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CAP, BLASTING, ELECTRIC
AMMUNITION SURVEILLANCE PROCEDURES

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By Order of the Secretary of the Army:

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DEPARTMENT OF THE ARMY SUPPLY BULLETIN

**CAP, BLASTING, ELECTRIC
AMMUNITION SURVEILLANCE PROCEDURES**

**HEADQUARTERS, DEPARTMENT OF THE ARMY, WASHINGTON, D.C.
21 December 1988**

The proponent agency of this supply bulletin is the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). Direct reporting of errors, omissions, and recommendations for improving this bulletin is authorized and encouraged. Comments should pertain to suggested procedural changes, functioning characteristics, defects, cause of failures, remedial action, etc. A DA Form 2028 (Recommended Changes to Publications and Blank Forms) may be completed and forwarded to the Commander, AMCCOM, ATTN: AMSMC-QAS-P, Rock Island, IL 61299-6000.

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SECTION I. INTRODUCTION

1. Purpose and scope

This bulletin, when used in conjunction with SB 742-1, provides a method for determining serviceability of subject items.

a. Visual inspection and function testing criteria in this procedure will be accomplished under a centralized control program managed by U.S. Army Armament, Munitions and Chemical Command (AMCCOM), AMSMC-QAS, Rock Island, IL 61299-6000. This procedure is to be used in serviceability assessment of specified lots

based on inspection and testing of individual items.

b. Provisions of this bulletin are mandatory for all Department of the Army (DA) organizations within the continental U.S. (CONUS) and outside the continental U.S. (OCONUS) with an ammunition receipt, storage, and distribution mission. This bulletin is not intended for use by organizations with stocks in basic loads.

c. SB 742-1 contains additional information pertaining to frequency of test, sample selection, defect standards, and records and reports.

*This supply bulletin supersedes SB 742-1375-94-452, 21 April 1978.

2. Item Description

a. The M6 Electric Blasting Cap is the primary model used by U.S. Army. This cap consists of a base charge of RDX, an intermediate charge of lead azide and an ignition charge of smokeless powder, potassium chlorate, and lead salt of dinitro cresol, in an aluminum alloy cup. Two 12-foot lead wires, connected by a bridge wire in the ignition charge, extend through a rubber (or rubber and sulfur) plug assembly in the open end of cup. Two circumferential crimps secure plug assembly in cup. M6 caps are used to initiate high explosives with a blasting machine or other suitable source of electric power and are capable of detonating all standard military explosives. M6 caps replace older J-2 caps.

b. Other electric blasting caps can be tested according to procedures contained in this supply bulletin when so directed by AMCCOM. Item descriptions can be found in applicable technical manuals.

3. References

a. The following publications will provide more information on surveillance of subject items. This list is not to be considered all inclusive.

(1) AR 75-1, Malfunctions Involving Ammunition and Explosives.

(2) SB 742-1, Ammunition Surveillance Procedures.

(3) TM 9-1375-213-12, Demolition Materials.

(4) TM 9-1375-213-34, Demolition Materials.

(5) TM 43-0001-38, Army Ammunition Data Sheets for Demolition Materials.

b. Each item of ammunition peculiar equipment (APE) has an operational manual that should be consulted prior to and during use of that item. Manual is titled with APE number and nomenclature of APE item.

4. Safety

a. Visual examinations and surveillance function testing in this bulletin must be conducted according to provisions set forth in appropriate safety regulations and implementing instructions. Special attention must be devoted to technical manuals describing the item. A standing operating procedure (SOP) that specifies the safe-

ty requirements will be posted at the inspection and test site. Absence of a safety requirement in this or any other publication is not to be construed as meaning that precaution is unnecessary.

b. Function testing will only be conducted during daylight hours and in an area that is clear of flammable material such as dry grass, weeds, etc. Testing will not be conducted during electrical, rain, or snow storms or during any other conditions that might create a hazardous situation or adversely affect test results. Testing may be conducted indoors, but must be conducted according to any other applicable regulations, e.g., U.S. Environmental Protection Agency (EPA), local regulations, etc.

c. Blasting caps are a unique hazard because initiation is easier than with other demolition materials. A single cap can endanger personnel. Detonated in a hand, one cap can destroy that hand. Exposed personnel are considered safe from blast effects of a single cap at 50 feet. Approved eye protection must be worn at this distance because of fragments and other material propelled by cap detonation.

d. Blasting caps can be detonated by lightning and induced currents such as those emitted by radio frequency (RF) signals. For minimum safe distances with regard to transmitter power, refer to TM 9-1375-213-12.

e. Blasting caps are extremely sensitive. Caps must be handled carefully and must be protected from impact, shock, and extreme heat. Do not store blasting caps with other explosives. Personnel should wear hearing protection when testing blasting caps.

f. In event of a dud or misfire, personnel will not approach blasting cap for 30 minutes. Destruction of duds will be accomplished according to all applicable safety regulations and an approved SOP including protective equipment such as heat-resistance gloves, full face-shield, flame-resistant clothing, etc.

5. Personnel

Visual examination and function testing will be conducted under direct control of a Quality Assurance Specialist (Ammunition Surveillance) (QASAS).

SECTION II. SURVEILLANCE

6. Sample size

Unless otherwise directed, a representative sample size of 60 caps is required for a surveillance function test. To satisfy requirements of a periodic inspection prescribed in conjunction with a surveillance function test, additional sampling of item,

inner and outer packing may be required according to SB 742-1.

7. Sample selection

Sample items will be selected according to provisions of SB 742-1 except that no more than 10 items may be selected from any one box. If

samples are to be function tested at an installation other than one at which parent lot is stored, packing boxes and containers that are not shipped will be inspected. The appropriate part of DA Form 984 (Munitions Surveillance Report) will be completed prior to shipment. Samples that are shipped must be packed and marked according to SB 742-1. During selection, samples must be numbered 1 through 60. For safety reasons, do not mark numbers on caps. Use tape or numbered tags.

8. Surveillance test equipment

The following equipment is to be used in testing items according to this procedure:

- a. Shelter, personnel, APE 1937.
- b. APE 1980, universal resistance test instrument.
- c. APE 1984, electric firing instrument.
- d. APE 1984E001, blasting cap fixture and signal transfer box kit.
- e. Oven, preconditioning, APE 1916.
- f. Tank, immersion, APE 1901.
- g. Thermometer.
- h. Chamber, low-temperature, APE 1938.
- i. Table, function testing, APE 1903.
- j. Lead disks.

NOTE

Testing facilities must procure lead disks as required (reference OSM 2-50A, appendix NO-43, 7 Nov 56). Disks must be fabricated according to Military Specification QQ-L-201, from grade B, 8 lb sheet lead; each disk 1/8-inch thick by 1-inch square or diameter.

9. Preparation for test

a. Condition blasting caps as follows:

(1) Low-temperature dry phase. Blasting caps 1 through 20 will be conditioned at -40 ± 5 degrees F (-40 ± 2 degrees C) for 2 hours.

(2) High-temperature dry phase. Blasting caps 21 through 40 will be conditioned at 120 ± 5 degrees F (49 ± 2 degrees C) for 2 hours.

(3) Ambient temperature wet phase. Blasting caps 41 through 60 do not require temperature conditioning, but will be immersed in water to a depth of 3 feet for 4 hours at a temperature of 75 ± 5 degrees F (23 ± 5 degrees C).

b. Test temperature conditioned blasting caps within 15 minutes after conditioning. (If samples can be placed into an insulated box capable of maintaining temperature, 15 minute time limit can be extended to 4 hours.)

c. Set up the function test table so that blasting cap leads can be attached to the wire from the APE test set.

10. Test procedures

Purpose of this test is to evaluate safety in handling (ability of blasting cap to receive a small amount of extraneous electricity without detonating). The test also determines cap's reliability (ability to detonate completely, as evidenced by perforation of a lead disk, when an electric current of 0.50 amperes is applied to each cap). The APE listed above will be used for this test. All sample blasting caps will be tested as directed in following paragraphs.

NOTE

The person assigned to install blasting caps in fixture will carry key to control box or test set at all times to prevent unauthorized detonation of caps.

a. Center lead disk over a 15/16-inch hole in a metal block.

b. Fix blasting cap in an upright position so that cap base is in contact with lead disk.

c. Note and record resistance of blasting cap to nearest hundredth of an ohm.

d. Apply an electric current of 0.20 amperes for a period of not less than 5 seconds.

e. If the blasting cap does not detonate, apply an electric current of 0.50 amperes.

11. Observations

All observations of nonstandard conditions and malfunctions, especially those not included among defects listed in paragraphs 14 and 15 (below), or in SB 742-1, should be reported in full detail. Pictorial evidence of nonstandard conditions should be included whenever pertinent and practical. The following observations, as a minimum, must be reported.

a. Report any markings that are incorrect, misleading, incomplete, or unidentifiable.

b. Give location and extent of any rust, corrosion, damage, or deterioration.

c. Report the resistance of each blasting cap (including lead wires) to the nearest 0.01 ohm.

12. Definitions

Spalling is a condition that occurs when lead disk is not perforated by blasting cap; however, back side of lead disk is cracked, chipped, or otherwise missing particles of lead from force of impact.

13. Classification of defects

Defects observed during inspection and testing will be classified and reported according to paragraphs 14 and 15 below and with SB 742-1. Any defects or nonstandard conditions observed that are not listed below or in SB 742-1 will be described fully and reported with the recommendations of the QASAS as to classification.

14. Nonfunctioning defects

a. Critical—

- (1) Lead wires not shunted by twisting or by a short circuit tab.
- (2) Blasting cap split, cracked, or otherwise exposing explosive charge.
- (3) Corrosion (to extent damage is caused to blasting cap cup (casing)).

b. Major—

- (1) Marking misleading as to strength of blasting caps.
- (2) Longitudinal crack in lead wire insulation longer than 1/2-inch.
- (3) Longitudinal crack in lead wire insulation terminating in a circumferential crack.
- (4) Flaking of any part of lead wire insulation.
- (5) More than one circumferential crack at any point in wire that is normally bent more than 90 degrees (when in authorized packaging configuration).

c. Minor—

- (1) Corrosion.
- (2) Marking unidentifiable as to strength of blasting cap.
- (3) More than one circumferential crack in any segment of wire less than 6 inches long.
- (4) More than one longitudinal crack of less than 1/2-inch in lead wire insulation in any segment of wire less than 6 inches long.
- (5) Combination of a longitudinal crack less than 1/2-inch long with a circumferential crack in any segment of wire less than 6 inches long.

15. Functioning defects

The code following each functioning defect is for use by testing personnel only.

a. *Critical*—blasting cap detonates upon application of 0.20 amperes or less (HL001).

b. Major—

- (1) *Dud*. Blasting cap fails to detonate upon application of 0.50 amperes (HL020).
- (2) *Low-order detonation*. Back of lead disk is not cracked. This defect applies whenever no spalling whatsoever occurs on back of a lead disk that has not been perforated (DC021).

c. *Minor-low-order detonation*. Back of lead disk is cracked. This defect applies when spalling

occurs but does not result in at least a pinhole perforation (DC050).

16. Evaluation

Using the following criteria, and considering non-functional and functional characteristics separately, an interim condition code will be assigned according to SB 742-1. A lot will be classified condition code J and reported according to SB 742-1 if any critical defect is observed.

a. *Nonfunctional characteristics*.

(1) Serviceable for unrestricted issue and use. A lot not classified as condition code J will qualify as serviceable for unrestricted issue and use if the following requirements are met on inspection of 60 items:

- (a) Not more than 3 major defectives.
- (b) Not more than 5 minor defectives.

(2) Priority of issue. A lot not classified as condition code J or as serviceable for unrestricted issue and use will qualify as serviceable for priority of issue if following requirements are met on inspection of 60 items:

- (a) Not more than 8 major defectives.
- (b) Not more than 13 minor defectives.

(3) Unserviceable. A lot not classified as condition code J or as serviceable for unrestricted issue and use or for priority of issue will be classified as unserviceable.

b. *Functional codes*:

(1) *Code A*: A lot not classified as condition code J will qualify for functional code A if following requirements are met in test of 60 items:

- (a) Not more than 3 major defectives.
- (b) Not more than 5 minor defectives.

(2) *Code B*. A lot not classified as condition code J, or functional code A, will qualify for functional code B if following requirements are met in test of 60 items:

- (a) Not more than 8 major defectives.
- (b) Not more than 13 minor defectives.

(3) *Code D*. A lot not classified as condition code J, functional code A, or functional code B will be classified functional code D.

17. Records and Reports

Inspection and function test results will be recorded and reported on DA Form 984 and other appropriate forms as outlined in SB 742-1.

By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

Official:

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Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

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