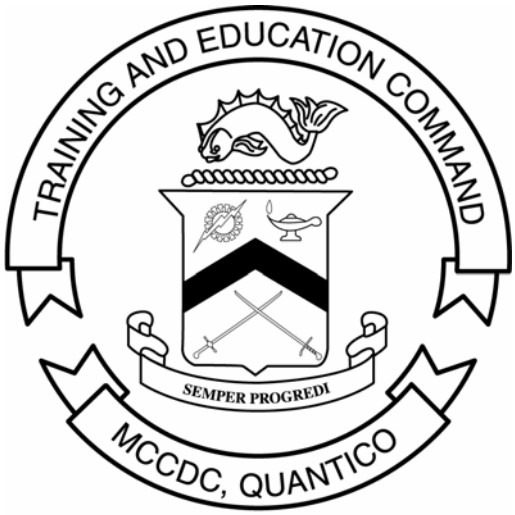
MCI 0321B

MARINE CORPS INSTITUTE



THE M240G MACHINEGUNNER

MARINE BARRACKS
WASHINGTON, DC

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MARINE CORPS INSTITUTE
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IN REPLY REFER TO:
1550
Ser 0321B
16 May 2007

From: Director
To: Marine Corps Institute Student

Subj: THE M240G MACHINEGUNNER (MCI 0321B)

1. Purpose. The subject course has been published to provide instruction to all Marines. The M240G medium machinegun is found in units throughout the Marine Corps. It is likely most Marines will either use this weapon or supervise its use.

2. Scope. This course addresses the operation and care of the M240G medium machinegun and its associated equipment, including the following; capabilities, maintenance, operation, basic marksmanship, troubleshooting, and night/low visibility operation.

3. Applicability. This course is intended for instructional purposes only. It is designed for use by all Marines: machinegunners by MOS 0331, incidental users who may be required to operate the M240G, and leaders of units employing the M240G.

4. Recommendations. Comments and recommendations on the contents of the course are invited and will aid in subsequent course revisions. Please complete the course evaluation questionnaire at the end of the final examination. Return the questionnaire and the examination booklet to your proctor.

T.M. FRANUS
By direction

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Table of Contents

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Student Information

Number and Title	MCI 0321B THE M240G MACHINEGUNNER
Study Hours	6
Course Material	Text
Review Agency	School of Infantry (East)
Reserve Retirement Credits (RRC)	2
ACE	Not applicable to civilian training/education.
Assistance	For administrative assistance, have your training officer or NCO log on to the MCI home page at www.mci.usmc.mil. Marines CONUS may call toll free 1-800-MCI-USMC. Marines worldwide may call commercial (202) 685-7596 or DSN 325-7596.

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Study Guide

Congratulations

Congratulations on your enrollment in a distance education course from the Distance Learning and Technologies Department (DLTD) of the Marine Corps Institute (MCI). Since 1920, the Marine Corps Institute has been helping tens of thousands of hard-charging Marines, like you, improve their technical job performance skills through distance learning. By enrolling in this course, you have shown a desire to improve the skills you have and master new skills to enhance your job performance. The distance learning course you have chosen, MCI 0321B, *The M240G Machinegunner*, provides instruction to all Marines tasked with operating the M240G medium machinegun. This course consists of learning experiences necessary to perform those duties associated with operating and maintaining the M240G and all of its associated equipment.

Your Personal Characteristics

- **YOU ARE PROPERLY MOTIVATED.** You have made a positive decision to get training on your own. Self-motivation is perhaps the most important force in learning or achieving anything. Doing whatever is necessary to learn is motivation. You have it!

- **YOU SEEK TO IMPROVE YOURSELF.** You are enrolled to improve those skills you already possess, and to learn new skills. When you improve yourself, you improve the Corps!

- **YOU HAVE THE INITIATIVE TO ACT.** By acting on your own, you have shown you are a self-starter, willing to reach out for opportunities to learn and grow.

- **YOU ACCEPT CHALLENGES.** You have self-confidence and believe in your ability to acquire knowledge and skills. You have the self-confidence to set goals and the ability to achieve them, enabling you to meet every challenge.

- **YOU ARE ABLE TO SET AND ACCOMPLISH PRACTICAL GOALS.** You are willing to commit time, effort, and the resources necessary to set and accomplish your goals. These professional traits will help you successfully complete this distance learning course.

Continued on next page

Beginning Your Course

Before you actually begin this course of study, read the student information page. If you find any course materials missing, notify your training officer or training NCO. If you have all the required materials, you are ready to begin.

To begin your course of study, familiarize yourself with the structure of the course text. One way to do this is to read the table of contents. Notice the table of contents covers specific areas of study and the order in which they are presented. You will find the text divided into several study units. Each study unit is comprised of two or more lessons and lesson exercises.

Leafing Through the Text

Leaf through the text and look at the course. Read a few lesson exercise questions to get an idea of the type of material in the course. If the course has additional study aids, such as a handbook or plotting board, familiarize yourself with them.

The First Study Unit

Turn to the first page of study unit 1. On this page, you will find an introduction to the study unit and generally the first study unit lesson. Study unit lessons contain learning objectives, lesson text, and exercises.

Reading the Learning Objectives

Learning objectives describe in concise terms what the successful learner, you, will be able to do as a result of mastering the content of the lesson text. Read the objectives for each lesson and then read the lesson text. As you read the lesson text, make notes on the points you feel are important.

Completing the Exercises

To determine your mastery of the learning objectives and text, complete the exercises developed for you. Exercises are located at the end of each lesson, and at the end of each study unit. Without referring to the text, complete the exercise questions and then check your responses against those provided.

Continued on next page

Continuing to March

Continue on to the next lesson, repeating the above process until you have completed all lessons in the study unit. Follow the same procedures for each study unit in the course.

Preparing for the Final Exam

To prepare for your final exam, you must review what you learned in the course. The following suggestions will help make the review interesting and challenging.

- **CHALLENGE YOURSELF.** Try to recall the entire learning sequence without referring to the text. Can you do it? Now look back at the text to see if you have left anything out. This review should be interesting. Undoubtedly, you'll find you were not able to recall everything. But with a little effort, you'll be able to recall a great deal of the information.

- **USE UNUSED MINUTES.** Use your spare moments to review. Read your notes or a part of a study unit, rework exercise items, review again; you can do many of these things during the unused minutes of every day.

- **APPLY WHAT YOU HAVE LEARNED.** It is always best to use the skill or knowledge you've learned as soon as possible. If it isn't possible to actually use the skill or knowledge, at least try to imagine a situation in which you would apply this learning. For example make up and solve your own problems. Or, better still, make up and solve problems that use most of the elements of a study unit.

- **USE THE "SHAKEDOWN CRUISE" TECHNIQUE.** Ask another Marine to lend a hand by asking you questions about the course. Choose a particular study unit and let your buddy "fire away." This technique can be interesting and challenging for both of you!

- **MAKE REVIEWS FUN AND BENEFICIAL.** Reviews are good habits that enhance learning. They don't have to be long and tedious. In fact, some learners find short reviews conducted more often prove more beneficial.

Continued on next page

Tackling the Final Exam

When you have completed your study of the course material and are confident with the results attained on your study unit exercises, take the sealed envelope marked **"FINAL EXAM"** to your unit training NCO or training officer. Your training NCO or officer will administer the final examination and return the examination and the answer sheet to MCI for grading. Before taking your final examination, read the directions on the DP-37 answer sheet carefully.

Completing Your Course

The sooner you complete your course, the sooner you can better yourself by applying what you've learned! However, you do have 2 years from the date of enrollment to complete this course.

Graduating!

As a graduate of this distance education course and as a dedicated Marine, your job performance skills will improve, benefiting you, your unit, and the Marine Corps.

Semper Fidelis!

STUDY UNIT 1

INTRODUCTION TO THE M240G MEDIUM MACHINEGUN

Overview

Scope

The successful use and employment of the M240G medium machinegun requires a basic knowledge of the weapon. To properly use and maintain the M240G medium machinegun, you must know the weapon from one end to the other—the parts, how it works, what it is capable of, and what it shoots.

In this study unit, you will learn the characteristics, nomenclature, and functioning of the M240G medium machinegun. You will also learn the steps for clearing, disassembling, assembling, and performing a function check. The different types of ammunition used with the M240G and how the ammunition is handled and stored will also be covered.

In This Study Unit

This study unit contains the following lessons:

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LESSON 1

CHARACTERISTICS, NOMENCLATURE, AND FUNCTIONING

Introduction

Scope

Knowing the capabilities of a weapon is essential to its use. However, to maintain it, you must know what all the parts are and how they go together.

In this lesson, you will learn the purpose of the M240G medium machinegun; the characteristics, capabilities, and nomenclature; and the nomenclature and purpose of the related SL-3 components. Also, you will learn the steps in the cycle of operation for the M240G.

Learning Objectives

After completing this lesson, you should be able to

- Identify the purpose of the M240G medium machinegun.
- Identify the characteristics of the M240G medium machinegun.
- Identify the capabilities of the M240G medium machinegun.
- Identify the nomenclature of the M240G medium machinegun.
- Identify the purpose for each assembly of the M240G medium machinegun.
- Identify the nomenclature of the M240G medium machinegun SL-3 components.
- Identify the purpose of the M240G medium machinegun SL-3 components.
- Identify the steps in the cycle of operation of the M24G medium machinegun.

Continued on next page

In This Lesson

This lesson contains the following topics:

Purpose of the M240G Medium Machinegun

Two-Fold

The M240G medium machinegun is used in offensive and defensive combat, combat support, and combat logistics units in all parts of the MAGTF. The purpose of the M240G is to

- Provide heavy volumes of close, accurate, and continuous fire support to suppress and destroy enemy personnel in support of an attack.
- Serve as an integral part of a unit's defensive fire plan when employing final protective fires by breaking up and stopping an enemy's assault.

Characteristics and Capabilities

Descriptive Characteristics

The M240G has four descriptive characteristics:

Characteristic	Description
Belt-fed	The gun is fed by a disintegrating metallic link belt.
Air-cooled	The barrel and receiver are exposed to permit cooling by the air.
Gas-operated	Gas produced from firing one round provides the energy to mechanically prepare the weapon to fire the next.
Fully automatic	Continues to fire until the trigger is released, a malfunction occurs, or the ammunition is exhausted.

Weight

The table below lists the weights of selected components of the M240G:

Item	Weight in Pounds
Machinegun (complete)	25.6
Spare barrel w/case (SL-3 complete)	6.6
M122 tripod, flex-mount, and traversing and elevation (T&E) mechanism (complete)	20

Dimensions

The table below lists the dimensions of the M240G:

Item	Dimension in Inches
Length	49
Height on M122 tripod	17

Rifling

The barrels of the M240G consist of the following rifling characteristics:

- Four grooves
- Uniform right hand turn
- One turn per 12 inches

Continued on next page

Rates of Fire

The table below lists the rates of fire for the M240G:

Rates	Rounds per Minute	Remarks
Cyclic	650 to 950	Fires continuously depending on the gas setting
Sustained	100	Fires 6 to 8 round bursts with 4 or 5 seconds between bursts
Rapid	200	Fires 10- to 12-round bursts with 2 or 3 seconds between bursts

Range

The table below lists the ranges of the M240G:

Range	Limits in Meters
Maximum overall	3725
Maximum effective area target	1800
Maximum effective point target	800
Tracer burnout	About 900
Grazing fire	600

Limits of Manipulation

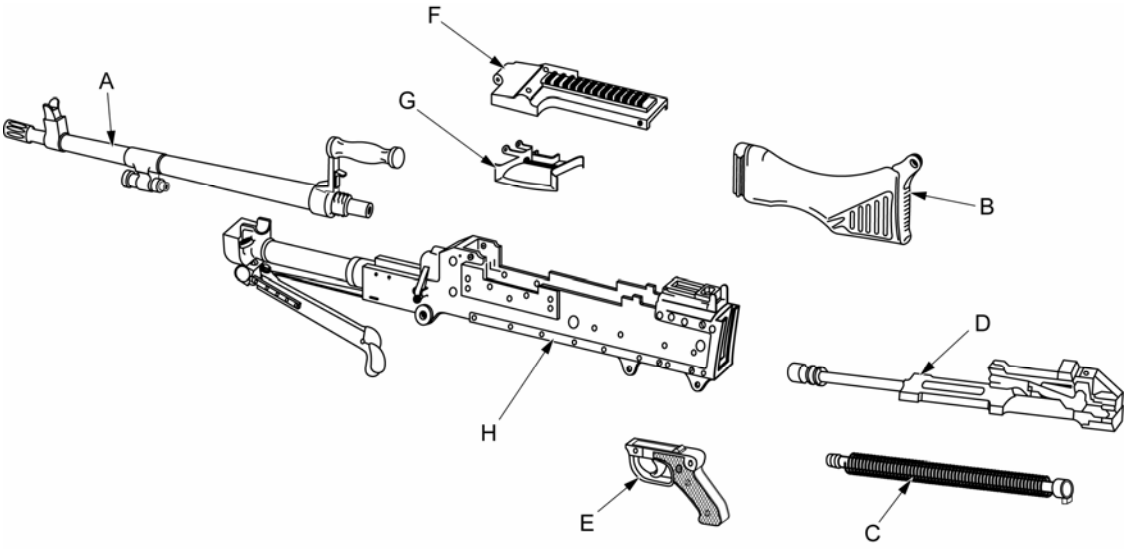
The table below lists the traverse limits for the M240G (with M122 tripod and T&E mechanism):

Item	Limits in Mils
Elevation	247
Depression	200
Traverse (traversing bar)	875 425 left/450 right

Nomenclature

Main Components

The M240G medium machinegun consists of the following main components:



Item	Component
A	Barrel group
B	Buttstock and buffer group
C	Drive spring rod assembly (operating group sub-assembly)
D	Bolt and operating rod assembly (operating group sub-assembly)
E	Trigger housing group
F	Cover assembly (receiver group sub-assembly)
G	Feed tray (receiver group sub-assembly)
H	Receiver assembly (receiver group sub-assembly)

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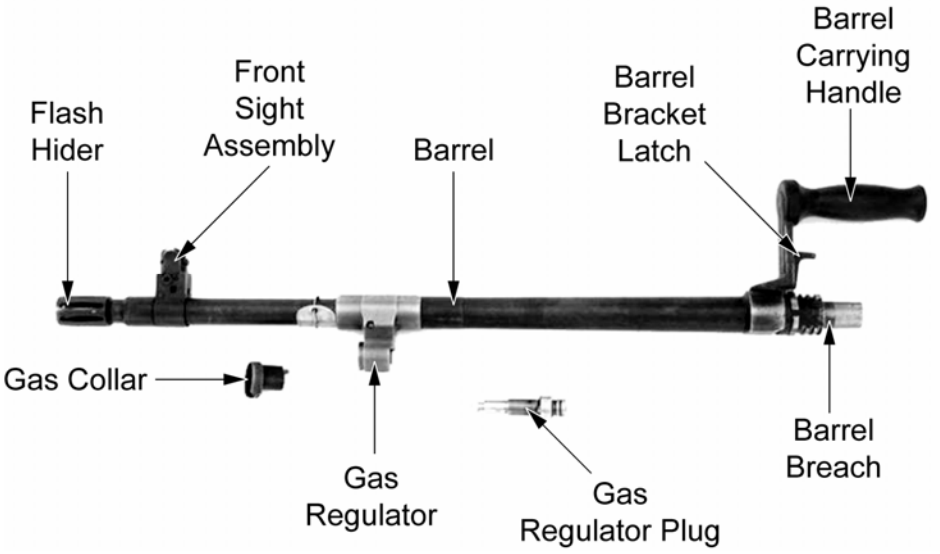
Nomenclature, Continued

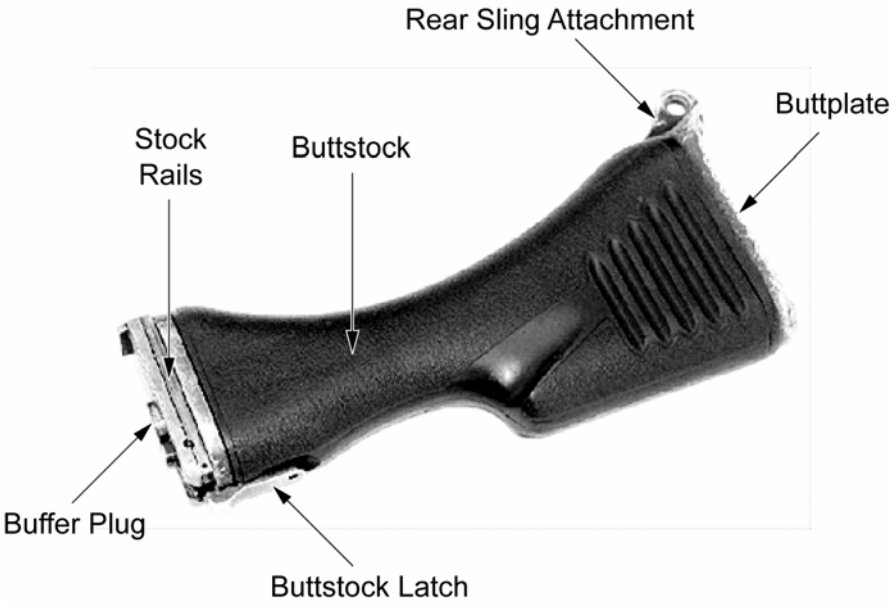
Barrel Group

The barrel group houses rounds for firing and directs the projectile after firing. Components of the barrel group are shown in the graphic below:



Buttstock and Buffer Group

The buttstock and buffer assembly absorbs the recoil for the bolt and operating rod assembly at the end of the recoil movement. Components of the buttstock and buffer assembly are shown in the graphic below:



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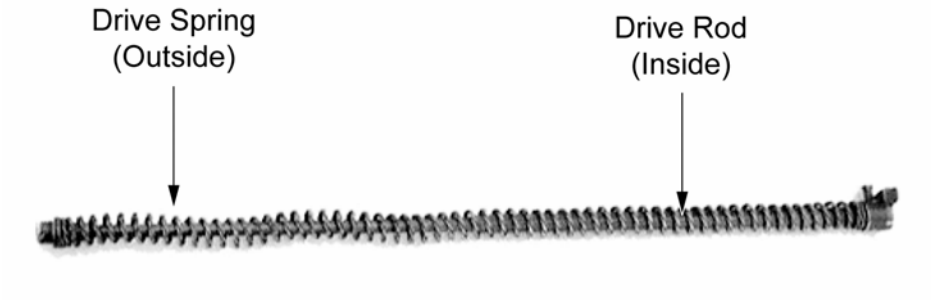
Nomenclature, Continued

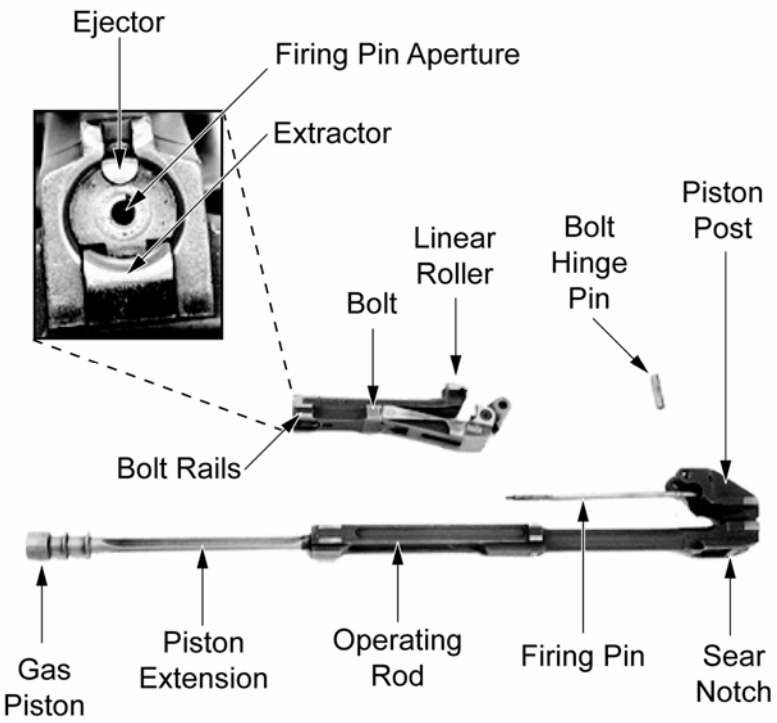
Drive Spring Rod Assembly

The drive spring rod assembly is part of the operating group. It provides energy for returning the bolt and operating rod assembly to the firing position.



Bolt and Operating Rod Assembly

The bolt and operating rod assembly is part of the operating group. It provides feeding, striping, chambering, firing, extraction, and ejection of cartridges using the projectile-propelling gases for power. Components of the bolt and operating rod assembly are shown in the graphic below:



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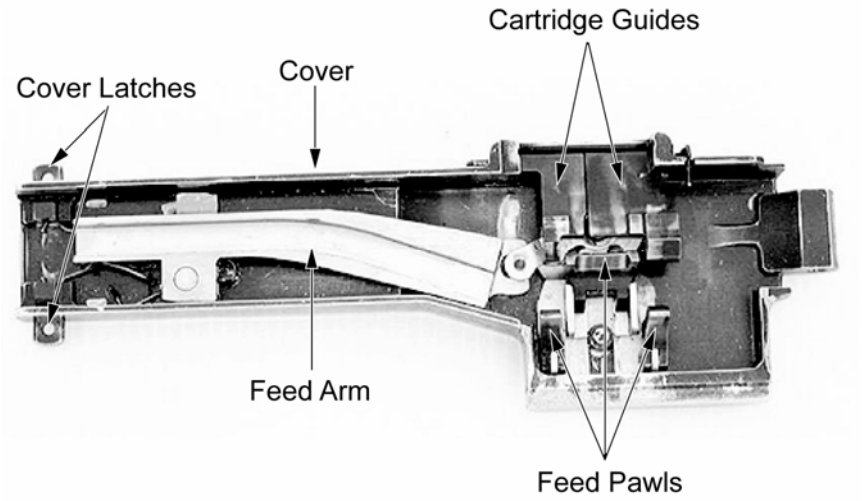
Trigger Housing Group

The trigger housing group controls the firing of the machinegun. Components of the trigger housing group are shown in the graphic below:

Cover Assembly

The cover assembly is part of the receiver group. It feeds linked belt ammunition and positions and holds rounds in position for stripping, feeding, and chambering. The cover has an integral sight mounting rail for current and future accessories. Components of the cover assembly are shown in the graphic below:



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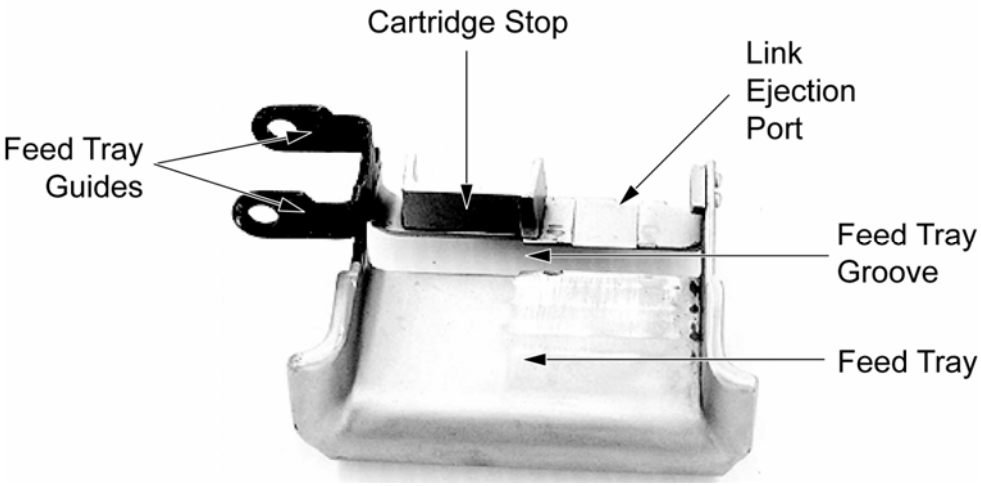
Feed Tray

The feed tray is part of the receiver group. It serves as a guide for positioning cartridges to assist in chambering. Components of the feed tray are shown in the graphic below:



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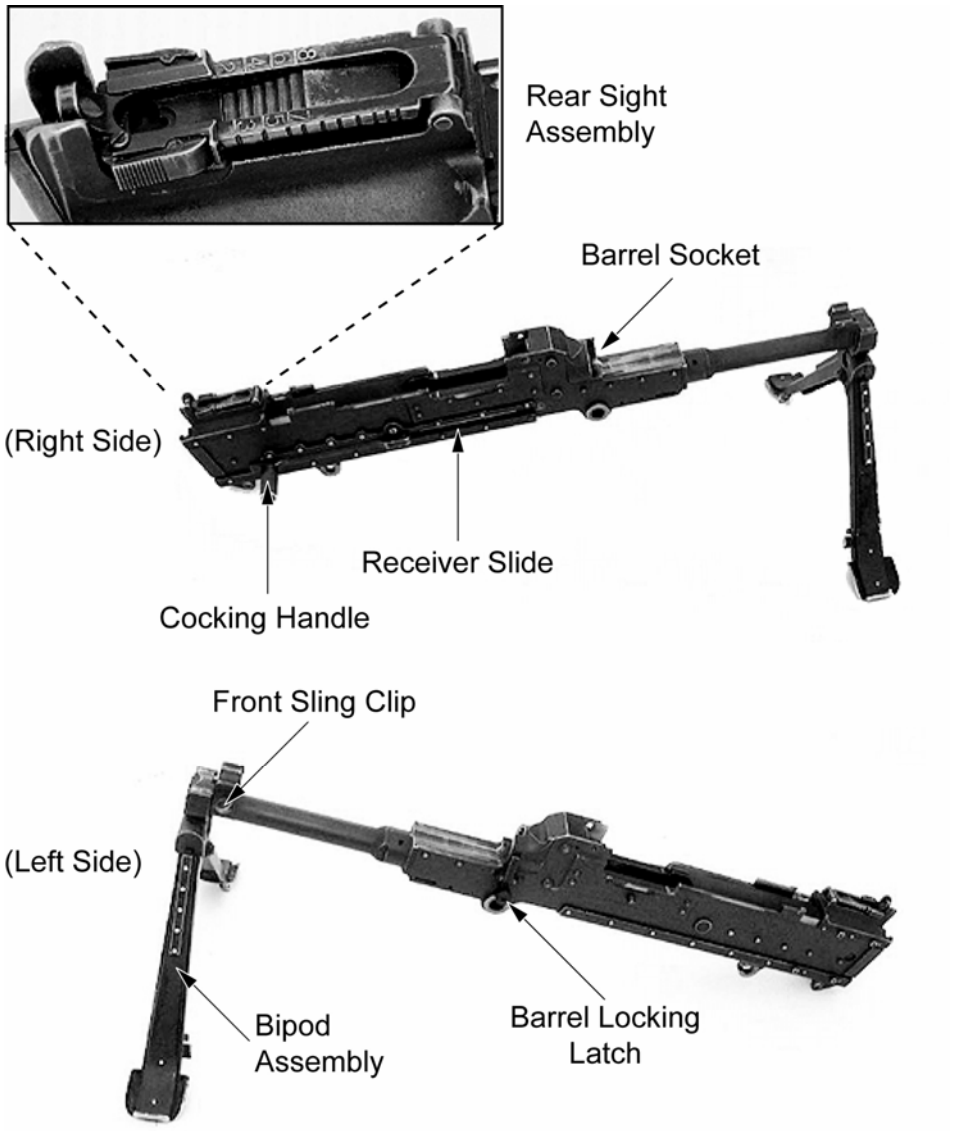
Nomenclature, Continued

Receiver Assembly

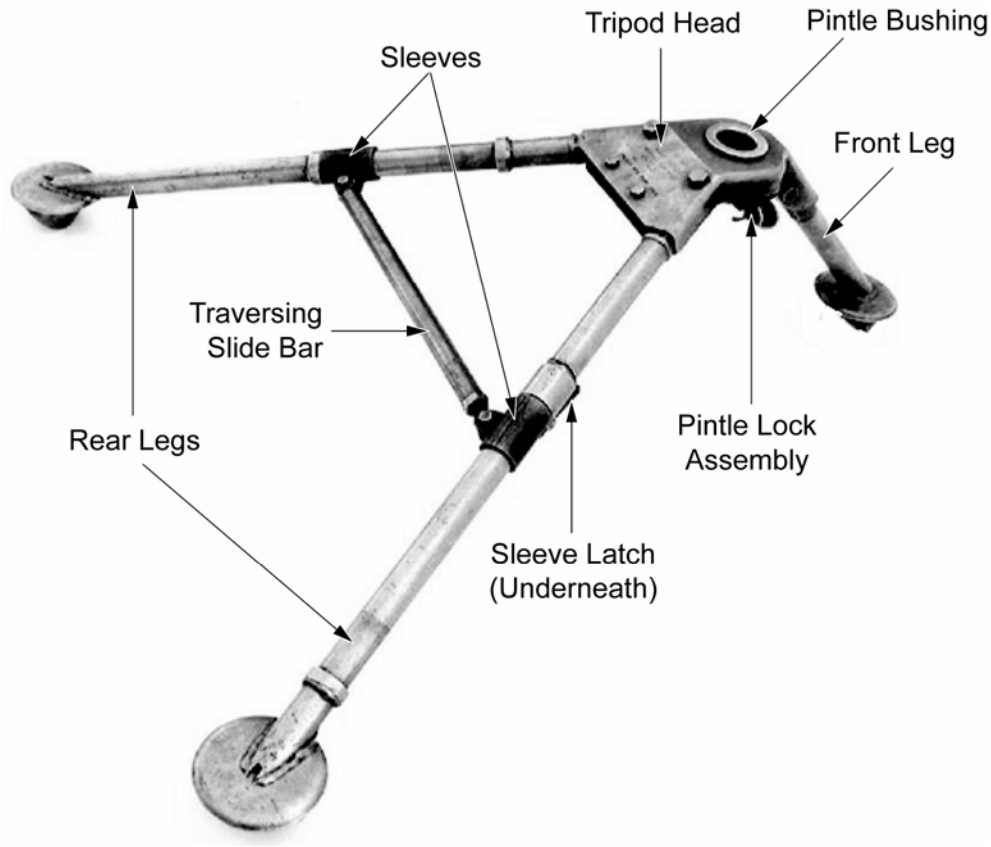
The receiver assembly is part of the receiver group. It serves as a support of all of the main components. It houses the action of the weapon and controls the functioning of the weapon through a series of cam ways and rails. Components of the receiver assembly are shown in the graphic below:



SL-3 Components

M122 Tripod

The M122 tripod provides a stable, lightweight base for the M240G. It can be folded into a closed position for carrying or storage. Components of the M122 tripod are shown in the graphic below:



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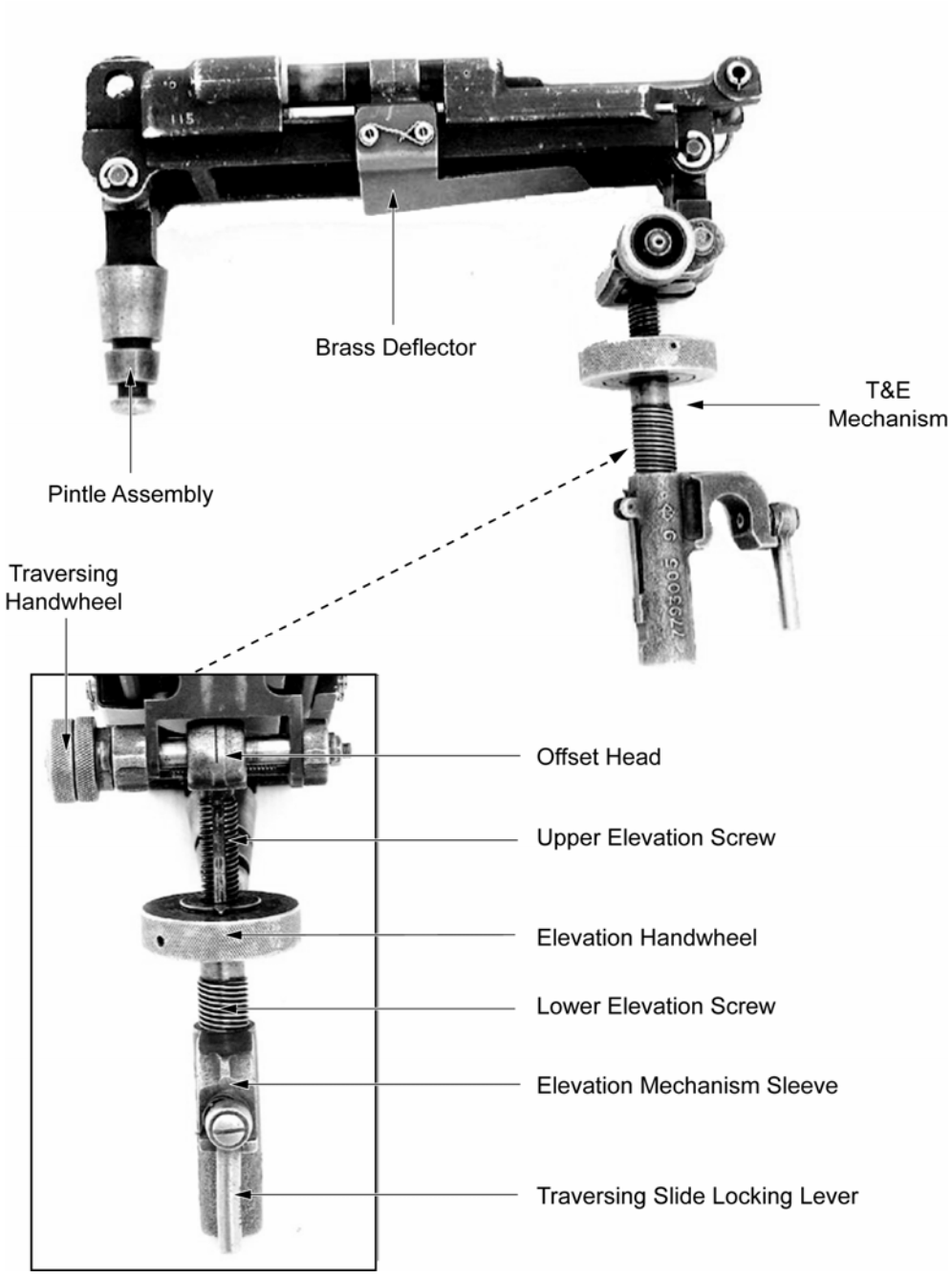
Flex-Mount with T&E Mechanism

The flex-mount with the T&E mechanism is used to mount the M240G to the M122 tripod. It enhances the stability of the tripod and dampens the recoil of the weapon. Components of the flex-mount with the T&E mechanism are shown in the graphic below:



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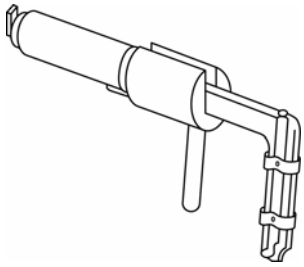
SL-3 Components, Continued

Gun Bag

The gun bag is used to carry and protect the M240G machinegun. It consists of a large outer bag and a smaller, removable spare barrel bag inside. The complete gun bag is used to carry the machinegun, tripod, flex-mount, spare barrel, and all other SL-3 components. The removable spare barrel bag is designed for field use and will carry the spare barrel and a complete set of user maintenance equipment and accessories.

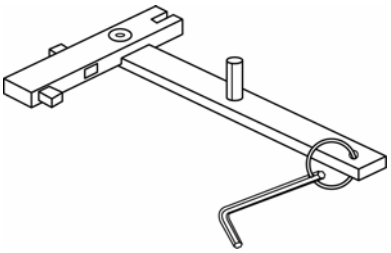
Combination Scraper and Extractor Tool

The combination scraper and extractor tool is used for removing carbon from certain areas of the weapon during maintenance.



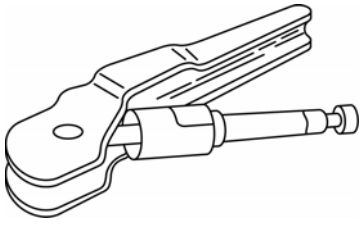
Front Sight Adjustment Tool

The front sight adjustment tool is used for adjusting the front sight of the M240G during zeroing procedures.



Ruptured Cartridge Extractor

The ruptured cartridge extractor is used to remove ruptured cartridges from the chamber during troubleshooting procedures.



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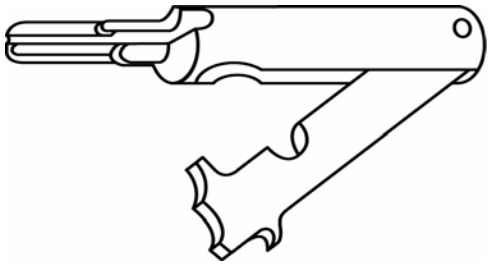
SL-3 Components, Continued

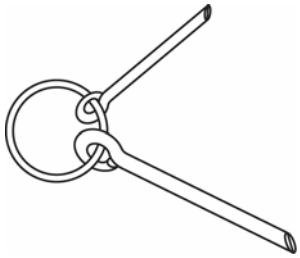
Combination Regulator Scraper

The combination regulator scraper—also known as the scraper tool—is used to remove carbon buildup from the gas regulator plug during maintenance.



Large and Small Reamers

The reamers are used to clean the gas port holes on the gas regulator plug and the barrel.



Cleaning Rod with Attachments

The five sections and handle assembly of the cleaning rod join together to make the cleaning rod. The attachments are used with the cleaning rod to assist in the cleaning of various parts of the M240G.

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SL-3 Components, Continued

Technical Manual	Marine Corps Technical Manual (TM) 08670A/09712A-10/1B, dated November 2002, is the operator's manual for the M240G medium machinegun.

Functioning

Cycle of Operation

The functioning of the M240G consists of a cycle of operation that can be broken down into eight basic steps. Understanding how the M240G functions will make it easier to recognize and correct malfunctions and stoppages that occur during firing. The eight steps are listed below:

- Feeding
- Chambering
- Locking
- Firing
- Unlocking
- Extracting
- Ejecting
- Cocking

Feeding

Feeding is the process of moving the next round in the belt of ammunition onto the feed tray groove. When the bolt is to the rear, the outer feed pawls are outside the first round of ammunition. The inner feed pawl is between the first and second rounds.

- The bolt moves forward to fire the round in the feed tray groove, causing the belt feed pawl to move to the left.

- The feed pawl moves up and over the second round in the belt of ammunition and is now in position to drag the second round into the feed tray groove.

- The bolt moves to the rear after firing, causing the belt feed pawl to move to the right, dragging the second round into the feed tray groove.

- Inside the cover, the cam roller, the feed arm with control spring, the feed arm fork, and the pivot arm are present only so the feed pawls can move back and forth, dragging rounds into position to be chambered.

Continued on next page

Functioning, Continued

Chambering

Chambering is the process of stripping a round from the belt and seating it in the chamber.

- The bolt travels forward, causing the upper locking lug of the bolt to contact the base of the cartridge.
- The bolt strips the round from the belt link.
- The chambering ramp angles downward and forces the round toward the chamber along with the spring tension of the cartridge guide pawl.
- The cartridge guide pawl also holds back the belt link.
- When the round is fully seated in the chamber, the extractor snaps over the extractor rim of the cartridge, and the ejector is depressed.

Locking

Locking is the process of seating the bolt into the barrel socket. Although the term locking is used here, it should be noted that in the M240G the bolt and barrel do not physically interlock. This is why the barrel can be removed even when the bolt is forward.

- During chambering, the bolt enters the barrel socket as the operating rod is driven forward by the drive spring and the locking lever.
- Once the operating group with the bolt is all the way forward, the bolt is "locked" into the barrel socket.

Firing

Firing is the process of detonating the round in the chamber.

- After the bolt reaches its locked position, the operating rod continues to move forward, independent of the bolt.
- It carries the striker of the fixed firing pin through the aperture in the face of the bolt, striking and detonating the primer of the cartridge.

Continued on next page

Functioning, Continued

Unlocking

Unlocking is the process of moving the bolt back and out of the barrel socket.

- After the cartridge ignites and the projectile passes the gas port, part of the gases enter the gas cylinder.
- The rapidly expanding gas enters the hollow end cap of the gas piston and forces the operating group to the rear, providing the power for the last four steps in the cycle of functioning.
- The operating rod now moves rearward, independent of the bolt, for a short distance.
- The locking lever begins to swing toward the rear, carrying the bolt with it into its unlocked position, and clears the barrel socket.

Extracting

Extracting is the process of removing the expended cartridge from the chamber. The extractor grips the rim of the cartridge as the bolt and operating rod pull the case from the chamber.

Continued on next page

Functioning, Continued

Ejecting

Ejecting is the process of expelling the spent cartridge and link from the weapon.

- The cartridge is withdrawn from the chamber, with the ejector exerting a push from the top, and the extractor exerting a pull from the bottom.
- The casing falls from the gun as soon as it reaches the cartridge ejection port.
- At approximately the same time, the empty link is forced out of the link ejection port between the cartridge stops on the feed tray by the next round moving into the feed tray groove.

Cocking

Cocking is the process of placing the parts of the gun in position to fire the next round.

- During the rearward independent movement of the operating rod, the firing pin striker is withdrawn from the face of the bolt.
- The bolt moves to the rear, far enough to pick up the next round for chambering.

Lesson 1 Exercise

Directions Complete exercise items 1 through 8 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 Two purposes of the M240G medium machinegun are to

- _____

  _____

- _____

  _____

Item 2 The four descriptive characteristics of the M240G medium machinegun are

- _____
- _____
- _____
- _____

Item 3 Complete the following statement.

The maximum effective range of the M240G on an area target is _____ meters.

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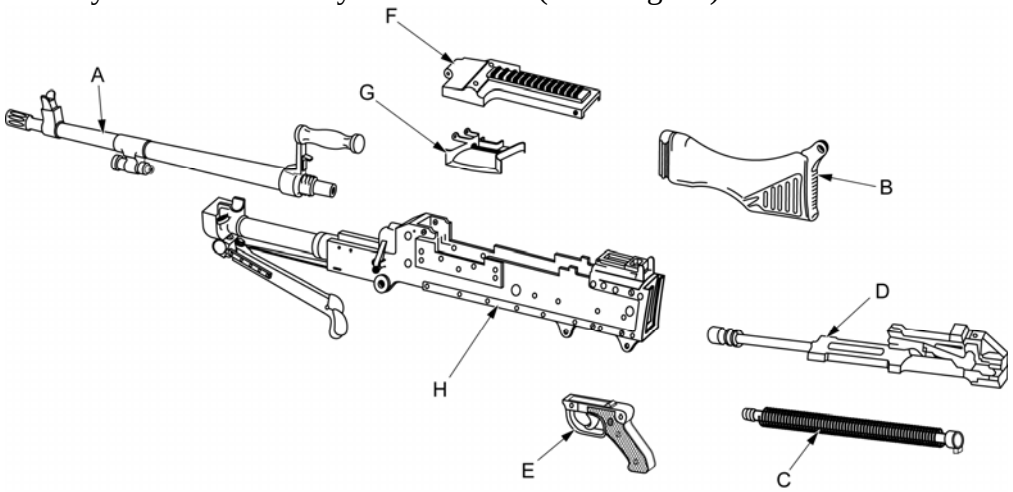
Item 4

Identify the main assembly for each item (A through H) shown below:



a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

Item 5

The barrel assembly houses the round and _____ the projectile after firing.

a. aims
b. directs
c. removes
d. catches

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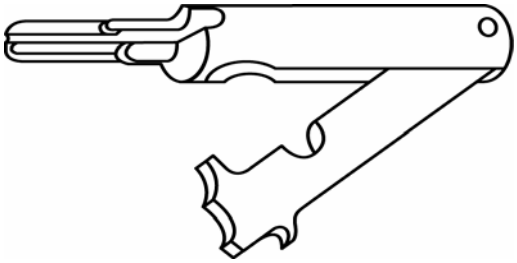
Item 6 Identify the SL-3 component shown below:



Item 7 The purpose of the ruptured cartridge extractor is to remove a ruptured cartridge from the

a. receiver.
b. buffer.
c. chamber.
d. feed tray.

Item 8 List the eights steps in the M240G cycle of operation.

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Continued on next page

Answers

The table below lists the answers to the exercise items. If you have questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	• Provide heavy volumes of close, accurate, and continuous fire support to suppress and destroy enemy personnel in support of an attack. • Serve as an integral part of a unit's defensive fire plan when employing final protective fires by breaking up and stopping an enemy's assault.	1-5
2	• Belt-fed • Air-cooled • Gas-operated • Fully automatic	1-6
3	1800	1-7
4	a. Barrel assembly b. Buttstock and buffer assembly c. Drive spring rod assembly d. Bolt and operating rod assembly e. Trigger housing assembly f. Cover assembly g. Feed tray h. Receiver assembly	1-8
5	b	1-9
6	Combination tool scraper and extractor	1-16
7	c	1-16

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
8	• Feeding • Chambering • Locking • Firing • Unlocking • Extracting • Ejecting • Cocking	1-19

Lesson Summary

In this lesson, you have learned the purpose of the M240G medium machinegun; the characteristics, capabilities, and nomenclature of the weapon; the SL-3 components; and the functioning of the weapon.

In the next lesson, you will learn the procedures for clearing, disassembly, assembly, and function check.

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LESSON 2

CLEARING, DISASSEMBLY, ASSEMBLY, AND FUNCTION CHECK

Introduction

Scope

To safely use and maintain the M240G medium machinegun and ensure it is in good working order, you must know certain procedures. Being able to properly disassemble and assemble the weapon is essential for maintaining the weapon. Performing a function check is required to make sure that the weapon functions properly after cleaning.

In this lesson, you will learn the procedures for clearing, disassembly, assembly, and performing a function check of the M240G medium machinegun.

Learning Objectives

After completing this lesson, you should be able to

- Identify the steps for clearing the M240G medium machinegun.
- Identify the two categories of disassembly and assembly.
- Identify the sequence of steps for disassembling the M240G medium machinegun.
- Identify the sequence of steps for assembling the M240G medium machinegun.
- State when a function check should be performed.
- Identify the sequence of steps for performing a function check of the M240G medium machinegun.

Continued on next page

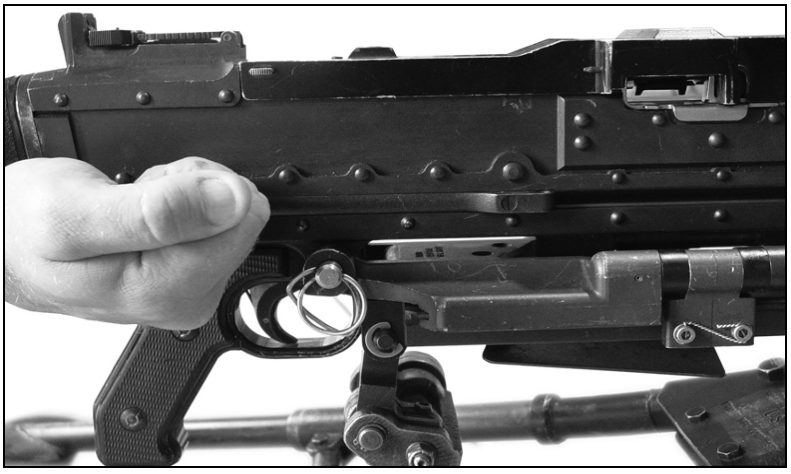
In This Lesson

This lesson contains the following topics:

Clearing

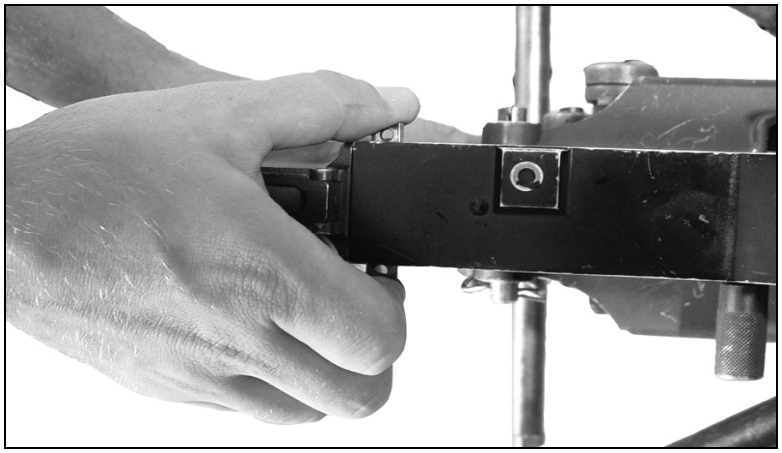
Procedure

Before the weapon is handled or disassembled, it must be cleared. This ensures the safety of the user and nearby personnel. The procedure for properly clearing the M240G is listed in the table below:

Step	Action
1	Point the weapon in a safe direction, away from personnel.
2	Place the safety on "F" fire. 
3	Pull the cocking handle to the rear to lock the bolt to the rear. Push the cocking handle all the way forward. 
4	Place the safety on "S" safe. 

Continued on next page

Procedure, continued

Step	Action
5	Push the cover latches in to release the cover and open the cover assembly. 
6	Remove any ammunition or links.
7	Raise the feed tray.
8	Visually and physically inspect the chamber to make sure it is empty. If a round/cartridge is still in the chamber, remove the round/cartridge as outlined in the troubleshooting section of this course. 

Continued on next page

Procedure, continued

Step	Action
9	Lower the feed tray.
10	Place the safety on “F” fire.
11	Pull the cocking handle to the rear and hold it. Pull the trigger and ease the bolt forward ensuring that it locks and the cocking handle is all the way forward.
12	Close the cover.

Disassembly

Introduction

The M240G is designed for easy disassembly—the use of force is not necessary. No special tools are required. As the weapon is disassembled, place the parts on a clean, flat surface. This reduces the possibility of losing a part and aids in assembly. To prevent unnecessary wear, disassembly should be kept to a minimum, consistent with maintenance and training requirements.

Disassembly is divided into two categories—general and detailed. General disassembly involves separating the weapon into main groups. This is also known as field stripping. This allows the operator to quickly break the weapon down into main components that can be hastily cleaned to keep the weapon ready for action.

Detailed disassembly involves the removal of some component parts from some of the main groups. This allows the operator to take more time to more thoroughly clean the weapon. Complete general and detailed disassembly is normal in garrison after field use or live fire but can also be done in a field environment as necessary, to ensure the proper functioning and maintenance of the weapon.

WARNING: Disassembly beyond the scope of this course, MCWP 3-15.1 Machineguns and Machinegun Gunnery, or TM 08670A/09712A-10/1B is *not authorized*, except by qualified ordnance personnel.

General Disassembly

Disassembly of the M240G medium machinegun begins with general disassembly of the weapon into its five main groups in the following order:

- Barrel group
- Buttstock group
- Operating group
- Trigger housing group
- Receiver group

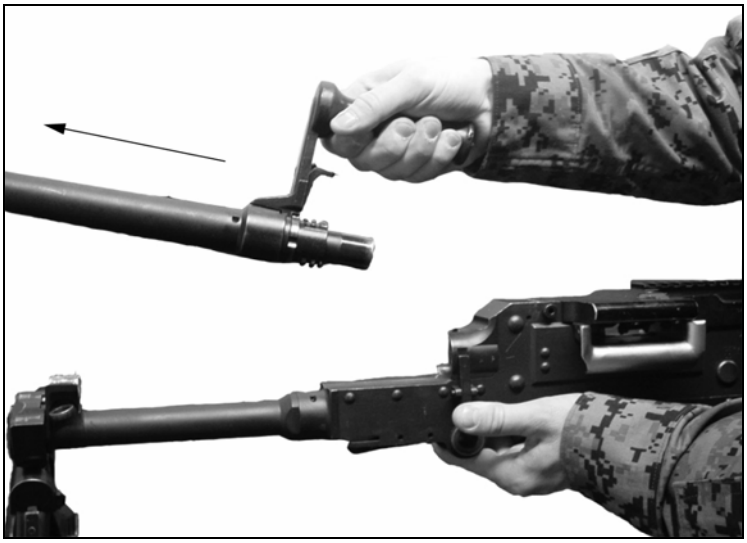
Note: Prior to disassembly of the M240G medium machinegun, ensure that you have cleared the weapon.

Continued on next page

Disassembly, Continued

Removing the Barrel Group

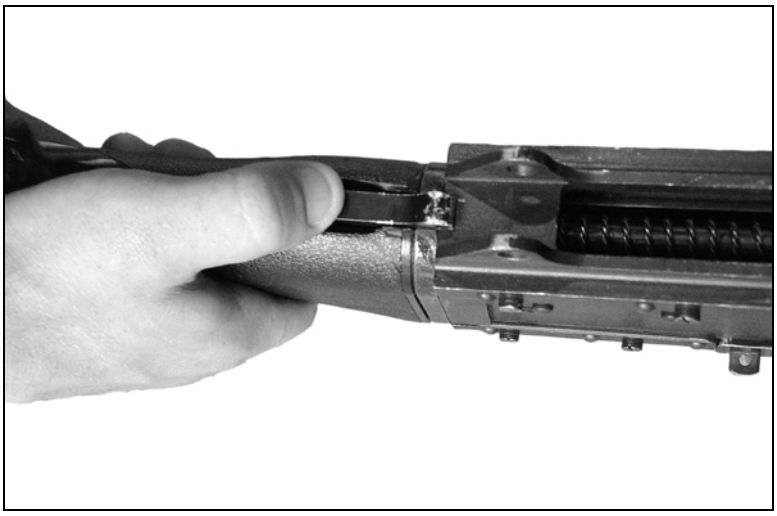
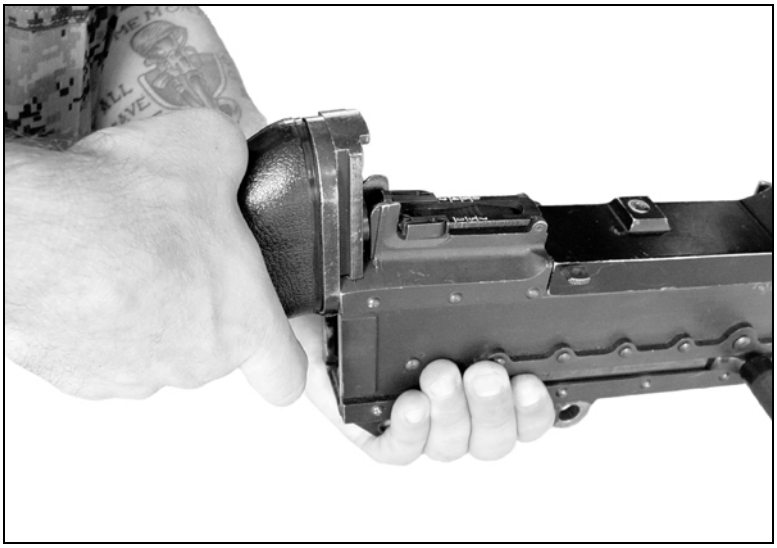
The procedure for removing the barrel group is listed in the table below:

Step	Action
1	Depress the barrel locking latch while grasping the barrel carrying handle and rotating it to the upright position. 
2	Push forward and pull up and remove the barrel. 

Continued on next page

Removing the Buttstock Group

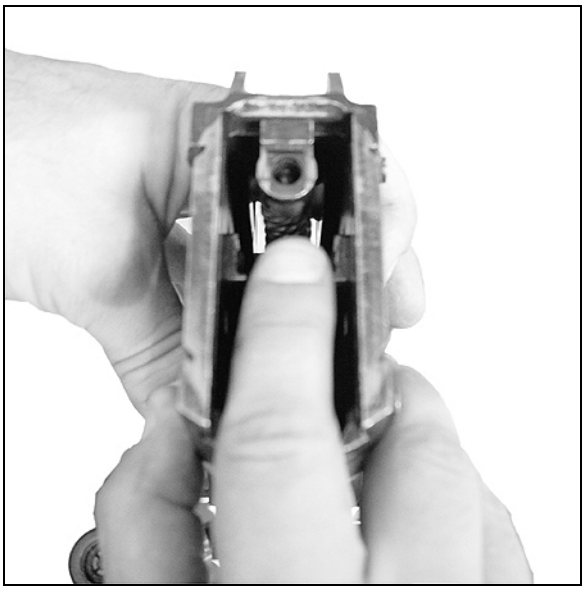
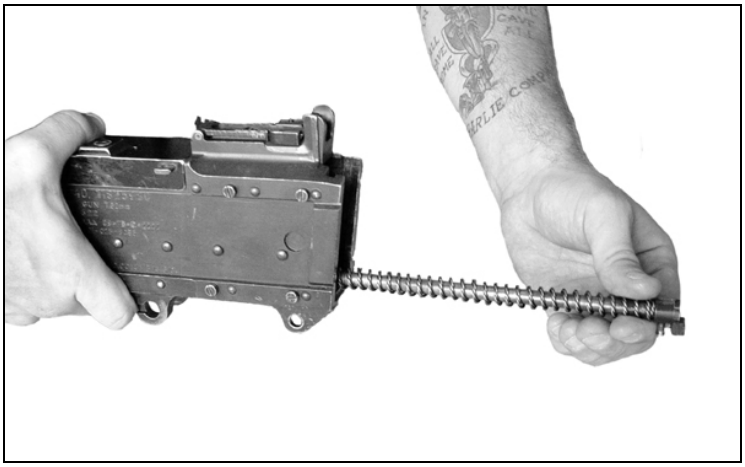
The procedure for removing the buttstock group is listed in the table below:

Step	Action
1	Make sure the bolt is forward and raise the cover.
2	Depress the buttstock latch located on the underside of the buttstock where it joins the receiver. 
3	Slide the buttstock upward and remove it from the receiver. 

Continued on next page

Removing the Operating Group

The procedure for removing the operating group is listed in the table below:

Step	Action
1	Push in against the base of the drive spring rod assembly and lift upward and out so that it clears the retaining studs inside the receiver. 
2	Remove the drive spring rod assembly from the receiver. 

Continued on next page

Removing the Operating Group, continued

Step	Action
3	Pull the cocking handle to the rear.
4	Reach inside the top of the receiver and push rearward on the face of the bolt with the index finger until the bolt and operating rod assembly are exposed at the rear of the receiver.
5	Grasp the bolt and operating rod assembly and remove them from the rear of the receiver. 

Continued on next page

Removing the Trigger Housing Group

The procedure for removing the trigger housing group is listed in the table below:

Step	Action
1	Remove the trigger housing spring pin. 
2	Rotate the rear of the trigger housing assembly down and remove the trigger housing assembly. 

Continued on next page

Disassembly, Continued

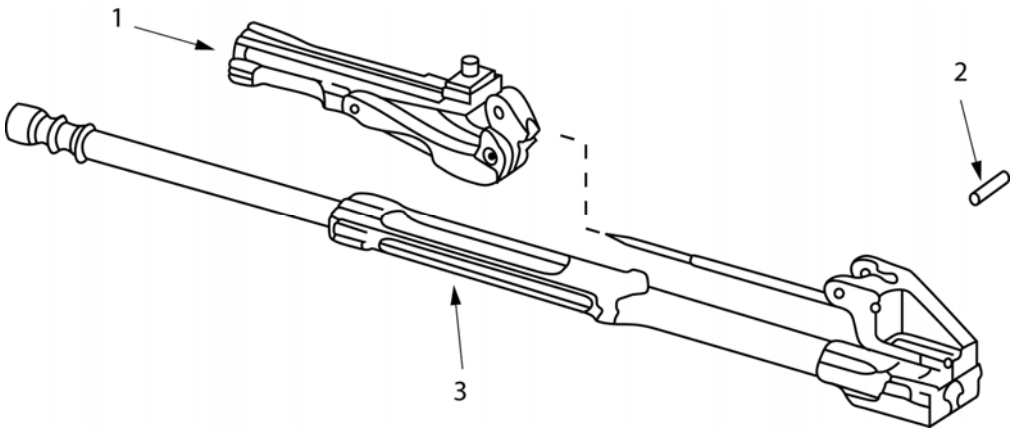
Detailed Disassembly

Detailed disassembly involves removing component parts of some of the main groups. Detailed disassembly of these groups should be kept to a minimum to reduce the possibility of damaging or losing parts. The buttstock and trigger housing groups will not have a detailed disassembly performed by the operator.

Operating Group

The operating group consists of the operating rod, bolt, and drive spring rod assembly. The bolt and operating rod assembly can have a detailed disassembly performed by the operator. The procedures for performing detailed disassembly on the bolt and operating rod are listed in the table below.

Step	Action
1	Remove the spring-loaded pin (2) that holds the bolt (1) onto the operating rod (3) as shown in the graphic below.
2	Pull the bolt forward until it is clear of the firing pin.

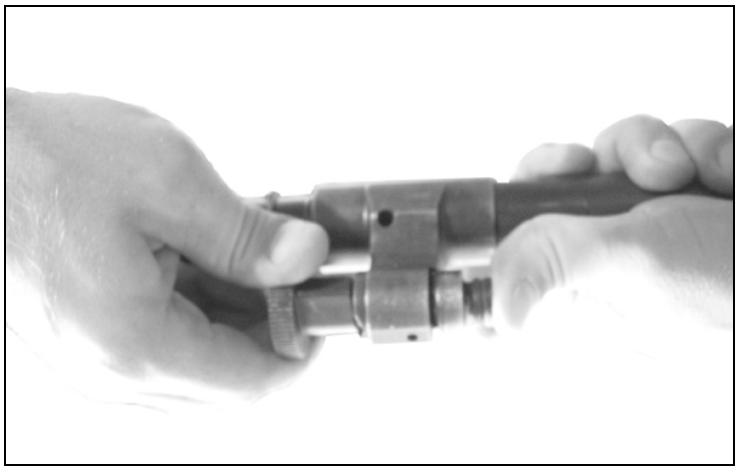
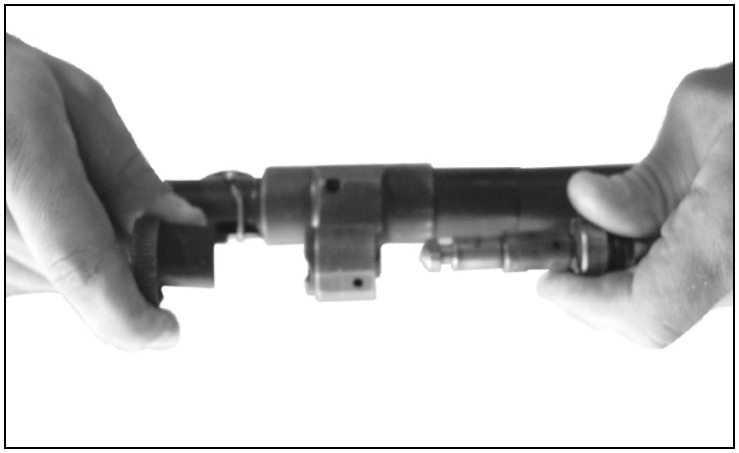


Continued on next page

Disassembly, Continued

Barrel Group

The barrel group consists of the barrel with attached gas system, adjustable front sight assembly, flash hider, and barrel carrying handle. The gas system can have a detailed disassembly performed by the operator. The procedures for performing the detailed disassembly are listed in the table below:

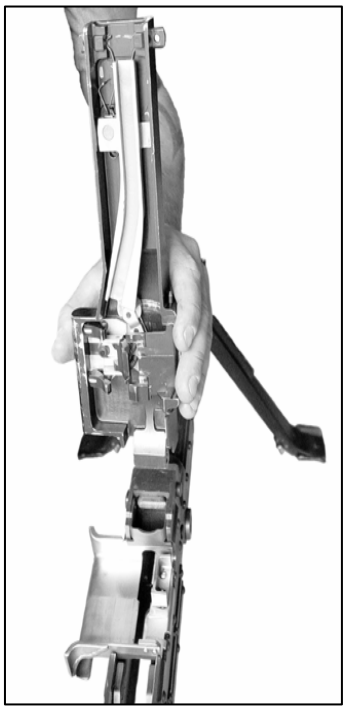
Step	Action
1	Hold the barrel at the point where the gas system attaches to it.
2	Push down and rotate the collar counterclockwise until it releases from the gas plug. 
3	Remove the collar from the gas plug.
4	Slide the gas plug to the rear and out of the gas regulator. 

Continued on next page

Disassembly, Continued

Receiver Group

The receiver group consists of the receiver with rear sight, cover assembly, feedtray, and bipod assembly. The cover assembly and feedtray can be removed by the operator. The procedures for removing the cover assembly and feedtray as listed in the table below:

Step	Action
1	Raise the cover straight up.
2	Pull the hinge spring pin out.
3	Lift the cover and feedtray from the receiver.   Note: Place cover down with moving parts facing up—moving parts facing down can damage parts.

Note: This procedure completes general and detailed disassembly of the M240G medium machinegun. Any further disassembly is *not* authorized.

Assembly

Detailed

Detailed assembly must be completed before general assembly of the weapon. Detailed assembly is conducted on the operating group, barrel group, and receiver group in any order.

Operating Group

The procedure for detailed assembly of the operating group is listed in the table below:

Step	Action
1	Hold the rod in one hand and slide the rear of the bolt over the firing pin.
2	Align the holes on the bolt with those on the operating rod.
3	Push the spring loaded pin through the holes.

Barrel Group

The procedure for detailed assembly of the barrel group is listed in the table below:

Step	Action
1	Insert the gas plug into the gas regulator.
2	Place the collar over the forward end of the gas plug.
3	Push against the collar while rotating clockwise until the collar locks in place.

Receiver Group

The procedure for detailed assembly of the receiver group is listed in the table below:

Step	Action
1	Lay the feed tray on the receiver so the feed tray guides are aligned with the receiver brackets.
2	Place the cover on the receiver aligning the mounting holes with the mounting brackets on the receiver. Push the cover down into the closed position.
3	Insert the cover hinge spring pin.

Continued on next page

Assembly, Continued

General

General assembly is completed after detailed assembly. The process is the reverse of general disassembly. The groups are assembled to the receiver group in the following order:

- Trigger housing group
- Operating group
- Buttstock group
- Barrel group

Attaching the Trigger Housing Group

The procedure for assembling the trigger housing group to the receiver group is listed in the table below:

Step	Action
1	Insert the holding notch on the front of the trigger housing into its recesses on the bottom of the receiver.
2	Rotate the rear of the trigger housing group upward and align the hole in the trigger housing with the mounting bracket on the receiver.
3	Insert the trigger housing assembly spring pin into the hole.

Installing the Operating Group

The procedure for assembling the operating group to the receiver group is listed in the table below:

Step	Action
1	Insert the bolt and operating rod into the receiver, aligning their slots with the rails inside the receiver.
2	Extend the bolt to the unlock (forward) position.
3	Push the entire bolt and operating rod assembly into the receiver.
4	Pull the trigger and continue to push the bolt and operating rod all the way into the receiver.
5	Insert the drive spring rod assembly into the receiver aligning the end with the recess in the rear of the operating rod.
6	Lower the drive spring rod assembly so that its base is seated against the retaining stud inside the receiver.

Continued on next page

Attaching the Buttstock Group

The procedure for assembling the buttstock group to the receiver group is listed in the table below:

Step	Action
1	Align the recessed grove at the front of the buttstock with the vertical rails at the rear of the receiver.
2	Slide the buttstock downward until it locks in place.

Attaching the Barrel Group

The procedure for assembling the barrel group to the receiver group is listed in the table below.

Step	Action
1	Insert the barrel breach into the barrel socket on the receiver aligning the gas plug with the gas cylinder.
2	Depress the barrel locking latch and fully seat the barrel in the receiver.
3	Rotate the barrel carrying handle to the down position.

Function Check

Purpose

The purpose of performing a function check is to ensure that the weapon is working properly prior to use. Function checks should be done immediately after any type of disassembly and assembly.

Procedure

The procedure for conducting a function check of the M240G medium machinegun is listed in the table below:

Step	Action
1	Place the safety on “F” fire.
2	Pull the cocking handle to the rear and lock the bolt to the rear. Return the cocking handle to the forward position.
3	Place the safety on “S” safe.
4	Pull the trigger; nothing should happen.
5	Place the safety on “F” fire.
6	Pull and hold the cocking handle to the rear.
7	Pull the trigger and ease the bolt forward until it locks.

Lesson 2 Exercise

Directions Complete exercise items 1 through 13 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 List the steps for clearing the M240G medium machinegun.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Item 2 The two categories of disassembly are

a. operator and upper echelon.
b. authorized and unauthorized.
c. general and detailed.
d. field and garrison.

Continued on next page

Item 3

To ensure the safety of the operator, prior to disassembling the M240G medium machinegun, the operator should

a. clean the weapon.
b. clear the weapon to ensure it is not loaded.
c. make sure the rear sight is in the down position.
d. change the barrels.

Items 4 Through 7

Matching: For items 4 through 7, match the letter of the component groups from column 2 to column 1 in the proper order they are disassembled from the receiver group when performing general disassembly.

Column 1	**Column 2**
Order	**Group**
___ 4.	a. Barrel
___ 5.	b. Trigger housing
___ 6.	c. Buttstock
___ 7.	d. Operating

Items 8 Through 11

Matching: For items 8 through 11, match the letter of the component groups from column 2 to column 1 in the proper order they are assembled to the receiver group when performing general assembly.

Column 1	**Column 2**
Order	**Group**
___ 8.	a. Trigger housing
___ 9.	b. Buttstock
___ 10.	c. Operating
___ 11.	d. Barrel

Continued on next page

Item 12

After completing disassembly and assembly, the operator should

a. return the M240G to the armory.
b. place the M240G in the gun bag.
c. change the barrels.
d. perform a function check.

Item 13

List the steps for performing a function check for the M240G medium machinegun.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

Continued on next page

Answers

The table below provides the answers to the exercise items. If you have any questions, refer to the reference page listed for each item.

Item Number	Answer	Reference Page
1	1. Point the weapon in a safe direction, away from personnel. 2. Place the safety on "F" fire. 3. Pull the cocking handle to the rear to lock the bolt to the rear. Push the cocking handle all the forward. 4. Place the safety on "S" safe. 5. Push the cover latches in to release the cover and open the cover assembly. 6. Remove any ammunition or links. 7. Raise the feed tray. 8. Visually and physically inspect the chamber to make sure it is empty. If a round/cartridge is still in the chamber, remove the round/cartridge. 9. Lower the feed tray. 10. Place the safety on "F" fire. 11. Pull the cocking handle to the rear and hold it. Pull the trigger and ease the bolt forward ensuring that it locks and the cocking handle is all the way forward. 12. Close the cover.	1-31 through 1-33
2	c	1-34
3	b	1-34
4	c	1-34
5	d	1-34
6	b	1-34
7	a	1-34
8	a	1-44
9	c	1-44
10	b	1-44

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
11	d	1-44
12	d	1-46
13	1. Place the safety on "F" fire. 2. Pull the cocking handle to the rear and lock the bolt to the rear. Return the cocking handle to the forward position. 3. Place the safety on "S" safe. 4. Pull the trigger; nothing should happen. 5. Place the safety on "F" fire. 6. Pull and hold the cocking handle to the rear. 7. Pull the trigger and ease the bolt forward until it locks.	1-46

Lesson Summary

In this lesson, you have learned the procedures for clearing the M240G, performing disassembly and assembly, and conducting a function check.

In the next lesson, you will learn about the ammunition used with the M240G medium machinegun.

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LESSON 3

AMMUNITION

Introduction

Scope

Another aspect of employing the M240G medium machinegun is knowing which type of ammunition to use.

In this lesson, you will learn the different types of ammunition used with the M240G, how to identify the ammunition, and the purpose of each type. In addition, you will also learn how to properly store and handle the ammunition.

Learning Objectives

After completing this lesson, you should be able to

- Identify the types of ammunition used with the M240G medium machinegun.
- Identify the purpose of the different types of ammunition used with the M240G medium machinegun.
- Identify the guidelines when storing M240G ammunition.
- Identify the guidelines when handling the M240G ammunition.

In This Lesson

This lesson contains the following topics:

Ammunition

Characteristics

The ammunition used for the M240G medium machinegun has the following common characteristics:

- 7.62 mm NATO cartridge
- Uses a disintegrating metallic split-link belt
- Linked in 100-round bandoleers (belts) that weigh approximately 7 pounds

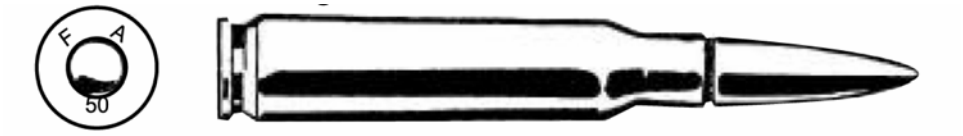
Types

There are five different types of M240G medium machinegun 7.62mm ammunition.

- M80 ball
- M62 tracer
- M82 blank
- M63 dummy
- M61 armor-piercing

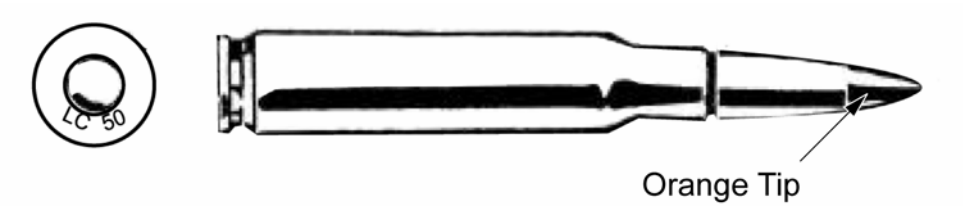
M80 Ball

The M80 ball 7.62 mm cartridge is identified by a plain bullet tip with a full metal jacket. It is used for marksmanship training, anti-personnel, and light material targets. The M80 ball is the non-tracer component used in the 4 and 1 combat mix.



M62 Tracer

The M62 tracer 7.62 mm cartridge is identified by an orange bullet tip. It is used for the observation of fire, incendiary effects, signaling, and marking targets. The M62 tracer is the tracer component of the 4 and 1 combat mix.



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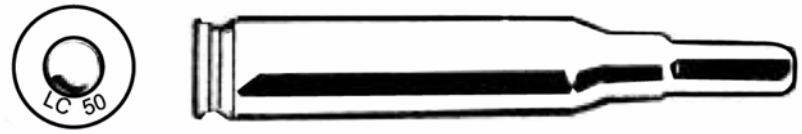
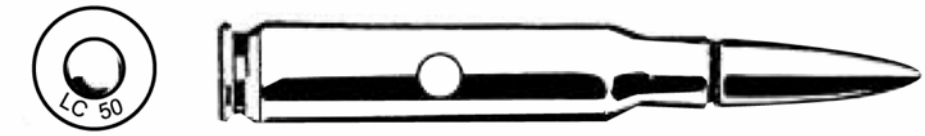
M82 Blank

The M82 blank cartridge is identified by the absence of a bullet and a double-tapered neck, only a sealed metal casing. It is used with a special adapter to simulate live-fire during training.



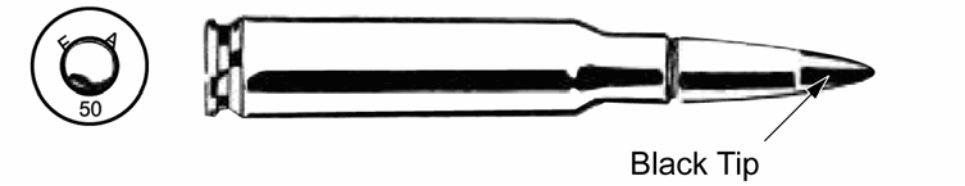
M63 Dummy

The M63 dummy cartridge is identified by a plain bullet, six longitudinal corrugations (flutings) along the casing, and the absence of a vent hole in the primer pocket. It is used for training purposes such as loading, unloading, and gun drills.



M61 Armor-Piercing

The M61 armor-piercing is identified by a black bullet tip. It is used against lightly armored targets where armor penetration effects are desired.



Armor Penetration

The table below details the armor penetration of the M80 ball and M61 armor-piercing ammunition.

Ammunition Type	Armor Penetration	
	300 Meters	500 Meters
M80 ball	4mm	3mm
M61 armor-piercing	7mm	5mm

Ammunition Storage and Handling

Ammunition Storage

The following guidelines should be followed when storing M240G ammunition:

- Store away from heat sources such as open flame, radiators, heaters, and hot water pipes.
- Do not store ammunition in the direct rays of the sun for long periods. If the powder is hot, excessive pressure may be developed when the weapon is fired.
- If stored outdoors in the open, keep the ammunition at least six inches off the ground and covered with tarp. Use materials to keep the tarp elevated off the ammunition to allow free air circulation.

Ammunition Handling

The following guidelines should be followed when handling M240G ammunition.

- Ammunition containers should not be opened until the ammunition is to be used. Ammunition removed from containers in damp environments can corrode.
- Protect the ammunition from mud, dirt, and water. If the ammunition gets wet or dirty, wipe it off prior to use.
- Wipe off light corrosion when it is discovered. Ammunition that is heavily corroded should be replaced.

Continued on next page

Ammunition Handling When Firing

The following guidelines should be followed during live-fire of the M240G:

- Avoid getting the ammunition in the dirt when firing. The ammunition can pick up pieces of dirt that can cause a weapon to malfunction.
- Do not oil or grease the ammunition. Dust and other abrasives will collect on it and could damage the operating parts of the weapon.
- Do not fire dented cartridges, cartridges with loose projectiles, or other defective rounds.
- Do not fire over friendly troops with ammunition marked as FOR TRAINING PURPOSES ONLY. Special lots of ammunition are approved for overhead fire and are marked FOR OVERHEAD FIRE.
- Do not fire ammunition, other than blank ammunition, that cannot be identified by type (i.e., the colored marking is rubbed off).

Lesson 3 Exercise

Directions Complete exercise items 1 through 8 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 List the five types of ammunition used with the M240G medium machinegun.

- _____
- _____
- _____
- _____
- _____

Item 2 What is the purpose of M80 ball ammunition?

_____

_____

Item 3 What is the purpose of M62 tracer ammunition?

_____

_____

Item 4 What is the purpose of M82 blank ammunition?

_____

_____

Continued on next page

Item 5 What is the purpose of M63 dummy ammunition?

_____

_____

_____

Item 6 What is the purpose of M61 armor-piercing ammunition?

_____

_____

_____

Item 7 Which of the following is a storage consideration when storing M240G ammunition?

a. Store ammunition near heat sources.
b. Store ammunition away from heat sources.
c. Store ammunition at least 6 inches off the ground and cover with tarps to restrict air circulation.
d. Store ammunition in the direct rays of the sun.

_____

Item 8 Which of the following is a consideration when handling M240G ammunition during live fires?

a. You should oil or grease the ammunition to aid in operation.
b. You should fire dented cartridges, cartridges with loose projectiles, or other defective rounds.
c. You should avoid getting the ammunition in the dirt when firing.
d. It is acceptable to fire ammunition, other than blank ammunition, that cannot be identified by type (i.e., the colored marking is rubbed off).

_____

Continued on next page

Answers

The table below provides the answers to the exercise items. If you have any questions, refer to the reference page listed for each item.

Item Number	Answer	Reference Page
1	• M80 ball • M62 tracer • M82 blank • M63 dummy • M61 armor-piercing	1-54
2	Marksmanship training, anti-personnel, and light material targets.	1-54
3	Observation of fire, incendiary effects, signaling, and marking targets.	1-54
4	Simulate live-fire during training.	1-55
5	Training purposes such as loading, unloading, and gun drills.	1-55
6	Against lightly armored targets where armor penetration effects are desired.	1-55
7	b	1-56
8	c	1-57

Lesson Summary

In this lesson, you learned the different types of ammunition, how to identify them, and their purpose. You also learned considerations when storing and handling M240G ammunition.

Study Unit 1 Summary

In this study unit, you have learned the characteristics, nomenclature, functioning, and ammunition used with the M240G medium machinegun. Also, you learned the procedures to clear, disassemble, assemble, and perform a function check.

In the next study unit, you will learn how to maintain the weapon and its associated equipment.

STUDY UNIT 2

MAINTENANCE

Overview

Scope

Having a weapon that is clean and functioning properly is paramount to the success of your mission. To ensure the M240G is ready for combat, you need to know how to properly clean and inspect it for damage.

In this study unit, you will learn how to properly care for the M240G medium machinegun. This includes the authorized cleaning materials to use, how to clean and inspect each main group of the M240G, and how to care for the associate components such as the tripod, mount, and carrying bags.

In This Study Unit

This study unit contains the following lessons:

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LESSON 1

CLEANING MATERIALS AND LUBRICANTS

Introduction

Scope

Cleaning the weapon is important to ensure it is in good working condition. Using the wrong materials or the wrong lubrication can cause damage that can render the M240G useless.

In this lesson, you will learn what materials are authorized to clean the M240G, what lubricants to use, and under what conditions each lubricant should be used.

Learning Objectives

After completing this lesson, you should be able to

- Identify the authorized cleaning materials for the M240G medium machinegun.
- Identify the authorized lubricants for the M240G medium machinegun.
- Identify which lubricants should be used under certain temperatures.

In This Lesson

This lesson contains the following topics:

Cleaning Materials

Authorized Cleaning Agents

Only three cleaning agents are authorized for use when cleaning the M240G medium machinegun:

- CLP (cleaner, lubricant, and preservative)
- RBC (rifle bore cleaner)
- Dry cleaning solvent

CLP

Cleaner, lubricant, and preservative is used for general cleaning, carbon removal, and corrosion removal.

RBC

Rifle bore cleaner is used for general cleaning, carbon removal, and corrosion removal in the chamber and barrel areas.

Dry Cleaning Solvent

Dry cleaning solvent is a chemical used to remove lubricants and other cleaning agents from the weapon. Use dry cleaning solvent to remove lubricants from the weapon when changing from one lubricant to another.

Lubricants

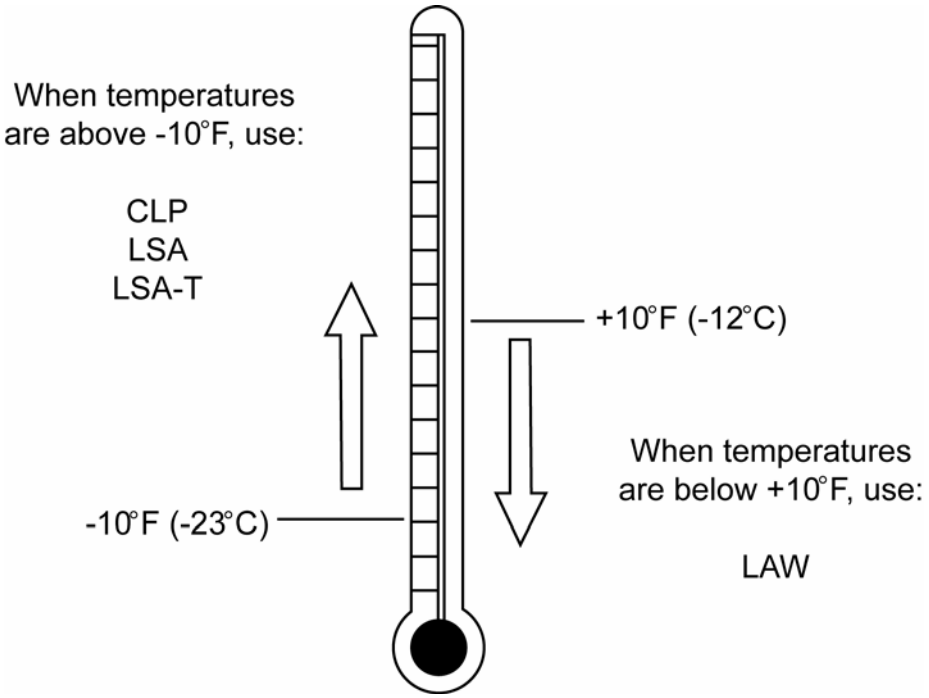
Authorized Lubricants

Lubricants are used on the M240G medium machinegun on certain operating parts before, during, and after operation. The lubrication aids in the operation of the weapon and helps to protect it from corrosion. Only the lubricants listed below are authorized for use on the M240G medium machinegun:

- CLP (cleaner, lubricant, and preservative)
- LSA (lubricating oil, semi-fluid)
- LSA-T (lubricating oil, semi-fluid with Teflon)
- LAW (lubricating oil, arctic weather)

Lubricant Use

CLP, LSA, or LSA-T should be used under all but the coldest arctic conditions:



Lesson 1 Exercise

Directions

Complete exercise items 1 through 3 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1

List the authorized cleaning materials for use on the M240G medium machinegun.

- _____
- _____
- _____

Item 2

List the authorized lubricants for use on the M240G medium machinegun.

- _____
- _____
- _____
- _____

Item 3

Which lubricant should be used when the normal outside temperature is +10°F (–12°C) or below?

a. CLP
b. LSA
c. LSA-T
d. LAW

Continued on next page

Answers

The table below lists the answers to the exercise items. If you have questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	• CLP • RBC • Dry cleaning solvent	2-4
2	• CLP • LSA • LSA-T • LAW	2-5
3	d	2-5

Summary

In this lesson, you have learned what items are used to clean and lubricate the M240G as well as which lubricants to use under what conditions.

In the next lesson, you will learn how to properly care for the M240G medium machinegun.

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LESSON 2

CARING FOR THE M240G MEDIUM MACHINEGUN

Introduction

Scope

Not maintaining the M240G correctly can result in poor weapon performance or even failure. As an operator of the M240G medium machinegun, it is your responsibility to keep the weapon clean and operational at all times.

In this lesson, you will learn how to properly clean, lubricate, and inspect each group of the M240G. You will also learn how to perform a function check to ensure the machinegun is working properly. In addition, the required care before, during, and after firing will also be covered.

Learning Objectives

After completing this lesson, you should be able to

- List general maintenance guidelines.
- Identify the steps for maintaining the different groups of the M240G.
- Identify the steps for inspecting the M240G.
- Identify the steps for care before, during, and after firing.
- Identify the steps for checking the headspace.

Continued on next page

In This Lesson

This lesson contains the following topics:

Operator Maintenance Guidelines

Precautions

When cleaning the M240G medium machinegun, follow these guidelines:

- Use care when removing excess carbon from the weapon. Carbon may chip off and fly into the eyes. Protective goggles should be worn.
- Using cleaning materials other than those listed in the previous section such as gasoline, kerosene, hydraulic oil, benzene, bensol, or high-pressure water is prohibited.
- Do *not* use abrasives to clean the bore, piston, gas cylinder, or gas regulator plug.
- Do *not* apply lubricants to composite or rubber components.
- Do *not* apply dry solvent to plastic parts.

Non-Use

If the M240G is not used, it should still be maintained (cleaned and lubricated) at least every 90 days.

Preparation

Before cleaning the M240G medium machinegun, do the following:

- Clear the weapon.
- Perform general and detailed disassembly on the weapon.
- To ensure thorough cleaning, clean the M240G one group at a time.

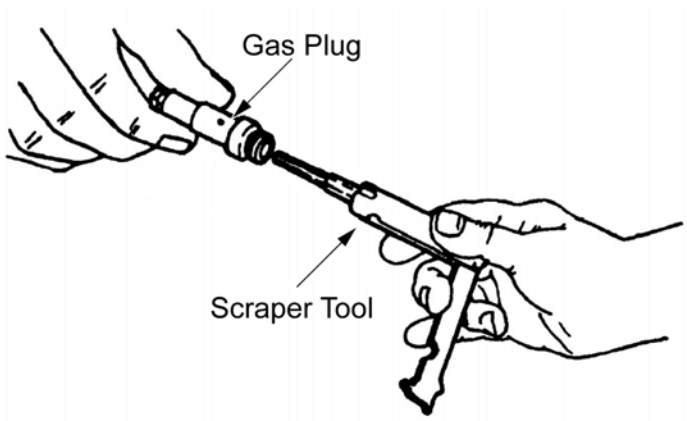
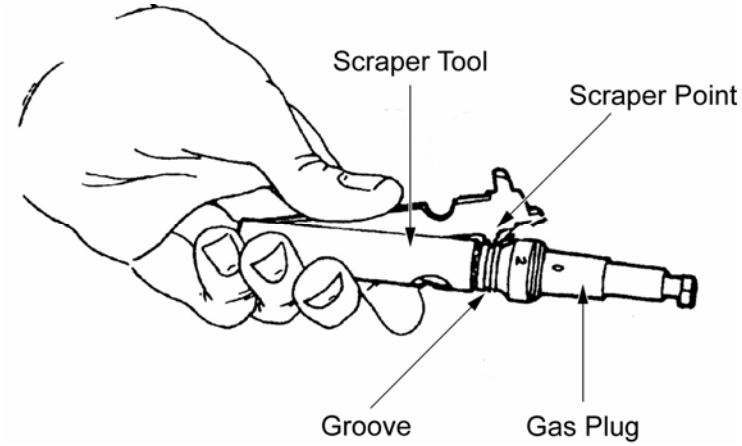
Note: Upon completion of operator maintenance, be sure to perform a function check after assembling the weapon.

Continued on next page

Barrel Group

Gas Regulator Plug

Use the procedure in the table below to maintain the gas regulator plug:

Step	Action
1	Using the scraper tool, insert the scraper into the center hole of the gas regulator plug as shown below. Twist the scraper clockwise to remove carbon from the center hole until the scraper is fully seated against the gas regulator plug. 
2	Fold the scraper over and press the scraper point into the groove. Turn the gas regulator plug clockwise to remove carbon from the groove. 

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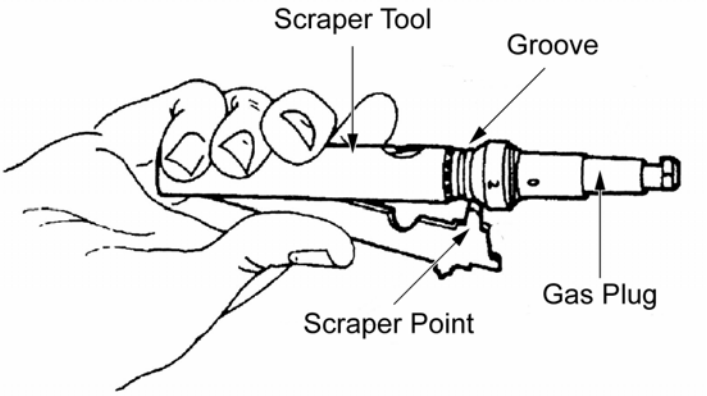
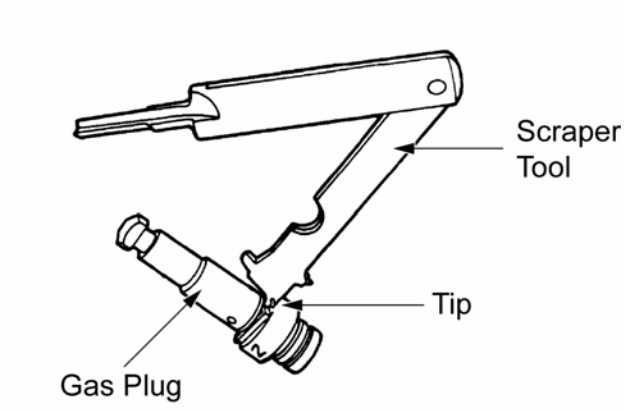
Gas Regulator Plug, continued

Step	Action
3	Pivot the scraper blade 180° to the opposite side and place the scraper point into the groove of the gas regulator plug. Turn the gas regulator plug clockwise to remove carbon from the groove. 
4	Using the tip of the scraper, scrape carbon from the surface of the gas regulator plug. 

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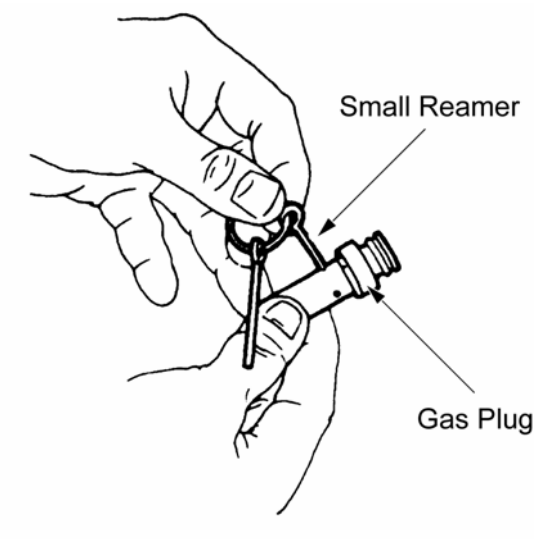
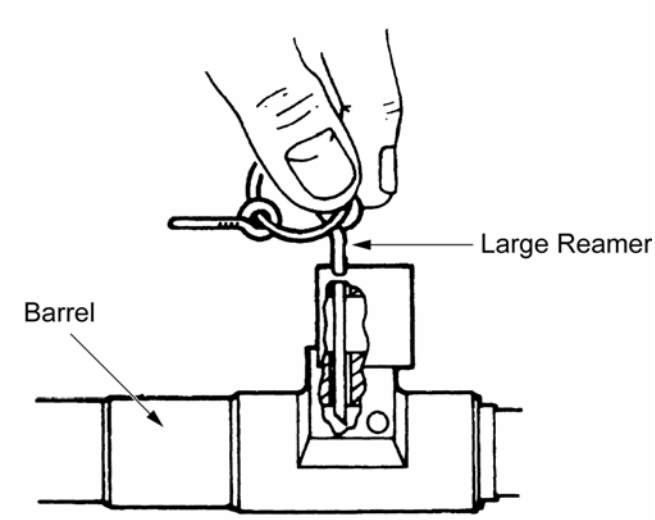
Gas Regulator Plug, continued

Step	Action
5	Insert the small reamer into each gas inlet hole of the gas regulator plug and twist back-and-forth to remove carbon. 

Barrel Group, Continued

Maintaining

Use the procedure in the table below to maintain the barrels. Make sure the procedure is done to both barrels:

Step	Action
1	Insert the large reamer through the hole in the gas port busing into the gas port hole in the barrel. Twist the reamer back-and-forth until the reamer enters the bore of the barrel to remove carbon. 
2	Remove carbon, dirt, and corrosion from the bore and chamber using the cleaning rod with the bore brush, chamber brush, and swabs dampened with CLP or RBC.
3	Clean the remaining parts of the barrel using a soft bristle brush and wiping rag dampened with CLP.
4	Lubricate the barrel surfaces with CLP, LSA, or LSA-T. • Apply a light coat of lubricant to all metal surfaces. • Apply a light coat of lubricant to the bore using the cleaning rod and a swab lightly moistened with lubricant.
5	Assemble the barrel group. Make sure the gas regulator plug is set to 1 and facing the barrel before securing it with the gas collar.

Barrel Group, Continued

Inspecting

When inspecting the barrel group, look for the following:

- Cracks, dents, or metal burrs which may hinder the operation of the weapon
- Obstructions in the bore or chamber of the barrel
- Damage to the front sight
- Damage to the barrel carrying handle, bracket, or bracket latch
- Damage to the flash hider
- Buffer plug damage

Buttstock and Buffer Group

Maintaining

Use the procedure in the table below to maintain the trigger housing group:

Step	Action
1	Clean the metal parts: stock rails, buttstock latch, buttplate, and rear sling attachment with CLP to remove any corrosion and carbon residue.
2	Clean the composite/plastic parts with a damp wiping rag removing any dirt or carbon residue.
3	Lubricate the buttstock and buffer assembly. Make sure lubricant does not get on composite/plastic parts. Lightly lubricate the • Stock rails • Buttstock latch • Buttplate and rear sling attachment to prevent corrosion

Inspecting

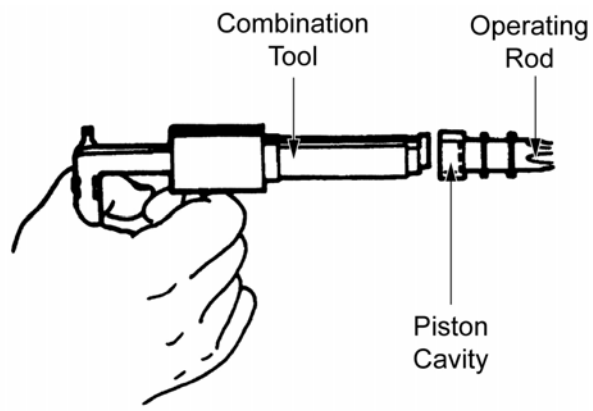
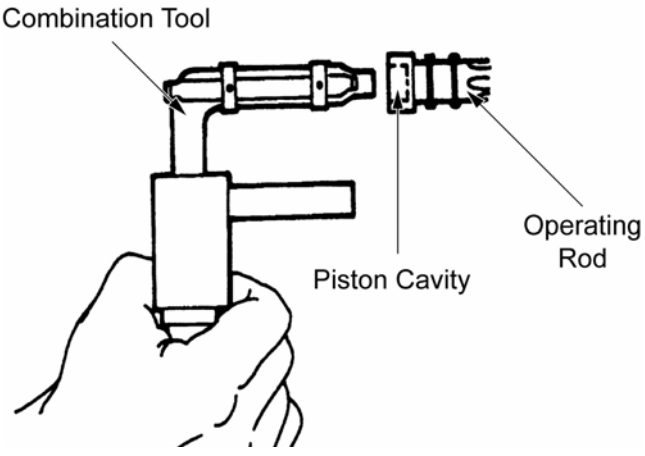
When inspecting the buttstock and buffer group, look for the following:

- Loose fit when the buttstock assembly is attached to the receiver
- Proper operation of the buttstock latch
- Damage to the rear sling attachment
- Buffer plug sticking out 1/8 inch (weapon will not function.)

Operating Group

Maintaining

Use the procedure in the table below to maintain the operating group:

Step	Action
1	Insert the combination tool into the cavity of the piston on the operating rod. Squeeze the handle firmly while twisting the combination tool back-and-forth to remove carbon from the sides of the cavity. 
2	Insert the screwdriver end of the combination tool into the cavity of the piston on the operating rod. Twist back-and-forth to remove carbon in the bottom of the cavity. 

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Maintaining, continued

Step	Action
3	Clean the remaining portions of the operating group to include the operating rod, firing pin, bolt, and driving spring using an all-purpose brush moistened with CLP and a wiping rag.
4	Apply a thin coat of lubricant to the operating group: • Bolt and operating rod moving parts • Polished areas • Firing pin • Linear roller • Driving spring
5	Assemble the operating group.

Inspecting

When inspecting the operating group, look for the following:

- Burrs, cracks, broken pins or a frozen linear roller on the bolt and operating rod.

- Broken strands on the driving spring. If two or more strands are broken on the same coil or three or more strands are broken in any location, notify unit maintenance.

Trigger Housing Group

Maintaining

Use the procedure in the table below to maintain the trigger housing group:

Step	Action
1	Clean the internal parts with a cotton swab moistened with CLP or RBC to remove any carbon residue.
2	Clean the outside with a cleaning rag.
3	Lubricate the internal moving parts including tripping lever, sear, trigger, and trigger housing spring pin with a light coat of lubricant.

Inspecting

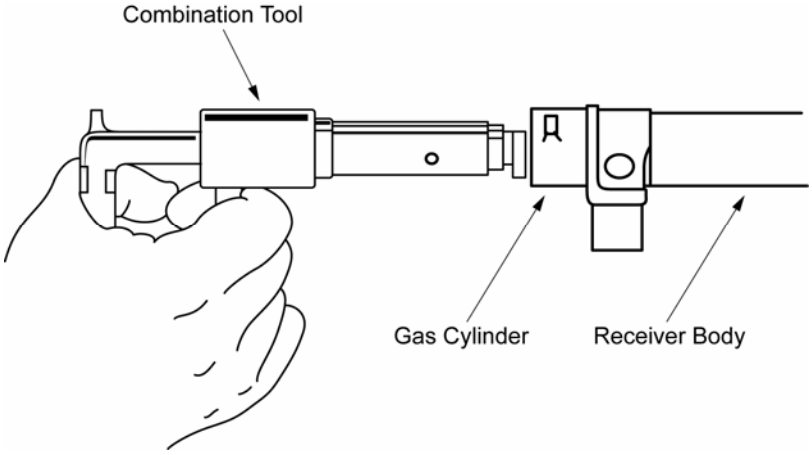
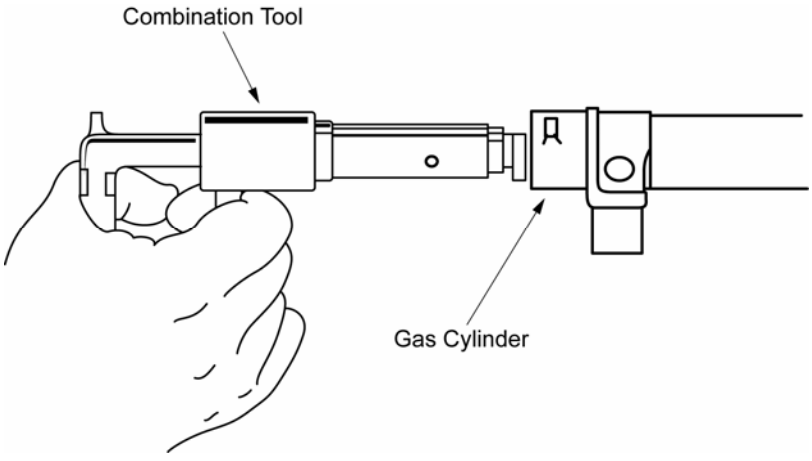
When inspecting the trigger housing group, look for the following:

- Broken or damaged trigger housing lug.
- Broken, cracked, or missing grips.
- Make sure trigger guard is not bent and interferes with trigger operation.
- Burrs, cracks, or wear on the tripping lever and sear.
- Test cocking action by pushing back on the tripping lever then pulling trigger.
- Test safety function. Place safety on SAFE, pull trigger, sear should not lower. Place safety on FIRE, pull trigger, sear should lower.

Receiver Group

Maintaining

Use the procedure in the table below to maintain the receiver group:

Step	Action
1	Remove carbon from inside of cover assembly using wiping rags and swaps moistened with CLP. Pay close attention to the moving parts such as the feed pawls and feed lever.
2	Clean the top of the cover and accessory mounting rails with a wiping rag and all-purpose brush moistened with CLP.
3	Carefully insert the combination tool into the fore end of the gas cylinder of the receiver body. 
4	Make sure the combination tool is fully seated in the gas cylinder. Apply slight pressure to the handles and twist back-and-forth to remove carbon. 

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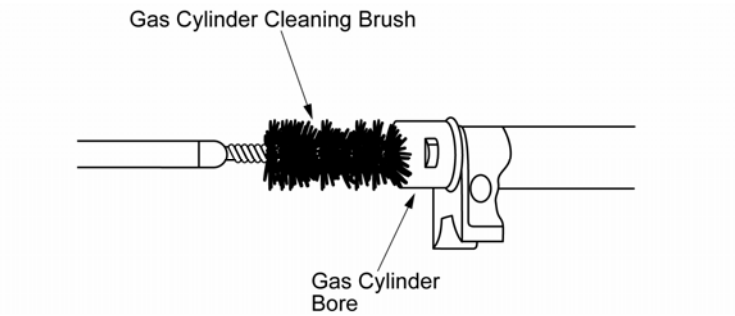
Maintaining, continued

Step	Action
5	Clean the gas cylinder bore with the gas cylinder brush moistened with CLP or RBC. 
6	Clean the remainder of the receiver group to include the receiver body, rear sight, and bipods.
7	Lightly lubricate the receiver group: • Moving parts of the cover assembly • Moving parts of the receiver body • Rails inside the receiver body • Moving parts of the bipod assembly

Continued on next page

Receiver Group, Continued

Inspecting

When inspecting the receiver group, check the following:

- Proper operation of the bipod latch
- Proper operation of the bipod assembly
- Spring tension on the front and rear feed pawls (press on them.)
- Spring tension on the feed arm (move it back and forth.)
- Spring tension on the cartridge guides
- Excessive wear of the moving parts of the cover
- Proper operation of the cover latches
- Damage to the mounting rail on the cover
- Spring tension and operation of the barrel locking latch
- Smooth operation of the cocking handle
- Damage on the rear sight assembly
- Operation of the rear sight assembly

Care and Cleaning Before, During, and After Firing

Before Firing

Before firing the M240G, the operator should

- Inspect the M240G for cleanliness, proper mechanical condition (function check), and missing or broken parts.
- Remove excess lubricant from the bore, chamber, barrel socket, and face of the bolt.
- Apply lubricant on the recesses of the operating rod that make contact with the receiver rails.
- Lightly lubricate the spring pin, roller, and other moving parts of the bolt.
- Lubricate the receiver by pulling the bolt to the rear with the cocking handle and running a line of lubricant on either side of the bolt. Manually pull the bolt back and forth to spread the lubricant over the bolt and receiver rails.

Check Headspace

Check the headspace of both barrels by rotating the barrel handle and counting the number of clicks heard. There should be a minimum of two clicks and a maximum of seven. If there are less than two or more than seven, the weapon should not be fired, but turned in for higher level maintenance.

During Firing

Maintain a light coat of lubrication on the areas that were lubricated prior to firing. Ensure the gas system remains tight. Change barrels when necessary.

After Firing

After firing the M240G, the operator should

- Perform operator maintenance for three consecutive days. After cleaning each day, all cleaning materials should be wiped off the weapon. Then, place a light coat of CLP on all metal surfaces.
- If the weapon is fired daily, general cleaning should be performed on the weapon broken down into the five main groups. Repeated detailed disassembly will cause unnecessary wear.

Lesson 2 Exercise

Directions Complete exercise items 1 through 6 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 Before performing maintenance on the M240G medium machinegun, the operator should

a. request authorization from the section leader.
b. soak the entire machinegun in dry cleaning solvent for one hour.
c. fire the machinegun so that it is dirty.
d. clear the weapon prior to disassembling it.

Item 2 When cleaning the gas regulator plug, the operator should use _____ to remove carbon.

a. the scraper tool
b. a screwdriver
c. steel wool
d. abrasive cleaners

Item 3 How many strands can be broken on a single coil of the driving spring before it should be replaced?

a. 1
b. 2
c. 3
d. 4

Continued on next page

Item 4

Prior to firing the M240G, the operator should remove excess lubricant from the

a. front and rear sight assemblies.
b. belt of ammunition.
c. bore, chamber, barrel socket, and face of the bolt.
d. barrel surface.

Item 5

When checking the headspace on the M240G, there should be between _____ and _____ clicks.

a. 1; 5
b. 2; 5
c. 1; 7
d. 2; 7

Continued on next page

Answers

The table below lists the answers to the exercise items. If you have questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	d	2-11
2	a	2-12
3	b	2-19
4	c	2-24
5	d	2-24

Summary

In this lesson, you have learned how to properly care for the M240G medium machinegun.

In the next lesson, you will learn how to care for the associated components such as the M122 tripod and the flex-mount/T&E mechanism.

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LESSON 3

CARING FOR THE SL-3 COMPONENTS

Introduction

Scope

Often, the associated components are needed to help accomplish the mission with the M240G. If the tripod or mount fails during combat, it can have serious consequences on the outcome of the mission.

In this lesson, you will learn how to care for the associate components of the M240G medium machinegun.

Learning Objectives

Upon completion of this lesson, you should be able to

- Identify the procedures for caring for the M122 tripod.
- Identify the procedures for caring for the flex-mount/T&E mechanism.
- Identify the procedures for caring for the carrying bag and the spare barrel bag.

In This Lesson

This lesson contains the following topics.

M122 Tripod

Cleaning

To clean the M122 tripod, do the following:

- Remove all dirt using a soft bristle brush and a damp wiping rag.
- Remove any corrosion using a soft bristle brush dampened with CLP.

Inspecting

Inspect the following areas on the M122 tripod:

- Rear legs expand properly and lock in place
- Sleeve latch functions properly
- Front leg folds out properly
- Legs are not bent
- Markings on the traverse slide bar are legible
- Pintle lock functions by locking the flex-mount onto the tripod head

Lubricating

Lubricate the M122 tripod using the same guidelines for the M240G medium machinegun. Lightly lubricate the following areas of the tripod:

- Pintle lock assembly
- Sleeve latch
- Moving parts of the sleeve and portion of the legs on which the sleeves slide

Flex-Mount/T&E Mechanism

Cleaning

To clean the flex-mount/T&E mechanism, do the following:

- Remove all dirt with a soft bristle brush and a damp wiping rag.
- Remove any corrosion with a soft bristle brush dampened with CLP.
- Extend the T&E mechanism to clean the entire length of both the upper and lower elevating screws.
- Turn the traversing handwheel all the way in both directions to clean the entire traversing screw.

Inspecting

Inspect the following areas on the flex-mount/T&E mechanism:

- Pintle for excessive wear or burrs that may interfere with its fit into the tripod
- Pivot points on the flex-mount so
- that they move freely
- Brass deflector is not bent up to obstruct the ejection of brass during operation
- Traversing handwheel for smooth operation and dead clicks
- Elevating handwheel for smooth operation and dead clicks
- Elevation and traverse scales can be read without difficulty
- Traversing slide lock lever or proper operation

Lubricating

Lubricate the flex-mount/T&E mechanism using the same guidelines for the M240G medium machinegun. Lightly lubricate the flex-mount/T&E mechanism:

- Pivot points on the flex-mount
- Entire length of the upper and lower elevating screws
- Entire traversing screw
- Pivot point on the traversing slide lock lever

Carrying Bag and Spare Barrel Bag

Cleaning

To clean the bags, use the following guidelines:

- Remove any dirt or mud with a stiff bristle brush.
- Wash the bags with a mild detergent and cold or warm water. Rinse thoroughly with clean water.
- Air dry the bags in the shade or indoors.
- Do *not* wash in hot water.
- Do *not* wash or dry in laundry machines.
- Do *not* use chlorine bleach, yellow soap, cleaning fluids, or solvents to clean the bags.
- Do *not* dry in direct sunlight, direct or extreme heat, or with an open flame.
- Do *not* attempt to dye or repair the bags. Turn them in for replacement.

Inspecting

Inspect the following on the carrying and spare barrel bags:

- Excessive wear
- Closures on both bags for serviceability
- Retaining straps for serviceability
- Carrying straps for serviceability

Lesson 3 Exercise

Directions Complete exercise items 1 through 3 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 When caring for the M122 tripod, what are the three areas you should lubricate?

- _____
- _____
- _____

Item 2 When caring for the T&E mechanism, what two components should be checked for smooth operation and dead clicks?

- _____
- _____

Item 3 When cleaning the carrying bag or spare barrel bag, do *not*

- _____
- _____
- _____
- _____
- _____

Continued on next page

Answers

The table below provides the answers to the exercise items. If you have any questions, refer to the reference page listed for each item.

Item Number	Answer	Reference Page
1	• Pintle latch assembly • Sleeve latch • Portion of legs on which the sleeves move	2-30
2	• Traversing handwheel • Elevating handwheel	2-31
3	• Do *not* wash in hot water. • Do *not* wash or dry in laundry machines. • Do *not* use chlorine bleach, yellow soap, cleaning fluids, or solvents to clean the bags. • Do *not* dry in direct sunlight, direct or extreme heat, or with an open flame. • Do *not* attempt to dye or repair the bags.	2-32

Lesson Summary

In this lesson, you learned how to properly care for the M122 tripod, flex-mount/T&E mechanism, and the carrying bags.

Study Unit 2 Summary

In this study unit, you learned which cleaning materials and lubricants are authorized for use on the M240G medium machinegun. Also, you learned how to properly clean, inspect, and lubricate the different parts of the weapon and its associated components. Proper cleaning with the proper materials is instrumental in keeping the M240G medium machinegun operational and in the fight.

In the next study unit, you will learn how to mount, load, zero, operate, and troubleshoot the M240G.

STUDY UNIT 3

OPERATING THE M240G MEDIUM MACHINEGUN

Overview

Scope

Proper operation of the M240G is the key to a successful mission. As the operator, you need to know how to properly setup and load the weapon to get accurate fire on your targets as quickly as possible. The mission may depend on your ability to accurately suppress the enemy and destroy targets. If your M240G stops working, you have to be able to identify the problem, correct it, and get your weapon back in action with minimal down time.

In this study unit, you will learn how to mount the M240G on bipod and tripod mounts; loading and unloading procedures; how to fire the weapon; how to zero the weapon; and how to troubleshoot problems if something goes wrong.

In This Study Unit

This study unit contains the following lessons:

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LESSON 1

MOUNTING

Introduction

Scope

Being able to operate the M240G and provide accurate fire is essential to the mission. Hollywood has portrayed automatic weapons as being effective when fired as the action star is running into combat—each round hitting its intended target every time. The truth is automatic weapons are only effective and accurate when they have a stable base to fire from.

In this lesson, you will learn how to properly set up the M240G for firing from the attached bipod and the M122 tripod.

Learning Objectives

Upon completion of this lesson, you will be able to

- List the steps for setting up the M240G with the bipod mount.
- List the steps for setting up the M240G with the tripod mount.
- List the steps for preparing the T&E mechanism.

In This Lesson

This lesson contains the following topics:

Using the Bipod

The Bipod

The bipod is permanently attached to the M240G and is a part of the receiver group. The bipod is attached to the receiver by a ball joint that allows limited movement.

Lowering the Bipod

Use the steps listed in the table below to lower the bipod:

Step	Action
1	Grasp the bipod and push in on the bipod latch. 
2	Rotate the bipod legs down and forward. 

Continued on next page

Lowering the Bipod, continued

Step	Action
3	Release the legs. They will automatically expand to the outward and locked position. 

Moving the M240G on the Bipod

The bipod pivots on the ball joint, allowing quick and easy left or right lateral movement of the weapon.

Continued on next page

Using the Bipod, Continued

Raising the Bipod

The steps for raising the bipod are listed in the table below:

Step	Action
1	Squeeze the bipod legs together. 
2	Rotate the legs rearward and upward into the slot on the bottom of the receiver. 
3	Push in until the bipod latch engages, locking the bipod in place.

Using the Tripod

The Tripod Mount

The tripod mount consists of the M122 tripod and the flex-mount with T&E mechanism. The tripod provides a stable and lightweight base that is far superior to the bipod. The tripod is the preferred method of employment.

Setting up the Tripod

The steps for setting up the tripod are listed in the table below:

Step	Action
1	Spread the rear tripod legs apart to extend them. 
2	Continue until the sleeve latch engages, locking them in the open position. 

Continued on next page

Setting up the Tripod, continued

Step	Action
3	Extend the front leg to the open position. 
4	Place the tripod on the ground with the front leg point in the general direction of fire. 

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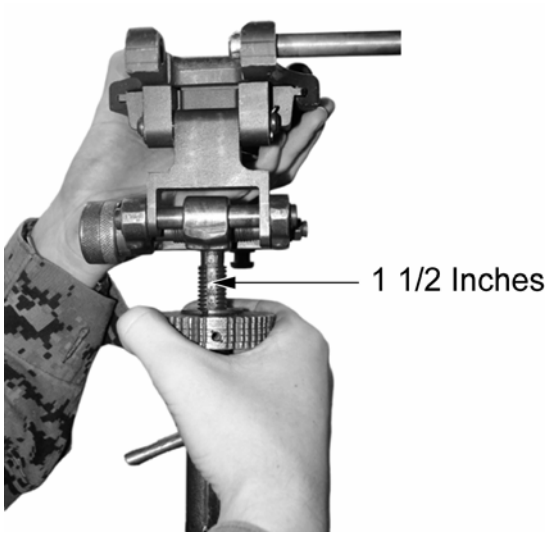
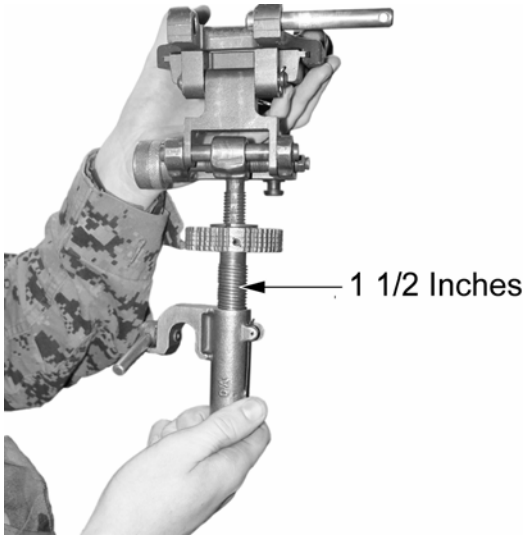
Preparing the T&E

The steps for preparing the T&E are listed in the table below:

Step	Action
1	Rotate the elevating hand wheel until approximately 1 1/2 inches are visible on the upper elevation screw. 
2	Rotate the traversing slide until approximately 1 1/2 inches are visible on the lower elevation screw. 

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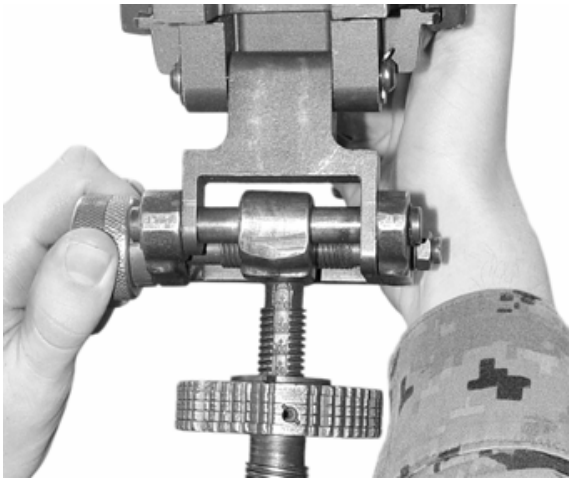
Preparing the T&E, continued

Step	Action
3	Rotate the traversing hand wheel until the offset head is centered on the traversing screw. 

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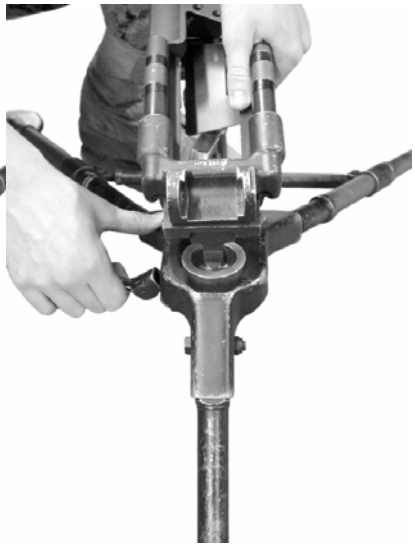
Attaching the Flex-Mount

The steps for attaching the flex-mount to the tripod are listed in the table below:

Step	Action
1	Open the pintle locking lever. 
2	Insert the flex-mount pintle into the tripod pintle bushing.  

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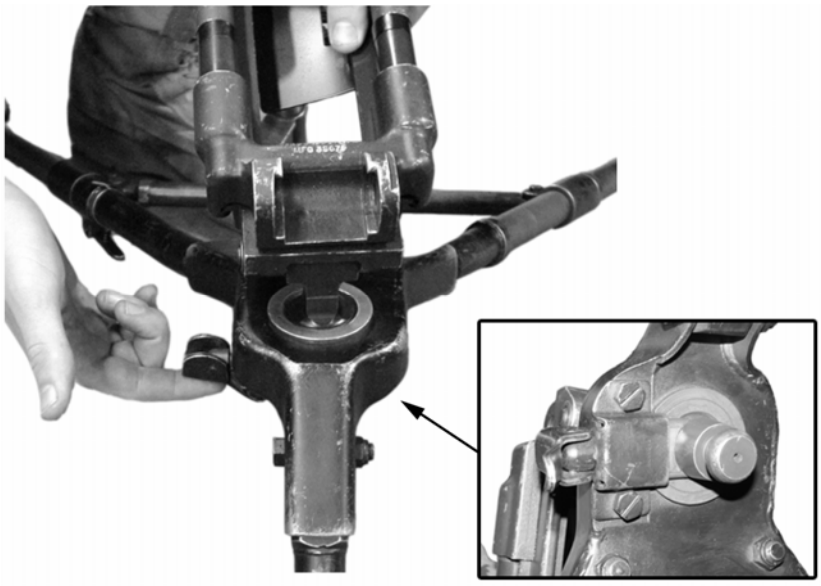
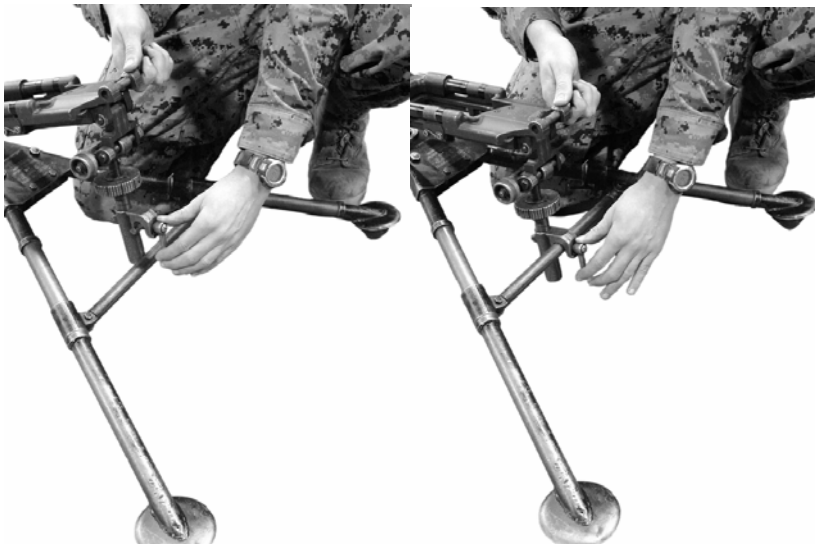
Attaching the Flex-Mount, continued

Step	Action
3	Engage the pintle locking lever to lock the pintle in place. 
4	Lower the traversing slide over the traversing bar with the traversing locking lever to the rear. 

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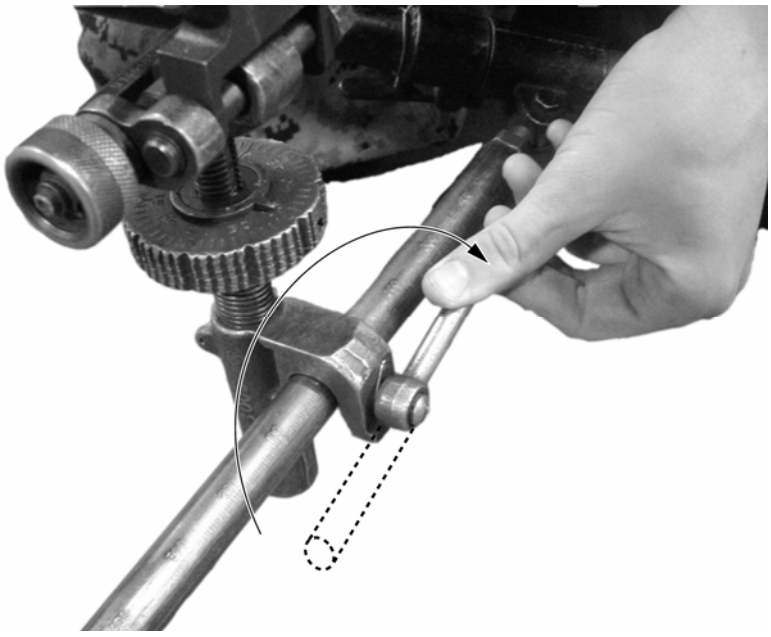
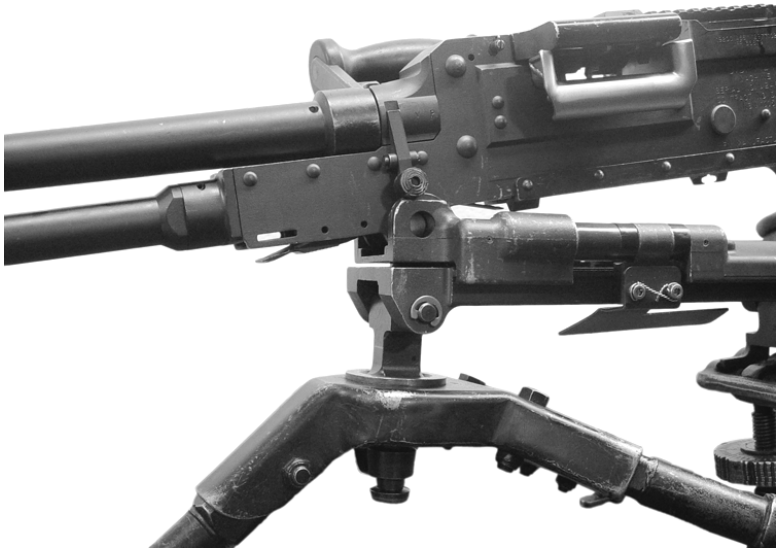
Attaching the Flex-Mount, continued

Step	Action
5	Lock the traversing slide in place by turning the traversing locking lever clockwise. 
6	Pull out the retaining pin. 

Continued on next page

Attaching the M240G

The steps for attaching the M240G to the flex-mount are listed in the table below:

Step	Action
1	Slide the recesses on the lower front of the receiver onto the forward bushings of the flex-mount.  

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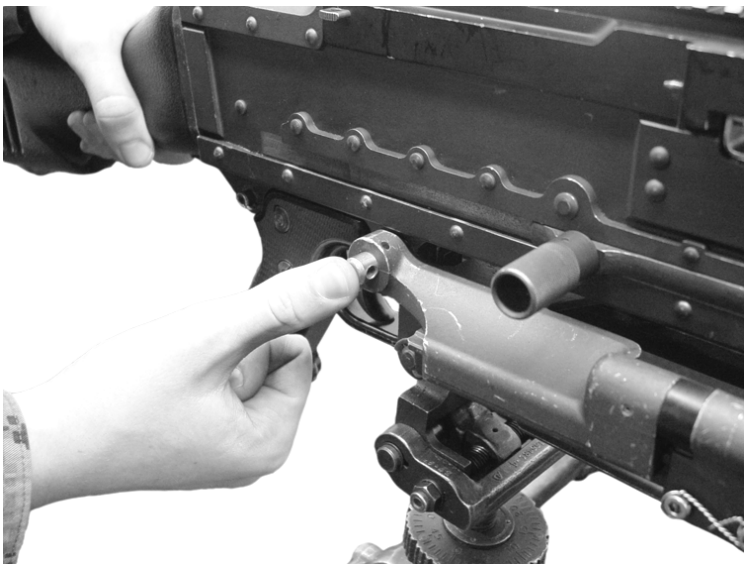
Attaching the M240G, continued

Step	Action
2	Rotate the rear of the M240G down onto the flex-mount, ensuring the holes on the receiver are aligned with the holes on the flex-mount.  

Continued on next page

Attaching the M240G, continued

Step	Action
3	Insert the retaining pin to lock the M240G onto the flex-mount.  

Lesson 1 Exercise

Directions

Complete exercise items 1 through 6 by performing the action required. Check your answers against those listed at the end of this study unit.

Item 1

To lower the bipod for use, push in on the _____ to release the bipod.

a. bipod latch
b. slide release latch
c. bipod lever
d. slide release lever

Items 2 Through 5

Matching: For items 2 through 4, match the action for setting up the M122 tripod in column 2 with the proper step in column 1 when using the tripod.

Column 1	**Column 2**
Order	**Action**
____ 2. Step 1	a. Attach the flex-mount.
____ 3. Step 2	b. Attach the M240G.
____ 4. Step 3	c. Set up the tripod.
____ 5. Step 4	d. Prepare the T&E.

Item 6

When preparing the T&E mechanism, you manipulate the elevation hand wheel and the traversing slide until approximately _____ inches are exposed on both the upper and lower elevation screws.

a. 1/2
b. 1
c. 1 1/2
d. 2

Continued on next page

Answers

The table below lists the answers to the exercise items on the previous pages. If you have any questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	a	3-4
2	c	3-7
3	d	3-9
4	a	3-11
5	b	3-14
6	c	3-9

Lesson Summary

In this lesson, you have learned how to set up the M240G using the bipod, tripod, and a tactical vehicle mount.

In the next lesson, you will learn how to properly load and unload ammunition from the M240G.

LESSON 2

LOADING AND UNLOADING

Introduction

Scope

The M240G is designed to provide a heavy, controlled volume of accurate, continuously, and long-range fire that is beyond the capabilities of individual small arms to suppress and destroy the enemy. To keep M240G fire continuous, the operator must be able to load the weapon correctly in a timely manner.

In this lesson, you will learn the weapon condition codes as they apply to the M240G and how to properly load and unload ammunition from the M240G.

Learning Objectives

Upon completion of this lesson, you should be able to

- Identify the weapon conditions for the M240G.
- Identify the steps for loading the M240G with the cover open.
- Identify the steps for loading the M240G with the cover closed.
- Identify the steps for unloading the M240G.

In This Lesson

This lesson contains the following topics:

Weapon Conditions

Four Conditions

The table below lists and describes the four weapon conditions for the M240G:

Condition	Description
1	The bolt is locked to the rear, the safety is engaged. Ammunition is on the feed tray, the cover is closed.
2	Does not apply to the M240G.
3	The bolt is forward, the chamber is empty, and the safety is disengaged. Ammunition is on the feed tray, the cover is closed.
4	The bolt is forward, the safety is disengaged, and the feed tray is clear of ammunition. The cover is closed.

Loading

Cover Opened

The steps for loading the M240G with the cover opened are listed in the table below:

Step	Description
1	Clear the weapon (condition 4).
2	Open the cover.
3	Insert the link belt into the feed tray with the open side of the link facing down.
4	Position the first round against the cartridge stop aligning it with the feed tray grove.
5	Close the cover, ensuring it locks shut (condition 3).
6	Pull and hold the cocking handle to the rear, ensuring the bolt locks to the rear.
7	Place the safety on SAFE (condition 1).
8	Return the cocking handle to the forward position.

Cover Closed

The steps for loading the M240G with the cover closed are listed in the table below:

Step	Description
1	Ensure the cover is closed, the bolt is forward, and the safety is on FIRE.
2	Insert the link belt into the feed tray with the open side of the link facing down.
3	Push the first round into the feedway, ensuring the first round engages the feed pawl and is held in place (condition 3).
4	Pull and hold the cocking handle to the rear, ensuring the bolt locks to the rear.
5	Place the safety on SAFE (condition 1).
6	Return the cocking handle to the forward position.

Unloading

Procedure

The procedure for unloading the M240G is listed in the table below:

Step	Description
1	Pull the cocking handle to the rear, ensuring the bolt locks to the rear. Return the cocking handle to the forward position.
2	Place the safety on SAFE (condition 1).
3	Open the cover.
4	Remove the belt of ammunition and any links from the feed tray.
5	Raise the feed tray and inspect the chamber and receiver for rounds or brass.
6	Lower the feed tray. The weapon is now unloaded.

Note: After the weapon is unloaded, it can be reloaded to a condition 1 weapon or cleared to make a condition 4 weapon.

Lesson 2 Exercise

Directions Complete exercise items 1 through 4 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 Name and give a brief description of the four weapon conditions for the M240G medium machinegun.

- _____

  _____

- _____

  _____

- _____

  _____

- _____

  _____

Item 2 List the steps in order to load the M240G with the cover open.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Continued on next page

Item 3 List the steps in order when loading the M240G with the cover closed.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Item 4 List the steps in order when unloading the M240G.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Continued on next page

Answers

The table below lists the answers to the exercise items on the previous pages. If you have any questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	• Condition 1. The bolt is locked to the rear and the safety is engaged. Ammunition is on the feed tray, the cover is closed. • Condition 2 does not apply to the M240G. • Condition 3. The bolt is forward, the chamber is empty, and the safety is disengaged. Ammunition is on the feed tray, the cover is closed. • Condition 4. The bolt is forward, the safety is disengaged, and the feed tray is clear of ammunition. The cover is closed.	3-20
2	1. Clear the weapon (condition 4). 2. Open the cover. 3. Place the link belt in the feed tray with the open side of the link facing down. 4. Position the first round against the cartridge stop aligning it with the feed tray grove. 5. Close the cover, ensuring it locks shut (condition 3). 6. Pull and hold the cocking handle to the rear, ensuring the bolt locks to the rear. 7. Place the safety on SAFE (condition 1). 8. Return the cocking handle to the forward position.	3-21

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
3	1. Ensure the cover is closed, the bolt is forward, and the safety is on FIRE. 2. Insert the link belt into the feed tray with the open side of the link facing down. 3. Push the first round into the feedway, ensuring the first round engages the feed pawl and is held in place (condition 3). 4. Pull and hold the cocking handle to the rear, ensuring the bolt locks to the rear. 5. Place the safety on SAFE (condition 1). 6. Return the cocking handle to the forward position.	3-21
4	1. Pull the cocking handleto the rear, ensuring the bolt locks to the rear. Return the cocking handle to the forward position. 2. Place the safety on SAFE (condition 1). 3. Open the cover. 4. Remove the belt of ammunition and any links from the feed tray. 5. Raise the feed tray and inspect the chamber and receiver for rounds or brass. 6. Lower the feed tray. The weapon is now unloaded.	3-22

Lesson Summary

In this lesson, you learned the weapon conditions as they apply to the M240G and how to properly load and unload ammunition.

In the next lesson, you will learn how to fire the M240G.

LESSON 3

FIRING

Introduction

Scope

You are in your position. The M240G is mounted on the tripod with a full belt of ammunition loaded. Now it is time to wait on the signal from the team leader to begin engaging targets. What is next?

In this study unit, you will learn how to fire the M240G, including trigger manipulation, sight adjustment and aiming, firing from the different mounts, and changing the barrel.

Learning Objectives

Upon completion of this lesson, you should be able to

- Identify trigger manipulation as it relates to rates of fire.
- Identify the use for the two position of the rear sight assembly.
- Identify the how to adjust the rear sight assembly.
- Define sight alignment.
- Define sight picture.
- Identify the guidelines when firing from the bipod.
- Identify the guidelines when firing from the tripod.
- Identify how to manipulate the traversing and elevating mechanism.
- Identify when to conduct a barrel change.
- Identify the steps for changing the barrel.

Continued on next page

In This Lesson This lesson contains the following topics:

Trigger Manipulation

Trigger Control

The trigger on the M240G is not squeezed as with other small arms. The trigger is pulled to the rear to allow a burst of rounds to fire. This action allows the gunner to control the number of rounds fired to achieve different rates of fire. Bursts of six rounds or less should not be fired as this can cause excessive wear on the sear and sear notch.

Rates of Fire

Achieving the different rates of fire with the M240G is accomplished by holding down the trigger for a specific round burst. The rates of fire with the associated firing information are listed in the table below:

Rate of Fire	Rounds per Minute	Burst	Pause
Rapid	200	10–12 rounds	2–3 seconds
Sustained	100	6–8 rounds	4–5 seconds

Adjusting the Sights

The Front Sight

The front sight can be adjusted using the front sight combination tool. This adjustment is done during the zeroing procedure, which is covered in Lesson 4, "Adjusting the Front Sight Assembly."

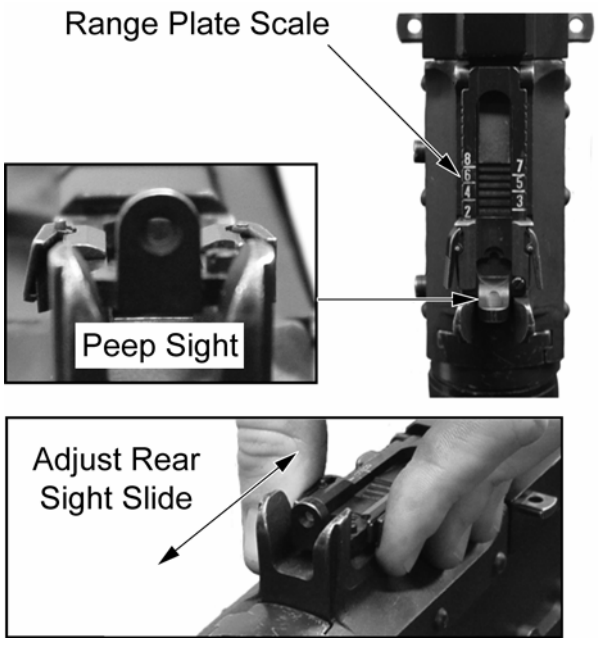
The Rear Sight

The rear sight consists of a peep sight aperture on an adjustable sight leaf slide. The sight leaf slide rides on a range plate with a graduated scale and is attached to the receiver by a hinged plate. The rear sight has two positions—horizontal and vertical.

Sight Position	Target Range	Used with
Horizontal	800 meters or less	Bipod or Tripod
Vertical	Greater than 800 meters	Tripod

Horizontal Position

In the horizontal position, the gunner can engage targets up to 800 meters. The sight is adjusted by squeezing the catches on the rear sight slide and moving it forward or backward to the range setting on the range plate scale. The range plate scale is marked in 100 meter increments from 200 to 800 meters. In this position, the peep sight aperture is used with the front sight blade to aim at the target.



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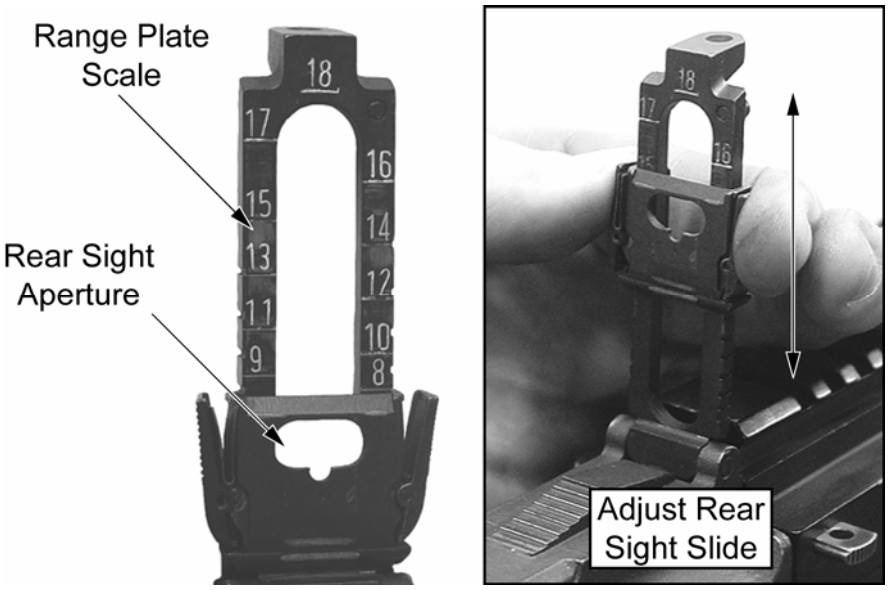
Vertical Position

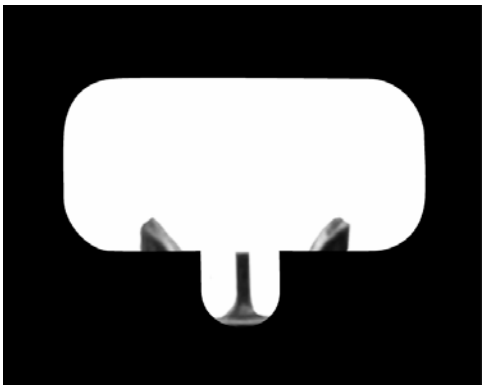
In the vertical position, the gunner can engage targets from 800 meters to 1,800 meters. The sight is adjusted by squeezing the catches on the rear sight slide and moving it up or down to the required range setting on the range plate scale. In the vertical position, the range plate scale is marked in 100 meter increments from 800 meters to 1800 meters. In this position, the groove in the rear sight slide and the front sight blade are used to aim at the target.



Aiming

Sight Alignment

Sight alignment is the relationship between the front sight blade, the rear sight, and the aiming eye. When the rear sight is in the *horizontal* position, obtain sight alignment by placing the tip of the front sight blade in the center of the peep sight aperture. When the rear sight is in the *vertical* position, obtain sight alignment by centering the front sight blade in the rear sight with the tip of the front sight blade even with the bottom of the peep sight aperture.



Sight Picture

Sight picture is placing the tip of the front sight blade on the target while maintaining sight alignment. Obtain a sight picture by centering the front sight blade over the center of the target.

Using the Bipod

Firing Position

When firing the M240G while using the bipod, follow the guidelines listed below:

- The gunner is in a prone position behind the weapon.
- The buttplate is placed into the right shoulder.
- The right hand grasps the pistol grip and manipulates the trigger.
- The left hand is placed on the comb of the stock, palm down.
- The cheek rests lightly on the buttstock and/or left hand.
- Exert a firm pressure with both hands to the rear during aiming and firing.
- Lean forward and apply forward pressure on the bipod.

Changing Direction

The bipod attaches to the M240G with a ball joint allowing for minor changes in direction up to about 45 degrees. To make a minor change in the direction of fire, the gunner will shift the shoulders and upper torso to the left or right. To make a major change in direction, the gunner's entire body must move until it is realigned behind the weapon.

Changing Elevation

To make changes in elevation, the gunner will simply move the elbows closer together or farther apart moving the stock of the weapon up or down.

Using the Tripod

Firing Position

When firing the M240G while using the tripod, follow the guidelines listed below:

- The gunner is in a prone position behind the weapon.
- The right shoulder is placed against the buttplate.
- The right hand grasps the pistol grip and manipulates the trigger.
- The left hand is placed on the elevation hand wheel; palm down, to manipulate the T&E mechanism.
- The cheek rests lightly on the buttstock.
- Exert a firm pressure with both hands to the rear during aiming and firing.
- Exert pressure down and to the right with the shoulder to take up the slack in the T&E mechanism.

Orienting the Weapon

Before firing, the weapon should be adjusted so the muzzle is pointing in the general direction of fire. To do this, release the slide lock lever and move the T&E mechanism to the left or right along the traversing bar. Once the weapon is properly oriented, secure the slide lock lever.

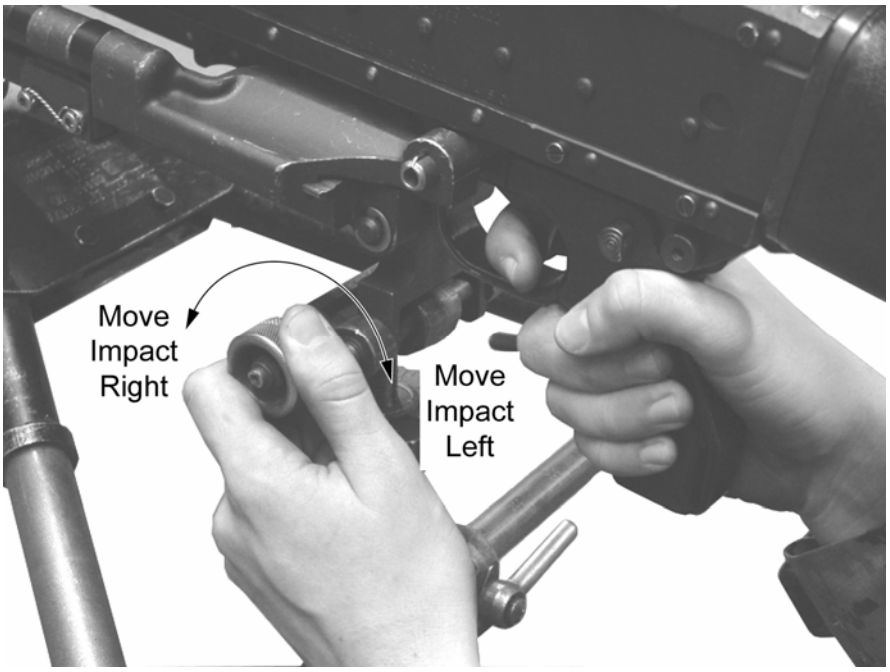
Continued on next page

T&E Manipulation

All changes to the T&E mechanism will be made with the left hand. Changes in direction (traversing) will always be made first then changes in elevation. If the situation requires rapid changes in direction and elevation that cannot be achieved with the T&E, the weapon should be fired from the bipod.

Changing Direction

Changing the direction is called traversing. To traverse, place the left hand on the traversing hand wheel, thumb up. To move the impact of the rounds to the right, push (rotate) the traversing hand wheel away from you with the thumb—***push right.*** To move the impact of the rounds to the left, pull (rotate) the traversing hand wheel to the rear toward you with the thumb—***pull left.***



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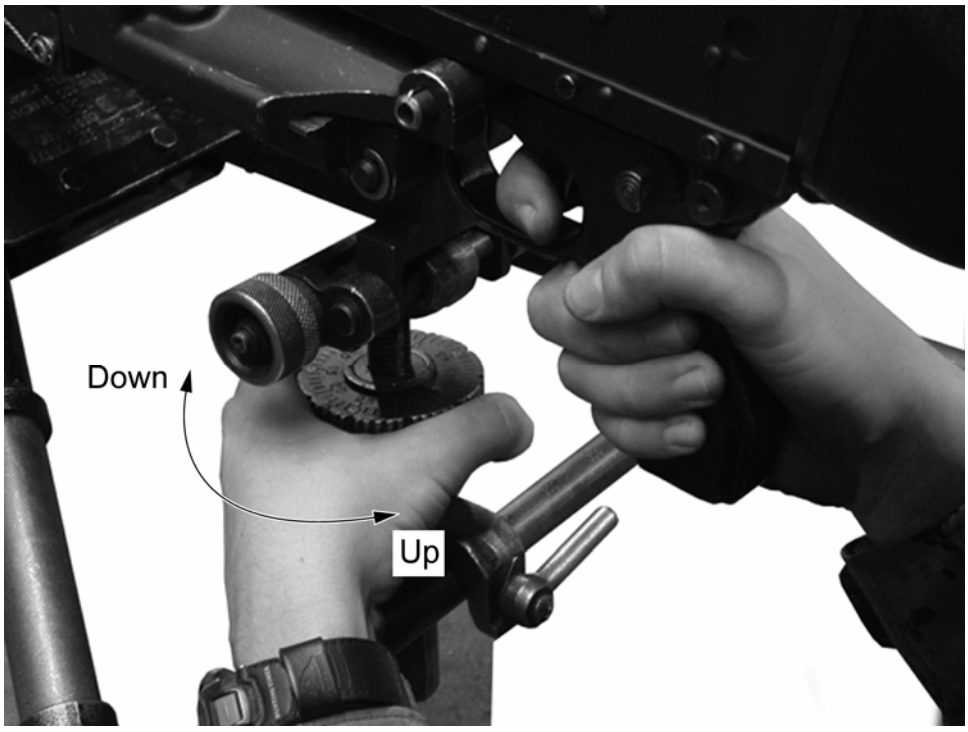
Changing Elevation

Changing the elevation is called searching. To search, rest the left hand on the elevation hand wheel. To increase the distance of the impact of the rounds or up on a target, push (rotate) the hand wheel to the right with your thumb—***push up.*** To decrease the distance of the impact of the rounds or down on a target, pull (rotate) the hand wheel to the left with your thumb—***pull down.***



Using the Sights

Estimate the range to the target and place the information on the rear sight. Manipulate the T&E mechanism until there is a good sight picture on the target. Once this is achieved, lower the rear sight if it is in the vertical position. The tripod provides a stable base and control manipulation, which makes the use of the sight during firing unnecessary. It will also block the gunner's view of the target and impacting rounds.

Changing the Barrel

Overview

The ability to change barrels on the M240G is a great advantage. It allows one barrel to cool while the other is being used. This increases the life of each barrel and ensures a continuous rate of accurate fire. Changing the barrels only takes a few seconds and significantly improves the rate of fire and accuracy.

Frequency of Changes

Barrels should be changed when they begin to overheat. Barrel change is required after

- 10 minutes of firing at a sustained rate
- 2 minutes of firing at a rapid rate

Barrel Changing Procedure

The barrel can be changed with the bolt to the front or to the rear. If the bolt is to the rear, the weapon should be placed on SAFE. The procedure to change the barrel begins in the table below:

Step	Action
1	Depress and hold the barrel locking latch in.
2	Rotate the barrel carrying handle to the up position.  Note: Do not rotate the barrel carrying handle to the up position using the carrying handle release latch. This will not unlock the breach from the socket.

Continued on next page

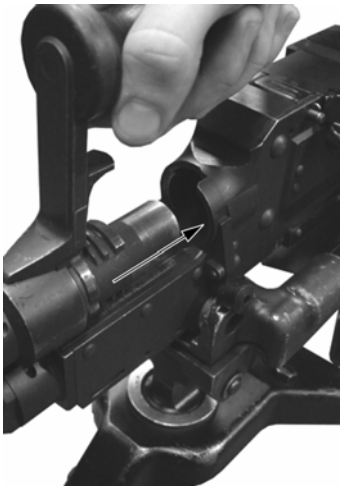
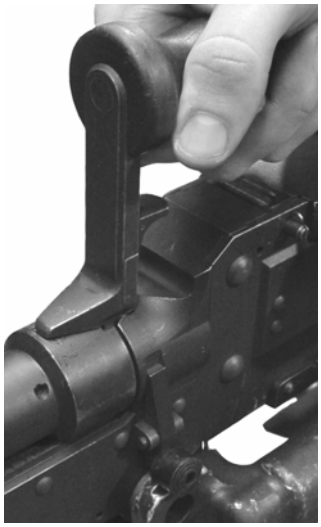
Barrel Changing Procedure, continued

Step	Action
3	Push forward and up on the barrel changing handle, separating the barrel from the receiver.  
4	Place the barrel on a clean surface or the spare barrel bag to cool.

Continued on next page

Changing the Barrel, Continued

Barrel Changing Procedure, continued

Step	Action
5	Grab the spare barrel by the barrel changing handle.
6	Insert the barrel socket into the receiver ensuring the gas plug is aligned with the gas cylinder.  
7	Pull the barrel to the rear until the barrel is fully seated in the receiver.  

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Barrel Changing Procedure, continued

Step	Action
8	Rotate the barrel changing handle to the down position, counting clicks to verify proper headspace. 

Lesson 3 Exercise

Directions Complete exercise items 1 through 10 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 Complete the statement below.

Fire a burst of _____ rounds with a pause of _____ seconds to achieve a rapid rate of fire.

Item 2 Complete the statement below.

In the down (horizontal) position, the rear sight allows for ranges from _____ meters.

Item 3 Explain how to adjust the rear sight assembly to the required range setting.

_____

_____

Item 4 Define sight alignment.

_____

_____

Item 5 Define sight picture.

_____

_____

Continued on next page

Item 6

When firing the M240G from the bipod, the gunner is in a prone position behind the weapon with the buttstock in the _____ shoulder with the _____ hand on the pistol grip.

a. right; right
b. left; right
c. right; left
d. left; left

Item 7

When firing the M240G from the tripod, the gunner is in a prone position behind the weapon with the _____ hand on the pistol grip and the _____ hand on the _____ hand wheel.

a. right; left; traversing
b. left; right; traversing
c. right; left; elevation
d. left; right; elevation

Item 8

Rotate the traversing hand wheel to the _____ to move the impact of the rounds to the left.

Item 9

Change the barrel after firing for _____ minutes at the sustained rate.

Continued on next page

Item 10 List in order the steps to change the barrel on the M240G.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

Continued on next page

Answers

The table below lists the answers to the exercise items on the previous pages. If you have any questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	10–12; 2–3	3-29
2	200 to 800	3-30
3	Squeeze the catches on the side of the rear sight and move it on the rear sight slide to the desired range setting.	3-30
4	Sight alignment is the relationship between the front sight blade, the rear sight, and the aiming eye.	3-32
5	Sight picture is placing the tip of the front sight blade on the target while maintaining sight alignment.	3-32
6	a	3-33
7	c	3-34
8	rear toward you	3-35
9	10	3-37

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
10	1. Depress and hold the barrel locking latch in. 2. Rotate the barrel changing handle to the up position. 3. Push forward and up on the barrel changing handle, separating the barrel from the receiver. 4. Place the barrel on a clean surface or the spare barrel bag to cool. 5. Grab the spare barrel by the barrel changing handle. 6. Insert the barrel socket into the receiver ensuring the gas plug is aligned with the gas cylinder. 7. Pull the barrel to the rear until the barrel is full seated in the receiver. 8. Rotate the barrel changing handle to the down position, counting clicks to verify proper headspace.	3-37 through 3-40

Lesson Summary

In this lesson, you learned how to manipulate the trigger to achieve the desired rate of fire, adjust the sights, aim, fire from the bipod and tripod, and change the barrel.

In the next lesson, you will learn how to properly zero the weapon.

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LESSON 4

ZEROING

Introduction

Scope

The ability to provide accurate long-range machinegun fire is the key to successful support with the M240G. To help ensure that initial burst is on target, the barrels on the M240G must be properly zeroed. If the initial burst is not on target, you must adjust the impact of the rounds onto the target. Spending time adjusting your position with the bipod or adjusting the T&E on the tripod allows the enemy to respond to your attack.

In this lesson, you will learn the procedures for zeroing the barrels.

Learning Objectives

Upon completion of this lesson, you should be able to

- Identify the steps for adjusting the elevation on the front sight assembly.
- Identify the steps for adjusting the windage on the front sight assembly.
- Identify the steps for conducting a battlesight zero of the M240G medium machinegun.
- Identify the steps for conducting a field expedient zero of the M240G medium machinegun.

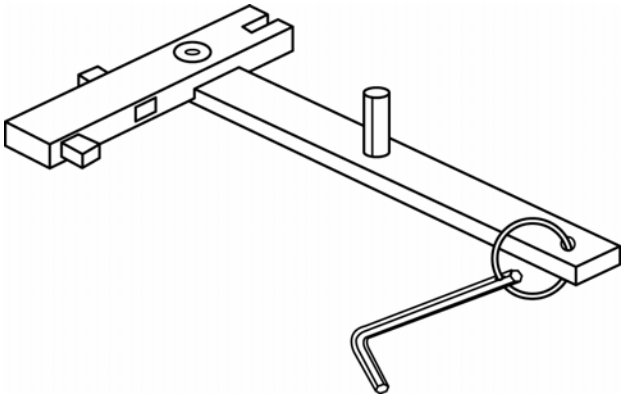
In This Lesson

This lesson contains the following topics:

Adjusting the Front Sight Assembly

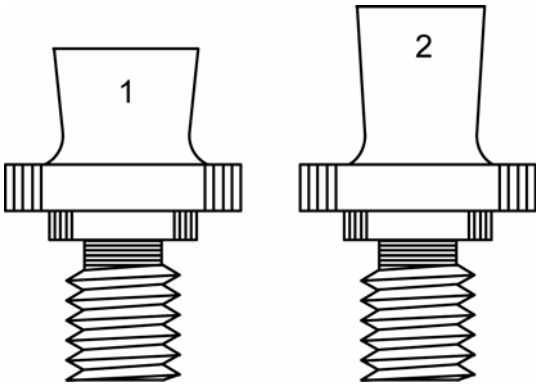
Adjusting Tool

The front sight adjustment tool is part of the SL-3 components. It is used to adjust the front sight of the M240G medium machinegun. It enables the operator to unlock the front sight blade for adjusting elevation or turning the socket head windage adjustment screws for adjusting windage.



Front Sight Blade

There are two types of front sight blades. The number 1 blade is 9.8 mm and the number 2 blade is 11.8 mm. If the required correction cannot be obtained using the installed blade, the other blade should be used. The maximum unscrewed position of either blade is where the base of the blade is flush with the front sight protector surface. When zeroing, if the center of the shot group is still above the point of aim with the number 1 blade unscrewed to the maximum position, remove it and install the number 2 blade. If the center of the shot group is still below the point of aim with the number 2 blade screwed all the way in, remove it and install the number 1 blade. If the center of the shot group cannot be brought to the point of aim after trying both blades, the barrel assembly should be replaced.



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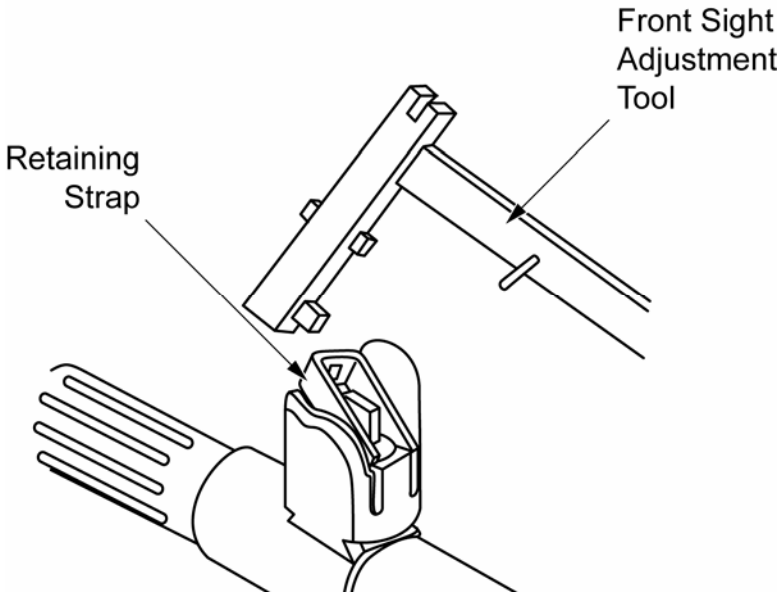
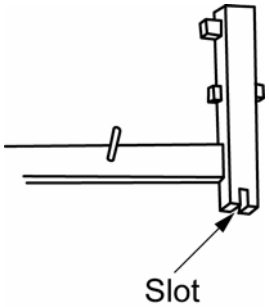
Adjusting for Elevation

Rotating the front sight blade clockwise raises the point of impact on the target. Rotating the front sight blade counter-clockwise lowers the point of impact on the target. To adjust for elevation, use the following procedures.

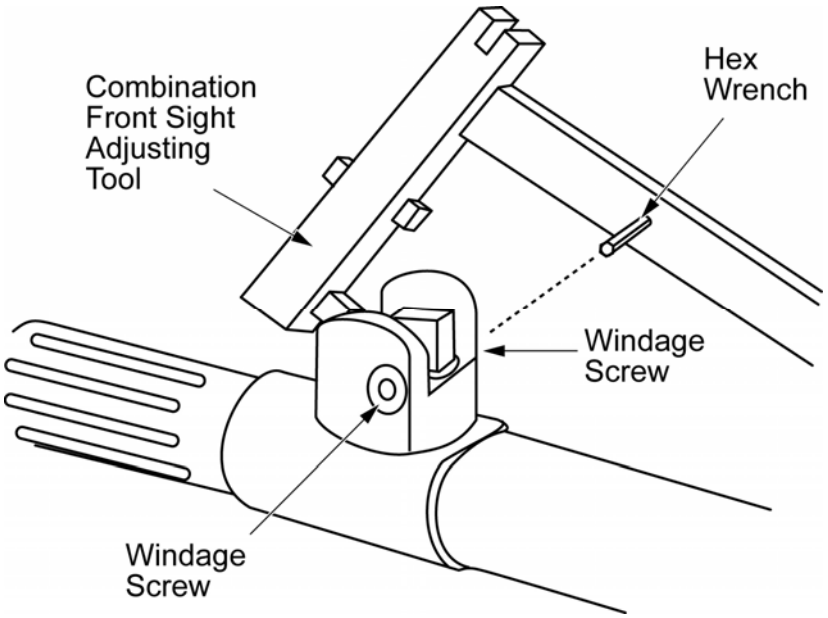
Step	Action
1	Using the combination front sight adjusting tool, unlock the retaining strap and rotate it upwards. 
2	Apply a few drops of lubricant to the base of the front sight blade to make it easier to turn.
3	Using the slotted end of the tool, place it over the front sight blade. Rotate the front sight blade in the desired direction for the required number of turns. 
4	Lower the retaining strap but do not lock it until the zero is complete.

Continued on next page

Adjusting the Front Sight Assembly, Continued

Adjusting for Windage

Moving the front sight blade to the right moves the point of impact to the left. Moving the front sight blade to the left moves the point of impact to the right. The front sight windage adjustment procedure is the combination of creating slack on one side, then taking up slack on the opposite side. The front sight protector should always be tightly clamped between the two opposing adjustment screws. As the adjusting crews are turned, noticeable clicks (eight per full revolution) should be detected. If this is not the case, notify unit maintenance. The procedure to adjust for windage is listed in the table below:

Step	Action
1	Using the hex wrench portion of the combination front sight adjustment tool, loosen the adjusting screw on the side opposite of the direction the front sight blade needs to move. To move right, loosen left; to move left, loosen right. 
2	Using the hex wrench, tighten the screw on the same side of the direction the front sight blade needs to move. To move right, tighten right; to move left, tighten left.
3	Once the windage is set, check that there is no play in the front sight assembly. If there is, check both screws for looseness.

Note: The windage adjustment screws will break with the slightest over-torquing. Be careful not to over tighten the adjustment screws.

Battlesight Zero

Overview

Zeroing aligns the sights with the barrel so that point-of-aim equals point-of-impact. Battlesight zero (BZO) is the sight settings used in combat and enable engagement of targets within the M240G's effective range in a no-wind condition. The BZO is conducted with the M240G mounted on the tripod at a range of 12.7 meters to the target. The target is a paper target with a series of 1-inch black squares. Standard machinegun qualification targets are normally used. When setting the BZO, all adjustments are made to the front sight of the weapon. Each barrel of the M240G has to be individually zeroed to ensure the accuracy of both barrels.

Procedure

The procedure for conducting a BZO is listed in the table below:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Leave the front sight post in its present position.</td></tr>
<tr><td>2</td><td>Set the rear sight elevation to 500 meters.</td></tr>
<tr><td>3</td><td>Load a belt of three rounds of ammunition.</td></tr>
<tr><td>4</td><td>Manipulate the T&E to get sight alignment and sight picture on the 1-inch black square of the target.</td></tr>
<tr><td>5</td><td>Fire each round one at a time. Check the sight alignment and sight picture between each shot.</td></tr>
<tr><td>6</td><td>Observe the impact of the group in relation to the target. Find the approximate center of the group; this is the point of impact.</td></tr>
<tr><td>7</td><td>If the point of impact is not in the center of the target, adjust the point of impact by manipulating the elevation and windage of the front sight assembly based on the formula in the table below:
<table>
<tr><th>Adjustment</th><th>Formula</th></tr>
<tr><td>Elevation</td><td>1/2 turn equals 1/5 of an inch (5mm); 1 full turn equals 3/8 of an inch (10mm).</td></tr>
<tr><td>Windage</td><td>1 full rotation (eight clicks) of the adjusting screw equals 1/3 of an inch (8mm).</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Repeat steps 3 through 7 to confirm the adjustments. If the second shot group is not in the center of the target, continue repeating until BZO is confirmed.</td></tr>
<tr><td>9</td><td>Repeat this procedure for the spare barrel.</td></tr>
</table>

Field Expedient Zero

Overview

If the situation does not allow for the conduct of a BZO on a 12.7-meter firing line, then a field expedient zero can be conducted. Any point of aim, point of impact target can be used for a field expedient zero. A target that is between 300 and 700 meters is preferred. The target should be at the same elevation as the firing position and have a solid mass behind it for observing the impact of the rounds. For the field expedient zero, the M240G should be mounted on the tripod.

Procedure

The procedure for conducting a field expedient zero is listed in the table below:

Step	Action
1	Estimate the range to the target.
2	Place the range on the rear sight.
3	Center the T&E and adjust the position of the tripod to align the gun to the target.
4	Adjust the T&E to get a correct sight alignment and sight picture on the target.
5	Load a six-round belt of ammunition.
6	Fire a group of six rounds and observe the impact of the rounds in relation to the target.

Continued on next page

Procedure, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>7</td><td>If the center of the group does not impact the target, adjust the elevation and windage of the front sight assembly.

• To adjust the elevation, use the table below:

<table>
<tr><th>Range to Target</th><th>One full turn of the front sight blade moves the impact of the round</th></tr>
<tr><td>100</td><td>4.25 inches</td></tr>
<tr><td>200</td><td>8.5 inches</td></tr>
<tr><td>300</td><td>12.75 inches</td></tr>
<tr><td>400</td><td>17.0 inches</td></tr>
<tr><td>500</td><td>21.25 inches</td></tr>
<tr><td>600</td><td>25.5 inches</td></tr>
<tr><td>700</td><td>29.75 inches</td></tr>
<tr><td>800</td><td>34.0 inches</td></tr>
<tr><td>900</td><td>38.25 inches</td></tr>
</table>

• To adjust the windage, use the table below:

<table>
<tr><th>Range to Target</th><th>One full turn of the adjusting screws moves the impact of the round</th></tr>
<tr><td>100</td><td>3.15 inches</td></tr>
<tr><td>200</td><td>6.3 inches</td></tr>
<tr><td>300</td><td>9.45 inches</td></tr>
<tr><td>400</td><td>12.6 inches</td></tr>
<tr><td>500</td><td>15.75 inches</td></tr>
<tr><td>600</td><td>18.9 inches</td></tr>
<tr><td>700</td><td>22 inches</td></tr>
<tr><td>800</td><td>25.2 inches</td></tr>
<tr><td>900</td><td>28.35 inches</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Repeat steps 5 through 7 to confirm the zero.</td></tr>
<tr><td>9</td><td>Repeat for the spare barrel.</td></tr>
</table>

Lesson 4 Exercise

Directions

Complete exercise items 1 through 4 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1

List in order the steps for adjusting the elevation on the front sight assembly.

1. _____

   _____

2. _____

   _____

3. _____

   _____

4. _____

   _____

Item 2

List in order the steps for adjusting the windage on the front sight assembly.

1. _____

   _____

2. _____

   _____

3. _____

   _____

Continued on next page

Item 3

Complete the following statement for adjusting the front sight assembly when performing a battlesight zero on the M240G.

A half turn of the front sight blade moves the impact of the rounds _____ inches at 12.7 meters.

Item 4

Complete the following statement for adjusting the front sight assembly when performing a field expedient zero on the M240G.

A full turn of the front sight blade moves the impact of the rounds _____ inches for every 100 meters of distance to the target.

Continued on next page

Answers

The table below lists the answers to the exercise items on the previous pages. If you have any questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	1. Using the combination front sight adjusting tool, unlock the retaining strap and rotate it upwards. 2. Apply a few drops of lubricant to the base of the front sight blade to make it easier to turn. 3. Using the slotted end of the tool, place it over the front sight blade. Rotate the front sight blade in the desired direction for the required number of turns. 4. Lower the retaining strap but do not lock it until the zero is complete.	3-49
2	1. Using the hex wrench portion of the combination front sight adjustment tool, loosen the adjusting screw on the side opposite of the direction the front sight blade needs to move. To move right, loosen left; to move left; loosen right. 2. Using the hex wrench, tighten the screw on the same side of the direction the front sight blade needs to move. To move right, tighten right; to move left, tighten left. 3. Once the windage is set, check that there is no play in the front sight assembly. If there is, check both screws for looseness.	3-50
3	1/5 (one fifth)	3-51
4	4.25	3-53

Lesson Summary

In this lesson, you learned how to adjust the front sight assembly and zero the M240G.

In the next lesson, you will learn how to troubleshoot the M240G if it fails to operate properly.

LESSON 5

TROUBLESHOOTING

Introduction

Scope

In the middle of a firefight is not the time for your M240G to stop firing. If it does, you must react quickly to identify and correct the problem and get the weapon back into action. Your fellow Marines' lives may depend on it.

In this lesson, you will learn how to identify a malfunction or a stoppage and then apply immediate action or remedial action to remedy the problem.

Learning Objectives

Upon completion of this lesson, you should be able to

- Define a malfunction.
- Identify sluggish operation.
- Identify the steps for adjusting the gas regulator setting.
- Identify a runaway gun.
- Identify the steps for correcting a runaway gun.
- Define a stoppage.
- Define a hangfire.
- Define a cook off.
- Define a hot barrel.
- Define immediate action.
- Identify the steps for applying immediate action.
- Define remedial action.
- Identify the steps for applying remedial action.

Continued on next page

Introduction, Continued

In This Lesson

This lesson contains the following topics:

Malfunctions

Definition

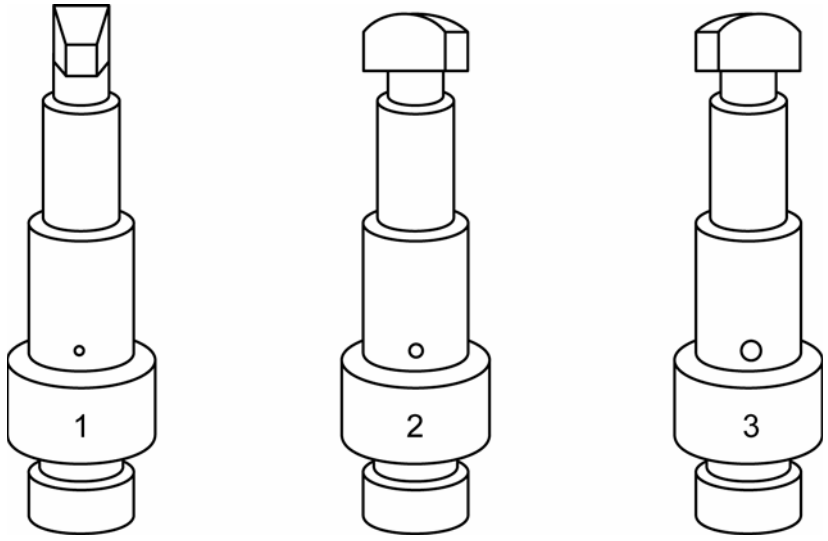
A malfunction is a failure of the gun to function satisfactorily; the gun will fire, but fire improperly. Defective ammunition or improper operation of the gun by a crewmember is not considered a malfunction. Two of the more common malfunctions are sluggish operation and a runaway gun.

Sluggish Operation

Sluggish operation is when the M240G fires slower than its normal rate of fire of 9 or 10 rounds per second. This can be due to excessive friction or a loss of gas pressure. Excessive friction is due to a lack of lubrication or a buildup of carbon or dirt in the gas system or on the bolt and receiver rails. Loss of gas pressure is usually due to loose connections in the gas system. The remedy for sluggish operation is for the operator to clean and lubricate the weapon or have maintenance personnel tighten loose parts or replace worn ones. If the current situation does not allow for this, sluggish operation can be reduced by adjusting the gas regulator setting.

Gas Regulator Plug Settings

The gas regulator plug has three different settings determined by three different size gas inlet holes. Each hole is numbered 1, 2, and 3. Hole 1 is the smallest—the normal setting—and hole 3 is the largest. Always insert the gas regulator plug with this setting after cleaning.



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Adjusting the Gas Regulator Setting

If the weapon becomes sluggish, the gas regulator plug can be removed, rotated to setting 2 or 3, and reinserted. This adjustment should reduce the sluggish operation until the operator can perform maintenance on the weapon. The steps to adjust the gas regulator setting are listed in the table below:

Step	Action
1	Clear the weapon and make condition 4.
2	Remove the barrel.
3	Remove the gas collar and gas regulator plug.
4	Reinsert the gas regulator plug with setting 2 or 3.
5	Attach the gas collar.
6	Attach the barrel.
7	Continue with mission.

Runaway Gun

A runaway gun occurs when the weapon continues to fire after the trigger is released. Firing is uncontrolled. A runaway gun is usually caused by a worn, broken, or burred sear in the trigger housing group or a worn sear notch on the operating rod. The sear shoulder is unable to grab the operating rod and hold it to the rear after the trigger is released. The steps to stop a runaway gun are listed in the table below:

Step	Action
1	Keep the weapon pointed towards the target.
2	If there are fewer than 50 rounds, let the rounds fire out.
3	If there are more than 50 rounds or the fire needs to cease immediately, grasp the belt of ammunition with both hands and twist the hands in opposite directions to break the belt of ammunition.
4	Let the remaining rounds fire out.
5	Clear the weapon and make condition 4.
6	Turn weapon in to maintenance personnel for repairs before using again.

Note: As a last resort, grasp the cocking handle and hold to the rear. This is a last resort because of likely damage to the gun.

Stoppages

Definition	A stoppage is any interruption in the cycle of functioning caused by faulty action of the gun or defective ammunition that causes the weapon to stop firing.
Hangfire	A hangfire occurs when there is a delay in the round firing after the firing pin strikes the primer on the round.
Cook Off	A cook off occurs when a round discharges before being fully fed and locked inside the chamber due to the high heat of the barrel.
Hot Barrel	A barrel is considered hot if more than 200 rounds have been fired in the last 2 minutes.

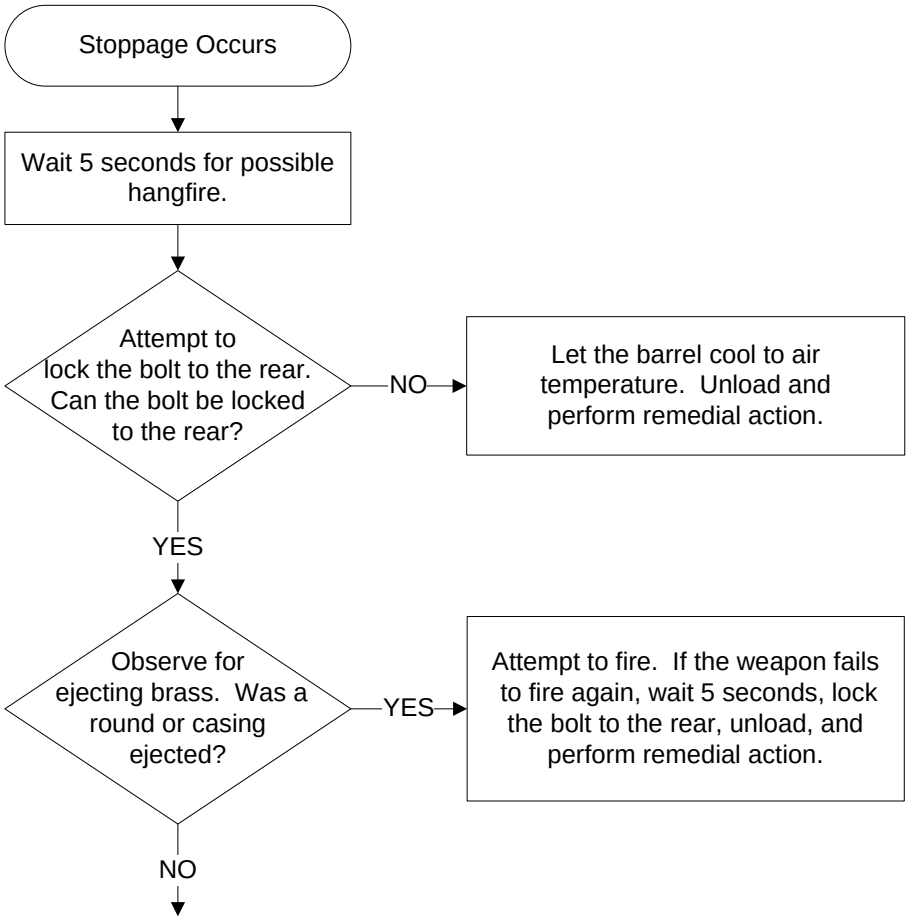
Immediate Action

Definition

Immediate action is the prompt action taken by the operator to reduce a stoppage without investigating the cause.

Procedure

When a stoppage occurs, you must react quickly to clear the stoppage and return the weapon to operation in order to maintain a continuous rate of fire. The procedure for conducting immediate action is illustrated in the chart below:



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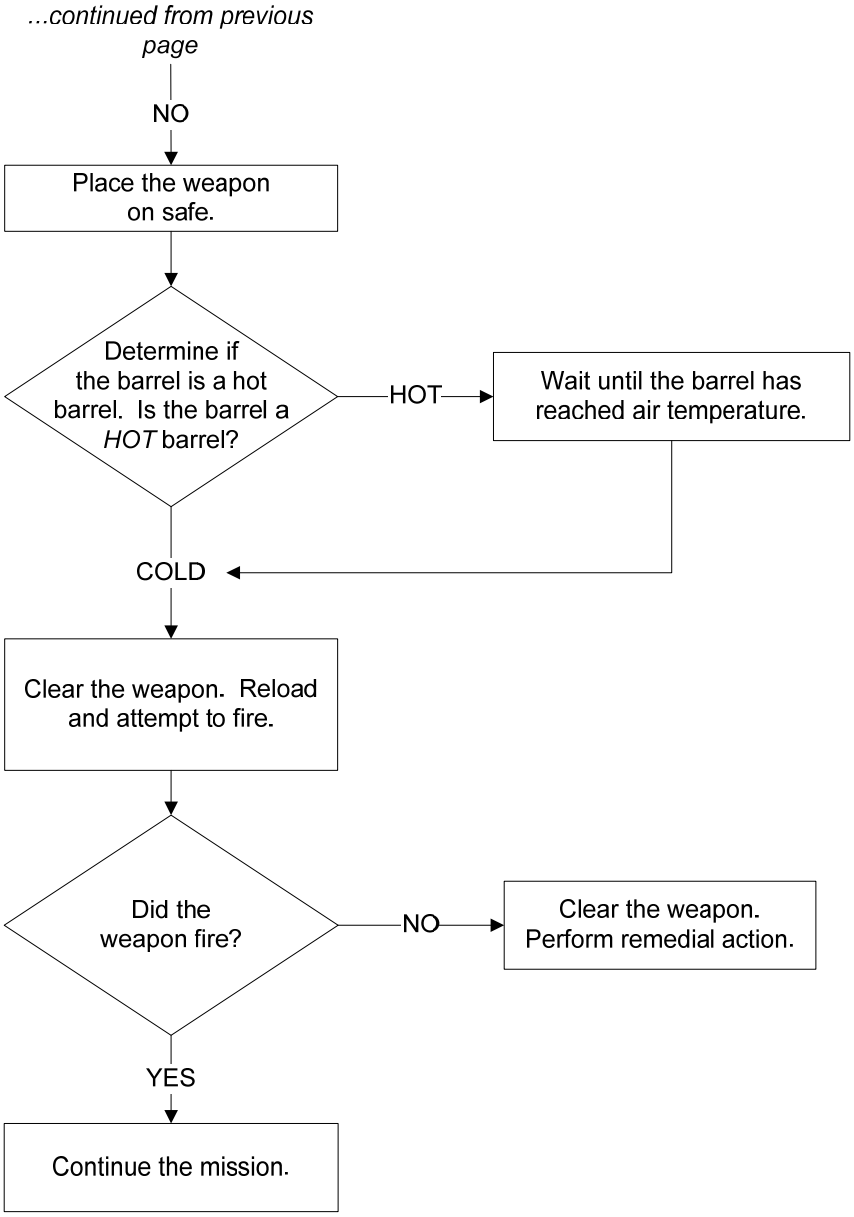
Procedure, continued



Remedial Action

Definition

When immediate action fails to correct the stoppage, remedial action must be taken. Remedial action is the action taken to inspect, identify, and correct the cause of the stoppage. The cause can be due to either the weapon or the ammunition. Performing remedial action may involve some disassembly of the weapon to determine the cause.

Procedure

The procedure for remedial action is based on the problem. To determine the problem, use the cycle of operation as a guide to narrow down the cause. Determine at what stage in the cycle of operation the weapon had a stoppage and use the guidelines below.

Failure to Fire on Initial Burst

If the weapon failed to fire on the initial burst, do the following:

- Check the safety. If the safety is on SAFE, place it on FIRE.
- Check the ammunition. Raise the cover and ensure the belt of ammunition is loaded properly.
- Check the weapon condition. Pull the charging handle to the rear to ensure the weapon is properly charged.
- Check the ammunition. Pull the charging handle to the rear to eject a defective round.

Continued on next page

Remedial Action, Continued

Failure to Feed

If the weapon failed to feed ammunition properly, do the following:

- Make sure the rounds in the belt of ammunition are aligned properly. Reload if necessary.
- Make sure the belt of ammunition is not inverted in the feed tray. If so, remove it and load the ammunition with the open side of the links facing down.
- Check the ammunition for defective links or rounds. Remove any defective ammunition.
- Check for obstructions in the receiver. Remove any obstructions.
- Check the receiver and operating groups for proper lubrication. Apply lubrication if needed.
- Check the cover assembly for damaged, missing, or weak parts. If problems exist, notify unit maintenance.
- Make sure the cover is properly closed and secure.

Stops Firing

If the weapon stopped firing, do the following:

- Check for a defective round in the chamber and eject the round.
- Check for an unfired round with a dented primer. Eject the round and notify unit maintenance.
- Check that the bolt assembly is fully forward and locked. Remove any obstructions or clean and lubricate the operating group and inside the receiver.
- Check for a sticking feeding mechanism. Clean and lubricate the feed mechanism. If problem continues, notify unit maintenance.
- Check for a short recoil. Clean and lubricate the operating group and inside the receiver. If problem continues, notify unit maintenance.

Sluggish Operation

If the rate of fire cannot be maintained with proper trigger manipulation, check for a dirty receiver. Clean and lubricate the receiver as necessary.

Continued on next page

Remedial Action, Continued

Failure to Chamber

If the weapon failed to chamber a round, do the following:

- Check for a stuck or ruptured cartridge case. Remove the stuck or ruptured cartridge case.
- Check for dirty ammunition. Wipe the ammunition off with a clean rag.
- Check for built-up carbon in the receiver to include the gas cylinder. Clean if necessary.
- Check for a damaged round. Remove the round and recharge the weapon.
- Check for a damaged or weak drive spring. Notify unit maintenance if necessary.
- Check for a damaged gas regulator plug. Notify unit maintenance if necessary.
- Check for a dirty chamber. Clean as necessary.

Failure to Fire

If the weapon failed to fire, do the following:

- Check for faulty ammunition. Unload and replace if necessary.
- Check for a damaged firing pin. Notify unit maintenance if necessary.
- Check for a damaged or weak drive spring. Notify unit maintenance if necessary.

Failure to Extract

If the bolt failed to extract a cartridge, do the following:

- Check for a short recoil. Clean and lubricate the operating group and inside the receiver. If problem continues, notify unit maintenance.
- Check for a damaged extractor or extractor spring on the bolt. Notify unit maintenance if necessary.

Continued on next page

Remedial Action, Continued

Failure to Eject

If the bolt failed to eject a cartridge, do the following:

- Check for a short recoil. Clean and lubricate the operating group and inside the receiver. If problem continues, notify unit maintenance.
- Check for a damaged ejector or ejector spring on the bolt. Notify unit maintenance if necessary.
- Check under the weapon to see if spent cartridges are piled high enough to block ejection port. Clear away spent cartridges if needed.

Failure to Cock

If the bolt failed to lock to the rear or cock the weapon, do the following:

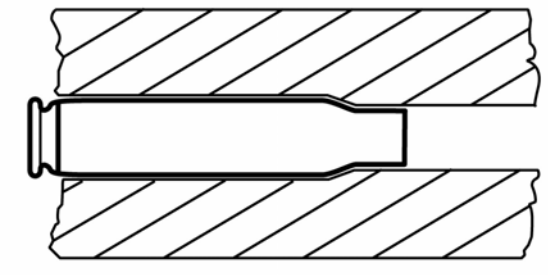
- Check for a damaged or worn sear. Notify unit maintenance if necessary.
- Check for a stuck sear. Notify unit maintenance if necessary.
- Check for a damage or worn sear notch on the operating rod. Notify unit maintenance if necessary.
- Check for a short recoil. Clean and lubricate the operating group and inside the receiver. If problem continues, notify unit maintenance.

Continued on next page

Remedial Action, Continued

Stuck Cartridge

Over time, the extractor spring may weaken from use causing the extractor not to tightly grip the base of the cartridge. When the bolt moves to the rear, the cartridge is released and not removed from the chamber. Other times, when a round is fired, some swelling of the cartridge occurs. When this swelling is excessive, the cartridge can become fixed inside the chamber.



Removing a Stuck Cartridge

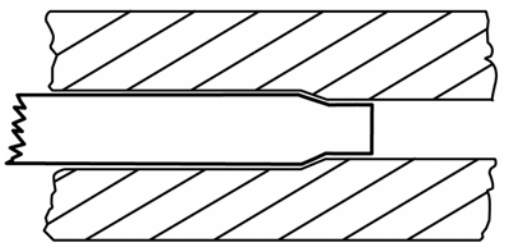
The steps for removing a stuck cartridge are listed in the table below:

Step	Action
1	Lock the bolt to the rear.
2	Place the weapon on safe.
3	Assemble the cleaning rod.
4	Insert the cleaning rod into the muzzle end of the barrel to push the stuck cartridge out of the chamber.
5	Remove the cleaning rod.
6	Continue the mission.

Continued on next page

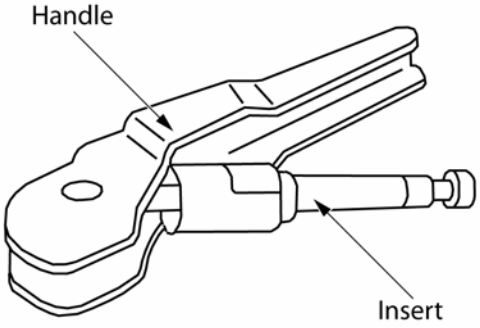
Ruptured Cartridge

When a round is fired, it can cause the cartridge to weaken. Again, swelling may occur. When both of these happen, the extractor may rip the base of the cartridge off during the extraction process leaving behind the upper portion of the cartridge in the chamber.



Removing a Ruptured Cartridge

The ruptured cartridge extractor tool is used to help the operator remove a rupture cartridge. The steps for removing a ruptured cartridge are listed in the table below:

Step	Action
1	Lock the bolt to the rear.
2	Place the weapon on safe.
3	Remove the barrel.
4	Insert the ruptured cartridge case extractor into the ruptured cartridge. 
5	Rotate the handle away from the barrel making the extractor grasp the ruptured cartridge.
6	Holding the handle, pull the ruptured cartridge from the barrel.
7	Visually inspect the chamber for damage or debris. Clean if necessary.
8	Reattach the barrel.
9	Continue the mission.

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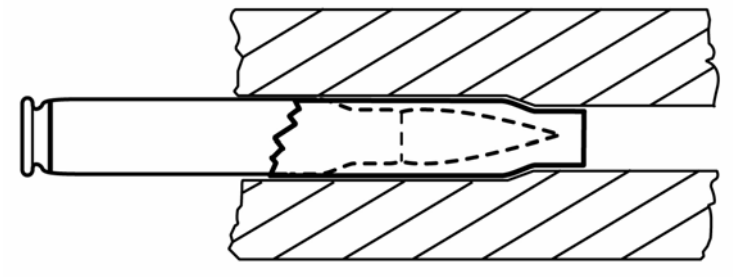
Stuck and Ruptured Cartridge

When a ruptured cartridge occurs, there is a possibility that another round has been chambered into the ruptured cartridge.



Removing Stuck and Ruptured Cartridge

The steps for removing a stuck cartridge and a ruptured cartridge are listed in the table below.

Step	Action
1	Lock the bolt to the rear.
2	Place the weapon on safe.
3	Remove the barrel.
4	Insert the cleaning rod into the muzzle end of the barrel to push the cartridges out of the chamber.
5	Remove the cleaning rod.
6	If both cartridges have been removed, reattach the barrel and continue the mission.
7	If the rupture cartridge remains, follow the procedure for removing a ruptured cartridge.
8	Continue the mission.

Lesson 5 Exercise

Directions Complete exercise items 1 through 15 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 Define malfunction.

_____

_____

Item 2 What is sluggish operation?

_____

_____

Item 3 List the steps for adjusting the gas regulator setting.

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Item 4 What is a runaway gun?

_____

_____

Continued on next page

Item 5 List the steps for correcting a runaway gun.

- _____
- _____
- _____
- _____
- _____
- _____

Item 6 Define stoppage.

_____

_____

Item 7 Define hangfire.

_____

_____

Item 8 Define cook off.

_____

_____

Item 9 A barrel is considered hot if more than _____ rounds have been fired in the last _____ minutes.

Continued on next page

Item 10

Complete the statement below.

Immediate action is the _____

_____

Item 11

When applying immediate action to a weapon that has stopped firing, the first thing the operator should do is

a. pull the charging handle to the rear.
b. remove the barrel.
c. wait 5 seconds in case there is a hangfire.
d. open the cover to investigate.

Items 12 Through 15

Matching: For items 12 through 15, match the problem in column 1 with the likely cause in column 2.

Column 1	**Column 2**
Problem	**Cause**
___ 12. Stuck cartridge	a. Cover not completely closed
___ 13. Ruptured cartridge	b. Weak extractor spring
___ 14. Failure to feed	c. Damaged firing pin
___ 15. Failure to fire	d. Base ripped from cartridge

Continued on next page

Answers

The table below lists the answers to the exercise items on the previous pages. If you have any questions about the items, refer to the reference page.

Item Number	Answer	Reference Page
1	A failure of the gun to function satisfactorily; the gun will fire, but fire improperly.	3-59
2	The M240G fires more slowly than its normal rate of fire of 9 or 10 rounds per second.	3-59
3	• Clear the weapon and make condition 4. • Remove the barrel. • Remove the gas collar and gas regulator plug. • Reinsert the gas regulator plug with setting 2 or 3. • Attach the gas collar. • Attach the barrel. • Continue with mission.	3-60
4	The weapon continues to fire after the trigger is released.	3-60
5	• Keep the weapon point towards the target. • If there are fewer than 50 rounds, let the rounds fire out. • If there are more than 50 rounds or the fire needs to cease immediately, grasp the belt of ammunition with both hands and twist the hands in opposite directions to break the belt of ammunition. • Let the remaining rounds fire out. • Clear the weapon and make condition 4. • Turn weapon in to maintenance personnel for repairs before using again.	3-60

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
6	Any interruption in the cycle of functioning caused by faulty action of the gun or defective ammunition that causes the weapon to stop firing.	3-61
7	When there is a delay in the round firing after the firing pin strikes the primer on the round.	3-61
8	When a round discharges before being fully fed and locked inside the chamber due to the high heat of the barrel.	3-61
9	200; 2	3-61
10	Immediate action is the prompt action taken by the operator to reduce a stoppage without investigating the cause.	3-62
11	c	3-62
12	b	3-68
13	d	3-69
14	a	3-65
15	c	3-66

Lesson Summary

In this lesson, you learned how to identify and respond to the various malfunction and stoppages that may occur when operating the M240G.

Study Unit Summary

In this study unit, you have learned how mount, load and unload, fire, zero, and troubleshoot the M240G medium machinegun. You now have the requisite knowledge to operate this weapon and use it in training and more importantly, combat.

In the next study unit, you will learn how to engage targets in periods of limited visibility and darkness using special optics.

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STUDY UNIT 4

OPTICS

Overview

Scope

Your effectiveness as a machinegunner is based on your ability to engage targets in periods of limited visibility and darkness. This can only be accomplished through the use of optic systems designed for this purpose.

In this study unit, you will learn how to use special optics to engage targets during periods of limited visibility and darkness.

In This Study Unit

This study unit contains the following lessons:

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LESSON 1

AN/PAS-13B V(2) MEDIUM WEAPON THERMAL SIGHT

Introduction

Scope

This lesson will acquaint you with the AN/PAS-13B medium weapon thermal sight (MWTS)—its characteristics and reticle indicators. Basic operation and the mounting and zeroing procedures will also be discussed.

Learning Objectives

After completing this lesson, you should be able to

- Identify the fields of view on the AN/PAS-13B.
- Identify the four major components of the AN/PAS-13B.
- Identify the controls for the AN/PAS-13B.
- Identify the indicators for the AN/PAS-13B.
- Identify the parts of the M240 reticle.
- Identify the steps for mounting the AN/PAS-13B to the M240G.
- Identify the steps for installing the battery into the AN/PAS-13B.
- Identify the steps for operating the AN/PAS-13B.

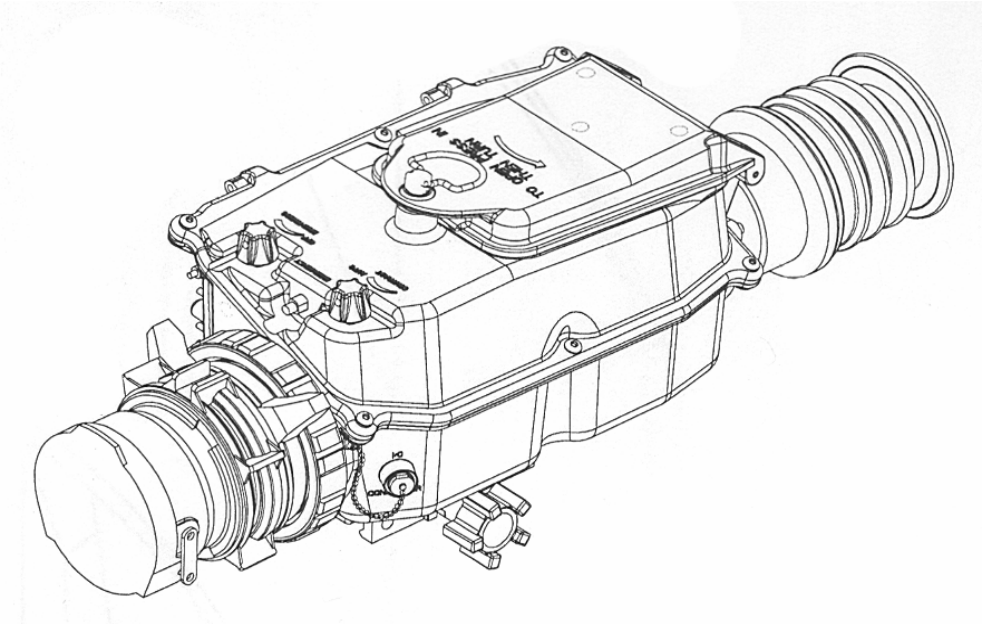
In This Lesson

This lesson contains the following topics:

General Information

Description

The AN/PAS-13B V(2) MWTS is a silent, lightweight, compact, durable, battery-powered thermal sight that operates with low power consumption. The MWTS is capable of target acquisition under conditions of limited visibility—such as darkness, smoke, fog, dust, and haze—and operates just as effectively during daylight.



Characteristics

The characteristics of the MWTS are listed in he table below:

Characteristic	Dimension/Description
Height	6.25 inches
Width	6.25 inches
Length	15.50 inches
Weight	4.19 pounds

Continued on next page

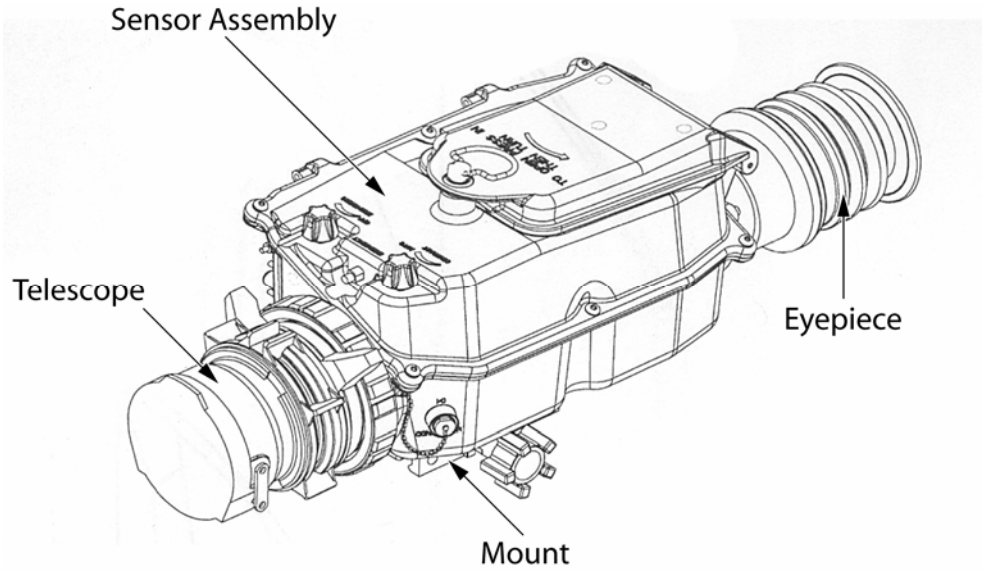
Field of View

The MWTS consists of two fields of view (FOV)—narrow and wide:

FOV	Description	Magnification
Narrow	6º	5.0 ×
Wide	18º	1.66 ×

Four Major Components

The table below lists the MWTS components and their function:

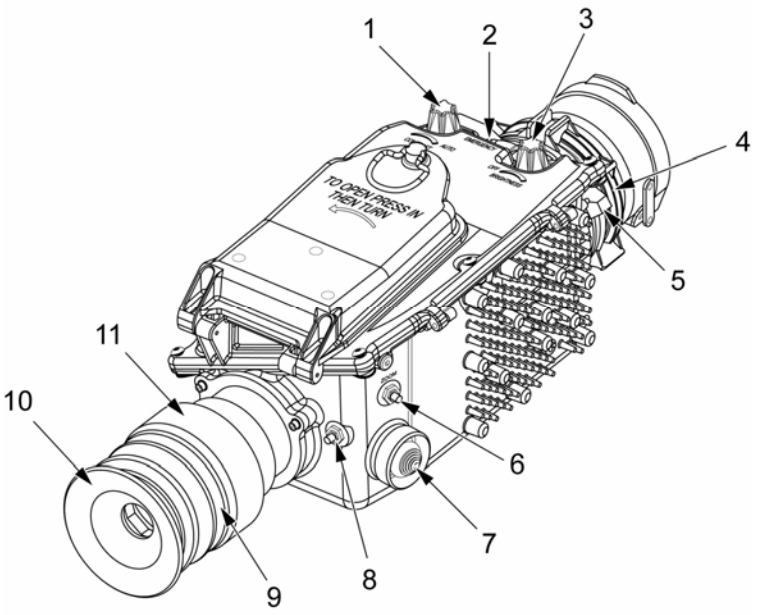


Component	Function
Telescope	Provides magnification of the thermal image
Sensor Assembly	Processes the thermal image for display
Eyepiece	Displays the thermal image and all system indicators for the operator
Mount	Universal attachment that interface between the MWTS and the weapon

Controls and Indicators

Controls

The table below lists the MWTS controls and their function:

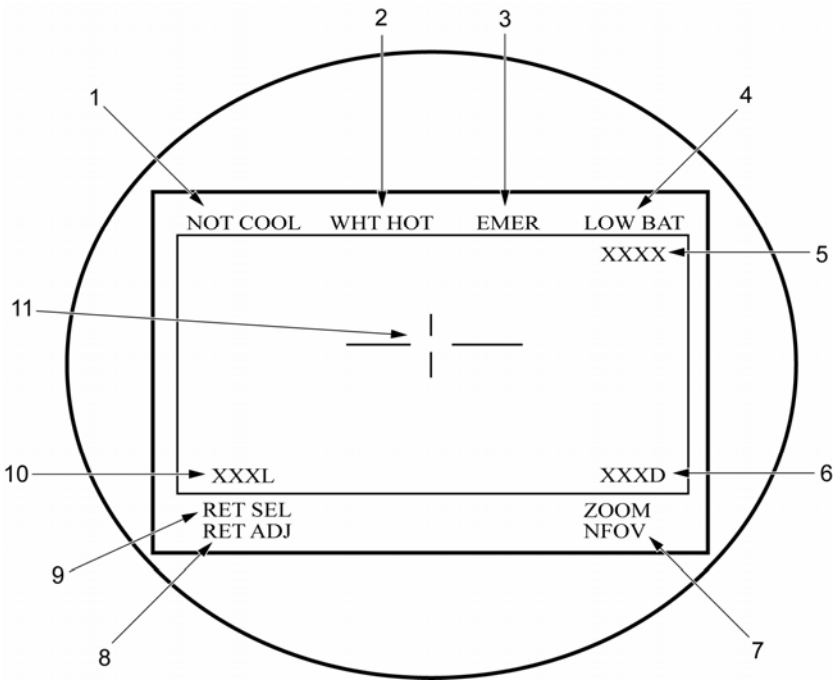


Item	Control	Function
1	Contrast Knob	Adjusts the contrast of the thermal scene. When turned fully clockwise to the AUTO detent position, contrast is automatically controlled by the sight.
2	Emergency Select	Places the sight in emergency mode with the system power on.
3	Brightness Knob	Turns system power ON and OFF. Adjusts brightness of display.
4	Focus Knob	Adjusts focus of thermal scene.
5	FOV Knob	Selects either WIDE or NARROW field of view.
6	Zoom/Reticle Select	Turns on the 2× zoom and changes the reticle.
7	Reticle Adjust	Used only for zeroing and sight aligning.
8	Black/White Select	Controls polarity (white hot or black hot) of thermal scene.
9	Diopter Holding Device	For use with cathode ray tube display only. Not required on liquid crystal display. Allows diopter to be adjusted.
10	Eyecup	Controls Standby or ON operating mode.
11	Diopter	Adjust focus of reticle and indicators.

Continued on next page

Indicators

The table below lists the MWTS indicators and their function:



Item	Indicator	Function
1	NOT COOL	Displays when the system is not cool enough for proper operation
2	WHT HOT/BLK HOT	Indicates the target polarity selected by the BLK/WHT switch
3	EMER	Displays when the system is placed in emergency mode
4	LOW BAT	Displays when battery power is low. Approximately 15 minutes of battery time remain
5	Reticle select/FOV	Identifies which reticle and FOV is currently selected
6	Elevation	Indicates the elevation zeroing adjustment of the reticle
7	NFOV/WFOV	Indicates wide FOV or narrow FOV
8	RET ADJ	Indicates the reticle adjustment mode is selected
9	RET SEL	Indicates the reticle select mode is selected
10	Azimuth	Indicates the azimuth zeroing adjustment of the reticle
11	SENSOR COOLING	Displays when system is first turned on and switches to the current reticle after approximately 2 minutes

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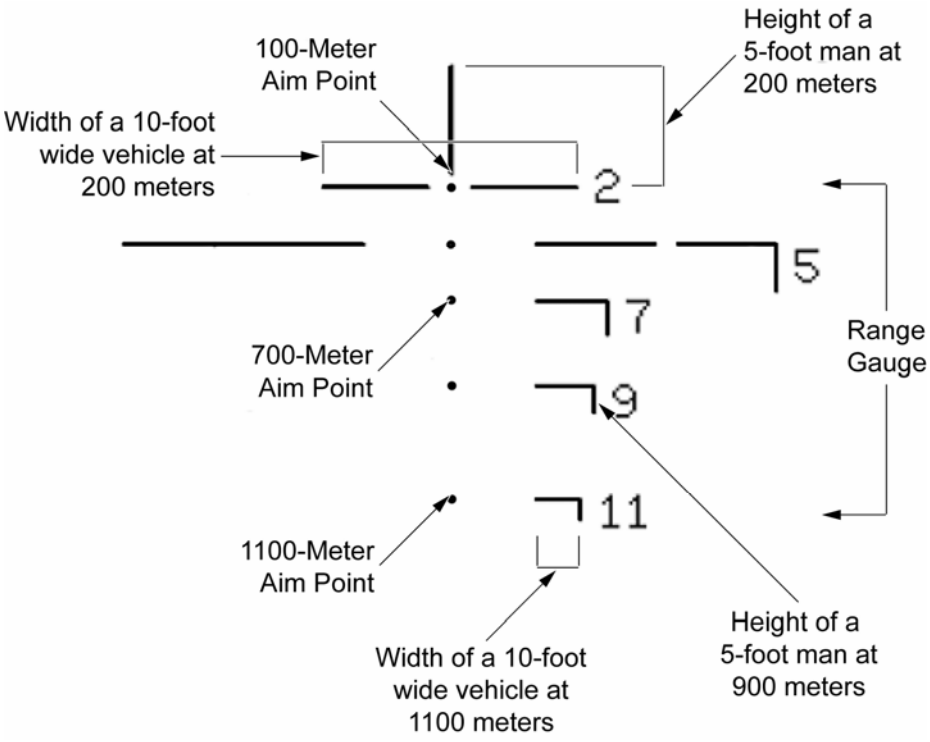
Reticles

General

The M240 reticles provide multiple dot aim points and range gauges used for range estimation and target firing. Each dot aim point is used for a different range as indicated on the side of the range gauge. The bottom of the vertical line above the 200-meter aim point is the 100-meter aim point. The height of the vertical line at each aim point represents the height of a 5-foot tall man at that range. The width of the horizontal line at each aim point represents the width of a 10-foot-wide vehicle at that range.



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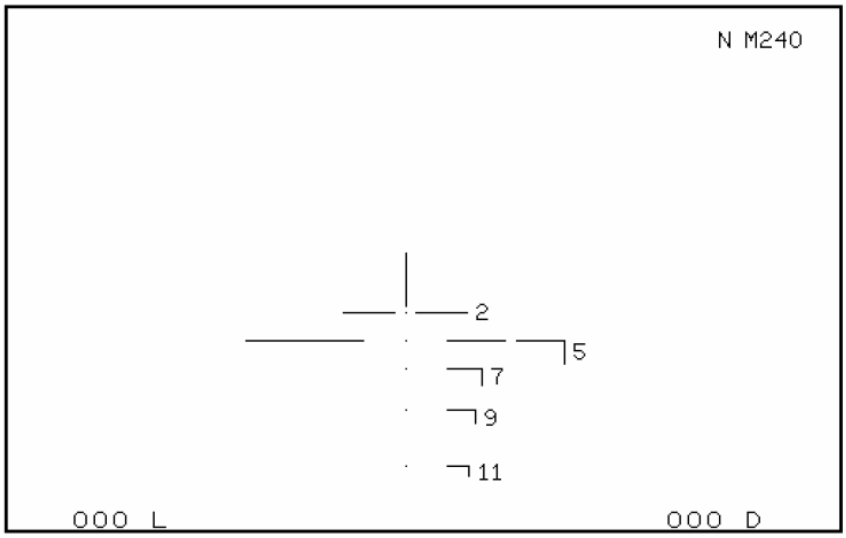
M240 Narrow FOV Reticle

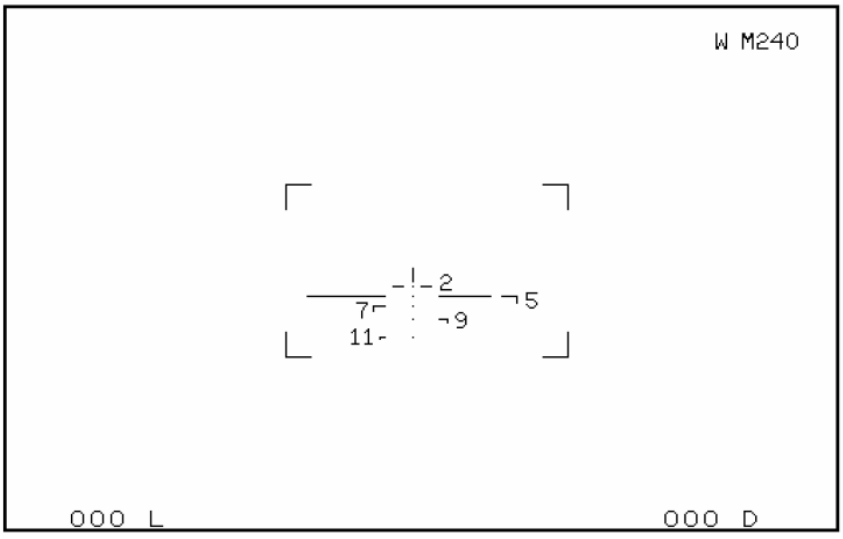
The M240 narrow field of view (NFOV) reticle is shown below:



NFOV

M240 Wide FOV Reticle

The M240 wide field of view (WFOV) reticle is shown below:



WFOV

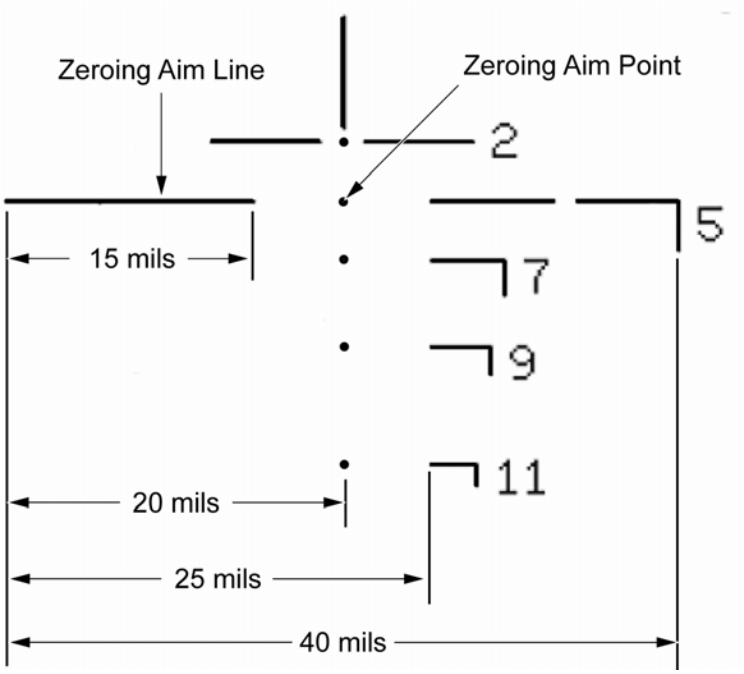
Continued on next page

Reticles, Continued

Zeroing Aim Line and Zeroing Aim Point

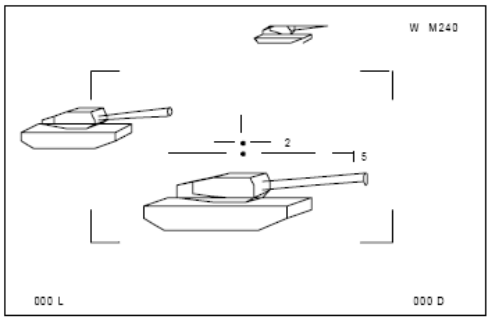
The zeroing aim line is composed of the horizontal lines to the left and right of the zeroing aim point. The zeroing aim line serves two purposes:

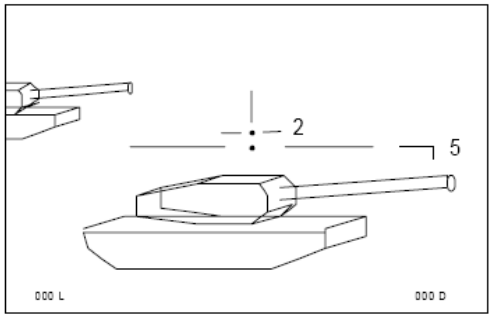
- Indicates the zeroing aim point for reticles with multiple aim points
- Provides a means of measuring angles for combat preparation, directing fire, and range estimation



Zoom

The MWTS has a 2-times electric zoom. When the zoom is activated, the image size is doubled and the FOV is cut in half as shown below:





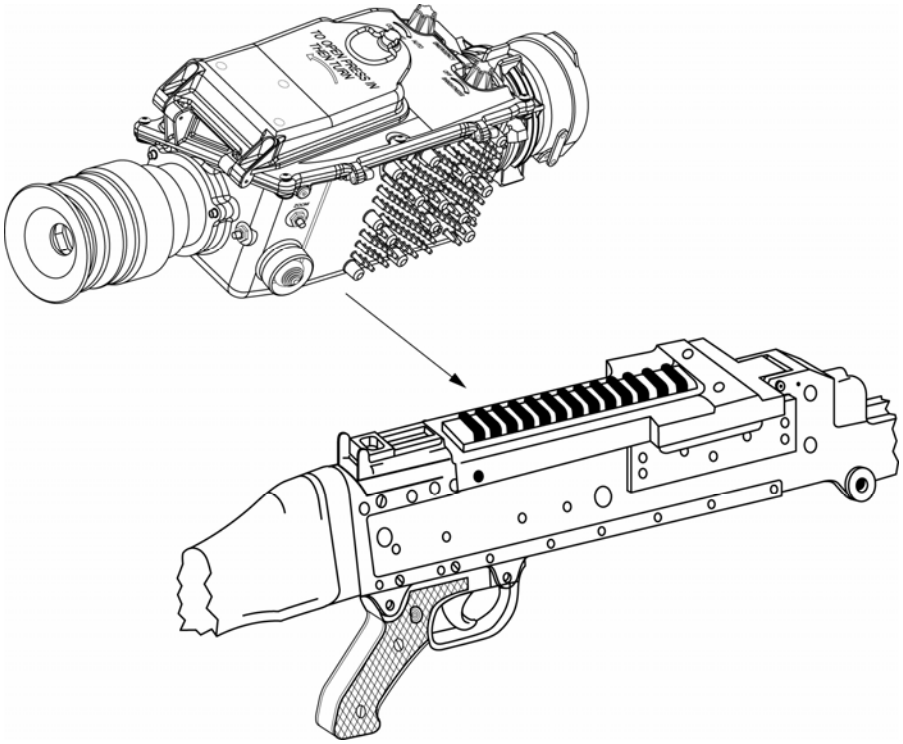
Mounting

Introduction

Make sure the M240G is in weapon condition 4 before mounting the AN/PAS-13B. Avoid carrying the AN/PAS-13B by the eyecup, objective lens cover, or battery cover. These items may detach from the site, causing it to drop.

Procedure

The procedure for mounting the AN/PAS-13B to the M240G is listed in the table below:

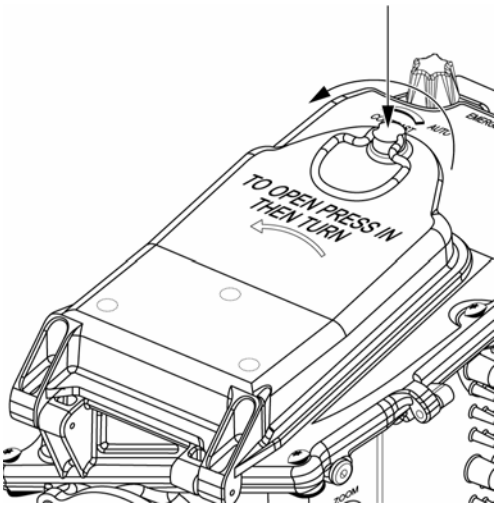
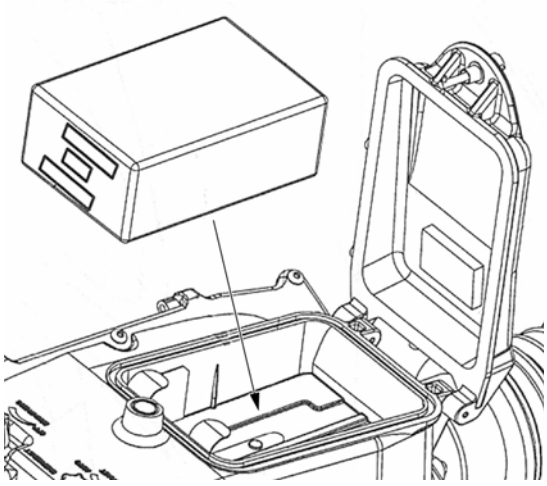


Step	Action
1	Make sure the rear sight of the M240G is in the down (horizontal) position.
2	Loosen the mounting knob on the site.
3	Place the site on the mounting rail on the cover of the M240G.
4	Align the mounting rail of the AN/PAS-13 to the fourth slot from the rear of the mounting rail on the M240G. Mounting the site on a different slot can result in damage to the sight.
5	Hand tighten the mounting knob until two clicks are heard.

Operation

Installing the Battery

The procedure for installing the battery is listed in the table below:

Step	Action
1	Press in battery door latch, turn counterclockwise, and open battery door. 
2	Hold battery with contacts facing forward.
3	Install battery into battery compartment. 
4	Close battery door. Press in while turning battery door latch clockwise until battery door latch catches in slot. Continue turning battery door latch one-quarter turn.

Continued on next page

Operating the MWTS

The steps for operating the MWTS are listed below:

Step	Action
1	Push in and turn the BRIGHTNESS knob fully clockwise to turn to turn on power.
2	Place eye to eyecup and push to activate the display. During initial cool down period, NOT COOL indicator is displayed and reticle is replaced with SENSOR COOLING.
3	Adjust BRIGHTNESS knob for best display.
4	Adjust the diopter for best focus of the display.
5	Remove eye from eyecup to allow system to cool down.
6	Open objective lens cover on telescope.
7	Place eye to eyecup and push to activate display.
8	Set CONTRAST knob to AUTO or adjust for best scene.
9	Adjust FOCUS on telescope for best picture.
10	Adjust BRIGHTNESS knob for best picture.
11	Using BLK/WHT switch, select polarity as desired.
12	Rotate FOV ring to select WIDE or NARROW as desired.
13	Repeat steps 7 through 12 as needed to accomplish mission.
14	Following operation, push in and turn BRIGHTNESS knob fully counterclockwise to the OFF detent position to turn off power.

Lesson 1 Exercise

Direction Complete exercise items 1 through 8 by performing the action required. Check your answers against those listed at the end of this study unit.

Item 1 Complete the following statement.

What is the magnification for the narrow field of view (NFOV)?

_____

Item 2 List the four major components of the AN/PAS-13B.

- _____
- _____
- _____
- _____

Item 3 Which control knob is used to turn the system power on and off?

a. Contrast knob
b. Brightness knob
c. Focus knob
d. FOV knob

Item 4 What is displayed in the center of the reticle/display when you first turn on the system?

a. SYSTEM COOLING
b. WHITE HOT
c. BLACK HOT
d. SENSOR COOLING

Continued on next page

Item 5

On the reticle, the zeroing line can be used for measuring angles in what unit of measurement?

a. Meters
b. Feet
c. Degrees
d. Mils

Item 6

When mounting the AN/PAS-13B to the M240G, the mounting rail should be aligned with the _____ slot from the rear of the mounting rail.

a. second
b. third
c. fourth
d. fifth

Item 7

To open the battery compartment door, push in and rotate the battery door latch

a. clockwise.
b. counterclockwise.
c. upward.
d. downward.

Item 8

When operating the AN/PAS-13B, push in and turn the _____ knob fully clockwise to turn on the power.

a. CONTRAST
b. POWER
c. BRIGHTNESS
d. FOCUS

Continued on next page

Answers

The table below lists the answers to the exercise items. If you have any questions about these items, refer to the reference page.

Item Number	Answer	Reference Page
1	5.0 ×	4-5
2	• Telescope • Sensor assembly • Eyepiece • Mount	4-5
3	b	4-6
4	d	4-7
5	d	4-8
6	c	4-11
7	b	4-12
8	c	4-13

Lesson Summary

In this lesson, you were introduced to the AN/PAS-13B thermal weapon sight. We covered characteristics, controls and indicators, mounting, and operations.

In the next lesson, you will learn about the AN/PVS-17C miniature night sight.

LESSON 2

AN/PVS-17C MINIATURE NIGHT SIGHT

Introduction

Scope

In this lesson, you will become familiarized with the AN/PVS-17C miniature night sight. You will learn the characteristics and components of the sight. You will be able to identify the control, how to mount the sight to the M240G, and how to operate the sight.

Learning Objectives

After completing this lesson you should be able to

- Identify the physical characteristics of the AN/PVS-17C.
- Identify the major components of the AN/PVS-17C.
- Identify the controls for the AN/PVS-17C.
- Identify the steps for installing a battery into the AN/PVS-17C.
- Identify the steps for mounting the AN/PVS-17C to the M240G.
- Identify the steps for operating the AN/PVS-17C.

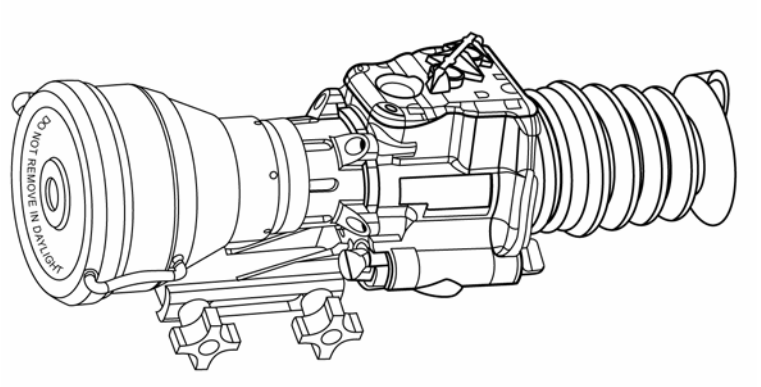
In This Lesson

This lesson contains the following topics:

General Information

Description

The AN/PVS-17C miniature night sight (MNS) is a high performance, compact, lightweight, monocular, night vision aiming system. The MNS takes ambient/available light from night time sources—such as moonlight, starlight, and sky glow—and amplifies it into a viewable image.



Physical Characteristics

The MNS consists of the following physical characteristics:

Characteristic	Dimension/Description
Height	4.75 inches
Width	3.25 inches
Length w/eyeguard	11.375 inches
Weight w/battery	3 pounds

Operating Characteristics

The MNS consists of the following operating characteristics:

Characteristic	Description
Operating Temperature Range	–40°F to +125.6°F (–40°C to +52°C)
Maximum Altitude	45,000 feet
Maximum Water Immersion (Fresh)	66 feet
Target Detection Range	500 meters
Magnification	4.5 times
Battery	1 AA alkaline or lithium battery

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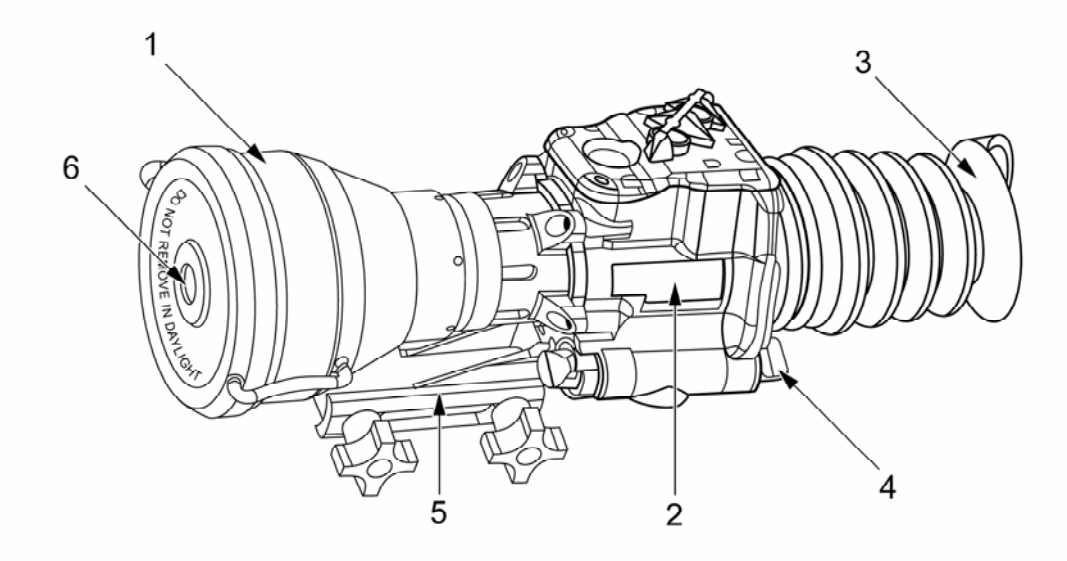
Major Components

The table below lists the MNS major components and their function:



Item	Description	Function
1	Objective Lens	Provides magnification for imager
2	Image Intensifier	Amplifies available light into a viewable image for the operator
3	Eyeguard	Provides protection for the eyepiece optics, recoil protection for the operator, and light security to within 10 meters
4	Eye Bumper (not shown)	Provides recoil protection for the operator but no light security; used instead of the eyeguard
5	Mount	Universal attachment that interface between the MNS and the weapon
6	Daylight Filter	Protects the image intensifier from bright light during limited daylight use of the MNS for zeroing—a neutral density

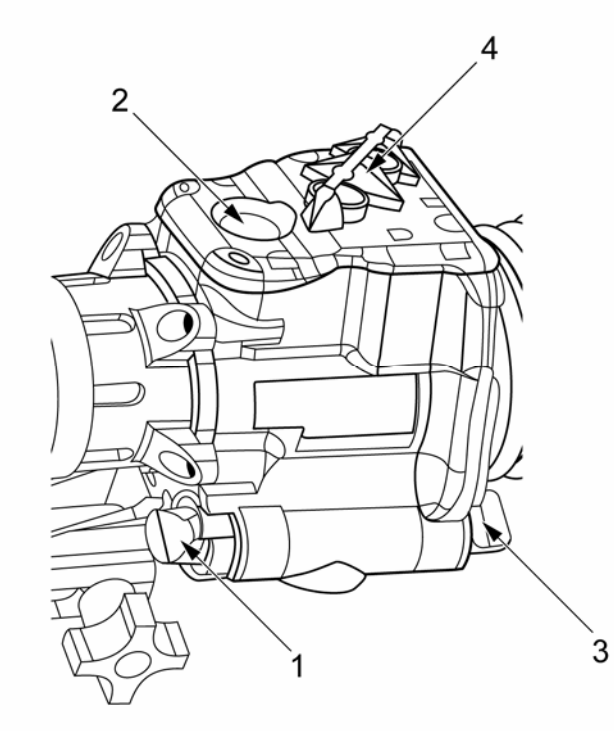
Continued on next page

General Information, Continued

Internal Reticle	The MNS contains an internal reticle that projects a red dot with an intensified image of the viewed scene onto the eyepiece lens to provide an aiming point for targeting. The illumination brightness of the red dot reticle is controlled by the reticle brightness knob.
Low Battery Warning LED	A yellow LED will illuminate in the eyepiece to indicate that a minimum of 30 minutes of battery life remains. It is located in the upper right of the eyepiece.

Controls

Description The table below lists the MNS controls and their function:



Item	Control	Function
1	OFF-ON-ON Selection Switch	• OFF – Power is not provided to the image intensifier or reticle. • ON – Used with the momentary button. • ON – Continuous power to the image intensifier and reticle.
2	Momentary Button	Power is applied to the image intensifier and reticle while this button is pressed and held in.
3	Reticle Brightness Knob	Consists of five levels of brightness to adjust the brightness of the reticle.
4	Reticle Elevation and Windage Adjustment	Used when zeroing the MNS

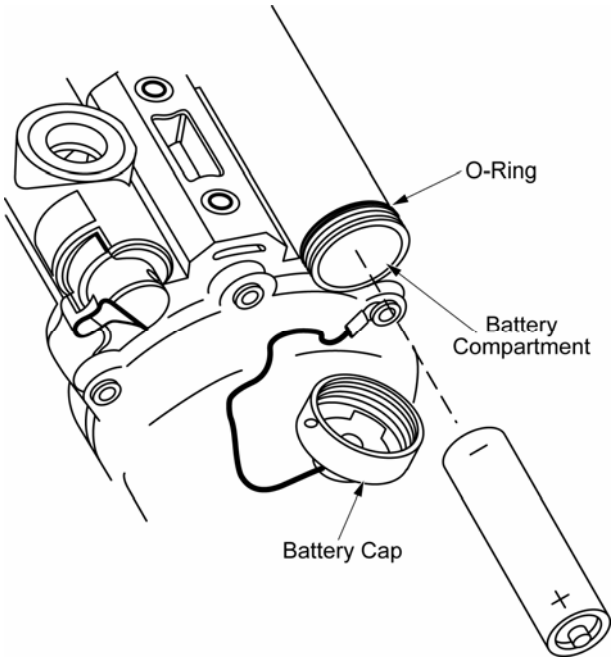
Mounting

Introduction

Make sure the M240G is in weapons condition 4 before mounting the MNS. Avoid carrying the MNS by the eyeguard or objective lens cover. These items may detach from the sight, causing it to drop.

Installing the Battery

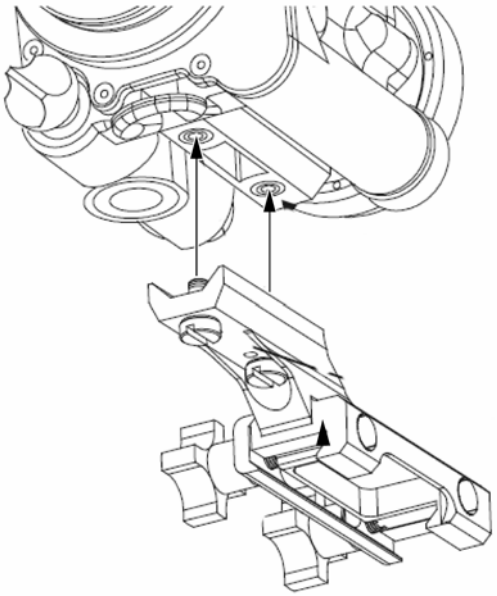
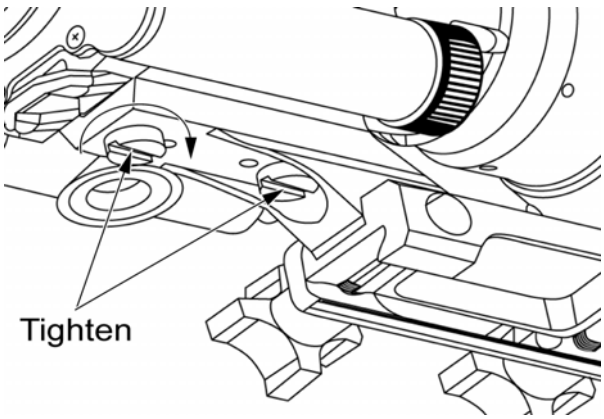
Before mounting the MNS to the M240G, you should install the battery. The procedure for installing the battery is listed in the table below:

Step	Action
1	Make sure the objective lens cover is installed.
2	Place the OFF-ON-ON switch to the OFF position.
3	Open the battery compartment by rotating the battery cap counterclockwise.
4	Insert the battery negative terminal first. 
5	Place the battery cap on the battery compartment and rotate clockwise until closed.

Continued on next page

Installing the Rail Assembly Mount

To mount the AN/PVS-17C to the M240G, the rail assembly mount must be used. The procedure for mounting the rail assembly mount onto the AN/PVS-17C is listed below:

Step	Action
1	Align the mounting screws on the rail assembly mount with the threaded mounting holes on the bottom of the MNS. 
2	Rotate the mounting screws clockwise using a flat tip screwdriver until tight. Do not over-tighten. 

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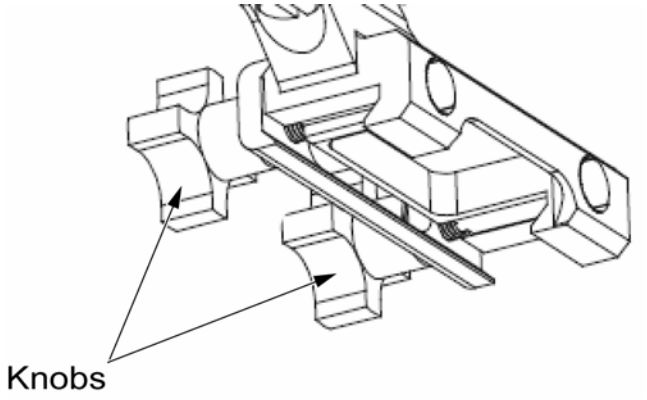
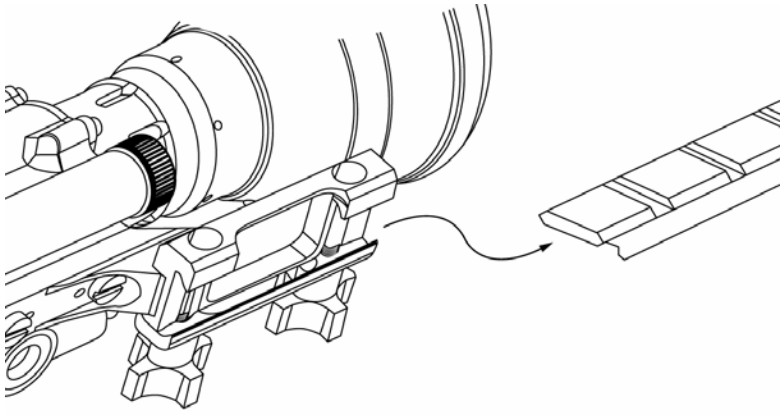
Mounting the MNS to the M240G

The procedure for mounting the AN/PVS-17C to the M240G is listed in the table below:

Step	Action
1	Loosen the two knobs. 
2	Slide the rail assembly mount onto the mounting rail. 
3	Move the MNS forward until the recoil stops are aligned with the recoil slots on the rail assembly mount.
4	Check the eye relief. Adjust the MNS on the mounting rail as needed.
5	Tighten the rear knob and then the front knob. Repeat three more times until knobs are tight.

Operation

Precautions

When using the MNS during night operations, carefully read and understand the following precautions:

- The equipment's level of performance depends upon some night light—moonlight, starlight, sky glow, etc.—to operate.
- Night light is reduced by passing cloud cover or while operating under trees, in building shadows, etc.
- Equipment is less effective when viewing into shadows and darkened areas.
- Equipment's function degrades through rain, fog, sleet, snow, or smoke.
- Equipment's function degrades underwater in cloudy, murky water conditions.
- Make sure the objective lens cover is installed over the objective lens when operating the MNS during the day.

Procedure

The steps for operating the MSN when mounted to the M240G are listed in the table below:

Step	Action
1	Assume a firing position behind the weapon.
2	Place the OFF-ON-ON selection switch to the ON position.
3	Press your eye against the eye guard.
4	Rotate the BRIGHTNESS knob until the reticle is clearly visible.
5	Adjust the eyepiece focus ring until a sharp image of the reticle is obtained.
6	Remove your eye from the eye guard.

Lesson 2 Exercise

Directions Complete exercise items 1 through 6 by performing the action required. Check your answers against those listed at the end of this lesson.

Item 1 What is the magnification of the AN/PVS-17C MNS?

a. 2.5 times
b. 3.5 times
c. 4.5 times
d. 5.5 times

Item 2 List the six main parts of the AN/PVS-17C.

- _____
- _____
- _____
- _____
- _____
- _____

Item 3 To use the momentary button, the OFF-ON-ON selection switch must be in the _____ position.

a. OFF
b. ON
c. OFF
d. ON

Continued on next page

Lesson 2 Exercise, Continued

Item 4

Before opening the battery compartment, you should ensure

_____

_____

Item 5

To use the AN/PVS-17C with the M240G, the _____ mount must be used.

a. rail assembly
b. all purpose
c. night optic
d. receiver cover

Item 6

List the steps in order for operating the AN/PVS-17C mounted on an M240G.

- _____
- _____
- _____
- _____
- _____
- _____

Continued on next page

Answers

The table below lists the answers to the exercise items. If you have you questions about these items refer to the reference page.

Item Number	Answer	Reference Page
1	c	4-18
2	• Objective Lens • Image Intensifier • Eyeguard • Eye Bumper • Mount • Daylight Filter	4-19
3	b	4-21
4	The objective lens cover is installed and the OFF-ON-ON switch is in the OFF position.	4-22
5	a	4-23
6	• Assume a firing position behind the weapon. • Place the OFF-ON-ON selection switch to the ON position. • Press your eye against the eye guard. • Rotate the BRIGHTNESS knob until the reticle is clearly visible. • Adjust the eyepiece focus ring until a sharp image of the reticle is obtained. • Remove your eye from the eye guard.	4-25

Lesson Summary

In this lesson, you have learned the characteristics, components, and operation of the AN/PVS-17C miniature night sight.

Study Unit Summary

This study unit has familiarized you with two different optic systems for use with the M240G, allowing you to operate in periods of limited visibility or darkness.

M240G MEDIUM MACHINEGUNNER

REVIEW LESSON EXAMINATION

Review Lesson

Introduction

The purpose of the review lesson examination is to prepare you for your final examination. We recommend that you try to complete your review lesson examination without referring to the text, but for those items (questions) you are unsure of, restudy the text. When you finish your review lesson and are satisfied with your responses, check your responses against the answers provided at the end of this review lesson examination

Directions

Select the ONE answer that BEST completes the statement or that answers the item. For multiple choice items, circle your response. For matching items, place the letter of your response in the space provided.

Item 1

The M240G is used to support both

a. offensive and defensive operations.
b. desert and jungle operations.
c. combat and training operations.
d. Army and Marine Corps operations.

Item 2

The weight of the M240G without the mount and tripod is _____ pounds.

a. 20.6
b. 25.6
c. 26.5
d. 29.5

Item 3

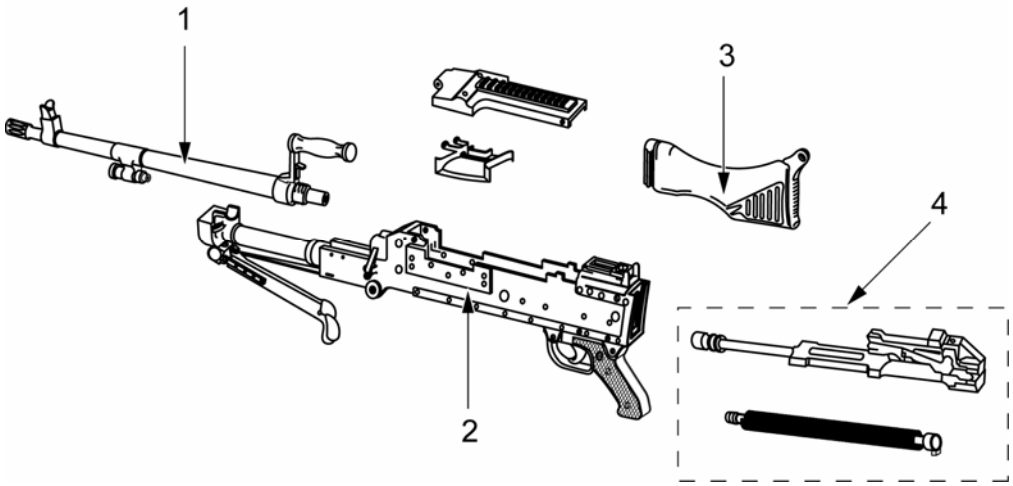
The maximum effective range of the M240G against an area target is _____ meters.

a. 1400
b. 1600
c. 1800
d. 2000

Continued on next page

Items 4 Through 7

Matching: For items 4 through 7, use the illustration below to match the group in column 2 with its item number in column 1.



Column 1	Column 2
Item	**Group**
_____ 4. 1	a. Receiver
_____ 5. 2	b. Buttstock
_____ 6. 3	c. Operating
_____ 7. 4	d. Barrel

Items 8 Through 11

Matching: For items 8 through 11, match the purpose in column 2 with its group in column 1.

Column 1	Column 2
Group	**Purpose**
_____ 8. Barrel group	a. Controls firing
_____ 9. Buttstock group	b. Houses the action of the weapon
_____ 10. Trigger housing group	c. Directs the projectile after firing
_____ 11. Receiver group	d. Absorbs recoil

Continued on next page

Item 12 The M240G uses the _____ tripod.

a. M2
b. M3
c. M122
d. M112

Item 13 Which tool is used to clean the gas ports on the barrel and gas regulator plug?

a. Combination tool scraper and extractor
b. Scraper tool
c. Cleaning rods and attachments
d. Reamers

Item 14 In the cycle of operations for the M240G, what follows firing?

a. Chambering
b. Ejecting
c. Extracting
d. Unlocking

Item 15 When clearing the M240G, you need to raise the feed tray and

a. visually and physically inspect the chamber for ammunition.
b. have an NCO check the weapon for ammunition.
c. remove the barrel to check for ammunition.
d. physically inspect the chamber for ammunition.

Item 16 The two types of disassembly are

a. dynamic and static.
b. field and garrison.
c. combat and armory.
d. general and detailed.

Continued on next page

Item 17 Detailed disassembly of the receiver group includes removing the

a. bipod assembly.
b. charging handle.
c. cover and feed tray.
d. rear sight assembly.

Item 18 When assembling the M240G, you must assemble the _____ and _____ before the buttstock.

a. bipod assembly; operating group
b. trigger housing group; operating group
c. trigger housing group; barrel assembly
d. tripod; flex-mount

Item 19 A function check should always be performed

a. after firing the weapon.
b. before loading the weapon.
c. after the weapon has been disassembled and assembled.
d. before mounting on the tripod.

Item 20 The first step in performing a function check for the M240G is to

a. place the safety on SAFE.
b. place the safety on FIRE.
c. pull the cocking handle to the rear.
d. open the cover.

Item 21 The M240G uses _____ ammunition.

a. 5.56 millimeter
b. 7.62 millimeter
c. 40 millimeter
d. .50 caliber

Continued on next page

Items 22 Through 25

Matching: For items 22 through 25, match the purpose in column 2 with the ammunition in column 1.

Column 1 **Ammunition**	Column 2 **Purpose**
_____ 22. M80 ball	a. Practice of loading and unloading
_____ 23. M62 tracer	b. Observation of fire and signaling
_____ 24. M82 blank	c. Anti-personnel and marksmanship training
_____ 25. M63 dummy	d. Simulated live fire

Item 26

When storing M240G ammunition outdoors for long periods, it should be kept at least _____ inches off the deck.

a. 2
b. 4
c. 6
d. 8

Item 27

Ammunition that is heavily corroded should be

a. fired immediately.
b. returned to the manufacturer.
c. thrown away.
d. replaced with clean ammunition.

Item 28

The only cleaning agents authorized for use on the M240G are

a. CLP, RBC, and dry cleaning solvent.
b. CLP, LAW, and LSA.
c. LSA-T, RBC, and gasoline.
d. LSA-T, LAW, and JP5.

Continued on next page

Item 29 The only lubricants authorized for use on the M240G are

a. CLP, RBC, LAW, and WD-40.
b. LAW, LSA, LSA-T, and WD-40.
c. CLP, LAW, LSA, and LSA-T.
d. LAW, LSA, WD-40, and LSA-T.

Item 30 When environmental temperatures are normally below 10°F, the lubricant that should be used on the M240G is

a. CLP.
b. LSA.
c. LAW.
d. LSA-T.

Item 31 When cleaning the M240G, avoid getting lubricants or solvents

a. on wooden parts.
b. on composite or rubber parts.
c. inside the receiver.
d. on the barrel.

Item 32 The scraper tool is used to clean

a. the barrel chamber and bore.
b. the receiver.
c. the operating rod.
d. the gas regulator plug.

Item 33 The driving spring should be replaced if there are _____ or more broken strands on a single coil or _____ or more broken strands anywhere on the spring.

a. 1; 3
b. 1; 4
c. 2; 3
d. 2; 4

Continued on next page

Item 34 Before firing the M240G, you should

a. remove excess lubrication from the bore, chamber, barrel socket, and face of the bolt.
b. add extra lubrication to the bore, chamber, barrel socket, and face of the bolt.
c. remove the lubrication from the spring pin, roller, and other moving parts of the bolt.
d. remove the lubrication from the receiver rails.

Item 35 To check the headspace on the M240G, rotate the barrel handle to the "down" position and count the number of clicks. There should be

a. 1 to 7 clicks.
b. 2 to 7 clicks.
c. 2 to 8 clicks.
d. 3 to 6 clicks.

Item 36 When caring for the M122 tripod, inspect the

a. rear legs for expanding properly and locking in place.
b. tripod head for missing paint.
c. mil scale on the rear legs for serviceability.
d. front leg locking pin for serviceability.

Item 37 When caring for the flex-mount/T&E mechanism, be sure to

a. extend the T&E mechanism all the way to clean the upper and lower elevating screws.
b. rotate the traversing hand wheel to ensure no clicks are heard.
c. rotate the elevating hand wheel to ensure no clicks are heard.
d. check the functioning of the pintle lock.

Continued on next page

Item 38

When caring for the carrying bag, be sure to wash the bag

a. using a washing machine dry with a dryer.
b. with hot water and detergent.
c. with chlorine bleach and solvents to remove lubricant stains.
d. with cold water and mild detergent.

Item 39

To release the bipod from the receiver, press the

a. bipod latch.
b. bipod lever.
c. barrel release.
d. slide latch.

Item 40

When setting up the tripod for use, extend the rear legs until the _____ latch engages, locking the legs in place.

a. sleeve
b. leg locking
c. bipod
d. tripod

Item 41

When preparing the T&E mechanism for use with the tripod, extend the upper and lower elevating screws so that _____ are visible on both.

a. 1 1/2 inches
b. 2 inches
c. 2 1/2 inches
d. 2 3/4 inches

Continued on next page

Items 42 Through 45

Matching: For items 42 through 45, match the description in column 2 to the weapon condition in Column 1.

Column 1	**Column 2**
Condition Code	**Description**
_____ 42. 1	a. The bolt is forward, the safety is disengaged, and the feed tray is clear of ammunition. The cover is closed.
_____ 43. 2	b. The bolt is forward, the chamber is empty, and the safety is disengaged. Ammunition is on the feed tray, the cover is closed.
_____ 44. 3	c. The bolt is locked to the rear, the safety is engaged. Ammunition is on the feed tray, the cover is closed.
_____ 45. 4	d. Does not apply to the M240G.

Item 46

To load the M240G with the cover opened, place the belt of ammunition on the feed tray with

a. closed side of the links facing down.
b. the links removed from the belt.
c. open side of the links facing up.
d. open side of the links facing down.

Item 47

When loading the M240G with the cover closed, the bolt should be

a. forward with the safety on SAFE.
b. to the rear with the safety on SAFE.
c. forward with the safety on FIRE.
d. to the rear with the safety on FIRE.

Continued on next page

Item 48 When unloading the M240G, be sure to

a. center the T&E on the traversing slide bar.
b. raise the feed tray and inspect the chamber and receiver for rounds or links.
c. leave the bolt forward so no additional rounds are chambered.
d. leave the safety on FIRE.

Item 49 The rapid rate of fire is 200 rounds per minute which equates to firing

a. 6- to 8-round bursts with a 2- to 3-second pause.
b. 6- to 8-round bursts with a 3- to 4-second pause.
c. 10- to 12-round bursts with a 2- to 3-second pause.
d. 10- to 12-round bursts with a 3- to 4-second pause.

Item 50 Placing the rear sight in the horizontal ("down") position is for targets at ranges

a. greater than 1000 meters.
b. less than 1000 meters.
c. greater than 800 meters.
d. less than 800 meters.

Item 51 When adjusting the rear sight in the vertical position, the range scale has settings from 800 (8) to 1800 (18) meters in increments of _____ meters.

a. 25
b. 50
c. 100
d. 200

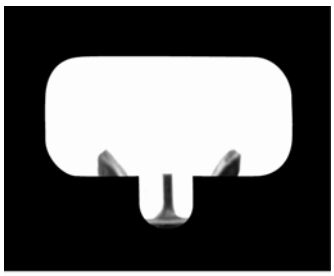
Continued on next page

Item 52 Sight alignment for the M240G with the rear sight in the horizontal position consists of aligning the tip of the front sight

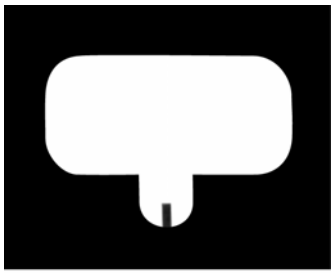
a. blade in the center of the peep sight aperture.
b. blade with the center of the bottom of the peep sight aperture.
c. post with the center of the rear sight groove.
d. post with the center of the peep sight aperture.

Item 53 Which illustration shows the proper sight alignment with the rear sight in the vertical position?

a. 

b. 

c. 

d. 

Item 54 When firing from the bipod, place the

a. right hand on the stock and the left hand on the pistol grip.
b. left hand on the stock and the right hand on the pistol grip.
c. right hand under the receiver and the left hand on the pistol grip.
d. left hand under the receiver and the right hand on the pistol grip.

Continued on next page

Item 55 When firing from the tripod, the _____ hand is on the pistol grip and the _____ hand wheel.

a. right; left hand is on the traversing
b. left; right hand is on the traversing
c. right; left hand is on the elevation
d. left; right hand is on the elevation

Item 56 To change direction using the T&E mechanism, rotate the

a. traversing hand wheel front or back with the left hand.
b. traversing hand wheel front or back with the right hand.
c. elevation hand wheel left or right with the left hand.
d. elevation hand wheel left or right with the right hand.

Item 57 Barrel changes should be done every _____ minutes when firing at the sustained rate of fire.

a. 2
b. 5
c. 10
d. 15

Item 58 To remove the barrel from the receiver, press the barrel

a. locking latch.
b. release latch.
c. locking lever.
d. release lever.

Continued on next page

Item 59

After unlocking the restraining strap on the front sight assembly, use the _____ to adjust the front sight blade for elevation.

a. hex end of the combination tool
b. hex end of the front sight adjusting tool
c. slotted end of the combination tool
d. slotted end of the front sight adjusting tool

Item 60

When adjusting the windage on the front sight assembly, how many clicks are there in one complete revolution of the adjusting screws?

a. 5
b. 6
c. 8
d. 10

Item 61

When conducting a BZO for the M240G, the target is 12.7 meters away and the rear sight is set to _____ meters.

a. 300
b. 400
c. 500
d. 800

Item 62

When conducting a field expedient zero, one full turn of the front sight blade moves the impact of the round _____ inches for every 100 meters.

a. 2
b. 2 1/4
c. 4
d. 4 1/4

Continued on next page

Item 63

The _____ field of view on the AN/PAS-13B has a 5 × magnification.

a. narrow
b. wide
c. day
d. night

Items 64 Through 67

Matching: For items 64 through 67, match the function in column 2 with its component in column 1.

Column 1	**Column 2**
Component	**Function**
_____ 64. Telescope	a. Processes the thermal image for display
_____ 65. Sensor assembly	b. Universal attachment interface between the MWTS and the weapon
_____ 66. Eyepiece	c. Provides magnification of the thermal image
_____ 67. Mount	d. Displays the thermal image and all system indicators for the operator

Items 68 Through 71

Matching: For items 68 through 71, match the function in column 2 with the control in column 1.

Column 1	**Column 2**
Control	**Function**
_____ 68. Contrast knob	a. Selects the field of view
_____ 69. Brightness knob	b. Adjusts the focus of the reticle
_____ 70. Diopter	c. Used to turn power on and off
_____ 71. FOV knob	d. Adjusts the contrast of the thermal scene

Continued on next page

Items 72 Through 75

Matching: For items 72 through 75, match the function in column 2 with the indicator in column 1.

Column 1 **Indicator**	**Column 2** **Function**
_____ 72. NOT COOL	a. Displays when battery power is low
_____ 73. LOW BAT	b. Indicates the selected polarity
_____ 74. WHT HOT/BLK HOT	c. Displays when the system has not cooled down sufficiently
_____ 75. EMER	d. Displays when system is in emergency mode

Item 76

The _____ is used zeroing the sight and as a tool for measuring angles in mils.

a. zeroing aim line
b. zeroing aim point
c. range gauge
d. aiming point

Item 77

When mounting the AN/PAS-13B to the M240G, align the mounting rail of the sight with the _____ slot from the rear of the mounting rail on the weapon.

a. second
b. third
c. fourth
d. fifth

Item 78

To open the battery door, push in on the latch and rotate it

a. clockwise.
b. counterclockwise.
c. forward.
d. backward.

Continued on next page

Item 79

When operating the AN/PAS-13B, place the eye against the eyecup and push in to

a. activate the display.
b. power on the sight.
c. to change the field of view.
d. auto-focus the display.

Item 80

How much does the AN/PVS-17C weigh with a battery installed?

a. 2 pounds
b. 3 pounds
c. 4 pounds
d. 5 pounds

Item 81

What type of battery does the AN/PVS-17C use?

a. AAA cell
b. AA cell
c. C cell
d. D cell

Items 82 Through 85

Matching: For items 82 through 85, match the function in column 2 with the component in column 1.

Column 1	**Column 2**
Component	**Function**
_____ 82. Objective lens	a. Provides magnification for the imager
_____ 83. Image intensifier	b. Protects the image intensifier during daylight use
_____ 84. Eyeguard	c. Amplifies available light into a viewable image
_____ 85. Daylight filter	d. Provides light security to within 10 meters from the sight

Continued on next page

Items 86 Through 89

Matching: For items 86 through 89, match the function in column 2 with the control in column 1.

Column 1	**Column 2**
Control	**Function**
_____ 86. OFF-ON-ON switch	a. Provides power while it is held in
_____ 87. Momentary button	b. Controls the power for the sight
_____ 88. Reticle brightness	c. Used during zeroing to adjust windage and elevation
_____ 89. Reticle adjustment	d. Adjusts the reticle at five levels

Item 90

After mounting the AN/PVS-17C to the mounting rail on the M240G, you need to check

a. safety on the weapon.
b. battery level.
c. polarity of the sight.
d. the eye relief and adjust if necessary.

Item 91

For the AN/PVS-17C to operate effectively,

a. some night light such as moonlight or starlight is needed.
b. it must be below 60º F outside.
c. it must be mounted on a weapon.
d. the objective lens cover needs to be installed.

Answers

The table below lists the answers to the review lesson examination item. If you have questions about these items, refer to the reference page.

Item Number	Answer	Reference Page
1	a	1-5
2	b	1-6
3	c	1-7
4	d	1-8
5	a	1-8
6	b	1-8
7	c	1-8
8	c	1-9
9	d	1-9
10	a	1-11
11	b	1-13
12	c	1-14
13	d	1-17
14	d	1-19
15	a	1-32
16	d	1-34
17	c	1-42
18	b	1-44
19	c	1-46
20	b	1-46
21	b	1-54
22	c	1-54
23	b	1-54
24	d	1-55
25	a	1-55
26	c	1-56
27	d	1-56
28	a	2-4
29	c	2-5
30	c	2-5
31	b	2-11
32	d	2-12
33	c	2-19

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
34	a	2-24
35	b	2-24
36	a	2-30
37	a	2-31
38	d	2-32
39	a	3-4
40	a	3-7
41	a	3-9
42	c	3-20
43	d	3-20
44	b	3-20
45	a	3-20
46	d	3-21
47	c	3-21
48	b	3-22
49	c	3-30
50	d	3-31
51	c	3-32
52	a	3-32
53	b	3-33
54	b	3-34
55	a	3-35
56	a	3-35
57	c	3-37
58	a	3-37
59	d	3-49
60	c	3-50
61	c	3-51
62	d	3-53
63	a	4-5

Continued on next page

Answers, continued

Item Number	Answer	Reference Page
64	c	4-5
65	a	4-5
66	d	4-5
67	b	4-5
68	d	4-6
69	c	4-6
70	b	4-6
71	a	4-6
72	c	4-7
73	a	4-7
74	b	4-7
75	d	4-7
76	a	4-10
77	c	4-11
78	b	4-12
79	a	4-13
80	b	4-18
81	b	4-18
82	a	4-19
83	c	4-19
84	d	4-19
85	b	4-19
86	b	4-21
87	a	4-21
88	d	4-21
89	c	4-21
90	d	4-24
91	a	4-25