

TECHNICAL MANUAL

UNIT MAINTENANCE MANUAL

**CARTRIDGES,
CARTRIDGE ACTUATED DEVICES,
AND
PROPELLANT ACTUATED DEVICES**

HEADQUARTERS, DEPARTMENT OF THE ARMY

September 1993

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 No. 1

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 Washington, D.C., 14 February 1994

TECHNICAL MANUAL
 UNIT MAINTENANCE MANUAL
 FOR
 CARTRIDGES, CARTRIDGE ACTUATED DEVICES,
 AND
 PROPELLANT ACTUATED DEVICES

TM 9-1377-200-20, 22 September 1993, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. New or revised illustrations are indicated by a vertical bar adjacent to the identification number.

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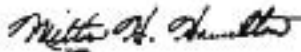
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Official:



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**TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 72
CONSISTING OF THE FOLLOWING:**

| Page No. | *Change No. |
|---------------------|----------------|
| Cover | 0 |
| a thru d | 0 |
| A | 1 |
| B | 0 |
| i and ii | 0 |
| 1-1 thru 1-5 | 0 |
| 1-6 | 1 |
| 1-7 thru 1-10 | 0 |
| 2-1 thru 2-14 | 0 |
| 3-1 thru 3-24 | 0 |
| 4-1 and 4-2 | 0 |
| A-1 and A-2 | 0 |
| B-1 thru B-4 | 0 |
| C-1 and C-2 | 0 |
| D-1 thru D-4 | 0 |
| Authentication Page | 0 |

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WARNING PAGE

In addition to the specific CAUTIONS and WARNINGS set forth in the text for each individual item, the following are general safety precautions that are not related to any specific procedure. These safety precautions do not appear elsewhere in this publication. All personnel shall understand and apply these safety precautions during maintenance and operation of explosively actuated systems: WARNINGS, CAUTIONS, AND NOTES

Warnings, cautions, and notes

Warnings, cautions, and notes found in this manual are defined as follows:

WARNING

An operating or maintenance procedure, practice, etc., which, if not strictly observed, could result in injury to or death of personnel.

CAUTION

An operating or maintenance procedure, which, if not strictly observed, could result in damage to or destruction of equipment, or loss of mission effectiveness.

NOTE

An operating or maintenance procedure, condition, etc., which is essential to emphasize or clarify.

WARNING

THE EQUIPMENT DESCRIBED IN THIS PUBLICATION CONTAINS EXPLOSIVE MATERIAL WHICH, IF INADVERTENTLY ACTIVATED, CAN RESULT IN INJURY TO OR DEATH OF PERSONNEL AND DAMAGE TO OR DESTRUCTION OF EQUIPMENT. ALL PERSONS INVOLVED IN THE MAINTENANCE AND INSPECTION OF THIS EQUIPMENT SHALL BE THOROUGHLY FAMILIAR WITH THE CONTENTS OF THIS PUBLICATION.

ALL CADS/PADS SHALL BE HANDLED AS LIVE AMMUNITION.

CADS/PADS WHICH HAVE BEEN FIRED MAY RETAIN AN EXPLOSIVE RESIDUE CAPABLE OF PRESENTING A HAZARDOUS CONDITION.

ALL DEVICE SUSPECTED OF HAVING BEEN FIRED SHALL BE SEPARATED FROM READY-FOR-ISSUE MATERIAL AND CLEARLY MARKED TO PREVENT ISSUE OR USE. DISPOSITION SHALL BE REQUESTED IN ACCORDANCE WITH DA PAM 738-750. SUSPECT CADS/PADS SHALL BE HANDLED IN ACCORDANCE WITH THE SAFETY PRECAUTIONS APPLICABLE TO THE LIVE ITEM CONTAINED IN THIS PUBLICATION.

ELECTRICALLY INITIATED CADS SHALL NOT BE RESISTANCE CHECKED PRIOR TO INSTALLATION IN THE DEVICE OF INTENDED APPLICATION.

THE AIRCRAFT ELECTRICAL SYSTEM SHALL BE DEACTIVATED AND THE AIRCRAFT SHALL BE PROPERLY GROUNDED PRIOR TO AND DURING MAINTENANCE OF ELECTRICALLY INITIATED CADS. ELECTRICAL TESTING (i.e. RESISTANCE CHECK, CONTINUITY TEST) OF CADS AND OF AIRCRAFT SYSTEMS WITH CADS INSTALLED USING OTHER THAN BUILT-IN TEST EQUIPMENT (BITE) IS STRICTLY PROHIBITED AT ALL LEVELS OF MAINTENANCE.

CADS/PADS RECEIVED IN A DAMAGED CONDITION SHALL NOT BE USED. THESE CADS/PADS SHALL BE REPORTED IN ACCORDANCE WITH AR 55-38, AR 735-11-2, DA PAM 738-750 AND AR 702-7.

WHEN A CAD/PAD IS REMOVED FROM THE AIRCRAFT, HELICOPTER, OR EQUIPMENT FOR INSPECTION OR SAFETY REASONS, IT SHOULD BE MARKED OR TAGGED WITH IDENTIFYING DATA SO IT CAN BE REINSTALLED IN THE SAME DEVICE FROM WHICH IT WAS REMOVED. THIS DOES NOT APPLY TO STORES RELEASE CARTRIDGES.

CARTRIDGES SHALL NOT BE REMOVED FROM "SEALED-IN" DEVICES. A CAD OR PAD FOUND TO HAVE NO IDENTIFICATION MARKINGS SHALL NOT BE USED. SUCH CADS/PADS SHALL BE REPORTED IN ACCORDANCE WITH DA PAM 738-750 AND DISPOSED OF IN ACCORDANCE WITH TM 9-1300-206.

SPECIAL CARE SHALL BE EXERCISED TO PREVENT CADS/PADS FROM BEING DROPPED OR STRUCK. A DEFORMED, DENTED, OR CORRODED DEVICE SHALL NOT BE USED. CORRODED CADS/PADS AND CADS/PADS SUSPECTED OF HAVING BEEN DROPPED OR STRUCK WILL BE REPORTED IN ACCORDANCE WITH DA PAM 738-750 WITH A REQUEST FOR DISPOSITION INSTRUCTIONS.

EXCEPT DURING AN EMERGENCY, AND ONLY WITH THE APPROVAL OF THE UNIT COMMANDER, CADS/PADS SHALL NOT BE REMOVED FROM OR INSTALLED INTO AIRCRAFT/HELICOPTERS DURING FUELING/DEFUELING OPERATIONS.

STEEL AND ALUMINUM CAPS AND PLUGS SHALL NOT BE USED AS PROTECTIVE CLOSURES DURING MAINTENANCE OF SYSTEMS USING CADS/PADS.

BEFORE INSTALLING AN ELECTRICALLY INITIATED CAD, ENSURE ALL CIRCUITS OF THE ACTUATING SYSTEM ARE OPENED.

CADS/PADS USED IN ESCAPE SYSTEMS ARE DESIGNED FOR ONE-TIME-USE ONLY, BALLISTICALLY. THEY ARE NOT TO BE REFURBISHED FOR USE AFTER FIRING.

DO NOT APPLY ANTI-CORROSIVE MATERIALS TO CADS/PADS UNLESS SPECIFICALLY APPROVED AND DIRECTED TO DO SO BY THE AIRCRAFT/EQUIPMENT TM OR APPROPRIATE TECHNICAL DIRECTIVE. IF ANTI-CORROSIVE MATERIAL IS BEING APPLIED IN THE VICINITY OF CADS/PADS, CARE WILL BE EXERCISED TO PREVENT CONTAMINATION OF THE CADS/PADS.

GRANTING OF AN ADDITIONAL SERVICE LIFE EXTENSION IS BASED UPON SURVEILLANCE DATA RESULTING FROM TESTS CONDUCTED TO DETERMINE THE RELIABILITY OF A CAD/PAD BEYOND ITS ESTABLISHED SERVICE LIFE. CADS/PADS SHALL NOT BE USED BEYOND THE CONTINGENCY (30 DAY) EXTENSION DATE WITHOUT APPROVAL BY AMCCOM, ROCK ISLAND, IL.

TO PREVENT INJURY, RELEASE TENSION BY PRESSING DOWN ON TOP OF BOX WHILE CUTTING STRAPS ON SIDE OF BOX.

OPERATORS SHALL WEAR SUITABLE EYE PROTECTION AND GLOVES WHEN PERFORMING THE FOLLOWING PROCEDURE.

DO NOT ROLL, DROP THROW OR SUBJECT CADS/PADS TO ROUGH HANDLING. THESE CADS/PADS ARE DEPARTMENT OF TRANSPORTATION (DOT) CLASS C AND B EXPLOSIVES.

FIRST AID

SEE FM 21-11 FOR GENERAL FIRST AID INFORMATION.

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| Cover | 0 |
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| B | 0 |
| i and ii | 0 |
| 1-1 thru 1-5 | 0 |
| 1-6 | 1 |
| 1-7 thru 1-10 | 0 |
| 2-1 thru 2-14 | 0 |
| 3-1 thru 3-24 | 0 |
| 4-1 and 4-2 | 0 |
| A-1 and A-2 | 0 |
| B-1 thru B-4 | 0 |
| C-1 and C-2 | 0 |
| D-1 thru D-4 | 0 |
| Authentication Page | 0 |

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Technical Manual)
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No. 9-1377-200-20)

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 22 September 1993

UNIT MAINTENANCE MANUAL

**CARTRIDGES,
CARTRIDGE ACTUATED DEVICES
AND PROPELLANT ACTUATED DEVICES**

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or know of a way to improve the procedures, please let us know. Mail your DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, U.S. Army Armament Research, Development and Engineering Center, ATTN: SMCAR-LSB, Picatinny Arsenal, NJ 07806-5000. A reply will be furnished to you.

| | <u>Page</u> |
|--|-------------|
| CHAPTER 1. INTRODUCTION | |
| Scope | 1-1 |
| Forms, records and reports | 1-1 |
| Destruction of Ammunition to Prevent Enemy Use | 1-1 |
| Safety | 1-1 |
| Maintenance Policy | 1-3 |
| Care and Handling | 1-4 |
| Requisitioning | 1-4 |
| Disposition | 1-4 |
| Disposal by EOD Personnel | 1-4 |
| Service Life | 1-4 |
| Shelf Life | 1-4 |
| Installed Life | 1-6 |
| Extended Deployment | 1-6 |
| Service Life Changes | 1-7 |
| Marking Expiration Dates and Logbook Entries | 1-7 |
| Service Life Extension | 1-7 |
| Reference Publications | 1-8 |
| CHAPTER 2. DESCRIPTION AND DATA | |
| Section I. General..... | 2-1 |
| Section II. Cartridge, Aircraft Fire Extinguisher | 2-1 |
| Section III. Cutters..... | 2-3 |
| Section IV. Cartridge, Delay | 2-5 |
| Section V. Detonating Cord and Window Cutting Assemblies | 2-6 |
| Section VI. Cartridge, Impulse | 2-10 |
| Section VII. Initiators | 2-11 |
| Section VIII. Rocket Catapults and Rocket Motors | 2-12 |
| Section IX. Thrusters | 2-12 |
| Section X. Miscellaneous Items | 2-13 |

*This manual supersedes TM 9-1377-200-20&P dated 28 November 1985, including all changes.

| | <u>Page</u> |
|---|-------------|
| CHAPTER 3. MAINTENANCE INSTRUCTIONS | |
| Section I. Service Upon Receipt of Materiel | 3-1 |
| Section II. Tools and Equipment | 3-7 |
| Section III. Maintenance | 3-8 |
| Section IV. Aircraft Log Book Entries | 3-23 |
| Section V. Removal and Installation of CADs/PADs | 3-23 |
| CHAPTER 4. SHIPMENT AND STORAGE | |
| Section I. Shipment | 4-1 |
| Section II. Storage | 4-2 |
| APPENDIX A. REFERENCES | A-1 |
| APPENDIX B. MAINTENANCE ALLOCATION CHART | B-1 |
| APPENDIX C. AVIATION UNIT MAINTENANCE ACCESSORIES, AND TOOLS | C-1 |
| APPENDIX D. AVIATION UNIT MAINTENANCE PACKING MATERIALS, EXPENDABLE AND DURABLE ITEMS LIST | D-1 |

LIST OF ILLUSTRATIONS

| <u>Figure No.</u> | <u>Title</u> | <u>Page</u> |
|-------------------|---|-------------|
| 1-1 | Definition of code for ammunition production lot number | 1-5 |
| 1-2 | Message format for CAD/PAD service life extension/request | 1-9 |
| 1-3 | Message format for CAD/PAD service life extension | 1-10 |
| 3-1 | Typical containers (with sallee closer) | 3-2 |
| 3-2 | Typical packing | 3-3 |
| 3-3 | Sallee closer | 3-6 |
| 3-4 | Aircraft fire extinguisher cartridges | 3-17 |
| 3-5 | Impulse and delay cartridges | 3-18 |
| 3-6 | Detonating cords | 3-19 |
| 3-7 | Armed/firing mechanism..... | 3-19 |
| 3-8 | Reefing line cutters | 3-20 |
| 3-9 | Rocket motor | 3-20 |
| 3-10 | Cutter, cartridge actuated, M21 and M22 | 3-21 |
| 3-11 | Thruster | 3-22 |

LIST OF TABLES

| <u>Table No.</u> | <u>Title</u> | <u>Page</u> |
|------------------|---|-------------|
| 2-1 | Army Authorized Aircraft Extinguisher Cartridges (Group 0100) | 2-2 |
| 2-2 | Army Authorized Cutters (Group 0200) | 2-4 |
| 2-3 | Army Authorized Delay Cartridges (Group 0300) | 2-5 |
| 2-4 | Army Authorized Detonating Cord and Window Cutting Assemblies (Group 0400) | 2-6 |
| 2-5 | Army Authorized Impulse Cartridges (Group 0500)..... | 2-10 |
| 2-6 | Army Authorized Initiators/Firing Mechanisms (Group 0600) | 2-11 |
| 2-7 | Army Authorized Rocket Catapults and Rocket Motors (Group 0700) | 2-12 |
| 2-8 | Army Authorized Thrusters (Group 0800) | 2-12 |
| 2-9 | Army Authorized Miscellaneous Items (Group 0900) | 2-13 |
| 3-1 | Inspection Criteria for Packaging | 3-10 |
| 3-2 | Inspection Criteria | 3-13 |

CHAPTER 1 INTRODUCTION

1-1. Scope

a. TM 9-1377-200-20 is intended to inform Department of the Army personnel of the procedures for the proper identification, handling, storage and use of Federal Supply Class (FSC) 1377 Cartridges/Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs). Throughout this manual, the term CAD shall be synonymous with and collectively represent FSC 1377 cartridges, cartridge actuated devices, and explosive detonating cord systems used in aircraft/helicopter emergency escape systems, fire extinguisher systems, and equipment/stores jettison and separation systems. The term PAD shall be synonymous with and collectively represent FSC 1377 rocket catapults and rocket motors used in aircraft escape systems.

b. The Naval Ordnance Station, Indian Head, MD 20640 (Code 51) has been designated as the Cognizant Field Activity (CFA) for FSC 1377 CADs and PADs. Any questions concerning the CADs/PADs described in this publication should be directed to this station, Code 51.

1-2. Forms, Records, and Reports

a. Authorized Forms. Forms required by organizational maintenance personnel are listed in Appendix A and in DA PAM 25-30. Information on applicability and instructions for completing forms are published in DA PAM 738-750.

b. Field Report of Accidents. Accidents involving injury to personnel or damage to material will be reported on DA Form 285 in accordance with AR 385-40. Malfunctions will be reported in accordance with AR 75-1.

c. Report of Damaged or Improper Shipment. Material received in damaged or otherwise unsatisfactory condition because of deficiencies in preservation, packaging, marking, loading, storage, or handling will be reported on Standard Form 364 in accordance with AR 735-11-2. Reports of improper shipment or damage caused by transportation discrepancies will be reported on SF 361 in accordance with AR 55-38.

d. Reporting Malfunctions, and Accidents. All malfunctions, and accidents involving DISC 1377 CADs/PADs shall be reported by the most expeditious means available to AMCCOM, Rock Island, IL 61299 (ATTN: AMSMC-QAS) in accordance with AR 75-1.

e. Reporting of Product Quality Deficiencies. Deficiencies encountered with newly manufactured material must be reported in accordance with AR 702-7 on SF 368, Quality Deficiency Report (QDR). This may also be applied to defective products which were government inspected at source and subsequently presented to the government for acceptance at destination.

f. Reporting Discrepancies for Disposition Instructions. All deficiencies noted during inspection should be reported on Ammunition Condition Report (ACR) DA 2415 in accordance with DA PAM 738-750. Items with expired shelf life should be reported by letter in accordance with DA PAM 738-750.

1-3. Destruction of Ammunition to Prevent Enemy Use

Destruction of munitions when subject to capture or abandonment will be undertaken by the user only when, in judgment of the unit commander concerned, such action is necessary in accordance with orders of, or policy established by, the Army Commander, (refer to TM 750-2445-1).

1-4. Safety

a. Observe all safety regulations, local standing operating procedures, and precautions generally applicable to ammunition.

b. CADs/PADs used in aircraft/helicopter escape systems and emergency life support systems must function perfectly the first time. Malfunction of a CAD/PAD designed for a lifesaving application or failure to fire when needed, usually results in severe injury to or death of the person(s) involved. Malfunction of a CAD designed for stores separation/jettison equipment will result in equipment damage or destruction with possible serious injury to or death of the person(s) involved.

c. CADs/PADs are carefully designed and manufactured and a sample of each lot is tested prior to acceptance for service use. Since individual CADs/PADs cannot be functionally or operationally tested, the responsibility for proper functioning is in the hands of the person(s) handling and maintaining these devices. Correct performance can only be ensured when the CADs/PADs have been properly handled and maintained. Utmost care shall be applied to maintain both CADs/PADs and the systems.

d. All persons engaged in operations involving munitions or other hazardous material shall be thoroughly trained in explosive safety (AR 385-10 and AR 385-64). All personnel handling and maintaining CADs/PADs shall be capable of instantly recognizing hazardous explosive exposures. The safety provisions cited in the AR 385 Series publications and in TM 9-1300206 shall be thoroughly understood and strictly adhered to. All persons required to inspect, handle, maintain, or operate any munitions or explosive equipment including CADs/PADs shall be frequently instructed in the safety precautions applicable to the devices with which they may be involved.

e. Persons supervising or performing work in connection with the handling, installations removal, or inspection of CADs/PADs shall observe the following restrictions:

(1) Ensure all applicable maintenance procedures and regulations governing ammunition safety are thoroughly understood and rigidly observed by subordinate persons.

(2) Carefully supervise the activities of subordinate persons.

(3) Ensure no person performs maintenance or inspections of CADs/PADs, or related systems without the immediate presence of another person capable of rendering aid.

(4) Inform all persons of the need for using the utmost care in the performance of their work.

(5) Ensure all persons involved in the handling, preparation, installation, inspection, or removal of CADs/PADs are qualified to perform the tasks involved. Inexperienced personnel shall not be allowed to work with CADs/PADs.

f. Smoking is prohibited on or near any aircraft or vehicle handling, loading, or unloading explosives. Smoking areas may be designated upon approval by competent authority provided such areas are located a safe distance (TM 91300-206) from the vehicle or aircraft. "NO SMOKING" warning signs shall be posted during operations involving handling, loading or unloading explosive cargo. At least one such "NO SMOKING" sign shall be located a reasonable distance from the vehicle or aircraft when handling, loading or unloading is taking place.

g. Naked lights, matches, lighters and other spark and flame, or heat producing devices shall never be taken into or stowed in magazines or other areas containing explosives or munitions. Only approved lighters shall be used in explosive areas and then only in the designated smoking areas.

1-2 h. Individual CADs/PADs shall not be installed in any equipment for which they have not been qualified and authorized. Some CADs/PADs have the same external dimensions and can be physically interchanged. Utmost care must be taken to identify each CAD/PAD. Ensure the proper CAD/PAD is used only in the equipment for which it was designed. A CAD/PAD that does not freely and fully enter the chamber for which it was designed shall not be used. Such an occurrence shall be reported in accordance with DA PAM 738-750. Such a CAD/PAD should be held for 30 days pending a request for the item for engineering investigation. If a request for return of the CAD/PAD for engineering investigation has not been received within 30 days, the item should then be disposed of in accordance with TM 9-1300206.

i. Upon receipt, CADs/PADs shall be inspected for the following: (1) All CAD/PAD containers shall be properly identified and the marking shall be in agreement with the documents accompanying the containers.

(2) The packaging shall show no evidence of rough handling.

(3) The hermetical seals on the inner containers shall not have been broken.

j. If inlet and outlet ports are present on a CAD/PAD, they shall be covered with a protective plastic cap when the device is not installed. If a protective plastic cap is not available, a shipping cap may be used.

k. Safety pins/devices shall be kept in good conditions and used only for the CAD/PAD for which they were designed. When a loaded CAD/PAD is not in use, its safety pin/device shall be installed.

l. CADs/PADs are designed to safely accept only the exact shape, diameter, and strength of safety pin provided for each specific application (e.g., shipping, maintenance, installed). Improvised materials (e.g., cotter pins, nails, rods, wires) shall not be used.

m. CADs/PADs removed from ejection seats/parachutes/survival equipment/stores separation systems during maintenance shall be stored in containers with adequate separation, support, and cushioning to prevent damage during handling and storage. Authorized safety pins/devices shall be installed at all times to prevent accidental firing. Plastic protective caps/plugs shall be installed to prevent contamination by moisture or foreign matter.

n. CADs/PADs shall be stored in a cool, dry place. CADs/PADs shall be protected from the direct rays of the sun and from extreme temperatures. CADs/PADs exposed to temperatures in excess of the limits presented in the individual data entries in this manual shall not be used. CADs/PADs exposed to extreme temperatures shall be reported in accordance with DA PAM 738-750.

o. CADs/PADs installed on/in ejection seats/parachutes/survival equipment which remain installed during maintenance do not require removal prior to storage in the maintenance space. (Refer to the applicable aircraft/helicopter/equipment TM for specific disarming requirements and procedures.) Safety pins/devices and protective caps and plugs shall be installed at all times.

p. The ejection seats/parachutes/survival equipment with CADs/PADs installed shall only be handled with authorized personnel in an area approved and designated by the maintenance officer. The Post fire department shall be notified of the locations, type, quantity, and explosive classification of CADs/PADs expected to be within the maintenance space. Proper hazard identification shall be posted. Unauthorized personnel shall be restricted from this area. Smoking regulations shall be strictly adhered to.

q. CADs/PADs removed from equipment shall be stored in the correct containers (according to drawing or packaging data sheet) with adequate separation, support, and cushioning to prevent damage during storage and normal handling. The properly-packaged CADs/PADs shall then be stored in a ready-service magazine approved for the applicable hazard class and compatibility group. Certain CAD/PAD items are approved for Storage Compatibility Group S. These items may normally be stored in a magazine authorized for storage of hazard class/division 1.4 explosives. Consult the Joint Hazard Classification System microfiche for proper hazard classification of specific items. If the CADs/PADs are required for reinstallation the same day, they may be stored in an area approved and designated by the maintenance officer.

r. The short term CAD/PAD storage area shall be secured and access limited to authorized ordnance personnel. Proper hazard identification shall be posted. The Post fire department shall be notified of the location, type, quantity, and explosive classification for CADs expected to be in the maintenance area.

s. Under certain conditions, dangerous current can be stored in circuits after the power source has been disconnected because of charges retained by capacitors. To avoid injuries, always disconnect the

power source, and ground circuits prior to touching them.

t. Persons handling CADs/PADs shall wear appropriate protective equipment. Prior to performing maintenance on aircraft-helicopter equipment employing electrically initiated CADs, ensure all circuits of the actuating system are open and that the aircraft/helicopter/ equipment is properly grounded. Since some CADs may be initiated by static electricity, persons handling electrically initiated CADs shall ensure these CADs are protected from stray currents/static electricity at all times.

u. Handle, ship, and store CADs/PADs in accordance with provisions of the AR 55 and AR 385 Series Publications, TM 9-1300-206, DARCOM-R 385-100 (Safety Manual), and the hazard classification data provided in the Joint Hazard Classification System published by DARCOM. Additionally, ensure compliance with the safety precautions presented in this Safety Summary as well as the specific WARNINGS and CAUTIONS presented for the individual CAD/PAD in the text of this publication.

v. Unserviceable CADs/PADs that are authorized for disposal will be demilitarized in accordance with applicable Depot Maintenance Work Requirements (DMWR) and either DARCOM-R 385-100 or TM 9-1300-206.

1-5. Maintenance Policy

a. Each CADs/PADs installed in aircraft escape system must function perfectly. Malfunction of the device, or failure to fire when needed, usually results in injury to or death of crew member(s). Malfunction of CADs/PADs used in other applications usually results in damage to or destruction of the equipment with possible serious injury to or death of the persons involved.

b. CAD/PAD maintenance policy prohibits unauthorized adjustment at any level of maintenance. The only maintenance actions authorized are removal, inspection, and installation unless specifically detailed in this manual, the aircraft/equipment TM, or by an approved technical directive.

c. Periodically, certain FSC 1377 CADs/PADs are needed for various test and evaluation actions (i.e., engineering investigation, surveillance, and/or quality evaluation). As the need arises, the Commander, U.S. Army Armament Munitions and Chemical Command (AMCCOM), Rock Island, IL will issue the appropriate directives for the return of samples of this material. When samples are required, each CAD/PAD shall be marked or labeled with

the following:

- 1-27.1. Nomenclature
- 1-27.2. Lot number
- 1-27.3. Serial number
- 1-27.4. Container open date
- 1-27.5. Removal date
- 1-27.6. Expiration date
- 1-27.7. Aircraft/equipment type
- 1-27.8. Aircraft/equipment serial number

d. When CADs/PADs are not installed, their inlet and outlet ports shall be sealed with protective closures to prevent contamination by moisture or foreign matter. During shipping, the inlet ports and outlet ports shall be protected by caps and plugs. The caps and plugs provided with the new CAD/PAD shall be returned on the old CAD/PAD.

e. During system maintenance, all disconnected CADs/PADs shall have protective covers installed. Plastic plugs conforming to MILC-5501/10A and plastic caps conforming to MILC-5501/11 should be used.

1-6. Care and Handling

a. CADs/PADs are technically designed and manufactured, but their performance is dependable only when they are properly handled and maintained.

b. FSC 1377 CADs/PADs which are inspected and found to be discrepant, malfunctioning, or involved in an accident caused by a malfunctioning shall be separated from Condition Code "A" serviceable material. These CADs/PADs should be clearly labeled "HOLD FOR ENGINEERING INVESTIGATION (EI) PENDING DISPOSITION INSTRUCTIONS" and returned to the nearest supporting ammunition supply point.

c. The material should be held at the supporting supply point for 90 days pending disposition instructions. If specific disposition instructions are not receive within 90 days, the material shall be disposed of in accordance with TM 9-1300-206. The accident, malfunction, or discrepancy report should identify the supporting supply point holding the material for engineering investigation.

1-7. Requisitioning

To acquire FSC 1377 CADs/PADs, submit a request in accordance with AR 725-50 citing the item name, DODAC (if assigned), NSN, quantity, and required delivery date.

NOTE

- **Replacement FSC 1377 CADs/PADs should be ordered 90 days prior to the required delivery date.**
- **FSC 1377 CADs/PADs are not to be ordered for local stock at any maintenance activity unless such action has been approved by AMCCOM, Rock Island, IL.**

1-8. Disposition

When the computed service life of any FSC 1377 CADs/PADs is exceeded, it shall be reported for disposition in accordance with DA PAM 738-750.

1-9. Disposal by EOD Personnel

Disposal of FSC 1377 CADs/PADs determined to be in a hazardous condition is the responsibility of Explosive Ordinance Disposal (EOD) personnel. A CAD/PAD may only be disassembled by EOD personnel in order to render the unit safe. No other disassembly is authorized. When a unit has been rendered safe by EOD personnel, it shall be disposed of in accordance with TM 9-1300-206.

1-10. Service Life

a. Service life is defined as the period of time during which a CAD or PAD can be used with an ensured high degree of reliability. Performance of CADs and PADs is influence by the environment to which they are exposed (e.g., temperature, humidity, vibration, shock); therefore, time limits during which they can be used are assigned in this manual. These time limits are assigned in this manual. These time limits are designated as SHELF LIFE and INSTALLED LIFE. Shelf life and installed life are not to be combined. A CAD or PAD is overaged if either of these limits is exceeded. Overaged CADs/PADs shall not be used without specific approval by AMCCOM, Rock Island, IL 61299-6000 (Attn: DRSMC-QAS).

b. The establishment of service life limits is based on design verification tests, qualification tests, and surveillance evaluations. These limits are approved by AMCCOM, Rock Island, IL; therefore, compliance with the established service life limits is mandatory.

1-11. Shelf Life

Shelf life is the period of time beginning from the date of manufacture that a CAD or PAD can remain in its hermetically-sealed con

tainer and still be serviceable. The shelf life expiration date shall always be computed from the date of manufacture available from the lot number (refer to

figure 1-1). For verification of lot numbers and manufacture date, contact AMCCOM, Rock Island, IL.

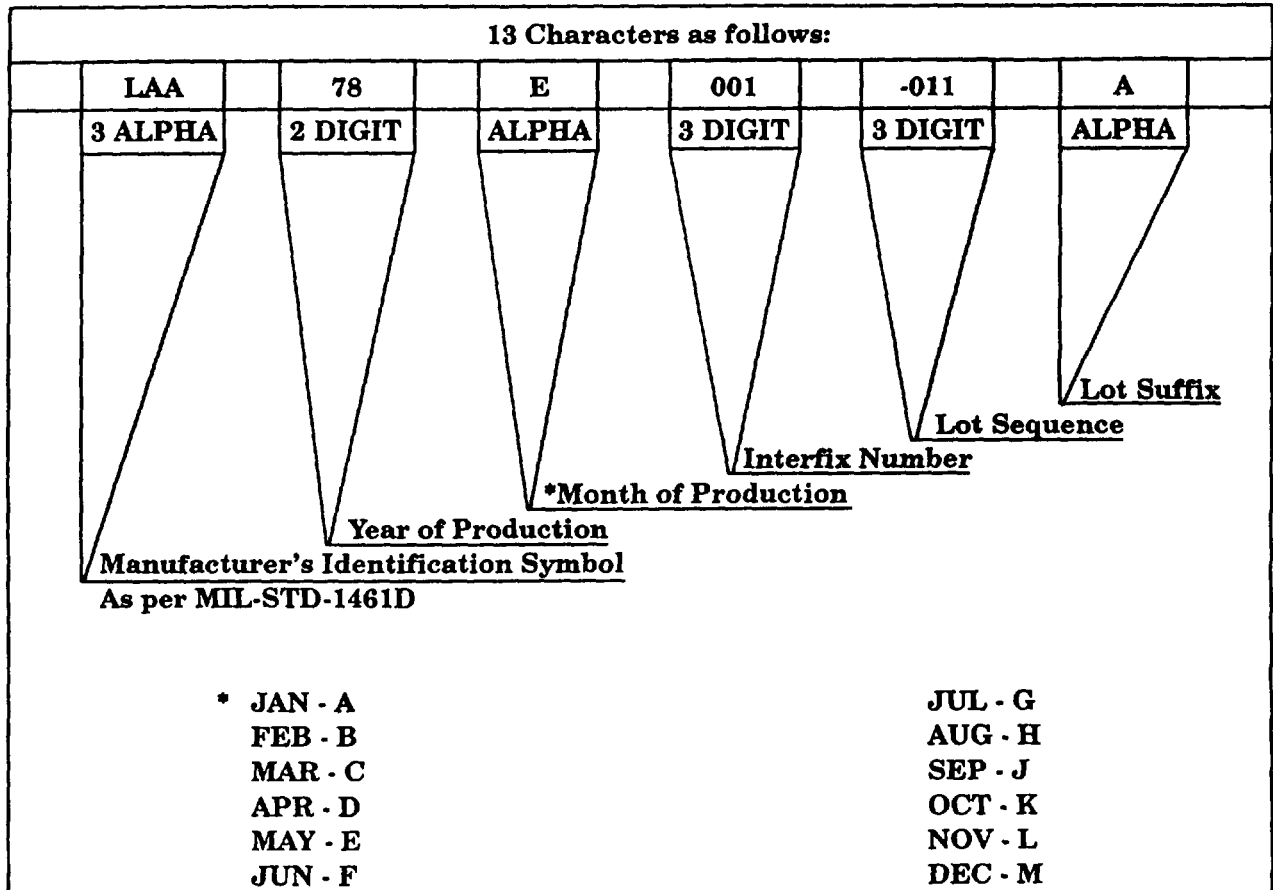


Figure 1-1. Definition of code for ammunition production lot number.

1-12. Installed Life

a. Installed life is the period of time a CAD or PAD is allowed to be used after its hermetically-sealed container is opened; however, the installed life expiration date shall never exceed the shelf life expiration date. The installed life expiration date is computed from the date the hermetically-sealed container is opened and is always computed to the last day of the month involved. For example, if a cartridge has an eighteen-month installed life, and the hermetically-sealed container is opened on 12 June 1983, the installed life expiration date is 12-84. The CAD in this example would require replacement during December 1984.

NOTE

When the hermetically-sealed container is opened, the container open date and the service life expiration date shall be marked with indelible ink (month and year) on the container and each individual CAD in the container.

b. Since CAD/PAD service life is based on both a shelf life and an installed life, whichever date occurs first is the CAD/PAD service life expiration date. To compute shelf life or installed life, use the following formulas:

| | | | | |
|--------------|---------------------|--------------|-------------|------|
| (1) | Shelf | Life | Expiration | Date |
| Computation: | | | | |
| | <u>Time Element</u> | <u>Month</u> | <u>Year</u> | |
| | Shelf Life | 00 | 07 | |
| | Manufacture Date | 10 | 83 | |
| | Shelf Life Expires | 10 | 90 | |
| | Conversion of Total | 10 | 90 | |

| | | | | |
|--------------|------------------------|--------------|-------------|------|
| (2) | Installed | Life | Expiration | Date |
| Computation: | | | | |
| | <u>Time Element</u> | <u>Month</u> | <u>Year</u> | |
| | Installed Life | 06 | 02 | |
| | Date Opened | 07 | 84 | |
| | Installed Life Expires | 13 | 86 | |
| | Conversion of Total | 01 | 87 | |

(3) In this example, the CAD/PAD would expire by installed life during January 1987 since this date occurs prior to the computed shelf life expiration date.

NOTE

If the date the hermetically-sealed container was opened is not available, the installed life expiration

date shall be computed from the date of manufacture available in the lot number.

c. TM 43-0001-39 and Appendix E of TB 91300-385-1 contain maximum approved shelf life and maximum installed life for FSC 1377 CADs/PADs. In the event of a conflict on maximum shelf and installed life between these two manuals, the manual with the latest publication date shall take precedence. The shelf life and installed life limits for specific applications that are published in the aircraft/helicopter/ equipment Technical Manuals shall take precedence provided these limits do not exceed the maximum limits published in TM 43-0001-39 and Appendix E of TB 9-1300-385-1. The aircraft/helicopter/equipment TMs shall be consulted to determine the inspection interval during which installed FSC 1377 CADs/PADs are to be replaced. Consult TB 9-1300-385-1 and TB 9-1300-385-2 to ensure the lots installed in Army aircraft/helicopter/equipment have not been suspended or restricted from use.

d. During scheduled maintenance inspection of aircraft/helicopter/equipment employing CADs/PADs, the computed service life expiration dates shall be verified. CADs/PADs should be replaced if they will become overage before the next maintenance inspection. This practice minimizes the impact of CAD/PAD service life expiration on Army aircraft and helicopter operations.

e. During depot level overhaul, the expiration dates of installed CADs/PADs should be checked. CADs/PADs assigned to Aviation Unit Maintenance (AVUM) or Aviation Intermediate Maintenance (AVIM) level for maintenance with service life expiration dates which occur prior to the next scheduled inspection after the aircraft is to be returned to the custodian shall be replaced. CADs/PADs assigned to the depot level for maintenance with expiration dates which occur prior to the next scheduled depot rework shall be replaced in accordance with established standards of serviceability. This precludes loss of mission capability caused by CAD/PAD service life expiration.

1-13. Extended Deployment

When an aircraft or helicopter is scheduled for deployment in an area that does not permit ready resupply and servicing of CADs/PADs, a pre-deployment inspection of the log book should be made. All CADs/PADs that will become overage during the scheduled deploy-

* U.S. G.P.O.:1994-546-043:80736

ment, should be replaced before the aircraft or helicopter is deployed.

1-14. Service Life Changes

The approved maximum service life for a CAD/PAD can be changed only by a formal change to the TM 43-0001-39 or TB 9-1300-3851. These changes will be issued as either a permanent change or as an Immediate Action Interim Change (LAIC) depending on the urgency of the action required.

1-15. Marking Expiration Dates and Logbook Entries

Before installing a CAD/PAD, the service life expiration date shall be computed. Both the container open date and the service life expiration date shall be marked on the CAD/PAD with indelible ink.

NOTE

- Use permanent indelible ink for marking CADs/PADs with container open dates and service life expiration dates. Do not scribe, scratch, or vibroetch these dates as damage will occur to the CADs/PADs corrosion resistant surface. Marking pen, NSN 7520-00-043-3408, available from the General Services Administration (GSA) Supply is recommended for this purpose.
- Cartridges removed from hermetically-sealed containers that are being fired the same day are exempt from marking requirements. Included are stores release CADs, ejection seat cartridges, training cartridges, etc. Log book entries are not required on these entries.
- Detonating cord CADs (SMDC, FCDC) are exempt from the marking requirements above, however, documentation in aircraft log books are required for those items that have an assigned item service life.

WARNING

GRANTING OF AN ADDITIONAL SERVICE LIFE EXTENSION IS BASED UPON SURVEILLANCE DATA RESULTING FROM TESTS CONDUCTED TO DETERMINE THE RELIABILITY OF A CAD/PAD BEYOND ITS ESTABLISHED SERVICE LIFE. CADS/PADS SHALL NOT BE USED BEYOND THE CONTINGENCY (30-DAY) EXTENSION EXPIRATION DATE WITHOUT APPROVAL BY AMCCOM, ROCK ISLAND, IL.

1-16. Service Life Extension

Contingency service life extensions for the CADs listed in this publication, not to exceed 30 days, may be granted by the local Commander having custody of the aircraft, or by his authorized alternate. These extensions may be applied only once to a specific CAD/PAD as follows:

- a. When replacements are not available and failure to extend the service life would disrupt flight operations.
- b. When a 30-day extension will result in the CAD/PAD expiring concurrent with a scheduled inspection.
- c. When the CAD/PAD expires while the aircraft/helicopter is deployed and a 30-day extension will allow the aircraft to be returned to the maintenance facility.
- d. This contingency service life extension authority is granted on the condition that AMCCOM, Rock Island, IL; NAVORDSTA Indian Head, MD and U.S. Army Aviation Systems Command (AVSCOM), St. Louis, MO be notified immediately by message (fig. 1-1) when this authority is exercised.

NOTE

When an aircraft is transferred with service life extension in effect, the gaining activity shall be notified and no new contingency service life extension may be granted by the Commander of the gaining activity.

- e. When required, the service life of CADs/PADs may be extended beyond this 30day period by HQ AMCCOM, Rock Island, IL. Extension beyond this 30-day period shall be approved in writing prior to operating the aircraft/helicopter involved. Request for extension

beyond this 30-day period shall be submitted by message using the format in figure 1-2. Approval of these extension requests will be transmitted by message similar to the format in figure 1-3.

f. An entry should be made in the aircraft/helicopter log book (citing the message number) to record contingency and approved additional service life extensions.

NOTE

- **When extension of CADs installed life only is being requested, the request will be sent to AVSCOM ST LOUIS, MO with AVSCOM ROCK ISLAND, IL**

and NAVORDSTA INDIAN HEAD, MD as INFO addresses (fig. 1-2).

- **Item I of fig. 1-3 extends a specific CAD/PAD for a specific aircraft not to exceed a specific date and is applicable to the requesting activity only. TM 43-0001-39 and TB 9-1300-385-1 will be strictly adhered to in all other applications.**

1-17. Reference Publications

Refer to Appendix A for reference publications.

FROM: (Activity making notification or request)

TO: //AMCCOM ROCK ISLAND, IL//AMSMC-QAS (R)

INFO: AVSCOM ST LOUIS, MO

NAVORDSTA INDIAN HEAD, MD

(other as appropriate)

UNCLAS

SUBJ: CAD/PAD CONTINGENCY SERVICE LIFE EXTENSION NOTIFICATION OR ADDITIONAL
CAD SERVICE LIFE EXTENSION: REQUEST FOR

- A. TM 43-0001-39
1. SPECIFIC CAD/PAD NOMENCLATURE
 2. DODIC AND NSN
 3. LOT NUMBER AND CONTAINER OPEN DATE
 4. ORIGINAL COMPUTED EXPIRATION DATE
 5. CONTINGENCY EXPIRATION DATE (Granted by Local Commander)
 6. REQUISITION NUMBER
 7. AIRCRAFT/HELICOPTER AND EQUIPMENT INVOLVED (e.g., type/model/series, BUNO, parachute serial number)
 8. LENGTH OF ADDITIONAL EXTENSION REQUESTED
 9. SPECIFIC REASON FOR EXTENSION (e.g., maintenance, supply)
 10. POINT OF CONTACT (include name, rank and complete telephone number both Autovon and Commercial)

Figure 1-2. Message format for CAD/PAD service life extension/request.

FROM: //AMCCOM ROCK ISLAND, IL//
 TO: REQUESTING ACTIVITY
 INFO: AVSCOM ST LOUIS, MO
 NAVORDSTA INDIAN HEAD, MD

UNCLAS

CAD/PAD SERVICE LIFE EXTENSION (DODIC OR NSN)

A. YOUR MESSAGE

B. TM 43-0001-39

1. PER REQ REF A, SERVICE LIFE OF (DODIC AND NSN) IS EXTND UNTIL REPL MATL RECD, NOT TO EXCEED (DAY, MONTH, YEAR) FOR BUNO XXXXXX.
2. RESCISSION DATE THIS MSG: (DAY, MONTH, YEAR).
3. THIS IS A ONE TIME EXTN; REF B WILL NOT BE REVISED.
4. FOR INFO CONTACT: (NAME), AUTO

Figure 1-3. Message format for CAD/PAD service life extension.

CHAPTER 2 DESCRIPTION AND DATA

Section I. GENERAL

2-1. General

The cartridges, cartridge actuated devices (CADs) and propellant actuated devices (PADs) described in this manual are used in Army aircraft/helicopter emergency escape systems, fire extinguisher systems, stores release/jettison systems and cargo hook cable cutting systems. Each CAD/PAD is designed to perform a specific function in the aircraft or equipment that it was designed for. The descriptive material in this chapter and the Maintenance Allocation Charts in Appendix B

are organized to reflect these specific functions and applications.

2-2. Identification

CADs/PADs are identified by markings on the packaging container, on the item proper, and/or on individual components. These markings include, as appropriate, National Stock Number (NSN), Department of Defense Identification Code (DODIC), type and model of CAD or PAD, lot number and loader's symbol, characteristics (e.g., 20 sec delay), and other appropriate information.

Section II. CARTRIDGE, AIRCRAFT FIRE EXTINGUISHER

2-3. Description

Aircraft fire extinguisher cartridges are designed to release the fire extinguishing fluid from a container into the area surrounding an aircraft or helicopter engine in the event of a fire. The cartridges in this section are electrically initiated.

2-4. Data

All Army-authorized aircraft fire extinguisher cartridges are listed in table 2-1 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, NSN, P/N, Application/Remarks. The maintenance tasks are described in Appendix B. Group No. 0100 is assigned to aircraft fire extinguisher cartridges.

Table 2-1. Army Authorized Aircraft Fire Extinguisher Cartridges (Group 0100)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|--|-------|----------------------------------|----------------------|-------------------------|
| Cartridge, Aircraft Fire Extinguisher | M182 | 00-756-1384 | 841155 | CH-46 |
| Cartridge, Aircraft Fire Extinguisher | M193 | 00-930-9390 | 13083-5 | OV-1/CH-47 |
| Cartridge, Aircraft Fire Extinguisher | M232 | 00-824-5858 or 00-087-7103 | 2519707 (30003) | OV-1/CH-47 |
| Cartridge, Aircraft Fire Extinguisher | MT20 | 01-263-3627 | 897899 | UH-60 |
| Cartridge, Aircraft Fire Extinguisher CCU-90/A | MH92 | 01-185-2622 | 1512AS105 (30003) | UH-60A |

*See Appendix B for Maintenance Function.

Section III. CUTTERS

2-5. Description

a. General. Cutters are designed to explosively cut line, cable, refueling hose, etc. They utilize ballistic gas pressure to operate a knife blade or cutting surface to perform their designed function.

b. Reefing Line Cutters.

(1) The M21 and M22 cartridge actuated cutters (fig. 3-10) are used to cut parachutes loose from their loads after landing.

(2) The M21 cutter is cylindrical of body and contains a 2-second delay element in its actuating cartridge. The M21 does not contain a hexagonal screw and lockwasher.

(3) The M22 cutter is of square cross sectioned, rectangular prismoid body, and has a 10-second delay element in its actuating cartridge. The M22 does contain a hexagonal screw and lockwasher.

c. Functioning.

(1) When the rigged cargo load is ejected or dropped and the parachute starts to deploy, the lanyards are withdrawn from the reefing line cutters installed in the parachute canopy skirts and the parachute release assembly.

(2) Withdrawal of the lanyards simultaneously releases the spring-actuated firing pins of each cutter.

(3) The impact of the firing pins on the primers initiates the primers.

(4) The primers initiate the igniter charge which in turn ignites the delay charges. After a delay of 2 seconds for cutter M21 or 10 seconds for Cutter M22, the delay charges initiate the propellant charges. The propellant charges propel the knives forward thus cutting the reefing lines installed in the Cutter M21 and the cords that hold Cutters M22 in the release assemblies.

2-6. Data

All Army-authorized cutters are listed in table 2-2 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects

Nomenclature, DODIC, NSN, P/N, and Application Remarks. The maintenance tasks are described in Appendix B. Group No. 0200 is assigned to cutters.

Table 2.2. Army Authorized Cutters (Group 0200)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|---|-------|----------------------------|------------------------------------|--|
| Cutter, Parts Kit | M405 | 00-011-9082 | 278C01-10 100996-5 | UH-1 Cable Cutter |
| Cutter, Reefing Line M21 | M600 | 00-060-0885 | 8875978 | CTU-2A High Speed Aerial Delivery System |
| Cutter, Propellant Actuated | M554 | 00-412-4377 | 14195-1 | CH-54B |
| Cutter, Assembly | MU03 | 01-064-4927 | FTL3648-2 | High Altitude Para- chute delivery system |
| Refire, Kit Cutter, Cartridge Actuated | MU02 | 01-073-3831 01-087-5166 | K303104-1 303104-1 42277E182 | UH-60 Cable Cutter UH-60 Cable Cutter |
| Cutter, Delay Propellant Actuated Cutter, Reefing Line M22 | MU11 | 01-288-0418 | 6261278 | Allows parachute to deploy fully Parachute Release Assemblies |

*See Appendix B for maintenance function

Section IV. CARTRIDGE, DELAY

2-7. Description

Delay cartridges are designed to perform a specific function in a specified time frame. In some aircraft, a sequence of operations must be performed before crewman can escape in an emergency. Some applications are series and parallel assemblies of cartridge actuated devices and are used to perform several functions concurrently, or in sequence, as required. Such escape systems are arranged to meet

the design requirements of a particular type of aircraft/helicopter.

2-8. Data

All Army-authorized delay cartridges are listed in table 2-3 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N, and Application/Remarks. The Maintenance function tasks are described in Appendix B. Group No. 0300 is assigned to delay cartridges.

Table 2-3. Army Authorized Delay Cartridges (Group 0300)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|--|--------------|----------------------------|--------------------|---|
| Cartridge, Delay CCU-57/B | MF35 | 01-084-6046 | 5184858 | CTU-2A, Thruster for high speed aerial delivery system |
| Cartridge, Delay CCU-89/B Cartridge, Delay M252 | MH88 M308 | 01-178-6691 00-958-1048 | 5185107 8886478 | Replaces M308 Delay Cartridge Cargo Parachute |

*See Appendix B for maintenance function.

Section V DETONATING CORD AND WINDOW CUTTING ASSEMBLIES

2-9. Description

This section contains descriptive and technical data pertaining to the detonating cord system used in the Army AH-1 series helicopter. The types of detonating cord are Flexible Confined Detonating Cord (FCDC), Shielded Mild Detonating Cord (SMDC), and the Window Cutting Assemblies (WCA). The system is used to explosively cut the windows of the canopy and doors from the canopy support structure to provide a rapid means of escape or access in an emergency.

2-10. Data

All Army-authorized detonating cord systems and components used on Army helicopters AH-1G and HE-E/F/P are listed in table 2-4 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N, and Application/Remarks. The maintenance tasks are described in Appendix B. Group No. 0400 is assigned to detonating cord and window cutting assemblies.

**Table 2-4. Army Authorized Detonating Cord and Window Cutting Assemblies
(Group 0400)***

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|----------------------------|--------------|------------------|------------------------------|---|
| Cord, Detonating (FCDC) | MD15 | 00-410-8271 | 209-030-711-11 813592-5 | AH-1S (MOD) between left junction manifold and WCA gunner's door |
| Cord, Detonating (FCDC) | MD16 | 00-409-1099 | 209-030-711-13 813592-5 | AH-1S (MOD) between right junction manifold and WCA pilot's door |
| Cord, Detonating (SMDC) | MD17 | 00-410-8297 | 209-030-711-19 813475-19 | AH-1S (MOD) between left junction manifold and WCA pilot's window |
| Cord, Detonating (SMDC) | MD18 | 00-409-1098 | 209-030-711-27 813475-27 | AH-1S (MOD) between right junction manifold and WCA gunner's window |
| Cord, Detonating | MD33 | 00-409-1096 | 209-030-711-105 814280-15 | AH-1 E/F/P/S (MOD) Pilot's Canopy window |
| Cord, Detonating | MD34 | 00-409-1095 | 209-030-711-99 814280-9 | AH-1S (MOD) Gunner's Canopy window |
| Cord, Detonating | MD35 | 00-106-7773 | 209-030-711-101 814280-11 | AH-1S (MOD) |

**Table 2-4. Army Authorized Detonating Cord and Window Cutting Assemblies
(Group 0400)* (Cont)**

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|-------------------------------|--------------|------------------|----------------------------------|---------------------------------|
| Pilot's Door Cutting Assembly | MD36 | 00-409-1097 | 209-030-711-103 814280-13 | AH-1S (MOD) |
| Cord, Detonating (SMDC) | MS47 | 00-410-8266 | 209-030-711-15 813475-15 | AH-1S (MOD) |
| Cord, Detonating (SMDC) | MS48 | 00-410-8289 | 209-030-711-17 813475-17 | AH-1S (MOD) |
| Cord, Detonating (SMDC) | MS49 | 00-410-8222 | 209-030-711-21 813475-21 | AH-1S (MOD) |
| Cord, Detonating (SMDC) | MS50 | 00-409-1100 | 209-030-711-25 813475-25 | AH-1S (MOD) |
| Cord, Detonating (SMDC) | MS51 | 01-035-4124 | 209-033-011-105 813475-109 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS52 | 01-037-9237 | 209-033-011-107 813475-107 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS53 | 01-037-4090 | 209-033-011-109 813475-109 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS54 | 01-037-4096 | 209-033-011-111 813475-111 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS55 | 01-037-4095 | 209-033-011-113 813475-113 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS56 | 01-037-4094 | 209-033-011-115 813475-115 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS57 | 01-037-4093 | 209-033-011-117 813475-117 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS58 | 01-032-3286 | 209-033-011-119 813475-119 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS59 | 01-032-3283 | 209-033-011-125 813475-125 | AH-1 E/F/P |
| Crd, Detonating (SMDC) | MS60 | 01-032-3279 | 209-033-011-123 813475-123 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS61 | 01-032-3280 | 209-033-011-23 209-033-011-49 | AH-1 E/F/P |
| Linear Shape Charge | MS76 | 01-032-1047 | 209-033-009-1 816986-1 | AH-1 E/F/P |

**Table 2-4. Army Authorized Detonating Cord and Window Cutting Assemblies
(Group 0400)* (Cont)**

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|----------------------------|--------------|------------------|--------------------------------|---------------------------------|
| Linear Shape Charge | MS77 | 01-032-1048 | 209-033-009-3 816986-3 | AH-1 EIF/P |
| Cord, Detonating (WCA) | MS78 | 01-032-1049 | 209-033-010-1 816987-103 | AH-1 E/F/P |
| Cord, Detonating (WCA) | MS79 | 01-032-1050 | 209-033-010-105 816987-105 | AH-1 E/F/P |
| Cord, Detonating (SMDC) | MS80 | 01-170-5244 | ET 51134-47; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS81 | 01-170-5245 | ET 51134-53; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS82 | 01-170-5246 | ET 51134-51; 841AS425 | AH-64 |
| Cord, Detonating (FCDC) | MS83 | 01-170-5261 | ET 51134-45; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS84 | 01-170-5262 | ET 51134-57; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS85 | 01-170-5263 | ET 51134-55; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS86 | 01-170-5264 | ET 51134-23; 841AS425 | AH-64 |
| Cord, Detonating (SMDC) | MS87 | 01-170-5265 | ET 51134-49; 841AS425 | AH-64 |
| Cord, Detonating (FCDC) | MS88 | 01-186-9898 | ET 51134-35; 841AS425 | AH-64 |
| Cord, Detonating (FCDC) | MS89 | 01-170-5260 | ET 51135-5; 53711-6260906-5 | AH-64 |
| Cord, Detonating (FCDC) | MS90 | 01-186-9899 | ET 51135-1; 53711-6260906-1 | AH-64 |
| Cord, Detonating (FCDC) | MS91 | 01-186-9900 | ET 51135-2; 53711-6260906-2 | AH-64 |
| Cord, Detonating (FCDC) | MS92 | 01-186-9901 | ET 51135-7; 53711-6260906-7 | AH-64 |

**Table 2-4. Army Authorized Detonating Cord and Window Cutting Assemblies
(Group 0400)* (Cont)**

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|--|--------------|------------------|--------------------------------|---------------------------------|
| Cord, Detonating (FCDC) | MS93 | 01-186-9902 | ET 51135-4; 53711-6260906-4 | AH-64 |
| Cutting Assembly Gunner's Window | MS94 | 01-184-6112 | ET 51188-1; 53711-6260965-5 | AH-64 |
| Cutting Assembly Pilot's Window | MS95 | 01-184-6113 | ET 51390-1; 53711-6260965-7 | AH-64 |
| Cutting Assembly Pilot's Door | MS96 | 01-185-8908 | ET 51391-1; 53711-6260965-4 | AH-64 |
| Cutting Assembly Gunner's Door | MS97 | 01-187-4477 | ET 51389-1; 53711-6260965-2 | AH-64 |
| Initiator, Mechanical Actuated JAU-59/A | MT06 | 01-269-6496 | ET 51207-3; 53711-6260964 | AH-64 |
| Cord Assembly, Deton- ating | SP02 | 01-356-7841 | 7-311/2017-47 | AH-64 |
| Cord Assembly, Deton- ating | SP03 | 01-356-7842 | 7-311/2017-49 | AH-64 |
| Connector, Elbow | | 01-170-4493 | ET 23869-2; 6261073 | AH-64 Inert |
| Connector, Tee | | 01-170-5319 | ET 21738-3; 6261072 | AH-64 Inert |
| Connector, 180 Degree Union | | 01-170-5321 | ET 21602-2; 6261071 | AH-64 Inert |

*See Appendix B for maintenance function.

Section VI. CARTRIDGE, IMPULSE

2-11. Description

Impulse cartridges are initiated electrically, manually, or by gas pressure. They are designed to be used in devices utilizing ballistic gas pressure for their operation or function.

2-12. Data

All Army-authorized impulse cartridges for Army aircraft/helicopters are listed in table 2-5 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N, and Application/Remarks. The Maintenance tasks are described in Appendix B. Group No. 0500 is assigned to impulse cartridges.

Table 2-5. Army Authorized Impulse Cartridges (Group 0500)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|---|-------|-------------|----------------------------------|--|
| Cartridge, Impulse | M162 | 00-999-7463 | TA 96713 | Actuated helicopter hoist cable cutter |
| Cartridge, Impulse ARD863-1 | M189 | 01-057-0686 | ARD-853-1 | Replaced by MD66 cartridge |
| Cartridge, Impulse | M197 | 00-999-7462 | 2518352 | AN/ALE-29A |
| Cartridge, Impulse | M253 | 00-878-6510 | R4181-1 | CH-54/A |
| Cartridge, Impulse MK 104 and Mod 0 | M291 | 00-707-0590 | 1863079 | Used to actuate telescope catapult |
| Cartridge Set, Impulse Reduced Charge Primary | M397 | 00-845-5242 | 26434-1 (1 ea) 29231-1 (2 ea) | OV-1 |
| Cartridge, Impulse Drogue | M507 | 00-883-8997 | 7356-1 | OV-1 |
| Cartridge, Impulse Guillotine | M520 | 00-883-8998 | 16650-1 | OV-1 |
| Cartridge, Impulse | M657 | 00-168-5802 | 300051-1 | CH-54/B |
| Cartridge, Impulse CCU-44/B | MD66 | 01-063-3164 | 5184850 | Used in ejection racks |
| Cartridge, Impulse | MD73 | 01-049-6365 | 9311660 | M130 Dispenser Pod |
| Cartridge, Impulse | MF90 | 00-253-4436 | 67D7263 | |
| Cartridge, Impulse | MF92 | 00-805-9281 | 64D10783 | |
| Cartridge, Electric CCU-92/A | MJ21 | 01-211-7211 | FE7590-95 | Use in the TCU-3A Thruster |

Table 2-5. Army Authorized Impulse Cartridges (Group 0500)* (Cont)

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|----------------------------------|--------------|------------------|------------|---|
| Cartridge, Impulse MK19 Mod O | M012 | 00-793-9926 | 2164465 | Used as power source in stores ejection systems |

*See Appendix B for maintenance function.

Section VII. INITIATORS

2-13. Description

Initiators are explosive devices which are designed to start a sequence of functions within a system.

table 2-6 by DODIC order. Those items are not assigned a DODIC are listed by NSN in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N, and Application/Remarks. The maintenance tasks are described in Appendix B. Group 0600 is assigned to initiators.

2-14. Data

All Army-authorized initiators used in Army helicopters AH-1 E/F/P/S (MODs) are listed in

Table 2-6. Army Authorized Initiators/Firing Mechanisms (Group 0600)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|-------------------------|--------------|------------------|-------------------------------|---------------------------------|
| Initiator, Cartridge | MT06 | 01-269-6496 | 6260964 | AH-64 |
| Arm/Firing Mechanism | MW80 | 00-410-8265 | 208-030-711-37 813633-4 | AH-1 E/F/P/S (MODs) |
| Arm/Fire Initiator | | 01-833-5088 | 209-033-008-101 814033-101 | AH-1 E/F/P/S (MODs) |

*See Appendix B for maintenance function.

Section VIII. ROCKET CATAPULTS AND ROCKET MOTORS**2-15. Description**

Rocket Catapults and Rocket Motors are explosive devices designed to provide a source of power to propel an ejection seat and its occupant out of an aircraft in the event of an emergency.

2-16. Data

All Army-authorized rocket catapult(s) and rocket motor(s) used in Army aircraft are listed in table 2-7 by DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N and Application Remarks. The maintenance tasks are described in Appendix B. Group 0700 is assigned to rocket catapults and rocket motors.

Table 2-7. Army Authorized Rocket Catapults and Rocket Motors (Group 0700)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|---------------------|--------------|------------------|------------|---------------------------------|
| Rocket Motor | M447 | 00-244-1578 | 1044-2 | OV-1 |

*See Appendix B for maintenance function.

Section IX. THRUSTERS**2-17. Description**

Thrusters are explosive devices designed to perform a mechanical operation or function by the use of ballistic gas pressure.

DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N and Application/Remarks. The maintenance tasks are described in Appendix B. Group 0800 is assigned to thrusters.

2-16. Data

All Army-authorized rocket thrusters used in Army aircraft are listed in table 2-8 by

Table 2-8. Army Authorized Thrusters (Group 0800)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|---|--------------|------------------|---------------|---|
| Thruster, Cartridge Actuated, TCU-1B | MF24 | 01-075-6433 | 5184910 | CTU-2A, high speed aerial delivery system |
| Thruster, Cartridge Actuated TCU-3A | MJ20 | 01-211-7212 | 1512AS120 | UH-60 Cargo hook |
| Thruster, without Cartridge | (Inert) | 01-062-4196 | 209-033-007-3 | AH-1 E/F/P |

*See Appendix B for maintenance function.

Section X. MISCELLANEOUS ITEMS

2-19. Description

This section covers miscellaneous items that are designed to be used with systems that use explosive devices, or are explosive devices themselves.

2-20. Data

The miscellaneous items listed in table 2-9 are listed in DODIC order. Those items not assigned a DODIC are listed by NSN, in numerical order. This table reflects Nomenclature, DODIC, NSN, P/N and Application Remarks. The maintenance tasks are described in Appendix B. Group 0900 is assigned to the miscellaneous items contained in this manual.

Table 2-9. Army Authorized Miscellaneous Items (Group 0900)*

| Nomenclature | DODIC | NSN 1377- | P/N | Application/ remarks |
|-----------------------------------|-------|-------------|--------------------------------------|-------------------------|
| Charge, linear shaped | | 01-032-1047 | 209-033-009-1 | AH-1 E/F/P |
| Charge, linear shaped | | 01-032-1048 | 209-033-009-3 816986-3 | AH-1 E/F/P |
| Pin Puller, Explosive | | 01-037-4091 | 209-033-006-1 and-101 116417-1 | AH-1 E/F/P Inert |
| Manifold, Junction | | 01-037-4092 | 115154-1 | AH-1 E/F/P Inert |
| Connector, Inline | | 01-062-4195 | 209-030-011-103 819347-103 | AH-1 E/F/P Inert |
| Squib, Electric | M905 | 00-101-8703 | 10057 | Parts Kit, Cutter |
| Cartridge, Assembly Cargo Hook | | 01-115-3711 | 14398-1 | UH-60 |
| Cartridge, Assembly Cargo Hook | | 01-149-5917 | FE7590-65 | UH-60 |
| Manifold, Junction | | 00-409-1101 | 209-030-711-7 813488-1 | AH-1S (MOD) Inert |
| Manifold, Junction | | 00-410-8228 | 209-030-711-9 813487-2 | AH-1S (MOD) Inert |
| Cartridge, Assembly Cargo Hook | | | FE7590-98 | UH-60 |

*See Appendix B for maintenance function.

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CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

3-1. General

a. This section contains information and instructions for unpacking, repacking, and marking containers used in shipping Federal Supply Class (FSC) 1377 Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs). Typical containers are shown in figure 3-1. Figure 3-2 illustrates typical packaging.

b. Upon receipt of CADs/PADs, verify each packaged item against the requisition list. If marking on package conflicts with nomenclature on requisition, check with ammunition supply personnel to determine if an issue error has been made.

c. Unless packing containers show evidence of moisture or damage to the extent that the contents may be unusable, do not open container until material is to be used. Unpack only as far as necessary to determine the serviceability of the material. Do not open hermetically-sealed containers until the item is to be used.

NOTE

The recording of the starting date for the SERVICE LIFE, (was installed life) is established when opening hermetically sealed containers. This data is now reported in TB 9-1300-385, Appendix B, SHELF/SERVICE LIFE DATA FOR ARMY CLASS V MATERIEL. (Issued quarterly or by supplementary notice.)

3-2. Precautions

a. Avoid injury from sharp edges when cutting and handling metal strapping. The end of

the strap may fly up suddenly when tension is released.

b. Limit personnel and quantity of explosives and flammables at work site to the minimum necessary for efficient operation.

c. In handling CADs and PADs, take care not to drop the containers and keep all sources of fire away.

3-3. Unpacking, Repacking, and Marking Requirements

NOTE

When unpacking containers, save material for use in repacking rejected items when return shipments are required.

a. Barrier Bag Requirements. Preparing, unpacking, repacking, and marking requirements are as follows:

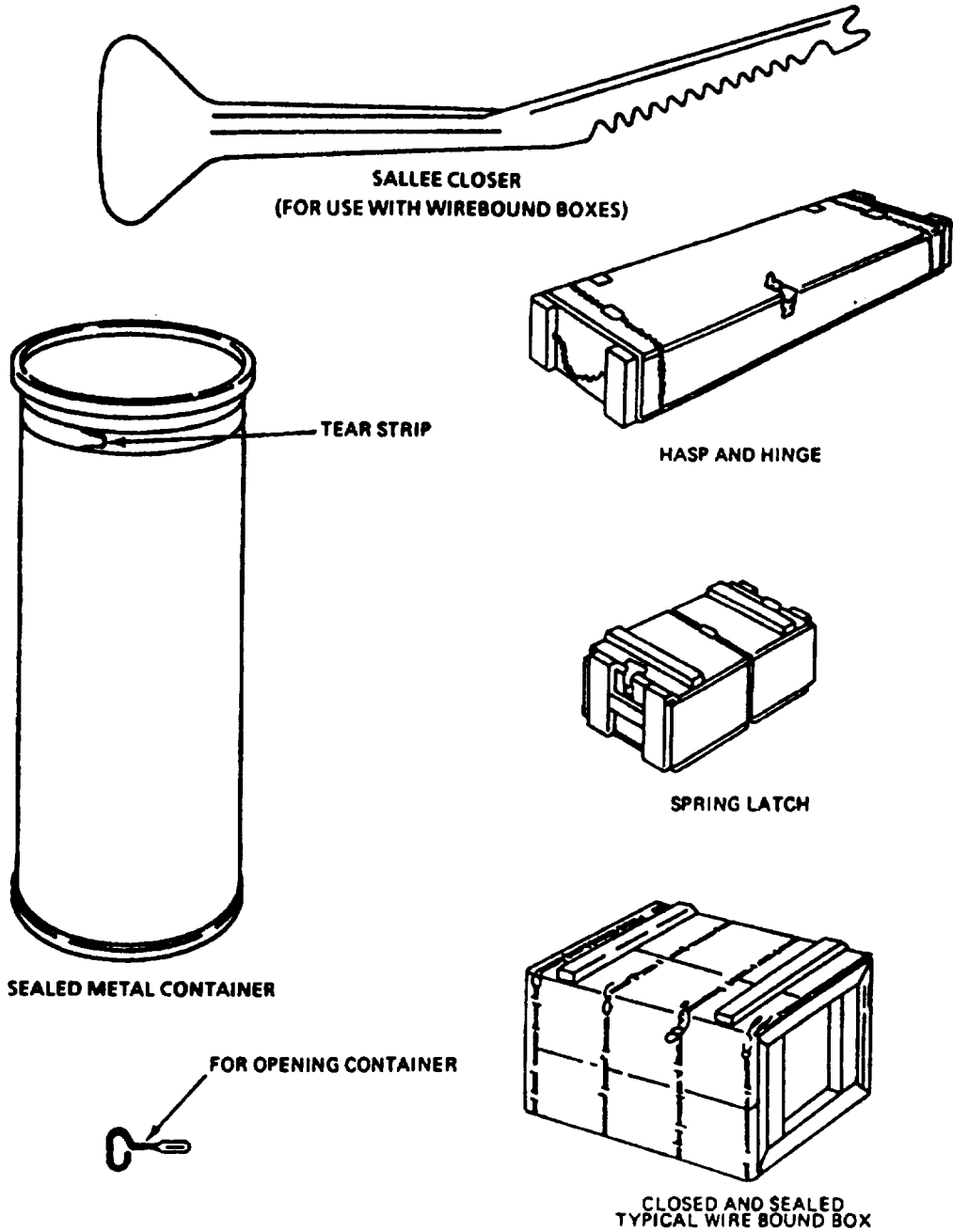
(1) Preparation. Prior to unpacking items sealed in barrier bags, ensure the item is the correct part by verifying the part number, delay time, etc. Barrier bags are to be considered hermetically-sealed.

(2) Unpacking. Barrier bags will be unpackaged as follows:

(a) Open outer container.

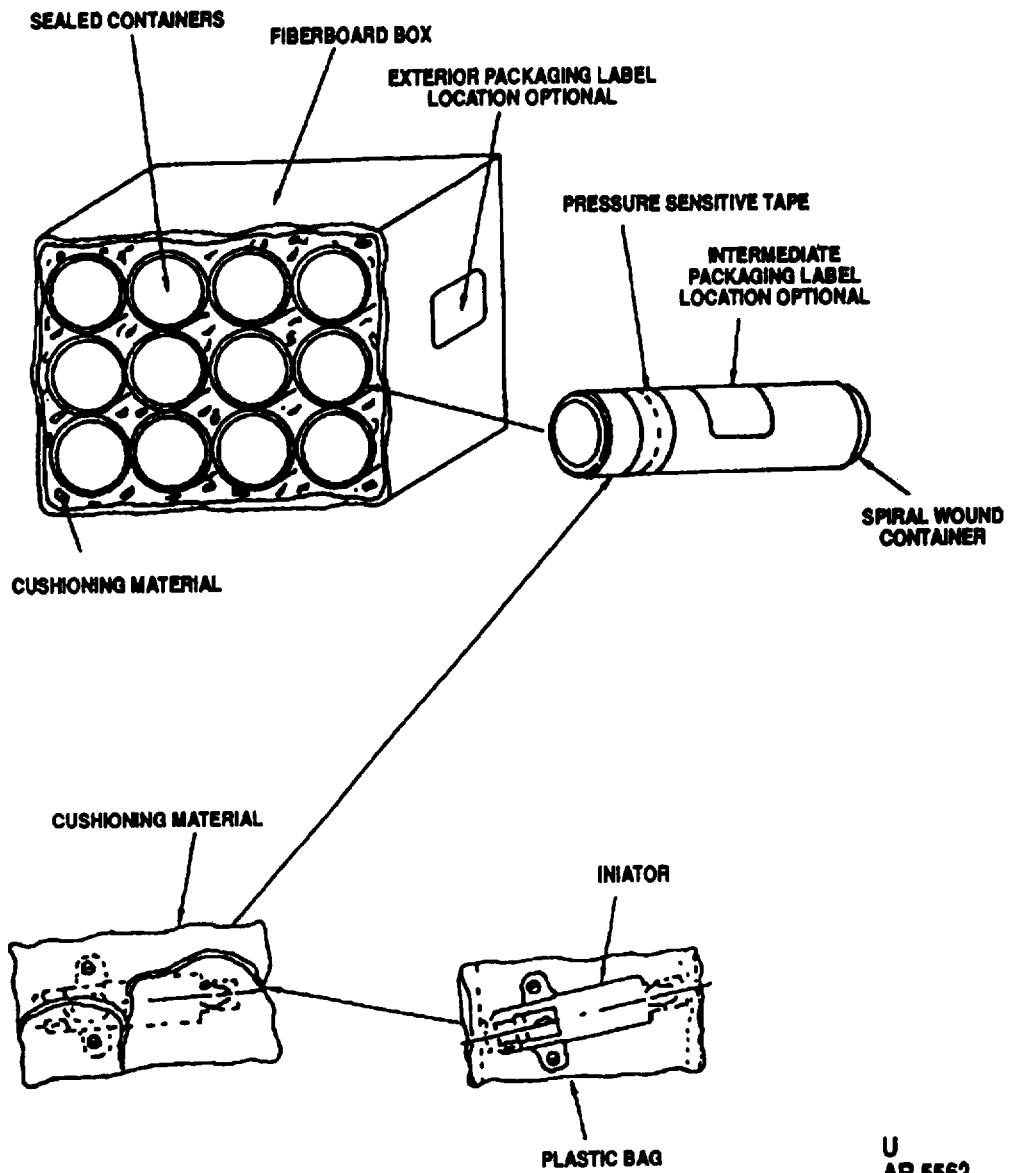
NOTE

Gas generated within the barrier bag can cause the bag to balloon. If barrier bag is normal, omit steps b and c.



U
AR 3769

Figure 3-1. Typical containers (with sallee closer).



U
AR 5562

Figure 3-2. Typical packing.

(b) Using a pointed wooden stick, puncture the bag just below the heat seal.

(c) Allow collected gas to escape.

(d) Remove bag from outer container.

(e) Open bag by carefully cutting material just below heat seal with scissors or sharp blade.

(f) Remove contents from the barrier bag.

(3) Repacking.

NOTE

Aviation Unit Maintenance levels will normally be required to repack only those CADs/PADs which have been removed from aircraft/helicopter systems due to expired shelf life or service life. Exceptions to this may result from Supply Bulletins (SBs) or Technical Bulletins (TBs) that require opening, inspection, and repacking. In this case repacking instructions will be outlined in such bulletins.

(a) Place item in barrier bag. Fold and compress bag in original manner in order to evacuate excess air.

(b) Using pressure sensitive tape, tape opening closed.

(c) Place barrier bag in the outer container (if any).

(4) Marking. CADs/PADs repacked in barrier bags will be identified by proper markings placed conspicuously on the barrier material and the outer container.

(a) CADs/PADs with expired shelf life will be marked "condition code (as applicable)".

(b) CADs/PADs that are required for malfunction/engineering investigations shall be marked "E.I. MATERIAL".

(c) Ensure outer container has correct Department of Transportation markings.

(d) CADs/PADs will be returned to the supporting ASP who will assure marking and condition code is correct as well as store, report and/or ship items for test/examination as required.

b. Hermetically-Sealed Tear-strip Container Requirements. Hermetically-sealed tearstrip containers shall not be opened until the items are to be used. Opening hermetically-sealed containers constitutes starting date for the service life for a CAD or PAD. Unpacking, repacking, and marking requirements are as follows:

(1) Unpacking.

(a) Remove hermetically-sealed can from outer container (if any).

(b) Ensure nomenclature, delay time, mark and mod, etc., on the container identify the correct item needed.

(c) Remove key for tear-strip from the outside of the container.

(d) Using the key, lift end of tear-strip and insert tear-strip through slot in key.

(e) With head of key pointing upward, turn key clockwise removing tear-strip from the container.

(f) Remove the lid of container.

(g) Remove contents.

NOTE

Save packing/padding material for later use.

(2) Repacking. Aviation Unit Maintenance (AVL,M) personnel will normally be required to repack only those items that are removed from aircraft/helicopter systems due to shelf, service or installed life expiration, or malfunctioning, and damaged items. In other instances, instructions in Supply Bulletins (SBs) or Technical Bulletins (TBs) directing the opening, inspection, and repacking of hermetically-sealed CADs/PADS will be followed.

(a) Place item in container.

(b) Replace packing/padding in container.

(c) Install lid on container.

(d) Using two layers of pressure sensitive tape, secure lid to container.

(e) Place in outer container (if any).

(3) Marking. Repacked hermetically sealed tear-strip container will be identified by marking outer container in a conspicuous place. The inscription will read: "NOT HERMETICALLY-SEALED. OPENED (date as applicable)."

(a) Marking for hermetically-sealed tear-strip containers that contain more items than is required for use at that time (e.g., stores/release CADs) shall have the opened date and the words "NOT HERMETICALLY-SEALED" marked on the container and on each CAD in the container.

(b) CADs/PADs removed from aircraft/helicopter systems with expired shelf/service or installed life will be turned in to the ammunition supply point (ASP) for assigning proper condition code and requesting disposition or shipping for test as required.

(c) CADs/PADs removed from aircraft/helicopter systems that are required for engineering investigation will be marked "E.I. MATERIAL", and turned in to the ASP for assigning condition codes and requesting disposition or shipping instructions as required.

(d) Ensure outer container has correct DOT markings.

c. Wirebound Wooden Boxes. Unpacking, repacking, and marking requirements are as follows:

WARNING

- TO PREVENT INJURY, RELEASE TENSION BY PRESSING DOWN ON TOP OF BOX WHILE CUTTING STRAPS ON SIDE OF BOX.
- OPERATORS SHALL WEAR SUITABLE EYE PROTECTION AND GLOVES WHEN PERFORMING THE FOLLOWING PROCEDURE.

(1) Unpacking.

- (a) Cut binding wire or strapping.
- (b) Remove and dispose of binding wire or strapping.
- (c) Cut lead seal wire with pliers and remove.
- (d) Bend wire loops up straight using a sallee closer, screwdriver, or pliers.

NOTE

Use a strapping cutter or metal cutting shears to cut steel strappings whenever possible. Using any other tool to cut or break strapping can damage the wirebound box and its contents. See procedures and warnings in d. below.

(e) Lift lid panel to opener box.
 (f) Remove top packing (if any) from box.

(g) Remove inner pack(s).

(2) Repacking.

- (a) Install inner pack(s).
- (b) Install top packing (if any).
- (c) Close lid.
- (d) Using a sallee closer, (fig. 3-3), screwdriver, or pliers, bend wire loops down through closing loops.

NOTE

Lead seal and lead wire not required for resealing.

(3) Marking.

(a) Ensure that proper Department of Transportation (DOT) markings are on container.

(b) Unserviceable CADs/PADs repacked in wirebound wooden boxes should be marked Condition Code F or H as applicable.

d. Wood Boxes with Metal Hardware. Unpacking, repacking, and marking requirements are as follows:

WARNING

- TO PREVENT INJURY, RELEASE TENSION BY PRESSING DOWN ON TOP OF BOX WHILE CUTTING STRAPS ON SIDE OF BOX.
- OPERATORS SHALL WEAR SUITABLE EYE PROTECTION AND GLOVES WHEN PERFORMING THE FOLLOWING PROCEDURE.

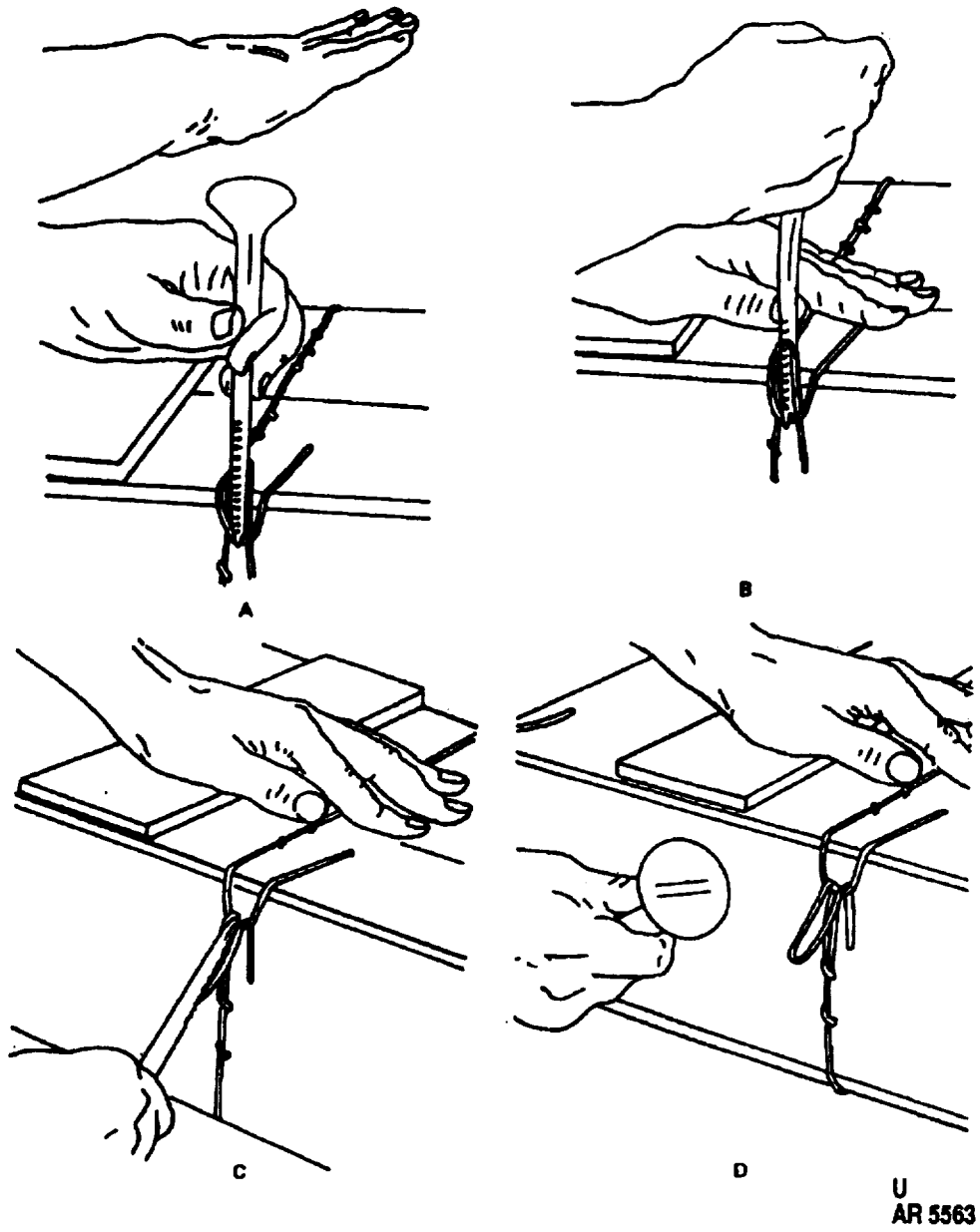


Figure 3-3. Sallee closer.

- (1) Unpacking.
 - (a) Cut steel strapping with metal cutting shears.
 - (b) Remove and dispose of metal straps.
 - (c) Cut lead seal wire with pliers and remove.
 - (d) Turn catch and open hasp, or pull out on spring-latch to release.
 - (e) Lift box top to open. On spring-latched boxes, note position of top for guidance in repacking.
 - (f) Remove top padding/filler (if any) from box.
 - (g) Remove inner pack(s).
- (2) Repacking.
 - (a) Place inner containers in box.
 - (b) Place top padding/filer (if any) on top of inner container.

- (c) Close lid on box.
- (d) Fasten hasp or spring-latch.

NOTE

Rebanding with metal straps is not required at the Aviation Unit Maintenance (AVUM) level.

(3) Marking. Ensure container has correct DOT markings. Unserviceable CADs/PADs should be marked with Condition Code, as applicable, and turned in to the ASP

e. Other Container Requirements. Containers will be returned to storage/supply points in original condition and package, or equivalent, upon completing inspection of material or the return of unserviceable CADs/PADs. Rebanding of individual containers need not be accomplished until containers are outshipped; however, containers will be securely closed. Containers of sensitive or pilferable items will be banded or security sealed for resources protection. Cardboard-type, multipack containers frequently opened for issue and use may be resealed with pressure-sensitive tape.

Section II. TOOLS AND EQUIPMENT

3-4. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to CADs and PADs are authorized for issue by tables of organization and equipment Table of Organization and Equipment (TOE).

3-5. Packing Materials, Accessories, and Tools

Packing materials, accessories, and tools required at organizational level are listed in Appendix C.

Section III. MAINTENANCE

3-6. General

a. Maintenance of Cartridges, Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs) at the Aviation Unit Maintenance (AVUM) level is performed only by designated personnel.

b. Maintenance at the AVUM level is limited to inspection, removal, and installation of CADs and PADs unless specifically detailed in this manual, the aircraft/equipment TM, or by an approved technical directive.

c. Responsibilities for maintenance are limited to those functions specified in Appendix B, Maintenance Allocation Chart (MAC).

d. CADs/PADs installed in aircraft escape systems must function perfectly the first time. Malfunction of the device, or failure to fire when needed, usually results in injury to or death of crew member(s). Malfunction of CADs/PADs used in other applications usually results in damage to or destruction of the equipment with possible serious injury to or death of the persons involved.

e. Repair, cleaning, touch up painting, and marking touch up or remarking of outer container is authorized, materials in Appendix D should be used.

WARNING

- **DO NOT APPLY ANTICORROSIVE MATERIALS TO CADS/PADS UNLESS SPECIFICALLY APPROVED AND DIRECTED TO DO SO BY THE AIRCRAFT/EQUIPMENT TM OR APPROPRIATE TECHNICAL DIRECTIVE. IF ANTICORROSIVE MATERIAL IS BEING APPLIED IN THE VICINITY OF CADS/PADS, CARE WILL BE EXERCISED TO PREVENT CONTAMINATION OF THE CADS/PADS.**
- **STEEL AND ALUMINUM CAPS AND PLUGS SHALL NOT BE USED AS PROTECTIVE CLOSURES DURING MAINTENANCE OF SYSTEMS USING CADS/PADS.**

f. When CADs/PADs are not installed, their inlet and outlet ports shall be sealed with protective closures to prevent contamination by moisture or foreign matter. During shipping, the inlet ports and outlet ports shall be protected by caps and plugs. The caps and plugs provided with the replacement CAD/PAD shall be returned on the replaced CAD/PAD.

WARNING

- **ELECTRICALLY INITIATED CADS SHALL NOT BE RESISTANCE CHECKED PRIOR TO INSTALLATION IN THE DEVICE OF INTENDED APPLICATION.**
- **THE AIRCRAFT ELECTRICAL SYSTEM SHALL BE DEACTIVATED AND THE AIRCRAFT SHALL BE PROPERLY GROUNDED PRIOR TO AND DURING MAINTENANCE OF ELECTRICALLY INITIATED CADS. ELECTRICAL TESTING (I.E., RESISTANCE CHECK, CONTINUITY TEST) OF CADS AND OF AIRCRAFT SYSTEMS WITH CADS INSTALLED USING OTHER THAN BUILT-IN TEST EQUIPMENT (BITE) IS STRICTLY PROHIBITED AT ALL LEVELS OF MAINTENANCE.**

g. During system maintenance, all disconnected CADs/PADs and associated ballistic lines shall have protective covers installed. Plastic plugs conforming to MIL-C-5501/10A and plastic caps conforming to MIL-C-5501/11 should be used. Supportive data for the most frequently required caps and plugs are provided in Appendix D.

3-7. Expendable Materials, Accessories, and Tools

a. Paint, cleaning compounds, and other expendable materials authorized for use by organizational maintenance personnel are listed in Appendix D.

b. Expendable materials should be requisitioned through normal supply channels on an as-required basis.

3-8. Inspection of Packaging

a. If receipt inspection or storage inspection of packaging reveals damage or deterioration to the extent that serviceability of the CAD or PAD is questionable, unpack CAD or PAD and visually inspect inner packs and/or items. Unpack only as far as necessary to determine serviceability.

b. For reporting of packaging discrepancies refer to AR 735-11-2.

c. Specific inspection criteria and identification of defects (as acceptable, repairable, or irreparable) are outlined in table 3-1. The most commonly encountered packaging defects are listed below: (1) Outer containers (boxes) damaged, weathered, or rotted to the extent contents are not protected.

(2) Inner container (hermetically-sealed, tear-strip can or barrier bag) damaged to the extent contents are not protected or cannot be readily removed.

(3) Container cap or closure insecure to the extent contents are not protected.

(4) Inner containers moldy or mildewed.

(5) Inner containers (metal) rusty or corroded to the extent that contents are not protected or loss of vacuum.

(6) Hardware or banding loose, missing, broken, or ineffective.

(7) Handle or cleat missing or broken.

(8) Contents loose to the extent item(s) may be damaged in handling.

3-9. Inspection of CADs/PADs

Specific defects (identified as major, minor or critical, repairable or irreparable) and inspection criteria are outlined in table 3-2. The most commonly encountered type of defects are listed.

a. Corrosion on cartridge case.

b. Cracks, dents, and other obvious damage to metal components.

c. Missing, illegible, incorrect or misleading markings.

d. Shorting devices (on electrically fired squibs) disconnected or missing.

e. Shipping safety pins missing.

Table 3-1. Inspection Criteria for Packaging

| Component | Acceptable | Repairable | Irreparable at AVUM level |
|--|---|--|---|
| Barrier Bags | | | |
| Bag | Sealed, ballooning with no evidence of leaks. No tears or holes. | Material received with open bag marked with opened date. (Reseal with tape.) | Moisture evident in bag - open bag with no open date marking. |
| Hermetically-Sealed, Tear-Strip Can | | | |
| Metal container | Operative with no evidence of loss of vacuum. No evidence of rust or corrosion. Dents that would not preclude easy removal of contents. | Rust and corrosion that has not penetrated the container. Obliterated markings (if correct markings are available). | Rust or corrosion has penetrated the container and a loss of vacuum. Dents that preclude easy removal of contents. Open container if open date is unknown. |
| Metal Containers (reclosable) | | | |
| Body | Dents less than 1/4-inch deep. Flanges which are bent but do not prevent placement or removal of cover with normal hand pressure. Tight seams which prevent entrance of moisture. Free from rust. be removed. Free from perforations. Supports which are integral to container present and in serviceable condition. | Dents deeper than 1/4-inch which may be removed without weakening structure of container. Flanges which can be straightened to allow placement and removal of cover with normal hand pressure. None. Minor rust which can pitting and perforations. None. Supports which can be replaced. | Dents which impair the structural integrity of the material, or prevent removal of contents. Flanges which cannot be straightened. Loose or leaking seams. Rust which has caused Perforated. Damaged supports which are integral to container. |
| Caps and covers | Dents which do not prevent cover from closing. Free from rust. removed. Free from perforations. | Dents which can be removed. assembly to body. Minor rust which can be excessive pitting, None. | Dents which cannot be removed and/or prevent Rust which has caused Perforated. |

Table 3-1. Inspection Criteria for Packaging (Cont)

| Component | Acceptable | Repairable | Irreparable at AVUM level |
|---|---|--|--|
| Metal Containers (reclosable) (Cont) | | | |
| | Gaskets present and sufficiently serviceable to make container air tight in single round metal containers and to make metal containers for propelling charges air tight. Operative spiders, air test holes, and threads. | Missing or damaged gaskets. None. | None. Irreparable spiders, air test holes and thread. |
| Wooden Boxes and Crates | | | |
| Ends | Free from damage. | Broken or missing cleats and handles. | Damage which requires disassembly of box. |
| Hardware | Operative and tight. Nails, screws and fasteners present and in good condition. | Inoperative or loose. Nails, screws, and fasteners which can be replaced or properly sealed. | None. None. |
| Strapping | Present and unweakened by rust or distortion. | Missing, rusted or distorted. | None. |
| Wood | Splits less than 3-inches long no closer than 1-inch to edge of board or adjoining split. The board must be secured by at least one nail on each side of the split when it extends to the end of the board. Warping which does not prevent sealing of box or insertion of required ammunition. Light mold which can be brushed off. Mildew stains which do not effect legibility of markings. Sound tight knots the diameter of which do not exceed 1/2 the width of the board. Skids securely attached to box or crate. Knots no greater than 1/4 the width of skid. | Splits over 3-inches but no closer than 1-inch to edge of board or adjoining split, or 1/8-inch wide, which can be repaired by use of corrugated fasteners. None. None. None. Loose skids. | Splits closer than 1-inch to edge of board or adjoining split or over 1/8-inch wide. Warping which prevents insertion or removal of rounds and/or sealing of the box. Excessive mildew and mold which cannot be removed and which render markings illegible. Holes or loose knots which exceed 1-1/2-inch in largest diameter or 1/3 width of board. Knots greater than 1/4 the width of skid. |

Table 3-1. Inspection Criteria for Packaging (Cont)

| Component | Acceptable | Repairable | Irreparable at AVUM level |
|-------------------------|--|---|---|
| Fiber Containers | | | |
| Body and cap | <p>No tears, cuts or gouges.</p> <p>1/2-square inch in area.</p> <p>No mold, mildew or rot.</p> <p>Free from wrinkles caused by looseness between layers.</p> <p>Blisters with combined totaling less than 1/2-square inch. No moisture absorption.</p> | <p>Cuts, tears or gouges not closer than 1-inch to closure, less than 1/2-square inch in and unpenetrated layers which can be spot painted.</p> <p>None.</p> <p>None.</p> <p>None.</p> <p>None.</p> | <p>Cuts, tears or gouges closer than 1-inch to closure, more than area, or through all impregnated layers.</p> <p>Molded, mildewed or rotted.</p> <p>Wrinkled or peeling.</p> <p>Blisters with area combined area of more than 1/2-square inch. Wet or soft containers.</p> |
| Metal ends | <p>Minor rust, cracks, indentations or splits which would not impair water proofing or serviceability of container.</p> | <p>None.</p> | <p>Perforations, excessive rust or ends which are crushed or not securely crimped to body.</p> |
| Metal Boxes | | | |
| Body and cover | <p>Free from rust.</p> <p>Tight seams. Dents less than 1/4-inch deep. without weakening structure.</p> <p>Rust not penetrated.</p> <p>Separators integral to container serviceability, allowing easy insertion and removal of contents.</p> <p>Gaskets present and sufficiently serviceable to ensure moisture-proof pack.</p> | <p>Minor rust which can be removed.</p> <p>Repair not practical. Dents deeper than 1/4-inch which may be removed material. structure of container.</p> <p>None.</p> <p>None.</p> <p>Damaged or missing gaskets.</p> | <p>Extensive pitting and rust.</p> <p>Split seams. Dents which impair the structural integrity of the</p> <p>Rust penetrated.</p> <p>Missing or broken separators.</p> <p>Not applicable.</p> |
| Hardware | <p>Operative.</p> | <p>Inoperative.</p> | <p>Broken or missing.</p> |

Table 3-2. Inspection Criteria

| Component | Checkpoint | Defect classification | Corrective action |
|---|---|-----------------------|---|
| Armed/firing mechanisms (fig. 3-7) | Evidence of moisture in sealed bag or initiator water soaked. | Major | Reject. |
| | Rust or corrosion on housing or gas generator cap. | Major | Reject. |
| | Cracks in housing or gas generator cap. | Major | Reject. |
| | Scratches or gouges on case. | Major | Reject. |
| | Service life expired. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Foreign objects in inlet/outlet ports; shipping cap or plug on inlet/outlet port missing. | Minor | Remove foreign objects in inlet/outlet ports if present. Reinstall used or new cap or plug. |
| | Threads damaged. | Major | Reject. |
| Cutters (fig. 3-8) | Cutter body dented, bent, cracked, or otherwise damaged. | Major | Reject. |
| | Pitting on cutter body. | Major | Reject. |
| | Lanyard assembly damaged. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Corrosion (etching) on cutter body. | Major | Reject. |
| Reefing line cutters M21/M22 (fig. 3-8) (fig. 3-10) | Safety pin missing. | Critical | Reject. |
| | Safety pin in place but damaged. | Critical | Making sure not to handle cutter by the lanyard, insert a cotter pin (AN 381-3-24), ensuring pin is inserted between lanyard cables. |
| | Holding screw missing. | Major | Reject. |

Table 3-2. Inspection Criteria (Cont)

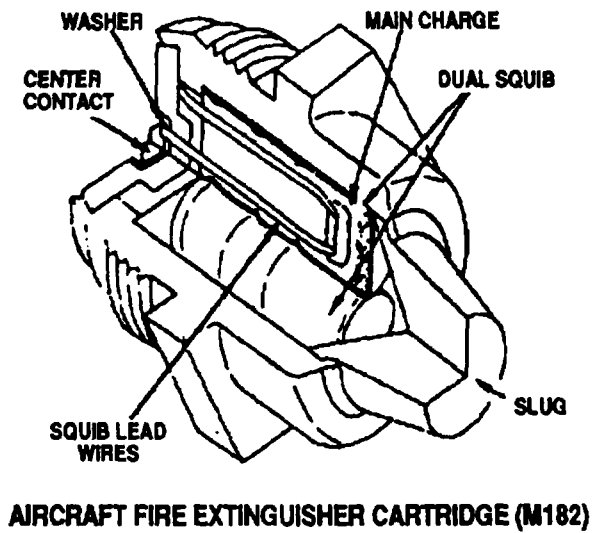
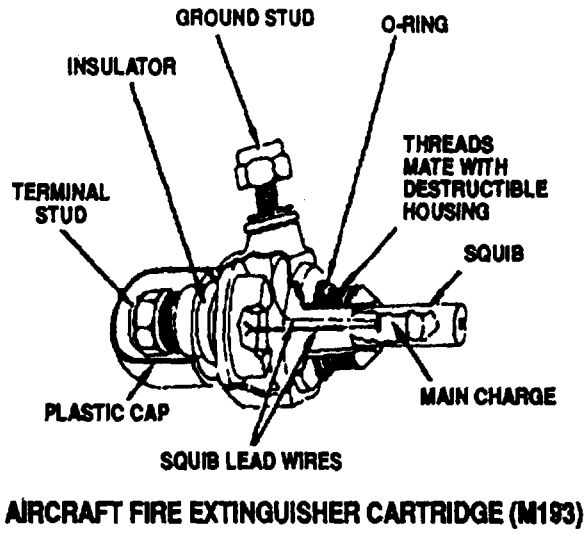
| Component | Checkpoint | Defect classification | Corrective action |
|---|---|-----------------------|---|
| Cord, detonating assembly (fig. 3-6) | Service life expired. | Major | Reject. |
| | Corrosion on detonator. | Major | Reject. |
| | Wrapping or shielding cracked, frayed, or broken. | Major | Reject. |
| | Detonator completely or partially separated from detonating cord. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| Fire extinguisher cartridge (fig. 3-4) | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Damaged threads or corrosion on threads. | Major | Mild corrosion that can be removed with a soft cotton cloth may be removed. Damaged threads is cause for rejection. |
| | Terminal post loose. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable, otherwise reject. |
| Impulse and delay cartridges (fig. 3-5) | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Service life expired. | Major | Reject. |
| | Model number missing or illegible. | Major | Reject. |
| Cartridge case dented or bent where distortion extends into closure disc crimping area. | Major | Reject. | |

Table 3-2. Inspection Criteria (Cont)

| Component | Checkpoint | Defect classification | Corrective action |
|--|---|-----------------------|---|
| Impulse and delay cartridges (fig. 3-5) (cont) | Cartridge case distorted to degree that cartridge cannot normally be installed (without use of undue force). | Major | Reject. |
| | Minor corrosion on cartridge case. | Minor | Remove corrosion by hand buffing with soft cloth, brass or copper wool. |
| | Etching on cartridge case. (Etching is a type of corrosion, and is not to be confused with scratches or scribe marks on the cartridge.) | Minor | Remove by wiping with a soft cloth or paper tissue. |
| | Presence of any type lubricant (oil, grease, etc.) on cartridge. | Major | Reject. |
| | Evidence of cartridge having been subjected to water (water marks/rings) | Major | Reject. |
| | Closure disc torn, punctured, cocked or bulged. | Major | Reject. |
| | Electrode or primer button insulation cracked or chipped. | Major | Reject. |
| | Electrode or primer button covered with foreign matter other than corrosion (oil, sealant overlap, etc.) | Minor | Remove by hand buffing with soft cloth. Use anti-static material on electrically fired cartridges. |
| | Ignition element plug (if applicable) loose. | Major | Reject. |
| | Threads damaged to extent cartridge cannot be installed. | Major | Reject. |
| Rocket motors (fig. 3-9) | Service life expired. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Rust or corrosion on housing. | Major | Reject. |

Table 3-2. Inspection Criteria (Cont)

| Component | Checkpoint | Defect classification | Corrective action |
|---|---|-----------------------|---|
| Rocket motors (fig. 3-9) (cont) | Cracks, dents or other obvious damage. | Major | Reject. |
| | Shipping safety pin missing. | Critical | Reinstall new or used safety pin. |
| Thrusters (fig. 3-11) | Shelf life expired. | Major | Reject. |
| | Rust or corrosion on on body assembly. | Major | Reject. |
| | Cracks, dents or other obvious damage to housing or attacking hardware. | Major | Reject. |
| | Piston assembly loose. | Major | Reject. |
| | Shipping safety pin missing. | Critical | Reinstall new or used safety pin. |
| | Mounting bracket cracked or bent. | Major | Reject. |
| | Lot number or date of manufacture missing or illegible. | Major | If lot number or date of manufacture can be obtained from shipping documents, use indelible ink and mark data on cartridge as applicable. |
| | Shelf life expired. | Major | Reject. |
| | Installed life expired. | Major | Reject. |
| | Thruster has evidence of having been subjected to water. | Major | Reject. |
| Missing hardware (T handle, firing lanyard, etc.) | Major | Reject. | |



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AR 5564

Figure 3-4. Aircraft fire extinguisher cartridges.

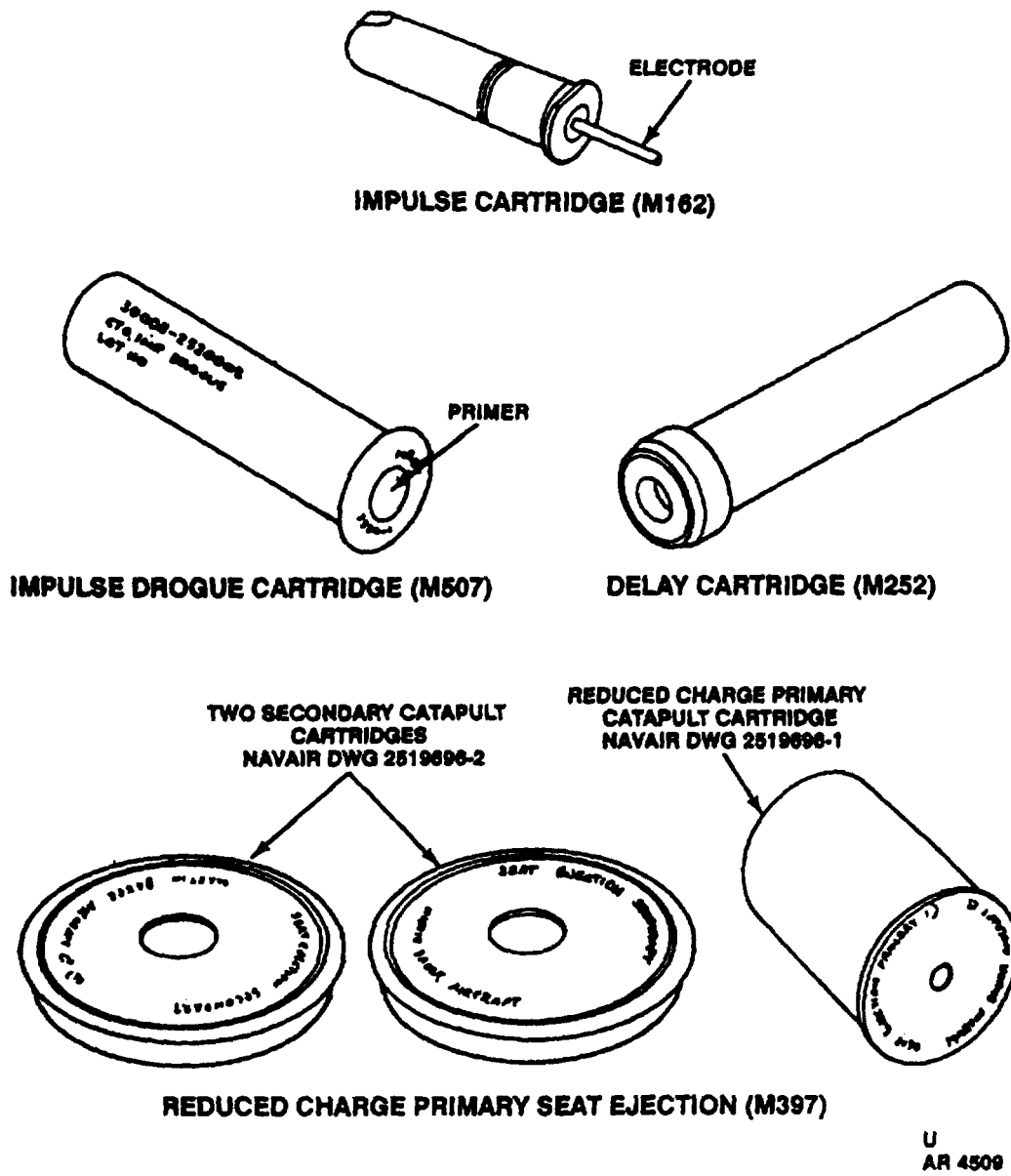


Figure 3-5. Impulse and delay cartridges.

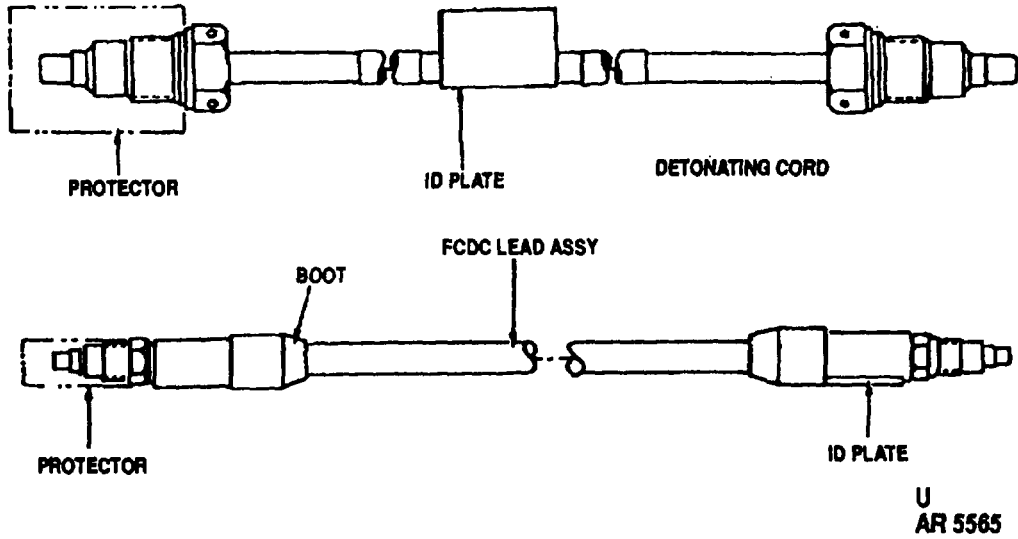


Figure 3-6. Detonating cords.

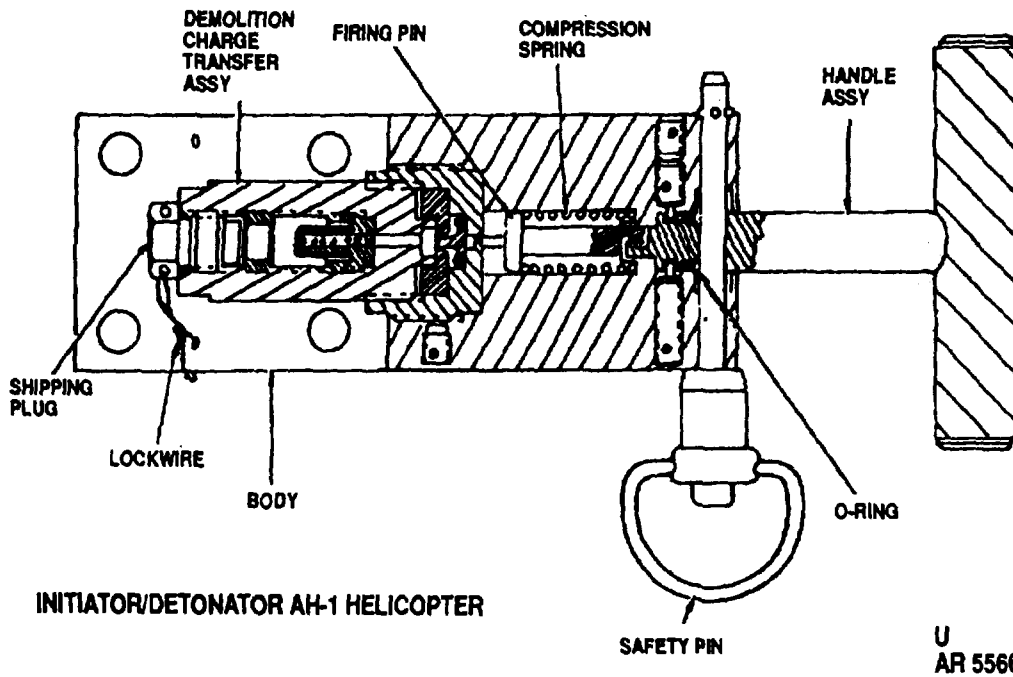


Figure 3-7. Armed/firing mechanism.

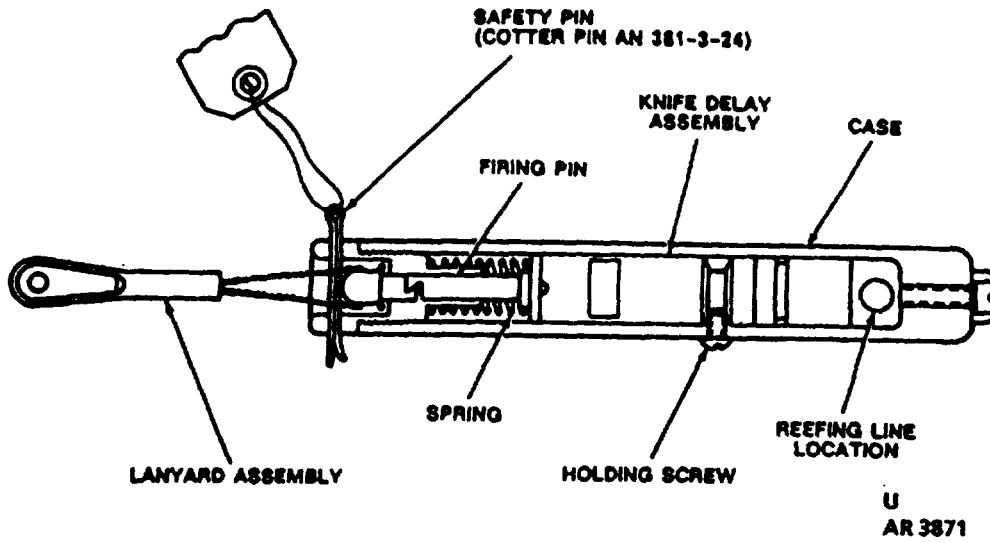


Figure 3-8. Reefing line cutter.

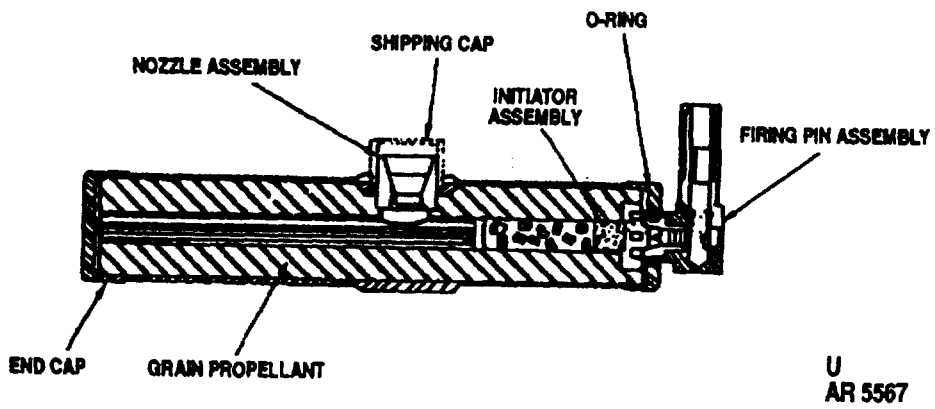
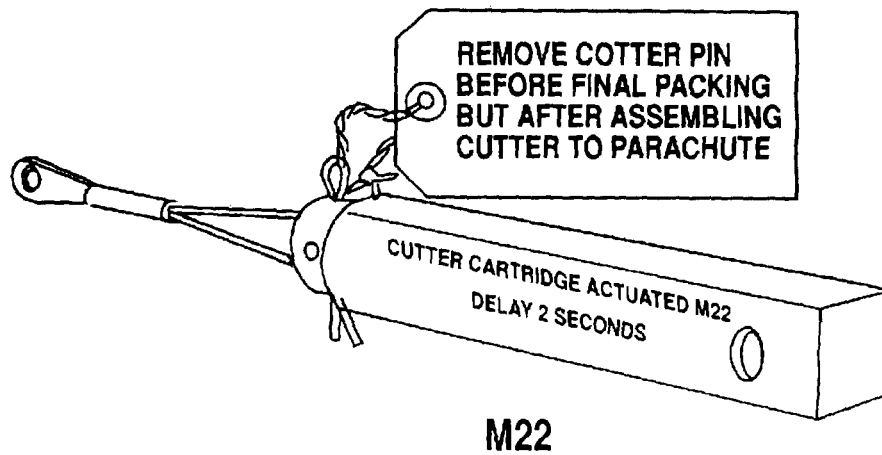
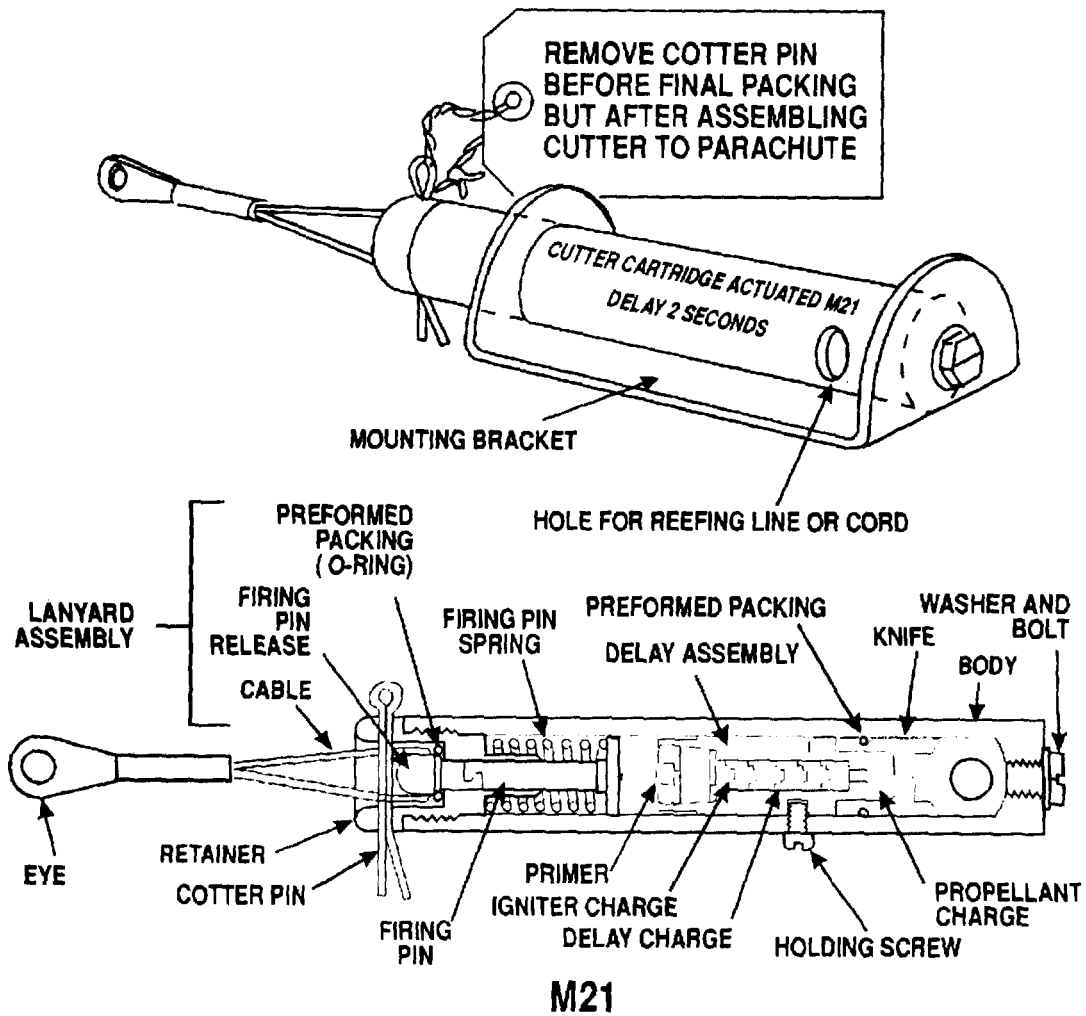
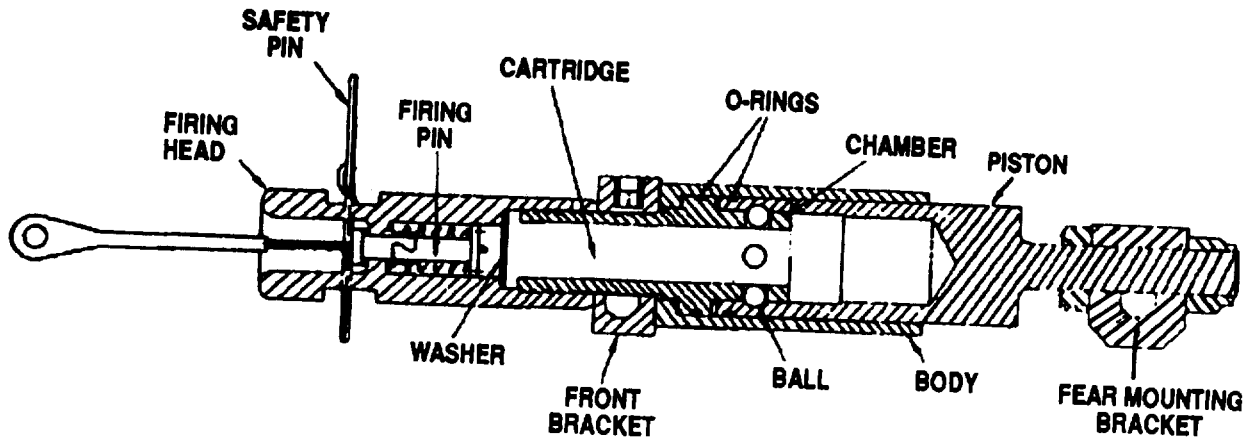


Figure 3-9. Rocket motor.



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AR6199

Figure 3-10. Cutter, cartridge actuated, M21 and M22
3-21



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AR 5568

Figure 3-11. Thruster

Section IV AIRCRAFT LOG BOOK ENTRIES

3-10. Marking Expiration Dates and Log Book Entries

a. Before installing a CAD/PAD, the service life expiration date shall be computed. (See Chapter 1.) Both the container open date and the service life expiration date shall be marked on the CAD/PAD with indelible ink.

NOTE

Use permanent indelible ink for marking CADs/PADs with container open dates and service life expiration dates. DO NOT scribe, scratch, or vibroetch these dates as damage will occur to the

CADs/PADs corrosion-resistant surface. Marking pen, NSN 7520-00-043-3408, available from the General Services Administration (GSA) Supply is recommended for this purpose.

b. An entry will be made in the aircraft/helicopter/equipment log book in accordance with DA PAM 738-750 for each CAD/PAD installed. The recording of the starting date for the SERVICE LIFE (was installed life) is established when opening hermetically sealed containers. This data is now reported in TM 9-1300385, Appendix B, SHELF/SERVICE LIFE DATA FOR ARMY CLASS V MATERIEL. (Issued quarterly or by supplementary notice).

Section V REMOVAL AND INSTALLATION OF CADs/PADs

3-11. General

a. For step-by-step procedures of removing and installing CADs/PADs in Army aircraft/helicopters, refer to the applicable aircraft/helicopter TM.

b. Ensure all explosive devices have approved safety pins/devices installed prior to performing any maintenance on aircraft/helicopter systems which utilize CADs/PADs.

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CHAPTER 4
SHIPMENT AND STORAGE
Section I. SHIPMENT

4-1. General

a. This information contained in this section outlines regulations controlling the shipment and transportation of Federal Supply Class 1377 CADs/PADs that are used in Army aircraft/helicopter emergency escape systems, aircraft/helicopter fire extinguisher systems, stores release/jettison systems, cargo and rescue hoist cable cutter systems, and aerial delivery systems.

b. Shipments of military explosives and other dangerous material by either military or commercial carriers within continental United States are governed by AR 55-355. Shipments by military aircraft are governed by TM 38-250. Shipments in military vehicles on public highways are subject to all laws, rules, and regulations applicable to commercial carriers. Shipments made by military establishments will comply with applicable requirements of these regulations and recommendations. If any difficulties are encountered in complying with these regulations, a detailed report will be submitted through appropriate channels.

c. Shipments of explosives and other dangerous articles will comply with: (1) Department of Transportation regulations.

(2) Department of the Army regulations and instructions.

(3) United States Coast Guard regulations and instructions.

(4) Port and harbor regulations.

(5) State and municipal laws.

(6) Federal Aviation Agency and Civil Aeronautics Board Regulations relating to air transportation.

d. Shipments of military explosives by either military or commercial carriers outside the continental United States are governed by AR 55-355 and host country requirements.

4-2. Precautions

a. Damaged, contaminated, overaged, misfired or otherwise degraded CADs/PADs may be dangerous and their usefulness impaired.

b. All personnel engaged in operations in which CADs/PADs are evolved shall be thoroughly trained in explosive safety (AR 385-10 and AR 385-64) and be capable of recognizing hazardous explosive exposures. Safety must become a firmly established habit when working with, or in the vicinity of items having explosives, flammables, or toxic hazards.

4-3. Packaging

a. Cartridges, Cartridge Actuated Devices (CADs) and Propellant Actuated Devices (PADs) are shipped in a variety of containers most of which are reuseable and shall be retained for use in repacking unserviceable CADs/PADs (see Chapter 3 for repacking information).

b. Aviation unit maintenance levels will normally be required to repack only those items which are removed from aircraft/helicopter systems because of service life or installed life expiration, malfunctioning or defective items.

4-4. Transportation**WARNING**

**DO NOT ROLL, DROP, THROW OR
SUBJECT CADS/PADS TO ROUGH
HANDLING. THESE CADS/PADS
ARE DEPARTMENT OF
TRANSPORTATION (DOT) CLASS C
AND B EXPLOSIVES.**

a. Block and brace CAD/PAD packages being transported in trucks or tactical vehicles. Blocking and bracing shall be adequate to withstand sudden stops and starts, as well as offroad operations.

- b. Stack CAD/PAD containers in such a manner as to prevent shifting during transporting.
- c. Assure packaging provides adequate protection for CADs/PADs during transporting.
- d. Smoking is prohibited on or near any air-

craft or vehicle handling, loading, or unloading explosives. Smoking areas may be designated upon approval by competent authority provided such areas are located a safe distance (see TM 91300-206) from the vehicle or aircraft. "NO SMOKING" warning signs shall be posted during operations involving handling, loading or unloading explosive cargo.

Section II. STORAGE

4-5. Precautions

a. Handle, ship, and store CADs/PADs in accordance with the provisions of AR 665 and AR 385 series publications, TM 9-1300-206, DARCOM-R 385-100, Safety Manual and the Hazard Classification data provided in the Joint Hazard Classification System published by DARCOM. Additionally, ensure compliance with the safety precautions presented in the safety summary as well as the specific WARNINGS and CAUTIONS presented for the individual CAD/PAD in the text of this publication.

b. Naked lights, matches, lighters, and other spark and flame or heat producing devices shall never be taken into or stowed in magazines or other areas contain explosives or munitions. Only approved lighters shall be used in explosive areas and then only in designated smoking areas.

c. CADs/PADs removed from ejection seats/parachutes/survival equipment/emergency escape systems/stores separation systems during maintenance shall be stored in containers with adequate separation, support, and cushioning to prevent damage during handling and storage. Authorized safety pins/devices shall be

installed at all times to prevent accidental firing. Plastic protective caps/plugs shall be installed to prevent contamination by moisture or foreign matter.

d. CADs/PADs shall be stored in a cool, dry place. CADs/PADs shall be protected from the direct rays of the sun and from extreme temperatures. CADs/PADs exposed to temperatures in excess of the limits published in the individual data entries of TM 43-0001-39 shall not be used. CADs/PADs exposed to extreme temperatures shall be reported by the most expeditious means available to Commander, U.S. Army Armament, Munitions, and Chemical Command, ATTN: AMSMC-QAS(R), Rock Island, IL 61299-6000 in accordance with DA PAM 738-750.

e. The properly-packaged CADs/PADs shall be stored in a ready-service magazine approved for the applicable hazard class and compatibility group. "ASP storage is preferred until items are needed in the maintenance shop." These items may normally be stored in a magazine authorized for storage of hazard class/division 1.4 explosives. Consult the Joint Hazard Classification System microfiche for proper hazard classification of specific items.

f. If the CADs/PADs that are removed from aircraft/equipment are required for reinstallation the same day, they may be stored in an area approved and designated by the maintenance officer.

APPENDIX A

REFERENCES

A-1. Administrative Publications

a. Army Regulations.

| | |
|---|---------------|
| Army Safety Program..... | AR 385-10 |
| System Safety Engineering and Management..... | AR 385-16 |
| Accident Reporting and Records | AR 385-40 |
| Ammunition and Explosive Safety Standards | AR 385-64 |
| Fire Prevention and Protection | AR 420-90 |
| Reporting of Transportation Discrepancies in Shipment | AR 55-38 |
| Worldwide Ammunition Reporting System (WARS) | AR 700-22 |
| Reporting of Item and Packaging Discrepancies (DLAR 4140-55; SECNAUIINST 4355-18; AFR 400-64; MCO 4330-3J) | AR 735-11-2 |
| Ammunition Stockpile Reliability Program (ASRP) and Army Nuclear Weapons Stockpile Reliability Program (ANWSRP) | AR 702-6 |
| Reporting of Product Quality Deficiencies Across Component Lines (RCS DD-BR&E(Q) (1525) (DLAR 4155.24; SECNAVINST 4855.5; AFR 78-6; MCO 4855.5F) (Reprinted with basic incl C1) | AR 702-7 |
| Requisitioning, Receipt, and Issue System | AR 725-50 |
| Report of Item and Packaging Discrepancies | AR 735-11-2 |
| Malfunctions Involving Ammunition & Explosives | AR 75-1 |
| Munitions, Restricted or Suspended | TB 9-1300-385 |
| Cartridges, Cartridge Actuated Devices and Propellant Actuated Devices FSC 1377 | TM 43-0001-39 |
| Ammunition and Explosive Standards | TM 9-1300-206 |

b. DA Pamphlets.

| | |
|---|----------------|
| Consolidated Index of Army Publications and Blank Forms | DA PAM 25-30 |
| The Army Maintenance Management System (TAMMS) | DA PAM 738-750 |

A-2. Blank Forms

| | |
|---|----------------|
| Recommended Changes to Publications and Blank Forms | DA Form 2028 |
| Maintenance Request | DA Form 2407 |
| Ammunition Condition Report | DA Form 2415 |
| US Army Accident Investigation Report..... | DA Form 285 |
| Fire Emergency Report | DA Form 2324-1 |
| Ammunition Malfunction Report | DA Form 4379-R |
| Transportation Discrepancy Report | SF Form 361 |
| Report of Discrepancy (ROD)..... | SF Form 364 |
| Product Quality Deficiency Report..... | SF Form 368 |

A-3. Equipment Manuals

a. Technical Manuals

| | |
|--|---------------------------|
| Airdrop of Supplies and Equipment from Army Aircraft (to 13C7-51-1) | TM 10-500 series |
| Cartridge Actuated Devices and Propellant Actuated Devices FSC 1377 | TM 43-0001-39 |
| Aircraft Technical Manual | TM 55-1510-as appropriate |
| Helicopter Technical Manual | TM 55-1520-as appropriate |
| Destruction of Conventional Ammunition and Improved Conventional Munitions to Prevent Enemy Use (excluding Toxic and Incapacitating Chemical Agents) (For Combat Units)..... | TM 750-244-5-1 |
| Ammunition, General | TM 9-1300-200 |
| Ammunition and Explosive Standards | TM 9-1300-206 |
| Military Explosives | TM 9-1300-214 |

b. Technical Bulletins and Supply Bulletins.

| | |
|---|-----------------|
| Munitions, Restricted or Suspended | TB 9-1300-285 |
| Munitions Permanently Suspended or Restricted..... | TB 9-1300-285-2 |
| Department of Defense Ammunition Code (Cataloging Handbook H3) | SB 708-3 |
| Federal Item Name Directory for Supply Cataloging (Cataloging Handbook H6 A & B) | SB 708-6B |

A-4. Supply Catalogs

| | |
|--|---------------|
| FSC Group 13 Ammunition and Explosives (Classes 1340-1398) | SC 1340/98 IL |
|--|---------------|

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

NOTE

Maintenance operations of aircraft/helicopter systems that contain explosive devices shall be performed only by qualified personnel.

e. The unpack and repack maintenance of CADs/PADs that are specified to be performed at defined level of maintenance, refers to the unpacking and repacking of CADs/PADs as they are received from supply.

B-2. Maintenance tasks by Group No.

NOTE

CADS and PADs are assigned nine(9) "functional" groups as used in aircraft. Tasks for maintenance are defined below and in column 3, section 2.

B-1. General

- a. The Maintenance Allocation Chart designates responsibility for the performance of maintenance tasks.
- b. Only the lowest level of maintenance authorized to perform a maintenance task is indicated.
- c. A maintenance task assigned to a maintenance level will automatically be authorized to be performed at any higher maintenance level.
- d. A maintenance task that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the next higher maintenance level. Higher maintenance levels will perform the maintenance tasks of lower maintenance levels when required or directed by appropriate commander.

The implementation of maintenance tasks will be consistent with the assigned maintenance in accordance with the following definitions:

NOTE

Cartridges, Cartridge Actuated Devices (CADs), and Propellant Actuated Devices (PADs) are either complete items, or are sealed-in devices ready for use. These CADs/PADs will not be disassembled at any level of maintenance. Repairable CADs/PADs will be shipped (condition code F) to the Supporting Ammunition Supply Point (ASP) upon expiration of their shelf life.

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

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

c. Service. Operations required periodically to keep an item or system in proper operating condition.

(1) Unpack. To remove the item from packing container for service or for the performance of other maintenance.

(2) Repack. To return the item to the packing container after service or other maintenance operations.

- (3) Clean. To rid the item of contamination.
- (4) Touch up. To spot paint scratched or blistered surfaces.
- (5) Mark. To restore obliterated identification.

d. Install. To emplace, seat or fix into place or position an item in a manner to allow the proper functioning of the system or equipment; also to assemble one component of an end item with another.

e. Adjust. To maintain within prescribed limits by bringing into proper or exact position.

f. Renovate. To restore item to a serviceable condition.

(1) Paint. To repaint the entire item.

(2) Repair. To restore serviceability to an item by correcting specific damage, fault, malfunction or failure through the application of maintenance services or other maintenance actions.

(3) Replace. To supply and install a serviceable component in a manner to allow the proper functioning of a system or equipment.

B-3. Explanation of Format

a. Group Number. Column 1 lists the group numbers, the purpose of which is to identify each CAD/PAD according to its characteristics.

b. Functional Group. Column 2 lists the item nomenclature.

c. Maintenance Task. Column 3 lists the twelve maintenance tasks defined in preceding paragraph B-2. Capital letters are inserted under appropriate maintenance tasks, on line with each functional group, to indicate the lowest level of maintenance authorized to perform that task. Symbols used and the maintenance category each represents are as follows:

| <u>Maintenance Symbol</u> | <u>Explanation of Symbol</u> |
|---------------------------|------------------------------|
| O..... | Organizational |
| F..... | Direct Field Support |
| H..... | General Support |
| D..... | Depot Maintenance |
| CFA..... | Cognizant Field Activity |

d. Tools and Equipment. Column 4 lists the special tools by item number specified in Appendix C, section III required to perform the maintenance function.

e. Remarks. Column 5 is self explanatory.

Section II. MAINTENANCE ALLOCATION CHART

| (1) G R O U P N U M B E R | (2) CAD/PAD Functional group | (3) Maintenance functions | | | | | | | | | | | (4) Tools and equipment | (5) Remarks |
|--|---|---------------------------------|------------------|---------------------------------|----------------------------|-----------------------|---------------------------------|------------------|--------------------------------------|----------------------------|-----------------------|----------------------------|-------------------------------|--|
| | | I N S P E C T | T E S T | S E R V I C E | | | | | R E N O V A T E | | | | | |
| | | | | U N P A C K | R E P A C K | C L E A N | T O U C H U P | M A R K | I N S T A L L | A D J U S T | P A I N T | R E P A I R | | |
| 0100 | Cartridge, Aircraft | O | D | O | O | O | D | O | O | - | D | D | O | Common hand tools and equipment is used for CAD/PAD removal and installation with the exception of Martin-Baker ejection seat components. Special tools for Martin-Baker seat are listed in TM 55-1680-308-24. |
| 0200 | Fire Extinguisher Cutters | O | D | O | O | O | D | O | O | D | D | O | | |
| 0300 | Delay Cartridges | O | D | O | O | O | D | O | O | D | D | O | | |
| 0400 | Cord, Detonating | O | D | O | O | - | D | O | O | - | D | D | O | |
| 0500 | Impulse Cartridges | O | D | O | - | O | D | O | O | - | D | D | O | |
| 0600 | Initiators (AH-1) | O | D | O | O | - | D | O | O | D | D | O | | |
| 0700 | Rocket Motors | O | D | O | O | O | D | O | O | D | D | O | | |
| 0800 | Thrusters | O | D | O | O | O | D | O | O | D | D | O | | |
| 0900 | Miscellaneous Items, See Group Description. | | | | | | | | | | | | | |
| All Groups | Outer Containers | O | - | - | - | O | O | O | - | - | - | O | O | |
| | Inner Containers | O | - | O | O | O | O | O | - | - | - | O | O | |
| | Barrier Bags | O | - | O | O | O | O | O | - | - | - | O | O | |

NOTE

Refer to Chapter 2 (by group number for the specific item applicable to each functional group), Section X and Appendix E.

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**APPENDIX C
AVIATION UNIT MAINTENANCE
PACKING MATERIALS, ACCESSORIES, AND TOOLS**

Section I. INTRODUCTION

C-1. Scope

a. This appendix lists packing materials accessories, and tools required for the performance of aviation unit maintenance of federal supply class (FSC) 1377 cartridges/cartridge actuated devices (CADs) and propellant actuated devices (PADs) used in army aircraft/ helicopter emergency escape systems, fire extinguisher systems, stores release/jettison systems, and aerial delivery systems.

b. Additional packaging, packing, marking and storage data may be obtained by referring to TM 43-0001-39, Cartridges, Cartridge Actuated Devices and Propellant Actuated Devices.

C-2. General

This appendix consists of *Section II Packing Materials*. A list of packing materials authorized for the performance of maintenance at the direct support and general support levels.

C-3. Explanation of Columns

The following provides an explanation of columns in Section II.

a. *Part Number (Drawing Number)*. The primary number used by the manufacturer which controls the design and characteristics of the item. Drawings can be obtained from originating source (see CAGE Code).

b. *Contractor and Government Entity code (CAGE Code)* (Formerly known as federal supply code for manufacturers (FSCM)). A five digit code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

00266 ACME Packaging, Division of Interlake, Inc.
19203 Picatinny Arsenal

c. *Figure Number*. The number of the figure where the item is identified/located.

d. *Description*. The Federal item name and any additional description of the item required.

Section II. PACKING MATERIALS, ACCESSORIES, AND TOOLS

| PART NO. DWG. NO. | CAGE CODE | FIGURE NO. | DESCRIPTION |
|----------------------|--------------|---------------|---|
| 8864731 | 19203 | | SALLEE CLOSER: |
| 520 | 00266 | | STRAPPING AND SEALING KIT: 5/8" strapping |
| 1035 | 00266 | | STRAPPING AND SEALING KIT: 1-1/4" strapping |

**APPENDIX D
AVIATION UNIT MAINTENANCE
EXPENDABLE AND DURABLE ITEMS LIST**

Section I. INTRODUCTION

D-1. Scope

a. This appendix lists expendable and durable items for aviation unit maintenance of federal supply class (FSC) 1377 cartridges/cartridge actuated devices (CADs) and propellant actuated devices (PADs) used in army aircraft/helicopter emergency escape systems, fire extinguisher systems, stores release/jettison systems, and aerial delivery systems.

b. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, expendable items (except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. Explanation of Columns

a. *Column (1) Item number.* This number is assigned to the entry in the listing for referencing when required.

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

- C - Operator/Crew
- O - Unit Maintenance
- F - Direct Support Maintenance
- H - General Support Maintenance

c. *Column (3) National Stock Number.* This is the national stock number assigned to the item; use it to request or requisition the item.

d. *Column (4) Description.* Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the commercial and government entity code (CAGEC) parentheses followed by the part number.

| | |
|-------|--|
| 03042 | Carters Ink Co |
| 06383 | Panduit Corp |
| 26066 | Minnesota Mining & Manufacturing Co |
| 45092 | Osborn Manufacturing Corp |
| 53034 | John P Nissen Jr. Co. |
| 58536 | Federal Item Description |
| 64067 | National Industries for the Severely Handicapped |
| 70787 | Cabot Corp Aluminum Master Alloy Business Unit |
| 81346 | American Society for Testing and Materials |
| 81348 | Federal Specifications |
| 81349 | Military Specifications |
| 89264 | International Business Machines |

e. *Column (5) Unit of Measure (U/M)/Unit of Issue (U/I).* This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue as shown in the army master data file (AMDF) requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE AND DURABLE ITEMS LIST

| (1) Item Number | (2) Level | (3) National Stock Number | (4) Description | (5) U/I |
|-----------------------|--------------|---------------------------------|--|------------|
| 1 | 0 | 8020-00-240-6361 | Brush, Artists: flat chisel edge stock 0.688 x 0.125 (81348) H-B-118 | ea |
| 2 | 0 | 8020-00-246-8504 | Brush, Artists: round flat edge stock 1-in. lg (81348) H-B-118 | ea |
| 3 | 0 | 8020-00-262-9084 | Brush, Varnish: camel's hair 1/2-in.w, 1/4-in. thk, 1-1/4-in. exposed flat stock (45092) 608-1 | ea |
| 4 | 0 | 8020-00-889-7919 | Brush, Varnish: flat 1-v/2-in.w/stock x 0.406-in.thk x 2.125-in. lg (81348) H-B-695 | ea |
| 5 | 0 | 7920-00-255-5135 | Brush, Wire Scratch: beryllium copper alloy, curved handle (70787) PTB82 | ea |
| 6 | 0 | 7920-00-269-0933 | Brush, Wire Scratch: beryllium copper alloy, straight handle, 7-in. (70787) PTB80 | ea |
| 7 | 0 | 5350-00-192-6051 | Cloth, Abrasive: 180 grit (58536) A-A-1048 | pg |
| 8 | 0 | 7930-00-249-8036 | Detergent, General Purpose: (58536) A-A-1376 | co |
| 9 | 0 | 6810-00-848-9272 | Enamel: Olive Drab No.34087, spray can (81348) TT-E-516 | pt |
| 10 | 0 | 5315-00597-9766 | Fastener, Corrugated, Wood, Joint: Steel, sawtooth w, 1-in. lg (58536) A-A-1957 | hd |
| 11 | 0 | 6810-00-753-4993 | Isopropyl, Alcohol: (89264) 2200200 | cn |
| 12 | 0 | 7520-00-973-1059 | Marker, Tube Type: black (03042) MARKS A LOT BLACK | dz |
| 13 | 0 | 7520-00-537-6505 | Metal Marker, Tube Type: (53034) METAL MARKER 1-8 IN | ea |
| 14 | 0 | 5315-00-889-2744 | Nail, Steel: 2-in.6D (81348) FF-N-105 | pg |
| 15 | 0 | 5315-00-889-2743 | Nail: steel permanent head style 19, 1.5-in. (81348) FF-N-105 | pg |
| 16 | 0 | 5315-00-889-2745 | Nail: 8d, 2-1/2-in.(81348) FF-N-105 | pg |
| 17 | 0 | 5350-00-271-7936 | Paper, Abrasive: Flint, 120 grit (81348) P-P-105 | pg |

Section II. EXPENDABLE AND DURABLE ITEMS LIST - Continued

| (1) Item Number | (2) Level | (3) National Stock Number | (4) Description | (5) U/I |
|-----------------------|--------------|---------------------------------|---|------------|
| 18 | O | 7520-00-043-3408 | Pen, Marking, Indelible: (06383) DX-O | ea |
| 19 | O | 7920-00-205-1711 | Rag, Wiping: cotton, unbleached, mixture (64067) 7920-00-205-1711 | be |
| 20 | O | 7510-00-266-5016 | Tape, Pressure Sensitive Adhesive: cotton and liner, opaque olive drab 2-in.w, water resistant, 2160-in.roll (58536) A-A-1586 | ro |
| 21 | O | 7510-00-266-6711 | Tape, Pressure Sensitive Adhesive: masking 3/4-in.w, 2160-in. roll (26066) 232 3/4 IN. | ro |
| 22 | O | 8135-00-823-8073 | Tape, Pressure Sensitive Adhesive: plastic polyethylene, opaque, black, 1.5-in.w, 2160-in.roll (81349) MIL-T-43036 | ro |
| 23 | O | 9505-00-294-7373 | Wire, Nonelectrical: zn-ctd steel, rnd, 0.0363-in. dia, 516 coil (81346) ASTM-A641 | cl |
| 24 | O | 5350-00-242-4405 | Wool, Metallic: steel (58536) A-A-1043 | lb |
| 25 | O | 5350-00-255-7736 | Wool, Metallic: copper (58536) A-A-1048 | lb |

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By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official: 
MILTON H. HAMILTON
Administrative Assistant to the
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