

CHAPTER 6

ENHANCED PRESSURE-DEMAND OXYGEN MASK SYSTEMS

MBU-23(V)/P SERIES AND MBU-24/P22P-16

Section 6-1. Description

6-1. GENERAL.

6-2. The latest and most advanced pressure demand oxygen mask systems in use in the Navy are the MBU-23(V)/P series low profile and MBU-24/P22P-16 oxygen masks. The MBU-23(V)/P series was developed for non-positive

pressure breathing for g applications in aircraft not equipped with the Navy Combat Edge system. The MBU-24/P22P-16 oxygen mask was developed for positive pressure breathing for g applications as a component of the Navy Combat Edge (NCE) A/P22P-16 Aircrew Protective Assembly.

Section 6-2. MBU-23(V)/P Series Oxygen Mask

6-3. GENERAL.

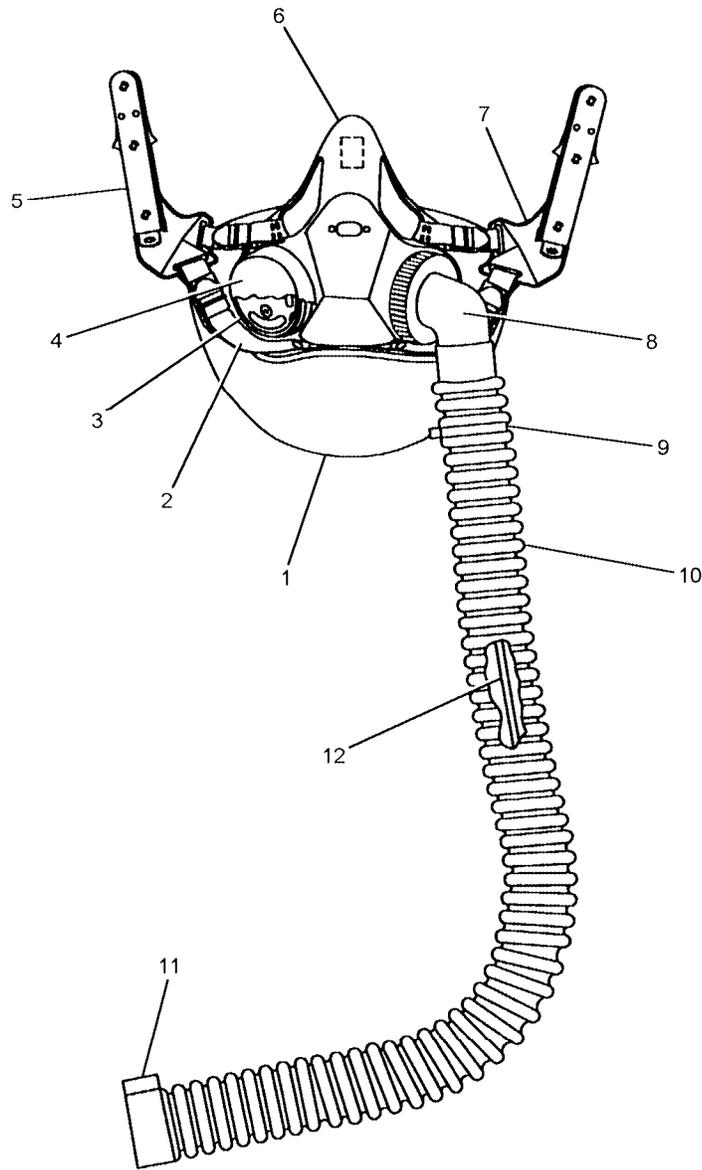
6-4. The MBU-23(V)1/P Basic Oxygen Mask ([figure 6-1](#)) is a low profile pressure-demand oxygen mask developed for Non-Positive-Pressure-Breathing for g (Non-PBG) applications. The mask was designed as an alternative to the MBU-12/P and MBU-5/P to fit aircrew personnel having problems wearing the standard MBU-12/P oxygen mask. The MBU-23(V)1/P was developed for United States Navy and Marine Corps aircrew personnel flying high performance tactical jet and fixed-wing trainer aircraft. Developed by the Aircrew Systems Division of the Naval Air Warfare Center, Aircraft Division, NAS Patuxent River, MD, the MBU-23(V)1/P Oxygen Mask represents the Navy's latest technology in advanced oxygen masks and is the basic mask used in the development of the MBU-23(V)/P Series Oxygen Mask Assemblies.

6-5. The newly designed low profile MBU-23(V)1/P oxygen mask fits a wider range of face and nose shapes than some masks currently in use. It features a triangular shaped cover around the nose and mouth that provides an excellent seal. Separate inhalation and exhalation valves present less breathing resistance than current single valve masks.

6-6. CONFIGURATION.

6-7. The MBU-23(V)1/P Oxygen Mask Assembly consists of a silicone rubber facepiece with associated hard shell, inhalation and exhalation valves, flexible oxygen delivery hose, and left and right bayonet connectors. The separate inhalation and exhalation valve design requires the oxygen delivery hose to be offset from the center of the mask. The inhalation and exhalation valves are interconnected by a compensation tube. The compensation tube senses inhalation pressure and directs a portion of the pressure to the underside of the exhalation valve plate. This compensation pressure keeps the exhalation valve shut during inhalation. Mask to helmet connection is accomplished by the use of offset bayonet connectors that interface with current bayonet receivers.

6-8. The MBU-23(V)/P series enhanced pressure-demand oxygen mask configurations covered in this chapter are all based upon the MBU-23(V)1/P Basic Oxygen Mask Assembly. Each configuration in the series is developed by adding to or removing various major components of the basic MBU-23(V)1/P assembly to arrive at the desired configuration. Desired configurations are dependent upon the aircrew or aircraft application. Refer to [table 6-1](#) and [table 6-2](#).



- | | |
|--------------------------|--------------------------|
| 1. FACEPIECE | 7. LEFT BAYONET |
| 2. RETAINING STRAP | 8. INHALATION VALVE ASSY |
| 3. EXHALATION VALVE ASSY | 9. UPPER CABLE GUIDE |
| 4. EXHALATION VALVE CAP | 10. OXYGEN DELIVERY HOSE |
| 5. RIGHT BAYONET | 11. LOWER CABLE GUIDE |
| 6. HARDSHELL | 12. STRAIN RELIEF CORD |

Figure 6-1. MBU-23(V)1/P Basic Oxygen Mask Assembly

Table 6-1. Oxygen Mask Configuration Matrix

Mask Designator	Mask	Connector			Mike and Amp				Communication Cables						Regulators (Note 2)			Misc.	
	MBU-23(V)1/P G010-1314-21/-22/-23/-24	MS22796	MC-3A - P/N MS22016-1 (Note 1)	CRK-90 - P/N 123AB50534-5 (Note 3)	Receptacle Assy	P/N N100493-00, 10-Volt	M-101/AIC - P/N MIL-M-26542/4	AM-7067A/A - P/N MS23595/3-3	CX-13126A/A - P/N M22442/26-3	CX-13127/A - P/N M22442/42-1	CX-13017/AR - P/N M22442/24-1	CX-13154/A - P/N 765AS380-1	CX-4434U/16 in.	M22442/33-4707	CRU-78/P (Note 4)	CRU-103	CRU-88/P	Panel Mounted or Walk-around	Offset Bayonets
MBU-23(V)2/P	X	X	-	-	-	-	X	X	X	-	-	-	-	-	O	X	O	-	X
MBU-23(V)3/P	X	X	-	-	-	-	X	X	-	X	X	-	-	-	O	X	O	-	X
MBU-23(V)4/P	X	X	-	-	-	-	X	X	X	-	-	-	-	-	-	X	O	-	X
MBU-23(V)5/P	X	-	X	-	-	-	X	X	-	-	-	X	-	-	-	-	-	X	X
MBU-23(V)6/P	X	-	X	-	X	-	X	-	-	-	-	X	X	-	-	-	-	X	X
MBU-23(V)7/P	X	-	-	X	-	-	X	X	-	-	-	X	-	-	-	-	-	X	X
MBU-23(V)8/P	X	-	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	X
MBU-23(V)9/P	X	X	-	-	X	-	X	-	-	-	-	-	-	X	-	-	-	-	X

Legend: X = Required - = Not Applicable
O = Optional

Notes:

- MC-connector used with panel mounted regulator and walk-around unit.
- Regulators are not a part of the oxygen mask configuration and are shown here for reference only. Refer to NAVAIR 13-1-6.4-2 for further information.
- CRK-90 oxygen connector is only used in E-2C aircraft equipped with backpack emergency equipment.
- LOX aircraft only.
- Regulator-to-seat kit hose assembly is not part of oxygen mask configuration. Refer to NAVAIR 13-1-6.3-1 for further information.
- Use of Bayonet, LH, P/N 70280-10 NIIN 00-186-0276 and Bayonet, RH, P/N 70280-20, NIIN 00-186-0277 with MBU-23/P oxygen masks is authorized.

Table 6-2. Oxygen Mask Application Matrix

Mask Designator	Fighter Recon				Attack		ASW	Electronics		Cargo Transport	Trainers								Tilt Rotor
	Fighters	F-5 Series	F/A-18	All Reconnaissance	AV-8B	All Other Attack	S-3 Series	E-2C	EA-6 Series	C-2A Pilot and Copilot	T-2C	T-6 Series	TA-4 Series	TA-7C	TAV-8B	TE-2C	CT-34 Series	T-45A	MV-22
MBU-23(V)2/P	X	-	X	X	-	X	-	-	X	-	X	-	X	X	-	-	-	X	-
MBU-23(V)3/P	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
MBU-23(V)4/P	-	-	O	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-
MBU-23(V)5/P	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	X	-	-	-
MBU-23(V)6/P	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X	-	-
MBU-23(V)7/P	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-
MBU-23(V)8/P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
MBU-23(V)9/P	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Legend: X Required O Optional																			

6-9. MBU-23(V)/P SERIES OXYGEN MASK CONFIGURATIONS. The MBU-23(V)/P series mask assembly configurations are based on aircraft and aircrew communication equipment requirements. Configurations are as follows:

6-10. MBU-23(V)2/P Oxygen Mask Assembly. The MBU-23(V)2/P oxygen mask assembly (figure 6-2), equipped with an M-101/AIC microphone and an AM-7067A/A amplifier, is designed for use in aircraft where a mask is required at all times. Specific aircraft are the F-14, all reconnaissance aircraft, EA-6, KA-6D, T-2C, TA-4, TA-7C, and T-45A. The MBU-23(V)2/P is used with a helmet and a chest mounted regulator. The mask is also equipped with an MS27796 connector and CX-13126A/A communications cable.

6-11. MBU-23(V)3/P Oxygen Mask Assembly. The MBU-23(V)3/P oxygen mask assembly (figure 6-3), equipped with an M-101/AIC microphone and an AM-7067A/A amplifier, is designed for use in S-3 aircraft. The MBU-23(V)3/P is used with the HGU-49/P helmet and the HGU-68(V)3/P helmet incorporating the binaural M22442/26-3 and the 40 inch CX-13017/AR communications cables. The 40 inch cable is secured to the regulator-to-seat kit oxygen delivery hose. The mask is equipped with MS27796 connector for use with chest-mounted diluter-demand regulator or CRU-79/P miniature regulator without the MS27796 connector.

6-12. MBU-23(V)4/P Oxygen Mask Assembly. The MBU-23(V)4/P oxygen mask assembly (figure 6-4), equipped with an M-101/AIC microphone and an AM-7067A/A amplifier, is designed for use in the AV-8 series aircraft where an oxygen mask is required at all times. In the AV-8 series the mask is used with a helmet and is equipped with the CX-13126A/A communications cable and MS27796 connector for use with torso mounted diluter-demand regulators.

6-13. MBU-23(V)5/P Oxygen Mask Assembly. The MBU-23(V)5/P oxygen mask assembly (figure 6-5), equipped with an M-101/AIC microphone and an AM-7067A/A amplifier, is designed for use in OV-10, E-2C, and TE-2C aircraft. The mask is fitted with the

CX-13154/A communications cable as well as the MC-3A connector for use with a panel mounted regulator, walk-around unit, or bailout bottle.

6-14. MBU-23(V)6/P Oxygen Mask Assembly. The MBU-23(V)6/P oxygen mask assembly (figure 6-6), equipped with an M-101/AIC microphone, is designed for use in the C-2A and T-34 aircraft. The MBU-23(V)6/P communication configuration does not require an amplifier. The mask is fitted with the CX-13154/A and CX-4434/U 16 inch communications cables. The MBU-23(V)6/P is equipped with the MC-3A connector for use with a panel mounted regulator, walk-around unit, or bailout bottle.

6-15. MBU-23(V)7/P Oxygen Mask Assembly. The MBU-23(V)7/P oxygen mask assembly (figure 6-7) is designed for use in the E-2C aircraft which is equipped with the crew backpack escape system. The mask is equipped with the M-101/AIC microphone, AM-7067A/A amplifier, CX-13154/A communications cable, and the CRK-90 connector which is used with a panel mounted regulator or emergency escape system.

6-16. APPLICATION.

6-17. The MBU-23(V)/P Series Oxygen Masks were designed as an alternative solution for personnel having problems wearing the MBU-12/P oxygen mask and as a replacement for the MBU-5/P oxygen mask. The individual configurations of the MBU-23(V)/P series were designed to meet aircrew requirements in specific types of aircraft.

6-18. SERVICE LIFE.

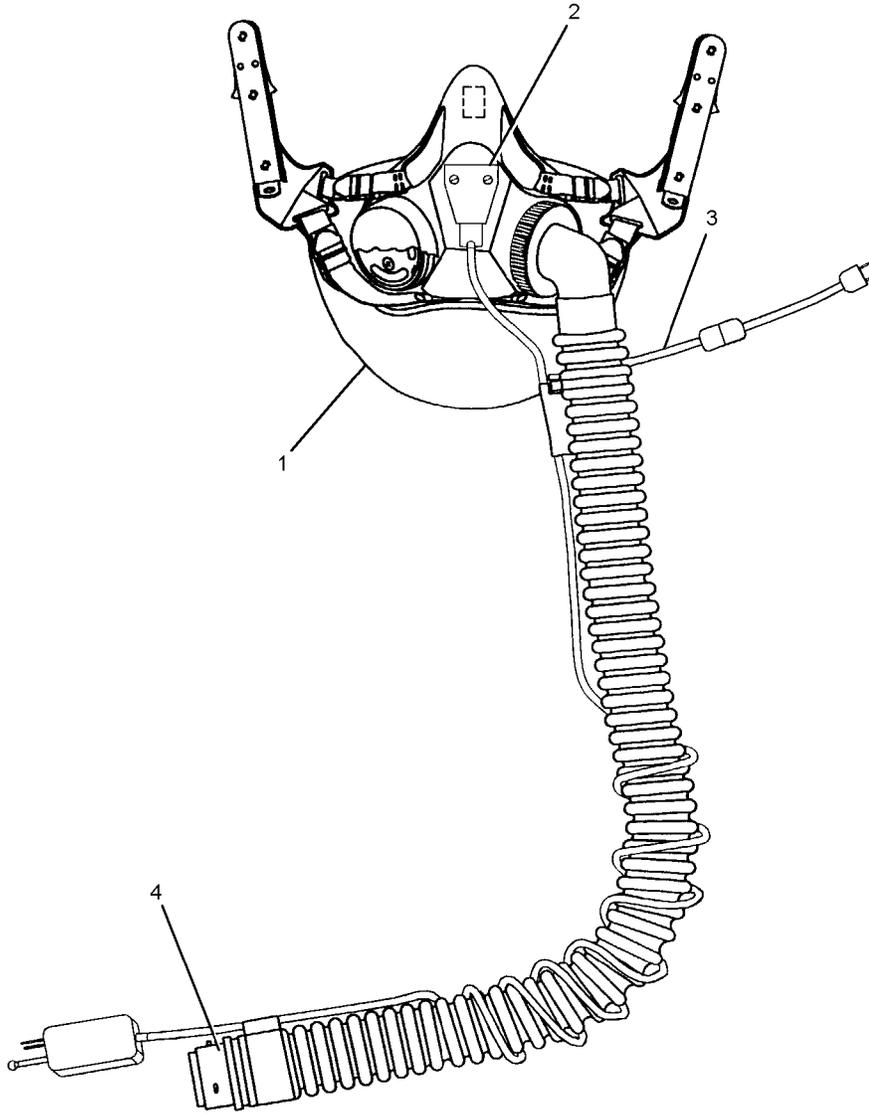
6-19. The MBU-23(V)/P Series Oxygen Mask Assemblies shall remain in service as long as repairs can be made at the organizational level of maintenance.

6-20. MODIFICATIONS.

6-21. Table 6-3 contains a list of technical directives applied to the MBU-23(V)/P Series Oxygen Mask Assemblies. There are no modifications currently authorized for the MBU-23(V)/P Series oxygen masks.

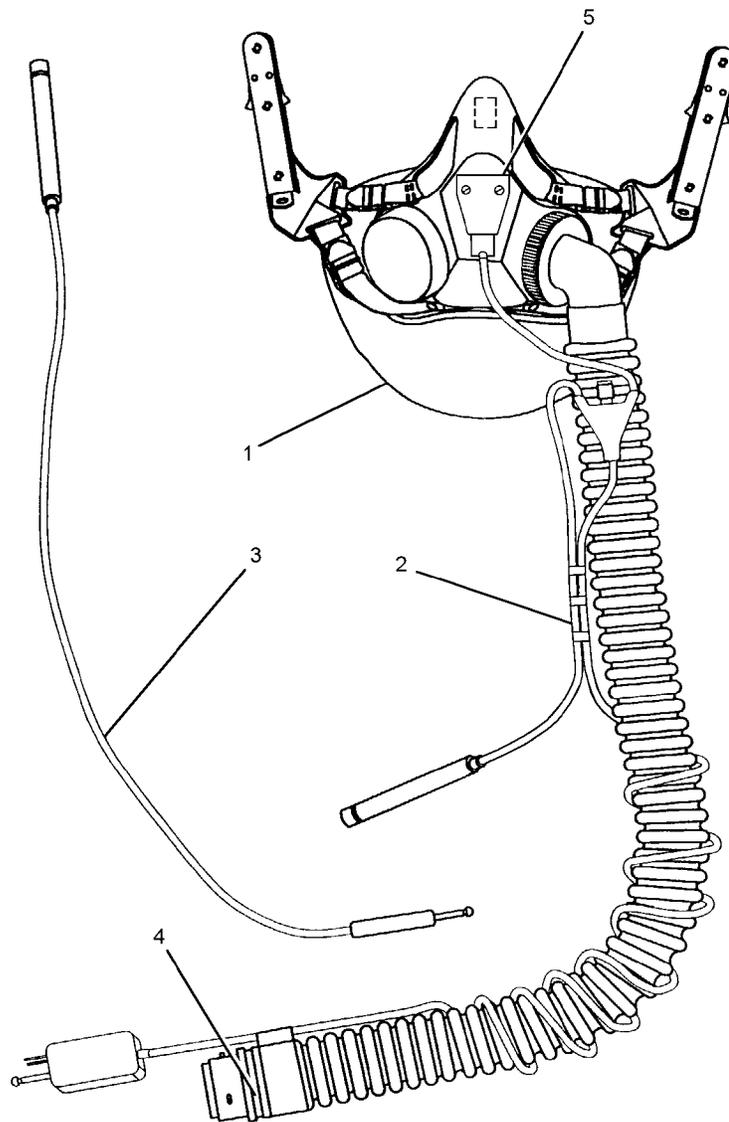
Table 6-3. MBU-23(V)/P Series Oxygen Mask Assembly Directives

Description of Modification	Application	Modification Code
None	None	None



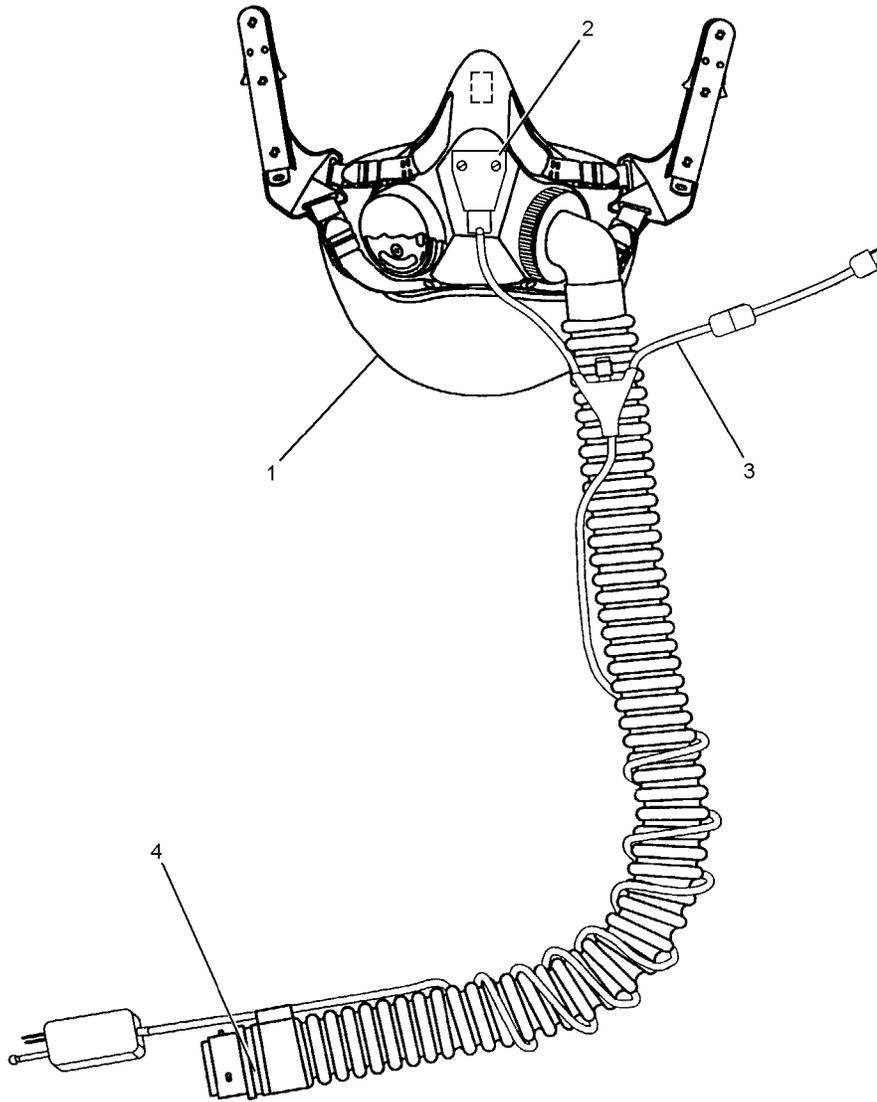
1. BASIC MASK
2. M-101/AIC MICROPHONE ASSY/
AM-7067/A AMPLIFIER ASSY
3. CX-13126A/A CABLE ASSY
4. OXYGEN CONNECTOR, MS27796

Figure 6-2. MBU-23(V)2/P Oxygen Mask Assembly



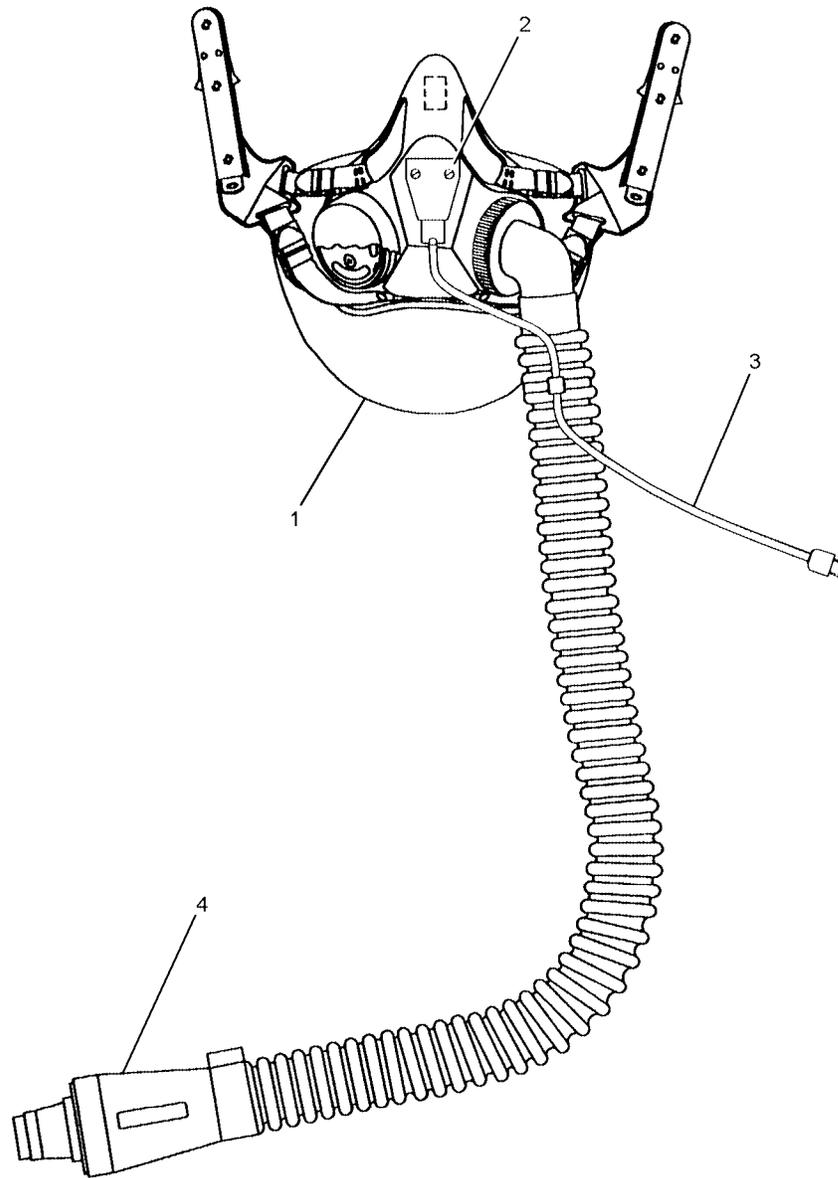
- 1. BASIC MASK
- 2. M22442/42-1 CABLE ASSY
- 3. CX-13017/AR CABLE ASSY
- 4. OXYGEN CONNECTOR, MS27796
- 5. M-101/AIC MICROPHONE ASSY/
AM-7067/A AMPLIFIER ASSY

Figure 6-3. MBU-23(V)3/P Oxygen Mask Assembly



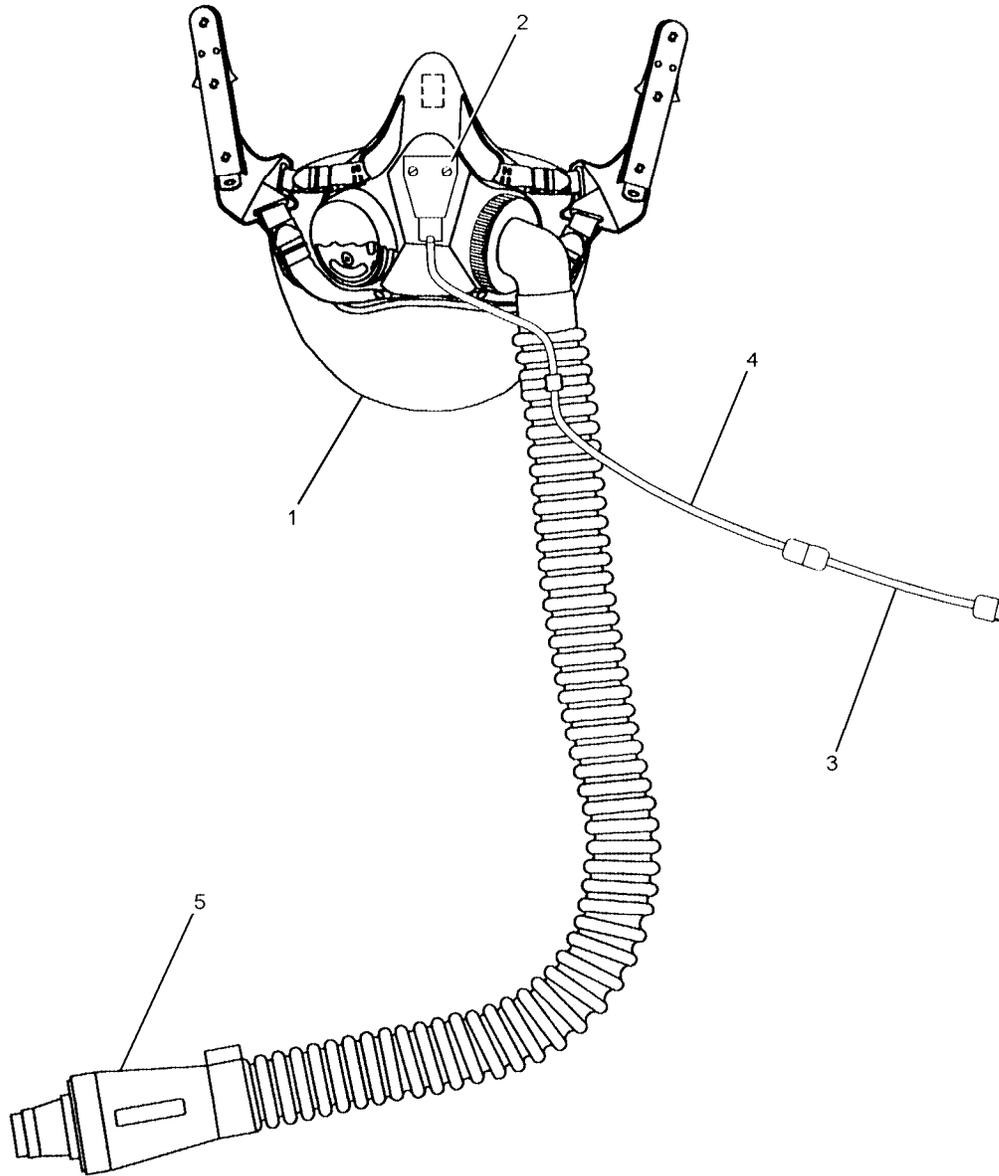
- 1. BASIC MASK
- 2. M-101/AIC MICROPHONE ASSY/
AM-7067/A AMPLIFIER ASSY
- 3. CX-13126A/A CABLE ASSY
- 4. OXYGEN CONNECTOR, MS27796

Figure 6-4. MBU-23(V)4/P Oxygen Mask Assembly



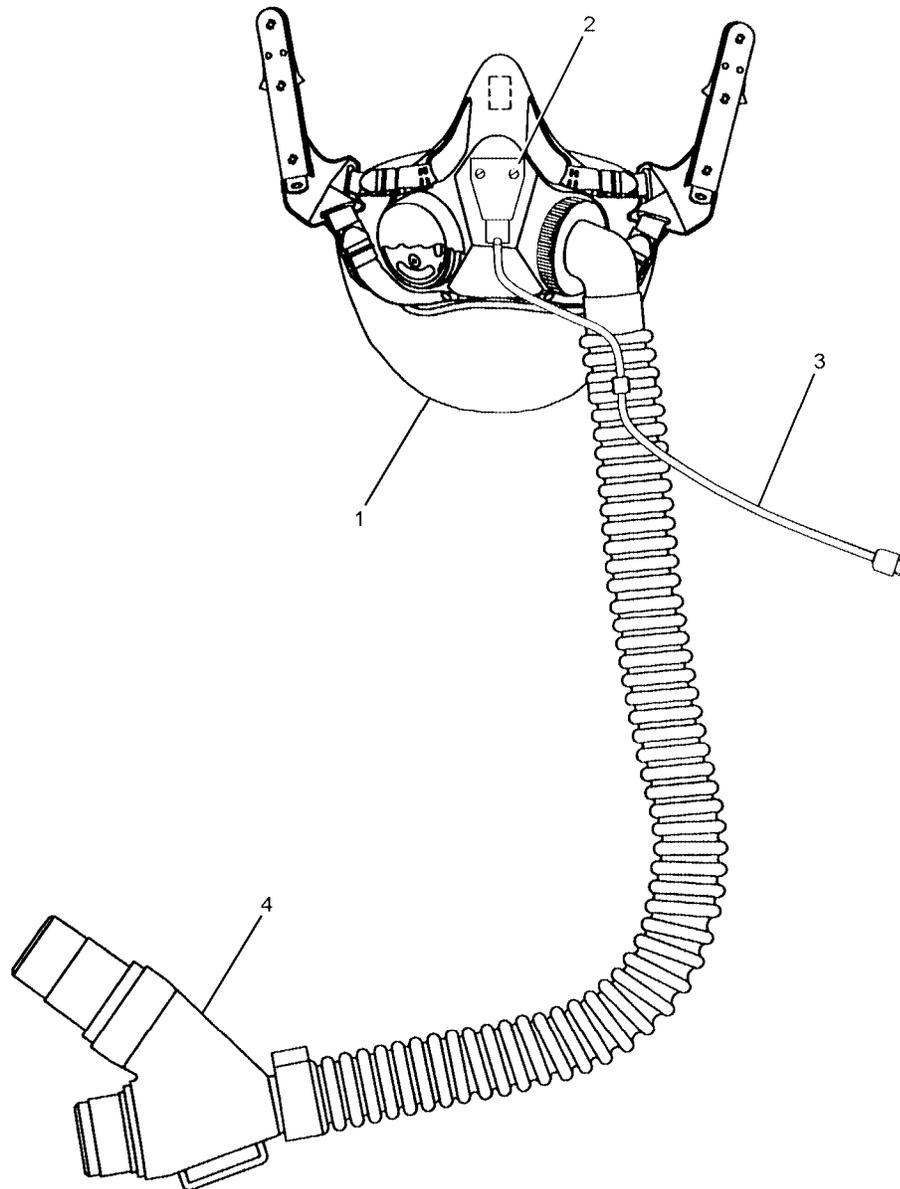
- 1. BASIC MASK
- 2. M-101/AIC MICROPHONE ASSY/
AM-7067/A AMPLIFIER ASSY
- 3. CX-13154/A CABLE ASSY
- 4. MC-3A OXYGEN CONNECTOR

Figure 6-5. MBU-23(V)5/P Oxygen Mask Assembly



1. BASIC MASK
2. M-101/AIC MICROPHONE ASSY/
RECEPTACLE
3. CX-13154/A CABLE ASSY
4. CX-4434U/16IN CABLE ASSY
5. MC-3A OXYGEN CONNECTOR

Figure 6-6. MBU-23(V)6/P Oxygen Mask Assembly



- 1. BASIC MASK
- 2. M-101/AIC MICROPHONE ASSY/
AM-7067/A AMPLIFIER ASSY
- 3. CX-13154/A CABLE ASSY
- 4. CRK-90 OXYGEN CONNECTOR

Figure 6-7. MBU-23(V)7/P Oxygen Mask Assembly

6-22. SIZING AND FITTING.

6-23. The concept of sizing as used in this section refers to the basic method used by the Aircrew Survival Equipmentman to determine proper size mask to order for a specific crewmember. Once the proper size mask has been obtained, desired configuration and fitting can be accomplished.

NOTE

The MBU-23/P oxygen mask shall be procured open purchase or GSA contract directly from the manufacturer at the following address:

Gentex Corporation
 11525 6th Street
 Rancho Cucamonga, CA 91730
 Telephone: (909) 481-7667
 Fax: (909) 481-7759

6-24. SIZING. There are four mask sizes available, small narrow, medium narrow, medium wide, and large wide. Refer to figure 6-8 and proceed as follows to determine individual crewmembers mask size.

1. Advise crewmembers to relax facial muscles and position jaw as it would normally be when wearing a mask.

2. Using sizing calipers, measure distance between nasal root and supramental as illustrated in figure 6-8. Compare caliper measurement to a standard millimeter scale and refer to Sizing Chart in figure 6-8 to obtain mask size.

3. If measurement is near a size boundary, try both sizes for comfort before selecting one for fitting.

6-25. FITTING. When proper size mask has been obtained, the crewmember must wear the mask during fitting process. If eyeglasses are normally worn, the glasses must also be worn during fitting. When glasses and mask are donned, proceed as follows.

1. Don properly fitted helmet.
2. With mask straps loosened, don mask and insert bayonets into the bayonet receivers to the second click.
3. While holding mask centered on crewmember's face, have crewmember tighten mask straps evenly to achieve centered fit. Check to ensure there is no twisting or bunching of mask straps. The straps should be taut and the mask should feel comfortable, but snug.
4. Lower helmet visor to ensure mask is centered on crewmember's face. The mask and visor should be in alignment. Adjust straps as necessary until centered fit is achieved.

5. After mask has been on for a few minutes, have mask removed and look for signs of non-uniform pressure. Re-adjust straps and repeat step 4 as necessary to obtain uniform fit.

6. If prominent cheekbones or eyeglasses prevent uniform pressure, especially in the nose/nasal root region, try next larger or smaller mask size and repeat steps 2 thru 5.

NOTE

If crewmembers wearing a large wide or medium wide mask has a comfortable, stable fit, but experiences leakage in the cheek area during use, try next smaller size mask.

7. If mask fitting procedures in steps 1 through 6 do not correct pressure problems in cheekbone and nose/nasal root area, the hardshell may require alteration.

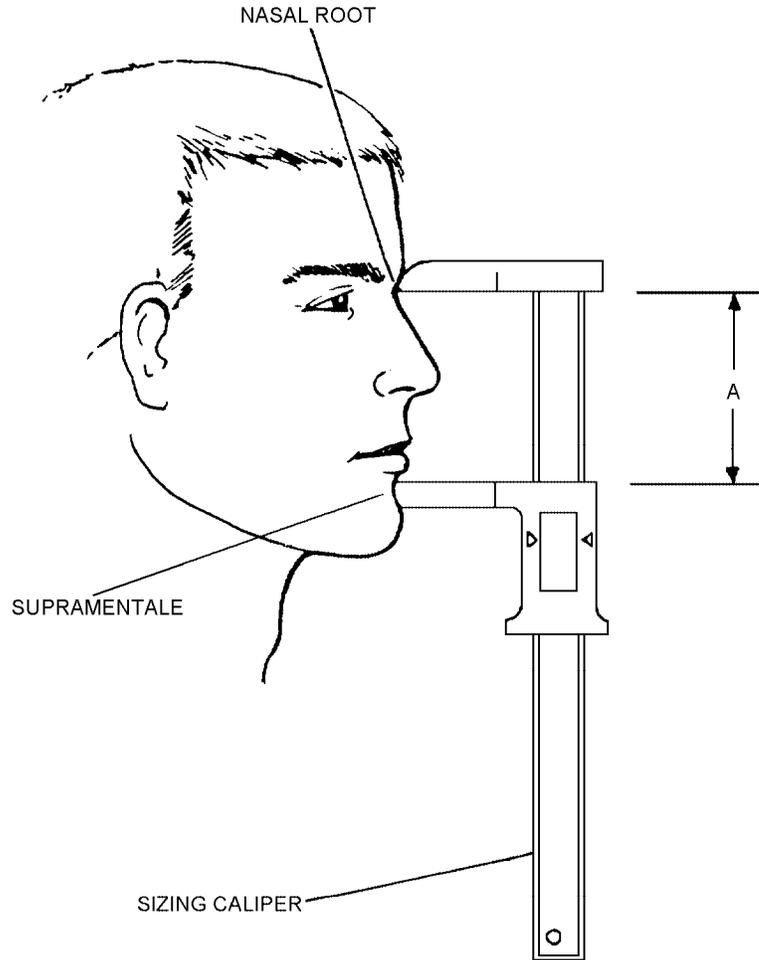
6-26. Hardshell Alteration. If hardshell requires alteration to ensure proper fitting of the mask, material may be removed using a file as follows:

Materials Required		
Quantity	Description	Reference Number
1	Tiedown Strap	MIL-S-23190 NIIN 00-984-6582
As Required	Isopropyl Alcohol	TT-I-735 NIIN 00-286-5435



Do not remove any material from the hardshell any closer than 1/4 inch of the valsalva ports.

1. Mark the area from which material must be removed from the hardshell. Exercise care not to remove anymore material than is necessary to achieve a proper fit.
2. Remove microphone assembly.
 - a. Press red button on the U-173/U plug and disconnect plug from the AM-7067A/A amplifier.
 - b. Remove two mounting screws from amplifier.
 - c. Without twisting, gently pull the amplifier away from the microphone bracket.
 - d. Remove microphone bracket with attached microphone element from the inside of the mask.
3. Remove inhalation valve, exhalation valve, and compensation tube.



NASAL ROOT = DEEPEST IMPRESSION OF THE NOSE LINE

SUPRAMENTALE = DEEPEST IMPRESSION BETWEEN THE LOWER LIP AND THE CHIN

SIZING CHART

MASK SIZE	FACE LENGTH A (MILLIMETERS)
SMALL NARROW	LESS THAN 87
MEDIUM WIDE; MEDIUM NARROW	87 TO 100
LARGE WIDE	MORE THAN 100

Figure 6-8. Face Measurement

NAVAIR 13-1-6.7-3

- a. Remove exhalation valve cover.
- b. Unthread Inhalation valve elbow from mask.
- c. Using spanner wrench, remove exhalation valve lockring from valve on outside of mask.
- d. Using spanner wrench, remove inhalation valve lockring from valve on outside of mask.

WARNING

Handle the delicate compensation tube with care. It is critical to proper operation of the exhalation valve. If kinks, twists, or other damage exists, the exhalation valve may not function properly.

- e. Remove inhalation valve, exhalation valve, and compensation tube from mask by pushing valves through to inside of mask. The compensation tube easily slips off and on the inhalation and exhalation valve ports.
4. Separate the facepiece from the hardshell.
 5. Using a hand file, remove material from the area marked in [step 1](#).
 6. Clean hardshell using isopropyl alcohol and let air dry.
 7. Reassemble mask.
 - a. Insert facepiece into hardshell and align inhalation and exhalation valve openings (see [figure 6-23](#)).

NOTE

Ensure inhalation and exhalation valves are installed in correct positions. Viewing inside of mask, the inhalation valve is on the left.

The soft rubber facepiece acts as the gasket for sealing the valves in place. Ensure facepiece material is not pinched between threads and hardshell.

b. Note alignment of keyways and insert threaded components of inhalation and exhalation valves through the mask from inside. Ensure holes in facepiece and hardshell are properly aligned.

c. Install exhalation valve lockring, with flat side of lockring to outside, and tighten with spanner wrench. Do not over-tighten.

d. Install and tighten inhalation lockring using spanner wrench, observing same precautions as in [step c](#). Do not over-tighten.

NOTE

Check exhalation valve cover for proper fit.

e. Install rubber exhalation valve cover over outer exhalation valve lockring. Ensure openings in cover are oriented down.

WARNING

The delicate compensation tube is critical to the function of the exhalation valve. Ensure tube is free of kinks, twists, and other damage.

f. If compensation tube has become disconnected, reconnect tube to inhalation and exhalation valve compensation tube ports. Ensure connections are secure and there are no kinks or twists in the compensation tube.

WARNING

Cross threading may give a false indication that inhalation valve elbow is properly tightened. A cross-threaded elbow may separate during flight.

g. Install washer and carefully thread inhalation valve elbow onto inhalation valve and hand tighten. Check to ensure cross thread did not occur.

h. Position microphone bracket with attached microphone element inside the mask.

i. Position amplifier on the outside of the mask and press the amplifier connector pins, through the facepiece holes, into the microphone bracket without twisting. Install amplifier attaching screws and secure the amplifier to the microphone bracket. Do not over-tighten screws.

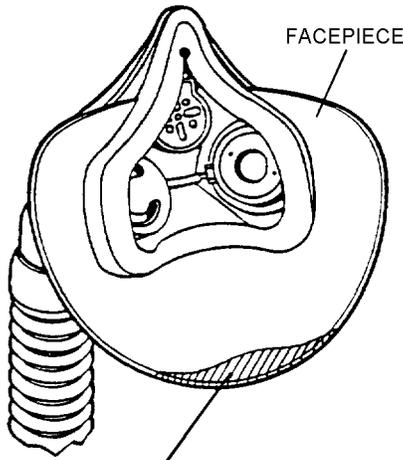
- j. Insert U-173/U plug into AM-7067A/A amplifier ensuring red locking button engages.
- k. Test microphone assembly for proper operation.

NOTE

The test should be performed using Oxygen Hose and Communications Test Set TTU-489/E in accordance with NAVAIR 17-15BC-22. If Test Set TTU-489/E is not available, standard shop procedures shall be used to test the microphone assembly.

6-27. Softshell (Facepiece) Trimming. If necessary for crewmembers comfort, the facepiece may be trimmed in the area under the chin as follows:

- 1. Mark the area of the facepiece to be trimmed.



MARK THIS AREA NO MORE THAN 1/2 INCH AT CENTER AND BLEND INTO CONTOUR OF FACEPIECE EDGE AS SHOWN

Step 1 - Para 6-27

6p27s1

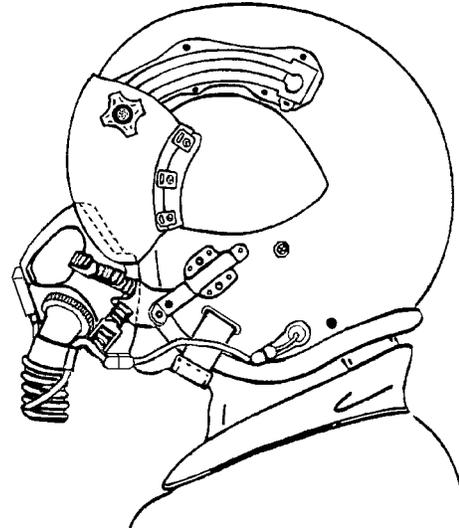
NOTE

Maximum depth trimmed shall not exceed 1/2 inch from the center edge nor extend laterally above the jawline.

- 2. Using small scissors carefully remove area marked for trimming in [step 1](#). Blend trim area with contour of facepiece edge so there will be no sharp corners.
- 3. Check mask for proper fit. Repeat above steps as necessary. But do not exceed maximum depth of 1/2 inch from center edge of facepiece.

6-28. Visor/Mask Interface Adjustment. Before the function of the oxygen mask, visor, and helmet can be considered acceptable, all three units must interface properly. Refer to [Chapter 4](#) for helmet, visor, and mask configurations. Check interface of mask and visor as follows:

- 1. With visor down, check that visor contacts hardshell of mask between back edge of valsalva port and rear edge of hardshell. If aircrewmember wears glasses, check for interference with visor.



Step 1 - Para 6-28

6p28s1

- 2. If adjustments are necessary for standard visors:
 - a. Lower visor to in-service position.

NOTE

If no light is visible to wearer between mask and visor, the visor does not need to be trimmed.

- b. Place lens snugly around nose section of oxygen mask and along masks suspension strap.



Care must be taken during trimming and sanding procedure to avoid scratching or marring lens.

- c. If lens need to be trimmed, using a hand electric grinder, carefully grind visor lens away until lens follow contour of the mask. Remove no more than 1/8 inch of lens at a time. Trim slowly, ensure edges are even, and check fit with wearer frequently. After proper fit has been achieved, remove sharp edges using No. 240 grit sandpaper.

6-29. CONFIGURATION BUILD-UP.

6-30. Refer to [figure 6-1](#), Oxygen Mask Configuration Matrix, for components applicable to individual mask configurations and [figure 6-4](#) for installation of components.

6-31. INSTALLATION OF BAYONET RECEIVER ASSEMBLY. To install the bayonet receiver assembly, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
1	Bayonet Receiver Assembly	93A8514 (CAGE 97427)
1	Bayonet, LH	G013-1000-01 -or- P/N 70280-10 NIIN 00-186-0276
1	Bayonet, RH	G013-1000-02 -or- P/N 70280-20 NIIN 00-186-0277
As Required	Adhesive, Polychloroprene, Class 3	MIL-A-5540 NIIN 00-515-2246
As Required	Adhesive, RTV 102/732	MIL-A-46106 NIIN 00-877-9872
As Required	Thread, Nylon, Type E	V-T-295 NIIN 00-244-0609



Ensure that TPL assembly and chin/nape strap assembly are properly fitted and adjusted to aircrewmember's head prior to drilling holes in helmet shell assembly. Location/alignment of the bayonet receiver assembly is critical, since the bayonet receivers are not adjustable.

1. Have aircrewmember don properly fitted helmet assembly.

NOTE

Aircrewmembers who will be wearing personal prescription glasses, aviator sunglasses, or laser spectacles during flight, should be wearing those items while fitting the mask.

2. With helmet properly fitted and oriented on head, have aircrewmember hold oxygen mask in proper position on face. Lower visor until contours of mask and visor are fully mated. Lock visor in place.

3. Insert each bayonet of oxygen mask harness assembly into a bayonet receiver to the second locking position. The projections on bayonet receiver should be positioned toward the tip end of the oxygen mask bayonet.

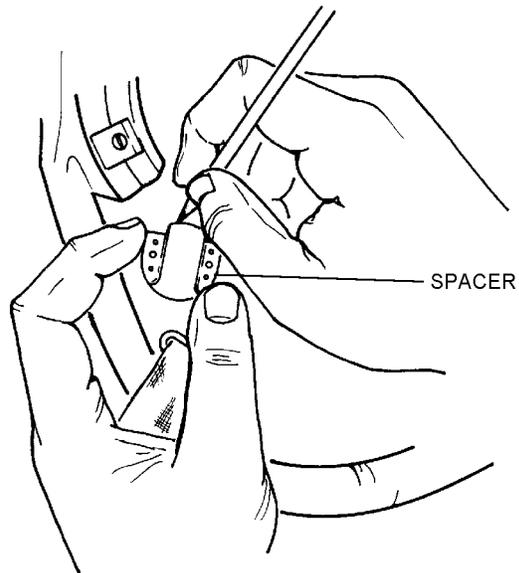
4. While aircrewmember holds properly adjusted oxygen mask to face, ensure that the straps of the oxygen mask have equal tension.

NOTE

Ensure that placement of bayonet receivers is no closer than 1/2 inch from edge of helmet shell assembly.

5. While holding bayonet receivers firmly against the helmet shell assembly, ensure upper edge of bayonet offset is flush with helmet shell assembly edge roll ([figure 6-9](#)). Then, trace outline of each bayonet receiver with a lead pencil onto the helmet shell assembly. Do not use marker or grease pencil.

6. While holding only the bayonet receiver spacers against the helmet shell assembly at marked positions, use a lead pencil to mark the location of the upper receiver screw hole onto the right and left hand sides of the helmet shell assembly.



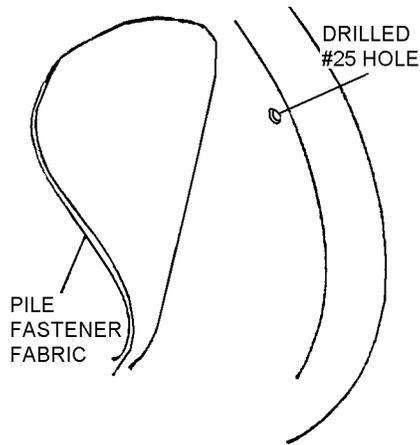
Step 6 - Para 6-31

6p31s6

NOTE

When drilling holes in helmet shell assembly, ensure that drill is held perpendicular to helmet shell assembly.

7. Remove mask and helmet from wearer and remove earcup assemblies. Hold pile fastener fabric inside helmet shell assembly away from area to be drilled. At the marked hole locations, drill each screw hole using a number 25 drill.



Step 7 - Para 6-31

6p31s7

NOTE

A small amount of RTV may be applied to the first few threads of screws prior to installation.

8. Attach only right and left hand receivers to helmet shell assembly using the upper screw, lock washer, and backup plate. Do not tighten screw more than four turns, allowing the assembly to rotate to its optimum location for the user, during mask fitting.

9. Reinstall earcup assemblies and have aircrewmember don helmet assembly and oxygen mask assembly, again inserting each bayonet into the second locking position of receiver.

NOTE

When experiencing difficulty inserting the bayonet into the bayonet receiver due to helmet shell edgeroll interference, fabricate and install bayonet receiver shims in accordance with paragraph 6-32, Steps 1 through 4.

10. Readjust the straps on the mask tightening upper left and lower right straps together, keeping mask centered on face and equalizing tension on straps. While tightening straps, allow bayonet receivers to rotate freely to their optimum location for the individual. Lower visor and tighten visor knob. Visor cutout should mate with mask profile. Ensure comfortable, air tight fit of the mask is achieved by having crewmember breathe while manually twisting the oxygen hose to cut off air supply through hose. If leaks occur between mask and face, check the following:

- a. Assure proper mask size has been issued (refer to paragraph 6-24).
- b. Check fit of nape strap.

11. Using the receiver as a template, mark position of the remaining holes in the right and left hand receivers onto the helmet shell surface with a lead pencil. Have aircrewmember remove helmet and mask. Detach earcups from helmet shell interior and remove installed receivers.

12. Drill remaining holes following procedures detailed in Step 7 above. Install spacers and receivers onto helmet shell at drilled locations using screws, lock washers, and backup plates. Tighten mounting screws securely ensuring receiver and spacer conform to the contour of the helmet surface.

13. Glue down pile fastener tape over backup plate.

14. Replace earcup assemblies.

15. Perform functional check in accordance with paragraph 6-49.

6-32. FABRICATION AND INSTALLATION OF BAYONET RECEIVER SHIMS. These shims provide increased bayonet receiver height to alleviate edgeroll induced bayonet/bayonet receiver interface problems. Fabricate shims as follows:

Materials Required		
Quantity	Description	Reference Number
1	Spacer, Bayonet	80B4858 NIIN 01-141-5916
4	Screw, Pan Head, 6-32 x .500-Inch, Black	MS51957-30B NIIN 00-469-5382
As Required	Adhesive, Polychloroprene, Class 3	MIL-A-5540 NIIN 00-515-2246
As Required	Adhesive, RTV 102/732	MIL-A-46106 NIIN 00-877-9872

NOTE

Shims are fabricated from spacers provided in kit P/N 80B4858. Shims are intended for use by aircrewmembers experiencing difficulty inserting the bayonet into the receiver due to helmet shell edgeroll interference.

1. Remove spacers from the package and perform the following procedure on each spacer.

NAVAIR 13-1-6.7-3

a. Position a spacer between the jaws of a bench vise with one raised projection facing the technician and clamp in place. Using a rotary hand tool (dremel) with a grinding drum or a rough cut hand file, grind or file raised projection flush with adjacent surface of spacer. Loosen vise and position remaining raised projection into position, clamp in place and repeat grinding/filing procedure.

b. Smooth uneven surfaces to a uniform height using a jeweler's file.

2. Detach right and left earcups from helmet shell earcup cavity pile fastener material and position clear of work area. Pull installed pile fastener material away from the interior surface of the earcup cavity and fold clear of work area.

3. Remove four screws, lock washers and backup plates securing installed spacers and receivers to helmet shell exterior, discard screws but retain remaining items for use during reinstallation.

NOTE

A small amount of RTV may be applied to each screw prior to adding lock washer and backup plate.

4. Using screws P/N MS51957-30B, lock washers and backup plate, reinstall shim, spacer and receiver onto helmet shell exterior. Ensure concave surface of shim is flush with helmet shell exterior prior to securing in place.

5. Cement pile fastener material into place on interior surface of earcup cavity.

Table 6-4. Installation of Components

Component	Paragraph
M-101/AIC Microphone and Receptacle	6-33
M-101/AIC Microphone	6-34
AM-7067A/A Amplifier	6-34
MS27796 Connector	6-40
MC-3A Connector	6-38
CRK-90 Connector	6-38
CX-13126A/A (M22442/26-3) Cable Assembly or CX-13127/A (M22442/42-1) Cable Assembly	6-36
CX-13017/AR (M22442/24-1) Cable Assembly	6-37
CX-13154/A Cable Assembly	6-35
CX-4434/U, 16-Inch Cable Assembly	6-35
Bayonet Receiver Assembly	6-31
Regulator-to-Seat Kit Hose Assembly	6-39
Torso/Chest Mounted Regulator	6-40

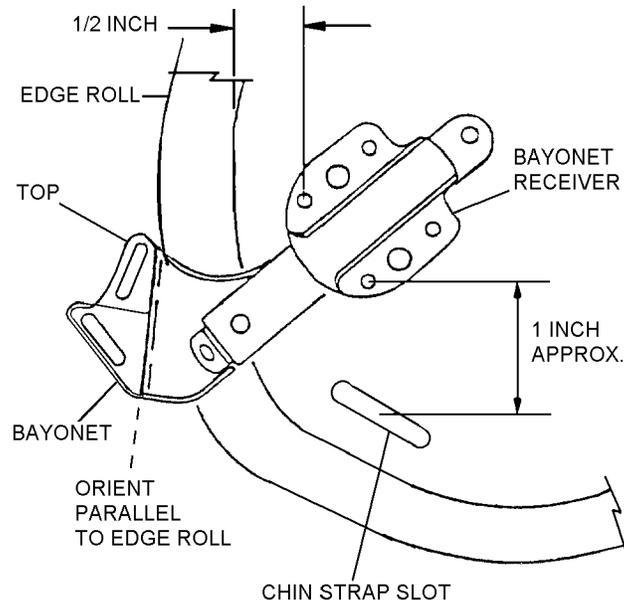


Figure 6-9. Positioning Bayonet Receivers

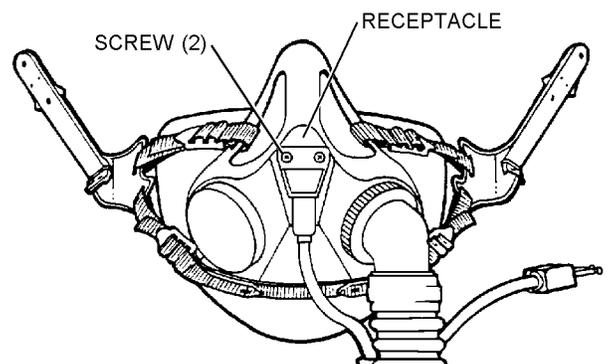
6-9

6-33. INSTALLATION OF M-101/AIC MICROPHONE ASSEMBLY AND RECEPTACLE ASSEMBLY (MBU-23(V)6/P ONLY). The M-101/AIC microphone assembly is installed as follows:

1. Remove two screws from receptacle assembly.

Materials Required

Quantity	Description	Reference Number
1	Microphone Assembly	M-101/AIC (CAGE 16575) NIIN 00-843-9957
2	Screw, Machine 2-56 x 5/16-Inch	MS35275-204 (CAGE 96906) NIIN 00-948-4042



Step 1 - Para 6-33

6p33s1

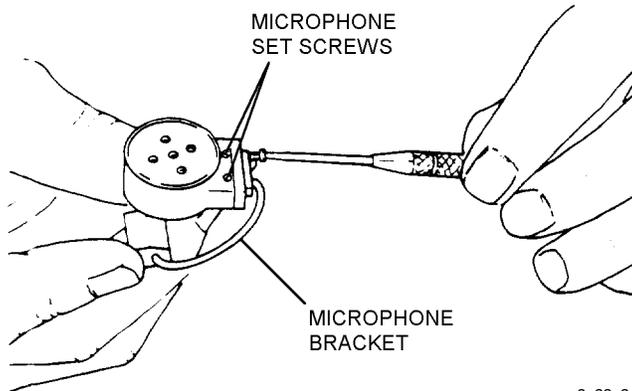
CAUTION

When removing receptacle assembly use care not to damage gasket.

2. Inside mask, separate microphone bracket from receptacle assembly.

NAVAIR 13-1-6.7-3

3. Install microphone onto bracket and secure with two attaching screws; ensure set screws are tight.



Step 3 - Para 6-33

CAUTION

Ensure screws are tight enough to form a good seal between connector and mask hardshell. However, do not strip screws or crack receptacle by over tightening. Over tightening may also damage internal communication wires.

NOTE

Aircrewmembers may experience a slight electrical shock when the face or lips touch the microphone set screws. In these cases, install the microphone backwards such that the set screws face away from the mouth. The microphone should perform satisfactorily when speaking into either side.

4. Place receptacle assembly in position on hardshell of mask and install microphone bracket inside mask and align with receptacle assembly.

a. Ensure proper seating of receptacle assembly and good gasket seal. Attach with two screws removed in step 1.

NOTE

Crewmembers may experience high noise level when completed mask and helmet assembly are donned. Proper positioning of M-101/AIC microphone can reduce the noise level.

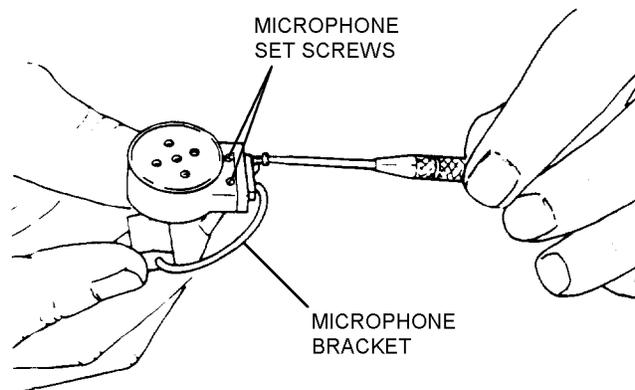
5. Position M-101/AIC microphone so it is not in direct line with oxygen flow. Push microphone back against mask hardshell.

6-34. INSTALLATION OF M-101/AIC MICROPHONE AND AM-7067A/A AMPLIFIER. Install the M-101/AIC microphone and AM-7067A/A amplifier as follows:

Materials Required

Quantity	Description	Reference Number
1	Microphone Assembly	M-101/AIC (CAGE 16575) NIIN 00-843-9957
2	Screw, Machine 2-56 x 5/16-Inch	MS35275-204 NIIN 00-948-4042
1	Amplifier Assembly, AM-7067A/A	M23595 (CAGE 81349) NIIN 01-310-6240
1	Gasket, Amplifier	G012-1141-01 NIIN 01-314-9930
2	Screw, Machine 2-56 x 3/4-Inch	AN500D2-5
1	Bracket Assembly, Microphone, Oxygen	P/N 00-6268 NIIN 01-113-8365

1. Install microphone element onto microphone bracket pins, secure in place using two 2-56 x 5/16-inch long screws, then tighten the two microphone set screws.

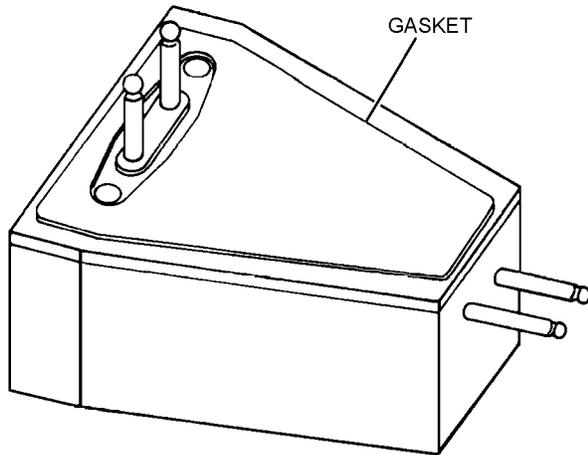


Step 1 - Para 6-34

NOTE

Amplifier gaskets can be ordered separately. Use care when removing and installing.

2. Place amplifier gasket on amplifier.



Step 2 - Para 6-34

6p34s2



Ensure screws are tight enough to form good seal between amplifier and hardshell, but do not strip screw threads or crack amplifier.

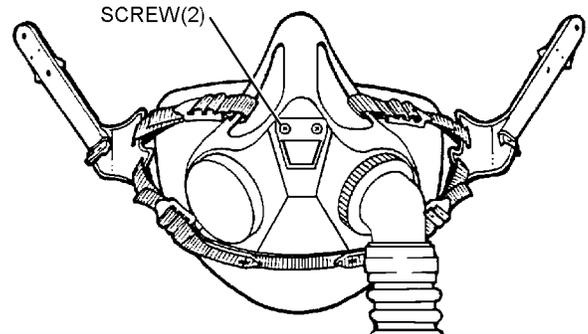
NOTE

Ensure correct screws are used to attach amplifier.

Aircrewmembers may experience a slight electrical shock when the face or lips touch the microphone set screws. In these cases, install the microphone backwards such that the set screws face away from the mouth. The microphone should perform satisfactorily when speaking into either side.

3. Install microphone and bracket into mask and align with amplifier.

- a. Ensure proper seating of amplifier and good gasket seal. Attach using two screws P/N AN500D2-5.



Step 3a - Para 6-34

6p34s3a

6-34A. INSTALLATION OF P/N N100493-00 MICROPHONE/AMPLIFIER 10 VOLT ASSEMBLY ON THE MBU-23(V)8/P (MV-22 OXYGEN MASK). To install the microphone/amplifier 10 volt assembly P/N N100493-00 on the MBU-23(V)8/P oxygen mask for use in the MV-22 aircraft, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Microphone/ Amplifier, 10 Volt, Oxygen Mask	P/N N100493-00 NIIN TBD (Not [])
2	Screw machine, 2-56 x 3/4 inch	MS35275-209 NIIN 00-941-3545
1	Cable, Branched, Electrical, CX-4434/U 16 Inch	P/N 57C12661-1-2-1-4 (CAGE 80058) NIIN 00-890-8614
1	Connector	MS27796 NIIN 01-703-4187

Notes: 1. Microphone /Amplifier, 10 Volt assembly P/N N100493-00 is commercially available from:
Gentex Corporation
Derry, NH
(603) 434-3002

1. Open package and remove amplifier and gasket. Position amplifier gasket on amplifier.



Ensure that screws are tight enough to form a good seal between the amplifier and the mask hardshell, but do not strip screws or crack amplifier.

NOTE

The screws removed during step 1 are not long enough for attachment of the amplifier.

2. Place amplifier with gasket into position on the mask hardshell with the electrical contact pins protruding into the interior of the mask facial cavity.

3. While holding amplifier in place on hardshell exterior, push microphone bracket firmly onto amplifier contact pins.

4. Insert 2-56 x 3/4-inch long screws through amplifier body into microphone bracket and tighten. Ensure proper seating of amplifier and good gasket seal.

6-35. INSTALLATION OF CABLE ASSEMBLIES CX-13154/A (MBU-23(V)5/P, MBU-23(V)6/P, AND MBU-23(V)7/P ONLY) AND CX-4434/U, 16 INCH (MBU-23(V)6/P ONLY). The following procedures are applicable to installation of both the CX-13154/A and CX-4434/U cable assemblies.

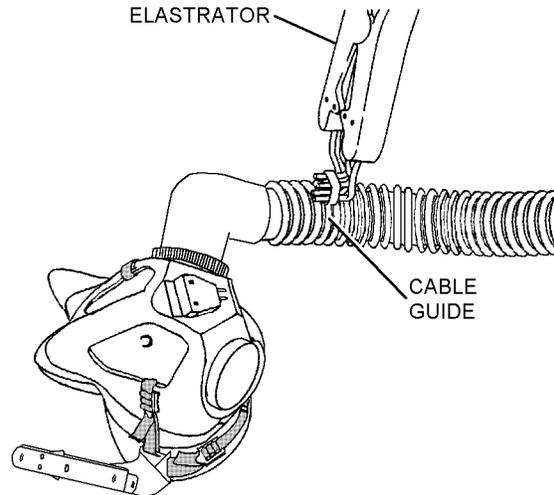
Materials Required

Quantity	Description	Reference Number
1	Cable Assembly, CX-13154/A	P/N 765AS380-1 NIIN 01-135-4320
1	Cable Assembly, CX-4434/U, 16-Inch	P/N 57C12661-1-2-1-4 (CAGE 80058) NIIN 00-890-8614



Do not overexpand cable guides with elastrator. Expand only enough to pass cable assembly through opening.

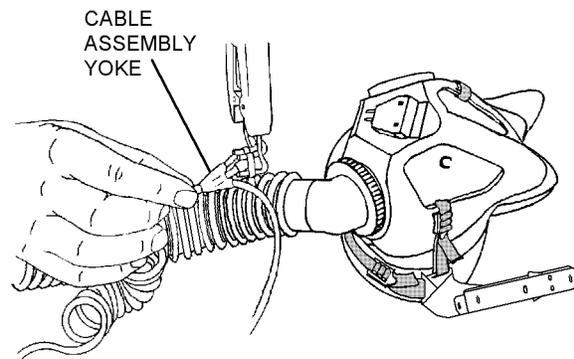
1. Pass elastrator (P/N 00-6297) through opening in upper cable guide on delivery hose and stretch open.



Step 1 - Para 6-35

6p35s1

2. Insert the nub on yoke of upper portion of cable assembly into the opening of the cable guide and remove elastrator.



Step 2 - Para 6-35

6p35s2

3. Let cable assembly hang loosely from delivery hose.

4. Connect cable to corresponding receptacle, amplifier, or cable assembly.

6-36. INSTALLATION OF CX-13126A/A (MBU-23(V)2/P AND MBU-23(V)4/P) OR CX-13127/A (MBU-23(V)3/P ONLY) CABLE ASSEMBLIES. The CX-13126A/A cable assembly is installed as follows:

NOTE

The CX-13126A/A cable assembly was modified by Avionics Change No. 1248 and redesignated CX-13126A/A.

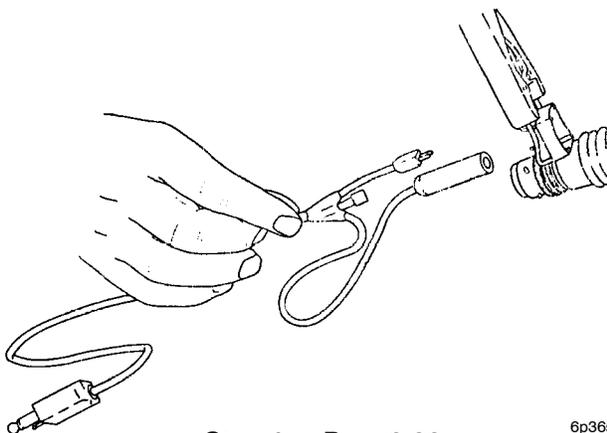
Materials Required

Quantity	Description	Reference Number
1	Cable Assembly, CX-13126A/A	M22442/26-3 NIIN 01-209-3117
As Required	Tape, Electrical, Black, 3/4-Inch	MIL-I-24391 NIIN 00-419-4291
1	Cable Assembly, CX-13127/A	M22442/42-1 NIIN 01-309-4909



Do not overexpand cable guides with elastrator. Expand only enough to pass cable assembly through opening.

1. Insert elastrator (P/N 00-6297) through opening in lower cable guide and expand the opening.
 - a. Insert upper portion of cable assembly through opening in cable guide.

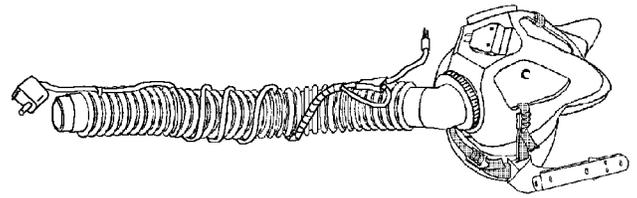


Step 1a - Para 6-36

6p36s1a

- b. Feed cable through opening until approximately 6 inch of cable remains below the cable guide.
 - c. Remove elastrator.

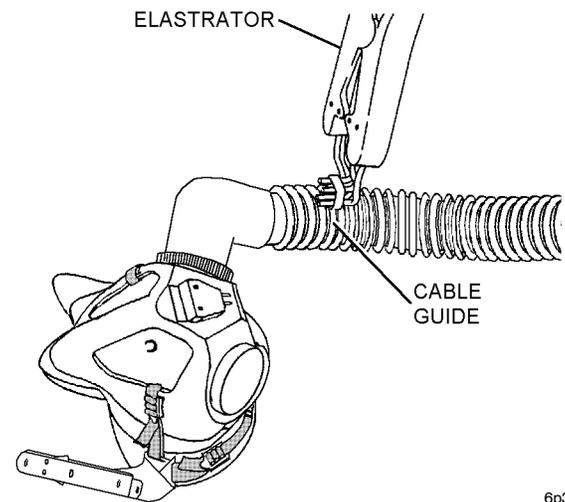
2. Wrap cable around delivery hose.



Step 2 - Para 6-36

6p36s2

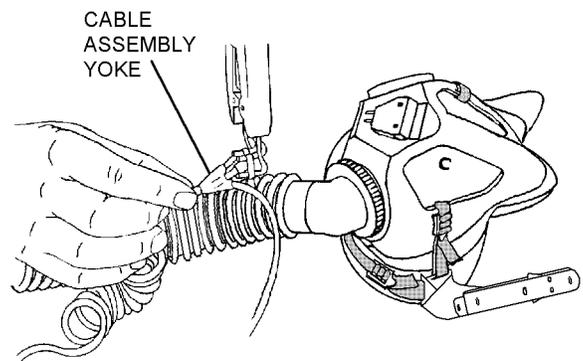
3. Pass elastrator through opening in upper cable guide and expand opening.



Step 3 - Para 6-36

6p36s3

- a. Insert nub of cable yoke on upper portion of cable assembly through expanded cable guide opening and remove the elastrator.



Step 3a - Para 6-36

6p36s3a

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b. Connect cable assembly with corresponding receptacle assembly, amplifier assembly, or cable assembly.

6-37. INSTALLATION OF CX-13017/AR 40-INCH CABLE ASSEMBLY. The 40-inch cable assembly completes the communication cable setup required between helmet cable (CX-13128/A) and the cable assembly attached to the oxygen hose. The 40-inch CX-13017/AR cable assembly is installed as follows:

Materials Required

Quantity	Description	Reference Number
1	Cable Assembly, CX-13017/AR, 40-Inch	MIL-C-81866AS P/N 1099AS102
2	Strap, Tiedown, Electrical	MS3367-1-9

1. Position the 40-inch cable assembly on regulator-to-seat kit hose assembly (P/N 33C1178) so the male communication jack extends just below the fitting on the lower end of the regulator-to-seat kit hose.

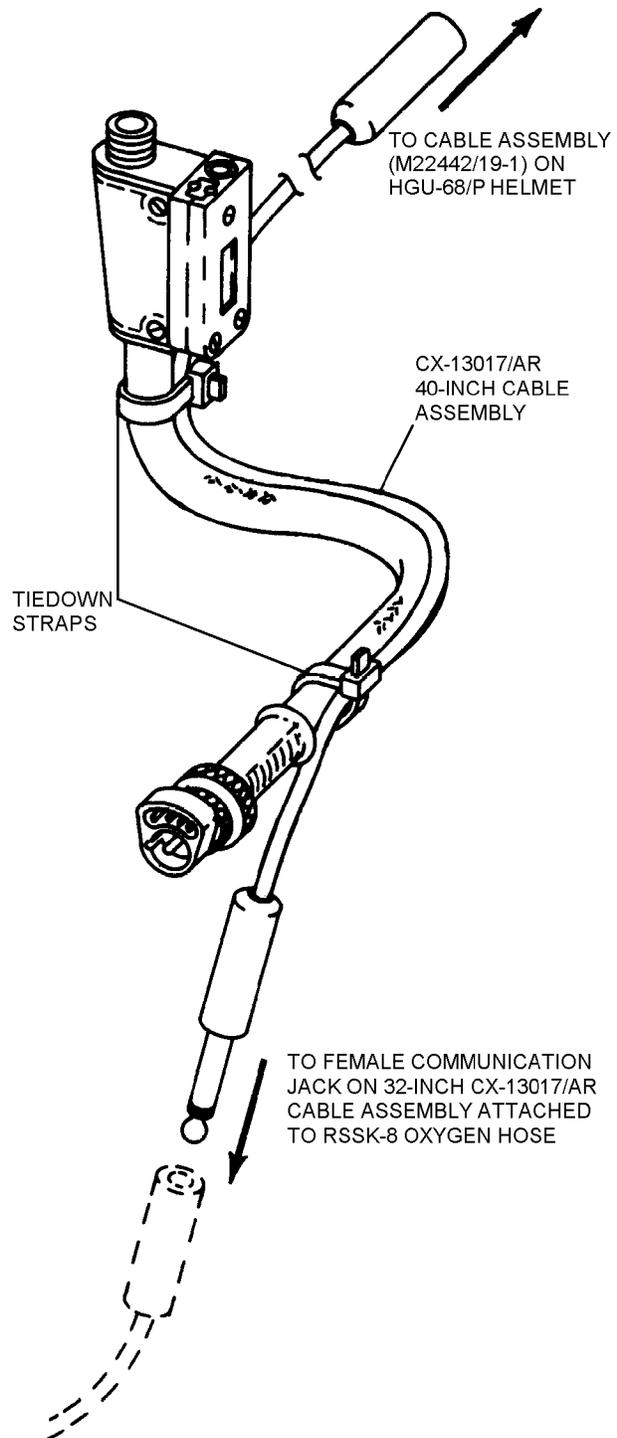
2. Secure the 40-inch cable assembly to the regulator-to-seat kit hose using two tiedown straps.

3. Ensure straps are tight; cut off excess length of tiedown strap after tightening.

6-38. INSTALLATION OF MC-3A OR CRK-90 CONNECTOR FOR PANEL-MOUNTED REGULATORS, WALK-AROUND UNITS, AND BAILOUT BOTTLES. Install connectors as follows:

NOTE

If oxygen mask bag is to be used, it must be fabricated and installed before installing MC-3A connector. Refer to [Chapter 5](#) for fabrication procedures.



Steps 1 thru 3 - Para 6-37

6p37s1

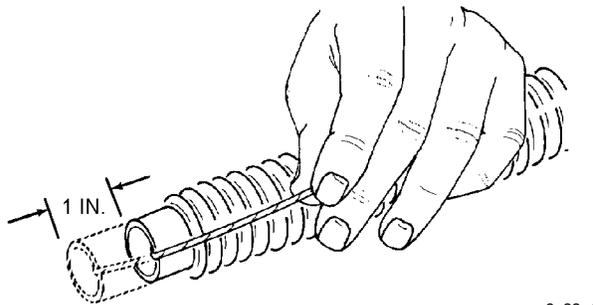
Materials Required

Quantity	Description	Reference Number
1	Connector, MC-3A	MS22016-1 NIIN 00-694-8121
	-or-	
1	Connector, CRK-90	P/N 123AB50534-5 (CAGE 26912)
1	Hose Clamp Pliers (See note)	P/N 450-813 (CAGE 53655) NIIN 01-073-4187
As Required	Hose Clamp	P/N 450-134A -or- MS22064-5

NOTE

If installing electrical tiedown strap instead of hose clamp, pliers are not required.

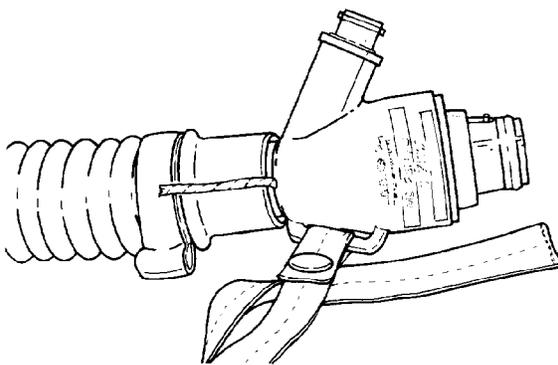
1. Route strain relief cord outside of delivery hose assembly. Adjust cord so there is no more than 1 inch extension of delivery hose when hose is grasped at each end and stretched. Mark hose accordingly.



Step 1 - Para 6-38

6p38s1

2. Install connector into delivery hose assembly.



Step 2 - Para 6-38

6p38s2

WARNING

Do not reuse two locking position hose clamps.

CAUTION

Tighten mask hose clamp only enough to retain and seal delivery hose on connector. An excessively tightened clamp may damage hose or connector.

NOTE

If tiedown straps are to be used instead of hose clamp, refer to [paragraph 6-60](#) for tiedown strap installation.

3. Using hose clamp pliers, install hose clamp over strain relief cord and lower end of delivery hose and tighten.

4. Cut off excess length of relief cord leaving no more than 1/2 inch extending past clamp.

5. Position lower cable guide over lower hose clamp.

6-39. INSTALLATION OF CRU-79/P MINIATURE REGULATOR AND REGULATOR-TO-SEAT KIT HOSE ASSEMBLY. To install the CRU-79/P Series miniature regulator and regulator-to-seat kit hose assembly, proceed as follows:

NOTE

If the oxygen mask bag is to be used, it must be fabricated and installed prior to installing the miniature regulator. Refer to [Chapter 5](#). The installation of the CRU-79/P miniature regulator is shown in these procedures. The installation of other miniature regulators is similar.

Materials Required

Quantity	Description	Reference Number
1	Miniature Oxygen Breathing Regulator (CRU-79/P)	P/N 900-002-025-05 -or- P/N 900-002-025-03 -or- 29267-A1 -or- 3260024-0101
1	Hose Clamp Pliers	P/N 450-813 (CAGE 53655) NIIN 01-073-4187

NAVAIR 13-1-6.7-3

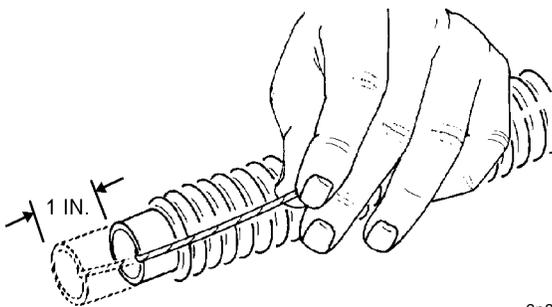
Materials Required (Cont)

Quantity	Description	Reference Number
1	Regulator-to-Seat Kit Hose Assembly	P/N 12080-2 (CAGE 31441) NIIN 00-915-4603 -or- P/N 33C1178-1 (CAGE 80206) NIIN 00-915-4603
1	Locknut	P/N B122-2P2 NIIN 00-715-2761
1	Nipple Adapter	P/N 1-8FGD NIIN 00-433-2506
1	Elbow, 90°	AN911-1D

NOTE

If installing electrical tiedown strap instead of hose clamp (P/N 450-134A or P/N MS22064-5) pliers are not required.

1. Route cord outside tube assembly. Adjust so that there is no more than 1-inch extension in delivery tube when pulled from each end.



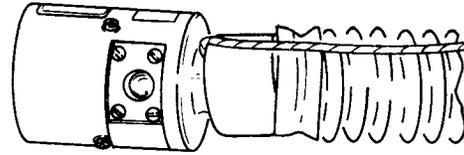
6p39s1

Step 1 - Para 6-39

NOTE

The CRU-79/P regulator is shown here for illustration purposes only.

2. Install CRU-79/P regulator into tube assembly.



6p39s2

Step 2 - Para 6-39

WARNING

Do not reuse two locking position hose clamps.

CAUTION

Tighten mask hose clamp only enough to retain and seal the delivery tube on the CRU-79/P regulator. An excessively tightened clamp may damage the tube or regulator assembly. Be careful not to bend hook on clamp during installation.

NOTE

Electrical tiedown straps may be used in place of mask hose clamps (P/N 450-134A or P/N MS22064-5), refer to [Chapter 5](#) for tiedown strap installation.

3. Using hose clamp pliers, install hose clamp over nylon cord and lower end of tube assembly and tighten. Ensure hook is fully inserted into notch of clamp, and that hook is not bent.

4. Cut off excess nylon cord so that there is no more than 1/2 inch of cord extending past clamp.

5. Lower cable guide over lower hose clamp.

NOTE

(CRU-79/P P/N 900-002-025-05 only) The locknut is not required on the 90° elbow. The 90° elbow male threads shall be wrapped with two turns of antisieze tape (MIL-T-27730) prior to installation [step 8](#).

(CRU-79/P P/N 900-002-025-05 only) The type regulator already has a 90° elbow installed, [steps 9](#) and [10](#) apply for installation only.

During installation of the locknut onto the fittings installed [steps 6, 7, and 8](#). The locknut should be threaded onto the seat-kit hose, 90° elbow and adapter hand tight. Ensure a minimum of two to three full threads are showing on fittings prior to installation of components, the locknuts may have to be tightened to achieve the two to three threads.

6. Thread one locknut onto regulator-to-seat kit hose connection. Teflon face on locknut shall face toward female port of adapter assembly. See [figure 6-10](#).

7. (CRU-79/P series regulators without installed 90° elbow only) Thread one locknut onto male-threaded portion of 90° elbow. Teflon face of locknut shall face toward the regulator during installation of the 90° elbow. See [figure 6-10](#).

8. (CRU-79/P series regulators without installed 90° elbow only) Thread 90° elbow into inlet port of regulator hand tight. Using a wrench tighten 90° elbow a minimum of one full turn. An additional one turn can be used as required until 90° elbow is tight and orientation of female port of the fitting is pointing the opposite direction of the regulator outlet. Tighten locknut until flush with regulator body, once flush tighten locknut an additional one quarter of a turn until tight. See [figure 6-10](#).

9. (All CRU-79/P series regulators) Thread one locknut onto male-threaded portion of nipple adapter coupling (see [figure 6-10](#)). Teflon face on locknut shall face toward 90° elbow during installation. Thread nipple adapter coupling into 90° elbow hand tight. Using a wrench tighten adapter coupling one turn. An additional one turn can be used if required until adapter is tight. Tighten locknut until flush with 90° elbow, once locknut is flush tighten locknut an additional one quarter of a turn or until tight. See [figure 6-10](#).

10. Thread regulator-to-seat-kit hose into nipple adapter a minimum of two full turns until tight and proper orientation is achieved (see [figure 6-10](#)). Tighten locknut until locknut is flush with the nipple adapter, once locknut is flush with nipple adapter tighten locknut an additional one quarter of a turn or until tight.

11. Connect communication leads as required.

6-40. INSTALLATION OF THE TORSO/CHEST MOUNTED OXYGEN REGULATOR AND REGULATOR-TO-SEAT KIT HOSE ASSEMBLY. To install the

oxygen regulator and regulator-to-seat kit assembly, proceed as follows:

NOTE

If the oxygen mask bag is to be used, it must be fabricated and installed prior to installing the regulator. Refer to paragraph [Chapter 5](#).

The S-3 Series aircraft has been authorized to use the CRU-79/P miniature regulator. Refer to [paragraph 6-39](#) for installation instructions.

Materials Required		
Quantity	Description	Reference Number
1	Demand Oxygen Torso-Mounted Regulator (Type CRU-103/P)	P/N F241-2300-3 (CAGE 04577)
	-or-	
1	Positive Pressure Torso-Mounted Regulator (Type CRU-88/P)	P/N 2900W000-001 (CAGE U1605)
1	Regulator-to-Seat Kit Hose Assembly	P/N 57012-3-2 NIIN 01-407-0686 -or- P/N MBEU148020 (CAGE U1604) NIIN 01-407-0686 -or- P/N A11206-2 (CAGE 28845) NIIN 01-169-6129
1	Elbow, 45°	AN915-1D
1	Elbow, 90°	AN911-1D
1 (If Required)	Connector	MS27796 NIIN 01-730-2247
1 (If Required)	Hose Clamp Pliers (See note)	P/N 450-813 (CAGE 92114) NIIN 01-073-4187
1	Locknut	P/N B122-2P2 NIIN 00-715-2761
1	Nipple Adapter	P/N 1-8FGD NIIN 00-433-2506
1	Adapter, Straight Flared	P/N 1643340-1 or P/N 1643340-2
1	Adapter, 90° Elbow	P/N 1654461-1
As Required	Tape, Anti-Seize	MIL-T-27730

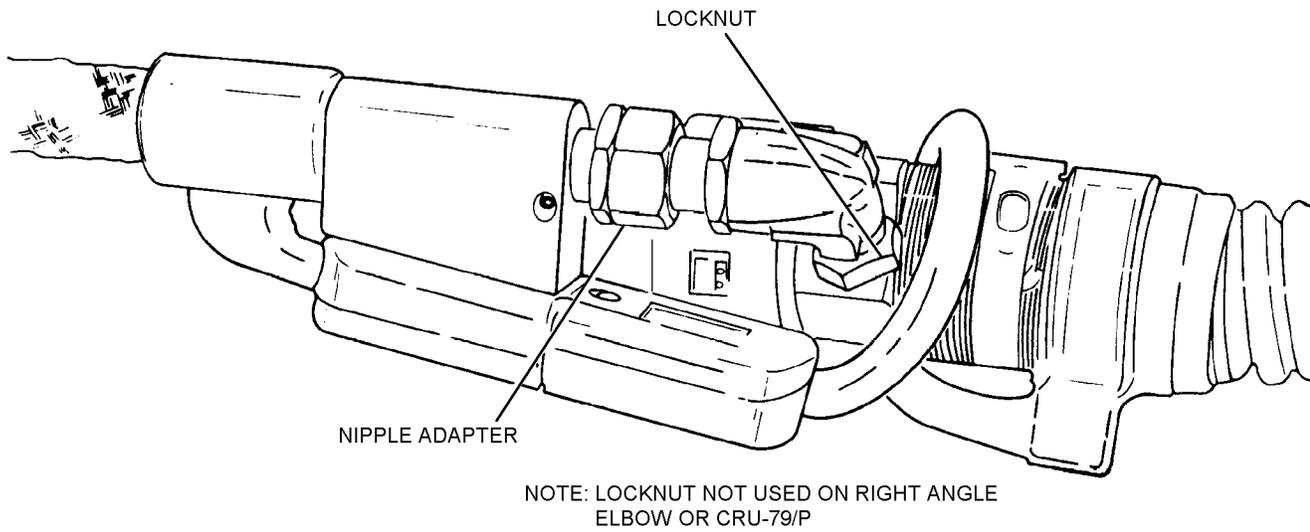


Figure 6-10. Assembly of Hoses to the CRU-79/P Series Regulator

6-10

Figure 6-11. Deleted

NOTE

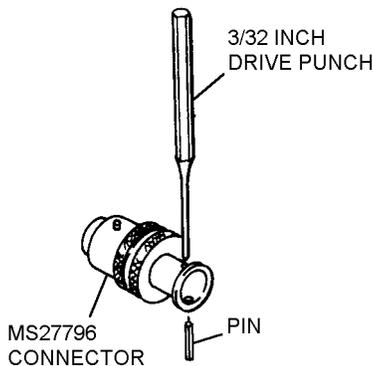
Aircrewmembers may choose one of two adapters available for use on the CRU-82/P regulator, P/N 326005-0401. One is the straight flared adapter, P/N 1643340-1 and -2. The other is a modified 90 degree elbow adapter, P/N 1654461-1. The 90 degree adapter is authorized only if its use will not cause excessive bends while routing the seat kit hose.

If installing electrical tie down strap instead of hose clamp (P/N 450-134A or P/N MS22064-5), pliers are not required.



Care should be taken when removing pin from connector not to damage shell of connector.

1. Using 3/32-inch drive punch, remove pin from connector.



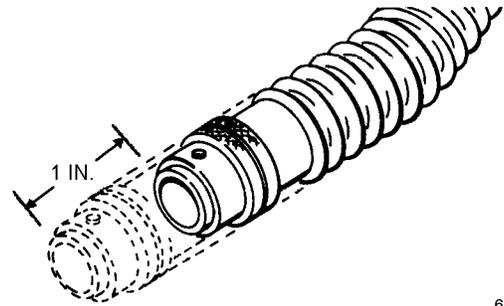
Step 1 - Para 6-40

6p40s1



Care should be taken to avoid damage to connector shell when inserting pin into connector.

2. Install cord and snap assembly to MS27796 connector; replace pin and slide connector into delivery tube.
3. Ensure that there is no more than 1-inch extension in delivery tube when pulled from each end. If necessary, remove connector from delivery tube and adjust length of cord.



Step 3 - Para 6-40

6p40s3



Do not reuse two locking position hose clamps.



Tighten mask hose clamp only enough to retain and seal the delivery tube on the CRU-79/P regulator. An excessively tightened clamp may damage the tube or regulator assembly.

Carefully avoid puncturing or otherwise damaging delivery tube with hose clamp tool or screwdriver.

NOTE

For ease of removing (or installing) hose clamps, place a small screwdriver under and slightly behind the hook.

If installing electrical tiedown strap in place of hose clamp (P/N 450-134A or MS22064-5), pliers are not required. Refer to [paragraph 6-60](#) for tiedown strap installation.

4. Using hose clamp pliers, install hose clamp over nylon cord and lower end of tube assembly and tighten.
5. Lower cable guide over lower hose clamp.
6. Inspect regulator inlet and outlet for foreign objects, dirt, corrosion, bends, dents, cracks, and other damage. Ensure that regulator inlet filter screen is properly installed.



When attaching regulator to oxygen mask assembly, cut and discard cord holding dust cap to regulator housing. Retain dust cap in organizational work center and use only for storage or when regulator has been removed from the oxygen mask assembly for maintenance. Do not allow dust cap to remain on regulator when regulator and mask assembly are joined as a unit.

7. With a push-down, twisting motion, install regulator to the MS27796 connector on end of oxygen mask delivery hose.

NOTE

LOX aircraft only with CRU-79/P and CRU-103/P regulators. Refer to paragraph 6-39 for regulator oxygen hose connection.

8. For OBOGS regulators only, thread regulator-to-seat kit hose connection onto regulator nipple adapter coupling hand tight. Using two wrenches, hold inlet fitting at regulator inlet port and tighten oxygen seat kit hose B nut one to two turns maximum until tight.

9. Wrap communication lead around hose to eliminate slack and couple together.

Figure 6-12. Deleted

Figure 6-13. Deleted

6-41. MAINTENANCE.

6-42. Aircrew maintenance of the MBU-23(V)/P series oxygen mask shall be limited to Preflight and Postflight inspections and routine cleaning. All other maintenance actions such as scheduled inspections, in-depth cleaning, and repairs shall be performed by qualified Organizational Maintenance personnel. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

6-43. INSPECTION. Inspection of the MBU-23(V)/P series oxygen masks shall consist of Place-In-Service, Preflight, Postflight, and Special inspections.

6-44. Place-In-Service Inspection. Prior to being placed in service the oxygen mask shall be visually inspected in accordance with paragraph 6-47 and cleaned in accordance with paragraph 6-51.

6-45. Preflight/Postflight Inspection. A Preflight/Postflight inspection shall be performed by the crewmembers to whom the oxygen mask and regulator-to-seat kit

hose assemblies are assigned prior to and after every flight. The inspections shall be visual inspections in accordance with paragraphs 6-47 and 6-48.

6-46. Special Inspection. Special inspections shall be performed by organizational maintenance personnel in service and every 30 days thereafter. The inspection shall consist of visual inspection of the oxygen mask and regulator-to-seat kit assembly in accordance with paragraphs 6-47 and 6-48, thorough cleaning in accordance with paragraph 6-51, and functional check of the mask assembly in accordance with paragraph 6-49.

6-47. Visual Inspection of Oxygen Mask Assembly. The visual inspection of the oxygen mask assembly shall consist of the following:

1. Oxygen delivery hose for cuts, breaks, dust, and dirt. Replace cut or split delivery tubes, clean dirty delivery tubes in accordance with paragraph 6-51.
2. Inhalation and exhalation valves for fit and seal. Refit valves into seats or replace inhalation or exhalation valves that will not achieve a proper seal.



Do not pull on microphone assembly.

3. Microphone assembly for damage, loose connection, and proper seating. Replace defective microphone assembly.

4. Facepiece assembly for damage and deformation. Replace damaged or deformed facepiece.

5. Communication cable for cuts and split or abraded insulation. Small areas of abrasion may be covered with electrical tape, cut or split insulation may require cable replacement.

6. Offset bayonets for proper operation.

7. Security of hose clamps. Tighten or replace loose hose clamps.

8. Delivery hose tolerance in accordance with paragraph 6-53.

6-48. Visual Inspection of Regulator-To-Seat Kit Hose. The visual inspection of the regulator-to-seat kit hose shall consist of the following:

NOTE

Perform visual inspection on attached oxygen regulator in accordance with NAVAIR 13-1-6.4-2.

1. Hose for damage, wear, fraying, and kinks.

- 2. Quick disconnects for operation, damage, corrosion, and loose or missing pins.
- 3. Cleanliness and presence of foreign matter.
- 4. Housing for damage, discoloration, and wear.
- 5. Fittings for damaged threads, rounded hexagonal flats, security of attachment to regulator, and corrosion.

6-49. FUNCTIONAL CHECK OF OXYGEN MASK AND REGULATOR-TO-SEAT KIT HOSE. Functional check of the oxygen mask assembly and regulator-to-seat kit hose should be performed using Test Set TTU-489/E in accordance with NAVAIR 17-15BC-22.

6-50. DISASSEMBLY. Disassembly of the MBU-23(V)/P series oxygen mask shall be only to the extent necessary to replace a damaged part or cleaning in accordance with [paragraph 6-51](#). Disassemble mask as follows:

NOTE

Disassembly of the mask is performed after delivery hose has been disconnected from the inhalation valve elbow and from the regulator/connector and the lower end of the strain relief cord has been released. In addition, if disassembly is for cleaning purposes, the upper and lower cable guides with attached communications cable are removed from the delivery hose.

- 1. Remove microphone assembly.
 - a. Push red button on U-173/U plug and disconnect plug from the AM-7067A/A amplifier.



Do not twist or turn amplifier while disconnecting.

- b. Remove two amplifier attaching screws and gently pull amplifier away from the microphone bracket assembly.
 - c. Remove microphone bracket with attached microphone element from inside of mask.
- 2. Remove inhalation valve, exhalation valve, and compensation tube.
 - a. Remove exhalation valve cover.
 - b. Unthread inhalation valve elbow from valve and remove from mask pulling attached strain relief cord from delivery hose.

- c. Using spanner wrench, remove exhalation valve locking from valve on outside of mask.
 - d. Using spanner wrench, remove inhalation valve locking from valve on outside of mask.



Handle delicate compensation tube with care. It is critical to proper operation of the exhalation valve. If any kinks, twists, or other damage to the tube exists, the exhalation valve may not function properly.

- e. Remove inhalation valve, exhalation valve, and compensation tube from the mask as one unit by pushing the valves from the outside of the mask through to the inside. The compensation tube is then easily removed from the compensation ports of the inhalation and exhalation valves.

- 3. Separate facepiece from hardshell.

6-51. CLEANING AND SANITIZING. Cleaning and sanitizing of the MBU-23(V)/P series oxygen masks shall be performed only by authorized Aviation Survival Equipment personnel. Cleaning and sanitizing shall be performed as often as in-service conditions require, but not less than once every 30 days. Masks not on a personal issue basis shall be cleaned and sanitized after every use. Cleaning and sanitizing shall be performed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Gauze Pads, Absorbent	CCC-G-101
As Required	Bleach, Laundry	O-S-602 NIIN 00-598-7316
As Required	Detergent, General Purpose, Type I	MIL-D-16791 NIIN 00-282-9699
	-or-	
As Required	Soap, Laundry, Low-Filter	P-S-600
As Required	Isopropyl Alcohol	TT-I-735 NIIN 00-286-5435
As Required	SANI-COM 3205	SC3205 (Not)

Notes: 1. Open Purchase from:
Celeste Industries Corp
7978 Industrial Park Rd.
Easton, MD 21601
(401) 822-6200

NAVAIR 13-1-6.7-3

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Cotton Swabs	6003-0019 NIIN 01-362-5829
As Required	Towelettes	MILP36792 NIIN 00-786-3736

CAUTION

Do not use Methyl Ethyl Ketone (MEK) on or near oxygen mask. The face piece and/or hardshell may craze or crack if it comes in contact with MEK.

1. Disassemble oxygen mask in accordance with [paragraph 6-50](#).
2. Inspect each component in accordance with [paragraph 6-47](#).
3. Prepare preferred cleaning solution.
 - a. Using General Purpose Detergent, make a 1 percent by weight cleaning solution by adding 1/4 to 1/2 ounce (liquid) detergent to one gallon of water.

CAUTION

When necessary to use a substitute cleaning solution, only the lather from the solution shall be used for cleaning. This prevents undissolved soap particles from getting into the valves.

- b. Using a substitute cleaning compound such as Low-Filter Laundry Soap, P-S-600, add approximately 4 tablespoons of soap powder to one gallon of water. Hardness of the water may require use of more soap powder, but the solution must be sufficiently strong to readily form lather when agitated. Make sure all soap is dissolved.

CAUTION

Ensure cleaning solution does not enter inhalation/exhalation valve assemblies.

Use only the lather of a substitute cleaning solution.

4. Moisten a gauze pad with cleaning solution.

- a. Clean facepiece inside and out.

- b. Use cotton swabs to clean under nose bridge portion of mask.

5. After cleaning mask, thoroughly and repeatedly rinse mask in warm water.

6. After mask is dry, disinfect with a solution of 1/3 cup of liquid bleach per gallon of water using gauze pads or other lint-free wipes. Ensure disinfectant reaches inner crevices of face form. Rinse with clean water and air dry.

WARNING

Isopropyl alcohol is flammable. Keep away from heat, sparks, and open flame. Avoid prolonged breathing of vapors. Keep container closed.

7. Clean inhalation and exhalation valves using isopropyl alcohol.

- a. Use clean small container large enough to submerge valve assembly.

- b. Fill container half full with isopropyl alcohol.

CAUTION

Do not submerge unprotected oxygen (inhalation) valve.

Do not probe any portion of the valve.

Do not allow isopropyl alcohol to enter compensation tube port(s), it may cause malfunction of exhalation valve.

- c. With inhalation and exhalation valves still connected to the compensation tube, cover the compensation inlet hole of the inhalation valve ([figure 6-14](#)) tightly with finger and submerge valves, washers, and lockrings in isopropyl alcohol. Using gauze pad or other lint-free cloth, wipe washers, lockrings, and valve threads clean.

- d. Using cotton swab saturated with isopropyl alcohol, remove stubborn residue from inhalation valve. Lightly rub exhalation valve seat. Depress poppet and clean between poppet and seat.

- e. Gently shake excess alcohol from inhalation and exhalation valves and allow to air dry.

8. Wash delivery hose and PGB supply hose in clean isopropyl alcohol. Rinse in clean clear water and allow to air dry.

6-51A. SANITIZING NON-PERSONAL ISSUE MASKS. Masks not on a personal issue basis shall be sanitized after each use as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Bleach, Laundry	O-S-602 NIIN 00-598-7316

1. Prepare a sanitizing solution by mixing 1/3 cup of liquid bleach with 1 gallon of water.

2. Moisten a gauze pad with bleach solution and squeeze to prevent dripping. Wipe interior of mask, exclusive of valves and microphone, ensuring that sanitizing solution penetrates all crevices.

3. Wipe interior dry with a clean, lint-free cloth. Ensure all sanitizing solution is dried from mask interior.

6-52. ASSEMBLY. Assemble the MBU-23(V)/P series oxygen mask and perform functional test of microphone assembly. For best results, the test should be performed using test set TTU-489/E in accordance with NAVAIR 17-15BC-22. The TTU-489/E is presently the only test unit which can perform this test. If test set is not available, use standard shop procedures to test the microphone assembly.

WARNING

The delicate compensation tube is critical to the function of the exhalation valve. If improperly installed with kinks, twists, or other damage, the compensation tube may malfunction.

Cross threading could give the false indication that inhalation valve has been properly tightened and could separate during flight.

NOTE

Ensure inhalation and exhalation valves are reinstalled in their proper positions. Viewing the interior of the facepiece, the inhalation valve should be installed on the left and the exhalation valve on the right.

The soft rubber of the facepiece serves as a gasket for sealing the valves in place. Ensure facepiece material is not pinched between threads and hardshell.

6-53. OXYGEN MASK DELIVERY HOSE TOLERANCE. Check delivery hose tolerance by grasping delivery hose by each end and extending hose to full extension permitted by the installed strain relief cord. The length of the extended hose shall not exceed tolerance of 1 inch beyond normal extension. If adjustment is necessary to bring hose within required tolerance, proceed as follows.

1. Remove tiedown strap securing delivery hose to oxygen regulator.
 - a. Using diagonal cut pliers cut the head of tiedown strap in half laterally from above. Do not attempt to cut under tiedown strap head (see [figure 6-15](#)).

- b. Separate delivery hose from oxygen regulator.

NOTE

Separating delivery hose from regulator also releases lower end of strain relief cord.

2. Holding strain relief cord as it extends from end of delivery hose, grasp delivery hose at each end and extend hose to its normal length. Hold the cord in place and mark cord where it exits from the end of the hose.
 - a. Fold exposed relief cord back over the delivery hose and install regulator on end of hose. Ensure marked position on cord is still at exit point from hose.
 - b. Install tiedown strap, or hose clamp, over cord and lower end of hose assembly.
 - c. Check cord length and tolerance. Cut off excess cord so no more than 1/2 inch extends beyond tiedown strap/clamp.

6-54. REPAIR/REPLACEMENT. Repair of the MBU-23(V)/P series oxygen masks shall be limited to replacement of defective parts. Any holes or tears in any part of the facepiece or delivery hose shall be cause for rejection of that component.

6-55. Facepiece/Hardshell Retaining Strap Assembly Replacement. Refer to [paragraph 6-50](#) for details of disassembly.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295

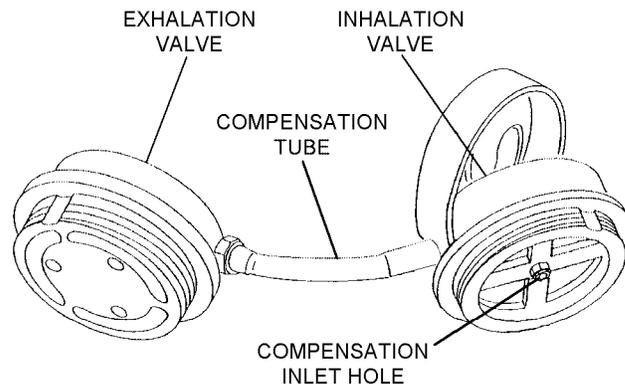


Figure 6-14. Cleaning Inhalation/Exhalation Valves

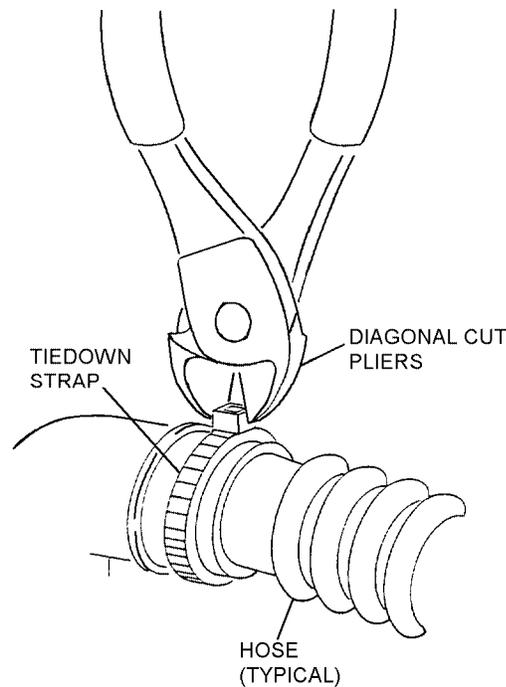


Figure 6-15. Tiedown Strap Removal

6-15

1. Disassemble mask in accordance with [paragraph 6-50](#).

a. Remove microphone bracket with attached microphone element.

b. Remove inhalation valve, exhalation valve, and compensation tube assembly.

c. Remove facepiece from hardshell.

2. Cut tacking, if installed, on retaining straps.

3. Remove retaining straps from buckles, facepiece, and both bayonets.

4. Remove bayonets.

5. Cut replacement retaining straps to size.

6. Thread straps through bayonets, facepiece, and retaining buckles.

7. Reinstall facepiece in hardshell.

8. Reinstall inhalation valve, exhalation valve, and compensation tube assembly into facepiece as a unit.

9. Reinstall microphone bracket with attached microphone element.

10. Perform functional test of microphone assembly.

NOTE

For best results, the functional test should be performed using TTU-489/E Test Set in accordance with NAVAIR 17-15BC-22. The TTU-489/E test set is presently the only test set available which can perform this test. If test set is not available, use standard shop procedures to functionally test the microphone assembly.

11. Perform fit check in accordance with [paragraph 6-25](#).

12. If desired by crewmembers, buckles may be tacked to retaining straps using two turns of size E nylon thread doubled. Tie with surgeons knot and secure with square knot.

6-56. Microphone Assembly Replacement. Refer to [paragraph 6-50](#) for details of disassembly and proceed as follows:

1. Push red button on U-173/U plug and disconnect plug from AM-7067A/A amplifier.



Do not twist or turn amplifier while separating it from the microphone bracket.

2. Remove two screws attaching amplifier to microphone bracket and carefully separate amplifier from bracket by pulling straight back on amplifier. Remove amplifier and set aside.

3. Remove microphone bracket with attached microphone element from inside mask.

NOTE

Aircrewmembers may experience a slight electrical shock when the face or lips touch the microphone set screws. In these cases, install the microphone backwards such that the set screws face away from the mouth. The microphone should perform satisfactorily when speaking into either side.

4. Loosen and remove the two screws securing the microphone element to the bracket assembly.

a. Dislodge RTV sealant, from the heads of the two set screws, if applied, loosen set screws and remove defective microphone element from bracket connector posts.

b. Install replacement microphone element onto bracket connector posts and secure in place using two screws removed during step 4.

c. Tighten set screws and apply RTV sealant over the screw heads.

5. Place amplifier in position on outside of mask, gently press amplifier connector pins through holes in facepiece and into microphone bracket receptacle. Secure amplifier to microphone bracket using two attaching screws removed in step 2. Do not over-tighten screws.

6. Insert U-173/U plug into amplifier and ensure red locking button engages.

7. Perform functional test of microphone assembly.

8. Document in accordance with OPNAVINST 4790.2 Series.

NOTE

For best results the functional test should be performed using TTU-489/E test set in accordance with NAVAIR 17-15BC-22. The TTU-489/E is presently the only test set available which can perform required test. If test set is not available, use standard shop procedures to test the microphone assembly.

6-57. Inhalation Valve, Exhalation Valve, and Compensation Tube Replacement Reference Figure 6-18, for component reference and paragraph 6-50 for details of disassembly and proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Valve Assembly, Inhalation	P/N G001-1077-01
	-or-	
1	Valve Assembly, Inhalation	P/N G010-1050-03
1	Valve Assembly, Exhalation	P/N G001-1010-03
1	Tube, Compensation	P/N G010-1058-01

1. Push red button on U-173/U plug and disconnect plug from amplifier.

2. Remove exhalation valve cover.

3. Unthread and remove inhalation valve elbow from mask.

4. Using spanner wrench, remove exhalation valve locking from outside of mask.

5. Using spanner wrench, remove inhalation valve locking from outside of mask.

6. Remove inhalation valve, exhalation valve, and compensation tube from mask as a unit by carefully pushing valves through to inside of mask.



Remove compensation tube carefully to avoid damage to tube.

NOTE

The following step is to be performed only if the compensation tube is to be replaced.

7. Carefully pull compensation tube from exhalation and inhalation valve ports. Do not twist tube. Retain tube for reinstallation or to aid in preparation of new compensation tube.

8. Prepare new compensation, as required, using old tube as a guide.

a. Trim non-flared end of new tube to same length as old tube.

b. If old tube is not usable as guide, cut new tube to 1 3/16 inch for wide mask, 7/8 inch for medium narrow mask, and 11/16 inch for small narrow mask.



The delicate compensation tube is critical to the proper operation of the exhalation valve. Any twists, kinks, or other damage could cause the exhalation valve to malfunction.

9. Reinstall compensation tube to exhalation valve and exhalation valves.

a. Carefully install compensation tube on exhalation valve compensation tube port, ensure no twists or kinks result.

b. Carefully install compensation tube on inhalation valve compensation tube port, ensure no twists or kinks result.



Ensure inhalation and exhalation valves are installed in correct positions. Viewing inside of mask, the inhalation valve is on the left and the exhalation valve is on the right.

NOTE

The soft rubber material of the facepiece serves as gasket for sealing valves in place. Ensure no facepiece material is pinched between threads and hardshell.

10. Ensure holes in facepiece and hardshell are aligned; carefully align keyways and insert threaded portion of inhalation and exhalation valves through mask from inside.

11. Ensure there are no twists or kinks in the compensation tube as installed. If necessary retrim the compensation tube and return to [step 9](#) above.

12. Reinstall exhalation valve lockring on outside of mask with flat side of lockring to outside. Hands tighten using spanner wrench.

13. Reinstall and hand tighten inhalation valve lockring on outside of mask using spanner wrench.

14. Reinstall exhalation valve cover over flat of lockring with openings in cover oriented downward.



Cross threading may give false impression that inhalation valve elbow is properly installed and tightened. Elbow could become loosened and separate during flight if not properly installed.

15. Install washer and carefully thread inhalation valve elbow onto inhalation valve.

16. Connect U-173/U plug to AM-7067A/A amplifier. Check to make sure red locking button is engaged.

NOTE

For best results the functional test should be performed using TTU-489/E test set in accordance with NAVAIR 17-15BC-22. The TTU-489/E is presently the only test set available to perform the required test. If test set is not available, use standard shop procedures to test microphone assembly.

17. Perform functional test of microphone assembly.

6-58. Oxygen Delivery Hose Replacement. Disconnect oxygen delivery hose from regulator. Refer to [paragraph 6-50](#) for details of disassembly and proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Strap, Tiedown, Electrical	MR-1-0 (CAGE 96303) NIIN 00-984-6382
As Required	Strap, Tiedown, Electrical	MR-4-0 (CAGE 96303) NIIN 00-903-2284
1	Hose, Oxygen Delivery	P/N G010-1025-01
As Required	Clamp, Adjustable	P/N MS22064-5
	-or-	
As Required	Clamp, Adjustable	P/N 450-134A
As Required	Strap, Tiedown Electrical	P/N MS3367-1-0 NIIN 00-984-6582

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1. Press red button on U-173/U plug and disconnect plug from amplifier.

2. Unthread inhalation valve elbow from mask.

3. Remove hose clamps or tiedown straps from upper and lower ends of delivery hose.

a. Remove hose clamps using hose clamp pliers and a small screwdriver.

b. To remove tiedown straps, refer to [figure 6-15](#) and use diagonal cut pliers.

4. Separate delivery hose from inhalation valve elbow and lower connector/regulator. Disconnect strain relief cord from the connector and slide delivery hose down over free end of strain relief cord.

5. Remove upper and lower cable guides, with communications cable attached, from delivery hose.

a. Remove upper and lower hose clamps using hose clamp pliers and small screwdriver. If installed, discard two locking position hose clamps.

b. To remove tiedown straps, refer to [figure 6-15](#) and use diagonal cut pliers.

6. Uncoil communications cable from around delivery hose.

7. If necessary, replace strain relief cord and attach replacement cord to inhalation valve connector pin with a larks' head knot.

8. Coil communications cable around delivery hose and slide upper and lower cable guides, with attached communications cable, onto delivery hose.

a. Position top end of delivery hose on inhalation valve elbow.

b. On lower end of delivery hose install regulator and strain relief cord in accordance with [paragraph 6-53](#).

9. Insert free end of strain relief cord through upper end of replacement delivery hose.

a. Slide upper end of delivery hose over inhalation valve elbow.

b. Attach free end of strain relief cord to connector in accordance with [paragraph 6-38](#) or if attaching regulator in accordance with [paragraph 6-39](#).

WARNING

Do not reuse two locking position hose clamps.

10. Install upper and lower hose clamps using hose clamp pliers, or install tiedown straps using tensioning tool adjusted to setting 3.

11. Insert U-173/U connector pins into amplifier and ensure red locking button engages.

12. Document in accordance with OPNAVINST 4790.2 Series.

6-59. Communication Cable CX-13126A/A Replacement. To replace the CX-13126A/A communications cable, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Cable Assembly, CX-13126A/A	P/N M22442/26-3 NIIN 01-209-3117

1. Push red button on U-173/U plug and disconnect plug from amplifier.

2. Remove nub of cable yoke assembly from upper cable guide.

3. Uncoil communication cable from around delivery hose.

4. Expand lower cable guide, using elastrator tool and remove upper portion of communication cable through lower cable guide.

5. Using an elastrator tool, expand lower cable guide and insert upper portion of replacement communications cable through expanded cable guide.

6. Coil cable around delivery hose.

7. Insert nub of cable yoke assembly through upper cable guide using an elastrator tool.

8. Insert U-173/U plug connector pins into amplifier and ensure red locking button engages.

9. Document in accordance with OPNAVINST 4790.2 Series.

6-60. INSTALLATION OF ELECTRICAL TIEDOWN STRAPS (OPTIONAL). If use of tiedown straps instead of hose clamps is desired, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Installation Tool	MS90387-1 (CAGE 28210) NIIN 00-781-7894
As Required	Strap, Tiedown, Electrical	MS3367-1-0 NIIN 00-984-6352

NOTE

Ensure tiedown strap tool has been lubricated with oxygen safe lubricant. List of safe lubricants can be found in NAVAIR 13-1-6.4-2, Chapter 3.

1. Install tiedown strap around delivery hose at desired location (upper and lower hose attachment points) with ribbed portion of tiedown strap inboard.



Ensure bottom end of oxygen delivery hose is flush against upper surface of connector or regulator to ensure proper seating of raised lip of connector/regulator coupling into mating groove of delivery hose. (Mating groove of hose is located on interior surface of each end of delivery hose).

2. Thread tip of tiedown strap, from left to right through eye of strap boss. Cinch strap snugly around oxygen delivery hose at inhalation valve elbow or regulator connection.

3. Set tension selector knob for width of tiedown strap being installed.

NOTE

The correct setting for installation tool P/N MS390387 is standard (STD) when installing tiedown strap P/N MS3367-1-0. The setting is read from the bottom of the tension strap knob on the handle of the tool.

4. Pass free end of tiedown strap through the slotted end of the tool, keeping open side of slot to users left. Push tip of tool snugly against strap boss.

5. With installation tool properly positioned, pull trigger. The tool will tighten the tiedown strap and automatically sever excess strap at preset location.

6-61. FABRICATION OF INHALATION/EXHALATION SPANNER WRENCH. Fabricate spanner wrench using 2024T3 Aluminum Alloy Tubing in accordance with figure 6-16.

6-61A. FABRICATION AND INSTALLATION OF OXYGEN MASK SECURING FASTENER. To provide a means of fastening the oxygen mask to the PCU-33/P series and PCU-56/P series torso harnesses to secure and protect the mask from accidental exposure to contamination, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Button, Snap Fastener	MS27980-1B NIIN 00-359-6844
1	Socket, Snap Fastener	MS27980-6B NIIN 00-285-6250
1	Chuck, Socket	P/N 1410 NIIN 00-144-2084
1	Die, Button	P/N 1401 NIIN 00-090-4412
1	Snap Setter	P/N A741 NIIN 00-880-0619
1	Punch, Cutting Revolving	MIL-P-2001 NIIN 00-596-9604

1. With the oxygen mask properly fit and adjusted, there is a minimum of 1 and 1/2 inches of retention harness webbing remaining.

2. On the lower left retention harness strap, measure, toward the adjustment buckle, 3/4 of an inch from the sear cut end of the retention harness webbing and place a mark at the center of the webbing.

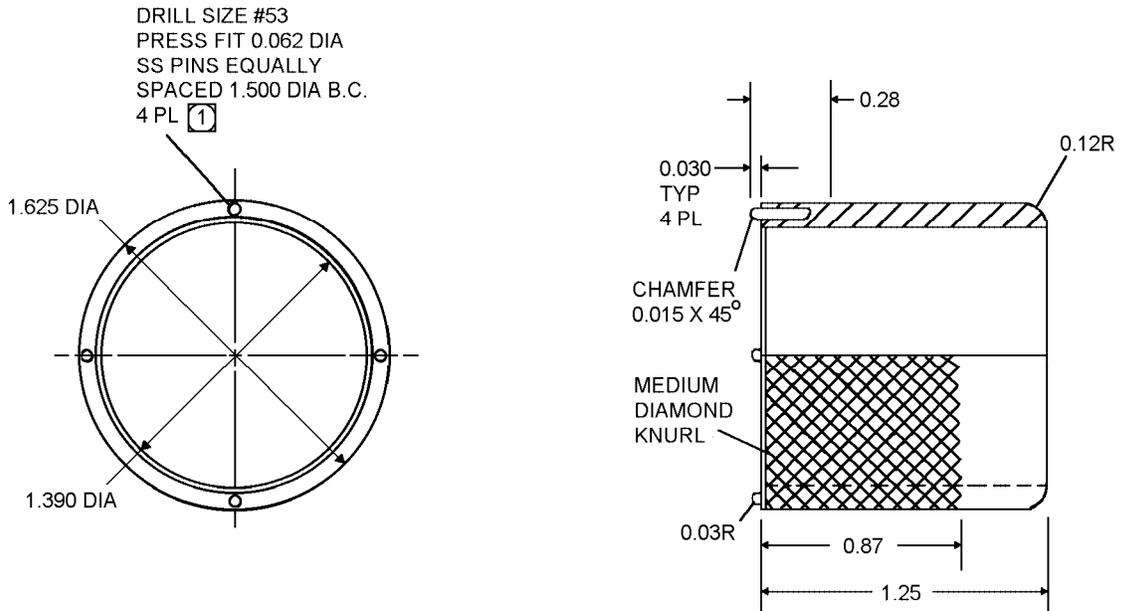
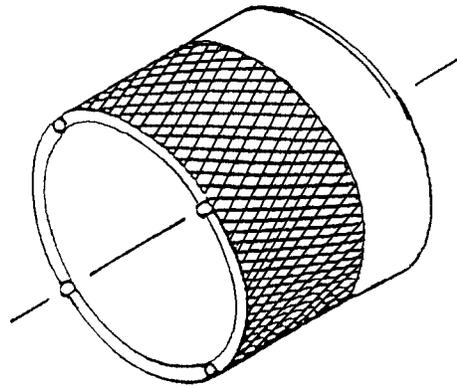
3. At the marked location, using a revolving punch, make a hole slightly smaller than the diameter of the shaft of the snap fastener button.

4. Assemble snap fastener button and socket onto retention harness with the button outboard, install onto harness webbing with a snap setter.

6-62. ILLUSTRATED PARTS BREAK-DOWN.

6-63. This section lists and illustrates the assemblies and detail parts of the MBU-23(V)/P Series Oxygen Masks.

6-64. The Illustrated Parts Breakdown (IPB) is intended for use in identification, procurement, storing, and issuing of replacement parts. It also illustrates disassembly and assembly relationships. Installation, operation, and maintenance of the equipment detailed herein shall be performed only by authorized personnel using the instructions set forth in the preceding sections.



1 PINS (MS16555-601)

DIMENSIONS: 1.25 IN L X 1 5/8 IN DIA
(LINEAR DIMENSIONS ARE IN INCHES)

MAKE FROM: 2024T3 ALUMINUM ALLOY

TOLERANCES

FRACTIONS	DECIMALS	ANGLE
+/- 1/32	+/- 0.01 +/- 0.005	+/- 1°

Figure 6-16. Fabrication of Spanner Wrench

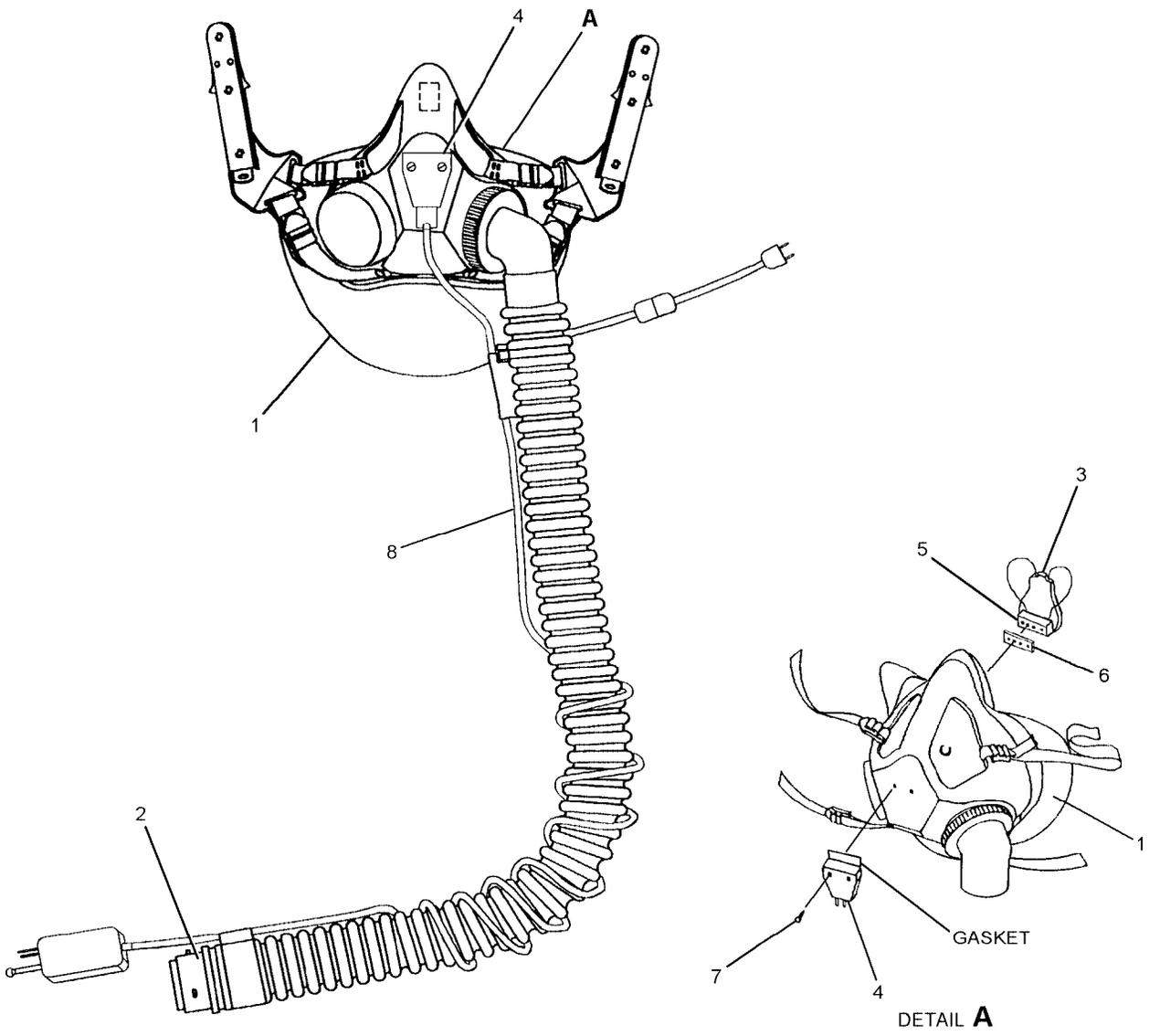


Figure 6-17. MBU-23(V)2/P Oxygen Mask Assembly Components

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Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
6-17	No Number	MBU-23(V)2/P OXYGEN MASK ASSEMBLY, Small narrow							REF	A
	No Number	MBU-23(V)2/P OXYGEN MASK ASSEMBLY, Medium narrow							REF	B
	No Number	MBU-23(V)2/P OXYGEN MASK ASSEMBLY, Medium wide							REF	C
	No Number	MBU-23(V)2/P OXYGEN MASK ASSEMBLY, Large wide							REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Small narrow (See figure 6-23 for breakdown)							REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Medium narrow (See figure 6-23 for breakdown)							REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Medium wide (See figure 6-23 for breakdown)							REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Large wide (See figure 6-23 for breakdown)							REF	D
-2	MS27796	. CONNECTOR							1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC							1	
-4	M23595/3-3	. AMPLIFIER ASSEMBLY, AM-7067A/A							1	
-5	G012-1076-01	. ADAPTER, M-101/AIC							1	
-6	G012-1141-01	. GASKET							1	
-7	AN500D2-5	. SCREW							2	
-8	M22442/26-3	. CABLE, Communications, CX-13126A/A							1	

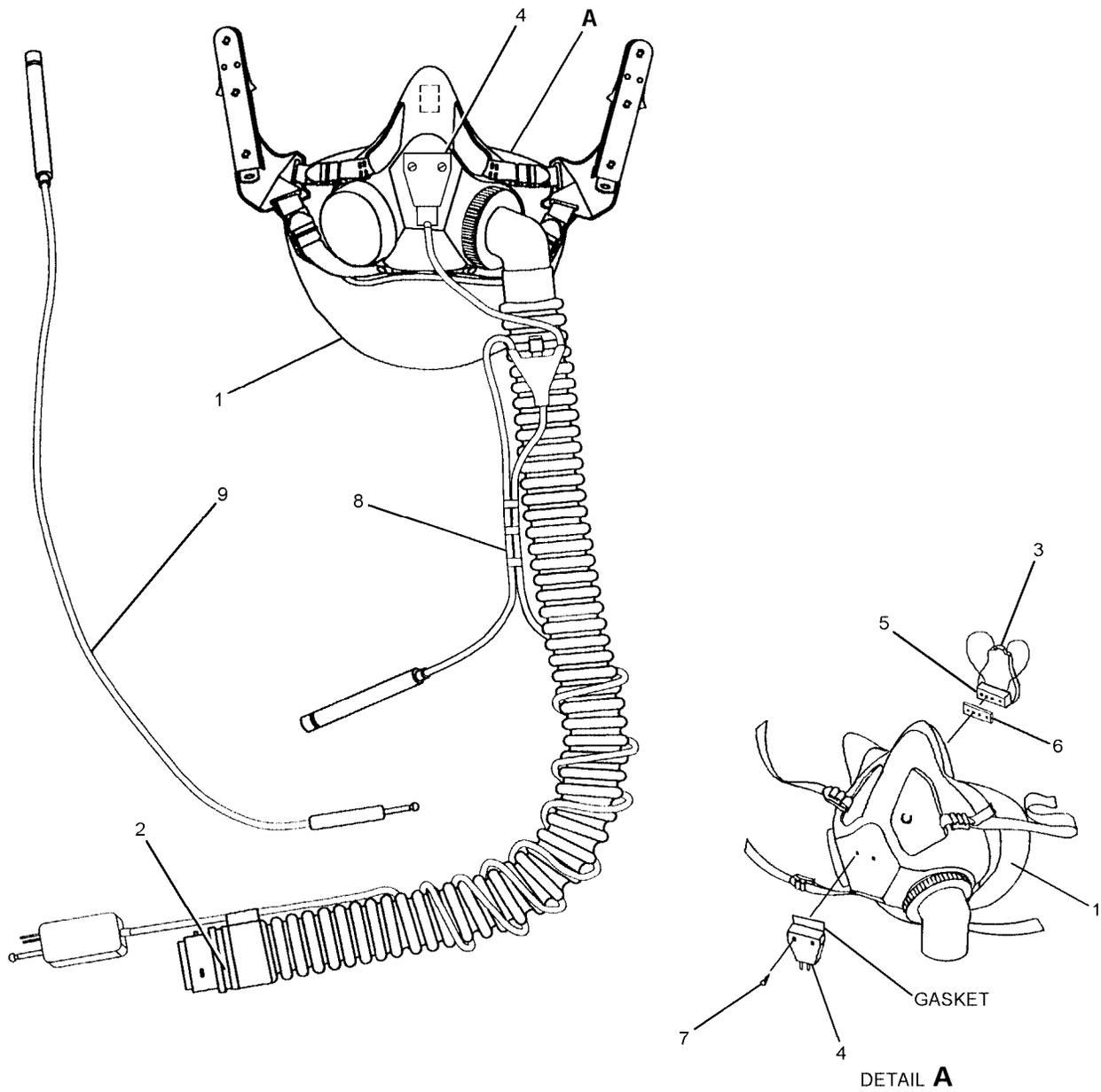


Figure 6-18. MBU-23(V)3/P Oxygen Mask Assembly Components

NAVAIR 13-1-6.7-3

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
6-18	No Number	MBU-23(V)3/P OXYGEN MASK ASSEMBLY, Small narrow	REF	A
	No Number	MBU-23(V)3/P OXYGEN MASK ASSEMBLY, Medium narrow	REF	B
	No Number	MBU-23(V)3/P OXYGEN MASK ASSEMBLY, Medium wide	REF	C
	No Number	MBU-23(V)3/P OXYGEN MASK ASSEMBLY, Large wide	REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Small narrow (See figure 6-23 for breakdown)	REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium narrow (See figure 6-23 for breakdown)	REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium wide (See figure 6-23 for breakdown)	REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Large wide (See figure 6-23 for breakdown)	REF	D
-2	MS27796	. CONNECTOR	1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC	1	
-4	M23595/3-3	. AMPLIFIER ASSEMBLY, AM-7067A/A	1	
-5	G012-1076-01	. ADAPTER, M-101/AIC	1	
-6	G012-1141-01	. GASKET	1	
-7	AN500D2-5	. SCREW	2	
-8	M22442/42-1	. CABLE, Communication, CX-13127/A	1	
-9	M22442/24-1	. CABLE, Communication, CX-13017/A	1	

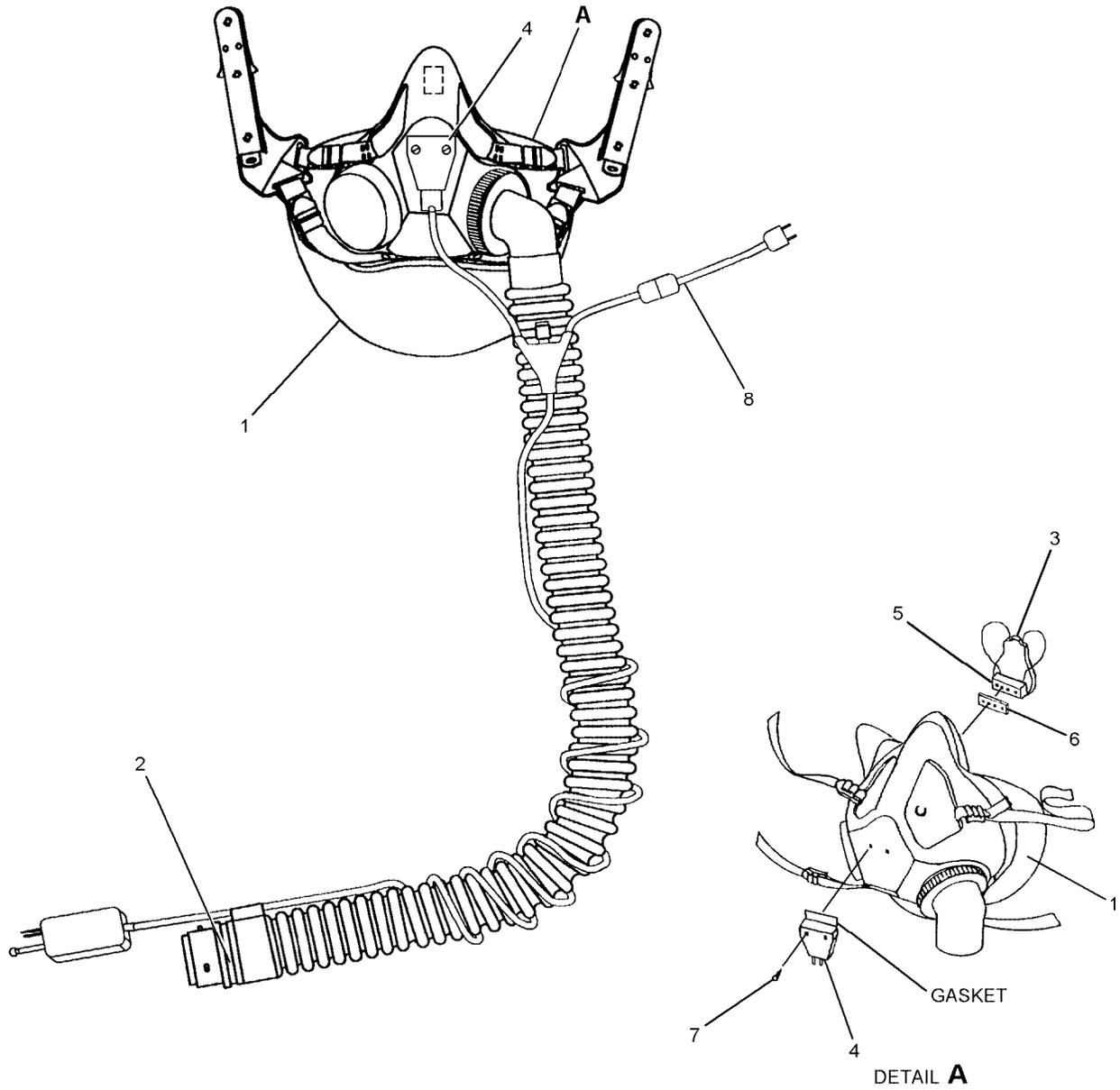


Figure 6-19. MBU-23(V)4/P Oxygen Mask Assembly Components

NAVAIR 13-1-6.7-3

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
6-19	No Number	MBU-23(V)4/P OXYGEN MASK ASSEMBLY, Small narrow	REF	A
	No Number	MBU-23(V)4/P OXYGEN MASK ASSEMBLY, Medium narrow	REF	B
	No Number	MBU-23(V)4/P OXYGEN MASK ASSEMBLY, Medium wide	REF	C
	No Number	MBU-23(V)4/P OXYGEN MASK ASSEMBLY, Large wide	REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Small narrow (See figure 6-23 for breakdown)	REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium narrow (See figure 6-23 for breakdown)	REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium wide (See figure 6-23 for breakdown)	REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Large wide (See figure 6-23 for breakdown)	REF	D
-2	MS27796	. CONNECTOR	1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC	1	
-4	M23595/3-3	. AMPLIFIER ASSEMBLY, AM-7067A/A	1	
-5	G012-1076-01	. ADAPTER, M-101/AIC	1	
-6	G012-1141-01	. GASKET	1	
-7	AN500D2-5	. SCREW	2	
-8	M22442/26-3	. CABLE, Communication, CX-13126A/A	1	

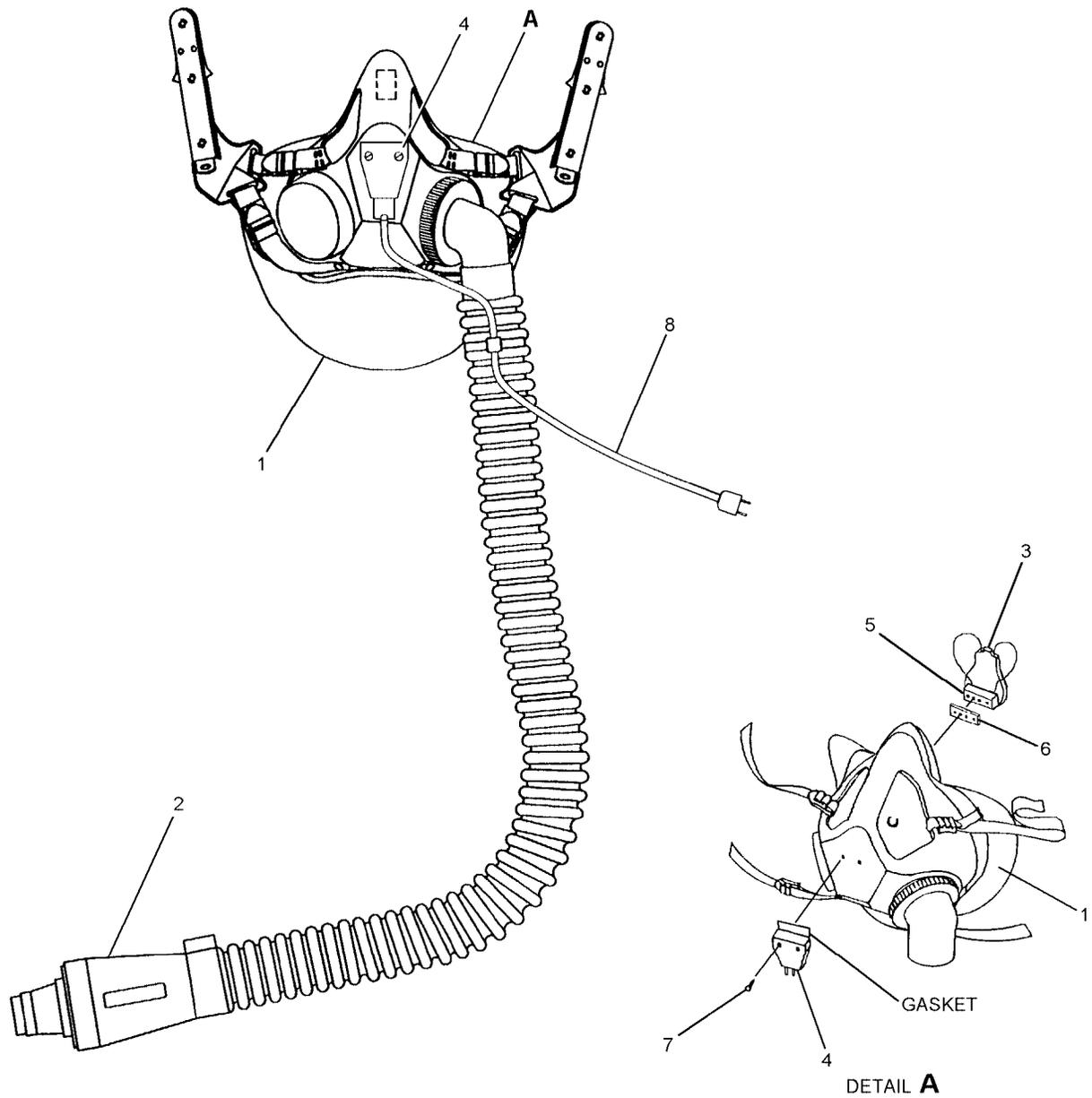


Figure 6-20. MBU-23(V)5/P Oxygen Mask Assembly Components

NAVAIR 13-1-6.7-3

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
6-20	No Number	MBU-23(V)5/P OXYGEN MASK ASSEMBLY, Small narrow							REF	A
	No Number	MBU-23(V)5/P OXYGEN MASK ASSEMBLY, Medium narrow							REF	B
	No Number	MBU-23(V)5/P OXYGEN MASK ASSEMBLY, Medium wide							REF	C
	No Number	MBU-23(V)5/P OXYGEN MASK ASSEMBLY, Large wide							REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Small narrow (See figure 6-23 for breakdown)							REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium narrow (See figure 6-23 for breakdown)							REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium wide (See figure 6-23 for breakdown)							REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Large wide (See figure 6-23 for breakdown)							REF	D
-2	MS22016-1	. CONNECTOR, MC-3A							1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC							1	
-4	M23595/3-3	. AMPLIFIER ASSEMBLY, AM-7067A/A							1	
-5	G012-1076-01	. ADAPTER, M-101/AIC							1	
-6	G012-1141-01	. GASKET							1	
-7	AN500D2-5	. SCREW							2	
-8	765AS380-1	. CABLE, Communication, CX-13154/A							1	

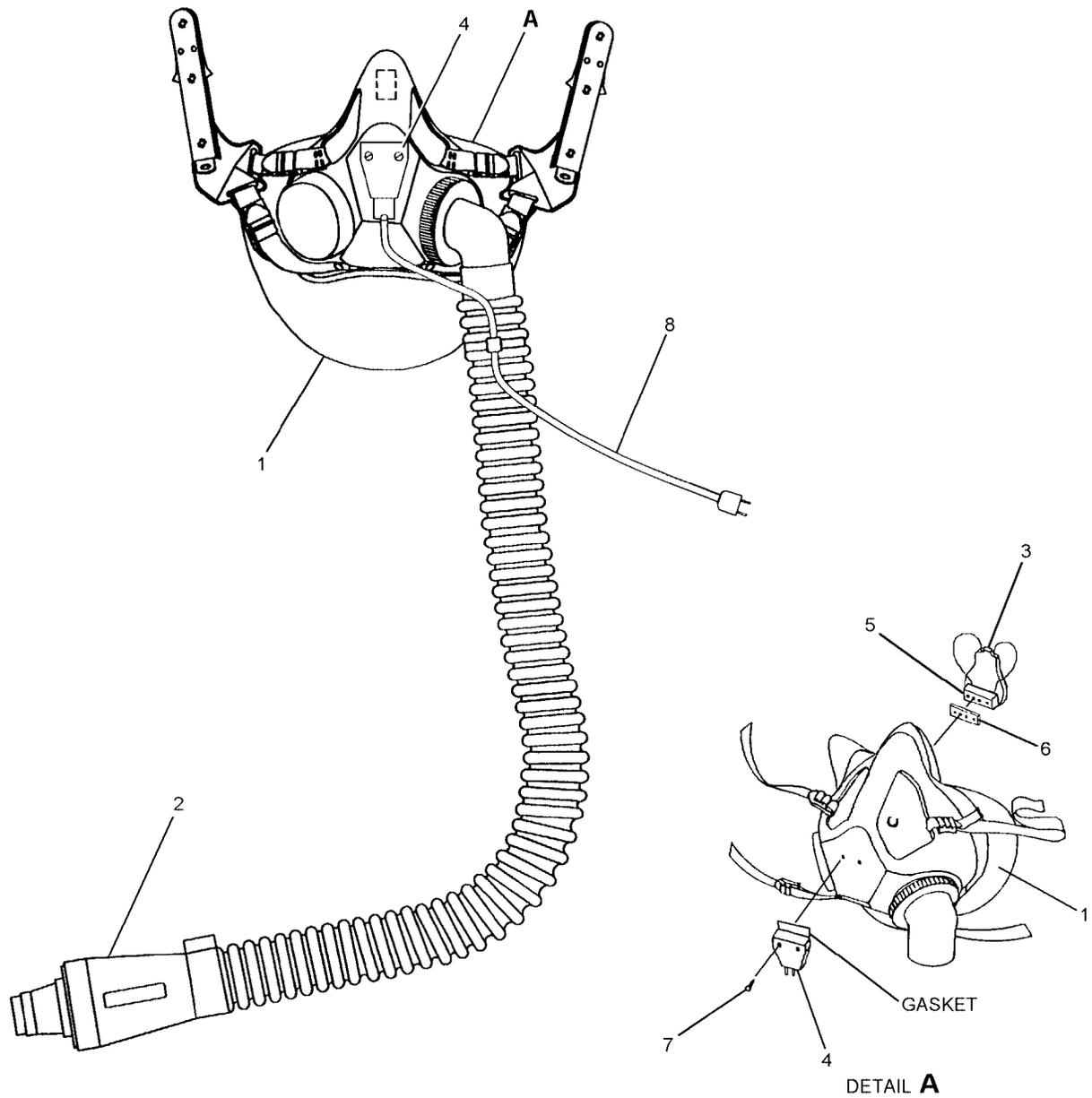


Figure 6-21. MBU-23(V)6/P Oxygen Mask Assembly Components

NAVAIR 13-1-6.7-3

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
6-21	No Number	MBU-23(V)6/P OXYGEN MASK ASSEMBLY, Small narrow	REF	A
	No Number	MBU-23(V)6/P OXYGEN MASK ASSEMBLY, Medium narrow	REF	B
	No Number	MBU-23(V)6/P OXYGEN MASK ASSEMBLY, Medium wide	REF	C
	No Number	MBU-23(V)6/P OXYGEN MASK ASSEMBLY, Large wide	REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Small narrow (See figure 6-23 for breakdown)	REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium narrow (See figure 6-23 for breakdown)	REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium wide (See figure 6-23 for breakdown)	REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Large wide (See figure 6-23 for breakdown)	REF	D
-2	MS22016-1	. CONNECTOR, MC-3A	1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC	1	
-4	No Number	. RECEPTACLE	1	
-5	G012-1076-01	. ADAPTER, M-101/AIC	1	
-6	G012-1141-01	. GASKET	1	
-7	AN500D2-5	. SCREW	2	
-8	765AS380-1	. CABLE, Communication, CX-13154/A	1	
-9	57C12661-1-2-1-4	. CABLE, Communication, CX-4434U/16 IN	1	

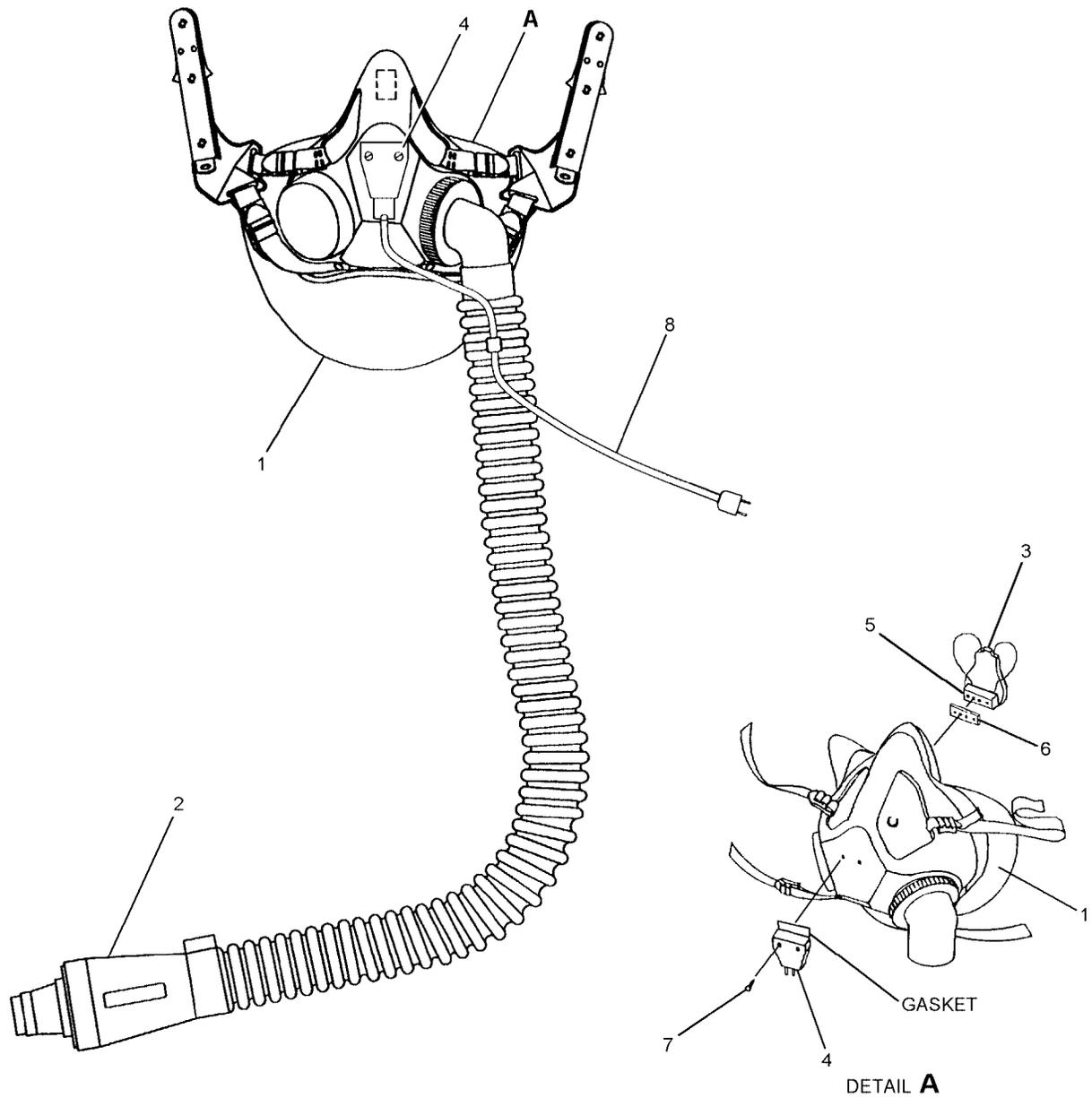


Figure 6-22. MBU-23(V)7/P Oxygen Mask Assembly Components

NAVAIR 13-1-6.7-3

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
6-22	No Number	MBU-23(V)7/P OXYGEN MASK ASSEMBLY, Small narrow	REF	A
	No Number	MBU-23(V)7/P OXYGEN MASK ASSEMBLY, Medium narrow	REF	B
	No Number	MBU-23(V)7/P OXYGEN MASK ASSEMBLY, Medium wide	REF	C
	No Number	MBU-23(V)7/P OXYGEN MASK ASSEMBLY, Large wide	REF	D
-1	G010-1314-21	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Small narrow (See figure 6-23 for breakdown)	REF	A
	G010-1314-22	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium narrow (See figure 6-23 for breakdown)	REF	B
	G010-1314-23	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Medium wide (See figure 6-23 for breakdown)	REF	C
	G010-1314-24	. MBU-23(V)1/P OXYGEN MASK SUBASSEMBLY, Large wide (See figure 6-23 for breakdown)	REF	D
-2	123AB50534-5	. CONNECTOR, CRK-90	1	
-3	MIL-M-26542/4	. MICROPHONE, M-101/AIC	1	
-4	M23595/3-3	. AMPLIFIER ASSEMBLY, AM-7067A/A	1	
-5	G012-1076-01	. ADAPTER, M-101/AIC	1	
-6	G012-1141-01	. GASKET	1	
-7	AN500D2-5	. SCREW	2	
-8	765AS380-1	. CABLE, Communication, CX-13154/A	1	

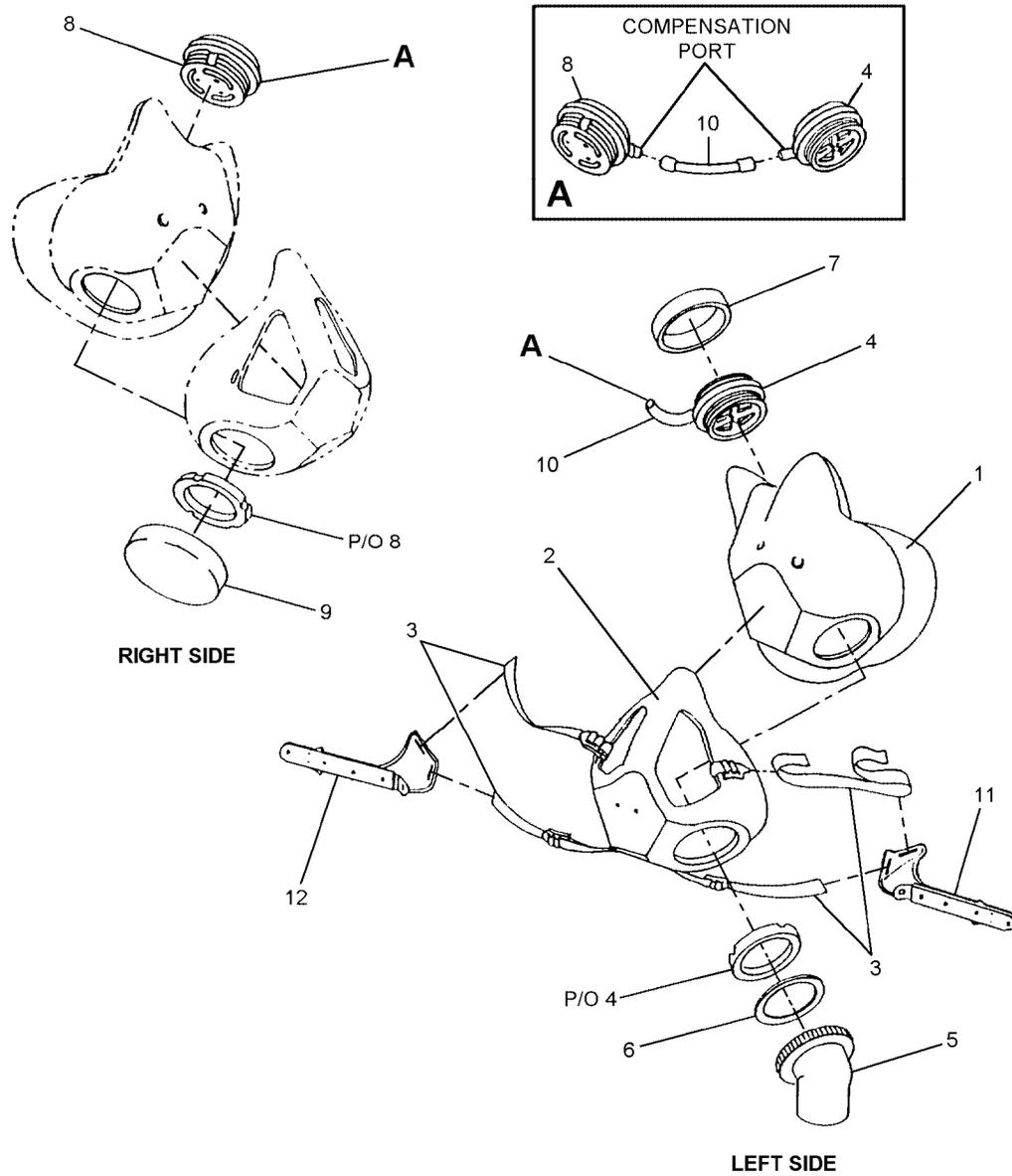


Figure 6-23. MBU-23(V)1/P Basic Oxygen Mask Assembly Components (Sheet 1 of 2)

6-23-1

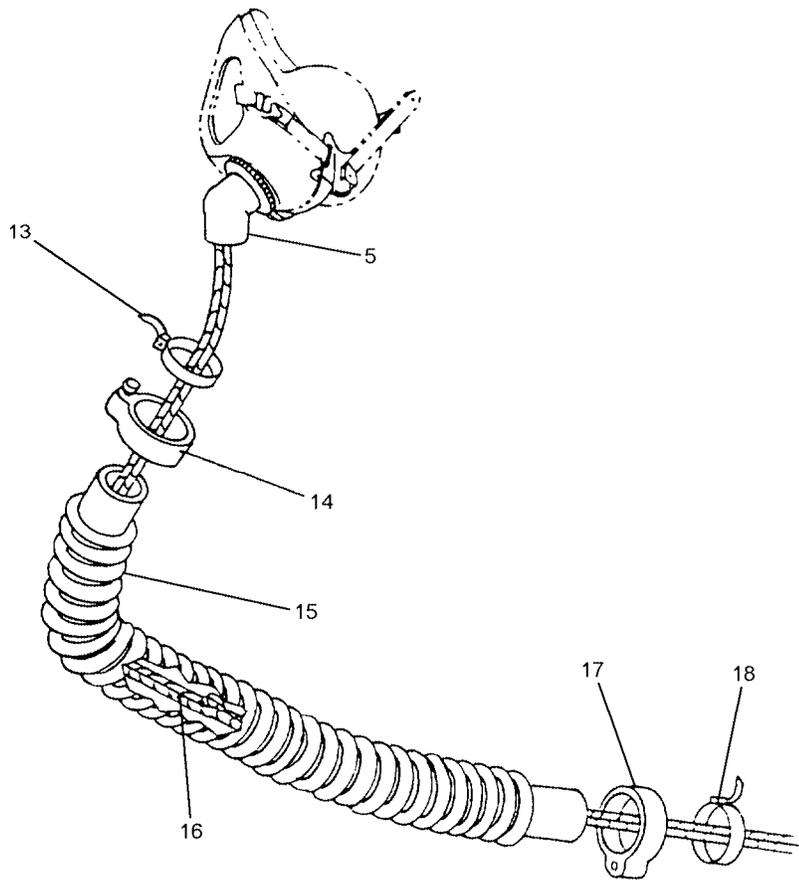


Figure 6-23. MBU-23(V)1/P Basic Oxygen Mask Assembly Components (Sheet 2 of 2)

6-23-2

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
6-23	G010-1314-21	MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Small narrow							REF	A
	G010-1314-22	MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Medium narrow							REF	B
	G010-1314-23	MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Medium wide							REF	C
	G010-1314-24	MBU-23(V)1/P OXYGEN MASK ASSEMBLY, Large wide							REF	D
-1	G010-1101-11	. FACEPIECE, Small narrow							1	A
	G010-1101-12	. FACEPIECE, Medium narrow							1	B
	G010-1101-13	. FACEPIECE, Medium wide							1	C
	G010-1101-14	. FACEPIECE, Large wide							1	D
-2	G010-1181-01	. HARDSHELL, Small narrow							1	A
	G010-1181-02	. HARDSHELL, Medium narrow							1	B
	G010-1181-03	. HARDSHELL, Medium wide							1	C
	G010-1181-04	. HARDSHELL, Large wide							1	D
-3	MIL-T-5038	. WEBBING ASSEMBLY							A/R	
-4	G001-1077-01	. VALVE ASSEMBLY, Inhalation (When exhausted, use P/N G010-1050-03 (60240)) (Note 1)							1	
	G010-1050-03	. VALVE ASSEMBLY, Inhalation							1	
-5	G001-1078-01	. ELBOW, Inhalation Valve							1	
-6	G010-1064-01	. WASHER							1	
-7	G033-1015-02	. COVER, Valve, Inhalation							1	
-8	G001-1010-03	. VALVE ASSEMBLY, Exhalation							1	
-9	G033-1014-01	. COVER, Valve, Exhalation							1	
-10	G010-1058-01	. TUBE, Compensation							1	
-11	G013-1000-01	. BAYONET, Left							1	
-12	G013-1000-02	. BAYONET, Right							1	
-13	MS3367-4-0	. STRAP, Tiedown							1	
-14	G012-1034-02	. GUIDE, Cable, Upper							1	
-15	G010-1025-01	. HOSE, Oxygen delivery							1	
	G002-1244-01	. HOSE, Eng, Oxygen Delivery (Note 2)							1	
-16	M5040-2N	. CORD, Restraint, Fibrous							1	
-17	G012-1035-02	. GUIDE, Cable, Lower							1	
-18	MS3367-4-0	. STRAP, Tiedown							1	
Notes: 1. Requires spanner wrench P/N G010-2009-03 for assembly. Spanner wrench is available open purchase from Gentex Corporation, 11525 6th St. Rancho Cucamonga, CA 91730 (909) 481-7667. 2. 24 inch hose, optional item for MBU-23/P Mask. Open purchase from Gentex Corporation, 11525 6th St. Rancho Cucamonga, CA 91730 (909) 481-7667.										

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code	Part Number	Figure and Index Number	SM&R Code
AN500D2-5	6-17-7	PAOZZ		6-23	PAOZZ
	6-18-7	PAOZZ	G012-1034-02	6-23-14	PAOZZ
	6-19-7	PAOZZ	G012-1035-02	6-23-17	PAOZZ
	6-20-7	PAOZZ	G012-1076-01	6-17-5	PAOZZ
	6-21-7	PAOZZ		6-18-5	PAOZZ
	6-22-7	PAOZZ		6-19-5	PAOZZ
G001-1010-03	6-23-8	PAOZZ		6-20-5	PAOZZ
G001-1077-01	6-23-4	PAOZZ		6-21-5	PAOZZ
G001-1078-01	6-23-5	PAOZZ		6-22-5	PAOZZ
G002-1244-01	6-23-15	XDOZZ	G012-1141-01	6-17-6	PAOZZ
G010-1025-01	6-23-15	PAOZZ		6-18-6	PAOZZ
G010-1050-03	6-23-4	PAOZZ		6-19-6	PAOZZ
G010-1058-01	6-23-10	PAOZZ		6-20-6	PAOZZ
G010-1064-01	6-23-6	PAOZZ		6-21-6	PAOZZ
G010-1101-11	6-23-1	PAOZZ		6-22-6	PAOZZ
G010-1101-12	6-23-1	PAOZZ	G013-1000-01	6-23-11	PAOZZ
G010-1101-13	6-23-1	PAOZZ	G013-1000-02	6-23-12	PAOZZ
G010-1101-14	6-23-1	PAOZZ	G033-1014-01	6-23-9	PAOZZ
G010-1181-01	6-23-2	PAOZZ	G033-1015-02	6-23-7	PAOZZ
G010-1181-02	6-23-2	PAOZZ	MIL-M-26542/4	6-17-3	PAOZZ
G010-1181-03	6-23-2	PAOZZ		6-18-3	PAOZZ
G010-1181-04	6-23-2	PAOZZ		6-19-3	PAOZZ
G010-1314-21	6-17-1	PAOZZ		6-20-3	PAOZZ
	6-18-1	PAOZZ		6-21-3	PAOZZ
	6-19-1	PAOZZ		6-22-3	PAOZZ
	6-20-1	PAOZZ	MIL-T-5038	6-23-3	PAOZZ
	6-21-1	PAOZZ	MS22016-1	6-20-2	PAOZZ
	6-22-1	PAOZZ		6-21-2	PAOZZ
	6-23	PAOZZ	MS27796	6-17-2	PAOZZ
G010-1314-22	6-17-1	PAOZZ		6-18-2	PAOZZ
	6-18-1	PAOZZ		6-19-2	PAOZZ
	6-19-1	PAOZZ	MS3367-4-0	6-23-13	PAOZZ
	6-20-1	PAOZZ		6-23-18	PAOZZ
	6-21-1	PAOZZ	M22442/24-1	6-18-9	PAOZZ
	6-22-1	PAOZZ	M22442/26-3	6-17-8	PAOZZ
	6-23	PAOZZ		6-19-8	PAOZZ
G010-1314-23	6-17-1	PAOZZ	M22442/42-1	6-18-8	PAOZZ
	6-18-1	PAOZZ	M23595/3-3	6-17-4	PAOZZ
	6-19-1	PAOZZ		6-18-4	PAOZZ
	6-20-1	PAOZZ		6-19-4	PAOZZ
	6-21-1	PAOZZ		6-20-4	PAOZZ
	6-22-1	PAOZZ		6-22-4	PAOZZ
	6-23	PAOZZ	M5040-2N	6-23-16	PAOZZ
G010-1314-24	6-17-1	PAOZZ	123AB50534-5	6-22-2	PAOZZ
	6-18-1	PAOZZ	57C12661-1-2-1-4	6-21-9	PAOZZ
	6-19-1	PAOZZ	765AS380-1	6-20-8	PAOZZ
	6-20-1	PAOZZ		6-21-8	PAOZZ
	6-21-1	PAOZZ		6-22-8	PAOZZ
	6-22-1	PAOZZ			

Section 6-3. MBU-24/P22P-16 Oxygen Mask

6-65. GENERAL.

6-66. The MBU-24/P22P-16 Oxygen Mask (figure 6-24) is designed to be worn in conjunction with the HGU-87(V)/P22P-16 and HGU-89(V)/P22P-16 helmets as a component of the pressure breathing system comprising the Navy Combat Edge (NCE) A/P22P-16 Aircrew Protective Assembly.

6-67. CONFIGURATION.

6-68. The MBU-24/P22P-16 oxygen mask has separate inhalation and exhalation valves. The separate valve design requires the breathing hose to be offset from the center of the mask. A compensation tube interconnects the inhalation and exhalation valves. Inhalation pressure is sensed by the compensation tube which directs a portion of the pressure to the underside of the exhalation valve plate. This compensation pressure keeps the exhalation valve shut during inhalation. Mask connection to the helmet is accomplished using offset bayonet connectors that interface with bayonet receivers installed on the helmet. A bladder supply hose connects the mask assembly to the KMU-561/P22P-16 bladder installed in the HGU-87(V)/P22P-16 and HGU-89(V)/P22P-16 helmets.

6-69. APPLICATION.

6-70. The MBU-24/P oxygen mask is used in conjunction with Navy Combat Edge flight equipment worn by aircrew personnel assigned to high performance aircraft which have the Navy Combat Edge system integrated.

6-71. SERVICE LIFE.

6-72. The MBU-24/P oxygen mask shall remain in service until it can no longer be economically repaired.

6-73. MODIFICATIONS.

6-74. Table 6-5 lists all technical directives applied to the MBU-24 Mask. There are no modifications currently authorized for the MBU-24/P22P-16 Oxygen Mask Assembly.

6-75. SIZING/FITTING.

6-76. Refer to paragraph 6-22 for sizing and fitting procedures.

6-77. OXYGEN MASK DELIVERY HOSE TOLERANCE.

6-78. Grasp oxygen delivery hose at each end and extend to full length permitted by the installed strain relief cord. Hose should not extend more than one inch beyond its normal extension. If hose stretches beyond its normal extended length by more than one inch, adjustment of strain relief cord is necessary to bring it within tolerance as follows:

1. Press red button on U-173/U plug and carefully disconnect plug from amplifier.
2. Unthread inhalation valve from mask.



Cut tiedown strap head laterally from above.
Do not cut under tiedown head.

3. Using diagonal cut pliers remove tiedown straps from inhalation valve elbow and 3-pin connector.

Table 6-5. MBU-24/P22P-16 Oxygen Mask Assembly Directives

Description of Modification	Application	Modification Code
None	None	None

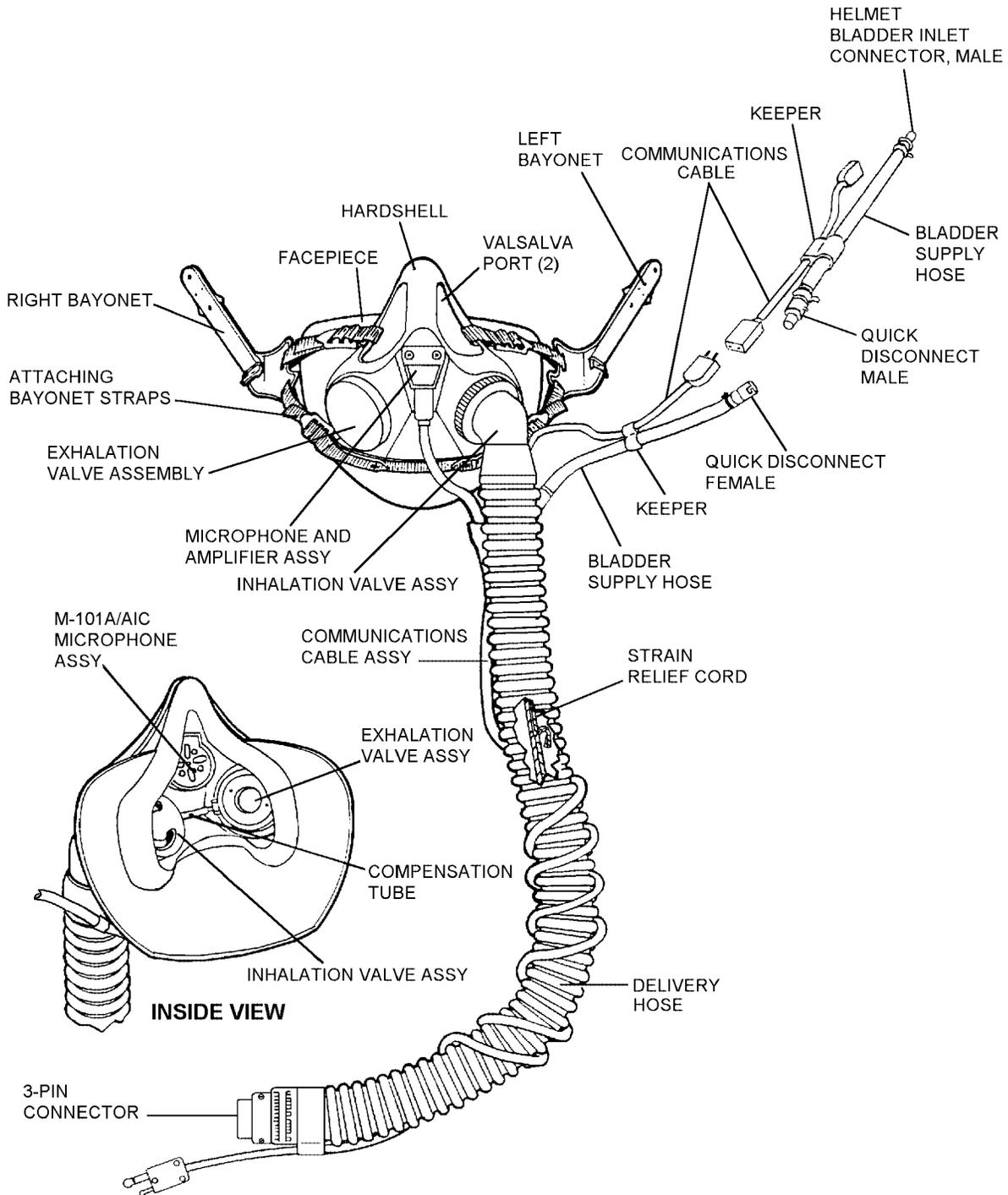


Figure 6-24. MBU-24/P22P-16 Enhanced Pressure - Demand Oxygen Mask Assembly

4. Separate delivery hose from 3-pin connector.

NOTE

Present MBU-24/P22P-16 Oxygen Mask does not have clip on strain relief cord so retaining pin must be removed from 3-pin connector to release cord.

5. Using 3/32 inch drift punch, remove retaining pin and remove strain relief cord from 3-pin connector.
6. Remove delivery hose from inhalation valve elbow. Slide delivery hose off the strain relief cord.
7. Shorten strain relief cord by retying cord at the loop knot. See [figure 6-25](#).
8. Reinstall hose. Check hose length and repeat process if necessary until proper length is achieved.

6-79. FITTING HELMET BLADDER SUPPLY HOSE.

6-80. Have aircrew member don helmet and mask and proceed as follows:

1. Attach male quick disconnect to helmet bladder supply hose and secure with tiedown strap using a tensioning tool at setting 3. Connect male and female quick disconnects that form the junction in the bladder supply hose.
2. Align bladder supply hose with the edge of the opening of the bladder inlet connector. Mark supply hose with chalk where connector meets the supply hose. Cut off excess hose.

NOTE

To reduce the possibility of creating either a snag hazard or a potential oxygen blockage, the supply hose should not be kinked or bowed away from helmet.

3. Install male bladder inlet connector and verify the length.

4. Secure bladder inlet connector to bladder hose with tiedown strap using tensioning tool at setting 3.

6-81. MAINTENANCE.

6-82. Aircrew member responsibility for maintenance of the MBU-24/P22P-16 oxygen mask is limited to Preflight and Postflight Inspections. All other maintenance actions shall be performed by Organizational Maintenance and documented in accordance with OPNAVINST 4790.2 Series.

6-83. INSPECTION. Refer to [paragraph 6-43](#) for inspection requirements and procedures. Refer to [table 6-6](#) for troubleshooting.

6-84. FUNCTIONAL CHECK OF OXYGEN MASK AND REGULATOR-TO-SEAT KIT HOSE. Functional check should be performed using Test Set TTU-489/E in accordance with NAVAIR 17-15BC-22.

6-85. DISASSEMBLY OF MBU-24/P22P-16. The MBU-24/P22P-16 oxygen mask is disassembled as follows:

1. Disassemble oxygen mask in accordance with [paragraph 6-50](#) instructions.
2. Cut tiedown strap and remove female quick disconnect from end of helmet bladder supply hose.
3. Remove cable keeper from bladder supply hose using elastrator.
4. Remove cable guides (with communication cable intact) from oxygen delivery hose using elastrator.
5. Uncoil communication cable from delivery hose.

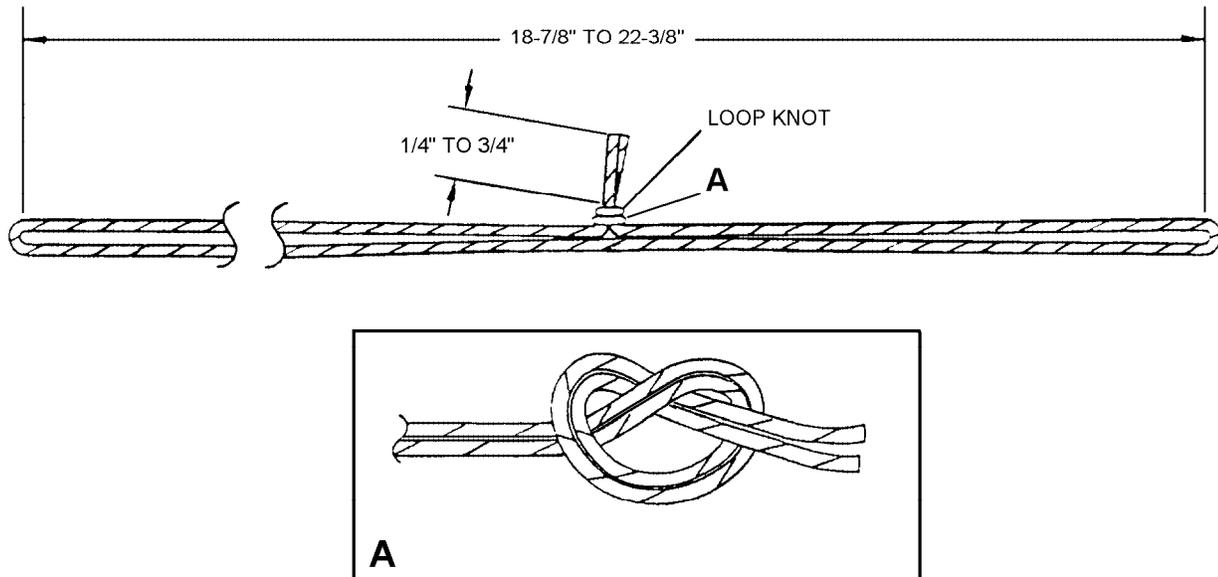
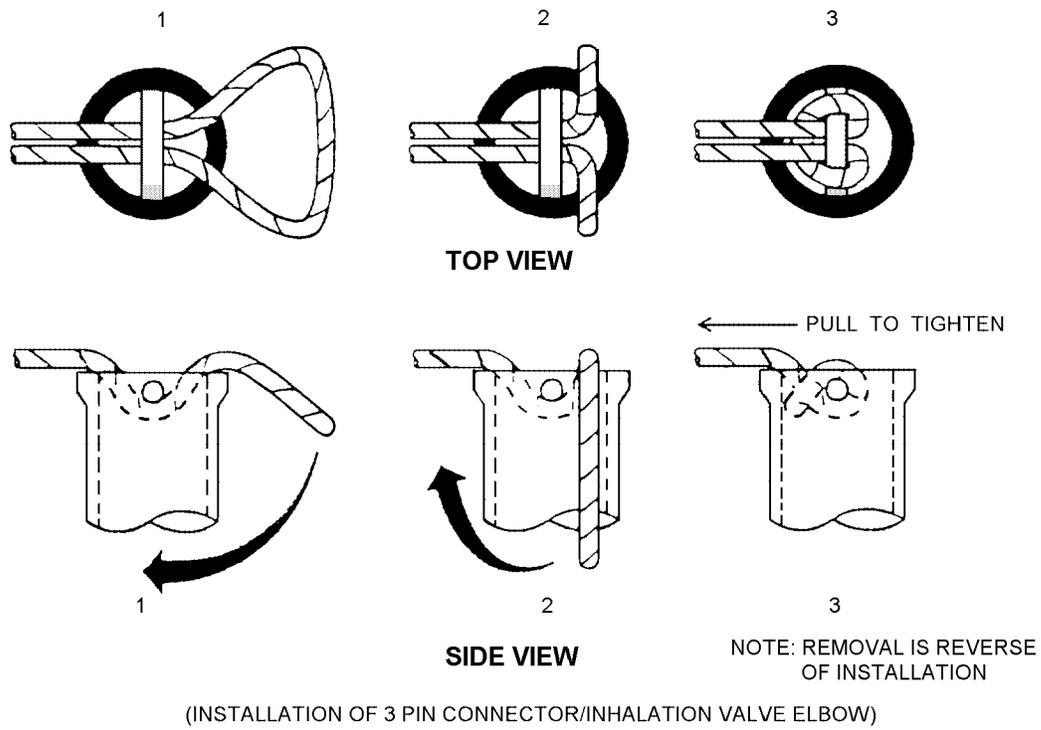


Figure 6-25. MBU-24/P22P-16 Oxygen Mask Strain Relief Cord Installation

Table 6-6. Troubleshooting MBU-24/P22P-16 Oxygen Mask

Trouble	Probable Cause	Remedy
Leakage from facepiece	Improper mask size	Ensure correct mask size and fit IAW paragraph 6-22
	Improper mask adjustment	Verify strap, bayonet and receiver adjustment is correct IAW paragraph 6-31
	Mask seal torn or ripped	Replace mask facepiece IAW paragraph 6-88
	Mask shell failed	Remove/Replace mask hard shell IAW paragraph 6-88
	Helmet bladder functioning im-properly	See procedures for helmet bladder
Reduced or no oxygen flow to mask	Malfunction of regulator	See procedures for CRU-103/P regulator.
	Improper connection of supply hose to regulator.	Verify connection of hose to regulator. Inspect connector for proper operation. Replace connector as required. See paragraph 6-97
	Leak or obstruction of oxygen supply hose.	Inspect oxygen hose for rips/tears/obstructions. Replace hose as required. See paragraph 6-91
	Improper connection of oxygen supply hose to inhalation valve.	Ensure that threaded connection at inhalation valve is correct threaded and snug IAW paragraph 6-57
	Inhalation valve obstructed	Inspect inhalation valve for obstruction. Clean and replace as required IAW paragraph 6-51
Unable to exhale or difficulty exhaling	Compensation tube broken or dis-connected	Inspect compensation tube for proper connection or failure. Reconnect or replace as required IAW paragraph 6-57
	Inhalation valve failed open	Inspect exhalation valve for proper operation. Replace as required IAW paragraph 6-57
	Exhalation valve failed/obstructed	Inspect compensation tube for obstruction and correct installation. Replace compensa-tion tube as required IAW paragraph 6-57

Table 6-6. Troubleshooting MBU-24/P22P-16 Oxygen Mask (Cont)

Trouble	Probable Cause	Remedy
No/reduced PPG pressure	Improper pressure from regulator	See procedure for regulator
	Compensation tube kinked or twisted	Inspect exhalation valve for obstruction and correct installation. Replace compensation tube as required IAW paragraph 6-57
	Inhalation valve obstruction	Inspect inhalation valve for obstruction. Clean/replace as required IAW paragraphs 6-51 and 6-57
	Exhalation valve failed to open	Inspect exhalation valve for proper operation. Replace as required IAW paragraph 6-57
Uncommanded PPG pressure	Improper pressure schedule from regulator	See procedures for regulator
	Compensation tube broken or disconnected	Inspect compensation tube for proper connection or failure. Reconnect or replace as required IAW paragraph 6-57
	Inhalation valve failed to open	Inspect inhalation valve for proper operation. Replace as required IAW paragraph 6-57
	Exhalation valve failed/obstructed	Inspect exhalation valve for obstruction/ proper operation. Replace as required IAW paragraph 6-57

6-86. CLEANING AND SANITIZING. Refer to [paragraph 6-51](#) for cleaning and sanitizing requirements and procedures.

6-87. ASSEMBLY. Assemble the MBU-24/P22P-16 oxygen mask as follows:

1. If applicable, reinstall bladder supply hose.
2. Install bladder inlet connection into bladder supply hose. Secure with tiedown strap using tensioning tool set at 3.
3. Coil communications cable around delivery hose, attach upper and lower cable guides to upper and lower ends of delivery hose.
4. Refer to [figure 6-25](#) and prepare new strain relief cord as required.
5. Connect strain relief cord to inhalation valve elbow as shown in [figure 6-25](#). Ensure knot is centered between ends of strain relief cord.
6. Insert free end of strain relief cord in delivery hose and pull cord through hose.
7. Install upper end of delivery hose onto inhalation valve elbow.
8. Connect free end of strain relief cord to 3-pin connector as shown in [figure 6-25](#).
9. Install lower end of delivery hose on 3-pin connector.
10. Install upper and lower hose clamps using clamp pliers or install tiedown straps. Smooth all sharp edges.
11. Insert bladder supply hose through cable keeper.
12. Reinstall facepiece in hardshell and align inhalation and exhalation valve openings.
13. Reinstall inhalation and exhalation valves in accordance with [paragraph 6-57](#).

WARNING

Crossthreading may give false indication that inflation valve elbow is properly installed and tightened. Cross threaded elbow could separate during flight.

14. Carefully reinstall inhalation valve elbow and orient so bladder supply hose will lie flush along helmet.

15. Reinstall microphone assembly in accordance with [paragraph 6-56](#).

6-88. REPAIR/REPLACEMENT. Repair of the MBU-24/P22P-16 Oxygen Mask ([figure 6-26](#)) shall be limited to replacement of defective parts as determined by inspection and troubleshooting. Any holes or tears in any part of the facepiece or delivery hose shall be basis for rejection of damaged component.

6-89. Facepiece/Hardshell Strap Assembly. Refer to [paragraph 6-55](#) for replacement of facepiece/hardshell strap assembly.

6-90. M-101/AIC Microphone Assembly. Refer to [paragraph 6-56](#) for replacement of M-101/AIC Microphone Assembly.

6-91. MBU-24/P22P-16 Delivery Hose. To replace oxygen mask delivery hose assembly, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Tensioning Tool	MS90387-1
1	Elastrator Tool	00-6297
2	Strap, Tiedown, Electrical	MS3367-1-0 (CAGE 96306) NIIN 00-984-6582
1	Hose, Oxygen Delivery	P/N G010-1155-01, NIIN 01-380-7440

1. Remove the delivery hose assembly as follows:

a. Press red button on communications cable plug and disengage plug from amplifier connector pins.

b. Unthread inhalation valve elbow from mask.

NOTE

Remove tiedown straps using diagonal cut pliers. Cut strap head in half laterally from above. Do not cut under tiedown strap head.

c. Remove tiedown strap on bladder supply hose three flange coupler and remove bladder supply hose.

d. Remove hose clamps using hose clamp pliers and a small screw driver or tiedown straps using diagonal pliers.

e. Remove cable guides from delivery hose with communications cable attached.

f. Uncoil communications cable from around delivery hose and set aside.

g. Separate 3-pin connector from delivery hose, release strain relief cord, remove 3-pin connector and set aside.

h. Remove delivery hose from inhalation valve elbow and attached strain relief cord.

2. Install new delivery hose assembly as follows:

a. Install bladder supply hose and coupler onto delivery hose outlet from inside delivery hose.

CAUTION

Exercise care not to damage delivery hose nipple when installing bladder supply hose on coupler.

NOTE

If installing bladder hose on three-flange coupler, position only the hose up to the middle flange. The hose does not go over the nipple on the delivery hose.

b. While supporting the bladder supply hose coupler from inside the delivery hose, install the helmet bladder supply hose on bladder supply hose coupler.

c. Install tiedown strap using tensioning tool set at 3.

d. If strain relief cord requires replacement, refer to [paragraph 6-98](#).

e. Refer to [figure 6-25](#) and connect strain relief cord to inhalation valve elbow. Ensure knot is centered between ends of cord as indicated.

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f. Coil communications cable around replacement delivery hose and install upper and lower cable guides onto appropriate ends of hose.

g. Insert free end of strain relief cord into upper end of delivery hose and pull through hose. Slide upper end of delivery hose onto inhalation valve elbow.

h. Refer to [figure 6-25](#) and connect free end of strain relief cord to 3-pin connector.

i. Check delivery hose tolerance in accordance with [paragraph 6-77](#) and adjust if required.

j. Slide delivery hose onto 3-pin connector.

k. Orient inhalation valve elbow so that bladder supply hose will lie flush along helmet.

l. Install upper and lower hose clamps or tiedown straps using hose clamp pliers or strap tensioning tool.

WARNING

Cross threading may give false indication of properly installed and tightened inhalation valve elbow. Cross threaded elbow could separate during flight.

m. Install washer and thread inhalation valve elbow onto inhalation valve and hand tighten.

n. Connect U-173/U plug to amplifier and ensure red locking button engages.

6-92. Bladder Inlet Connector Quick Disconnect. Replace bladder inlet connector quick disconnect as follows:

1. Remove the bladder inlet connector quick disconnect as follows:

CAUTION

Cut through top of tiedown strap head. Do not cut under strap head.

a. Cut tiedown strap using diagonal pliers.

b. Remove bladder inlet quick disconnect.

2. Install new bladder inlet quick disconnect as follows:

a. Install bladder inlet quick disconnect in bladder supply hose.

b. Secure quick disconnect with tiedown strap using tensioning tool set at 3.

6-93. Helmet Bladder Supply Hose. Replace helmet bladder supply hose as follows:

1. Remove helmet bladder supply hose as follows:

CAUTION

Cut laterally through top of tiedown strap head. Do not cut under strap head.

a. Cut tiedown straps from each end of the helmet bladder supply hose using diagonal cut pliers.

NOTE

When removing helmet bladder supply hose equipped with three-flange coupler, cut only the outer tiedown strap and the tiedown strap securing the quick disconnect fitting of bladder supply hose.

b. Remove bladder inlet quick disconnect fitting from helmet bladder supply hose.

c. Push red button on U-173/U plug and separate plug from AM-7067/A amplifier.

d. Remove and retain two screws securing amplifier to microphone assembly and remove amplifier. Remove microphone bracket with microphone assembly from mask.

e. Remove (unthread) inhalation elbow from mask.

f. Remove cable guides with communication cable intact from delivery hose.

g. Remove clamp using hose clamp pliers and small screwdriver, or tiedown strap using diagonal cut pliers, as applicable, from mask end of delivery hose.

h. Remove delivery hose from inhalation valve elbow.

i. Remove helmet bladder supply hose from delivery hose.

j. If required, remove helmet bladder supply hose coupler from inside delivery hose.

NOTE

If removing a three-flange hose coupler, remove remaining tiedown strap using diagonal cut pliers.

k. Remove helmet bladder supply hose from cable keeper using elastrator.

2. Install new helmet bladder supply hose as follows:

a. If required, install bladder supply hose coupler in delivery hose outlet from inside delivery hose.



Use care to prevent damage to delivery hose nipple when installing bladder supply hose on coupler.

NOTE

When installing bladder supply hose, position hose only to middle flange. Hose does not go over nipple extending from the delivery hose.

b. While supporting bladder supply hose coupler from inside delivery hose, install helmet bladder supply hose on coupler and secure with tiedown strap using tensioning tool set at 3.

c. Install delivery hose on inhalation valve elbow and adjust position of elbow so bladder supply hose will lay flush along helmet.

d. Secure delivery hose on elbow with hose clamp or, if preferred, tiedown strap using tensioning tool set at 8. Smooth any sharp edges.

e. Install lower cable guide on delivery hose.

f. Install cable keeper on bladder supply hose using elastrator.

g. Install bladder inlet connector on bladder supply hose and secure with tiedown strap using tensioning tool set at 3.



Crossthreading could give false indication of properly tightened inhalation valve elbow and could become separated during flight.

h. Install washer and carefully thread elbow on inhalation valve hand tight. Ensure crossthreading does not occur.

i. Install microphone assembly inside mask.

j. Connect new AM-7067/A amplifier with gasket to microphone assembly from outside mask and secure with two mounting screws. Do not overtighten screws.

k. Connect U-173/U plug to amplifier connector ensuring red locking button engages.

6-94. Replacement of Helmet Bladder Supply Hose Extension. Replace helmet bladder supply hose extension connecting bladder supply hose from mask to helmet female quick disconnect as follows:

1. Remove helmet bladder supply hose extension as follows:



Remove tiedown strap by carefully cutting laterally through tiedown strap head using diagonal cut pliers. Do not attempt to cut under strap head.

a. Remove tiedown straps securing male connectors at each end of bladder supply hose extension. Remove connectors and retain for reinstallation.

b. Separate supply hose from hose/cable keeper using elastrator.

2. Install new helmet bladder supply hose extension as follows:

a. Route required length of new bladder supply hose through hose/cable keeper.

b. Install male connectors at each end of bladder supply hose and secure with tiedown straps using tensioning tool set at 3.

6-95. Replacement of Communication Cable Extension Assembly, Oxygen Mask to Helmet. Replace communication cable extension between cable leading from mask and helmet as follows:

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1. Remove communication cable extension assembly as follows:

a. Remove connector from one end of defective communication cable assembly to facilitate removal.

b. Using elastrator separate cable assembly from hose/cable keeper.

2. Install new communication cable extension assembly as follows:

a. Using elastrator install new communication cable extension assembly in hose/cable keeper.

b. Connect new cable extension assembly between cable leading from mask and connector on helmet and perform communication check.

6-96. Communication Cable CX-13126A/A. Replace communication cable as follows:

1. Remove communication cable as follows:

a. Push red button on U-173/U plug and disconnect from AM-7067/A amplifier.

b. Remove communication cable from keeper using elastrator.

c. Remove communication cable from cable guides using elastrator.

d. Uncoil cable from delivery hose.

2. Install new communication cable as follows:

a. Insert communication cable in lower cable guide.

b. Coil cable around delivery hose, insert cable through upper cable guide, and cable keeper.

6-97. 3-Pin Connector. Replace 3-pin connector as follows:

1. Remove 3-pin connector as follows:

a. Remove cable guide from lower hose clamp or tiedown strap.

b. Remove hose clamp using hose clamp pliers and small screwdriver or tiedown strap using diagonal cut pliers.

c. Separate 3-pin connector from delivery hose.

d. Remove strain relief cord from 3-pin connector ([figure 6-25](#)).

2. Install new 3-pin connector as follows:

a. Attach strain relief cord to 3-pin connector ([figure 6-25](#)).

b. Insert 3-pin connector into delivery hose and secure with hose clamp or, if preferred, tiedown strap using tensioning tool set at 8. Smooth any sharp edges.

c. Slide cable guide over clamp or tiedown strap, as applicable.

6-98. Strain Relief Cord. Replace strain relief cord as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cord, Nylon	MIL-C-5040

1. Remove strain relief cord as follows:

a. Press red button on U-173/U plug and disconnect plug from amplifier.

b. Unthread inhalation valve elbow from mask.

c. Remove hose clamp using hose clamp pliers and small screwdriver or tiedown strap using diagonal cut pliers.

d. Separate 3-pin connector from delivery hose.

e. Refer to [figure 6-25](#) and remove strain relief cord from 3-pin connector.

f. Separate delivery hose from from inhalation valve elbow. Remove delivery hose from over strain relief cord.

g. Disconnect strain relief cord from inhalation valve elbow.

2. Adjust or, if necessary, construct and install new strain relief cord as follows:

a. Cut a length of 100 pound-test nylon cord approximately 49.5 inch long.

b. Tie loop in cord at desired length as shown in [figure 6-25](#). Pull cord out to full length tightly and check for proper length.

c. Sear cord ends 1/4 to 3/4 inch as shown in figure 6-25.

d. Install washer and thread the inhalation valve elbow to inhalation valve hand tight.

e. Insert U-713/U plug into amplifier connector ensuring red locking button engages.

1. With the oxygen mask properly fit and adjusted, there is a minimum of 1 and 1/2 inches of retention harness webbing remaining.

2. On the lower left retention harness strap, measure, toward the adjustment buckle, 3/4 of an inch from the sear cut end of the retention harness webbing and place a mark at the center of the webbing.

3. At the marked location, using a revolving punch, make a hole slightly smaller than the diameter of the shaft of the snap fastener button.

4. Assemble snap fastener button and socket onto retention harness with the button outboard, install onto harness webbing with a snap setter.

6-98A. FABRICATION AND INSTALLATION OF OXYGEN MASK SECURING FASTENER. To provide a means of fastening the oxygen mask to the PCU-33/P series and PCU-56/P series torso harnesses to secure and protect the mask from accidental exposure to contamination, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Button, Snap Fastener	MS27980-1B NIIN 00-359-6844
1	Socket, Snap Fastener	MS27980-6B NIIN 00-285-6250
1	Chuck, Socket	P/N 1410 NIIN 00-144-2084
1	Die, Button	P/N 1401 NIIN 00-090-4412
1	Snap Setter	P/N A741 NIIN 00-880-0619
1	Punch, Cutting Revolving	MIL-P-2001 NIIN 00-596-9604

6-99. ILLUSTRATED PARTS BREAK-DOWN.

6-100. This section lists and illustrates the assemblies and detail parts of the MBU-24/P22P-16 Oxygen Mask Assembly.

6-101. The IPB is intended for use in the identification, procurement, storing, and issuing of replacement parts. It also illustrates disassembly and assembly relationships. Installation, operation, and maintenance of this helmet shall be performed only by authorized personnel utilizing the instructions set forth in the preceding sections.

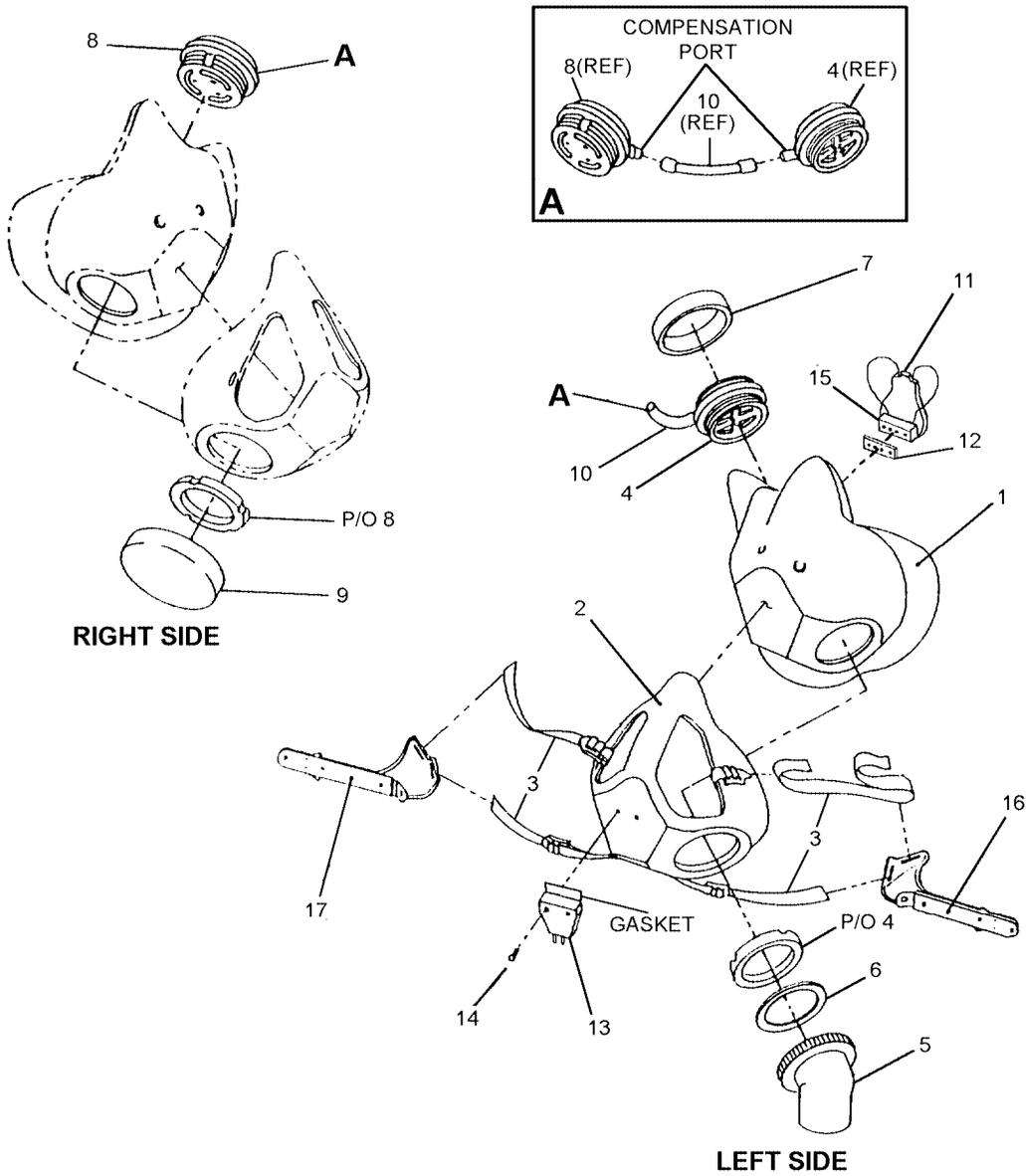


Figure 6-26. MBU-24/P22P-16 Oxygen Mask Assembly (Sheet 1 of 2)

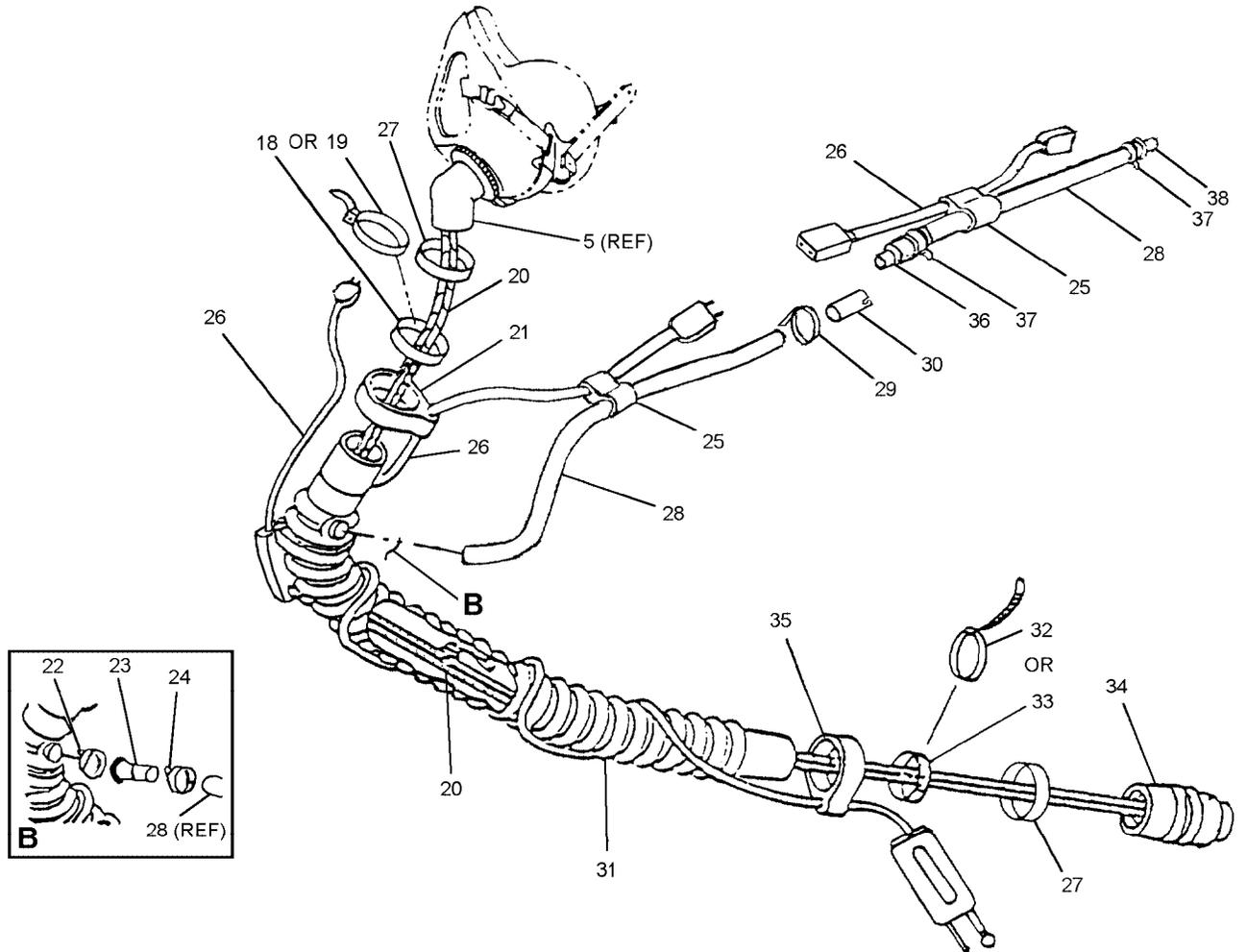


Figure 6-26. MBU-24/P22P-16 Oxygen Mask Assembly (Sheet 2 of 2)

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Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
6-26	G010-1310-01	MBU-24/P22P-16 OXYGEN MASK ASSEMBLY Small Narrow	REF	A
	G010-1310-02	MBU-24/P22P-16 OXYGEN MASK ASSEMBLY, Medium Narrow	REF	B
	G010-1310-03	MBU-24/P22P-16 OXYGEN MASK ASSEMBLY, Medium Wide	REF	C
	G010-1310-04	MBU-24/P22P-16 OXYGEN MASK ASSEMBLY, Large Wide	REF	D
-1	G010-1101-11	. FACEPIECE, Small Narrow	1	A
	G010-1101-12	. FACEPIECE, Medium Narrow	1	B
	G010-1101-13	. FACEPIECE, Medium Wide	1	C
	G010-1101-14	. FACEPIECE, Large Wide	1	D
-2	G010-1181-01	. HARDSHELL, Small Narrow	1	A
	G010-1181-02	. HARDSHELL, Medium Narrow	1	B
	G010-1181-03	. HARDSHELL, Medium Wide	1	C
	G010-1181-04	. HARDSHELL, Large Wide	1	D
-3	MIL-T-5038	. WEBBING ASSEMBLY, Black	A/R	
-4	G001-1077-01	. VALVE ASSEMBLY, Inhalation (When exhausted, use P/N G010-1050-03 (60240)) (Not <input type="checkbox"/>)	1	
	G010-1050-03	. VALVE ASSEMBLY, Inhalation	1	
-5	G001-1078-01	. . ELBOW, Inhalation Valve	1	
-6	G010-1064-01	. . WASHER	1	
-7	G033-1015-02	. . COVER, Valve, Inhalation	1	
-8	G001-1010-03	. VALVE ASSEMBLY, Exhalation	1	
-9	G033-1014-01	. COVER, Valve, Exhalation	1	
-10	G010-1058-01	. TUBE, Compensation	1	
-11	MIL-M-26542/4	. MICROPHONE ELEMENT, M-101/AIC	1	
-12	G012-1141-01	. GASKET	1	
-13	M23595/3-3	. AMPLIFIER ASSEMBLY, 7067A w/Gasket (ATTACHING PARTS)	1	
-14	AN500D2-5	. SCREW ---*---	2	
-15	G012-1076-01	. ADAPTER, M-101/AIC	1	
-16	G013-1000-01	. BAYONET, Left	1	
-17	G013-1000-02	. BAYONET, Right	1	
-18	MS22064-5	. CLAMP, Hose	1	
-19	MS3367-4-0	. STRAP, Tiedown	1	
-20	M5040-2N	. CORD, Restraint	1	
-21	G012-1034-02	. GUIDE, Cable, upper	1	
-22	MS3367-4-0	. STRAP, Tiedown	1	
-23	G010-1154-01	. COUPLER, Bladder Supply Hose	1	
-24	MS3367-4-0	. STRAP, Tiedown	1	
-25	G002-1056-01	. KEEPER, Hose/Cable	1	
-26	G030-1076-01	. CABLE ASSEMBLY, Communication	1	
-27	G010-1027-01	. COVER, Clamp	2	
-28	G002-1051-02	. HOSE, Bladder Supply, Helmet	1	
-29	MS3367-4-0	. STRAP, Tiedown	1	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
6-26-30 -31 -32 -33 -34 -35 -36 -37 -38	G002-1191-01 G010-1155-01 MS3367-4-0 MS22064-5 MS27796 G012-1035-02 G002-1192-01 MS3367-4-0 G002-1120-01	. CONNECTOR, Quick Disconnect, Female HOSE, Oxygen Delivery STRAP, Tiedown CLAMP, Hose CONNECTOR, 3-Pin GUIDE, Cable, Lower CONNECTOR, Quick Disconnect, Male STRAP, Tiedown CONNECTOR, Bladder Supply Hose, Male	1 1 1 1 1 1 1 2 1	
Notes: 1. Requires spanner wrench P/N G010-2009-03 for assembly. Spanner wrench is available open purchase from Gentex Corporation, 11525 6th St. Rancho Cucamonga, CA 91730 (909) 481-7667.				

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
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Part Number	Figure and Index Number	SM&R Code
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AN500D2-5	6-26-14	PAOZZ
G001-1010-03	6-26-8	PAOZZ
G001-1077-01	6-26-4	PAOZZ
G001-1078-01	6-26-5	PAOZZ
G002-1051-02	6-26-28	PAOZZ
G002-1056-01	6-26-25	PAOZZ
G002-1120-01	6-26-38	PAOZZ
G002-1191-01	6-26-30	PAOZZ
G002-1192-01	6-26-36	PAOZZ
G010-1027-01	6-26-27	PAOZZ
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G010-1058-01	6-26-10	PAOZZ
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G010-1101-11	6-26-1	PAOZZ
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G010-1181-04	6-26-2	PAOZZ
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G010-1310-03	6-26	PAOOO
G010-1310-04	6-26	PAOOO
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G033-1014-01	6-26-9	PAOZZ
G033-1015-02	6-26-7	PAOZZ
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MIL-T-5038	6-26-3	PAOZZ
MS22064-5	6-26-18	PAOZZ
	6-26-33	PAOZZ
MS27796	6-26-34	PAOZZ
MS3367-4-0	6-26-19	PAOZZ
	6-26-22	PAOZZ
	6-26-24	PAOZZ
	6-26-29	PAOZZ
	6-26-32	PAOZZ
	6-26-37	PAOZZ
M23595/3-3	6-26-13	PAOZZ
M5040-2N	6-26-20	PAOZZ