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(CFP 317(5))

WEAPONS

VOLUME 5

GRENADES AND PYROTECHNICS

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Issued on Authority of the Chief of the Defence Staff

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WARNING

MISUSE OF WEAPONS, AMMUNITION AND EXPLOSIVES

Purpose

1. This order outlines Canadian Forces Policy governing the use or misuse of weapons, ammunition and explosives.

Weapons

2. Firing or attempting to fire locally manufactured weapons, obsolete service or foreign weapons, or weapons used for display, ceremonial or trophy purposes in museums, messes, parade grounds, armouries or such like areas is prohibited except when specifically authorized by NDHQ.

3. Attention is also drawn to the following references which concern offences connected with the use or misuse of weapons:

- a. National Defence Act, Section 117;
- b. QR&O 103.59;
- c. Criminal Code of Canada, Sections 82 to 106; and
- d. CFP 128(1), Security Orders for the Canadian Forces, General, art 5113.

Ammunition and Explosives

4. Tampering with or use of service and commercial ammunition or explosives for other than their designed purpose is prohibited.

5. Except as prescribed in para 6, the modification, breakdown or sectioning of live ammunition for experimental, instructional or any other purpose, or manufacture of explosives is forbidden; this prohibition includes:

- a. unauthorized interchange of fuzes or primers or both;
- b. experiments with blank ammunition to alter the powder charge or to introduce any other substance into the cartridge case or into the weapon with the approved cartridge;
- c. experiments involving the use of altered propelling charges or bursting charges with ammunition of any type;
- d. the use of any non-service or obsolete ammunition;
- e. the use of foreign ammunition other than that received through normal supply channels or supplied in accordance with NATO Standardization Agreements;
- f. the manufacture and use of locally fabricated explosive training devices, battle simulators, saluting charges, etc;
- g. any alteration to the design of ammunition or explosive devices;
- h. deviations from authorized drills for use of ammunition or explosive devices; and

- j. rendering live ammunition inert for use as museum or instructional items.
6. The prohibition in para 5 does not apply to:
- a. authorized experiments, modifications, etc carried out by experimental, research, proof or inspection establishments.
 - b. authorized breakdown, modification, repairs, proof-testing, etc, carried out as normal functions of a Canadian Forces ammunition depot or base ammunition facility;
 - c. personnel employed at Canadian Forces School of Aerospace and Ordnance Engineering as instructors or trainees under supervision, when breaking down is carried out as part of a course training standard and in accordance with an approved course training plan;
 - d. the use for its designed role of commercial pattern ammunition, which is obtained by local purchase as specified in CFP 137 or as authorized by NDHQ in accordance with CFAO 36-19;
 - e. the use for its designed role of commercial pattern ammunition which is taken into service and catalogued;
 - f. hand-loading small arms ammunition in accordance with CFAO 50-18; or
 - g. other cases, when specifically authorized by NDHQ.

NATIONAL DEFENCE HEADQUARTERS

FOREWORD

9 February 1976

1. B-GL-317-005/PT-001, Weapons, Volume 5, Grenades and Pyrotechnics is issued on authority of the Chief of the Defence Staff.
2. This publication is effective on receipt and supersedes previous interim editions of CFP 317(5) and CA MT 7-5, Grenades (Revised), 1956. CFP 317(5) should be read in conjunction with B-GL-304-003/TS-001, Land and Operations Training, Volume 3, Ranges and Training Safety.
3. Any loss or suspected compromise of this publication, or portion thereof, shall be reported in accordance with A-SJ-100-001/AS-000, Security Orders for the Canadian Forces, Volume 1, General.
4. Suggestions for changes to this publication shall be forwarded through normal channels to Mobile Command Headquarters, Attention SSO Infantry.

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CHAPTER 1

INTRODUCTION

SECTION 1 - GRENADES

101. General

Grenades are items of explosive or chemical ammunition used for attacking enemy troops, vehicles or fortified positions at close range. They are usually hand thrown (hand-grenades) but some types may also be launched from rifles (rifle-grenades). Most varieties of hand-grenades are cheap and easy to manufacture and can be used effectively by troops with little training. Despite the trend of modern technology to develop ever more complicated weapons, the simple hand-grenade remains a valuable infantry weapon.

102. Description

Grenades are designed primarily to be thrown and therefore are small in size. The shape of the grenade varies with the type and purpose. For example a fragmentation grenade is usually oval in shape in order that the shrapnel will cover a given area with equal density when the grenades explodes. Smoke and chemical grenades, however, are usually larger than fragmentation grenades, and cylindrical in shape. They can therefore contain a relatively large volume of smoke-producing chemical filler.

103. Operation

Most grenades are fitted with a safety lever and safety pin. The pin holds the lever in the "safe" position. When the pin is pulled and the lever is released the grenade becomes "armed". Fragmentation grenades have a "delay" fuze which burns for a specific period of normally a few seconds before exploding a detonator. The explosion of the detonator sets off the main explosive charge scattering shrapnel in the immediate area. Smoke and chemical grenades are also equipped with "delay" fuzes which burn for a few seconds before exploding a detonator and starting the production of the smoke or chemical agent. Most grenades are issued with the fuze and primer already in place; other grenades must be primed by the user.

104. Types

1. The following grenades are either currently in use or will soon become available in the Canadian Forces. They are discussed in detail in Chap 2. These grenades which are among the most commonly used are:

- a. Grenade, Hand, Fragmentation, Delay, M61;
- b. Grenade, Hand, Practice, Delay, M62;
- c. Grenade, Hand, Fragmentation, Delay, M67;
- d. Mini Grenade, Hand, Fragmentation, Delay, NWM V40;
- e. No 36M Grenade;

- f. No 80 MK 1 Grenade (White Phosphorus);
- g. Grenade Hand, Smoke, No 83 and C3;
- h. Grenade, Hand, Smoke, HC C1A1;
- j. Grenade, Hand, Riot, CS, M7A3; and
- k. Grenade, Hand Smoke "Pains Wessex".

105. Safe Handling of Grenades

1. Instructors must be qualified and experienced in the type of grenade being taught.
2. The Instructor will PERSONALLY verify all grenades (including live, inert, dummy and practice) prior to the commencement of training. Grenades which show signs of structural defects or damage, whose identification cannot be accurately established, or which are not appropriate to the lesson to be conducted, will be set aside and returned to the issuing authority unless destruction is warranted as prescribed in the detailed safety precautions contained in this publication.
3. Grenades will NOT be left unattended. Grenades (including dummy, inert, or practice grenades) will be handled in the same manner as controlled stores.
4. No modifications will be made by instructors, or anyone under their supervision, to live, dummy, inert, or practice grenades.
5. The instructor/class ratio should NOT be less than one instructor per platoon or equivalent sized sub-unit (approximately thirty servicemen). Ideally, when live or practice grenades are in use, the ratio should be one instructor per section (approximately ten servicemen).
6. Dummy and display ammunition shall not be mixed with live ammunition in the same container or vehicles; nor will live ammunition be present during an instructional period when dummy or display ammunition is being used.
7. A list of exhibits will be kept and checked before and after use. Every item will be accounted for before the class leaves.
8. All exhibits will be proved deliberately with an explanation at the outset of the period (Annex A, Appendices 1 to 7). Subsequently, the proving action shall be taken by each individual receiving the exhibit.
9. During instruction all stores and exhibits will be treated as live even when they are marked dummy, inert or empty.
10. Specific safety precautions for each grenade will be covered in Chap 2. Instructors and other users of this publication will also consult CFP 304 Land and Tactical Training, Volume 3, Ranges and Training Safety, before conducting grenade training.

106. Identification of Hand-grenades

To assist users in the identification of commonly used fragmentation and smoke hand-grenades the colour coding table at Annex A gives details of markings in a convenient condensed form. The coloured illustrations at Annexes B and C are designed as a quick and positive means of identification.

SECTION 2 - PYROTECHNICS

107. General

1. Pyrotechnics are used in the Canadian Forces for both operational and training purposes to produce smoke, battlefield illumination, signals, and battlefield noises.
2. Pyrotechnics are similar to fireworks in design and operation. Like fireworks, pyrotechnics are safe to handle and use if safety precautions are observed. If handled carelessly pyrotechnics can cause death or serious injury to personnel and damage to equipment.

108. Safe Handling of Pyrotechnics

The safety principles and measures enunciated in art 105 will be applied to the handling of all pyrotechnics.

109. Types

1. The following pyrotechnics are currently in use in the Canadian Forces and will be discussed in detail in Chap 5:
 - a. Flare, Parachute, Hand Fired, C3;
 - b. Thunderflash C1A1;
 - c. Simulator, Projectile, Ground Burst, C1 Series; and
 - d. Firing Projector, Pyrotechnic, Hand, C1.

SECTION 3 -TRIP FLARES

110. General

1. Trip flares are devices designed to provide warning of night infiltration by the enemy and to disclose his location. When a wire attached to the flare is pulled or tripped, the flare ignites and lights up the surrounding area. They are not intended as a substitute for normal vigilance and alertness at night but when properly used they will give added warning to the defender and increased visibility.

2. Trip flares are potentially very dangerous and the user must understand how the mechanism of the flare operates. Trip flares must be handled by trained personnel only.

111. Types

The following trip flares are currently in use in the Canadian Forces and will be discussed in detail in Chap 6:

- a. Flare, Surface, Trip, Parachute, M48; and
- b. Flare, Surface, Trip, M49A1.

112. Safe Handling of Trip Flares

The safety principles and measures enunciated in art 105 will be applied to the handling of all trip flares.

SECTION 4 - SMOKE POTS

113. General

Smoke pots are basically large smoke grenades designed to provide relatively dense smoke screens for extended periods of time during operations or training.

114. Types

The following smoke pots are currently in use in the Canadian Forces and will be discussed in detail in Chap 7:

- a. Smoke Pot, Ground Type, No 24 MK 2; and
- b. Smoke Pot, Ground Type, Orange, SC-41.

115. Safe Handling of Smoke Pots

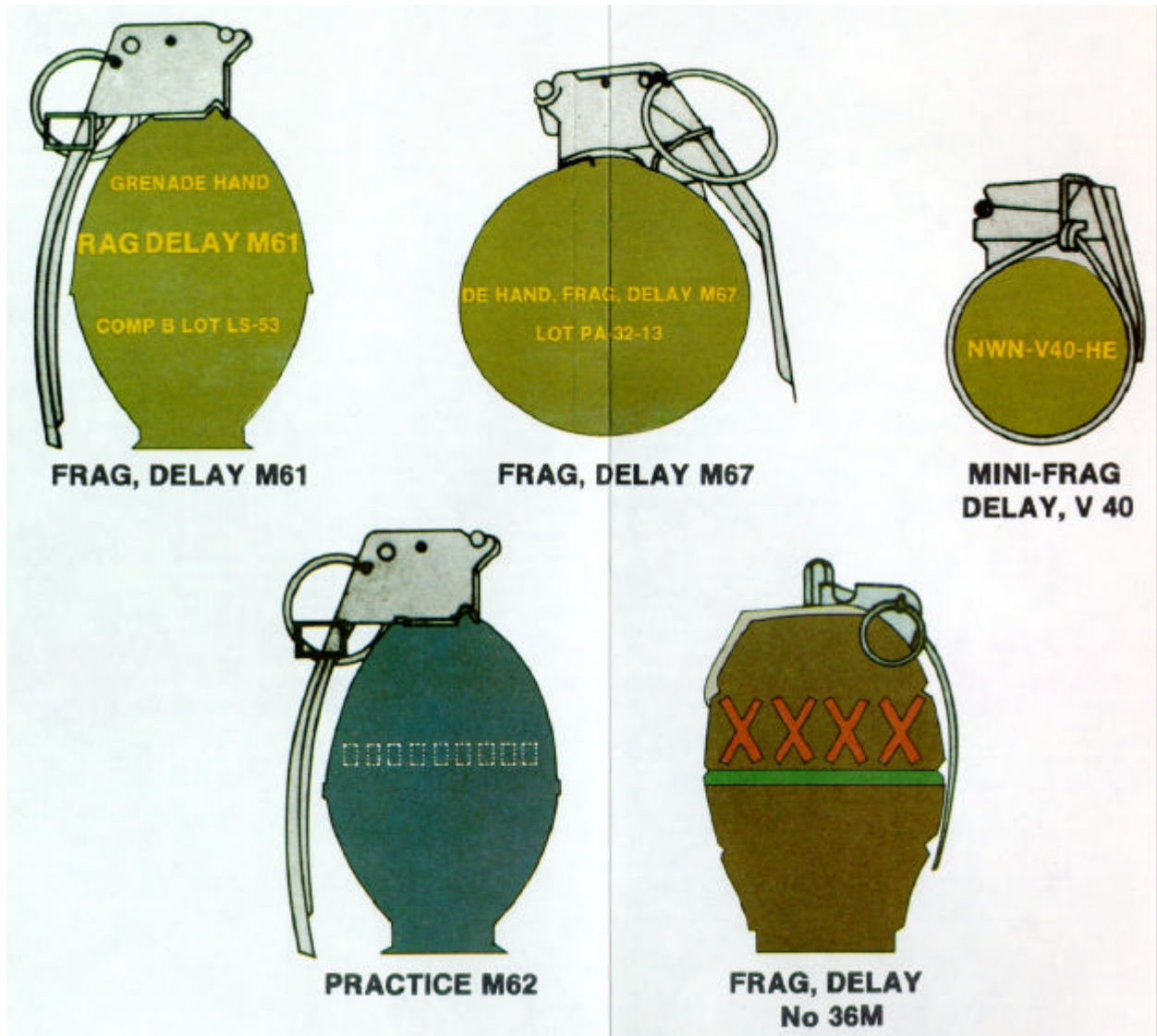
The safety principles and measures enunciated in art 105 will be applied to the handling of all smoke generating devices.

(116 to 199 not allocated)

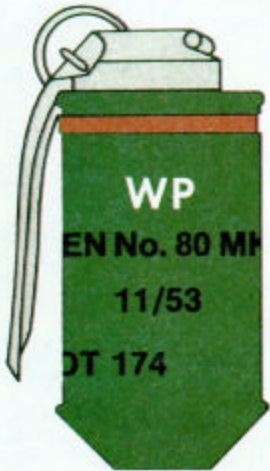
IDENTIFICATION - COMMON USER HAND-GRENADES

Model	Type of Grenade	Colour			Remarks
		Body	Markings	Band	
M61	Fragmentation	Dark Green (Olive drab)	Yellow	Nil	There is a yellow rind under the fuse.
M67	Fragmentation	Dark Green (Olive drab)	Yellow	Nil	
V40	Fragmentation	Dark Green (Olive drab)	Yellow	Nil	
No 36M	Fragmentation	Brown (Varnished finish)	White	Green	There is a ring of red X's above the green band which is an old marking indicating suitability for use in a hot climate.
M30	Practice	Light Blue	White	Nil	Similar to M62 - but has no safety clip.
M62	Practice	Light Blue	White	Nil	Similar to M30 but equipped with safety clip. Brown path on the striker lever.
No 80	Smoke WP (White Phosphorus)	Light Green or Dark Green	Red	Nil	Older stocks are dark green, marked with black lettering, have a read band an WP in large white letters.
M743	Riot	Grey	Red	Red	
No 83	Smoke Coloured	Light Green	Black	Nil	Similar appearance to C3. Colour may be printed on body of grenade or indicated by a large coloured "C".
C3	Smoke, coloured	Light Green	Black	Nil	Similar appearance to No 83 Grenade. A large "C" in the colour of the smoke produced is marked on the body.
C1 or C1A1	Smoke HC	Light Green	Black	Nil	
Pains - Wessex	Smoke, coloured	Light Green	Black	Nil	Cap of the grenade is the same colour as the smoke produced.
All Dummies	Dummy	Dark Blue	White	Orange	Orange band is designed to assist in underwater location and retrieval.

IDENTIFICATION - FRAGMENTATION – GRENADES



IDENTIFICATION-SMOKE-GRENADES



GRENADE, No 80 MK1
(White Phosphorous)



GRENADE, SMOKE,
HCC1A1



GRENADE, SMOKE,
No 83 (C3)



GRENADE, SMOKE,
PAINS WESSEX



GRENADE, RIOT.
M7A3

CHAPTER 2

GRENADES

SECTION 1 - GRENADE, HAND, FRAGMENTATION, DELAY, M61 AND M67

201. General

1. The M61 Grenade is the standard anti-personnel grenade which has great lethality and dependability, and is light in weight.
2. The M67 Grenade is a similar but improved version of the M61. It is planned to issue the M67 Grenade when stocks of the M61 are depleted.
3. The M61 and M67 Grenades are used in close quarter fighting to clear enemy from slit trenches, dugouts, buildings and any position that cannot be neutralized by direct fire. The risk of casualties to one's own troops when the grenade is used, particularly in the open, must be taken into consideration.

202. Description

1. The M61 is egg-shaped and has a flat base. The M67 has a spherical shape. Both grenades are shown in Figure 2-1.
2. Both grenades consist of the following main components:
 - a. body assembly;
 - b. bursting charge;
 - c. fuze; and
 - d. safety clip.

Figure 2-4 shows the principal components of the M61 grenade.

3. Inside the tin body is a closely wound coil of hard drawn square steel wire. The wire has notches cut at intervals on the interior surface and it is this which provides the fragmentation effect of the grenade.

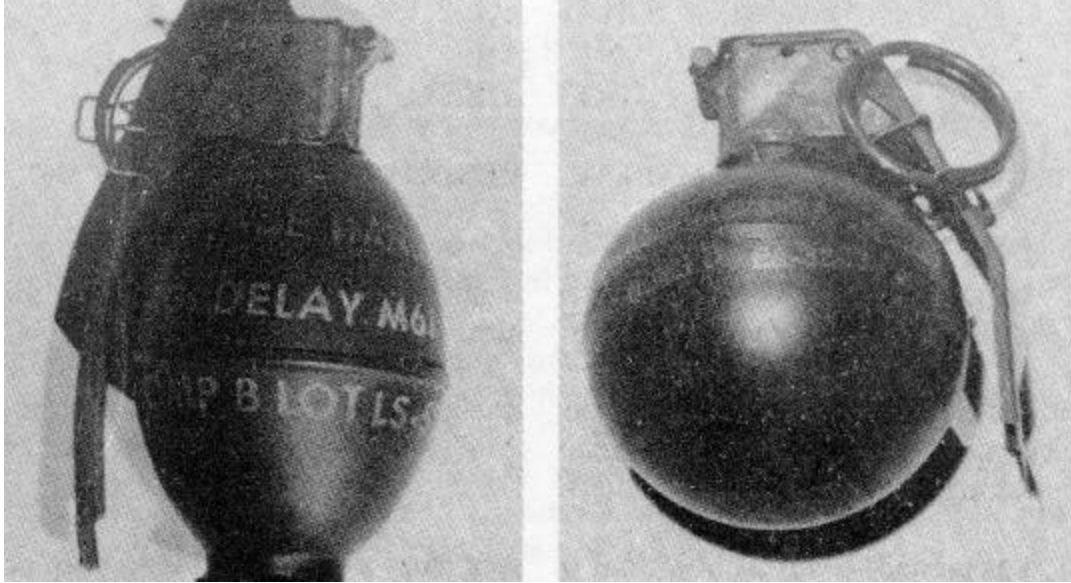


Figure 2-1 Fragmentation Grenades

4. The M61 is 10.5 cm (4 1/8 in) high and 6 cm (2.4 in) in diameter. The M67 is 9 cm (3.5 in) high and 7 cm (2.8 in) in diameter.
5. For MARKINGS both grenades are painted OLIVE DRAB and have the following information stencilled in YELLOW on the exterior:
 - a. designation of the grenade;
 - b. filled lot number;
 - c. month and year of filling; and
 - d. type of filling.

See also Chap 1, Annex B.

203. Packaging

M61 and M67 Grenades are issued in wooden boxes each containing 30 grenades. Each grenade is packed in a fibreboard container (see Figure 2-2).

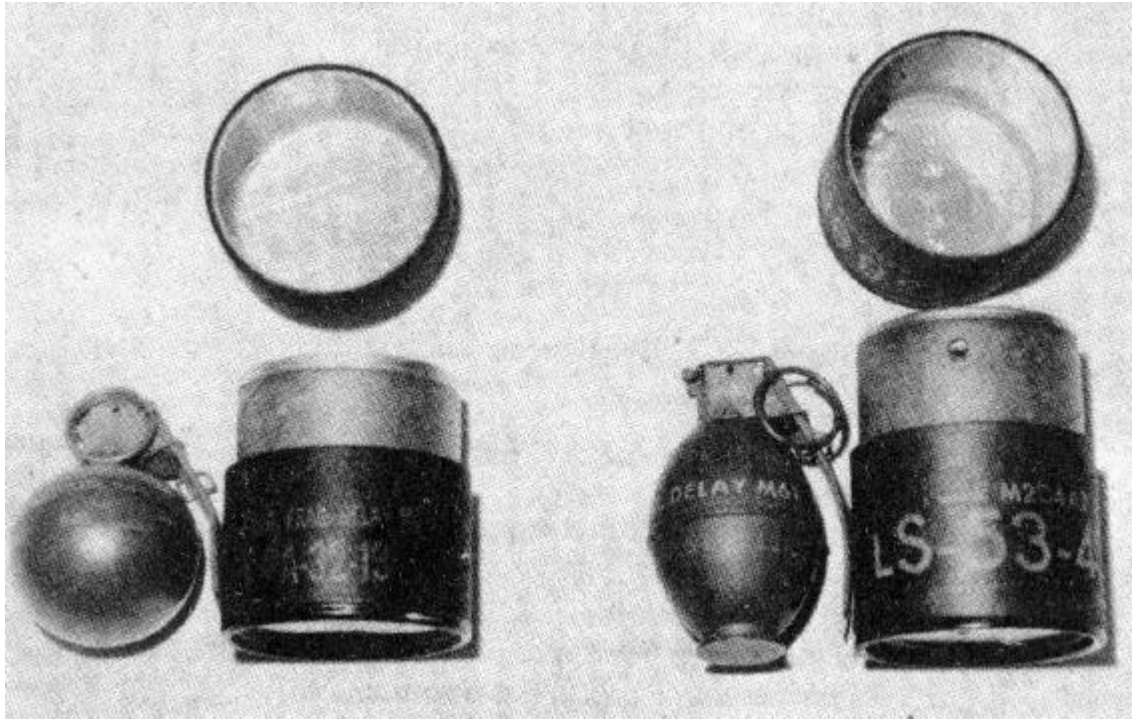


Figure 2-2 M67 and M61 Grenades with Containers

204. Safety Clip

The M61 and M67 are each fitted with a safety clip. The safety clip is a single piece of steel spring which is wound around the fuze body, the claw of which snaps over the safety lever. The safety clip secures the safety lever even when the safety pin has been removed. The safety clip will prevent accidental firing if the fuze safety pin and pull ring should snag on undergrowth and be accidentally pulled from its channel.

205. Safety Precautions

1. Each M61 and M67 Grenade comes in its own container primed and ready for throwing. See Figure 2-2. Safety precautions must be carried out in the following sequence:
 - a. Remove the top portion of the container. **DO NOT REMOVE THE GRENADE FROM THE CONTAINER.**
 - b. Inspect the top portion of the grenade to ensure that the safety pin and safety clip are secure in their correct positions and that the grenade has been packed right-side up.
 - c. If the safety pin and safety clip are not secure, or are missing, or if the grenade is up-side down the grenade must **NOT** be removed from the container.
 - d. The safety pin and safety clip must **NOT** be removed unless the grenade is to be thrown.
 - e. If the safety pin and safety clip are secure, the grenade can be removed from the container.

- f. Check the body for cracks.
- g. Inspect for a broken safety lever, damaged safety pin, safety clip, and pull ring.
- h. Damaged grenades will be treated as duds and will be placed in the impact area and destroyed.

206. Characteristics

1. Characteristics of the M61 and M67 Grenades are:
 - a. weight -.45 kg (1 lb);
 - b. fuze - Both grenades are issued primed from the manufacturer. No preparation is required;
 - c. delay times - the M61 has a five second fuze; and the M67 has a 4.5 second fuze;
 - d. method of delivery -both may be hand thrown. Only the M61 can be rifle launched using the L1A2 launcher and the M1A2 projector;
 - e. lethality -grenades have a lethal radius of up to 18 metres (20 yards) from the point of burst; and
 - f. danger radius -up to 300 m (325 yds) from point of impact.

207. Mechanism

1. When the safety clip and pin are removed and the safety lever released the striker spring forces the striker to rotate on its axis and to strike the primer. See Figures 2-3 and 2-4.
2. The flash from the primer ignites a safety fuze which burns for 4.5 to 5 seconds before setting off the detonator. The detonator in turn sets off the main explosive charge in the grenade. The explosion of the main charge causes the steel body to rupture and to project the steel wire, which is broken into many fragments of uniform size and weight, up to a distance of 200 metres (approximately two hundred fifteen yards).

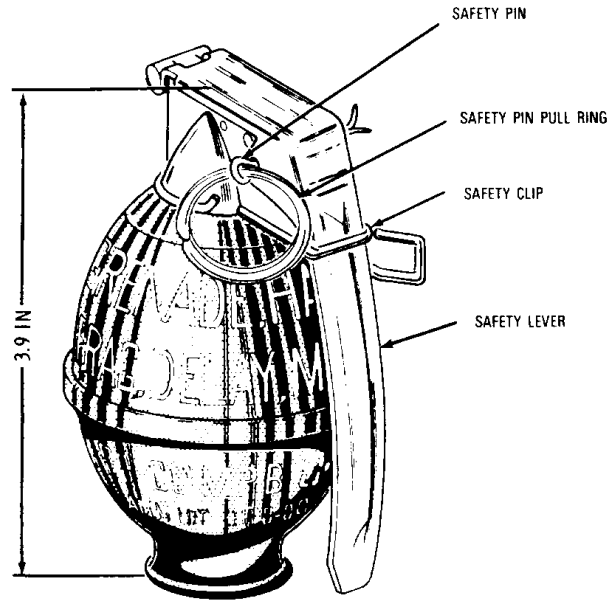


Figure 2-3 Grenade, Hand, Fragmentation, Delay, M61

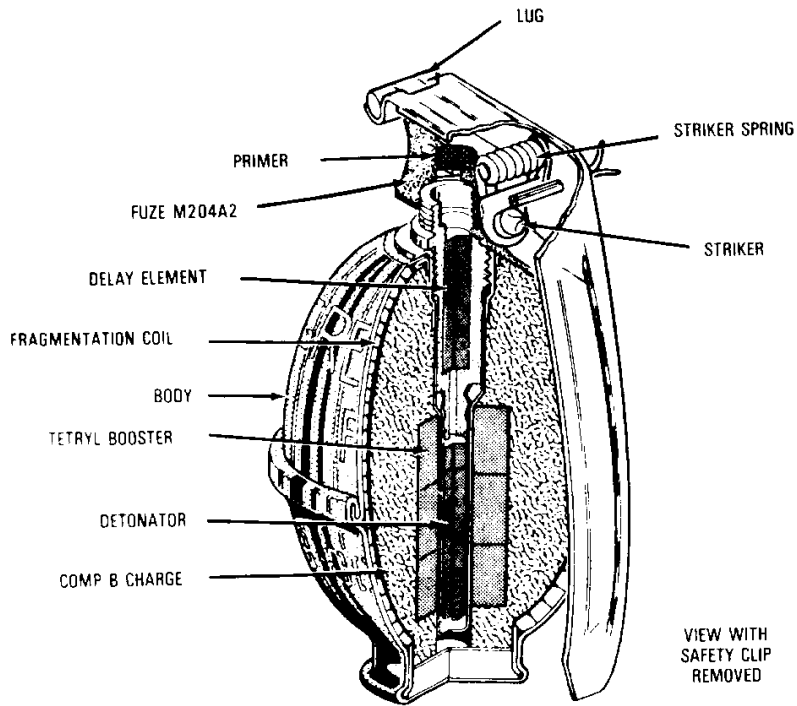


Figure 2-4 Mechanism - M61 Grenade (Safety Clip Removed)

SECTION 2 - GRENADE, HAND, PRACTICE, DELAY, M62

208. General

1. The M62 is a practice grenade similar in size and shape to the M61. It is a safe and economical training device designed to increase the realism of field training and to give personnel safe practice in accurate throwing techniques. The grenade body can be used repeatedly by replacing the expended fuze assembly, plastic stopper, washer, powder charge and safety clip. See Figure 2-5.

2. The safety clip is a single piece of steel spring placed around the fuze body, the claw of which snaps over the fuze safety lever. The safety clip secures the safety lever even with the safety pin removed, in the same manner as with the M61 and M67 Grenades. Some M62 Grenades when issued may not, however, have a safety clip attached. See Figure 2-5.



Figure 2-5 Assembled M62 Grenade - (Safety Clip Removed)

209. Description

1. The complete M62 Grenade is issued in its separate component parts. The parts consist of the following as shown in Figure 2-6:

- a. Body Practice, Hand-grenade M62. The body is an egg-shaped cast iron container. Its upper part is screw-threaded to receive the fuze.
- b. Fuze, Hand-grenade, Practice M205A2.
- c. Safety Clip. Similar in operation to that of the M61 Grenade (not shown in Figure 2-6).
- d. Charge Assembly. The charge consists of 2.4 grams (37.5 grains) of black powder contained in a silk or cloth bag 11 cm (4.5 in) long.
- e. Stopper. The stopper is "U" shaped and made of moulded polyethylene. The stopper is push-fitted the plug hole of the grenade body.

- f. Washer. The washer is 1.6 mm (1/16 in) thick and is positioned between the fuze and the body of the grenade and effectively provides a waterproof seal at the junction.
2. The assembled M62 has similar dimensions to the M61 Grenade.
3. For MARKINGS the body of the grenade is painted BLUE with the designation of the grenade stencilled in WHITE. Refer also to Chap 1, Annex B.
4. The body of the fuze is stamped with the following information:
 - a. designation of the fuze;
 - b. filled lot number; and
 - c. month and year of filling.

210. Packaging

The items described in art 209, less the grenade body, are issued as a kit.

211. Safety Precautions

1. Safety precautions are as follows:
 - a. Ensure that only the correct fuze is used.
 - b. Never insert more than one bag of black powder into the cavity of the grenade. If more than one bag is used the grenade could explode with greater force sufficient to cause casualties.
 - c. When the fuze detonates it may project fragments of the fuze assembly up to a distance of 18 metres (20 yards). Precautions must be taken to protect personnel in this danger area.

212. Characteristics

1. Characteristics of the assembled M62 Grenade are:
 - a. weight - .45 kg (1 lb);
 - b. fuze delay time - five seconds;
 - c. method of delivery - may be thrown by hand or fired from the FNC1 or FNC2 using the grenade launcher L1A2 and the Adapter, Grenade, Projection, M1A2; and
 - d. purpose - used for training only and has no lethal radius, but can cause injury if safety precautions are NOT followed.

213. Mechanism

1. When the safety clip and pin are removed and the safety lever released, the striker spring forces the striker to rotate on its axis. This pushes the safety lever upward and away from the grenade, and allows the striker to activate the primer. See Figure 2-6.

2. The primer ignites a delay fuze which burns for approximately five seconds before causing the detonator to explode. This in turn detonates the black powder in the cavity of the grenade. The exploding black powder blows out the plastic base plug. A sharp "pop" similar to an exploding firecracker is heard and a puff of white smoke exits from the base plug hole.

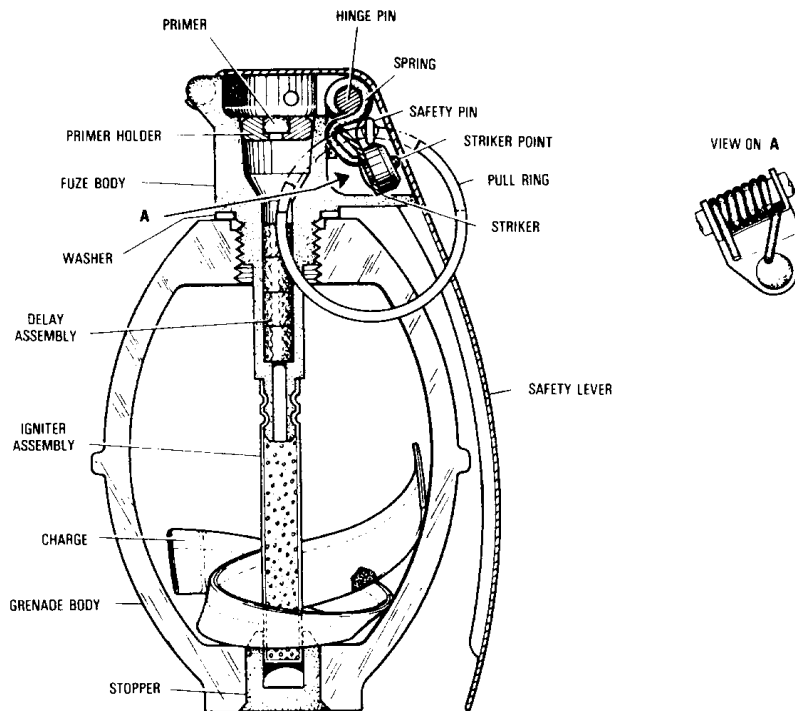


Figure 2-6 Mechanism of the M62 Grenade (Safety Clip Removed)

214. Reloading the M62 Grenade

1. The body of the M62 Grenade can be re-used many times. A kit is available (shown in Figure 2-7) which contains the following items:

- a. one firing mechanism (including a live fuze);
- b. one plastic base plug and one washer; and
- c. one bag of black powder.

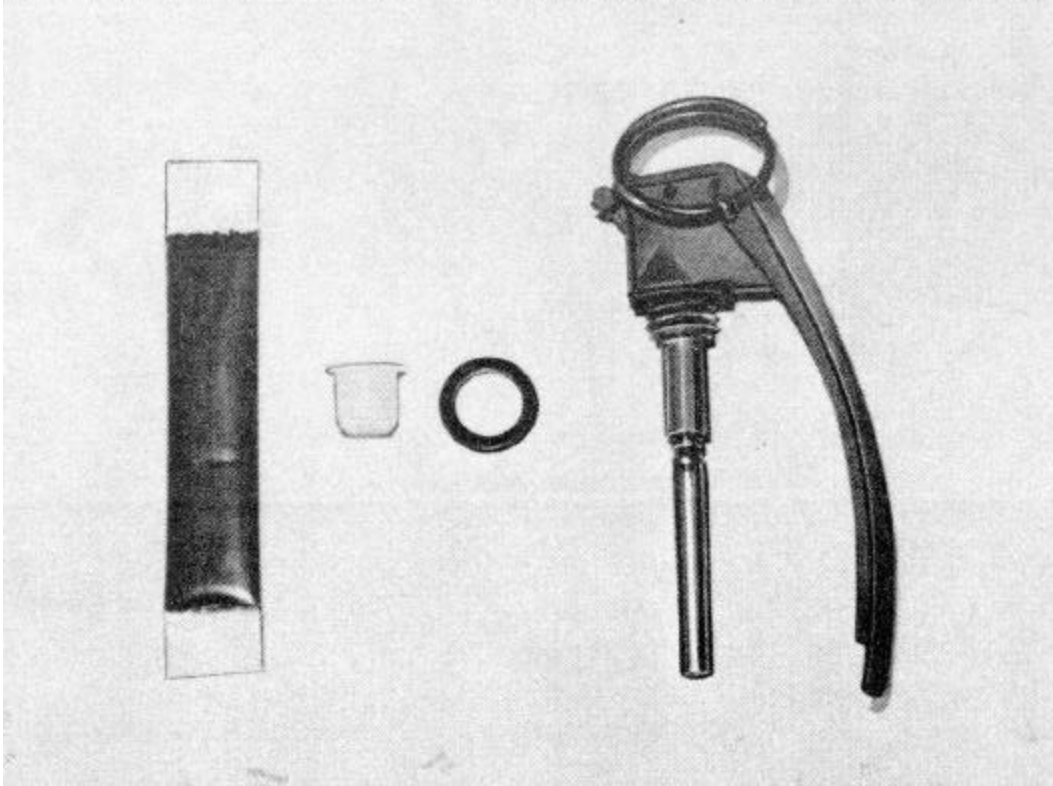


Figure 2-7 Replacement Kit for M62 Grenade

2. To reload the M62 Grenade:
 - a. unscrew the firing mechanism from the expended grenade (if it has not been blown clear) and discard it;
 - b. place the washer over the fuze of the firing mechanism and push the washer until it is flush against the fuze body;
 - c. screw the new firing mechanism into the grenade ensuring that the safety clip is in place, see Figure 2-8;
 - d. turn the grenade base end up and insert the bag of black powder into the cavity at the base of the grenade;
 - e. insert the plastic base plug into the base plug hole; and
 - f. attach the safety clip.

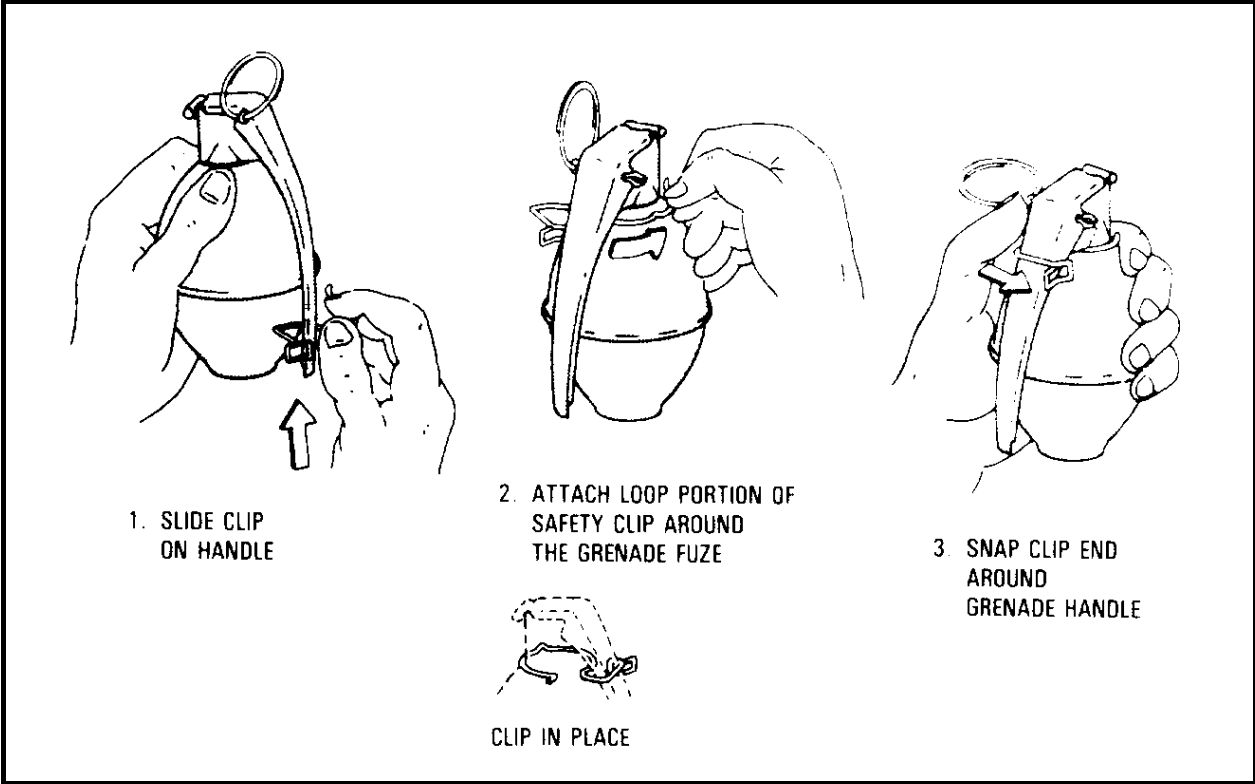


Figure 2-8 Attaching The Safety Clip to M62

SECTION 3 - GRENADE, HAND, PRACTICE, DELAY M69

215. General

The M69 is a practice grenade similar in size and shape to the M67. It has been developed as a replacement for the M62 practice grenade described in Section 2.

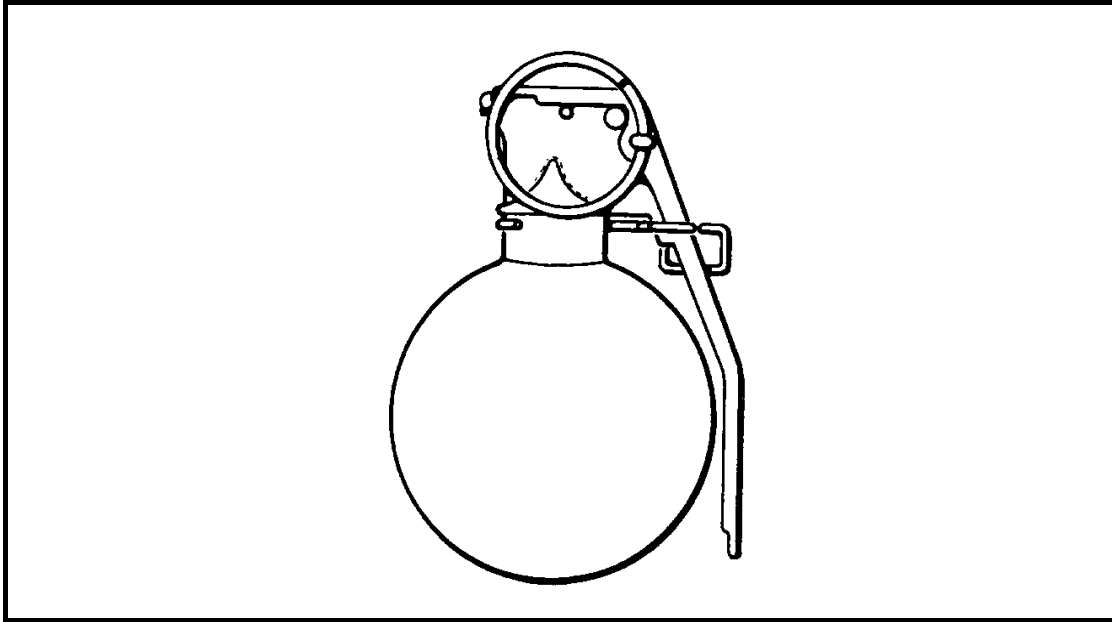


Figure 2-9 Assembled M69 Grenade

216. Description

1. The complete M69 grenade is issued in its separate component parts as shown in Figure 2-10:
 - a. Body Practice, Hand Grenade, M69. It is spherical in shape and is made of steel. The body of the grenade is empty. The upper part is screw threaded to receive the fuze.
 - b. Fuze, Hand Grenade, Practice, M228. See Figure 2-10.
 - c. Safety Clip. See Figures 2-10 and 2-11.

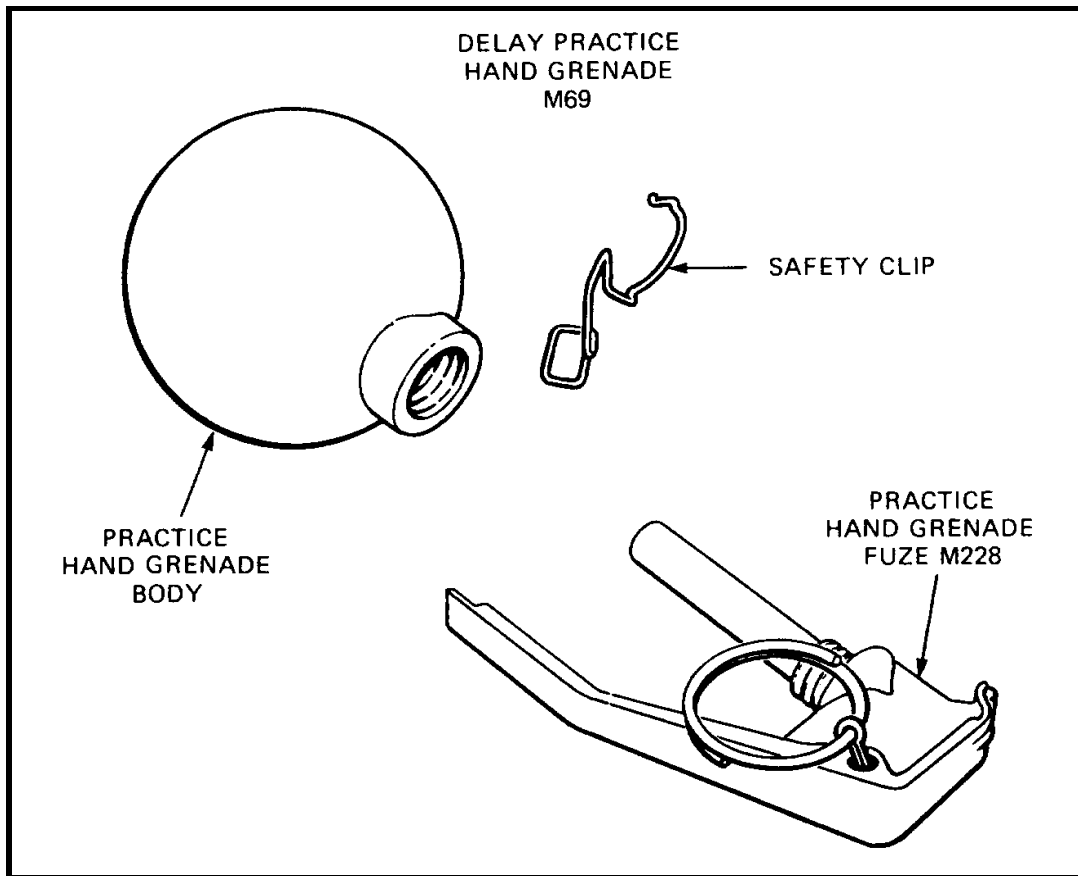


Figure 2-10 Component Parts of Grenade, Hand, Practice, Delay M69

2. For MARKINGS, the body of the grenade is painted blue, with a brown band around the body with the designation and stock number of the grenade stencilled in white. Also see Chap 1, Annex B.
3. The top of the fuze is stamped with the following information:
 - a. designation of the fuze;
 - b. filled lot number; and
 - c. month and year of filling.
4. The safety lever of the M228 fuze is painted blue with the end painted red.

217. Safety Precautions

1. Ensure that only the correct fuze is used.
2. When assembling the fuze to the body, do not face the port hole in the base toward personnel and do not cover the hole with the hand.

3. Prior to use, inspect the body for cracks, foreign material in the grenade body and in the fuze opening threads, and assure that the vent port hole in the body base is not blocked.

218. Characteristics

1. Characteristics of the M69 grenade are:
 - a. weight (fuzed) - 397 grams (14 ounces);
 - b. fuze delay time - 4 to 5 seconds;
 - c. method of delivery - may be thrown by hand; and
 - d. purpose - used for training only and has no lethal radius, but may cause injury if not handled properly.

219. Assembly

1. The M228 fuze is screwed into the top of the body and should be firmly seated on the grenade neck. (See Figure 2-10.)
2. The grenade safety clip is assembled to the grenade and positioned around the safety level as shown in Figure 2-11.

220. Mechanism

1. Release of the safety clip and removal of the safety pin permits release of the safety lever. When the safety lever is released, it is forced away from the grenade body by a striker acting under the force of a striker spring. The striker rotates on its axis and strikes the percussion primer. The flash from the primer ignites the delay element. The delay element burns for 4 to 5 seconds and ignites the black powder in the igniter assembly which burns emitting a puff of smoke, and making a sharp report. (See Figure 2-10).

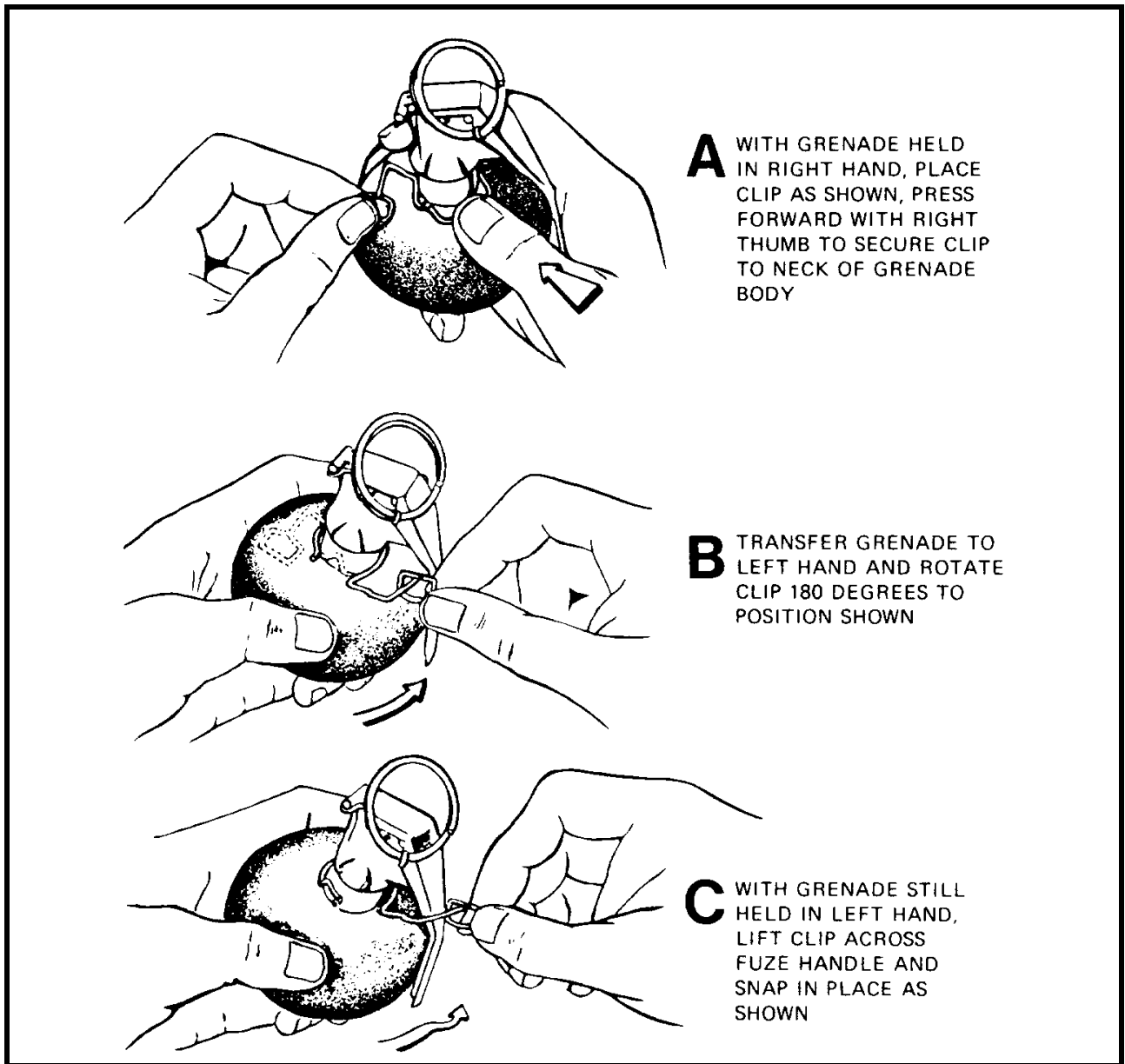


Figure 2-11 Placing the Safety Clip on Grenade, Hand Practice, Delay M69

2. Safety clips from expended hand grenades may be reused on the M69 provided that visual inspection indicates the clip is not damaged or distorted.

221. Reloading the M690

1. The following procedure shall be followed for reloading an expended grenade.
 - a. recover the expended grenade and allow 5 minutes for grenade to cool.
 - b. Unscrew the fired fuze. Remove all foreign material from the inside and outside of the grenade body.
 - c. Inspect the grenade body for damage. Discard damaged bodies and dispose of in accordance with A-LM-181-001/IS-001, Chap 15-1, Annex A.
 - d. Reassemble as detailed in art 219.

SECTION 4 - MINI GRENADE, HAND, FRAGMENTATION, DELAY, V40

222. General

The V40 grenade, manufactured in the Netherlands, is a small grenade designed to fulfill a similar function to the M61 and M67 grenades. Because of its smaller size and weight, more grenades can be carried and it can also be thrown farther than the M61 and M67 grenades. The grenade is shown in Figure 2-12 and in Chap 1, Annex B.

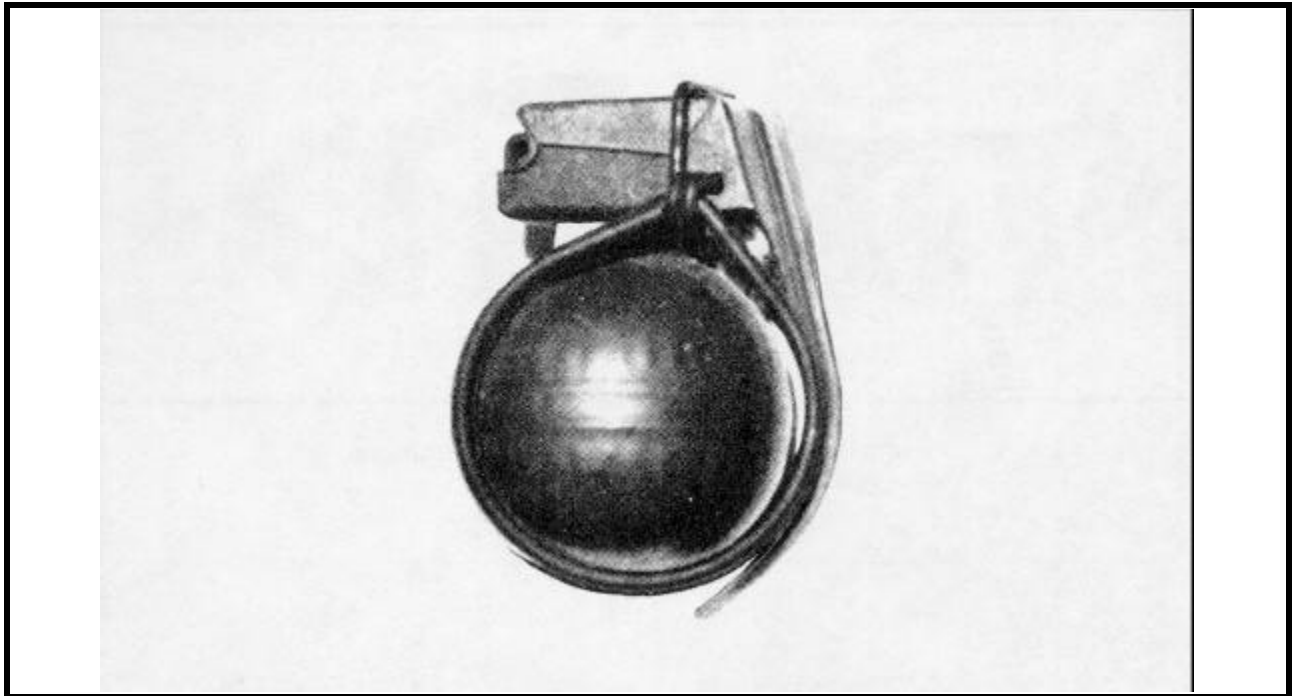


Figure 2-12 V40 Grenade

223. Description

1. The V40 grenade is spherical in shape, is 6.5 cm (2.5 in) high, and 4 cm (1.5 in) in diameter. It has a safety pin and safety lever with a safety clip attached to the safety lever.
2. The steel body of the grenade has 326 squares pressed into its inside face to produce separate fragments when the explosive fill is detonated.
3. As MARKINGS, the V40 grenade is painted OLIVE DRAB and has the following information stencilled in YELLOW on the bottom:
 - a. designation of the grenade;
 - b. lot number; and
 - c. month and year of manufacture.

224. Packaging

1. Five V40 grenades are packed in pouches in a plastic disposable bandolier equipped with a carrying strap as shown in Figure 2-13.
2. Two bandoliers are packed in a long, narrow pressed paper box. Sixteen boxes are packed in a re-usable steel chest. (See Figures 2-14 and 2-15.)

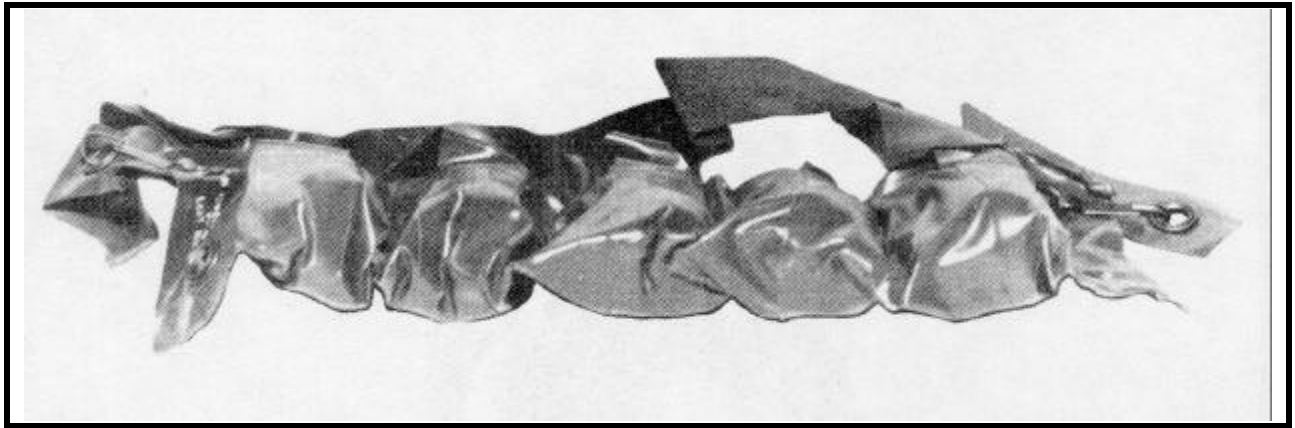


Figure 2-13 Bandolier of V40 Grenades

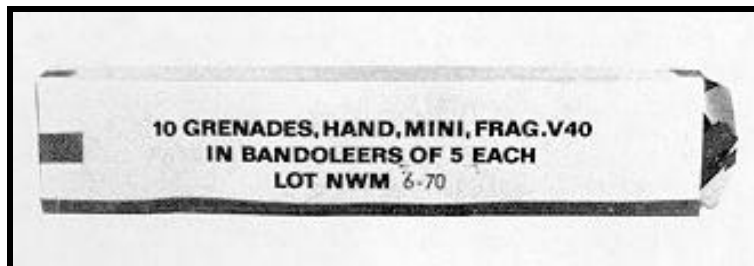


Figure 2-14 Box of V40 Grenades

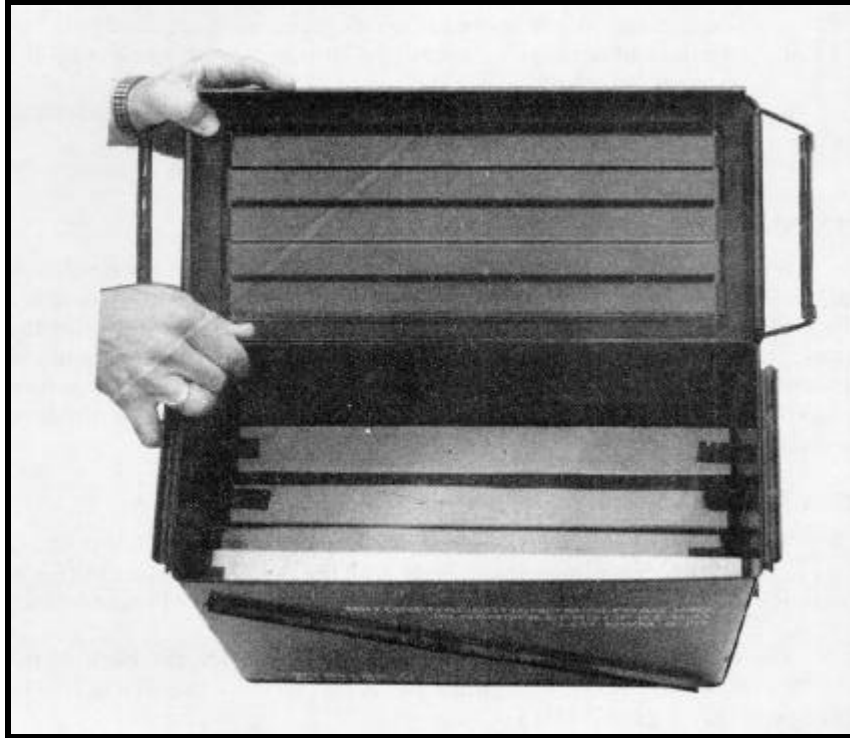


Figure 2-15 Steel Chest Containing V40 Grenades

225. Safety Precautions

1. V40 grenades come primed and ready for use. Safety, precautions are as follows:
 - a. Carefully tear open the pouch and check to ensure that the safety pin is fitted in place through the hole in the safety lever.
 - b. Remove the grenade from the pouch and re-examine it to ensure that the body is not cracked and that the fuze assembly is undamaged. Damaged grenades will be treated as duds and will be placed in the impact area for destruction.

226. Characteristics

1. Characteristics of the V40 grenade are:
 - a. weight - 136 gm (4.8 oz);
 - b. fuze - issued primed from the manufacturer;
 - c. delay time - four second fuze (no preparation required);
 - d. method of delivery - cannot be launched from a rifle with the present launcher;
 - e. lethality - has a lethal radius of up to 18 metres (20 yards) from the point of burst;
and
 - f. danger radius - up to 300 m (325 yds) from point of impact.

227. Mechanism

When the safety pin is rotated and withdrawn as shown in Figures 2-16A to 2-16D and the safety lever released, the striker spring asserts itself, rotating the striker forward. The projecting nut on the striker hits the top of the time-delay detonator column inserted through the centre of the grenade as shown in Figure 2-17. The fired primer ignites a four second fuze which in turn triggers an initiator and burster. The burster causes the main explosive charge to detonate and the body breaks up into fragments.

227A. Arming the V40

1. When preparing to throw, hold the grenade so that the handle is firmly held in position against the grenade body with the thumb and place the tip of the index finger over the plastic cap the firing mechanism (See Figure 2-16A.)
2. The safety pin has a detent portion passing outside the back of the handle and the grip of the hand must be such as to leave this detent free to disengage. (See Figure 2-16B.)

Note: Because of differences in size and shape of hands, some individuals (especially left handed personnel) may find it necessary to vary the hold described. (See Figures 2-16C and 2-16D.) But it must be always be kept in mind that whatever technique is used it must be such that the hand will be retaining the safety lever in position when the safety pin is removed.

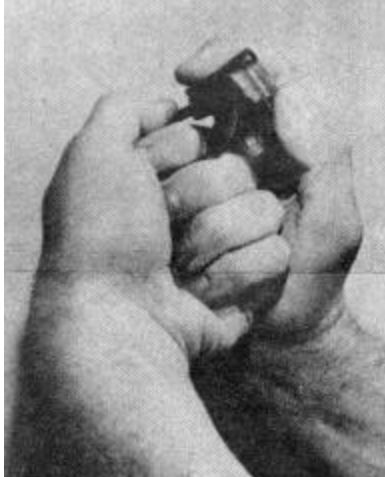


Figure 2-16A Preparing to Throw (Right Handed)

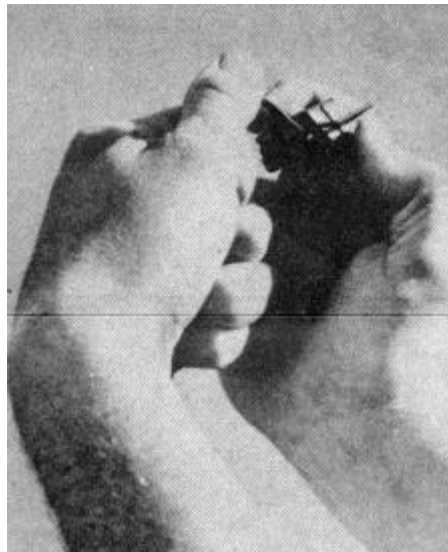


Figure 2-16B Rotating the Pin (Right Handed)

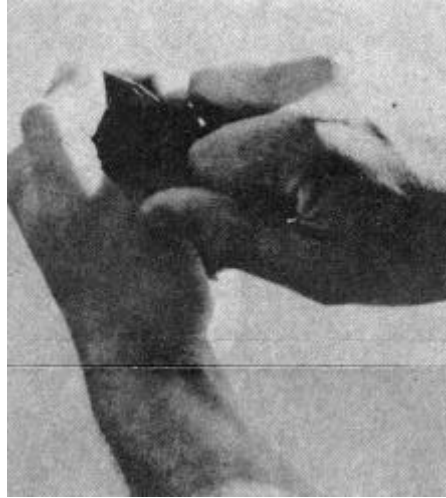


Figure 2-16C Preparing to Throw (Left Handed)

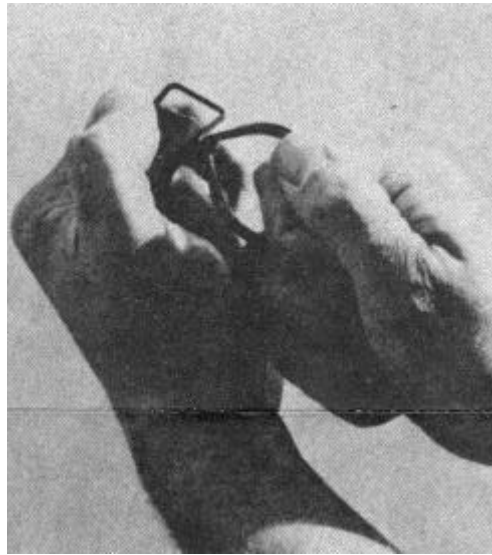


Figure 2-16D Rotating the Pin (Left Handed)

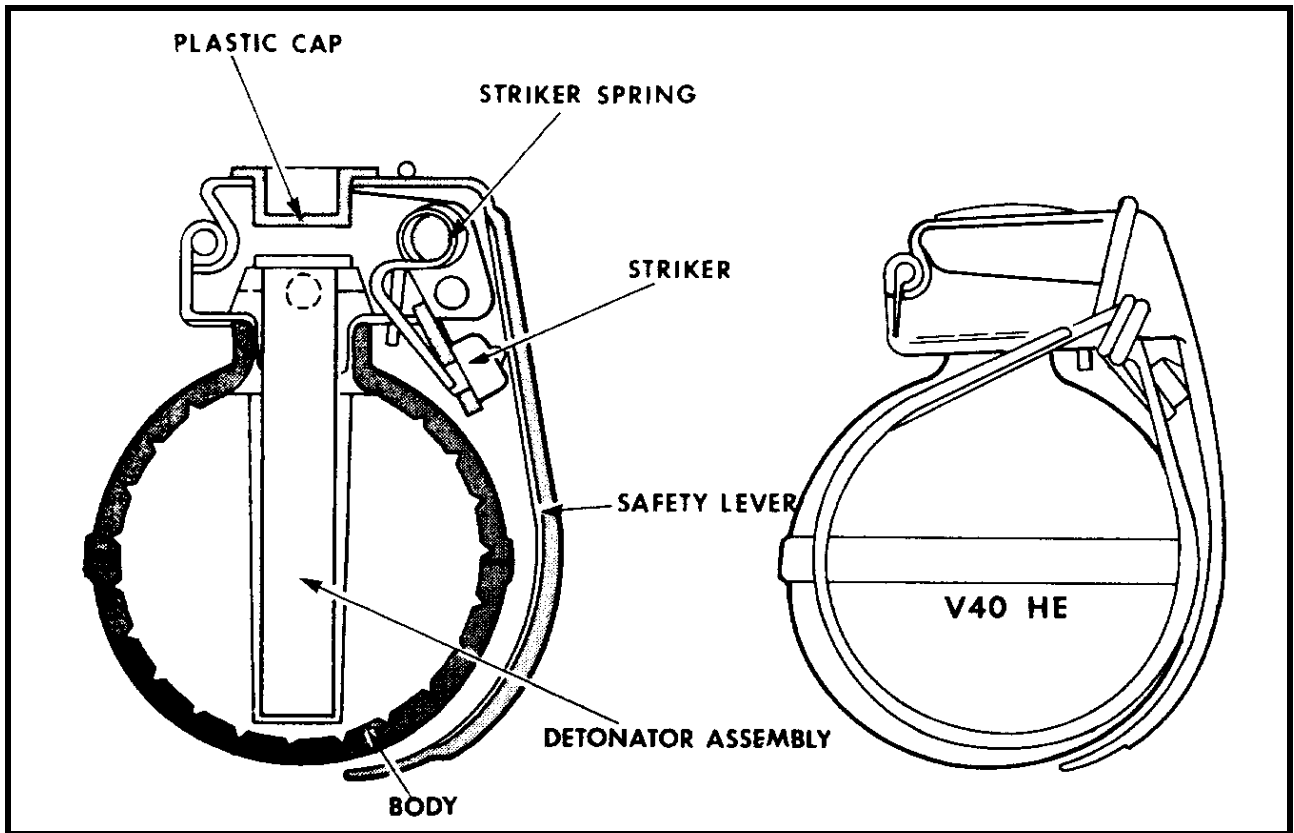


Figure 2-17 Mechanism - V40 Grenade

SECTION 5 - THE NO. 80 MK 1 GRENADE

228. General

1. The No. 80 Mk 1 grenade is a bursting type grenade which provides an immediate smoke screen of short duration. It is filled with a white phosphorus composition which forms an immediate and effective smoke screen when the grenade body bursts open and exposes the composition to air. The length of time the screen lasts depends on the strength of the wind. In calm conditions, the smoke remains dense from 20 to 40 seconds. The grenade also has considerable incendiary value due to lumps of burning phosphorus which are scattered over an area approximately 20 metres (22 yards) wide. (See Figure 2-18.)

2. Users must be aware that the phosphorus can cause serious burns due to the fact that it cannot be extinguished unless the affected part is immersed in water or otherwise isolated from contact with air. However, it will ignite again spontaneously when exposed once again to air. The danger area of the grenade is 20 metres (22 yards) and more distance must be allowed in windy conditions.



Figure 2-18 Smoke Cloud Produced by Two No 80 Grenades

229. Description

1. The No. 80 grenade has a tin-plated body with a slightly tapered base. Screwed into the top of the body is the striker mechanism No. 2 Mk 1 consisting of a striker and spring, safety lever and safety pin. The grenade must be primed by the user.
2. The grenade is marked as follows:
 - a. The body bears a RED FILLING RING around the top of the body and is coloured DARK GREEN with the following information stencilled in BLACK -
 - (1) number and mark of the grenade,
 - (2) filler's initials or trade mark,
 - (3) month and year of filling, and
 - (4) lot number of filled stores.
 - b. To indicate that the grenade contains white phosphorus, the WHITE letters "WP" 19 mm (3/4 inch) high are found in two diametrically opposed places on the body. See Figure 2-19 and Chap 1, Annex C for identification.

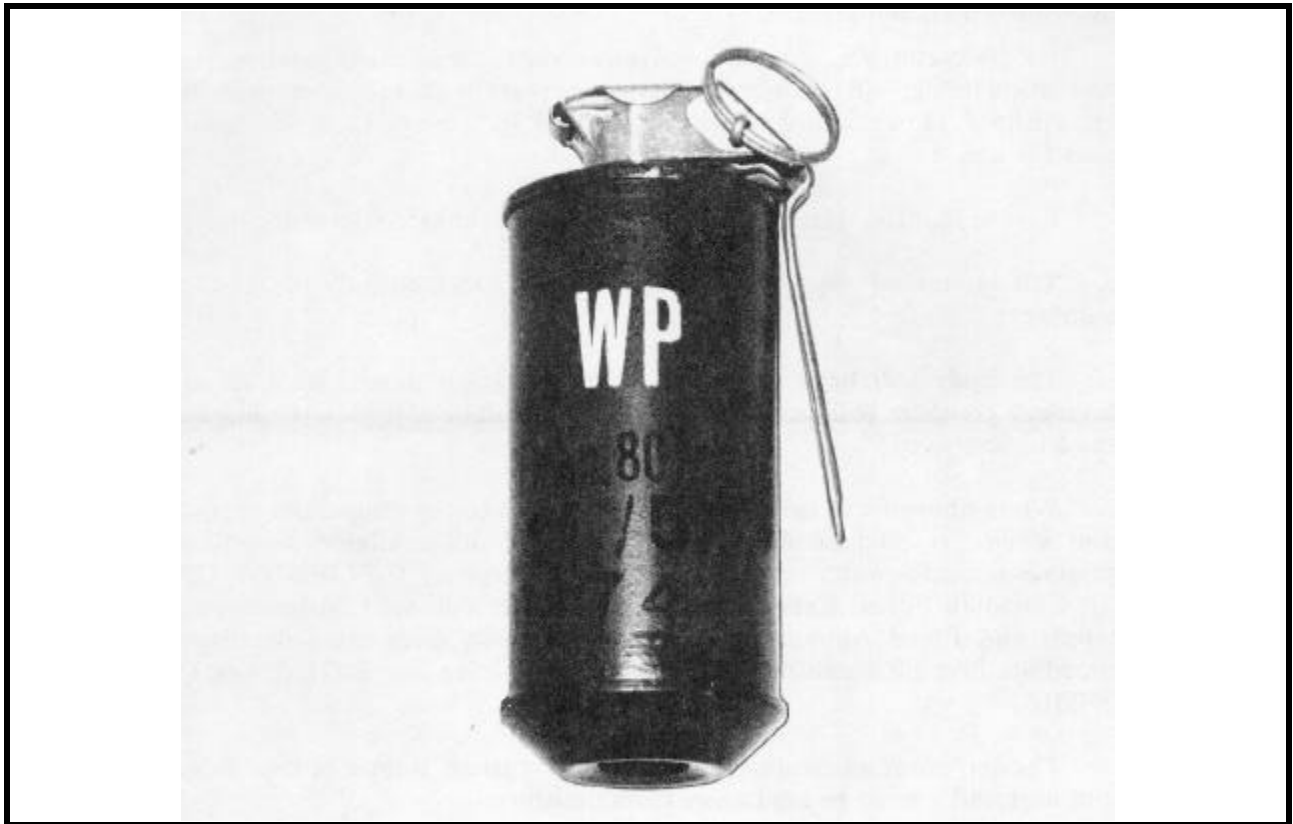


Figure 2-19 No. 80 Grenade

3. A newer version of the No. 80 Grenade has the following markings:
 - a. colour of the body - LIGHT GREEN; and
 - b. identifying markings - RED.

230. Packaging

Currently all No. 80 grenades are packed one to a hermetically sealed cylinder and 18 grenades to a wooden box. In addition, the box contains two metal cylinders each containing nine detonators, and four keys to open the cylinders. The grenade number is marked on the box. There is a risk of fire if one of the grenades is hit by a bullet or shell fragment. When loading vehicles, the No. 80 Mk 1 grenade should, if possible, be stored in a protected location.

231. Safety Precautions

1. Before each training period and whenever the grenade is handled, the mechanism holder will be unscrewed to ensure that the grenade is not primed. If it is primed, the detonator set will be removed and kept in a safe place until ready for use.
2. Ensure that the safety pin is in place holding the safety lever securely.
3. The igniter set must be handled carefully and held only by the cap chamber.
4. The body will be inspected to ensure it is not dented or cracked. Damaged grenades will be treated as duds and will be placed in the impact area and destroyed.
5. White phosphorus first aid kits will be taken to the ranges and kept at hand when No. 80 grenades are being used. If not available, first field dressings soaked in water may be applied in an emergency. C-74-040-004/TS-001, Canadian Forces Explosives Safety Manual, Volume 1, Ammunition Depots and Fixed Ammunition Facilities, art 908 gives more detail on immediate first aid measures which can be taken. See also B-GL-304-003/TS-001.
6. The detonator set must never be struck or crushed. It must be kept away from heat and it must be kept away from moisture.

232. Characteristics

1. The No. 80 grenade has the following characteristics:
 - a. weight of the grenade - .57 kg (1.25 lbs);
 - b. weight of the WP filter - .37 kg (13 oz);
 - c. time delay - 2.5 to 4 secs;
 - d. delivery - handthrown only;
 - e. duration of burning - instantaneous burst - cloud lasts 20 to 40 secs; and
 - f. danger area - 20 metres (22 yards) from point of burst.

233. Igniter Set

The detonator No. 75 Mk 2 assembly is used with the no. 80 grenade and consists of a .22 inch cap in a chamber, a short length of straight safety fuze, BROWN in colour, and a detonator. (See Figure 2-21.) The assembly must be handled very carefully. IT MUST NEVER BE STRUCK OR CRUSHED. It must be kept away from heat and not allowed to become damp. No attempt must ever be made to strip down any part of the set.

234. Priming and Unpriming

1. To prime the No. 80 grenade:
 - a. unscrew the No. 2 Mk 1 striker mechanism;
 - b. insert No. 75 detonator assembly into the detonator tube being careful to hold it only by the cap chamber; and
 - c. screw the striker mechanism on to the grenade.
2. To unprime the grenade unscrew the striker mechanism and remove the detonator assembly.

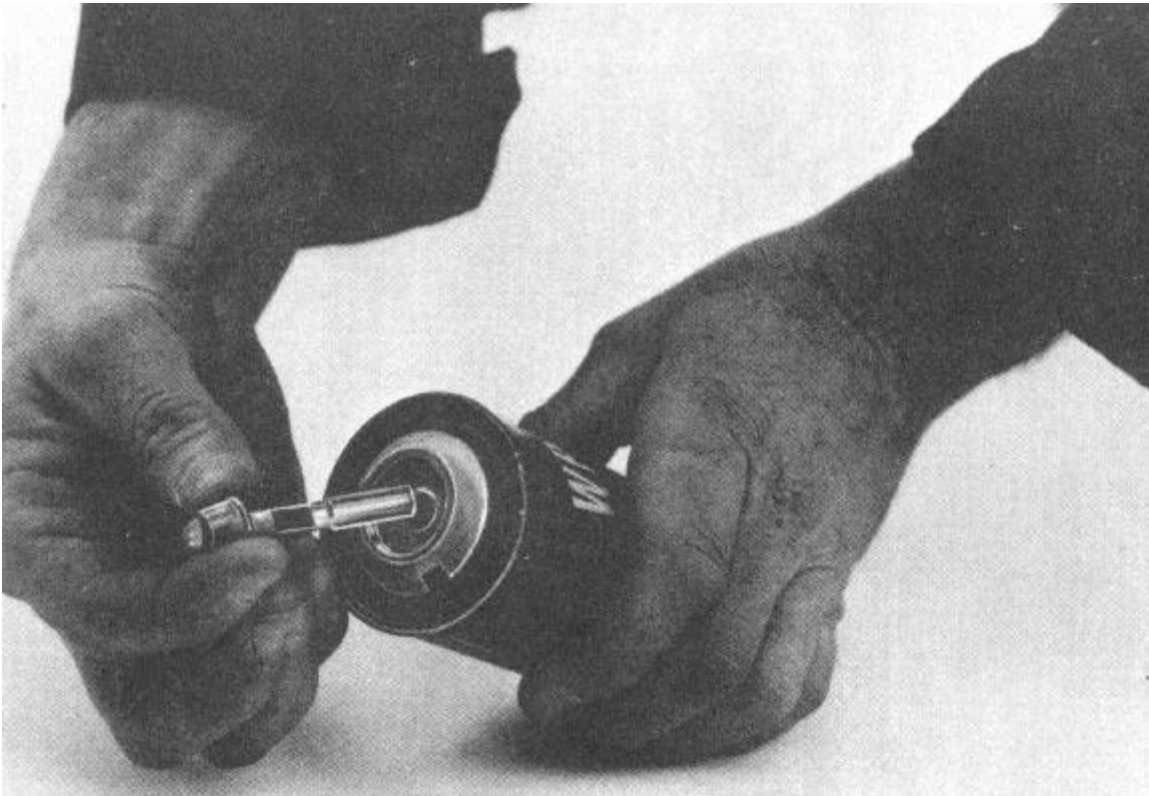


Figure 2-20 Priming the No. 80 Mk 1 Grenade

235. Mechanism

1. The striker mechanism requires no preparation. The striker and spring are in a cocked position when issued, in a manner similar to that of a mousetrap when set. They are kept in position by the striker lever which is hooked to the front of the holder and secured to its body by the safety pin. (See Figure 2-21.)
2. A delay of 2.5 to 4.0 seconds occurs after the ignition of the fuze before the detonator bursts the grenade bursts there is an instantaneous cloud of smoke. Burning lumps of white phosphorus are thrown out to distances of 20 metres (22 yards).

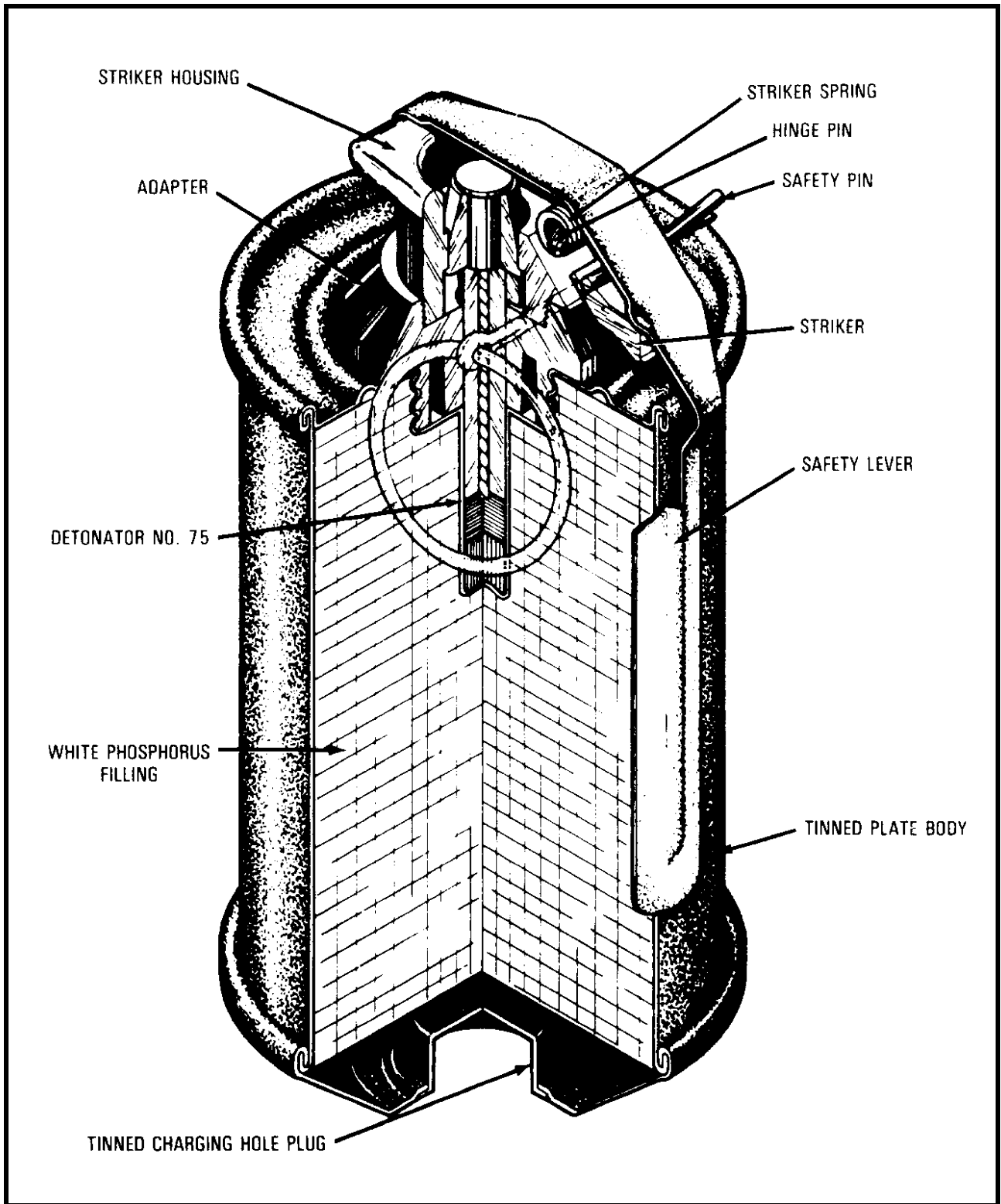


Figure 2-21 Mechanism - No. 80 Grenade

SECTION 6 -THE GRENADE, HAND, SMOKE NO. 83 MK 2 AND THE GRENADE, HAND, SMOKE C3 SERIES

236. General

The No.83 Grenade is an emission type smoke grenade that produces an effective coloured smoke that lasts for 60 seconds. It can be used either for signalling purposes during daylight or to produce an effective smoke screen when favourable wind conditions exist.

237. Description

1. The grenade has a tin-plated body, and is cylindrical in shape with a flat base. Screwed into the top of the body is a No. C19 fuze assembly with a BLACK top and consisting of a striker and spring, striker lever and safety pin. On the top of the body between the mechanism holder and the lip of the grenade are four sealed emission holes.

2. The grenade body is coloured LIGHT GREEN with the following information stencilled or painted in BLACK as shown in Figure 2-22 and Chap 1, Annex C:

- a. nomenclature of smoke;
- b. colour of smoke;
- c. lot number of filled stores;
- d. date of filling (month and year); and
- e. identification code number as applicable.



Figure 2-22 The No. 83 Mk 2 Grenade

238. Packaging

1. The grenade is packed in individual metal containers, 20 to a wooden box. On the outside of the box the following is stencilled:

- a. nomenclature of the grenade;
- b. colour of smoke;
- c. lot number of filled stores;
- d. weight and volume of box; and
- e. date of packing of box (month and year).

239. Safety Precautions

The No. 83 grenade is issued primed. While it has no significant danger radius, it does present a health hazard if used in a confined space because a high concentration of smoke will make breathing difficult. Prolonged breathing of the smoke should be avoided because the vapour is mildly toxic.

240. Characteristics

1. The No. 83 grenade has the following characteristics.
 - a. weight - .45 kg (1 lb);
 - b. available colour range - blue/violet, green, red, and yellow;
 - c. delivery - thrown by hand only;
 - d. time delay - smoke emission commences within two to five seconds;
 - e. duration of emission - approximately one minute; and
 - f. danger area - none.

241. Mechanism

The No. 83 grenade requires no preparation. The striker and spring of the C 19 fuze assembly are in a cocked position when issued. They are kept in position by the striker being hooked on to the front of the holder and secured to its body by the safety pin. There is no detonator in this grenade (See Figure 2-23). When the pin is pulled out and the grenade is thrown, the lever flies off releasing the striker which, acting under the influence of its spring, performs like the spring wire of a mousetrap. The striker swings over and strikes the cap of the igniter set. This causes a flash which ignites a short length of instantaneous fuze, which in turn ignites a primed muslin disc. The flash from the fuze and disc ignites the filler. There is a short delay before the smoke is in full production. The smoke comes out through the four emission holes in the top of the body.

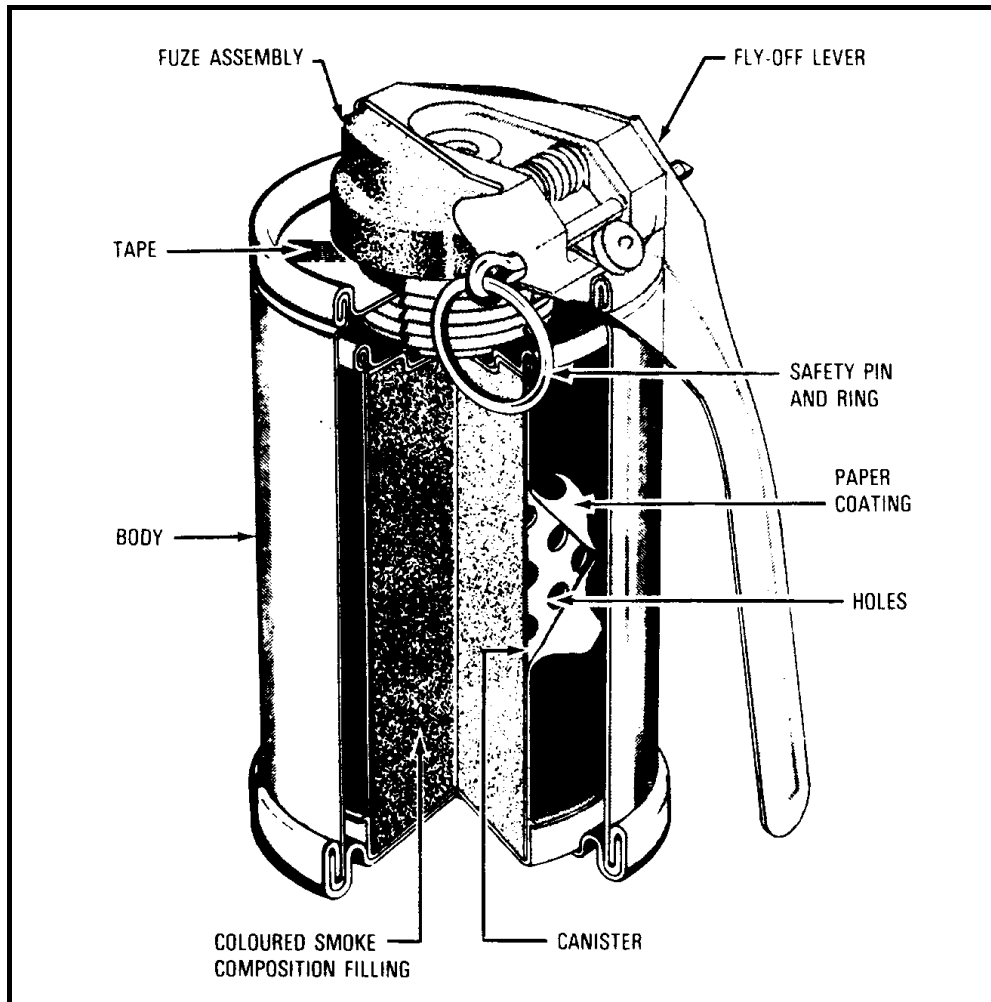


Figure 2-23 Mechanism of the No. 83 Grenade

242. Grenade, Hand, Smoke, C3 Series

1. The C3 smoke grenade series is identical to the No. 83 grenade, with respect to its use, appearance, mechanism, safety precautions, etc, except for the following:
 - a. The fuze delay is seven seconds.
 - b. The colour of the smoke produced by the grenade is indicated by the letter "C" marked on the body of the grenade beneath the nomenclature, and painted in the colour of the smoke produced.
2. See Figure 2-24 and Chap 1, Annex C.

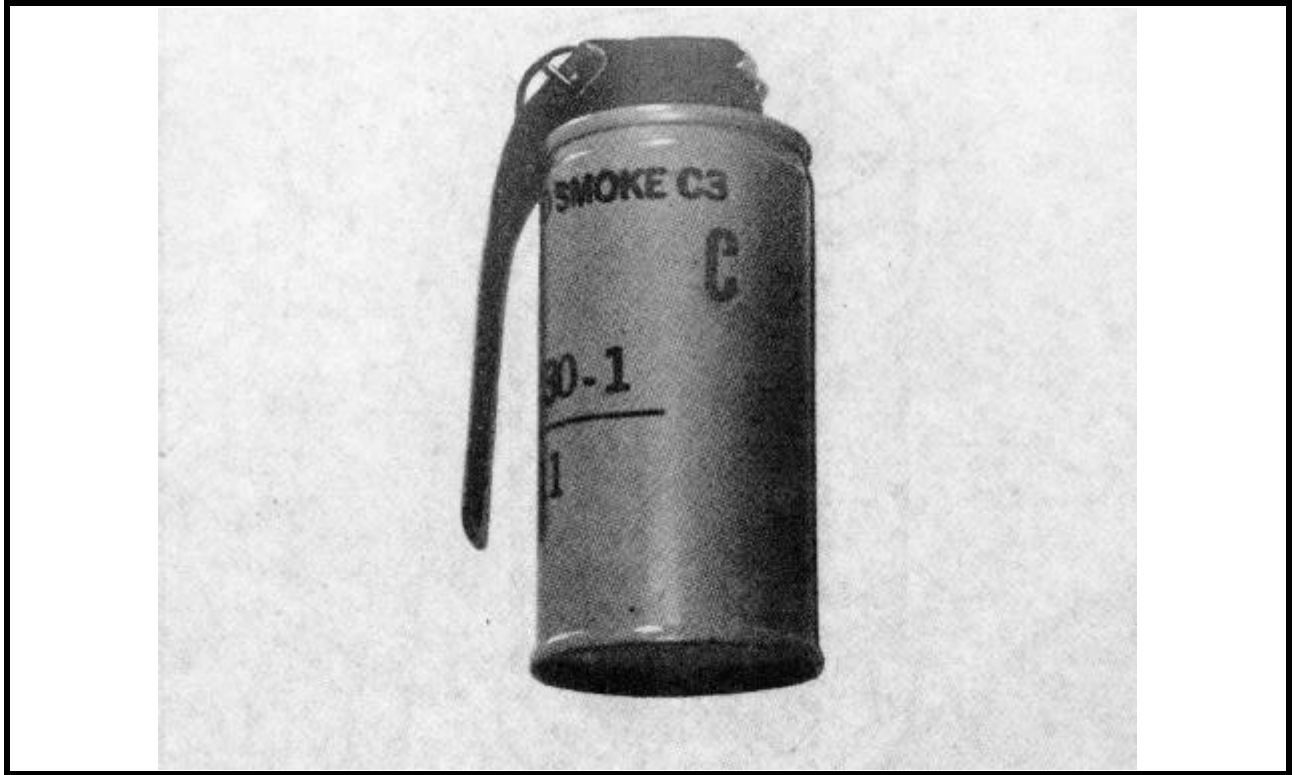


Figure 2-24 Grenade, Hand, Smoke, C3 Series

SECTION 7 - THE GRENADE, HAND, SMOKE, HCC1A1

243. General

The HCC1A1 grenade shown in Figure 2-25 is an emission type smoke grenade used to provide screening smoke for troops in the field. It is capable of being thrown by hand or projected from a rifle equipped with the L1A2 launcher and it produces an effective smoke screen that may last up to 60 seconds.



Figure 2-25 The HCC1A1 Grenade

244. Description

1. The HCC1A1 grenade which is shown in Figure 2-25 and Chap 1, Annex C, has a tin-plated body with a slightly tapered base. Screwed into the top of the body is a No. C19 Fuze Assembly with a BLACK tap, consisting of a striker and spring, safety lever and safety pin. On the top of the body between the mechanism holder and the lip of the grenade are four emission holes. The holes are sealed with pressure sensitive tape and coated with a primer paint. The grenade is LIGHT GREEN in colour and has the following information stencilled in BLACK on the body:

- a. type of grenade; and
- b. lot number.

245. Packaging

The HCC1A1 grenade is packaged in an individual metal container as shown in Figure 2-26. Twenty of these containers are packed in a wooden box on which the type and number of grenades are stencilled.



Figure 2-26 The HCC1A1 Grenade in its Container

246. Safety Precautions

The HCC1A1 grenade functions on the ignition principle and therefore requires no priming. It has no danger area. However, it should not be used in a confined space during training because a high concentration of smoke will make breathing difficult. The emission area of this grenade becomes very hot during operation and can cause severe burns if handled.

247. Characteristics

1. The HCC1A1 grenade has the following characteristics:
 - a. weight - .45 kg (1 lb);
 - b. filler - a non-toxic chemical composition - produces grey smoke;
 - c. duration of smoke - up to 60 seconds;

- d. delivery - can be hand thrown or rifle launched;
- c. time delay - emission starts in two to five seconds; and
- f. danger zone - none.

248. Mechanism

The No. C19 fuze set requires no preparation. The striker and spring are in a cocked position when issued, in a manner similar to that of a mousetrap when set. They are kept in position by the safety lever being hooked on to the front of the holder and secured to its body by the safety pin. When the safety pin is removed and the safety lever released, the striker to rotate on its axis to push the safety lever upwards and off the grenade and to strike the primer. The ignites a safety fuze which burns for approximately five seconds before igniting the composition. A dense GREY smoke is expelled from the body of the grenade for 25 to 35 seconds.

SECTION 8 - GRENADE, HAND, RIOT, CS, M7A2 AND M7A3

249. General

1. The grenade, hand, riot, CS M7A2 and M7A3 are pyrotechnic types of grenades designed for flushing enemy troops from dug in positions, command posts. etc, for the purpose of taking prisoners, and for riot control. It produces d CS cloud that causes irritation and stinging of the eyes, nose, breathing passages and most parts of the body. Extreme concentrations will cause complete physical incapacity.

2. Details on the tactical use of this grenade on internal security operations, eg, assistance to federal prisons, may be found in CFP 302, Specific Operations, Volume 8, Aid of the Civil Power, and in local region operation directives.

250. Description

1. The grenade has a tin-plated body in a cylindrical shape. A M201A1 fuze assembly consisting of a striker and spring, safety lever., and safety pin is screwed into the top of the body. There are four emission holes, three on the cop plate and one on the bottom plate. The grenade is filled with CS in pellet form. See Figure 2-27 and Chap 1, Annex C.

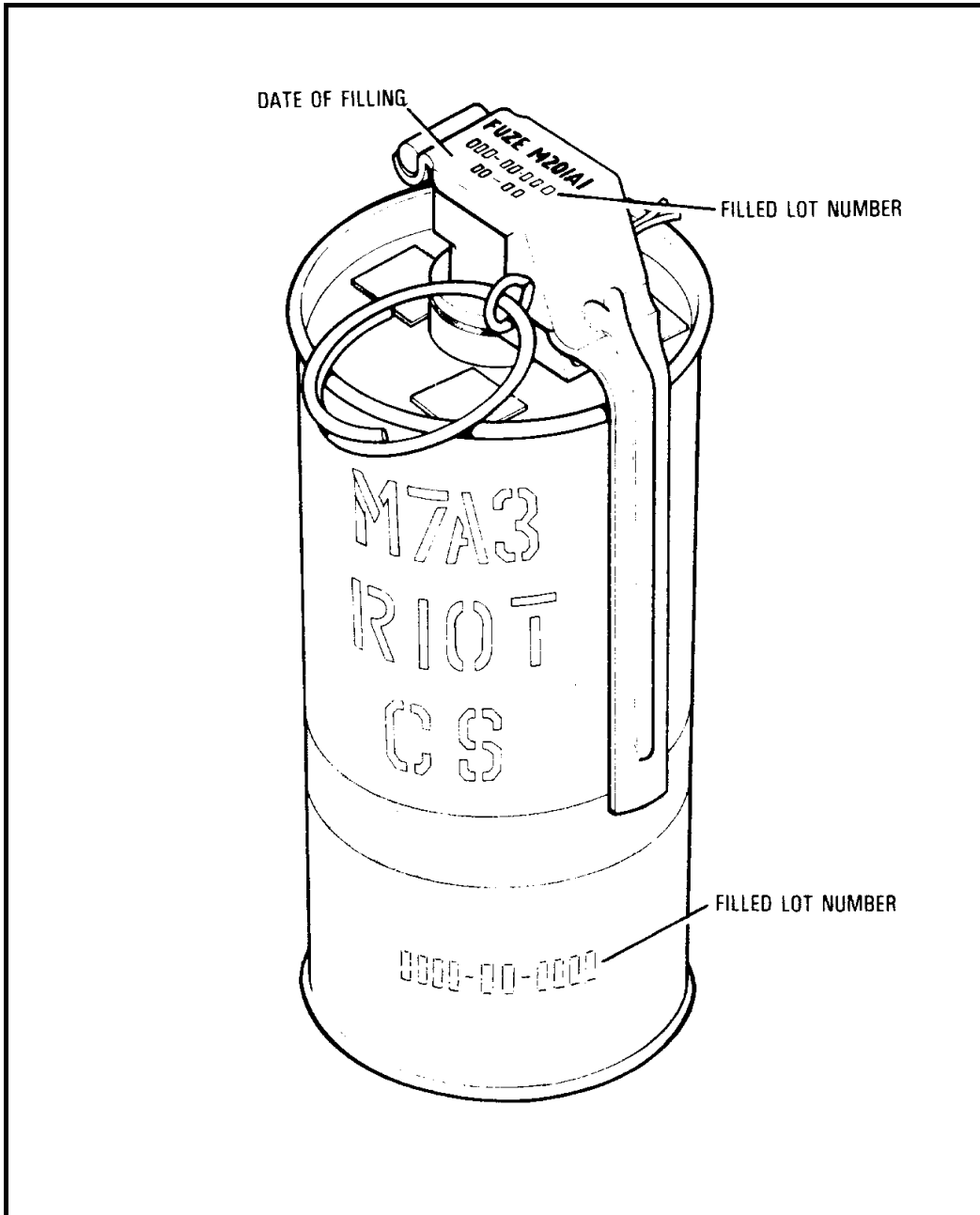


Figure 2-27 CS M7A2/7A3 Grenade

2. For MARKINGS the grenade is painted GREY with markings in RED. A 12mm (1/2 in) RED band encircles the grenade.
3. The following information is stenciled on the side of the M7A3:
 - a. nomenclature of grenade;
 - b. type of filling; and
 - c. filled lot number.

4. The following information is stamped on the top of the fuze:
 - a. fuze designation; and
 - b. filled lot number.

251. Packaging

Each grenade is individually packed in a fibre container, sixteen of which are packed in a wooden box.

252. Safety Precautions

1. Prior to removing the grenade from its container it must be ensured that the safety pin is in place.
2. The grenade should be used only under supervision. A high concentration of CS against untrained personnel may cause panic.
3. Users should ensure that non-belligerents will not be affected in the downwind area.
4. The grenade must not be used against personnel in a confined space unless easy exit is possible, due to likelihood of causing lung damage.

253. Characteristics

1. The M7A3 riot grenade has the following characteristics:
 - a. weight - .5 kg (18.5 oz),
 - b. chemical filler - CS pellets plus a burning mixture;
 - c. delivery - hand thrown, rifle delivery requires use of M2A1 launcher which is not a CF supply item;
 - d. duration of emission - 28 seconds; and
 - c. danger area - none.

254. Mechanism

The M7A3 grenade requires no preparation. The striker and spring of the M 20A1 fuze assembly are in a cocked position when issued, in a manner similar to that of a mousetrap when set. They are kept in position by the safety lever being hooked on to the front of the assembly and secured to its body by the safety pin. When the safety pin is withdrawn and the safety lever released, the striker, driven by its spring, throws off the safety lever and rotates about its pivot to strike the primer. The flash from the primer ignites the safety fuze. The fuze burns for approximately two seconds before firing the igniter which in turn ignites the starter mixture and the filling. Pressure developed by the burning filling blows the tapes from the four holes to allow expulsion of smoke and gas for approximately twenty-eight seconds.

SECTION 9 - GRENADE, SMOKE, PAINS WESSEX

255. General

The Pains Wessex family of smoke grenades are used for screening and marking purposes. They will eventually replace the No. 83 and C3 smoke grenades.

256. Description

1. The Pains Wessex Smoke Grenade is cylindrical in shape and has no safety lever. It is initiated by unscrewing the cap on top of the grenade and pulling it away from the body. The grenade emits smoke through the top near the striker assembly. See Figure 2-28 and Chap 1, Annex C.

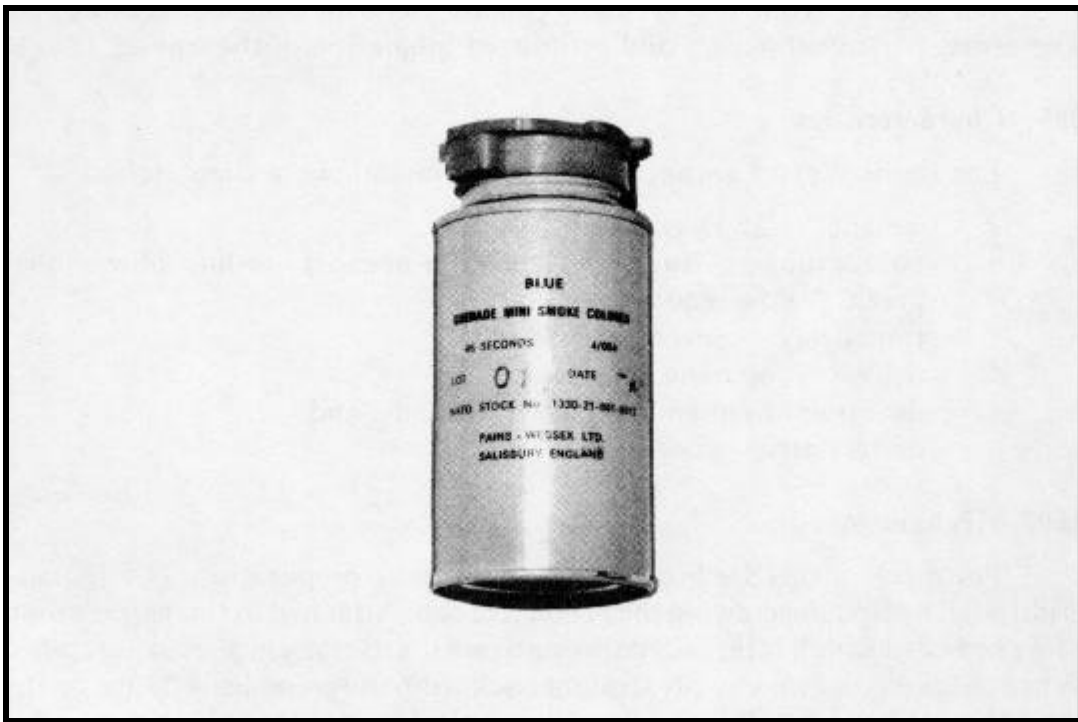


Figure 2-28 Pains Wessex Smoke-Grenade

2. The grenade body is coloured GREEN with the colour of the cap corresponding to the colour of the smoke produced. The following information is stencilled on the side of the body:

- a. nomenclature of grenade;
- b. colour of smoke,
- c. serial and lot number; and
- d. date of manufacture.

257. Packaging

Each grenade is enclosed in a heat sealed plastic bag. Ten grenades in bags are packed to a cardboard box. Two cardboard boxes are packed in a larger waterproof cardboard box. Two of these larger boxes are packed in a wire bound box.

258. Safety Precautions

1. The Pains Wessex Grenade is issued primed. It has no lethal radius. Users must ensure that the cap remains screwed in place on the grenade until just before use.
2. The smoke from the grenade can be toxic in high concentrations. Therefore, personnel must avoid prolonged inhalation of the smoke.

259. Characteristics

1. The Pains Wessex smoke grenade has the following characteristics:
 - a. weight - .25 kg (.5 lb);
 - b. colour range - (indicated by colour of caps) - white, blue/violet, green, yellow, and red;
 - c. time delay - several seconds;
 - d. deliver - by hand only;
 - e. duration of emission - 60-90 seconds; and
 - f. danger area - none.

260. Mechanism

The mechanism (See Figure 2-29) requires no preparation. The grenade is initiated by first unscrewing the protective cap. Attached to this cap is a loop of waxed cord which is threaded through two plastic lugs in a securing collar. When the cap is drawn sharply straight back from the grenade. A flange on the top of the striker extends into a groove on each lug so that the striker is pulled up also. As the lugs come out of the securing collar, they fall away allowing the striker spring to assert itself and drive the striker onto a primed cap. The cap fires a delay element which in turn initiates the smoke compound. Smoke is emitted from the top of the grenade.

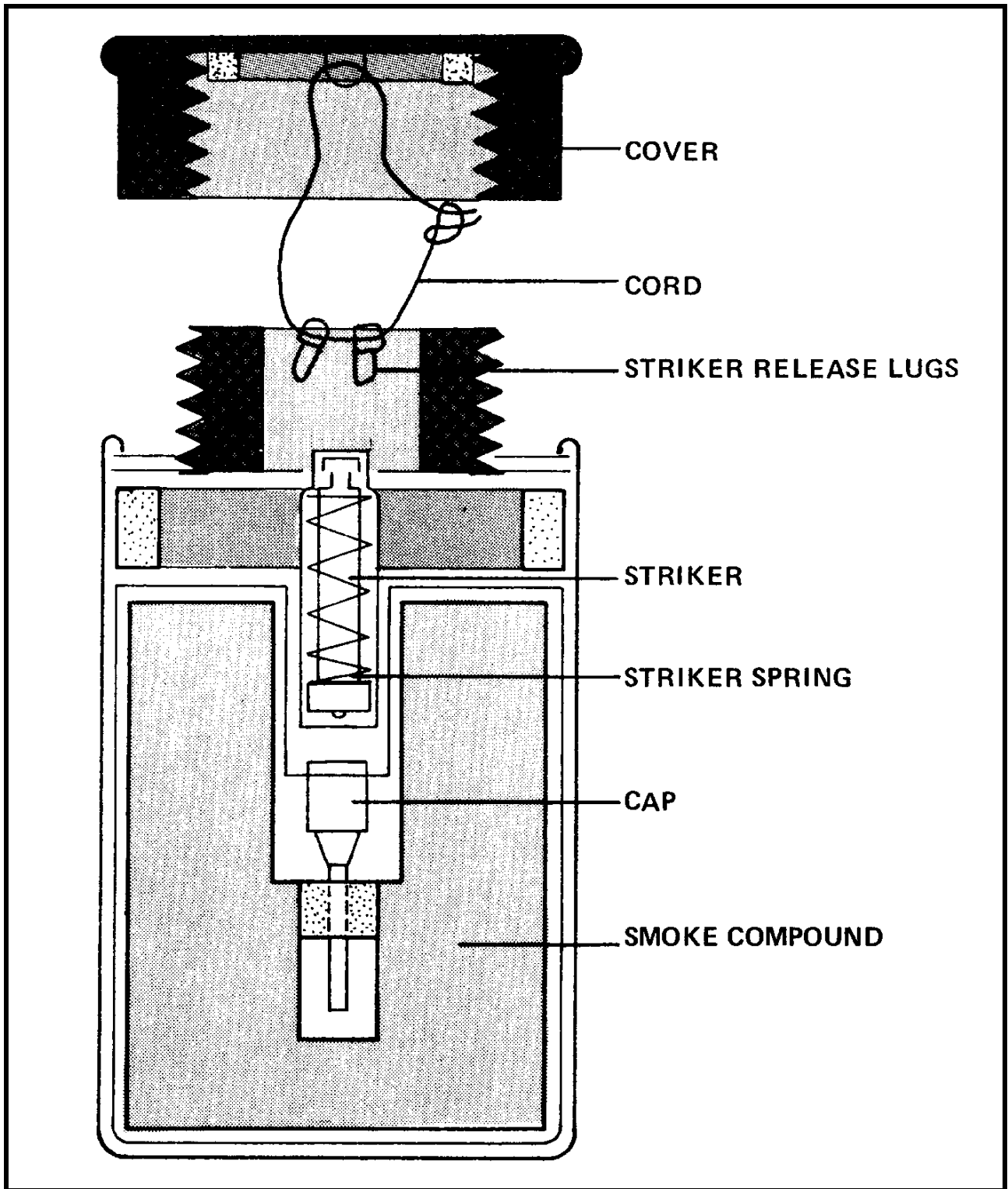


Figure 2-29 Mechanism of the Pains Wessex Smoke-Grenade

(261 to 299 - not allocated)

CHAPTER 3

GRENADE THROWING

SECTION 1 - GRENADE THROWING TECHNIQUES

301. General

1. Grenades may be lobbed underhand or thrown overhand like a baseball. The method used is a matter of personal preference and a man should not alter his style as long as accuracy is achieved. To obtain accuracy against a target located behind high cover, the grenade must be thrown at a high angle. The easiest method to obtain maximum range and height, especially with grenades weighing .45 kg (one pound) or more, is by the method described in this section.
2. Smoke grenades such as the No 83 and the HCC1A1 may be rolled and dropped if necessary due to the fact that the thrower does not require to be protected from the grenade.

302. Ready Position

1. The grenade is held by the RIGHT hand in an overhand grip as shown in Figure 3-1. The safety lever is retained in the palm of the hand between the thumb and the forefinger. The thumb and forefinger of the LEFT hand grab the extended portion of the safety clip.
2. For a LEFT-HANDED thrower, the grenade is held in the LEFT hand and the first or second finger of the RIGHT hand is placed through the safety pin ring. The body is turned to the left so that the right shoulder and foot are towards the target.



Figure 3-1 Ready Position



Figure 3-2 Ready Position for V40 Grenade

303. Not Allocated



Figure 3-3 Safety Pin and Lever Cheek

304. Throwing

On the command **THROW** the **LEFT** arm is extended in the direction of the target. The body is swung backwards as far as possible allowing the **LEFT** hand and **LEFT** foot if necessary to come up naturally as shown in Figure 3-4. Then, without pause, the body and the straight **RIGHT** arm are swung quickly upward and forward in an arc and the grenade is released as the hand reaches its highest point above the shoulder as shown in Figure 3-5. The fall of the grenade should be watched.



Figure 3-4 Throwing Action 1

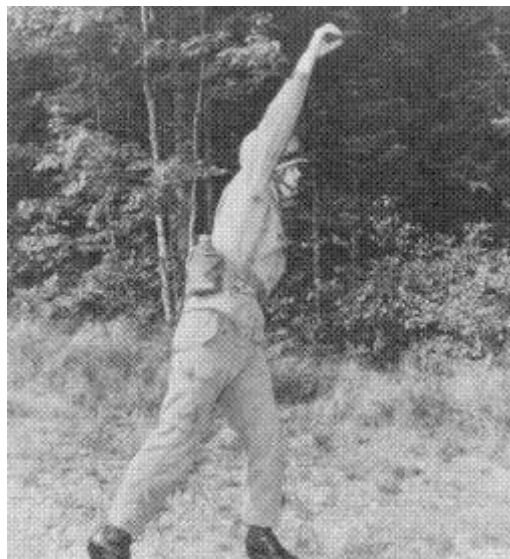


Figure 3-5 Throwing Action 2

305. Correction of faults

1. There is a loss of distance if the grenade is released either before the hand reaches, or after it has passed, the highest point above the shoulder.
2. The grenade will fall wide of the target if the shoulder is not kept in line with the target.

306. Throwing the M61 and M67 Grenades

1. General. The M61 and M67 Grenades, unlike other grenades, have an additional safety device; the safety clip.
2. The Ready Position. The grenade is held in the RIGHT hand as described in art 287.
3. Preparing to Throw. On the command "READY" the thrower must first remove the safety clip from the safety lever and rotate the safety clip counterclockwise as far as possible. On the completion of this rotation of the safety clip, the first or second finger of the LEFT hand is placed through the safety pin ring.
4. Throwing. On the command "throw", the thrower swiftly pulls the right hand down and to the rear, while holding on to the safety pin securely at waist level. This downward movement and rearward thrust pulls the grenade away from the safety pin. The thrower must glance down to ensure that the safety pin has been removed from the grenade and that the safety lever remains secure, as shown in Figure 3-3. The thrower then looks at the target and ensures that the left shoulder is pointing in its direction. The thrower then throws the grenade as described in Art 304. The above sequence of throwing the grenade must be done all in one motion.

307. Throwing Positions



Figure 3-6 Standing Position

1. Standing Position. The standing position is used when the thrower is in a trench or behind high cover. The thrower gets into the "Ready Position" and making full use of the cover, throws the grenade and then ducks behind the cover. If at all possible, he should observe the fall of the grenade. See Figure 3-6.



Figure 3-7 Kneeling Position

2. Kneeling Position. The kneeling position is used when the thrower is behind cover of medium height such as an embankment, ditch, low wall, etc. The thrower kneels on his LEFT knee, bends his RIGHT leg and keeps the RIGHT foot flat on the ground at an angle to his body. He ensures that his LEFT shoulder is pointing towards the target. He then swings his body quickly backwards, throws the grenade and immediately lies down behind the cover (Figure 3-7). When the cover is lower than practical for throwing from the kneeling position, the modified kneeling position may be used.



Figure 3-8 Modified Kneeling Position

3. Modified Kneeling Position. The thrower kneels on his LEFT knee but extends his RIGHT leg straight out behind him. To adopt an even lower position, the thrower can bend forward. He must ensure however that his LEFT shoulder is pointing in the direction of the enemy. He then swing,; his body quickly backwards, throws the grenade, and immediately lies down behind his cover. See Figure 3-8.



Figure 3-9 Prone Position

4. **Prone Position.** When there is virtually no cover, the prone position as shown in Figure 3-9 should be used. Note that the LEFT shoulder is still pointed in the direction of the enemy. The body should be swung quickly backwards, and after the grenade is released, the thrower must take extra care to ensure his whole body is behind cover.

308. Lobbing the Grenade

1. When fighting in close country or in a built-up area, it may be necessary to "plant" or lob a grenade through a window or door way, or into a clump of bushes. It is not possible to lay down hard and fast rules for these situations but certain points to note are as follows:
 - a. It may be practical to remove the safety pin BEFORE moving to the position from which the grenade is to be delivered.
 - b. It is important to select cover BEFORE delivering the grenade.
 - c. The thrower must deliver the grenade in the manner most likely to ensure accuracy.

SECTION 2 - TRAINING WITH LIVE GRENADES - RANGE PROCEDURES

309. General

1. Live practices can instil confidence in the handling of a potentially dangerous weapon. Accidents can generally be traced to one or more of the following main causes:

- a. ignorance;
- b. negligence;
- c. deliberate flouting of approved procedures, "bravado"; and
- d. nervousness or lack of confidence.

2. The first three can be overcome by training, supervision, or disciplinary action, the last can be mastered by practice. All can be eliminated by competent instructors who inspire confidence and who exercise efficiency and good control on the grenade range.

3. Details of the responsibilities, safety, action on duds, and the conduct of practices are to be found in CFP 304(3). The instructional and range control staffs must be thoroughly acquainted with the regulations contained therein.

310. Organization of Practice For a Grenade Issued Unprimed

1. As an aid to the smooth running of the practice, a demonstration to show what each man must do during the practice should be given by the Range Safety Officer (RSO) and supervising NCOs.

2. It is the duty of the RSO when conducting "live" practices to foresee the possible incidents that may occur, either as a result of nervousness or grenade malfunctions, and which may endanger participants. He must specify the immediate remedial action to be taken by the instructors and their assistants in the event of an accident. For example, should a grenade be dropped in the bay during the act of throwing, the safety assistant will be instructed that he must immediately get the man behind cover around the traverse, before taking cover himself.

3. Servicemen undergoing training will be formed into throwing details and issued with the number of grenades they are to throw. They will then be sent to the shelters.

4. The No 36M Grenades, when issued, will be cleaned under the supervision of an NCO and a "striker test" will be performed. An NCO will watch the "striker test" being done and will ensure that it has been correctly performed.

WARNING: Igniter sets will not be issued or otherwise made available to soldiers before they have entered the priming bays.

5. The safety assistants will then take their places in the priming and throwing bays. Safety assistants detailed for the priming bays will have with them the required number of igniter sets in their boxes.

6. The RSO will take his place at the Control Post, taking with him the demolition box. Having satisfied himself that all safety regulations have been complied with, he will lower the GREEN range flag, raise the RED range flag and order the first detail into the priming bays.

7. The first detail will then prepare their grenades and pass on to the throwing bays. The second detail will then take its place in the priming bays.

8. Only those grenades which are to be used before the men return to the shelter will be prepared.

CAUTION: Primed grenades shall never be taken into the shelter.

9. Should the practice be cancelled for any reason before the number of primed grenades has been used, the safety assistants in the throwing and priming bays will ensure that the primers are removed from the unused grenades. This rule does not apply, however, to the temporary stopping of a practice due to a dud.

311. Organization of Practice For a Grenade Issued Primed

1. When primed grenades are used, all grenades will be kept in the priming bays. The flow of movement will be from the shelter to the priming bay to pick up the primed grenades and then to the throwing bay.

2. The safety assistant in the priming bay will issue the primed grenades to personnel as they arrive in the priming bay from the shelter. He will ensure that all personnel proceeding from or through the priming bay to the shelter do not have any grenades in their possession.

CAUTION: Primed grenades shall not be taken into the shelter at any time.

312. Sequence For the Conduct of a Grenade Range Practice

1. The following is a suggested sequence for running a typical grenade practice:
 - a. RED flag is raised.
 - b. Figure 3-10 indicates the commands and procedures to be employed during all supervised conventional range practices. The actions to be carried out by the thrower are as described in Art 306.

SER	OIC/RSO	ARSO	ACTION BY THROWER	REMARKS
1	“Nos 1 & 2 move to Preparation Bay/s”.		Nos 1 & 2 move to Preparation Bay and pick up grenade/s.	
2	“Nos 1 & 2 move to Preparation Bay/s”.		Nos 1 & 2 move to Throwing Bay/s.	ARSO will meet throwers in the Bay and brief thrower.
3	“Nos 3 & 4 move to Preparation Bay/s”		As for Ser 1.	
4		“Adopt the READY posn.”	As described in Art 302.	
5	“No. 2 Throwing Bay Down”.		ARSO and thrower get down behind cover.	
6	No. 1 Bay “GO ON”.	“READY”	As described in Art 306 para 3.	
7		“THROW”	As described in Art 306 para 4.	Upon throwing the grenade the thrower will report
8	“DOWN”	“DOWN”	ARSO and thrower get down behind cover.	
9	“No. 1 Bay DOWN”		As for Ser 5.	
10	“No. 2 Bay GO ON”			As for Ser 6, 7 and 8.
11	“CHANGE”		Nos 1 & 2 move to waiting area, Nos 3 & 4 move to Throwing Bay. Nos 5 & 6 move to Preparation Bay.	The above serials will be repeated until practice is completed.

Figure 3-10 Supervised Conventional Range Practice

NOTE

During field firing or during an operation, the above commands and procedures will be modified to suit the situation. However, the report "GRENADE" given by the thrower when he throws the grenade, will be used in all cases to warn his fellow soldiers of his actions.

- c. Upon completion of the practice the GREEN flag is raised.
- d. An inspection by the RSO and a declaration by all personnel that they do not have any grenades in their possession will follow the end of the exercise.
- e. For grenades issued primed, an inspection and accounting will be made of all empty boxes and unused grenades to ensure that, where applicable, they are primed.
- f. All holes in the target area are to be filled.

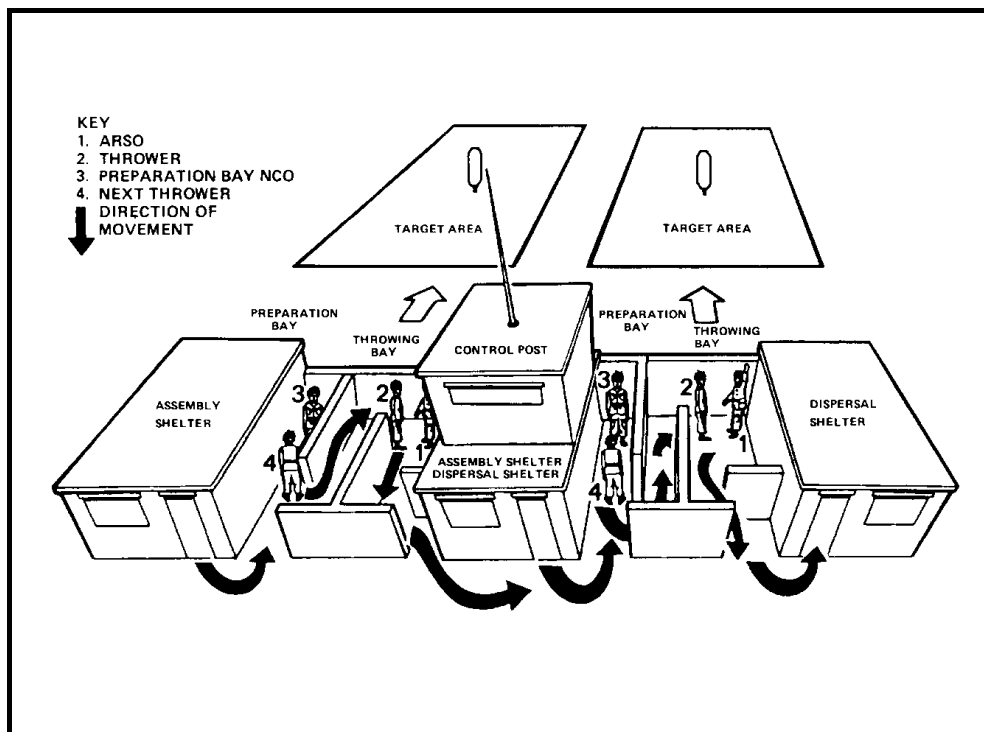


Figure 3-11 Sequence of Conduct for Live Grenade Throwing

NOTE: The range layout may vary, however, conduct of the range will remain the same.

313. Causes of Duds

1. In most cases it is possible for the RSO to deduce the cause of duds from the moment a grenade is thrown. With the M61 Grenade, for example, if the mechanism is working correctly the following sequence of events should be noticed:

- a. lever seen flying off;
 - b. sound of cap being detonated by the striker; and
 - c. smoke seen issuing from the grenade either in the air or on the ground.
2. If the grenade does not explode, the fault may lie in one or more of the following areas:
- a. lever pin was NOT withdrawn or lever became jammed;
 - b. failure of the striker-mechanism - (due to either faulty preparation of the grenade or faulty manufacture);
 - c. fuze fails to burn - (due to faulty fuze or cap); and
 - d. faulty detonator.

(314 to 399 not allocated)

CHAPTER 4

EMPLOYMENT OF THE GRENADE LAUNCHER L1A2

SECTION 1 - INTRODUCTION

401. General

The Grenade Launcher L1A2 was developed to permit the projection of the M61 Fragmentation Grenade and the HCC1A1 Smoke Grenades from the FNC1 and FNC2 Rifles. Ranges of up to 140 metres (150 yards) can be attained with all grenades. The M62 Grenade, the practice version of the M61, can also be launched achieving ranges equivalent to those attained with the M61.

SECTION 2 - DESCRIPTION OF THE GRENADE LAUNCHER L1A2

402. The Main Launcher Assembly

1. The main launcher assembly consists of a barrel-like tube 17.1 cm (6 3/4 inches) long which is fitted with a folding leaf-type sight and a retaining catch that locks onto the bayonet stud of the rifle. A wing-type retainer spring prevents the grenade adapter from falling off the launcher. The launcher weighs about 340 grams (12 ozs). See Figure 4-1.
2. The sight is graduated in 25 metre (27 yard) increments from 50 to 100 metres (55 to 110 yards). Ranges beyond 100 metres (110 yards) are achieved by increasing elevation progressively until the maximum range of 140 metres (150 yards) for the M61 Grenade and the HCC1A1 Grenade is achieved at an elevation of about 800 mils. Intermediate ranges can be achieved with practice.

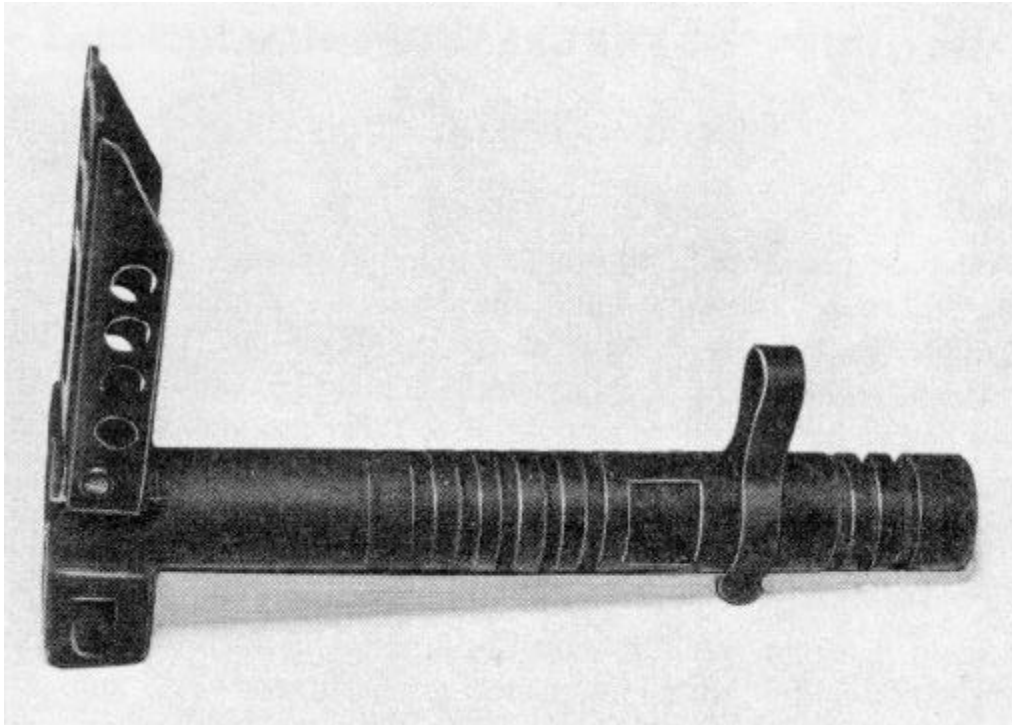


Figure 4-1 Grenade Launcher With the Positioning Clip Attached

403. Ancillary Equipment

1. Adapter, Grenade, Projection M1A2. The adapter consists of four parts: a fin assembly, a stabilizer tube, a cup, and three claws. It is fabricated from sheet steel with three spring-steel claws adjusted to grip the grenade body. The fin assembly, which stabilizes the grenade during flight, is attached to the rear of the stabilizer tube. The cup and claws, attached to the forward end of the stabilizer tube, hold the grenade in place during projection. The longest of the three claws contains an arming clip which is held in place by a brittle piece of metal: the arming clip retainer. The adapter is coloured OLIVE DRAB and has BLACK markings. See Figure 4-2.

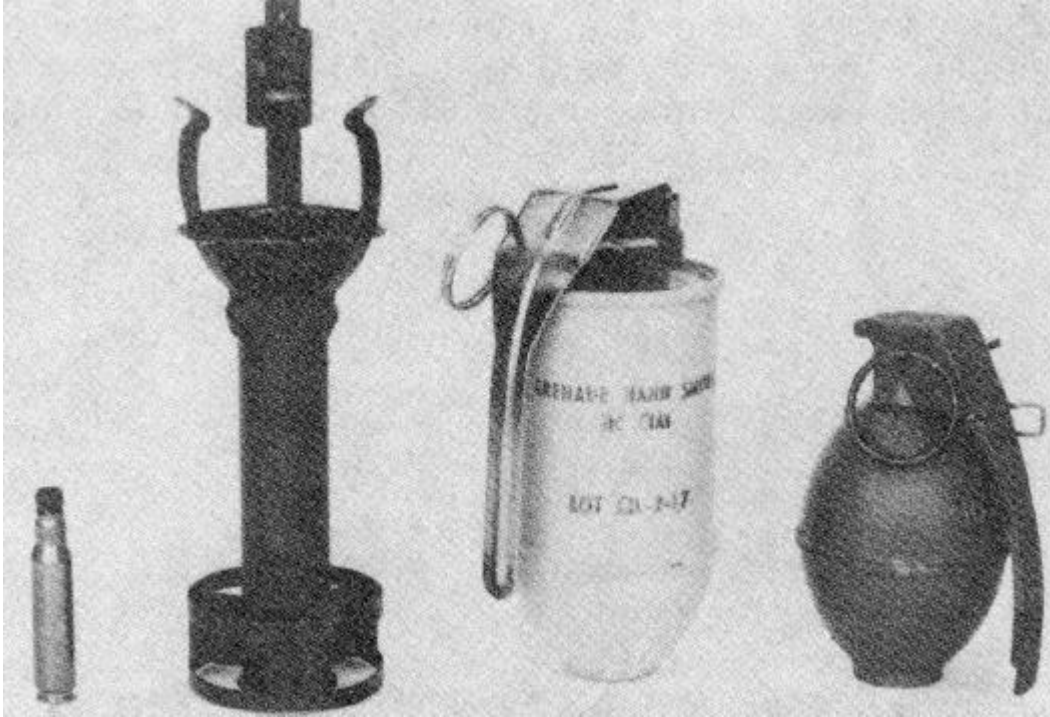


Figure 4-2 Grenade Cartridge, Adapter and Grenades

2. Cartridge, Grenade C33. Grenade cartridges are non-bulleted cartridges containing a special charge which produces the pressure required to propel a rifle-launched grenade. The C33 Grenade Cartridge (see Figure 4-3) may be identified by the method of closure (a cone crimp over a deep-seated closing disc) and by a lacquered BLACK band approximately 1/4-inch wide around the mouth. These two features, which are also shown in Figure 4-4, distinguish rifle grenade cartridges from the ordinary blank cartridges which must NEVER be used in place of the C33 cartridges. The C33 cartridges are issued in seated boxes of ten and are normally issued at the same time as the adapters. The cartridge cannot be magazine fed because the blunt end of the cartridge tends to cause the round to jam just below the breach entrance. Grenade cartridges can be irreparably damaged by attempting to magazine feed them.

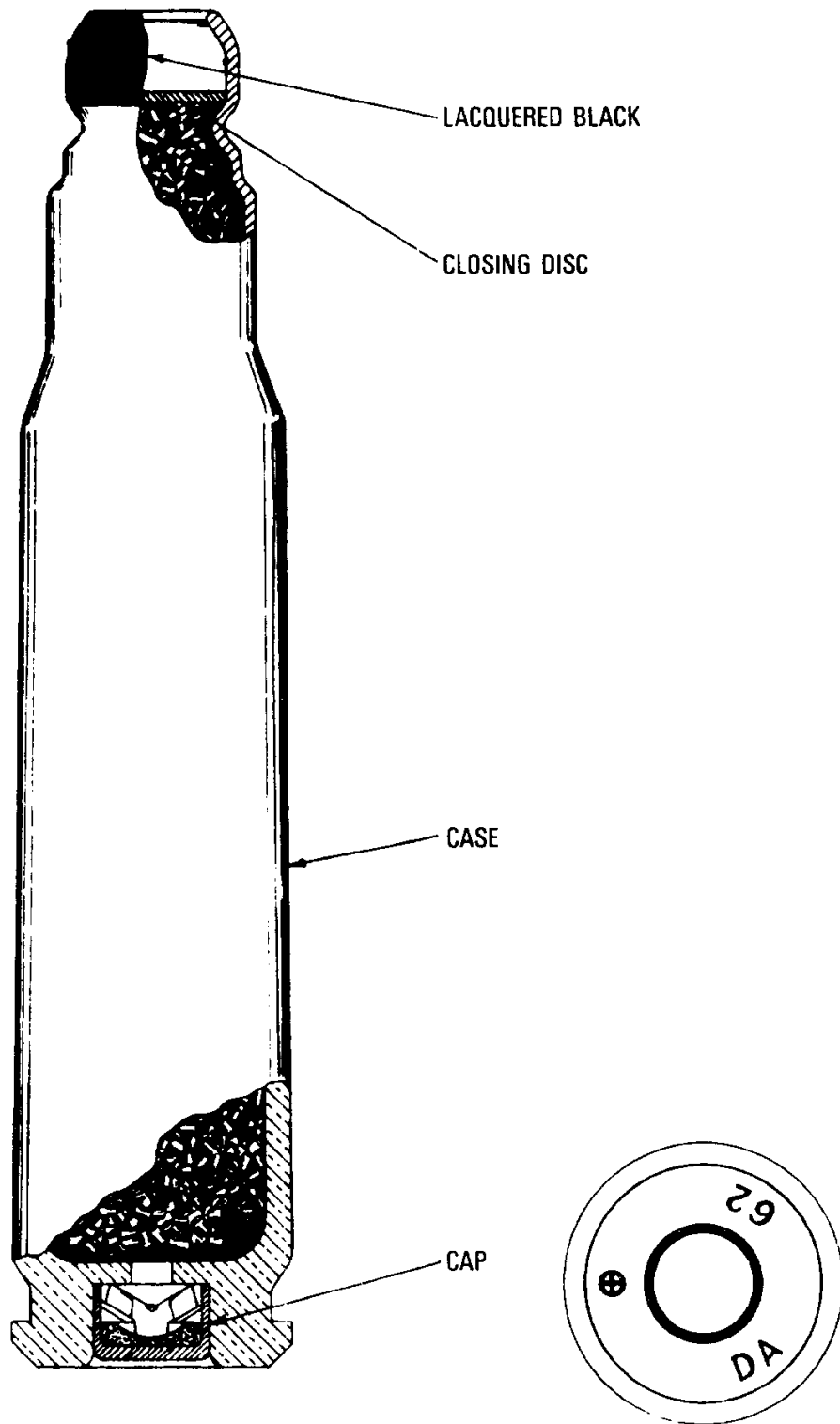


Figure 4-3 Cartridge, Grenade, C33

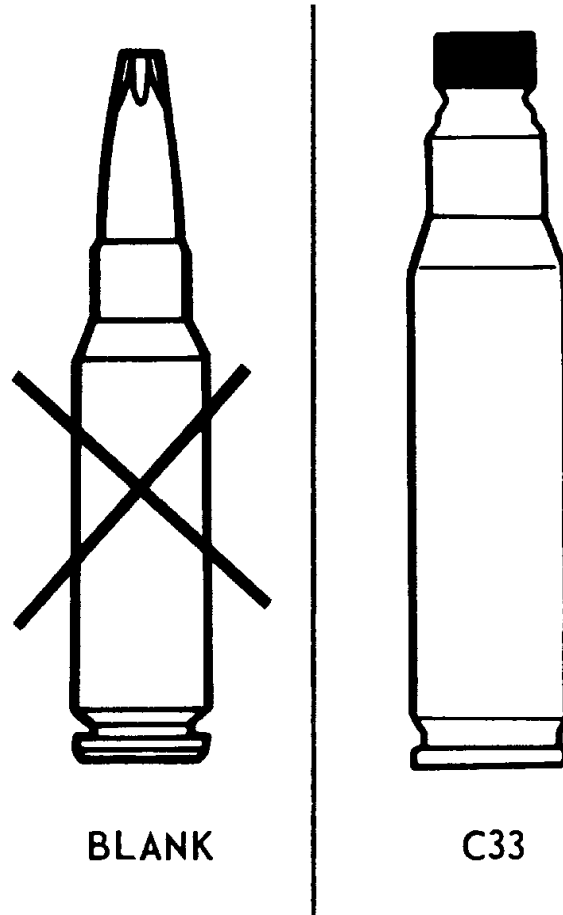


Figure 4-4 The 7.62 mm Blank Cartridge and the C33 Cartridge

3. Clip, Positioning. The positioning clip is used to prevent the adapter from sliding too far down the launcher and to assist aiming and is issued in packets with the adapters.
4. Grenades. The following grenades may be launched using the grenade launcher:
 - a. M61 Fragmentation Grenade;
 - b. M62 practice version of the M61; and
 - c. HCC1A1 Emission-type Smoke Grenade.

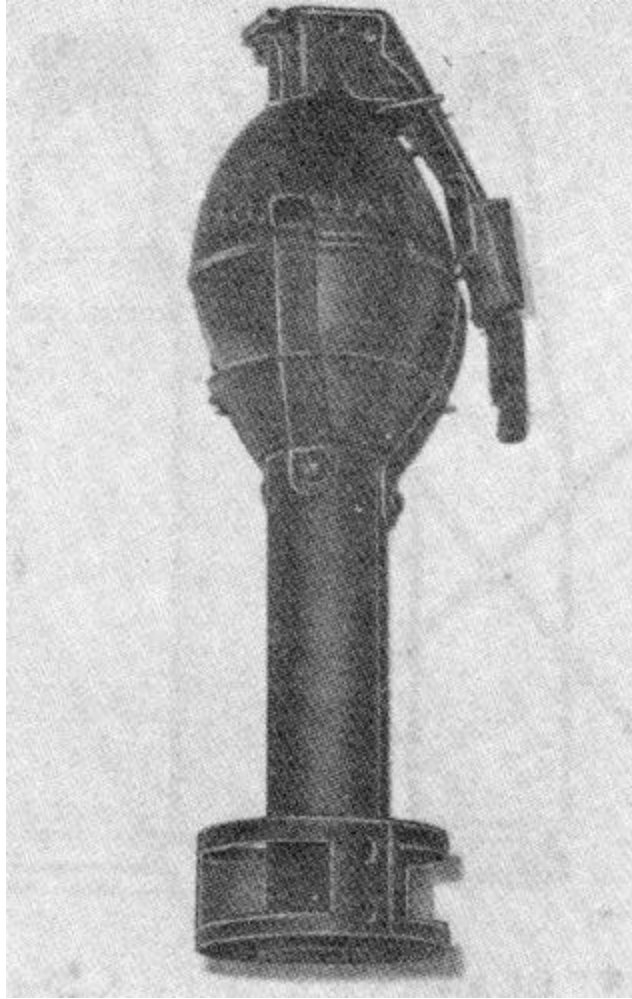


Figure 4-5 Adapter Fitted With Fragmentation Grenade

SECTION 3 - SAFETY PRECAUTIONS

404. Cartridge, Grenade C33

1. Only the Cartridge C33 will be used to launch grenades. The accidental firing of a bullet round with a grenade fixed to the launcher could cause a serious injury, therefore care must be taken to ensure that the C33 cartridges are kept separate from other 7.62 mm ammunition.
2. A rifle grenade cartridge must NEVER be fired from a rifle not equipped with a grenade launcher.
3. If a grenade cartridge fails to fire it must be inspected to determine if the primer has been struck. If it has, another cartridge will be loaded and fired. If it still does not fire, the rifle must be checked for a broken firing pin or weak hammer spring housing assembly.
4. The C33 Cartridge should not be fired unless the gas plug on the rifle has been rotated so that the slot on the gas plug is in a position facing the barrel. Failure to adjust the gas plug may result in damage to the rifle.

405. Adapter, Grenade, Projection, M1A2

1. Prior to loading the grenade onto the adapter, it should be carefully inspected with particular attention being paid to the arming clip retainer and the arming clip.
2. Fins which have become bent should be straightened by using a bayonet or similar aid. Occasionally the fins may become loose and slide freely along the stabilizer tube, or come off completely. Such adapters will tumble in flight and should not be used.
3. Do not use an adapter that has a bent, cracked, or damaged stabilizer tube.
4. Careful attention must be paid to the grenade adapter during every stage of the launching procedure and it must be ensured that the arming clip retainer and arming clip are intact.
5. Force will not be applied to the arming clip after the grenade has been attached. A grenade must never be assembled to an adapter by striking the case of the adapter against a hard surface, as this may break or damage the small extension, allowing the arming clip to fall free unexpectedly.
6. No attempt will be made to launch grenades other than the M61, M62, or HCC1A1.

406. M61 Fragmentation Grenade

1. Prior to removing the grenade from the can, the user will ensure that the safety pin and safety clip are in position on the grenade and that the grenade is correctly positioned in the can, fuze assembly uppermost.

2. Inspect the grenade to ensure that the safety pin is securely in place and that the striker lever is not damaged or bent. A grenade with a bent or damaged lever must not be used for grenade launching.
3. Do not attempt to replace the safety pin once it has been removed. If for some reason the grenade must be removed from the rifle without being launched, destroy the grenade in the same manner as a dud.
4. If the striker lever is accidentally released after the grenade has been armed and placed on the rifle, immediately fire the rifle down range and take cover. If the rifle fails to fire, throw it down range, immediately take cover and at the same time shout a warning. Should it be necessary to throw the rifle, and the grenade proves to be a dud, the entire grenade, adapter and rifle assembly will be treated as a dud and destroyed in situ. No attempt will be made to recover the rifle before destroying the grenade.

407. Grenade Launcher

1. Prior to launching, the following inspection must be made:
 - a. Ensure that the bore is clear of any obstruction.
 - b. Check the retaining catch for smooth operation, lubricating it if necessary, and then attach it to the rifle and confirm the proper operation of the catch. It should not be possible to remove the launcher unless the retaining catch is depressed.
 - c. Inspect the retainer spring and test its ability to hold the adapter in place on the launcher. The retainer spring should be strong enough to prevent the grenade and adapter from sliding off under their own momentum.
 - d. Ensure that the rings are free of burrs and dirt.

SECTION 4 - LAUNCHING THE GRENADE

408. Launching Drill

1. General. The launching drill is divided into the following stages:
 - a. grenade assembly;
 - b. rifle preparation;
 - c. grenade preparation; and
 - d. firing.

2. Grenade Assembly. This operation is often the most time-consuming part of the procedure. Therefore, prior to launching, assembly must be completed for ALL grenades to be used. This would normally be done on the initial issue of ammunition at the commencement of a given operation. Grenades are assembled on the adapter in the following manner:
 - a. While holding the adapter claws up, place the adapter on a flat horizontal surface and turn it so that the longest claw (the one with the arming clip attached) faces outwards.
 - b. Take the grenade and slip the striker lever into the arming clip as shown in Figure 4-6.
 - c. Keep the grenade at a slight angle towards the body. Push down on the grenade and slightly away from the body until the two claws facing the body engage the seam on the grenade. It may be necessary to engage the claws individually. See Figure 4-7.

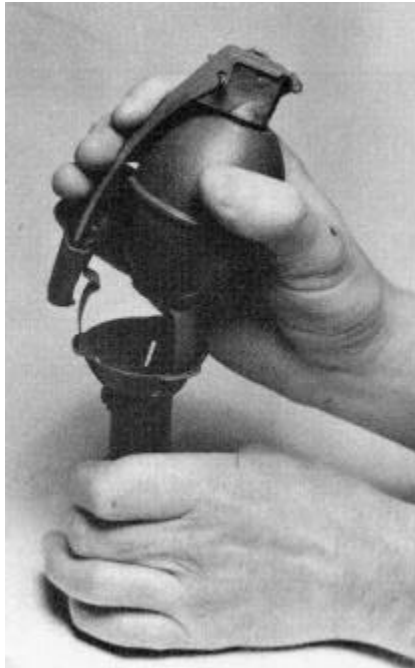


Figure 4-6 Inserting the Safety Lever into the Arming Clip

- d. Adjust the grenade to a completely upright position and ensure that -
- (1) the base of the grenade is fully seated against the base of the cup,
 - (2) each claw holds the grenade tightly above the seam of the grenade,
 - (3) the safety lever is securely inserted well up in the arming clip, opposite the seam of the grenade, as shown in Figures 4-5 and 4-8, and
 - (4) no damage has occurred to the grenade or the adapter. Particular attention must be paid to the arming clip and the arming clip retainer.

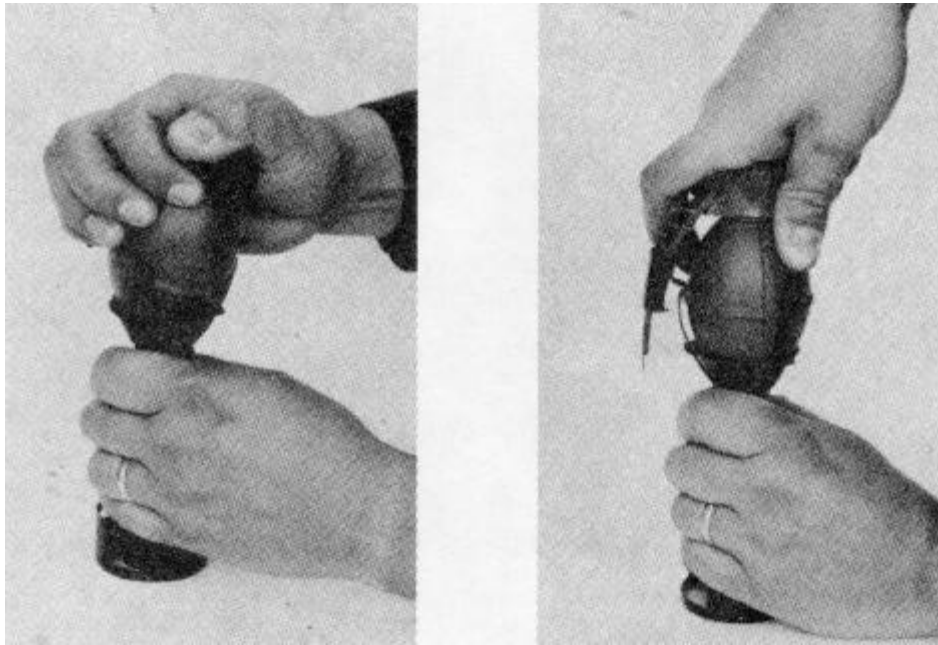


Figure 4-7 Engaging the Adapter Claws

3. Rifle Preparation. The following procedure must be adhered to when preparing the rifle. The user will:
- a. Reverse the gas plug.
 - b. Attach the grenade launcher to the rifle and ensure that it is firmly held.
 - c. Remove the magazine from the rifle. Engage the breech block in the open position with the holding open device and check to ensure that the breech is clear.
 - d. Ensure that the change lever is on "SAFE".

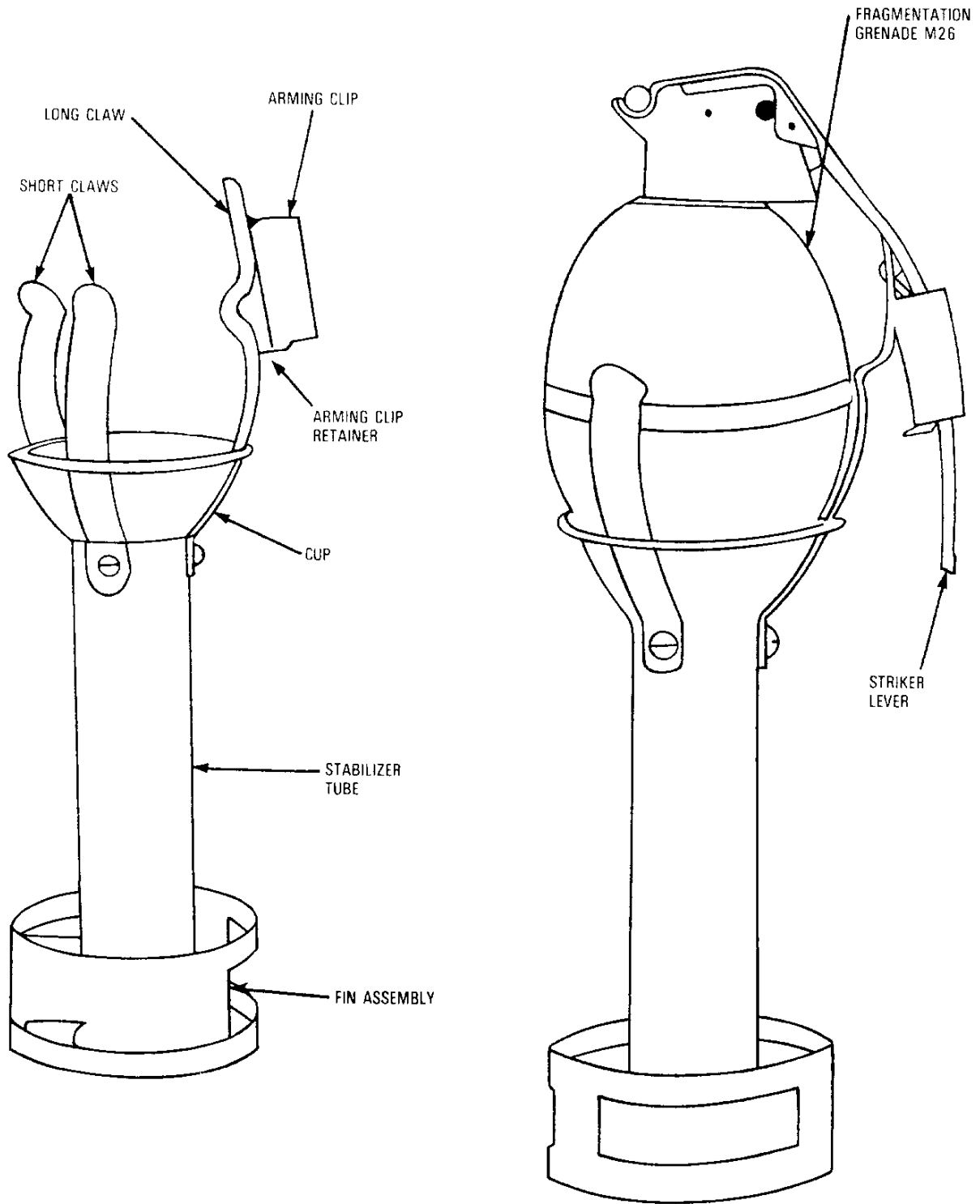


Figure 4-8 Adapter Fitted With Fragmentation Grenade

- e. Grasp the rifle with one hand under the magazine housing in order to catch the C33 cartridge should it be dropped while being inserted into the breech. See Figure 4-9.
- f. Using the free hand, insert a cartridge into the breech.
- g. For the launching of additional grenades the procedures outlined in subparas d to g are repeated.

Figure 4-9 Inserting the C33 Cartridge

4. Grenade Preparation. The grenade is prepared in the following manner:
- a. Pick up the grenade in its adapter assembly in the throwing hand.
 - b. Make a final visual check of the grenade to ensure that the arming clip and arming clip retainer are intact.
 - c. Withdraw the safety pin while maintaining a constant pressure on the safety lever. It is important that the pull on the safety pin be absolutely straight, as any twisting motion may result in the pin being jammed in the grenade (Figure 4-10).
 - d. Maintain pressure on the safety lever while giving the grenade a quick visual check. Gradually release the pressure on the safety lever paying particular attention to the arming clip and arming clip retainer.

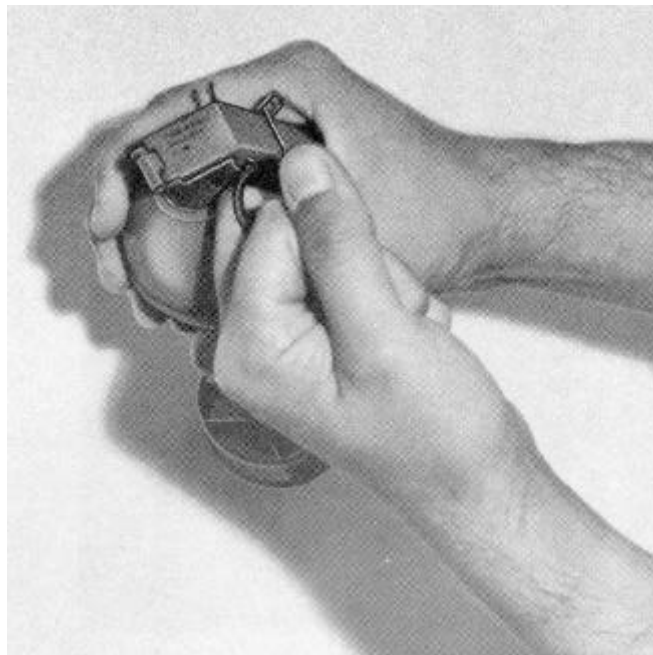


Figure 4-10 Pulling the Safety Pin

5. Firing. The procedure detailed below must be adhered to prior to firing the rifle, to launch the grenade:

- a. Holding the rifle near the muzzle with the RIGHT hand, use the LEFT hand to place the grenade and adapter on the rifle as shown in Figure 4-11.
- b. Rotate the safety clip out of the way.
- c. Move the change lever to "R".
- d. Aim and fire the rifle.

WARNING: Immediate Action. SHOULD THE GRENADE SAFETY LEVER UNINTENTIONALLY BE RELEASED WHEN ON THE RIFLE, THE IMMEDIATE ACTION WILL BE TO FIRE THE RIFLE. IF THE RIFLE FAILS TO FIRE THEN THE NEXT IMMEDIATE ACTION IS TO THROW THE ENTIRE RIFLE, GRENADE, AND LAUNCHER, DOWN RANGE AND THEN TAKE COVER.



Figure 4-11 Placing the Grenade and Adapter on the Launcher

6. The Safety Lever. The grenade must be placed on the launcher with the safety lever to the LEFT of the rifle as shown in Figure 4-11. If the safety lever is facing upwards it will interfere with the sight picture. This position also simplifies removal of the safety clip on the M61 Grenade. Neither the safety pin or safety clip will be removed from a grenade mounted in its adapter until the adapter is about to be placed on the launcher. If one safety device is pulled off by undergrowth, etc, the other will keep the safety lever in place.

409. Aiming

1. Using the Grenade Launcher Sight - Low Angle Fire. There is no front sight for the grenade launcher, therefore, the grenade itself becomes a front sight. The following factors are important for accurate sighting when using low angle fire:

- a. Align the rear sight aperture for the appropriate range of the grenade, with the target.
- b. Ensure that the sight is perpendicular.
- c. It may be desirable to aim short of the target to ensure a round in the target area because the grenade tends to bounce past the initial point of impact.
- d. The HCC1A1 Smoke Grenade tends to fall short of the expected range.
- c. Beyond 100 metres (110 yards) it is necessary to use high angle fire but the sight can still be used to give rough alignment onto the target.

2. Using High Angle Fire. Ranges greater than 100 metres (110 yards) are achieved by increasing elevation until the maximum range is achieved (about 1,600 mils 45E) above the horizontal plane. Proper alignment must be estimated. At about 125 metres (135 yards) range, M61 Grenades start to detonate in the air. It will be necessary to ensure that grenades are not bursting any higher than 15 metres which is an effective casualty producing radius. Thus the maximum effective range of the M61 will be about 125-140 metres (135-155 yards).

3. Positioning Clip. The positioning clip issued with the grenade adaptors can also be used as an aid to calculating high angle Fire. The clip is placed in the 15.9 mm (5/16 in) wide groove 38.1 mm (1 1/2 in) from the muzzle of the launcher. Next, place the adaptor on the launcher by seating it against the clip. At 800 mils (45E) the grenade travels 100 metres (110 yards). By increasing or decreasing elevation the range can be dropped below 100 metres (110 yards). The advantage of high angle fire is that the grenade will strike the target area at a steeper angle and will not have the same tendency to bounce past the initial point of impact.

SECTION 5 - FUNCTIONING

410. Functioning

After the safety pin and the safety clip have been removed, the striker lever is held in place only by the arming clip of the adapter. When the grenade launcher is fired, inertia causes the arming clip to strike the small extension on the bottom of the arming clip retainer. This extension is made of brittle metal, and the force of the arming clip against it will break it and allow the arming clip to fall free. This action releases the striker lever and the striker and initiates the fuze. At the termination of the normal delay action of the fuze, the grenade will explode.

SECTION 6 - FIRING POSITIONS

411. General

When launching grenades, both supported and unsupported positions may be adapted to the normal firing positions of prone, sitting, kneeling and standing. When using a supported fire position the firer places the rifle butt against something solid in order to absorb the shock or recoil. In unsupported fire positions the recoil is taken up by the arms and body of the firer.

412. Unsupported Position

1. When firing from an unsupported firing position, adopt the position in the following manner:
 - a. Assume a normal "Ready" position with the forestock in one hand, the pistol grip in the other, and the butt held by the arm against the body as shown in Figure 4-12.
 - b. Ensure the heel of the hand is placed squarely behind the pistol grip as shown in Figure 4-13. This allows the whole arm to absorb the recoil.
 - c. Keep the arm supporting the forestock against the rib cage as this ensures maximum support and steadiness for the rifle.
 - d. Adjust the sight picture by raising or lowering the butt of the rifle, or by 0 pivoting the rifle around the hand grasping the pistol grip.
 - e. On firing, grasp the weapon firmly and allow the whole body to take up the recoil.



Figure 4-12 Basic Hold for an Unsupported Fire Position



Figure 4-13 Hand Hold on the Pistol Grip

413. Supported Positions

1. Where it is possible to support the weapon by placing the butt against a solid object on the ground to take up the recoil, precautions to project the trigger hand are not necessary. Supported positions have the disadvantage of placing excessive shock on the rifle. Furthermore, they can be awkward when using the sight for low-angle fire although they adapt readily to high angle fire methods of sighting. Some examples of supported positions are:

a. Prone

- (1) When lying on the stomach, place the rifle under the armpit; dig the butt into the ground if possible. See Figure 4-14A.
- (2) When lying on the back, place the feet toward the target and roll the body toward the rifle to allow proper sight alignment. The butt is again placed under the armpit, preferably dug in. See Figure 4-14B.



A

B

Figure 4-14 Prone Positions

- b. Sitting. In the sitting position the butt of the rifle sits on the ground and some weight can be applied to the butt (Figure 4-15A).
- c. Kneeling. In the kneeling position the butt rests on the ground close to the knee. See Figure 4-15B.
- d. Standing. In the fire trench it may be possible to place the butt against the rear wall of the trench. The unsupported position, however, is preferred in order to avoid damage to the rifle.

A
Sitting Position

B
Kneeling Position



Figure 4-15 Supported Positions

2. The use of the rifle sling reduces the recoil effects and achieves greater accuracy, as well. A proven method is to thrust the arm, while grasping the forestock of the rifle, between the sling and the rifle. Bring the hand around the sling to effect a bight around the wrist and forearm, then grasp the forestock tightly. The sling may be adjusted for correct length so that the forward thrust of the arm absorbs most of the recoil. The trigger-hand controls the upward movement of the butt when the grenade is fired.

SECTION 7 - CLEANING AND MAINTENANCE

414. General

1. The launcher and adapters should be kept clean, dry, and clear of any foreign matter that will cause an obstruction.
2. The most fragile parts of the adapters are the small extension of the arming clip retainer and the fins. During operations it is imperative that grenades and adapters be assembled as soon as possible after issue as the assembly procedures are time consuming. It will therefore be necessary to periodically inspect both the extension and the fins. If the extension has become damaged the adapter must not be used. Bent fins can be repaired easily with a bayonet and the adapter can still be used unless the fins have become loose or detached from the stabilizer tube. See Figure 4-16.

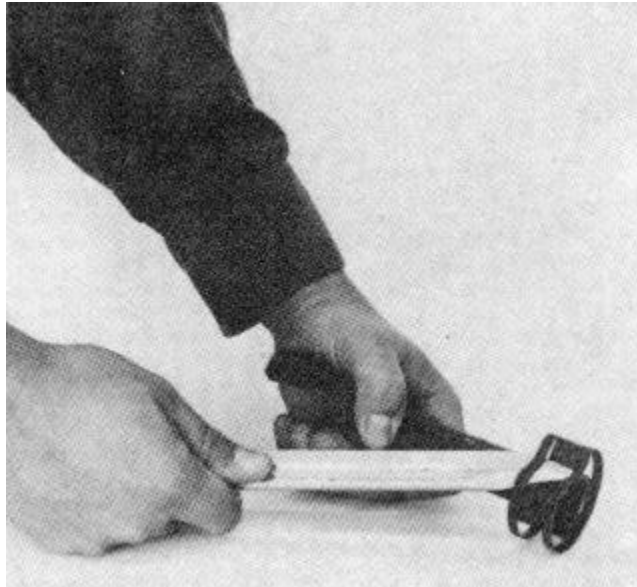


Figure 4-16 Repairing Bent Fins

SECTION 8 - DUDS

415. General

A dangerous situation may arise if a grenade is fired from a FNC1 or FNC2 with the safety pin of the fuze still assembled. The pin can shear off when the grenade impacts and becomes partially buried in the ground. The safety lever also could be held in position by the earth. Any movement of such a grenade may permit the lever to fly-off and allow the striker to ignite the fuze. Therefore all duds of the M61 fired from the FNC1 or FNC2 will be destroyed in situ without any attempt to touch or move them.

(416 to 499 not allocated)

CHAPTER 5

PYROTECHNICS

SECTION 1 - FLARE, PARACHUTE, HAND FIRED, C3

501. General

The C3 Parachute Flare is used as a battlefield illuminating device by the Canadian Forces. The flare is self-contained and waterproof.

502. Description

1. The flare consists of a rocket-type projectile enclosed in an aluminium alloy tube which in turn acts as the launcher. The tube is fitted on both ends with a threaded plastic cap as shown in Figure 5-1.
2. The projectile is in two sections: the head assembly, and the motor assembly. The head assembly, or forward section, contains the ejection charge, parachute and flare canister. The motor assembly, or rear section, contains the delay element, the propellant charge, the venturi and the stabilizing fin. Figure 5-2 illustrates these components of the flare.



Figure 5-1 C3 Hand Fired Parachute Flare

3. Current production flares can be identified by the METALLIC GREEN colour of the aluminium tube on which the following information is marked in WHITE:
 - a. designation of the flare;
 - b. month and year of manufacture;
 - c. filled lot number;
 - d. an arrow indicating the direction of firing; and
 - e. directions for use.
4. Older models of the flare which may be encountered can be identified by the METALLIC SILVER colour of the tube.

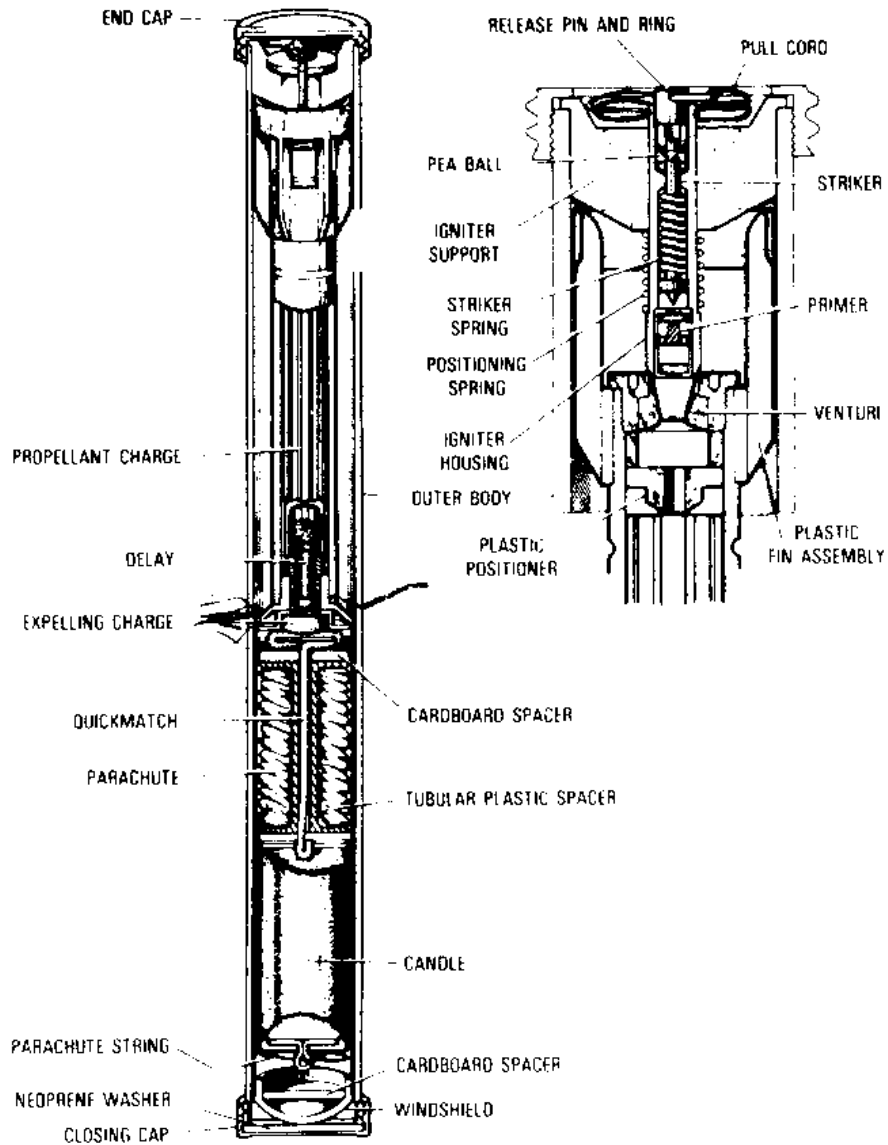


Figure 5-2 Components - C3 Hand Fired Parachute Flare

503. Packaging

Four flares are packed in a carton which is sealed in a moisture-resistant polyethylene film. Six cartons (24 flares) are packed in a wooden-box.

504. Safety Precautions

1. Ensure that the other tube is not denied or damaged before using the flare.
2. Follow the directions on the outer tube exactly.

3. When firing, pull the cord at a 530 mil (30E) angle from the tube to avoid the backblast. Care should be taken not to greatly exceed this angle because, if the angle is too great, the cord may break.
4. Before firing ensure that there is no obstruction (eg, trees, helicopters) on the flight path of the flare.
5. The flare will not be carried fully prepared for firing. End caps will be kept in position at all times when not in use.
6. Before firing, the user will make absolutely certain that NO ONE IS IN FRONT of or IMMEDIATELY BEHIND the flare. The flare will NOT be fired in normal usage at less than 800 mils (45E) elevation from the horizontal.
7. Procedures for the disposal of malfunctions and duds are described in art 507 and will be strictly adhered to.
8. No attempt will be made to tamper with or alter a flare in any way.

505. Characteristics

- | | | |
|----|--|--|
| 1. | Total length | - 32.7 em (12 7/8 in). |
| 2. | Weight | - 0.32 kg (11 1/2 oz). |
| 3. | Functioning height
at 800 mils (45E)
at 1600 mils (90E) | - 140 m (460 ft approximately).
- 280 m (915 ft approximately). |
| 4. | Minimum horizontal range
when fired at 800 mils (45E) elevation | - 335 m (1,100 ft). |
| 5. | Burning time of flare | - 30-35 seconds. |
| 6. | Flare intensity | - 30,000 candle power. |
| 7. | Air temperature limits for normal
functioning | - from -18EC to + 38EC (0EF to + 100EF). |

506. Firing Instructions

1. Remove BOTH end caps.
2. With arm outstretched, hold flare at an angle away from body.
3. Hold firing cord at an angle to flare to avoid backblast.

4. Fire by pulling cord as illustrated in Figure 5-3.

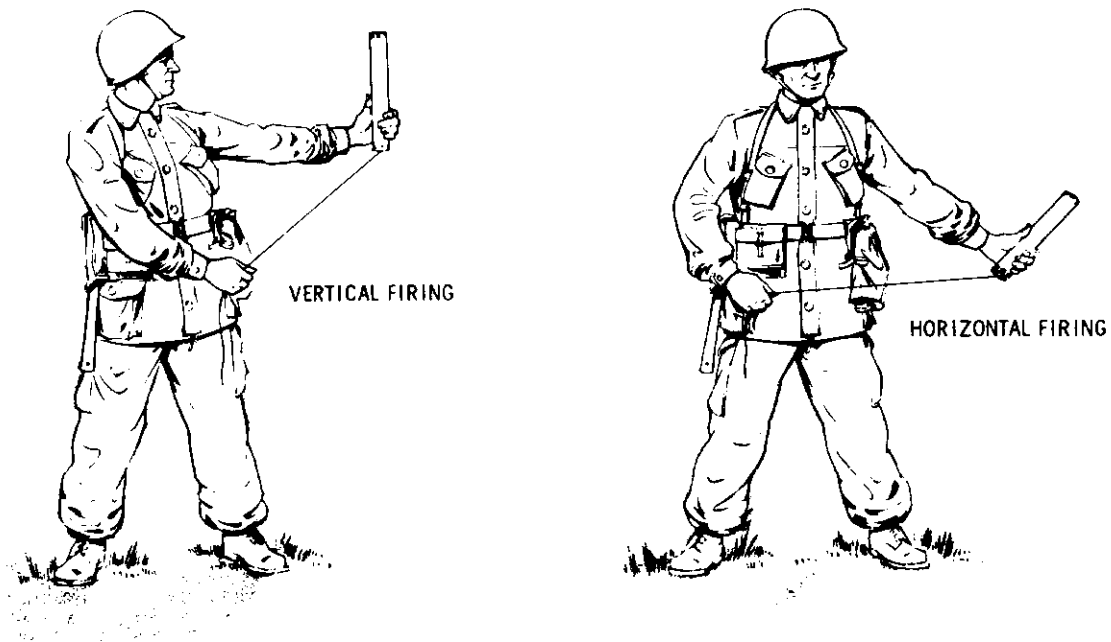


Figure 5-3 Method of Holding and Firing the Flare

507. Disposal of Malfunctions and Duds

1. Particular care must be exercised when destroying flares that have malfunctioned. These malfunctions will normally fall under one of the following categories:
 - a. Misfire. The rocket-type projectile does not leave the tube and the flare is intact.
 - b. Dud No 1. The projectile is ejected from the tube but the candle fails to eject, and the whole falls as a unit.
 - c. Dud No 2. The projectile is ejected from the tube and the candle separates but fails to ignite.

508. Disposal of Malfunctions

1. Misfire. Flares which have misfired will be laid carefully on the ground, ensuring that neither end is pointed toward any person. A demolition charge, consisting of 0.24-kg (8-oz) of plastic explosive or equivalent, will be placed in close proximity to the flare and initiated. Care must be taken that the flare is NOT disturbed.
2. Dud No 1. Place a 0.11-kg (4-oz) charge of plastic explosive or the equivalent well forward of the junction of the body and tail and initiate.
3. Dud No 2. Place a 0.11-kg (4-oz) charge of plastic explosive, or equivalent, centrally against the body and initiate.

SECTION 2 - THUNDERFLASH C1A1

509. General

The thunderflash, shown in Figure 5-4, is used to simulate exploding grenades and battle noises. It contains an explosive charge which could cause injury if improperly used.

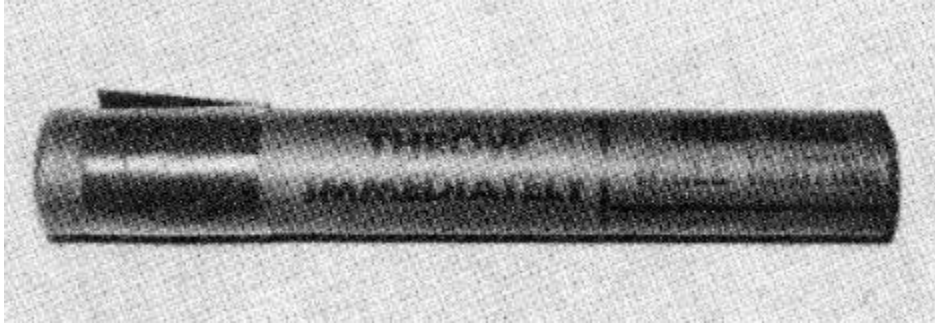


Figure 5-4 Thunderflash C1A1

510. Description

1. The thunderflash is 21.3 cm (8.4 in) long and consists of the following main parts:
 - a. explosive charge assembly;
 - b. expansion changer; and
 - c. holder.
2. The component parts are illustrated in Figure 5-5.

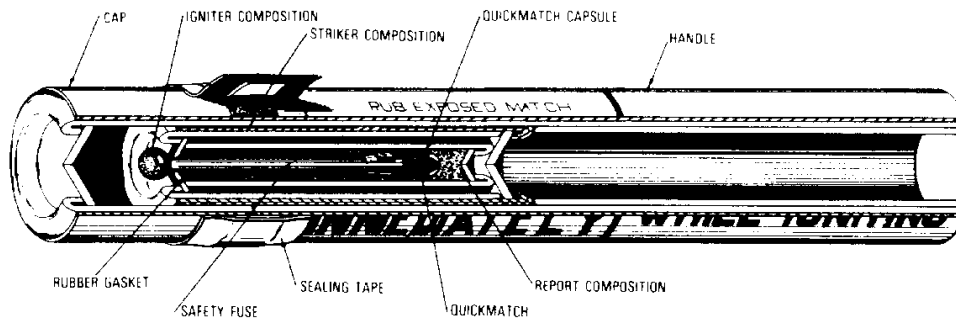


Figure 5-5 Sectional Diagram of the Thunderflash C1A1

3. The explosive charge assembly consists of a paper cylinder 7.6 cm (3 in) long that contains a report composition and a delay fuse assembly. The delay fuse assembly consists of a match head type of igniter, a 6.4 (2.5 in) length of safety fuze and a short length of quickmatch in a capsule. The safety fuze is centered in the cylinder and protrudes from the cylinder a sufficient distance to expose the igniter. The assembly is sealed at both ends.

4. Current Canadian produced thunderflashes are BROWN with BLACK markings. The serviceman may, however, still encounter the older model in the CF supply system. Although identical in size, shape, and functioning to the new version, it is RED in colour with BLACK markings. An instructional label with black lettering is affixed around the holder. This label also contains the lot number, filler and date of filling. See Figure 5-4.

511. Packaging

Ten thunderflashes are packed in a plastic covered cardboard carton. Ten cartons are packed in a fibreboard box.

512. Safety Precautions

1. Thunderflashes will be ignited and thrown BY HAND ONLY. No mechanical devices will be used.
2. Directions on the thunderflash label will be followed.
3. The sealing tape will not be removed until the thunderflash is ready for use. Thunderflashes will not be carried prepared.
4. Thunderflashes will be ignited and thrown one at a time.
5. When igniting a thunderflash, point the cap composition away from persons. Care must be taken to avoid burns caused by striker composition adhering to the striker.
6. DO NOT use the thunderflash in confined spaces such as rooms, trenches, weapons pits, etc, because such areas dangerously increase the effect of the explosion.
7. Thunderflashes will NOT be thrown within 5 metres (15 feet) of personnel, flammable, or damageable material.
8. The construction of a thunderflash will NOT be tampered with nor attempts made to modify it in any way.

513. Ignition Instructions

1. Hold the thunderflash by the handle (the portion of the thunderflash that states HOLD HERE WHILE IGNITING).
2. Tear off the sealing tape and remove the cap.

3. Rub the igniter sharply across the cap striker composition surface thus causing the igniter to ignite. This shall be accomplished whether left or right handed by always rubbing across the striker in the direction that carries the thunderflash away from the body and the hand holding the striker.
4. THROW the thunderflash IMMEDIATELY.

Note: Instructions for ignition are also printed on the thunderflash.

514. Functioning

The ignition of the igniter causes the safety fuze to burn for approximately seven seconds. The safety fuze ignites successively the quickmatch, the quickmatch capsule, and the report composition. A thunderflash will function if submerged in water.

515. Malfunctions

Misfired thunder flashes will not be touched for at least fifteen minutes after throwing. They will be destroyed by burning each one individually in a pit three feet deep.

SECTION 3 - SIMULATOR, PROJECTILE, GROUND BURST, C1 SERIES

516. General

The ground burst simulator is used to simulate artillery, mortar etc, fire and thus provide realism during field training.

517. Description

1. General. The complete simulator assembly is made up of a simulator and a fuze lighter as illustrated in Figure 5-6. The simulator portion has the following main components:

- a. body assembly which contains 45.4 grams (1.6 ozs) of Type 1 photoflash powder;
- b. cover assembly; and
- c. whistle assembly.

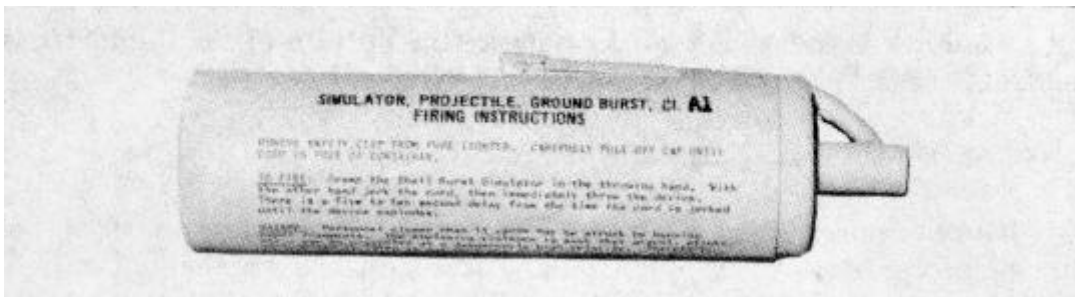


Figure 5-6 Simulator, Projectile, Ground Burst, C1 Series

2. Markings. The exterior surface of the simulator, excluding the safety fuze, is WHITE with BLACK markings. A gummed paper on the simulator gives the following information:

- a. designation of store; and
- b. firing instructions.

518. Packaging

Five simulators are packed into a cardboard carton. Ten cartons are packed in a cardboard box.

519. Safety Precautions

1. The instructions printed on the simulator should be read prior to use.
2. The safety wire will NOT be removed or the pull cord extended until immediately before the simulator is to be fired.

3. The explosive violence of the simulator is such that gravel, sticks and similar objects and burning fragments of cardboard may be projected at high velocity. Therefore care should be taken to see that the device is thrown on ground that is free from potential missiles. Dry grass and leaves may be ignited within a radius of several feet. The danger area of the simulator for training purposes is 15 metres (16 yards). Simulators will not be used closer than this to personnel. When the general public is present the danger area is 100 metres.

4. Simulators can cause severe injury if improperly used. They will be ignited and thrown **BY HAND ONLY**. Mechanical devices **WILL NOT** be used. Simulators must be thrown immediately after ignition.

5. Simulators are to be ignited and thrown one at a time. They will **NOT** be fastened together either for carrying or for use.

6. The simulator will not be used in confined spaces such as rooms, trenches or weapon pits, because this may dangerously increase the effect of the explosion.

7. The construction of the simulator will not be tampered with nor any attempt made to modify it in any way.

520. Ignition

1. The safety clip will be removed from the fuze lighter; the cap will be pulled off to free the cord.

2. Pull the cord sharply.

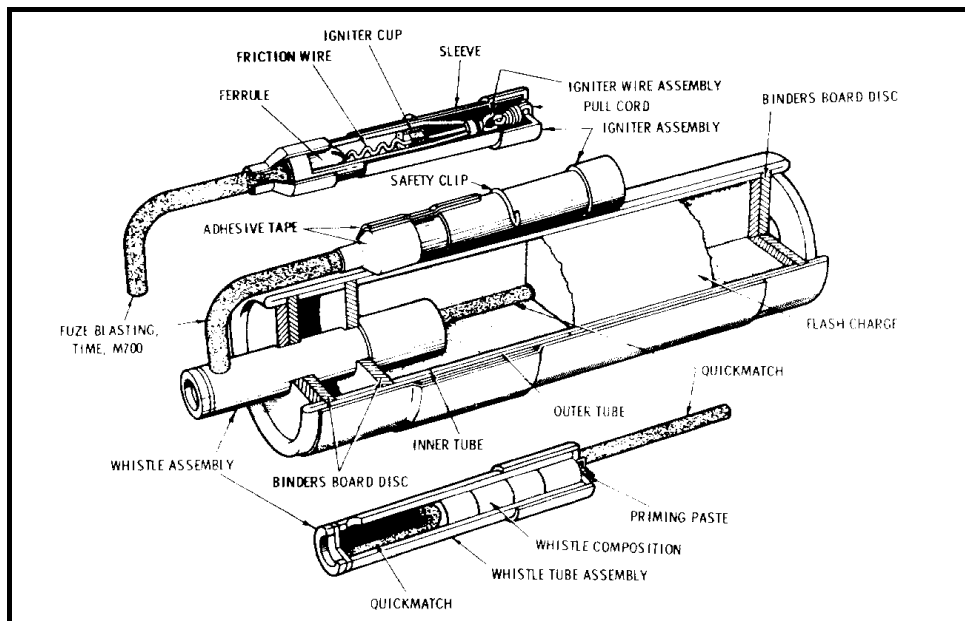


Figure 5-7 Simulator, Projectile, Ground Burst, C1

3. Throw the simulator IMMEDIATELY.

521. Functioning

When the cord is pulled, the friction wire is drawn through an igniter composition. The resultant flame ignites the safety which burns for six to ten seconds before igniting the whistle charge. The burning whistle charge emits a high pitched whistle for two to four seconds. This is followed by ignition of the photoflash powder produces a flash and a loud report. (See Figure 5-7.)

522. Duds

If a simulator fails to explode, a waiting period of 30 minutes must be observed before approaching it. The simulator will be destroyed where it lies, using one to two ounces of plastic explosives as described in B-GL-304-003/TS-001.

SECTION 4 - PROJECTOR, PYROTECHNIC, HAND MINIFLARES AND THE SIGNAL ILLUMINATION, GROUND

523. General

There are two types of protectors used in the Canadian Forces. One (the miniflare) is used for training and will remain in use until stocks are depleted. The other type of protector is basically the same but at present is only issued on operations. The flare cartridges are not interchangeable.

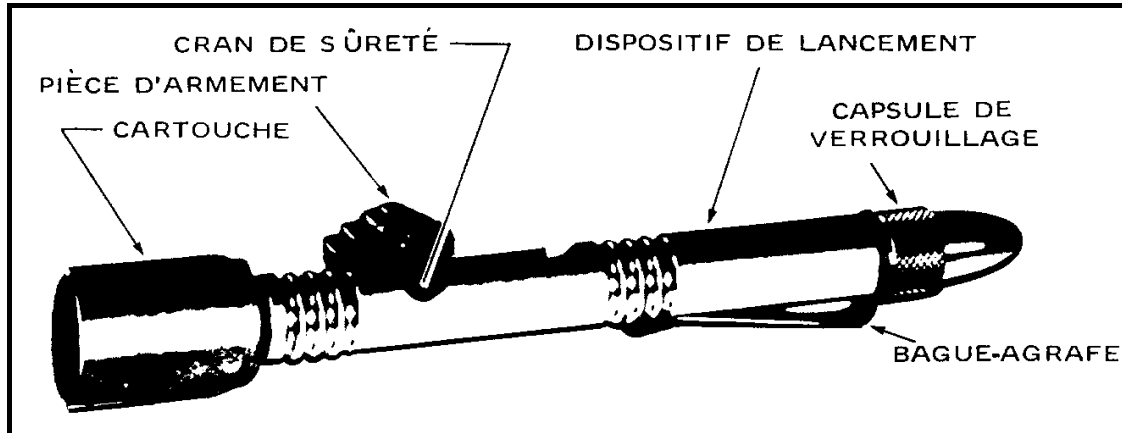


Figure 5-8 The Projector Pyrotechnic, Hand (Miniflare)

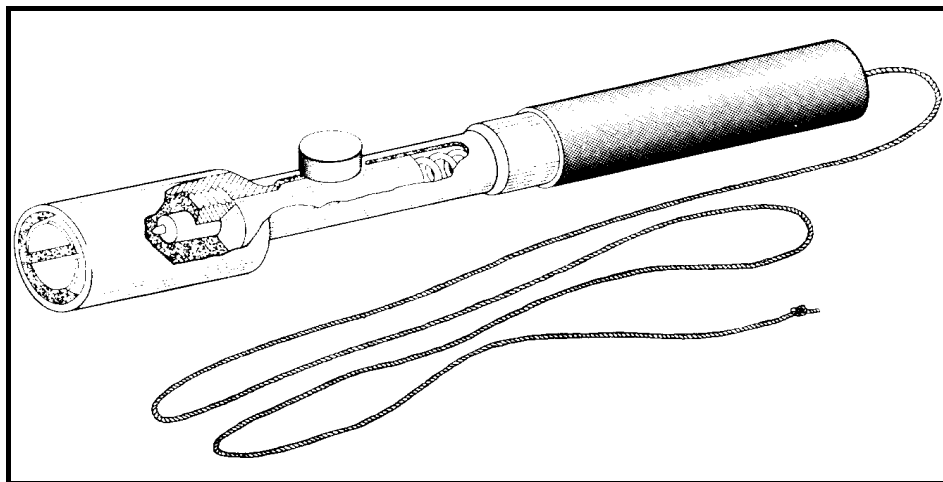


Figure 5-9 The Signal Illumination, Ground (M207 Projector)

524. Description

1. The miniflare consists of an aluminum body, locking cap, penclip, striker, spring guide, spring and cocking piece. The aluminum body is internally threaded at the lower end to accept the knurled locking cap which retains the penclip and the spring. The upper end of the body houses the striker protrusion hole and is internally threaded to accept the cartridge. The striker is

attached to the external cocking piece which functions, under pressure, to compress the internal spring and cock the projector. The cocking piece may be coloured red or black. Overall dimensions are 11.4 cm (4.5 inches) long, diameter 1.3 cm (.5 inch) and two ounces in weight. A lanyard may be attached.

2. The M207 projector (Signal Illumination, Ground) issued for operations is basically the same as the training projector, and consists of a black anodized aluminum housing, spring, firing pin, release knob and flare holder. All internal parts are corrosion resistant steel. Overall dimensions are 14 cm (5.5 inches) long, diameter 2 cm (0.8 inch) and 2 1/2 ounces in weight. A lanyard is attached to the projector.

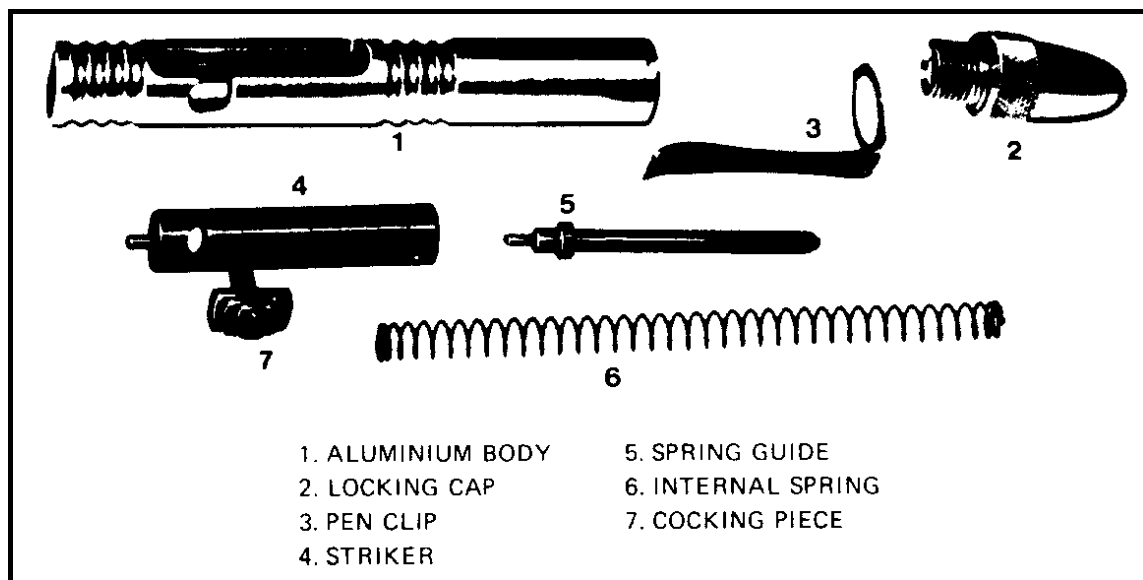


Figure 5-10 Miniflare Disassembled

525. The Cartridges

1. There are two cartridges available for the miniflare, red and green. They consist of an aluminum casing which contains the igniter and tracer composition. Each is closed at the upper end by a fibreboard disc and sealed with NC varnish. The lower end of the cartridge casing embodies a rimfire blank cartridge and is externally threaded to mate with the upper end of the projector. Dimensions are: 33 cm (1.25 inches) long, diameter 20 mm (.75 inch) and five ounces in weight.

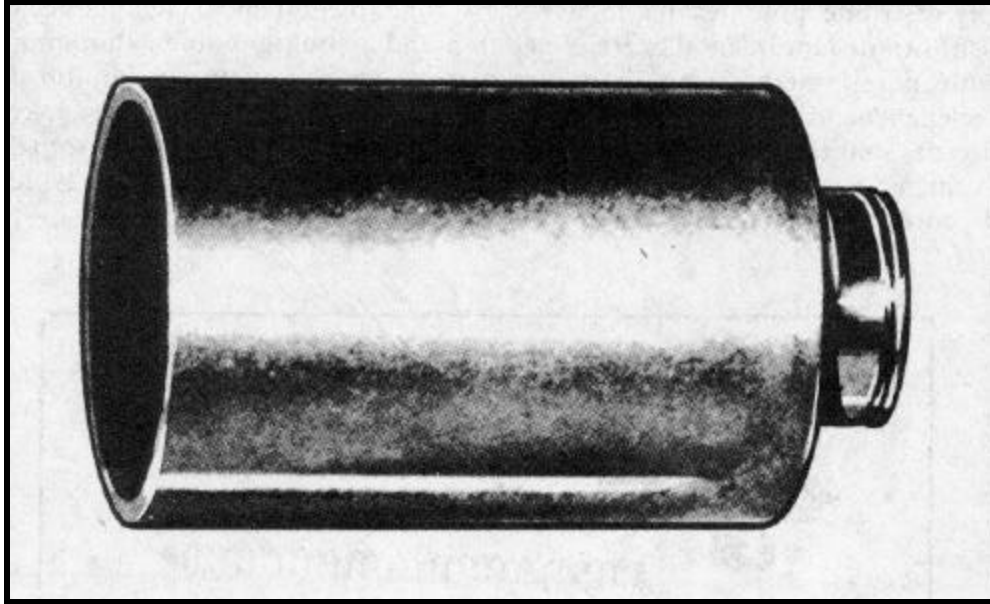


Figure 5-11 Cartridge for the Miniflare

2. Cartridges for the M207 projector are available in red, green and white. The cartridges are rocket propelled and spin stabilized with a foliage penetrating capability. They are composed of two cylindrical sections (steel rear and aluminum front) which are assembled by a press fit. The steel section houses the rocket motor nozzle plate with a centrally located primer, spacer, propellant and delay column. The rocket nozzle motor plate has two central gas exit holes and is held in place by a rolled crimp. The candle composition is consolidated directly into the aluminum front section. The overall dimensions are 5 cm (2 inches) long, 1.3 cm (0.5 inch) in diameter and approximately 1/2 ounce in weight.

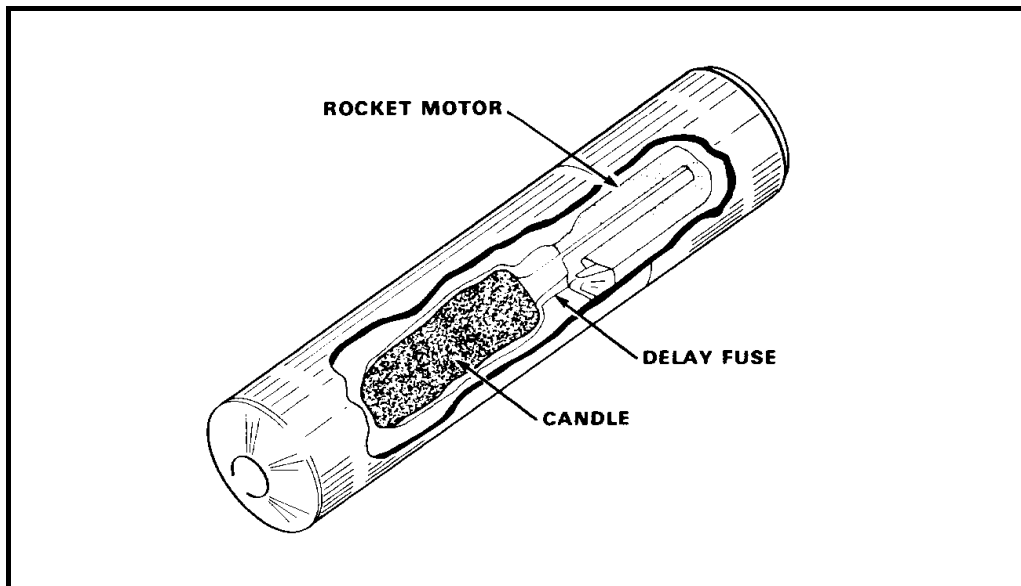


Figure 5-12 Cartridge for the M207 Projector

526. Operation

1. Miniflare. To operate the training projector the following procedure is followed:
 - a. The projector open, the striker recess is inspected for foreign matter and freedom of movement. The cocking piece is retracted and engaged in the safe notch;
 - b. The cartridge is inspected for the following:
 - (1) security of the top closure or sealing disc,
 - (2) security of the primer (percussion cap),
 - (3) cracks, dents or distortion of the case, and
 - (4) damaged threads.
 - c. The projector is held with the open end pointed in a safe direction. The cartridge is screwed into the projector;
 - d. To fire, the projector is held at arms length and pointed upwards. The cocking pieces is then moved from the safe position; and
 - c. To remove the cartridge, the cocking piece is engaged in the safe notch and the cartridge is unscrewed and removed.
2. The M207 Projector. To operate the M207 projector, the following procedure is used:
 - a. inspect the retainer (open end) for foreign matter;
 - b. inspect the cartridge for damage,
 - c. the flat end of the flare is inserted into the retainer end of the projector (ensure the flare is completely bottomed in the retainer); and
 - d. using the thumb, pull the trigger to the fully retracted position of the trigger slot and release it.

527. Safety Precautions

1. Under no circumstances, will a damaged cartridge be installed in the projectors.
2. When loading, firing and unloading, the projector must always be pointed in a safe direction away from the firer.
3. The projectors will not be loaded until immediately prior to use.
4. When issued for training, the M207 projector is limited to 30 firings and to 7 firings when contained in survival kits.

528. Illuminant Data

1. The miniflare:
 - a. Colour - red and green;
 - b. Burning Time - 4 to 8 seconds;
 - c. Ejection height 45 m (150 feet) minimum; and
 - d. Illumination 6000 LUX minimum.

2. The M207 Projector:
 - a. Colour - red, green and white;
 - b. Burning Time - 7 to 15 seconds for red and 4 to 12 seconds for green and white;
 - c. Ignition height - (400 feet);
 - d. Flight altitude - (700 feet - 1900 feet); and
 - e. Illumination - 10,000 candle power for red and white, 8,000 candle power for green.

(529 to 599 - not allocated)

CHAPTER 6

TRIP FLARES

SECTION 1 - FLARE, SURFACE, TRIP, M49A1

601. General

1. The M49A1 flare resembles the No. 83 grenade in size and shape. It is issued with a removable U-shaped mounting bracket as illustrated in Figures 6-1 and 6-2.
2. When the flare is actuated, the pyrotechnic illuminant mixture is ignited immediately. The flare burns with a yellowish-white light for 55 to 70 seconds. It produces approximately forty thousand candle power, illuminating an area up to 275 metres in radius, depending on the terrain. The flare is activated either by means of a loose trip wire, or a trip wire under tension.

602. Description

1. General. The flare, which is OLIVE DRAB, in colour, consists of the following main components which are illustrated in Figures 6-1, 6-2 and 6-3.
 - a. the illuminant assembly;
 - b. the cover loading assembly; and
 - c. the mounting bracket assembly.
2. The Illuminant Assembly. The illuminant assembly consists of an aluminium case containing three identical illuminant pellets, an ignition pellet topped with the first fire composition, and a baffle.
3. The Cover Loading Assembly. The cover loading assembly consists of a zinc alloy cover to which are assembled a percussion primer M42, intermediate charge, disc, hinge pin, striker, spring, lever and safety clip with pull pin. The cover is press fitted into the aluminium case with the joint being waterproofed.

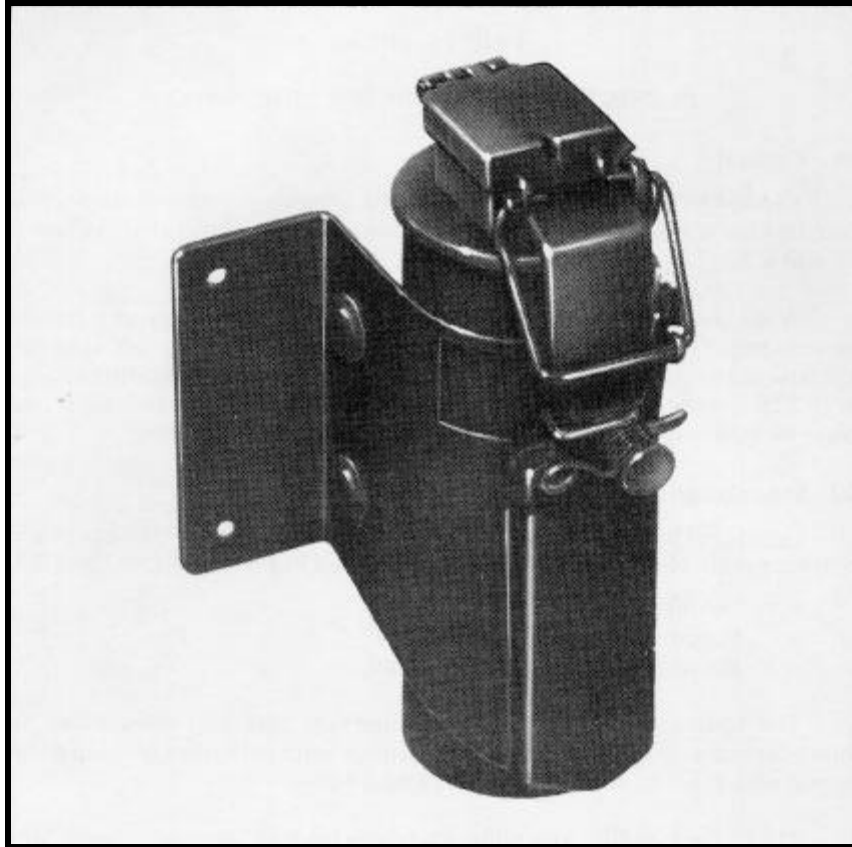


Figure 6-1 Flare, Surface, Trip, M49A1

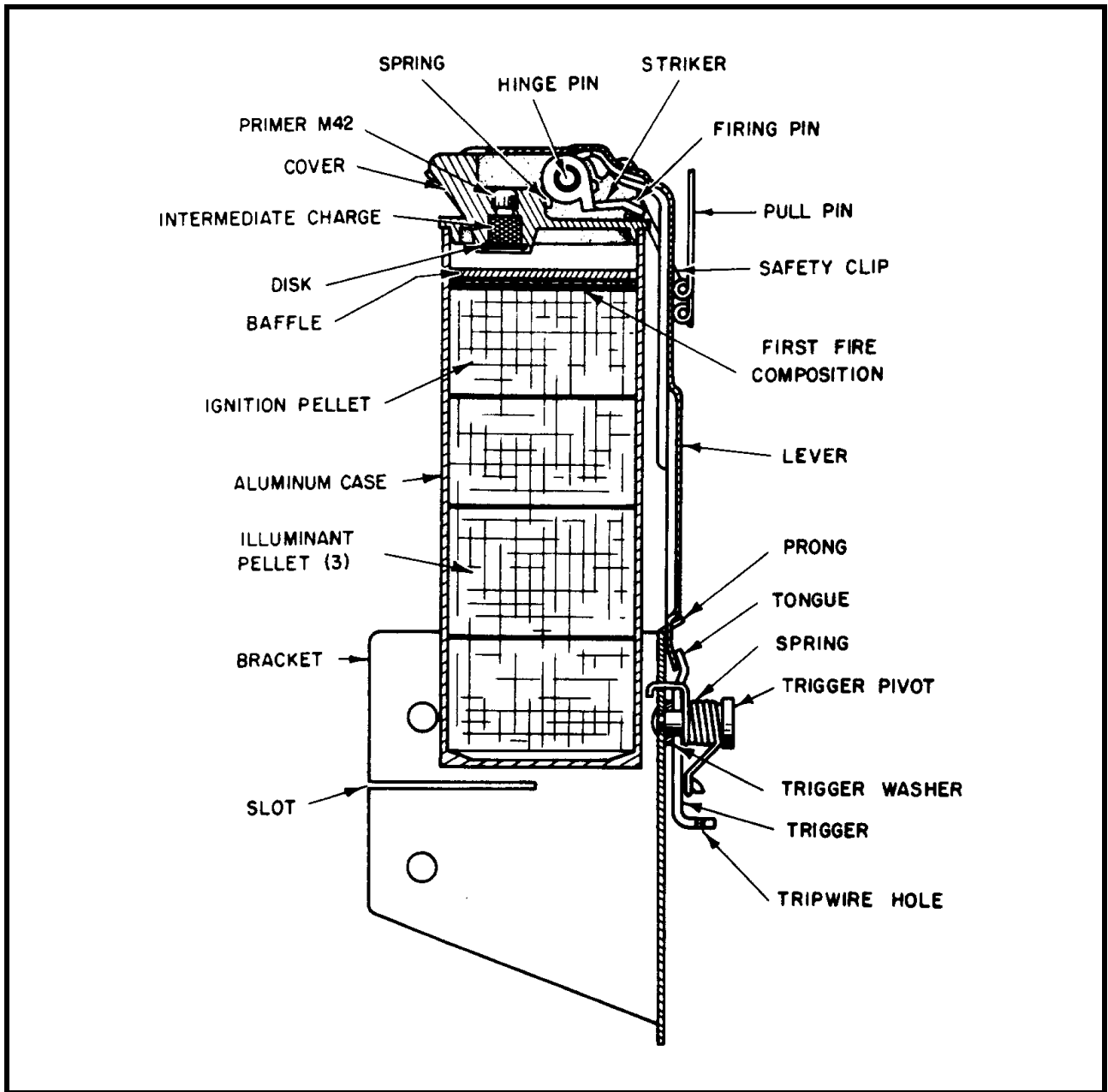


Figure 6-2 Mechanism of M49A1 Trip Flare

4. Mounting Bracket Assembly. The mounting bracket assembly consists of a U-shaped steel bracket, two carriage bolts with wing nuts, and a trigger assembly. (See Figure 6-3).

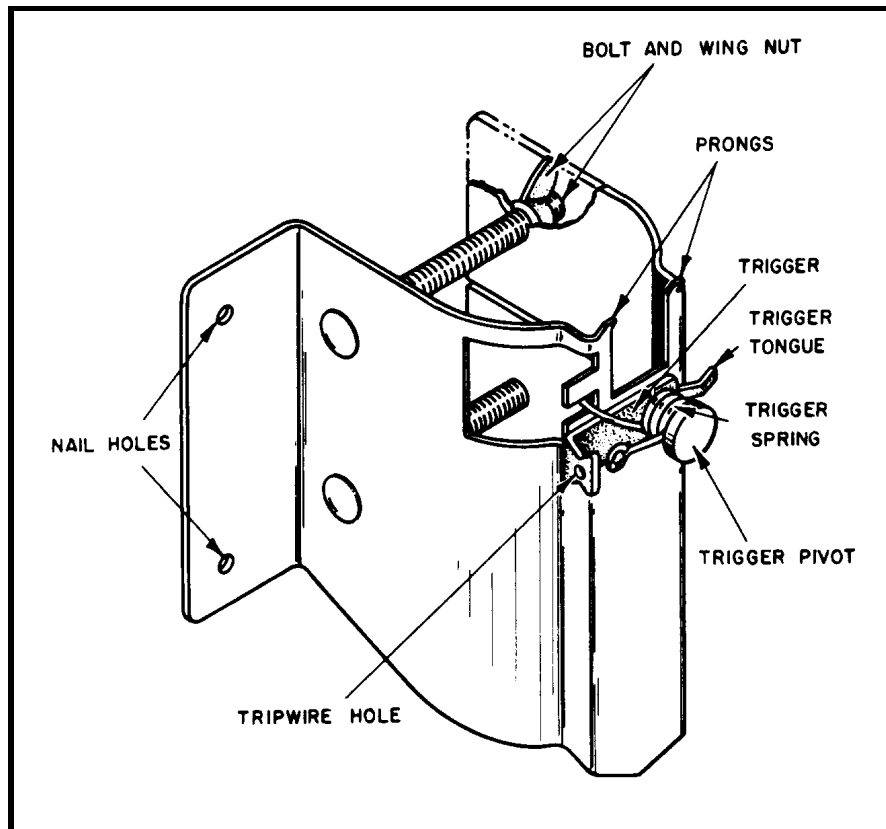


Figure 6-3 Bracket Assembly

603. Identification

1. The flare and bracket are painted OLIVE DRAB. The following is marked in BLACK on the bracket:
 - a. nomenclature;
 - b. lot number; and
 - c. month and year filled.

604. Packaging

Thirty-two flares with holders are packed in a wooden box. Also included are rolls of trip wire and nails.

605. Safety Precautions

1. The safety clip will be inspected to assure correct assembly to the holes provided for it in the cover loading assembly.
2. The cover loading assembly will be inspected for corrosion and looseness. No attempt will be made to tighten or reassemble a loose cover loading assembly.

3. The flare and bracket will be inspected for deformities.
4. The trigger spring will be inspected for proper tension and position. The trigger will be rotated approximately 2400 mils (135 degrees) in a counterclockwise direction. It should turn sufficiently, under load, to a position corresponding to that required to obtain release of the fly off lever as a result of increased tension on a trip wire. It should return to the normal position (as issued) when released.
5. Additional precautions, relating to installation and safety, are discussed in arts 607 to 613 and should be carefully noted.

606. Functioning

1. When armed using the bracket trigger assembly, the flare is installed with a taut wire which holds the trigger in a VERTICAL position against the pressure of the trigger spring. The safety clip is then removed and the flare is armed with the fly-off lever held by the trigger tongue only.
2. A pull of one to four kilograms (two to nine pounds) on the trip wire rotates the trigger tongue in a counter-clockwise direction against the pressure of the trigger spring. If the trip wire is severed, the spring forces the trigger tongue in a clockwise direction. In either case, the movement of the trigger tongue releases the fly-off lever.
3. When the fly-off lever is released, the striker spring forces the striker to rotate. In so doing, it throws the fly-off lever clear and forces the firing pin onto the primer which is ignited.
4. The primer ignites the intermediate charge which in turn ignites the first fire composition of the ignition pellet. When the ignition pellet functions, it blows off the cover and ignites the illuminant pellets.
5. When the flare is armed, using the pull pin inserted in the safety clip holes, a pull of one to two kilograms (two to four pounds) withdraws the pull pin and releases the fly-off lever causing the flare to function as described in paras 3 and 4.

Note: When armed with the pull pin, severing the trip wire will not cause the flare to function.

607. Installation

The flare can be installed on a tree (or board), on a post, or on the ground. The location chosen for installation should be in the logical path of infiltrating troops and so positioned that the field toward the enemy will be illuminated while friendly defence positions will not be disclosed. An example of an emplacement is illustrated in Figure 6-4.

WARNING: During installation of a flare in training, all personnel, except those actually working on the flare, should be under cover or at a distance of not less than 50 metres (55 yards) from the firing site.

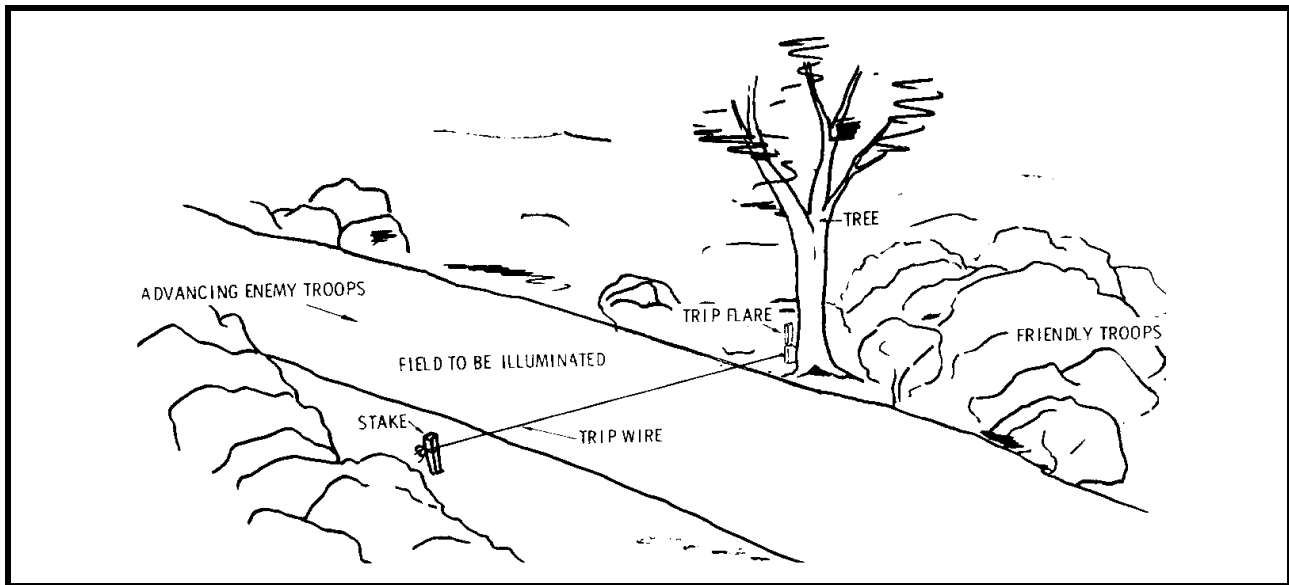


Figure 6-4 Typical Installation Using Bracket Trigger Assembly

608. Installation on a Tree or Board, by Nailing

1. The procedure given in this para should be followed for the installation of a flare on a tree or, sturdy board, by nailing:
 - a. Loosen the wing nuts on the brackets. Remove the flare by sliding it upwards through the bracket.
 - b. Place the flare in a safe location until it is ready to use.
 - c. Mount the bracket using two of the nails provided. The bracket must be as vertical as possible and at a height of 38 to 45 cm (15 to 18 inches) above the ground.
 - d. Mount the flare by aligning the lever with the trigger pivot and carefully sliding the flare downward into its bracket until the bottom edge of the lever is not more than 1.6 mm (one-sixteenth inch) above the bracket but not past it. The bottom edge of the lever must clear the bracket by no more than 1.6 mm (one sixteenth inch) to prevent the lever from slipping out of the trigger when the safety clip is removed.
 - e. Clamp the flare in its bracket by tightening the upper wing nut with sufficient force to grip the flare firmly.
 - f. Perform arming as indicated in art 611-2 and 3 depending on the method required.

609. Installation on a Post by Clamping

1. The following procedure should be followed for installation of the flare on a post, stake or sturdy stick by means of clamping:

- a. The item to which the flare will be clamped should be approximately 38 mm (1 1/2 inches) in diameter, to assure a firm grip, and should be situated in a location corresponding to that described for installation on a tree in art 608.
- b. Loosen both wing nuts on the bracket and slide the flare upwards until the base of the flare is aligned with the top of the slot or slightly above it.
- c. Clasp the flare in its bracket by tightening the upper wing nut with sufficient force to grip the flare firmly.
- d. Slide the bracket (with its flare) over the post or similar item.
- e. Clamp the post in the bracket by tightening the lower wing nut with sufficient force to grip the post firmly.
- f. Perform arming as indicated in art 611-2 and 3 depending on the method required.

610. Installation on the Ground

1. The following procedures should be followed for installation of the flare on the ground. In this installation, arming with the pull pin should be planned since the bracket trigger mechanism will not function due to interference from the ground. The correct sequence is the following:

- a. Remove the lower wing nut and bolt and retain for future use.
- b. Loosen the upper wing nut and remove the flare by sliding it upward through the bracket.
- c. Place the flare in a safe location until ready to use.
- d. Install the bracket on a mount or raised area by forcing the point of the bracket into firm ground at least up to the slot. If this cannot be done by hand, the foot should be used to force down on the rear portion of the bracket.

CAUTION: Do not place the foot on the thin section near the trigger assembly as bending of the lever may prevent the flare from functioning.

- e. Mount the flare by aligning the lever with the trigger pivot and carefully sliding the flare downward into its bracket but not past it. The bottom edge of the lever must clear the bracket by no more than 1.6 mm (one-sixteenth inch) to prevent the lever from slipping out of the trigger when the safety clip is removed.
- f. Clamp the flare in its bracket by tightening the upper wing nut with sufficient force to grip the flare firmly.
- g. Perform arming as indicated in art 611-3.

611. Arming Procedures

1. General. Depending on the type of installation, arming will be carried out using the bracket trigger assembly or the pull pin.

2. Method No. 1. To arm the flare using the bracket trigger assembly as shown in Figure 6-5, the following will be carried out:

- a. Fasten one end of the trip wire to a post, stake or other rigid object at the desired distance (usually 12 metres (14 yards)) from the flare and to the right of the flare when facing the flare trigger. The trip wire should be at right angles to the axis of the trigger so that there will be no binding at the trigger pivot when the trigger is cocked.
- b. Press the lever down against the flare body with one hand. With the other hand rotate the trigger one-quarter turn counterclockwise against the spring pressure to a vertical position so that the lower end of the lever is behind the tongue (upper end) of the trigger.
- c. Pull the loose end of the trip wire taut and fasten to the hole in the lower end of the trigger.
- d. At this point, ensure that the trip wire is taut and fastened at both ends with the trigger in a vertical position and the end of the lever behind the tongue of the trigger, so that when the safety clip assembly is removed, the lever will still be held by the trigger as shown in Figure 6-6.
- e. Hold the lever with one hand while carefully removing the safety clip assembly.
- f. Very carefully release the hold on the lever while making sure that the lever will be held in place by the tongue of the trigger.

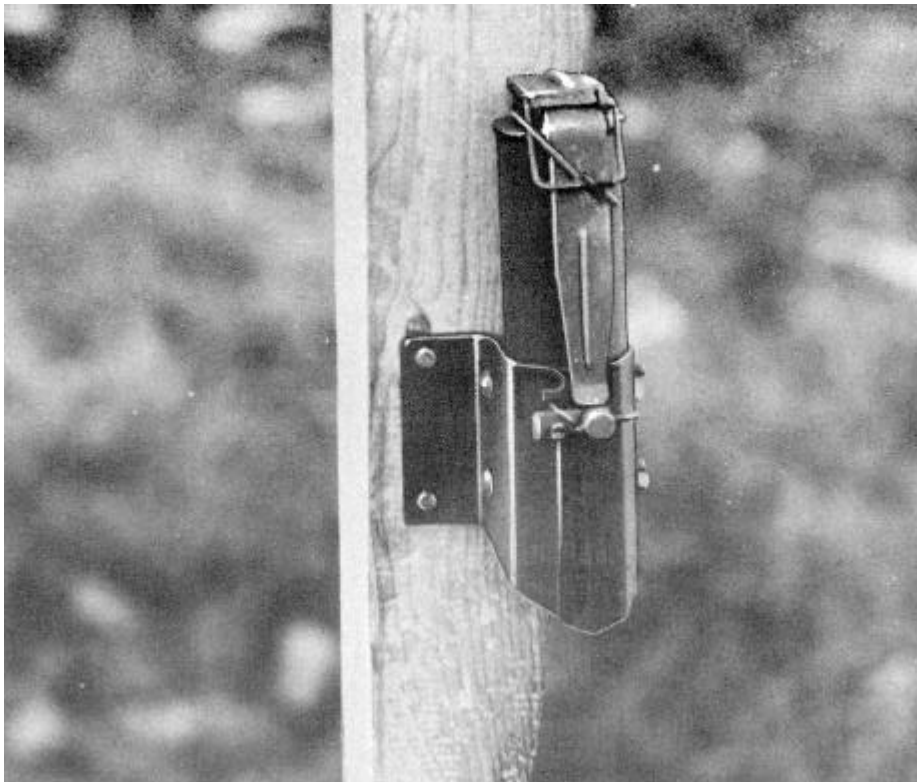


Figure 6-5 M49A1 Trip Flare Unarmed

3. Method No 2. To arm the flare with the pull pin, the following will be carried out:
 - a. Fasten one end of the trip wire to a post, stake or other rigid object at the desired distance (usually 12 metres (14 yards) from the flare and to the right or left of the flare when facing the flare trigger).
 - b. Press the lever down with one hand and remove the safety clip assembly.

WARNING: Do not release the lever because this will cause the flare to function.

- c. While still holding the lever insert the pull pin, which is attached to the safety clip, through the two safety clip holes of the cover loading assembly.
- d. Pull the loose end of the trip wire taut and fasten it to the loop in the pull pin.
- e. Very carefully, release the hold on the lever making certain that the pull pin is retained in the safety clip holes by the lever.
- f. Ensure visually that the trip wire is taut and fastened at both ends.

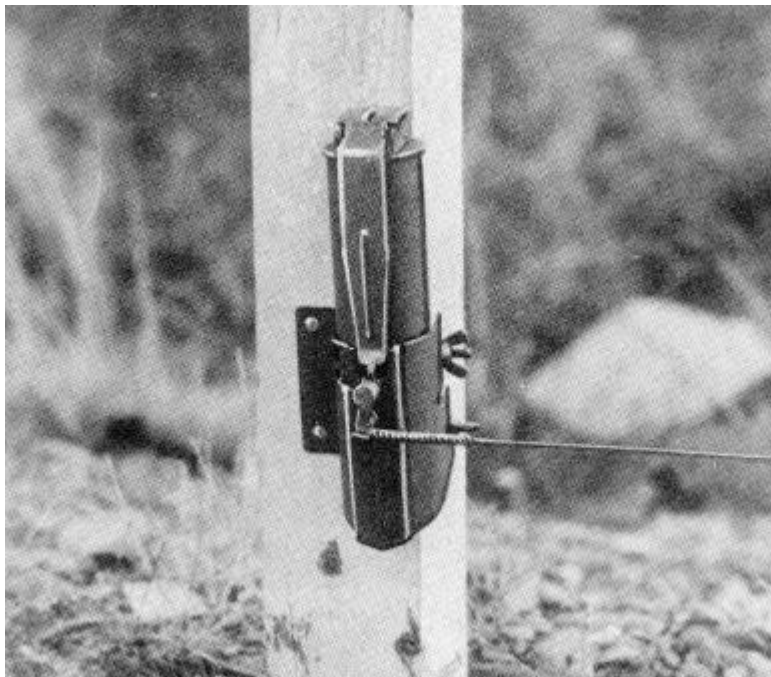


Figure 6-6 M49A1 Trip Flare Armed

612. Disarming

1. Disarming procedures will be carried out as follows:
 - a. Carefully depress the lever against the flare body.
 - b. If the pull pin was used as the method of arming, remove the pull pin.

- c. Secure the lever by inserting one end of the safety clip through one of the safety clip holes of the cover holding assembly. Snap the other end of the safety clip into the other safety clip hole.
- d. Detach the trip wire from the pull pin or trigger depending on which method of arming was used.

613. Precautions in Installation

1. Since the trigger assembly is spring loaded, it is possible that some kinks or bends in the trip wire may straighten after installation. This will cause the lever, which is seven-sixteenths of an inch wide at its lower end, to be released. This would cause the flare to function. Therefore always ensure that the trip wire is free of kinks and bends.
2. Install the flare in firm ground since softening of the ground due to rain or thaw may allow the flare or the item to which the trip is anchored to become dislodged. This may cause the flare to function prematurely.
3. If the trip wire is attached to the pull pin, the trip wire must be sufficiently taut so that it is above the ground. If it rests on the ground, it may be stepped over or stepped on and thus fail to initiate the flare.

614. Duds

1. All armed trip flares which fail to ignite will be regarded as duds and will be destroyed by the method laid down for destroying dud M61 grenades.
2. The person who destroys trip flare duds will:
 - a. disconnect the trip wire from the outer picket;
 - b. jerk the wire a few times to see whether ignition takes place;
 - c. hit the picket to which the flare is attached two or three times with a stick at least 1.5 metres long keeping his head well away from, and, if possible, below the level of the trip flare; and
 - d. if the flare fails to ignite, put the stick or bayonet underneath the flare, tip it off the picket, and destroy it on the ground where it lies using the method described in EO 30-500HA-2.

(615 to 699 - not allocated)

CHAPTER 7

SMOKE POTS

SECTION 1 - SMOKE POT, GROUND TYPE, NO 24, MK 2 AND SMOKE POT, GROUND TYPE, NO 24, MK 2 (SC 39)

701. General

The Smoke Pot, Ground Type, No 24, Mk 2 shown in Figure 7-1 and its facsimile the Smoke Pot, Ground Type, No 24, Mk 2 (SC 39) shown in Figure 7-3 are designed to provide extensive smoke screens for use during both training and operations. Older versions of this device were referred to as smoke generators. The modern term is now smoke pot.

702. Description

1. The smoke pot is 31.1 cm (12.25 in) high and 20.4 cm (8.05 in) in diameter. The body consists of a metal cylinder having a top and bottom secured by a folded seam. The top has a roll-threaded screw neck fixed to the middle by a folded seam. A tear-off seal is lightly soldered over the screw neck to form an airtight joint and a primed cotton disc is placed underneath it. A knurled threaded cap is screwed onto the screw neck over the tear-off seal. The smoke pot weighs about 16.7 kg (37 lbs).
2. A steelwire carrying handle with a wooden grip is attached by two clips welded on the top.
3. The smoke pot contains a priming charge of approximately .7 kg (1.5 lbs) and a main smoke filling of approximately 14.5 kg (32 lbs) of SR264A(M) pressed in two increments. The smoke pot emits a voluminous cloud of WHITE smoke during a period of approximately fifteen minutes duration.
4. The exterior of the smoke pot, with the exception of the screw threads, is painted GREEN and the following instructions and markings are painted in BLACK.
 - a. REMOVE SCREW CAP AND TEAR-OFF SEAL. LIGHT WITH PORTFIRE OR FUSEE;
 - b. designation of smoke pot;
 - c. filler and month and year of filling;
 - d. lot number; and
 - e. filling composition.

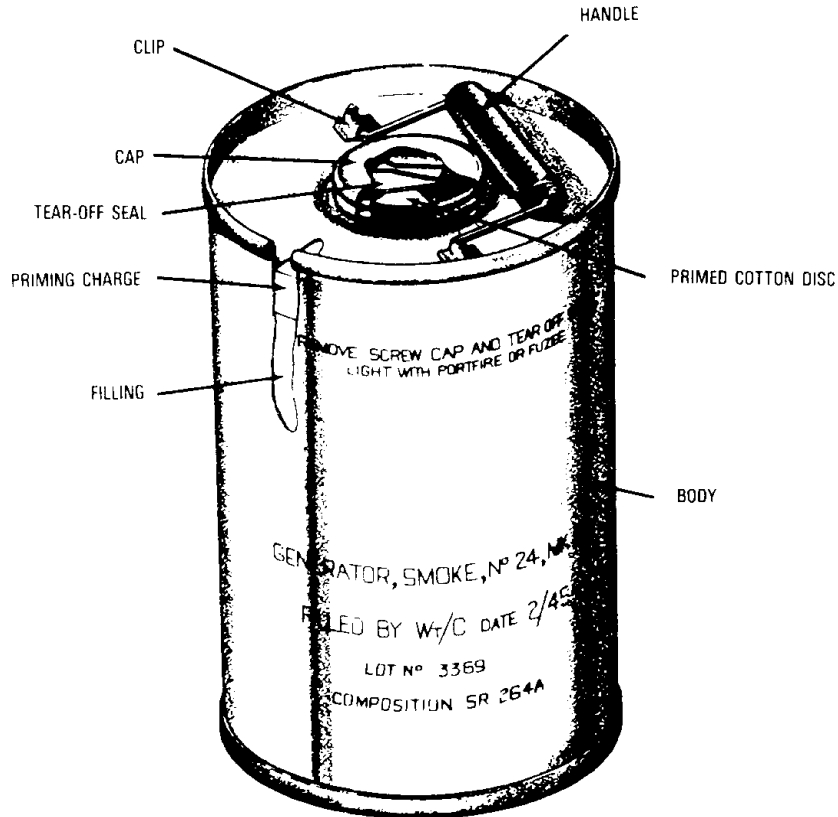


Figure 7-1 Smoke Pot (Generator), Ground Type, No 24, Mk 2

703. Packaging

1. Smoke Pot, Ground Type, No 24, Mk 2. Two smoke pots are contained in one wirebound crate that has the following stencilled on it in BLACK paint as shown in Figure 7-2:

- a. number and nomenclature of store;
- b. lot number of store;
- c. lot number of packaging; and
- d. month and year of packaging.

2. Smoke Pot, Ground Type, No 24, Mk 2 (SC 39). This smoke pot, shown in Figure 7-3, is identical to the No 24 Mk 2 Smoke Pot except that a label glued on the container replaces the stencilled markings. The label, in English and French, shows the following information:

- a. SC-39 SMOKE GENERATOR 15 MINUTES WHITE;

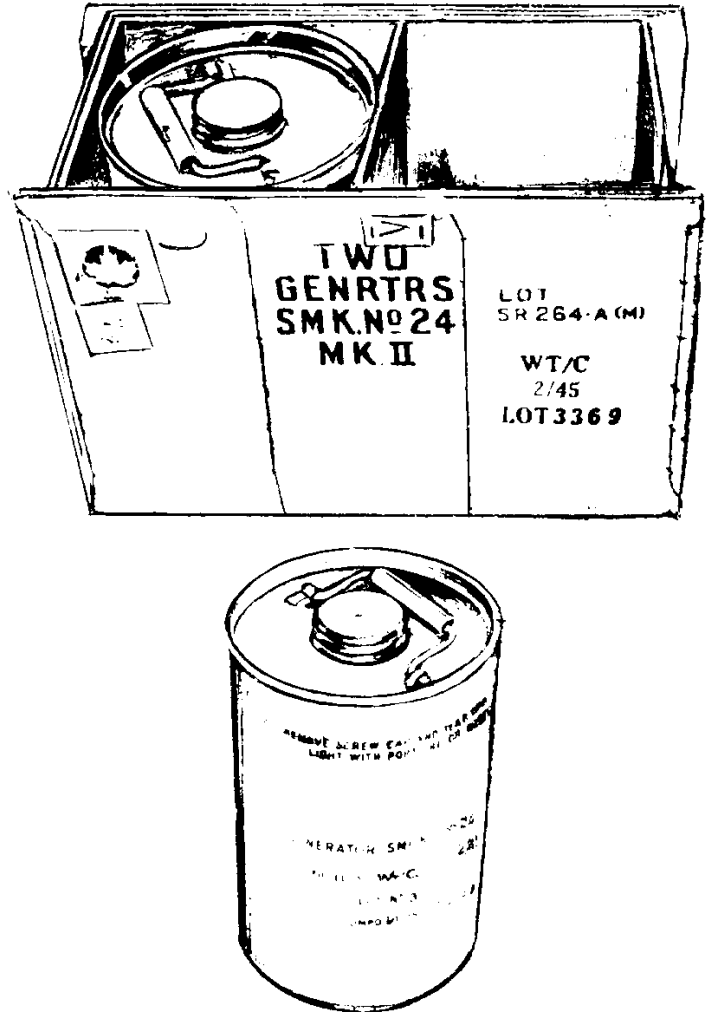


Figure 7-2 Packaging of the No 24, Mk 2 Smoke Pot (Generator)

- b. directions for use; and
 - c. manufacturer's trademark.
3. The SC-39 Smoke Pot is not identified by lot number.
4. The smoke Pot is packaged one per cardboard box. See Figure 7-3. The following information is stencilled on the box:
 - a. "SMOKE GENERATOR 15 MINUTES WHITE ONE ONLY SC-39 HANDLE CAREFULLY"; and
 - b. the lot number.



Figure 7-3 Packaging of the SC-39 Smoke Pot (Generator)

704. Safety Precautions

The No 24 Mk 2 Smoke Pot and the SC-39 Smoke Pot are a dangerous health hazard if used in a confined space. They will only be used in open, well ventilated areas.

705. Method of Initiation

1. Remove the cap and tear-off seal. Ignite the smoke pot by lighting the primed cotton disc with a fusee match.
2. Safety fusee matches are necessary for the satisfactory ignition of the No 24 Smoke Pots and are issued on the scale of three matches to each pot. Fusee matches are not included in the packaging of the smoke pot and must be indented for separately on the scale of one box of fusee matches for every four smoke pots, No 24, or any fraction of four. The delay time to full smoke emission after ignition is approximately five seconds.

706. Duds

A smoke pot that fails to burn completely or not at all on ignition will be moved to a safe location where it will be destroyed by burning or detonation (EO 30-500 HA-2).

SECTION 2 -SMOKE POT, GROUND TYPE, ORANGE, SC-41

707. General

1. The SC-41 Smoke Pot is designed for use on the ground. It will not withstand the shock of impact if dropped by aircraft.
2. When ignited, the smoke generator is designed to emit ORANGE smoke for a period in excess of three minutes.
3. The smoke pot is intended:
 - a. as a means of signalling to the crew of an aircraft, or to other friendly land or sea elements; and
 - b. for indicating the direction and strength of the wind.

708. Description

1. The smoke pot (generator), shown in Figure 7-4, is 15.7 cm (6.2 in) high and 9.2 cm (3.6 in) in diameter. The top is closed by a baffle plate, containing a smoke emission hole, and to which is attached an igniter cover and a striker.
2. The body is filled with approximately 0.68 kg (1.5 lbs) of smoke composition, SR264C (M).
3. An igniter pellet is retained in position over the filling by a strawboard washer. The pellet is topped with a starter composition which is surfaced with a match, composition.
4. Smoke emission commences between 10 and 30 seconds after ignition.
5. The exterior of the smoke pot is painted ORANGE and the number of the smoke composition is stencilled in BLACK on the body. A label is secured to the top of the lid giving the following details:
 - a. nomenclature of the store;
 - b. instructions for use;
 - c. lot number;
 - d. fillers monogram; and
 - e. month and year of filling.

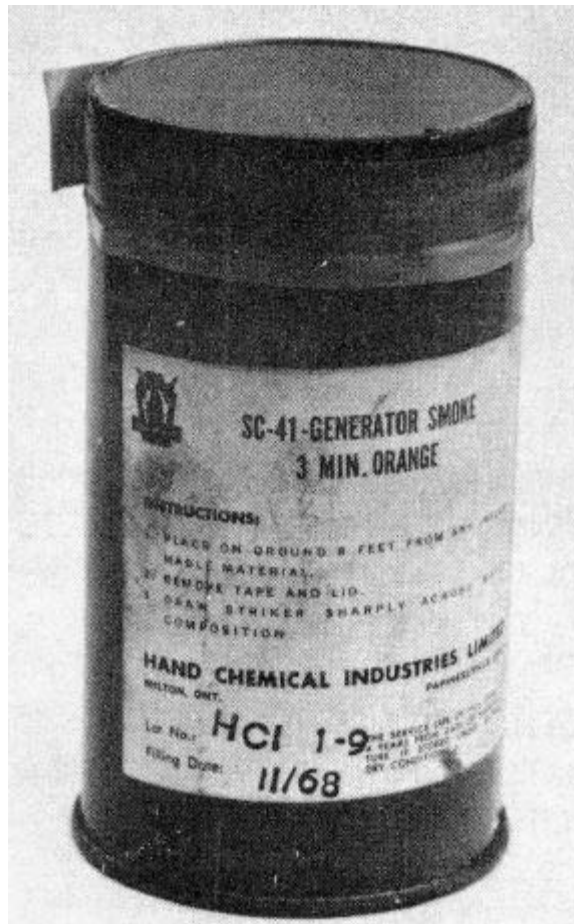


Figure 7-4 SC-41 Smoke Pot (Generator.)

709. Packaging

Twenty SC-41 Smoke Pots are packed in a metal box on which is stencilled the numbers and nomenclature of the store.

710. Safety Precautions

After ignition personnel will maintain a six metre (20 feet) safety distance from the smoke pot as the smoke pot is liable to explode and scatter burning fragments.

711. Method of Initiation

The lid and the igniter cover are removed. The smoke pot is then ignited by drawing the striker sharply across the match head composition.

712. Duds

SC-41 Duds will be handled in a similar fashion to those of the No 24 Smoke Pot.

(713 to 799 not allocated)

CHAPTER 8

INSTRUCTION

SECTION 1 - GENERAL

801. Introduction

1. This chapter has been prepared to assist instructors in organizing and preparing successful instruction on grenades and pyrotechnics. The Canadian Forces Instruction Manual deals with the principles of instruction, preparation of Instructor Lesson Plans (ILP) and training aids in general. In this chapter will be found specific information and guidance for the conduct of instruction on grenades and pyrotechnics.

2. The content of each lesson listed in this chapter and the time to be allocated are only for the guidance of the instructor. Lesson guides are intended for use in recruit or initial training. For refresher training or review, the instructor must modify the subject matter and the time allocated as he sees fit.

802. Preparation for Instruction

In Sect 2 of this chapter most of the work of collecting and arranging the subject matter has been done. Instructors must prepare their own ILP from the information given. Beside each topic to be covered in the lesson is a cross reference indicating where detailed information may be found in the text.

CAUTION: The instructor will personally examine each grenade or pyrotechnic to be used in the lesson to ensure that it is, in fact, the correct item for the lesson to be conducted. See Chap 1, art 105.

803. Performance Checks and Annual Classification

1. Performance checks are at Annex A.

2. Performance checks may be deleted as necessary if the applicable grenade is not available, but must be performed at a later date when the grenade becomes available.

3. Performance checks measure skills essential to safe and efficient handling of grenades and pyrotechnics. To prove he is capable and is ready to progress to the use of live grenades the student must pass the associated performance check. The aim of a performance check is to ensure that the soldier can use grenades and pyrotechnics effectively in battle. If a student fails any part of a performance check or is unsure of himself he must be given further training and retested before using live grenades and pyrotechnics.

4. The performance check will be done "dry" until the desired standards of accuracy and degree of confidence have been achieved. Annual classification then consists of a repetition of the performance checks, but throwing a minimum of two live fragmentation and one live smoke grenades in accordance with Annex A, Appendix 9. Remaining live grenade performance checks may be carried out using the M62 Practice Grenades as required. All soldiers of the Combat Arms should pass the classification yearly. Local materials should be used if necessary to construct suitable targets.

804. Lesson 1 - Grenade, Hand, Fragmentation, Delay, M61 and M67

1. Lesson Objective. The student will describe the appearance and mechanical functioning of the M61 and/or M67 Grenades and perform safety precautions.

2. Time. The time is 40 minutes.

3. Stores and Training Aids. The aids are as follows:

- a. charts; and
- b. one dummy grenade per student.

4. Sequence and Method.

a. Introduction. Introduction by explanation (art 201);

b. Body. The body shall include the following -

- (1) safety precautions by explanation, demonstration and imitation (art 205),
- (2) description, including the safety clip, by explanation and demonstration (arts 202 and 204),
- (3) characteristics by explanation (art 206),
- (4) mechanism by explanation, demonstration and imitation (art 207), and
- (5) packaging by explanation (art 203);

c. Test. For the M61 and/or M67 Grenade the student must -

- (1) describe the outside appearance,
- (2) describe the mechanical functioning,
- (3) perform safety precautions, and
- (4) describe the packaging; and

d. Conclusion. The need to recognize the grenades and to correctly perform safety precautions before using them will be emphasized.

805. Lesson 2 - Grenade, Hand, Practice, Delay, M62

1. Lesson Objective. The student will describe the M62 Practice Grenade and reload it after use.
2. Time. The time is 40 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts;
 - b. one grenade body per student;
 - c. two mechanisms per student; and
 - d. two powder bags per student.
4. **Sequence and Method**
 - a. Introduction. Introduction by explanation (art 208).
 - b. Body. The body shall include the following -
 - (1) safety precautions by explanation, demonstration and imitation (art 211),
 - (2) description by explanation and demonstration (art 209),
 - (3) characteristics by explanation (art 212),
 - (4) mechanism by explanation, demonstration and imitation (art 213),
 - (5) reloading by explanation, demonstration and imitation (art 214), and
 - (6) packaging by explanation (art 214).
 - c. Practice Grenade. For the M62 Practice Grenade the student must -
 - (1) describe the outside appearance,
 - (2) state the characteristics, and
 - (3) reload.
 - d. Conclusion. Safety precautions and correct method of reloading will be emphasized.

806. Lesson 3 - Mini Grenade, Hand, Fragmentation, Delay, NWM V40

1. Lesson Objective. The student will describe the appearance and mechanical functioning of the V40 Grenade and will perform safety precautions.
2. Time. The time is 40 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts; and
 - b. one dummy grenade per student.

4. **Sequence and Method**

- a. Introduction. Introduction by explanation (art 215);
- b. Body. The body shall include the following -
 - (1) safety precautions by explanation, demonstration and imitation (art 218),
 - (2) description by explanation and demonstration (art 216),
 - (3) characteristics by explanation (art 219),
 - (4) mechanism by explanation, demonstration, and imitation (art 220), and
 - (5) packaging by explanation (art 217);
- c. V40 Grenade. For the V40 Grenade the student must -
 - (1) describe the outside appearance,
 - (2) describe the mechanical functioning,
 - (3) perform safety precautions, and
 - (4) describe the packaging; and
- d. Conclusion. Emphasize the need for performing safety precautions.

807. Lesson 4 - No 80 Mk 1 Grenade

1. Lesson Objective. The student will describe the grenade, observe safety precautions and prime and unprime the grenade.
2. Time. The time is 40 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts; and
 - b. one dummy grenade per five students.

4. **Sequence and Method**

- a. Introduction. Introduction by explanation (art 221);
- b. Body. The body shall include the following -
 - (1) safety precautions by explanation, demonstration and imitation (art 224),
 - (2) description by explanation (art 222),
 - (3) priming by explanation, demonstration, and imitation (art 227-1),
 - (4) unpriming by explanation, demonstration and imitation (art 227-2),
 - (5) mechanism by explanation (art 228), and
 - (6) packaging by explanation (art 223);
- c. Test. For the No 80 Mk 1 Grenade the student must -

- (1) describe the outside appearance,
 - (2) state the mechanical functioning,
 - (3) perform safety precautions,
 - (4) prime and unprime, and
 - (5) describe the packaging; and
- d. Conclusion. The need to observe safety precautions because of the filling of the grenade will be stressed.

808. Lesson 5 - Grenade, Hand, Smoke, No 83 and Grenade, Hand, Smoke, C3 Series

1. Lesson Objective. The student will describe the No 83 and C3 Series of grenades.
2. Time. The time is 30 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts of the No 83 and C3 Series of grenades; and
 - b. one dummy grenade per five students.
4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 229).
 - b. Body. The body shall include the following -
 - (1) safety precautions by explanation (art 232),
 - (2) description by explanation (art 230),
 - (3) characteristics by explanation (art 233),
 - (4) mechanical functioning by explanation (art 234),
 - (5) packaging by explanation (art 231), and
 - (6) grenade, Hand, Smoke, C3 Series by explanation (art 235);
 - c. Test. The student must -
 - (1) describe the outside appearance of the No 83 Grenade,
 - (2) state the mechanical functioning of the No 83 Grenade,
 - (3) describe the packaging of the No 83 Grenade, and
 - (4) state the differences between the No 83 Grenade and the C3 Series of grenade; and
 - d. Conclusion. Emphasize the differences between the No 83 and C3 Series of grenades.

809. Lesson 6 - Grenade, Hand, Smoke, HCC1A1

1. Lesson Objective. The student will describe the Grenade, Hand, Smoke, HCC1A1.
2. Time. The time is 30 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts; and
 - b. one inert Grenade, Hand, Smoke, HCC1A1 per five students.
4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 236);
 - b. Body. The body shall include the following -
 - (1) safety precautions by explanation (art 239)..
 - (2) description by explanation (art 237),
 - (3) characteristics by explanation (art 240),
 - (4) mechanism by explanation (art 241), and
 - (5) packaging by explanation (art 238);
 - c. Test. The student must, for the Grenade, Hand, Smoke, HCC1A1 -
 - (1) state the safety precautions,
 - (2) describe the outside appearance,
 - (3) state the mechanical functioning, and
 - (4) state the method of packaging; and
 - d. Conclusion. Emphasize the description of the grenade.

810. Lesson 7 - Grenade, Hand, Riot, CS M7A3

1. Lesson Objective. The student will describe the Grenade, Hand, Riot, CS, M7A3.
2. Time. The time is 30 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. charts of Grenade, Hand, Riot, CS, M7A3;
 - b. one inert grenade per five students; and
 - c. one cutaway grenade if available, per five students.
4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 242);
 - b. Body. The body shall include the following -

- (1) safety Precautions by explanation (art 245),,
 - (2) description of grenade by explanation (art 243),
 - (3) characteristics by explanation (art 246),
 - (4) mechanism of grenade by explanation (art 247), and
 - (5) packaging by explanation (art 244);
- c. Test. For the Grenade, Hand, Riot, CS, M7A3 the student must -
- (1) state the safety precautions,
 - (2) describe in detail, including the markings,
 - (3) describe the functioning of the mechanism, and
 - (4) describe the packaging; and
- d. Conclusion. Emphasize the capabilities of CS gas.

811. Lesson 8 - Throwing Grenades

1. Lesson Objective. The student will throw grenades from various positions.
2. Time. The time is 80 minutes.
3. Stores and Training Aids. There is one inert fragmentation type grenade per student.
4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 301);
 - b. Body. The body shall include the following -
 - (1) ready position by explanation, demonstration and imitation (art 302),
 - (2) preparing to throw by explanation, demonstration and imitation (art 303),
 - (3) throwing by explanation, demonstration and imitation (art 304),
 - (4) correction of faults by explanation, demonstration and imitation (art 305),
 - (5) throwing the M61 Grenade by explanation, demonstration and imitation (art 306), and
 - (6) throwing the grenade in the following manner by explanation, demonstration and imitation -
 - (a) standing (art 307-1),
 - (b) kneeling (art 307-2),
 - (c) kneeling modified (art 307-3), and
 - (d) lobbing (art 308);
 - c. Test. The student must -
 - (1) state why and in what circumstances different positions are used, and

- (2) throw a grenade while using the standing, kneeling and kneeling modified position (see Annex A for standard); and
- d. Conclusion. Emphasize the proper throwing positions and the need for safety while dealing with grenades.

812. Lesson 9 - Launcher Grenade L1A2

1. Lesson Objective. The student will fire grenades using the Launcher Grenade L1A2.
2. Time. The time is 80 minutes.
3. Stores and Training Aids. The aids are as follows;
 - a. one FNC1 rifle per candidate;
 - b. one Launcher, Grenade, L1A2 per rifle;
 - c. minimum of four M62 or HCC1A1 Grenades per student;
 - d. four Adapters, Grenade, Projection M1A2 per rifle;
 - e. four Cartridges, Grenade, C33 per rifle; and
 - f. one clip positioning per rifle.
4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 401).
 - b. Body. The body shall include the following -
 - (1) description of Launcher Grenade L1A2 by explanation and demonstration (art 402),
 - (2) description of the following ancillary equipment by explanation and demonstration -
 - (a) Adapter, Grenade, Projection M1A2 (art 403-1),
 - (b) Cartridge, Grenade, C33 (art 403-2), and
 - (c) Clip, Positioning (art 403-3),
 - (3) safety precautions of the following items by explanation, demonstration and imitation, as applicable
 - (a) Cartridge, Grenade, C33 (art 404),
 - (b) Adapter, Grenade, Projection (art 405).,
 - (c) M61 Fragmentation Grenade (art 406), and
 - (d) Grenade Launcher (art 407),
 - (4) functioning by explanation (art 411),
 - (5) preparation for firing in the following stages by explanation, demonstration and imitation -

- (a) grenade assembly (art 408-2),
 - (b) rifle preparation (art 408-3),
 - (c) grenade preparation (art 408-4), and
 - (d) firing (art 408-5),
- (6) aiming by explanation, demonstration and imitation (art 409),
 - (7) using high angle fire by explanation, demonstration and imitation (art 410),
- (8) firing positions, supported and unsupported, with and without the use of the rifle sling by explanation, demonstration and imitation (arts 413 and 414), and
 - (9) care and maintenance by explanation, demonstration and imitation (art 415);
- c. Test. The student must -
- (1) describe and state the use of the following -
 - (a) Launcher, Grenade, L1A2,
 - (b) Adapter, Grenade, Projection M1A2,
 - (c) Cartridge, Grenade, C33, and
 - (d) Clip, Positioning,
 - (2) state the safety precautions to be observed when using the following -
 - (a) Cartridge, Grenade, C33,
 - (b) Adapter, Grenade, Projection M1A2,
 - (c) M61 Fragmentation Grenade, and
 - (d) Launcher, Grenade, L1A2,
 - (3) state the functioning of the Launcher, Grenade, L1A2,
 - (4) prepare a grenade for firing,
 - (5) demonstrate the use of all firing positions, supported and unsupported, with and without the use of the sling, and
 - (6) demonstrate care and maintenance; and
- d. Conclusion. Emphasis will be placed on correct fire positions and the need to use only the C33 Grenade cartridge.

813. Lesson 10 - Flare, Parachute. Hand Fired, C3

1. Lesson Objective. The student will fire the Flare, Parachute, Hand Fired, C3.
2. Time. The time is 40 minutes.

3. Stores and Training Aids. The aids are as follows:
 - a. at least one Flare, Parachute, Hand Fired, C3 per candidate; and
 - b. one cutaway diagram of the Flare, Parachute, Hand Fired, C3.

4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 501).
 - b. Body. The body shall include the following
 - (1) description by explanation (art 502),
 - (2) safety precautions by explanation, demonstration, and imitation (art 504),
 - (3) characteristics by explanation (art 505),
 - (4) firing instructions by explanation, demonstration and imitation (art 506),
 - (5) types and disposal of malfunctions by explanation (art 507), and
 - (6) packaging by explanation (art 503);
 - c. Test. The student will correctly -
 - (1) identify the flare,
 - (2) perform safety precautions,
 - (3) fire the flare,
 - (4) state types of malfunctions, and
 - (5) state the method of disposal of malfunctions; and
 - d. Conclusion. Safety will be emphasized.

814. Lesson 11 - Thunderflash C1A1

1. Lesson Objective. The student will ignite and throw the Thunderflash C1A1.
2. Time. The time is 30 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. one Thunderflash C1A1 per candidate; and
 - b. one cutaway diagram of the Thunderflash C1A1.

4. Sequence and Method
 - a. Introduction. Introduction by explanation (art 509);
 - b. Body. The body shall include the following
 - (1) description by explanation (art 510),
 - (2) safety precautions by explanation, demonstrations and imitation (art 512),

- (3) ignition by explanation, demonstration and imitation,
 - (4) functioning by explanation (art 514),
 - (5) packaging by explanation (art 511), and
 - (6) handling of misfires by explanation (art 515);
- c. Test. The student will correctly -
- (1) describe the Thunderflash,
 - (2) observe and state safety precautions, and
 - (3) ignite and throw the Thunderflash; and
- d. Conclusion. Emphasis will be placed on safety when using thunderflashes.

815. Lesson 12 - Simulator, Projectile Ground Burst, C1

1. Lesson Objective. The student will ignite and throw the Simulator, Projectile Ground Burst, C1.

2. Time. The time is 30 minutes.

3. Stores and Training Aids. The aids are as follows:

- a. one Simulator, Projectile Ground Burst, C1 per candidate; and
- b. one cutaway diagram of the Simulator, Projectile Ground Burst, C1.

4. Sequence and Method

- a. Introduction. Introduction by explanation (art 516);
- b. Body. The body shall include the following -
 - (1) description by explanation (art 517),
 - (2) safety precautions by explanation, demonstration and imitation (art 519),
 - (3) ignition by explanation, demonstration and imitation (art 520),
 - (4) functioning by explanation (art 521),
 - (5) packaging by explanation (art 518), and
 - (6) handling of duds by explanation, demonstration and imitation (art 522);
and
- c. Test. The student will correctly -
 - (1) describe the ground burst projectile simulator in detail,
 - (2) observe and describe safety precautions, and
 - (3) ignite and throw the simulator; and
- d. Conclusion. Emphasis will be placed on safety.

816. Lesson 13 - Firing Projector, Pyrotechnics, Hand, C1

1. Lesson Objective. The student will fire the Firing Projector Pyrotechnic, Hand C1.
2. Time. The time is 20 minutes.
3. Stores and Training Aids. The aids are as follows:
 - a. one Firing Projector Pyrotechnic Hand C1 per candidate;
 - b. one Signal, Illumination, Ground 10 Gauge Single Star, Green, C5 per two candidates;
 - c. one Signal, Illumination, Ground 10 Gauge Single Star, Red, C4 per two candidates;
 - d. one cutaway diagram of the Firing Projector Pyrotechnic Hand C1;
 - e. one diagram of the Signal, Illumination, Ground, 10 Gauge Single Star, Green C5;
 - f. one diagram of the Signal, Illumination, Ground, 10 Gauge Single Star Red C4; and
 - g. one diagram of method of index marking of closure caps.
4. Sequence and Method of Presentation
 - a. Introduction. Introduction by explanation (art 523).
 - b. Body. The body shall include the following -
 - (1) describe projector and signals by explanation (art 524),
 - (2) safety precautions by explanation (art 526), and
 - (3) functioning by explanation (art 527);
 - c. Test. The student must correctly -
 - (1) describe the Firing Projector Pyrotechnic Hand C1,
 - (2) state safety precautions,
 - (3) describe the Signal, Illumination, Ground, 10 Gauge Single Star, Green C5 and Red C4, and
 - (4) fire the Firing Projector, Pyrotechnic, Hand, C1; and
 - d. Conclusion. Emphasize safety and proper loading and unloading.

817. Lesson 14 - Flare, Surface, Trip, Parachute, M48

1. Lesson Objective. The student will set up the M48 Trip Flare.
2. Time. The time is 50 minutes.
3. Stores and Training Aids. The aids are as follows:

- a. one dummy M48 Trip Flare in accordance with EIS (Equipment Issue Scale), per two candidates;
- b. one cutaway diagram of the M48 Trip Flare;
- c. one picket (or board, stake, angle iron etc) per M48 Trip Flare;
- d. one shovel per trip flare; and
- e. one pick per trip flare (if required).

4. Sequence and Method

- a. Introduction. Introduction by explanation (art 601);
- b. Body. The body shall include the following -
 - (1) description by explanation (art 602),
 - (2) safety precautions by explanation, demonstration, and imitation (art 605),
 - (3) safety devices by explanation (art 604),
 - (4) setting up the flare by explanation, demonstration and imitation (art 607),
 - (5) arming by explanation, demonstration and imitation (art 608),
 - (6) removal of flare by explanation, demonstration and imitation (art 609),
 - (7) considerations in siting the flare, by explanation, demonstration and imitation (art 610), and
 - (8) functioning by explanation (art 606);
- c. Test. The student must correctly -
 - (1) carry out the safety precautions for the M48 trip flare,
 - (2) describe the safety devices,
 - (3) set up, arm and remove the flare, and
 - (4) state the considerations in siting; and
- d. Conclusion. Emphasis will be laid on the need for correct installation and siting of the flare.

818. Lesson 15 - Flare, Surface, Trip, M49A1

- 1. Lesson Objective. The student will install the M49A1 Trip Flare.
- 2. Time. The time is 50 minutes.
- 3. Stores and Training Aids. The aids are as follows:
 - a. one dummy M49A1 Trip Flare, in accordance with EIS, per two candidates;
 - b. one cutaway diagram of the M49A1 Trip Flare; and
 - c. one picket (board, stake, angle iron etc) per flare.

4. Sequence and Method

- a. Introduction. Introduction by explanation (art 612);
- b. Body. The body shall include the following -
 - (1) description by explanation (art 612),
 - (2) safety precautions by explanation, demonstration and imitation (art 615, 617),
 - (3) functioning by explanation (art 616),
 - (4) precautions to take during installation, by explanation, demonstration and imitation (art 623),
 - (5) installation on a tree or board by nailing by explanation, demonstration and imitation (arts 617 and 618),
 - (6) installation on a post by clamping by explanation, demonstration and imitation (art 619),
 - (7) installation on the ground by explanation, demonstration and imitation (art 620),
 - (8) arming procedures by explanation, demonstration and imitation (art 621), and
 - (9) disarming procedures by explanation, demonstration and imitation (art 622);
- c. Test. The student must correctly -
 - (1) identify the M49A1 Trip Flare,
 - (2) carry out safety precautions,
 - (3) install by nailing, by clamping and on the ground, observing the proper precautions,
 - (4) arm and disarm the flare, and
 - (5) inspect the flare prior to use; and
- d. Conclusion. Emphasis will be placed on safety and arming.

819. Lesson 16 - Smoke Pots

- 1. Lesson Objective. The student will describe smoke pots in general use.
- 2. Time. The time is 40 minutes.
- 3. Stores and Training Aids. Aids are as follows:
 - a. one Smoke Pot, Ground Type, No 24, Mk 2; or
 - b. one Smoke Pot, Ground Type, No 24, Mk 2 (SC-.39); and
 - c. one Smoke Pot, Ground Type, Orange, (SC-41).

4. Sequence and Method

- a. Introduction. Introduction by explanation (arts 701 and 707).
- b. Body. The body shall include the following -
 - (1) for the Smoke Pot, Ground Type, No 24, Mk 2 and the Smoke Pot, Ground Type, No 24, Mk 2 (SC-39), by explanation and demonstration -
 - (a) description (art 702),
 - (b) method of initiation (art 705),
 - (c) safety precautions (art 704), and
 - (d) packaging (art 703),
 - (2) for the Smoke Pot, Ground Type, Orange, SC-41 by explanation and demonstration -
 - (a) description (art 708),
 - (b) safety precautions (art 710), and
 - (c) method of initiation (art 711);
- c. Test. The student must describe the following in detail -
 - (1) Smoke Pot, Ground Type, No 24, Mk 2,
 - (2) Smoke Pot, Ground Type, No 24, Mk 2 (SC-39), and
 - (3) Smoke Pot, Ground Type, Orange, SC-41; and
- d. Conclusion. Sum up main points.

(820 to 899 not allocated)

PERFORMANCE CHECKS

STORES

1. The student is to be provided with the following stores:
 - a. one inert Grenade, Hand, Fragmentation, Delay, M61; and/or
 - b. one Grenade, Hand, Practice, Delay M62 complete with a replacement kit;
 - c. one inert Grenade, Hand, Fragmentation, Delay NWM V40;
 - d. one inert No 80 Mk 1 Grenade with one inert igniter set;
 - e. one inert Grenade, Hand, Smoke, No 83 Mk 1;
 - f. one inert Grenade, Hand, Smoke, C3 Series;
 - g. one inert Grenade, Hand, Smoke, HCC1A1;
 - h. one inert Grenade, Hand, Riot, CS, M7 A3;
 - j. one Rifle, FN, 7.62 mm, C1 per EIS;
 - k. one Launcher Grenade L1A2 with the following ancillary equipment -
 - (1) one Adapter, Grenade, Projection M1A2,
 - (2) one Cartridge, Grenade, C33,
 - (3) one Clip, Positioning, and
 - (4) one Grenade, Hand, Practice, Delay, M62;
 - m. one Flare, Parachute, Hand Fired, C3;
 - n. one Thunderflash C1A1;
 - p. one Simulator, Projectile, Ground Burst C1;
 - q. one Projector, Pyrotechnic, Hand, C1 with one signal, Illuminating, Ground, 10 Gauge, Single Star Red C4 or Green C4;
 - r. one inert Flare, Surface, Trip, Parachute M48 with following items -
 - (1) one shovel and one pick per Flare, and
 - (2) boards, pickets, angle iron pickets, etc;
 - s. one Flare, Surface, Trip, M49A1;
 - t. one Smoke Pot, Ground Type, No 24, Mk 2;
 - u. one Smoke Pot, Ground Type, Orange, SC-41; and
 - v. cleaning material as required.

STANDARD

2. The student must:
 - a. carry out all drills correctly as taught; and
 - b. complete all tests within the time limit, if a time limit is given.

SPECIAL INSTRUCTIONS

3. Excessive hesitation by a student, when being tested on a performance check for which no time limit is given, indicates that he requires additional training before proceeding with further testing or range practice.
4. Students who fail should be informed of their errors as they occur.
5. Students who exceed the time limit due to another man's error should be retested.
6. The format and sequence of the performance check in the appendices to Annex A should be followed. The sequence of testing is designed to save time in conducting the tests and in providing continuity.

PERFORMANCE CHECKS

7. Grenade, Hand, Fragmentation, Delay, M61 and M67 - Appendix 1
8. Grenade, Hand, Practice, Delay, M62 - Appendix 2
9. Grenade, Hand, Fragmentation, Delay NWM V40 - Appendix 3
10. No 80 Mk 1 Grenade - Appendix 4
11. Grenade, Hand, Smoke, No 83 Mk 1 (C2A1) and Grenade, Hand, Smoke, C3 Series - Appendix 5
12. Grenade, Hand, Smoke, HCC1A1 - Appendix 6
13. Grenade, Hand, Riot, CS, M7A3 - Appendix 7
14. Principles of Throwing Grenades - Appendix 8
15. Throwing From Behind Cover (Dry and Live) - Appendix 9
16. Launcher Grenade L1A2 - Appendix 10
17. Pyrotechnics - Appendix 11
18. Flare, Surface, Trip, Parachute, M48 - Appendix 12
19. Flare, Surface, Trip, M49A1 - Appendix 13
20. Smoke Pots - Appendix 14

GRENADE, HAND, FRAGMENTATION, DELAY, M61 and M67

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> CARRY OUT SAFETY PRECAUTIONS.		
1	Remove top portion of container.		
2	Inspect top of grenade ensuring that safety pin and safety clip are in proper position.		
3	Ensure that the retaining lugs are not cracked or broken.		
4	Ensure that there is no damage to the body of the grenade.		

GRENADE, HAND, PRACTICE, DELAY, M62

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> RELOAD THE M62 GRENADE.		
1	Place the washer over the fuze of the firing mechanism and push the washer until it is flush against the fuze body.		
2	Screw the new firing mechanism into the grenade ensuring that the safety clip is in place.		
3	Insert the bag of black powder into the cavity at the base of the grenade.		
4	Insert the plastic base plug into the base plug hole.		

GRENADE, HAND, FRAGMENTATION, DELAY NWM V40

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> CARRY OUT SAFETY PRECAUTIONS.		
1	Carefully open the bandolier pouch and ensure that the safety pin is in place.		
2	Examine the grenade body for cracks and damage.		

NO 80 MK 1 GRENADE

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> CARRY OUT SAFETY PRECAUTIONS.		
1	Check to ensure that the grenade is not primed. Unscrew the mechanism holder and check the detonator tube to ensure that the igniter set is not in the grenade. Replace mechanism holder.		
B	<u>COMMAND</u> PRIME THE GRENADE.		
1	Unscrew mechanism holder.		
2	Insert igniter set into detonator tube.		
3	Screw mechanism holder into the grenade.		
C	<u>COMMAND</u> UNPRIME THE GRENADE.		
1	Unscrew mechanism holder.		
2	Remove igniter set.		
3	Replace mechanism holder.		

GRENADE, HAND, SMOKE, NO 83 MK 1 (C2A1) AND GRENADE, HAND, SMOKE, C3 SERIES

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> IDENTIFY THE GRENADE HAND SMOKE NO 83 AND GRENADE, HAND, SMOKE, C3 SERIES AND DESCRIBE THE NO 83.		
1	Tin-plated body with flat bottom holder.		
2	Black mechanism holder consisting of striker, safety lever and safety pin is screwed into the top of the body.		
3	On top there are four emission holes.		
4	It is filled with blue/violet, green, red, or yellow smoke composition.		
B	<u>COMMAND</u> STATE THE DIFFERENCES BETWEEN THE GRENADE HAND SMOKE, NO 83 MK 1 (C2A1) AND THE GRENADE, HAND, SMOKE, C3 SERIES		
1	The fuze delay is seven (7) seconds instead of five (5) seconds.		
2	Colour of smoke produced by grenade is indicated by letter C marked on body of grenade beneath the nomenclature and painted in the colour of smoke produced.		

GRENADE, HAND, SMOKE, HCC1A1

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> IDENTIFY AND DESCRIBE THE GRENADE, HAND, SMOKE HCC1A1.		
1	Tin-plated body with slightly tapered base.		
2	Screwed into the top of the body is a black mechanism holder with safety lever, striker, safety pin.		
3	Has four (4) sealed emission holes on top.		
4	Colour - light green body.		
B	<u>COMMAND</u> STATE HOW GRENADES ARE PACKED.		
1	Individual metal containers.		
2	Twenty (20) of these containers to a wooden box.		

GRENADE, HAND, RIOT, CS, M7A3

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> CARRY OUT SAFETY PRECAUTIONS.		
1	Inspect and ensure that the safety pin is in position.		
2	When using, ensure that nonbelligerents will not be affected in the down wind area.		

PRINCIPLES OF THROWING GRENADES

Check	Skill to be Performed	Pass Fail	Remarks
A	<p><u>COMMAND</u> ADOPT READY POSITION.</p>		
1	Hold in right hand overhand grip.		
2	Safety lever is retained in palm of hand, between thumb and forefinger.		
3	Thumb and forefinger of left hand placed on safety clip (M61 and M67 Grenades).		
4	Grenade held against body, waist high.		
5	The body is then turned so left shoulder and foot are toward the target.		
	<p>Note: 1. A left-handed thrower will hold the grenade in his left hand with the thumb and forefinger of the right hand on the safety clip. The right shoulder and foot are toward the target.</p> <p>2. The position for the V40 Grenade is modified as shown in Figure 3-2.</p>		
B	<p><u>COMMAND</u> READY.</p>		
1	Thrower quickly rotates safety clip counter clockwise, grasps the safety ring, and then pulls the grenade away from it.		
2	Thrower glances down at the grenade to ensure that the safety pin is removed and that the safety clip is clear of safety lever.		
3.	When the thrower confirms that the grenade is safe, he looks at the target and ensures that his left shoulder is in the direction of the target.		
	<p>Note: For the V40 Grenade the actions are modified as shown in Figures 3-2.</p>		

C	<u>COMMAND</u> <u>THROW.</u>		
1	Extend left arm in direction of target.		
2	The body is swung back as far as possible allowing left arm and foot to come up naturally and without pause.		
3	The body and straight right arm are forward releasing grenade as hand reaches highest point above the shoulder.		
4	Observe the fall of the grenade.		
	Note:	In Check B and C the left handed thrower performs the drills using his left hand and right shoulder instead of left shoulder etc.	

THROWING FROM BEHIND COVER (DRY AND LIVE)

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> ADOPT THE STANDING POSITION.		
1	Adopt ready position making full use of cover.		
2	Drill for "prepare to throw" and throw as detailed in Annex A, Appendix 8.		
3	Watch grenade land then take cover.		
4	<u>STANDARD</u> Must throw a grenade into a circle 6 metres (20 ft) in diameter when standing 20 metres (65 feet) away from the centre of the circle.		
B	<u>COMMAND</u> ADOPT KNEELING POSITION.		
1	Kneel on left knee with right leg bent and right foot flat on the ground.		
2	Prepare to throw and throw as detailed in Annex A, Appendix 8.		
3	On the completion of the throw the thrower should immediately lie down without observing the fall.		
4	<u>STANDARD</u> Must throw a grenade into a circle 6 metres (20 ft) in diameter when standing 15 metres (50 ft) away from the centre of the circle.		
C	<u>COMMAND</u> ADOPT MODIFIED KNEELING POSITION.		
1	As per kneeling position except right leg is straight behind.		
2	To further lower body, thrower bends forward.		
3	<u>STANDARD</u> As in check "B" above.		
D	<u>COMMAND</u> LOB THE GRENADE.		

1	<p>Not possible to lay down rules but a few points to be noted:</p> <p>a. It may be practical to remove safety pin and clip before moving to position from where grenade is to be lobbed.</p> <p>This will NOT be done when using LIVE grenades.</p> <p>b. Select cover before delivering grenade.</p> <p>c. Deliver grenade in manner most likely to give accuracy.</p>		
2	<p><u>STANDARD</u></p> <p>Must be able to throw a grenade through an opening (window) from a distance of seven metres (22 feet)</p> <p>Note: This performance check will be done with a M62 Practice Grenade if the grenade range is not equipped with a mock window installation.</p>		

LAUNCHER GRENADE L1A2

Check	Skill to be Performed	Pass Fail	Remarks
A 1	<p><u>COMMAND</u> ASSEMBLE THE GRENADE AND ADAPTER.</p> <p>Assemble grenade with adapter in following manner:</p> <p>a. While holding the adapter, with claws up, place the adapter on a flat horizontal surface and turn it so that the longest claw faces outwards.</p> <p>b. Take the grenade and slip the striker lever into the arming clip.</p> <p>c. Keep the grenade on a slight angle, clip towards the body, and push down on the grenade as well as pushing it slightly away from the body until the two claws facing the body engage the seams of the grenade. It may be necessary to engage the claws individually.</p> <p>d. Adjust the grenade until it is completely upright in the adapter and ensure that -</p> <p>(1) the base of grenade is fully seated against the base of the cup,</p> <p>(2) each claw holds the grenade tightly above the seam of the grenade,</p> <p>(3) the end of the safety lever is securely hooked under the T-lug of the fuze body, and</p> <p>(4) no damage has occurred to grenade or the adapter (pay particular attention to the arming clip retainer).</p>		
B 1	<p><u>COMMAND</u> PREPARE THE RIFLE.</p> <p>The following procedure must be adhered to when preparing the rifle:</p> <p>a. Reverse the gas plug.</p> <p>b. Attach the grenade launcher to the rifle. Ensure it is attached firmly.</p> <p>c. Remove the magazine from the rifle, cock rifle, engage the holding open device, and ensure that the breech is clear.</p> <p>d. Grasp the rifle with one hand. Ensure that the</p>		

	<p>hand is under the magazine housing to catch the round should it be dropped while being inserted into breech.</p> <p>e. Using the free hand, insert a round into the breech and allow the action to go forward by pressing the holding open device.</p> <p>f. Place the change lever on "Safe."</p>		
C	<p><u>COMMAND</u> PREPARE THE GRENADE.</p>		
1	<p>The grenade is prepared in the following manner:</p> <p>a. Take the grenade in the normal throwing hand and hold it in a normal throwing grasp.</p> <p>b. Make a final visual check of the grenade to ensure that the arming clip and arming clip retainer are intact.</p> <p>c. Pull the grenade safety pin being careful not to disturb the adapter. The pressure of the lever forced up by the arming clip retainer may make extraction difficult. It is important that the pull be absolutely straight, as any twisting motion may result in the pin being jammed in the grenade.</p> <p>d. Maintain pressure on the safety lever while giving the grenade a quick visual check. Gradually release the pressure on the safety lever and inspect it again, paying particular attention to the arming clip and the arming clip retainer. The safety clip remains in place.</p>		
D	<p><u>COMMAND</u> FIRE.</p>		
1	<p>The procedure listed below must be adhered to prior to firing the rifle and launching the grenade:</p> <p>a. Take the adapter and grenade in the normal throwing hand and place them on the launcher keeping the safety lever to the left.</p> <p>b. Push the adapter fully home.</p> <p>c. Carefully inspect the grenade to ensure that the arming clip and retainer are intact.</p> <p>d. Rotate the safety clip with right thumb.</p> <p>e. Move the change lever to "R", Cheek Skill to be Performed</p> <p>Pass Remarks Fail</p>		

	<p>f. Aim and fire the rifle.</p> <p>Note: Ensure that the safety lever is to the left. If it is upwards the safety lever interferes with the sight picture. When the safety lever is to the left, the safety clip can be removed with a simple movement of the right thumb.</p>		
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PYROTECHNICS

Check	Skill to be Performed	Pass Fail	Remarks
A	<p><u>COMMAND</u> FIRE THE FLARE, PARACHUTE, HAND FIRED, C3.</p> <p>1 Remove both end caps.</p> <p>2 With the arm outstretched, hold the flare at an angle away from the body.</p> <p>3 Hold the firing cord at an angle to the flare to avoid back blast.</p> <p>4 Fire by pulling the cord.</p>		
B	<p><u>COMMAND</u> EXPLAIN THE THREE TYPES OF MALFUNCTIONS AND THE ACTION YOU WOULD TAKE WITH EACH.</p> <p>1 <u>Misfire</u>. The rocket type projectile does not leave the tube and the flare is intact:</p> <p>a. Place the flare on the ground ensuring that neither end is pointing toward a person or object.</p> <p>b. Detonate with a 225 g (8 oz) charge.</p> <p>2 <u>Dud No 1</u>. The projectile is ejected from the tube but the candle fails to eject and the whole falls as a unit.</p> <p>a. Place a 110 g (4 oz) charge well forward of the junction of the body</p> <p>b. Detonate.</p> <p>3 <u>Dud No 2</u>. The projectile is ejected from the tube and the candle separates but fails to ignite.</p> <p>a. Place a 110 g (4 oz) charge well</p>		<p>Qualified personnel only</p> <p>Qualified personnel only</p> <p>Qualified</p>

	<p>forward against the body.</p> <p>b. Detonate.</p>	<p>personnel only</p>
C	<p><u>COMMAND</u> IGNITE AND THROW THE THUNDERFLASH.</p>	
1	<p>Hold the Thunderflash by the handle which is the portion of the Thunderflash marked "Hold Here While Igniting".</p>	
2	<p>Tear off the sealing tape and remove the cap.</p>	
3	<p>Rub the igniter sharply across the striker composition surface thus lighting the igniter.</p>	
4	<p>Throw immediately.</p>	
D	<p><u>COMMAND</u> IGNITE AND THROW THE SIMULATOR, PROJECTILE, GROUND BURST, C1 SERIES.</p>	
1	<p>Remove the safety clip from the fuze lighter and pull off the cap to free the cord.</p>	
2	<p>Pull the cord sharply.</p>	
3	<p>Throw immediately.</p>	
E	<p><u>COMMAND</u> LOAD AND FIRE THE PROJECTOR PYROTECHNIC HAND C1.</p>	
1	<p>Unlock the projector.</p>	
2	<p>Insert the signal into the barrel.</p>	
3	<p>Lock the projector.</p>	
4	<p>Rotate the safety catch to the release position.</p>	
5	<p>Hold the projector at arms length vertical to ground.</p>	
6	<p>Pull the striker to its fullest extent and release.</p>	
7	<p>Remove the expended signal.</p>	

FLARE, SURFACE, TRIP, PARACHUTE, M48

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> DEPLOY THE FLARE.		
1	Use local materials to deploy the flare.		
2	Before handling the flare ensure that: <ul style="list-style-type: none"> a. the firing pin safety pin is in position; b. the release safety pin is in position; and c. the joints in the flare housing are tight. 		
3	Place the flare in the hole so that the top of projectile is three (3) inches below ground level.		
4	Attach the trip wire to the stake and run it to the flare.		
5	Attach the loose trip wire to the pull ring.		
6	Arrange the cord of the firing pin safety pin so it will not be buried when the flare is buried.		
7	Straighten the firing pin so that it can be removed by pulling the cord.		
8	Remove the release pin safety pin.		
9	Test the firing pin safety pin to ensure it does not bind. If it does, the trip wire is either too tight or the fuze is defective. In either case replace the release safety pin and correct the defect by loosening the trip wire or by replacing the fuze.		
10	If the firing pin safety pin moves freely, leave it in place and cover the projectile with loose earth to the original ground level. Camouflage if necessary.		
B	<u>COMMAND</u> ARM THE FLARE.		
1	Withdraw the firing pin safety pin by gently		

	pulling the unburied end of its cord.		
2	Give the firing pin and release safety pins to an officer who must retain them along with a trip flare location diagram.		
C	<u>COMMAND</u>		
	REMOVE THE FLARE.		
1	This is done in reverse order to laying.		

FLARE, SURFACE, TRIP, M49A1

Check	Skill to be Performed	Pass Fail	Remarks
A	<u>COMMAND</u> INSTALL THE FLARE BY NAILING.		
1	Loosen the wing nuts on the brackets and remove the flare.		
2	Place the flare in a safe location until ready to use.		
3	Mount the bracket using two of the nails provided. The bracket must be as vertical as possible and 38 to 45 cm (15 to 18 in) above ground.		
4	Mount the flare by aligning the lever with the trigger pivot and slide the flare downward into its bracket until the bottom edge is 4.7 mm (1/16 in) above the bracket. This distance must be maintained to prevent the lever from slipping out of the trigger when the safety clip is removed.		
5	Clamp the flare in the bracket by tightening the top wing nut.		
B	<u>COMMAND</u> ARM USING METHOD NO 1		
1	Fasten one end of trip wire to a stake or rigid object about 12 metres (40 feet) to the right when facing trigger and at right angles to axis of trigger.		
2	Press the lever down against the flare body with one hand and with other hand rotate the trigger one-quarter turn counter-clockwise to a vertical position so that the lower end of the lever is behind the tongue of the trigger.		
3	Pull the loose end of the trip wire taut and fasten it to the hole on the lower end of the trigger.		
4	At this point ensure that the trip wire is taut and fastened at both ends with the trigger in a vertical position and with the end of the lever behind the		

	tongue of the trigger. Thus when the safety clip is removed the lever will still be held by the trigger.		
5	Hold the lever with one hand and remove safety clip assembly.		
6	Very carefully release the hold on the lever ensuring that the lever will be held by the tongue of the trigger.		

SMOKE POTS

Check	Skill to be Performed	Pass Fail	Remarks
A	<p><u>COMMAND</u> INITIATE THE SMOKE POT, GROUND TYPE NO 24, MK 2.</p> <p>1 Remove the cap.</p> <p>2 Tear off the seal.</p> <p>3 Light the prime cotton disc with a fusee match.</p> <p>Note: Fusee matches are not part of smoke pot and must be indented for separately at scale of 1 box per four (4) smoke pots or any part of four.</p>		
B	<p><u>COMMAND</u> INITIATE THE SMOKE POT, GROUND TYPE, ORANGE, SC-41.</p> <p>1 Remove the lid and igniter cover.</p> <p>2 Draw the igniter sharply across the match head composition.</p>		
C	<p><u>COMMAND</u> STATE THE SAFETY PRECAUTIONS TO BE USED WITH THE SMOKE POT, GROUND TYPE, ORANGE, SC-41.</p> <p>1 After ignition personnel will maintain a 6 metre (20 foot) safety distance from the smoke pot as it might explode and scatter burning fragments.</p>		