TECHNICAL MANUAL
TM 9-285

WAR DEPARTMENT
Washington, September 21, 1942

SHOTGUNS, ALL TYPES

Prepared under the direction of the
Chief of Ordnance

CONTENTS

SHOTGUNS, ALL TYPES

Section I

INTRODUCTION

1. SCOPE.

a. This technical manual is intended to serve temporarily (pending the publication of a more complete revision) to give information and guidance to personnel of the using arms charged with the operation, maintenance and minor repair of this materiel.

b. This manual contains in brief the available information necessary for the identification, operation, care, and cleaning of the shotguns listed below. In addition is included the disassembly and assembly of the guns for the purpose of cleaning and lubrication, and available information on ammunition.

Shotguns covered in this bulletin are as follows:

- Winchester Repeater, 12-Gage, M97
- Winchester Repeater, 12-Gage, M12
- Stevens Repeater, 12-Gage, M620A
- Stevens Repeater, 12-Gage, M520
- Stevens Repeater, 12-Gage, M620
- Ithaca Repeater, 12-Gage, M37
- Remington Repeater, 12-Gage, M10
- Remington Repeater, 12-Gage, M31
- Remington Auto-loading, 12-Gage, M11
- Remington Auto-loading, 12-Gage, Sportsman
- Savage Auto-loading, 12-Gage, M720

c. Disassembly, assembly, and such repairs as may be handled by using arm personnel will be undertaken only under the supervision of an officer or the chief mechanic.

d. In all cases where the nature of the repair, modification, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed in order that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

2. ARRANGEMENT OF MANUAL.

a. The shotguns covered in this manual are of various makes, models, and types. In some cases different models of the same make differ widely

in design, in others the differences are principally in detail of design. Each make of gun herein is treated separately and where there is extreme variation in model, the model is treated as a separate gun. Where slight variations occur in different models of the same make, they are grouped and the differences explained as they occur.

b. Instructions for disassembly and assembly, and special care and maintenance are covered in the section pertaining to the gun and in section XI; while cleaning, lubrication, and general maintenance, which are more or less common to all the guns, are covered in section II, covering the Winchester M97 gun, and can be applied in general to the other guns as indicated.

c. A general description of the gun for identification, together with such identification marks as may be found upon the gun, are given at the beginning of the section pertaining to the gun in question.

3. GENERAL.

a. The repeating shotguns covered in this manual are of two general types, the slide action, sometimes termed pump action, and the autoloading or semiautomatic. The autoloading gun is often called an automatic, which is incorrect as the trigger must be pulled for each shot.

b. As already explained, different models of the same make of gun may vary in design in whole or in part. Also guns of the same make and model but of different grades may vary slightly in design. In addition some guns of the same make, model, and grade but of various dates of manufacture may have slight variations in design. Such variations are dealt with as far as possible herein. Other variations which may appear must be dealt with as such.

c. Due to absence of standard ordnance nomenclature for the guns covered in this technical manual, with the exception of the Ithaca M37, the parts and assemblies are given the nomenclature supplied by the manufacturer and appearing in their parts lists. Therefore parts and assemblies of, for example, a Winchester gun, may be referred to by a different name than similar parts of a Remington gun. For example, the slide handle, operating handle, and fore end refer to similar parts on different makes of guns. The Ithaca Gun M37 has been given standard nomenclature by the Ordnance Department and this nomenclature is used herein, and will differ in some respects from that appearing in the manufacturer's parts list.

d. The word "shell" is standard nomenclature for the shotgun cartridge. The word "shell" has therefore been used throughout this technical manual and substituted for the word "cartridge" appearing in the manufacturer's parts lists. Therefore when identifying parts referred to herein, this fact should be borne in mind.

RA PD 40535

Figure 1—Gun with Bayonet, Hand Guard and Sling—Left Side View—Riot Type (Solid-Frame)—Winchester Shotgun M97

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Figure 2—Gun with Bayonet Attachment and Hand Guard—Right Side View—Riot Type (Solid Frame)—Winchester Shotgun M97

RA PD 40532

Figure 3—Left Side View—Sporting Trap Type (Take-down)—Winchester Shotgun M97

RA PD 40533

Figure 4—Right Side View—Sporting Trap Type (Take-down)—Winchester Shotgun M97

gun, while the barrel of the solid-frame gun of early manufacture, has no such extension, and screws directly into the receiver. The magazine band is absent in both guns when the bayonet attachment is assembled to the gun, and the magazine plug has an integral stud on its forward end. Barrel and magazine of the two guns are not interchangeable (par. 3 i).

d. The take-down design of this gun is furnished in various grades having barrels of different lengths and degrees of boring and other modifications of design. Basically, however, the mechanism of the guns is identical except for the differences in design mentioned in b and c above. For convenience herein the guns will be classified as three types: riot, sporting skeet, and sporting trap, although variations of these types may occur.

(1) The riot-type gun (figs. 1 and 2) may come in either the solid-frame or take-down design, with a 20-inch plain barrel, bored cylinder. Most of these guns have a bayonet attachment and hand guard (fig. 5) attached to the muzzle end of the barrel and the magazine, and a leather sling attached to a sling swivel on the bayonet attachment and the stock. These are always of the solid-frame or modified solid-frame type.

(2) The sporting skeet-type gun usually comes in the take-down design only and is furnished with a 26-inch plain or ribbed barrel, bored improved cylinder, and is without bayonet attachment or sling.

(3) In the sporting trap-type gun (figs. 3 and 4) is similar to the skeet gun but is made with a 30-inch barrel, bored full choke, and is without bayonet attachment or sling.

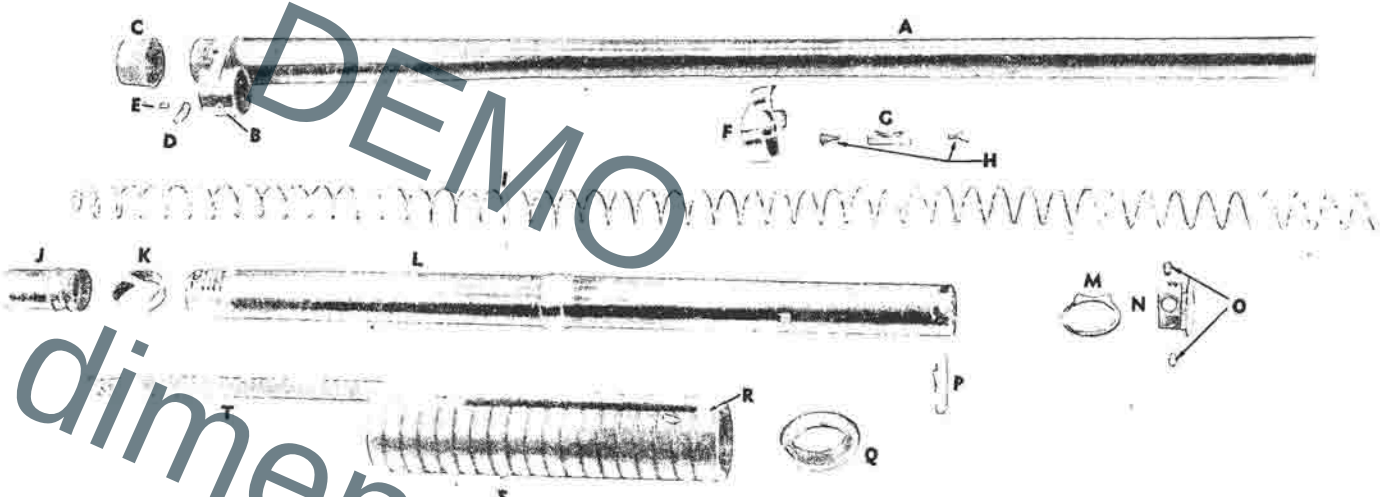
e. **General Description** (figs. 6, 7, 8, 14, and 15).

(1) The stock of the gun is bolted to the rear end of the receiver, and the barrel and magazine are fastened to the forward end of the receiver in either of the ways explained in b and c above. The action slide is mounted and operates on the magazine. The rear end of the slide or bar passes through the forward end of the receiver and engages with and cam-operates the carrier, pivoted in the receiver, and at the same time reciprocates the breech bolt through the medium of a hook pivoted on the bolt.

(2) The receiver contains the operating mechanism and to its lower rear end is attached the trigger plate in which the trigger is mounted. The receiver is open at the bottom to permit loading, the rear to permit rearward passage of the breech bolt, and the right side for ejection of the fired shell cases.

(3) The breech bolt (fig. 8) contains the firing pin, firing pin lock and the extractors. The carrier (fig. 8) contains the hammer, sear, and action slide lock, together with their springs and components. The trigger plate contains the trigger, trigger spring, and stop screw. The ejector is mounted to the left wall of the receiver and the action slide lock release plunger pin in the right wall of the receiver.

Figure 5—Bayonet Attachment, Magazine and Action Slide Groups Disassembled from Gun—Riot Type (Solid-Frame)—Winchester Shotgun M97



A — BARREL
B — RECEIVER EXTENSION
C — BARREL ADJUSTING SLEEVE
D — BARREL ADJUSTING SLEEVE LOCK
E — BARREL ADJUSTING SLEEVE LOCK SCREW
F — MAGAZINE BAND
G — MAGAZINE BAND BUSHING
H — MAGAZINE BAND BUSHING SCREW
I — MAGAZINE SPRING
J — MAGAZINE FOLLOWER
K — ACTION SLIDE SPRING
L — MAGAZINE TUBE
M — MAGAZINE PLUG STOP
N — MAGAZINE PLUG
O — MAGAZINE PLUG SCREW
P — MAGAZINE LOCKING PIN AND SPRING
Q — ACTION SLIDE SLEEVE SCREW CAP
R — ACTION SLIDE SLEEVE
S — ACTION SLIDE HANDLE
T — ACTION SLIDE BAR

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Figure 6—Barrel, Magazine and Action Slide Group—Disassembled View—Winchester Shotgun M97—(Take-down)

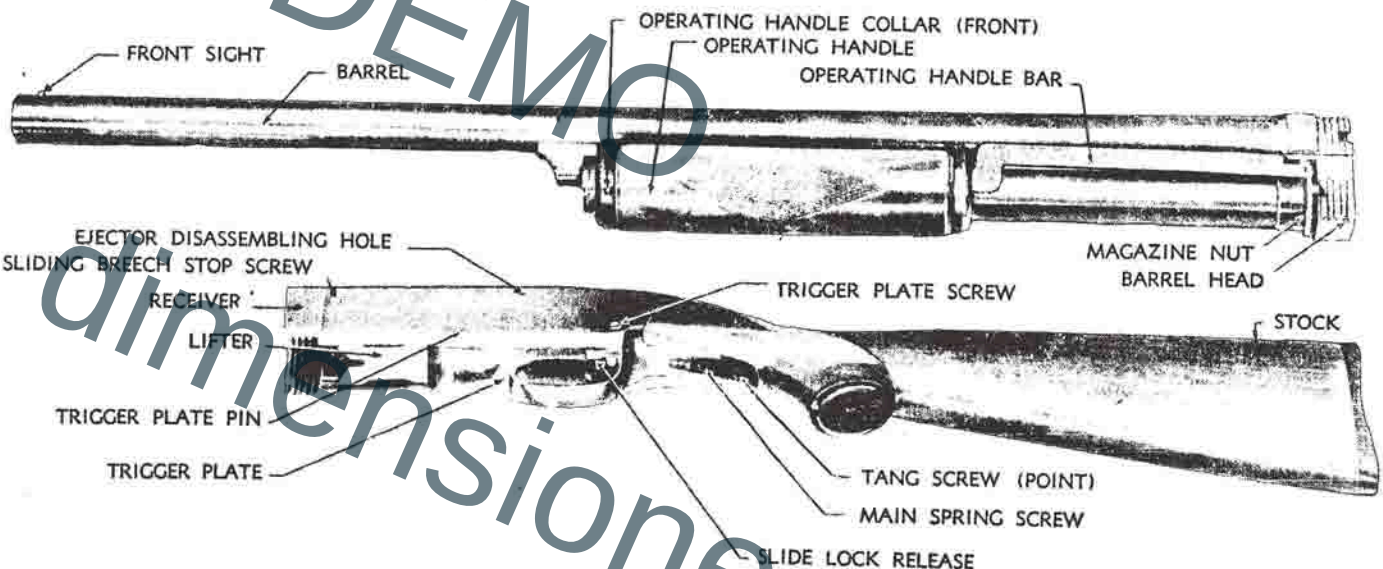


Figure 45—Gun Taken Down—Left Side View—Showing Location of Parts—Stevens Shotgun M620

Figure 46—Gun Taken Down—Right Side View—Showing Location of Parts—Stevens Shotgun M620

Figure 47—Disengaging Magazine Nut—Stevens Shotgun M620

Figure 48—Disengaging Operating Handle Bar from Slide—Stevens Shotgun M620

Figure 49—Disengaging Operating Handle Bar—Stevens Shotgun M620

Figure 50—Barrel Head Disengaged from Receiver—Stevens Shotgun M620

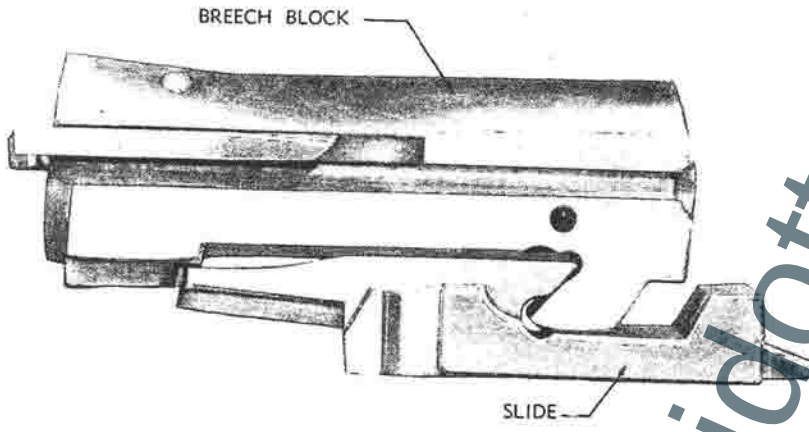


Figure 89—Breechblock and Slide—Unlocked Position—Left Side View—Remington Shotgun M31

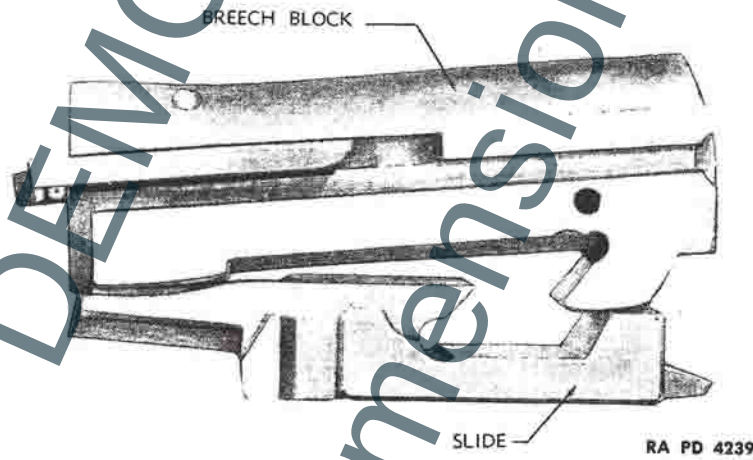


Figure 90—Breechblock and Slide—Locked Position—Left Side View—Remington Shotgun M31

d. As the slide is pulled forward by the action bar, it pulls the breechblock with it, as already explained. The slide cams up the carrier which lifts the shell in line with the chamber and the breechblock pushes the shell into the chamber.

e. As the hammer reaches the rearward position, it is caught and held by the nose of the trigger which acts as a sear. At the same time the trigger lock functioned by the slide lock engages with and blocks the trigger preventing its pulling. The trigger remains thus blocked until the slide has reached the extreme forward position and locked the breechblock. At this point the action bar lock, over which the slide has been riding, slips from under the slide and springs up in back of it to block

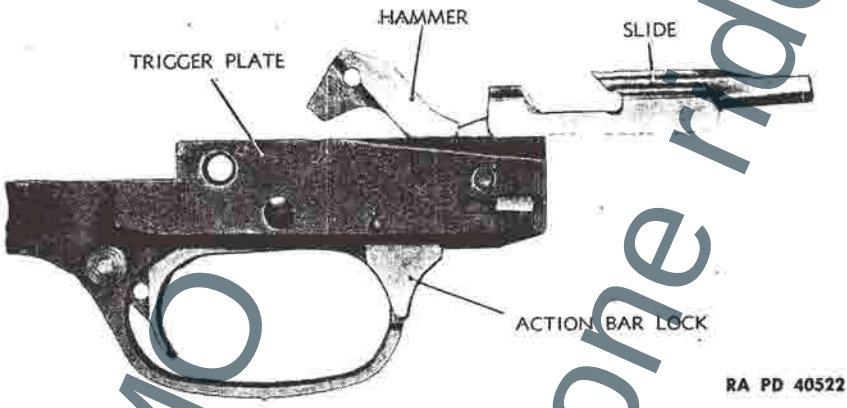


Figure 91—Slide and Trigger Plate Groups—Slide Riding Over Lock—Remington Shotgun M31

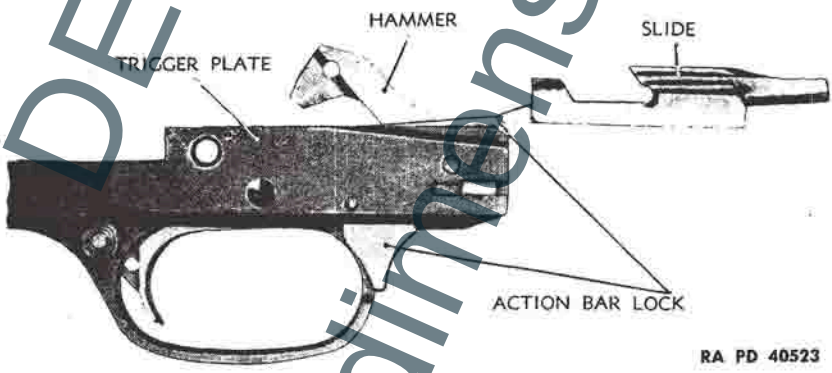


Figure 92—Slide and Trigger Plate Groups—Slide Blocked—Remington Shotgun M31

rearward movement of the slide (figs. 91 and 92). As the lock springs up, it disengages the trigger lock from the trigger, which is now free to be pulled.

f. The hammer is released to fire the gun by pulling the trigger, which levers the nose of the trigger, which acts as a sear, down from engagement with the seer notch in the hammer.

48. REMOVAL OF GROUPS (figs. 86, 93 and 94).

a. Groups and parts should be removed and replaced in the order given below. Groups and parts when removed should be placed on a clean, flat surface and care observed to prevent loss of screws and small parts. Remove as follows:

(1) BARREL.

(a) Press action bar lock located just forward of trigger plate bow, to release slide by disengaging lock, and pull fore end all the way to the rear (fig. 95). This disengages extractors from rear end of barrel.

(b) Rest gun on butt plate with magazine forward. Grasp barrel lock, located at forward end of magazine, pull down (rearward) until free of stud and pin on rear face of barrel lug, and hold against spring pressure (fig. 96). In 31-A grade guns the barrel lock is threaded and is disengaged by turning counterclockwise.

(c) Turn barrel clockwise ¼ turn and pull from receiver (figs. 97 and 98). The magazine is screwed into the receiver at manufacture and should not be removed.

(d) Close action by pushing fore end all the way forward.

(2) TRIGGER PLATE GROUP.

(a) Push out trigger plate pin, located just above trigger, from right to left. Turn gun bottom up and, with breechblock in forward position, depress action bar lock, located at forward end of the trigger plate bow, to disengage lock from slide.

(b) With lock disengaged, slide trigger plate forward until right and left side lugs aline with mating slots in walls of receiver and pull group upward out of receiver. Then remove right and left shell stops from inner walls of receiver by pressing inward on pivot studs projecting through receiver walls near lower edge. Stops will usually shake out.

(3) SLIDE, BREECHBLOCK, AND CARRIER GROUP.

(a) With receiver bottom side up and magazine facing to left, move action bar rearward by pulling fore end to rear until rear face of small lug on rear end of slide is alined with forward edge of trigger plate pin hole in receiver.

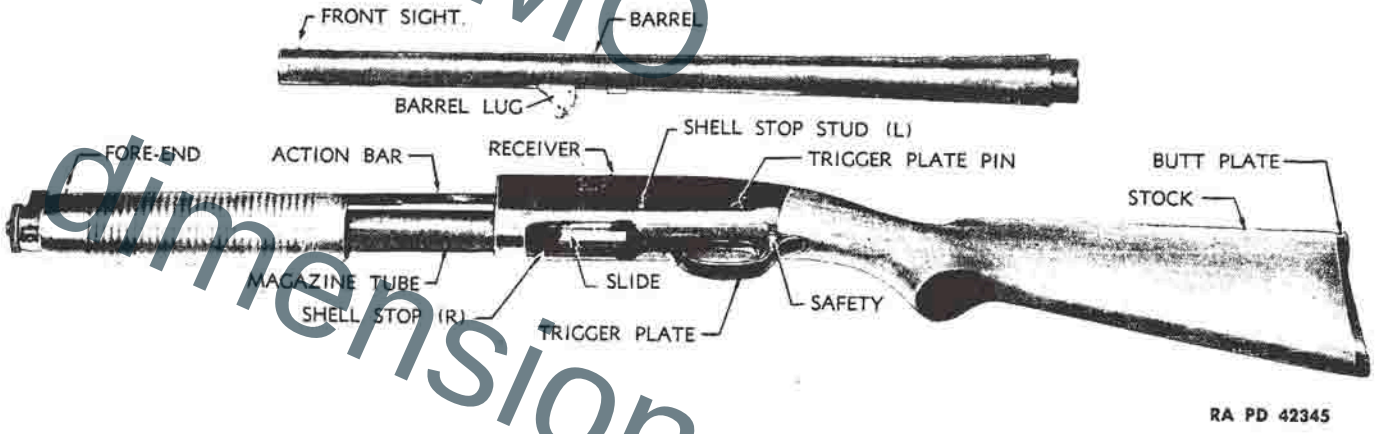


Figure 93—Gun Taken Down (Riot Type)—Left Side View—Showing Location of Parts—Remington Shotgun M31

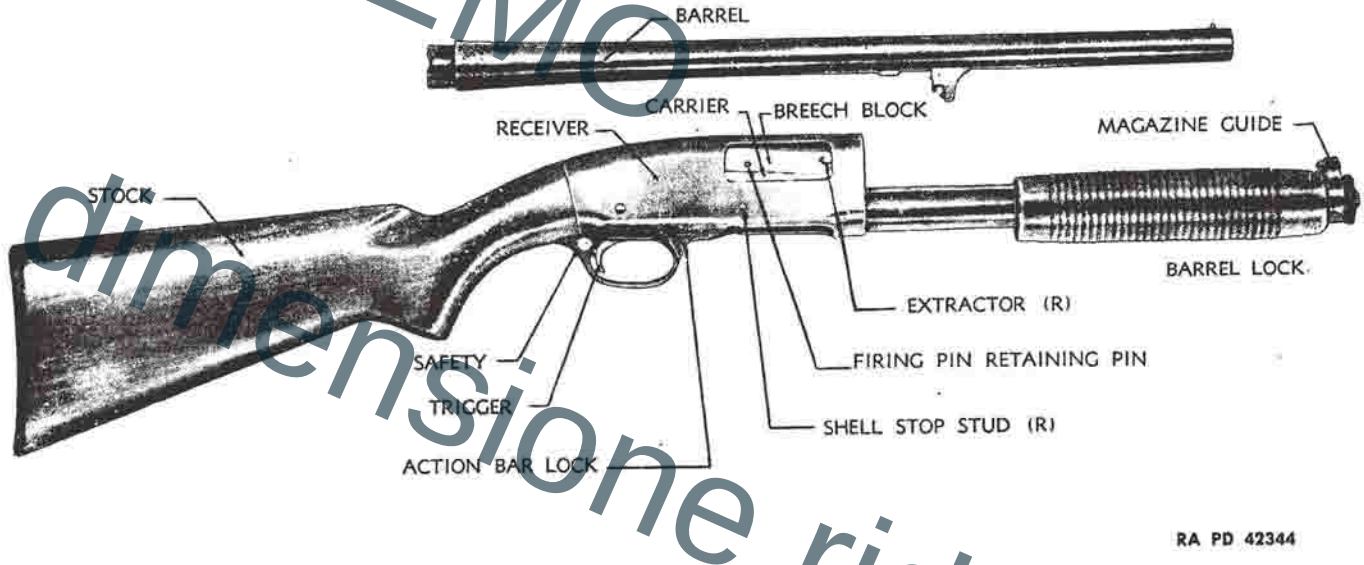


Figure 94—Gun Taken Down (Riot Type)—Right Side View—Showing Location of Parts—Remington Shotgun M31

(b) Lift slide horizontally to clear action bar lug and move disengaged action bar fully forward.

(c) Move slide slightly forward to disengage hook lug from breechblock and holding slide up disengaged from breechblock, move breechblock fully forward to locked position, holding carrier down against breechblock to keep ejector depressed.

(d) With carrier resting on breechblock, move slide forward until forward end of guides on side faces of slide are ⅛ inch to rear of the trigger plate lug slots in right and left sides of receiver.

(e) Lift up right side of slide and swing slide up and out sidewise from receiver. This can be done without effort when slide is properly positioned and can be removed only when properly positioned. Do not force.

NOTE: To remove the slide, the forward end of the carrier must be resting upon the breechblock. In this position, it clears and presses the ejector into its seating groove. If the carrier slips up from the breechblock, it cannot be depressed again until the ejector is pressed out of the way of the carrier arm. This can be accomplished by inserting a small tool through the ejection opening in the side of the receiver and to the rear of the breechblock to press the ejector back into its seat, and thus allow the carrier to be depressed against the breechblock.

(f) Swing forward end of carrier upward out of receiver until carrier is perpendicular to receiver; then press rear ends together to disengage trunnions from receiver. Then lift carrier up out of receiver.

(g) Press ejector back into its seat, lift rear end of breechblock to disengage from locking shoulder in receiver, move to rear and lift from receiver. Then, remove ejector by pulling outward and forward. If ejector spring is loose in ejector, it should be removed to guard against loss.

49. REPLACEMENT OF GROUPS.

a. Groups and parts should be thoroughly cleaned, lightly oiled and lubricated, if necessary, before replacing. Replace as follows:

(1) SLIDE, BREECHBLOCK AND CARRIER GROUPS.

(a) With gun bottom side up and magazine to left, pull action bar fully forward.

(b) Insert the ejector into its T-shaped seat in the left inner wall of the receiver. If ejector spring has been disassembled, replace it in its seat in rear inner face of ejector so that expanded spring coil holds spring in seat. To seat ejector, insert T-end, with spring towards receiver wall, into undercut vertical groove in ejector seat and push ejector back and towards receiver until seated against spring force. Do not lever ejector in towards receiver until forward end is mating with longitudinal groove of seat. Ejector should seat easily. Do not force.

Figure 104—Operating Safety—Remington Shotgun M11—Sportsman

Figure 105—Loading Magazine—Carrier Latch Button Depressed—Remington Shotgun M11—Sportsman

Figure 106—Retracting Breech Bolt—Remington Shotgun M11—Sportsman

Figure 107—Easing Breech Bolt Forward—Carrier Latch Button Depressed—Remington Shotgun M11—Sportsman

REMINGTON SHOTGUN, 12-GAGE, M11 AND SPORTSMAN

Figure 108—Gun Taken Down—Left Side View—Showing Location of Parts—Remington Shotgun, Sportsman

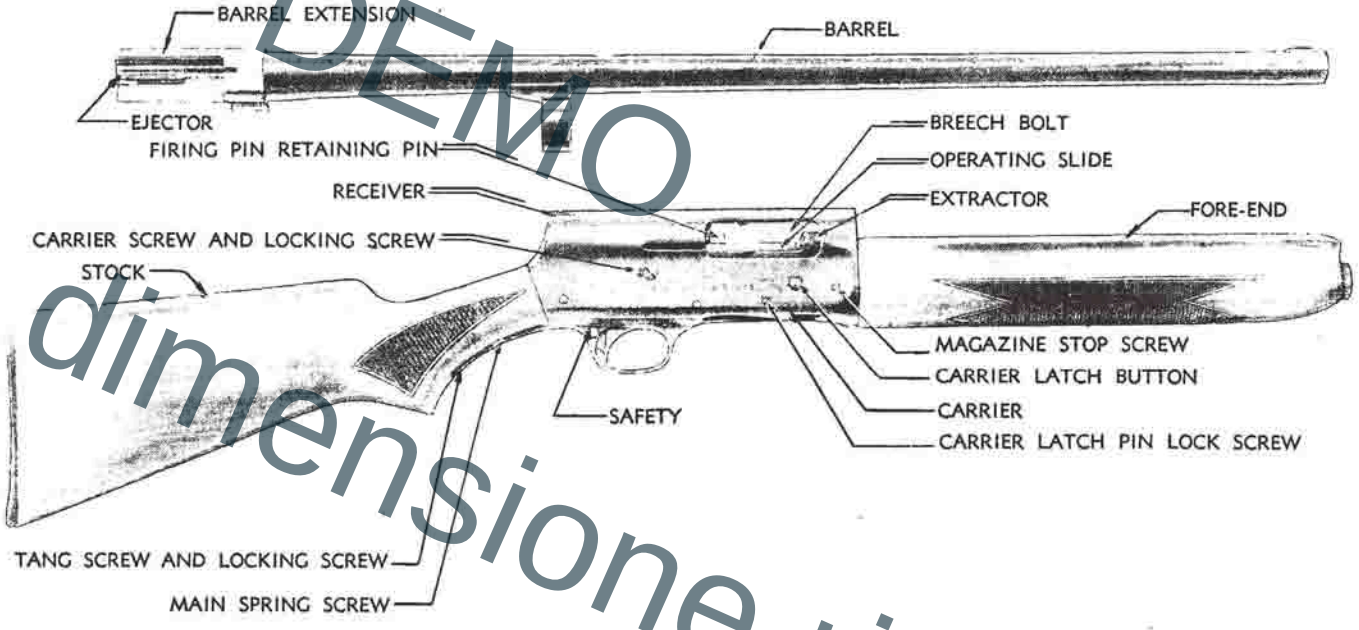


Figure 109—Gun Taken Down—Right Side View—Showing Location of Parts—Remington Shotgun, Sportsman

REMINGTON SHOTGUN, 12-GAGE, M11 AND SPORTSMAN

Figure 110—Disengaging Take-down Screw While Holding Fore End Against Spring Tension—Remington Shotgun, Sportsman

RA PD 42379

Figure 111—Removing Barrel from Magazine and Receiver—Remington Shotgun M11—Sportsman

REMINGTON SHOTGUN, 12-GAGE, M11 AND SPORTSMAN

(f) Replace fore end on magazine tube, press down against recoil spring, and screw in take-down screw or magazine cap (M11) to hold recoil spring, friction piece, and friction ring in position. Exercise care not to lose friction piece spring.

CAUTION: Do not press carrier latch button allowing breech bolt to spring forward after barrel is removed from receiver. To move bolt forward and remove tension from action spring, grasp operating slide handle firmly; then, press carrier latch button and ease bolt to forward position against force of action spring.

(2) BUTT STOCK. Due to expansion of action spring when breech bolt is removed, it is necessary to remove this spring before removing the groups from the receiver. To remove the spring, the butt stock must first be removed. This is accomplished by removing tang screw locking screw, and then the tang screw from under side of trigger plate tang (rear screw in tang), and pulling butt stock to rear from receiver and action spring tube. (If withdrawal of butt stock is difficult, remove trigger plate pin, press carrier latch button to release carrier, and press forward end of trigger plate upward slightly into receiver.)

(3) TRIGGER PLATE GROUP.

(a) With butt stock removed, remove trigger plate pin locking screw from lower left hand side of receiver (near center) and, using pin drift, drive out trigger plate pin from right to left.

(b) Remove trigger plate screw from lower rear corner of left side of receiver, and pull trigger plate group downward out of receiver.

(4) CARRIER.

(a) Press forward end of carrier spring from under retaining stud and remove spring from pivot stud. Be careful spring does not fly out when disengaging forward end.

(b) Remove locking screws and then, carrier screws from right and left sides of receiver and lift out carrier. Carrier screws are largest screws in sides of receiver, just to rear of center.

(5) ACTION SPRING.

(a) With butt stock, trigger plate and carrier removed, press in the wooden plug at rear end of action spring tube, and using pin drift, push out cross pin.

(b) Holding plug with finger against force of spring, withdraw drift slowly and ease plug and spring to rear out of tube. When fully expanded, pull plug, spring, and spring follower to rear out of tube.

(6) BREECH BOLT AND LINK. Recoil spring, friciton piece, and ring must be moved forward on the magazine tube before breech bolt can be removed from receiver.

(a) Move breech bolt until locking block latch pin alines with hole in left side of receiver to rear of shell stop. Then, using straight pin drift, push pin clear through breech bolt and receiver from right to left; then, withdraw pin drift slowly at same time holding down locking block latch against force of latch spring. When drift is removed, ease latch upward and remove latch and spring.

(b) Swing rear end of link downward to clear operating slide, and move breech bolt forward out of receiver with the link attached. The operating slide will slide out of the breech bolt as it moves forward and the handle of the slide strikes the forward edge of the ejection opening in the receiver.

57. REPLACEMENT OF GROUPS.

a. Groups and parts should be thoroughly cleaned, lightly oiled, and lubricated, if necessary, before replacing. Replace as follows:

(1) BREECH BOLT AND LINK.

(a) With recoil spring, friction piece, and ring moved forward on the magazine tube, slide the link and breech bolt, link first, into the forward end of the receiver, so that guides on lower face of breech bolt mate with guideways in receiver.

(b) Move breech bolt to rear into receiver until half the bolt has entered. Then, holding operating slide by the handle, slip rear end into receiver to rear of bolt, through ejection opening in right side. Hold slide parallel to bolt and move bolt to rear, at the same time mating guides on slide with guideways in right side of bolt. As slide enters bolt, move bolt to rear thus seating slide in bolt. The link must be pointed downward to accomplish the mating.

(c) Slide recoil spring, friction piece, and friction ring to rear on magazine tube, in their proper order and position and replace fore end to hold in place (par. 56 a (1) *(e)* and *(f)*).

(d) Slide breech bolt to rear until locking block latch pin holes in bolt and receiver aline, insert latch pin through left side of receiver and left wall of bolt to hold in position, then, replace latch spring in seat in bolt and place latch on top of spring with long flat end to rear and drilled lug down. Press latch down on spring, aline hole in latch with holes in receiver, and bolt and push pin through latch and bolt until flush with both sides of bolt. Move bolt to see that pin does not interfere with receiver.

(2) CARRIER.

(a) With receiver bottom side up, move breech bolt forward and push link towards top of receiver.

(b) With carrier dog up and to rear, slide carrier, beneath spring retaining stud, into receiver and aline screw holes in carrier with those in

receiver. Replace carrier screws; then, turn screws until cuts in screw heads aline with countersinks for locking screws and replace locking screws. (Catch threads in both carrier screws before tightening either screw. Be careful not to cross threads).

(c) Slide carrier spring onto the pivot stud in left rear of receiver so that short leaf rests on rear of carrier. Then, press down long leaf of spring and slip under retaining stud head just forward of pivot stud. Hold spring to prevent slipping from pivot stud while positioning long leaf.

(3) ACTION SPRING.

(a) With breech bolt forward, insert action spring follower first (assembled to spring) into rear end of action spring tube. Push through tube and mate rear nose of link with indent in follower.

(b) Press action spring into tube until head of wooden plug (assembled to spring) is flush with end of tube. Turn plug until pin hole in plug alines with that in tube and insert plug pin. Still holding plug, push pin through until flush with tube. A pin drift may be used to hold plug while inserting pin.

(4) TRIGGER PLATE GROUP.

(a) With the breech bolt forward and the hammer cocked, press trigger plate group, with tang to rear, horizontally upward into the rear under side of the receiver and adjust until pin and screw holes in trigger plate and receiver aline. If plate does not seat easily, retract operating slide slightly to allow safety sear to enter slot in link.

(b) Insert trigger plate pin from left side and push through until head is flush with face of receiver.

(c) Using screwdriver in slotted head of pin, turn pin until cut in pin head alines with locking screw countersink in receiver. Then replace locking screw.

(d) Insert trigger plate screw from left side of receiver, catch threads, and turn down tightly.

(5) BUTT STOCK.

(a) Push butt stock on over action spring tube until stock fits snugly and evenly against rear face of receiver, and tang screw hole in trigger plate tang and stock aline. Stock may be seated by striking butt smartly with heel of hand. Do not strike butt on hard surface.

(b) Replace tang screw and screw in tightly until cut in screw head alines with locking screw countersink in tang; then replace locking screw. If replacement of butt stock is difficult, remove trigger plate pin. Replace pin after assembly.

(6) BARREL AND FORE END.

(a) With breech bolt forward, fore end removed from magazine tube, and recoil spring, friction piece, and friction ring in their proper order

and position, hold gun in vertical position and rest butt of stock on firm surface.

(b) Slide the barrel extension into open end of receiver so that guides on barrel extension mate with guideways in receiver and barrel guide slips over magazine tube and bears on friction assembly on tube.

(c) Slide fore end on barrel and magazine tube as far as it will go.

(d) Grasp muzzle end of barrel and push barrel down into receiver against spring force until the barrel extension is wholly within the receiver. Then, press fore end down until it mates evenly with receiver and engage and screw down take-down screw (Sportsman) or magazine cap (M11) until tight. Pin in screw can be pushed out and used as a lever, if necessary. Be sure fore end is fully mated flush with receiver and take-down screw or magazine cap (M11) is tight.

(e) Release barrel and operate gun to test assembly.

58. USE OF FRICTION RING.

a. Proper use of friction ring and piece will reduce recoil and prevent excessive wear of parts. To change friction adjustment, remove fore end and barrel and assemble the recoil spring, friction piece (with friction spring assembled), and the friction ring as prescribed below.

(1) FOR HEAVY LOADS. When heavy loads are used, ranging from 3¼ to 3¾ drams (or equivalent) of powder, assemble as follows:

(a) Place the recoil spring on the magazine tube first so that it bears directly against the receiver. The Sportsman Model Gun has a stop ring on the magazine next to the receiver, held in position by a set screw. This ring should not be removed.

(b) Place the friction ring next on the magazine tube with the outside bevel to the rear against the recoil spring.

(c) Place the friction piece (with friction spring assembled) on the magazine tube ahead of the friction ring.

NOTE: Refer to figure 112, position 1.

(2) FOR LIGHT LOADS. When light loads are used, 3 drams (or equivalent) or less of powder, assemble as follows:

(a) Place friction ring next to receiver with outside bevel facing forward, away from receiver.

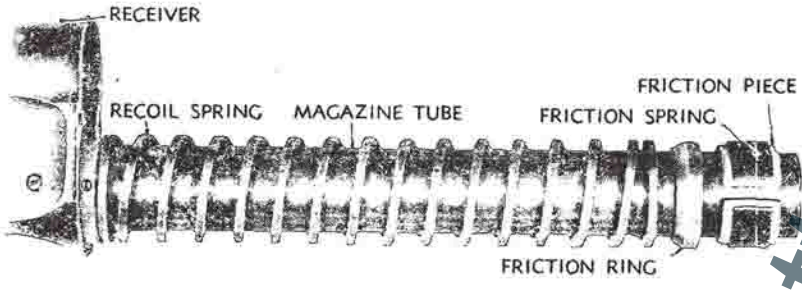
(b) Place recoil spring next to friction ring.

(c) Place friction piece (with friction spring assembled) next to recoil spring.

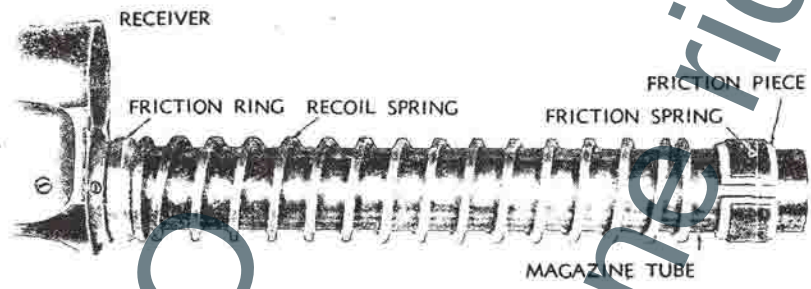
NOTE: Refer to figure 112, position 2.

(3) FOR USE WITH CUTTS COMPENSATOR. When the Cutts Compensator is mounted to the gun barrel, assemble as follows:

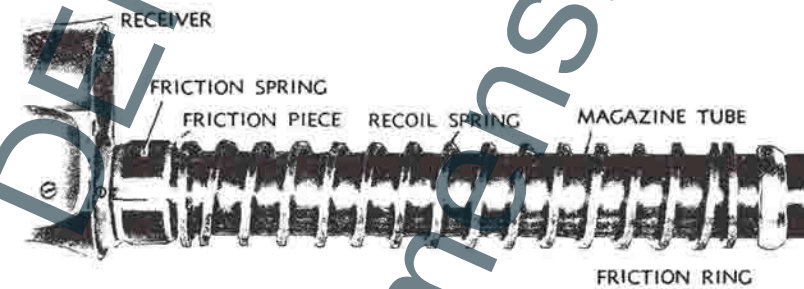
REMINGTON SHOTGUN, 12-GAGE, M11 AND SPORTSMAN



Sportsman—POSITION 1—Heavy Loads



Sportsman—POSITION 2—Light Loads



Sportsman—POSITION 3—With Cutts Compensator

Figure 112—Recoil Adjustments—Remington Shotgun M11

(a) Place friction piece (with friction spring assembled) next to receiver.

(b) Place recoil spring next to friction piece.

(c) Place friction ring next to recoil spring with outside bevel facing forward, away from spring.

NOTE: Refer to figure 112, position 3. The Cutts Compensator is a slotted tube, sometimes attached to the muzzle end of the barrel for the purpose of reducing recoil and controlling shot pattern.

(4) The friction is progressively reduced (subpar. *a* to *c* above), figure 112, positions 1 to 3. In order to reduce recoil and excessive wear of parts, use greatest friction possible which will give satisfactory functioning of gun. If gun fails to eject, however, try next lighter friction adjustment; if failures occur with position 1, try position 2; if failures occur with position 2, try position 3.

(5) Magazine tube should be kept free from foreign matter and rust and lightly oiled. If gun does not function smoothly and freely, lubricate friction piece and ring lightly.

59. FIELD INSPECTION.

a. With the gun completely assembled, test the mechanism for proper functioning. Fired shells may often be used for testing, when dummy shells are not available, by turning in the uncrimped end so that the length of the shell will approximate that of a live shell. Use of live shells for testing is prohibited.

CAUTION: Keep fingers clear of ejection opening and path of operating slide handle as bolt moves forward with considerable force when released and may cause injury to operator. Be sure gun is fully unloaded before inspection.

b. Operate the gun as follows:

(1) Grasping fore end with left hand and, operating slide handle with right hand, pull breech bolt all the way to the rear until bolt is caught and hung by carrier dog. Barrel should remain in forward position.

(2) With bolt hung in rearward position, press carrier latch release button and allow the bolt to spring forward. The bolt should spring forward smartly to the extreme forward position to lock with the barrel.

(3) Load a dummy shell into the magazine (par. 54 **f**). Retract breech bolt fully by means of operating slide and attempt to hang bolt in rearward position. Bolt should not hang, due to shell bearing on carrier latch (par. 55 **d**).

(4) Allow bolt to spring forward to load the shell into the barrel chamber. Retract bolt fully by means of operating slide to eject the shell and attempt to hang bolt. Bolt should hang, as there is no longer a shell in the receiver to bear upon the carrier latch.

(5) Test gun for doubling as follows:

(a) With gun fully unloaded, pull bolt fully to the rear by means of the operating slide handle until it is hung by the carrier dog.

(b) Hold bolt thus with right hand, and with the left hand press carrier latch button to release the bolt, and ease bolt forward just enough to release it from the hung position (about ¼ in.). Then, with left hand, pull the trigger.

(c) Holding trigger retracted, ease bolt slowly forward to the locked position.

(d) Then ease pull on trigger slowly until entirely removed and the trigger moves forward. The hammer should not release to fire the gun during the slow release of the trigger.

(e) When trigger is fully released, pull it again. The hammer should release to fire the gun when the trigger is thus pulled.

NOTE: This test is to insure that the gun will not double (fire automatically) if the trigger is not released (c (10) below). To insure the gun will not double, it is desirable that the movement of the trigger at the center point of finger contact be not less than 1/16 inch.

(6) Retract the bolt fully and, then, holding operating slide, press carrier latch button and allow the bolt to close slowly. Release and attempt to pull the trigger at intervals during the closing of the bolt. The trigger should not pull to fire the gun until the operating slide handle is within 1/16 to ⅛ inch from the normal forward position. This test is to make sure that the gun will not fire until the locking block is engaged with the recoil shoulder of the barrel extension and bolt and barrel thus locked together.

(7) Retract bolt fully and then allow it to move fully forward to the locked position, thereby cocking the hammer. Then, push the trigger safety all the way to the right and attempt to pull the trigger. The trigger should not pull nor the hammer be released to fire the gun.

(8) Push the safety all the way to the left and attempt to pull the trigger. The trigger should pull and the hammer be released.

c. When the gun does not operate and function smoothly when tested as above, damaged or improperly assembled parts are indicated as follows:

(1) BOLT DOES NOT HANG IN REARWARD POSITION WITH GUN UNLOADED. May be due to broken or worn carrier dog, worn retaining

notch of operating slide or link shoulder, broken or missing carrier latch spring, broken carrier latch or foreign matter under forward end of latch.

(2) BOLT DOES NOT SPRING FORWARD SMARTLY WHEN RELEASED. May be due to broken action spring, link broken or improperly seated in action spring follower, jammed or broken carrier or carrier latch, broken locking block latch or broken or missing latch spring.

(3) BOLT DOES NOT LOCK TO BARREL. May be due to foreign matter in receiver or barrel extension, burred locking block or locking apertures in barrel extension, or broken or jammed locking block latch spring.

(4) CARRIER DOES NOT FUNCTION TO HANG BOLT OR LIFT SHELL. May be due to broken carrier dog or follower spring, jammed or broken carrier latch, foreign matter in mechanism, or worn or broken operating slide.

(5) CARRIER DOES NOT RETURN TO LOWER POSITION. May be due to broken or improperly assembled carrier spring, or jammed or broken carrier latch.

(6) SHELL DOES NOT SPRING FROM MAGAZINE WHEN RELEASED. May be due to broken or kinked magazine spring, dented tube, bent follower, or foreign matter or rust in tube.

(7) HAMMER DOES NOT COCK OR SLIPS. May be due to worn or broken hooks on trigger, or notches in hammer, broken trigger or mainspring, or foreign matter in mechanism.

(8) SAFETY SEAR DOES NOT RELEASE TRIGGER WHEN BOLT IS LOCKED. May be due to broken or jammed safety sear spring follower, or damaged safety sear.

(9) TRIGGER SAFETY DOES NOT OPERATE. May be due to burred web on rear of trigger, burs in slot in safety, broken, or bent leaf on trigger spring which bears on safety ball, or foreign matter in aperture.

(10) HAMMER IS RELEASED WHEN TESTED (par. 59 b (5)). May be due to worn or broken hooks on hammer or trigger, foreign matter in notches, or spread or broken upper U-end of trigger.

(11) THE FOLLOWING MALFUNCTIONS MAY OCCUR WHEN GUN IS FIRED:

(a) Barrel Is Not Unlocked From Breech Bolt. May be due to broken or damaged carrier dog or carrier latch, worn operating slide notch, or broken slide.

(b) Shells Do Not Eject. May be due to broken ejector in barrel extension, broken extractor or incorrect friction adjustment (par. 58 a (4)).

(c) Shell Stop Does Not Function. May be due to broken stop or broken or missing stop spring.

(d) Two Shells Enter Receiver at Once (Double Feeding). May be due to broken carrier latch or carrier dog.

d. Inspect barrel and test trigger pull (par. 3 *n*).

e. In addition to inspection of the gun for operation and functioning, the gun should be inspected generally for condition and defects noted. Attention should be directed to such defects as cracked wooden parts, cracked or deformed metal parts, dented or rusted magazine tube, loose screws and pins, loose or binding parts or assemblies, loose barrel or magazine, loose stock or butt plate, rust, dents, burs, or excessive wear of parts. If defects are such that early malfunction of the gun is indicated, the gun should be turned over to ordnance personnel for inspection and correction.

f. Where defects and malfunctions cannot be remedied by cleaning, lubrication and simple adjustments of assembly, which lie within the scope of using troops, the gun should be turned over to ordnance personnel for a thorough inspection, correction and/or repair.

g. Removal of burs on working parts, trigger adjustments and like corrections should not be attempted by using troops, as stoning of parts must be exacting, the angle of the faces concerned must not be changed, and volume of metal must not be materially reduced.

h. In addition to inspection of the barrel (**d** above), it should be inspected for looseness and alinement in the barrel extension. The draw marks on barrel and barrel extension should be in alinement as misalinement of these parts will cause binding of the barrel guide with the magazine tube and affect the functioning of the gun when assembled. If misalinement is evident, the gun should be turned over to ordance personnel for correction.

i. If shell appears unnecessarily loose in chamber with breech bolt locked, the gun should be turned over to ordnance personnel to be checked for headspace and worn locking block.

j. Adjustment and maintenance of the gun in the case of using troops is limited to the removal and replacement of the parts and groups of parts, as outlined in paragraphs 56 and 57, together with cleaning, lubrication, and such adjustments as are necessary in assembling the gun as outlined.

60. CLEANING AND LUBRICATION.

a. Cleaning, oiling, and lubrication may be accomplished in a manner

similar to that described for the Winchester Gun M97 (par. 11). Attention should be given to corresponding parts and surfaces when lubricating.

b. The fore end and barrel should be removed from the receiver for cleaning the bore, and for thorough cleaning, the groups should be removed from the receiver and assemblies cleaned, oiled and lubricated as directed.

c. Points to lubricate are:

(1) Outer surface of barrel extension and barrel extension guides.

(2) Friction piece and friction ring when necessary, where they bear on magazine tube. Tube should be kept clean and lightly oiled. Too much oil will reduce friction, and prevent proper functioning of gun (par. 58 a (5)).

(3) Breech bolt guides and surface, occasionally.

(4) Link pin, connecting locking block with link.

(5) Locking block guides.

(6) Trigger and hammer pins.

(7) Carrier (trunnion) screws.

(8) Action spring follower. Spring should be removed occasionally and tube cleaned and oiled.

(9) Safety sear stud and spring follower.

d. Oiling and lubrication should be light, as excess oil collects foreign matter and powder residue which will become gummy, impede functioning of gun, and produce undue wear of parts. In very cold climates, oiling and lubrication should be reduced to a minimum. Only surfaces showing signs of wear should be lightly oiled. Refer to "Special Maintenance," section XI.

Section IX

SAVAGE SHOTGUN, 12-GAGE, M720

61. DESCRIPTION.

a. Identification marks on this gun are generally to be found as follows:

(1) Name of maker and model number of the gun are stamped on the left side of barrel near the rear end, and the chamber length and gage size in the corresponding position on the right side of the barrel.

(2) The word "SAVAGE" is embossed on the left side of the receiver.

(3) The serial number of the gun is stamped on the forward lower face of the receiver and the left side of the trigger guard tang.

(4) The letters U.S. are stamped on the forward left face of the receiver.

b. This gun (figs. 113 and 114) is an autoloading or semiautomatic shotgun similar in every way to the Remington Gun M11 covered in Section VIII, which varies slightly from the Sportsman Model. Like the Remington gun this gun is recoil operated, the force generated by the expanding powder gas acting against the breech bolt on the recoil movement, together with the force generated by the compressed recoil and action springs on the counterrecoil movement, operates the mechanism of the gun to load, feed, extract and eject the shell, and cock the hammer. The trigger must be pulled each time to fire the gun.

c. This gun is so constructed that the barrel can easily be removed from the receiver by removal of the magazine cap and pulling fore end and barrel from the receiver. This construction facilitates cleaning and transportation.

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RA PD 40555

Figure 113—Left Side View—Riot Type—Savage Shotgun M720

RA PD 40556

Figure 114—Right Side View—Riot Type—Savage Shotgun M720

AMMUNITION

b. Table of Fire. The following table indicates the pattern or dispersion as a percentage of the total number of shot falling within a circle of 30-inch diameter at the range indicated. The approximate pattern spread is also indicated. These values are only approximate since there is considerable variation in shotgun ballistics. This variation may be due not only to a particular loading but also to atmospheric conditions.

Table V.

Range, in yards	Guard or combat load[1]		Sporting trap,[2]	Sporting trap or sporting skeet load[3]	Sporting skeet load,[4] fired in 26-inch cylinder bore barrel
	Fired in 30-inch full choke barrel	Fired in 26-inch cylinder bore barrel	Fired in 30-inch full choke barrel	Fired in 26-inch cylinder or skeet bore barrel	
5	100%	100%	—	—	—
10	100%	100%	—	—	—
15	100%	100%	—	—	—
20	100%	100%	100%	75%	87%
25	100%	100%	100%	57%	66%
30	100%	100%	90%	45%	59%
35	90%	70%	80%	40%	43%
40	75%	60%	70%	33%	33%
45	—	—	—	—	—
50	50%	38%	—	—	—
55	—	—	—	—	—
60	35%	25%	—	—	—
Maximum effective range	60-75 yd	60-75 yd	45-50 yd	30-35 yd	25-30 yd
Pattern spread per yd	¾ in.	1 in.	9/10 in.	1⅛ in.	1⅛ in.

[1] Contains 9 (1⅛ oz) No. 00 buckshot.
[2] Contains 445±15 (1¼ oz) No. 7½ chilled shot.
[3] Contains 435±15 (1⅛ oz) No. 7½ chilled shot.
[4] Contains 660±40 (1⅛ oz) No. 9 chilled shot.

97. DEFECTS FOUND AFTER FIRING.

Name of defect	How to recognize	Common causes—precautions
Misfire	No action on firing. Primer shows normal impression of firing pin.	Primer is defective.
	No action on firing. Primer shows light impression of firing pin.	Indicates mechanical defect in weapon as short or broken firing pin, weak firing pin spring, bolt of weapon not being completely locked, or grease in firing pin hole which cushions blow of firing pin, or caused by defective shell or primer.
	No action on firing. Primer shows normal impression of firing pin, but off center.	Defect in weapon.

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Name of defect	How to recognize	Common causes—Precautions
Hangfire	Delayed ignition of powder in the shell.	Small or decomposed primer pellet, damp powder or light blow of firing pin caused by dirt or defect in weapon. This is a serious defect if delay is long enough to permit the bolt to be opened before the powder burns completely, in which case, injury to firer or damage to weapon, or both, may result. A hangfire in some shotguns may even force the breech open. For precautions, see paragraph 93.
Pierced primer	Perforation of primer cup by the firing pin. Discoloration around indent of very small perforation. Disk from large perforation blown into action of gun, with such an escape of gas as to lower velocity of the shot.	Imperfect firing pin or very thin metal in base of primer cup.
Primer leak	Discoloration around the primer and the metal head. Slight discoloration when primer leak is small, or heavy for a large primer leak.	Too small a primer, too large a primer hole, or excessive pressure generated by propelling charge.
Blown primer	Primer is blown completely from pocket of metal head or case.	Seldom encountered.
Primer setback	Primer protrudes above the metal head.	Defective bolt or shell or excessive pressure.
Leak back of case	Discoloration along the shell body or case.	Escape of gas into the action of weapon.
Failure of case to extract	Failure of case to extract.	Defective extractor or shell, a swollen case or dirty chamber.
Blowback	Escape of gas to the rear.	Pierced primer, primer leak, blown primer, and ruptured shell case.
Split body	Longitudinal split in shell body or case, thereby reducing velocity of the shot.	Case of body made of defective materiel.
Complete rupture	Circumferential separation completely around shell body or case, causing it to separate into two parts.	Bad bolt locking, excessive headspace, or defective shell case. This is a serious defect, because if the forward portion of the case remains in the chamber, it will cause the next round to jam.
Partial rupture	Partial circumferential separation around shell body or case.	See "Complete rupture."

98. FIELD REPORT OF ACCIDENTS.

a. Any serious malfunctions of ammunition must be reported promptly to the ordnance officer under whose supervision the materiel is maintained or issued (par. 7, AR 45-30).

Section XIV

REFERENCES

99. STANDARD NOMENCLATURE LISTS.

a. Cleaning, preserving and lubricating materials, recoil fluids, special oils, and similar items of issue. SNL K-1

b. Shotguns—parts, equipment and appendages. SNL B-9

c. Shells, shotgun SNL T-3

d. Soldering, brazing and welding material, gases and related items SNL K-2

e. Tools, maintenance, for repair of small and hand arms and pyrotechnic projectors SNL B-20

f. Truck, small arms repair, M1—parts, equipment and load SNL G-72

Current Standard Nomenclature lists are as tabulated here. An up-to-date list of SNL's is maintained as the "Ordnance Publications for Supply Index". OPSI

100. EXPLANATORY PUBLICATIONS.

a. Ammunition.

(1) Ammunition, general TM 9-1900

(2) Small-arms, ammunition TM 9-1990

(3) Qualifications in arms and ammunition training allowances AR 775-10

b. Gas Attack.

Defense against chemical attack FM 21-40

Decontamination, 1941 TC No. 38

Military chemistry and chemical agents TM 3-215

c. Maintenance.

Cleaning, preserving, lubricating and welding materials and similar items of issue by the Ordance Department TM 9-850

Ordnance Maintenance: shotguns, all types TM 9-1285

Ordnance maintenance procedure: materiel inspection and repair TM 9-1100

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d. Ordnance Storage and Shipment.	
Marking shipments of ordnance supplies	IOSSC-(b)
Ordnance storage and shipment chart—Group B—Major items	OSSC-B
e. Ordnance field service in time of peace	AR 45-30
f. Shooting and Targets.	
Shotgun and skeet shooting	TM 1-1100
Targets, target materials, and rifle range construction	TM 9-855
g. Instruction guide: small arms data	TM 9-2200

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION: R 9(2); IBn 9(1); IC 9(4), 11(30), 19(8).
(For explanation of symbols, see FM 21-6)