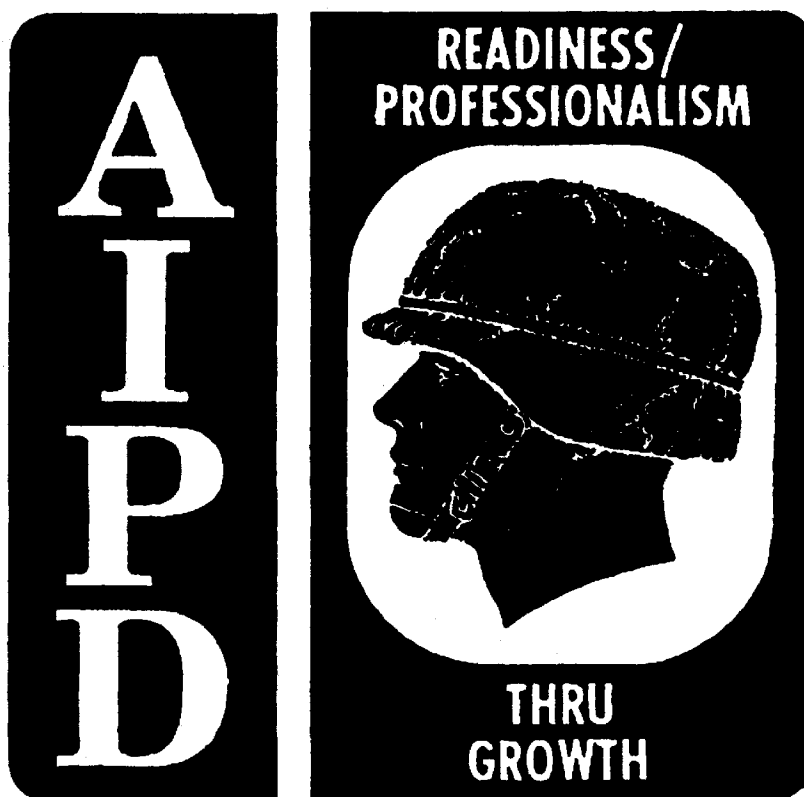


SUBCOURSE  
MM0159

EDITION  
A

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CONVENTIONAL AMMUNITION  
MALFUNCTION INVESTIGATION



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THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT

ARMY CORRESPONDENCE COURSE PROGRAM

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**CONVENTIONAL AMMUNITION MALFUNCTION INVESTIGATION**

Subcourse Number MM0159

**EDITION A**

Missile and Munitions  
United States Army Combined Arms Support Command  
Fort Lee, Virginia 23801-1809

5 Credit Hours

Edition Date: May 1992

**SUBCOURSE OVERVIEW**

This subcourse is designed to identify the responsibilities of the individuals and agencies involved in an ammunition malfunction, then cover malfunction investigation and reporting requirements.

There are no prerequisites for this subcourse.

This subcourse reflects the doctrine which was current at the time it was prepared. In your own work situation, always refer to the latest official publications.

Unless otherwise stated, the masculine gender of singular pronouns is used to refer to both men and women.

TERMINAL LEARNING OBJECTIVE

**ACTION:** You will identify action to take in the event of an ammunition malfunction, to include identifying responsibilities, conducting the preliminary investigation, preparing the preliminary reports, conducting a follow-up investigation, and preparing the detailed report.

**CONDITION:** You will have access to extracts from AR 75-1 and TM 43-0001-28. You will need only the material contained in this subcourse.

**STANDARD:** To demonstrate competency of this task, you must achieve a minimum of 70% on the subcourse examination.

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AR 75 - 1	Malfunctions Involving Ammunition and Explosives (RCS CS GLD-1961 [MIN]), 1 March 1989.
TM 43-0001-28	Army Ammunition Data Sheets for Artillery Ammunition: Guns, Howitzers, Mortars, Recoilless Rifles, Grenade Launchers and Artillery Fuzes (Federal Supply Class 1310, 1315, 1320, 1390), Change 22, August 1991.

Use the above publication extracts to take this subcourse. At the time we wrote this subcourse, these were the current publications. In your own work situation, always refer to the latest official publications.

## LESSON 1

### AMMUNITION MALFUNCTION INVESTIGATING AND REPORTING

MQS II Critical Task: 03-4010.01-0008

## OVERVIEW

### LESSON DESCRIPTION

In this lesson you will learn the definitions of the terms used in ammunition malfunction investigations and reports. You will identify the responsibilities of the individuals and agencies involved in malfunction investigating and reporting. You will learn the procedures to follow to report a conventional ammunition malfunction.

### TERMINAL LEARNING OBJECTIVE

**ACTION:** Define the terms used to describe a conventional ammunition malfunction, and the responsibilities of the specific individuals and agencies involved. Identify malfunction reporting requirements. Learn to prepare malfunction reports.

**CONDITION:** You will be given a description of the terms used, the investigating procedures, the reporting procedures, and a blank DA Form 4379-R.

**STANDARD:** Given a malfunction situation, you will identify the responsibilities of the people involved, determine the class of the malfunction, and prepare a DA Form 4379-R.

**REFERENCES:** The material contained in this lesson was derived from AR 75-1, TB 9-1300-385, and TM 43-0001-28.

## INTRODUCTION

As an Ammunition Officer you must be aware that no matter how reliable and proven a round of ammunition or a weapon system is, under various conditions it may fail to function as designed or intended. Since you will be among the first to be notified when a malfunction occurs, you must be familiar with malfunction reporting procedures. You must provide detailed and accurate information, since an incomplete investigation could cost both human life and large amounts of money. You must also be able to determine the difference between misfires, hangfires, and duds in order to complete the report.

### PART A: TERMINOLOGY

In order to conduct a malfunction investigation, you must first understand the terminology involved. Let's first cover the terms used in malfunction investigating and reporting.

A malfunction is the failure of an ammunition item to function as expected when fired or launched, or the functioning of explosive items under conditions that should not cause functioning. Malfunctions include misfires, hangfires, and duds. Malfunctions also include abnormal or premature functioning of

explosive ammunition items, warheads, missiles, and rockets during normal handling, maintenance, storage, transportation, and tactical deployment. Not included are accidents and incidents resulting from negligence, malpractice, or unusual situations such as vehicle accidents or fires.

Malfunctions are divided into three classes: A, B, and C.

- Class A malfunctions are those that result in death or major injury, and those that have adverse political implications.
- Class B malfunctions are those that result in damage to major equipment that cannot be repaired at unit level, and those that result in an ammunition suspension that significantly impacts readiness or training.
- Class C malfunctions are those not included in Class A or Class B.

The types of malfunctions are described as follows:

- A misfire is the complete or partial failure of the primer or propelling charge of a round to function.
- A hangfire is an undesired delay in the functioning of a firing system. A hangfire for a rocket occurs if the rocket propellant is ignited by the firing impulse, but the rocket fails to leave the launcher within the expected time. (Applies to HYDRA-70/2.75 inch rocket.)
- A dud is an explosive munition that fails to arm as intended, or fails to explode after being armed. Avoid the common tendency to refer to all malfunctions as duds.

Suspended munitions are ammunition items withdrawn from issue or use, with or without qualifications, due to a suspected or confirmed unsafe or other defective condition. Suspensions result directly from malfunction reports, field reports, and surveillance function testing. They may be either temporary or permanent. A temporary suspension is an interim order prohibiting the issue, movement, or use of an item due to an unsafe or defective condition that is unconfirmed. A permanent suspension is a permanent order prohibiting the issue, movement, or use of an item when an investigation confirms an unsafe or defective condition.

Malfunctions may be caused by defective ammunition, defective weapons, or malpractice.

Some examples of ammunition defects that can cause malfunctions are: a wet propelling charge, a damaged rotating band, and a fixed round with a loose projectile. Improper storage of white phosphorus (WP) ammunition can also cause a malfunction.

A serious defect is one which, as a result of improper design, manufacture, handling, or storage, could cause a malfunction when ammunition is handled or fired.

Defective weapons can cause ammunition not to function as intended. A weapon is any device used to launch a projectile, a rocket, or a guided missile. Examples are rifles, cannons, rocket launchers, and mortars. Some defects are as follows:

- A damaged or missing firing pin.
- A faulty safety and arming mechanism.

- Excessive rust or corrosion.
- An improper recoil.
- Damaged or missing parts.

Human error, sometimes called malpractice, is any accident or incident caused by the misuse of the weapon or ammunition on the part of the user. This is probably the most common cause of apparent ammunition malfunctions. Some common human errors are as follows:

- Failing to properly maintain the ammunition or the weapon.
- Failing to follow correct procedures.
- Using incorrect settings or adjustments.
- Using suspended, restricted, or defective items.
- Using an excessive or an insufficient propelling charge.
- Operating under unsafe conditions, such as adverse weather, or obstructions in the line of fire.

Refer to the Glossary in the extract of AR 75-1 (Appendix) for clarification of any other relevant terms.

## **PART B: IDENTIFICATION OF RESPONSIBILITIES**

### **Responsibilities When a Malfunction Occurs**

When defective ammunition is the suspected cause of a malfunction, the responsibilities go from the point of the malfunction site up the chain of command. See Figure 1-1.

The commander or senior person in charge of the using element where the malfunction occurred will take the following actions:

- Immediately cease firing the suspected ammunition.
- Contact the local ammunition officer of the unit where the ammunition was stored and issued.
- Give all available facts on the malfunction to the local ammunition officer.

The local ammunition officer, with the local quality assurance specialist (ammunition surveillance) (QASAS) and the Army Materiel Command (AMC) weapon representative, when available, will take the following actions:

- Gather the data required for the preliminary report.
- Locally suspend the affected lot of ammunition until disposition instructions are received from the US Army Armament, Munitions, and Chemical Command (AMCCOM) or the US Army Missile Command (MICOM).

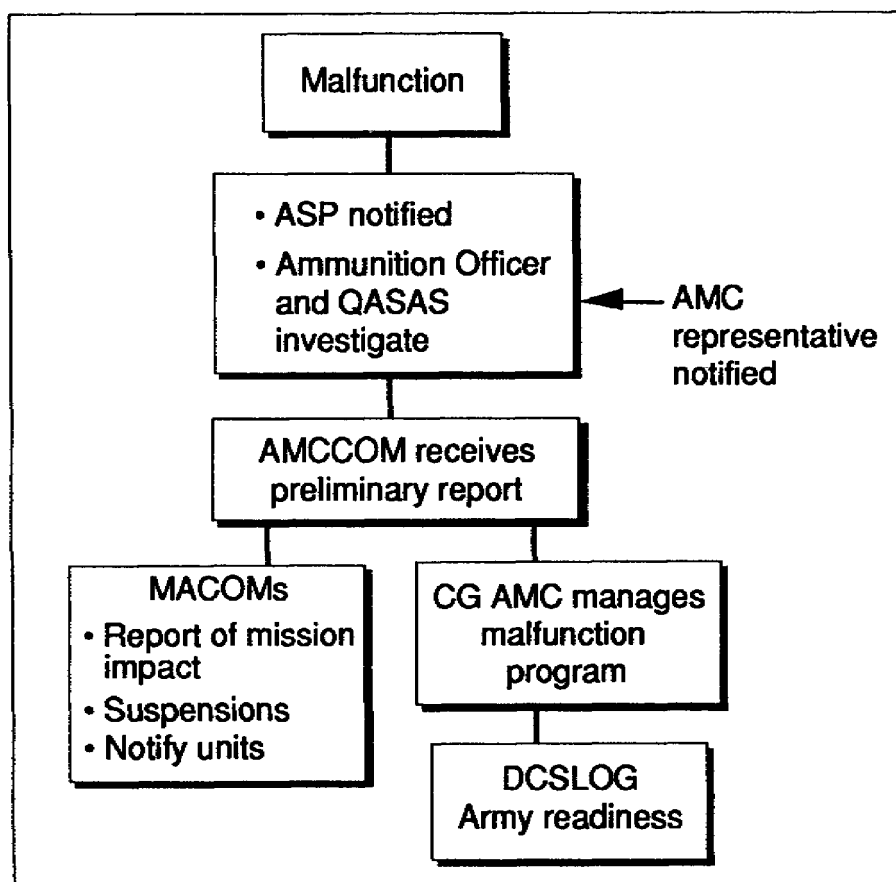


Figure 1-1. Responsible elements

- Submit the preliminary report immediately by telephone, teletype, or the fastest means possible to the Commander, AMCCOM, according to AR 75-1, paragraph 2.f. This must be done even during combat operations.

The Commander, AMCCOM, will take the following actions:

- Issue suspension or restriction notices to all commanders of major Army commands (MACOMs).
- If the suspension will create a serious impact on readiness or training, issue a temporary suspension and submit a serious impact statement to the Commanding General (CG), AMC for approval.
- Monitor accumulated suspensions or restrictions, assess their effect on readiness at wholesale and retail levels, and notify AMC if a serious mission impact is identified.
- Decide within 24 hours after receipt of the preliminary report whether an on-site investigation by the Department of the Army investigation team for malfunctions (DAITM) is required, and advise the reporting organization of this decision.

The commanders of MACOMs will designate a point of contact (POC) to accomplish the following actions:

- Notify all units within their command of the suspension or restriction.
- Receive, coordinate, or initiate reports of serious mission impacts resulting from the suspension or restriction.
- Report serious mission impacts that cannot be corrected within the MACOM to AMCCOM.
- Support the DAITM, if it is used.

The CG, AMC will take the following actions:

- Manage the malfunction investigation program and the suspension and release program, and provide a budget for both programs.
- Review and approve serious impact suspensions, if readiness is not affected, and notify the Headquarters, Department of the Army (HQDA), or—
- Refer serious impact suspensions to HQDA for a decision if the suspensions will affect the readiness of the Army.

The Deputy Chief of Staff for Logistics (DCSLOG) at HQDA will provide the final decision on type, block, or serious impact suspensions or restrictions affecting the readiness of the Army.

- A type suspension or restriction is one that is applied to all lots of one model number, including all modifications or variations produced; for example: Ctg 105mm HEP-T M393 series.
- Block suspension or restriction applies to all lots of one particular modification or variation of a model number, for example: Ctg 105mm HEP-T M393A1.
- A serious impact suspension or restriction: 1. Results in reducing serviceable assets of a munitions item to less than 50 percent of the stockpile; 2. Is determined to have a significant impact on Army readiness regardless of percentage of stockpile affected; or 3. Prevents a unit from meeting its operational commitment.

## **Responsibilities When the DAITM is Used**

The DAITM is authorized to conduct an in-depth, on-site inquiry to determine the conditions, the chain of events, and the probable cause of the malfunction in order to initiate corrective action Army-wide. When the DAITM is used, responsibilities go back down the chain of command.

AMCCOM will take the following actions:

- Determine, within 24 hours of receiving the preliminary report, whether an on-site investigation by DAITM is required, and notify the reporting organization of this decision.
- Direct the shipment of samples or residue as required.
- Ensure that the DAITM provides an exit briefing to the affected MACOM.

The MACOM experiencing the malfunction will take the following actions:



- Designate a senior POC who will ensure that all information gathered is provided to the DAITM.
- Coordinate the shipment of samples or residue as directed by the DAITM or AMC.
- Ensure that the personnel involved are available to the DAITM for interviews.
- Coordinate with the installation commander for EOD support.

The installation commander will take the following actions:

- Preserve the malfunction site until the investigation is complete, or until notified that the DAITM will not conduct an on-site investigation.
- Provide support and liaison, including EOD support to the DAITM.
- Coordinate with the unit experiencing the malfunction, and arrange interviews with personnel.
- Arrange for the shipment of samples or residue. All fragments and residue will be kept for 90 days after the malfunction. If disposition instructions are not received within 90 days, local disposition is authorized.

The DAITM will take the following actions:

- Interview witnesses and others involved.
- Examine the malfunction site, and search for fragments.
- Examine storage facilities.
- Examine the ammunition remaining in storage.
- Review the log book for the weapon or missile.
- Review any other material as required.

## **Guided Missile and Rocket Malfunctions**

The responsibilities above pertain to malfunctions involving conventional ammunition. If the malfunction involves a guided missile or large rocket (GMLR), the responsibilities differ as follows:

- Submit preliminary reports to the Commander, MICOM, Fort Lee, Virginia.
- The MICOM commander issues temporary notices for type, block, or serious impact suspensions or restrictions of guided missiles and large rockets referred to AMC for approval.

## **PART C: REPORTING PROCEDURES**

Now that you are familiar with the terminology and the responsibilities associated with conventional ammunition malfunctions, you can conduct a preliminary investigation and prepare a preliminary report. This lesson covers procedures for a malfunction involving conventional ammunition, chemical ammunition, or GMLR.

## **Preliminary Reports**

The local ammunition officer of the combat force concerned uses the DA Form 4379-R to compile the preliminary report. The same form is used to submit the written detailed report within 10 days. The preliminary report will include all available information.

At Continental United States (CONUS) installations, reports of conventional ammunition malfunctions are transmitted to AMCCOM. In overseas commands, preliminary reports are relayed to the commander or a designated representative, who forwards the reports to AMCCOM.

The preliminary report for a conventional ammunition malfunction should contain all information available that is requested on the DA Form 4379-R. Do not delay the report if some information is not available.

The preliminary report for a GMLR malfunction is prepared and submitted in the same way as for conventional ammunition, except as follows:

- GMLR malfunction reports are sent to MICOM at Fort Lee, Virginia.
- GMLR malfunctions are reporting on DA Form 4379-1-R (Missile and Rocket Malfunction Report).

Remember guided missiles and large rockets include:

- All guided missiles and large rockets with non-nuclear, nuclear, or chemical capability; either in complete round configuration or in separately packaged items for issue in complete round assembly.
- Solid and liquid propellant.
- Explosive components for guided missiles and large rockets.

## **Detailed Reports**

A detailed written report bearing the same report number as the preliminary report will follow the preliminary report within 10 days of the malfunction. The detailed report must contain the following information:

- A completed DA Form 4379-R or DA Form 4379-1-R, as appropriate.
- Pictorial evidence, if available.
- Eyewitness accounts or statements, if available.
- Any other pertinent information, such as copies of records and reports concerning the ammunition involved in the malfunction.

## **Preparing the DA Form 4379-R**

When preparing the DA Form 4379-R, make entries in all of the blocks. If a block is not applicable to the report, enter "NA". If the requested information is not available within the specified reporting time, enter "UNK" (for "unknown").

NOTE: Study the examples given in Figure 1-2 and Figure 1-3 as you read the following description of each block.

Block 1. Enter the report number. It consists of the unit DODAAC, the number of reports submitted, and the two-digit calendar year. In the example, the unit DODAAC is W1EAA, this is the first malfunction of the year, and the year is 1991. The report number is "W1EAA-1-91." Use this report number in all correspondence on this malfunction.

Block 2. Enter the complete nomenclature for the item that malfunctioned. Include as applicable the caliber, type, model, NSN, DODIC, lot number, and serial number (if available).

Block 3. Provide the following information, as appropriate. If necessary, continue on the back of the form or on a separate sheet of paper:

- For small arms and both fixed and semifixed conventional ammunition (including mortar rounds), enter the fuze type, model, and lot number. Also enter the headstamp of the cartridge case (the manufacturer's symbol and the year of manufacture). See Figure 1-4.
- For separate-loading conventional ammunition, enter the projectile caliber, type, model, NSN, DODIC, lot number, and kind of filler. Enter the type and lot number of the booster or burster. Enter the propelling charge caliber, type, model, NSN, DODIC, lot number, and weight, including the number of increments used with the round that malfunctioned. Note the physical condition of the propelling charge bag or bags and the wrappings. Provide the pressure and velocity of the round that malfunctioned, if available. Enter the fuze type, model, NSN, DODIC, and lot number. State whether the fuze was properly assembled and seated with a fuze wrench prior to loading. Finally, list the primer type, model, NSN, DODIC, and lot number. See Figure 1-5.
- For all other conventional munitions (such as grenades, rockets, mines, smoke pots, pyrotechnics, demolition items, cartridge-actuated devices, and propellant-actuated devices), enter the type, model, NSN, DODIC, and lot number of the end item and any components, such as fuzes, rocket motors, and bursters. Also, provide the type of filler present in chemical munitions.
- For conventional or chemical-filled warheads and warhead sections that are not assembled to GMLR, enter the type of filler present in chemical munitions; the type, model, and lot number of the fuze; and the type, model, and lot number of the propulsion system. Also, give the type, model, and lot number of the adaption kit or adaption kit component involved in the malfunction.

Block 4. Enter a brief description of the malfunction.

Block 5. Enter the geographic location where the malfunction occurred.

Block 6. Enter the activity and address of the person to contact to gain access to the malfunction site.

Block 7. Enter the unit that was firing at the time of the malfunction.

Block 8. Enter the date and the local military time of the malfunction.

Block 9. Enter any casualties (killed, hospitalized, other injuries) that resulted from the malfunction.

<b>AMMUNITION MALFUNCTION REPORT</b> For use of this form, see AR 75-1; the proponent agency is DCSLOG				1. REPORT NO. WIEAA-1-91	Requirements control Symbol - CSGLD 1961
2. MALFUNCTIONING ITEM Chg. 1 lb. TNT Demo Blk, IOP-5-26, 1375-00-935-6139-M032			3. ITEM COMPONENTS (See back of form)		
4. MALFUNCTION DESCRIPTION Premature detonation					
5. SITE OF MALFUNCTION Range 50		6. UNIT CONTROLLING SITE Commander Fort Drum ATTN: AFZS Watertown NY 13602-5000		7. UNIT USING AMMUNITION Commander Fort Drum Company A, 41st Engineer Bn. Watertown NY 13602-5000	
8a. DATE MALFUNCTION OCCURRED 15 Jun 91	8b. TIME 0615 hrs	9a. CASUALTIES (No. Killed) 0		9b. CASUALTIES (Hospitalized) 1	9c. CASUALTIES (Other Injuries) 0
9d. DESCRIPTION TNT block detonated while setting charge. Soldier lost right hand and forearm.					
10. DAMAGE a. WEAPON DAMAGED? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A b. DAMAGE REPAIRABLE AT UNIT LEVEL? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A			10c. DESCRIPTION Detonation occurred on Range 50. No weapon or property damage.		
11. DETONATION <input type="checkbox"/> a. None <input type="checkbox"/> b. In Weapon			c. M FROM WEAPON N/A	d. M FROM NEAREST PERSON .25	
12. Quantity Remaining a. FIRING SITE See Back			b. LOCAL STORAGE See Back	13. EXHIBITS AVAILABLE (Hold Exhibits Pending Disposition Instructions Per AR 75-1, para 2-1). <input checked="" type="checkbox"/> a. Fragments <input checked="" type="checkbox"/> b. Intact Components <input type="checkbox"/> c. Weapon <input type="checkbox"/> d. None	
14. Firing Conditions for Malfunction Lot					
a. WEAPON N/A			b. TARGET N/A		
c. RANGE N/A M	d. AZIMUTH N/A	e. ELEVATION N/A	f. ZONE N/A	g. FUZE SETTING N/A	
h. FIRED HOW MANY ROUNDS PER MINUTE FROM WEAPON N/A		i. FOR HOW MANY MINUTES BEFORE MALFUNCTION N/A		j. TOTAL FIRED FROM WEAPON ON DAY OF MALFUNCTION N/A	
k. TOTAL MALFUNCTIONED 1		l. TOTAL FIRED 1		m. MALFUNCTION RATE 100%	
15. Terrain					
a. FIRING SITE Dry grassy	b. DOWN RANGE Dry grassy	c. POSSIBLE OBSTRUCTIONS NONE		d. CLEAR VIEW OF FLIGHT PATH PATH N/A M	
16. Weather Conditions					
a. VISIBILITY 2000M	b. PRECIPITATION Clear	c. TEMPERATURE 70 F	d. PRIOR 24 HOURS HIGH 80 F LOW 65 F	e. RELATIVE HUMIDITY 85%	
17. Malfunction Lot Storage Conditions				18. Packaging of Malfunction Lot	
a. Firing Site: <input checked="" type="checkbox"/> Open <input type="checkbox"/> Enclosed		b. Local Storage: <input checked="" type="checkbox"/> Open <input type="checkbox"/> Enclosed		a. Original Package?	YES NO
c. UNPACKED HOW MANY HRS. BEFORE MALFUNCTION 5		d. MAGAZINE TYPE 80-FT EARTH-COVERED MAG.	e. STORED HOW MANY MONTHS 8	b. Original Seal?	x
				c. Package Adequate?	x
				d. Package Damaged?	x
19. ADDITIONAL DATA (If more space is needed, use continuation sheet or back of form)					
20a. FOR ADDITIONAL DATA, CONTACT Mr. M. O. Pederson			21a. PERSON COMPLETING REPORT Mrs. Ann Pederson Mrs. Ann Pederson		
b. TELEPHONE NO. (Include Area Code) DSN 341-5556 Com. (205) 842-6391			b. TELEPHONE NO. (Include Area Code) DSN 341-5556 com (205) 842-6391		c. DATE 15 Jun 91

DA FORM 4379-R, JAN 89

DA FORM 4379, JUN 75 MAY BE USED

Figure 1-2. Sample of a completed DA Form 4379-R

**Additional information:**

**Blk. 3. Item Components:**

- a. M60 Fuse igniter, NSN: 1375-00-691-1671-M766, Lot: SGK85A010-003
- b. M700 Safety fuse, NSN: 1375-00-028-5246-M670, Lot: ENB86L011-005
- c. M7 Blasting cap, NSN: 1375-01-193-2976-M131, Lot: HEC84B007-003

**Blk. 12. Quantity remaining:**

	Firing Site	Local Storage
a. 1375-M032	66	1206
b. 1375-M131	100	852
c. 1375-M670	125	2458
d. 1375-M766	110	1933

**Blk. 19. Additional data:**

Soldier taped 2 one-pound TNT blocks together, primed each separately, then ignited fuse. Soldier walked with charge approximately 13 seconds. When he started to emplace charge, one block functioned. Second block did not detonate. Fuse burn time tested at 51 seconds per foot. Length of fuse on charge was fifteen inches.

Figure 1-3. Sample of a completed DA Form 4379-R (back)

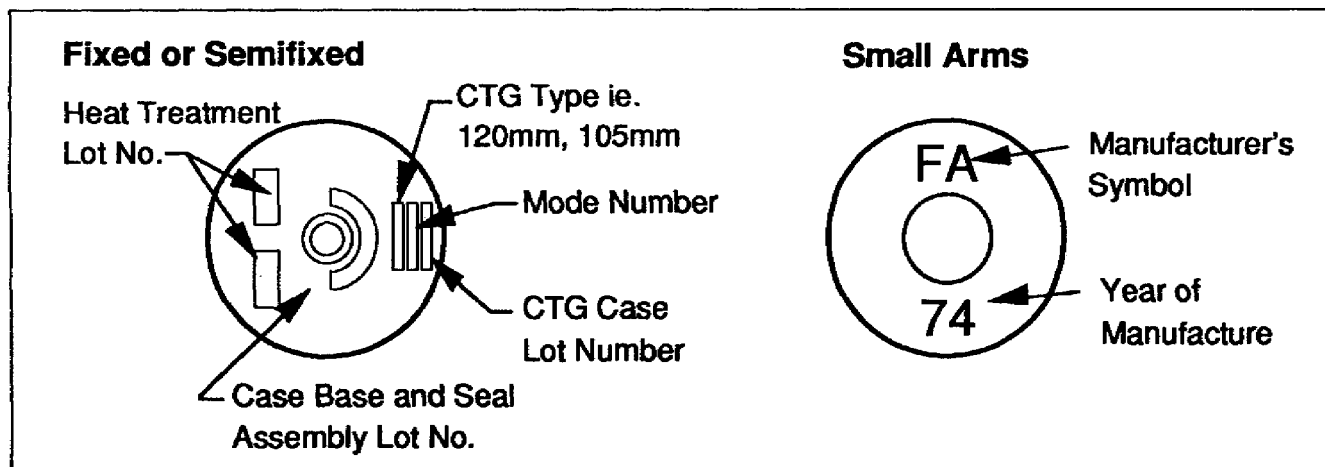


Figure 1-4. Head stamp

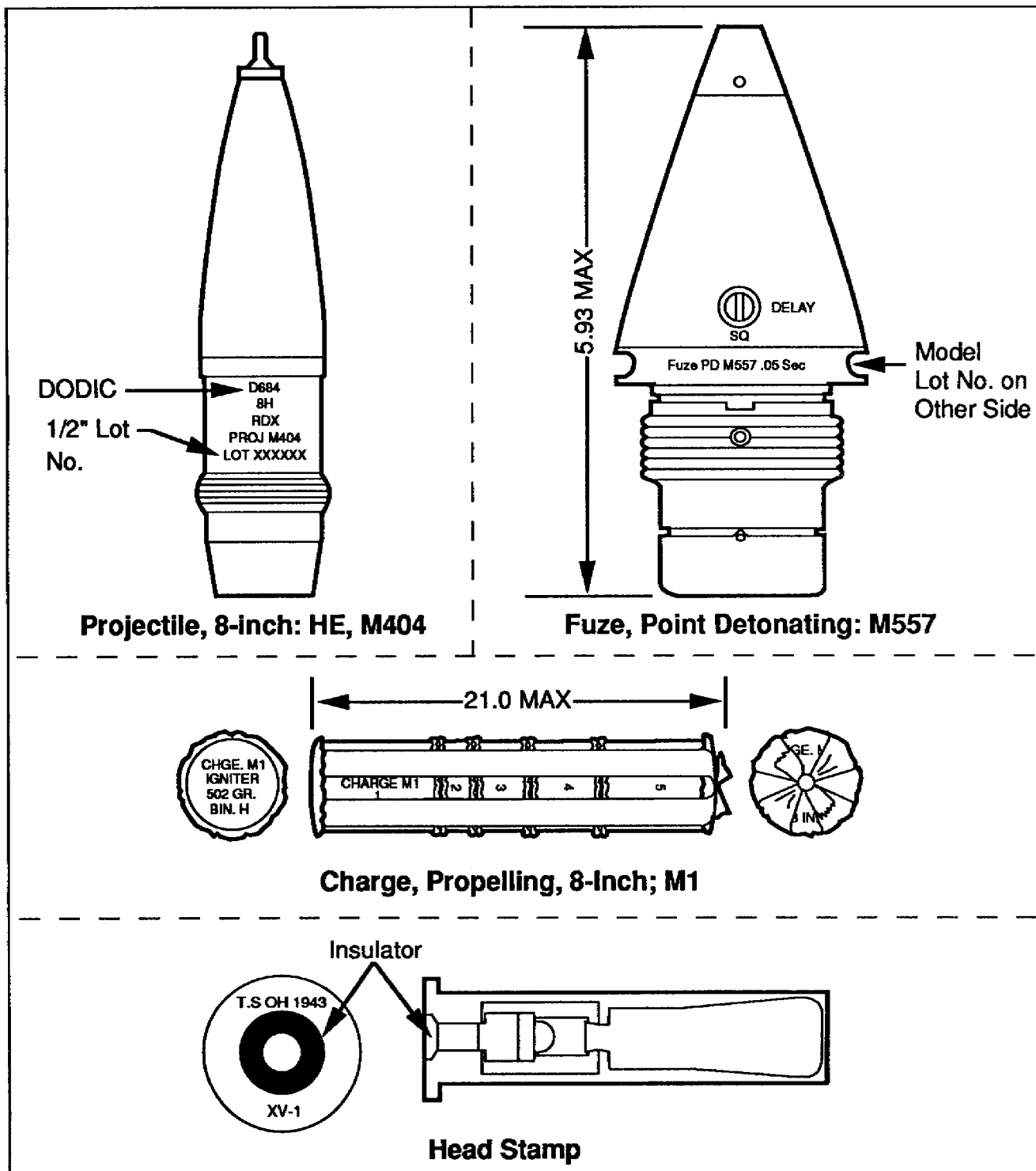


Figure 1-5. Examples of identification data

Block 10. Describe the damage to the weapon, the level of repairs required, and any damage to other materiel. Continue this item on the back of the form or on a separate sheet, if necessary. Attach any appropriate photographs, sketches, and measurements.

Block 11. Self-explanatory.

Block 12. Enter the quantity of affected ammunition on hand. Also, enter any local suspension data.

Block 13. Self-explanatory.

Block 14. In Block 14a, enter the abbreviated nomenclature, the NSN, and the serial number of the weapon or launcher in which the malfunctioning item was fired. Complete Blocks 14b through 14m as appropriate. When appropriate, provide the following information on the back of the form or on a continuation sheet:

- The name of the manufacturer (plant or arsenal).
- The number of propellant increments fired (for mortar rounds).
- Length recoil.
- The condition of the weapon or launcher prior to the malfunction. Include (as applicable) the date of the last overhaul, the overhauling installation, the timing and headspace dimensions of the weapon (by actual gauge check), the date of the last cleaning, and the date of the last boresight.
- For 37mm or larger weapons, enter the total number of rounds fired through the tube before the malfunction. Read and report the pullover gauge reading of the damaged gun tube according to the guidance contained in TM 9-4933-200-35. If the tube has been destroyed, or if the gauge is not available, extract the most recent pullover gauge reading from the log book, and list the total number of rounds fired subsequent to that reading.

Block 15. Briefly describe the general conditions at the firing site and along the flight path of the item (marsh, jungle, woods, dry grassy plain, or muddy hillside). Describe any natural or artificial barriers that may have obstructed the line of fire (overhanging trees or heavy camouflage). Enter the distance for which witnesses to the malfunction had an unobstructed view of the flight path.

Block 16. Enter the estimated visibility limit due to atmospheric conditions (haze, smoke, rain, or fog). Briefly describe the nature and quantity of any precipitation either at the time of, or shortly before the malfunction (rain, sleet, or snow). Enter the temperature and the relative humidity.

Block 17. Self-explanatory.

Block 18. Mark the appropriate blocks. If the package was inadequate or damaged, describe the problem on the back of the form or on a separate continuation sheet.

Block 19. Provide the following information on the back of the form or on a separate continuation sheet:

- Describe the events immediately before the malfunction and the actions taken following the malfunction.

- Indicate the locations of casualties with respect to the weapon and the malfunctioning item.
- Describe the most probable path of fragments, the distance fragments were found from the malfunction site, and their weight and appearance. Attach photographs, if available.
- For nuclear or chemical items, describe the extent and type of contamination resulting from the malfunction. Provide radiation readings, if applicable.
- Indicate whether the weapon was operating normally just before the malfunction. Describe the action of the weapon at the time of the malfunction.
- Indicate whether there is evidence or other reason to believe that foreign objects could have been blown into the bore when previous rounds were fired (pebbles, gravel).
- Indicate whether there was any evidence of unburned powder or residue in the tube.
- If the round detonated in the gun tube, indicate where in the tube the detonation occurred: at the breech, at the muzzle, or in the middle of the tube.
- Indicate whether the projectile reached the anticipated point of impact or intercept.
- If the malfunction was a premature detonation, indicate whether it was a high-order or low-order detonation.

A detonation is classed as an explosion. It is a chemical reaction that propagates so rapidly that the rate of advance of the reaction zone into the unreacted material exceeds the velocity of sound in the unreacted material. The rate of advance of the reaction zone is termed "detonation rate" or "detonation velocity." When this rate of advance attains such a value that it will continue undiminished throughout the unreacted material, it is termed the "stable detonation velocity." When the detonation rate is equal to or greater than the stable velocity of the explosive, the reaction is termed a "high-order detonation."

A low-order detonation is a chemical reaction in a detonatable material in which the reaction front advances with a velocity which is appreciably lower than that which is the characteristic detonation velocity for the material in question. In a low-order detonation, the ordnance case usually breaks into several large fragments rather than many small ones.

- Indicate the setting of the dual-purpose or time fuze.
- For electrically-initiated ammunition or explosives, describe any nearby sources of electrical or electromagnetic energy (power lines, generators, microwave towers, and radar antennas). Include the power rating of the source and its distance from the ammunition at the time of the malfunction.
- Describe any nonstandard conditions, such as the use of more propellant than specified for the weapon and round. Include any deviations from the instructions given in the appropriate technical manuals.



- Indicate whether any unauthorized modifications to the weapon or the ammunition had been made. If so, indicate whether the modification may have contributed to the malfunction.
- Provide a copy of the press release, if any.
- For a 2.75-inch rocket hangfire, include the tube number in which the hangfire occurred, the type of aircraft involved, the location of the launcher on the aircraft, and the number of rockets fired through the tube before the hangfire.
- For malfunctions of rifle grenades, indicate whether bulleted ammunition was in use.

Block 20. Enter the names and phone numbers of witnesses and anyone who can provide additional firsthand information.

Block 21. Enter the name, signature, and phone number of the person who compiles the information for the report. Make sure the person who compiles the report signs it. Enter the date of the report.

## **Preparing the DA Form 4379-1-R**

When the malfunction involves GMLR, report the incident using DA Form 4379-1-R. Prepare this form according to the instructions below.

Note: Study the examples given in Figure 1-6 and Figure 1-7 as you read the explanation of each entry.

Block 1. Self-explanatory.

Block 2. Enter the unit's DODAAC, the report number, and the 2-digit calendar year.

Block 3. Self-explanatory.

Block 4. Enter the battery, battalion, division, or other organization that experienced the malfunction.

Block 5. Enter the location where the malfunction occurred (for example, McGregor Range, Fort Bliss, TX).

Block 6. On Line 6a, enter the type of firing (for example, troop training, fire demonstration, standardization flight, or annual service practice). On Line 6b, enter the method of firing, such as surface-to-surface or surface-to-air.

Block 7. Enter the missile's flight time in seconds. This is the length of time from the launch until the malfunction occurred.

Block 8. Enter the missile type and model number (for example, SHILLELAGH-MTM-51A).

Block 9. Enter the missile's serial number, lot number, and NSN. Get this information from the missile body.

Block 10. Enter the warhead type, serial and lot numbers from DD Form 1650 (Ammunition Data Card).

Block 11. Enter the rocket motor model designation, serial, and lot numbers from the DD Form 1650.

MISSILE AND ROCKET MALFUNCTION REPORT			Requirements control Symbol - CSGLD 1961	
For use of this form, see AR 75-1; the proponent agency is DCSLOG				
TO Commander U.S. Army Missile Command ATTN: AMSMI-LC-AM Redstone Arsenal, AL 35898		FROM Commander 2044th CSG (ORD) ATTN: ASP # 1, Surveillance APO NY 09112		
1a. DATE OF MALFUNCTION 27 Feb 91	1b. TIME OF MALFUNCTION 1037 hrs	2. MALFUNCTION REPORT NO. WHHG8P-1-91	3. DATE OF REPORT 2 Mar 91	
4a. UNIT (Battery) C Company		4b. BATTALION 1/7 INF		
4c. DIVISION 3RD INF		4d. OTHER (Specify)		
5. LOCATION OF FIRING Range 301, position 2.2 Grafenwoehr, Germany		6. TYPE AND METHOD OF FIRING a. Type of Firing Troop Training b. Method of Firing Surf. to Surf.		7. MISSILE TIME OF FLIGHT (SEC) 1.5 sec
8a. MISSILE OR ROCKET TYPE TOW GM, Surface Attack, BGM-71A-2		8b. MODEL NO. BGM-71A2		
9a. MISSILE SERIAL NO. 004498	9b. MISSILE LOT NO. HAQ-104-10A	9c. MISSILE NSN 1410-01-139-1512-PB94		
10a. WARHEAD TYPE HEAT M207E1	10b. SERIAL NO. N/A	10c. LOT NO. IOP-3-5		
11a. ROCKET MOTOR MODEL N-14	11b. SERIAL NO. N/A	11c. LOT NO. RAD-1-8-70		
12a. MOTOR CLUSTER MODEL N/A	12b. SERIAL NO. N/A	12c. LOT NO. N/A		
13a. IGNITER MODEL N/A	13b. SERIAL NO. N/A	13c. LOT NO. N/A		
14a. FUZE MODEL N/A	14b. SERIAL NO. N/A	14c. LOT NO. N/A		
15a. SSA DEVICE MODEL N/A	15b. SERIAL NO. N/A	15c. LOT NO. N/A		
16a. LIQUID PROPELLANTS (Fuel) N/A		16b. LIQUID PROPELLANTS (Oxidizer) N/A		
17a. LAUNCHER MODEL M220A1		17b. SERIAL NO. (If damaged, explain in item 32) 21174		
18a. WEATHER CONDITIONS (Wind) 0-5 MPH	18b. WEATHER CONDITIONS (Visibility) Overcast	18c. WEATHER CONDITIONS (Temperature) 40 degrees F.		
19. TARGET RANGE (Meters or Kilometers) 1500 meters	20. TARGET ALTITUDE (Feet or Kilometers) N/A	21. TARGET AZIMUTH (Miles) N/A	22. TARGET SPEED (Knots or Meters Per Sec) Stationary	
23. TELEMETRY SYSTEM N/A	24. STORAGE CONDITIONS PRIOR TO FIRING OR OPERATION Stored in original containers in an 80-foot earthcovered magazine. Item was unpacked 30 minutes prior to firing.			
25. NATURE OF PROPERTY DAMAGE		26. NUMBER OF FATALITIES OR INJURIES		
27. DESCRIPTION OF MALFUNCTION (Erratic Flight, Short Round, In-Flight Breakup, Down-Range, Premature, Etc.) (Continue on Reverse Side)  Missile fired, flew down range, and nosed into ground. Impact was approx. 128 meters from launcher. Investigation revealed the guidance wires were either disconnected at launch or cut after launch. Missile did not detonate upon impact. A MICOM representative was on site during the initial investigation.				

DA FORM 4379-1-R, JAN 89

DA FORM 4379-1-R JUN 75 MAY BE USED

Figure 1-6. Sample of completed DA Form 4379-1-R (front)

27. DESCRIPTION (Continued)			
28a. NO. ROUNDS/MISSILES FIRED FROM SUSPECT LOT ON DAY OF MALFUNCTION  1	28b. NO. ROUNDS/MISSILES REMAINING FROM SUSPECT LOT ON DAY OF MALFUNCTION  3	29. LOCATION OF MALFUNCTION IN RELATION TO WEAPON OR LAUNCHER (Yards or Meters)  128 meters downrange	
30. CORRECTIVE ACTION TAKEN (Such as Withdrawal of Missiles/Rockets from Use)			
31a. FRAGMENTS OR COMPONENTS OF INTEREST TO MALFUNCTION INVESTIGATION ARE AVAILABLE?  <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		31b. TECHNICAL ASSISTANCE FROM COMMODITY COMMAND IS NECESSARY TO DETERMINE CAUSE OF MALFUNCTION?  <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
32. OTHER PERTINENT INFORMATION (include Sketches or Photographs of Important Features that may Assist in Establishing the Cause of the Malfunction)			
SAMPLE			
33a. NAME OF WITNESS WHO CAN PROVIDE ADDITIONAL INFORMATION REQUIRED  SFC Steve Nelson		33b. TELEPHONE NO. OF WITNESS  DSN: 323-8813	
34a. TYPED NAME OF AMMUNITION OFFICER OR PERSON MAKING REPORT  Lt. Joe Higgins	34b. RANK  O-2	34c. SIGNATURE OF AMMUNITION OFFICER OR PERSON MAKING REPORT  <i>Lt. Joe Higgins</i>	34d. DATE  12 Nov 92

REVERSE OF DA FORM 4379-1-R, JAN 89

Figure 1-7. Sample of a completed DA Form 4379-1-R (back)

- Block 12. Enter the rocket motor cluster, model identification (when applicable), serial, and lot numbers from DD Form 1650. If you need additional space, continue in block 27.
- Block 13. Enter igniter model identification, serial, and lot numbers from DD Form 1650.
- Block 14. Enter the fuze model, serial, and lot numbers from the DD Form 1650.
- Block 15. Enter the safe and arming device model, serial, and lot numbers from the DD Form 1650.
- Block 16. For missiles using liquid propellants, include the name of the fuel and the oxidizer (for example, IRFNA and UDMH).
- Block 17. Enter the model and the serial number of the launcher.
- Block 18. Provide the wind speed and direction, visibility (for example, clear, fog, or rain), and the Fahrenheit temperature at the time of the malfunction.
- Blocks 19 through 22. Self-explanatory.
- Block 23. Enter model number of telemetry, where appropriate.
- Block 24. Describe the storage conditions of the ammunition before the malfunction occurred, including whether the items were received in original sealed containers. Identify the length of time the items were exposed to climatic conditions and whether they were stored in uncovered open storage.
- Block 25. Describe any damage to the launcher or to other property. Include photographs, sketches, and measurements of important features.
- Block 26. Enter the number of fatalities or injuries resulting from the malfunction. Classify the injuries as major only if hospitalization is required. Classify injuries that do not require hospitalization as minor.
- Block 27. Describe the missile or rocket malfunction. If the flight was abnormal or erratic, give details; for example, "the missile flew a normal trajectory for about 100 meters. At that time, it made a sharp downward turn to the right and detonated on impact with the ground."
- Block 28. Enter the number of missiles fired from the lot on the day the malfunction occurred. Give quantity of rounds of that lot remaining on hand.
- Block 29. Enter the estimated or actual distance from the launcher, in yards or meters, where the malfunction occurred.
- Block 30. State whether or not the involved lot was temporarily suspended from further issue and use.
- Block 31. Check applicable blocks, showing whether fragments or other components of interest are available. Also, indicate whether technical assistance is needed from the commodity command (AMC or MICOM).
- Block 32. Give other pertinent information for personnel evaluating the report (data helpful in determining the reason for the unsatisfactory performance). Include photographs or sketches of

important features as appropriate. State whether the malfunction was due to personnel error. If any unusual observations were made during preparation for firing, include a history statement.

Block 33. Enter the names and phone numbers of witnesses (for example, REDEYE gunner) or other persons who can provide additional firsthand information.

Block 34. In Block 34a, enter the typed or printed name of the person submitting the report. In Block 34b, enter the rank of the person listed in Block 34a. In block 34c, enter the signature of the person submitting the report. In block 34d, enter the date of the report.

## **Summary**

During this lesson you have learned:

- The terminology used to discuss malfunctions.
- The responsibilities of the individuals and agencies involved with a malfunction.
- Malfunction reporting requirements.
- The procedures used to report a conventional ammunition malfunction. You will now take a practice exercise that covers the material you learned in this lesson. When you complete the practice exercise satisfactorily, proceed to Lesson 2.

## LESSON 1

### PRACTICE EXERCISE

The following items will test your grasp of the material covered in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

1. What is meant by a dud?
  - A. Any munition that fails to fire.
  - B. An explosive munition that fails to arm, or fails to explode after being armed.
  - C. An item of ammunition that has been withdrawn from issue.
  - D. An ammunition malfunction that endangers life or materiel.
  
2. Who is responsible for issuing suspension or restriction notices on conventional munitions to all commanders of MACOMs?
  - A. The commander or senior person in the unit where the malfunction occurred.
  - B. The Commander, US Army Materiel Command.
  - C. The ammunition officer at the retail level.
  - D. The Commanding General, US Army Armament, Munitions, and Chemical Command (CG, AMCCOM).
  
3. What is meant by a Class B malfunction?
  - A. A malfunction that resulted in loss of lives, materiel, or both.
  - B. A malfunction caused by human error.
  - C. A malfunction that resulted in damaged major equipment.
  - D. A malfunction that resulted from an improper recoil in a weapon.
  
4. Who is responsible for conducting preliminary ammunition malfunction investigations and submitting the required reports?
  - A. The local ammunition officer.
  - B. The leader of the unit where the malfunction occurred.
  - C. The point of contact designated by the MACOM commander.
  - D. The quality assurance specialist (ammunition surveillance) (QASAS).
  
5. Who is responsible for conducting an in-depth, on-site inquiry to determine the probable cause of the malfunction?
  - A. The senior person in charge of the firing unit.
  - B. The DA investigation team for malfunctions (DAITM).
  - C. The ammunition officer at battalion level or higher.
  - D. The installation commander.

6. For how long after the malfunction occurs should any fragments and residue be kept?
  - A. Until the report is complete.
  - B. For 90 days.
  - C. For 30 days.
  - D. Until the investigation is complete.
  
7. When will a detailed report be submitted?
  - A. After pictorial evidence is obtained.
  - B. Not required if the malfunction is not due to defective ammunition.
  - C. Within 10 days of the reported malfunction.
  - D. Within 5 working days of the malfunction.
  
8. When a malfunction occurs, the affected lot of ammunition will be locally suspended from issue. For how long will the suspension remain in effect?
  - A. For 90 days after the malfunction.
  - B. For 15 working days after the malfunction occurs.
  - C. Until the onsite investigation is complete and DAITM reports.
  - D. Until disposition instruction are received from AMCCOM or MICOM.
  
9. Use the extracts from AR 75-1 and TM 43-0001-28 contained in the Appendix to fill out the blank DA Form 4379-R. Use the following data on a hypothetical ammunition malfunction.

You are the Ammunition Officer/Operations Officer at ASP-1, operated by the 41st Ordnance Company (DS) at Fort Comanche, Arizona 29917 (DODAAC WG75AA). The unit that experienced the ammunition malfunction is the 1st Platoon, Company A, 2d Tank Battalion, 5th Armored Division (DODAAC WG73AA). The platoon leader is 1LT Rommel H. Klank.

The ammunition malfunction is a premature detonation in the bore of a tank cannon. The malfunction occurred at 1430 on 12 August 1991, at Range 9, training area Bravo, during a tactical combat fire exercise for Operation Desert Push. The gunner and the loader were killed, and the commander and the driver were badly burned.

The malfunctioning round was a 105mm HEAT-T, C508. The tank had already fired five rounds of APFSDS-T, C521, with no problem. The rounds were drawn this morning at about 0625, transported to the staging area, unpacked, and placed in the tank ready racks at 0830. Each round was visually inspected. No deficiencies were noted. The tanks were loaded on transporters at about 1100, and were transported to the exercise rally points. They were unloaded by 1300 hours. The exercise began at 1345, with temperatures over 100°F.

The weapon involved was an M60A1 tank with a 105mm cannon. The tank's serial number is 2261785. The cannon's serial number is 161371. It was manufactured by Brown Engineering Corporation after August 1967. The gun tube blew out about two feet behind the muzzle brake, the breech block blew out, and the interior of the tank was extensively damaged by heat generated by the propellant. The other ammunition on board did not detonate, but several rounds were extensively damaged before the fire was brought under control.

All firing has been terminated. The battalion commander and the DAO have been notified. The damaged tank remains in place under security.

The 723d GS Maintenance Company and the Division G3 have been notified. The battalion commander has ordered all ammunition of the suspected lot to be repacked in the original containers and returned to the ASP. The dead and wounded have been evacuated.

The target was a Soviet T54 tank at 1500 meters. There was no overhead firing, and there were no obstructions in the line of fire. There were no deviations from technical instructions. The firing table is available.

The Stock Control section provides the following information: The 2d Tank Battalion was issued 200 rounds of cartridge, 105mm gun, HEAT-T, M456E1, NSN 1315-00-889-2095, DODIC C508, lot number PA 3-21A. All 200 rounds were taken from magazine 34, leaving zero balance there. There are still 1820 rounds in magazines 35 and 220 rounds in magazine 36. All ammunition in this lot is ACC-A. The only previous issue of this lot was 1,600 rounds issued to the 9th Marine Corps Amphibious Battalion on 29 June 91. Copies of the DA Form 581 (Request for Issue and Turn-In of Ammunition), the DA Form 3151-R (Ammunition Stores Slip), and the Lot and Locator are available.

The surveillance section states that all containers were inspected during the issue of this ammunition. All of the containers appeared new, with no signs of deterioration. The loaded vehicles were inspected and certified as within parameters. A copy of the DD Form 1650 shows that the cartridge case lot number is ABA-1-22, the primer lot number is PBX-3-13-1, the propellant lot number is BG-116-12-8-3, and the fuze lot number is PA-3-116. The fuze is PIBD, fully enclosed.

The DA Form 3022-R (Army Depot Surveillance Record) shows that this lot was last inspected on 9 February 1991, and was assigned ACC-A. According to past and current editions of TB 9-1300-385-1 and TB 9-1300-385-2, this lot has never been suspended or had any malfunctions.

This lot has been locally suspended until the investigation is complete. The suspension could have a serious impact on the planned training programs.

The storage section states that all of the subject ammunition had been stored for over six months in 25-foot by 80-foot Stradley magazines according to current storage drawings. All three magazines have been monitored on a regular basis, and temperatures have been recorded. The storage temperature limits for this ammunition item (-65°F to +145°F) have never been exceeded.



<b>AMMUNITION MALFUNCTION REPORT</b> For use of this form, see AR 75-1; the proponent agency is DCSLOG				1. REPORT NO.	Requirements control Symbol - CSGLD 1961
2. MALFUNCTIONING ITEM			3. ITEM COMPONENTS		
4. MALFUNCTION DESCRIPTION					
5. SITE OF MALFUNCTION		6. UNIT CONTROLLING SITE		7. UNIT USING AMMUNITION	
8a. DATE MALFUNCTION OCCURRED	8b. TIME				
9a. CASUALTIES (No. Killed)		9b. CASUALTIES (Hospitalized)		9c. CASUALTIES (Other Injuries)	
9d. DESCRIPTION					
10. DAMAGE a. WEAPON DAMAGED? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A b. DAMAGE REPAIRABLE AT UNIT LEVEL? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			10c. DESCRIPTION		
11. DETONATION <input type="checkbox"/> a. None <input type="checkbox"/> b. In Weapon			c. M FROM WEAPON		d. M FROM NEAREST PERSON
12. Quantity Remaining			13. EXHIBITS AVAILABLE (Hold Exhibits Pending Disposition Instructions Per AR 75-1, para 2-1).		
a. FIRING SITE	b. LOCAL STORAGE	c. SUSPENDED <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> a. Fragments <input type="checkbox"/> b. Intact Components <input type="checkbox"/> c. Weapon <input type="checkbox"/> d. None	
14. Firing Conditions for Malfunction Lot					
a. WEAPON			b. TARGET		
c. RANGE M	d. AZIMUTH	e. ELEVATION	f. ZONE	g. FUZE SETTING	
h. FIRED HOW MANY ROUNDS PER MINUTE FROM WEAPON		i. FOR HOW MANY MINUTES BEFORE MALFUNCTION		j. TOTAL FIRED FROM WEAPON ON DAY OF MALFUNCTION	
k. TOTAL MALFUNCTIONED		l. TOTAL FIRED		m. MALFUNCTION RATE	
15. Terrain					
a. FIRING SITE	b. DOWN RANGE	c. POSSIBLE OBSTRUCTIONS		d. CLEAR VIEW OF FLIGHT PATH M	
16. Weather Conditions					
a. VISIBILITY	b. PRECIPITATION	c. TEMPERATURE F	d. PRIOR 24 HOURS HIGH F LOW F	e. RELATIVE HUMIDITY	
17. Malfunction Lot Storage Conditions				18. Packaging of Malfunction Lot	
a. Firing Site: <input type="checkbox"/> Open <input type="checkbox"/> Enclosed b. Local Storage: <input type="checkbox"/> Open <input type="checkbox"/> Enclosed				YES NO	
c. UNPACKED HOW MANY HRS. BEFORE MALFUNCTION		d. MAGAZINE TYPE	e. STORED HOW MANY MONTHS		a. Original Package?
					b. Original Seal?
					c. Package Adequate?
					d. Package Damaged?
19. ADDITIONAL DATA (If more space is needed, use continuation sheet or back of form)					
20a. FOR ADDITIONAL DATA, CONTACT			21a. PERSON COMPLETING REPORT		
b. TELEPHONE NO. (Include Area Code)			b. TELEPHONE NO. (Include Area Code)		c. DATE

DA FORM 4379-R, JAN 89

DA FORM 4379, JUN 75 MAY BE USED

Practice exercise worksheet

Use this page as the back of the DA Form 4379-R.

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## LESSON 1

### PRACTICE EXERCISE

#### ANSWER KEY AND FEEDBACK

<u>Item</u>	<u>Correct Answer and Feedback</u>
1.	B. An explosive munition that fails to arm, or fails to explode after being armed. A dud is an explosive munition that fails to arm as intended, or fails to explode after being armed and fired (page 1-2).
2.	D. The Commander, US Army Armament, Munitions and Chemical Command. The Commander, AMCCOM, will take the following actions: issue suspension or restriction notices to all commanders of major Army commands (MACOMs) (page 1-4).
3.	C. A malfunction that resulted in damaged major equipment. Class B malfunctions are those that result in damage to major equipment...(page 1-2).
4.	A. The local ammunition officer. The local ammunition officer will take the following actions: Gather the data required for the preliminary report. Submit the preliminary report immediately by telephone, teletype...(page 1-3).
5.	C. The DA investigation team for malfunctions (DAITM). The DAITM is authorized to conduct an in-depth, on-site inquiry to determine the conditions, the chain of events, and the probable cause of the malfunction in order to initiate corrective action Army-wide (page 1-5).
6.	B. For 90 days. All fragments and residue will be kept for 90 days after the malfunction (page 1-6).
7.	C. Within 10 days of the reported malfunction. A detailed report bearing the same report number as the preliminary report, along with any available pictorial evidence, will be submitted within 10 days of the reported malfunction (page 1-7).
8.	D. Until disposition instructions are received from AMCCOM or MICOM. The local ammunition officer...will take the following actions: Locally suspend the affected lot of ammunition until disposition instructions are received from the US Army Armament, Munitions, and Chemical Command (AMCCOM) or the US Army Missile Command (MICOM) (page 1-3).
9.	Check the form you completed against the completed DA Form 4379-R shown on pages 1-26 and 1-27.

<b>AMMUNITION MALFUNCTION REPORT</b> For use of this form, see AR 75-1; the proponent agency is DCSLOG				1. REPORT NO. WG 75AA-1-91	Requirements control Symbol - CSGLD 1961
2. MALFUNCTIONING ITEM Ctg. 105mm gun, HEAT-T 1315-00-889-2095 C508 Lot # PA 3-21A			3. ITEM COMPONENTS		
4. MALFUNCTION DESCRIPTION Premature in-bore detonation			See back of form		
5. SITE OF MALFUNCTION Range 9, Training Area B		6. UNIT CONTROLLING SITE Co. A, 2d Tank Bn. 5th Armored Div Ft. Comanche AZ 29917		7. UNIT USING AMMUNITION 1st PLT Co. A, 2d Tank Bn.	
9a. DATE MALFUNCTION OCCURED 12 Aug 91	9b. TIME 1430				
9a. CASUALTIES (No. Killed) Gunner and Loader 2		9b. CASUALTIES (Hospitalized) Driver and Commander 2		9c. CASUALTIES (Other Injuries) UNK	
9d. DESCRIPTION First round fired. Lead tank. In-bore det. 20" behind muzzle brake					
10. DAMAGE a. WEAPON DAMAGED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A b. DAMAGE REPARABLE AT UNIT LEVEL? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A			10c. DESCRIPTION See back of form		
11. DETONATION <input type="checkbox"/> a. None <input checked="" type="checkbox"/> b. In Weapon			c. M FROM WEAPON in bore		d. M FROM NEAREST PERSON 1
12. Quantity Remaining			13. EXHIBITS AVAILABLE (Hold Exhibits Pending Disposition Instructions Per AR 75-1, para 2-1).		
a. FIRING SITE 199	b. LOCAL STORAGE 2040	c. SUSPENDED <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> a. Fragments <input type="checkbox"/> b. Intact Components <input checked="" type="checkbox"/> c. Weapon <input type="checkbox"/> d. None	
14. Firing Conditions for Malfunction Lot					
a. WEAPON Tank gun 105mm ser # 161371			b. TARGET Soviet tank, T54		
c. RANGE 1500 M	d. AZIMUTH UNK	e. ELEVATION UNK	f. ZONE UNK	g. FUZE SETTING N/A	
h. FIRED HOW MANY ROUNDS PER MINUTE FROM WEAPON UNK		i. FOR HOW MANY MINUTES BEFORE MALFUNCTION immediate		j. TOTAL FIRED FROM WEAPON ON DAY OF MALFUNCTION 5 rd AP PSDS-T/1 HEAT-T 6	
k. TOTAL MALFUNCTIONED 1		l. TOTAL FIRED 1 (HEAT-T)		m. MALFUNCTION RATE 100%	
15. Terrain					
a. FIRING SITE Desert	b. DOWN RANGE Desert (clear)	c. POSSIBLE OBSTRUCTIONS None		d. CLEAR VIEW OF FLIGHT PATH Unlimited M	
16. Weather Conditions					
a. VISIBILITY Clear	b. PRECIPITATION None		c. TEMPERATURE +100	d. PRIOR 24 HOURS HIGH F UNK LOW F UNK	e. RELATIVE HUMIDITY None
17. Malfunction Lot Storage Conditions				18. Packaging of Malfunction Lot	
a. Firing Site: <input checked="" type="checkbox"/> Open <input type="checkbox"/> Enclosed		b. Local Storage: <input type="checkbox"/> Open <input checked="" type="checkbox"/> Enclosed		a. Original Package?	YES NO
c. UNPACKED HOW MANY HRS. BEFORE MALFUNCTION 5		d. MAGAZINE TYPE 25' x 80' Stradley		e. STORED HOW MANY MONTHS 6	b. Original Seal? x
				c. Package Adequate?	x
				d. Package Damaged?	x
19. ADDITIONAL DATA (If more space is needed, use continuation sheet or back of form) See back of form					
20a. FOR ADDITIONAL DATA, CONTACT Your Name			21a. PERSON COMPLETING REPORT Your Name <i>Your Signature</i>		
b. TELEPHONE NO. (Include Area Code) UNK			b. TELEPHONE NO. (Include Area Code) UNK		c. DATE 12 Aug 91

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Practice exercise solution

Block No.	Additional Information
3	<p>Cartridge Case: Lot #ABA-1-22, M148A1B1            Primer: Lot #PBX-3-13-1, M83            Propellant: Lot #BG-116-1Z-8-3, M30            Fuze: Lot #PA-3-116, PIBD-M509A1. Fuze is fully enclosed in projectile. Not removable.            Projectile: 105mm HEAT-T with fuze PIBD and tracer, M13. Contains filler of 2.14 lbs. of comp B.</p>
10c	<p>Weapon data: Tank, M60A1 with cannon, 105mm. Tank serial number: 2261785.            Cannon serial number: 161371            Manufacturer: Browning Engineering Corp.            Date of manufacture: After August 1967.            Damage: Tube ruptured approximately 24 inches to the rear of muzzle brake.            Breech block blew out.</p>
14d, e, f	See firing table attached.
19	<p>Preliminary Findings: High-order detonation in bore. Suspected that ammunition in tank ready racks could have been subjected to temperatures in excess of 120° F during transfer from staging area to exercise area. (Approx. 2 hours.) Ammunition temperature limits IAW TM 43-0001-28 indicate ammunition should not have been fired. Five rounds of APDS-T were fired from the same weapon prior to the malfunction.</p>

Practice exercise solution (cont.)

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## LESSON 2

### CONVENTIONAL AMMUNITION DUD AND MISFIRE REPORTING PROCEDURES

Critical Task: 03.4070.02-0001

#### OVERVIEW

##### LESSON DESCRIPTION:

In this lesson you will learn when reports regarding conventional ammunition duds and misfires are required, which reports are required, and how failure rates are calculated.

##### TERMINAL LEARNING OBJECTIVE:

- ACTION:** Identify reportable dud and misfire rates, calculate percentages of duds and misfires, and identify reporting procedures.
- CONDITION:** You will be given extracts from AR 75-1 and a hypothetical dud or misfire ammunition malfunction situation.
- STANDARD:** You will calculate percentage rates for duds or misfires and determine if a malfunction report is required according to AR 75-1.
- REFERENCE:** The material in this lesson was derived from AR 75-1.

#### INTRODUCTION

You do not have to report duds and misfires unless the dud or misfire rate is excessive. As an Ammunition Officer/Operations Officer, you must know when these malfunctions are reportable. This lesson will provide you with the criteria for dud and misfire reporting. You will also learn how to calculate dud and misfire rates and how to determine if these dud and misfire rates are excessive.

#### REPORTING DUD AND MISFIRE MALFUNCTIONS

Use the extract of AR 75-1, Table B-1 in the Appendix (page A-3) of this course to determine if the malfunction rate is excessive. If it is, a report is required. Duds and misfires do not require a preliminary investigation or a preliminary report.

Submit reports for excessive duds and misfires on DA Form 4379-R or DA Form 4379-1-R like other malfunctions. Forward complete reports as follows:

- Conventional ammunition: Forward to the Commander, AMCCOM, Rock Island, Illinois.
- GMLR: Forward to the Commander, US Army Missile Command MICOM, Fort Lee, Virginia.



- All reports: Forward a copy to the Commander, US Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland.

Local procedures should require accurate dud and misfire records, whether these malfunctions are reportable or not. See Figure 2-1 for an example of a monthly dud/misfire record.

## CALCULATING DUD AND MISFIRE PERCENTAGE RATES

Dud and misfire percentage rates are calculated by dividing the number of malfunctions by the total number of rounds expended. For example, a using unit expended 30 fragmentation grenades. Two of these are duds. Table B-1 in AR 75-1 shows that two grenade duds make a reportable number. The percentage rate is calculated as follows:

$$2 \text{ (duds)} \div 30 \text{ (expended)} = .07 \times 100 = 7\%$$

Table B-1 shows that the reportable defect rate for grenades is five percent. The seven percent rate exceeds the reportable rate.

Normally, the total quantity used in the calculation will be the quantity fired by the using unit in a particular day. However, if satisfactory records are kept, a cumulative total for a certain lot fired by other units on other days may be compiled. Records for time periods of up to 30 days may be used. For example, a using unit fires 62 mortar rounds and has four duds. This makes a 6% dud rate, which is reportable according to Table B-1. However, other units over the past 30 days have fired 238 rounds of the same lot and have had only six duds. Using the total duds and the total rounds, the cumulative percentage is calculated as follows:

$$\begin{aligned} 4 + 6 &= 10 \text{ total duds} \\ 62 + 238 &= 300 \text{ total rounds expended} \\ 10 \div 300 &= .0333 \times 100 = 3.33\% \end{aligned}$$

Table B-1 shows that the reportable rate is 5%. The cumulative percentage rate in this case is 3.33%. Therefore, this dud rate is not reportable.

## Summary

During this lesson you have learned:

- Reporting procedures and requirements and procedures for conventional ammunition duds and misfires.
- How to calculate failure rates.

You will now take a practice exercise that covers the material you learned in this lesson. When you complete the practice exercise satisfactorily, proceed to the subcourse examination.

No	Date	Unit	DODAC	Lot No	Nomenclature	Fired	Dud	Misfire	Remarks
1	3 Jun	3d FA	1315-C449	PBA 4-092	Ctg., 105 mm Illum	12	2		Illum Fail
2	5 Jun	6th IN	1315-C222	IOP 9-62	Ctg., 81 mm HE	110	8		Expl Fail
3	5 Jun	21 Sig	1330-G963	SF-10-166	Gren, Hnd CS	20	2		Burn Fail
4	9 Jun	8th FA	1315-C449	PBA 4-092	Ctg., 105 mm Illum	14	3		Illum Fail
5	10 Jun	1st MP	1305-A011	BS-12-9	Ctg., 12 Gauge #100	100		9	
6	14 Jun	107th OD	1330-G890	RRA 9-56	Gren, Hnd Frag	140	8		Expl Fail
7	21 Jun	14th IN	1310-B568	RSA 20-551	Ctg., 40 mm HE	82		8	
8	22 Jun	9th CAV	1330-G963	SF-10-166	Gren, Hnd CS	33	2		Burn Fail
9	26 Jun	31st FA	1315-C449	PBA 4-092	Ctg., 105 mm Illum	22	2		Illum Fail
10	29 Jun	5th TC	1330-G890	RRA 9-56	Gren, Hnd Frag	106	4		Expl Fail

Figure 2-1. Monthly Dud/Misfire record surveillance section--ASP 2  
1 through 30 June 1991

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## LESSON 2

### PRACTICE EXERCISE

The following items will test your grasp of the material covered in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Use the data shown in Figure 2-1 and the extract of AR 75-1 in the Appendix to answer questions one and two.

1. Which items listed on the dud/misfire record (Figure 2-1) have reportable malfunction rates?
  - A. All items listed.
  - B. Items 1, 2, 4, 5, 6 and 7.
  - C. Items 2, 5 and 7.
  - D. Items 1, 2, 4, 5, and 7.
  
2. What is the dud percentage rate for the listed 105mm illuminating cartridge (DODIC C449)?
  - A. 16 percent.
  - B. 21 percent.
  - C. 9 percent.
  - D. 14.5 percent.

Use the extract of AR 75-1 in the Appendix to answer question 3.

3. A unit fired five 155mm illuminating projectiles (M118 series), and three were duds. Why is this not reportable?
  - A. Because the dud percentage is 60% and the reportable defect rate is 15%.
  - B. Because the minimum number of reportable duds is two, and in this case there were three.
  - C. Because the minimum number of reportable duds is four, and in this case there are three
  - D. Because there may be other units firing the same lot, which could change the percentage.
  
4. A using unit reports that they fired 10 WP mortar rounds, and all 10 failed to detonate. How much time do you have to conduct the preliminary investigation and submit the preliminary malfunction report?
  - A. 30 days.
  - B. 15 working days.
  - C. 10 days.
  - D. A preliminary report is not required.

LESSON 2

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<u>Item</u>	<u>Correct Answer and Feedback</u>
1.	<p>C. Items 2, 5, and 7. Other items with excessive duds or misfires are not reportable when the percentage is combined over the 30-day period (page A-3, Extract from AR 75-1, Appendix, para B-2.d.).</p>
2.	<p>D. 14.5 percent. This figure is derived after combining all dud rates over the 30-day period (page A-3, Extract from AR 75-1, Appendix, para B-2.d.).</p>
3.	<p>C. Because the minimum number of reportable duds is four, and in this case there are three. This item of ammunition is an exception to the normal rate for illumination shells (page A-3, Appendix, Extract from AR 75-1, Table B-1).</p>
4.	<p>D. A preliminary report is not required. Duds and misfires do not require a preliminary investigation or a preliminary report (page 2-2, para 1).</p>