

CUI
AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

TECHNICAL MANUAL

**OPERATOR'S MANUAL
WITH
ILLUSTRATED PARTS BREAKDOWN**

**JOINT SERVICE MASK LEAKAGE TESTER
(JSMLT)**

M46 TESTER, PN 03001A0001, NSN 6665-01-506-9002
M46A1 TESTER, PN 9300156, NSN 6665-01-537-7697
M46A2, PN 9300157, NSN 6665-01-665-5513

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INTRODUCTION

1 PURPOSE.

This manual contains general information, operating instructions, maintenance procedures, and an Illustrated Parts Breakdown (IPB) for the Joint Service Mask Leakage Tester (JSMLT), M46, Part Number (PN) 03001A0001, National Stock Number (NSN) 6665-01-506-9002; the M46A1, 5.2 Pound-force per Square Inch (PSI), PN 9300156, NSN 6665-01-537-7697; and the M46A2, 5.2 PSI, modernized, PN 9300157, NSN 6665-01-665-5513.

2 SCOPE.

This manual consists of the following chapters:

Chapter 1	General Information
Chapter 2	Components of the JSMLT
Chapter 3	Unpacking and Assembly
Chapter 4	Initialization
Chapter 5	Mask Testing
Chapter 6	Drink Tube System Testing
Chapter 7	Outlet Valve Test [VALVE]
Chapter 8	Quantitative Fit Test [FIT]
Chapter 9	Powering Down and Packing the JSMLT
Chapter 10	Preventative Maintenance Checks and Services (PMCS)
Chapter 11	Maintenance Procedures
Chapter 12	Troubleshooting; Fault and Error Messages
Chapter 13	Maintenance and Calibration Request Procedures
Chapter 14	Illustrated Parts Breakdown

3 SYMBOLS.

-	A dash (-) before an index number denotes a part which is not illustrated.
*	An asterisk (*) flush right of the part number denotes a marking that is to be requisitioned in accordance with DODI 5330.03_AFI 33-395.
#	A number sign (#) flush right of a part number indicates that detail parts are listed in a separate manual.
F	The letter "F" before the figure number means "follows" and is used when an assembly or part has not been assigned an index number, and the figure and index number of the preceding part has been used.

4 ABBREVIATIONS.

All abbreviations used in this manual are shown in the list of abbreviations below. Standard abbreviations are in accordance with ASME Y14.38, Abbreviations and Acronyms for Use on Drawings and Related Documents.

°C	degrees Celsius
°F	degrees Fahrenheit
AC	Alternating Current
ACF	Altitude Control Function
ACPT	Accept
AF	Air Force
AFMIRP	Air Force Mask Inspection and Repair Program

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AFTO	Air Force Technical Order
ALT	Alternate
AP	Attaching Parts
AR	As Required
ASSY	Assembly
ATI	Air Techniques International
CAGE	Commercial and Government Entity
CBRN	Chemical, Biological, Radiological, and Nuclear
CBRN-IRC	Chemical, Biological, Radiological, and Nuclear Information Resource Center
CBT	Computer Based Training
CD	Compact Disk
CD-ROM	Compact Disc Read-Only Memory
CFE	Contractor Furnished Equipment
CLS	Contractor Logistics Support
COML	Commercial
CU	Control Unit
DLA	Defense Logistics Agency
DoD	Department of Defense
DOT	Department of Transportation
EIR	Equipment Improvement Recommendations
ESDS	Electrostatic Discharge Sensitive
ETIMS	Enhanced Technical Information Management System
GFE	Government Furnished Equipment
HAZMAT	Hazardous Material
HCI	Hardness Critical Items
Hz	Hertz
I&S	Interchangeability and Substitution
ID	Identification
IFSTHA	Inflatable Face Seal Test Head Adapter
IPB	Illustrated Parts Breakdown
IRC	Information Resource Center
JDRS	Joint Deficiency Reporting System
JPEO	Joint Program Executive Office
JPEO-CBD	Joint Program Executive Office for Chemical and Biological Defense
JPM P	Joint Project Manager for Protection
JSAM-JSF	Joint Service Aircrew Mask-Joint Strike Fighter
JSAM RW	Joint Service Aircrew Mask, Rotary Wing
JSF	Joint Strike Fighter
JSMAC	Joint Service Mask Adapter Kit
JSMLT	Joint Service Mask Leakage Tester
LPM	Liters per Minute
LRU	Line Replaceable Unit
LSC	Light Scattering Chamber
mg	Milligrams
MIPR	Military Interdepartmental Purchase Request
mL	Milliliters
MPL	Maintenance Parts List
NATO	North Atlantic Treaty Organization

NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NHA	Next Higher Assembly
NI	Numerical Index
No.	Number
NSN	National Stock Number
OEM	Original Equipment Manufacturer
OSHA	Occupational Safety and Health Administration
PAO	Poly Alpha Olefin
PC	Personal Computer
PDREP	Product Data Reporting and Evaluation Program
PMCS	Preventative Maintenance Checks and Service
PMEL	Precision Measurement Equipment Laboratory
PN	Part Number
PDQR	Product Quality Deficiency Reports
PSI	Pound-force per Square Inch
QDR	Quality Deficiency Report
QRLS	Quick-Release Locking System
RA	Return Authorization
RDI	Reference Designator Index
REF	Reference
RO	Roll
RSC	Reusable Shipping Container
SCCM	Standard Cubic Centimeters per Minute
SDS	Safety Data Sheet
SLPM	Standard Liters Per Minute
SM&C	Scheduled Maintenance & Calibration
SMR	Source, Maintenance, and Recoverability
TCTO	Time Compliance Technical Order
TO	Technical Order
TPDR	Technical Publication Deficiency Report
IUID	Item Unique Identification
UOC	Usable on Code
UPA	Units Per Assembly
U.S.	United States
USA	United States Army
USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
V	Volts
VAC	Volts Alternating Current
WC	Water Column

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5 RELATED PUBLICATIONS.

NOTE

When searching Technical Order (TO) numbers in the Enhanced Technical Information Management System (ETIMS) catalog, please use the wildcard (*) after typing in the TO number. Many TOs are not available in paper format, (i.e., digital (WA-1) or Compact Disk (CD-1)). This ensures TOs in all media formats will populate the search.

The following publications contain information in support of this technical manual.

List of Related Publications

Number	Title
ASME Y14.38	Abbreviations and Acronyms for Use on Drawings and Related Documents
DODI 5330.03_AFI 33-395	Defense Logistics Agency (DLA) Document Services
MD 5668-00103JSF	Joint Service Aircrew Mask-Joint Strike Fighter (JSAM-JSF) Manual Specification Number
S6470-AB-MMO-010 (NAVSEA)	Navy Operator and Maintenance Manual MCU2P/MCU2AP
TM 3-4240-541-12&P (USA), TO 14P4-19-1 (USAF), TM 10589A-OR (USMC) and S6470-AC-OMP-010 (NAVSEA)	Operator and Unit Maintenance Manual for Mask, Chemical-Biological: Protective, M53 and Mask, Chemical-Biological: Protective, M53, Left
TM 3-4240-543-13&P (USA), TO 14P3-1-212 (USAF) and 13-1-6.10-3 (NAVAIR)	Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for Mask, Chemical-Biological: Joint Service Aircrew Mask, MPU-5(V)/P
TM 3-4240-542-13&P (USA), TO 14P4-20-1 (USAF), TM 09204G/09205G-OI/1 (USMC) and S6470-AD-OMP-010 (NAVSEA)	Operator and Field Maintenance Manual for Mask, Chemical-Biological: Joint Service General Purpose, Field, M50 and Mask, Chemical Biological: Joint Service General Purpose, Combat Vehicle, M51
TO 00-5-1	AF Technical Order System
TO 00-25-195	AF Technical Order System Source, Maintenance, and Recoverability Coding of Air Force Weapons, Systems, and Equipments
TO 00-25-234	General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment
TO 00-35D-54	USAF Deficiency Reporting, Investigation, and Resolution
TO 33K-1-100-1	Calibration Procedure for Maintenance Data Collection Codes and Calibration Measurement Summaries
TO 33K6-4-3548-1	Calibration Procedure for Joint Service Mask Leakage Tester (JSMLT) 9300156

6 RECORD OF APPLICABLE TIME COMPLIANCE TECHNICAL ORDERS (TCTOS).

List of Time Compliance Technical Orders

TCTO Number	TCTO Title	TCTO Date
None		

7 HCI HARDNESS CRITICAL ITEMS (HCI).



The HCI symbol (HCI) establishes special requirements limiting changes and substitutions and that the specific parts listed must be used to ensure hardness is not degraded.

If included, items with nuclear survivability requirements are marked with the HCI symbol (HCI). All changes to, or proposed substitutions of, HCIs must be approved by the acquiring activity.

8 ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) ITEMS.



All ESDS parts shall be handled in accordance with the ESDS device handling procedures in TO 00-25-234.

If included, items containing ESDS parts are marked with the ESDS symbol (.

9 REPORTING ERRORS.

Only the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD), Joint Project Manager for Protection (JPM P) is authorized to approve changes to this publication. Users shall submit change recommendations through their chains of command to the service program managers listed below. Service component program managers shall submit change recommendations to JPM P, Attention: PSM, 50 Tech Parkway, Stafford, VA 22556.

9.1 AF Users. Recommended changes to this manual shall be submitted in accordance with TO 00-5-1.

9.2 Navy Users. Submit a Technical Publication Deficiency Report (TPDR) in accordance with the instructions contained in COMNAVAIRFORINST 4790.2 to the Aircrew Systems Fleet Support Team, APML Chemical Biological Defense, Systems Survivability Division Code 6.6.4.2, Building 2187, Suite 1280-D1, Patuxent River, MD 20670-1906. TPDRs can be submitted on OPNAV 4790/66, via the Joint Deficiency Reporting System (JDRS) website at <https://JDRS.mil/>.

9.3 Marine Corps Users. Discrepancies or suggested changes for this publication may be reported by submitting a NAMC 10772. For instructions on how to submit NAVMC 10772, go to <http://www.marcorsyscom.marines.mil/Professional-Staff/SEAL/ALPS/> and click on "NAVMC 10772 Submittal". Questions or concerns regarding the NAVMC 10772 should be reported via email to SMB.LOG.Tech.Pubs.fct@usmc.mil. A response will be provided to you.

9.4 Coast Guard Aviation Survival Shops. Coast Guard Aviation Survival Shops shall submit Form CG-22 electronically direct to ALSE Technical Services. ALSE Technical Services will forward Form CG-22 to the Joint Project Manager for Protection (JPM P), via the Technical Publications Cell, USCG ARSC (252-335-6014/6838).

10 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) AND PRODUCT QUALITY DEFICIENCIES.

If the JSMLT needs improvement, report it. User feedback on equipment is important. Explain how the design or performance of these items can be improved. The JPEO-CBD, JPM P manages JSMLT design change recommendations and Product Quality Deficiency Reports (PDQR). Users shall submit EIRs and PQDRs through their chains of command to the service program managers listed below. Service component program managers shall submit EIRs and PQDRs to JPM P, Attention: PSM, 50 Tech Parkway, Stafford, VA 22556, or JPM_P_Logistics@usmc.mil.

10.1 USN (United States Navy) Users. USN users submit a PQDR on SF 368 or Naval message in accordance with COMNAVAIRFORINST 4790.2 series to the Aircrew Systems Fleet Support Team, APML Chemical Biological Defense, System Survivability Division Code 6.6.4.2, 48110 Shaw Road, B-2187 Suite 1280-D3. PQDRs can also be submitted directly online to the JDRS website at <https://JDRS.mil/>.

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10.2 United States Marine Corps (USMC) Users. USMC users submit an Quality Deficiency Report (QDR) via the Product Data Reporting and Evaluation Program (PDREP) web site (<https://pdrep.csd.disa.mil/>) and in accordance with MCO 4855.10. Additional information and resources are available at <http://www.logcom.marines.mil/Centers/General-Staff/LSMC/pqdr/>.

10.3 United States Air Force (USAF) Users. USAF users submit PQDR or other Deficiency Reporting in accordance with TO 00-35D-54.

10.4 United States Coast Guard (USCG) Users. USCG Aviation Survival Shops shall submit Form CG-22 electronically direct to ALSE Technical Services. ALSE Technical Services will forward Form CG-22 to the JPM P, via the Technical Publications Cell, USCG ARSC (252-335-6014/6838).

SAFETY SUMMARY

1 GENERAL SAFETY INSTRUCTIONS.

This manual describes physical and/or chemical processes which may cause injury or death to personnel, or damage to equipment, if not properly followed. This safety summary includes general safety precautions and instructions that must be understood and applied during operation and maintenance to ensure personnel safety and protection of equipment. Prior to performing any specific task, the WARNINGS, CAUTIONS, and NOTES included in that task shall be reviewed and understood.

2 WARNINGS, CAUTIONS, AND NOTES.

WARNINGS and CAUTIONS are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are considered essential to protection of personnel (WARNING) or equipment (CAUTION). WARNINGS and CAUTIONS immediately precede the step or procedure to which they apply. WARNINGS and CAUTIONS consist of four parts: heading (WARNING, CAUTION, or icon), a statement of the hazard, minimum precautions, and possible results if disregarded. NOTES are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are not essential to protection of personnel or equipment. NOTES may precede or follow the step or procedure, depending upon the information to be highlighted. The headings used and their definitions are as follows:

WARNING

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc. Failure to comply could result in injury to, or death of, personnel or long term health hazards.

CAUTION

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Highlights an essential operating or maintenance procedure, condition, or statement.

3 HAZARDOUS MATERIALS (HAZMAT) WARNINGS.

HAZMAT Warnings are provided through use of the following Hazard Symbols. Consult the HAZMAT DESCRIPTION or Safety Data Sheet (SDS) (formerly MSDS) (Occupational Safety and Health Administration (OSHA) Form 20 or equivalent) for specific information on hazards, effects, and protective equipment requirements. MSDS and SDS may be used interchangeably. If you do not have an SDS for the material involved, contact your supervisor, or the base Safety or Bioenvironmental Engineering Offices.

3.1 HAZMAT Icons. The following icons are used throughout Air Force (AF) technical manuals to indicate the use of HAZMAT:



The symbol of a human figure in a cloud shows that the material gives off vapors that are a danger to life or health.

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The rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.



The symbol of a person wearing goggles shows that the material will injure eyes.



The symbol of a flame shows that the material can ignite and burn.



The symbol of a liquid entering the mouth shows that eating or drinking this material can cause a health hazard.



The hand symbol shows a material that can irritate the skin or enter the body through the skin and cause a health hazard.

3.2 HAZMAT Description. The following detailed HAZMAT warnings pertain to materials or substances used in connection with procedures called out or described in this technical manual. Use these advisory warnings and their associated precautions in conjunction with the current SDS for each material or substance. If there is conflict between this safety summary and the SDS, the SDS takes precedence.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

Poly alpha olefin aerosol oil is flammable, and an eye, skin and respiratory irritant. It may be harmful if swallowed. Avoid contact with skin and eyes, and avoid breathing vapors. Do not ingest. Keep away from heat, sparks and flame. Appropriate skin and eye protection must be worn. Use in a well ventilated area.



ALCOHOL, ISOPROPYL, TT-I-735

2

Isopropyl alcohol is flammable, and an eye, skin and respiratory irritant. It may be harmful if swallowed. Avoid contact with skin and eyes, and avoid breathing vapors. Do not ingest. Keep away from heat, sparks and flame. Appropriate skin and eye protection must be worn. Use in a well ventilated area. Half mask respirator required in poorly ventilated areas.

CHAPTER 1

GENERAL INFORMATION

1.1 GENERAL INFORMATION.

NOTE

- The use of the equipment in a manner not specified in the manual may impair protection provided by equipment.
- Equipment should only be operated by trained personnel.

This manual provides information and procedures for setup, operation, and maintenance of the Joint Service Mask Leakage Tester (JSMLT), Protective Mask: M46 (6.0 Pound-force per Square Inch (PSI)), M46A1 (5.2 PSI) and M46A2 (5.2 PSI modernized); herein referred to as the JSMLT.

1.2 DESCRIPTION OF THE JSMLT.

The JSMLT, Figure 1-1 is a portable device designed to test the serviceability and fit of protective masks. The JSMLT will provide leak and serviceability testing of designated Chemical, Biological, Radiological, and Nuclear (CBRN) masks and components without requiring the operator to wear the mask. The JSMLT will provide quantitative fit testing while an individual is wearing his/her assigned protective mask. The JSMLT is completely self-contained in a rugged JSMLT case. The JSMLT includes a universal clamping assembly, inflatable mask seal, and clamping adapters which allow it to be used to test multiple types of protective masks. The lightweight plastic headform is available in two sizes and can be quickly interchanged to accommodate a wide span of protective mask sizes. The JSMLT utilizes solid-state electronic circuitry with simple menu-driven touch pad controls and an alphanumeric display.



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Figure 1-1. JSMLT Setup

1.3 LEADING PARTICULARS.

See Table 1-1 for the leading particulars of the JSMLT.

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Table 1-1. Leading Particulars

Item	Characteristics
Case Dimensions:	32 inch (length) x 22 inch (width) x 20 inch (height)
Weight	≈95.6 pounds (42 kilograms) when packed in JSMLT case
Input Power	100 Volts Alternating Current (VAC), 60 Hertz (Hz), 2 amp; 230 VAC, 50 Hz, 1 amp
Noise Level	Measured to be 73.4 decibels ampere at 1 meter (m) away from equipment
Aerosol Detection	Near-forward light scattering
Aerosol Generator Output Concentrations	Mask Test - approximate test concentration 60 milligrams per cubic meter (mg/m3) Fit Test - approximate test concentration 35 mg/m3 Aerosol Oil - Poly Alpha Olefin (PAO)-4
Communication Port	Serial RS-232 (Null-modem cable required) Baud Rate -9600 Data Bits - 8 Parity - none Stop Bit - 1 Flow control - X ON/X OFF

1.4 ENVIRONMENTAL INFORMATION.

The JSMLT operates under the following environmental conditions:

NOTE

- If operating the JSMLT at temperatures greater than 100 degrees Fahrenheit (°F), it is recommended that a fan be used to circulate the air around the JSMLT. Do not point the fan directly at the JSMLT as it may cause difficulties when setting up the aerosol.
- If ambient temperature is 45 °F (7 degrees Celsius (°C)) or below, the oil warmer must be installed in accordance with Paragraph 3.5.5.

Temperature	32 to 120 °F (0 to 48.8 °C)
Relative Humidity	0 to 95 percent
Altitude	-500 feet to 10,000 feet (-152.4 meters to 3048 meters)

1.5 STORAGE CONDITIONS.

The JSMLT should be stored under the following conditions:

Temperature	-38 to 160 °F (-38.8 to 71.1 °C)
Relative Humidity	0 to 100 percent
Altitude	Any

1.6 SYMBOLS.

Table 1-2 describes the common symbols used in this manual.

Table 1-2. Symbols

Symbol	Description
[Window]	Indicates the information displayed in a window.
<Function>	Indicates a function button.
«Start»	Indicates the start of a system procedure.

1.7 TESTS CONDUCTED BY THE JSMLT.

The following tests are conducted by the JSMLT:

1.7.1 Mask Leakage Test [MASK]. The Mask Leakage Test [MASK] tests a variety of protective masks for leakage. Masks may be tested with or without an attached hose. When a failure is detected, the JSMLT provides the operator with a probe option to help isolate the location of the leak(s). In the probe mode, aerosol is directed at various areas and parts of the mask to identify which area or component of the mask is leaking. For more information, refer to Chapter 5.

1.7.2 Drink Tube Flow Test [DRINK]. The Drink Tube Flow Test [DRINK] tests for any airflow obstruction via resistance through the drink coupler. Connecting the drink coupler to the drink tube test adapter on the JSMLT opens the quick-disconnect/drink coupler valve to allow airflow. The resistance is measured as the airflow is passed through the drink tube. For more information, refer to Paragraph 6.1.

1.7.3 Drink Train Assembly Leakage Test. The Drink Train Assembly Leakage Test tests the airflow leakage through the entire mask drinking assembly. To run this test, the internal drink tube must be plugged with the Quick-Release Locking System (QRLS) pin. For more information, refer to Paragraph 6.2.

1.7.4 Drink Valve Seat Test. The Drink Valve Seat Test identifies leakage in the seat valve of the quick disconnect/drink coupler. Once the drink coupler is connected to the drink tube test adapter on the JSMLT, airflow leakage from the applied air pressure is measured. For more information, refer to Paragraph 6.3.

1.7.5 Outlet Valve Test [VALVE]. The Outlet Valve Test [VALVE] checks the leakage from the outlet valve on the mask. Air pressure is applied against the outlet valve and the airflow is checked. For more information, refer to Chapter 7.

1.7.6 Quantitative Fit Test [FIT]. The Quantitative Fit Test [FIT] tests a mask for leakage when worn by an individual. While the individual is wearing his/her mask, a shroud is placed over the head and on the individual's shoulders. For this test, aerosol is concentrated inside the shroud. The amount of aerosol that breaches the seal of the mask is calculated and displayed as quantitative fit factor, along with a [PASSED] or [FAILED] message. For more information, refer to Chapter 8.

1.7.7 Mask All Test [M ALL]. The Mask All Test [M ALL] tests all functions of the mask and includes the Mask Leakage Test [MASK], Drink Tube Flow Test [DRINK], Drink Train Assembly Leakage Test, Drink Valve Seat Test, and the Outlet Valve Test [VALVE] [VALVE], sequentially.

1.7.8 All Test [ALL]. The All Test [ALL] tests the functionality and fit of the mask and includes the Mask Leakage Test [MASK], Drink Tube Flow Test [DRINK], Drink Train Assembly Leakage Test, Drink Valve Seat Test, Outlet Valve Test [VALVE], and the Quantitative Fit Test [FIT], sequentially.

1.8 CONSUMABLE MATERIALS.

Refer to Table 1-3 for a list of consumables used for the JSMLT.

Table 1-3. Consumable Materials

Description	National Stock Number (NSN)	Unit of Measure
Alcohol, Isopropyl, Rubbing: 16 ounce (unit of issue is optional)	6505-00-655-8366	Bottle

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Table 1-3. Consumable Materials - Continued

Description	National Stock Number (NSN)	Unit of Measure
Aerosol Oil, Poly Alpha Olefin, PAO-4 (ATI Part Number (PN) 200188)	9150-01-537-7939	Bottle
Knife, Craftsman's or suitable substitute	5110-00-892-5071	Each
Sponge, Cellulose, 2-1/4" diameter or suitable substitute	7920-00-161-6219	Dozen
Tape, Pressure Sensitive, Adhesive: Clear, 1.5 inch width, 60 yards length or suitable substitute	7510-00-721-9756	Roll
Towel, Machinery Wiping or suitable substitute	7920-01-448-7052	Box

1.9 DISPOSAL OF OLD ELECTRICAL AND ELECTRONIC EQUIPMENT.

This product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.

For more detailed information about recycling of this product, please contact your local Civic Office, your household waste disposal service or the Company where you purchased this equipment.

CHAPTER 2

COMPONENTS OF THE JOINT SERVICE MASK LEAKAGE TESTER (JSMLT)

2.1 INTRODUCTION.

This chapter provides general identification and referencing of the components of the JSMLT. For supply ordering information of particular components or parts for the JSMLT see Chapter 14.

2.2 MAJOR COMPONENTS OF THE JSMLT.

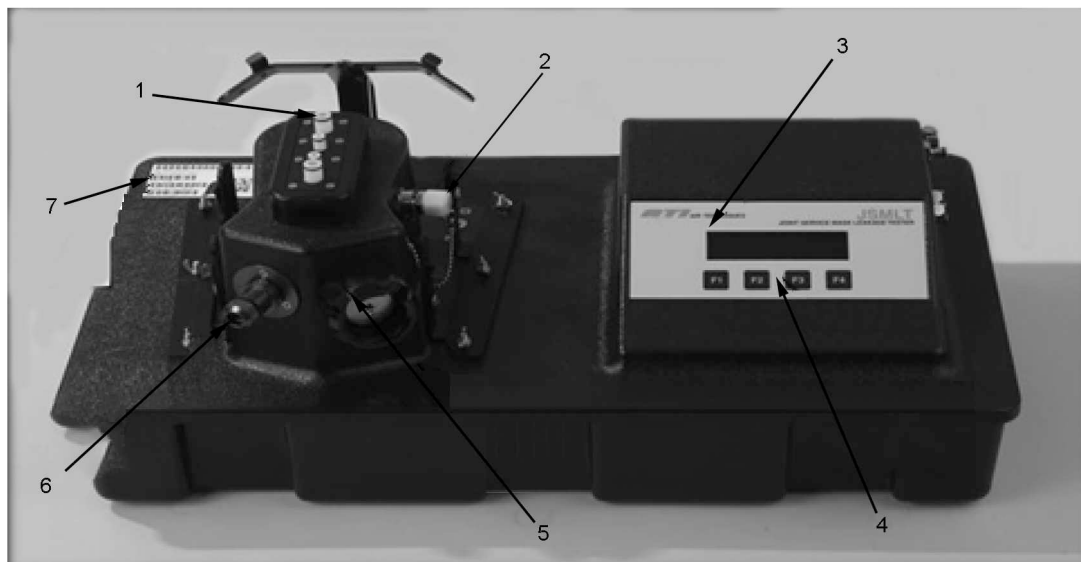
The JSMLT consists of four (4) major components and several accessories and adapters. The major components are the Control Unit (CU), the power unit, the aerosol generator assembly, and the fit test kit.

NOTE

The JSMLT consists of three configurations: the JSMLT 6.0 Pound-force per Square Inch (PSI), the JSMLT 5.2 PSI, and the JSMLT Modernized 5.2 PSI. The base manual covers the core procedures for all variants. Specific operations for the JSMLT 5.2 PSI variants are covered in Chapter 5.

2.3 CU.

The CU comprises the microprocessor, which monitors and controls the JSMLT. It enables the operator to respond to the software prompts by use of function keys, displays system parameters, and provides operator prompts for testing. The rear panel provides electrical power, vacuum and pressure connections, as well as a data/communications port for transferring data (only used by the manufacturer). The right-side panel houses the fit interface ports and aerosol generator ports. Refer to Table 2-1, Figure 2-2, Table 2-2, Figure 2-3 and Table 2-3.



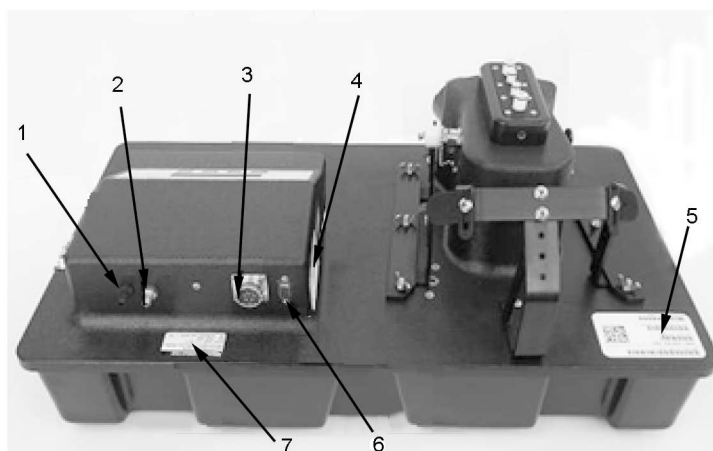
TO-33A4-7-10-1-002

Figure 2-1. CU (Front View)

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Table 2-1. CU (Front View)

Index Number (No.)	Nomenclature	Description
1.	Headform Ports	Support the headform during testing.
2.	Hose Test Port and Plug	Port used for hose test option.
3.	Display Screen	Displays operator-prompted actions, system information, and function options.
4.	Function Keys	Used in the option menu to select or change options. The function of the key is displayed above in the display screen.
5.	Outlet Valve Test Adapter	Used for testing the outlet valve of a mask. Different adapters are required for different mask types.
6.	Drink Tube Test Adapter	Used for testing the drink tube of the mask. Different adapters are required for different mask types.
7.	Item Unique Identification (IUID) Label	Bar code and electronic Identification (ID) for inventory scanning purposes.

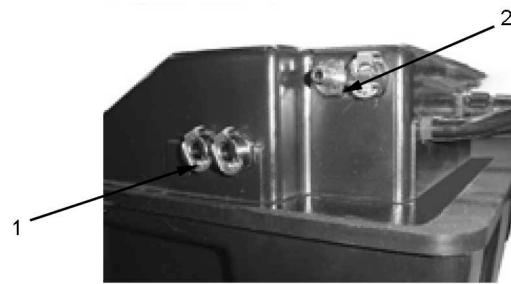


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Figure 2-2. CU (Rear View)

Table 2-2. CU (Rear View)

Index No.	Nomenclature	Description
1.	Pressure Port (Black Fitting)	Used for connecting the twin tube interface hose to the power unit.
2.	Vacuum Port (Brass Fitting)	Used for connecting the twin tube interface hose to the power unit.
3.	Power Cable Interface Port	Supplies power to the CU from the power unit.
4.	Original Equipment Manufacturer (OEM) Serial Number Label	Identifies the CU by serial number.
5.	IUID Label	Bar code and electronic ID for inventory scanning purposes.
6.	Data Communication Port	Used for connecting to Personal Computer (PC) serial port.
7.	Calibration Label	Identifies required calibration intervals.



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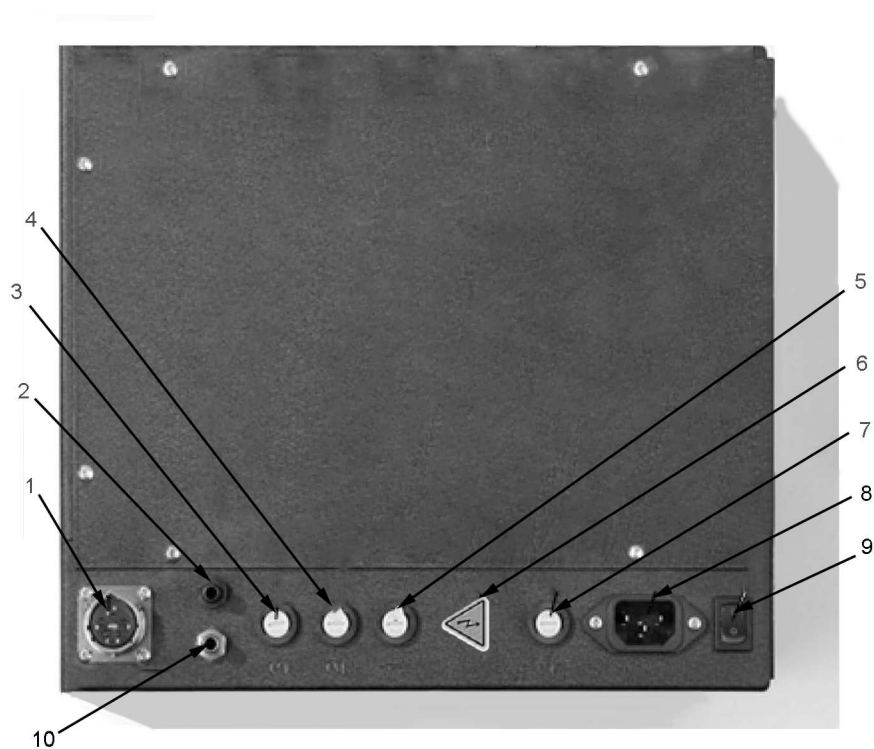
Figure 2-3. CU (Side View)

Table 2-3. CU (Side View)

Index No.	Nomenclature	Description
1.	Aerosol Generator Ports	Used for connecting the aerosol generator assembly to the CU.
2.	Fit Test Interface Ports	Used for connecting the fit test interface tubing to the CU.

2.4 POWER UNIT.

The power unit supplies vacuum, pressure, and electrical power to the CU. Refer to Figure 2-4. Table 2-4, Figure 2-5, Table 2-5, Figure 2-6 and Table 2-6.



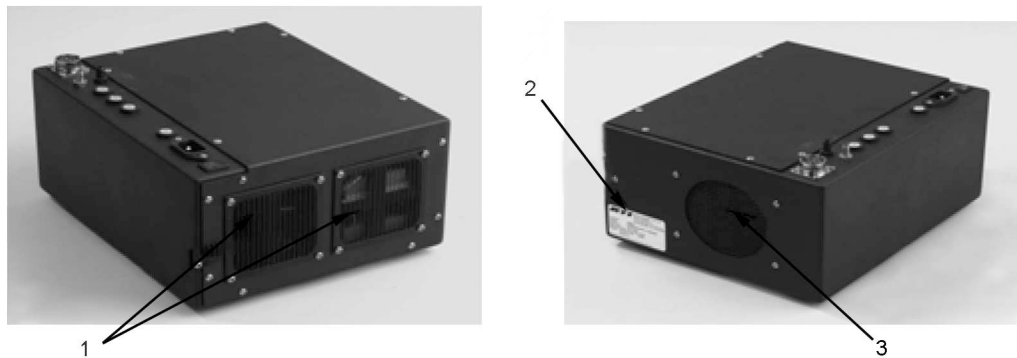
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Figure 2-4. Power Unit (Top View)

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Table 2-4. Power Unit (Top View)

Index No.	Nomenclature	Description
1.	Power Interface Port	Supplies electrical power to the CU.
2.	Pressure Port (Black Fitting)	Used for connecting the twin tube interface hose to the power unit.
3.	Fuse 3	Fuse for the system pump (4 ampere, 250 Volts (V) slow-blow).
4.	Fuse 2	Fuse for the CU valves (2.5 ampere, 250V slow-blow).
5.	Fuse 1	Fuse for the CU (2.5 ampere, 250V slow-blow).
6.	Warning Label	Electrical hazard.
7.	Fuse 4	Fuse for Alternating Current (AC) power input (4 ampere, 250V slow-blow).
8.	Alternating Current (AC) Power Input	AC power cord connection to the JSMLT.
9.	ON/OFF Power Switch	Turns the system ON and OFF.
10.	Vacuum Port (Brass Fitting)	Used for connecting the twin tube interface hose to the power unit.

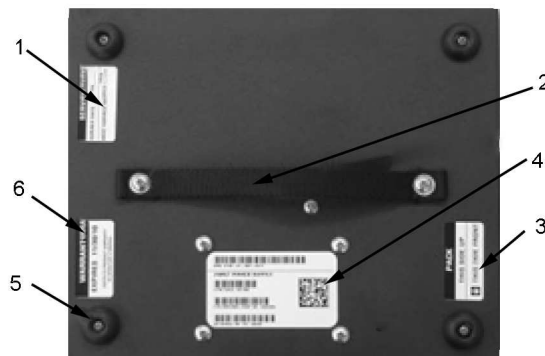


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Figure 2-5. Power Unit (Side View)

Table 2-5. Power Unit (Side View)

Index No.	Nomenclature	Description
1.	Air Vents	Cooling air vents for the internal pump.
2.	OEM Serial Number Label	Identifies the power unit by serial number.
3.	Fan	Fan which draws air through the power unit to help cool internal pump.



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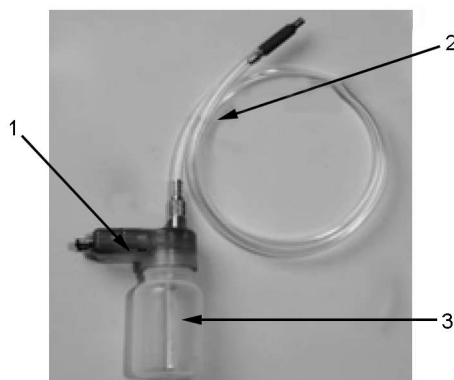
Figure 2-6. Power Unit (Bottom View)

Table 2-6. Power Unit (Bottom View)

Index No.	Nomenclature	Description
1.	Service Tag	Displays next due date for factory service.
2.	Carrying Handle	Used to lift and carry power unit.
3.	Packing Instruction	Reminder to store power unit this side up and forward inside JSMLT case tray.
4.	IUID Label	Bar code and electronic ID for inventory scanning purposes.
5.	Support Leg	Supports the power unit on tabletop or floor.
6.	Warranty Label	Displays warranty expiration date.

2.5 AEROSOL GENERATOR ASSEMBLY.

The aerosol generator assembly is used to create the challenge aerosol when performing a mask leakage test [MASK] or a Quantitative Fit Test [FIT]. Refer to Figure 2-7 and Table 2-7.



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Figure 2-7. Aerosol Generator Assembly

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Table 2-7. Aerosol Generator Assembly

Index No.	Nomenclature	Description
1.	Generator Cap	Used to connect the aerosol generator bottle to the aerosol generator ports. Generates aerosol from the PAO test oil.
2.	Aerosol Probe Hose	Directs the generator's aerosol output.
3.	Generator Bottle	Holds PAO oil. Marked with minimum and maximum fill lines.

2.6 FIT TEST KIT.

The fit test kit contains all the necessary subcomponents required to perform a Quantitative Fit Test [FIT]. Refer to Figure 2-8 and Table 2-8.



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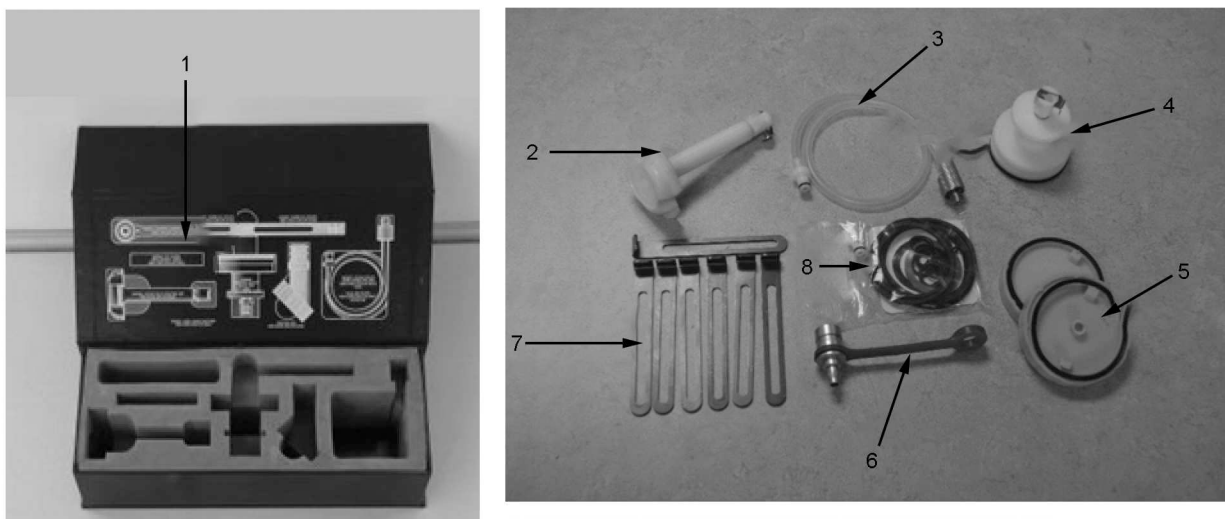
Figure 2-8. Fit Test Kit

Table 2-8. Fit Test Kit

Index No.	Nomenclature	Description
1.	Fit Test Interface Tubing	Used for sampling aerosol leakage.
2.	Fit Test Support Rods (x2)	Used to support the fit test shroud.
3.	Fit Test Shroud	Used to contain the aerosol around a test subject. *Fit Test Shroud for the M46/M6A1, Part Number (PN) 1200121 and M46A2, PN 1200316.
4.	Y-Hose Aerosol Extension	Extends the aerosol probe hose to direct the generator aerosol output into the shroud.
5.	Fit Test Bag	Used to secure the fit test items when not in use.

2.7 JSMAK.

The components of the JSMAK are shown below in Figure 2-9 and described in Table 2-9.



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Figure 2-9. JSMAK Components

Table 2-9. JSMAK Components

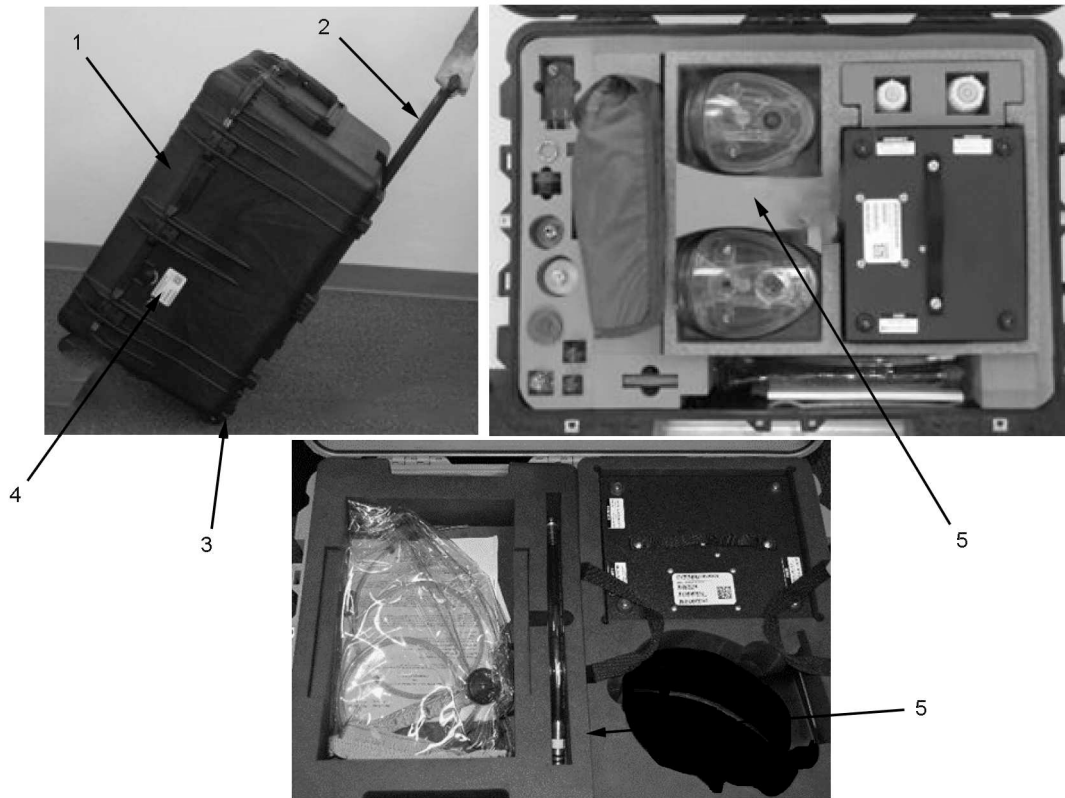
Index No.	Nomenclature	Description
1.	JSMAK Case	Used to house all JSMAK components. Stored within the JSMLT case
2.	M50 Outlet Valve Plug/Adapter	Used to plug the outlet valve assembly during Mask Leakage Test [MASK] and isolates the outlet valve assembly for test while in the VALVE test mode.
3.	M50 Outlet Valve Hose	Connects the M50 outlet valve plug/adapter to the JSMLT test port.
4.	M53 Outlet Valve	Used to plug the M53 outlet valve assembly during Mask Leakage Test [MASK] and isolates the outlet valve assembly for test while in the VALVE test mode.
5.	M50 Filter Plugs (2)	Externally plug the M50/51 mask's filters during Mask Leakage Test [MASK].
6.	M50 Drink/Fit Test Adapter **	Dual purpose interface between JSMLT North Atlantic Treaty Organization (NATO) drink test adapter and M50/51 drink tube. Can be used for all DRINK mode testing and during FIT test operation. Includes the attached spacer ring for Drink Valve Seat Tests.
7.	M50 Mask Clips (7)	Used to secure the mask to the test head and pedestal. Includes six (6) required and one (1) spare clip.
<p style="text-align: center;">NOTE</p> <p>The M50 mask clips are not used with the IFSTHA and will not be included.</p>		
8.	O-ring and Gasket Replacement Package	18 spare O-rings and gaskets for the M50 filter plugs, M40 series hose connector, and the M53 outlet valve plug/adapter.
<p>NOTE: **The drink/fit test adapters have been modified from the original manufacturer adapter. The new authorized drink/fit test adapter is the color BLUE and the old adapter is CLEAR and no longer procurable.</p>		

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2.8 ACCESSORIES.

The accessories are the JSMLT case and all accessory parts not previously listed which are provided and stored within the JSMLT case.

2.8.1 JSMLT Case. Refer to Figure 2-10 and Table 2-10.



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Figure 2-10. JSMLT Case (M46/M46A1 (Top Right) and M46A2 (Bottom))

Table 2-10. JSMLT Case

Index No.	Nomenclature	Description
1.	JSMLT Case	Reusable case used for safekeeping, storage, and shipping the JSMLT.
2.	Retractable Handle	Telescopes up and down for pulling JSMLT case.
3.	Wheels	To easily roll the JSMLT case from one place to another.
4.	IUID Label	Text and bar coded ID information.
5.	JSMLT Case Trays	Tray inside the JSMLT case used for storage of the power unit and JSMLT accessories.

2.8.2 JSMLT M46/M46A1 Accessory Parts. Refer to Figure 2-11 and Table 2-11 for the JSMLT M46/M46A1 accessory parts. Refer to Figure 2-12 and Table 2-12 for the JSMLT M46A2 accessory parts.



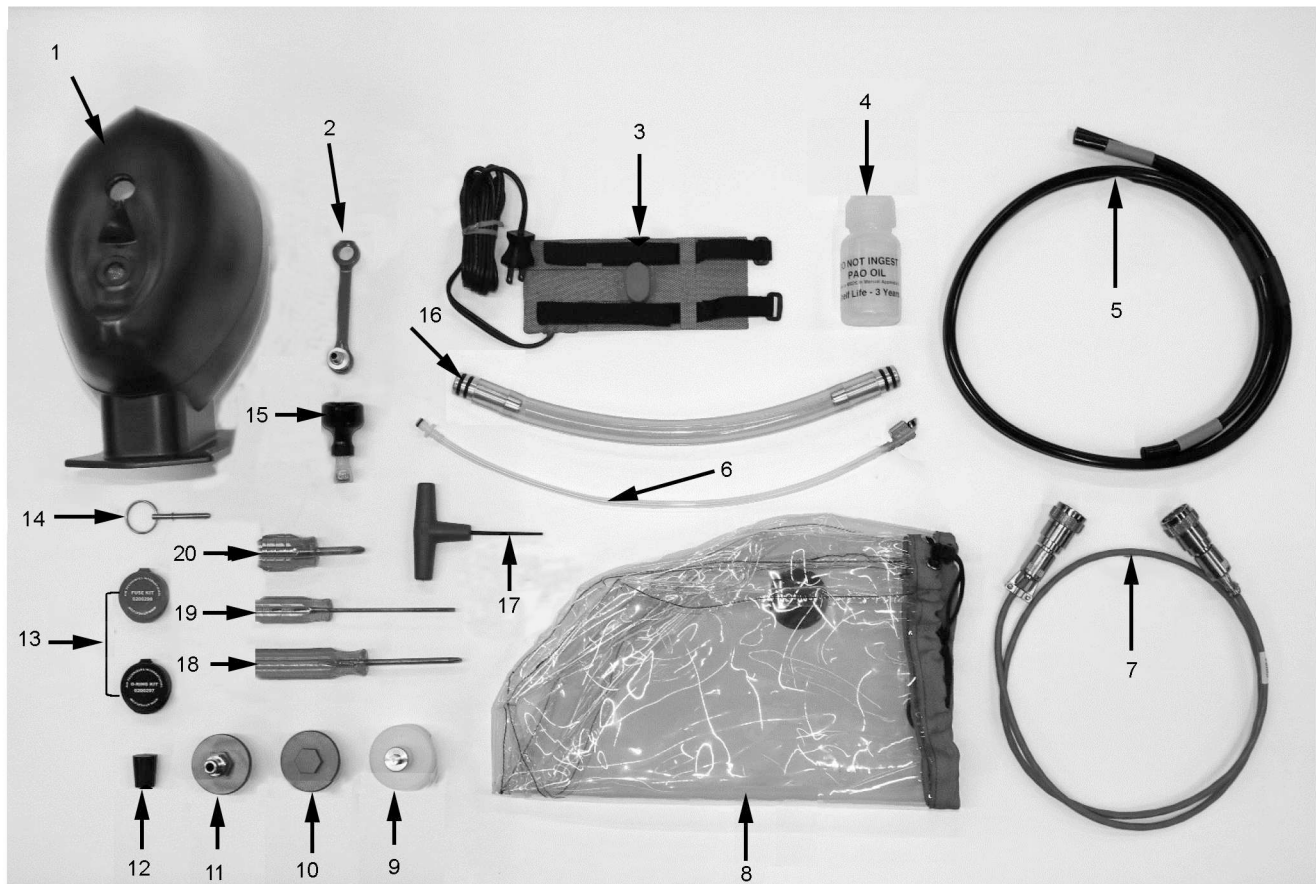
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Figure 2-11. JSMLT M46/M46A1 Accessory Parts

Table 2-11. JSMLT M46/M46A1 Accessory Parts List

Index No.	Description	Index No.	Description
1.	Medium Headform	13.	Outlet Valve Clamp
2.	Small Headform	14.	Hose Test Adapter
3.	Oil Warmer	15.	No. 2 Rubber Stopper
4.	100 mL Bottle of PAO Oil	16.	T-Handle Hex Wrench
5.	Mask Passing Tube	17.	No. 2 Stubby Cross Tip Screwdriver
6.	Power Cord	18.	1/8 Inch Flat Tip Screwdriver
7.	Twin Tube Interface Hose	19.	No. 1 Cross Tip Screwdriver
8.	Power Interface Cable	20.	QRLS Pin
9.	Mask Test Shroud	21.	Operator's Manual
10.	Spare O-ring Kit	22.	Computer Based Training (CBT) Product
11.	Spare Fuse Kit	23.	Compact Disc Read-Only Memory (CD-ROM) with Support Materials
12.	Canister Port Plug	24.	Packet of 12 Cellulose Sponges

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Figure 2-12. JSMLT M46A2 Accessory Parts

Table 2-12. JSMLT M46A2 Accessory Parts List

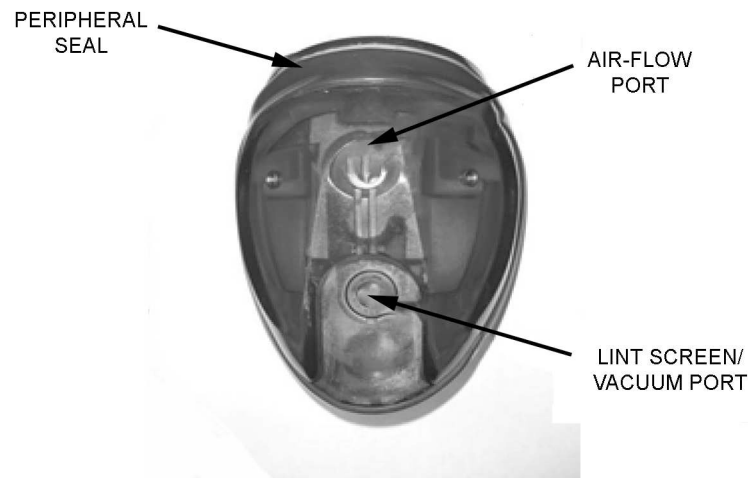
Index No.	Description	Index No.	Description
1.	IFSTHA	11.	Hose Test Adapter
2.	Drink Tube Adapter, M50	12.	No. 2 Rubber Stopper
3.	Oil Warmer	13.	Spare Fuse/O-ring Kits
4.	100 mL Bottle of PAO Oil	14.	QRLS Pin
5.	Twin Tube Interface Hose	15.	Joint Service Aircrew Mask, Rotary Wing (JSAM RW) Outlet Valve Plug/Adapter
6.	Outlet Valve Hose	16.	Mask Passing Tube
7.	Power Cord	17.	T-Handle Hex Wrench
8.	Mask Test Shroud	18.	No. 2 Stubby Cross Tip Screwdriver
9.	Outlet Valve Clamp	19.	1/8 Inch Flat Tip Screwdriver
10.	Canister Port Plug	20.	No. 1 Cross Tip Screwdriver

2.8.2.1 Headforms.

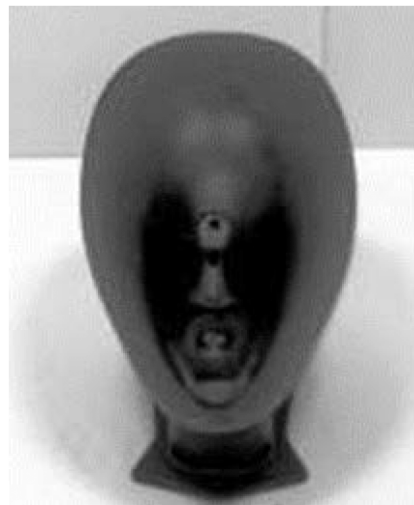
NOTE

If the yellow small and medium headforms are lost or damaged, the user cannot procure replacements and will have to upgrade to the IFSTHA and have the control unit adjusted to 5.2 PSI.

Two yellow headforms, Figure 2-13, are supplied with the M46 and M46A1 JSMLT; one sized SMALL and the other sized MEDIUM. The IFSTHA, Figure 2-14, is supplied in the M46A2 JSMLT. The recommended headform to use with a specific mask size and type is listed in Table 5-2.



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Figure 2-13. Yellow Headform

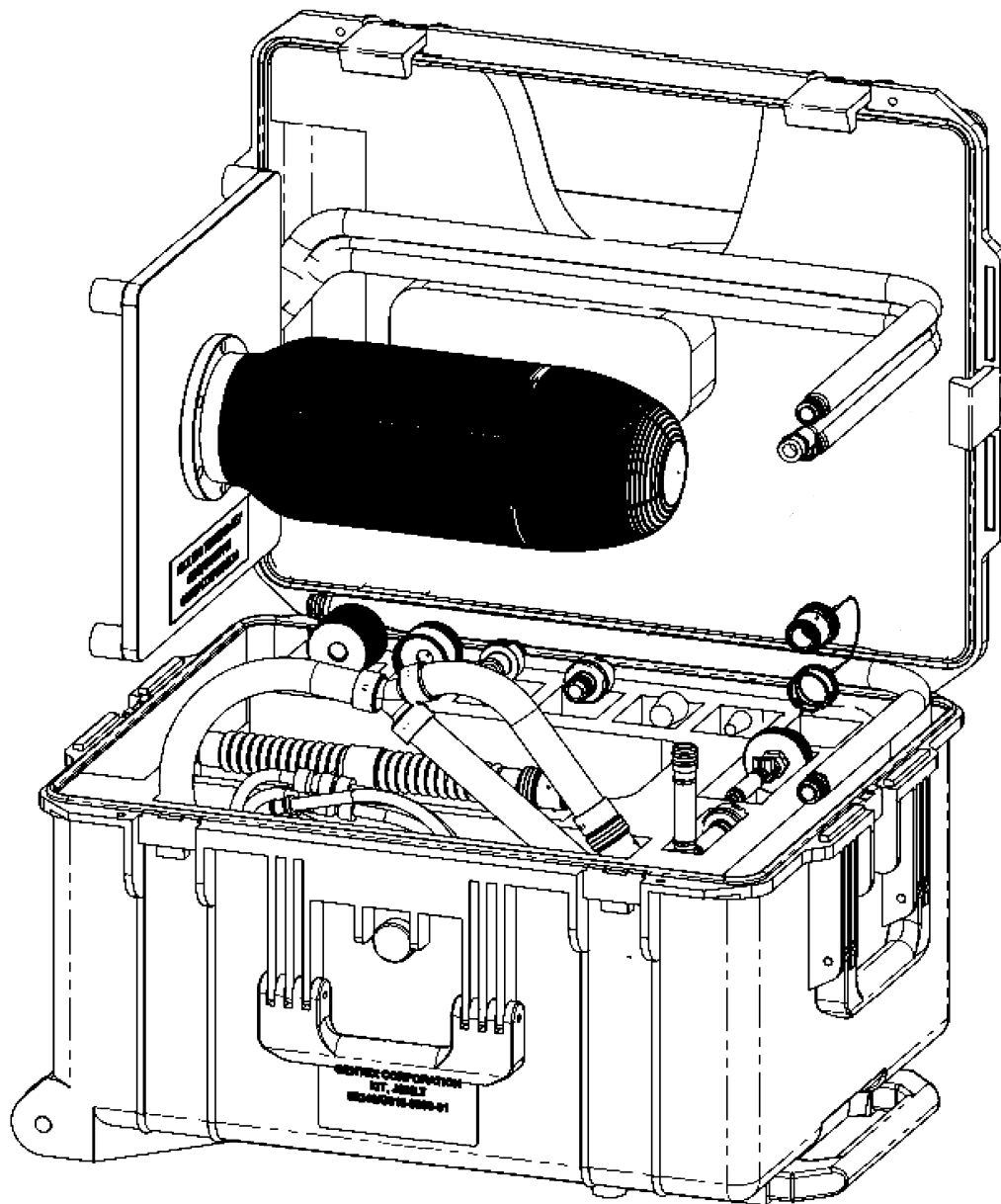
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Figure 2-14. IFSTHA

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2.9 JOINT SERVICE AIRCREW MASK-JOINT STRIKE FIGHTER (JSAM-JSF) ADAPTER KIT.

The JSAM-JSF Adapter Kit and all components are stored in a separate case, see Figure 2-15.



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Figure 2-15. Joint Service Aircrew Mask-Joint Strike Fighter (JSAM-JSF) Adapter Kit

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NOTE

Details of the JSAM-JSF Adapter Kit can be found in JSF Manual Specification Number MD 5668-00103.

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CHAPTER 3

UNPACKING AND ASSEMBLY

3.1 UNPACKING AND ASSEMBLY.

This chapter provides important information about unpacking and assembling the Joint Service Mask Leakage Tester (JSMLT). Be sure to carefully check the furnished items list and become familiar with all locations and functions before operating the JSMLT. Procedures should be followed correctly to ensure that the JSMLT is properly unpacked and set up.

3.2 ITEMS FURNISHED WITH THE JSMLT.

Refer to Table 3-1 for a list of items furnished for the M46/M46A1 JSMLT and Table 3-2 for a list of items furnished for the M46A2 JSMLT.

Table 3-1. List of Items Furnished for the M46/M46A1

Quantity	Description
1	JSMLT Case with Foam
1	JSMLT Case Tray
1	Mask Test Shroud
1	Operator's Manual
1	Power Unit
1	Small Headform
1	Medium Headform
1	Aerosol Generator Assembly
1	Quick-Release Locking System (QRLS) Pin
1	Canister Port Plug
1	Outlet Valve Clamp
1	100 Milliliters (mL) Bottle of Poly Alpha Olefin (PAO) Oil
1	T-Handle Hex Wrench
1	Fit Test Kit
1	Control Unit (CU)
1	Twin Tube Interface Hose
1	Power Cord
1	Power Interface Cable
1	Mask Passing Tube
1	Spare O-ring Kit
1	Spare Fuse Kit
1	Oil Warmer
1	Hose Test Adapter
1	Number (No.) 2 Rubber Stopper
1	No. 2 Stubby Cross Tip Screwdriver
1	No. 1 Cross Tip Screwdriver
1	1/8 Inch Flat Tip Screwdriver
1	Computer Based Training (CBT) Product
1	Compact Disc Read-Only Memory (CD-ROM) with Support Materials
1	Packet of 12 Cellulose sponges

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Table 3-1. List of Items Furnished for the M46/M46A1 - Continued

Quantity	Description
1	Joint Service Mask Adapter Kit (JSMAC)

Table 3-2. List of Items Furnished for the M46A2

Quantity	Description
1	JSMLT Case with Foam
1	JSMLT Case Tray
1	Mask Test Shroud
1	Operator's Manual
1	Power Unit
1	Test Head, Inflatable Face Seal
1	Aerosol Generator Assembly
1	QRLS Pin
1	Canister Port Plug
1	Outlet Valve Clamp
1	100 mL Bottle of PAO Oil
1	T-Handle Hex Wrench
1	Fit Test Kit
1	CU
1	Twin Tube Interface Hose
1	Power Cord
1	Power Interface Cable
1	Mask Passing Tube
1	Spare O-ring Kit
1	Spare Fuse Kit
1	Oil Warmer
1	Hose Test Adapter
1	No. 2 Rubber Stopper
1	No. 2 Stubby Cross Tip Screwdriver
1	No. 1 Cross Tip Screwdriver
1	1/8 Inch Flat Tip Screwdriver
1	Packet of 12 Cellulose sponges
1	JSMAC

3.3 REQUIRED OPERATOR SUPPLIES.

Refer to Table 3-3 for a list of required operator supplies.

NOTE

For sanitary reasons, users must discard cleaning sponges at the end of each mask testing day.

Table 3-3. List of Required Operator Supplies

Quantity	Description
1	Cellulose sponge

Table 3-3. List of Required Operator Supplies - Continued

Quantity	Description
1	110/220 Volts (V) Power Source

3.4 UNPACKING.**WARNING**

The JSMLT is a heavy item. Two people should be used to lift and/or carry the JSMLT, as seen noted in the sticker affixed to the carrying case (displayed below). The JSMLT should be carefully lowered into place, never dropped. Failure to follow proper procedures when lifting the JSMLT could result in injury to personnel and/or damage to equipment.

**CAUTION**

- Components not being used should be stored in the plastic tray and/or case to avoid damaging the equipment.
- The JSMLT should not be used in the rain and any contact with water should be avoided as it could cause damage to the equipment, as noted in the sticker affixed to the carrying case (displayed below).

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NOTE

If any items are missing, contact supervisor immediately. Preventive Maintenance Checks and Services (PMCS) should be performed during the unpacking and setup of the JSMLT. Refer to Chapter 10.

- a. Open the JSMLT case.
- b. Remove the mask test shroud (Figure 3-1, 1) from the case.
- c. Remove the operator's manual (2) from the front storage section of the case.

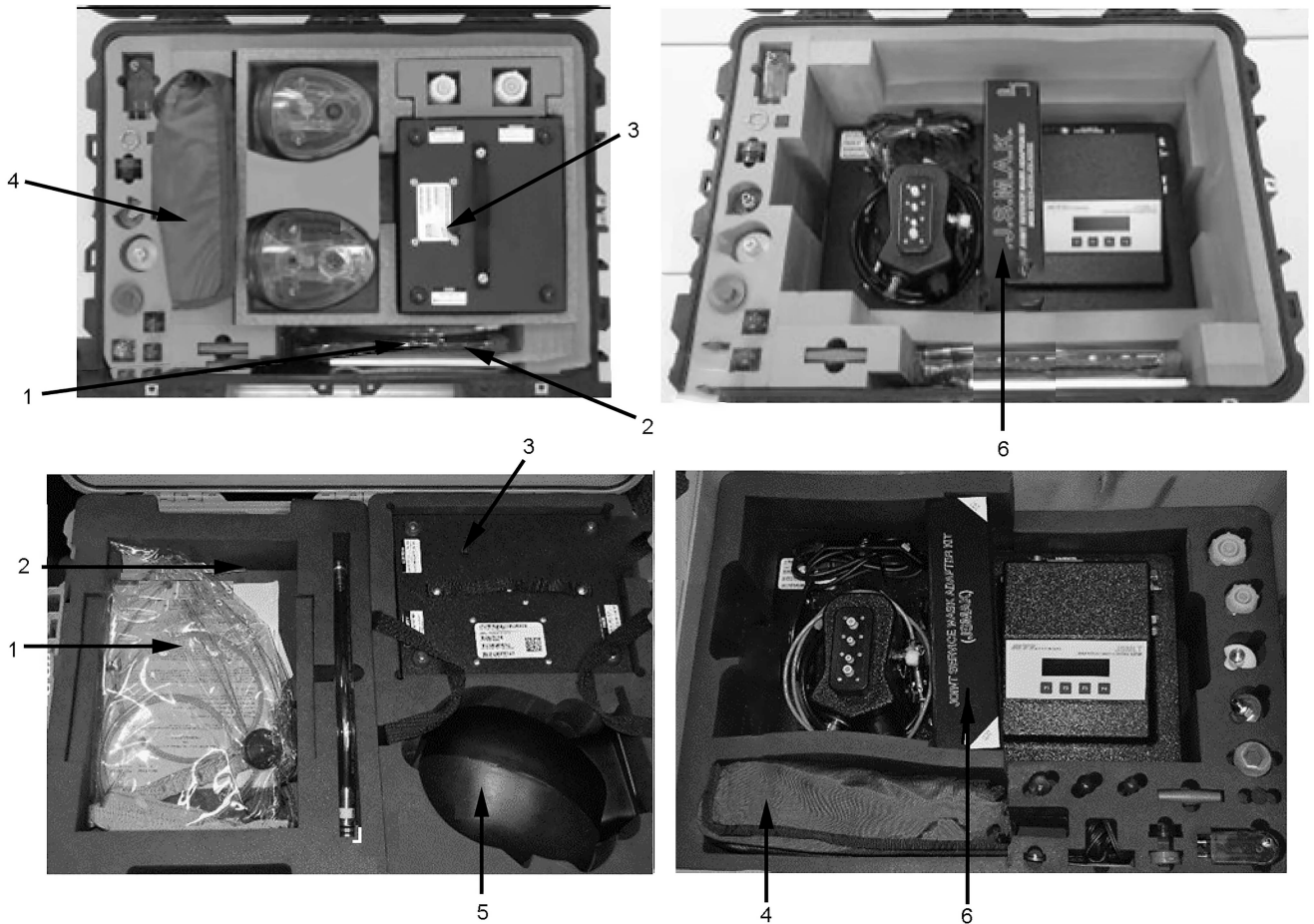
CAUTION

The power unit (3) must be removed before lifting the tray (5) from the case. Failure to do so may result in damage to the tray.

- d. Remove the power unit (3) from the tray (5) by lifting the unit by its nylon handle. Place the power unit on a flat surface with the handle/foot side down.
- e. Remove the fit test kit (4) from the JSMLT case. Lift the tray (5) out of the case.
- f. Remove the JSMAK (6) from between the headform pedestal and display screen and set it aside.
- g. Remove the CU, Figure 3-2, from the case.
- h. Remove the twin tube interface hose, aerosol probe hose, and the power interface cord from around the headform pedestal and the power cable from behind the pedestal.
- i. Place the tray (Figure 3-1, 5) and unused components back in the case and secure the case.

CUI

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



- LEGEND:
- 1. MASK TEST SHROUD
 - 2. OPERATOR'S MANUAL
 - 3. POWER UNIT
 - 4. FIT TEST KIT
 - 5. TRAY
 - 6. JSMAK

TO-33A4-7-10-1-016

Figure 3-1. M46/M46A1 (Top) and M46A2 (Bottom) JSMLT in Case

CUI

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TO-33A4-7-10-1-017

Figure 3-2. CU Unpacked

3.5 ASSEMBLING THE JSMLT.

3.5.1 Aerosol Generator Assembly.



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Refer to Figure 3-3.

- a. Remove the cap from the generator bottle and place the cap in the generator slot of the tray.
- b. Inspect the generator bottle to ensure that the oil level is between the top and bottom fill lines on the generator bottle for optimal aerosol generation. If required, use the bottle of PAO oil to fill the generator bottle or to store any excess oil.



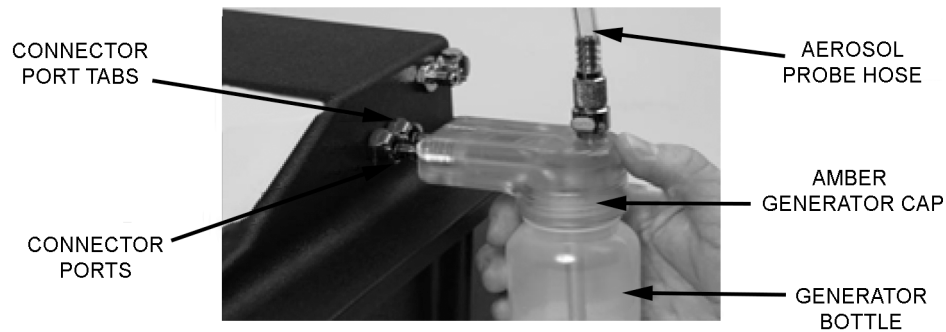
Do not cross-thread the generator cap to the generator bottle. The generator bottle must always be attached/installed on the CU. Damage to the generator cap may result if the generator bottle is not properly attached.

- c. Hand-tighten the amber generator cap onto the generator bottle. Hand-tighten the amber generator cap onto the generator bottle.
- d. Snap the aerosol probe hose into the snap tabs on top of the amber generator cap.
- e. If ambient temperature is 45 degrees Fahrenheit (°F) (7 degrees Celsius (°C)) or below, install oil warmer in accordance with Paragraph 3.5.5.



Failure to ensure the aerosol generator port tabs are depressed prior to inserting the aerosol generator assembly may cause damage to the JSMLT.

- f. Attach the aerosol generator assembly to the CU by depressing connector port tabs, and inserting the male adapters into the aerosol generator ports until locked, Figure 3-4.



TO-33A4-7-10-1-018

Figure 3-3. Attaching the Aerosol Generator Assembly to CU



TO-33A4-7-10-1-019

Figure 3-4. Attaching the Aerosol Generator Assembly to CU Into Generator Ports

3.5.2 Connecting the Power Unit to the CU.

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- Never position the power unit upside down or with the fan opening obstructed (except when stored within the case). Ensure that the power switch is off to prevent damage to the JSMLT.
 - Ensure that power cord is not plugged in to prevent damage to the JSMLT.
- a. Position the power unit with feet down, connector ports facing up next to the CU.
 - b. Connect the male end of the power interface cable to the top of the power unit using alignment pins and twist the locking ring until the detent is felt, Figure 3-5.



TO-33A4-7-10-1-020

Figure 3-5. Power Interface Cable to Power Unit, Male End

- c. Connect the female end of the power interface cable to the back of the CU, Figure 3-6.



TO-33A4-7-10-1-021

Figure 3-6. Power Interface Cable to Power Unit, Female End

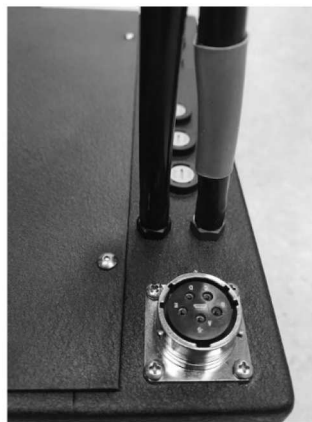
- d. Connect the yellow-banded ends of the twin tube interface hose to the brass fittings on the CU and the power unit, Figure 3-7.



TO-33A4-7-10-1-022

Figure 3-7. Yellow-Banded End to Brass Fitting

- e. Connect the solid black ends of the twin tube interface hose to the black fittings on the CU and the power unit, refer to Figure 3-8.



TO-33A4-7-10-1-023

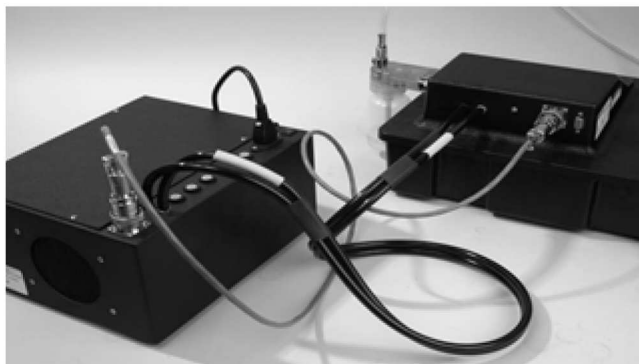
Figure 3-8. Black End to Black Fitting

WARNING

Do not connect the power cord if any wiring is frayed, doing so could result in injury to or death of personnel and/or damages to the equipment.

- f. Ensure the power unit is positioned to where the power switch is well within reach of the operator and ensure that the power switch is toggled in the “OFF” position.
- g. Connect the power cord to the power unit, Figure 3-9.

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TO-33A4-7-10-1-024

Figure 3-9. CU and Power Unit Properly Connected

3.5.3 Attaching the Headform.

NOTE

When initialized, the JSMLT conducts an inflation and seal test on the headform that is in place. If there is a failure, a SEAL FAILED error message will appear. Refer to Paragraph 12.6.6 for troubleshooting. If the headform is changed during operation, the JSMLT must be restarted to allow the system to verify the inflation and seal process of the second headform. This seal check is only required once per headform per operating period.

- a. Center the headform to be used over the pedestal with the chin (narrow portion) toward the front of the CU. Refer to Paragraph 5.4 for recommended headform selection.
- b. Align the white fittings on top of the pedestal with the holes in the headform, Figure 3-10.



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Figure 3-10. Headform and Pedestal Apart (Yellow Headform (Left) and Inflatable Face Seal Test Head Adapter (IFSTHA) (Right))

- c. Press down on the headform until it is fully seated onto the pedestal.
- d. Insert the QRLS pin (1) into the hole in the back of the headform to secure its position, refer to Figure 3-11



TO-33A4-7-10-1-026

Figure 3-11. Headform and Pedestal Assembled (Yellow Headform (Left) and IFSTHA (Right))

NOTE

- When the JSMLT is unpacked and sitting idle, make sure the headform is attached and the mask test shroud is placed over the headform to prevent the ports from collecting debris.
 - If fit testing is to be conducted, proceed to Paragraph 3.5.4. If fit testing is not conducted, proceed to Chapter 4.
- e. Ensure the lint screen is in place and clear of lint, dirt, or other debris.

3.5.4 Assembling the Fit Test Kits.

CAUTION

The fit test shroud and fit test interface tubing should only be assembled prior to performing the fit tests or it can be easily damaged.

- a. Unpack the fit test shroud, Y-hose aerosol extension, fit test interface tubing, and the fit test support rods (x2) from the fit test bag.

WARNING

Use care when handling the fit test support rods, failure to do so could result in injury to the eyes.

- b. Carefully unfold each fit test support rod and connect the aluminum tubing together so that the connected rods eventually form an arc.

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- c. Insert one end of a fit test support rod into the base of the fit test shroud and tuck it into one of the nylon corner pouches, Figure 3-12



TO-33A4-7-10-1-027

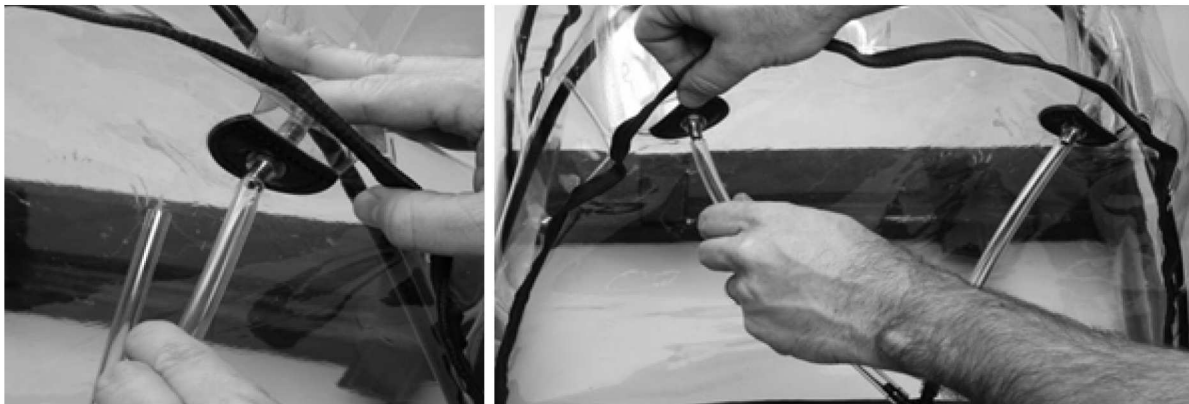
Figure 3-12. Fit Test Support Rod Into Nylon Corner Pouch

- d. Flex the fit test support rod until the opposite end tucks into the diagonally opposite corner nylon pouch, Figure 3-13.
- e. Repeat Step b, Step c and Step d for the other side of the fit test shroud. When finished, both fit test support rods should form a crisscrossed support pattern inside the fit test shroud, Figure 3-13.
- f. Attach the Y-hose aerosol extension to the brass fittings that connect through the grommets into the aerosol manifolds. (Two tubes in the top of the fit test shroud, Figure 3-14.)



TO-33A4-7-10-1-028

Figure 3-13. Fit Test Rods Form Support Arc



TO-33A4-7-10-1-029

Figure 3-14. Y-Hose Aerosol Extension onto Brass Fittings

- g. Connect the Y-hose aerosol extension to the aerosol probe hose, Figure 3-15.



TO-33A4-7-10-1-030

Figure 3-15. Y-Hose Aerosol Extension Connecting to Aerosol Probe Hose

- h. Install the fit test interface tubing into the fit test interface ports on the CU by depressing the port tabs, Figure 3-16

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Figure 3-16. Fit Test Interface Tubing Assembly

- i. Proceed to Chapter 4.

3.5.5 Oil Warmer.



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Refer to Figure 3-17.



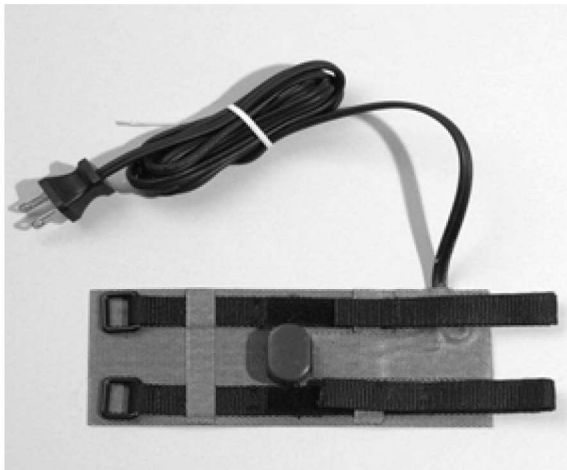
A voltage transformer is required for operation other than 110V and not following this could result in damage to the equipment.

NOTE

For use when operating temperature is 45 °F (7 °C) or below.

- a. Remove the oil warmer from the front storage area of the JSMLT case.

- b. Unfasten the hook and pile straps from the oil warmer.



TO-33A4-7-10-1-032

Figure 3-17. Oil Warmer

NOTE

When detaching the aerosol generator assembly from the CU, ensure that it is kept upright to prevent spilling the oil.

- c. Detach the aerosol generator assembly from the CU by pressing down on the aerosol generator port tabs and pulling back on the generator cap.
- d. Place the oil warmer around the generator bottle.
- e. Close the hook and pile straps over the generator bottle, Figure 3-18.



Failure to ensure the aerosol generator port tabs are depressed prior to inserting the aerosol generator assembly may cause damage to the JSMLT.

- f. Reinstall the aerosol generator assembly by depressing the aerosol generator port tabs and inserting the male adapters into the aerosol generator ports until locked.

WARNING

Do not connect the power cord if any wiring is frayed, doing so could result in injury to or death of personnel and/or damage to the equipment.

- g. Plug the oil warmer into a 110V outlet. If the power source is other than 110V, a transformer is required.

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- h. Allow the oil to warm up for at least 15 minutes before you begin mask testing. The oil warmer has an automatic thermostat built in and will shut off when the operating temperature is reached (15-20 minutes).



TO-33A4-7-10-1-033

Figure 3-18. Oil Warmer Attached

CHAPTER 4

INITIALIZATION

4.1 PREPARING THE JOINT SERVICE MASK LEAKAGE TESTER (JSMLT) FOR TESTING.

This chapter provides instructions for how to prepare the JSMLT for testing. Descriptions of the menus are displayed on the display screen of the Control Unit (CU). If problems or error messages are displayed during the initialization process, refer to Table 12-1 for troubleshooting points of contact.

4.2 POWER-UP.

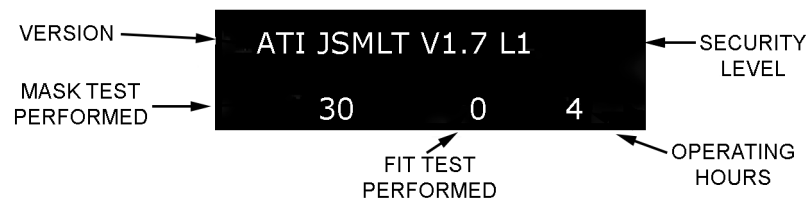
WARNING

Do not connect the power cord if any wiring is frayed, doing so could result in injury to or death of personnel and/or damage to equipment.

- a. Plug the power cord into the power source.
- b. On the power unit, toggle the power switch to the "ON" position.

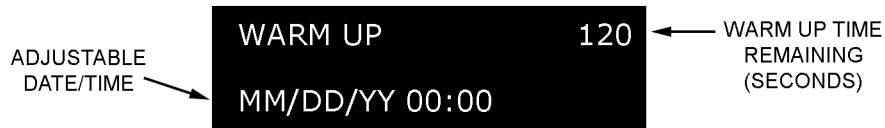
NOTE

- The JSMLT requires no operator input for Step c through Step e.
 - The JSMLT's data will not be zeroed during cleaning, calibration or any other form of maintenance.
- c. After power-up, the system version screen is displayed for approximately 10 seconds. The system version screen displays the software version number, security level, number of mask tests performed, number of fit tests performed, and the number of hours run since the last cleaning and verification of the JSMLT.



- d. The [WARM UP] screen follows the system version and test summary and displays the current date and time along with the warm up interval. Refer to Paragraph 11.1, Date and Time, for instructions on setting the current date and time. The warm up interval will be displayed as a backward countdown from 120 to 0 seconds, in 5-second intervals, in the upper right corner of the display screen.

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- e. After the JSMLT completes the internal warm-up, a [SYSTEM CHECK] screen is displayed. The [SYSTEM CHECK] screen indicates that the system is checking the internal sensors.

SYSTEM CHECK

CAUTION

DO NOT press on the headform seal while it is inflating or once it is inflated. External pressure against the seal may cause a false SEAL FAILED error and require the system to be re-initialized.

NOTE

When initialized, the JSMLT conducts an inflation and seal test on the attached headform. If there is a failure, a SEAL FAILED error message will appear. Refer to Paragraph 12.6.6 for troubleshooting. If the headform is changed during operation, the JSMLT must be restarted to allow the system to verify the inflation and seal process of the second headform. This seal check is only required once per headform per operating period.

- f. Upon completion of a successful system check, the following screen will appear:

ALTITUDE NOW 0000FT
 CHANGE CONT

4.3 SETTING THE ALTITUDE.

The JSMLT operating altitude should be set to the nearest 1000 foot increment of elevation. To adjust the operating altitude, follow Step a through Step c, below. The selected operating altitude will remain saved into the system's memory until manually readjusted.

ALTITUDE NOW	0000FT
CHANGE	CONT

- <F1> CHANGE** SENDS THE OPERATOR TO THE [ALTITUDE] ADJUSTMENT SCREEN.
- <F4> CONT** CONTINUES ON TO THE [SELECT TEST] SCREEN.

- a. Press <F1> in order to change the present altitude.

ALTITUDE NOW	0000FT
UP DOWN	CONT

- <F1> UP** SCROLLS UP THROUGH THE AVAILABLE ALTITUDES IN 1000 FT INCREMENTS.
- <F2> DWN** SCROLLS DOWN THROUGH THE AVAILABLE ALTITUDES IN 1000 FT INCREMENTS.
- <F4> CONT** CONTINUES ON TO THE [SELECT TEST] SCREEN.

- b. Using the <F1> UP and <F2> DWN keys, scroll to the nearest altitude in 1000 foot increments.
- c. Press <F4> CONT to program the appropriate altitude into the JSMLT and return to the [SELECT TEST] screen. Continue on to Paragraph 4.4
- 4.4 SELECTING A TEST.

NOTE

The JSMLT is equipped with internal temperature monitoring. If the internal temperature changes (0.9 °F/0.5 °C), the JSMLT will automatically enter into the [SYSTEM CHECK] routine. When the system check is completed, the menu will return to the point of operation. Extreme temperature fluctuations or altitude variations could result in low vacuum failure readings (4.0-5.49).

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SELECT TEST= M ALL

SYS UP DWN ACPT

- <F1> SYS** SENDS THE OPERATOR TO THE SYSTEM DIAGNOSTICS MENU.
- <F2> UP** SCROLLS UP THROUGH THE LIST OF AVAILABLE TESTS.
- <F3> DWN** SCROLLS DOWN THROUGH THE LIST OF AVAILABLE TESTS.
- <F4> ACPT** ACCEPTS THE TEST TYPE DISPLAYED

NOTE

Scrolling up/down the lists of tests, the display will start over at the end of the list. After power-up, if [MASK], [M ALL], [FIT], or [ALL] is selected, an aerosol setup must be conducted, Table 4-1.

The display screen indicates the tests available. A more detailed description of the available tests is contained in Paragraph 1.7.

- Scroll to the appropriate test using <F2> UP and <F3> DWN.
- Select the appropriate test by pressing <F4> Accept (ACPT) and refer to the chapter related to that test for specific instructions

Table 4-1. Test Options

Test	Function
[MASK]	Performs a mask leakage test. Refer to Chapter 5 for the Mask Testing.
[DRINK]	Performs a drink flow, drink train, and drink seat test. Refer to Chapter 6 for the Drink Tube System Testing.
[VALVE]	Performs a test on the outlet valve. Refer to Chapter 7 for the Outlet Valve Test [VALVE].
[M ALL]	Performs the [MASK], [DRINK], and [VALVE] tests sequentially. Refer to Chapter 5 for the mask testing; Chapter 6 for the Drink Tube System Testing; and Chapter 7 for the Outlet Valve Test [VALVE].
[FIT]	Performs a Quantitative Fit Test [FIT]. Refer to Chapter 8.
[ALL]	Performs the mask, drink, valve, and fit tests sequentially. Refer to Chapter 5 for the Mask Testing; Chapter 6 for the Drink Tube System Testing; Chapter 7 for the Outlet Valve Test [VALVE]; and Chapter 8 for the Quantitative Fit Test [FIT].

CHAPTER 5

MASK TESTING

5.1 MASK TEST SETTINGS AND DESCRIPTIONS.

NOTE

If needed in support of the MCU2P/MCU2AP mask for testing, see service manual: S6470-AB-MMO-010 Naval Sea Systems Command (NAVSEA).

Refer to Table 5-1 for test settings and descriptions of the Joint Service Mask Leakage Tester (JSMLT).

Table 5-1. Mask Test Settings and Descriptions

Setting	Description
Mask Leakage Test [MASK]	Sample flow = 16 Standard Liters per Minute (SLPM). Sample resistance = 6 inches Water Column (WC) Volts Alternating Current (VAC) ± 0.5 percent Leakage Failure ≥ 0.0030 percent.
Drink Tube Flow Test [DRINK]	Set flow = 2 SLPM. Failure resistance ≥ 2.2 inches WC (Press).
Drink Valve Seat Test	Set resistance = 6 inches WC. (Press) Failure flow ≥ 0.5 Standard Cubic Centimeters per Minute (SCCM).
Drink Train Leakage Test	Set resistance = 6 inches WC. (Press) Failure flow ≥ 0.5 SCCM.
Outlet Valve Leakage Test	Set resistance = 1 inch WC. (Press) Failure flow ≥ 15 SCCM.
Quantitative Face Fit Test	Set flow = 4 SLPM. Failure Quantitative Fit Factors are <3000 for Navy, Marine Corps, and Coast Guard personnel, <2000 for Air Force (AF) personnel, and <1667 for Army personnel. Number (No.) of exercises = 5. Exercise length = 60 seconds.

5.2 TESTING THE MASK.



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NOTE

For instructions to setup the JSMLT and conduct testing on M50/51, refer to Paragraph 5.11 through Paragraph 5.19, for the M53 series masks, refer to Paragraph 5.20 through Paragraph 5.27 and for the MPU-5, refer to Paragraph 5.28 through Paragraph 5.36.

A mask test allows the operator to test the serviceability of the face blank. This test is completed under negative pressure by challenging the mask with an aerosol mist. Table 5-2 shows the tests required by mask type.

Table 5-2. Tests Required by Mask Type

Mask Type	Mask Leakage Test [MASK]	Drink Tube Flow Test	Drink Train Assembly Leakage Test	Drink Valve Seat Test	Outlet Valve Test
M40 Series	X	X		X	X

Table 5-2. Tests Required by Mask Type - Continued

Mask Type	Mask Leakage Test [MASK]	Drink Tube Flow Test	Drink Train Assembly Leakage Test	Drink Valve Seat Test	Outlet Valve Test
MCU Series	X	X	X	X	X
M50/51 Series	X	X	X	X	X
M53 Series	X	X	X	X	X
MPU-5	X	X	X	X	X

NOTE

Test required for the Joint Service Aircrew Mask-Joint Strike Fighter (JSAM-JSF) Mask can be found in JSF Manual Specification Number MD 5668-00103.

5.3 MASK AEROSOL SETUP.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

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Refer to Figure 5-1. An aerosol setup is used to set the 0 percent aerosol level (best seal) and 100 percent aerosol level (no seal) for any Mask Leakage Test [MASK]. These levels must be established every time the JSMLT is setup in either the [MASK], [FIT], [M ALL], and [ALL] modes or if the JSMLT is switched off and then restarted in one of those modes. It is also recommended that an aerosol setup be conducted whenever mask testing is resumed after the JSMLT has been sitting idle for more than thirty (30) minutes.

NOTE

Ensure that the aerosol probe hose input grommet of the test shroud is located at the rear of the headform. Improper assembly may cause improper aerosol distribution and possibly cause false test failures.

- Insert the aerosol probe hose into the grommet on the test shroud.



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Figure 5-1. Mask Aerosol Setup

- Place the test shroud over the headform. Ensure that the test shroud completely covers the headform and the aerosol probe hose input grommet is located at the rear of the headform.

AEROSOL SETUP

YES

<F1> YES

STARTS THE AEROSOL SETUP PROCEDURE.

- c. Select <F4> YES to perform an aerosol setup. The following steps are then completed automatically by the JSMLT:

[SETTING] ADJUSTING TO TEST PARAMETERS.

[LOADING] GENERATOR TURNS ON AND AEROSOL IS LOADED UNDER THE TEST SHROUD.

[SETTING] SETTING 100% RANGE.

- [SETTING]**
- WITH AEROSOL SETUP NUMBER DISPLAYED (-20 TO 100+).
 - IF THE NUMBER DISPLAYED EXCEEDS 90, REFER TO THE PARAGRAPH 12.7.3, AEROSOL SETUP OF 90 OR GREATER, FOR TROUBLESHOOTING RECOMMENDATIONS.
 - IF REPEATED LSC ERROR IS DISPLAYED, CONTINUE TO PARAGRAPH 12.7.4.

AEROSOL SETUP
NUMBER

SETTING

6

NOTE

- If a M40 series protective mask that has a hose attached is being tested, refer to Paragraph 5.37 through Paragraph 5.43. M51 masks hoses do not require testing on the JSMLT.
- The JSMLT should complete the aerosol setup and display the following screen within five minutes.

- d. At the completion of an aerosol setup, the following screen will be displayed:

APPLY MASK

SET

ESC

START

- e. Remove the test shroud from the headform, leaving the aerosol probe hose inserted.

5.4 APPLYING A MASK.

Table 5-3 provides recommendations for selecting which headform to use when conducting mask testing:

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When using the Inflatable Face Seal Test Head Adapter (IFSTHA), the test operator must ensure that JSMLT pressure switch has been adjusted to 5.2 Pound-force per Square Inch (PSI). When using a yellow headform, the JSMLT can be adjusted to either 5.2 or 6.0 PSI. Using the JSMLT without the PSI properly adjusted to the headform being used can cause damage to the equipment. Systems that have undergone the pressure switch adjustment will display a sticker indicating “Ground and Aviation Masks” on the front of the unit,” as shown below.

NOTE

When initialized, the JSMLT conducts an inflation and seal test on the headform that is in place. If there is a failure, a SEAL FAILED error message will appear. Refer to Paragraph 12.6.6 for troubleshooting. If the headform is changed during operation, the JSMLT must be restarted to allow the system to verify the inflation and seal process of the second headform. This seal check is only required once per headform per operating period.

- a. When applying a MPU-5 mask, refer to Paragraph 5.28 through Paragraph 5.36.



Figure 5-2. Pressure Switch Sticker

Table 5-3. Recommended Headform Sizes

Mask Type (Size)	Recommended Headform Size
MCU (S and M)	Yellow-SMALL or IFSTHA
MCU (L)	Yellow-MEDIUM or IFSTHA
M40 Series (S)	Yellow-SMALL or IFSTHA
M40 Series (M and L)	Yellow-MEDIUM or IFSTHA
M50/51 (S)	Yellow-SMALL or IFSTHA
M50/51 (M and L)	Yellow-MEDIUM or IFSTHA
M53 (XS and S)	Yellow-SMALL or IFSTHA
M53 (M and L)	Yellow-MEDIUM or IFSTHA
MPU-5 (ALL)	IFSTHA
JSAM-JSF Mask (ALL)	JSF Headform

- b. Ensure that the mask clips are properly adjusted for the type and size of protective mask being tested if using a yellow headform. Refer to Paragraph 11.12 for specific instructions.
- c. Ensure that external components (hood, second skin, eyelens outserts, outlet valve cover, canister) are removed from the protective mask prior to testing. It is not necessary to remove the head harness prior to testing.

- d. Inspect the lint screen for debris. Clean as necessary.

NOTE

For sanitary reasons, users must discard cleaning cellulose sponges at the end of each mask testing day.

- e. Clean the mask seal area and peripheral seal on the headform with a cellulose sponge dampened with water.

NOTE

- If the head harness is attached to the protective mask, fully extend the harness straps and position the head harness to the rear of the headform.
 - Ensure that mask nose cup does not cover the top port of the headform.
 - When testing the large mask, ensure that the forehead of the mask is not pulled too far over the peripheral seal of the headform as the mask could fail.
- f. Position the mask on the headform, Figure 5-3, by placing it on the chin first for both the yellow headform and the IFSTHA. If using the IFSTHA, skip ahead to Step j.



LEGEND:
1. FOREHEAD TABS
2. TEMPLE TABS
3. CHEEK TABS

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Figure 5-3. Mask on Headform

- g. Hold down the chin of the mask while fastening the two temple tabs (Figure 5-3, 2) to their corresponding mask clips on the middle brackets of the headform pedestal.
- h. Fasten the two cheek tabs (3) to their corresponding mask clips, Figure 5-4, on the bottom brackets of the headform pedestal.
- i. Fasten the two forehead tabs (Figure 5-3, 1) to their corresponding mask clips on the top brackets of the headform pedestal.
- j. Smooth the mask over the peripheral seal.

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- k. Ensure that the mask covers as much of the seal as possible. If this cannot be achieved, ensure that the proper headform is installed for the mask being tested.
- l. If using the yellow headform, ensure that even tension is applied from all of the straps of the mask to the mask clips, Figure 5-4. This step is not applicable to the IFSTHA.

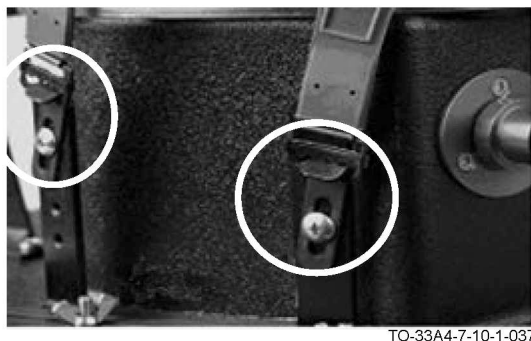


Figure 5-4. Properly Connected Mask Clips

- m. Retract the plunger on the outlet valve clamp and slide it over the outlet valve housing from the bottom. Then, release the plunger to seal the valve, as shown in Figure 5-5.



Figure 5-5. Mask with Adapters

CAUTION

Do not use a wrench when tightening the canister port plug as overtightening can cause damage to the mask.

- n. Install the canister port plug into the canister port of the mask and hand-tighten until it is snug, as shown in Figure 5-5.
- o. Ensure that the hose test port plug is installed.
- p. Place the test shroud over the protective mask and headform with the aerosol probe hose at the rear of the headform.

- q. Ensure the mask test shroud, Figure 5-6 extends to the base of the headform pedestal and completely covers the mask.



TO-33A4-7-10-1-039

Figure 5-6. Mask Under Shroud

5.5 CONDUCTING A TEST.

- a. To begin the mask test, press <F4> START.

APPLY MASK

SET

ESC

START

<F1> SET

DISPLAYS THE AEROSOL SETUP MENU PARAGRAPH 5.3, MASK AEROSOL SETUP

<F3> ESC

RETURNS THE OPERATOR TO THE SELECT TEST MENU. PARAGRAPH 4.4, SELECTING A TEST.

<F4> START

STARTS THE MASK TEST PROCEDURE.

- b. Wait approximately 10 seconds while the peripheral seal inflates. The following steps are then completed automatically by the JSMLT:

[SETTING] Indicates that the system is setting the test flow rate.
 [LOADING] Indicates that the system is applying aerosol under the test shroud.
 [TESTING] Indicates that the system is measuring the aerosol leakage through the mask.

- c. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

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[PASSED]

A PERCENTAGE OF PENETRATION (I.E.:.0001) IS DISPLAYED IN THE UPPER RIGHT CORNER. [PASSED] ALLOWS YOU TO CONTINUE ON TO A NEW MASK TEST. IF OPERATING IN EITHER THE M ALL OR ALL MODE, THEN TESTING CONTINUES ON TO THE DRINK TUBE TEST.

PASSED 0.0001

[FAILED]

AUTOMATICALLY STOPS TESTING. A STEADY TONE INDICATED FAILURE AND A PERCENTAGE OF PENETRATION (I.E.: 3.44%) IS DISPLAYED.

FAILED 3.44%
 CONT

[FAILED VAC]

AUTOMATICALLY STOPS TESTING. A STEADY TONE INDICATED FAILURE AND EITHER A LOW VAC OR HIGH VAC MESSAGE IS DISPLAYED.

FAILED LOW VAC
 CONT

FAILED HIGH VAC
 CONT

<F4> CONT

PROCEEDS TO THE [PAUSED] SCREEN FOR FURTHER TESTING OPTIONS AND STOPS THE ALARM. REFER TO PARAGRAPH 5.6, MASK PAUSED, FOR FURTHER OPTIONS.

- d. If [FAILED] or [FAILED (HIGH or LOW) VAC] appears, press <F4> CONT to continue and proceed to Paragraph 5.6.

5.6 MASK PAUSED.

The following functions are displayed after a mask failure:

PAUSED DEFL
 RES PROB REJ SEAL

<F1> RES

RESUMES NORMAL TESTING.

<F2> PROB

ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK.

<F3> REJ

REJECTS THE MASK, DEFLATES THE SEAL, AND RETURNS TO THE APPLY MASK SCREEN.

<F4> DEFL SEAL

DEFLATES THE PERIPHERAL SEAL. USE IF MASK WAS APPLIED INCORRECTLY AND ADJUSTMENTS NEED TO BE MADE.

5.6.1 **Mask Failure.** If a mask test fails, refer to the flowchart diagrams, Figure 5-8 through Figure 5-11, for guidance on which steps to perform next.

5.7 PROBE MODE.

The probe mode is used to help isolate the location of a leak.



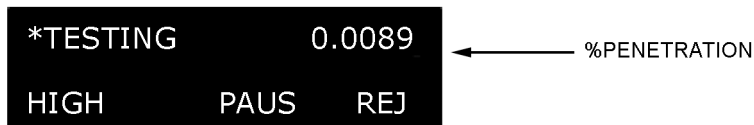
AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

NOTE

When the failure set point is exceeded in probe mode, a beep can be heard. The beep sounds only when the failure threshold (0.0030) is exceeded. When probing, the threshold may not be obtained since a lower concentration of aerosol is being applied.

- a. To begin probing, select <F2> PROB from the [PAUSED] menu and the following screen will appear:



- | | |
|-------------------------|---|
| <F1> HIGH | SWITCHES FROM NORMAL AEROSOL CONCENTRATION TO HIGH AEROSOL CONCENTRATION TO HELP ISOLATE SMALL LEAKS. AFTER [HIGH] IS SELECTED, THE SCREEN WILL DISPLAY [NORM] IN THE <F1> POSITION. SELECTING [NORM] RETURNS THE USER TO THE NORMAL AEROSOL CONCENTRATION FOR TESTING. |
| <F3> PAUSE | ENDS THE PROBE TEST AND RETURNS TO THE {PAUSED} SCREEN FOR FURTHER OPTIONS. REFER TO PARAGRAPH 5.6, MASK PAUSED, FOR FURTHER OPTIONS. |
| <F4> REJ | REJECTS THE CURRENT MASK TEST AND PROMPTS THE OPERATOR TO CONFIRM THE REJECTION. CONFIRMING THE REJECTIONS BY PRESSING <F4>REJ RETURN THE JSMLT TO THE [APPLY MASK] SCREEN. REFER TO PARAGRAPH 5.5, CONDUCTING A TEST. |

- b. Remove the test shroud from the headform and remove the aerosol probe hose from the test shroud.

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NEVER plug or block the probe end (blue) of the aerosol probe hose while the aerosol generator is bubbling. Blocking the flow of aerosol may result in damage to internal components of the JSMLT.

- c. Hold the aerosol probe hose away from the mask until the numbers on the screen appear to stabilize at their lowest reading, Figure 5-7.



TO-33A4-7-10-1-040

Figure 5-7. Using the Probe

NOTE

When probing a mask, it is recommended that the hand not holding the probe be cupped around the area of the mask being checked. This will prevent excess aerosol from drifting over the mask, possibly leading to false readings.

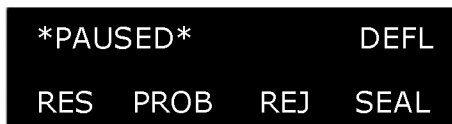
- d. Slowly pass the aerosol probe hose close to the mask surface. All potential areas for leaks should be probed (peripheral seal, lenses, recently replaced parts, etc.). The amount of time spent probing a leak is at the operator's discretion. An increase in the percentage of penetration displayed on the screen indicates a probable mask leak in the area being probed.

*TESTING	0.0000	← %PENETRATION
HIGH	PAUS	REJ

- e. When a suspected leak is isolated select <F3> PAUSE, then select <F1> RES or <F4> REJ from the [PAUSED] screen.

5.8 RESUME TESTING.

Resume testing from the [PAUSED] screen by pressing the <F1> RES key.



- <F1> RES** ENDS THE PROBE TEST AND RETURNS TO THE [APPLY MASK] SCREEN.
- <F2> PROB** ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK.
- <F3> REJ** REJECTS THE MASK, DEFLATES THE SEAL, AND DISPLAYS THE [REJECTED] SCREEN. PRESSING <F4>CONT RETURNS YOU TO THE [APPLY MASK] SCREEN.
- <F4> DEFL SEAL** DEFLATES THE PERIPHERAL SEAL. USE IF MASK WAS APPLIED INCORRECTLY AND ADJUSTMENTS NEED TO BE MADE.



- <F4> CONT** RETURNS TO THE [PAUSED] SCREEN.

NOTE

If LOW PRESSURE SEAL screen is displayed, operator should select <F4> INFL SEAL to reinflate the peripheral seal. This will redirect you to the <PAUSED> screen. Pressing the <F2> PROB key will allow the operator to resume probing for the leak.



- <F1> RES** ENDS THE PROBE TEST AND RETURNS TO THE [APPLY MASK] SCREEN.
- <F2> PROB** ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK.
- <F3> REJ** REJECTS THE MASK, DEFLATES THE SEAL, AND DISPLAYS THE [REJECTED] SCREEN. PRESSING <F4>CONT RETURNS YOU TO THE [APPLY MASK] SCREEN.
- <F4> INFL SEAL** RE-INFLATES THE PERIPHERAL SEAL AFTER A LOW SEAL PRESSURE FAULT. ALLOWS USER TO RETRY MASK PROBING OR OTHER LEAKAGE TESTING.

NOTE

Repeated [Low Seal Pressure] fault message requires troubleshooting. Refer to Paragraph 12.6.6 for troubleshooting recommendations.

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5.9 REMOVING THE MASK FROM THE HEADFORM.

When testing is complete, remove the mask from the headform as follows:

- Remove the mask test shroud from the headform.
- Remove the canister port plug from the mask.
- Remove the outlet valve clamp from the mask by pulling up the plunger and sliding the clamp off.
- Disconnect the forehead buckles from the mask clips. (If using yellow headform.)
- Disconnect the cheek buckles from the mask clips. (If using yellow headform.)
- Disconnect the temple buckles from the mask clips. (If using yellow headform.)
- Remove the protective mask from the headform.



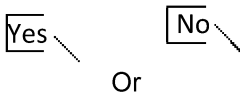
NOTE

- When mask testing is completed place the test shroud over the headform.
- To return to the [SELECT TEST] screen, press <F3> ESC.

5.10 MASK TESTING FAILURES FLOWCHARTS.

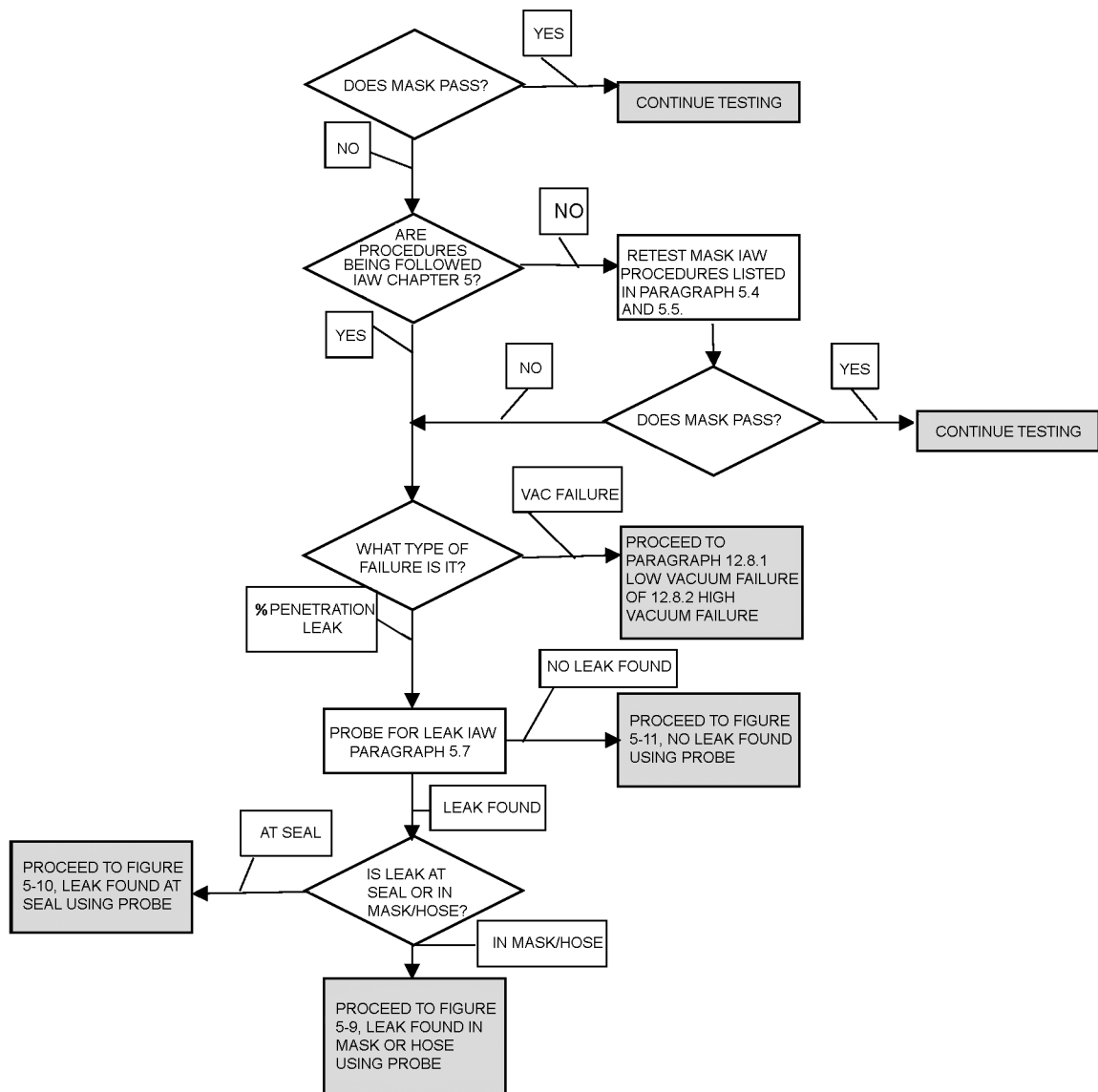
The symbols in Table 5-4 are used in Figure 5-8 through Figure 5-11.

Table 5-4. Flowchart Symbols

Symbol	Meaning
	Indicates a step/action to be taken.
	Indicates a point at which a decision must be made.
	Indicates the path down which an answer leads.

NOTE

- Some protective mask failures can be resolved with the mask seated on the headform and some require the protective mask to be removed.
- The purpose of the following diagrams is to isolate the failure in the mask prior to troubleshooting the JSMLT. Refer to Figure 5-8 through Figure 5-11.



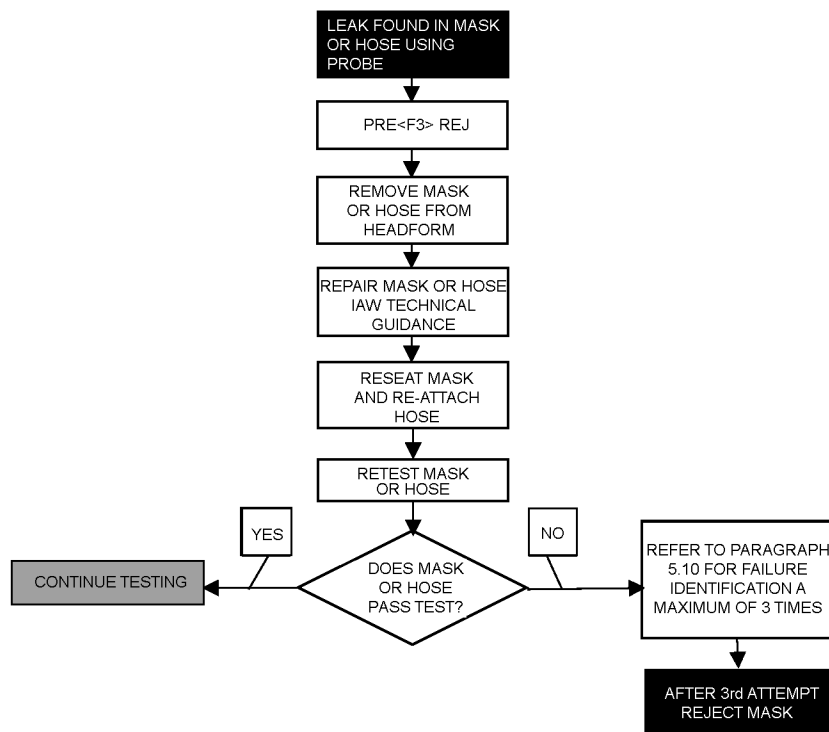
TO-33A4-7-10-1-041

Figure 5-8. Mask Testing Failures Flowchart

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
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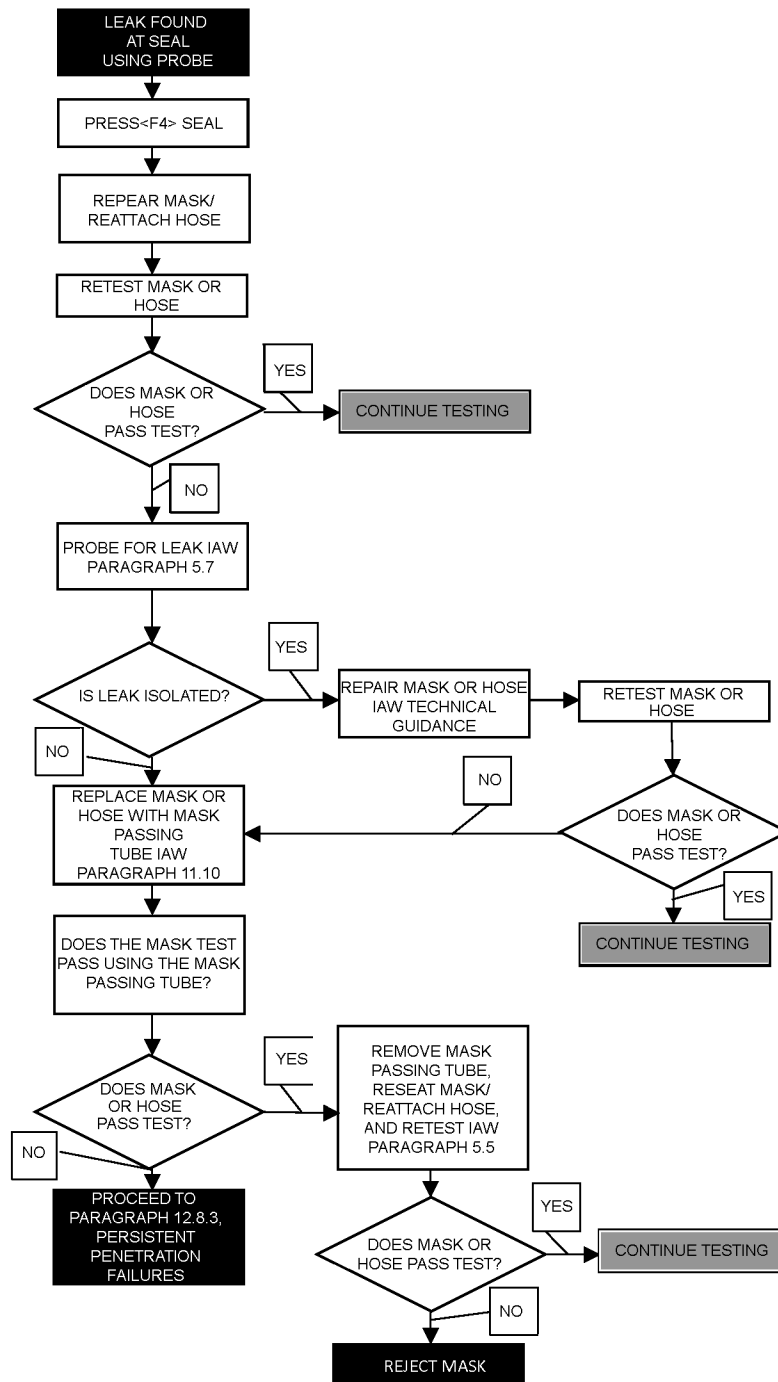
NOTE

REJECTED MASKS THAT CANNNOT BE REPAIRED
SHOULD BE ACCOUNTED FOR AS CONDITION CODE H
(UNSERVICEABLE) UNTIL THEY ARE DISPOSED OF.



TO-33A4-7-10-1-042

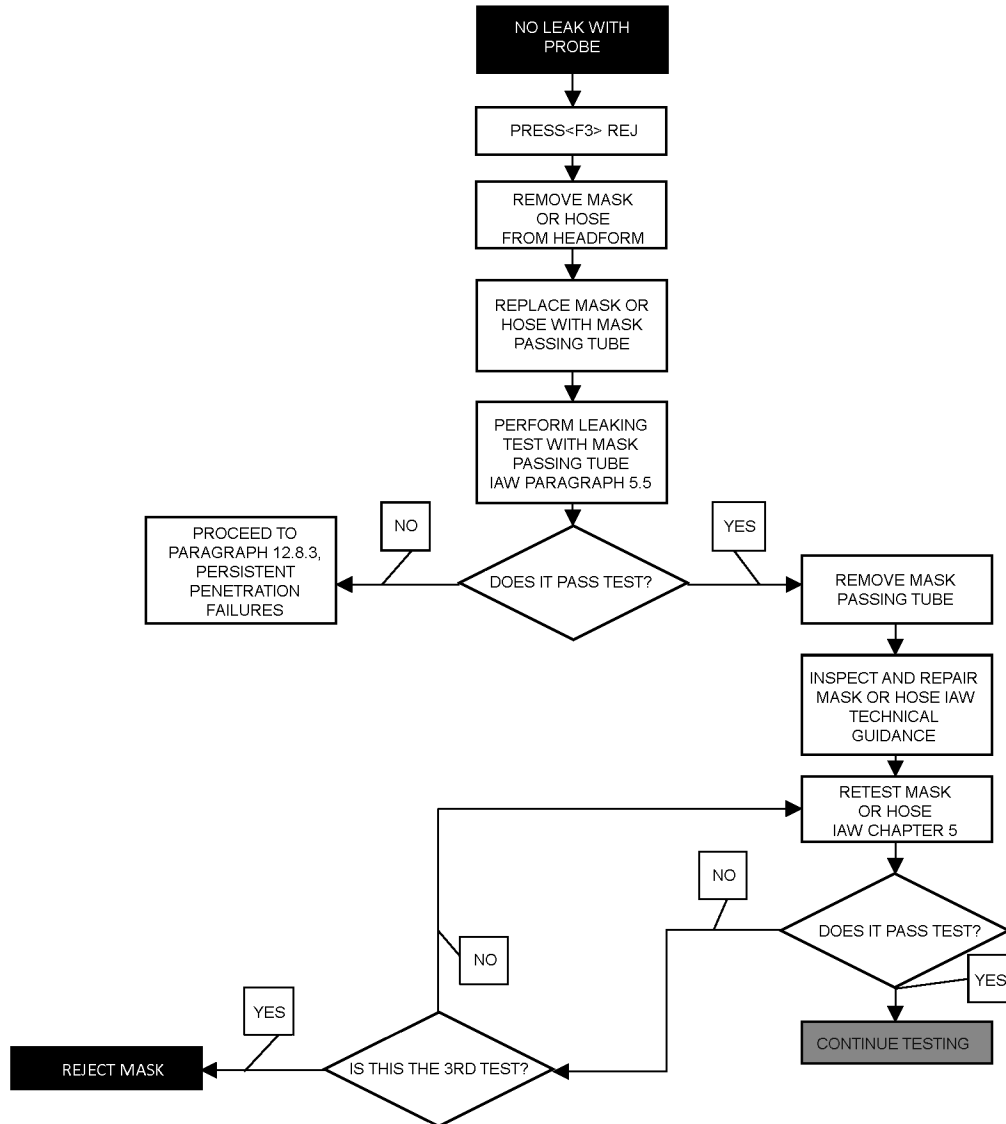
Figure 5-9. Leak Found in Mask or Hose Using Probe



TO-33A4-7-10-1-043

Figure 5-10. Leak Found at Seal Using Probe

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
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TO-33A4-7-10-1-044

Figure 5-11. No Leak Found Using Probe

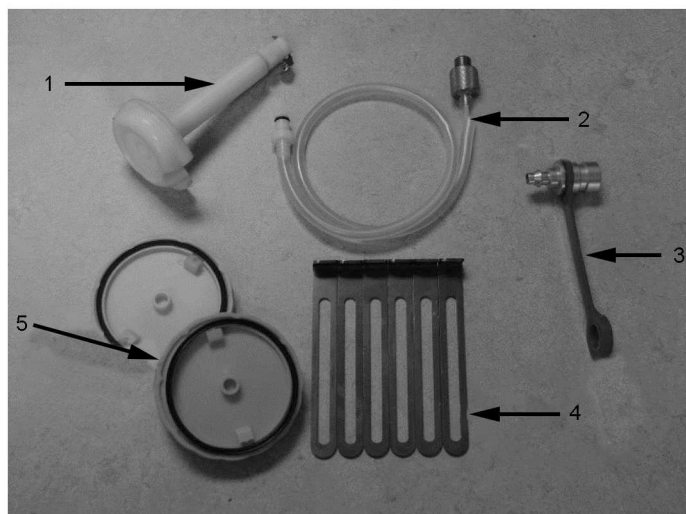
5.11 TESTING AN M50/51 JOINT SERVICE GENERAL PURPOSE MASK.

NOTE

If needed in support of the M50/51 Joint Service General Purpose Mask for testing, see applicable service manuals:
TM 3-4240-542-13&P United States Army (USA), Technical Order (TO) 14P4-20-1 United States Air Force (USAF), TM 09204G/09205G-OI/1 United States Marine Corps (USMC), S6470-AD-OMP-010 (NAVSEA)

5.11.1 M50/51 Test Equipment.

5.11.1.1 M50/51 Adapters. The major components used when testing the M50/51 are shown in Figure 5-12 and described in Table 5-5.



TO-33A4-7-10-1-109

Figure 5-12. M50/51 Adapters

Table 5-5. M50/51 Adapters

Index No.	Nomenclature	Description
1.	M50 Outlet Valve Plug/Adapter	Used to plug the M50/51 outlet valve assembly during Mask Leakage Test [MASK] and isolates the outlet valve assembly for test while in the VALVE test mode.
2.	M50 Outlet Valve Hose	Connects the M50 outlet valve plug/adapter to the JSMLT test port.
3.	M50 Drink/Fit Test Adapter	Dual purpose interface between JSMLT North Atlantic Treaty Organization (NATO) drink test adapter and M50/51 drink tube. Can be used for all DRINK mode testing and during FIT test operation. Includes the attached spacer ring for Drink Valve Seat Tests.
4.	M50 Mask Clips (6)	Used to secure the mask to the yellow headform and pedestal.
5.	M50 Filter Plugs (2)	Externally plug the mask's filters during MASK leakage tests.

5.11.1.2 IFSTHA.

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MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

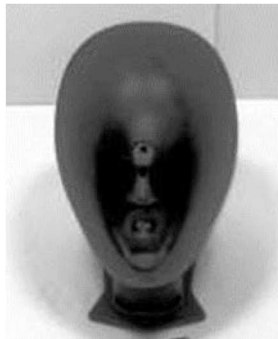


Failure to ensure that the pressure switch has been adjusted on the JSMLT Control Unit (CU) to 5.2 PSI could result in loss or damage of the equipment.

NOTE

Pressure switch adjustments must be performed by higher level maintenance.

When using the IFSTHA, Figure 5-13, the test operator must ensure that JSMLT pressure switch has been adjusted from 6.0 to 5.2 PSI.



TO-33A4-7-10-1-110

Figure 5-13. IFSTHA

5.11.1.3 Pressure Switch Sticker. Systems that have undergone the pressure switch adjustment will display a pressure switch sticker indicating "Ground and Aviation Masks" on the front of the unit as shown in Figure 5-14.



TO-33A4-7-10-1-111

Figure 5-14. Pressure Switch Sticker

5.11.1.4 Using the Yellow Headform to Test the M50/51. When using the yellow headform to test the M50/51, the SMALL headform should be used for SMALL masks and MEDIUM headform should be used for MEDIUM and LARGE masks, Figure 5-15.



TO-33A4-7-10-1-112

Figure 5-15. Yellow Headform

5.12 M50/51 JSMLT PREPARATION.

The M50/51 JSMLT unpacking and setup procedures should be completed in accordance with Chapter 3 of the JSMLT operator's manual as supplemented below:

- a. Use the mask clips as follows:
 - (1) For the yellow headform, use the No. 2 stubby cross-tip screwdriver to remove the six (6) standard sized mask clips and replace them with the six (6) M50 mask clips.
 - (2) For the IFSTHA, use the No. 2 stubby cross-tip screwdriver to remove the six (6) standard sized mask clips.
- b. Install the headform as follows:
 - (1) To install the yellow headform, it is recommended that the SMALL headform be utilized for all Joint Service General Purpose Mask leakage testing unless the test operator cannot obtain a seal against the mask. The MEDIUM headform may be used at the test operator's discretion if a seal cannot be obtained with the SMALL headform.
 - (2) To install the IFSTHA, Figure 5-16, proceed as follows:
 - (a) Center the IFSTHA over the pedestal with the face toward the front of the CU.
 - (b) Align the white fittings on the top of the pedestal with the holes in the headform.
 - (c) Press down on the headform until it is fully seated onto the pedestal.

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NAVY (NAVSEA) SS200-AW-MMC-010

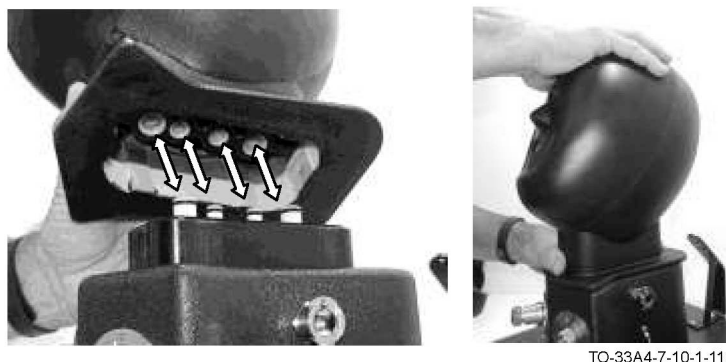
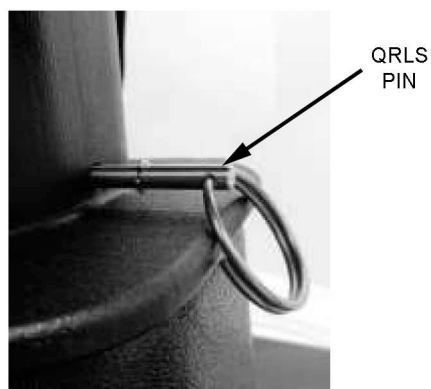


Figure 5-16. Installing the IFSTHA

NOTE

Insert the Quick-Release Locking System (QRLS) pin, Figure 5-17, until resistance is felt. The QRLS pin will appear to only be partially inserted.

- c. Insert the QRLS pin (1) into the hole located at the rear of the IFSTHA.



TO-33A4-7-10-1-114

Figure 5-17. Insertion of the QRLS Pin

- d. Remove the standard outlet valve test adapter and outlet valve retaining bolt in accordance with Paragraph 11.4.

NOTE

Over/under tightening the M50 outlet valve hose may cause the Outlet Valve Test [VALVE] to fail.

- e. Connect the M50 outlet valve hose to the pedestal by turning clockwise until hand-tight, Figure 5-18.
- f. Initialize the JSMLT in accordance with the instructions listed in Chapter 4.
- g. Conduct an aerosol setup in accordance with the instructions listed in Paragraph 5.3.



TO-33A4-7-10-1-115

Figure 5-18. Connection of the M50 Outlet Valve Hose

5.13 M50/51 MASK PREPARATION.

Prior to starting any leakage or component isolation test on the M50/51 mask, the operator should perform the following mask preparatory actions:

- a. Conduct a visual inspection of the mask in accordance with the appropriate technical guidance. Mask should be visually clean and serviceable with the filters installed prior to testing on the JSMLT.
- b. Loosen all head harness straps to allow maximum flexibility of the head harness when connecting the mask to the head-form.
- c. Remove the outlet valve cover assembly by following the procedures:
 - (1) Remove the drink coupler from its receptacle below the front module assembly.
 - (2) Unwrap the external drink tube from around the front module main body.

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- (3) Turn the M50/51 drink tube lever on the front module main body upward to approximately “MID” position to clear the outlet valve cover assembly as shown in Figure 5-19.



TO-33A4-7-10-1-116

Figure 5-19. Turning the M50/51 Drink Tube Lever to “MID” Position

- (4) Place thumb at the bottom of the cover below the communications port cover and between the cover and front module main body as shown in Figure 5-20.



TO-33A4-7-10-1-117

Figure 5-20. Removal of the M50/51 Outlet Valve Cover Assembly (Part One)

- (5) Gently lift the M50/51 outlet valve cover assembly (part two) away from the front module main body as shown in Figure 5-21. Set the cover aside until testing is complete.



TO-33A4-7-10-1-118

Figure 5-21. Removal of the M50/51 Outlet Valve Cover Assembly (Part Two)

- (6) Turn the M50/51 drink tube lever on the front module main body upward to open the drink tube shut-off valve as shown in Figure 5-22.

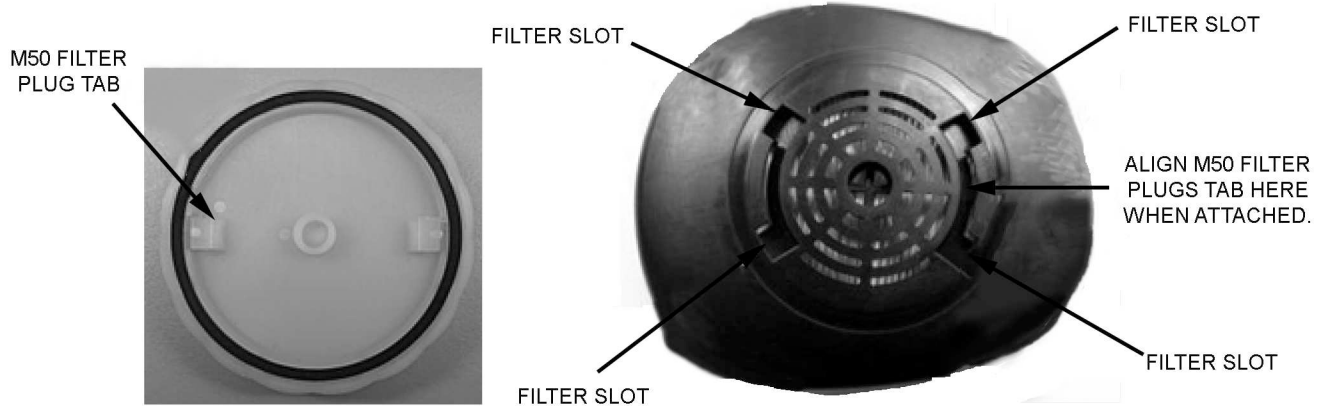


TO-33A4-7-10-1-119

Figure 5-22. Turning the M50/51 Drink Tube Lever to "OPEN" Position

- (7) Attach the M50 filter plugs to each filter by aligning the plug's tabs with the filter's slots and turning slightly until secure (approximately midway between each slot on top and bottom) as shown in Figure 5-23 and Figure 5-24.

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TO-33A4-7-10-1-120

Figure 5-23. Adjustment of the M50 Filter Plug Tab to Filter Slot



TO-33A4-7-10-1-121

Figure 5-24. Attachment of the M50 Filter Plug

- (8) Moisten the M50 outlet valve plug/adaptor with a cellulose sponge dampened with clean water.

- (9) Install the M50 outlet valve plug/adapter by inserting the tabbed section into the mask's outlet valve body between the drink tube and the microphone port. Tilt the handle upwards until you feel a slight "snap" to lock it into place as shown in Figure 5-25.

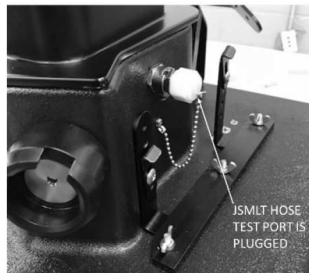


TO-33A4-7-10-1-122

Figure 5-25. Installing the M50 Outlet Valve Plug/Adapter

5.14 ATTACHING THE M50/51 MASK.

- a. Install the mask clips as follows:
 - (1) For the yellow headform, ensure that the mask clips are properly adjusted for the mask size being tested. Refer to Paragraph 11.2 for specific instructions.
 - (2) For the IFSTHA, proceed to Step b.
- b. Ensure that the hose test port plug, Figure 5-26 is in place on the JSMLT headform pedestal.



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Figure 5-26. Hose Test Port Plug

- c. Inspect the lint screen, Figure 5-27 for debris. Clean as necessary.

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NAVY (NAVSEA) SS200-AW-MMC-010



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Figure 5-27. Lint Screen, Yellow Headform (Left) and IFSTHA (Right)

NOTE

For sanitary reasons, users must discard cleaning cellulose sponge at the end of each mask testing day.

- d. Clean the mask seal area and peripheral seal on the headform with a cellulose sponge dampened with water.



Stretching the mask while attaching it to the headform may damage the mask and cause false failures during the mask leakage test.

NOTE

For SMALL (S) masks, it is necessary to compress the nosecup against the test head. This will enable the operator seal of the mask over the inflatable peripheral seal as you secure it to the headform.

- e. Position the mask on the headform by placing it on the chin first.
- f. Install the mask with faceclips as follows:
 - (1) For the yellow headform, press down on the center of the facepiece while attaching the two brow (TOP) tabs, Figure 5-26 to their corresponding mask clips on the top brackets of the headform pedestal.
 - (2) For the IFSTHA, proceed to Step i, Figure 5-28.

- g. Keeping the mask centered on the headform and while still applying pressure over the nosecup, loosely attach the two cheek (BOTTOM) tabs to their corresponding mask clips on the bottom brackets of the headform pedestal.



TO-33A4-7-10-1-125

Figure 5-28. Compressing the Nosecup

- h. Attach the two temple (MIDDLE) tabs to their corresponding mask clips on the middle brackets of the headform pedestal. When attached, the tension on these two tabs should be the minimum necessary to keep them attached to the headform during the leakage test.

NOTE

Ensure that the face seal is not turned under, particularly in the temple tab area.

- i. Stretch the mask over and around the peripheral seal to ensure that the mask covers as much of the seal as possible and tighten straps onto the headform.
- j. Place the test shroud over the protective mask and headform with the aerosol probe hose at the rear of the headform.
- k. Ensure the mask test shroud extends to the base of the headform pedestal and completely covers the mask as shown in Figure 5-29. The M50 outlet valve hose should NOT be attached to the M50 outlet valve plug/adaptor at this time and may be hanging outside of the shroud.



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Figure 5-29. Mask Test Shroud Over M50/51 Using Yellow Headform (Left) and IFSTHA (Right)

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

5.15 M50/51 MASK LEAKAGE TESTING.

NOTE

ALWAYS remember to use a damp cellulose sponge to moisten the inner face seal of the mask and the peripheral seal of the headform before EVERY mask leakage test. The purpose of this is to remove dust and debris that might interfere with the sealing surface and to simulate a small amount of sweat that is normal for mask wearers. The emphasis is “moisten” rather than wetting. Water should not be dripping down the headform or off the mask or sealing surfaces.

The Mask Leakage Test [MASK] procedures listed in Chapter 5, mask testing should be followed to conduct the mask leakage test of the M50/51. The mask testing failures flowcharts listed in Paragraph 5.10 and Figure 5-8 through Figure 5-11 are also applicable.

5.15.1 Yellow Headform. Follow the procedures in Paragraph 5.5 through Paragraph 5.9. At the completion of all M50/51 leakage testing, remove the test adapters and use the No. 2 stubby cross-tip screwdriver to remove the six (6) M50 mask clips and replace them with six (6) standard sized mask clips.

5.15.2 IFSTHA. Follow the procedures in Paragraph 5.5 through Paragraph 5.9, Step c (remove the outlet valve clamp from the mask by pulling up the plunger and sliding the clamp off), and then remove the mask from the headform by removing all the test adapters and loosening the strap.

5.16 M50/51 DRINK SYSTEM TESTING.

All three drink system tests may be performed on the M50/51. The tests, in sequential order, are the Drink Tube Flow Test [DRINK], Drink Train Assembly Leakage Test, and the Drink Valve Seat Test. The M50 Drink/Fit Test Adapter is needed to conduct each test. The M50 Drink Test Adapter spacer ring is added and required only for the Drink Valve Seat Test. The M50 Drink/Fit Test Adapter plugs directly into the standard drink test port on the JSMLT headform pedestal. Once connected, each test must be conducted by following the procedures listed in Chapter 6.

- a. Ensure the drink tube lever is turned into the “OPEN” (vertical) position as described in Figure 5-22.
- b. Plug the M50 Drink/Fit Test Adapter into the blue JSMLT Drink Test Adapter as shown in Figure 5-30.



TO-33A4-7-10-1-127

Figure 5-30. Attaching the M50 Drink/Fit Test Adapter

- c. Insert the drink tube until it is fully seated into the adapter as shown in Figure 5-31.



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Figure 5-31. Fully Seated Drink Tube

- d. Conduct the Drink Tube Flow Test [DRINK] and Drink Train Assembly Leakage Test in accordance with Paragraph 6.2 and Paragraph 6.3.
- e. Prior to conducting a drink valve seat (DRINK TUBE/TURN OUT) test, you must slide the M50 Drink Test adapter spacer ring over the tip of the mask's drink tube until it rests against the base of the drink coupler Figure 5-32.



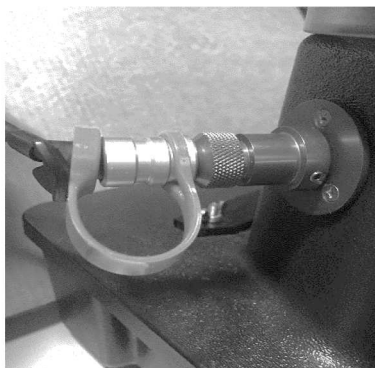
TO-33A4-7-10-1-129

Figure 5-32. Attaching the Adapter Spacer Ring

- f. Insert the drink tube until it is seated into the adapter and prevented from further penetration by the spacer ring as shown in Figure 5-33.
- g. Conduct the drink valve seat (DRINK TUBE/TURN OUT) test in accordance with Paragraph 6.4.

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- h. At the completion of all M50/51 drink testing, disconnect the M50 Drink/Fit Test Adapter from the JSMLT drink test adapter.

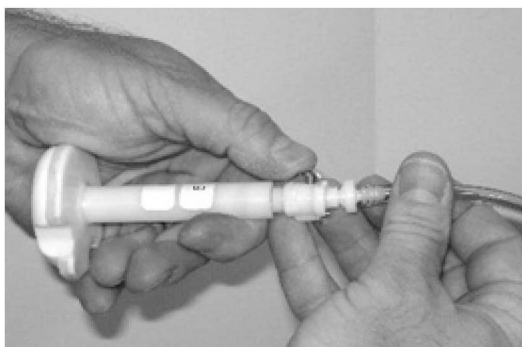


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Figure 5-33. Spacer Ring on Drink Tube

5.17 M50/51 OUTLET VALVE TESTING.

- a. Depress the snap lock on the M50 outlet valve plug/adapter and attach it to the M50 outlet valve hose as shown in Figure 5-34. Insert the hose into the adapter until the lock snaps into place. Tug gently to ensure components are locked together.
- b. Moisten the M50 outlet valve plug/adapter with a cellulose sponge dampened with clean water.
- c. Install the M50 outlet valve plug/adapter by inserting the tabbed section into the mask's outlet valve body between the drink tube and the microphone port. Tilt the handle upwards until you feel a slight "snap" to lock it into place.
- d. Conduct the outlet valve isolation test by following the procedures listed in Paragraph 7.2, Step g through Step k. The outlet valve failures flowcharts listed in Figure 7-2 are also applicable.
- e. At the completion of all M50/51 outlet valve testing, disconnect the M50 outlet valve plug/adapter from the M50 outlet valve hose by depressing the snap-lock and pulling apart. Disconnect the M50 outlet valve hose from the JSMLT pedestal by turning counterclockwise. Re-connect the JSMLT outlet valve test adapter in accordance with Paragraph 11.4.



TO-33A4-7-10-1-131

Figure 5-34. Attaching the M50 Outlet Valve Plug/Adapter

5.18 M50/51 FIT TESTING.

- a. Connect the M50/51 drink tube to the M50 Drink/Fit Test Adapter as shown in Figure 5-35.



TO-33A4-7-10-1-132

Figure 5-35. Attaching the M50 Drink/Fit Test Adapter

- b. Connect the M50 Drink/Fit Test Adapter to the JSMLT's (blue) fit test sampling adapter shown in Figure 5-36.



TO-33A4-7-10-1-133

Figure 5-36. Plugging Into the Fit Test Sampling Adapter

- c. Attach the badge clip to the excess material at the end of the head harness's temple tabs.
- d. Turn the drink lever all the way up to full "OPEN" (vertical) position as shown in Figure 5-37.



TO-33A4-7-10-1-134

Figure 5-37. Turning the Drink Tube Lever to "OPEN" Position

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- e. Conduct the fit test in accordance with Paragraph 8.4 through Paragraph 8.5. The fit test failure flowchart, Figure 8-5 is also applicable.

5.19 TROUBLESHOOTING THE JSMLT M50/51.

Refer to Table 5-6 for troubleshooting the JSMLT M50/51.

Table 5-6. Troubleshooting the JSMLT M50/M51

Issue	Resolution
Mask is not properly sealed to the headform's peripheral seal.	Visually inspect the applied mask to look for obvious gaps and breaks in seal. Re-seat the mask. Remember to use a damp cellulose sponge to moisten the headform seal and inner face seal of the mask.
M50 filter caps are not securely in place over filters causing air to pass into filters and create LOW Volts Alternating Current (VAC) error after test. Leaks cannot be detected with probe.	Reattach and secure filter cap onto filter. The filter caps seal in the middle of the application (at maximum tightness). The filter caps will not seal if excessively clockwise or counter-clockwise.
M50 filter cap(s) gasket(s) are worn out of grooves causing air to pass into filters and create LOW VAC error after test. Leaks cannot be detected with probe,	Remove filter caps. Visually inspect gasket and ensure it is properly seated into the groove of the filter cap. Reattach and secure filter cap onto filter. Ensure gaskets are of the "X" variety and not O-rings. Spares are included in each Joint Service Mask Adapter Kit (JSMAC) kit. (NOTE: There are two sealing surfaces on the "X" O-ring. Other O-rings in the JSMLT are just round, with one sealing surface.)
Mask tabs are over or under-tightened when attached to the mask clips.	Ensure minimal tension is applied to the middle (temple) tabs of the mask. In some cases, that may mean not attached at all OR it may mean they need to be tightened. Ensure that the seal area under the temple tabs IS NOT rolled under the facepiece causing a gap or breach in the seal.
Outlet valve/plug adapter may not be securely placed in outlet valve assembly. May manifest as LOW VAC error or FAIL with XXXX percent penetration displayed.	Remove and reattach the M50 outlet valve plug. Manually probing the failed mask will show increased aerosol penetration around the outlet valve area and will decrease to 0.0000 when the plug is properly secured.

5.20 TESTING AN M53 MASK.

NOTE

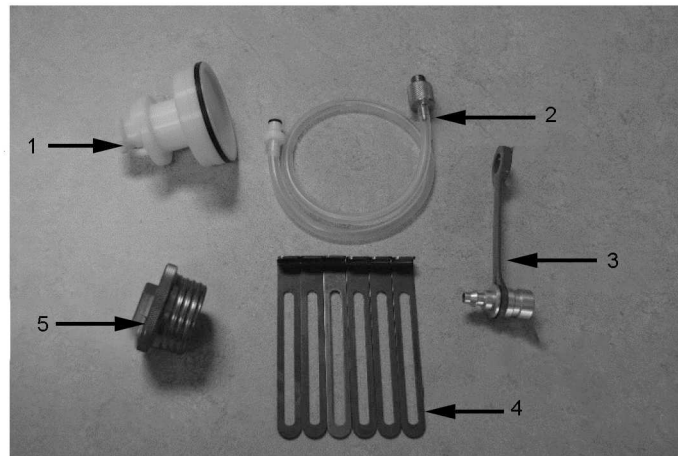
If needed in support of the M53 mask for testing, see applicable service manuals: TM 3-4240-541-12&P (USA), TO 14P4-19-1 (USAF), TM 10589A-OR (USMC), S6470-AC-OMP-010 (NAVSEA)

5.20.1 M53 Test Equipment.

NOTE

For best results, JSMLT software version 1.7 or higher is required to be installed for testing the M50/51 and M53 outlet valve assemblies. Software versions lower than 1.7 may result in unusually long test sampling times for the first Outlet Valve Test [VALVE] conducted each time the JSMLT is initialized.

5.20.1.1 M53 Adapters. The major components found in the JSMAC used to test the M53 are shown in Figure 5-38 and described in Table 5-7.



TO-33A4-7-10-1-135

Figure 5-38. M53 Adapters

Table 5-7. M53 Adapters

Index No.	Nomenclature	Description
1.	M53 Outlet Plug/Adapter	Used to plug the M53 outlet valve assembly during Mask Leakage Test [MASK] and isolates the outlet valve assembly for test while in the VALVE test mode.
2.	M50 Outlet Valve Hose	Connects the M50 outlet valve plug/adaptor to the JSMLT test port.
3.	M50 Drink/Fit Test Adapter	Dual purpose interface between JSMLT NATO drink test adapter and M53 drink tube. Can be used for all DRINK mode testing and during FIT test operation. Includes the attached spacer ring for Drink Valve Seat Tests.
4.	M50 Mask Clips (6)	Used to secure the mask to the yellow headform and pedestal. **Mask clips are not used with the IFSTHA and are not part of the M46A2 configuration.
5.	Canister Port Plug (stored in JSMLT case)	Used to plug and seal the canister inlet port of the mask during aerosol challenge leakage testing.

5.20.1.2 IFSTHA.

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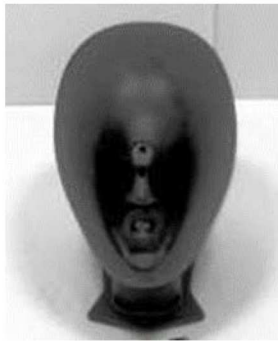


Failure to ensure that the pressure switch has been adjusted on the JSMLT CU to 5.2 PSI could result in loss or damage of the equipment.

NOTE

Pressure switch adjustments must be performed by higher level maintenance.

When using the IFSTHA, Figure 5-39, the test operator must ensure that the JSMLT pressure switch has been adjusted from 6.0 to 5.2 PSI.



TO-33A4-7-10-1-136

Figure 5-39. IFSTHA

5.20.1.3 Pressure Switch Sticker. Systems that have undergone the pressure switch adjustment will display a pressure switch sticker indicating "Ground and Aviation Masks" on the front of the unit as shown in Figure 5-40.



TO-33A4-7-10-1-137

Figure 5-40. Pressure Switch Sticker

5.20.1.4 Using the Yellow Headform. When using the yellow headform, Figure 5-41 to test the M53, the SMALL headform should be used on the XSMALL, SMALL, and the MEDIUM headform should be used on the MEDIUM and LARGE masks.



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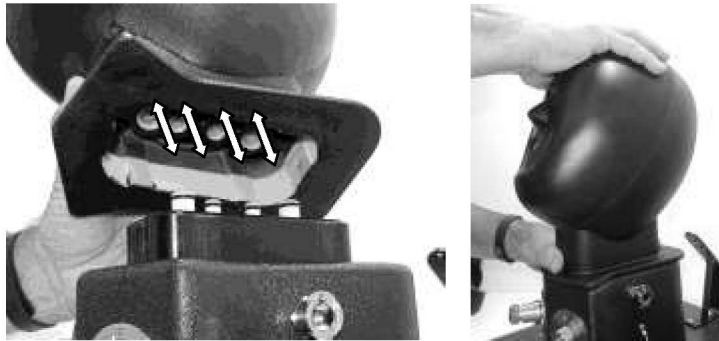
Figure 5-41. Yellow Headform

5.21 M53 MASK JSMLT PREPARATION.

The M53 mask JSMLT unpacking and setup procedures should be completed in accordance with Chapter 3 as supplemented below:

- a. Use the mask clips as follows:
 - (1) For the yellow headform, use the No. 2 stubby cross-tip screwdriver to remove the six (6) standard sized mask clips and replace them with six (6) mask clips.
 - (2) For the IFSTHA, use the No. 2 stubby cross-tip screwdriver to remove the six (6) standard sized mask clips.
- b. Install the headform as follows:
 - (1) When using the yellow headform to test the M53, the SMALL headform should be used on the XSMALL, SMALL, and the MEDIUM headform should be used on the MEDIUM and LARGE masks.
 - (2) To install the IFSTHA, Figure 5-42, proceed as follows:
 - (a) Center the headform over the pedestal with the face toward the front of the CU.
 - (b) Align the white fittings on the top of the pedestal with the holes in the headform.
 - (c) Press down on the headform until it is fully seated onto the pedestal.

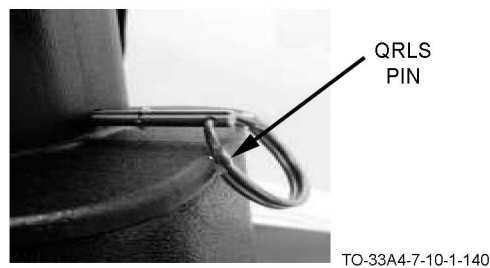
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Figure 5-42. Installing the IFSTHA

- c. Insert the QRLS pin (1) into the hole located at the rear of the IFSTHA until resistance is felt. The QRLS pin will appear to be partially inserted, Figure 5-43.



TO-33A4-7-10-1-140

Figure 5-43. Insertion of the QRLS Pin

- d. Remove the standard outlet valve test adapter and outlet valve retaining bolt in accordance with Paragraph 11.4.

NOTE

Over/under tightening the outlet valve hose may cause the Outlet Valve Test [VALVE] to fail.

- e. Install the M50 outlet valve hose to the pedestal by turning clockwise until hand-tight, Figure 5-44.

- f. Initialize the JSMLT in accordance with the instructions listed in Chapter 4 of the JSMLT Operator's Manual.



TO-33A4-7-10-1-141

Figure 5-44. Installing the M50 Outlet Valve Hose

5.22 M53 MASK PREPARATION.

Prior to starting any leakage or component isolation test, the operator should perform the following M53 mask preparatory actions:

- a. Conduct a visual inspection of the mask in accordance with appropriate technical guidance. Mask should be visually clean and serviceable prior to testing on the JSMLT.
- b. Remove and set aside the mask's filter canister.
- c. Screw the canister port plug into the mask's inlet port by turning clockwise until hand-tight.
- d. When using the small and medium headforms, loosen all head harness straps to allow maximum flexibility of the head harness when connecting the mask to the clips.
- e. Turn the drink tube lever of the mask into the "OPEN" position (rotated fully up) as shown in Figure 5-45.

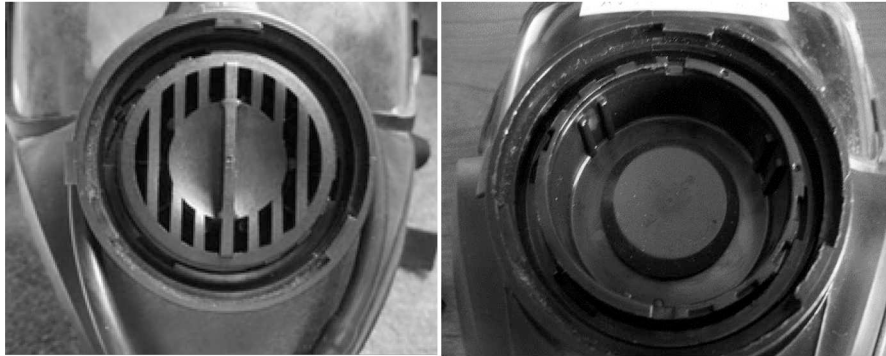


TO-33A4-7-10-1-142

Figure 5-45. Turning the Drink Selector to "OPEN" Position

- f. Turn the valve cassette assembly of the mask to the negative pressure position as shown in Figure 5-46.

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Figure 5-46. Turning the Valve Cassette Assembly to “OPEN” Position - Original (Left) and New (Right)

- g. Ensure that external components are removed from the protective mask prior to testing. It is not necessary to remove the head harness prior to testing.

5.23 ATTACHING THE M53 MASK.

- a. Install the M53 mask clips as follows:
 - (1) For the yellow headform, ensure that the mask clips are properly adjusted for the mask size being tested. Refer to Paragraph 11.12 for specific instructions.
 - (2) For the IFSTHA, proceed to Step b. Mask clips are not used for testing masks on the IFSTHA.
- b. Inspect the lint screen for debris. Clean as necessary.

NOTE

For sanitary reasons, users must discard cleaning cellulose sponges at the end of each mask testing day.

- c. Clean the mask seal area and peripheral seal on the headform with a cellulose sponge dampened with water.



Stretching the mask while attaching it to the headform may damage the mask and cause false failures during the mask leakage test.

NOTE

For SMALL (S) and EXTRA SMALL (XS) masks, it is necessary to compress the nose cup, Figure 5-47 against the test head. This will enable the operator to position the face seal of the mask over the inflatable peripheral seal as you secure it to the headform.

- d. Position the mask on the headform by placing it on the chin first.
- e. Install the mask clips with the following:
 - (1) For the yellow headform, use the No. 2 stubby cross-tip screwdriver to make any necessary adjustments to the mask clips.
 - (2) For the IFSTHA, proceed to Step i.

- f. Press down on the center of the facepiece, above the nosecup, while attaching the two brow (TOP) tabs to their corresponding mask clips on the top brackets of the headform pedestal.
- g. Keeping the mask centered on the headform and while still applying pressure over the nosecup, loosely attach the two cheek (BOTTOM) tabs to their corresponding mask clips on the bottom brackets of the headform pedestal.



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Figure 5-47. Compressing the Nosecup

- h. Attach the two temple (MIDDLE) tabs to their corresponding mask clips on the middle brackets of the headform pedestal. When attached, the tension on these two tabs should be the minimum necessary to keep them attached to the headform during the leakage test

NOTE

Ensure that the faceseal is not turned under, particularly in the temple tab area.

- i. Position the mask over and around the peripheral seal to ensure that the mask covers as much of the seal as possible and tighten the mask's straps.
- j. Attach the M53 Outlet Valve Plug/Adapter as shown in Figure 5-48.



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Figure 5-48. Attaching the M53 Outlet Valve Plug/Adapter

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5.24 M53 MASK LEAKAGE TESTING.

NOTE

ALWAYS remember to use a damp cellulose sponge to moisten the inner face seal of the M53 mask and the peripheral seal of the headform before EVERY mask leakage test. The purpose of this is to remove dust and debris that might interfere with the sealing surface and to simulate a small amount of sweat that is normal for mask wearers. The emphasis is “moisten” rather than wetting, Water should not be dripping down the headform or off the mask or sealing surfaces.

- a. Place the mask test shroud over the mask and hose, Figure 5-49
- b. The mask leakage procedures, Paragraph 5.5 through Paragraph 5.8 should be followed to conduct the Mask Leakage Test [MASK] on the M50/51. The mask testing failures flowcharts, Figure 5-8 through Figure 5-11 are also applicable.



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Figure 5-49. Placing the Mask Test Shroud Over the M53 Mask, Yellow Headform (Left) and IFSTHA (Right)

5.25 M53 MASK DRINK SYSTEM TESTING.

Three M53 mask drink system tests may be performed on the M53 protective mask. The tests, in sequential order, are the Drink Tube Flow Test [DRINK], the Drink Train Assembly Leakage Test, and the Drink Valve Seat Test. The M50 Drink Test Adapter is needed to conduct each test. The M50 Drink Test Adapter spacer ring is added and required only for the DRINK SEAT test. After the adapter(s) is attached to the M53's drink tube, the M50 adapter is plugged into the standard drink test port on the JSMLT headform pedestal. Once connected, each test must be conducted by following the procedures listed in the JSMLT Operator's Manual, Chapter 6.

- a. For the yellow headform, remove the mask from the JSMLT by uncoupling the mask tabs from the mask clips. For the IFSTHA, loosen the mask's straps and remove from headform.

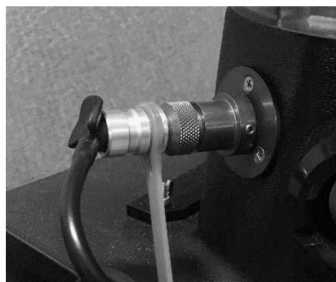
- b. Attach the M50 Drink Test Adapter into the blue JSMLT Drink Test Adapter as shown in Figure 5-50.



TO-33A4-7-10-1-147

Figure 5-50. Attaching the M50 Drink Test Adapter

- c. Ensure the drink tube is fully seated into the adapter as shown in Figure 5-51.



TO-33A4-7-10-1-148

Figure 5-51. Fully Seated Drink Tube

- d. Conduct the Drink Tube Flow Test [DRINK] and Drink Train Assembly Leakage Test in accordance with Paragraph 6.2 and Paragraph 6.3.
- e. Prior to conducting a Drink Valve Seat Test (DRINK TUBE/TURN OUT), you must slide the M50 Drink Test Adapter spacer ring over the tip and onto the mask's drink tube as shown in Figure 5-52.
- f. Seat the adapter ring flush with the back end of the drink tube's drink coupler. The spacer ring will prevent the plunger from depressing and opening the valve during the test, Figure 5-53

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- g. Conduct the Drink Valve Seat Test (DRINK TUBE/TURN OUT) in accordance with Paragraph 6.4.



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Figure 5-52. Attaching the Spacer Ring



TO-33A4-7-10-1-150

Figure 5-53. Seating the Spacer Ring on the Drink Tube

5.26 M53 MASK OUTLET VALVE TESTING.

- a. For the yellow headform, remove the M53 mask from the JSMLT by uncoupling the mask tabs from the mask clips. For the IFSTHA, loosen the mask's straps and remove from headform.
- b. Attach the M50 outlet valve hose to the snap connector on the M53 outlet valve plug/test adapter shown in Figure 5-54. Ensure the outlet valve plug/test adapter remains seated over and within the outlet valve assembly and that the hose snaps into place.

- c. Conduct the outlet valve isolation test by following the procedures listed in Paragraph 7.2 Step g through Step k. The outlet valve failures flowchart listed in Figure 7-2 are also applicable.



TO-33A4-7-10-1-151

Figure 5-54. Installing the M50 Outlet Valve Hose

5.27 TROUBLESHOOTING THE M53 MASK.

Refer to Table 5-8 for troubleshooting the M53 mask.

Table 5-8. Troubleshooting the M53 Mask

Issue	Resolution
Mask is not properly sealed to the headform's peripheral seal.	Visually inspect the applied mask to look for obvious gaps and breaks in seal. Re-seat the mask. Remember to use a damp cellulose sponge to moisten the headform seal and inner face seal of the mask.
M50 filter caps are not securely in place over filters causing air to pass into filters and create LOW VAC error after test. Leaks cannot be detected with probe.	Reattach and secure filter cap onto filter. The filter caps seal in the middle of the application (at maximum tightness). The filter caps will not seal if excessively clockwise or counter-clockwise.
M50 filter cap(s) gasket(s) are worn out of grooves causing air to pass into filters and create LOW VAC error after test. Leaks cannot be detected with probe,	Remove filter caps. Visually inspect gasket and ensure it is properly seated into the groove of the filter cap. Reattach and secure filter cap onto filter. Ensure gaskets are of the "X" variety and not O-rings. Spares are included in each JSMAK kit. (NOTE: There are two sealing surfaces on the "X" O-ring. Other O-rings in the JSMLT are just round, with one sealing surface.)
Mask tabs are over or under-tightened when attached to the mask clips.	Ensure minimal tension is applied to the middle (temple) tabs of the mask. In some cases, that may mean not attached at all OR it may mean they need to be tightened. Ensure that the seal area under the temple tabs IS NOT rolled under the facepiece causing a gap or breach in the seal.
Outlet valve/plug adapter may not be securely placed in outlet valve assembly. May manifest as LOW VAC error or FAIL with XXXX percent penetration displayed.	Remove and reattach the M50 outlet valve plug. Manually probing the failed mask will show increased aerosol penetration around the outlet valve area and will decrease to 0.0000 when the plug is properly secured.

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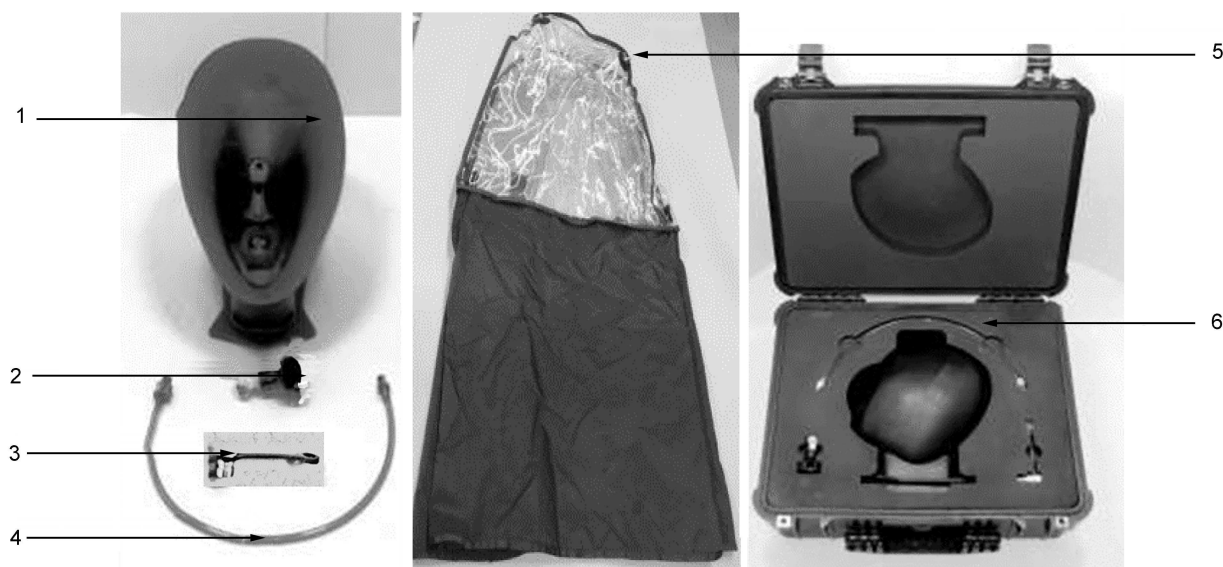
5.28 TESTING A JOINT SERVICE AIRCREW MASK, ROTARY WING (JSAM RW) (MPU-5).

NOTE

If needed in support of the MPU-5 mask for testing, see applicable service manuals: TM 3-4240-543-13&P (USA), TO 14P3-1-212 (USAF), and 13-1-6.10-3 Naval Air Systems Command (NAVAIR).

5.29 MPU-5 TEST ADAPTER.

In order to conduct an aerosol leakage test on the MPU-5, you must have a complete M46 JSMLT and the MPU-5 adapter kit for JSMLT. Refer to Figure 5-55 and Table 5-9.



TO-33A4-7-10-1-152

Figure 5-55. MPU-5 Adapter Kit

Table 5-9. MPU-5 Adapters

Index No.	Nomenclature	Description
1.	IFSTHA	Supports the testing of MPU-5 on the JSMLT.
2.	MPU-5 Outlet Valve Plug/Adapter	Used to plug the Joint Service Aircrew Mask (JSAM) exhalation valve assembly during the Mask Leakage Test [MASK] and isolates the exhalation valve assembly for component testing while in the valve test mode.
3.	M50 Outlet Valve Hose	Connects the MPU-5 outlet valve plug/adapter to the JSMLT test port.
4.	M50 Drink/Fit Test Adapter	Dual purpose interface between JSMLT NATO drink test adapter and MPU-5 drink coupler. Can be used for all drink mode testing and during fit test operation. Includes the attached spacer ring for Drink Valve Seat Tests.
5.	Extended Test Shroud	Test shroud for use with the IFSTHA.
6.	Pelican® Storage Case	For storing and safely shipping all components of the kit.

5.30 MPU-5 JSMLT PREPARATION.

The MPU-5 JSMLT unpacking and assembly procedures should be completed in accordance with Chapter 3.

5.30.1 Pressure Switch Adjustment.



Failure to ensure that the pressure switch has been adjusted on the JSMLT CU to 5.2 PSI could result in loss or damage of the equipment.

NOTE

Pressure switch adjustments must be performed by higher level maintenance.

Systems that have undergone the pressure switch adjustment will display a pressure switch sticker indicating "Ground and Aviation Masks" on the front of the unit as shown in Figure 5-56.



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Figure 5-56. Pressure Switch Sticker

5.30.2 Attaching the Headform. Refer to Figure 5-57.

- Center the headform over the pedestal with the face toward the front of the CU.
- Align the white fittings on the top of the pedestal with the holes in the headform.
- Press down on the headform until it is fully seated onto the pedestal

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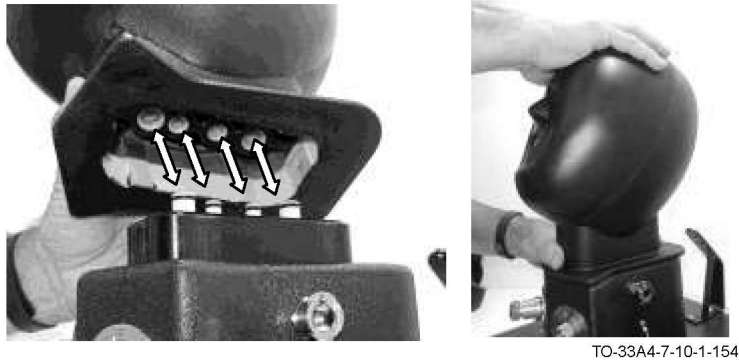
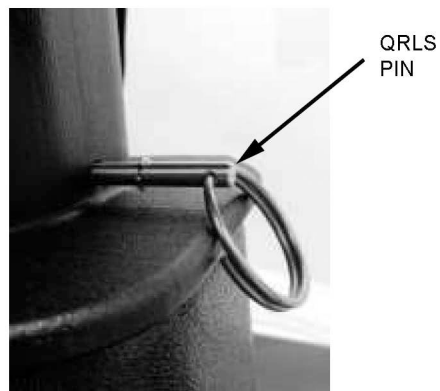


Figure 5-57. Installing the IFSTHA

NOTE

Insert the QRLS pin until resistance is felt. The QRLS pin will appear to only be partially inserted, Figure 5-58.

- d. Insert the QRLS pin (1) into the hole located at the rear of the IFSTHA.



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Figure 5-58. Inserting the QRLS Pin

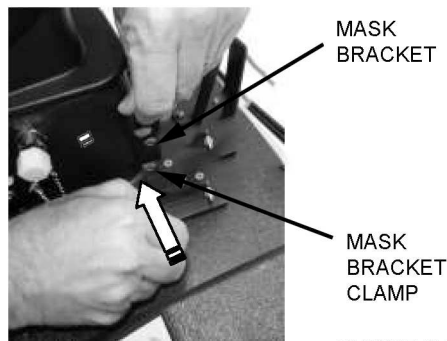
- e. Remove the forehead strap bracket using the No. 2 stubby cross-tip screwdriver to remove the two (2) cross-tipped screws that secure the forehead strap bracket. Set the forehead strap bracket aside, Figure 5-59.



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Figure 5-59. Removing the Forehead Strap Bracket

- f. Remove the mask brackets (4) by loosening the wing nuts that secure them to the mask bracket clamps and sliding them out from under their respective clamp. Set the mask brackets aside, Figure 5-60.



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Figure 5-60. Removing the Mask Bracket

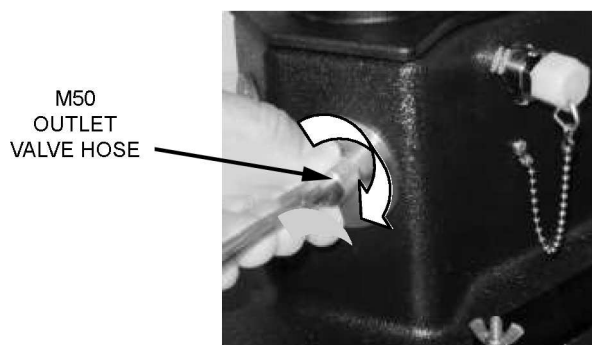
- g. Tighten the wing nuts, by turning clockwise until hand-tight, to secure the mask bracket clamps to the CU.
- h. Following the guidance in Paragraph 11.4, remove the outlet valve test adapter and its retaining bolt.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

NOTE

Over/under tightening the outlet valve hose may cause the outlet valve to fail.

- i. Connect the M50 outlet valve hose to the test pedestal by turning clockwise until hand tight, Figure 5-61.



TO-33A4-7-10-1-158

Figure 5-61. Connecting the M50 Outlet Valve Hose

- j. Unplug the hose test port plug by depressing the snap lock and pulling outward.
- k. Assemble the fit test shroud in accordance with Paragraph 3.5.4. Use the fit test shroud in place of the mask test shroud for aerosol setup and leakage testing.
- l. Secure the shoulder straps within the fit test shroud to their shortest length. This will allow the shroud to sit in place around the inflatable head and atop the CU.
- m. Insert the No. 2 rubber stopper into the top port of the inflatable head, Figure 5-62.



TO-33A4-7-10-1-159

Figure 5-62. Inserting the No. 2 Rubber Stopper

- n. Store all removed parts (forehead strap bracket, mask brackets, outlet valve test adapter and retaining bolt) in the JSMLT storage case.
- o. Initialize the JSMLT in accordance with the instructions listed in Chapter 4.

5.31 MPU-5 MASK PREPARATION.

Prior to testing the MPU-5, the following mask preparatory steps should be taken:

NOTE

A cellulose sponge dampened with clean water will be needed to properly conduct a leakage test. The test protocol that follows instructs the operator to dampen the IFSTHA and face seal of the mask to ensure that dust or debris does not obstruct the seal.

- a. Remove the MPU-5 outlet valve cover, Figure 5-63.



TO-33A4-7-10-1-160

Figure 5-63. Removing the MPU-5 Outlet Valve Cover

NOTE

When properly secured, the MPU-5 outlet valve plug/adapter will freely turn around the exhalation valve assembly.

- b. Attach the MPU-5 outlet valve plug/adapter: Ensure the flat edge of the plug/adapter is aligned in the 1 o'clock position when snug so it rests under the breathing hose when the mask is attached to the headform.
- c. Attach the hose test adapter to the 90 degree adapter at the end of the breathing hose, Figure 5-64.



TO-33A4-7-10-1-161

Figure 5-64. Attaching the Hose Test Adapter

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

5.32 COMPLETING THE MPU-5 MASK AEROSOL SETUP.

The MPU-5 mask aerosol setup, Figure 5-65 process detailed in Paragraph 5.3, should be followed to prepare for testing the MPU-5 with the following deviations:

- a. Use the inflatable test head in place of the standard (yellow) JSMLT IFSTHA.
- b. Use the fit test shroud in place of the mask test shroud.



TO-33A4-7-10-1-162

Figure 5-65. Mask Aerosol Setup Configuration

5.33 CONDUCTING THE MPU-5 M-ALL TEST CYCLE.

Attach the JSAM to the IFSTHA as follows:

- a. Disconnect the faceplate from the hood ring and set it aside, Figure 5-66.



TO-33A4-7-10-1-163

Figure 5-66. Removing the Faceplate From the Hood Ring

- b. Loosen the lower tensioner hood neck strap on the hood, Figure 5-67.



TO-33A4-7-10-1-164

Figure 5-67. Loosening the Hood Neck Straps

- c. Pull the hood assembly over the front of the hood ring, Figure 5-68.



TO-33A4-7-10-1-165

Figure 5-68. Pulling the Hood Assembly Over the Hood Ring

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

- d. Flip the harness assembly over the front of the hood ring and hood, Figure 5-69.



TO-33A4-7-10-1-166

Figure 5-69. Flipping the Harness Assembly Over the Hood Ring and Hood

NOTE

For sanitary reasons, users must discard cleaning cellulose sponges at the end of each mask testing day.

- e. Using a cellulose sponge, dampened with clean water, wipe the IFSTHA's facial area and hood face seal to remove any dust or debris that may be present, Figure 5-70.



TO-33A4-7-10-1-167

Figure 5-70. Using the Dampened Cellulose Sponge

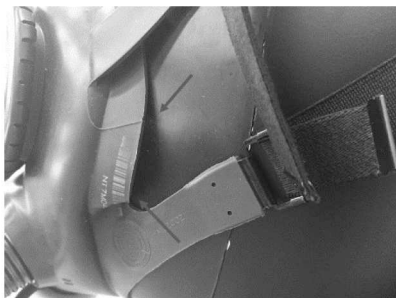
- f. Place the chin cup of the hood ring's inner seal onto the chin portion of the IFSTHA and carefully center the rest of the hood ring against the IFSTHA. Ensure the hood ring does not block the top port of the IFSTHA.
- g. While holding the hood ring in place with one hand, pull the harness assembly over the back of the IFSTHA, centering it with the other hand, Figure 5-71.



TO-33A4-7-10-1-168

Figure 5-71. Placing the Mask on the IFSTHA

- h. Visually check the seal of the mask to ensure it is not buckled and is smoothly in contact with the surface of the IFSTHA, Figure 5-72.



TO-33A4-7-10-1-169

Figure 5-72. Mask Buckling

- i. Evenly tighten both sides of the harness assembly webbing strap until snug, Figure 5-73.



TO-33A4-7-10-1-170

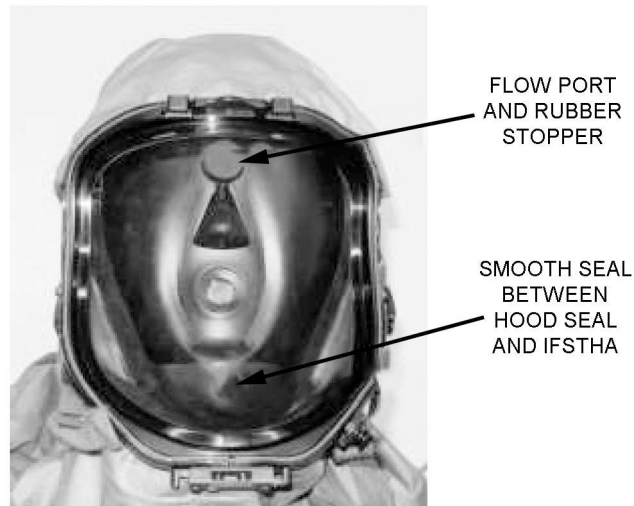
Figure 5-73. Tightening the Harness Assembly Webbing Strap

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

NOTE

The best seal will be achieved if the flow port of the IFSTHA and rubber stopper are visible when the hood ring is attached, Figure 5-74.

- j. Pull the hood assembly over the top of the IFSTHA and adjust it, as needed, to ensure smooth contact between the hood seal and the headform.



TO-33A4-7-10-1-171

Figure 5-74. Placement of the Hood Ring

- k. Attach the faceplate to the hood ring, Figure 5-75.



TO-33A4-7-10-1-172

Figure 5-75. Attaching the Faceplate to the Hood Ring

- l. Double check the connection of the faceplate by squeezing the top connection upwards from the faceplate into the hood ring, Figure 5-76.

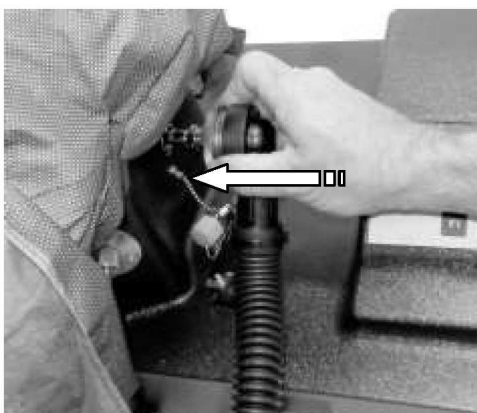


DOUBLE CHECK THE
FACEPLATE
CONNECTION

TO-33A4-7-10-1-173

Figure 5-76. Double Checking the Faceplate Connection

- m. Connect the hose test adapter into the host test port on the right side of the test pedestal, Figure 5-77.



TO-33A4-7-10-1-174

Figure 5-77. Connecting the Hose

5.34 CONDUCTING THE MPU-5 MASK LEAKAGE TEST.

MASK test procedures detailed in Paragraph 5.5 through Paragraph 5.8 and the flowcharts, Figure 5-8 through Figure 5-11, should be followed for testing the JSAM with the following deviations:

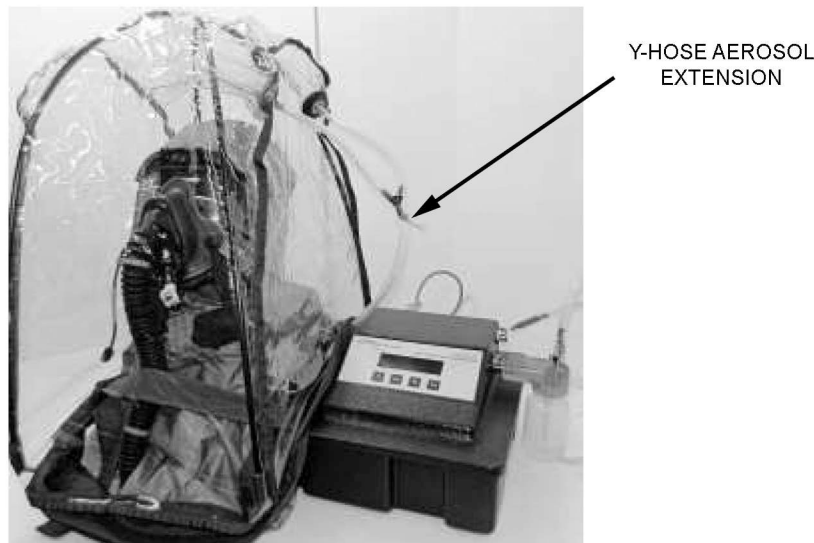
NOTE

Ensure that the drink train handle shaft is in the "OPEN" position before placing the fit test shroud over the mask and conducting the test.

- a. Place the fit test shroud over the mask and IFSTHA with the Y-hose aerosol extension, Figure 5-78 entering from the operator's right side. Ensure the fit test shroud extends to the base of the headform pedestal and completely encases the mask and hose.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

- b. Begin the M-ALL test process as described in Paragraph 5.5. If the leakage test successfully passes, the operator should move on to the drink system tests. If the test fails, the operator should troubleshoot according to the instructions in Chapter 12.



TO-33A4-7-10-1-175

Figure 5-78. Mask Test Configuration

5.34.1 Manual Probing of the Mask.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

Manual probing, Figure 5-79 should be used for a percent leakage failure and a readjustment of the mask should be conducted if deemed necessary. Follow the instructions listed in Paragraph 5.7.

- a. When probing, it is suggested that the following areas be probed at the operator's discretion:
- Faceplate to hood ring perimeter
 - Hose interface area on front of mask
 - End of hose at canister port plug
 - Exhalation valve assembly and remaining exterior area on the faceplate
 - Periphery of face seal under the hood assembly
- b. It is recommended that the operator start on the bottom portion of the faceplate under the hood before probing near the top of the IFSTHA.
- c. The aerosol probe hose must be snaked carefully between the hood assembly and mask periphery at the top of the head to avoid accidentally breaking the seal while probing.



TO-33A4-7-10-1-176

Figure 5-79. Examples of Probing the Mask (Clockwise From Top Left: Faceplate, Outlet Valve Assembly, Under the Hood, and Hose Port)

5.35 CONDUCTING THE MPU-5 DRINK SYSTEMS TESTS.

Three (3) drink system tests may be performed on the MPU-5. The tests, in sequential order, are the DRINK FLOW, the DRINK TRAIN, and the DRINK SEAT. The M50 Drink/Fit Test Adapter is required to conduct each test. The M50 Drink Test Adapter spacer ring is added and required only for the DRINK SEAT test. The M50 Drink/Fit Test Adapter plugs directly into the standard drink test port on the JSMLT test pedestal. Once connected, each test must be conducted by following the procedures listed in Chapter 6.

- a. Open the drink valve.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

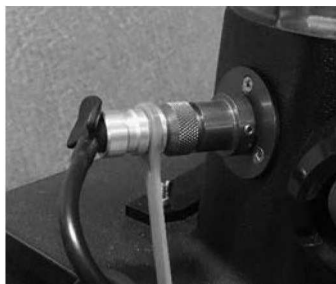
- b. Plug the M50 Drink/Fit Test Adapter into the blue JSMLT Drink Test Adapter, Figure 5-80.



TO-33A4-7-10-1-177

Figure 5-80. Plugging the M50 Drink/Fit Test Adapter In

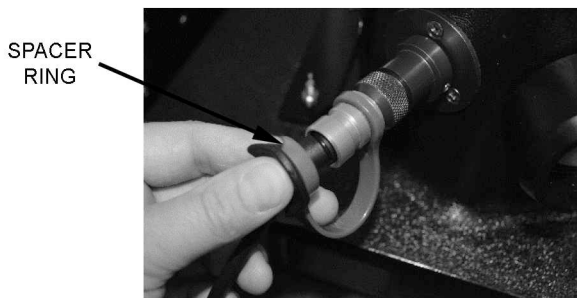
- c. Insert the drink coupler into the M50 Drink/Fit Test Adapter until it is fully seated, Figure 5-81.



TO-33A4-7-10-1-178

Figure 5-81. Inserting the Drink Coupler Into the M50 Drink/Fit Test Adapter

- d. Conduct the Drink Tube Flow Test (DRINK TUBE/TURN IN) and Drink Train Assembly Leakage Test in accordance with Paragraph 6.2 and Paragraph 6.3.
- e. Prior to conducting a drink valve seat (DRINK TUBE/TURN OUT) test, you must slide the M50 Drink Test Adapter spacer ring over the end of the drink coupler until it rests against the base of the drink coupler, Figure 5-82.



TO-33A4-7-10-1-179

Figure 5-82. Attaching the M50 Drink Test Adapter Spacer Ring

- f. Insert the drink coupler until it is seated into the M50 Drink/Fit Test Adapter and the spacer ring prevents further penetration, Figure 5-83.



TO-33A4-7-10-1-180

Figure 5-83. Spacer Ring on Drink Coupler

- g. Conduct the drink valve seat test (DRINK TUBE/TURN OUT) test in accordance with Paragraph 6.4. The drink testing failures flowchart, Figure 6-1 is also applicable.
- h. At the completion of all drink testing, disconnect the M50 Drink/Fit Test Adapter from the JSMLT Drink Test Adapter.

5.36 MPU-5 OUTLET VALVE TESTING.

The MPU-5 outlet valve testing should be conducted in accordance with Chapter 7.

- a. The JSAM outlet valve plug/adaptor must be connected to the M50 outlet valve hose prior to starting this test.

NOTE

When properly secured, the JSAM outlet valve plug/adaptor will freely turn around the exhalation valve assembly.

- b. Attach the JSAM MPU-5 outlet valve plug/adaptor to the mask's exhalation valve assembly by aligning the flat end of the rubber outlet valve adapter underneath the breathing hose and pressing the adapter onto the exhalation valve assembly, Figure 5-84.
- c. Ensure the exhalation valve assembly is flush with the outlet valve adapter around the entire periphery of the assembly.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-181

Figure 5-84. Attaching the MPU-5 Outlet Valve Plug/Adapter

- d. Externally support the mask with your free hand during the Outlet Valve Test [VALVE], Figure 5-85.



TO-33A4-7-10-1-182

Figure 5-85. Supporting the Mask During the Outlet Valve Test [VALVE]

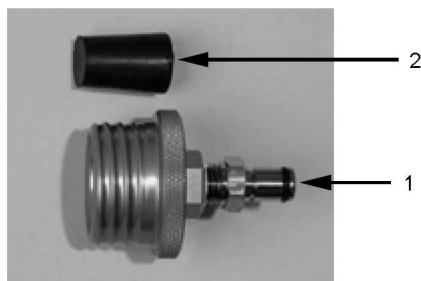
5.37 TESTING A MASK WITH AN ATTACHED HOSE.

5.38 HOSE TEST ADAPTERS KIT.

NOTE

JSMLT testing of the M51 mask hoses is not required.

Refer to Figure 5-86 and Table 5-10 for the hose test adapters kit.



TO-33A4-7-10-1-093

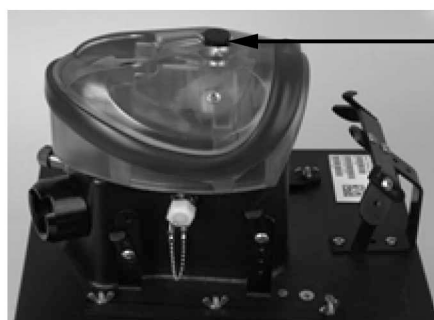
Figure 5-86. Hose Test Adapters Kit**Table 5-10. Hose Test Adapters Kit**

Index No.	Nomenclature	Description
1.	Hose Test Adapter (stored in JSMLT case)	Used to connect M42 and M45 hoses to the hose test port on the JSMLT headform pedestal.
2.	No. 2 Rubber Stopper (stored in JSMLT case)	Used to plug the air flow port of the headform so that air flow is redirected through the hose test port during leakage testing.

5.39 APPLYING THE MASK AND HOSE.**NOTE**

Test operators should check/adjust the back pressure settings in accordance with Paragraph 11.10 prior to conducting the first mask/hose leakage test. If a back pressure adjustment is necessary, ensure that a known good mask and hose are applied to the headform in lieu of the mask passing tube.

- a. Plug the rear headform port with the No. 2 rubber stopper, Figure 5-87. Ensure the stopper is seated fully into the port or the test resistance may be affected.



NO. 2 RUBBER STOPPER IN REAR HEADFORM PORT



TO-33A4-7-10-1-094

Figure 5-87. Installed Rubber Stopper, Yellow Headform (Left) and IFSTHA (Right)

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

NOTE

For sanitary reasons, users must discard cleaning cellulose sponges at the end of each mask testing day.

- b. Ensure that external components (hood, second skin, eyelens outserts, outlet valve cover, and canister), are removed from the protective mask prior to testing. It is not necessary to remove the head harness prior to testing.
- c. Inspect the lint screen for debris. Clean as necessary.
- d. Clean the mask seal area and peripheral seal on the headform with a cellulose sponge dampened with water.
- e. Position the mask on the headform and pull the chin down just over the peripheral seal in accordance with Paragraph 5.4. If using the IFSTHA, skip Step f through Step h and proceed to Step i.

NOTE

If the head harness is attached to the protective mask, fully extend the harness straps and position the head harness to the rear of the headform.

- f. Hold down the chin of the mask while fastening the two temple tabs to their corresponding mask clips on the middle brackets of the headform pedestal.
- g. Fasten the two cheek tabs to their corresponding mask clips on the bottom brackets of the headform pedestal.
- h. Fasten the two forehead tabs to their corresponding mask clips on the top brackets of the headform pedestal.
- i. Screw the hose test adapter onto the mask hose.
- j. While depressing the snap-locking tab, remove the hose test adapter plug from the connection port and insert the mask hose test adapter, Figure 5-88.



TO-33A4-7-10-1-095

Figure 5-88. Attaching the Mask Hose Test Adapter

- k. Retract the plunger on the outlet valve plug and slide it over the outlet valve housing, from the bottom upwards. Then, release the plunger to seal the valve.
- l. Double-check the tightness of the hose test adapter onto the mask hose. Ensure the adapter did not become loose when it was plugged into the hose test port.
- m. Place the mask test shroud over the mask and hose. Ensure the hose remains uninked and completely inside the mask test shroud, Figure 5-89



Figure 5-89. Test Shroud Over Mask with Hose, Yellow Headform (Left) and IFSTHA (Right)

5.40 CONDUCTING A MASK TEST.

- a. To begin the mask test, press <F4> START.

APPLY MASK
 SET ESC START

- | | |
|-------------------------|---|
| <F1> SET | DISPLAYS THE [AEROSOL SETUP] MENU. REFER TO PARAGRAPH 5.3, MASK AEROSOL SETUP. |
| <F3> ESC | RETURNS THE OPERATOR TO THE [SELECT TEST] MENU. REFER TO PARAGRAPH 4.4, SELECTING A TEST. |
| <F4> START | START THE MASK TEST PROCEDURE. |

- b. Wait approximately 10 seconds while the peripheral seal inflates. The following steps are then completed automatically by the JSMLT:

- | | |
|-----------|--|
| [SETTING] | Indicates that the system is setting the test flow rate. |
| [LOADING] | Indicates that the system is applying aerosol under the test shroud. |
| [TESTING] | Indicates that the system is measuring the aerosol leakage through the mask. |

- c. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

[PASSED]

ALLOW YOU TO CONTINUE WITH A NEW MASK TEST. IF EITHER THE M ALL OR ALL TEST WAS SELECTED, THEN TESTING CONTINUES ON TO THE DRINK TUBE TEST.

PASSED 0.0001

[FAILED]

AUTOMATICALLY STOPS TESTING. A STEADY TONE INDICATES FAILURE AND A PERCENTAGE OF PENETRATION (I.E.: 3.44%) IS DISPLAYED.

FAILED 3.44%
 CONT

[FAILED VAC]

AUTOMATICALLY STOPS TESTING. A STEADY TONE INDICATES FAILURE AND A HIGH VAC MESSAGE IS DISPLAYED.

FAILED HIGH VAC
 CONT

<F4> CONT

PROCEEDS TO THE [PAUSED] SCREEN FOR FURTHER TESTING OPTIONS AND STOPS THE ALARM. REFER TO PARAGRAPH 5.48, MASK PAUSED, FOR FURTHER OPTIONS.

- d. If [FAILED] or [FAILED VAC] (HIGH or LOW) appears, press <F4> CONT to continue and proceed to Paragraph 5.6 for further options.

5.41 MASK FAILURE.

The following functions are displayed after a mask failure. If a mask fails, see Figure 5-8 through Figure 5-11, Mask Test Failures Flowcharts for guidance on which steps to perform next.



<F1> RES	RESUMES NORMAL TESTING.
<F2> PROB	ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK.
<F3> REJ	REJECTS THE MASK, DEFLATES THE SEAL, AND RETURNS TO THE APPLY MASK SCREEN.
<F4> SEAL	DEFLATES THE PERIPHERAL SEAL. USE IF MASK WAS APPLIED INCORRECTLY AND ADJUSTMENTS NEED TO BE MADE.

5.42 PROBE MODE.

The probe mode is used to help isolate the location of a leak, Figure 5-90.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

NOTE

When the failure set point is exceeded in the probe mode, a beep can be heard. The beep sounds only when the failure threshold (0.0030) is exceeded. When probing, the threshold may not be obtained since a lower concentration of aerosol is being applied.

- To begin probing, select <F2> PROB from the [PAUSED] menu and the following screen will appear:

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



<F1> HIGH

SWITCHES FROM NORMAL AEROSOL CONCENTRATION TO HIGH AEROSOL CONCENTRATION TO HELP ISOLATE SMALL LEAKS. AFTER [HIGH] IS SELECTED, THE SCREEN WILL DISPLAY [NORM] IN THE <F1> POSITION. SELECTING [NORM] RETURNS THE USER TO THE NORMAL AEROSOL CONCENTRATION FOR TESTING.

<F3> PAUSE

ENDS THE PROBE TEST AND RETURNS TO THE [PAUSED] SCREEN FOR FURTHER OPTIONS. REFER TO PARAGRAPH 5.6, MASK PAUSED, FOR FURTHER OPTIONS.

<F4> REJ

REJECTS THE CURRENT MASK TEST AND PROMPTS THE OPERATOR TO CONFIRM THE REJECTION. CONFIRMING THE REJECTION BY PRESSING <F4>REJ RETURNS THE JSMLT TO THE [APPLY MASK] SCREEN. REFER TO PARAGRAPH 5.5, CONDUCTING A TEST.

- b. Remove the test shroud from the headform, and remove the aerosol probe hose from the test shroud.



NEVER plug or block the probe end (blue aluminum) of the aerosol probe hose while the aerosol generator is bubbling. Blocking the flow of aerosol may result in damage to internal components of the JSMLT.

- c. Hold the aerosol probe hose away from the mask and hose until the numbers on the screen appear to stabilize at their lowest reading.

NOTE

When probing a mask, it is recommended that the hand not holding the probe be cupped around the area of the mask being checked. This will prevent excess aerosol from drifting over the mask, possibly leading to false readings.

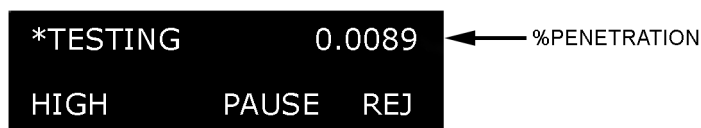
- d. Slowly pass the aerosol probe hose close to the mask and hose surfaces. All potential areas for leaks should be probed (peripheral seal, lenses, hose connections, recently replaced parts, etc.). The amount of time spent probing a leak is at the operator's discretion. An increase in the value displayed on the screen indicates a probable mask or hose leak in the area being probed.



TO-33A4-7-10-1-097

Figure 5-90. Using the Probe

- e. When a suspected leak is isolated, select <F3> PAUSE, then select <F1> RES or <F3> REJ from the [PAUSED] screen.



5.43 RESUME TESTING.

Resume testing from the [PAUSED] screen by pressing the <F1> RES key.

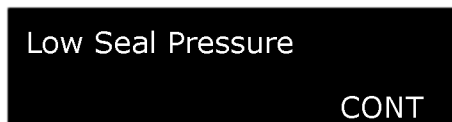
AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



- | | |
|-----------------------------|---|
| <F1> RES | ENDS THE PROBE TEST AND RETURNS TO THE [APPLY MASK] SCREEN. |
| <F2> PROB | ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK. |
| <F3> REJ | REJECTS THE MASK, DEFLATES THE SEAL, AND DISPLAYS THE [REJECTED] SCREEN. PRESSING<F4>CONT RETURNS YOU TO THE [APPLY MASK] SCREEN. |
| <F4> DEFL SEAL | DEFLATES THE PERIPHERAL SEAL. USE IF MASK WAS APPLIED INCORRECTLY AND ADJUSTMENTS NEED TO BE MADE. |

NOTE

If the peripheral seal loses pressure at any time during the [PAUSED] mode, pressing the <F2> PROB key will prompt the display of a [Low Seal Pressure] screen. When the “Low Seal Pressure” is displayed, pressing the <F4> CONT key takes you back to the [PAUSED] screen.



- | | |
|------------------------|---------------------------------|
| <F4> CONT | RETURNS TO THE [PAUSED] SCREEN. |
|------------------------|---------------------------------|

NOTE

If the “Low Seal Pressure” screen is displayed, the operator should select <F4> INFL SEAL to reinflate the peripheral seal. This will redirect you to the <PAUSED> screen. Pressing the <F2> PROB key will allow the operator to resume probing for the leak.



- <F1> RES** ENDS THE PROBE TEST AND RETURNS TO THE [APPLY MASK] SCREEN.
- <F2> PROB** ALLOWS THE APPLICATION OF AEROSOL TO THE MASK, USING THE PROBE TO HELP ISOLATE THE LEAK.
- <F3> REJ** REJECTS THE MASK, DEFLATES THE SEAL, AND DISPLAYS THE [REJECTED] SCREEN. PRESSING <F4>CONT RETURNS YOU TO THE [APPLY MASK] SCREEN.
- <F4> INFL SEAL** RE-INFLATES THE PERIPHERAL SEAL AFTER A LOW SEAL PRESSURE FAULT. ALLOWS USER TO REATTEMPT MASK PROBING OR OTHER LEAKAGE TESTING.

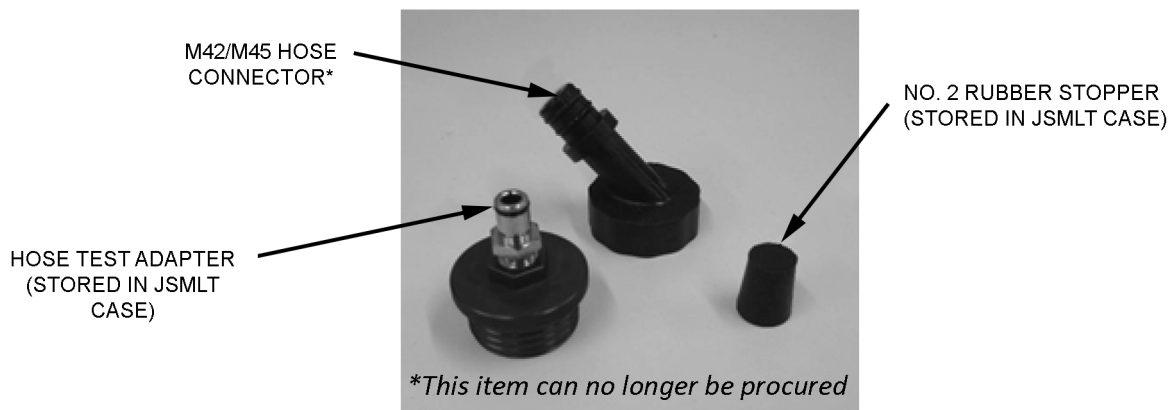
NOTE

Repeated LOW SEAL PRESSURE fault message require troubleshooting. Refer to Paragraph 12.6.6 for troubleshooting recommendations.

5.44 TESTING M40 SERIES MASK HOSES.

5.45 M40 SERIES MASK HOSE TEST ADAPTERS.

The M40 series mask hose test adapters are shown in Figure 5-91 and described in Table 5-11 below.



TO-33A4-7-10-1-098

Figure 5-91. M40 Series Mask Hose Test Adapters

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

Table 5-11. M40 Series Mask Hose Test Adapters

Nomenclature	Description
M40 Series Hose Connector	Connects M42 and M45 hoses directly into the JSMLT headform vacuum port for leakage testing. (NOTE: this item is no longer procurable.)
Hose Test Adapter (stored in JSMLT case)	Used to connect M42 and M45 hoses to the hose test port on the JSMLT headform pedestal.
No. 2 Rubber Stopper (stored in JSMLT case)	Used to plug the air flow port of the headform so that air flow is redirected through the hose test port during leakage testing.

5.46 M40 SERIES MASK HOSES JSMLT PREPARATION.

NOTE

Test operators should check/adjust the back pressure settings in accordance with Paragraph 11.10 prior to conducting the first hose leakage test. If a back pressure adjustment is necessary, ensure a known good hose is applied to the headform in lieu of the mask passing tube.

The JSMLT unpacking and setup procedures should be completed in accordance with Chapter 3

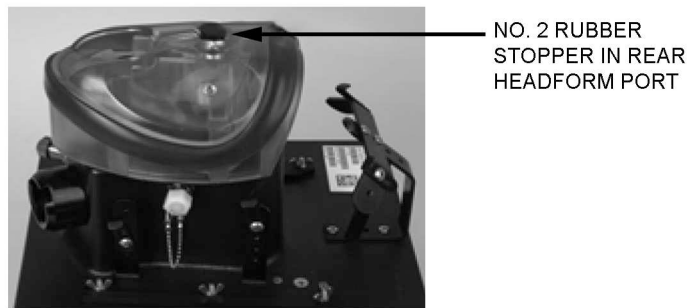
- a. Remove the mask test shroud.
- b. Using the 1/8 inch flat tip screwdriver, carefully remove the lint screen from the headform as shown in Figure 5-92.



TO-33A4-7-10-1-099

Figure 5-92. Removal of the Lint Screen, Yellow Headform (Left) and IFSTHA (Right)

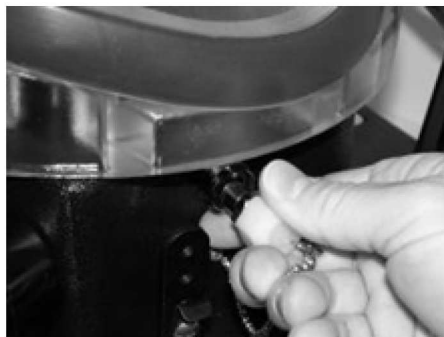
- c. Plug the rear headform port with the No. 2 rubber stopper as shown in Figure 5-93. Ensure the No. 2 rubber stopper is seated fully into the port or the test resistance may be affected.



TO-33A4-7-10-1-100

Figure 5-93. Installation of the No. 2 Rubber Stopper, Yellow Headform (Left) and IFSTHA (Right)

- d. While depressing the snap-locking tab, remove the hose test port plug from the connection port as shown in Figure 5-94.



TO-33A4-7-10-1-101

Figure 5-94. Removal of the Hose Test Port Plug

5.47 PREPARING THE M40 SERIES MASK HOSES.

Prior to starting any leakage or component isolation test, the operator should perform the following hose preparatory actions:

- a. Conduct a visual inspection of the hose in accordance with appropriate technical guidance. The hose should be visually clean and serviceable prior to testing on the JSMLT.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

- b. Check the canister end of the hose to ensure a gasket is in place as shown in Figure 5-95.



TO-33A4-7-10-1-102

Figure 5-95. Gasket in Canister End of Hose

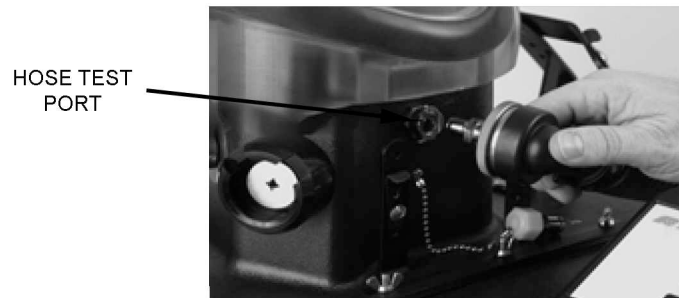
- c. Screw the hose test adapter onto the canister end of the hose as shown in Figure 5-96.



TO-33A4-7-10-1-103

Figure 5-96. Attaching the Hose Test Adapter

- d. Plug the JSMLT hose test adapter (and hose), into the hose test port on the right side of the JSMLT headform pedestal as shown in Figure 5-97.
- e. Double-check the tightness of the hose test adapter onto the mask hose. Ensure the adapter did not become loose when it was plugged into the hose test port.



TO-33A4-7-10-1-104

Figure 5-97. Plugging the Hose Test Adapter Into the Hose Test Port

- f. Check the M40 series hose connector to ensure a gasket is in place as shown in Figure 5-98.



TO-33A4-7-10-1-105

Figure 5-98. Checking the M40 Series Hose Connector Gasket

- g. Connect the hose to the M40 series hose connector as shown in Figure 5-99.



TO-33A4-7-10-1-106

Figure 5-99. Connecting the Hose to the M40 Series Hose Connector

- h. Plug the M40 series hose connector into the vacuum port of the headform as shown in Figure 5-100.



TO-33A4-7-10-1-107

Figure 5-100. Plugging the M40 Series Hose Connector Into the Vacuum Port

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

- i. Place the mask test shroud over the test head and hose. Ensure the hose remains free of kinks and completely encased by the mask test shroud as shown in Figure 5-101.



TO-33A4-7-10-1-108

Figure 5-101. Placing the Mask Test Shroud Over the Test Head Hose

5.48 CONDUCTING A M40 SERIES MASK HOSE TEST.

The M40 series mask hose testing procedures listed in Paragraph 5.40 through Paragraph 5.43 should be followed to conduct the leakage test on each hose. The mask testing failures flowcharts listed in Figure 5-9 and Figure 5-11 are also applicable.

5.49 TESTING A JOINT SERVICE AIRCREW MASK-JOINT STRIKE FIGHTER (JSAM-JSF).

Setup and test procedures specific for the JSAM-JSF Mask can be found in JSF Manual Specification Number MD 5668-00103.

CHAPTER 6

DRINK TUBE SYSTEM TESTING

6.1 TESTING THE DRINK TUBE SYSTEM.

This chapter covers the procedures necessary to complete the drink tube system testing.

NOTE

The blue drink tube test adapter installed on the Joint Service Mask Leakage Tester (JSMLT) headform pedestal is designed to test North Atlantic Treaty Organization (NATO) standard-designed drink connectors. Drink/fit test adapters for the M50/51, M53, and MPU-5 masks are contained within the Joint Service Mask Adapter Kit (JS-MAK) and will connect to the blue drink test adapter in accordance with Paragraph 5.11 through Paragraph 5.19, Paragraph 5.20 through Paragraph 5.27 and Paragraph 5.28 through Paragraph 5.36.

6.2 DRINK TUBE FLOW TEST (DRINK TUBE/TURN IN).

The drink tube flow test, Figure 6-1, utilizes air pressure to test the drinking system for blockage.

DRINK TUBE/TURN IN
 ESC START

<F3> ESC

RETURNS THE JSMLT TO THE [SELECT TEST] SCREEN.

<F4> START

BEGINS THE DRINK TUBE FLOW TEST.

- a. If installed, remove the mask test shroud from the headform.



TO-33A4-7-10-1-045

Figure 6-1. Drink Tube Flow Test Setup

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

- b. Ensure the drink tube adapter is turned fully counterclockwise until it stops in the (“OUT” position).
- c. Insert the drink coupler to be tested into the drink tube adapter until it locks in place.
- d. Turn the drink tube adapter fully clockwise until it stops in the (“IN” position).
- e. Press <F4> START. The following step is then completed automatically by the JSMLT:

[FLOW TEST] Signifies that the system is reading the resistance of the test.

- f. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

[PASSED]

ALLOWS YOU TO CONTINUE TESTING. THE TEST AUTOMATICALLY ADVANCES TO THE DRINK TRAIN TEST. REFER TO PARAGRAPH 6.3, DRINK TRAIN ASSEMBLY LEAKAGE TEST, FOR FURTHER INSTRUCTIONS.

PASSED

[FAILED]

AUTOMATICALLY STOPS TESTING; A STEADY TONE INDICATES FAILURE.

FAILED

CONT

<F4> CONT

PROCEEDS TO [PAUSED] SCREEN.

PAUSED

RES

REJ

<F2> RES

RETURNS TO DRINK TUBE FLOW TEST SCREEN. REVERTS TO THE BEGINNING OF THIS TEST. THE OPERATOR MAY THEN CONDUCT A RE-TEST OF THE CONNECTED DRINK TUBE OR TEST A DIFFERENT DRINK TUBE.

<F3> REJ

PROCEEDS TO [REJECTED] SCREEN.

REJECTED

CONT

- g. If failed, press <F4> CONT to continue and refer to the flowchart in Figure 6-3 for further instructions.

6.3 DRINK TRAIN ASSEMBLY LEAKAGE TEST.

The Drink Train Assembly Leakage Test utilizes air pressure to test the entire drink train for leakage. The internal drink tube must be plugged with the Quick-Release Locking System (QRLS) pin prior to starting this test.

TEST DRINK TRAIN?

YES NO

<F1> YES

PROCEEDS TO THE [PLUG TRAIN] SCREEN.

<F2> NO

SKIPS THE DRINK TRAIN TEST AND CONTINUES TO THE DRINK VALVE SEAT TEST.

- a. Select either <F1> YES or <F2> NO.

PLUG TRAIN

CONT

- b. During the drink train portion of the test cycle, the drink tube must be plugged with the QRLS pin, Figure 6-2 inside the mask to prevent airflow.



TO-33A4-7-10-1-046

Figure 6-2. Plugging the Drink Tube with the QRLS Pin

NOTE

Make sure that the drink tube adapter is rotated fully clockwise before continuing.

- c. Press <F4> CONT to run the test. The following step is then completed automatically by the JSMLT:

[D-TRAIN TEST] Indicates that the system is reading the airflow of the test.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

- d. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

[PASSED]

ALLOWS YOU TO CONTINUE TESTING. THE TEST AUTOMATICALLY MOVES TO THE DRINK SEAT TEST. REMOVE THE QRLS PIN AND REFER TO PARAGRAPH 6.4, DRINK VALVE SEAT TEST, FOR FURTHER INSTRUCTIONS.

PASSED

[FAILED]

AUTOMATICALLY STOPS TESTING; A STEADY TONE INDICATES FAILURE.

FAILED

CONT

<F4> CONT

PROCEEDS TO [PAUSED] SCREEN.

PAUSED

RES

REJ

<F2> RES

RETURNS TO DRINK TUBE FLOW TEST SCREEN. REFER TO PARAGRAPH 6.2 TUBE FLOW TEST, FOR FURTHER INSTRUCTIONS.

<F3> REJ

PROCEEDS TO REJECTED SCREEN.

REJECTED

CONT

- e. If failed, press <F4> CONT to continue and refer to the flowchart in Figure 6-3 for further instructions.
 f. Remove the QRLS pin from the internal drink tube.

6.4 DRINK VALVE SEAT TEST (DRINK TUBE/TURN OUT).

The Drink Valve Seat Test utilizes air pressure to test for leaks at the drink valve seat while the valve is in its “CLOSED” position.



DRINK TUBE/TURN OUT

CONT

<F4> CONT

STARTS THE DRINK VALVE SEAT TEST.

- a. Turn the drink tube adapter fully counterclockwise to the (“OUT” position) until it stops.
- b. Press <F4>. The following step is then completed automatically by the JSMLT:

[SEAT TEST] Indicates that the system is reading the airflow of the test.

- c. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

[PASSED]

ALLOWS YOU TO CONTINUE TESTING. IF A M ALL OR ALL TEST WAS SELECTED, PROCEED TO CHAPTER 7, OUTLET VALVE TEST. IF A DRINK TEST WAS SELECTED, PROCEED TO PARAGRAPH 6.2, DRINK TUBE FLOW TEST.



PASSED

CONT

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

[FAILED]

AUTOMATICALLY STOPS TESTING; A STEADY TONE INDICATES FAILURE.

FAILED

CONT

<F4> CONT

PROCEEDS TO [PAUSED] SCREEN.

PAUSED

RES

REJ

<F2> RES

RETURNS TO DRINK TUBE FLOW TEST SCREEN. REFER TO PARAGRAPH 6.2,
DRINK TUBE FLOW TEST, FOR FURTHER INSTRUCTIONS.

<F3> REJ

PROCEED TO [REJECTED] SCREEN.

REJECTED

CONT

- d. Press <F4> to continue and refer to Paragraph 6.5.
- e. If the drink system test was completed successfully, the following screen will be shown (dependent on test mode):

IF TESTING IN THE DRINK MODE:



<F3> ESC RETURNS TO THE [SELECT TEST] SCREEN.

<F4> START BEGINS ANOTHER DRINK TUBE FLOW TEST.

IF TESTING IN M ALL OR ALL MODE:



<F3> ESC RETURNS TO THE [VALVE TEST] SCREEN. REFER TO CHAPTER 7, OUTLET VALVE TEST, FOR FURTHER INSTRUCTIONS.



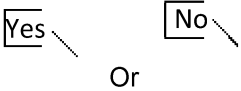
<F4> START BEGINS OUTLET VALVE TEST PROCEDURE.

- f. When the drink tube testing is complete, disconnect the protective drink coupler from the drink tube adapter.

6.5 DRINK TESTING FAILURES FLOWCHART.

The symbols in Table 6-1 are used in Figure 6-3.

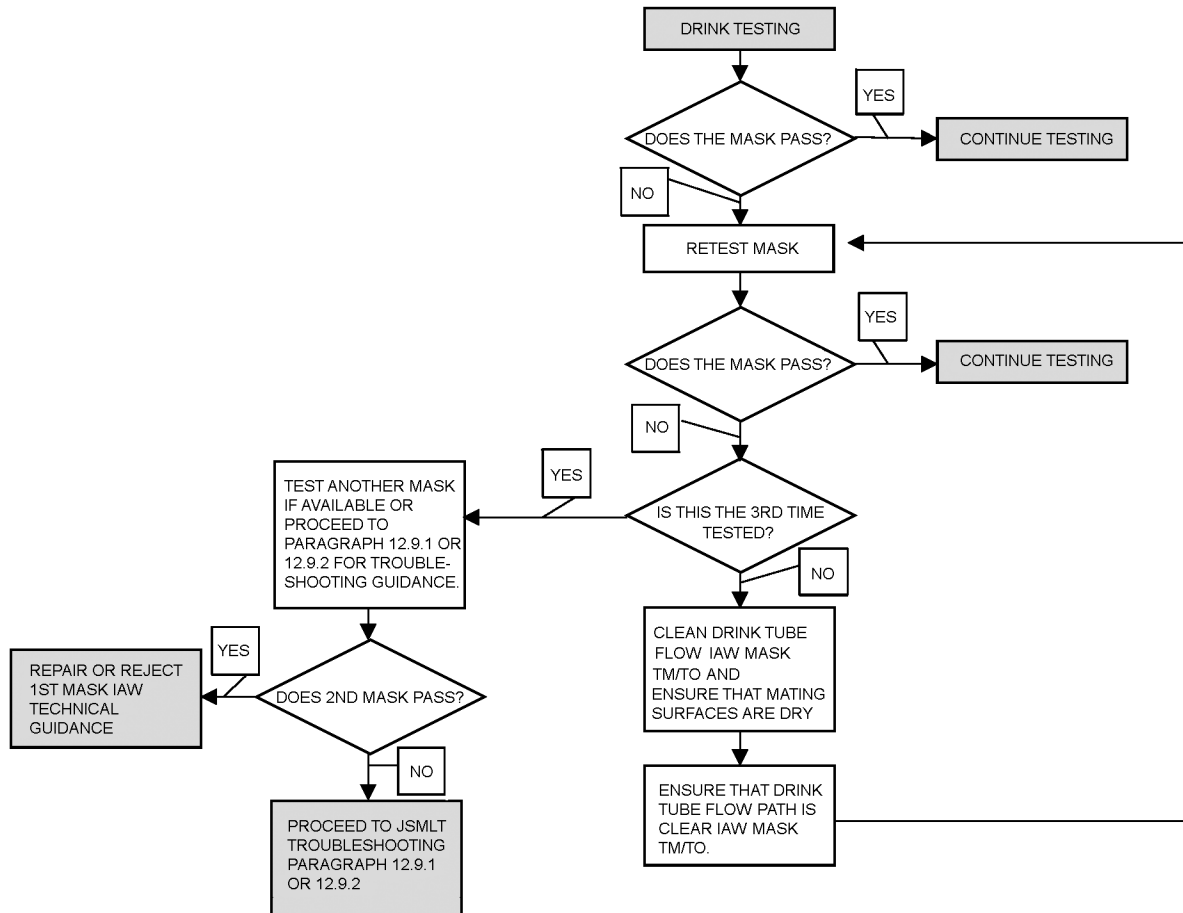
Table 6-1. Flowchart Symbols

Symbol	Meaning
	Indicates a step/action to be taken.
	Indicates a point at which a decision must be made.
	Indicates the path down which an answer leads.

NOTE

- Water inside the drink tube may cause repeated failures during the Drink Tube Flow Test [DRINK].
- The purpose of the following diagram is to isolate the failure in the mask prior to troubleshooting the JSMLT, Figure 6-3.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-047

Figure 6-3. Drink Testing Failures Flowchart

CHAPTER 7

OUTLET VALVE TEST [VALVE]

7.1 OUTLET VALVE TESTING.

This chapter covers the procedures necessary to complete the outlet valve testing.

NOTE

- Outlet valve plug/adapters for the M50/51 and M53 series are contained within the Joint Service Mask Adapter Kit (JSMAK). For further information on the outlet valve plug/adapters for the M50/51, refer to Paragraph 5.11 through Paragraph 5.19, for the M53 series masks refer to Paragraph 5.20 through Paragraph 5.27, and for the MPU-5, refer to Paragraph 5.28 through Paragraph 5.36.
- For best results, Joint Service Mask Leakage Tester (JSMLT) software version 1.7 is required to be installed for testing M50/51 and M53 outlet valve assemblies. Software versions lower than 1.7 may result in unusually long test sampling times for the first Outlet Valve Test [VALVE] conducted each time the JSMLT is initialized. To determine software version, refer to Paragraph 4.2.

VALVE TEST

ESC

START

<F3> ESC

RETURNS TO [SELECT TEST] SCREEN.

<F4> START

STARTS THE OUTLET VALVE TEST.

7.2 CONDUCTING THE OUTLET VALVE TEST [VALVE].

- Ensure the mask test shroud is removed from the headform.
- Verify that the outlet valve assembly cover has been removed from the protective mask.
- Moisten the inner surface of the JSMLT outlet valve test adapter, Figure 7-1 with a cellulose sponge dampened with water.

NOTE

The outlet valve disk must remain dry during this test.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-048

Figure 7-1. Outlet Valve Test [VALVE]

- d. Align and insert the outlet valve assembly lug(s) into the notch(es) and gently apply pressure until it is fully seated.
- e. Continue pressing the outlet valve assembly into the adapter until a click is felt.
- f. Support the mask with your free hand while the outlet valve assembly is seated in the outlet valve test adapter during the test.

NOTE

It may be necessary to periodically hand-tighten the JSMLT outlet valve test adapter. Refer to Paragraph 11.4 for further instructions.

- g. Press <F4> START. The following steps are automatically completed by the JSMLT:

[VALVE TEST] Indicates that the system is reading the airflow of the test.

- h. At the end of the test, either a [PASSED] or [FAILED] screen will appear.

[PASSED]

ALLOWS YOU TO CONTINUE TESTING. IF AN MALL MODE WAS SELECTED, PROCEED TO PARAGRAPH 5.4, APPLYING A MASK. IF ALL MODE WAS SELECTED, PROCEED TO CHAPTER 8, QUANTITIVE FIT TEST. IF VALVE TEST WAS SELECTED YOU'LL BE RETURNED TO THE FIRST [VALVE] TEST SCREEN TO BEGIN ANOTHER TEST.



PASSED

[FAILED]

AUTOMATICALLY STOPS TESTING; A STEADY TONE INDICATES FAILURE.



FAILED

CONT

<F4> CONT

PROCEEDS TO [PAUSED] SCREEN.



PAUSED

RES

REJ

<F2> RES

RETURNS JSMLT TO [VALVE] TEST SCREEN.

<F3> REJ

PROCEEDS TO THE [REJECTED] SCREEN.



REJECTED

CONT

- i. Press <F4> CONT to continue and refer to Paragraph 7.3.
- j. If the Outlet Valve Test [VALVE] was completed successfully, the following screen will be shown (dependent on test mode):

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

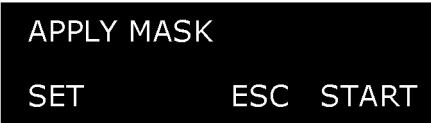
IF TESTING IN THE VALVE MODE: :



<F3> ESC RETURNS TO THE [SELECT TEST] SCREEN.

<F4> START BEGINS ANOTHER OUTLET VALVE TEST.

IF TESTING IN M ALL OR ALL MODE:



<F1> SET DISPLAYS THE AEROSOL SETUP MENU. PARAGRAPH 5.3, MASK AEROSOL SETUP.

<F3> ESC RETURNS THE OPERATOR TO THE SELECT TEST MEND. PARAGRAPH 4.4, SELECTING A TEST.

<F4> START STARTS THE MASK TEST PROCEDURE.

- k. If outlet valve testing is complete, disconnect the protective mask from the outlet valve test adapter by gently pulling away.

7.3 OUTLET VALVE FAILURES FLOWCHART.

NOTE

The purpose of the following diagram is to isolate the failure in the mask prior to troubleshooting the JSMLT.
The symbols in Table 7-1 are used in Figure 7-2:

Table 7-1. Flowchart Symbols



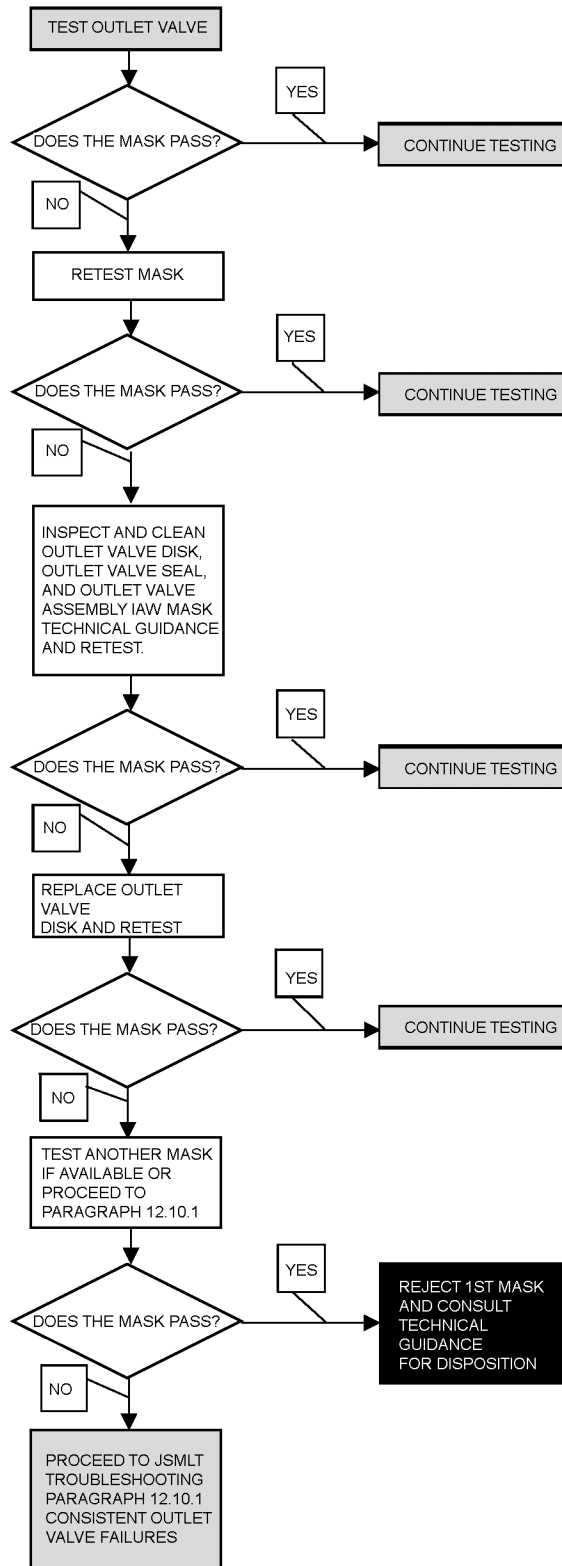
Symbol	Meaning
	Indicates a step/action to be taken.
	Indicates a point at which a decision must be made.

Table 7-1. Flowchart Symbols - Continued

Symbol	Meaning
<div><div>Yes</div><div>Or</div><div>No</div></div>	Indicates the path down which an answer leads.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-4-1-049

Figure 7-2. Outlet Valve Failures Flowchart

CHAPTER 8

QUANTITATIVE FIT TEST [FIT]

8.1 QUANTITATIVE FIT TEST [FIT].

This chapter describes the Quantitative Fit Test [FIT]. This series of tests is designed to give a standard indication of the leakage rate of a mask while it is being worn by a subject.

NOTE

- Fit testing must be conducted in accordance with specific Service and protective mask technical directives.
- Marine Corps personnel will have their mask fit test during initial issue, within 6 months prior to deploying, and annually while deployed.
- Drink/fit adapters for M50/51, M53, and MPU-5 masks are contained within the Joint Service Mask Adapter Kit (JSMAC).
- Fit test setup should be accomplished in accordance with Paragraph 3.5.4.
- Prior to conducting a fit test, ensure that the Joint Service Mask Leakage Tester (JSMLE) has been operating at least 20 minutes to prevent the condensation of human breath on the internal measuring optics.
- Ensure that the fit test is performed with a known serviceable protective mask and canister.
- An aerosol setup is required prior to performing the first fit test after initialization.
- Prior to performing a fit test, ensure that there is a serviceable canister attached to the mask in accordance with the appropriate mask technical manual.

8.2 SELECTING A SERVICE.

NOTE

The user is required to select the Branch of Service for the subject being tested (United States Air Force (USAF), United States Army (USA), United States Marine Corps (USMC), and NAVY) before the first aerosol setup. The user is also required to select a Branch of Service if [ALL] test was selected. Coast Guard personnel should select NAVY. Failure to select the appropriate Branch of Service could result in incorrect results.

```
SELECT TEST=FIT
SYS  UP   DWN  ACPT
```

- a. From the [SELECT TEST] menu, select <F4> Accept (ACPT) to accept the FIT test.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

CHOOSE SERVICE

USAF ARMY USMC NAVY

- | | |
|------------------------|--|
| <F1> USAF | UNITES STATES AIR FORCE (QFF FAILURE = <2000) |
| <F2> ARMY | UNITED STATES ARMY (QFF FAILURE = < 1667) |
| <F3> USMC | UNITED STATES MARINE CORPS (QFF FAILURE = <3000) |
| <F4> NAVY | UNITED STATES NAVY/UNITED STATES COAST GUARD (QFF FAILURE = <3000) |

- b. Select the appropriate Branch of Service for which the testing will be completed.
- c. Proceed to Paragraph 8.3.

8.3 FIT TEST AEROSOL SETUP.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

NOTE

Paragraph 8.4 may be completed simultaneously with Paragraph 8.3.

An fit test aerosol setup, Figure 8-1, is used to set the 0 percent aerosol level (best seal) and 100 percent aerosol level (no seal) for any mask leakage test. These levels must be established every time the JSMLT is setup in the [MASK], [FIT], [M ALL], and [ALL] modes or if the JSMLT is switched off and then restarted in one of those modes. It is also recommended that an aerosol setup be conducted whenever mask testing is resumed after the JSMLT has been sitting idle for more than thirty (30) minutes.

- a. Use the attached badge clip to attach the drink adapter end of the fit test interface tubing to the inside of the fit test shroud.



Do not lay the fit sampling tube (blue tubing with “v” cut end) directly onto the surface of a table, desktop, floor, etc. during aerosol setup. If dirt and/or debris is drawn through the open end directly into the internal optics, damage can result in a system malfunction requiring Original Equipment Manufacturer (OEM) factory service to repair.

- b. Ensure the fit test shroud is standing upright, Figure 8-1.

AEROSOL SETUP

YES

<F1> YES

CONTINUES THE AEROSOL SETUP PROCEDURE.

<F2> NO

(NOT ALWAYS ACTIVE) BYPASSES THE AEROSOL SETUP AND CONTINUES WITH TESTING.

NOTE

After initialization, <F2> NO selection is inactive and not displayed.

- c. At [AEROSOL SETUP], select <F1> YES. The following steps are then completed automatically by the JSMLT:

[SETTING]

ADJUSTING TO TEST PARAMETERS.

[LOADING]

GENERATOR TURNS ON AND AEROSOL IS LOADED UNDER THE TEST SHROUD.

[SETTING]

SETTING 100% RANGE.

[SETTING]

- WITH AEROSOL SETUP NUMBER DISPLAYED (-20 TO 100+).
- IF THE NUMBER DISPLAYED EXCEEDS 90, REFER TO PARAGRAPH 12.7.3, AEROSOL SETUP OF 90 OR GREATER, FOR TROUBLESHOOTING RECOMMENDATIONS.

AEROSOL SETUP
NUMBER

SETTING

6

NOTE

The JSMLT should complete the aerosol setup and display the following screen within five minutes:

READY SUBJECT – 5

SET

ESC

CONT

- d. If not completed within five minutes, refer to Paragraph 12.11.1.
- e. Unclip the badge clip from the fit test shroud and remove the fit test interface tubing from beneath the fit test shroud.
- f. Proceed to Paragraph 8.4.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

8.4 PREPARING THE MASK.

- a. Ensure that all protective mask components are attached to the mask. This includes a serviceable filter canister, eyelens outserts, outlet valve cover, hood, etc.
- b. Prepare the mask by removing the internal drink tube or by turning the internal drink tube away from the subject's mouth.
- c. Instruct the test subject to sit down.
- d. Have the subject don, clear, and check the seal of the mask in accordance with mask-specific technical procedures.

NOTE

- It is critical to ensure that there are no obstructions in the drink tube during the test. A [DRINK] test can be conducted in accordance with Chapter 6 to verify that there are no obstructions in the drink tube flow path.
 - Mask drink/fit test adapters are contained within the JSMAK and will connect to the blue drink test adapter. For further information on the drink/fit test adapters for the M50/51, refer to Paragraph 5.11 through Paragraph 5.19, for the M53 series masks and M69, refer to Paragraph 5.20 through Paragraph 5.27, and for the MPU-5, refer to Paragraph 5.28 through Paragraph 5.36.
- e. Attach the fit sampling adapter, Figure 8-2, (blue aluminum adapter on the fit test interface tube) to the subject's drink tube. Make sure that the drink tube is inserted fully into the blue adapter.



TO-33A4-7-10-1-050

Figure 8-1. Fit Test Aerosol Setup



TO-33A4-7-10-1-051

Figure 8-2. Attaching the Fit Sampling Adapter

- f. Attach the badge clip, Figure 8-3, to the excess material at the end of the head harness temple strap for all masks except the MPU-5. For the MPU-5, attach the badge clip to clothing under the test shroud.



TO-33A4-7-10-1-052

Figure 8-3. Attaching the Badge Clip

NOTE

Ensure the end of the sampling line is not resting near the outlet valve.

- g. Place the fit test shroud, Figure 8-4, over the subject's head, resting on the subject's shoulders with the Y-hose aerosol extension in the back.
- h. Adjust the straps of the fit test shroud, Figure 8-4, to ensure that the subject can move his/her head without contacting the fit shroud.
- i. Ensure that the green nylon apron of the fit test shroud, Figure 8-4, extends below the subject's shoulders.



TO-33A4-7-10-1-053

Figure 8-4. Fit Test Shroud

8.5 TESTING A SUBJECT.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

READY SUBJECT – 5

SET ESC CONT

- <F1> SET** PROCEEDS TO THE [AEROSOL SETUP] SCREEN.
- <F3> ESC** CANCELS THE TEST AND RETURNS TO THE [SELECT TEST] SCREEN.
- <F4> CONT** STARTS LOADING THE SHROUD WITH AEROSOL TO CONDUCT FIT TEST.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

- a. Advise the subject to relax. Select <F4> CONT. The JSMLT will then load the shroud with aerosol and automatically advance to the first EXERCISE screen. The following screens will be displayed:

SETTING

AND THEN

LOADING

ABORT

- <F2> ABORT** ABORTS THE CURRENT TEST AND DISPLAYS A [CANCEL DURING TEST] SCREEN.

NOTE

The <F2> ABORT option is available in every step of the fit test process. Selecting <F2> ABORT at any time during the fit test process will allow the test to immediately be terminated.

CANCEL DURING TEST

CONT

- b. <F4> CONT returns the user to the [READY SUBJECT] screen.

- c. Once the test aerosol has finished loading into the fit test shroud, the fit test is ready to begin and the EXERCISE 1 screen is displayed.

EXER= 1: 60
 ABORT START

- d. Explain to the test subject that there are a total of five (5) exercises: normal breathing, deep breathing, head side to side, head up and down, and jaw rotation. Each exercise will be performed for approximately 2 minutes.
- e. Ensure the subject understands each exercise.

NOTE

- After each exercise, a Fit Score will be displayed in the upper right corner of the screen.
- Recording the Fit Score may be a requirement, refer to local guidance.
- A test subject may receive a low Fit Score for any single exercise and still receive an overall passing fit Factor. The overall Fit Factor reflects a calculation based on all of the test subject's individual Fit Scores and is not an average.
- Ensure the test subject does not over-exaggerate each exercise, as this may cause breaking of the seal and cause inaccurate Fit Scores.
- Ensure the test subject does not allow the filter canister to come in contact with their chest, shoulders, or the fit test shroud. This may cause breaking of the seal and cause inaccurate Fit Scores.

EXER= 1: 60
 ABORT START

- f. For the first exercise, normal breathing, instruct the test subject to stay motionless and breathe normally. Have the test subject begin the exercise, and then select <F4> START.
- g. At the end of the first exercise period, the start screen for EXERCISE 2 will appear. In addition, the Fit Score for EXERCISE 1 will be displayed in the upper right corner of the screen. Record the Fit Score for EXERCISE 1, if required, and proceed to the next step.

EXER= 2: 60 138097
 ABORT START

← EXERCISE 1
 FIT SCORE

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- h. For the second exercise, deep breathing, instruct the test subject to stay motionless and breathe in and out deeply for the duration of the exercise. Have the test subject begin the exercise, and then select <F4> START.
- i. At the end of the second exercise period, the start screen for EXERCISE 3 will appear. In addition, the Fit Score for EXERCISE 2 will be displayed in the upper right corner of the screen. Record the Fit Score for EXERCISE 2, if required, and proceed to the next step.

EXER= 3: 60	91486	← EXERCISE 2 FIT SCORE
ABORT	START	

- j. For the third exercise, turn head side to side, instruct the subject to slowly turn his/her head and look over each shoulder alternately. It should take a count of 3 to move from shoulder to shoulder. The subject should continue to breathe normally. Have the test subject begin the exercise, and then select <F4> START.
- k. At the end of the third exercise period, the start screen for EXERCISE 4 will appear. In addition, the Fit Score for EXERCISE 3 will be displayed in the upper right corner of the screen. Record the Fit Score for EXERCISE 3, if required, and proceed to the next step.

EXER= 4: 60	200000	← EXERCISE 3 FIT SCORE
ABORT	START	

- l. For the fourth exercise, move head up and down, instruct the subject to slowly move his/her head up and down, from looking at the ceiling to looking at the floor, continuously. It should take a count of 3 to move from up to down. Have the test subject begin the exercise, and then select <F4> START.
- m. At the end of the fourth exercise period, the start screen for EXERCISE 5 will appear. In addition, the Fit Score for EXERCISE 4 will be displayed in the upper right corner of the screen. Record the Fit Score for EXERCISE 4, if required, and proceed to the next step.

EXER= 5: 60	200000	← EXERCISE 4 FIT SCORE
	START	

- n. For the fifth exercise, jaw rotation, instruct the subject to rotate their jaw in a circular fashion being careful not to over extend the jaw. Have the test subject begin the exercise, and then select <F4> START.
- o. At the conclusion of the fifth and final exercise, the Fit Score for EXERCISE 5 will appear in the upper right corner of the screen. Pressing <F4> CONT will cause the overall Fit Factor to appear along with [PASSED] or [FAILED].

EXER= 5:	200000
ABORT	START

← EXERCISE 5
FIT SCORE

- p. If the test subject's Fit Factor was at or above the selected service's standard, the following screen will appear:

PASSED	150730
	CONT

← OVERALL FIT
FACTOR

[PASSED]

ALLOWS YOU TO CONTINUE TESTING AFTER PRESSING <F4>. IF ALL TEST WAS SELECTED, PROCEED TO PARAGRAPH 5.4, APPLYING A MASK. IF A FIT TEST WAS SELECTED, PROCEED TO PARAGRAPH 8.4, PREPARING A SUBJECT.

- q. If the test subject's Fit Factor was below the selected service's standard, the following screen will appear:

FAILED	1250
	CONT

← OVERALL FIT
FACTOR

[FAILED]

AUTOMATICALLY STOPS TESTING; A STEADY TONE INDICATES FAILURES. AFTER RESULT IS RECORDED,

<F4> CONT

ADVANCES TO THE [PAUSED] SCREEN.

PAUSED
RES REJ

<F2> RES

RETURNS TO [READY SUBJECT -5] SCREEN.

<F3> REJ

PROCEEDS TO [REJECTED] SCREEN.

PAUSED
CONT

<F4> CONT

RETURNS TO [READY SUBJECT -5] SCREEN.

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- r. If the test failed, select <F4> CONT and proceed to Paragraph 8.6.
- s. At the conclusion of the fit test, remove the fit test shroud, disconnect the fit test interface tubing, and direct the test subject to doff the mask.

NOTE

Due to minor variances in how the fit test exercises may be performed, a subject's overall Fit Factor may vary from fit test to fit test. This is acceptable.

- t. Prepare another subject for testing.



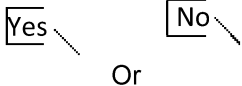
8.6 FIT TESTING FAILURES FLOWCHART.

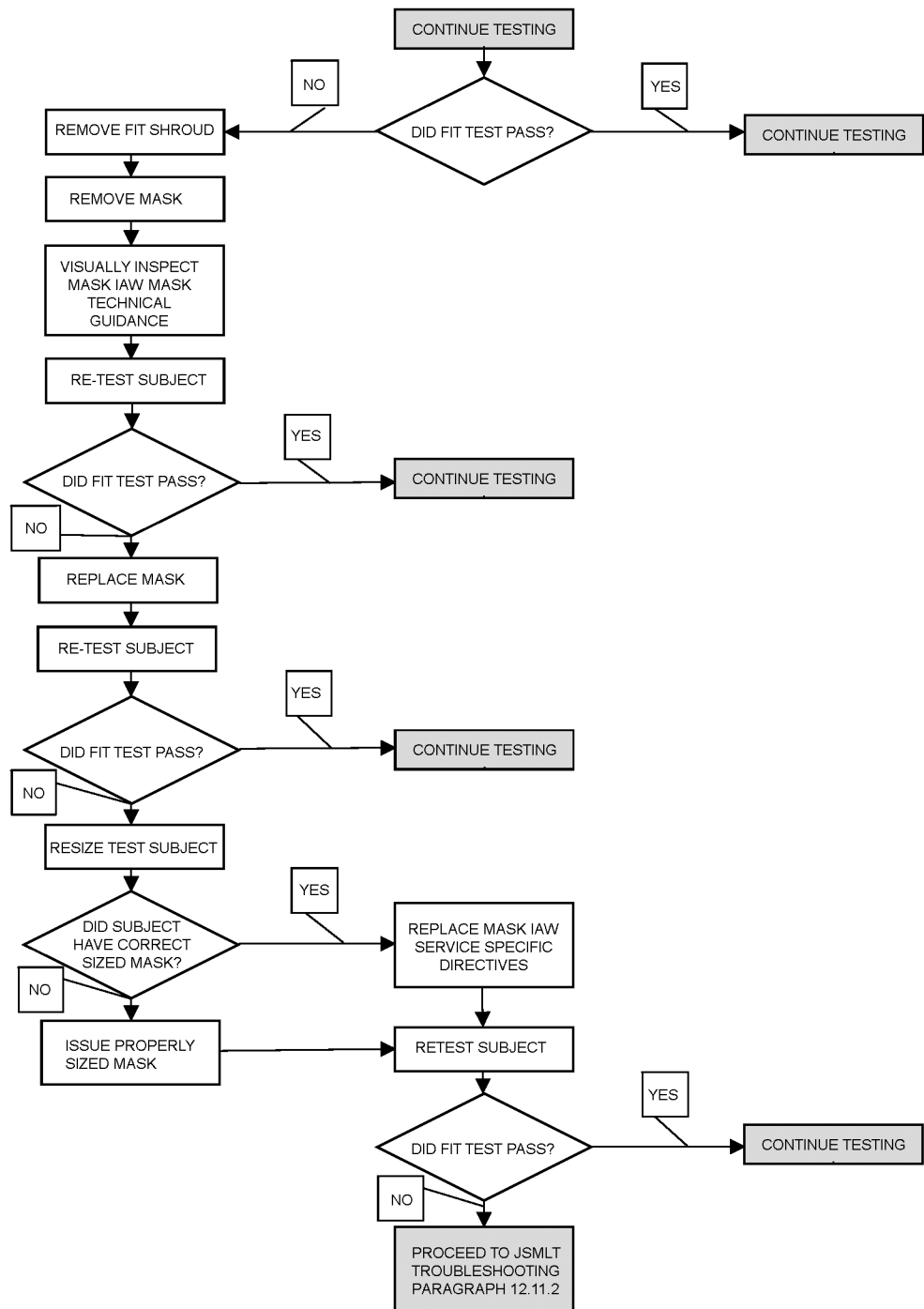
NOTE

The purpose of the following flowchart, Figure 8-5 is to isolate a failure in the mask prior to troubleshooting the JSMLT.

The symbols in Table 8-1 are used in Figure 8-5:

Table 8-1. Flowchart Symbols

Symbol	Meaning
	Indicates a step/action to be taken.
	Indicates a point at which a decision must be made.
	Indicates the path down which an answer leads.



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Figure 8-5. Fit Testing Failures Flowchart

CHAPTER 9

POWERING DOWN AND PACKING THE JOINT SERVICE MASK LEAKAGE TESTER (JSMLT)

9.1 POWERING DOWN THE JSMLT.

- a. Toggle the power switch to the “OFF” position.
- b. Unplug the power cord from the outlet and proceed to Paragraph 9.2.

NOTE

Unplugging the cord is the means of disconnecting the equipment from the power supply.

9.2 PACKING.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

- a. Open the JSMLT case and remove the tray.

WARNING

Failure to remove the aerosol generator assembly from the Control Unit (CU) before packing may result in damage to the CU and aerosol generator assembly.

- b. Disconnect the aerosol generator assembly from the CU and then disconnect the aerosol probe hose from the generator cap.

WARNING

Do not ingest Poly Alpha Olefin (PAO) aerosol oil, as doing so could result in illness or death of personnel, or long term health hazards.

CAUTION

When packing the JSMLT for storage, the aerosol generator assembly must be disassembled to prevent oil spilling during shipping. The aerosol probe hose must be removed from the generator cap and the oil warmer, if installed, should be removed and stored in the front storage space of the shipping case. If these procedures are not strictly observed, damage to the JSMLT may occur.

- c. Remove the generator cap from the generator bottle and wipe off excess oil using a machinery wiping towel.
- d. Place the bottle cap on the generator bottle, making sure it is tight but not cross-threaded.
- e. Place the generator bottle and generator cap in the appropriate storage slot of the tray.

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- f. Remove the Quick-Release Locking System (QRLS) pin from the back of the headform and place it in the tray.
- g. Lift the headform off of the headform pedestal and place it in the tray.
- h. Disconnect the power unit from the CU.
 - (1) Remove the power interface cable from both the CU and the power unit.
 - (2) Disconnect the twin tube interface hose from the CU and power unit.
- i. If the JSMLT was not setup for fit testing, proceed to Step m. If the JSMLT was setup for fit testing, disconnect the fit test interface tubing from the CU.
- j. Disconnect the Y-hose aerosol extension from the aerosol probe hose and the fit test shroud.

WARNING

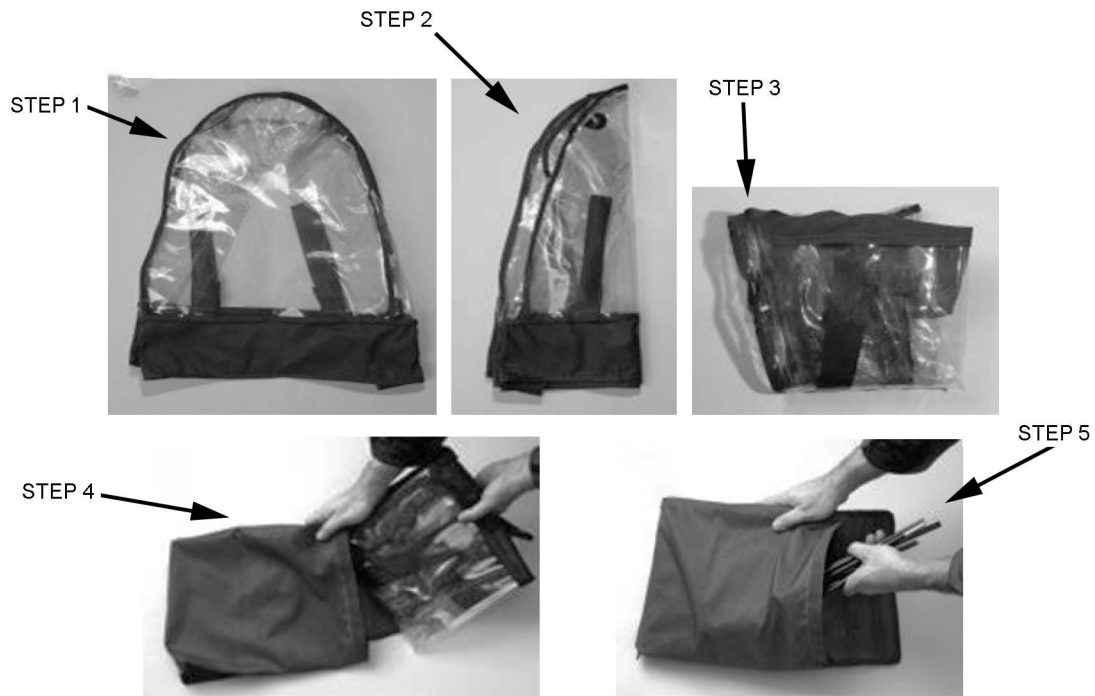
Use care when handling the fit test support rods, failure to do so could result in injury to the eyes.

- k. Carefully remove the fit test support rods from the fit test shroud and set them aside.
- l. Fold the fit test shroud for storage in accordance with Figure 9-1, Step 1 through Step 5.
 - (1) Lay the fit test shroud flat, with the brass connectors facing down, Step 1.
 - (2) Fold the fit shroud in half so that the brass connectors are opposite each other, Step 2.
 - (3) Fold in half again, from the bottom up to the top, squeezing out as much air as possible, Step 3.
 - (4) Store the fit test shroud inside the fit test bag, Step 4.
 - (5) Once the fit test shroud is stored, place the Y-hose aerosol extension, fit test interface tubing, and fit test support rods inside the fit test bag and close the bag, Step 5.
- m. Wrap the twin tube interface hose, the power interface cable, and the aerosol probe hose around the headform pedestal.
- n. Place the power cord in the space under the forehead strap bracket.

CAUTION

If the M50 mask clips are installed on the headform pedestal, they must be removed prior to storing the CU in the bottom of the case. The M50 mask clips should be stored inside the JSMAK case. Failure to remove the M50 mask clips may cause damage to the clips or tray when the tray is placed into the JSMLT case.

- o. Place the CU into the bottom of the JSMLT case, Figure 9-2
- p. Place the JSMAK between the headform pedestal and the display screen on top of the CU, Figure 9-3.



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Figure 9-1. Folding and Storing the Fit Test Shroud



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Figure 9-2. CU Packed in Case, M46/M46A1 (Left) and M46A2 (Right)

- q. Place the tray into the JSMLT case.



Failure to store the power unit upside down may cause damage to the power cable interface port and the pressure/vacuum ports.

- r. Place the power unit in the tray upside down so the power interface port fits into the cutout on the left side.

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- s. Place the fit test bag in the space on the left side of the tray, Figure 9-3.
- t. Ensure the small headform is stored in the rear slot of the tray.
- u. Ensure the medium headform is stored in the front slot of the tray.
- v. Place the rest of the JSMLT accessories and tools in their appropriate storage locations on the tray.
- w. Place the Operator's Manual, oil warmer, mask passing tube, sponges, and other documentation and support materials in the storage space at the front of the JSMLT case.
- x. Fold the test shroud in half and place it in the storage space at the front of the JSMLT case.



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Figure 9-3. JSMLT Properly Packed, M46/M46A1 (Left) and M46A2 (Right)

WARNING

The JSMLT is a heavy item. Two people should be used to lift and/or carry the JSMLT, as seen noted in the sticker affixed to the carrying case (displayed below). The JSMLT should be carefully lowered into place, never dropped. Failure to follow proper procedures when lifting the JSMLT could result in injury to personnel and/or damage to equipment.

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- y. Close and secure the JSMLT case.

CUI

CHAPTER 10

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

10.1 CATEGORIES OF PMCS FOR THE JOINT SERVICE MASK LEAKAGE TESTER (JSMLT).

PMCS of the JSMLT are broken down into 2 categories:

10.1.1 Pre-Operational Category. Pre-operational is a quick, but thorough inspection of components that should be accomplished each time you prepare to setup and operate the JSMLT.

10.1.2 Periodic Category. Periodic is accomplished at least once for every 100 operational test hours.

10.1.3 120 Day Preventative Maintenance. The manufacture of the JSMLT recommends, when possible, to start-up the JSMLT every 120 days, as a minimum, to lubricate internal seals and help prevent unnecessary unscheduled maintenance on the unit.

10.2 CORRECTIVE ACTION.

- a. If corrective action directs you to contact the next higher-level maintenance, refer to service specific instructions listed below.
 - United States Air Force (USAF). Contact the nearest Air Force Precision Measurement Equipment Laboratory (PMEL) for calibration services and other maintenance that is authorized in Technical Order (TO) 33K6-4-3548-1. If the JSMLT is located at the Air Force Mask Inspection and Repair Program (AFMIRP), calibration and repairs are authorized under TO 33K-1-100-1 guidance and other approved Joint guidance.
 - United States Navy (USN). Return the JSMLT to the Fleet Consolidated Sustainment Facility or email nswcpd_cbd_ipe@navy.mil.
 - Marine Corps. Return the JSMLT to the Consolidated Storage Program Unit Issue Facility) or contact the Joint Program Executive Office (JPEO) Information Resource Center (IRC) at 1-800-831-4408 or email: cbrn-IRC@us.army.mil.
- b. If corrective action directs you to replace a specific part, utilize normal supply process for replacement. (For Marine Corps units, all parts will be obtained from the Consolidated Storage Program Unit Issue Facility).

10.3 MAINTAINING THE JSMLT.

This chapter provides PMCS tables to assist in properly maintaining the JSMLT and related accessories included with the system. The PMCS tables cover the Control Unit (CU), the power unit, the fit test kit, the aerosol generator assembly, the accessories, and the Joint Service Mask Adapter Kit (JSMAK).

10.4 PREOPERATIONAL PMCS.

Table 10-1 through Table 10-6 list all preoperational PMCS that should be conducted each time you prepare to setup and operate the JSMLT.

10.4.1 Preoperational PMCS Procedures for the CU. Refer to Table 10-1 for the preoperational PMCS procedures for the CU.

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Table 10-1. Preoperational PMCS Procedures for the CU

Item to Check	PMCS Process	Corrective Action If Needed
Aerosol Generator Ports	Press and release snap tabs to test function.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Fit Test Interface Ports	Press and release snap tabs to test function.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Pressure/Vacuum Ports	Visually inspect for obstructions, cracks or signs of crushing.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Power Cable Interface Port	Visually inspect for cracks in the fitting, broken or bent pins.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Display SCREEN	Visually inspect for cracks or other physical damage.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Function Keys	Visually inspect for cracks or other physical damage.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Wing Nuts (6)	Visually inspect for presence, corrosion, and tightness.	Tighten or replace, as necessary. See Paragraph 10.2, Step b.
Mask Clip Screws (8)	Visually inspect for presence, corrosion, and tightness.	Use Number (No.) 2 stubby cross tip screwdriver to tighten or replace, as necessary. See Paragraph 10.2, Step b.
Mask Bracket Clamps (2)	Visually inspect for cracks or bends.	Replace if damaged. See Paragraph 10.2, Step b.
Mask Brackets (5)	Visually inspect for cracks or bends.	Replace if damaged. See Paragraph 10.2, Step b.
Mask Clips (6)	Visually inspect for cracks or bends.	Replace if damaged. See Paragraph 10.2, Step b.
Forehead Strap Bracket	Visually inspect for cracks or bends.	Replace if damaged. See Paragraph 10.2, Step b.
Headform Ports	Visually inspect for cuts or cracks. Inspect the O-rings for wear, cuts, or missing O-rings.	Contact next higher level maintenance. See Paragraph 10.2, Step a. Replace damaged O-rings as necessary in accordance with Paragraph 11.6.
Headform Pedestal Screws (8)	Visually inspect for tightness. Screw should appear flush with surface.	Tighten, if loose, using No. 1 cross tip screwdriver.
Outlet Valve Test Adapter	Visually inspect to ensure it is not deformed.	Replace if deformed or damaged. See Paragraph 10.2, Step b.
Calibration Sticker	Visually inspect for presence and check to ensure scheduled calibration date has not passed.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
<p style="text-align: center;">NOTE</p> <p>Hours will NOT be reset during calibration.</p>		

10.4.2 Preoperational PMCS Procedures for the Power Unit. Refer to Table 10-2 for the preoperational PMCS procedures for the power unit.

Table 10-2. Preoperational PMCS Procedures for the Power Unit

Item to Check	PMCS Process	Corrective Action If Needed
Pressure/Vacuum Ports	Visually inspect for obstructions. Ensure ports are not cracked or crushed.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Power Interface Cable Port	Visually inspect to ensure it is not cracked and the pins are not crushed, bent, or broken. Verify that the cable is not cut and the wires are not visible.	Replace, if damaged. See Paragraph 10.2, Step b.
Service Tag	Visually inspect for presence and check to ensure scheduled service date has not passed.	Contact next higher level maintenance. See Paragraph 10.2, Step a.

10.4.3 Preoperational PMCS Procedures for the Fit Test Kit. Refer to Table 10-3 for the preoperational PMCS procedures for the fit test kit.

Table 10-3. Preoperational PMCS Procedures for the Fit Test Kit

Item to Check	PMCS Process	Corrective Action If Needed
Y-Hose Aerosol Extension	Visually inspect for oil, dirt, or debris and holes, cuts, or other damage.	Allow to drain, or rinse out with isopropyl alcohol. Replace if damaged. See Paragraph 10.2, Step b.
Fit Test Shroud	Visually inspect for cuts, tears, and damaged or loose stitching.	Repair with clear pressure sensitive tape or replace shroud. See Paragraph 10.2, Step b.
Fit Test Support Rods	Visually inspect the rods to ensure the elastic banding is not ripped or heavily frayed. Ensure aluminum tubing is not abnormally bent, cracked or broken.	Replace if damaged. See Paragraph 10.2, Step b.
Fit Test Interface Tubing	Visually inspect tubing for blockage, cuts or cracks and the presence of excess water or oil. Visually inspect the blue sampling tube to ensure the end has a "V" cut. Inspect O-rings for wear or cuts.	Clear blockage or replace tubing if damaged or unable to clear blockage. Allow to drain if excess water or oil are present or flush out with isopropyl alcohol. If "V" cut is missing, use craftsman's knife to trim end into "V" or replace tubing. See Paragraph 10.2, Step b. Replace damaged O-rings using spare O-ring kit in accordance with Paragraph 11.6.
Fit Test Bag	Visually inspect for rips, tears, torn stitching. Check hook and pile fasteners for function.	Repair with clear pressure sensitive tape or replace if damage is excessive. See Paragraph 10.2, Step b.

10.4.4 Preoperational PMCS Procedures for the Aerosol Generator Assembly. Refer to Table 10-4 for the preoperational PMCS procedures for the aerosol generator assembly.

Table 10-4. Preoperational PMCS Procedures for the Aerosol Generator Assembly

Item to Check	PMCS Process	Corrective Action If Needed
Generator Cap	Visually inspect for cracks or other damage. Inspect the ports to ensure they are not damaged or obstructed.	Replace, if damaged. See Paragraph 10.2, Step b.

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Table 10-4. Preoperational PMCS Procedures for the Aerosol Generator Assembly - Continued

Item to Check	PMCS Process	Corrective Action If Needed
	Visually inspect the O-rings for wear or cuts.	Replace damaged O-rings using spare O-ring kit in accordance with Paragraph 11.6.
Generator Bottle	Visually inspect for cracks or other damage. Inspect the threads to ensure they are continuous. Visually inspect the level of oil.	Replace if damaged. See Paragraph 10.2, Step b. Refill or remove oil as necessary using Poly Alpha Olefin (PAO) oil supplied and spare bottle.
Aerosol Probe Hose	Visually inspect to ensure the tubing is not cut or crushed. Inspect the metal probe tip to ensure it is not crushed or obstructed. Press and release snap tabs to test function.	Replace if damaged. See Paragraph 10.2, Step b. Replace, if damaged. See Paragraph 10.2, Step b.

10.4.5 Preoperational PMCS Procedures for Accessories. Refer to Table 10-5 for the preoperational PMCS procedures for accessories.

Table 10-5. Preoperational PMCS Procedures for Accessories

Item to Check	PMCS Process	Corrective Action If Needed
Headforms	Visually inspect overall and at the interface ports for cracks. Visually inspect the peripheral seal for holes or cuts. Visually inspect the lint screen for dirt or damage.	Replace if headform or peripheral seal is damaged. See Paragraph 10.2, Step b. Clean or replace lint screen. See Paragraph 10.2, Step b.
Mask Test Shroud	Visually inspect for cuts, tears, or loose stitching. Inspect the drawstring and clasp for serviceability and function. Visually inspect for PAO oil residue.	Repair using clear pressure sensitive tape. Replace if damaged. See Paragraph 10.2, Step b. Remove oil residue with isopropyl alcohol and machinery wiping towel.
Canister Port Plug	Visually inspect to ensure that the threading is continuous and the plug overall is not dented or deformed.	Replace, if damaged. See Paragraph 10.2, Step b.
Outlet Valve Clamp	Visually inspect for the plastic portions for cracks and the rubber for dry rot, nicks or peeling. Make sure the spring is taut and retaining bolt is tight.	Replace, if damaged. See Paragraph 10.2, Step b. Tighten as necessary.
Twin Tube Interface Hose	Visually inspect for holes, cuts, or sharp bends. Ensure that the ends are not over stretched. Inspect to ensure that a yellow band is present on both sides of the same tube.	Trim the ends as necessary with a sharp blade in accordance with Paragraph 11.8 or replace hose. See Paragraph 10.2, Step b.

Table 10-5. Preoperational PMCS Procedures for Accessories - Continued

Item to Check	PMCS Process	Corrective Action If Needed
Power Cord	Visually inspect to ensure the cord is not cut or frayed and the wires are not exposed. Ensure prongs on plug are not bent or damaged.	Replace, if damaged. See Paragraph 10.2, Step b.
Oil Warmer	Visually inspect to ensure the cord is not cut or frayed and the wires are not exposed. Check hook and pile fasteners for proper function. Ensure prongs on plug are not bent or damaged.	Replace, if damaged. See Paragraph 10.2, Step b.
Mask Passing Tube	Visually inspect O-rings for wear or cuts. Visually inspect tube for the presence of debris, holes, damage, moisture, or blockage of any kind.	Replace damaged O-rings using spare O-ring kit in accordance with Paragraph 11.6. Replace, if damaged. See Paragraph 10.2, Step b. Remove any blockage. Allow moisture to dry before use.
Power Cable Interface Port	Visually inspect for cracks in the fitting, broken or bent pins.	Contact next higher level maintenance. See Paragraph 10.2, Step b.

10.4.6 Preoperational PMCS Procedures for the JSMAK. Refer to Table 10-6 for the preoperational PMCS procedures for the JSMAK.

Table 10-6. Preoperational PMCS Procedures for the JSMAK

Item to Check	PMCS Process	Corrective Action If Needed
M50 Mask Clips (7)	Inspect for corrosion, cracks, and bends.	Replace, if damaged. See Paragraph 10.2, Step b.
M50 Drink/Fit Test Adapter	Inspect the silver adapter for dirt, cracks, dents, and damage to the narrow connection. Inspect the O-rings for worn spots or cuts. Ensure plastic spacer ring is attached and not cut or torn.	Replace, if damaged. Use a machinery wiping towel to clean as necessary. See Paragraph 10.2, Step b. Replace O-rings using the JSMAK O-ring and gasket package. Replace, if damaged. See Paragraph 10.2, Step b.
M50 Outlet Valve Hose	Inspect tubing for cuts, cracks, and sharp bends. Inspect the O-rings for worn spots or cuts.	Replace, if damaged. See Paragraph 10.2, Step b. Replace O-rings using the JSMAK O-ring and gasket package.
M50 Outlet Valve Plug/Adapter	Press and release snap tab to test function. Inspect the plastic portions for cracks and the rubber for dry rot, nicks or peeling Ensure there are no blockages in the hollow neck. Inspect the rubber portion for debris.	Replace, if damaged. See Paragraph 10.2, Step b. Replace, if damaged. See Paragraph 10.2, Step b. Remove blockages. Clean as needed with a cellulose sponge dampened with water.
M50 Filter Plugs	Inspect the plastic portions for damaged or missing lock tab wings.	Replace, if damaged. See Paragraph 10.2, Step b.

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Table 10-6. Preoperational PMCS Procedures for the JSMAK - Continued

Item to Check	PMCS Process	Corrective Action If Needed
	Inspect the O-ring for worn spots or cuts. Ensure O-ring is properly seated.	Replace O-rings using the JSMAK O-ring and gasket package. Seat O-ring, as needed.
M53 Outlet Valve Plug/Adapter	Press and release snap tab to test function	Replace, if damaged. See Paragraph 10.2, Step b.
	Inspect the O-ring for worn spots or cuts. Inspect the plastic portions for cracks	Replace O-rings using the JSMAK O-ring and gasket package. Replace, if damaged. See Paragraph 10.2, Step b.
JSMAK Case	Visually inspect the exterior for physical damage and the interior foam lining to ensure it is securely attached. Ensure the two (2) round bumpers are in place on the bottom of the case.	Replace case if it is damaged and deemed unserviceable or if bumper(s) are missing or broken. See Paragraph 10.2, Step b.

10.5 PERIODIC PMCS (EVERY 100 OPERATIONAL HOURS).

The following is a list of all PMCS which should be conducted after every 100 hours of operation. This PMCS may be completed in conjunction with the preoperational PMCS.

10.5.1 Periodic PMCS Procedures for the JSMLT Case. Refer to Table 10-7 for the preoperational PMCS procedures for the JSMLT case.

Table 10-7. Preoperational PMCS Procedures for the JSMLT Case

Item to Check	PMCS Process	Corrective Action If Needed
Case	Visually inspect the locking clasps to ensure they are present and functional. Ensure clasps are not crushed or broken. Visually inspect the interior foam lining to ensure it is securely attached. Inspect wheels for physical damage and function. Ensure the Item Unique Identification (IUID) label is present and legible. Ensure the side carrying handles are securely attached and inspect the telescoping handle for function.	Contact next higher level maintenance. See Paragraph 10.2, Step a. Contact next higher level maintenance. See Paragraph 10.2, Step a. Replace case if handles are damaged or missing. See Paragraph 10.2, Step b.
Tray	Visually inspect the tray to ensure it is not cracked or broken and that the foam is securely attached	Replace, if damaged. See Paragraph 10.2, Step b.
<p style="text-align: center;">NOTE</p> <p>The M46/M46A1 contains one tray and the M46A2 has two trays.</p>		

10.5.2 Periodic PMCS Procedures for the CU. Refer to Table 10-8 for the preoperational PMCS procedures for the CU.

Table 10-8. Preoperational PMCS Procedures for the CU

Item to Check	PMCS Process	Corrective Action If Needed
Fit Test Interface Ports	Visually inspect the O-rings for nicks, wear, and cuts.	Replace damaged O-rings using spare O ring kit in accordance with Paragraph 11.6.
Data Communications Port	Visually inspect to ensure that the port is securely attached.	Secure, if loose, using No. 1 cross tip screwdriver.
Serial Number Label	Visually inspect to ensure it is securely attached.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
IUID Label	Ensure the IUID Label is present and legible.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Hose Test Port Plug	Visually inspect O-ring for wear, nicks or cuts. Visually inspect to ensure that the metal plug is securely attached to white cover.	Replace damaged O-ring using spare O-ring kit in accordance with Paragraph 11.6. Replace plug. See Paragraph 10.2, Step b.
Outlet Valve Retaining Bolt	Use stubby cross tip screwdriver to remove and then visually inspect threads for continuity and stripping. Hand-tighten when reattaching in accordance with Paragraph 11.4.	Replace, if damaged. See Paragraph 10.2, Step b.
Drink Tube Test Adapter	Inspect the inner adapter for dirt, oil, or debris. Visually inspect the O-ring for worn spots or cuts.	Use a machinery wiping towel to clean as necessary in accordance with Paragraph 11.7. Replace O-ring using spare O-ring kit in accordance with Paragraph 11.5.
Headform Pedestal	Visually inspect for cracks.	Contact next higher level maintenance. See Paragraph 10.2, Step a.
Light Scattering Chamber (LSC) Setting	Complete an aerosol setup to determine the setting number.	Contact next higher level maintenance if setting number is 90 or higher. See Paragraph 10.2, Step a.

10.5.3 Periodic PMCS Procedures for the Power Unit. Refer to Table 10-9 for the preoperational PMCS procedures for the power unit.

Table 10-9. Preoperational PMCS Procedures for the Power Unit

Item to Check	PMCS Process	Corrective Action If Needed
Fuse Holders	Visually inspect to ensure they are flush with the top surface of the power unit.	Secure with 1/8 inch flat tip screwdriver. If unable to secure, contact next higher level maintenance. See Paragraph 10.2, Step a.
Serial Number Label	Visually inspect to ensure it is securely attached.	Contact next higher lever maintenance. See Paragraph 10.2, Step a.
IUID Label	Ensure the IUID Label is present and legible.	Contact next higher level maintenance. See Paragraph 10.2, Step a.

10.5.4 Periodic PMCS Procedures for the Fit Test Kit. Refer to Table 10-10 for the preoperational PMCS procedures for the fit test kit.

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Table 10-10. Preoperational PMCS Procedures for the Fit Test Kit

Item to Check	PMCS Process	Corrective Action If Needed
Y-Hose Aerosol Extension	Visually inspect tubing for cuts, cracks, sharp bends.	Replace, if damaged. See Paragraph 10.2, Step b.
Fit Test Interface Tubing	Visually inspect tubing for cuts, cracks, and sharp bends. Visually inspect the O-rings for worn spots or cuts. Visually inspect the drink tube adapter for cracks and to ensure it is not deformed. Visually inspect for blockage.	Replace, if damaged. See Paragraph 10.2, Step b. Replace damaged O-rings using spare O-ring kit in accordance with Paragraph 11.6. Replace, if damaged. See Paragraph 10.2, Step b. If blockage cannot be removed, replace tubing. See Paragraph 10.2, Step b.
Fit Test Shroud	Visually inspect for oil residue. Visually inspect for cuts or tears. Visually inspect the manifolds for oil buildup. Inspect brass connections to manifold ports to ensure they have not pulled through grommets.	Remove oil residue with and isopropyl alcohol and cellulose sponge or machinery wiping towel. Repair using clear pressure sensitive tape. Replace shroud if severely damaged. See Paragraph 10.2, Step b. Flush with isopropyl alcohol. Contact next higher level maintenance. See Paragraph 10.2, Step a.

10.5.5 Periodic PMCS Procedures for Accessories. Refer to Table 10-11 for the preoperational PMCS procedures for accessories.

Table 10-11. Preoperational PMCS Procedures for Accessories

Item to Check	PMCS Process	Corrective Action If Needed
Yellow Headforms	Visually inspect the screws which connect the peripheral seal interface port to ensure they are securely attached. Visually inspect the clear inflation tubing on the underside of the headform for cuts.	Tighten, if loose, using No. 1 cross tip screwdriver. Contact next higher level maintenance. See Paragraph 10.2, Step a.
Inflatable Face Seal Test Head Adapter (IFSTHA)	Visually inspect per pre-operational check only.	Inspect the lint screen.
Bottle of PAO Oil	Visually inspect for oil quality and ensure it is not contaminated. Visually inspect for oil. Visually inspect for cuts or cracks. Visually inspect to ensure the cap is present and secure.	Replace oil as needed. Replenish PAO oil supply, as needed. Replace bottle, if damaged, or if cap is missing or damaged. See Paragraph 10.2, Step b.

CHAPTER 11

MAINTENANCE PROCEDURES

NOTE

No serviceable parts are required with the exception of replacing the external fuses.

11.1 DATE AND TIME.

Date and time is used to set the date in United States (U.S.) format (month/day/year) and the time in the 24 hour format.

```
SELECT TEST= M ALL
SYS   UP   DWN  ACPT
```

- a. From the [SELECT TEST] screen press <F1> SYS.

```
SYS DIAG?
YES      NO      OPT
```

- b. Press <F4> OPT, this opens the [OPTIONS] screen.

```
OPTIONS
TIME      ACF
```

<F1> TIME

ENTERS INTO THE DATE AND TIME SCREEN.

<F2> ACF

ENTERS INTO THE ALTITUDE CONTROL FUNCTION.

- c. Press <F1> TIME.

CUI

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MM/DD/YY	00:00
SET	ESC

- <F1> SET** ENTERS INTO THE SET DATE AND TIME SCREEN.
- <F3> ESC** RETURNS TO THE [SYS DIAG?] SCREEN.

d. Press <F1> SET.

MM/DD/YY	00:00	
UP	DWN	CONT

- <F1> UP** INCREASE THE SELECTED VALUE.
- <F2> DWN** DECREASES THE SELECTED VALUE.
- <F4> CONT** ACCEPTS THE ENETERED VALUE AND MOVES TO THE NEXT ENTRY.

- e. Using either <F1> UP or <F2> DOWN, set the date in mm/dd/yy format, pressing <F4> CONT after each entry.
- f. Using either <F1> UP or <F2> DOWN, set the time in 24-hour format, pressing <F4> CONT after each entry.
- g. Press <F4> CONT again after time and date are set to return to the Set Date and Time screen.
- h. From the Set Date and Time screen, press <F3> ESC to return to the [SYS DIAG?] screen.
- i. From the [SYS DIAG?] screen, press <F2> NO to return to the [SELECT TEST] screen.

11.2 CHANGING THE ALTITUDE.

NOTE

Altitude must be known prior to operating the Joint Service Mask Leakage Tester (JSMLT).

During testing, it is possible to adjust the altitude setting without shutting down the JSMLT.

- a. Exit out of the current test screen and enter into the [SELECT TEST] screen.

```
SELECT TEST= M ALL
SYS  UP   DWN ACPT
```

- b. Press <F1> SYS.

```
SYS DIAG?
YES      NO      OPT
```

<F1> YES

PROCEEDS TO THE [CHECK?] SCREEN.

<F2> NO

PROCEEDS TO THE [SELECT TEST] SCREEN.

<F4> OPT

PROCEEDS TO THE [OPTIONS] SCREEN.

- c. Press <F4> OPT.

```
OPTIONS
TIME   ACF
```

<F1> TIME

PROCEEDS TO THE SET DATE AND TIME SCREEN.

<F2> ACF

PROCEEDS TO THE ALTITUDE CONTROL FUNCTION SCREEN.

- d. Press <F2> ACF.

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ALTITUDE 0000FT
UP DWN CONT

- <F1> UP** SCROLLS UP THROUGH THE AVAILABLE ALTITUDES IN 1000 FOOT INCREMENTS.
- <F2> DWN** SCROLLS DOWN THROUGH THE AVAILABLE ALTITUDES IN 1000 FOOT INCREMENTS.
- <F4> CONT** PROGRAMS THE SELECTED ALTITUDE AND RETURNS TO THE [SYS DIAG?] SCREEN.

- e. Using the <F1> UP and <F2> DOWN keys, scroll to the nearest altitude in 1000 foot increments.
- f. Press <F4> CONT to program the appropriate altitude into the JSMLT and return to the [SYS DIAG?] screen.

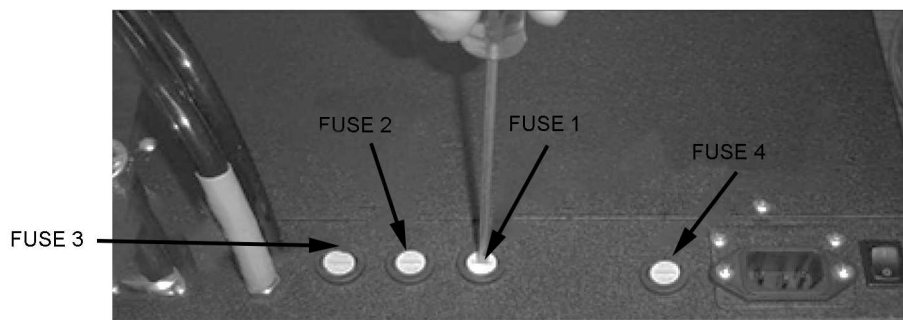
SYS DIAG?
YES NO OPT

- g. Press <F2> NO to return to the [SELECT TEST] screen.

11.3 REPLACEMENT OF THE FUSE.

Refer to Figure 11-1 and Table 11-1 to replace the fuses.

- Turn off the JSMLT.
- Unplug the power cord from the power source.
- Using a 1/8 inch flat tip screwdriver, push down and turn the fuse holder cap counterclockwise. This will allow the spring loaded fuse holder cap to pop up.



TO-33A4-7-10-1-058

Figure 11-1. Replacing the Fuses**Table 11-1. Replacing the Fuses**

Fuse Number (No.)	Use
Fuse 1	Fuse for the Control Unit (CU) (2.5 amp. 250 Volts (V) slow-blow)
Fuse 2	Fuse for the CU valves (2.5 amp. 250V slow-blow)
Fuse 3	Fuse for the system pump (4 amp, 250V slow-blow)
Fuse 4	Fuse for Alternating Current (AC) power input (4 amp, 250V slow-blow)

- d. Using your thumb and forefinger, lift the fuse holder cap out of its socket.
- e. Remove the fuse from the fuse holder cap.
- f. Select a replacement fuse from the spare fuse kit and insert it into the fuse holder cap.
- g. Using your thumb and forefinger, place the fuse and fuse holder cap back into its socket.
- h. Using a 1/8 inch flat tip screwdriver, push down and turn the fuse holder cap clockwise. This will lock it into place.

WARNING

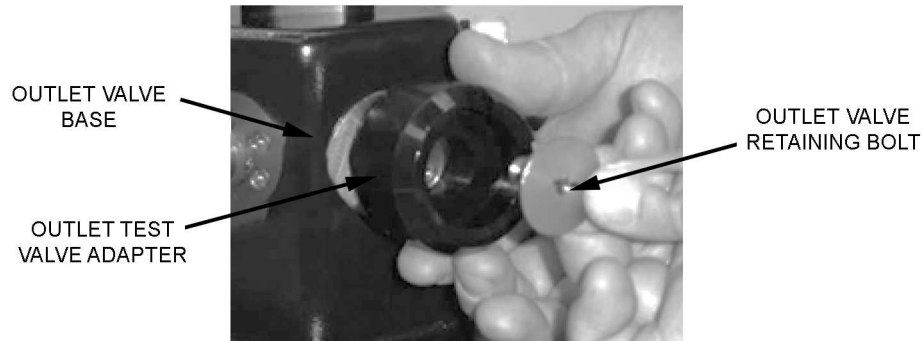
Do not connect the power cord if any wiring is frayed, doing so could result in injury to or death of personnel and/or damages to the equipment.

- i. Connect the power cord to the power source.

11.4 REPLACEMENT OF THE OUTLET VALVE TEST ADAPTER.

- a. Remove the outlet valve retaining bolt from the outlet valve base using the No. 2 stubby cross tip screwdriver provided with the JSMLT and then remove the outlet valve test adapter, Figure 11-2.

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Figure 11-2. Removing the Retaining Bolt

- b. To install a replacement outlet valve test adapter; first insert the outlet valve retaining bolt through the center of the outlet valve test adapter, Figure 11-3.



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Figure 11-3. Reinstalling the Bolt and Adapter

NOTE

Over/under tightening the outlet valve retaining bolt may cause the Outlet Valve Test [VALVE] to fail.

- c. Reinstall the outlet valve retaining bolt and outlet valve test adapter, Figure 11-4 into the base by turning clockwise. Hand-tighten the outlet valve retaining bolt until resistance is felt and continue to tighten until the notches are centered

and facing up. The outlet valve test adapter should remain attached to the outlet valve base unless it becomes unserviceable or needs to be changed to accommodate other types of masks for testing.



TO-33A4-7-10-1-061

Figure 11-4. Outlet Valve Test Adapter

11.5 REPLACEMENT OF THE DRINK TUBE ADAPTER O-RING.

Refer to Figure 11-5 for replacement of the drink tube adapter

- Using the 1/8 inch flat tip screwdriver provided with the JSMLT, carefully remove the drink tube adapter O-ring by inserting the flat tip of the screwdriver between the inside surface of the metal adapter and the O-ring.
- Using a prying motion, carefully lift the O-ring out of its groove.
- Using the flat tip of the screwdriver, carefully insert the new O-ring into the groove.
- Starting in one location and continuing around the circumference of the adapter, press down on the O-ring until it is fully seated into the adapter.



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Figure 11-5. Replacement of the Drink Adapter O-ring

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11.6 REPLACEMENT OF THE EXTERNAL O-RING AND GASKET.

NOTE

The JSMLT has external O-rings located in the following areas: headform pedestal, fit test interface ports, generator cap, hose test port plug, mask passing tube, hose test adapter, and the fit test interface tubing. The following adapters within the Joint Service Mask Adapter Kit (JSMAC) also have external O-rings and/or gaskets: M50 Drink/Fit Test Adapter, the M53 Outlet Valve Plug/Adapter, and the M40 Series Hose Connector.

- a. Using your index finger and thumb, remove the O-ring/gasket by squeezing it inward while pulling upward, Figure 11-6.
- b. Place the new O-ring/gasket over or into the fitting and press down to secure.



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Figure 11-6. Replacement of the External O-ring

11.7 CLEANING OF THE DRINK TUBE ADAPTER: INNER ADAPTER.

Refer to Figure 11-7 to clean the drink tube adapter: inner adapter.

- a. Turn the drink tube adapter fully counterclockwise to the “OUT” position.
- b. Use a machinery wiping towel to gently wipe between the drink tube adapter and the CU.
- c. Turn the drink tube adapter fully clockwise to the “IN” position.



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Figure 11-7. Cleaning the Drink Tube Adapter

11.8 TRIMMING/CUTTING OF THE TWIN TUBE INTERFACE.

NOTE

When trimming the twin tube interface hose, ensure that the yellow band is not cut and that it is securely attached to the hose.

- Place the tubing to be trimmed on a flat surface.
- Using a craftsman's knife, carefully make a complete perpendicular cut as close to the end of the tubing as possible.

11.9 CLEANING OF THE SHROUD/MANIFOLD.



ALCOHOL, ISOPROPYL, TT-I-735

1



If liquid gets inside the JSMLT, damage to the electronics can occur resulting in loss of mission effectiveness or damage to equipment.

- Using a machinery wiping towel very lightly dampened with isopropyl alcohol, TT-I-735, carefully wipe all surfaces. Use care to avoid dripping alcohol on any adjacent surfaces.
- Use a separate machinery wiping towel to dry all surfaces.

11.10 USING THE MASK PASSING TUBE.

11.10.1 Installation of the Mask Passing Tube.

NOTE

When using the mask passing tube, leakage should not exceed 0.0009 percent during a mask test. If leakage exceeds 0.0009 percent, the mask passing tube is unserviceable.

- Remove the mask test shroud.
- Using the 1/8 inch flat tip screwdriver, carefully remove the lint screen from the headform, Figure 11-8.



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Figure 11-8. Removal of the Lint Screen, Yellow Headform (Left) and IFSTHA (Right)

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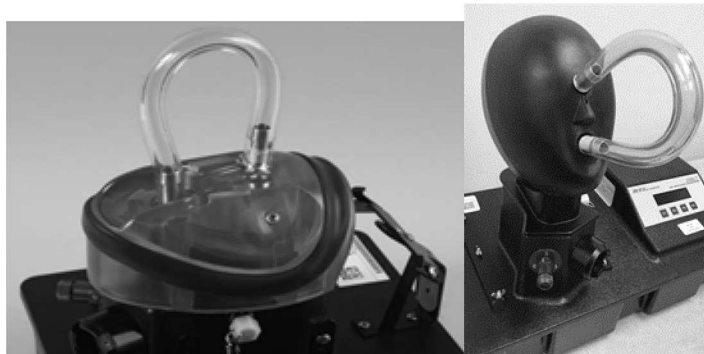
- c. Insert one end of the mask passing tube into the top (flow) port of the headform, Figure 11-9.



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Figure 11-9. Inserting the Mask Passing Tube, Yellow Headform (Left) and IFSTHA (Right)

- d. Insert the other end of the mask passing tube into the bottom (vacuum) port of the headform, Figure 11-10.



TO-33A4-7-10-1-067

Figure 11-10. Mask Passing Tube Inserted, Yellow Headform (Left) and IFSTHA (Right)

11.10.2 Removal of the Mask Passing Tube.

- Remove the mask passing tube from the headform, Figure 11-10.
- Reinsert the lint screen into the vacuum port of the headform.

11.11 BACK PRESSURE ADJUSTMENT.

Refer to Figure 11-11 for the back pressure adjustment.

- From the [SELECT TEST] screen, press <F1> SYS to enter the system diagnostics screen.

```
SELECT TEST= M ALL
SYS  UP    DWN  ACPT
```

- b. From the [SYS DIAG?] screen, press <F1> YES to enter the [CHECK?] screen.

```
SYS DIAG?
YES  NO      OPT
```

- c. Place the mask passing tube on the JSMLT headform in accordance with Paragraph 11.10.

```
CHECK?
MSK  VAL  MORE  EXIT
```

<F1> MSK	ENTERS INTO THE MASK PRESSURE AND FLOW SCREEN.
<F2> VAL	ENTERS INTO THE VALVE PRESSURE AND FLOW SCREEN (USED ONLY BY OEM FACTORY TECHNICIANS).
<F3> MORE	ENTERS INTO MORE DIAGNOSTIC SCREENS (USED ONLY BY OEM FACTORY TECHNICIANS).
<F4> EXIT	EXITS THE [CHECK?] SCREEN AND RETURNS TO THE [SYS DIAG?] SCREEN.

- d. At the [CHECK?] screen, select <F1> MSK to enter the mask pressure and flow diagnostics screen.

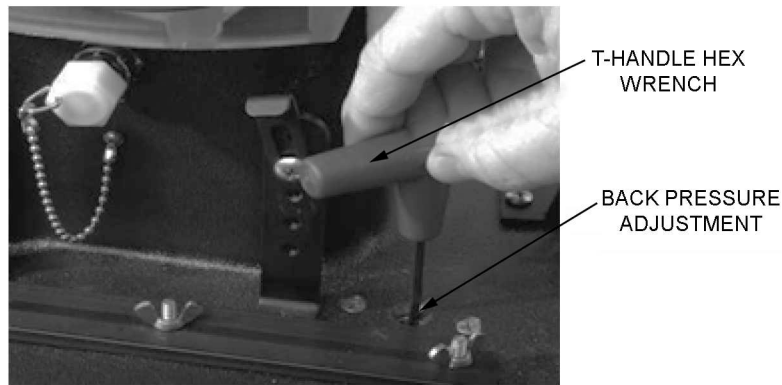
NOTE

When the flow is 15.9 to 16.1 Liters per Minute (LPM), adjust the back pressure to 6.1 to 6.3. This should take no more than 30 seconds.

```
MASK = 16.0 / 6.2
CONT
```

- e. If the numbers displayed are in the proper ranges, press <F4> CONT and proceed to Step 1.
- f. If the numbers are not in the acceptable range, use the stubby cross tip screwdriver to remove the cover screw of the back pressure adjustment control. This is the largest diameter screw, located between two smaller cross tip screws on the upper right of the pedestal. (Do not lose this screw).
- g. Place the T-Handle hex wrench in the back pressure control adjustment screw.

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Figure 11-11. Back Pressure Adjustment

- h. Adjust the vacuum to 6.2 inches at a flow of 16.0 by turning the hex wrench clockwise or counterclockwise. Clockwise turns increase the vacuum while counterclockwise turns decrease the vacuum.
- i. Allow the numbers to stabilize. This should take no more than 30 seconds.
- j. Once the numbers read 16.0 and 6.2, respectively, press <F4> CONT.
- k. Repeat from Step d to verify that the vacuum is now set correctly.

MASK = 16.0 / 6.2

CONT

- l. Replace the cover screw, if removed, and press <F4> CONT to exit the mask pressure and flow screen into the [CHECK?] screen.

CHECK?


MSK VAL MORE EXIT

- m. Press <F4> EXIT to return to the [SYS DIAG?] screen.

SYS DIAG?

YES NO OPT

- n. Press <F2> NO to return to the [SELECT TEST] screen.



SELECT TEST= M ALL
SYS UP DWN ACPT

- o. Select your next mask testing mode, then press <F4> Accept (ACPT) to continue.
- p. Remove the mask passing tube and reinsert the lint screen into the vacuum port of the headform.

11.12 ADJUSTMENT OF THE UNIVERSAL HOLD-DOWN ASSEMBLY.

Ensure that the universal hold-down assembly is properly adjusted. There are five hold-down brackets (four (4) side brackets and one (1) top bracket), six (6) mask clips, and two (2) side bracket clamps. Assembly can be adjusted to fit most mask styles, Figure 11-12.



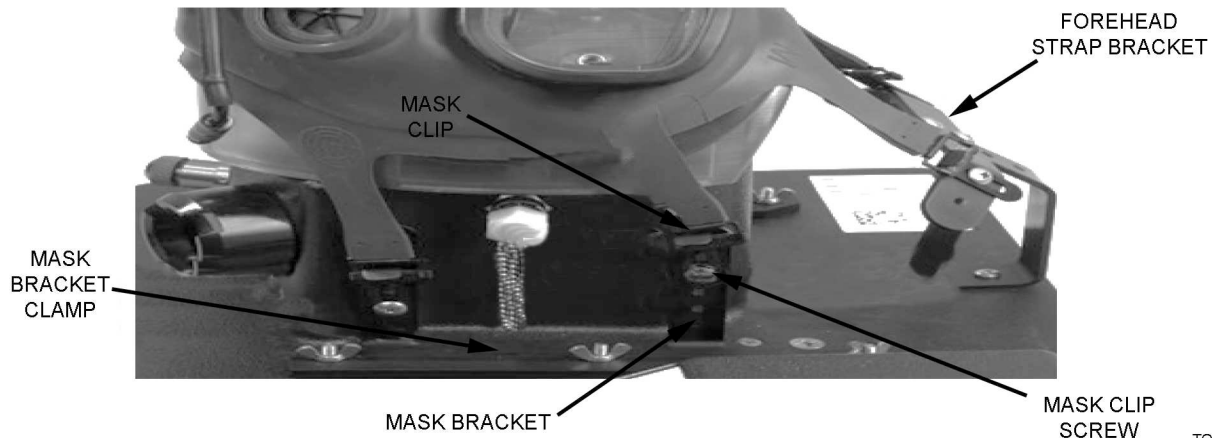
Incorrectly adjusting mask clips can cause disfiguring and damage to the mask which could result in insufficient sealing and test failures.

NOTE

The brackets may need to be adjusted for each size/type of mask to be tested. Failure to properly adjust the brackets may cause false readings during a test.

- a. Position the mask to be tested on the headform with the chin of the mask pulled down over the peripheral seal. Apply the mask in accordance with instructions detailed in Paragraph 5.3
- b. If using the Yellow Headform, mask brackets and mask clips should be adjusted to follow the angle and location of the mask straps. Adjust the mask clip for each strap to be approximately the distance of the width of one (1) mask clip away from the mask buckle in the relaxed state.
- c. If adjustments are necessary, use the stubby cross tip screwdriver to loosen the mask clip screws and then adjust the clips up or down the bracket. Tighten the mask clip screws with the stubby cross tip screwdriver when finished. Loosen the wing nuts to slide the mask brackets forward or backward then hand-tighten the wing nuts to secure the brackets in place.

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Figure 11-12. Properly Adjusted Mask and Clips

CHAPTER 12

TROUBLESHOOTING; FAULT AND ERROR MESSAGES

12.1 TROUBLESHOOTING POINTS OF CONTACT.

The primary means of technical support for all Chemical and Biological Defense equipment is the Joint Program Executive Office (JPEO), Chemical, Biological, Radiological, and Nuclear Defense Information Resource Center (CBRN-IRC). Contact information for the CBRN-IRC is listed in Table 12-1.

Table 12-1. Troubleshooting Points of Contact

Technical Support	Contact
Toll-Free	1-800-831-4408
DSN	793-7349
Commercial	309-782-7349
Germany (Toll-Free)	0130-81-0280
South Korea (Toll-Free)	0078-14-800-0335
E-Mail	cbrn.IRC@mail.mil

12.2 TROUBLESHOOTING FLOWCHARTS AND FAULT AND ERROR MESSAGES.



The Control Unit (CU) or power unit should NEVER be opened. These units contain sensitive electronics that can be damaged if tampered with and opening either of these units voids the manufacturer's factory warranty.

The following pages contain troubleshooting flowcharts and fault and error messages you may encounter while operating the Joint Service Mask Leakage Tester (JSMLT).

12.3 SYMBOLS.

The symbols in Table 12-2 are used in the flowcharts in this chapter.

Table 12-2. Flowchart Symbols

Symbol	Meaning
	Indicates a step/action to be taken.
	Indicates a point at which a decision must be made.
	Indicates the path down which an answer leads.

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12.4 CORRECTIVE ACTION.

If corrective action directs you to contact the next higher-level maintenance, refer to service specific instructions listed below:

- For United States Navy (USN) Users, return the JSMLT to the Fleet Consolidated Sustainment Facility, or email: nswcpd_cbd_ipe@navy.mil.
- For United States Air Force (USAF) Users, contact the nearest Air Force Precision Measurement Equipment Laboratory (PMEL) for calibration services and other maintenance that is authorized in TO 33K6-4-3548-1. If the JSMLT is located at the Air Force Mask Inspection and Repair Program (AFMIRP), calibration and repairs are authorized under TO 33K-1-100-1 guidance or other approved Joint guidance.
- For Marine Corps Users, return the JSMLT to the Consolidated Storage Program Unit Issue Facility or contact the JPEO Information Resource Center (IRC) at 1-800-831-4408 or email: cbrn-IRC@us.army.mil

12.5 LIST OF FLOWCHART ERRORS.

Refer to Table 12-3 for a list of flowchart errors.

Table 12-3. List of Flowchart Errors

Type of Error	Paragraph and Figure Number (No.)	Description
CU/Power Unit	Paragraph 12.6.1 and Figure 12-1	Display is Blank Error
CU/Power Unit	Paragraph 12.6.2 and Figure 12-2	Single Dash on Display Error
CU/Power Unit	Paragraph 12.6.3 and Figure 12-3	Pump Not Operating Error
CU/Power Unit	Paragraph 12.6.4 and Figure 12-4	Flow Error
CU/Power Unit	Paragraph 12.6.5 and Figure 12-5	Memory Error
CU/Power Unit	Paragraph 12.6.6 and Figure 12-6	Seal Failure Error
CU/Power Unit	Paragraph 12.6.7 and Figure 12-7	CU Resetting Error
Aerosol	Paragraph 12.7.1 and Figure 12-8	Remains in Loading During Mask Aerosol Set Up or Mask Test Error
Aerosol	Paragraph 12.7.2 and Figure 12-9	Remains in Loading During Fit Test Aerosol Set Up Error
Aerosol	Paragraph 12.7.3 and Figure 12-10	Aerosol Set Up of 90 or Greater Error
Aerosol	Paragraph 12.7.4 and Figure 12-11	Light Scattering Chamber (LSC) Error
Aerosol	Paragraph 12.7.5 and Figure 12-12	Low/High Aerosol Error
Mask Test	Paragraph 12.8.1 and Figure 12-13	Low Vacuum Failure Error
Mask Test	Paragraph 12.8.2 and Figure 12-14	High Vacuum Failure Error
Mask Test	Paragraph 12.8.3 and Figure 12-15	Persistent Penetration Failures Error
Drink Test	Paragraph 12.9.1 and Figure 12-16	Consistent Drink Tube Flow Failures Error
Drink Test	Paragraph 12.9.2 and Figure 12-17	Consistent Drink Train or Seat Failures Error
Valve Test	Paragraph 12.10.1 and Figure 12-18	Consistent Outlet Valve Failures Error
Fit Test	Paragraph 12.11.1 and Figure 12-19	Remains in Setting During Fit Test Error
Fit Test	Paragraph 12.11.2 and Figure 12-20	Consistent Low Fit Factor Error

12.6 CU/POWER UNIT ERRORS.

12.6.1 Display is Blank Error. The root cause of the display is blank error can be attributed to either the power unit or the CU, Figure 12-1.

NOTE

- A total lack of power could indicate a failure of fuse 4 on the power unit. Check fuse 4 and replace if defective in accordance with Paragraph 11.3. If the power unit initializes when toggled “ON” and the display is still blank on the CU, use the flow chart below to troubleshoot the problem.
- To determine if the fuse is blown, visually inspect the fuse for burn marks or broken inner filament.

12.6.2 Single Dash on Display Error. The root cause of the single dash on display error can usually be attributed to the CU, Figure 12-2.

12.6.3 Pump Not Operating Error. The root cause of the pump not operating error can usually be attributed to the power unit, Figure 12-3.

12.6.4 Flow Error. The root cause of the flow error can usually be attributed to the CU, Figure 12-4.

12.6.5 Memory Error. The root cause of the memory error can always be attributed to the CU, Figure 12-5.

12.6.6 Seal Failure Error. The root cause of the seal failure error can always be attributed to the CU, Figure 12-6.

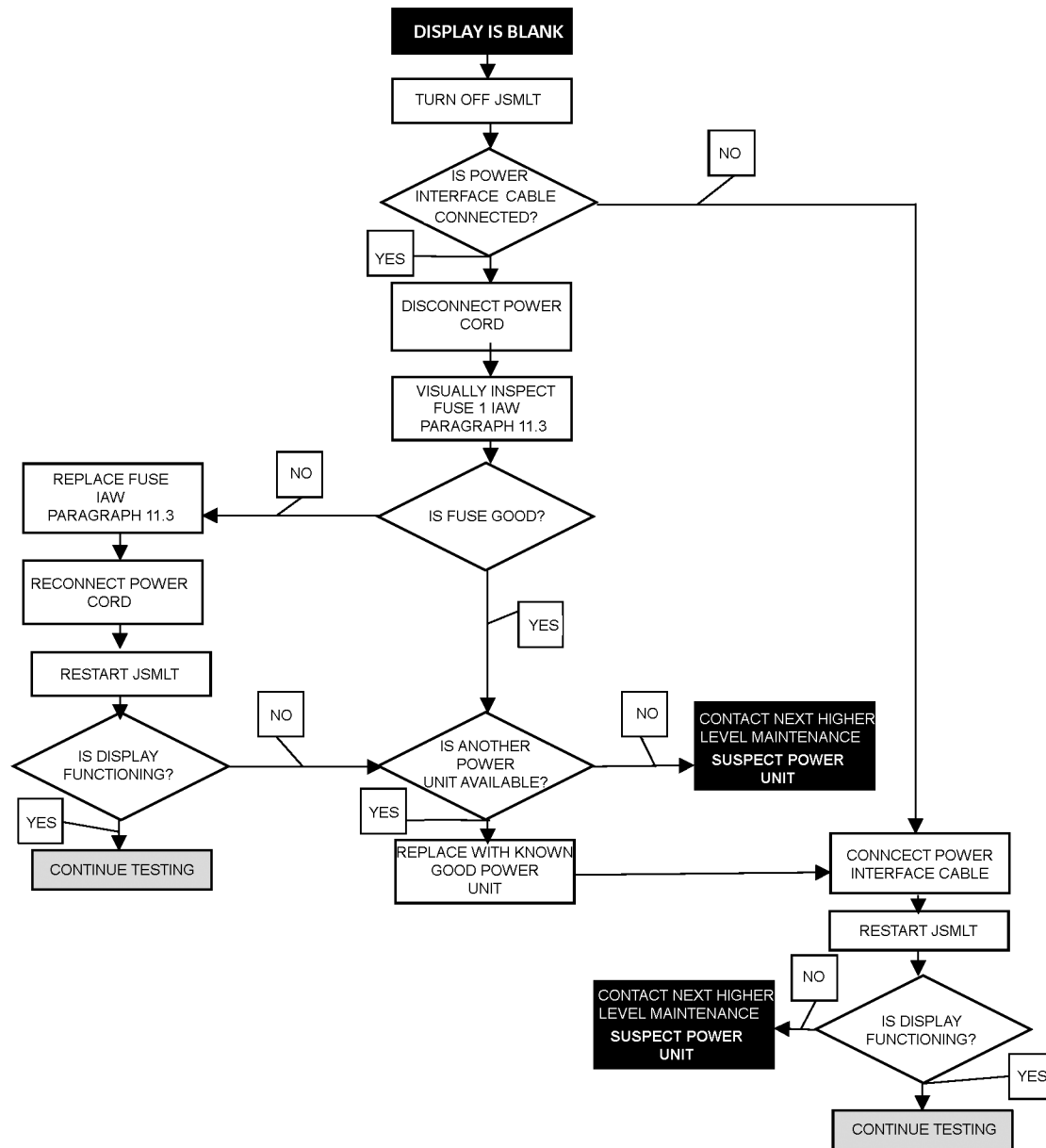
12.6.7 CU Resetting Error. The root cause of the CU resetting error can always be attributed to the CU, Figure 12-7.

12.7 AEROSOL ERRORS.

12.7.1 Remains in Loading During Mask Aerosol Set Up or Mask Test Error. The root cause of the loading during mask aerosol set up or mask test error can be attributed to either the power unit or CU, Figure 12-8.

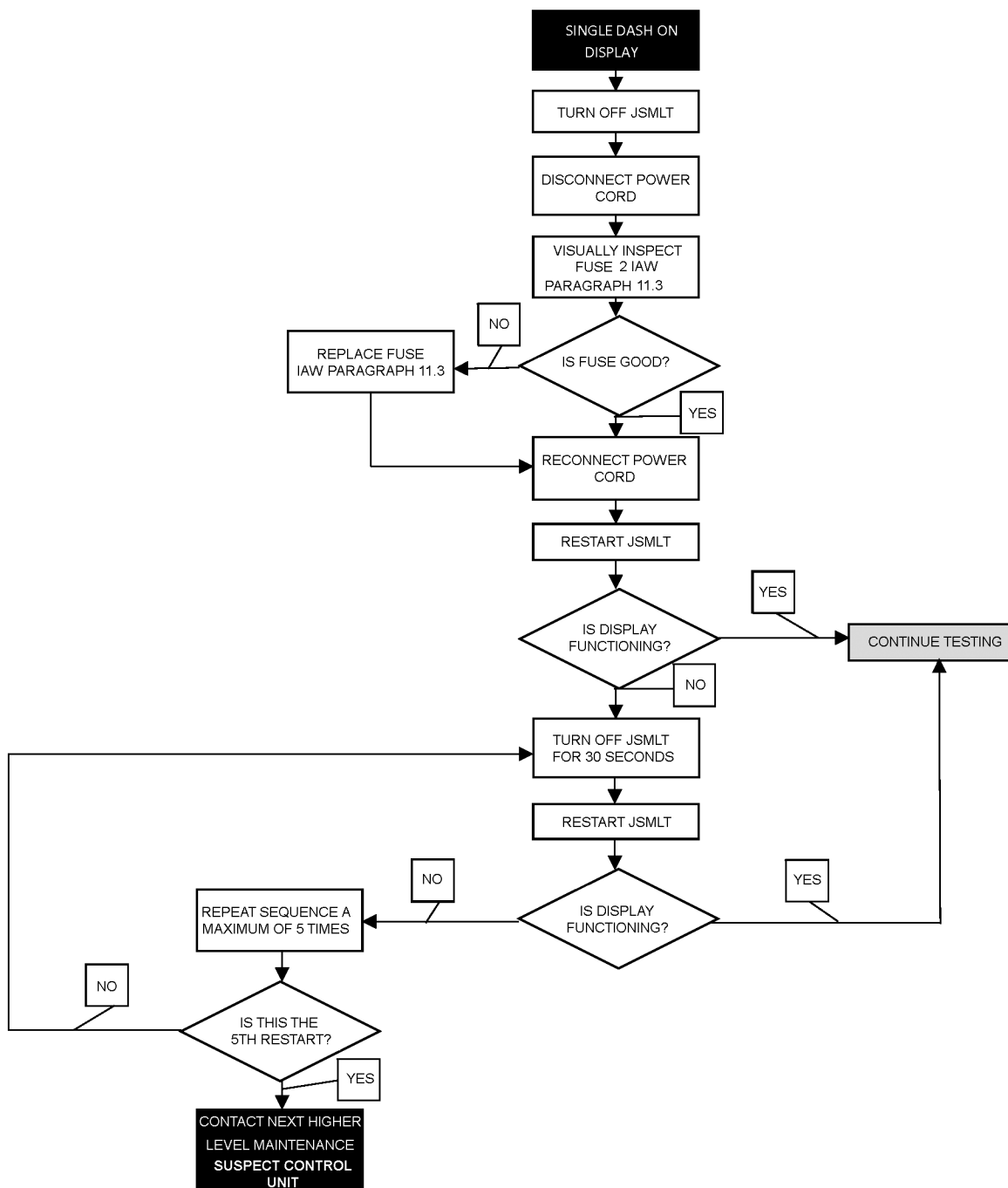
12.7.2 Remains in Loading During Fit Test Aerosol Set Up Error. The root cause of the remains in loading during fit test aerosol set up error can be attributed to either the power unit or CU, Figure 12-9.

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-101-070

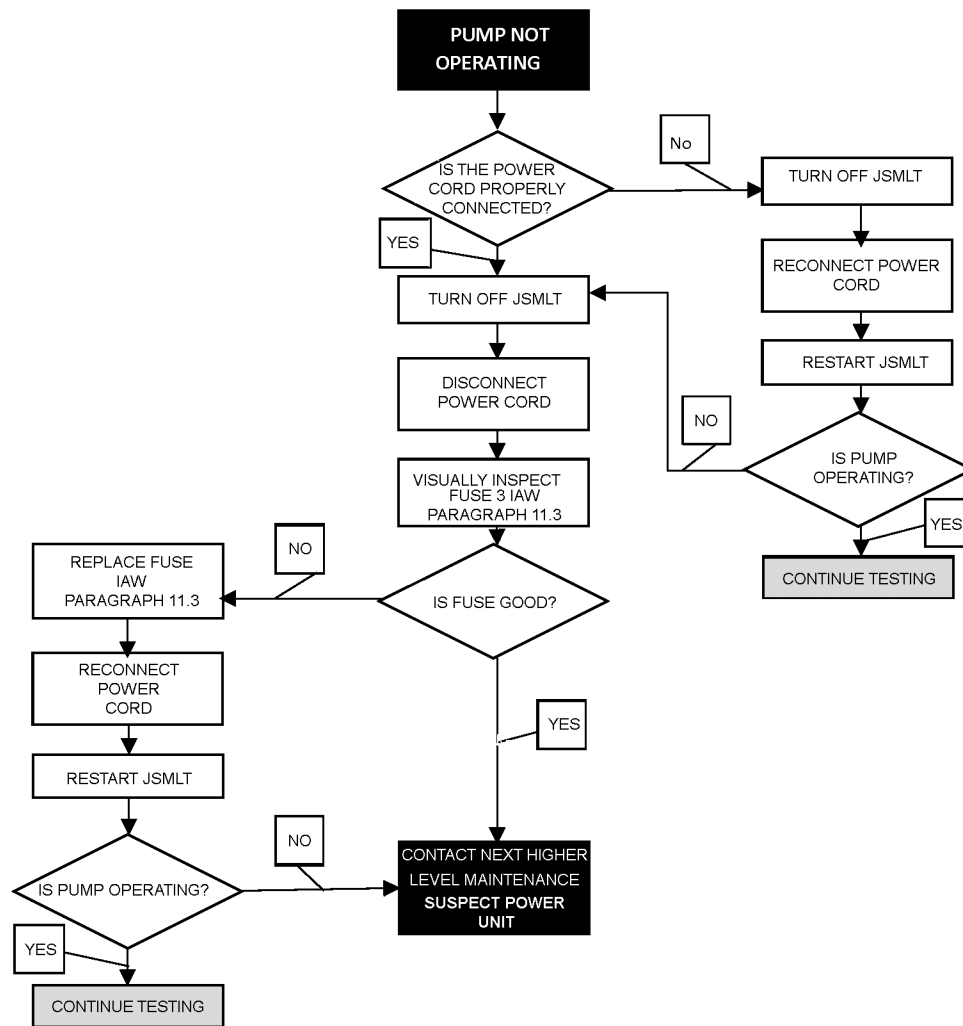
Figure 12-1. Display is Blank Error



TO-33A4-7-10-1-071

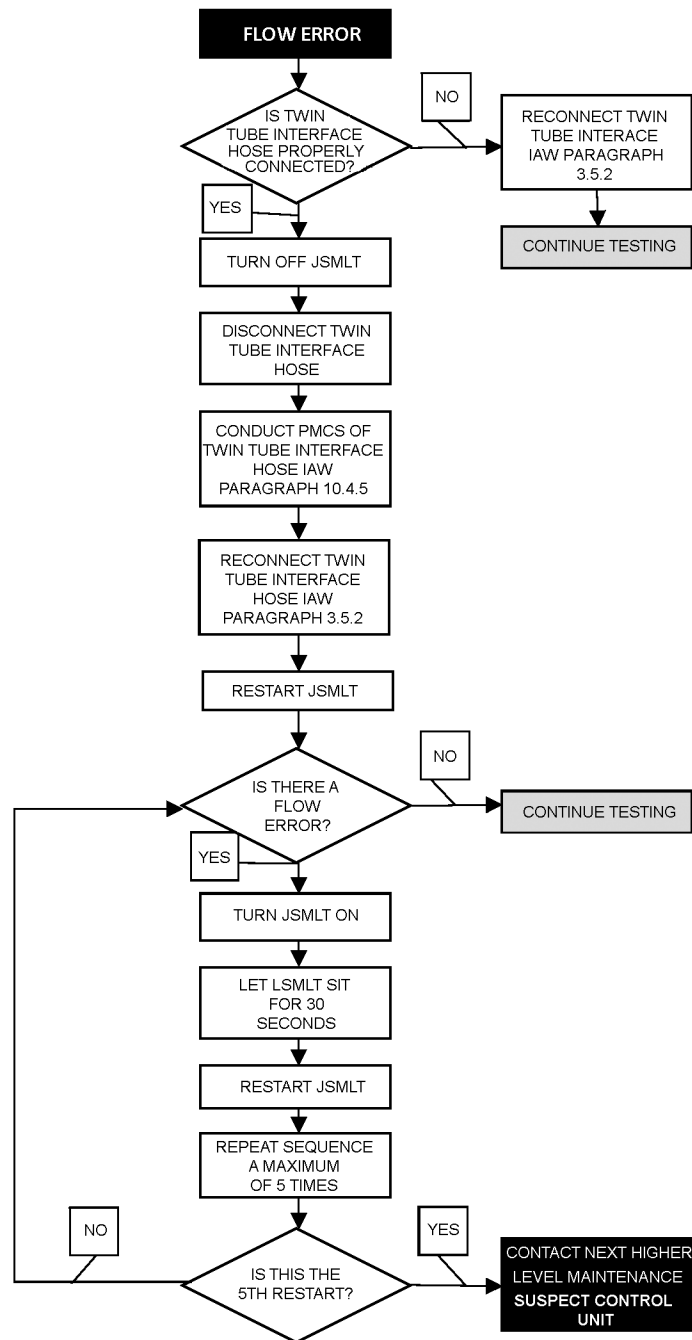
Figure 12-2. Single Dash on Display Error

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-072

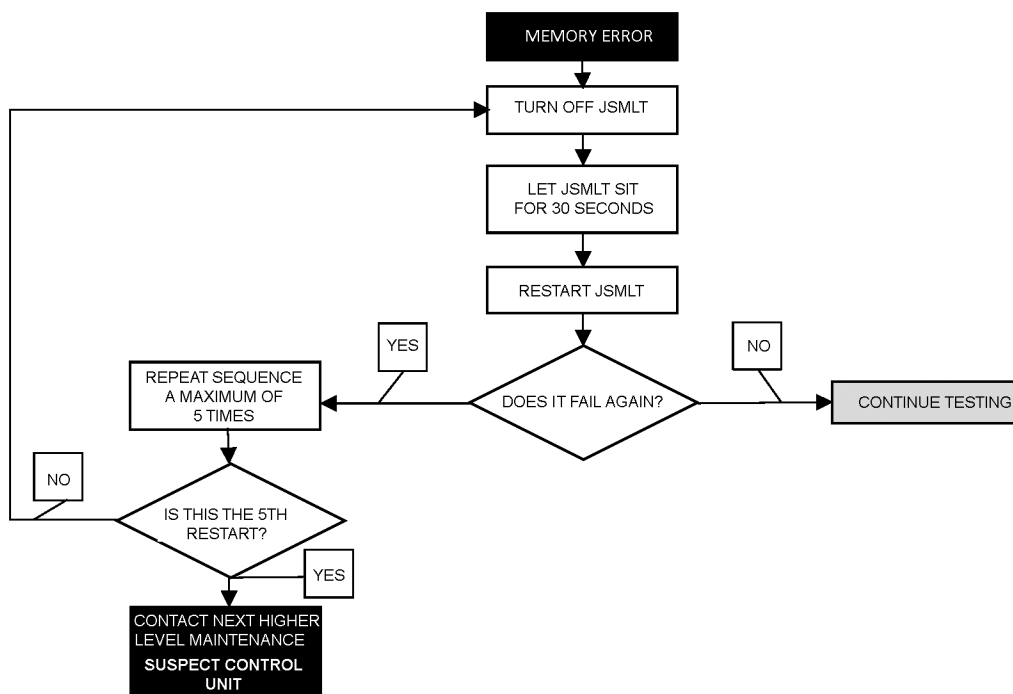
Figure 12-3. Pump Not Operating Error



TO-33A4-7-10-1-073

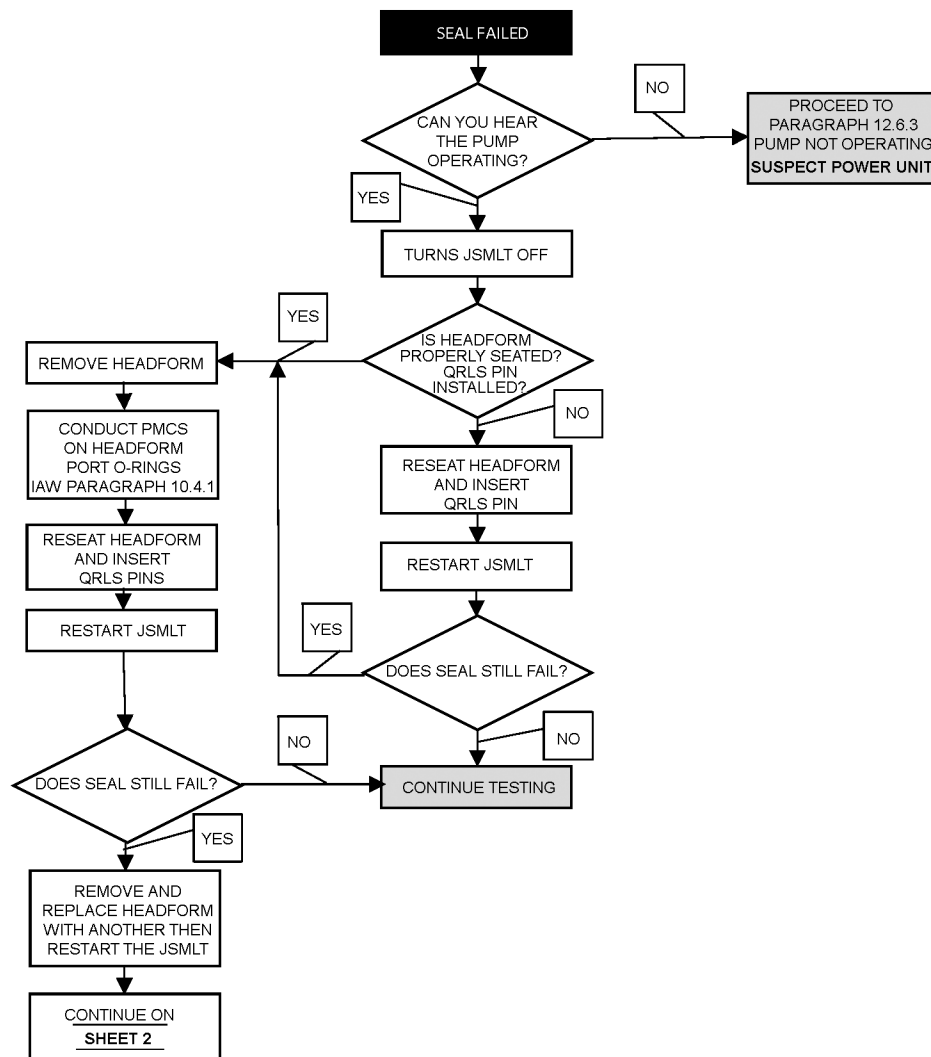
Figure 12-4. Flow Error

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-074

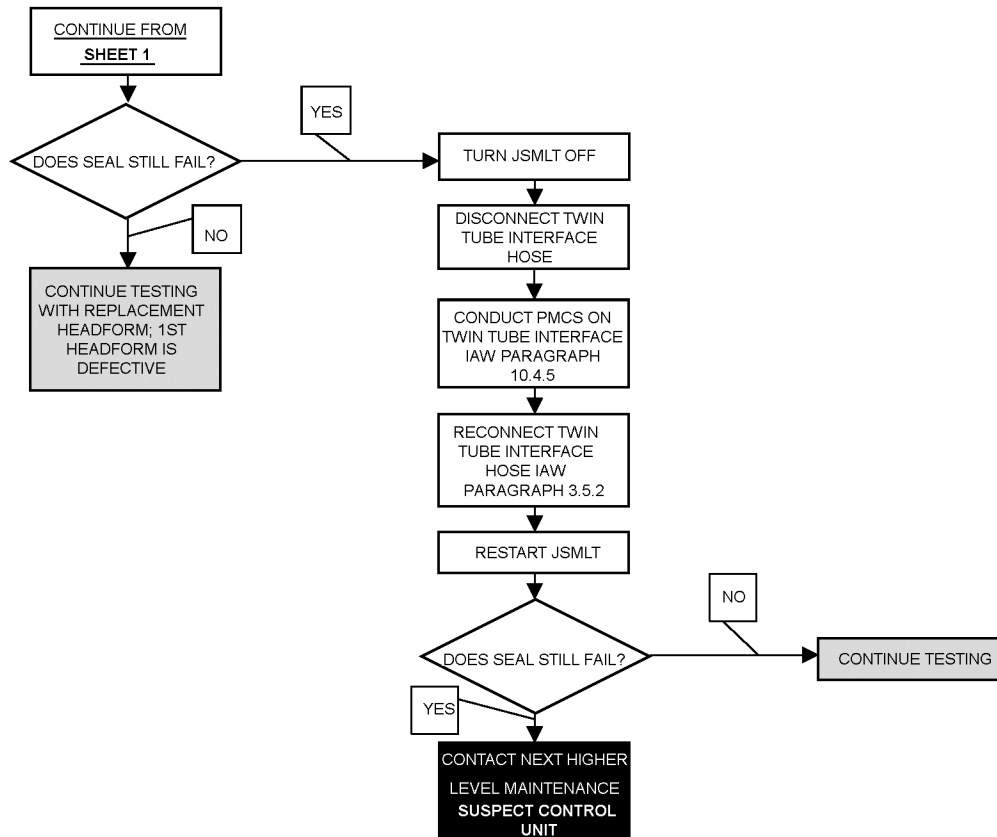
Figure 12-5. Memory Error



TO-33A4-7-10-1-075

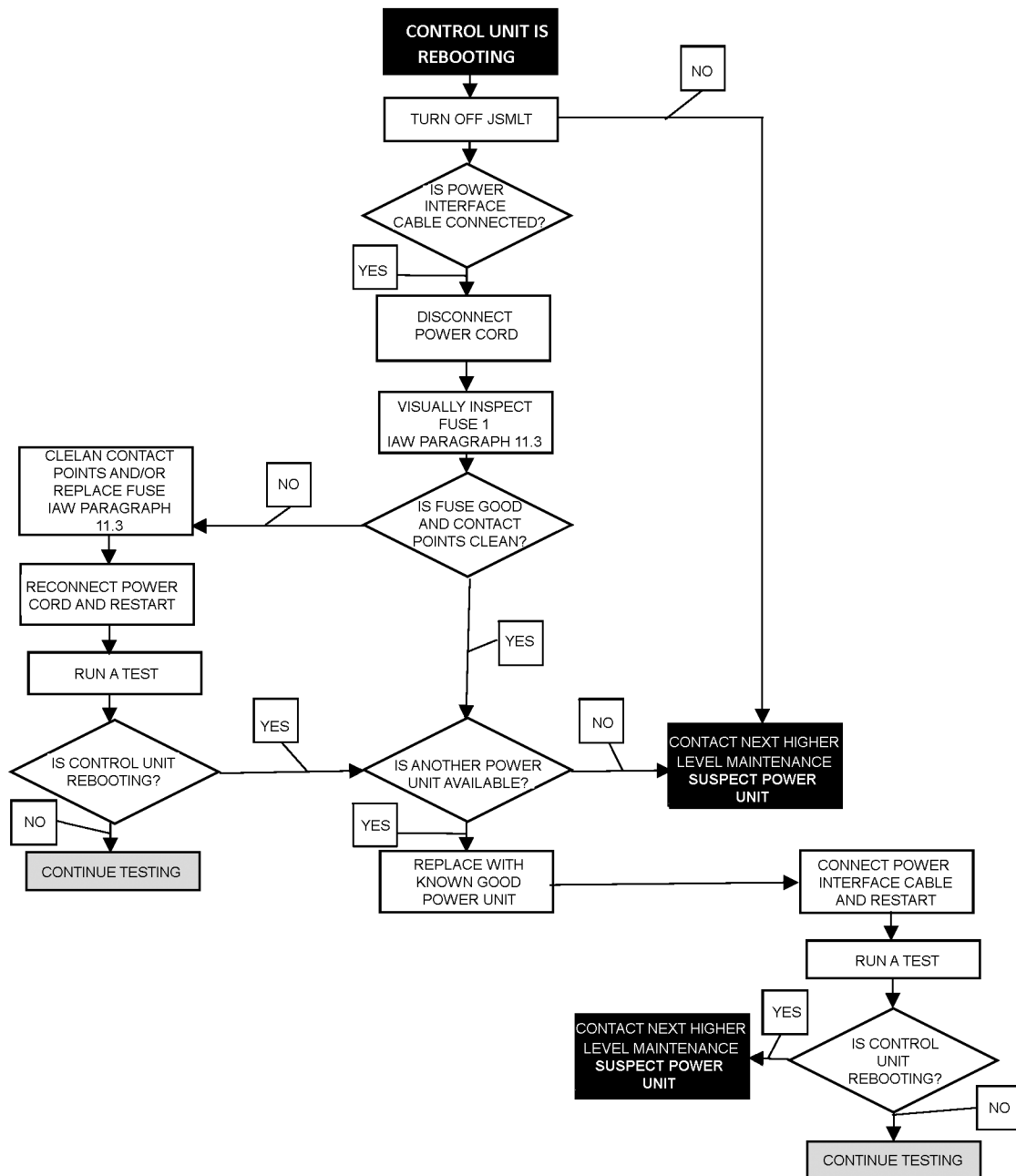
Figure 12-6. Seal Failure Error (Sheet 1 of 2)

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-076

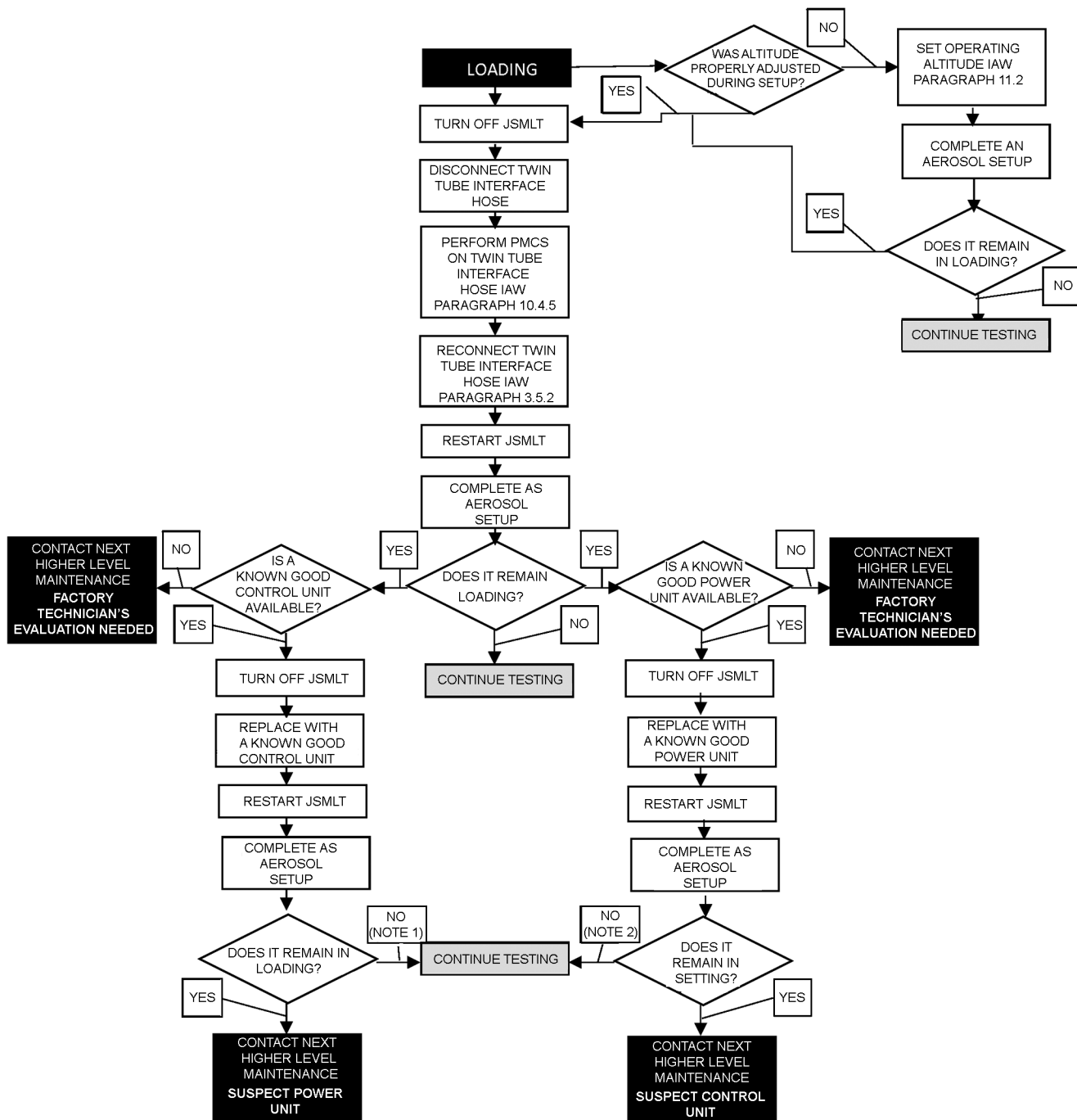
Figure 12-6. Seal Failure Error (Sheet 2)



TO-33A4-7-10-1-077

Figure 12-7. CU Resetting Error

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

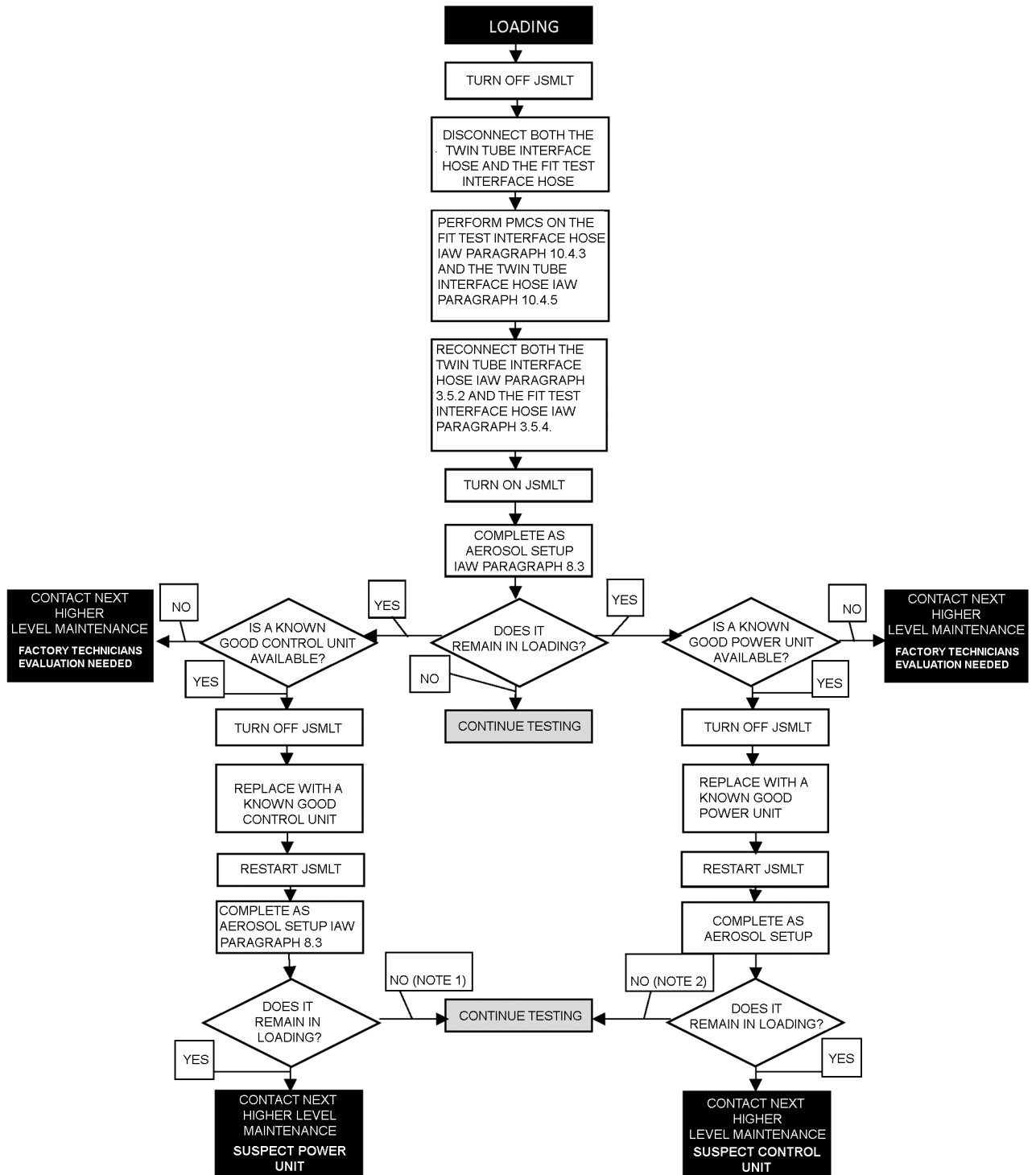


NOTE 1: SUSPECT FIRST CONTROL UNIT IS DEFECTIVE.

NOTE 2: SUSPECT FIRST POWER UNIT IS DEFECTIVE.

TO-33A4-7-10-1-078

Figure 12-8. Loading During Mask Aerosol Set Up or Mask Test Error



NOTE 1: SUSPECT FIRST CONTROL UNIT IS DEFECTIVE
 NOTE 2: SUSPECT FIRST POWER UNIT IS DEFECTIVE.

TO-33A4-7-10-1-079

Figure 12-9. Remains in Loading During Fit Test Aerosol Set Up Error

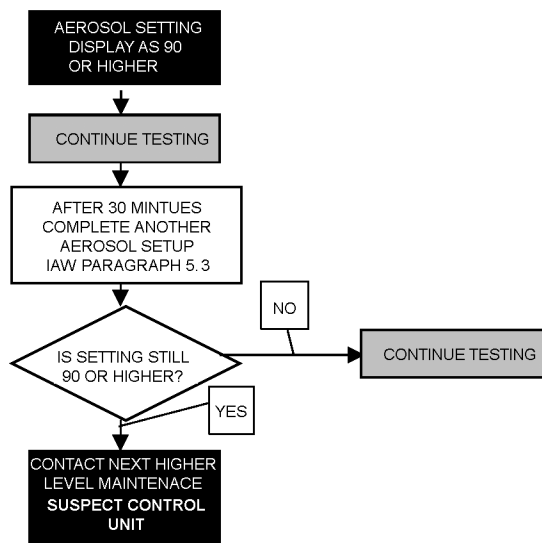
AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

12.7.3 Aerosol Setup of 90 or Greater Error.



The JSMLT will not operate above an aerosol number of 120 and higher-level maintenance must be scheduled when the number reaches 90. Failure to properly maintain the equipment may result in damage to the equipment and loss of mission effectiveness.

After completing an aerosol setup, a number is displayed in the lower left corner of the screen. This number reflects the cleanliness of the optics within the CU. In order to minimize the amount of time that the JSMLT will be out of service, it is essential that the following procedures are followed. The root cause of the aerosol setup of 90 or greater error can usually be attributed to the CU. Figure 12-10.



TO-33A4-7-10-1-080

Figure 12-10. Aerosol Setup of 90 or Greater Error

12.7.4 LSC Error. The following process should be used to try and resolve your recurring LSC errors, Figure 12-11. Setup and initialize the JSMLT. When the [SELECT TEST] screen is reached, follow Step a through Step q, as needed.

```

SELECT TEST= M ALL
SYS  UP   DWN ACPT
  
```

- a. From the [SELECT TEST] screen, press <F1> SYS. This will lead you into the [SYS DIAG?] screen.



SYS DIAG?

YES NO OPT

- b. Press <F1> YES; this will initiate a JSMLT [SYSTEM CHECK] screen.



SYSTEM CHECK *

- c. At the conclusion of the [SYSTEM CHECK], the following screen will be displayed:



CHECK?

MSK VAL MORE EXIT

- d. Press <F3> MORE; your next screen will display the following:




CHECK?

D-L D-H LSC CONT

- e. Press the <F3> LSC key to enter into the LSC diagnostic program. The screen will display a [SETTING] message and then the LSC diagnostic screen (below) will be displayed.

THIS NUMBER MAY VARY



LSC (98)

0.0016

ZERO OFF HI EXIT

THIS NUMBER MAY VARY

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

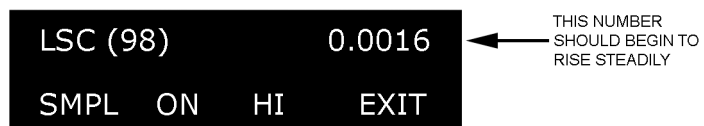
- f. Make a note of the initial number in parenthesis next to “LSC” and the number on the top right corner of the screen. The number in the upper right may initially show some minor fluctuation but should remain fairly stable within 5 seconds. If the number in the top right corner of the screen continues to fluctuate, it may be an indication of contamination within the LSC.



AEROSOL OIL, POLY ALPHA OLEFIN, PAO-4 (ATI PN 200188)

1

- g. If not already completed, place the mask test shroud over the test head with the aerosol probe hose inserted, (as you would for a MASK test aerosol setup).
- h. Press <F1> ZERO; the text will change to SMPL and the numbers in the upper right corner will begin to fluctuate. This is a normal reaction as the LSC begins to detect background particles in the ambient air within the shroud.
- i. Next, press <F2> OFF to turn on the aerosol generator. The text will change to read ON and the aerosol generator should begin to bubble and aerosolize the PAO inside. Your display screen should look like the example below:



- j. Allow the generator to run for 30 to 45 seconds as the numbers in the top right corner of the display screen steadily rise. If these numbers DO NOT fluctuate upwards, it may be an indication of an internal electrical signal problem.



- k. Deactivate the aerosol generator by pressing the <F2> ON key; the aerosol generator will stop bubbling and the text will change to read OFF. Then press the <F1> SMPL key to return to ZERO. Your display screen should like the example below:



- l. Press <F4> EXIT; your next screen will read as follows:

```
CHECK?  
MSK VAL MORE EXIT
```

- m. Press <F4> EXIT again; your next screen will read as follows:

```
SYS DIAG?  
YES NO OPT
```

- n. Press <F2> NO and you will be returned to the [SELECT TEST] screen.
- o. Once you have returned to the [SELECT TEST] screen, select the MASK or M-ALL mode. Then conduct the aerosol setup. If you set up successfully, exit out of that mode and set up for FIT testing. If you register another LSC error, shut the system down and proceed to the next step.
- p. If your aerosol setup was unsuccessful in the previous step, re-start the JSMLT. At the [SELECT TEST] screen, select the MASK or M-ALL mode and initiate another aerosol setup BUT DO NOT connect the aerosol probe hose to the mask test shroud. Complete the aerosol setup with no aerosol to try and force a "LOW AEROSOL ERROR". That may, in turn, force the LSC to reset itself and allow you to re-initiate testing. If you complete this step and get a "LOW AEROSOL ERROR" or another "LSC ERROR", shut the system down and proceed to the next step.
- q. Re-start the JSMLT. At the [SELECT TEST] screen, select either MASK or FIT mode and then conduct the aerosol setup. If you set up successfully, proceed to test as you normally would. However, if you are still unable to resolve the "LSC ERROR", your system may need to be returned to the Original Equipment Manufacturer (OEM).

NOTE

If the above procedures do not work, proceed with the following flowchart, Figure 12-11.

12.7.5 Low/High Aerosol Error. The root cause of the low/high aerosol error can be attributed to either the power unit or the CU, Figure 12-12.

12.8 VACUUM ERRORS.

12.8.1 Low Vacuum Failure Error. The root cause of the low vacuum failure error can always be attributed to the CU, Figure 12-13.

12.8.2 High Vacuum Failure Error. The root cause of the high vacuum failure error can always be attributed to the CU, Figure 12-14.

12.8.3 Persistent Penetration Failures Error. The root cause of the persistent penetration failures error can always be attributed to the CU, Figure 12-15.

12.9 DRINK TEST ERRORS.

12.9.1 Consistent Drink Tube Flow Failures Error. The root cause of the consistent drink tube flow failures error can be attributed to either the power unit or the CU, Figure 12-16.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

12.9.2 Consistent Drink Train or Seat Failures Error. The root cause of the consistent drink train or seat failures error can always be attributed to the CU, Figure 12-17.

12.10 VALVE TEST ERRORS.

12.10.1 Consistent Outlet Valve Failures Error. The root cause of the consistent outlet valve failures error can always be attributed to the CU, Figure 12-18.

12.11 FIT TEST ERRORS.

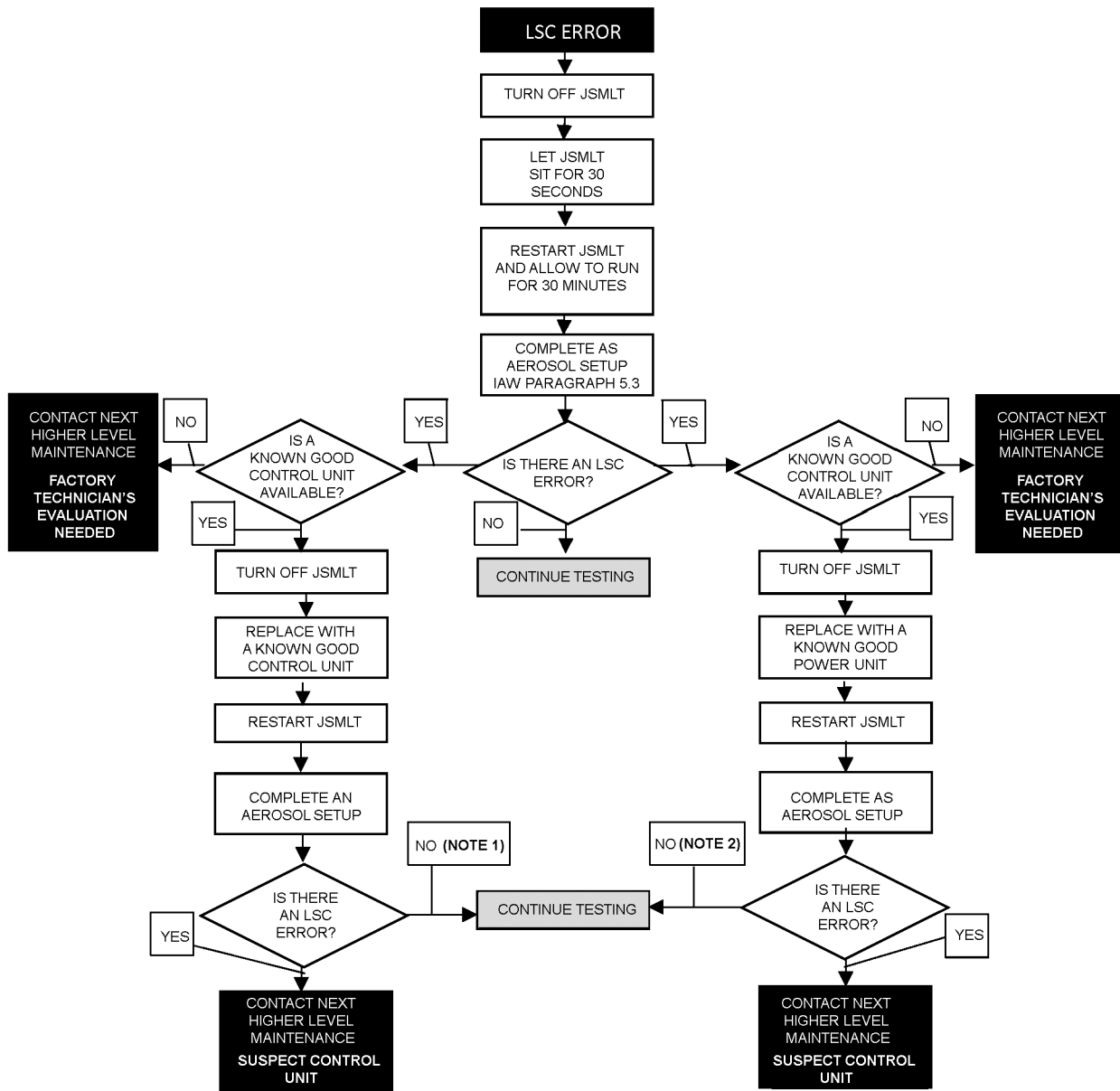
12.11.1 Remains in Setting During Fit Test Error. The root cause of the remains in setting during fit test error can always be attributed to the CU, Figure 12-19.

12.11.2 Consistent Low Fit Factor Error.

NOTE

Consistent low fit factor scores could be the result of the test subject being categorized as “hard to fit.” If recommended troubleshooting does not resolve your problem, consider this possibility before assuming defective equipment.

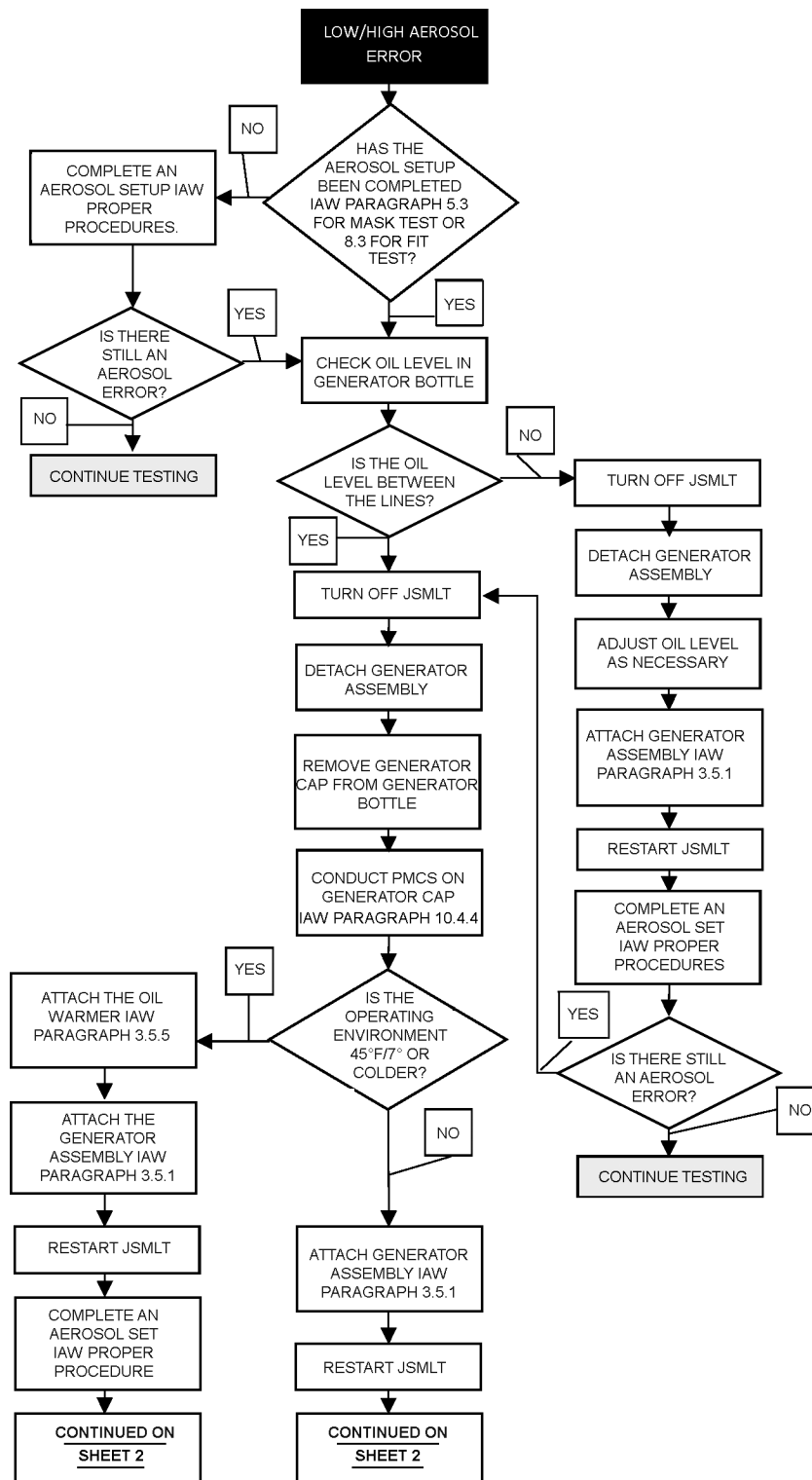
The root cause of the consistent low fit factor error can always be attributed to the CU, Figure 12-20.



NOTE 1: SUSPECT FIRST CONTROL UNIT IS DEFECTIVE.
 NOTE 2: SUSPECT FIRST POWER UNIT IS DEFECTIVE.

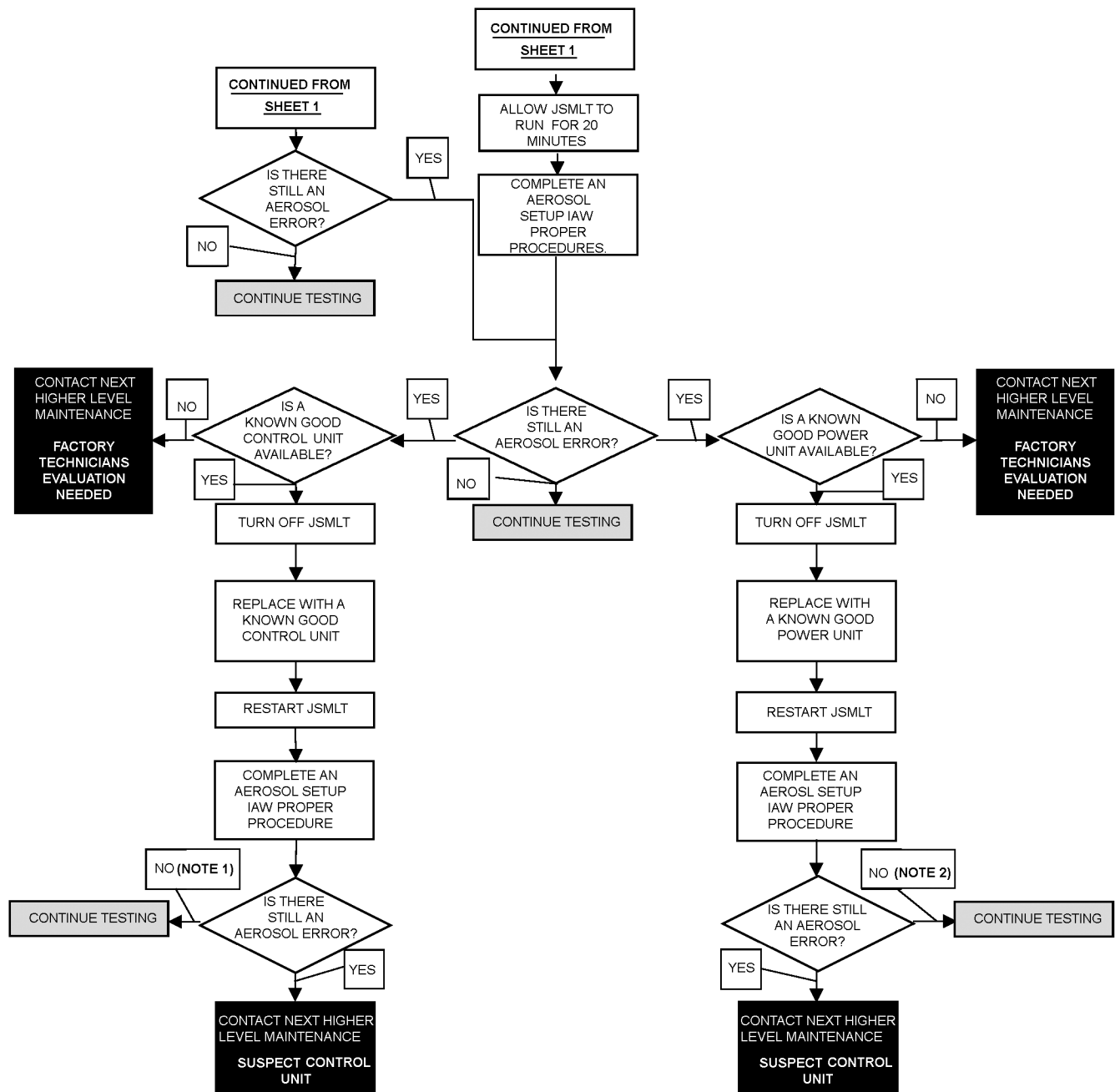
TO-33A4-7-10-1-081

Figure 12-11. LSC Error



TO-33A4-7-10-1-082

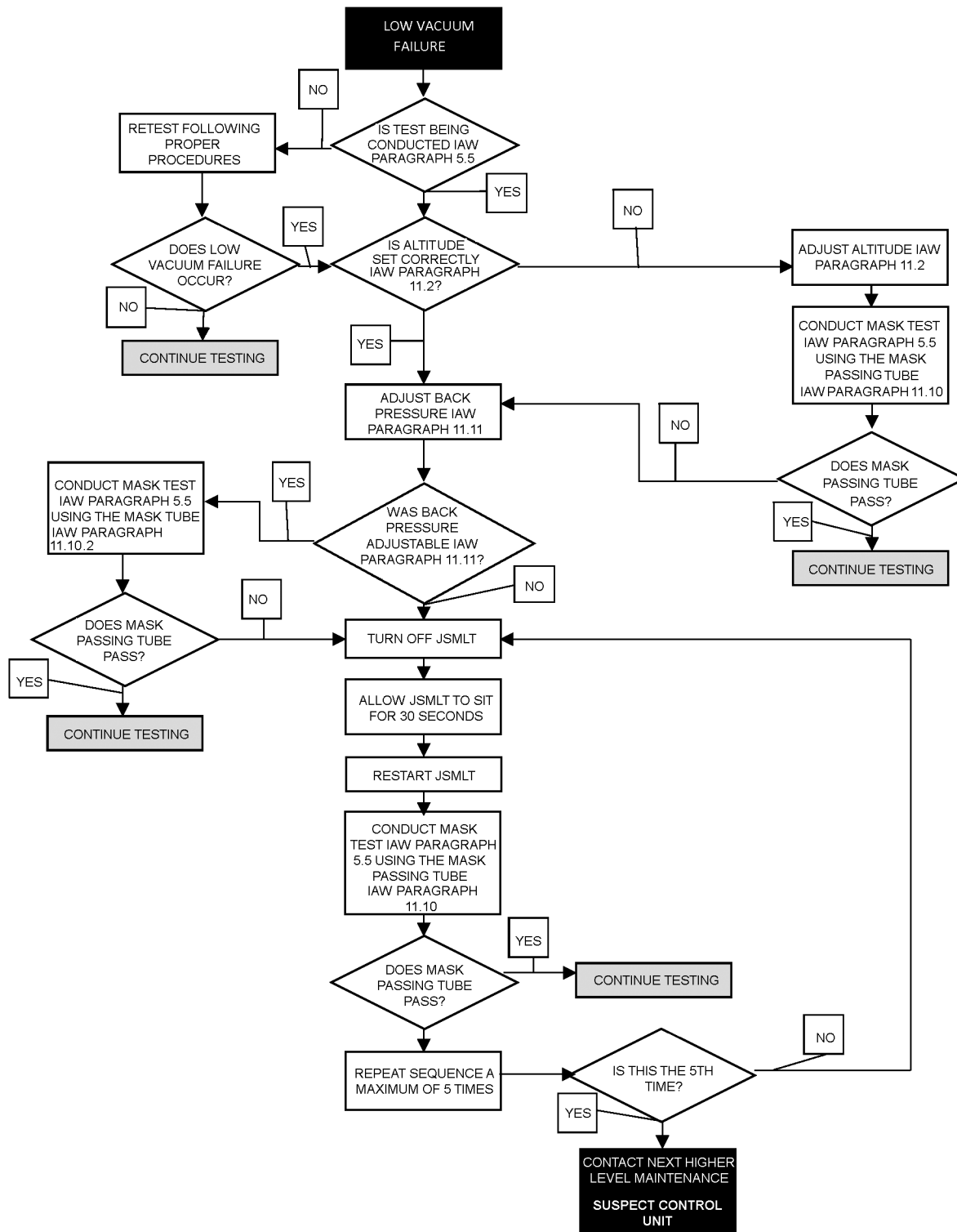
Figure 12-12. Low/High Aerosol Error (Sheet 1 of 2)



NOTE 1: SUSPECT FIRST CONTROL UNIT IS DEFECTIVE.
 NOTE 2: SUSPECT FIRST POWER UNIT IS DEFECTIVE.

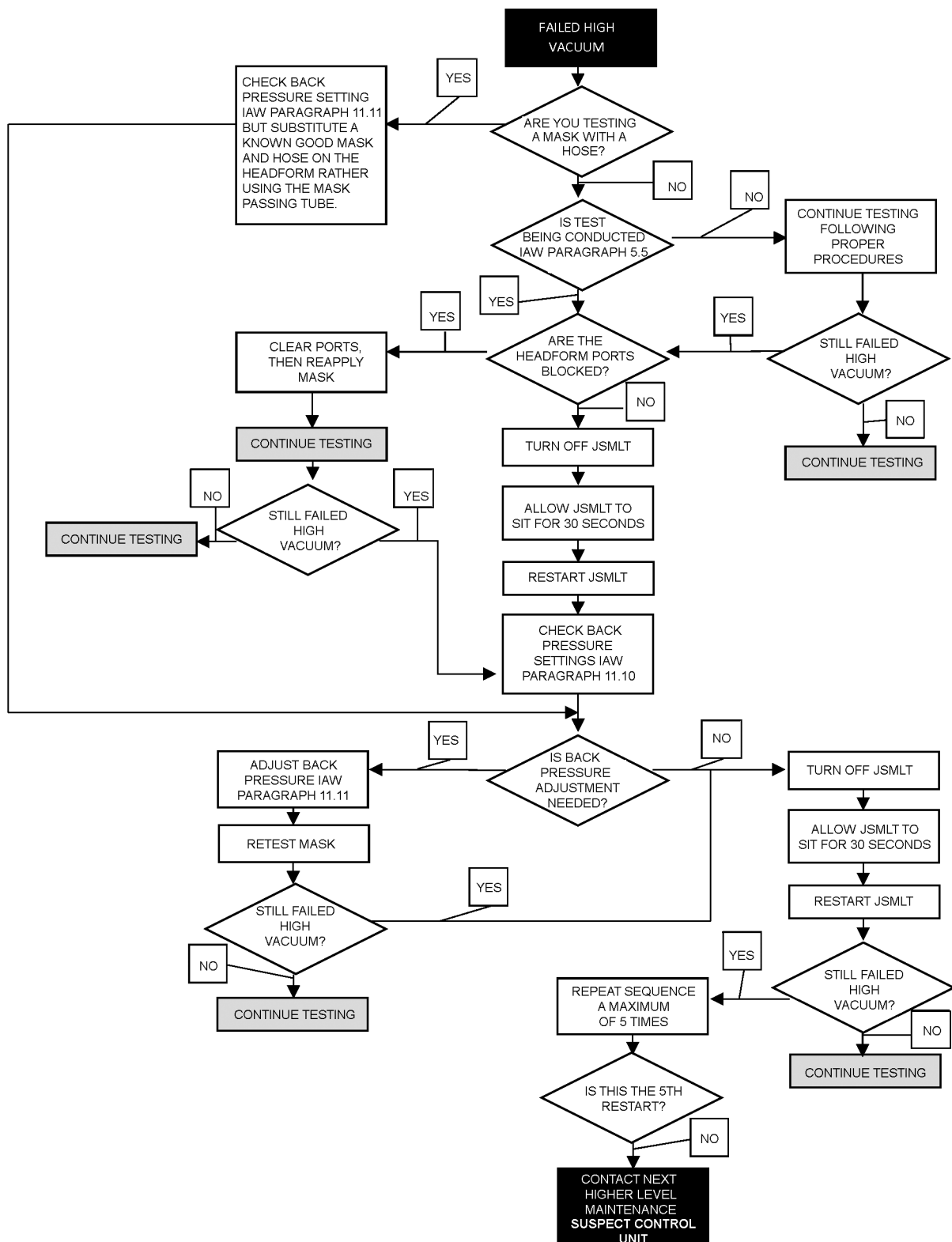
Figure 12-12. Low/High Aerosol Error (Sheet 2)

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-084

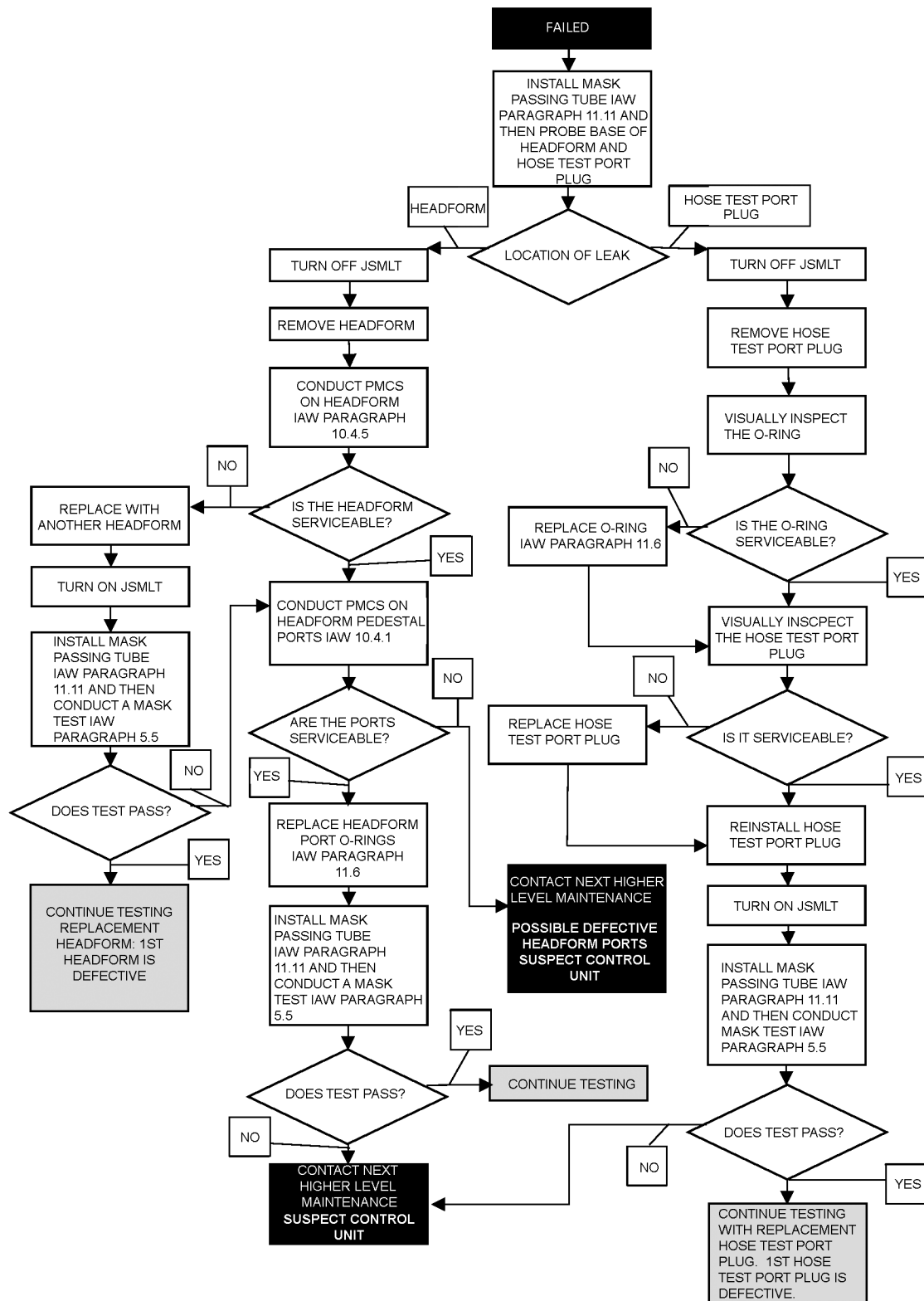
Figure 12-13. Low Vacuum Failure Error



TO-33A4-7-10-1-085

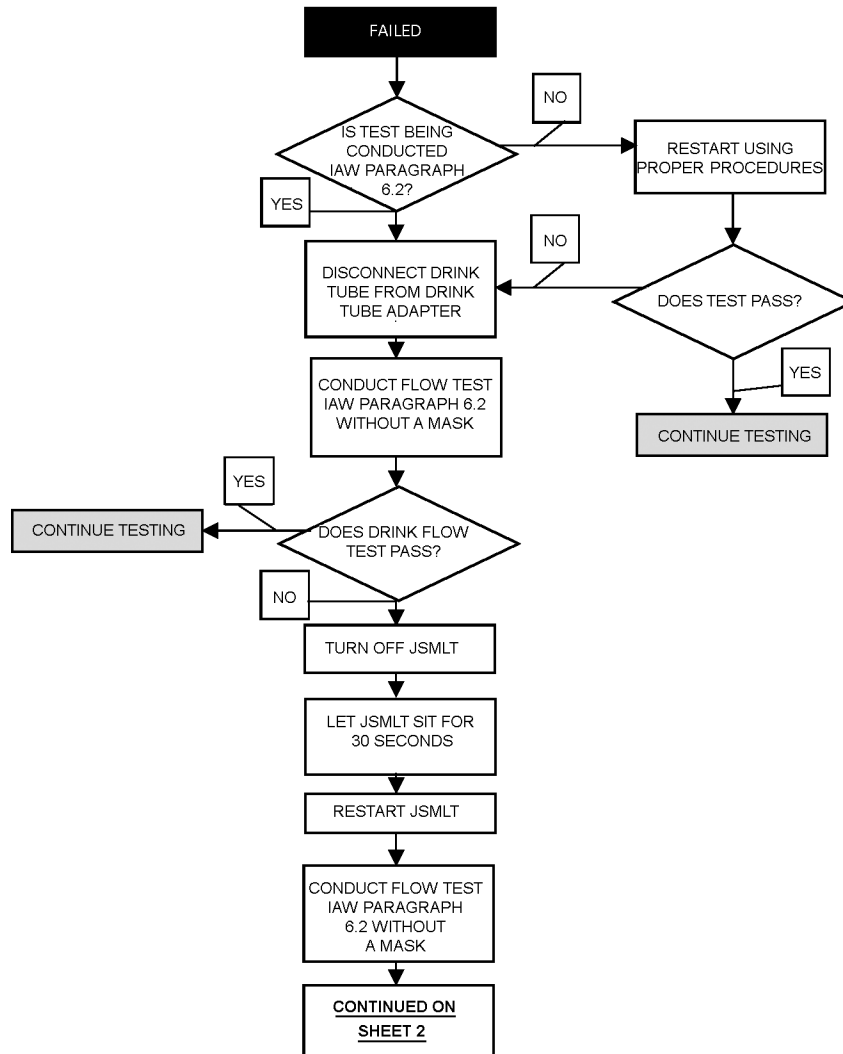
Figure 12-14. High Vacuum Failure Error

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-086

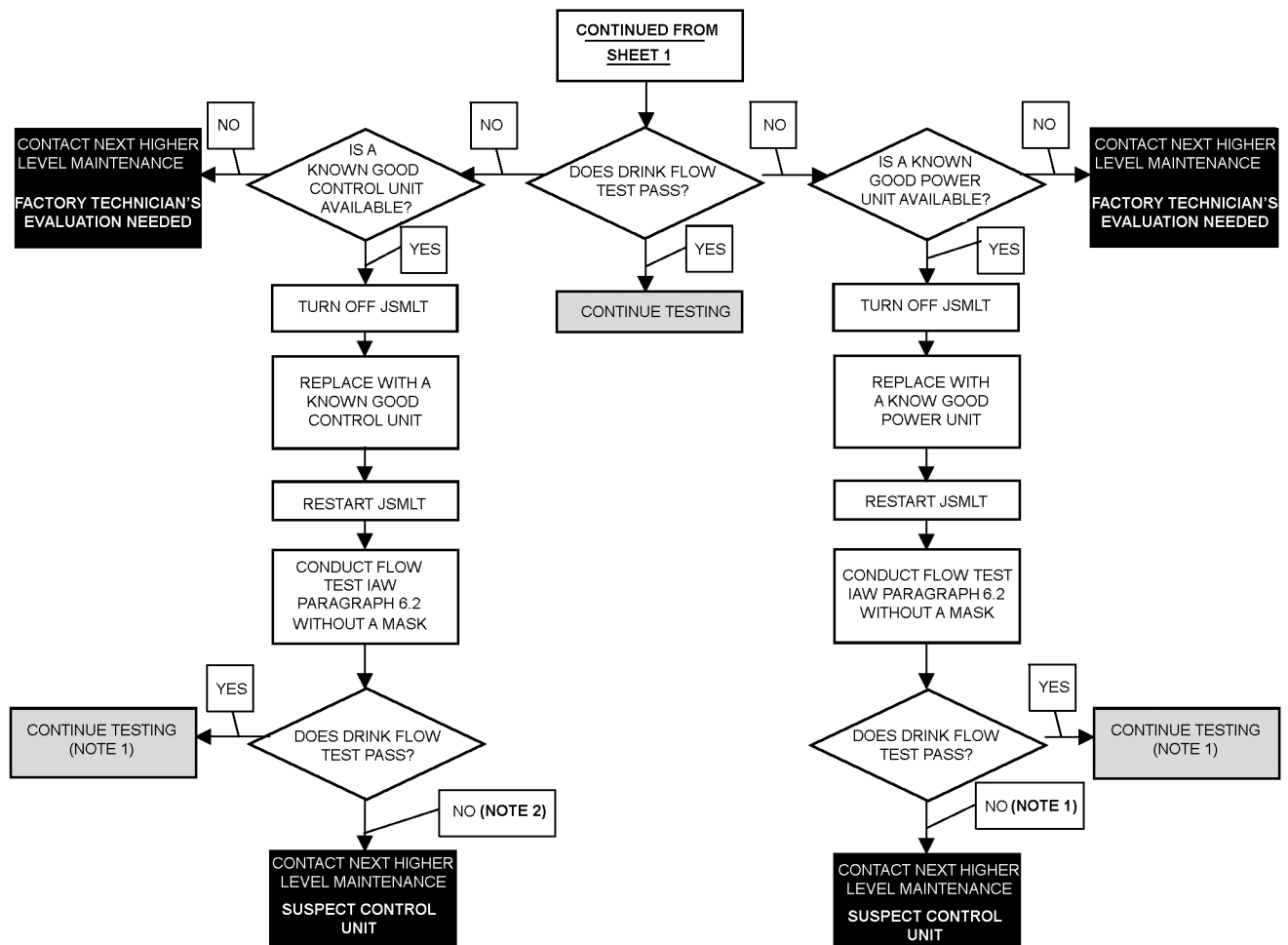
Figure 12-15. Persistent Penetration Failures Error



TO-33A4-7-10-1-087

Figure 12-16. Consistent Drink Tube Flow Failures Error (Sheet 1 of 2)

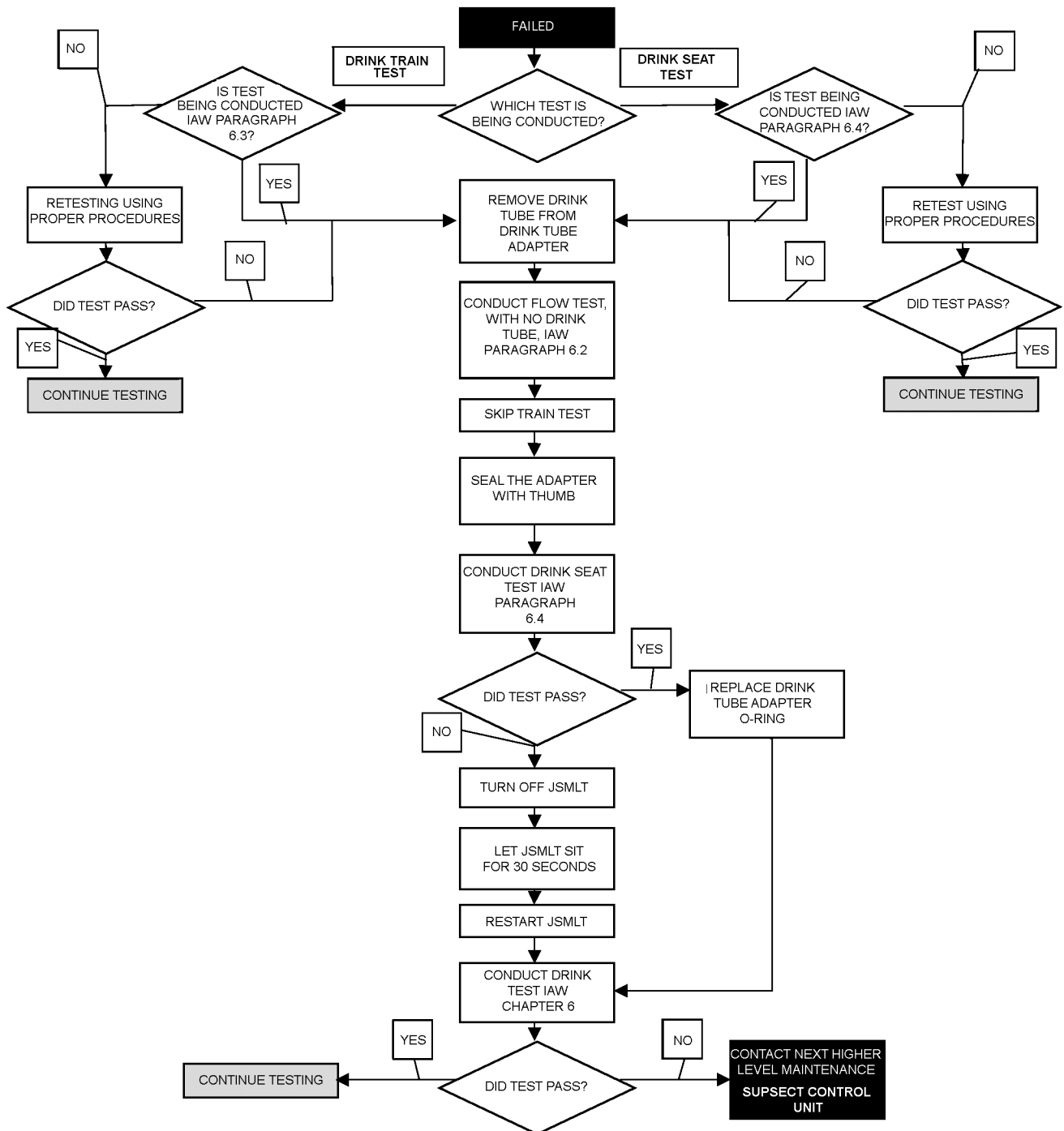
AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010



NOTE 1: SUSPECT FIRST CONTROL UNIT IS DEFECTIVE.
 NOTE 2: SUSPECT FIRST POWER UNIT IS DEFECTIVE.

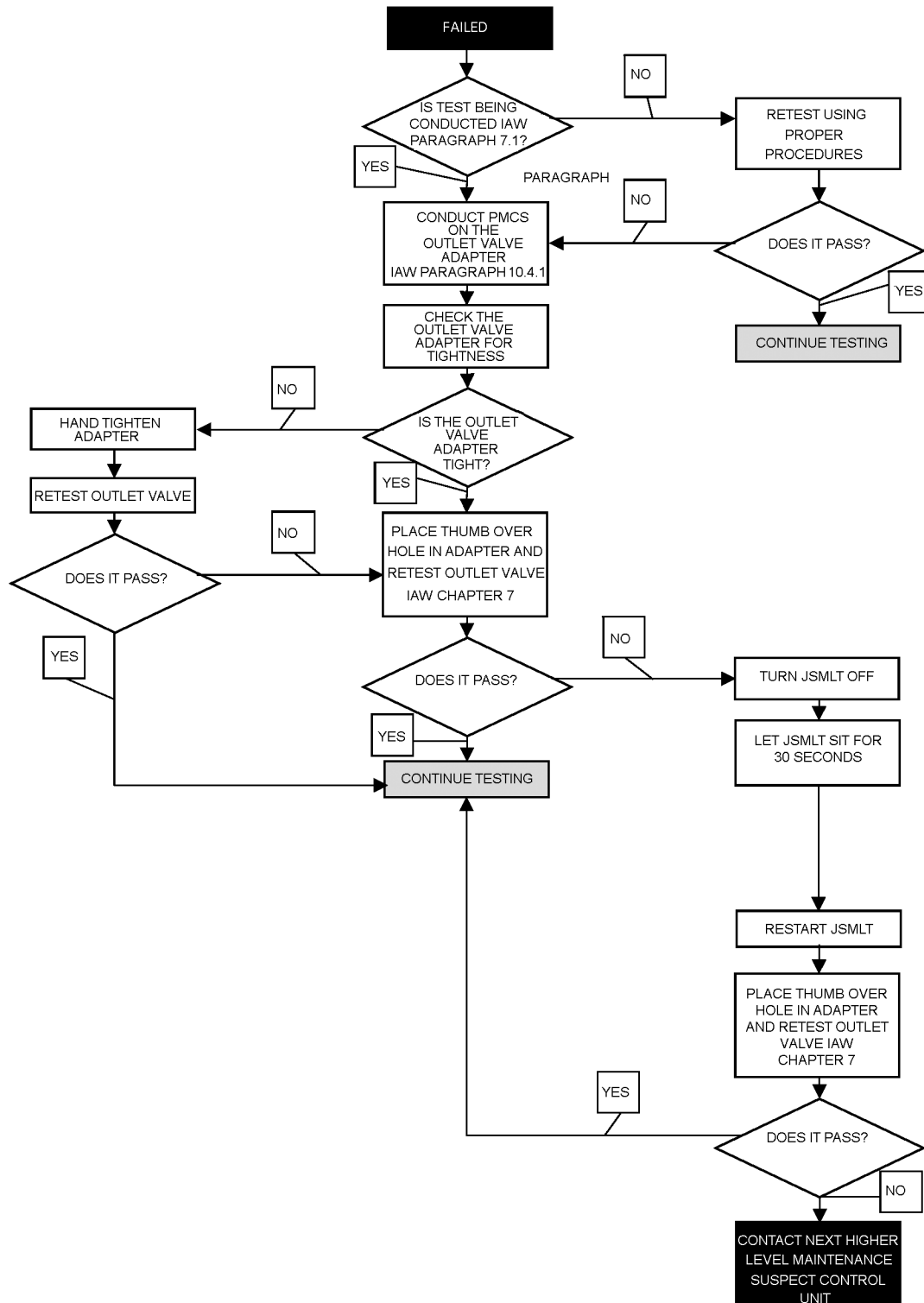
TO-33A4-7-10-1-088

Figure 12-16. Consistent Drink Tube Flow Failures Error (Sheet 2)



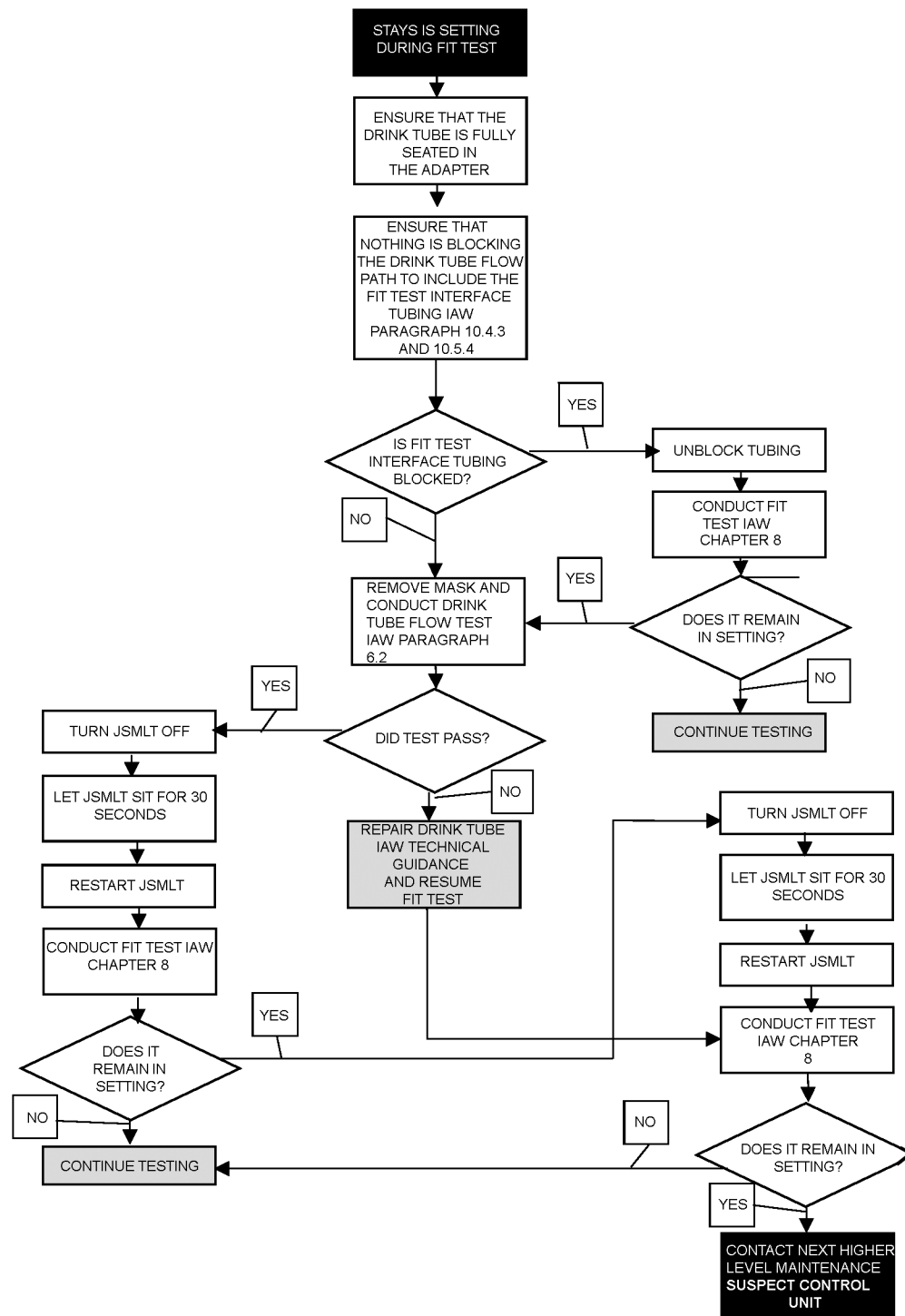
TO-33A4-7-10-1-089

Figure 12-17. Consistent Drink Train or Seat Failures Error



TO-33A4-7-10-1-090

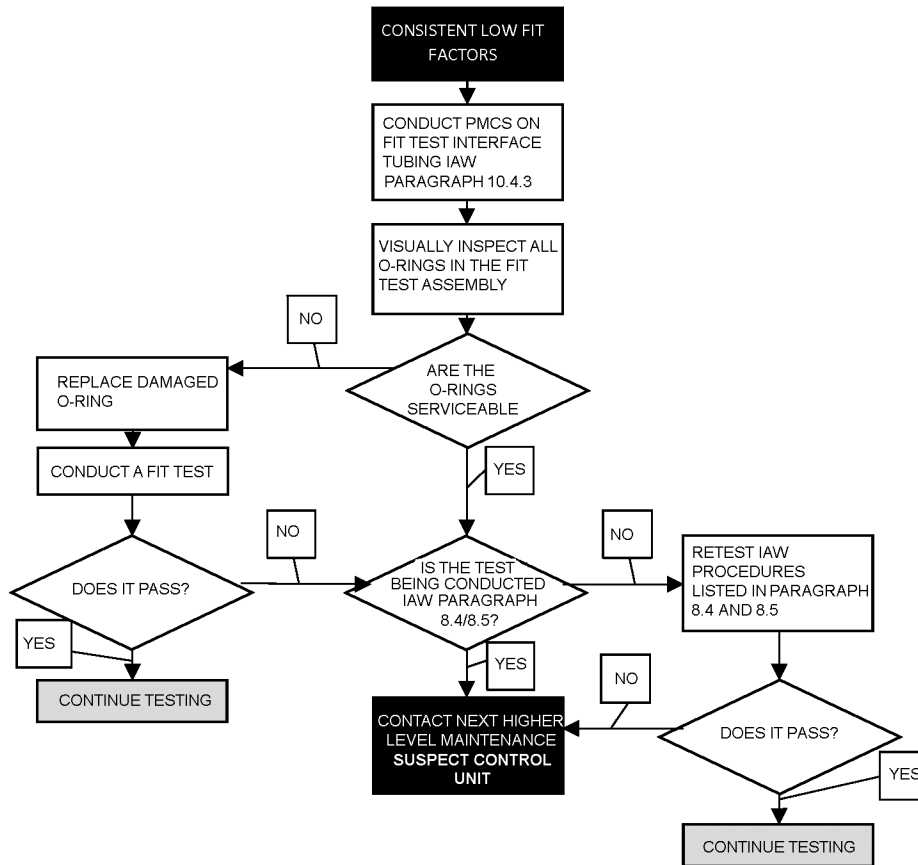
Figure 12-18. Consistent Outlet Valve Failures Error



TO-33A4-7-10-1-091

Figure 12-19. Remains in Setting During Fit Test Error

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-092

Figure 12-20. Consistent Low Fit Factor Error

CHAPTER 13

MAINTENANCE AND CALIBRATION REQUEST PROCEDURES

13.1 BACKGROUND INFORMATION.

The Joint Service Mask Leakage Tester (JSMLT) production contract was awarded to Air Techniques International (ATI). JSMLT maintenance, calibration, and repair are performed by ATI via a centrally managed Contractor Logistics Support (CLS) contract. ATI is the only approved source for JSMLT maintenance and repair. The Services have the choice of sending their JSMLT to ATI or utilizing the Services organic calibration capability. The JSMLT Program Office has full oversight of all maintenance, calibration and repair actions conducted via its CLS contract with ATI.

13.1.1 MAINTENANCE ABOVE OPERATOR LEVEL. All maintenance above the Operator Level as described in this manual will be performed by Air Techniques International (ATI). Therefore, JSMLT(s) requiring maintenance must be shipped to ATI. Where as the services have the choice of utilizing organic calibration or sending JSMLT(s) to ATI for this support.

13.1.2 Primary Higher Level Maintenance. The two primary higher level maintenance actions are Scheduled Maintenance & Calibration and Unscheduled Maintenance.

13.2 TECHNICAL SUPPORT.

The primary means of technical support for all Chemical and Biological Defense equipment is the Joint Program Executive Office-Chemical, Biological, Radiological, and Nuclear (JPEO-CBRN) Information Resource Center (IRC). The phone number is 1-800-831-4408 (24 hours a day, 7 days a week). The CBRN-IRC can also be reached at the following electronic mail address: cbrn.irc@mail.mil.

13.3 SCHEDULED MAINTENANCE AND CALIBRATION.

NOTE

For Air Force (AF) operations, the scheduled maintenance for 1500 hours or 24 months is not required.

Scheduled maintenance and calibration is required for the JSMLT when any of the following are true: the JSMLT has been in operation for 1500 hours; or the JSMLT has not been serviced within the last 24 months; or the display screen shows a number of 90 or greater upon completion of an aerosol setup.

13.3.1 Requirements of Scheduled Maintenance and Calibration. When any of the conditions outlined in Paragraph 13.3 have been met, the JSMLT requires scheduled maintenance and calibration. The user must contact ATI at 1-877-465-7658 (08:30 to 17:00 Eastern Standard Time, Monday through Friday), to schedule the scheduled maintenance and calibration service. When calling ATI, the user will be asked to provide the following information (either via the telephone operator or via a Return Authorization (RA) Information Request form, Figure 13-2):

- Name
- Rank
- Phone Number
- E-mail Address
- Unit
- Installation

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

- Return Shipping Address
- Control Unit (CU), Power Supply, and Mask Tester serial numbers

13.3.2 ATI Requirements. ATI will provide the user with the following information via a RA form, Figure 13-3:

- A cost estimate for the scheduled maintenance and calibration.
- RA number
- Scheduled service date
- Shipping address
- Other disposition instructions (if necessary)

13.3.2.1 ATI will also supply the user with the contact information for the financial contracting officer. The user will then submit a Military Interdepartmental Purchase Request (MIPR) to the contracting office.

13.3.2.2 The user will ship the JSMLT to ATI (at user's cost) using the system's Reusable Shipping Container (RSC). If possible, the user shall include all parts and accessories when returning systems to ATI so that a complete inventory/inspection can be performed. Once the JSMLT is received by ATI and the required funds have been received by the contracting office, ATI will perform the scheduled maintenance and calibration. ATI will return the JSMLT and RSC to the user once all scheduled maintenance and calibration actions have been completed. The contracting office will return any excess funds (if necessary) to the user.

13.3.2.3 If in the event that ATI determines that any additional maintenance or repair is required, then ATI will notify the user and provide a cost estimate.

13.3.2.4 Reference Figure 13-1 for a flowchart referencing the scheduled maintenance and calibration request procedures.

13.4 UNSCHEDULED MAINTENANCE.

Unscheduled maintenance is defined as any maintenance or repair action on the JSMLT that is not specified under the conditions for scheduled maintenance and calibration.

13.4.1 JSMLT Not Working Properly. If the user determines that their JSMLT is not working properly, the user should contact ATI at 1-877-465-7658 (08:30 to 17:00 EST, Monday through Friday) to schedule diagnostic testing. However, it may not be necessary for the user to ship the entire JSMLT to ATI if it is determined that the problem is isolated to a specific Line Replaceable Unit (LRU), which is either the CU or the Power Supply. In this case, ATI will give the user the option to exchange the faulty LRU for a spare LRU. The advantage of exchanging LRUs is that the user will be able to significantly reduce the downtime of their JSMLT. However, a nominal fee will be required in advance of the new LRU shipment. If the user chooses to exchange the LRU, the user will need to wait until the new LRU has arrived and then ship the faulty LRU back to ATI in the new LRU's RSC. In order to receive a cost estimate from ATI, fill out RA Information Request Form, (refer to Figure 13-2) and send request to ATI.

13.4.2 ATI Requirements. In either case, ATI will provide the user with the following information via a RA form, Figure 13-3:

- A cost estimate for the scheduled maintenance and calibration
- RA number
- Scheduled service date
- Shipping address

- Other disposition instructions (if necessary)

13.4.2.1 ATI will also supply the user with the contact information for the financial contracting officer. The user will then submit a MIPR to the contracting office.

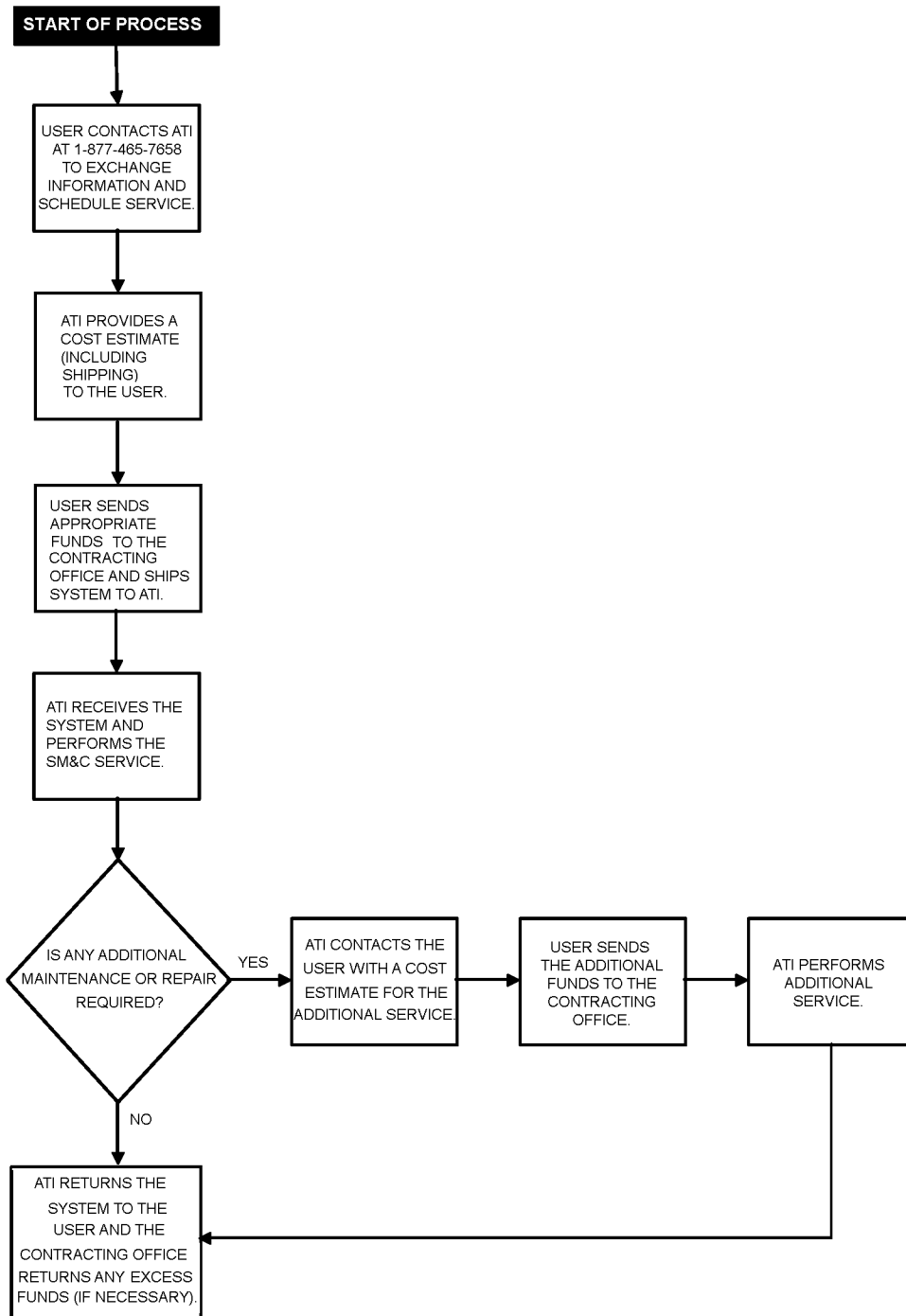
NOTE

The user must have a RA Number from ATI prior to shipping the JSMLT.

13.4.2.2 The user will ship the JSMLT to ATI (at user's cost) using the system's RSC. If possible, the user shall include all parts and accessories when returning systems to ATI so that a complete inventory/inspection can be performed. Once the JSMLT is received by ATI and the required funds have been received by the contracting office, ATI will perform the scheduled maintenance and calibration. ATI will return the JSMLT and RSC to the user once all scheduled maintenance and calibration actions have been completed. The contracting office will return any excess funds (if necessary) to the user.

13.4.2.3 In the event that an unscheduled maintenance action is required on a JSMLT within 180 days of the system's scheduled maintenance and calibration, ATI will perform the scheduled maintenance and calibration service in addition to the unscheduled maintenance service. ATI will include the cost of the scheduled maintenance and calibration in their cost estimate.

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NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010



TO-33A4-7-10-1-183

Figure 13-1. Scheduled Maintenance and Calibration Process

Division of Hamilton Assoc., Inc.



AIR TECHNIQUES

11403 Cronridge Drive
 Owings Mills, Maryland
 21117-2247 USA

Tel 410 . 363 . 9696
 Fax 410 . 363 . 9695

Thank you for contacting Air Techniques International regarding the service of your JSMLT Protective Mask Leakage Tester. Please complete the information below and return it to ATI. Upon receipt of the information below we will provide you with an RA assignment form. This form will have your return authorization number along with estimated charges including return freight as well as Contracting Office Financial POC Contact Information. You will be required to provide the financial POC with a MIPR or DA form 3953.

Date: _____

Serial Number of JSMLT	MT# _____	CU# _____	PS# _____
(PLEASE PROVIDE ALL THREE NUMBERS)	(on left side of case)	(on left side of display)	(on left side of power supply)
	MT# _____	CU# _____	PS# _____
	(on left side of case)	(on left side of display)	(on left side of power supply)

Company/Unit Name: _____

Return Shipping Address: _____

Street address _____

City, State, Zip Code _____

Reason for Return: _____

Contact Name & email
address _____

Telephone Number _____ Fax Number _____

TO-33A4-7-10-1-189

Figure 13-2. Sample RA Information Request Form

AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

Division of Acquisition Assets, inc



AIR TECHNIQUES
 11413 Courage Drive
 Odessa, FL 33464
 21117 2247 USA
 Tel: 407.365.3658
 Fax: 407.365.3658

June 30, 2009

To: TSgt John Doe

E-mail: johndoe@anymilitarybase.gov

RE:

MT#	CU#	PU#	RA Number
01319	01349	01358	00000
01328	01351	01360	00000

Thank you for contacting Air Techniques International for service and/or maintenance of the JSMLT. Based on the information that you have provided the estimated charge will be \$1372.00 per unit for standard calibration. Estimated return freight for the 2 units on this shipment to zip code 12345 is \$382.00. The total estimate for this request is \$3126.00

Please send the unit (s) to our address shown on the top of this form and please reference the RA number on your shipping documents. Our DoDAAC is CB0V43.

Please contact the below to arrange funding:

Contracting Office Financial POC Contact Information:

-Ms. Renee Couturier
 -Email: renee.couturier@usardec.mil
 -Phone: 508-238-4338
 -Address: Chief USARDECOM/ Natick Contracting Division
 Attn: AMSRD-ACC-N (Renee Couturier)
 Kansas Street
 Natick, MA 01760-5011

- Payment: MIPR or DA Form 3953
 - Please Reference Contract# W911QY-09D-0008

I have scheduled the work to be completed on the JSMLTs during the week of July 6, 2009 for return shipment no later than July 20th. If the units will not arrive on or about July 6, please advise at your earliest convenience.

TO-33A4-7-10-1-190

Figure 13-3. Sample RA Form

CHAPTER 14

ILLUSTRATED PARTS BREAKDOWN

SECTION I INTRODUCTION

14.1 INTRODUCTION.

This Illustrated Parts Breakdown (IPB) is designed to assist supply and maintenance personnel in requisitioning, storing, issuing, and identifying parts, and to illustrate assembly and disassembly relationships. It is not intended to be used as an authority for procedures of disassembly or assembly. Maintenance or repair shall be performed by authorized personnel using the applicable maintenance instructions.

14.2 MODELS COVERED.

This IPB lists and describes items necessary for support of the Joint Service Mask Leakage Tester (JSMLT), M46, Part Number (PN) 03001A0001, National Stock Number (NSN) 6665-01-506-9002; the M46A1, 5.2 Pound-force per Square Inch (PSI), PN 9300156, NSN 6665-01-537-7697; and the M46A2, 5.2 PSI, modernized, PN 9300157, NSN 6665-01-665-5513.

14.3 FINDING PART NUMBERS, ILLUSTRATION, DESCRIPTION.

Refer to the illustrations at the end of this section for an explanation of how to find a part number or description using the table of contents and illustration titles and how to find the illustration or description if a part number or reference designation is known.

14.4 SIMILAR ASSEMBLIES.

Similar assemblies, which contain a majority of identical parts, are combined and listed as follows; otherwise, assemblies are listed separately.

- Similar assembly part numbers are listed first, followed by detail parts.
- A part common to all assemblies in the same quantity is listed once.
- A part common to all assemblies in differing quantities is listed once for each quantity and is related to the applicable assembly by Usable on Code(s) (UOC).
- Peculiar parts are listed once and related to the applicable assembly by UOC(s).

14.5 SHEET NUMBER EXPLANATION.

If an illustration consists of more than one sheet, the sheet number follows the index number and is separated by a slash (/). If an indexed item is on more than one sheet of an illustration, the first and last sheet numbers on which the item appears are given.

14.6 UOC(S).

When two or more assemblies are listed in the same parts list, a code letter (A, B, etc.) is assigned to each main assembly. All subcomponents, peculiar to a particular assembly, are identified by the same code letter as the main assembly. If parts are common to all assemblies covered, the UOC column is left blank.

14.7 SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES.

This manual contains Joint Military SMR codes. Definitions of these codes are available in Technical Order (TO) 00-25-195.

AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

14.8 PARTS STANDARDIZATION.

Authority for use of a part number different than the part number listed in this IPB is established by the Department of Defense (DoD) Interchangeability and Substitution (I&S) Program. Refer to the D043B Master Item Identification Base for Air Force I&S information. The maintenance technician has final responsibility and authority for determining acceptability of substitute parts.

14.9 MANUFACTURER'S LIST.

Additional information about the Commercial and Government Entity (CAGE) codes listed in this manual can be found at <https://cage.dla.mil/>.

14.10 MAINTENANCE PARTS LIST (MPL).

The MPL is divided into figures by main equipment groups and/or assemblies. Each group or assembly is keyed to a related illustration by figure and index number. They are then broken down into assemblies, modules, and detailed parts. The relation of each part to its Next Higher Assembly (NHA) and/or group is shown either by indentation or by figure cross-reference notes. The MPL is divided into columns as described below.

14.10.1 Figure and Index Number Column. This column provides the figure and index numbers used to key a part or assembly listed in the MPL to its location in an illustration. The figure number precedes the first index number in each listing and the first index number on each page of a multi-page listing. Index numbers are listed in sequence. When an assembly or part has not been assigned an index number, the figure and index number of the preceding part in the MPL is used with the letter F before the figure number, such as F7-6. The letter F means follows.

14.10.2 Part Number Column. Part numbers, including dash numbers, are assigned to each listed part in accordance with current industry engineering practices. Appropriate numbers for types, models, specifications, specification control drawings, and source control drawings follow the nomenclature in the description column. If a drawing number is different from the part number (excluding dash differences), the drawing number follows the description. If a part is authorized for local manufacture, and a specific drawing is required, that drawing number follows the description. If only a model or type number identifies a component, that number is used in lieu of a part number.

14.10.2.1 Commercial (COML) Hardware. The letters COML in the part number column indicate commercial hardware procurable from normal COML sources.

14.10.2.2 Parts Not Illustrated. Parts which are indexed in the MPL, but not shown on the illustration, have a dash (-) preceding the index number.

14.10.2.3 Markings. Decalcomanias, metalcals, vinyl film markings, etc., are considered parts. The identifying drawing number for each marking appears in the part number column. An asterisk (*) means the marking is to be requisitioned according to requirements of DODI 5330.03_AFI 33-395.

14.10.2.4 Government Furnished Equipment (GFE) and Contractor Furnished Equipment (CFE) Covered by Separate Manuals. A number symbol (#) following a part number means that detail parts are listed in a separate manual. Refer to the List of Related Publications.

14.10.3 CAGE Column. Refer to the Manufacturer's List for CAGE codes and manufacturers information applicable to this manual. When a CAGE code for the appropriate design or government agency is not active or government agency is not published at <https://cage.dla.mil/>, the word "none" shall be inserted in the CAGE column directly opposite the part, model or type number listed in the part number column.

14.10.4 Description Column. The description column contains indenture, nomenclature and cross-reference information. The identifying noun is given first. Sizes, dimensions, materials, and tolerances are then indicated. If applicable, the appropriate numbers for types, models, specifications, specification control drawings and source control drawings follow the nomenclature. When the drawing number for a part is different than the part number (excluding dash differences), the drawing number follows the description. When a part is authorized for local manufacture, and a specific drawing is required, the drawing number follows the description. References to other illustrations for information on detail parts or information on NHAs are given. Attaching parts are identified by the abbreviation (AP) following the description.

14.10.4.1 Indentation. Parts listed in the MPL are indented to indicate item relationship or NHA. Nomenclature of each assembly is followed in the list (except for attaching parts) by nomenclature of its component indented one column to the right. This indentation indicates relationship of component to assembly. To determine NHA of a part or assembly, note column in which the first word of nomenclature appears. First item directly above, which appears one column to the left (except for AP), is NHA.

Description

1 2 3 4 5 6 7

END ITEM, COMPONENT, MAJOR ASSEMBLY

. **[HCI]** DETAIL PARTS FOR END ITEM, COMPONENT, MAJOR ASSEMBLY

. ASSEMBLY

. Attaching parts for assembly (AP)

. .  Detail parts for assembly

. . Subassemblies

. . Attaching parts for subassemblies (AP)

. . . Detail parts for subassemblies

. . . Sub-subassemblies

. . . Attaching parts for sub-subassemblies (AP)

. . . . Detail parts for sub-subassemblies

14.10.5 Units Per Assembly (UPA) Column. Quantities shown in this column represent units required for each detail part in an assembly, each assembly in the NHA, and each attaching part to attach one unit or one assembly. The abbreviation AR (as required) is used when quantity required must be determined when parts are installed. The abbreviation REF (Reference) indicates that item has been previously listed under its NHA. The SEE FIGURE notation in the item description indicates figure and index numbers at which units per assembly can be determined.

14.10.6 UOC Column. These codes indicate the configuration of the end items to which listed assemblies and parts apply. No code is shown in this column if a part applies to all configurations.

14.10.7 SMR Code Column. This column contains the five-digit Joint Military Services Uniform SMR codes. For complete information about SMR codes, refer to TO 00-25-195.

14.11 NUMERICAL INDEX (NI).

If applicable, an NI is provided which contains an alphanumeric listing of all drawings and parts listed in the MPL (including model and type numbers for components not assigned part numbers).

14.11.1 Part Number Column. Part numbers begin at the extreme left and continue from left to right, one position at a time. For the first character of the part number, the letters A through N and P through Z take precedence over the numerals, 0 through 9 (alphabetic Os are considered numeric zeros). For the second and succeeding characters of a part number, precedence is as follows: (1) diagonal, (2) period, (3) dash, (4) letters A through N and P through Z, and (5) numerals 0 through 9.

14.11.2 Figure and Index Number Column. This column contains the figure and index numbers for all parts listed. If an assembly or part is not indexed, the figure and index number of the preceding part in the MPL is used with the letter F in front of the figure number. The letter F means follows.

14.12 REFERENCE DESIGNATION.

If applicable, reference designators may be shown on the applicable illustrations or contained in a Reference Designator Index (RDI). The RDI contains a listing of the reference designations that have been assigned to parts listed in the MPL. Not all parts in the MPL will have an associated reference designation. Columns in the RDI are explained below.

14.12.1 Reference Designator Column. This column contains all applicable reference designators which are arranged in alphanumeric sequence.

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NAVY (NAVSEA) SS200-AW-MMC-010

14.12.2 Figure and Index Number Column. This column lists the figure and index numbers applicable to all reference designations. An F before the figure number means an assembly or part has a reference designator, but not an index number, and the figure/index number of the preceding part in the MPL has been used. The F means follows.

IF PART NUMBER OR REFERENCE DESIGNATION IS KNOWN . . .



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HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

IF PART NUMBER OR REFERENCE DESIGNATION IS **NOT** KNOWN . . .

Do This . . .

1. Turn to the TABLE OF CONTENTS which contains a list of all illustrations in the manual. From this list select the illustration most likely to contain the desired part.

Fig. 11. Microcircuit, Linear 2-45

2. Refer to page number of the illustration selected from TABLE OF CONTENTS. Locate the desired part on the illustration. Note index number.

3. Refer to corresponding MAINTENANCE PARTS LIST. Locate the index number selected from the illustration for part number, nomenclature, etc.

Section	Page
I. INTRODUCTION	1-1
1-1 Purpose and Scope	1-1
1-2 Group Assembly Parts List	1-1
1-3 Numerical Index	1-3
1-3a Abbreviations and Symbols	1-4
1-3b Record of Applicable Time Compliance Technical Orders	1-4
1-3c Related Publications	1-4
1-40 Improvement Reports	1-7
1-40 Commercial and Government Entity Codes	1-7
II. GROUP ASSEMBLY PARTS LIST	2-1
1 Pitch and Roll Channel Assembly	2-45
III. NUMERICAL INDEX	3-1

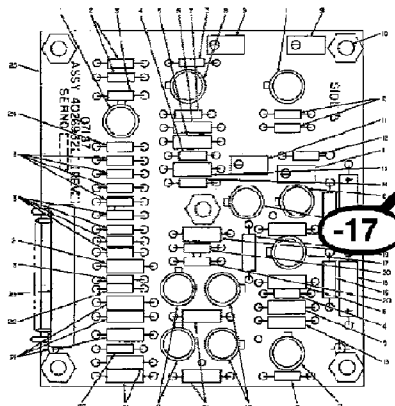


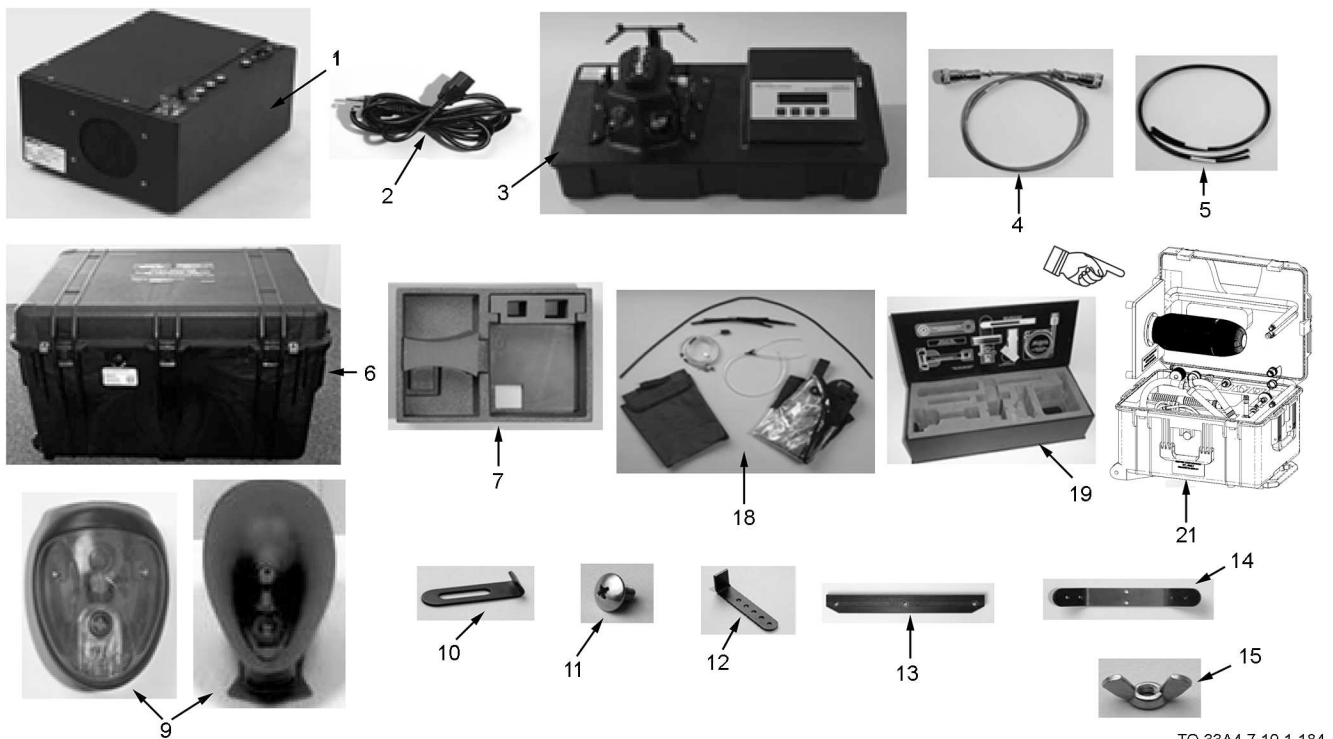
Figure 11. Pitch Servo Assembly

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FIGURE INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SWP CODE
11-	025-45079-2	MACH SERVO A	1	REF	PAC02
	05179	GOVERN. HOUS. (ATTACHING PARTS)	1	PAC02	PAC02
	45090C4-2	SCREW, Csp	4	PAC02	PAC02
-3	050-45000-17C	O-RING	1	PAC02	PAC02
-4	040-45000	SCREW, A	1	PAC02	PAC02
-5	040-45004	PLATE, M	1	PAC02	PAC02
		(ATTACHING PARTS)			
-6	025-45090C2-04	SCREW, Csp	4	PAC02	PAC02
-7	100-45020	SPRNG	4	PAC02	PAC02
-8	110-45029	WASHER	2	PAC02	PAC02
-9	020-45015	ROTAT. ANCHOR AND HOOK	1	PAC02	PAC02
-10	100-45005	CLAMP	1	PAC02	PAC02
		(ATTACHING PARTS)			
-11	050-45000C2-2	SCREW, Csp, A	2	PAC02	PAC02
	050-45000C2-0	SCREW, Csp, A	2	PAC02	PAC02
-12	120-45007	RT. BEARING	1	PAC02	PAC02
-13	050-45000C4-4	SCREW, Csp, A	2	PAC02	PAC02
-14	AR16184 020A1H	Pressure activated dynamite (MSD) Mene 500 Gals 5095SH400A1	1	PAC02	PAC02
-15	MS28775-0-3	WING	1	PAC02	PAC02
-17	B0445-00		1	PAC02	PAC02
-20	NAS181-02T3B	SCREW	4	PAC02	PAC02
-21	NAS181-02T3B	SCREW	8	PAC02	PAC02
-22	040-45181	PLATE, M	1	PAC02	PAC02
-23	MS28775-027	PACKING	1	PAC02	PAC02
-24	AD167	MATCHED BELLOWS, PO & PS	1	PAC02	PAC02
-25	020-45029	ANCHOR ASSEMBLY	1	PAC02	PAC02
-26	020-45029	BELLOWS ASSEMBLY	1	PAC02	PAC02
-27	MS28775-024	PACKING	1	PAC02	PAC02
-28	040-45177	PLATE, M	1	PAC02	PAC02
-29	NAS181-02T3B	SCREW	7	PAC02	PAC02
-30	MS28775-027	PACKING	1	PAC02	PAC02
-31	MS28775-0-7	PACKING	1	PAC02	PAC02

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SECTION II MAINTENANCE PARTS LIST



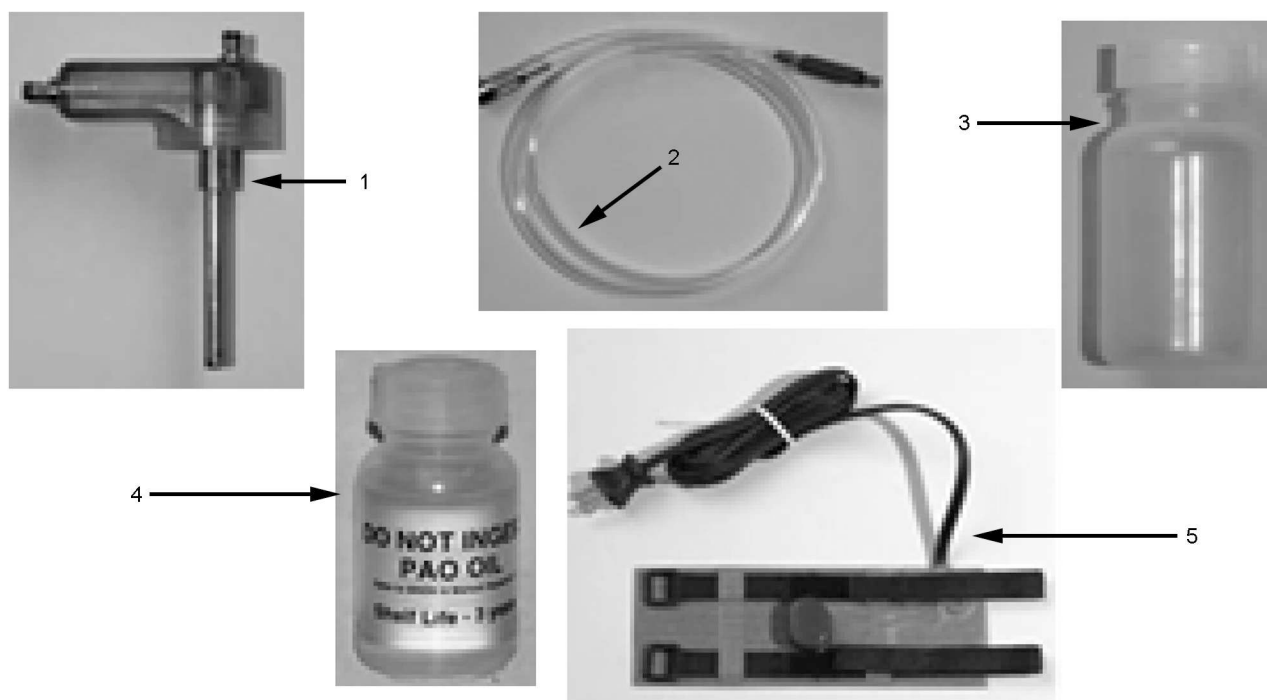
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Figure 14-1. JSMLT Tester

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION							UNITS PER ASSY	USABLE ON CODE	SMR CODE
			1	2	3	4	5	6	7			
1-	03001A0001	0D1M0	TESTER, JSMLT, M46, NSN 6665-01-506-9002							1	A	PAODD
	9300156	0D1M0	TESTER, JSMLT, 5.2 PSI, M46A1, NSN 6665-01-537-7697							1	B	PAODD
	9300157	0D1M0	TESTER, JSMLT, 5.2 PSI, modernized, NSN 6665-01-665-5513							1	C	PAODD
	1 0200305	0D1M0	. POWER SUPPLY, NSN 6130-01-537-6417							1	A,B,C	PAODD
	2 T2E0-0064	0D1M0	. CABLE ASSEMBLY, Power, electrical, NSN 6150-01-537-7702							1	A,B,C	PAOZZ
	3 200185	0D1M0	. CONTROL UNIT, Gas mask tester, NSN 4240-01-537-6415							1	A	PAODD
	0200185-A	0D1M0	. CONTROL UNIT, Gas mask tester, 5.2 PSI, NSN 4240-01-665-0164							1	B,C	PAODD
	4 6700137	0D1M0	. CABLE ASSEMBLY, Electrical, power interface, NSN 6150-01-537-7706							1	A,B,C	PAOZZ
	5 0600225	0D1M0	. HOSE, Rubber, duplex, interface, NSN 4720-01-537-7728							1	A,B,C	PAOZZ
	6 1200136	0D1M0	. CASE, Gas mask tester, NSN 8145-01-537-6419							1	A,B	PAODD
7	23-00393-001	0D1M0	. CASE, Gas mask tester, NSN 8145-01-671-7836							1	C	PAOOO
	1200170	0D1M0	. TRAY, Foam, insert (For yellow heads and accessories), NSN 5975-01-537-7699							1	A,B	PAOZZ
	23-00391-001	0D1M0	. TRAY, Foam, insert (For shroud and accessories), NSN 5975-01-671-5800							1	C	PAOZZ

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FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
			1 2 3 4 5 6 7			
1-	-8	23-00392-001	0D1M0 . TRAY, Foam, insert (For IFSTHA head, NSN 5975-01-671-5797)	1	C	PAOZZ
	9	T99M-1380	0D1M0 . HEADFORM, Medium (Yellow head), NSN 6665-01-537-7924	1	A,B	PAOOO
		T99M-1479	0D1M0 . HEADFORM, Small (Yellow head), NSN 6665-01-537-7928	1	A,B	PAOOO
		1200381	0D1M0 . TEST HEAD, Inflatable face seal (IFSTHA), NSN 6665-01-655-2494	1	C	PAOOO
	10	T104-0234	0D1M0 . CLIP, Spring tension (For yellow head), NSN 5340-01-537-7890	1	A,B	PAOZZ
	11	3300201	0D1M0 . SCREW, Machine (For yellow head), NSN 5305-01-537-7725	1	A,B	PAOZZ
	12	T99M-1346	0D1M0 . CLIP, Spring tension (For yellow head), NSN 5340-01-537-7889	1	A,B	PAOZZ
	13	T99M-1337	0D1M0 . CLAMP, Loop (For yellow head), NSN 5340-01-537-7893	1	A,B	PAOZZ
	14	T99M-1345	0D1M0 . STRAP, Retaining (For yellow head), NSN 5340-01-537-7888	1	A,B	PAOZZ
	15	3100127	0D1M0 . NUT, Plain, wing (For yellow head), NSN 5310-01-537-7921	1	A,B	PAOZZ
	-16	5500112	0D1M0 . SCREEN, Lint (Repair material for IFSTHA), NSN 4310-01-537-7925	1	C	PAOZZ
	-17	NO NUMBER	none . GENERATOR ASSEMBLY, Aerosol (See Figure 14-2 for detail breakdown)	1	A,B,C	AFF
	18	9300123	0D1M0 . KIT, Fit test, NSN 5999-01-537-7932 (See Figure 14-3 for detail breakdown)	1	A,B,C	PAOOO
	19	9300184	0D1M0 . ADAPTER KIT, JSMLT, JSMAK, NSN 6665-01-581-1108 (See Figure 14-4 for detail breakdown)	1	A,B,C	PAOZZ
	-20	NO NUMBER	none . ACCESSORIES (See Figure 14-5 for detail breakdown)	AR	A,B,C	AFF
	21	G018-5090-01	60240 . ADAPTER KIT, JSMLT, JSAM-JSF (See JSF manual specification number MD 5668-00103 for breakdown)	1		PAOZZ
			<u>CODES</u> <u>USABLE ON</u> A JSMLT, M46 B JSMLT, M46A1 C JSMLT, M46A2			

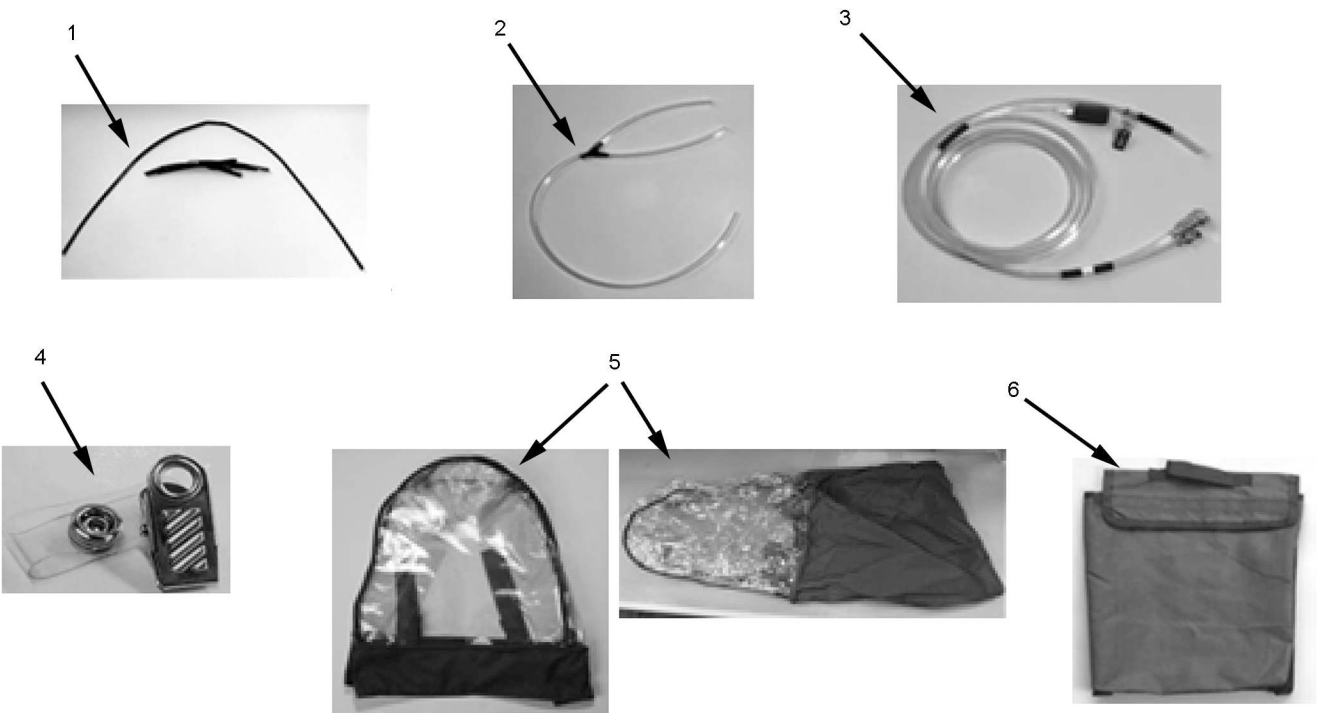


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Figure 14-2. Aerosol Generator Assembly

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
2-	NO NUMBER	none	1 2 3 4 5 6 7 GENERATOR ASSEMBLY, Aerosol (See Figure 14-1 for NHA)	REF	A,B,C	AFF
1	9300164	0D1M0	. CAP, Generator with nozzle, NSN 5340-01-537-7918	1	A,B,C	PAOZZ
2	0200316	0D1M0	. HOSE, Probe, aerosol, NSN 6625-01-537- 7726	1	A,B,C	PAOZZ
3	0600222	0D1M0	. BOTTLE, Generator, NSN 6625-01-537- 7727	1	A,B,C	PAOZZ
4	0200188	0D1M0	. OIL, PAO, bottle, 100 mL, NSN 9150-01-537-7939	1	A,B,C	PAOZZ
5	0200303	0D1M0	. WARMER, Oil, NSN 6665-01-537-7940	1	A,B,C	PAOZZ
			<u>CODES</u> <u>USABLE ON</u>			
			A JSMLT, M46			
			B JSMLT, M46A1			
			C JSMLT, M46A2			

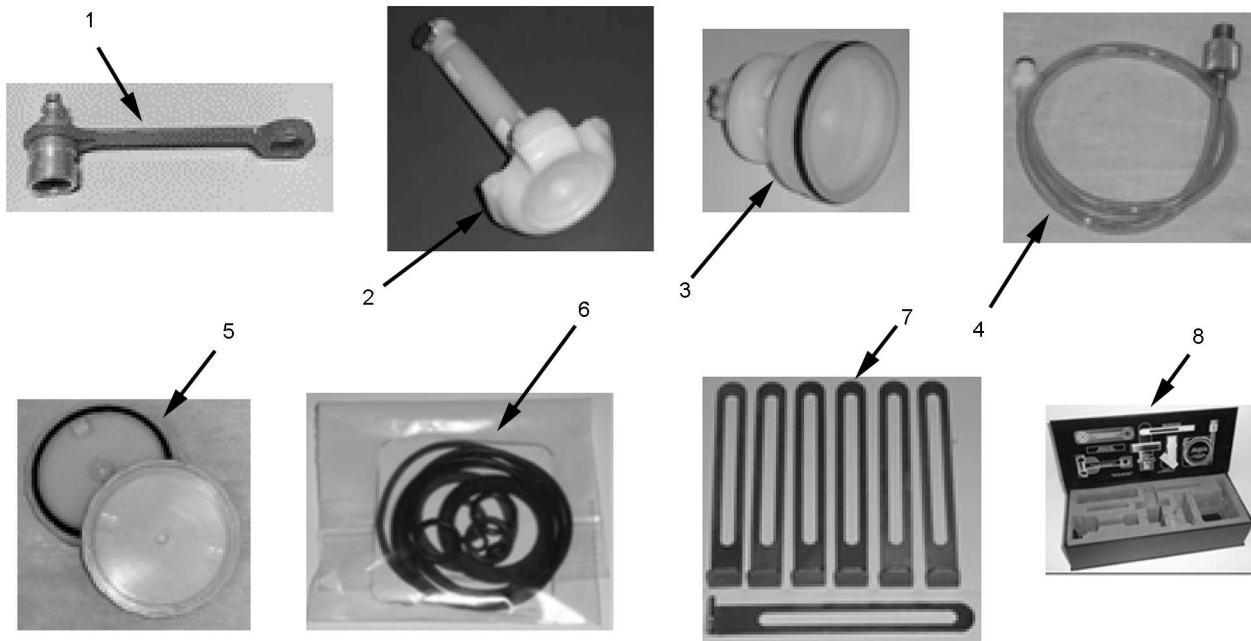
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Figure 14-3. Fit Test Kit

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION				UNITS PER ASSY	USABLE ON CODE	SMR CODE			
			1	2	3	4	5	6	7			
3-	9300123	0D1M0	KIT, Fit test, NSN 5999-01-537-7932 (See Figure 14-1 for NHA)							REF	A,B,C	PAOOO
1	1200220	0D1M0	. ROD, Fitting, tester, NSN 6625-01-537- 7722							2	A,B,C	PAOZZ
2	0600366	0D1M0	. HOSE, Tee, NSN 4730-01-537-7713 (Replaces. . . . PN 0200208)							1	A,B,C	PAOZZ
3	T99M-1487	0D1M0	. TUBING, Nonmetallic, NSN 4720-01-537- 7903							1	A,B,C	PAOZZ
4	3500161	0D1M0	. CLIP, Retaining (Badge clip), NSN 5340-01-537-7908							1	A,B,C	PAOZZ
5	1200121	0D1M0	. SHROUD, Fit test (For use on yellow head), NSN 6665-01-537-7898							1	A,B	PAOZZ
	1200316	0D1M0	. . SHROUD, Mask, test, extended, 23 inch (For use on IFSTHA), NSN 5340-01-655-2330							1	C	PAOZZ
6	1200230	0D1M0	. BAG, Fit for test kit, NSN 6665-01-537- 7910							1	A,B,C	PAOZZ
			<u>CODES</u>		<u>USABLE ON</u>							
			A		JSMLT, M46							
			B		JSMLT, M46A1							
			C		JSMLT, M46A2							

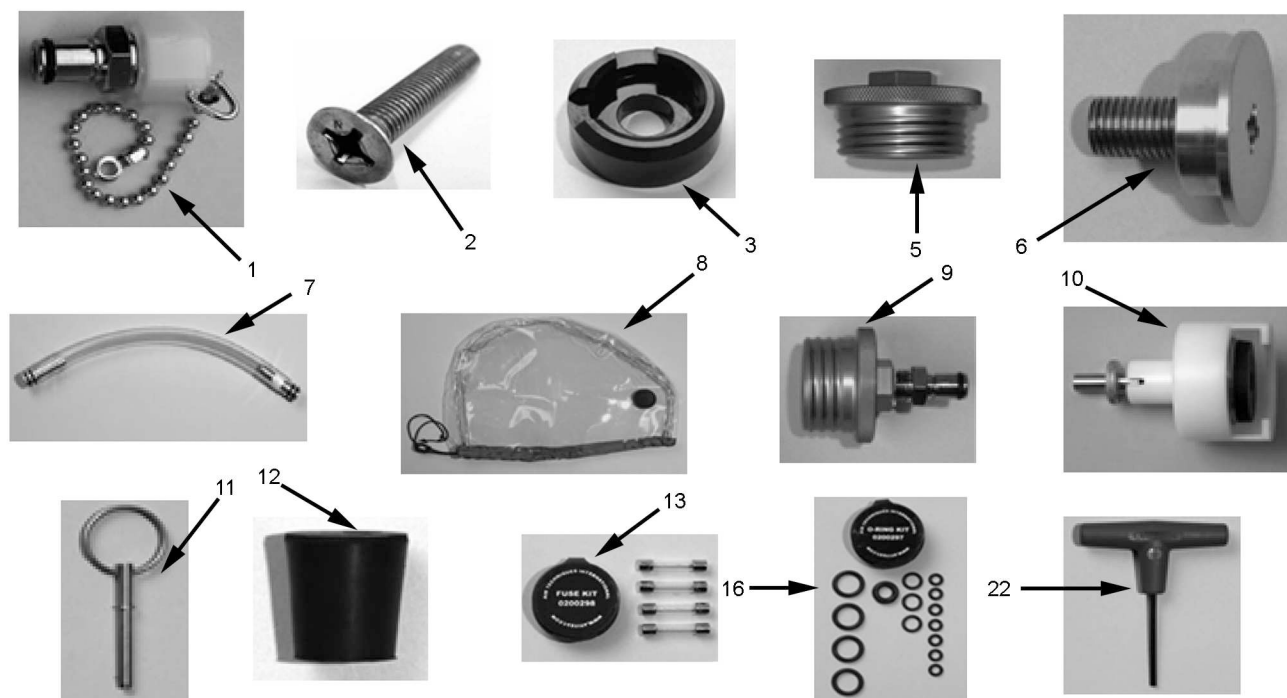


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Figure 14-4. JSMLT, JSMAK Adapter Kit

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
4-	9300184	0D1M0	ADAPTER KIT, JSMLT, JSMAK, NSN 6665-01-581-1108 (See Figure 14-1 for NHA)	REF	A,B,C	PAOZZ
1	0200498	0D1M0	. ADAPTER, Drink, fit (JSMAK, M50 drink/fit test adapter), NSN 6665-01-655-2499	1	A,B,C	PAOZZ
2	0200336	0D1M0	. ADAPTER, Test (JSMAK, M50 outlet valve), NSN 6625-01-581-2886	1	A,B,C	PAOZZ
3	0200332	0D1M0	. ADAPTER, Test (JSMAK, M53 outlet valve), NSN 6625-01-581-2888	1	A,B,C	PAOZZ
4	0200334	0D1M0	. HOSE ASSEMBLY, Nonmetallic (JSMAK, M50 outlet valve hose, NSN 4720-01-581-2894	1	A,B,C	PAOZZ
5	5-1-4164	81361	. CAP-PLUG SET (JSMAK, M50 filter plugs), NSN 5340-01-581-3827 (ATI PN 0200451)	2	A,B,C	PAOZZ
6	0200443	0D1M0	. O-RING AND GASKET, Replacement package (JSMAK), NSN 6665-01-581-1156	1	A,B,C	PAOZZ
7	1000352	0D1M0	. CLIP, Retaining (JSMAK, M50 mask clip), NSN 5340-01-581-2884	7	A,B	PAOZZ
8	0200339	0D1M0	. CASE, JSMLT adapter kit case (JSMAK case) 6665-01-581-1115	1	A,B,C	PAOZZ
			<u>CODES</u> <u>USABLE ON</u> A JSMLT, M46 B JSMLT, M46A1 C JSMLT, M46A2			

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Figure 14-5. Accessories

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
			1 2 3 4 5 6 7			
5-	NO NUMBER	none	ACCESSORIES (See Figure 14-1 for NHA)	REF	A,B,C	AFF
1	0600248	0D1M0	. PLUG, Machine thread (Hose test port plug), NSN 5365-01-537-7730	1	A,B,C	PAOZZ
2	3300388	0D1M0	. SCREW, Machine (Back pressure cover screw), . . . NSN 5305-01-671-5222	1	A,B,C	PAOZZ
3	1200115	0D1M0	. ADAPTER, Valve, outlet (Outlet valve test adapter), NSN 6665-01-537-7892	1	A,B,C	PAOZZ
-4	200470	0D1M0	. PLUG, Adapter, outlet (JSAM RW outlet valve plug/adapter), NSN 6665-01-655-2338	1	C	PAOZZ
5	1000245	0D1M0	. PLUG, Seal, leakproof (Canister port plug), NSN 5340-01-537-7901	1	A,B,C	PAOZZ
6	T99M-1318	0D1M0	. BOLT, Machine (Outlet valve retaining bolt), NSN 5306-01-537-7885	1	A,B,C	PAOZZ
7	0600316	0D1M0	. TUBING, Nonmetallic (Mask passing tube), NSN 4720-01-537-7897	1	A,B,C	PAOZZ
8	1200116	0D1M0	. SHROUD, Mask, test (For leak testing mask), NSN 5340-01-537-7905	1	A,B,C	PAOZZ
9	0200307	0D1M0	. ADAPTER, Kit, hose (Hose test adapter), NSN 4730-01-537-7586	1	A,B,C	PAOZZ
10	4800148	0D1M0	. CLAMP, Mask, gas (Outlet valve clamp), NSN 5340-01-537-7923	1	A,B,C	PAOZZ
11	3000156	0D1M0	. PIN, QRLS pin, NSN 5315-01-537-7919	1	A,B,C	PAOZZ
12	4300148	0D1M0	. STOPPER, Rubber, no. 2, NSN 8125-01-537-7583	1	A,B,C	PAOZZ
13	0200298	0D1M0	. FUSE KIT, Spare, assortment, NSN 5920-01-537-7704	1	A,B,C	PAOZZ
-14	T2E0-0321	0D1M0	. . FUSE, 2.5 ampere, 250V slow-blow	2	A,B,C	PAOZZ
-15	T5A0-0319	0D1M0	. . FUSE, 4 ampere, 250V slow-blow	2	A,B,C	PAOZZ
16	0200297	0D1M0	. O-RING KIT, Spare, assortment, NSN 5331-01-537-7576	1	A,B,C	PAOZZ

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AIR FORCE TO 33A4-7-10-1
MARINE CORPS TM 10942A-13/1
NAVY (NAVAIR) NA 17-15HB-22
NAVY (NAVSEA) SS200-AW-MMC-010

FIGURE & INDEX/ SHEET NO.		PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
				1 2 3 4 5 6 7			
5-	-17	4300134	0D1M0	. . O-RING, Rubber	4	A,B,C	PAOZZ
	-18	4300143	0D1M0	. . O-RING, Rubber	1	A,B,C	PAOZZ
	-19	4300172	0D1M0	. . O-RING, Rubber	3	A,B,C	PAOZZ
	-20	4300176	0D1M0	. . O-RING, Rubber	7	A,B,C	PAOZZ
	-21	A-A-2073	58536	. SPONGES, Packet of 12 (Unless otherwise instructed, dozen) NSN, 7920-00-161-6219 (ATI PN 4800231)	1	A,B,C	PAOZZ
	22	4800161	0D1M0	. WRENCH, Socket (T-handle, 1/8 inch hex, 2 5/16 inch blade length), NSN 5120-01-539- 5736	1	A,B,C	PAOZZ
	-23	B107.30 TY1CL3	80244	. SCREWDRIVER, Cross tip (No. 2 tip, stubby), NSN 5120-00-227-7293 (ATI PN 4800147)	1	A,B,C	PAOZZ
	-24	B107.30 TY1CL1	80244	. SCREWDRIVER, Cross tip (No. 1 tip), NSN 5120-00-240-8716 (ATI PN 4800229)	1	A,B,C	PAOZZ
	-25	B107.15 TY1	80244	. SCREWDRIVER, Flat tip (1/8 inch wide blade), NSN 5120-00-542-2281	1	A,B	PAOZZ
		4800230	80244	. SCREWDRIVER, Flat tip (1/2 inch wide blade), NSN 5120-00-236-3242	1	C	PAOZZ
				<u>CODES</u>	<u>USABLE ON</u>		
				A	JSMLT, M46		
				B	JSMLT, M46A1		
				C	JSMLT, M46A2		

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AIR FORCE TO 33A4-7-10-1
 MARINE CORPS TM 10942A-13/1
 NAVY (NAVAIR) NA 17-15HB-22
 NAVY (NAVSEA) SS200-AW-MMC-010

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B107.30 TY1CL3	5-23	1200381	F1-9		
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	1-17	23-00391-001	F1-7		
	2-	23-00392-001	1-8		
	5-	23-00393-001	F1-6		
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T2E0-0321	5-14	3300201	1-11		
T5A0-0319	5-15	3300388	5-2		
T99M-1318	5-6	3500161	3-4		
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T99M-1346	1-12	4300148	5-12		
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0200498	4-1				
03001A0001	1-				
0600222	2-3				
0600225	1-5				
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0600316	5-7				
0600366	3-2				
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