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DATED 13 OCT. 1978

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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TM 9-1300-254-12

U.S. MARINE CORPS TECHNICAL MANUAL

TM 1300-12/1

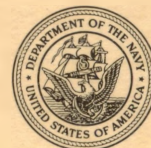
OPERATOR AND ORGANIZATIONAL MANUAL

CARTRIDGE, 105-MM: HIGH-EXPLOSIVE, M413 AND M444

PROJECTILE, 155-MM: HIGH-EXPLOSIVE, M449, M449E1, M449E2, AND M449A1

PROJECTILE, 8-INCH: HIGH-EXPLOSIVE, M404 (U)

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DEPARTMENTS OF THE ARMY AND THE NAVY
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WARNINGS

Do not touch, move, or otherwise handle projectile duds; their fuzes may be armed. Unexploded grenades expelled from the munitions will not be touched. Projectile duds or unexploded grenades will be destroyed by explosive ordnance disposal personnel only.

Injury to personnel or damage to materiel may result if the U-shaped packing stop (fig. 1-9) is not removed before firing the 105-mm cartridge M413 or M444.

If the lip or flange of the cartridge case for the 105-mm cartridge M413 or M444 becomes damaged, do not insert the round in the howitzer tube as it could become jammed in the tube.

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*TM 9-1300-254-12/TM 1300-12/1

TECHNICAL MANUAL
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DEPARTMENTS OF THE ARMY
AND THE NAVY

WASHINGTON, D.C., 2 July 1969

OPERATOR AND ORGANIZATIONAL MANUAL

CARTRIDGE, 105-MM: HIGH-EXPLOSIVE, M413 AND M444; PROJECTILE, 155-MM: HIGH-EXPLOSIVE, M449, M449E1, M449E2, AND M449A1; PROJECTILE, 8-INCH: HIGH-EXPLOSIVE, M404 (U)

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*This manual supersedes TM 9-1315-246-12/TM 1315-12/2A, 2 March 1966, including all changes, TM 9-1320-202-12/TM 1320-12/2, 14 July 1965, including all changes, TM 9-1320-239-12/TM 1320-12/1B, 16 August 1967, TM 9-1315-246-12/TM 1315-12/2A (Modified), 19 January 1968, including all changes, TM 9-1315-246-12/TM 1315-12/2A (Modified/1), 19 January 1968, including all changes, TM 9-1320-202-12/TM 1320-12/2 (Modified), 19 January 1968, including all changes, and TM 9-1320-239-12/TM 1320-12/1B (Modified), 19 January 1968, including all changes; which will be destroyed in accordance with applicable security regulations.

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CHAPTER 1 (C)

INTRODUCTION

Section I (U). GENERAL

1-1 (U). Scope

a. This manual is published for the use of personnel to whom the high-explosive cartridges and projectiles are issued. It contains information on the care, handling, and use of the ammunition.

b. The appendix contains a list of current references including technical manuals, forms, and other available authorized publications applicable to the ammunition. The appendix is not applicable to the Marine Corps.

c. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to the Commanding Officer, Picatinny Arsenal, ATTN: SMUPA-DB7, Dover, N.J. 07801. Marine Corps units should report the above by letter to the Commandant of the Marine Corps (Code CSY).

1-2 (U). Forms, Records, and Reports

a. *General.* Commanding officers of units issued the ammunition are responsible for the maintenance of records and preparation of reports pertaining to these items. Lot numbers of the affected items will be included in all reports. The forms required by using units issued this ammunition are listed in the appendix. For a listing of all forms, refer to the current DA Pam 310-2.

b. *Field Report of Accidents.* Any accident involving injury to personnel or damage to materiel will be reported on DA Form 285 (Accident) in accordance with AR 385-40. Marine Corps units will report injuries in accordance with chapter 12, Marine Corps Personnel Manual MCO P5000.3. Damage to mate-

riel reports will be made by letter or message to the Commandant of the Marine Corps (Code CSY).

c. *Malfunctions Involving Ammunition or Explosives.*

(1) A malfunction is defined as the failure of an ammunition item to function in accordance with the design, intent, and expected performance when fired, launched, or when explosive components function during a nonfunctional test. Malfunctions do not include accidents and incidents resulting from negligence, malpractice, or implications in other situations such as vehicle accidents, fires, etc. However, malfunctions do include abnormal or premature function of an ammunition item as a result of normal handling, maintenance, storage, transportation, and tactical deployment.

(2) When a malfunction involving a munition occurs, *firing of the affected lot will be halted immediately.* The commanding officer or senior individual in charge of the activity will immediately contact the officer under whose supervision the ammunition for the activity involved is maintained or issued, and will report all available facts concerning the malfunction.

(3) Ammunition malfunction reports from Army activities will be reported as prescribed in AR 700-1300-8.

(4) Ammunition malfunction reports from Marine Corps activities will be reported as prescribed in TI-8010-15/1B.

d. *Report of Damaged or Improper Shipment.* Damaged or improper shipments of this materiel will be reported on DD Form 6 in accordance with AR 700-58. Marine Corps units will submit such reports in accordance with MCO P4610.5 and Military Traffic Management Regulations (NAVMC 1175).

Section II (C). HIGH-EXPLOSIVE 105-MM CARTRIDGES M413 AND M444—DESCRIPTION

1-3 (C). General

a. The cartridges M413 and M444 (fig. 1-1) are designed to be fired from 105-mm howitzer cannons (table 2-1). The 105-mm cartridge case M14 series

is common to both cartridges. Each cartridge is classified as semifixed; the cartridge case and the projectile are issued unassembled so that the propelling charge may be accessible for adjustment.

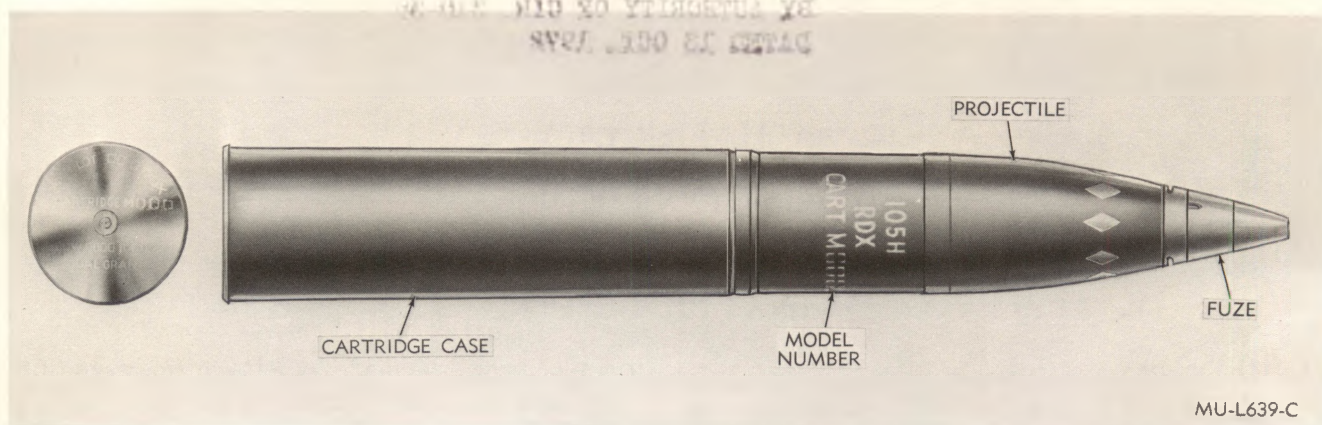
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Figure 1-1 (U). 105-mm cartridge M413 or M444 (U).

b. The cartridges contain antipersonnel submunitions in the form of a number of individual grenades. The primary differences between the cartridge M413 and cartridge M444 are in the appearance and functional characteristics of the submunitions within the projectile body.

c. The cartridge M413 contains a fuze M554. The cartridge M444 contains a modified fuze M548 or M565 (para 1-5a(1)).

1-4 (C). Cartridge M413

a. *General.* The cartridge M413 consists of three major components: the fuze, projectile, and cartridge case.

(1) *Fuze M554* (fig. 1-2). The fuze M554 is a mechanical-time, superquick, point-detonating fuze threaded to the nose of projectile M413. The fuze may be set to function at any time between 2 and 75 seconds. It is similar to the standard fuze M501A1 but is modified by the addition of a safety adapter and a staked-on expulsion charge. A safety adapter provides a delay feature to assure that the expulsion charge will not accidentally detonate in the proximity of the howitzer. A safety pullwire is installed on the fuze to prevent movement of the setting mechanism before the fuze is set for firing.

(2) *Projectile for cartridge M413* (fig. 1-3). The projectile consists of fuze M554 with a staked-on expulsion charge, a body assembly, and an O-ring which forms a seal between the fuze and the body assembly. Three locating pins also retain the pusher plate to resist the rotational forces during firing. There are six layers of grenades M35, three in each layer, which are secured in position by spacer plates and collars fitted into load-locking rods which seat into both the pusher plate and base plug. The load-locking rods secure the internal load against angular movement, while the spacer plates and collars protect the grenades against setback forces

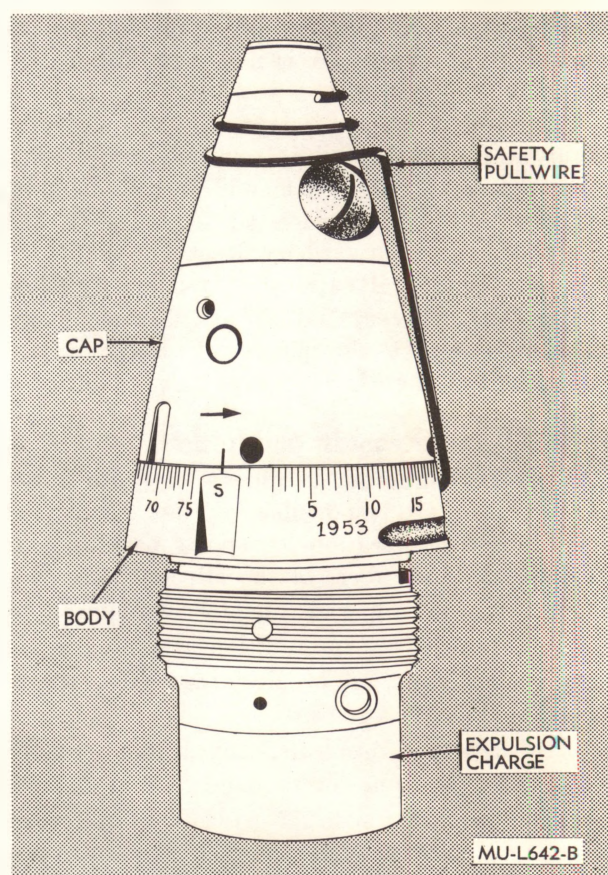


Figure 1-2 (U). Fuze M554 with expulsion charge (U).

during firing. The base plug which seats the aft end of the load-locking rods is press-fitted into the aft end of the body assembly and pinned by six twist pins and three shear pins.

(3) *Cartridge case M14 series* (fig. 1-4). The cartridge case M14 series contains a percussion primer and houses the propelling charge. The propelling charge increments are packed to facilitate

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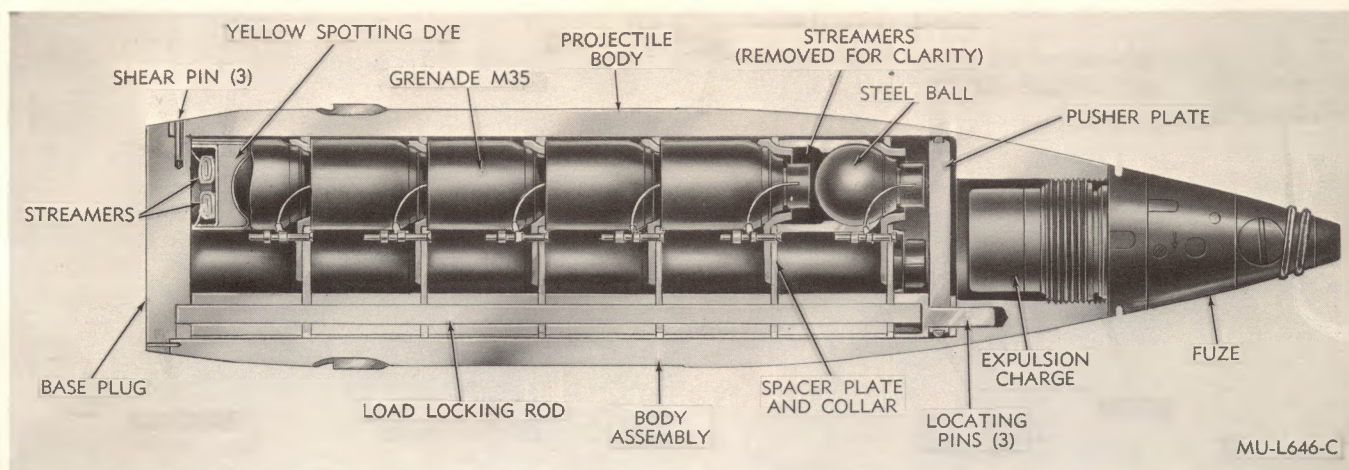


Figure 1-3 (U). Projectile for 105-mm cartridge M413—cutaway view (U).

removal for adjustment to achieve the desired firing charge. The lip end of the cartridge case is designed to form a free fit over the aft end of the projectile. The propelling charge is composed of seven numbered increments placed in the cartridge case in numerical order.

b. Grenade M35 (fig. 1-5).

(1) The grenade M35 is a groundburst munition consisting essentially of a steel ball with an aluminum skirt and a point-detonating grenade fuze and striker in the nose. Two nylon ribbon streamers, attached to the inside of the aluminum skirt, orient and drag-stabilize the grenade in flight. The steel ball is filled with Comp B.

(2) Three grenades in the aft layer next to the base plug contain a yellow dye which acts as a spotting charge. The dye is in polyethylene bags

secured by a polyethylene cup which is located beneath the ribbon streamers.

1-5 (C). Cartridge M444

a. General. The cartridge M444 (fig. 1-1) consists of three major components as follows: the fuze, the projectile, and the cartridge case.

(1) Modified fuzes M548 and M565 (fig. 1-6).

(a) Either modified fuze M548 or M565 has been assembled with the cartridge M444. Each fuze has been modified by means of an expulsion charge threaded and staked to the bottom of the fuze. The standard fuzes M548 and M565 do not have expulsion charges attached and therefore are not interchangeable with the modified fuzes.

(b) Both modified fuzes are essentially the same except that the fuze M548 incorporates a

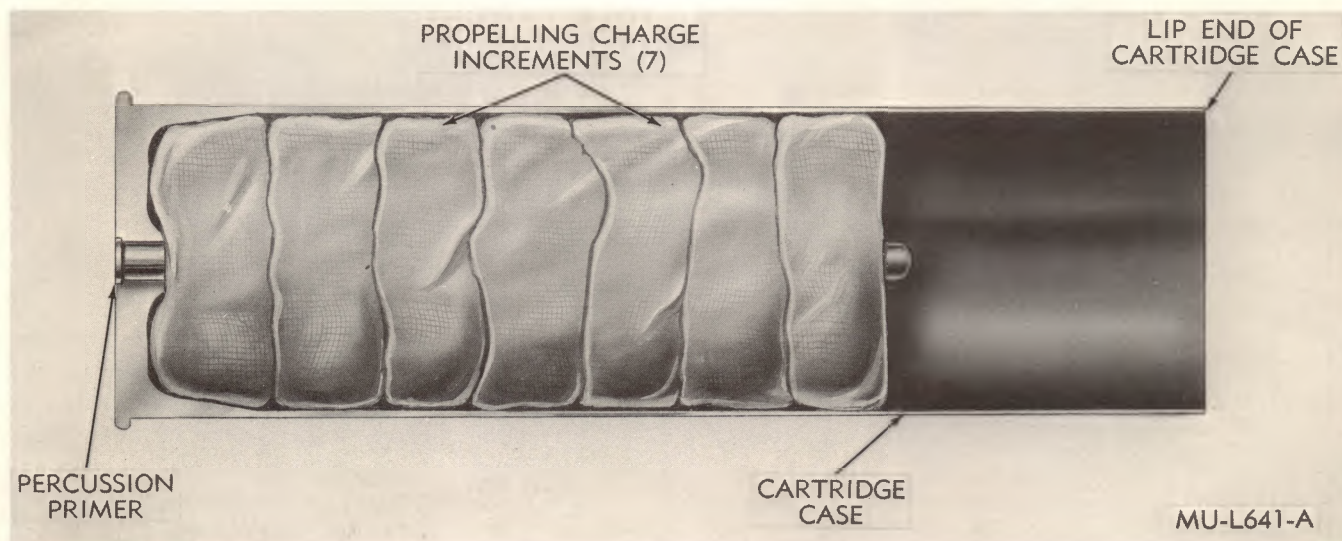


Figure 1-4 (U). Cartridge case with propelling charges (U).

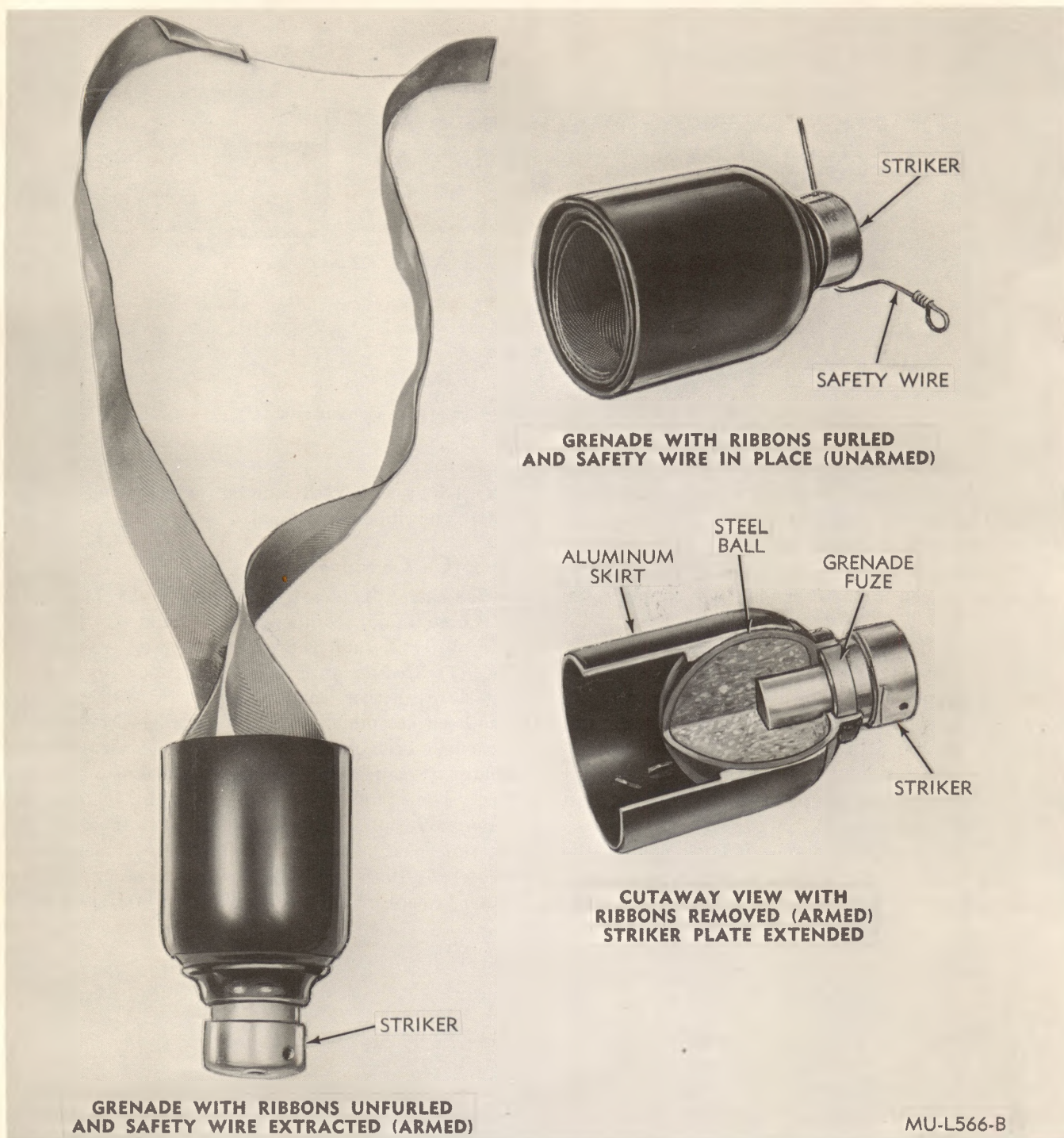
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Figure 1-5 (U). Grenade M35 (U).

point-detonating feature not necessary to the function of the cartridge and was eliminated from the cartridge when the fuze M565 became available to the production program.

(c) Each fuze has a mechanical-time mechanism that may be set to function at any time between 2 and 100 seconds. A time scale permits setting the fuze in whole seconds and a vernier scale permits

further setting the fuze to tenths of a second. The fuze arms due to the centrifugal force generated by the projectile spin; arming occurs between 1,500 and 2,000 rpm.

(d) The fuzes incorporate a number of safety features that are described in 1 through 8 below.

1. The timing disk is locked by the setting pin and cannot be turned except with the appropri-

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Figure 1-6 (U). Modified fuzes M548 and M565 (with expulsion charges) (U).

ate fuze setter. The disk is released from the pin on setback when the hammspring flattens the setting lug on the timing disk.

2. A post projecting from the movement prevents the hammerspring from moving when the fuze is set on "S" (safe). Until the fuze is set for a specific time, the hammerspring is thus kept from disengaging the timing disk from the setting pin.

3. The escapement lever in the movement assembly is locked by two spring-locked detents that prevent oscillation of the lever until they slide out of engagement by the application of the required centrifugal force.

4. The arbor stop lever on the main arbor keeps the mainspring from unwinding until it slides out of engagement by the application of the required centrifugal force.

5. The safety disk covers the firing notch on the timing disk when the fuze is set on "S" or for any time less than the prescribed minimum setting; under these conditions, the safety disk prevents the release of the firing arm and the tripping of the time firing pin.

6. The fuze safety adapter detonator is in an out-of-line position until a fixed time after the fuze safety adapter mechanism is put in operation by centrifugal force when the projectile is fired.

7. A setting torque (90-100 inch-pounds) precludes inaccuracies which may result from movement of the lower cap after the fuze has been set.

8. In the fuze M548 only, two interlocking detents prevent movement of the point-detonating assembly firing pin until they are swung out of position by centrifugal force when the projectile is fired. The firing pin is also held by a support cup

and is unable to strike a detonator until impact with a target.

(2) *Projectile for cartridge M444* (fig. 1-7). The projectile includes either fuze described in (1) above and a body assembly with grenades M39. At the bottom of the fuze well, a threaded take-up sleeve is torqued against a pusher plate which eliminates possible clearances between the grenade layers. An indexing pin retains the pusher plate to resist rotational forces during firing. There are six layers of grenades, three in each layer, which are secured in position by the pressure obtained through torquing the take-up sleeve against the pusher plate and the indexing of adjacent striker plate guide rods and guide rod holes. The aft plate is positioned between the bottom grenade layer and the base plug. The base plug is press-fitted at the aft end of the projectile and pinned with three groove-type, shear pins.

(3) *Cartridge case M14 series*. The cartridge case M14 series is common to both cartridges and is described in paragraph 1-4a(3).

b. *Grenade M39* (fig. 1-8). The grenade M39 is an airburst munition which is expelled from the projectile body in flight. Upon surface impact, the explosive components are ejected upward for airburst. The grenade consists, essentially, of a housing assembly, two vanes which extend in flight, pivoted on two D-shaped sear pins, a striker plate, two striker plate guide rods which interlock the sear pins, and a steel ball. The steel ball is filled with RDX.

1-6 (C). Functioning of Cartridges M413 and M444

a. *General*. Firing procedures for both cartridges are the same as that for all semifixed, cartridge-

type ammunition. The primer is functioned by the firing pin, causing initiation of the igniter charge. This ignites the propelling charge which propels the projectile out of the howitzer tube at a specific muzzle velocity depending upon the zone charge used. The howitzer tube rifling engraves the rotating band of the projectile and imparts a stabilizing spin to the projectile as it moves forward.

b. *Expulsion*. The fuze, having been set to function at a predetermined time in flight, initiates the expulsion charge. The force of this charge acts upon the pusher plate and grenade assembly which shears the pins that hold the base plug in place and ejects the entire grenade load from the base of the projectile. Centrifugal force disperses the grenades radially from the projectile line-of-flight.

c. Grenade Functioning.

(1) *Grenade M35 (cartridge M413)* (fig. 1-5).

(a) When each grenade M35 is expelled from the projectile body, the grenade fuze pulls free of the safety wire which is attached to the spacer plate (fig. 1-3).

(b) This starts a mechanical action within the grenade fuze which aligns the explosive train.

(c) The aluminum skirt of the grenade contains two streamer ribbons which unfurl when the grenade is in free flight. These ribbons drag-stabilize and orient the grenade with the point-detonating grenade fuze and striker downward.

(d) When the striker impacts, the grenades detonate. The yellow dye, which was contained in three grenades, is visible for 2 miles on a clear day.

(2) *Grenade M39 (cartridge M444)* (fig. 1-8).

(a) When each grenade M39 is expelled from the projectile body, the vanes open and orient the grenade by interaction of the air stream.

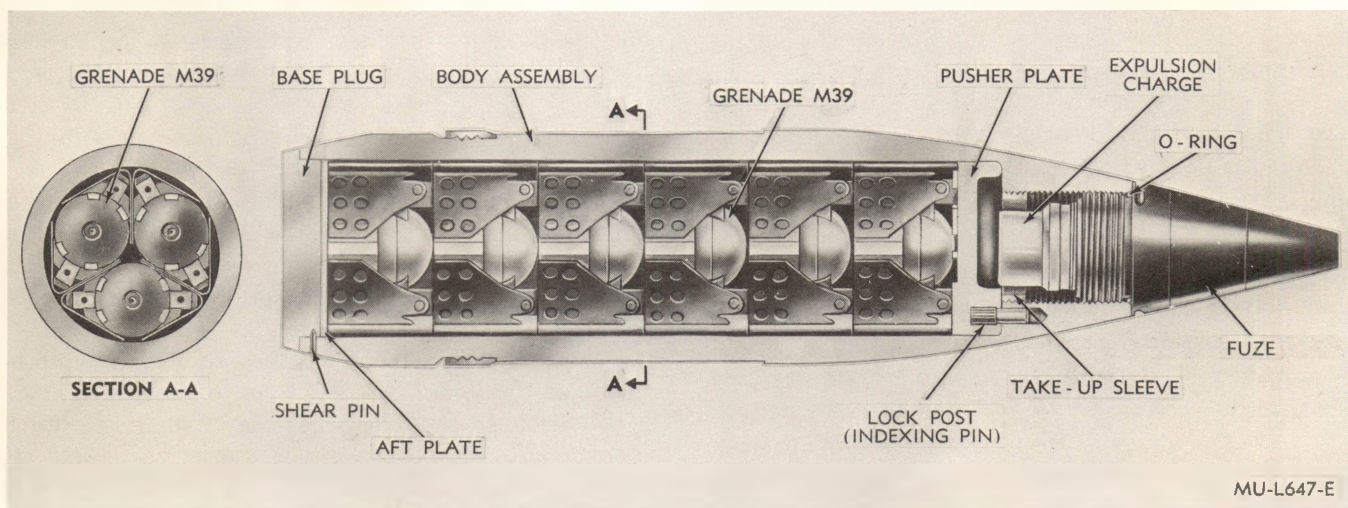
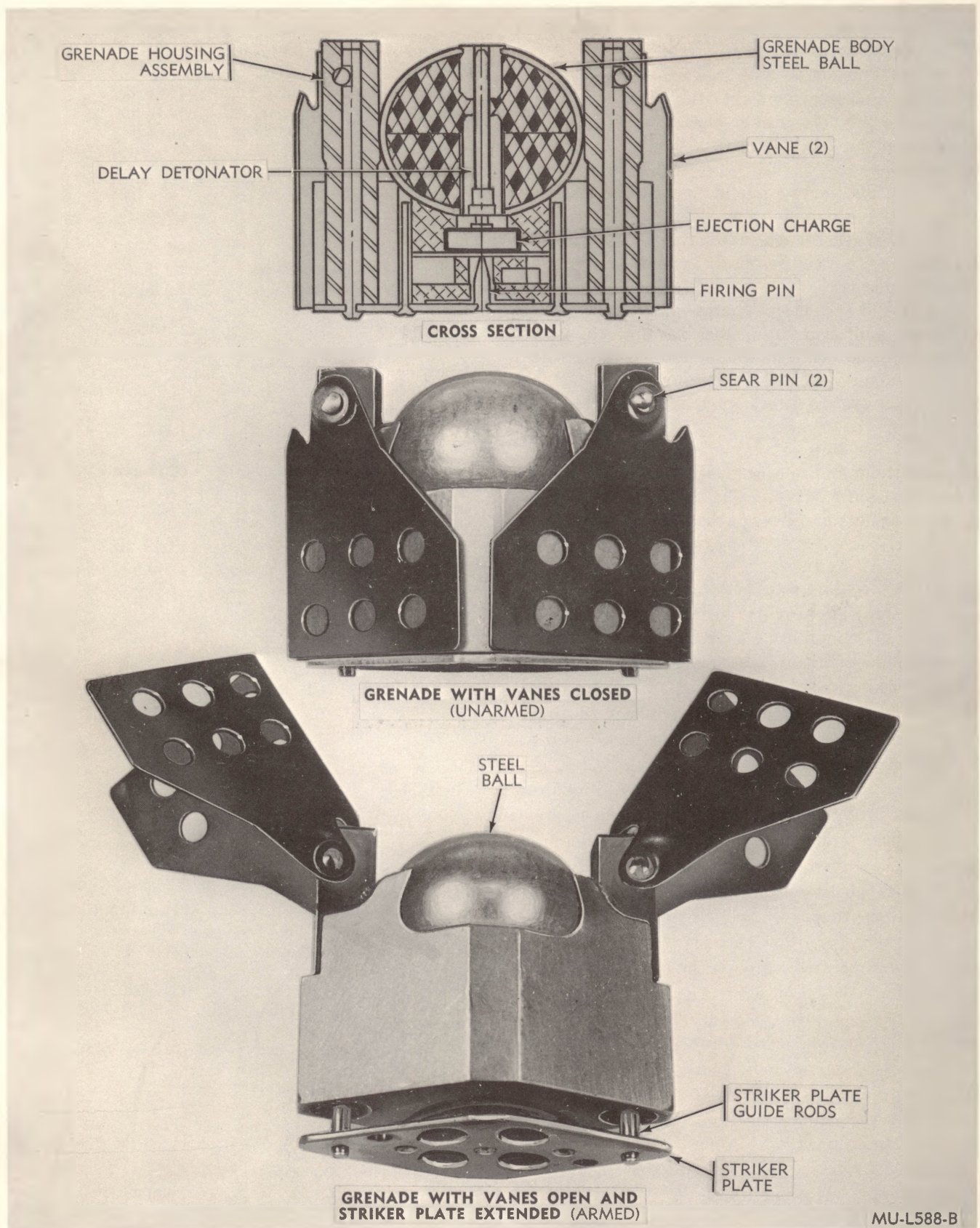


Figure 1-7 (U). Projectile for cartridge M444 (U).



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Figure 1-8 (U). Grenade M39 (U).

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(b) The D-shaped sear pins rotate with the vanes, and free the striker plate guide rods which allow the spring to extend the striker plate.

(c) This action withdraws the firing pin from the slider and a spring forces the slider into a position where the detonator is aligned with the ejection charge and the delay detonator. The grenade is now armed.

(d) The vanes are held open by the air stream and striker plate guide rods.

(e) When the grenade impacts, the firing pin is driven into the detonator which initiates the ejection charge.

(f) The ejection charge initiates the delay detonator and propels the steel ball upward.

(g) The delay detonator is assembled with a delay element designed to detonate the steel ball approximately 4 to 6 feet above impact surface.

1-7 (U). Packing

One cartridge and one cartridge case are packed in a fiber container M105A2 (figs. 1-9 and 1-10). Two fiber containers are then packed into a wooden box (fig. 1-11).

1-8 (U). Painting and Marking

a. *General.* To provide positive identification of the type of ammunition covered in this manual, a row of yellow diamonds is stenciled on the packaging. These markings were first applied on ammunition in field stocks. Not all field stocks have been reworked. The projectiles of cartridges now in production are being marked in addition to the packaging.

b. *Projectile.* The projectile is painted olive drab. Markings are stenciled in yellow. Nomenclature is indicated on figure 1-1. On current production, a row of yellow diamonds is stenciled around the circumference of the projectile, 1 $\frac{3}{8}$ inches from the bottom of the fuze.

c. *Cartridge Case.* The cartridge case has markings stamped and painted white on the base only. Typical markings are shown on figure 1-1.

d. *Fiber Container M105A2.* The circular fiber container is marked with white paint on the body and embossed on the metal ends (fig. 1-10). A row of yellow diamonds is stenciled around the circumference of the container. Refer to figure 1-10 for fiber container markings.

e. *Wooden Packing Box.* The wooden packing box is not painted. Markings are stenciled in black on the box. A row of yellow diamonds on a black stripe is stenciled on the top and down the two adjacent sides. Refer to figure 1-11 for markings.

1-9 (C). Tabulated Data—105-mm Cartridges

Weight of complete round.....	42 lb.
Weight of projectile (as fired)....	33 lb.
Length:	
Cartridge case (max).....	14.64 in.
Fuzed projectile (max).....	19.13 in.
Complete round (max).....	31.04 in.
Cartridge M413:	
Fuze.....	M554.
Number of grenades M35....	18.
Type of explosive.....	Comp B.
Explosive weight:	
One grenade.....	28 grams.
Total cartridge M413....	1.1 lb.
Total cartridges per packing box.	2.2 lb.
Maximum range.....	12,205 yd.
Maximum muzzle velocity.....	1,550 fps.
Cartridge M444:	
Fuze.....	Modified M548 or M565.
Number of grenades M39....	18.
Type of explosive.....	RDX.
Explosive weight:	
One grenade.....	23.55 grams.
Total cartridge.....	0.93 lb.
Total cartridges per packing box.	1.86 lb.
Maximum range.....	12,205 yd.
Maximum muzzle velocity....	1,550 fps.
Propellant:	
Number of base charges (zone 1 charge).	1.
Number of increments (zones 2 through 7).	6.
Weight (zones 1 through 7)...	2.75 lb.
Type.....	Dualgran.
Expulsion charge:	
Type.....	M10 mortar propellant.
Weight.....	10 grams.
Packaging:	
Rounds per fiber container M105A2.	1.
Fiber container per wooden packing box.	2.
Wooden packing box:	
Dimensions.....	37 $\frac{1}{4}$ x 12 x 7 $\frac{3}{8}$ in.
Loaded weight.....	120 lb.
Cubic displacement....	2 cu ft.
FSN and DODIC code:	
M413 (w/fuze M554).....	1315-629-3875-C462.
M444 (w/modified fuze M548).	1315-797-7199-C462.
M444 (w/modified fuze M565).	1315-965-0739-C462.
Quantity-distance class (M413 and M444).	4.
Storage compatibility group (M413 and M444).	A.
DOT shipping classification.....	A.
DOT marking.....	Ammunition for cannon with explosive projectiles.
Coast Guard shipping classification.	VII.

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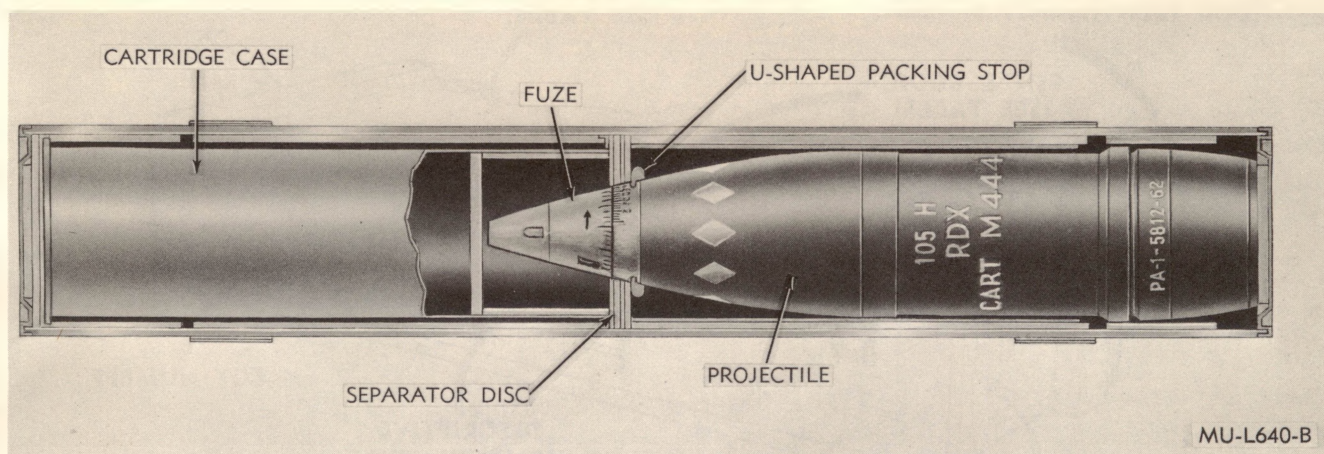


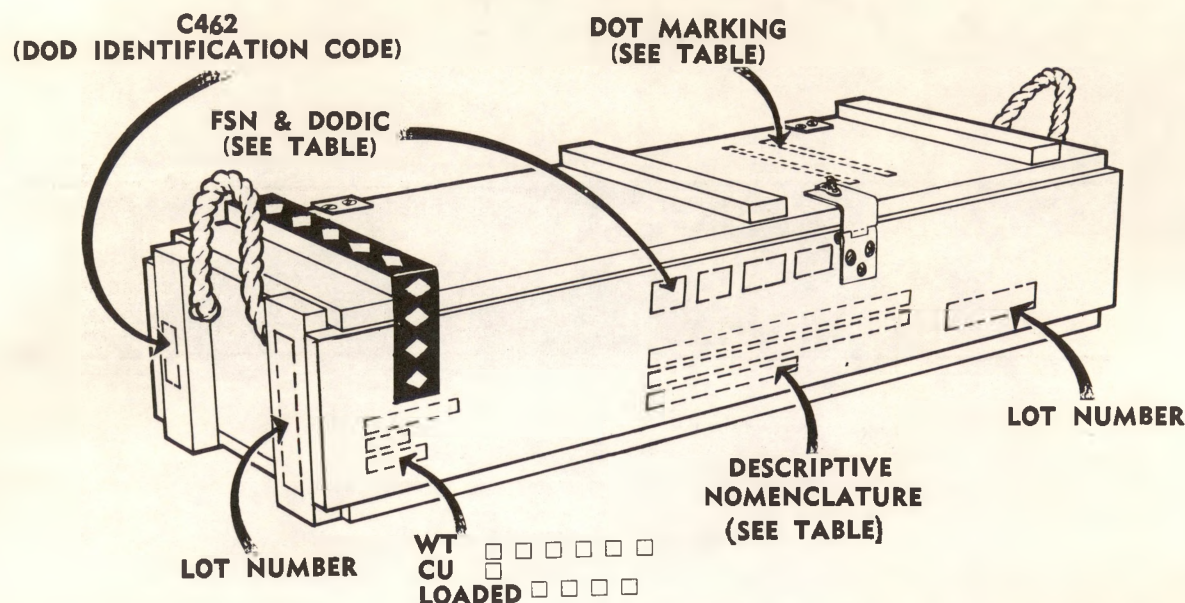
Figure 1-9 (U). Fiber container M105A2—cutaway view (U).



DESCRIPTIVE NOMENCLATURE	DODIC MARKING (CURRENT)	BURSTING CHARGE MARKING	LOT NUMBER MARKING (TYPICAL)
CARTRIDGE 105 MM HE M413 DUALGRAN W/FUZE MTSQ M554	C469 +	COMP B	LOT PA-211-23X (TYPICAL)
CARTRIDGE 105 MM HE M444* DUALGRAN W/FUZE MTSQ M548	C462 +	RDX	LOT LOP-5-8X (TYPICAL)
CARTRIDGE 105 MM HE M444 DUALGRAN W/FUZE MT M565	C462	RDX	LOT LOP-25-26X (TYPICAL)

* EARLY LOTS WERE T378E1 W/FUZE XM548 + EARLY LOTS MAY NOT HAVE DODIC NUMBER MU-L648-C

Figure 1-10 (U). Fiber container M105A2—markings (U).

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DESCRIPTIVE NOMENCLATURE	FSN AND DODIC	DOT MARKING
2 - CARTRIDGE 105 MM HE M413 DUALGRAN W/FUZE MTSQ M554	1315-629-3875-C469 +	AMMUNITION FOR CANNON WITH EXPLOSIVE PROJECTILES
2 - CARTRIDGE 105 MM HE M444* DUALGRAN W/FUZE MTSQ M548	1315-797-7199-C462 +	AMMUNITION FOR CANNON WITH EXPLOSIVE PROJECTILES
2 - CARTRIDGE 105 MM HE M444 DUALGRAN W/FUZE MT M565	1315-965-0739-C462	AMMUNITION FOR CANNON WITH EXPLOSIVE PROJECTILES

* EARLY LOTS WERE MARKED T378E1

+ DODIC NUMBER MAY BE MISSING ON EARLY LOTS.

MU-L649-D

Figure 1-11 (U). Wooden packing box markings (U).

Section III (C). HIGH-EXPLOSIVE 155-MM PROJECTILES M449, M449E1, M449E2, AND M449A1—DESCRIPTION

1-10 (C). General

a. The 155-mm projectiles M449, M449E1, M449E2, and M449A1 (fig. 1-12) are submissiled, airburst, antipersonnel munitions that are fired from 155-mm howitzer cannons (table 2-1). The projectile M449E2 was type classified M449A1; this projectile has been issued to the field marked either M449E2 or M449A1.

b. The primary differences between the projectiles are an increase in grenade lethality between the projectiles M449 and M449E1, and an increase

in range for the projectiles M449E2 and M449A1.

c. Each projectile is classified as separate loading; the projectile, primer, propelling charge, and fuze are handled and loaded separately.

d. A description of the propelling charges (M3 series and M4 series) and primers for use with these projectiles is contained in TM 9-1300-203 under ammunition for 155-mm howitzer cannons. In addition to the above charges, propelling charge XM119, when issued, will be used to increase the range to zone 8 for the projectiles M449E2 and

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Figure 1-12 (U). 155-mm projectile (U).

M449A1 only. When the range is increased, the projectiles will only be fired from a 155-mm howitzer cannon M126. The range cannot be increased beyond zone 7 for projectiles M449 and M449E1.

e. The projectiles are issued with an eyebolt lifting plug threaded into the fuze cavity of each projectile.

f. The projectiles use the standard mechanical time fuze M548 or M565 (fig. 1-16).

1-11 (C). 155-mm Projectile M449

a. *General.* The projectile M449 shell assembly has the external configuration and ballistic characteristics of the standard high-explosive projectile M107. A metal rotating band encircles the projectile near the base. The rotating band is protected by a grom-

met during shipment and storage. The shell assembly serves as a carrier for 60 individual optimum fragmentation grenades M43.

b. *Description.* The projectile M449 (fig. 1-13) consists of a shell assembly, an expulsion charge, a pusher plate, individual grenades, and offset plate, and a base plug. The base plug is press-fitted and pinned into the base of the shell assembly. The grenades are arranged in ten layers with six grenades in each layer. The grenades are wedge-shaped to facilitate packaging in the shell assembly; they fit snugly without added support and each one is designed to withstand the setback forces caused by the grenades above it. The offset plate insures that one-half of the grenades are offset from the remaining half; this prevents the spin of the projectile from rotating the individual grenade layers with respect to an adjacent layer. The pusher plate consists of an aluminum plate and an O-ring installed at the nose end of the grenade group.

c. *Grenade M43.* The grenade M43 (fig. 1-14) is not painted or marked. It is an airburst munition which is expelled from the projectile in flight. Upon surface impact, the explosive components are ejected upward for airburst. The grenade essentially consists of a housing assembly with two spring-loaded vanes and a two-piece steel ball filled with RDX.

1-12 (C). 155-mm Projectile M449E1

a. Projectile M449E1 (fig. 1-13) is similar to projectile M449 (para 1-11) except that the shell assembly serves as a carrier for 60 grenades M43E1 instead of grenades M43. The fuzes and propelling charges used with this round are identical to those used with projectile M449.

b. Grenade M43E1 (fig. 1-14) is similar to grenade M43 (para 1-11c) with the exception that lethality of grenade M43E1 is increased.

1-13 (C). 155-mm Projectiles M449E2 and M449A1

a. *General.* The projectiles M449E2 and M449A1 (fig. 1-15) are identical (the M449E2 was type classified M449A1) and are fired from 155-mm howitzer cannons. The shell assembly is similar to projectile M449 with the addition of an obturating band just to the rear of the rotating band. The shell assembly serves as a carrier for 60 individual grenades. The projectile M449E2 contains grenades M43E2 and the projectile M449A1 contains grenades M43A1 (fig. 1-14). Both grenades are identical; the grenade M43E2 was type classified M43A1. These grenades have a greater lethality potential than grenade M43 (projectile M449).

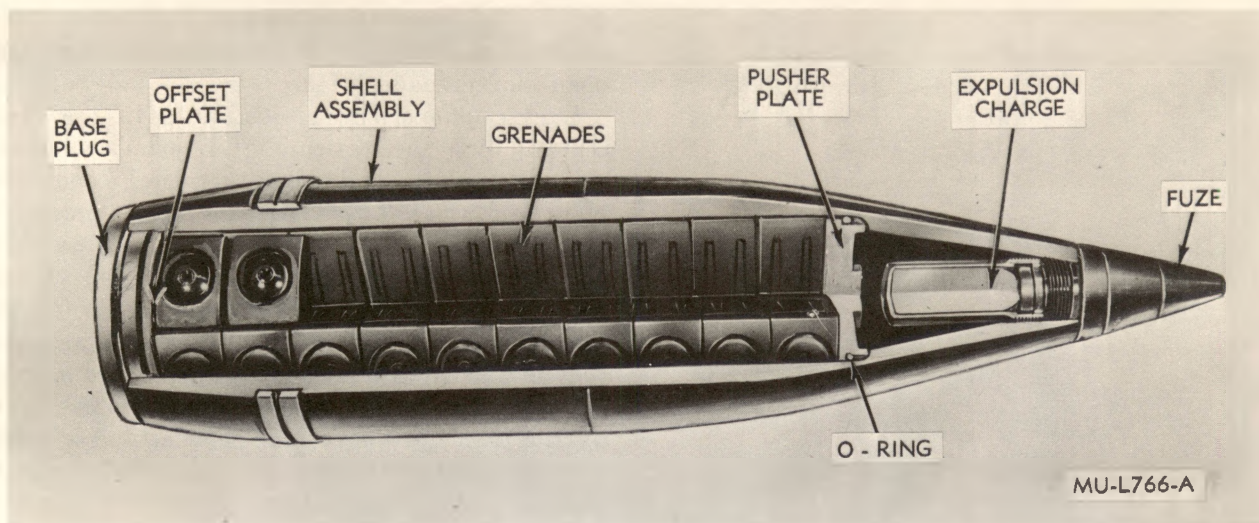
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Figure 1-13 (U). 155-mm projectile M449 or M449E1—cross-sectional view (U).

b. *Description* (fig. 1-15). The projectile M449E2 or M449A1 consists of the same configuration as projectile M449, with the addition of a support plate and an additional offset plate. The support plate enables the shell casing to withstand the extra pressure of firing with the propelling charge XM119. The grenades are inserted into the shell assembly in 10 layers of six grenades each. The layer of grenades between the base plug and the support plate are not offset. One half of the remaining nine layers of grenades are offset by the addition of an offset plate to prevent the projectile spin from rotating the individual grenade layers in respect to adjacent layers.

c. *Grenades M43E2 and M43A1* (fig. 1-14). The grenades are similar to grenade M43 (para 1-11c) except that the grenades M43E2 and M43A1 have a greater lethality potential and each has a superior locking device to maintain the vanes in the open position upon expulsion from the projectile.

1-14 (U). Standard Fuzes M548 and M565

a. Either standard fuze M548 or M565 (fig. 1-16) is used with the projectile M449 series. Both fuzes are essentially the same except that the fuze M548 incorporates a point-detonating feature not necessary to the function of the projectile.

b. Each fuze has a mechanical-time mechanism that may be set to function at any time between 2 and 100 seconds. A time scale permits setting the fuze in whole seconds, and a vernier scale permits further setting to tenths of a second. The fuze arms due to the centrifugal force generated by projectile spin; arming occurs between 1,500 and 2,000 rpm.

c. The fuzes incorporate a number of safety features that are described in paragraph 1-5a(1)(d).

1-15 (C). Functioning of Projectiles M449, M449E1, M449E2, and M449A1

a. *General*. Firing procedure for the projectiles are the same as that for all separate-loaded, large-caliber ammunition. The primer is functioned by the firing pin, causing ignition and burning of the black powder primer charge. This ignites the propelling charge which propels the projectile out of the howitzer tube at a specific muzzle velocity depending upon the charge used. The howitzer tube rifling engraves the rotating band of the projectile and causes it to rotate as it moves forward.

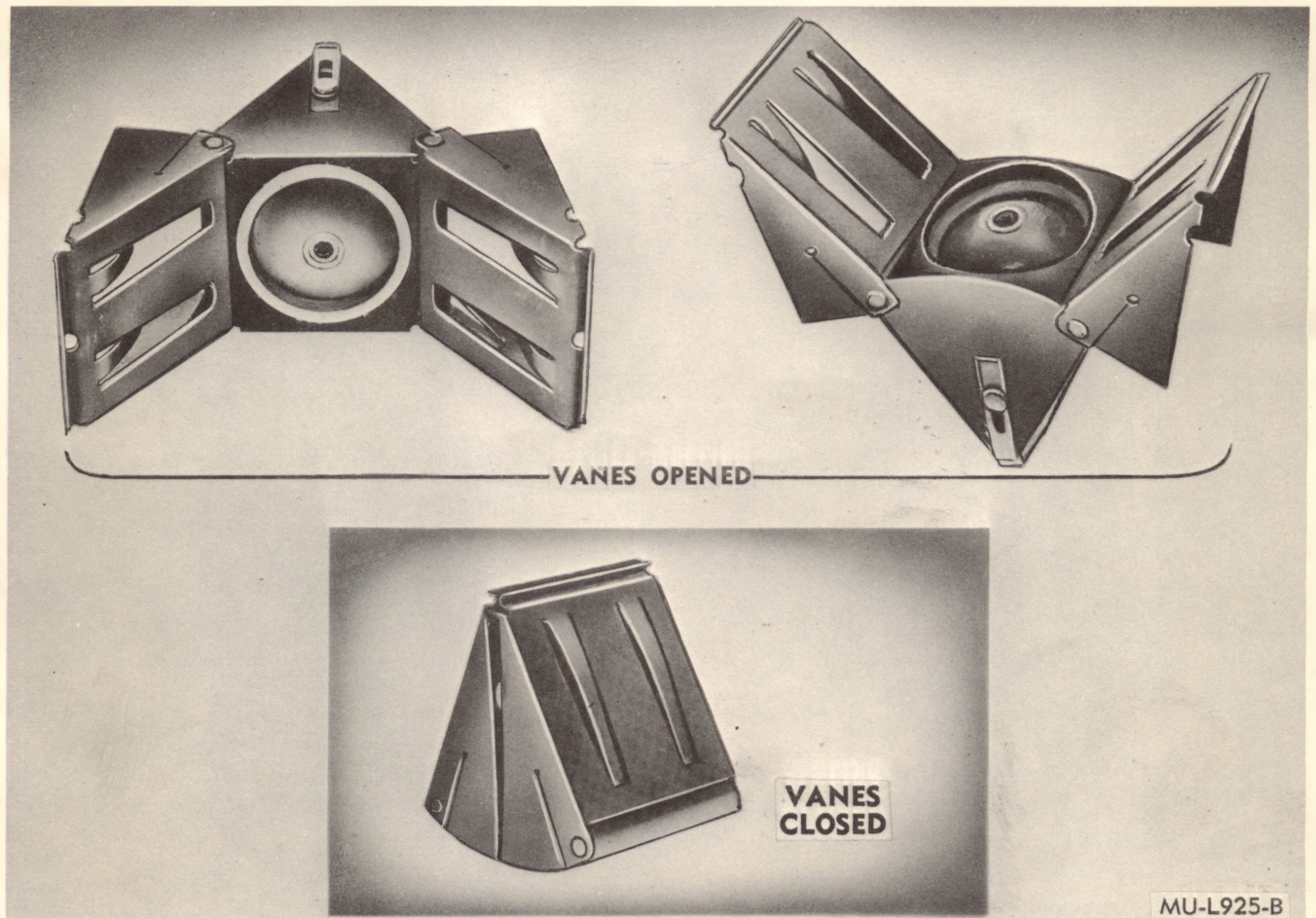
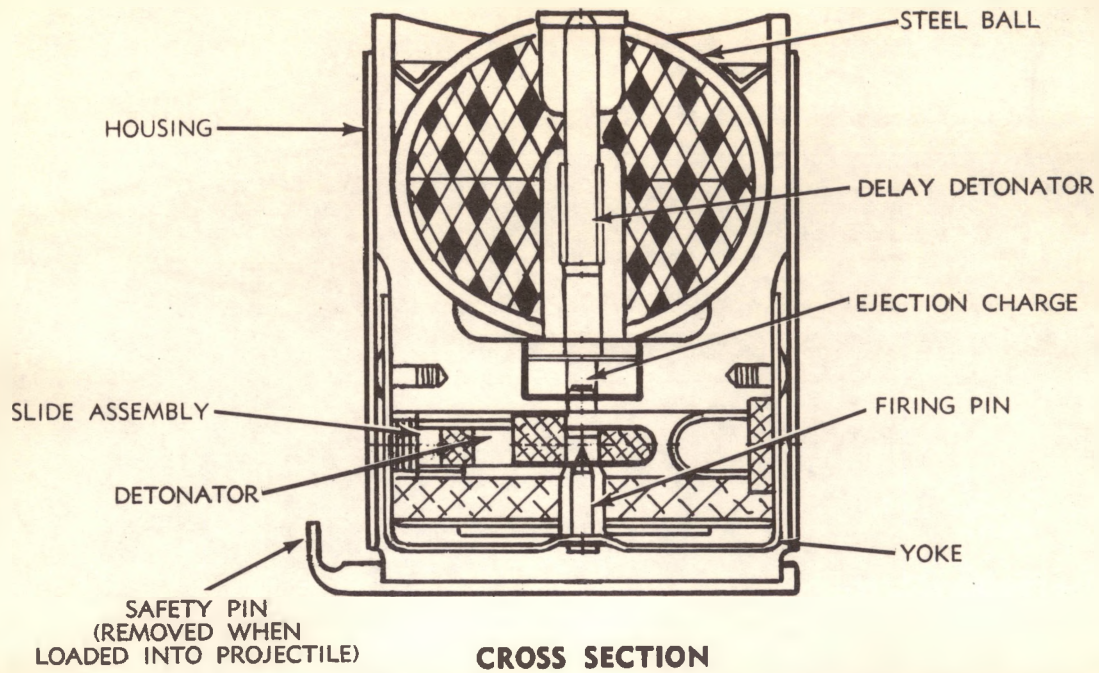
b. *Expulsion*. The fuze, having been set to function at a predetermined time in flight, initiates the expulsion charge. The force of this charge acts upon the pusher plate which sears the pins that hold the base plug in place and ejects the grenades from the base of the projectile. Centrifugal force disperses the grenade radially from the projectile line-of-flight.

c. *Functioning of Grenade M43, M43E1, M43E2, or M43A1* (fig. 1-14).

(1) Upon expulsion from the projectile, the vanes open and orient the grenade in a vertical or near-vertical position. The energy of the vane springs and the airstream lock the two vanes in the open position and stabilize the grenade.

(2) After the vanes are extended, a spring moves the yoke to the extended position. The firing pin, attached to the yoke, retracts from the slide assembly, permitting movement of this assembly which locates the detonator in the armed position. A delay in arming of the grenade is provided by restricting the air flow caused by movement of the slide assembly. This delay helps prevent premature grenade functioning caused by midair collision immediately after ejection from the projectile. Arming delay is

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Figure 1-14 (U). Grenade M43, M43E1, M43E2, or M43A1 (U).

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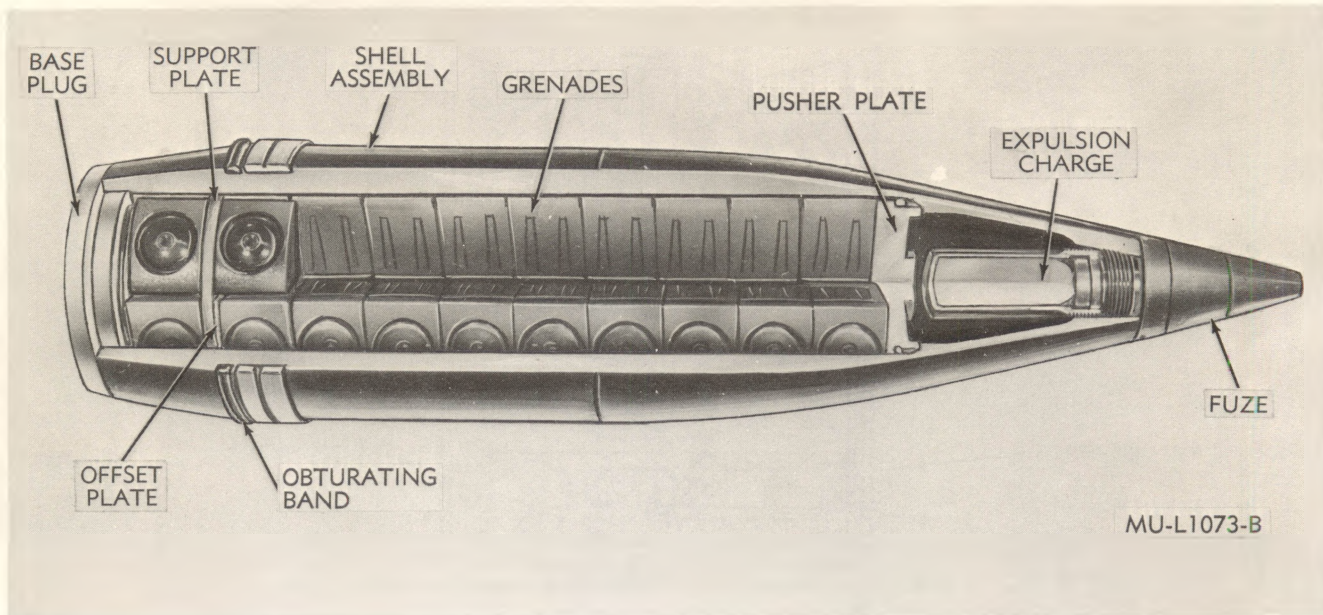


Figure 1-15 (U). 155-mm projectile M449E2 or M449A1 (U).



Figure 1-16 (U). Standard fuzes M548 and M565 (U).

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achieved by allowing air to pass through a porous plug in the housing located adjacent to the slider recess.

(3) When the grenade impacts the target surface, the yoke drives the firing pin into the detonator which initiates the ejection charge. The ejection charge forces the steel ball with the retaining washer up and away from the housing, ignites the first-fire mixture in the delay detonator, and forces the detonator into the in-line position. The delay detonator functions the high-explosive RDX at a distance of 4 to 6 feet above the impacted surface, causing the steel ball to fragment.

1-16 (U). Packing

The projectiles are packed eight to a pallet as illustrated in figure 1-17.

1-17 (U). Painting and Marking

a. General. To provide positive identification of the type of ammunition covered in this manual, a row of yellow diamonds is stenciled on the projectile. These markings were first applied on ammunition in field stocks. Not all stocks have been reworked. Projectiles in future production will be marked with yellow diamonds.

b. Projectile (fig. 1-18). The projectile is painted olive drab. Markings are stenciled in yellow. The lot number and date loaded are stenciled $\frac{1}{4}$ inch aft of the rotating band. A row of yellow diamonds is stenciled 4 or 5 inches from the nose of the projectile.

c. Pallet. The pallet is not painted. Markings are stenciled in black as indicated in figure 1-18.

1-18 (C). Tabulated Data—155-mm Projectiles

Weight of projectile as fired (approx)....95 lb.

Length of projectile (w/lifting plug)....26.9 in.

Length of projectile (w/fuze).....	27.5 in.
Fuze.....	Standard M548 or M565.
Type of explosive.....	RDX.
Explosive weight:	
Total projectile.....	3 lb.
Total projectiles (8) per pallet.....	24 lb.
Expulsion charge:	
Type.....	M10 mortar propellant.
Weight.....	30 grams.
Projectile M449:	
Number of grenades M43.....	60.
Maximum range.....	14,948 meters.
Maximum muzzle velocity.....	1,850 fps.
Projectile M449E1:	
Number of grenades M43E1.....	60.
Maximum range.....	14,948 meters.
Maximum muzzle velocity.....	1,850 fps.
Projectile M449E2:	
Number of grenades M43E2.....	60.
Maximum range.....	18,000 meters.
Maximum muzzle velocity.....	2,245 fps.
Projectile M449A1:	
Number of grenades M43A1.....	60.
Maximum range.....	18,000 meters.
Maximum muzzle velocity.....	2,245 fps.
Packing:	
Pallet.....	8 projectiles.
Cubical displacement.....	6.8 cu. ft.
Weight:	
M449 or M449E1.....	804 lb.
M449A1 or M449E2.....	793 lb.
FSN and DODIC code:	
M449.....	1320-073-8847-D562.
M449E1.....	1320-226-6147-D561.
M449A1 and M449E2.....	1320-073-8847-D562.
Quantity-distance class.....	4.
Storage compatibility group.....	A.
DOT markings.....	Explosive projectile.
DOT shipping class.....	A.
Coast Guard shipping class.....	VII.

Section IV (C). HIGH-EXPLOSIVE 8-INCH PROJECTILE M404—DESCRIPTION

1-19 (U). General

a. The projectile M404 is a submissiled, airburst, antipersonnel munition that is fired from 8-inch howitzer cannons (table 2-1).

b. The projectile is classified as separate loading; the projectile, primer, propelling charge, and fuze are handled and loaded separately.

c. A description of the propelling charges M1 and M2 and primers for use with the projectile is contained in TM 9-1300-203 under ammunition for 8-inch howitzer cannons.

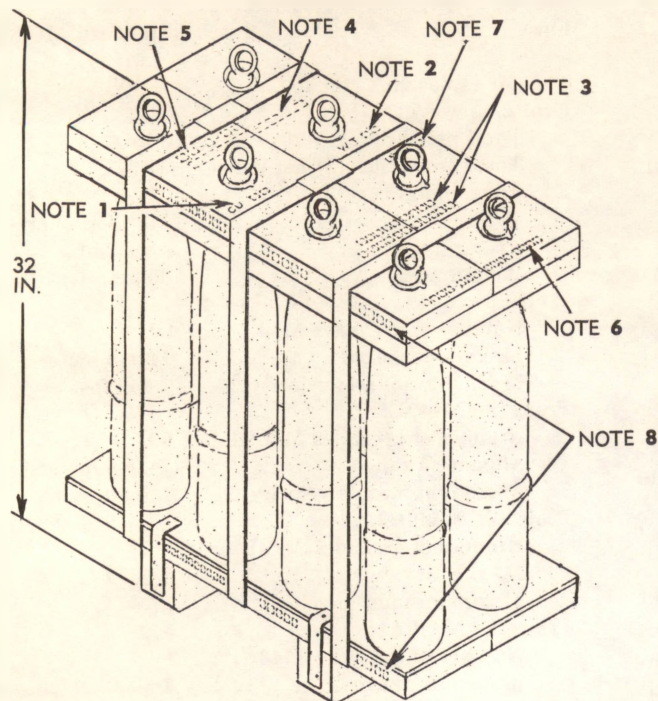
d. The projectile is issued with an eyebolt lifting plug threaded into the fuze cavity of the projectile.

e. The projectile uses the standard mechanical-time fuze M548 or M565.

1-20 (C). 8-Inch Projectile M404

a. General. The shell body is a slightly modified version of the 8-inch high-explosive projectile M106 shell body and has the same external configuration and ballistic characteristics as the standard high-explosive projectile. A metal rotating band encircles the projectile near the base. The rotating band is protected by a grommet during shipment and storage. The shell body serves as a carrier for 104 individual grenades M43A1.

b. Description (fig. 1-19). The projectile M404 consists of a body assembly, a rotating band, and an expulsion charge assembly. Inside the body assembly a pusher plate is seated against a collar behind the expulsion charge. An O-ring is fitted around the

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MARKING INSTRUCTIONS
ALL MARKINGS ARE IN BLACK
STENCIL INK, 1/2 INCH HIGH

NOTES

- 1 - CUBICAL DISPLACEMENT
- 2 - GROSS WEIGHT TO NEAREST POUND
- 3 - D.O.T. MARKINGS
- 4 - DESCRIPTIVE NOMENCLATURE
- 5 - LOT NUMBER
- 6 - FSN AND DODIC CODE
- 7 - MONTH AND YEAR LOADED
- 8 - 8 PROJECTILES 155-MM HE ☐ ☐ ☐ ☐
(MODEL NUMBER)

MU-L2090

Figure 1-17 (U). Palletized 155-mm projectiles (U).

outer edge of the pusher plate to form a seal with the shell. Two pins are secured through a star-shaped aluminum support rod into a hub on the pusher plate. The support rod extends the length of the shell cavity and 13 layers of grenades, with 8 wedge-shaped grenades in each layer, are sandwiched in around the rod. Each grenade layer is designed to withstand the set-back forces caused by the adjoining grenade layers. The aluminum support rod prevents the spin of the projectile from rotating an individual grenade layer in respect to adjacent grenade layers. A base plug is threaded through a sealing gasket and an O-ring into the aft end of the shell body. The threads are designed to shear when pressure is applied by firing the expulsion charge.

c. *Grenade M43A1* (fig. 1-14). The grenade M43A1 is not painted or marked. It is an airburst munition which is expelled from the projectile in flight. Upon surface impact, the explosive components are ejected upward for airburst. The grenade essentially consists of a housing assembly with spring-loaded vanes, and a two-piece steel ball filled with RDX.

d. *Fuzes M548 and M565* (fig. 1-16). For a description of the standard fuzes M548 and M565, refer to paragraph 1-14.

1-21 (C). Functioning of Projectile M404

a. *General*. Firing procedures for the projectiles are the same as that for all separate-loaded, large caliber ammunition. The primer is functioned by the

firing pin, causing ignition burning of the black powder primer charge. This ignites the propelling charge which propels the projectile out of the howitzer tube at a specific muzzle velocity depending upon the charge used. The howitzer tube rifling engraves the rotating band of the projectile and causes it to rotate as it moves forward.

b. *Expulsion*. The fuze, having been set to function at a predetermined time in flight, initiates the expulsion charge. The force of this charge acts upon the pusher plate which shears the threads that hold the base plug in place and ejects the grenades from the base of the projectile. Centrifugal force disperses the grenades radially from the projectile line-of-flight.

c. *Functioning of Grenade M43A1*. Refer to paragraph 1-15c for functioning of grenade M43A1.

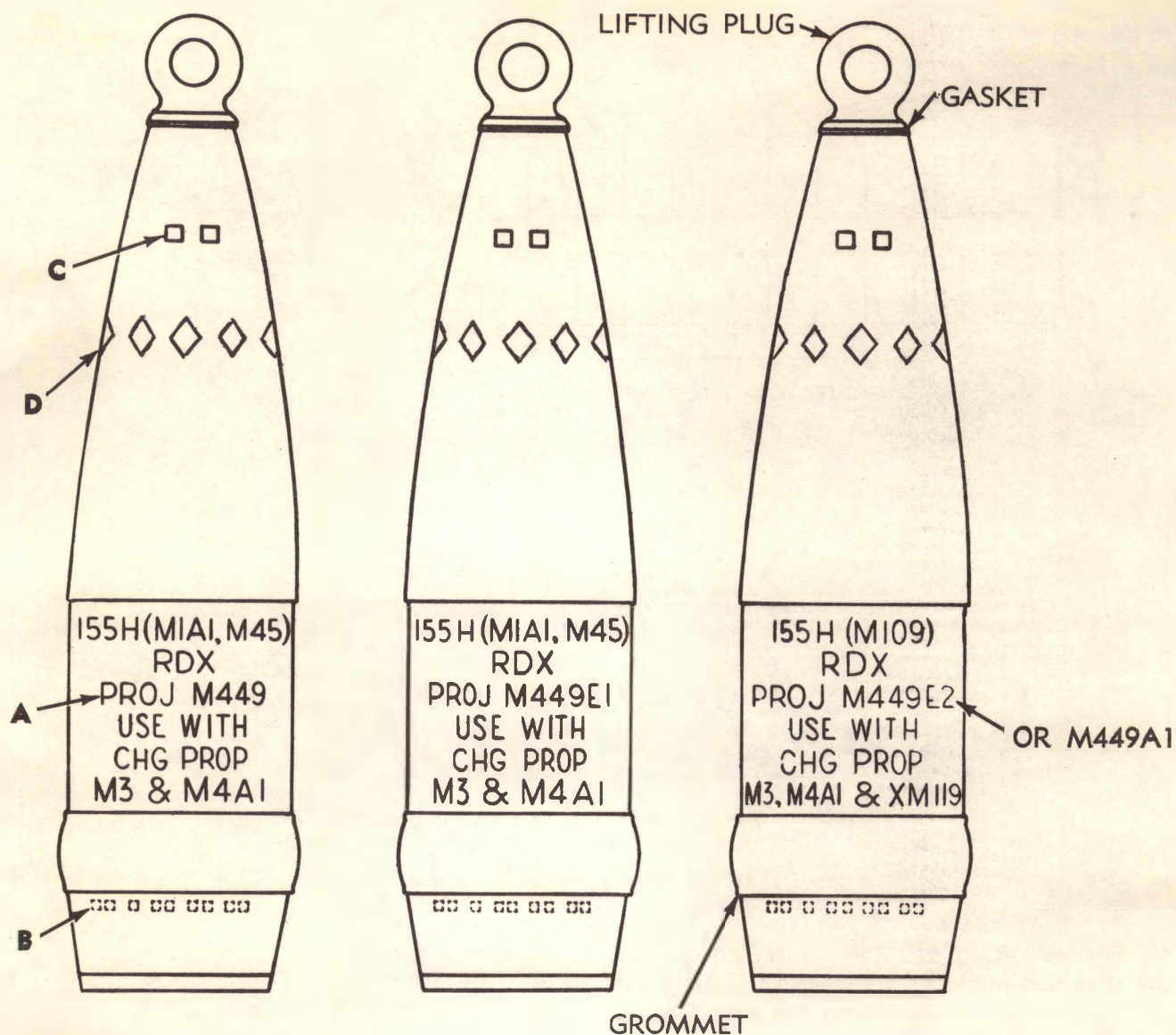
1-22 (U). Packing

The projectiles are packed six to a pallet as illustrated on figure 1-20.

1-23 (U). Painting and Marking

a. *General*. To provide positive identification of the type of ammunition covered in this manual, a row of yellow diamonds is stenciled on the projectile. These markings were first applied on ammunition in field stocks. Not all stocks have been reworked. Projectiles in future production will be marked with yellow diamonds.

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NOTES:

- A** - STENCILED NOMENCLATURE 5/8 INCH HIGH, 1/4 INCH BETWEEN LINES.
- B** - STENCILED LOT NUMBER AND DATE (MONTH AND YEAR) LOADED. 1/4 INCH HIGH.
- C** - STENCILED ZONE WEIGHT. ZONE WEIGHTS DO NOT INCLUDE NOMINAL WEIGHT OF LIFTING PLUG 1.1 LBS AND NOMINAL WEIGHT OF GROMMET 0.7 LB.
- D** - STENCILED DIAMONDS, 1-1/4 INCHES HIGH, 3/4 INCH WIDE, 3/4 INCHES DOWN FROM ZONE WEIGHT.

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Figure 1-18 (U). 155-mm projectiles M449, M449E1, M449E2, and M449A1—Markings (U).

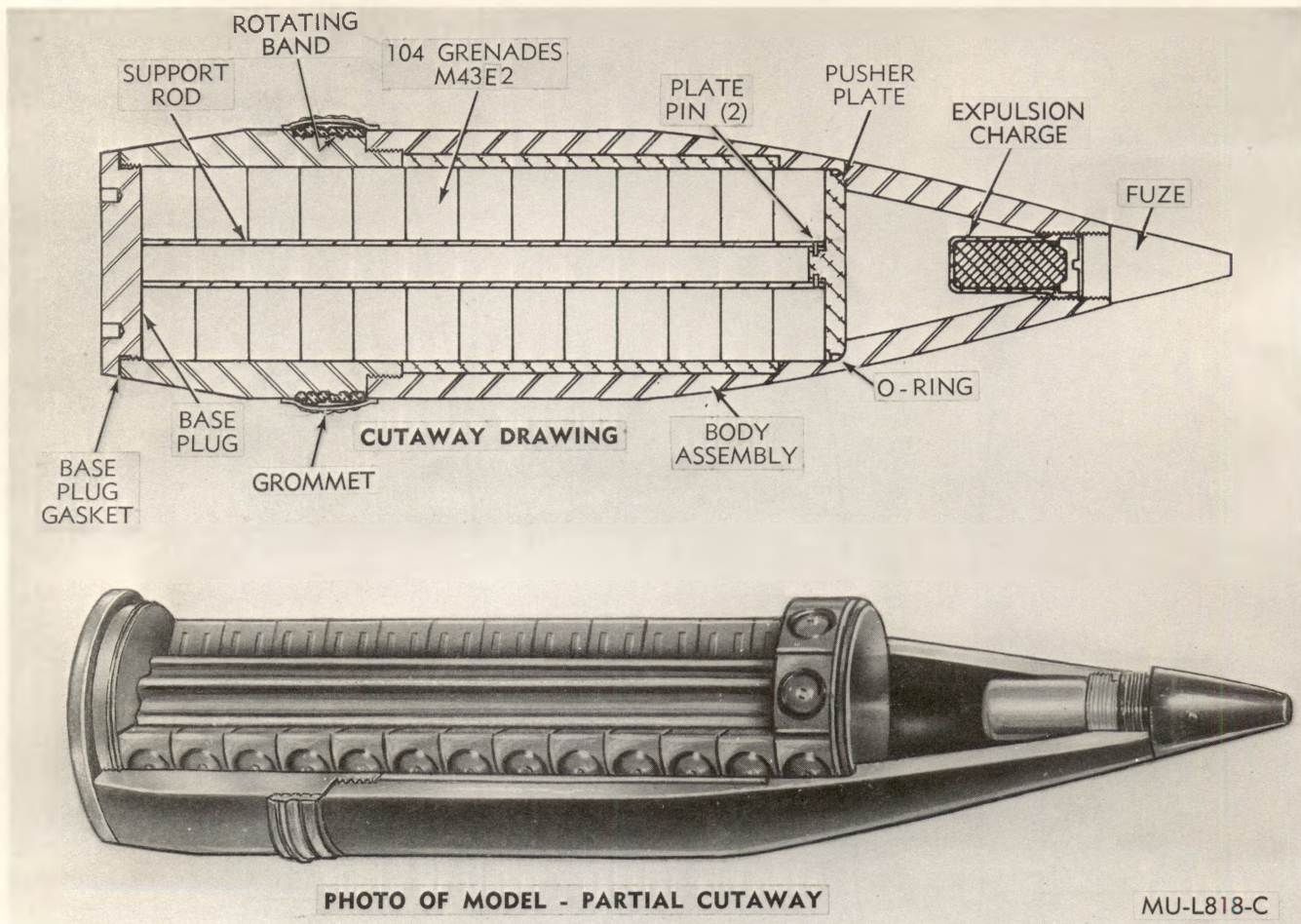
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Figure 1-19 (U). 8-inch projectile M404—cutaway views (U).

b. Projectile (fig. 1-21). The projectile is painted olive drab and markings are stenciled in yellow. A row of yellow diamonds is stenciled 4 or 5 inches from the nose of the projectile.

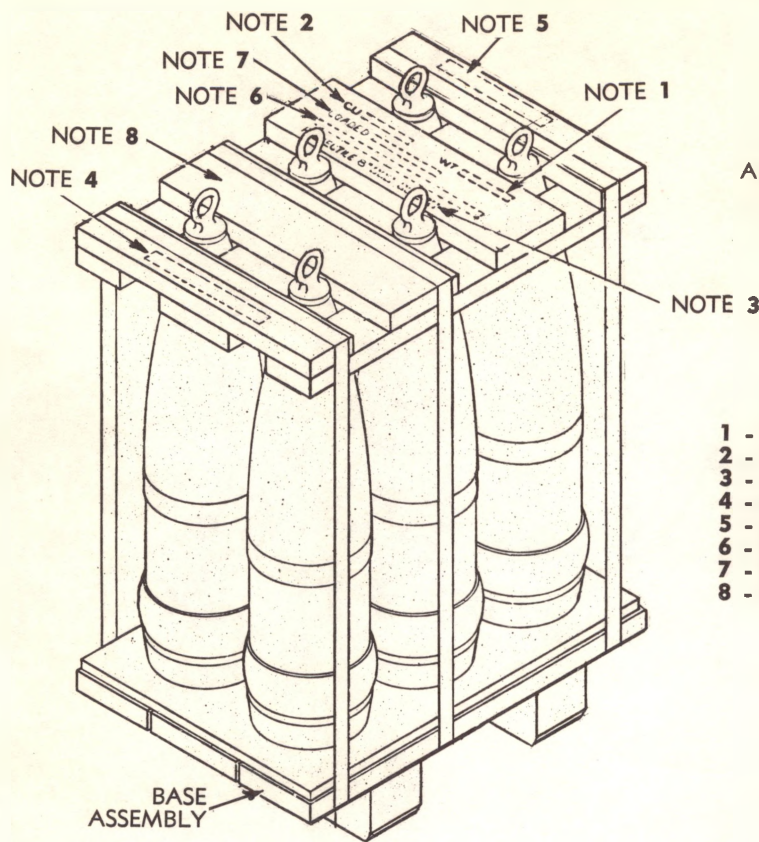
c. Pallet. The pallet is not painted. Markings are stenciled in black as indicated in figure 1-20.

1-24 (C). Tabulated Data—8-Inch Projectile

Weight of projectile as fired (approx).	200 lb.
Length of projectile (w/lifting plug) -	31.3 in.
Length of projectile (w/fuze) -	34.9 in.
Fuze -	Standard M548 or M565.
Number of grenades M43A1 in projectile.	104.
Type of explosive -	RDX.

Explosive weight:	
Total projectile -	5.4 lb.
Total projectiles (6) per pallet -	32.4 lb.
Expulsion charge:	
Type -	M10 mortar propellant.
Weight -	60 grams.
Maximum range -	16,700 meters.
Maximum muzzle velocity -	1,950 fps.
Packing:	
Pallet -	6 projectiles.
Cubical displacement -	12.4 cu. ft.
Weight -	1,253 lb.
FSN and DODIC code -	1320-986-9731-B684
Quantity-distance class -	4.
Storage compatibility group -	A.
DOT shipping class -	A.
DOT markings -	Explosive projectile
Coast guard shipping class -	VII.

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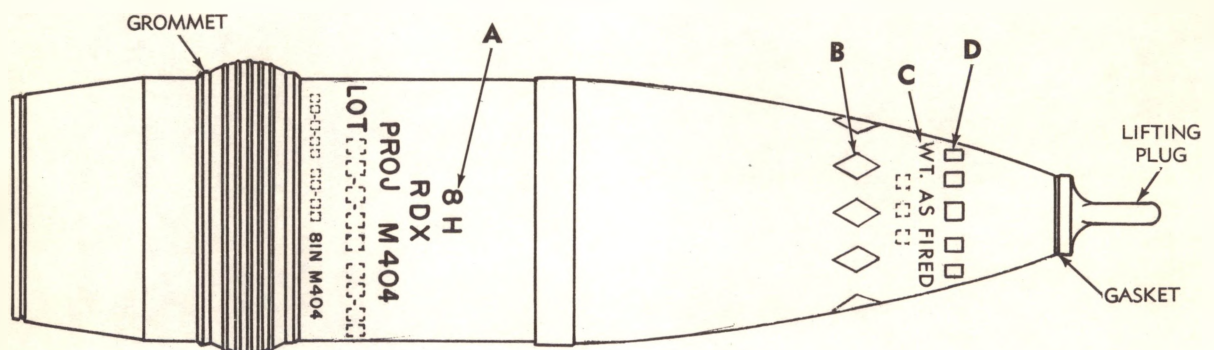


MARKING INSTRUCTIONS
ALL MARKINGS ARE IN BLACK STENCIL INK
1/2 INCH HIGH, EXCEPT FEDERAL STOCK
NUMBER WHICH IS 1-INCH HIGH.

- NOTES**
- 1 - GROSS WEIGHT TO NEAREST POUND
 - 2 - CUBICAL DISPLACEMENT
 - 3 - DESCRIPTIVE NOMENCLATURE
 - 4 - FEDERAL STOCK NUMBER AND DODIC CODE
 - 5 - LOT NUMBER
 - 6 - D.O.T. MARKINGS
 - 7 - MONTH AND YEAR LOADED
 - 8 - OVERSEAS ADDRESS

MU-L2091

Figure 1-20 (U). Palletized 8-inch projectiles (U).



NOTES:

- A - STENCILED NOMENCLATURE, LOT NUMBER, AND DATE (MONTH AND YEAR) LOADED, 3/4 INCH HIGH, 3/8 INCH BETWEEN LINES.
- B - STENCILED DIAMONDS, 1-1/2 INCH HIGH x 1 INCH WIDE.
- C - WEIGHT AS FIRED 1/2 INCH HIGH.
- D - STENCILED ZONE WEIGHT. ZONE WEIGHTS DO NOT INCLUDE NOMINAL WEIGHT OF LIFTING PLUG AND NOMINAL WEIGHT OF GROMMET. 1/2 INCH HIGH.

MU-L1220-A

Figure 1-21 (U). 8-inch projectile—markings (U).

CHAPTER 2 (C)

HANDLING AND USE

Section I (U). SAFETY PRECAUTIONS

2-1 (U). General

Safety precautions for the handling and firing of artillery ammunition as prescribed in TM 9-1300-203, TM 9-1300-206, TM 9-1900, and AR 385-63 are applicable to the ammunition contained in this manual.

WARNING

Do not touch, move, or otherwise handle projectile duds; their fuzes may be armed. Unexploded grenades expelled from the munitions will not be touched. Projectile duds or unexploded grenades will be destroyed by explosive ordnance disposal personnel only.

2-2 (U). Grenade Hazards

Figures 2-1 through 2-5 show grenades in various configurations that may be encountered during movement through areas that have been subjected to artillery fire. The illustrations are representative and do not necessarily reflect all configurations that may be encountered. Study these carefully so that hazards may be recognized.

2-4 (U). Receipt of Materiel

When the ammunition is first received by the using organization, it is the responsibility of the officer in charge to determine if the ammunition was received from the supplying organization in a serviceable condition.

2-5 (U). Handling of Unused Ammunition

The ammunition should remain in the original

2-3 (U). Safety Precautions

a. Do not use damaged, severely corroded, or improperly assembled ammunition.

b. Do not fire ammunition that is obviously wet. Wet propellant may cause a malfunction. Protect the propelling charges from the elements when adjusting the propelling charge increments to achieve the specific charge to be fired, and protect the ammunition from the elements until it is loaded into the howitzer for firing.

c. Green bag and white bag propellant charges are different in design and in the amount and chemical composition of the propellant. Green bag and white bag increments must not be mixed in making up a propelling charge. The use of propelling charges with increments of more than one color is prohibited.

d. Before loading the ammunition into the howitzer, check the howitzer tube for any obstructions.

e. If a firing mission is aborted and the ammunition has been loaded into a howitzer that has been subjected to a high sustained rate of fire thereby causing the howitzer to become hot, fire or remove the ammunition within 5 minutes or follow hot tube procedures as prescribed in TM 9-1300-203.

Section II (U). GENERAL

packing, e.g., wooden box or pallet, until ready for use. Ammunition that was removed from boxes or pallets and not fired, will be returned to their original condition and packings and be appropriately marked. Such ammunition will be used first in subsequent firings in order to keep stocks of opened ammunition to a minimum.

Section III (U). 105-MM CARTRIDGES M413 AND M444

2-6 (U). Unpacking

a. Open the wooden box and remove the two fiber containers.

WARNING

Injury to personnel or damage to materiel may result if the U-shaped packing stop is not removed in *b* below before firing.

b. Open each fiber container and remove the cartridge case and cartridge. Remove the U-shaped packing stop (fig. 1-9) from the fuze of the cartridge at the point where the fuze is joined to the body assembly.

2-7 (U). Preparation for Use

a. *Propelling Charge.*

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EMPTY M43 GRENADE HOUSINGS WITH THE VANES OPEN OR SEPARATED AND THE GRAY STEEL BALL MISSING ARE CONSIDERED SAFE.

THE M43 GRENADE WITH THE BALL IN PLACE MUST BE CONSIDERED HAZARDOUS AT ALL TIMES. THE VANES MAY BE OPEN, CLOSED, OR MISSING COMPLETELY. DO NOT TOUCH. MARK AND REPORT THEIR LOCATION.

DARK GREY STEEL BALLS CONTAIN A HIGH EXPLOSIVE, AND WHEN SEPARATED FROM THE M43 GRENADE HOUSINGS, ARE CONSIDERED EXPLOSIVE DUDS. AVOID, MARK, AND REPORT THEIR LOCATION.

MU-L2210

Figure 2-1 (U). Grenade M43 (series) and components on light to medium gravel (U).

WARNING

If the lip or flange of the cartridge case becomes damaged, do not insert the round in the howitzer tube as it could become jammed in the tube.

Adjust the propelling charge in the cartridge case for the charge to be fired. Refer to the appropriate firing table to ascertain the proper charge to achieve the desired range.

b. Setting of Fuzes.

CAUTION

Do NOT replace a fuze on the 105-mm cartridge. If the fuze is unserviceable, report the cartridge for disposition instructions.

CAUTION

When setting any fuze in (1) or (2) below, if the cap is inadvertently moved beyond the desired setting, continue turning in the same direction until the desired setting is reached. Do not turn the cap back as it will render the fuze unserviceable.

(1) Fuze M554 assembled to cartridge M418.

(a) Prior to firing, remove the safety pullwire (fig. 1-2) from the fuze by pulling the lower end of the wire from the hole in the body and sliding the wire off the end of the fuze.

(b) Select the applicable fuze setting from the appropriate firing table.

(c) Using fuze setter M14, M23, or M27 (fig. 2-6), turn the cap counterclockwise (as indicated by the arrow imprinted on the fuze) until the vertical line on the cap is aligned with the desired setting. If the fuze is inadvertently set higher than desired, continue to rotate the cap in a counterclockwise direction until the desired setting is obtained.

(d) To reset the fuze to safe, rotate the cap counterclockwise (in the direction of the arrow) until the S on the body is aligned with the vertical line on the cap (fig. 1-2). Slip the safety pullwire over the end of the fuze and insert the lower end in the hole in the body. When safed, the cartridge is ready for repacking and subsequent reuse.

(2) Fuze M548 or M565 assembled to cartridge M444.

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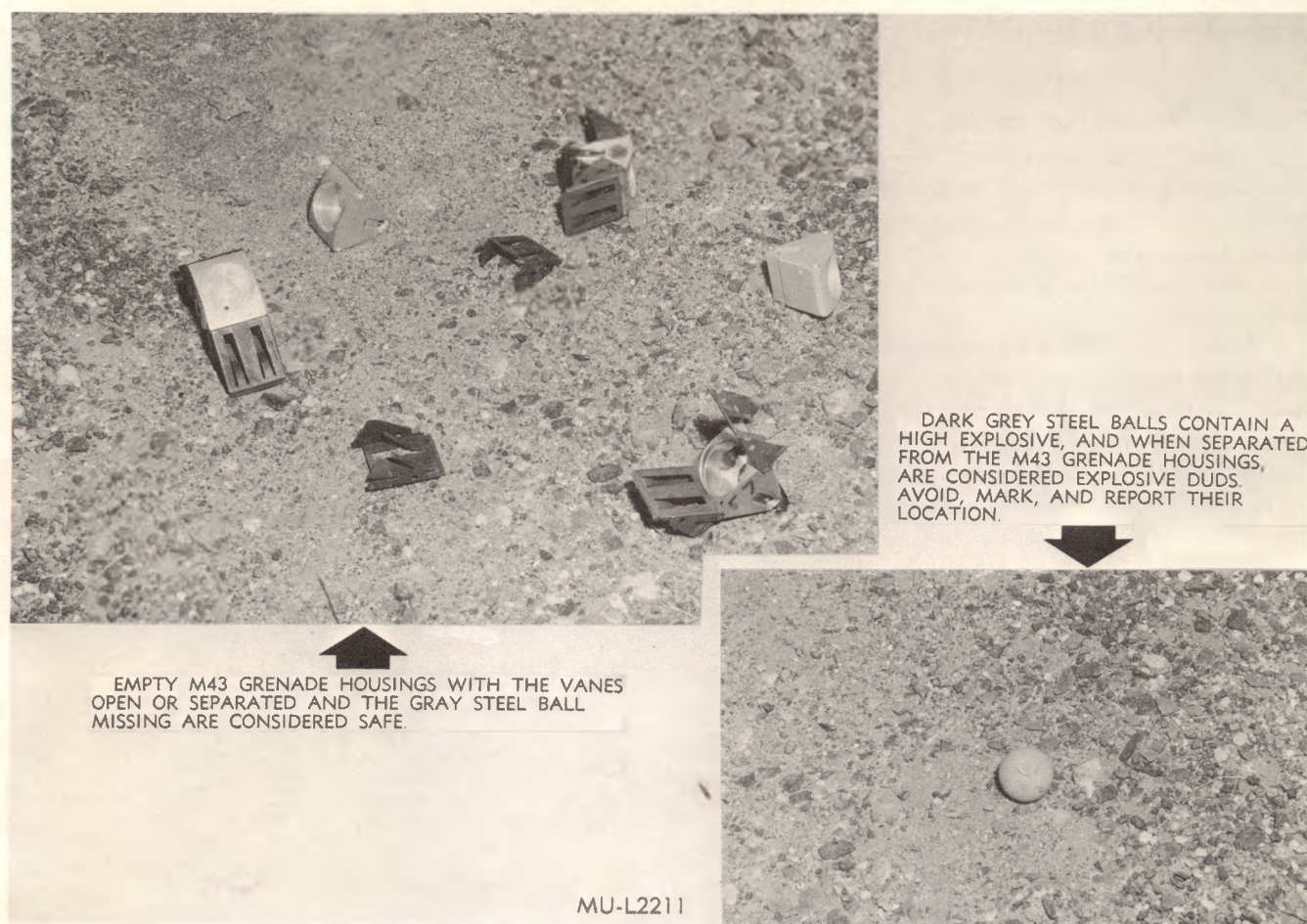


Figure 2-2 (U). Grenade M43 (series) components on light to medium gravel (U).

NOTE

Firing a cartridge with fuze M548 during heavy rain (comparable to rain which occurs during a summer thunderstorm) may cause premature functioning of the fuze.

Either fuze is set by turning the cap in a clockwise direction (as indicated by arrow imprinted on fuze) to the desired setting with fuze setter M63 or fuze setter XM34 (fig. 2-7). If the fuze is inadvertently set higher than desired, continue to rotate the cap in a clockwise direction until the desired setting is obtained. The time scale on the fuze is graduated in whole seconds, and the vernier scale is graduated in tenths of a second (A, fig. 2-8). Set the fuze as instructed below:

(a) Select the applicable fuze setting from the appropriate firing table.

(b) Using fuze setter M63 or XM34 (fig. 2-7), rotate the fuze cap clockwise (as indicated by the arrow imprinted on the fuze) until the desired number of whole seconds on the time scale is alined with the O on the vernier scale. To further set the fuze to additional tenths of a second, continue to *slightly* rotate the cap clockwise until the desired tenth of a

second on the vernier scale is alined with the very next graduation to it on the time scale.

Example 1. To set the fuze for $5\frac{5}{10}$ seconds, rotate the cap clockwise until the numeral "5" (5 seconds) on the time scale is alined with the O on the vernier scale (B, fig. 2-8). For the additional $\frac{5}{10}$ second, continue to *slightly* rotate the cap clockwise until the numeral "5" ($\frac{5}{10}$ second) on the vernier scale is alined with the very next graduation on the time scale, which is the numeral "15" (C, fig. 2-8). The fuze is now set for $5\frac{5}{10}$ seconds.

Example 2. To set the fuze for $5\frac{5}{10}$ seconds, rotate the cap clockwise until the numeral "5" (5 seconds) on the time scale is alined with the O on the vernier scale (B, fig. 2-8). For the additional $\frac{5}{10}$ second, continue to *slightly* rotate the cap clockwise until the numeral "9" ($\frac{5}{10}$ second) on the vernier scale is alined with the very next graduation on the time scale, which is the 23d graduation (D, fig. 2-8).

(c) To reset the fuze to safe (S alined with O) (A, fig. 2-8) rotate the cap in the direction of the arrow (clockwise) until the S on the time scale is alined with the O on the vernier scale. When safed, the cartridge is ready for repacking and subsequent use.

Section IV (C). 155-MM PROJECTILES M449, M449E1, M449E2, AND M449A1; AND 8-INCH PROJECTILE M404**2-8 (U). Preparation for Use**

a. Refer to the appropriate firing table to ascertain the proper propelling charge to achieve the desired range. If applicable, adjust increments for the charge to be fired.

b. Using a suitable wrench, remove the lifting plug and gasket.

c. Inspect the cavity for presence of foreign material. Remove any loose material from the cavity.

d. Obtain a fuze M548 or M565 and install the fuze in the projectile fuze cavity by screwing the fuze by hand. If binding occurs, inspect the fuze cavity and fuze threads for damage. Reject whichever component is at fault.

e. Assemble the fuze handtight; back off one-quarter of a turn and, with fuze wrench M18, tighten

the fuze to the projectile with a sharp snap of the wrench. Make sure the fuze shoulder seats firmly against the projectile nose.

f. Select the applicable fuze setting from the appropriate firing table.

CAUTION

When setting the fuze, if the cap is inadvertently moved beyond the desired setting, continue turning in the same direction (as indicated by arrow imprinted on fuze) until the desired setting is reached. Do not turn cap back as it will render the fuze unserviceable.

g. Set the fuze as instructed in paragraph 2-7b(2).

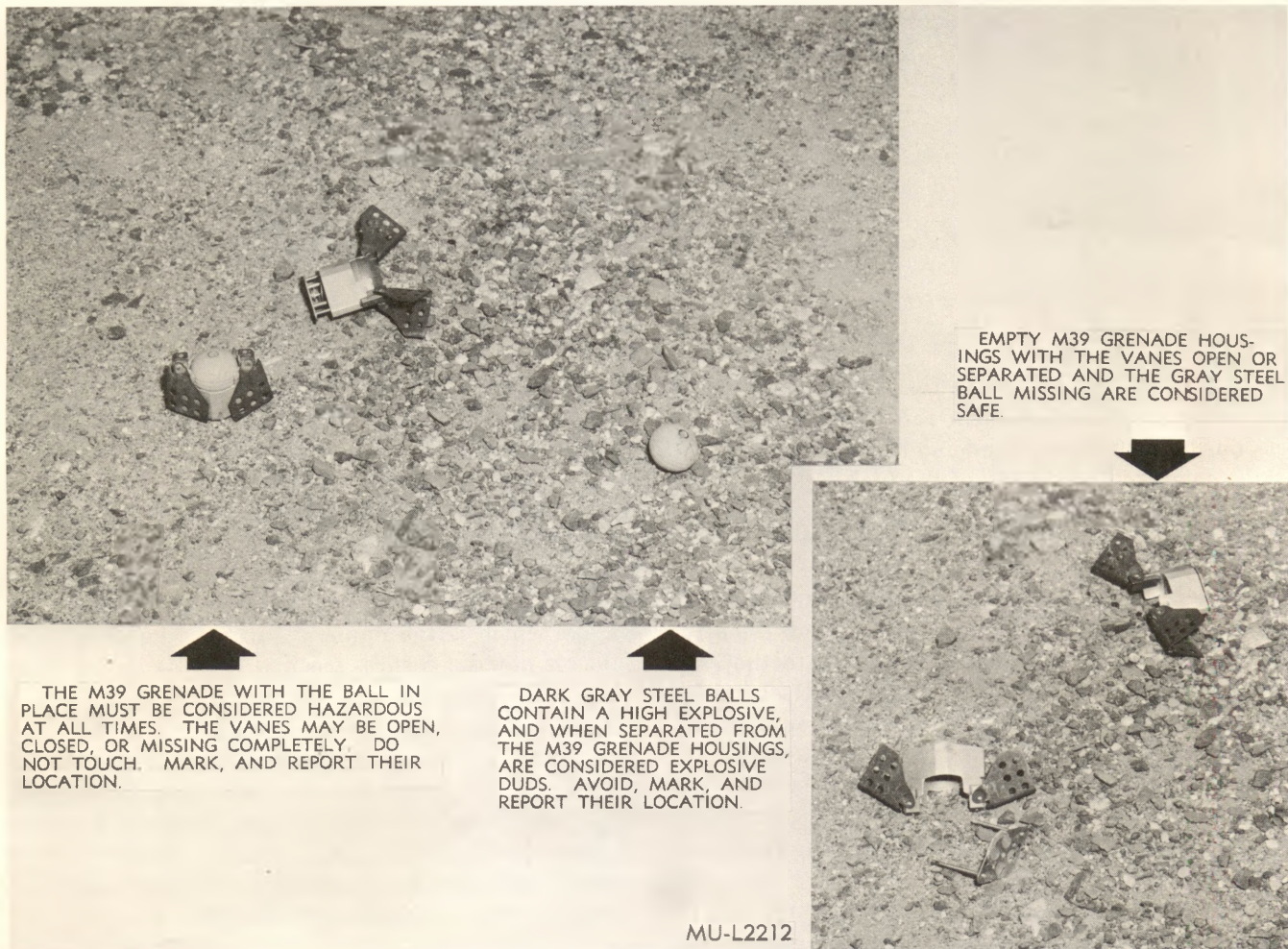


Figure 2-3 (U). Grenade M39 and components on light to medium gravel (U).

Section V (C). FIRING

2-9 (U). Firing

Firing of the ammunition contained in this manual does not require any specialized equipment or techniques, except for the use of the pertinent firing tables applicable to the cartridge and projectiles covered in this manual.

2-10 (C). Firing Tables

a. The firing tables that apply to the cartridges and projectiles covered by this manual are listed in table 2-1.

b. Supplemental and additional firing tables, as

they become available, will be listed in DA Pam 310-3.

c. Use of the 105-mm cartridge M444 at low quadrant elevation (QE) in zone 7 in howitzer M102 (towed) and howitzer M108 (self-propelled) can be expected to cause relatively high grenade dud rates because high spin and high slip-stream velocities cause damage to the payload. Use of the cartridge M444 in this mode should be avoided if it is possible to adequately accomplish the firing mission in another mode.



THE M35 GRENADE MUST BE CONSIDERED HAZARDOUS AT ALL TIMES. THE RIBBONS MAY BE OUT OF THE HOUSING, IN THE HOUSING, OR MISSING COMPLETELY. DO NOT TOUCH. MARK AND REPORT THEIR LOCATION.

MU-L2213

Figure 2-4 (U). Grenades M35 and components on medium gravel (U).

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GRENADERS HANG UP IN TREES AND BUSHES.
DO NOT TOUCH. MARK AND REPORT THEIR LOCATION.

MU-L2214

Figure 2-5 (U). Grenades M43 (series) and components lodged in tree (U).

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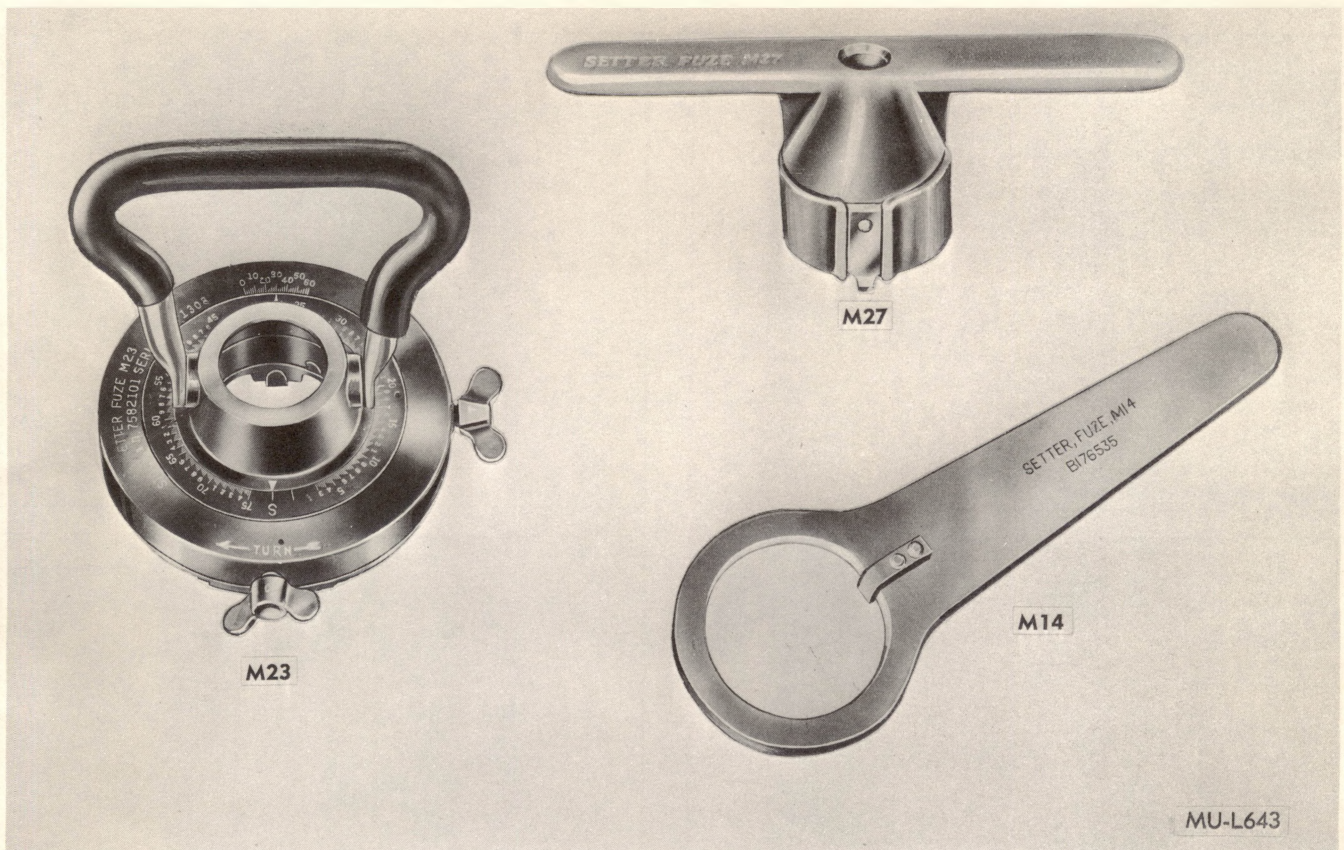


Figure 2-6 (U). Fuze setters M14, M23, and M27 for fuze M554 (U)

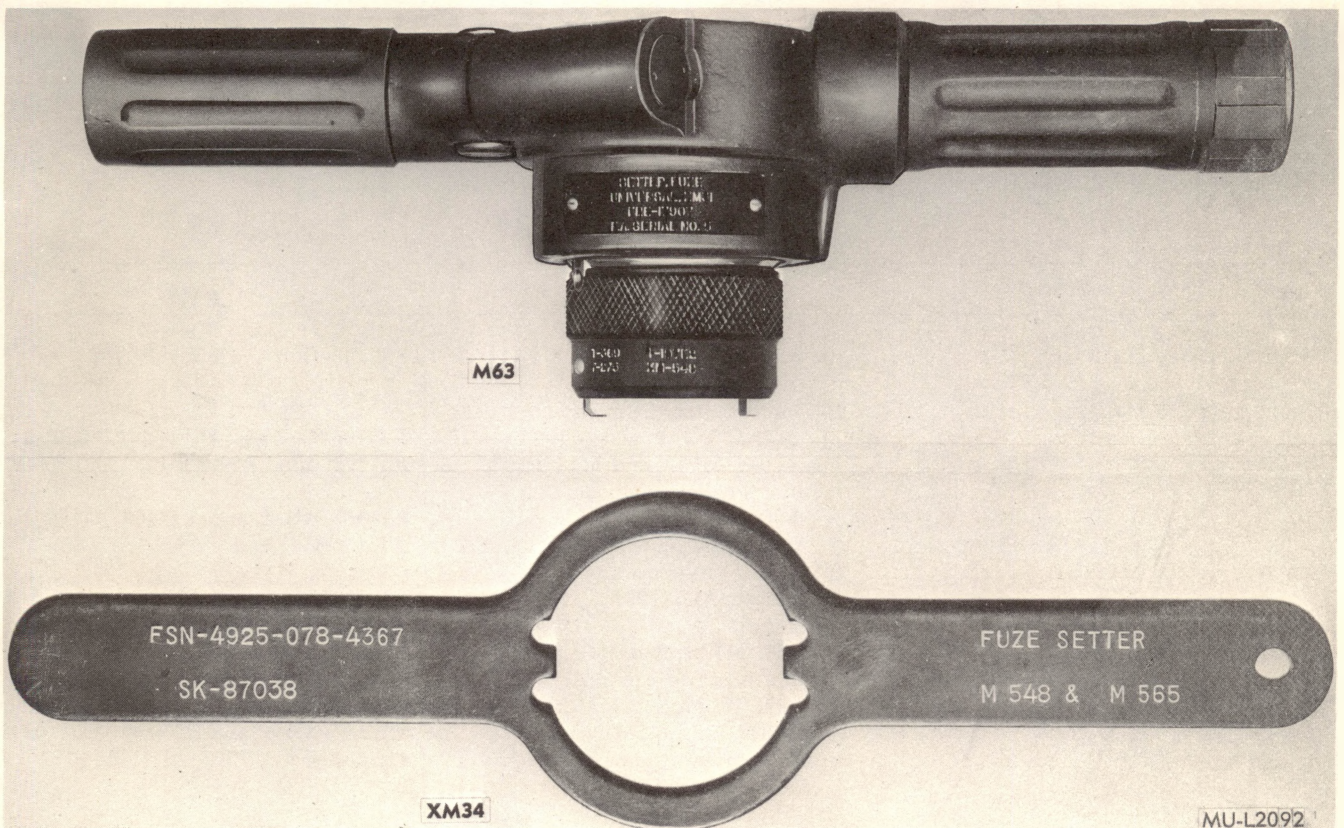
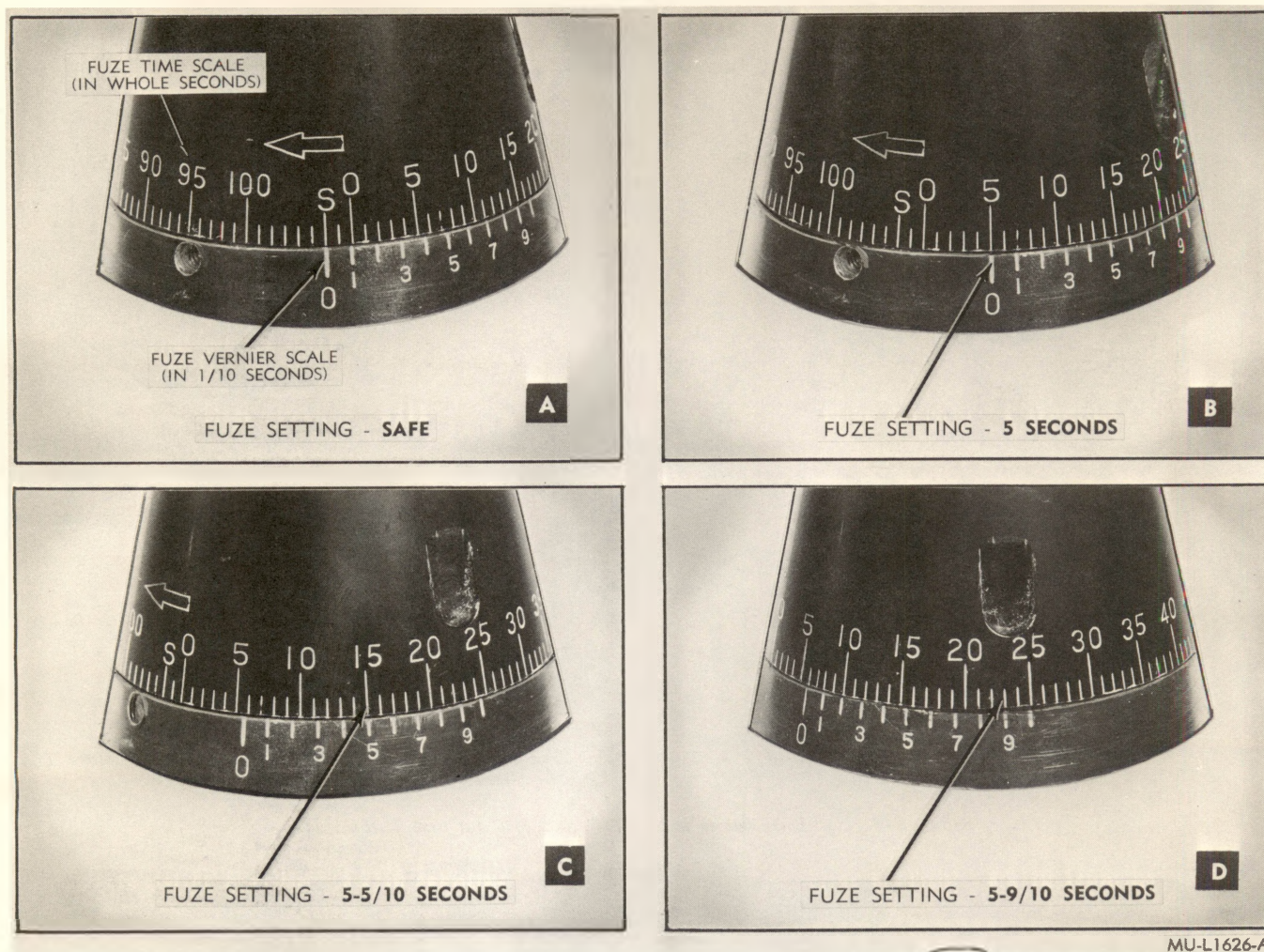


Figure 2-7 (U). Fuze setters M63 and XM34 for fuze M548 or M565 (U).

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MU-L1626-A

Figure 2-8 (U). Settings on fuze M548 or M566 (U).

Table 2-1 (U). Firing Tables (U)

Ammunition	Howitzer cannons	Firing tables
105-mm cartridge M413-----	105-mm howitzer cannons M2A1, M2A2, and M49.	FT 105-H-6 and FT 105-ADD-A-0.
105-mm cartridge M444-----	105-mm howitzer cannons: M2A1, M2A2, and M49----- M103, M137, and M137E1-----	FT 105-H-6 and FT 105-ADD-B-2. FT 105-AS-2 and FT 105-ADD-F-1.
155-mm projectile M449-----	155-mm howitzer cannons: M126 and M126E1----- M1, M1A1, and M45-----	FT 155-AH-2 and FT 155-ADD-D-1. FT 155-Q-4 and FT 155-ADD-A-1.
155-mm projectile M449E1-----	155-mm howitzer cannons: M126 and M126E1----- M1, M1A1, and M45-----	FT 155-AH-2 and FT 155-ADD-A-1 and FT 155-ADD-D-1. FT 155-Q-4 and FT 155-ADD-A-1.
155-mm projectiles M449E2 and M449 \1-----	155-mm howitzer cannons: M1, M1A1, and M45----- M126 and M126E1-----	FT 155-Q-4 and FT 155-ADD-C-1 FT 155-AH-2 and FT 155-ADD-B-1.
8-inch projectile M404-----	8-inch howitzer cannons M2, M2A1, M2A1E1, and M47.	FT 8-J-4 and FT 8-ADD-A-1.

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CHAPTER 3 (U)

SHIPMENT, LIMITED STORAGE, AND DESTRUCTION TO PREVENT ENEMY USE

Section I (U). SHIPMENT AND LIMITED STORAGE

3-1 (U). Shipment

Shipment of the ammunition will be in accordance with TM 9-1300-206.

3-2 (U). Limited Storage

The storage of the ammunition will be in accordance with TM 9-1300-206.

Section II (U). DESTRUCTION OF AMMUNITION TO PREVENT ENEMY USE

3-3 (U). Destruction of Ammunition To Prevent Enemy Use

Refer to TM 9-1300-203 for procedures on destruction of ammunition to prevent enemy use.

APPENDIX (U)**REFERENCES****A-1 (U). Publication Indexes**

The following publication indexes should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to the materiel covered in this manual:

Index of Administrative Publications.....	DA Pam 310-1
Index of Blank Forms.....	DA Pam 310-2
Index of Doctrinal, Training, and Organizational Publications.....	DA Pam 310-3
Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9) Supply Bulletins, and Lubrication Orders.....	DA Pam 310-4
Index of Supply Catalogs and Supply Manuals (excluding types 7, 8, and 9).....	DA Pam 310-6

A-2 (U). Technical Manuals

Artillery Ammunition.....	TM 9-1300-203
Care, Handling, Preservation, and Destruction of Ammunition.....	TM 9-1300-206
General Ammunition.....	TM 9-1900

A-3 (U). Army Regulations

Accident Reporting and Records.....	AR 385-40
Regulations for Firing Ammunition for Training Target Practice, and Combat.....	AR 385-63
Report of Packaging and Handling Deficiencies.....	AR 700-58
Malfunctions Involving Ammunitions and Explosives.....	AR 700-1300-8

A-4 (U). Forms

Accident Report.....	DA Form 285
Recommended Changes to DA Publications.....	DA Form 2028
Report of Packaging and Handling Deficiencies.....	DD Form 6

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NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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