Manual No. CM 101

COLT'S AUTOMATIC RIFLE

MODEL M16
AND
MODEL M16A1

OPERATION AND MAINTENANCE

INSTRUCTIONS

July 1972

Colt Industries

Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102

A division of the Colt Industries Operating Corp

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Hartford, Connecticut 06102

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Colt Industries
Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102
A division of the Colt Industries Operating Corp

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Colt Industries
Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102
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CHAPTER I - INTRODUCTION

Section 1 - Scope of Manual

1 - 1. Scope

This manual contains instructions for the operation and maintenance of the 5.56mm Automatic Rifle, Models M16A1 (Fig. 1 - 1) and M16 (Fig. 1 - 2).

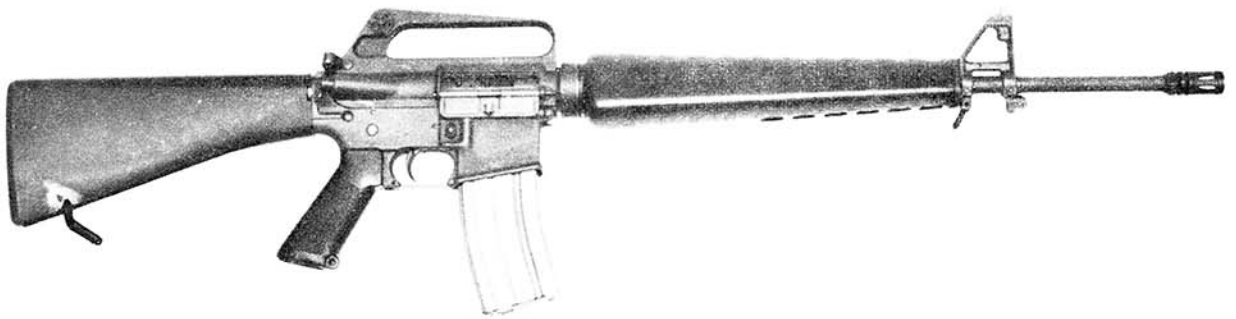

Figure 1 - 1. M16A1 Automatic Rifle
shown with 30 Round Magazine

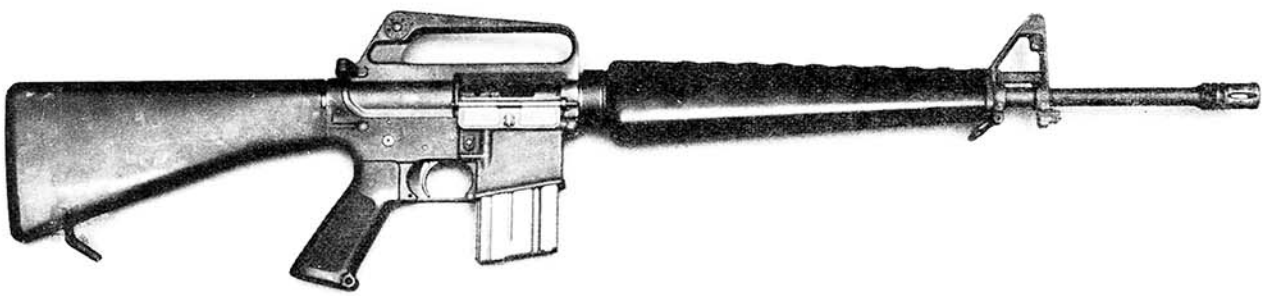

Figure 1 - 2. M16 Automatic Rifle
shown with 20 Round Magazine

1 - 2. Recommendations for Improvement of this Manual.

User reports of errors or omissions and recommendations for improving this manual are encouraged.

It is requested that such reports be submitted to:

Colt Industries
Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102

Section 2 - Description and Data

1 - 3. Description (Refer to Figure 1 - 3, page 3)

The Automatic Rifle is a lightweight, air cooled, gas operated, magazine fed, shoulder weapon. It is capable of semiautomatic or automatic fire. The rifle accommodates the U. S. Model M7 Bayonet-knife. The rifle is easily opened to expose the working parts for inspection and cleaning. A brief description of the major components of the rifle follows:

1-3.1 Upper Receiver and Barrel Assembly Group.

1-3.1.1 Barrel Group.

The barrel group consists of the barrel and barrel extension assembly, the front sight group, the flash suppressor, barrel nut and slip ring assembly, and the left and right handguards. The front sight group is comprised of the forward sling swivel assembly, the front sight and gas tube assembly, and the front sight post which is adjustable vertically for elevation. The handguards have heat resisting inner shields.

1-3.1.2 Upper Receiver Group.

The upper receiver group contains the upper receiver, bolt carrier assembly, forward assist assembly (Model M16A1 only), charging handle, ejection port cover assembly, and mounting provisions for the barrel assembly. The top of the upper receiver is in the form of a carrying handle which contains the rear sight group, adjustable laterally for windage, and provision for mounting a riflescope.

1-3.2 Lower Receiver and Buttstock Assembly.

The lower receiver and buttstock assembly consists of the lower receiver, the pistol grip, lower receiver extension, and buttstock. The

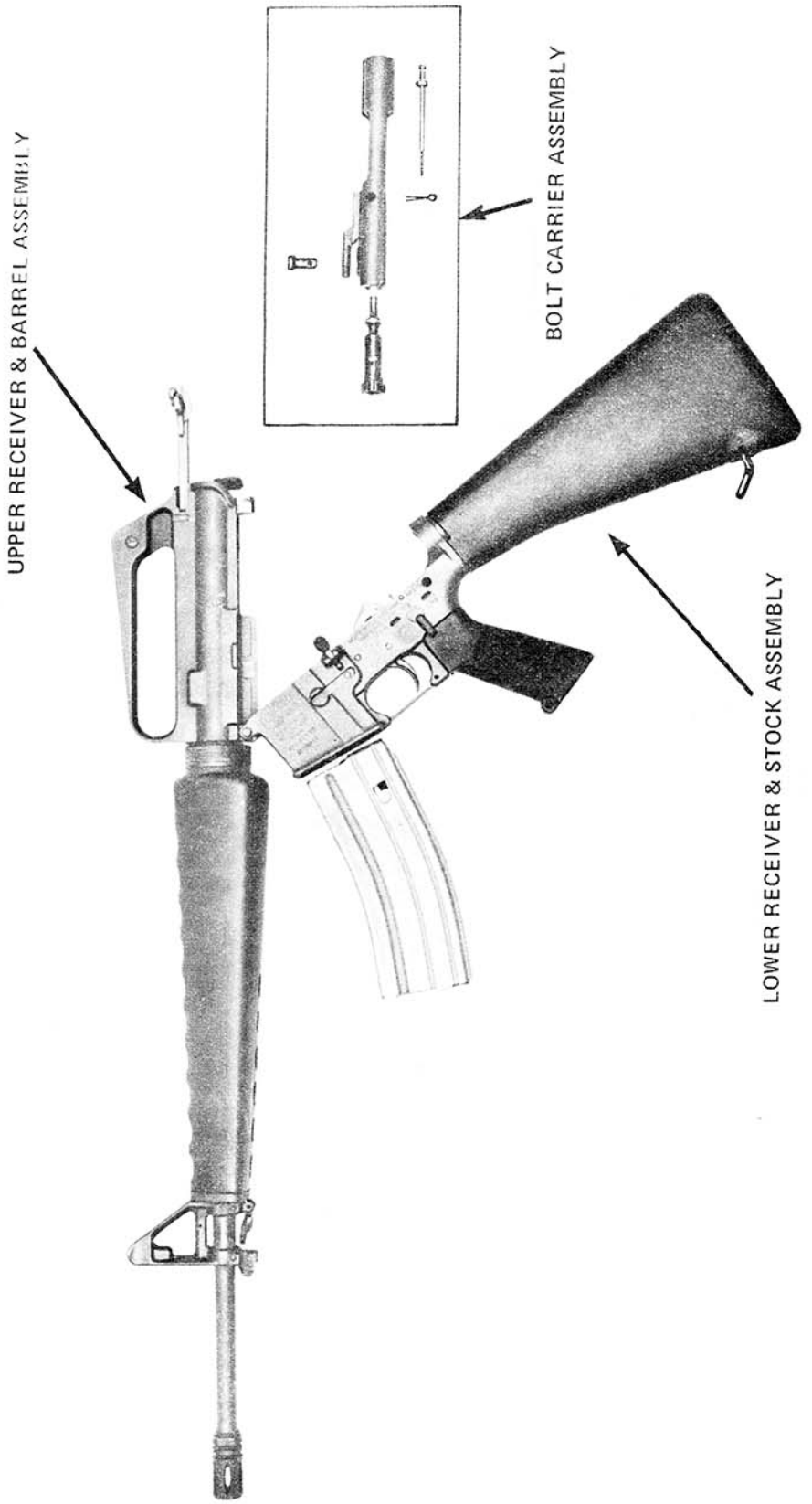

Figure 1 - 3a. M16 & M16A1 Automatic Rifle Major Groups

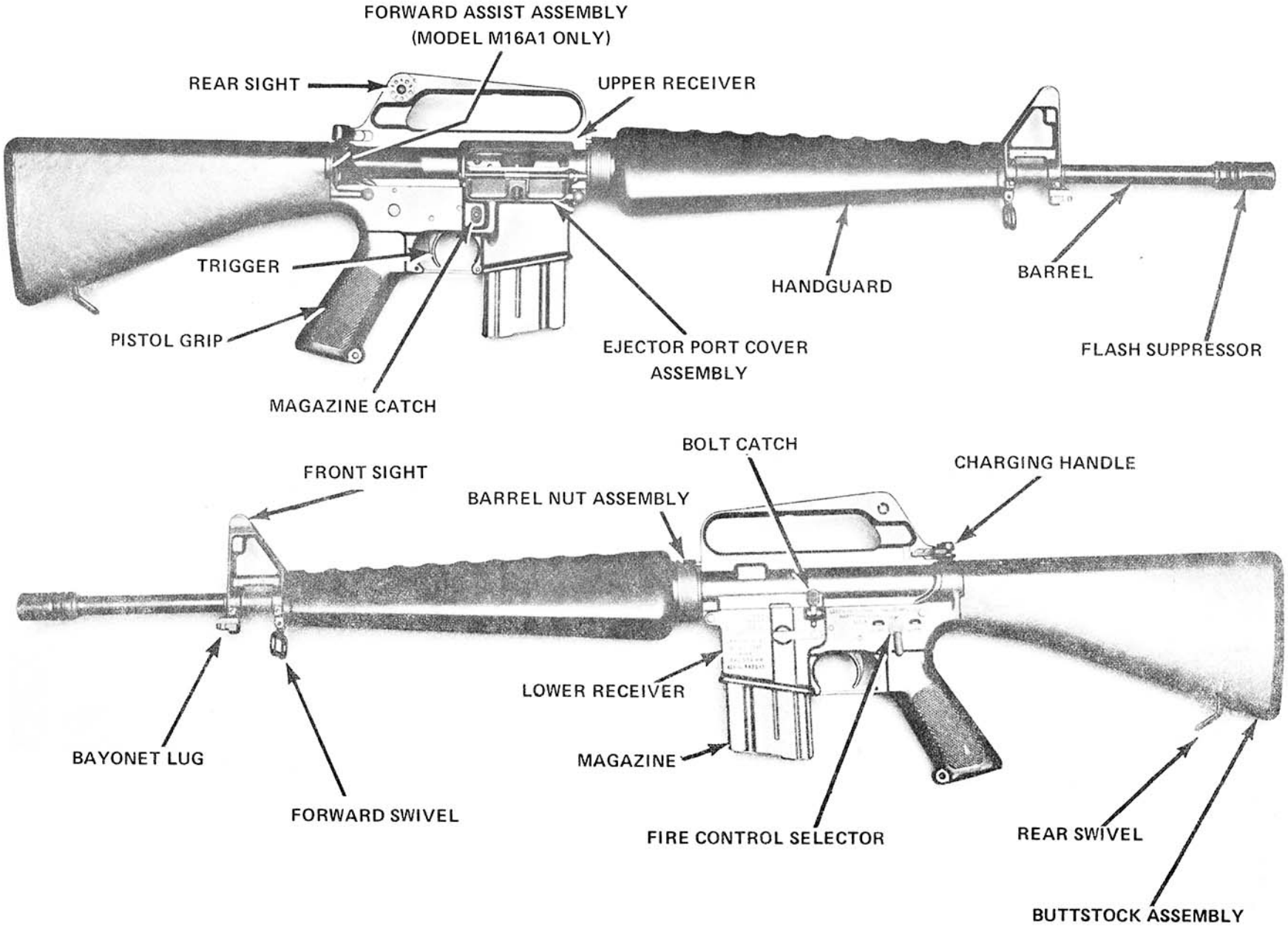

FIGURE 1 - 3b M16 & M16A1 RIFLE PARTS

lower receiver contains the trigger, fire control selector, bolt catch, disconnect, automatic sear, and magazine catch. The receiver extension, which is the mounting device for the buttstock, contains the buffer assembly and the action spring. The receivers are made of aluminum alloy, durable yet light in weight. The buttstock and pistol grip are made of high impact plastic material.

1-3.3 Bolt Carrier Assembly. (See Figure 1-4)

The bolt carrier assembly consists of the bolt carrier, bolt assembly, firing pin, firing pin retaining pin, cam pin, extractor assembly and ejector. The rotary bolt locking action is one of the mechanical features of the rifle. The bolt and barrel extension contain locking lugs which engage and lock the bolt firmly to the barrel extension. The initial force of the cartridge explosion is absorbed by the barrel, barrel extension, and bolt.

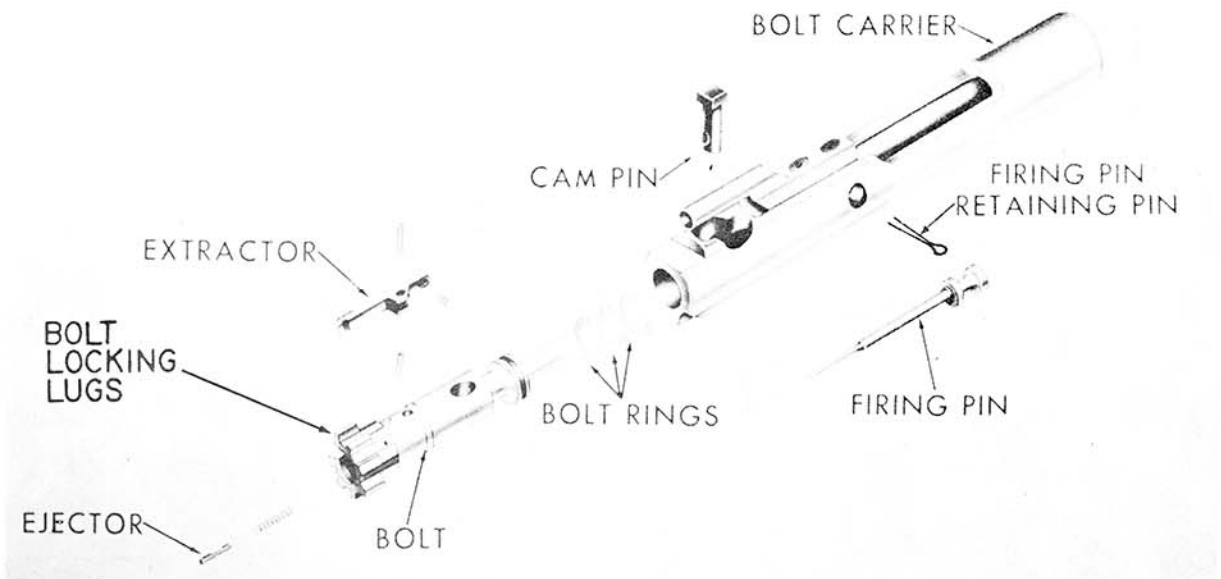

Figure 1-4. Bolt Carrier Assembly.

1 - 4. Tabulated Data

Weight:	
Model M16 Rifle without magazine, sling & cleaning equipment	6.8 lb.
Model M16A1 Rifle without magazine and sling	7.0 lb.
Sling	0.4 lb
Empty magazine (20 rd)	0.2 lb
Empty magazine (30 rd)	.25 lb
Loaded magazine (20 rd)	0.7 lb
Loaded magazine (30 rd)	1.0 lb
Model M16 Rifle with sling and loaded magazine (20 rd)	7.9 lb.
Model M16 Rifle with sling and loaded magazine (30 rd)	8.2 lb.
Model M16A1 Rifle with sling and loaded magazine (20 rd)	8.1 lb.
Model M16A1 Rifle with sling and loaded magazine (30 rd)	8.4 lb.
Length:	
Rifle with flash suppressor	39 in
Barrel	20 in
Barrel with flash suppressor	21 in
Mechanical Features:	
Rifling, R.H., 6 grooves, 1 turn in	12 in
Method of operation	Gas
Type of breech mechanism	Rotating Bolt
Method of feeding	Magazine
Cooling	Air
Ammunition:	
Caliber	5.56 mm (Cal .223)
Type	Ball, blank, dummy,and tracer
Firing characteristics:	
Muzzle velocity (approx)	3,250 f/s
Muzzle energy	1,270 ft-lb
Chamber pressure (max)	52,000 psi
Cyclic rate of fire	700 to 950 rds/min
Maximum rate of fire:	
Semi-automatic	45/65 rds/min
Automatic	150/200 rds/min
Sustained rate of fire	12/15 rds/min
Maximum range	2,653 meters
Maximum effective range	460 meters

1-5. Difference in Models.

The Model M16A1 Rifle (Fig. 1 - 1, page 1) differs from the Model M16 Rifle (Fig. 1 - 2, page 1) in that it contains a forward assist assembly. The forward assist assembly, when pressed forward, forces the bolt into the locked position.

Colt Industries

Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102

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CHAPTER II – OPERATION

Section 1 - Cycle of Operation

2-1. Cycle of Operation

The cycle of operation of the M16 & M16A1 Rifle is described as follows:

2-1.1 Cocking (before firing).

The rifle is cocked before firing by pulling the charging handle rearward which pulls the bolt carrier group to the rear. As the carrier moves rearward, it cocks the hammer. If an empty magazine is installed at the time of cocking, the magazine follower will actuate the bolt catch to hold the carrier to the rear. If a loaded magazine is installed in the gun or the magazine is removed, the bolt catch must be manually operated to hold the bolt to the rear.

2-1.2 Feeding and Chambering.

To feed a cartridge into the chamber, the bolt carrier group must be pulled to the rear by the charging handle or held there by the bolt catch. With a loaded magazine installed, the charging handle or the bolt catch is released and the action spring drives the carrier forward. As the carrier moves forward, the lugs of the bolt pick up a cartridge from the magazine (See Figure 2-1, page 8) and feed it into the chamber. (See Figure 2-2, page 8). As the bolt locking lugs enter the barrel extension, the ejector is compressed against the left side of the cartridge head and the extractor snaps into the extractor groove on the right side of the cartridge.

2-1.3 Locking. (See Figure 2-3, page 9)

When the forward motion of the bolt and cartridge are stopped by the chamber, the bolt carrier continues forward until it is stopped by contact with the rear face of the barrel extension. This last portion of the forward travel of the carrier rotates the bolt through the action of the cam slot in the carrier on the cam pin in the bolt. This engages the bolt lugs with the barrel extension lugs to lock the bolt in battery. The bolt, when so locked, is said to be "closed".

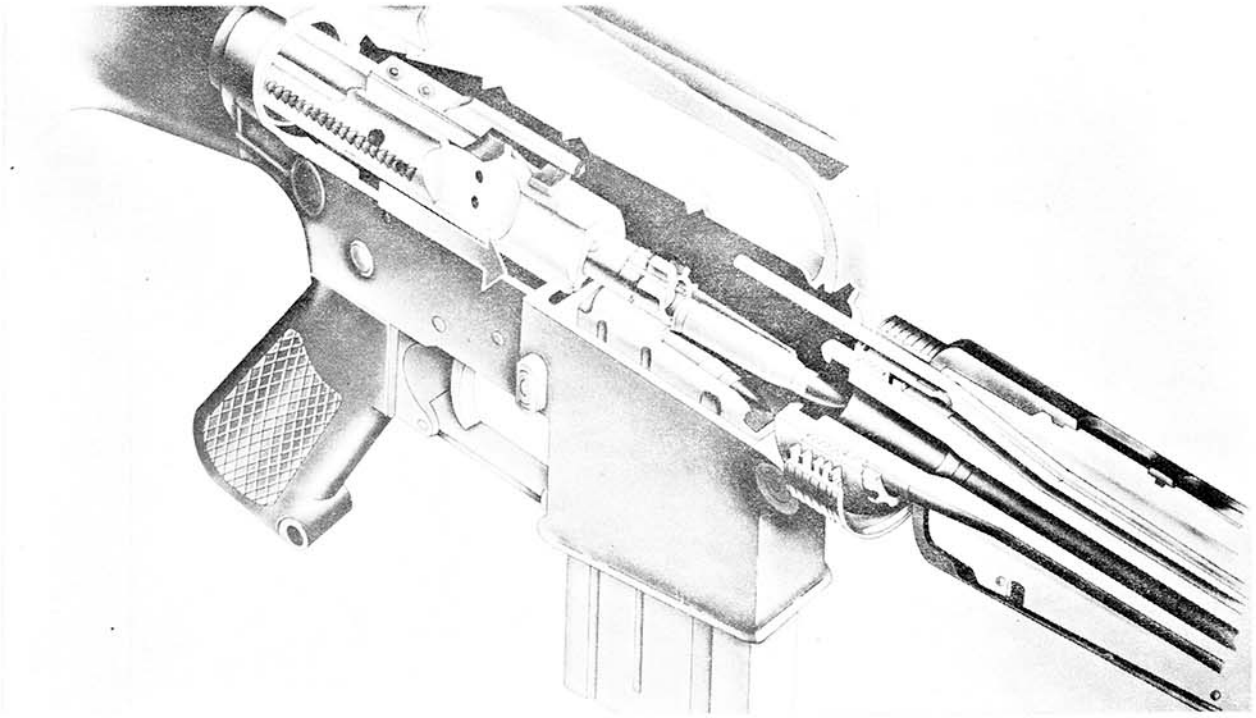


Figure 2-1. Feeding.

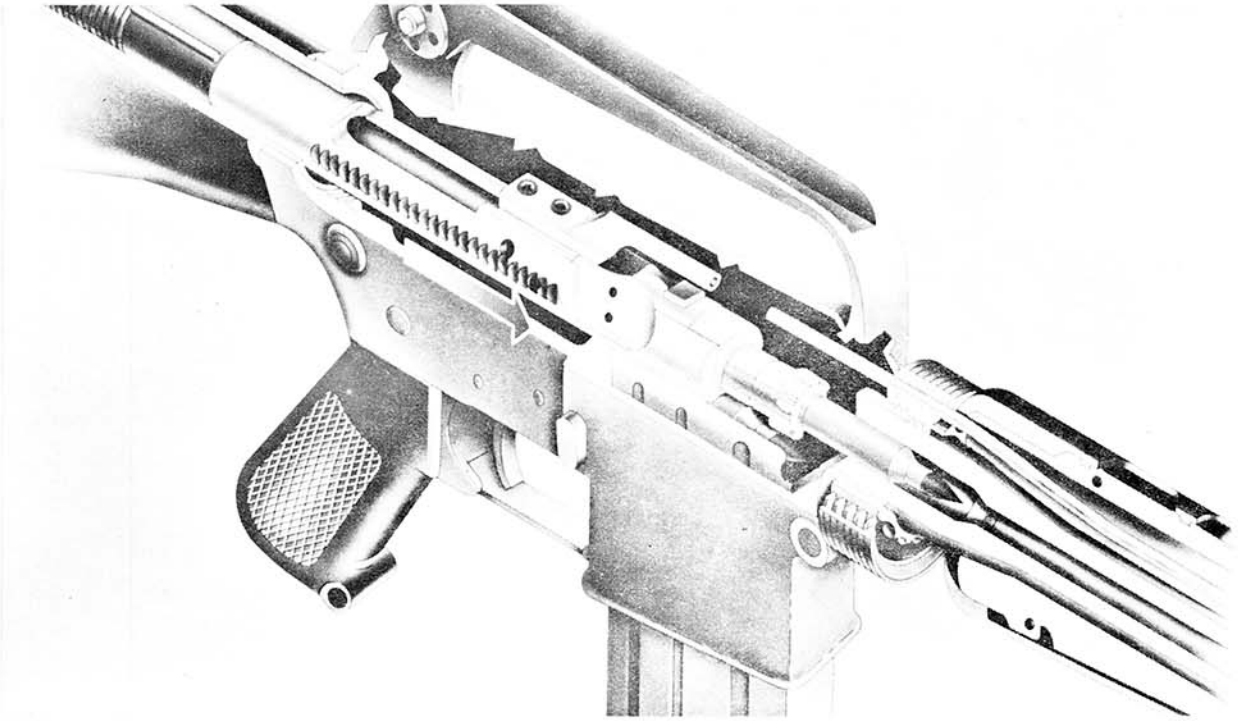


Figure 2-2. Chambering.

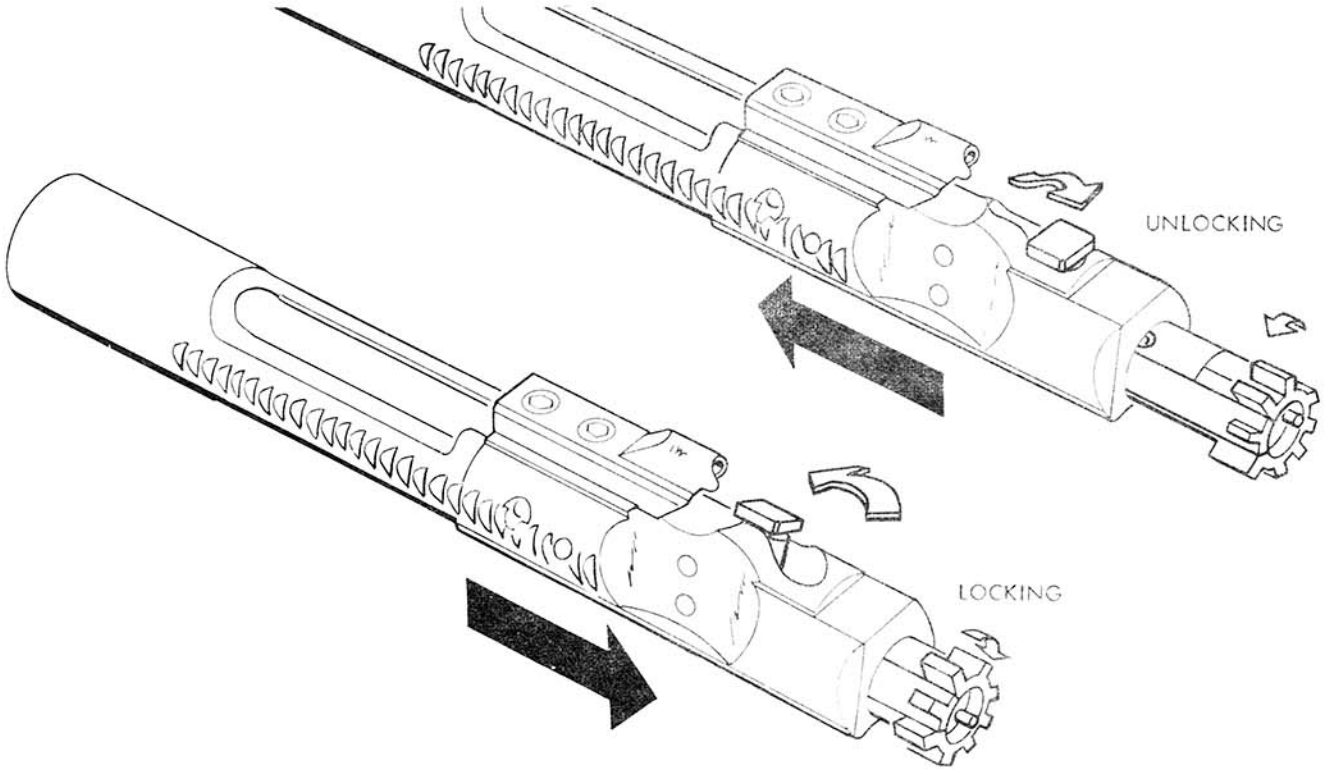


Figure 2-3. Locking.

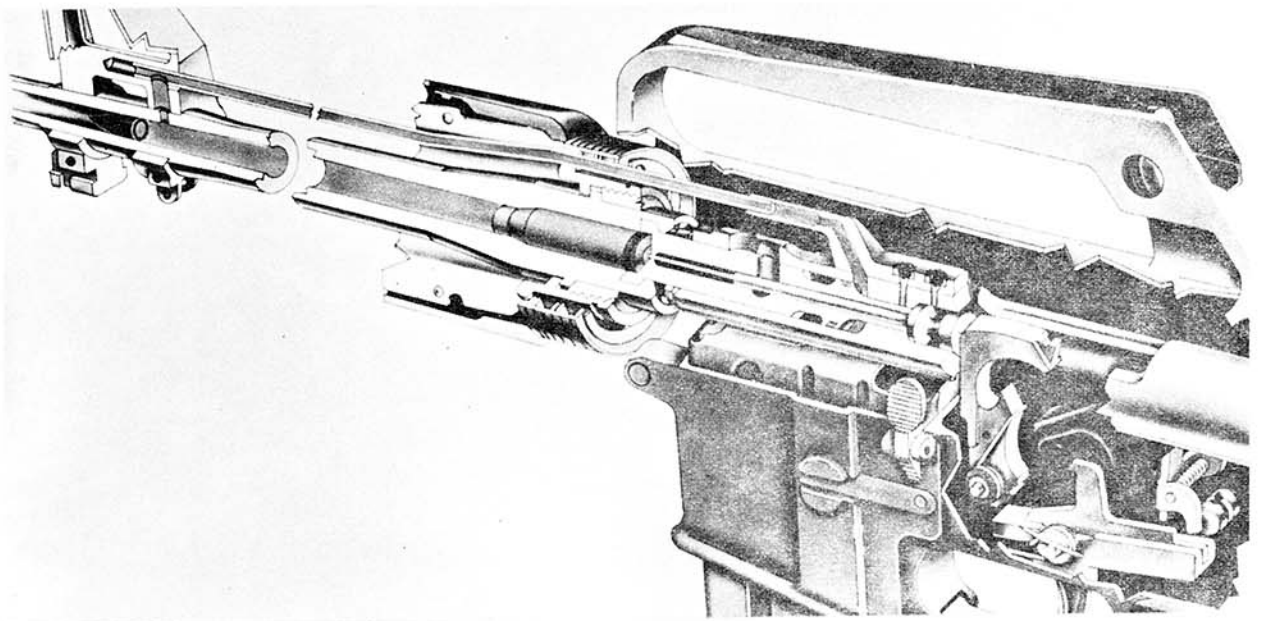


Figure 2-4. Firing.

2-1.4 Firing. (See Figure 2-4, page 9).

With the fire control selector, located on the left side of the lower receiver (Fig. 2-10, page 15) set to either "Auto" or "Semi", the rifle may be fired. When the trigger is pulled, it causes the sear to release the hammer. The hammer spring then drives the hammer against the firing pin, which then strikes the cartridge primer to discharge the chambered round.

2-1.5 Unlocking. (See Figure 2-3, page 9).

As the pressure of the gas generated by the burning propellant drives the projectile down the barrel and past the gas port, a small quantity of the gas is bled off through the gas port, gas tube, and bolt carrier key into a cylindrical section in the bolt carrier where it expands and drives the bolt carrier rearward. During the first rearward travel of the carrier, the bolt is rotated by the cam pin acted on by the bolt carrier cam slot. This rotation disengages the bolt lugs from the barrel extension lugs so the bolt is unlocked. The carrier then continues rearward with the unlocked bolt.

2-1.6 Extraction. (See Figure 2-5, page 11).

As the bolt is moved rearward by the carrier, the extractor, which is engaged in the extractor groove of the fired cartridge case and is pinned to the bolt, withdraws the spent case from the chamber.

2-1.7 Ejection. (See Figure 2-6, page 11).

As soon as the extractor has drawn the spent case out of the chamber, the spring loaded ejector, acting against the left side of the case head, pushes the spent case out of the ejection port which is located on the right side of the upper receiver.

2-1.8 Cocking (after firing).

As the carrier group continues rearward in recoil, it compresses the action spring and cocks the hammer. Two different actions now take place dependent upon whether the fire control selector is set on SEMI (Semiautomatic) or AUTO (Automatic). These actions are as follows:

a. SEMI (Semiautomatic).

When the trigger is pulled, the firing action of the rifle is so much faster than human reaction that it would be impossible to release the trigger quickly enough to prevent several shots being fired unless there were

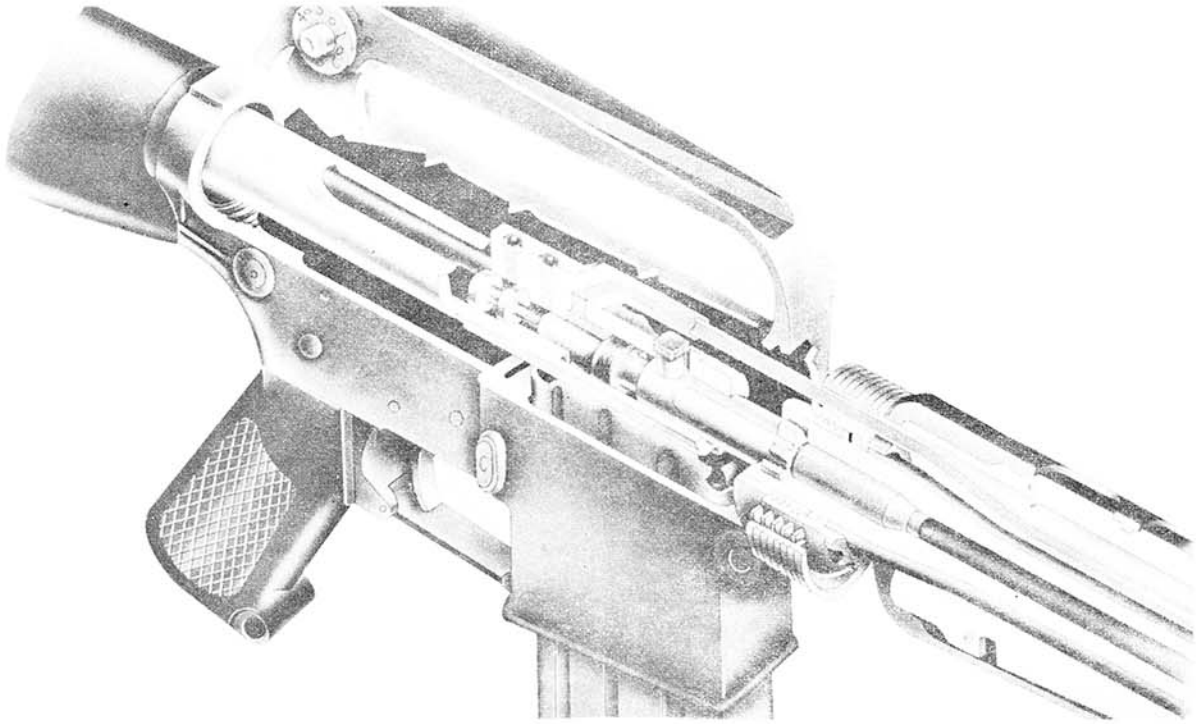


Figure 2-5. Extracting

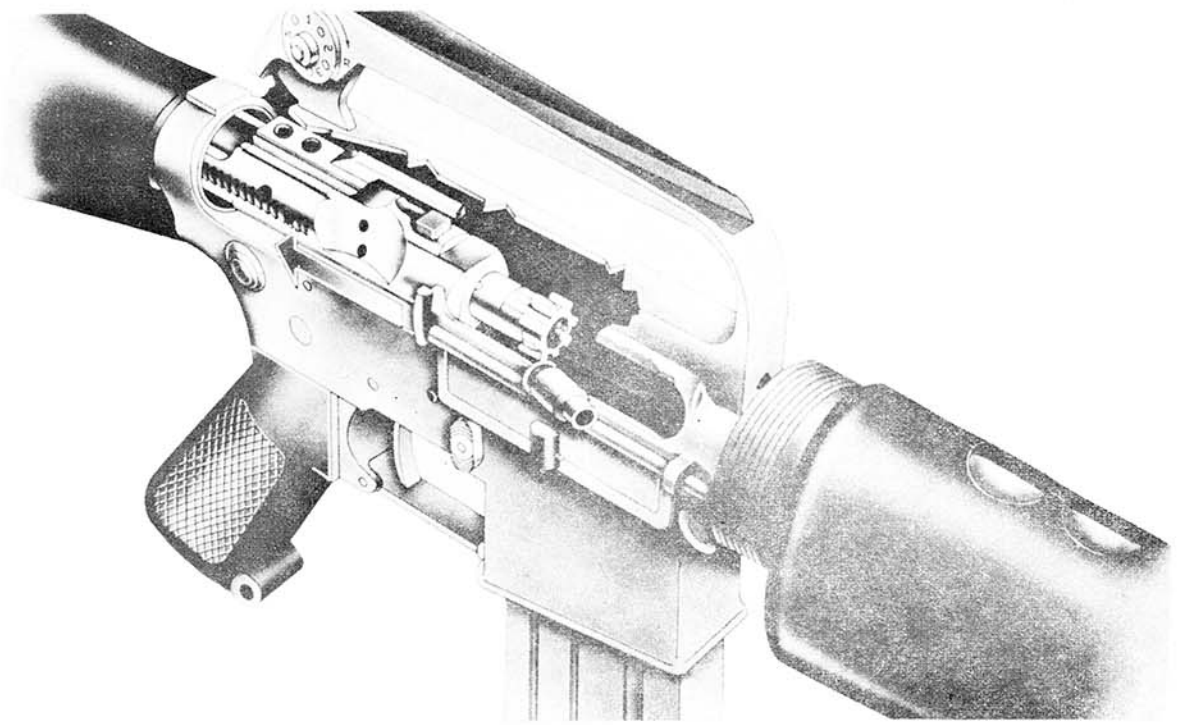


Figure 2-6. Ejecting.

a device provided which would limit the shots fired to one. For this reason, a disconnect is used to catch and hold the hammer until the trigger is released and pulled a second time when the fire control selector is in the semi-automatic position. When the trigger is pulled, the disconnect is rotated forward by the action of the disconnect spring. As the hammer is cocked by the recoil action of the carrier group, the hook of the disconnect engages the upper inside notch of the hammer, holding it to the rear. (Figure 2-8, page 13)

When the trigger is released, the trigger spring returns the trigger to its normal position rotating the disconnect back with it. The hammer is thus released from the hook on the disconnect. However, before the disconnect hook actually releases the hammer, the trigger sear surface has moved in front of its hammer notch so that the hammer drops from the disconnect sear to the trigger sear. The rifle is then ready for a second shot.

b. AUTO (Automatic). (See Figure 2-9, page 14)

When the fire control selector is set on AUTO and the trigger is pulled, the trigger sear releases the hammer. The disconnect is prevented from moving forward to engage the hammer by a cam on the fire control selector. After the first shot, as the hammer is being cocked by the recoil action of the carrier group, the notch on the top outside edge of the hammer is engaged by the automatic sear. The hammer is then held in the cocked position by the automatic sear until the bolt carrier strikes the upper edge of the automatic sear in counter-recoil, causing it to release the hammer near the end of the forward travel of the carrier. The hammer then falls to fire the next round. This cycle repeats until the magazine is emptied or the trigger is released. When the trigger is released, the hammer falls from the automatic sear but is held by the trigger sear, thus ending the cycle of automatic fire.

2-1.9 Buffering.

The rearward or recoil movement of the carrier group is arrested by the buffer assembly acting against the bottom of the receiver extension. (See Figure 3-5, page 36).

2-1.10 Counter-recoil.

After buffering, the action spring forces the carrier forward toward the chamber.

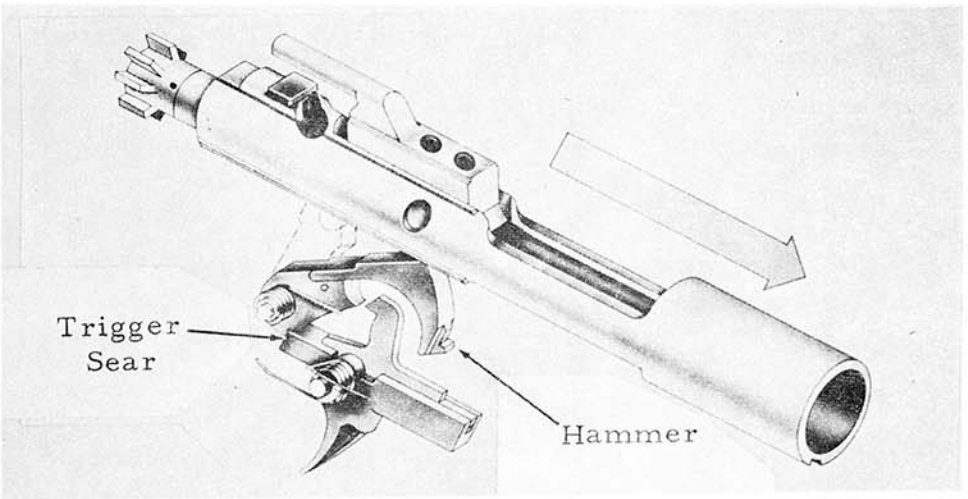


Figure 2-7. Normal Cocking.

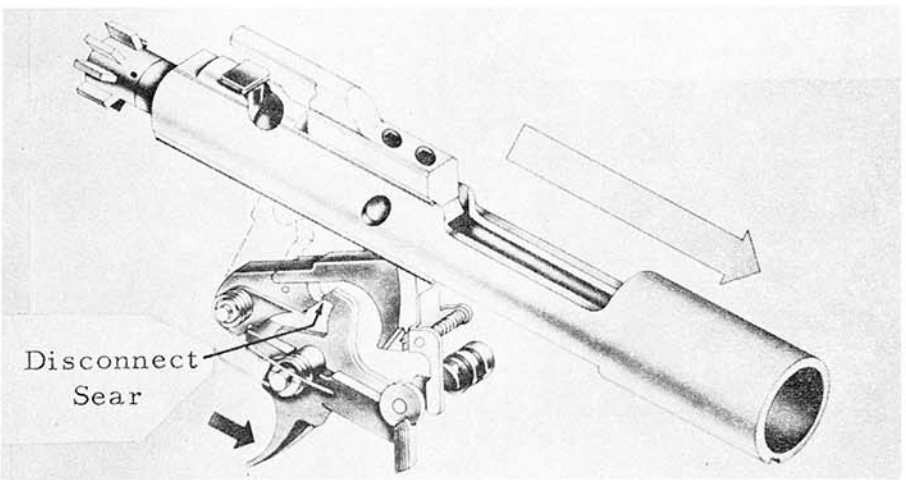


Figure 2-8. Semiautomatic Cocking with Trigger Held Back.

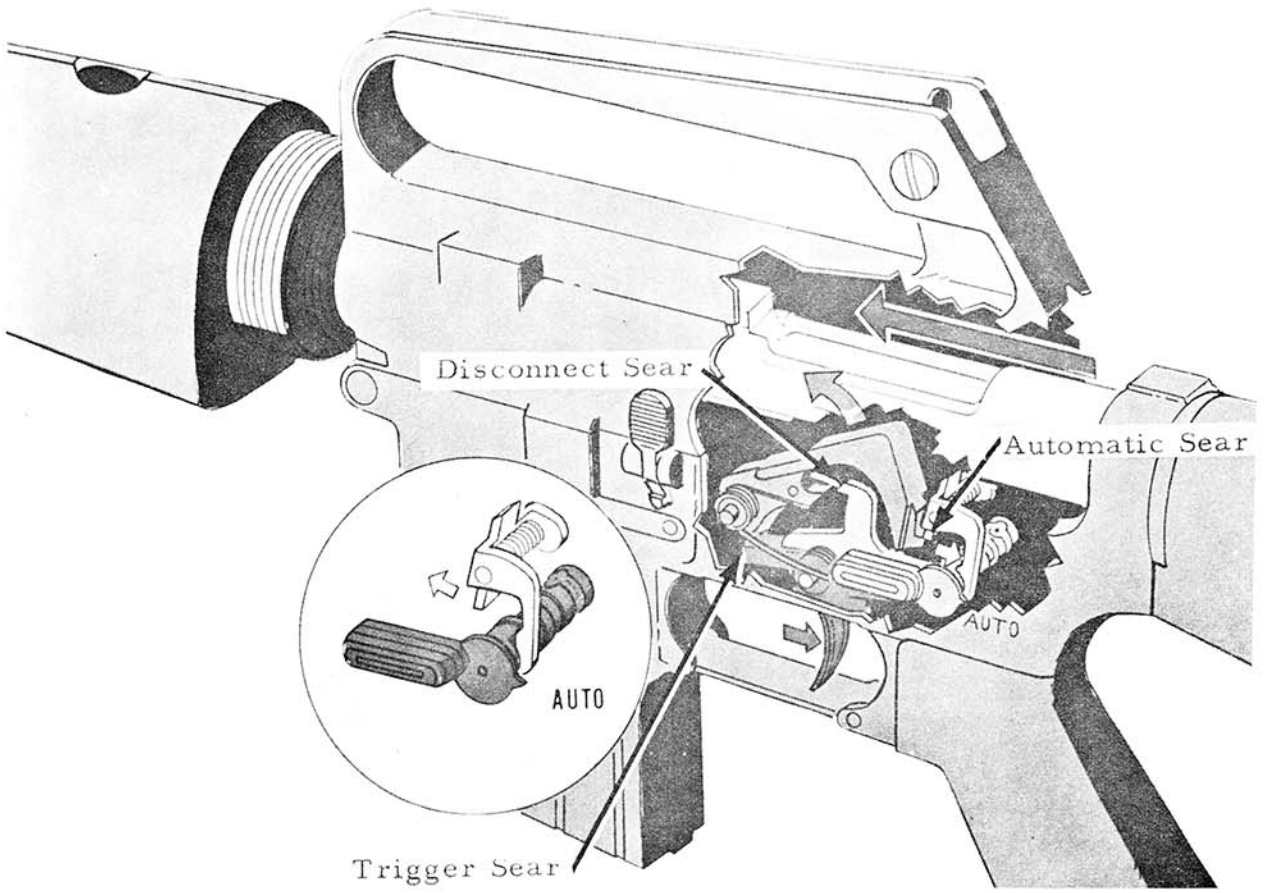


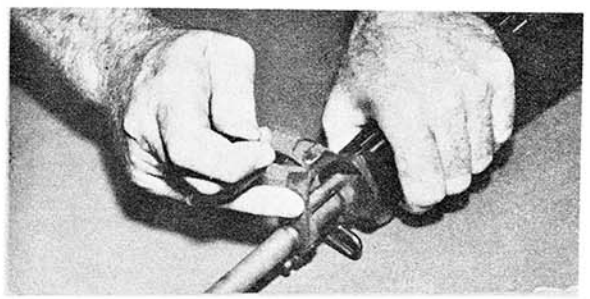
Figure 2-9. Automatic Cocking and Firing.

Section 2 - Controls

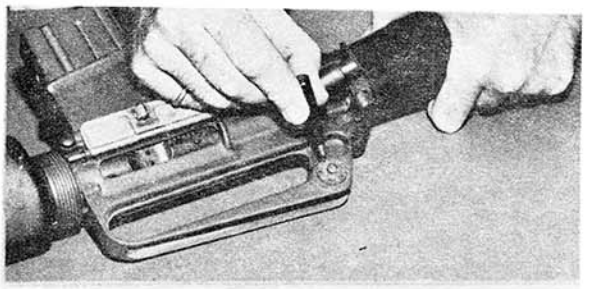
2-2. General.

This section describes, locates, illustrates, and furnishes the operator essential information pertaining to the various controls provided for the proper operation of the rifle. Refer to Figure 2-10, page 15 for controls and their functions.

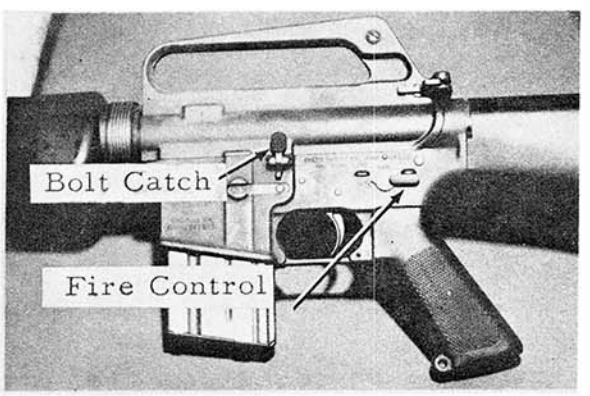
Figure 2-10. RIFLE CONTROLS.



Front Sight - To adjust elevation, depress detent and rotate post. Each notch moves point of impact 1 inch at 100 yards (2.8 cm at 100 meters) up or down. To raise point of impact, turn post in direction marked "UP" on sight (clockwise).



Rear Sight - Has two apertures for range. The unmarked or forward leaf is for ranges up to 300 meters and the leaf marked "L" is for ranges from 300 to 500 meters. To adjust windage, depress detent and rotate drum. Amount of correction per notch is same as front sight. To move point of impact to right, turn drum in direction marked "R" on sight (clockwise).

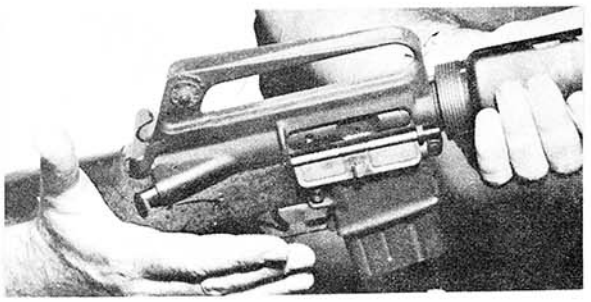


Bolt Catch - Holds bolt carrier and bolt in open position. Press lower tang of catch to engage bolt, upper tang to release.

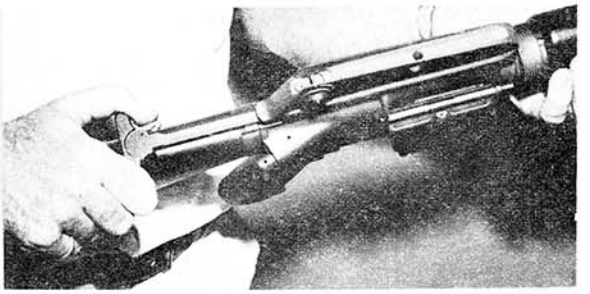
Fire Control Selector - Used to select SAFE position and SEMIautomatic or AUTOmatic fire modes.

Magazine Catch - Retains magazine in rifle. Press to release magazine.

Figure 2-10. RIFLE CONTROLS (Cont.).



Forward Assist Assembly - If bolt fails to close and lock, press forward assist until bolt is moved into locked position. (Model M16A1 only)



Charging Handle - Retracts bolt carrier and bolt. Has a thumb latch to hold it in forward position.

Section 3 - Operating Instructions - Usual Conditions.

2-3. General.

This section contains instructions for the operation of the rifle under usual conditions which are defined as conditions of moderate temperatures and humidity. Instructions for operation under unusual conditions are covered in Section 4, page 23.

2-4. Clearing Rifle.

a. Clear rifle as shown in Figure 2-11.

Step 1. Remove Magazine.

Step 2. Hold Charging Handle Back and Inspect Chamber.

Step 3. Set Selector Lever in SAFE Position

Figure 2-11. Clearing Rifle.

b. Clean and lubricate as indicated in Section 7, page 28.

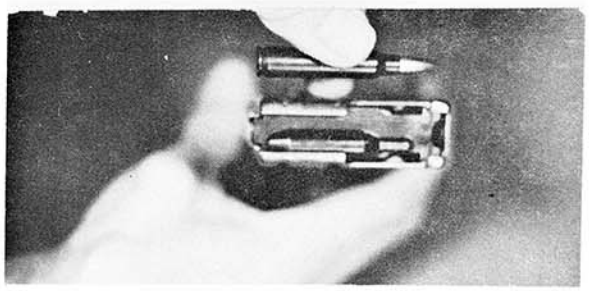


Figure 2-12. Magazine Loading, Cartridge Orientation.

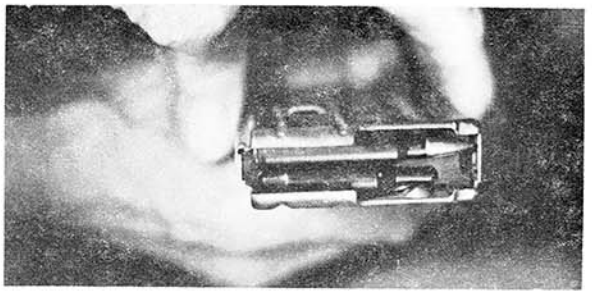


Figure 2-13. Magazine Loaded, First Cartridge.

2-5. Loading.

a. Loading the Magazine. The magazine has a capacity of either twenty or thirty rounds depending upon the magazine provided. It may be loaded with any amount up to these capacities. The magazine follower has a raised portion resembling the outline of a cartridge. Cartridges are loaded into the magazine so that the tips of the bullet point in the same direction as the smaller end of the raised portion of the follower (See Figure 2-12 and 2-13 above).

WARNING. Prior to loading the rifle make certain fire control selector is in "SAFE" position.

b. Loading the Rifle. The magazine may be inserted with the bolt opened or closed. Grasp the pistol grip, point the muzzle in a safe direction, and insert the loaded magazine into the magazine housing. Push upward until the magazine catch engages and holds the magazine. If the bolt carrier is locked to the rear, push in the upper portion of bolt catch (Figure 2-10, page 15) and allow the action to close, chambering a round. If the bolt carrier is in the forward position when the magazine is inserted, pull the charging handle fully to the rear and release it.

NOTE: Do not "ride" the charging handle forward with the hand. If the charging handle is eased forward from the open position, the bolt may fail to close fully and lock. If the bolt fails to lock, use the forward assist assembly (Model M16A1 Rifles only) (Figure 2-10, page 16). For Model M16 Rifle, recharge.

The rifle is now loaded and can be fired with the fire control selector placed in the "Auto" or "Semi" position.

WARNING: If not ready to fire, be sure the fire control selector is placed in the "SAFE" position.

2-6. Precautions in Firing Ammunition.

a. The general precautions concerning the firing and handling of ammunition in the field, as described in Chapter V, page 63, should be observed. In addition, the precautions given in the following paragraphs should be closely observed in order to prevent injury to personnel or damage to material.

b. Ammunition which is seriously corroded should not be fired.

c. Cartridge cases are easily dented and should be protected from hard knocks and blows. Dented cartridge cases may jam in the chamber, and cause difficulty in extraction.

d. Cartridges which have been seriously damaged, or those having loose bullets, should not be used.

e. Cartridges should be kept clean and free of foreign matter.

f. Cartridges which have been elevated to temperatures of 135°F., (uncomfortable to hold) or more, due to exposure to direct radiation from the sun, or other sources of heat, should not be fired while at these temperatures or dangerously high chamber pressures may result. When returned to lower temperatures, these cartridges are safe to fire.

g. If a cartridge remains in the chamber of a very hot weapon at any time firing is interrupted, the cartridge should be removed immediately (within 10 seconds) or there should be a 15-minute wait to prevent the possibility of injury to personnel in the event of a cartridge cook-off (See Paragraph 2-9, page 21).

WARNING: If a noticeable difference in sound or recoil is experienced, further firing should be suspended. Either of these conditions could indicate incomplete propellant combustion and present the possibility that the bullet has not been propelled with sufficient force to clear the bore.

In such instances, the bolt should be retracted slowly to remove and identify the fired cartridge case. The weapon should be cleared and examined for the presence of unburned propellant grains in the receiver, or the possible presence of a bullet remaining in the bore. Any unburned propellant or obstruction in the bore should be removed before firing.

NOTE. If a bullet is lodged in the bore, the rifle must be turned in to a maintenance facility for proper removal.

2-7. Firing.

a. Fire Control Selector. The rifle may be fired semiautomatically or automatically by moving the fire control selector (Figure 2-10, page 15) to the desired position as indicated in Paragraphs b and c below.

b. SEMIautomatic Position. When the fire control selector is in this position, the rifle will fire one round each time the trigger is pulled.

c. AUTOmatic Position. With the fire control selector in this position, the rifle will continue to fire until the magazine is empty or the trigger is released. When the rifle is fired in either SEMI or AUTO, the bolt will lock in open position when the last round from the magazine has been fired.

2-8. Stoppage and Immediate Action.

a. Stoppage. A stoppage is any unintentional interruption in the cycle of functioning. Immediate remedial action must be taken to clear stoppages.

b. Immediate Action. Immediate action is the action taken to correct a stoppage without analyzing the cause. Immediate action to clear a stoppage in the rifle is as follows:

(1) Strike the forward assist assembly to insure that the extractor has engaged the round (Model M16A1 only). Tap upward on the bottom of the magazine to insure that it is fully seated. Pull the charging handle fully to the rear. Watch for ejection of a complete cartridge or cartridge case.

(2) If a cartridge or case is ejected, release the charging handle to feed a new round (do not ride the charging handle forward). Strike the forward assist assembly to assure bolt closure (Model M16A1 Rifle only). Attempt to fire the weapon. If the weapon fails to fire, inspect to determine the cause of malfunction and take appropriate action as indicated in Chapter III, Section 5 - Trouble Shooting, page 53.

(3) If a cartridge or case is not ejected, check for a round in the chamber. If the chamber is clear, release the charging handle to feed a round, strike the forward assist assembly (Model **M16A1 only**), and attempt to fire. If the weapon still fails to fire, inspect to determine the cause of malfunction and take appropriate action as indicated in Chapter III, Section 5 - Trouble Shooting, page 53.

(4) If a cartridge or case is seen in the chamber it must be removed before attempting to reload or recycle the rifle. A stuck cartridge or case can usually be removed by inserting the cleaning rod into the bore from the muzzle end and tapping lightly.

2-9. Misfires and Cook-Offs.

a. General. Although these malfunctions, described in the following paragraphs, are rarely encountered when authorized and properly maintained ammunition is fired in properly maintained and operated weapons, it is important that all personnel concerned understand the nature of each kind of malfunction as well as the proper preventive and corrective procedures in order to avoid injury to personnel or damage to materiel. General precautions for removing chambered cartridges associated with these malfunctions are described in Paragraph b, below.

(1) Misfire. A misfire is a complete failure to fire which may be due to a faulty firing mechanism in the rifle or a faulty element in the propelling charge explosive train of the cartridge.

(2) Cook-Off. A cook-off is a functioning of any or all of the explosive components of a cartridge chambered in a very hot weapon due to heat from the weapon. To prevent injury from a cook-off, observe the time limit prescribed in b, below.

b. Precautions. After a failure to fire, the following general precautions, as applicable, must be observed:

WARNING: A cook-off will occur after ten seconds of contact with the chamber in a hot barrel.

(1) Attempt to remove the cartridge before ten seconds has elapsed. If the cartridge cannot be removed well within this length of time, attempt to lock the bolt as rapidly as possible either with the forward assist (Model M16A1) or by manually pushing bolt forward.

(2) In the case of a cartridge chambered in a very hot rifle which can neither be fired or removed within the ten second time limit, all personnel except the operator shall remain clear of the rifle for a minimum of 15 minutes.

2-10. Water in Barrel.

WARNING: Do not attempt to fire the weapon if water is present in the barrel. Immersion during fording, heavy rain, or fog can cause water to be present in the barrel.

Observe the following procedures to empty water from the barrel:

NOTE: Make certain the muzzle cap is removed before performing the following procedures.

a. Point the muzzle down.

b. Pull the charging handle slightly rearward to vent the barrel, and shake the weapon vigorously to allow water to drain from the muzzle.

c. Press the forward assist to make sure the round is seated in the chamber and the bolt is locked (Model M16A1 only). The weapon can now be fired.

NOTE: Clean and lubricate in accordance with Chapter III, Section 2, page 31, as soon as possible.

2-11. Unloading.

Repeat operation in Figure 2-11, page 17.

Section 4 - Operating Instructions - Unusual Conditions.

2-12. General.

The following paragraphs cover instructions for operation and maintenance under unusual conditions. See Chapter III, Section 4, page 52, for preventive maintenance instructions to be followed for operation under usual conditions.

2-13. Operation in Extreme Cold.

a. In climates where the temperature is consistently below 0°F., it is necessary to prepare the materiel for cold-weather operation. The rifles should be cleaned and lubricated as indicated in Section 2 of Chapter III, page 31, using Weapons Lubricating Oil (LAW) or equivalent.

b. Exercise the various controls through their entire range at intervals as required. This aids in keeping them from freezing in place and reduces the effort required to operate them.

c. Materiel not in use and stored outside must be protected with a proper cover.

2-14. Operation in Extreme Heat.

a. Hot Climates.

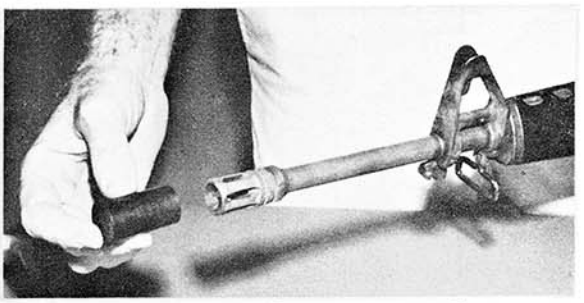
(1) When operating in hot climates, the coating of oil necessary for operation and preservation will dissipate quickly. Inspect the rifle and bipod frequently, paying particular attention to all hidden surfaces of the bolt carrier group, forward assist assembly (Model M16A1 Rifle) and lower receiver components.

(2) Perspiration contributes to corrosion because it contains acids and salts. After handling the rifle, clean, wipe dry, and oil using LSA oil or equivalent.

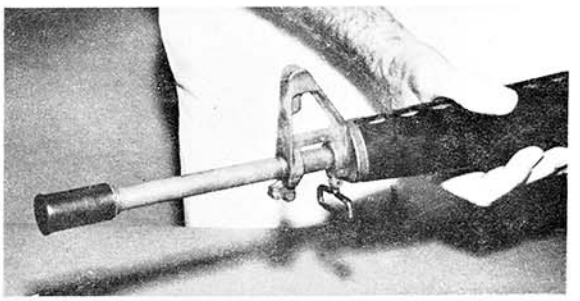
b. Hot, Dry Climates. Clean and oil the bore of the rifle more frequently when operating in hot, dry climates.

2-15. Operating in Dusty and Sandy Areas.

Clean and lubricate the rifle more frequently. Exercise particular care to keep sand out of mechanisms when inspecting and lubricating weapon. Shield parts from flying sand or dust with tarpaulins during disassembly and assembly operations. Clean and lubricate the rifle after operating same. Cover end of barrel with protective cap (See Figure 2-14).



a. Installing Protective Cap.



b. Protective Cap Installed.

Figure 2-14. Protective Cap.

2-15.1. Protective Cap Features.

a. The cap should be removed before firing the rifle. However, the cap is designed so that a bullet will pass through the end without affecting accuracy and without causing a safety hazard to the user.

b. Do not place the cap on a hot rifle. The plastic will become soft and form into the grooves of the flash suppressor making it difficult to remove.

2-16. Operations Under Hot, Rainy or Very Humid Conditions and in Salt Water Areas.

a. Inspect the rifle more frequently when operating in hot, moist areas.

b. When the rifle is in use, clean and lubricate the bore and chamber and exposed metal surfaces more frequently than prescribed for normal service. A very thin film of oil is prescribed for the chamber and bore.

c. Moist and salty atmospheres have a tendency to mix with oil and grease and destroy their rust preventive qualities. Inspect all parts frequently for rust or corrosion.

d. When the rifle is not in use, cover all metal surfaces with a film of LSA oil or equivalent.

Section 5 - Functional Check.

2-17. General.

A complete functional check of the rifle consists of checking the operation of the rifle with the fire control selector in the SAFE, SEMI, and AUTO positions. The following is a rapid, complete check. Any portion of the check may be used separately to determine the operational condition of any specific selector position.

Step	Action	Reference
1.	Clear rifle.	Figure 2-11, page 17.
2.	Pull takedown pin and open receivers.	Figure 3-1, Steps 1 & 2, page 32.
3.	Set fire control selector on SAFE.	Figure 2-11, page 17.
4.	Pull trigger, hammer should not fall.	
5.	Set fire control selector on SEMI.	Figure 2-10, page 15.
6.	Pull trigger, hammer should fall.	
7.	Hold trigger to rear, recock hammer manually, hammer should be engaged by disconnect.	Figure 2-8, page 13.
8.	Release trigger, hammer should be released by disconnect and drop to engagement by the trigger sear.	Figure 2-7, page 13.
9.	Set fire control selector on AUTO.	Figure 2-10, page 15.
10.	Pull trigger, hammer should fall.	
11.	Hold trigger to rear and manually cock hammer, hammer should be engaged by automatic sear.	Figure 2-9, page 14.
12.	With trigger still held to rear, push top of automatic sear forward, hammer should drop.	Figure 2-9, page 14.

Step	Action	Reference
13.	With trigger still held to rear, manually cock hammer, hammer will be engaged by automatic sear.	Figure 2-9, page 14.
14.	Release trigger and push top of automatic sear forward, automatic sear should release hammer and hammer should drop to engagement with the trigger sear.	Figure 2-9, page 14.
15.	Move fire control selector to SAFE.	Figure 2-10, page 15.
16.	Close receivers and engage takedown pin. CAUTION: Failure to move fire control selector to SAFE position before closing receivers will cause the automatic sear to be damaged.	
17.	Set fire control selector on SEMI, and pull trigger, hammer should drop.	
18.	Install an empty magazine and check that it is locked in place by the magazine catch.	Para. 2-5, Page 18.
19.	With the empty magazine installed and the fire control selector set on SEMI or AUTO, pull charging handle back and then release same. Bolt carrier assembly should be held to the rear by engagement of the bolt with the bolt catch.	
20.	Push top of bolt catch to release bolt and bolt carrier. The bolt and carrier assembly should move forward into locked position.	Figure 2-10, page 15.
21.	Set fire control selector on SAFE.	Figure 2-10, page 15.
22.	Close ejection port cover.	Figure 1-3, page 4.
23.	Install protective cap.	Figure 2-14, page 24.

Section 6 - Pre-issue Service.

2-18. General.

To determine whether the rifle and the other basic issue items have been properly prepared for service by the supplying organization and to be sure they are in proper condition to be functioned, the following service is recommended.

2-19. Pre-issue Service Check List.

Step	Action	Reference
a.	Check to determine that all basic issue items have been furnished.	Para's 3-1, page 29, and 3-2, page 30.
b.	Clear rifle.	Figure 2-11, page 17.
c.	Open receivers.	Figure 3-1, Steps 1 and 2, page 32.
d.	Remove bolt carrier assembly from rifle.	Figure 3-2, page 33.
e.	Visually inspect bolt carrier assembly for proper assembly, damaged, or missing parts.	
f.	Clean, lubricate, and reassemble rifle.	Section 2, Chapter III, page 31.
	NOTE: Wipe excess oil from barrel bore and chamber. Particular attention should be given to cleaning the bolt carrier key.	
g.	Hand function rifle to assure proper operation.	Section 5, page 25.
	NOTE: When retracting the bolt carrier group, check that there is free movement between the bolt carrier key and the gas tube.	

Section 7 - Pre-functioning Lubrication.

2-20. General.

Prior to operation of the rifle, the following lubrication procedure is to be performed. The recommended lubricant to be used is Semi-fluid Lubricating Oil (LSA), MIL-L-46000.

2-20.1. Application Areas.

Step	Action	Reference
a.	Coat all components of the lower receiver and the bolt carrier group with a light coating of LSA oil or equivalent using a lightly oiled cotton wiping cloth, cleaning swabs, and pipe cleaners.	
b.	Apply a drop of LSA oil or equivalent in the mouth of the bolt carrier key.	Figure 3 - 13j, page 43
c.	Apply a drop of LSA oil or equivalent in each of the bolt carrier exhaust parts.	Figure 3 - 13k, page 43

CHAPTER III - OPERATOR AND UNIT MAINTENANCE INSTRUCTIONS

Section 1 - Tools and Material Required for Maintenance.

3-1. Operator Maintenance Tools and Material.

The tools and material needed by the operator to perform the required maintenance functions are as follows:

Item No.	Description	Page No.
1.	BRUSH, CLEANING: Bore. (P/N 94144)	72
2.	BRUSH, CLEANING: Chamber. (P/N 94145)	72
3.	CLEANER, TOBACCO PIPE	
4.	CLEANING COMPOUND, RIFLE BORE: Small Arms bore cleaner. (U.S. Fed Spec P-C-111 or equivalent)	
5.	LUBRICATING OIL, SEMI-FLUID (LSA). (MIL-L-46000)	
6.	LUBRICATING OIL, WEAPONS (LAW) (MIL-L-14107) (for operation in extreme cold only)	
7.	CLEANING COMPOUND, SOLVENT (MIL-C-372)	
8.	RAG, WIPING: Cotton	
9.	ROD, CLEANING, SMALL ARMS (P/N 62684)	72
10.	SWAB, SMALL ARMS CLEANING	

Note: The weapon is compatible with and will function properly using any good grade of oil and bore cleaner. The above formulations are recommended only because it is believed they are the best for all firearms; however, their specific use is not necessary to insure proper operation and longevity of the rifle.

3-2. Unit Maintenance Tools and Material.

The tools and equipment required for the unit armorer to perform his maintenance functions are as follows:

Item No.	Description
1.	TOOLS AND MATERIAL: Listed in Paragraph 3-1, page 29.
2.	BRUSH, ARTISTS: Metal ferrule, flat chisel edge, 7/6w, 1-1/8 lg., exposed bristle.
3.	BRUSH, CLEANING, TOOLS AND PARTS.
4.	CLOTH, ABRASIVE: crocus, ferric oxide and quartz.
5.	LACQUER: black (jet) lusterless acrylic nitrocellulose type (touch up). (Spec, Fed, TT-L-50D or MIL-L-19538, Color 37038) or equivalent.
6.	PENETRATING OIL: (Spec, FED, VV-P-216) or equivalent.

Section 2. - Operator Maintenance Procedures, Usual Conditions.

3-3. General.

This section describes maintenance procedures to be performed by the operator under usual conditions. Usual conditions are defined as conditions of moderate temperature and humidity. For additional maintenance procedures to be performed by the operator under unusual conditions, refer to Chapter II, Section 4, page 23.

3-4. Disassembly (Field Stripping).

The extent of disassembly required for the performance of maintenance by the operator is as follows:

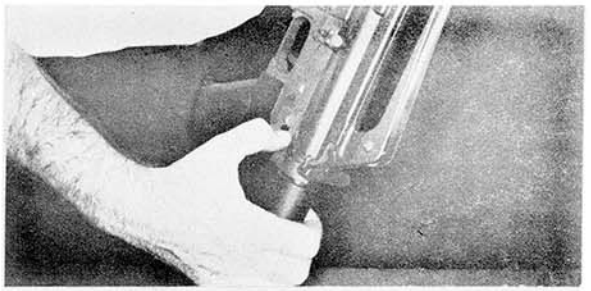
Step	Action	Reference
a.	Clear rifle.	Figure 2-11, page 17
b.	Separate receivers.	Figure 3-1, page 32
c.	Remove bolt carrier assembly and charging handle.	Figure 3-2, page 33
d.	Disassemble bolt carrier assembly but do NOT disassemble ejector.	Figure 3-3, page 33
e.	Remove handguard.	Figure 3-4, page 35
f.	Remove buffer assembly and action spring.	Figure 3-5, page 36
g.	Disassemble magazine.	Figure 3-6, page 37

3-5. Cleaning.

After the rifle has been field stripped, it is to be cleaned as follows:

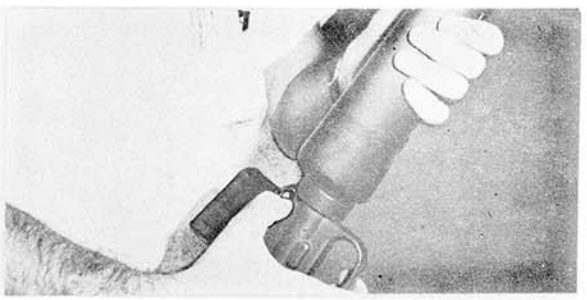
a. Attach the small, bore cleaning brush to the cleaning rod and insert it in the bolt carrier key. Rotate brush clockwise to remove carbon and powder residue. Do NOT use any cleaning compound on the brush when cleaning out the key.

Figure 3-1. RECEIVER SEPARATION PROCEDURE.



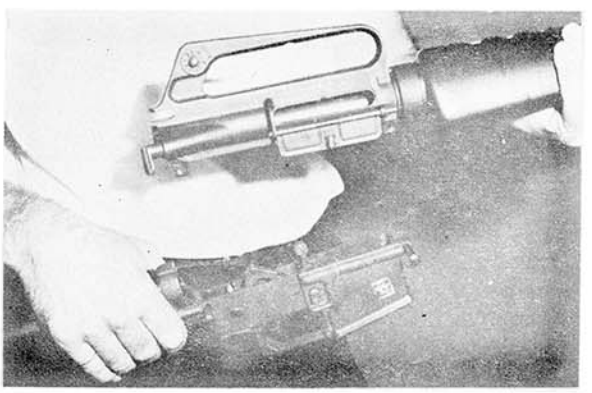
Step 1. Push Take-down Pin to Start.

Step 2. Pull Take-down Pin Out to Detent



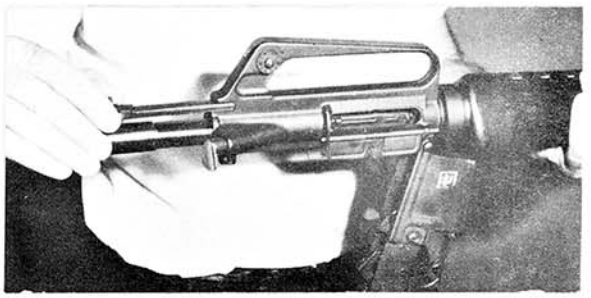
Step 3. Push Pivot Pin to Start.

Step 4. Pull Pivot Pin Out to Detent.

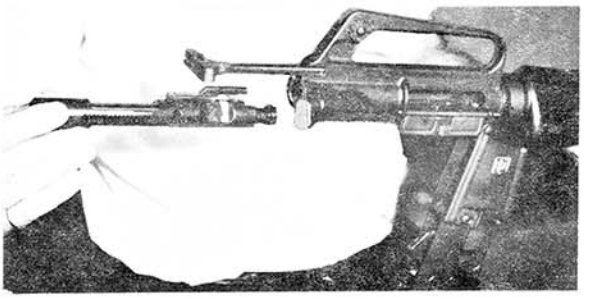


Step 5. Receivers Separated.

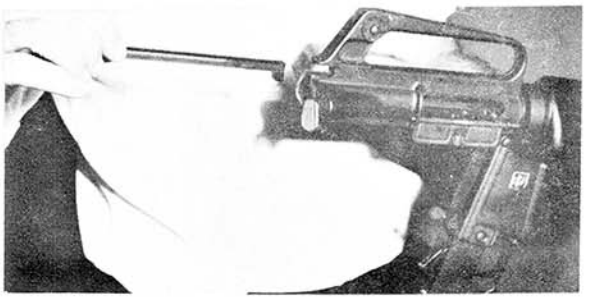
Figure 3-2. BOLT CARRIER ASSEMBLY AND CHARGING HANDLE REMOVAL.



Step 1. Pull Charging Handle to Rear.

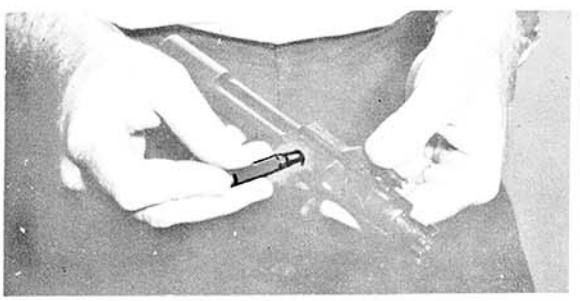


Step 2. Remove Bolt Carrier Assembly.



Step 3. Remove Charging Handle.

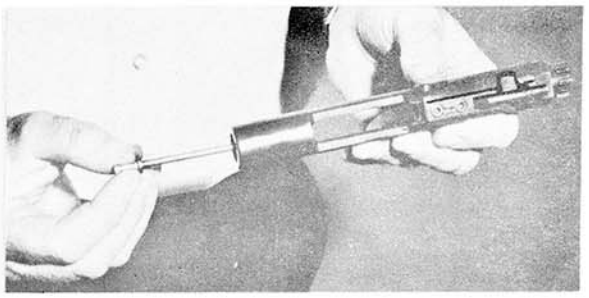
Figure 3-3. BOLT CARRIER DISASSEMBLY. (Part 1 of 3)



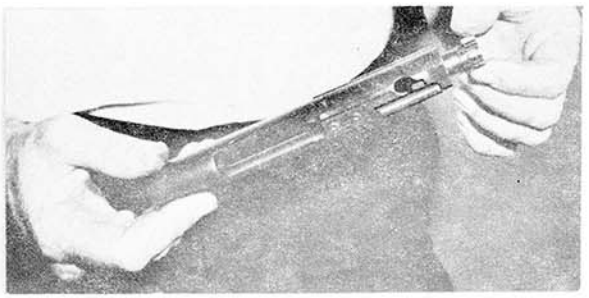
Step 1. Start Removal of Firing Pin Retaining Pin with Cartridge Nose.

Step 2. Withdraw Firing Pin Retaining Pin.

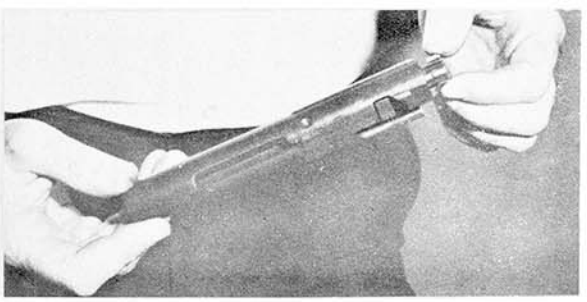
Figure 3-3. BOLT CARRIER DISASSEMBLY.
(Part 2 of 3)



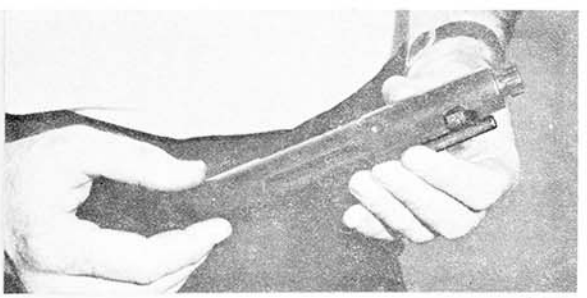
Step 3. Remove Firing Pin.



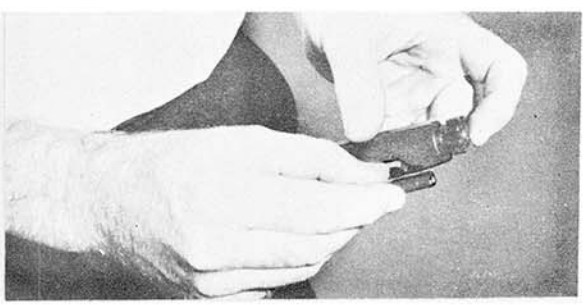
Step 4. Push Bolt to Locked Position.



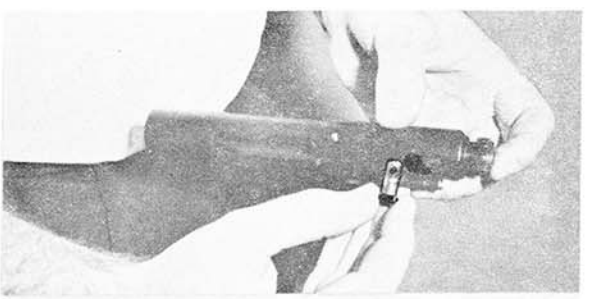
Step 5. Bolt in Locked Position.



Step 6. Bolt Cam Pin Turned 90°.



Step 7. Remove Cam Pin

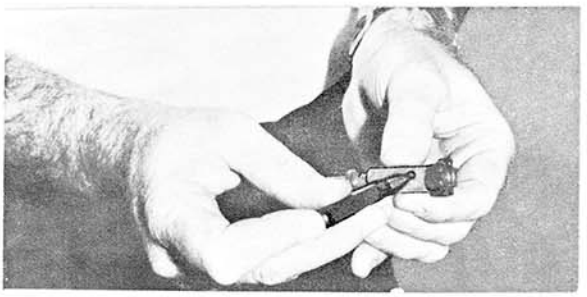


Step 8. Cam Pin Removed.

Step 9. Remove Bolt.

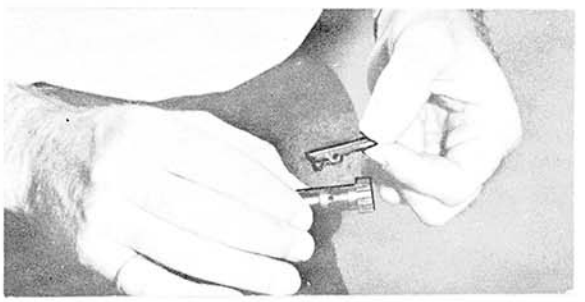
Step 10. Bolt Removed.

Figure 3-3. BOLT CARRIER DISASSEMBLY.
(Part 3 of 3)



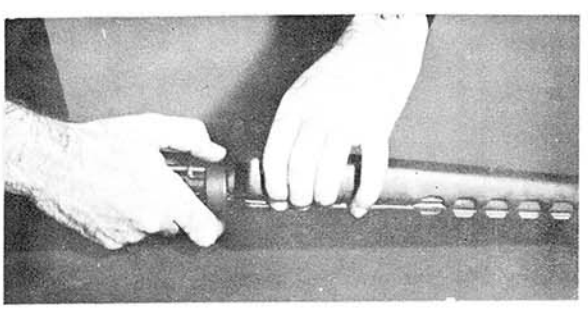
Step 11. Start Removal of Extractor Pin with Bullet Nose.

Step 12. Extractor Pin Removed.

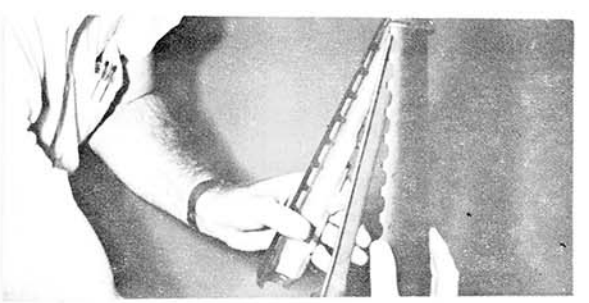


Step 13. Extractor Removed.

Figure 3-4. HANDGUARD REMOVAL.



a. Handguard Slipring Pulled Back.

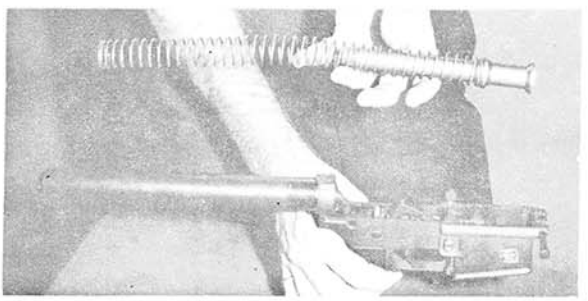


b. Handguards Released from Slipring.

Figure 3-5. BUFFER AND ACTION SPRING REMOVAL.

a. Buffer Retainer Depressed to Start Buffer Removal.

b. Hammer Depressed to Continue Buffer Removal.



c. Buffer and Action Spring Removed.

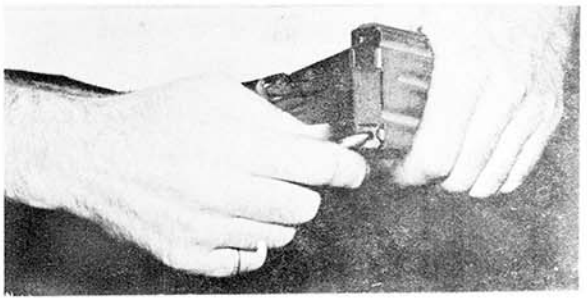
b. Dip the bore cleaning brush in bore cleaning compound and brush the bore from the chamber end of the barrel. Push the brush through the bore until it extends beyond the muzzle before pulling it back. NEVER reverse the brush direction while the brush is in the bore. Continue brushing until the bore is well covered with compound (See Figure 3-8, page 38).

c. Use the bore cleaning brush still wet with bore cleaning compound and clean all carbon and powder residue from around the gas tube in the upper receiver (Figure 3-8b, page 38), the bolt locking lugs (Figure 3-8c, page 38), behind the bolt rings (Figure 3-8d, page 38), the firing pin (Figure 3-8e, page 38), the bolt cam pin (Figure 3-8f, page 38), and inside the bolt carrier from the front (Figure 3-8g, page 38), and from the rear (Figure 3-8h, page 38). Also carefully clean the under lip of the extractor.

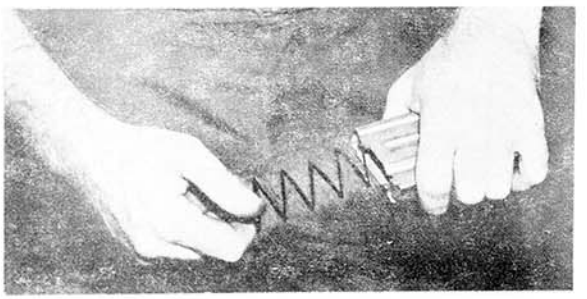
d. Attach the large, chamber cleaning brush to the cleaning rod, dip the brush in bore cleaning compound, and clean the chamber. Use a minimum of five plunge strokes and three, 360°, clockwise, rotational strokes (Figure 3-9, page 39).

CAUTION: Do not use a wire brush on aluminum surfaces such as the receivers.

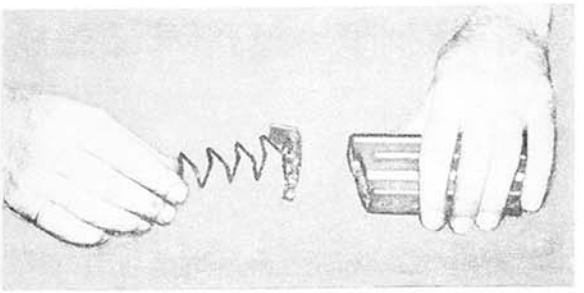
Figure 3-6. MAGAZINE DISASSEMBLY.



a. Bottom Plate Removal.



b. Spring Removal.



c. Spring and Follower Removed.

Figure 3-7. MAGAZINE BOX CLEANING.

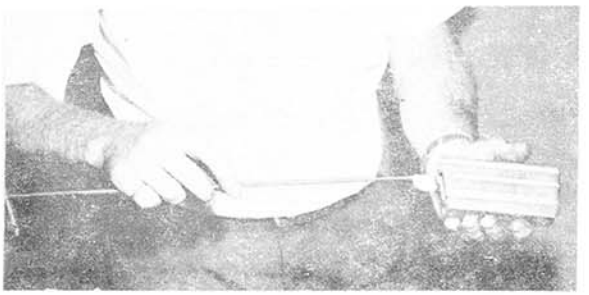
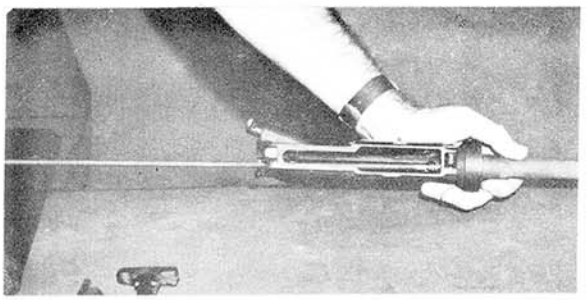
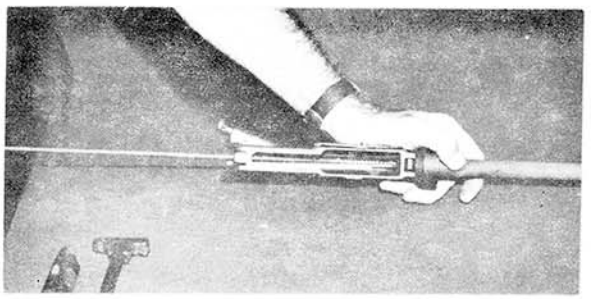


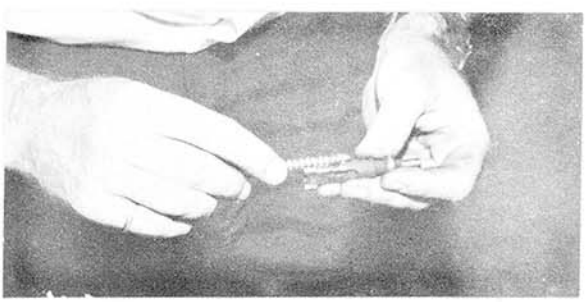
Figure 3-8. CLEANING WITH BORE BRUSH.



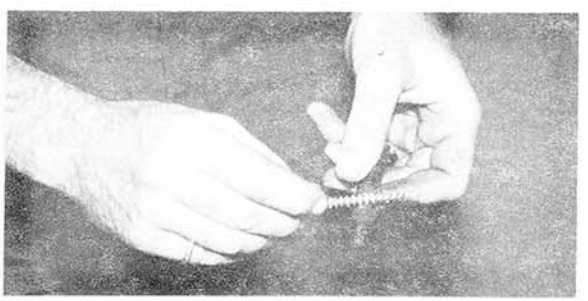
a. Through Barrel.



b. Lower Receiver Around Gas Tube.



c. Bolt Locking Lugs.

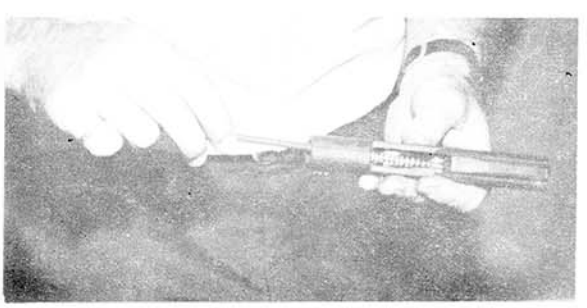


d. Rear of Bolt.

e. Firing Pin

f. Bolt Cam Pin.

g. Inside Bolt Carrier - Front.



h. Inside Bolt Carrier - Rear.

Figure 3-9. CLEANING CHAMBER.

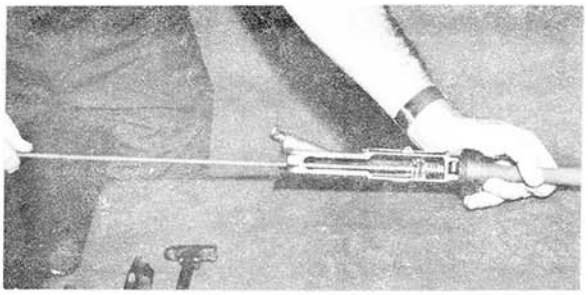
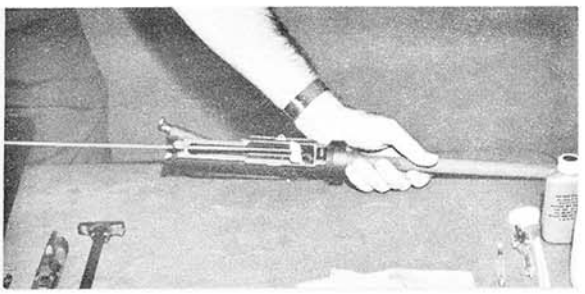
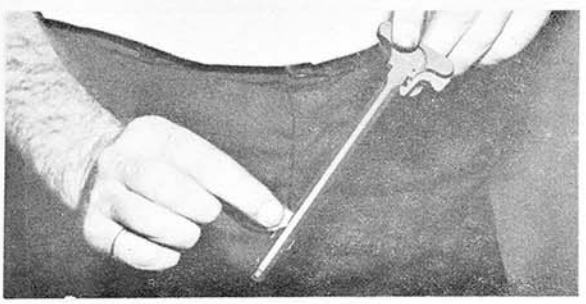


Figure 3-10. WIPING PARTS CLEAN AND DRY.

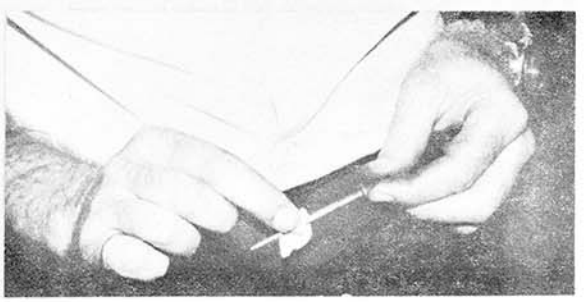


a. Wiping Barrel.

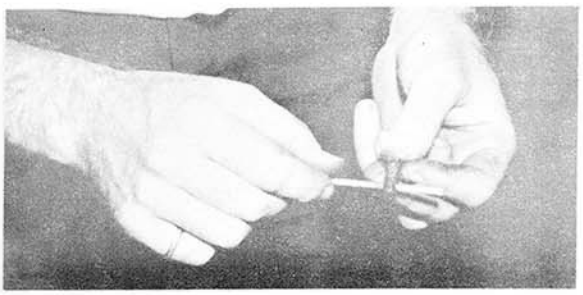
b. Wiping Action in Lower Receiver



c. Wiping Charging Handle.



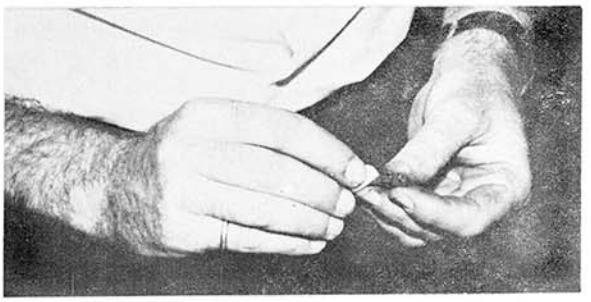
d. Wiping Firing Pin.



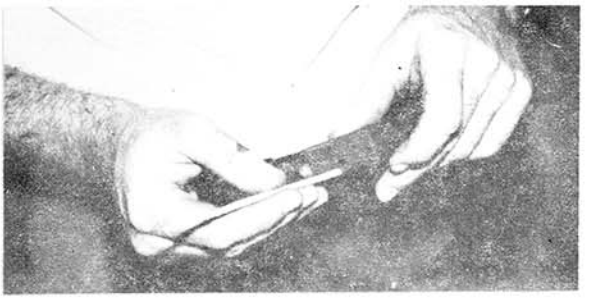
e. Wiping Inside Cam Pin.

f. Wiping Firing Pin Retaining Pin.

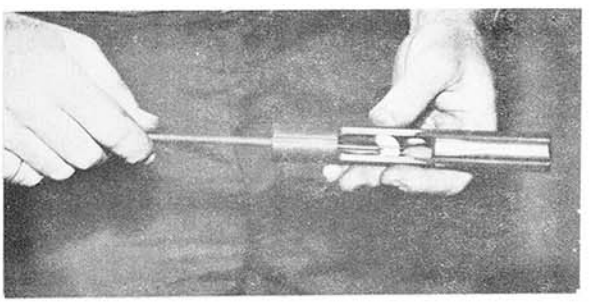
Figure 3-10. WIPING PARTS CLEAN AND DRY (Cont.).



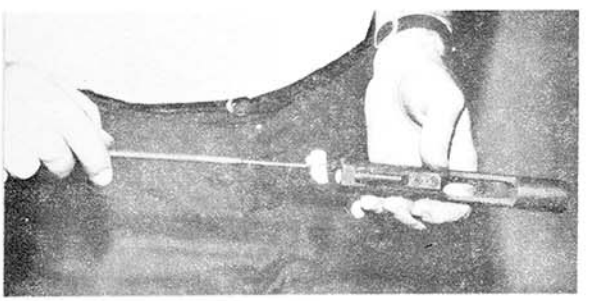
g. Wiping Extractor



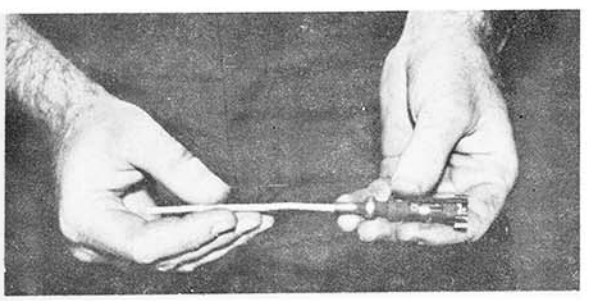
h. Wiping Bolt Carrier Key.



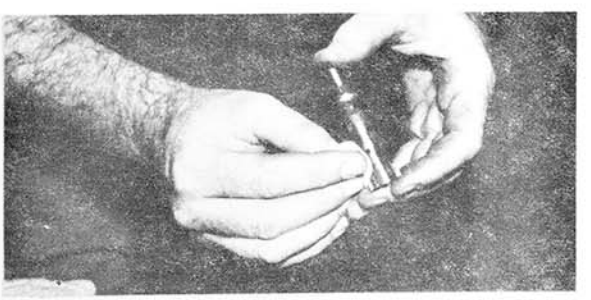
i. Wiping Inside Bolt Carrier - Rear.



j. Wiping Inside Bolt Carrier - Front.



k. Wiping Inside Bolt.



l. Wiping Outside Bolt.

e. Using a fiber or nylon brush and dry cleaning solvent, clean the balance of the rifle parts as well as the magazine parts (Figure 3-7, page 37).

WARNING: Most cleaning solutions are toxic and, if their vapors are inhaled for extended periods, may be very harmful. Therefore, these solutions should be used sparingly and in a well ventilated area.

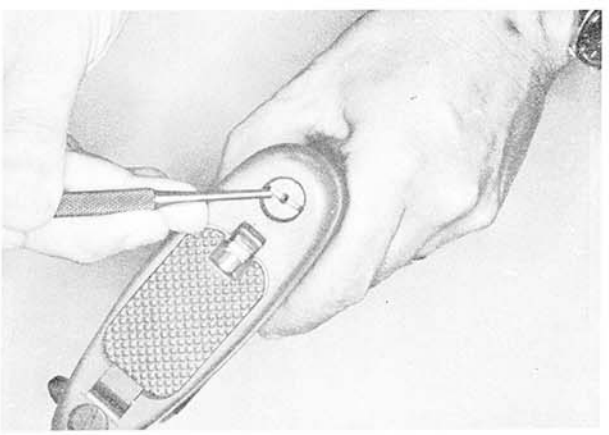
f. Wipe all parts of the rifle clean and dry with clean, dry, cotton wiping rags, pipe cleaners, and cleaning swabs, especially those areas shown in Figure 3-10, page 39. When wiping out the barrel bore, use a new swab inserted in the cleaning rod swab holder for each pass through the barrel. Continue this process until a swab comes out of the barrel clean and dry.

g. Clean out drain hole in butt cap screw using a pipe cleaner (see Figure 3-11, page 41).

3-6. Inspection.

After cleaning, inspect all parts for excessive wear, corrosion, or mechanical damage. If any of these faults are discovered, the rifle shall be turned in for repair. Also inspect magazine components for cracks, distortion, or excess wear. If any of these conditions are found, the magazine should be replaced.

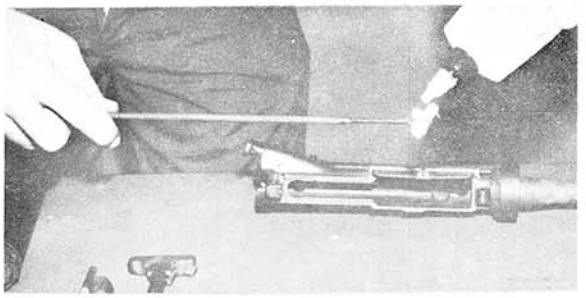
Figure 3-11. BUTT CAP SCREW DRAIN HOLE.



3 - 7. Lubrication

After the rifle parts have been cleaned and inspected, all metal parts shall be wiped with a cotton wiping cloth or cleaning swabs which have been lightly oiled with LSA or equivalent lubricant. A lightly oiled swab installed in the cleaning rod swab holder shall be run through the barrel bore once (See Figure 3 - 12).
CAUTION: The chamber shall be lubricated but it is important that only a thin film of lubricant be applied. Then apply one drop of LSA or equivalent lubricant to each of the places shown in Figure 3 - 13. An exception to the above is the magazine. The only part which is to be wipe-oiled is the magazine spring.

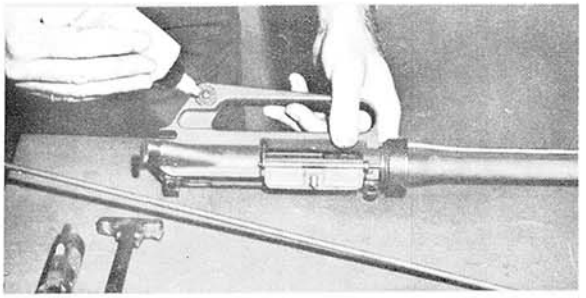
Figure 3-12. INTERNAL LUBRICATION OF BARREL BORE.



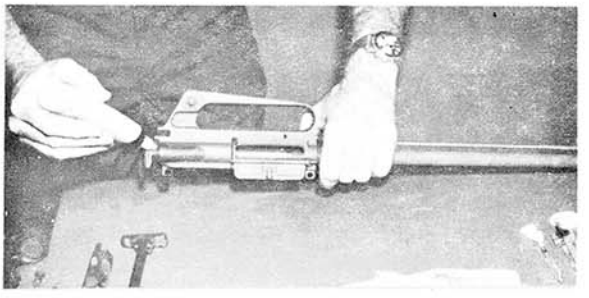
a. Applying LSA to Cleaning Swab.

b. Lubricating Barrel Bore.

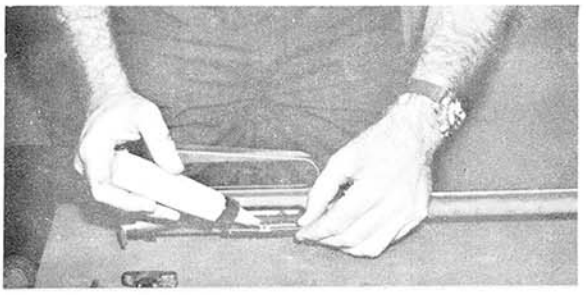
Figure 3 - 13. APPLICATION OF LSA LUBRICANT (or equivalent)



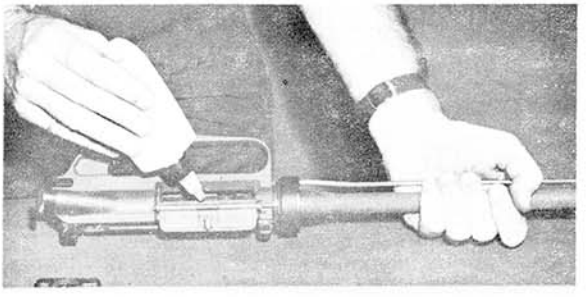
a. Windage Drum Detent.



b. Forward Assist.

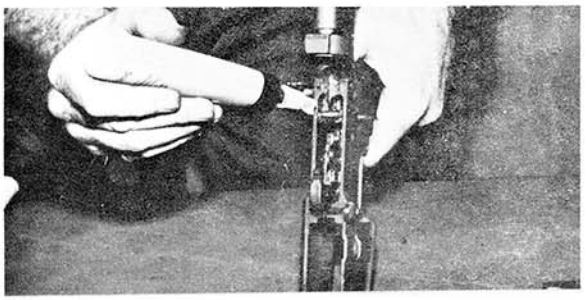


c. Ejection Port Cover Latch.

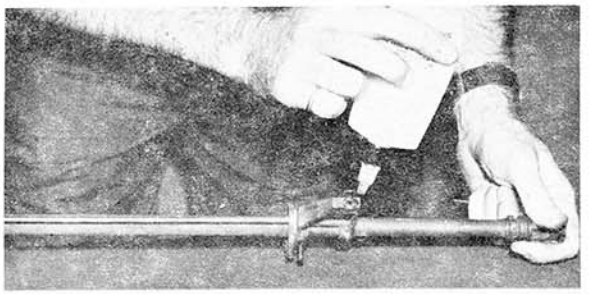


d. Ejection Port Cover Spring.

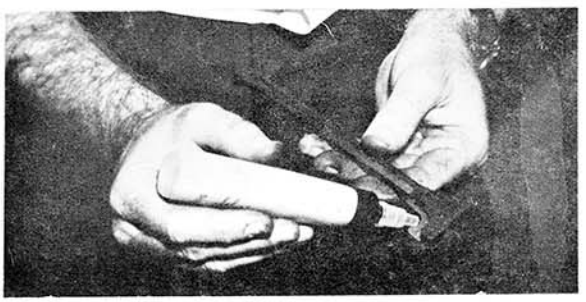
Figure 3-13. APPLICATION OF LSA LUBRICANT (Cont.).



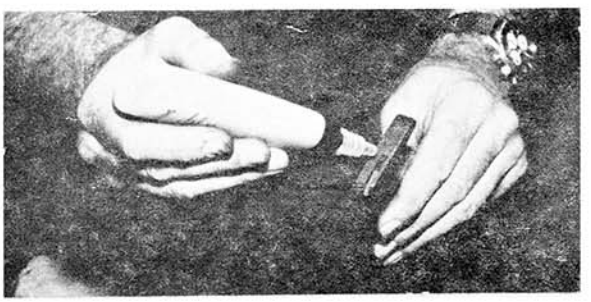
e. Action Springs and Pins.



f. Front Sight Detent.

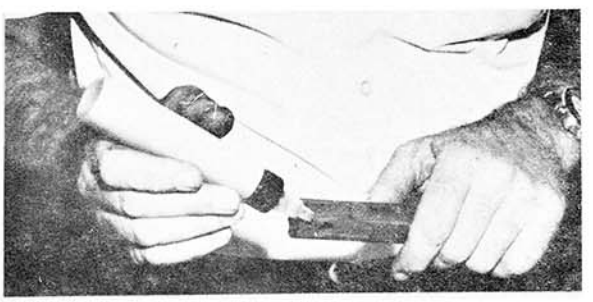


g. Charging Handle Catch.

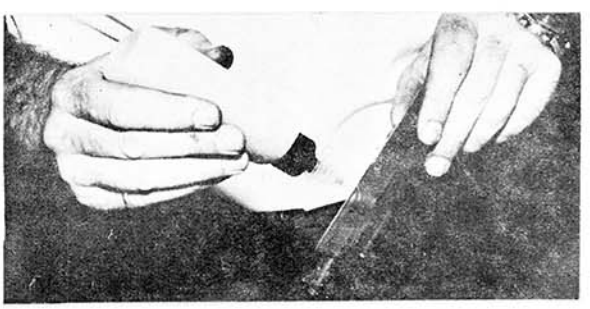


h. Charging Handle Catch Spring.

i. Inside Bolt At Rear.



j. Mouth of Bolt Key.



k. Bolt Carrier Exhaust Ports.
(After Assembly)

3-8. Assembly.

Reassemble rifle by reversing the procedure in Paragraph 3-4, page 31.

Section 3 - Unit Maintenance Instructions.

3-9. General.

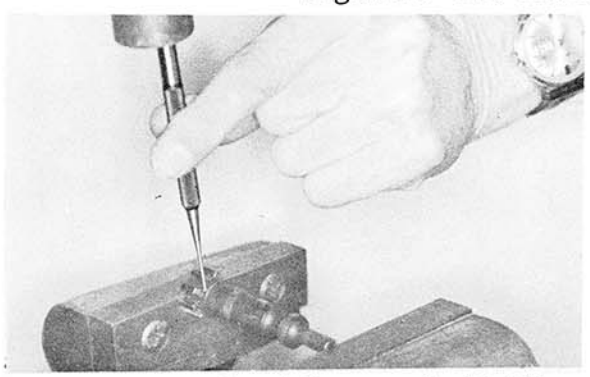
This section describes maintenance procedures to be performed by the unit armorer.

3-10. Disassembly.

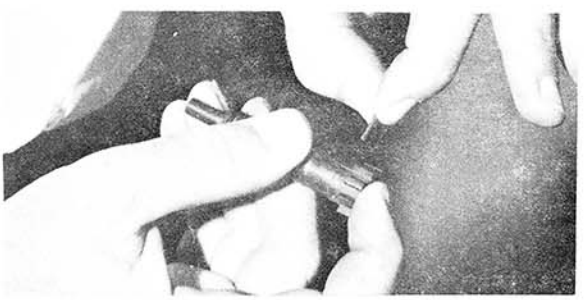
The extent of disassembly required for the performance of maintenance by the unit armorer is as follows:

Step	Action	Reference
a.	Field strip rifle and magazine.	Paragraph 3-4, page 31.
b.	Remove ejector from bolt.	Figure 3-14

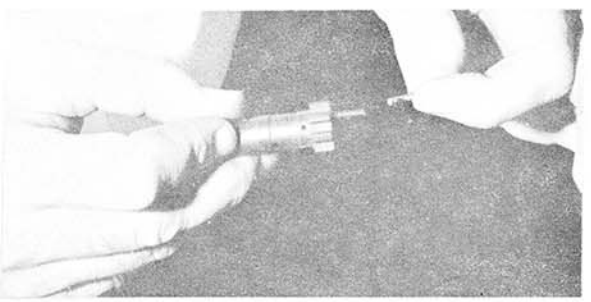
Figure 3-14. EJECTOR DISASSEMBLY.



a. Driving Out Ejector Roll Pin.



b. Ejector Roll Pin Removed.

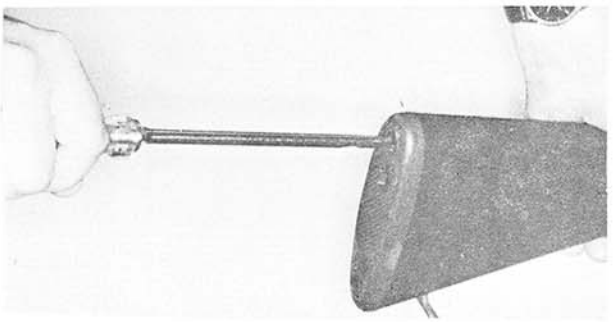


c. Ejector Removed.

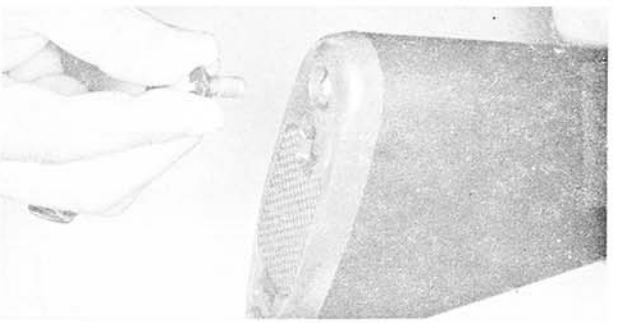
NOTE: When disassembling ejector, keep figure over ejector to keep it from being lost due to ejector spring force when ejector roll pin is driven out.

c. Remove butt cap screw with a large screwdriver. Figure 3-15

Figure 3-15. BUTT CAP SCREW REMOVAL.



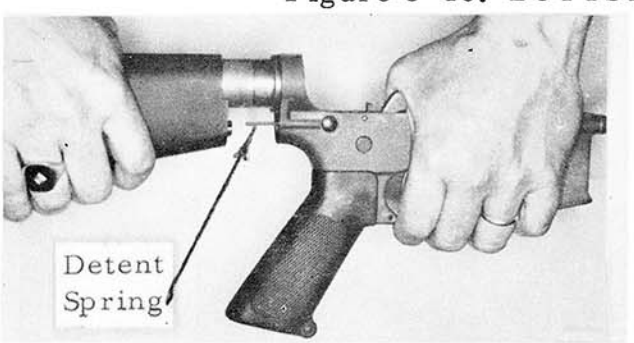
a. Butt Cap Screw Removal.



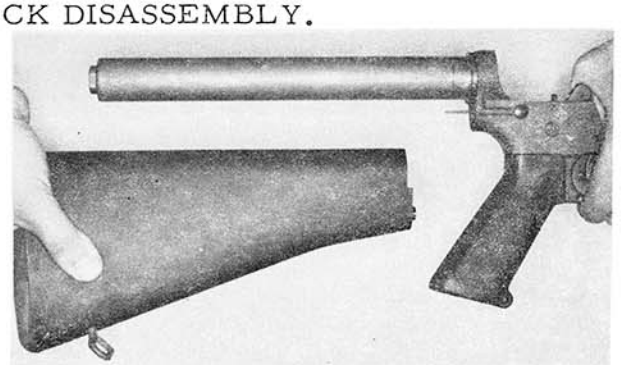
b. Butt Cap Screw Removed.

d. Remove buttstock slowly so takedown pin detent spring does not fly out and get lost. Figure 3-16

Figure 3-16. BUTTSTOCK DISASSEMBLY.



a. Buttstock Removal.

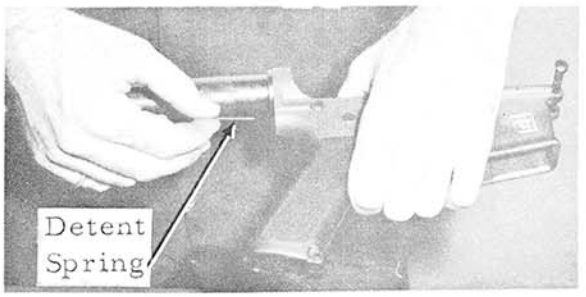


b. Buttstock Removed.

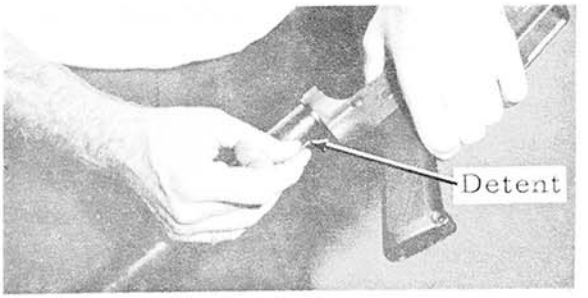
e. Drop out takedown pin detent spring and detent and remove takedown pin. Figure 3-17, page 47

LIST OF ILLUSTRATIONS

Figure 3-17. TAKEDOWN PIN DISASSEMBLY.



a. Detent Spring Removed.



b. Detent Removed.

c. Takedown Pin Removed.

f. Test all detents for freedom of movement. If any are stuck or frozen, the following procedure shall be followed.

(1) Attempt to depress the detent with a small punch or screwdriver.

(2) If the detent cannot be depressed enough for disassembly, saturate it with penetrating oil, bore cleaner, or carbon removing compound and let stand for twenty-four hours. Then disassemble the components.

Figure 3-16 thru 3-20, page 46 thru 50.

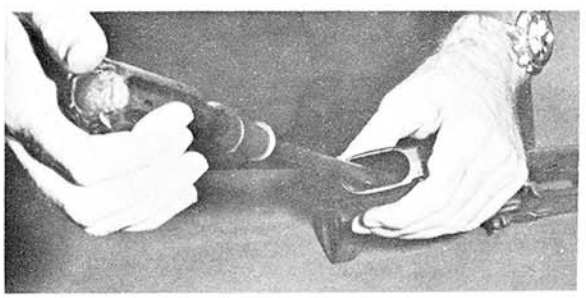
WARNING: Avoid skin contact. The compound should be washed off thoroughly with running water if it comes in contact with the skin. A

good lanolin base cream after exposure to compound is helpful. The use of gloves and protective equipment is recommended.

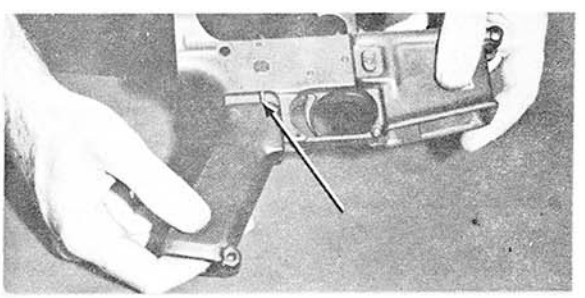
g. After disassembly, the springs, detents, and detent wells should be thoroughly cleaned, then generously oiled with LSA lubricant or equivalent before assembly to the rifle.

h. If the rifle cannot be disassembled by the methods described above, it shall be turned in to a repair facility.

Figure 3-18. FIRE CONTROL SELECTOR DETENT DISASSEMBLY.



a. Pistol Grip Screw Removal.

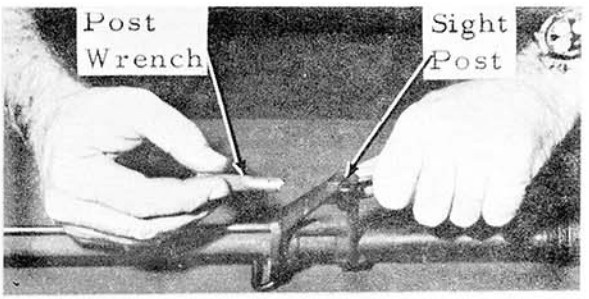


b. Pistol Grip Removal.

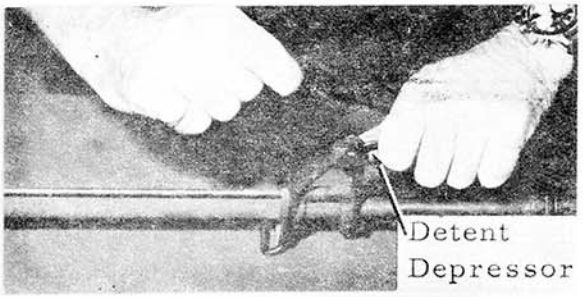
c. Pistol Grip Removed.

d. Detent Removed.

Figure 3-19. FRONT SIGHT POST DISASSEMBLY.



a. Front Sight Post Removal.

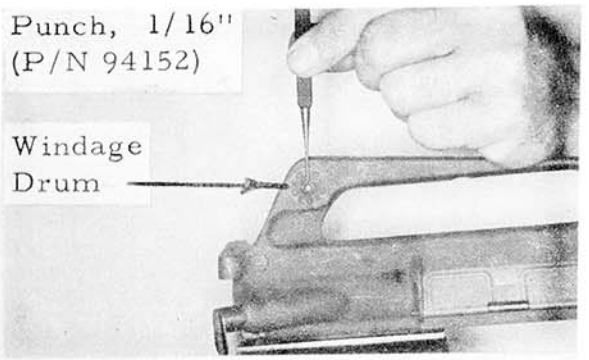


b. Front Sight Post Removed.

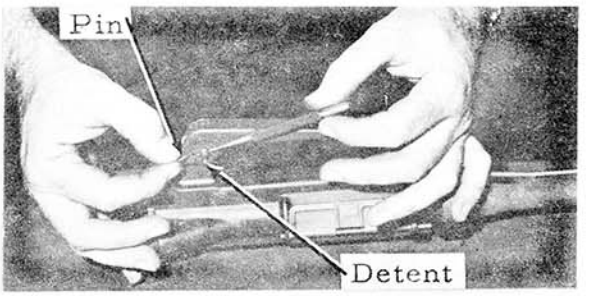
c. Front Sight Detent Removed.

NOTE: The front sight post is removed by turning it counterclockwise with the nose of a cartridge while holding the detent depressed or by using the detent depressor, P/N 62672, and the sight post wrench P/N CE1008, as illustrated above.

Figure 3-20. Windage Drum Detent Disassembly.

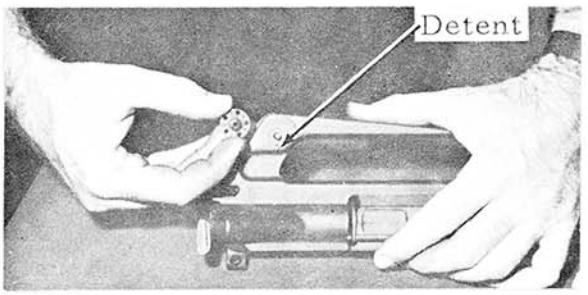


a. Drum Pin Removal.



b. Drum Pin Removed.

Figure 3-20. WINDAGE DRUM DETENT DISASSEMBLY (Cont.).



c. Drum Removed.

NOTE: When removing windage drum pin, hold drum against receiver so detent will not fly out and be lost.

3-11. Cleaning.

Clean the rifle parts as instructed in paragraph 3-5, page **31.** Also remove all signs of rust on steel surfaces but do not use a courser abrasive than crocus cloth. If corrosion is discovered on aluminum surfaces, turn in to a maintenance facility for repair.

3-12. Inspection and Repair

Proceed as instructed in Paragraph 3-6, page **41.** Also comply with the instructions which follow:

a. Bolt Assembly. Inspect for cracks in the bolt (especially in the area of the cam pin hole), condition of the locking lugs, pitted or chipped bolt face, elongated firing pin hole, or broken bolt rings. If any of these conditions are discovered, turn in the item to a maintenance facility for repair. Also, inspect the ejector, ejector spring, and ejector pin for excessive wear or or rust and replace if necessary.

b. Upper Receiver Group. Inspect the upper receiver for cracks and parts for wear. If these conditions are discovered, turn in the item to a maintenance facility for repair. Also inspect the charging handle latch for worn or damaged latch hook and worn or weak spring and replace if necessary. If the receiver finish is scratched or worn off (shiny bright), remove all lubricant

from the surface and touch up with the lacquer listed Paragraph 3-2, page 30. If corrosion is found, turn the item into a maintenance facility for repair.

c. Lower Receiver Group. Inspect pistol grip for cracks and for damaged screw or lockwasher. Replace damaged parts. Inspect the stock and assembly for cracks or damage and replace if necessary. Damaged or cracked stocks are to be turned in to a maintenance facility for repair. Inspect the lower receiver extension takedown pin, pivot pin, and fire control selector as well as their detents and detent pins. Replace worn or damaged parts. Inspect the receiver finish for scratches or wear (shiny bright areas). If discovered, refinish as in b above. If corrosion is found on the receiver, turn it in to a maintenance facility for repair.

d. Magazine. Inspect the magazine box for bulges, dents, excessive wear, or damaged lips; the spring for kinks, cracks, breaks, or rust; and the follower for excessive wear. If any of the above conditions are found, replace the magazine.

3-13. Lubrication.

Proceed as instructed in Paragraph 3-7, page 42.

3-14. Reassembly.

Reassemble the rifle and magazine by reversing the disassembly procedure in Paragraph 3-10, page 45.

Section 4 - Preventive Maintenance Services.

3-15. General.

Preventive maintenance is the systematic care, inspection, and servicing of equipment to keep it in serviceable condition, prevent breakdowns, and assure operational readiness. The operator's role in performance of this service is to perform daily service and to assist the unit armorer in the performance of scheduled periodic services.

3-16. Specific Procedures.

Listed below are the specific procedures to be performed by the operator (0) and unit armorer (A).

Step	Internal	Action	Reference
a.	Before operation (0)	Wipe excessive oil from bore and chamber.	Figure 3-10a, page 39.
b.	Before operation (0)	Hand function rifle to assure proper operation.	Paragraph 2-17, page 25.
c.	After operation (0)	Clean and lubricate.	Paragraphs 3-5, page 31 and 3-7, page 42.
d.	Monthly. (A)	Clean and lubricate detents and springs and outer surface of lower receiver extension.	

Section 5 - Troubleshooting.

3-17. General.

The troubleshooting instructions which follow are to aid the operator and unit armorer to restore worn, damaged, or inoperative rifles to a serviceable condition.

Malfunction	Probable Cause	Corrective Action
Failure to fire.	Selector lever on SAFE.	Move selector to SEMI or AUTO.
	Damaged firing pin.	Replace.
	Improper assembly of firing pin in bolt carrier group.	Remove firing pin and install correctly. Inspect retaining pin for damage.
	Too much oil in bolt firing pin recess.	Disassemble bolt and clean out excess oil.
	Fire control mechanism improperly assembled or with worn, broken, or missing parts.	Turn in to a maintenance base for repair.
	Trigger pin improperly installed.	Check that tails of hammer spring engage grooves in trigger pin.
Failure to unlock (bolt seizes - will not rotate from locked position)	Bolt group, firing pin, or barrel extension burred, dirty, or carboned.	Hold rifle pointing up and strike butt sharply on ground while pulling back on charging handle.
	WARNING: Make certain to be clear of muzzle. Strike butt squarly on ground to prevent damage to stock.	
		Remove bolt group, clean and lubricate.

3.17 Troubleshooting - General (Cont.).

Malfunction	Probable Cause	Corrective Action
Failure to extract.	Dirty or corroded ammunition.	Remove ammunition from magazine and clean same.
	Carbon and dirt build-up in chamber.	Clean chamber.
	Carbon and dirt build-up in extractor recess or extractor lip.	Disassemble and clean.
	Defective extractor, extractor spring, or pin.	Replace.
	Rim shear due to badly pitted chamber.	Turn in to a maintenance facility for replacement.
	Separated cartridge case caused by excessive headspace, etc.	Remove bolt and run bore brush thru from muzzle end of barrel. If this does not remove separated case, turn in for repair. In any event, headspace should be checked by an armorer.
Failure to eject.	Broken ejector.	Replace.
	Frozen ejector.	Disassemble and clean.
	Weak or broken ejector spring.	Replace.
	Short recoil.	See "Short Recoil", in malfunction column.
Failure to remain cocked.	Worn, broken, or missing parts in fire control mechansim.	Turn in to a maintenance facility for repair.
	Hammer pin incorrectly installed.	Remove and install correctly.

3.17 Troubleshooting - General (Cont.).

Malfunction	Probable Cause	Corrective Action
Failure to feed.	Magazine not seated properly.	Adjust magazine catch. Push in magazine catch button with a cartridge and rotate catch clockwise to tighten.
	Dirty or corroded ammunition.	Remove ammunition from magazine and clean same.
	Dirty magazine.	Disassemble and clean.
	Defective magazine.	Replace same.
	Too many rounds in magazine.	Reload rifle.
	CAUTION: Do not load the magazine beyond its rated capacity.	
	Restricted buffer assembly action.	Remove, clean, and lubricate buffer assembly and action spring.
	Short recoil.	See "Short recoil" in Malfunction column.
Double feed.	Defective magazine.	Replace same.
Failure to chamber.	Dirty or corroded ammunition.	Remove ammunition from magazine and clean.
	Restricted movement of bolt carrier group.	Disassemble, thoroughly clean, and lubricate rifle. Remove charging handle from upper receiver, point receiver upward, and install bolt carrier group in receiver. Slowly slide carrier in receiver to check alignment and free movement of carrier key and gas tube. If binding occurs, turn rifle in to a maintenance facility for repair.

3.17 Troubleshooting - General (Cont.).

Malfunction	Probable Cause	Corrective Action
Failure to chamber (Cont'd.)	Bolt cam pin missing.	Replace.
	Loose or damaged bolt carrier key.	Turn in to a maintenance facility for repair.
	Improperly assembled extractor spring.	Disassemble and assemble correctly.
	Bent gas tube.	Turn in to a maintenance facility for repair.
	Misaligned carrier key and gas tube.	Turn in to a maintenance facility.
	Damaged ammunition.	Replace.
	Carbon buildup in chamber.	Clean chamber.
Failure to lock.	Dirt, corrosion, or carbon buildup on bolt or barrel extension locking lugs.	Clean.
	Frozen extractor.	Clean and lubricate.
	Dirt on bolt face.	Clean.
	Frozen ejector.	Disassemble and clean.
	Restricted buffer assembly movement.	Remove buffer and action spring, clean and lubricate. Also clean inside receiver extension and butt screw drain hole.
	Weak or broken action spring.	Replace.
Short recoil.	Gaps in bolt ring not staggered.	Stagger bolt ring gaps.

3.17 Troubleshooting - General (Cont.).

Malfunction	Probable Cause	Corrective Action
Short recoil. (Cont'd.)	Carbon buildup or dirt in carrier key and on outside of gas tube.	Clean and lubricate bolt carrier group and outside of gas tube.
	Restricted movement of bolt carrier group or buffer assembly.	See "Failure to lock" in malfunction column.
	Missing or broken bolt rings or loose carrier key.	Turn in to maintenance facility for repair.
	Gas leakage due to broken or loose gas tube.	Turn in to a maintenance facility for repair.
	Restricted gas flow through gas tube due to propellant deposits.	Turn in to a maintenance facility for replacement.
Bolt fails to lock to rear after last shot fired.	Dirty or corroded bolt catch.	Clean and lubricate. If disassembly is necessary turn in to a maintenance facility for repair.
	Faulty magazine.	Replace.
	Broken bolt catch or spring or old type buffer installed.	Turn in to a maintenance facility for repair.
Failure to cycle with selector set at AUTO.	Worn, broken or missing parts in fire control mechanism.	Turn in to a maintenance facility for repair.
Fires with selector at SAFE.	Worn, broken or missing parts in fire control mechansim.	Turn in to a maintenance facility for repair.
With selector on SEMI, fires when trigger released.	Worn, broken or missing parts in fire control mechansim.	Turn in to a maintenance facility for repair.

3.17 Troubleshooting - General (Cont.).

Malfunction	Probable Cause	Corrective Action
Selector lever binds.	Lack of cleanliness or lubrication.	Clean and lubricate.

CHAPTER IV - ACCESSORY EQUIPMENT

Section 1 - Bayonet and Scabbard

4 - 1. General

This section contains operation and maintenance information on the bayonet and scabbard used with the M16 & M16A1 Rifle.

Figure 4-1. BAYONET - KNIFE AND SCABBARD.

4-2. Description and Usage.

a. Bayonet-Knife, US Model M7 (See Figure 4-1).

The bayonet-knife is used for close combat, guarding prisoners, riot duty, etc., when installed on the rifle as a bayonet. It is also used as a general purpose knife. The blade is pointed with a full length cutting edge on the bottom as installed on the rifle, and a three inch cutting edge on the top. The handle is shaped and has a knurled surface for a firm, comfortable grip.

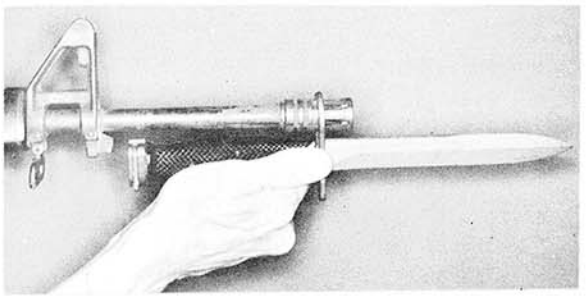
b. Bayonet-Knife Scabbard, U.S. Model M8A1 (See Figure 4 - 1 above)

The bayonet-knife scabbard is used to carry the bayonet-knife.

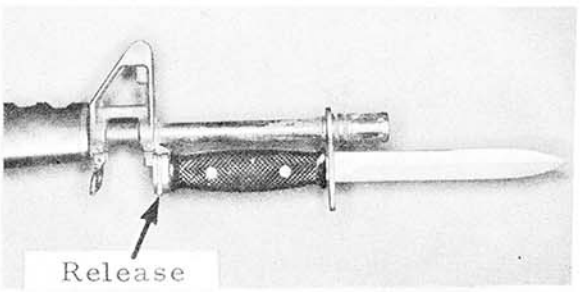
4 - 3. Installation and Removal

The bayonet-knife is installed on the M16 & M16A1 Rifle as shown in Figure 4 - 2, page 60.

Figure 4-2. BAYONET INSTALLATION.



a. Installing Bayonet.



b. Bayonet Installed.

4-4. Cleaning and Lubrication.

a. Bayonet-Knife. - Remove the grip screws, lock washers, and grips. Thoroughly clean all parts. Apply a light coat of lubricant to all metal surfaces and generously lubricate the releases.

b. Scabbard - Scrub with a stiff dry brush to remove loose foreign matter. Then scrub with soap and water to remove oil, grease and imbedded dirt. Rinse well with water and dry thoroughly.

CAUTION: Do not use gasoline or any solvent to remove oil or grease from the canvas.

4-5. Inspection and Repair.

a. Bayonet-Knife - Inspect the releases for proper operation. If the bayonet will not slide over the rifle bayonet stud or can be removed without compressing the releases, the releases are incorrectly installed or the release springs are weak or broken; and so, the bayonet should be turned in to a maintenance facility for repair. If any grip screws or lock washers are missing, replace same.

b. Scabbard - Inspect the fabric for evidence of rotting or weakening due to mildew by stretching and pulling. If fabric shows signs of weakening, turn in the scabbard for a replacement.

Section 2 - Bipod, Rifle.

4-6. General.

This section contains operation and maintenance instructions for the Bipod, Rifle, US Model M3 used with the M16 & M16A1 Rifle (See Figure 4 - 3).

Figure 4-3. BIPOD.

4-7. Description.

The bipod is a lightweight, non-adjustable mount which clamps on the barrel with or without the bayonet installed.

4-8. Installation and Removal.

The bipod is installed on, or removed from, the Rifle by squeezing the bipod legs together, as shown in Figure 4-4, page 62.

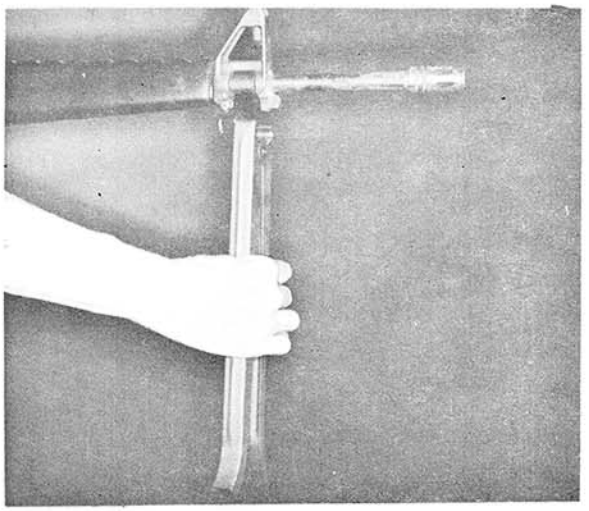
4-9. Cleaning and Lubrication.

Clean off all dirt and grease with bore cleaning compound. Apply a generous amount of lubricant to all surfaces making certain the spring is well lubricated.

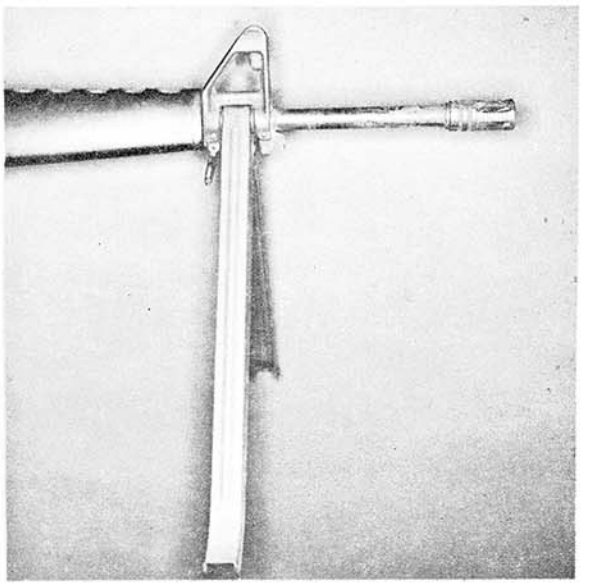
4-10. Inspection.

Inspect the bipod for cracks, distortion, or a weak spring. If any of these conditions exist, replace the bipod.

Figure 4-4. BIPOD INSTALLATION.



a. Installing Bipod.



b. Bipod Installed.

CHAPTER V - AMMUNITION

5 - 1. General

The ammunition for the M16 & M16A1 Automatic Rifle is classified as small-arms ammunition and is in the form of a complete round. A complete round (cartridge) consists of all the components necessary to fire the weapon once; that is, projectile (bullet), cartridge case, propellant, and primer.

5-2. Classification & Identification.

a. Cartridges for the M16 & M16A1 Rifle are classified as centerfire cartridges. In a centerfire cartridge the primer is located in a small well or pocket in the center of the cartridge case head.

b. The cartridges for these weapons are classified and identified according to type and model as in the following examples:

Type	U. S. Model	Identification
(1) Ball	M193	None.
(2) Tracer	M196	Red bullet tip.
(3) Dummy	M199	Six longitudinal corrugations in case.
(4) Blank	M200	*Rosette crimp and identification knurl 1/2. inch from base of case, white tip.

5-3. Identification.

a. General. Ammunition for this weapon is identified completely by packing and marking which includes the ammunition lot number, on original packing containers. When ammunition is removed from its original packing container, the full identity of the ammunition including the lot number, nomenclature and model designation should be maintained with the ammunition.

*In the past the tip has been clear or black, but currently it is white.

b. Marking. Ammunition for 5.56 mm weapons has the manufacturer's identification and year of manufacture impressed on the head of the cartridge case. The year is denoted by the last two digits of the calendar year.

5-4. Care, Handling and Preservation.

a. This ammunition is not dangerous to handle. It is packed to withstand conditions normally encountered in the field.

b. Ammunition boxes should not be opened until the ammunition is to be used. Ammunition removed from airtight containers for extended periods of time, particularly in damp climate, is apt to corrode or thereby rendering the ammunition unserviceable.

c. Cartridges should be protected from high temperatures and prolonged exposure to the direct rays of the sun. Such exposure is likely to affect ballistic performance of the cartridges. The combination of high temperatures and a humid atmosphere is particularly detrimental to the stability of the propellant and to the tracer mixture in tracer ammunition.

d. Cartridges should be kept clean and free of foreign matter. If cartridges get wet or dirty, they should be wiped off at once. If light corrosion forms on cartridges, it should be wiped off with a clean dry cloth. If a cartridge case becomes so corroded that any amount of metal is eaten away, it is dangerous to fire and should not be fired. Cartridges should not be polished to make them look better or brighter.

e. No oil or grease should be permitted on cartridges. Oil or grease might cause injurious abrasives to collect in weapons or produce excessive and hazardous chamber pressures when fired.

f. Whenever practicable, ammunition should be stored under cover. This applies particularly to tracer ammunition.

g. When it is necessary to store ammunition in open storage, raise it on dunnage at least six inches from the ground and cover it with a double thickness of tarpaulin. Leave enough space for free circulation of air through the stack. Suitable trenches should be dug to prevent water from running under the stack.

h. When ammunition is stored, it should be segregated by ammunition lot.

i. When only part of a box of ammunition is issued or used, the ammunition remaining in the ammunition box should be protected by firmly refastening the cover.

j. Ammunition removed from the original packing should be tagged or marked so as to preserve the ammunition lot number.

5-5. Authorized Cartridges.

The following U. S. Military cartridges are among those authorized for use with this weapon:

a. Ball, M193
b. Tracer, M196
c. Dummy, M199
d. Blank, M200

5-6. Preparation for Firing.

a. After removal from packing materials, these cartridges are ready to be used.

b. Cartridges which are not used should be returned to their original packings. If the original packings are not utilized, the boxes in which the ammunition is stored should be appropriately marked with the nomenclature of the cartridges and the ammunition lot number.

Colt Industries
Firearms Division
150 Huyshope Avenue
Hartford, Connecticut 06102
A division of the Colt Industries Operating Corp

APPENDIX A

PARTS LIST
(OPERATOR INSTALLED)

Parts For: 5.56MM Rifles, Models M16 & M16A1

Part Number	Major Groups and Assemblies
62103	Magazine Assembly: 20 Cartridge capacity
62328	Magazine Assembly: 30 Cartridge capacity
	Upper Receiver Group
62198	Guard, Hand Gun: R. H. (Black)
62196	Guard, Hand Gun: L. H. (Black)
62290	Charging Handle Assembly
	Bolt Carrier Group
62335	Pin, Firing Pin Retaining
62294	Pin, Firing
61704	Pin, Bolt Cam
61563	Pin, Extractor
61562	Extractor, Cartridge
61568	Spring, Extractor
	Lower Receiver Group
92701	Screw, Pistol Grip
90001	Washer, Lock: Flat, ext-Teeth, ¼ Nom size, 0.267 Max. ID, 0.510 Max. OD, 0.028 Max. Thk.
62194	Grip, Pistol (Black)
61569	Spring, Ejector and Selector Lever Detent
61785	Detent, Selector Lever
92601	Screw, Butt Cap
62727	Buttstock Stowage Assembly

APPENDIX B

PARTS LIST
(UNIT MAINTENANCE INSTALLED)

(Refer to Figures B - 1, B - 2, B - 3, B - 4 and D - 1)

Part Number	Nomenclature	Fig. No.
61562	Extractor	B2
61563	Pin, Extractor	B2
61564	Ejector	B2
61568	Spring, Extractor	B2
61569**	Spring, Ejector and	B2
	Spring, Safety Detent	B4
61581	Spring, Action	B4
61655	Pin, Takedown	B4
61692**	Spring, Detent, Takedown Pin and Pivot Pin	B4
61698**	Detent, Takedown Pin and Pivot Pin	B4
61700	Sight, Rear	B3
61702	Screw, Rear Sight Windage	B3
61703	Drum, Windage	B3
61704	Pin, Cam	B2
61705	Detent, Front Sight	B3
61706	Post, Front Sight	B3
61708	Spring, Rear Sight	B3
61709	Spring, Front Sight Detent	B3
61754	Spring, Detent, Rear Sight	B3
61755	Detent, Rear Sight	B3
61785	Detent, Fire Control Selector	B4
62116	Bolt Assembly	B2
62194	Grip, Pistol	B4
62196	Handguard Assembly, L. H.	B3
62198	Handguard Assembly, R. H.	B3
62290	Charging Handle Assembly	B3
62294	Pin, Firing	B2
62335	Pin, Retaining, Firing Pin	B2
62339	Buffer Assembly	B4
90001	Washer, Lock (MS-35335-61)	B4
92601	Screw, Butt Cap	B4
92701	Screw, Pistol Grip (MS-35276-284)	B4
95101	Pin, Roll, Rear Sight Drum (MS-16561-96)	B3
95102	Pin, Roll, Ejector (MS-16562-99)	B2
62728	Buttplate Assembly	D1
62730	Door Assembly	D1
62736	Hinge	D1
62734	Hinge Pin	D1
62735	Screw	D1
62737	Swivel	D1

** = Multiple Use Item

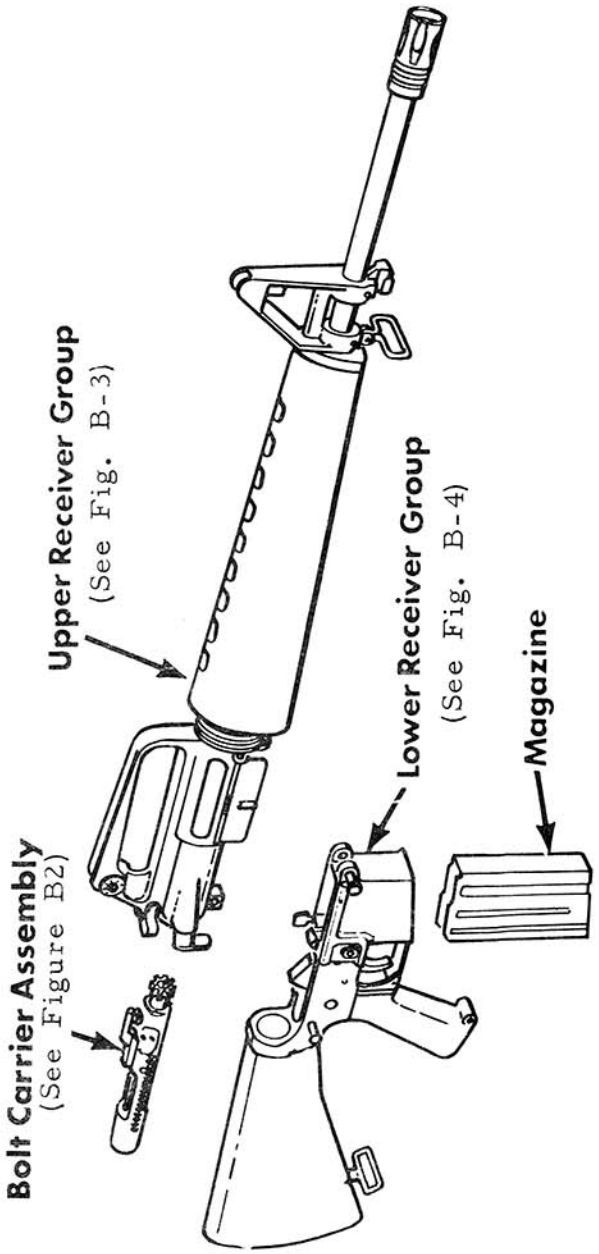


Figure B-1. Parts List Illustrations Key

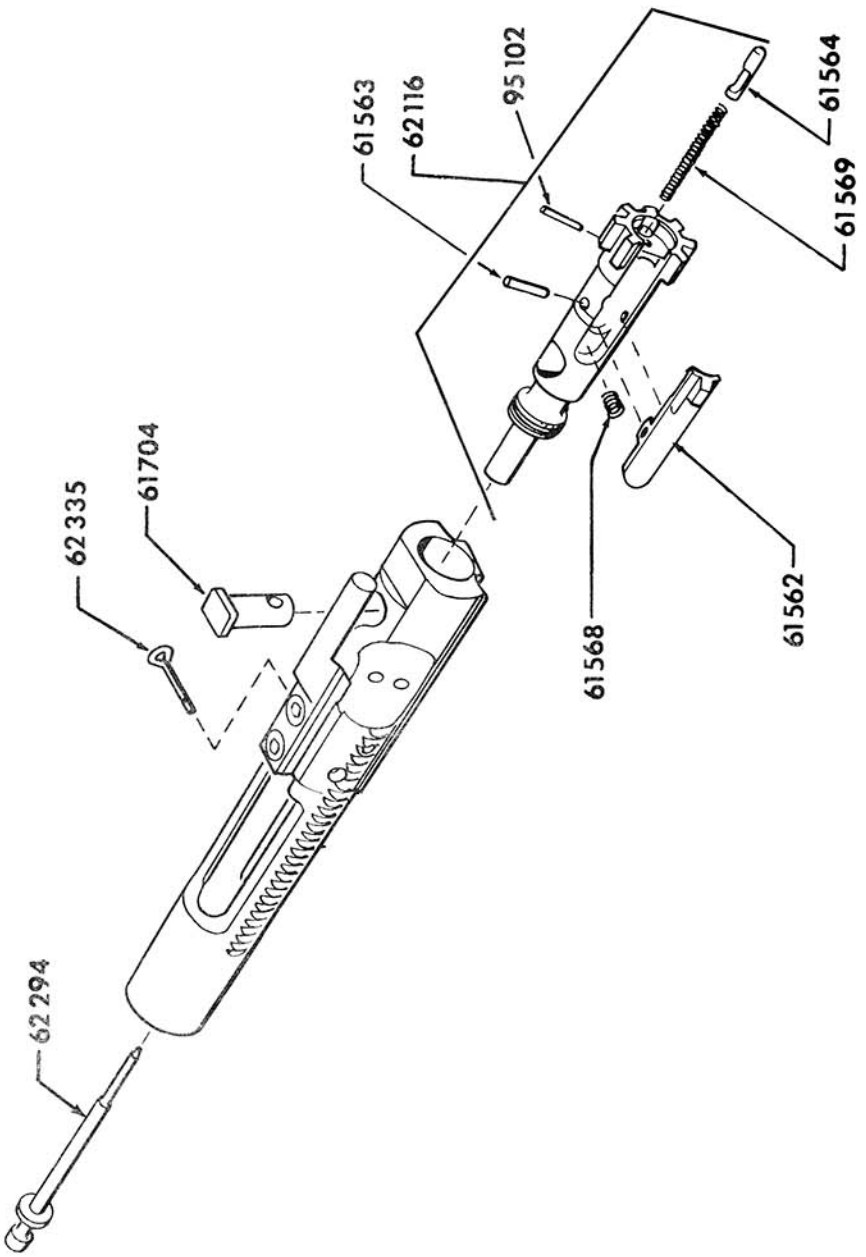


Figure B-2. Bolt Carrier Assembly Parts

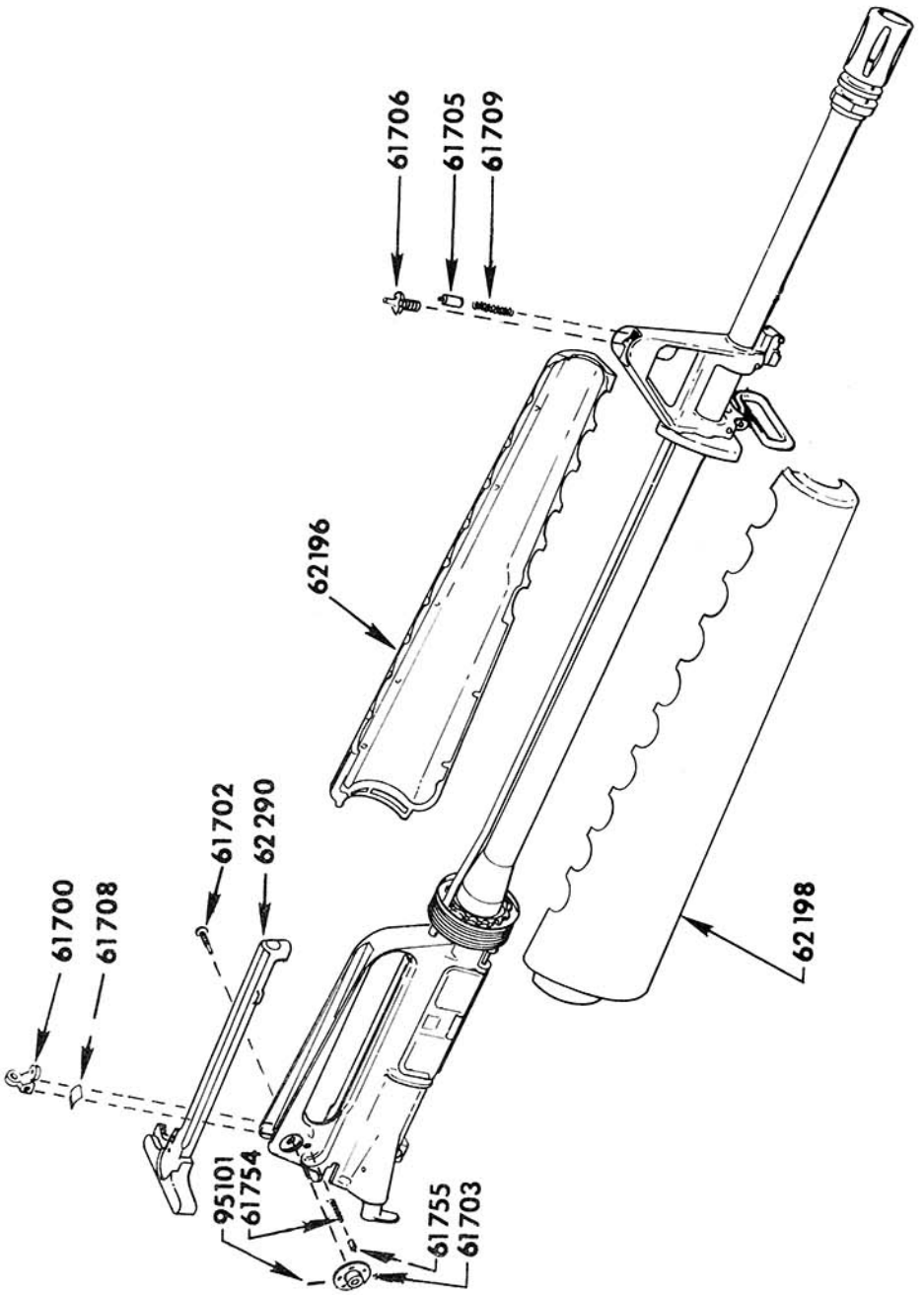


Figure B-3. Upper Receiver Parts

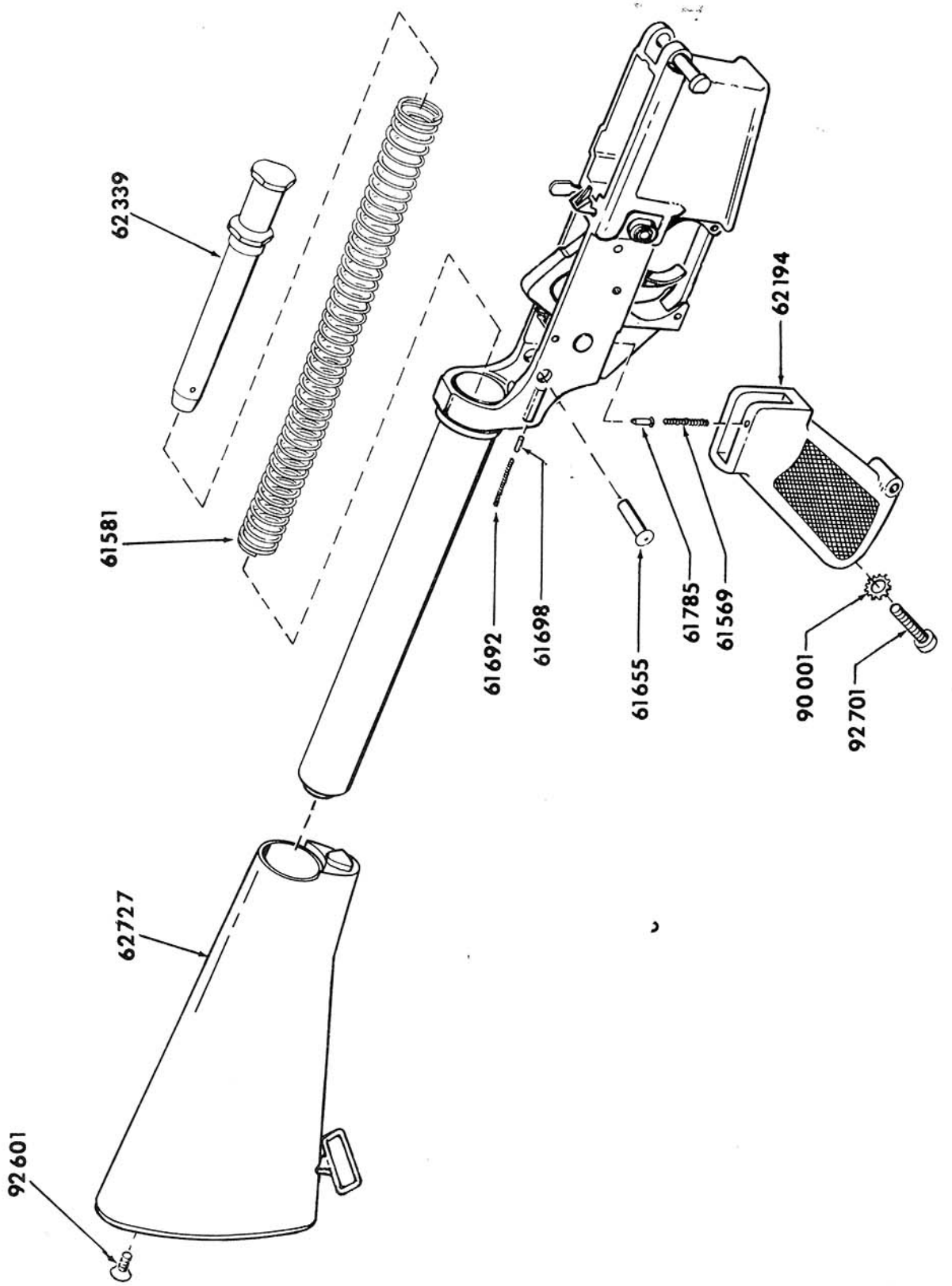


Figure B-4. Lower Receiver Parts.

APPENDIX C

BORE AND CHAMBER CLEANING TOOLS

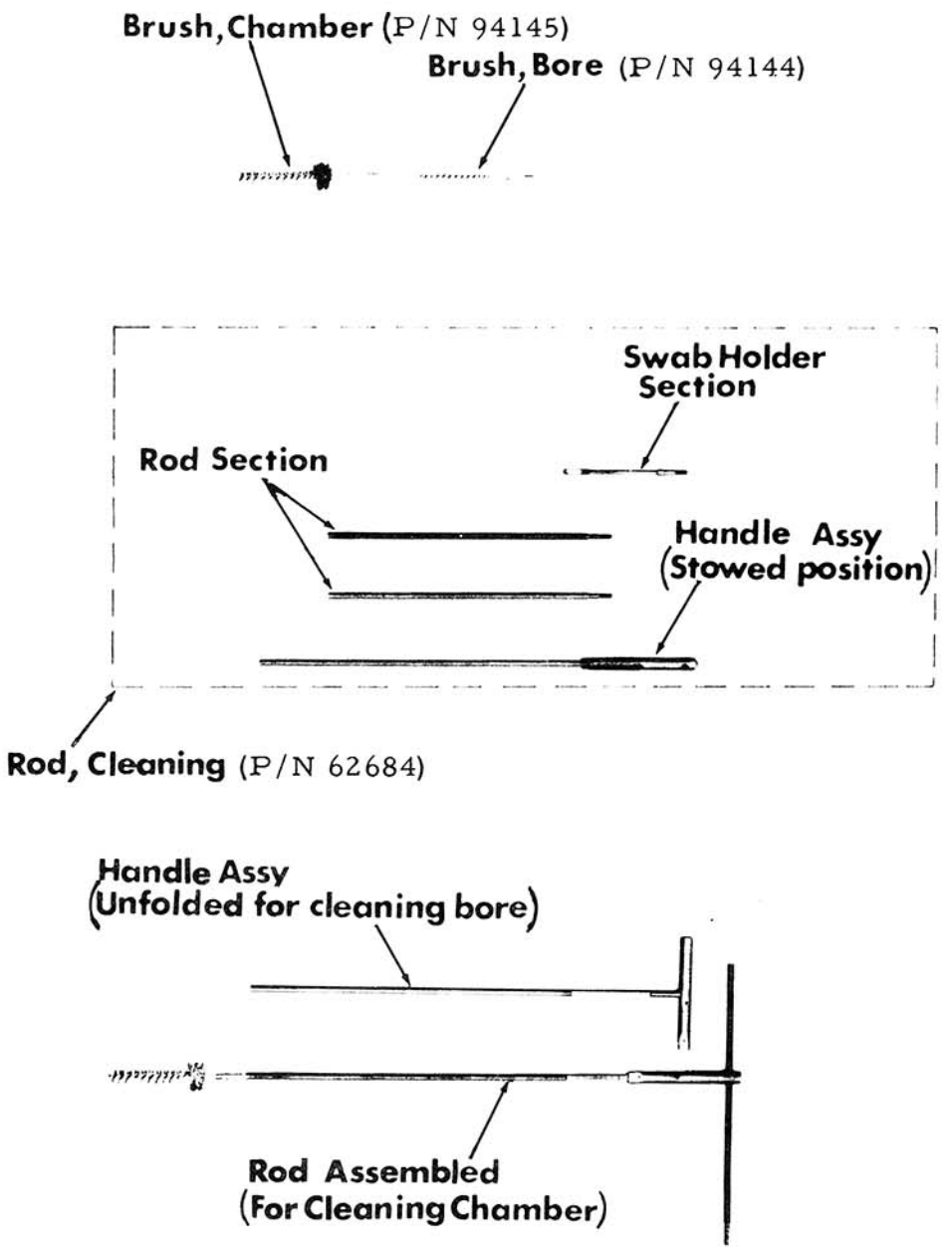


Figure C-1. Bore and Chamber Cleaning Tools

62738	Buttstock
62728	Buttplate Assembly
62730	Door Assembly
62736	Hinge
62734	Hinge Pin
62735	Screw
62737	Swivel

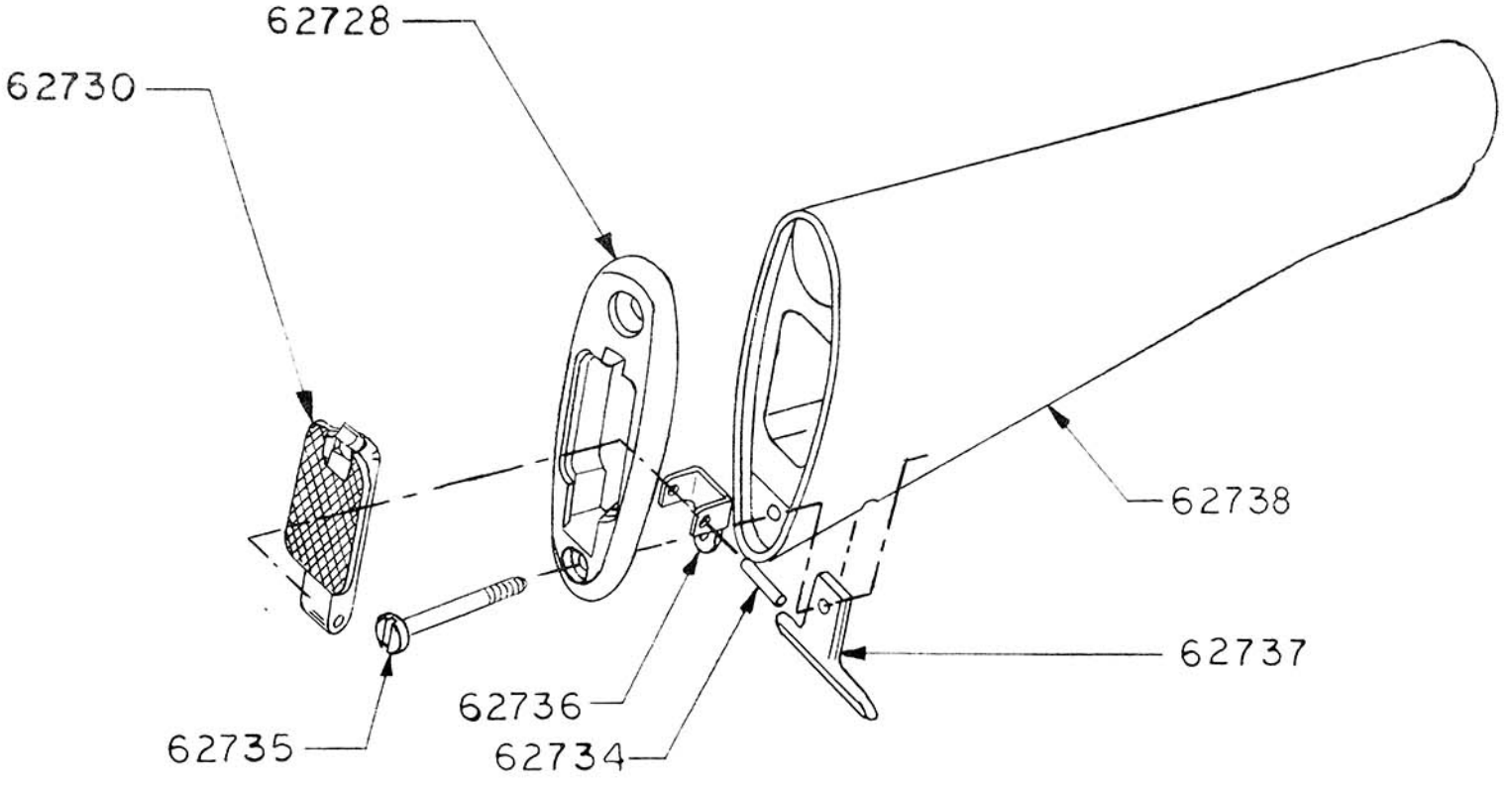
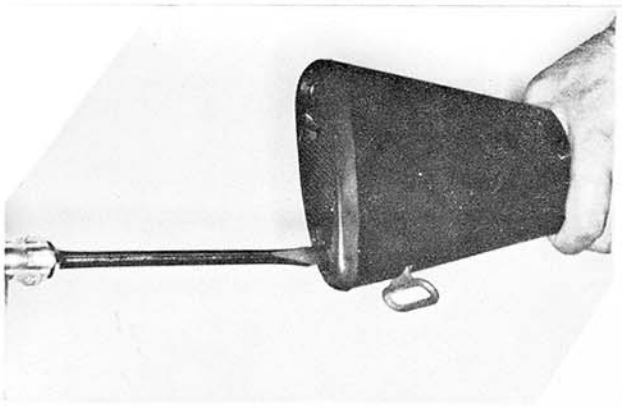
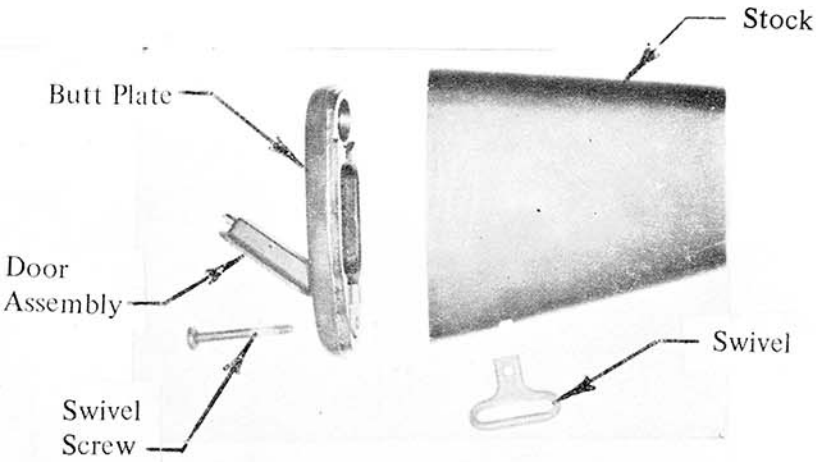


FIGURE D - 1. BUTTSTOCK STOWAGE ASSEMBLY PARTS

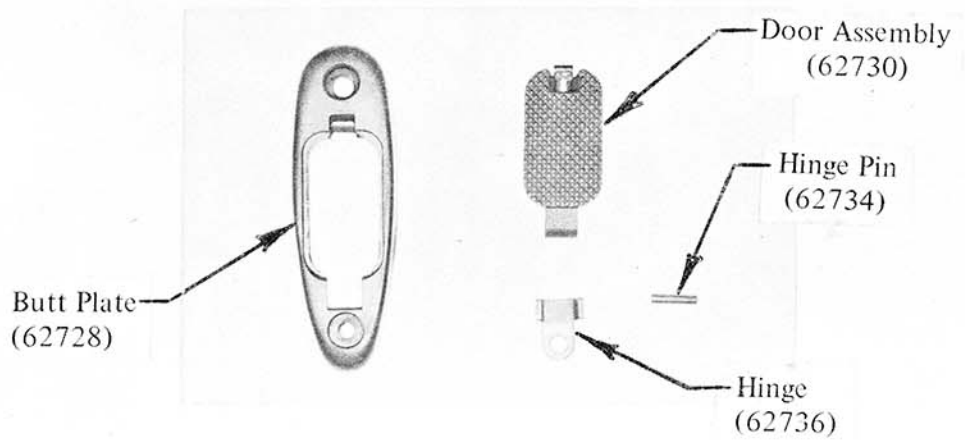
FIGURE E - 1. BUTTSTOCK STOWAGE DISASSEMBLY



a. Removal of screw from Buttstock Assembly.



b. Separation of Buttplate, Buttstock, Screw and Swivel.



c. Separation of Door Assembly, Buttcap, Hinge and Hinge Pin.

Disassembly of the Buttstock Assembly is accomplished as follows:

1. Remove stock screw (92601). This will permit the Buttstock to be removed from the weapon (Figure 3 - 15, page 46).
2. Remove swivel screw (62735) and swivel (62737). The swivel acts as the retaining nut for the screw (Figure E - 1a).
3. Remove the butt plate assembly from the stock (Figure E - 1b).
4. Remove door assembly from plate. This will expose and permit disassembly of the hinge pin. (This pin is a slip fit in the hinge.) (Figure E - 1c)