

## CHAPTER 2

### MAINTENANCE

*Proper maintenance contributes to weapon effectiveness as well as unit readiness. This chapter discusses the maintenance aspects of the M249 AR to include inspection; cleaning and lubrication; and maintenance before, during, and after firing and during NBC conditions. Associated tasks essential to maintenance (clearing general assembly and disassembly, and function checks) are provided in detail.*

#### 2-1. CLEARING PROCEDURES

The first step in maintenance is to clear the weapon (Figure 2-2). This applies in all situations, not just after firing. The automatic rifleman must always assume the M249 AR is loaded. To clear the M249, the automatic rifleman performs the following procedures.

- a. Moves the safety to the FIRE position by pushing it to the left until the red ring is visible.
- b. With his right hand, palm up, pulls the cocking handle to the rear, locking the bolt in place.
- c. While holding the resistance on the cocking handle, moves the safety to the SAFE position by pushing it to the right until the red ring is not visible. (The weapon cannot be placed on safe unless the bolt is locked to the rear.)
- d. Returns and locks the cocking handle in the forward position.

#### CAUTION

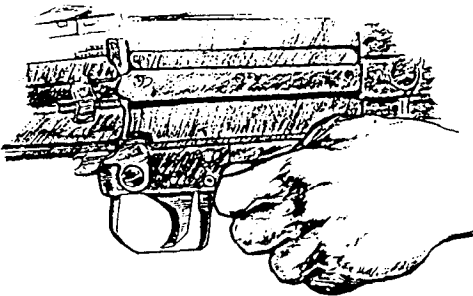
**When opening the feed cover, make sure the weapon is on the ground away from your face. With the weapon on your shoulder, possible injury could occur if a round goes off when the cover is raised.**

- e. Raises the cover and feed mechanism assembly, and conducts the **five-point safety check** for brass, links, or ammunition.
  1. Checks the feed pawl assembly under the feed cover.
  2. Checks the feed tray assembly.
  3. Lifts the feed tray assembly and inspects the chamber.
  4. Checks the space between the bolt assembly and the chamber.
  5. Inserts two fingers of his left hand in the magazine well to extract any ammunition or brass.
- f. Closes the cover and feed mechanism assembly and moves the safety to the FIRE position. With his right hand, palm up, returns the cocking handle to the rear position. Presses the trigger and at the same time eases the bolt forward by manually riding the cocking handle forward.

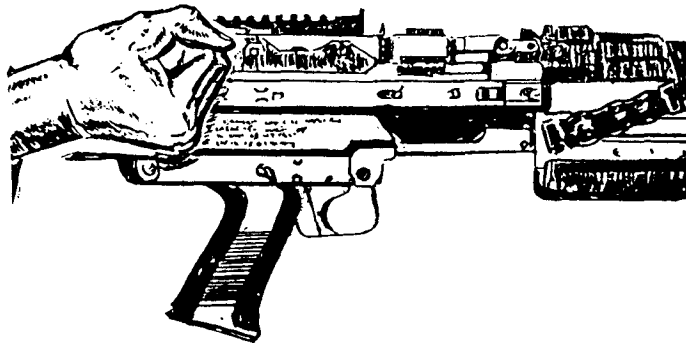
**CAUTION**

The cocking handle must be manually returned to the forward and locked position each time the bolt is manually pulled to the rear.

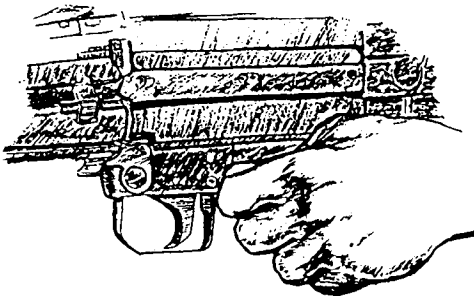
**A** Fire position



**B** Locking bolt in place



**C** Safe position



**D** Cocking handle in forward position

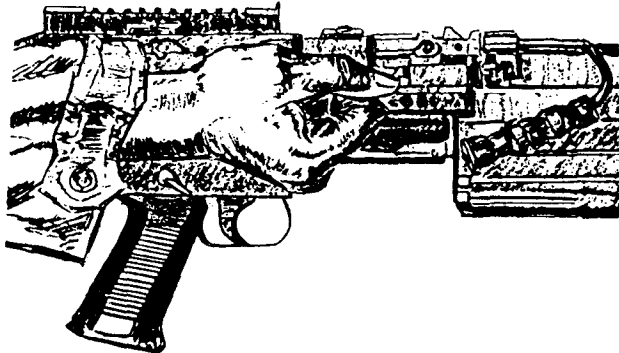


Figure 2-1. Clearing procedures.

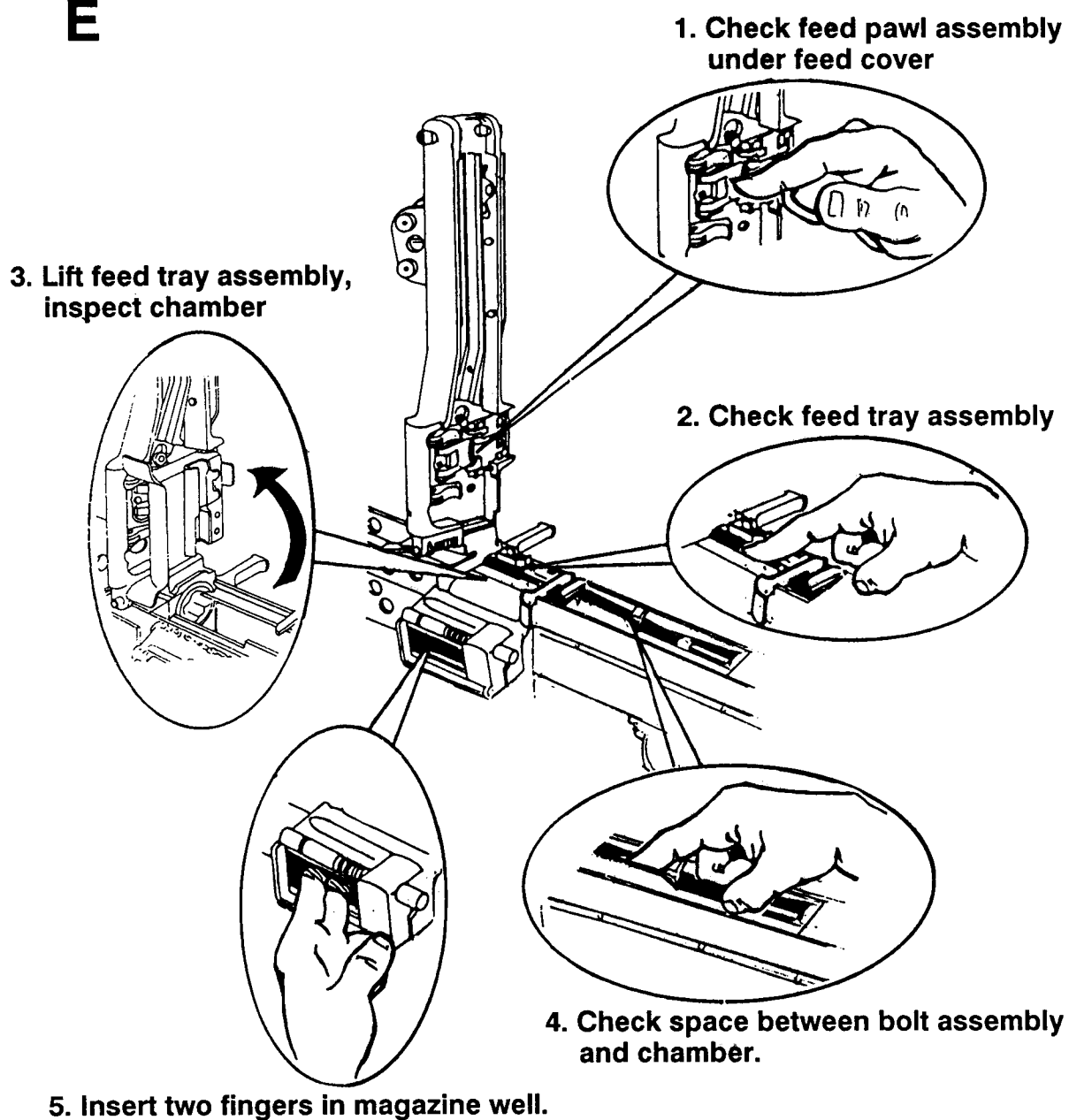
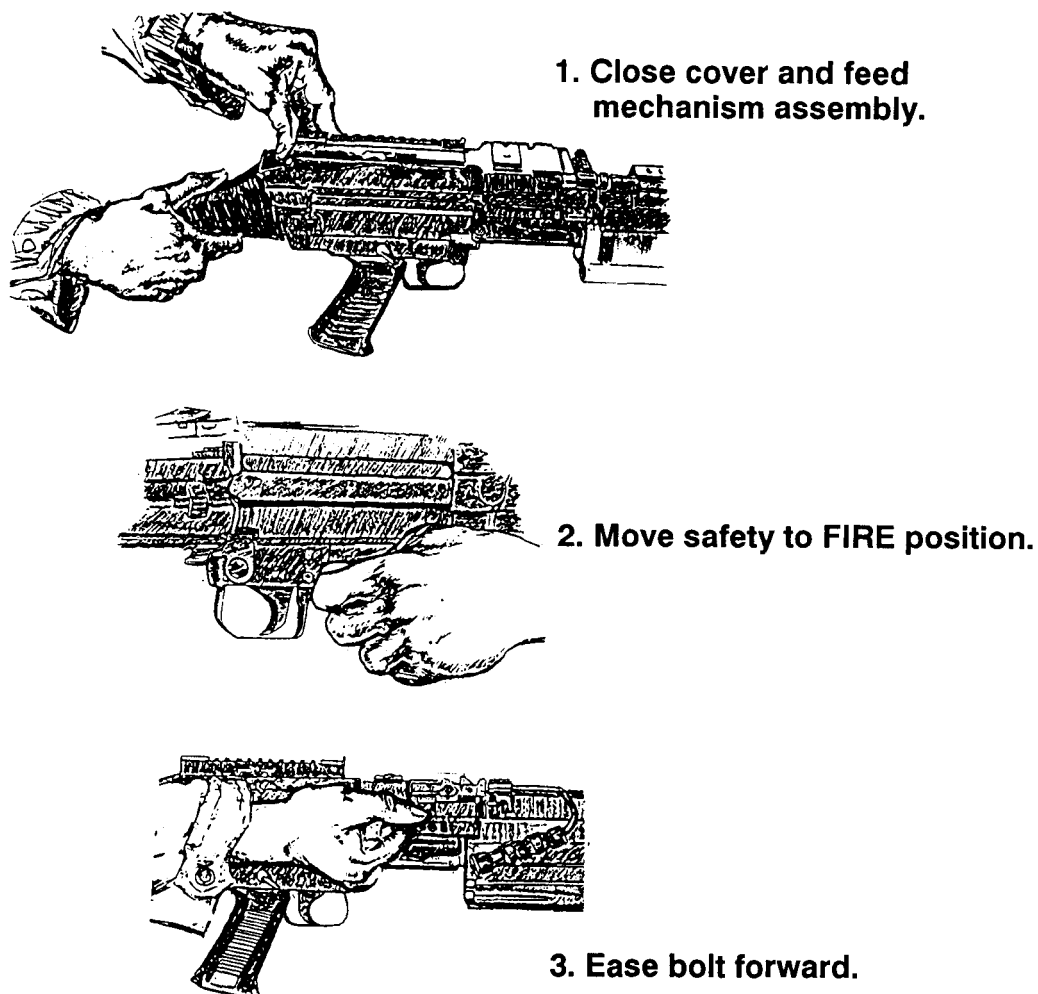
**E**

Figure 2-1. Clearing procedures (continued).

**F**

**Figure 2-1. Clearing procedures (continued).**

## **2-2. GENERAL DISASSEMBLY**

General disassembly is removing and replacing the eight major groups. (Figure 2-2.) The unit armorer performs detailed disassembly. Disassembly beyond what is explained in this manual is prohibited except by ordnance personnel. During general disassembly, each part is placed on a clean flat surface such as a table or mat. This aids in assembly in reverse order and avoids the loss of parts. Before disassembling the M249, the bipod legs must be released from under the receiver and placed into the bipod mode position.

**DANGER**

Be sure the bolt is in the forward position before disassembly. The guide rod can cause death or injury if the guide spring is retracted with the bolt pulled to the rear.

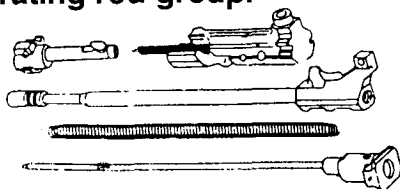
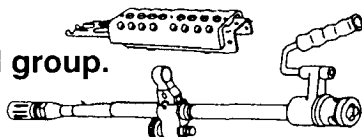
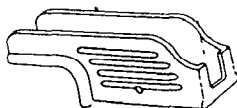
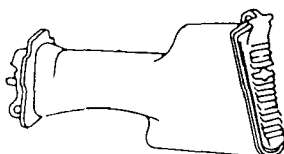
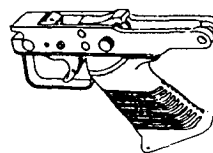
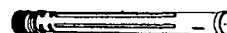
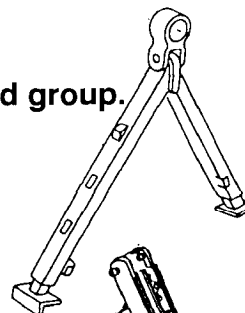
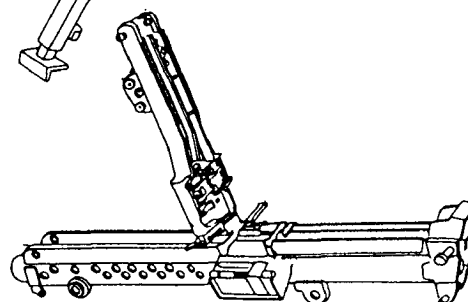
**1. Operating rod group.****2. Barrel group.****3. Handguard group.****4. Buttstock and buffer assembly group.****5. Trigger mechanism group.****6. Gas cylinder group.****7. Bipod group.****8. Receiver group.**

Figure 2-2. Eight major groups.

a. **Removing the Operating Rod Group (Figure 2-3).** The operating rod group consists of the spring guide rod, operating rod spring, slide assembly, piston assembly, and bolt assembly.

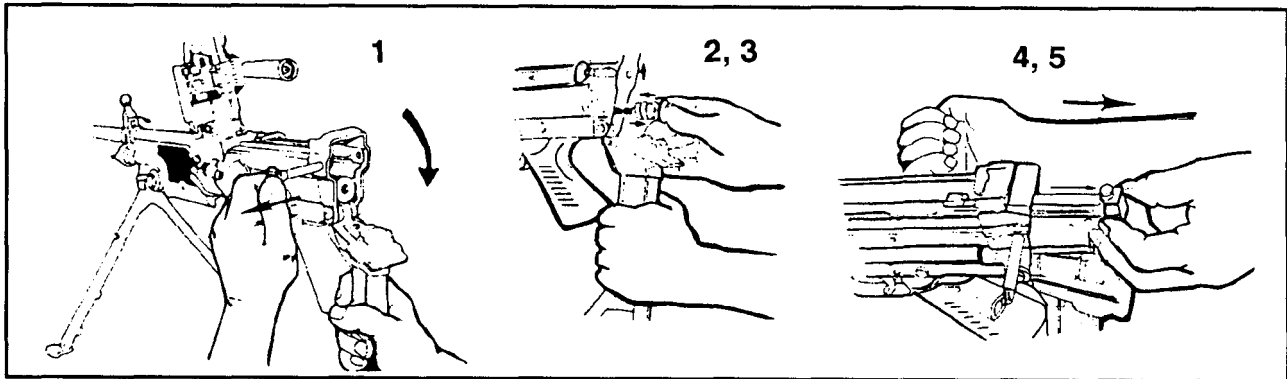
(1) To remove the operating rod, pull the upper retaining pin at the rear of the receiver to the left. Allow the buttstock to pivot downward and place it on a surface to support the weapon for disassembly.

(2) To release the operating rod assembly from the positioning grooves inside the receiver, hold the weapon with one hand on the buttstock assembly and use the thumb of the other hand to push in and upward on the rear of the operating rod assembly.

(3) Pull the operating rod and spring from the receiver group and separate the parts.

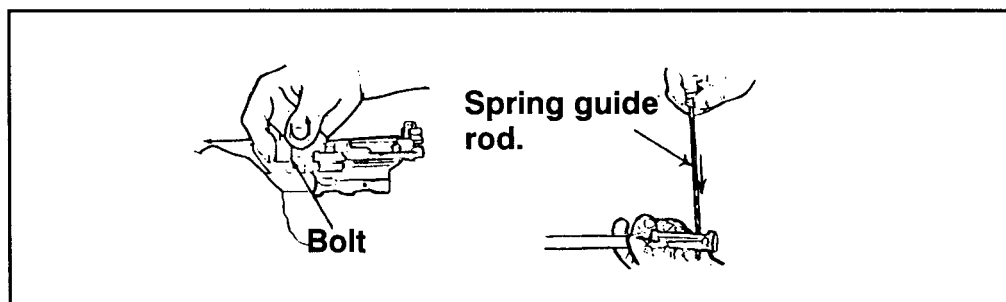
(4) Hold the buttstock assembly with your left hand to stabilize the weapon. With your right hand, pull the cocking handle to the rear to lock the bolt. Return the cocking handle to the forward position. Place a finger on the face of the bolt and push until your finger makes contact with the bridge at the end of the receiver. This leaves the piston, slide, and bolt assemblies exposed.

(5) Hold the slide assembly while pulling the moving parts out the rear of the receiver.



**Figure 2-3. Removing the operating rod group.**

(6) To separate the operating rod group (Figure 2-4), hold the piston assembly in one hand, place your other hand on the bolt assembly, and rotate the bolt to disengage the bolt from the slide assembly. Remove the firing pin spring from the firing pin, but be careful not to break the spring. If the spring sticks, rotate it clockwise to free it. The weapon will function without the spring; however, this weakens the firing pin action. To separate the slide assembly from the piston, press the retaining pin at the rear of the slide assembly to the left and lift the slide assembly.



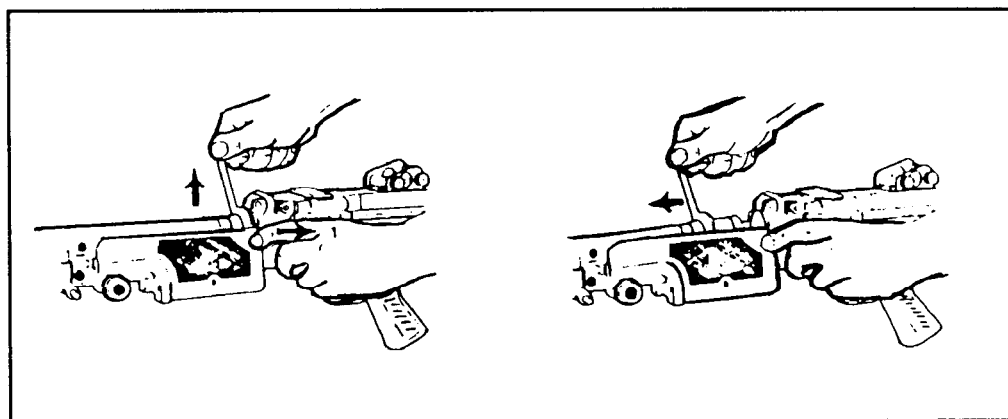
**Figure 2-4. Separating the operating rod group.**

b. **Removing the Barrel Group (Figure 2-5).** The barrel group consists of barrel, heat shield, flash suppressor, front sight, gas regulator, and gas regulator collar.

**CAUTION**

Barrels must not be interchanged with those from other M249s unless the headspace has been certified for that weapon by direct support personnel.

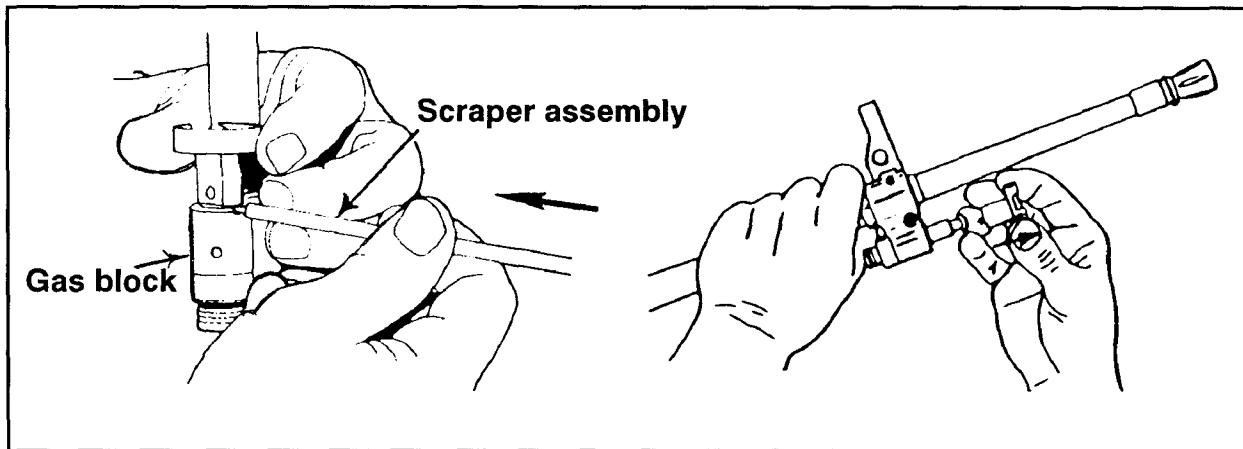
(1) To remove the barrel from the receiver, close the cover and feed mechanism assembly, depress the barrel locking lever with your left hand, lift the carrying handle using your right hand and push the barrel forward. To remove the heat shield, place the barrel with the muzzle end on a hard, flat surface and with the heat shield facing away from your body. Place the index fingers of each hand inside the chamber. Use your thumbs to push up on the top clip.



**Figure 2-5. Removing the barrel.**

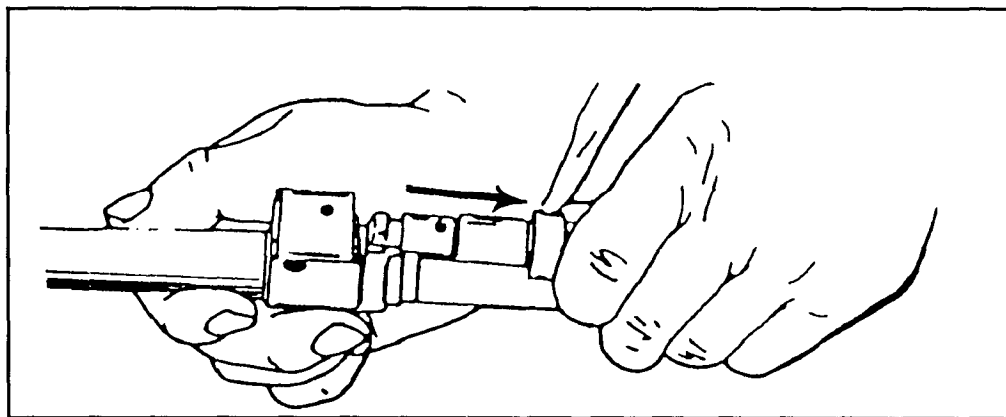
(2) Raise the feed cover.

(3) To remove the gas regulator and collar, rotate the gas collar pin out of the notch. Place the tip of the scraper with the concave side facing the pin of the collar inside the notch. (Be careful not to use too much pressure, so as not to break the tip of the scraper.) Rotate the collar counterclockwise over the concave portion of the tip on the scraper and past the notch until the collar slides off. (Figure 2-6.)



**Figure 2-6. Removing the collar.**

(4) To remove the gas regulator (Figure 2-7), separate it from the gas block.



**Figure 2-7. Removing the gas regulator.**

c. **Removing the Handguard Group (Figure 2-8).** The handguard group consists of the handguard, handguard retaining pin, and cleaning equipment retaining clip. Push the handguard retaining pin to the left using a cartridge or the spring guide rod; then pull the handguard down.

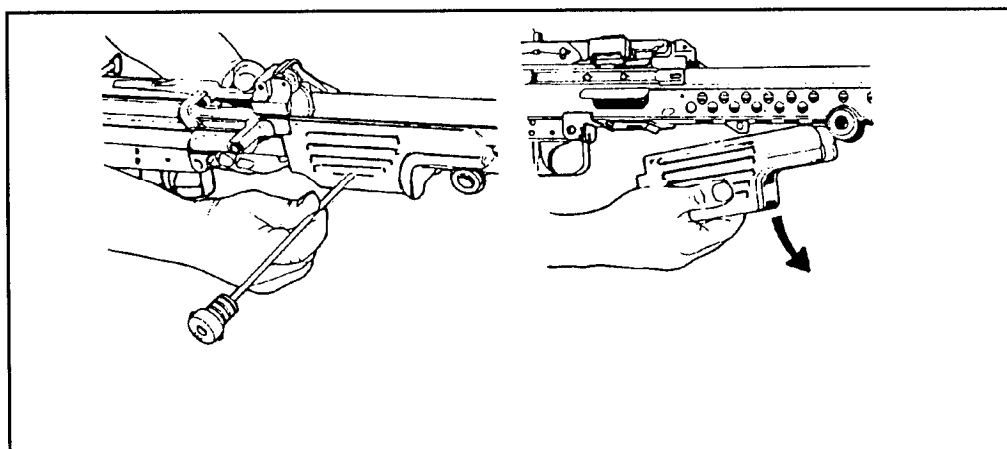


Figure 2-8. Removing the handguard.

**CAUTION**

The handguard retaining pin is a captured pin. Do not attempt to remove it completely.

d. **Removing the Buttstock and Buffer Assembly Group.** To remove the buttstock and buffer assembly (Figure 2-9), use a cartridge or the spring guide rod to push the lowermost retaining pin on the rear of the receiver to the left. It is a captured pin; it is not removed. Remove the buttstock and shoulder assembly by pulling it rearward, while supporting the trigger mechanism.

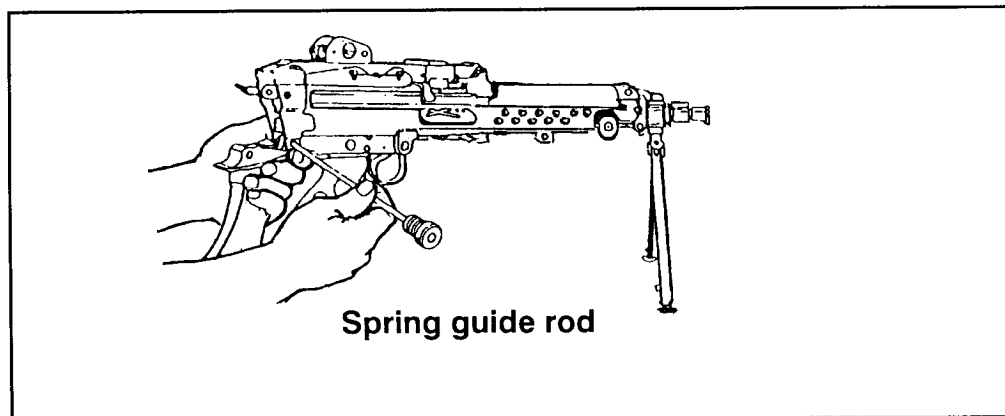


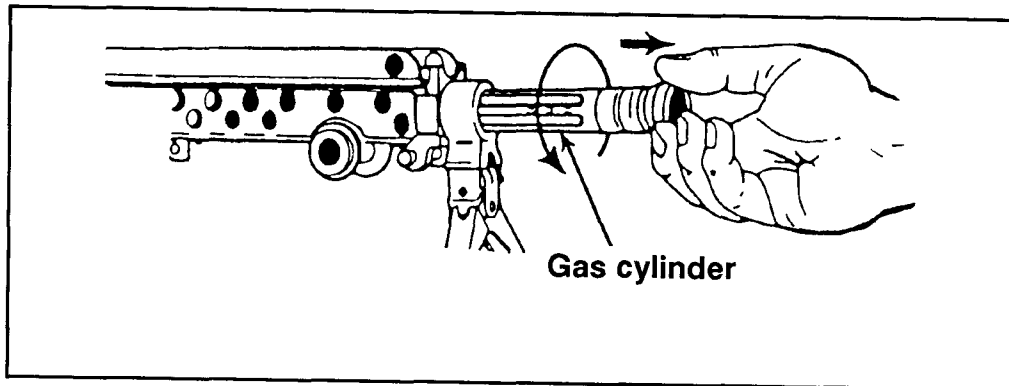
Figure 2-9. Removing the buttstock and buffer assembly.

e. **Removing the Trigger Mechanism Group.** To separate the trigger group, push in on the lowermost retaining pin.

**CAUTION**

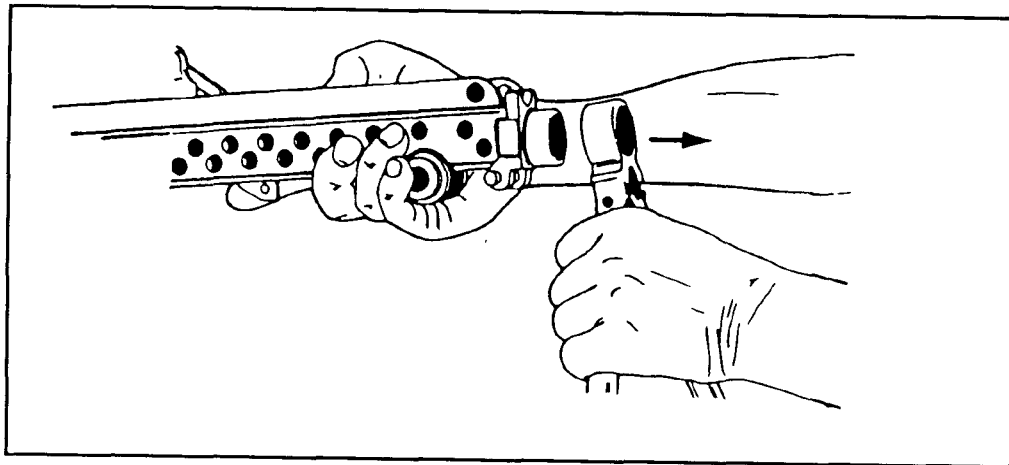
The upper and lower retaining pins in the rear of the receiver are captured pins. Do not attempt to remove them completely.

f. **Removing the Gas Cylinder Group.** To remove the gas cylinder from the receiver (Figure 2-10), grasp the gas cylinder at the top of the bipod legs, turn it to the left or right to release the locking spring, and then pull it away from receiver.



**Figure 2-10. Removing the gas cylinder group.**

g. **Removing the Bipod Group.** Once the gas cylinder is removed, remove the bipod group (Figure 2-11) by pulling it away from the receiver.



**Figure 2-11. Removing the bipod group.**

h. **Removing the Receiver Group.** Once the bipod group is removed, the part remaining is the receiver group, and disassembly is complete.

## 2-3. INSPECTION

Inspection begins with the weapon disassembled in its major groups. Shiny surfaces do not mean the parts are unserviceable. The following parts of the weapon and related equipment are inspected for the conditions indicated. Any broken or missing parts should be repaired *or* replaced IAW TM 9-1005-201-10.

a. **Operating Rod Group.** The operating rod should not be bent, broken, or cracked. The buffer spring should not have breaks. Lug pins should protrude equally on both sides of the buffer spacer. The operating rod spring should not have kinks or separated strands or broken strands. It can have a maximum of one break on any one strand.

(1) The bolt assembly is checked for visible damage. The cartridge extractor should not be cracked or chipped.

(2) The slide assembly is checked for visible damage. The feed roller is checked for spring tension when compressed and that the pivot slide is locked onto the slide assembly.

(3) The firing pin is checked for straightness and cracks and that the tip is completely rounded.

(4) The firing pin spring should not be crushed or bent. The beveled end should not be stretched.

(5) The sear notch on the piston assembly is checked for signs of excessive wear or burring. Slight rotation of the piston on its housing is normal and is not cause for rejection.

b. **Barrel Group.** The flash suppressor should not be cracked, and it should be fastened securely. The front sight post and front sight base must not be bent, cracked, or broken. Weapons already zeroed should not be adjusted. The heat shield assembly is inspected for damage, cracks, or broken retaining clamps. The gas regulator and collar are checked for cracks or burrs. The barrel is checked for bulges, cracks, bends, obstructions, or pits in the chamber or bore. The gas plug is checked for obstructions, cracks, and bulges. The carrying handle is checked to ensure it is not cracked, broken, or missing; that it can be folded under spring pressure to the right and left; and that it remains locked in an upright position.

c. **Handguard Group.** The handguard should not be cracked or broken. The retaining clip must be attached to the handguard retaining pin.

d. **Buttstock and Buffer Assembly Group.** The buttstock is checked for cracks, bends, or breaks; and for missing components. It is checked for linkage and tension on the buffer rod. The shoulder rest is checked to ensure it is not bent or broken and that it locks in both positions.

e. **Trigger Mechanism Group.** The shoulder of the sear should not show excessive wear. The safety should function properly. (The sear should move

only slightly when the safety is on SAFE, and freely when the safety is on FIRE.) The sear pin should not protrude from the trigger mechanism, because the trigger mechanism will not go back in place.

f. **Gas Cylinder Group.** The gas cylinder should not be cracked, bent, or broken.

g. **Bipod Group.** The bipod group should not be cracked, bent, or broken. The bipod legs should extend and collapse easily.

h. **Receiver Group.** The cover latch should work properly. All parts inside the cover assembly should move under spring tension. All spotwelds are checked for cracks. The cover assembly should remain open without support. The belt-holding pawl must be under spring tension. The receiver should not be bent or cracked. The cocking handle should slide freely within its guide and lock in its forward position. The windage and elevation knobs on the rear sight should be movable and legible. The windage scale screws should not be worn or burred.

#### **2-4. CLEANING, LUBRICATION, AND PREVENTIVE MAINTENANCE**

The M249 AR should be cleaned immediately after firing. It should be disassembled into its major groups before cleaning. After it has been cleaned and wiped dry, a thin coat of CLP is applied by rubbing with a cloth. This lubricates and preserves the exposed metal parts during all normal temperature ranges. When not in use, the M249 AR should be inspected weekly and cleaned and lubricated when necessary.

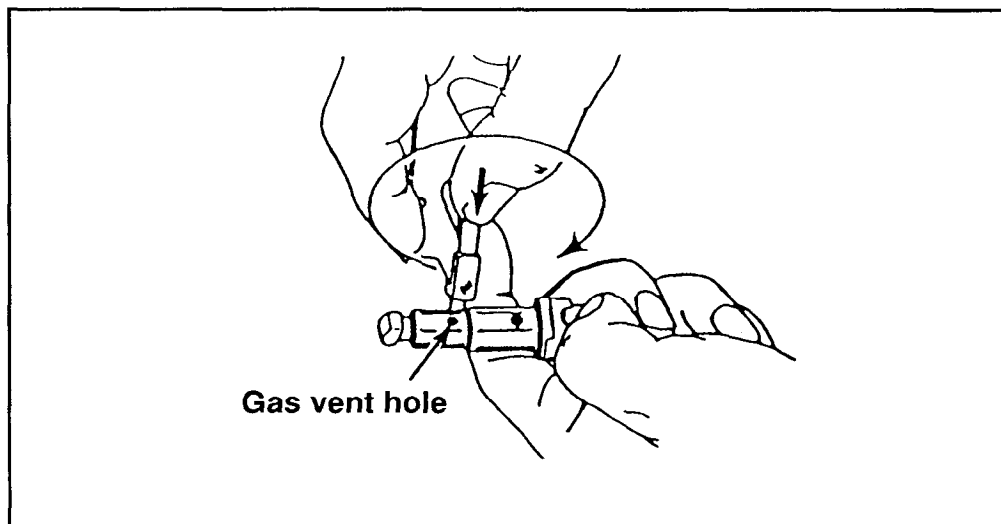
a. **Cleaning.** All metal components and surfaces that have been exposed to powder fouling should be cleaned using CLP on a bore-cleaning patch. The same procedure is used to clean the receiver.

#### **CAUTION**

**When using CLP, no other type cleaner can be used. Never mix CLP with RBC or LSA.**

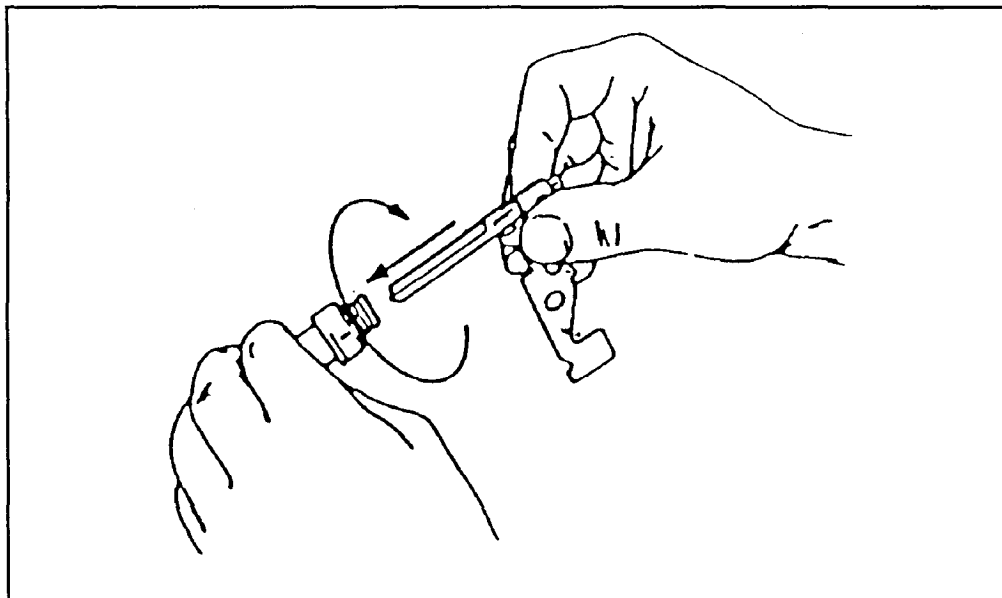
- (1) Clear and disassemble the weapon.
- (2) Clean the bore and chamber using CLP and fresh swabs.
- (3) Clean the gas regulator with the special tool (scraper). Remove all carbon dust. Do not use CLP on the collar, gas block, or body.

(a) Clean the gas vent hole (Figure 2-12).



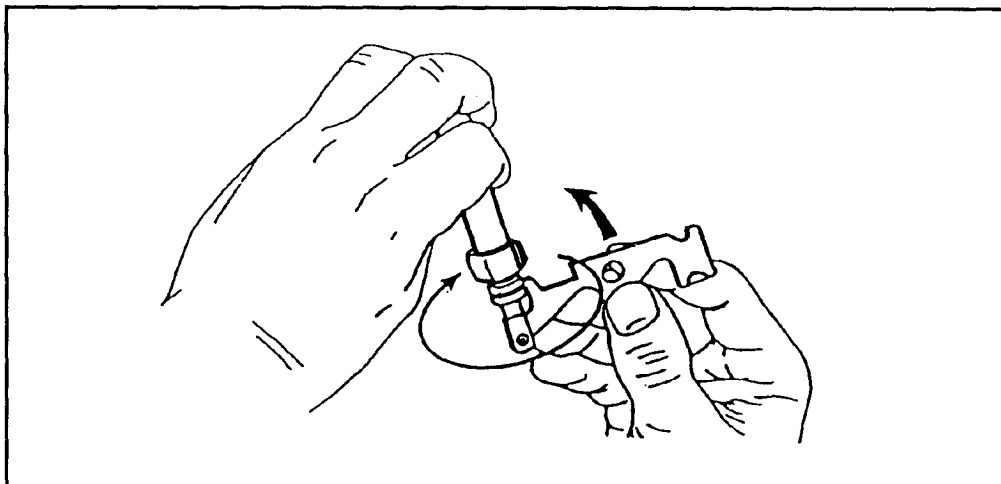
**Figure 2-12. Cleaning the gas vent hole.**

(b) Clean the central hole with the appropriate part of the scraper by turning it clockwise and pushing it inward toward the bottom of the housing (Figure 2-13).



**Figure 2-13. Cleaning the central hole.**

(c) Use the protruding tips of the scraper to clean the two grooves of the body (Figure 2-14, page 2-14).

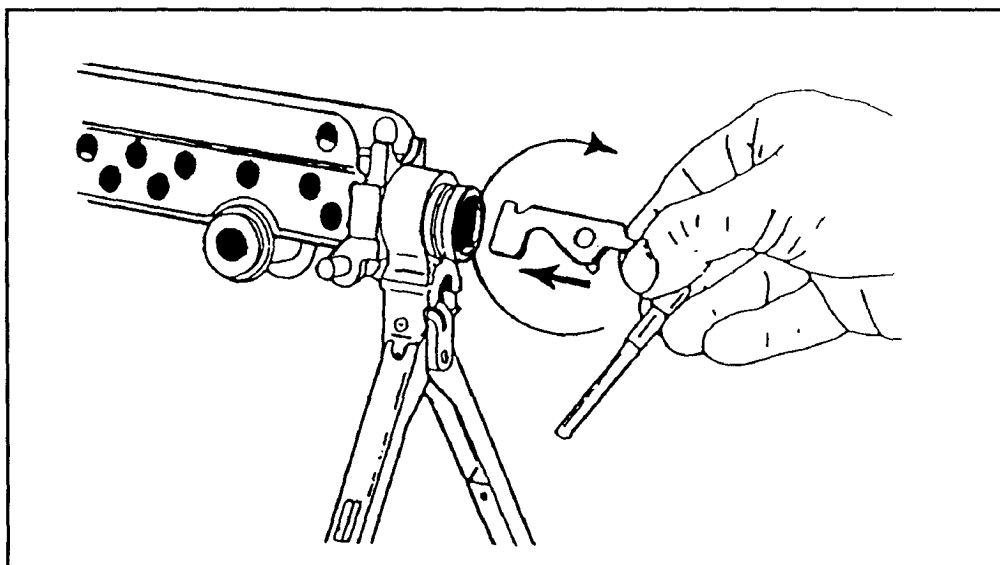


**Figure 2-14. Cleaning the grooves of the body.**

(4) Clean the gas cylinder and piston with the special tool (scraper). Do not use CLP on the gas cylinder or piston.

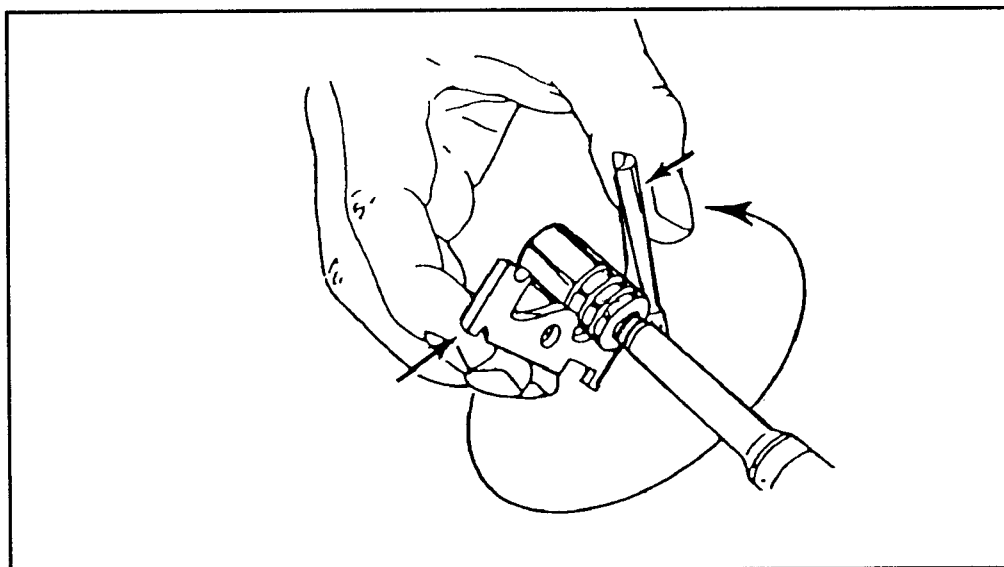
(a) Clean the front interior of the gas cylinder (repositioned in receiver with bipod in place) by inserting and turning the flat side of the scraper in a 360-degree circular motion (Figure 2-15).

(b) Clean the internal grooves of the front side of the gas cylinder the same as in paragraph (a) above, except insert the scraper farther into the gas cylinder (Figure 2-15).



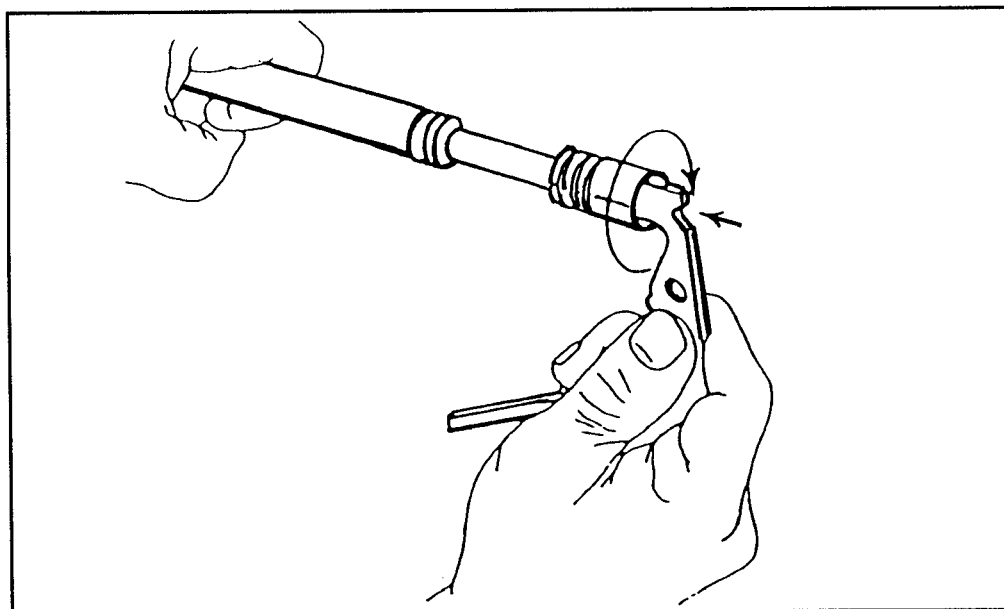
**Figure 2-15. Cleaning the front interior and internal grooves of the gas cylinder.**

(c) Clean the three grooves of the piston using a 360-degree circular motion (Figure 2-16). Remove **all** carbon dust from the piston inside and out.



**Figure 2-16. Cleaning the grooves of the piston.**

(d) Clean the hole in the front of the piston by inserting and turning the flat side of the scraper in a 360-degree circular motion (Figure 2-17).



**Figure 2-17. Cleaning the hole in the front of the piston.**

(5) Clean carbon and dirt from all other parts of the weapon.

NOTE: A cloth saturated in CLP is used on exterior surfaces to prevent corrosion.

b. **Lubrication.** After the M249 AR is cleaned and wiped dry, a thin coat of CLP is applied by rubbing it with a cloth. This lubricates and preserves the exposed metal parts during all normal temperature ranges. The moving parts are lubricated with CLP. After lubricating, rub the components by hand to spread the CLP.

(1) *Operating rod group.* Use CLP on the operating rod and spring, the slide assembly, the feed roller, and the bolt-locking lug.

(2) *Barrel group.* Use CLP on the cam surfaces of the bolt-locking lugs, the heat shield, and along the outer surfaces of the barrel clamp.

(3) *Receiver group.* Use CLP on all moving parts on the cover assembly and the receiver rails.

c. **Preventive Maintenance.** Weapons that are seldom fired or stored for prolonged periods should have a light film of CLP applied to the interior of the gas plug, the gas regulator, and the piston immediately after cleaning or after inspection. Preventive maintenance is performed every 90 days unless inspection reveals more frequent servicing is necessary. The use of the lubricant does not eliminate the need for cleaning and inspecting to ensure that corrosion has not formed. The gas regulator, gas plug, and piston must be clean and free of oil and lubricants before using the weapon. If not cleaned and oil free, stoppages will occur. The following procedures apply to cleaning and lubricating the M249 AR during unusual conditions:

NOTE: CLP is the only lubricant to use on the M249 AR.

(1) Extremely hot—use CLP, grade 2.

(2) Damp or salty air—use CLP, grade 2. Clean and apply frequently.

(3) Sandy or dusty areas—use CLP, grade 2. Clean and apply frequently. Remove excess with a rag after each application.

(4) Below -18 degrees Celsius (0 degrees Fahrenheit)—use CLP, grade 2, generously. Lubricate heavily enough so that it can be spread with finger.

NOTE: Although CLP provides required lubrication at temperatures between 0 degrees Fahrenheit and -35 degrees Fahrenheit, it will not flow from a 1/2-ounce bottle at temperatures below 0 degrees Fahrenheit.

## 2-5. GENERAL ASSEMBLY

The M249 AR is assembled in reverse order of the disassembly.

a. **Replacing the Receiver Group and Bipod Group.** Place the bipod group on the receiver group with the bipod legs open and pointed downward. (See Figure 2-11.)

b. **Replacing the Gas Cylinder Group.** Push the gas cylinder through the bipod yoke into the receiver. Push the cylinder to the rear while countering the pressure of the locking spring and guiding the end of the cylinder into the receiver with the other hand applying downward pressure. Position the recess in the cylinder near the spring. Turn the cylinder until the spring clicks into the recess at the rear of the gas cylinder (Figure 2-18).

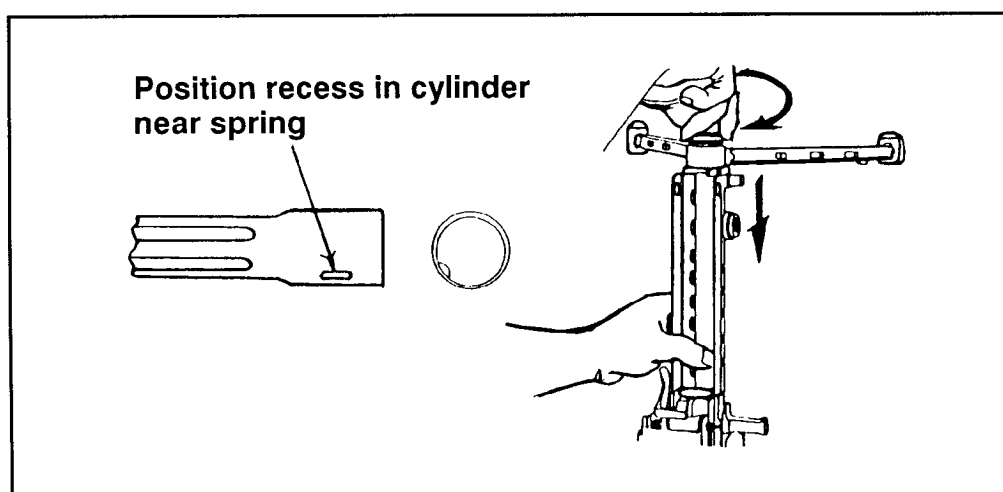


Figure 2-18. Replacing gas cylinder group.

c. **Replacing the Trigger Mechanism Group.** Align the trigger mechanism with the slot on the bottom of the receiver. Hold the trigger mechanism in position to accomplish the next step. (Figure 2-19.)

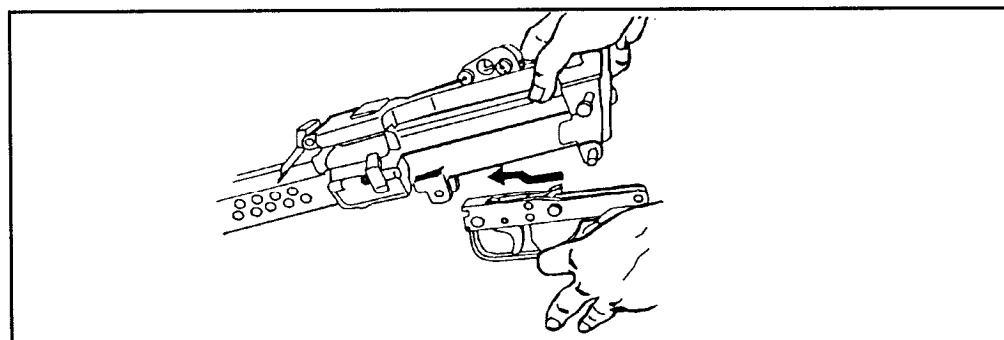
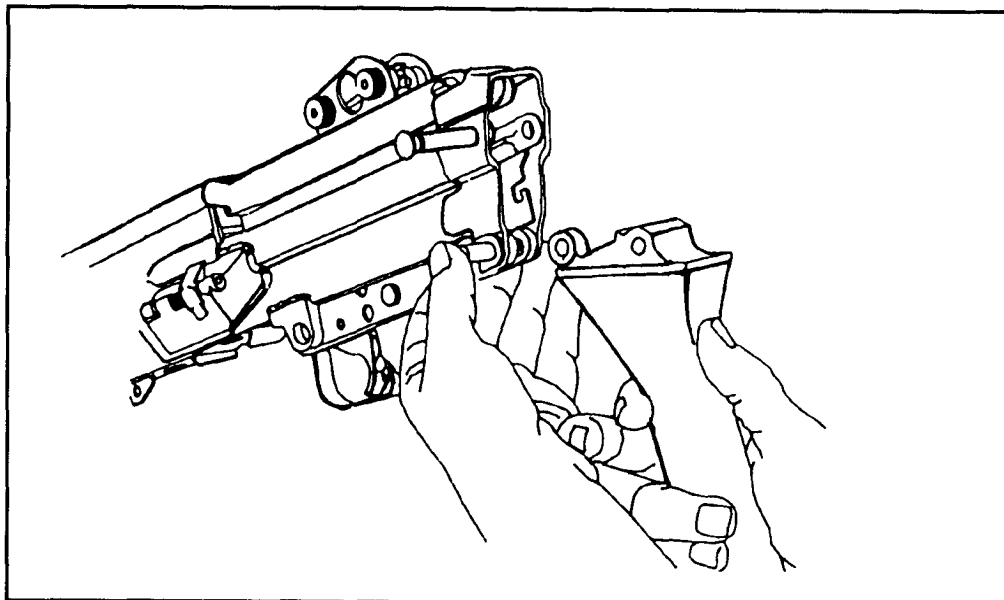


Figure 2-19. Replacing the trigger mechanism group.

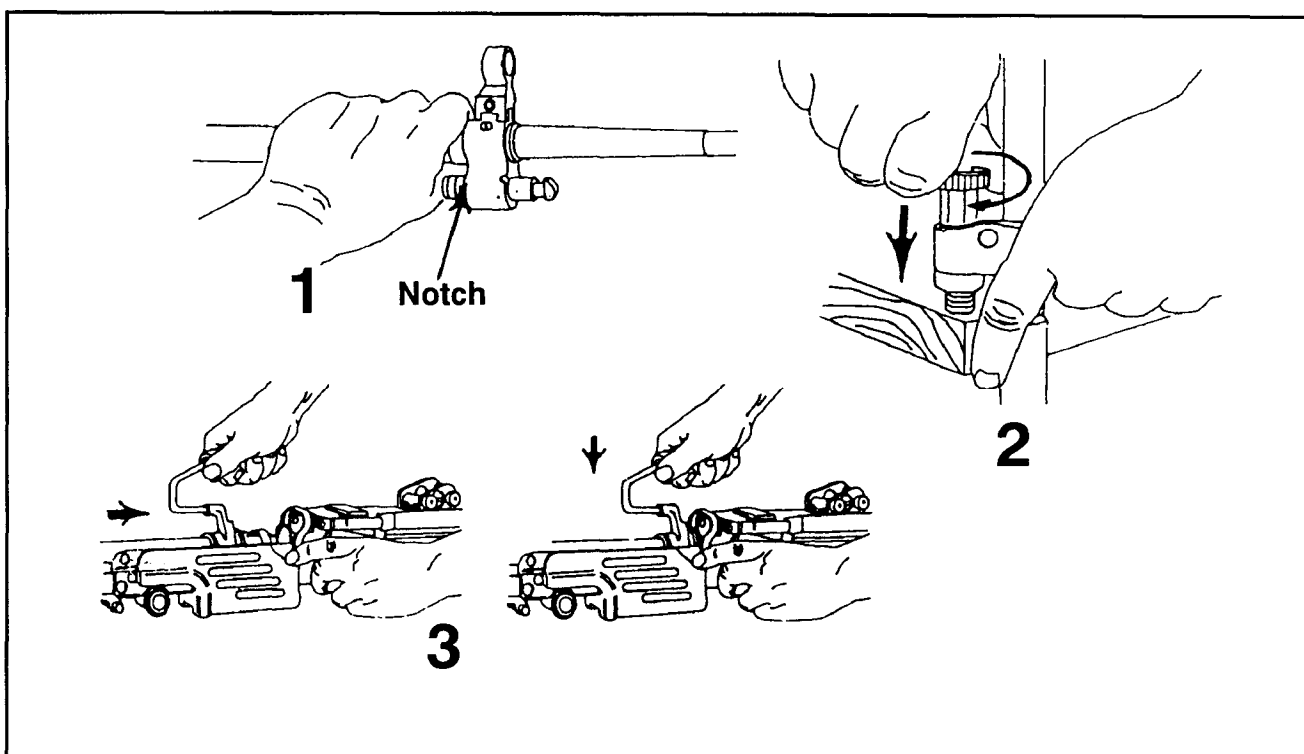
d. **Replacing the Buttstock and Buffer Assembly Group.** Align the lower hole in the buttstock and buffer assembly with the rear hole in the trigger mechanism; then push the lower retaining pin to the right. (Figure 2-20.)



**Figure 2-20. Replacing the buttstock and buffer assembly group.**

e. **Replacing the Handguard Group.** To replace the handguard, place it on the receiver from the bottom and push it to the rear until it stops. Using the guide rod, push the handguard retaining pin to the right, which locks the handguard into position. Push the handguard down to make sure it is locked. (See Figure 2-8, page 2-9.)

f. **Replacing the Barrel Group.** Insert the gas regulator into the gas block and align the notch on the gas regulator with the notch of the gas block. With the gas regulator installed and supported on a firm surface, place the gas regulator collar onto the protruding end of the body and align the spring with the stud. Push the gas regulator collar downward firmly and rotate it until it slips into place. Then, press it in and rotate it to lock it in place. Depress the barrel locking lever to the rear with your left hand, while holding the carrying handle with your right hand. Pull the barrel rearward and push downward; align the gas regulator with the gas cylinder and lock it by releasing the barrel locking lever. Check the barrel to ensure it is locked into the receiver by pulling or lifting on the carrying handle. Replace the heat shield by placing the hook end of the heat shield under the front sight post and press down until the clamps lock on the barrel. (Figure 2-21.)



**Figure 2-21. Replace the barrel group.**

**g. Replacing the Operating Rod Group.** Hold the piston in one hand with the face of the piston facing outward and the sear notches downward. With the other hand, place the slide assembly onto the rear of the piston with the firing pin toward the front of the piston. (Check the slide assembly retaining pin to make sure it is out.) (Figure 2-22, page 2-20.)

(1) Push the slide assembly retaining pin to the right. This locks the piston assembly and the slide assembly together.

(2) Put the firing pin spring on the firing pin of the slide assembly. Place the bolt on the slide assembly, aligning the driving lug of the bolt with the slot of the slide assembly. Apply pressure to the face of the bolt to compress the firing pin spring. Then, rotate the bolt to hook the driving lug into the slide assembly. Open the cover assembly on the receiver. Insert the face of the piston into the receiver, aligning the bolt lugs onto the receiver rails. Pull the trigger and push the moving parts forward until the bolt is seated into the chamber.

(3) Place the operating rod tip into the operating rod spring. Then, insert the free end of the operating rod and spring into the rear of the piston. Depress the rear of the operating rod assembly until the two lugs on the buffer are positioned in the receiver grooves.

(4) Pivot the buttstock upward into position and push the upper retaining pin to the right, locking the buttstock to the receiver.

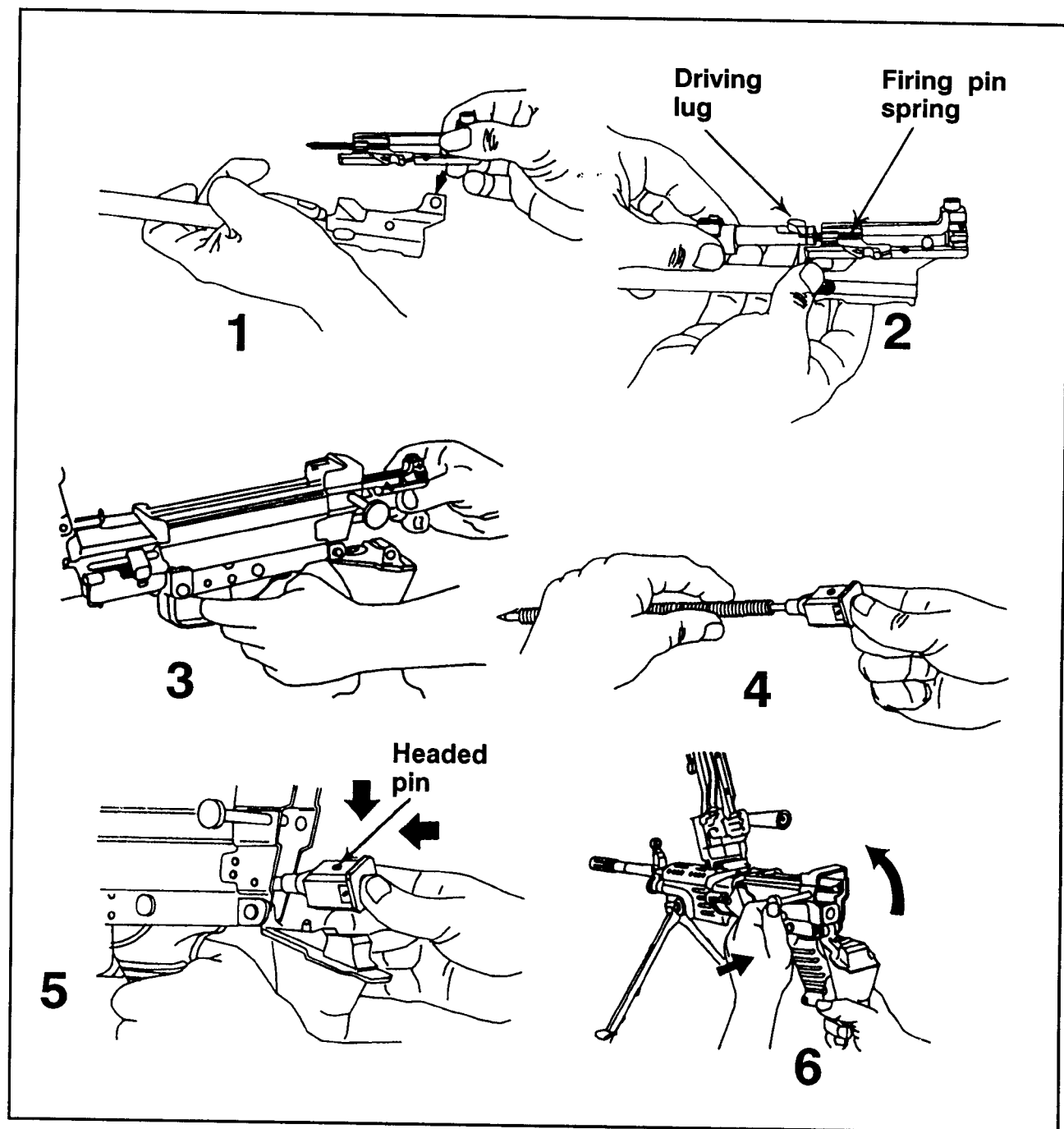


Figure 2-22. Replacing the operating rod group.

## 2-6. FUNCTION CHECK

A function check must be performed to ensure that the M249 AR has been assembled correctly. The procedures, in order, are—

- Grasp the cocking handle with the right hand, palm up, and pull the bolt to the rear locking it in place.
- While continuing to hold the resistance on the cocking handle, use the left hand to move the safety to the SAFE position.
- Push the cocking handle forward into the forward lock position.
- Pull the trigger. (The weapon should not fire.)
- Grasp the cocking handle with the right hand, palm up, and pull and hold it to the rear.
- Move the safety to the FIRE position.
- While continuing to hold resistance on the cocking handle, use the left hand to pull the trigger and ease the bolt forward to prevent it from slamming into the chamber area and damaging the face of the bolt.
- If the weapon fails the function check, check for missing parts or the reassembly procedures. (Before disassembling the weapon, make sure it is positioned where the guide rod and spring cannot cause bodily harm if the bolt is locked to the rear.)

### CAUTION

The bolt must be eased forward to prevent damage to the cover and feed mechanism assembly and operating rod group.

NOTE: The cover and feed mechanism assembly can be closed with the bolt in either the forward or the rearward position.

## 2-7. MAINTENANCE PROCEDURES

There are certain actions that must be taken before, during, and after firing to properly maintain the M249 AR.

### a. Before firing—

- Wipe the bore dry.
- Inspect the weapon as outlined in the operator's TM.
- Lubricate the weapon.

b. **During firing**—

- Inspect the weapon periodically to ensure that it remains lubricated.
- When malfunctions or stoppages occur, follow the procedures in Chapter 4.

c. **After firing**—

- Immediately clear and clean the weapon.
- Every 90 days during inactivity, clean and lubricate the weapon unless inspection reveals more frequent servicing is necessary.

## **2-8. MAINTENANCE DURING NBC CONDITIONS**

If the M249 AR is contaminated by chemical, biological, or radiological agents, appropriate action is taken to reduce exposure and minimize penetration.

a. **Chemical.** Use towelettes from the M258A1 kit to wipe off the weapon. If these are not available, wash the weapon with hot, soapy water and rinse.

b. **Biological.** Use towelettes or hot, soapy water and rinse the weapon as above.

c. **Radiological.** Brush or wipe the weapon, or wash with water and rinse. For more details, see FM 3-5.