

CHAPTER 2

MECHANICAL TRAINING

Section 1. DISASSEMBLY AND ASSEMBLY

6. General.

The purpose of this chapter is to enable the user to understand how to disassemble and assemble the submachinegun, how it functions, and how to care for it properly. In understanding functioning of the submachinegun, the soldier is better prepared to reduce malfunctions and stoppages as they occur. In learning the loading, firing, unloading, and safety checks, the individual acquires greater knowledge and thus develops confidence in the weapon. The first steps in understanding functioning are to learn the nomenclature and how to disassemble and assemble the weapon.

7. Nomenclature.

Nomenclature should be taught to the user to simplify and assist future instruction. In the disassembly/assembly procedures, the titles of the tasks involved are the names of the parts. The soldier should read and say the task to be performed aloud and thus learn the nomenclature.

8. Disassembly, General.

a. The soldier is permitted to disassemble only certain parts of the submachinegun—not because he cannot learn to disassemble all of them, but because unnecessary disassembly causes extra wear. Also, disassembly and assembly of some parts require tools that are not normally available in troop units.

b. The left column of the following chart shows those parts that may be disassembled by the soldier. The center column indicates those parts that the unit armorer may remove, including the parts disassembled by the soldier. The right column shows those parts that only ordnance personnel may disassemble.

Disassembly authorized	Disassembly performed by		
	Individual soldier	Unit armorer	Ordnance personnel
Field disassembly	X	X	
Barrell assembly			X
Housing assembly			X
Trigger and sear group	X	X	
Bolt and guide rod group	X	X	
Extractor		X	
Magazine	X	X	
Receiver			X

9. Guides To Follow in Disassembly and Assembly.

These guides should be followed when disassembling and assembling the submachinegun.

a. Follow the step-by-step explanation in disassembling the submachinegun.

b. Do not attempt to disassemble or assemble the weapon against time.

c. If it is necessary to apply force, do it carefully so that none of the parts are damaged.

d. As the weapon is disassembled, line up the parts in the order of their removal. This procedure helps in assembly of the weapon, which is done in reverse order of disassembly.

10. Field Disassembly.

The soldier must learn field disassembly (removal of the groups) so well that he can perform this operation in the dark. The submachinegun can be field disassembled without special tools. Parts of the weapon are used instead of tools.

11. Procedure for Field Disassembly.

a. Before disassembling the submachinegun, make sure that the weapon is *clear* (para 31). Press in on the magazine catch, and remove the magazine. Raise the cover, pull the bolt to the rear, and inspect the chamber. Allow the bolt to go forward by squeezing the trigger. Close the cover.

Note. To pull back (retract) the bolt on the M3, pull the retracting handle to the rear. To pull back the bolt on the M3A1, insert a finger into the cocking slot on the bolt and pull the bolt to the rear.

b. To disassemble the submachinegun, follow the procedure illustrated in figures 5 through 15.

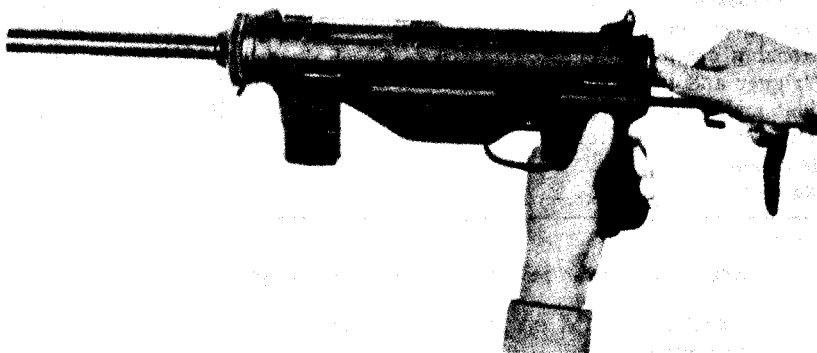


Figure 5. Press in on stock catch on the left side of the pistol grip, and remove the stock by pulling it directly to the rear.

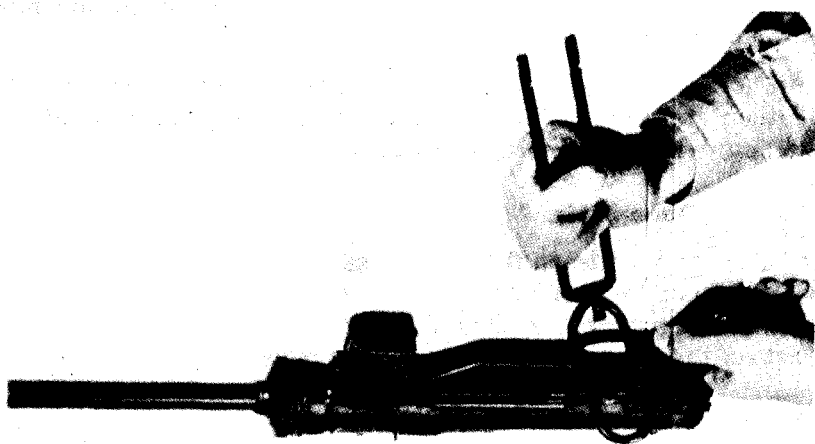


Figure 6. To remove the trigger guard, place one side of the shoulder rest of the stock on the housing assembly, against the trigger guard, and pry the trigger guard out of the pistol grip. Rotate the trigger guard toward the front of the weapon, and unhook the trigger guard from the housing assembly.

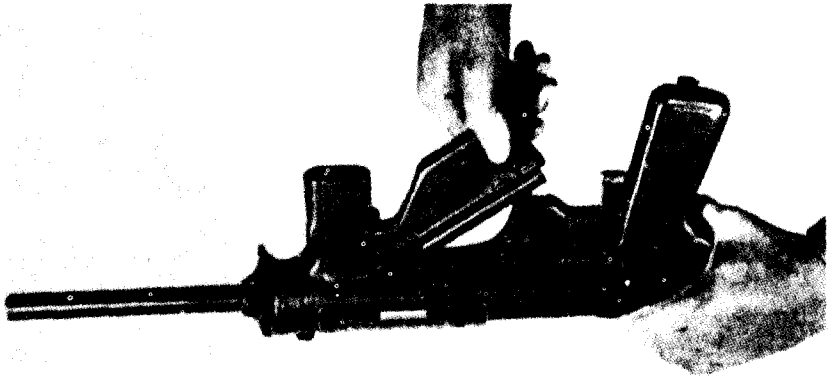


Figure 7. Remove the housing assembly by pulling up and to the rear on the rear end.

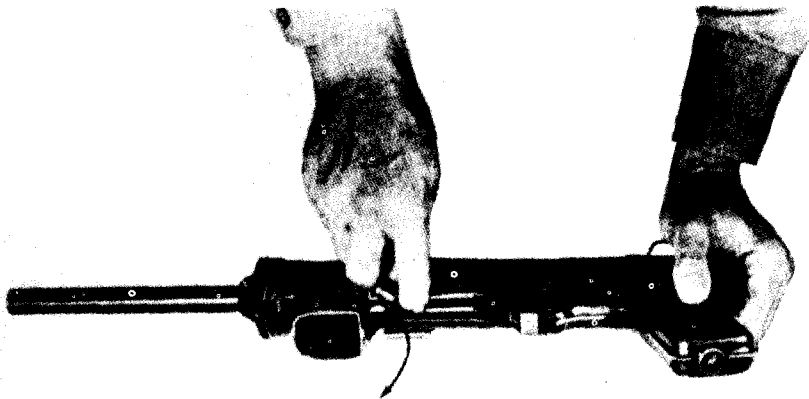


Figure 8. Remove the magazine catch assembly by rotating it toward the right side of the receiver.

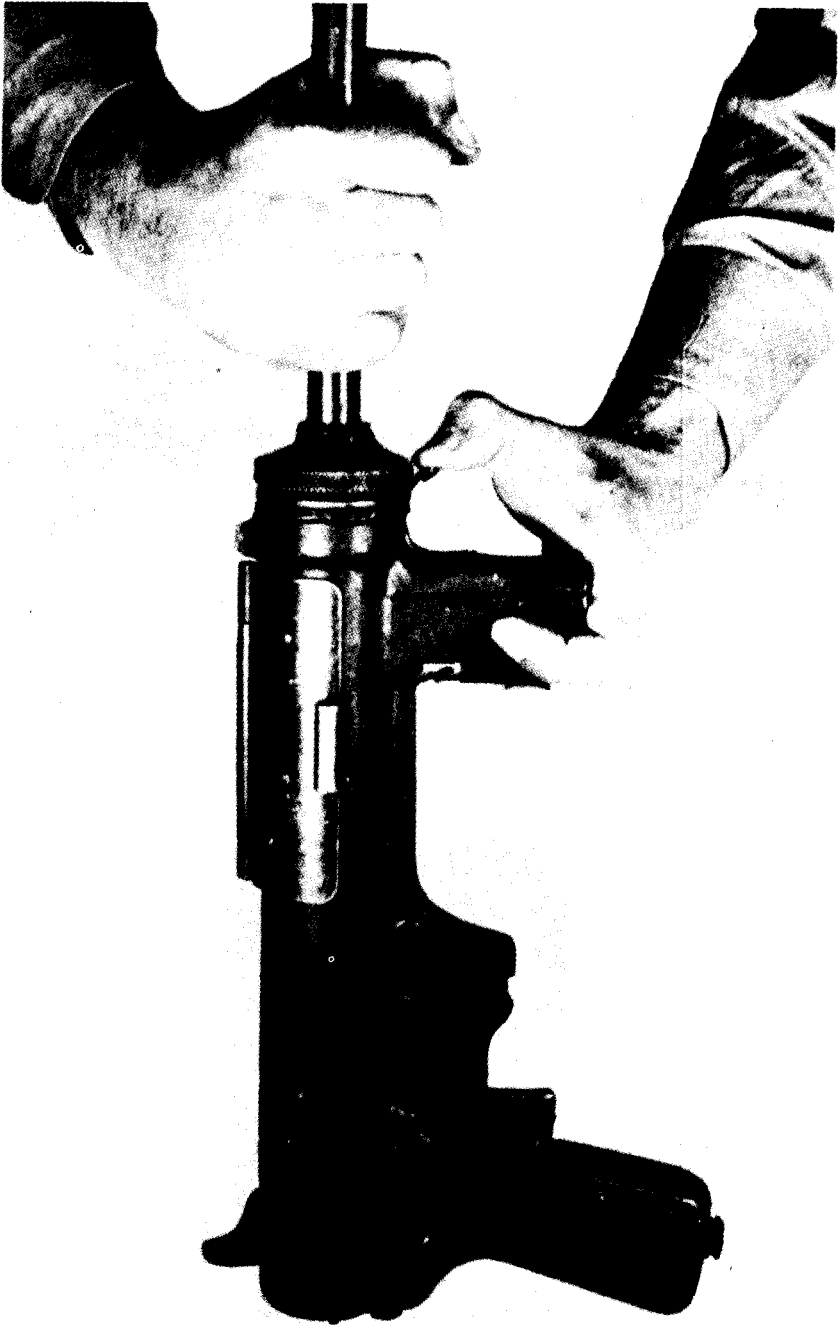


Figure 9. To remove the barrel, make sure the bolt is forward, depress the barrel ratchet, and unscrew the barrel. Do not allow the barrel ratchet to contact the notches in the barrel collar when removing or replacing the barrel.

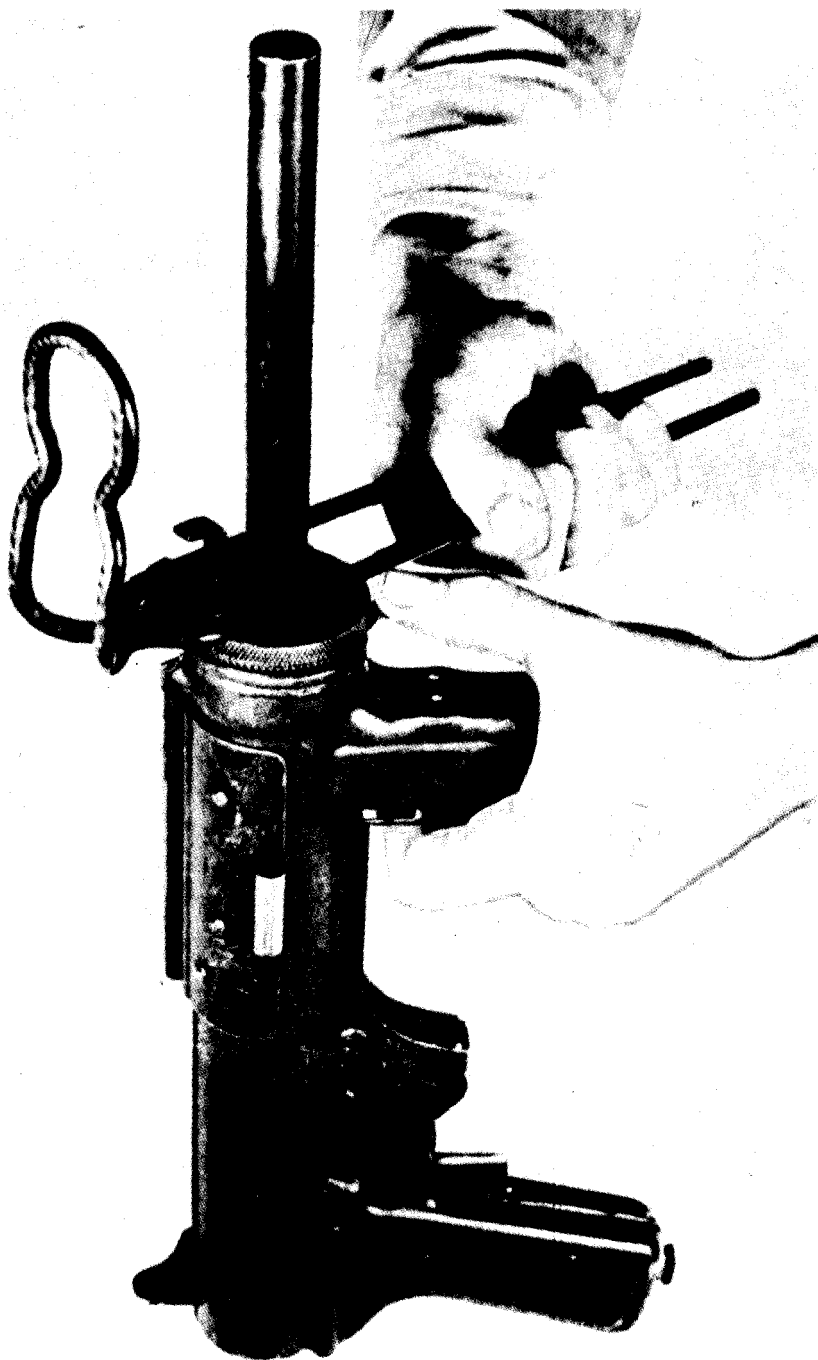


Figure 10. Using M3A1 stock as a wrench.

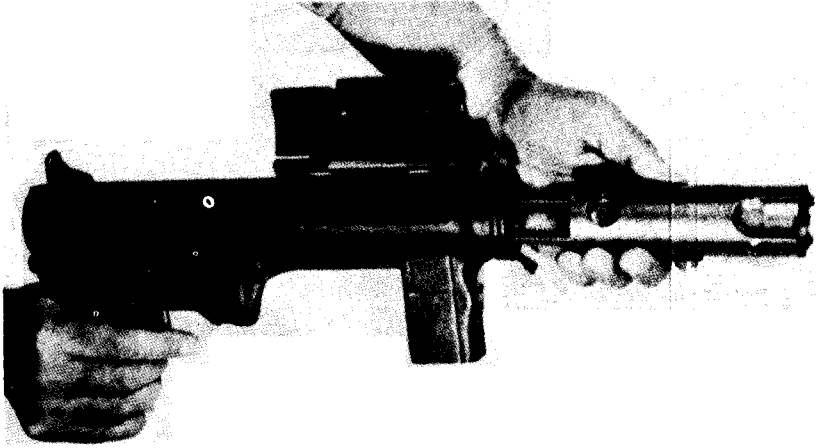


Figure 11. Open the cover, and withdraw the bolt and guide rod group from the receiver.

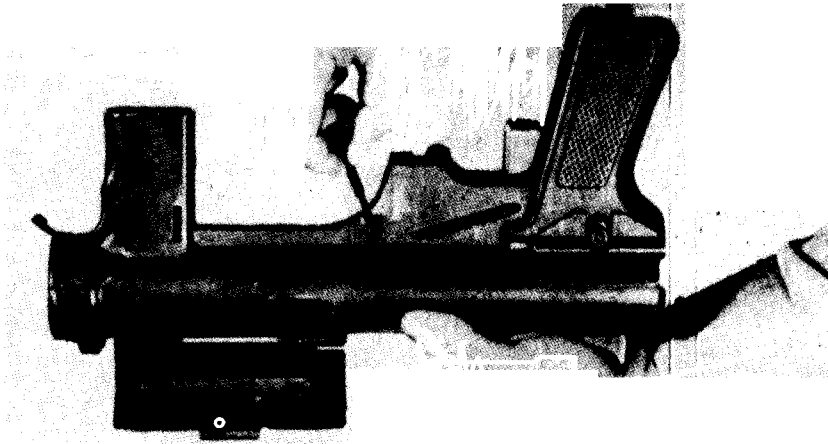


Figure 12. Drift out the sear pin. The magazine catch, ejector, or oiler stylus may be used as a drift.

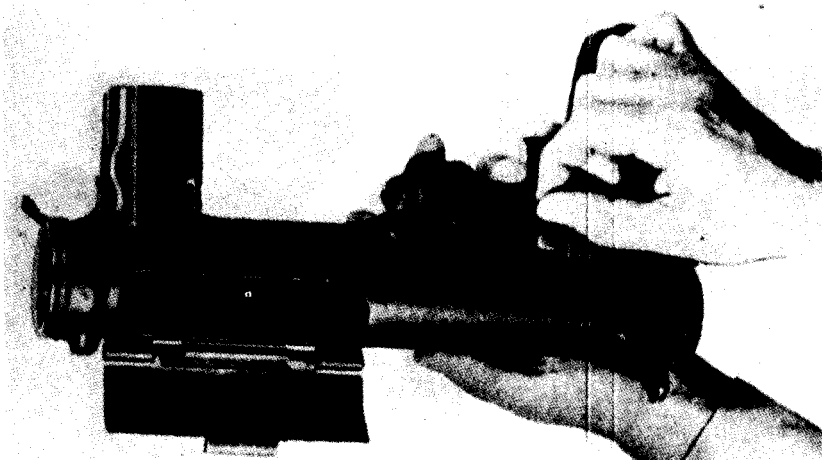


Figure 13. Remove the trigger pin.

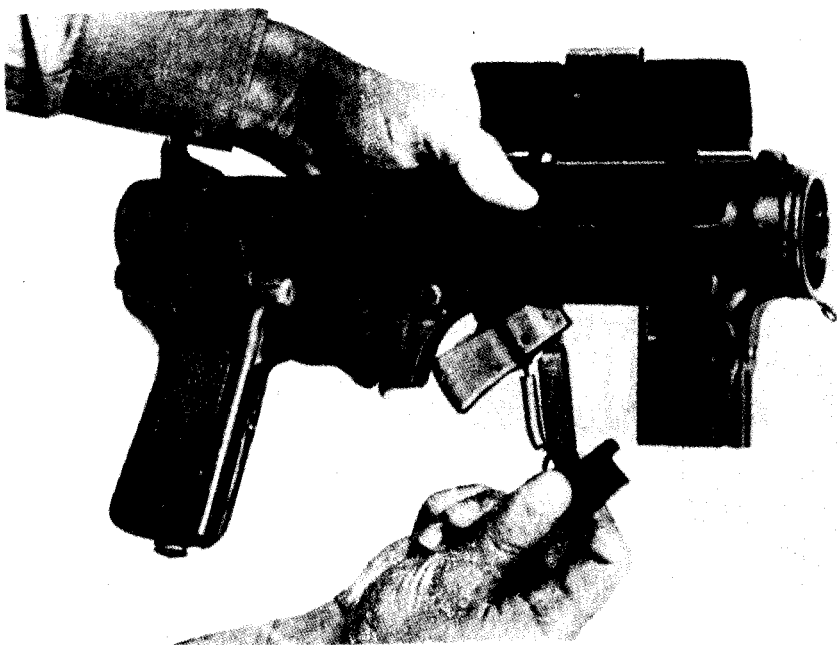
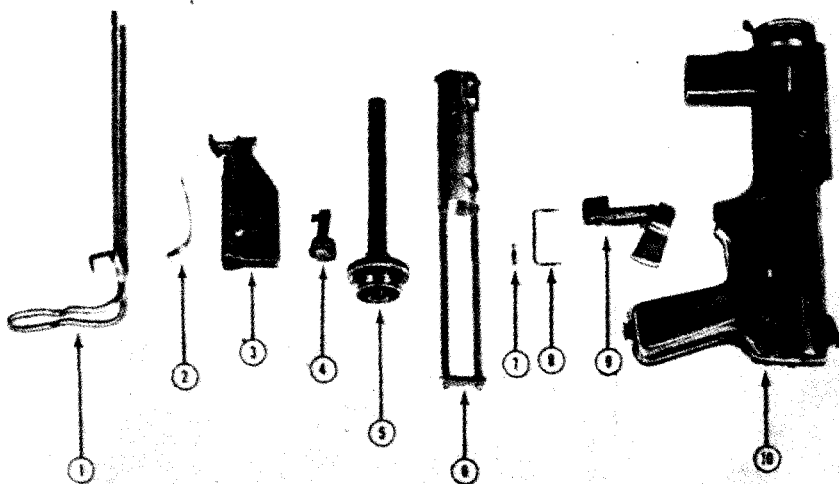


Figure 14. Withdraw the trigger and sear group from the receiver. Be careful not to drop the connector pin. This completes field disassembly.



- | | |
|----------------------------|---------------------------|
| 1. Stock | 6. Bolt and guide group |
| 2. Trigger guard | 7. Sear pin |
| *3. Housing assembly | 8. Trigger pin |
| 4. Magazine catch assembly | 9. Trigger and sear group |
| *5. Barrel assembly | *10. Receiver |

*Further disassembly is performed by ordnance personnel only.

Figure 15. Parts lined up in order of removal during field disassembly.

12. Procedure for Assembly After Field Disassembly.

a. The first steps in assembling the submachinegun are illustrated in figures 16 and 17.

b. Replace the bolt and guide rod group into the receiver with the retaining plate to the rear and the sear notch down. Close the cover. Depress the barrel ratchet, and replace the barrel by screwing the barrel collar all the way down until it is snug against the receiver. Replace the magazine catch assembly. Place the front projection on the housing assembly into its recess in the magazine guide. Press the rear end of the housing into place; make certain that it is properly seated. Insert the forward end of the trigger guard in its slot in the housing assembly, and rotate it to the rear (fig 18). Do not use force in this operation. Press the rear end of the trigger guard until it snaps into its slot in the pistol grip. Press in on the stock catch, and replace the stock.

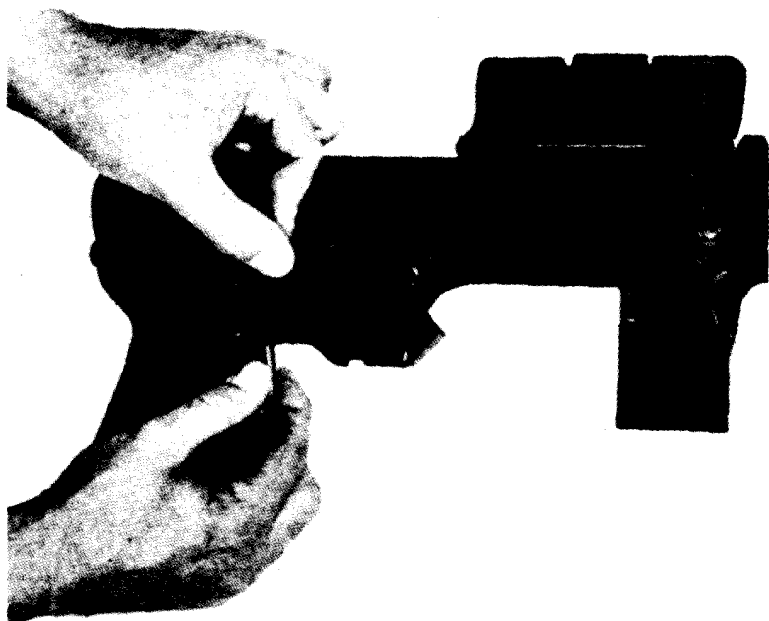


Figure 16. Replace the trigger and sear group in the receiver, with the trigger pin holes in the trigger and receiver alined. Replace the trigger pin. The front arm of the trigger pin goes through the holes in the receiver and does not go through any other parts.



Figure 17. Grasp the receiver, with the little finger on the trigger and the first finger against the sear. Press down on the trigger, and at the same time manipulate the sear until the sear pin hole in the sear is alined with the hole in the receiver. Replace the sear pin.

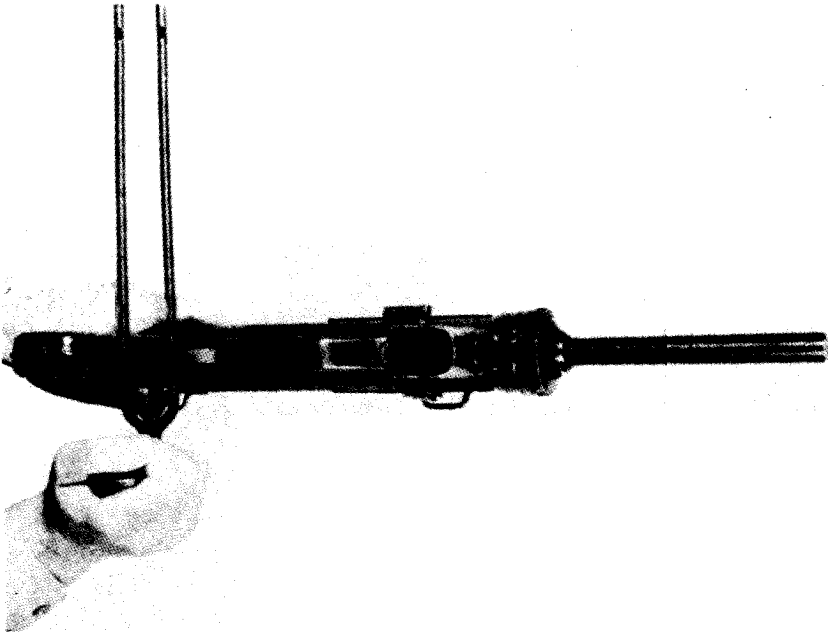


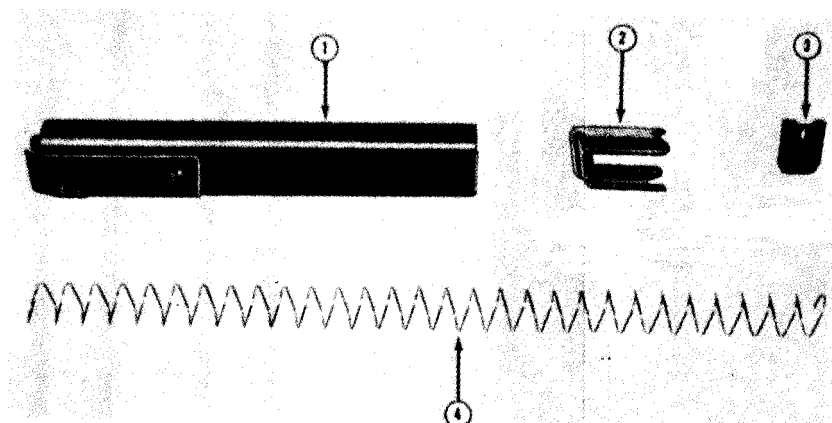
Figure 18. Use of the stock in replacing the trigger guard.

13. Disassembly of Groups (Detailed Disassembly).

a. Magazine (fig 19). Lift the tab in the base plate by inserting a screwdriver in the hole. Remove the base plate, placing the fingers over the bottom of the magazine to prevent the magazine spring from flying out. Remove the magazine spring and the magazine follower.

b. Bolt and Guide Rod Group (fig 20 thru 24). Compress the driving springs, and remove the guide rod retaining clip. Remove the guide rod locating plate. Remove the bolt and driving springs from the guide rods. Do not remove the guide rod retaining plate from the two guide rods (this is done by ordnance personnel only). The extractor is removed for replacement only (this should be done by the unit armorer). To remove the extractor, drift out the extractor pin (from the small end, located on the bottom of the bolt). Place the rim of a dummy cartridge under the lip of the extractor, and lift it out.

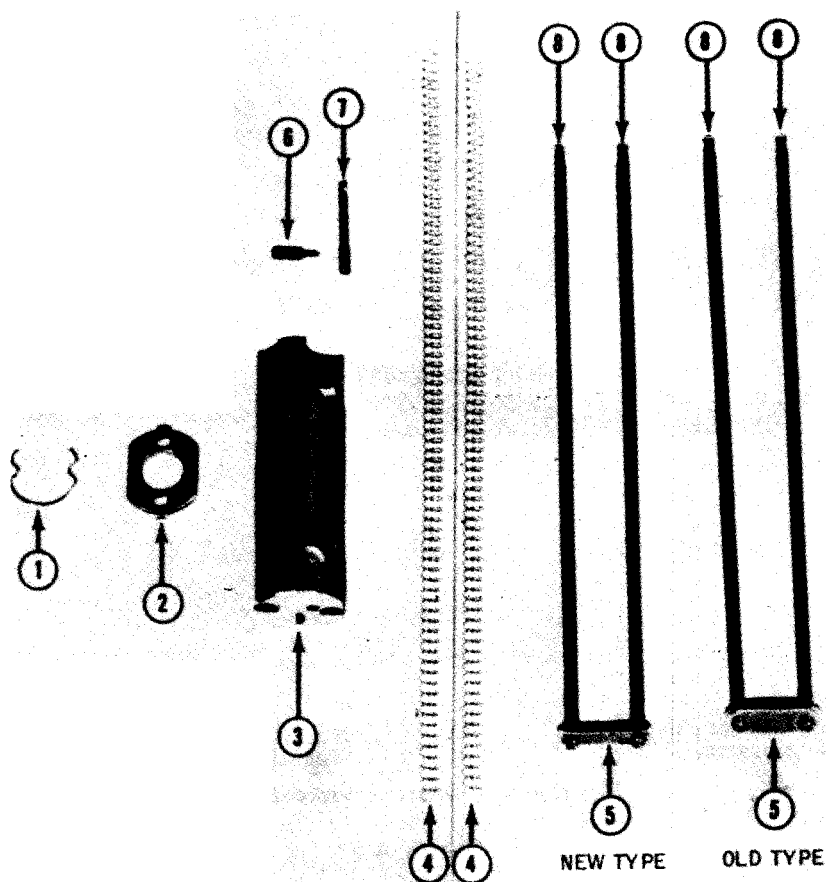
c. Trigger and Sear Group (fig 25). Drift out the connector pin. Remove the sear. Unfasten the trigger spring from the connector (do not remove it from the trigger).



- 1. Magazine body
- 2. Magazine follower

- 3. Magazine base
- 4. Magazine spring

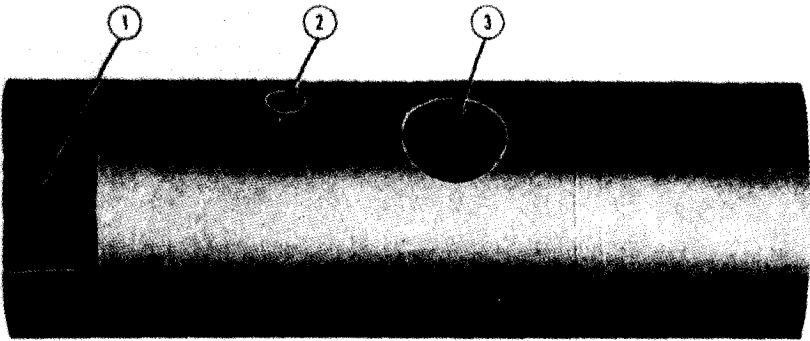
Figure 19. Magazine assembly.



1. Guide rod retaining clip
2. Guide rod locating plate
3. Bolt
4. Driving springs

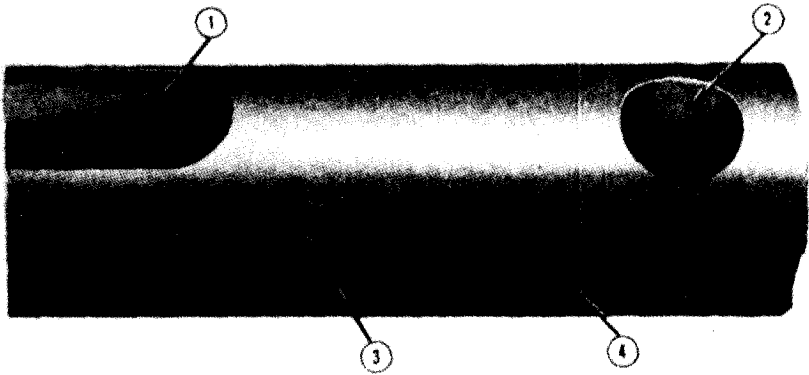
5. Guide rod retaining plate
6. Extractor pin
7. Extractor
8. Guide rods

Figure 20. Bolt and guide rod group.



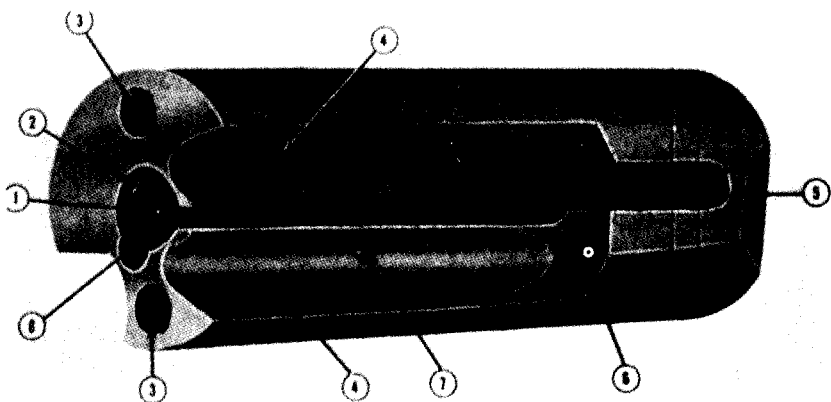
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| 1. Clearance cut to allow ejection
of spent cartridge case | 2. Extractor pin |
| | 3. Safety lock recess |

Figure 21. Top view of M3 Bolt.



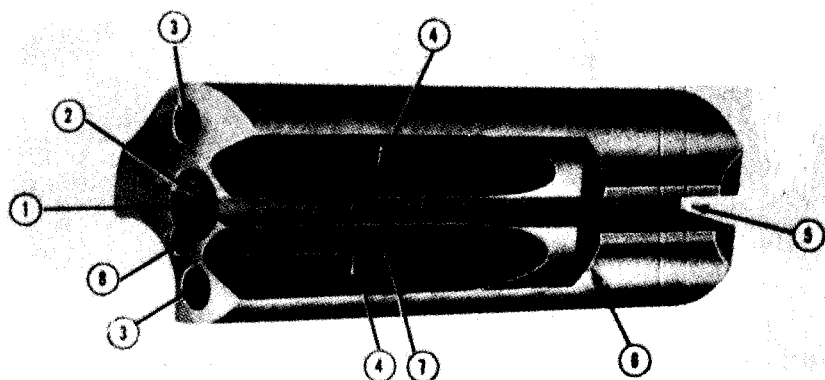
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| 1. Cocking slot | 3. Extractor pin |
| 2. Safety lock recess | 4. Clearance groove for cover rivets |

Figure 22. Top view of M3A1 bolt.



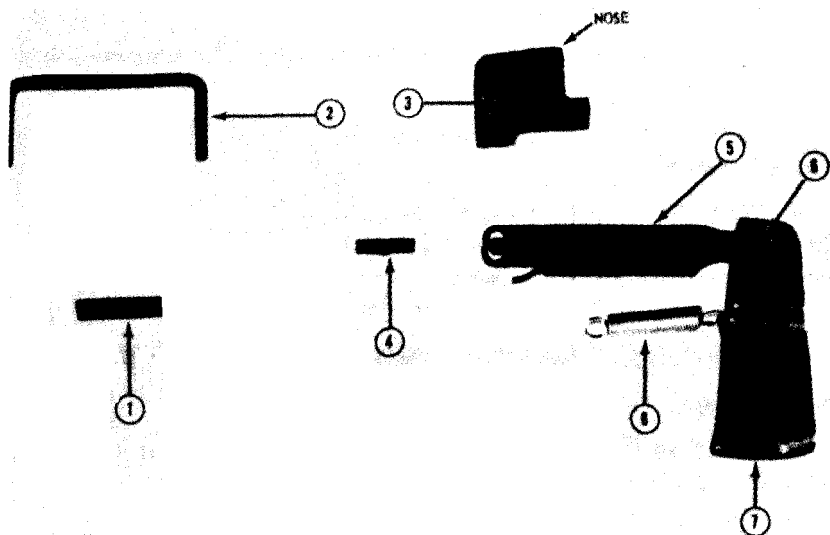
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| 1. Firing pin | 5. Retracting lever pawl notch |
| 2. Cartridge recess | 6. Sear notch |
| 3. Guide rod bearing | 7. Extractor pin |
| 4. Magazine lip recess | 8. Extractor |

Figure 23. Bottom view of M3 bolt.



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|------------------------|-------------------|
| 1. Firing pin | 5. Ejector groove |
| 2. Cartridge recess | 6. Sear notch |
| 3. Guide rod bearing | 7. Extractor pin |
| 4. Magazine lip recess | 8. Extractor |

Figure 24. Bottom view of M3A1 bolt.



- | | |
|------------------|--------------------|
| 1. Sear pin | 5. Connector |
| 2. Trigger pin | 6. Connector rivet |
| 3. Sear | 7. Trigger |
| 4. Connector pin | 8. Trigger spring |

Figure 25. Trigger and sear group.

14. Assembly of the Groups.

a. Magazine. Replace the magazine follower and the magazine spring, with the loop toward the front of the magazine. Compress the magazine spring into the magazine body, and replace the magazine base. Press the tab back into its original position.

b. Bolt and Guide Rod Group. Replace the extractor so that the notch and hole for the extractor pin in the bolt are aligned. Firmly seat the extractor pin, and stake it in place. Place the driving springs on the guide rods. Compress the driving springs, and place the bolt on the guide rods with the firing pin away from the guide rods retaining plate. Replace the guide rod locating plate and the guide rod retaining clip.

c. Trigger and Sear Group. Fasten the trigger spring to the connector. Place the sear on the connector, with the sear nose up and to the rear. Replace the connector pin.

15. Operation Check.

After the weapon has been assembled, it should be checked to insure that it has been correctly assembled.

a. Pull the bolt to the rear sharply. It should be engaged and held to the rear by the sear.

b. Close the cover, and squeeze the trigger. The bolt should not move forward.

c. Open the cover, and squeeze the trigger. The bolt should move forward.

d. With the trigger held to the rear, pull the bolt to the rear and release it. The bolt should not be held to the rear by the sear, but should move forward.

Section II. HOW THE SUBMACHINEGUN FUNCTIONS

16. General.

a. By disassembling and assembling the submachinegun, the soldier becomes familiar with the parts. The next step is to learn how these parts function. If the soldier understands how the submachinegun works, he will be able to keep it in operating condition and reduce any stoppage which might occur during firing. This knowledge will give the soldier confidence in his weapon.

b. Each time a cartridge is fired, the parts inside the submachinegun function in a given order. This is known as the cycle of operation (functioning).

c. The cycle of operation of small arms is broken down into eight basic steps. However, in the submachinegun, two of these steps—locking and unlocking—do not occur. The 6 basic steps of the cycle of operation of the submachinegun are listed below in the proper sequence, although more than 1 step may occur at the same time.

(1) Feeding—the placing of a cartridge in the receiver, in front of the bolt, so it can be chambered. This action takes place in the magazine only.

(2) Chambering—moving the cartridge forward until it is properly seated in the chamber.

(3) Firing—the striking of the primer of the cartridge by the firing pin to ignite the cartridge.

(4) Extracting-removal of the empty cartridge case from the chamber.

(5) Ejecting—removal of the empty cartridge case from the receiver.

(6) Cocking—retraction of the bolt far enough so that it

will pick up a new cartridge and, as it moves forward, will have enough energy to fire the new cartridge.

17. Functioning of the Submachinegun, General.

As the bolt is moved back to a cocked position, the driving springs are compressed, and the ear engages the sear notch of the bolt. When the trigger is pressed, the sear releases the bolt, which is driven forward by the driving springs. During this forward movement, the bolt pushes a cartridge from the magazine into the chamber. The bolt continues forward and fires the cartridge. When the cartridge is fired, the chamber pressure forces the bullet out of the muzzle of the barrel. At the same time, this pressure overcomes the forward movement of the bolt and starts it to the rear. By the time the bolt and empty cartridge case have moved to the rear far enough to open the rear end of the chamber, the bullet has left the barrel, and the chamber pressure has decreased. (In the submachinegun, the chamber pressure is relatively low and the bolt is relatively heavy; this eliminates the need for the steps of locking and unlocking.) During the rearward movement of the bolt, the empty cartridge case is extracted and ejected, the driving springs are compressed, and the top round in the magazine moves up against the lips of the magazine (fig 26). The rearward movement of the bolt is stopped by the compressed driving springs or when it contacts the guide rod retaining plate.

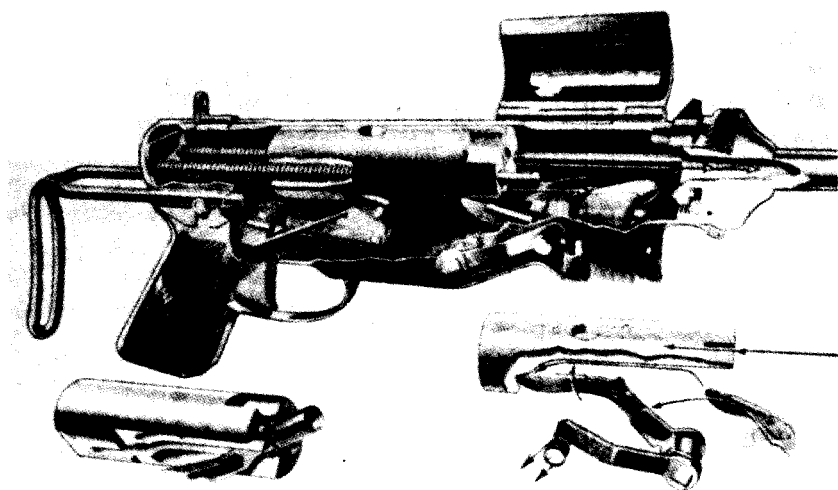


Figure 26. M3, cutaway view. Lower left shows camming action of ejector on empty cartridge case. Lower right shows action of retracting lever and handle in cocking the gun.

18. Operation of the Trigger and Sear Group.

a. When the trigger is pressed, it rotates around the rear arm of the trigger pin and forces the connector forward. This rotates the sear from the sear notch in the bottom of the bolt. This allows the bolt to move forward under the action of the expanding driving springs.

b. If the trigger is held to the rear, the nose of the sear cannot engage the sear notch. The bolt will continue to move forward and backward, firing the weapon automatically until the trigger is released.

c. If the trigger is released, the nose of the sear engages in the sear notch in the bottom of the bolt, and holds the bolt in its rearward or cocked position. The trigger spring furnishes the spring action to the sear. The front arm of the trigger pin is a stop for the sear and prevents it from rotating forward when it engages the bolt.

19. Feeding.

a. When a loaded magazine is placed in the weapon, the magazine catch holds the magazine in position. The top cartridge is held against the lips of the magazine through the action of the magazine spring and follower. When the bolt moves forward, it removes the round from the magazine.

b. When the bolt moves to the rear and clears the top of the magazine, the next cartridge is placed against the lips of the magazine by the action of the magazine spring and follower.

20. Cambering.

The bolt, moving forward under the action of the expanding driving springs, pushes the top cartridge out of the magazine. The lips of the magazine aid to aline the cartridge with the chamber. As the bolt continues forward, the cartridge is pushed into the chamber by the front of the bolt and the extractor. The base of the cartridge protrudes slightly from the chamber when the cartridge is fully seated.

21. Firing.

After the cartridge is chambered, the bolt continues to move forward. The extractor springs out to the side and snaps into the extracting groove of the cartridge. At the same time, the fixed firing pin in the center of the cartridge recess of the bolt strikes the primer of the cartridge, firing the cartridge. At the instant of firing, the cartridge is inclosed in the chamber by the cartridge

recess of the bolt, and the rim of the cartridge is engaged by the extractor.

22. Extracting.

a. When the cartridge is fired, the gas pressure forces the bullet out of the muzzle and the empty cartridge case out of the chamber, pushing the bolt to the rear. The extractor holds the base of the cartridge case against the bolt. The bolt continues moving to the rear, carrying the empty cartridge case with it. Extraction is completed when the front of the cartridge case clears the rear of the chamber.

b. If the cartridge is not fired, the extractor will remove it from the chamber when the bolt is manually pulled to the rear.

23. Ejecting.

As the bolt moves to the rear, the empty cartridge case is held by the extractor. The base of the cartridge strikes the fixed ejector. The extractor serves as a pivot point for the cartridge, which is deflected out of the ejection opening of the receiver. The extractor and ejector are both needed to complete the ejection.

24. Cocking.

As the bolt moves to the rear, the driving springs are compressed. If the trigger has been released, the nose of the sear will move up. As the bolt moves forward, the sear nose will engage in the sear notch and hold the bolt to the rear in a cocked position. If the trigger has not been released, the bolt will continue forward and the cycle of operation will be repeated.

Caution. If the gun is accidentally dropped, the bolt may be jarred far enough to the rear to clear the top cartridge in the magazine, but not far enough for the sear nose to engage in the sear notch. When this happens, the bolt will chamber and fire the cartridge as it goes forward.

25. Operation of the Housing Assembly.

a. On the M3, when the retracting handle is pulled to the rear, the retracting lever pawl rises into the pawl notch in the bottom of the bolt. As the retracting handle is moved farther to the rear, the retracting lever pawl pushes the bolt to the rear until the bolt is engaged by the sear and held in a cocked position.

b. On the M3A1, the firer retracts the bolt with his finger. The retracting mechanism has been eliminated.

26. Operation of Safety Lock.

a. When the bolt is forward and the cover is closed, the safety lock on the cover engages in the safety lock recess in the bolt. This prevents movement of the bolt.

b. When the bolt is to the rear and the cover is closed, the safety lock enters the cocking slot of the M3A1 bolt, or the notch on the front top portion of the M3 bolt, forces the bolt back off the sear, and holds it to the rear. Closing the cover is called "locking the piece."

Section III. OPERATION

27. General.

Before firing the submachinegun, the firer must know how to fill the magazine; must know how to load, fire, and unload the weapon; and must observe safety precautions. These points are covered in this section.

28. To Fill Magazine.

a. Place the magazine loader on top of the magazine, then place the base of the magazine on a firm surface. Push down on the loader to depress the magazine follower. Insert a cartridge, base first, into the magazine. Lift the loader, and push the cartridge all the way into the magazine. Push down on the loader, depressing the cartridge and magazine follower. Repeat the operation (fig 27) until the magazine is full.

b. To use the stock as the hand loader (fig 28), place the butt of the stock over the magazine and use the same procedure as with the magazine loader.

29. To Load Submachinegun.

To load the submachinegun, pull the bolt sharply to the rear (cock), close the cover (lock), insert the magazine, and push it upward until the magazine catch clicks into the magazine notch (load).

30. To Fire Submachinegun.

a. To fire the gun, raise the cover and manipulate the trigger.

b. The gun has no mechanism for semiautomatic fire. However, it is possible to fire single shots by proper manipulation of the trigger, pressing it and then quickly releasing it. It takes practice for a firer to become proficient at firing single shots.



Figure 27. Using magazine loader.

c. When firing long bursts, the weapon has a tendency to move to the right. The firer can control this tendency by always taking a correct firing position (para 69).

d. When the magazine has been emptied, the bolt will close on the empty chamber. Cock and lock the weapon before inserting another loaded magazine.

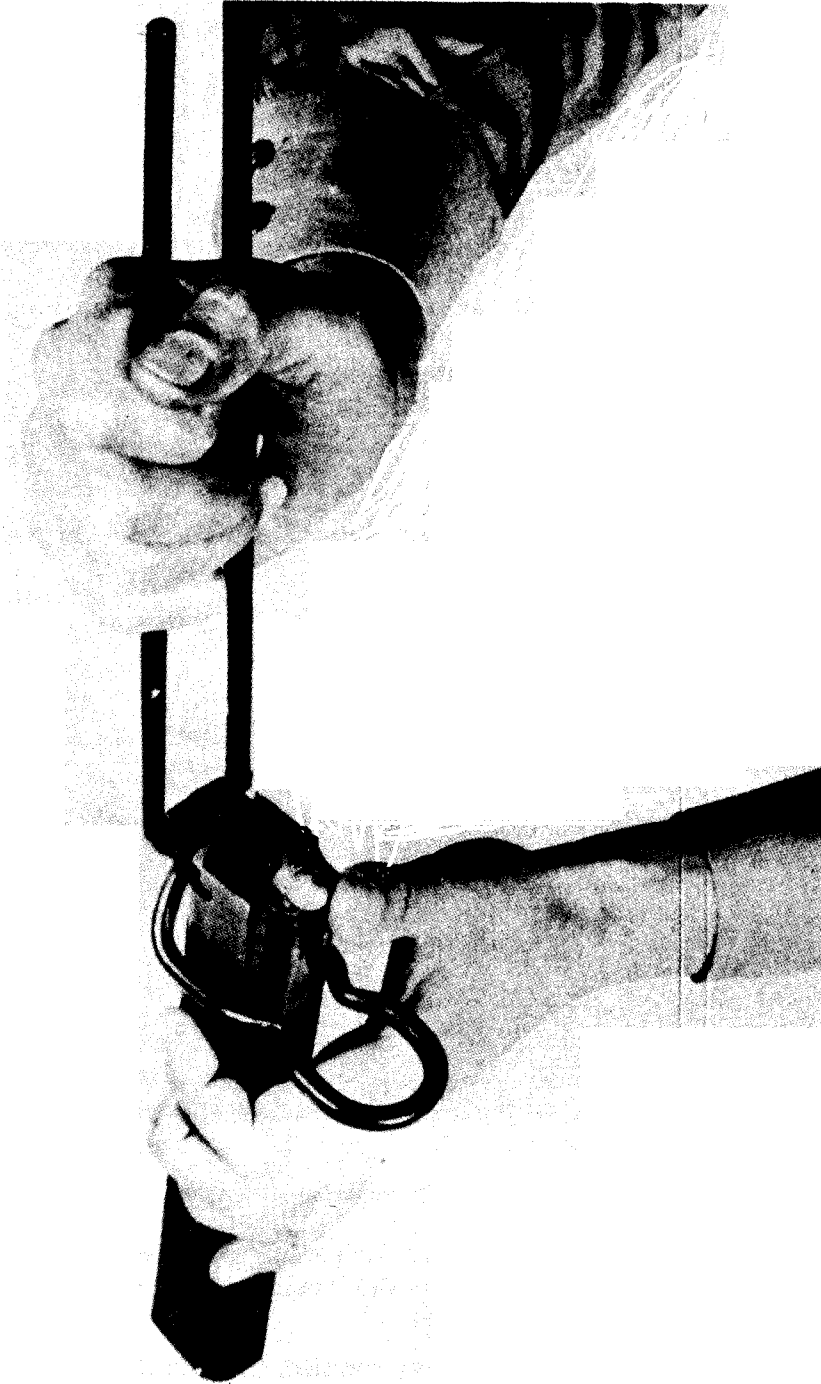


Figure 28. Use of the stock as a hand loader.

31. To Unload Submachinegun (Clearing).

Remove the magazine, and raise the cover. If the bolt is forward, pull it to the rear. Inspect the chamber (look and feel). Press the trigger and allow the bolt to go forward, then close the cover.

32. Safety Precautions, General.

Safety cannot be overemphasized. The submachinegun has no mechanical means of locking the trigger. The insertion of a loaded magazine loads the gun. If the cover is open and the bolt cocked, pressure on the trigger will fire the gun. If an unlocked gun is dropped, it may fire whether the bolt is cocked or not. The safety precautions to observe in handling the submachinegun are:

- a. Never consider the weapon to be safe unless it has been properly cleared.
- b. Never playfully or carelessly point the weapon at anyone.
- c. Load the weapon only when ready to fire.
- d. Unlock the loaded weapon only when it is raised for firing.
- e. Never leave any obstruction in the muzzle or bore.

Section IV. MALFUNCTIONS, STOPPAGES, AND IMMEDIATE ACTION

33. General.

A malfunction is a failure of the weapon to function satisfactorily. A stoppage is any unintentional interruption in the cycle of operation. If the submachinegun stops firing through no fault or intention of the firer, or an attempt to fire is made and the weapon does not fire, then a stoppage has occurred. The firer must be able to reduce a stoppage and continue firing. In combat, lives and the success of a mission may depend on the soldier's ability to reduce a stoppage quickly and continue to deliver accurate fire. Immediate action is the prompt action taken by the firer to reduce a stoppage.

34. Malfunctions.

- a. *Failure To Function Freely.* Sluggish operation of the gun is usually due to excessive friction caused by dirt, lack of proper lubrication, burred or bent guide rods, or a dent in the receiver.
- b. *Uncontrolled Automatic Fire (Runaway Gun).* Uncontrolled automatic fire is fire that continues after the trigger has been released. This may be caused by the following:

- (1) A worn sear nose.
- (2) A worn sear notch on the bolt.
- (3) A weak or broken trigger spring.

In case of uncontrolled automatic fire, keep the gun pointed at the target and press the magazine catch to release the magazine.

35. Stoppages.

a. Stoppages are classified in accordance with the six steps in the cycle of operation of the submachinegun (para 16 c). Stoppages are usually the result of worn parts or improper care of the gun. A knowledge of how the gun functions enables the soldier to classify and correct the stoppage. Listed below are the classes of stoppages which might occur.

(1) *Failure to feed.* The top cartridge in the magazine is not positioned up and in front of the bolt. Most stoppages of the submachinegun are failures to feed caused by a defective or dirty magazine.

(2) *Failure to chamber.* The top cartridge from the magazine is not seated in the chamber.

(3) *Failure to fire.* The cartridge is chambered but does not fire.

(4) *Failure to extract.* If the cartridge fires, the chamber pressure will usually push the empty cartridge case out of the chamber. If the cartridge case is not completely removed from the chamber and the bolt is retracted, then there is a failure to extract. This stoppage seldom occurs.

(5) *Failure to eject.* The empty cartridge case is not ejected from the receiver.

(6) *Failure to cock.* If the bolt is retracted and is not held by the sear, or if, during firing, the bolt does not move to the rear far enough to clear the top cartridge in the magazine, the gun has a failure to cock.

b. *Common Stoppages.* The two most common stoppages are:

- (1) Failure to feed—usually caused by a defective magazine,
- (2) Failure to fire—usually caused by defective ammunition.

c. *Causes of Stoppages.* The following chart lists common causes of various stoppages.

Stoppage	Cause	How to reduce
Failure to feed	Dirty or dented magazine	Replace magazine.
	Weak or broken magazine spring.	Replace magazine.
	Worn magazine notch	Replace magazine.
	Corroded ammunition	Replace ammunition.
	Worn or broken magazine catch.	Replace magazine catch.
Failure to chamber .	Dirty chamber	Clean chamber.
	Obstruction in chamber	Remove obstruction.
	Weak driving springs	Replace driving spring.
Failure to fire	Defective ammunition	Replace ammunition.
	Defective firing pin	Replace bolt.*
	Weak driving springs	Replace driving springs.
Failure to extract .	Broken extractor	Replace extractor.
Failure to eject	Broken ejector	Replace ejector.*
	Broken or missing extractor . .	Replace extractor.
Failure to cock	Worn sear	Replace sear.*
	Worn sear notch	Replace bolt.*
	Bent guide rods	Straighten.

*These items are not carried as a unit repair parts.

d. Prevention of Stoppages. Periodic inspection and proper care and cleaning will reduce the possibility of the submachine-gun having a stoppage.

36. Immediate Action.

a. As the first step in reducing a stoppage, remove the magazine, retract the bolt, and inspect the chamber to insure that it does not contain a live cartridge, or any other obstruction. If there is no obstruction, close the cover, replace the magazine, open the cover, and attempt to fire. If the gun still does not fire, check to see whether a live cartridge has chambered; if it has not, remove the magazine and insert a new magazine.

b. If there is a live cartridge or other obstruction lodged in the chamber, cock the gun and hold the cover down firmly; remove the barrel; then clear the chamber by using the stock to push the obstruction out of the barrel. Under combat conditions, when time is short, omit the step of removing the barrel.

Section V. CARE AND CLEANING

37. General.

The submachinegun will function under conditions that would cause some automatic weapons to fail. However, its continued

dependability and accuracy depend on its receiving proper care and cleaning. The chamber and bore, receiver, and moving parts must be kept clean and *very lightly* oiled. The same care must be given the magazines.

38. Cleaning, Materials, Lubricants, and Rust Preventives.

a. *Cleaning Materials.*

(1) Cleaning compound, solvent (rifle bore cleaner), is used to clean the bore and the face of the bolt after firing. It dissolves corrosive primer salts and removes primer fouling, powder ash, and carbon. This cleaner has preservative properties and provides temporary protection against rust.

Caution. Rifle bore cleaner is usable at temperatures of minus 20° Fahrenheit and higher. When it is below that temperature, it must be thawed and shaken well before it is used. **Do not mix water with rifle bore cleaner.** This destroys its preservative qualities and impairs its value as a cleaner.

(2) Hot or cold water may be used to clean the bore when rifle-bore cleaner is not available. Hot, soapy water is preferable. One-quarter pound of soap dissolved in 1 gallon of water makes a desirable solution. After using the solution, dry the barrel thoroughly and apply a thin coat of oil.

(3) Volatile mineral spirits paint thinner and drycleaning solvent are noncorrosive solvents used for removing grease, oil, or light rust-preventive compounds from weapons. Apply them with rags to large parts, and use them as a bath for small parts.

Caution. These solvents are highly flammable. Do not smoke when using them. Continuous contact with them will dry the skin and may cause irritation.

(4) Decontaminating agents are used under special conditions to remove chemical agents (para 45).

b. *Lubricants.*

(1) Medium preservative lubricating oil is a highly refined, nonhardening mineral oil containing a rust-inhibiting additive. It forms a relatively heavy film that resists direct action of salt spray. This makes it useful for coating all parts of a weapon before amphibious operations. It should be used in preference to special preservative lubricating oil only when the weapon is exposed to salt water, high humidity, or high temperatures. This oil should not be used in temperatures below freezing.

(2) Special preservative lubricating oil is a thin oil used for lubricating at normal and below-normal temperatures, and for

providing temporary protection against rust. When this oil is used, moving parts of weapons must be checked frequently to make sure that they have an adequate film of lubricant.

(3) Engine oil SAE 10 may be used when preservative lubricating oils cannot be obtained. In cold weather, any heavy oil will cause sluggish operation, and may prevent the submachinegun from functioning properly. Engine oil does not have the rust-preventive properties of preservative lubricating oils. When engine oil is used, the weapon must be inspected, cleaned, and reoiled frequently.

c. Rust Preventive. Medium rust-preventive compound can be used to protect the submachinegun for a long period of time when it is boxed for storage.

39. Care and Cleaning Before Firing.

Before the submachinegun is fired, the following steps should be taken to make sure that it will function properly:

a. Field disassemble the weapon.

b. Clean the bore and chamber with a clean, dry patch.

Note. Do not apply oil to bore or chamber before firing.

c. Clean all parts thoroughly.

d. Use a lightly oiled cloth, apply a light coat of lubricating preservative oil to all parts that do not come in contact with the ammunition.

e. Assemble the weapon.

f. Wipe excess oil from the receiver.

g. Clean the magazines, and place a light film of oil on their outer surfaces.

40. Care and Cleaning During Firing.

a. During lulls in firing, lubricate the guide rods, oil the sear pin, and trigger pin. Use the stylus of the oiler to apply oil from the oiler.

b. If time permits, during a lull in firing, disassemble the submachinegun and oil the sear, sear notch, connector pin, connector rivet, and the grooves in the bottom of the bolt.

41. Care and Cleaning After Firing.

The weapon must be cleaned as soon as practicable on the day of firing in the following manner:

- a. Disassemble the groups.
- b. Clean all parts with dry, clean cloth, using rifle bore cleaner if necessary. Inspect all parts, and apply a light film of oil.
- c. Clean the bore and chamber, using the following procedure:
 - (1) Saturate a patch with rifle bore cleaner, and run it back and forth through the bore.
 - (2) Repeat the operation 2 or 3 times with clean patches saturated with bore cleaner.
 - (3) Run dry patches through the bore until they come out dry and clean.
 - (4) Inspect the bore for cleanliness. If it is not free of oil residue, repeat the cleaning process. If the residue cannot be removed by the use of patches, the bore brush should be used.
 - (5) Clean the chamber with rifle bore cleaner applied to a patch on the chamber cleaning brush.
 - (6) Dry the chamber, and inspect it for cleanliness.
 - (7) After the bore and chamber are cleaned dry them and apply a light coat of oil.
- d. Assemble the weapon.
- e. Perform an operation check (para 15).
- f. Inspect periodically.

42. Care and Cleaning During Combat.

- a. There is no basic difference in the care and cleaning of the submachinegun during range firing and during combat. However, when the weapon is being fired each day, rifle bore cleaner may be left in the bore and chamber each night.
- b. To obtain the maximum efficiency from the submachinegun:
 - (1) Before firing, carefully check the bore and chamber for obstructions.
 - (2) Keep the bore and chamber free from oil and dirt when firing.
 - (3) Never leave a patch, plug, or other obstruction in the chamber or bore. Neglect of this precaution may result in serious injury.
 - (4) Oil the guide rods frequently to insure smooth operation of the gun,
 - (5) In emergencies, when the prescribed lubricants are not available, use any clean light mineral oil such as engine oil.

43. Preparation for Storage.

Medium preservative lubricating oil is the most suitable oil for short-term protection. It is effective for storage over periods of 2 to 6 weeks, depending on climatic conditions. However, submachineguns in short-term storage must be inspected every 4 or 5 days and reoiled if necessary. For longer periods of storage, submachineguns are protected with medium rust-preventive compound. This compound is a semisolid material. It will preserve the weapon for a period of approximately 1 year, depending on climatic and storage conditions.

a. The weapon must be cleaned and prepared for storage with great care. The bore, receiver, and other parts of the gun should be thoroughly cleaned and completely dried with rags. In damp climates, particular care must be taken to see that the rags are dry. After a metal part is dried, it should not be touched with bare hands. All metal parts should then be coated with either medium preservative lubricating oil or medium rust-preventive compound, depending on the length of storage required. The best way to apply rust-preventive compound to the bore and chamber is to dip a clean bore brush into the compound and then run it through the bore 2 or 3 times. When the weapon is placed in storage, the bolt should be in the forward position.

b. Guns should be stored in wooden packing boxes which are provided with wooden supports for the stocks and muzzles of the guns. These supports should be coated with medium rust-preventive compound. Guns should be handled with oily rags while being placed in storage. Under no circumstances should a submachinegun be placed in storage in a cloth or other cover, or with a plug in the bore; this will cause the weapon to rust. The sling should be removed from the weapon and wrapped in oil paper coated with medium rust-preventive compound.

44. Cleaning Weapons Received From Storage.

Submachineguns removed from storage will be coated with either preservative lubricating oil or rust-preventive compound. Weapons received from ordnance storage will usually be coated with rust-preventive compound. Use drycleaning solvent or volatile mineral spirits paint thinner to remove the compound or oil. Failure to thoroughly clean the driving spring recesses in the bolt may cause a malfunction or stoppage at below normal temperatures, since the rust-preventive compound will congeal during cold weather. After using solvent, dry all parts by wiping them with a dry cloth. Then apply a thin film of special preservative lubricating oil.

45. Care and Cleaning in Connection With a CBR Attack.

a. If a chemical, biological, or radiological attack is anticipated, the following action is taken: Apply oil to all outer metal surfaces of the submachinegun and accessories. *Do not* apply oil to ammunition. If the weapon is not to be used, cover the weapon, accessories, and ammunition with protective coverings and place them under natural cover. Ammunition should be kept in its containers as long as possible.

b. After a CBR attack, determine by means of detectors whether or not the equipment is contaminated. A complete suit of protective clothing, including protective gloves and a gas mask, must be worn during decontamination. If the contamination is too great, it may be necessary to discard the equipment. Detailed information on decontamination is contained in FM 21-40 and TM 3-220.

46. Care and Cleaning Under Unusual Climatic Conditions.

a. *Cold Climates.* It is necessary that the moving parts will solidify and cause sluggish operation or complete failure.

(1) Before firing in temperatures below 0° Fahrenheit, disassemble the gun and clean all parts of the gun and magazine thoroughly. Oil them very lightly by rubbing them with a cloth dipped in special preservative lubricating oil. Leave the bore and chamber free of oil.

(2) When the gun is brought indoors, allow it to come to room temperature; then disassemble it, wipe it completely dry of any moisture, clean it, and oil it lightly with special preservative lubricating oil.

(3) If the gun has been fired, the bore should be immediately swabbed out with an oily patch. When the weapon reaches room temperature, clean and oil it as prescribed in paragraph 41.

b. *Tropical Climates.* Where temperature and humidity are high, or during rainy seasons, thoroughly inspect the weapon daily and keep it lightly oiled when not in use. Remove the groups at regular intervals and, if necessary, disassemble them for cleaning, drying, and oiling. Be careful to see that all unexposed parts, as well as exposed surfaces, are kept clean and oiled with special or medium preservative lubricating oil.

c. *Hot, Dry Climates.*

(1) In hot, dry climates, where sand and dust are likely to get into the mechanisms and bore, the weapon should be wiped clean daily, or oftener if necessary. Groups should be disassembled to insure thorough cleaning.

(2) When the weapon is used under sandy conditions, lubricants should be wiped from exposed and noncritical operating surfaces. This will prevent sand or dust from sticking to the lubricants and forming an abrasive which can damage the moving parts.

(2) When the weapon is used under sandy conditions, lubricants should be wiped from exposed and noncritical operating surfaces. This will prevent sand or dust from sticking to the lubricants and forming an abrasive which can damage the moving parts.

(3) Immediately after use in sandy terrain, the weapon should be cleaned and lubricated with special preservative lubricating oil.

(4) During sand or dust storms, the gun should be kept covered. It should be cleaned immediately after the storm.

Section VI. REPAIR PARTS AND ACCESSORIES

47. Repair Parts.

a. The parts of any submachinegun may in time become unserviceable through breakage or wear resulting from usage. For this reason, extra parts are provided for replacement of parts most likely to fail. Sets of repair parts must be kept complete at all times; when a part is used, it should be replaced in the set as soon as possible. Repair parts are kept clean and lightly oiled to prevent rust. Parts must always be ready for immediate use.

b. Extra 30-round magazine are also issued with the gun. The number of magazines issued per gun, and the allowance of repair parts, are prescribed in appropriate supply publications.

48. Accessories.

Accessories include the tools required to disassemble and assemble the submachinegun, cleaning and preserving materials, sling, repair parts envelope, oiler, flash hider, magazine loader, and similar items. They must be used for no other purpose than that for which they are intended.

Section VII. AMMUNITION

49. General.

a. The soldier armed with the submachinegun must be familiar with the types of ammunition used in the weapon, ways of identifying each type of ammunition, and how to care for, handle, and use it.

b. A complete round of submachinegun ammunition consists of all the components necessary to fire the weapon once. The components are a cartridge case, bullet, propellant powder, and primer.

50. Classification of Ammunition.

Contents of original ammunition boxes or containers can be identified by markings on the box. These markings indicate the number of cartridges in the container, caliber, type, code symbol, and lot number. Types, uses, and means of identification of ammunition used in submachinegun are:

a. *Cartridge, Caliber .45, Ball, M1911*. Used against personnel and light materiel targets. The ball bullet consists of a metal jacket surrounding a lead alloy core. The bullet tip is unpainted.

b. *Cartridge, Caliber .45, Blank, M9*. Used to simulate fire and for salutes. This cartridge can be fired single shot only. It can be identified by the absence of a bullet and by its tapered mouth.

c. *Cartridge, Caliber .45, Dummy, M1931*. Used for training personnel in the operation of loading and unloading the submachinegun, and for testing weapons. This cartridge can be identified by the empty primer pocket and two holes in the cartridge case.

d. *Cartridge, Caliber .45, Tracer, M26*. Used for observation of fire. Secondary uses are for incendiary effect and for signaling. The bullet consists of three parts: a copper-plated or gliding metal-clad steel jacket, a slug of lead hardened with antimony, and a tracer mixture in the rear portion of the jacket. The bullet is painted red for a distance of approximately $\frac{3}{16}$ inch from the tip.

e. *Cartridge, Caliber .45, High Density Shot, XM261*. Used against personnel. It employs 16 spheres encased in a sabot similar in shape to the ball bullet.

51. Ammunition Lot Number.

Ammunition is assigned a lot number at the time of manufacture. It is marked on all packing containers and entered on all records pertaining to that ammunition. It must be included in all reports on condition and functioning of the ammunition and all reports of accidents in which the ammunition is involved. Therefore, it is important to retain the lot number with the cartridges after they are removed from their original containers. If cartridges

cannot be identified by ammunition lot number they are automatically placed in grade 3. Grade 3 ammunition is unserviceable and will not be fired, but will be turned to the ammunition supply point.

52. Care, Handling, and Preservation of Ammunition.

a. Small arms ammunition is generally safe to handle. However, do not allow ammunition boxes to become broken or damaged. Repair broken boxes immediately. Transfer original markings to the new parts of the box.

b. Do not open ammunition boxes until the ammunition is used. Ammunition removed from airtight containers, particularly in damp climates, is likely to corrode and become unserviceable.

c. Use care when opening wooden ammunition boxes; they can be continued in use as long as they are serviceable.

d. Protect ammunition from mud, sand, dirt, and water. If it appears wet or dirty, wipe clean with a dry cloth immediately. Wipe off light corrosion as soon as it is discovered. Cartridges with a heavy coat of corrosion must be turned in to the ammunition supply point.

e. Do not oil or polish cartridges.

f. Do not expose ammunition to direct rays of the sun for any length of time. If the powder is heated, excessive pressure will be developed when the weapon is fired. This condition will affect accuracy and operation of the weapon.

g. Do not attempt to fire cartridges that have dents, scratches, loose bullets, or corroded cases. If a cartridge is defective, turn it in. Do not throw away or attempt to destroy defective ammunition.

h. Do not strike the primer of a cartridge; it may ignite the cartridge and cause injury.

53. Storage of Ammunition.

a. Small arms ammunition is not an explosive hazard; however, under poor storage conditions it may become a fire hazard.

b. Small arms ammunition should be stored away from all sources of extreme heat.

c. Whenever practicable small arms ammunition should be stored under cover. If necessary to leave ammunition in the open, it should be placed on dunnage at least 6 inches above the ground.

It should be covered with a double thickness of tarpaulin or suitable canvas. The cover should be placed so that it gives maximum protection yet allows free circulation of air. Suitable trenches should be dug to prevent water from flowing under the ammunition.

54. Precautions in Firing Ammunition.

Precautions concerning the firing and handling of ammunition in the field prescribed in AR 385-63, TM 9-1305-200, and TM 9-1300-206 must be observed. Precautions particularly applicable to small arms ammunition include the following:

a. No small arms ammunition will be fired until it has been positively identified by ammunition lot number and grade.

b. Before firing, the firer must be sure that the bore of the pistol is free from any foreign matter. Firing a pistol with any obstruction in the bore will result in damage to the weapon and may cause injury to the firer.

55. Hangfire.

a. A hangfire is a delay in the functioning of the propelling charge or explosive train. The amount of delay is unpredictable, but in most cases will be from a fraction of a second to several seconds. Thus, a hangfire cannot immediately be distinguished from a misfire. There is a danger in immediately assuming that a failure to fire is a misfire when in fact it is a hangfire. For this reason, always wait 5 seconds before pulling the bolt to the rear after a failure to fire.

Caution. During this time, keep the submachinegun pointed at the target.

b. Use of ammunition in any lot that has experienced a hangfire is suspended and a report given to the ammunition supply point. The ammunition in the affected lot will be turned in and replaced with serviceable ammunition.