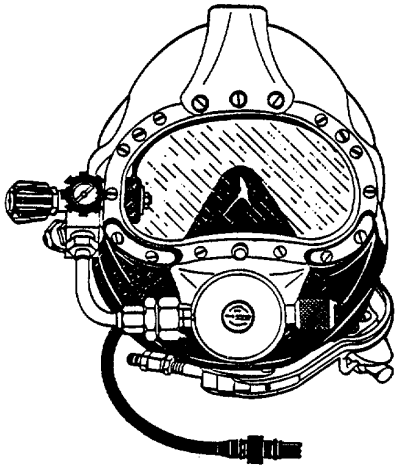
TECHNICAL MANUAL

OPERATOR/CREW, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

SUPERLITE 17B DIVING HELMET

NSN 4220-01-128-4386



HEADQUARTERS, DEPARTMENT OF THE ARMY

28 MAY 1993

WARNING

If visual Inspection indicates weakening of the hose or couplings, or otherwise renders the hose suspect, the hose shall be retired from service and replaced immediately. Failure to replace weakened hose or couplings may result in personnel injury or death.

WARNING

Failure to follow the procedures prescribed in this manual may result in equipment failure and possible personnel injury or death.

WARNING

To prevent personnel injury, ensure air is available to the helmet, and the steady flow valve is opened slightly before placing helmet on the diver.

WARNING

Dives must always be aborted when the emergency air supply is used. If an underwater emergency occurs, notify dive station and dive partner immediately. Do not ditch the diving helmet. Failure to follow prescribed emergency procedures may result in injuries to personnel.

WARNING

Cleaning with compressed air can create airborne particles that may enter eyes or penetrate skin. Pressure shall not exceed 30 psig. Wear goggles or face shield and clear immediate area of personnel. Do not direct compressed air against skin.

WARNING

When using the purge button as a second method for clearing a flooded helmet, use caution to avoid inflation injury. Do not inhale when purge button is depressed.

WARNING

Never connect umbilical supply hose to the Emergency Air Supply valve. The valve does not incorporate a non-return valve which protects the diver from barotrauma (squeeze) in the event of loss of pressure in the umbilical.

WARNING

If in doubt about the serviceability of a part, repair or replace it. Repair or replace worn or damaged parts immediately with authorized replacement parts. Failure of a component during a dive could result in injury or death to the diver.

WARNING

Do not attempt to disassemble diving system components while a breathing air circuit is pressurized. Failure to observe this warning may result in injury or death to personnel.

WARNING

Cleanliness is imperative in maintaining and handling diving system components. All tools and parts must be kept free of oil, grease, rust, or other contamination in accordance with accepted Army diving cleaning procedures in Chapter 4, Section VII.

WARNING

Remove all traces of lacquer thinner with Nonionic Detergent (NID) solution and rinse with fresh water. Residual lacquer thinner will contaminate breathing atmosphere and may cause injury or death to personnel.

WARNING

Do not use trichloroethylene or methyl chloroform in cleaning operations associated with any diving system. Use of either chemical can result in death when operators are exposed to these contaminates under pressure. The contaminates are not water soluble. If contamination, or suspected contamination occurs, immediately discontinue all equipment operations and notify the Army Diving Safety Office at Fort Eustis, Virginia AUTOVON 927-1329/Commercial 804-878-1329. The only acceptable cleaning agents are basic trisodium phosphate and nonionic soaps.

WARNING

Toxic and flammable solvent is used for various maintenance procedures. Illness or skin damage may be caused by prolonged breathing of solvent vapors or excessive skin contact with the liquid. Ensure there is adequate ventilation and avoid open flame or sparks when using flammable solvent. Observe manufacturer's warning labels and the warnings and cautions in this manual.

TECHNICAL MANUAL

No. 5-4220-226-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 28 May 1993

OPERATOR/CREW, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) SUPERLITE 17B DIVING HELMET NSN 4220-01-128-4386

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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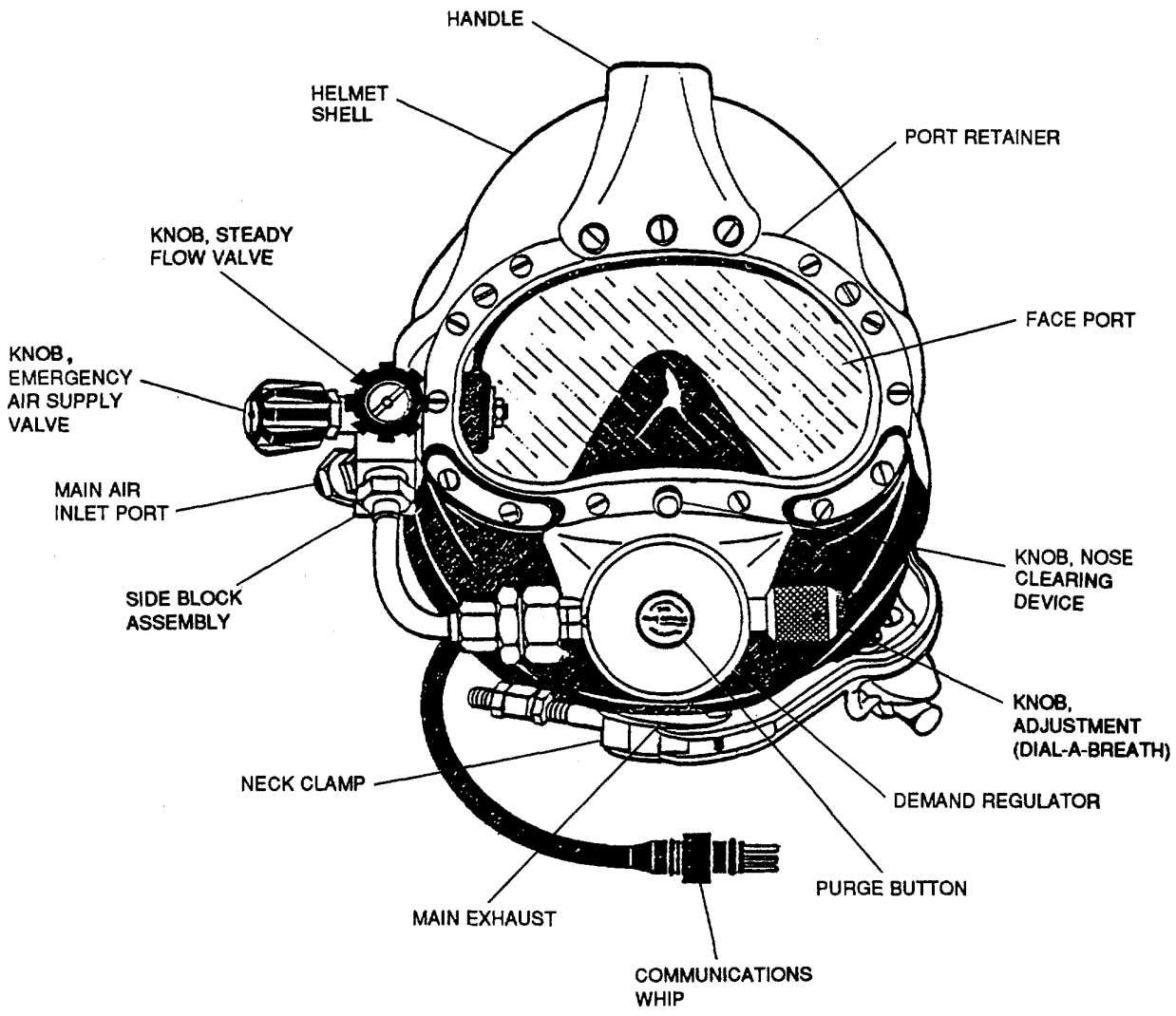


Figure 1-1. Superlite 17B Diving Helmet.

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. Scope.

a. Type of Manual: Operator/Crew, Organizational, Direct Support and General Support Maintenance Manual. The manual also provides a repair parts and special tools list located in Appendix F.

b. Equipment Name: Superlite 17B Diving Helmet.

c. Purpose of Equipment: The Superlite 17B Diving Helmet provides the latest in helmet design, providing a good swimming helmet, performing very similar to a mask.

1-2. Maintenance Forms and Records.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. Destruction of Army Materiel To Prevent Enemy Use.

Destruction of army materiel to prevent enemy use will be accomplished in accordance with (IAW) TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-4. Preparation for Storage or Shipment.

For storage or shipment instructions, refer to Chapter 4, Section VI, of this manual.

1-5. Reporting Equipment Improvement Recommendations (EIR).

If your diving helmet needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on a SF368, Quality Deficiency Report (QDR). Mail it to us at: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MOF, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We will send you a reply.

Section II. EQUIPMENT DESCRIPTION

1-6. Equipment Characteristics, Capabilities, and Features.

a. Characteristics. This head-mounted diving helmet eliminates the need for jock down cables or additional weights to secure the helmet to the diver.

1-6. Equipment Characterlstlcs, Capabilities, and Features - continued.

b. Capabilities and Features.

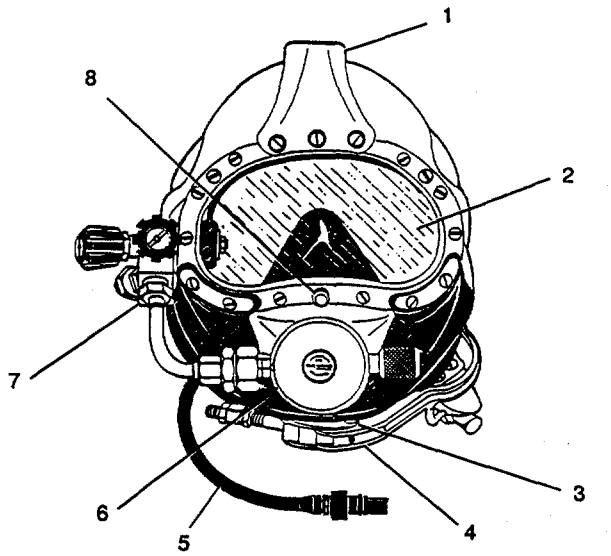
(1) Capable of operating from both a main breathing air supply or an emergency supply.

(2) Capable of communicating with surface personnel.

(3) Woven fiberglass and polyester resin construction resists cracks and will not carry an electrical charge.

(4) Offers complete head protection (head, ears, and face remain dry).

1-7. Location and Description of Major Components.



1	Handle	Convenience for carrying and handling the helmet. Can also be used to mount lights or tape weights or other items to helmet.
2	Face Port	Provides field of vision for diver.
3	Main Exhaust	Provides automatic water purging for any flooding.
4	Neck Dam System	Secures the helmet from accidental removal by firmly locking helmet around diver's neck.
5	Communications Whip	Waterproof four-pin connector for sending and receiving communications signals.
6	Demand Regulator	Supplies breathing air to diver on demand and shuts off during the exhalation portion of breathing cycle.
7	Side Block Assembly	Manifold that receives breathing air from the main or emergency supply, then directs air flow to the demand regulator.
8	Nose Clearing Device	Allows diver to block his (her) nose to provide an overpressure in the sinus and inner ear for equalization.

1-8. Equipment Data.

a. Helmet Weight: 24 pounds (approximate).

b. Helmet Construction: Woven fiberglass and polyester resin.

c. Maximum Operating Depth: 250 feet (IAC FM 20-11-1).

1-9. Safety, Care, and Handling.

a. Safety. It is imperative that all safety precautions specified on the warning pages in front of this manual be observed. Also, observe specific warnings and cautions specified throughout this manual. The warnings are provided for protection from death or serious injury.

b. Care and Handling.

(1) Cleanliness is imperative in maintaining and handling diving system components. All tools and parts must be kept free of oil, grease, rust, or other contaminants.

(2) Store helmet in a dry, well ventilated location, protected from pilferage, dampness, fire, dirt, insects, rodents, and direct sunlight.

Section III. PRINCIPLES OF OPERATION

1-10. General.

This section describes how the diving helmet operates.

1-11. Head Attached Dry Diving Helmet.

The helmet is attached directly to the diver's head. It moves with the divers head and handles similarly to a diving mask. Primary advantages to this helmet compared to a mask are:

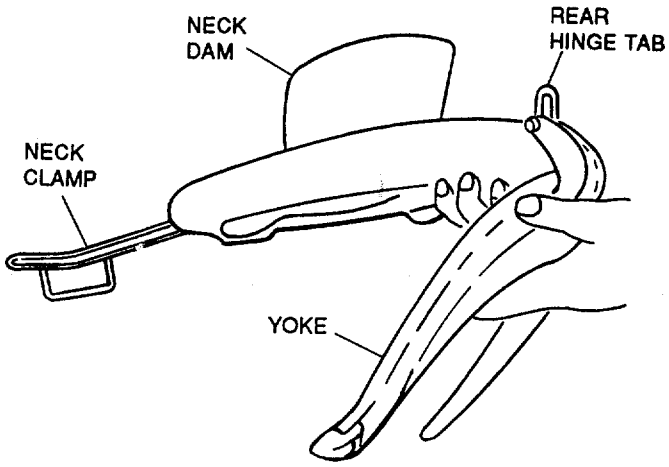
a. Elimination of the mask face seal provides more comfort to the diver. Ear infection is reduced. Communications are improved both to and from the diver.

b. It is unlikely that the helmet be accidentally pulled from the diver's head, even if diver is unconscious.

1-12. Neck Clamp.

The neck clamp provides rapid locking in place of the helmet by the diver without assistance.

1-12. Neck Clamp - continued.



1-13. Neck Dam System.

WARNING

- Never modify neck dam to accommodate a dry suit. Ballooning may occur putting the diver at risk of injury or death.
- The hood of the wet/dry suit should never be worn inside the helmet. The neck dam seal, communications, and divers breathing will be adversely affected.

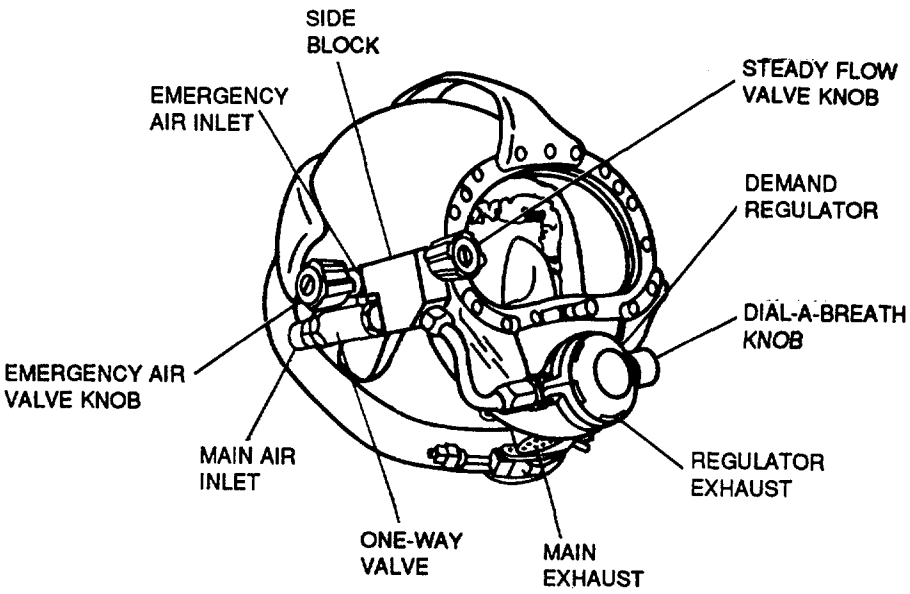
a. The slot in the yoke that fits around the diver's neck is smaller than his head. It is improbable that the helmet could be accidentally pulled from the head with the yoke in place.

b. The yoke hinges into place around the divers upper neck and the lower part of his head. The lower part of the head cushion (inside the helmet) is pushed in by the yoke, thus section the helmet comfortably onto the diver's head.

c. The neck dam is sandwiched between the yoke and the lower part of the head cushion, preventing ballooning or any bellows effect from the breathing cycle.

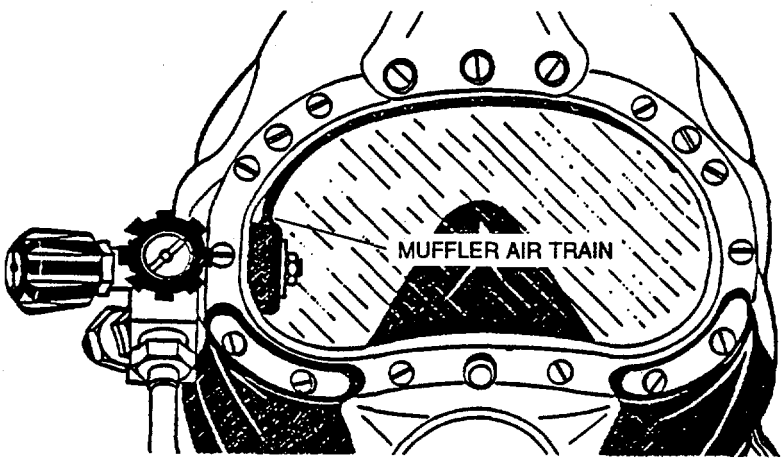
1-14. Life Support System.

The Superlite 17B is designed for use with umbilical supplied air and emergency air supply. Only under very controlled conditions should the helmet be used with a self-contained air supply (SCUBA mode). The flow of the breathing medium (air or mixed gas) is described below.



a. The breathing medium flows through the air hose portion of the umbilical to the main air inlet port, which connects with the one-way adapter and then the side block assembly.

b. The flow continues into the side block assembly. A through passage in the side block assembly is always open to supply the demand regulator whenever the air supply is pressured up. The steady flow knob controls flow from the passage in the side block through the muffler air train into the helmet interior. In cold water, the face port fogs up from the diver's face warmth and moisture. Directing the incoming air onto the lens clears this fogging.



c. The demand regulator functions like a standard Self-Contained Underwater Breathing Apparatus (SCUBA) unit. The dial-a-breath knob allows the diver to control the regulator for a wide range of air supply pressures. Diver control allows for the least breathing resistance. The diver's exhalation gases exit the oral-nasal mask Into the demand regulator and out through the exhaust.

1-14. Life Support System - continued.

d. When the steady flow system is on, air that is not being inhaled by the diver flows through the main exhaust system and out into the water. The main exhaust valve is located at the lowest point in the helmet (when in a normal working or swimming position) so the slight overpressure created by the incoming steady flow air automatically ejects any water that may be present in the helmet.

WARNING

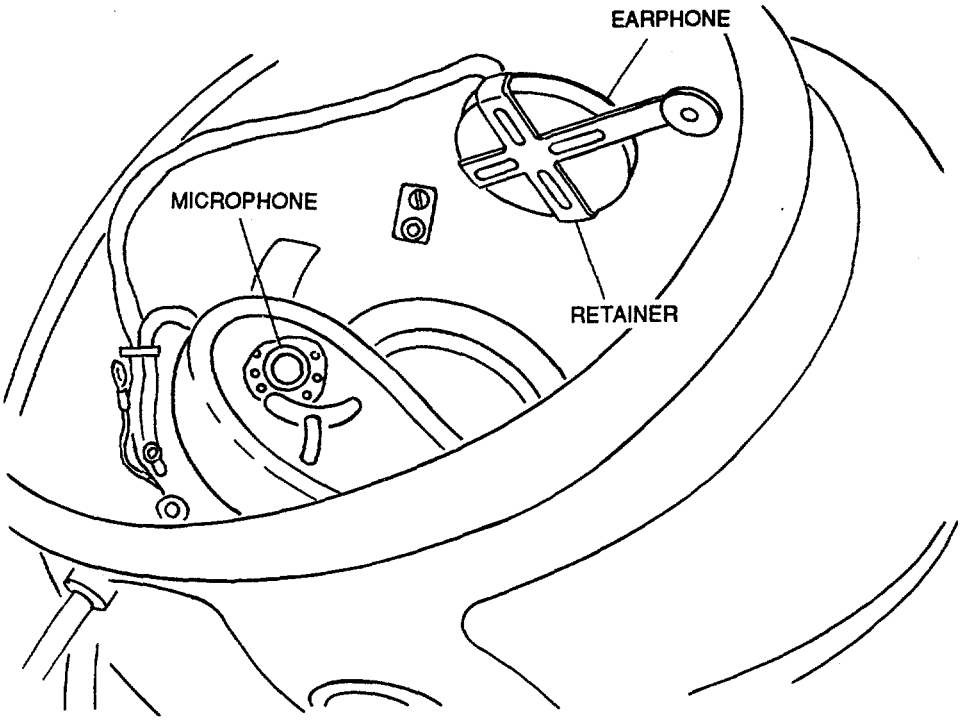
If emergency air supply valve is inadvertently opened before or during a normal dive, it can deplete the entire emergency air supply.

e. Another inlet to the side block assembly is fined with an emergency valve. It is strongly recommended that the working diver carry an independent supply of air which is fitted with an air reduction valve and hose to the inlet of the emergency air valve. A high quality, high flow SCUBA first stage regulator may be used for this purpose. Be sure it is fitted with a relief valve for overpressurization of the supply hose. Air flow from the emergency valve enters the side valve and follows the same route as the main supply.

1-15. Communications System.

a. A pair of dynamic speakers for earphones and a matching rnicrophone are standard equipment in the helmet. Each unit is wired in parallel and connected to the communications whip at the two communications posts inside the helmet. The earphones differ from each other only in the length of the wires.

b. The earphones and microphone must "breathe" or equalize as the internal pressure changes. Tiny tubes surround the wires of these units and allow slight amounts of air to flow through the tubes.



1-16. Flooding.

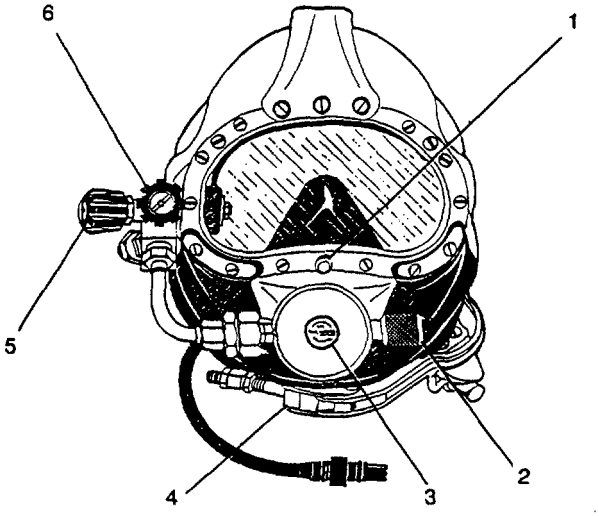
It is very unlikely that the diver will ever flood out the helmet. The demand regulator keeps a slight over-pressure in the helmet, preventing water entry. However, the diver should practice clearing a flooded helmet to build confidence and knowledge of the situation. Should flooding occur, increasing the steady flow air supply will stop or reverse the helmet flooding.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

2-1. Operator Controls.



Operator controls needed to operate the diving helmet are as follows:

1	Nose Clearing Device	Allows diver to block his (her) nose to provide an overpressure in the sinus and inner ear for equalization.
2	Dial-A-Breath Knob	Controls flow of air into the helmet for the diver to breathe.
3	Demand Regulator Purge Button	Pressing the purge button clears the oral-nasal mask in the event of accidental flooding.
4	Neck Clamp	Locks helmet to yoke system to prevent accidental removal.
5	Emergency Air Supply Knob	Controls the flow of air from the emergency supply.
6	Steady Flow Valve Knob	Directs flow of air from the umbilical or emergency supply through the muffler air train.

Section II. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. Introduction.

a. General. Table 2-1 (PMCS Table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

b. Warnings and Cautions. Always observe the WARNINGS and CAUTIONS appearing in your PMCS table. Warnings and cautions appear before applicable procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your equipment from being damaged.

c. Explanation of Table Entries.

(1) Item number column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

(2) Interval column. This column tells you when you must do the procedure in the procedure column. BEFORE procedures must be done before you operate or use the equipment for its intended mission. DURING procedures must be done during the time you are operating or using the equipment for its intended mission. AFTER procedures must be done immediately after you have operated or used the equipment.

(3) Location, item to check/service column. This column provides the location and the item to be checked or serviced. The item location is underlined.

(4) Procedure column. This column gives the procedure you must do to check or service the item listed in the check/service column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.

(5) Not fully mission capable if: column. Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you perform check and service procedures that show faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failures.

d. Other Table Entries. Be sure to observe all special information and notes that appear in your table.

Table 2-1. Operator's Preventive Maintenance Checks and Services

Item No	Interval	Location Item to check service	Procedure	Not fully mission capable if:
1	Before	EXTERIOR Neck Dam and Yoke	Inspect neck dam for holes, cuts, tears, or other damage. Ensure clamp lock nut and adjustment nut have not loosened or changed adjustment. Lock clamp into place on helmet. Locking tension should be tight, but not forced to the point of bending the lever.	Damage to neck dam allows possibility of leakage. Clamp cannot be locked onto helmet.

Table 2-1. Operator's Preventive Maintenance Checks and Services - CONT

Item No	Interval	Location Item to check service	Procedure	Not fully mission capable if:
2	Before	EXTERIOR Side Block Assembly	Inspect for loose mounting hardware. Inspect bent tube for dents or other damage. Check moving parts such as the steady flow and emergency air supply valve knobs for smooth and proper operation.	Bent tube is defective. Valve handles are difficult to operate.
3	Before	EXTERIOR One Way Valve Assembly	Close steady flow valve and open emergency air supply valve. Connect emergency air cylinder whip to emergency air inlet. Open emergency air cylinder valve and turn in on dial-a-breath knob until it stops freeflow. Check for leaks at the umbilical connection.	Valve is defective.
4	Before	EXTERIOR Demand Regulator	Inspect for loose mounting hardware and excessive dents or other damage that would interfere with its function. Check dial-a-breath knob and purge button for smooth and proper operation.	Dial-a-breath knob and purge button do not operate smoothly.
5	Before	INTERIOR Oral-Nasal Mask	Inspect the mask for dirt, cracks, or any signs of deterioration. Ensure the mask is properly positioned on the demand regulator mounting nut.	Mask is cracked or torn.
6	Before	INTERIOR Nose Clearing Device	Inspect for proper operation. The nose clearing device knob should turn smoothly as well as sliding in and out smoothly.	Nose clearing device does not operate smoothly.
7	Before	INTERIOR Port Retainer	Inspect for dents, cracks, or any sign of damage. Remove any sand or dirt from the interior of the face port which might cause scratches when anti-fogging solution is applied.	
8	Before	INTERIOR Muffler Air Train	Inspect for loose mounting hardware. Check for dents, cracks, bends, or any other sign of damage.	Damage restricts air flow.
9	Before	EXTERIOR Exhaust Tube/Whisker Exhaust	Inspect for cracks, cuts, tears, or any other sign of damage.	Damage would interfere with proper operation.
10	Before	EXTERIOR Exhaust Valve Assembly	Inspect for dents, cracks, or any other sign of damage. Remove main exhaust cover and lubricate valve with silicone lubricant. Reinstall cover.	Damage interferes with operation.

2-2. Introduction - continued.

Table 2-1. Operator's Preventive Maintenance Checks and Services - CONT

Item No	Interval	Location Item to check service	Procedure	Not fully mission capable if:
11	Before	EXTERIOR Communications Whip	Inspect the cable for cracks, signs of deterioration, or any other damage. Check the connector for cracks, corrosion, bent pins or any other damage.	
12	Before	INTERIOR Helmet Liner	Inspect cushion for holes, tears, rips, or other damage. If foam is saturated with water, squeeze it out. Ensure head cushion is dry and properly fastened inside the helmet.	
13	Before	EXTERIOR Helmet Shell	Inspect shell and face plate for gouges, chips, and deep scratches. If scratches are 1/32 inch deep or deeper and more than 1 inch long, replace part or select alternate helmet to continue with the dive.	Damage exceeds listed tolerance.
14	Before	INTERIOR Communications Set	Inspect microphone and earphones. Ensure they are dry and undamaged. Inspect wires and communications connectors to ensure they are clean and undamaged. Check for corrosion and breaks in the wires.	Communication system not operative.
15	Before	EXTERIOR Umbilical	Clear umbilical of moisture and contaminants by connecting the umbilical to an air source. Hold open end of umbilical while starting air flow and increase slowly. Run air flow until hose is purged of moisture, dust, and any other contaminants. Shut off air supply at source. Inspect umbilical for cracks, bulges, or sticky surface texture. Ensure umbilical hose manufacture dates are within specifications prescribed by FM 20-11-1, Military Diving Manual.	Umbilical shows signs of cracks, bulges, or sticky surface texture. Hose manufacture dates are not within specifications prescribed by FM 20-1 1 -1, Military Diving Manual.
16	Before	EXTERIOR Helmet Adapter Hose	Inspect hose and fittings for date of manufacture/testing. Ensure assembly is within specifications for service life prescribed by FM 20-11-1, Military Diving Manual. Inspect for damage such as cracks, breaks, or sticky surface texture, and extensive wear.	Hose is not within specifications for service life/testing. Hose shows signs of cracks, bulges, or sticky surface texture.

2-3. Reporting Deficiencies.

If any problem with the equipment is discovered during PMCS or while it is being operated that cannot be corrected at the operator/crew level, it must be reported. Refer to DA PAM 738-750 and report the deficiency using the proper forms.

2-4. Special Instructions.

a. Keep It Clean. Cleanliness is imperative in maintaining and handling diving system components. All tools and parts must be kept free of oil, grease, rust, or other contamination IAW chapter 4, section VII.

b. Cleaning. Do not use trichlorethylene or methyl chloroform in cleaning operations. The only acceptable cleaning agents are Tri Basic Sodium Phosphate and nonionic soaps.

SECTION III. OPERATION UNDER USUAL CONDITIONS

2-5. General.

This section describes normal operating procedures for the diving helmet. Included are predive setup procedures, mission operational procedures, and post dive procedures.

2-6. Predive Setup Procedures.

After performing PMCS procedures in Section II, accomplish the steps listed in table 2-2, predive setup procedures. These procedures are intended as an overview of predive setup and are not intended to replace a proper training program, but are only a general outline of use.

Table 2-2. Predive Setup Procedures

Step	Procedure
1. Visual inspection.	Perform PMCS.
2. Connect and check emergency air supply.	a. Gage emergency air cylinder and record. Install first stage regulator on emergency air cylinder and set over bottom pressure at 135 psig ±5 psig. b. Ensure emergency air supply valve is completely closed. Connect the cylinder valve to the emergency air supply inlet on the side block. Set relief valve on first stage regulator at 200 psig. c. Open the cylinder valve and the emergency air supply valve. d. Verify that air flows by listening for the characteristic hiss of escaping air.

2-6. Predive Setup Procedures - continued.

Table 2-2. Predive Setup Procedures - CONT

Step	Procedure
2. Connect and check emergency air supply - continued	e. Check that no air is escaping through the one-way valve by holding a moistened finger lightly to the main air supply inlet. **WARNING** It is required that the emergency air supply be worn on all dives to depths in excess of 60 feet. It is recommended that it be worn on shallow dives (less than 60 feet deep) as well. f. Close the cylinder valve and the emergency air supply valve on the side block. Wipe any residual moisture from the one-way valve.
3. Connect and check main air supply.	**WARNING** Never connect the main air supply hose (umbilical) to the emergency air supply inlet. The emergency air supply valve does not incorporate a one-way valve to protect the diver from baratrauma (squeeze) in the event of loss of pressure in the umbilical. a. Using the helmet adapter hose, connect the umbilical to the main air inlet on the side block assembly. **NOTE** Use two wrenches to connect the umbilical - one to hold the adapter and one to turn the hose fitting to prevent damage to the adapter threads. Umbilical connection should be snug but not overtight. Do not use excessive force or the adapter will be damaged. b. Turn on the main air supply from the surface support platform. c. Slowly open the steady flow valve on the side block and check for flow of air into the helmet. d. Close the steady flow valve. e. Momentarily depress the demand regulator purge button. f. Turn dial-a-breath knob out until regulator freeflows, then turn knob back in until it stops. g. Extend the nose block device outside the mask.

Table 2-2. Predive Setup Procedures - CONT

Step	Procedure
4. Connect and check communications cable.	a. Connect communications cable to helmet whip and wrap with tape. b. Check communications.

2-7. Donning Procedures.

Table 2-3 provides the procedural steps that must be followed when donning the helmet. The experienced diver may want his (her) tender to assist in the donning procedures. However, until the procedures are well known, it is recommended that the diver dress himself (herself). This will help in the event of unforeseen emergencies.

Table 2-3. Donning Procedures

Step	Procedure
1. Don thermal protection suit, if necessary.	**WARNING** The hood of the wet/dry suit should never be worn inside the helmet. The neck dam seal, communications, and diver's breathing will be adversely affected.
2. Don harness.	Place diver's harness over his shoulder and around his chest.
Don Integrated Diver's Vest (IDV) (for dives deeper than 60 feet)	Procedures are the same as harness.

2-7. Donning Procedures - continued.

Table 2-3. Donning Procedures - CONT

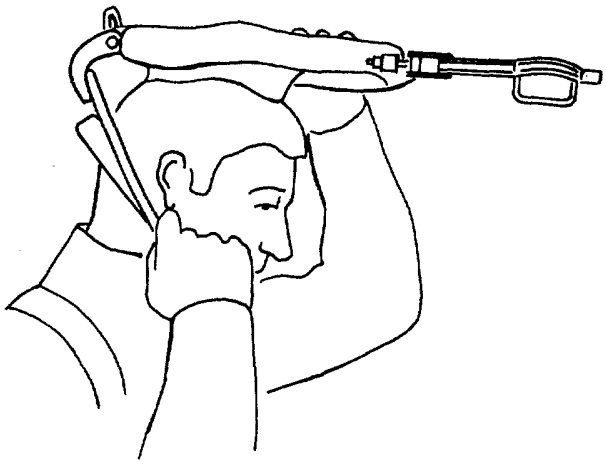
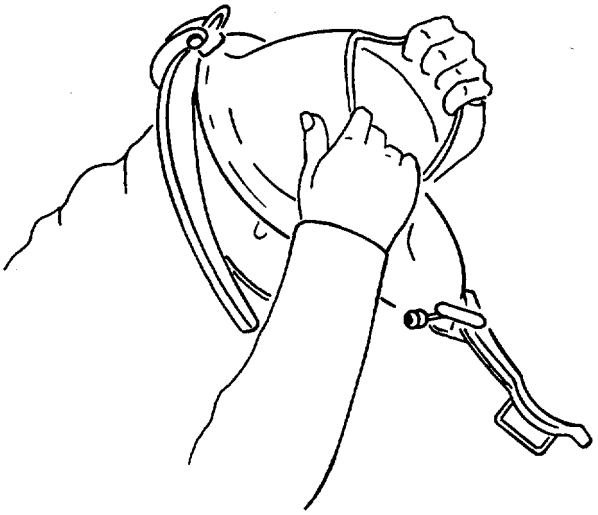
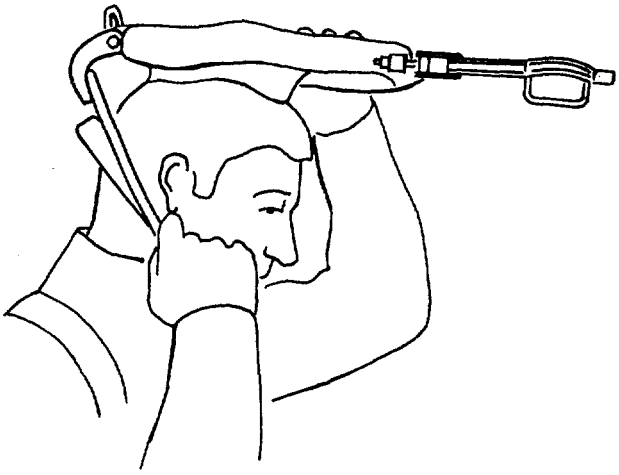
Step	Procedure
3. Adjust head cushion and chin strap.	a. Align head cushion in helmet so it does not protrude into the front of the helmet interfering with vision. b. The chin strap should be inspected to make sure it is secure at the proper adjustment to suit the diver. If chin strap is too loose, the helmet will ride up during the dive. 
4. Don neck dam and yoke	a. The neck dam and yoke is hinged open and pulled over the divers head. 

Table 2-3. Donning Procedures - CONT

Step	Procedure
4. Don neck dam and yoke - continued.	b. Spread the rubber neck dam apart and slip it over the head. Pull neck dam down until it is comfortable in place around the neck.  c. Ensure upper edge of neck dam is turned up. Improperly turned neck dam will allow breathing air to vent from neck dam.  **WARNING** To prevent personnel injury, ensure air is available to the helmet and the steady flow valve is opened slightly before placing helmet on diver.

2-7. Donning Procedures - continued.

Table 2-3. Donning Procedures - CONT

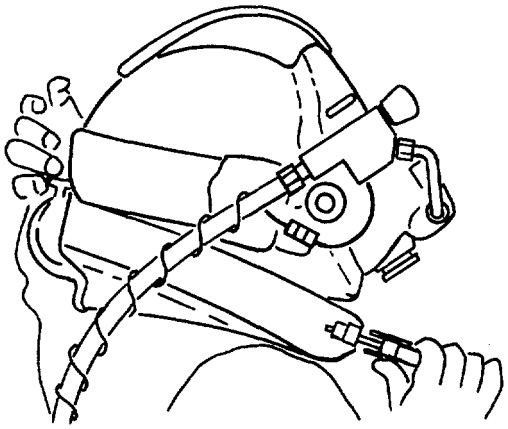
Step	Procedure
5. Don helmet	a. Position helmet, face port down on soft surface with head cushion neck strap sticking out, in front of diver. b. Pick up helmet by grasping the lower opening, holding the protruding head cushion with thumbs, while holding tail of chin strap under left thumb. c. Pull helmet down over head and from side to side until it is aligned with the neck clamp and yoke and feels comfortable.  d. Pull chin strap down and fasten under chin. Ensure strap is not trapped between helmet and neck dam. e. Pushing neck clamp and yoke rearward, place rear hinge tab on alignment sleeve. Diver tilts head upward to allow neck dam to clear lower front portion of helmet. 

Table 2-3. Donning Procedures - CONT

Step	Procedure
5. Don helmet - continued.	f. Pull neck dam forward and then pull up over the front of the helmet until helmet o-ring Is covered by the neck dam and neck ring. g. Once the neck dam is in place, swing the neck clamp lever to the left until it snaps closed and locks neck ring onto the helmet. h. Feel the lever and latch catch mechanism to ensure it is correctly engaged and locked. 
6. Breathing system check.	a. Open and close the steady flow valve to ensure proper operation. b. Open and close dial-a-breath knob to ensure proper operation. c. Check breathing resistance by breathing in and out. Adjust dial-a-breath so that only slight effort is required to inhale. d. Press demand regulator purge button to check air purge.
7. Don weight belt.	Place the SCUBA-type weight belt around the diver's waist.
8. Attach umbilical to harness.	Attach the umbilical to the D-ring at the left side of the diver's waist and tuck pneumfathometer into harness.

2-8. Equipment Checks Prior to Water Entry.

The checks in table 2-4 will be accomplished after donning the equipment, but prior to water entry.

2-8. Equipment Checks Prior to Water Entry - continued.

Table 2-4. Equipment Checks Prior to Water Entry

Step	Procedure
1. Breathing system check.	a. Open and close the steady flow valve to ensure proper operation. b. Turn dial-a-breath out until it begins to freeflow, then back in until it stops. Turn in one additional turn. Check purge button for full purge. c. Check breathing resistance by breathing in and out. Adjust dial-a-breath so that only slight effort is required to inhale. d. Press purge button to check air purge.
2. Communications check.	Perform communications check, sending and receiving at both ends.
3. Leak check.	TENDER - Apply leak detector to check for leaks to all mask connections Including: a. Umbilical to main air inlet on side block. b. Emergency air supply hose to emergency air inlet on side block. c. First stage regulator on emergency air cylinder. d. Bent tube assembly to side block. e. Bent tube assembly to demand regulator. f. Demand regulator to helmet.
4. Accessory check.	TENDER AND DIVER - Ensure that diver has all necessary accessories and that they are properly donned, including: a. Boots/fins. b. Knife, strap on. c. Weights. d. Diver tools. e. Diver lights. f. Other, as required.
5. Standby diver ready.	TENDER - Ensure standby diver is ready to enter water and alert diving supervisor.
6. Check entire rig.	TENDER - Check entire rig, including: a. Hose connections. b. Harness. c. Strain relief shackle. d. Air flow to diver.

Table 2-4. Equipment Checks Prior to Water Entry

Step	Procedure
6. Check entire rig - continued.	e. Ensure emergency air supply cylinder valve is fully opened, then back off one-quarter turn. **NOTE** All equipment should be functioning correctly and the diver breathing comfortably for at least two minutes from ON AIR time before entering water. TENDER - Notify diving supervisor that diver is "READY TO ENTER WATER."
7. Diver enter water.	TENDER - Assist diver into water.

2-9. In-Water Checkout Procedures.

The procedures in table 2-5 are to be performed In the water before the diver begins his descent to the working depth.

Table 2-5. In-Water Checkout Procedures

Step	Procedure
1. Breathing check.	Perform the following system checks as necessary. a. Ensure adequate air flow. b. Open and close steady flow valve to ensure proper operation. c. Open and close dial-a-breath valve to ensure proper operation. d. Check breathing resistance by breathing in and out. Adjust dial-a-breath valve so that only slight effort is required to inhale. e. Press purge button to check air purge.
2. Communications check.	Diving Supervisor - Perform communications check: a. Diver to diver, send and receive. b. Divers to standby diver, send and receive. c. Divers to surface support personnel, send and receive. d. Divers to communications operator (if applicable), send and receive. e. Communications operator to surface support personnel (if applicable), send and receive.

2-9. In-Water Checkout Procedures - continued.

Table 2-5. In-Water Checkout Procedures - CONT

Step	Procedure
3. Adjust straps.	Adjust harness straps for snug and comfortable fit in water.
4. Buoyancy check.	Check for correct buoyancy.
5. Thermal protection suit check.	Check thermal protection suit.

2-10. In-Water Operations.

The diving mission will be conducted at the work site according to the guidelines of the dive plan, and as directed by the diving supervisor.

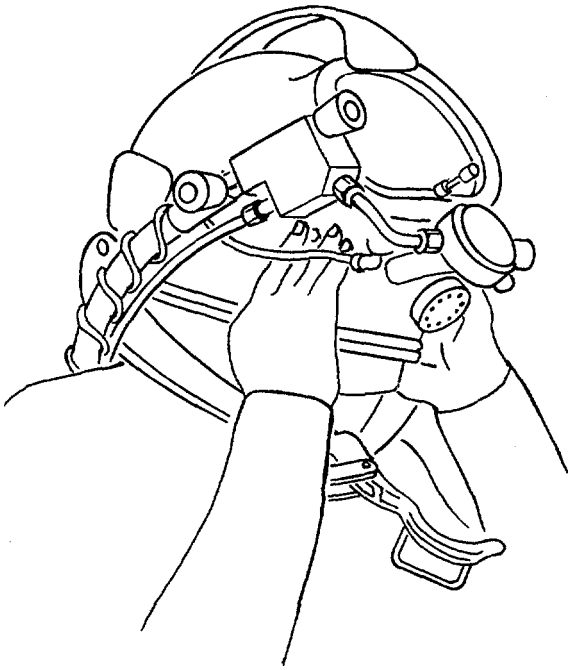
2-11. Postdive Procedures.

Upon mission completion, the diver will exit the water, doff equipment, and perform the postdive procedures and maintenance listed in table 2-6.

Table 2-6. Postdive Procedures

Step	Procedure
1. Doff helmet.	Upon completion of dive, the diver exits the water and removes the helmet as follows: a. Swing the neck clamp lever wide open pushing the neck dam down at the end of the opening swing. Then push back so the rear hinge tab on the yoke system falls clear of the alignment sleeve. 

Table 2-6. Postdive Procedures - CONT

Step	Procedure
1. Doff helmet - continued.	b. Pull nose clearing device fully outward; unfasten chin strap. Then, grasping the lower opening, thumbs inside to hold head cushion in place, push forward and up on the helmet.
	
	c. After helmet is removed, the umbilical strain relief shackle is disconnected from the harness.
	d. Neck dam and yoke is removed by hinging the neck clamp from the yoke and pulling neck dam/neck clamp up and over the head. Let the yoke hinge open and slip off the neck to the rear.
2. OFF air.	a. Secure the main air supply.
	b. Close the emergency air supply cylinder valve.
	c. Open the emergency air supply valve and press purge button to bleed air in whip and side block assembly.
	d. Obtain a pressure reading for the emergency air cylinder between each dive.
3. Doff equipment.	a. Remove diver's weight belt.
	b. Remove emergency air supply.
	c. Remove harness/vest.

2-11. Postdive Procedures - continued.

Table 2-6. Postdive Procedures - CONT

Step	Procedure
4. Clean equipment.	Disinfect oral-nasal mask and nose clearing device with Betadine solution and wipe dry. **NOTE** If no further dives are to be conducted, proceed to step 5.
5. Disconnect umbilical.	Disconnect umbilical air hose and emergency air supply hose from the side valve. Disconnect the communications cable from the communications whip. **NOTE** Be sure that air is turned off at supply source and pressure is bled down.
6. Inspect and clean equipment.	a. Rinse the diver-worn equipment and umbilical thoroughly; air or blow dry. b. Turn on air supply and blow side block and demand regulator clean of water. c. Inspect all equipment for damage, tag as appropriate. d. Allow all gear to dry thoroughly before storing.
7. Postmission maintenance.	Perform postmission maintenance and any additional cleaning as necessary.
8. Inventory.	Inventory the helmet and ancillary equipment to be sure all component assemblies are complete.
9. Maintenance actions required.	Repair or replace all defective items prior to next dive.

2-12. Decals and Instruction Plates.

Manufacturer's decals are located on both the right and left sides of the helmet.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-13. Operation In Poor Visibility Conditions.

If conditions, such as poor visibility, hamper the effectiveness of the diver, notify dive station immediately. Diver and dive partner return to dive station. Poor visibility caused by operations in sandy or heavy oil environment may require increased maintenance and the replacement of rubber parts on a more frequent basis.

2-14. Operation In Bad Weather Conditions.

In the event of bad weather, conduct operations IAW unit standard operating procedures.

2-15. Operation Unfamiliar Diving Areas.

When the dive plan dictates that operations be conducted in unfamiliar areas, it is important that extra caution be exercised during the dive.

2-16. Nuclear, Biological, and Chemical (NBC) Decontamination.

In the event of nuclear, biological, or chemical attack, conduct operations and decontamination IAW unit standard operating procedures.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

SECTION I. LUBRICATION INSTRUCTIONS

No special lubrication instructions are required for the helmet.

SECTION II. TROUBLESHOOTING PROCEDURES

No operator troubleshooting procedures are required for the helmet.

SECTION III. MAINTENANCE PROCEDURES

3-1. Introduction.

a. This section contains maintenance procedures which are the responsibility of operator level maintenance as authorized by the maintenance allocation chart (MAC) and the source maintenance recoverability (SMR) coded items that are identified in the repair parts and special tools list (RPSTL).

b. Maintenance at the operator level is restricted to the inspection and cleaning of the main components and replacement of minor components such as thread protective caps and valve handles.

NOTE

Maintenance procedures should be performed IAW the MAC. Unless specified, procedures requiring disassembly of sub-components will not be performed at the operator level.

3-2. Maintenance and Reentry Control Procedures.

a. Maintenance and reentry control procedures are established to document and maintain the integrity, cleanliness, and safety of the system and to ensure work is done IAW proper specifications and procedures.

b. A reentry control (REC) report must be completed and approved for each maintenance action and a control log will be maintained for each system. A sample REC report and a sample control log are provided at the end of this chapter.

c. Instructions for completing the REC report (figure 3-1) are as follows:

(1) REC Nr: A sequential three digit number assigned from the control log beginning with 001.

(2) Julian Date: Julian Date.

3-2. Maintenance and Reentry Control Procedures - continued.

(3) 2407 Control NR: (Attach 2407) Taken from the DA Form 2407, upper left-hand comer.

(4) UIC: Unit Identification Code.

(5) SYSTEM: Superlite 17B Diving Helmet.

(6) SUB-ASSEMBLY: The portion of the system that is being worked on.

(7) COMPONENT: The part of the subassembly that will be fixed, i.e., gage isolation valve, etc.

(8) S/N: Subassembly serial number.

(9) P/N: Component part number.

(10) FAULT ANALYSIS PERFORMED: (Describe Problem) Describe the problem and any special procedures used to isolate the problem.

(11) ACTION TAKEN: (Check One)
TEST:_____ADJUST:_____REPLACE:_____REPAIR:_____OTHER:_____
Check the appropriate maintenance action.

(12) MAINT LEVEL: Enter the single element maintenance code IAW the MAC.

(13) WORK TIME: HRS. Enter the required time to complete the task (hours and tenths).

(14) WORK DESCRIPTION: Describe the procedures used to perform the required maintenance.

(15) OLD COMPONENT DISPOSITION: What did you do with the old part (i.e., disposed, turned Into general support for repair, etc.).

(16) WAS SYSTEM INTEGRITY COMPROMISED? YES_____ NO_____ Check appropriate box.

(17) IF YES, CLEANING PROCEDURE USED: Enter the cleaning procedure used.

(18) WAS AIR SAMPLE TAKEN? YES_____ NO_____
ANALYSIS RESULTS: Check appropriate box and enter the analysis results.

(19) REENTRY CONTROL LOG COMPLETED: (Initial) Enter initials after log entry is made.

(20) WORK PERFORMED BY: Enter name, rank, title of person performing maintenance.

(21) WORK CHECKED BY: Enter name, rank, title of person performing check.

REENTRY CONTROL (REC) REPORT

REC NR: 001
2407 Control NR: (Attach 2407) 001-3

JULIAN DATE: _____
UIC: WC7AA

SYSTEM: 17B SUPERLITE
SUB-ASSEMBLY: NECK DAM
COMPONENT: REAR HINGE TAB

S/N: 002
P/N: 545-013

FAULT ANALYSIS PERFORMED: (Describe Problem)

ACTION TAKEN: (Check One)

TEST: _____ ADJUST: _____ REPLACE: ✓ REPAIR: _____ OTHER: _____

MAINT LEVEL: ORG

WORK TIME: 0.5 HRS.

WORK DESCRIPTION:

OLD COMPONENT DISPOSITION:

WAS SYSTEM INTEGRITY COMPROMISED? YES ____ NO ✓
IF YES, CLEANING PROCEDURE USED:

WAS AIR SAMPLE TAKEN? YES ____ NO ✓
ANALYSIS RESULTS:

REENTRY CONTROL LOG COMPLETED: (INITIAL) RWB

WORK PERFORMED BY: DOE John P SSG _____
LAST FIRST MI RANK/TITLE DATE

WORK CHECKED BY: _____ _____
LAST FIRST MI RANK/TITLE DATE

Figure 3-1. Reentry Control (REC) Report

3-2. Maintenance and Reentry Control Procedures - continued.

d. Instructions for completing the reentry control log (figure 3-2) are as follows:

(1) SYSTEM: Enter system acronym.

(2) UIC: Unit Identification Code.

(3) PAGE NR: Enter sequential log page number, beginning with 01.

(4) REC NR: Reentry Control Number; a sequential three digit number assigned to track entries from the REC Reports beginning with 001.

(5) SUB-ASSEMBLY: The portion of the system being worked on transcribed from REC Report.

(6) S/N: Serial Number of the subassembly.

(7) COMPONENT: The part of the subassembly that will be fixed (i.e., gage isolation valve, etc.).

(8) P/N: Part Number of the component.

(9) JULIAN DATE: Julian date.

(10) ACTION TAKEN: Enter replace, repair, etc., from REC Report.

(11) MAINT LEVEL: Enter maintenance level from REC Report.

(12) WORK TIME: Enter time required to complete task from the REC Report.

(13) REMARKS: Enter pertinent remarks, cleaning data, etc., in this block.

e. The reentry control report will be completed for all maintenance actions conducted on the helmet. A record of the maintenance procedures must be maintained for the life of the system. This requirement is in addition to other maintenance documentation required through TAMMS or unit requirements.

SYSTEM: REENTRY CONTROL LOG PAGE NR. _____

UIC:

REC NR	SUB-ASSEMBLY	S/N	COMPONENT	P/N	JULIAN DATE	ACTION TAKEN	MAINT LEVEL	WORK TIME	REMARKS
001	NECK DAM	002	R. HINGE TAB	545-013				0.5	

Figure 3-2 Reentry Control Log

3-3. Maintenance of Oral-Nasal Mask.

This task covers:

Test

INITIAL SETUP

Equipment Conditions:

Helmet donned IAW paragraph 2-7.

Test

NOTE

Normally the diver breathes in and out of the demand regulator. However, the valve in the side of the oral-nasal mask allows the diver to receive air from the side block.

a. Test the oral-nasal mask by turning in the dial-a-breath and adjusting the steady flow valve on the side block to allow the diver to receive air from the side block.

b. If air can be received through the valve, the oral-nasal mask can continue to be used.

c. Replace the oral-nasal mask if it fails to meet this test.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

SECTION I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

4-1. Common Tools and Equipment.

For authorized common tools and equipment, refer to modified table of organization and equipment (MTOE) applicable to your unit.

4-2. Special Tools, TMDE, and Support Equipment.

Special tools required for organizational maintenance are listed and illustrated in the repair parts and special tools list (appx F). TMDE and support equipment are listed in the maintenance allocation chart (appx B).

4-3. Repair Parts.

Repair parts are listed in the repair parts and special tools list (appx F).

SECTION II. SERVICE UPON RECEIPT

4-4. Introduction.

This section provides information and procedures for the receipt, installation, and testing of the Superlite 17B Diving Helmet.

4-5. Initial Inspection.

Upon receiving the helmet, all parts should be inspected and tested. The equipment may not be ready for immediate operational use and some parts may require special preparation.

a. Inventorv. Upon receiving the equipment an inventory of the helmet should be completed. To ensure receipt of all items, the shipment should be compared with packing lists included in the shipping documentation.

b. Inspection. Remove each item from the shipping container and perform a thorough inspection for any deviation from good manufacturing and packaging processes, such as incompleteness of assembly, faulty workmanship, rust, dirt, delamination, cracks, deterioration, and corrosion. Specific items to be inspected are indicated in the following subparagraphs.

(1) Helmet assembly. The helmet assembly is inspected to ensure all components are present and in a condition suitable for use according to U.S. Army Diving Manual and PMCS listed in Chapter 2 of this technical manual.

(a) Check oral-nasal mask, nose clearing device padding, head cushion foam, and whisker for signs of deterioration and damage.

(b) Inspect frame and faceplate for chips, scratches, and gouges.

(c) Open and close the emergency air valve, steady flow valve, and dial-a-breath to ensure smooth and proper operation. Maneuver nose clearing device in and out to check for ease of operation.

(d) Ensure side block, bent tube assembly, and exhaust valve covers and other metal parts are free of dents or other signs of damage.

(e) Inspect communications set and whip for corrosion.

(f) Inspect for loose, missing, or damaged screws.

(2) Spare kits and regulator adjustment kits. The helmet includes spare kits and regulator adjustment kits. Each kit is to be inventoried and inspected for completeness and suitable operating condition.

c. Maintenance Check. Examine maintenance records accompanying the shipment to verify that required preventive maintenance checks and services have been performed. Perform all preventive maintenance checks and services as scheduled before operational use of the equipment.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-6. Introduction.

This section lists the monthly preventive maintenance checks and services to be performed at the organizational maintenance level.

a. Item Number Column. Checks and services are listed in the order of performance. This column shall be used as a source of item numbers for the TM Number Column on DA Form 2404, Equipment inspection and Maintenance Worksheet, in recording results of PMCS.

b. Item To Be Inspected Column. Indicates the portion of the equipment to be inspected.

c. Procedure Column. Contains a brief description of the procedure by which the check is to be performed.

4-7. Organizational Preventive Maintenance Checks and Services.

Refer to table 4-1 for organizational monthly preventive maintenance checks and Services.

Table 4-1. Organizational Monthly Preventive Maintenance Checks and Services

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Helmet Assembly	Clean and inspect helmet shell, weights, and faceplate.
2	Neck Dam and Yoke Assembly	Clean and inspect neck dam and yoke assembly.
3	Nose Clearing Device	Check for smooth operation.
4	Emergency Air Supply Valve	Inspect valve to ensure it is clean and undamaged. Open and close the valve to ensure that the valve turns smoothly.
5	Demand Regulator	Inspect for dents or other signs of damage. Turn dial-a-breath knob in and then fully out to check for smooth operation. Press purge button to ensure valve resets correctly. .
6	Umbilical	Flush exterior with fresh water. Inspect cables and hoses for cracks or other damage. Inspect coupling nuts for thread damage.
7	Communications Whip	Flush exterior of cable with fresh water. Inspect cable for cracks, fraying, or other damage. Inspect electrical connector for cracks, bent pins, or other damage.

SECTION IV. TROUBLESHOOTING PROCEDURES

48. Introduction.

a. Table 4-2 lists the common malfunctions which you may find during the operation or maintenance of the helmet or its components. You should perform the tests/inspections and corrective actions in the order listed.

4-8. Introduction - continued.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.

4-9. Troubleshooting.

Refer to table 4-2 for organizational maintenance troubleshooting.

Tale 4-2. Organizational Maintenance Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. WATER LEAKAGE INTO HELMET
a. Check for damaged or improperly seated exhaust valve.
Seat or replace valve (para 4-21).
b. Check for damage or improperly seated regulator diaphragm.
Seat or replace diaphragm (para 4-15).
c. Check for torn neck dam or improperly adjusted neck clamp.
Replace neck dam or adjust neck clamp (para 4-12).
d. Check for loose port retainer screws.
Tighten screws (para 4-18).
2. DEMAND REGULATOR CONTINUOUSLY FREE FLOWS
a. Check for too high air supply pressure.
Adjust supply pressure lower than 200 psi over ambient.
b. Check for regulator out of adjustment.
Adjust regulator (para 4-15).
c. If free flow occurs only under water, check for turned down or torn neck dam.
Adjust or replace neck dam (para 4-12).

Tale 4-2. Organizational Maintenance Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
3. DEMAND REGULATOR BREATHING RESISTANCE TOO HIGH
a. Check for too low air supply pressure.
Adjust supply pressure to minimum 120 psi over ambient.
b. Check for regulator out of adjustment.
Adjust regulator (para 4-15).
4. DEMAND REGULATOR DOES NOT SUPPLY AIR
a. No air in umbilical.
Ensure proper operation of air supply system.
b. Check for blocked regulator or worn or damaged internal regulator parts.
Disassemble, clean, repair, and adjust regulator (para 4-15).
5. ONE-WAY VALVE ALLOWS BACK FLOW
a. Foreign matter in valve.
Replace valve (para 4-14).
b. Valve is damaged.
Replace valve (para 4-14).

SECTION V. MAINTENANCE PROCEDURES

4-10. Superlite 17B Diving Helmet Maintenance.

The diving helmet consists of the helmet assembly and helmet adapter hose. Organizational maintenance procedures for these components are covered in the following paragraphs.

4-11. Helmet Assembly Maintenance.

Organizational maintenance procedures for the helmet components are covered in paragraphs 4-12 through 4-26.

4-12. Neck Dam and Yoke Assembly Maintenance.

This task covers:

a. Removal **b. Disassembly** **c. Clearing and Inspection**
d. Repair **e. Reassembly** **f. Installation**

INITIAL SETUP

Tools

Tool kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)

Materials Required (continued)

Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID) Solution (item 3, appx E)
Loctite 222 Thread Sealant (item 6, appx E)

a. Removal

Unhinge neck clamp/yoke from helmet. Set helmet aside.

b. Disassembly

(1) Unscrew one of the two hinge bolts (1) and slide the hinge sleeve (2) out by using a pair of pliers to pull on the other hinge bolt.

(2) Remove three screws (3) and three washers (4) securing hinge (5) to yoke (6).

(3) Remove three screws (7) and separate latch catch (8) from yoke (6).

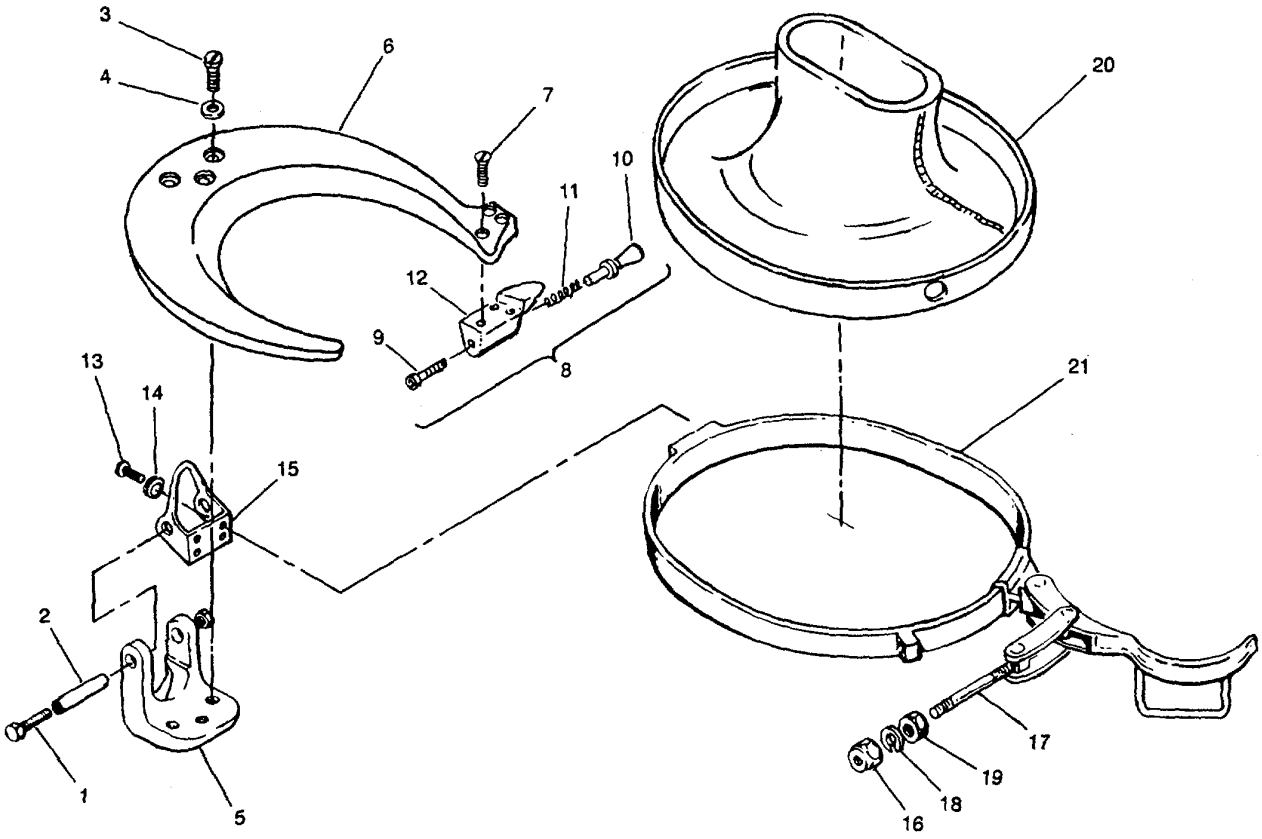
NOTE

Note position of plunger (1), spring (11), and capscrew (9) relative to latch catch body (12). Plunger should be reassembled in the same position.

(4) Cover plunger (10) with clean, lint-free rag and grip with pliers. Remove capscrew (9), plunger (1 0), and spring (11).

(5) Remove four screws (13), four washers (14), and separate rear hinge tab (15) from the neck clamp.

(6) Remove the neck clamp Locknut (16) and slip the threaded neck clamp adjustment boft (17) out of the retaining block. Then remove the lockwasher (18) and nut (19) from the threaded neck clamp adjustment bolt.



(7) If necessary to remove neck dam (20) from neck clamp (21), proceed as follows:

(a) The neck clamp has guide tracks that guide and hold together the two ends of the clamp. Pull the front of the neck clamp apart. The base of the lever is one end of the neck clamp and the other end overlaps inside for about 5 or 6 inches.

(b) While pulling apart, press down on the block end of the neck clamp and up on the lever end. The base of the lever mount stops the lower track at the end and a jog in the pull-apart motion is necessary.

(c) After the two ends of the neck clamp are free from each other, slide the rubber neck dam so that the lever end of the neck clamp starts coming out of the neck dam through the hole in the glued sleeve of the neck dam. Keep working the rubber around until the neck clamp is free of the neck dam.

c. Cleaning and Inspection

(1) Clean all components of neck clamp, yoke, and latch catch mechanism with NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse with warm fresh water; air or blow dry.

4-12. Neck Dam and Yoke Assembly Maintenance - continued.

(3) Inspect yoke for cracks or gouges.

(4) Inspect neck clamp for bends, breaks, or thread damage.

(5) Inspect neck dam for tears, holes, or deformation of rubber.

d. Repair

Repair is accomplished by replacement of damaged parts.

e. Reassembly.

(1) Assemble the neck dam on the neck clamp as follows:

(a) The starting hole for the neck clamp is the front hole next to the sewn (and glued) seam.

(b) Set the neck clamp down with the open ends facing you. Lever end on the right with the locking loop down. Hold the neck dam in the center of the neck clamp.

(c) Start feeding the end of the clamp (end that does not have the lever) into the neck dam. Work the rubber around, helping it over the block and keeping the end running in the sleeve. When the rear sewn seam is just past the hinge tab mount plate on the rear of the neck clamp, stop feeding the rubber. This is the correct position. Even out the rubber of the neck dam so it is uniform in stretch all about the neck clamp.

(d) The two ends of the neck clamp are now overlapping. The block that receives the threaded adjustment arm is protruding through second hole of a new neck dam, and should be in the correct position.

(e) Next, make sure the sleeve is not stretched unevenly (the hole at the base of the handle should not be pulled or stretched into elongation).

(f) Run the nut (1 9) onto the threaded adjustment bolt (1 7) about 1/2 inch. Slip on the lockwasher (18) and place the threaded adjustment bolt in place through the block. Install locknut (16). Work the lever back and forth and check that the ends of the clamp are tracking correctly within the neck dam.

(g) Make sure the rear sewn seam of the neck dam is next to, but not on, the hinge tab plate at the rear of the next clamp. Punch four small holes for the mounting screws and install the rear hinge tab (15) using four screws (13) and four washers (14).

(2) Install spring (11) on plunger (10), and insert into latch catch body (12).

(3) Apply Loctite 222 to the first 114 inch of threads on capscrew (9), and install screw into plunger. Tighten screw until plunger is in position noted during disassembly.

(4) Fasten latch catch (8) to yoke (6) with three screws (7).

(5) Attach hinge (5) to yoke (6) using three screws (3) and three washers (4).

(6) Fasten assembled yoke to neck clamp with hinge sleeve (2) and two hinge bolts (1).

f. Neck Clamp Adjustment

(1) Place the assembled neck dam and yoke assembly on the helmet.

(2) Place the neck clamp lever in the locked (or closed) position. If it will not close, loosen the adjustment locknut (16) until it does.

(3) Loosen nut (19) by turning it so that it travels toward the lever. Tighten locknut (16) until some tension is present. At this point, test the lever action. You should be able to pull the lever open about an inch and have it snap closed. The lever should open without excessive force if pulled out several inches.

(4) Test by opening and closing the lever several times. When the adjustment is correct, tighten nut (19) against lockwasher (18). If a new neck dam was installed, readjustment may be necessary after a few days due to compression of the neck dam rubber.

4-13. Side Block Assembly Maintenance.

This task covers:

a. Removal **b. Cleaning and Inspection** **c. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID) Solution (item 3, appx E)

Materials Required (continued)

Lacquer Thinner (item 5, appx E)
Silicone Sealant (RTV) (item 9, appx E)
Preformed Packing
Washer

Equipment Conditions

Muffler air train removed (para 4-19).

a. Removal

(1) Place helmet on clean workbench.

(2) Unthread bent tube assembly (1) from side block.

(3) Holding inlet cap on the demand regulator, loosen the opposite end of the bent tube assembly. Unthread the nut until it becomes free, then pull the bent tube assembly straight away from the demand regulator. Remove washer (2) and preformed packing (3). Discard washer and packing.

(4) On inside of helmet, remove nut (4), lockwasher (5), and washer (6) from stud (7). Remove side block screw (8).

(5) Remove side block assembly (9) from side of helmet.

4-13. Side Block Assembly Maintenance - continued.

b. Cleaning and Inspection

(1) Clean helmet shell with lacquer thinner to remove all traces of silicone sealant.

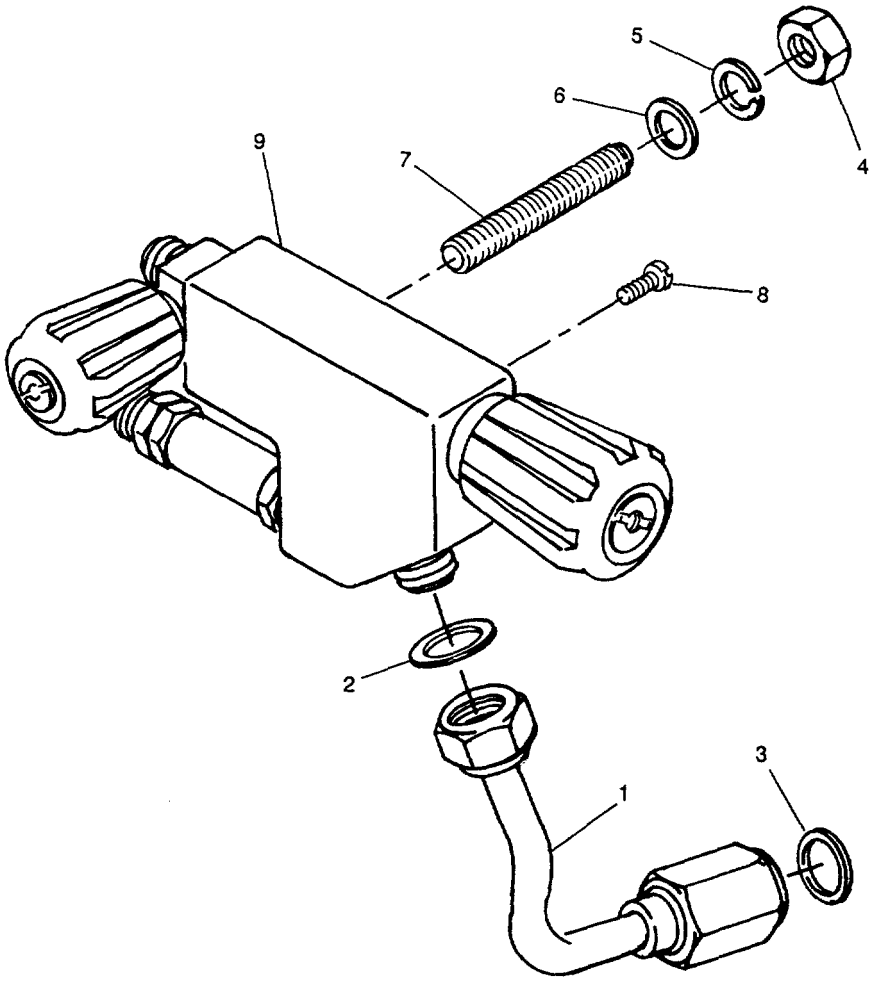
WARNING

Remove all traces of lacquer thinner with NID solution and rinse with fresh water. Residual lacquer thinner will contaminate divers air and can cause injury or death.

(2) Remove all traces of lacquer thinner from helmet shell with NID solution and soft bristle brush. Wipe clean with lint-free cloths. Rinse with fresh water; air or blow dry.

(3) Inspect side block assembly for cracks, stripped threads, or other signs of damage.

(4) Inspect bent tube for cracks, major dents, or stripped threads.



c. Installation

(1) Apply silicone sealant to helmet shell over the side block mounting screw and side block stud openings.

(2) Insert side block stud (7) through helmet shell. Install washer (6), lockwasher (5), and nut (4). Install side block screw (8).

(3) Thread bent tube (1) with new preformed packing (3) onto inlet cap of demand regulator. Do not tighten.

(4) With new washer (2) installed in opposite bent tube nut, thread nut onto side block. Tighten nut onto side block and then tighten opposite nut onto demand regulator.

4-14. One-Way Valve Assembly Maintenance.

This task covers:

a. Removal **b. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

Materials Required (continued)

Nonionic Detergent (NID) Solution (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Preformed Packing

Equipment Conditions

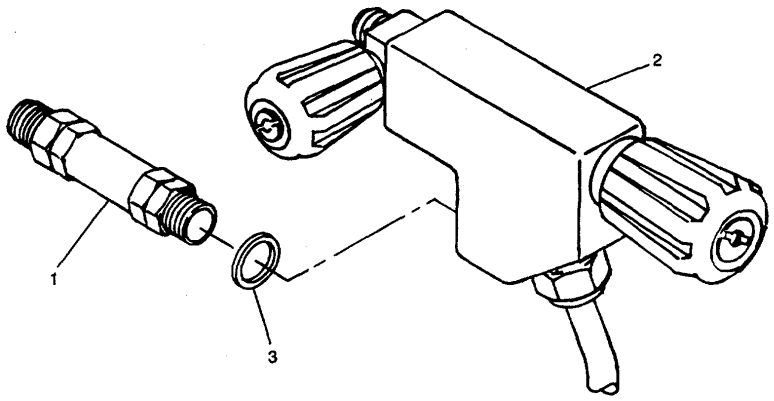
Helmet adapter hose removed (para 4-26).

a. Removal

(1) Place helmet on clean workbench.

(2) Remove one-way valve (1) from side block (2).

(3) Remove and discard preformed packing (3).



4-14. One-Way Valve Assembly Maintenance - continued.

b. Installation

(1) Apply silicone lubricant to new preformed packing (3).

(2) Install preformed packing and one-way valve (1) into side block (2). Do not over tighten.

4-15. Demand Regulator Assembly Maintenance.

This task covers:

a. Adjustment **b. Removal** **c. Disassembly**
d. Cleaning and Inspection **e. Repair** **f. Reassembly**
g. Installation

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Regulator Adjustment Tool (item 1, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

Materials Required (continued)

Nonionic Detergent (NID) Solution (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Preformed Packing
Locknut

Equipment Conditions

Whisker exhaust removed (para 4-20).

a. Adjustment

NOTE

- The regulator can be removed from the helmet or left in place on the helmet during adjustment.
- For maximum regulator performance, allow the regulator to sit for 24 hours with the dial-a-breath knob (4) screwed in before adjusting. This will allow the rubber in the inlet valve stem (5) to take a set against the inlet nipple (13). If this is not possible, then adjust the lever (10) to favor the looser limit of 1/8 inch so as to compensate for the inward travel of the stem (5) after the valve (1 2) rubber has compressed.
- All regulator parts should be free of damage and dirt.
- All rubber components should be in excellent condition.
- All internal parts should be lubricated with silicone lubricant.

(1) Remove clamp (1), cover (2), and diaphragm (3).

(2) Unscrew the dial-a-breath knob (4) all the way out.

(3) Insert the inlet valve holder wrench between the inlet valve stem (5) and the piston (6), aligning the blade of the wrench with the small slot in the end of the stem. This prevents stem rotation.

(4) Tighten the dial-a-breath knob (4) all the way in and then open it four full turns.

(5) Pressure the regulator to between 120 and 150 lbs of supply pressure.

CAUTION

- It is permissible to loosen the nut (7) no more than 1/8 turn to adjust the lever height. If the nut (7) is loosened beyond this amount, the regulator will not flow to its maximum rate due to insufficient leverage between the lever (10) and the bearing washers on the inlet valve stem. If the nut (7) is adjusted too tight, the regulator will leak.

- The two opposing blades on the bottom of the lever (1 0) must be in perfect alignment with each other and be free of tool marks or burrs.

- Normally, if the regulator leaks gas, the nut (7) is too tight and should be loosened until the lever (10) has 1/8 inch of freedom at the end.

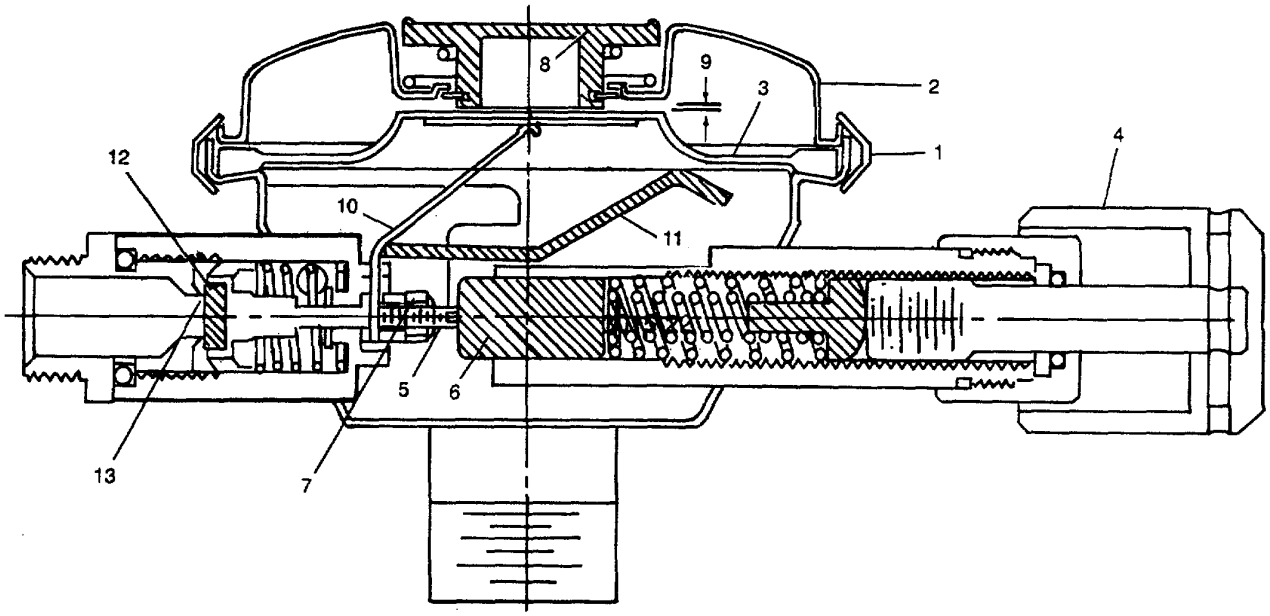
- If the regulator continues to leak, either the inlet valve (1 2) should be changed or the regulator needs a thorough cleaning and lubricating.

(6) Adjust the nut (7) until there is 1/8 inch of freedom at the end of the lever (10).

(7) Place the diaphragm (3) and cover (2) in place and depress the cover tightly to simulate the clamping action of the clamp (1).

(8) Depress the purge button (8) in the center of the cover (2). There should be 1/8 inch of free travel before the button comes in contact with the diaphragm (9). The lever (10) must now be adjusted to this proper height if it is not already correct. The nut (7) can be loosened no more than 1/8 turn to lower the lever (1O) height. The lever (10) must be bent if more adjustment is necessary.

4-15. Demand Regulator Assembly Maintenance - continued.



NOTE

Be very careful not to place undue stress on the lower arms of the lever as this will disfigure the lower blades and cause spongy operation.

(9) To bend the lever (10) up, grip the lever from the side with a pair of long-nosed pliers and bend the lever using a twisting action, if possible, depending on lever styles.

(10) To bend the lever down, place the disk end of the diving systems integral 1/4-inch wrench (11) onto the flat area of the adjustment tube within the regulator. Next slide the disk, as far as possible, under the lever (10). With your finger, bend the lever down over the disk to the desired height. Be careful not to bend the lever too far.

(11) Replace the diaphragm (3) and the cover (2) and test the purge button (8) once more.

b. Removal

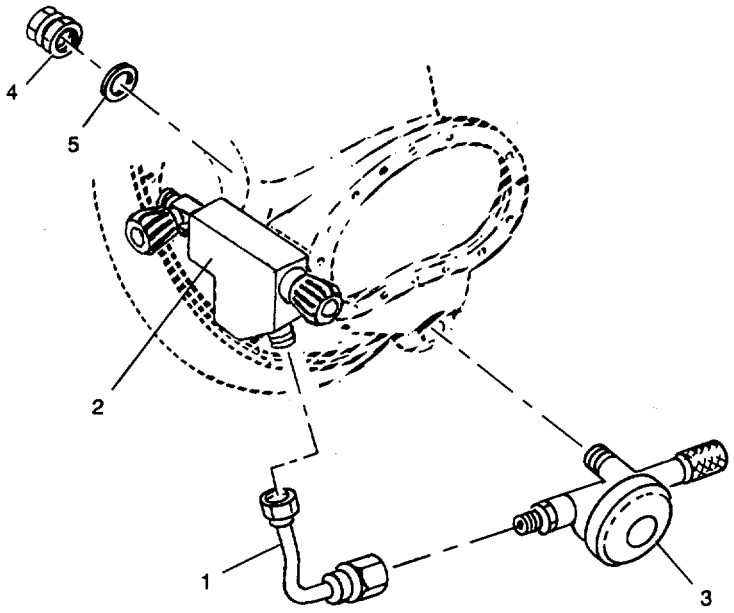
(1) Completely unthread the bent tube (1) from the side block (2).

(2) While holding the inlet cap on the demand regulator (3), loosen the bent tube nut and pull the bent tube straight away from the demand regulator.

(3) Inside the helmet, gently pull the oral-nasal mask away from the regulator mount nut (4). The oral nasal mask will still be attached to the nose block device.

(4) Remove the regulator mount nut (4) and mount nut preformed packing (5). Discard the packing.

(5) Pull the demand regulator body (3) away from the helmet.



c. Disassembly

(1) Remove cover clamp screw (1) and cover clamp (2).

(2) Lift off cover (3) and remove diaphragm (4).

(3) Turn dial-a-breath knob (5) counterclockwise until packing nut (6) is fully exposed. Then, remove packing nut, dial-a-breath knob (5), shaft (7), preformed packing (8), and washer (9) as a unit.

(4) Place the dial-a-breath knob on a block of wood and drive retaining pin (1 0) out of the knob. Remove washer (9) and preformed packing (8) from shaft (7). Discard packing.

(5) Tilt regulator body (14) so that spacer (I 1), spring set (12), and piston (13) fall out of the adjustment shaft tube.

(6) Remove inlet nipple (15) from regulator body. Remove preformed packing (16). Discard packing.

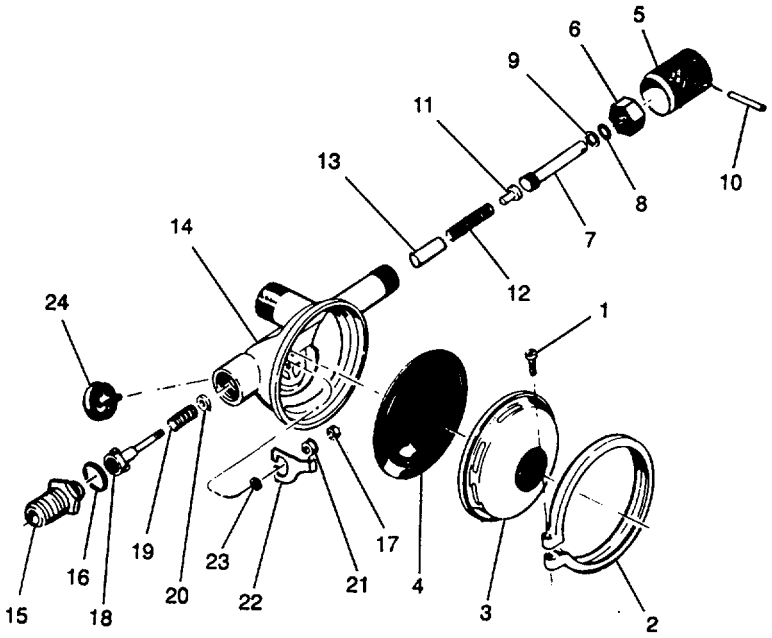
(7) Remove nut (17) from inlet valve (18). Discard nut. Tit the regulator body and drop out inlet valve (18), spring (19), and washer (20). The spacer (21), lever (22), and washer (23) will now fall out of the regulator body.

NOTE

Do not re-use exhaust valve once it has been removed from the regulator body.

(8) Inspect exhaust valve (24) for tears, deterioration, or deformation of rubber. If damaged, pull valve away from regulator body.

4-15. Demand Regulator Assembly Maintenance - continued.



d. Cleaning and Inspection

(1) Clean all parts with NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse thoroughly with fresh water; air or blow dry.

(2) Inspect inlet valve (18) for damage to sealing face. Ensure stem is straight.

(3) Inspect diaphragm (4) for cracks, pin holes, or deformation of rubber. Check for separation of rubber from metal.

(4) Inspect washers (9 and 23) for deterioration.

(5) Inspect remaining parts for damage or wear.

e. Repair

Repair is limited to the replacement of damaged parts.

f. Reassembly

(1) If exhaust valve (24) is damaged or has been removed, wet new valve stem with fresh water and install valve into regulator body. Cut valve stem so that it protrudes no more than 1/4 inch from regulator body.

(2) Place washer (20) and spring (19) on the shaft of inlet valve (18). Insert the inlet valve, with spring and washer in place, into the regulator body.

CAUTION

Locknut (17) should always be replaced with a new locknut if removed from the inlet valve.

(3) Place washer (23), lever (22), and spacer (21) onto the shaft of the inlet valve (18). Screw a new locknut (17) onto the inlet valve until the inlet valve threads protrude slightly (about two threads) past the nut.

(4) Lubricate new preformed packing (16) with silicone lubricant. Install inlet nipple (15) with packing (16) into the regulator body.

(5) Lubricate piston (1 3), spring set (I 2), and spacer (11) generously with silicone lubricant. Insert piston, spring set, and spacer into the adjustment tube of the regulator body.

(6) Thread shaft (7) into tube of regulator body. Slide washer (9) and preformed packing (8) onto shaft (7).

(7) Slide packing nut (6) over shaft (7) and thread onto tube of regulator body.

(8) Fit knob (5) onto shaft (7) and align with holes of shaft. Support knob on block of wood and install retaining pin (10) by tapping it through knob and shaft.

CAUTION

Do not over tighten inlet valve nut as this will cause malfunctioning of demand regulator.

(9) Tighten inlet valve nut (17) until lever (22) is snug with no play.

(10) Check dial-a-breath knob (5) for free rotation and tighten packing nut (6) accordingly.

(11) Replace diaphragm (4) into regulator body.

(12) Install regulator cover (3) and secure with clamp (2) and screw (1).

g. Installation

(1) Lubricate new preformed packing (5) and packing groove on regulator body (3). (Ref III, para 4-1 5b).

(2) Mount regulator body on helmet and install new preformed packing (5) and regulator mount nut (4).

NOTE

Do not tighten mount nut until the bent tube is installed on the inlet cap and side block body.

(3) Refer to illustration in paragraph 4-15b and thread bent tube (1) nut on regulator inlet cap of demand regulator. Do not tighten.

(4) Thread bent tube nut onto side block (2). Tighten side block bent tube nut, then regulator mount nut, and regulator end bent tube nut.

4-16. Oral-Nasal Mask Maintenance.

This task covers:
a. Removal b. Cleaning and Inspection c. Repair d. Installation

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

Materials Required (continued)

10% Providone-Iodine Solution (item 7, appx E)
Oral-Nasal Valve

Equipment Conditions

Nose block device removed (para 4-17).

a. Removal

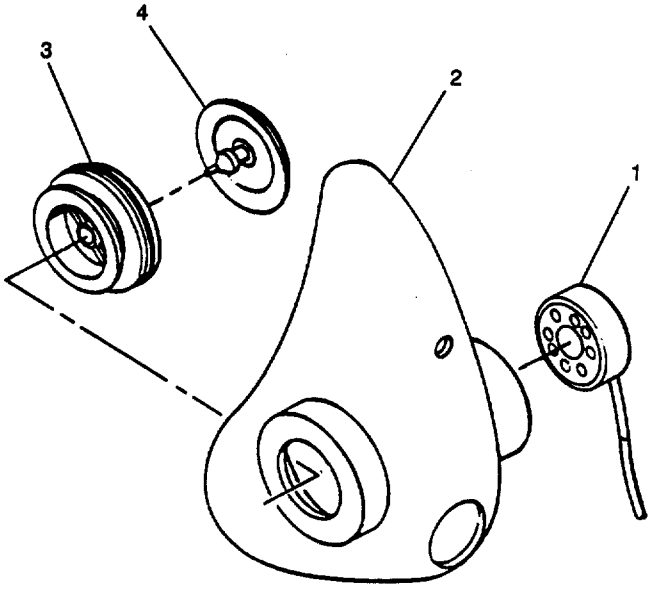
(1) Place helmet on clean workbench.

(2) Refer to paragraph 4-24 and pull microphone (1) out of oral-nasal mask (2).

(3) Remove oral-nasal mask (2) from helmet by pulling mask away from regulator mount nut.

(4) Remove oral-nasal valve body (3) by pulling away from mask.

(5) Remove oral-nasal valve (4) from body. Discard valve.



NOTE

Do not re-use oral-nasal valve once it has been removed from the valve body.

b. Cleaning and Inspection

(1) Inspect all components for cracks, holes, or signs of deterioration.

(2) Wipe out the mask with 10% providone-iodine solution and clean, lint-free cloths.

(3) Rinse the mask with fresh water. Wipe with clean, lint-free cloths; air or blow dry.

c. Repair

Repair is limited to the replacement of damaged parts.

d. Installation

(1) Wet new oral-nasal valve stem with fresh water and install valve (4) into body (3). Cut valve stem so that it protrudes 1/4 inch from retainer.

(2) Install assembled valve body (3) into oral-nasal mask (2).

(3) Install microphone (1) into mask.

(4) Install oral-nasal mask on regulator mount nut.

4-17. Nose Clearing Device Maintenance.

This task covers:

a. Removal **b. Cleaning and Inspection** **c. Repair** **d. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)

Materials Required (continued)

Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID Solution) (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Preformed Packing

4-17. Nose Clearing Device Maintenance - continued.

a. Removal

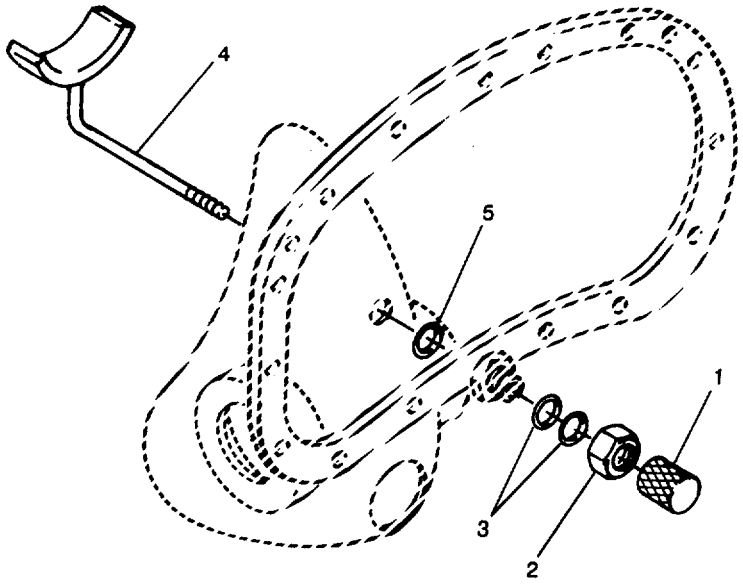
(1) Place helmet on clean workbench.

(2) While holding nose clearing device on inside of helmet, use pliers to remove nose clearing device knob (1).

(3) Remove packing nut (2) and preformed packing (3) from nose clearing device. Discard packing.

(4) Pull nose clearing device (4) out through the interior of the oral-nasal mask.

(5) Remove preformed packing (5) from interior of faceplate retainer. Discard packing.



b. Cleaning and Inspection

(1) Clean component parts with NID solution and soft bristle brush. Wipe with clean, lint-free cloth. Rinse with warm water; air or blow dry.

(2) Inspect component parts for deterioration or other damage.

c. Repair

Repair is Limited to the replacement of damaged parts.

d. Installation

(1) Lubricate new preformed packing (5) with silicone lubricant and install on the rear of the faceplate retainer.

(2) Install nose clearing device (4) from the interior of the oral-nasal mask and out through the lower packing fitting on the faceplate retainer.

(3) Lubricate new preformed packings (3) with silicone lubricant and slide the two packings onto the shaft of the nose cleaning device.

(4) Install and tighten packing nut (2) until some resistance is felt when the nose clearing device shaft is pushed in and out.

(5) Install the nose clearing device knob (1) on the nose clearing device shaft.

4-18. Exhaust Tube/Whisker Exhaust Assembly Maintenance.

This task covers:

a. Removal **b. Cleaning and Inspection** **c. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Torque Wrench (item 9, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)

Materials Required (continued)

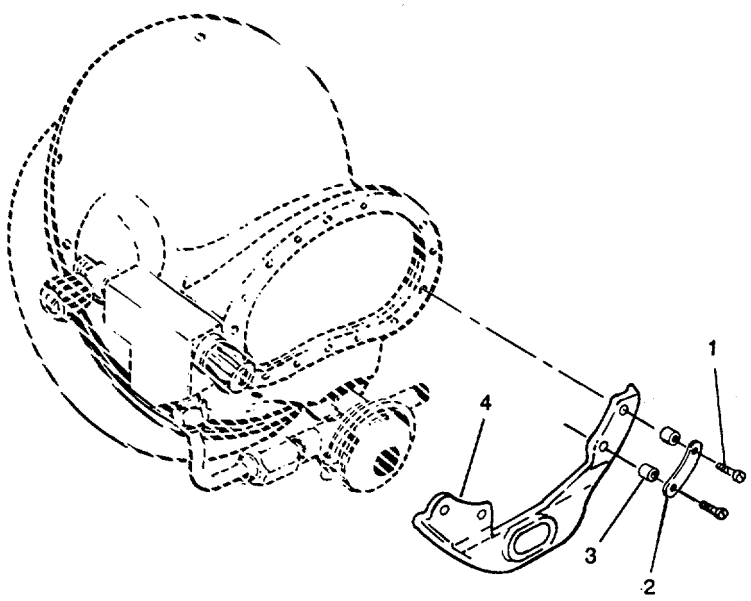
Nonionic Detergent (NID Solution) (item 3, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

a. Removal

(1) Remove the four retainer screws (1), two whisker plates (2), and four spacers (3).

(2) Remove whisker (4) from port retainer.

4-18. Exhaust Tube/Whisker Exhaust Assembly Maintenance - continued.



b. Cleaning and Inspection

(1) Clean parts with NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse thoroughly with fresh water; air or blow dry.

(2) Inspect whisker for cracks, tears, deterioration, or deformation of rubber. Check for separation of rubber from metal. Replace if necessary.

(3) Inspect remaining parts for damage or wear. Replace parts if necessary.

c. Installation

(1) Align holes in whisker (4) with screw holes in port retainer. Install spacers (3), whisker plates (2), and screws (1).

(2) Tighten screws (1) to 12 in.-lb.

4-19. Muffler/Air Train Assembly Maintenance.

This task covers:

a. Removal **b. Cleaning and Inspection** **c. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Unt-Free Cloths (item 2, appx E)
Nonionic Detergent (NID Solution) (item 3, appx E)

Materials Required (continued)

Warm Fresh Water (item 4, appx E)

Equipment Conditions

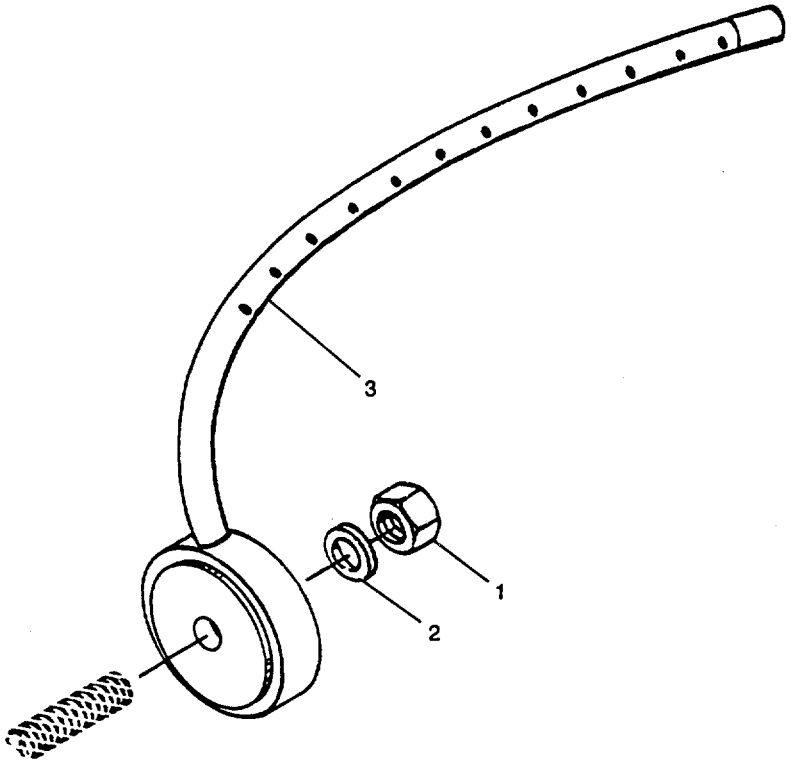
Helmet liner removed (para 4-23).

a. Removal

(1) Place helmet on clean workbench.

(2) Remove nut (1) and washer (2) from side block stud.

(3) Remove muffler/air train (3) from side block stud.



4-19. Muffler/Air Train Assembly Maintenance - continued.

b. Cleaning and Inspection

(1) Inspect components for dents, cracks, clogging, or any other signs of damage.

(2) Clean air train with NID solution and soft bristle brush. Wipe with clean, line-free cloths. Rinse with warm fresh water; air or blow dry.

c. Installation

(1) Place muffler/air train (3) on side block stud.

(2) Align air train with upper edge of faceplate.

(3) Secure muffler/air train with washer (2) and nut (1). Do not over tighten.

4-20. Port Retainer Maintenance.

This task covers:
a. Removal **b. Cleaning and Inspection** **c. Repair** **d. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (Item 4, appx B)
Torque Wrench (item 10, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

Materials Required (continued)

Nonionic Detergent (NID Solution) (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Silicone Sealant (item 9, appx E)
Preformed Packing

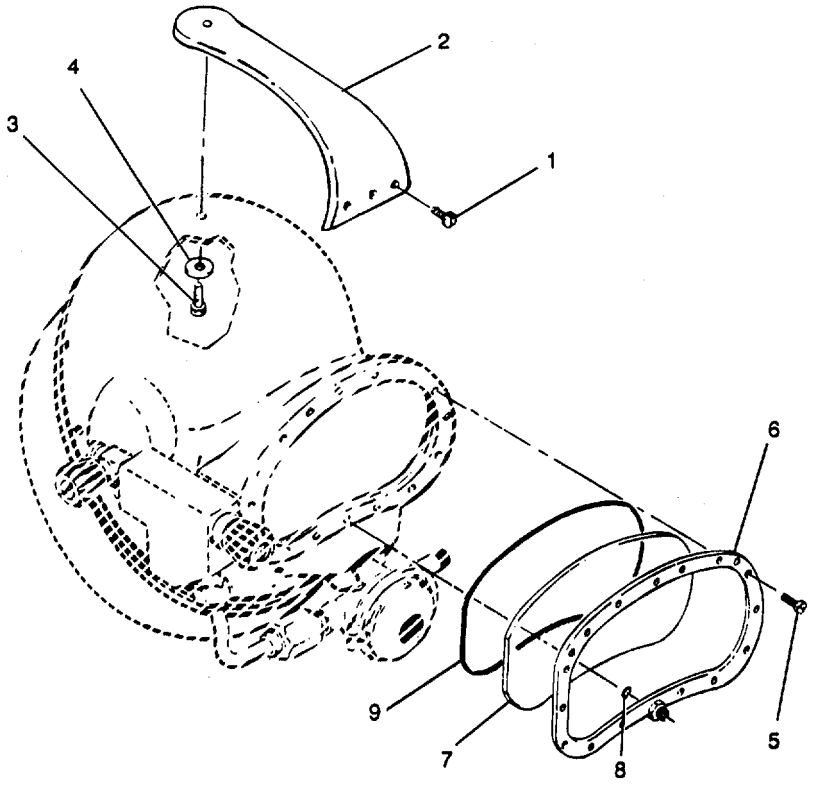
Equipment Conditions

Nose clearing device removed (para 4-17).
Whisker exhaust removed (para 4-18).

a. Removal

(1) Place helmet on clean workbench.

(2) Remove three screws (1) securing the front of the helmet handle (2).



(3) Remove screw (3) and washer (4) from helmet interior and pry up on the front of the handle. Set handle aside.

(4) Remove retaining screws (5), then the port retainer (6). The face port (7) will now come out.

(5) Remove preformed packing (8) from retainer. Discard packing.

(6) Remove preformed packing (9) from groove in helmet shell. Discard packing.

b. Cleaning and Inspection

(1) Clean component parts with NID solution and soft bristle brush. Wipe with clean, lint4ree cloths. Rinse with warm fresh water; air or blow dry.

(2) Clean mounting channel and packing groove in helmet shell with NID solution and soft bristle brush. Wipe with clean lint4ree cloths dampened in warm fresh water; air or blow dry.

(3) Inspect face port for cracks, scratches, or any other damage. Replace face port if cracked or if scratches exceed 1-inch long and 1/32-inch deep.

(4) Inspect port retainer for any damage, especially around the mounting holes.

4-20. Port Retainer Maintenance - continued.

c. Repair

Repair is limited to the replacement of damaged parts.

d. Installation

(1) Lubricate new preformed packing (9) with silicone lubricant and install in the helmet shell.

(2) Place face port (7) into helmet shell. Ensure packing (9) is properly seated under the face port.

(3) Lubricate new preformed packing (8) with silicone lubricant and install on the rear of port retainer (6).

(4) Align port retainer holes with holes in helmet shell.

(5) Install whisker exhaust (para 4-18). Do not tighten screws.

(6) Place a liberal amount of sealing compound on the rear mount surface of the handle (2) and in the mount screw hole of the helmet. Set the handle in place and run in the front mount screws (1) until snug, but not tight. Hold the handle to avoid leverage on the front screws while starting the rear mount washer (4) and screw (3) in place. Make the screw snug but not tight.

(7) Install retaining screws (5). Do not tighten.

(8) Slightly tighten center screw at top of port retainer, followed by screws on each side of nose clearing device. Slightly tighten screw next to side block assembly and then the screw opposite it. Slightly tighten remaining screw.

(9) Starting with top screw and working in a clockwise direction around the retainer, slightly tighten screws with torque wrench until screws are torqued to 12 in.-lb.

(10) Tighten the rear handle mount screw and immediately wipe up any excess sealing compound.

(11) Install nose clearing device (para 4-17).

4-21. Exhaust Valve Assembly Maintenance.

This task covers:

a. Removal **b. Cleaning** **c. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)

Materials Required (continued)

Nonionic Detergent (NID Solution) (item 3, appx E)
Warm Fresh Water (item 4, appx E)
Lacquer Thinner (item 5, appx E)
Silicone Sealant (item 9, appx E)
Exhaust Valve

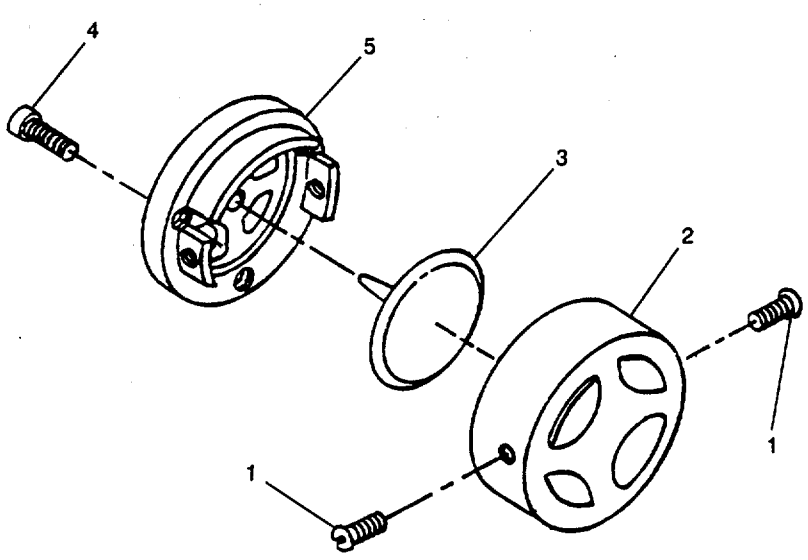
a. Removal

(1) Place helmet on clean workbench.

(2) Remove screws (1) from valve cover (2). Remove valve cover.

(3) Remove exhaust valve (3) by grasping the rubber valve and pulling. Discard valve.

(4) The valve body may be removed from the helmet by removing three screws (4) from the inside of the helmet and removing the valve body (5).



4-21. Exhaust Valve Assembly Maintenance - continued.

b. Cleaning and Inspection

(1) Remove silicone sealer from valve body and from helmet shell with lacquer thinner.

WARNING

Residual lacquer thinner will contaminate the diver's air and can cause injury or death.

(2) Remove all traces of lacquer thinner from components using NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse with fresh water; air or blow dry.

(3) Inspect cover and valve body for cracks, bends, or other damage. Inspect exhaust valve for wear or deterioration.

NOTE

Do not re-use exhaust valve once it has been removed from the valve body.

c. Installation

(1) Apply silicone sealant around the edge of the sealing surface on the valve body (5). Insert valve body into helmet and fasten with three screws (4). Do not over tighten.

(2) Wet new exhaust valve (3) with fresh water and install the valve in the valve body. Be sure the valve tip points toward the interior of the helmet.

(3) Cut the valve tip so that it protrudes 1/4-inch from the valve body.

(4) Place cover (2) over valve body and fasten with screws (1).

4-22. Communications Whip Maintenance.

This task covers:

Test

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Multimeter (item 2, appx B)

Test

(a) Tag and disconnect communications whip wires from the communications posts in the interior of the helmet.

(b) Using the Multimeter, test each wire in the whip for continuity. Also, check to ensure there are no shorts between wires, and between pins of the connector.

(c) Replace the communications whip if it does not meet the test requirements (Direct Support Maintenance).

(d) If the whip passes the test requirements, return it to service by reconnecting the tagged wires to the communications posts in the interior of the helmet.

4-23. Helmet Liner Maintenance.

This task covers:

a. Removal **b. Cleaning and Inspection** **c. Installation**

INITIAL SETUP

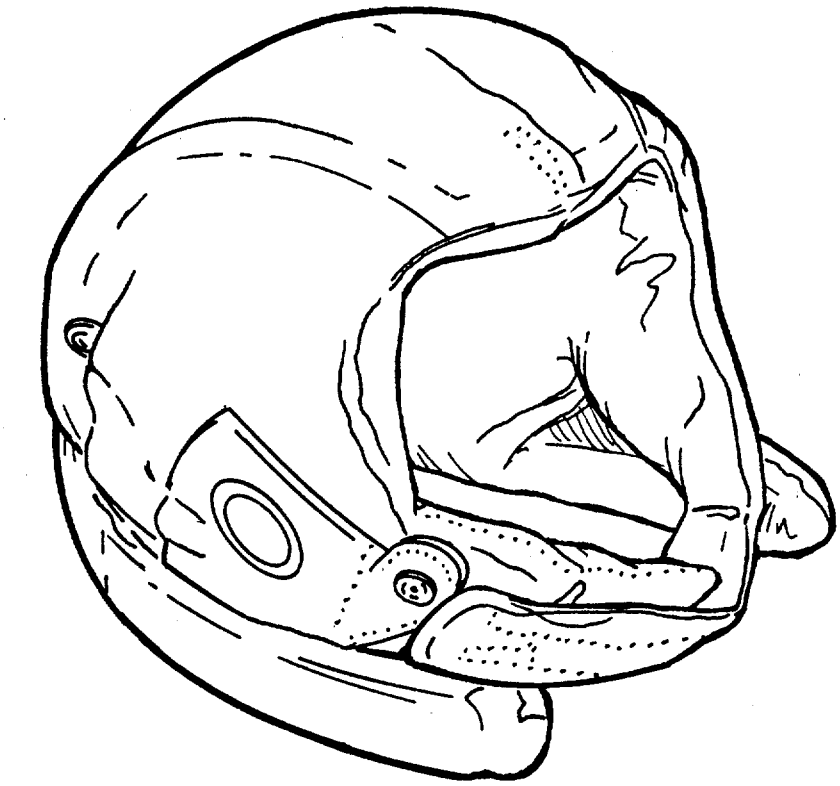
Materials Required

Nonionic Detergent (NID Solution) (item 3, appx E)
Warm Fresh Water (item 4, appx E)

a. Removal

The helmet liner is held in place in the helmet shell by snaps. Unsnap the liner and remove it from the helmet shell.

4-23. Helmet Liner Maintenance - continued.



b. Cleaning and Inspection

(1) Clean helmet liner with NID solution. Rinse thoroughly with fresh water. Remove foam pads from pockets in the nylon liner and dry separately to prevent bacterial growth. Squeeze foam, do not wring. Reinstall when liner and pads are dry.

(2) Inspect helmet liner for fabric damage, loose stitching, or other signs of wear. If fabric is damaged, the liner must be replaced.

c. Installation

Place the helmet liner in the helmet shell and snap into place.

4-24. Helmet Communications Maintenance.

This task covers:
a. Removal **b. Inspection** **c. Repair** **d. Installation**

INITIAL SETUP

Tools Required	Equipment Conditions
Tool Kit, General Mechanic's (item 4, appx B)	Helmet liner removed (para 4-23).

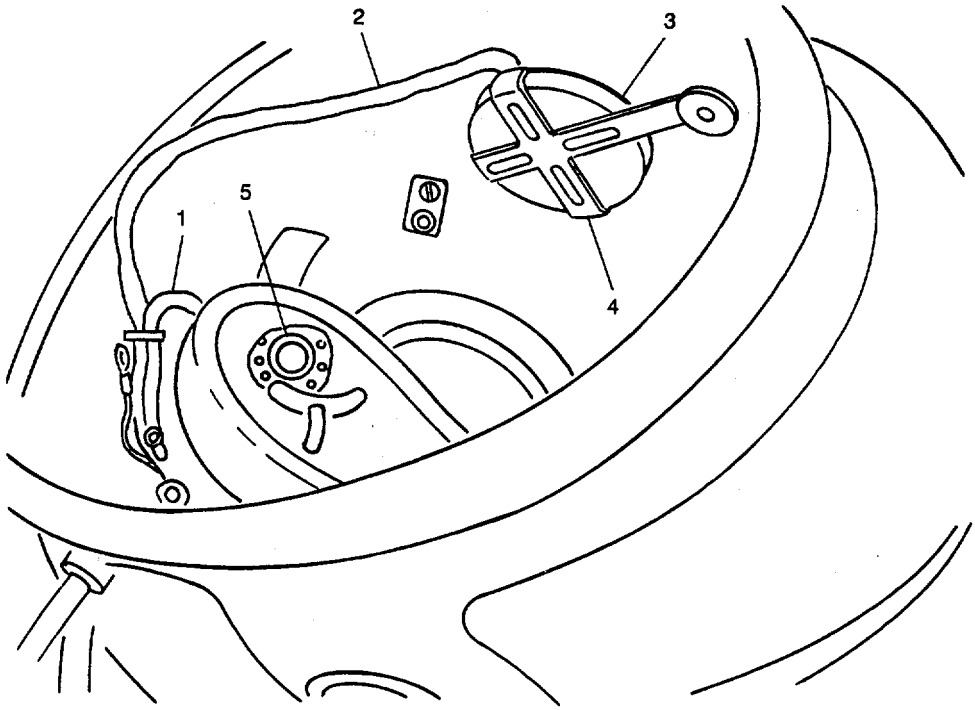
a. Removal

(1) Place helmet on clean workbench.

(2) Tag and disconnect microphone wires (1) and earphone wires (2) from the communications posts in the interior of the helmet.

(3) Carefully pull the two earphones (3) out of the retainers (4) attached to the helmet shell.

(4) Pull microphone (5) out of the oral-nasal mask.



4-24. Helmet Communications Maintenance - continued.

b. Inspection

(1) Inspect communications components for cracked, frayed, or broken wires.

(2) Inspect for torn mylar diaphragms in the microphone and earphones.

c. Repair

Repair is limited to the replacement of damaged parts.

d. Installation

(1) Insert microphone (5) in the oral-nasal mask by feeding the wires from the interior of the mask through the small hole in the microphone pocket.

(2) Install earphones (3) into the earphone retainers (4) attached to the helmet shell. Be sure the earphone with the shortest wire is installed in the retainer on the side block assembly side of the helmet.

(3) Connect microphone wires (1) and earphone wires (2) to the communications posts.

(4) Install helmet liner (para 4-23).

4-25. Umbilical Maintenance.

This task covers:
a. Removal **b. Installation**

INITIAL SETUP

Tools Required

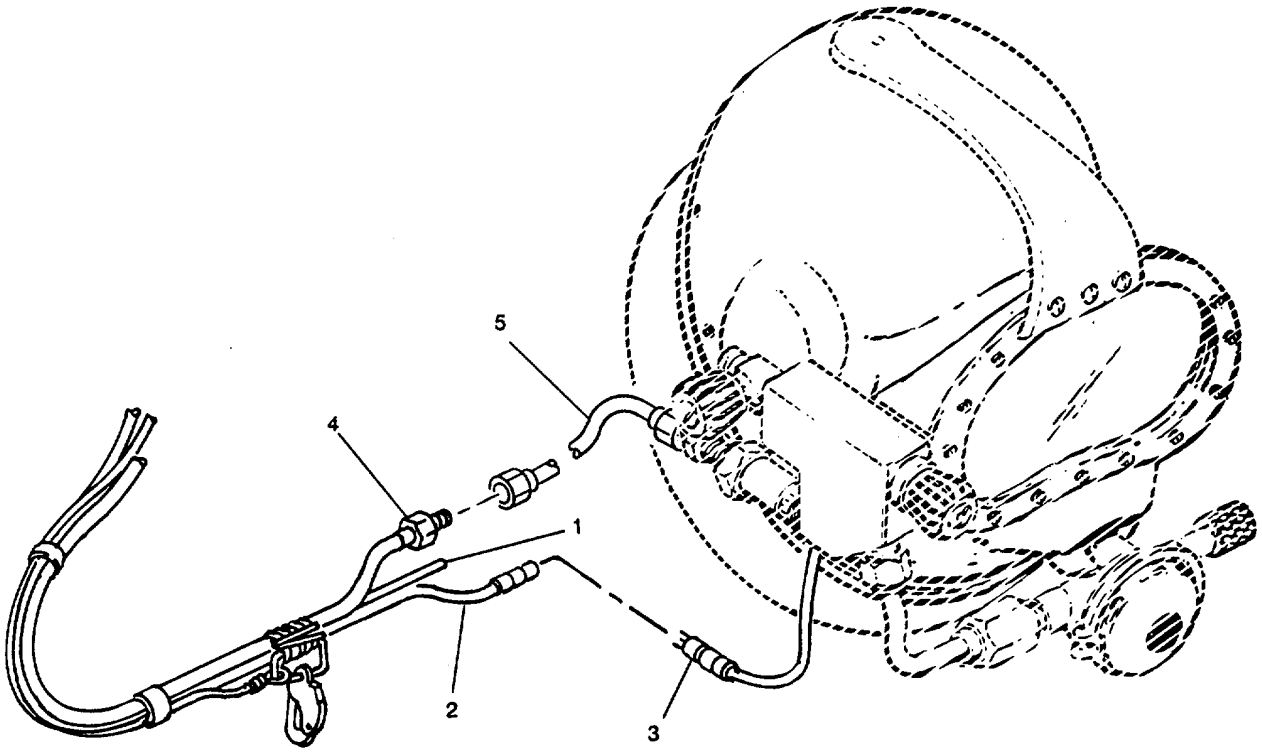
Tool Kit, General Mechanic's (item 4, appx B)

a. Removal

(1) Disconnect pneumofathometer hose (1), if used.

(2) Disconnect communications cable (2) from communications whip (3).

(3) Disconnect air hose (4) from the helmet adapter hose (5).



b. Installation

(1) Connect umbilical air hose (4) to the helmet adapter hose (5).

(2) Connect the communications cable (2) to the communications whip (3).

(3) Connect the pneumofathometer hose (1), if used.

4-26. Helmet Adapter Hose Maintenance.

This task covers:

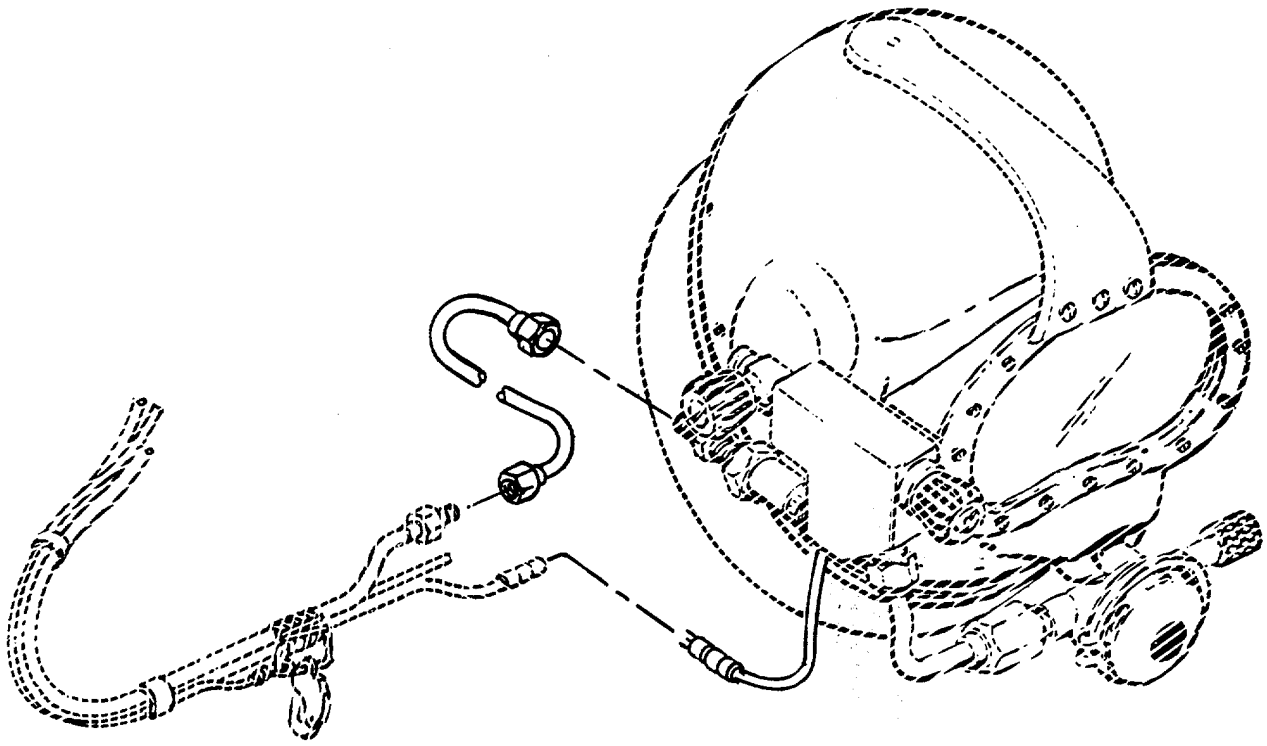
a. Removal **b. Installation**

INITIAL SETUP

Tools Required	Equipment Conditions
Tool Kit, General Mechanic's (item 4, appx B)	Umbilical removed (para 4-25).

a. Removal

Disconnect helmet adapter hose from main air inlet port on the side valve.



b. Installation

WARNING

Never connect the adapter hose to the emergency air supply inlet. The emergency air supply valve does not incorporate a one-way valve to protect the diver from barotrauma (squeeze) in the event of loss of pressure in the umbilical.

Connect helmet adapter hose to the main air inlet port on the side valve. Install umbilical (para 4-25).

SECTION VI. PREPARATION FOR STORAGE OR SHIPMENT

4-27. General.

Because the Superlite 17B Helmet is a life support system, careful handling and storage is required. Specific storage requirements for certain components are covered by the Storage Serviceability Standards Supply Bulletin, SB 740-TBS for Diving Equipment Sets, Life Support Equipment and Ancillary Items.

4-28. Preparation for Storage or Shipment.

a. Components shall not be stored near fire or at temperatures higher than 120°F (48.9°C) or lower than 0°F (-17.8°C). Equipment shall not be exposed to direct sunlight for prolonged periods.

b. Components shall be clean and dry with specific parts lightly lubricated.

c. To protect equipment from dust, dirt, and humidity, components shall be sealed in bags with desiccant packages.

d. Care shall be taken to prevent continuous distortion of flexible parts and pressure from heavy parts on fabric or rubber components during storage. Rubber items shall be sorted without folding or creasing to prevent permanent distortion of the items.

e. To prevent damage and deterioration, do not lay components or sealed plastic bags on bare concrete, masonry, or earth floors for prolonged periods. Storage racks should be at least six inches from the floor. Ensure that the storage area is well ventilated, and no corrosive or volatile fumes or grease are present.

SECTION VII. ORGANIZATIONAL LEVEL CLEANING PROCEDURES FOR DIVING LIFE SUPPORT AIR SYSTEMS

4-29. General.

This section covers the cleaning procedures for hyperbaric and diving life support air systems. The importance of maintaining a diver's air breathing system in a clean and operable condition cannot be overemphasized. This procedure provides basic steps and methods for removing and installing components and piping; simplified methods for cleaning small components, pipes and hoses for air systems; and methods for cleaning component soft goods.

4-30. Determining System Cleanliness.

A periodic inspection of the air system will verify system cleanliness. If a system is suspected of contamination, a hydrocarbon analysis of a particulate sample may be taken or a gas sample may be drawn to determine the level of system cleanliness. These samples can be coordinated through the U.S. Army Troop Support Command, ATTN: AMSTR-M, 4300 Goodfellow Blvd., St. Louis, Missouri 63120-1798.

4-31. Clean Area.

All cleaning for life support air systems to be performed on components and piping shall be cleaned in a "clean area." This area shall be isolated from oil, grease, paper, lint particles, and other airborne contaminates. It shall be as free as possible of dust and debris. Workbenches shall be covered with easily cleaned surfaces such as stainless steel, synthetic rubber, vinyl, linoleum or formica. Floor shall be non-dusting. Walls and ceiling shall be covered with washable vinyl, latex paint, or polyurethane-based paint.

4-32. Removing and Installing System Components or Piping.

a. General. The following steps are guidelines for the removal and installation of piping or components from or into a clean system. In general, common sense and clean work habits must prevail at all times to maintain system cleanliness. Prior to the removal of any pipe or component, appropriate maintenance forms are to be completed and approved.

b. Removal. Extreme care shall be used in the removal of any component or pipe from a clean system to avoid introducing any contamination. To eliminate any chance of contamination, the following steps shall be adhered to:

(1) Secure the system by closing valves and controls both upstream and downstream of the component or pipe to be removed. The components shall be tagged to ensure that gas is not brought on line.

(2) Removal of all debris, such as dirt, dust, loose paint, and grease from the intended area of assembly or disassembly is mandatory. This includes cleaning the pipe or component which is to be removed and the adjacent components or piping.

(3) Wipe all external surfaces of components and piping with detergent to remove grease or dirt.

(4) All personnel shall have clean hands.

(5) All tools used in the removal must be clean and grease-free.

(6) Remove component or piping.

(7) Immediately bag or seal all exposed ends of system with plastic.

c. Installation or Reinstallation.

(1) The new component or cleaned pipe shall be wrapped or double-bagged. If not, the item shall be returned for cleaning.

(2) The component or piping shall be removed from bagging and shall be inspected for damage at the mating surfaces, threads, or connecting surfaces and any primary surface. Inspect for dust or minor particle contamination, and remove with lint-free rag.

(3) Mating components and pipe shall have protection materials or plugs removed.

(4) Mating surfaces, preformed packings, and threads shall be coated lightly with an approved lubricant. Threaded surfaces must be coated to prevent galling of threads at assembly.

(5) A pressure test shall be performed to verify there are no leaks and the correct fittings have been installed in the system.

4-33. Pre-cleaning of Components or Piping.

a. Upon receipt of new components not cleaned or components and pipe removed from the system for cleaning, the item shall be pre-cleaned. Doing this shall prepare the component for final cleaning. Pre-cleaning will be accomplished in an area separate from the clean area. The pre-cleaning will include, but is not limited to, the following:

b. All wrapping shall be removed.

c. Loose paint, rust, brackets, panels, tags, supports, and other items shall be removed.

d. If hydrocarbons and/or other contaminants are known to have been introduced into the component or piping, a thorough degreasing procedure shall be initiated. Trisodium phosphate (TSP) or nonionic detergent (NID) may be used.

e. Visually inspect the pre-cleaned articles under a bright light to ensure that all gross contamination has been removed.

f. Bag all components and ends of pipe with plastic to await cleaning.

4-34. Cleaning Method - Nonionic Detergent.

a. General. This method outlines the cleaning procedures for oil-free cleaning of metallic/nonmetallic components or assemblies using nonionic detergent. This procedure is only to be used if there is no equipment available to conduct the TSP cleaning method.

b. Cleaning Components or Assemblies (excluding hose assemblies).

WARNING

Chemical protective gloves should be worn to prevent skin irritation from detergent and hot water.

(1) Disassemble components down to the smallest parts. Separate soft goods and clean as specified in paragraph 4-36.

(2) Clean each component by scrubbing with a nonionic detergent solution (1/2 teaspoon (2.4 ml) detergent to 1 gallon (3.8 l) water) using a nylon bristle brush and clean cloths.

(3) Rinse with distilled water at 125°F (54°C) until effluent shows no visible signs of detergent.

(4) Collect some of the water rinsed over the items in a flask that can be fitted with a rubber stopper. Shake the flask for a few seconds and if any bubbles form and remain on the surface of the water in the flask, continue to rinse item until no bubbles form and remain in the sample flask.

(5) Purge with dry, oil-free nitrogen until visually dry, or allow to air dry. The following dated and signed records shall be maintained.

4-34. Cleaning Method - Nonionic Detergent - continued.

(a) Identification of all parts cleaned.

(b) Results of shake test.

(6) Reassemble as outlined on assembly or component drawing.

(7) Double bag all components in plastic and close securely.

c. Cleaning Hose Assemblies.

(1) Clean hose assemblies IAW the following steps using the specific materials and proper equipment. Pre-clean hose assemblies outside the clean area by rinsing externally with distilled water.

(2) Most hose assemblies will not lend themselves to disassembly. Disassemble to maximum extent without removing fittings or clamps.

(3) The cleaning solution shall be made by adding 1/2 oz (14.7 ml) nonionic detergent to each 80 gallons (302.8 l) of distilled water.

(4) Heat the cleaning solution to 120°F (49°C) and circulate through the hose assembly for 30 minutes at a flow rate of not less than 1 gallon (3.8 L) per minute.

(5) Rinse the hose assembly with distilled water heated to 125°F (52°C) for 30 minutes minimum at a flow rate of not less than 1 gallon (3.8 L) per minute. Do not recirculate the water.

(6) Perform a shake test by collecting a 1000 ml sample of rinse water in a flask that can be fitted with a rubber stopper. Shake the flask for a few seconds, and if any bubbles form and remain on the surface of the water in the flask, continue to rinse the hose until no bubbles form and remain in the sample flask.

(7) Purge hose assembly with clean, dry, oil-free nitrogen (preferably heated to 200°F (93°C)) until all visible signs of water are absent. Continue drying process for 1 to 2 hours after initial purge.

NOTE

At no time shall the upstream purge pressure for all hose assemblies exceed 100 psig (6895 millibars).

(8) After drying, cover each hose end with a clean plastic bag to maintain internal cleanliness. Secure the bag with 1 in. (2.5 cm) wide tape.

(9) When components and systems have been reassembled, an air sample shall be taken to verify cleanliness.

4-35. Cleaning Method - Trisodium Phosphate (TSP).

a. This method is the preferred method if all equipment is available. A steam/hot water cleaner that has adjustable siphon control for cleaning applications works well.

b. For components, the following steps should be followed:

WARNING

The TSP cleaning solution is harmful to eyes and skin. Wear chemical protective apron, gloves, and goggles/face shield when handling or working with the solution.

(1) Prepare a solution consisting of 2 lb (0.9 kg) TSP, 0.5 oz (14.7 ml) nonionic detergent and 80 gallons (302.8 l) of distilled or deionized water.

(2) Heat solution to 165°F (74°C), mixing occasionally during the heating.

(3) Disassemble components down to the smallest parts (separate and clean soft goods and aluminum parts as specified in paragraph 4-36) and soak in the solution for 10 minutes minimum, 30 minutes maximum.

(4) After soaking, clean the parts in the ultrasonic cleaner until all visible traces of contaminate dirt or grease are gone.

(5) For components too large for an ultrasonic cleaner, scrub the parts with a nylon bristle brush until all visible traces of contaminate dirt or grease are gone.

(6) Rinse all parts in running hot distilled water or deionized water until all visual traces of cleaning solution are removed.

(7) Draw 10 ml sample. Agitate water to observe for soap bubbles. If any soap bubbles are present, repeat steps (6) and (7) until no bubbles are observed.

(8) Blow dry components with clean air, nitrogen, or helium.

(9) Reassemble components using an approved lubricant.

(l0) Bag and sea[or tape closed all components and ends of pipe or hoses with plastic until ready for reinstallation.

c. For cleaning pipe or tubing, the following procedures should be followed:

(1) Determine the volume of cleaning solution by estimating the length of pipe or hose to be cleaned and the size of the pipe to be cleaned. Look up the appropriate pipe/tube size and then the corresponding volume per one foot length in table 4-3. Multiply that volume by the estimated length to be cleaned. After the total volume is calculated, multiply the answer in cubic inches by 0.0433 to obtain the number of gallons to fill the system. Determine applicable flow rate from table 4-4 and multiply flow rate by thirty (30) to compute number of gallons required to pump through the system. Add volume required to fill system and the volume required to pump through the system for the total volume of cleaning solution required.

4-35. Cleaning Method - Trisodium Phosphate (TSP) - continued.

Table 4-3. TSP Cleaning Solution Volume

PIPE/TUBE SIZE (inches)	VOLUME OF 1 FOOT (0.3 m) LENGTH
1/4 (0.6 cm)	0.6 cu in. (9.8 cm^3)
3/8 (0.9 cm)	1.4 cu in. (22.9 cm^3)
1/2 (1.2 cm)	2.4 cu in. (39.3 cm^3)
3/4 (1.9 cm)	5.4 cu in. (88.4 cm^3)
1 (2.5 cm)	9.5 cu in. (1.5 m^3)
1-1/2 (3.8 cm)	21.2 cu in. (3.4 m^3)
2 (5.2 cm)	37.7 cu in. (6.1 m^3)

(2) Prepare a solution at a ratio of 2 lb (0.9 kg) of TSP, 0.5 oz (14.7 ml) nonionic detergent for each 80 gallons (302.8 l) of distilled or deionized water as determined.

(3) Heat solution to 165°F (74°C), mixing occasionally during the heating.

(4) Pump the cleaning solution through the pipe/tubing for 30 minutes at a rate listed in table 4-4 using the solution pump, and maintain constant temperature at all times. It may be necessary with some piping configurations to cap or plug some openings and alternate with others to maintain even flow of cleaning solution to all segments of the pipe. If you run out of cleaning solution prior to the 30 minutes listed, prepare another volume of cleaning solution.

Table 4-4. Cleaning Solution Flow Rate

TUBE SIZE (inches)	GPM	PIPE SIZE (inches)	GPM
1/4 (.6 cm)	1/2	1/4 (.6 cm)	2
3/8 (0.9 cm)	2	3/8 (.9 cm)	3
1/2 (1.2 cm)	3 3/4	1/2 (1.2cm)	5 1/2
3/4 (1.9 cm)	6 3/4	3/4 (1.9 cm)	9 1/2
1 (2.5 cm)	12 1/2	1 (2.5 cm)	15 1/2
		1 1/4 (3.1 cm)	23
		1 1/2 (3.8 cm)	35
		2 (5.2 cm)	50

(5) Pump hot distilled or deionized water through the system to rinse until all visible traces of cleaning solution are removed.

(6) Draw 10 ml sample. Agitate to observe for soap bubbles. If any soap bubbles are present, repeat step (5) until no bubbles are observed.

(7) Blow dry parts or components with clean, dry, oil-free nitrogen (preferably heated to 200°F (93°C) until all visible signs of water are absent. Maintain process for 1 to 2 hours after initial purge.

(8) Double bag and seal or tape closed all components and ends or pipe or hoses with plastic until ready for reinstallation.

d. Hoses shall be cleaned as specified in paragraph 4-34.

4-36. Cleaning Component Soft Goods.

a. The following isopropyl alcohol method is provided for the cleaning of the soft goods and aluminum parts of system components. The method for nonionic detergent is the same procedure as that in paragraph 4-34.

WARNING

- Ensure ventilation is adequate and avoid breathing vapors.
- Personnel should wear chemical protective gloves to prevent skin irritation when contact with isopropyl alcohol is necessary.
- lsopropyl alcohol shall be maintained in a covered container to preclude excess concentrations in the air for fire protection. The cover should be removed only for placement or removal of soft goods.

NOTE

Table 4-5 lists all compatible cleaning agents for general soft goods used in the army diving systems. Only the isopropyl alcohol procedure is listed below.

b. Soak component soft goods or aluminum parts in a tray of isopropyl alcohol for 10 minutes maximum.

c. Wipe each piece of soft goods individually with wipes soaked in isopropyl alcohol. Do this until all dirt and foreign matter is visually removed.

d. Rinse software with fresh isopropyl alcohol.

e. Blow dry with air, nitrogen, or helium.

4-36. Cleaning Component Soft Goods - continued.

Table 4-5. Cleaning Agents Compatible with Soft Goods

SOFT GOODS	FREON PCA MIL-C-81302B	TSP 0-S-642	NID MIL-D-6791	IA TI-1-735A
Adiprene C	x		x	
Adiprene L	x		x	
Buna N	x	x	x	x
Buna S	x	x	x	x
Butyl			x	x
Delrin	x	x	x	
Epoxy Resin	x		x	
Kel-f	x	x	x	x
Hypalon 40	x		x	
Kralartic	x		x	
Lexan	x		x	
Lucite	x		x	
Neoprene W	x		x	
Nylon		x		x
Polyethylene 7050	x	x	x	x
Polyethylene 9140	x	x	x	x
Polyvinyl Chloride	x	x	x	x
Surlyn A	x		x	
Teflon TFE	x	x	x	x
Teflon FEP	x	x	x	x
Thiokol FA	x		x	x
Viton A	x	x	x	x
Viton B	x	x	x	x
Zytel 100	x		x	
Ethylene Propylene	x	x	x	x

X - Solvent is compatible with soft goods.
Blank - Solvent is not compatible with soft goods.

4-37. Hydrocarbon Inspection and Analysis.

a. Visual Method. By definition, visibly clean is the absence of all particulate and non-particulate matter visible to the normal unaided (except for corrected vision) eye. Particulate is identified as matter of miniature size with observable length, width, and thickness. Non-particulate is film matter without definite dimension. Examples of visual inspection are:

(1) A clean cloth placed over the discharge end may collect particulates and debris when air or nitrogen is blown through the system.

(2) A component that has been in service may have visible signs of grease, dirt, etc.

(3) Absorption of oil or grease on a clean filter paper from a surface swipe.

b. Ultraviolet Light Method. The ultraviolet method for detecting hydrocarbons may be employed in several different ways.

WARNING

Most ultraviolet lamps contain mercury. Extreme caution should be taken not to break the mercury vapor lamp which will contaminate the component or pipe being inspected and may also cause human injury.

(1) Direct inspection. The component may be examined directly with the ultraviolet light. By passing the component under the ultraviolet light, hydrocarbon surface contamination may exhibit fluorescence where some hydrocarbons exist.

(2) Inspection of cleaning solution when detergent is used. Used cleaning solution collected in a clean beaker when agitated will form bubbles. These bubbles, under ultraviolet light, may exhibit fluorescence.

4-38. Documentation and Record Keeping.

a. All diving systems currently involved in U.S. Army diving operations require that they be certifiable. It is with this requirement understood, that a diving system must retain certain records and documents to substantiate safety standards. The individual operating the clean area being directly involved with system maintenance should therefore be required to maintain records documenting cleaning operations in a systematic manner.

b. The purpose of this section is to set forth a guide for documentation and record keeping involved in cleaning operations and in no way intends to impose restrictions on the amount of paperwork a unit feels it requires to operate safely.

c. Maintain a sequential record of components cleaned (i.e., regulators, pipe, and/or any component) affecting re-entry into a certified system. It should include a written record of all cleaning analysis and testing accomplished as per this procedure. A data sheet should be completed for items cleaned and tested per this procedure. All other information which pertains to the cleaning and/or testing of a particular item shall be attached to or referenced on the data sheet. Such information should include, but is not limited to, outside laboratory reports, vendor data, etc.

d. It is possible that certain data and results will apply to more than one data sheet. For example, it is possible that a sample for gaseous contaminants will be taken by sampling an entire system. This system will consist of numerous items each having its own data sheet. To assure complete documentation, reference the results of the gaseous contamination analysis on each affected data sheet.

e. As a minimum the data sheet should reflect the following information:

(1) Unit

(2) Date

(3) Name of Point of Contact

(4) Description of Cleaning Performed

4-38. Documentation and Record Keeping - continued.

(5) Person Performing the Cleaning

(6) Results of any Analysis

(7) Description of Item Being Cleaned

(8) Part Number/NSN

(9) Remarks.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

SECTION I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

5-1. Common Tools and Equipment

For authorized common tools and equipment, refer to the modified table of organization and equipment (MTOE)
applicable to your unit.

5-2. Special Tools, TMDE, and Support Equipment.

Special tools required for direct support maintenance are listed and illustrated in the repair parts and special tools list (appx F). TMDE and support equipment are listed in the maintenance allocation chart (appx B).

5-3. Repair Parts.

Repair parts are listed and illustrated in the repair parts and special tools list (appx F).

SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

No preventive maintenance checks and services are required for direct support of the diving helmet.

SECTION III. TROUBLESHOOTING PROCEDURES

5-4. Introduction.

a. Table 5-1 lists the common malfunctions which you may find during the maintenance of the diving helmet or its components. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by the corrective action, notify your supervisor.

5-5. Troubleshooting Procedures.

Table 5-1. Direct Support Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. EMERGENCY AIR SUPPLY DRAINED WITHOUT USE
a. Check for defective emergency air supply. Replace defective air supply.
b. Check for bent emergency air supply valve stem indicated by difficulty in turning valve handle. Replace valve stem (para 5-8).
c. Check valve stem. Replace/repair valve (para 5-8).
2. ONE-WAY VALVE ALLOWS AIR BACK FLOW
a. Check for damaged valve. Replace valve (para 4-14).
b. Check for foreign matter in valve. Replace valve (para 4-14).
3. STEADY FLOW SUPPLY VALVE INOPERATIVE
a. Check for damaged seat assembly indicated when valve cannot be closed or when air free flows through air train. Repair damaged valve seat (para 5-1 0).
b. Check for bent valve stem indicated by difficulty in turning valve handle. Replace defective valve stem (para 5-10).
4. MUFFLER/AIR TRAIN INOPERATIVE
a. Check for defective steady flow valve indicated by free flow of air through air train. Repair defective valve (para 5-1 0).
b. Check for clogged or damaged muffler indicated by no air flow through air train. Replace/repair defective muffler (para 5-11).

Section IV. MAINTENANCE PROCEDURES

5-6. Superlite 17B Diving Helmet Maintenance.

Specific maintenance instructions for direct support maintenance personnel, as allocated by the maintenance allocation chart (MAC), are covered in the following paragraphs.

5-7. Side Block Assembly Maintenance.

Maintenance of the side block assembly consists of the repair of assembly components. Specific repair instructions for the components are covered in paragraphs 5-8 through 5-10.

5-8. Emergency Air Supply Valve Assembly Maintenance.

This task covers: a. Disassembly b. Cleaning and Inspection c. Repair d. Reassembly

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INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Screwdriver, Notched (item 5, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)

Materials Required (continued)

Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID Solution) (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Teflon Tape (item 10, appx E)

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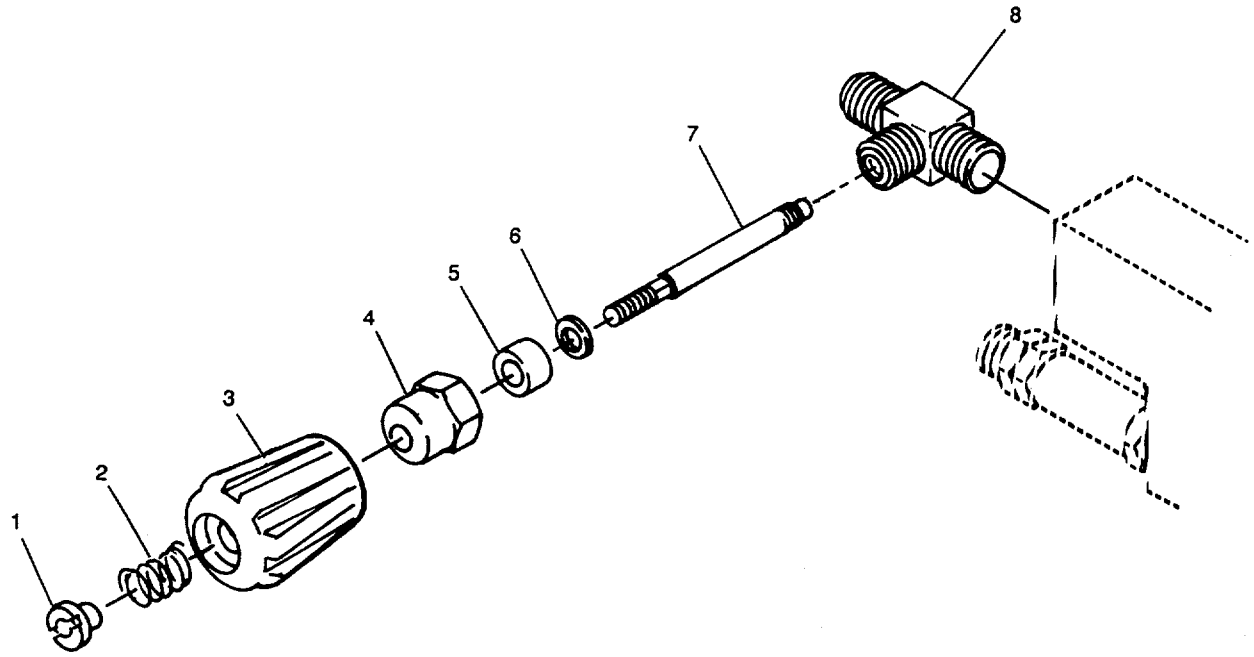
a. Disassembly

(1) Place helmet on clean workbench.

(2) Using notched screwdriver, unscrew locknut (1). Remove locknut, spring (2), and control knob (3).

(3) Remove packing nut (4). Unscrew stem (7) from valve body (8), and remove packing (5) and washer (6) from stem. Remove valve body (8) from side block.

5-8. Emergency Air Supply Valve Assembly Maintenance - continued.



b. Cleaning and Inspection

(1) Clean all parts with NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse with fresh water; air or blow dry.

(2) Inspect components for pitting, cracks, or other damage.

(3) Inspect valve seat in valve body for wear or other damage.

c. Repair

Repair is limited to the replacement of defective parts.

d. Reassembly

(1) Lubricate all components with a light coat of silicone lubricant.

(2) Apply 2 1/2 wraps of Teflon tape to the tapered pipe thread end of the valve body (8) prior to installation in the side block. Be sure the Teflon tape does not extend over the opening of the valve body. There should be no loose pieces of tape in the opening of the side block. Install valve body in side block.

(3) Place the washer (6) and packing (5) on stem (7).

(4) Install valve stem (7) into the valve body (8). Tighten the stem until it is seated, then back it out about 1/2 turn.

(5) Thread packing nut (4) onto the valve body and tighten slightly.

(6) Place control knob (3) onto stem (7) and rotate the stem all the way out, then back again. The control knob should turn smoothly without binding.

(7) Tighten packing nut (4) with a wrench until resistance is felt when turning the knob.

(8) Install spring (2) and locknut (1) onto the stem. Tighten the locknut until tight or until the threaded end of the valve stem is flush or slightly protrudes.

5-9. One-Way Valve Assembly Maintenance.

This task covers:
a. Disassembly **b. Cleaning and Inspection** **c. Repair** **d. Reassembly**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID Solution) (item 3, appx E)

Materials Required (continued)

Silicone Lubricant (item 8, appx E)
Teflon Tape (item 10, appx E)

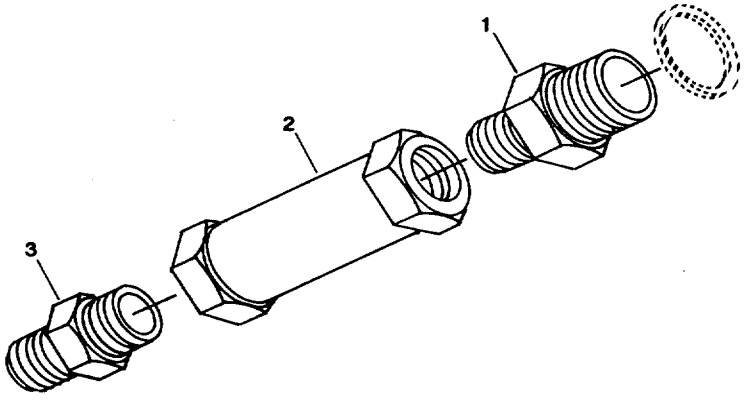
Equipment Conditions

One-way valve removed from side block (para 4-14).

a. Disassembly

(1) Secure valve in soft-jaw vise and remove adapter (1).

(2) Remove adapter (3) from valve (2).



b. Cleaning and Inspection

(1) Clean parts with NID solution and soft bristle brush. Wipe with clean, lint4ree cloths. Rinse with fresh water; air or blow dry.

(2) Inspect components for pitting, cracks, wear, or other signs of damage.

c. Repair

Repair is limited to the replacement of defective parts.

d. Reassembly

(1) Apply 2 1/2 turns of Teflon tape clockwise around threads on adapter (3) leaving three threads free. Install adapter (3) in valve (2). Do not allow any excess tape to cover the end of the adapter or to enter the seat.

(2) Apply 2 1/2 turns of Teflon tape clockwise around threads on adapter (1) leaving three threads free.

(3) Install adapter (1) in valve body (2). Do not allow any excess tape to cover the end of the adapter or to enter the valve body.

5-10. Side Block Assembly Maintenance.

This task covers:
a. Disassembly **b. Cleaning and Inspection** **c. Repair** **d. Reassembly**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Screwdriver, Notched (item 5, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)

Materials Required (continued)

Nonionic Detergent (NID Solution) (item 3, appx E)
Silicone Lubricant (item 8, appx E)
Preformed Packing

Equipment Conditions

Side block assembly removed (para 4-13).
Emergency air supply valve removed (para 5-8).
One-way valve assembly removed (para 5-9).

---

a. Disassembly

(1) Using notched screwdriver, unscrew locknut (1). Remove locknut, spring (2), control knob (3), and washer (4).

(2) Remove bonnet (5) from side block. Separate stem (6) and preformed packing (7) from bonnet. Separate washer (8) and preformed packing (9) from stem. Discard packings (7 and 9).

(3) Unscrew seat assembly (10) from side block (1).

b. Cleaning and Inspection

(1) Clean all components with NID solution and soft bristle brush. Wipe with clean, lint-free cloths. Rinse in fresh water; air or blow dry.

(2) Inspect seat assembly (10) and washer (8) for wear or damage.

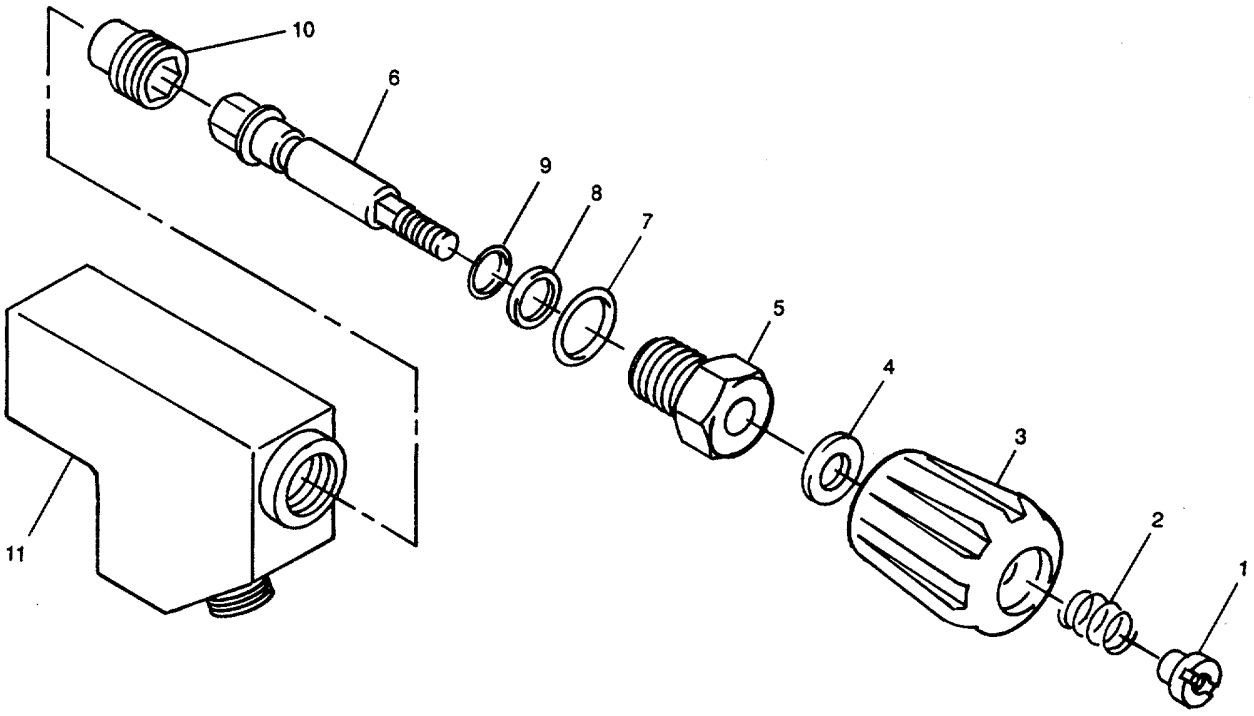
(3) Inspect remaining components for pitting, cracks, stripped threads, or other damage which could interfere with performance.

c. Repair

Repair is limited to the replacement of defective parts.

d. Reassembly

(1) Install seat assembly (1 0) in side block (11). Tighten until seat assembly is flush with end of side block opening.



(2) Lubricate new preformed packing (9) with silicone lubricant. Install packing and washer (8) on valve stem (6).

5-10. Side Block Assembly Maintenance - continued.

(3) Lubricate new preformed packing (7) with silicone lubricant and install on bonnet (5).

(4) Install valve stem in bonnet. Ensure longer, tapered end of stem is inserted into bonnet.

(5) Screw bonnet into the side block enough to hold it in place (1 to 2 turns), then turn stem clockwise until the seat assembly has bottomed out.

(6) Tighten the bonnet.

(7) Place washer (4) and control knob (3) on the stem and rotate the stem counterclockwise until the valve is fully open, then close valve completely. The knob should turn freely, without any binding.

(8) Install spring (2) and locknut (1) on valve stem. Using notched screwdriver, tighten locknut until the threaded end of the valve stem is flush or slightly protrudes.

5-11. Muffler Air Train Maintenance.

This task covers:
a. Disassembly **b. Cleaning and Inspection** **c. Repair** **d. Reassembly**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Clean, Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (Item 4, appx E)
Nonionic Detergent (NID Solution) (item 3, appx E)

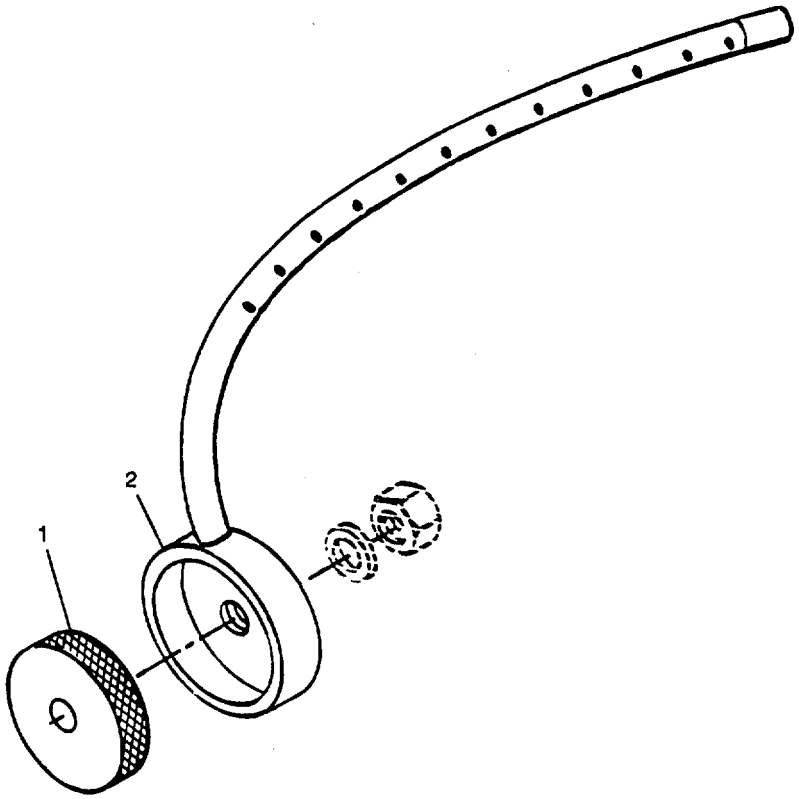
Equipment Conditions

Helmet liner removed (para 4-20).
Air train removed (para 4-21).

---

a. Disassembly

With air train removed from helmet, separate muffler (1) from air train (2).



b. Cleaning and Inspection

(1) Wash muffler with NID solution; rinse with warm fresh water. Squeeze, do not twist to remove excess water.

(2) Dry by wrapping In clean, lint-free cloth.

(3) Inspect for cracks, tears, or any sign of damage or deterioration.

c. Repair

Repair is accomplished by replacement of damaged parts.

d. Reassembly

(1) Install muffler (1) in air train (2).

(2) Install muffler/air train in helmet (para 4-21).

(3) Install helmet liner in helmet (para 4-23).

512. Communications Whip Maintenance.

This task covers:
a. Removal **b. Installation**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Equipment Conditions

Helmet liner removed (para 4-23).

Materials Required

Preformed Packing
Silicone Lubricant (item 8, appx E)

a. Removal

(1) Tag and disconnect communications whip wires (5) from the communications posts in the interior of the helmet.

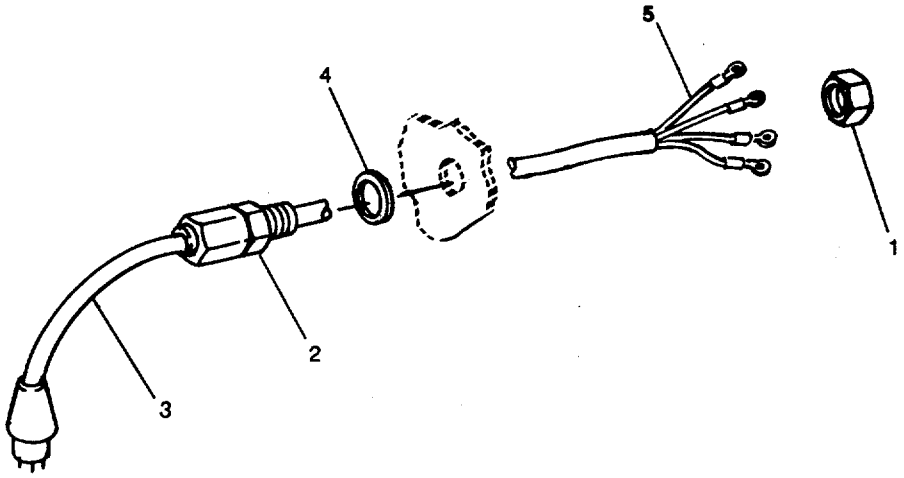
CAUTION

To avoid damage to the fiberglass helmet shell, ensure packing gland on communications whip does not turn while removing the nut in the interior of the helmet.

(2) Remove nut (1) from interior of helmet while holding packing gland (2) on communications whip (3).

(3) Carefully pull packing gland with communications whip from helmet.

(4) Remove and discard preformed packing (4).



5-12. Communications Whip Maintenance - continued.

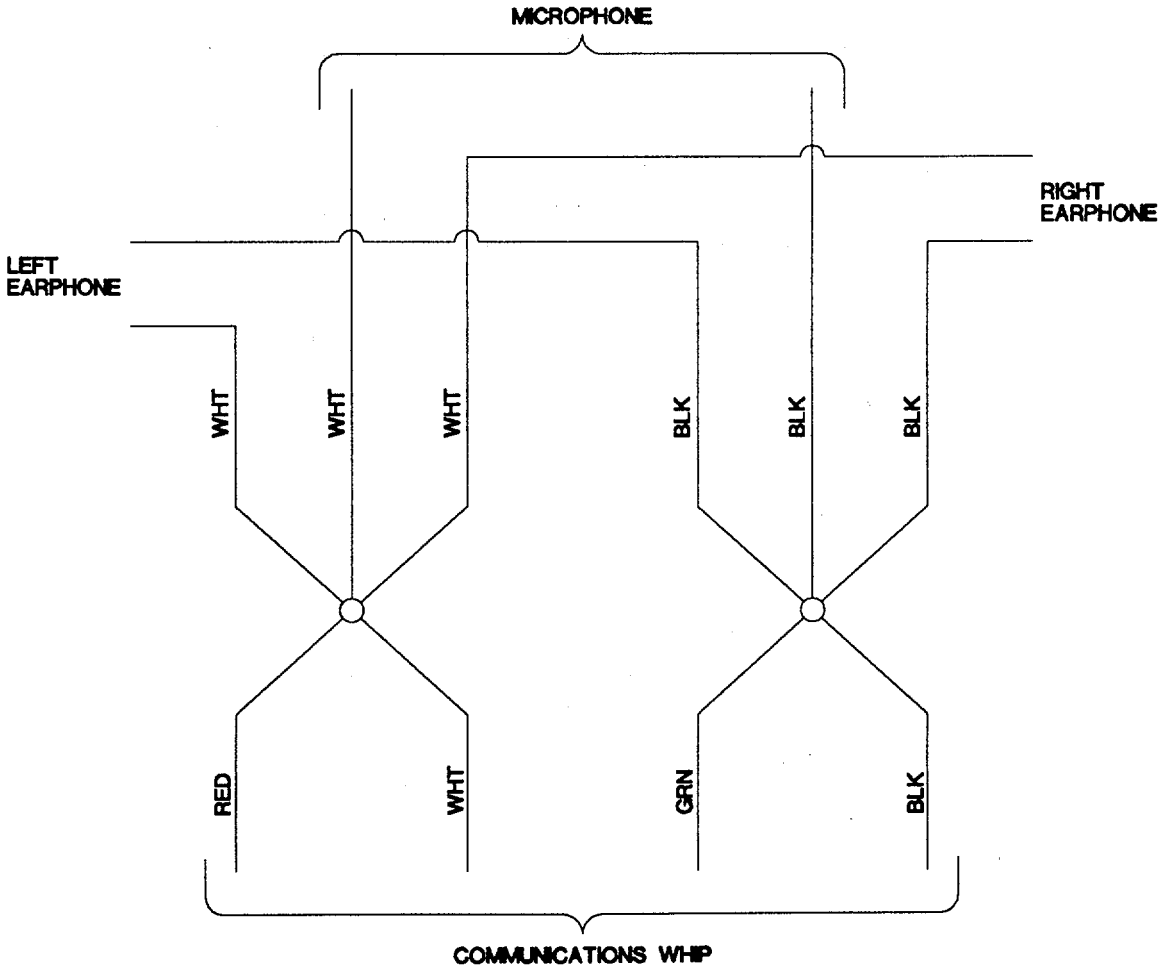
b. Installation

(1) Lightly lubricate new preformed packing (4) with silicone lubricant and install on packing gland (2).

(2) Install communications whip with packing gland through helmet shell.

(3) Fasten communications whip to shell by tightening nut (1) while holding packing gland (2).

(4) Connect wires (5) from communications whip to communication posts in the interior of helmet, per diagram shown below.



5-13. Helmet Shell Maintenance.

This task covers:
a. Disassembly **b. Reassembly**

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 4, appx B)

Materials Required

Soft Bristle Brush (item 1, appx E)
Clean Lint-Free Cloths (item 2, appx E)
Warm Fresh Water (item 4, appx E)
Nonionic Detergent (NID) Solution (item 3, appx E)
Lacquer Thinner (item 5, appx E)
Silicone Sealant (item 9, appx E)
Silicone Lubricant (item 8, appx E)
Preformed Packing

Equipment Conditions

Neck dam and yoke assembly removed (para 4-12).
Umbilical and adapter hose removed (para 4-25 and 4-26).

Equipment Conditions (continued)

Helmet liner removed (para 4-23).
Muffler/air train removed (para 4-19).
Side block assembly removed (para 4-13).
Nose block device removed (para 4-17).
Oral-nasal mask removed (para 4-16).
Exhaust valve removed (para 4-21).
Whisker exhaust removed (para 4-18).
Port retainer and face port removed (para 4-20).
Demand regulator removed (para 4-15).
Communications set removed (para 4-24).
Communications whip removed (para 5-12).

a. Disassembly

(1) Place helmet on clean workbench.

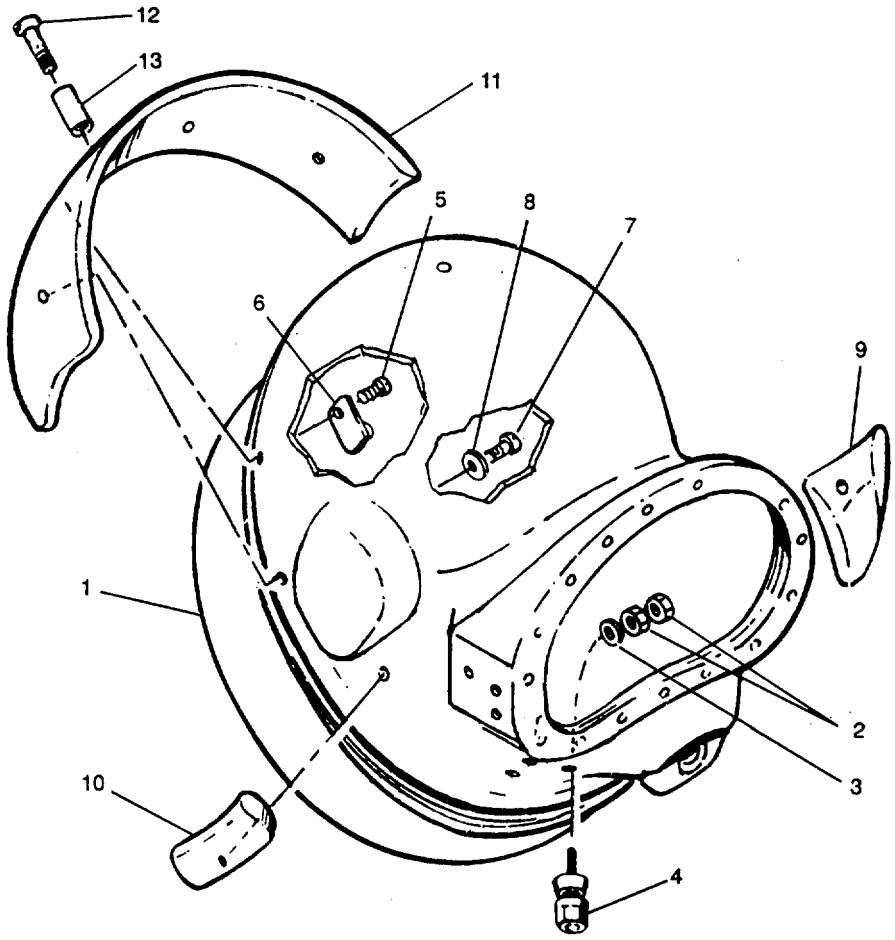
(2) Remove preformed packing seal (1) from base of helmet shell.

(3) Remove nuts (2), washers (3), and communications posts (4) from helmet shell.

(4) Remove screws (5) and cushion snap tabs (6) from helmet shell.

(5) Remove screws (7) and washers (8) securing left side weight (9), right side weight (10), and rear weight (11) to the helmet shell.

(6) Remove screw (12) securing alignment sleeve (13) to the rear weight.



b. Reassembly

WARNING

Residual lacquer thinner will contaminate diver's air and can cause injury or death.

NOTE

When installing previously used weights, be sure all traces of silicone sealant are removed from both the weights and the mounting hardware.

(1) Remove all traces of silicone sealant using lacquer thinner.

(2) Remove all traces of lacquer thinner using NID solution and soft bristle brush. Wipe clean with lint-free cloths. Rinse with fresh water; air or blow dry.

(3) Attach alignment sleeve (13) to rear weight (11) with screw (12).

5-13. Helmet Shell Maintenance - continued.

(4) Apply silicone sealant to all weight mounting hardware. Attach rear weight (11), left side weight (9), and right side weight (1 0) to the helmet shell using screws (7) and washers (8).

(5) Attach cushion snap tabs (6) with screws (5).

(6) Install communications posts (4) using nuts (2) and washers (3).

(7) Apply silicone lubricant to new preformed packing (1) and install packing on base of helmet shell.

5-14. Helmet Adapter Hose Maintenance.

This task covers: Test

INITIAL SETUP

Equipment Conditions

Helmet adapter hose removed (para 4-19).

Test

a. Connect male and female fittings of test hose to opposite fitting on two other Helmet Adapter Hoses.

WARNING

Hydrostatic testing is potentially dangerous due to the high pressures involved and unpredictable results.

b. Subject hoses to an internal hydrostatic pressure of 600 psig.

c. Check for slippage of test hose out of fittings, cracking of outer rubber cover, soft spots or bulges on hose body, cuts, tears, and shape change in couplings.

d. If any of the above occur due to test, replace hose immediately.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

6-1. Common Tools and Equipment.

For authorized common tools and equipment, refer to the modified table of organization and equipment (MTOE) applicable to your unit.

6-2. Special Tools, TMDE, and Support Equipment.

Special tools required for general support maintenance are listed and illustrated in the repair parts and Special tools list (appx F). TMDE and support equipment are listed in the maintenance allocation chart (appx B).

6-3. Repair Parts.

Repair parts are listed and illustrated in the repair parts and special tools list (appx F).

Section II. MAINTENANCE PROCEDURES

6-4. Superlite 17B Diving Helmet Maintenance.

Specific maintenance instructions for general support maintenance personnel, as allocated by the maintenance allocation chart (MAC), are covered in the following paragraphs.

6-5 Umbilical Maintenance.

This task covers:

a. Test **b. Repair**

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (item 4, appx B)
Band-It Tool (item 3, appx B)
Knife, Craftsman (item 7, appx B)
Wrench (item 6, appx B)
Gage, Pressure (item 12, appx B)
Hoist, Chain (item 10, appx B)
Scale (0-300) (item 11, appx B)

Materials Required

Rags, Wiping (item 2, appx E)
Cement, Rubber (item 11, appx E)

a. Test

(1) Air hose hydrostatic test.

WARNING

- Hydrostatic testing is potentially dangerous due to the high pressures involved and unpredictable results.
- Clear area before conducting test to avoid injury to personnel.
- Ensure all air has been removed from hose before conducting test.

NOTE

- A records log shall be maintained for documentation of all testing of divers hose. Upon completion of required testing an entry shall be made in the log stating date of manufacture of hose tested, number of hoses tested, results and date of testing and names of persons conduction the testing.
- Perform hydrostatic test three years from manufacture date and every two years thereafter and at any time the hose is suspect.
- Any hose that leaks or exhibits excessive bulging shall be removed from service.

(a) Fill hose with clean, fresh water.

(b) Seal open end of hose with blanking plug.

WARNING

Hydrostatic testing is potentially dangerous due to the high pressures involved and the unpredictable results.

(c) Install test tee and hydrostatic pump.

(d) Subject hose to a pressure of 250 psig and hold for two minutes.

(e) Release pressure from hose.

(f) Disconnect hydrostatic pump; test tee and seal.

(g) Drain water from hose.

(h) Discard hose that fails this test.

(i) Record test in hose log or install metal tag on hose with testing activity, date tested, and test pressure.

(2) Air hose burst test.

WARNING

- Hydrostatic testing is potentially dangerous due to the high pressures involved and unpredictable results.
- Clear area before conducting test to avoid injury to personnel.
- Ensure all air has been removed from hose before conducting test.

NOTE

- Air burst test is conducted IAW Federal Test Method STD. No. 401, Method 10011.
- Perform burst test five years from manufacture date and every two years thereafter and at any time the hose is suspect.

(a) Randomly select one length of hose from each lot of hose on board. A lot is defined as all hose with same date of manufacture.

(b) Cut a 36-inch test specimen from each length selection.

(c) Install 0-5000 psi pressure gage in supply line of hydrostatic pressure source.

(d) Connect one end of test specimen to hydrostatic pressure source.

(e) Purge specimen of air.

(f) Seal open end of specimen.

6-5. Umbilical Maintenance-continued.

(g) Lay specimen out straight on a flat surface.

(h) Observe pressure gage; increase hydrostatic pressure SLOWLY until specimen bursts; secure hydrostatic pressure.

NOTE

- Minimum acceptable burst pressure is 2400 psi.
- If specimen fails burst test, each hose bearing the same date is to be removed from diving service.
- If specimen passes burst test, each hose from the same lot and the unburst tested section of specimen hose may be continued in service until the next annual testing period.

(i) Remove specimen from hydrostatic pressure source.

(j) Remove pressure gage.

(k) Reinstall coupling and new clamps on unburst tested specimen hose if specimen passes burst test.

1 Roughen cut end of hose with sandpaper.

2 Coat roughened end surfaces with rubber cement.

3 Seal end surfaces with Neoprene or polymarized rubber washer (1-inch OD x 1/2-inch ID x 1/16-inch thick or 3/4-inch OD x 3/8-inch ID x 1/16-inch thick) as required.

4 Install coupling. If lubrication is required use water only.

5 Install three clamps on MIL-W-2845 hose, three clamps on 3/8-inch hose equally spaced along shank. Clamps shall be tightened until the clamp depressses the hose so that daylight appears when a straight edge is held along the outside surface of the hose.

6 Perform coupling pull-out test.

(3) Coupling Pull-out Test.

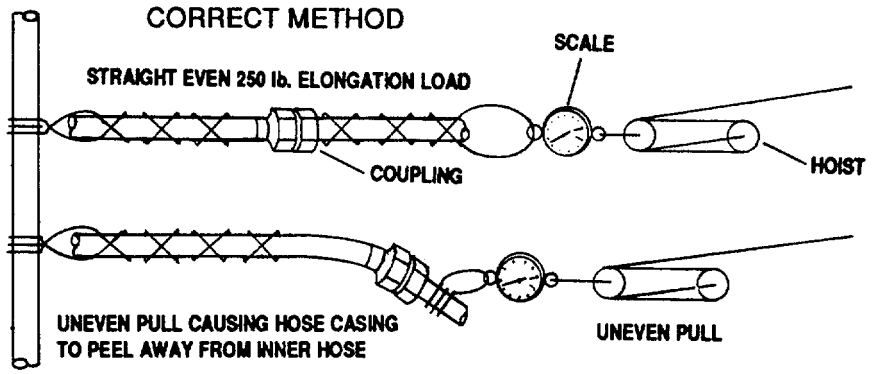
WARNING

- Hydrostatic testing is potentially dangerous due to the high pressures involved and unpredictable results.
- Clear area before conducting test to avoid injury to personnel.
- Ensure all air has been removed from hose before conducting test.

NOTE

- Scheduled coupling pull-out test is not normally required on leader hoses. Perform test on leader hose only if test a. reveals suspicious conditions.
- Perform coupling pull-out test three years from manufacture date and every two years thereafter and at any time the hose is suspect.
- Grip on the hose should be made approximately one foot back from the fittings with a standard support grip.

(a) Install standard support grip one foot behind fitting.



(b) Fill hose with clean fresh water before installing test tee.

(c) Install hydrostatic pressure source.

(d) Install scale (0-300 LBS).

(e) Install chain hoist for an even pull.

(f) Subject hose to a pressure of 600 psig concurrent with axial tensile load of 250 LBS and hold for one minute.

(g) Release pressure and tension from hose.

(h) Disconnect chain hoist, scale, hydrostatic pressure source, and test tee from hose.

(i) Drain water from hose.

(j) Discard hose and coupling that fail this test.

6-5. Umbilical Maintenance-continued.

b. Repair

(1) Disassemble.

(a) Lay out umbilical on clean floor or ground surface where there is sufficient working room.

CAUTION

When cutting a marine or tape wrap, be careful not to damage hoses or communication cable.

(b) Using knife, cut wrap at one end of umbilical and separate hoses and communication cable. Continue separating hoses and cable until other end is reached.

(2) Assemble.

(a) Attach lifeline (1) to handle (2) with a soft eye splice.

(b) Apply tension to lifeline (1).

NOTE

During wrapping process, pressure is maintained in pneumofathometer and air hoses.

(c) Measure 36 inches from diver's end of communication cable (3). Mark cable.

(d) Measure 12 inches from diver's end of pneumofathometer hose (4). Mark hose.

(e) Measure six inches from diver's end of air hose (5). Mark hose.

(f) Start 12 inches from end of rope, and wrap it once around handle.

(g) Gather cable hoses and handle and align marks.

(h) Make 21 wraps around all components.

(i) Make last turn around handle then around air hose.

(j) Pass 12-inch length under wrap and up between air hose and communication cable and pneumofathometer.

(k) Pass one of ends under communication cable and secure with a square knot.

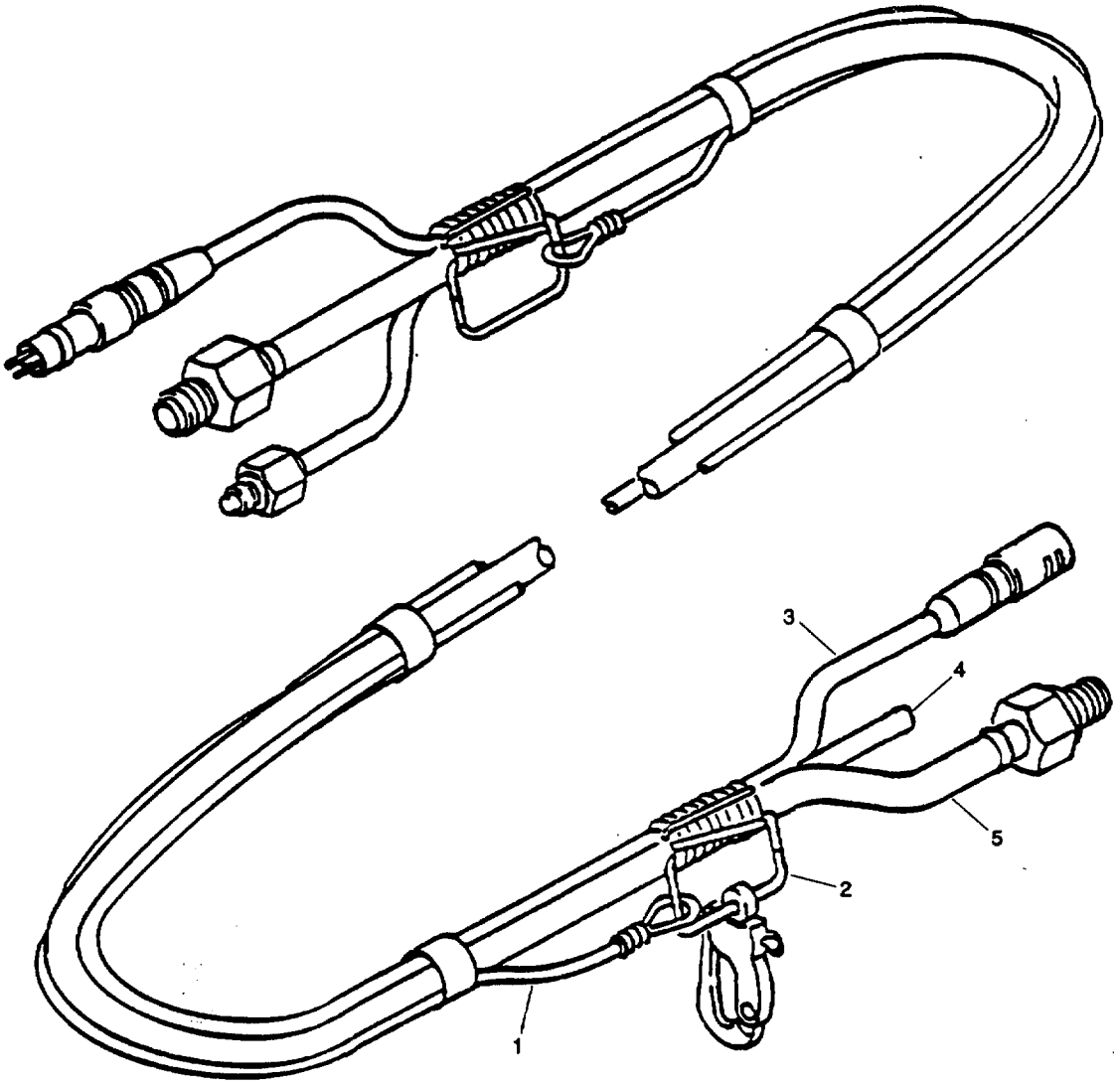
(l) Every 18 inches, tape cable, hoses, and lifeline together with eight to ten wraps.

(m) At every 100 ft mark, wrap tape wrap of 12 inches.

NOTE

Make last wrap 20 ft from surface end.

(n) Make a marlin wrap securing cable, hoses, and lifeline together.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4
5
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1

APPENDIX A

REFERENCES

A-1. Scope.

The following index should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual.

Index of Administrative Publications	DA PAM 25-30

A-2. Forms.

Recommended Changes to Publications and Blank Forms	DA 2028-2
Equipment Inspection and Maintenance Worksheet.	DA Form 2404
Equipment Control Record	DA Form 2408-9
Packaging Improvement Report.	DD Form 6
Quality Deficiency Report	SF 368

A-3. Field Manuals.

Military Diving Manual	FM 20-11-1

A-4. Technical Manuals.

The Army Maintenance Management System (TAMMS).	DA PAM 738-750
Painting Instructions for Field Use	TM 43-0139
Procedures for Destruction of Equipment to Prevent Enemy Use.	TM 750-244-3

A-5. Technical Bulletins.

Storage Serviceability Standards Supply Bulletin for Diving Equipment Sets, Life Suport Equipment and Ancillary Items	SB 740-TBS

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

Section 1. INTRODUCTION

B-1. General.

This appendix provides a summary of the maintenance operations for Superlite 17B Diving Helmet. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Functions.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition; i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

B-2. Maintenance Functions-continued.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to the like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. Column Entries.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in Column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures will be shown for each level. The number of task-hours specified by the work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. The time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

Unit
C (Operator)
O (Unit)

Intermediate
F (Direct Support)
H (General Support)

Depot
D (Depot)

e. Column 5, Tools and Equipment. Column 5 specifies, by a code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in Section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. Tool and Test Equipment Requirements (Sections III and IV).

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Level. The codes in this column indicate the maintenance level allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for Manufacturers (5-digit) in parentheses.

B-5. Remarks (Section IV).

a. Reference Code. This code refers to the appropriate item in Section II, Column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in Sections II and V.

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINT. FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS & EQUIP.	(6) REMARKS
00	Superlite 17B	Inspect		2.8					
	Diving Helmet	Test		0.7	1.1	0.5			A
		Service		0.3	1.6				B
		Adjust		0.3					
		Replace		3.8	1.9				C
		Repair			7.5				D
01	Helmet Assembly	Service							B
		Inspect		0.2					
		Test		0.2				4,8	
0101	Neck, Dam and	Inspect	0.1						
	Yoke Assembly	Repair		0.8				4	
0102	Side Block	Inspect	0.1					4	
	Assembly	Replace		0.9					
		Repair			1.2			4,5,6	D
010201	Emergency Air	Inspect		0.4					
	Supply Valve	Replace			0.6				
	Assembly	Repair			1.8			4	C
									D
010202	One-Way Valve	Inspect	0.1						
	Assembly	Replace		0.5					
		Repair			1.0			4	
0103	Demand Regulator	Inspect	0.1						
	Assembly	Adjust		0.5				1	
		Replace		0.6					
		Repair		1.0				4,6,8	
0104	Oral-Nasal Mask	Inspect	0.1						
		Test	0.2						
		Repair		0.4				4	D
0105	Nose Clearing	Inspect	0.1						
	Device	Replace		0.3				4	
		Repair		0.3				4	
0106	Exhaust Tube/	Inspect	0.2						
	Whisker Exhaust	Replace		0.4				4	
	Assembly	Repair			0.4			4	

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINT. FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS & EQUIP.	(6) REMARKS
0107	Muffler Air Train	Inspect	0.2						
		Replace		0.3					
		Repair			0.3				
0108	Port Retainer	Inspect	0.1						
		Replace		0.8				4,9	
		Repair		0.8				4,9	
0109	Exhaust Valve Assembly	Inspect	0.1						
		Replace		0.3					
0110	Communications Whip	Inspect	0.2						
		Test		0.2				2	
		Replace			0.3			4	
0111	Helmet Liner	Inspect	0.1						
		Replace		0.2					
0112	Helmet Shell	Inspect	0.2						
		Replace			1.0			4,9	
0113	Helmet Communications	Inspect	0.2						
		Replace		0.2					
		Repair		0.2				4	
02	Helmet Adapter Hose	Inspect	0.1						
		Test			0.4				
		Replace		0.2				4,6	A

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NO.
1	O	DSI Regulator Adjustment Tool	5180-01-205-4649	
2	F	Multimeter	6625-00-999-6282	
3	F	Band-It Tool		
4	O	Tool Kit, General Mechanic's	5180-00-177-7033	
5	F	Screwdriver, Notched		
6	O	Open-End Wrench, 1-1/8 Inch	5120-00-228-9516	
7	F	Knife, Craftsman	5110-00-293-1143	
8	F	Scriber		
9	F	Wrench, Torque, 0-50 In-Lb, 3/8 Inch Drive 8	5120-00-028-4229	
10	F	Hoist, Chain	3950-00-235-4236	MIL-H-904
11	F	Scale, 0-300 LBS		39428 1756T5
12	F	Gage, Pressure, 0-5000 LBS	6685-01-049-8069	MIL-L-18997

Section IV. REMARKS

MAINTENANCE ALLOCATION CHART

REFERENCE CODE	REMARKS
A	Test includes hydrostatic test of cylinders.
B	Service is cleaning.
C	Replace is removing system from operation and installation of replacement system.
D	Repair is replacement of subcomponents.

APPENDIX C

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

Section I. INTRODUCTION

C-1. Scope.

This appendix lists components of end item and basic issue items for the diving helmet to help you inventory items required for safe end efficient operation.

C-2. General.

Components of End Item (COEI) and Basic Issue Items (BII) Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These essential items are required to place the Superlite 17B Diving Helmet in operation, operate it, and to do emergency repairs. Although shipped separately packaged, Bll must be with the diving helmet during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE.

C-3. Explanation of Columns.

The following provides an explanation of columns found in the tabular listing.

a. Column (1)-Illustration Number. This column indicates the number of the illustration in which the item is shown.

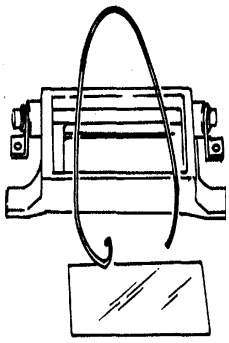
b. Column (2)-National Stock Number. Indicates the National Stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3)-Description and Part Number. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4)-Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (ea, in, pr).

e. Column (5)-Quantitv Required. Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

(1) ILLUSTRATION NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION AND PART NUMBER	(4) (U/M)	(5) QUANTITY REQUIRED
1		Lens, Welding 525-403 (58366) 	ea	1

Section III. BASIC ISSUE ITEM

(1) ILLUSTRATION NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION AND PART NUMBER	(4) (U/M)	(5) QUANTITY REQUIRED
		TM 5-4220-226-14&P Operator/Crew, Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List)	ea	1

APPENDIX D

ADDITIONAL AUTHORIZATION LIST (AAL)

NOT APPLICABLE

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

E-1. Scope.

This appendix lists expendable supplies and materials you will need to operate and maintain the diving helmet. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts and Heraldic Items), or CTA 8-1 00, Army Medical Department.

E-2. Explanation of Columns.

a. Column 1-Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item (e.g. *Use Loctite, item 6, appx E*.)

b. Column 2-Level. This column identifies the lowest level of maintenance that requires the listed item.

C-Operator/Crew
O-Organization
F-Direct Support
H-General Support

c. Column 3-National Stock Number. This is the national stock number assigned to the item; use it to request/requisition the item.

d. Column 4-Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Commercial and Government Entity Code (CAGE) in parentheses, if applicable.

e. Column 5-Unit of Measure (U/M). Indicates the measure used in performing the actual mainte- nance function. This measure is expressed by a two-character alphabetical abbreviation (ea., in, pr). If the lowest unit of measure differs from the rest of the issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	O	7920-00-205-2401	Brush, Soft Bristle (81349) MIL-B-43871	ea
2	O	7920-00-044-9281	Cloth, Lint-Free (81349) MIL-C-85043	bx
3	O	7930-00-282-9699	Detergent, Nonionic (80244) MIL-D-16791, Type 1	gal
	O	7930-00-985-6911	Detergent, Nonionic (80244) MIL-D-16791, Type 1, 5 Gal Can	cn
4	O	6810-00-297-9540	Distilled Water, Technical (96906) MS36300-5	5 gal
5	O	8010-00-943-7128	Lacquer Thinner	gal
6	O	8030-01-054-3968	Loctite 222 Thread Sealant MIL-S-46163	oz
7	O	6505-00-754-6374	Providone-Iodine Solution, 10%	gal
8	O	6850-00-963-5402	Silicone Lubricant MIL-A-46186	oz
9	O	8040-00-225-4548	Silicone Sealant	oz
10	F	8030-00-889-3534	Teflon Tape MIL-T-27730	rl
11	O	8040-00-117-8738	Cement, Rubber	oz

APPENDIX F

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

SECTION I. INTRODUCTION

1. SCOPE. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit, direct support and general support maintenance of the Air Conditioner. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

2. GENERAL. In addition to this section, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in functional groups in Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown in the associated illustration(s)/figure(s).

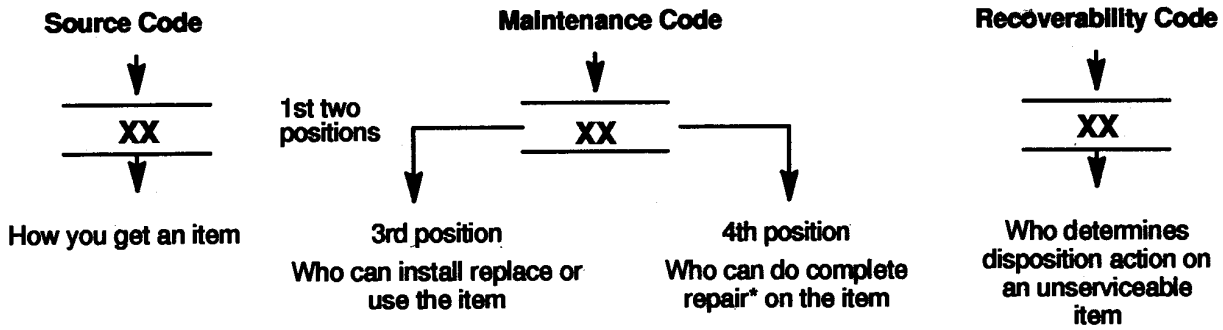
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. Section IV. Cross-Reference Index. A list, in National Item Identification Number (NIIN) sequence, of all national stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross references NSN, CAGEC and part number.

3. EXPLANATION OF COLUMNS (SECTIONS II AND III).

a. ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



* Complete Rear: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow.

Code	Explanation
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code. **NOTE : Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO (Made at org AVUM level) MF (Made at DS/AVUM level) MH (Made at GS level) ML (Made at Specialized Repair Activity (SRA)) MD (Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AO (Assembled by org AVUM Level) AF (Assembled by DS/AVUM Level) AH (Assembled by GS Category) AL (Assembled by SRA) AD	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code, authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.

XA- Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)

XB- If an "XB" item is not available from salvage, order it using the CAGE Code and part number given.

XC- Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.

XD- Item is not stocked. Order an "XD"-coded item through normal supply channels using the CAGE Code and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1

(2) Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance.

Maintenance Code	Application/Explanation
C-	Crew or operator maintenance done within unit/AVUM maintenance.
O-	Unit level /AVUM maintenance can remove, replace, and use the item.
F-	Direct support/AVIM maintenance can remove, replace, and use the item.
H-	General support maintenance can remove, replace, and use the item.
L-	Specialized repair activity can remove, replace, and use the item.
D-	Depot can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). This position will contain one of the following maintenance codes.

NOTE

Some limited repair may be done on an item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
O-	Unit VAVUM is the lowest level that can do complete repair of the item.
F-	Direct support VAVIM is the lowest level that can do complete repair of the item.
H-	General Support is the lowest level that can do complete repair of the item.
L-	Specialized repair activity is the lowest level that can do complete repair of the item.
D-	Depot is the lowest level that can do complete repair of the item.
Z-	Nonreparable. No repair is authorized.
B-	No repair is authorized. No parts or special tools are authorized for the maintenance of a "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Application/Explanation
Z-	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.
O-	Reparable item. When not economically reparable, condemn and dispose of the item at unit or AVUM level.
F-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or AVIM level.
H-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D-	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L-	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A-	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. CAGEC (Column (3)). The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

d. PART NUMBER (Column (4)). Indicates the primary number used by the manufacturer, (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.
(2) Part numbers of bulk materials are referenced in this column in the line entry for the item to be manufactured/fabricated.
(3) The statement END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both Section II and Section III.

f. QTY (Column (6)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and may vary from application to application.

4. EXPLANATION OF INDEX FORMAT AND COWMNS (SECTION IV).

a. NATIONAL STOCK NUMBER (NSN) INDEX.

(1) STOCK NUMBER Column. This column lists the NSN in national item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.

NSN
5305-01-574-1467
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. Use the complete NSN (13 digits) when requisitioning items by stock number.

(2) FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

(3) ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PART NUMBER INDEX. Part numbers in this index are listed in ascending alphanumeric sequence (i. e., vertical arrangement of letter and number combinations which place the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

(1) CAGEC Column. The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.
(2) PART NUMBER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.
(3) STOCK NUMBER Column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGEC columns to the left.
(4) FIG. Column. This column lists the number of the figure where the item is identified/located in Section II and Section III.
(5) ITEM Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. FIGURE AND ITEM NUMBER INDEX.

(1) FIG. Column. This column lists the number of the figure where the item is identified/located in Section II and Section Ill.
(2) ITEM Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.
(3) STOCK NUMBER Column. This column lists the NSN for the item.
(4) CAGEC Column. The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.
(5) PART NUMBER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

5. SPECIAL INFORMATION.

a. ASSOCIATED PUBLICATIONS. Refer to Appendix A, References.

6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Numbers or Part Numbers are NOT Known.

(1) First. Using the table of contents, determine the assembly or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and use the Figure and Item Number Index to find the NSN.

b. When National Stock Number or Part Number is Known.

(1) First. Using the of National Stock Number and Part Number Indexes find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see paragraph 4.a.). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see paragraph 4.b.). Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.

(2) Second. Turn to the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

7. ABBREVIATIONS**.** Abbreviations used in this manual are listed in MIL-STD-12.

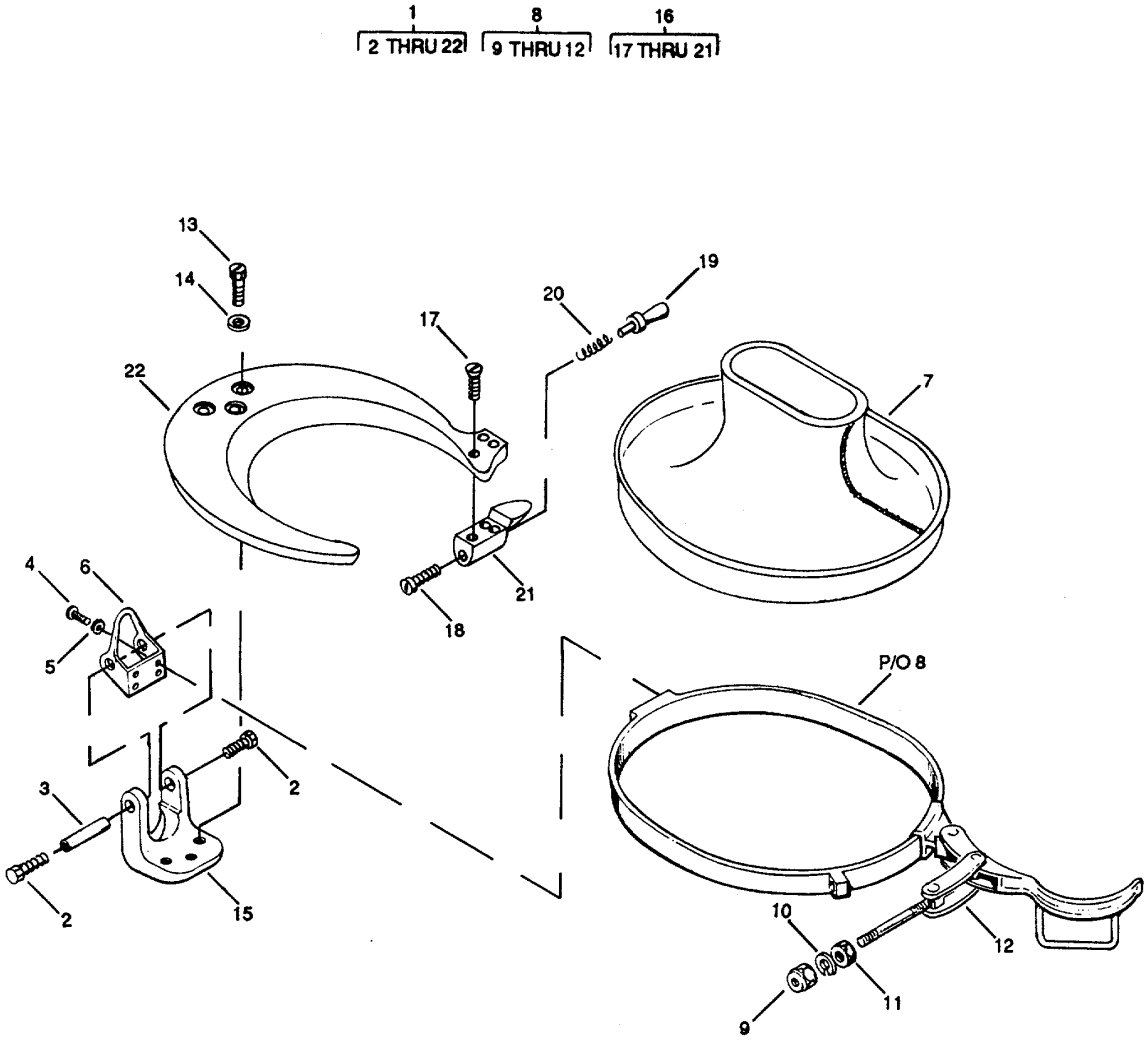


Figure F-1. Neck, Dam, and Yoke Assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-1 NECK, DAM, AND YOKE ASSEMBLY	
1	PBOOO	58366	505-006	.NECK, DAM, YOKE ASSY	1
2	PAOZZ	58366	530-201	..BOLT	2
3	PAOZZ	58366	550-018	..HINGE, SLEEVE	1
4	PAOZZ	58366	530-025	..SCREW	4
5	PAOZZ	58366	530-406	..WASHER	4
6	PAOZZ	58366	545-013	..REAR HINGE, TAB	1
7	PAOZZ	58366	510-528	..NECK DAM	1
8	PAOOO	58366	505-003	..CLAMP ASSEMBLY, NECK	1
9	PAOZZ	58366	530-320	...NUTLOCK	1
10	PAOZZ	58366	530-415	...WASHER	1
11	XDOZZ	58366	530-317	...NUT	1
12	XDOZZ	58366	545-011	...CLAMP, NECK.	1
13	PAOZZ	58366	530-080	...SCREW	3
14	PAOZZ	58366	530-530	..WASHER	3
15	PAOZZ	58366	560-026	..HINGE	1
16	PAOOO	58366	505-015	..LATCH CATCH ASSY	1
17	PAOZZ	58366	530-065	...SCREW	3
18	PAOZZ	58366	530-205	...SCREW, CAP, SOCKET, HE	1
19	PAOZZ	58366	550-016	...PLUNGER	1
20	PAOZZ	58366	535-801	...SPRING, FLAT	1
21	PAOZZ	58366	560-034	...LATCH CATCH BODY	1
22	PAOZZ	58366	520-060	..YOKE, FIBERGLASS	1
				END OF FIGURE	

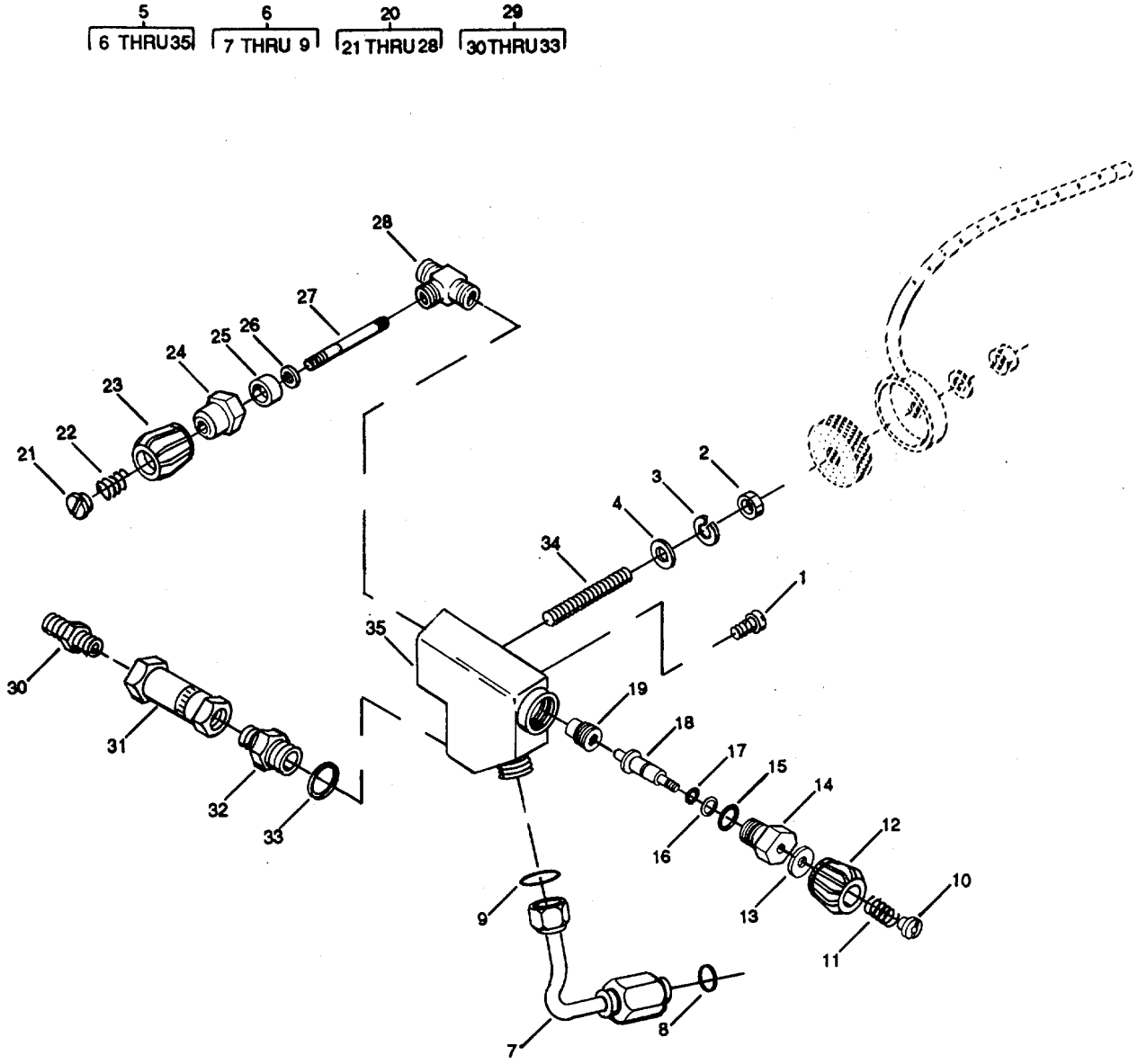


Figure F-2. Side Block Assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-2 SIDE BLOCK ASSEMBLY	
1	PAFZZ	58366	530-050	.SCREW	1
2	XDOZZ	58366	530-317	.NUT	1
3	PAOZZ.	58366	530-415	.WASHER	1
4	PAOZZ	58366	530-535	.WASHER, FLAT	1
5	PAOFF	58366	505-024	.SIDE BLOCK ASSY	1
6	PAOFZ	58366	555-155	..TUBE, BENT, METALLIC ASSEMBLY	1
7	XDFZZ	58366	555-154	...TUBE, BENT MATALLIC	1
8	PAFZZ	58366	510-012	...PACKING, PREFORMED	1
9	PAFZZ	58366	520-033	...PACKING, PREFORMED	1
10	PAFZZ	58366	550-019	..LOCKNUT, TUBE FI	1
11	PAFZZ	58366	535-802	..SPRING, HELICAL, COMP	1
12	PAFZZ	58366	520-016	..KNOB	1
13	PAFZZ	58366	520-030	..WASHER, FLAT	1
14	PAFZZ	58366	550-020	..BONNET	1
15	PAFZZ	58366	510-015	..PACKING, PREFORMED	1
16	PAFZZ	58366	520-031	..WASHER, FLAT	1
17	PAFZZ	58366	510-010	..PACKING, PREFORMED	1
18	PAFZZ	58366	550-022	..STEM, VALVE	1
19	PAFZZ	58366	550-023	..SEAT ASSEMBLY	1
20	PAFFF	58366	505-018	..VALVE ASSEMBLY	1
21	PAFZZ	58366	550-019	...LOCKNUT, TUBE FI	1
22	PAFZZ	58366	535-802	...SPRING, HELICAL, COMP	1
23	PAFZZ	58366	520-016	...KNOB	1
24	PAFZZ	58366	550-032	...PACKING NUT	1
25	PAFZZ	58366	520-029	...PACKING, PREFORMED	1
26	PAFZZ	58366	550-034	...WASHER, FLAT	1
27	PAFZZ	58366	550-035	...STEM	1
28	PAFZZ	58366	550-036	...VALVE	1
29	PAOFF	58366	505-017	..VALVE ASSEMBLY	1
30	XDFZZ	58366	555-117	...ADAPTER, BRASS	1
31	XDFZZ	58366	555-150	...VALVE ASSEMBLY	1
32	XDFZZ	58366	555-118	...ADAPTER, DIVERS MASK	1
33	PAFZZ	58366	510-483	...PACKING, PREFORMED	1
34	PAOZZ	58366	550-024	..STUD, CONTINOUS THRU	1
35	XDOZZ	58366	550-029	..SIDE BLOCK	1

END OF FIGURE

3
4 THRU 28

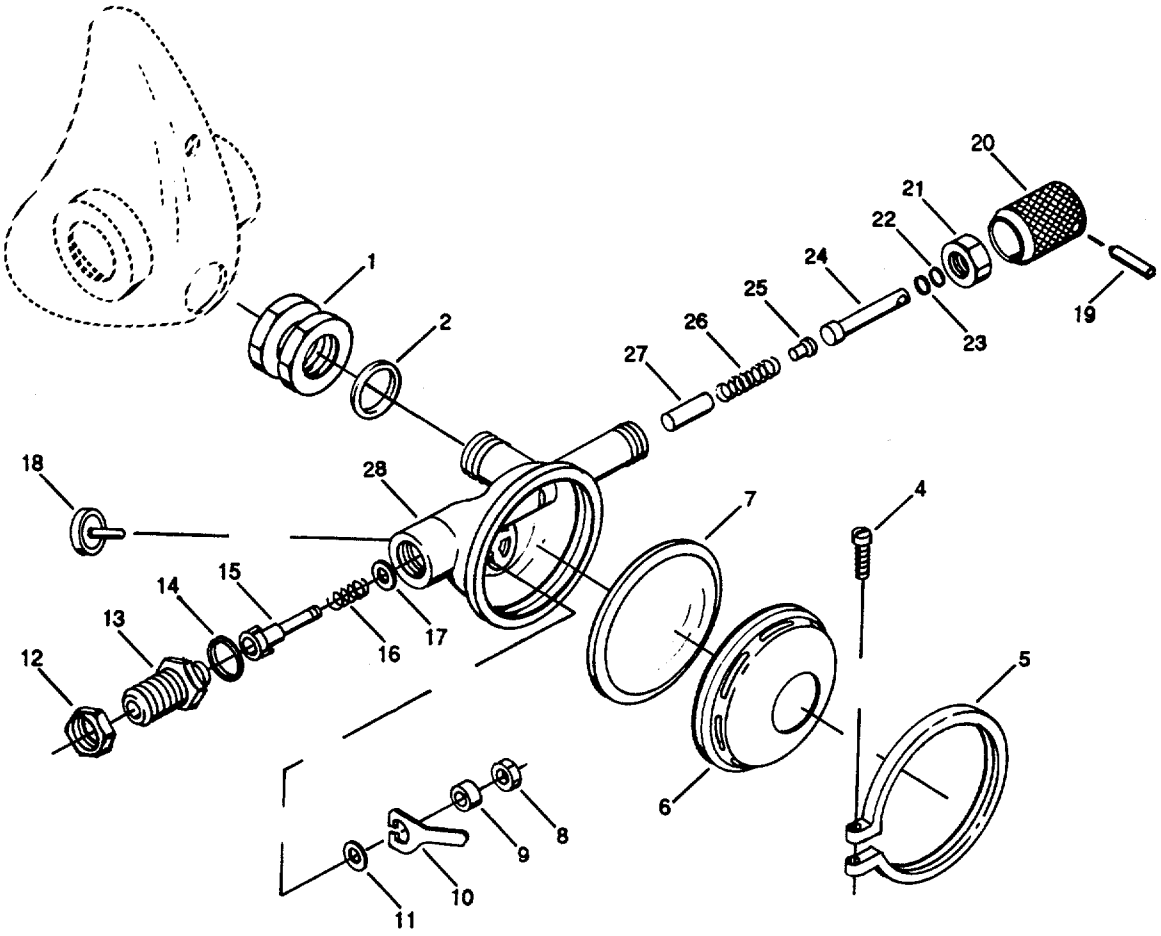


Figure F-3. Demand Regulator Assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-3 DEMAND REGULATOR ASSEMBLY	
1	PAOZZ	58366	550-038	.NUT, REGULATOR MOUNT	1
2	PAOZZ	58366	510-211	.PACKING, PREFORMED	1
3	PAOOO	58366	505-027	.ASSY , DEMAND, REGULAT	1
4	PAOZZ	58366	530-030	..SCREW	1
5	PAOZZ	58366	545-020	..CLAMP, RIM CLENCHING	1
6	PAOZZ	58366	545-018	..COVER	1
7	PAOZZ	58366	510-553	..DIAPHRAGM	1
8	PAOZZ	58366	530-303	..NUT	1
9	PDOZZ	58366	550-052	..SPACER	1
10	PAOZZ	58366	545-038	..LEVER, ROLLER	1
11	PAOZZ	58366	530-506	..WASHER	1
12	PAOZZ	58366	550-050	..JAM NUT	1
13	PAOZZ	58366	550-048	..NIPPLE, INLET	1
14	PAOZZ	58366	510-014	..O-RING	1
15	PAOZZ	58366	545-026	..VALVE, INLET	1
16	PAOZZ	58366	535-804	..SPRING	1
17	PAOZZ	58366	530-505	..WASHER	1
18	PAOZZ	58366	510-552	..VALVE, EXAUST	1
19	PAOZZ	58366	530-601	..PIN, RETAINING	1
20	PAOZZ	58366	550-053	..KNOB, ADJUSTMENT	1
21	PAOZZ	58366	550-055	..PACKING NUT	1
22	PAOZZ	58366	510-011	..PACKING, PREFORMED	1
23	PAOZZ	58366	520-032	..WASHER	1
24	PAOZZ	58366	550-057	..SHAFT	1
25	PAOZZ	58366	550-059	..SPACER	1
26	PAOZZ	58366	535-807	..SPRING, SET	1
27	PAOZZ	58366	550-060	..PISTON	1
28	PAOZZ	58366	545-022	..REGULATOR BODY	1

END OF FIGURE

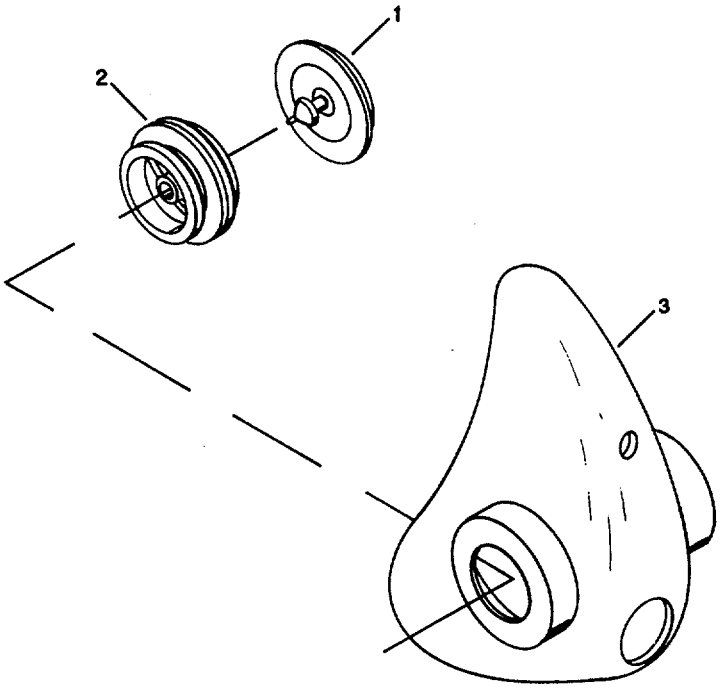


Figure F-4. Oral Nasal Mask.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-4 ORAL NASAL MASK	
1	PAOZZ	58366	510-550	.VALVE, ORAL NASAL	1
2	XDOZZ	58366	520-020	.BODY, VALVE	2
3	PAOZZ	58366	510-540	.MASK, NASAL	1
				END OF FIGURE	

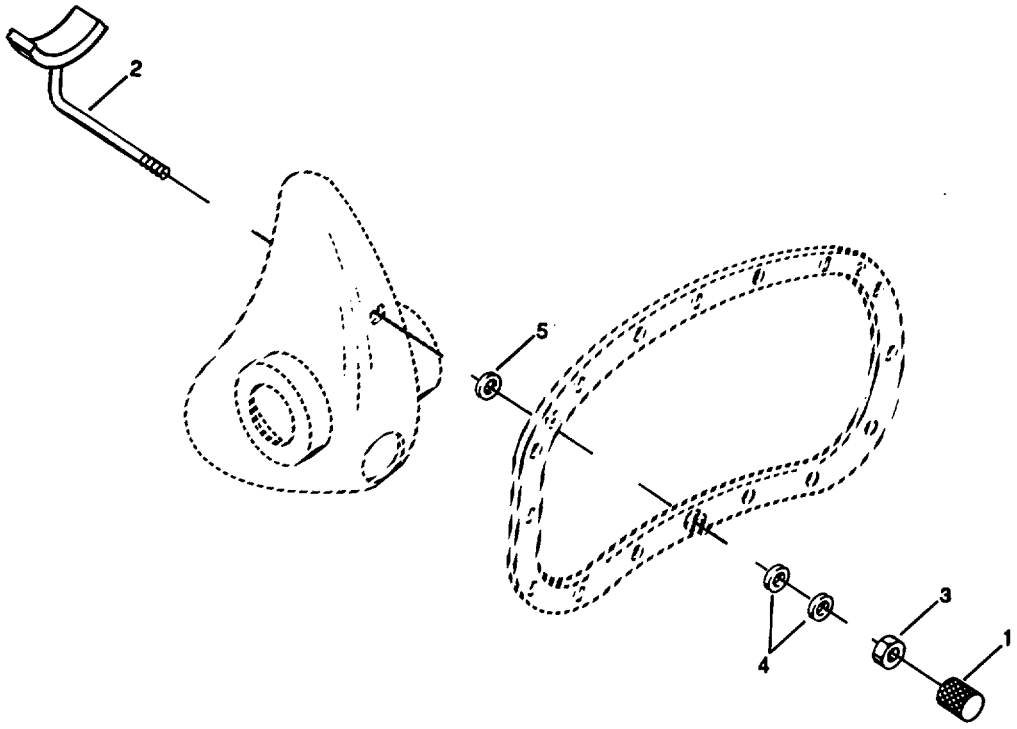


Figure F-5. Nose Clearing Device.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-5 NOSE CLEARING DEVICE	
1	PAOZZ	18366	550-062	.KNOB	1
2	PAOZZ	58366	545-015	.BLOCK DEVICE, NOSE	1
3	PAOZZ	58366	555-180	.PACKING NUT	1
4	PAOZZ	58366	510-008	.PACKING, PREFORMED	2
5	PAOZZ	58366	510-010	.PACKING, PREFORMED	1
				END OF FIGURE	

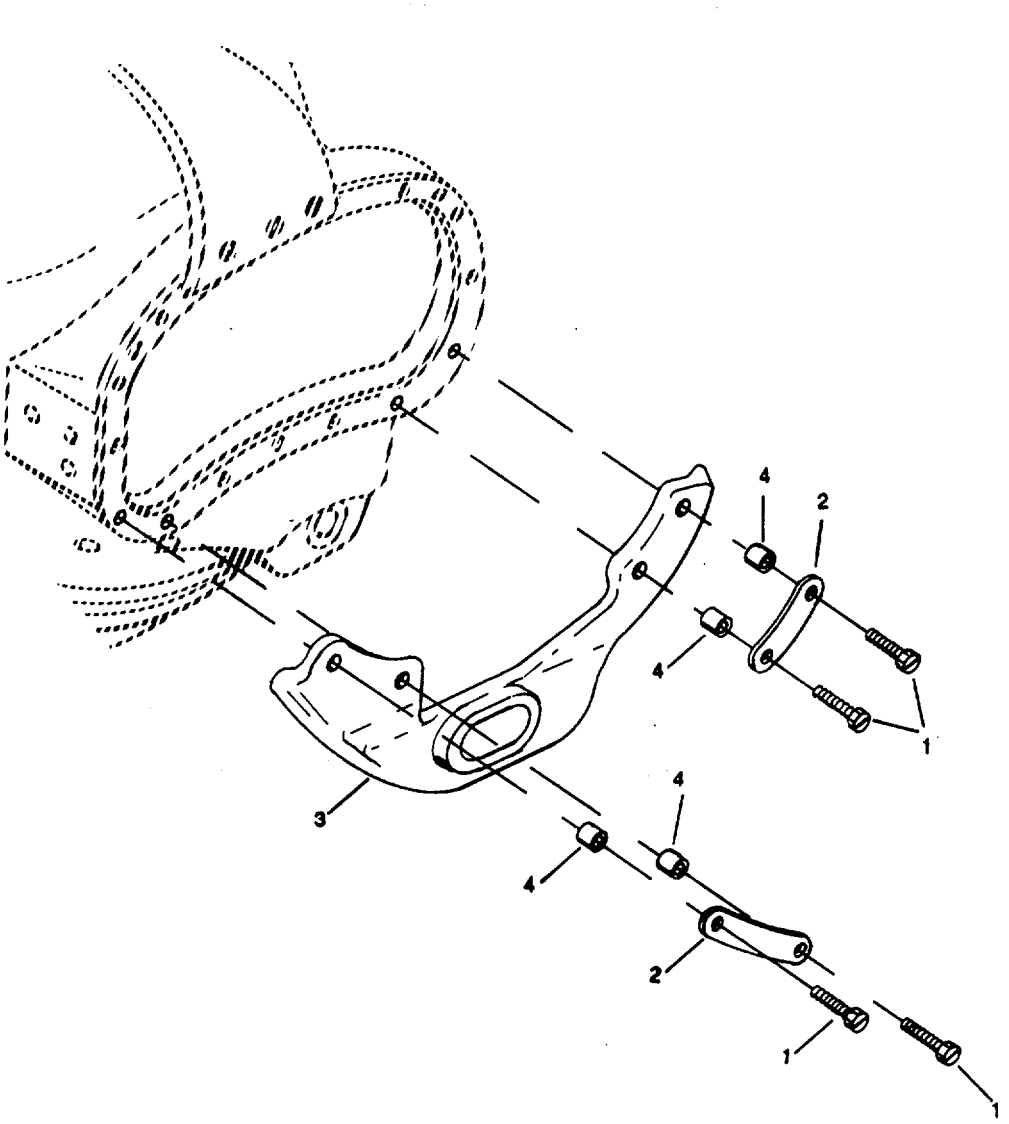


Figure F-6. Exhaust Tube/Whisker Exhaust Assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-6 EXHAUST TUBE/WHISKER EXHAUST ASSEMBLY	
1	PAOZZ	58366	530-045	.SCREW,CAP,HEXAGON	4
2	PAOZZ	58366	540-015	.PLATE,DIVERS MASK	2
3	PAOZZ	58366	510-554	.WHISKER,RUBBER	1
4	PAOZZ	58366	550-061	.SPACER,SLEEVE	4
				END OF FIGURE	

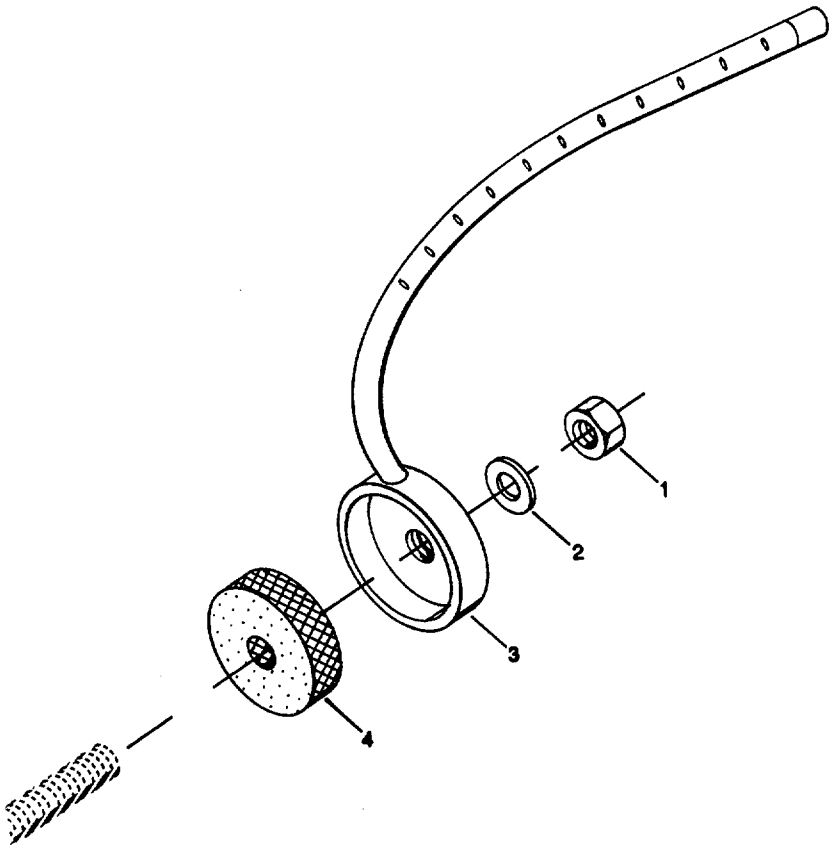


Figure F-7. Muffler Air Train.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-7 MUFFLER AIR TRAIN	
1	XDOZZ	58366	530-317	.NUT	1
2	PAOZZ	58366	530-535	.WASHER,FLAT.....	1
3	PAOZZ	58366	545-016	.AIR TRAIN	1
4	PAOZZ	58366	510-551	.MUFFLER,DIVERS MASK	1
				END OF FIGURE	

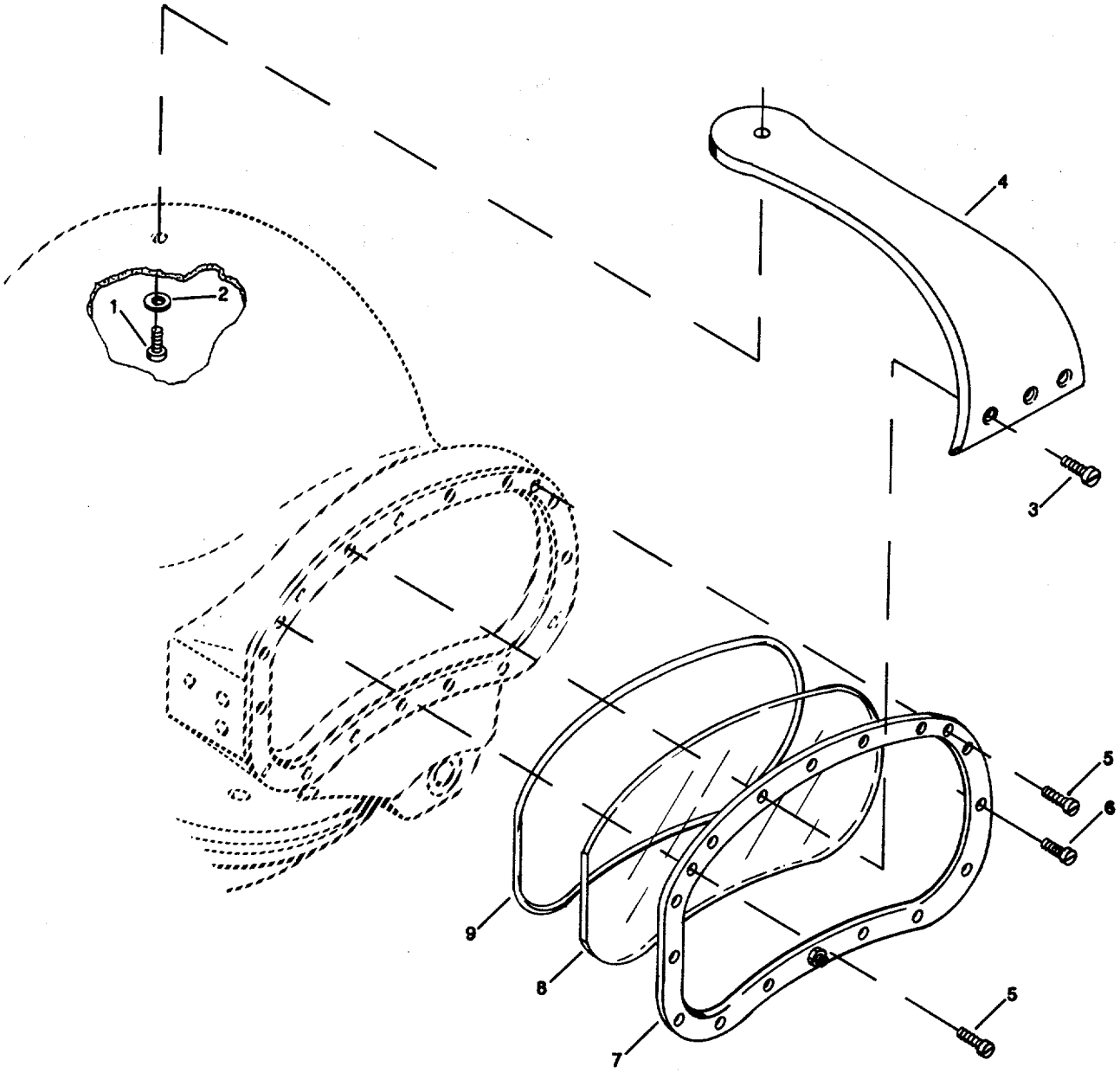


Figure F-8. Port and Port Retainer.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-8 PORT AND PORT RETAINER	
1	PAOZZ	58366	530-070	.SCREW	1
2	PAOZZ	58366	530-540	.WASHER	1
3	PAFZZ	58366	530-040	.SCREW	3
4	XDOZZ	58366	560-014	.HANDLE	1
5	PAOZZ	58366	530-052	.SCREW,MACHINE	2
6	PAOZZ	58366	530-035	.SCREW	8
7	PAOZZ	58366	560-040	.RETAINER,PORT	1
8	PAOZZ	58366	520-004	.LENS,DIVERS MASK	1
9	PAOZZ	58366	510-260	.PACKING,PREFORMED	1
				END OF FIGURE	

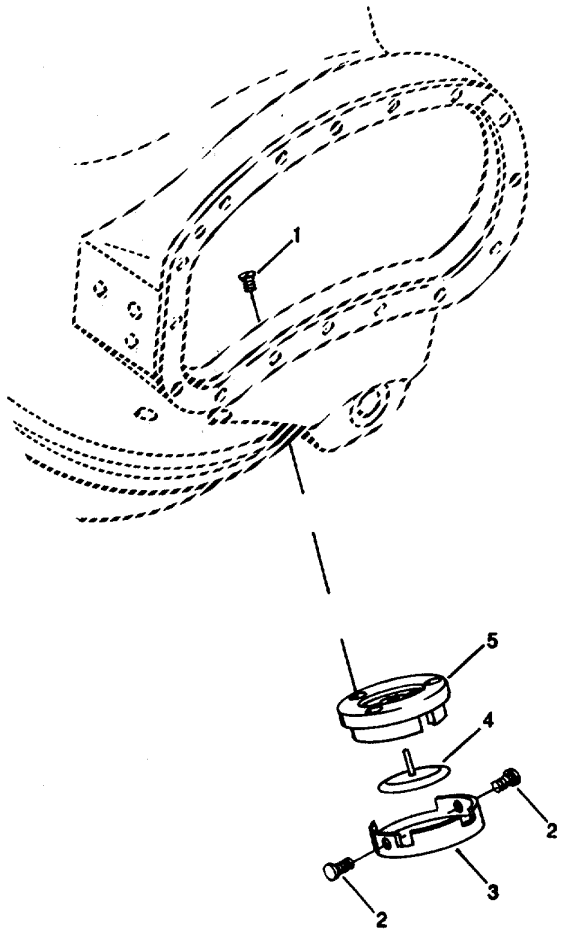


Figure F-9. Exhaust Valve Assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-9 EXHAUST VALVE ASSEMBLY	
1	PAOZZ	58366	530-035	.SCREW	3
2	PAOZZ	58366	530-021	.SETSCREW	2
3	XDOZZ	58366	545-024	.VALVE COVER,EXHAUST	1
4	PAOZZ	58366	510-561	.VALVE,EXHAUST	1
5	XDOZZ	58366	550-063	.VALVE BODY,EXHAUST	1
				END OF FIGURE	

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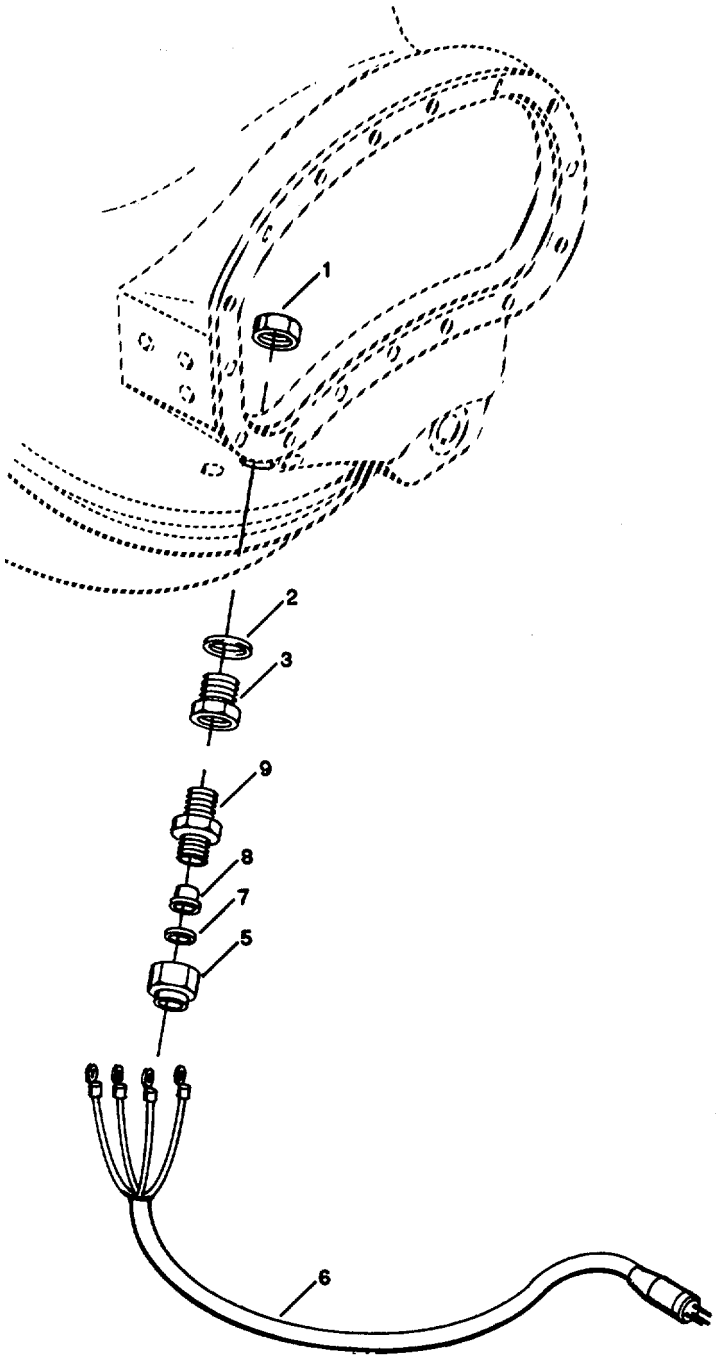

Figure F-10. Communications Whip.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-10 COMMUNICATIONS WHIP	
1	XDFZZ	58366	550-040	.NUT	1
2	PAFZZ	58366	510-481	.PACKING,RETAINER	1
3	XDFZZ	58366	550-043	.PLVG	1
4	PAFFF	58366	505-047	.CONNECTOR ASSEMBLY	1
5	PAFZZ	58366	555-178	..NUT	1
6	PAFZZ	58366	515-045	..CONNECTOR,MALE	1
7	PAFZZ	58366	520-036	..FERRULE,BACK	1
8	XDFZZ	58366	520-035	..FERRULE,FRONT	1
9	PAFZZ	58366	555-175	..RETAINER,PACKING	1
				END OF FIGURE	

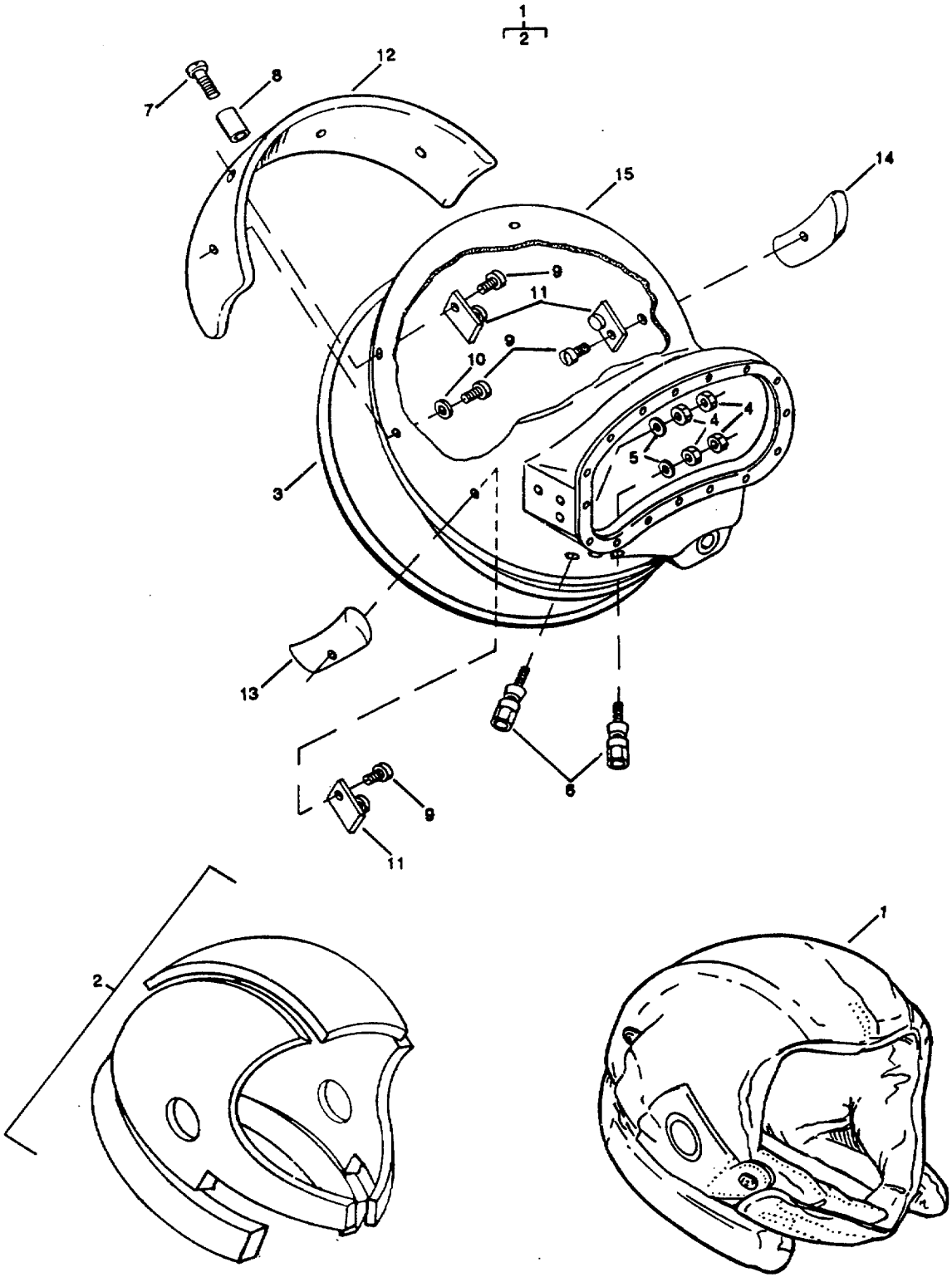

Figure F-11. Helmet Liner and Helmet Shell.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-11 HELMET LINER AND HELMET SHELL	
1	PAOZZ	58366	510-521	.HEAD,CUSHION	1
2	PAOZZ	58366	510-523	..REPLACEMENT FOAM	1
3	PAFZZ	58366	510-446	.PACKING,PREFORMED	1
4	XDFZZ	58366	530-308	.NUT	4
5	PAFZZ	58366	530-525	.WASHER,FLAT	2
6	XDFZZ	58366	515-035	.POST,COMMUNICATIONS	2
7	PAFZZ	58366	530-090	.SCREW,ALIGNMENT	1
8	PAFZZ	58366	550-039	.SLEEVE,ALIGNMENT	1
9	PAOZZ	58366	530-070	.SCREW W	6
10	PAOZZ	58366	530-540	.WASHER	1
11	PAFZZ	58366	545-027	.SNAP TAB	4
12	XDFZZ	58366	560-005	.WEIGHT,REAR	1
13	XDFZZ	58366	560-023	.WEIGHT,STARBOARD RIGHT	1
14	PAFZZ	58366	560-019	.WEIGHT,PORT LEFT	1
15	XDFZZ	58366	520-065	.HELMET,FIBERGLASS	1

END OF FIGURE

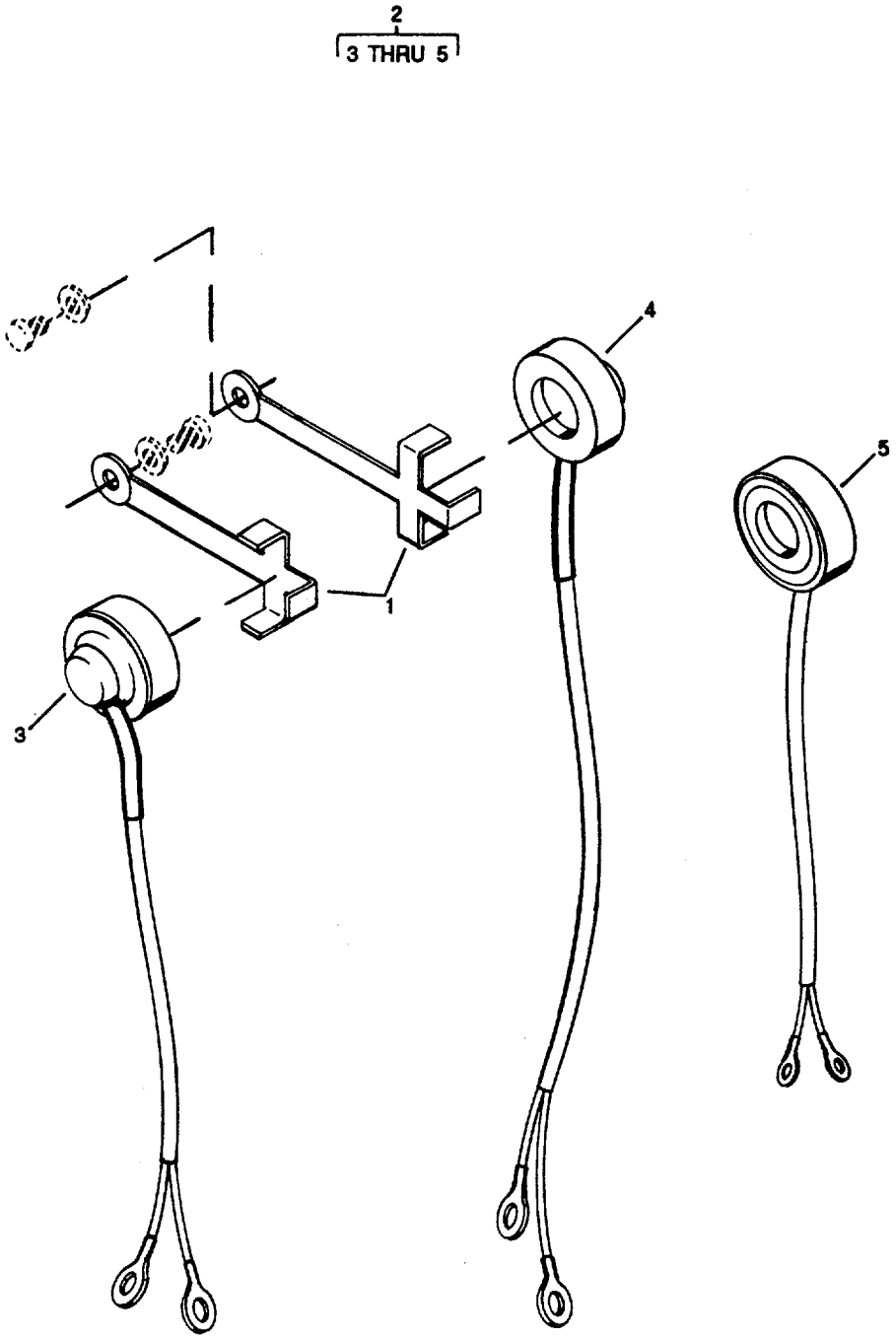

Figure F-12. Helmet Communications.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 HELMET ASSEMBLY	
				FIG. F-12 HELMET COMMUNICATIONS	
1	XDOZZ	58366	540-054	.RETAINER,EARPHONE	2
2	PAOOO	58366	515-030	.COMMUNICATIONS SET	1
3	PAOZZ	58366	515-005	..EARPHONE,ELEMENT RIGHT	1
4	PAOZZ	58366	515-006	..EARPHONE,ELEMENT LEFT	1
5	PAOZZ	58366	515-009	..MICROPHONE, ELEMENT	1
				END OF FIGURE	

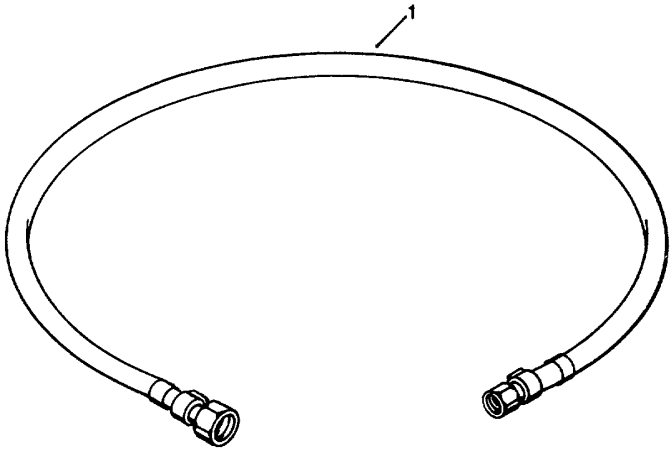

Figure F-13. Helmet Adapter Hose.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 02 HELMET ADAPTER HOSE	
				FIG. F-13 HELMET ADAPTER HOSE	
1	PAOZZ	41620	4666845	HOSE ASSEMBLY,NONME HELMET ADAPTER. ..	1
				END OF FIGURE	

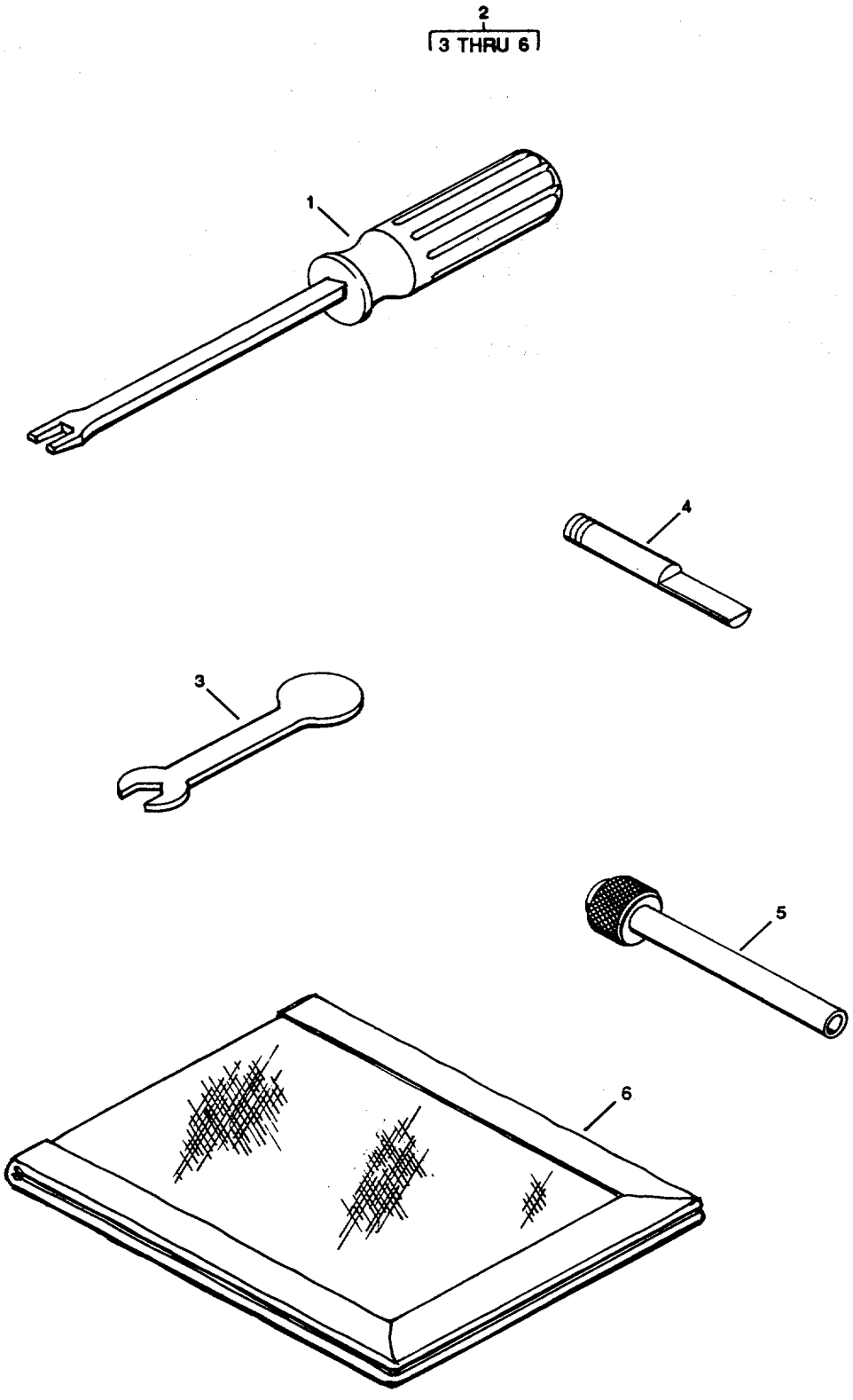

Figure F-14. Special Tools.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 03 SPECIAL TOOLS	
				FIG. F-14 SPECIAL TOOLS	
1	PAOZZ	77948	D339	SCREWDRIVER,FLAT TI MODIFY AS REQUIRED	
2	PAOZZ	58366	525-615	TOOL KIT W-POUCH.	
3	PAOZZ	58366	525-611	.WRENCH,REGULATOR AD.	
4	PAOZZ	58366	525-610	.INLET VALVE HOLDER	
5	PAOZZ	58366	525-612	.SOCKET WRENCH.	
6	PAOZZ	58366	525-613	.TOOL POUCH	
				END OF FIGURE	

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5120-00-227-7338	F-14	1			
5330-01-169-4569	F-2	17			
	F-5	5			
4220-01-172-4055	F-3	18			
4220-01-172-4058	F-3	24			
4220-01-172-4059	F-3	10			
5365-01-172-4064	F-3	25			
5310-01-172-4065	F-3	8			
4220-01-183-2999	F-2	18			
5330-01-183-3154	F-2	25			
5330-01-183-3156	F-3	2			
5310-01-237-3339	F-2	26			
4710-01-237-3407	F-2	6			

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
77948	D339	5120-00-227-7338	F-14	1
41620	4666845		F-13	1
58366	505-003		F-1	8
58366	505-006		F-1	1
58366	505-015		F-1	16
58366	505-017		F-2	29
58366	505-018		F-2	20
58366	505-024		F-2	5
58366	505-027		F-3	3
58366	505-047		F-10	4
58366	510-008		F-5	4
58366	510-010	5330-01-169-4569	F-2	17
			F-5	5
58366	510-011		F-3	22
58366	510-012		F-2	8
58366	510-014		F-3	14
58366	510-015		F-2	15
58366	510-211	5330-01-183-3156	F-3	2
58366	510-260		F-8	9
58366	510-446		F-11	3
58366	510-481		F-10	2
58366	510-483		F-2	33
58366	510-521		F-11	1
58366	510-523		F-11	2
58366	510-528		F-1	7
58366	510-540		F-4	3
58366	510-550		F-4	1
58366	510-551		F-7	4
58366	510-552	4220-01-172-4055	F-3	18
58366	510-553		F-3	7
58366	510-554		F-6	3
58366	510-561		F-9	4
58366	515-005		F-12	3
58366	515-006		F-12	4
58366	515-009		F-12	5
58366	515-030		F-12	2
58366	515-035		F-11	6
58366	515-045		F-10	6
58366	520-004		F-8	8
58366	520-016		F-2	12
			F-2	23
58366	520-020		F-4	2
58366	520-029	5330-01-183-3154	F-2	25
58366	520-030		F-2	13
58366	520-031		F-2	16
58366	520-032		F-3	23
58366	520-033		F-2	9
58366	520-035		F-10	8
58366	520-036		F-10	7
58366	520-060		F-1	22
58366	520-065		F-11	15

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
58366	525-610		F-14	4
58366	525-611		F-14	3
58366	525-612		F-14	5
58366	525-613		F-14	6
58366	525-615		F-14	2
58366	530-021		F-9	2
58366	530-025		F-1	4
58366	530-030		F-3	4
58366	530-035		F-8	6
			F-9	1
58366	530-040		F-8	3
58366	530-045		F-6	1
58366	530-050		F-2	1
58366	530-052		F-8	5
58366	530-065		F-1	17
58366	530-070		F-8	1
			F-11	9
58366	530-080		F-1	13
58366	530-090		F-11	7
58366	530-201		F-1	2
58366	530-205		F-1	18
58366	530-303	5310-01-172-4065	F-3	8
58366	530-308		F-11	4
58366	530-317		F-1	11
			F-2	2
			F-7	1
58366	530-320		F-1	9
58366	530-406		F-1	5
58366	530-415		F-1	10
			F-2	3
58366	530-505		F-3	17
58366	530-506		F-3	11
58366	530-525		F-11	5
58366	530-530		F-1	14
58366	530-535		F-2	4
			F-7	2
58366	530-540		F-8	2
			F-11	10
58366	530-601		F-3	19
58366	535-801		F-1	20
58366	535-802		F-2	11
			F-2	22
58366	535-804		F-3	16
58366	535-807		F-3	26
58366	540-015		F-6	2
58366	540-054		F-12	1
58366	545-011		F-1	12
58366	545-013		F-1	6
58366	545-015		F-5	2
58366	545-016		F-7	3
58366	545-018		F-3	6

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
58366	545-020		F-3	5
58366	545-022		F-3	28
58366	545-024		F-9	3
58366	545-026		F-3	15
58366	545-027		F-11	11
58366	545-038	4220-01-172-4059	F-3	10
58366	550-016		F-1	19
58366	550-018		F-1	3
58366	550-019		F-2	10
			F-2	21
58366	550-020		F-2	14
58366	550-022	4220-01-183-2999	F-2	18
58366	550-023		F-2	19
58366	550-024		F-2	34
58366	550-029		F-2	35
58366	550-032		F-2	24
58366	550-034	5310-01-237-3339	F-2	26
58366	550-035		F-2	27
58366	550-036		F-2	28
58366	550-038		F-3	1
58366	550-039		F-11	8
58366	550-040		F-10	1
58366	550-043		F-10	3
58366	550-048		F-3	13
58366	550-050		F-3	12
58366	550-052		F-3	9
58366	550-053		F-3	20
58366	550-055		F-3	21
58366	550-057	4220-01-172-4058	F-3	24
58366	550-059	5365-01-172-4064	F-3	25
58366	550-060		F-3	27
58366	550-061		F-6	4
58366	550-062		F-5	1
58366	550-063		F-9	5
58366	555-117		F-2	30
58366	555-118		F-2	32
58366	555-150		F-2	31
58366	555-154		F-2	7
58366	555-155	4710-01-237-3407	F-2	6
58366	555-175		F-10	9
58366	555-178		F-10	5
58366	555-180		F-5	3
58366	560-005		F-11	12
58366	560-014		F-8	4
58366	560-019		F-11	14
58366	560-023		F-11	13
58366	560-026		F-1	15
58366	560-034		F-1	21
58366	560-040		F-8	7

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
F-1	1		58366	505-006
F-1	2		58366	530-201
F-1	3		58366	550-018
F-1	4		58366	530-025
F-1	5		58366	530-406
F-1	6		58366	545-013
F-1	7		58366	510-528
F-1	8		S8366	505-003
F-1	9		58366	530-320
F-1	10		58366	530-415
F-1	11		58366	530-317
F-1	12		58366	545-011
F-1	13		58366	530-080
F-1	14		58366	530-530
F-1	15		58366	560-026
F-1	16		58366	505-015
F-1	17		58366	530-065
F-1	18		58366	530-205
F-1	19		58366	550-016
F-1	20		58366	535-801
F-1	21		58366	560-034
F-1	22		58366	520-060
F-2	1		58366	530-050
F-2	2		58366	530-317
F-2	3		58366	530-415
F-2	4		58366	530-535
F-2	5		58366	505-024
F-2	6	4710-01-237-3407	58366	555-155
F-2	7		58366	555-154
F-2	8		58366	510-012
F-2	9		58366	520-033
F-2	10		58366	550-019
F-2	11		58366	535-802
F-2	12		58366	520-016
F-2	13		58366	520-030
F-2	14		58366	550-020
F-2	15		58366	510-015
F-2	16		58366	520-031
F-2	17	5330-01-169-4569	58366	510-010
F-2	18	4220-01-183-2999	58366	550-022
F-2	19		58366	550-023
F-2	20		58366	505-018
F-2	21		58366	550-019
F-2	22		58366	535-802
F-2	23		58366	520-016
F-2	24		58366	550-032
F-2	25	5330-01-183-3154	58366	520-029
F-2	26	5310-01-237-3339	58366	550-034
F-2	27		58366	550-035
F-2	28		58366	550-036
F-2	29		58366	505-017

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FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
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F-2	31		58366	555-150
F-2	32		58366	555-118
F-2	33		58366	510-483
F-2	34		58366	550-024
F-2	35		58366	550-029
F-3	1		58366	550-038
F-3	2	5330-01-183-3156	58366	510-211
F-3	3		58366	505-027
F-3	4		58366	530-030
F-3	5		58366	545-020
F-3	6		58366	545-018
F-3	7		58366	510-553
F-3	8	5310-01-172-4065	58366	530-303
F-3	9		58366	550-052
F-3	10	4220-01-172-4059	58366	545-038
F-3	11		58366	530-506
F-3	12		58366	550-050
F-3	13		58366	550-048
F-3	14		58366	510-014
F-3	15		58366	545-026
F-3	16		58366	535-804
F-3	17		58366	530-505
F-3	18	4220-01-172-4055	58366	510-552
F-3	19		58366	530-601
F-3	20		58366	550-053
F-3	21		58366	550-055
F-3	22		58366	510-011
F-3	23		58366	520-032
F-3	24	4220-01-172-4058	58366	550-057
F-3	25	5365-01-172-4064	58366	550-059
F-3	26		58366	535-807
F-3	27		58366	550-060
F-3	28		58366	545-022
F-4	1		58366	510-550
F-4	2		58366	520-020
F-4	3		58366	510-540
F-5	1		58366	550-062
F-5	2		58366	545-015
F-5	3		58366	555-180
F-5	4		58366	510-008
F-5	5	5330-01-169-4569	58366	510-010
F-6	1		58366	530-045
F-6	2		58366	540-015
F-6	3		58366	510-554
F-6	4		58366	550-061
F-7	1		58366	530-317
F-7	2		58366	530-535
F-7	3		58366	545-016
F-7	4		58366	510-551
F-8	1		58366	530-070

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FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
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F-8	3		58366	530-040
F-8	4		58366	560-014
F-8	5		58366	530-052
F-8	6		58366	530-035
F-8	7		58366	560-040
F-8	8		58366	520-004
F-8	9		58366	510-260
F-9	1		58366	530-035
F-9	2		58366	530-021
F-9	3		58366	545-024
F-9	4		58366	510-561
F-9	5		58366	550-063
F-10	1		58366	550-040
F-10	2		58366	510-481
F-10	3		58366	550-043
F-10	4		58366	505-047
F-10	5		58366	555-178
F-10	6		58366	515-045
F-10	7		58366	520-036
F-10	8		58366	520-035
F-10	9		58366	555-175
F-11	1		58366	510-521
F-11	2		58366	510-523
F-11	3		58366	510-446
F-11	4		58366	530-308
F-11	5		58366	530-525
F-11	6		58366	515-035
F-11	7		58366	530-090
F-11	8		58366	550-039
F-11	9		58366	530-070
F-11	10		58366	530-540
F-11	11		58366	545-027
F-11	12		58366	560-005
F-11	13		58366	560-023
F-11	14		58366	560-019
F-11	15		58366	520-065
F-12	1		58366	540-054
F-12	2		58366	515-030
F-12	3		58366	515-005
F-12	4		58366	515-006
F-12	5		58366	515-009
F-13	1		41620	4666845
F-14	1	5120-00-227-7338	77948	D339
F-14	2		58366	525-615
F-14	3		58366	525-611
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F-14	5		58366	525-612
F-14	6		58366	525-613

APPENDIX G

MANUFACTURED ITEMS

NOT APPLICABLE

APPENDIX H

TORQUE LIMITS

SECTION I. INTRODUCTION

H-1. Scope.

This appendix provides standard torque values and general information and methods for applying torque.

H-2. General.

Only standard torque values are provided in this appendix. Special torque values and sequences are provided in the maintenance procedures for applicable components.

SECTION II. TORQUE LIMITS

H-3. Breakaway Torque Values.

Refer to table H-1 for minimum breakaway torque values.

Table H-1. Self-Locking Nut Breakaway Torque Values

Thread Size	Minimum Breakaway Torque (In.-Lbs.)	Thread Size	Minimum Breakaway Torque (In.-Lbs.)
10-32	2.0	5/8-18	32.0
1/4-28	3.5	3/4-16	50.0
5/16-24	6.5	7/8-14	70.0
3/8-24	9.5	1-12	90.0
7/16-20	14.0	1 1/8-12	117.0
1/2-20	18.0	1 1/4-12	143.0
9/16-18	24.0		

NOTE

To determine breakaway torque, thread nut onto screw or bolt until at least two threads stick out. Nut shall not make contact with a mating part. Stop the nut. Torque necessary to begin turning nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet minimum breakaway torque.

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GORDON R. SULLIVAN
General, United States Army
Chief of Staff

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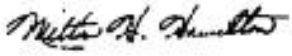

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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