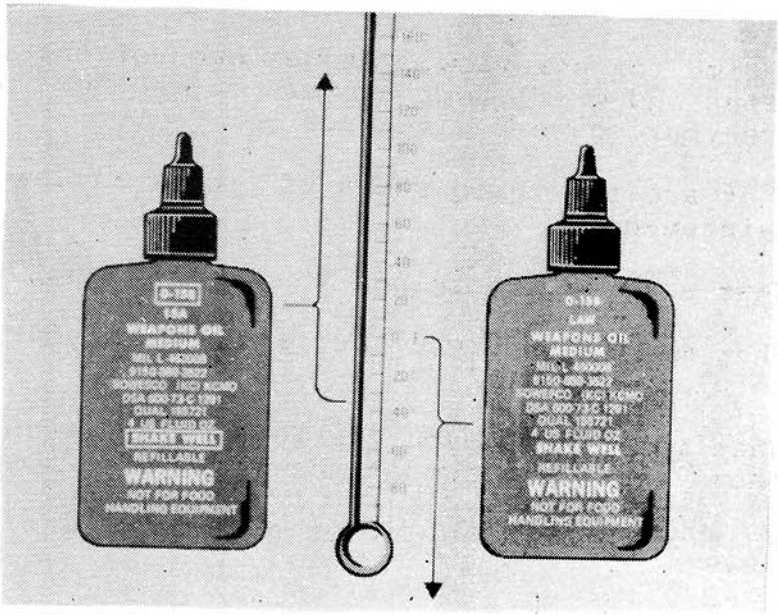
M16A1 RIFLE

SUBCOURSE 029-2

(TEC 939-071-0009F)

BOOKLET 1



Either can be used from minus thirty-five degrees to zero degrees Fahrenheit.

Okay, time for a review. Answer each of the following questions and write your answers on the next page. Compare your answers with page 35.

1. What are the three steps of proper rifle maintenance?

2. What are the two things you inspect your rifle for?

3. What material do you use, along with your brushes to clean your rifle?

4. What material do you use to lubricate your rifle? There are two possible answers. Give both.

5. What are the three levels of lubrication?

REVIEW

1.

2.

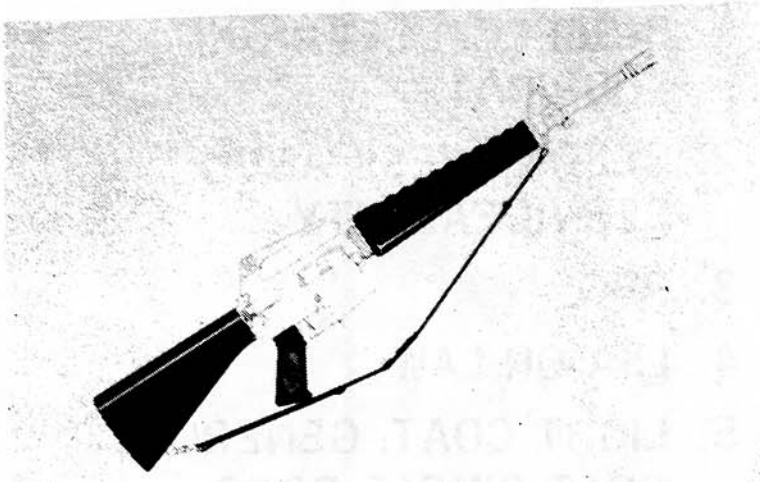
3.

4.

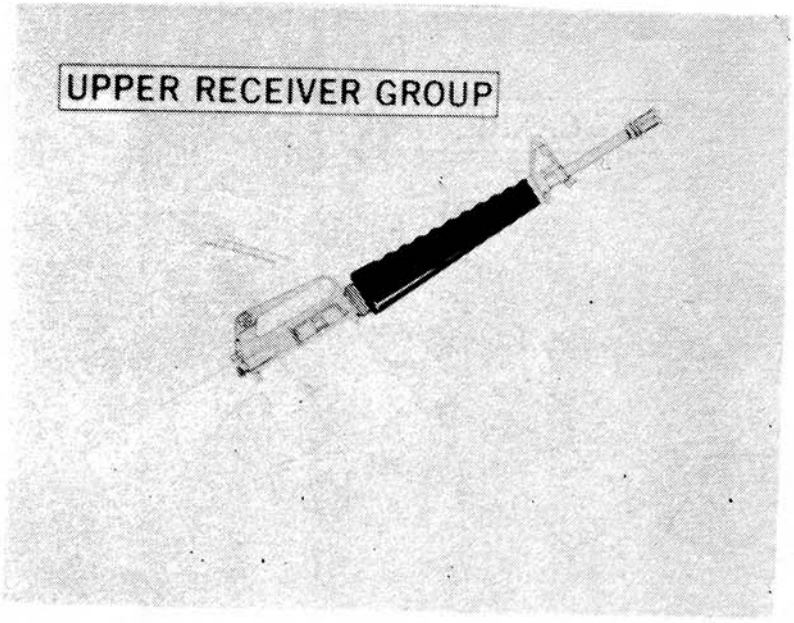
5.

1. INSPECT, CLEAN AND LUBRICATE
2. CLEANLINESS AND SERVICEABILITY
3. RBC
4. LSA OR LAW
5. LIGHT COAT, GENEROUS COAT, SINGLE DROP

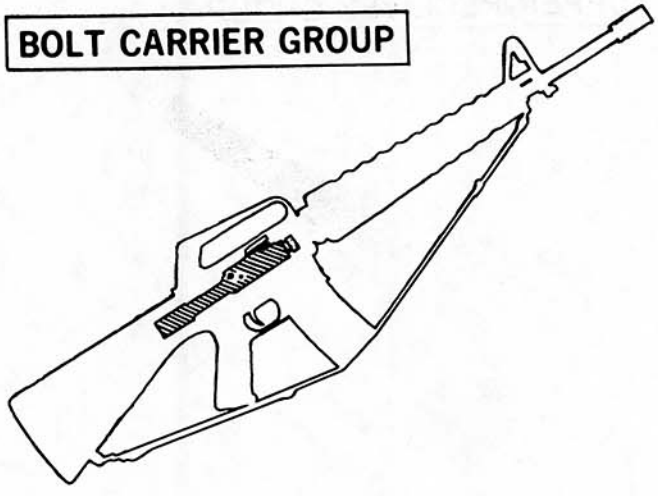
Here are the correct answers. Check your answers and then continue.



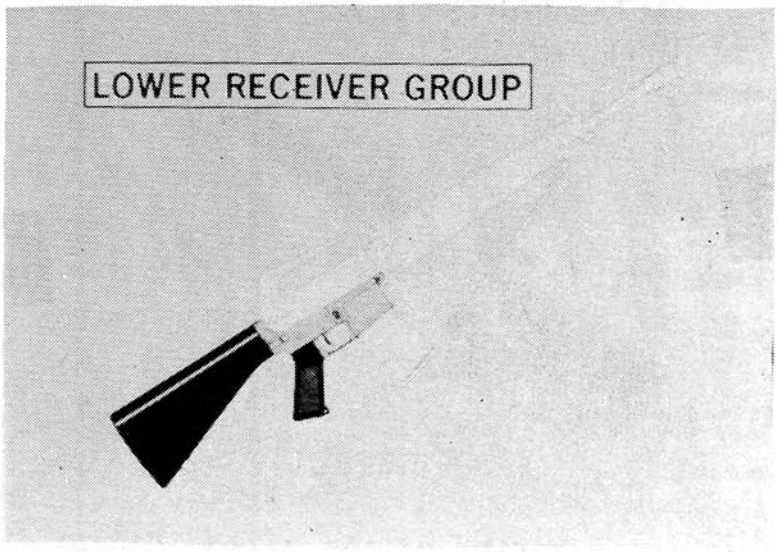
Let's apply these principles of inspecting, cleaning, and lubricating where they'll do the most good, on your rifle. For our purpose we are going to discuss the exterior of the rifle and then the three main groups. The first of these areas we will discuss is the exterior, or outside of the rifle.



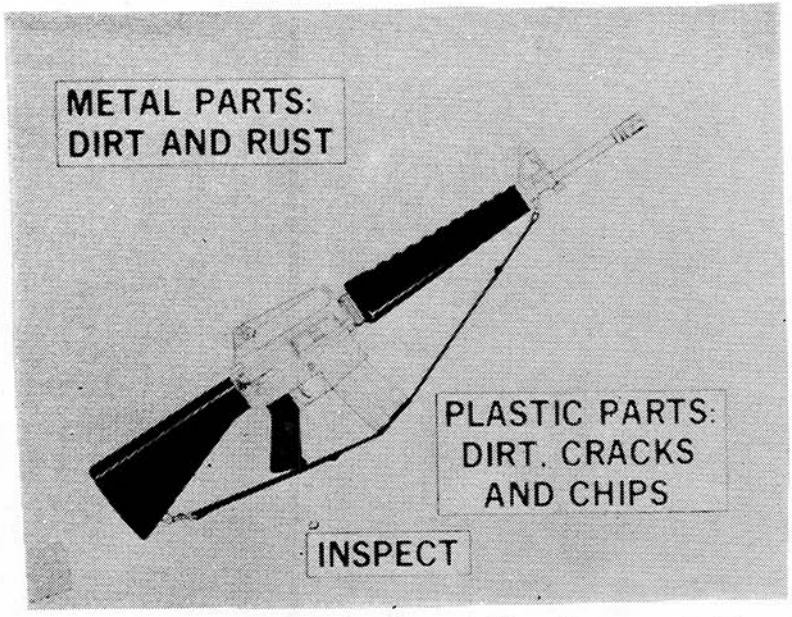
The second area will be the upper receiver group.



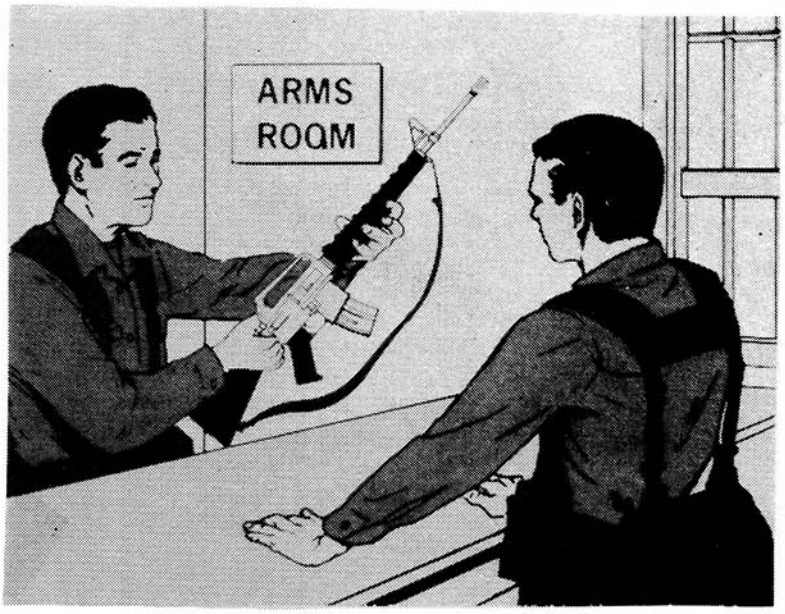
Then we'll discuss the bolt carrier group.



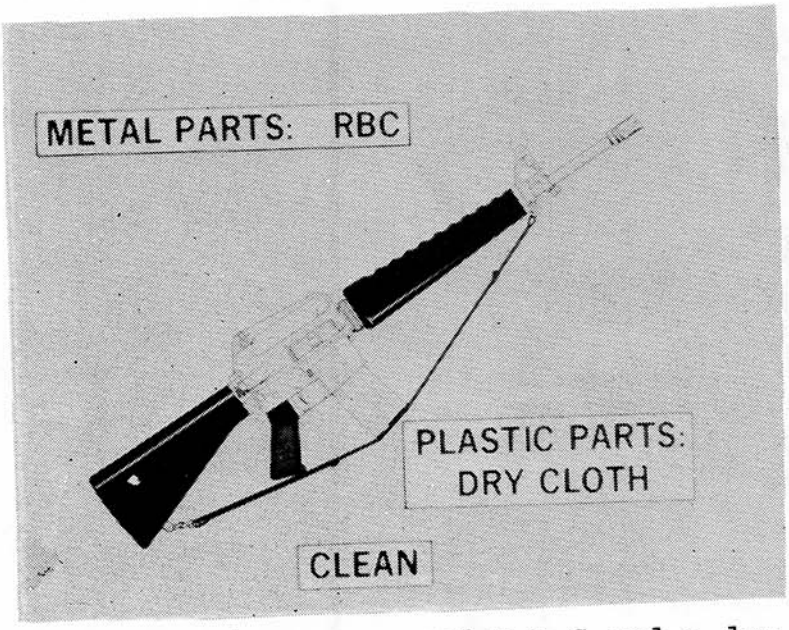
And finally we'll discuss the lower receiver group.



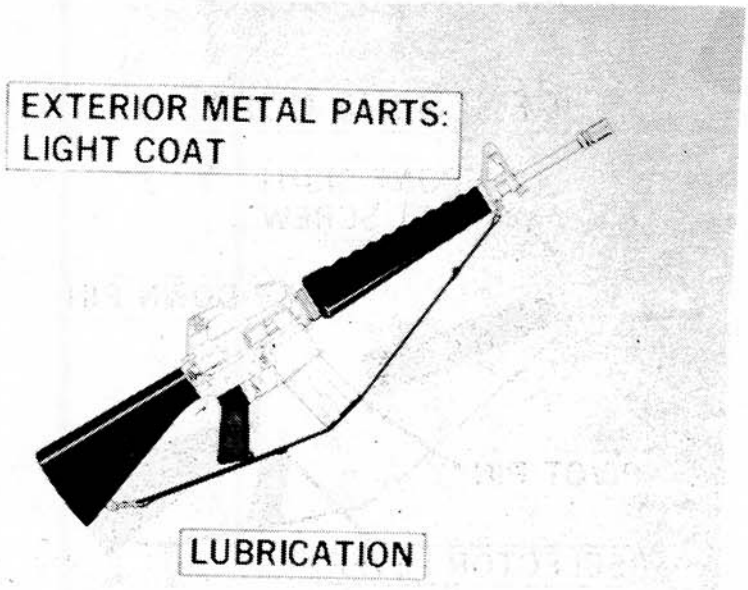
Looking at the exterior of the rifle inspect the metal portions very carefully for dirt and the red menace-rust. The handguards and stock are made of plastic and will not rust but they will crack and chip and they will get dirty.



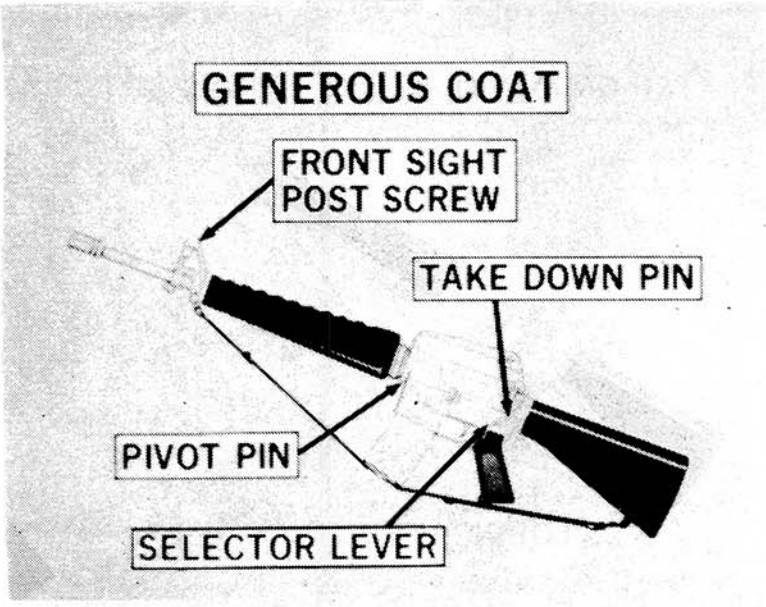
If there are cracks or chips in the plastic parts, show them to your company armorer. They will need replacement.



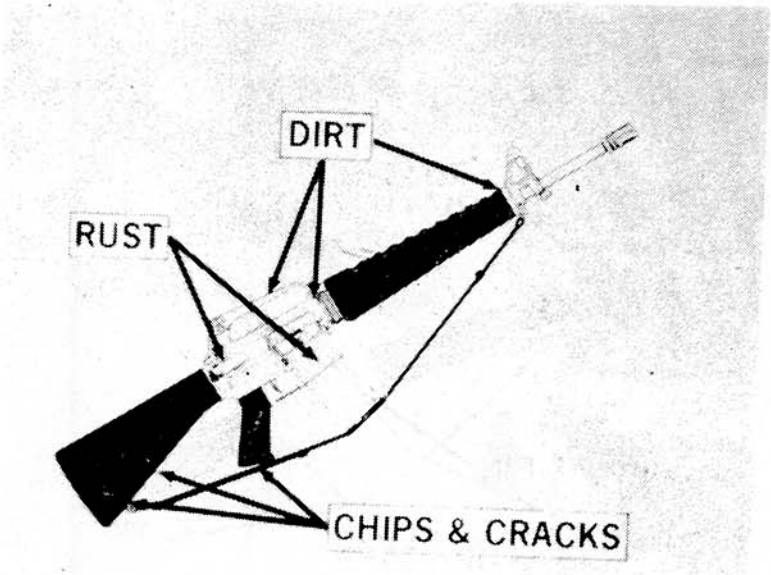
To clean the exterior, you need R-B-C and a dry cloth. R-B-C to remove the carbon and rust and a dry cloth to clean the plastic parts. Don't use R-B-C on the handguards and stock.



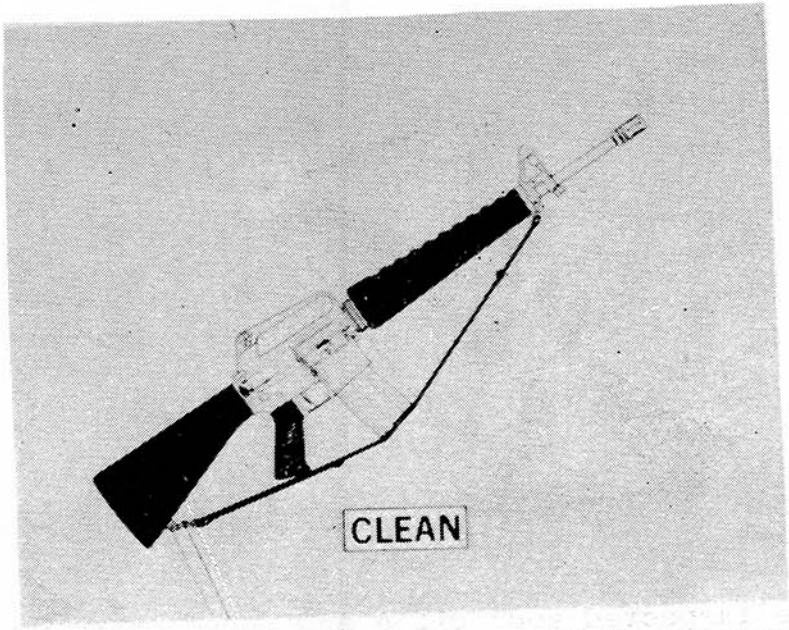
Lubrication of the exterior requires two levels. Most of the metal parts get a light coat . . . to prevent rust.



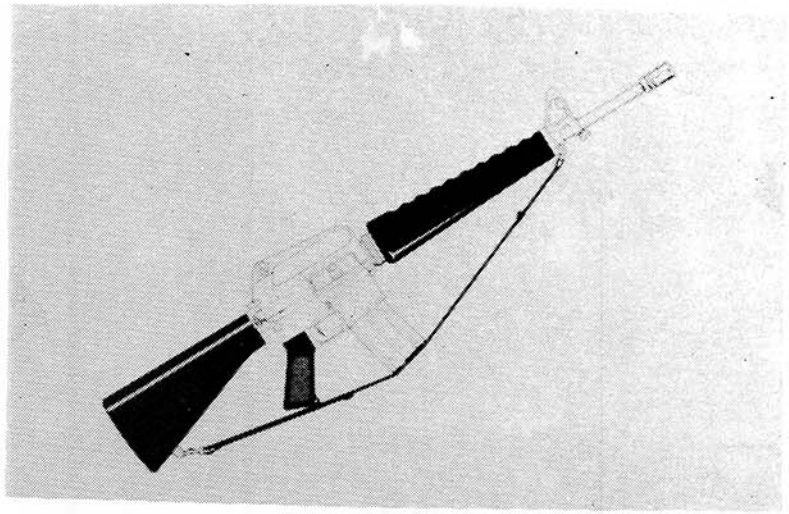
The above parts are working parts. They require a generous coat to reduce friction. The plastic parts require no lubrication at all.



You have inspected your rifle and found these problems. How would you remove the rust and dirt and what would you do about the chips and cracks? Think your answer.



You should clean the metal parts with R-B-C and the plastic ones with a cloth. And those cracks and chips should be reported to your company armorer.

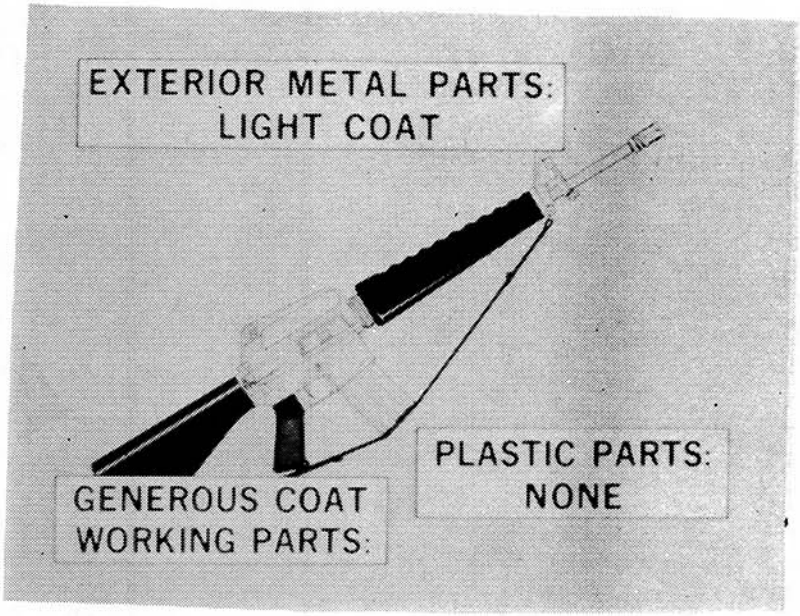


Now write down how you would lube the three areas of the rifle.

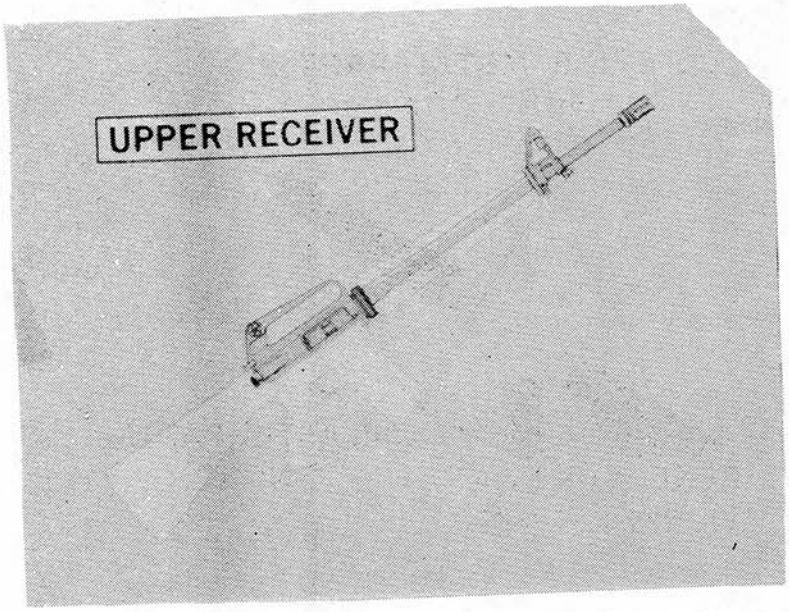
Exterior _____

Plastic parts _____

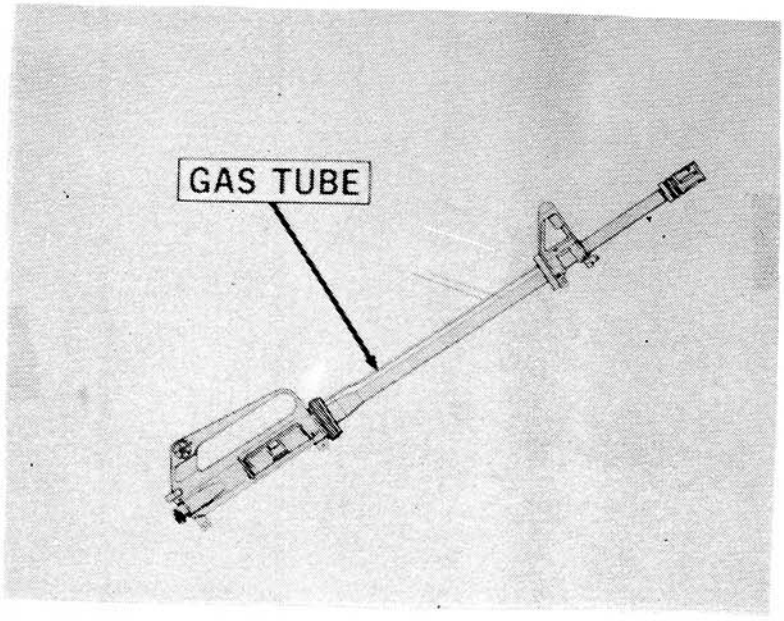
Working parts _____



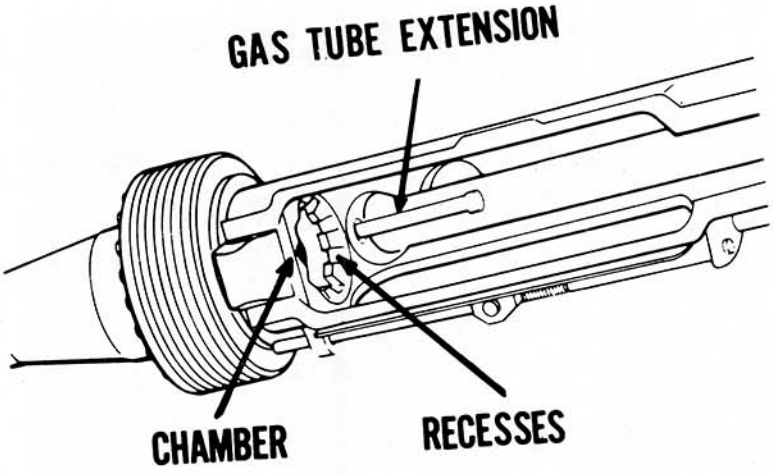
Okay, here are the answers, compare these with yours. Be sure you understand how to lube the exterior of your weapon before going to the next page.



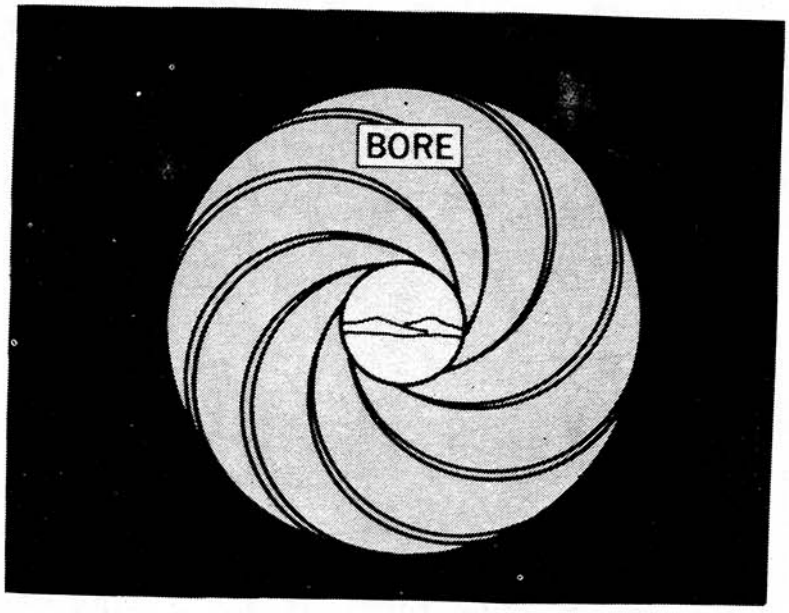
That covers the exterior of the rifle, so let's look at the upper receiver. This group consists of . . .



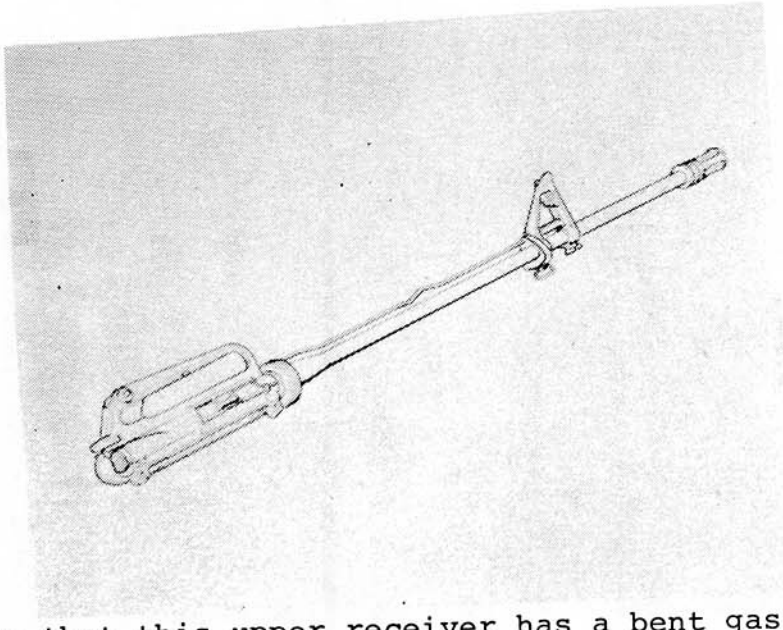
The gas tube, which is the little aluminum tube that runs along the top of the barrel . . .



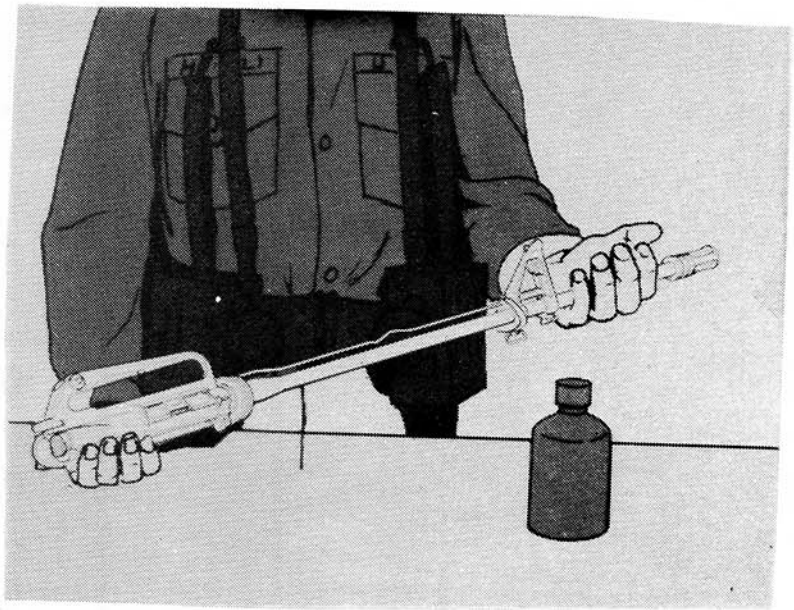
. . . the inside of the upper receiver, the gas tube extension on the inside, the recesses, the chamber . . .



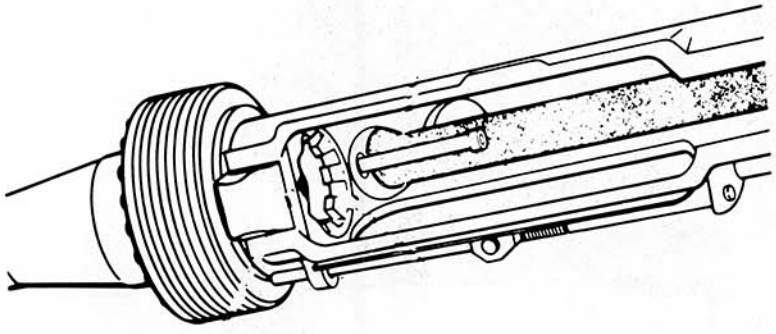
. . . and the bore.



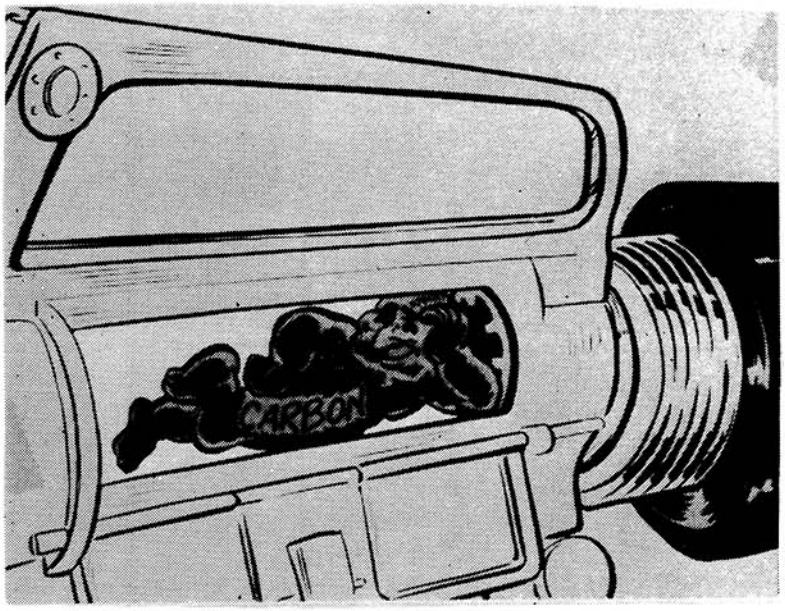
We see that this upper receiver has a bent gas tube. What should you do about it? Let's also suppose this upper receiver needs cleaning. What do we use to clean it. Think your answer.



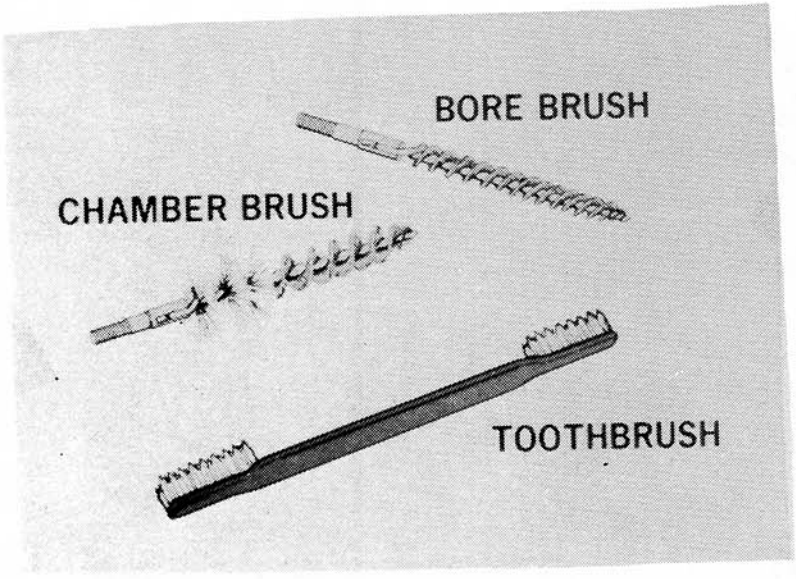
The only thing you are authorized to do about a bent gas tube is report it to your armorer. To clean that upper receiver you use R-B-C.



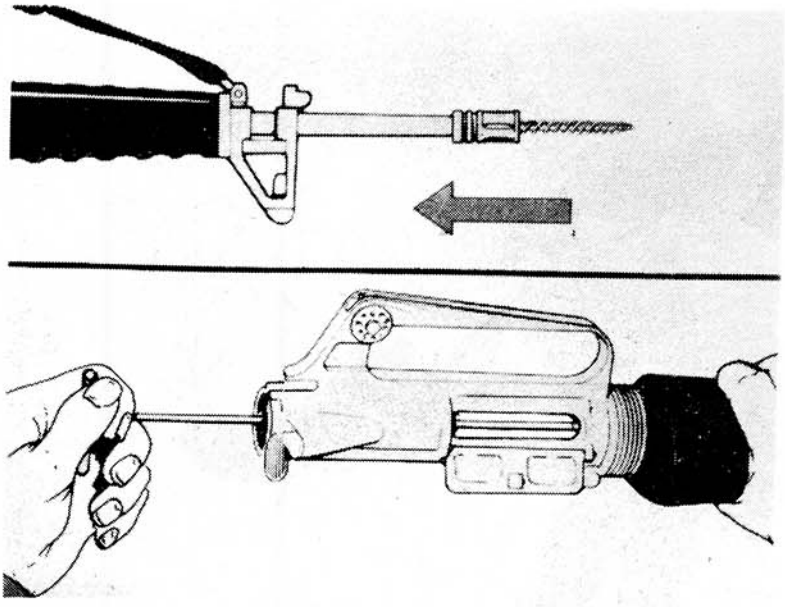
Let's look inside the upper receiver. Since these parts are inside the rifle, what kind of problem would you expect to find here after firing.
Write your answer _____



Your answer should have been carbon fouling. That's your major problem, but don't forget to look out for rust; it can show up anywhere.

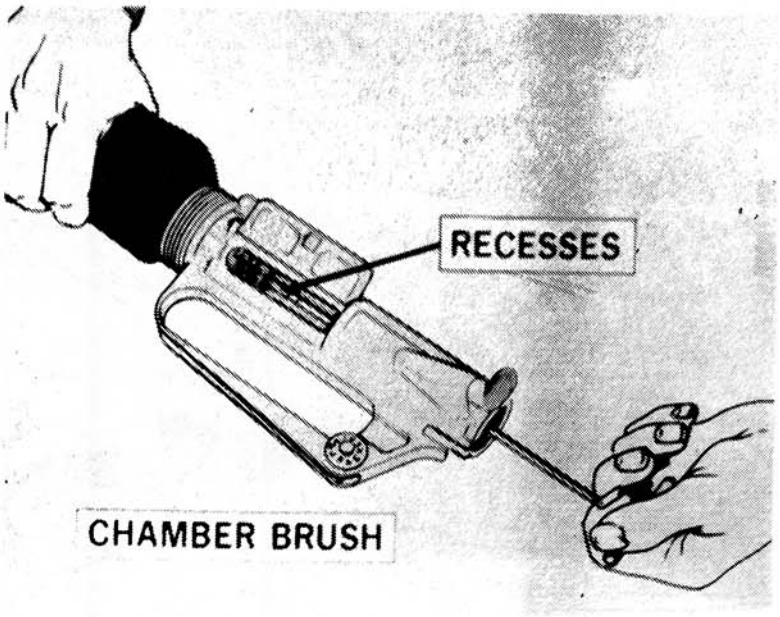


There are some special cleaning problems with the upper receiver, so you'll need something more than just R-B-C to handle them. You'll need this equipment which is in your cleaning kit.

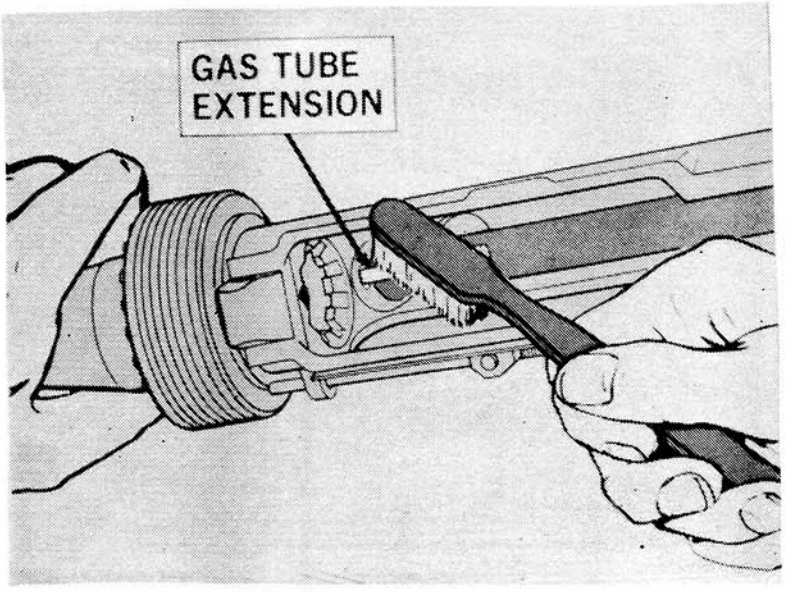


To clean the bore, wet the bore-brush with R-B-C, insert the bore-brush into the bore from the chamber and push it all the way through until it comes out the other end. Then you can reverse directions and bring it back through.

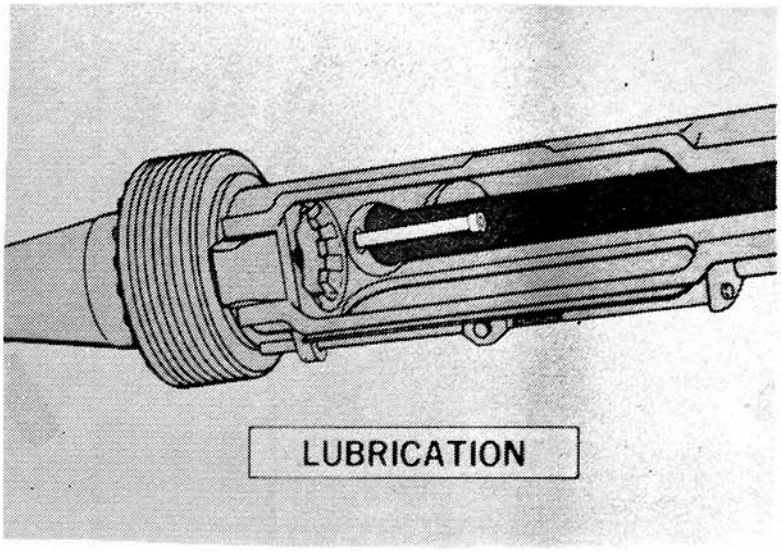
Do not reverse directions with the brush while it is still in the bore. This could damage the bore.



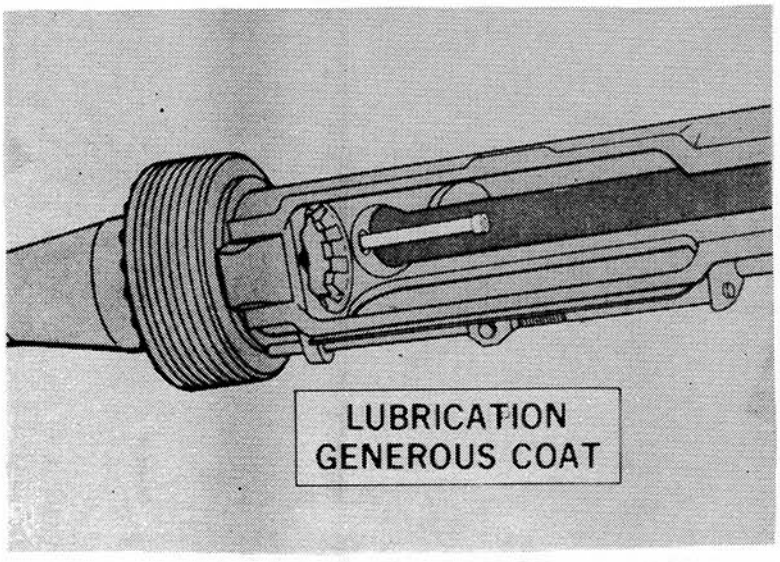
The wide part of the chamber brush will help you clean out carbon from those hard-to-get-at places in the chamber. Pay particular attention to the recesses where you'll get a lot of carbon buildup.



Use the toothbrush with its softer bristles to clear the gas tube extension.



Now, what level of lubrication would these parts get? They are working parts. So would you apply the generous, light, or single drop level of lubrication? Underline your answer.



Since they're working parts, a generous coat is the answer. There is one exception, however. The bore and chamber only get a light coat.

CLEAN

- **BORE**
- **RECESSES**
- **CHAMBER**
- **EXTENSION**

Here are four parts of the upper receiver. Write above how you would clean each part. If it takes any special equipment be sure to write it down. 'Compare your answers with those on the next page.

CLEAN

- **BORE** – RBC AND BORE BRUSH
- **RECESSES** – RBC AND CHAMBER BRUSH
- **CHAMBER** – RBC AND CHAMBER BRUSH
- **EXTENSION** – RBC AND TOOTH BRUSH

Here are the correct answers. Always remember the R-B-C. Be sure you understand this page before going on.

LUBE

- BORE
- INSIDE OF RECEIVER
- CHAMBER
- RECESSES

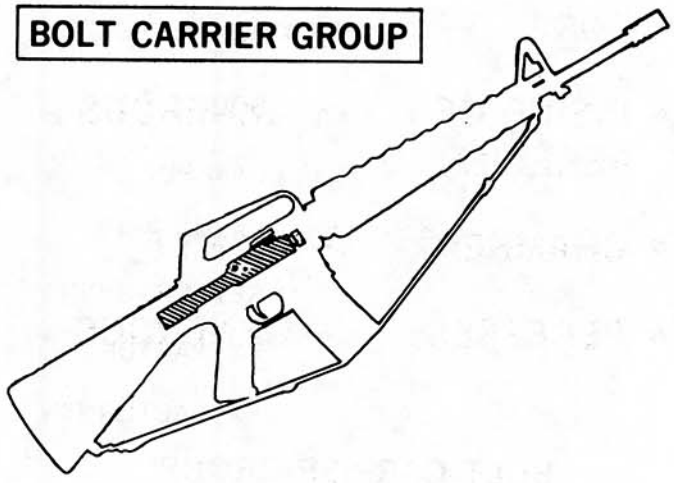
Now look at these four parts. What level of lubrication would each get? Write your answer above.

LUBE

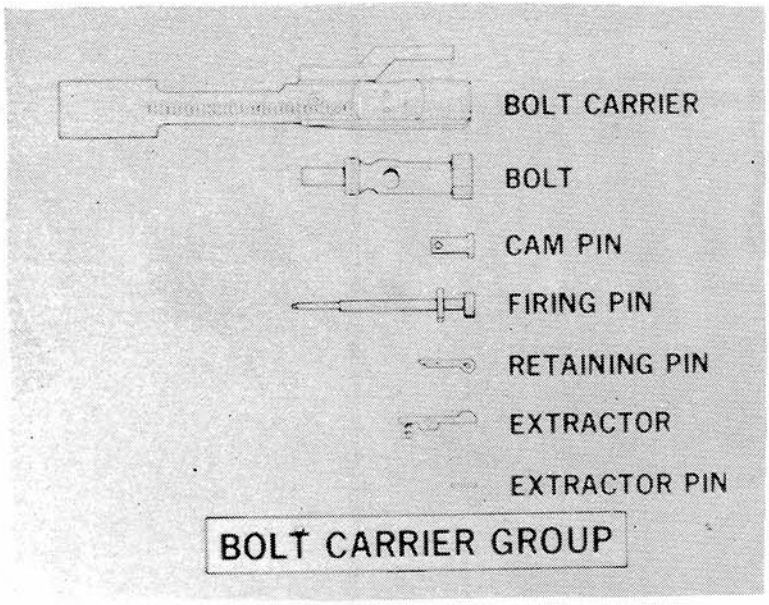
- **BORE** – LIGHT
- **INSIDE OF RECEIVER** – GENEROUS
- **CHAMBER** – LIGHT
- **RECESSES** – GENEROUS

Everything gets a generous coat, except the chamber and the bore. They get a light coat.

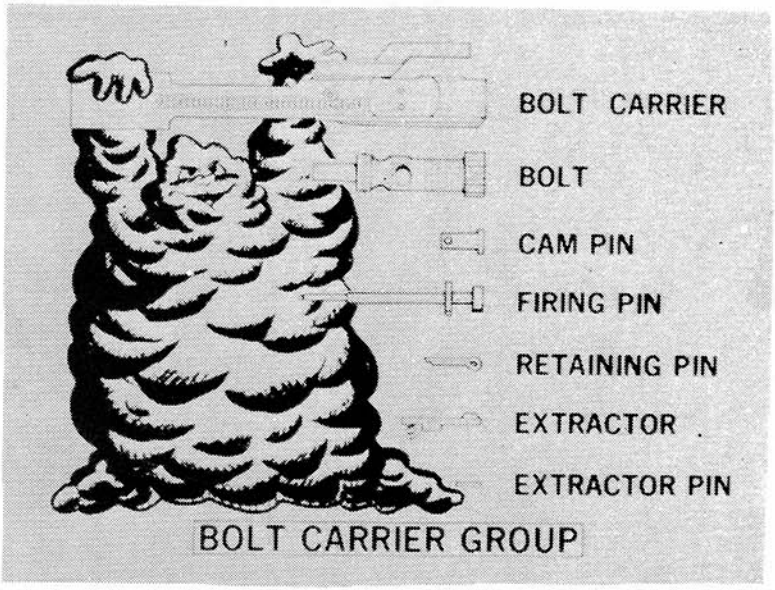
BOLT CARRIER GROUP



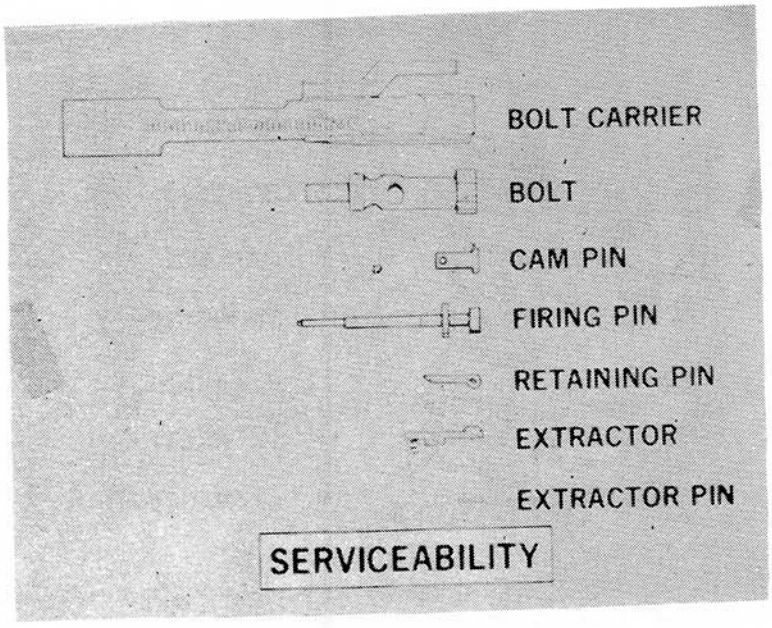
This is the bolt carrier group.



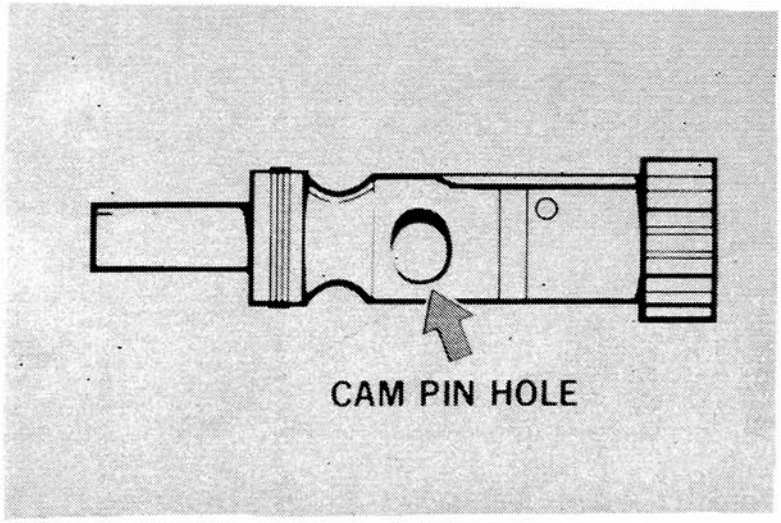
The bolt carrier group consists of these parts. Look them over and be sure you know what items make up the bolt carrier group. These are working parts. What kind of fouling would you look for when inspecting them? Think your answer.



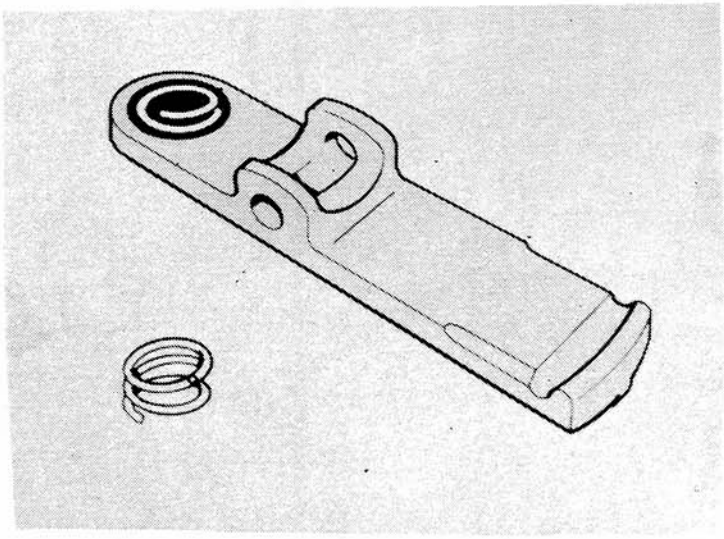
Carbon is the most common enemy on the working parts inside the rifle. However, again, you may find rust, so be sure to check for it.



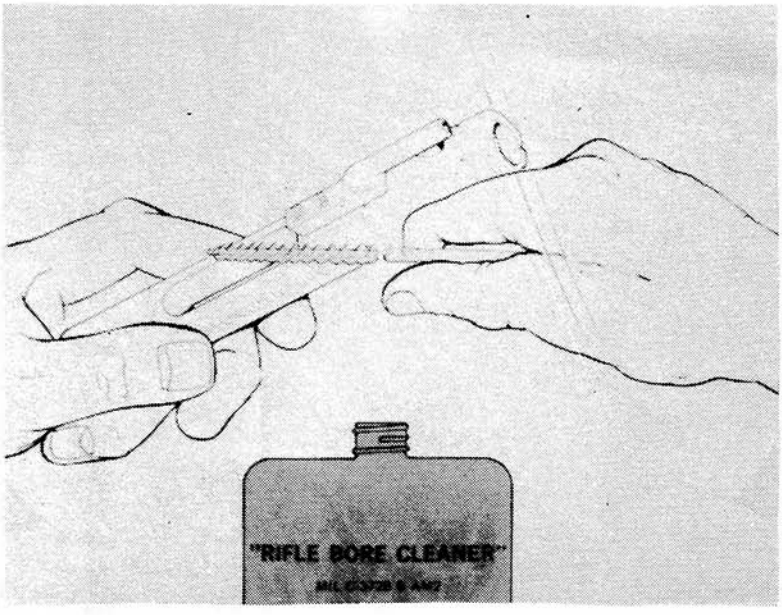
Since the working of these parts is supercritical to the performance of the rifle, there are a couple of specific things to check here for serviceability.



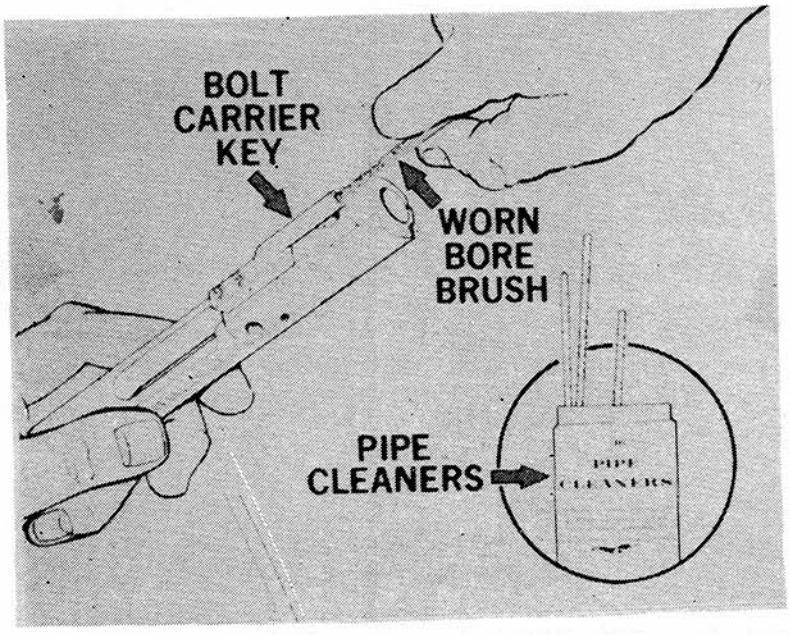
Check the bolt very carefully for cracks, especially around the cam pin hole.



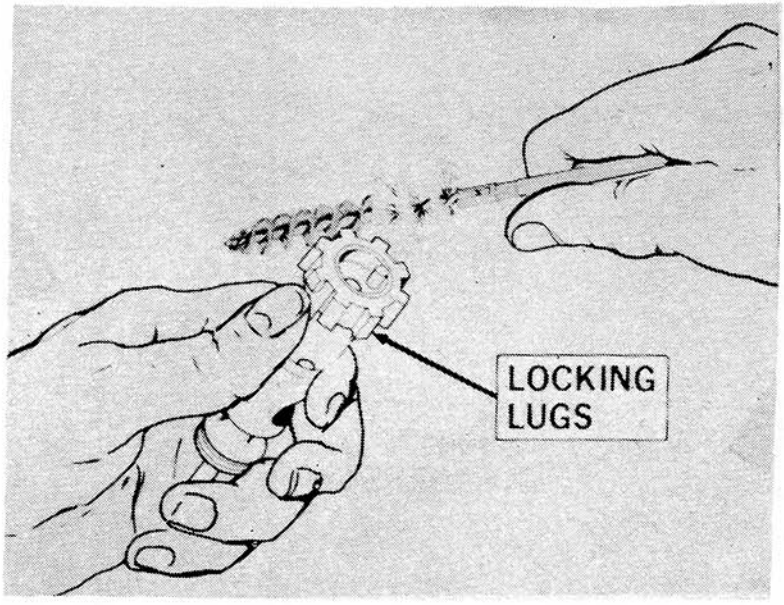
The extractor needs a careful going-over. The spring on the extractor may be broken. If a part is broken, like this one, take it to your company armorer. If it is dirty or rusty, what do you clean it with?



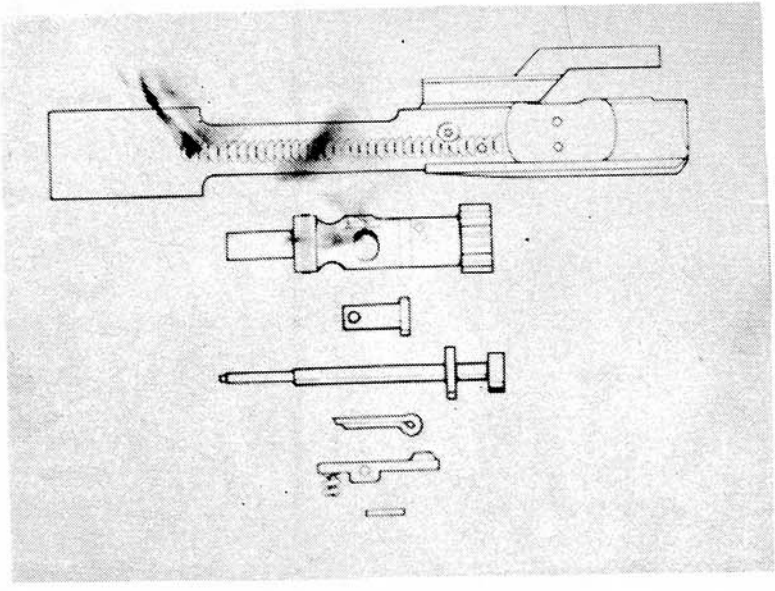
R-B-C is the correct answer . . . the only answer. But, there are a couple of specific cleaning procedures.



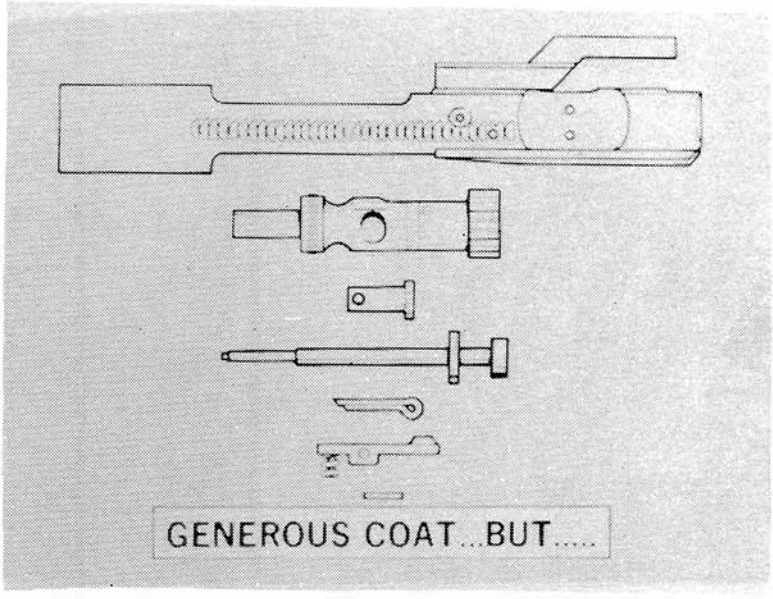
Since you can't get your fingers down inside the bolt carrier key, use an old worn bore brush and a pipe cleaner to clean it.



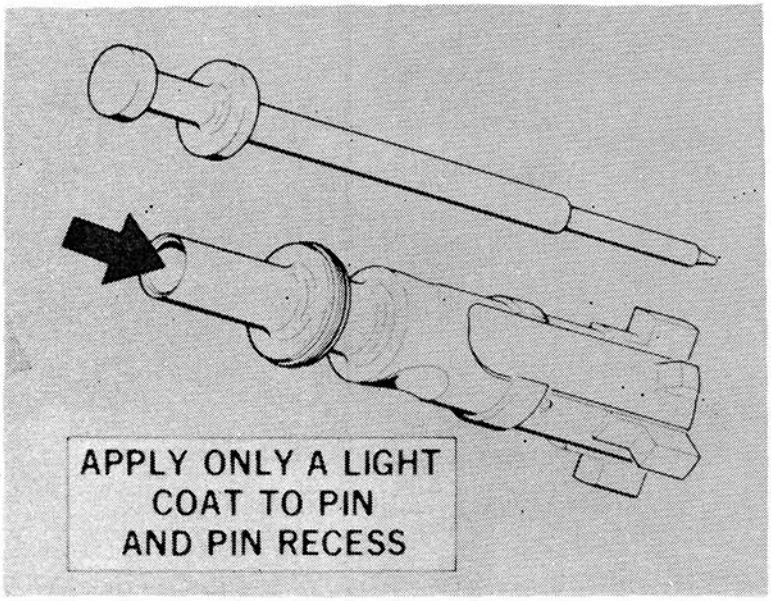
And pay special attention to the locking lugs on the front of the bolt. These little teethlike affairs fit into the recesses of the chamber and you may find a carbon buildup on them.



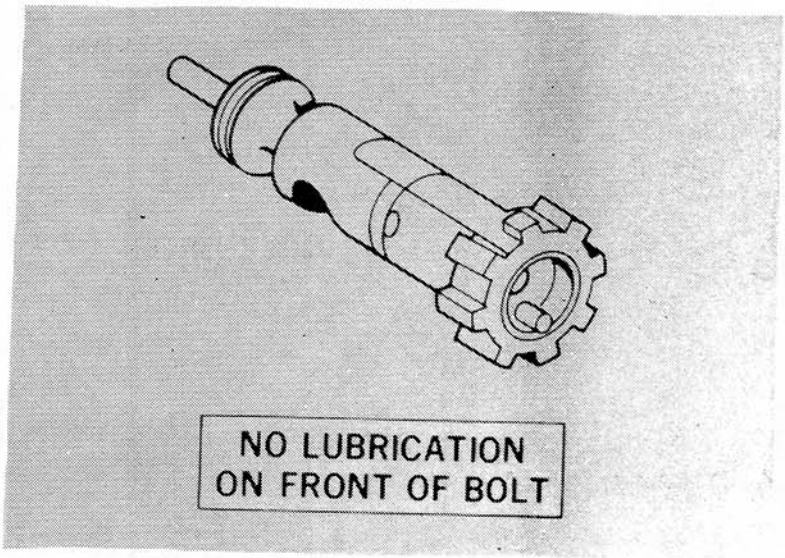
Remember the bolt carrier group is made up of all working parts, so what level of lubrication should they receive?



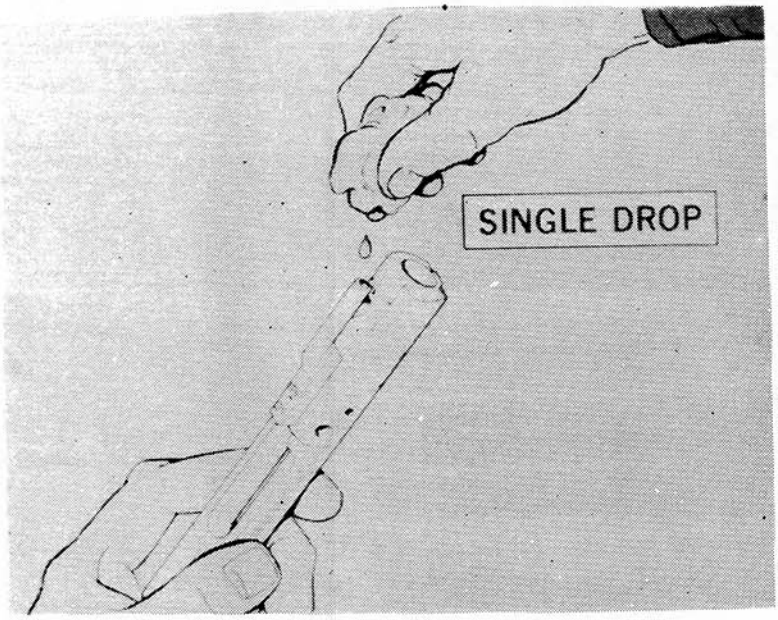
If you said generous coat, you were right. However, there are a couple of exceptions.



The firing pin and the firing pin recesses in the bolt get only a light coat.



And the front of the bolt doesn't get any lubrication at all.



Remember the little arm of the carrier? This is the bolt carrier key. It gets a single drop of lubrication.

SPECIAL EQUIPMENT

BOLT CARRIER

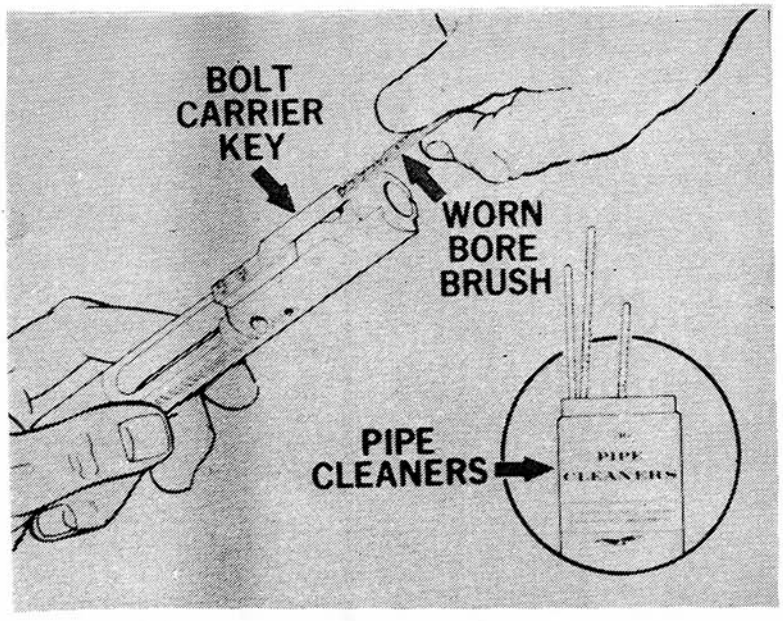
BOLT

FIRING PIN

EXTRACTOR

BOLT CARRIER KEY

You know that you would use R-B-C to clean these parts, but one part listed here requires some special equipment. Write down the name of that piece of equipment and what equipment you would use to clean it.



That special part is the bolt carrier key, and the special equipment you need is a worn bore-brush and a pipe cleaner.

LUBE

- BOLT CARRIER
- FRONT OF THE BOLT
- BOLT
- FIRING PIN AND FIRING PIN RECESSES
- BOLT CARRIER KEY

Here is a list of parts. Write down what level of lubrication each part should get.

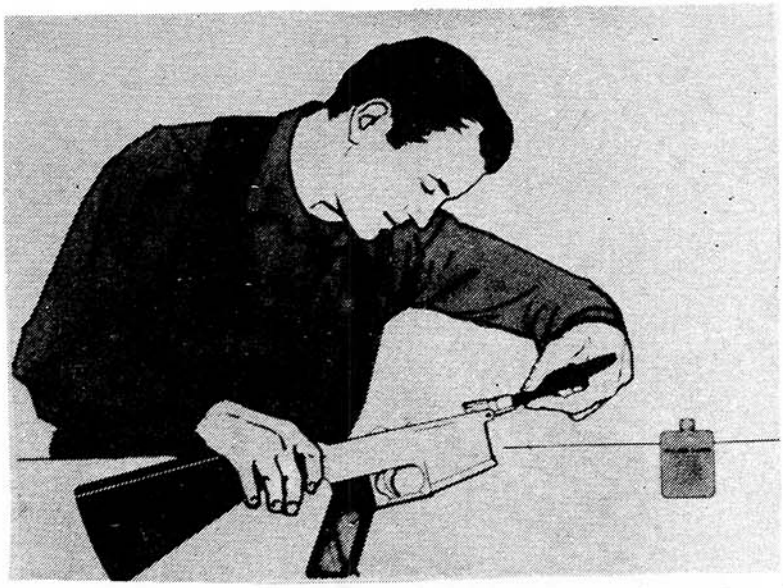
LUBE

- BOLT CARRIER — GENEROUS
- FRONT OF THE BOLT — NONE
- BOLT — GENEROUS
- FIRING PIN AND FIRING PIN RECESSES — LIGHT
- BOLT CARRIER KEY — SINGLE DROP

Check your answers before going on.

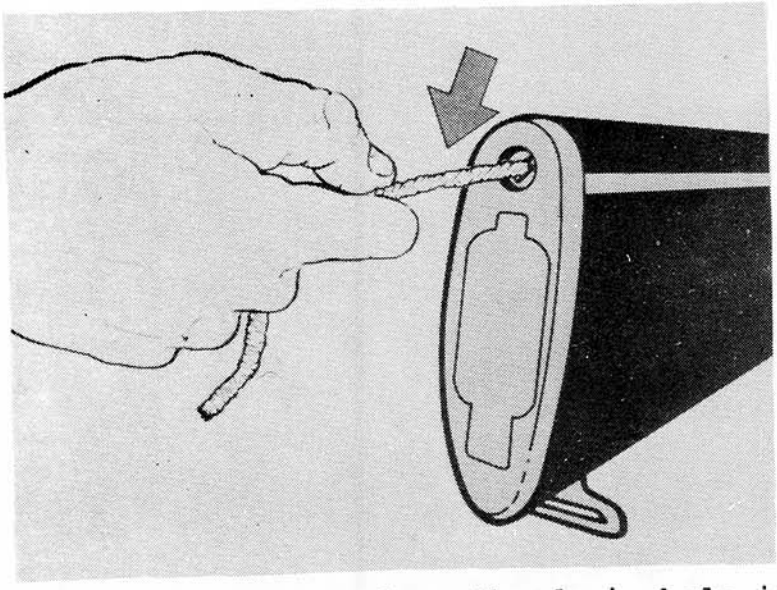
LOWER RECEIVER GROUP

The last part we want to look at is the interior of the lower receiver.

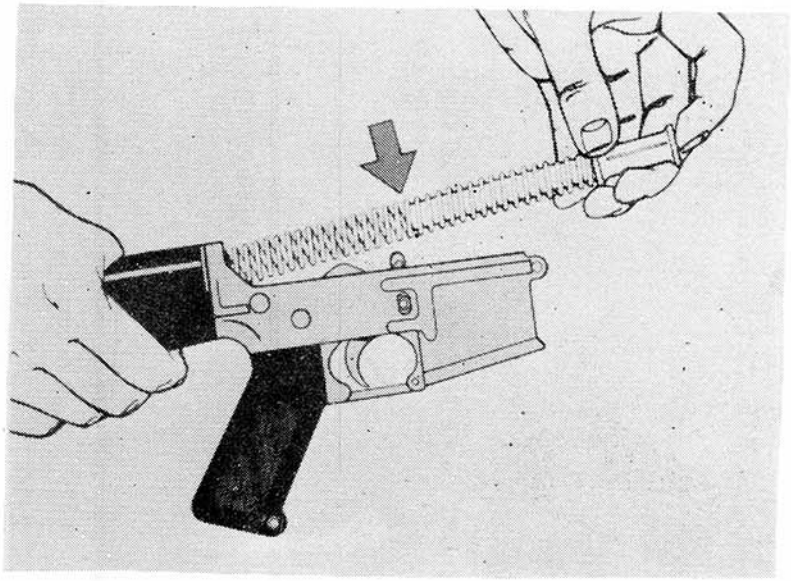


Use an artist's brush to get down inside the lower receiver. This area being inside the rifle is subject to carbon fouling. After you've cleaned the interior dry it off with a swab. And since we're still talking about working parts, what level of lubrication is applied.

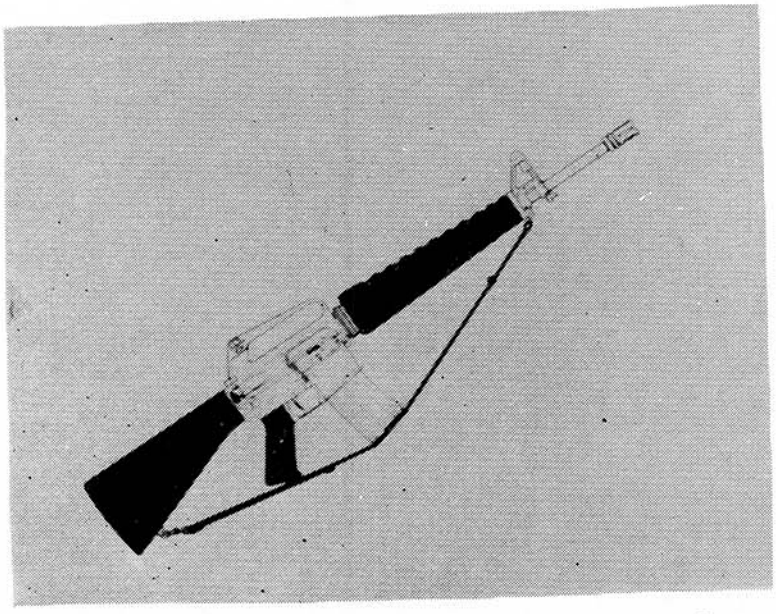
The correct answer is a generous coat. There are two more parts to clean on the lower receiver.



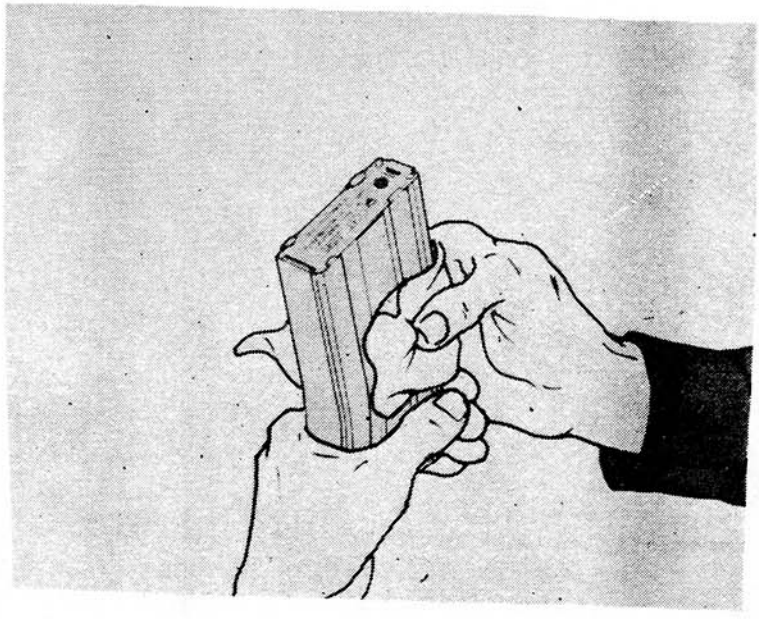
First, make sure you clean the drain hole in the butt plate. Use a pipe cleaner for this. It often gets clogged with dirt and traps the dirt inside the stock. This will rust the buffer assembly and cause you all kinds of problems.



Also pull the buffer assembly from the stock and clean it with R-B-C. Leave a light coat of oil on the spring, the buffer and the inner surface of the extension.



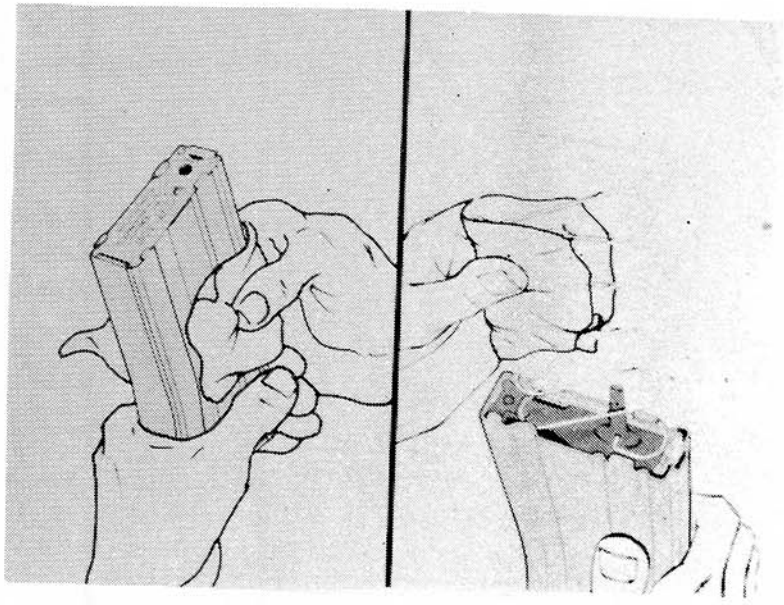
That just about covers the rifle, but there is one more part that you have to maintain--and that's the magazine.



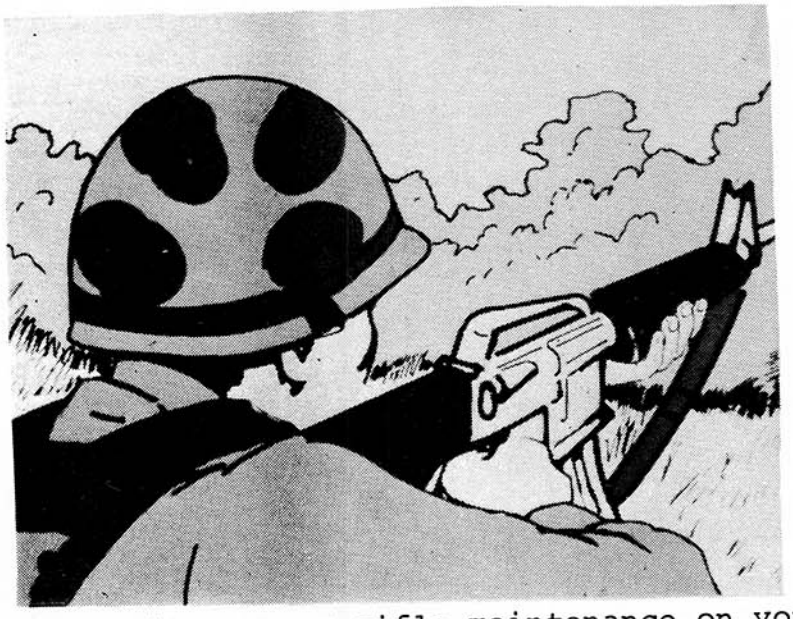
The outside and inside of the magazine are wiped with a dry cloth.

LIGHTCOAT - SPRING ONLY

The only part of the magazine that gets any lube is the spring and it gets a light coat. Simple, isn't it? But, since one of the major reasons for rifle malfunction is a dirty magazine, it is also very important. What are the two steps of maintaining the magazine. Think your answer.



Wipe the magazine clean with a dry cloth, inside and out, and lightly oil the spring only.



By performing proper rifle maintenance on your M16A1 you can avoid most malfunctions. That's really the whole purpose behind proper maintenance. Your life may depend upon a perfectly functioning rifle. Take care of it!

75596 Army-Ft.Benning,Ga. 26 May 75

M16A1 RIFLE

SUBCOURSE 029-2

(TEC 939-071-0012F)

BOOKLET 4

M16A1 RIFLE

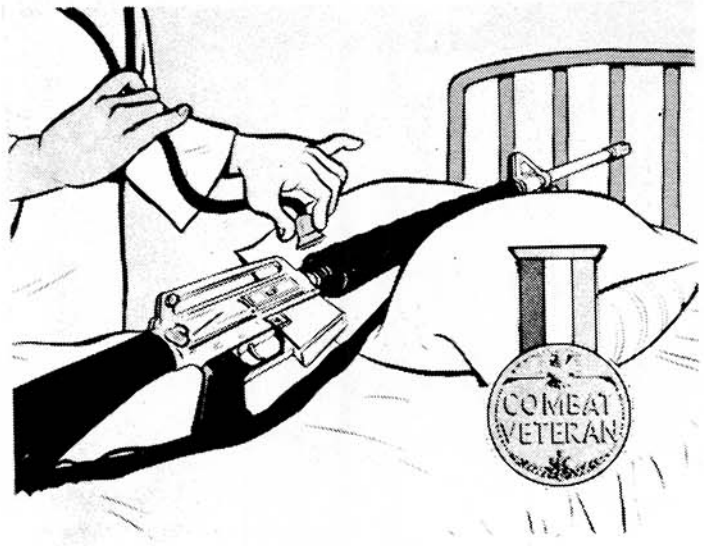
PREVENTING AND CORRECTING COMMON MALFUNCTIONS

TEC 939-071-0012-F

This is Booklet IV of Lesson 1 in the series on the M16A1 rifle.

PREVENT AND CORRECT MALFUNCTIONS

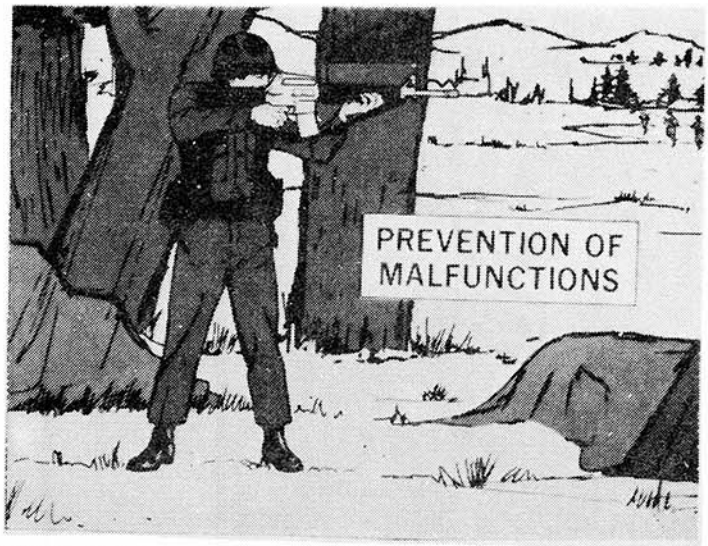
In this booklet you will learn to prevent common malfunctions and, if they occur, how to correct them.



Your M16A1 is a pretty tough little cookie. She's been there and come back to tell the story. But as good as she is--and she is one of the best in the world--even she can malfunction on you.

When finding yourself in this situation you want your weapon to perform--and not malfunction.

But sometimes a malfunction will happen at the worst time.



The best malfunction is one that doesn't occur. Let's take a look at how to prevent them. There is really only one way to prevent rifle malfunctions, and that is ....

. . . through proper rifle maintenance. There are three basic steps in rifle maintenance.

INSPECT THE RIFLE FOR:

1. CLEANLINESS

2. SERVICEABILITY

If it is dirty . . . you clean it. If it needs servicing do it.

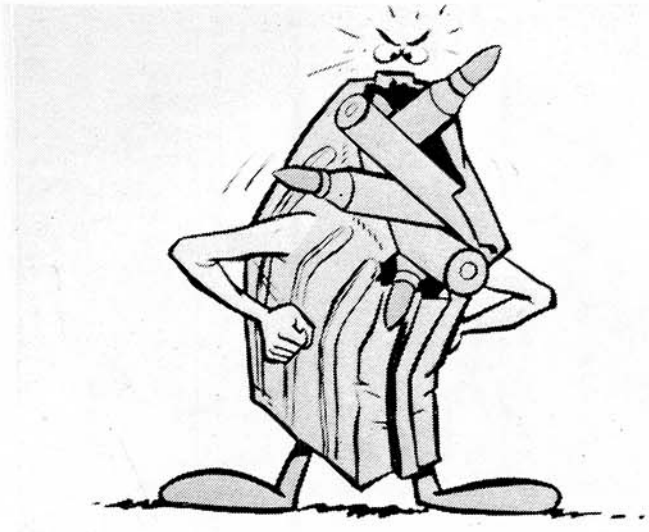
To clean your weapon use Rifle Bore Cleaner, and authorized cleaning tools.

To correctly lubricate your rifle, use LSA (LUBRICANT-SEMI-AUTOMATIC), most of the time. If you are in a very cold climate, use LAW (LUBRICANT-ARTIC WEATHER).

- **LIGHT COAT**
- **GENEROUS COAT**
- **ONE DROP**

There are three levels of lubrication for your M16A1 rifle. A light coat--a barely visible coat on the metal that you can't move around with your finger, a generous coat--which is a visible, heavy coat of lubricant, and one drop--you just squeeze a single drop on a specific place.

Continuous, proper maintenance will keep your rifle almost troublefree, and prevent most malfunctions before they happen.

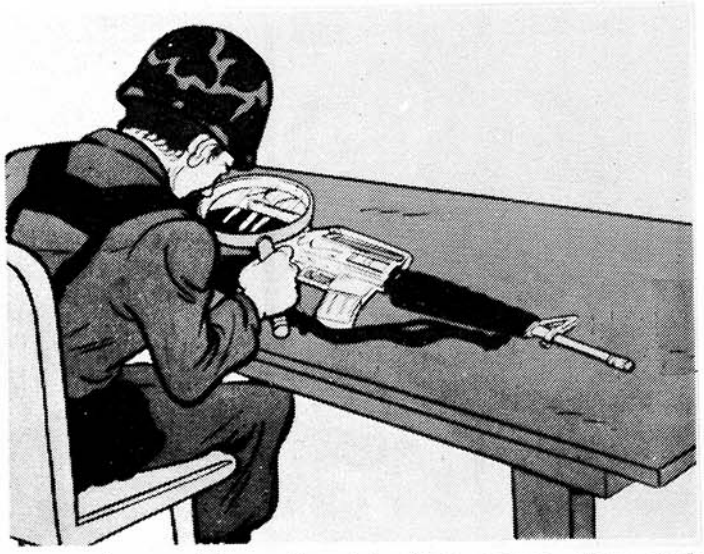


And don't forget that magazine. One of the major causes of malfunctions . . . is an improperly loaded magazine . . . .

. . . or one that has not been properly cared for. Be sure you don't make either one of these mistakes.

It could mean something previous to you--like your life.

Follow these maintenance procedures faithfully, and your rifle and magazine will prevent most malfunctions.



But, sometimes, in spite of all the care you take, you will have a malfunction anyway. Let's look closely at the rifle and try to understand why common malfunctions occur and how they can be corrected. To do this, you must first become familiar with the cycle of functions for the rifle.

CYCLE OF FUNCTIONS

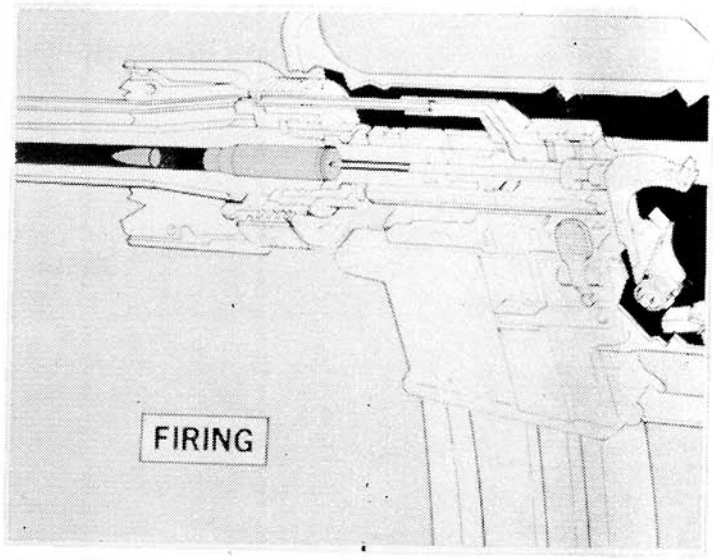
- FIRING
- UNLOCKING
- EXTRACTING
- EJECTING
- COCKING
- FEEDING
- CHAMBERING
- LOCKING

These are the steps in the cycle of functions. Beginning with firing and ending with locking become familiar with the cycle of functions as listed above.

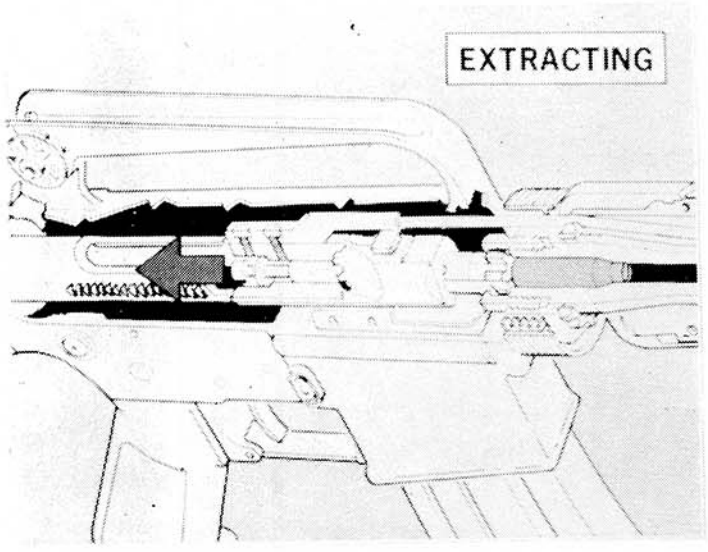
CYCLE OF FUNCTIONS

- **FIRING**
- **UNLOCKING**
- **EXTRACTING**
- **EJECTING**
- **COCKING**
- **FEEDING**
- **CHAMBERING**
- **LOCKING**

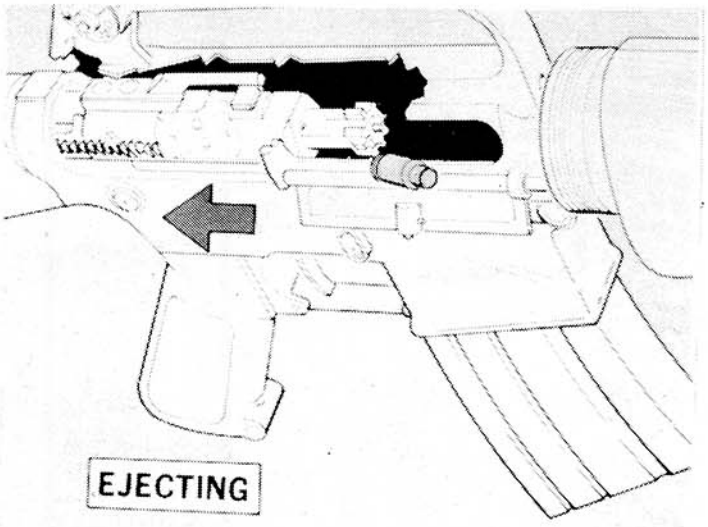
. . . most of your malfunctions will occur during these four steps--firing, extracting, ejecting, and feeding.



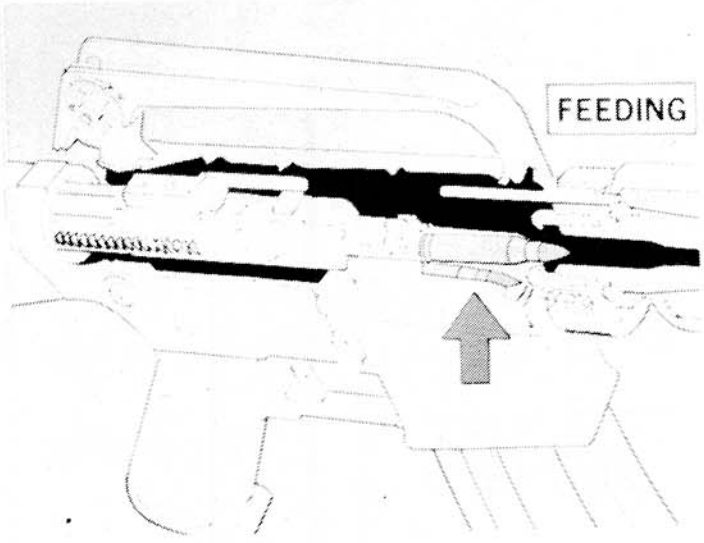
Firing is the first step that could cause you some trouble. Firing occurs when the bolt closes over the round and the trigger is pulled. The firing pin strikes the round and it fires.



Malfunctions may also occur during extracting. Extracting is when the spent cartridge is pulled from the chamber.



The next most likely problem area in the cycle of functions is ejecting. This is when a spent cartridge is kicked out of the rifle through the ejection port.



Finally there is feeding. This is when a round is stripped from the magazine and fed into the chamber of the weapon.

CYCLE OF FUNCTIONS

- FIRING
- UNLOCKING
- EXTRACTING
- EJECTING
- COCKING
- FEEDING
- CHAMBERING
- LOCKING

These are the four steps in the cycle of functions where malfunctions will most likely occur. So, how will you know when the cycle of functions hasn't functioned?

The sign that everything hasn't gone right . . . that you've got a malfunction . . . is a stoppage. That's when the weapon stops firing before you do.

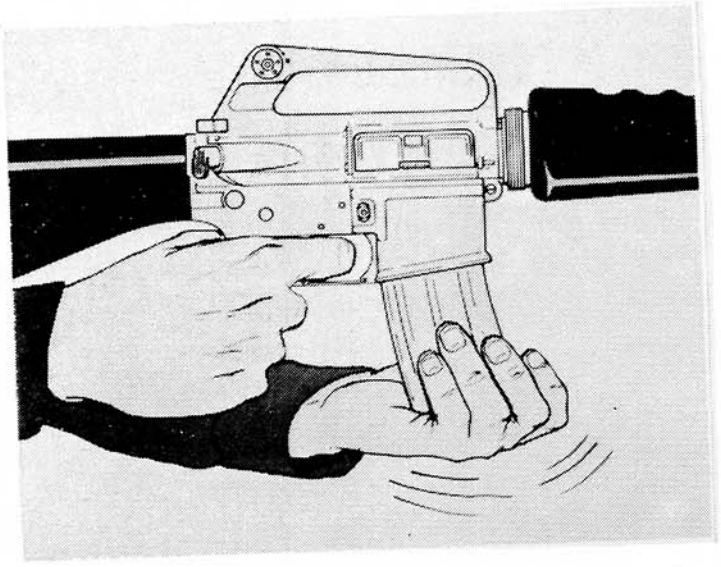
MALFUNCTIONS ARE FAILURE TO:

- FIRE
- EXTRACT
- EJECT
- FEED
- LOCK BOLT OPEN

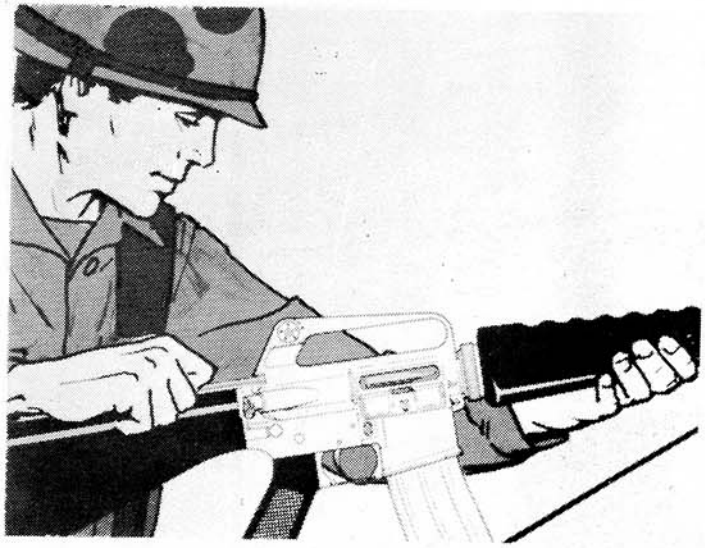
No matter what malfunction occurs, keep your cool and use a little common sense.

IMMEDIATE ACTION

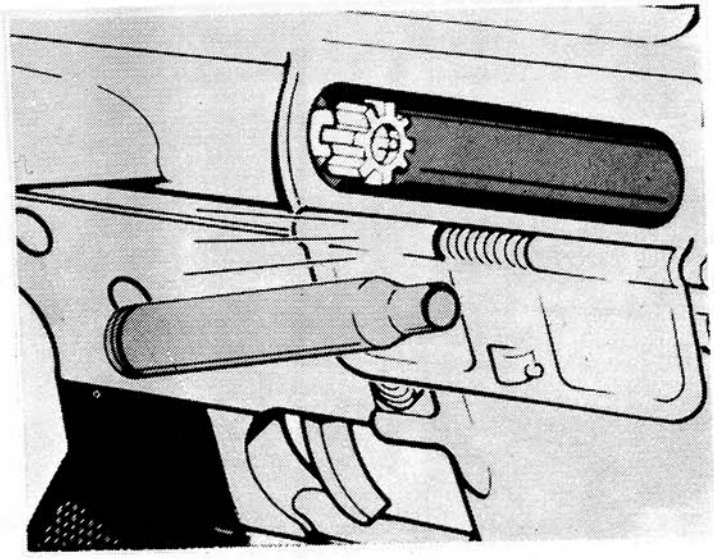
Your first step, no matter what the malfunction, is to perform immediate action. Perform this without hesitation at the first sign of a malfunction.



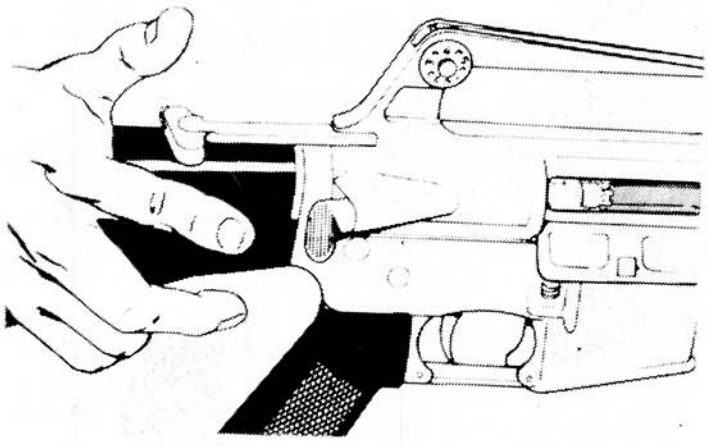
To perform immediate action, first make sure the magazine is fully seated by tapping upwards on the magazine.



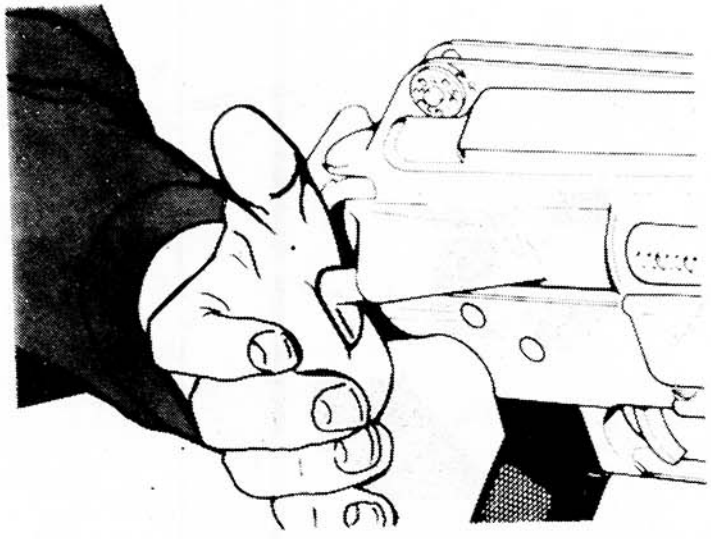
The second step is to pull the charging handle all the way back and watch for ejection.



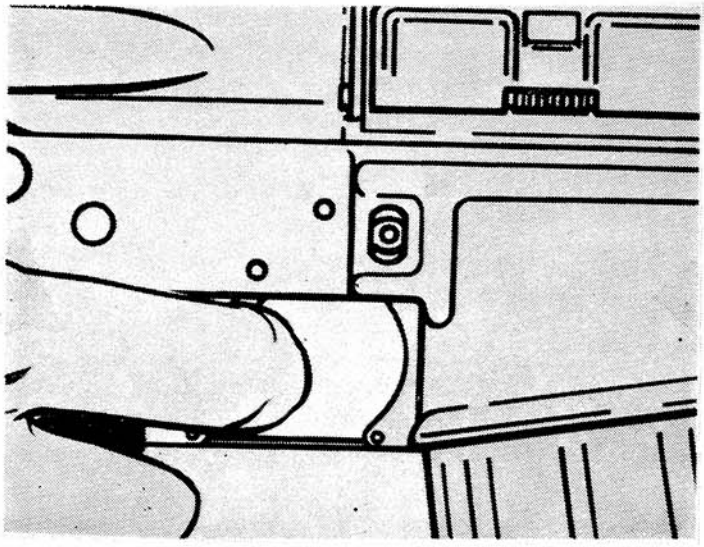
If the case or cartridge is ejected . . .



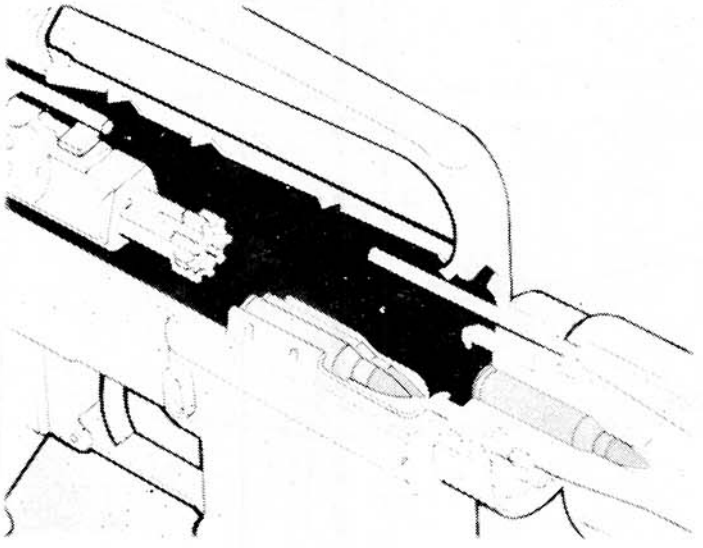
release the charging handle to feed a new round. Just release it, don't ride it forward!



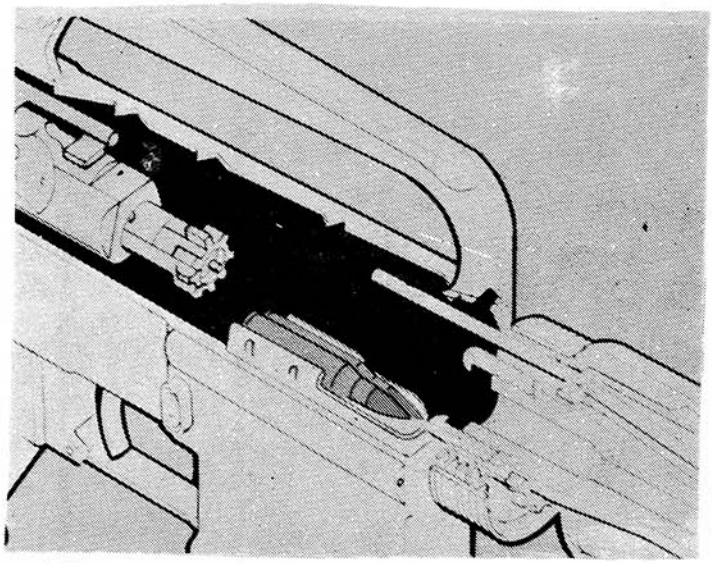
Tap the forward assist with the heel of your hand . . . .



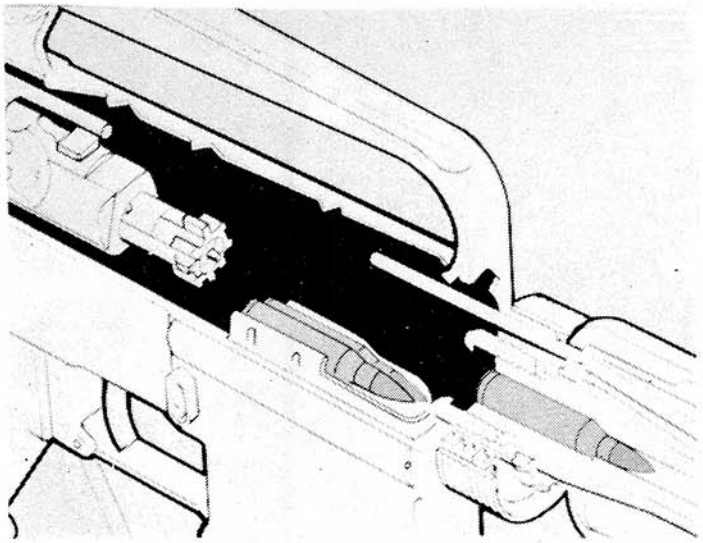
. . . and try to fire the weapon again.



If when you pulled the charging handle all the way to the rear, ...



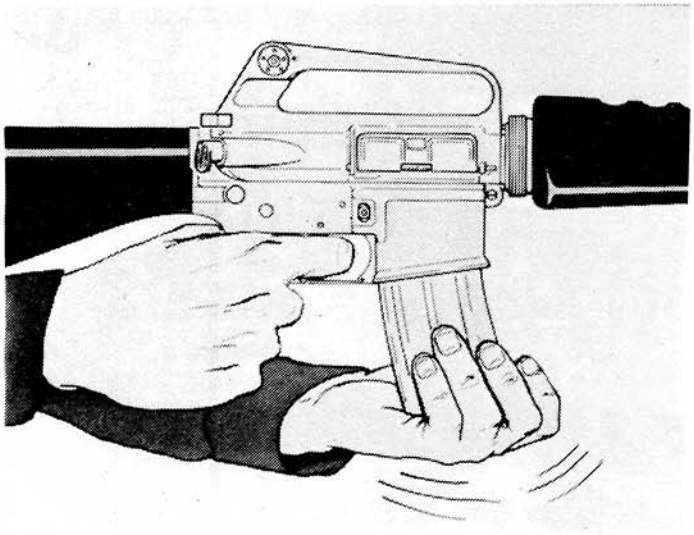
. . . a cartridge or case is <u>not</u> ejected, check for a round in the chamber. If the chamber is clear, release the charging handle to feed a new round and continue with the same steps as before.



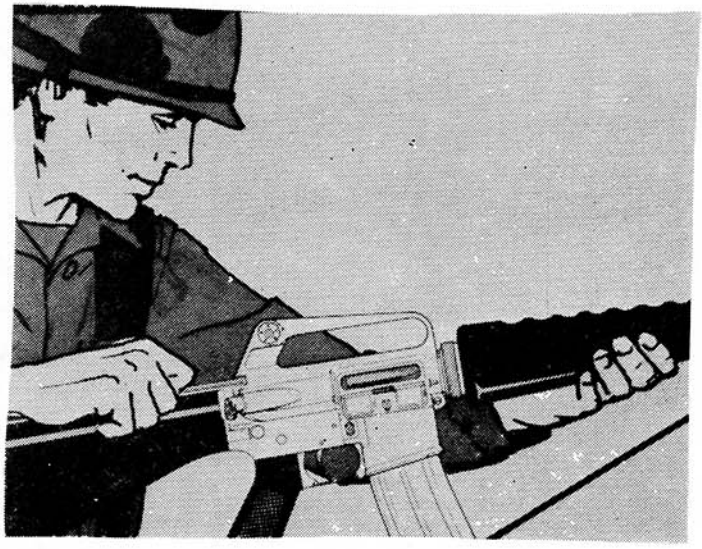
If there is a cartridge or case in the chamber, your weapon failed to extract. You must remove this cartridge before letting the bolt go forward to feed another round.

IMMEDIATE ACTION

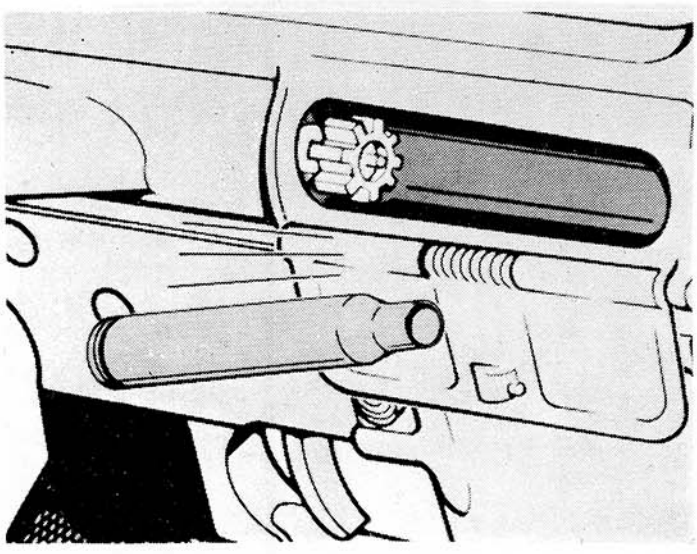
Let's look at the steps to performing immediate action again.



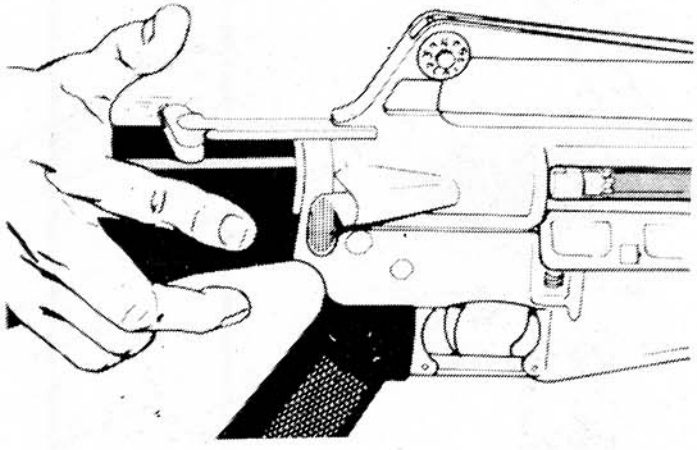
Tap the base of the magazine . . .



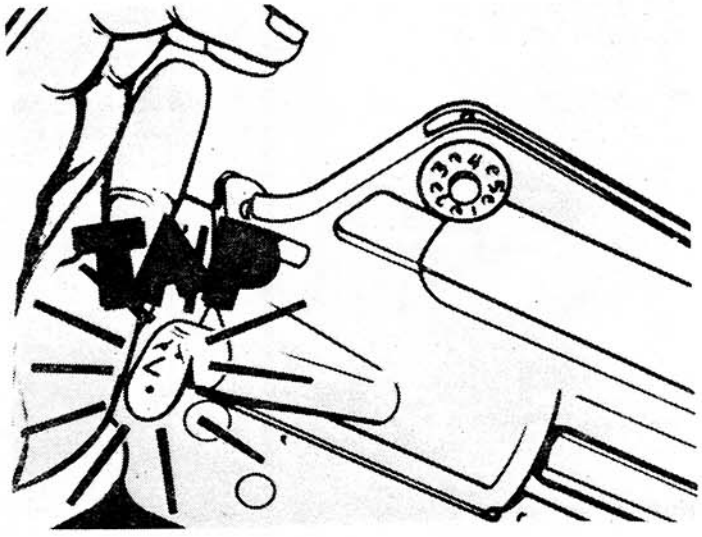
. . . pull the charging handle all the way back, . . .



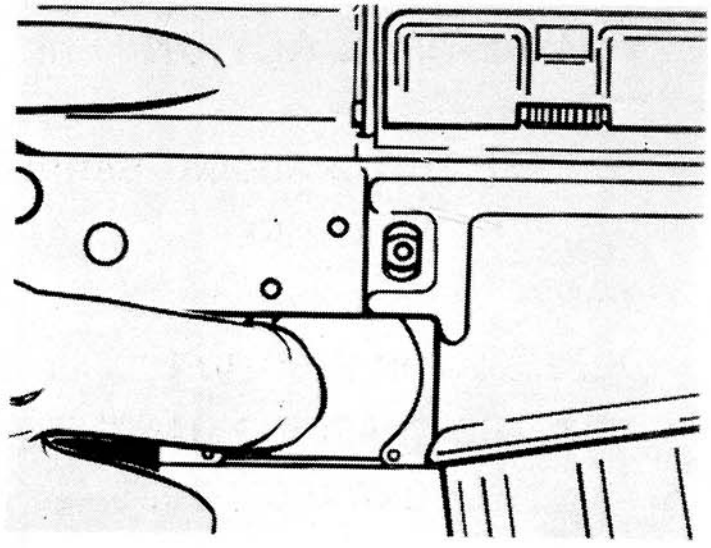
. . . watch for ejection.



After ejection, release the charging handle and . . .



. . . hit the forward assist; then, . . .



. . . attempt to fire.

IMMEDIATE ACTION

- RELEASE THE CHARGING HANDLE
- SLAP THE MAGAZINE
- SHOOT
- OBSERVE FOR EJECTION
- PULL THE CHARGING HANDLE
- TAP THE FORWARD ASSIST

Here are steps used to perform immediate action. But they are not in the right order. Put them in the right order and write your answer on the next page.

Now compare your answer with the answer on the next page.

IMMEDIATE ACTION

STEP 1- SLAP THE MAGAZINE

STEP 2- PULL THE CHARGING HANDLE

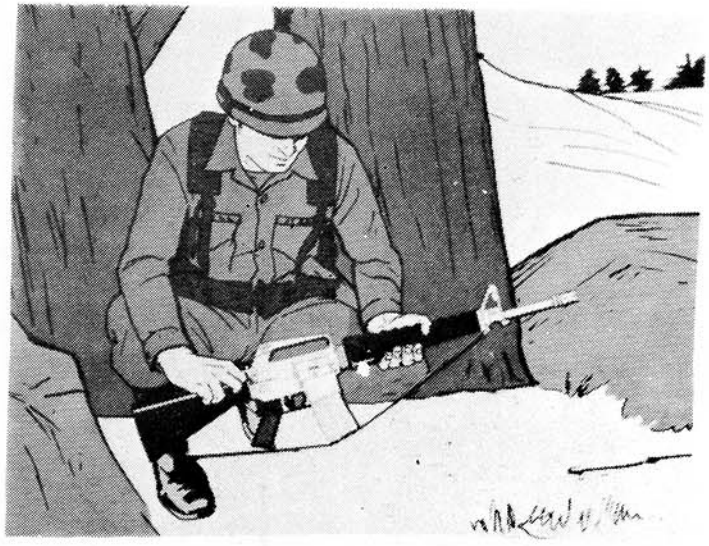
STEP 3- OBSERVE FOR EJECTION

STEP 4- RELEASE THE CHARGING HANDLE

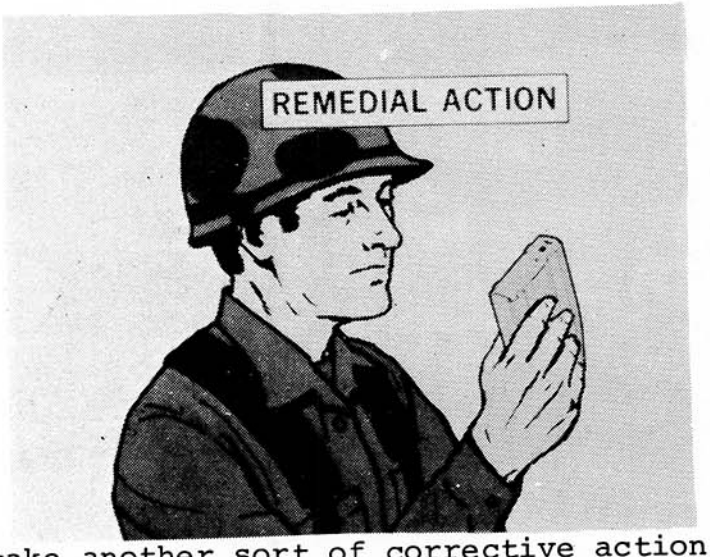
STEP 5- TAP THE FORWARD ASSIST

STEP 6- SHOOT

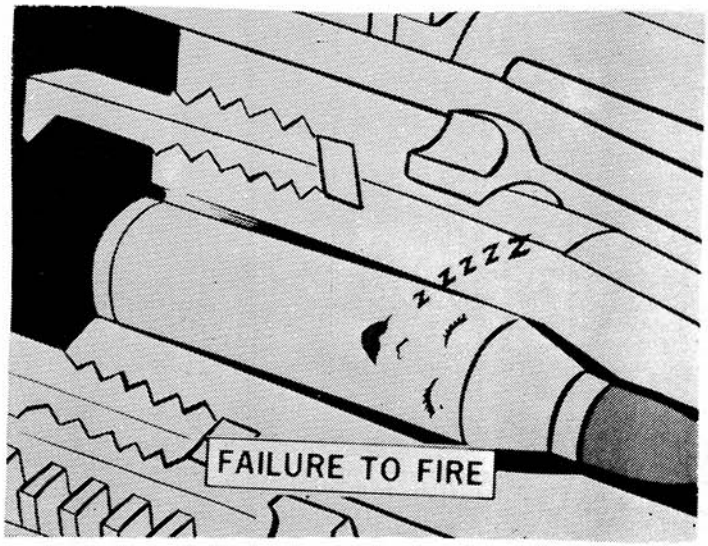
Did you get all the steps correct? If not study these steps before going on.



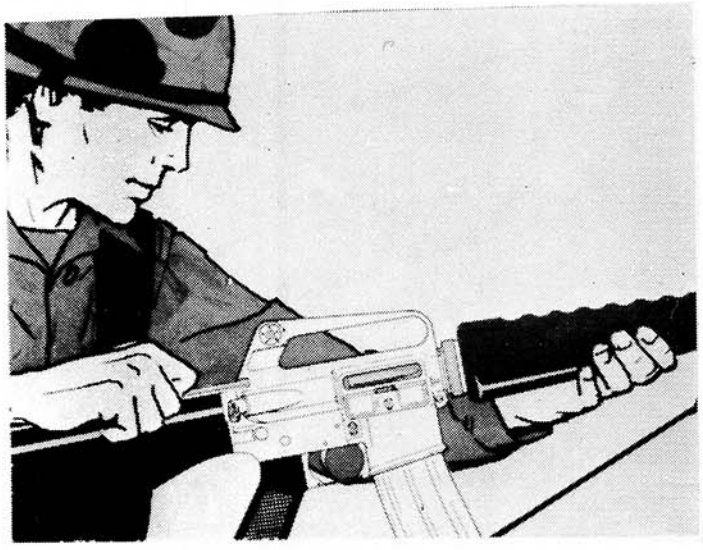
Okay, so you perform immediate action and the rifle still doesn't function. What do you do now?



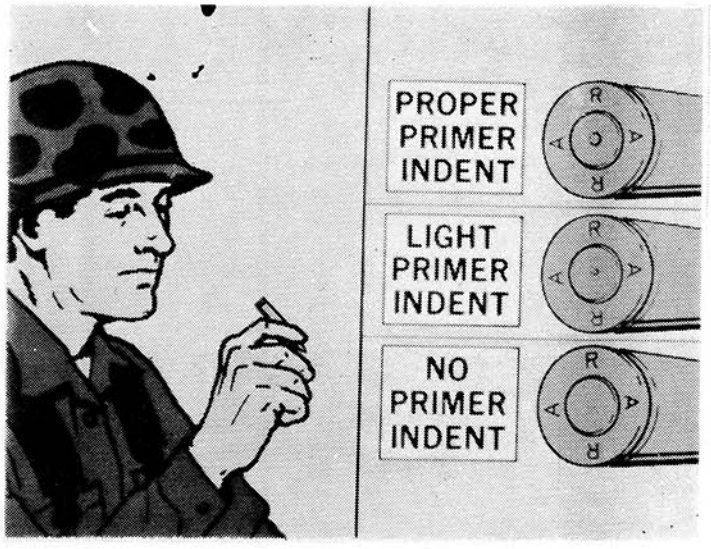
Well, you take another sort of corrective action, called remedial action. This is nothing more than inspecting the weapon to locate the cause of the malfunction and correcting it. Let's take the malfunctions in the order of the cycle of functions.



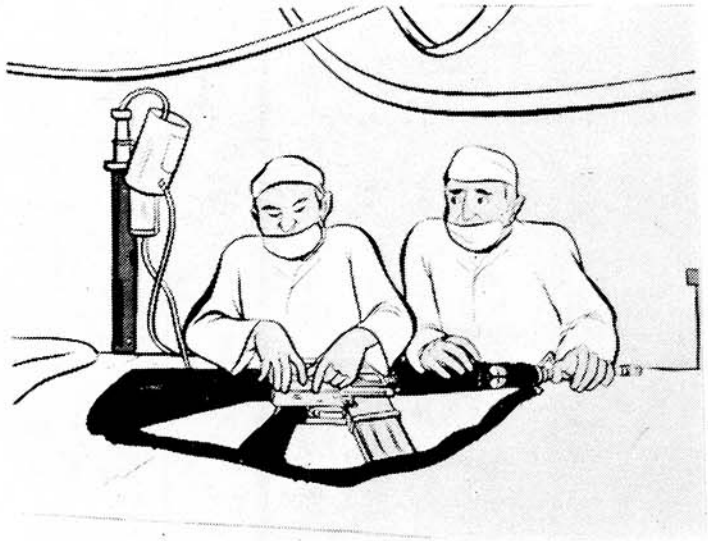
The first would be failure to fire. This malfunction is normally caused by a bad round, but it can also be caused by a carbon-fouled or broken firing pin.



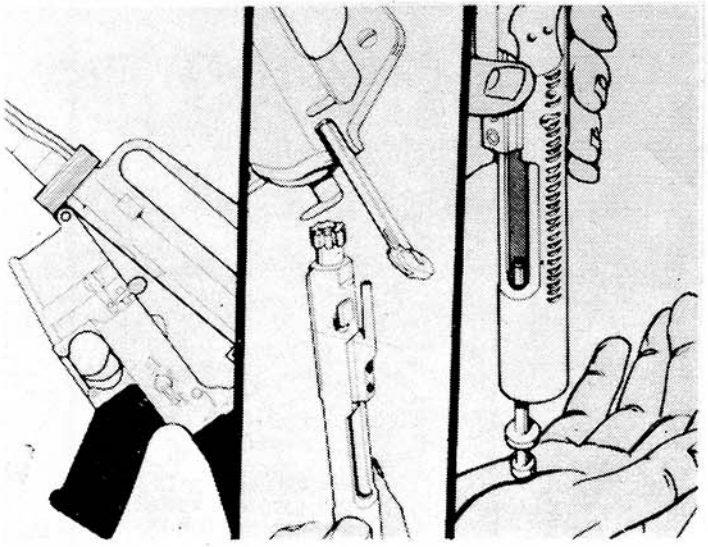
To correct failure to fire, apply immediate action. If the failure continues, . . .



. . . look at the ejected round. If the primer is properly dented, you have some bad ammo and must change magazines.



If the primer is not properly dented or if there are no dents in the primer, you'll have to pull a little surgery.



Break the weapon open, remove the bolt carrier group, take out the firing pin and clean it.

CAUSES OF FAILURE TO FIRE

1.

2.

Now it's your turn. What are the two possible causes of a failure to fire. Write your answer in the blank spaces above. Compare your answers with the next page.

CAUSES OF FAILURE TO FIRE

1. BAD ROUND:

2. FIRING PIN - DIRTY OR BROKEN

Here are the two causes of failure to fire. Now what action will correct the problems. Again write your answers above. Compare your answers with the next page.

CAUSES OF FAILURE TO FIRE

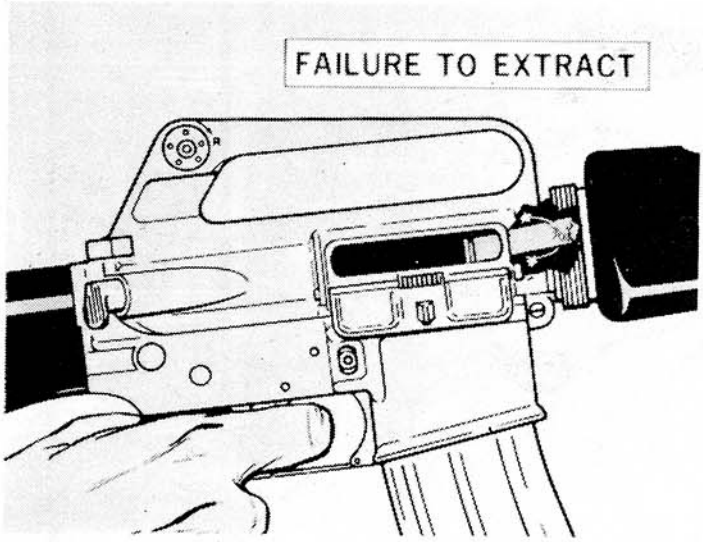
1. BAD ROUND: EJECT ROUND

2. FIRING PIN:

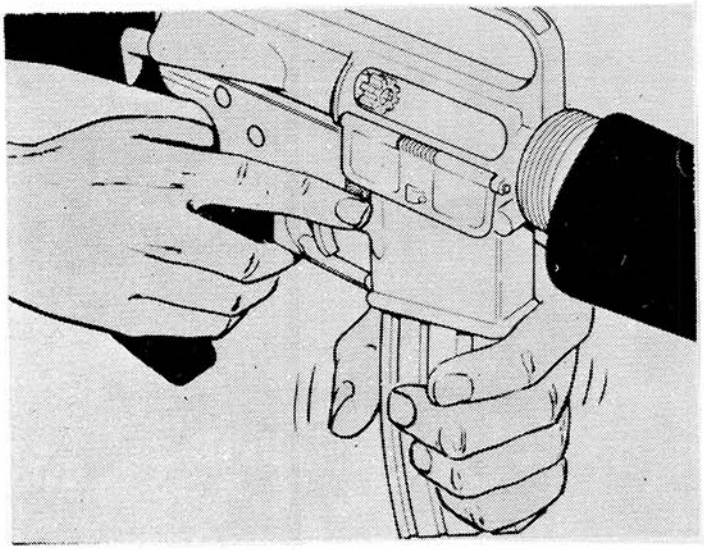
IF DIRTY - REMOVE AND CLEAN

IF BROKEN - REPLACE

If it's a bad round, eject it. If the malfunction continues after ejecting the round, remove and clean the firing pin or if it is broken--you'll have to get a new one.



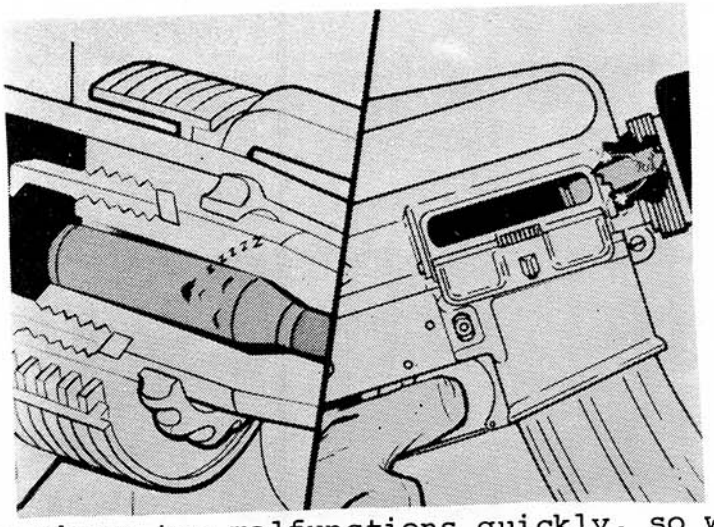
When the round fires, but the case doesn't leave the chamber, you've got a failure to extract. This is one of the trickiest malfunctions to correct.



First unload the rifle of <u>all</u> live rounds . . .

. . . then, gently tap the case out of the chamber with your cleaning rod. Check for debris in the chamber and clean it with your chamber brush. After you've cleaned the chamber, load the rifle and commence firing.

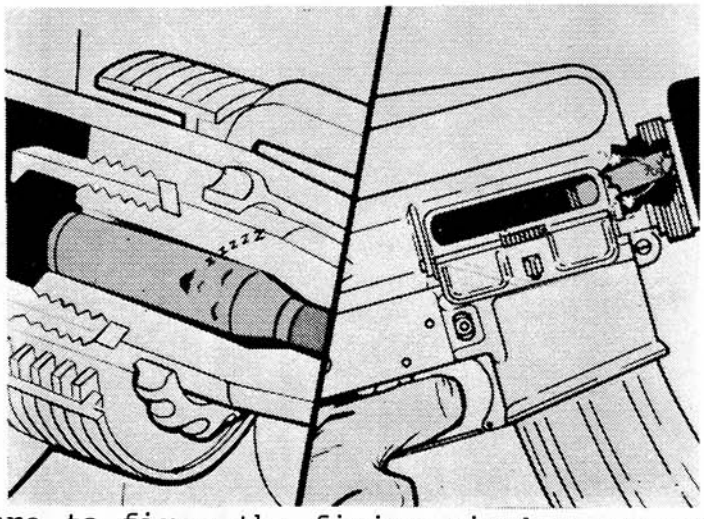
A



B

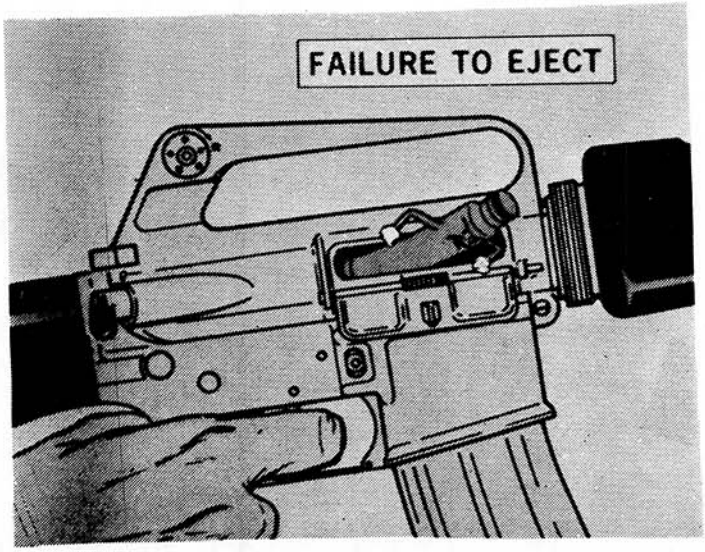
Let's review those two malfunctions quickly, so we don't forget them or get them confused. In A a round was fed correctly and you pulled the trigger and nothing happened. What kind of malfunction would that be? In B--the round hasn't left the chamber. What type of malfunction is this?

A

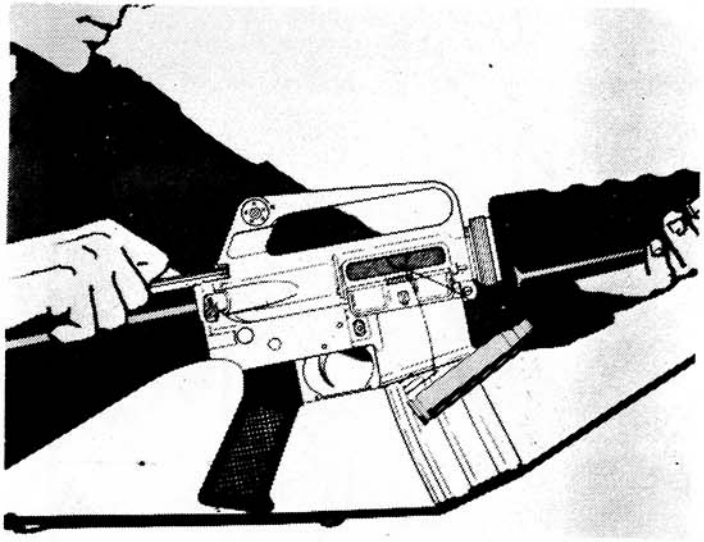


B

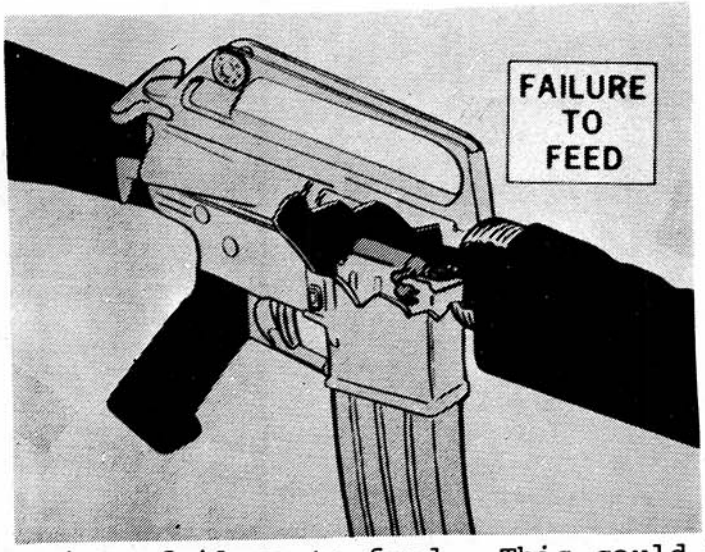
A is a failure to fire--the firing pin has struck the round but it did not fire. B is a failure to extract--the round hasn't been extracted from the chamber. Now, if the case leaves the chamber, but doesn't leave the rifle, what kind of malfunction is that?



That would be a failure to eject. What would you do with this fellow? What is your answer?

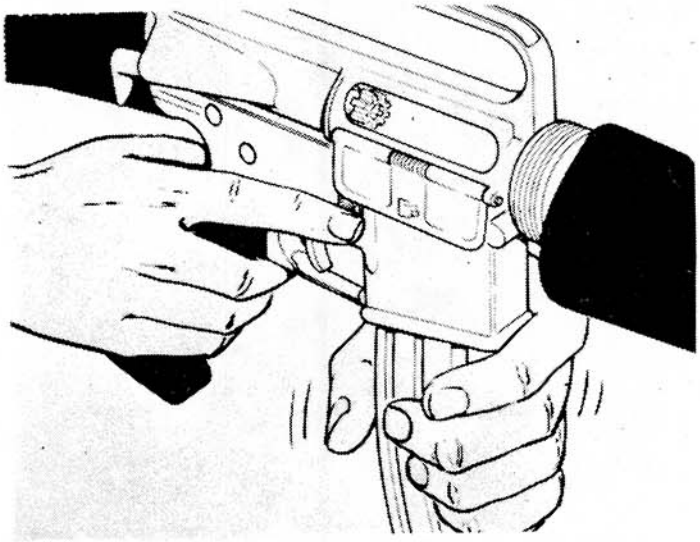


Get rid of the case by pulling the charging handle back. Make sure the next round is properly positioned before you release the charging handle to close the bolt and commence firing.



Finally, there is a failure to feed. This could happen with either the first round from the magazine or later rounds. The round wasn't stripped from the magazine properly to allow it to be chambered. A failure to feed is normally detected by a failure to fire.

Upon applying immediate action, you find the chamber is empty when the magazine is not. It is usually caused by an improperly loaded or damaged magazine. It can also be caused by a short recoil.



To correct this malfunction, simply change magazines and attempt to fire.

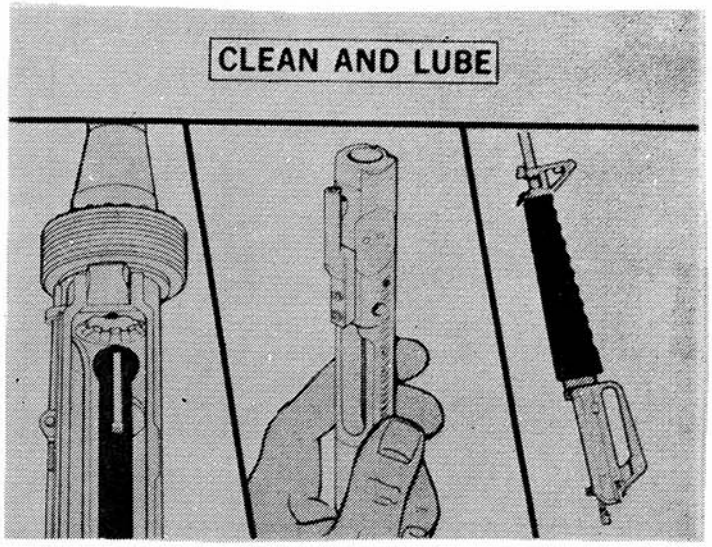
If the same thing happens again, the cause is probably a short recoil.

SHORT RECOIL

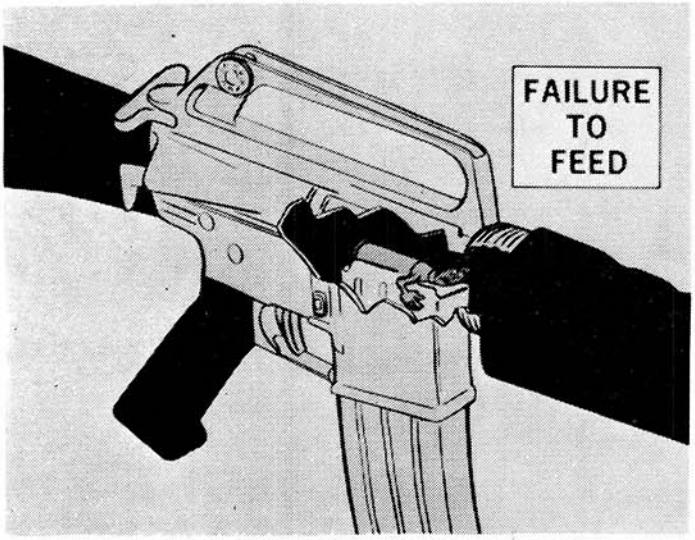
CAUSED BY DIRT

OR IMPROPER LUBE

A short recoil is caused by dirt or improper lubrication. You must clean and properly lube your rifle.



Take special care to clean and lube the gas tube, bolt carrier key, and the moving parts in the upper receiver.



What are the causes of a failure to <u>feed</u>? Write your answers below?

A.

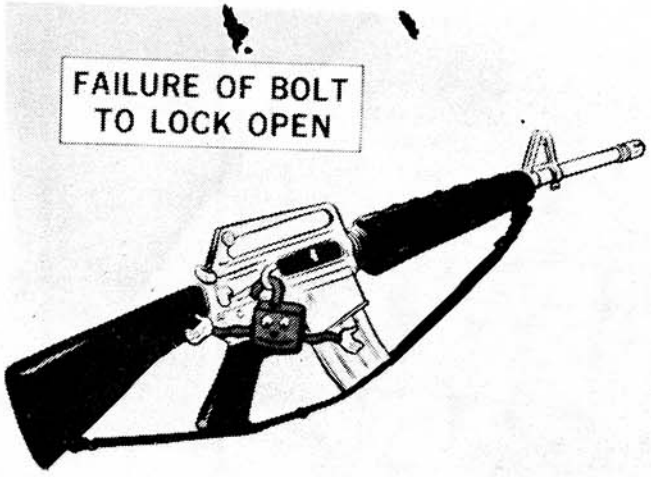
B.

FAILURE TO FEED CAUSED BY

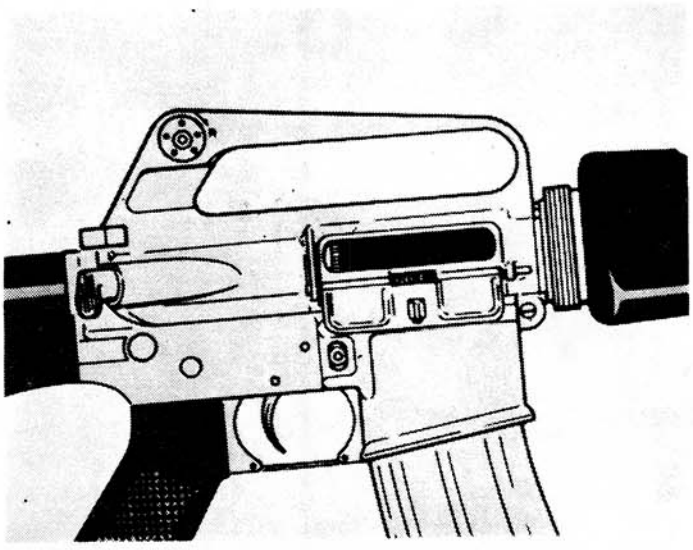
- **IMPROPERLY LOADED OR DAMAGED MAGAZINE**
- **SHORT RECOIL**

A failure to feed is normally caused by an improperly loaded or damaged magazine or a short recoil. If immediate action doesn't solve the problem, what is the next action you should take to correct a failure to feed?

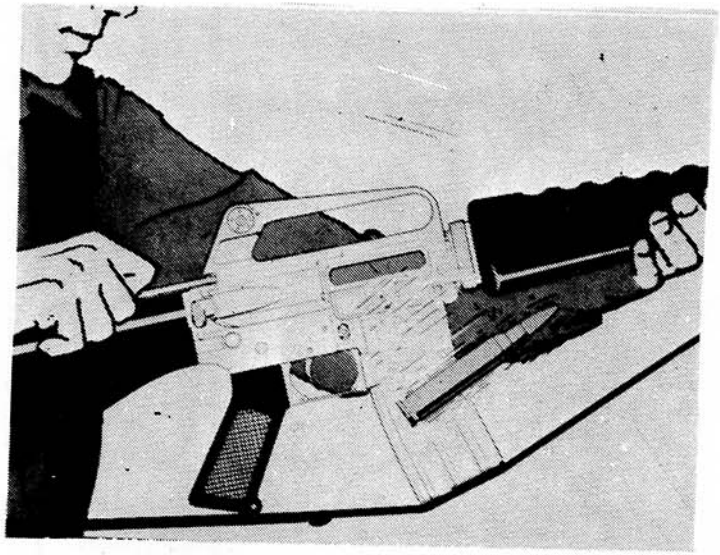
To correct a failure to feed, first change magazines and attempt to fire. If this doesn't work, break out your cleaning kit and start cleaning and lubing your rifle.



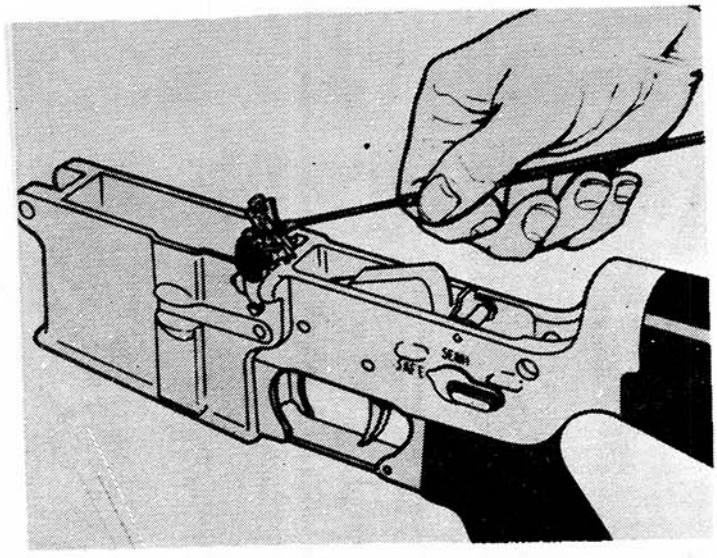
The last malfunction we'll deal with is not part of the normal cycle of function. It is failure of the bolt to lock open after the last round has been fired. When this failure occurs, you have no immediate visual check to determine whether a malfunction has interrupted firing, or the last round has been fired. The weapon appears to be in a normal bolt-closed position.



Normally, when the magazine is empty, the rifle should look like this--the bolt locked open. It's ready for another magazine. If yours doesn't do this, . . .



. . . go back to our old friend, the charging handle, and pull it all the way back; that should lock the bolt open. If it fails to lock open, operate the bolt manually. If that doesn't work . . .



. . . disassemble the rifle and inspect, clean, and lubricate the bolt catch mechanism.

COMMON MALFUNCTIONS

Okay, now you write down the five malfunctions we've discussed. Write your answers above.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

Here they are--failure to fire, failure to extract, failure to eject, failure to feed, and failure of the bolt to lock open. How can you prevent these malfunctions from occurring?

You can prevent most malfunctions through a constant program of proper maintenance. If a malfunction occurs, what is your first action? Write your answer here _____.

IMMEDIATE ACTION

The correct answer is immediate action. Now write down the six steps in performing immediate action. Write your answer on the next page.

IMMEDIATE ACTION

STEP 1- S LAP THE MAGAZINE

STEP 2- P ULL THE CHARGING HANDLE

STEP 3- O BSERVE FOR EJECTION

STEP 4- R ELEASE THE CHARGING HANDLE

STEP 5- T AP THE FORWARD ASSIST

STEP 6- S HOOT

Here they are. Compare your answer with the one above. If you aren't sure, study these steps before going on.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

Now let's review the corrective actions you would take for the five common types of malfunctions.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

First, what would you do to correct a failure to fire. Think your answer.

FAILURE TO FIRE

- EJECT THE ROUND
- IF IT CONTINUES, CLEAN FIRING PIN OR REPLACE IT

The first thing is to get rid of the bad round. If the malfunction continues you're probably going to have to clean the firing pin or replace it if it is broken.

What type of malfunction is this the corrective action for?

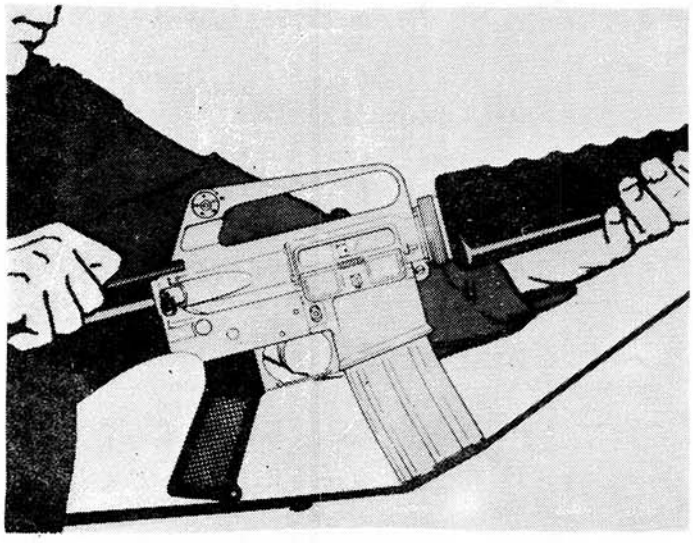
Answer _____.

It's that tricky failure to extract. Remember to unload all live rounds from the rifle and tap the case from the chamber with a cleaning rod.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

Next, how would you correct a failure to eject? Again write your answer _____.



Eject the round by pulling the charging handle to the rear, is the correct answer.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

Now describe what you would do to correct a failure to feed.

Answer_____.

FAILURE TO FEED

- **CHANGE THE MAGAZINE**

OR

- **CLEAN AND LUBE**

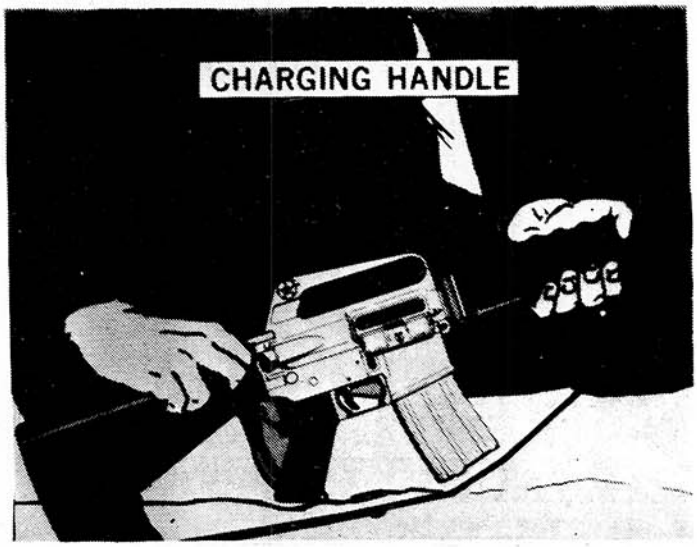
You may have to do two things in the event of a failure to feed . . . change the magazine or if that doesn't work, clean and lube your rifle.

COMMON MALFUNCTIONS

1. FAILURE TO FIRE
2. FAILURE TO EXTRACT
3. FAILURE TO EJECT
4. FAILURE TO FEED
5. FAILURE OF THE BOLT TO LOCK OPEN

One last question, what would you use to correct a failure of the bolt to lock open?

Answer _____.



The charging handle. If the corrective actions mentioned here don't work, you'll have to turn your weapon in to your company armorer. You have done all that you can do to get your rifle working.

Remember, the best way to handle malfunctions is to keep them from happening--through proper maintenance. But when they do occur, act quickly and with common sense.

In this lesson, you learned how to prevent and correct common malfunctions of the M16A1 rifle when they occur. Remember, the major weakness of the M16A1 rifle is you. Make sure you properly handle and take care of her.

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ST 7-194 FY 75

UNITED STATES ARMY

LOW LIGHT LEVEL SIGHT SYSTEM

UNITED STATES ARMY INFANTRY SCHOOL
FORT BENNING, GEORGIA

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United States Army Infantry School
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Fort Benning, Georgia 31905

for comment and forwarding to the responsible department.

LOW LIGHT LEVEL SIGHT SYSTEM

TABLE OF CONTENTS

Section I. General

Purpose. The purpose of this special text is to provide the soldier with the essential background knowledge and employment techniques required to use the Low Light Level Sight System during periods of limited visibility as well as during periods of unrestricted visibility.

General. The initial production of the sights discussed in this special text were commonly referred to as the "Promethium Sights". This term evolved as the result of the luminous material, used in the front sight to produce the glow, being Promethium. The possible use of a different luminous material in future production of the sights has necessitated the adoption of a more general term. Thus the term "Low Light Level Sight System". Throughout the remainder of this text; however, the Low Light Level Sight System will be referred to as the Promethium Sight.

Instructions. 1. Study all material covered in this special text prior to firing any weapon equipped with the Low Light Level Sight System.

2. The use of the Low Light Level Sight System and automatic fire (3-round bursts) was developed to increase the soldiers combat effectiveness during periods of limited visibility. It is not intended to deemphasize the importance/superiority of a single well aimed shot when possible nor to eliminate the requirement to train soldiers in the pointing technique presently being taught in Basic Combat Training.

Section II. Background

The American soldier's combat effectiveness during periods of limited visibility has alwasy been hindered by his inability to quickly and accurately aline his weapon on target without the aid of a night vision device. Such field expedients as luminous tape or paint placed on the sights have been used to assist in the alinement of the weapon during periods of limited visibility. These expedients have obvious short comings, e.g., the material not being readily available and coming off the sights after limited use. An interim solution to this problem has been the development of the Promethium Sight and its subsequent adoption as a product improvement to selected M16A1 rifles.

Section III. Characteristics

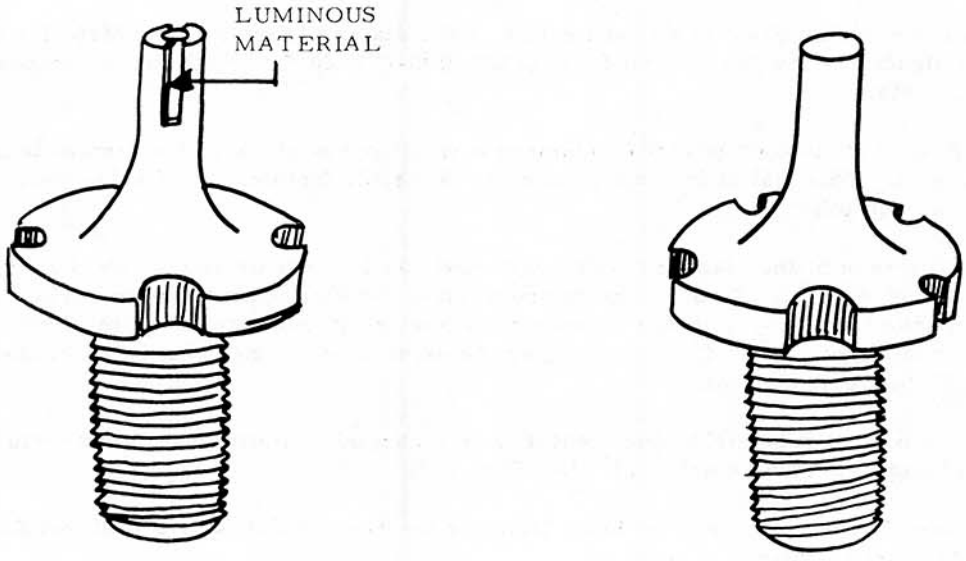
1. The Promethium Sight is a modification of the standard sights of the M16A1 rifle. The modified sights are available in kit form (FSN 1005-071-8030). Each kit is composed of the following parts:

a. A split front sight post which houses a small pyrex glass vial of luminous material (A, Figure 1). This vial of luminous material is visible from only two sides which are directly opposite each other.

NOTE: The base of the standard front sight post has five evenly spaced notches cut into it (B, Figure 1). To optimize the position of the vial of luminous material in relation to the firer's eye, it was necessary to have only four notches on the Promethium front sight. The effect of changing the number of notches will be discussed in Section V (battlesight zero).

b. A modified rear sight which features an enlarged (7-mm) unmarked aperture and a (2-mm) aperture marked "L" (A, Figure 2).

2. The installation of the Promethium Sights is the responsibility of the Direct Support and/or General Support Maintenance Unit.

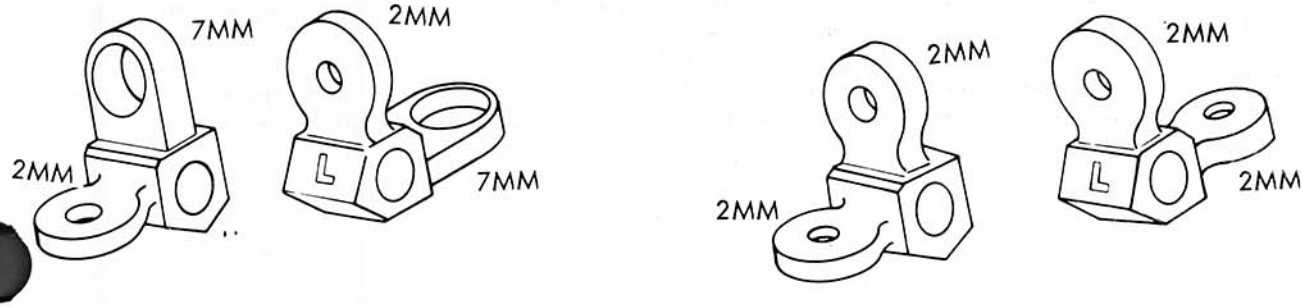


A. Promethium Sight. B. Standard Sight.

FIGURE 1. Front sight for promethium and standard sights for M16A1 rifles.

LOW LIGHT LEVEL SIGHT

STANDARD DAYLIGHT SIGHT



A. Promethium Rear Sight. B. Standard Rear Sight.

FIGURE 2. Rear sight for promethium and standard sights for M16A rifles.

Section IV. Special Precautions

1. The normal practice of blackening the front sight post to reduce glare can be used on any weapon which has a Promethium front sight installed. Direct exposure to flame can cause scorching of the pyrex glass if exposure is prolonged.

2. The firer must carefully clean the smudge off the glass vial to restore its effectiveness during periods of limited visibility. This is best done with a toothbrush and RBC.

Section V. Battle Sight Zero

1. The procedures for sight manipulation outlined in FM 23-9 are the same with the Promethium Sights as with the standard sights. However, there are some differences in the battlesight zero procedure.

a. To optimize the position of the vial of luminous material to the firer's eye, it was necessary to reduce the number of notches in the base of the front sight post from five to four, which also reduced the number of clicks per revolution from five to four. The reduced number of clicks per revolution increases the distance that one click of elevation will move the strike of the projectile. With the Promethium front sight one click of elevation will move the strike .875cm at 25 meters. The elevation and windage rule discussed in FM 23-9 may still be applied when making windage changes. The rule can also be used for elevation changes and the firer may substitute the constant factor of .875cm for .7cm in the rule. Limited practical experience with the sight system indicates that this substitution is not necessary and the presently used two clicks of elevation or windage per square on the standard 25-meter battle sight zero target (FSN 6920-906-0169) may still be used. The reason for this is, the difference between .7cm and .875cm per click of elevation is not significant enough to be considered during actual firing by most shooters.

b. The "unmarked" rearsight aperture previously used to obtain a battlesight zero with the standard sights (B, Figure 2) has been enlarged to 7-mm (A, Figure 2). Because of this modification it is necessary to zero the rifle with the 2-mm aperture marked "L".

c. The split front post is constructed so as to expose the vial containing the luminous material on a 180-360 degree axis. After establishing a battlesight zero with a weapon equipped with the Promethium front sight, the vial of luminous material may not be in alinement with the firer's eye. Should this occur it will be necessary to rotate the front sight post one click until its luminous portion is visible to the firer. This action will slightly alter the daytime zero setting, but will have little effect when engaging targets out to 300 meters.

2. Soldiers armed with weapons which have been battlesight zeroed (250 meters) with the Promethium Sights no longer have the capability of flipping to the aperture marked "L" and automatically extending the zero to 375 meters. Any target engagement beyond 250 meters (the original battle sight zero) must be accomplished by applying "hold-off," i.e., aiming above the desired point of impact. The amount of "hold-off" taken will depend on the distance to the target. To become and remain proficient in applying "hold-off" requires practice.

Section VI. Employment Techniques

1. The Promethium Sights when installed on the M16A1 rifle increases the soldier's ability to obtain sight/weapons alinement during periods of limited visibility. The mode of fire which the soldier will use to engage targets will depend upon how well he can define the target.

NOTE: Only a limited number of M16A1 rifles will be equipped with the Promethium Sights.

a. When ambient light conditions are such that targets can be detected and their outline established, the firer aims and obtains a good sight picture in the same manner as during daylight hours, i.e., obtains sight alinement by centering the top of the luminous portion of the front sight post both vertically and horizontally within the 7-mm aperture, adjusts his point of aim onto the center of visible mass of the target (Figure 3), and squeezes off a single round.

NOTE: The Night Record Fire range is an excellent facility for training soldiers in the use of semiautomatic fire with Promethium Sights.

b. Under certain light conditions the firer may be able to see the luminous front sight but unable to determine the exact location of the 7-mm rear sight aperture. To insure that he is

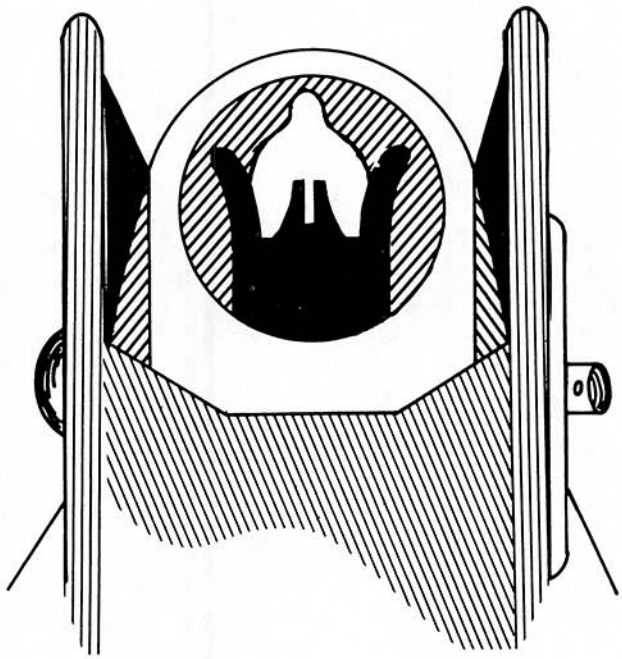


FIGURE 3. Sight picture using Promethium Sight.

in fact looking through the rear sight aperture and not over or to the side of it, the firer must practice obtaining the proper stock weld. Practice must continue until the firer is able to instinctively obtain the proper stock weld which enables him to see through the rear sight aperture. The firer then completes the sight picture by placing the luminous portion of the front sight post onto the target, and fires a single round.

c. During daylight firing, the 2-mm aperture marked "L" (A, Figure 2) is used for the engagement of targets at all ranges out to the maximum effective range of the weapon. This is accomplished by aiming at the center of visible mass out to the reange of 250 meters and applying "hold off" from 250 meters to the maximum effective range (460 meters). The amount of "hold off" to be taken will depend on the range to the target.

d. The Promethium Sight is also expected to permit accurate fire under artificial illumination because the firer will be able to see through the 7-mm aperture and attain sight alinement. The firer can not usually see through the 2-mm aperture because of the flickering shadowy nature of artificial illumination.

NOTE: The Promethium Sight may prove to be more effective than quick fire for daylight engagement of close in targets which must be accurately engaged within extreme time pressure limitations. The large rear aperture may also be the most effective sight against moving or fleeting targets during daylight when the shot must be fired quickly before the target disappears.

Section VII. Firing Positions

The use of the Promethium Sight during daylight and periods of limited visibility does not require altering any of the six standard firing positions. They are assumed and modified in either case as the tactical and training situation dictate and are equally applicable to the defense as well as the offense.

Section VIII. Training

In all cases, where the Promethium Sights are used during training, the soldier should also receive instruction in the pointing technique as is presently being taught in Basic Combat Training (BCT). This is necessary for three reasons. First, not all M16A1 rifles will be equipped with the Promethium Sights; second, a working knowledge of the pointing technique will allow the rifleman to remain relatively effective should the vial of luminous material become damaged or broken; and third the Promethium Sight is not a night sight.