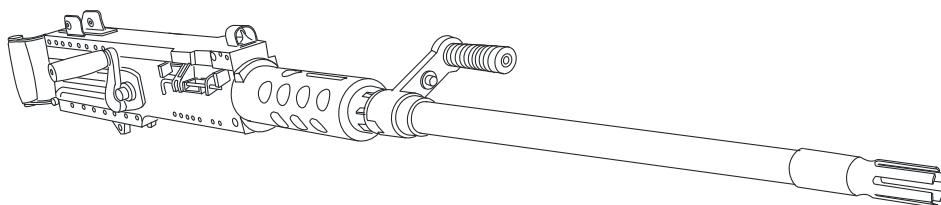


**OPERATOR'S MANUAL**  
**for**  
**MACHINE GUN, CALIBER .50; M2A1,**  
**W/FIXED HEADSPACE AND TIMING**  
**(1005-01-511-1250) (EIC 4AZ)**



2ne311

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**HEADQUARTERS, DEPARTMENTS OF THE ARMY AND AIR  
FORCE, AND COMMANDANT OF THE MARINE CORPS**

**APRIL 2011**

Publication Control Number 184 024984 00



## WARNING SUMMARY

This warning summary contains general safety warning and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the Technical Manual.

### FIRST AID

For first aid information, refer to FM 4-25.11.

Air Force personnel should refer to AFMAN 44-163(I).

Marine Corps personnel refer to MCRP 3-02G

### EXPLANATION OF SAFETY WARNING ICONS



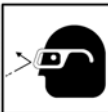
**FLYING PROJECTILE** – spring loaded parts could release and hit body causing injury or death.



**EAR PROTECTION** - headphones over ears shows that noise level will harm ears.



**EXPLOSION** - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.



**EYE PROTECTION** - person with goggles shows that the material will injure eyes.



**WEAPON FIRE** - accidental discharge of a weapon could penetrate the body causing serious injury or death.



**HOT AREA** – hand over object radiating heat shows that part is hot and can burn.

## WARNING SUMMARY – Continued

### GENERAL SAFETY WARNINGS DESCRIPTION

#### WARNING



#### HEADSPACE AND TIMING

Headspace and timing on the M2A1 is fixed and not adjustable by the operator and must be verified by field maintenance at time of issue. Headspace and timing adjustment is performed at field maintenance. Improper headspace and timing can cause malfunctions (internal explosion) and damage to the gun. Flying shrapnel may cause injury to personnel.

During barrel installation, the charging handle must be pulled back to view the square on the barrel locking lug through the 3/8 in. hole in the right side of the receiver. If the square on the barrel extension is **NOT** pulled back **PAST** the 3/8 in. hole on the right side of the receiver, the barrel will not be properly attached to the barrel extension. Failure to comply may cause an explosion, damage to the weapon and injury to personnel.

Never open the cover on a hot weapon or when performing immediate action. An open cover cook-off could occur and result in serious injury or death. Keep the weapon pointed downrange while performing immediate action. Failure to keep a matched set will cause the gun to lose headspace and timing and will result in an explosion, damage to equipment and injury to personnel.

#### WARNING



#### ACCIDENTAL FIRING

Be sure to clear weapon before disassembling, cleaning, inspecting, transporting, or storing. Clearing consists of unloading the machine gun and visually inspecting weapon and chamber to ensure all rounds have been removed. Do not release the bolt or press the trigger. Ensure weapon is cleared and on SAFE mode.

Ensure weapon is clear of ammunition before starting maintenance procedures. To avoid accidental firing, remove ammunition, clear weapon and verify that chamber is clear.

### WARNING



### COOK-OFF

Never open the cover on a hot weapon or when performing immediate action. An open cover cook-off could explode and result in serious injury or death. Keep the weapon pointed down range while performing immediate action.

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.

Adhere to the following warnings to prevent damage to equipment and injury to personnel:

- Use only ammunition authorized for use in the M2A1 Machine gun.
- Do not expose ammunition to the direct rays of the sun.
- Do not oil or grease ammunition. Oiled cartridges will produce excessive chamber pressure.
- Depending on climate condition, do not leave live rounds laying on top of hot expended brass.
- Round may fall to surface and possibly explode.

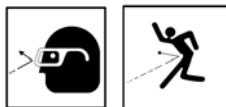
### WARNING



Chamber may be hot. Use caution when inspecting T-slot.

## WARNING SUMMARY – Continued

### WARNING



#### DRIVING SPRING ROD ASSEMBLY

Never attempt to cock the machine gun with the back-plate removed and the driving spring rod assembly in place. If the back-plate is off and the driving spring rod assembly is compressed, the retaining pin on the driving spring rod assembly could slip from its seat in the side-plate and could cause serious injuries to anyone behind the machine gun.

Do not attempt to release the firing pin with cocking lever forward. The cocking lever could spring back forcibly and serious injury to the hand. Do not place finger between cocking lever and sear.

Do not attempt to charge machine gun without the back-plate assembled to machine gun. Stand to one side when removing back-plate. Do not remove back-plate unless the bolt is in the forward position. Never remove back-plate assembly from any weapon until the chamber has been cleared. Ensure the weapon is clear to prevent inadvertent accidental firing and injury to personnel.

### WARNING



Wear appropriate eye and hearing protection when repairing, firing, or cleaning your weapon and/or its parts.

When firing the machine gun, all soldiers within 56 meters of the firing position should wear single hearing protection. This is adequate protection for exposure up to 1,000 rounds within a 24-hour period.

#### MACHINE GUN BARREL

Personnel could be injured if the following are not followed:

- Do not use a damaged barrel. Inspect barrel for damaged barrel threads and guide pins.
- Allow barrel to cool before changing the barrel if the carrying handle assembly is broken. Use mittens to remove barrel if handle is not present.

**LIST OF EFFECTIVE PAGES/WORK PACKAGES**

**NOTE:** Zero in the "Change No." column indicates an original page or work package.

Dates of issue for original and changed pages/work packages are:

Original ..... 0 ..... 08 April 2011

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FOLLOWING:**

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Title .....	0	WP 0018 00 .....	0
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A - B .....	0	WP 0021 00 .....	0
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WP 0001 00 .....	0	WP 0023 00 .....	0
WP 0002 00 .....	0	WP 0024 00 .....	0
WP 0003 00 .....	0	WP 0025 00 .....	0
WP 0004 00 .....	0	WP 0026 00 .....	0
WP 0005 00 .....	0	WP 0027 00 .....	0
WP 0006 00 .....	0	WP 0028 00 .....	0
WP 0007 00 .....	0	WP 0029 00 .....	0
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WP 0011 00 .....	0	WP 0033 00 .....	0
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WP 0014 00 .....	0	WP 0036 00 .....	0
WP 0015 00 .....	0	WP 0037 00 .....	0
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ARMY TM 9-1005-347-10  
AIR FORCE TO 11W2-6-3-181  
MARINE CORPS TM 02498D-OR

HEADQUARTERS,  
DEPARTMENTS OF THE ARMY  
AND AIR FORCE, AND  
COMMANDANT OF THE MARINE CORPS  
WASHINGTON, D.C., 08 April 2011

**OPERATOR'S MANUAL**  
**for**  
**MACHINE GUN, CALIBER .50; M2A1,**  
**W/FIXED HEADSPACE AND TIMING**  
**(1005-01-511-1250) (EIC 4AZ)**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <https://aeeps.ria.army.mil>. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS website will enable us to respond more quickly to your comments and better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-MPP / TECH PUBS, 6501 E. 11 Mile Road, Warren, MI 48397-5000. The e-mail address is [taconlcmc.daform2028@us.army.mil](mailto:taconlcmc.daform2028@us.army.mil). The fax number is DSN 793-0726 or Commercial (309) 782-0726. A reply will be furnished to you.

Air Force users will submit requests for changes or reports of errors utilizing AFTO Form 22, Technical Manual Change Recommendation and Reply, in accordance with the guidance in Air Force Technical Order 00-5-1.

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**USMC Publication Control Number 184 024984 00**



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## HOW TO USE THIS MANUAL

### GENERAL

Knowing how to use this manual is very important.

a. References are to pages in this manual.

b. Throughout this manual, text is keyed to illustrations by numbered callouts. When an item is called out in a procedure, a number in parentheses in the text corresponds with a number on the illustration.

### INDEXES

This manual is organized to help you quickly find the information needed. There are two useful indexes:

a. **Table of Contents.** The Table of Contents lists, in the order of presentation, all chapters, sections, appendixes, and alphabetical index and gives the page numbers where they begin.

b. **Alphabetical Index.** This index, located in the back, is an extensive subject index for the entire manual. The page numbers following each entry tell where in the manual to find a particular subject.

## **CHAPTER 1**

# **GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION**



---

**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****GENERAL INFORMATION**

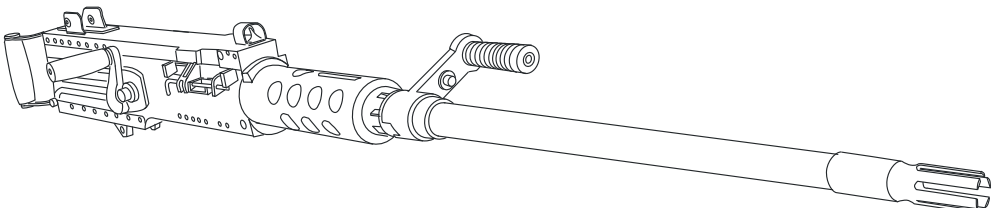
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**SCOPE**

**Type of Manual:** Operator's Manual

**Model Number and Equipment Name:** Machine Gun, Caliber .50; M2A1, W/Fixed Headspace and Timing. For maintenance of the M3 Tripod Mount, MK93 Mod 0 and Mod 1 Mounts refer to TM 9-1005-245-13&P. Air Force users refer to Air Force Technical Order 11 W2-8-1-322 for maintenance of the M3 Tripod Mount and Air Force Technical Order 11 W2-8-32-4 for MK64 Mount maintenance procedures. Marine Corps users refer to TO 11W2-8-1-322 for MK64 Mount maintenance procedures.

**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, M2A1, is installed on mounts of several different types of combat vehicles and ships.



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## **MAINTENANCE FORMS, RECORDS, AND REPORTS**

Department of Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

Marine Corps forms and procedures for equipment maintenance will be those prescribed by TM 4700-15/1.

Air Force users refer to TO 11W1-1-10, Historical Data Recording of Inspection, Maintenance, and Firing Data for Ground Weapons, and AFI 36-2226, Combat Arms Program for applicable forms and records.

## **REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)**

If your M2A1 Machine Gun needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to follow the instructions and links below:

For ALL non-Aviation/Missile Warranty, EIR and PQDRs must be submitted through the Web Product Quality Deficiency Reporting (PQDR) site.

New accounts can be established at the following address:  
<http://www.nslcptsmh.csd.disa.mil/accessforms/uarform.htm>.

If an account has already been established, the web site for submitting an EIR, PQDR, etc. is <http://www.nslcptsmh.csd.disa.mil/webpqdr/webpqdr.htm>.

You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 using e-mail, regular mail, or fax using the addresses/fax numbers specified in (DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10, Quality Deficiency Report (QDR), to: Commander, Marine Corps Logistics Base (Code 808), Albany, GA 31704-5000.

Air Force users submit Materiel Deficiency Report (MDR) and Quality Deficiency Report (QDR), in accordance with Technical Order 00-35D-54 and Air Force Instruction (AFI) 21-115.



## **CORROSION PREVENTION AND CONTROL (CPC)**

Corrosion Prevention and Control (CPC) of materiel 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.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF Form 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

SF Form 368 should be submitted to: ATTN: AMSTA-AR-QAW-C, TACOM-ARDEC, 1 Rock Island Arsenal, Rock Island, IL 61299-7300.

Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10, Quality Deficiency Report (QDR), to: Commander, Marine Corps Logistics Base (Code 808), Albany, GA 31704-5000.

Air Force users should submit a Quality Deficiency Report (QDR) in accordance with Technical Order 00-35D-54 and Air Force Instruction (AFI) 21-115.

## **HAZARDOUS MATERIALS DISPOSAL INFORMATION**

When servicing this weapon, performing maintenance, or disposing of materials such as cleaning fluids, cleaning compounds, lubricants, and sealing compounds (or items, such as cleaning rags contaminated with these substances) consult your unit/local hazardous waste disposal center or safety office for local regulatory guidance. If further information is needed, please contact The Army Environmental Hotline at 1-800-872-3845/OCONUS: 410-436-1244 or online at <http://aec.army.mil/usaec/contactus.html>. Accidental or intentional introduction of contaminants into the environment violates military, state, and federal regulations. Failure to comply may adversely affect the public or environment.

## **DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE**

Refer to TM 750-244-7, for procedures concerning destruction of material to prevent enemy use.

## **PREPARATION FOR STORAGE OR SHIPMENT**

### **NOTE**

The marking of small arms by use of permanent etching, painting (oil or latex), stamping, or burning on metal, rubber-coated material synthetic material, or wood components is strictly forbidden. However, the use of white tape, making tape, embossed tape, bar codes, or tags is permissible.

1. Serial number is required and shall be listed on the packing list. Packing list shall be put inside of the fiberboard box.
2. Apply the following marking on the outside of each fiberboard box:
  - a. National Stock Number.
  - b. Federal Item Name.
  - c. One Each.
  - d. Date.
  - e. Weight: Cube.
3. Only the following markings shall be applied by stencil or label to exterior of shipping box:
  - a. Address of Destination.
  - b. Weight and Cube.

## **END OF WORK PACKAGE**

---

**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****EQUIPMENT DESCRIPTION AND DATA**

---

**EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

The caliber .50 Machine Gun, M2A1, 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.

**WARNING**

During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.

- b. The M2A1 kit contains unique parts that are used to convert an M2HB to the M2A1 configuration. M2A1 unique parts should NEVER be installed on M2HB weapons at the operator level. The Barrel Extension Assembly and Bolt have been serialized to remain together as an assembly with serial number of receiver. If a new Barrel Extension or Bolt is required, servicing the headspace and timing will be necessary. Headspace and timing adjustment is performed at field maintenance.

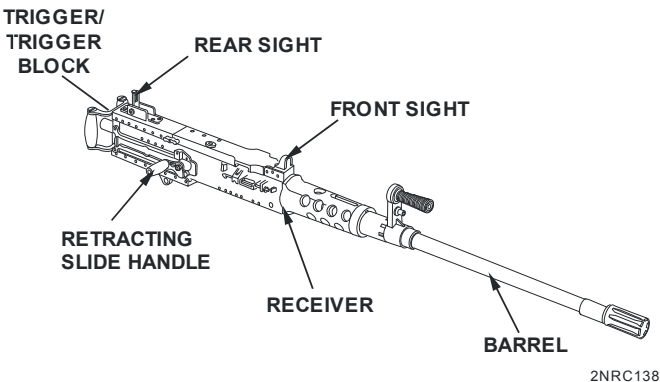
**NOTE**

Do not attempt to remove the Breech Lock from the Barrel Extension. It is not intended for the Breech Lock to be removed during cleaning. Pinning the Breech Lock insures that the assigned Breech Lock/Barrel Extension combination is maintained, thus insuring proper headspace.

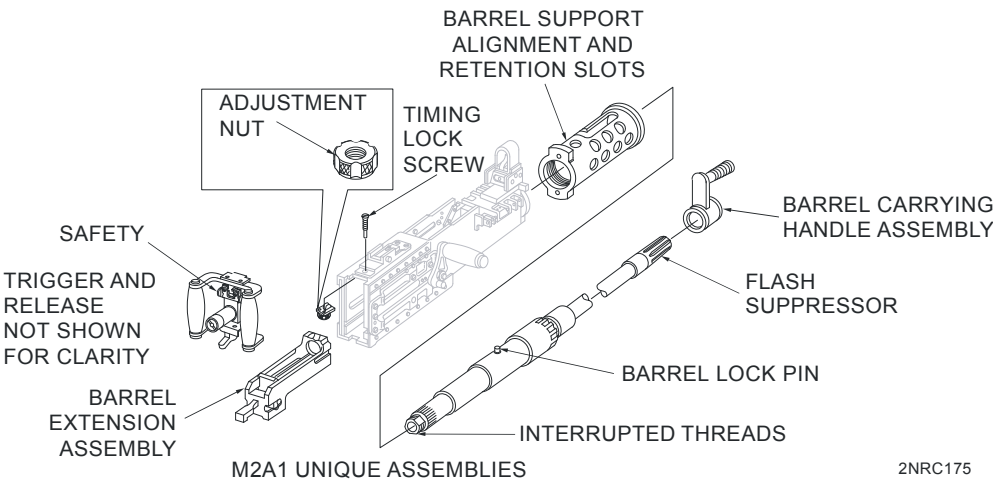
- c. Is used as a ground gun mounted on the M3 Tripod, MK 93 Mod 0 and Mod 1 mounts, M6 and M7 pedestal, or is installed on the M66 ring mount of several different types of combat vehicles.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

The M2A1 Machine Gun (Flex Type) is composed of the following: front and rear sights, barrel, receiver, retracting slide handle, and trigger/ trigger block.



M2A1 UNIQUE COMPONENTS



Barrel Assembly.....	PN 13027965
Barrel Extension Assembly.....	PN 13027974
Barrel Support.....	PN 13027972
Barrel Cap.....	PN 13027970
Barrel Carrying Handle Assembly.....	PN 13027981
Trigger Block, Small Arms Safety .....	PN 1968
Sear Stop and Pin.....	PN 13027991

Trigger Block, Shoulder Screw.....	PN MB3955
Trigger Block, Flat Spring.....	PN 1969
Breech Lock Pin .....	PN 13027976
Breech Lock (set of 16) .....	PN 3425-1 through 3425-16
Spring Pin.....	PN MS16562-109
Timing Lock Screw .....	PN 13027977
Headless Shoulder Pin.....	PN 13027978
Knurled Plain Nut .....	PN 13027979

## EQUIPMENT DATA

### 1. Machine gun data.

Weight of gun (receiver/barrel)(approx) .....	82 lbs (37.22 kg)
Weight of barrel .....	25.6 lbs (11.62 kg)
Length of gun .....	67.75 in. (172.10 cm)
Length of barrel (w/flash suppressor).....	47 in. (119.38 cm)
Length of rifling (approx) .....	41.88 in. (106.38 cm)
Number of lands and grooves .....	8
Twist, right -hand .....	one turn is 15 in. (38.10 cm)
Feed .....	link-belt
Operation.....	short recoil
Cooling .....	air
Muzzle velocity (approx) .....	2,910 fps (890 mps)
Maximum range (approx) .....	7,440 yds (6,803 m)
Maximum effective range (approx).....	2,000 yds (1,829 m)

### 2. Rates of Fire.

#### NOTE

For Abrams series tanks refer to FM 17-12-1.

- a. 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 (1,829m). Change barrel at end of firing day or if the barrel is damaged.
- b. 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 day or if the barrel is damaged.
- c. 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 one hour intervals or if the barrel is damaged.
- d. CYCLIC FIRE. Refer to FM 3-22.65. The cyclic rate of this caliber .50 machine gun is 450 to 600 rounds per minute. Change barrel at one-half hour intervals or if the barrel is damaged.

**EQUIPMENT DATA - Continued**

3. M3 Tripod Mount: Refer to TM 9-1005-245-13&P. Air Forces users refer to TO 11W2-8-1-322.
4. MK 93 Mod 0 and MK 93 Mod 1 Mounts: Refer to TM 9-1005-245-13&P.

**END OF WORK PACKAGE**

---

**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****THEORY OF OPERATION**

---

**THEORY OF OPERATION**

1. Open the cover, place the weapon on safe if so equipped and charge the weapon by retracting charging handle to the rear. Insert a round in chamber, allow bolt to go forward by releasing charging handle (do not allow bolt to slam forward) and close the cover.
2. Keep muzzle pointed at target and if so equipped, move the trigger block from S (safe) to F (fire) position.
3. Align the front and rear sight with the target and push down on the trigger.
4. Pushing down on the trigger releases the firing pin and allows it to impact the primer on the round.
5. The primer ignites the propellant in the round.
6. Expanding gas from the burning propellant pushes the projectile through the barrel.
7. The rifling in the barrel causes the projectile to rotate, which provides stability during flight to the target.

**END OF WORK PACKAGE**





## **CHAPTER 2**

# **OPERATOR INSTRUCTIONS**



---

**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS**

---

**GENERAL**

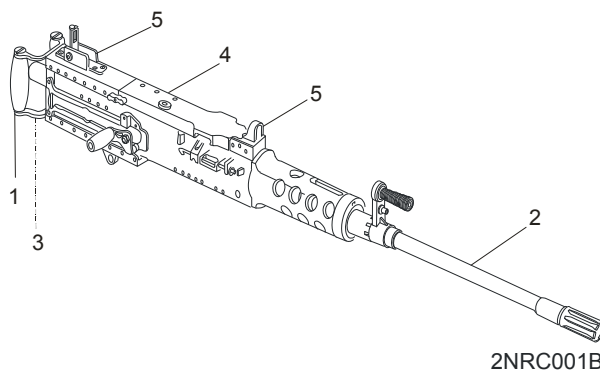
Familiarize yourself with the following parts before operating the machine gun and various mounts. The M2A1 machine gun operates in the same manner as the standard .50 caliber machine gun. However, it offers added features, which include fixed headspace and timing, barrel carrier assembly, and backplate trigger block.

**CALIBER .50 MACHINE GUN, M2A1, HEAVY BARREL, FLEXIBLE****BACK PLATE**

The back plate (1) houses the trigger and buffer tube.

**BARREL**

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

**NOTE**

All M2A1 barrels are interchangeable without affecting the headspace or timing of the weapon

**BUFFER TUBE SLEEVE**

The 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.

**COVER**

The cover (4) feeds the belt and positions and holds the cartridges for chambering.

**FRONT AND REAR SIGHTS**

The front and rear sights (5) zero and accurately sight the machine gun.

## RETRACTING SLIDE HANDLE

The retracting slide handle (6) is used for cocking the machine gun.

## TRIGGER

The trigger (7) controls the firing of the machine gun.

## BACKPLATE ASSEMBLY

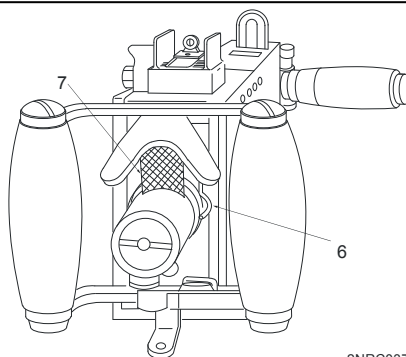
### NOTE

Lockwire installation may appear as shown or as two double strands.

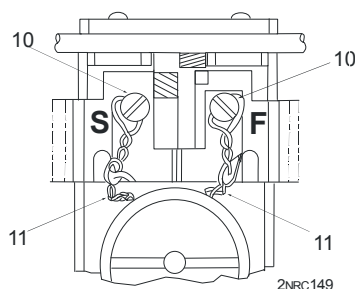
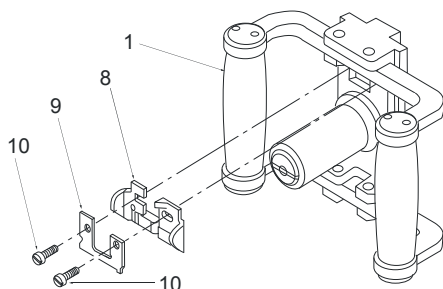
The back plate (1) includes a small arms trigger block (8) and flat spring (9), which are secured onto the backplate with two shoulder screws (10) and lockwire (11).

## RECEIVER

The receiver (12) houses the internal components of the machine gun and serves as support for the entire machine gun.



2NRC037

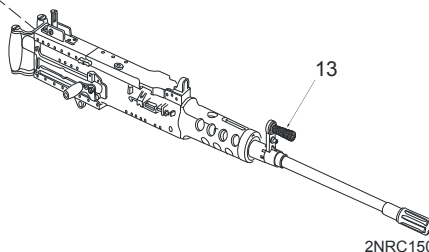


2NRC149

14, 15

## BARREL CARRIER ASSEMBLY

The barrel carrier assembly (13) permits quick removal or installation of the barrel and is secured to locking and retaining grooves of barrel. Fixed timing is provided by means of a fixed timing lock screw (14) and adjustment nut (15).



2NRC150

## MOUNTS

For description, use, and maintenance of the M3 Tripod, MK 93 Mod 0 and Mod 1 machine gun mounts refer to TM 9-1005-245-13&P. Air Force users refer to TO 11W2-8-1-322 for M3 Tripod information.

## END OF WORK PACKAGE

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## OPERATOR

### MACHINE GUNS, CALIBER .50; M2A1 W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

#### OPERATION UNDER USUAL CONDITIONS PREPARATION FOR FIRING

---

## WARNINGS



Ensure gun is clear of ammunition before disassembling, cleaning, inspecting, transporting, or storing. Clearing consists of unloading the machine gun and visually inspecting the weapon and chamber to ensure all rounds have been removed. Do not release the bolt or press the trigger.



Headspace and timing must be verified by field maintenance prior to issuing. Headspace and timing adjustment is performed at field maintenance.

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

During barrel installation, the charging handle must be pulled back to view the square on the barrel locking lug through the 3/8 in. hole in the right side of the receiver.

Ensure that during barrel installation the square on the barrel extension is **NOT** pulled back **PAST** the 3/8 in. hole on the right side of the receiver or the barrel will not be attached to the barrel extension.



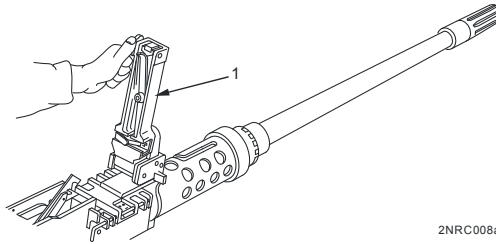
When repairing, firing or cleaning weapons, wear safety glasses, hearing protection, and protective clothing to prevent injury to personnel.

## NOTE

All M2A1 barrels are interchangeable without affecting the headspace or timing of the weapon.

**PREPARATION FOR FIRING.**

1. Raise top cover (1) all the way up.



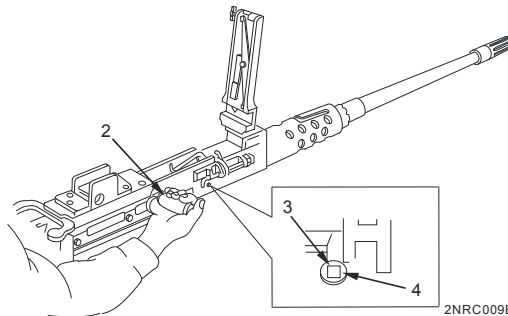
2NRC008a

**WARNING**

During barrel installation, the charging handle must be pulled back to view the square on the barrel locking lug through the 3/8 in. hole in the right side of the receiver.

Ensure that during barrel installation the square on the barrel extension is **NOT** pulled back **PAST** the 3/8 in. hole on the right side of the receiver or the barrel will not be attached to the barrel extension.

2. Grasp retracting slide handle (2) and retract bolt to align barrel locking spring lug (3) with the 3/8 in. hole (4) in the right side of receiver while inserting barrel.



2NRC009B

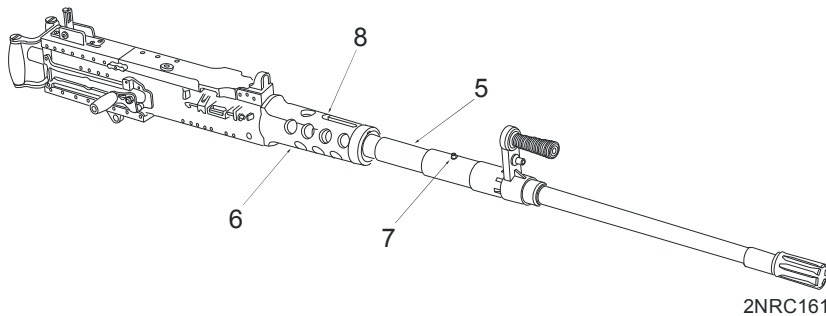
**CAUTION**

Care must be taken to prevent the bolt from slamming forward with the barrel removed.

**NOTE**

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

3. Insert barrel (5) into barrel support (6) until locking pin (7) engages camming slot (8). Rotate barrel clockwise and secure locking pin in retention slot.



4. Release retracting slide handle and allow bolt to go forward, then place weapon on automatic fire.
5. Charge the weapon to ensure that the barrel moves back and forth freely.
6. Disengage automatic fire.

### NOTE

As long as the Wear-Limit Gage indicates the weapon to be acceptable, the barrel(s) can be changed and fired as required. Once the weapon accepts the Wear-Limit Gage (0.212 in.), notify field maintenance for headspace servicing.

Headspace is set by Field Maintenance. Headspace increases gradually with firing due to normal component wear. Periodic unit armor checks are required to ensure that the specific wear limit of 0.212 is not exceeded.

7. Perform Safety/Function check for M2A1.
  - a. Place trigger block to 'S' (safe) position.
  - b. Unlock bolt latch release (rotate clockwise) and place the weapon on semi-automatic fire.
  - c. Charge weapon.

### CAUTION

Do not dry fire weapon by allowing bolt to slam forward.

- d. Holding handle, depress bolt latch release and slowly return bolt forward.
- e. Press trigger. Weapon should not fire.
- f. Place trigger block to 'F' (fire) position.
- g. Press trigger. Firing pin should release.
- h. If weapon fails safety/function check, notify field maintenance.

**END OF WORK PACKAGE**

**0005 00-3/4 blank**





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**OPERATOR**

**MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)**

**OPERATION UNDER USUAL CONDITIONS  
SINGLE SHOT MODE, AUTOMATIC FIRE, FIRING MACHINE GUN  
ON M3 TRIPOD MOUNT AND FIRING MACHING GUN ON MK93 MOD 0,  
MK 93 MOD 1, M6 PEDESTAL AND M7 PEDESTAL MOUNTS**

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**INITIAL SETUP:****Reference**WP 0008 00

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**WARNING**

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

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

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

**WARNING**

When bolt latch release and trigger are both held down, machine gun will fire automatically (flex only/M2A1).

**WARNING**

To prevent injury to personnel, wear hearing protection when firing this weapon.

## SINGLE SHOT MODE

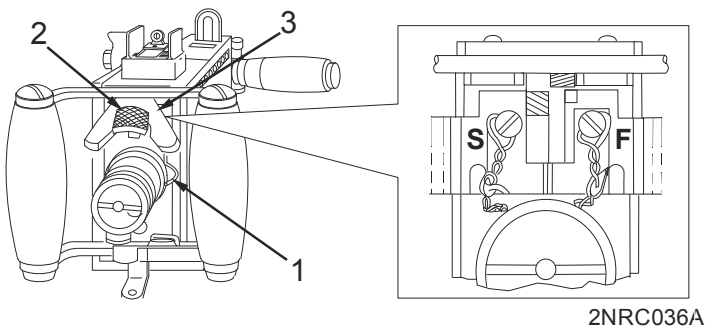
### NOTE

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

### NOTE

If M2A1 machine gun is provided with trigger block, trigger block must be placed to "F" (Fire) position before firing.



## 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 (2) down and lock by turning the bolt latch release lock (1) to the left. Ensure that bolt latch release is held completely down with no movement.

### NOTE

If M2A1 machine gun is provided with trigger block, trigger block must be placed to "F" (Fire) position before firing.

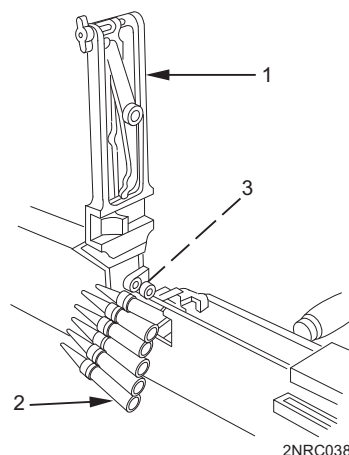
## FIRING MACHINE GUN ON M3 TRIPOD MOUNT

### NOTE

Ensure bolt is forward.

Ensure the correct front cartridge stop is installed (the left side, right side and Blank firing Adapter cartridge stops are different).

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).



### CAUTION

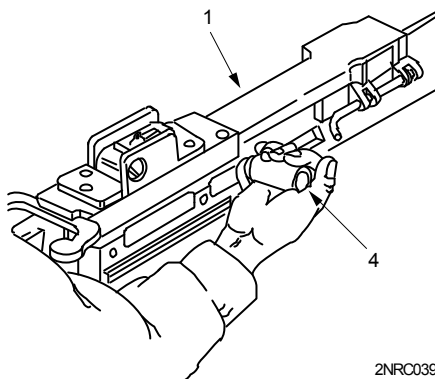
Do not close cover when bolt is held rearward as damage may occur when bolt goes forward.

2. Close 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.



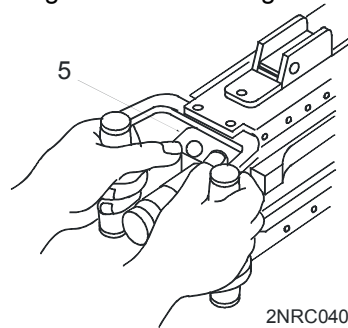
**FIRING MACHINE GUN ON M3 TRIPOD MOUNT – Continued****NOTE**

If machine gun is set for single shot fire, the bolt 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 (5) to fire the machine gun.

**NOTE**

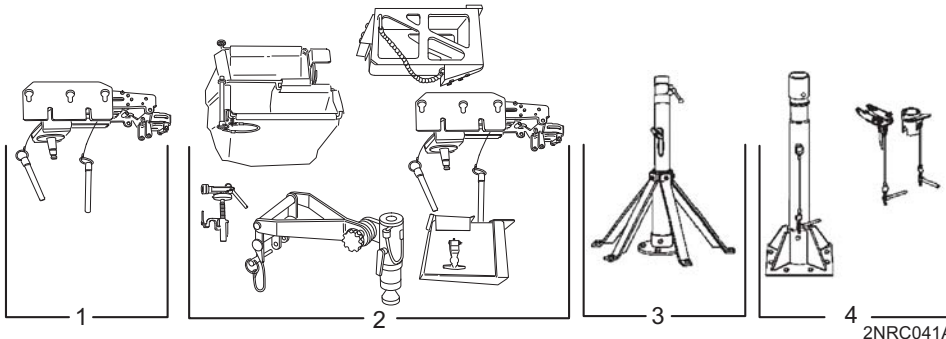
In case of failure to fire, refer to Immediate Action, WP 0008 00.



2NRC040

**FIRING MACHINE GUN ON MK 93 MOD 0, MK 93 MOD 1, M6 PEDESTAL, AND M7 PEDESTAL MOUNTS**

The loading and firing procedures for the machine gun on the MK 93 MOD 0 (1), MK 93 MOD 1 (2), M6 pedestal (3), and M7 pedestal (4) mounts are the same as those for the M3 mount.



2NRC041A

**END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
GENERAL, MISFIRE, COOK-OFF, HOT GUN PREVENTION,  
STOPPAGE, RUPTURED CARTRIDGE CASE REMOVAL**

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**INITIAL SETUP:****Materials/Parts**

Heat protective mittens  
(Item 4, WP 0035 00)

**References**

WP 0008 00  
WP 0022 00  
WP 0032 00

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**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. An open cover cook-off could occur and result in serious injury or death.

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.

**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, WP 0008 00.

## COOK-OFF

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, WP 0008 00.

## HOT GUN PREVENTION

In order to prevent the machine gun from becoming excessively hot, the barrel should be rotated as follows:

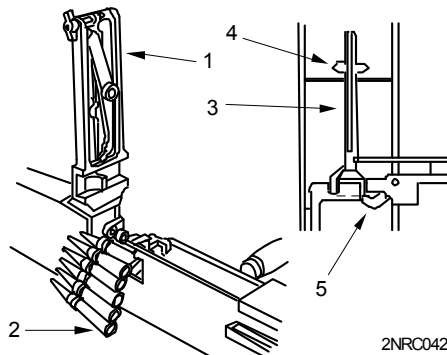
- a. **SINGLE SHOT:** Change the barrel at the end of the firing day or if the barrel is damaged.
- b. **SLOW FIRE:** (less than 40 rounds per minute): Change the barrel at the end of the firing day or if the barrel is damaged.
- c. **RAPID FIRE:** (greater than 40 rounds per minute): Change the barrel at one hour intervals or if the barrel is damaged.
- d. **CYCLIC FIRE:** (450-600 rounds per minute): Change the barrel at one-half hour intervals or if the barrel is damaged.

## 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.

## RUPTURED CARTRIDGE CASE REMOVAL

1. Open machine gun cover (1), remove ammunition belt (2).
2. Clear the machine gun of all ammunition.
3. With bolt in the forward position, place the ruptured cartridge case extractor (3) (item 3, WP 0035 00) 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.

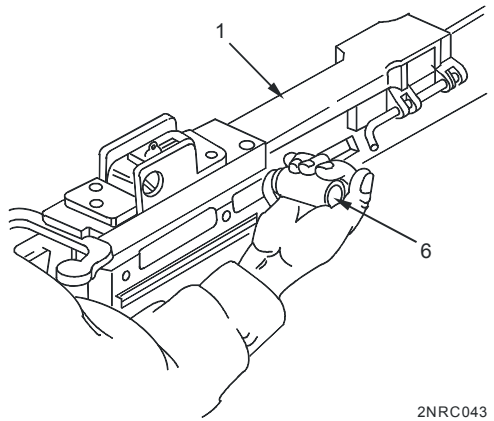


2NRC042

## CAUTION

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

4. Close machine gun cover (1), retract the bolt pulling the retracting slide handle (6) rearward, and release to the forward position.
5. Retract the bolt to extract the ruptured cartridge case and extractor from the chamber.



2NRC043

## WARNING



Wear a heat protective mitten when barrel is hot to prevent injury to personnel.

6. If steps 3 through 5 do not remove the ruptured cartridge case, remove the barrel (WP 0022 00), and install the spare barrel (WP 0032 00, step 7).

## NOTE

If the ruptured cartridge case cannot be removed, notify field maintenance.

After removing ruptured cartridge case, field maintenance must verify headspacing.

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

## END OF WORK PACKAGE





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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
IMMEDIATE ACTION PROCEDURES**

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**INITIAL SETUP:****References**WP 0009 00

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**WARNING**

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

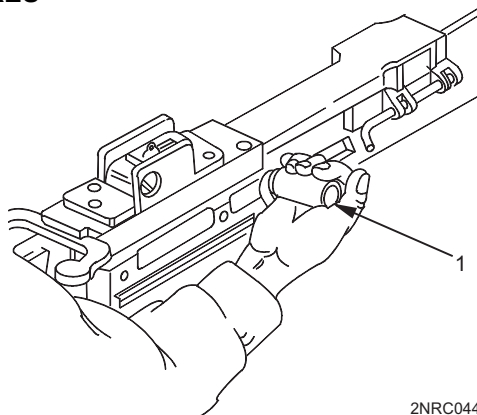
Never remove the backplate assembly from any weapon until the chamber has been cleared.

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

**IMMEDIATE ACTION PROCEDURES****NOTE**

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

1. Pull retracting slide handle (1) rearward.



2NRC044

**IMMEDIATE ACTION PROCEDURES – Continued**

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 (100 rounds per minute), place the bolt in the forward position and place the weapon in single action mode.
4. Evacuate immediate area for 15 minutes.
5. If immediate action fails to correct stoppage, apply remedial action (WP 0009 00) after the weapon has cooled sufficiently.

**END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
REMEDIAL ACTION PROCEDURES**

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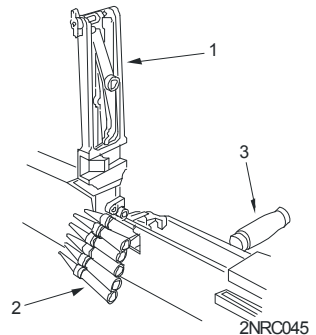
**INITIAL SETUP:****References**WP 0019 00

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**REMEDIAL ACTION PROCEDURES****WARNING**

Keep the weapon pointed downrange while performing the following procedure.

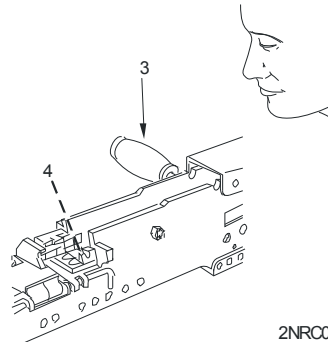
1. Open cover (1) and remove ammunition belt (2). Close cover.
2. Pull retracting slide handle (3) to the rear.



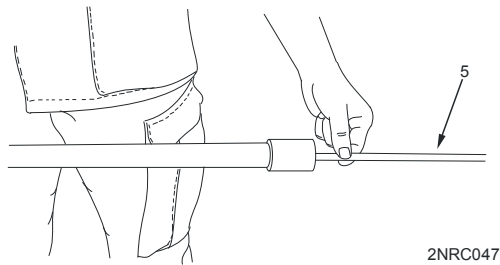
**REMEDIAL ACTION PROCEDURES – Continued**

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) (items 16 or 17, WP 0037 00) 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 Troubleshooting Procedures (WP 0019 00) or turn in to field maintenance for repair

**END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
UNLOADING AND CLEARING THE GUN**

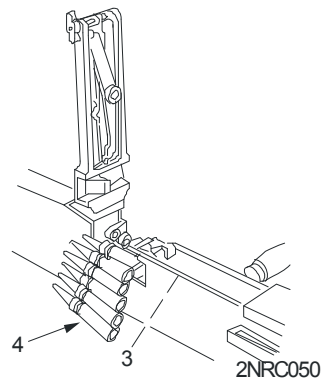
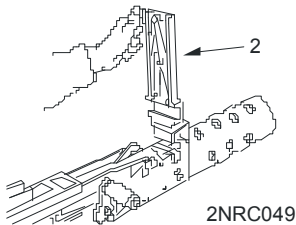
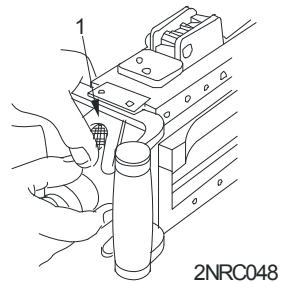
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**INITIAL SETUP:****References**WP 0021 00

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**UNLOADING AND CLEARING THE GUN**

1. Place trigger block on S (safe).
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 the cover.

**UNLOADING AND CLEARING THE GUN – Continued****WARNING**

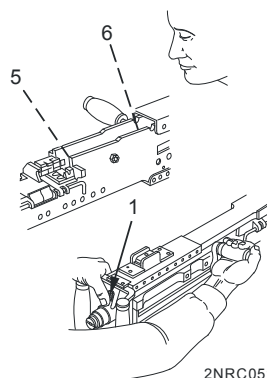
Round may fall to surface and possibly explode.

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

**WARNING**

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

7. 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).
8. Press the bolt latch release (1) and ease the bolt forward with retracting slide handle.
9. Close the cover.
10. Press the trigger.
11. Perform “after operation” PMCS (WP 0021 00).



**END OF WORK PACKAGE**

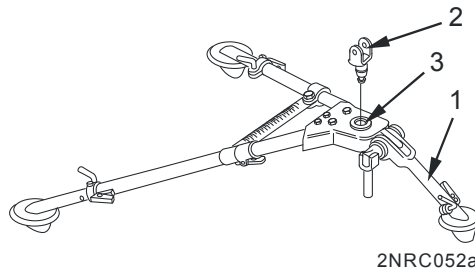
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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
INSTALLATION OF M3 TRIPOD**

---

**INSTALLATION OF M3 TRIPOD**

1. Firmly plant M3 tripod (1).
2. Lower pintle yoke (2) into the M3 Tripod ground mount bearing sleeve (3) assuring the pintle latch locks in place.

**END OF WORK PACKAGE**



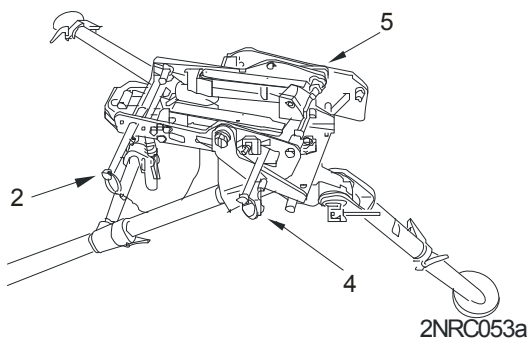
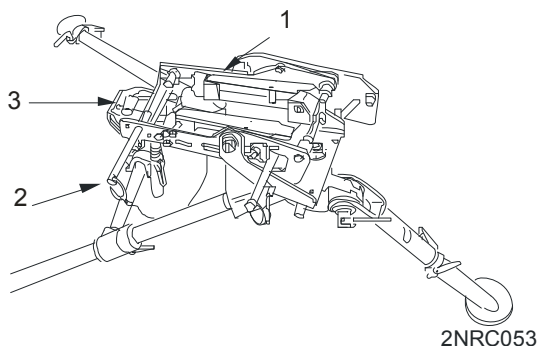


**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
INSTALLATION ON MK 93 MOD 0 MOUNT****INSTALLATION ON MK 93 MOD 0 MOUNT****NOTE**

The M2A1 should be mounted without the barrel.

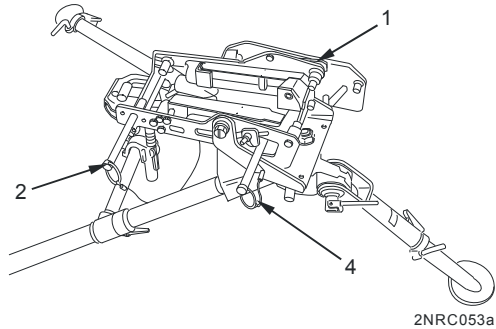
If required, remove the .50 caliber pin assembly.

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 the 'UP' position.
5. Place the M2A1 in the mount and insert pin assembly (4) through slider and weapon.
6. Align rear mounting hole of the M2A1 with the rear slider assembly and insert pin (2).
7. Mount the .50 caliber ammunition can bracket on the mount's side plate (5).

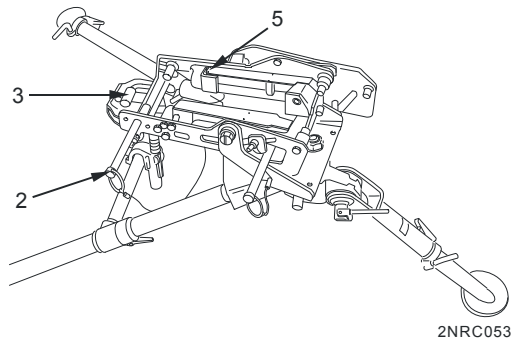


**REMOVAL OF MK 93 MOD 0 MOUNT**

1. Remove the .50 caliber ammunition can bracket from the mount's side plate (1).
2. Remove pin (2) from the rear slider assembly (3).
3. Remove pin assembly (4) from slider assembly.



4. Rotate rear slide assembly (3) to the 'DOWN' position.
5. Install rear .50 caliber pin (2) into the rear slider assembly (3).
6. Rotate shock absorber assemblies (5) to the 'DOWN' position.

**END OF WORK PACKAGE**

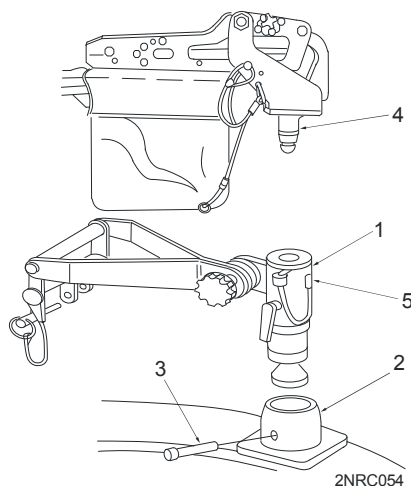
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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER USUAL CONDITIONS  
INSTALLATION ON MK 93 MOD 1 MOUNT**

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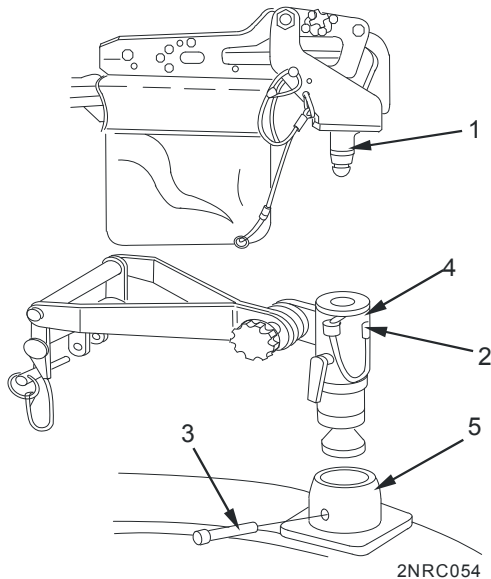
**INSTALLATION ON MK 93 MOD 1 MOUNT**

1. If present, remove original HMMWV pedestal.
2. Place the universal pintle 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 the 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 traversing and elevating mechanism between the universal pintle adapter and the MK 93 MOD 1.
7. Install weapon onto the MK 93 MOD 1.
8. Install the appropriate ammunition can bracket.



**REMOVAL OF MK 93 MOD 1 MOUNT**

1. Remove ammunition can bracket.
2. Remove weapon from MK 93 MOD 1.
3. Remove the traversing and elevating mechanism from the universal pintle adapter and the MK 93 MOD 1.
4. Remove catch bag.
5. Unlock the lower body from 0 degrees azimuth with the stow lock and unlock the adjustable arm assemblies from 0 degrees elevation.



6. Remove quick release pin (1) and MK 93 mount pintle (2) from socket.
7. Remove quick release pin (3) and universal pintle adapter assembly (4) from the HMMWV ring sock (5).
8. If present, install original HMMWV pedestal.

**END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER UNUSUAL CONDITIONS  
EXTREME COLD CLIMATES, EXTREME HEAT AND HUMIDITY,  
HOT DRY CLIMATES, HOT, HUMID, AND SALTY CLIMATES,  
AND EXPOSURE TO WATER**

---

**INITIAL SETUP:****Materials/Parts**

Lubricating oil, general purpose  
(item 13, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

**Materials/Parts (cont)**

Rifle bore cleaning compound (RBC)  
(item 9, WP 0037 00)  
Wiping rag (item 20, WP 0037 00)

**Reference**

FM 31-71

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**EXTREME COLD CLIMATES****NOTE**

Refer to FM 31-71.

1. All moving parts of the machine gun 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 (LAW). Remove excess oil from moving parts.
2. 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 (LAW).
3. If the machine gun has been fired, the bore must be immediately swabbed out with several patches saturated with rifle bore cleaning compound (RBD). 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.

1. 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 at least once daily. Remove excess oil from moving parts.
2. 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.
3. Immediately upon leaving sandy terrain, clean and lubricate with general purpose lubricating oil.
4. After handling, wipe with a wiping rag to remove perspiration, which will cause rust.
5. During sand or dust storms the machine guns and mounts should be kept 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, and keep covers in place.

## **EXPOSURE TO WATER**

After exposure to water, especially salt water (accidentally splashed or submerged), drain, wipe dry, clean, and lubricate the weapons and mounts as soon as practical. DO NOT USE HIGH PRESSURE HOSE.

## **END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER UNUSUAL CONDITIONS  
USE OF AUXILIARY BOLT HANDLE**

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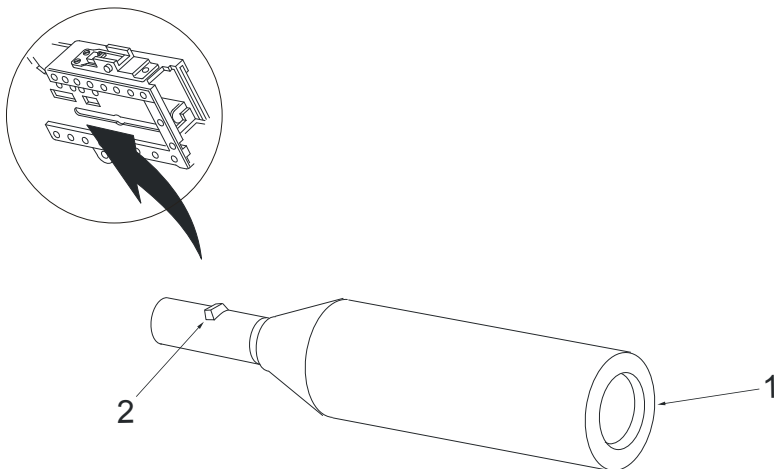
**INITIAL SETUP:****Reference**

WP 0005 00

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**USE OF AUXILIARY BOLT HANDLE**

When primary method of charging weapon fails, install auxiliary bolt handle (1) on opposite side of bolt stud. Ensure notch (2) is installed toward rear end of the weapon. Rotate auxiliary bolt handle 90 degrees. Follow normal procedures to charge the machine gun. Refer to WP 0005 00, step 2.



2NRC055

**END OF WORK PACKAGE**





**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER UNUSUAL CONDITIONS  
BOLT ASSEMBLY FAILS TO LOCK TO THE REAR**

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**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.

1. Open cover. Charge the machine gun and hold bolt to the rear.
2. 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 stop.
3. To release bolt assembly, pull rearward to allow extractor to drop and ease bolt assembly forward.

**END OF WORK PACKAGE**



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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATION UNDER UNUSUAL CONDITIONS  
CLEARING THE GUN DURING NIGHT OPERATION**

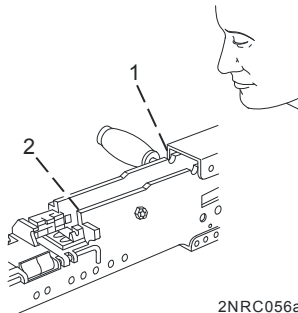
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**CLEARING THE GUN DURING NIGHT OPERATION****WARNING**

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

Round may fall to surface and possibly explode.

The gunner must ensure gun is clear by inspecting the T-slot (1) and chamber (2) for rounds.



**END OF WORK PACKAGE**



# **CHAPTER 3**

## **TROUBLESHOOTING PROCEDURES**



OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

TROUBLESHOOTING INDEX  
INTRODUCTION, MALFUNCTION/SYMPTOM INDEX

INTRODUCTION

The troubleshooting table in WP 0019 00 lists the common malfunctions which you may find during the operation or maintenance of the M2A1 Machine Gun or its components. You should perform the tests/inspections and corrective actions in the order listed.

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 field maintenance.

Numerous malfunctions are caused by improper assembly. Check for proper assembly of all components.

MALFUNCTION/SYMPTOM INDEX

<u>Malfunction</u>	<u>Symptom Number</u>
Bolt Will Not Lock .....	3
Round Will Not Chamber .....	2
Sluggish Operation .....	9
Weapon Will Not Cock .....	8
Weapon Will Not Eject .....	7
Weapon Will Not Extract .....	6
Weapon Will Not Feed .....	1
Weapon Will Not Fire .....	4
Weapon Will Not Unlock .....	5

END OF WORK PACKAGE





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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES  
TROUBLESHOOTING PROCEDURES**

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**INITIAL SETUP:****Materials/Parts**

Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)  
Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Rifle bore cleaning compound (RBC)  
(item 9, WP 0037 00)

**Materials/Parts (cont)**

Small arms cleaning swab  
(item 19, WP 0037 00)

**Reference**

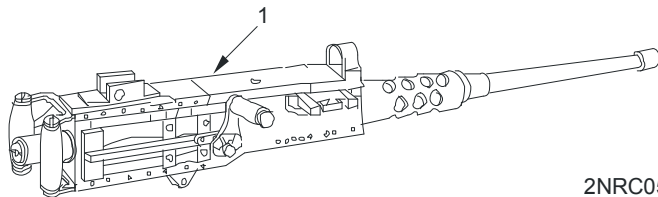
WP 0008 00  
WP 0021 00  
WP 0031 00

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**TROUBLESHOOTING PROCEDURES****1. SYMPTOM: WEAPON WILL NOT FEED.****CORRECTIVE ACTION**

STEP 1. Check if cover (1) is completely down and latched.

STEP 2. Latch cover.



2NRC058

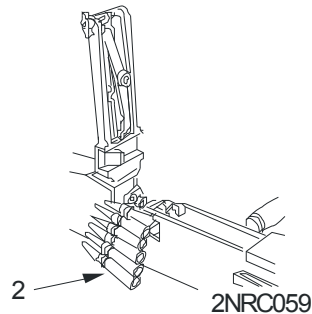
**TROUBLESHOOTING PROCEDURES - Continued****1. SYMPTOM: WEAPON WILL NOT FEED - Continued****NOTE**

Ensure bolt is forward.

**CORRECTIVE ACTION**

STEP 1. Check ammunition belt (2) for short round or misfired link.

STEP 2. Open cover, remove short round or align link.

**CORRECTIVE ACTION**

STEP 1. If weapon repeatedly fires two rounds then fails to feed.

STEP 2. Turn weapon into Field Maintenance to check for early timing.

**CORRECTIVE ACTION**

STEP 1. Check for weak or broken belt holding pawl assembly (3) or belt feed pawl springs (4).

STEP 2. Notify field maintenance.

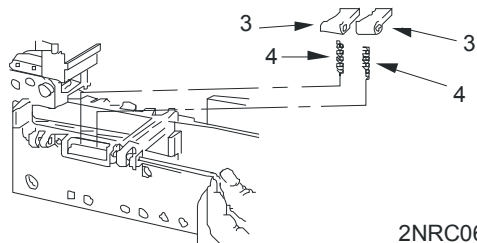
**NOTE**

Cartridge stop for blank ammunition is not the same as for live ammunition.

**CORRECTIVE ACTION**

STEP 1. Check for correct cartridge stop.

STEP 2. Notify field maintenance.

**CORRECTIVE ACTION**

STEP 1. Improper lubrication.

STEP 2. Lubricate as necessary (WP 0021 00).

**2. SYMPTOM: ROUND WILL NOT CHAMBER.****CORRECTIVE ACTION**

STEP 1. Check for corroded or damaged ammunition.

STEP 2. Remove defective ammunition.

**CORRECTIVE ACTION**

STEP 1. Check chamber and T-slot for obstruction.

STEP 2. Notify field maintenance.

**CORRECTIVE ACTION**

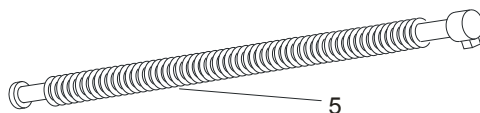
STEP 1. Potential headspace issue.

STEP 2. Turn weapon into Field Maintenance to check for proper headspace.

**CORRECTIVE ACTION**

STEP 1. Check driving spring rod assembly (5) for crack(s), weak or broken springs or cracked/bend rod.

STEP 2. Notify field maintenance.

**3. SYMPTOM: BOLT WILL NOT LOCK.****CORRECTIVE ACTION**

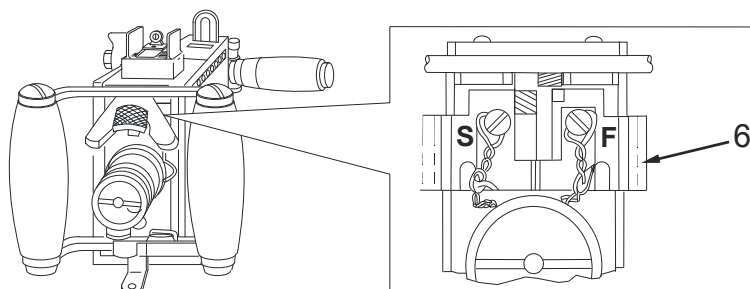
STEP 1. Check to see if bolt returns to forward position.

STEP 2. Notify field maintenance.

**4. SYMPTOM: WEAPON WILL NOT FIRE.****CORRECTIVE ACTION**

STEP 1. Check if safety lever (6) is in S (safe) position

STEP 2. Place safety lever in F (fire) position



2NRC062A

**CORRECTIVE ACTION**

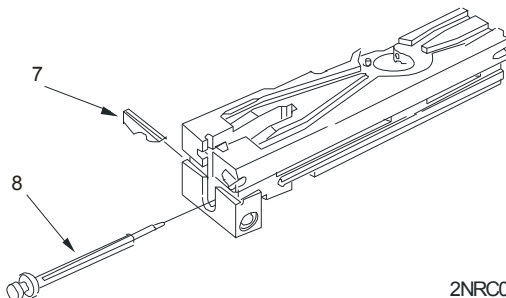
STEP 1. Check for defective ammunition.

STEP 2. Remove defective ammunition.

**TROUBLESHOOTING PROCEDURES - Continued****4. SYMPTOM: WEAPON WILL NOT FIRE - Continued****CORRECTIVE ACTION**

STEP 1. Check for incorrectly installed sear slide (7).

STEP 2. Install sear slide from left side.



2NRC063

**CORRECTIVE ACTION**

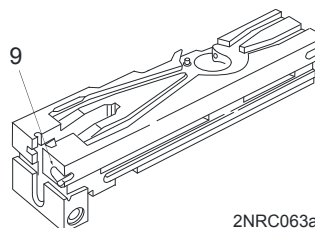
STEP 1. Check for broken or damaged firing pin (8).

STEP 2. Notify field maintenance.

**CORRECTIVE ACTION**

STEP 1. Check firing pin well inside bolt (9) for obstruction.

STEP 2. Clean the interior of the bolt with a swab saturated with RBC. Lubricate by applying light coat of lubricating oil (item 13, 14 or 15, WP 0037 00) to interior of bolt.

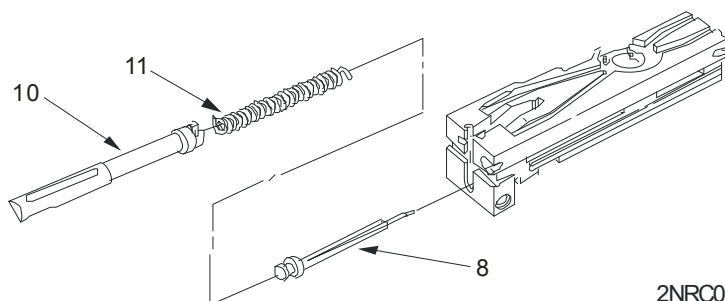


2NRC063a

**CORRECTIVE ACTION**

STEP 1. Inspect firing pin (8) and firing pin extension (10) for burrs or broken firing pin spring (11).

STEP 2. Notify field maintenance.



2NRC064

**CORRECTIVE ACTION**

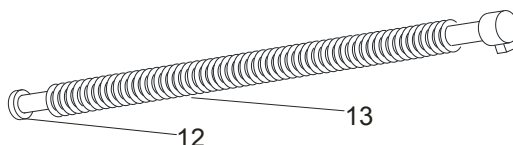
STEP 1. Check for bent/cracked driving spring rod (12) or weak or broken rod springs (13).

STEP 2. Notify field maintenance.

**CORRECTIVE ACTION**

STEP 1. Potential timing issue.

STEP 2. Turn weapon into Field Maintenance to check for incorrect timing.

**5. SYMPTOM: WEAPON WILL NOT UNLOCK.****CORRECTIVE ACTION**

STEP 1. Potential timing issue.

STEP 2. Turn weapon into Field Maintenance to check for incorrect timing.

**6. SYMPTOM: WEAPON WILL NOT EXTRACT.****CORRECTIVE ACTION**

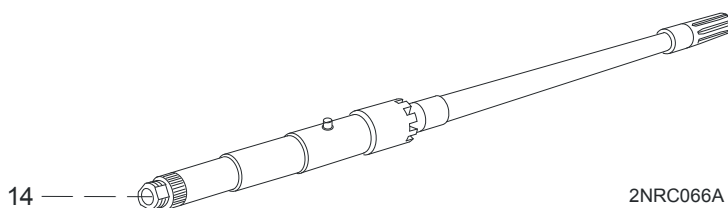
STEP 1. Check for ruptured cartridge.

STEP 2. Remove ruptured cartridge (WP 0008 00).  
Notify field maintenance.

**CORRECTIVE ACTION**

STEP 1. Check chamber (14) for excessive pitting.

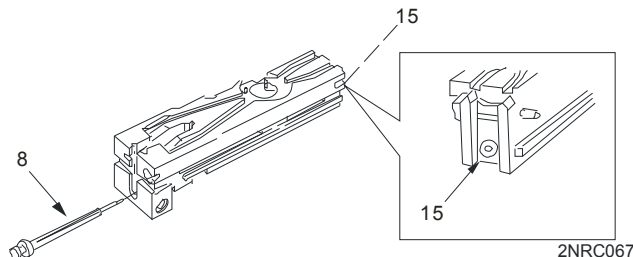
STEP 2. Replace barrel.  
Notify field maintenance.



**TROUBLESHOOTING PROCEDURES – Continued****7. SYMPTOM: WEAPON WILL NOT EJECT.****CORRECTIVE ACTION**

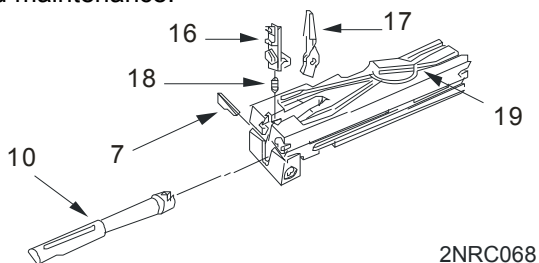
STEP 1. Check bolt space (15) for enlarged firing pin hole and deformed firing pin (8). These can cause the spent brass to bind in the T-slot, preventing ejection.

STEP 2. Notify field maintenance.

**8. SYMPTOM: WEAPON WILL NOT COCK.****CORRECTIVE ACTION**

STEP 1. 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. Determine if left or right hand feed. Weapon will not cock or charging handles will not be easily pulled to the rear if wrong setup (right/left hand feed) (WP 0008 00, step 5).

STEP 2. Notify field maintenance.

**9. SYMPTOM: SLUGGISH OPERATION.****CORRECTIVE ACTION**

STEP 1. Check for dirt, carbon, burrs, and lack of lubrication.

STEP 2. Clean and lubricate.

**END OF WORK PACKAGE**

**CHAPTER 4**

**MAINTENANCE INSTRUCTIONS**





**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)  
INTRODUCTION  
PMCS GENERAL PROCEDURES**

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**INITIAL SETUP:****Reference**

DA Form 2404  
WP 0021 00

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**GENERAL**

The table in WP 0021 00 has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

**WARNINGS AND CAUTIONS**

Always observe the WARNINGS and CAUTIONS appearing in your PMCS table. WARNINGS and CAUTIONS appear before applicable procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or to prevent equipment from being damaged.

**PMCS PROCEDURES**

1. 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.
2. Interval Column. This column tells when procedure in the PROCEDURE Column must be performed. Frequencies are as follows:
  - a. BEFORE - Checks and services performed prior to the equipment leaving its containment area or performing its intended mission.

**PMCS PROCEDURES - Continued**

- b. DURING - Checks begin when the equipment is being used in its intended mission.
  - c. AFTER - Checks and services begin when the equipment is taken out of its mission mode or returned to its containment area.
3. Item to be Checked/Service Column. This column lists the item to be checked or serviced.
  4. Procedure Column. This column gives the check or service that must be done for the item listed in the Item to be Checked/Service Column to know if the equipment is ready or available for its intended mission or for operation. Procedures must be done in the time stated in the Interval Column.
  5. Not Fully Mission Capable If Column. Information in this column lists what faults will keep equipment from being capable of performing its primary mission. Do not operate the equipment that show faults listed in this column. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

**END OF WORK PACKAGE**

OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)  
INCLUDING LUBRICATION PROCEDURES

INITIAL SETUP:

Materials/Parts	Materials/Parts (cont)
Cleaner, lubricant and preservative (CLP) (item 7, WP 0037 00)	Wiping rag (item 20, WP 0037 00)
Lubricating oil, (LSA) (item 14, WP 0037 00)	Reference
Lubricating oil, weapons (LAW) (item 15, WP 0037 00)	AR 385-10
Lubricating oil, (PL-M) (item 13, WP 0037 00)	DA Form 2404
Rifle bore cleaning compound (RBC) (item 9, WP 0037 00)	DA Form 5988-E
	WP 0022 00
	WP 0023 00
	WP 0032 00
	WP 0035 00

GENERAL

In the United States Military, Preventive Maintenance Checks and Services (PMCS) is the checks, service and maintenance performed before, during, and after any type of movement, or before use of all types of military equipment. Every piece of military equipment has a PMCS Chart used to go over every detail needed or noted to ensure the proper function of every mechanical item or non-mechanical surface. Performing a PMCS check every time equipment is used will help to reduce the number of failures. This will reduce the number of injuries during training exercises as well as improve effectiveness in combat.

PMCS consists of training, system usage and system operations. Routinely performing PMCS on training, system usage and system operations will definitely decrease weapon malfunction and increase system readiness.

PMCS

PMCS is checks and services performed by the operator/crew personnel. This is done using assigned equipment, operator's manual, and other applicable technical publications at scheduled intervals to ensure equipment is Fully Mission Capable (FMC) or faults are identified and corrective action is complete.

## **PMCS – Continued**

For operators to conduct a proper and thorough PMCS on their assigned equipment, they must understand how to correctly use the equipment technical manuals. Leaders are required to ensure that soldiers understand procedures outlined in this manual through effective hands on training and providing them with supervision.

## **PMCS Types**

Before Operations Checks concentrate on ensuring equipment is FMC. Faults detected during before operation checks that make the equipment Non Mission Capable (NMC) or violate a safety directive must be corrected before the mission. During Operations Checks are faults that occur during the mission that affect the FMC status and must be fixed during the mission. Faults that are found that do not affect FMC status will be recorded on DA Form 5988-E or DA Form 2404 and corrected at completion of the mission.

After Operations Checks detect faults that result from the mission and ensure identification and correction of faults to maintain the equipment to 10/20 standard. Weekly Operational Checks are checks that are required to be completed at least weekly and if it is the first time the equipment has been used.

Monthly Operations Checks are completed at least weekly and if it is the first time a piece of equipment has been operated.

Daily PMCS checks are conducted when the weapon is used but not fired (M2A1 headspace and timing (H/T), training (H/T, basic operations), disassembly, inspection and assembly) and to inspect barrels to ensure there is no spent cartridge case or excessive corrosion.

### **NOTE**

Before, During, and After Operation Checks will be conducted prior to a weapon's being issued IAW AR 385-10. (Anytime a weapon is leaving the AO (Area of Operation), either going back to the rear or another Forward Operating Base, PMCS MUST be performed.

## **PMCS Performance**

PMCS in combat zones will be required before and weekly operation as a minimum. Equipment that is not utilized is not exempt from maintenance standards. While deployed, correction of NMC faults will be initiated immediately. The goal for non-deadline faults is to have all corrective action completed, job orders open, or parts requisitioned within 72 hours.

1. Recording of Faults: Faults discovered during any inspection that are not corrected on the spot will be recorded on DA Form 5988-E or DA Form 2404.
2. Deadline Fault: Mechanics will verify and troubleshoot the same day the NMC fault is found. Final resolution on NMC faults will be determined within 48 hours of original fault identification. All NMC faults will be repaired before operating equipment.
3. Routing Fault: Mechanics will troubleshoot and identify corrective action with a seven-day period from fault identification. These faults will be reported by first line supervisor or his designated representative. Routine faults will be repaired, parts placed on order, or work request opened before operating the equipment. If the fault is noted during operation of a dispatched piece of equipment, the fault will be annotated on the equipments DA Form 5988-E and reported to maintenance when mission is complete. Once a fault has been verified by field maintenance, the first line supervisor will verify the NSN/NIIN through FEDLOG and if the NSN/MIIN is correct, they will place it on order.
4. Parts Requisitioning Standards: Once a fault has been verified by field maintenance, the first line supervisor will verify the NSN/NIIN through FED LOG and if the NSN/NIIN is correct, they will place it on order.

## **GENERAL CLEANING AND LUBRICATION**

### **CAUTION**

Do not use dry cleaning solvent to clean backplate assembly. Use clean wiping rag to remove foreign matter. Lubricate exterior very lightly with oil saturated cloth.

1. Immediately after firing, clean all powder fouled surfaces with rifle bore cleaning compound (RBC).
2. Field strip machine gun into major groups and assemblies (See WP 0022 00).
3. Clean components with RBC.
4. Wipe dry and oil with weapons lubricating oil (LSA) at temperatures above 0° F (-18° C), or weapons lubricating oil (LAW) at temperatures below 0° F (-18° C).
5. Thereafter, clean and oil as above every 90 days, unless inspection reveals more frequent servicing is required.
6. Reassemble major groups and assemblies (See WP 0032 00).
7. Remove oil from barrel bore before firing.

## LUBRICATION INSTRUCTIONS

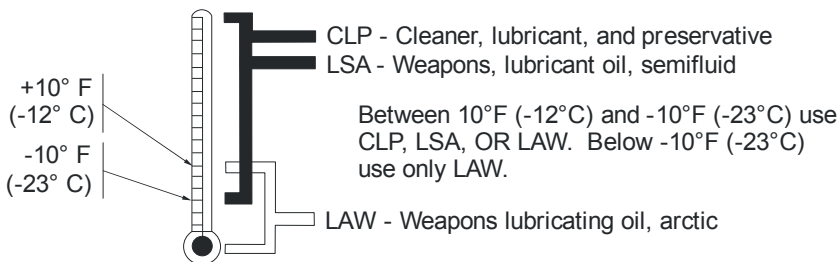
Under all but the coldest arctic conditions, LSA or CLP are the recommended lubricants to use on your machine gun. Remember to remove excessive oil from the bore before firing.

### NOTE

Lubrication instructions are mandatory. Wherever the term CLP or the words lube or lubricant are cited in this TM, it is to be interpreted to mean CLP, LSA, or LAW can be utilized as applicable. The following constraints must be adhered to:

1. Under all but the coldest arctic conditions, LSA or CLP are the lubricants to use on your weapon. Either may be used at  $-10^{\circ}$  F ( $-23^{\circ}$  C) or above. However, do not use both on the same weapon at the same time.
2. LAW is the lubricant to use during cold arctic conditions,  $+10^{\circ}$  F ( $-12^{\circ}$  C) or below.
3. Any lubricant may be used from at  $-10^{\circ}$  F ( $-23^{\circ}$  C) to  $+10^{\circ}$  F ( $-12^{\circ}$  C).
4. Do not mix lubricants on the same weapon. The weapon must be thoroughly cleaned during change from one lubricant to another.

Dry cleaning solvent is recommended for cleaning during change from one lubricant to another. Only lubricants and cleaners specified in this manual are authorized for use on this weapon.

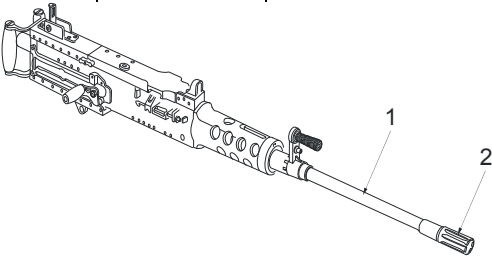


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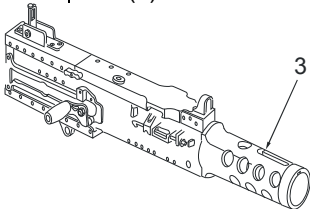
Lightly lube – A film of oil barely visible to the eye.

Generously Lube – Heavy enough so that it can be spread with the finger.

Table 1. Preventive Maintenance Checks and Services

Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
<p><b>WARNING</b></p> <p>When servicing this weapon, performing maintenance, or disposing of materials such as cleaning fluids, cleaning compounds, lubricants, and sealing compounds (or items, such as cleaning rags contaminated with these substances) consult your unit/local hazardous waste disposal center or safety office for local regulatory guidance. If further information is needed, please contact The Army Environmental Hotline at 1-800-872-3845/OCONUS: 410-436-1244 or online at <a href="http://aec.army.mil/usaec/contactus.html">http://aec.army.mil/usaec/contactus.html</a>. Accidental or intentional introduction of contaminants into the environment violates military, state, and federal regulations. Failure to comply may adversely affect the public or environment.</p> <p>Be sure to clear weapon before disassembling, clearing, inspecting, transporting, or storing.</p> <p><b>CAUTION</b></p> <p>If SLAP ammunition is being used, barrel life will be reduced significantly.</p> <p><b>NOTE</b></p> <p>If any procedure does not meet "Equipment Not Ready/Available If" criteria, notify field maintenance.</p>				
1	Before	Barrel Assembly	<p><b>CAUTION</b></p> <p>Do not use a damaged barrel.</p> <p>Check barrel (1) for obstruction, abnormalities, or damage. Barrel must be cleaned before use.</p>	<p>Obstruction in barrel cannot be removed or barrel is damaged.</p>
 <p>2NRC001A</p>				
2	Before	Flash Suppressor	<p><b>CAUTION</b></p> <p>If the carrying handle assembly is broken, allow barrel to cool before changing the barrel.</p> <p>Inspect for damage to barrel threads and guide pins.</p> <p>Check flash suppressor (2) for breaks or binding</p>	<p>Barrel threads or guide pins are damaged.</p> <p>Flash suppressor is broken or binds.</p>

**Table 1. Preventive Maintenance Checks and Services – Continued**

Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
3	Before	Barrel Support	Check barrel support cam slot (3) for burrs.	Burrs are present.
 <p>2NRC155</p>				
4	Before	Complete Weapon	Check for proper lubrication.	Weapon not properly lubricated
<p><b>WARNING</b></p> <p>During reassembly ensure that the bolt and barrel extension assembly serial number matches the last four digits of the receiver serial number to prevent losing headspace, which could cause gun to malfunction and serious injury.</p>				
5	Before	Machine Gun	<p>a. Hand-operate the machine gun with feed tray cover in the closed position.</p> <p>Check to ensure that all moving parts are clean, lightly oiled and function freely.</p> <p>b. Visually inspect bolt switch to ensure it is set for the correct feed (left/right hand feed).</p> <p>c. Notify field maintenance to verify headspace and timing. After headspace and timing has been verified, notify field maintenance if headspace and timing fails.</p> <p>d, Check to ensure all BII are present and serviceable (WP 0035 00)</p>	<p>Weapon will not function.</p> <p>Weapons will not cock or charging handles cannot be easily pulled to the rear with wrong setup (right/left hand feed).</p> <p>Headspace and timing has not been verified by field maintenance.</p> <p>One or more BII items are missing or unserviceable.</p>



Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
6	Before	Backplate Assembly	<p>a. Check latch and latch lock for function and retention of back-plate assembly in receiver group. Check that latch completely holds the trigger bar down.</p> <p>b. Check trigger and bolt latch release for function. Check for cracks and looseness in grips. Check that trigger bar is not bottoming out.</p> <p>c. Inspect backplate buffer tube for any fluids (oil, solvent, or water) coming from the inside of the buffer tube.</p>	<p>Backplate will not lock in receiver.</p> <p>Cracks in backplate assembly.</p> <p>Fluids coming from inside of the buffer.</p>
7	Before	Breech Lock/Pin	Check for abnormalities, excessive wear or looseness.	Abnormalities, excessive wear or looseness.
8	Before	Sear Spring	Check for correct installation, deformity, or breakage.	Improperly installed, weak, deformed, or broken.

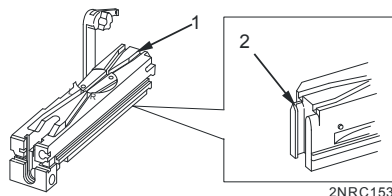
#### NOTE

The user and/or field maintenance will be responsible for the serviceability of the gages by performing a visual inspection of the gages prior to issue/use. Those gages that are broken, bent, rusted, pitted or exhibit other forms of mutilation that could affect the dimensional tolerance of the gages, will be turned in for replacement.

9	Before	Bolt Assembly	Check for burred, scored, loose, or deformed cam.	Cam is loose or deformed or contains burrs or scores.
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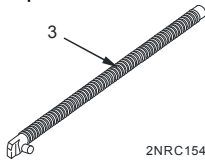
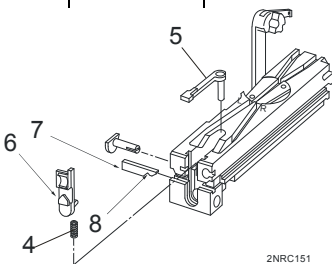
#### NOTE

Bolt assembly with minor gouging and/or imperfections in locking lug(s) causing no degradation in performance is acceptable. The minor gouging/imperfection can be removed by stoning.



		a. Bolt	<p>a. Check bolt alternate feed area, cam grooves (1), and T-slot (2) for burrs or cracks. Check for chipped T-slot.</p>	<p>Bolt alternate feed area, cam grooves or T-slot are burred, cracked, or chipped.</p>
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**Table 1. Preventive Maintenance Checks and Services – Continued**

Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
9 (cont)	Before (cont)	a. Bolt (cont)	b. Check bolt bottom slot for burrs or cracks.	Bolt bottom slot is burred or cracked.
		b. Drive Spring Rod Assembly	a. Check drive spring rod assembly (3) for bent, broken or cracked springs, collapsed coils, and flat spots on coils. 	Driving spring rod assembly springs are bent, broken or cracked, coils have flat spots, or coils are collapsed.
		c. Sear Spring	b. Check drive spring rod assembly (3) for deformed, cracked, or broken rod.  a. Check sear spring (4) for deformity, collapsed coils, weakness, elongation, crisp spring action, and/or incorrect installation (must be in sear hole and recess in bottom of the bolt). 	Drive spring rod is deformed, cracked or broken.  Sear spring is deformed, weak, or incorrectly installed.
		d. Bolt Body	b. Spring should not be able to be compressed fully with fingers.	Sear spring can be compressed fully with fingers.
		e. Cocking Lever Pin	Check bolt body for burrs and failure to slide freely.	Bolt body has burrs or fails to slide freely.
		f. Sear	Check cocking lever pin (5) for burrs or breaks.  Check sear (6) for burrs. Ensure sear notch has a sharp edge and is not chipped or broken.	Cocking lever pin is burred or broken.  Sear has burrs or sear notch is dull, chipped, or broken.

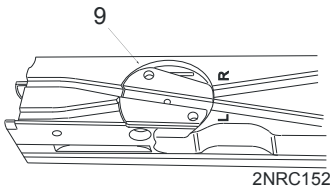
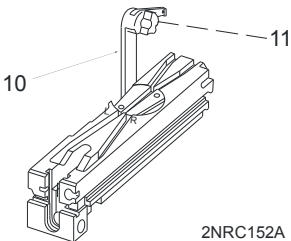
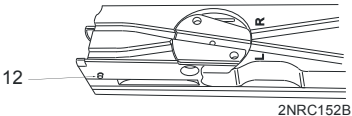
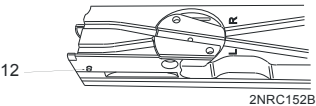
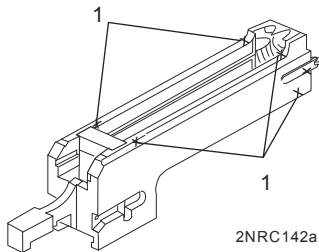
Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
		g. Sear Slide	a. Check sear slide (7) for free movement in guide grooves. b. Check for distorted notch (8) and proper installation; enters from left to right (for left hand feed).	Sear slide binds. Notch is distorted or improperly installed.
<p style="text-align: center;"><b>CAUTION</b></p> <p>Incorrect installation of bolt switch can lead to battered belt feed lever if cover is closed and an attempt is made to function test the weapon.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Bolt assembly with minor gouging and/or imperfections in locking lug(s) causing no degradation in performance is acceptable. The minor gouging/imperfection can be removed by stoning.</p> <p>Correct installation of bolt switch (1) for left-hand feed is shown on illustration.</p>				
		h. Bolt Switch	Check bolt switch (9) for burrs, looseness, and incorrect installation. 	Bolt switch is burred, loose, or installed incorrectly. If broken, contact field maintenance.
		i. Cartridge Extractor	Check cartridge extractor (10) and spring (11) for burrs or breaks. 	Cartridge extractor or spring is burred or broken.
		j. Extractor Stop Pin	Check for deformed, broken, or missing extractor stop pin (12). 	Extractor stop in is missing, deformed, or broken.

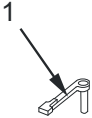
Table 1. Preventive Maintenance Checks and Services – Continued

Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
9. (cont)	Before (cont)	k. Extractor Mounting Arm Support	<p>Check extractor mounting arm support (13) for chips and burrs</p>  <p>2NRC152B</p>	Extractor mounting arm support is chipped or burred.
<p style="text-align: center;"><b>WARNING</b></p> <p>During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.</p>				
10.	Before	Barrel Extension	<p>a. Check barrel extension for cracks (1), gouges, burrs, and binding. Check barrel locking spring for proper staking in its groove. Check for burred or stripped threads.</p> <p>b. Check breech lock/pin for cracks and looseness.</p> <p>c. Check that bolt and barrel extension assembly serial number match the last four digits of the receiver serial number.</p>	<p>Barrel extension threads are damaged.</p> <p>Cracked or missing parts.</p> <p>Serial numbers do not match.</p>



Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
11.	During	Machine Gun	Erratic or sluggish firing may indicate carbon buildup or change in headspace and timing.	Weapon ceases to operate.
12.	After	Machine Gun	Field strip, clean, inspect, and lubricate entire weapon immediately after firing (WP 0023 00). Check all BII is present and serviceable (WP 0035 00).	One or more BII items are missing or unserviceable.
13.	After	Bolt Group and Rod Assembly	a. Check for sharp edges on any surface of bolt group. Check spring rod assembly for deformation, cracks, bent or broken pin or rod assembly. Check sear for burrs.	Bolt group cracked, missing, or defective.
14.	After	Receiver and Cover Assemblies	b. Check sear spring for deformation or breakage. Check firing pin and firing pin extension for bends or cracks.	Bolt group cracked, missing, or defective.
			a. Check working surfaces for cracks, burrs, and gouges. Check belt holding pawl(s) for binding and broken or missing pawls.	Receiver cracked. Operating parts missing or damaged.
			b. Check compression spring for correct installation. Check feed pawl cotter pin/casing wire.	Feed pawl cotter pin/casing wire missing.
			c. Check lever for cracks or breaks. Check trigger lever and stop assembly for cracks and binding. Check cartridge stops for cracks.	Receiver cracked. Operating parts missing or damaged.
			d. Check retracting slide assembly for broken, missing, or loose lever. Check cover assembly for missing or broken springs.	Cover latch does not lock cover in closed position.
			e. Check belt feed lever and belt feed slide group for binding, cracks, and broken parts. Check function of cover latch.	Cover latch does not lock cover in closed position.

Table 1. Preventive Maintenance Checks and Services - Continued

Item No.	Interval	Item to be Checked/ Serviced	Procedure	Not Fully Mission Capable If:
15.	After	Receiver Rivets	<p>a. Inspect receiver rivets. Check for rivets that have relative movement under finger pressure. Rivets may turn. No missing rivets are allowed.</p> <p>b. Attempt to move riveted receiver components forward and to the rear, and up or down. Riveted components must not move.</p> <p>c. Open feed tray cover and using hand only, attempt to move top plate. If top plate has obvious movement, weapon must be evacuated to field maintenance for further inspection. Rivets are allowed to turn.</p> <p>d. Turn receiver over onto top plate, grasp bottom plate with hand and attempt to move bottom plate. If bottom plate has obvious movement, weapon must be evacuated to field maintenance for further inspection. Rivets are allowed to turn.</p> <p>e. Turn receiver over onto top plate, while holding receiver assembly, grasp barrel support and attempt to move barrel support. If trunnion has obvious movement, weapon must be evacuated to field maintenance for further inspection. Rivets are allowed to turn.</p>	<p>Rivets are missing.</p> <p>There is movement of riveted components.</p> <p>Top plate has obvious movement.</p> <p>Bottom plate has obvious movement.</p> <p>Trunnion has obvious movement.</p>
16.	Quarterly	Sear Stop and Pin	<p>Check sear stop and pin (1) for bends and breaks.</p> 	<p>Sear stop and pin are broken, flat or twisted.</p>

END OF WORK PACKAGE

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****FIELD STRIP  
REMOVAL**

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**INITIAL SETUP:****Tools and Special Tools**

Heat protective mitten  
(item 4, WP 0035 00)

**References**

WP 0010 00

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**WARNING**

During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.

**REMOVAL****WARNING**

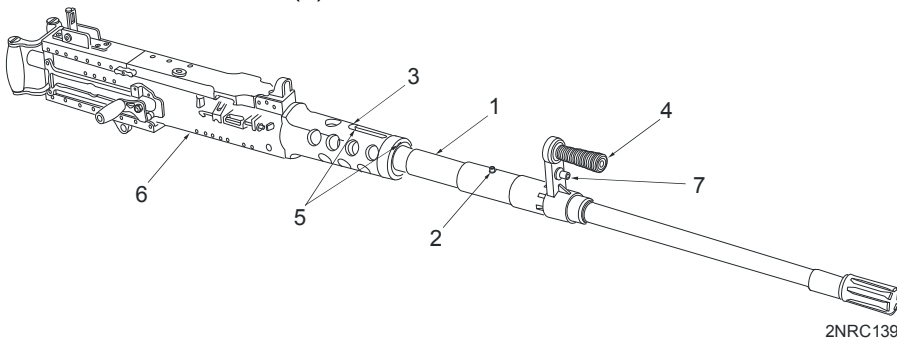
To avoid accidental firing, remove ammunition, clear weapon (WP 0010 00), and verify chamber is clear.

Heat protective mitten should be used when barrel is hot to avoid injury to personnel.

1. After ensuring weapon has been cleared, retract the retracting slide handle approximately 3/8 inch.

**REMOVAL - Continued**

2. Rotate barrel (1) counterclockwise until barrel lock pin (2) engages barrel support camming slot (3). Continue rotating the barrel using barrel carrying handle (4) (the handle is now pointed upward) until the barrel lock pin engages alignment slot (5).
3. The barrel (1) is now unlocked from barrel extension. Pull barrel forward and remove from receiver (6).



4. Press release knob (7) and remove barrel carrying handle (4) from barrel assembly (1).

**WARNING**

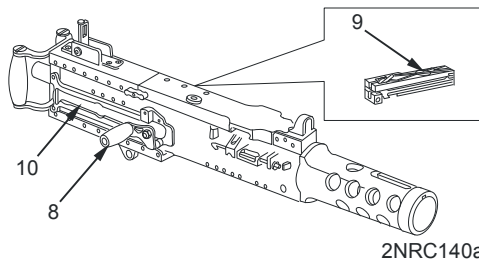
Injury to personnel could occur if the following are not followed:

- 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. Stand to one side when removing backplate.

**CAUTION**

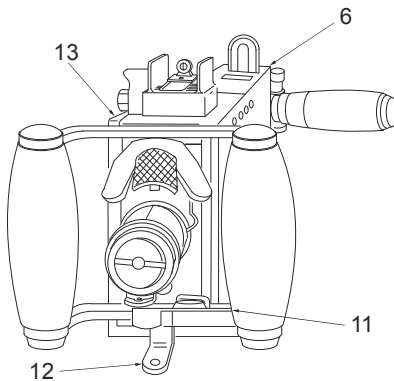
Care must be taken to prevent the bolt from slamming forward with the barrel removed.

5. Release charging handle (8) and allow bolt (9) and retracting slide (10) to go forward

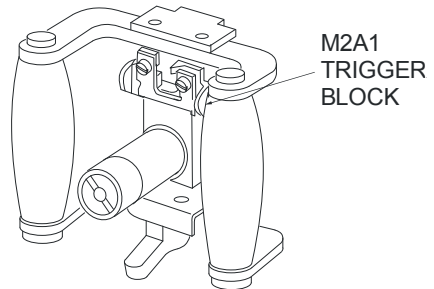




6. Ensure weapon is in single shot mode and bolt is in forward position. Pull backplate latch lock (11) straight back, while lifting up on backplate latch (12). Raise backplate assembly (13) straight up and remove from receiver (6).



TRIGGER AND RELEASE  
NOT SHOWN FOR CLARITY



2NRC070a

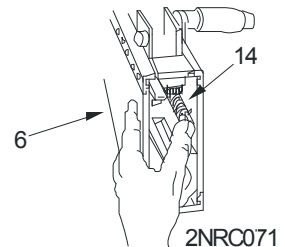
## WARNING

Never attempt to cock the machine gun with the backplate removed and the driving spring rod assembly in place. If the backplate is off and the driving spring rod assembly is compressed, the retaining pin on the driving spring rod assembly could slip from its seat in the sideplate and could cause serious injuries to anyone behind the machine gun.

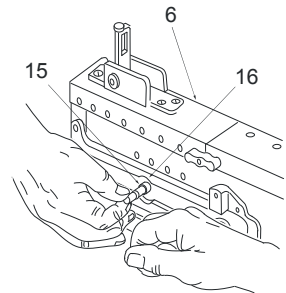
## NOTE

The driving spring rod is located at the sideplate

7. Push in on head of driving spring rod assembly (14) and push it to the left to remove retaining pin from its seat in the receiver (6) right sideplate.
8. Pull driving spring rod assembly (14) to the rear of out of receiver (6).
9. Retract bolt assembly far enough to align bolt stud (15) with (enlarged) bolt stud hole (16) in receiver (6). Remove bolt stud.



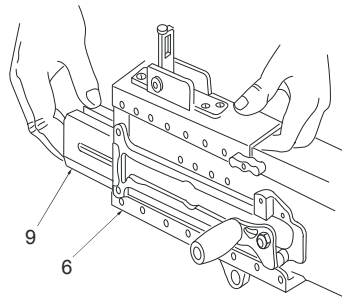
2NRC071



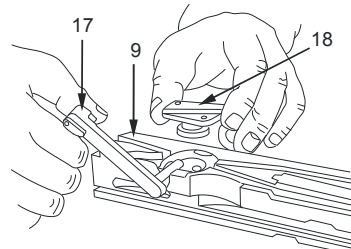
2NRC073a

**REMOVAL – Continued**

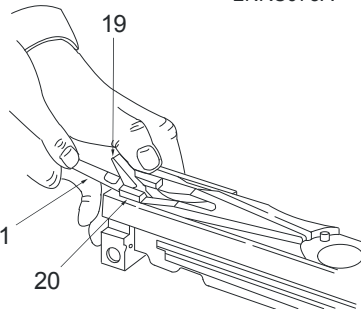
10. Slide bolt (9) to the rear and out of receiver (6). To keep extractor from falling from bolt, place bolt down on its right side.



11. Rotate cartridge extractor (17) upward and remove from left side of bolt (9). Remove bolt switch (18) by lifting straight up from bolt.



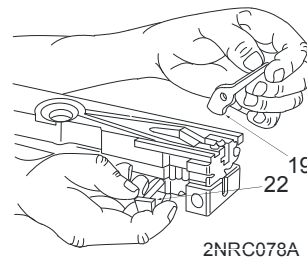
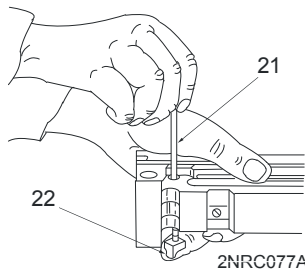
12. Place cocking lever (19) in its rearmost position.

**WARNING**

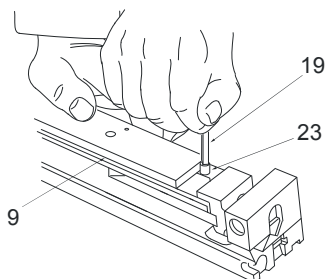
Do not place finger between cocking lever and sear or injury could occur.

13. Release firing pin spring by pressing down on sear (20) with swab holder section (21).

14. Using swab holder section (21), remove cocking lever pin (22) and cocking lever (19).



15. Using thin edge of cocking lever (19), rotate sear stop to center of recess and bolt.

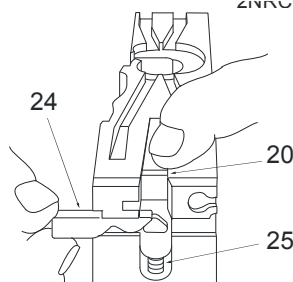


2NRC079B

16. Turn bolt (9) over and use thin edge of cocking lever (19) to press sear stop and pin (23) from bottom of bolt.

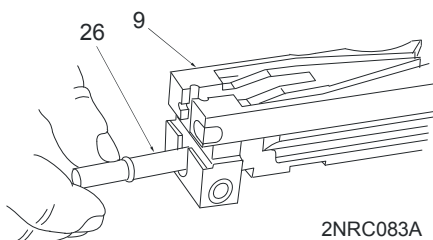
17. With top of bolt (9) up, use thin edge of cocking lever (19) to pry up and remove sear stop and pin (23).

18. Depress sear (20) and remove sear slide (24). Remove sear and sear spring (25).



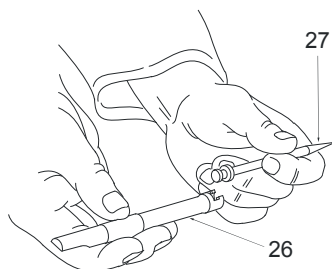
2NRC082A

19. Tip the front end of the bolt (9) upward and remove firing pin extension assembly (26).



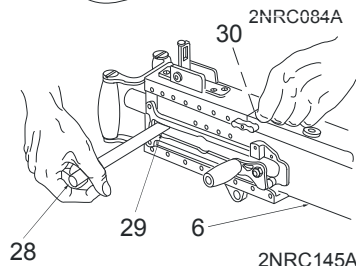
2NRC083A

20. Remove firing pin (27) from firing pin extension assembly (26).



2NRC084A

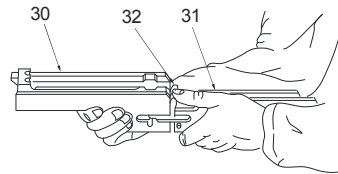
21. Insert pointed end of M4 cleaning rod (28) into hole (29) in receiver (6) and depress buffer body lock while applying rearward pressure on barrel extension assembly (30).



2NRC145A

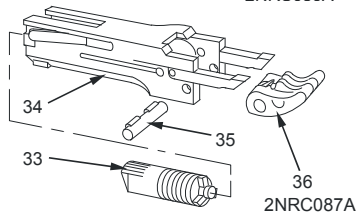
## REMOVAL – Continued

22. Remove barrel buffer assembly (31) and barrel extension assembly (30) together. Separate the assemblies by pushing forward on tips of buffer accelerator (32).



2NRC086A

23. Remove buffer assembly (33) by pushing it out rear of barrel buffer body (34). Drive accelerator pin assembly (35) from barrel buffer body with swab holder. Remove buffer accelerator (36).

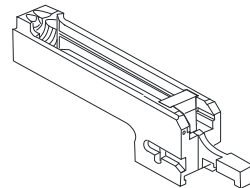


2NRC087A

### NOTE

The breechlock is pinned to the barrel extension and not removable at operator level. No further disassembly of barrel extension is authorized.

24. Remove belt holding pawl pin (37) and lock pin (38) attaching front cartridge stop (39) and rear cartridge stop assembly (40) to receiver (6). Remove front cartridge stop and rear cartridge stop assembly.

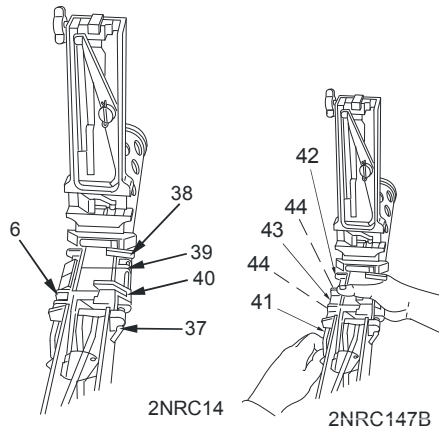


2NRC148B

### NOTE

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

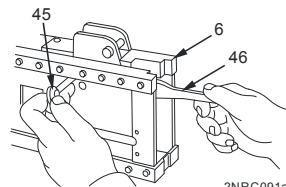
25. Remove bolt holding pawl pin (41), lock pin (42), belt holding pawl assembly (43) and two springs (44).



2NRC14

2NRC147B

26. Raise loop of trigger lever pin (45) and rotate pin until loop is in vertical position. Reach inside receiver (6) and hold trigger lever (46) while removing trigger lever pin assembly. Remove trigger lever.



2NRC091a

## END OF WORK PACKAGE

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## OPERATOR

### MACHINE GUNS, CALIBER .50; M2A1 W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

### MAINTENANCE OF BARREL ASSEMBLY REMOVAL, CLEANING, INSPECT/REPAIR, LUBRICATION, INSTALLATION

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#### INITIAL SETUP:

##### Materials/Parts

Bore brush (item, 3, WP 0037 00)  
Carbon removing compound  
(item 6, WP 0037 00)  
Chamber brush  
(item 4, WP 0037 00)  
Cleaning rods  
(items 16 or 17, WP 0037 00)  
Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

##### Materials/Parts (cont)

Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Rifle bore cleaning compound (RBC)  
(item 9, WP 0037 00)  
Small arms cleaning swab  
(item 19, WP 0037 00)  
Wiping rags  
(item 20, WP 0037 00)

##### Personnel Required

Two

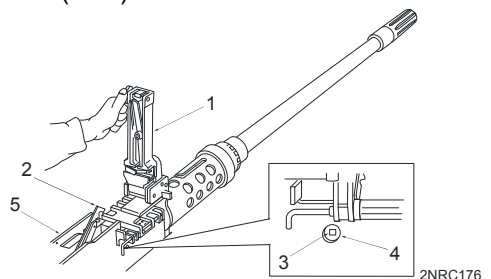
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#### REMOVAL

#### WARNING

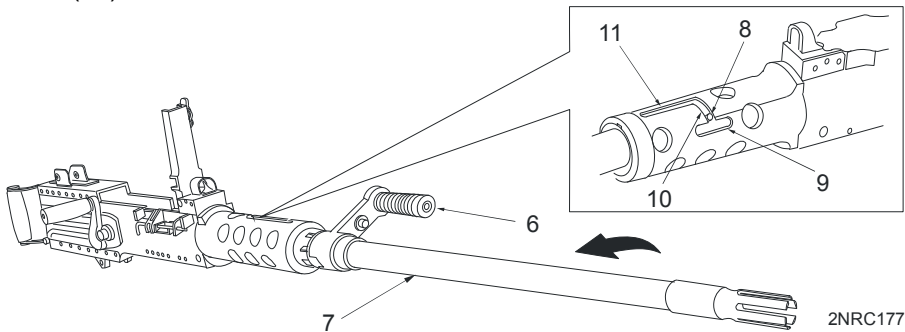
Be sure to clear weapon before disassembling, cleaning, inspecting, transporting, or storing or personnel could be injured. Clearing consists of unloading the machine gun and visually inspecting weapon and chamber to ensure all rounds have been removed. Do not release the bolt or press the trigger. Ensure weapon is cleared and on S (safe) mode.

1. Raise cover assembly (1) all the way up. Retract bolt assembly (2) far enough for barrel locking spring lug (3) to center in barrel locking spring hole (4) on right hand side of receiver (5).

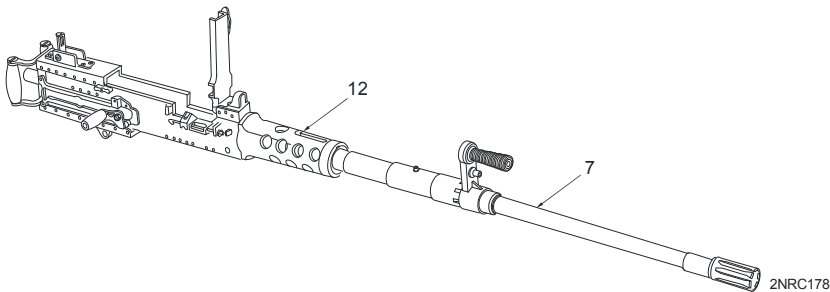


**REMOVAL – Continued**

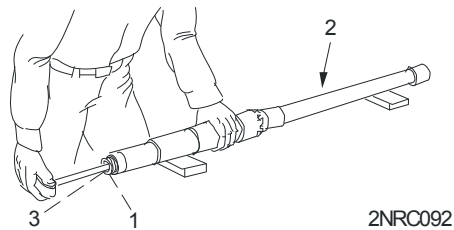
- After retracting slide handle approximately 3/8 in., grasp barrel carrying handle (6) and rotate barrel assembly (7) counterclockwise until locking pin (8) disengages retention slot (9) and engages camming slot (10). Continue rotating barrel assembly counterclockwise until locking pin engages alignment slot (11).



- Pull barrel assembly (7) forward out of barrel support (12). Release slide handle and allow bolt to go forward.

**CLEANING****CAUTION**

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

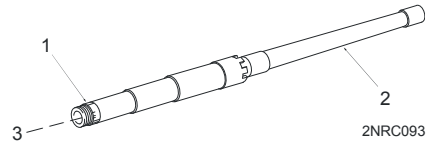


- Using the cleaning rods, bore brush, and RBC, dip bore brush in RBC and run through chamber (1) of barrel (2). Unscrew bore brush from cleaning rods, remove rods from bore, reattach brush to rods, and repeat process until clean.
- Using cleaning rods and chamber brush, dip chamber brush in RBC and clean chamber (1) using clockwise twisting motion. Unscrew chamber brush from

- cleaning rods, remove rods from bore, reattach chamber brush to rods, and repeat process until clean.
3. Remove chamber brush from swab holder section, insert a cleaning swab in slot, then run clean swab through bore (3), from chamber end and back. Repeat until clean swab is obtained.
  4. Clean outside surface of barrel (2) with carbon removing compound. Wipe all surfaces dry with clean wiping rags.

#### NOTE

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



#### INSPECT/REPAIR`

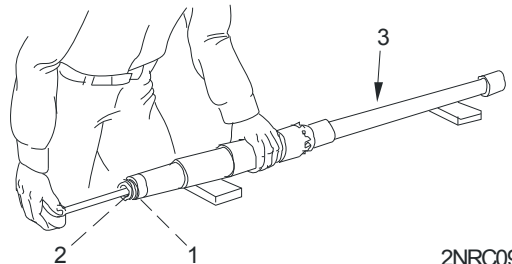
#### WARNING

Do not use a damaged barrel. Personnel could be injured.

1. Check barrel assembly for missing, damaged, or worn parts. Inspect barrel for damaged barrel threads and guide pins. Allow barrel to cool before changing the barrel if the carrying handle assembly is broken.
2. Check barrel locking pin and interrupted threads for wear and damage. If worn or damaged, notify field maintenance.
3. Check flash suppressor for burrs, looseness, damaged or bent prongs, and broken parts. If damaged, notify field maintenance.

#### LUBRICATION

Place clean cleaning swab in swab holder. Dip swab in lubricating oil (item 13, 14, or 15, WP 0037 00) and run through chamber (1) and bore (2) of barrel (3).



#### INSTALLATION

#### WARNING

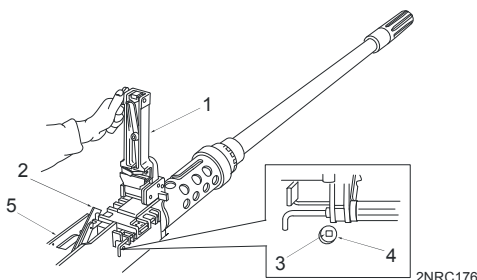
During barrel installation, the charging handle must be pulled back to view the square on the barrel locking lug through the 3/8 in. hole in the right side of the receiver.

Ensure that during barrel installation the square on the barrel extension is **NOT** pulled back **PAST** the 3/8 in. hole on the right side of the receiver or the barrel will not be attached to the barrel extension.

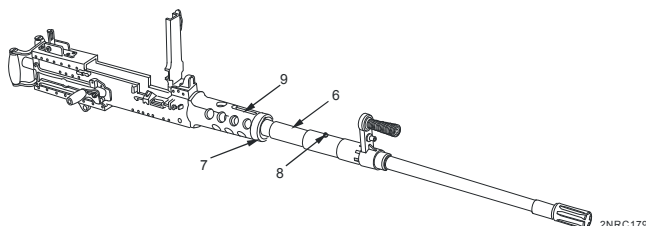
**INSTALLATION - Continued****NOTE**

M2A1 barrels are interchangeable without affecting the headspace or timing of the weapon.

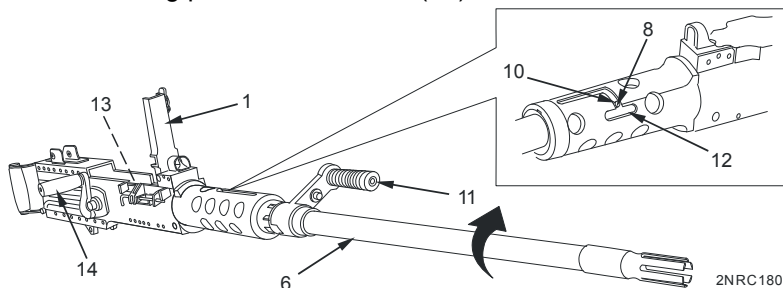
1. With cover assembly (1) all the way up, retract bolt assembly (2) far enough for barrel locking spring lug (3) to center in barrel locking spring hole (4) on right hand side of receiver (5).



2. Insert barrel assembly (6) into barrel support (7) until barrel locking pin (8) engages alignment slot (9).



3. Push barrel assembly (6) rearward until locking pin (8) engages camming slot (10). Grasping barrel carrying handle (11), rotate barrel assembly clockwise and secure locking pin in retention slot (12).



4. Inspect the barrel (6) and lower barrel extension (13) to ensure end of barrel protrudes beyond the barrel extension threads (see photo).
5. Release retracting slide handle (14) and allow bolt to go forward, then close cover assembly (1).

**END OF WORK PACKAGE**



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OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

MAINTENANCE OF BACKPLATE ASSEMBLY  
CLEANING, INSPECTION, AND LUBRICATION

---

INITIAL SETUP:

Materials/Parts	Reference
Lubricating oil, (LSA) (item 14, WP 0037 00)	WP 0005 00
Lubricating oil, weapons (LAW) (item 15, WP 0037 00)	
Lubricating oil, (PL-M) (item 13, WP 0037 00)	
Wiping rags (item 20, WP 0037 00)	

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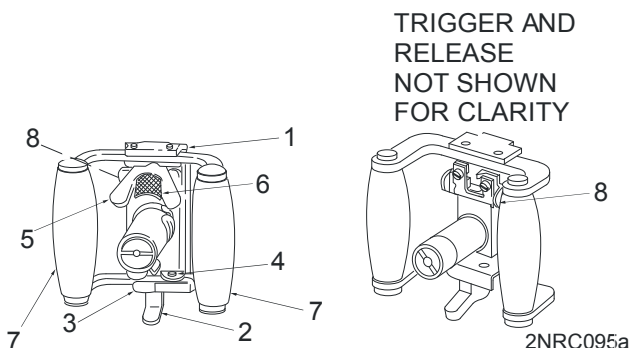
CLEANING

NOTE

Do not submerge backplate assembly in any fluid. Use clean wiping rags 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.
6. Handle grips (7) should not move freely and should not be cracked.
7. Function check the safety (8). Refer to WP 0005 00, para 7.

## LUBRICATION

Lubricate exterior of backplate assembly very slightly using a clean wiping rag saturated with lubricating oil (item 13, 14, or 15, WP 0037 00).

## END OF WORK PACKAGE

---

## OPERATOR

### MACHINE GUNS, CALIBER .50; M2A1 W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

#### MAINTENANCE OF BACKPLATE TRIGGER BLOCK OPERATION, INSPECT/REPAIR

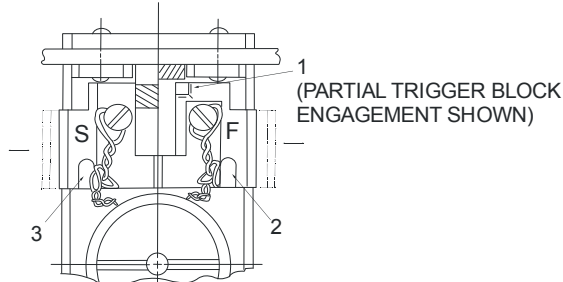
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##### OPERATION

##### NOTE

The trigger block is provided to further ensure that the M2A1 machine gun is not inadvertently fired.

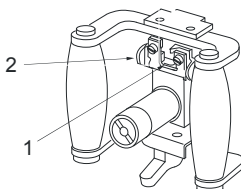
1. When the trigger block (1) is pushed to the right, it allows the trigger to be fully depressed. When the trigger block is pushed to the left, it prevents the trigger from being fully depressed.
2. Note that a red indicator (2) and letter **F** is visible when in the fire ready mode. A white indicator (3) and the letter **S** is visible when the weapon is in safe mode.



2NRC166

##### INSPECT/REPAIR

1. Check for bent or damaged flat spring (1) on small arms trigger block (2).



TRIGGER AND RELEASE  
NOT SHOWN FOR CLARITY

2NRC162

2. Check for cracked or broken trigger block (2).
3. If repair is needed, notify field maintenance.

##### END OF WORK PACKAGE



## OPERATOR

### MACHINE GUNS, CALIBER .50; M2A1 W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

#### MAINTENANCE OF BOLT ASSEMBLY AND ROD ASSEMBLY CLEANING, INSPECTION, AND LUBRICATION

##### INITIAL SETUP:

##### Materials/Parts

- Carbon removing compound  
(item 6, WP 0037 00)
- Lubricating oil, (LSA)  
(item 14, WP 0037 00)
- Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)
- Lubricating oil, (PL-M)  
(item 13, WP 0037 00)

##### Materials/Parts (cont)

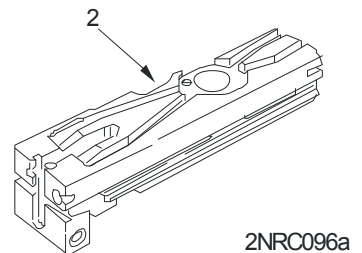
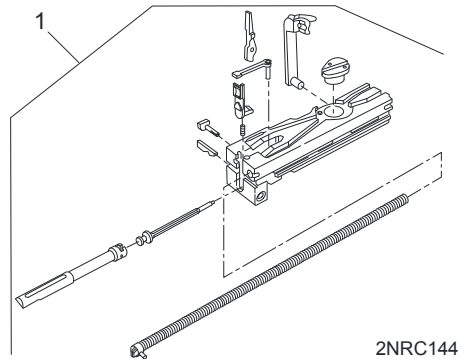
- Rifle bore cleaning compound (RBC)  
(item 9, WP 0037 00)
- Small arms cleaning swab  
(item 19, WP 0037 00)
- Wiping rags  
(item 20, WP 0037 00)

##### CLEANING

1. Clean all parts of bolt assembly (1) with a cleaning swab saturated with carbon removing compound and/or RBC.
2. Clean entire bolt (2) with a cleaning swab saturated with RBC.
3. Wipe all parts dry with clean wiping rags.

##### NOTE

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



## INSPECTION

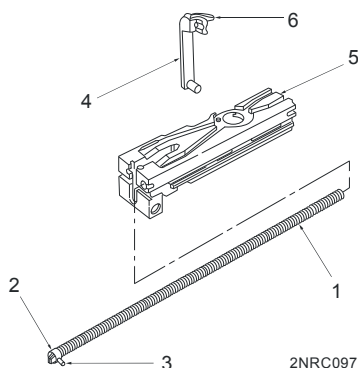
## CAUTION

If a new or different barrel extension is required, servicing headspace and timing must be performed. Evacuate to field maintenance.

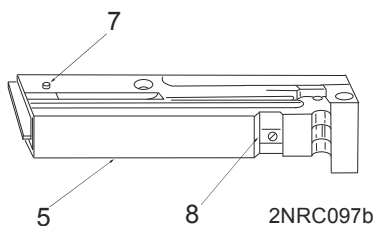
1. Inspect driving spring rod assembly (1) for flat spots and cracks on springs. Ensure that springs operate freely and that rod (2) and pin (3) are not cracked, bent or broken.
2. Check movement of cartridge extractor (4) in bolt (5). Cartridge extractor (4) should raise and lower without binding. Check movement of cartridge ejector (6). Inspect for cracks and burrs.
3. Check cartridge extractor stop pin (7) for cracks, bends, and burrs. Check breech locking slot (8) on bottom of bolt (5) for cracks, burrs, or deformation.
4. Inspect bolt switch (9), cocking lever pin (10), cocking lever (11), sear stop and pin (12), and sear slide (13) for cracks, bends, and burrs.
5. Inspect sear (14) for cracks and burrs, and inspect sear notch (15) for wear, chips, or burrs. Inspect sear spring (16) for breaks or lack of tension.
6. Inspect firing pin (17) for cracks and chipped or sharp tip.

## NOTE

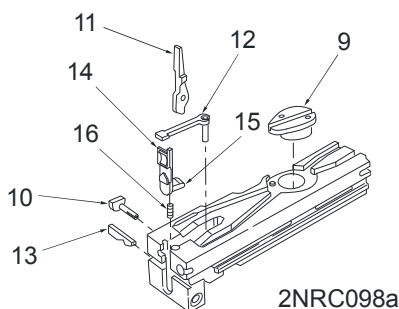
Tip should be smooth and well-rounded.



2NRC097

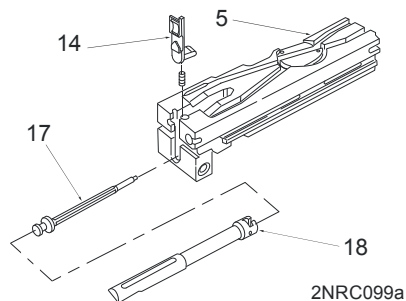


2NRC097b



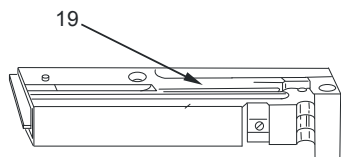
2NRC098a

7. Check firing pin extension (18) for cracks, burrs, and free movement in bolt (5). Ensure both notches on sear (14) and firing pin extension (18) engage and are free of chips and burrs.
8. Ensure bolt (5) is free of burrs and cracks. Firing pin hole must not be visibly out of round. Check hole where cartridge extractor is installed for cracks and burrs.



### WARNING

During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.



### LUBRICATION

Apply light coat of lubricating oil (item 13, 14, or 15, WP 0037 00) to all parts of the bolt assembly and rod assembly.

### END OF WORK PACKAGE





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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****MAINTENANCE OF BARREL BUFFER ASSEMBLY  
CLEANING, INSPECTION, AND LUBRICATION**

---

**INITIAL SETUP:****Materials/Parts**

Carbon removing compound  
(item 6, WP 0037 00)  
Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

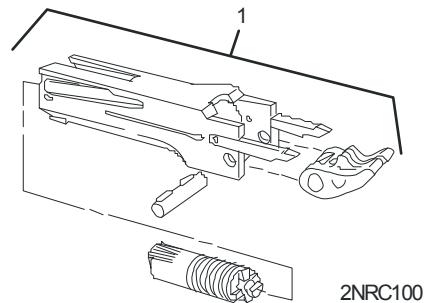
**Materials/Parts (cont)**

Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Small arms cleaning swab  
(item 19, WP 0037 00)  
Wiping rags  
(item 20, WP 0037 00)

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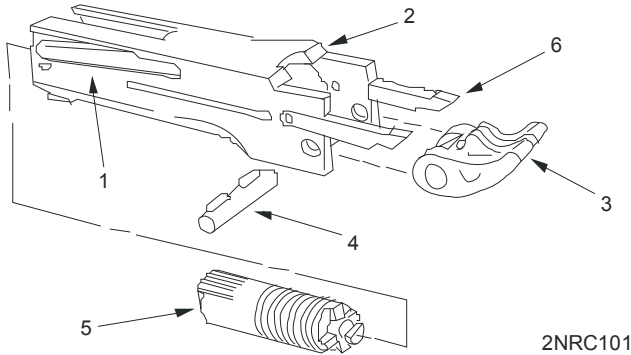
**CLEANING**

1. Clean all parts of barrel buffer assembly (1) with a cleaning swab saturated with carbon removing compound.
2. Wipe all parts dry with clean wiping rags.



## 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, breaks, and spring tension.
5. Breech lock depressors (6) may have movement as long as the movement does not cause the weapon to malfunction, or the depressors are damaged or missing.



## LUBRICATION

Apply a light coat of lubrication oil (item 13, 14, or 15, WP 0037 00) to all parts of barrel buffer assembly.

## END OF WORK PACKAGE

OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

MAINTENANCE OF BARREL EXTENSION ASSEMBLY  
CLEANING, INSPECTION, AND LUBRICATION

INITIAL SETUP:

Materials/Parts

Carbon removing compound  
(item 6, WP 0037 00)  
Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

Materials/Parts (cont)

Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Small arms cleaning swab  
(item 19, WP 0037 00)  
Wiping rags  
(item 20, WP 0037 00)

WARNING

The M2A1 kit contains unique parts that are used to convert an M2HB to the M2A1 configuration. M2A1 unique parts should NEVER be installed on M2HB weapons at the operator level. The Barrel Extension Assembly and Bolt have been serialized to remain together as an assembly with serial number of receiver. If a new Barrel Extension or Bolt is required, servicing the headspace and timing will be necessary.

CLEANING

1. Clean all parts of barrel extension assembly with a cleaning swab saturated with carbon removing compound.
2. Wipe all parts dry with clean wiping rags.

## INSPECTION

### CAUTION

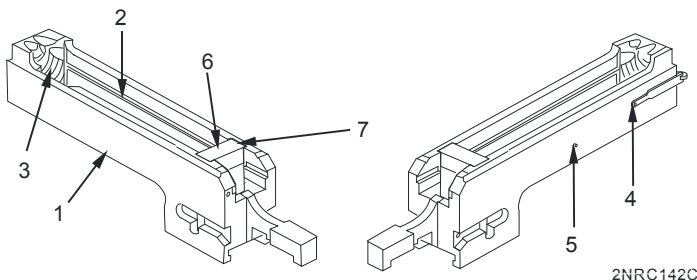
If a new or different barrel extension is required, servicing headspace and timing must be performed. Evacuate to field maintenance.

1. Inspect barrel extension assembly (1) to ensure it is not cracked and that 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 spring has good tension and the lug is not damaged.

### WARNING

During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.

4. Check breech lock (6) for smooth movement in guideways (7) of barrel extension assembly (1). If breech lock exhibits excessive wear (bolt locking surface and/or mating surfaces appear rounded and/or metal displacement appears cupped), turn in weapon to field maintenance. Breechlock is pinned to barrel extension and must not be removed at the operator level.



## LUBRICATION

Apply a light coat of lubrication oil (item 13, 14, or 15, WP 0037 00) to all parts of barrel extension assembly.

## END OF WORK PACKAGE

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OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

MAINTENANCE OF RETRACTING SLIDE HANDLE  
CLEANING, INSPECTION, AND LUBRICATION

NOTE

This work package applies only to the flexible type.

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INITIAL SETUP:

Materials/Parts

Carbon removing compound  
(item 6, WP 0037 00)  
Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

Materials/Parts (cont)

Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Small arms cleaning swab  
(item 19, WP 0037 00)  
Wiping rags  
(item 20, WP 0037 00)

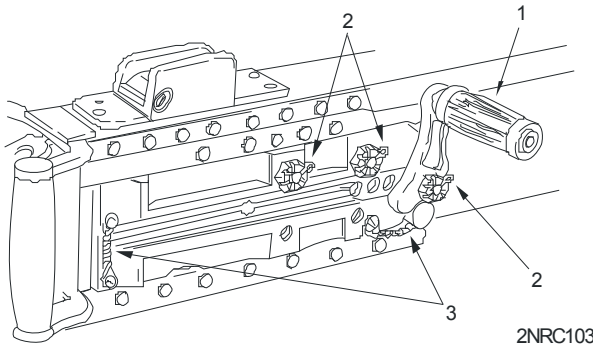
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CLEANING

1. Clean all surfaces of retracting slide handle with a cleaning swab saturated with carbon removing compound.
2. Wipe all parts dry with clean wiping rags.

## 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 lubrication oil (item 13, 14, or 15, WP 0037 00) to all parts of retracting slide handle.

## END OF WORK PACKAGE

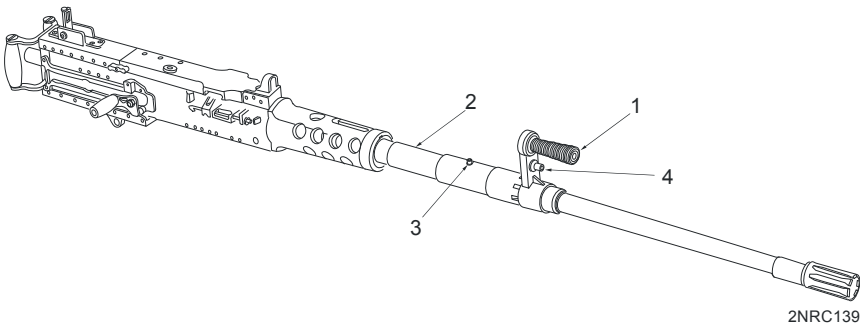
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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****MAINTENANCE OF CARRYING HANDLE ASSEMBLY  
REMOVAL, INSPECT/REPAIR, INSTALLATION**

---

**REMOVAL**

Press release knob and remove barrel carrying handle (1) from barrel assembly (2).

**INSPECT/REPAIR**

Check for missing, damaged, or worn parts. If repair is needed, notify field maintenance.

**INSTALLATION**

1. Install barrel carrying handle (1) on barrel assembly (2).
2. Align barrel carrying handle (1) with barrel lock pin (3).
3. Press release knob (4) to secure.

**END OF WORK PACKAGE**





**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****MAINTENANCE OF RECEIVER ASSEMBLY  
CLEANING, INSPECTION, AND LUBRICATION**

---

**INITIAL SETUP:****Materials/Parts**

Carbon removing compound  
(item 6, WP 0037 00)  
Lubricating oil, (LSA)  
(item 14, WP 0037 00)  
Lubricating oil, weapons (LAW)  
(item 15, WP 0037 00)

**Materials/Parts (cont)**

Lubricating oil, (PL-M)  
(item 13, WP 0037 00)  
Small arms cleaning swab  
(item 19, WP 0037 00)  
Wiping rags  
(item 20, WP 0037 00)

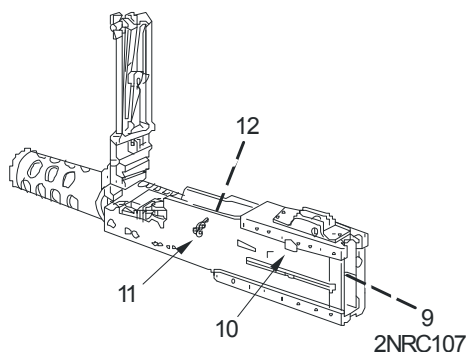
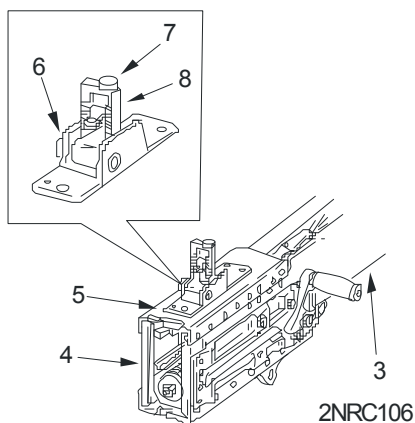
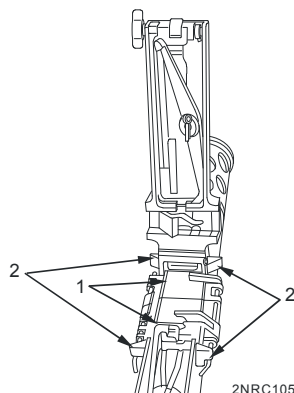
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**CLEANING**

1. Clean all surfaces of receiver assembly with a small arms cleaning swab saturated with carbon removing compound.
2. Wipe all parts dry with clean wiping rags.

## 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 at 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 sight assembly (8) is secured tightly to receiver.
6. Ensure trigger lever (9) moves freely without binding.
7. Ensure trigger lever pin (10) locks in place.
8. Ensure cotter pin (11) is in place on extractor switch.



## LUBRICATION

Apply a light coat of lubrication oil (item 13, 14, or 15, WP 0037 00) to all parts of receiver group

## END OF WORK PACKAGE

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**OPERATOR**
**MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)**
**MAINTENANCE  
ASSEMBLY OF M2A1 MACHINE GUN**


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**INITIAL SETUP:****References**

WP 0005 00

**ASSEMBLY OF M2A1 MACHINE GUN****WARNING**

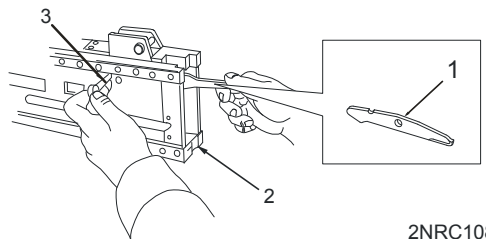
During reassembly, the bolt and barrel extension serial numbers must match the last four digits of the receiver serial number to maintain headspace, and prevent gun malfunctions and serious injury.

**1. INSTALL TRIGGER LEVER.**

- a. Install trigger lever bar (1) in receiver (2).

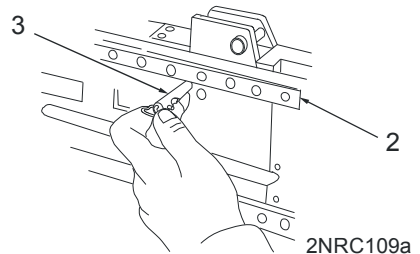
**NOTE**

Ensure trigger lever bar is aligned directly under timing nut.



2NRC108a

- b. Align hole in trigger lever bar (1) with mounting hole in receiver (2).
- c. Place trigger lever pin assembly (3), loop end vertical, in assembly hole on left side plate of receiver (2).
- d. Match key on trigger lever pin assembly (3) with keyway in side plate of receiver (2) and install pin completely.
- e. Rotate trigger lever pin assembly (3) 90 degrees to lock securely in place, And fold down out of the way.



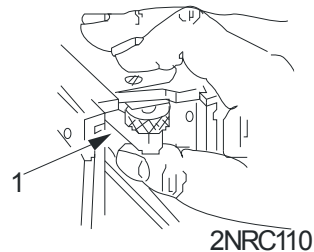
2NRC109a

**ASSEMBLY OF M2A1 MACHINE GUN - Continued****1. INSTALL TRIGGER LEVER - Continued.**

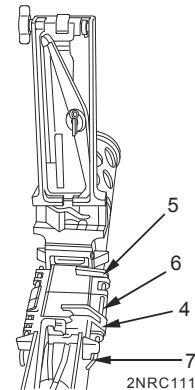
- f. Check that trigger lever bar (1) moves freely.

**NOTE**

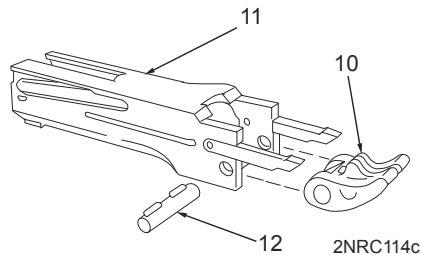
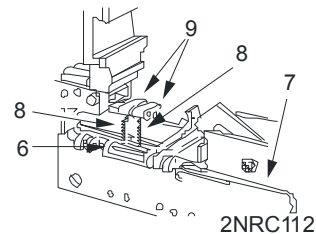
Determine direction of feed before proceeding.  
Left hand feed is shown.

**2. INSTALL RECEIVER ASSEMBLY.**

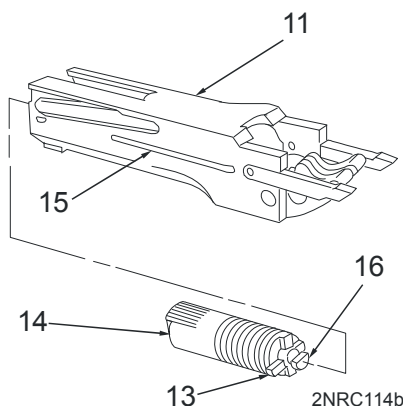
- a. Place right hand rear cartridge stop assembly (4) and front cartridge stop (5) on belt holding pawl bracket (6) with lock pin.
- b. Install belt holding pawl pin (7) with hooked end to rear.
- c. Seat belt holding pawl springs (8) in place on belt holding pawl bracket (6).
- d. Place belt holding pawl assembly (9) on belt holding pawl springs (8). Compress springs and insert belt holding pawl pin (7). Ensure springs are in recesses in belt holding pawl bracket (6).

**3. INSTALL BARREL BUFFER ASSEMBLY.**

- a. Place buffer accelerator (10) (tips up) into barrel buffer body (11), aligning mounting holes. Install barrel buffer pin assembly (12). Ensure both ends of the barrel buffer pin assembly are flush with the sides of the barrel buffer body.

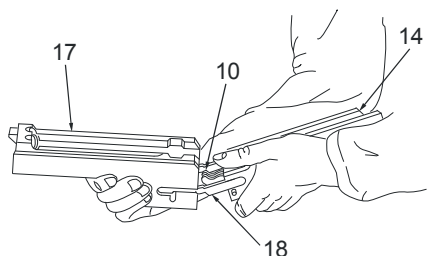


- b. Align key (13) on barrel buffer assembly (14) with key slot (15) in barrel buffer body (11). Ensure engaging notch (16) is facing up and slide barrel buffer assembly into barrel buffer body.



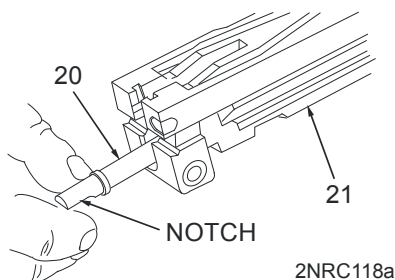
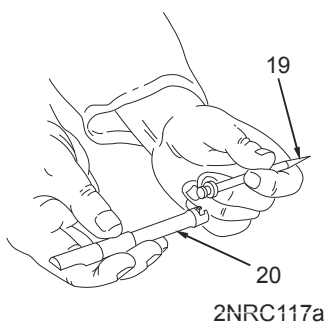
- c. Hold barrel buffer assembly (14) with buffer accelerator (10) up slightly above breech lock depressors and engage notch on shank of barrel extension assembly (17) with cross groove in piston rod of barrel buffer assembly.

- d. Align breech lock depressors (18) in grooves of barrel extension assembly (17) and push barrel buffer assembly (14) forward.



#### 4. INSTALL BOLT ASSEMBLY

- a. Attach firing pin (19) to firing pin extension assembly (20).
- b. Place firing pin extension assembly (20) into bolt (21) with notch of firing pin extension assembly down.
- c. Slide firing pin extension assembly (20) forward so that tip of firing pin protrudes from face of bolt (21).

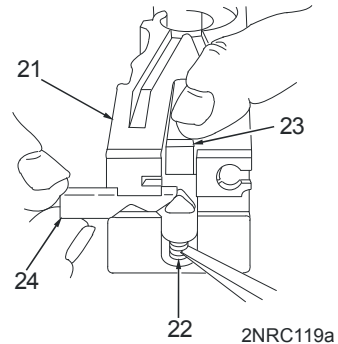


**ASSEMBLY OF M2A1 MACHINE GUN – Continued****4. INSTALL BOLT ASSEMBLY- Continued**

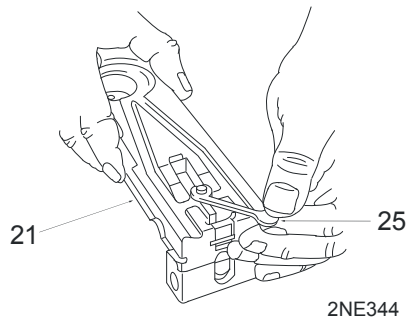
- d. Place sear spring (22) in recess on bolt (21). Ensure sear spring is installed correctly. Use cocking lever to assist installing sear spring.
- e. Slide sear (23) down into vertical grooves at rear of bolt (21) with wedge-shaped lug pointed outward and upward.

**NOTE**

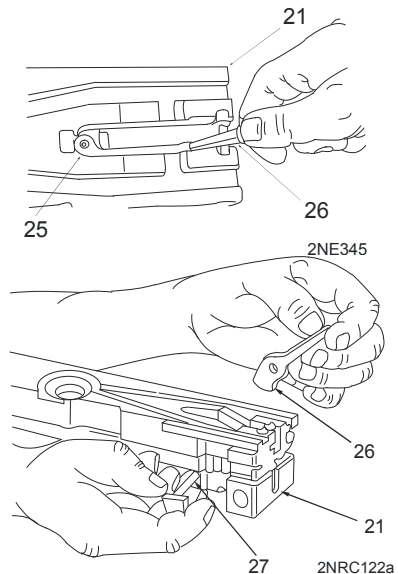
Ensure that sear and sear spring engage properly. Sear also has a recess for sear spring.



- f. Compress sear spring (22) by pressing down on sear (23). Install sear slide (24) from left side of bolt (21) in grooves of bolt with V notch down.
- g. Install sear stop and pin (25) into center recess of bolt (21).
- h. Using wedge shaped end of the cocking lever (26) as a tool, press down on the flat end of the sear stop and pin (25) and swing it into groove on left side of the bolt (21).
- i. Insert cocking lever (26), with rounded nose on lower end of lever to rear, into slot in top of bolt (21).



- j. Align hole in cocking lever (26) with holes in the bolt (21). Insert cocking lever pin (27) from left side.
- k. Push cocking lever (26) forward to charge firing pin. Return cocking lever to rearward position.

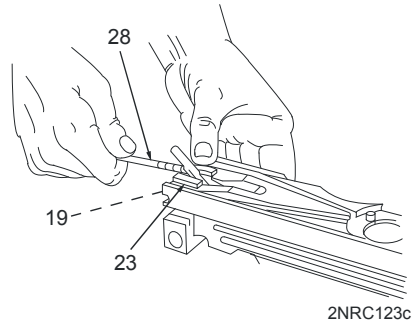


## WARNING

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.

Do not place finger between cocking lever and sear.

- I. Trip firing pin (19) by depressing top of sear (23) with a swab holder section (28).



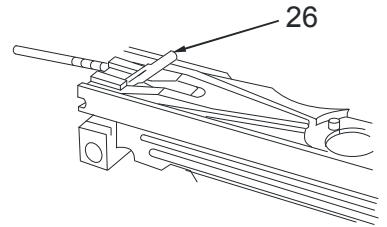
## NOTE

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

## CAUTION

Failure to perform the following step will result in a jammed weapon.

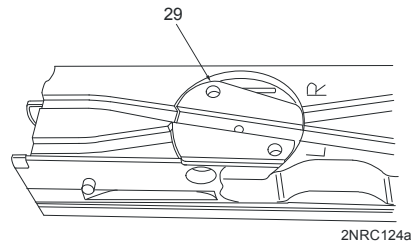
- m. Place cocking lever (26) in forward position after testing firing pin release. Ensure this step is followed or weapon will be jammed.



## NOTE

Determine direction of feed before installing bolt switch left or right. Left hand feed is illustrated.

- n. Place bolt switch (29) in position so that the feed groove is continuous for feed direction selected.

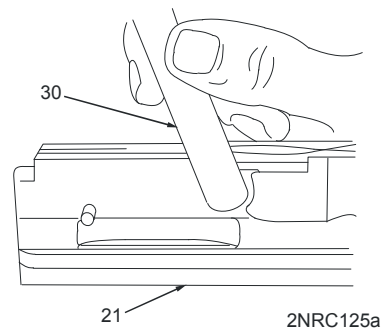


- o. Hold cartridge extractor (30) in vertical position. Insert shank end of cartridge extractor into left side of bolt (21).

## NOTE

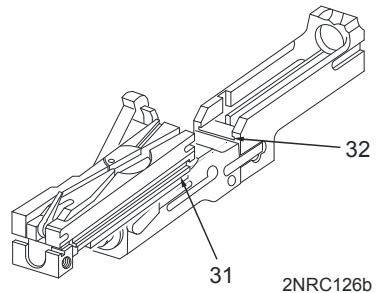
Ensure cartridge extractor (30) fits into bolt (21) as far as possible.

- p. Rotate cartridge extractor (30) downward to full horizontal position.
- q. Check that flange on bottom of cartridge extractor (30) has engaged shoulder on bolt (21).



**ASSEMBLY OF M2A1 MACHINE GUN – Continued****4. INSTALL BOLT ASSEMBLY- Continued****WARNING**

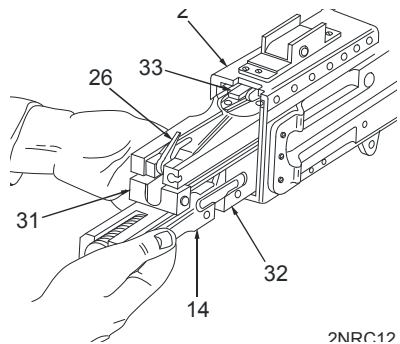
During reassembly ensure that the last four digits of the barrel extension assembly serial number matches the last four digits of the bolt serial number to prevent losing headspace, which could cause gun to malfunction and serious injury to personnel.

**CAUTION**

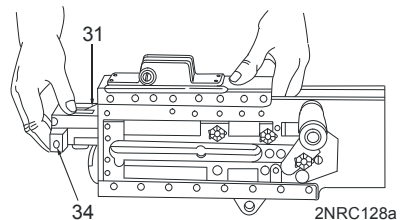
When installing bolt assembly, do not trip buffer accelerator.

**NOTE**

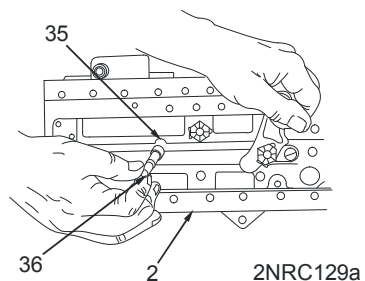
Ensure cocking lever is forward before installing bolt assembly into receiver.



- r. Align rails of bolt assembly (31) with grooves in barrel extension (32).
- s. Ensuring cocking lever (26) is positioned forward, install bolt assembly (31) into barrel extension (32) and buffer assembly (14), then install into the receiver (2).
- t. Raise bolt latch (33) and push bolt assembly (31) into receiver (2).
- u. Align hole (34) in bolt assembly (31) with stud assembly hole (35) in receiver (2) and install bolt stud (36) in hole in bolt assembly.

**NOTE**

The bolt stud is installed in the bolt on the right side of the receiver for the flex.

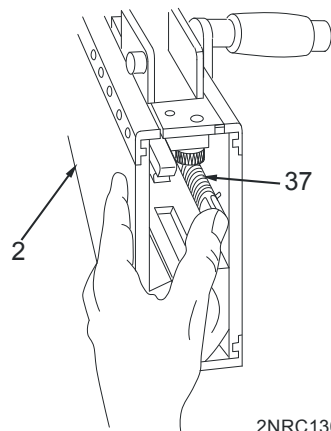


- v. Place bolt in forward position.



## 5. INSTALL DRIVE SPRING ROD ASSEMBLY

Install driving spring rod assembly (37) in upper right hand corner of bolt. Push forward and to the right until driving spring rod assembly engages in hole in side plate of receiver (2) and not in the groove for the backplate.



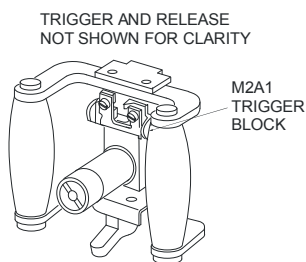
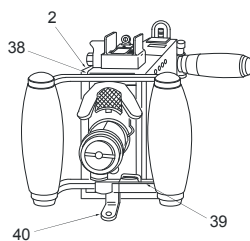
2NRC130a

## 6. INSTALL BACKPLATE ASSEMBLY

### NOTE

Illustration shows M2A1 flexible type backplate.

- Install backplate assembly (38) in receiver (2) grooves. Pull backplate latch lock (39) while lifting up on backplate latch (40). Lower backplate assembly down until engaged in receiver.
- Check to ensure backplate assembly is locked securely.



2NRC131a

**ASSEMBLY OF M2A1 MACHINE GUN – Continued****7. INSTALL BARREL ASSEMBLY**

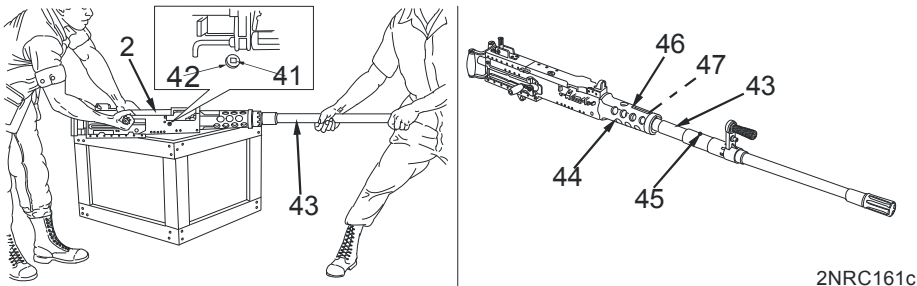
- a. Retract bolt far enough for barrel locking spring lug (41) to center in barrel locking spring hole (42) on right hand side of receiver (2).

**WARNING**

During barrel installation, the charging handle must be pulled back to view the square on the barrel locking lug through the 3/8 in. hole in the right side of the receiver.

Ensure that during barrel installation the square on the barrel extension is **NOT** pulled back **PAST** the 3/8 in. hole on the right side of the receiver or the barrel will not be attached to the barrel extension.

- b. Insert barrel assembly (43) into barrel support (44) until locking pin (45) engages camming slot (46). Rotate barrel clockwise and secure locking pin in retention slot (47). Refer to WP 0005 00.



- c. Perform weapon function check to ensure proper assembly. Refer to WP 0005 00, para 7.

**NOTE**

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

**END OF WORK PACKAGE**

## **CHAPTER 5**

### **AMMUNITION**



**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****AMMUNITION  
AUTHORIZED AMMUNITION, AMMUNITION WHICH FAILS TO FIRE,  
CARE, HANDLING, AND PRESERVATION**

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**INITIAL SETUP:****Reference**TM 9-1005-314-12&P

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**AUTHORIZED AMMUNITION****WARNING**

This work package lists 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 M33 and one tracer M17 with M9 link.

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

Normal combat mix: 4 SLAP M903 and one SLAP M962 with M9 link.

**NOTE**

All cartridges except the M2A1 DUMMY have plain cases.

M1A1 blank is to be utilized with the M19 blank firing attachment. Refer to TM 9-1005-314-13&P.

The sights on the M2A1 machine gun are designed for conventional ball, tracer, and armor-piercing incendiary ammunition. The following cartridges are in the stockpile and authorized for use.

**AUTHORIZED AMMUNITION – Continued**

<u>Slap Ammunition</u>	<u>NSN</u>	<u>DODIC</u>
4 Ball/1 Tracer (every 5th round)	1305-01-332-8254	(A518)
Slap "T" Single Rounds	1305-01-462-0651	(AA38)
<u>Short Range Training Ammunition (SRTA) Target Practice</u>		
4 M858 TP/1 M860 TP-T	1305-01-126-6201	(A602)
M858 TP Linked	1305-01-126-6200	(A603)

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 traversing and elevating mechanism. For targets beyond 1,000 meters, align the sights and come down three clicks.

SRTA requires M3 Recoil Amplifier for use. When using the M3 Recoil AMP headspace and timing must be reset using the headspace and timing gauge. See TM 9-1005-203-13&P. SRTA is intended for target practice out to 700 meters. SRTA can be lethal and is NOT to be used for force-on-force training.



M1A1 Blank Cartridge: Used with M19 Blank Firing Attachment. It simulates firing in training exercises.

M33 Ball Cartridge: Used against personnel or unarmored targets. Has a plain bullet tip.

M17 Tracer Cartridge: Used against personnel or unarmored targets. Tracer element permits visible observation of the bullets in-flight path or trajectory to the point of impact.

M20 Armor Piercing Incendiary-Tracer Cartridge: Used against flammable targets and light-armored or unarmored targets. Permits visible observation of the bullet in-flight path or trajectory to the point of impact.

M8 Armor Piercing Incendiary Ball Cartridge: Combines functions of M2 armor piercing bullet and incendiary bullet. Used against flammable targets and light-armored or unarmored targets.

MK211 Mod 0 Armor Piercing Incendiary (API) Cartridge: Used against light armored vehicles and aircraft. Provides improved penetration performance against light armor vehicles.

MK 257 Mod 0 Armor Piercing Incendiary - Dim Tracer Cartridge: Combines functions of armor piercing, incendiary, and dim tracer visible only with Night Vision Devices. Used against light armored vehicles, aircraft, and flammable targets.

M962 Saboted Light Armor Penetrator-Tracer (SLAP-T) Cartridge: Used against light armor vehicles and aircraft with additional tracer feature.

M903 Saboted Light Armor Penetrator (SLAP) Cartridge: SLAP is used in combat against current and future light armored targets and Armored Attack Helicopters (AAHs). Capable of defeating these targets at ranges two to three times that of currently available ammunition.

M860 Plastic Practice Tracer Cartridge: Intended for scaled range training to permit visible observation of the bullet's in-flight path or trajectory to the point of impact. Intended to be used with M858 Plastic Practice Ball Cartridge. Must be used with M3 Recoil Amplifier.

M858 Plastic Practice Ball Cartridge: Intended for scaled range training purposes, where range restrictions limit or prohibit the use of one of the other types of live ammunition. Must be used with M3 Recoil Amplifier.

## **AMMUNITION WHICH MALFUNCTIONS OR FAILS TO FIRE**

Ammunition which malfunctions or fails to fire must be reported to supporting ASP and/or QASAS/Ammo LAR in accordance with AR 75-1, Malfunctions Involving Ammunition and Explosives, at [http://www.apd.army.mil;jw2/xmldemo/r75\\_1/head.asp](http://www.apd.army.mil;jw2/xmldemo/r75_1/head.asp).

## **CARE, HANDLING, AND PRESERVATION**

1. 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.
2. 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.
3. 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.
4. Do not oil or grease the ammunition. Dust and other abrasive collecting on oiled or greased ammunition will damage the operating parts of the gun. Oiled cartridges will produce dangerously excessive chamber pressures that will damage the weapon or cause operator injury. Oil on cartridges can also penetrate into the cartridge and contaminate the propellant and/or primer causing squibs, hangfires, or duds.

## **END OF WORK PACKAGE**



**CHAPTER 6**  
**SUPPORTING INFORMATION**



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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****REFERENCES**

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**SCOPE**

This work package lists all field manuals, forms, miscellaneous publications, and technical manuals referenced in this manual.

**AIR FORCE REFERENCES**

AFI 21-115	Product Quality Deficiency Program
AFI 36-2226	Combat Arms Program
AFTO Form 22	Technical Order System Publication Improvement Report and Reply
AFTO Form 105	Inspection, Maintenance, Firing Data for Ground Weapons
TO 00-35D-54	Air Force Materiel Deficiency Reporting and Investigating System
TO 11W-1-10	Historical Data Recording of Inspection, Maintenance and Firing Data for Ground Weapons

**FIELD MANUALS**

FM 4-25.11 MCRP 3-02G AFMAN 44-163(I)	First Aid
FM 3-22.65	Browning Machine Gun, Caliber .50 HB, M2
FM 17-12-1	Tank Combat Tables, M1
FM 31-71	Northern Operations

**FORMS**

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988-E	Equipment Inspection Maintenance Worksheet (EGA)
SF 368	Product Quality Deficiency Report

**USMC REFERENCES**

NAVMC 10722	Marine Corps Recommended Changes to Publications
MCO 4855.10	Marine Corps Quality Deficiency Report
MCO P4450.7	Marine Corps Warehousing Manual
MCO P4610.19	Marine Corps Transportation and Travel Record Discrepancies
TM 4700-15/1	Marine Corps Forms and Procedures for Equipment Maintenance

**MISCELLANEOUS PUBLICATIONS**

AR 385-10	The Army Safety Program
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (Except Medical Class V, Repair Parts, and Heraldic Items)
DA PAM 385-64	Ammunition and Explosives Safety Standards
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

**TECHNICAL MANUALS**

TM 9-1005-245-13&P TM 1005-13&P/1 TO 11W2-8-1-322	Machine Gun Mounts and Combinations for Tactical/Armored Vehicles M122 Machine Gun Tripod Mount, M122A1 Machine Gun Mount, M192 Machine Gun Tripod, M3 Machine Gun Tripod, M142 Machine Gun Mount, M197 Machine Gun Mount, MK64 Machine Gun Mount Mod 5; Mod 9, MK93 Mod 0 Machine Gun Mount (USMC ONLY) MK93 Mod 2 Machine Gun Mount
TM 9-1005-203-13&P	Recoil Amplifier M3
TM 9-1005-314-12&P	Blank Firing Attachment (BFA) M19
TM 750-244-7	Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090, and 1095 to Prevent Enemy Use

**END OF WORK PACKAGE**

**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

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**INTRODUCTION**

**Scope.** This work package lists Components of End Item and Basic Issue Items for the M2A1 machine gun to help you inventory items for safe and efficient operation.

**General.** The Components of End Item and Basic Issue Items Lists are divided into the following lists.

Components of End Item (COEI): This list is for information purposes only and is not authority to requisition replacements. These items are part of the M2A1 machine gun. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII): These essential items are required to place the M2A1 machine gun in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the M2A1 machine gun during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List.

Column (1), Illus Number, gives you the number of the item illustrated.

Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes and contains an illustration of the item.

**INTRODUCTION – Continued**

Column (3), Description, Part Number/(CAGEC), identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (4), Usable on code, when applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below.

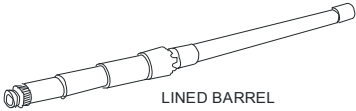
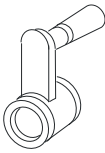
<b><u>Code</u></b>	<b><u>Used on</u></b>
BNO	M2A1 Machine gun

Column (5), U/I U nit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

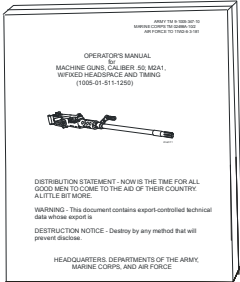
Column (6), Qty Rqr, indicates the quantity required.

**COMPONENT OF END ITEM (COEI) LIST.** There are no components of end items.

**Table 1. Basic Issue Items**

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER/ (CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
*1	1005-01-541-2478  LINED BARREL	BARREL, MACHINE GUN 13027965 (19200)	BNO	EA	1
*2	1005-01-539-3410  2NE406	BARREL CARRYING HANDLE ASSEMBLY 13027981 (19200)		EA	1

\*NOTE: These items are issued as a quantity of two (2) each and must be turned in with weapon.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER/ (CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
3	4933-00-716-0041	EXTRACTOR, RUPTURED CARTRIDGE 7160041 (19204)		EA	1
4	8415-01-092-0039	MITTEN, HEAT PROTECTIVE MIL-M-11199F (81349)		EA	1
5	 <p>2NRC137</p>	OPERATOR'S MANUAL TM 9-1005-347- 10		EA	1

END OF WORK PACKAGE





OPERATOR

MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)

ADDITIONAL AUTHORIZATION LIST

INTRODUCTION

**Scope.** This work package lists additional items you are authorized for the support of the M2A1 machine gun.

**General.** This list identifies items that do not have to accompany the M2A1 machine gun and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

EXPLANATION OF COLUMNS in the AAL.

Column (1) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (3) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used on</u>
BNO	M2A1 Machine Gun

Column (4) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) Qty Recm. Indicates the quantity recommended.

Table 1. Additional Authorization List

(1) NATIONAL STOCK NUMBER (NSN)	(2) DESCRIPTION PART NUMBER/(CAGEC)	(3) Usable On Code	(4) U/I	(5) QTY Recm
<i>CTA AUTHORIZED ITEMS</i>				
8105-00-921-5821	BAG, ORDNANCE WEAPON SPARE PARTS 11686430 (19204)		EA	1
1005-01-091-7510	BLANK FIRING ATTACHMENT (BFA) M19 9324931 (19200)		EA	1
TBD	CAP, BARREL VC-1375-16 (99017)		EA	1
1005-00-487-4100	COVER, MACHINE GUN 11631791 (19207)		EA	1
1005-00-659-1031	COVER, SPARE BARREL 6591031 (19200)		EA	1
1005-00-600-8583	HANDLE, AUXILIARY BOLT 6008583 (19200)		EA	1
5340-00-550-4080	HANDLE, MANUAL CONTROL 5504080 (19200)		EA	1
4925-00-299-1268	LINKER-DELINKER 7160003 (19204)		EA	1
1005-01-323-5406	RECOIL AMPLIFIER ASSY, M3 12929082 (19200)		EA	1
4933-00-556-4255	REFLECTOR, GUN BARREL 5564255 (19204)		EA	1
	SMALL ARMS INTEGRATION BOOKLET ( <a href="https://www.us.army.mil/suite/folder/4718898">https://www.us.army.mil/suite/folder/4718898</a> )		EA	1
1005-00-716-2072	SUPPRESSOR, FLASH 7162072 (19200)		EA	1
<i>MTOE AUTHORIZED ITEMS (ASIOE)</i>				
5855-00-629-5327	NIGHT VISION SIGHT CREW SERVED WEAPON, AN/TVS-5 SMD850100-1 (80063)		EA	1

(1) NATIONAL STOCK NUMBER (NSN)	(2) DESCRIPTION PART NUMBER/(CAGEC)	(3) Usable On Code	(4) U/I	(5) QTY Recm
5360-01-471-2091	BORELIGHT SYSTEM, LASER AN/PEM-1 (80058)		1	EA
5340-01-552-0082	CAP, BARREL PROTECTIVE VC-1375-16 (99017)		1	EA
5220-00-535-1217	*GAGE, HEADSPACE AND TIMING 5351217 (19200)		1	EA
5220-01-531-0865	GAGE, WEAR LIMIT/TIMING MA4585 (26978)		1	EA
5340-00-600-8583	HANDLE, AUXILIARY BOLT 6008583 (19200)		1	EA
5855-01-447-8992	ILLUMINATOR, INFRARED AN/PEQ-15 (0B107)		1	EA
1005-00-322-9716	MOUNT, M3 TRIPOD 8403398 (19204)		1	EA
1010-01-502-7547	MOUNT, MG MK93 PINTLE T&E 13001175 (19200)		1	EA
5855-01-458-0211	SIGHT, HEAVY THERMAL AN/PAS-13A(V)3 (80058)		1	EA
5855-01-464-3151	SIGHT, HEAVY THERMAL AN/PAS-13B(V)3 (80058)		1	EA

\*Not used with the M2A1 MG. Used ONLY for headspacing and timing of the M3 Amplifier, NSN 1005-01-323-5406/PN 12929082.  
Headspace and timing procedures are located in TM 9-1005-203-13&P.

**END OF WORK PACKAGE**

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**OPERATOR****MACHINE GUNS, CALIBER .50; M2A1  
W/FIXED HEADSPACE AND TIMING (1005-01-511-1250)****EXPENDABLE AND DURABLE ITEMS LIST**

This work package lists expendable and durable items that you need to operate and maintain the M2A1 machine gun. This list is for information 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); or CTA 8-100, Army Medical Department Expendable/ Durable Items.

**EXPLANATION OF COLUMNS.**

Column (1) – Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., “Use cleaner, lubricant and preservative (item 7, WP 0037 00)”).

Column (2) – Level. This column includes 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, which you can use to requisition it.

Column (4) – Item name, Description, Contractor and Government Entity Code (CAGEC), and Part Number. This column provides the other information you need to identify the item.

Column (5) - Unit of Issue (U/I). This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

**Table 1. Expendable and Durable Items List**

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) Item Name, DESCRIPTION, (CAGEC)/Part Number	(5) U/I
1	C	8020-00-244-0153	BRUSH, ARTIST (81343) H-B-241	EA
2		1005-00-716-2702	BRUSH, CLEANING, SMALL ARMS (FIRING PIN HOLE) (19205) 7162702	EA

Table 1. Expendable and Durable Items List- Continued

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) Item Name, DESCRIPTION, (CAGEC)/Part Number	(5) U/I
3	C	1005-00-550-4037	BRUSH, CLEANING, SMALL ARMS BORE (19204) 5504037	EA
4	C	1005-00-766-0915	BRUSH, CLEANING, SMALL ARMS CHAMBER (19204) 7790737	EA
5	C	7920-00-205-2401	BRUSH, CLEANING, TOOL AND PARTS (80244) 7920-00-205-2401	EA
6	C	6850-00-965-2332	CARBON REMOVING COMPOUND, DIP TYPE, RINSING REQUIRED (81348) P-C-111	GL
7	C		CLEANER, LUBRICANT AND PRESERVATIVE (CLP) (81349) MIL-PRF-63460	
		9150-01-102-1473	½ oz bottle	BT
		9150-01-079-6124	4 oz bottle	BT
		9150-01-053-6688	1 gl can	GL
8	C	6850-01-486-5448	CLEANING COMPOUND, SOLVENT (0K209) IT-WCP 500 (SMALL)	BX
9	C		CLEANING COMPOUND, SOLVENT: rifle bore cleaner (RBC) (81349) MIL-PRF-372	
		6850-00-224-6656	2 oz bottle	BT
		6850-00-224-6657	8 oz can	CN
10	C	5350-00-221-0872	CLOTH, ABRASIVE (80204) ANSI B74.18	PG

11	C	8415-00-823-7460	GLOVES, Rubber, Industrial (81349) MIL-DTL-32066	PR
12	C	9150-01-360-1908	LUBRICANT, SOLID FILM (81349) MIL-PRF-46147 TYPE 1	QT
13	C	9150-00-273-2389	LUBRICATING OIL, GENERAL PURPOSE, MEDIUM (PL-M) 4 oz (118.30 ml) can (81349) MIL-PRF-32033	CN
14	C	9150-00-889-3522	LUBRICATING OIL, WEAPONS Semi-fluid (LSA) 4 oz bottle (19204) 8436793	BT
15	C	9150-00-292-9689	LUBRICATING OIL, WEAPONS (LAW) 1 qt (0.951) can (81349) MIL-PRF-14107	EA
16	C	1005-00-653-5441	ROD, CLEANING, SMALL ARMS (19204) 6535441	EA
17	C	1005-00-556-4102	ROD, CLEANING, SMALL ARMS (19204) 5564102	EA
18	C	1005-00-716-2704	SWAB HOLDER SECTION (19205) 7162704	EA
19	C	1005-00-716-2704	SWAB, SMALL ARMS CLEANING: cotton (19200) 7162704	BE
20	C	7920-00-205-1711	WIPING RAG: cotton 50 lb bale (58536) A-A-531	BE

**END OF WORK PACKAGE**

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TO: (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000						FROM: (Activity and location) (Include ZIP Code)  Your mailing address			
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS									
PUBLICATION/FORM NUMBER TM 9-1005-347-10						DATE 08 April 2011		TITLE Operator's Manual for M2A1 Machine Gun	
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).			
	0004-2	4-7				Wrong POC is listed.			
*Reference to line numbers within the paragraph or subparagraph.									
TYPED NAME, GRADE OR TITLE  Your Name						TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE  Your Signature	

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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
								SAMPLE	
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE Your Name				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION				SIGNATURE Your Signature	

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**GEORGE W. CASEY, JR**  
General, United States Army  
Chief of Staff

Official:



JOYCE E. MORROW  
Administrative Assistance to the  
Secretary of the Army  
1106702

**By Order of the Secretary of the Air Force:**

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**DONALD J. HOFFMAN**  
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Program Manager, Infantry Weapons  
Marine Corps Systems Command

**DISTRIBUTION:** To be distributed in accordance with the Initial  
Distribution Number (IDN) 401264 requirements for TM 9-1005-347-10.

**MARINE CORPS DISTRIBUTION:** PCN 184 024984 00



## THE METRIC SYSTEM AND EQUIVALENTS

### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meter = 0.3937 Inch  
1 Decimeter = 10 Centimeters = 3.94 Inches  
1 Meter = 10 Decimeters = 100 Centimeters  
= 1000 Millimeters = 39.37 Inches  
1 Dekameter = 10 Meters = 32.8 Feet  
1 Hectometer = 10 Dekameters = 328.08 Feet  
1 Kilometer = 10 Hectometers = 1000 Meters  
= 0.621 Mile = 3,280.8 Feet  
Millimeters = Inches times 25.4  
Inches = Millimeters divided by 25.4

### WEIGHTS

1 Centigram = 10 Milligrams = 0.154 Grain  
1 Decigram = 10 Centigrams = 1.543 Grains  
1 Gram = 0.001 Kilogram = 10 Decigrams  
= 1000 Milligrams = 0.035 Ounce  
1 Dekagram = 10 Grams = 0.353 Ounce  
1 Hectogram = 10 Dekagrams = 3.527 Ounces  
1 Kilogram = 10 Hectograms = 1000 Grams  
= 2.205 Pounds  
1 Quintal = 100 Kilograms = 220.46 Pounds  
1 Metric Ton = 10 Quintals = 1000 Kilograms  
= 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liter = 0.034 Fluid Ounce  
1 Centiliter = 10 Milliliters = 0.34 Fluid Ounce  
1 Deciliter = 10 Centiliters = 3.38 Fluid Ounces  
1 Liter = 10 Deciliters = 1000 Milliliters  
= 33.82 Fluid Ounces  
1 Dekaliter = 10 Liters = 2.64 Gallons  
1 Hectoliter = 10 Dekaliters = 26.42 Gallons  
1 Kiloliter = 10 Hectoliters = 264.18 Gallons

### SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inch  
1 Sq Decimeter = 100 Sq Centimeters = 15.5 Sq Inches  
1 Sq Meter (Centare) = 10 Sq Decimeters  
= 10,000 Sq Centimeters = 10.764 Sq Feet  
1 Sq Dekameter (Are) = 100 Sq Meters = 1,076.4 Sq Feet  
1 Sq Hectometer (Hectare) = 100 Sq Dekameters  
= 2.471 Acres  
1 Sq Kilometer = 100 Sq Hectometers  
= 1,000,000 Sq Meters = 0.386 Sq Mile

### CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.061 Cu Inch  
1 Cu Decimeter = 1000 Cu Centimeters = 61.02 Cu Inches  
1 Cu Meter = 1000 Cu Decimeters  
= 1,000,000 Cu Centimeters = 35.31 Cu Feet

### TEMPERATURE

$5/9 (^{\circ}\text{F} - 32^{\circ}) = ^{\circ}\text{C}$   
 $(9/5 \times ^{\circ}\text{C}) + 32^{\circ} = ^{\circ}\text{F}$   
-35° Fahrenheit is equivalent to -37° Celsius  
0° Fahrenheit is equivalent to -18° Celsius  
32° Fahrenheit is equivalent to 0° Celsius  
90° Fahrenheit is equivalent to 32.2° Celsius  
100° Fahrenheit is equivalent to 38° Celsius  
212° Fahrenheit is equivalent to 100° Celsius

## APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>	<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches .....	Centimeters.....	2.540	Centimeters .....	Inches.....	0.394
Feet .....	Meters.....	0.305	Meters .....	Feet .....	3.280
Yards .....	Meters.....	0.914	Meters.....	Yards.....	1.094
Miles .....	Kilometers .....	1.609	Kilometers .....	Miles .....	0.621
Square Inches .....	Square Centimeters.....	6.451	Square Centimeters ...	Square Inches.....	0.155
Square Feet.....	Square Meters.....	0.093	Square Meters.....	Square Feet .....	10.764
Square Yards.....	Square Meters .....	0.836	Square Meters.....	Square Yards.....	1.196
Square Miles .....	Square Kilometers .....	2.590	Square Kilometers ....	Square Miles.....	0.386
Acres.....	Square Hectometers .....	0.405	Square Hectometers....	Acres .....	2.471
Cubic Feet .....	Cubic Meters .....	0.028	Cubic Meters .....	Cubic Feet.....	35.315
Cubic Yards.....	Cubic Meters .....	0.765	Cubic Meters .....	Cubic Yards .....	1.308
Fluid Ounces .....	Milliliters.....	29.573	Milliliters .....	Fluid Ounces .....	0.034
Pints .....	Liters .....	0.473	Liters .....	Pints.....	2.113
Quarts.....	Liters .....	0.946	Liters .....	Quarts.....	1.057
Gallons .....	Liters .....	3.785	Liters .....	Gallons.....	0.264
Ounces.....	Grams .....	28.349	Grams .....	Ounces .....	0.035
Pounds.....	Kilograms .....	0.454	Kilograms .....	Pounds .....	2.205
Short Tons.....	Metric Tons .....	0.907	Metric Tons .....	Short Tons .....	1.102
Pound-Feet.....	Newton-Meters.....	1.356	Newton-Meters.....	Pound-Feet .....	0.738
Pounds-Inches.....	Newton-Meters.....	0.11375	Kilopascals .....	Pounds per Square Inch.....	0.145
Pounds per Square Inch..	Kilopascals .....	6.895	Kilometers per Liter ...	Miles per Gallon.....	2.354
Ounce-Inches.....	Newton-Meters.....	0.007062	Kilometers per Hour ...	Miles per Hour .....	0.621
Miles per Gallon.....	Kilometers per Liter .....	0.425	°Fahrenheit .....	°Celsius .....	°C = (°F-32)x5/9
Miles per Hour .....	Kilometers per Hour .....	1.609	°Celsius .....	°Fahrenheit .....	°F = (9/5x°C)+32

