CHAPTER 3

SMALL ARMS

Strictly defined, the term *small arms* means any firearm with a caliber (cal.) of .60 inch or smaller and all shotguns. Since there are no .60-cal. weapons in the Navy, all pistols, rifles, shotguns, and machine guns up through .50 cal. are small arms. For maintenance purposes, grenade launchers and mortars have also been included in the category of small arms. Such weapons are carried or mounted aboard ship for certain watch standers and members of the ship's internal security force.

In this chapter we will review some of the fundamental principles of small-arms nomenclature and operation as well as how automatic and semiautomatic operation is accomplished. We will then describe the small arms currently in use by the Navy—including handguns, shoulder weapons, shotguns, machine guns, and grenade launchers. We will conclude with brief discussions on small-arms special precautions, maintenance, stowage and issue requirements, range duties, some hand grenade fundamentals, and landing-party equipment.

Small arms intended for match competition (match conditioned) are not covered in this text. They are not repairable at any level other than depot, such as the Naval Weapons Support Center, Crane, Indiana.

SMALL-ARMS FUNDAMENTALS

LEARNING OBJECTIVE Describe the operating cycles of Navy small arms and machine guns.

As a Gunner's Mate, you will be concerned with pistols, rifles, shotguns, grenade launchers, and machine guns. Your responsibility in the field of small arms is twofold. First, you must know how to assemble, disassemble, maintain, and repair them. Second, you must be able to train other personnel in their operation, safe handling, and maintenance.

The majority of small arms are procured from the Army and issued by the Navy to its field activities and the fleet. Maintenance on small arms is performed according to the applicable maintenance requirement cards (MRCs), but all other information (operation, troubleshooting, parts lists, and soon) is normally found in Army technical manuals (TMs) and field manuals (FMs). FMs and TMs list the spare parts, special tools, and organizational maintenance procedures for a particular weapon. The FMis the operator's manual and is intended for personnel in the field who must maintain the weapon. Indexes of Army FMs and TMs are printed in Army pamphlets 310-3 and 310-4, respectively. OP 0 also lists TMs, FMs, and OPs pertaining to small arms.

SMALL-ARMS NOMENCLATURE

Before we begin the study of the individual weapons, let's examine some of the quirks in small-arms nomenclature (names of the parts). Generally, terminology pertaining to the weapons themselves is fairly standard because the Navy has adopted most of the Army's system of identification. For example, the Army uses the letters *M* and *A;* the Navy uses the abbreviations Mk (mark) and Mod (modification). The Army's carbine Ml AZ, for example, is the Navy's carbine Mk 1 Mod 2.

The diameter of the bore of a shotgun is referred to as the gauge of the shotgun. Gauge (with the exception of the .410 shotgun) is not a measurement of inches or millimeters. Instead, it is the number of lead balls of that particular diameter required to make a pound. For example, if you measured the diameter of a bore of the 12-gauge shotgun, you would find it to be 0.729 inch. If you were to make a number of lead balls of this diameter and weigh them, you would find that 12 of them make a pound.

So the larger the bore of a shotgun, the smaller the gauge number. A 16-gauge shotgun, for example, has a smaller bore than a 12-gauge.

CYCLES OF OPERATION

Every weapon has a cycle of operation. This cycle is a group of actions that takes place upon the firing of one round and that must occur before the firing of the next round. In the automatic small arms currently used by the Navy, the sequence or manner of accomplishing these actions may vary between weapons of different design; however, they are always performed.

There are eight steps in the cycle of operation, as shown in figure 3-1. We will briefly discuss each step.

Feeding

The feeding action places a round in the receiver just to the rear of the chamber. In its simplest form, it amounts to putting a cartridge by hand in the path of the device that will chamber the round. Most often feeding is done by a spring-loaded follower in a magazine. However, magazines have a limited capacity that cannot sustain the continuous rate of fire required by machine guns. Therefore, machine gun ammunition is belted, and the rounds are fed to the rear of the chamber by cam and lever action.

Cambering

This action is required to ram a new round into the chamber. Again, in its simplest form, this amounts to placing the round there by hand. In military weapons, cambering takes place as the forward moving bolt strips the round from the feed mechanism and forces it into the chamber. The bolt closes on the cartridge and the extractor attaches itself to the extracting groove machined around the base of the cartridge case.

Locking

The locking action holds the bolt in its forward position for a short period of time (after firing) to prevent the loss of gas pressure until unlocked by other forces. For low-powered weapons, it is possible to seal the breech for a short time by merely increasing the weight of the bolt. The bolt starts to move upon firing; but, if sufficiently heavy, it will not move far enough to release the gases until their pressure has been satisfactorily reduced. This method is used by submachine guns and other straight blowback-operated small arms, such as the .22-cal. rimfire autoloading pistols.

Firing

The firing action occurs when the tiring pin strikes the primer of the cartridge.

Unlocking

Unlocking occurs after the firing of the round. Actions for unlocking are just the reverse of those required for locking. For most rifles, the first movement of the bolt is a rotating movement that disengages the locking lugs.

Extracting

The extracting action is the process of pulling the empty case back out of the chamber. The extractor (normally a small hooked piece of metal encased in the bolt) snaps over the rim of the cartridge case when the round is chambered. As the bolt moves rearward after firing, the extractor hauls out the empty brass.

Ejecting

It is not only necessary to pull the cartridge case out of the chamber but also to throw it free of the receiver. This action is called ejection and is created by placing a small projection on one side of the receiver so that, as the bolt and case move to the rear, the case will strike the projection and be expelled from the weapon. This

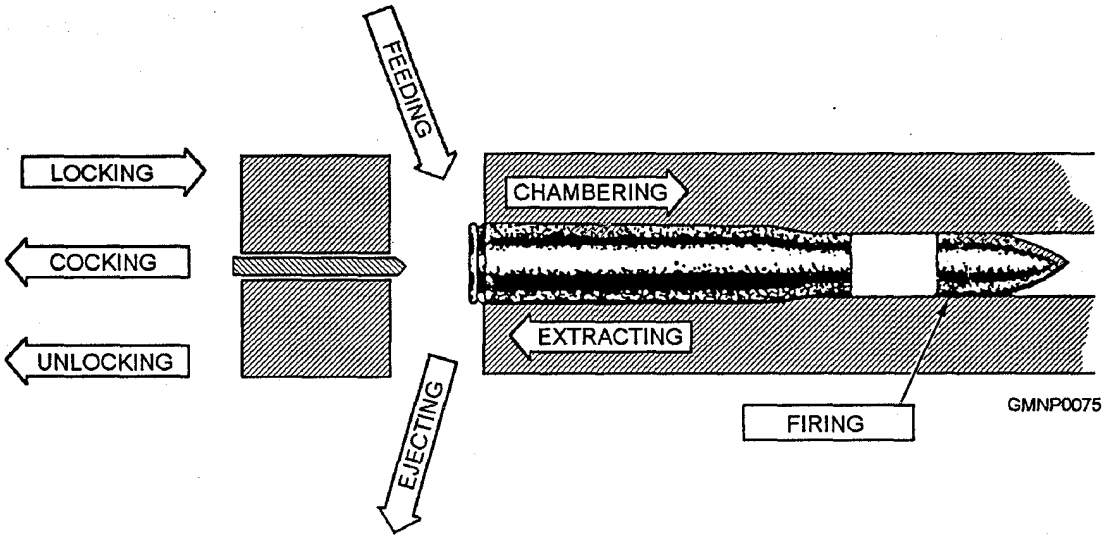


Figure 3-1.—The small-arms cycle of operation.

method is used in the .45-cal. pistol. Another method of accomplishing this step is to incorporate a spring-loaded ejector in the face of the bolt. In this arrangement the case is flipped from the weapon as soon as its forward end clears the chamber. This method is used in the M14 rifle.

Cocking

Cocking is the retraction of the firing mechanism (firing pin and hammer) against spring pressure so that there will be sufficient energy to fire the cartridge in the next cycle of operation. The firing pin, hammer or, in some cases, the bolt itself is held in a cocked position by a piece called the sear.

Firing is initiated by squeezing a trigger. This movement trips the sear, releasing the firing mechanism (firingpin, hammer or, in automatic weapons, such parts as the bolt group or slide), causing it to move forward with enough force to discharge the round.

AUTOMATIC AND SEMIAUTOMATIC FIRING SYSTEMS

LEARNING OBJECTIVE Discuss the operation and maintenance of Navy small arms.

A semiautomatic weapon unlocks, extracts, ejects, cocks, and reloads automatically. However, the trigger must be pulled each time to fire a round. By this definition, the .45-cal. M1911A1 pistol is semiautomatic, though often called automatic. A fully automatic weapon keeps on firing as long as the trigger is kept pulled.

Two examples of weapons that can be fired both automatically and semiautomatically are the 7.62-mm M14 rifle and the 5.56-mm M16 rifle.

SMALL-ARMS OPERATING PRINCIPLES

Automatic and semiautomatic weapons are classified on the basis of how they obtain the energy required for operation. Fundamentally, small arms obtain the energy from the forces that accompany the explosion created when around of ammunition is fired. The use of these forces does not reduce the effectiveness of the weapon but uses otherwise wasted energy.

There are three basic types of operation for semiautomatic and automatic small arms—gas operation, recoil operation, and blowback operation. Figure 3-2 shows the three methods.

Gas Operated

In gas-operated weapons, a portion of the expanding powder gases behind the bullet is tapped off into a gas cylinder located beneath the barrel. (The hole connecting the barrel and cylinder is near the muzzle end.) As the bullet passes this hole, gases push this piston rearward. The piston is connected by a rod to an operating mechanism of the weapon, such as the bolt. The piston carries the bolt aft with it, unlocking, extracting, ejecting, and cocking the weapon.

Three basic types of gas systems are used in semiautomatic and automatic small arms. They are the gas impingement, gas tappet, and gas expansion systems.

GAS IMPINGEMENT SYSTEM.— The impingement system has a negligible volume of gas at the cylinder with expansion dependent on piston motion. As the piston moves, gas continues pouring through the port until the bullet exits the muzzle with a subsequent drop in pressure in the bore. An example of such a mechanism is found in the Ml Garand rifle, which was the standard service rifle in World War II and Korea.

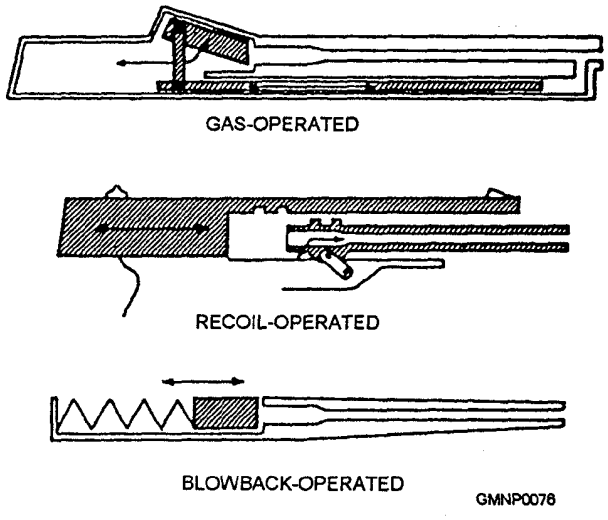


Figure 3-2.—Types of operating systems.

GAS TAPPET SYSTEM.— The gas tappet system is an impingement system with a short piston travel. It is often referred to as a gas short stroke system. An example of such a mechanism is found in the Ml and M1A1 .30-cal. carbine. In some tappet mechanisms, the piston only taps the lock mechanism open and exerts no force to recoiling components.

GAS EXPANSION SYSTEM.— The gas expansion system, in contrast to the impingement system, has an appreciable initial volume of gas in its expansion chamber. This requires more time to pressurize the chamber and also more time to exhaust the gas by selection of port size and location as the required pressurized gas can be drained from the bore.

There is also a cutoff expansion that is similar to the direct expansion system, except for a valve that closes the port after the piston moves. As the pressure builds up to a specific value, the piston moves, closing the port and leaving the gas to expand, providing the force effort needed to operate the moving components. The 7.62-mm M14 rifle uses this type of operation.

Recoil Operated

As a round is fired, high pressures develop behind the bullet and force it down the barrel. The force behind the bullet is also directed rearward against the breech. If the barrel and bolt are secured to one another, the entire force of recoil is felt on the shooter's shoulder. But, by designing the barrel and breech assembly so that they can slide in the frame or receiver, the energy of the rear moving assembly can be used to compress springs, move levers, and soon, necessary to complete the cycle of operation.

Generally, in recoil-operated weapons, the barrel and the bolt move rearward together for a short distance. Then the barrel is stopped and the bolt (now unlocked) continues to the rear against spring pressure until the empty case is ejected. The force of recoil is also used to cock the weapon and compress the spring, returning the bolt to its firing position and cambering a new round in the process.

There are two basic methods of recoil operation for semiautomatic and automatic small arms. They are the long-recoil (Browning) and short-recoil (Maxim) methods.

LONG-RECOIL METHOD.— The dynamics of long-recoil-operated weapons are similar to straight blowback operation, except that the barrel, breechblock, and component parts recoil together for the complete recoil cycle. This recoil distance must be greater than the length of the complete round. At the end of the recoil stroke, the bolt is held while the barrel counterrecoils alone. One particular note of importance on the long-recoil type of operation is that ejection takes place on counterrecoil instead of recoil. An example of a long-recoil weapon is the Browning designed, Remington model 11 shotgun, used by the Navy before and during World War II.

SHORT-RECOIL METHOD.— The dynamics of short-recoil-operated weapons approach those of the retarded blowback types more nearly than long-recoil. The bolt latch is not released until the propellant gases become ineffective to eliminate all blowback tendencies. After unlatching (unlocking), the bolt continues recoiling and in some mechanisms is accelerated by mechanical or gas systems. The barrel is arrested by spring, buffer, stop, or a combination of these and is caused to return to battery by these or the counterrecoiling components. Examples of short-recoil-operated weapons are the .45-cal. pistol and the Browning machine gun.

Blowback Operated

There are some similarities between recoil- and blowback-operated weapons. But there are several major differences. In recoil operation, the bolt and barrel are locked together until the bullet has left the barrel and most of the recoil thrust is spent. The combined thrust of the recoiling barrel, bolt, and some other parts is used to operate the weapon. In blowback (inertia) operation, however, the bolt is not locked to the barrel and, inmost cases, the barrel does not recoil. The bolt is held closed by spring pressure and the mass of the breechblock. The initial blow of the exploding cartridge starts the bolt moving rearward, but the weight of the bolt is such that it does not allow the chamber to be entirely opened until the round has left the bore. Action by a recoil spring returns the bolt to the CLOSED position, cambering a new round.

Thus the weight of the breech bolt is an important factor in the design and operation of a blowback-operated weapon. When used with low-powered ammunition, it is a suitable arrangement. A military rifle, however, using the standard .30-cal. cartridge and the blowback action, would require a 27-pound breechblock.

Besides the submachine gun, many types of so-called pocket automatic pistols and .22-cal. automatic rifles use blowback operations.

There are variants in the methods used for each of these types to operate the mechanism for blowback. These are the straight blowback, retarded blowback, and accelerated blowback methods.

STRAIGHT BLOWBACK METHOD.— Straight blowback is the most elementary and simple. It uses recoil energy from the firing of a round of ammunition to operate the mechanism of the weapon and extract the fired case, eject it against spring tension, and return the mechanism to firing position again. This, in turn, picks up an unfired round from a magazine and chambers it. Straight blowback is used in weapons that fire ammunition of fairly low power, such as pistol ammunition and .22-cal. rimfire rifle cartridges. The bolt slide or breechblock is fairly heavy in these weapons when compared to the weight of the bullet and power of the cartridge. Therefore, the mechanism will stay closed (but not locked) momentarily until the bullet gets free of the barrel and pressure is subdued to allow extraction. All submachine guns and semiautomatic .22-cal. rimfire pistols use straight blowback for their operation.

RETARDED BLOWBACK METHOD.— An example of retarded blowback is found in the mechanism of the original Thompson submachine gun. This is based on the principle of operation that the recoil force exerted on the mechanism must overcome some form of mechanical disadvantage, momentarily holding the breechblock closed until the bullet had cleared the muzzle of the weapon. However, this was later found unnecessary if the bolt or breechbhck was of sufficient weight. The Thompson Ml-Al submachine gun (formerly used by the Navy) uses straight blowback as have all submachine guns designed since that time.

ACCELERATED BLOWBACK METHOD.— An example of accelerated blowback is found in the .22-cal. rimfire Colt Ace semiautomatic pistol. In this pistol, the Williams floating chamber, apart of the barrel on firing a round of ammunition, moves with accelerated force against the mechanism (in this case, the fairly heavy slide and its components), providing sufficient energy to operate the component parts of a .45-cal. pistol with .22-cal. rirnfire ammunition.

Range and Rate of Fire

Some other important terms that apply to small arms describe their range and rate of fire. The range of a weapon is stated in terms of ***maximum range*** and ***maximum effective range. The*** rate of fire of an automatic weapon is stated as the cyclic rate of fire and the sustained rate of fire.

MAXIMUM RANGE.— Maximum range is the greatest distance that the projectile will travel.

MAXIMUM EFFECTIVE RANGE.— Maximum effective range is the greatest distance at which a weapon may be expected to fire accurately to inflict damage or casualties.

CYCLIC RATE OFFIRE.— The cyclic rate of fire is the maximum rate at which a weapon will fire in automatic operation, stated in rounds per minute (rpm).

SUSTAINED RATE OF FIRE.— The sustained rate of fire of a weapon is normally stated in a chart. The chart correlates the average number of rounds fired per minute with the number of minutes this rate can be sustained without damage to the weapon.

HANDGUNS

LEARNING OBJECTIVE Describe the cycle of operation, disassembly, assembly, and safeties of Navy handguns.

Three standard issue handguns are used by the Navy today-the .45-cal. semiautomatic pistol, the 9-mm M9 semiautomatic pistol, and the .38-cal. Smith and Wesson (S&W) revolver. In this section we will provide you with information concerning the description, operation, and maintenance of these three pistols.

M1911A1 .45-CALIBER SEMIAUTOMATIC PISTOL

During the uprising of the Moro tribes in the Philippines during the early 1900s, it was found that the tribesmen often were not stopped when hit by bullets from the .38-cal. side arms then used by American troops. This lack of stopping power was one of the factors that led to the adoption in 1911 of the .45-cal. semiautomatic pistol as the official military side arm.

The .45-cal. semiautomatic pistol was designed and patented by John M. Browning, who was probably the greatest inventor of automatic weapons in the world. The original model 1911 differs only in one detail from the current model 1911A1. The 1911A1 includes an additional safety feature (the grip safety). Other than this, the operation of the two models is identical.

Figure 3-3 shows the pistol with nomenclature for some of the external parts.

The .45-cal. M1911A1 pistol is a recoil-operated, semiautomatic, magazine-fed, self-loading handgun with fixed sights. is often called a .45-cal. semiautomatic pistol (SAP) or a .45-cal. autoloading Colt (the manufacturer) pistol (ACP). This text will refer to it as a .45-cal. pistol.

The magazine holds seven rounds when fully loaded; one round is fired with each squeeze of the trigger. Rifling in the barrel is machined for a left-hand twist (the only Navy weapon with left-hand rifling). Empty, the pistol weighs approximately 2 1/2 pounds. It has a maximum range of a little over 1,600 yards and a maximum effective range of about 50 yards.

Disassembly

Care of the .45-cal. pistol includes daily preventive maintenance, prefiring cleaning, and postfiring cleaning. For daily maintenance the pistol need not be disassembled; but, for the prefiring and postfiring cleaning, the pistol should be disassembled.

There are two phases of disassembly for the pistol—general disassembly (field stripping) and detailed disassembly. General disassembly (fig. 3-4) is necessary for normal care and cleaning and after the weapon has been fired. This is the extent of disassembly that is generally explained to personnel, such as watch standers. The detailed disassembly of the receiver group (fig. 3-5) is the job of the Gunner's Mate during periodic cleaning and repair. Detailed disassembly is not currently called for in any 3-M Systems MRCs. However, it is a very good idea to perform a detailed disassembly and cleaning after heavy use, such as security force range qualifications.

To do a good job of cleaning and repairing the weapon, you must know the names of the parts. The nomenclature of the parts of the pistol should be learned while practicing disassembly and assembly. As each

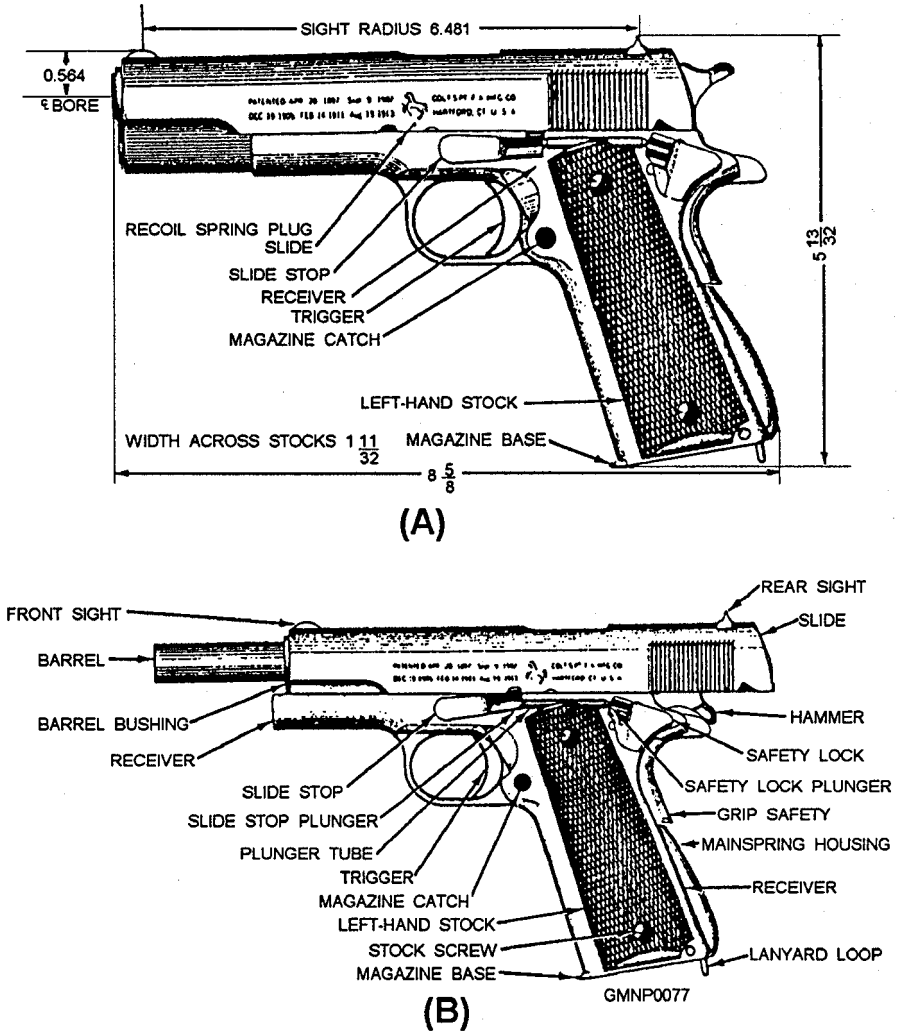


Figure 3-3.—.45-cal. M1911A1 semiautomatic pistol: (A) Slide closed; (B) Slide open.

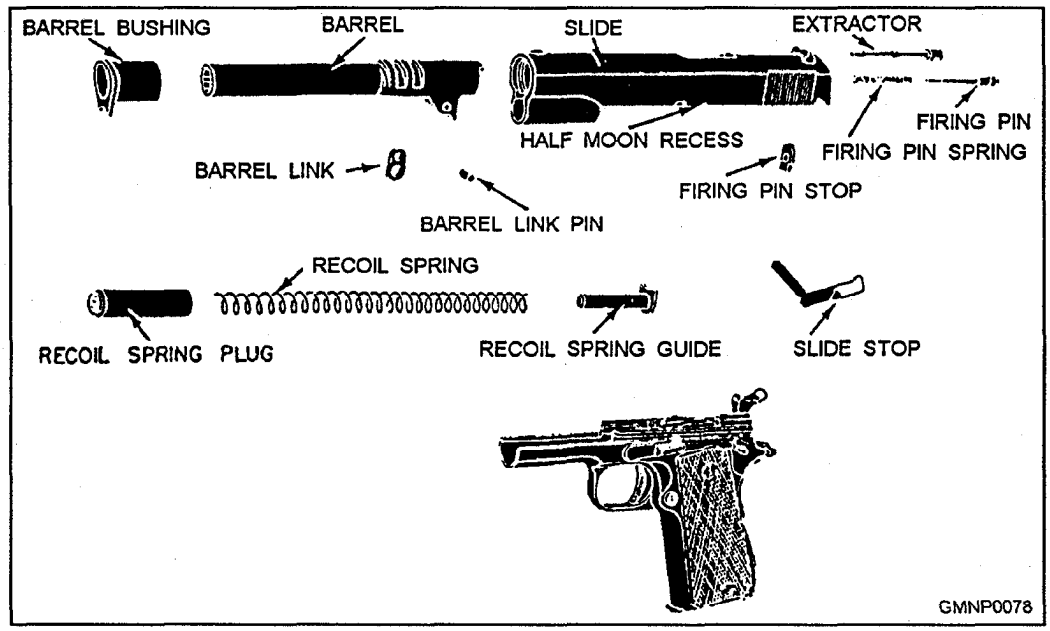


Figure 3-4.—A field stripped .45-cal. pistol.

part is removed and replaced, the nomenclature is repeated until known. While studying the disassembly arid assembly of the pistol, refer to the illustration showing the parts by name and description (fig. 3-5). Become thoroughly familiar with the parts and their functions. Knowing the names of the parts will also help you understand the operation of the weapon.

GENERAL DISASSEMBLY (FIELD STRIPPING).— Before performing work on any weapon, you should make sure the weapon is clear of ammunition. On the M191lA1 this is accomplished by removing the magazine, pulling the slide to the rear, and inspecting the chamber. Then perform the following steps:

1. Cock the hammer and put the safety lock in its UP (safe) position. Depress the recoil spring plug and turn the barrel bushing about one-quarter turn clockwise. This releases the tension on the spring. Allow the spring to expand slowly, under control, to prevent injuiy o; loss 0} parts. ll-rn the recoil spring plug counterclockwise and remove it from the recoil spring. Move the safety lock back down to its FIRE position.

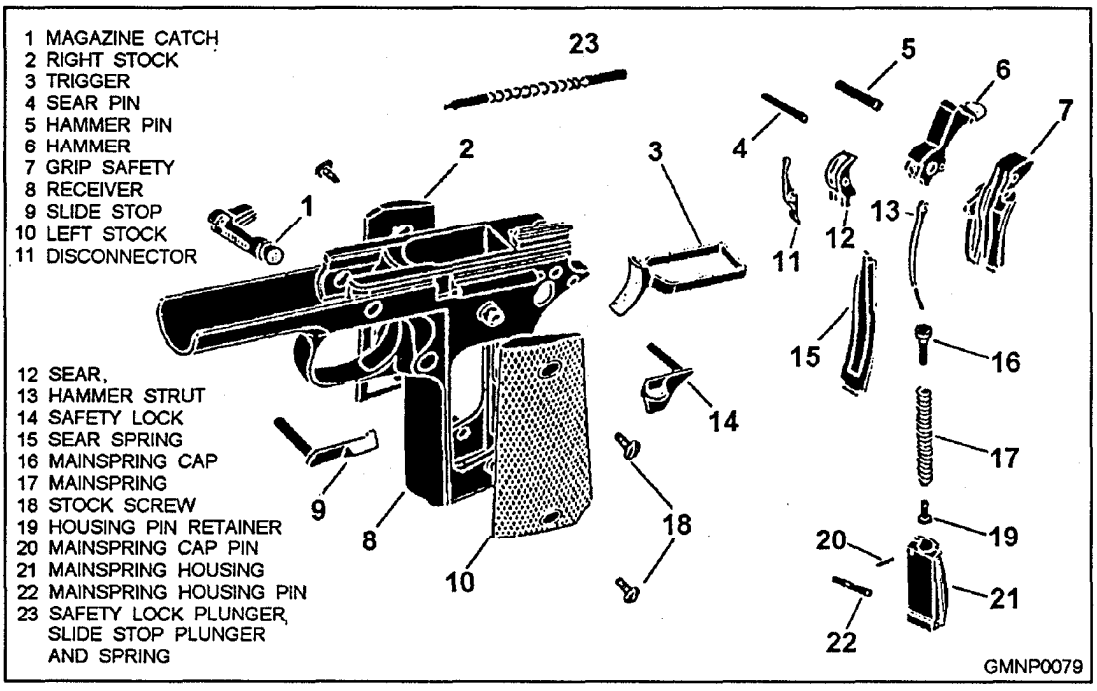


Figure 3-5.—Detailed receiver disassembly of the .45-cal. pistol.

2. Draw the slide to the rear until the half-moon recess (on the slide) is directly above the projection on the slide stop. Push out the slide stop from right to left.

3. Turn the pistol upside down and draw the receiver to the rear, disengaging it from the slide. Lay the receiver down.

4. Draw the recoil spring and its guide to the rear and out of the slide.

5. Take the barrel bushing out of the slide by turning it counterclockwise as far as it will go, then lifting up.

6. Lay the barrel link forward and pull the barrel out of the muzzle end of the slide.

7. Takeout the firing pin by pressing on the rear of the firing pin with any pointed object until you can slide out the firing pin stop. Keep your fingers over the firing pin, allowing the spring tension to ease; then lift both firing pin and spring from the slide.

8. Pry the extractor out of the rear of the slide.

DETAILED DISASSEMBLY OF THE RECEIVER GROUP.— Disassembly of the receiver group into its individual parts, as shown in figure 3-5, is done as follows:

1. The hammer should be in its cocked position. Move the safety lockup and down and, at the same time, pull it outward from the receiver. (Do not use any tool to pry the stop out.) With the safety lock removed, squeeze the trigger, and allow the hammer to ease forward.

2. Remove the mainspring housing pin. This step requires a good deal of force, so the receiver must be placed on a sturdy supporting surface. The end of the safety lockpin cart be used to push the mainspring housing pin out.

3. Remove the mainspring housing. Take out the grip safety and the sear spring.

4. Using a driftpin, punch out the hammer pin; then lift the hammer from the receiver.

5. Drift out the sear pin from right to left, and let the sear and disconnector drop out into your hand.

6. Press the magazine catch in until it is flush with the left side of the receiver. Then, using a suitable screwdriver, turn the magazine catch lock one-quarter turn counterclockwise. Lift the magazine catch from the right side of the receiver.

7. Remove the trigger from the rear of the receiver.

8. Remove the four stock screws and the left and right stocks.

Assembly

Assembly of the weapon is also covered in two phases. First, the receiver group is assembled. At the end of this phase the weapon is in a field stripped condition. Then the field stripped weapon is assembled.

Both phases of assembly are done by performing the disassembly procedures in reverse order. Here are four hints that should be helpful in assembling the pistol:

1. All the pins go in from left to right.

2. Place the sear and disconnector in as one unit, fitted together, as shown in figure 3-6.

3. When you place the sear spring in position, have the mainspring housing ready to slide up about three quarters of the way into the receiver to hold the spring in place.

4. Make sure the hammer strut is actually fitting well down into the mainspring cap before sliding the mainspring housing into place. (Sometimes the hammer strut will catch on top of the cap instead of properly seating in the recess of the cap.)

Safeties

Three safety features and one positive safety are on the .45-cal. pistol. The three safety features are the half-cock notch, the grip safety, and the disconnector. The positive safety is the safety lock (sometimes called the thumb safe).

The safety lock positively locks the slide in the forward position. In addition, a stud on the safety lock

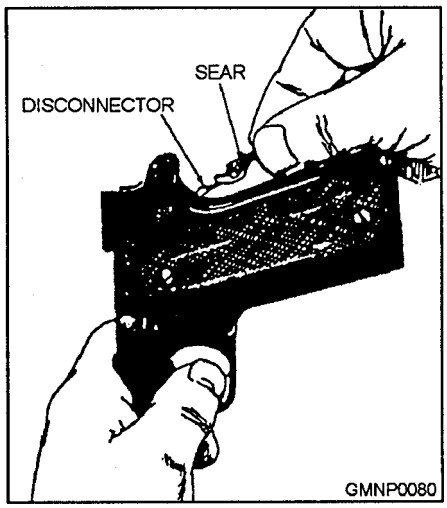


Figure 3-6.—Replacing the sear and disconnector.

(fig. 3-7, view A) blocks the shoulders of the sear to prevent any movement of the sear out of the full-cock notch of the hammer.

The half-cock notch is the notch just above the full-cock notch. It has a lip that prevents movement of the sear from that notch when pressure is applied to the trigger. (See fig. 3-7, view B.)

The grip safety (fig. 3-7, view C) indirectly stops any movement of the sear by blocking the trigger movement. If the trigger cannot be actuated, the sear cannot move and the hammer will not fall.

The disconnector and sear (fig. 3-7, view D) prevents firing unless the slide is fully forward and locked. Anytime the slide is not fully forward, the nose of the disconnector is forced downward. In this condition the disconnector spade does not contact the sear when the trigger is pulled. When the trigger is pulled, the disconnector will be pushed to the rear; but the sear remains in position, holding the hammer to the rear.

When the slide is forward, the disconnector rides up into a recess on the underside of the slide. The spade of the disconnector (dark area) bears against lugs on the sear. When the trigger is pulled, the trigger yoke pushes back against the disconnector spade, which transmits the motion to the sear, rotating the sear nose out on the full-cock notch of the hammer, and the weapon fires.

Cycle of Operation

Refer to figures 3-3,3-4, and 3-5 as we explain the functions of the pistol. We will assume that a loaded magazine is in the weapon, a round is in the chamber, the grip safety is depressed, the trigger has been squeezed, and the round fired. The cycle of operation now begins.

As the gases from the burned powder expand, the bullet is forced down the barrel while the same force is directed rearward against the slide. The slide and barrel are locked together at this point, and both are forced aft. The barrel link is pinned to the receiver by the slide stop shaft and to the barrel by the barrel link pin. As the barrel moves rearward, it pivots on the slide stop shaft and is moved downward as well as to the rear. As the barrel locking ribs are disengaged from the recesses in the slide, unlocking is completed.

As the slide moves aft in recoil, the extractor pulls the empty case along with it. Extraction is completed when the cartridge clears the chamber.

Ejection occurs when the cartridge strikes the stationary ejector, pivots on the extractor, and flips from the weapon through the ejection port.

Cocking begins as soon as the slide started its recoil movement. The hammer is moved rearward and the hammer strut is pushed down against the mainspring,

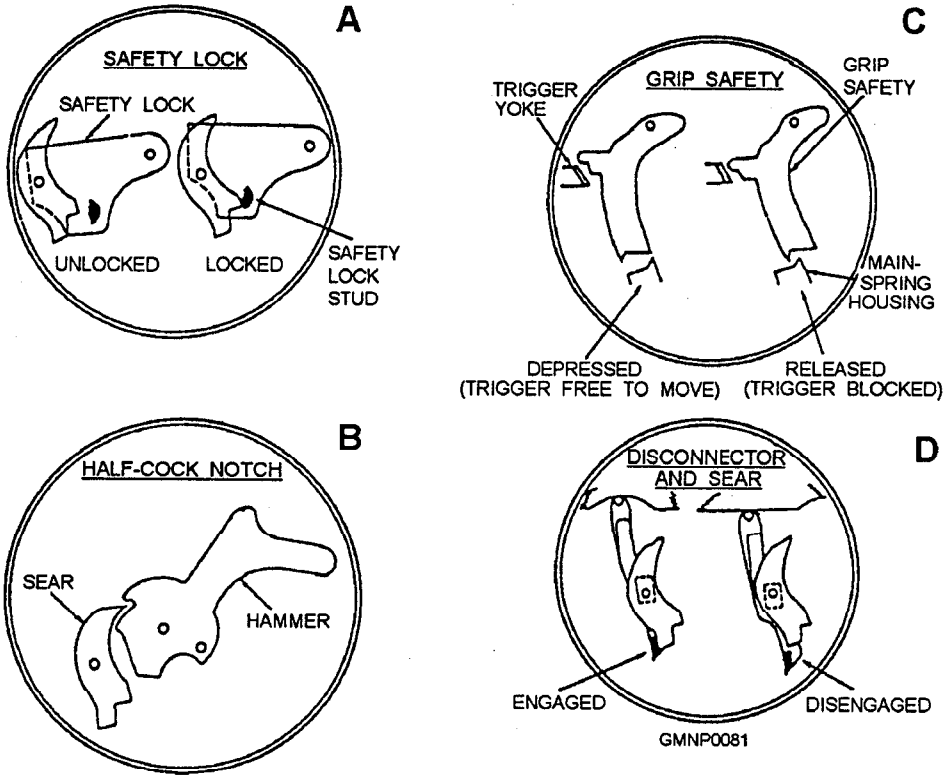


Figure 3-7.—Safeties on the .45-cal. pistol.

compressing it. When the slide strikes the recoil spring guide collar, its rearward movement is stopped. The recoil spring then causes the slide to begin its forward movement. The hammer follows the slide for a short distance. Then the sear, which bears against the hammer through the action of the sear spring, enters the full-cock notch of the hammer and holds it in a cocked position. Feeding starts as soon as the slide, moving to the rear, clears the top of the magazine. The magazine follower, under pressure from the magazine spring, forces the top round against the lips of the magazine. This places the top cartridge in position to be picked up by the face of the slide during its forward movement.

Cambering occurs when the forward moving slide pushes a new round into the chamber. As the bullet is pushed up the ramp into the chamber, the base of the cartridge slides up the face of the slide. As this happens the groove on the base of the cartridge is engaged by the hooked extractor.

After cambering, the slide continues forward a small distance, pushing the barrel ahead of it. As the barrel moves, it pivots up and forward on the barrel link. The locking ribs on the barrel enter the locking recesses in the slide, thereby locking the two together.

Firing will start the cycle all over again. When the grip safety is depressed and the trigger is squeezed, the trigger yoke presses against the disconnector, which pushes aft on the sear. The sear rotates on its pin, disengaging from the notch on the hammer. The mainspring pushes up on the hammers strut, roataing the hammer forward. The hammer strikes the firing pin which, in turn, strikes the cartridge primer.

For more information on the M1911A1 .45-cal. pistol, refer to U.S. Army TM 9-1005-211-12.

9-MM M9 SEMIAUTOMATIC PISTOL

The 9-mm M9 pistol (fig. 3-8) is a single- or double-action, short-recoil-operated, semiautomatic, magazine-fed, self-loading handgun with fixed sights. The M9 is primarily designed as a personal defense side arm for guards, sentries, and boarding and landing parties.

The M9 is chambered for the 9-mm cartridge. The magazine (fig. 3-9) is a staggered, steel constructed, aluminum follower and removable floor plate. It has a capacity of 15 rounds, which is more than double the traditional single-line magazine of the same length. Empty, the pistol weighs approximately 2.1 pounds. It has a maximum range of 1,962.2 yards (1,800 meters) and a maximum effective range of 54.7 yards (50 meters).

Operation

The M9 pistol has a short recoil system, using a falling locking block. The pressure delveloped by the expanding gases of a fired round recoils the slide and barrel assembly. After a short distance, the locking block is disengaged from the slide, the barrrel stops against the frame, and the slide continues its rearward

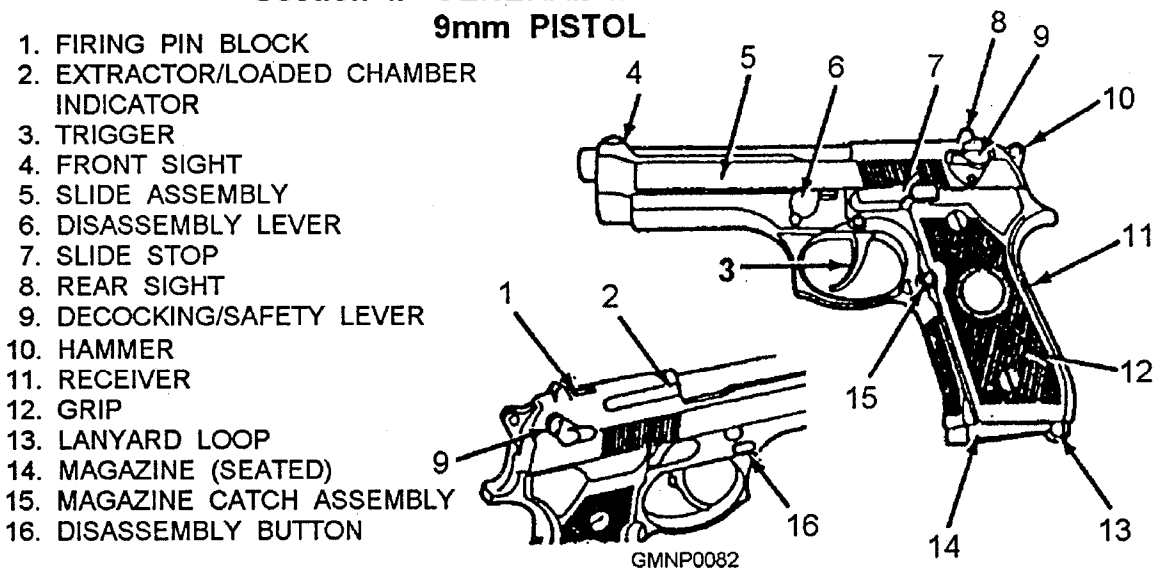


Figure 3-8.—9-mm M9 semiautomatic pistol.

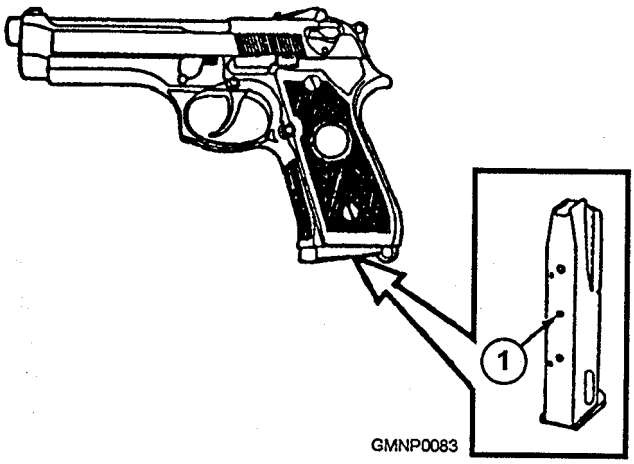


Figure 3-9.—M9) magazine.

movement. The slide then extracts and ejects the fired cartridge case, cocks the hammer, and compresses the recoil spring. The slide moves forward, stripping the next cartridge from the magazine, and feeds it into the chamber. After the last cartridge has been fired and ejected, the slide and barrel assembly will remain open by the magazine follower pressing up on the slide stop lever.

Disassembly

Disassembly of the M9 is to be conducted according to the current 3-M Systems MRCs. Detailed disassembly is not normally conducted by the GM armorer. General disassembly (field stripping) will only be discussed in this section. A detailed disassembly, as shown in figure 3-10

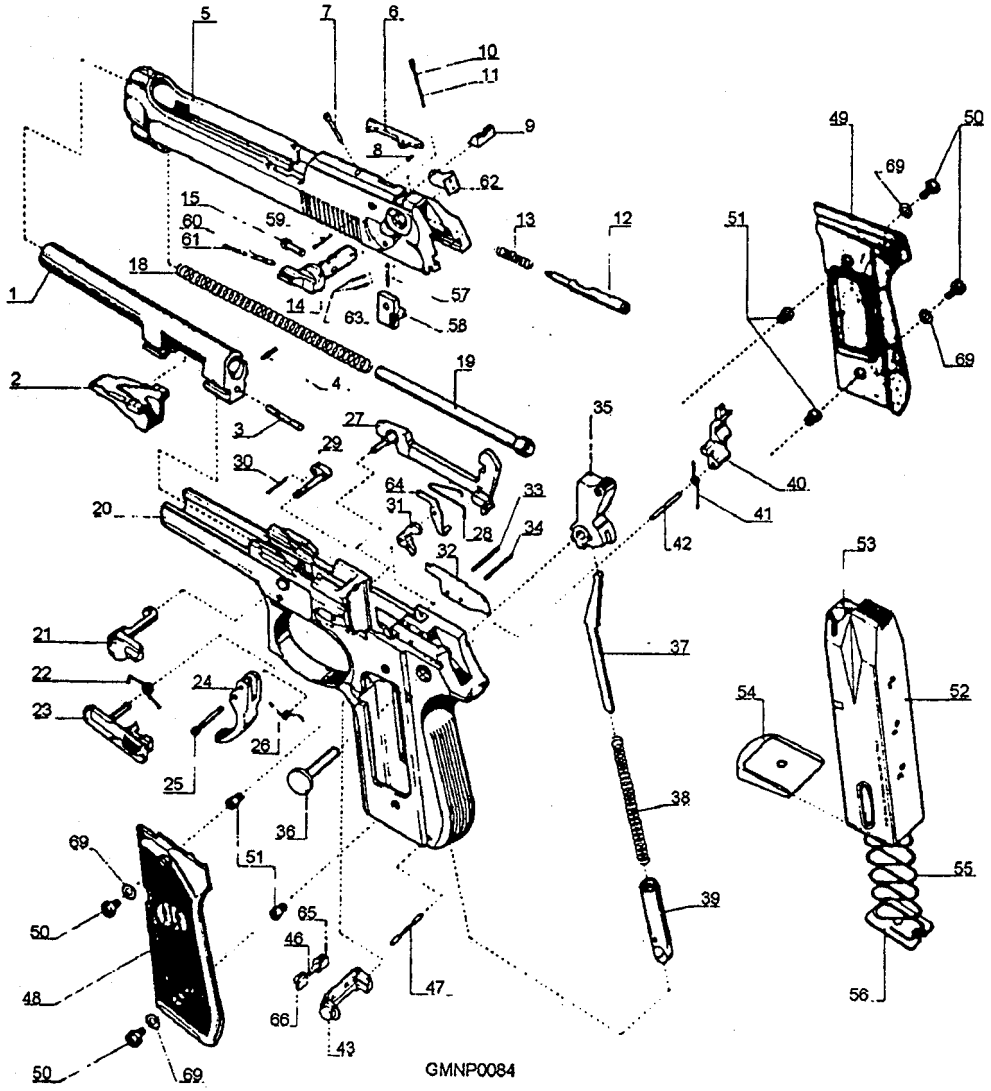


Figure 3-10.—Detailed disassembly of the 9-mm M9 pistol.

Table 3-1.—Part Number Nomenclature

Part #	Nomenclature	Part #	Nomenclature
1	Barrel (Factory Fitting Required)	34	Ejector Spring Pin
2	Locking Block	35	Hammer
3	Locking Block Plunger	36	Hammer Pin
4	Locking Block Plunger – Retaining Pin	37	Hammer Spring Guide
5	Slide (Factory Fitting Required)	38	Hammer Spring
6	Extractor	39	Hammer Spring Cap
7	Extractor Pin	40	Sear
8	Extractor Spring	41	Sear Spring
9	Rear Sight (Fitting Required)	42	Sear Pin
10	Trigger Bar Release Plunger	43	Magazine Release
11	Trigger Bar Release Plunger Spring	46	Magazine Release Button Spring
12	Firing Pin	47	Hammer Spring Cap Pin
13	Firing Pin Spring	48/49P	Grips (Plastic) Pair
14	Safety	48/49W	Grips (Wood) Pair
15	Firing Pin Plunger	50	Grip Screw
18	Recoil Spring	51	Grip Bush
19	Recoil Spring Guide	52	Magazine Box
20	Frame	53	Magazine Follower
21	Disassembling Latch	54	Magazine Bottom
22	Slide Catch Spring	55	Magazine Spring
23	Slide Catch	56	Magazine Lock Plate
24	Trigger	57	Firing Pin Catch Spring
25	Trigger Pin	58	Firing Pin Catch
26	Trigger Spring	59	Firing Pin Catch Retaining Spring Pin
27	Trigger Bar	60	Safety Plunger Spring
28	Trigger Bar Spring	61	Safety Plunger
29	Disassembling Latch Release Button	62	Right Safety Lever
30	Disassembling Latch Release Button	63	Right Safety Lever Spring Pin
31	Hammer Release Lever	64	Firing Pin Catch Lever
32	Ejector	65	Magazine Catch Spring Bush (Short)
33	Hammer Release Lever Pin	66	Magazine Catch Spring Bush (Long)
		69	Spring Washer

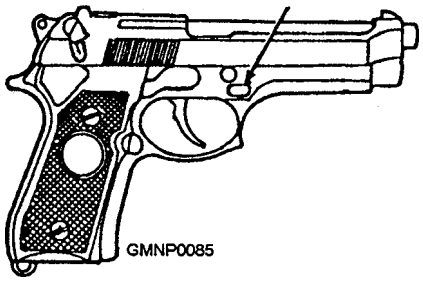


Figure 3-11.—disassembly lever release button.

and table 3-1, is shown for parts identification.

The M9 is designed for ease of field stripping under adverse conditions. With practice, field stripping can be performed in seconds. Ensure that the magazine is removed and the pistol is unloaded. The pistol can be disassembled and assembled with the safety in the ON or OFF position. For safety, and to prevent damage to the pistol, always engage the safety (ON position, warning dots covered, DOWN position) before disassembly and assembly.

To field-strip the M9, hold the pistol in the right hand with the muzzle slightly elevated. With the forefinger, press the disassembly lever release button (fig. 3-11), and with the thumb, rotate the disassembly lever (fig. 3-12) downward until it stops. Pull the slide and barrel assembly (fig. 3-13) forward and remove it from the receiver assembly.

WARNING

Care should be used when removing the recoil spring and spring guide. Because of the amount of compression, the assembly will be released under spring tension and could cause possible injury to personnel, or become damaged or lost.

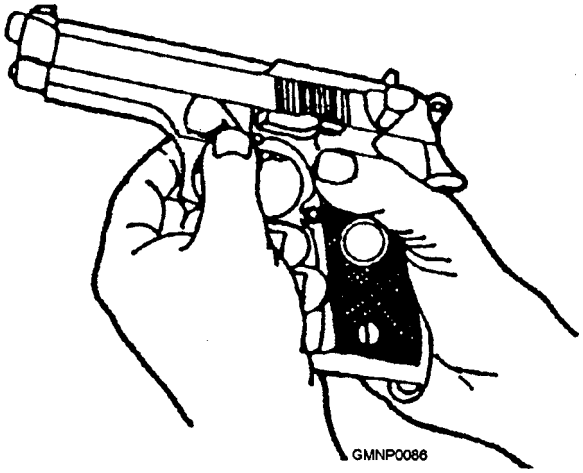


Figure 3-12.—Disassembly lever.

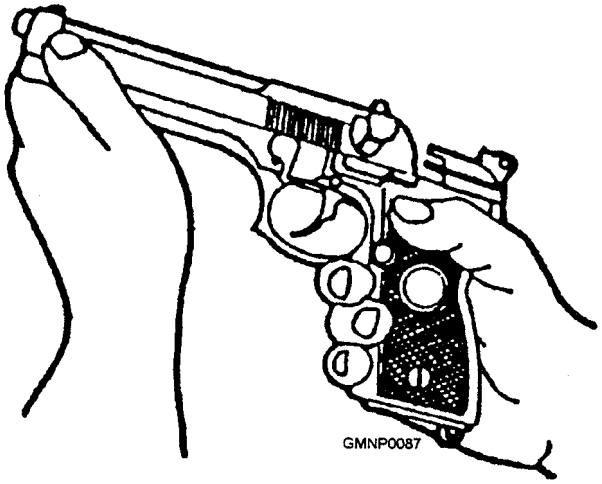


Figure 3-13.—Removal of slide and barrel assembly.

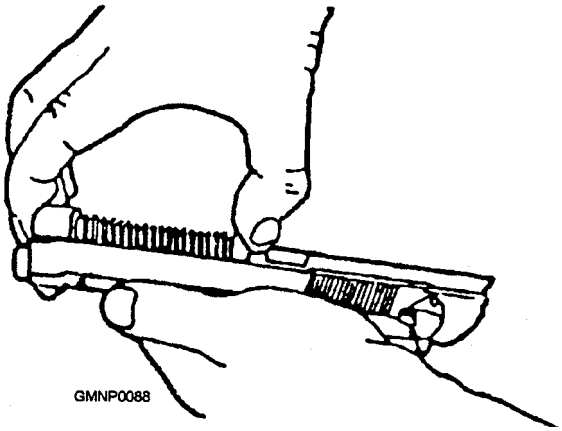


Figure 3-14.—Compressing the recoil spring.

Firmly hold the slide in the palm of one hand and slightly compress the recoil spring and spring guide (fig. 3-14), while at the same time lifting and removing the recoil spring and spring guide (fig. 3-15). Care should be taken to allow the spring tension to be released. After the spring tension is released, separate the recoil spring from the spring guide (fig. 3-16).

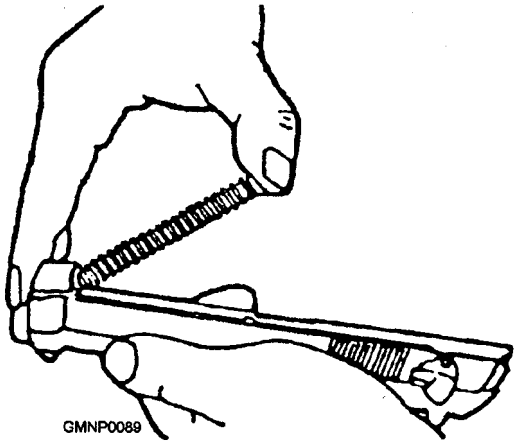


Figure 3-15.—Removing the recoil spring and spring guide.

Figure 3-16.—Recoil spring and spring guide.

To remove the barrel from the slide, push in on the locking block plunger (fig. 3-17) while pushing the barrel forward slightly. Lift and remove the locking block and the barrel assembly from the slide.

Once the pistol is disassembled, look for worn or damaged parts while cleaning and before assembly. For more information on the M9 pistol, refer to Navy SW 370-AA-OPI-010/9mm.

THE .38-CALIBER REVOLVER

You will find the .38-cal. S&W revolver (fig. 3-18) in some ships and ashore armories where it is used by personnel assigned to guard or police duties. Because it is lighter than the .45-cal. pistol, the .38-cal. revolver is frequently issued by flight personnel. This weapon has about the same maximum and effective ranges (1,600 and 50 yards, respectively) as the .45-cal. pistol. Figure 3-19 shows the revolver disassembled to the extent usually required for normal care.

Operation

In this discussion, operation of the revolver is limited to loading, firing, and unloading. To load the revolver, swing the cylinder out by pushing forward on the thumbpiece and applying a little pressure on the right side of the cylinder. The thumbpiece will not release the cylinder if the hammer is cocked

NOTE

The cylinder should not be flipped out sharply because this can cause the crane to be bent, throwing the cylinder out of timing and/or alignment.

Insert a round in each of the six chambers of the cylinder and swing the cylinder back into position. The weapon is now loaded and ready to be fired.

This revolver can be fired by single or double action. For single-action firing, the hammer is pulled back with the thumb to the full-cock position for each round. This

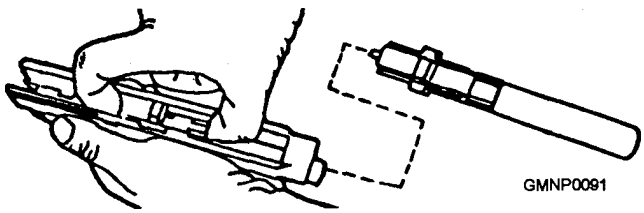


Figure 3-17.—Removing the barrel from the slide.

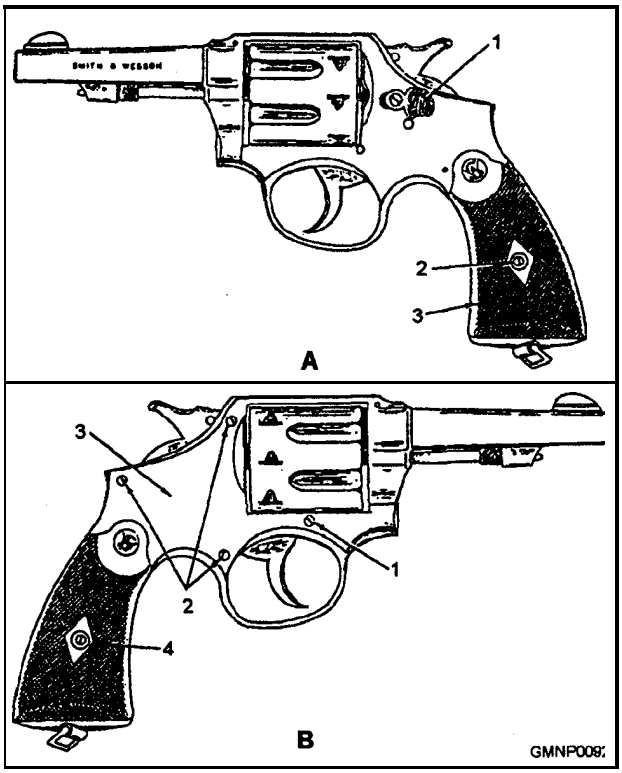
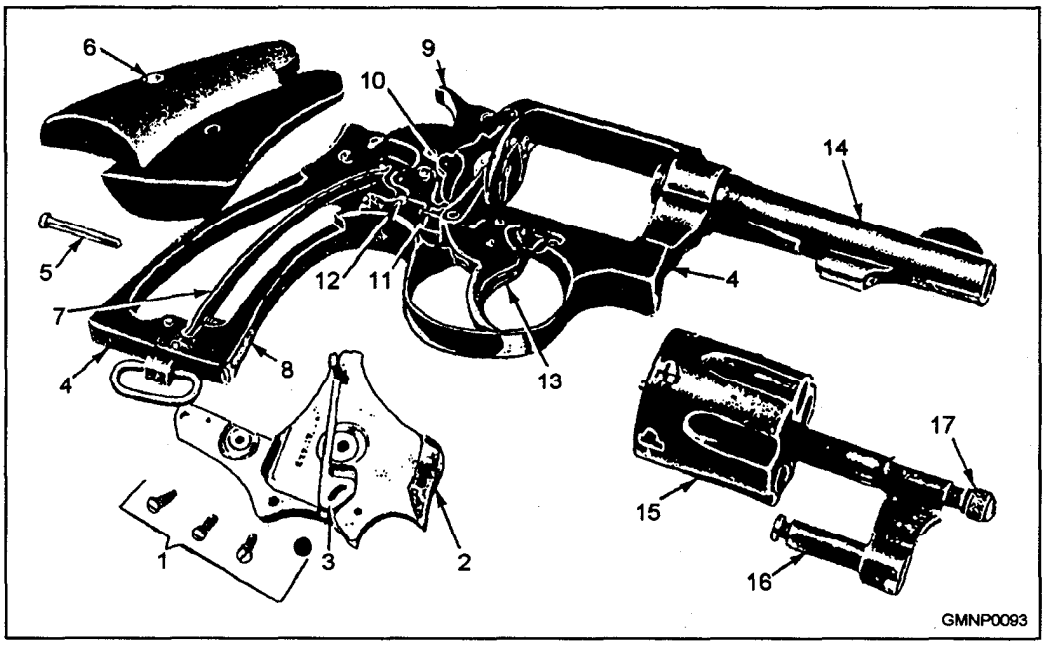


Figure 3-18.—.38-cal. special Smith and Wesson revolver: A. Left side—(1) thumbpiece (cylinder release), (2) stock screw, (3) stock, B. Right side—(1 and 2) side-plate screws, (3) side plate, (4) stock.

action also rotates the cylinder. The hammer is held in the cocked position by the sear until released by the trigger. In double-action firing, pulling the trigger causes the hammer to be raised to nearly its full-cock position. The hammer strut will then escape the trigger, and the spring-loaded hammer will fall and strike the cartridge. In double-action firing, the cylinder is rotated by pulling the trigger. Since it requires considerably less trigger pull for single action, this method should produce better accuracy.

The empty cartridges are ejected by swinging out the cylinder to the left and pushing the ejector plunger toward the rear of the cylinder. There are two built-in safeties on this revolver—the hammer block and the rebound slide. 'The hammer block prevents the hammer from going far enough forward to strike the cartridge primer when both the hammer and the trigger are in the forward or uncocked position. Thus, if the revolver were dropped or otherwise struck on the hammer, the round would not be freed. The rebound slide actuates the hammer block to prevent the hammer from traveling far enough to strike the primer should the hammer slip from the thumb while being manully cocked.



1. Side-plate screws
2. Side plate
3. Hammer block
4. Frame
5. Stock screw
6. Stocks
7. Mainspring
8. Mainspring strain screw
9. Hammer
10. Sear
11. Rebound slide
12. Hammer block pin
13. Trigger
14. Barrel
15. Cylinder
16. Crane or yoke
17. Ejector plunger

Figure 3-19.—.38-cal. Smith and Wesson revolver, completely disassembled.

Disassembly and Assembly

To disassemble the revolver, do the following:

1. Remove the stock screws and liftoff the stocks. (See fig. 3-18.)

2. Push forward on the thumbpiece (No. 1 in fig. 3-18, view A), which actuates the cylinder latch, and swing the cylinder out to the left. With a small screwdriver, remove the side-plate screw (No. 1 in fig. 3-18, view B) located directly under the cylinder. This screw retains the crane (or yoke) of the cylinder and ejector group.

3. Remove the cylinder and ejector group by pulling the ejector forward.

4. Remove the three remaining side-plate screws (No. 2 in fig. 3-18, view B).

5. Remove the side plate. (Do not use excessive force.)

6. If the revolver has a hammer block that fits over a pin in the rebound slide, remove the hammer block If the revolver has the type of hammer block that is staked to the side plate (early models), removal is not required.

To reassemble the weapon, if the hammer block has been removed, place the hole in the hammer block over the hammer block pin (No. 12 in fig. 3-19) so that the L projection of the hammer block will fit between the hammer and the frame. Assemble the side plate, making sure the hammer block fits in the recess in the side plate (do not force). Install the remaining parts, following the reverse order of disassembly.

For further information on the .38-cal. revolver, refer to the U.S. Army TM 9-1005-206-14&P-l.

SHOULDER WEAPONS

LEARNING OBJECTIVE Discuss the controls, safeties, and maintenance of shoulder weapons used by the U.S. Navy.

Shoulder weapons are designed to be held with both hands; they are braced against the shoulder to absorb the force of recoil and to improve accuracy. Included in this group are the M14 and M16 rifles.

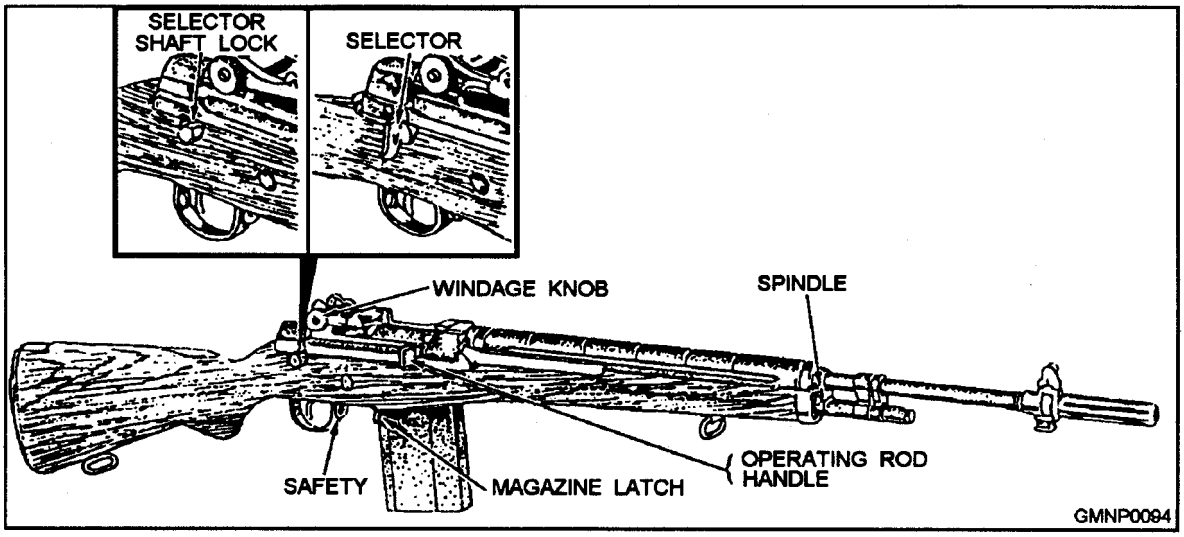


Figure 3-20.—7.62-mm M14 rifle and controls—right-front view.

M14 RIFLE

The M14 rifle (fig. 3-20) is a lightweight air-cooled, gas-operated, magazine-fed shoulder weapon. It is designed for semiautomatic or fully automatic fire at the cyclic rate of 750 rounds per minute. The rifle is chambered for 7.62-mm cartridges. It is designed to accommodate a 20-round cartridge magazine, the M2 rifle bipod (fig. 3-21), and the M6 bayonet (fig. 3-22).

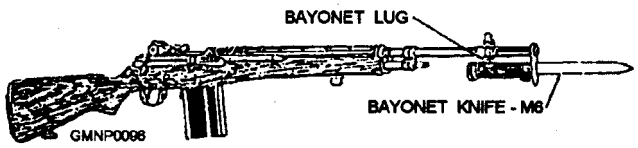


Figure 3-22.—7.62-mm M14 rifle with the M6 bayonet knife.

M14 Rifle Controls

Figure 3-23 shows an M14 rifle equipped with a selector for automatic operation. Position the selector as shown in view A for semiautomatic fire and as shown in view B for automatic fire. In firing for semiautomatic fire, squeeze the trigger for each round fired For automatic fire, squeeze the trigger and hold. Most of the M14 rifles issued to the Navy will not be equipped with the automatic selector, only semiautomatic fire will be possible.

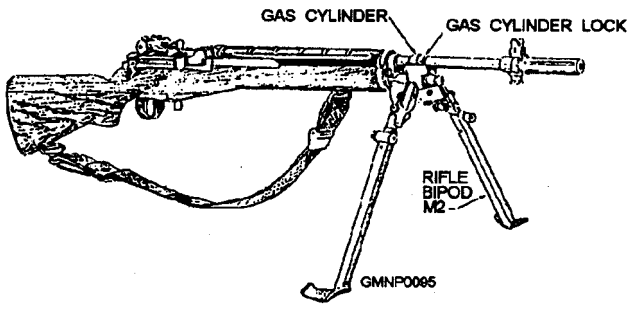


Figure 3-21.—7.62-mm M14 rifle with the bipod installed.

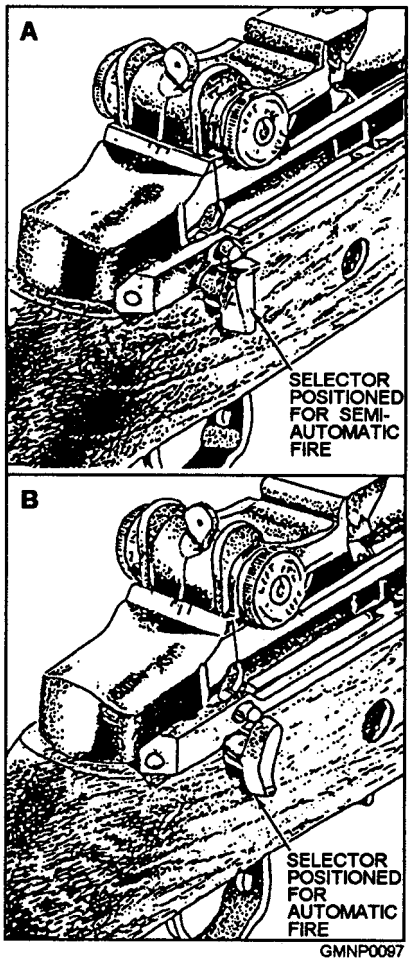


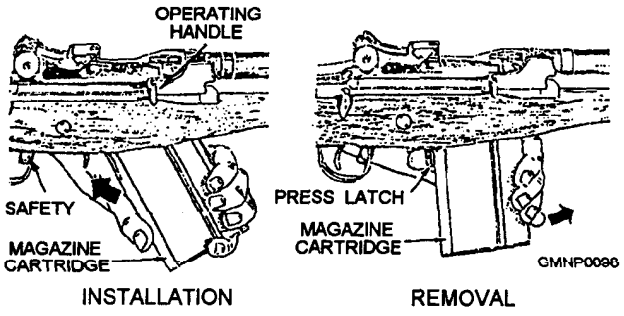
Figure 3-23.—Selector for semiautomatic and automatic fire.

The location of the safety is just forward of the trigger guard. To prevent firing, press the safety back from in front of the trigger guard. To permit firing, press it forward from inside the trigger guard. The safety can only be engaged when the weapon is cocked.

If a magazine is in the rifle, press the magazine latch (fig. 3-24) and remove the magazine. Pull the operating handle all the way to the rear and check to see that the weapon is free of ammunition. Then ease the operating rod forward to the locked position and move the safety to the rear (SAFE position).

There are two methods of reloading an empty magazine. Figure 3-25 shows the method with the magazine in the rifle. (This method should only be used in the field since it creates a possible accidental firing situation.) After the last round is fried from a magazine, the magazine follower will engage the bolt lock and hold the bolt in the rear position. If this fails to happen, make sure you did not have a misfire, then pull the operating handle to the rear and manually depress the bolt lock (located on the left side of the receiver), ease the bolt down against it, then engage the safety. Insert a 5-round clip into the cartridge clip guide, as shown in figure 3-25, and push the cartridges down into the magazine. Four 5-round clips will fully load a magazine. After the last clip is loaded and the clip removed, pull the operating handle to the rear to release the bolt lock and then release the handle. This will let the bolt go into battery, stripping and feeding the top round into the chamber. The weapon is now ready to fire.

The safest way to reload a magazine is shown in figure 3-26. Each bandolier containing the 5-round clips also contains a magazine loading tool. Insert the tool over the top rear of the magazine, as shown in figure 3-26, insert a 5-round clip into the loading tool, and press the cartridges into the magazine.



Ftgure 3-24.—Installation and removal of magazine.

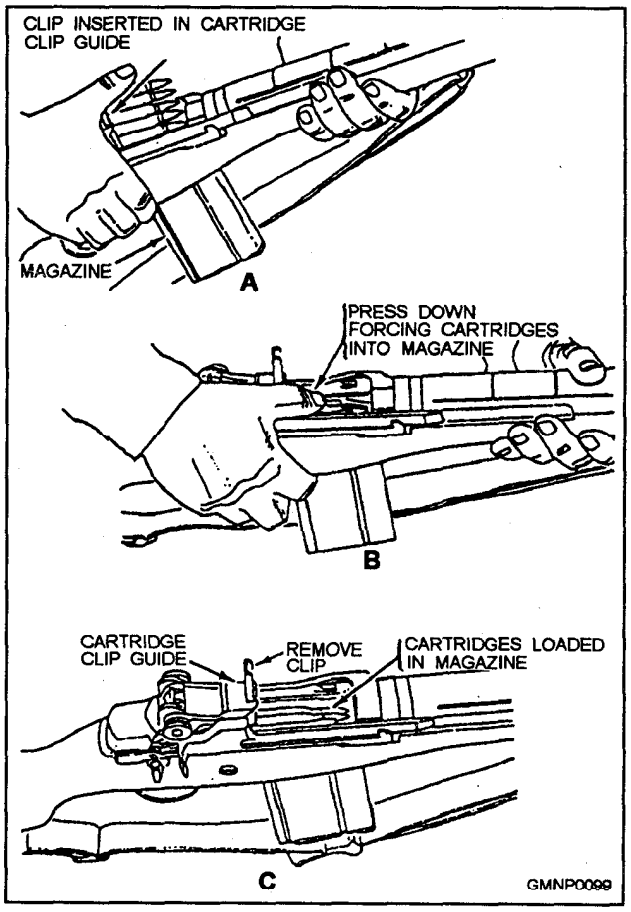


Figure 3-25.—Loading magazine through cartridge clip guide.

To load a full magazine into a rifle, insert the front end of the loaded magazine well into the front catch until the front catch snaps into engagement, then pull rearward and upward until the magazine latch locks the magazine into position (fig. 3-24).

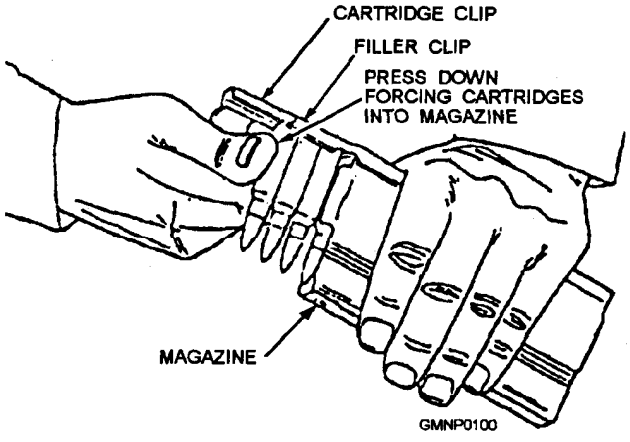


Figure 3-26.—Loading magazine with a loading tool.

The gas spindle valve (fig. 3-27) controls the gases used in firing the rifle. When the slot of the spindle valve is in the vertical or ON position (upper view), the valve is open and directs gases to the operating piston for ordinary functioning of the rifle. When the slot is in the horizontal or OFF position (lower view), the spindle valve is closed. This permits the full pressure of the gas to be used in propelling a rifle grenade or line-throwing projectile.

The rear sight controls consist of a windage knob and pinion assembly. (See fig. 3-20.) The function of the windage knob is to adjust the sight laterally. To move the sight to the right, turn the knob clockwise; to the left, counterclockwise. The pinion assembly adjusts the sight aperture vertically. Turn the pinion clockwise to raise, counterclockwise to lower.

Firing the M14 Rifle

If the command does not desire automatic fire,, the selector on your rifle will be removed and a selector shaft lock is (see fig. 3-20) inserted so that the rifle is capable only of semiautomatic fire.

For a rifle equipped with a selector shaft lock, simply push the safety forward and then fire a round with each squeeze of the trigger.

For semiautomatic fire on a rifle equipped with a selector, position the selector for semiautomatic fire and then fire a round with each squeeze of the trigger.

For automatic fire with a selector (rifle cocked), proceed as follows:

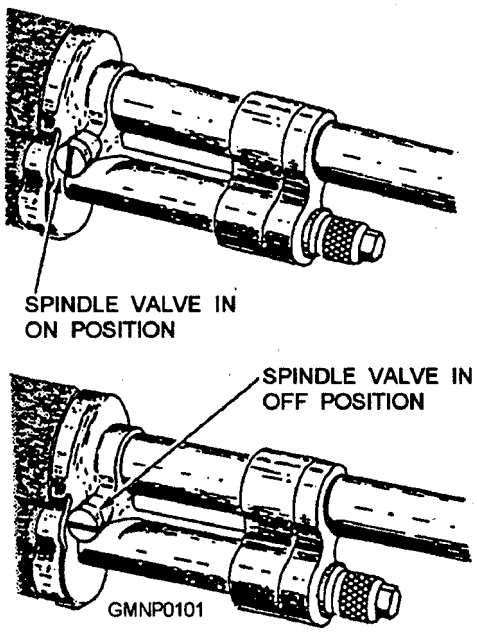


Figure 3-27.—Gas spindle valve in the ON and OFF positions.

1. Position the selector for automatic free.

2. Push the safety forward.

3. Squeeze the trigger. The rifle will fire automatically as long as the trigger is squeezed and there is ammunition in the magazine. Release the trigger to cease firing.

4. After the last round is fired, the magazine follower (a spring-driven plate in the magazine that forces cartridges upward as rounds are expended and cases ejected) actuates the bolt lock, locking the bolt in the rearward position. When an empty magazine is removed and a loaded one inserted, release the bolt lock by retracting the operating rod, thereby drawing the bolt rearward, then close the bolt. As the bolt assembly is closed, the top cartridge in the magazine is pushed forward into the chamber.

Unloading the M14 Rifle

To unload the M14 rifle, proceed as follows:

1. Push the safety to the SAFE (back) position.

2. Grasp the magazine with your thumb on the magazine latch, and squeeze the latch to release it. Push the magazine forward and downward to disengage it from the front catch, and then remove it from the magazine well, as shown in the right-hand view of figure 3-24.

3. Pull the operating rod handle all the way to the rear and lock it, using the bolt catch.

4. Inspect the chamber to make sure it is clear.

The rifle is clear only when no round is in the chamber, the magazine is out, the safety is set (to the rear), and the bolt is in the REAR position.

Field Stripping the M14 Rifle

Figure 3-28 shows how the M14 rifle breaks down into seven group assemblies. You should be able to disassemble the rifle to this extent for cleaning, lubrication, and maintenance. This procedure is called field stripping the rifle. The names of the numbered group assemblies shown in figure 3-28 areas follows:

1. Magazine
2. Firing mechanism
3. Stock with butt plate assembly
4. Handguard assembly
5. Operating rod and connector group

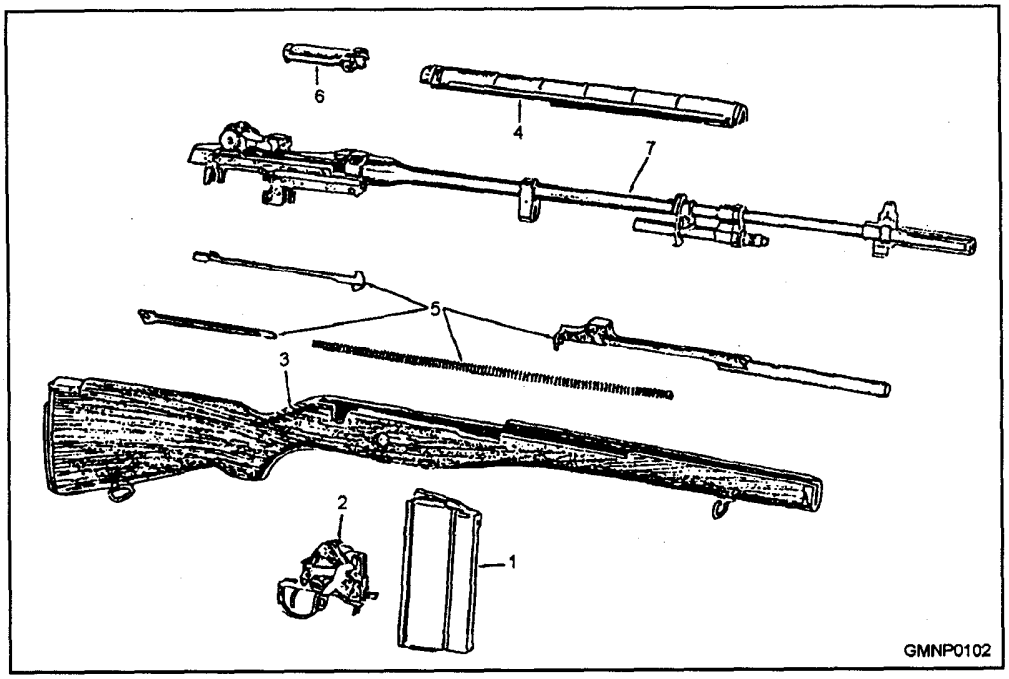


Figure 3-28.—Group assemblies of the M14 rifle.

6. Bolt assembly

7. Barrel and receiver group

To withdraw the firing mechanism (No. 2 in fig. 3-28) from the stock, proceed as follows:

1. Remove the magazine.

2. Place the safety in the SAFE position after making sure the rifle is cocked.

3. Disengage the hooked end of the trigger guard from the firing mechanism housing.

4. Swing the trigger guard away from the stock (but do not rotate it more than 90 degrees), and pull straight away from the stock to draw out the firing mechanism.

To remove a stock with a butt plate assembly after removing the firing mechanism, proceed as follows:

1. Separate the stock with a butt plate assembly from the rifle by grasping the receiver firmly with one hand and striking the butt of the stock sharply with the palm of the other.

2. Lift the stock from the barrel and receiver group.

To separate the operating rod and connector group from the barrel and receiver group, proceed as follows:

1. Depress the rear sight to the lowest position and turn the barrel and receiver group on its side with the connector assembly upward

2. If the rifle has a selector, press in and turn the selector until the face marked "A' is toward the rear of the sight knob and the projection forward is at an angle of about 35 degrees. Then remove the connector assembly, as indicated in paragraphs 3 and 4.

3. If the rifle has a selector shaft lock, press forward on the rear of the connector assembly with your right thumb, as shown in figure 3-29, until the front end can be lifted off the connector lock.

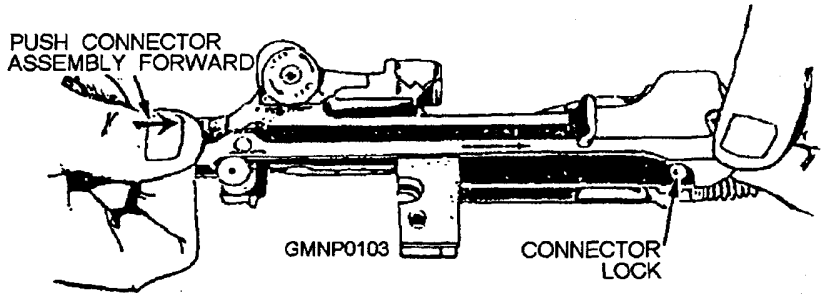


Figure 3-29.—Disengaging the connector assembly.

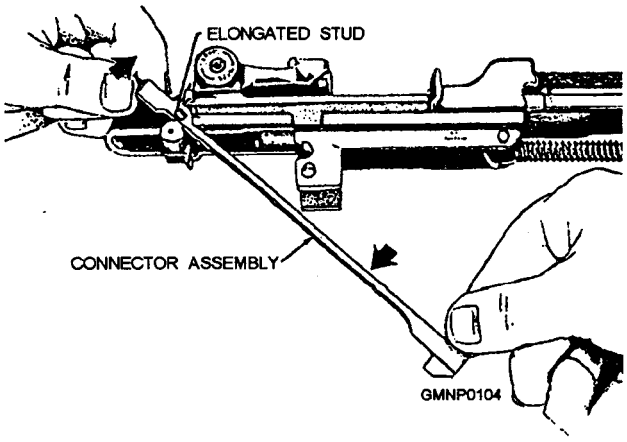


Figure 3-30.—Removing the connector assembly.

4. Rotate the connector assembly about 35 degrees clockwise until the slot at the rear is aligned with the elongated stud on the sear release (fig. 3-30); then lower the front end of the connector assembly and lift it off the sear release.

The next step is to remove the operating rod spring guide, the operating rod spring, and the operating rod. These parts are identified as 2, 3, and 4, respectively, in figure 3-31. The correct step-by-step procedure is as follows:

1. with the barrel and receiver group upside down, pull forward on the operating rod spring, relieving pressure on the connector lockpin. Pull the lock outward to disconnect the operating rod spring guide.

2. Remove the operating rod spring guide and the operating rod spring. Turn the barrel and the receiver group right side up.

3. Retract the operating rod until the key on its lower surface coincides with the notch in the receiver.

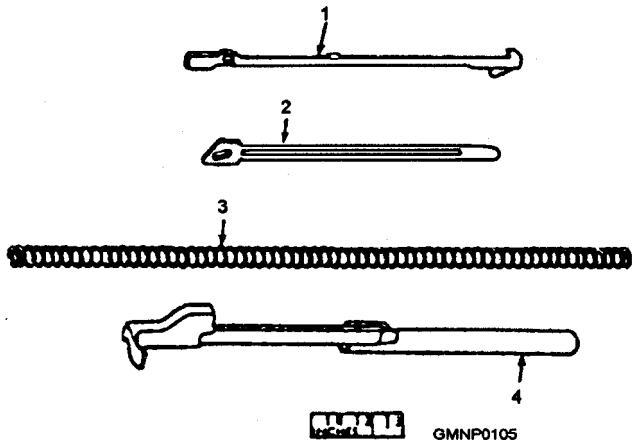


Figure 3-31.—Component parts of the operating rod and connector group.

Lift the operating rod free and pull to the rear, disengaging it from the operating rod guide.

To remove the bolt after removal of the operating rod, grasp the bolt roller that engages with the operating rod and slide it forward. Lift upward and outward to the right with a slight rotating motion and remove the bolt from the receiver. The weapon is now field-stripped for cleaning.

Reassembly of this weapon is basically the reverse of disassembly. A step-by-step procedure for reassembly and other maintenance procedures is covered in the U.S. Army FM 23-8.

M16A1 RIFLE

The M16A1 rifle (fig. 3-32) is a 5.56-mm (about .223-cal.) magazine-fed, gas-operated, air-cooled

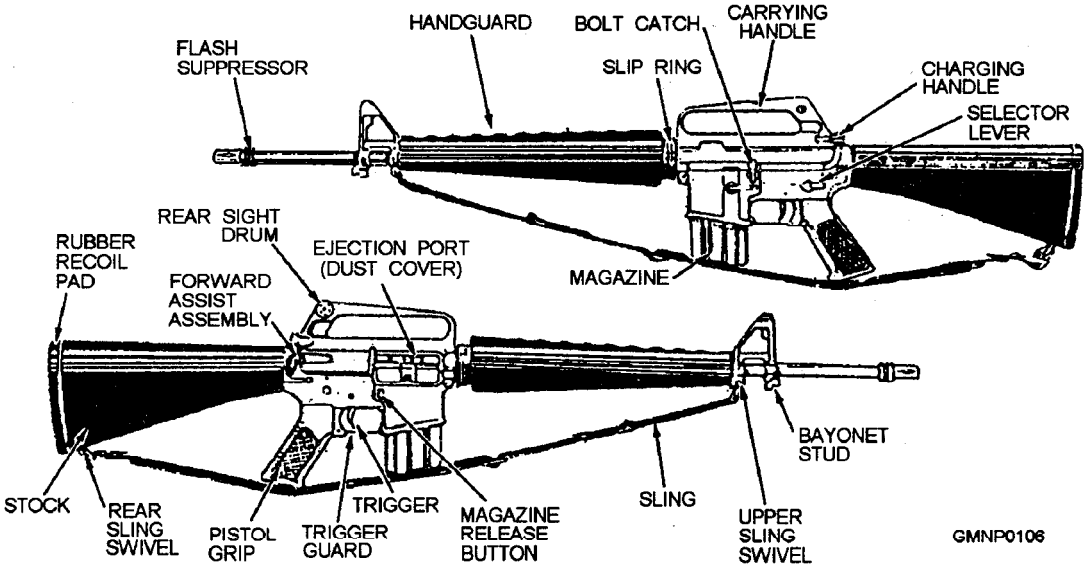


Figure 3-32.—5.56-mm M16A1 rifle, left-and right-side views.

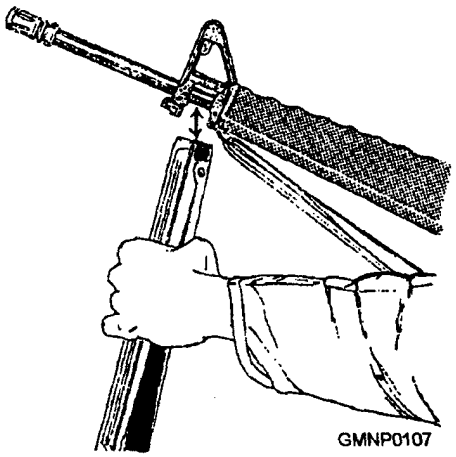


Figure 3-33.—Attaching the clothespin bipod to the M16A1 rifle.

shoulder weapon. It is designed for either semiautomatic or fully automatic fire through the use of a selector lever. The original Ml 6 rifle was introduced for service in Vietnam by the U.S. Army in 1966 and was adopted by the Marine Corps in 1968 after the addition of the Al upgrade. The M16A1, which is the current version in use by the Navy, incorporates a forward assist mechanism. The forward assist was added to allow the operator to close the bolt completely should it hang up while feeding. Heavy use in dirty conditions with the close tolerances of the bolt mechanism combine to cause many such feeding problems.

A "clothespin" bipod shown in figure 3-33 is used in the prone and foxhole positions. The bipod is attached to the barrel directly beneath the front sight between the bayonet lug and the front sling swivel.

Clearing the M16A1 Rifle

The first consideration in handling any weapon is to make it safe by clearing it. To clear the M16A1 rifle,

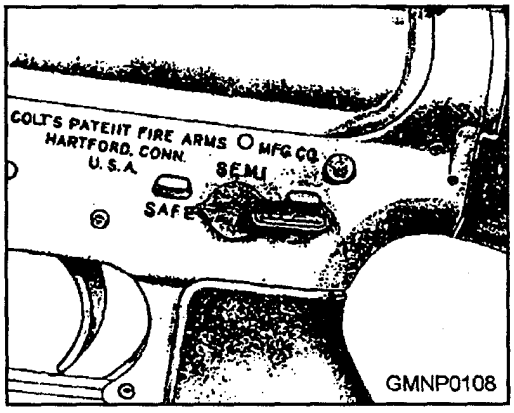


Figure 3-34.—Selector lever pointing to SAFE.

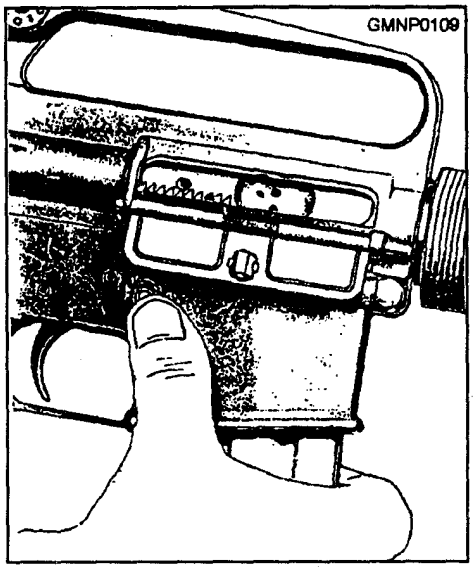


Figure 3-35.—Removing the magazine.

place the butt against the right thigh and proceed as follows:

1. Attempt to point the selector lever toward SAFE, the position shown in figure 3-34. If the weapon is not cocked, the selector lever cannot be pointed toward SAFE. If this is the case, do not cock the weapon at this time; instead, goon to the next step in clearing.

2. Remove the magazine, as shown in figure 3-35. Grasp it with the right hand (fingers curled around the front of the magazine). Place the thumb on the. magazine catch button, apply pressure on the magazine catch button with the thumb, and pull the magazine straight out of the weapon.

3. Lock the bolt open, as shown in figures 3-36 and 3-37. Grasp the charging handle with the thumb and forefinger of the right hand, depress the charging handle latch with the right thumb, and pull to the rear (fig. 3-36). When the bolt is at the rear, press the bottom of the bolt catch with the thumb or forefinger of the left hand

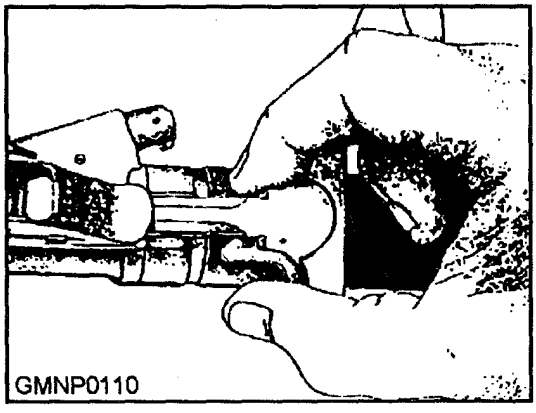


Figure 3-36.—Pulling the charging handle rearward.

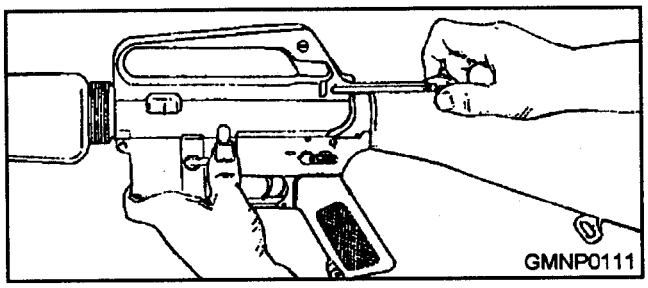


Figure 3-37.—Locking the bolt open.

(fig. 3-37). Allow the bolt to move slowly forward until it engages the bolt catch, and then return the charging handle to its forward position.

4. Inspect the receiver and chamber of the weapon by looking through the ejection port to make sure these spaces contain no ammunition.

5. Check the selector lever to make sure it points toward SAFE, and then allow the bolt to go forward by depressing the upper portion of the bolt catch.

CAUTION

The selector must be in the SAFE position to prevent damage to the automatic sear.

Field Stripping the M16A1 Rifle

The individual GM is authorized to disassemble the M16A1 to the extent called field stripping. Field stripping can be done without supervision and is adequate for normal maintenance. As the weapon is disassembled, the parts should be laid out on a table or other clean surface in the order of removal, from left to right. This makes assembly easier because the parts are assembled in the reverse order of disassembly. Nomenclature should be learned as the weapon is disassembled and assembled to enable the GM to better understand the function of the parts in the weapon.

The steps infield stripping are as follows:

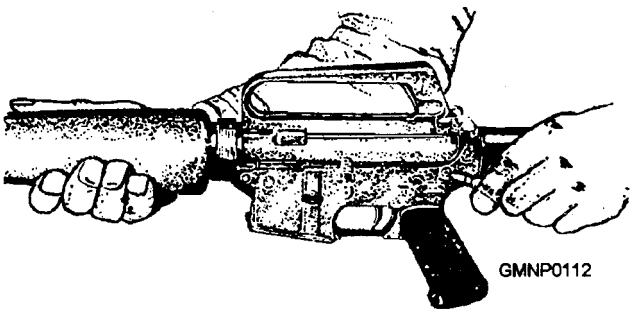


Figure 3-38.—Pressing the takedown pin to the right.

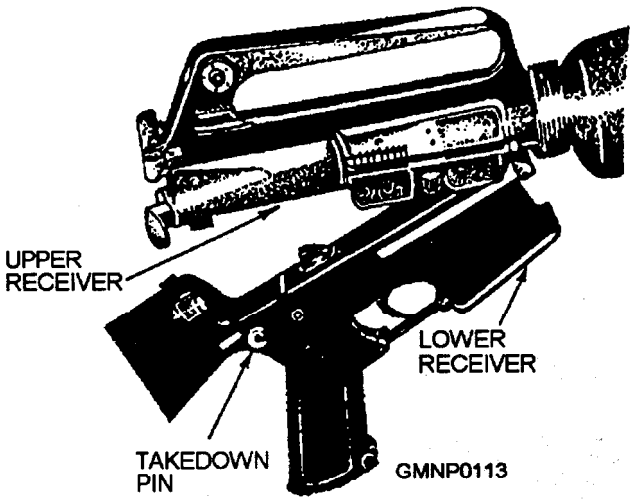


Figure 3-39.—Breaking the upper receiver away from the lower receiver.

1. Remove the sling and place the rifle on a table or flat surface, muzzle to the left.

2. Keeping the muzzle to the left, turn the weapon on its right side. Use a punch or the end of a cleaning rod (nose of cartridge used only as a last resort in the field) to press the takedown pin (fig. 3-38) until the upper receiver swings free of the lower receiver (fig. 3-39),

NOTE

The takedown pin does not come out of the receiver.

3. Again using a punch or the end of a cleaning rod, press the receiver pivot pin (fig. 3-40). Separate the upper and lower receiver groups (fig. 3-41) and place the lower receiver group on the table.

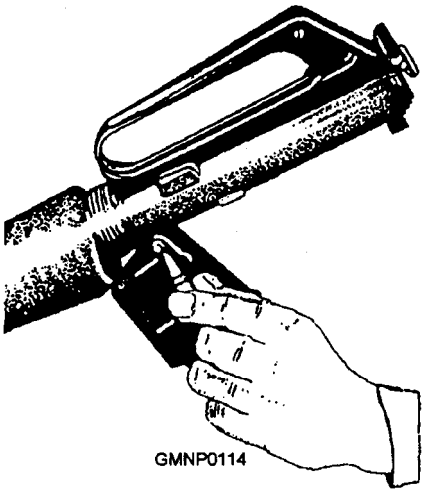


Figure 3-40.—Pressing out the receiver pivot pin.

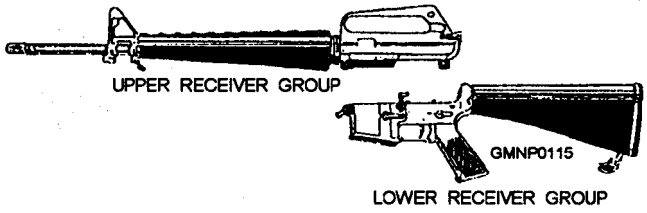


Figure 3-41.—Upper and lower receiver groups.

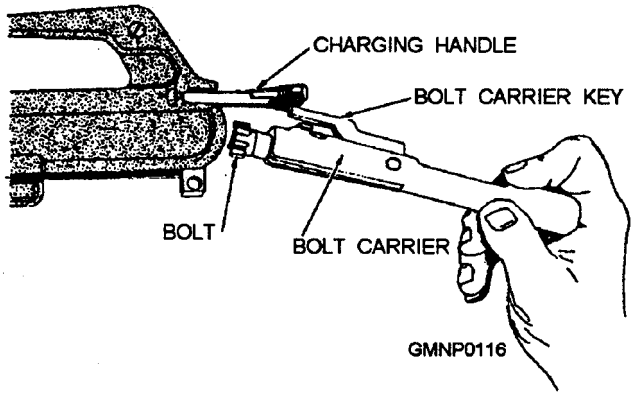


Figure 3-42.—Removing the bolt carrier from the receiver.

NOTE

The receiver pivot pin does not come out of the receiver.

4. Pick up the upper receiver group; keep the muzzle to the left. Grasp the charging handle, pressing in on the latch, and pull to the rear to withdraw the bolt carrier from the receiver. Grasp the bolt carrier and pull it from the receiver (fig. 3-42). When the bolt carrier is removed, the charging handle will fall free of its groove in the receiver (fig. 3-43). Place the receiver on the table.

5. To disassemble the bolt carrier group, press out the firing pin retaining pin by using a driftpin (fig. 3-44). Elevate the front of the bolt carrier and allow the firing

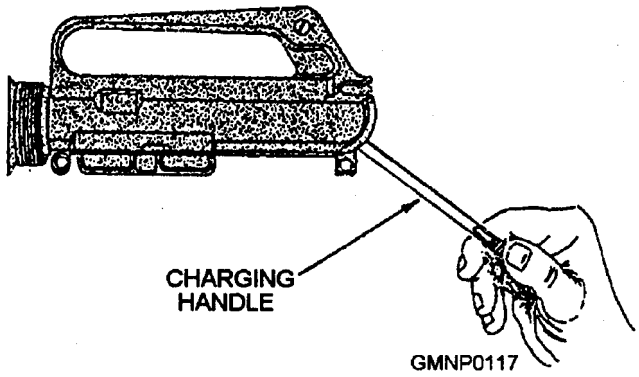


Figure 3-43.—Removing the charging handle.

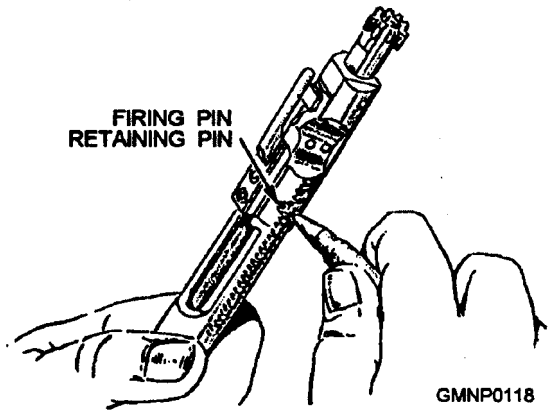


Figure 3-44.—Pressing out the firing pin retaining pin.

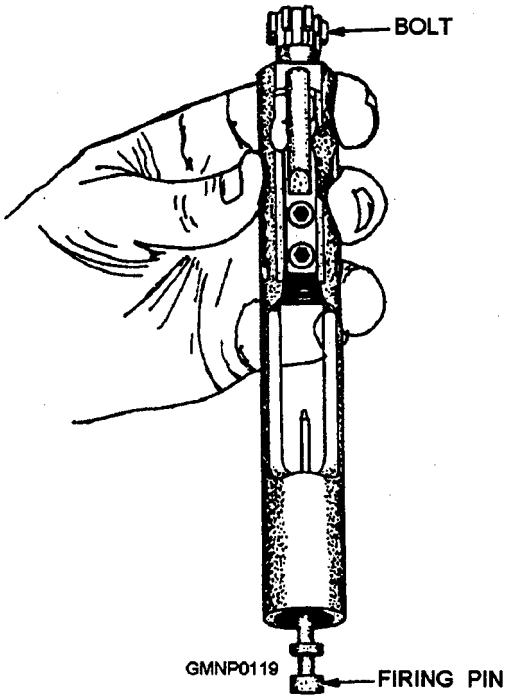


Figure 3-45.—Removing the firing pin.

pin to drop from its well in the bolt (fig. 3-45). Rotate the bolt until the cam pin is clear of the bolt carrier key and remove the cam pin by rotating it 90 degrees (one-quarter turn) and lifting it out of the well in the bolt and bolt carrier (fig. 3-46). After the cam pin is

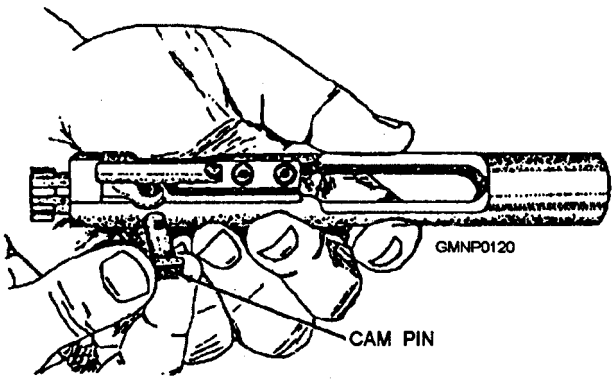


Figure 3-46.—Removing the cam pin.

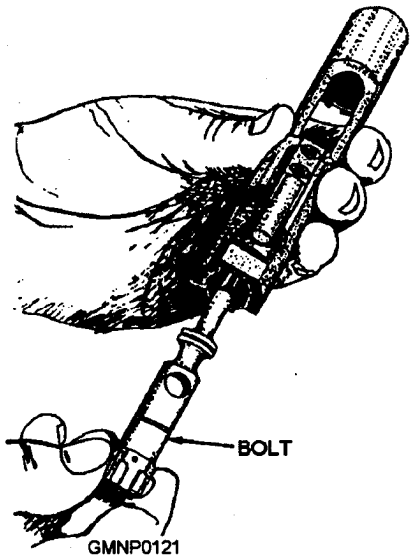


Figure 3-47.—Removing the bolt.

removed, the bolt can be easily removed from its recess in the bolt carrier (fig. 3-47).

Loading the Magazine

Magazines are available with a capacity of 20 or 30 rounds and may be loaded with any amount up to that capacity. 'he magazine follower has a raised portion generally resembling the outline of a cartridge. Cartridges are loaded into the magazine so that the tips of the bullets point in the same direction as the raised portion of the follower (fig. 3-48).

A magazine charger and magazine charger strip (fig. 3-49) are provided to facilitate loading of the magazine.

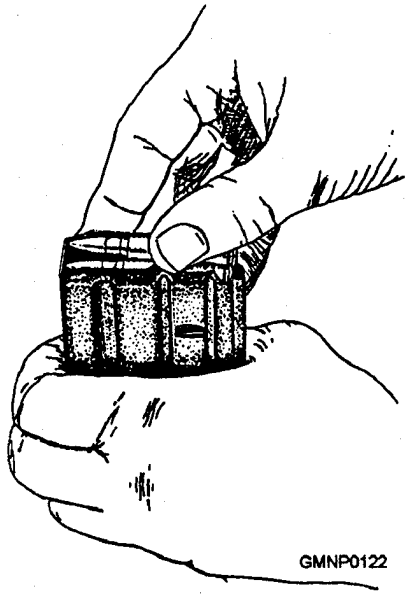


Figure 3-48.—Loading cartridges into the magazine.

The magazine charger is connected to the magazine and is fully seated. The charger strip is inserted into the magazine charger until it is fully seated. Pushing on the top cartridge will force cartridges into the magazine.

Loading the Rifle

with the weapon cocked, place the selector lever on SAFE. The magazine may be inserted with the bolt either open or closed; however, you should learn to load with the bolt open. This reduces the possibility of a first-round stoppage and saves the time required to chamber the first round by pulling back the charging handle.

Open the bolt and lock it open as previously described. Hold the stock of the rifle under the right arm with the right hand grasping the pistol grip and point the muzzle in a safe direction. With the left hand, insert a loaded magazine into the magazine feedway. Push upward until the magazine catch engages and holds the magazine. Rap the base of the magazine sharply with the heel of the hand to ensure positive retention. Then release the bolt by depressing the upper portion of the bolt catch as previously described The bolt, as it rides forward, will chamber the top round

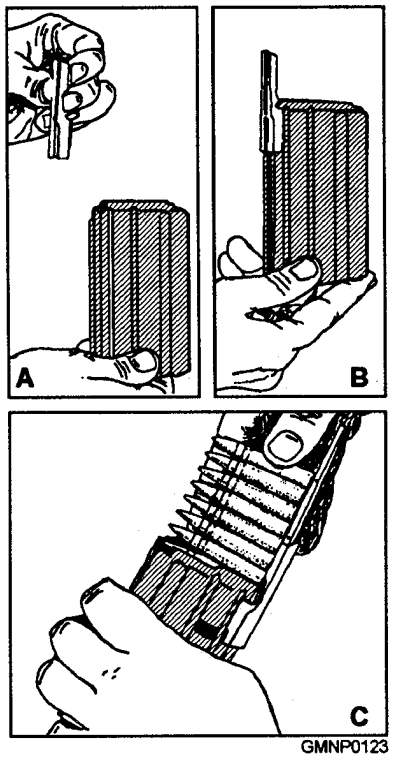


Figure 3-19.—Luading cartridges into the magazine with the magazine loading strip and charger.

If you load the rifle with the bolt closed, you chamber the top round by pulling the charging handle fully to the rear and releasing it.

NOTE

Do not "ride" the charging handle forward with the right hand. If the handle is eased forward from the OPEN position, the bolt may fail to lock. If the bolt fails to go forward fully, strike the forward assist assembly with the heel of the right hand.

Unloading the Rifle

To unload the rifle and make it safe, place the selector lever on SAFE, press the magazine catch button and remove the magazine, pull the charging handle to the rear, inspect the chamber to make sure it is clear, lock the bolt carrier to the rear by depressing the lower portion of the bolt catch, and return the charging handle forward.

Remember, the rifle is clear (and therefore safe) only when no round is in the chamber, the magazine is out, the bolt carrier is to the rear, and the selector lever is on the SAFE setting.

Gun Maintenance

A clean, properly lubricated and maintained M16Al rifle will function properly and fire accurately when needed. To keep the rifle in good operating condition, you must take care of it properly and maintenance must be performed according to set procedures. Procedures for the care and cleaning of the rifle can be found on the 3-M Systems MRCs or in the Army's TM 9-1005-249-10.

Maintenance of the M16A1 rifle is generally the same as for other small arms previously discussed. The bore and chamber must be kept free of residue and foreign matter. Inspect, while cleaning and lubricating, all sliding or working surfaces for burrs, cracks, or worn areas (repair or replace as necessary) and lubricate with a thin film of lubricant. Remove dirt, rust, grit, gummed oil, and water as these will cause rapid deterioration of the inner mechanism and outer surfaces.

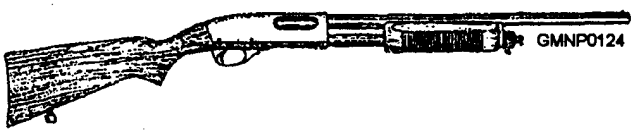


Figure 3S0.—Remington M870 shotgun.

SHOTGUNS

LEARNING OBJECTIVE Describe the operating cycle, safeties, and maintenance of the Remington M870 and the Mossberg M500 shotguns.

Shotguns used by the armed forces are military versions of civilian models procured from military specifications. The Remington model 870 (M870) and the Mossberg model 500 (M500) are the Navy's standard issue riot type of shotguns. In this section we will describe the Remington M870 (fig, 3-50) in detail, then note how the Mossberg 500 differs. The Mossberg 500 is very similar to the Remington 870 in construction and operation.

REMINGTON M870 SHOTGUN

The M870 shotgun, used by the Navy for guard work, is a manually operated magazine-fed (tubular), pump-action shoulder weapon.

Technical Description

The essential features of the Remington M870 shotgun are displayed here in chart form for easy reference.

Length of shotgun	39 inches (approximately)
Length of barrel	20 inches
Magazine capacity—rounds	4
Shell (gauge)	12
Ammunition	12 gauge, 2 3/4 inch 00 buck, military round
Safety	Crossbolt type
Fore-end	Plain beaver-tail style

Functioning of the Remington M870

The M870 shotgun can be loaded and unloaded in several different ways. The following paragraphs describe the different options for loading and unloading the M870 and how to operate the mechanical safety. A single load puts a round directly into the chamber for fast firing, while a magazine load fully loads the tubular magazine, but does not chamber around. Loading the barrel from the magazine chambers a round from the loaded tubular magazine for firing.

SAFETY.— Before loading or unloading, push the safety (fig. 3-5 1) across the rear of the trigger, left to right, to the SAFE position (the red band on the safety will not show).

FIRE POSITION.— Push the safety across to the FIRE position (the red band on the safety will show). The trigger can then be pulled to fire the gun.

SINGLE LOAD.— Push the safety to the SAFE position. Press in the action bar lock (fig. 3-51) if the action is cocked and pull the fore-end fully to the rear. Place the shell into the open ejection port upon the downthrust carrier. Slide the fore-end toward the muzzle to load the shell into the barrel chamber and leek the action closed

MAGAZINE LOAD.— Push the safety to the SAFE position. Slide the fore-end completely forward to close the action. Turn the gun bottom upward and press the shell against the carrier, then forward fully into the magazine. Make sure the rim of the shell snaps past the shell latch to prevent the shell from sliding back over the carrier. Should this occur, open the action or, if necessary, remove the trigger plate assembly (fig. 3-52) if the gun is cocked to remove the shell.

LOADING THE BARREL FROM THE MAGAZINE.— Shells can be fed from the loaded magazine by simply pumping the fore-end. Press in the

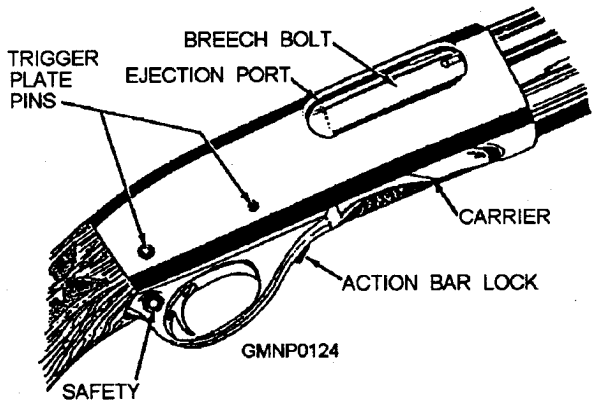


Figure 3-51.—Remington M870 receiver nomenclature.

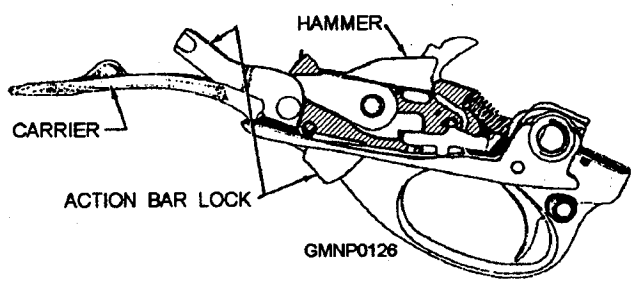


Figure 3-52.—M870 trigger plate assembly.

action bar leek if the gun is cocked Pump the fore-end back and forth to open and close the action.

UNLOADING THE GUN.— Pushthe safety to the SAFE position. Press in the action bar lock; pull the fore-end (fig. 3-53) slowly rearward until the front end of the shell from the barrel is even with the ejection port in the receiver. Lift the front of the shell outward and remove it from the ejection port. Continue pulling the fore-end back fully until the next shell releases from the magazine. Roll the gun sideways to allow the released shell to drop from the ejection port. Close the action by pushing forward on the fore-end. Continue this same method until the magazine and gun are empty.

CAUTION

Open the action and check the shell chamber in the breech and magazine to make sure no rounds remain in the gun.

UNLOADING THE BARREL ONLY.— Push the safety to the SAFE position. Press in the action bar leek and pull the fore-end rearward until the front end of the shell from the barrel is even with the front end of the ejection port. Lift the front end of the shell from the receiver as described previously. A shell with different powder and shot combination may then be placed in the chamber and the action closed without disturbing shells in the magazine.

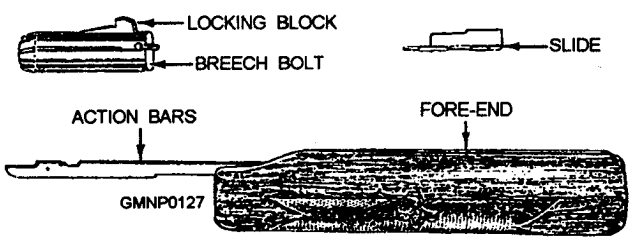


Figure 3-53.—M870 fore-end assembly.

Remington M870 Operating Cycle

To understand an operating cycle of the M870 shotgun fully, you must know the names and general functions of the parts of the gun. To become more familiar with the parts during our discussion of an operating cycle, refer to figure 3-54A, the individual parts breakdown, and figure 3-54B, the accompanying parts list.

The entire operating cycle of the M870 shotgun is completed by pulling the trigger, sliding the fore-end rearward to open the action, and forward again to close the action. The fore-end is mounted on double-action bars and is fully controlled and operated by the shooter.

Assume the magazine is loaded and one shell is in the chamber and locked; the gun is ready to fire. The firing cycle is described in the following paragraphs.

FIRING.— with the crossbolt safety pushed to the FIRE position (red band showing), the gun is fired by pulling the trigger. The top part of the trigger rotates forward carrying the right connector, in READY position, forward against the sear. This movement pivots the sear out of engagement with the hammer. The released hammer, with force from the spring-loaded hammer plunger, strikes the firing pin, which is pinned in the breech bolt and spring retracted. The firing pin strikes the primer and ignites the powder charge. During the upward movement of the hammer, it engages the action bar lock just before it strikes the firing pin. Downward movement of the front of the action bar lock is restrained until pressure against it is briefly released by the shooter's arm as it recoils rearward When the action bar lock is released, the forward end of the action bar lock is lowered from its position at the rear of the left action bar, and the rear section rises and lifts the left connector, which lifts the right connector from contact with the sear. This completes the "lock or firing cycle. The action bar lock serves a twofold purpose. It serves as a safety feature that disconnects the trigger assembly and sear until a shell is fully seated in the chamber and the breech mechanism again is ready for firing and it locks the action closed.

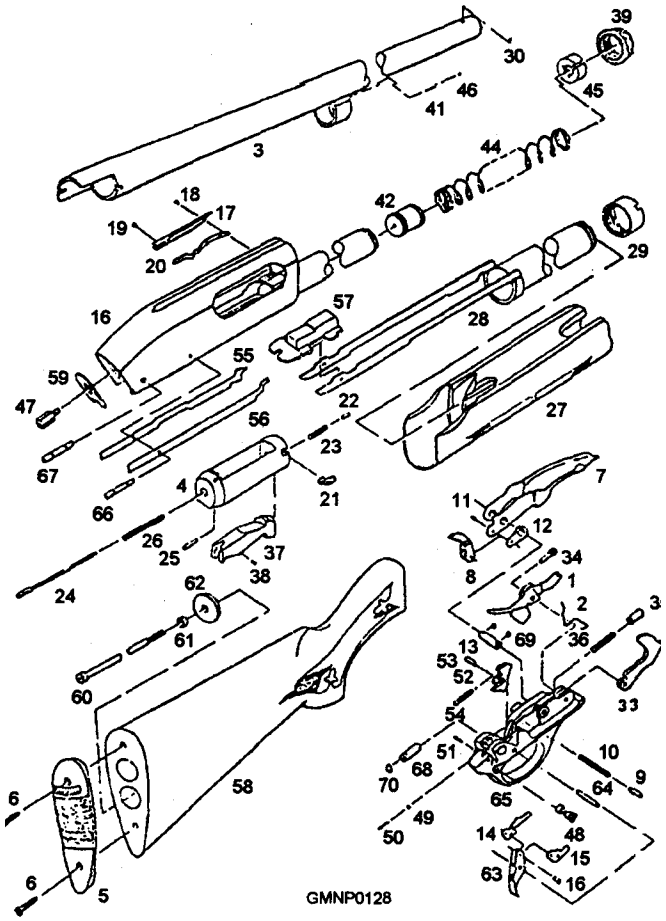


Figure 3-54A.—M87O individual parts breakdown.

After pulling the trigger, pulling the fore-end rearward will open the action and accomplish the unlock, extract, eject, cock, and feed cycles.

UNLOCKING.— The initial rearward movement of the fore-end, after the shell has been fired, carries the slide to the rear of the breech bolt. As the breech bolt passes to the rear, the slide cams the locking block from the recoil shoulder of the barrel. This movement unlocks the action and cams the firing pinto the rear where it is locked and prevented from protruding through the bolt face.

EXTRACTING.— Continued rearward movement of the fore-end opens the action. The breech bolt moves back and the fired shell is extracted from the chamber. The extractor claw, which overhangs the bolt face, grips the rim of the shell tightly as extraction progresses. Pivot pressure is exerted on the rear of the extractor by the extractor plunger and spring.

EJECTING.— AS the extracted shell clears the chamber, its base engages a shoulder on the rear of the ejector spring, which is located on the left side of the receiver. This pivots the shell so its front end is ejected first through the ejection port.

COCKING.— Before ejection occurs, the breech bolt in its rearward travel forces the hammer down against the coiled hammer spring to engage the sear. Sear spring pressure locks the sear in a notched position against the cocked hammer.

VIEW NO.	NAME OF PART
1	Action Bar Lock
2	Action Bar Lock Spring
3	Barrel Asssembly, 12 Ga. PLAIN, 20" (includes Barrel, Barrel Guide Ring, Barrel Guide Pin Front Sight (Steel), Magazine Cap Detent, Magazine Cap Detent Spring)
4	Breech Bolt, 12 Ga.
	Breech Bolt Assembly, Complete, 12 Ga. (includes Breech Bolt, Extractor, Extractor Plunger, Extractor Spring, Firing Pin, Firing Pin Retaining Pin, Firing Pin Retractor Spring, Locking Block Assembly, Slide)
5	Butt Plate
6	Butt Plate Screw
7	Carrier
	Carrier Assembly, (includes Carrier, Carrier Dog, Carrier Dog Pin, Carrier Dog Washer)
8	Carrier Dog
9	Carrier Dog Follower
10	Carrier Dog Follower Spring
11	Carrier Dog Pin
12	Carrier Dog Washer
13	Carrier Pivot Tube
14	Connector, Left
15	Connector, Right
16	Connector Pin
17	Ejector, 12 Ga.
18	Ejector Rivet, Front
19	Ejector Rivet, Rear
20	Ejector Spring
21	Extractor
22	Extractor Plunger
23	Extractor Spring
24	Firing Pin
25	Firing Pin Retaining Pin
26	Firing Pin Retractor Spring
	Fore-end (Wood only) 12 Ga.
27	Fore-end Assembly, 12 Ga. (includes Fore-end, Fore-end Tube Assembly, Fore-end Tube Nut)
28	Fore-end Tube Assembly (includes Action Bar, Left; Action Bar, Right; Fore-end Tube)
29	Fore-end Tube Nut
30	Front Sight (Plain Barrel)
	Front Sight (Vent Rib) Steel Bead
	Front Sight Retaining Pin (for use on Vent Rib Steel Sight)
33	Hammer
34	Hammer Pin
	Hammer Pin Washer
35	Hammer Plunger
36	Hammer Spring
37	Locking Block Assembly (includes Locking Block, Locking Block Stud)
	Locking Block Assembly (oversize)
38	Locking Block Stud
39	Magazine Cap
40	Magazine Cap Detent
41	Magazine Cap Detent Spring
42	Magazine Follower, 12 Ga.
44	Magazine Spring
45	Magazine Spring Retainer
46	Receiver Assembly, 12 Ga. (includes Receiver, Ejector, Ejector Rivet, Front; Ejector Rivet, Rear; Ejector Spring, Magazine Tube, Barrel Support)
47	Receiver Stud
48	Safety
49	Safety Detent Ball
50	Safety Spring
51	Safety Spring Retaining Pin
52	Sear
53	Sear Pin
54	Sear Spring
55	Shell Latch, Left, 12 Ga.
56	Shell Latch, Right, 12 Ga.
57	Slide
58	Stock Assembly (includes Stock, Grip Cap, Grip Cap Screw, Butt Plate, Butt Plate Screws (2))
59	Stock Bearing Plate
60	Stock Bolt
61	Stock Bolt Lock Washer
62	Stock Bolt Washer
63	Trigger
	Trigger Assembly (includes Trigger, Connector, Left; Connector, Right; Connector Pin)
64	Trigger Pin
65	Trigger Plate, R.H. (Right Hand Safety)
	Trigger Plate, L.H.
	Trigger Plate Assembly, R.H. (includes Action Bar Lock, Action Bar Lock Spring, Carrier, Carrier Dog, Carrier Dog Follower, Carrier Dog Follower Spring, Carrier Dog Pin, Carrier Dog Washer, Carrier Pivot Tube, Connector Left; Connector Right; Connector Pin, Hammer, Hammer Pin, Hammer Pin Washer, Hammer Plunger, Hammer Spring, Safety, Safety Plunger, Safety Spring, Safety Spring Retaining Pin, Sear, Sear Pin, Sear Spring Trigger, Trigger Pin, Trigger Plate, R.H.; Trigger Plate Pin Bushing, Trigger Plate Pin Detent Springs, From (2); Trigger Plate Detent Spring, Rear)
	Trigger Plate Assembly, (L.H. Safe)
66	Trigger Plate Pin, Front
67	Trigger Plate Pin, Rear
68	Trigger Plate Pin Bushing
69	Trigger Plate Pin Detent Spring, Front
70	Trigger Plate Pin, Pin Detent Spring, Rear

Figure 3-54B.—M870 parts list.

FEEDING.— The final movement of the fore-end carries the slide, breech bolt assembly, and locking block to the rear of the receiver. Termination of this rearward stroke also permits the left action bar to cam the left shell latch, in turn, releasing the first shell from the magazine. The released shell is forced from the magazine by a spring-loaded follower. The carrier receives the released shell. Meanwhile, the right shell latch, which was caromed into the magazine way by the right action bar during the extraction cycle, intercepts the base of the second shell.

With a shell resting on the depressed carrier, forward movement of the fore-end will close the action of the gun and complete the loading and locking cycles.

LOADING.— Forward movement of the fore-end will carry with it the slide, the breech bolt, and the locking block. The carrier dog is engaged by the slide, pivots the shell carrier upward, and places a shell in the path of the returning breech bolt. As the bolt continues to advance, it depresses the ejector spring and the shell is picked up and loaded into the chamber. The carrier dog is released by the passing slide, forced up by the carrier dog follower, and pivots the carrier from the path of the loading shell. The following shell from the magazine, being retained by the right shell latch, is released by the caroming action of the returning right action bar. At this point the shell is intercepted and held by the left shell latch until the next feeding cycle.

LOCKING.— When the shell is fully loaded in the chamber, the action closes and the bolt is against the shell base. The slide continues to travel within the bolt and cams the locking block into the recoil shoulder of the barrel. The locking block secures the breech bolt firmly and is supported by the slide as it completes its forward travel. With the locking block fully seated, the passage through the locking block allows protrusion of the firing pin through the bolt face.

Maintenance

The following discussion on maintenance of the M870 shotgun covers only action necessary for routine maintenance of the weapon. Maintenance is performed according to the MRCs for this weapon.

Before any disassembly of the M870 shotgun is attempted, be sure no shells remain in the chamber or magazine.

BARREL.— To remove and clean the barrel, push the safety to the SAFE position. Open the action, unscrew the magazine cap, and pull the barrel from the receiver. Replace the magazine cap on the end of the magazine tube. To clean the barrel, use a cleaning rod with a lightly oiled cloth. If powder fouling remains in the barrel, use a powder solvent to scrub the bore. After using solvent, wipe the barrel clean and re-oil it very lightly. Replace the barrel by removing the magazine cap, insert the barrel in the receiver, and replace the magazine cap.

TRIGGER PLATE ASSEMBLY.— Wlth the safety pushed to the SAFE position, cock the action. Tap out the front and rear trigger plate pins (fig. 3-54A). Lift the rear of the trigger plate from the receiver, then slide it rearward to remove it from the gun. The trigger assembly will be cleaned as a unit by brushing with a solvent. Wipe the trigger assembly dry and re-oil it very sparingly. When replacing the plate assembly in the gun, make sure the action bar lock enters the receiver easily and operates in position.

FORE-END ASSEMBLY UNIT.— Push the safety to the SAFE position. Close the action and remove the magazine cap and barrel. Reach into the bottom of the receiver and press the left shell latch inward. Remove the fore-end by sliding it forward off the magazine tube. After the fore-end assembly has been removed from the gun, the breech bolt parts and the slide may be lifted from the ends of the action bars.

NOTE

The top right edge of the slide may bind on the bottom front edge of the ejector port in the receiver. To free the slide, push downward on the front end of the bolt.

It is not necessary to disassemble the bolt for routine cleaning. Brush it with solvent to clean, then wipe it dry.

Assembly of the weapon is done in reverse of disassembly. There are, however, set procedures to follow to facilitate the assembly.

When you are assembling the fore-end parts, the gun must be cocked. During this assembly, place the slide in the correct position on the ends of the double-action bar. Place the breech bolt assembly, which includes the attached locking block assembly, over the slide on the action bars. Insert the end of the action bars into the matching grooves in the receiver. Move the fore-end slowly until contact is made with the front end of the right shell latch. Press the front right shell latch into the side of the receiver and continue moving the fore-end past this latch until contact is made with the left shell latch. Press the front of the left shell

latch in to allow the fore-end assembly to pass and move freely into the receiver. Assemble the barrel to the receiver and tighten it firmly with the magazine cap. This completes the assembly of the shotgun.

For further information on the Remington M870 shotgun, refer to the U.S. Air Force TM TO-11W3-6-2-1.

MOSSBERG M500 SHOTGUN

While very similar to the M870, the Mossberg M500 has a few significant differences. The following is a brief description of the differences that affect operation of the weapon. Figure 3-55 shows the location of the safety switch and the action lock lever on the M500 shotgun. The M500 safety switch is located on the top of the receiver and the action lock release is to the rear of the trigger guard. The M870 has the safety switch in the trigger guard and the action lock release to the front of the trigger guard. The disassembly and maintenance of the M500 is basically the same as that of the M870 so much so that they are both currently covered on the same MRC. Further information on the Mossberg M500 shotgun maybe found in the manual supplied with the weapon.

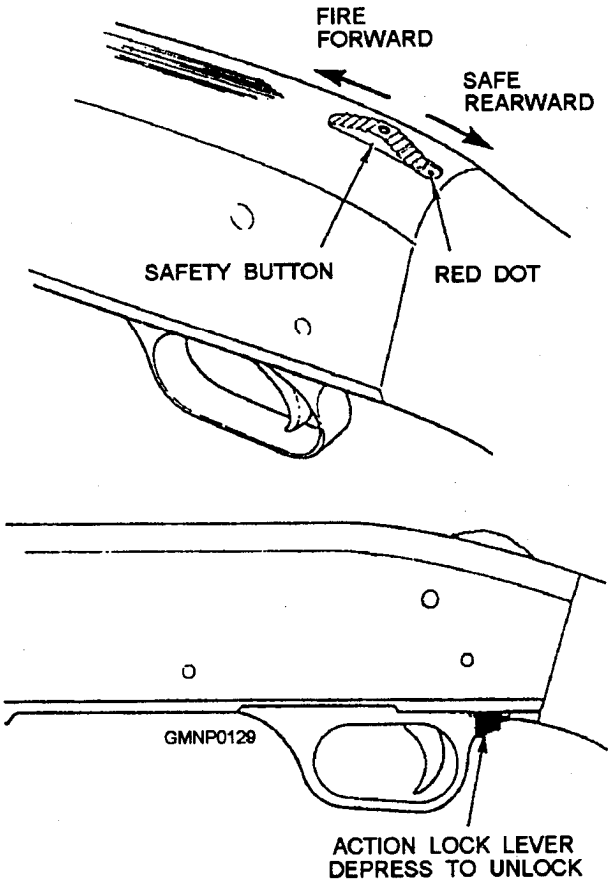


Figure 3-55.—Mossberg M500 shotgun safety and action release.

MK 87 MOD 1 LINE-THROWING RIFLE ADAPTER KIT

LEARNING OBJECTIVE Discuss the Mk 87 Mod 1 line-throwing kit and describe what is needed in preparation for firing.

This kit redates the Mk 87 Mod O kit that replaced the 45/70 line-throwing gun. Included in the kit are 6 projectiles, 1 launcher,18 chemical light wands, and 1 recoil pad. The line-throwing assembly (launcher, projectile, and canister) is designed to be used with the M14 and Ml 6A1 rifles and applicable grenade cartridges (M64 and M195, respectively).

LAUNCHER

The launcher (fig. 3-56) is used to hold the projectile and trap propellant gases that propel the projectile. It consists of a cylindrical steel tube approximately 8.5 inches long and 2.75 inches in diameter at the launching end and 1 inch in diameter at the connecting end. When the launcher is used with the M14 rifle, it slides over the flash suppressor and is secured to the rifle by the latch and its wire loop that fits over the bayonet lug of the rifle. The safety retaining pin, fastened to the launcher by a stainless steel lanyard, fits through the latch to lock the launcher to the rifle. The connecting end of the launcher is threaded internally to accept the M16A1 rifle barrel after the flash suppressor of the rifle is removed.

PROJECTILE

The projectile (fig. 3-57) fits into the launcher. When the rifle grenade cartridge is fired, the projectile

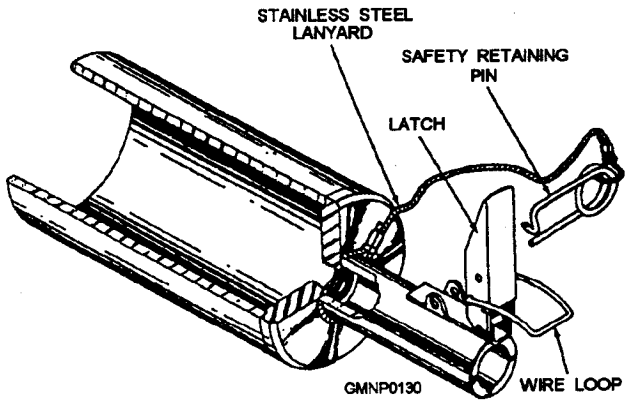


Figure 3-56.—Launcher.

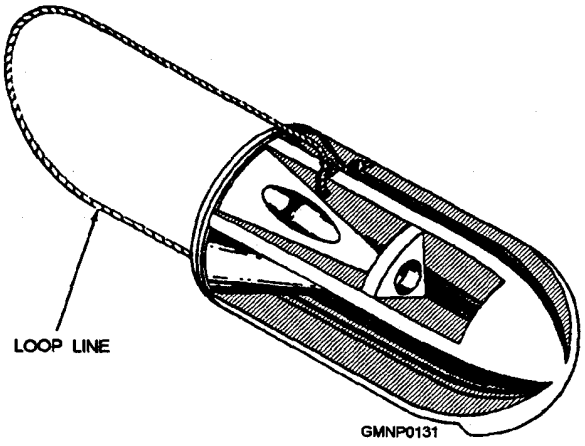


Figure 3-57.—Projectile.

carries one end of the attached shot line tome desired destination. ‘he projectile also houses the chemical light wands for night operation.

The reusable projectile is made of butyl rubber with a stainless steel disk assembled in the base end. The disk absorbs the impact of the propellant gases and the wadding of the rifle grenade cartridge. The hole and groove shown in figure 3-57 support the light wand. Three of these supports, located 120 inches apart, are contained in each projectile. The loop line is used to connect the shot line to the projectile.

CHEMICAL LIGHT WAND

The chemical light wand (fig. 3-58) is used to illuminate the projectile during night operations. The light wand is installed by inserting it, tapered end first, into the hole and groove of the projectile.

The light wand is a two-component chemical illuminate system consisting of a yellow-green oxalate solution inside a nylon tube. To activate the light, flex the nylon tube enough to break an inner glass tube, as shown in figure 3-59, and shake well. Do not activate

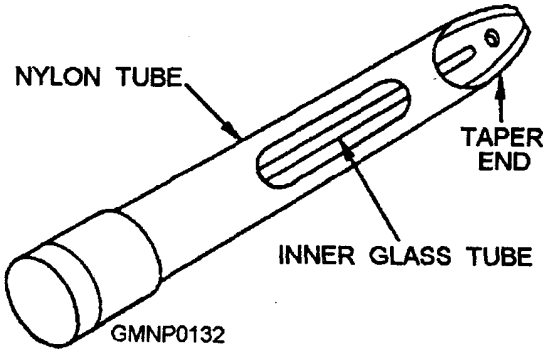


Figure 3-58.—Chemical light wand.

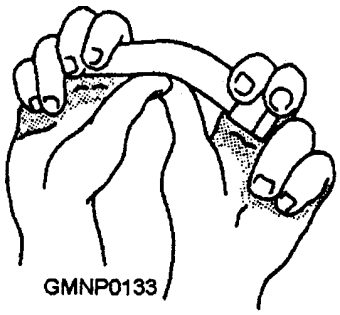


Figure 3-59.—Activating chemical light wand.

the light wand until ready to use because once it is activated it must be used or disposed of. Do not dispose of the chemical light wand overboard as it may be mistaken for a “man overboard exercise.

WARNING

If the nylon tube should puncture during activation, individuals may experience some mild discomfort from excessive skin or eye exposure to the oxalate solution. Personnel should wash exposed areas with soap and water as soon as possible.

Since the chemical light produces no flame or heat, its stowage is not restricted to ventilated and unconfined (topside) spaces. The active life of the chemical light is from 3 to 12 hours, depending on the ambient temperature. Its shelf life is approximately 2 years under normal conditions.

CANISTER

The canister (fig. 3-60) is made of polyethylene and houses the spool of shot line when attached to the appropriate rifle. Attachment is made by the metal clamp shown in figure 3-60.

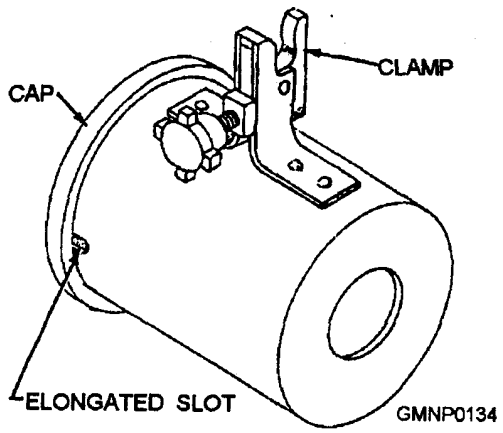


Figure 3-60.—Canister.

To install the shot line in the canister, remove the cap from the after end of the canister. Place the spool of shot line in the canister and feed the line from the center of the spool through the hole in front of the canister. Tie knot in the bitter end of the shot line and slide it into the slot at the after end of the canister. Replace the canister cap. (The action of placing the knotted end of the shot line into the canister slot attaches the bitter end of the shot line to the canister.) Connect the line coming from the front end of the canister to the loop line on the projectile. These lines (shot line and loop line) are connected by a series of loosely tied half-hitch knots (three to five). Figure 3-61 shows the canister, shot line, and launcher mounted on the M14 rifle.

Note in figure 3-61 that the use of the canister is optional. With another person holding the shot line, the canister is not needed. The canister is part of the Mod 0 kit and should be retained for optional use with the Mod 1 kit.

RECOIL PAD

The recoil pad provided by this kit will reduce the recoil on the operator when the projectile is launched. It is of the slip-on type and made of neoprene rubber that resists attacks by oil and other solvents. It is designed for a tight fit on the butt stock Thus care is required during installation to prevent tearing. Once installed on the rifle used for line throwing, it is recommended that the recoil pad not be removed. The pad is designed to fit both the M14 and M16A1 rifles. However, on the M16A1 rifle, the sling swivel is closer to the rifle butt and the skirt of the recoil pad must be folded back or cut to fit around the swivel. The recoil pad is shown installed on the M14 rifle in figure 3-61.

GRENADE CARTRIDGES

Figure 3-62 shows the grenade cartridges used with the M14 and M16A1 rifles when firing the line-throwing projectile. The larger of the two is the M64 (7.62-mm) cartridge used with the M14 rifle, while the smaller is the M195 (5.56-mm) cartridge used with the M16A1 rifle. Besides the difference in overall size, the cartridges can be identified by looking at, or by feeling, their crimped ends; the M64 is five-pointed and the M195 is seven-pointed. Only one cartridge should be loaded into the rifle at a time, and it should not be loaded until at the rail, just before firing, with the rifle pointing outboard in a safe direction. No cartridge other than those designated should ever be used to fire a line-throwing projectile.

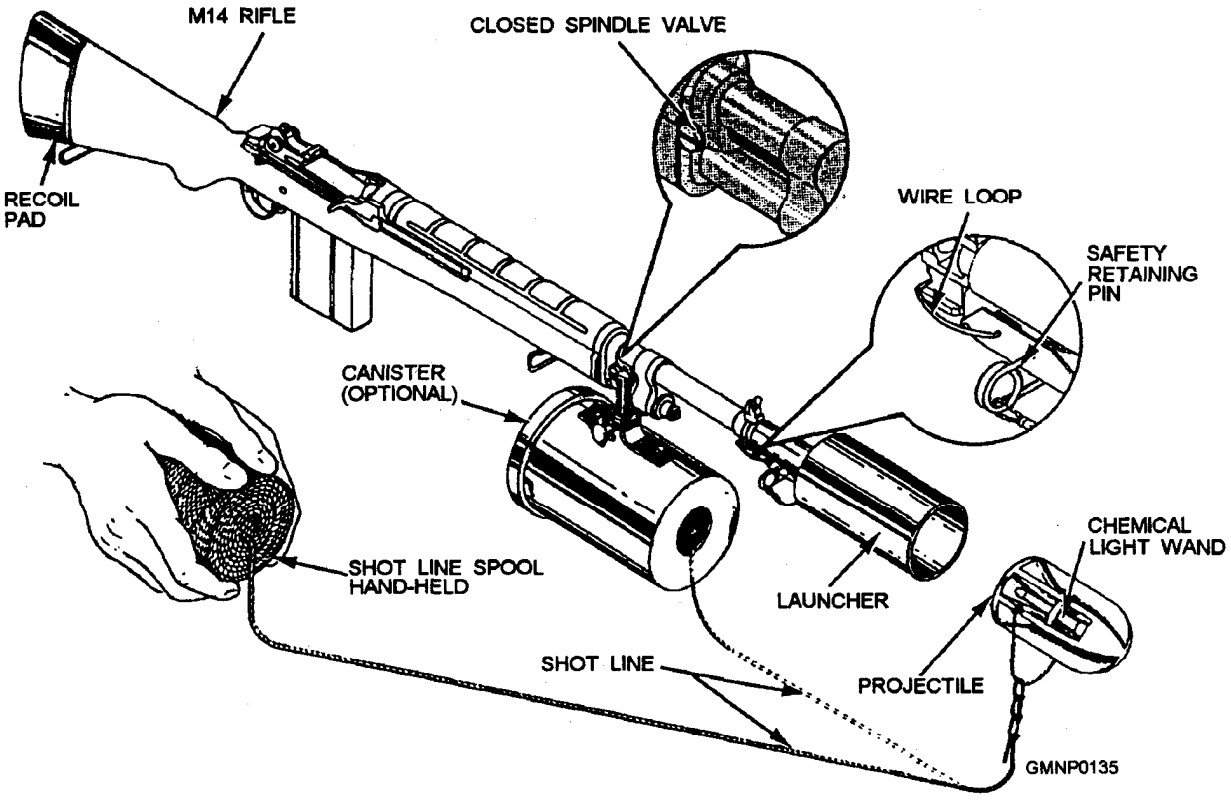


Figure 3-61.—Mk 87 Mod 1 kit on M14 rifle.

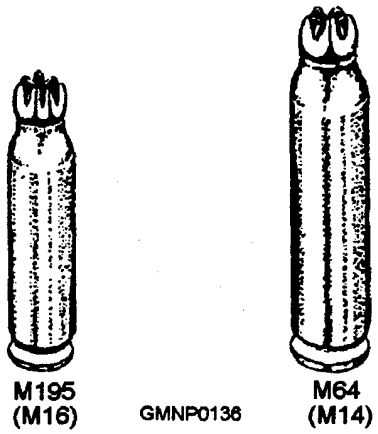


Figure 3-62.—Grenade cartridge.

SHOT LINE

The nylon shot line comes in spools (fig. 3-63). The line is approximately 550 feet long and has a tensile strength of 125 pounds. It is wound around a wooden spindle in such a way that prevents fouling the line when the projectile is fired. The line is colored international orange and is treated with a water-repellent solution to make the line buoyant enough to float on the surface at least 24 hours.

PREPARATION FOR FIRING

On the M14 rifle, the spindle valve must be in the CLOSED (slot parallel to the barrel) position (see fig. 3-61) when firing the line-throwing projectile.

NOTE

This position of the spindle valve is described as being in the OFF (horizontal) position in the first part of this chapter and in the TM9-1005-223-10.

On the M16A1 rifle, the flash suppressor must be removed and the launcher screwed onto the end of the barrel. To prevent damage to the launcher and/or the threads on the barrel, leave the lock washer that is located between the suppressor and barrel in place.

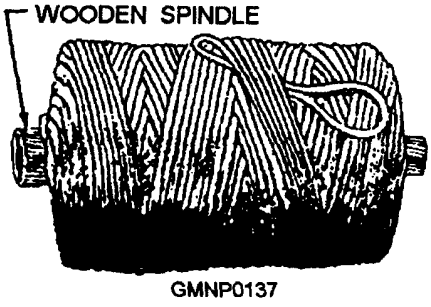


Figure 3-63.—Shot line.

FIRING

When firing the line-throwing projectile from the applicable rifle, elevate and aim the rifle over and across the designated target. Although the projectile is made of rubber, it has enough velocity to cause injury. The rifle should be kept elevated until the projectile reaches its target to prevent line entanglement,

In the event of a misfire or hangfire, wait 10 seconds before ejecting the grenade cartridge. Malfunctions of cartridges should be reported according to OPNAVINST 5102.1.

The maximum reliable range of the line-throwing projectile is approximately 90 yards when fired from the M14 rifle and approximately 85 yards when fired from the M16A1 rifle. These ranges are dependent upon having a dry shot line. A wet line can be used when a dry line is not available, but it will cause the range to be reduced. 'Fable 3-2 provides the approximate range data for firing from the M14 and M16A1 rifles.

MAINTENANCE

Maintenance and operation of the Mk 87 Mod 1 line-throwing rifle adapter kit is covered in NAVSEA SW350-A1-MMO-010. Kit maintenance is also covered by a 3-M Systems MRC.

MACHINE GUNS

LEARNING OBJECTIVE Discuss the operation and maintenance of the machine guns currently used by naval forces afloat.

Tabie 3-2.—Range Data

M14 RIFLE		M16 SERIES RIFLE	
Degrees of Elevation	Range	Degrees of Elevation	Range
60	80 yards	60	65 yards
45	90 yards	45	85 yards
30	85 yards	30	85 yards
0	55 yards	0	45 yards
NOTE: 0° (degrees) is when the rifle is parallel to the surface.			

The Navy currently uses four machine guns-the M2 .50 caliber Browning, the 7.62-mm M-60, the 20-mm Mk 16 Mod 5, and the 25-mm M242 chain gun. In this section we will provide you with some operational and maintenance information on these four weapons. Discussion on the Mk 16 Mod 5 machine gun will be brief since it is in the process of being phased out and replaced by the 25-mm M242.

THE .50-CALIBER BROWNING MACHINE GUN

Browning machine guns (abbreviated BMGs) are standard Army weapons used by the Navy. The .50-cal. BMG now used by the Navy and Army is the M2. The M2 BMG is only equipped with an air-cooled heavy barrel (HB) since the light air-cooled barrel is no longer in use.

For a time the .50-cal. BMG (fig. 3-64) was not used aboard surface ships but has since been installed on most types of ships and landing craft.

Because of its complexity, the mechanisms and the principles of operation of the .50-cal. BMG will not be taken up in this section of the chapter. For detailed information on the .50-cal. BMG, refer to the Army's FM 23-65.

The main characteristics of the .50-cal. BMG (M2) are as follows:

Weight of receiver group	56 lb
Weight of barrel	26 lb (approx)
Total weight of gun, complete, on tripod mount, M3	126 lb (approx)
Maximum range (M2 ball)	7,400 yd
Maximum effective range	2,000 yd
Cyclic rate of fire	450-500 rpm
Muzzle velocity (M2 ball)	2,930 fps
Length of gun overall	65 in. (approx)
Length of barrel	45 in.

General Description

The .50-cal. HB M2 Browning machine gun is a belt-fed, recoil-operated, air-cooled machine gun. The gun is capable of semiautomatic as well as automatic fire.

The gun is capable of alternate feed (ammunition can be fed from either the right or left side of the receiver) by repositioning some of the component parts; however, under most circumstances, the gun is fed from the left side. A disintegrating metallic link belt is used in feeding. In preparation for firing, the first round requires manual operation.

The force for recoil operation of the weapon is furnished by the expanding gases and is controlled by various springs, cams, and levers.

Air cooling of the weapon is permitted through maximum exposure to the air of the barrel and receiver. Perforations in the barrel support allow air to circulate around the breech end of the barrel and help to cool the parts. The heavy barrel is used to retard early overheating.

Operating the .50-Cal. BMG

The safest and best way to operate a .50-cal. machine gun is to follow the correct procedures. By following set procedures, you prevent damage to the gun and possible injury to you or others in the area. The operating procedures of the .50-cal. BMG include prefire, checks, loading and unloading, and postfire checks.

The primary prefire check requirement is the inspection of the weapons headspace and timing. This is done with a headspace and timing gauge (fig. 3-65). Headspace is the distance between the face of the bolt and the base of a cartridge case fully seated in the chamber. The timing of the gun makes sure that firing takes place with the bolt in the correct position (just before it reaches the full FORWARD position).

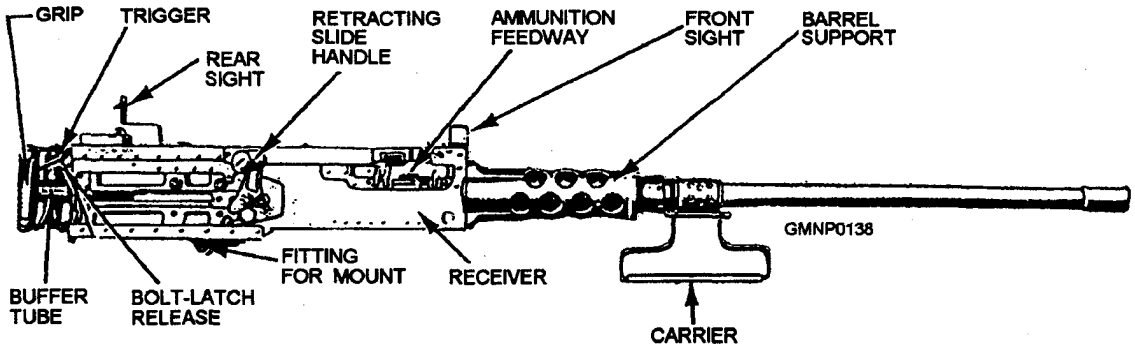


Figure 3-64.—.50-cal. HB Browning machine gun (M2).

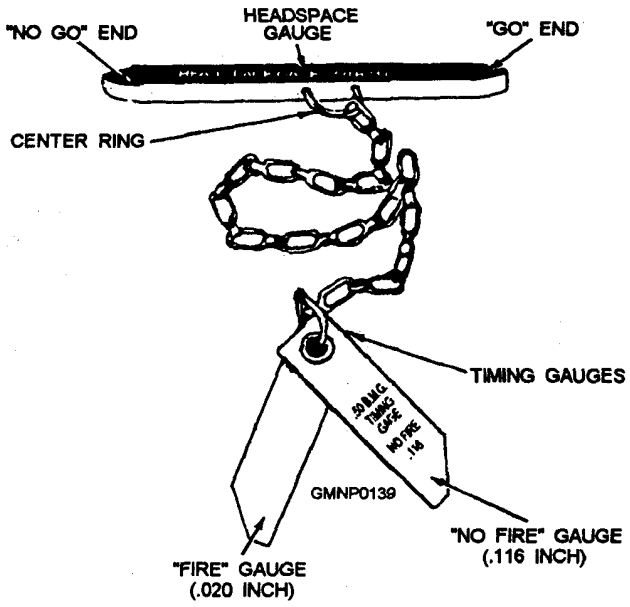


Figure 3-65.—Headspace and timing gauge.

The operator must also select automatic or semiautomatic firing; automatic is the normal mode of operation. The mode of operation is determined by the position of the bolt-latch-release lock (fig. 3-66). For automatic firing, the bolt-latch release must be locked in the DEPRESSED position by the bolt-latch-release lock. To engage the bolt-latch-release lock, first depress the bolt-latch release. Then turn the bolt-latch-release lock counterclockwise until it hooks and retains the bolt-latch release in the DEPRESSED position.

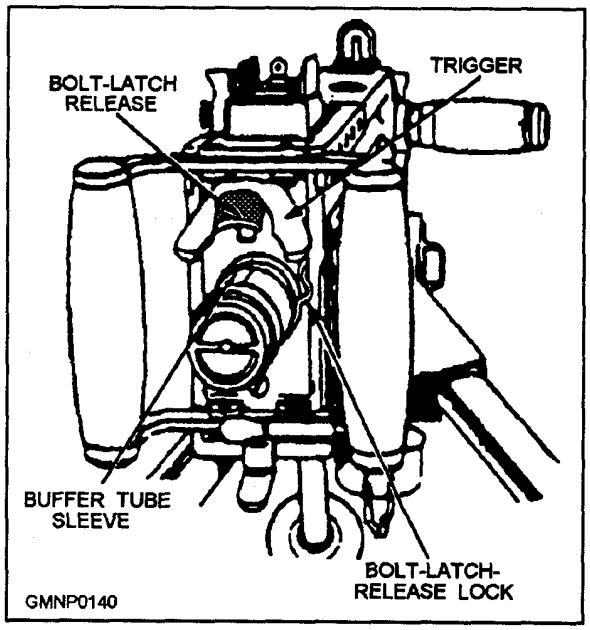


Figure 3-66.—Bolt-latch release free of the bolt-latch-release lock.

On the command HALF-LOAD, with the cover closes, the double-loop end of the ammunition belt is inserted in the feedway until the first round is held by the belt-holding pawl (fig. 3-67). The retracting slide handle is then pulled all the way to the rear and released. With the bolt-latch-release lock positioned to engage the bolt-latch release, the bolt and retracting slide handle will move forward under pressure of the driving spring group, thus half-loading the gun. However, if the bolt-latch release is up and free of the bolt-latch-release lock, the bolt latch will hold the bolt to the rear. Push the retracting slide handle all the way forward (before releasing the bolt); then press down on the bolt-latch release to let the bolt go forward.

The procedure for fully loading the gun is the same as for half-loading, except that the operation is repeated. Once fully loaded the machine gun is fired by depressing the butterfly trigger.

WARNING

Once fullyloaded, the M2 .50-cal. machine gun maintains a round of ammunition in the chamber at all times. During sustained firing operations, the high temperature of the barrel presents a possible "cook-off" situation. The weapon should always be kept pointed in a safe direction or cleared during breaks in firing. According to *Clearing of Live Ammunition from Guns*, NAVSEA SW300-BC-SAF-010, the M2 HB reaches cook-off temperatures after a burst of 250 rounds or more.

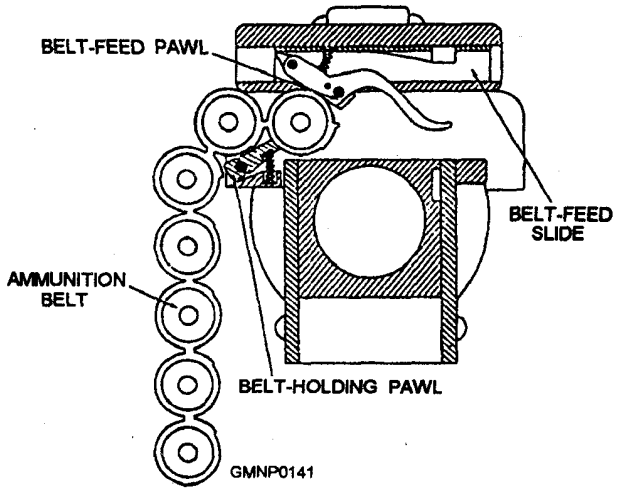


Figure 3-67.—First round held in feedway by belt-holding pawl.

An emergency situation may occur while firing the M2 or any other belt-fed machine gun: the runaway firing of the gun. That is, firing continues after the trigger has been released. This is remedied by twisting the ammunition belt at the feed slot, thereby causing it to jam and cease firing.

WARNING

In case of a runaway gun, keep the weapon laid on target and DO NOT UNLATCH THE COVER!

The bolt-latch release is unlocked to unload the gun, the cover-latch release is turned, and the cover is raised. The ammunition belt is lifted from the gun. The bolt is pulled to the rear, and the chamber and the T-slot are examined to see that they hold no rounds. After this examination, the bolt is allowed to go forward, the cover is closed and latched, and the trigger is pressed.

Gun Maintenance

The importance of a thorough knowledge of how to care for, clean, and preserve the machine gun cannot be overemphasized. Proper care, cleaning, and preservation determine whether this gun will shoot accurately and function properly when needed. The bore and chamber must be kept in perfect condition to ensure accurate fire. Because of the close fit of working surfaces and the high speed at which the gun operates, it is important that the receiver and moving parts be kept clean, well-lubricated and free of burrs, rust, dirt, or grease.

To ensure proper care of the machine gun, you must establish standard operating procedures concerning the frequency at which the gun is to be cleaned. This is normally done using the 3-M Systems MRCs. TM 9-1005-213-10 also provides maintenance instructions for this gun. Under combat conditions, it may be necessary to clean the gun where it is mounted, however, when possible, the gun should be disassembled, cleaned, and oiled in a clean, dry location where it is least exposed to moisture, dirt, and so on. Be particularly careful to remove all sand or dirt; it will act as an abrasive on moving parts, causing excessive wear, sluggish operation, or malfunction. Do not oil parts Excessively. Excessive oil solidifies and causes sluggish operation or complete failure.

Each gun should be cleaned as soon after firing as possible and each time it is taken to the field and returned. Under combat conditions, the gun should be cleaned and lightly oiled daily. Under ideal conditions, where the gun is not used and is stored in a clean, dry place, it may only be necessary to inspect, clean, and lubricate the gun once a week The threads on the gun barrels must be protected against being burred while handling and cleaning.

For more detailed information on the prescribed cleaning materials, lubricants, and rust preventives to be used in the .50-cal. BMG maintenance, refer to the Army'S FM 23-65 and TM 9-1005-213-10.

THE 7.62-MM M60 MACHINE GUN

The M60 machine gun (fig. 3-68) is an air-cooled, belt-fed, gas-operated automatic weapon. The machine gun was originally developed for use by ground troops; however, it is used on many types and classes of ships, river patrol craft, and combat helicopters.

The essential features of the M60 are as follows:

Length	43.5 in. (110.5 cm)
Weight	23 lb (10.4 kg)
Maximum range	3,725 meters (4,075 yd)
Maximum effective range	1,100 meters (1,200 yd)
Ammunition	7,62-mm ball tracer, armor-piercing, incendiary, and dummy
Rates of fire: Sustained	100 rpm
Rapid	200 rpm
Cyclic	550 rpm

The M60 has a front sight permanently affixed to the barrel. The rear sight leaf is mounted on a spring type of dovetail base (fig. 3-69). It can be folded forward to the horizontal when the gun is to be moved. The range plate on the sight leaf is marked for each 100 meters, from 300 meters to the maximum effective range of 1,100 meters. Range changes maybe made by using either the slide release or the elevating knob. The slide release is used for making major changes in elevation. The elevating knob is used for fine adjustments, such as during zeroing. Four clicks on the elevating knob equal a 1-mil change of elevation. The sight is adjustable for windage 5 mils right and left of zero. The windage knob is located on the left side of the sight. One click on the windage knob equals a 1-mil change of deflection.

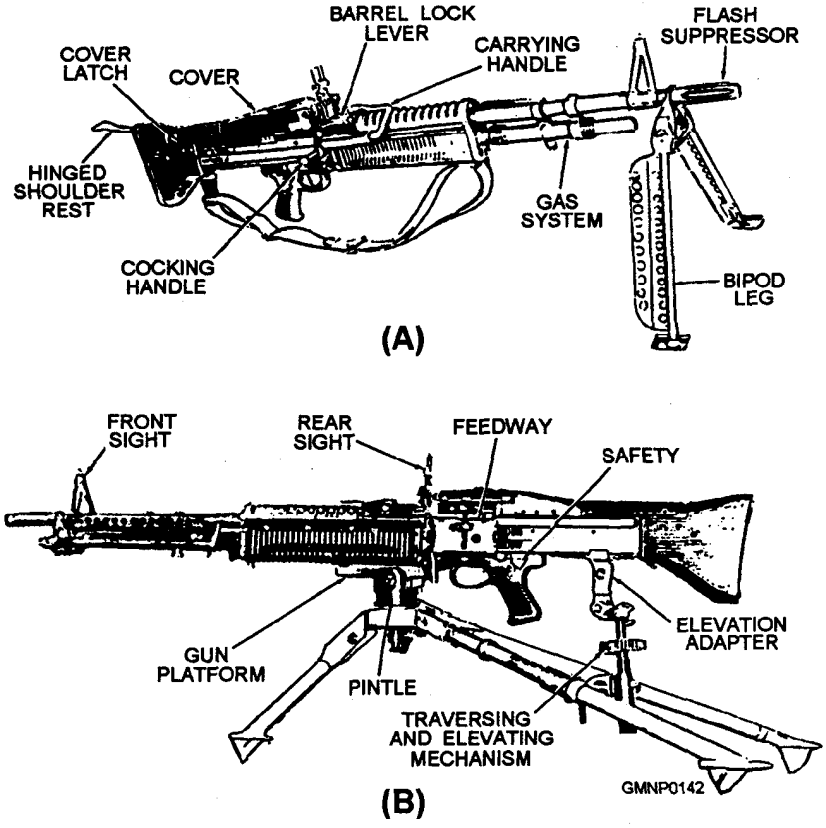


Figure 3-68.—M60 machine gun: (A) Bipod mounted; (B) Tripod mounted.

NOTE

1 mil equals 1 inch at 1,000 inches, 1 yard at 1,000 yards, 1 meter at 1,000 meters, and so on.

A safety lever is located on the left side of the trigger housing. It has an S (SAFE) position and an F (FIRE) position. On the SAFE position the bolt cannot be pulled to the rear or released to go forward. The cocking lever, on the right side of the gun, is used to pull the bolt to the rear. It must be returned manually to its FORWARD position each time the bolt is manually pulled to the rear.

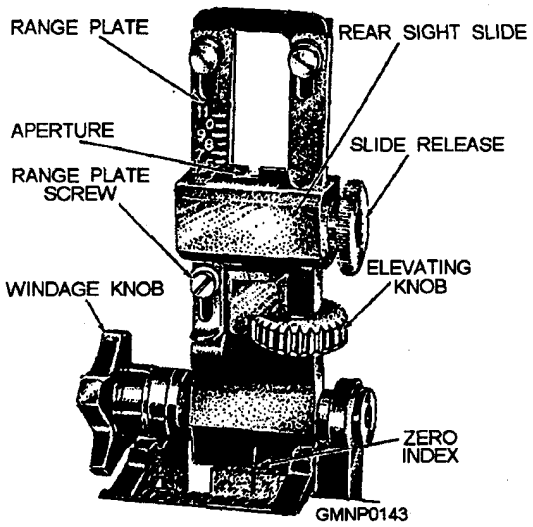


Figure 3-69.—M60 rear sight.

The M60 machine gun may be installed in helicopters by use of special mounts installed in the doors or escape hatches. The mount consists of an ammunition can support, a spent round chute, a link chute, and a stowage bag. The machine gun can be easily installed and removed from the mount by use of quick-release pins. Firing stops are incorporated into the design of the mount to determine the azimuth and elevation limits of the machine gun.

Operation

The machine gun is designed to function automatically as long as ammunition is fed into the gun and the trigger is held to the rear. Each time around is fired, the parts of the machine gun function in a certain sequence. Many of the actions occur simultaneously and are only separated for teaching purposes. The sequence of operation is known as the cycle of operation.

For ease of understanding, the complete cycle of operation is discussed in the following eight steps:

1. Feeding: Around is positioned in the feed tray groove.
2. Cambering: Around is stripped from the belt and placed in the chamber.
3. Locking: The bolt is locked inside the barrel socket.
4. Firing: The firing pin strikes and initiates the primer of the cartridge.
5. Unlocking: The bolt is unlocked from the barrel socket.
6. Extracting: The empty case is pulled from the chamber.
7. Ejecting: The empty cartridge case is thrown from the receiver.
8. Cocking: The sear engages the sear notch.

The cycle starts by putting a round in the feed tray groove and then pulling the trigger, releasing the sear from the sear notch (fig. 3-70). It stops when the trigger is released and the sear again engages the sear notch in the operating rod. When the trigger is held to the rear, the rear of the sear is lowered and disengaged from the sear notch. This allows the operating rod and bolt to be driven forward by the expansion of the operating rod spring. Now that the gun is functioning, the steps of the cycle can be traced

As the bolt begins its forward movement, the feed cam is forced to the right, causing the feed cam lever to pivot in the opposite direction and forcing the feed pawl over the next round in the belt, ready to place it in the feed tray groove when the rearward action occurs again. As the bolt moves to the rear after the firing, the cam roller in the top of the bolt forces the feed cam to the left. The feed cam lever is forced to pivot, moving the feed pawl to the right, placing a round in the feed tray groove, as shown in figure 3-71.

As the bolt travels forward, the upper locking lug engages the rim of the cartridge. The pressure of the front and rear cartridge guides hold the round so that positive contact is made with the upper locking lug of the bolt. The front cartridge guide prevents the forward motion of the link as the round is stripped from the belt. The upper locking lug carries the round forward, and the cambering ramp causes the nose of the cartridge to be caromed downward into the chamber, as shown in figure 3-72. When the round is fully seated in the chamber, the extractor snaps over the rim of the cartridge, and the ejector on the face of the bolt is depressed.

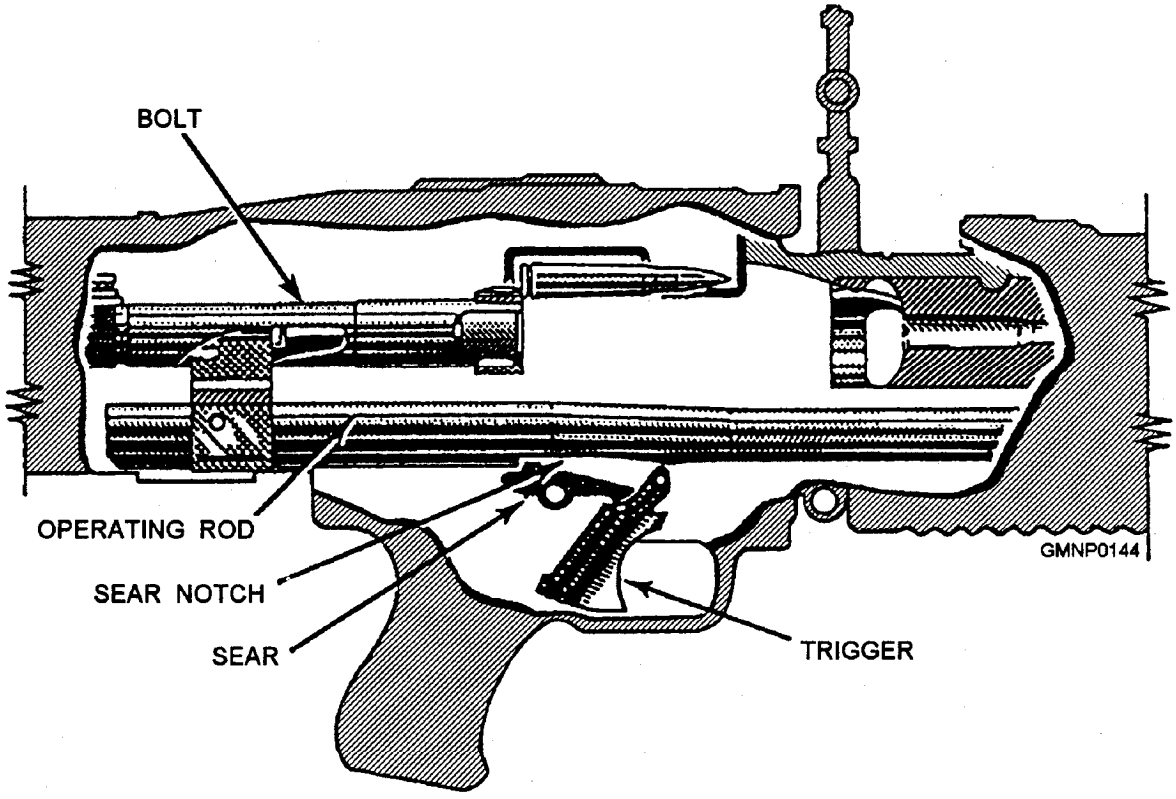


Figure 3-70.—Sear disengaging from sear notch.

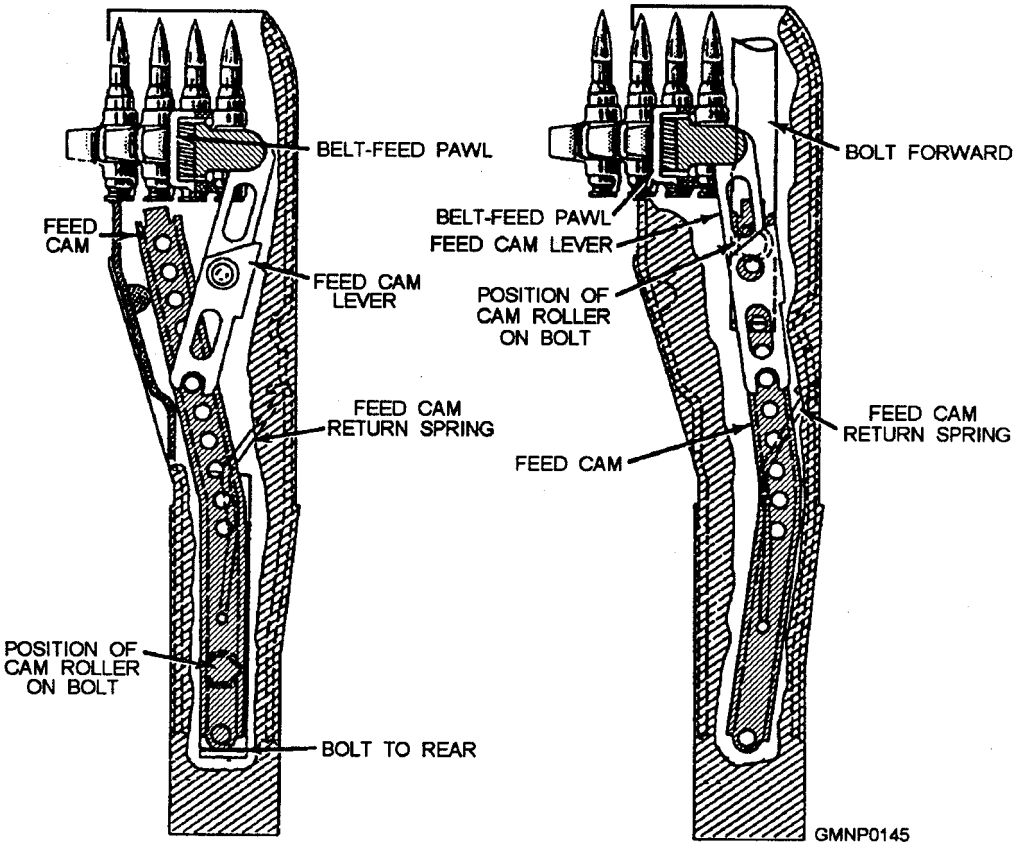


Figure 3-71.—Feeding.

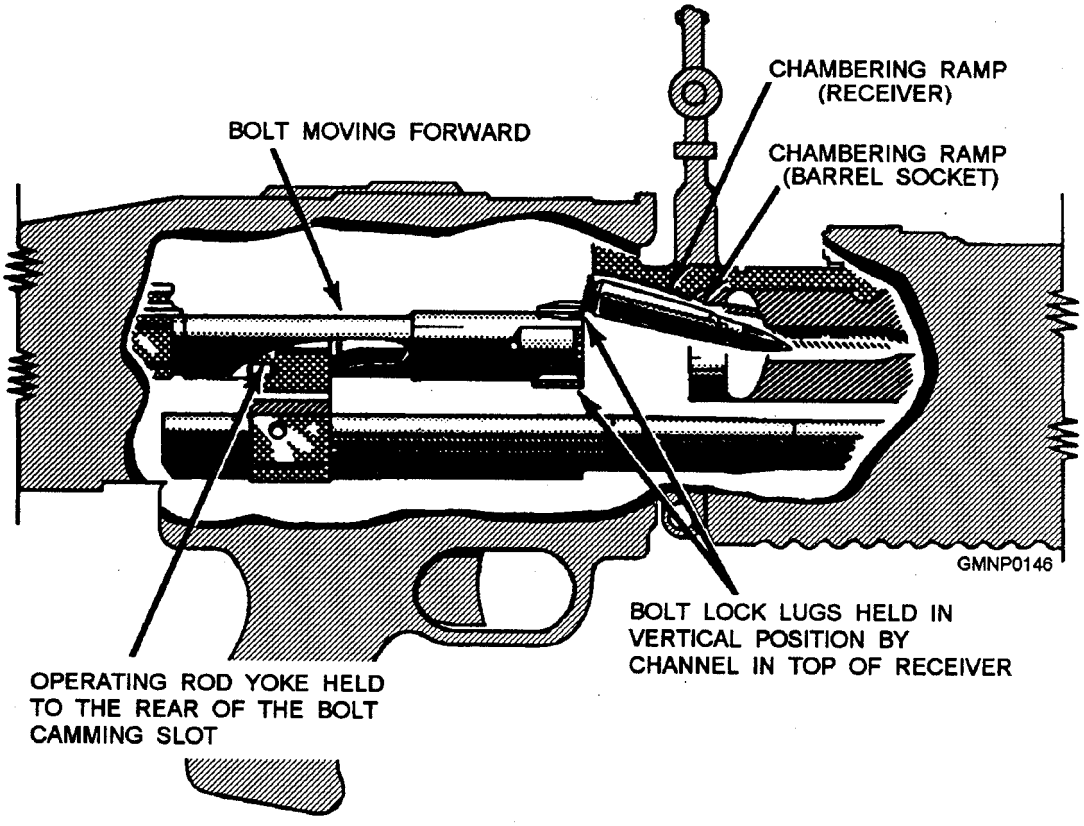


Figure 3-72.—Chambering.

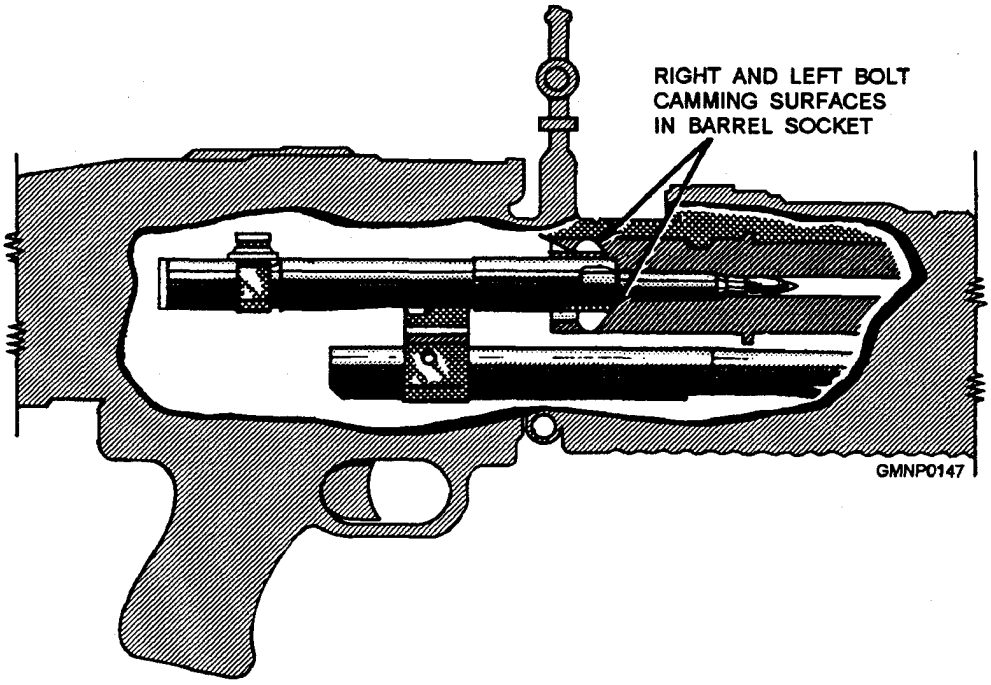


Figure 3-73.—Weapon locked, ready to fire.

As the round is chambered, the bolt enters the barrel socket. The upper and lower locking lugs contact the bolt caroming surfaces inside the barrel socket and start the rotation of the bolt clockwise. The action of the operating rod yoke against the bolt caroming slot, as the operating rod continues forward, causes the bolt to complete its one-quarter turn clockwise rotation (fig. 3-73). Locking is then completed.

After the bolt reaches its fully forward and locked position, the operating rod continues to go forward, independently of the bolt, for a short distance. The yoke, engaged between the firing pin spools, carries the firing pin forward. The striker of the firing pin protrudes through the aperture in the face of the bolt, strikes the primer of the cartridge, and ignites it. This action is shown in figure 3-74.

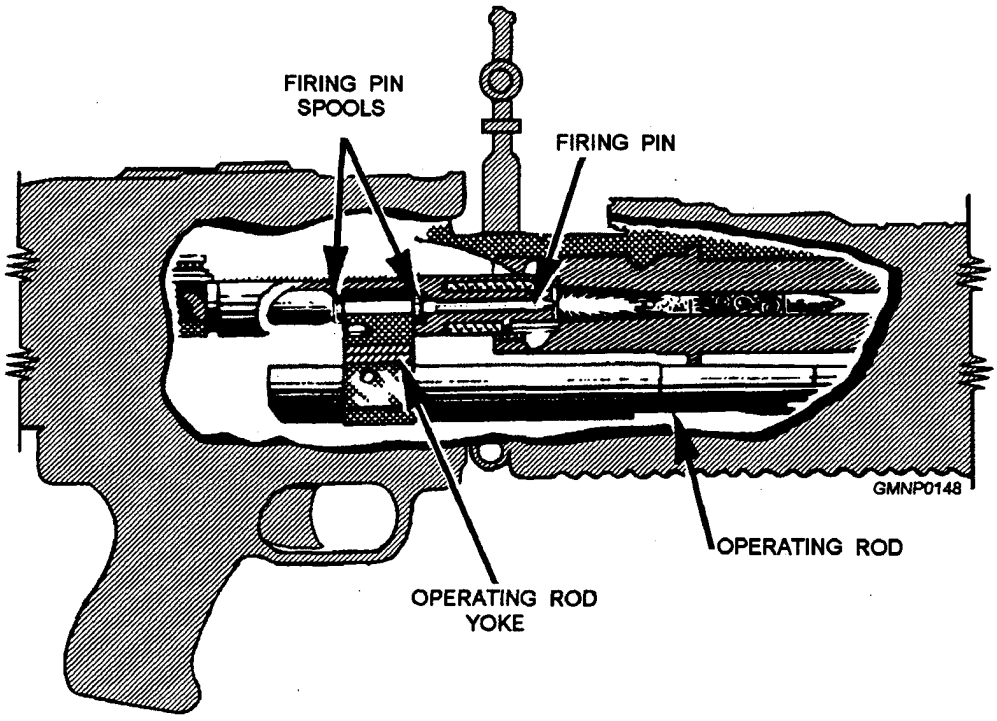


Figure 3-74.—Firing.

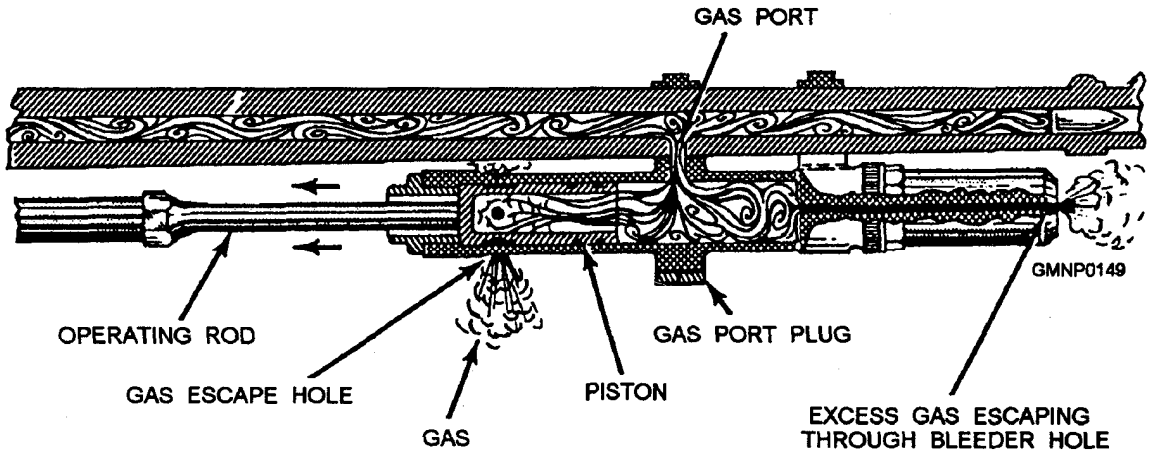


Figure 3-75.—Unlocking action of gases.

After the cartridge is ignited and the projectile passes the gas port, part of the expanding gases enter the gas cylinder through the gas port. The rapidly expanding gases enter the hollow gas piston, as shown in figure 3-75, and force the piston to the rear. The operating rod, being in contact with the piston, is also pushed to the rear. As the operating rod continues to the rear, the operating rod yoke acts against the bolt caroming slot to cause the bolt to begin its counterclockwise rotation. The upper and lower locking lugs of the bolt, contacting the bolt caroming surfaces inside the barrel socket, cause the bolt to complete its one-quarter turn rotation (counter-clockwise) and unlock the bolt from the barrel socket. Unlocking begins as the yoke of the operating rod contacts the curve of the bolt caroming slot and ends as the bolt clears the end of the barrel socket.

While unlocking is going on, extraction is beginning. The rotation of the bolt, in unlocking, loosens the cartridge case in the chamber. As the operating rod and bolt continue to the rear, the extractor (gripping the rim of the cartridge) pulls the cartridge case from the chamber. As the case is withdrawn from the chamber, the ejector spring expands. The ejector presses on the base of the cartridge case, forcing the front of the spent case against the right side of the receiver, as shown in figure 3-76. As the bolt continues to the rear, the action of the ejector pushing against the base of the cartridge case and the extractor gripping the right side of the case cause the cartridge case to spin from the gun as the case reaches the ejection port. The empty link is forced out of the link ejection port as the rearward movement of the bolt causes the next round to be positioned in the feed plate groove.

As the expanding gases force the gas piston to the rear, the operating rod is initially moved independently of the bolt. The yoke of the operating rod acts against the rear firing pin spool, withdrawing the firing pin from the primer of the spent cartridge case. The action of the operating rod yoke continuing to the rear against the rear firing pin spool fully compresses the firing pin spring. As long as the trigger is held to the rear, the weapon will continue to complete the first seven steps of functioning automatically y. When the trigger is released and the sear again engages the sear notch, the cycle of functioning is stopped and the weapon is cocked.

Disassembly

Two types of disassembly procedures may be performed on the M60 machine gun—general and detailed. General disassembly procedures involve the removal of most of the major groups and assemblies of the weapon, while the detailed procedures consist of removing the components of the major groups. Because of the complexity of the detailed procedures and the many steps and parts involved, only the general disassembly procedures are discussed here.

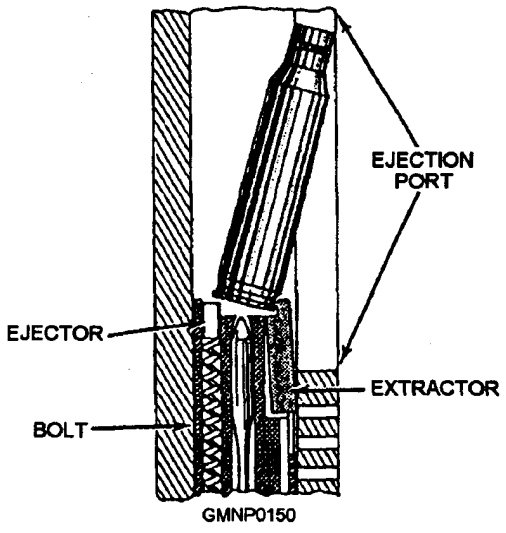
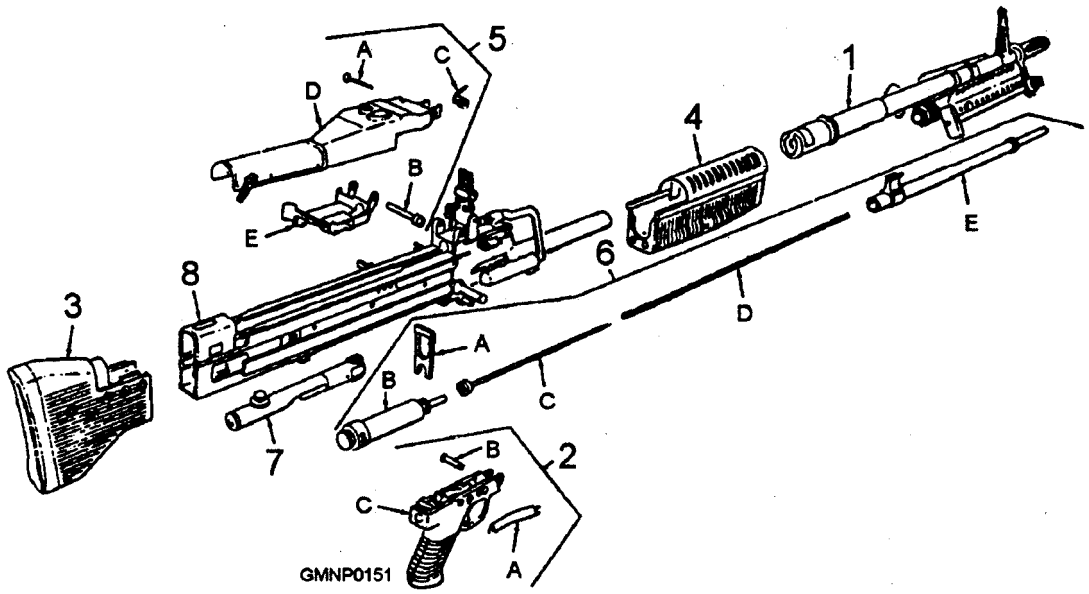


Figure 3-76.—Extraction and ejection.



1—Barrel assembly w/bipod assembly
2—Trigger mechanism grip group
- **A—Leaf spring**
- **B—Retaining pin**
- **C—Trigger mechanism grip assembly**

3—Shoulder stock
4—Forearm assembly
5—Cover assembly and cartridge tray assembly groups
- **A—Hinge pin latch**
- **B—Hinge cover pin**
- **C—Spring**
- **D—Cover assembly**
- **E—Cartridge tray assembly**

6—Buffer assembly and operating rod assembly groups
- **A—Retaining buffer yoke**
- **B—Buffer assembly**
- **C—Driving spring guide assembly**
- **D—Spring**
- **E—Operating rod assembly**

7—Bolt assembly
8—Receiver group

Figure 3-77.—Major groups and assemblies of the M60 machine gun.

The M60 machine gun can be disassembled into eight major groups and assemblies without the use of force or special tools. These groups and assemblies are shown in figure 3-77. Removal disassembly of all the groups and assemblies is not necessary for general disassembly. with the exception of the barrel assembly, all disassembly can be done with a driftpin or a similar pointed object.

General disassembly begins with the bolt forward, the cover closed, and the safety on SAFE. Before the weapon is disassembled, it must be thoroughly inspected to make sure it is unloaded. As the weapon is disassembled, place the parts (in the order in which they are removed) on a clean, flat surface. This reduces the possibility of loss of parts and aids in reassembly. The parts are replaced in reverse order. The nomenclature of each part is learned by naming it as it is removed and replaced

REMOVING THE STOCK— To remove the stock, raise the hinged shoulder rest and insert the nose of a driftpin into the latch hole, as shown in figure 3-78. With the latch depressed, remove the stock by pulling it directly to the rear.

REMOVING THE BUFFER GROUP.— The buffer assembly group consists of the buffer yoke and the buffer. To disassemble the group, hold the palm of the hand against the exposed buffer and press lightly. Remove the buffer yoke from the top of the receiver, as shown in figure 3-79. Withdraw the buffer slowly. Allow the drive spring to expand until the end of the drive spring guide is exposed at the rear of the receiver. Pull the buffer plunger from the drive spring guide (fig. 3-80).

REMOVING THE OPERATING GROUP.— The operating rod assembly group consists of the operating rod, the drive spring, the drive spring guide, and the bolt assembly. To remove the group, pull the

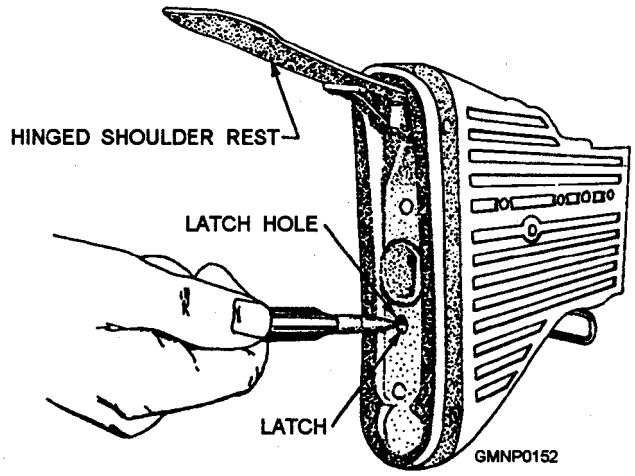


Figure 3-78.—Releasing the stock latch.

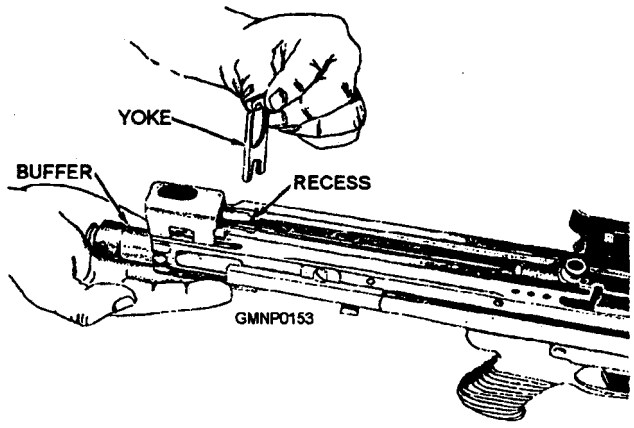


Figure 3-79.—Removing the buffer group.

drive spring guide and spring from the receiver and separate them. With the left hand, grasp the pistol grip and pull the cocking handle to the rear until the bolt is separated from the barrel socket. Continue to pull the operating rod and bolt to the rear by pulling the cam roller, as shown in figure 3-81, view A.

When the operating rod and bolt are exposed approximately 4 inches to the rear of the receiver, grasp them securely to prevent the bolt from "turning in," and remove them from the receiver (fig. 3-81, view B). Relax the grip and allow the bolt to rotate slowly. It is not necessary to separate the bolt from the operating rod.

REMOVING THE TRIGGER MECHANISM GROUP.— The trigger mechanism grip group consists of the trigger mechanism grip assembly (trigger housing, sear, sear pin, sear plunger, sear plunger spring, trigger pin, and trigger), the trigger housing pin (interchangeable with the sear pin), and the leaf spring. To remove the group, press in on the front of the leaf spring and rotate the front end down to clear it from the trigger housing pin, as shown in figure 3-82, view A.

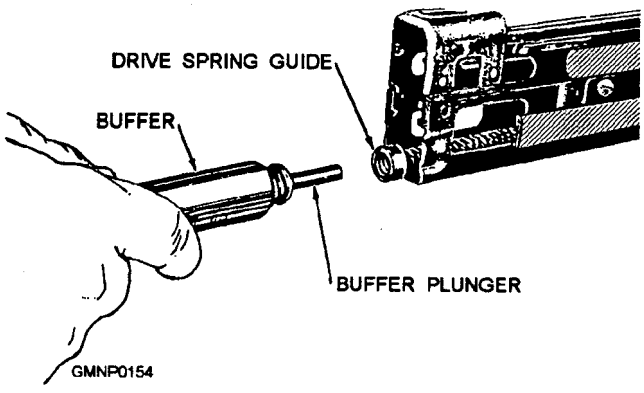


Figure 3-80.—Separating the buffer from the drive spring guide.

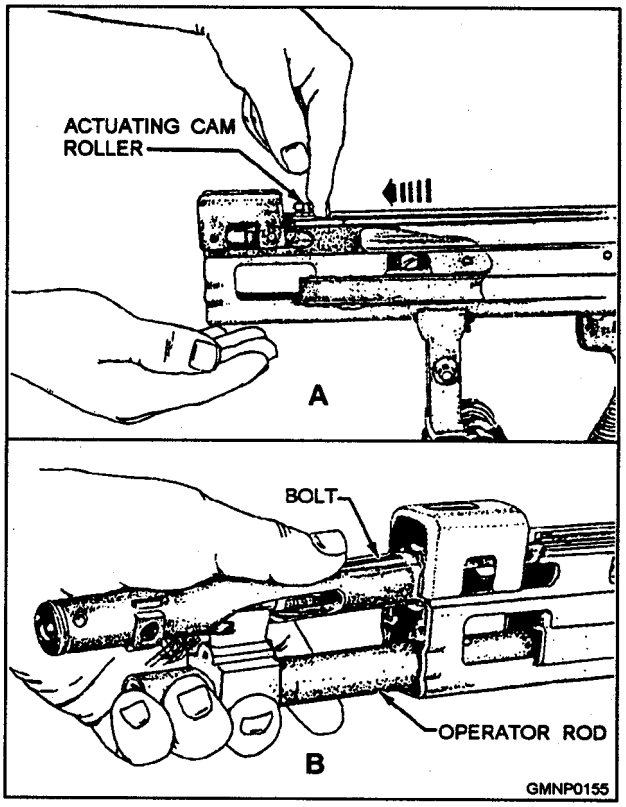


Figure 3-81.—Removing the operating group.

Pull forward to disengage the rear notch from the sear pin. Remove the trigger housing pin by pushing it to the left, Slide the trigger housing slightly forward, rotate

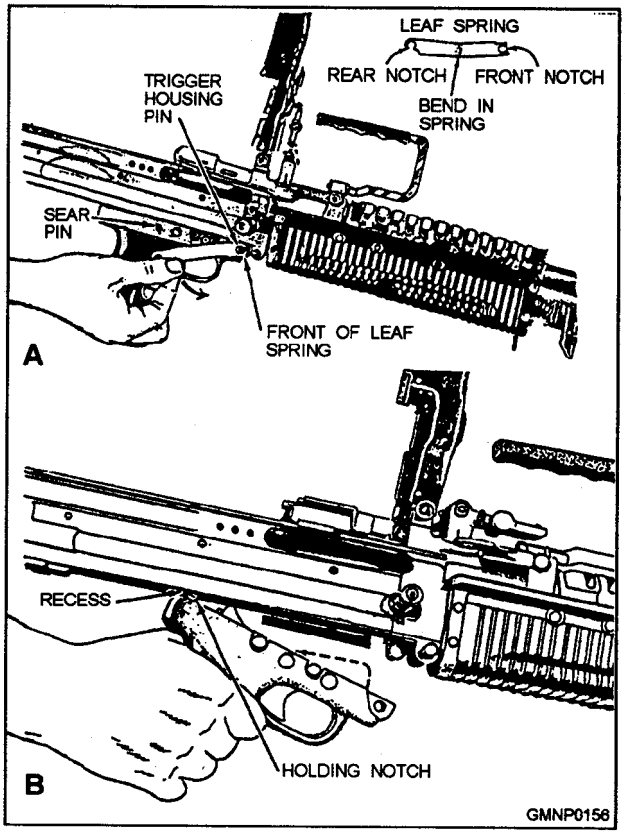


Figure 3-82.—Removing the trigger mechanism grip group.

the front of the housing down, and remove it (fig. 3-82, view B).

REMOVING THE BARREL ASSEMBLY.— The barrel assembly consists of the barrel, the flash suppressor, the front sight biped assembly, and the gas cylinder. To remove the assembly, raise the barrel lock lever to the vertical position and remove the barrel assembly by pulling it to the front, as shown in figure 3-83.

General disassembly to this point leaves the receiver group, the cover assembly and the cartridge tray assembly groups, and forearm intact, and is sufficient for general maintenance and cleaning of the M60 machine gun.

Assembly

The assembly procedures for the M60 machine gun are basically the reverse of the steps taken during disassembly. Starting with the receiver, each group and assembly are attached in the following manner:

1. Make sure the barrel lock lever is in the vertical position, as shown in figure 3-83. Insert the rear of the barrel under the barrel cover and align the gas cylinder nut with its recess in the forearm assembly. Lower the barrel lock lever.

2. Engage the holding notch of the trigger housing in its recess in the bottom of the receiver (fig. 3-82, view B). Rotate the front of the trigger housing up and align the holes of the trigger housing with the mounting bracket on the receiver. Insert the trigger housing pin from the left. Engage the rear of the leaf spring with the sear pin (fig. 3-82, view A). Make sure the leaf spring is positioned so that the bent portion is pressed against the side of the trigger housing. Rotate the front of the leaf spring up and engage it with the trigger housing pin.

3. Insert the end of the operating rod into the receiver. Hold the rod with one hand. With the other hand, push forward on the rear of the bolt, causing the bolt to rotate until the locking lugs are in the vertical position. With the cam roller up, push the operating rod and bolt into the receiver until the end of the operating rod is even with the rear of the receiver. Insert the drive spring guide into the drive spring; then insert the opposite end of the drive spring in the recess of the operating rod, as shown in figure 3-84. Pull the trigger and push in the drive spring until the head of the guide is approximately an inch from the receiver (fig. 3-80).

4. Insert the buffer plunger into the drive spring guide, as shown in figure 3-80. Push forward on the buffer until the operating rod and bolt go fully forward. Push in on the buffer until the recesses on the buffer are aligned with the recesses in the receiver. Replace the buffer yoke from the top of the receiver, as shown in figure 3-79.

5. Align the guide rails of the stock with the guide rails on the receiver. Push forward until the stock is fully seated. A distinct click will be heard when the latch engages.

6. To check for correct assembly, pull the cocking handle to the rear and return it to its forward position. Close the cover and pull the trigger. The bolt should go forward.

NOTE

The bolt must be in the rear (cocked) position to close the cover.

For further information on the M60 machine gun, refer to the Army's TM 9-1005-224-24 and TM 9-1005-24-10.

THE 20-MM MK 16 MOD 5 MACHINE GUN

The Mk 16 Mod 5 machine gun (fig. 3-85) is designed to be installed on board naval craft primarily for use against shore and surface targets. It is an

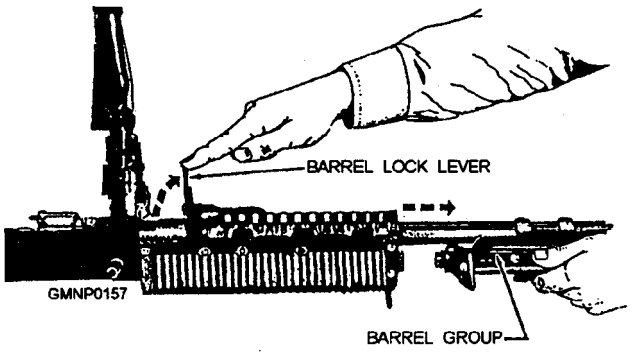


Figure 3-83.—Removing the barrel assembly.

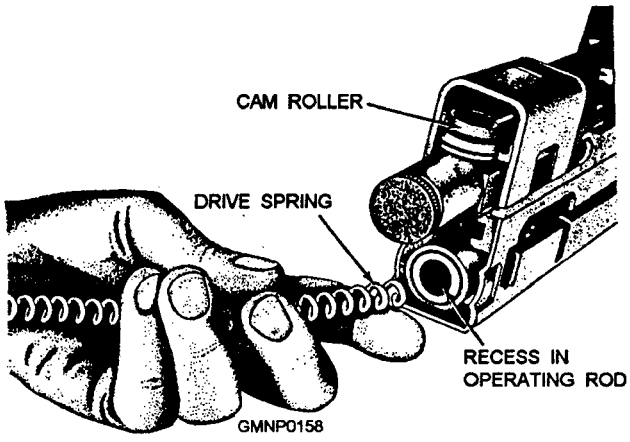


Figure 3-84.—Inserting the drive spring.

automatic, air-cooled weapon that is gas- and blowback operated. This gun is capable of firing 20-mm incendiary, armor-piercing, high-explosive ammunition at a maximum range of 7,000 yards. See table 3-3 for the other capabilities of this gun.

The principal components of the Mk 16 Mod 5 machine gun include the cradle, the gun barrel, the chamber lubricator, the recoil mechanism, the receiver, the breechblock, the sear mechanism magazine slide assembly, the rear buffer, the driving spring guide assembly, and the gas mechanism. Not all of these components are shown in figure 3-85 since they are located internally. This weapon is currently in limited use by the Navy and will most likely be replaced by the 25-mm gun over the next few years. Therefore, it will not be discussed in any further detail in this text.

Table 3-3.—Capabilities of the 20-mm Mk 16 Mod 5 Machine Gun

ITEMS	20-MM MACHINE GUN MK 16 MOD 5
Rate of fire	650-800 rounds per minute
Type of fire	Automatic (short bursts)
Range	7,000 yards maximum
Type of ammunition	Cartridges, APT M95 Cartridges, INC M96 Cartridges, TP M99 Cartridges, HEI M97
Power requirements	None
Mode of fire	Manual

THE 25-MM M242 AUTOMATIC GUN

The M242 is considered a minor caliber gun. The 25-mm M242 automatic gun (fig. 3-86) is a short-range,

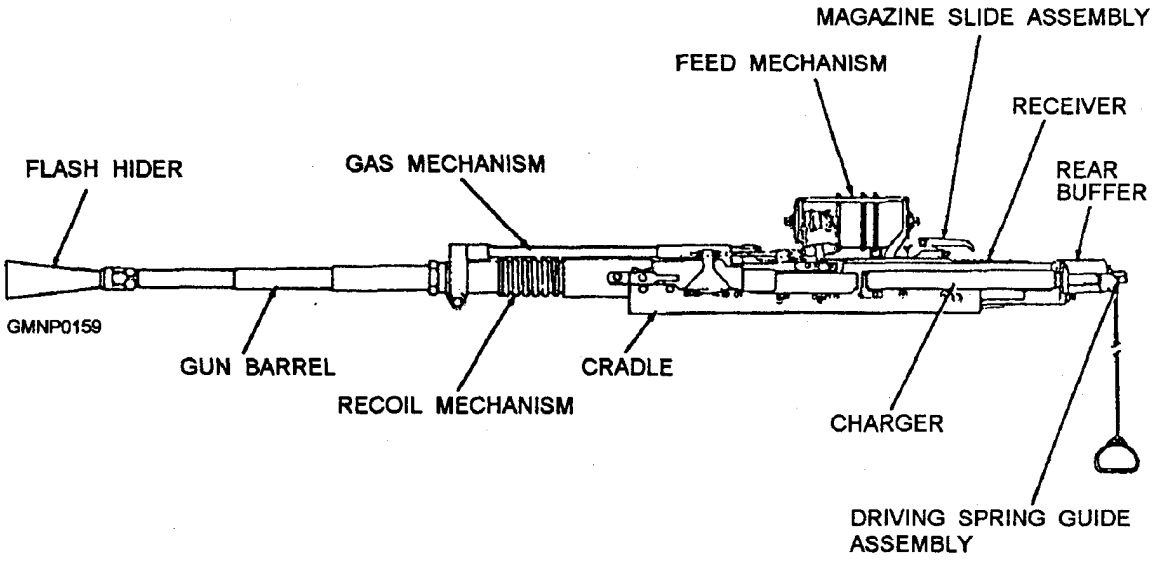


Figure 3-85.—20-mm Mk 16 Mod 5 machine gun.

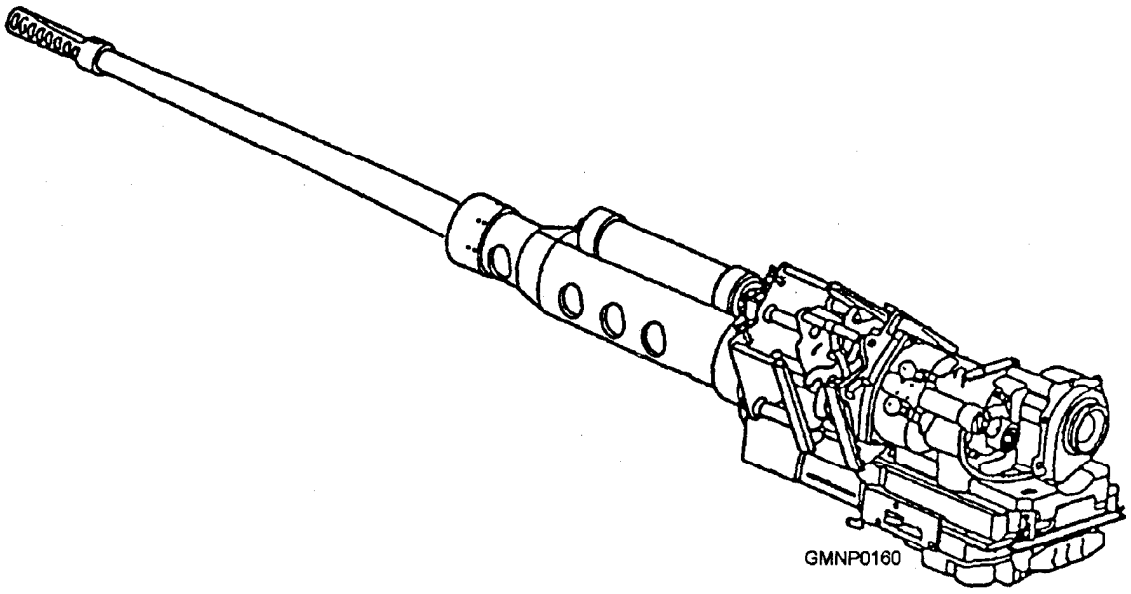


Figure 3-86.-25-mm M242 automatic gun.

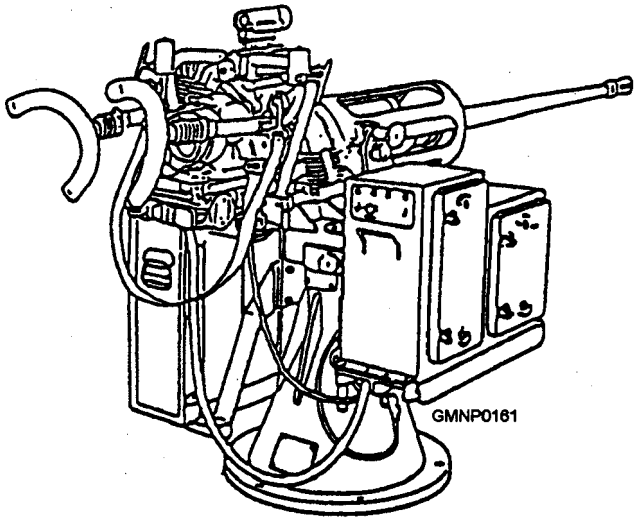


Figure 3-87.—The Mk 38 Mod 0 machine gun system.

up to 2,700 yards, surface-to-surface weapon, designed for use aboard naval vessels operating in coastal and inland areas. The gun is mounted on the Mk 88 Mod 0 machine gun mount to form the Mk 38 Mod 0 machine gun system (fig. 3-87).

Gun operation is powered by an electric motor. The power supply is a 24-volt battery located externally to the gun. The electric motor, attached to the bottom of the receiver, drives all the moving parts of the gun. The gun consists of three major components-the feeder assembly, the receiver, and the barrel (fig. 3-88).

Driven by the electric motor, the feeder assembly transfers linked ammunition from the feed chute, strips rounds from links, places rounds onto the bolt face, and removes spent cartridge cases from the bolt. The M242 is often refereed to as a "chain gun" due to the design of the bolt mechanism. As shown in figure 3-89, the bolt

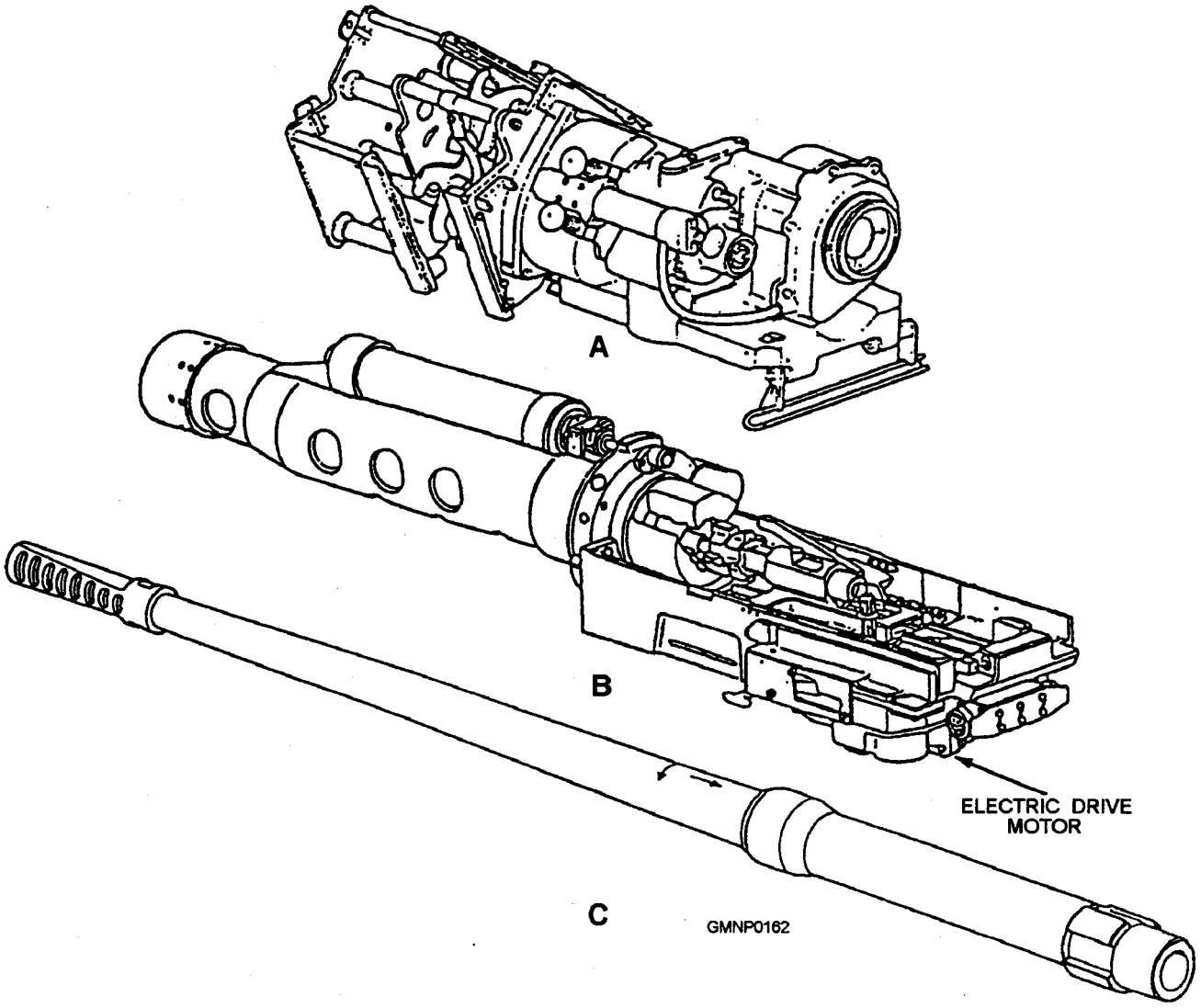


Figure 3-88.—M242 major components: A. Feeder assembly B. Receiver; C. Barrel.

is operated by a chain that is driven by the electric motor. The chain master link includes the slider that fits into a perpendicular track on the bottom of the bolt carrier. As the chain is driven around the track, the slider moves the bolt forward and rearward with a dwell time at each position. The forward dwell time allows propellant gases to disperse after firing while the rear dwell time allows for the spent case to be ejected and a new cartridge inserted.

GRENADE LAUNCHERS

LEARNING 0BJECTIVE: Describe the controls, safeties, and operation of the M79 and Mk 19 Mod 3 grenade launchers.

The Navy currently uses two types of grenade launchers-the M79 and the Mk 19 Mod 3 machine gun.

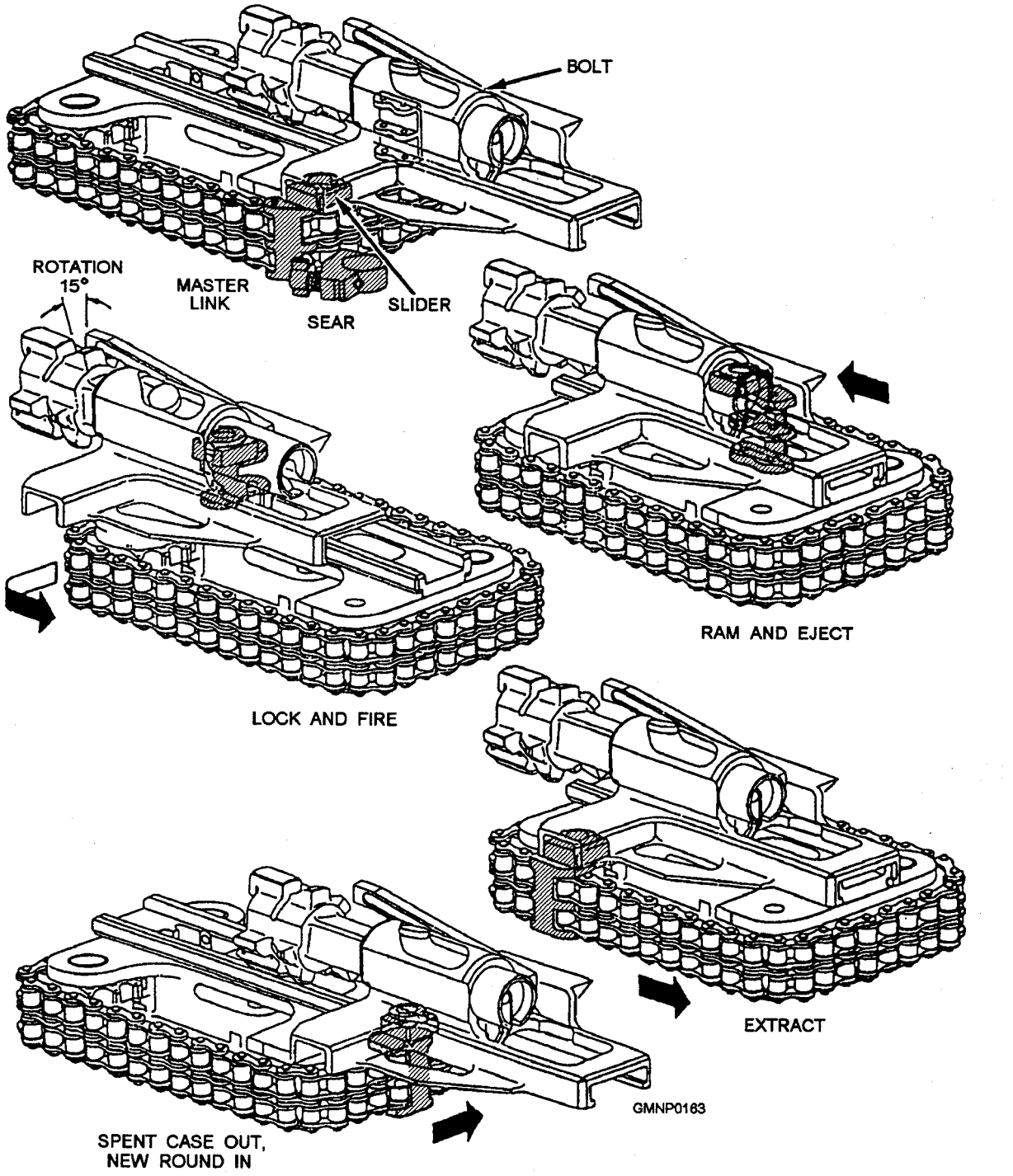


Figure 3-89.—M242 bolt 0peration.

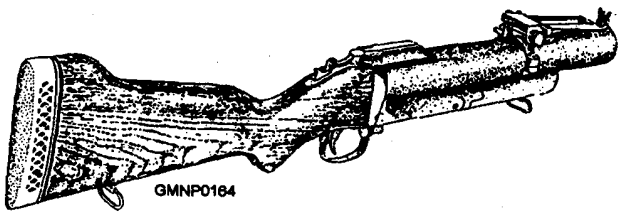


Figure 3-90.—M79 grenade launcher.

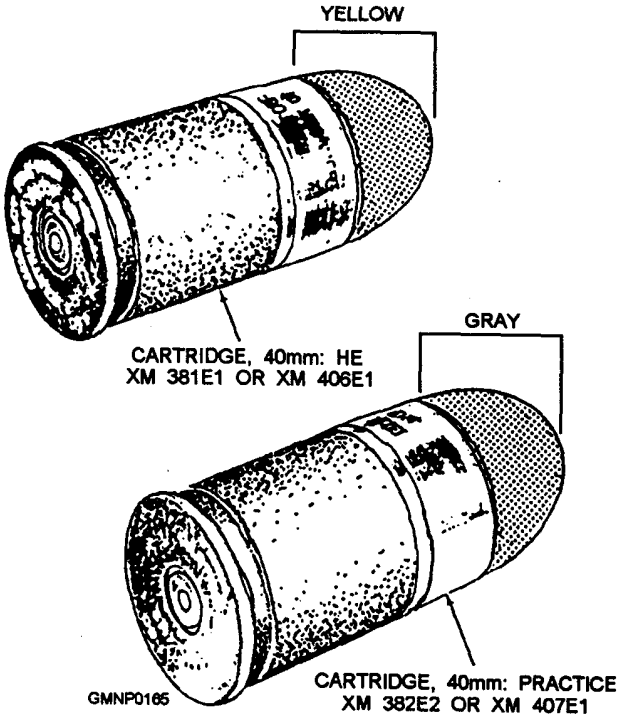


Figure 3-91.—Cartridges used with the M79 grenade launcher.

Both fire 40-mm grenade ammunition. However, the ammunition is not interchangeable. The linked rounds for the Mk 19 Mod 3 have a longer casing than those intended for use in the M79.

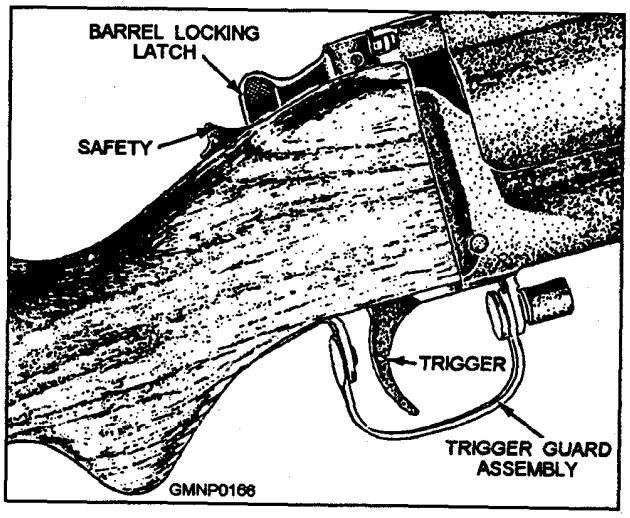


Figure 3-92.—Grenade launcher controls.

40-MM M79 GRENADE LAUCNHER

The M79 grenade launcher (fig. 3-90) is a break-open, single-shot weapon. It is breech loaded and chambered for a 40-mm metallic cartridge case with an internal primer. Cartridges used with the M79 grenade launcher are shown in figure 3-91.

Controls of the M79 Grenade Launcher

The safety (fig. 3-92) is in the SAFE position when pulled all the way back and in the FIRING position when pushed all the way forward

The barrel locking latch (fig. 3-92), when pushed all the way to the right, permits the breech end of the barrel to be swung up into the OPEN position. The grenade launcher cocks as it opens.

The trigger guard (fig. 3-92) is shown in lowered position. It can be released for setting to one side or the other by pushing back the cylindrical housing at the front. This makes it possible for a person wearing heavy gloves or mittens to fire the grenade launcher. The

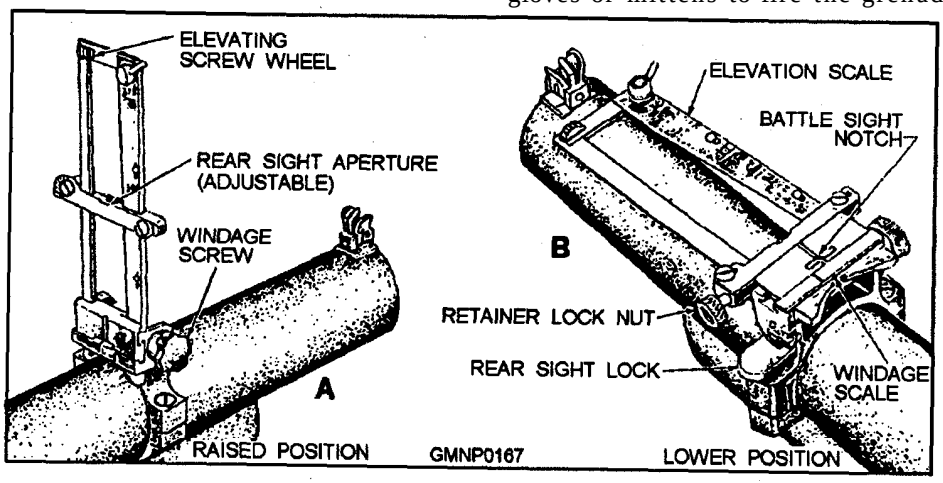


Figure 3-93.—Rear sight assembly.

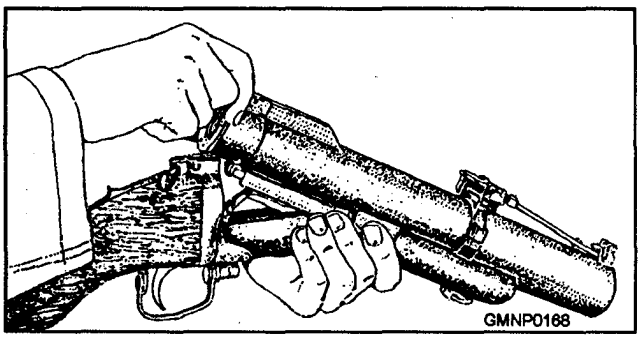


Figure 3-94.—Loading the M79 grenade launcher.

sighting equipment for the launcher is shown in figure 3-93.

Operating the M79 Grenade Launcher

The following procedures should be followed when loading and firing the M79 grenade launcher.

PREPARATION FOR FIRING.— Check the bore to be sure it is free of foreign matter or obstructions. Check all ammunition to be sure the proper type and grade are being used. Check the launcher to be sure it is properly cleaned. Inspect it for malfunction and other defects.

LOADING.— Point the muzzle of the launcher at the ground and clear the area of all personnel.

Move the barrel locking latch all the way to the right and break open the breech. If the safety is not already on SAFE, this procedure will cause it to move to SAFE, provided that the barrel locking latch is moved to its full limit of travel.

Insert the projectile portion of the ammunition into the chamber opening (fig. 3-94) and push the complete round forward into the chamber until the extractor contacts the rim of the cartridge case. Close the breech.

FIRING.— When the launcher is fired, you must be in either a standing or prone position. In the standing position, the butt is placed against the shoulder. In the prone position, the butt is placed against the ground. (See figs. 3-95 and 3-96.)

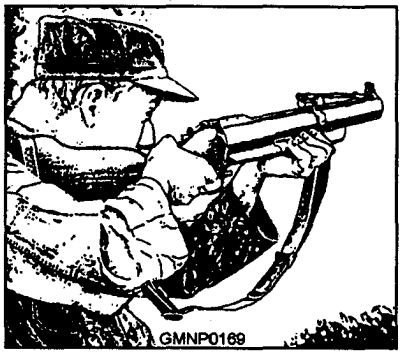


Figure 3-95.—Firing the M79 from the standing position.

Figure 3-96.—Firing the M79 from the prone position.

A detailed discussion of sight setting is beyond the scope of this course. However, to engage targets at ranges from 50 to 80 meters (165 to 265 feet), you should place the rear sight frame assembly in the lowered (called the "battle sight") position (fig. 3-93). Longer ranges are fired with the rear sight frame in the upright position (fig. 3-93) and the sight aperture bar set at the approximate target range of the scale. TM 9-1010-205-10 provides detailed instruction on the use of the sights of the launcher.

When firing grenades at targets within battle sight ranges (50 to 80 meters or 165 to 265 feet), the operator must be in a protected position. Targets that are within 80 meters (265 feet) of friendly troops must not be fired upon.

Field Stripping the M79 Grenade Launcher

Field stripping the M79 grenade launcher consists of separating the fore-end assembly from the barrel and receiver group and separating the stock from the receiver group.

To remove the fore-end assembly, first use the wrench assembly shown in figure 3-97 to remove the

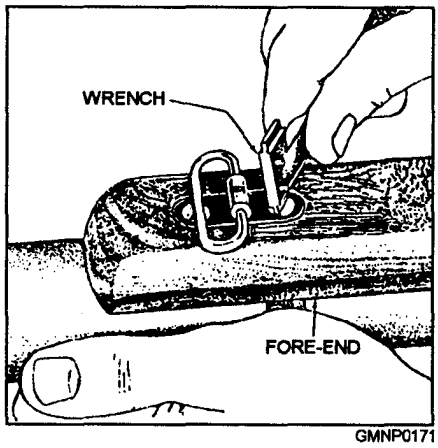


Figure 3-97.—Removing the fore-end assembly retainer screw.

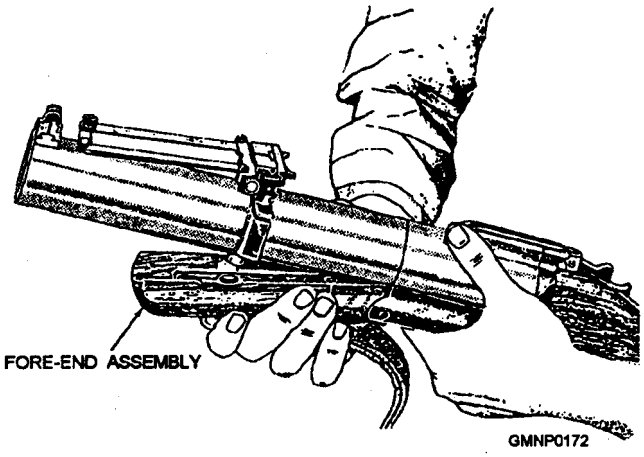


Figure 3-98.—Removing the fore-end assembly.

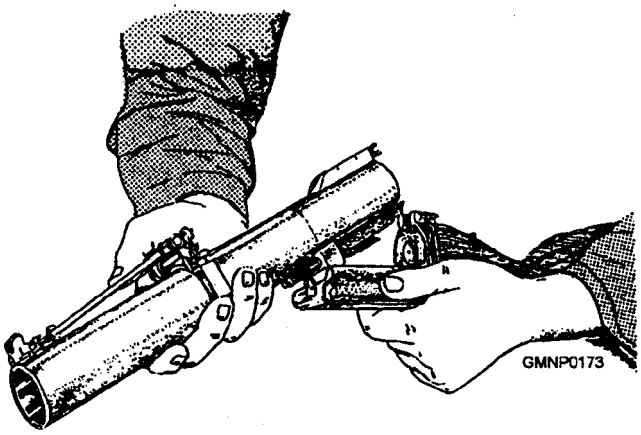


Figure 3-99.—Removing the barrel group.

machine screw shown in the same figure. Then pull the front end of the fore-end assembly away from the barrel, as shown in figure 3-98, until the lug on the rear sight base is clear of the hole in the upper surface of the fore-end bracket. Keeping the lug clear of the hole, pull

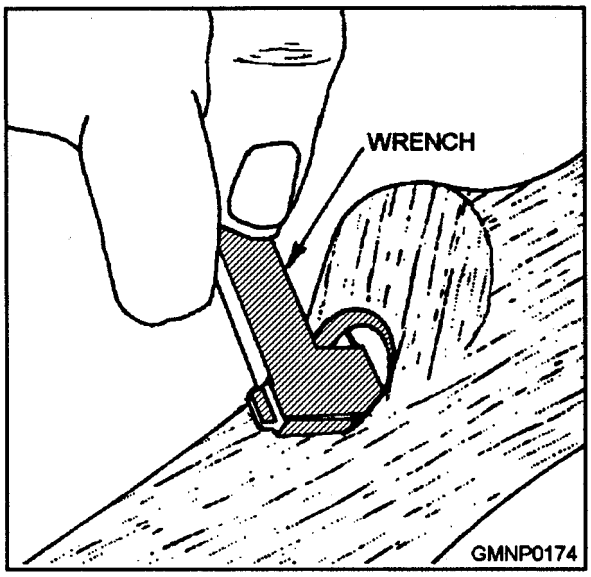


Figure 3-100.—Removing receiver group attaching screw.

forward on the fore-end assembly until it is free of the receiver assembly.

Tb remove the barrel group from the receiver group, first actuate the barrel locking latch and open the breech. Then, holding the stock and receiver stationary, move the barrel rearward in the receiver until it is disengaged from the fulcrum pin, as shown in figure 3-99. Separate the barrel from the receiver group.

To separate the stock from the receiver group, use a combination wrench assembly, as shown in figure 3-100, and remove the pin-headed machine screw that secures the stock to the receiver group.

For further information on the M79 grenade launcher, refer to U.S. Army TM 9-1010-205-24 and TM 9-1010-205-10.

MK 19 MOD 3 MACHINE GUN

The Mk 19 Mod 3 machine gun (fig. 3-101) fires a 40-mm grenade with antipersonnel fragmentation and

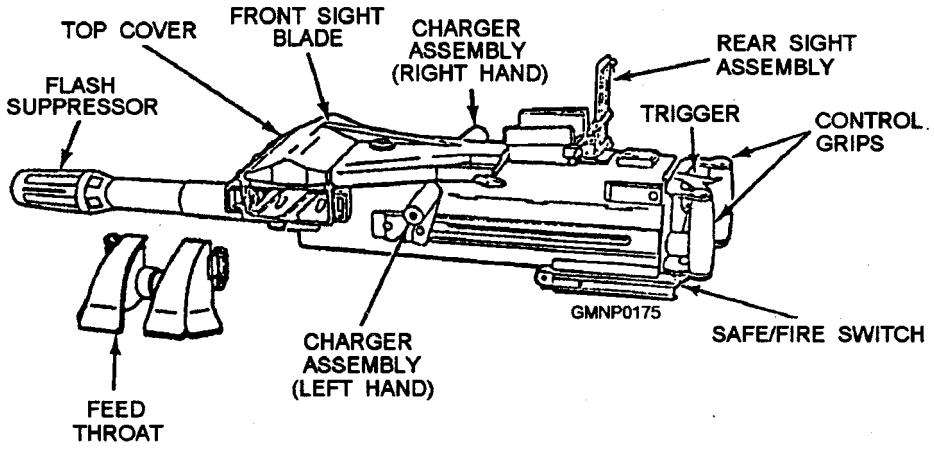


Figure 3-101.—Mk 19 Mod 3 machine gun.

light armor-piercing capability. It is an air-cooled, belt-fed, blowback-operated, fully automatic weapon. The Mk 19 Mod 3 machine gun is found on riverine craft and surface vessels that are tasked to operate in confined waters, such as the Persian Gulf.

Major Components

The Mk 19 Mod 3 machine gun has five major components, as shown in figure 3-102. These are the receiver assembly, the feed slide assembly and tray, the top cover assembly, the sear assembly, and the bolt and backplate assembly.

RECEIVER ASSEMBLY.— The receiver assembly (fig. 3-102, 1) provides support for the other major assemblies of the weapon.

FEED SLIDE ASSEMBLY AND TRAY.— The feed slide assembly and tray (fig. 3-102, 2) holds the rounds in the feeder and indexes ammunition into the firing position.

TOP COVER ASSEMBLY.— The top cover assembly (fig. 3-102, 3) holds the feed slide assembly and tray. It is opened by a latch (left side) for loading or to clean and inspect the weapon.

SEAR ASSEMBLY.— The sear assembly (fig.3-102, 4) holds the receiver sear. Trigger action depresses the sear, releasing the bolt and allowing the bolt to move forward for firing. The safety is attached to the sear assembly. When the safety slide is activated, it blocks the sear from being depressed by the operator as long as the safety is on S (SAFE).

BOLT AND BACKPLATE ASSEMBLY.— Located on the bolt and backplate assembly (fig. 3-102, 5) is the handgrips and the trigger. When the trigger is depressed, it operates the sear assembly that releases the bolt for firing. The bolt is driven forward by a duel set of operating springs set around guide rods.

Operational Sequence

As described in the U.S. Army TM 9-1010-230-10, the operation of the Mk 19 Mod 3 machine gun can be broken down into three functions-loading/charging, firing, and recoil/ejecting.

LOADING/CHARGING.— To begin operation of the Mk 19 Mod 3 machine gun with the weapon on SAFE and the bolt in the forward position, raise the top cover and load 40-mm ammunition into the feeder, as

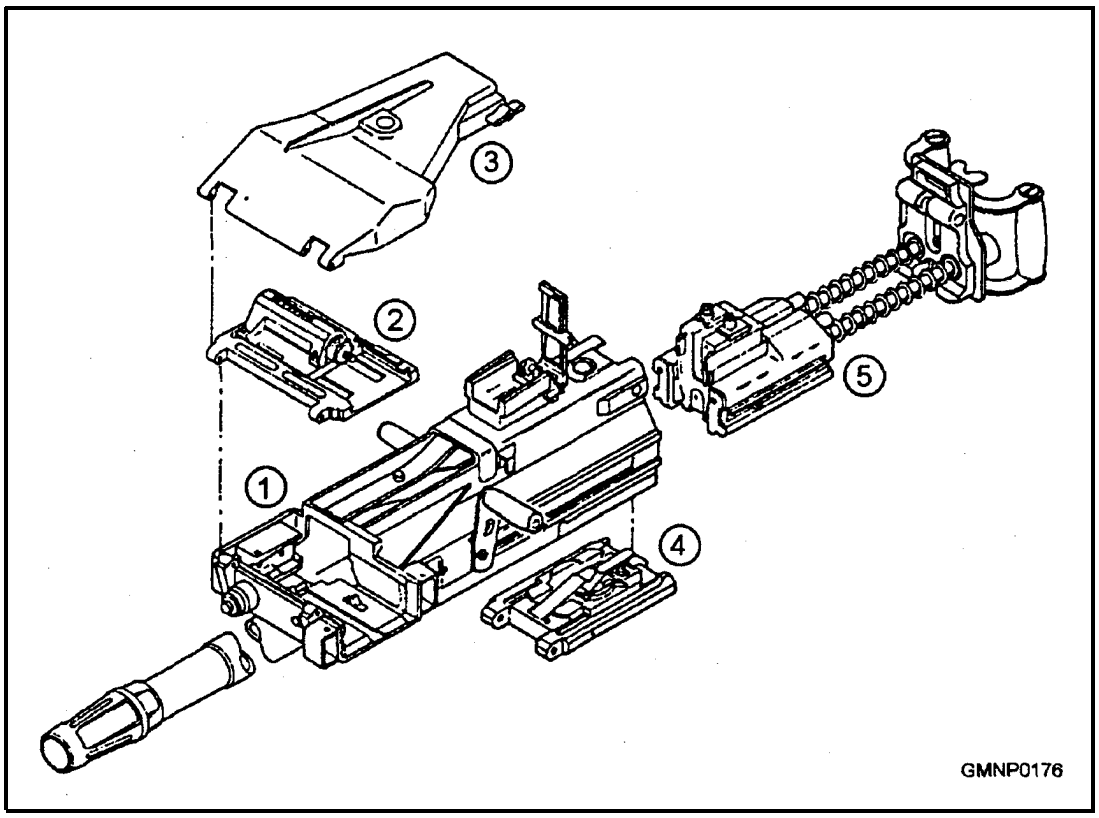


Figure 3-102.—Major components of the Mk 19 Mod 3 machine gun.

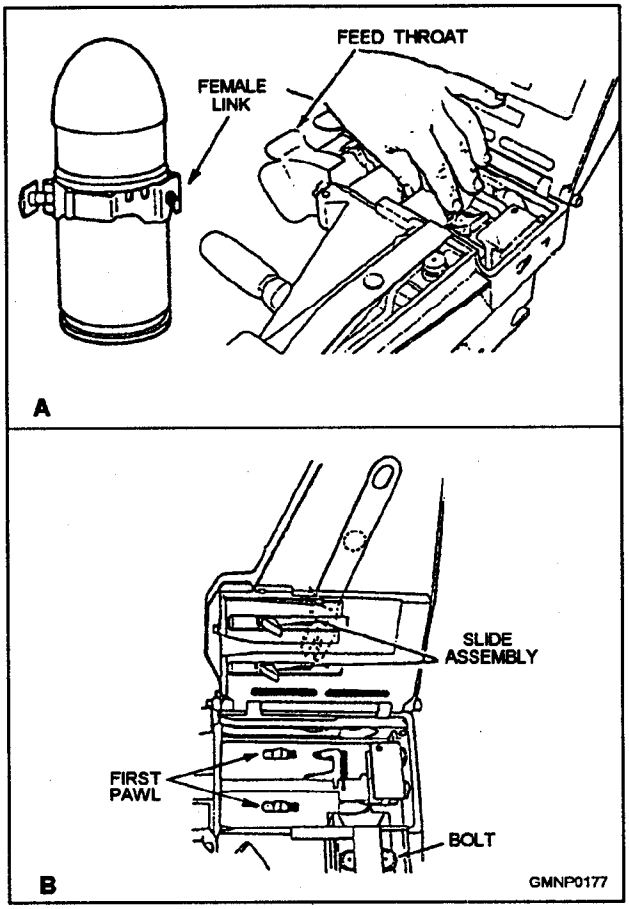


Figure 3-103.—Loading the Mk 19 Mod 3 machine gun.

shown in figure 3-103. With the female link first, feed the belted 40-mm ammunition through the feed throat (fig. 3-103, view A) and into the feeder and across the first pawl (fig. 3-103, view B). Now, move the slide assembly to the left and close and latch the top cover.

To charge the weapon, grasp the charger handles with palms down, as shown in figure 3-104, depress the charger handle leeks, and rotate the handles down. Then pull the charger handles sharply to the rear. When you

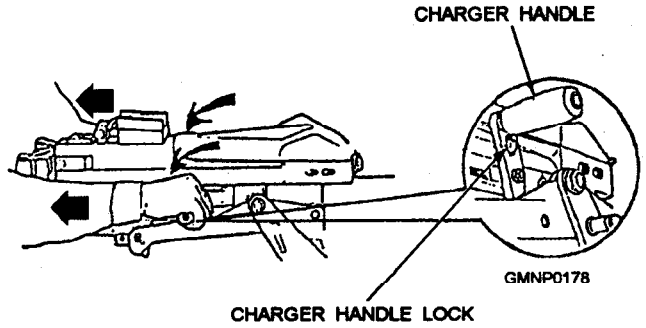


Figure 3-104.—Charging the Mk 19 Mod 3 machine gun.

feel the bolt latch in the rear position, push the charger handles forward and up into the locked position.

To load the first round, place the safety in the FIRE position and press the trigger. The bolt will spring forward and the first round will be loaded on the bolt face in the extractors. This is called the half-load position.

Depress the charger handle locks and pull the charger handles to the rear a second time to load around into position for firing (full-load). Pulling the bolt back a second time (fig. 3-105) delinks the round from the belt. The curved rail on the vertical cam assembly forces the round down the bolt face, out of the extractors, and into the bolt fingers.

FIRING.— With the weapon in the full-load condition, pressing the trigger causes the receiver sear to release the bolt. The recoil springs force the bolt forward (fig. 3-106). As the bolt travels forward, the cocking lever is released and the bolt sear strikes the receiver plate, pushing it rearward. This movement of the bolt sear releases the firing pin, which strikes the primer and fires the round.

RECOIL/EJECTING.—As a round is fired, recoil pressure from the burning propellant acts to force the bolt rearward (fig. 3-107). As the bolt moves rearward,

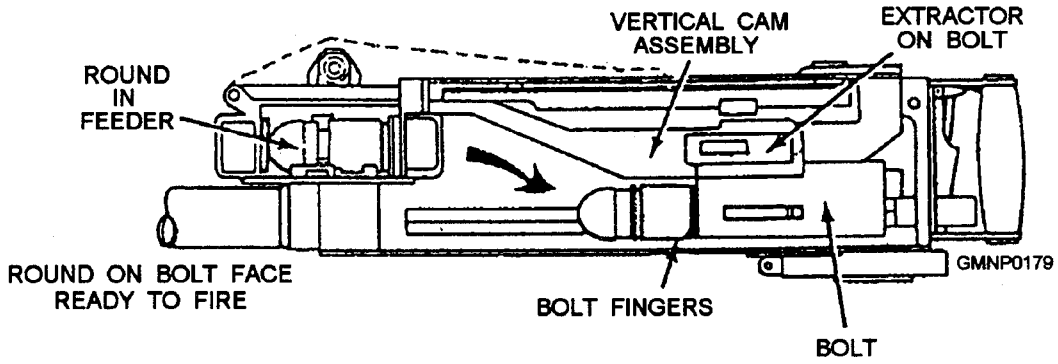


Figure 3-105.—MIK 19 Mod 3 machine gun loading operation.

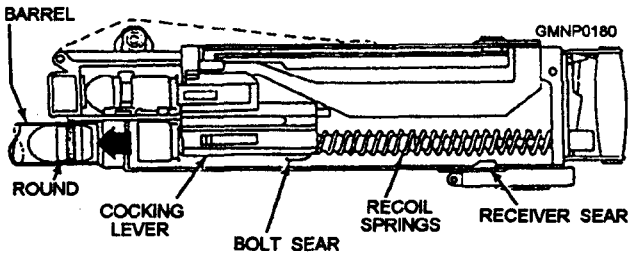


Figure 3-106.—Mk 19 Mod 3 machine gun firing sequence.

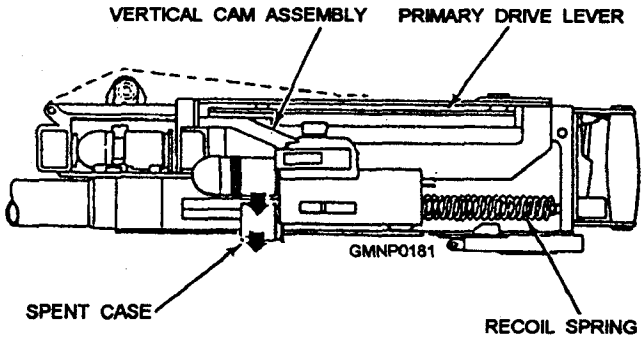


Figure 3-107.—Mk 19 Mod 3 machine gun recoil and ejecting sequence.

it extracts the spent cartridge, cams the next round down the bolt face, which forces the spent cartridge out the bottom of the gun, and moves the feeder drive levers to move the next round into position for delinking. Firing will continue automatically as long as the trigger is depressed. When the trigger is released, the bolt is held in the rear position by the sear assembly with a round in the bolt fingers.

The Mk 19 Mod 3 machine gun should be kept clean and lubricated as prescribed in the U.S. Army TM 9-1010-230-10 and the appropriate Navy 3-M Systems MRCs. Detailed disassembly, cleaning, and troubleshooting procedures are also found in these two sources.

SUPPORT WEAPONS

LEARNING OBJECTIVE Discuss and identify the weapons used to support the Seabees and special boat units.

As a GM you may be assigned to a Seabee or a special boat unit. These units have several support weapons that are not normally found in the fleet. In this section we will briefly discuss the M203, the LAW, and the 81-mm mortar.

40-MM GRENADE LAUNCHER, M203

When the M16A1 rifle is equipped with the grenade launcher, it becomes the 40-mm grenade launcher, M203, and loses its identity as the M16A1 rifle (fig. 3-108). As a GM attached to the Seabees as the armorer, you may have to assemble the launcher attachment on the M16. As a member of a landing or boarding party or special boat unit, you will have the responsibility of the employment, the trajectory, the method of firing, the firing effects, the malfunctions, and the care and cleaning of the launcher attachment.

The 40-mm grenade launcher (M203), mounted on the M16A1 rifle, is a lightweight, compact, breech-loading, pump-action (sliding-barrel), single-shot, manually operated weapon.

The launcher is approximately 16 inches in overall length. It weighs approximately 3.6 pounds loaded; 3 pounds unloaded It has a maximum range of 400 meters. Its area target range is 350 meters; its point

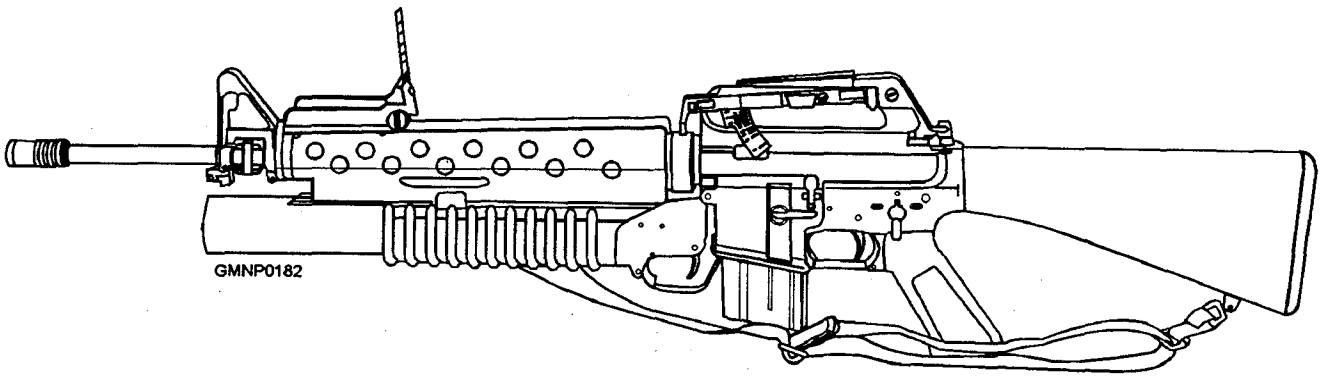


Figure 3-108.—40-mm grenade launcher, M203, mounted on the M16A1 rifle.

target range is 150 meters. The launcher consists of a handguard and sight assembly group, a receiver assembly, a quadrant sight assembly, and a barrel assembly (fig. 3-109).

Handguard and Sight Assembly Group

The handguard portion of the assembly group (refer to fig. 3-109) is a molded plastic protective cover that fits over the barrel of the M16A1 rifle. The cover prevents the operator from coming in contact with the barrel when it becomes heated from rapid firing. The heat produced by the rifle barrel dissipates through the ceding holes and slots on the cover. The protruding plastic tab on the left side of the cover prevents the barrel latch of the grenade launcher from being accidentally pressed when the weapon is laid on its side.

The sight leaf portion of the assembly group is a metallic folding blade sight. It provides range selection from 50 to 250 meters in 50-meter increments. The windage adjustment screw moves the blade element horizontally, providing a windage adjustment capability. The elevation adjustment machine screw, when loosened, allows the blade element to be moved vertically, providing an elevation adjustment capability.

Receiver Assembly

The receiver assembly (fig. 3-109) consists of an aluminum receiver that houses the barrel latch, the barrel stop, and the firing mechanism. The receiver assembly attaches to the barrel of the rifle, mounting the grenade launcher to the rifle. The receiver assembly also contains the follower assembly, the trigger, and the safety components that serve to fire or prevent accidental firing of the grenade launcher.

The safety is just forward of the trigger, inside the trigger guard. The safety must be in the forward position (fig. 3-109) to fire the launcher. The safety must be in the most rearward position to place the launcher on safe. The safety must be placed manually in either of these positions.

The barrel latch, when depressed, unlocks the barrel so that it can be moved forward along the receiver assembly. As the barrel and barrel extension (which are interlocked with the cocking lever) move forward, the cocking lever is forced downward. The cocking lever, in turn, forces the spring-loaded tiring pin rearward. At the same time, the spring-loaded follower follows the barrel extension forward. As the barrel continues its

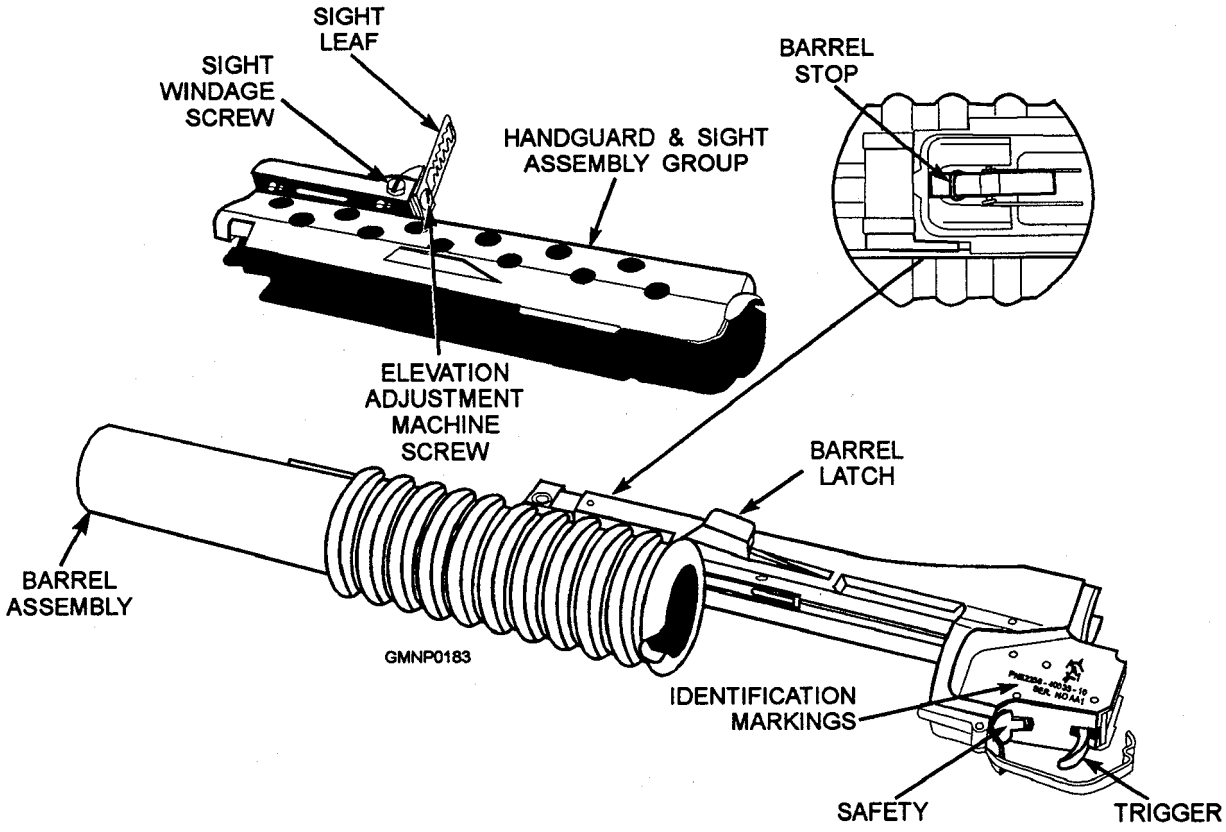


Figure 3-109.—40-mm grenade launcher, M203, controls and their identifications.

forward movement, the barrel extension disengages from the cocking lever. The movement of the follower is restricted by the receiver; the follower holds the cocking lever in the DOWN position. When the barrel is moved rearward, the follower is driven rearward, the cocking lever again engages the barrel extension, and the firing pin moves slightly forward and engages the sear.

The barrel stop (fig. 3-109) limits the forward motion of the barrel assembly. This prevents the barrel assembly from sliding off the receiver assembly barrel track during loading and cocking operations. When the barrel stop is depressed, it allows the barrel assembly to be removed from the receiver assembly for maintenance.

Quadrant Sight Assembly

The M203 has a quadrant sight assembly (fig. 3-110), which connects to the carrying handle of the M16 rifle. It consists of a sight arm, a range selection quadrant, and mounting brackets. The sight arm contains an aperture and post for sighting operations of the launcher. The range selection quadrant has embossed range graduations from 50 to 400 in 25-meter increments. The quadrant sight is used at ranges in excess of the 250 meters that is covered by the leaf sight. The 25-meter increments also allow for better accuracy at a greater number of range variations than the leaf sight.

Barrel Assembly

The barrel (refer to fig. 3-109) of the barrel assembly is constructed of specially treated and machined aluminum. The barrel extension is a rectangular, chrome-plated steel bar. It attaches to the barrel and provides a means of attaching the barrel to the receiver assembly. The handgrip is a molded plastic corrugated sleeve. When the grenade launcher is being fired, the plastic handgrip allows the Operator to hold the launcher without any discomfort from the heat.

66-MM LIGHT ANTITANK WEAPON SYSTEM, M72 SERIES (LAW)

The LAW is a lightweight, self-contained antitank system, consisting of a rocket packed within its own launcher. It is considered ammunition, rather than an individual arm, and is designed to be carried and used by designated personnel in addition to their individual weapons. The LAW will provide increased firepower against targets, ranging from personnel to heavy tanks.

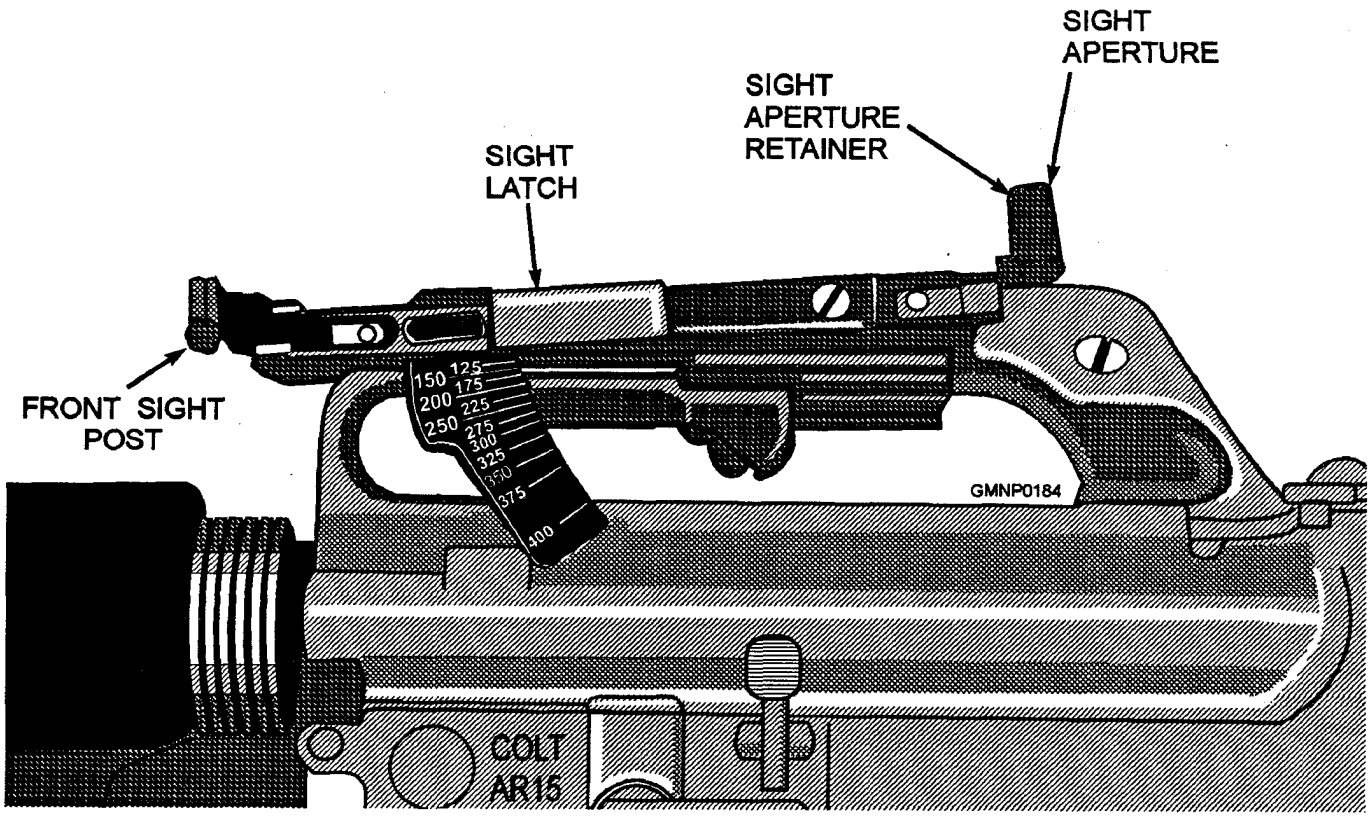


Figure 3-110.—Quadrant sight assembly.

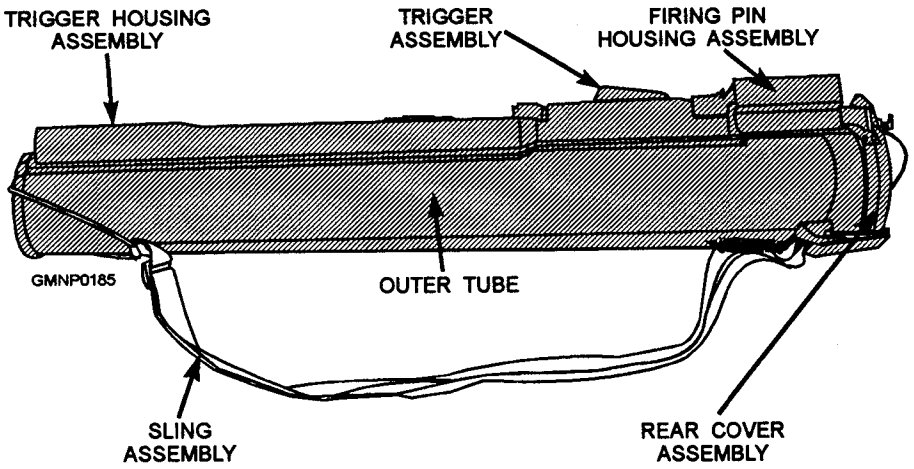


Figure 3-111.—M72A1 rocket launcher in CLOSED position.

When the launcher is issued, it serves as a watertight packing container for the rocket (fig. 3-111); however, when the launcher is placed in the FIRING position fig. 3-112), it serves to ignite and guide the rocket on its initial flight toward the target. Once the launcher is fired, it is designed to be discarded.

81-MM MORTAR

The 81-mm mortar (fig. 3-113) is a smooth-bore, muzzle-loaded, high-angle-of-fire weapon. It consists of a mortar barrel with a baseplug and a fixed firing pin for drop firing. The mount consists of a biped with traversing and elevating mechanism. A spring type of shock absorber absorbs the shock of recoil in firing. The baseplate is a unit that supports and aligns the mortar. For firing, the baseplug of the barrel is passed through the yoke of the biped mount, secured to the shock absorber and mounted into the baseplate. For transporting, disassemble the mortar into three groups: barrel, biped, and baseplate. A telescope sight, the M53, is provided for adjusting elevation and direction. The mortar can be hand carried as three separate one-man loads.

The mortar is fired by inserting a complete round into the muzzle, fin assembly down. The elevation of the barrel causes the round to slide toward the base of the barrel. On reaching the base, a propelling charge on the round is ignited by the firing pin. The pressure of the gas produced by the burning propelling charge drives the round up and out of the barrel. The fin assembly stabilizes the round in flight.

The mortar can deliver fire at ranges up to approximately 4,737 meters. The sustained and

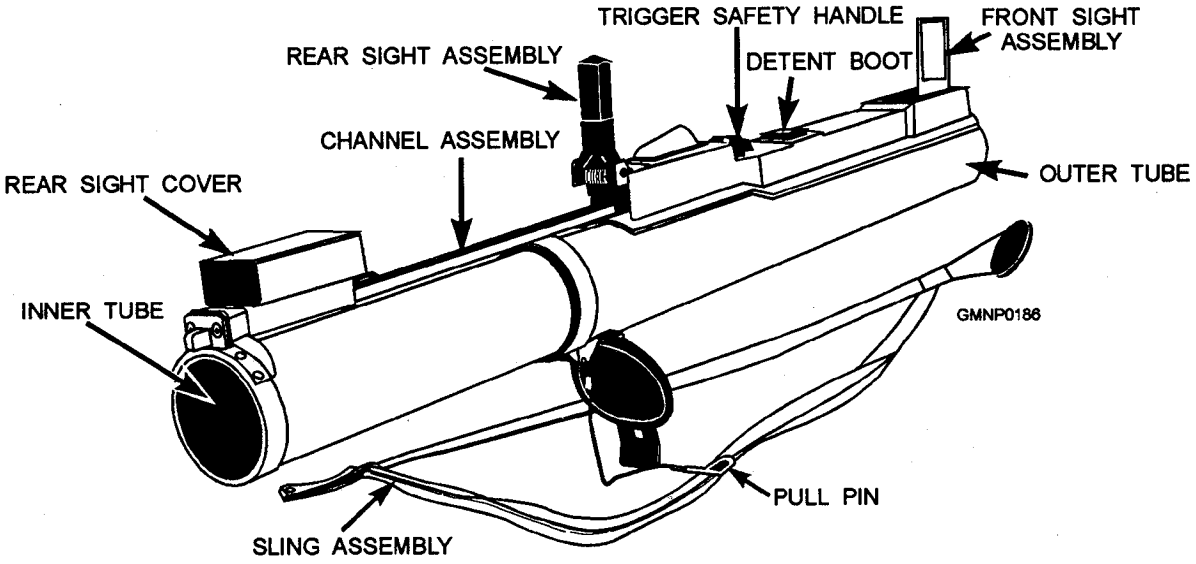


Figure 3-112.—M72A1 rocket launcher in OPEN position.

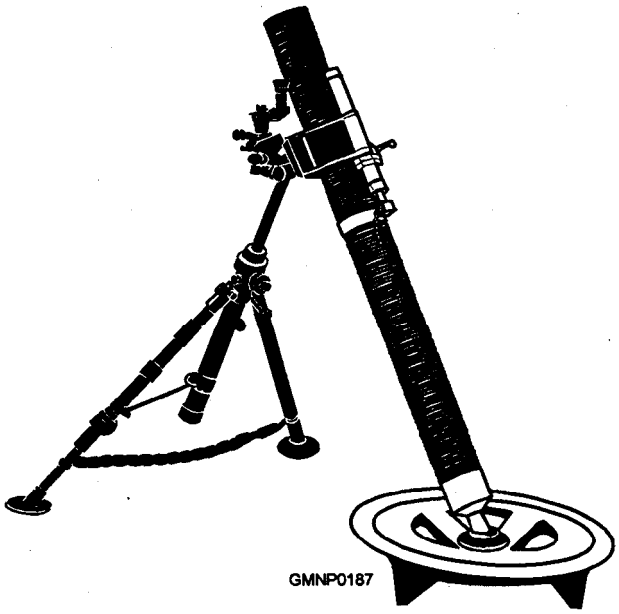


Figure 3-113.—The 81-mm mortar M29.

maximum rates of fire are related to the type of round and charge being used.

The complete mortar weighs 93 pounds. This includes the barrel (28 pounds), the biped (40 pounds), and the baseplate (25 pounds). The overall length is 51 inches and the maximum width is 21.6 inches.

A variety of shells and fuzes have been developed to make the 8 l-mm mortar a versatile weapon. It can be used as either an offensive or a defensive weapon.

SPECIAL PRECAUTIONS FOR SMALL ARMS

LEARNING OBJECTIVE: Discuss the special safety precautions that every Gunner's Mate should know before handling small arms.

Semiautomatic pistols in the hands of inexperienced or careless persons are largely responsible for the saying, "It's always the unloaded gun that kills." It is a fact that many accidental deaths and injuries are due to the mistaken belief that removing the magazine of the pistol (or other magazine-fed weapons) is all that is necessary to unload it. Nothing could be further from the truth. To unload a pistol or other magazine-fed weapon completely and render it safe to handle, it is necessary not only to remove or empty the magazine but also to make absolutely certain the chamber is empty. The only way this can be done is to pull back the slide or bolt and inspect the chamber either visually or, it if is dark by feel. This should be done after the magazine is removed and with the muzzle pointed upward. Of course, if the chamber is loaded, the round will be extracted and ejected when the slide is operated. "I didn't know it was loaded" is never an excuse for the accidental discharge of a weapon-especially for the Gunner's Mate. All weapons must be considered loaded when the slide or bolt is forward and/or the magazine is in the weapon. It is safe only when the slide or bolt is locked in the OPEN position, the magazine is out of the weapon, and the chamber is visibly empty.

When you are handling revolvers, a simple visual inspection is sufficient to determine if any chambers in the cylinder are loaded

Keep the hammer fully down when the pistol or revolver is not loaded. When the pistol is cocked, keep the safety lock in the ON (SAFE) position until ready to fire.

Let's review briefly some of the safety precautions that apply to the handling of all small arms:

- Never point a weapon at anyone or anything you are not ready to destroy.
- Unless the weapon is to be used immediately, never carry it with a round in the chamber.
- Unless you are about to fire it, the safety of every small-arms weapon must always be in the SAFE position. Always keep your finger away from the trigger. When the safety is moved from the SAFE to the FIRE position, many small arms will fire if the trigger is pressed as the safety is released
- Consider a gun loaded until you have opened the chamber and verified that it is empty. It is not enough to wail afterward, "I didn't know it was loaded." The empty weapon is the dangerous one.
- Before firing any weapon, be sure there are no obstructions in the bore.

. Before firing any weapon, be sure the ammunition you are using is the right ammunition. For example, the M14 ammunition cannot be used in the M16 rifle. Nor should you try to use illumination signals with shotguns, even though they look much like shotgun shells.

- Before firing, be sure there is no grease or oil on the ammunition or in the bore or chamber. Although lead bullets may be lightly waxed or greased, there must never be any lubricant on the cartridge case.

- Keep ammunition dry and cool. Keep it out of the direct rays of the sun. Keep ammunition clean, but do not polish it or use abrasives on it. Do not attempt to use dented cartridges, cartridges with loose bullets, or cartridges eaten away by corrosion. Be particularly careful with tracer ammunition, which can ignite spontaneously if damp.

- Misfires and hangfires can occur with small-arms ammunition as well as with other types. On some weapons, like the automatic pistol, you can recock and attempt to fire again without opening the breech. If, after a couple of attempts, this proves unsuccessful or if the weapon cannot be recocked without opening the bolt, wait at least 10 seconds, then open the bolt and eject the defective round. Defective small-arms ammunition should be disposed of according to current regulations.

A misfire with blank cartridges may leave unburned powder deposited in the bore; always check the bore after any misfire and clean it if necessary.

If you experience a light recoil or report, clear the weapon and check the bore for an obstruction. This may indicate a partial burning of the propellant that may not have been sufficient to force the bullet clear of the muzzle.

WARNING

Never try to dislodge a bullet from the barrel by firing another bullet.

SMALL-ARMS MAINTENANCE

LEARNING OBJECTIVE: Discuss the importance of proper maintenance on small arms.

The cleaning, preservation, and care given to small arms are determining factors in their operation and shooting accuracy. You have undoubtedly heard that an ounce of prevention is worth a pound of cure. This can aptly be applied to the maintenance of all ordnance weapons and equipment. To maintain these weapons properly, you must use a system of preventive maintenance. The preventive maintenance procedures for Navy small arms are set forth in the appropriate 3-M Systems MRCs.

Preventive maintenance is the systematic care, the inspection, and the servicing of material to maintain it in a serviceable condition, prevent breakdowns, and assure operational readiness. To maintain your small arms in a state of readiness, you must service (including lubrication) them each time they are used and periodically when in stowage.

Inspections of each weapon are an important part of preventive maintenance. Inspections to see if items are in good condition, correctly assembled, secure, not worn, and adequately lubricated, apply to most items in preventive maintenance procedures.

STOWAGE AND ISSUE OF SMALL ARMS

LEARNING OBJECTIVE Describe the requirements for the security, stowage, and issuing of small arms.

As a Gunner's Mate, you are responsible for the security, stowage, and issue of all small arms. The increasing number of reported instances of ammunition and weapon pilferage by dissident groups and individuals indicates the necessity for stricter control of stowage, security, custodial responsibility, and inventory reconciliation procedures for easily pilfered items, which include small arms.

Small arms should always be stowed in an authorized and secure stowage to prevent pilferage. You must maintain a strict accountability at all times. *Department of the Navy Physical Security Instruction for Conventional Arms, Ammunition, and Explosives (AA&E),* OPNAVINST 5530.13, contains detailed instructions for the security of small arms and other AA&E materials. This includes access control, key custody, and stowage requirements. Since this instruction is subject to frequent changes, we will not go into any detail on its contents. However, you are strongIy encouraged to become familiar with the specifics of this document and to make its contents the object of frequent training and review in your work center.

Since all small arms are *considered equipage,* **a** signature of subcustody is required before they are issued from their normal place of stowage. Any type of signed custody record may be used as long as it bears the receiving individual's signature. Inside the armory, you should have a list of personnel who are qualified to be issued weapons. Anyone who is not on that list should not be able to draw a weapon from the armory. A second consideration for issuing small arms is to

determine whether or not the requesting person is authorized to draw a weapon at this time. Any out-of-the-ordinary requests for weapons should be prearranged and authorized. When in doubt, call your chief, the division officer, or the command duty officer. Again, the important security measures are to keep the weapon locked up and, when it is issued, to determine qualification and authority and to get a signature.

SMALL-ARMS RANGE DUTIES

LEARNING OBJECTIVE: Discuss small-arms range duties and responsibilities both ashore and afloat.

As a Gunner's Mate, you maybe assigned to duty at one of the Navy's small-arms ranges ashore. However, you will certainly be routinely called upon to conduct the small-arms qualification firing of shipboard security force and quarterdeck watch stander personnel. Both cases require that you be proficient in range operation and safety as well as marksmanship procedures. Normally, every ship has two crewmen, usually Gunners' Mates who have been to the Navy small-arms instructor school and are certified as range masters. Certified range masters carry an 0812 or 0176 NEC. NEC 0812 is permanent and qualifies the holder to run a small-arms range both aboard ship and ashore. NEC 0176 is valid for 3 years and qualifies the holder to run shipboard ranges only. Even if you are not one of these persons, you may be called upon to assist by acting as an additional safety observer on the firing line, giving a safety brief, providing marksmanship instruction, or keeping score records.

Marksmanship procedures for each weapon are contained in the TM or FM for that weapon.

HAND GRENADES

LEARNING OBJECTIVE Describe the type and purpose of the various hand grenades used by naval forces.

A hand grenade is a small bomb with the user's arm providing the motive power to get it to the target. Hand grenades may be filled with explosives, explosives and chemicals, or (for practice purposes) maybe empty or contain inert filler. Hand grenades come in many sizes, shapes, and types and are designed to fulfill a wide variety of purposes. They can be used for inflicting material and personnel casualties, screening, signaling, illuminating, demolition, harassing, and incendiary action.

TYPES AND CHARACTERISTICS

The general types of hand grenades issued are (1) training, (2) practice, (3) fragmentation, (4) offensive, and (5) chemical. Each type is designed to do a special job. For a summary of the characteristics and capabilities of each hand grenade, refer to the Army FM 23-30. Certain characteristics common to all hand grenades are as follows:

- The range of a hand grenade is relatively short. The range depends on the ability of the individual and the shape of the grenade. A well-trained sailor should be able to throw the fragmentation hand grenade an average of 44 yards but may average only 27 yards with the heavier white phosphorus smoke grenade.

- The effective casualty radius of a hand grenade is relatively small when compared to that of other weapons. The term *effective casualty radius* is defined as the radius of a circular area around the point of detonation within which at least 50 percent of the exposed personnel will become casualties. The effective casualty radius varies with the type of hand grenade used, so casualties can and do occur at distances greater than this radius.

- Delay fuzes are used in all standard hand grenades. Detonation of the grenade is not on impact but after the delay element in the fuze has burned, The fuze assembly (fig. 3-114) consists of a the body, a

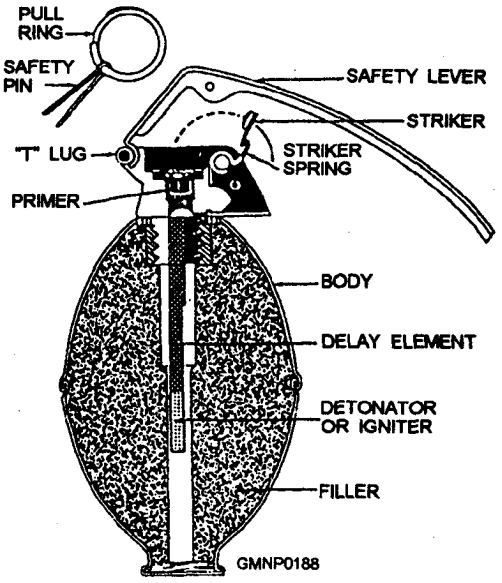


Figure 3-114.—Functioning of the fuze.

safety lever, a safety pin, a striker spring, a primer, a delay element, and a detonatcr or igniter. For further information about the operation of the fuze assembly, refer to FM 23-30. All casualty-producing grenades (fragmentation, offensive, and white phosphorus) have a 4- to 5-second delay. Because of this short delay, personnel must stay alert when arming and throwing hand grenades.

PROCEDURES FOR THROWING

For greater accuracy and range, you should throw the grenade like a baseball, using the throwing motion most natural to the individual. It is important to grip the grenade properly. Figure 3-115 shows the proper position of the grenade before pulling the safety pin. First, cradle the grenade in the fingers of the throwing hand. Hold the safety lever down firmly under the thumb between the tip and first finger joint. In this way, the grenade fits snugly into the curved palm of your hand, giving you a firm, comfortable grip but do not relax your thumb pressure on the safety lever until you throw the grenade.

The first steps in grenade throwing are to develop good throwing habits and several throwing positions. Four throwing positions are recommended: (1) standing, (2) kneeling, (3) prone, and (4) crouch.

The procedures for throwing from the standing position are as follows:

1. Stand half-facing the target with your weight balanced equally on both feet. Hold the grenade chest high, using-the correct grip (fig. 3-116, view 1).

Figure 3-115.—Proper way to grip the hand grenade.

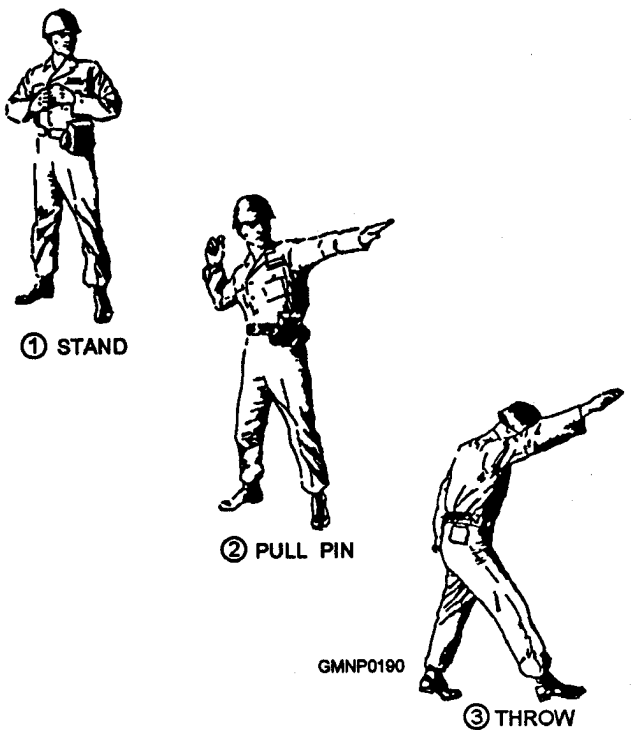


Figure 3-116.—To throw from the standing position.

2. Pull the pin with a twisting, pulling motion. Cock your throwing arm to the rear (view 2).

3. Throw the grenade with a free and natural motion. As it leaves your hand, follow through by stepping forward with your rear foot (view 3). Observe the point for probable strike, then duck your head to avoid fragments or other effects.

4. Recover, then resume the original standing position.

FM 23-30 explains the proper steps to be taken when using any of the other positions.

SAFETY

The following safety precautions should be observed when handling or using hand grenades:

1. Do not take any grenade apart unless ordered to do so by competent authority.

2. Do not tamper with grenades and do not recover or tamper with live grenades that fail to explode (duds). These duds are recovered and destroyed only by qualified personnel.

3. Do not pull the safety pin until you are ready to throw the grenade. If the safety pin will not pull out easily with a pulling-twisting motion, straighten its

ends. In the majority of cases, this will not be necessary. Maintain a firm grip on the safety lever when removing the safety pin.

4. After you pull the safety pin, throw the grenade. Do not attempt to replace the pinto return it to a safe condition.

5. When throwing a fragmentation grenade without protective cover, drop immediately to a prone position, face down, with your helmet toward the grenade. Keep your arms and legs flat against the ground. Other personnel in the area who are exposed must be warned to drop to a similar position. Steel helmets and body armor should be worn at all times when using grenades.

6. Although little danger is involved in using practice hand grenades, they require some degree of care in handling and throwing. You can throw the practice grenade a safe distance but, for the purpose of training and to prevent injury from an improperly loaded grenade, take cover. Wear the steel helmet, and keep all other personnel at a safe distance. Practice grenades that fail to function (duds) are not recovered for at least 10 minutes and then only by trained personnel.

7. Grenades are issued in the "with fuze" and "without tie" condition. They are not necessarily shipped in separate containers. The detonator of a fuze is very sensitive to heat, shock, or fiction. Army FM 23-30 explains the safety precautions and steps taken when fuzing hand grenades.

LANDING-PARTY EQUIPMENT

LEARNING OBJECTIVE. Identify the various components of landing-party equipment and discuss its proper assembly.

Landing-party or load-carrying equipment consists of the items shown in figure 3-117. Each item has been designed to make the job of carrying the equipment you will need easier and more comfortable. If you are a member of a boarding party, you may substitute other

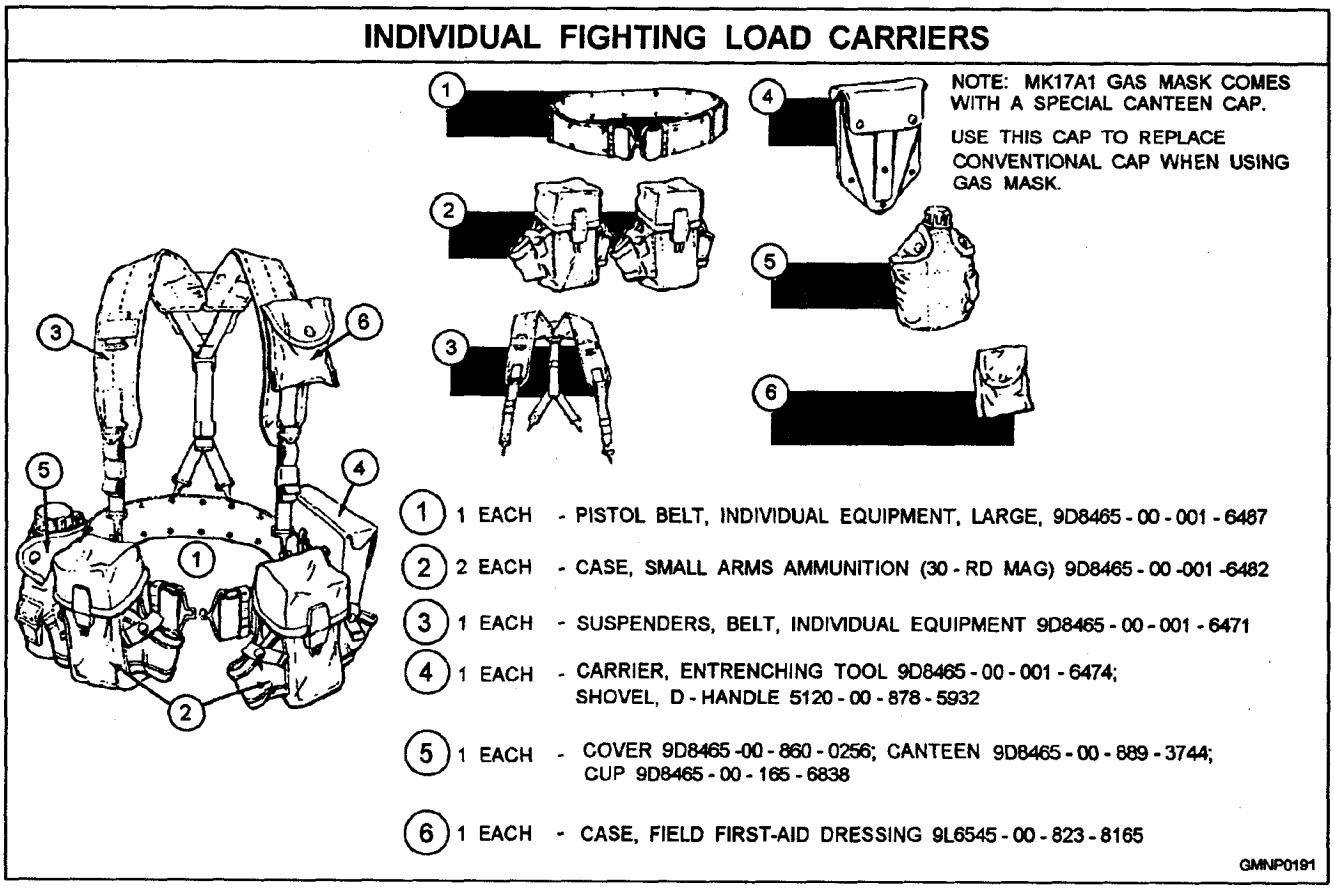


Figure 3-117.—Load-carrying equipment.

needed items that are essential to your mission. For example, you might want to replace the entrenching tool with another canteen when boarding foreign vessels.

The suspenders is one of the most overlooked necessities. The suspenders move the weight of the load from the waist to the shoulders where it should be. They also have hooks to hang additional equipment. Figure 3-118 shows an example of the equipment assembled. Remember, carry only the equipment needed to complete your mission and keep your load as light as possible. The assembled unit is usually worn over an armored vest.

SUMMARY

In this chapter we discussed the small arms currently in use by the Navy, their operation, functioning, and maintenance. We described some of the responsibilities of a Gunner's Mate relative to these small arms, including range operations, security procedures, and general small-arms safety. We described hand grenades, how they are used, and some safety precautions pertaining to them. Finally, we described some load-carrying equipment commonly used by boarding parties.

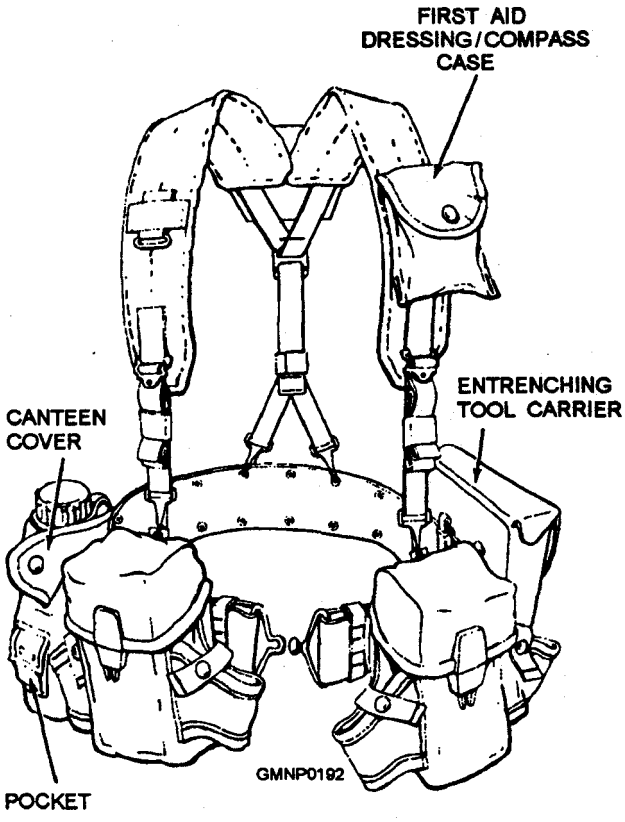


Figure 3-118.—Assembled load-carrying equipment.