiratory disease.

1.4 OSHA Regulations

1.4.1 OSHA Regulation 29 CFR 1910.134 for respiratory protection in General Industry is referenced throughout this document. Respiratory protection standards for Construction 29 CFR 1926.103 and for Maritime 29 CFR-1915.154, 1917, and 1918 refer back to 1910.134. The complete regulation is available through the U.S. Dept. of Labor web site at www.osha.gov.

1.4.2 OSHA Regulations 29 CFR 1910.134(a) and (c) require the employer to establish and maintain a comprehensive, written, respiratory protection program administered by a suitably-trained program administrator.

1.4.3 It is essential that the user be properly instructed in the use and maintenance of the respirator. This manual must be made available to all users of the respirator, and the users must demonstrate their understanding of its subject matter. Read the entire manual before installing or operating the equipment.

1.4.4 The respirator must be supplied with respirable air meeting requirements described herein. It is the responsibility of the employer to provide quality breathing-air to the respirator, and to establish a program to ensure that the respirator is properly used and maintained.

1.5 Respiratory and Health Alerts

 **WARNING**

TOXIC DUST POISONING

Research by the Occupational Safety and Health Administration (OSHA) has discovered potential risks of lead and other heavy metal poisoning to unprotected abrasive blasting operators and other personnel who may be

exposed to toxic dust in the abrasive blasting vicinity. Toxic dust is produced primarily by the removal and breakdown of lead or other heavy metal coatings during abrasive blasting.

The breakdown of toxic coatings and hazardous abrasive causes the contaminants to become airborne. Breathing toxic dust from lead or other heavy metal coatings may cause health and life threatening toxic poisoning and can damage vital organs. Breathing hazardous dust produced from silica abrasive may cause delayed life threatening respiratory disease such as silicosis.

Lead is one of several toxic dusts that may be present in an abrasive blasting operation. It is imperative that blasting contractors identify all material being removed by blasting, and obtain material safety data sheets (MSDS) for the blasting abrasive prior to blasting. It is the responsibility of the employer to identify all airborne contaminants in the blast vicinity, and ensure they do not exceed the permissible exposure limit (PEL) Ref. 29 CFR 1910.1000 and 29 CFR 1926.62. Thorough examinations should be made by an industrial hygienist or other qualified professional to identify all contaminants generated by blasting and in the blasting vicinity.

Exposure to dangerous levels of lead or other toxic or hazardous dust is not restricted to blast operators. There may be an equal or greater danger present after the blasting process due to lingering airborne dust particles, and especially from dust generated during cleanup activity. Heavy metal paint, asbestos, sand or other silica, and other toxic material dusts will cause serious lung disease or death if not prevented through the use of properly designed, and maintained NIOSH-approved, supplied-air respirators worn by blasting operators and all personnel within the work area. Lead poisoning can cause death. OSHA has stated that the permissible exposure limit of lead is 50 micrograms per cubic meter of air (50 µg/m³), averaged over an 8-hour workday.

The Apollo supplied-air respirator system is approved by NIOSH as a Type-CE, continuous-flow, abrasive blast, supplied-air respirator, in accordance with title 42 CFR Part 84. The NIOSH recognized assigned protection factor

(APF) for any supplied-air respirator equipped with a loose-fitting hood or helmet and operated in a continuous flow mode is 25, based upon the NIOSH Respirator Decision Logic (Pub. No. 87-108). In other words, any Type-CE respirator should be used only in atmospheres in which the contaminant level does not exceed 25 times the permissible exposure limit. However, in its Memorandum for Regional Administrators dated August 30, 1995, OSHA has stated that select individual Type-CE continuous-flow, abrasive blast, supplied-air respirator models that pass stringent tests conducted by independent third party testing laboratories will be granted APF values higher than the NIOSH recognized 25. Clemco contracted with Los Alamos National Laboratory to conduct the independent testing. Based upon the results of these tests, OSHA grants the Apollo Supplied-Air Respirator System (NIOSH Approval TC-19C-130) an APF of 1000 times the permissible exposure limit, or 50,000 $\mu\text{g}/\text{m}^3$ when used in lead removal applications.

The employer must provide and maintain appropriate approved respirators, in addition to providing operator training and employing required work site safety practices.

To avoid any potential danger of respiratory injury, approved, supplied-air respirators must be worn at all times in the presence of any type of dust. The respirator must be maintained as described herein. Improper use of any respirator may cause life threatening respiratory disease, and immediate poisoning from toxic dust. Respirators should be removed only after the ambient air has been tested with a dust monitor, and found to be safe to breathe.

Toxic dust poisoning also may occur by eating, drinking, or smoking in a contaminated area, or by eating, drinking, or smoking in a non-hazardous area before thorough washing of hands and face. Do not eat, drink or smoke in the blast area. Thoroughly wash hands and face to remove contaminants before eating, drinking, or smoking outside the blast area.

This manual does not contain all the health and safety requirements regarding toxic and hazardous dust exposure. Obtain copies of the OSHA regulations and consult a safety professional and/or industrial hygienist for complete requirements.

Within this manual we refer to hazardous or contaminated environments. These environments can be any place around the blast area that could contain toxic or hazardous dust.

If these warnings are not completely understood, or if further information is required, contact a local OSHA office. If any personnel in the abrasive blasting vicinity cannot read or comprehend these warnings and the entire content of this instructional material, assign a qualified person to instruct him/her.

Additional information on abrasive blasting hazards titled "Preventing Silicosis and Death From Sandblasting", Publication No. 92-102, is available from:

Publications Dissemination, DSDTT
National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226 (513) 533-8287

1.6 Cautions and Limitations

A - Not for use in atmospheres containing less than 19.5 percent oxygen.

B - Not for use in atmospheres immediately dangerous to life or health (IDLH).

C - Do not exceed maximum use concentrations established by regulatory standards.

D - Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 for Grade D or higher quality.

E - Use only the pressure ranges and hose lengths specified in the user's instructions.

J - Failure to properly use and maintain this product could result in injury or death.

M - All approved respirators shall be selected, fitted, used, and maintained in accordance with OSHA and other applicable regulations.

N - Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.

O - Refer to user's instructions, and/or maintenance manuals for information on use and maintenance of these respirators.

S - Special or critical user's instructions, and/or specific use limitations apply. Refer to instruction manual before donning.

1.7 S – Special or Critical User’s Instructions

1.7.1 Air pressure at the point of attachment (the point of attachment is where the respirator supply hose is connected to the respirable air source) must be maintained at pressures between the minimum and maximum pressure as shown in the table in Section 4.4.

WARNING

Failure to maintain the minimum pressure at the point of attachment may reduce air flow below the minimum flow required by OSHA. Reduced air flow may result in ingress of hazardous toxic dust, subjecting the user to immediate health and life threatening poisoning and subsequent respiratory disease.

1.7.2 Couple no more than the maximum number of sections and total maximum lengths of respirator hose as noted in the table in Section 4.4.

1.7.3 The respirator is designed for specific use in abrasive blasting applications. Do not use in other operations such as painting or welding.

1.8 Protection

1.8.1 Assigned Protection Factor (APF): The NIOSH recognized assigned protection factor for any Type-CE respirator (the Apollo respirator is a Type-CE respirator) is 25 times the permissible exposure limit (PEL). In other words, CE respirators should be used only in atmospheres in which the contaminant level does not exceed 25 times the PEL. However, based upon the results of independent testing, OSHA will treat the Apollo Supplied-Air Respirator as having an APF of 1000 times the PEL when used in lead removal applications.

1.8.2 Head: The respirator protects the wearer’s head and neck from impact and from abrasion caused by rebounding abrasive. The respirator meets physical requirements for industrial head protection as stated in ANSI Z89.1-1997 as a Type I, Class G protective helmet.

1.8.3 Face and Eye: The Apollo inner lens meets impact and penetration requirements under ANSI Z87.1-1989.

1.8.4 Hearing: Noise generated by the Apollo respirator, and measured inside the helmet does not exceed 80 decibels. (42 CFR part 84.140) When any exterior noise causes the internal noise level to exceed 80 decibels, the user must wear additional hearing

protection. A variety of hearing protectors can be worn with the respirator.

2.0 INSPECTION

NOTE: A Clemco respirator hose is part of the approval assembly, and must be used with the respirator. Hoses are not included with all respirators because blast operators are often assigned personal respirators, while using common respirator hoses. If a hose is not available, it must be ordered from an authorized distributor of Clemco products.

2.1 Component Checklist

2.1.1 Make sure that all the respirator components are present. Each respirator box should contain the following:

- Helmet with chin strap, suspension and cape attached
- Breathing tube assembly
- One of the following air-control devices with belt:

Constant-flow connector (CFC): Provides non-adjustable volume of supplied air, within the cfm range required by OSHA.

Air-control valve (ACV): Enables the user to adjust the volume of supplied air, within the cfm range required by OSHA. It is for use in areas where the air temperature is comfortable.

Clem-Cool air conditioner: Used in warm climates to enable the user to adjust supplied air to cooler temperatures.

Cool-air tube (CAT): Used in warm climates to enable the user to adjust supplied air to cooler temperatures.

Climate-control tube (CCT): Enables the user to adjust supplied air to warmer or cooler temperatures.

- Quick disconnect and male adaptor, used to connect the respirator hose to the air-control device.

NOTE: If the respirator does not include an approved Clemco respirator hose, and if one is not at the work site for use with the respirator, one or more alternate hoses must be ordered separately.

2.1.2 When all of these components are present, prepare the respirator for operation per Section 3.0.

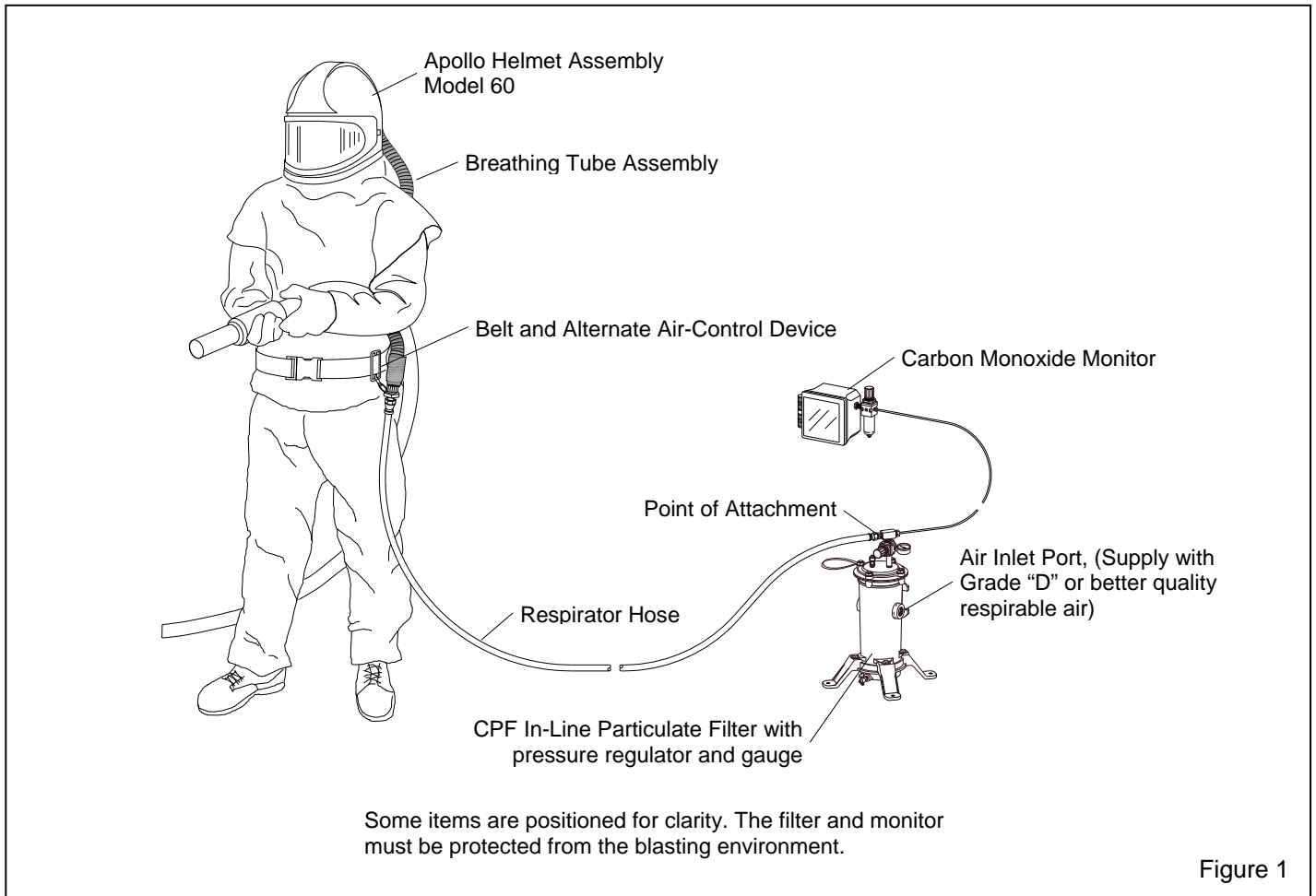


Figure 1

3.0 PREPARATION

3.1 Adjust Helmet Suspension per Section 6.1.

3.2 Prepare Lens System

⚠ WARNING

Never use the respirator without a complete lens system in place. A complete lens system includes the fixed inner lens, intermediate lens, and/or perforated outer lenses. The fixed, inner lens provides support for the window gasket. If the gasket is not adequately supported, leaks can occur which could permit entry of toxic and hazardous dust or abrasive into the helmet.

3.2.1 The lens system is an important part of the respirator assembly. The helmet is supplied with an inner lens that is secured by the lens gasket. To protect the inner lens, an optional intermediate lens and perforated outer lenses are securely held in position by the window frame. Always use an inner lens and one or

both intermediate lens or perforated outer lens options with the respirator. The perforated outer lens protects the intermediate lens from rapid frosting. Both protect the inner lens.

3.2.2 When the perforated outer lenses are correctly installed, as one lens becomes frosted during blasting, it can be torn off to expose the next lens. To protect the inner lens, make sure the perforated and/or intermediate lens(es) are in place per Section 9.1.

3.3 Breathing Tube Assembly

⚠ CAUTION

Note the directional flow arrows on the labels at both ends of the breathing tube. The flow arrows indicate the direction of air flow to the helmet. Flow arrows must point toward the helmet. Failure to properly attach the breathing tube may damage the tube's acoustical foam, which will block air flow, or it may increase noise levels beyond OSHA limits.

3.3.1 The breathing tube has a clamped-on end and a molded-on end. Attach the clamped-on end to the threaded air inlet fitting at the back of the helmet as shown in Figure 2. Do not over-tighten; hand-tight is sufficient.

3.3.2 Attach the molded-on swivel connector to the selected air-control device.

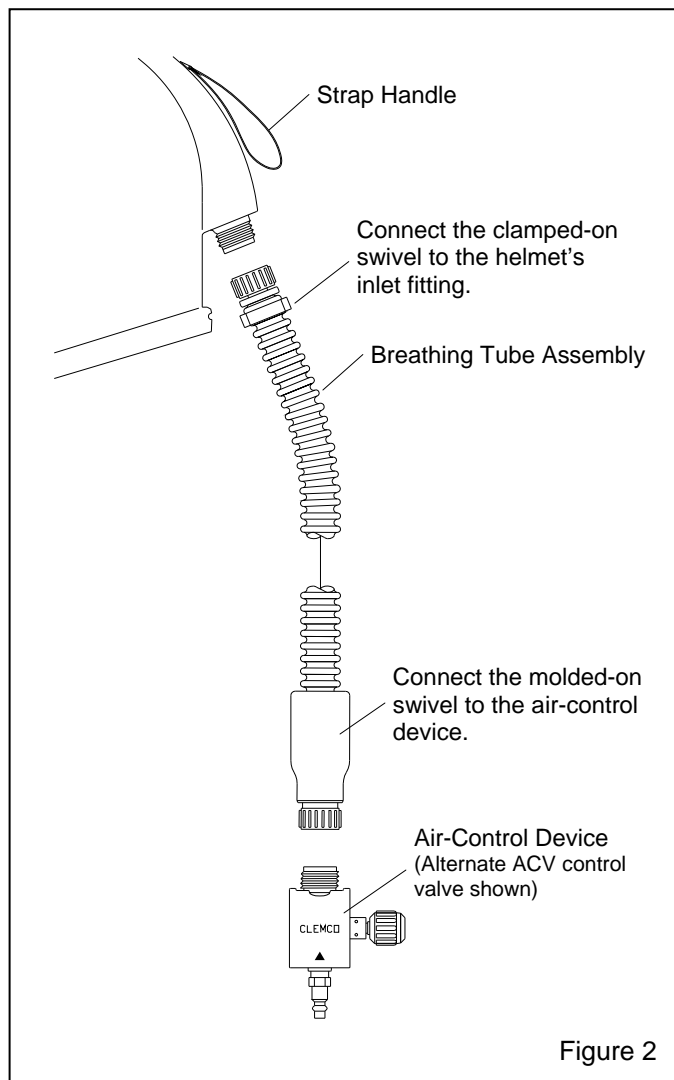


Figure 2

CAUTION

Use the strap handle to carry or hang the respirator. Never hold, carry or hang the respirator by the breathing tube. Mishandling the respirator in this manner may damage the tube or helmet inlet. Any leaks or breaks in the breathing tube will alter the air flow through the respirator and affect user's safety and comfort.

3.4 Respirator Hose

WARNING

OSHA regulations 29 CFR 1910 and 29 CFR 1926 require that respirator air line couplers be incompatible with air lines for non-respirable use. This incompatibility prevents inadvertent supply of respirators with potentially hazardous, non-respirable gases or oxygen. It is the employer's or facility owner's responsibility to comply with the regulation.

3.4.1 Respirator hose must be NIOSH-approved Clemco 3/8" ID respirator hose.

3.4.2 Apply Teflon tape to the 1/4" NPT threads on the 3/8" hose to 1/4" pipe adaptor as shown in Figure 3, and connect it wrench-tight to the female disconnect.

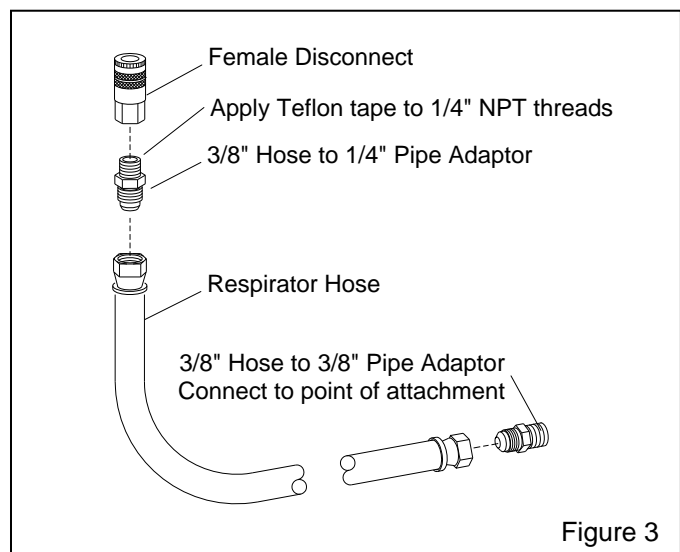


Figure 3

3.4.3 Attach the adapter/disconnect assembly to one end of the respirator hose.

3.4.4 Using the 3/8" hose to 3/8" pipe adaptor provided, connect the other end of the respirator hose to a respirable air source.

3.4.5 Connect the disconnect end of the respirator hose to the air-control device.

3.4.6 If longer hose is required, it must be a NIOSH-approved Clemco 3/8" respirator hose extension. Use any 25-foot, 50-foot and 100-foot Clemco respirator hoses in any combination as noted in the table in Section 4.4, not to exceed 300 ft. or 12 individual hose lengths.

4.0 COMPRESSED-AIR SUPPLY

 **WARNING**

Air supplied to this respirator system is critical to the safety of the user. Read this section carefully. Poor quality air or low air volume will cause serious respiratory injury or death to the user. See Toxic Dust Poisoning Warning in Section 1.5.

4.1 Air Quality

4.1.1 The quality of air supplied to the respirator is extremely critical to the safety of the user. Special care must also be taken to avoid accidental connection to any other gas lines; such as, oxygen, acetylene, or nitrogen.

 **DANGER**

Never connect a breathing-air line to an air source that has not been tested for gas and particulate contamination. The presence of unacceptable levels of carbon monoxide (CO) or other gases, or oxygen deficiency in breathing air will cause death to the user.

4.1.2 The employer is responsible for ensuring that breathing air shall meet the requirements for Grade D or higher quality, as described in Compressed Gas Association Commodity Specification pamphlet G-7.1., titled Commodity Specification For Air, published by Compressed Gas Association Inc., Chantilly, VA. Website: www.cganet.com (29 CFR 1910.134 (i)).

4.1.3 Limiting characteristics of Grade D air, at the time of publication of this manual are as follows:

Carbon Dioxide	maximum of 1000 ppm
Carbon Monoxide maximum of 10 ppm
Odor *No pronounced odor
Oil (hydrocarbons)maximum of 5 mg/m ³
Oxygenbetween 19.5 - 23.5%

* Specific measurement of odor in gaseous air is impractical. Air may have a slight odor but the presence of a pronounced odor renders the air unsatisfactory.

4.1.4 Prior to using the respirator, read the owner's manual and all instructions, labels, and warnings relating to the compressed air source. Take special care to abide by all warnings from the compressor manufacturer regarding compressor use, and from the cylinder and air supplier, for breathing air cylinders and their use.

4.1.5 A Clemco CPF filter may be installed and if regularly maintained will remove objectionable odors, as well as oil mist, water, pipe scale, and other particulate matter.

4.2 Breathing-Air From Cylinders

4.2.1 Using cylinders (high pressure air bottles) requires special knowledge of their use and compliance with OSHA Regulations. Refer to 29 CFR 1910.134(h) and (i) and 49 CFR part 173, and part 178.

 **DANGER**

Respirators must never use or operate breathing air cylinders, without proper pressure reducing devices, and training on their use. Breathing cylinders are under extremely high air pressure. Improper use could cause cylinders or accessories to rupture, resulting in severe injury or death.

4.2.2 The employer shall ensure that cylinders used to supply breathing air to respirators meet all requirements which may include, but are not limited to, their testing and maintenance, certificate of analysis for air quality, and moisture.

4.2.3 Cylinders must be equipped with a properly maintained pressure reducing valve that reduces pressure to the approved pressure range of the respirator. See 4.4.

4.3 Breathing-Air from Compressors

4.3.1 The employer shall ensure that air from compressors used to supply breathing air to respirators meets the requirements in 29 CFR 1910.134.(i)(5).

4.3.2 Precautions must be taken to prevent contaminants from entering through the compressor intake: Ref. 29 CFR 1910.134.(i)(5)(i). The compressor inlet must be located away from all sources of toxic contaminants including carbon monoxide, which is found in engine exhaust (including the exhaust from the compressor's engine), and in any form of combustion. No vehicles should be allowed near the compressor intake. Contaminants can enter respiratory equipment through the compressor air inlet. This inlet must not be located near any exhaust system outlet, ventilation flue, or source of fumes or particles of any kind.

4.3.3 The compressed-air supply system must be equipped with suitable in-line air-purifying sorbent beds and filters, and be maintained to further ensure breathing air quality: 29 CFR 1910.134 (iii).

4.3.4 If the breathing-air supply is from a non-oil-lubricated compressor, the employer shall ensure that the carbon monoxide levels in the breathing air do not exceed 10 ppm: 29 CFR 1910.134 (i)(6).

4.3.5 If an oil-lubricated compressor is used, the employer shall use a high-temperature alarm or carbon monoxide (CO) alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm: 29 CFR 1910.134 (i)(7).

S – Special or Critical User’s Instructions

4.4 Air Volume and Pressure

4.4.1 Operating Pressure

4.4.1.1 HP respirators operate within the pressure range of 65 and 100 psi (pounds per square inch), as shown in the table in this section. Maintaining the correct operating pressure at the point of attachment ensures the correct air flow to the respirator.

4.4.1.2 The Clemco CPF Inline Particulate Filter with regulator meets this requirement for a regulator and gauge, provided the inlet pressure does not exceed 150 psi. See typical installation, Figure 1.

 DANGER

Do not connect the Apollo Respirator or CPF Filter, or any other regulator or filter, to bottled air that does not have a pressure reducing valve that reduces pressure to the maximum operating pressure of the respirator or filter it services. Failure to comply with this warning will cause devices rated at lower pressures to explode under the high pressure of bottled air, and cause severe injury or death.

4.4.1.3 Use the following table to determine the minimum pressure settings and maximum respirator hose length, based on the air-control device. Adjust the pressure with the respirator hose and respirator attached. If the regulator is adjusted with static pressure (no air flow), pressure may drop below the required pressure when the respirator is connected, and may result in low air flow. Setting the pressure as instructed will provide a minimum of 7 cfm to the respirator.

Hose Length	Minimum Pressure Setting, psi				
	CFC	ACV	Clem-Cool	CAT	CCT
25 ft.	65	85	90	90	90
50 ft.	65	85	90	90	90
75 ft.	65	85	90	90	90
100 ft.	65	85	95	95	95
125 ft.	70	90	95	95	95
150 ft.	70	90	95	95	95
175 ft.	70	90	95	95	95
200 ft.	70	90	95	95	95
225 ft.	75	95	*	*	*
250 ft.	75	95	*	*	*
275 ft.	75	95	*	*	*
300 ft.	75	95	*	*	*

NOTE: Use any combination of hose shown to provide a maximum of 300 ft., but not to exceed 12 individual hose lengths.

* Do not use these control devices at distances greater than 200 ft.

4.4.2 Air Volume

4.4.2.1 When using a CFC constant-flow connector or ACV air valve, the respirator must be supplied with 15 cfm (cubic feet per minute) of Grade D breathing air at 65 to 100 psi. When using an alternate temperature control device, the respirator must be supplied with 20 cfm of Grade D breathing air at 90 to 100 psi.

 WARNING

The compressor must provide adequate output and the plumbing between the compressor and the point of attaching the respirator hose must have sufficient capacity to supply the volume of air at the pressure required. Restricted air flow will cause discomfort to the user, and may result in ingress of hazardous and toxic dust, subjecting the user to health and life threatening toxic poisoning and long term respiratory disease and death.

4.4.3 Pressure Conversion Kit

4.4.3.1 This optional accessory kit contains parts and instructions to convert an Apollo 60 respirator from high pressure (65 to 100 psi) to low pressure (6 to 20 psi). The kit is listed in Section 10.1.

5.0 OPERATION

WARNING

Except for emergency evacuation when the use of the respirator hinders escape, keep the respirator on and leave the respirator-use area immediately if any of the following occur:

- Any part of the respirator system becomes damaged
 - Any air monitoring alarm is activated
 - Air flow into the respirator is reduced or stops
 - Breathing becomes difficult
 - At the first sign of dizziness, nausea, fever, illness or injury
 - Any contamination is noted by taste, smell or vision inside the respirator
 - Vision becomes impaired
 - Any irritation is noted
-

5.1 Prior to operation, thoroughly inspect and clean the helmet, breathing tube, respirator hose, air entry ports, and fittings of all dust and debris. Inspect the helmet suspension and if necessary adjust it per Section 6.1.

5.2 Start the compressor and open the service valve to pressurize the air supply line.

5.3 Check air pressure at the point of attachment. Set the pressure within the minimum pressure assigned in Section 4.4 and the maximum of 100 psi. Pressure must be set with the respirator connected.

5.4 Inspect all safety and breathing equipment used in conjunction with the respirator as recommended by the manufacturer.

5.5 Inspect respirator hoses and connections for tightness and leaks.

5.6 Don the respirator in a clean non-hazardous environment, free of contaminants, where the air is safe to breathe.

5.7 When donning and removing the respirator, keep it upright to prevent dust and abrasive from falling inside. Holding the chin strap while donning the helmet will make it easier to position it once the helmet is on.

5.8 Position the chin strap so it fits comfortably under the chin.

5.9 Position the knit cuff on the inner collar so that it fits snugly around the neck in turtleneck fashion and without any interference from clothing or long hair. When correctly positioned, the smaller elastic end of the collar must face up.

WARNING

Correct placement of the inner collar is critical for providing the protection for which the respirator is designed. The collar must be positioned and maintained without any interference from items such as hair, facial hair, or shirt collars, between the inner collar and user's neck.

5.10 Pull the cape down to fully extend it and connect the four elastic straps (two on each side) under the arms, and tighten using the slides provided.

5.11 Put on the belt and control valve over the cape. Buckle the belt around the waist, and tighten it by pulling the belt end through the buckle insert.

5.12 When finished blasting, and after cleanup is completed, remove the respirator outside the respirator-use area and where the air is safe to breathe.

WARNING

Do not don the respirator, or store it in a blast contaminated environment. Do not remove the respirator in a contaminated environment except for emergency evacuation when the use of the respirator hinders escape.

6.0 ADJUSTMENTS

6.1 Suspension, Ref. Figure 4

⚠ WARNING

The suspension maintains a fixed distance between the head and the helmet. It is critical that the suspension is properly installed, and adjusted as described, to provide maximum head protection and comfort.

6.1.1 Remove the cape per Section 9.4.

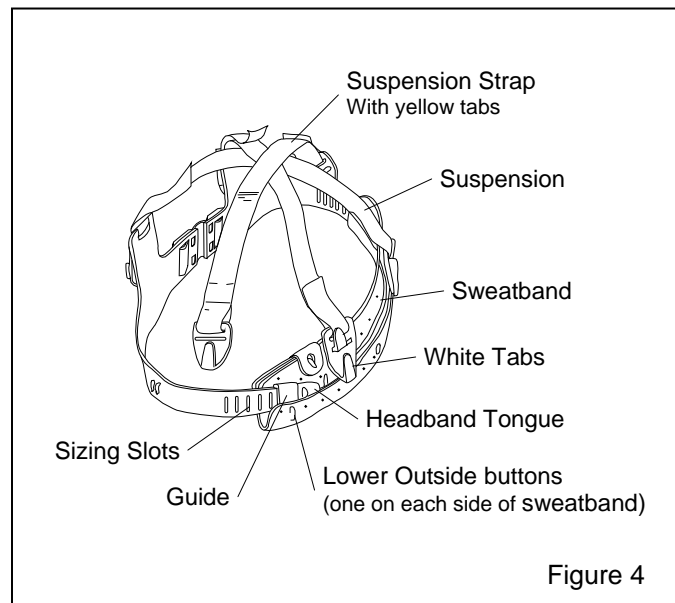
6.1.2 Unfasten the vinyl sweatband from the two lower, outside buttons, ref. Figure 4. It is not necessary to remove the suspension to make adjustments.

6.1.3 The suspension fits head sizes 6.5 to 8. Head sizes are marked on the headband slots. Slide the headband tongue in or out of the guide to attain the desired head size. It is important that the adjustment be made evenly on both sides. Press the selected slots firmly onto the fastening lugs on the front band.

6.1.4 Refasten the vinyl sweatband onto the suspension buttons.

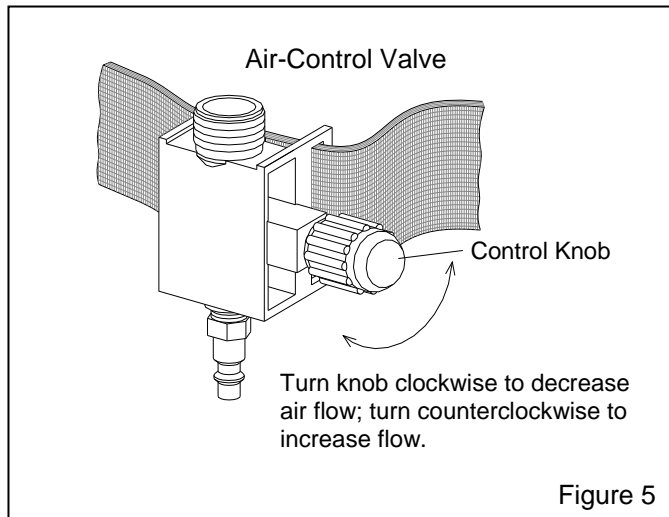
6.1.5 Try on the helmet for fit and readjust if necessary.

6.1.6 Reattach the cape to the helmet by following the instructions in Section 9.4.



6.2 Air-Control Valve, alternate, Ref. Figure 5

Refer to the manuals listed in Section 1.1.2 for other alternate air devices.



6.2.1 Clemco's ACV air-control valve allows the user to increase or decrease the volume of breathing-air while wearing the supplied-air respirator. The valve provides a range of 7 to 10 cfm of breathing-air when the respirator is supplied with respirable air as noted in Section 4.4.

6.2.2 To regulate the air flow, turn the control knob "clockwise" to decrease air flow, or "counterclockwise" to increase air flow. NOTE If the knob is turned fully clockwise to minimum flow, turning the knob one full turn counterclockwise increases the flow to maximum. Turning the knob more than one revolution counterclockwise will not increase air flow.

7.0 MAINTENANCE PROGRAM

7.1 Basic Service

7.1.1 A program for maintenance and care of the respirator must be established based on application, working conditions, and hazards involved, and include the following basic service.

- Inspection for defects (including a leak check)
- Cleaning and disinfecting
- Repair (service maintenance)
- Storage

Equipment must be properly maintained to retain its original effectiveness. Reference OSHA Regulation 29 CFR 1910.134 (h).

7.2 Inspection

Inspection must be done in compliance with OSHA Regulation 29 CFR 1910.134 (h)(3).

7.2.1 Inspect respirator before and after each use, and during cleaning. Inspection shall include a check for tightness of connections and the condition of the lenses, suspension, cape and elastic parts, breathing tube, respirator hoses and connectors, constant-flow connector, alternate air-control valve or temperature control valve.

7.2.2 Inspect the respirator hoses, breathing tube, air entry ports, and fittings for dust contamination; make sure they are clean before making connections.

7.2.3 The helmet suspension is very important for maintaining maximum hard hat and respiratory protection. It must be inspected for fit and wear on a daily basis, and replaced immediately at the first sign of wear (See Section 6.1 for adjustment and Section 9-3 for replacement).

7.2.4 The inner collar is very important for controlling air escape from the helmet and preventing ingress of dust. The elastic collar should fit snugly around the user's neck. The collar must be replaced when it no longer fits snugly around the neck.

7.2.5 The outer cape provides protection from rebounding abrasive and from abrasive ingress into the helmet. Inspect the outer cape frequently for wear. Replace the cape before holes wear through, or any wear occurs that prevents the cape from providing the protection for which it is intended.

7.3 Cleaning and Disinfecting

Cleaning and disinfecting must be done in compliance with OSHA Regulation 29 CFR 1910.134 (h)(1). See Section 8.0 for cleaning instructions.

7.3.1 A respirator issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.

7.3.2 Shared respirators must be cleaned and disinfected before being worn by different individuals.

7.4 Repairs (Service Maintenance)

Repairs must be done in compliance with OSHA Regulation 29 CFR 1910.134 (h)(4).

7.4.1 The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, adjusted, repaired or discarded in accordance with the following procedures:

7.4.2 Adjustments and repairs must be made only by appropriately-trained persons, and only with genuine Clemco NIOSH-approved parts designed for the respirator. No attempt shall be made to substitute components or to make adjustment or repairs beyond the manufacturer's recommendations. See Sec. 9.0 for service instructions.

7.5 Storage

Storage of the respirator must be done in compliance with OSHA Regulation 29 CFR 1910.134 (h)(2).

7.5.1 Daily Storage

7.5.1.1 When the respirator is not in use, it must be stored in a clean, dry area. Hang the respirator by the strap provided on the top. Do not tuck the cape inside the helmet. Let the cape hang loose to allow air to circulate, and condensation on the cape and inside the helmet to dry.

7.5.2 Long-term Storage

7.5.2.1 After inspection, cleaning, and thorough drying, and after necessary repairs are made, the cape should be tucked inside the helmet. The respirator shall be placed in a plastic bag and the bag sealed to keep out dust and moisture. Place the bag in a clearly-marked carton and store it in a clean, dry place.

8.0 CLEANING AND DISINFECTING

NOTE: Unless otherwise stated all cleaning and disinfecting should be done in accordance to OSHA Regulation 29 CFR-134 App. B-2.

CAUTION

Follow washing instructions as described in this section. Do not use any caustic chemicals or solvents that may be irritating or harmful to the user, or which change the properties of the materials used in any part of the respirator.

8.1 Outer Cape

8.1.1 See Section 9.4 for removal and installation instructions.

8.1.2 Machine wash in warm water with mild detergent. Dry in a clothes dryer at the lowest temperature setting. Do not dry clean.

8.2 Inner Collar

8.2.1 The removable inner collar should be frequently washed to remove build-up of dirt that accumulates from normal perspiration and air moisture. For general hygiene, daily washing is recommended.

8.2.2 The inner collar may be either washed or replaced separately or with the outer cape. To wash separately, unzip the collar and machine wash in warm water with mild detergent. Tumble dry in a clothes dryer at the lowest temperature setting. Do not dry clean.

8.3 Sweatband and Suspension

8.3.1 Wash the sweatband, suspension, and chin strap, using warm water and mild detergent. See Section 9.3 for removing the suspension.

8.4 Helmet Assembly

8.4.1 The helmet assembly should be wiped clean with a cloth dampened with water and mild detergent. Do not immerse the helmet in water. While this will not permanently damage the helmet, it will require an extended drying period.

8.4.2 Care must be taken to prevent abrasive entry when donning and removing the respirator and when changing lenses. Vacuum the inside of the helmet to remove any abrasive.

8.4.3 If the acoustical foam on the inside of the helmet becomes soiled, it can be wiped with a damp cloth or pulled off and replaced.

8.5 Disinfecting

8.5.1 Washing the respirator as instructed also disinfects it. Additional disinfecting may be done before and/or after use by wiping the surfaces with a commercial disinfecting wipe or spray.

9.0 SERVICE MAINTENANCE

CAUTION

To prevent recontamination of the respirator, clean the respirator of dust and abrasive before maintenance. All maintenance must be done in a clean environment away from dust and abrasive, and outside the respirator use area.

9.1 Lens Options and Replacement Procedures Refer to Figure 6

Note: The standard helmet assembly includes one inner lens and five perforated outer lenses.

Fixed Inner Lens: Replaceable lens required by OSHA, must be used with all lens systems. Refer to Section 9.2 for replacement of fixed inner lens.

Optional Non-Perforated Intermediate lens: Protects the inner lens.

Perforated Outer Lens: Use in multiples over intermediate lens and/or fixed inner lens. For high-abrasion applications and/or the convenience of tearing off frosted lenses during the work period.

NOTE: Choose one of the following lens system options

- a. Fixed inner – no intermediate – up to five perforated outer lenses.
- b. Fixed inner – one intermediate – up to three perforated outer lenses.
- c. Fixed inner – one intermediate – no perforated outer.

9.1.1 Perforated Outer Lenses

For maximum visibility, install only enough lenses to last during a work period, but no more than five, or, no more than three when using an intermediate lens. Preparing lenses in the following manner will permit the outer lenses to be torn off while blasting to expose a fresh lens as needed, while preserving the innermost perforated lens to protect the intermediate lens.

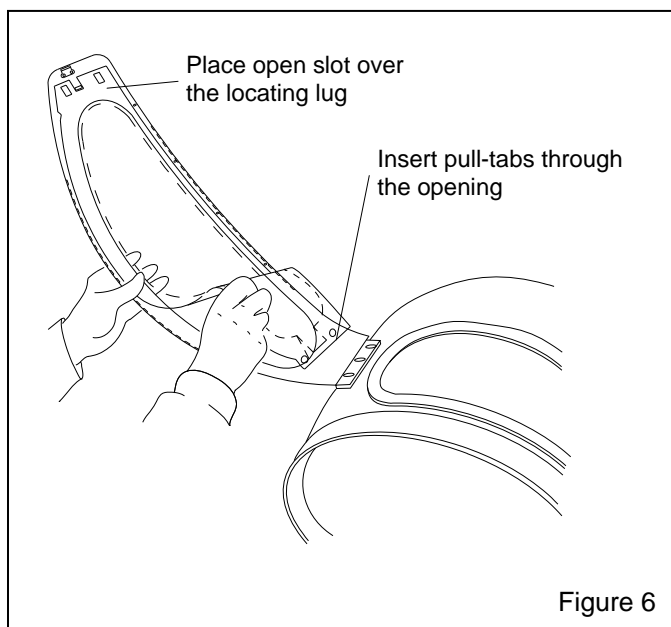
9.1.1.1 Unlatch and open the window frame and remove remnants of old lenses.

9.1.1.2 Inspect the window gasket and inner lens. If necessary replace per Section 9.2.

9.1.1.3 Arrange the stack of lenses on the inside of the opened window frame so the straight edge is toward the top of the frame, and the **pull-tabs are at the hinged end**, as shown in Figure 6.

9.1.1.4 Place the open slot on the latch end over the locating lug.

9.1.1.5 Insert the pull-tabs through the frame opening.



9.1.1.6 Place the pull-tab cutout over the lug on the outside of the window frame. The lens perforations should line up close to the window frame opening when the frame is closed and latched.

9.1.1.7 When using an intermediate lens, install the intermediate lens atop the perforated lenses while the window frame is open.

9.1.1.8 Close and latch the window frame to secure all lenses.

9.1.1.9 Snipping off the pull-tab on the innermost lens after the frame is closed will prevent unintentional removal of the last lens and prolong the life of the inner lens.

9.1.2 Intermediate Lens (optional)

9.1.2.1 Unlatch and open the window frame, and remove the old lens.

9.1.2.2 Inspect the window gasket and inner lens. If necessary replace per Section 9.2.

NOTE: It is not necessary to use perforated outer lenses, but they will protect the intermediate lens when rapid frosting occurs. If outer lenses are used, up to three may be installed before the intermediate lens, per Section 9.1.1.

9.1.2.3 Place the new lens on the frame with the straight edge toward the top.

9.1.2.4 Secure the lens to the frame by pressing the slots onto the locating lugs.

9.1.2.5 Close and latch the window frame.

9.2 Removing and Replacing the Inner Lens and Window Gasket

Note: The following instructions explain the method of first installing the gasket onto the helmet, and then the lens. Spraying a small amount of water or food grade silicone into the gasket grooves will reduce friction and ease installation. Alternatively, install the lens into the window gasket and then install the lens and gasket onto the helmet as an assembly.

9.2.1 Replace the inner lens when it becomes dirty or scratched.

9.2.2 Remove the outer cape to ease the installation.

- 9.2.3** Unlatch and open the window frame.
- 9.2.4** Working from inside the helmet, pull up on the window gasket lip and push out the gasket and lens through the front of the window opening.
- 9.2.5** Remove the old lens from the gasket.
- 9.2.6** Place the gasket over the window opening
- 9.2.7** From the inside of the helmet, work the gasket lip onto the helmet. Smooth out wrinkles in the gasket on the inside of the helmet.
- 9.2.8** Insert one end of the lens into the gasket groove. The lens must be fully seated into the groove.
- 9.2.9** Work the lens into the groove until it is completely seated into the gasket's groove.
- 9.2.10** Install the intermediate and outer lenses, and latch the window frame.
- 9.2.11** To maximize the wear life of the inner lens, do not use without an intermediate lens. The respirator must never be used without the inner lens in place.
- 9.2.12** Attach the outer cape.

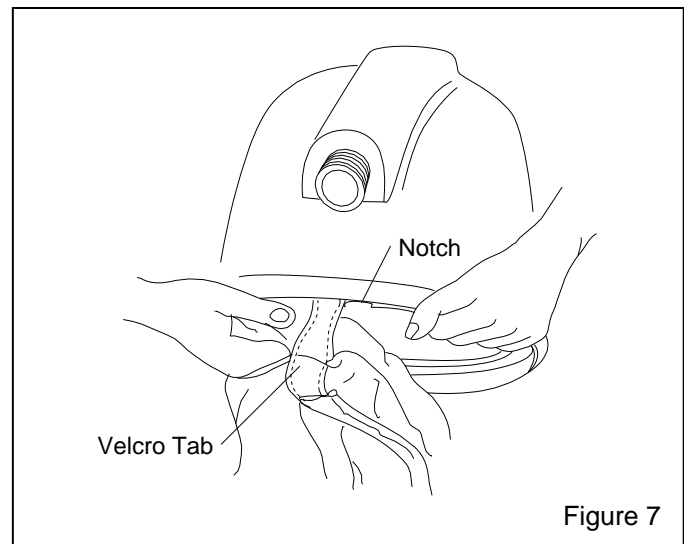
9.3 Removing and Replacing the Suspension

- 9.3.1** Remove cape from the helmet per Section 9.4.
- 9.3.2** Remove and discard the old suspension and suspension strap by extracting the plastic tabs from the wedge-shaped clefts in the shell.
- 9.3.3** Unfasten the vinyl sweatband from the two lower, outside buttons, ref. Figure 4.
- 9.3.4** The suspension fits head sizes 6.5 to 8. Head sizes are marked on the headband slots. Slide the headband tongue in or out of the guide to attain the desired head size. It is important that the adjustment be made evenly on both sides. Press the selected slots firmly onto the fastening lugs on the front band.
- 9.3.5** Refasten the vinyl sweatband onto the suspension buttons.
- 9.3.6** Install the suspension strap before installing the suspension. Insert the yellow end tabs into the clefts on the helmet shell. When correctly installed, the strap is between the suspension and helmet shell and above the ears.

- 9.3.7** Install the suspension by inserting the four white plastic tabs into the clefts on the shell. The tabs must fully seat in their respective clefts.
- 9.3.8** Try on the helmet for fit and readjust if necessary. It is not necessary to remove the suspension to make adjustments.
- 9.3.9** Make sure the chin strap is in place, then reattach the cape to the helmet by following the instructions in Section 9.4.

9.4 Removing and Replacing the Outer Cape

- 9.4.1** When the cape becomes soiled or requires replacement, it can easily be removed as follows.
- 9.4.2** Separate the Velcro tabs on the back of the cape. Refer to Figure 7.
- 9.4.3** Slide the ends of the cape to the notch. Continue sliding one end of the cape out of the groove until the entire cape is detached from the helmet.
- 9.4.4** To install the cape, separate the Velcro tabs on the cape and slide one end into the groove on the bottom edge of the cape attachment strap at the point where the groove is notched. Continue sliding the cape around the bottom of the helmet until the entire cape is completely into the groove. NOTE: Spraying a small amount of food grade silicone into the groove will reduce friction and ease assembly.



- 9.4.5** Join the Velcro tabs at the notch.

9.5 Removing and Replacing the Inner Collar

9.5.1 The inner collar controls air escape from the helmet and prevents ingress of dust.

9.5.2 The elastic properties of the collar provide a snug fit around the user's neck. The inner collar must be replaced before it is stretched to the point where it no longer fits snugly on the user's neck. The collar unzips from the outer cape for replacement or washing. See Section 8.2 for cleaning instructions.

9.6 Window Frame and Latch

9.6.1 The window frame or latch must be replaced when it becomes difficult to maintain a seal. When replacing the window frame or latch, the acoustical foam inside the helmet should also be replaced.

9.7 Chin Strap

9.7.1 Replace the chin strap when worn or when it loses its elasticity.

10.0 REPLACEMENT PARTS

 WARNING

Use of any non-Clemco replacements parts may permit ingress of hazardous contaminants, and may cause injury, disease, or death to the user. OSHA Regulation 29 CFR 1910.134(H)(4)(i) requires the use of the respirator manufacturer's NIOSH-approved parts designated for the respirator. Using any parts listed in this section made by any manufacturer other than Clemco voids the NIOSH approval, and voids Clemco's warranty.

10.1 Supplied-Air Respirator Systems and Alternate Accessories

Apollo 60 HP Less Respirator Hose, with:

Description	Stock No.
CFC constant-flow connector	21300
ACV air-control valve	10505
Clem-Cool air conditioner	24930
CAT cool-air tube	10508
CCT climate control tube	10509

Apollo 60 HP With 50 ft Respirator Hose, and:

Description	Stock No.
CFC constant-flow connector	20213
ACV air-control valve	10510
Clem-Cool air conditioner	24931
CAT cool-air tube	10511
CCT climate-control tube	10512

Alternate Air-Control Devices with Belt

Description	Stock No.
CFC constant-flow connector	21422
ACV air-control valve	100024
Clem-Cool Air conditioner	23825
CAT cool-air tube	04410
CCT climate-control tube	04411

Accessories

Description	Stock No.
Pressure conversion kit, HP to LP Converts Apollo 60 HP, high pressure (Grade "D" Compressed Air) respirator to LP low pressure (ambient air) respirator	22079
Hearing muffs, low profile noise reduction	23886
Do-rag, washable head scarf	23814

10.2 Respirator Replacement Parts, Figure 8

Item	Description	Stock No.
1.	Constant-flow connector, HP (alternate), without belt	21415
2.	Belt, 2" web with buckle	04430
3.	Respirator hose, 3/8" x 25 ft. (alternate), includes items 6, and 7	04397
4.	Respirator hose, 3/8" x 50 ft. (alternate), includes items 6, and 7	04415
5.	Respirator hose, 3/8" x 100 ft. (alternate), includes items 6, and 7	04398
6.	Adaptor, 3/8" hose to 3/8 NPT	00022
7.	Union, 3/8" hose to 3/8" hose	01020
8.	Disconnect, 1/4 NPT female	00025
9.	Adaptor, 3/8" hose to 1/4 NPT	01019
10.	Acoustical foam kit, both sides	04369

11.	Gasket, window	04452
12.	Inner lens, .040" package of 5	04367
13.	Outer lens, .0075", perforated, package of 25	04361
14.	Window frame kit	08741
15.	Chin strap	04460
16.	Handle strap	03623
17.	Suspension	10532
18.	Cape attachment strap	10534
19.	Cape, red, with item 22 inner collar	04435
20.	Breathing tube assembly includes two of item 21	22811
21.	O-Ring, 7/8" OD, 2 required	22815
22.	Inner collar	08740
23.	Window latch kit	04368
24.	Intermediate lens, .020", package of 5	24943
	package of 25	04373

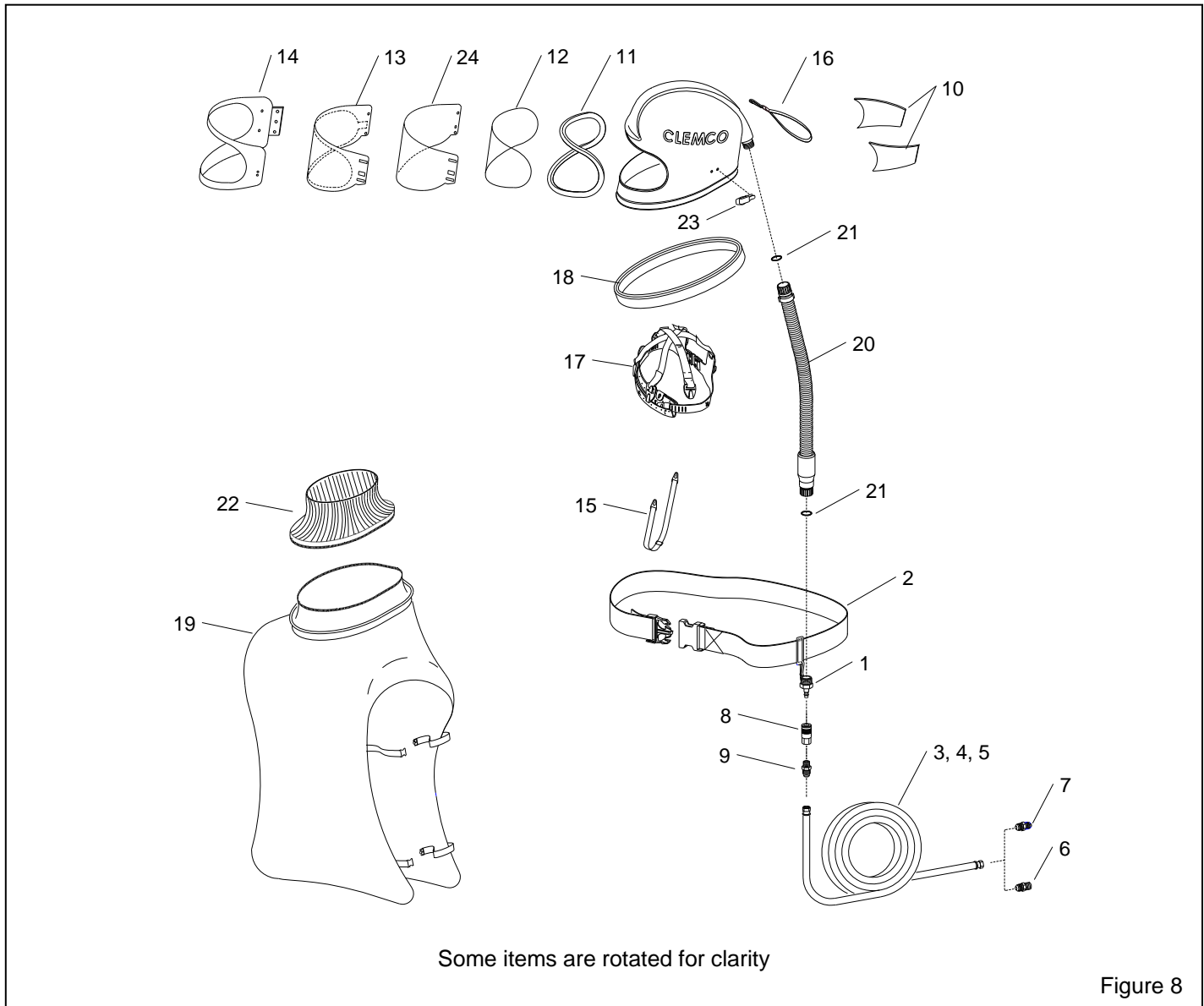


Figure 8