

DEPARTMENT OF THE ARMY SUPPLY BULLETIN

CARTRIDGE, 40-MM, RED SMOKE,
GROUND MARKER, M713
(1310-B5060;
CARTRIDGE, 40-MM, GREEN SMOKE,
GROUND MARKER, M715
(1310-B508)';
AND
CARTRIDGE, 40-MM, YELLOW SMOKE,
GROUND MARKER, M716
(1310-B509)'
AMMUNITION SURVEILLANCE
PROCEDURES

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1988

**CARTRIDGE, 40-MM, RED SMOKE, GROUND MARKER,
 M713 (1310-B506);
 CARTRIDGE, 40-MM, GREEN SMOKE, GROUND MARKER,
 M715 (1310-B508);
 AND
 CARTRIDGE, 40-MM, YELLOW SMOKE, GROUND MARKER,
 M716 (1310-B509)
 AMMUNITION SURVEILLANCE PROCEDURES**

The proponent agency of this supply bulletin is the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). The 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 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 the subject items.

a. The visual inspection and function testing criteria in this procedure will be accomplished under a centralized control program managed by the 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. The provisions of this bulletin are mandatory for all Department of Army organizations within the continental United States and outside the continental United States (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 the frequency of inspection, sample selection, defect standards, and records and reports.

2. Item description.

a. These cartridges are used to provide aerial identification and location of troops on the ground and are designed to be fired from the 40-mm grenade launchers M79 and M203 (attached to M16/M16A1 rifle).

b. The cartridges consist of a cartridge case, a projectile with pyrotechnic smoke payload, and a pyrotechnic impact fuze.

(1) The cartridge case is a dual-chambered aluminum container housing a brass propellant cup. The propellant cup is held in the case by a crimped base plug which provides a pressure-type waterproof seal.

(2) The projectiles utilize a one-piece, aluminum body-ogive and a steel base. The payload consists of a pyrotechnic smoke mixture pressed into the body-ogive with a cylindrical cavity in the center. The fuze is cemented to the base of the projectile and protrudes into cylindrical cavity of the smoke mixture.

(3) The fuze is designed to arm at a minimum of 15 meters and at a maximum of 45 meters from the muzzle of the weapon.

c. The muzzle velocity is expected to be approximately 254 ft/s and the maximum range is 400 meters. Upon firing, the primer ignites the propellant charge. In addition to launching the projectile, propellant gases ignite the first fire mixture of the fuze in base of the projectile. The first fire mixture ignites a high-temperature transfer mixture contained in the steel cup. The transfer mixture burns during the first 15 meters of projectile flight.

(1) When the projectile is between 15 and 45 meters from the launcher muzzle, heat transfer through the steel cup ignites the delay mixture.

Upon impact, the delay casing breaks and the burning portion flies forward out of the fuze support, contacting and igniting the pyrotechnic smoke mixture.

(2) Ignition of the smoke mixture causes a build-up of pressure that dislodges the fuze support at the aft end of the projectile, thus allowing smoke to be emitted at the aft end of the projectile.

(3) Projectile impact prior to the minimum arming distance (15 meters) results in a dud. Between 15 and 45 meters from the launcher muzzle, the fuze may or may not function upon impact.

(4) In the event that the fuze fails to function upon impact, the output mixture provided in the front end of the delay casing acts as a backup to the impact feature. When the flame reaches this point (8 to 10 seconds after launch), the output mixture flashes and ignites the smoke mixture.

3. References.

a. The following publications will provide more information on the surveillance of the 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 43-0001-28, Artillery Ammunition.

(4) TM 9-1010-205-10, Operator's Manual, 40mm: Grenade Launcher, M79.

(5) TM 9-1010-221-10, Operator's Manual, 40mm: Grenade Launcher, M203.

(6) TM 9-1005-249-10, Rifle M16A1.

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

4. Safety.

a. Inspection and surveillance function testing must be conducted according to the provisions set forth in appropriate safety regulations and implementing instructions, with special attention given to the technical manuals describing item. A standing operating procedure (SOP) for this operation is required and will delineate specific safety requirements. 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 be conducted during daylight hours only and only in an area that is clear of flammable material such as grass, weeds, etc. Testing will not be conducted during electrical, rain, or snow storms, or during any other conditions that might create a hazardous condition or adversely affect test results. Testing must be conducted according to any other applicable regulations; e.g., U.S. Environmental Protection Agency (EPA), local regulations, etc.

c. Do not test cartridges if wind velocities exceed 15 mi/h.

d. Any concentration of smoke is potentially hazardous when inhaled. If it becomes necessary for personnel to be in concentrations of smoke, a protective mask must be worn. Visible evidence of smoke will require personnel to mask.

(1) Personnel experiencing breathing difficulties or discomfort will also serve as a signal for all similarly exposed personnel to mask.

(2) If smoke enters the shelter, personnel must remain masked until smoke is removed.

Precautions should be taken to ensure that concentrations of smoke in the personnel shelter do not

exceed the capability of the protective mask.

(3) Assistance should be sought from local medical authority's industrial hygienist to determine potential in-shelter concentrations.

(4) Bathing and laundering of clothing following function test operations will eliminate the risk of skin irritation following exposure to smoke.

e. Dud cartridges will be recovered and destroyed according to all applicable safety regulations and an approved SOP including protective equipment such as heat-resistant gloves, full-face

shield, heat-resistant clothing, etc. A waiting time of 15 minutes minimum will be observed before approaching dud cartridges.

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 sample size of 44 items is required to make up a representative sample from a lot for a surveillance function test. To satisfy the requirements of a periodic inspection prescribed in conjunction with a surveillance function test, additional sampling of the item, inner and outer packing may be required according to SB 742-1.

7. Sample selection. Sample items will be selected according to the provisions of SB 742-1 except that no more than six items may be selected from any one box. If samples are to be function tested at an installation other than one at which the parent lot is stored, packing boxes and containers that are not shipped will also 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 sample selection, number items 1 to 44.

8. Surveillance test equipment. The following equipment is to be used in testing according to this procedure:

- a. Oven, preconditioning, APE 1916M1.
- b. Chamber, low-temperature, APE 1938/1904.
- c. Stopwatch, 2 each.
- d. APE 1902, holding device with APE 1902-E004 kit, holding, 40-mm for M79 launcher.
- e. APE 1902, holding device with APE 1902-E006 kit, holding, 40-mm for M203 launcher.

9. Preparation for test.

a. Condition cartridges 1 through 10 for at least 16 hours at 160 +/- 5 degrees F (71 +/- 2 degrees C). Fire the cartridges within 15 minutes after removal from oven.

b. Condition cartridges 11 through 34 for at least 16 hours at 70 +/- 5 degrees F (21 +/- 2 degrees C). Fire the cartridges within 15 minutes.

c. Condition cartridges 35 through 44 for at least 16 hours at - 65 +/- 5 degrees F (- 54 +/- 2 degrees C). Fire the cartridges within 15 minutes after removal from the low-temperature chamber.

NOTE

If samples can be placed into an insulated box capable of maintaining temperature, the 15-minute time limit can be extended up to 4 hours.

d. Set up the launcher on an approved mount according to the appropriate manual so that the projectile impacts a minimum of 300 meters down-range. (The angle of elevation of the launcher should be 22 +/- 2 degrees. The height of the muzzle from the ground should be 60 +/- 2 inches.)

10. Test Procedures.

NOTE

The person installing cartridges into the launcher will carry the key to the control box at all times to prevent unauthorized access to the lanyard.

a. Place the sample cartridge into the launcher and assure that the lanyard is properly attached to the launcher. Then return to the personnel shelter.

b. From inside the shelter unlock the lanyard box and pull on lanyard to function launcher.

NOTE

Facilities with pneumatic firing equipment will follow local operating procedures for functioning the launcher.

c. Note and record the observations in paragraphs 11 and 15, below.

d. Function test the remaining samples as instructed above.

11. Observations. All observations of nonstandard conditions and malfunctions, especially those not included among the defects listed in paragraphs 15 and 16, 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 the location and extent of any rust, corrosion, damage, or deterioration.

c. Give the duration of smoke to the nearest second.

d. Give the flame time to the nearest second.

12. Definitions.

a. Dud. The cartridge functions but the projectile does not emit smoke.

b. Misfire. The cartridge does not function.

c. Delay. The time between the launch of the projectile and the initial emission of smoke.

d. Flaming time. The interruption of the smoke emission by flame or black smoke with a gross reduction of desired smoke.

13. Classification of defects. Defects observed during inspection and testing will be classified and reported according to paragraphs 14 and 15 and 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) Marking incorrect or misleading as to the type or color of the cartridge.

(2) Head of primer above flush with the base of cartridge case (high primer).

(3) Primer inverted in the cartridge case.

b. Major-

(1) Marking unidentifiable.

(2) Major damage to the cartridge.

(3) Major rust or corrosion on the cartridge.

c. Minor-

(1) Marking partially incorrect, illegible, but not misleading as to the type of round.

(2) Minor damage to the cartridge that will not affect functioning.

(3) Minor rust or corrosion on the cartridge.

15. Functioning defects.

a. Critical-

(1) Incorrect color of smoke (CC002).

(2) Projectile sticks in launcher (BA004).

(3) Smoke ignites in launcher (JB001).

(4) Projectile bursts at less than 50 feet from launcher (BA002).

(5) Projectile bursts in launcher (BA001).

b. Major-

(1) Smoke is visible in volume less than 17 seconds (JB020).

(2) Delay time is more than 18 seconds (JBO21).

(3) Dud (BC021).

(4) Flame time exceeds 4 seconds (JB022).

(5) Projectile impacts at less than 250 meters (JB023).

(6) Cartridges will not chamber (JA024).

(7) Misfire (BC020).

c. Minor-smoke is visible in volume less than 22 seconds but not less than 20 seconds (JB050).

NOTE

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

16. Evaluation. Using the following criteria and considering nonfunctional 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 the inspection of 44 items:

(a) Not more than 4 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 the following requirements are met on the inspection of 44 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 the following requirements are met in the test of 44 items:

(a) Not more than 4 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 the following requirements are met in the test of 44 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:

Official:

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