# CHAPTER 2

# MECHANICAL TRAINING

## Section I. FIRE CONTROL EQUIPMENT

### 4. General

In order to keep the M67 operating effectively, all crew members must know the following:

*a.* Disassembly and assembly of the weapon to the extent authorized.

*b.* Common causes of stoppages.

*c.* Immediate actions to clear the weapon.

*d.* Maintenance procedures.

### 5. Direct Fire Sight—Telescope, M103

The 90mm rifle is equipped with the M103 sight for direct fire. There is no provision for an indirect fire sight since this weapon is not designed for an indirect fire role.

*a.* The M103 telescope has a fixed-focus, 3-power magnification, and a field of view of 10° (fig. 3).

*b.* The reticle is an optical glass disc with an 0.749-inch aperture etched with a metric scale. It is graduated at 50-meter intervals at ranges up to 800 meters, and numbered every 100 meters up to 800 meters. Lead lines are provided at 50-meter intervals up to 400 meters and at 100-meter intervals between 400 and 800 meters. The top vertical line is extended through the 0 line to forma boresight cross. Lead lines and spaces, each representing 5 mils, are provided horizontally for 30 mils on either side of the vertical centerline. Sixty l-mil spaces along the 800-meter range line and twelve l-mil spaces along the vertical axis are provided for small adjustments to the line of fire. Stadia lines are provided for ranging on targets having a 10- or 20-foot dimension. A level vial at the bottom of the reticle provides a zero cant reference for the telescope so that it may be kept level (fig. 3).

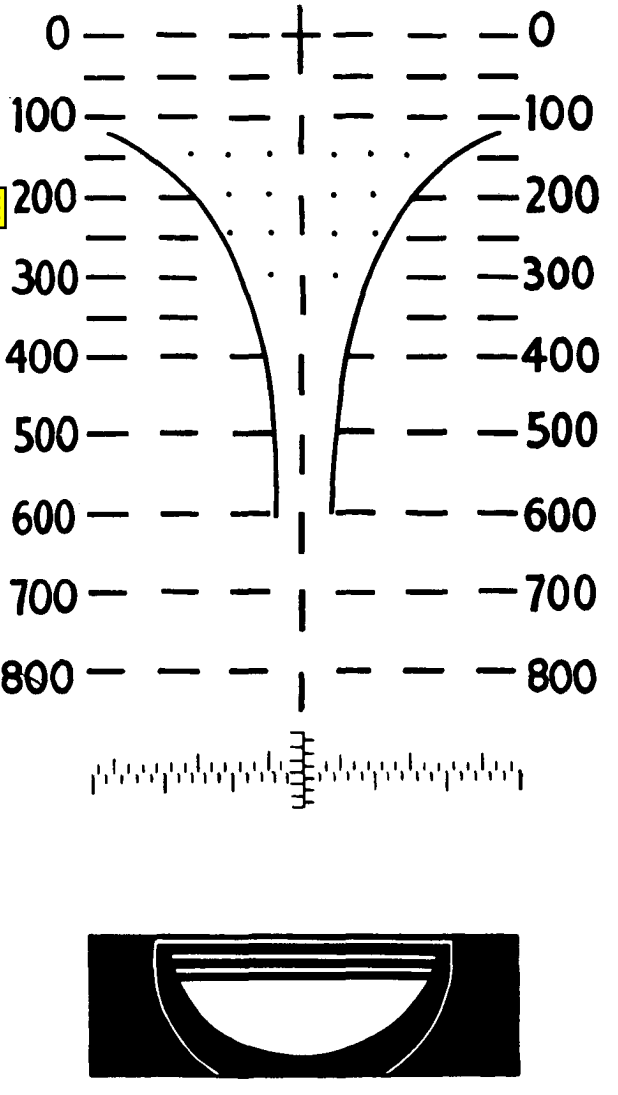



*Figure 3. Sight recticle, M103 sight.*

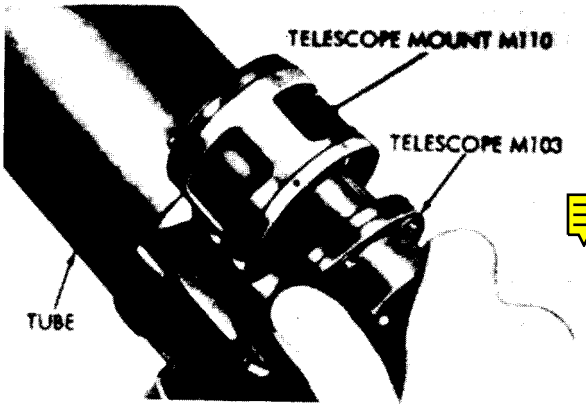



*Figure 4. M110 mount for telescope.*

*c.* A circular red glass window is provided in the wall of the telescope housing, adjacent to the reticle, to enable both the reticle and level vial to be illuminated. The red glass permits illumination with a minimum loss of target contrast.

### 6. Telescope Mount, M110

The telescope mount, M110, (fig. 4) holds the telescope, M103, to the weapon. The telescope mount is designed so the telescope can be inserted and seated rapidly and with assured replacement accuracy. The mount also features screws which enable boresight adjustment of the telescope with respect to the weapon in azimuth and in elevation. The telescope mount, M110, fits in the front bracket assembly.

### 7. Instrument, Light, T25

The sight reticle of the M103 telescope can be illuminated (fig. 5). A dovetail slot on the telescope receives the lamp bracket of the instrument light. The instrument light is powered through a lead wire by two BA42 flashlight batteries in the battery case. A rheostat knob on the end of the battery case turns the light on and off and controls the amount of illumination of the sight reticle.

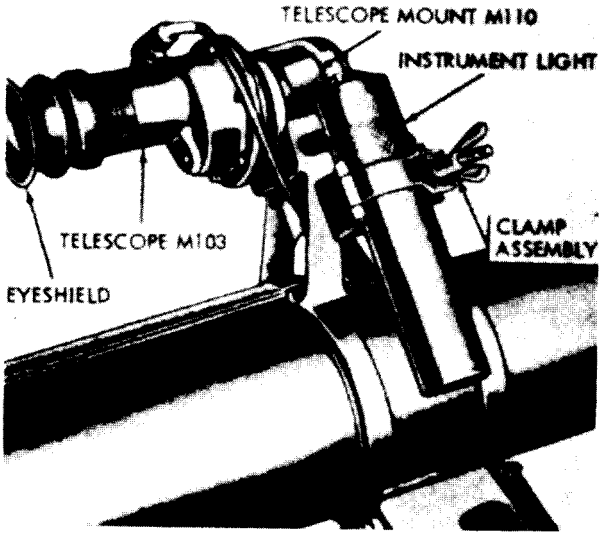



*Figure 5. Instrument light, T25.*

## Section II. DISASSEMBLY, ASSEMBLY, AND OPERATION

### 8. Disassembly of the Breech anf Hinge Mechanism

*a. General.* Operator and organizational maintenance of the breech and hinge mechanisms is limited to operations covered herein; for all other maintenance, notify maintenance personnel.

*b. Breech and Hinge Mechanism Components.*

(1) *Disassembly.*

*(a)* Make sure the weapon is clear and not cocked.

*(b)* With the breechblock in the closed and locked position unscrew the firing pin cap (1, fig. 6) and remove it and the firing pin spring (2, fig. 6 and fig. 7).

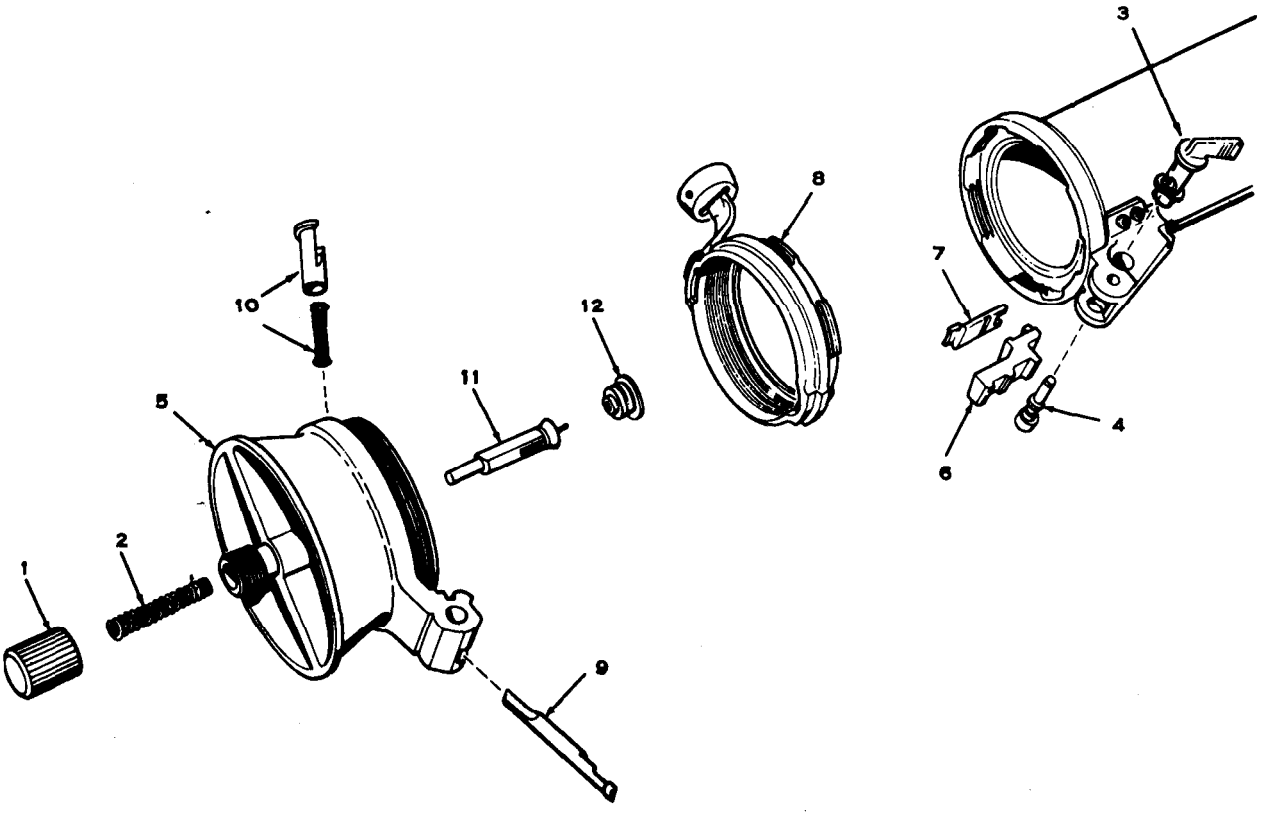
*(c)* Rotate the safety (3, fig. 6) 45 degrees clockwise from the FIRE posit ion; pull up and remove (fig. 8). The hinge block end of the cable assembly is now free.

*(d)* Pull the hinge block end of the cable assembly forward and remove it from the hinge block (fig. 9).

*(e)* Unlock and open the breechblock. Push downward on the hinge pin (4, fig. 6) and remove (fig. 10).

*(f)* Remove the extractor link (6, fig. 6) and the extractor (7, fig. 6).

*(g)* To prevent the sear from dropping down and blocking the lockring, hold the breechblock with the hinge portion up; depress the detent plunger (10, fig. 6), rotate the lockring (8, fig. 6) counterclockwise, and remove (fig. 11).




1 - FIRING PIN CAP
2 - FIRING PIN SPRING
3 - RECOILLESS RIFLE SAFETY
4 - HINGE PIN
5 - BREECHBLOCK
6 - EXTRACTOR LINK
7 - EXTRACTOR
8 - LOCKRING
9 - SEAR
10 - DETENT PLUNGER AND SPRING
11 - FIRING HAMMER
12 - HAMMER BUSHING

***Figure 6. Breech and hinge mechanism, exploded view.***

*(h)* Turn the breechblock over and remove the sear (9, fig. 6 and fig. 12).

*(i)* Remove detent plunger and spring (10, fig. 6 and fig. 13).

*(j)* Insert the small end of the hinge pin into the rearward end of the breechblock housing and tap the firing hammer (11, fig. 6) and hammer bushing (12, fig. 6) forward until free of the breechblock housing. Remove the firing hammer and hammer bushing from the front of the breechblock housing.

(2) *Assembly.*

*(a)* Holding the breechblock with the hinge portion up, install the firing hammer (11, fig. 6) and hammer bushing (12, fig. 6).

*(a)* Replace the sear (9, fig. 6).

*(c)* Replace the detent plunger and spring (10, fig. 6).

*(d)* While holding the breechblock with the hinge portion up, depress the detent plunger and install the lockring (8, fig. 6), turning it clockwise until tight; then turn counterclockwise until two distinct clicks are heard.

*(e)* Install the extractor (7, fig. 6) and the extractor link (6, fig. 6).

*(f)* With the extractor link in its full extract position, install the breechblock, making sure that the hinge portion of the breechblock enters the opening in the hinge block and engages the recess in the extractor link.

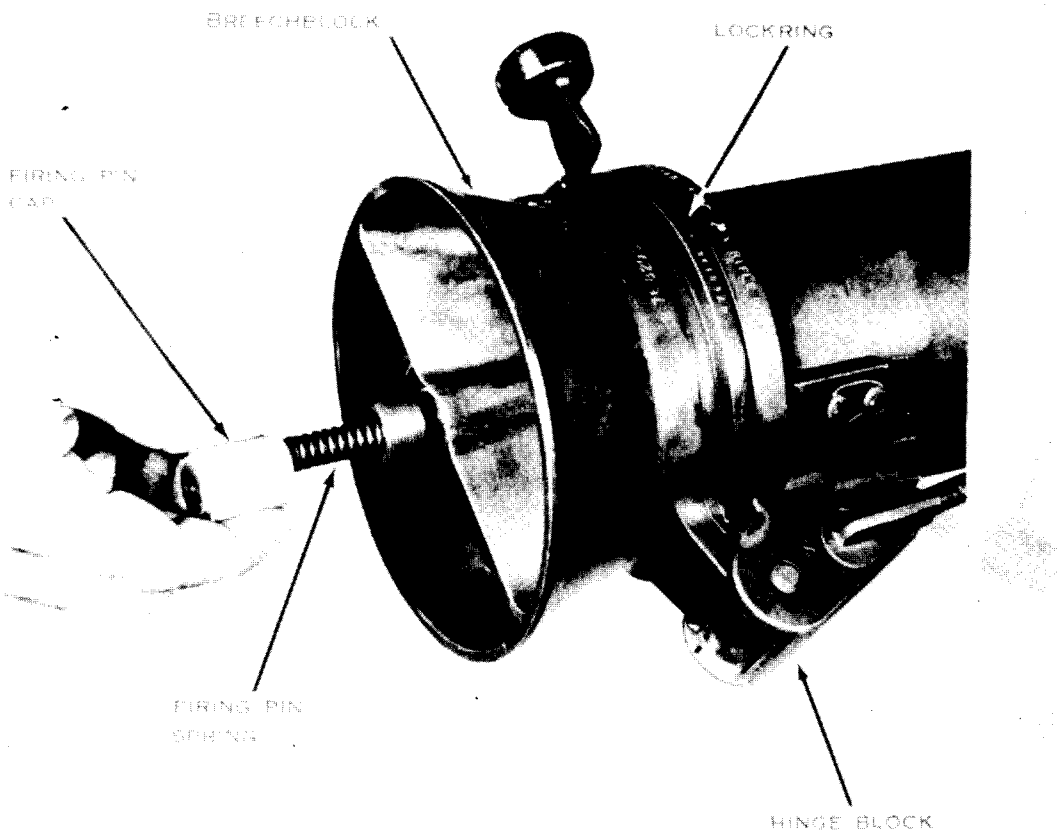



***Figure 7. Removing and installing the firing pin cap and firing pin spring.***

*(g)* Aline the hinge pin holes in the breechblock and hinge block, then install the hinge pin (4, fig. 6).

*(h)* Install the cable assembly in the hinge block with the notched portion that will mate with the safety facing away from the rifle tube.

*(i)* Position the recoilless rifle safety 45 degrees clockwise from the FIRE position, push downward, and rot ate it clockwise to the FIRE position.

*(j)* Install the firing pin spring and firing pin cap.

## 9. Principle of Recoilless Operation

The recoilless principle is based on the escape of a portion of the propellant gases to the rear of the weapon. The escape of these gases is controlled no movement of the weapon occurs (fig. 14).

## 10. Mechanical Functioning

*a.* In order to keep the 90mm rifle operating effectively, all crew members must understand the principles of operation and functioning of the weapon and its various parts.

*b.* Mechanical functioning is divided into three classes:

(1) Opening the breech.
(2) Closing the breech.
(3) Firing the piece.

*c.* Discussion of functioning may start with any of the three phases. Assuming that a cartridge has been fired, phases then occur as shown in *b* above. This represents one complete cycle of functioning.

*d. Opening the Breech.*

(1) *Unlocking.* As the lockring (8, fig. 6) is rotated clockwise to unlock the breechblock (5, fig. 6), a cam surface on the

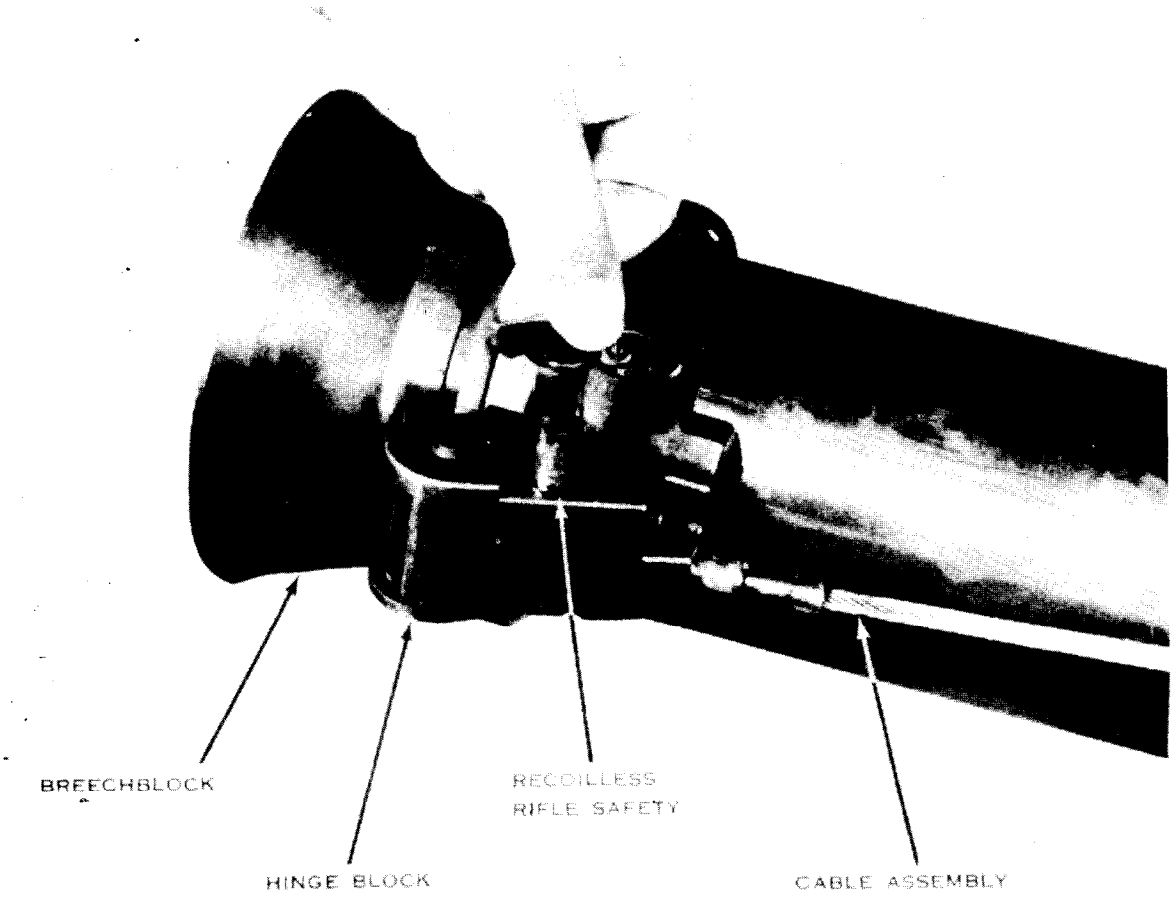



***Figure 8. Removing and installing the safety mechanism.***

interior of the lockring (8, fig. 6) comes in contact with the sear (9, fig. 6) and moves it inward. The cam surface exerts pressure against the firing hammer (11, fig. 6), forcing the firing hammer and firing pin spring (2, fig. 6) rearward. As the lockring (8, fig. 6) is further rotated clockwise, it is arrested by the detent plunger (10, fig. 6) and at this point the breechblock (5, fig. 6) is unlocked.

(2) *Cocking.* The weapon is normally cocked by opening the breechblock; however, the weapon may be cocked without opening the breechblock. This is accomplished by rotating the lockring to the unlocked position and then rotating it back to the locked position without opening the breechblock. When the lockring is rotated to the unlocked position and the breechblock is swung to the open position, it pivots on the hinge pin (4, fig. 6). A tooth on the inner hinge portion of the breechblock engaged in a recess on the extractor link (6, fig. 6) cams the extractor link and extractor (7, fig. 6) rearward out of the chamber.

*e. Closing the Breech.* As the breechblock is swung to the closed position, the tooth on the inner hinge portion of the breechblock retracts the extractor link (6, fig, 6) and extractor (7, fig. 6) into the chambers. As the lockring is rotated counterclockwise to the locked position, the cam

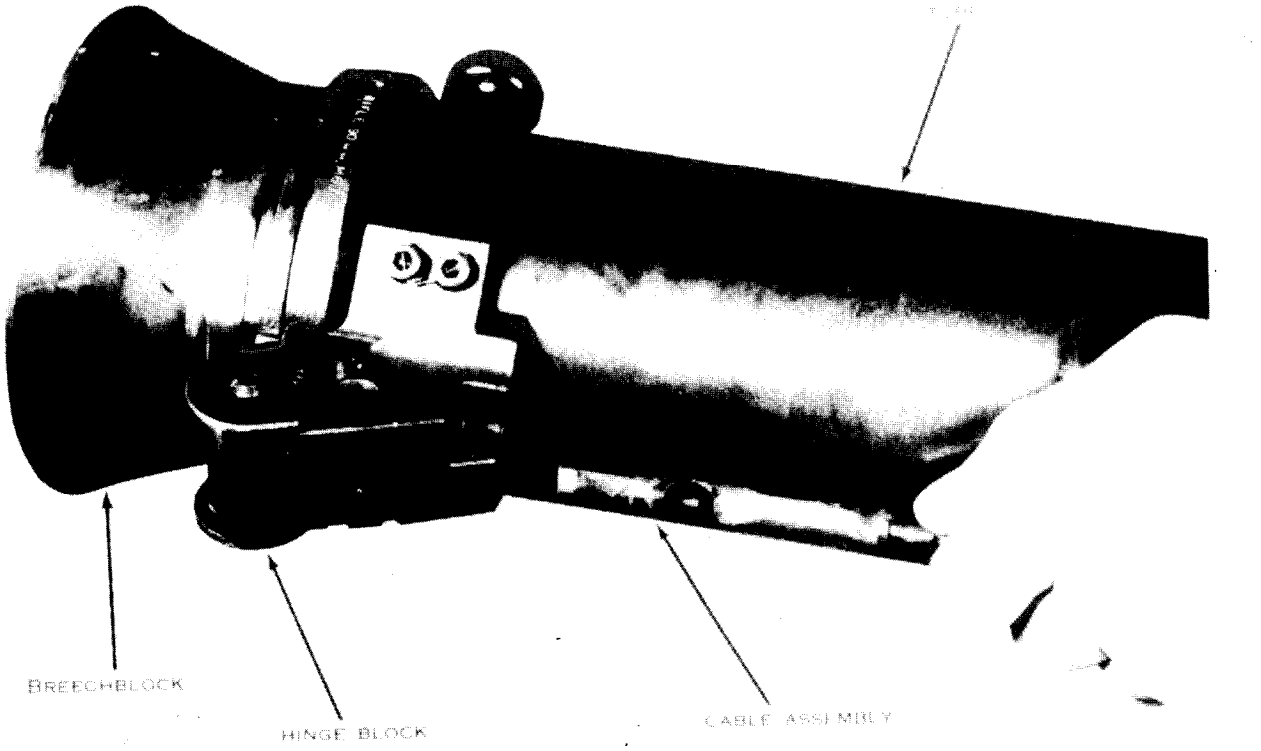



***Figure 9. Removing and installing the cable assembly.***

surface on the interior of the lockring allows the sear (9, fig. 6) to move outward and become engaged with the hinge block end of the cable assembly.

*f. Firing the Piece.* When the breechblock is swung to the open position the recoilless rifle safety automatically positions itself to the safe position. To fire the weapon the safety must be rotated from the SAFE to the FIRE position. When the trigger safety is depressed the trigger assembly is unlocked. As the trigger assembly is squeezed pressure is applied to the bottom of the cable actuating lever which pivots on the spring pin and imparts a pull on the cable assembly. As the cable assembly moves forward, the hinge block end oft he cable assembly releases the sear allowing it to move forward under pressure from the firing pin spring. As the firing hammer is released, the firing pin spring propels the firing pin against the primer, firing the projectile.

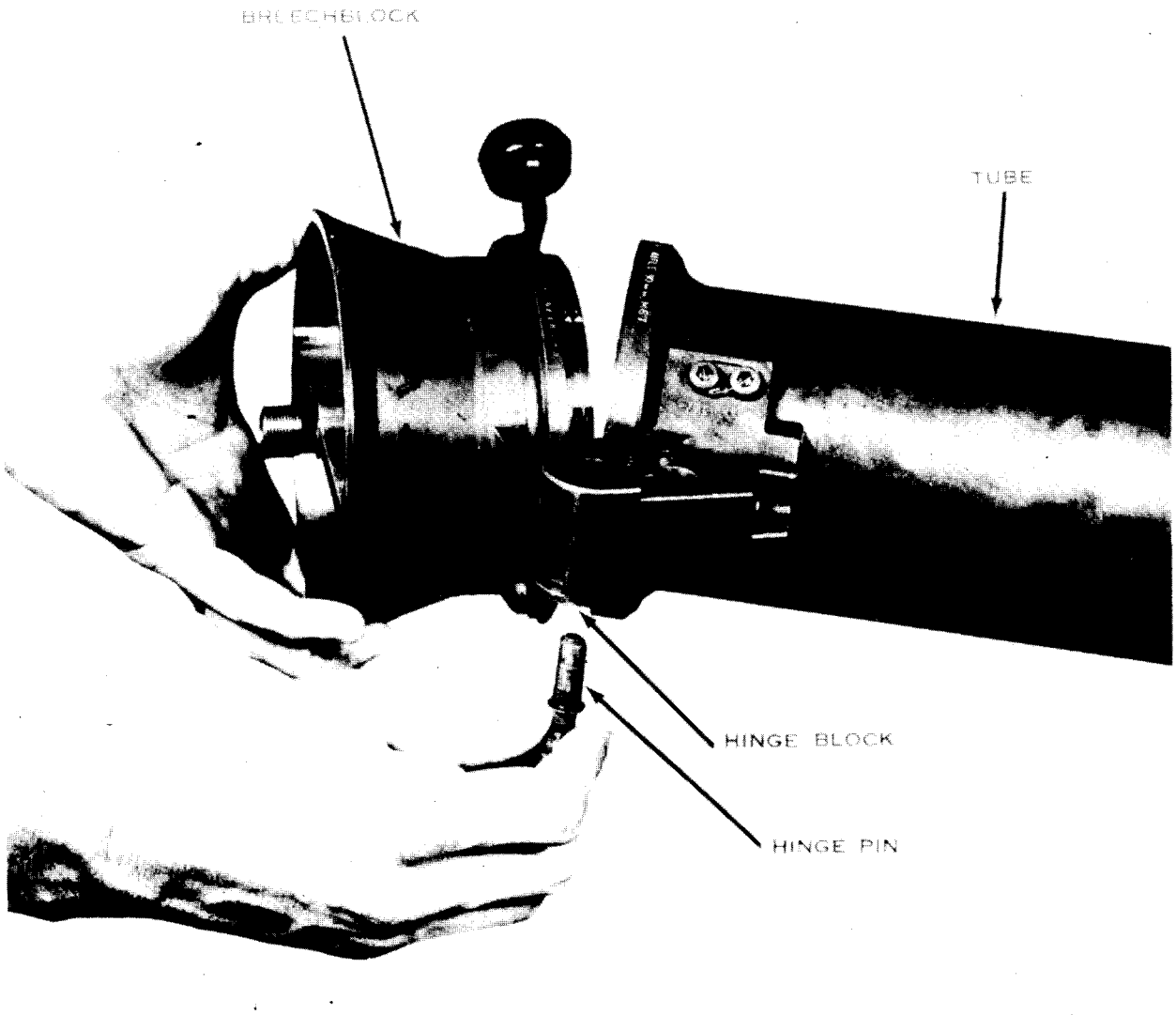



*Figure 10. Removing and installing the hinge pin.*

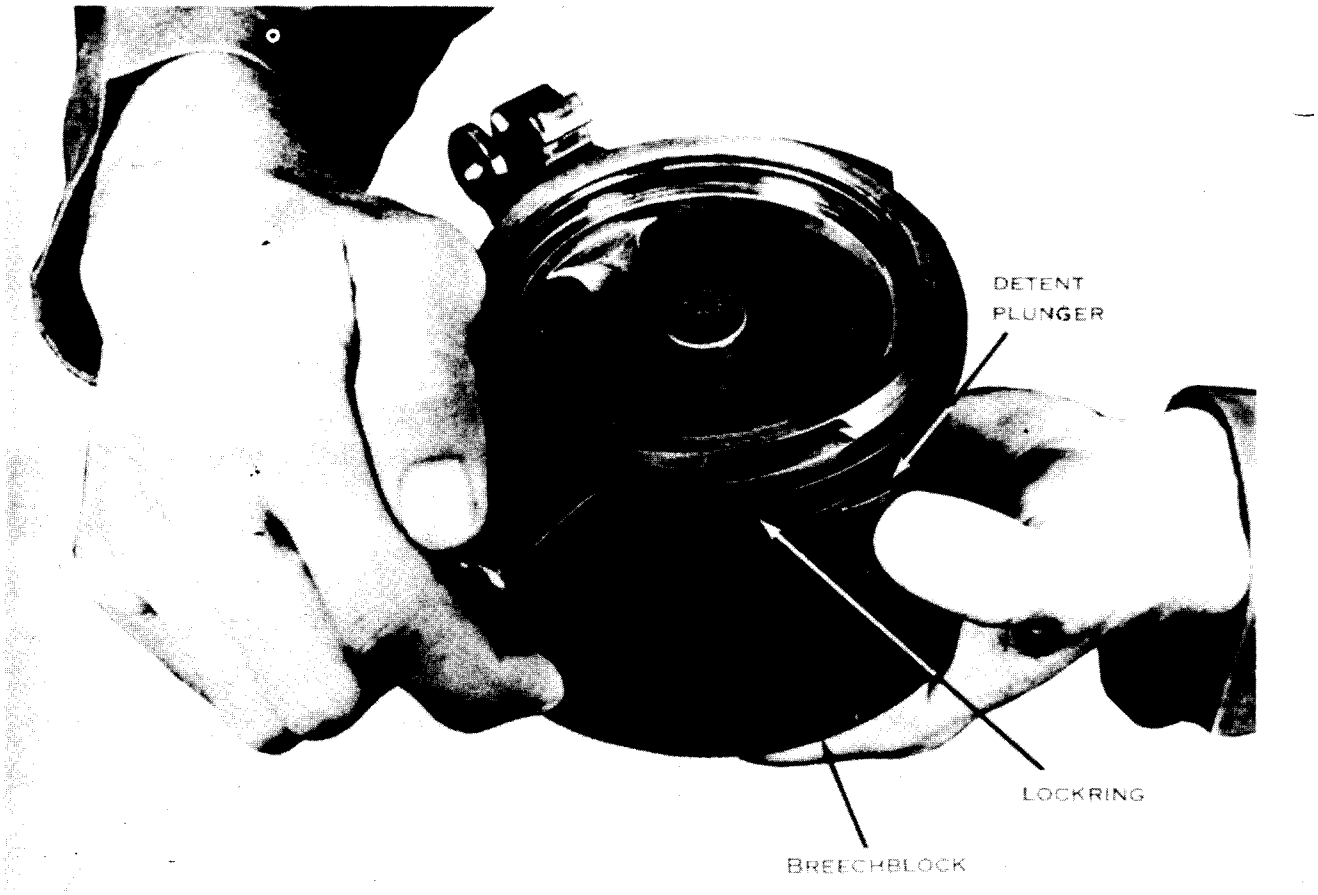



*Figure 11. Removing the lockring.*

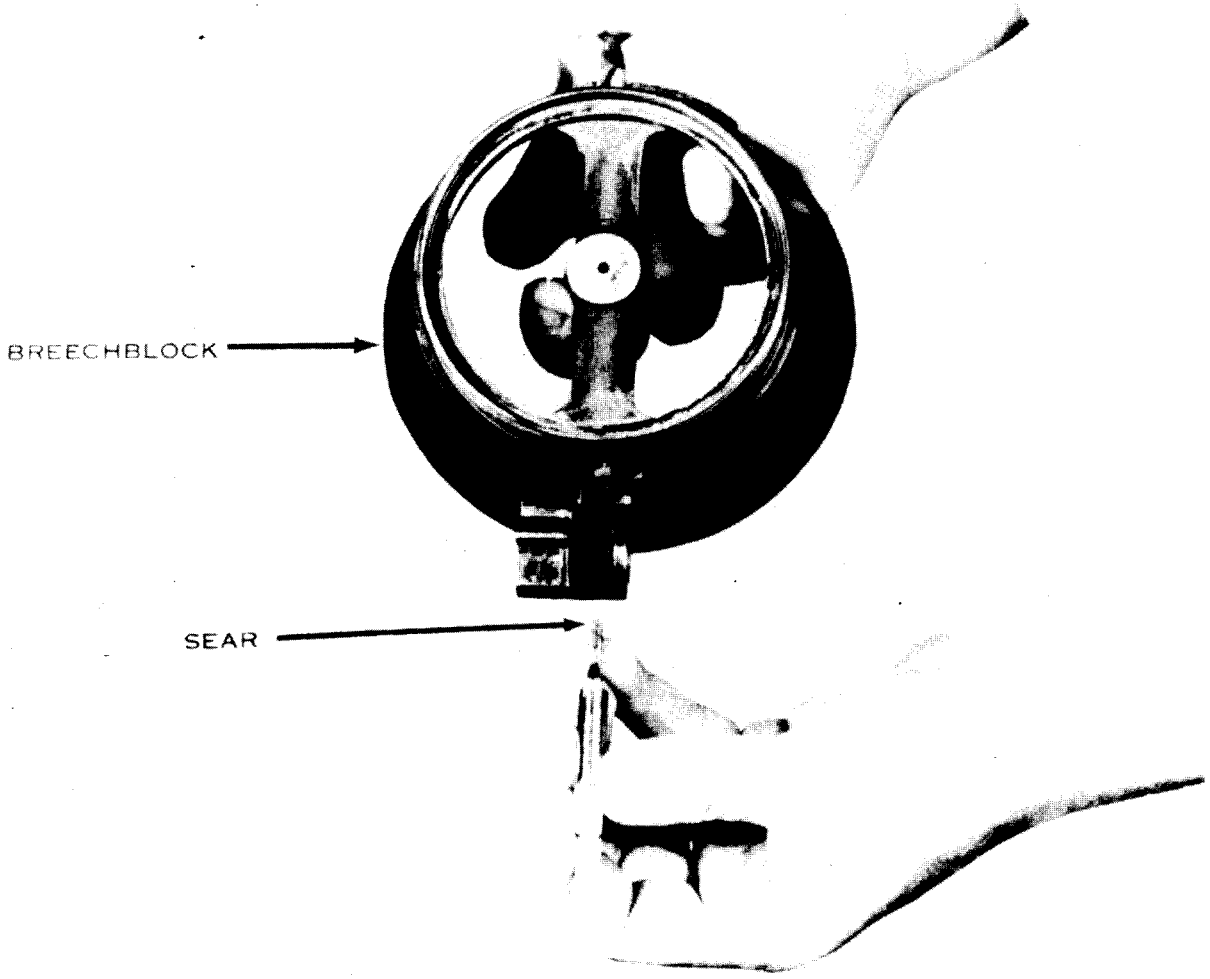



*Figure 12. Removing the sear.*

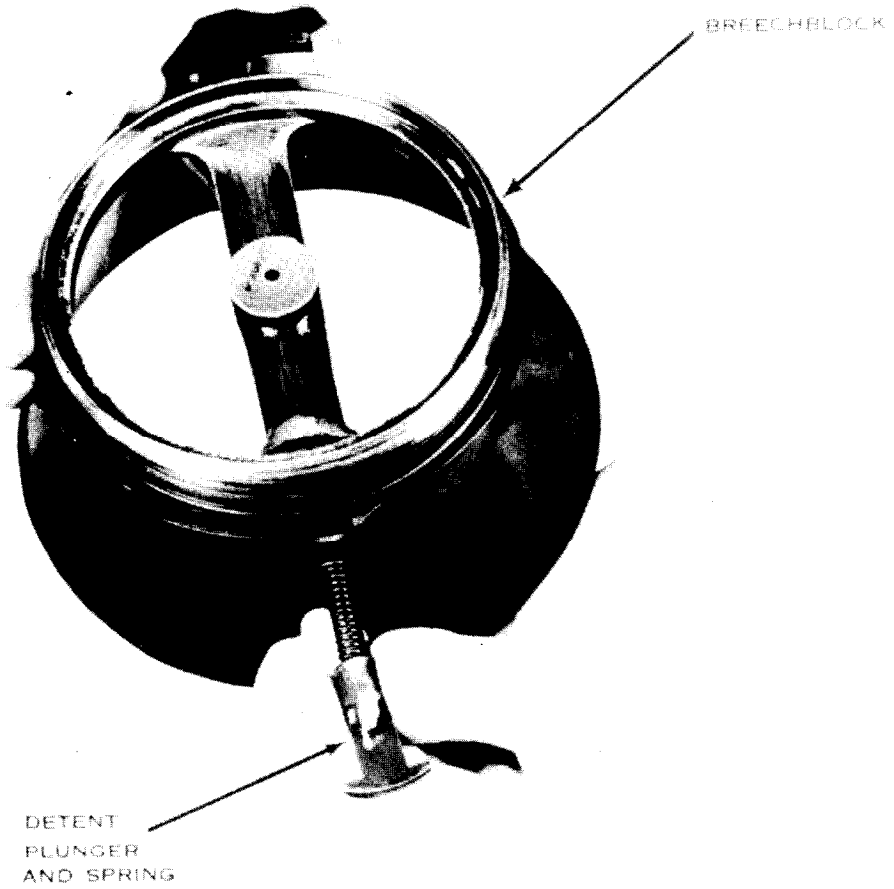



*Figure 13. Removing the detent plunger and spring.*

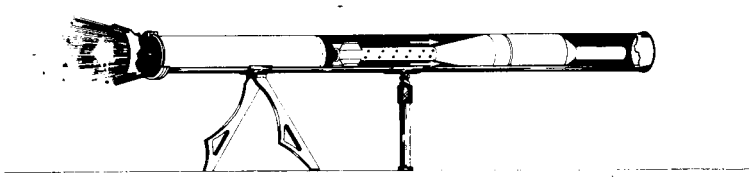


*Figure 14. Action of the gases.*

## Section III. MALFUNCTIONS, STOPPAGES, AND IMMEDIATE ACTION

### 11. Malfunctions and Restoration of Balance

When a recoilless weapon functions properly, it does not move when fired. The forces acting on the rifle neutralize each other and the rifle is balanced. If there is a major movement (either forward or rearward) when the rifle is fired, it must be sent to maintenance for restoration of balance.

### 12. Terms

*a.* A *stoppage* is an unintentional interruption of the cycle of operation.

*b. Immediate action* is the unhesitating application of a probable remedy to reduce a stoppage without considering the cause of the stoppage.

### 13. Stoppages

Prevention is the best solution to all stoppages. When the crew completely understands the operation of the weapon and applies normal care and frequent cleaning, the most common types of stoppages seldom occur. By making frequent checks and inspections, the crew insures the detection of worn or broken parts. Some of the more common stoppages causing the 90mm rifle to function improperly are:

*a. Failure to Fire.* This stoppage may be caused by—

(1) Defective primer of the ammunition.
(2) Weak or broken firing pin spring.
(3) Broken or deformed firing pin.
(4) Accumulation of carbon in the firing mechanism.
(5) Broken or maladjusted firing cable.
(6) Failure of breechblock to lock.

*b. Failure to Cock.* This stoppage may be caused by—

(1) Broken or damaged sear or sear catch.
(2) Broken or damaged cable assembly.

*c. Failure to Extract.* This stoppage may be caused by—

(1) Broken or damaged extractor.
(2) Broken or damaged link assembly.
(3) Deformed cartridge case.
(4) Broken or damaged tooth on breechblock hinge.

*d. Failure to Load.* This stoppage may be caused by—

(1) Damaged or deformed rotating band.
(2) Deformed or oversized round.
(3) Dirt, unburned propellant, or pieces of the cartridge case liner accumulated in the lands and grooves near the chamber.

### 14. Immediate Action

*a.* When the rifle fails to fire, the gunner releases pressure on the trigger and calls MISFIRE. The loader repeats MISFIRE, and waits 1 minute. Then the loader unlocks and locks the breech and calls UP. The gunner attempts to fire.

*b.* Should the rifle still fail to fire, the gunner releases pressure on the trigger and calls MISFIRE. The loader repeats MISFIRE, and again waits 1 minute. Then the loader opens the breech and unloads, being careful to catch the round as it is extracted. **If the rifle has been fired continuously for a considerable length of time before a misfire occurs, it becomes hot. This might cause the propellent charge to ignite by cookoff. If the rifle is hot, cool with water before removing the cartridge. If water is not available, all personnel will leave their positions until the rifle has cooled** (training only).

### 15. Reduction of Stoppages

If the rifle has misfired a second time and immediate action procedures fail to reduce the stoppages, it is necessary to apply additional measures.

*a.* After unloading the cartridge and placing it in a safe area, the gunner and loader should consider the following questions in determining the cause of the stoppage:

(1) What type of stoppage is this?
(2) What causes this type of stoppage?
(3) What parts have failed to function?

*b.* After determining the cause, corrective action is taken.

## Section IV. SPARE PARTS AND ACCESSORIES

### 16. Spare Parts

Each using unit is provided with a set of spare parts for the 90 mm rifle. These are issued as field replacements for those parts most likely to become worn, broken, or otherwise unserviceable. Requisition parts to keep the set complete. Components of the set are listed in TM 9–1015–223–12.

### 17. Equipment

*a.* Tools and material necessary for authorized disassembly, assembly, and maintenance of the rifle are issued with it. Covers and tool rolls are also issued with the rifle. Use these items for prescribed purposes only. This equipment is listed in TM 9-1015-223-12.

*b.* All new 90mm rifles are equipped with a sound suppressor ring. The purpose of this sound suppressor is to eliminate the telltale ring which is heard when the weapon is hit by a solid object.

## Section V. AMMUNITION

### 18. General Description

Ammunition for the 90mm rifle is issued in complete fixed cartridges. The term "fixed" means that the projectile and the cartridge case are crimped together. This insures correct alinement of the projectile and the cartridge case. It also permits faster loading because the projectile and the cartridge case are loaded as one unit. The rear end of the cartridge case is made of frangible material that is completely destroyed when fired.

### 19. Care, Handling, and Preservation

Complete rounds are packed individually in moistureproof fiber containers and sealed with tape. Two rounds in containers are packed in a wooden box and weigh approximately 47 pounds. This packaging is designed to withstand normal field use. Since moisture and heat adversely affect ammunition, observe the following precautions:

*a.* Do not take the sealing tape off the fiber container until the ammunition is to be fired.

*b.* Protect the ammunition from high temperatures and from direct rays of the sun. **Do not disassemble any part of the round.**

*c.* Return all unfired rounds to their original containers and mark them. Fire these rounds first in subsequent firing.

*d.* **Never handle duds** If a projectile is fired and fails to explode, the fuze may be armed. Any movement of the projectile may cause it to explode. In training areas, dud locations are marked and reported to the range officer for destruction.

### 20. Classification

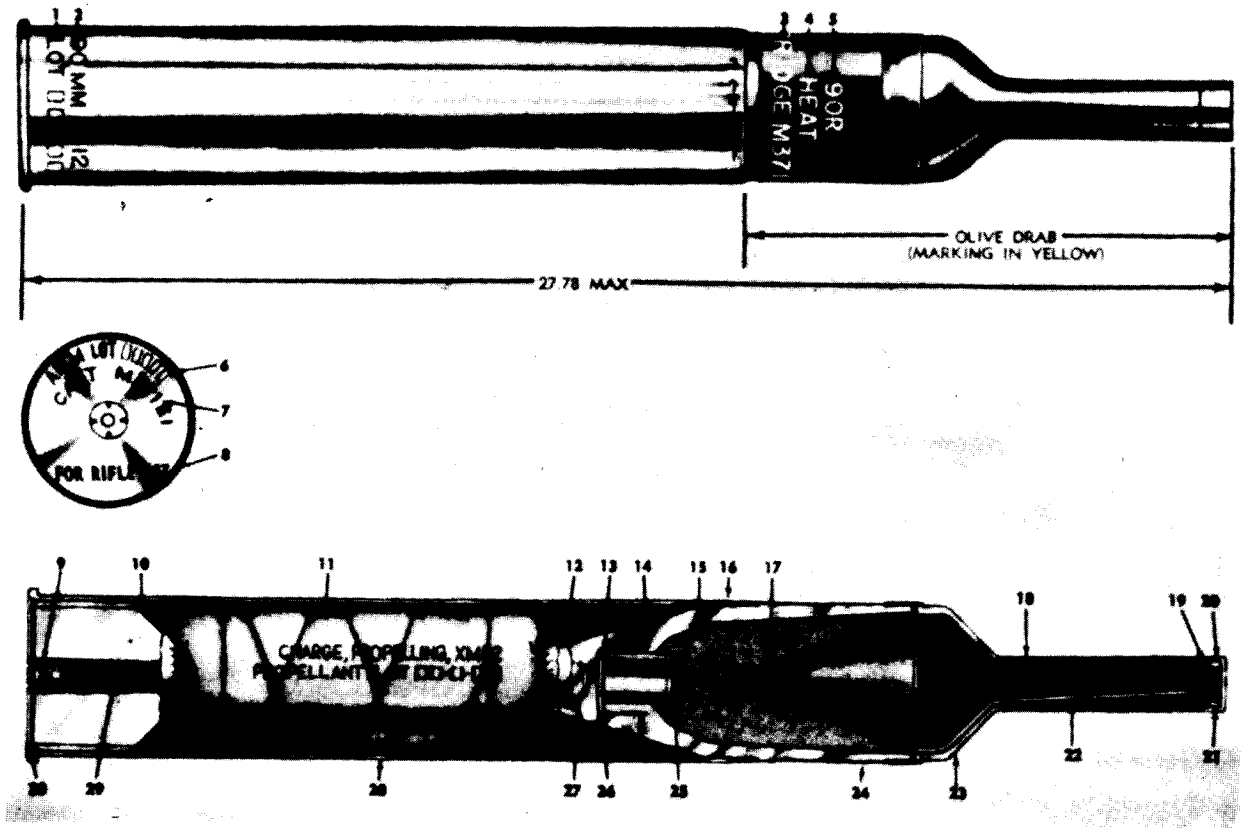
There-are two authorized rounds for the 90mm recoilless rifle, M67. These are TP M371 and HEAT M371E1. The target practice (TP) round is not standard, but it is available for issue in certain areas. It is ballistically identical to the high explosive antitank (HEAT) round but contains only a small spotting charge as the projectile filler.

### 21. High Explosive, Antitank, M371El

*a.* The high explosive, antitank round (fig. 15) utilizes a special fin-stabilized projectile which employs the shaped-charge principle to defeat armor. It does not depend upon velocity at the moment of impact for its effect. It relies upon a concentration of the effect of the explosive filler through its shape. The conical shape of the filler concentrates the force of the explosion into a hot jet that blows its way through the armor. The shape of the filler is maintained by a metal cone which forms a slug when the filler is exploded. This slug or metal may or may not follow the explosive jet through the armor. The complete cartridge weighs approximately 9¼ pounds. The projectile weighs approximately 6¾ pounds, and has a muzzle velocity of approximately 700 feet per second.

*b.* For maximum effect, the shaped filler must be at exactly the right distance from the face of the armor when it detonates. This distance is called "stand-off." Stand-off is provided by the ogive, or nose spike on the nose of the projectile.

*c.* The HEAT round is used primarily against armor. It can be used against secondary targets such as gun emplacements and pillboxes with excellent results. The warhead is capable of penetrating the armor of any known tank.




| | | | | | |
|---|---|---|---|---|---|
| 1 | Cartridge case lot number | 11 | Propelling charge | 22 | Wire lead |
| 2 | Caliber and model of cartridge case | 12 | Body adapter | 23 | Projectile body |
| | | 13 | Wave washer | 24 | Bottom section of projectile body |
| 3 | Model of cartridge | 14 | PIBD fuze M530 | 25 | Felt pad |
| 4 | Type of cartridge | 15 | Bursting charge | 26 | Insulating disc |
| 5 | Caliber and type of weapon | 16 | Rotating band | 27 | Tail boom |
| 6 | Ammunition lot number | 17 | Cone | 28 | Cartridge case |
| 7 | Model of cartridge | 18 | Nose spike | 29 | Ignition cartridge |
| 8 | Type and model of weapon | 19 | Nose cap threads | 30 | Rupture disc |
| 9 | Percussion primer M78 | 20 | Nose cap | | |
| 10 | Fin | 21 | Piezoelectric crystal | | |

*Figure 15. 90mm HEAT cartridge, M371E1.*

## 22. Fuze, PIBD, M530

*a.* A fuze is a device used with a projectile to explode it at the time and under the circumstances required.

*b.* The M530 fuze is point-initiating, base detonating with an inertially operated graze system. The fuse is armed by setback forces through a delay system. On impact, a piezoelectric crystal (lucky element) in the nose spike is crushed and generates an electric current that is transmitted by wire to the fuze. The graze system insures detonation regardless of the angle of impact. The M530 fuze is assembled with a booster. Due to its location in the projectile, the fuze is not visible in assembled rounds of ammunition.

## 23. Subcaliber Device

The subcaliber device (fig. 16) will be locally fabricated from drawings approved by USAMC. This device will permit realistic gunner training at a fraction of the coat necessary when service ammunition is used.

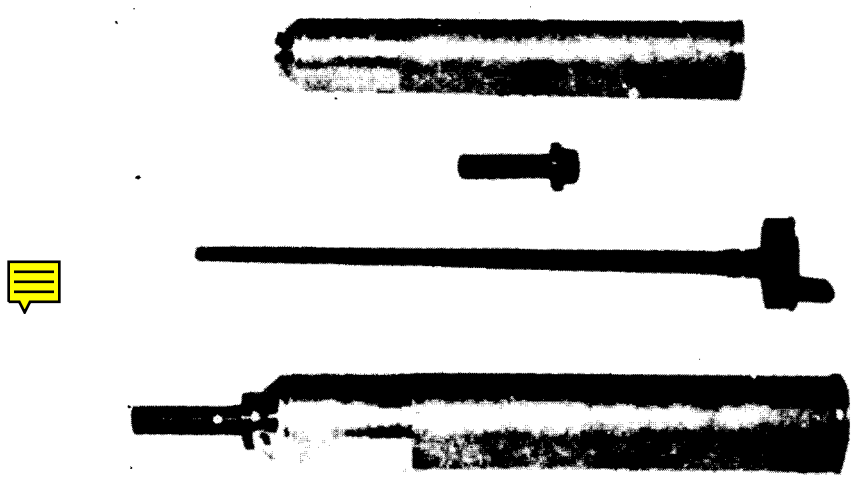


*Figure 16. The subcaliber device.*

## Section VI. MAINTENANCE AND INSPECTION

### 24. General

*a.* Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in a serviceable condition, prevent breakdown, and insure maximum operational readiness. First echelon preventive maintenance is accomplished by the equipment operator.

*b.* The operator's role in the performance of preventive maintenance service is—

(1) To perform service each day the equipment is operated.

(2) To assist the organizational maintenance mechanics in the performance of any other scheduled, periodic services specified by pertinent technical manuals.

(3) To assist the organizational maintenance mechanics in the lubrication of the equipment in accordance with the pertinent lubrication directives.

### 25. General Procedures for Inspections and Preventive Maintenance

*a.* Inspections to see if items are in good condition, correctly assembled, secure, not excessively worn, not leaking, and adequately lubricated, apply to most items in preventive maintenance and inspection procedures.

(1) Inspection for good condition is usually by external visual inspection to determine whether the weapon is damaged beyond safe or serviceable limits.

(2) Inspection of a unit to see if it is correctly assembled is usually a visual inspection to see if all parts are present and in their correct, relative position.

(3) Inspection of the weapon to determine if it is secure is usually a visual inspection or a check by hand or wrench for looseness. This type of inspection includes any brackets, lockwashers looknuts, and locking wires, as well as any connecting tubes or wires.

(4) In an inspection for excessively worn components of the weapon it should be determined whether parts of the weapon are worn beyond serviceable limits or to a point likely to result in a failure if the part is not replaced before the next scheduled inspection.

*b.* For any special cleaning and lubrication instructions required for specific mechanisms or parts see the pertinent section in TM 8-1016-228-12. General cleaning and lubrication instructions are as follows:

(1) Use drycleaning solvent or mineral spirits (paint thinner) to clean grease or oil from all metal parts, except those exposed to powder fouling during firing. This sol-

vent will not readily dissolve the corrosive salts from powder and primer compositions.

(2) Use rifle bore cleaner to clean all armament parts which have been exposed to powder fouling during firing. After cleaning a part with rifle bore cleaner it is necessary that the part be wiped dry and oiled.

(3) After all parts are cleaned, rinse and dry them thoroughly. Apply preservative lubricating (PL) (special) oil to all polished metal surfaces, other than optical equipment, to prevent rusting.

(4) When authorized to install new parts remove any preservative materials such as rust-preventive compound or protective grease. Prepare parts as required, and for those parts requiring lubrication apply the lubricant prescribed in the technical manual.

*c.* General precautions in cleaning are as follows:

(1) Drycleaning solvent and mineral spirits should not be used near an open flame. Fire extinguishers should be provided when these materials are used. Use only well-ventilated areas.

(2) These cleaners evaporate quickly and have a drying effect on the skin. If used without gloves, they may cause cracks in the skin and, in the ease of some individuals, a mild irritation or inflammation.

(3) Avoid getting petroleum products, such as drycleaning solvent, mineral spirits, or lubricants on rubber parts as they will deteriorate the rubber.

(4) The use of diesel fuel oil, gasoline, or benzine (benzol) for cleaning is prohibited.

*d.* To prevent formation of damaging mildew, shake out and air the canvas cover for several hours at frequent intervals. Have any loose grommets or rips in the canvas repaired without delay. Failure to make immediate repairs may allow a minor defect to develop into major damage. Mildewed canvas is best cleaned with a dry brush. If water is necessary to remove dirt it must not be used until mildew has been removed. If mildew is present, examine the fabric carefully for evidence of rotting or weakening of fabric by stretching and pulling.

## 26. Lubricating Instructions

*a. Usual Conditions.*

(1) *Firing handle.* After firing, or every 7 days, disassemble and clean with cleaning solvent; wipe dry and lubricate with PL (special).

(2) *Monopod assembly.* Daily and after firing, wipe dry and coat threaded portion with a light film of PL (special).

(3) *Front bracket assembly.* Before firing, wipe dry and lightly lubricate with PL (special). After firing, or every 7 days, clean with cleaning solvent, wipe dry and lightly lubricate with PL (special).

(4) *Cable assembly.* Before firing remove, wipe dry and lightly lubricate with PL (special ). After firing, or every 7 days, remove, clean, wipe dry, and lightly lubricate with PL (special).

(5) *Breech and hinge mechanism group.* Before firing, wipe dry and lubricate tooth on inner hinge portion of the breechblock and all threaded portions of the breechblock with Aircraft Instrument Grease MIL-L-46000. Apply a light coat of PL (special) to all other surfaces. Wipe external surfaces dry before firing. After firing, and on 3 consecutive days thereafter, clean with rifle bore cleaner. After the fourth cleaning, dry and lubricate as above. When the weapon is not fired, disassemble, clean with cleaning solvent; wipe dry and relubricate every 7 days.

(6) *Rear mounting bracket group.* Before firing, wipe dry all parts and lightly lubricate with PL (special). After firing, or every 7 days, clean with cleaning solvent; wipe dry all parts and lightly lubricate with PL (special).

(7) *Tube.* After firing and on 3 consecutive days thereafter, clean bore with bore cleaner. After the fourth cleaning, dry and lubricate bore with PL (special). When weapon is not fired, clean the tube, wipe dry, and reoil every 7 days. Wipe dry before firing.

*b. Unusual Conditions.* Reduce or increase lubrication intervals as required to compensate for abnormal operation and extreme conditions, such as high and low temperatures, prolonged periods of high rate operation, continued operation in sand or dust, or exposure to moisture. Any one

of the above may quickly destroy the protective qualities of the lubricant. Lubrication intervals may be extended during inactive periods.

(1) *Extreme cold weather lubrication.* Apply a light coat of low temperature lubricating oil to the rifle, and move the functioning parts frequently during periods of low temperature to insure proper functioning. In extreme cold weather areas, the weapon must be wiped dry after lubrication so that only a minimum amount of lubricant remains.

(2) *Extreme hot weather lubrication.* Special lubricants will ordinarily not be required at extremely high temperatures because the lubricants prescribed for the weapon provide adequate protection. However, more frequent servicing is necessary because heat dissipates the lubricants.

(3) *Lubrication for humid and salt air conditions.* High humidity, moisture, or salt air tend to contaminate the lubricant, necessitating frequent servicing.

(4) *Lubrication after operation under dusty or sandy conditions.* Thoroughly clean the weapon and lubricate as prescribed in *a* above.

### 27. Recording Procedures

The equipment record system provides for recording repairs required and accomplished on specific items of equipment. This will include, but is not limited to, adjusting, cleaning, and replacing. Deficiencies discovered before, during, or after operation that cannot be corrected by the operator will be entered on DA Form 2404, Equipment Inspection and Maintenance Worksheet. Deficiencies immediately corrected by the operator are not recorded, except when such correct ions are made by replacing parts, or which constitute repairs above first echelon. Such repairs will be recorded as organizational maintenance.

## Section VII. DECONTAMINATION PROCEDURES

### 28. Preparation and Testing

Oil rifles completely if chemical, biological, or radiological attacks are anticipated. Also oil accessories, except ammunition. Keep ammunition waxed when possible. Test for contamination, using detector paper for liquids or detector crayon for vapors. If equipment is not contaminated, clean and prepare it for use.

### 29. Decontamination

If equipment is contaminated, decontaminating personnel should use a complete suit of protective clothing (permeable or impermeable), including impermeable gloves and protective mask.

*a.* Equipment contaminated with chemicals other than the blister agent or G-series agents, is decontaminated by airing. For faster decontamination and to protect against corrosion, clean the rifle and accessories with rifle bore cleaner, denatured alcohol, or soap and water.

*b.* Equipment contaminated by blister agents is decontaminated as follows:

(1) Remove all dirt, dust, grease, and oil.
(2) Expose all parts to air.
(3) Decontaminate all metal surfaces except the bore with agent, decontaminating, noncorrosive (DANC) (FM 21-40). Hot soapy water is also an effective cleaner.
(4) Protective ointment, M5, can be used for emergency decontamination (FM 21-40).
(5) Test with detector kit to determine if decontamination is complete. If complete, clean, dry, oil, and prepare rifle for use.
(6) Burn, or preferably bury, all rags or wiping materials.

*Note.* Caution should be used to protect men against vapors created by burning.

*c.* In general, these actions are applicable to equipment contaminated by biological or radiological attack. Detailed information on decontamination is contained in FM 21-40 and TM 3-220.

## Section VIII. DESTRUCTION IN EVENT OF IMMINENT CAPTURE

### 30. Destruction To Prevent Enemy Use

*a. General.* Destruction of material is accomplished on authority delegated by division or higher commander. This is usually a matter of standing operating procedures. It is ordered only after all measures to save the equipment have been taken.

*b. Principles of Destruction.*

(1) Methods of destruction are adequate, uniform, and easily followed in the field.

(2) Destruction is as complete as possible within the limitations of time, equipment, and personnel. In any event, the most important parts of the weapon are destroyed or evacuated. The same essential parts are destroyed or evacuated on all like units to prevent the enemy from constructing one complete rifle from several damaged ones.

(3) Crews are trained in prescribed methods of destruction.

(4) Certain methods of destruction require special tools and equipment such as TNT or incendiary grenades. Issue of such special equipment and its use are command decisions and depend on the tactical situation.

*c. Destruction of the Rifle.*

(1) *Method No. 1—demolition materials.* When planning for simultaneous detonation, prepare the following demolition charge-s using TNT blocks or an equivalent to make up the required charge.

*(a)* One-pound charge. Insert the charge in the muzzle of the rifle to a distance of about 1 foot. Plug the bore to a distance of about 8 inches with earth, stone, or similar material, being careful not to damage the detonating cord.

*(b)* Two-pound charge. Insert the charge into the chamber. Pass the detonating cord out of the chamber through one of the vents in the breechblock. Plug the vents with any available material such as rags or mud, being careful not to damage the detonating cord.

*(c)* Connect the two charges for simultaneous detonation with detonating cord. For complete details on the use of demolition materials and method of priming and detonating demolition charges refer to FM 5–25.

(2) *Method No. 2—burning with incendiary grenades.* Destruction of essential parts followed by burning in an intense fire will usually render the rifle and related material useless. Since the rifle and related material are made almost entirely of metal, effective destruction by this means requires larger amounts of combustible material than may be available. However, the use of incendiary grenades will render the rifle useless.

*(a)* Insert two incendiary grenades, end-to-end, midway in the tube. Place a third incendiary grenade, fitted with a time blasting fuze, adjacent to the grenades in the tube.

*Note.* Time blasting fuze burns at a rate of 1 foot in approximately 40 seconds; test before using.

*(b)* With the breech open, place two incendiary grenades in the chamber. Place a third incendiary grenade, fitted with time blasting fuze, adjacent to the grenades in the chamber.

*(c)* Ignite the fuzed grenade. The time blasting fuze may be ignited by a blasting fuze igniter or a match. The metal from the grenades will fuze with the tube and will also weld the breechblock and vent bushing.

*Note.* When fitting incendiary grenades with time blasting fuzes, the fuzes should be of sufficient length so personnel may safely leave the immediate area before the grenades are detonated.

(3) *Method No. 3—by gun fire.* From an adjacent rifle or gun, tire on the rifle and related material to be destroyed. Although one well-placed direct hit may render the rifle and related material temporarily useless, several hits may be required for complete destruction.

(4) *Optical instruments.* Remove the direct fire sight. It is relatively lightweight and easy to carry, and is costly and diffi-

cult to replace. It should be evacuated if possible. When evacuation is impractical then smash the sight and mount.

**31. Destruction of Ammunition**

Ammunition is most effectively destroyed by burning. To accomplish this, stack rounds (either packed or unpacked) in piles, preferably in a trench or depression. Place flammable materials such as paper, rags, and wood around and on the pile. Pour gasoline and oil over the combustible materials and over the entire ammunition pile. Ignite by means of an incendiary grenade fired from a safe distance, a burst from a flamethrower, a combustible train of suitable length, or other appropriate means. *Take cover immediately*.