

DEPARTMENT OF THE ARMY SUPPLY BULLETIN

FIRING DEVICE, MULTI-PURPOSE,
M142 (1375-ML03)
AMMUNITION SURVEILLANCE PROCEDURES

HEADQUARTERS, DEPARTMENT OF THE ARMY, WASHINGTON, DC
9 December 1988

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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 Firing Device, Multi-Purpose, M142.

a. 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 the assessment of serviceability for individual lots of firing devices only.

b. Provisions of this bulletin are mandatory for use by all Department of Army (DA) organizations within continental U.S. (CONUS) and outside 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.

2. Item description. M142 mechanical firing device is intended for use with anti-personnel mines

and when setting up boobytraps using demolition charges. This device provides a simple means of mechanical initiation of a boobytrap by pressure, pull, pressure release, or tension release.

3. References.

- a. AR 75-1, Malfunctions Involving Ammunition and Explosives.
- b. SB 742-1, Ammunition Surveillance Procedures.
- c. TM 43-0001-38, Army Ammunition Data Sheets for Demolition Materials.

4. Safety. Surveillance function testing must be

Section II. SURVEILLANCE

6. Size of sample. Unless otherwise directed, a sample size of 60 firing devices 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 the item, inner and outer packing may be required per SB 742-1.

7. Sample selection. Sample firing devices will be selected according to provisions of SB 742-1 with exception that not more than five firing devices 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 be inspected and the appropriate part of DA Form 984 (Munitions Surveillance Report) completed prior to shipment. Samples that are shipped must be packed and marked according to SB 742-1. During sample selection number firing devices from 1 through 60.

8. Surveillance test equipment. The following ammunition peculiar equipment (APE) is to be used in testing M142 firing device according to procedures described herein:

- a. APE 1901, Tank, immersion.
- b. APE 1903, table, ammo testing.
- c. APE 1907, tester, pressure release.
- d. APE 1917, gage, pressure.
- e. APE 1938, chamber, low temperature.

conducted according to the provisions set forth in appropriate safety regulations and implementing instructions with special attention devoted to technical manuals describing the item. A standing operations procedure (SOP) for this item is required and will delineate specific safety requirements. Any absence of a safety requirement in this or any other publication is not to be construed as meaning that precaution is unnecessary.

5. Personnel. Visual examination and function testing will be conducted under direct control of a Quality Assurance Specialist (Ammunition Surveillance) hereinafter referred to as a QASAS.

9. Preparation for test. a. Assure firing devices and coupling bases are numbered from 1 to 60.

b. Assure safety pins are in place.

c. Attach each coupling base to its respective firing device. Hereafter each reference to a firing device will mean a firing device with a coupling base attached.

d. Completely submerge firing devices 1 through 5, 16 through 20, 31 through 35, and 46 through 50 in six inches of water at 70 +/5 degrees F (21 +/3 degrees C) for 60 minutes. APE 1901 should be used for this part of test. Wipe firing devices dry before conducting functioning portion of test.

e. Temperature condition firing devices 6 through 10, 21 through 25, 36 through 40 and 51 through 55 at -49 +/5 degrees F (-45 +/3 degrees C) for 16 hours. Fire within 15 minutes after removal from temperature conditioning.

f. Firing devices 11 through 15, 26 through 30, 41 through 45 and 56 through 60 will not require any special conditioning.

10. Test procedure. Refer to table 1-1 (below) for a summary of firing devices, functioning modes, and associated conditioning. The temperature conditioned firing devices will be tested within 15 minutes after their removal from temperature chamber.

Table 1-1.

Type of Test	Samples	Water Cond	Cold Cond	No Cond
Pull Phase	1-15	1-5	6-10	11-15
Pressure Phase	16-30	16-20	21-25	26-30
Pressure-Release Phase	31-45	31-35	36-40	41-45
Tension-Release Phase	46-60	46-50	51-55	56-60

a. Pull phase.

- (1) Firing devices 1 through 15 only will be used for this phase.
- (2) Secure firing device on a holding fixture on APE 1903 such that the firing device is in a horizontal position with sear plate side up.
- (3) Check safety pin for ease of removal, but do not remove. Assure legs of safety pin are straight. Assure round and square head pins are in place.
- (4) Attach approximately 10 inches of trip wire to firing device by threading it through hole on sear plate.
- (5) Attach a tension recording scale to other end of wire.
- (6) Remove square head pin.
- (7) Remove safety pin.
- (8) Pull scale in a direction perpendicular to longitudinal axis of device until firing pin is released.
- (9) Record tension to nearest half pound, required to release firing pin.
- (10) Record order of functioning (high order, low order or dud).

b. Pressure phase.

- (1) Firing devices 16 through 30 will be used for this phase.
- (2) Secure firing device in a holder such that firing device is in a horizontal position with sear plate side up.
- (3) Position holder on APE 1907 with sear plate directly under APE 1907 gauge.
- (4) Check safety pin for ease of removal, but do not remove. Assure legs of safety pin are straight. Assure round and square head pin are in place.
- (5) Remove square head pin.
- (6) Remove safety pin.
- (7) Function firing device by gradually applying pressure with pressure end of tension recording scale on APE 1907.
- (8) Record amount of pressure to nearest half pound, required to release firing pin.
- (9) Record order of functioning (high order, low order or dud).

c. Pressure sure release phase.

- (1) Firing devices 31 through 45 will be used for this phase.
- (2) Secure firing device in a holder such that firing device is in a horizontal position with sear plate up.
- (3) Position holder on APE 1907 with sear plate directly under APE 1907 weight holder.
- (4) Check safety pin for ease of removal, but do not remove. Assure legs of safety pin are

straight. Assure round and square head pins are in place.

- (5) Place a 4-pound restraining load in 2pound increments on firing device (in weight holder).
- (6) Remove round head pin.
- (7) Remove safety pin.
- (8) Function firing device by removing two pounds of restraining load.
- (9) Record order of functioning (high order, low order or dud).

d. Tension release phase.

- (1) Firing devices 46 through will be used for this phase.
- (2) Secure firing device in a holder fixture on APE 1903 such that firing device is in a horizontal position with sear plate side up.
- (3) Fit tension release attachment through trip wire hole in sear plate.
- (4) Check safety pin for ease of removal, but do not remove. Assure legs of safety pin are straight. Assure round and square head pins are in place.
- (5) Affix approximately three feet of trip wire to gooseneck arm of tension release attachment.
- (6) Thread the other end of wire through a pulley assembly and attach a tension recording scale.
- (7) Pull scale until a tension of 3 +/-0.5 pounds is exerted on trip wire.
- (8) After desired tension is attained, attach this end of trip wire to a stationary object being careful to maintain tension.
- (9) Check tension release attachment and note if gooseneck arm is adjacent to tip of straight arm.
- (10) Remove round head pin.
- (11) Remove safety pin.
- (12) Function firing device by cutting trip wire.
- (13) Record order of functioning (high order, low order, or dud).

e. Trip wire breakage.

- (1) Trip wire from device 1-60 will be used for this phase.
- (2) Divide 45 feet of trip wire into three lengths of 10, 15 and 20 feet each.
- (3) Subject each section of trip wire to a pull of 12 pounds.
- (4) Record any instances of trip wire breaking under a tension of 12 pounds or less.

11. Observations. All observations of nonstandard conditions and malfunctions especially those not included among defects listed in paragraphs 15 and 16, should be described in full detail. Pictorial

evidence of nonstandard conditions, whenever pertinent and practical, should be included. Observations to be recorded are as follows:

- a. Tension (to nearest one-half pound) required to release firing pin by pulling on trip wire.
- b. Pressure (to nearest one-half pound) required to release firing pin by applying weight to sear plate.
- c. Order of functioning (high order, low order or dud).
- d. All instances of any of following:
 - (1) Marking misleading, incomplete, or unidentifiable.
 - (2) Rust or corrosion on pins or container; give location and extent.
 - (3) Cracks on firing device or coupling base.
 - (4) Occurrence of any nonstandard conditions or malfunctions classified as defects in paragraphs 12 and 13 below, or SB 742-1; but which, in opinion of responsible personnel, merits consideration.

12. Definitions. a. *Low order detonation.* A detonation of less than usual intensity, accompanied by low noise and evaluated to be of insufficient force to detonate a blasting cap.

b. *Misfire.* Device appears to function properly but primer does not fire.

c. *Dud.* Device does not function properly.

13. Classification of defects. Defects observed during inspection and testing will be classified and reported according to paragraphs 15 and 16 (below) 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 recommendation of QASAS as to classification.

14. Nonfunctioning defects. a. *Major-*

(1) Any of following components missing or damaged (to extent which would preclude use of firing device).

- (a) Safety pin.
 - (b) Coupling base assembly.
 - (c) Screws or nails.
 - (d) Square head pin.
 - (e) Round head pin.
 - (f) Trip wire.
 - (g) Tension release attachment.
 - (2) Cracks in firing device.
 - (3) Cracks in coupling device.
 - (4) Major rust on pins or container.
 - (5) Major corrosion on pins or container.
- b. *Minor-*
- (1) Cord from safety pin missing.
 - (2) Minor rust on pins or container.
 - (3) Minor corrosion on pins or container.
 - (4) Setting instructions missing.

(5) Marking missing or illegible.

15. Functioning defects. The code following each functioning defect is for use by testing facility personnel only.

a. *Critical-*

- (1) Firing device functions prematurely-
 - (a) With less than 3 pounds of tension applied to trip wire (pull phase). (HT001)
 - (b) Prior to cutting trip wire (tension release phase) (HT002)
 - (c) With less than 13 pounds of pressure applied to sear plate (pressure phase). (HT003)
 - (d) Prior to removal of 2 pounds of restraining load (pressure release phase). (HT004)

b. *Major-*

- (1) Firing pin fails to release after-
 - (a) More than 12 pounds of tension is exerted on trip wire (pull phase). (HT020)
 - (b) Trip wire is cut (tension release phase). (HT021)
 - (c) Being subjected to more than 30 pounds of pressure (pressure phase). (HT022)
 - (d) Two pounds of restraining load is removed (pressure release phase). (HT023)
- (2) Tension on trip wire required to release firing pin is greater than 1 pound (pull phase). (HT024)
- (3) Pressure on sear plate required to release firing pin is greater than 30 pounds (pressure phase). (HT025)
- (4) Firing pin releases but primer fails to fire. (HB021)
- (5) Trip wire breaks at a tension of 12 pounds or less. (HT026)
- (6) Primer fires low order; would have resulted in a dud. (HB022)

Note

Whenever frequency of "low order primer" is such that classifying "low order" as a major defect would place lot in a code D, lot should be retested with blasting caps of known good quality assembled to coupling base to determine whether these "low order primers" can or cannot detonate blasting caps. Assure proper safety precautions are followed and operations are performed remotely when using blasting caps. Adequate SOP must be available.

c. *Minor-*

- (1) Tension on trip wire required to release firing pin is less than 4 pounds but not less than 3 pounds. (HT050)
- (2) Tension on trip wire required to release firing pin is more than 9 pounds but not more than 12 pounds. (HT051)

(3) Pressure on sear plate required to release firing pin is less than 15 pounds but not less than 13 pounds. (HT052)

(4) Pressure on sear plate required to release firing pin is more than 25 pounds but not more than 30 pounds. (HT053)

d. For reporting a defect other than ones listed in para 15a, b, or c above, installations performing function test should use code HT090.

16. Evaluation. Using 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 per 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 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

- (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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To be distributed in accordance with DA Form 12-34, requirements for Ammunition Surveillance Procedure Firing Devices, Demolition.

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