



# OPERATOR'S MANUAL



**HEAVY MACHINE GUN, .50 CAL, M2HB/QCB**

# SAFETY INFORMATION

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## Warning

Hearing protection must be worn when firing this weapon.

Headspace should be checked and adjusted before firing weapon, after assembling weapon, and after replacing barrel.

Improper headspace and timing can cause malfunctions, damage to the gun, and injury to personnel.

When bolt latch release and trigger are both held down, machine gun will fire automatically (flex only).

Immediate action should be applied to a hot weapon within 10 seconds (cook-off). If round is not removed within 10 seconds, wait 15 minutes. Keep the weapon trained on the target.

Never open the cover on a hot weapon. An open cover cook-off could occur and result in serious injury or death.

When machine gun has been in action, clear machine gun before anyone moves in front of the muzzle. Clearing consists of unloading the machine gun and visually inspecting weapon to ensure all rounds have been removed. Do not release the bolt or press the trigger.

Chemical resistant gloves must be worn while using dry cleaning solvent.

Do not expose ammunition to the direct rays of the sun.

Do not oil or grease ammunition. Oiled cartridges will produce excessive chamber pressure.

Be sure to clear weapon before disassembling, cleaning, inspecting, transporting, or storing.

Do not remove backplate unless the bolt is in forward position.

Do not attempt to charge machine gun without the backplate assembled to machine gun. Stand to one side when removing backplate.

Never attempt to lift machine gun by the backplate group assembly in the upright position.

To prevent accidental firing, immediately after a firing exercise, request unit maintenance remove the side plate trigger assembly from the receiver when the M2 flex machine gun has been used on the M63 antiaircraft mount. The side plate trigger is to be stored in the container attached to the M63 antiaircraft mount.

Heat protective mitten should be used when barrel is hot.

Do not close cover when bolt is held rearward as damage may occur when bolt goes forward.

Never remove the backplate assembly from any weapon until the chamber has been cleared.

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# CHAPTER 1-INTRODUCTION

## SECTION I. GENERAL INFORMATION



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### Scope

*Type of Manual:* Operator's Manual.

*Model Number and Equipment Name:* Browning Machine Gun, Caliber .50; M2, heavy barrel, flexible type, and M48 turret type, soft mount, and fixed type machine guns. For maintenance of the M3 Tripod Mount, MK 93 MOD 0 and MOD 1 Mounts refer to TM 9-1005-245-13&P. Marine Corps users refer to TM 9-1010-231-13&P for MK 64 Mount maintenance procedures.

## SECTION II. EQUIPMENT DESCRIPTION



**Purpose of Equipment:** To provide automatic weapon suppression fire for offensive and defensive purposes. This weapon can be used effectively against personnel, light armored vehicles, and low flying, slow flying aircraft. The caliber .50, M2 flexible version is used as a ground gun on either the M3 Tripod Mount or with the MK 93 MOD 0 Mount on the M3 Tripod. The caliber .50 M2, M48 turret type, fixed type and soft mount are installed on mounts of several different types of combat vehicles and ships.

### MAINTENANCE FORMS AND RECORDS.

Department of Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

Navy users refer to applicable preventive maintenance instructions. Marine Corps forms and procedures for equipment maintenance will be those prescribed by TM 4700-15/1. Air Force users refer to TO 11 W1 -1-10 for applicable forms and records.

### CORROSION PREVENTION AND CONTROL (CPC).

Corrosion Prevention and Control (CPC) of Army material is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, Quality Deficiency Report. Use of key words such as 'corrosion', 'rust', "deterioration", or "cracking" will assure that the information is identified as a CPC problem. The form should be submitted to: Commander, US Army Armament, Research, Development and Engineering Center, ATTN: AMSTA-AR-QAW, Rock Island, IL 61299-7300. Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10, Quality Deficiency Report, to: Commander, Marine Corps Logistics Base (Code 808), Albany, GA 31704-5000.

### Equipment characteristics, capabilities and features

The caliber .50 machine gun, Browning, M2, Heavy Barrel, Flexible:

- a. is a belt-fed, recoil-operated, air-cooled, crew-served machine gun. The machine gun is capable of firing single-shot and automatic. Is capable of right and left-hand feed.
- b. is used as a ground gun mounted on the M3 tripod mount, MK 56 MOD 0 and four gun mounts (Navy), MK 93 MOD 0 and MOD 1 mount, or is installed on the M66 ring mount of several different types of combat vehicles.

The caliber .50 machine gun, Browning, M2, Heavy Barrel, M48 Turret type:

- a. is an air-cooled, recoil-operated, alternate-feed, automatic, crew-served weapon.
- b. is mounted on the M1 and M1A1 Abrams main battle tank commander's station.

The caliber .50 machine gun, Browning, M2, Heavy Barrel, Soft Mount type:

- a. Is mounted on the MK 26 Mod 15, 16, and 17 gun mounts.
- b. Is a belt-fed, recoil operated, air-cooled, crew served machine gun.

The caliber .50 machine gun, Browning, M2, Heavy Barrel, Fixed Type:

- a. Is mounted on the MK 56, Mod 0 and 4 gun mounts.
- b. Is a belt-fed, recoil operated, air-cooled, crew served machine gun.
- c. Is primarily fired by a solenoid and requires a 24-28Vdc power source.

**The M3 Tripod Mount:**

Is a lightweight, portable folding mount which permits a high degree of accuracy and control of fire. Refer to TM 9-1005-245-13&P.

**The MK 93 MOD 0 Mount:**

Is an advanced soft recoil (for M2) dual purpose cradle mount to be used on the M3 Tripod or as part of the HMMWV vehicle mount MK 93 MOD 1 (which includes the carriage (MK 93 MOD 0), 40mm ammo can bracket, .50 cal ammo can bracket, T&E mechanism, MK 175 adapter and the catch bag assembly).

## Differences Between Models

ASSEMBLY	FLEX	SOFT MOUNT	TURRET TYPE	FIXED TYPE
Machine Gun Barrel (PIN 7266131)	X	X	X	X
Back Plate Assembly (PIN 6535477)		X		
Back Plate Assembly (P/N 5564311)			X	
Back Plate Assembly (PIN 5985102)		X		
Back Plate Assembly (PIN 2866381)				X
Breech Bolt Assembly (PIN 6528322)	X	X	X	X
Barrel Extension Assembly (PIN 5504082)	X	X	X	X
Retracting Slide Assembly (PIN 11010439)	X	X		X
Cover Assembly (P/N 6528309)	X	X	X	X
Receiver Assembly (PIN 6535480)	X	X	X	X
M10 Manual Charger (PIN 7267982)			X	X
Rear Sight Assembly (P/N 12003047)	X			
Barrel Carrier Assembly (P/N 5504080)	X			
Top Cover Plate (P/N 6008939)		X	X	
Front Sight Assembly (P/N 6085990)		X		
Electrical Solenoid Assembly (PIN 2846714)				X

Procedures are written for M2 Machine Gun (flexible) but apply to all models except where noted.

## Equipment data

Weight of gun (approx).....	84 lb (38.10 kg)
Weight of barrel .....	26 lb (11.79 kg)
Length of gun.....	65.13 in. (165.43 cm)
Length of barrel .....	45 in. (114.30 cm)
Length of rifling (approx) .....	41.88 in. (106.38 cm)
Number of lands and grooves .....	8
Twist, right-hand.....	one turn in 15 in. (38.10 cm)
Feed .....	link-belt
Operation.....	short recoil
Cooling .....	air
Muzzle velocity (approx) .....	3,050 fps (929.64 mps)
Maximum range (approx) .....	7,400 yds (6,767 m)
Maximum effective range (approx).....	2,000 yds (1,829 m)

### Rates of Fire:

*Single Shot* - Place gun in single shot mode and engage target with well aimed shots. The caliber .50 machine gun is extremely accurate and can effectively engage targets out to 2,000 yards (1,829 m). Change barrel at end of firing day, or if the barrel is damaged.

*Slow Fire* - Slow fire is less than 40 rounds per minute, fired in bursts of six to nine rounds, at 10-15 second intervals. Change barrel at the end of the firing session or if the barrel is damaged.

*Rapid Fire* - Rapid fire is greater than 40 rounds per minute, fired in bursts of six to nine rounds, at 5-10 second intervals. Change barrel at the end of the firing session or if the barrel is damaged.

*Cyclic Fire* - This rate represents the maximum amount of ammunition that can be expended by a gun without a break in firing. The cyclic rate of this caliber .50 machine gun is 400 to 550 rounds per minute. Change barrel at end of firing session, or if the barrel is damaged.

# CHAPTER 2-OPERATING INSTRUCTIONS

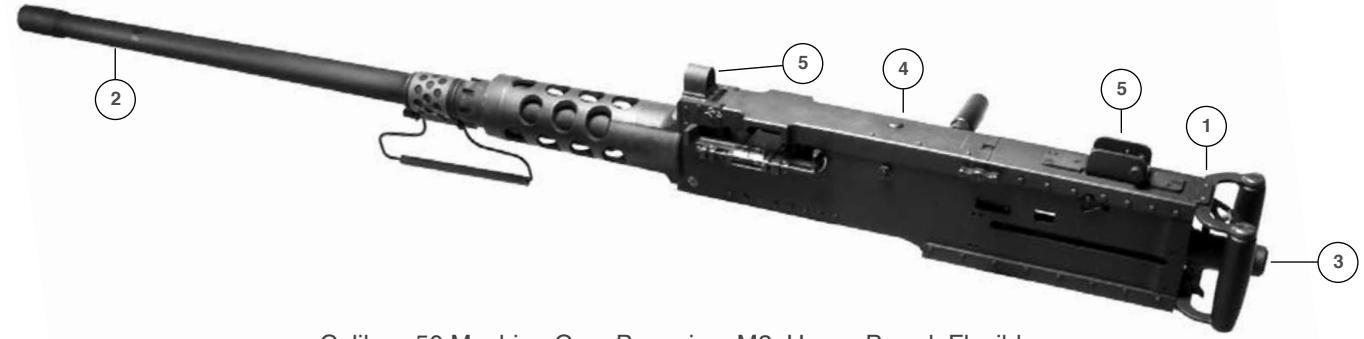
## SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS



### General

Familiarize yourself with the following parts before operating the machine guns and various mounts.





Caliber .50 Machine Gun, Browning, M2, Heavy Barrel. Flexible

**Back Plate** (1) houses trigger and buffer tube.

**Barrel** (2) has rifling to give bullet spin for accuracy and a chamber for firing the cartridge.

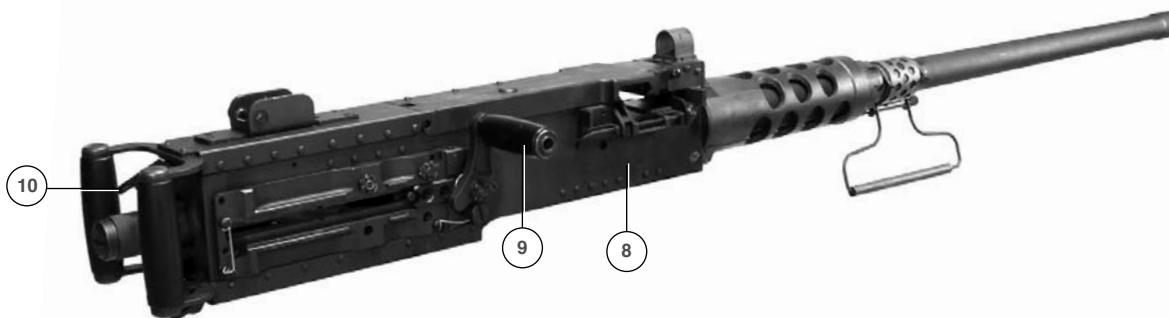
**Buffer Tube Sleeve** (3) locks the bolt latch release in the open position to permit the machine gun to fire automatic or the unlocked position for single shot (flexible type only).

**Cover** (4) feeds the belt and positions and holds the cartridges for chambering.

**Front And Rear Sights** (5) zero and accurately sight the machine gun (flexible type only).



Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, M48 Turret Type



Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, Flexible

**M10 Manual Charger** (6) has a cable and CHARGING HANDLE (7) for cocking the machine gun (M48 turret type and fixed type only).

**Receiver** (8) houses the internal components of the machine gun and serves as support for entire machine gun.

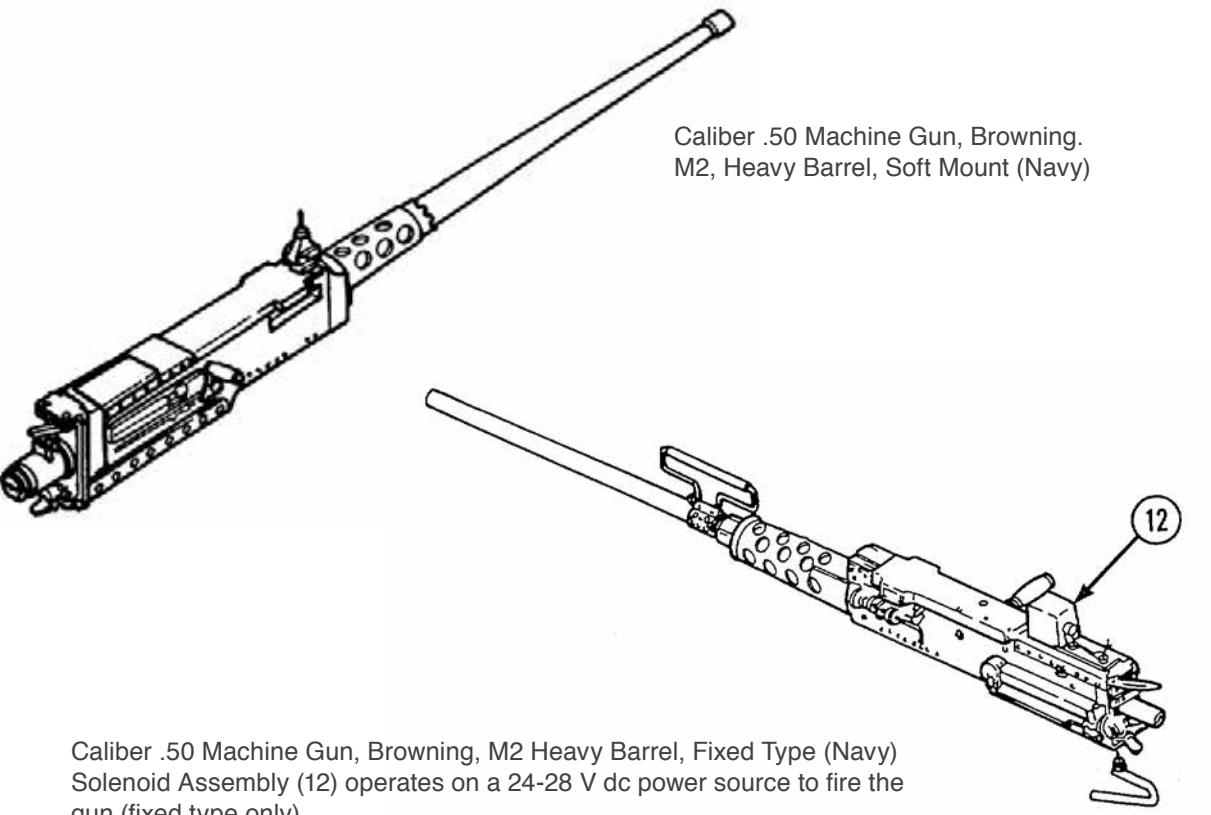
**Retracting Slide Handle** (9) is used for cocking the machine gun (flexible type and soft mount type only).

**Trigger** (10) controls the firing of the machine gun.

**Safety** (11) slides to select fire or no fire (M48 turret type and fixed type only).

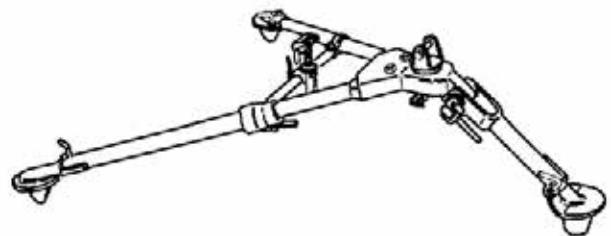


Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, M48 Turret Type

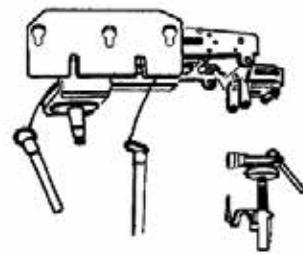


Caliber .50 Machine Gun, Browning, M2 Heavy Barrel, Fixed Type (Navy)  
Solenoid Assembly (12) operates on a 24-28 V dc power source to fire the  
gun (fixed type only).

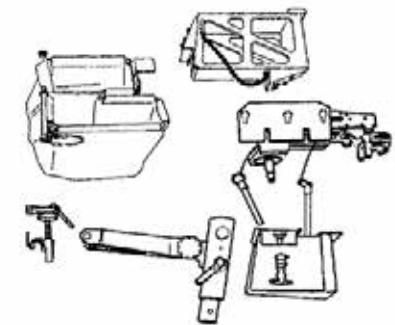
M3 Tripod Mount Refer to TM 9-1005-245-13&P.



Mk 93 Mod 0 Machine Gun Mount



Mk 93 Mod 1 Machine Gun Mount  
Refer to TM 9-1005-245-13&P.





## SECTION II. PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

### General

**a. General.** Your PMCS table has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

**b. Warnings and Cautions.** Always observe the WARNINGS and CAUTIONS appearing in your PMCS table BEFORE, DURING, and AFTER you operate the equipment. The warnings and cautions appear before certain procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent damage to your equipment.

### Explanation of Table Entries

**a. Item number column.** Numbers in this column are for reference. When completing DA Form 2404, Equipment Inspection and Maintenance Worksheet, include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

**b. Interval column.** This column tells you when you must do the procedure in the procedure column. BEFORE procedures must be done before you operate or use the equipment for its intended mission. DURING procedures must be done during the time you are operating or using the equipment for its intended mission. AFTER procedures must be done immediately after you have operated or used the equipment.

**c. Check/Service column.** This column provides the location and the item to be checked or serviced. The item location is underlined.

**d. Procedure column.** This column gives the procedure you must do to check or service the item listed in the Check/Service column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.

**e. Not fully mission capable if: column.** Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you make check and service procedures that show faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
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**WARNING: BEFORE PERFORMING PMCS, MAKE SURE WEAPON IS CLEAR OF LIVE ROUNDS.**

**NOTE: If any procedure does meet “Not Fully Mission Capable If:” criteria, notify unit maintenance.**

1	Before	Barrel Assemblies	Check barrels for obstruction, abnormalities, or damage.	Barrels are obstructed or damaged.
2	Before	Machine Guns (M2 Flex and M48 TT)	Hand operate the machine gun. Check to ensure that all moving parts are clean, lightly oiled and function freely. Check/adjust headspacing/ timing (p 31, 38). Notify unit maintenance If headspace and timing cannot be obtained. Check all BII is present and serviceable (p 148).	Weapon will not function. Proper headspacing/timing cannot be obtained. One or more BII items missing or unserviceable.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
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**NOTE: The following checks are for the M48 turret type and fixed type only.**

3	Before Charger	M10 Manual	a. Inspect safety wire to ensure presence.  b. Inspect charger bolt cover and channel housing for deformation, cracks, and damage.  c. Inspect charger cable assembly for kinks, broken strands, and loose or missing ball ends.  d. Inspect pulleys for burrs, elongated holes, and distortion.	Safety wire is missing.  Charger bolt cover is deformed, cracked, or damaged.  Charger cable assembly has broken strands or loose or missing ball ends.  Pulley has burrs or elongated holes or is distorted.
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ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
3	Before Charger	M10 Manual	<p>e. Inspect latches for wear and if broken.</p> <p>f. Inspect ball bearings for damage on swivel.</p> <p>g. Inspect charger catch and pulley retainer slide for deformation, burrs, and elongated holes.</p> <p>h. Inspect bolt stud assembly for deformation, burrs, and worn retaining collar.</p>	<p>Latches are worn or broken.</p> <p>Ball bearings are damaged.</p> <p>Charger catch and pulley retainer slide are deformed or have burrs, or elongated holes.</p> <p>Bolt stud assembly is deformed, has burrs, or is worn at retaining collar.</p>

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
<b>NOTE: The user and/or unit armorer will be responsible for the serviceability of the gauges by performing a visual inspection of the gauges prior to issue/use. Those gauges that are broken, bent, rusted, pitted or exhibit other forms of mutilation that could affect the dimensional tolerance of the gauges, will be turned in for replacement.</b>				
4	During	Machine Gun	Erratic or sluggish firing may indicate carbon buildup or change in headspace and timing. Change barrel and reverify headspace and timing (p 31) if situation allows.	Weapon ceases to operate. Headspace and timing cannot be obtained.
5	After	Machine Gun (cont'')	Field strip, clean, inspect, and lubricate entire weapon immediately after firing (p 71 and 81)	
		Barrel Assembly	Check bore and chamber for obstructions and abnormalities.	Obstructions in bore. Barrel damaged.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
6	After	Backplate Assembly	<p>Check latch and latch lock for function and retention of backplate assembly in receiver group. Check trigger and bolt latch release for function. Check for cracks and looseness in grips. Inspect backplate buffer tube for any fluids (oil, solvent, or water) coming from the inside of buffer tube.</p>	<p>Backplate will not lock in receiver. Cracks in back plate assembly.</p> <p>Fluids coming from inside the buffer.</p>
7	After	Bolt Group and Rod Assembly	<p>Check for sharp edges on any surface of bolt group. Check spring rod assembly for deformation and bent or broken pin or rod assembly. Check sear for burrs. Check firing pin and firing pin extension for bends or cracks.</p>	Bolt group cracked, missing, or defective.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
8	After	Barrel Extension	<p>Check barrel extension for gouges, burrs, and binding. Check barrel locking spring for staking in its groove. Check for burred or stripped threads. Check breech lock/pin for cracks and looseness.</p>	Barrel extension threads damaged. Cracked or missing parts.
9	After	Receiver and Cover Assemblies	<p>Check working surfaces for cracks, burrs, and gouges. Check belt holding pawls for binding and broken or missing pawls. Check trigger lever and stop assembly for cracks and binding. Check cartridge stops for cracks.</p>	Receiver cracked. Operating parts missing or damaged.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
10	After	Backplate Assembly	<p>Check retracting slide assembly for broken, missing, or loose lever. Check cover assembly for missing or broken springs. Check belt feed lever and belt feed slide group for binding, cracks, and broken parts. Check function of cover latch.</p> <p>Check latch and latch lock for function and retention of backplate assembly in receiver group. Check trigger and bolt latch release for function. Check for cracks and looseness in grips.</p>	<p>Cover latch does not lock cover in closed position.</p> <p>Backplate will not lock in receiver. Cracks in backplate assembly.</p>

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun, M3 Tripod Mount, M63 Antiaircraft Mount

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
11	After	Bolt Group and Rod Assembly	<p>Check for sharp edges on any surface of bolt group. Check spring rod assembly for deformation and bent or broken pin or rod assembly. Check sear for burrs. Check firing pin and firing pin extension for bends or cracks.</p>	Bolt group cracked, missing, or defective.
12	After	Barrel Extension	<p>Check barrel extension for gouges, burrs, and binding. Check barrel locking spring for staking in its groove. Check for burred or stripped threads. Check breech lock/pin for cracks and looseness.</p>	Barrel extension threads damaged. Cracked or missing parts.

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun, M3 Tripod Mount, M63 Antiaircraft Mount

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
13	After	Receiver and Cover Assemblies.	<p>Check working surfaces for cracks, burrs, and gouges. Check belt holding pawls for binding and broken or missing pawls. Check trigger lever and stop assembly for cracks and binding. Check cartridge stops for cracks.</p> <p>Check retracting slide assembly for broken, missing, or loose lever. Check cover assembly for missing or broken springs. Check belt feed slide group for binding, cracks, and broken parts. Check function of cover latch.</p>	<p>Receiver cracked. Operating parts missing or damaged.</p> <p>Cover latch does not lock cover in closed position.</p>

## Preventive Maintenance Checks and Services for Caliber .50 M2 Machine Gun, M3 Tripod Mount, M63 Antiaircraft Mount

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
14	After	Legs/Tripod Head	Check for missing, broken, or loose leg clamps. Check for missing, broken, or inoperative sleeve lock latch. Clean and lubricate tripod mount. Check pintle lock assembly.	Missing, broken, or loose leg clamps. Inoperative sleeve lock latch. Pintle will not secure to tripod head.
15	After	Traversing and Elevating Mechanism	Check quick release pin for burrs and corrosion. Check for missing parts. Check hand wheels for ease of operation. Check traversing and elevating scales for legibility.	Will not elevate or traverse.

## SECTION III. OPERATION UNDER USUAL CONDITIONS



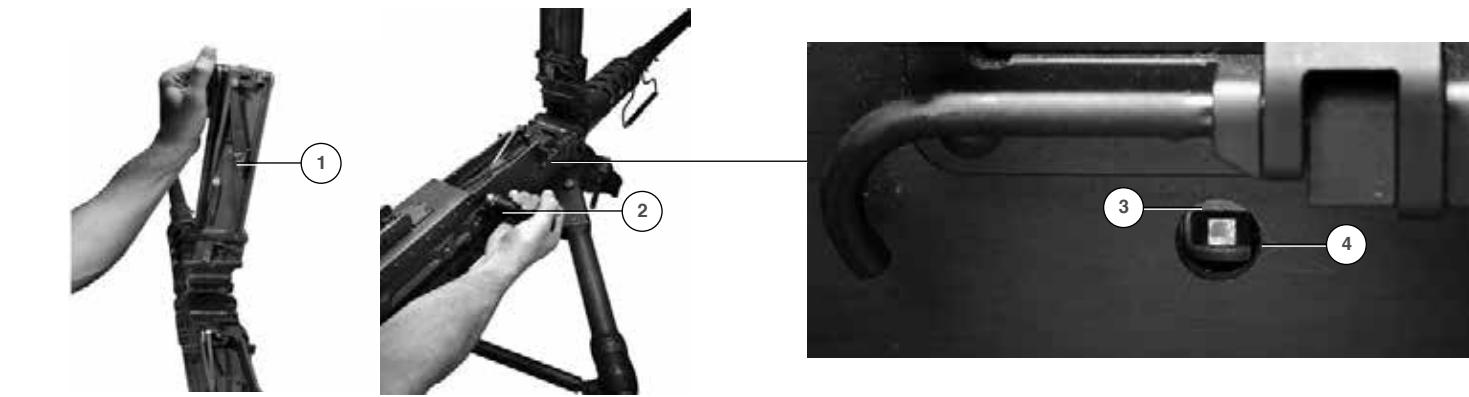
ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
16	After	Mount, Leg Elevator Assembly, and Base Assembly Group	Check for missing or inoperative lock assembly. Check toggle bolts for stripped threads. Check legs for damage. Check for missing or inoperative pintle lock clamp.	Mount legs inoperable. Elevator assembly will not function. Pintle lock clamp inoperable.
17	After	Cradle and Yoke Assembly	Check for cracked, bent, or missing parts. Check front and rear mounting pins and cradle locking pin to ensure they operate freely.	Yoke will not mount to elevator assembly.
18	After	Trigger Frame Assembly	Check gun grips and linkage for missing parts and proper functioning.	Missing or broken linkage.
19	After	Ammunition Box Tray Assembly	Check locking lever for proper functioning. Check for missing or broken straps.	Locking lever will not function. Missing or broken straps.

### Preparation for firing-checking and adjusting headspace

**WARNING: Ensure gun is clear of ammunition before starting (p 61).**

Headspace should be checked and adjusted before firing weapon, after assembling weapon, and after replacing barrel. Improper headspace and timing can cause malfunctions, damage to gun, and injury to personnel. If headspace cannot be obtained, turn in weapon to next higher level of maintenance.

1. Raise **cover (1)** all the way up.
2. Grasp **retracting slide handle (2)** and retract bolt to align **barrel locking spring lug (3)** with the **3/8 inch hole (4)** in the right side of receiver.



**NOTE: Ensure no obstructions are located in the barrel assembly before installing.**

3. Holding bolt in this position, continue holding the handle while screwing the **barrel** (6) fully into the **barrel extension** (7).

4. With bolt still retracted, unscrew **barrel** (6) two notches (clicks). Release retracting **slide handle** (2) (or remove **link** (5), if used) and allow bolt to go forward.

**WARNING: Check barrel to ensure it is locked with the bolt in the forward position. Attempt to turn barrel in either direction; barrel should not turn. If barrel does turn, stop here; do not attempt to fire the gun. Notify the unit armorer.**

5. Pull bolt to rear with retracting **slide handle** (2) and hold. This charges the weapon (withdraws firing pin into bolt). Otherwise headspace gauge won't fit at all.

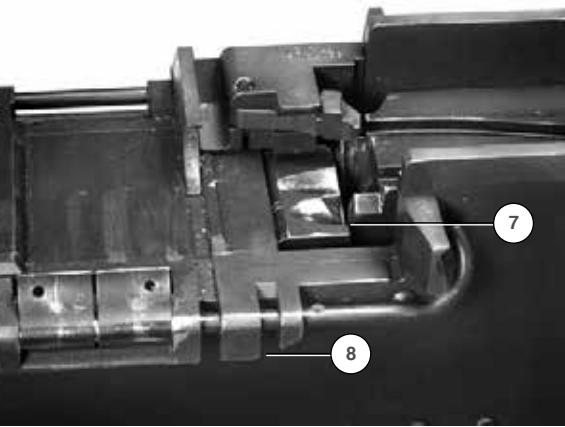
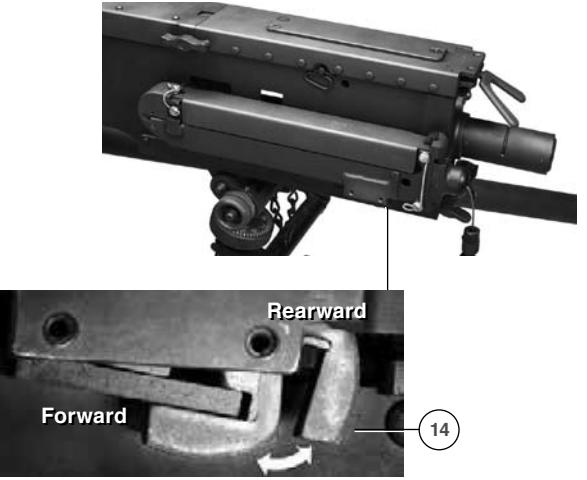
6. In single shot mode, hold retracting **slide handle** (2), push the bolt latch release, and slowly return bolt forward (do not slam). Do not fire the weapon.



**NOTE:** Steps 7 and 8 are for M48 turret type and fixed type only.

7. Move M10 **lock selector** (14) to rearward position. Charge weapon locking bolt to rear.

8. Move M10 **lock selector** (14) to the forward position. Pull on retracting slide handle until a click is heard, then ease bolt forward. (Do not allow bolt to slam forward).



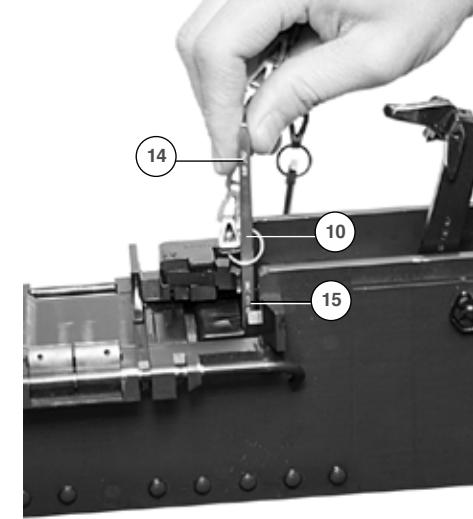
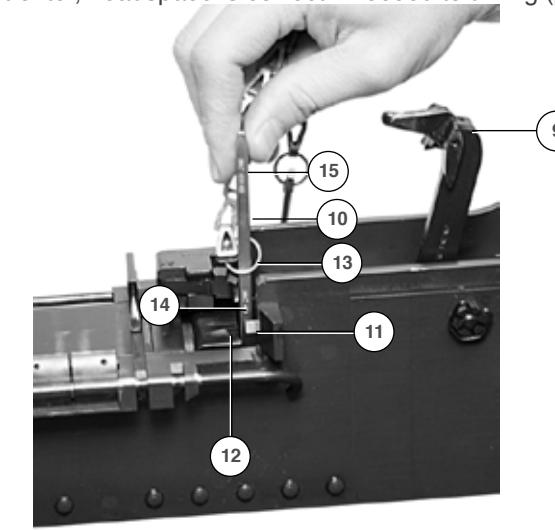
9. Remove slack in the bolt and barrel extension by retracting the retracting slide handle until the **barrel extension** (7) begins to separate (but not more than 1/16 of an inch) from the **trunnion block** (8).

**NOTE:** Ensure GO/NO GO gauge does not have any broken, bent, rusted, or pitted areas or other forms of mutilation that could affect dimensional tolerances.

10. Raise **cartridge extractor** (9) and attempt to insert the **GO end** (14) of the **GO/NO GO headspace gauge** (10) in the T-slot between the face of the **bolt** (11) and the rear of **barrel** (12) all the way up to the **ring** (13). If **GO end** (14) of **gauge** (10) enters freely down to the ring, proceed to step 12.

11. If **GO end** (14) of **gauge** (10) does not enter T-slot freely, follow the procedures for Headspace Too Tight (p 36).

12. Attempt to insert the **NO GO** (15) end of the **GO/NO GO headspace gauge** (10) while maintaining 1/16 inch separation. If **NO GO** (15) of **gauge** (10) enters, proceed to Headspace Too Loose (p 36). If **NO GO** (15) of **gauge** (10) does not enter, headspace is correct. Proceed to timing (p 38).



## Headspace too tight

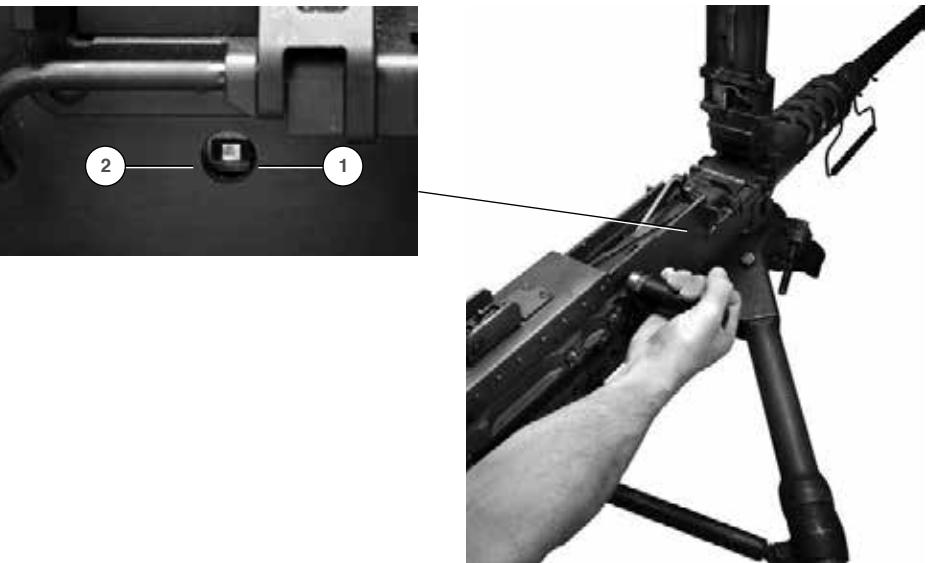
1. If **GO end (14)** of gauge will not enter T-slot freely, retract bolt so you can see **barrel locking lug spring (1)** in center of **receiver hole (2)** on right side of receiver.
2. Unscrew barrel one notch (click).
3. Slowly return bolt forward; then retract recoiling parts 1/16 inch (step 9, Checking And Adjusting Headspace, p 34).
4. Recheck headspace (step 10, CHECKING AND ADJUSTING HEADSPACE, p 36).
5. Repeat steps 1 thru 4 until **GO end (14)** of gauge enters and **NO GO (15)** of gauge does not enter.

**CAUTION:** Do not unscrew barrel more than a total of five notches (clicks) beyond the first setting of two clicks for a total of seven. If this condition occurs, turn in machine gun to unit armorer for inspection.

## Headspace too loose

1. If **NO GO (15)** of gauge enters T-slot, retract bolt so you can see **barrel locking lug spring (1)** in center of **receiver hole (2)** on right side of receiver.
2. Screw barrel in one notch (click).
3. Slowly return bolt forward (step 9, CHECKING AND ADJUSTING HEADSPACE, p 34).
4. Repeat steps 1 thru 3 until **NO GO (15)** of gauge does not enter and **GO end (14)** of gauge enters.

**CAUTION:** After obtaining proper headspace, recheck positive locking action of barrel by attempting to screw barrel in or out with bolt in forward position. Do not fire machine gun if barrel can be screwed in or out.  
See warning following step 4 of CHECKING AND ADJUSTING HEADSPACE, (p 32).



## Checking timing

**WARNING:** Ensure gun is clear of ammunition before starting. Improper headspace and timing can cause malfunctions, damage to gun, and injury to personnel.

**NOTE:** Ensure proper headspace before adjusting timing (p 31).

1. Pull bolt to rear with **retracting slide handle** (1) to cock machine gun; while holding handle, depress the **bolt latch release** (2) and slowly return bolt forward. Do not press trigger.



**NOTE:** Steps 2 thru 4 are for the M48 turret type and fixed type.

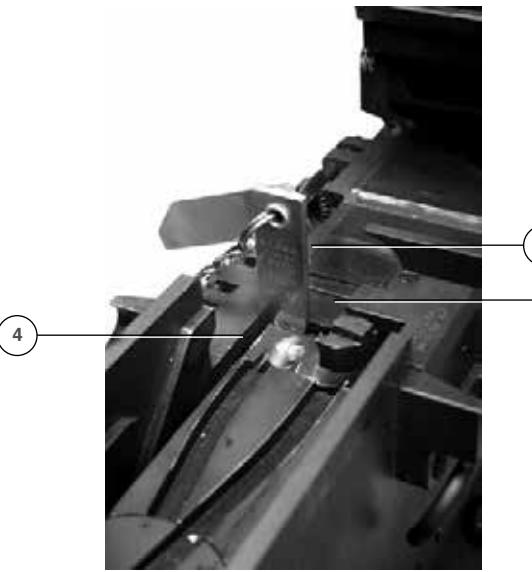
2. Move M10 **lock selector** (14) to rearward position. Charge the weapon, locking bolt to rear.
3. Move M10 **lock selector** (14) to the forward position. Pull on retracting slide handle until a click is heard, then ease the bolt forward. Do not allow bolt to slam forward.
4. Place safety to fire position.



5. Grasp retracting slide handle and retract bolt just enough (1/16 inch) to insert ***NO FIRE*** gauge (7) with beveled edge against barrel notches between ***barrel extension*** (4) and ***trunnion block*** (5). Release retracting slide handle slowly.

6. Depress ***trigger*** (6); gun should not fire.

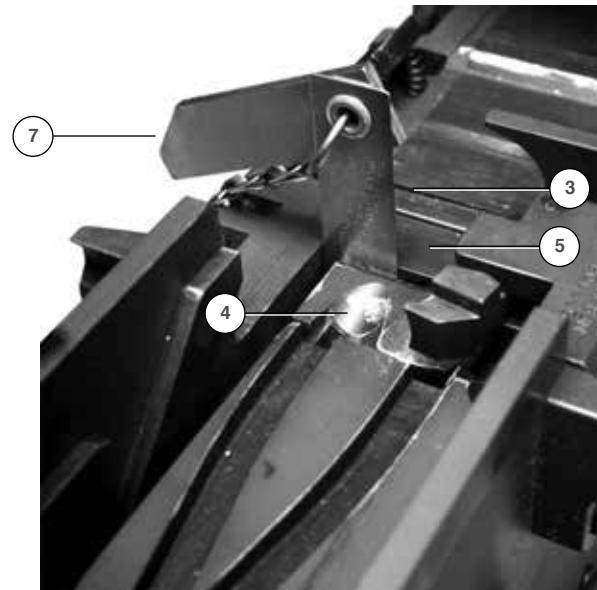
**NOTE:** If machine gun does fire, it has early timing. Go to ADJUSTING TIMING (either Early or Late) (p 42).



7. Retract bolt just enough to remove ***NO FIRE*** gauge (7) and insert ***Fire gauge*** (3) with beveled edge against barrel notches between ***barrel extension*** (4) and ***trunnion block*** (5). Release retracting slide handle slowly.

8. Depress trigger; machine gun should fire. If gun does fire, timing is now complete.

**NOTE:** If machine gun does not fire, it has late timing. Go to ADJUSTING TIMING (either EARLY or LATE) (p 42).



## Adjusting timing (either early or late)

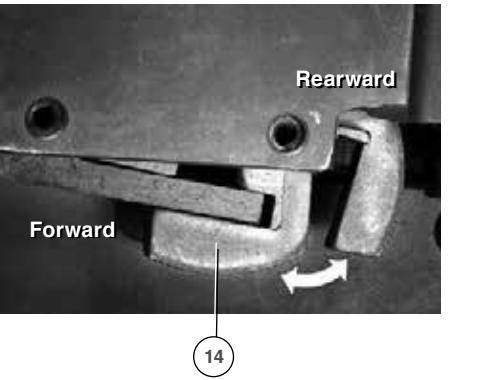
1. If gun has fired, remove gauge and charge gun. Return bolt forward by pressing **bolt latch release** (1) and ease the bolt forward with retracting slide handle.

**NOTE:** Steps 2 and 3 are for the M48 turret type and fixed type only.

2. Move M10 **lock selector** (14) to rearward position. Charge the weapon locking bolt to the rear.

3. Move M10 **lock selector** (14) to the forward position. Pull back on **charging handle** (2) until a click is heard, then ease bolt forward.

**WARNING:** Never charge gun with backplate off. Do not stand directly behind gun while removing backplate.



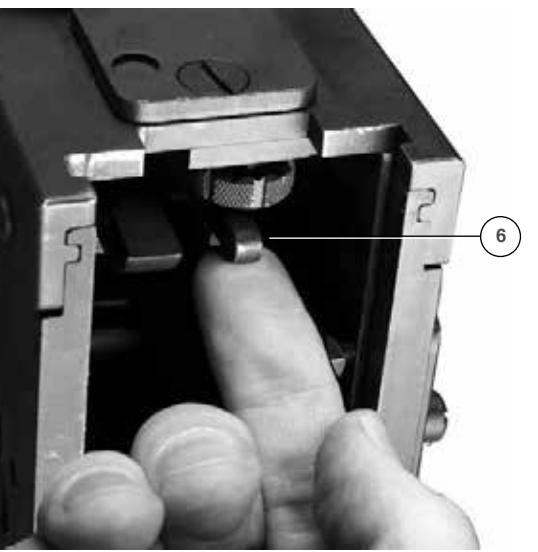
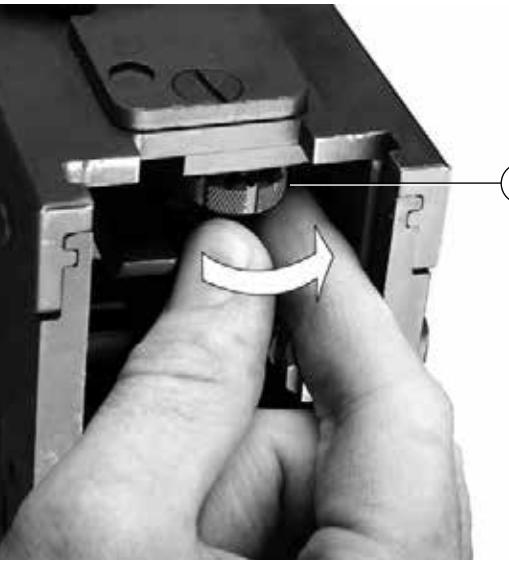
4. Insert **FIRE gauge** (3).

5. Remove **backplate** (4) (p 82).



6. Screw **timing adjustment nut** (5) all the way down (to the left). Nut should turn hard.

7. Attempt to fire gun by pushing up on rear of **trigger bar** (6). Gun should not fire.



8. Screw **timing adjustment nut** (5) up (to the right) one click at a time. Push up firmly on **trigger bar** (6) after each click. Repeat until gun fires. Return to and complete "before" firing Preventive Maintenance Checks and Services (p 20).

9. Turn **timing adjustment nut** (5) two more clicks up (to the right). Do not turn the timing adjustment nut any more.



10. Remove FIRE gauge.

11. Replace **backplate** (4).

**NOTE:** After setting headspace and timing, operator has to complete the following "function check" for flex and soft mount machine guns.

12. Pull **retracting slide handle** (2) to rear to charge machine gun.



13. Depress **bolt latch release** (1) and slowly ease bolt forward with retracting slide handle. Recheck timing with FIRE/NO FIRE gauge two more times to ensure that adjustment is correct.

**NOTE: Steps 14 and 15 are for M48 turret type and fixed type only.**

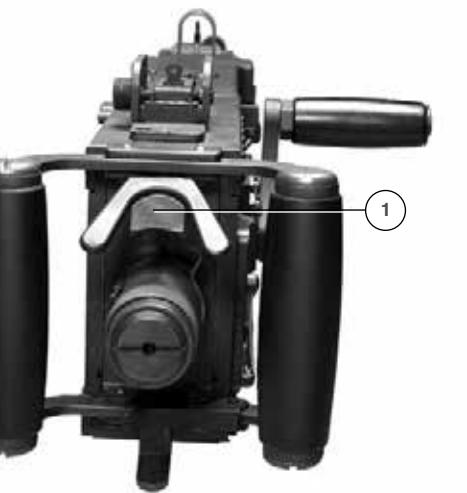
14. Move M10 lock selector to rearward position. Charge weapon locking bolt to rear.

15. Move M10 lock selector to the forward position. Pull on charging handle until a click is heard, then ease bolt forward. Recheck timing two more times.

## Checking and adjusting timing

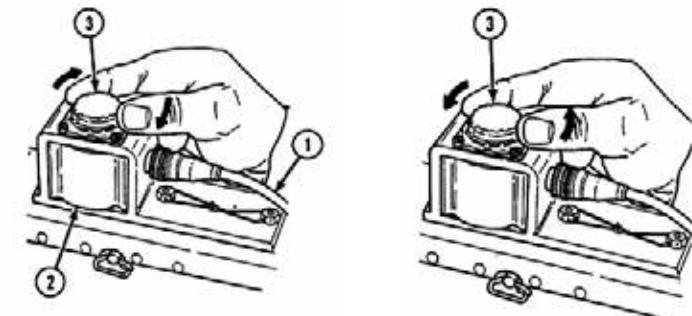
**NOTE: Perform Safety/Function check for the M48 turret type and fixed type.**

1. Place safety to S (safe) position.
2. Move M10 lock selector to the rear.
3. Charge the weapon.
4. Move M10 lock selector forward.
5. Pull charging handle until a click is heard, then ease bolt forward.
6. Press trigger. Weapon should not fire.
7. Place safety to F (fire) position.
8. Press trigger. Weapon should fire.



## Timing top plate solenoid (fixed type only)

1. Ensure headspace and timing are correctly adjusted (p 31).
2. Ensure solenoid assembly is properly attached to receiver and securing screws are lock wired.
3. Remove solenoid cover and install **power source cable** (1) to **solenoid** (2).
4. Push in and rotate **adjusting cap** (3) clockwise as far as possible.



**CAUTION: Ease recoiling parts slowly forward with charging or retracting slide handle to prevent damage to bolt.**

5. Retract recoiling parts fully to rear to cock the firing pin. Release recoil parts forward to battery position.
6. Retract recoil parts sufficiently and insert FIRE (0.020 inch) gauge between barrel extension and trunnion block. Allow barrel extension to slowly close on gauge.

7. Push in and rotate **adjustable cap** (3) counterclockwise one notch toward INCREASE position.

**NOTE: When firing pin releases, obtain three positive firings at this setting.**

8. Turn power source to ON position. Attempt to fire by depressing electrical trigger. If firing pin does not release, continue rotating **adjustable cap** (3) counterclockwise toward INCREASE position one notch at a time, attempting to fire at each notch until firing pin releases.

9. Retract recoiling parts sufficiently to remove FIRE gauge and repeat steps 5 and 6.

**NOTE: Count and record the amount of notches from when firing pin released until firing pin does not release.**

10. Push in and rotate **adjustable cap** (3) counterclockwise one notch toward INCREASE position. Depress electrical trigger; firing pin should release.

11. Retract recoiling parts sufficiently to remove FIRE gauge and repeat steps 5, 6, 10, and 11 until firing pin will not release.

12. Rotate **adjusting cap** (3) clockwise one-half the number of notches counted and recorded since firing pin released and until firing pin did not release.

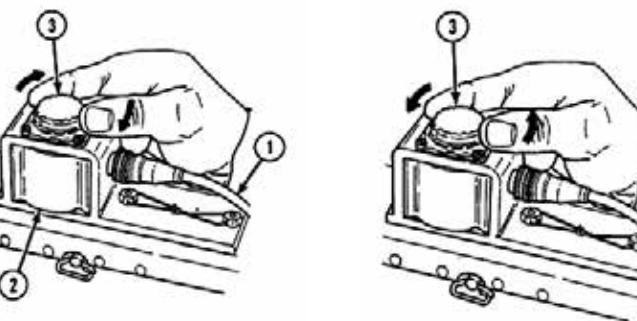
13. Retract recoiling parts sufficiently to remove FIRE gauge and install NO FIRE (0.116 inch) gauge between barrel extension and trunnion block. Allow barrel extension to slowly close on gauge.

14. Attempt to fire by depressing electrical trigger; firing pin should not release. If firing pin does release, readjust timing of **solenoid** (2).

15. Retract recoiling parts sufficiently to remove NO FIRE gauge and insert FIRE gauge between barrel extension and trunnion block. Allow barrel extension to slowly close on gauge.

16. Depress electrical trigger; firing pin should release. If firing pin does not release, readjust timing of **solenoid** (2).

17. Remove the FIRE gauge. Position power source switch to OFF. Disconnect **power source cable** (1) from **solenoid** (2). Reinstall solenoid cover.



## Firing procedures

### WARNING

Hearing protection must be worn when firing this weapon.

Do not expose ammunition to the direct rays of the sun.

When bolt latch release and trigger are both held down, machine gun will fire automatically (flex only).

Do not oil or grease ammunition. Oiled cartridges will produce excessive chamber pressure.

### Single shot mode

NOTE: If machine gun is set for single shot fire, the bolt assembly will remain in the rearward position. In this event, move the retracting slide handle forward before releasing the bolt with the bolt latch release.

Ensure **bolt latch release lock** (2) is in the unlocked position (turn right). The **bolt latch release** (1) must be in the up position (not locked down). For each round fired, press the bolt latch release, then the **trigger** (3).

### Automatic fire

NOTE: If the machine gun is set for automatic fire, the retracting slide handle will go forward with the bolt when released.

Press **bolt latch release** (1) down and lock by turning the **bolt latch release lock** (2) to the left.



## Firing machine gun on M3 tripod mount

**NOTE:** Ensure bolt is forward.

1. Open machine gun **cover** (1) and insert the double loop end of **ammunition** (2) in feedway until first cartridge is held by belt holding **pawls** (3).

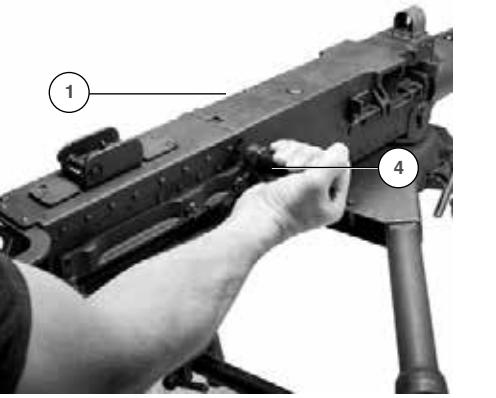
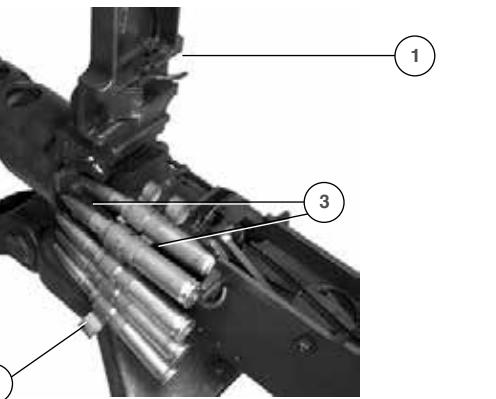
**WARNING:** Do not close cover when bolt is held rearward as damage may occur when bolt goes forward.

2. Ensure extractor arm is down and close the **cover** (1) of machine gun.

**NOTE:** To half load the machine gun, complete step 3; to fully load the machine gun, repeat step 3 before moving on to step 4.

3. Pull **retracting slide handle** (4) rearward, retracting the bolt all the way to the rear. Release the handle.

**NOTE:** If machine gun is set for single shot fire, the bolt assembly will remain in the rearward position. In this event, move the retracting slide handle forward before releasing the bolt with the **bolt latch release** (5). If the machine gun is set for automatic fire, the retracting slide handle will go forward with the bolt when released.



4. Press **trigger** (6) to fire the machine gun.

**NOTE:** In case of failure to fire, refer to IMMEDIATE ACTION (p 57).



## Firing machine gun on MK 93 Mod 0 mount TM 9-1005-213-10

**General:** The loading and firing procedures for the machine gun on the **MK 93 MOD 0** and **MOD 1** mounts are the same as those for the M3 mount.

## Firing malfunctions

### General

The malfunctions classified as misfires, hangfires, cook-offs, and stoppages are normally the result of improper weapon or ammunition maintenance and/or the use of unauthorized ammunition. The precautions described below are applicable to each specific type of malfunction rather than the occurrence of the malfunction in a specific weapon. All personnel concerned will know the nature of each malfunction, described below, as well as the proper preventive and corrective procedures in order to avoid injury to personnel or damage to materiel.

### Misfire

A misfire is the failure of a chambered round to ignite when the firing mechanism is actuated. Such failure can be due to an ammunition defect or faulty firing mechanism in the weapon. A misfire in itself is not dangerous, but because it cannot be immediately distinguished from a hangfire, it should be handled with IMMEDIATE ACTION (p 57).

**WARNING:** Never open the cover on a hot weapon, if a malfunction occurs. The possibility of a cook-off condition exists when the barrel is hot.

### COOK OFF WARNING

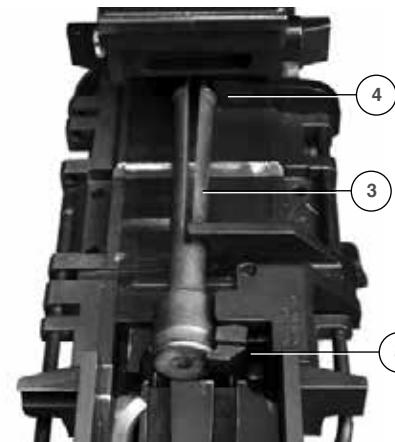
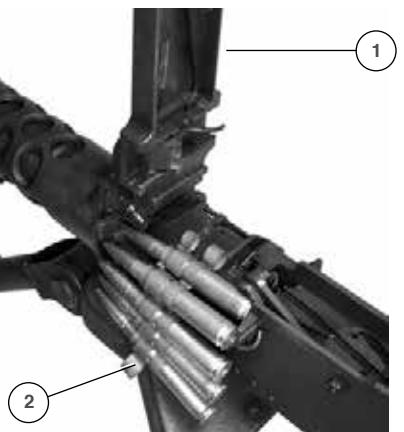
The climatic temperature of various global regions will make a difference as to what constitutes a hot gun. A cook-off can occur within 50 rounds when the weapon and ammunition have been sitting in the sun. A cook-off is the igniting of a round, caused by the heat of a very hot barrel, and not caused by actuating the firing mechanism. A cook-off may be avoided by immediately firing ammunition loaded in a hot machine gun or by unloading the weapon in the time specified under IMMEDIATE ACTION (p 57).

## Stoppage

Stoppage is any interruption in the cycle of operation caused by faulty action of the machine gun or ammunition. Any Stoppage must be handled as a misfire.

### Removing ruptured cartridge case

1. Open **machine gun cover** (1), remove **ammunition belt** (2).
2. Clear the machine gun of all live ammunition.
3. With bolt in the forward position, place the **ruptured cartridge case extractor** (3) with slot facing up into the **feedway** (4) against the **cartridge stop assembly pawl** (5) and hook the extractor assembly of the bolt over the ruptured cartridge case extractor.



**WARNING:** Do not close cover when bolt is held rearward as damage may occur when bolt goes forward.

**NOTE:** For M48 turret type and fixed type, proceed to step 7.

4. Close **machine gun cover** (1), retract the bolt pulling the **retracting slide handle** (7) rearward, and release to the forward position.



5. Retract the bolt to extract the ruptured cartridge case and extractor from the chamber.

**WARNING:** Heat protective mitten should be used when barrel is hot.

6. If steps 3 thru 5 do not remove the ruptured cartridge case, remove the barrel (p 81), install the spare barrel (p 128), and check headspace and timing (p 31).

**NOTE:** If the ruptured cartridge case cannot be removed, notify unit maintenance.

After removing ruptured cartridge case, check headspace (p 31).

Steps 7 thru 10 are for the M48 turret type and fixed type only.

7. Close cover and move M10 lock selector to the forward position. Pull charging handle rearward and allow the bolt to go forward.

8. Move M10 lock selector to the rear. Charge the weapon to lock the bolt to the rear.

9. Open machine gun cover and ensure the ruptured cartridge extractor has extracted the ruptured cartridge. Recheck headspace (p 31).

10. Repeat step 3 to extract the ruptured cartridge case and extractor from the chamber.

11. If spare barrel is installed, perform headspace and timing (p 31).

12. Load and continue firing until time permits to extract the ruptured cartridge case from the original barrel.

## Immediate action procedures

**WARNING:** Do not open cover while performing immediate action. Keep the weapon pointed downrange while performing immediate action.

Never remove the backplate assembly from any weapon until the chamber has been cleared.

Depending on climate condition, do not leave live rounds laying on top of hot expended brass.

**NOTE:** If your machine gun stops firing, take the following actions within 10 seconds.

1. Pull **retracting slide handle** (1) rearward.
2. Observe if round or fired case is ejected, release retracting slide handle, and attempt to fire again.

**WARNING:** Never open the cover on a hot weapon. An open cover cook-off could occur and result in serious injury or death.

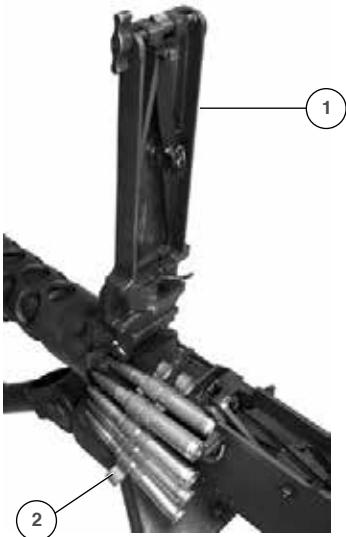
3. If weapon does not fire and the barrel is hot enough to cause a cook-off (200 rounds fired within 2 minutes), place the bolt in the forward position and place weapon in single-shot mode.
4. Evacuate immediate area for 15 minutes. For M48 turret type, refer to TM 9-2350-264-10-2 and TM 9-2350-255-10-2.
5. If immediate action fails to correct stoppage, apply the following remedial action after weapon has cooled sufficiently.



## Remedial action

**WARNING:** Keep the weapon pointed downrange while performing the following procedures.

1. Open **cover** (1) and remove **ammunition belt** (2).
2. Pull **retracting slide handle** (3) to the rear.
3. If round is not ejected, lock bolt to the rear, and, if applicable, return **retracting slide handle** (3) forward.
4. Visually inspect for cartridge in **chamber** (4).



5. If round is present in the chamber, with a second man standing to the side of the weapon, insert a cleaning rod (5) into the muzzle end of the machine gun and gently tap the round/case from the chamber.

6. The weapon is now clear.



7. Return bolt to forward position.

8. Check the weapon to determine the cause of the stoppage using the TROUBLESHOOTING CHART (p 74), or turn in to unit maintenance for repair.

## Unloading and clearing the gun

1. Place safety on SAFE (M48 turret type and fixed type).

2. Unlock the *bolt latch release* (1).

3. Raise the *cover* (2).



4. Lift the **cartridge extractor** (3) and remove the **ammunition belt** (4) from the feedway.

5. Place cartridge extractor down and close cover.

**WARNING:** Round may fall to surface and possibly explode.

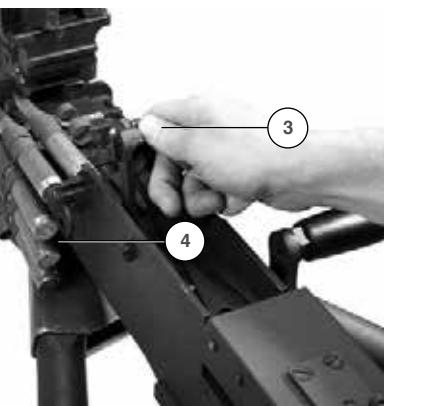
6. Pull and lock the bolt to the rear, leaving the retracting slide handle to the rear. Open cover.

**NOTE:** Step 7 is for the M48 turret type and fixed type.

7. Move M10 lock selector to the rear. Charge the weapon.

**WARNING:** Chamber may be hot. Use caution while inspecting T-slot.

8. Visually inspect the **chamber** (5) and **T-slot** (6) for rounds (in darkness the gunner must feel the chamber and T-slot to ensure they are clear).



9. Press the **bolt latch release** (1) and ease the bolt forward with retracting slide handle.

**Note:** Steps 10 and 12 are for the M48 turret type and fixed type.

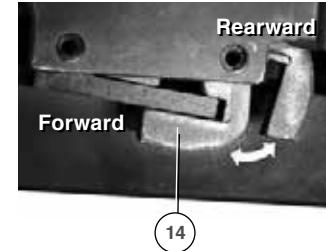
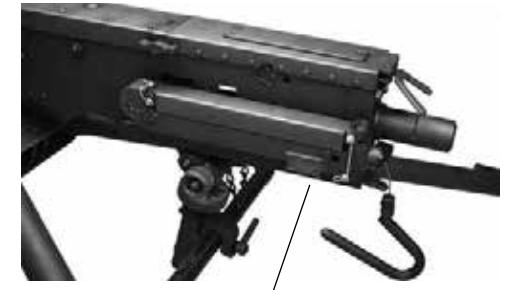
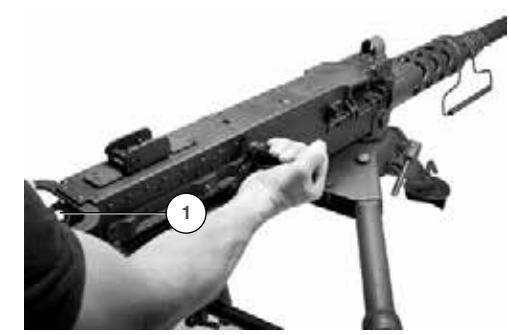
10. Move the M10 lock selector forward and pull back on charging handle until a click is heard, then ease the bolt forward.

11. Close the cover.

12. Place safety on FIRE.

13. Press the trigger.

14. Perform "after operation" Preventive Maintenance Checks and Services (p 20).



## Installation on the M3 tripod

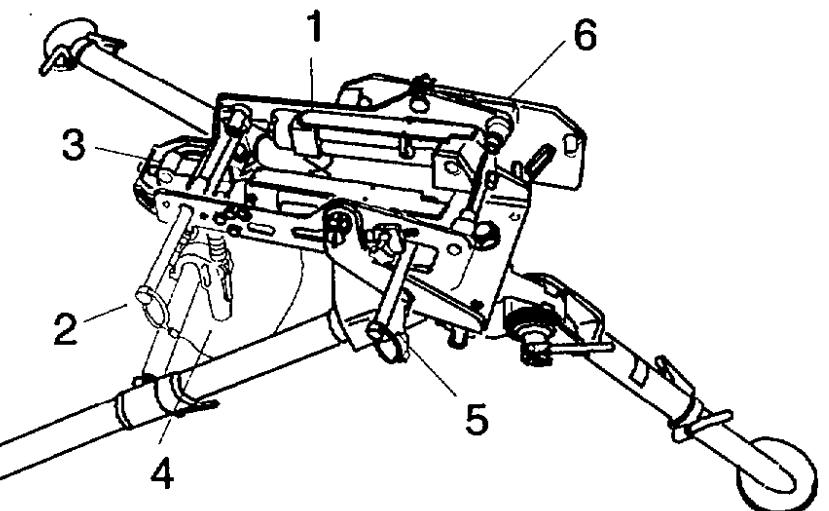
1. Firmly plant M3 tripod.
2. Lower MK 93 Mount pintle into the M3 Tripod ground mount bearing sleeve assuring the pintle latch locks the MK 93 in place.

## Installation on MK 93 Mod 0 mount

**NOTE:** The M2 should be mounted without the barrel.

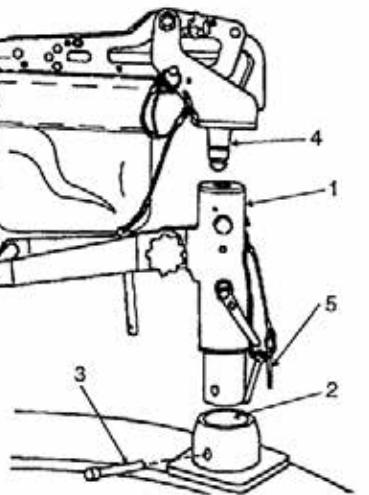
**NOTE:** If required, remove the .50 caliber pin assembly.

1. Rotate **shock absorber assemblies** (1) to the 'UP' position.
2. Remove rear .50 caliber **pin assembly** (2) from the **rear slider assembly** (3).
3. Rotate **rear slider assembly** (3) to 'UP' position.
4. Install **T & E mechanism** (4) onto the mount.
5. **Place the M2 in the mount and insert pin assembly** (5) through slider and weapon.
6. Align rear mounting hole of the M2 with the rear slider assembly and insert **pin** (2).
7. Mount the .50 caliber ammunition can bracket on the mount's **side plate** (6).
8. To remove, reverse installation procedures.



## Installation on MK 93 mod 1 mount

1. If present, remove original HMMWV pedestal.
2. Place the MK 175 **adapter assembly** (1) into the HMMWV **ring socket** (2) and insert the **quick release pin** (3).
3. Insert the MK 93 **mount pintle** (4) into socket and insert **quick release pin** (5).
4. Lock the lower body at 0 degrees azimuth with the stow lock and adjustable arm assemblies locked at 0 degrees elevation.
5. Install the catch bag.
6. Attach the T & E mechanism between the MK 175 and the MK 93 mount.
7. Install weapon onto the MK 93 MOD 1.
8. Install the appropriate ammunition can bracket.
9. To remove, reverse installation procedures.



## SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS



### Protective measures for unusual conditions

#### Extreme cold climates

**NOTE:** Refer to FM 31-71.

- a. All moving parts of machine guns and mounts must be kept free of moisture. Before firing in temperatures below 0°F (-18°C), completely disassemble and clean all parts of the machine gun and oil with weapons lubricating oil (item 8, app D). Remove excess oil from moving parts.
- b. When the machine gun and mounts are moved indoors they must first be brought to room temperature, then cleaned and lightly oiled with weapons lubricating oil (item 8 app D).
- c. If the machine gun has been fired, the bore must be immediately swabbed out with several patches saturated with rifle bore cleaning compound (RBC) (item 5, app D). Use dry patches to remove all solvent film.

#### Extreme heat and humidity

In climates where temperature and humidity are high, the weapons and mounts should be thoroughly inspected on a daily basis and disassembled to lubricate.



## Hot, dry climates

**NOTE:** Hot, dry climates are usually areas containing dust and sand.

- a. In climates where sand and dust enter the working parts and bore of the weapon, the machine gun should be disassembled and wiped clean with a wiping rag (item 10, app D) at least once daily. Remove excess oil from moving parts.
- b. The lubricants on exposed and noncritical operating surfaces of the mounts should be wiped. This will prevent wind blown sand from sticking to the lubricating oil and forming an abrasive. Remove excess oil from moving parts.
- c. Immediately upon leaving sandy terrain, clean and lubricate with general purpose lubricating oil (item 7, app D).
- d. After handling, wipe with a wiping rag (item 10, app D) to remove perspiration which will cause rust.
- e. During sand or dust storms the machine guns and mounts should be covered, if possible.

## Hot, humid and salty climates

Hot, humid and salty atmospheric conditions necessitate more frequent cleaning and lubricating of bore and exposed metal surfaces. When weapon and mounts are not in use, cover surfaces with a film of general purpose lubricating oil 7, (app d) and keep covers in place.

## Exposure to water

After exposure to water, especially salt water (accidentally splashed or sub merged), drain, wipe dry, clean, and lubricate the weapons and mounts as soon as practical.

## Use of auxiliary bolt handle



When primary method of charging weapon fails, install auxiliary bolt handle on opposite side of bolt stud. Ensure notch is installed toward barrel end. Rotate auxiliary bolt handle 90 degrees. Follow normal procedures to charge the machine gun.

## Bolt assembly fails to lock to the rear

**NOTE:** An assistant is recommended for this procedure. This procedure can be performed either using primary or auxiliary bolt handle method to charge the weapon.

- a. Open cover. Charge the machine gun and hold bolt to the rear.
- b. While holding bolt assembly to the rear, lift extractor and ease bolt forward while fitting front edge of the extractor into the notch of the bolt stop.
- c. To release bolt assembly, pull rearward to allow extractor to drop and ease bolt assembly forward.

## Night operation: clearing the gun

**WARNING:** Chamber may be hot. Use caution while inspecting T-slot.

Keep fingers out of chamber to prevent injury.

Round may fall to surface and possibly explode.

The gunner must ensure the gun is clear by feeling the T-slot and chamber for rounds.

# CHAPTER 3-MAINTENANCE

## SECTION I. LUBRICATION INSTRUCTIONS



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### Lube Guide

Under all but the coldest arctic conditions, LSA (item 9, app D) or CLP (item 4, app D) are the recommended lubricants to use on your machine gun. Remember to remove excessive oil from the bore before firing.

**NOTE:** Lubrication instructions are mandatory. It is not recommended to mix lubricants on the same weapon. The weapon must be thoroughly cleaned during change from one lubricant to another. Dry cleaning solvent (available at unit maintenance) is recommended for cleaning during change from one lubricant to another. Navy personnel follow applicable maintenance requirements cards to perform lubrication and preventive maintenance.

CLP - Cleaner, lubricant and preservative (item 4, app D).

LSA - Weapons lubricating oil, semifluid (item 9, app D).

Between 100F (- 120C) and - 100F (- 23°C) use CLP, LSA, or LAW. Below -100F (-230°C) use only LAW.

LAW - Weapons lubricating oil, arctic (item 8, app D).

PL-M - Lubricating oil, general purpose (item 7, app D).

Lightly Lube - A film of oil barely visible to the eye.

## Machine Gun

**CAUTION:** Do not use dry cleaning solvent to clean backplate assembly. Use clean wiping rag (item 10, app D) to remove foreign matter. Lubricate exterior very lightly with oil saturated cloth.

- a. Immediately after firing, clean all powder fouled surfaces with rifle bore cleaning compound (RBC) (item 5, app D).
- b. Field strip machine gun into major groups and assemblies (p 81).
- c. Clean components with RBC (item 5, app D).
- d. Wipe dry and oil with weapons lubricating oil (LSA) (item 9, app D) at temperatures above 0°F (-18°C), or weapons lubricating oil (LAW) (item 8, app D) at temperatures below 0°F (-18°C).
- e. Thereafter, clean and oil as above every 90 days, unless inspection reveals more frequent servicing is required.
- f. Reassemble major groups and assemblies (p 112).
- g. Remove oil from barrel bore before firing.

## SECTION II. TROUBLESHOOTING PROCEDURES



### Introduction

- a. The table lists the common malfunctions which you may find during operation or maintenance of the .50 caliber heavy barrel machine gun. You should perform the tests/inspections and corrective actions in the order listed.
- b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify unit maintenance.
- c. Numerous malfunctions are caused by improper assembly. Check for proper assembly of all components.

### Symptom Index

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## Troubleshooting

**Malfunction:**  
**Weapon will not feed**

**Test or Inspection:**

Step 1. Check if **cover (1)** is completely down and latched.  
Latch cover.

Step 2. Check **ammunition belt (2)** for short round or misaligned link.

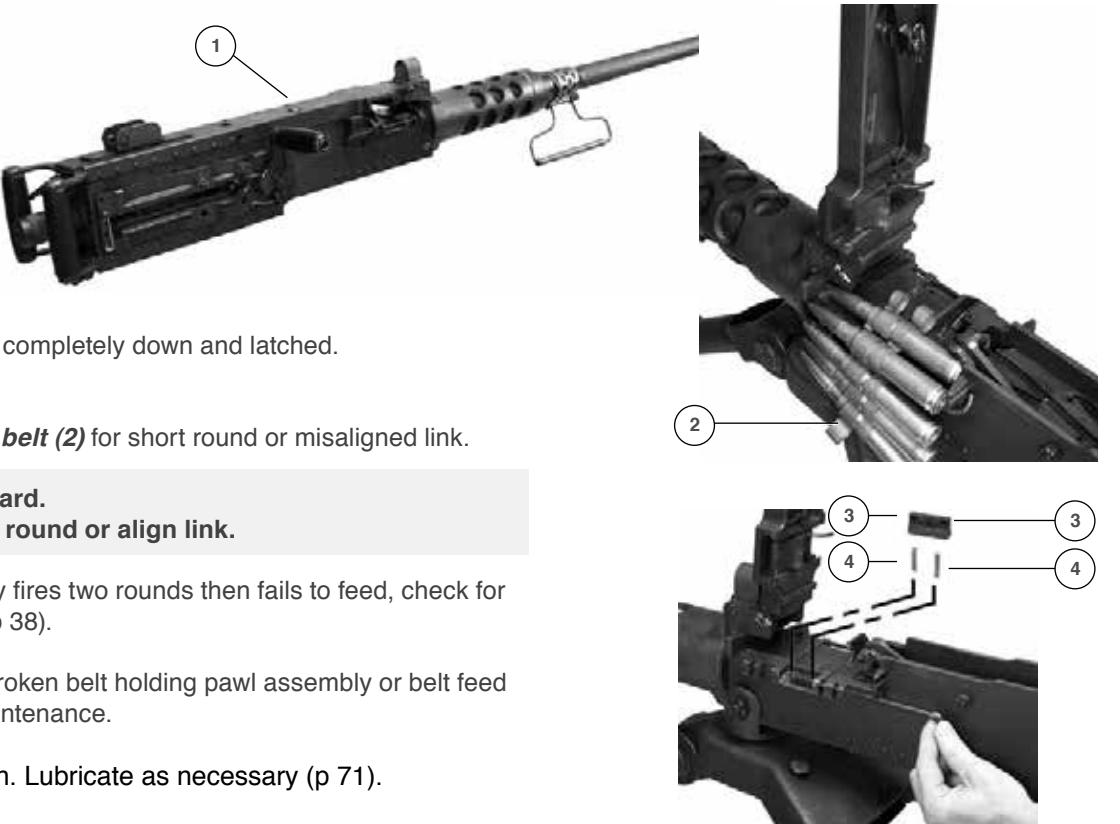
**NOTE: Ensure bolt is forward.**

**Open cover, remove short round or align link.**

Step 3. If weapon repeatedly fires two rounds then fails to feed, check for early timing. Adjust timing (p 38).

Step 4. Check for weak or broken belt holding pawl assembly or belt feed pawl springs. Notify unit maintenance.

Step 5. Improper lubrication. Lubricate as necessary (p 71).



**Malfunction:**  
**Round will not chamber**

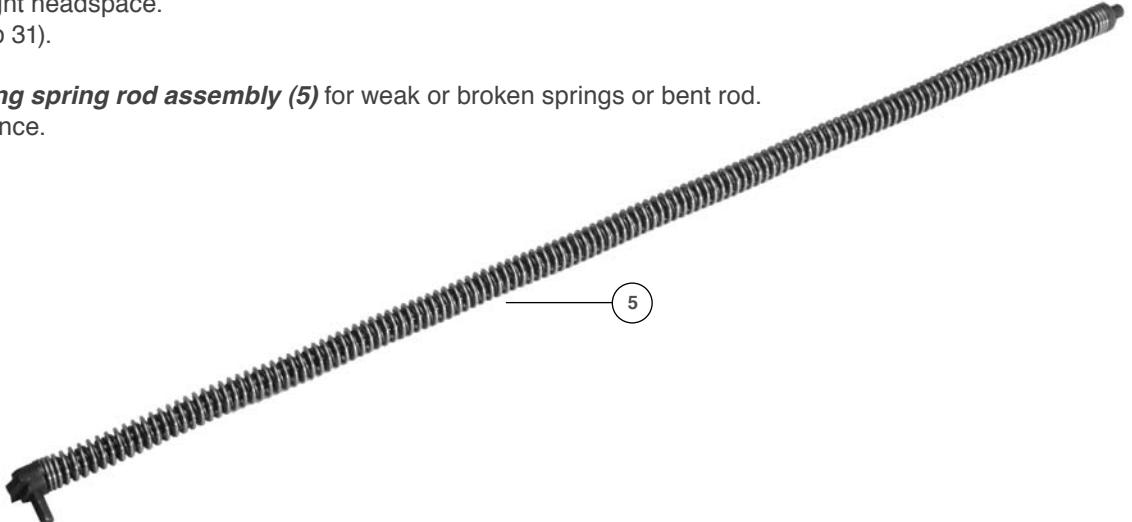
**Test or Inspection:**

Step 1. Check for corroded or damaged ammunition.  
Remove defective ammunition.

Step 2. Check chamber and T-slot for obstruction.  
Clear and clean chamber. (If obstruction was ruptured cartridge,  
check headspace (p 31).

Step 3. Check for tight headspace.  
Adjust headspace (p 31).

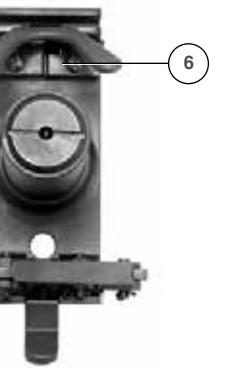
Step 4. Check **driving spring rod assembly (5)** for weak or broken springs or bent rod.  
Notify unit maintenance.



**Malfunction:**  
**Bolt will not lock**

**Test or Inspection:**

Check to see if bolt returns to forward position.  
Adjust headspace (p 31).



**Malfunction:**  
**Weapon will not fire**

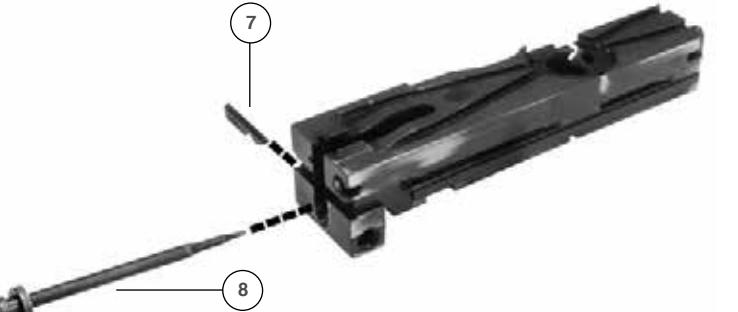
**Test or Inspection:**

Step 1. (M48 turret type only) Check if **safety lever** (6) is in "safe" position. Place safety lever in "fire" position.

Step 2. Check for defective ammunition.  
Remove defective ammunition.

Step 3. Check for incorrectly installed **sear slide** (7).  
Install sear slide from left side.

Step 4. Check for broken or damaged **firing pin** (8).  
Notify unit maintenance.



**Malfunction (cont.):**  
**Weapon will not fire**

**Test or Inspection (cont.):**

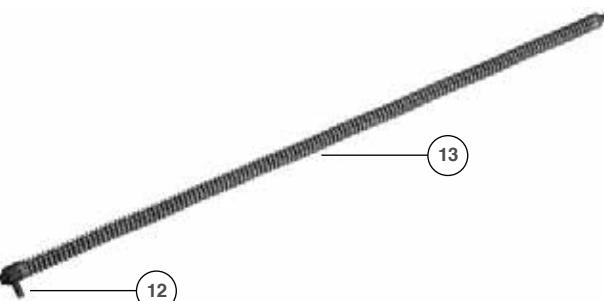
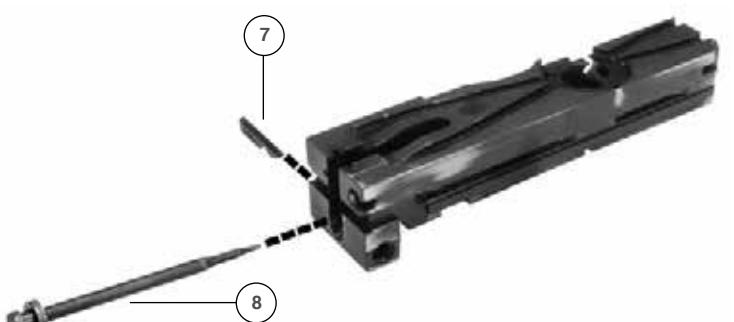
Step 5. Check firing pin well inside bolt for obstruction.  
Clean the interior of the bolt with a swab (item 11, app D) saturated with RBC (item 5, app D). Lubricate by applying light coat of lubricating oil (item 7, 8, or 9, app D) to interior of bolt.

Step 6. Inspect **firing pin** (8) and firing pin extension for burrs or broken firing pin spring. Notify unit maintenance.

Step 7. Check for bent **driving spring rod** (12) or weak or **broken rod springs** (13). Notify unit maintenance.

Step 8. Check for incorrect timing. Adjust timing (p 38).

**NOTE: If weapon still will not fire, refer to TM 9-2350-255-10 or TM 9-2350-264-10.**



**Malfunction:**  
**Weapon will not unlock**

**Test or Inspection:**  
Check for incorrect timing

**Corrective Action:**  
Adjust timing (p 38).

**Malfunction:**  
**Weapon will not extract**

**Test or Inspection:**  
Step 1. Check headspace; tight headspace will cause binding and excessive friction between the moving parts during recoil.  
Adjust headspace (p 31).

Step 2. Check for ruptured cartridge. Remove ruptured cartridge (p 55). Adjust headspace (p 31).

Step 3. Check chamber (14) for excessive pitting.

Replace barrel. Adjust headspace (p 31) and timing (p 38).



**Malfunction:**  
**Weapon will not eject**

**Test or Inspection:**  
Check **bolt face** (15) for enlarged firing pin hole and deformed **firing pin** (8). These can cause the spent brass to bind in the T-slot, preventing ejection.

Notify unit maintenance.



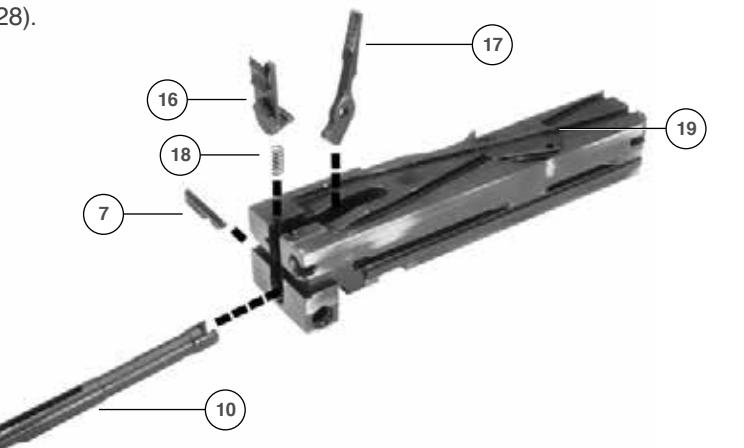
**Malfunction:**  
Weapon will not cock

**Test or Inspection:**

Check notch on **sear** (16), **sear slide** (7), and **firing pin extension** (10).

Check **cocking lever** (17) for wear and proper installation. Check **sear spring** (18) and **bolt switch** (19) for proper installation (p 128).

Notify unit maintenance.



**Malfunction:**  
Sluggish Operation

**Test or Inspection:**

Check for dirt, carbon, burrs, and lack of lubrication.  
Clean and lubricate.

## SECTION III. FIELD STRIPPING AND MAINTENANCE PROCEDURES



### Removal of barrel assembly

**WARNING:** To avoid accidental firing, remove ammunition, clear weapon (p 61), and verify chamber is clear. Heat protective mitten should be used when barrel is hot.

1. Retract bolt far enough for **barrel locking spring lug** (1) to center in **barrel locking spring hole** (2) on right hand side of **receiver** (3).
2. Unscrew and remove **barrel assembly** (4).



## Removal of backplate assembly

### WARNING

Never remove the backplate assembly from any weapon until the chamber has been cleared.

Do not attempt to remove backplate unless the bolt is in the forward position.

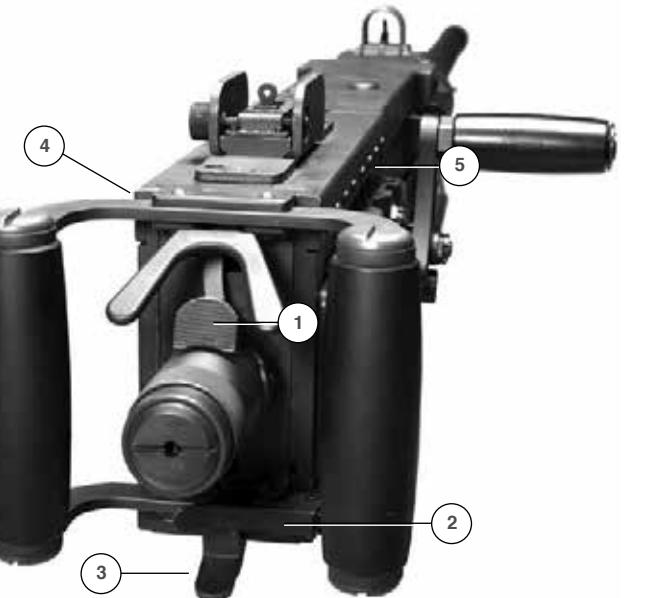
Do not attempt to charge weapon without backplate assembled to the machine gun.

**NOTE:** Illustration shows flexible type backplate. Procedure applies to both the flexible and M48 turret type backplates.

1. Ensure **bolt latch release** (1) is in unlocked (single shot) position (flexible type and soft mount type only).

**CAUTION:** Do not stand behind machine gun while removing backplate.

2. Pull **backplate latch lock** (2) straight back, while lifting up on **backplate latch** (3). Raise **backplate assembly** (4) straight up and remove from **receiver** (5).

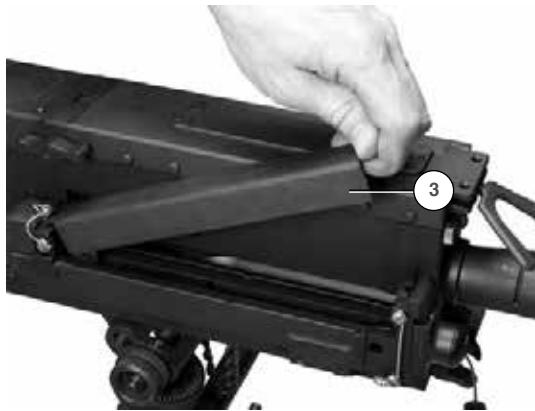
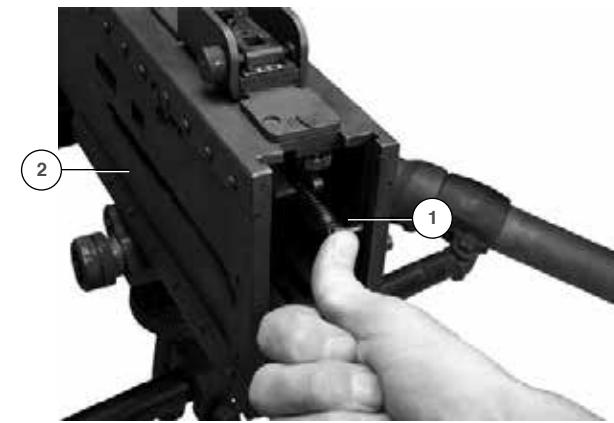


## Removal of driving spring rod assembly

Push rear of **driving spring rod assembly** (1) forward and to the left until free from the side of **receiver** (2). Remove **driving spring rod assembly** (1).

## Removal of bolt assembly

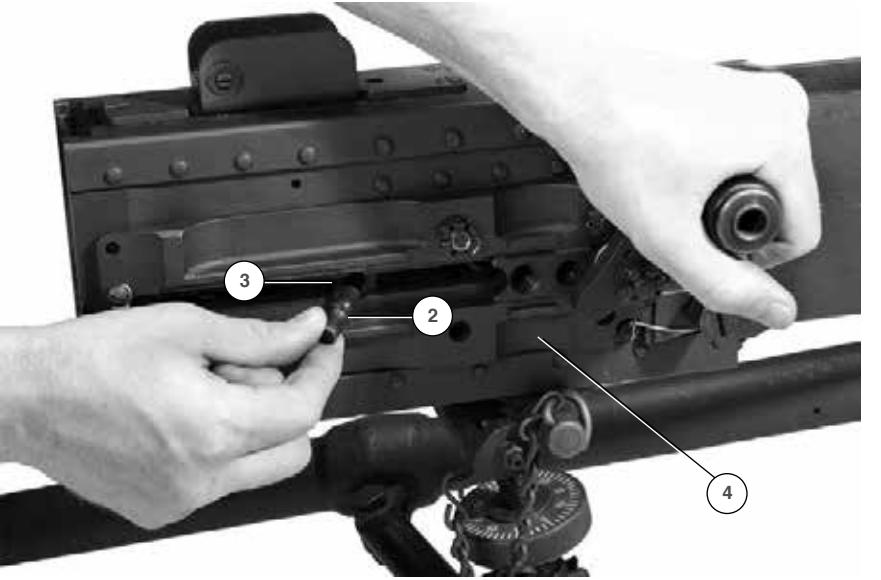
**NOTE:** For M48 turret type remove M10 charger cover (3) first.



**NOTE:** The **bolt stud** (2) is removed from the right side of the receiver for the flex and from the left side of the receiver for the M48 turret type.

Bolt latch cannot be pushed up until step 1 is completed.

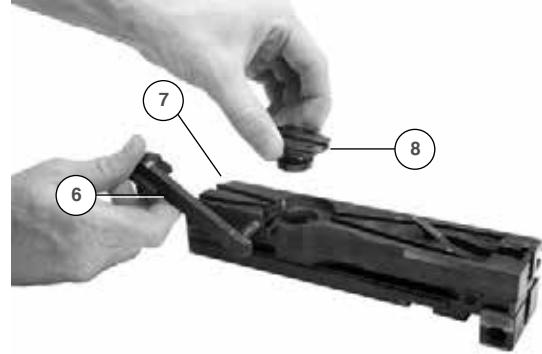
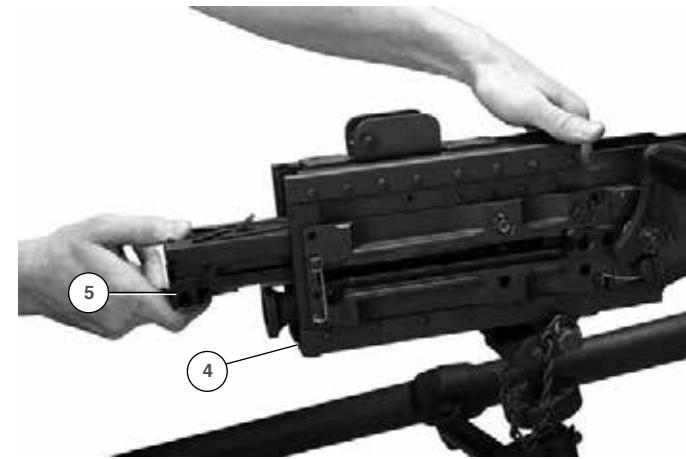
1. Retract bolt assembly far enough to align **bolt stud** (2) with **bolt stud hole** (3) in **receiver** (4). Remove **bolt stud** (2).



**NOTE:** For flex type, bolt latch must be pushed up to remove bolt.

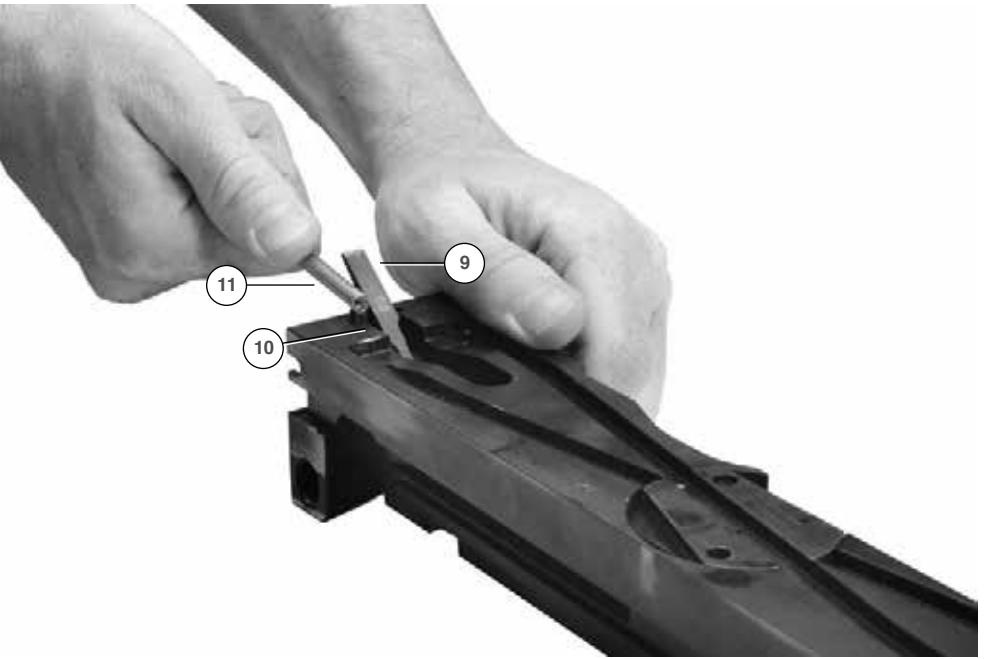
2. Remove **bolt assembly** (5) from **receiver** (4).

3. **Rotate cartridge extractor** (6) upward and remove from left side of **bolt** (7). Remove **bolt switch** (8) by lifting straight up from **bolt** (7).

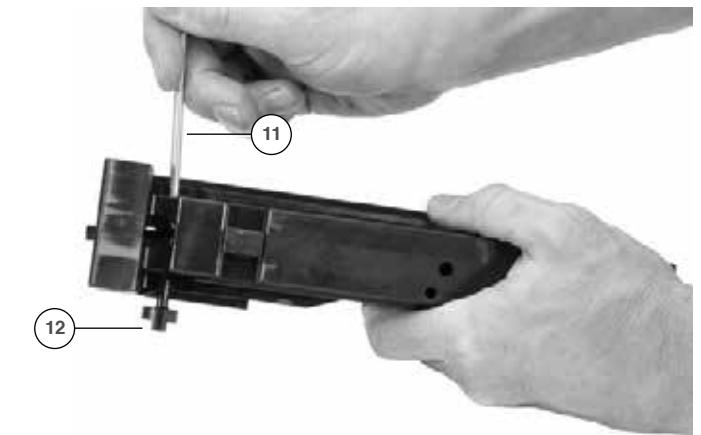


4. Place **cocking lever** (9) in its rearmost position.

5. Release firing pin spring by pressing down on **sear** (10) with **swab holder section** (11).



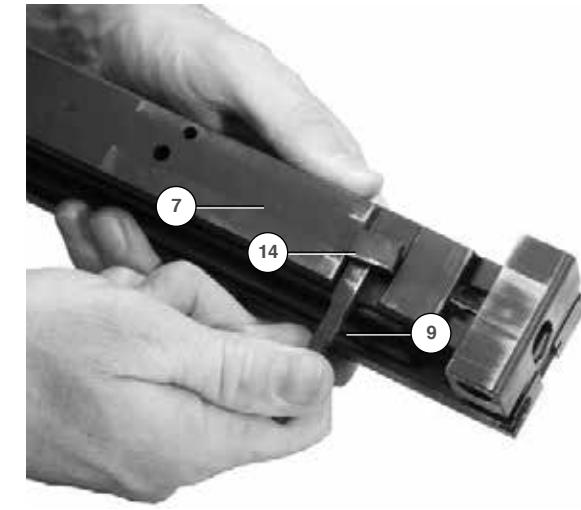
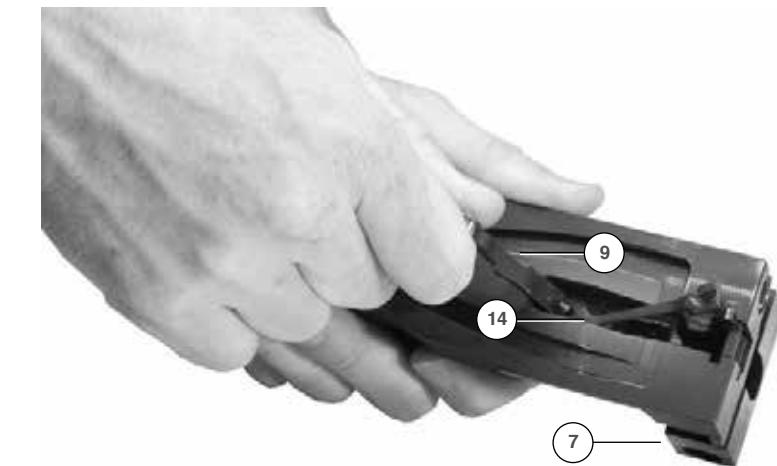
6. Using **swab holder section** (11), remove **cocking lever pin** (12) and **cocking lever** (9).



7. Using thin end of **cocking lever** (9), rotate **accelerator stop lock** (13) to center of recess in **bolt** (7). Pry up **accelerator stop lock** (13) and remove.



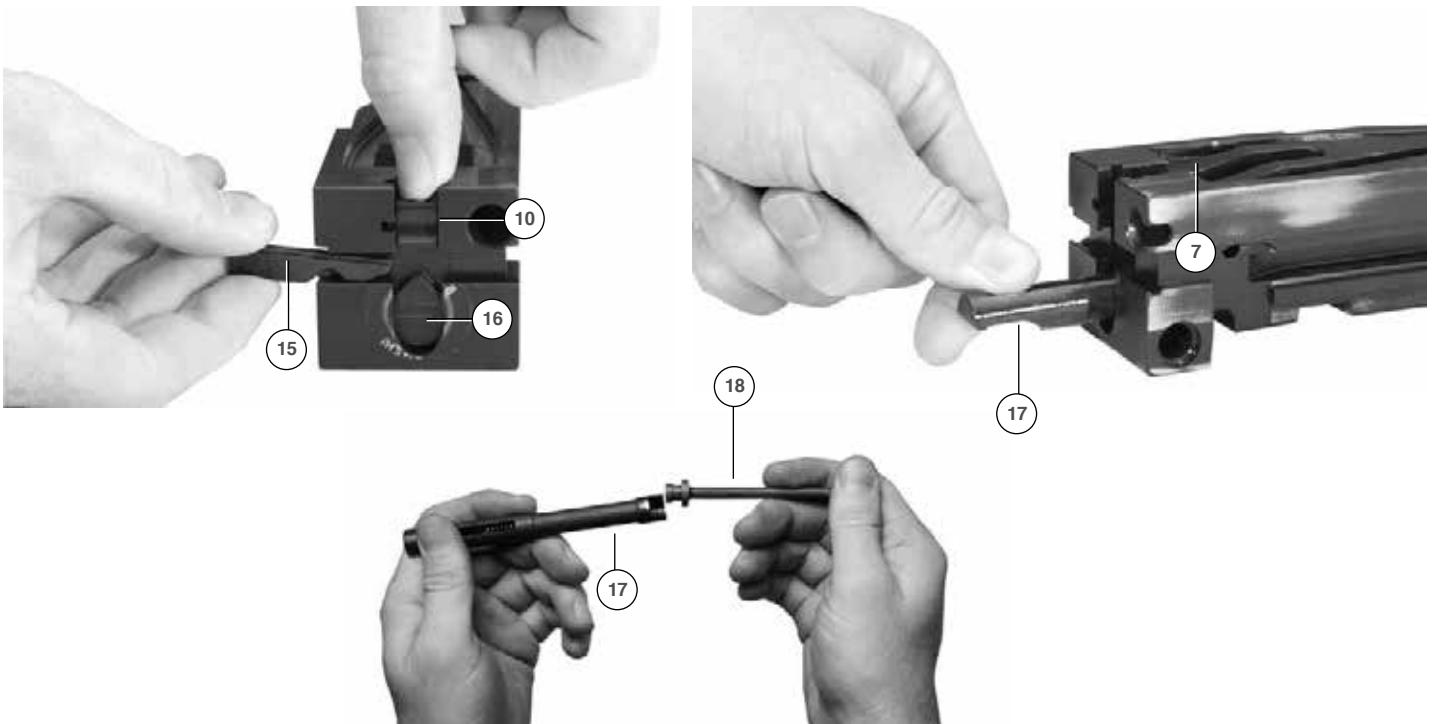
8. Using thin end of **cocking lever** (9), press **accelerator stop** (14) from **bolt** (7). Turn **bolt** (7) over and use thin end of **cocking lever** (9) to pry **accelerator stop** (14) from bottom of bolt.



9. Depress **sear** (10) and remove **sear slide** (15). Remove **sear** (10) and **sear spring** (16).

10. Tip the front end of the **bolt** (7) upward and remove **firing pin extension assembly** (17).

11. Remove **firing pin** (18) from **firing pin extension assembly** (17).



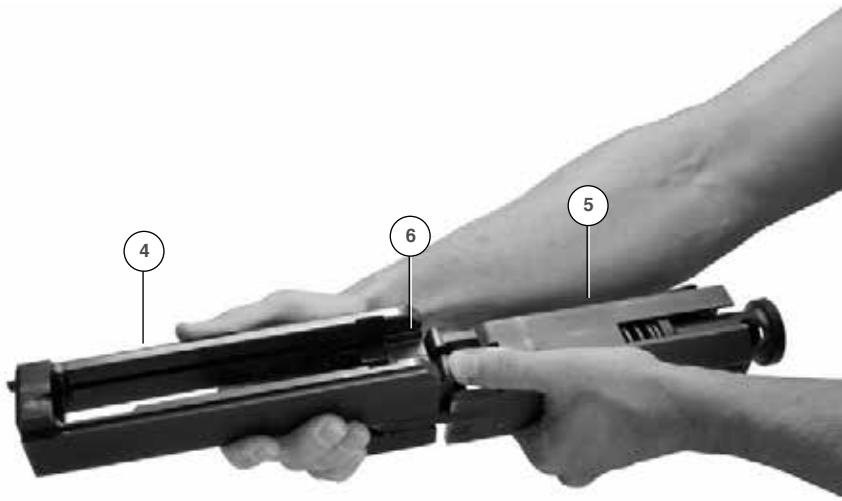
## Removal and field strip of barrel buffer and barrel extension assemblies

1. install pointed end of M4 **cleaning rod** (1) into **hole** (2) in **receiver** (3) and depress buffer body lock while applying rearward pressure on **barrel extension assembly** (4).



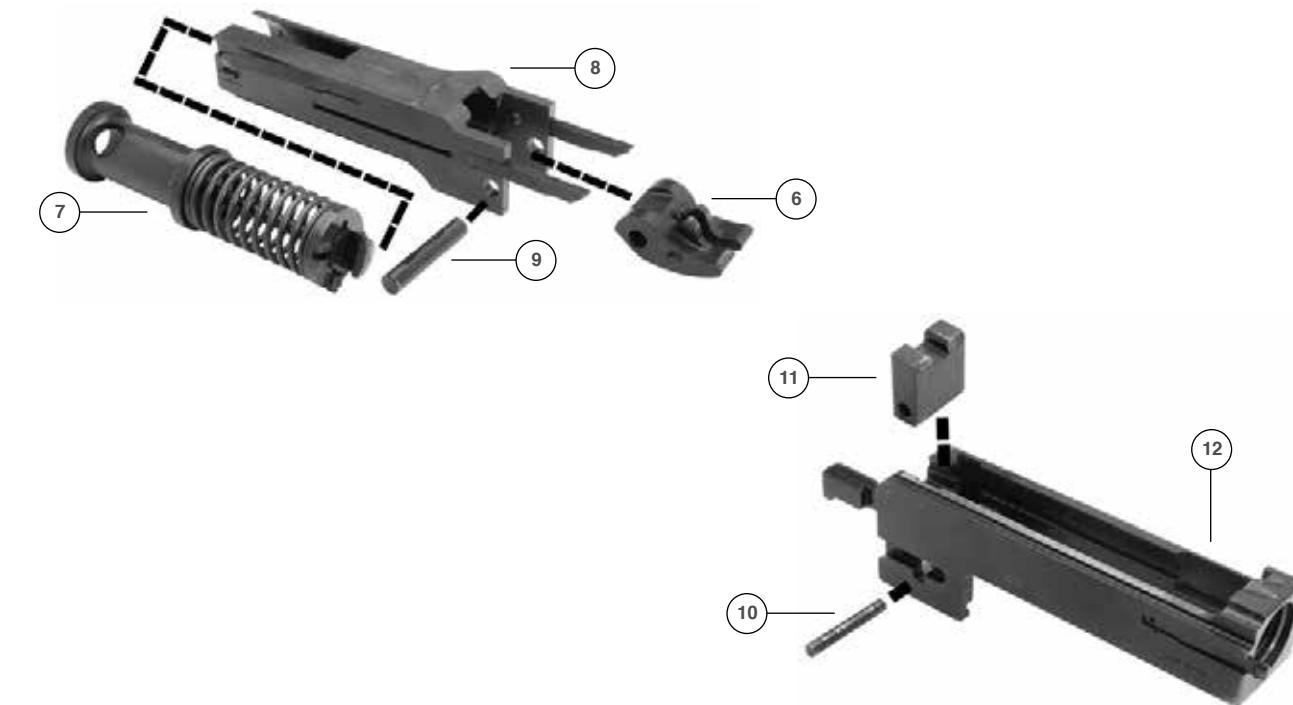
**WARNING:** While removing barrel buffer assembly (5) and barrel extension assembly (4), maintain thumb pressure on buffer accelerator (6).

2. Remove **barrel buffer assembly** (5) and **barrel extension assembly** (4) together. Separate the assemblies by pushing forward on tips of **buffer accelerator** (6).



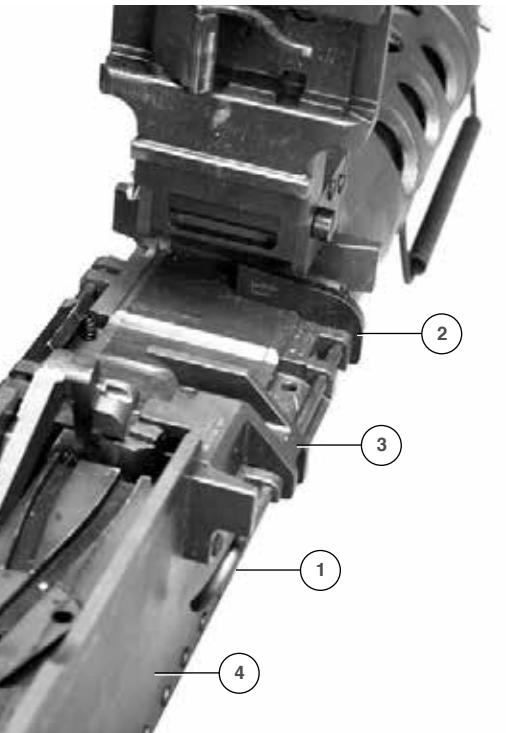
3. Remove **buffer assembly** (7) by pushing it out rear of **barrel buffer body** (8). Drive **accelerator pin assembly** (9) from **barrel buffer body** (8) with swab holder. Remove **buffer accelerator** (6).

4. Use pointed end of M4 **cleaning rod** (1) to remove **breech lock pin assembly** (10) and **breech lock** (11) from **barrel extension assembly** (12).



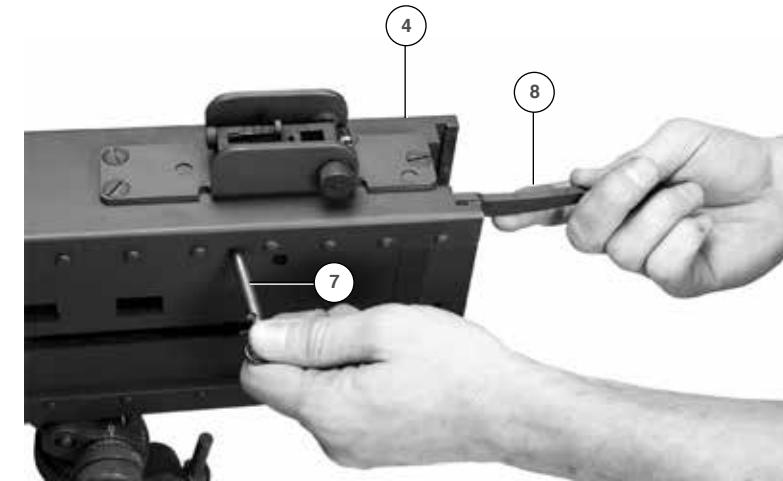
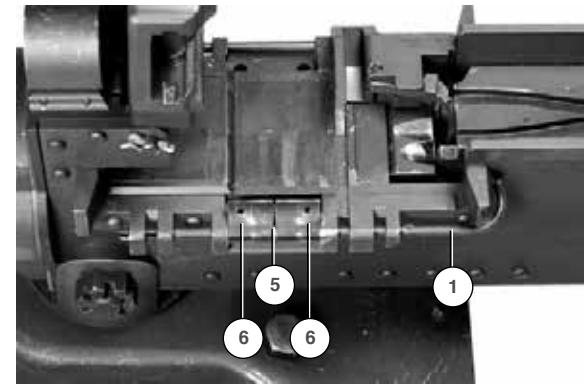
## Removal and field strip of receiver assembly

1. Remove **belt holding pawl pin** (1) attaching **front cartridge stop** (2) and **rear cartridge stop assembly** (3) to **receiver** (4). Remove **front cartridge stop** (2) and **rear cartridge stop assembly** (3).



**NOTE:** Hold down on belt holding pawl assembly to prevent loss of springs.

2. Remove **belt holding pawl pin** (1), **belt holding pawl assembly** (5), and **two springs** (6).
3. Raise loop of **trigger lever pin** (7) and rotate pin until loop is in vertical position. Reach inside **receiver** (4) and hold **trigger lever** (8) while removing **trigger lever pin assembly** (7). Remove **trigger lever** (8). (p 95)



## Maintenance of barrel assembly

### Cleaning

**NOTE: Do not reverse direction of bore brush while in bore in order to prevent damage to the bore brush and bore.**

1. Using the cleaning rods, bore brush, and RBC (item 5, app D), dip bore brush in RBC and run rod through **chamber (1)** of **barrel (2)**. Unscrew bore brush from cleaning rods, remove rods from bore, rescrew bore brush to rods, and repeat process until clean.
2. Using cleaning rods and chamber brush, dip chamber brush in RBC (item 5, app D) and **clean chamber (1)** using clockwise twisting motion. Unscrew chamber brush from cleaning rods, remove rods from bore, rescrew chamber brush to rods, and repeat process until clean.
3. Remove chamber brush from swab holder section, insert a cleaning swab (item 11, app D) in slot, then run clean swab through **bore (3)**, from chamber end and back. Repeat until a clean swab is obtained.

**NOTE: Chamber and bore must be clean, dry, and free of oil before firing and/or inspection.**

4. Clean outside surface of **barrel (2)** with carbon removing compound (item 3, app D). Wipe all surfaces dry with clean wiping rags (item 10, app D).



## Inspection

1. Inspect **barrel locking notches** (1) for wear or breakdown.
2. Inspect **barrel** (2) for rust.
3. Inspect **bore** (3) for bulges, missing bands, or large pits. (A bulge will appear as a shadowy depression or ring).

**NOTE:** Do not be confused by the ring 8 to 10 inches from breech end. This is caused by a "designed in" gap to allow for expansion of the stellite liner when the barrel gets hot.

4. Inspect **chamber** (4) for bulges or large pits.



**NOTE:** If there is any doubt about the condition of barrel, notify unit maintenance. Unless barrel is to be fired immediately, chamber, bore, and outside surfaces are to be lightly oiled.

## Lubrication

Place clean cleaning swab (item 11, app D) in swab holder. Dip swab in lubricating oil (item 7, 8, or 9, app D) and run through **chamber** (1) and **bore** (2) of **barrel** (3).



## Maintenance of backplate assembly

### Cleaning

**CAUTION:** Do not submerge backplate assembly in any fluid.

Use clean wiping rags (item 10, app D) to remove foreign matter from backplate assembly.

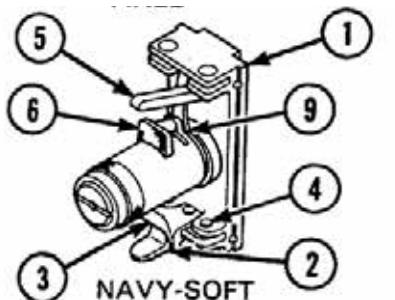
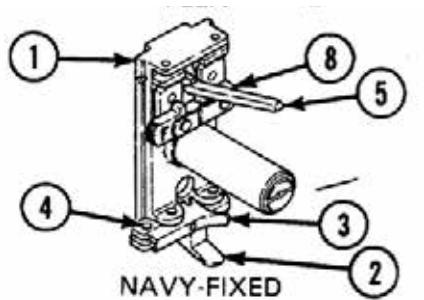
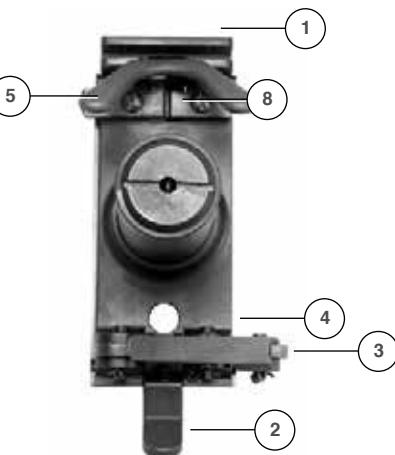
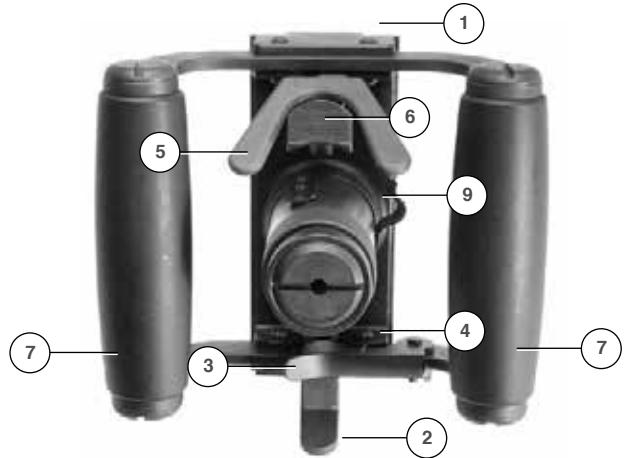
### Inspection

1. Inspect **guides** (1) for burrs or bent condition.
2. Check **backplate latch** (2) and **backplate latch lock** (3) for proper functioning.
3. Ensure **locking pins** (4) are in place.
4. Check **trigger** (5) for proper functioning.
5. Check **bolt latch release** (6) for proper functioning (flexible type only).
6. Handle **grips** (7) should not move freely and should not be cracked (flexible type only).
7. Function test **safety** (8) (M48 turret type only).

### Lubrication

Lubricate exterior of backplate assembly very slightly using a clean wiping rag (item 10, app d) saturated with lubricating oil (item 7, 8, or 9, app d).

8. Check **bolt latch release lock** (9) for proper functioning.

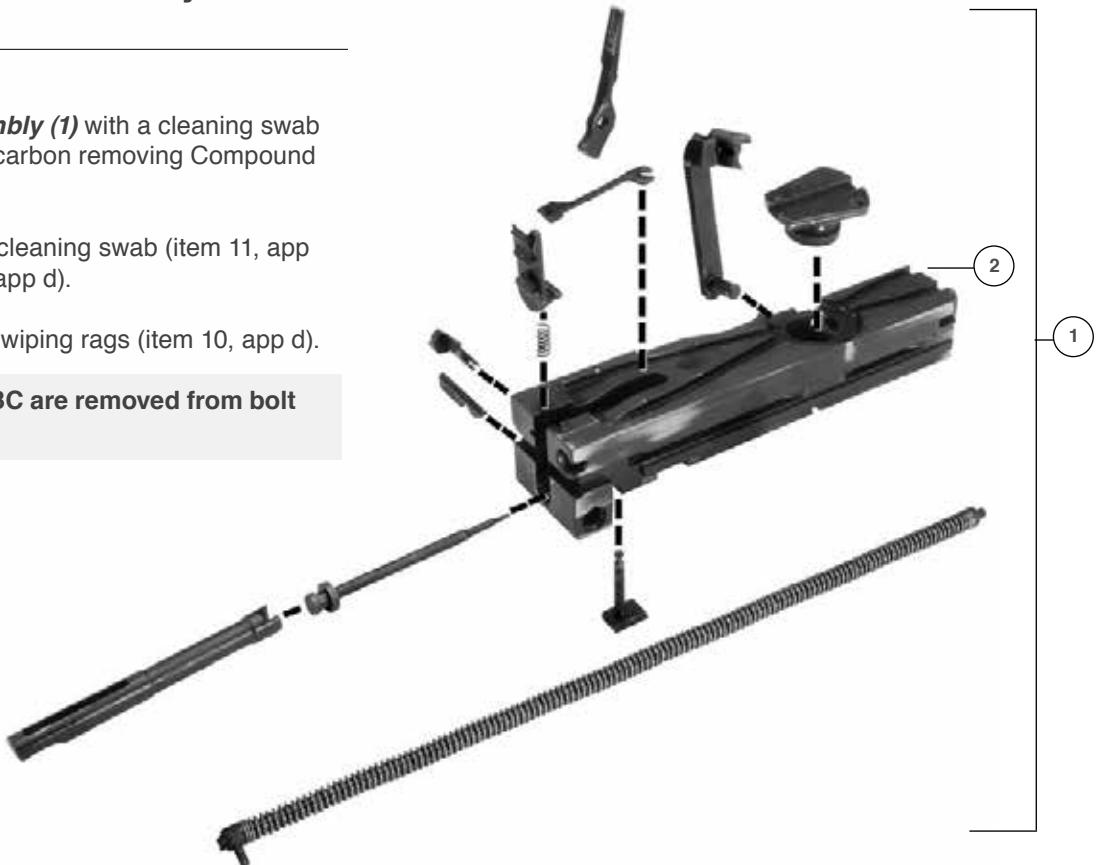


## Maintenance of bolt assembly and rod assembly

### Cleaning

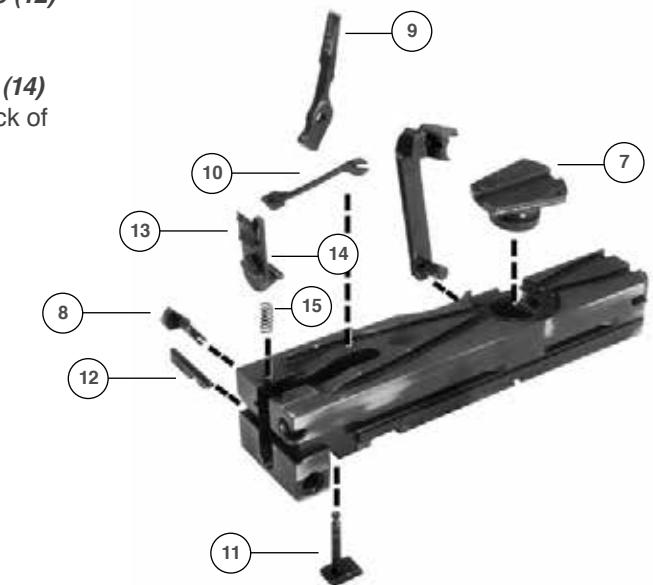
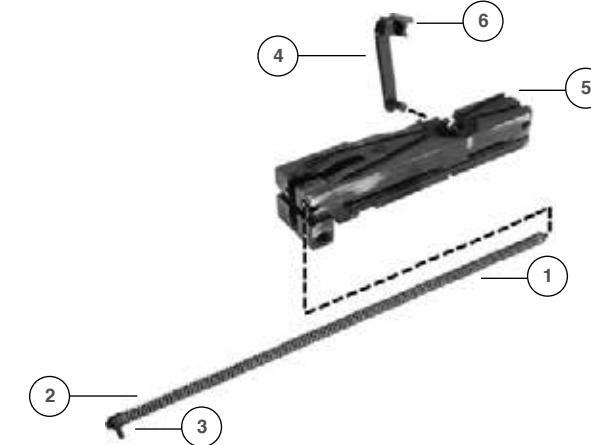
1. Clean all parts of **bolt assembly (1)** with a cleaning swab (item 11, app d) saturated with carbon removing Compound (item 3, app d).
2. Clean face of **bolt (2)** with a cleaning swab (item 11, app d) saturated with RBC (item 5, app d).
3. Wipe all parts dry with clean wiping rags (item 10, app d).

**NOTE:** Ensure all traces of RBC are removed from bolt assembly before lubricating.



### Inspection

1. Inspect **driving spring rod assembly (1)** for flat spots on springs. Ensure that springs operate freely and that **rod (2)** and **pin (3)** are not bent or broken.
2. Check movement of **cartridge extractor (4)** in **bolt (5)**. **Cartridge extractor (4)** should raise and lower without binding. Check movement of **cartridge ejector (6)**. Inspect for cracks and burrs.
3. Inspect **bolt switch (7)**, **cocking lever pin (8)**, **cocking lever (9)**, **accelerator stop lock (10)**, **accelerator stop (11)**, and **sear slide (12)** for cracks, bends, and burrs.
4. Inspect **sear (13)** for cracks and burrs, and inspect **sear notch (14)** for wear, chips, or burrs. Inspect **sear spring (15)** for breaks or lack of tension. (p 103)



5. Inspect **firing pin** (16) for cracks and chipped or sharp tip.

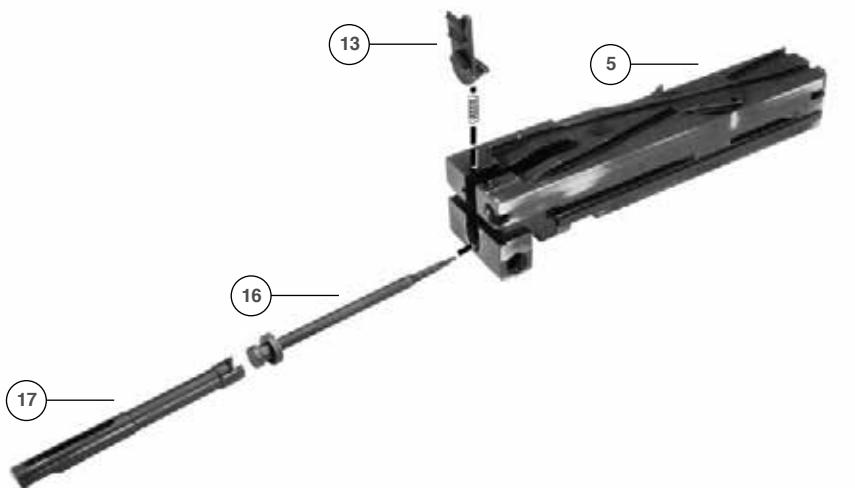
**NOTE:** Tip should be smooth and well rounded.

6. Check **firing pin extension** (17) for cracks, burrs, and free movement in **bolt** (5). Ensure shoulder that engages **sear** (13) has a sharp angle and is free of chips and burrs.

7. Ensure **bolt** (5) is free of burrs, and cracks. Firing pin hole must not be visibly out of round.

### Lubrication

Apply light coat of lubricating oil (item 7, 8, or 9, app d) to all parts of bolt assembly and rod assembly.



## Maintenance of barrel buffer assembly

### Cleaning

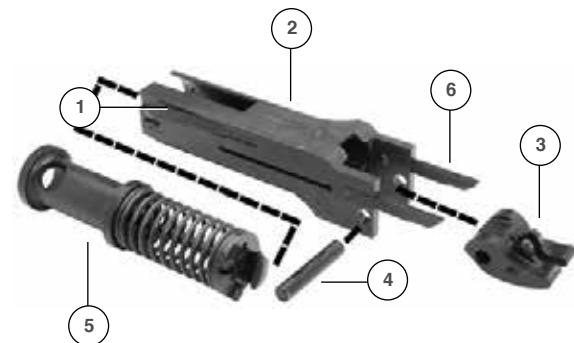
1. Clean all parts of barrel buffer assembly with a cleaning swab (item 11, app D) saturated with carbon removing compound (item 3, app D).
2. Wipe all parts dry with clean wiping rag (item 10, app D).

### Inspection

1. Inspect **buffer body lock** (1) for tension, staking, and retention in **barrel buffer body** (2).
2. Inspect **buffer accelerator** (3) for broken claws or tips.
3. Inspect **accelerator pin assembly** (4) for broken or missing spring.
4. Inspect **buffer spring** (5) for cracks or breaks.
5. **Breech lock depressors** (6) must have slight vertical (up and down) movement but should not have lateral (side to side) movement.

### Lubrication

Apply a light coat of lubricating oil (item 7, 8, or 9, app D) to all parts of barrel buffer assembly.



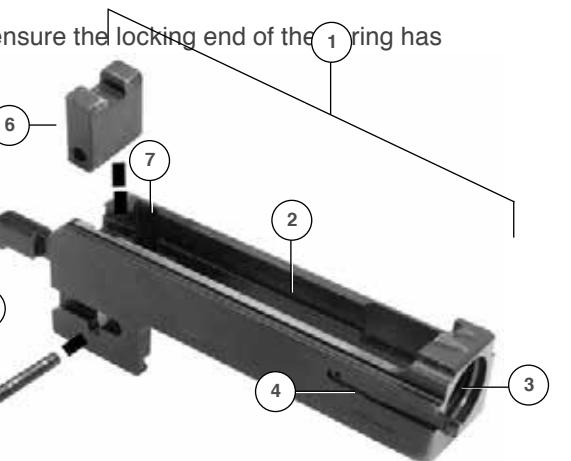
## Maintenance of barrel extension assembly

### Cleaning

1. Clean all parts of barrel extension assembly with a cleaning swab (item 11, app d) saturated with carbon removing compound (item 3, app d).
2. Wipe all parts dry with clean wiping rag (item 10, app d).

### Inspection

1. Inspect **barrel extension assembly** (1) to ensure it is not bent and the **bolt guideways** (2) are smooth and free of burrs.
2. Visually inspect **threads** (3) of **barrel extension assembly** (1) for any damage.
3. Ensure **barrel locking spring** (4) is staked and fully seated in its groove. Also ensure the locking end of the 1 ring has good tension and the lug is not damaged.
4. Inspect **breech lock pin assembly** (5) for broken or missing spring.
5. Check **breech lock** (6) for smooth movement in **guideways** (7) of **barrel extension assembly** (1).



### Lubrication

Apply a light coat of lubricating oil (item 7, 8, or 9, app D) to all parts of barrel extension assembly.

## Maintenance of retracting slide handle (flexible type only)

### Cleaning

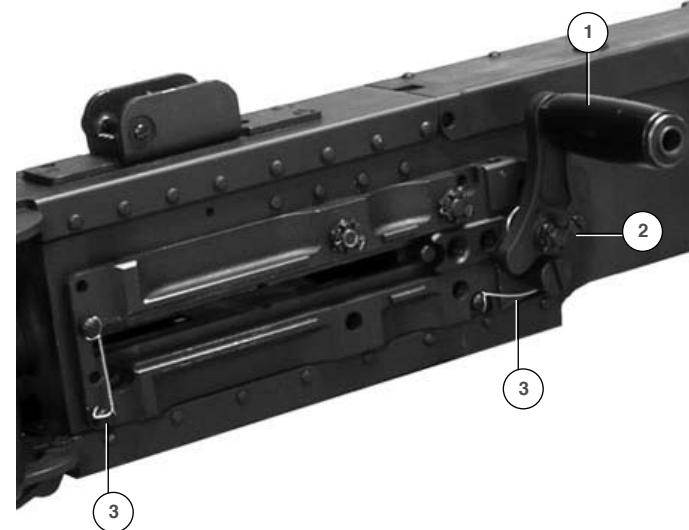
1. Clean all surfaces of retracting slide handle with a cleaning swab (item 11, app d) saturated with carbon removing compound (item 3, app d).
2. Wipe all parts dry with clean wiping rags (item 10, app d).

### Inspection

1. Inspect **retracting slide handle** (1) for cracks or other visible damage. Inspect for weak or broken retracting springs.
2. Ensure **cotter pins** (2) are present and in good condition.
3. Ensure **safety wire** (3) is in place and properly laced.

### Lubrication

Apply a light coat of lubricating oil (item 7, 8, or 9, app D) to all parts of retracting slide handle.



## Maintenance of M10 manual charger (M48 turret type only)

### Cleaning

1. Clean outside surface of M10 manual charger with a cleaning swab (item 1 app D) saturated with carbon removing compound (item 3, app D).
2. Wipe all parts dry with clean wiping rags (item 10, app D).

### Inspection

1. Inspect **cable** (1) for fraying or kinks.
2. Inspect all surfaces (inside and out) for any other visible damage.
3. All other deficiencies noted should be reported to unit maintenance.



### Lubrication

Apply a light coat of lubricating oil (item 7, 8, or 9, app D) to all parts of M10 manual charger.

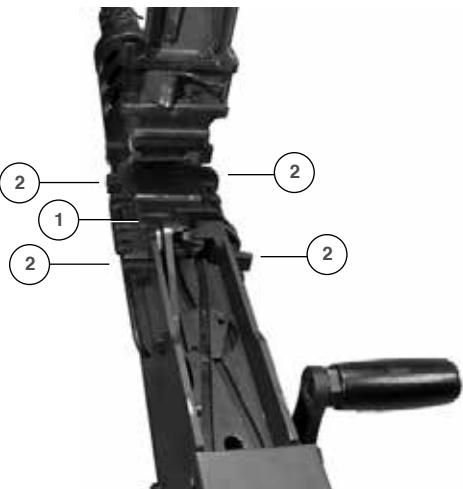
## Maintenance of receiver assembly

### Cleaning

1. Clean all surfaces of receiver assembly with a cleaning swab (item 11, app D) saturated with carbon removing compound (item 3, app D).
2. Wipe all parts dry with clean wiping rags (item 10, app D).

### Inspection

1. **Feedway** (1) must be clear of obstructions.
2. Inspect belt holding **pawl brackets** (2) for looseness, bends, or cracks.

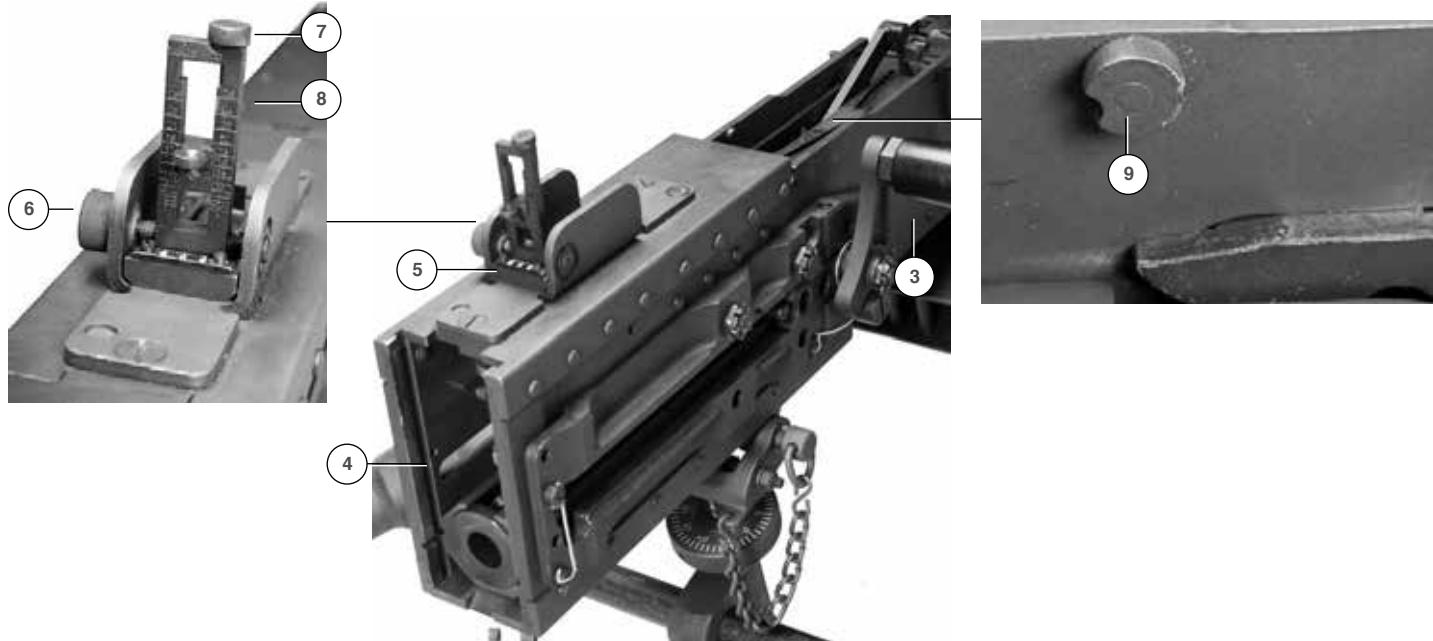


3. Inspect **side plates** (3) for bends that would affect movement of any internal components.

4. Inspect for cracks and burrs on **backplate grooves** (4).

5. Check operation of **rear sight** (5) (flexible type only). Ensure **windage screw** (6) and **elevation screw** (7) function without binding. Ensure **leaf assembly** (8) has good spring tension. Ensure sight assembly is secured tightly to receiver.

6. Ensure **bolt stop** (9) is present and in good condition.



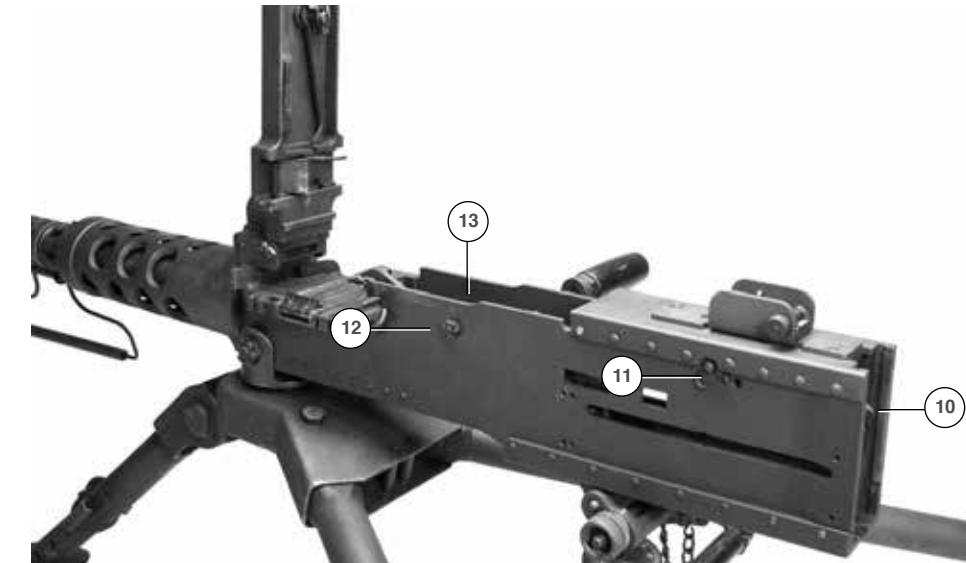
7. Ensure **trigger lever** (10) moves freely without binding.

8. Ensure **trigger lever pin** (11) locks in place.

9. Ensure **cotter pin** (12) is in place on **extractor switch** (13).

## Lubrication

Apply a light coat of lubricating oil (item 7, 8, or 9, app D) to all parts of receiver group.

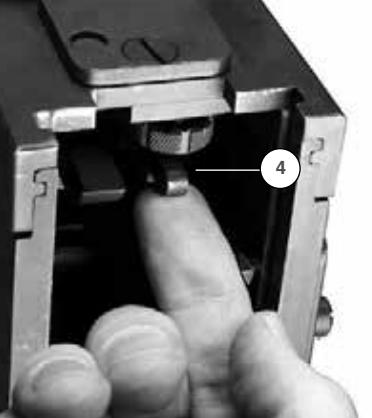
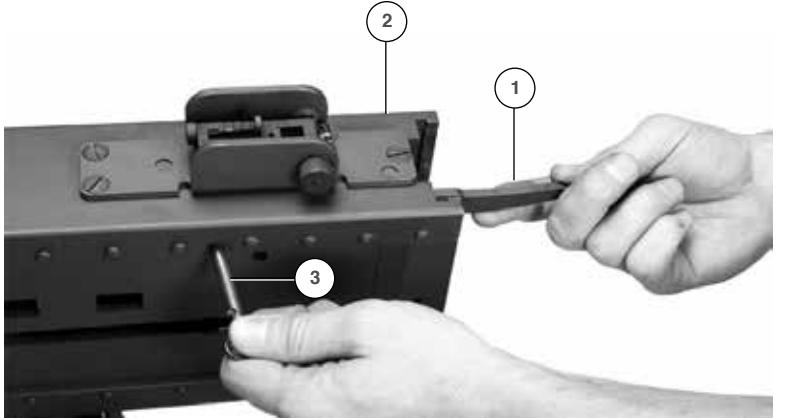


## Assembly of trigger lever

1. Install **trigger lever bar** (1) in **receiver** (2).

**NOTE:** Ensure trigger lever bar is aligned directly under timing nut.

2. Align hole in **trigger lever bar** (1) with mounting hole in **receiver** (2).
3. Place **trigger lever pin assembly** (3), loop end vertical, in assembly hole on left side plate of **receiver** (2).
4. Match key on **trigger lever pin assembly** (3) with keyway in side plate of **receiver** (2) and install pin completely.
5. Rotate **trigger lever pin assembly** (3) 90 degrees to lock securely in place, and fold down out of the way.
6. Check that trigger **lever bar** (4) moves freely.

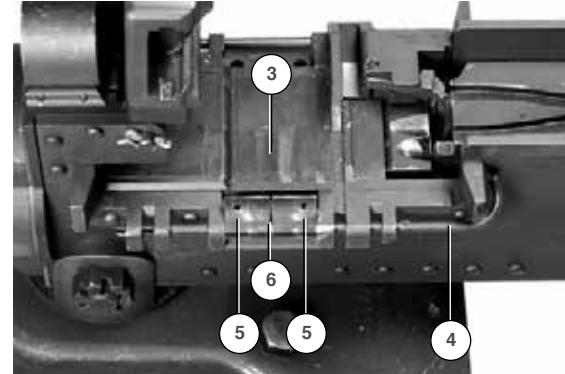
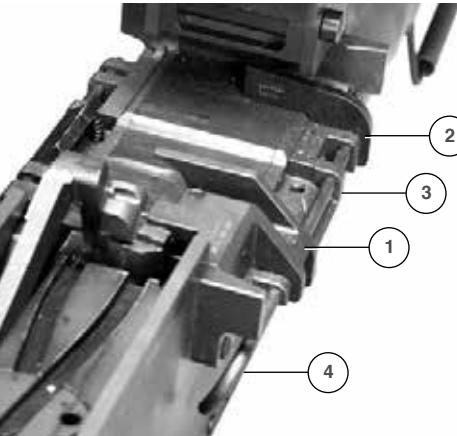


## Assembly of receiver assembly

**NOTE:** Determine direction of feed before proceeding. Left hand feed is shown.

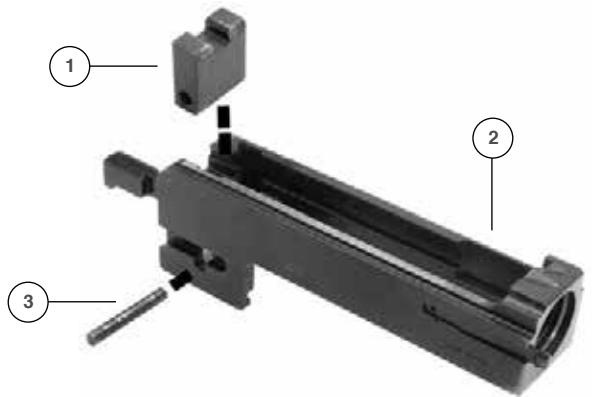
1. Place right hand rear cartridge **stop assembly** (1) and front **cartridge stop** (2) on belt holding **pawl bracket** (3).
2. Install belt holding **pawl pin** (4) with hooked end to rear.
3. Seat belt holding **pawl springs** (5) in place on belt holding **pawl bracket** (3).
4. Place belt **holding pawl assembly** (6) on **springs** (5). Compress **springs** (5) and insert belt holding **pawl pin** (4).

**NOTE:** To change direction of feed to right hand, refer to unit maintenance.



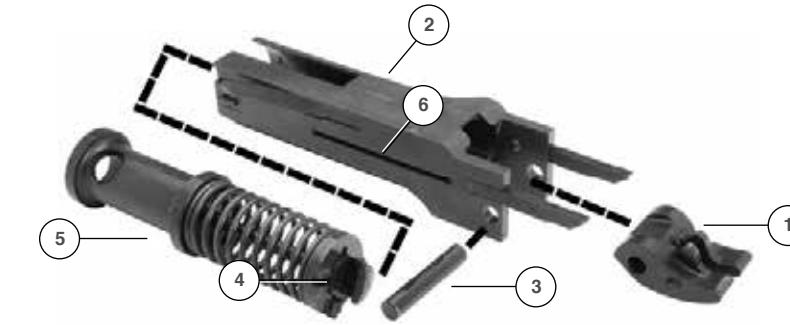
## Assembly of barrel extension assembly

1. Install **breech lock** (1) in **barrel extension assembly** (2) with double beveled edge up and to the front of **barrel extension assembly** (2).
2. Install **breech lock pin assembly** (3) in **barrel extension assembly** (2). Ensure both ends of **breech lock pin assembly** (3) are flush with sides of **barrel extension assembly** (2).



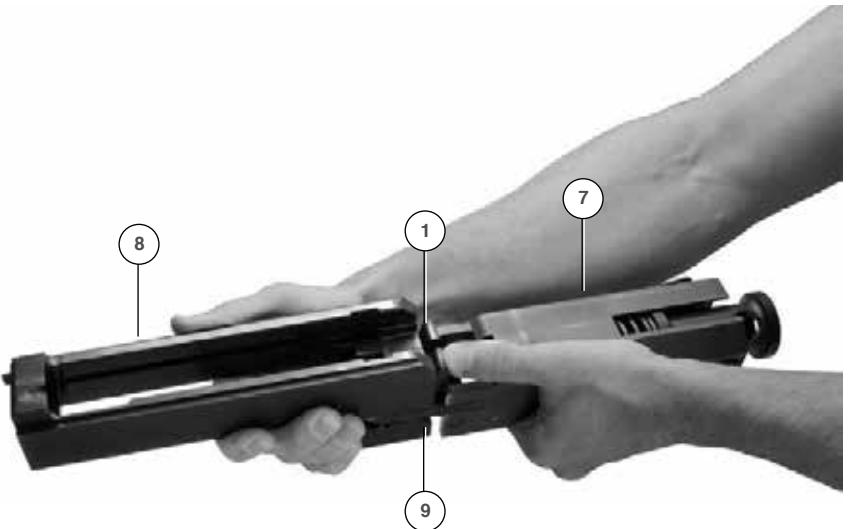
## Assembly of barrel buffer assembly

1. Place **buffer accelerator** (1) (tips up) into **barrel buffer body** (2), aligning mounting holes. Install **barrel buffer pin assembly** (3). Ensure both ends of the **barrel buffer pin assembly** (3) are flush with the sides of the **barrel buffer body** (2).
2. Align **key** (4) on **barrel buffer assembly** (5) with **key slot** (6) in **barrel buffer body** (2), and slide **barrel buffer assembly** (5) into **barrel buffer body** (2).



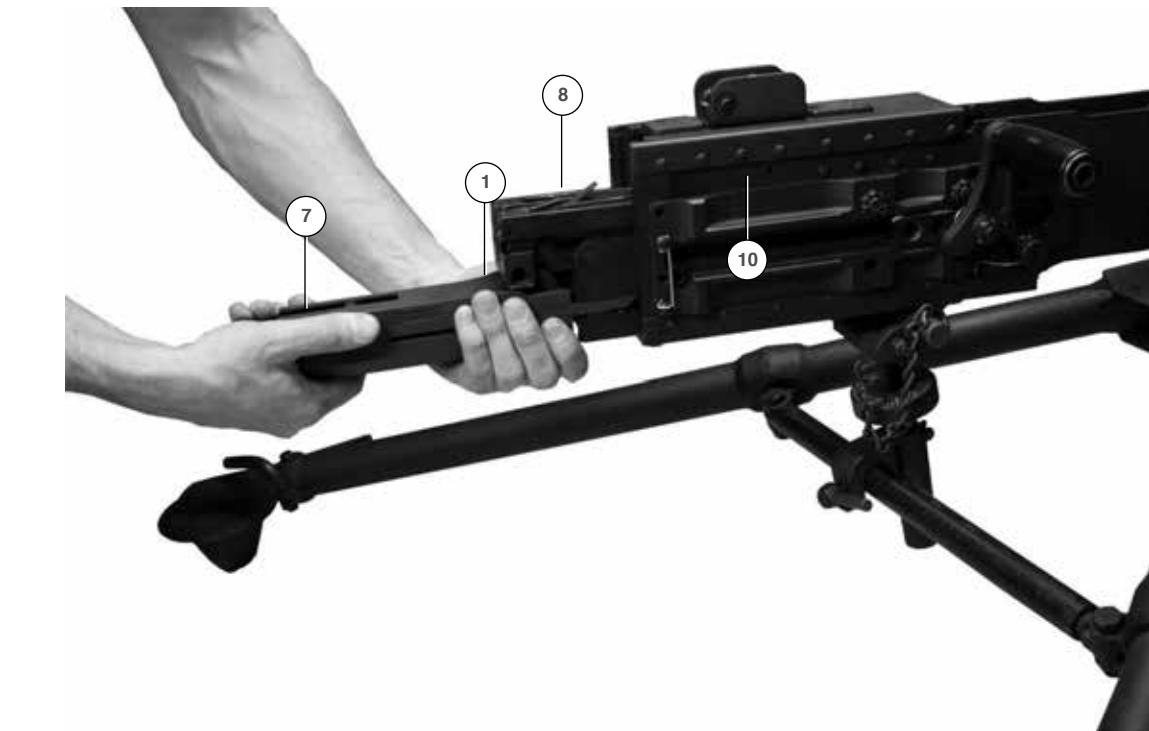
3. Hold **barrel buffer assembly** (7) with **buffer accelerator** (1) up and engage notch on shank of **barrel extension assembly** (8) with cross groove in piston rod of **barrel buffer assembly** (7).

4. Align **breech lock depressors** (9) in grooves of **barrel extension assembly** (8) and push **barrel buffer assembly** (7) forward.



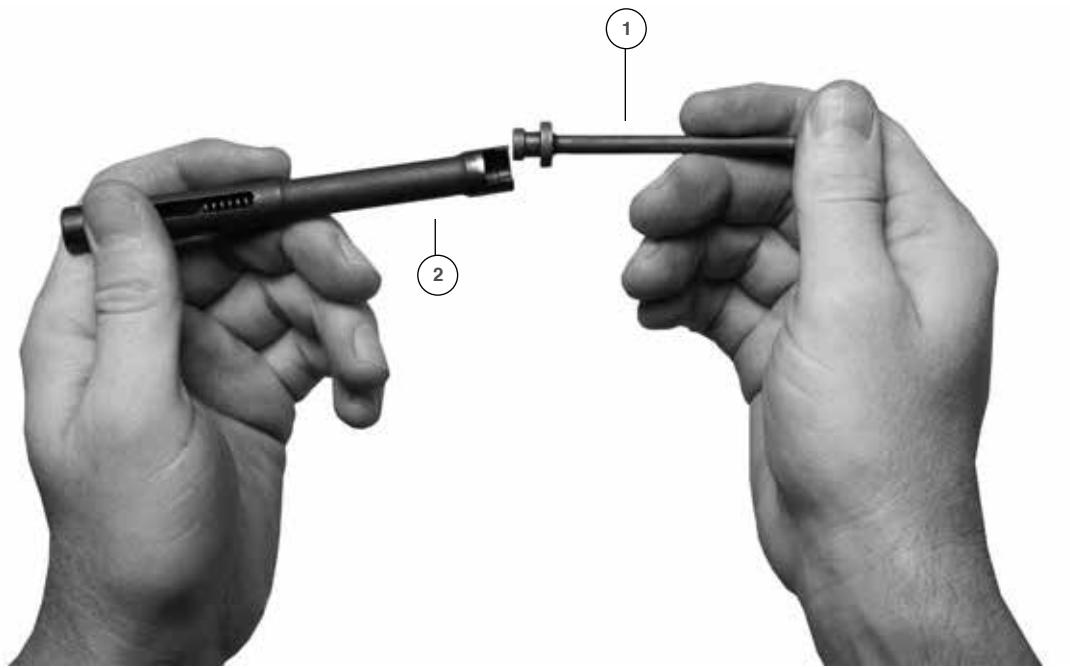
**CAUTION:** While installing barrel buffer assembly (7) and barrel extension assembly (8) into receiver (10), maintain thumb pressure on buffer accelerator (1).

5. Install **barrel buffer assembly** (7) and **barrel extension assembly** (8) in **receiver** (10).



## Assembly of bolt assembly

1. Attach **firing pin** (1) to **firing pin extension assembly** (2).



2. Place **firing pin extension assembly** (2) into **bolt** (3) with notch of **firing pin extension assembly** (2) down.

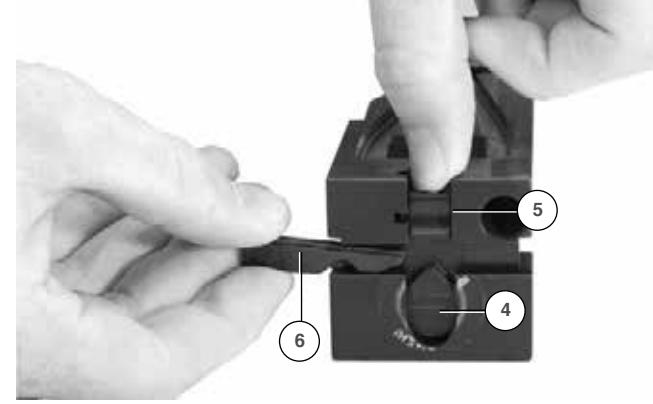
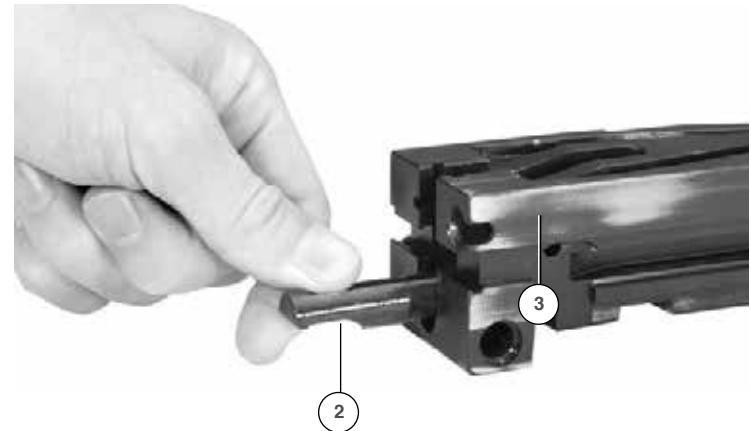
3. Slide **firing pin extension assembly** (2) forward so that tip of firing pin protrudes from face of **bolt** (3).

4. Place **sear spring** (4) in recess on **bolt** (3).

5. Slide **sear** (5) down into vertical grooves at rear of **bolt** (3) with wedge shaped lug pointed outward and upward.

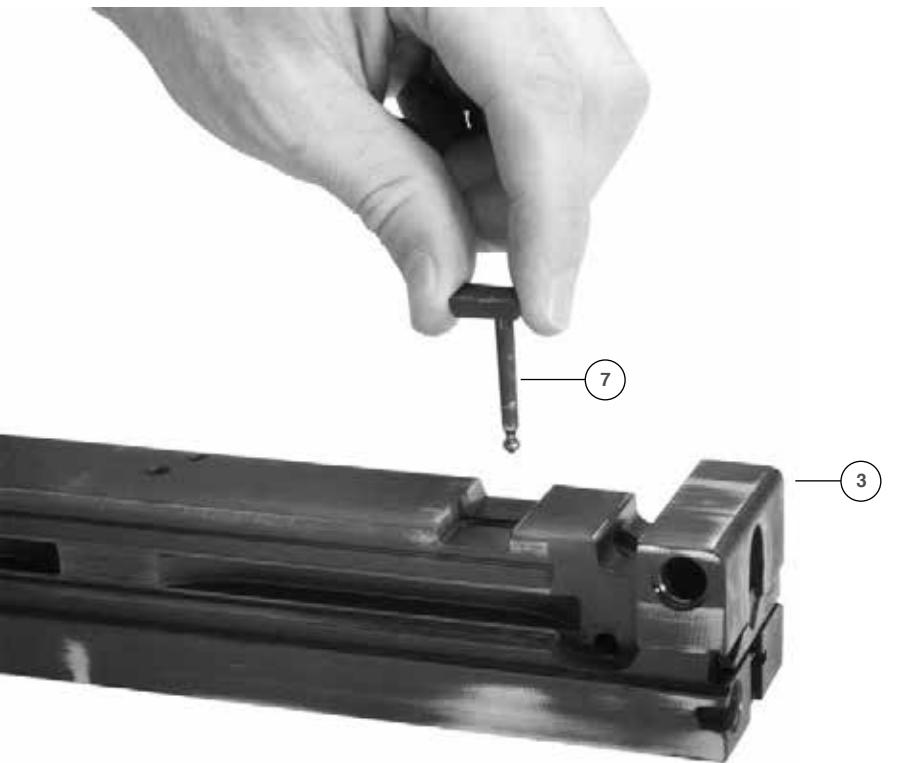
**NOTE:** Ensure that sear and sear spring engage properly. Sear also has a recess for sear spring.

6. Compress **sear spring** (4) by pressing down on **sear** (5). Install **sear slide** (6) from left side of bolt in grooves of **bolt** (3) with V notch down.



**NOTE:** Ensure pin end of accelerator stop is installed behind firing pin spring, not through a coil.

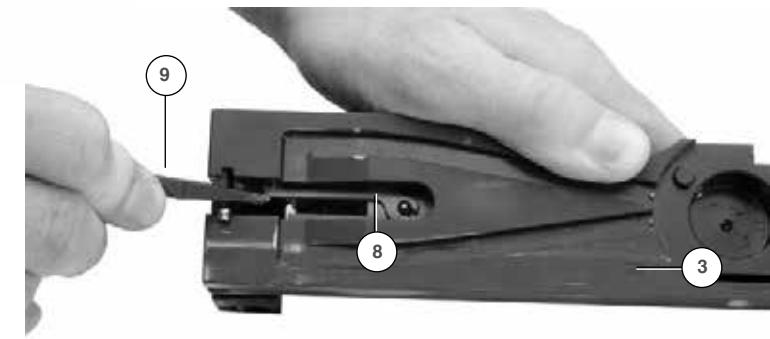
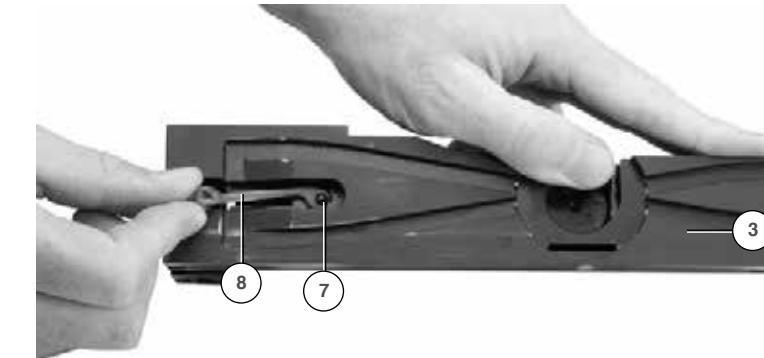
7. Insert pin end of **accelerator stop** (7) through bottom of **bolt** (3).



**NOTE:** Base end of **accelerator stop** (7) should be installed with long end forward so beveled edges match.

8. Turn **bolt** (3) over. Place forked end of **accelerator stop lock** (8) on notched end of **accelerator stop** (7).

9. Using wedge shaped end of the **cocking lever** (9) as a tool, press down on the flat end of the **accelerator stop lock** (8) and swing it into groove on left side of **bolt** (3).



10. Insert **cocking lever** (9), with rounded nose on lower end of lever to rear, into slot in top of **bolt** (3).

11. Align hole in **cocking lever** (9) with holes in the **bolt** (3). Insert **cocking lever pin** (10) from left side.

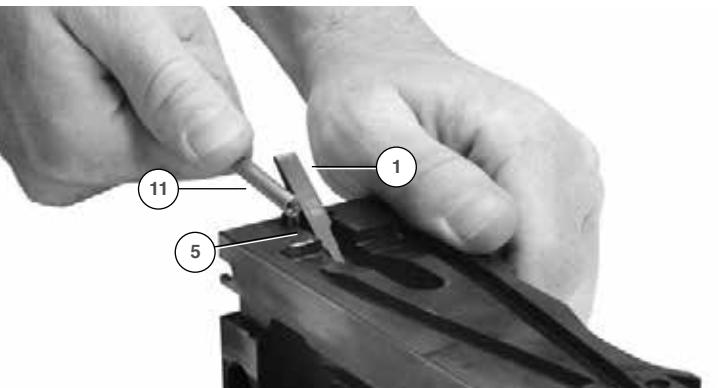
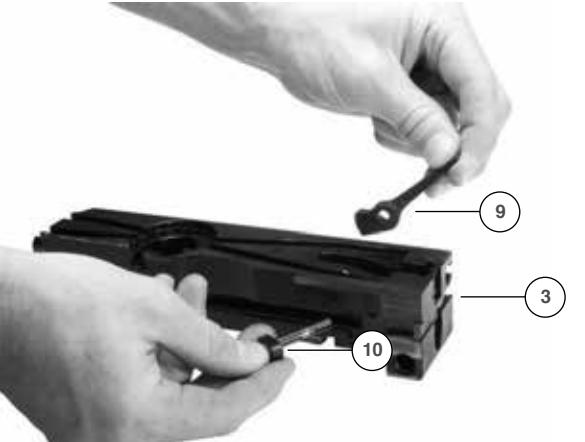
12. Push **cocking lever** (9) forward to charge firing pin. Return **cocking lever** (9) to rearward position.

**WARNING:** Do not attempt to release the firing pin with cocking lever forward. The cocking lever could spring back forcibly and cause serious injury to the hand.

13. Trip **firing pin** (1) by depressing **top of sear** (5) with a **swab holder section** (11).

**NOTE:** A sharp metallic sound indicates firing pin spring is in good condition.

14. Place **cocking lever** (9) in forward position after testing firing pin release.



**NOTE:** Determine direction of feed before installing bolt switch. Left hand feed is illustrated.

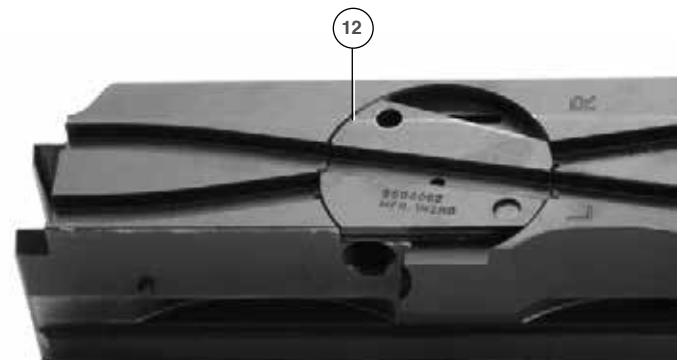
15. Place **bolt switch** (12) in position so that the feed groove is continuous for feed direction selected.

16. Hold **cartridge extractor** (13) in vertical position. Insert shank end of **cartridge extractor** (13) into left side of **bolt** (3).

**NOTE:** Ensure **cartridge extractor** (13) fits into **bolt** (3) as far as possible.

17. Rotate **cartridge extractor** (13) downward to full horizontal position.

18. Check that flange on bottom of **cartridge extractor** (13) has engaged shoulder on **bolt** (3).



**CAUTION:** When installing bolt assembly, do not trip buffer accelerator.

**NOTE:** Ensure *cocking lever* (9) is forward before installing *bolt assembly* (14) into *receiver* (15).

19. Push *bolt assembly* (14) forward into *receiver* (15) until bolt latch engages notches in top of *bolt assembly* (14).

**NOTE:** If unable to install by performing step 19, perform step 20.

20. Remove *barrel extension* (16) and *buffer assembly* (17) from the receiver. Install *bolt assembly* (14) into barrel extension and buffer assembly then install into the receiver.

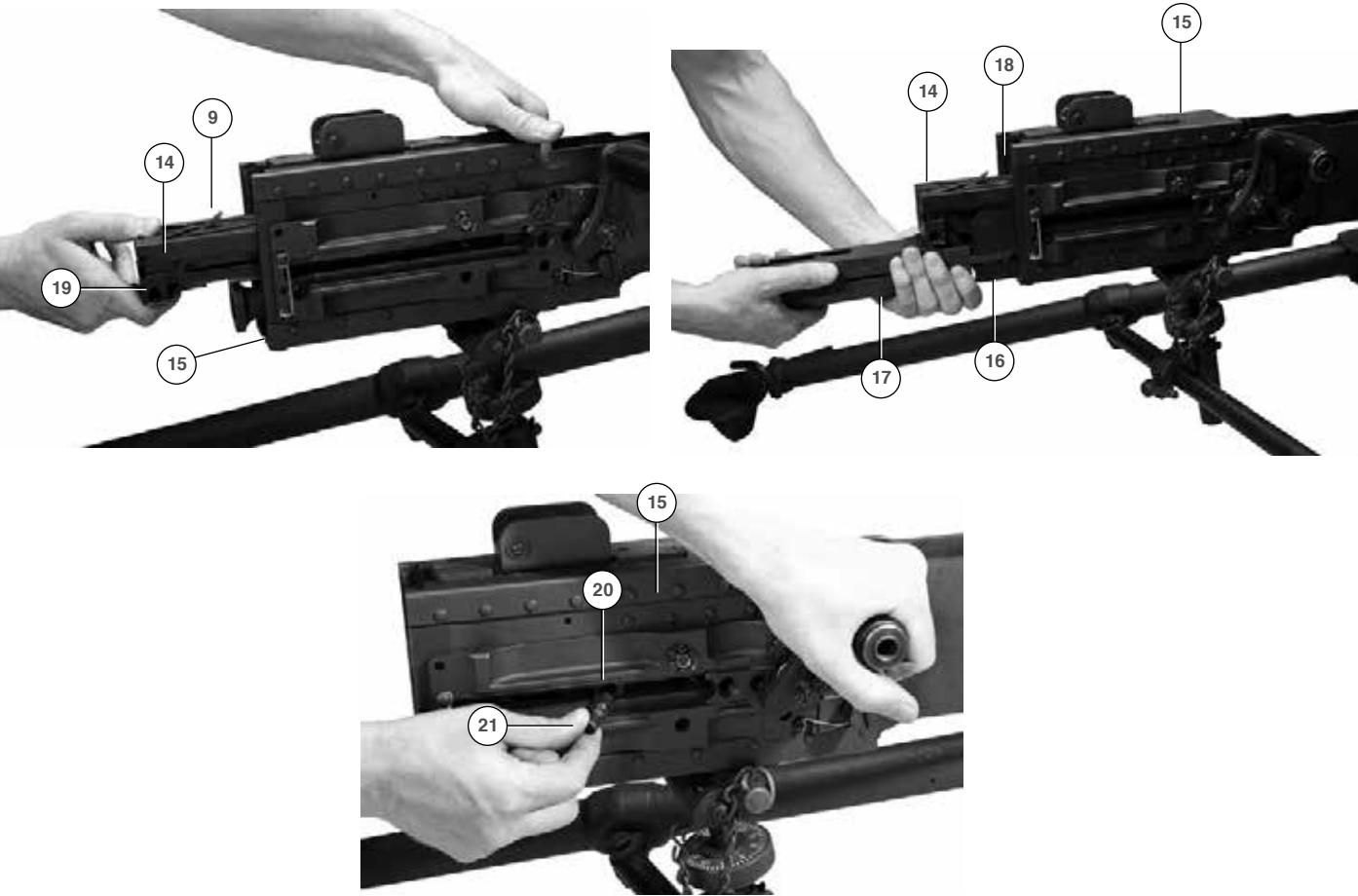
21. Raise *bolt latch* (18) and push *bolt assembly* (14) into *receiver* (15).

22. Align *hole* (19) in *bolt assembly* (14) with *stud assembly hole* (20) in *receiver* (15) and install *bolt stud* (21) in *hole* (19) in bolt assembly.

**NOTE:** The *bolt stud* (21) is installed in the right side of the receiver and bolt for the flex and in the left side of the receiver and bolt for the M48 turret type.

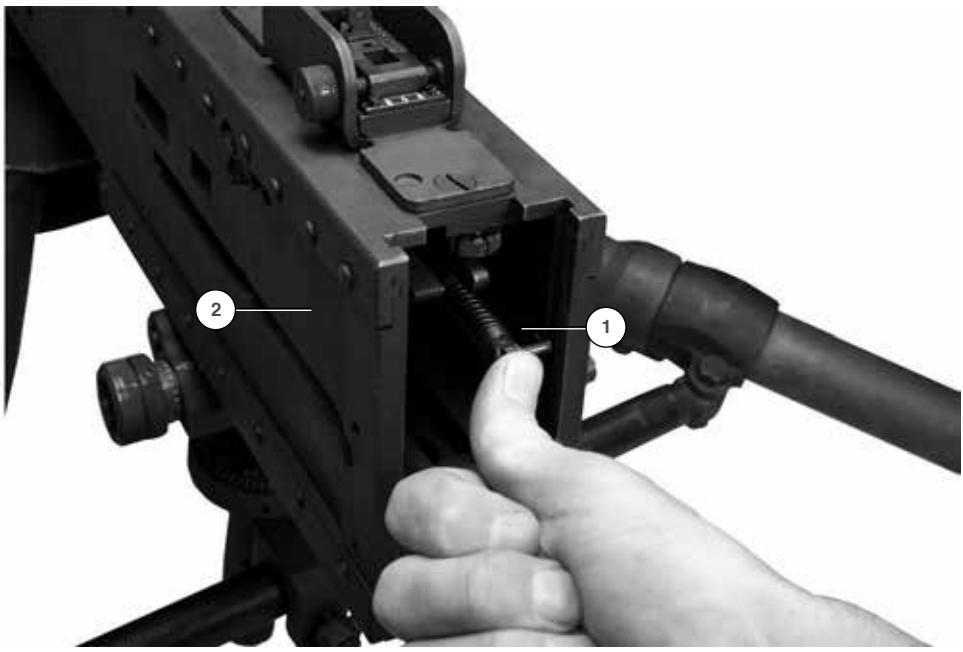
23. Place bolt in forward position.

24. Replace M10 charger cover (M48 turret type and fixed type only).



## Assembly of driving spring rod assembly

Install **driving spring rod assembly** (1) in upper right hand corner of bolt. Push forward and to the right until **driving spring rod assembly** (1) engages in hole in side plate of **receiver** (2) and not in the groove for the backplate.

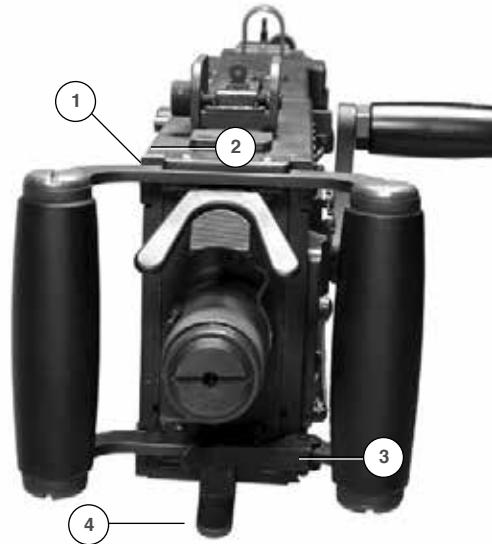


## Assembly of backplate assembly

NOTE: Illustration shows flexible type backplate. Procedure applies to both the flexible type and M48 turret type backplates.

Install **backplate assembly** (1) in **receiver** (2) grooves. Pull **backplate latch lock** (3) while lifting up on **backplate latch** (4). Lower **backplate assembly** (1) down until engaged in **receiver** (2).

NOTE: Test proper locking by pulling up on backplate assembly (1).



## Assembly of barrel assembly

1. Retract bolt far enough for **barrel locking spring lug** (1) to center in **barrel locking spring hole** (2) on right hand side of **receiver** (3).
2. Install and screw **barrel assembly** (4) completely into **receiver** (3). Unscrew barrel assembly until two clicks are heard and check headspace (p 31).
3. Perform weapon function check to ensure proper assembly.

**NOTE:** The above procedures are setup for use. If weapon is to be stored after cleaning and lubricating, return weapon to unit maintenance.

**WARNING:** Injury to personnel can result while holding a hot barrel without wearing a protective heat mitten.



# CHAPTER 4-M2A2 SYSTEM

## QUICK CHANGE BARREL



The M2QCB upgrades the M2HB weapon system increasing the safety level for operating personnel. The M2QCB allows for quick barrel changes with fixed headspace and timing to eliminate associated safety concerns with barrel changing and improper timing.

### M2QCB Features:

- Improved barrel handle simplifies hot-barrel changing with improved barrel alignment, and the retention system assures the barrel is securely locked and aligned.
- Utilizes the common barrel thread to interchange with existing M2HB barrels.
- Weapon can be fitted to all types of armored, light and heavy vehicles, patrol boats, helicopters and other aircraft.
- Features a single breech lock system allowing for field rebuild, eliminates the need for depot-level maintenance during its lifetime and thereby greatly reduces logistical support.
- Non-QCB parts are interchangeable with M2HB machine guns, which eliminate logistics concerns during fielding.

**WARNINGS:** Carry out safety check before handling the weapon. The weapon is heavily oiled for shipping. Clean and lubricate before firing. These procedures given apply only to the US Ordnance QCB version.

## Ensuring a clear and safe gun

1. Ensure **buffer tube sleeve** (1) is positioned in single shot fire mode (p. 50).
2. Open **machine gun cover** (2), lift the cartridge extractor and remove the ammunition belt, if present, from the feedway.
3. Pull **retracting slide handle** (3) rearward, retracting the bolt all the way to the rear. If the machine gun is set for single shot fire, the bolt assembly will remain in the rearward position.
4. Visually inspect the chamber and T-slot for rounds to ensure they are clear.

**Note:** Do not close feed cover with the bolt open.

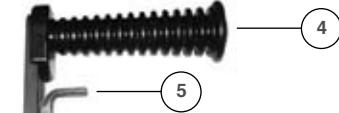
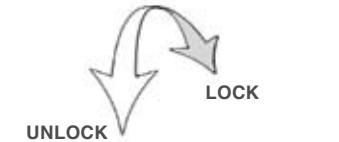
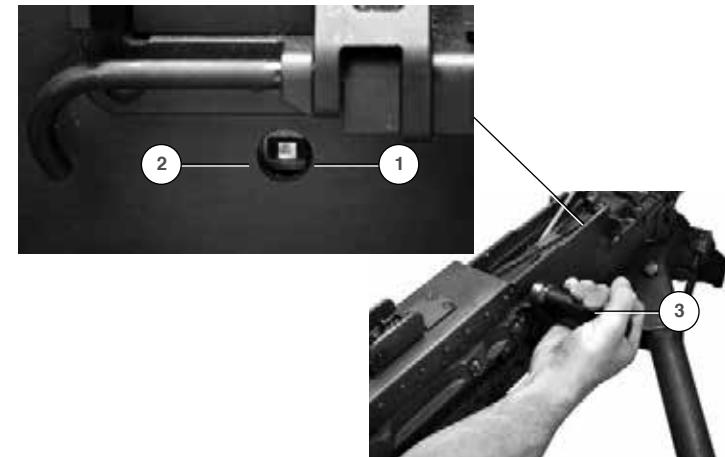
5. Press the bolt latch release and ease the bolt forward with the **retracting slide handle** (3).
6. Close the cover.



## Barrel removal

1. Pull **retracting slide handle** (3) rearward slightly until the handle lines up with the top of the feed cover or the **barrel locking lug spring** (1) aligns with the 3/8 inch **receiver hole** (1) in the right side of the receiver (p. 31).
2. Pull the **barrel carrying handle** (4) up to the vertical position, causing the barrel to turn and unlock.
3. Pull barrel out and release the **retracting slide handle** (3).

**Note:** Whenever the barrel is not fitted the retracting slide handle must be used to slow the moving parts when closing the bolt. Pulling the carrying handle release lever (5) disengages barrel carrying handle from barrel.



## Barrel assembly

1. Pull retracting slide handle rearward slightly until the handle lines up with the top of the feed cover or the barrel locking spring lug aligns with the 3/8 inch hole in the right side of the receiver (p. 31).
2. Slide barrel into barrel support with the carrying handle in the vertical position (the guide stud in the varrel support will enter the pathway on the barrel).
3. Push the barrel completely into the barrel support and rotate the **carrying handle (2)** down towards the left side of the weapon causing the barrel to rotate and lock.
4. Release the retracting slide handle.
5. Grasp the retracting slide handle and charge the weapon to ensure the barrel is properly seated in the barrel extension. If the bolt does not travel fully to the rear, the barrel is not properly installed. Repeat step

**WARNING:** Ensure barrel assembly is correctly installed. Firing the weapon with the barrel assembly incorrectly installed can cause malfunctions, damage to the gun, and injury to personnel.

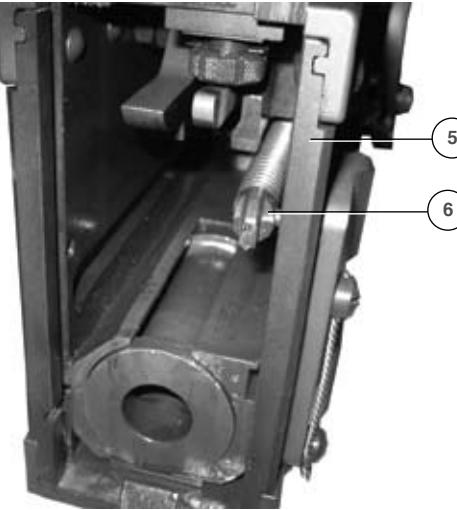
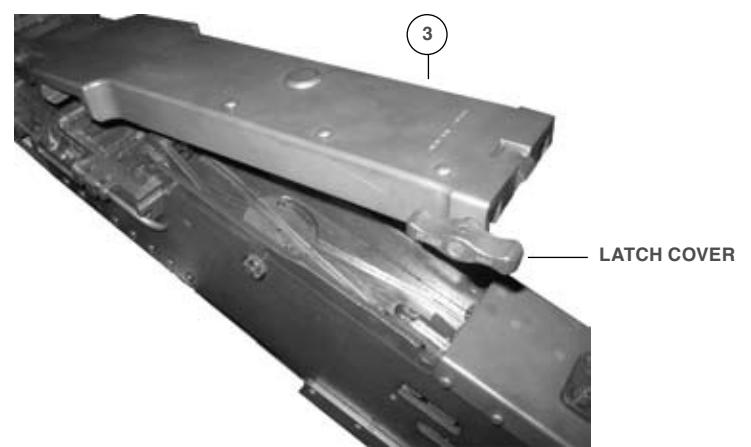


## Field Stripping

1. Ensure gun is clear and safe.
2. Remove barrel assembly.
3. Raise **feed cover (3)** and ensure the bolt is fully forward.

**Note:** Do not try to remove the back plate group with the bolt held open by the **bolt latch release (4)**.

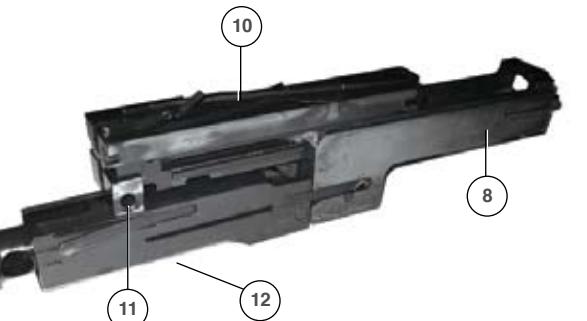
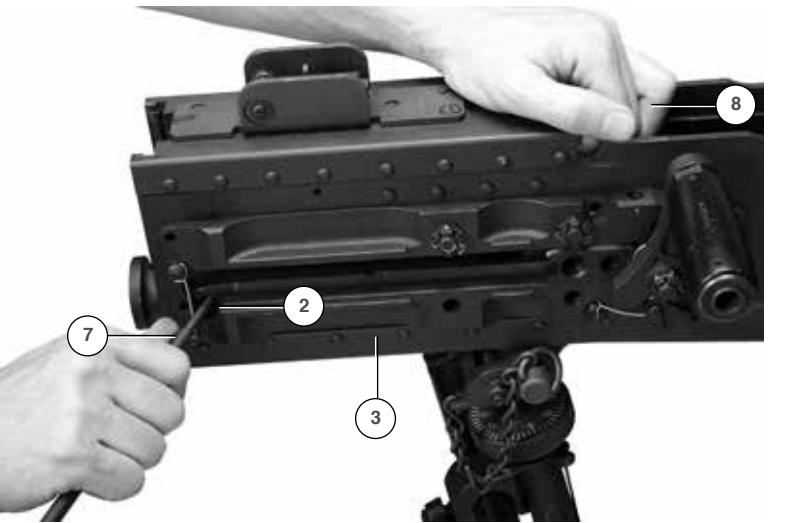
4. Ensure buffer tube sleeve is positioned in single shot fire mode (p. 50).
5. Pull backplate latch lock straight back, while lifting up on the backplate latch. Raise backplate assembly straight up and remove from **receiver (5)**.
6. Push rear of **driving spring (6) rod assembly** forward and to the left until free from the side of the receiver. Remove driving spring rod assembly.
7. Retract bolt assembly far enough to align bolt stud with bolt stud hole in receiver. Remove bolt stud.



8. Install pointed end of **M4 cleaning rod** (7) into **hole** (2) in **receiver** (3) and depress buffer body lock while applying rearward pressure on **barrel extension** (8) assembly.

9. Remove **bolt** (10), **barrel buffer** (12) and **barrel extension** (8) assembly together from receiver. Slide **bolt** (10) rearwards out of the **barrel extension** (8) assembly and put it down on its right side so the extractor will not fall out. Separate the barrel buffer assembly and the barrel extension assembly by pushing forward on tips of buffer **accelerator** (11).

10. Remove buffer assembly by pushing it out rear of barrel buffer body.

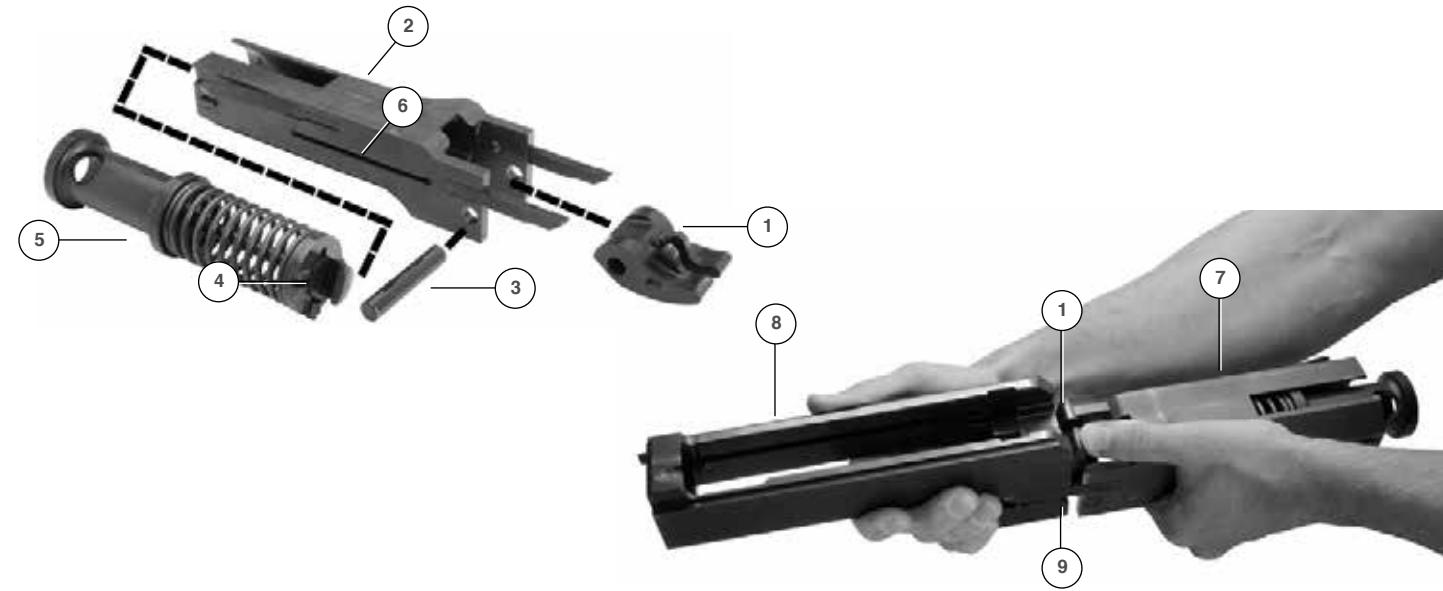


## Assembly

1. Align **key** (4) on **barrel buffer assembly** (5) with **key slot** (6) in **barrel buffer body** (2), and slide **barrel buffer assembly** (5) into **barrel buffer body** (2). (more on page 115)

2. Hold **barrel buffer assembly** (7) with **buffer accelerator** (1) up and engage notch on shank of **barrel extension assembly** (8) with cross groove in piston rod of **barrel buffer assembly** (7).

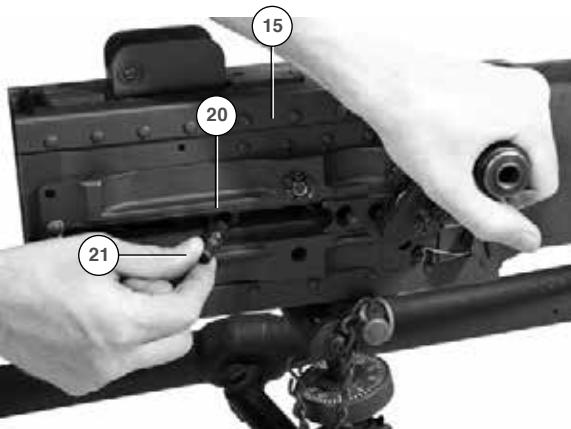
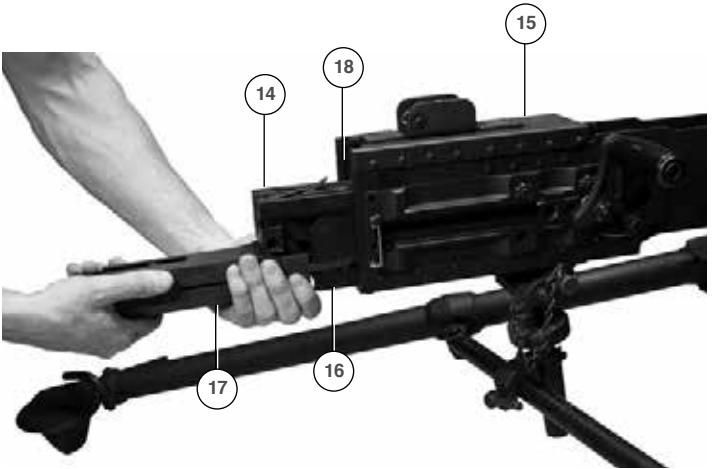
3. Align **breech lock depressors** (9) in grooves of **barrel extension assembly** (8) and push **barrel buffer assembly** (7) forward.



4. Install **bolt assembly** (14) (more on page 118) into barrel extension and buffer assembly then install into the receiver.
5. Raise **bolt latch** (18) and push **bolt assembly** (14) into **receiver** (15).

**Note:** Be sure that the firing pin cocking lever remains pointed forwards during assembly.

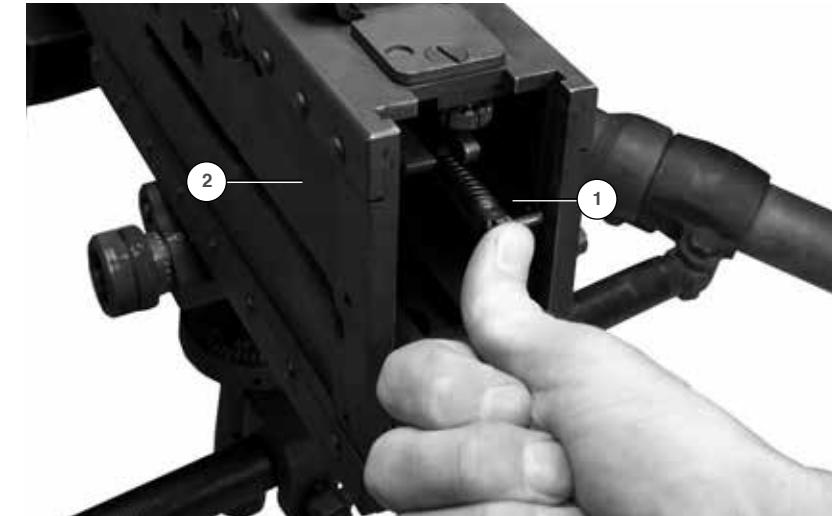
6. Align **hole** (19) in **bolt assembly** (14) with **stud assembly hole** (20) in **receiver** (15) and install **bolt stud** (21) in **hole** (19) in bolt assembly.
7. Place bolt in forward position.



8. Install **driving spring rod assembly** (1) in upper right hand corner of bolt. Push forward and to the right until **driving spring rod assembly** (1) engages in hole in side plate of **receiver** (2) and not in the groove for the backplate.
9. Install **backplate assembly** (15) in **receiver** (11) grooves. Pull **backplate latch lock** (13) while lifting up on **backplate latch** (14). Lower **backplate assembly** (15) down until engaged in **receiver** (11).

**NOTE:** Test proper locking by pulling up on **backplate assembly** (15).

10. Install barrel assembly (p 128).
11. Perform weapon function check to ensure proper assembly.



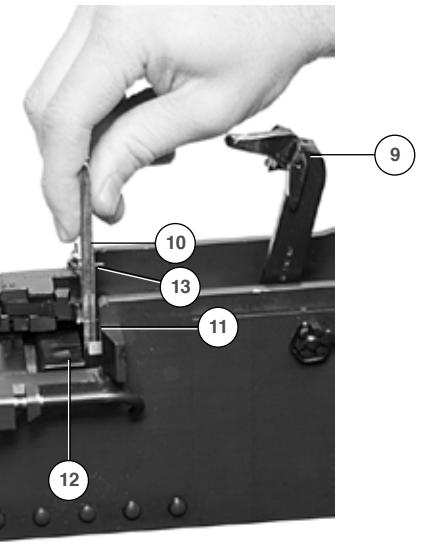
## Preparation for firing-checking and confirming headspace

**WARNING:** Headspace should be checked with M2QCB limit gauge before firing the weapon. Firing the weapon outside headspace tolerances can cause malfunctions, damage to the gun, and injury to personnel. If the weapon is NOT within headspace, turn in the weapon to the next higher level of maintenance.

**NOTE:** Ensure limit gauge does not have any broken, bent, rusted, or pitted areas or other forms of mutilation that could affect dimensional tolerances.

**WARNING:** Ensure weapon is clear and safe

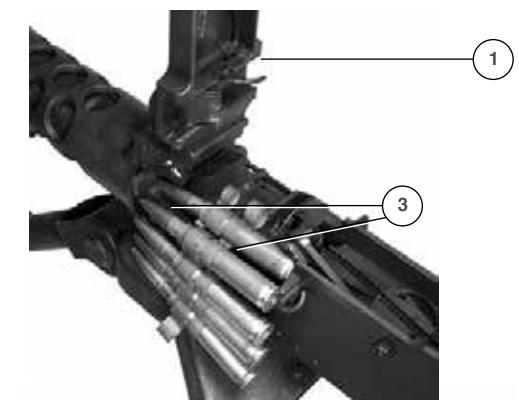
1. Ensure barrel assembly is correctly installed (p.132).
2. Raise **cartridge extractor** (9) and attempt to insert M2QCB limit **gauge** (10) in the T-slot between the face of the **bolt** (11) and the rear of the **barrel** (12) all the way up to the **ring** (13). If the Limit gauge DOES NOT enter the T-slot freely, the headspace is correct. If the Limit gauge DOES enter the T-slot freely, the headspace is incorrect and the weapon needs to be turned in to the next higher level of maintenance.



## Loading

**WARNING:** Ensure barrel assembly is correctly installed (p. 132).

1. Open machine gun **cover** (1), check that the bolt is forward.
2. Insert the double loop end of ammunition in the feedway until first cartridge is held by belt holding **paws** (3).
3. Close **cover** (1) of machine gun.
4. Pull **retracting slide handle** (4) rearward, retracting the bolt all the way to the rear. Release the handle.

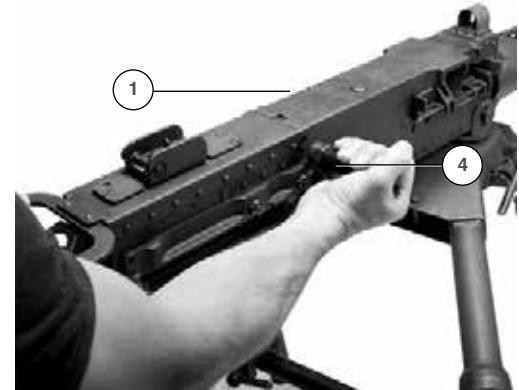


**NOTE:** To half load the machine gun, complete step 4; to fully load the machine gun, repeat step 4 before moving on to step 5.

**NOTE:** If machine gun is set for single shot fire, the bolt assembly will remain in the rearward position. In this event, move the retracting slide handle forward before releasing the bolt with the **bolt latch release** (1) on pg 140. If the machine gun is set for automatic fire, the retracting slide handle will go forward with the bolt when released.

5. Press trigger to fire the machine gun.

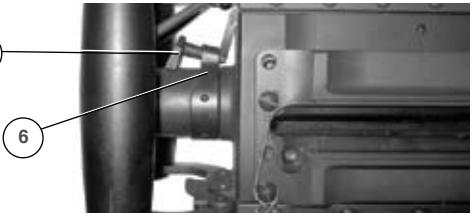
**NOTE:** In case of failure to fire, refer to IMMEDIATE ACTION (p 57).



## Firing mode

1. Single shot mode: check that the **bolt latch release** (5) is not held down by the **buffer tube sleeve** (6). Press the bolt latch release then the trigger to fire.

2. Automatic Fire: press **bolt latch release** (5) down and lock by turning the bolt latch release lock to the left.



## Unloading and clearing the gun

1. Unlock the **bolt latch release** (1).

2. Raise the **cover** (2).



3. Lift the **cartridge extractor** (3) and remove the **ammunition belt** (4) from the feedway.

4. Place cartridge extractor down and close **cover** (2).

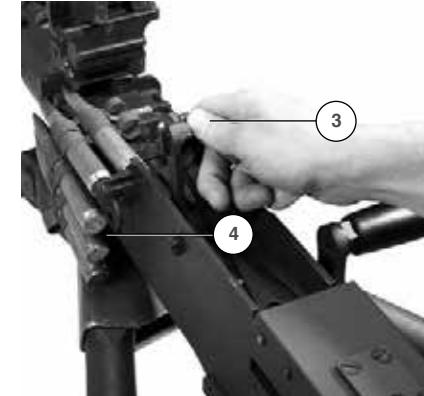
**WARNING:** Round may fall to surface and possibly explode.

5. Pull and lock the bolt to the rear, leaving the retracting slide handle to the rear. Open the cover.

**WARNING:** Chamber may be hot. Use caution while inspecting T-slot.

6. Visually inspect the **chamber** (5) and **T-slot** (6) for rounds (in darkness the gunner must feel the chamber and T-slot to ensure they are clear).

7. Press the **bolt latch release** (1) and ease the bolt forward with retracting slide handle.



## Firing Malfunctions

For firing malfunctions such as Misfire, Stoppage or Removing a ruptured cartridge case, please see page 54.

## Immediate Action

See page 57.

## Cleaning and Lubrication

See page 71-72.

# CHAPTER 5-AMMUNITION

## SECTION I. AUTHORIZED AMMUNITION



### WARNING

This is the only ammunition authorized for use in your machine gun. If it is not shown, it is not authorized. Because of the potential injury from discarding sabot fragments, neither the M903 nor the M962 should be fired over the heads of friendly personnel.

Normal training mix: 4 ball M2 and 1 tracer M17 with M9 link.

Normal combat mix: 4 ball API-M8 and 1 APIT M20 with M9 link.

Normal combat mix: 4 SLAP M903 and 1 SLAPT M962 with M9 link

**NOTE: All cartridges except the M2 DUMMY have plain cases.**

**M1A1 blank is to be utilized with the M19 blank firing attachment. Refer to TM 9-1005-314-12&P.**

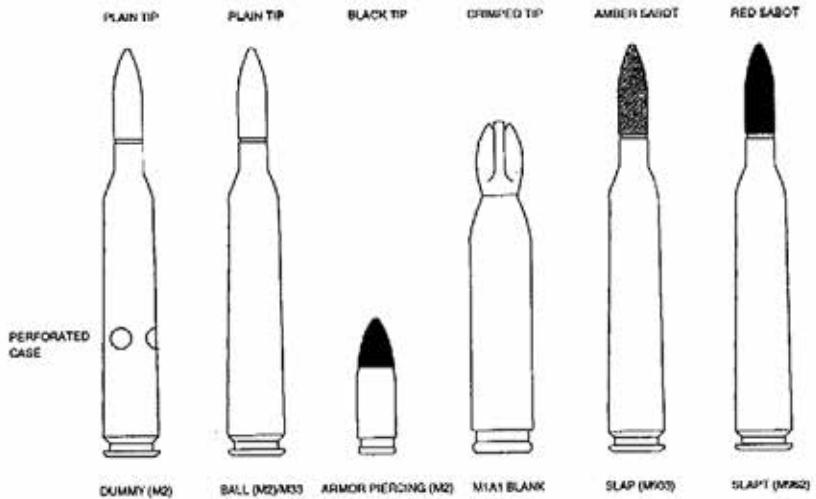
The sights on the M2 Machine gun are designed for conventional ball, tracer, and armor-piercing incendiary ammunition. Firing of the slap cartridges with the current sight will result in the projectile having a higher trajectory than desired. For targets at 1,000 meters or less, align the sights on the target and then drop two clicks on the sight or T&E mechanism. For targets beyond 1,000 meters, align the sights and come down three clicks.

## AMMUNITION WHICH FAILS TO FIRE

Ammunition which fails to fire should be disposed of in accordance with authorized procedures.

## CARE, HANDLING, AND PRESERVATION

- a. Do not open ammunition containers until the ammunition is to be used. Ammunition removed from the airtight containers, particularly in damp climates, is likely to corrode.
- b. Protect ammunition from mud, dirt, and water. If the ammunition gets wet or dirty, wipe it off prior to use. Wipe off light corrosion as soon as it is discovered. Heavily corroded cartridges or cartridges which have dented cases or loose projectiles should not be fired.
- c. Do not expose ammunition to the direct rays of the sun. If the powder is hot, excessive pressure may develop when the gun is fired.
- d. Do not oil or grease ammunition. Dust and other abrasives collecting on oiled or greased ammunition will damage the operating parts of the gun. Oiled cartridges will produce excessive chamber pressure.



# APPENDIX A

## REFERENCES

### Scope

This appendix lists publications referenced in this manual.

### Field Manuals

Browning Machine Gun Caliber .50, HB, M2.....	FM 23-65
First Aid for Soldiers .....	FM 21-11
Northern Operations .....	FM 31-71
Tank Combat Tables .....	FM 17-12-1

### Forms

Equipment Inspection and Maintenance Worksheet .....	DA Form 2404
Quality Deficiency Report .....	SF 368
Recommended Changes to Publications and Blank Forms .....	DA Form 2028
Quality Deficiency Report (Navy).....	SF 368
Marine Corps Forms and Procedures for Equipment Maintenance .....	TM 4700-15/1
Marine Corps Recommended Changes to Publications .....	NAVMC 10722
Publication Improvement Report (Navy) .....	TMDER NAVSEA 9086/10
Air Force Materiel Deficiency Reporting and Investigating System .....	TO 00-35D-54
Air Force Forms and Records .....	TO 11W-1-10
Technical Order System Publication Improvement Report and Reply .....	AFTO Form 22

### Miscellaneous Publications

The Army Maintenance Management System (TAMMS).....	DA PAM 738-750
Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items .....	CTA 50-970
Marine Corps Quality Deficiency Report .....	MCO 4855.10
Marine Corps Transportation and Travel Record of Transportation Discrepancies .....	MCO P4610.19
Marine Corps Warehousing Manual.....	MCO P4450.7

### Technical Manuals

Tactical/Armored Vehicles and Ground Mounting.....	TM 9-1005-245-13&P
Blank Firing Attachment (BFA) M19.....	TM 9-1005-314-12&P
Mount, Machine Gun, MK 64 .....	TM 9-1010-231-13&P
Tank, Combat, Full Tracked 105mm, M1 .....	TM 9-2350-255-10-1, 2*
Tank, Combat, Full Tracked 120mm, M1A1 .....	TM 9-2350-264-10-1, 2*
Marine Corps Upgunned Weapon Station (UGWS)	
Assault Amphibian Vehicle Personnel, Model 7A1 (AAAVP7A1) .....	TM 10004A-10/1
Marine Corps Stocklist SL-3 Components List for M2 HB Machine Gun.....	SL-3-02498
Maintenance Manual for Small Arms Machine Gun Mounts .....	W361-AO-MMO-010

\* - 1 - PMCS and Operation Under Usual Conditions

- 2 - Operation Under Unusual Conditions

# APPENDIX B

## COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

### Scope

This appendix lists components of end item and basic issue items for the machine guns and mounts to help you inventory items required for safe and efficient operation.

### General

This Components of End Item List is divided into the following sections:

a. Section II. Components of End Item. There is no COEI list for the machine guns and mounts.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the machine guns and mounts in operation, to operate them, and to perform emergency repairs. Although shipped separately packaged, BII must be with the machine guns and mounts during operation and whenever they are transferred between property accounts. The illustration will assist you with hard to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

### Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

- a. Column (1)-Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.
- b. Column (2)-National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.
- c. Column (3)-Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.
- d. Column (4)-Unit of Measure (UIM). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., es., in., pr).
- e. Column (5)-Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
1	1005-00-726-6131	BARREL ASSEMBLY (19204) 7266131	EA	1
2	4933-00-716-0041	EXTRACTOR, RUPTURED CARTRIDGE (19204) 7160041	EA	1
3	4933-00-535-1217	GAUGE, HEADSPACE AND TIMING (19205) 5351217	EA	1
4	8415-01-092-0039	MITTEN, HEAT PROTECTIVE (81349) MIL-M-1 1199	EA	1
5		TM 9-1005-213-10	EA	1



# APPENDIX C

## ADDITIONAL AUTHORIZATION LIST

### Scope

This appendix lists additional items you are authorized for the support of the machine guns and mounts.

### General

This list identifies items that do not have to accompany the machine guns and mounts and that do not have to be turned in with them. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

### Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
8105-00-921-5821	CTA  BAG, ORDNANCE WEAPON (19204)11686430		EA	1
1005-01-091-7510	BLANK FIRING ATTACHMENT (BFA) M19		EA	1
1005-00-550-4037	BRUSH, CLEANING, SMALL ARMS BORE (19204) 5504037		EA	1
1005-00-766-0915	BRUSH, CLEANING, SMALL ARMS CHAMBER (19204) 7790737		EA	1
1005-00-716-2702	BRUSH, CLEANING, SMALL ARMS (19205) 7162702		EA	1
1005-00-550-4080	CARRIER ASSEMBLY, BARREL (19204) 5504080		EA	1
1005-00-487-4100	COVER, MACHINE GUN (19207)11631791		EA	1

# APPENDIX D

## EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (EDSML)



(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
1005-00-659-1031	COVER, SPARE BARREL (19204) 6591031 (FLEX ONLY)		EA	1
1005-00-796-4436	COVER, SPARE BARREL (19207) 7964436 (TURRET TYPE ONLY)		EA	1
1005-00-716-2072	FLASH HIDER (19204) 7162072		EA	1
	MTOE			
5855-00-829-5327	NIGHT VISION SIGHT, CREW SERVED WEAPON AN/TVS-5		EA	1
1005-00-653-5441	ROD, CLEANING, SMALL ARMS (19204) 6535441		EA	1
1005-00-556-4102	ROD, CLEANING, SMALL ARMS (19204) 5564102		SET	1
1005-00-716-2704	SWAB HOLDER SECTION (19205)7162704		EA	1

### Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the machine guns and mounts. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

### Explanation of Columns

- Column (1)-Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, (item 5, .app D)").
- Column (2)-Level. This column identifies the lowest level of maintenance that requires the listed item. C-Operator/Crew
- Column (3)-National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.
- Column (4)-Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(25) U/M
1	C	8020-00-244-0153 (81348) H-B-241	BRUSH, ARTIST'S	EA
2	C		7920-00-205-2401 BRUSH, CLEANING, TOOL AND PARTS (81349) MIL-B-43871	EA
3	C		6850-00-965-2332 CARBON REMOVING COMPOUND, GAL dip type, rinsing required (81348) P-C- 11L, type II	
4	C	9150-01-102-1473 9150-01-079-6124	CLEANER, LUBRICANT AND PRESERVATIVE: grade 2 (CLP) 1/2 oz bottle 4 oz bottle (81349) MIL-L-63460	OZ

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(25) U/M
5	C	6850-00-224-6656 6850-00-224-6657	CLEANING COMPOUND, RIFLE BORE rifle bore cleaner (RBC) 2 oz (59.1 ml) container 8 oz (236.56 ml) can (81349) MIL-C-372	OZ OZ
6	C	8415-00-823-7457	GLOVES, CHEMICAL RESISTANT, (ZZ-G-381) type 3	PR
7	C	9150-00-273-2389	LUBRICATING OIL, GENERAL PURPOSE medium (PL-M) 4 oz (118.30 ml) can (81348) VV-L-800	OZ
8	C	9150-00-292-9689	LUBRICATING OIL, WEAPONS (LAW) 1 qt (0.95 l) can (81349) MIL-L-14107	QT

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(25) U/M
9	C	9150-00-889-3522	LUBRICATING OIL, WEAPONS semi-fluid (LSA) 4 oz bottle (19204) 8436793	OZ
10	C	7920-00-205-1711	RAG, WIPING, cotton designed for general use 50 lb bale (81348) DDD-R-30	LB
11	C		1005-00-288-3565 SWAB, SMALL ARMS CLEANING COTTON, 21/2 SO IN., 200 in. bundle (19204) 5019316	BDL

## METRIC CHART

The list below shows the difference between US customary and metric units. It also shows the symbols used for the units.

### US CUSTOMARY

### METRIC

#### Length and distance

inch: 1 in.....	2.54 cm: centimeters
yard: 1 yd .....	0.9144 m: meter

#### Temperature

degree Fahrenheit: °F .....	F° -32°x5/9=°C: degree Celsius
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#### Weight

pound: 1 lb .....	0.4536 kg: kilogram
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#### Volume

ounce: 1 oz.....	29.57 ml: milliliters
quart: 2 qt .....	0.9463 l: liter

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