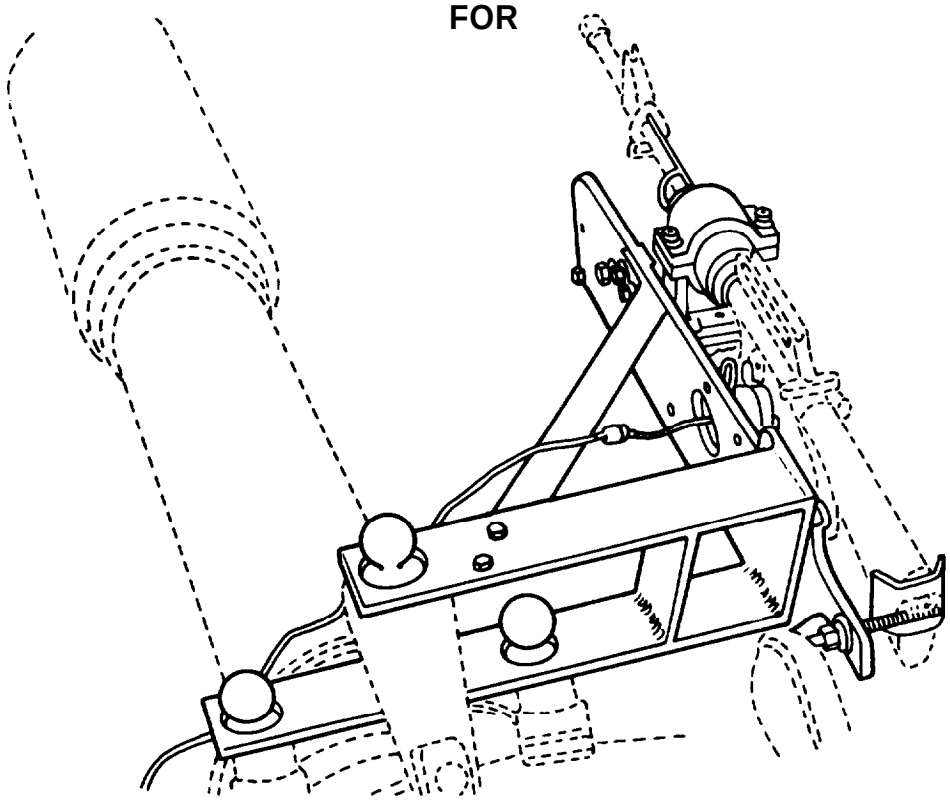
TM 9-6920-441-12&P

TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

FOR



MOUNT, GUN, TRAINING DEVICE: BREWSTER M180 (6920-01-117-8692) AND M181

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1982

This copy is a reprint which includes current pages from Change 1.

WARNING

There is one possible hazard connected with the M180/M181 Subcaliber Mount. The 24 volt wiring harness can set off electrically detonated ammunition if the insulation is worn away exposing bare wire or if the cable has been cut in half by a falling hatch cover. There are two things you must do to prevent this hazard:

- Route the wiring harness through the coax port instead of through the loader's hatch.
- Take very seriously the PMCS check of the wiring harness on page 2-3. Don't use a harness with cracked or worn insulation.

Refer to TM 9-1005-249-10 for Warnings applicable to the M16 Rifle.

The LASER Warning from TM 9-6920-357-10 is repeated on the opposite page.

TE-MED-279 is the source document for laser safety.

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *22 July 1983*

Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List For MOUNT, GUN, TRAINING DEVICE: BREWSTER M180 (6920-01-117-8692) AND M181 (6920-01-128-9892)

TM 9-6920-441-12&P, 21 June 1982, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the outer margin of the page. The revised illustration is indicated by a miniature hand adjacent to the illustration change and a vertical bar adjacent to the illustration number.
2. The new pages involve a new RPSTL showing the solenoid that is actually stocked as well as NSN's which had been missing before. On the How to Use This Manual page, the explanation that the M181 procedures are on yellow pages was deleted because the manual was printed without colored pages. The authenticated commercial manual statement on page ii was also deleted because it was not applicable.

Remove pages	*Insert pages*
Warning and How to Use This Manual	Warning (page a) and How to Use This Manual (page b)
i and ii	i and ii
C-1 and C-2	C-1 and C-2
C-5 through C-12	C-5 through C-12

3. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

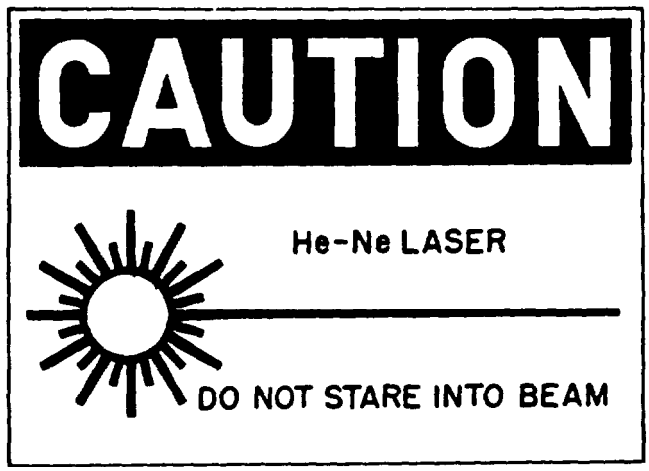
JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Operator's Maintenance requirements for Mount, Gun: Subcaliber Trainer, M180.



The laser beam is safe when the trainer is operated in the FLASH MODE.

Precautions are required to prevent possible eye damage when the trainer is operated in the CONTINUOUS MODE. Staring into the laser output or staring at the laser light reflection from a mirror-like surface can be hazardous out to a range of 4 kilometers.

WARNING

Observe the following precautions when the trainer is operated in the continuous mode:

Do not look into the laser beam or at mirror-like reflections of the laser beam. Staring into the laser beam is specifically prohibited.

Do not fire trainer at personnel.

Do not fire trainer at mirror-like surfaces.

The trainer is to be operated in the CONTINUOUS MODE only when a large target or other opaque backstop exists to terminate the beam.

Operation of this trainer involves the use of internal high voltage of 1200 and 10,000 volts that can cause death.

Back of trainer should not be opened during operation except by authorized maintenance personnel.

Allow 10 seconds for high voltage to discharge.

Before putting the trainer into operation, make sure the LASER SAFE-FIRE circuit breaker-switch is placed to SAFE position and the TRIGGER ON lamp is extinguished.

During operation, you will observe all range safety regulations.

Care must be taken to ensure that personnel do not look directly into the laser beam, since this may cause damage to the eyes.

Before replacing any component, disconnect connector 1J1 from the trainer.

HOW TO USE THIS MANUAL

This manual covers two different subcaliber training devices which have some parts common to both devices:

M180 used with M60 series tanks

M181 used with M551A1 AR/AAV

Since the user will only see the subcaliber mount that applies to his tank, the operating instructions have been written with a complete procedure for each configuration.

After the device is mounted on the tank, each procedure is divided into two parts:

- First, M16 Rifle
- Second, M55 Laser

Read only the instructions for whichever one you are using.

TECHNICALMANUAL

No. 9-6920-441-12&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC 21 June 1982

Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List)

MOUNT, GUN, TRAINING DEVICE: BREWSTER M180 AND M181

Reporting Errors and Recommending Improvements. You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, A Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished to you.

PAGE

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

SCOPE.

This manual contains operator instructions and maintenance; organizational maintenance and Repair Parts and Special Tools List for the M180 and M181 Subcaliber Mounts. There is no Direct Support or General Support maintenance required, and therefore no other TM for the M180/M181 than this one. This manual will also tell you how to adapt the M16 Rifle for use with the Mount.

PURPOSE OF EQUIPMENT.

The M180 and M181 Subcaliber Mounts allow a M16 Rifle or a M55 Laser Trainer to be mounted on a tank and fired in place of the main gun for training. Simulating firing of the main gun not only reduces ammunition cost but allows training to take place where reduced ranges, safety, or other considerations limit regular main gun firing. This device can not completely replace main gun practice firing. But it can provide early-on training, so that when the tank crew does move on to main gun firing, they are familiar with the procedures.

The M180 Subcaliber Mount is designed to be used with the M60, M60A1, M60A1 (AOS), M60A1 RISE, M60A3, and M48A5 Tanks. The M181 Subcaliber Mount is designed to be used with the M551A1 Vehicle.

HISTORY OF M180/M181

The US Army Armor Center determined that Subcaliber Firing on scaled ranges is effective in Tank Gunnery Training. To reduce parallax problems at close ranges, the Armor Center designed a subcaliber mount that fitted close to the firing optics. This mount, the Brewster Device, is adaptable to the M16 Rifle and the M55 Laser Trainer. The Brewster mounted M16, fitted with the caliber .22 Rim Fire Adapter, has proven highly effective for firing on 1/60 and 1/30 scaled ranges.

The M180/M181 Subcaliber Mount is a product improved version of the Brewster Device.

MAINTENANCE FORMS AND RECORDS.

Department of the Army Forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, the Army Maintenance Management System (TAMMS).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your Training Device needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about

your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at:

Commander
US Army Armament Materiel
Readiness Command
ATTN: DRSAR-MAO
Rock Island, IL 61299

We'll send you a reply.

BASIC ISSUE ITEMS LIST (BIIL)

The Components of End Items List, BIIL, Additional Authorization List and Expendable Supplies and Materials List are not included in this TM.

M180/M181 have no items which would appear on these lists. All expendable supplies and materials required are available among those authorized for your tank.

Section II. EQUIPMENT DESCRIPTION

Both the M180 and M181 consist of a universal mounting plate assembly, coaxial mount, solenoid assembly, wiring harness and system specific adapter. Both models are the same except for the adapter and the adapter mounting hardware.

The M180 is to be used with all M60 series and M48A5 tanks. Even though the M60A3 tanks don't have a searchlight, the modification is supposed to leave the searchlight mount and balls on the tank, just for the mounting of the M180. If you have a tank without the mounting balls, you won't be able to use the device.

The M181 is to be used with the M551A1 Vehicle.

The Wiring Harness provides the electrical connection between the main gun or Coax firing circuit and the firing solenoid (used with the M16 Rifle) or the M55 Laser.

USING ORGANIZATIONS

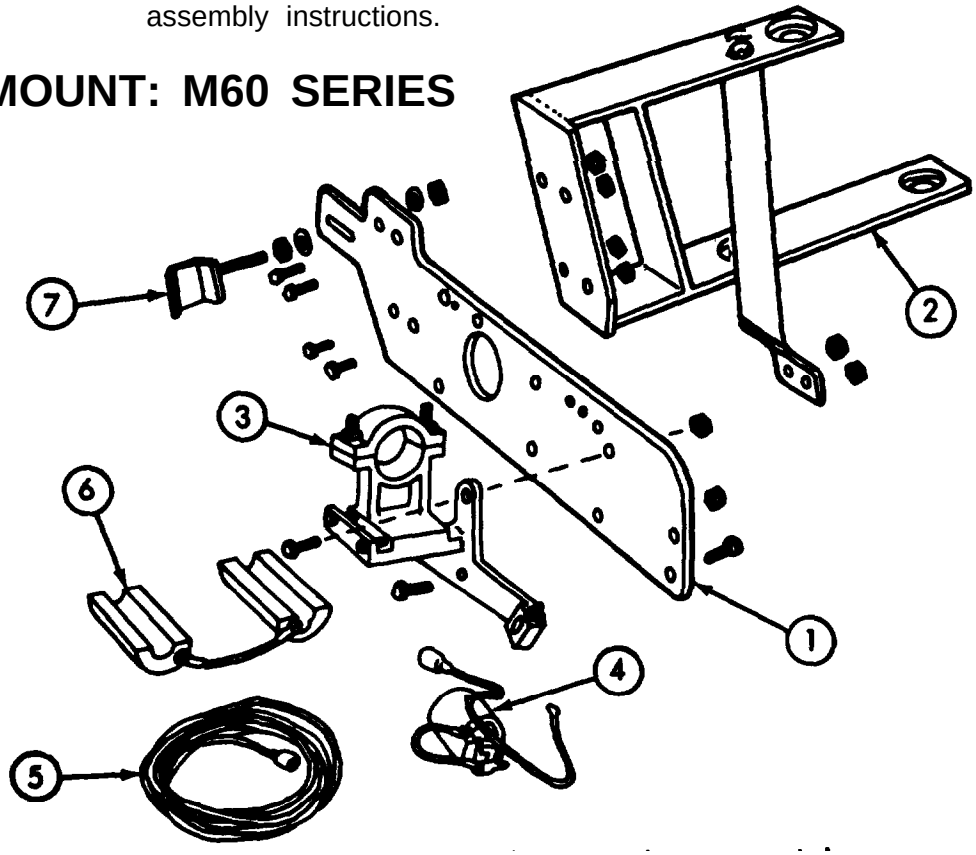
M180/M181 Subcaliber Mounts will be issued directly to Training Aids Support Centers (TASC's) where they will be hand receipted to your unit during training exercises.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. DESCRIPTION OF MAJOR COMPONENTS

Note: When you draw the device for training it should already be assembled. If it isn't, see page 3-4 for assembly instructions.

M180 MOUNT: M60 SERIES TANKS



1 UNIVERSAL MOUNTING PLATE - Supports the coaxial mount and the support bracket.

2 M60A1 ADAPTER BRACKET - Attaches the universal mounting plate to the tank.

3 COAXIAL MOUNT - Clamp either the M16 rifle or M55 loser to the universal mounting plate and provides adjustment for boresighting.

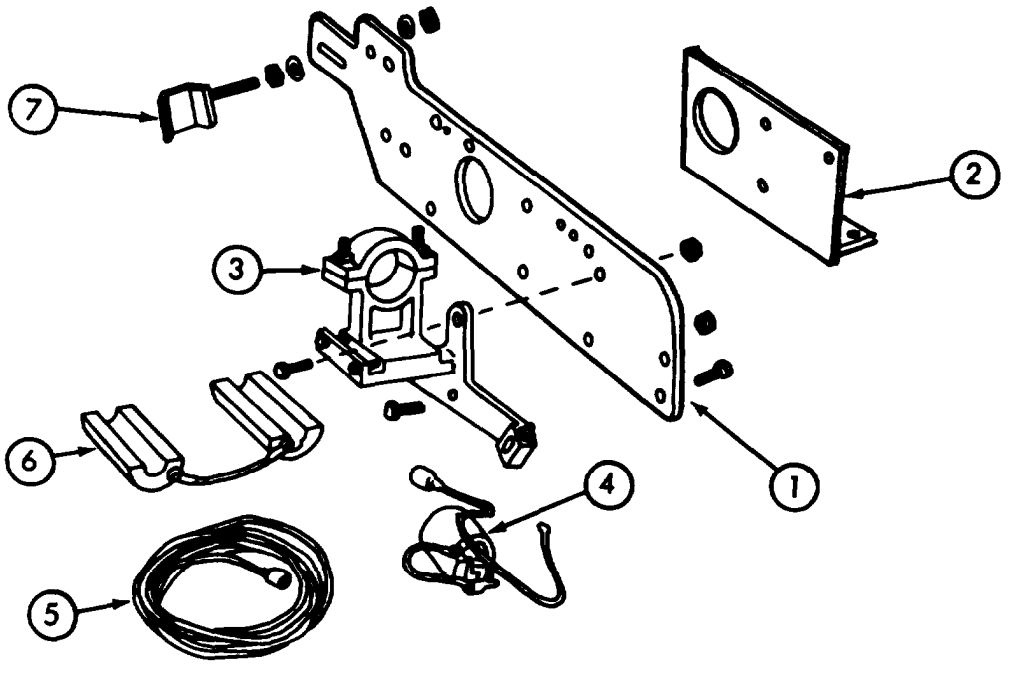
4 SOLENOID - Fires M16 rifle.

5 WIRE HARNESS - An extension cord which attaches the firing solenoid of the M16 rifle or the M55 laser to the main gun or coax firing circuit.

6 MOUNTING BLOCK - Adapts M16 rifle to fit coaxial mounting collar.

7 SUPPORT BRACKET - Supports the butt of the M16 rifle.

M181 MOUNT: M551A1 VEHICLE



1 UNIVERSAL MOUNTING PLATE - Supports the coaxial mount and the support bucket.

2 M551A1 ADAPTER BRACKET - Attaches the universal mounting plate to the vehicle,

3 COAXIAL MOUNT - Clamps either the M16 rifle or M55 laser to the universal mounting plate and provides adjustment for boresighting.

4 SOLENOID - Fires M16 rifle.

5 WIRE HARNESS - An extension cord which attaches the firing solenoid of the M16 rifle or the M55 laser to the main gun or coax firing circuit.

6 MOUNTING BLOCK - Adapts M16 rifle to fit coaxial mounting collar.

7 SUPPORT BRACKET - Supports the butt of the M16 rifle.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

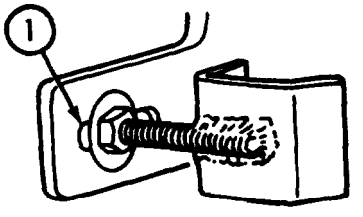
Check for missing or damaged bolts, washers or nuts. When you're done training, clean all components, except solenoid and wiring harness, with water. Clean wiring harness and solenoid with a dry soft cloth. Rub down metal parts, EXCEPT SOLENOID, with light coat of GP oil.

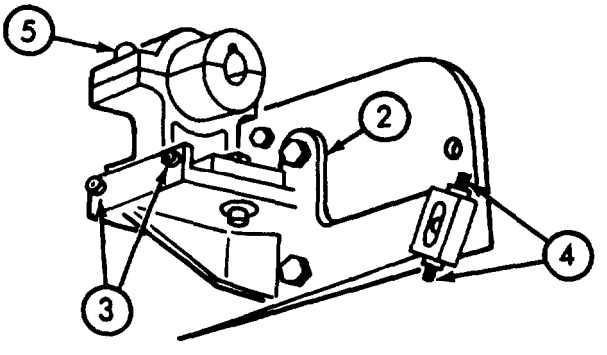
PMCS for the M16 Rifle or the M55 Loser will not be covered in this TM (see TM 9-1005-249-10 for the Rifle and TM 9-6920-357-10 for the Laser).

Table 2-1. Daily Preventive Maintenance Checks and Services

B -Before Operation D-During Operation A -After Operation

Item no.	Interval B	D	A	ITEM TO BE INSPECTED Procedure
1	●			REAR SUPPORT BRACKET Check that adjusting nut can be loosened to allow bracket to move freely along adjusting slot (1).
2	●			COAXIAL MOUNT Check mount (2) to make sure it is securely mounted to the Universal Mounting Plate. Check that boresight adjusting screws (3) and (4) turn freely. Check mounting collar bolts (5) for any damage that would prevent a tight fit.
3	●			SOLENOID Check for frayed, loose or missing cable, plug or grounding wire. Make sure solenoid holder and retainer piece are complete . . . no missing or broken screws, washers or retainer cable. Make sure retainer screw tightly clamps retainer to holder.





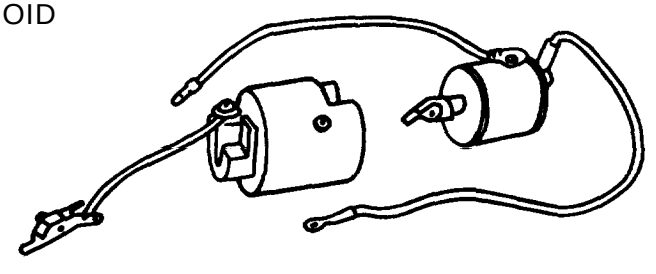
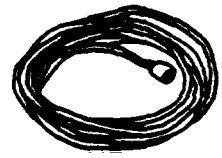


Table 2-1. Daily Preventive-Maintenance Checks and Servicer -con't

B -Before Operation D -During Operation A -After Operation

Item no.	Interval B	Interval D	Interval A	ITEM TO BE INSPECTED Procedure
				WARNING: Do not use a wiring harness with crocked or worn insulation. See warning on inside front cover.
4	●		●	WIRING HARNESS Inspect to make sure cable insulation is not crocked or worn and that connectors are not bent. 

Section III. OPERATION

This Section will tell you how to install the M180/M181 on the tank, mount, prepare, and boresight the weapon, and how to zero.

CAUTION: Do not use any machine gun or any other rifle with the M180/M181. The mount is not designed to support a machine gun or any other rifle.

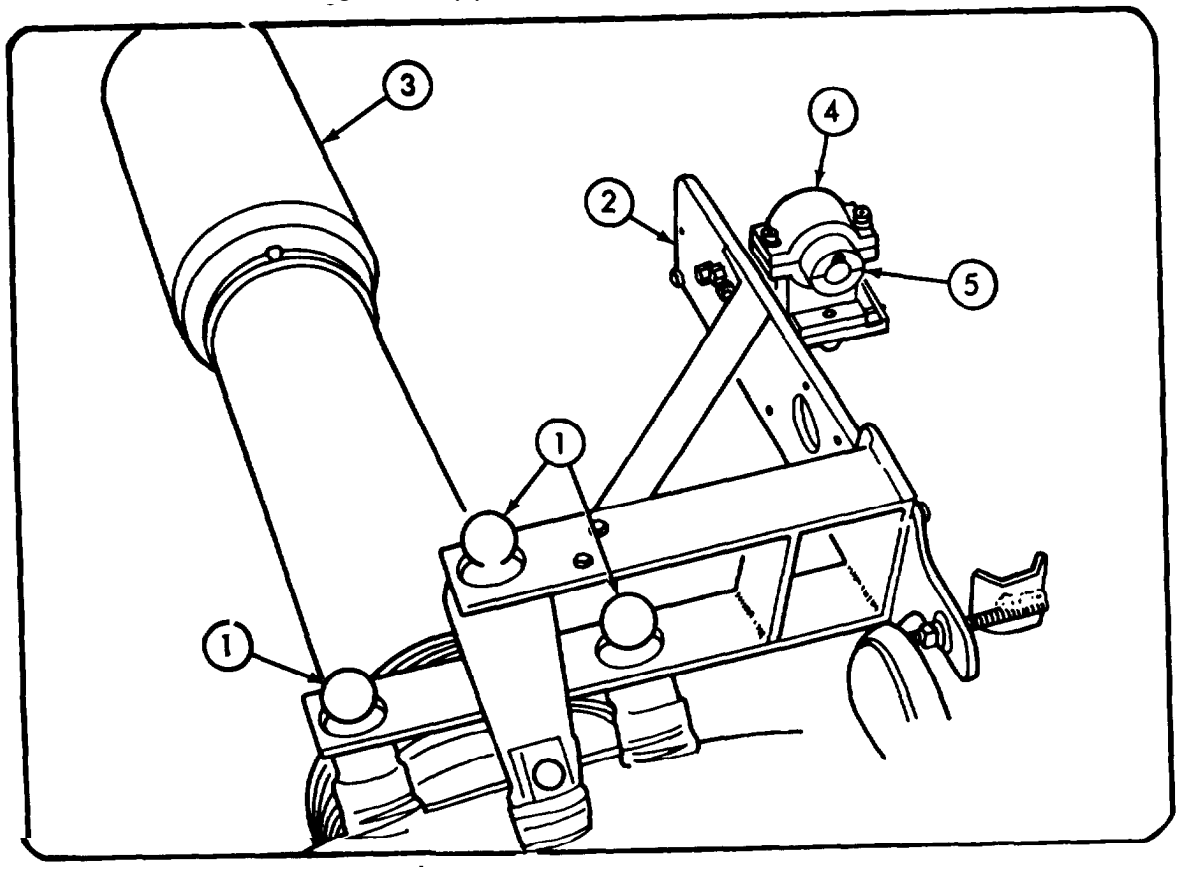
All tools that are needed for mounting, boresighting, and zeroing the Training Device are part of your tank tool set. Tools needed for M60 Series Tanks are listed below. Be sure you have these before heading out to the firing range.

TOOL	USE
3/4 socket with 1/2 square drive	Mounting traversing and elevating assembly to universal bracket
Ratchet 1/2 square drive	Mounting traversing and elevating assembly to universal bracket
1/8 Allen wrench	Adjusting traversing and elevating assembly
5/16 Allen wrench	Adjusting traversing and elevating assembly
12 in. adjustable wrench	Mounting Training Device on Tank
1-1/8 socket with 1/2 square drive	Mounting Training Device on Tank
5/32 Allen wrench	For ground wire screw and trigger adapter

MOUNTING THE DEVICE ON M60, M60A1, M60A3 AND M48A5 TANKS

1 Remove the xenon searchlight from its forward operating position and mount it in its stowed position.

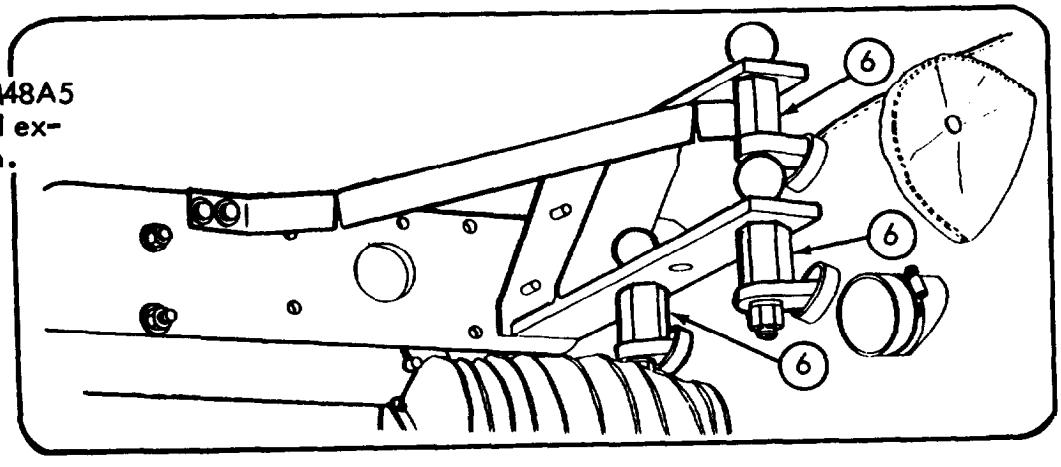
2 Remove the three mounting balls (1). You'll need a socket wrench for the center ball.



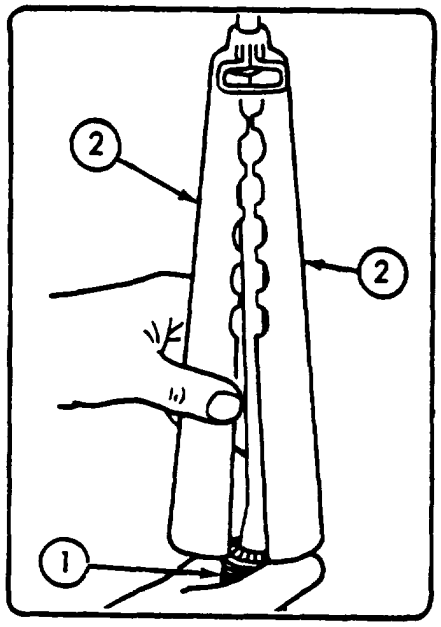
3 Set the device in place and replace the three mounting balls (1). Check that the universal mounting plate (2) is lined up parallel with gun (3) and then tighten the mounting balls.

4 Remove retainer (4) and mounting block (5) so you can mount the weapon.

M60 and M48A5
Use the stud ex-
(6) as shown.



PREPARING THE M16 RIFLE



1 Pull down on slip ring (1) and remove both handguards (2).

2 Determine if you are going to fire 5.56mm ammo or long rifle cal .22 ammo.

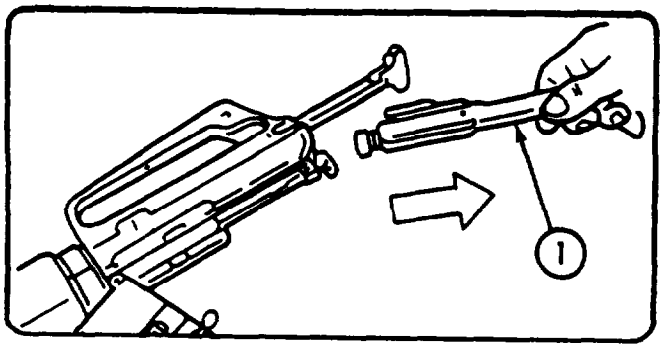
If you're going to use 5.56mm, skip to the next page.

If you're going to use cal .22 ammo, you must install the Rimfire Conversion Kit as shown below:

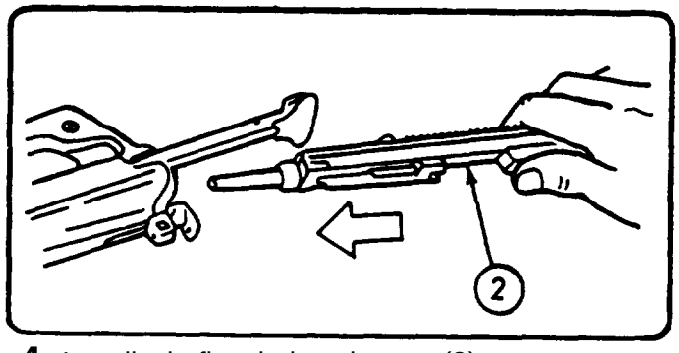
M16 RIFLE WITH CALIBER .22 RIMFIRE ADAPTER

CAUTION : Continuous firing with M861 Cal .22 tracer ammo can foul-up the M16A1 rifle gas system. Read the caution on page 4-1 before using Cal .22 tracer ammo.

You can fire either 5.56mm ammunition or (with the Rimfire Adapter) caliber .22 long rifle ammo. Refer to TM 9-6920-363-12&P for use of the Rimfire Conversion Kit. If you have the Kit, but don't have the TM, here's what you do:

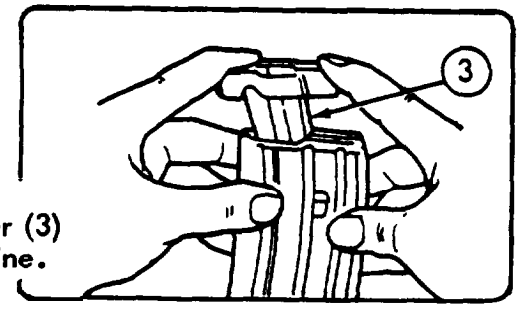


3 Remove bolt carrier group (1).



4 Install rimfire bolt adapter (2).

Note : When removing 5.56mm bolt carrier group (1), tag it to make sure it will be reinstalled in the same weapon.



5 Install magazine adapter (3) in the M16 rifle magazine.

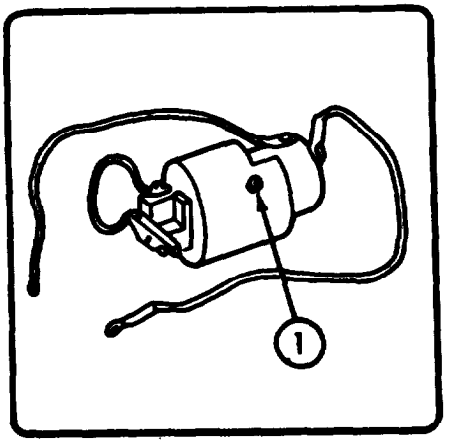
PREPARING THE WEAPONS FOR FIRING

M16 RIFLE

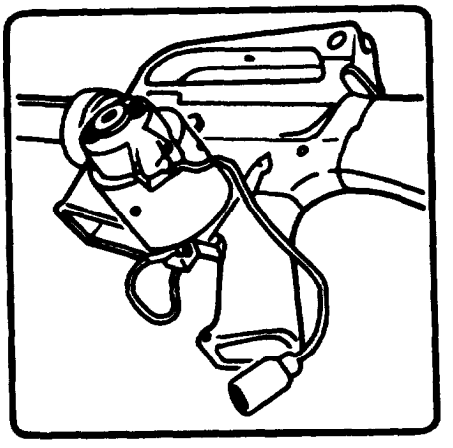
WARNING: Make sure rifle is clear of ammo.

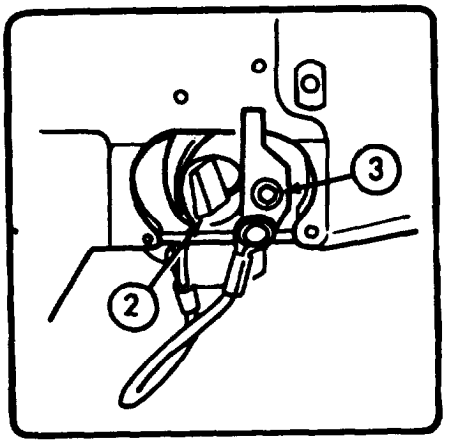
Note: Place rifle in semi-automatic mode.

1 Cock the rifle.

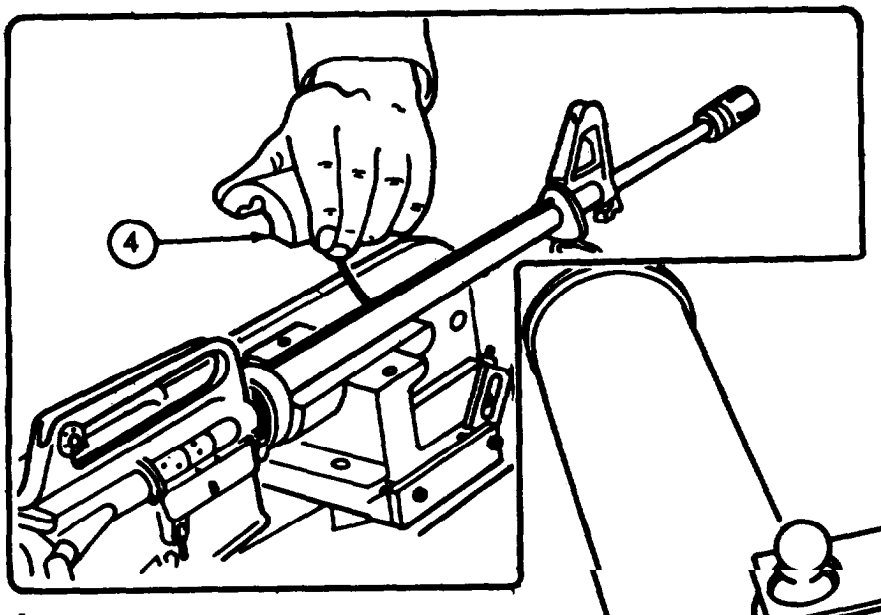


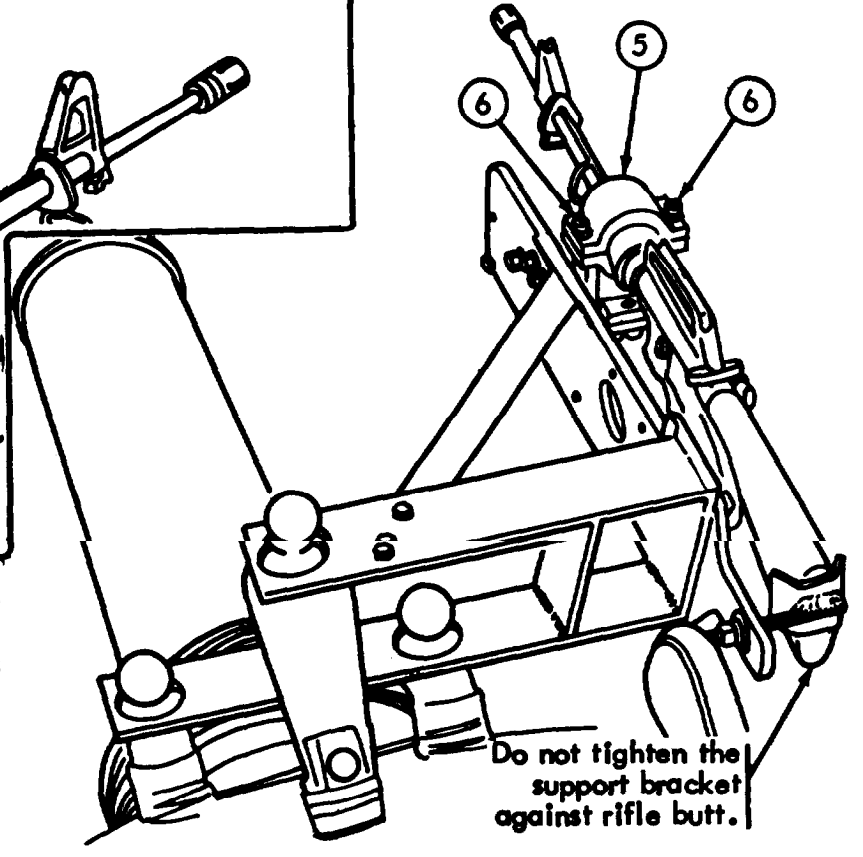
2 Put solenoid into. its housing and tighten two set screws (1).





3 Place solenoid and housing inside rifle trigger guard as shown above. The housing's bottom edge must be even with the tip of the trigger. Turn solenoid until pawl (2) will apply pressure to trigger. Tighten screw (3).

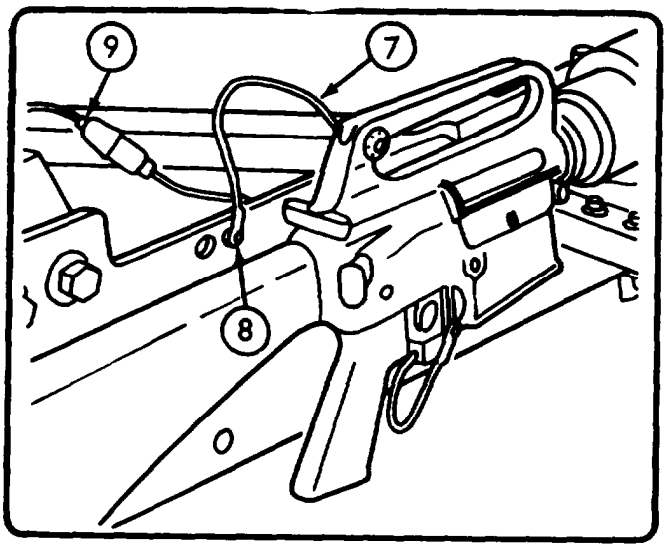




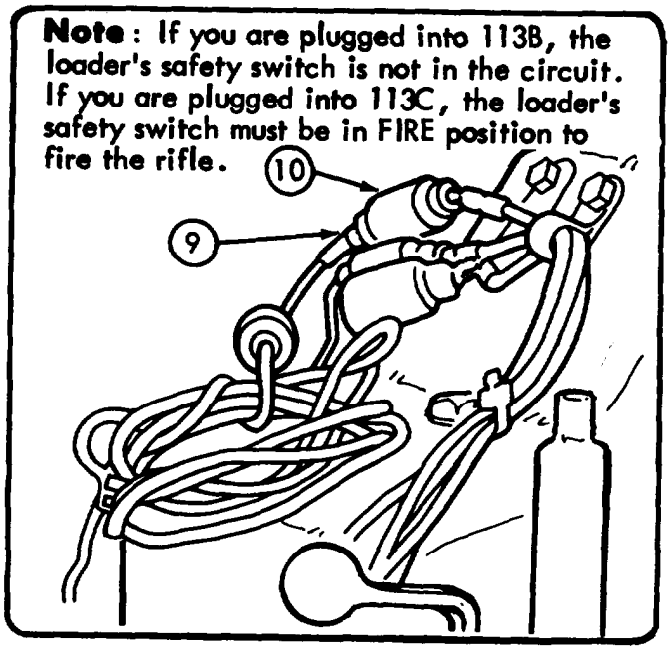
4 Place mounting block (4) and rifle in front mount. Make sure rifle is fully forward in mounting block as shown. Replace retainer (5) and tighten screws (6).

PREPARING THE WEAPONS FOR FIRING - con't

M16 RIFLE - con't



5 Attach solenoid ground wire (7) to mount. Tighten screw (8).



6 Plug wiring harness (9) into the solenoid cable and run it into the turret through the coax port.

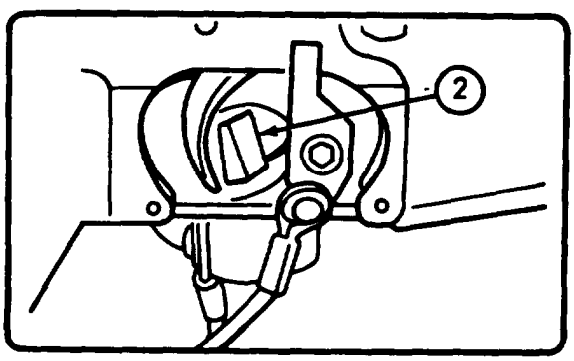
7 Plug wiring harness (9) into main gun firing wire (113B or 113C) (10).

Note : Ground wire (7) must connect solenoid to mount.

8 Turn on turret power. Place MAIN GUN switch ON.

9 Gunner fires rifle using the gunner's control handle, while a second crew member checks outside to see that solenoid pawl (2) moves and fires rifle.

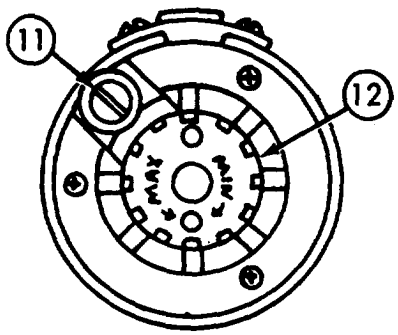
- If solenoid pawl (2) pushes back trigger and fires rifle, skip to page 2-10.
- If solenoid pawl (2) moves but doesn't fire rifle, do solenoid adjustment on next page.
- If solenoid doesn't "click" and pawl (2) doesn't move, go to step 3 of the Troubleshooting Table on page 3-1.



Note: Check to make sure you haven't installed solenoid pawl (2) too close to the trigger. The trigger must be all the way forward or it won't fire the rifle.

PREPARING THE WEAPONS FOR FIRING - con't

M16 RIFLE - ADJUSTING SOLENOID



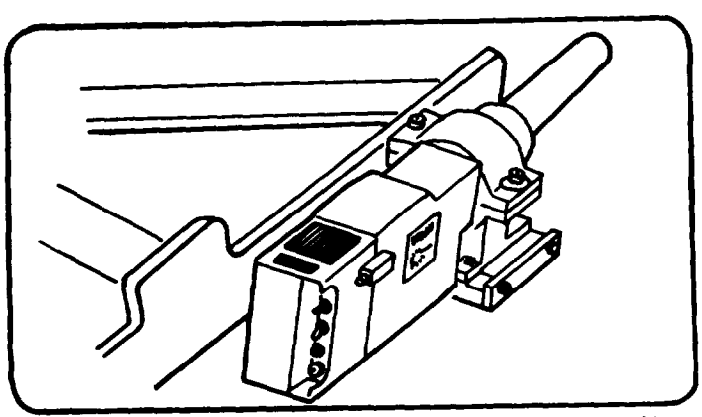
10 Loosen energizer lockscrew (11).

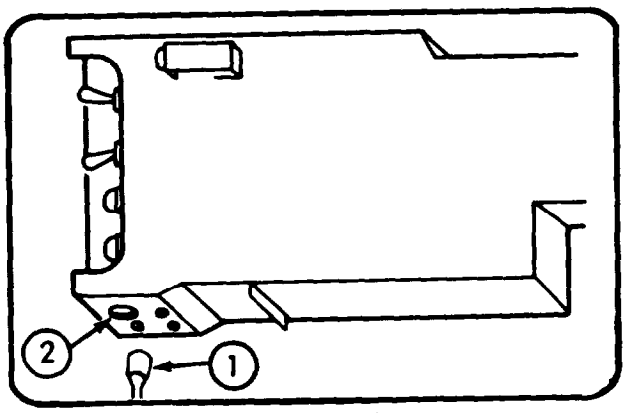
11 Press in and turn energizer cap (12) toward minimum (clockwise) as far as it will go.

12 Now turn energizer cap (12) toward maximum (counterclockwise) one notch at a time. Try to fire after each click until rifle fires.

13 After rifle fires, turn cap (12) toward maximum (counterclockwise) three more notches and tighten lockscrew (11).

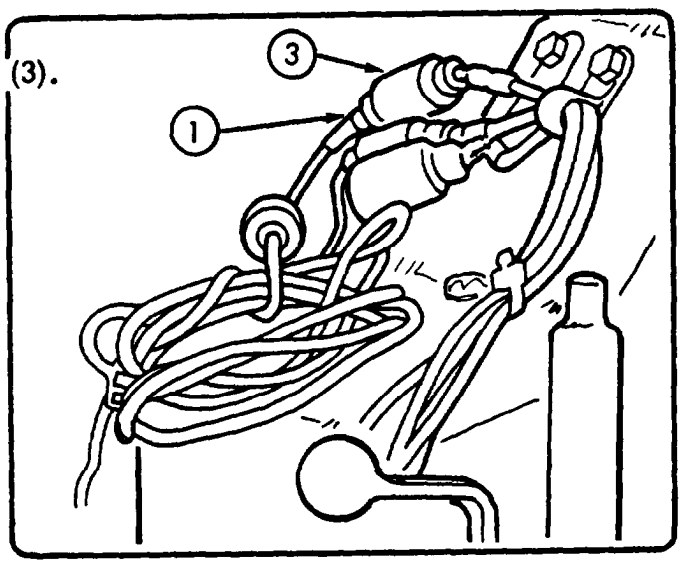
M55 LASER





1 Place the laser trainer in the mounting collar as shown above. Make sure the mounting ring on the trainer barrel fits in the groove on the mounting collar.

2 Plug the wiring harness (1) into laser receptacle (J1) (2), run the harness through the coax port into the turret and lug it into the main gun firing wire (113B or 113C) (3).



Note: If you're plugged into 113B, the loaders safe switch is not in the circuit. If you're plugged into 113C, the loader's safety switch must be in FIRE position to fire the laser.

Note: Laser may have to be energized a few minutes before it will emit a pulse of light.

Note: For continuous beam, laser must be connected to the coaxial circuit (1038); but for training, laser should be connected to the main gun circuit.

BORESIGHTING

Note: The boresight procedure which follows is written for a tank gunner ahead familiar with tank main gun boresight procedures. If you are not familiar with these procedures, refer to your tank operator's manual.

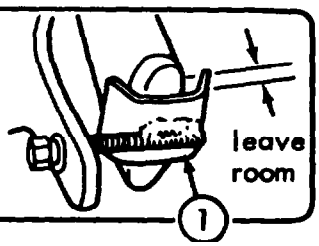
Note: If the periscope is zeroed for main gun, record the settings before turning knobs. Return to this zero after training.

M16 RIFLE

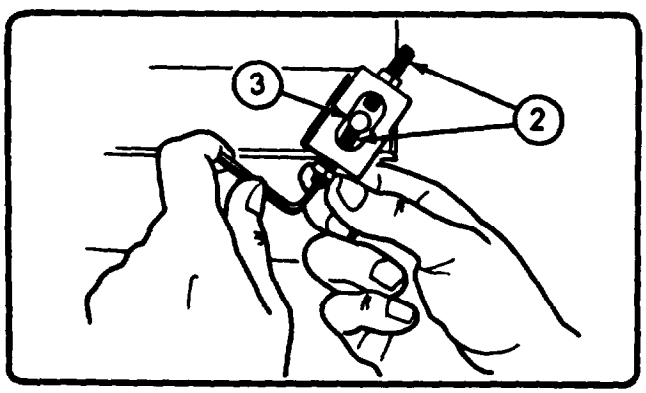
1 Set primary sight boresight knobs to center of travel. Turn computer off.

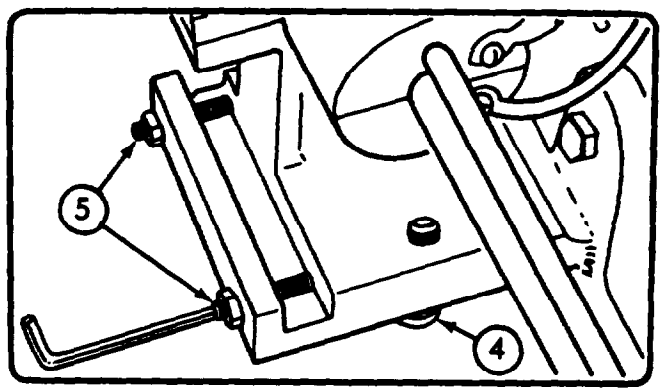
2 Place a scaled boresight target at midpoint of the range and use turret controls to lay the aiming cross of the primary sight on the target.

CAUTION: The support bracket (1) has to be loose when you're boresighting. If it's tight against the rifle butt you'll mess up your boresight and probably snap the support bracket bolt.



Note: To boresight one crew member looks through rifle sights while another crew member adjusts boresight adjusting screws. If you're way off target you can loosen the searchlight mounting balls and shift the entire mount.





3 Tighten/loosen elevating boresight screws (2) to bring rifle sights on target. Always remember that tightening one screw won't move the rifle unless you loosen the opposite screw. When sights are right for elevation, tighten both screws (2) against elevation bolt (3).

4 Loosen screws (4).

5 Tighten/loosen traversing boresight screws (5) to center rifle sights on target. Remember again that tightening one screw won't move the rifle unless you also loosen the opposite screw. When rifle sights are on target, tighten both screws (5) and then screws (4).

6 Now adjust the support bracket (1) so it's firmly seated against rifle butt.

BORESIGHTING - con't

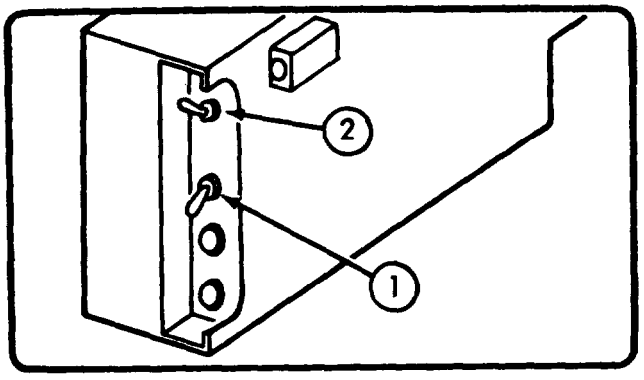
M55 LASER

1 Set primary sight boresight knobs to center of travel. Turn computer off.

2 Use a 3 X 3 foot retroreflective panel at midrange for boresighting.

3 Use turret controls to lay the aiming cross of the primary sight on the boresight panel. Use a precise aiming point the loader can see.

WARNING: The M55 laser is not eyesafe in the continuous mode. Don't look into the barrel.

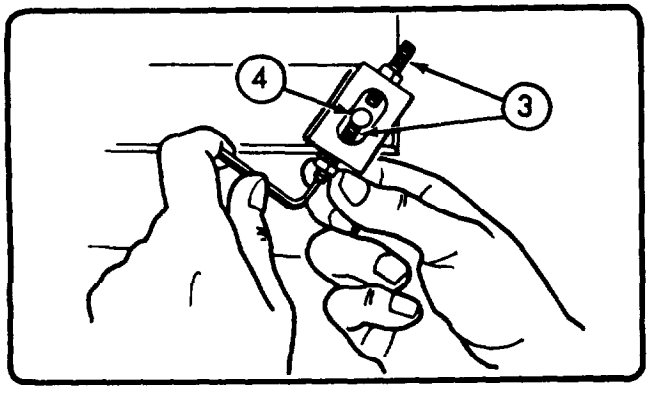


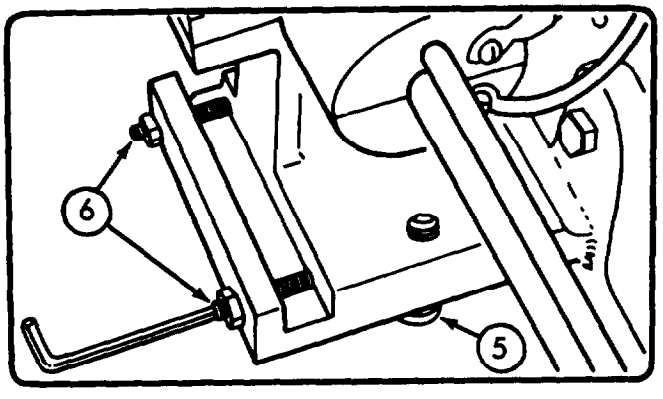
4 Set switch (1) on M55 laser to CONT (continuous mode).

5 Set switch (2) on M55 laser to FIRE.

6 Gunner, inside turret, turns on coaxial switch and presses firing trigger on gun controls to fire laser. See NOTE at the bottom of this page.

Note: To boresight, one crew member looks over the top of the laser while another crew member adjusts boresight adjusting screws. If you're way off target you can loosen the searchlight mounting balls and shift the entire mount.





7 Tighten/loosen elevating boresight screws (3) until you see laser beam strike the aiming point. Always remember that tightening one screw won't move the laser unless you loosen the opposite screw. When laser is right for elevation, tighten both screws (3) against elevation bolt (4).

8 Loosen screws (5).

9 Tighten/loosen traversing boresight screws (6) to center laser beam on aiming point. Remember that tightening one screw won't move the laser unless you also loosen the opposite screw. When laser beam is on aiming point, tighten both screws (6) and then screws (5).

Note: For continuous beam, laser must be connected to the coaxial circuit (1038); but for training, laser should be connected to the main gun circuit (113B or 113C).

ZEROING

M16 RIFLE

1 Load rifle.

2 Fire a 3 round shot group at boresight target using firing trigger on main gun controls.

3 By turning boresight knobs, move primary sight reticle to the center of the shot group. Now, using the "G" pattern, relay center mass and fire a confirmation round.

Note: If you didn't boresight properly and the periscope reticle won't move far enough to reach the shot group, you must:

4 Turn periscope boresight and zero knobs to center of travel.

5 As shown on page 2-10, adjust the boresight adjusting screws the estimated amount of distance to allow the shot group to be reached by the periscope reticle.

6 Repeat steps 2 and 3.

M55 LASER

You zeroed the laser when you boresighted it.

SHUT-DOWN

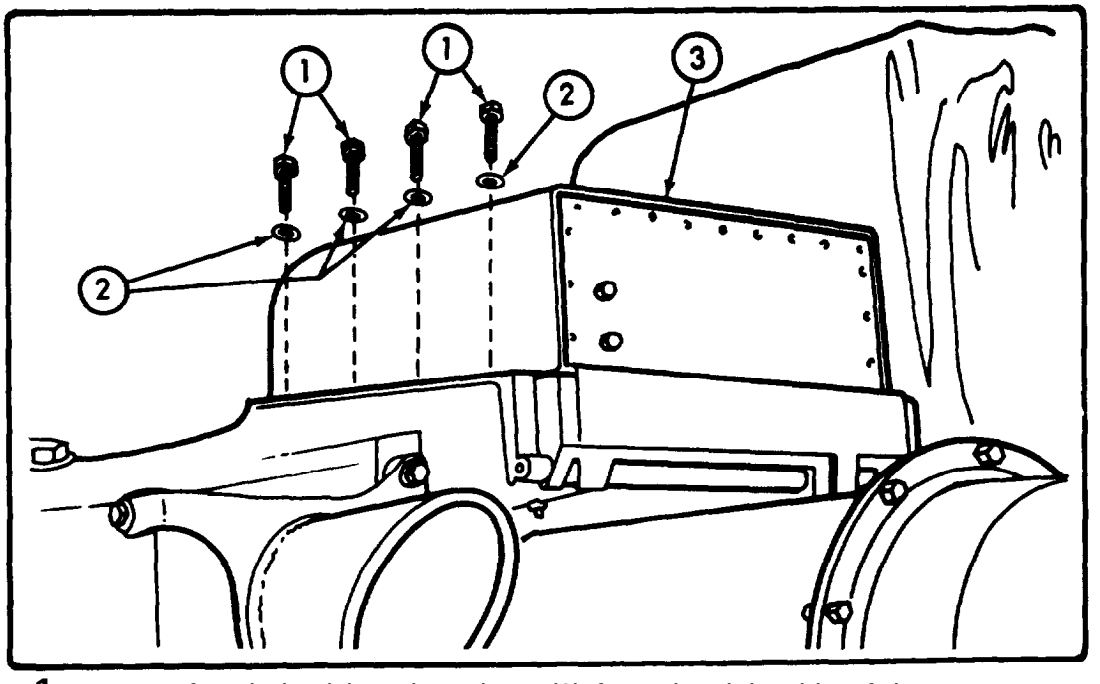
WARNING: After firing, always unload and inspect chamber to clear the rifle. Don't let anyone in front of the rifle until this is done.

1 After turning off power, disconnect wiring harness and unmount the device.

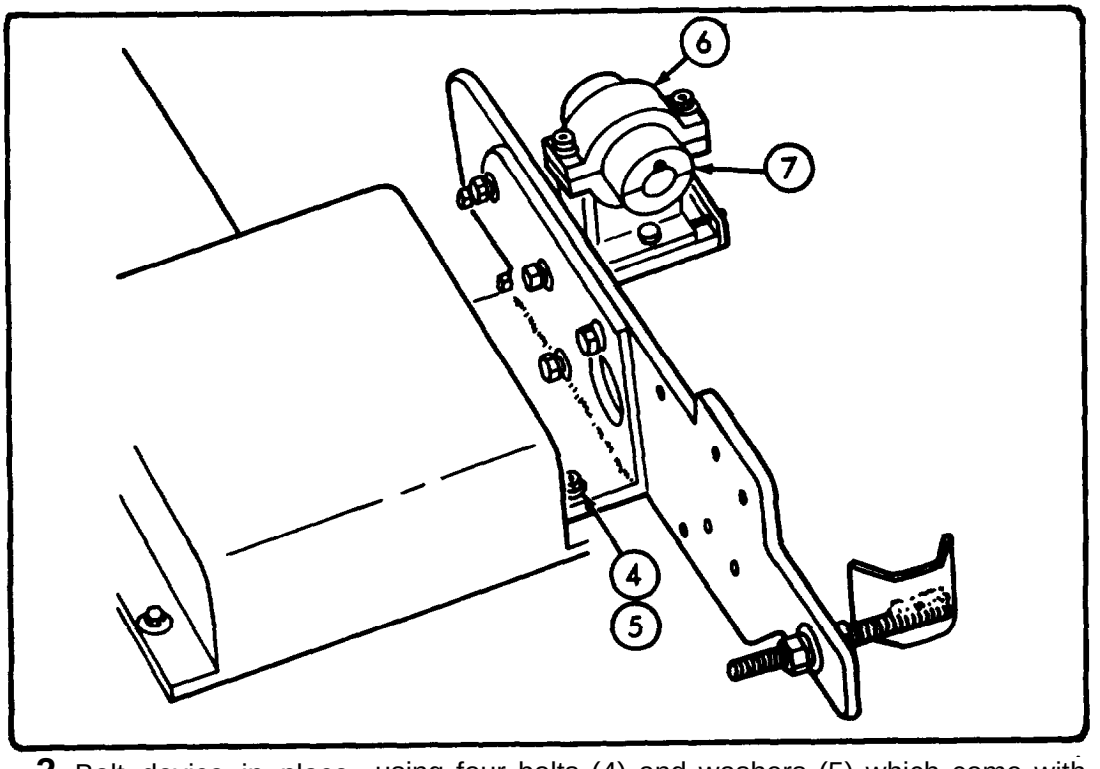
2 Put the tank back like it was. . . don't forget to reconnect the firing circuit wires.

3 Cleaning procedures for the device are on page 2-3. The only after operation PMCS check you make is to re-inspect the wiring harness for cracked or frayed insulation. If the wiring harness is bad, notify TASC or whoever you are giving the device.

M551A1: MOUNTING THE DEVICE



1 Remove four bolts (1) and washers (2) from the right side of the transmitter cover (3).

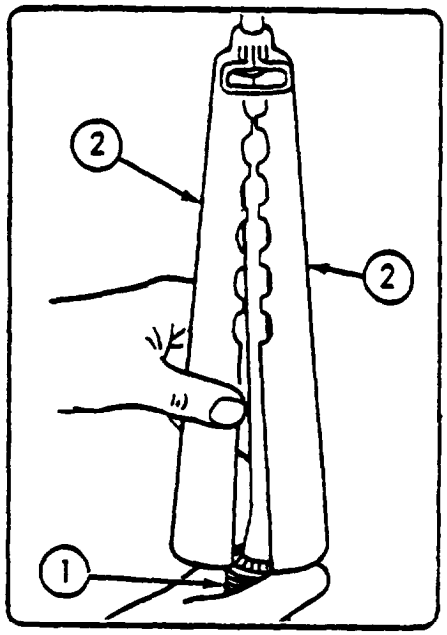


2 Bolt device in place, using four bolts (4) and washers (5) which come with the device. The bolt which comes with the device (4) is longer than the transmitter cover bolt (1) and should always be used.

3 Remove retainer (6) and mounting block (7) so you can mount weapon.

M551A1: PREPARING THE WEAPONS FOR FIRING

M16 RIFLE



1 Pull down on slip ring (1) and remove both handgaurds (2).

2 Determine if you are going to fire 5.56mm ammo or long rifle cal .22 ammo.

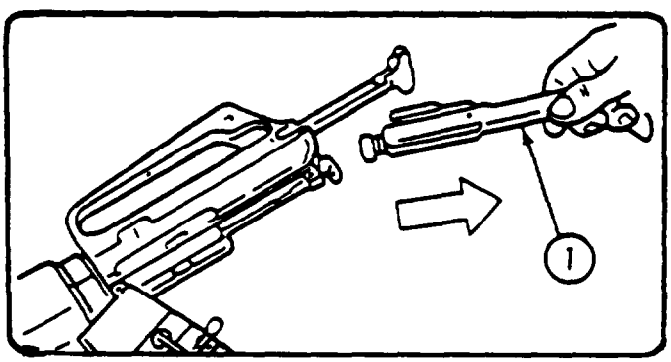
If you're going to use 5.56mm, skip to the next page.

If you're going to use cal .22 ammo, you must install the Rimfire Conversion Kit as shown below:

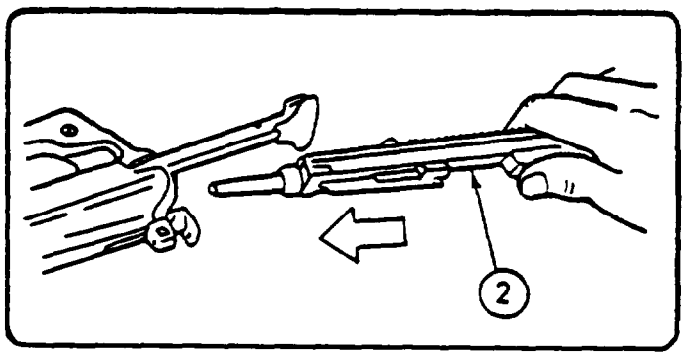
M16 RIFLE WITH CALIBER .22 RIMFIRE ADAPTER

CAUTION : Continuous firing with M861 Cal .22 tracer ammo can foul-up the M16A1 rifle gas system. Read the caution on page 4-1 before using Cal .22 tracer ammo.

You can fire either 5.56mm ammunition or (with the Rimfire Adapter) caliber .22 long rifle ammo. Refer to TM 9-6920-363-12&P for use of the Rimfire Conversion Kit. If you have the Kit, but don't have the TM, here's what you do:

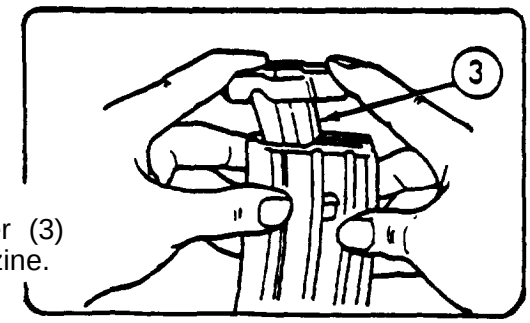


3 Remove bolt carrier group (1).



4 Install rimfire bolt adapter (2).

Note: When removing 5.56mm bolt carrier group (1), tag it to make sure it will be reinstalled in the same weapon.



5 Install magazine adapter (3) in the M16 rifle magazine.

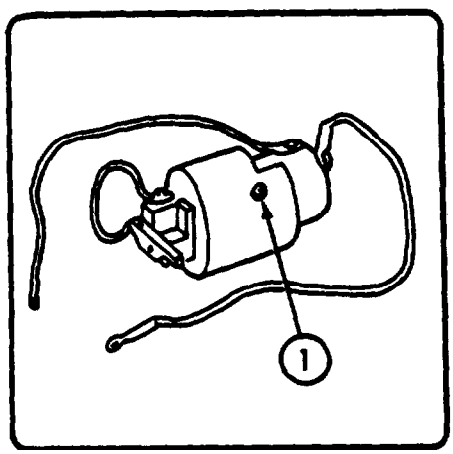
M551A1: PREPARING THE WEAPONS FOR FIRING - con't

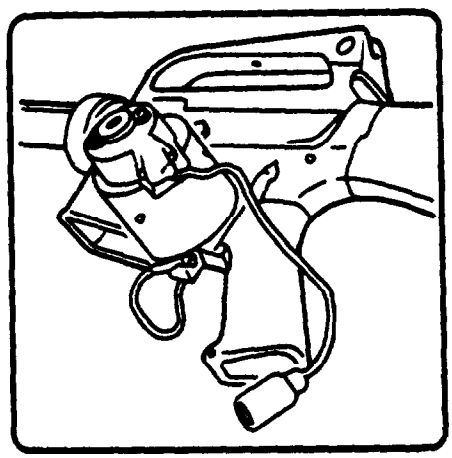
M16 RIFLE

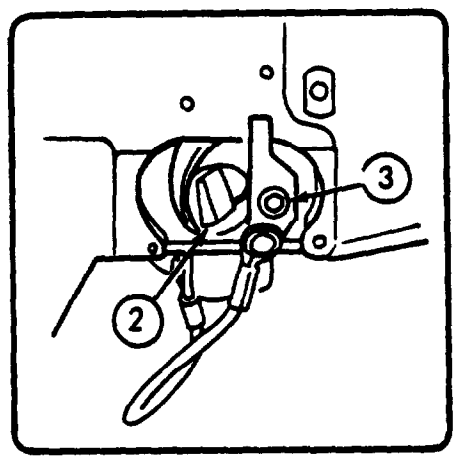
WARNING: Make sure rifle is clear of ammo.

Note: Place rifle in semi-automatic mode.

1 Cock the rifle.

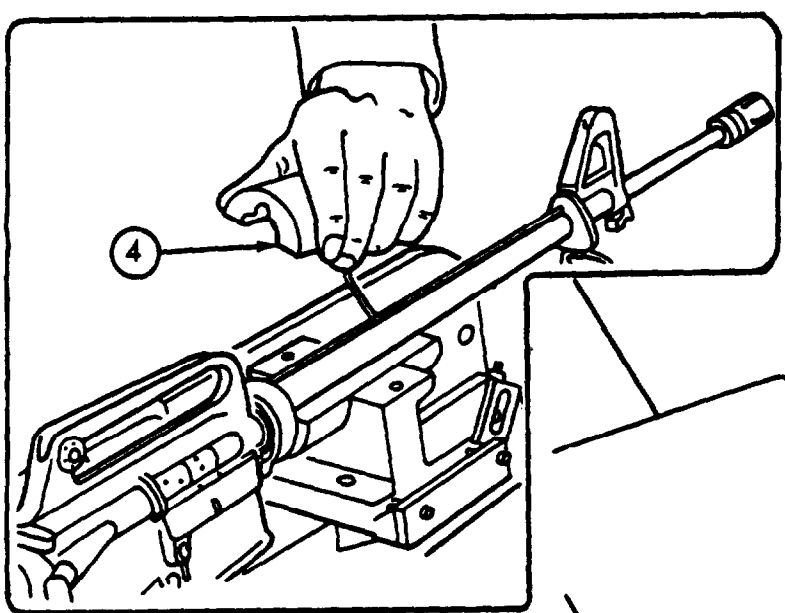


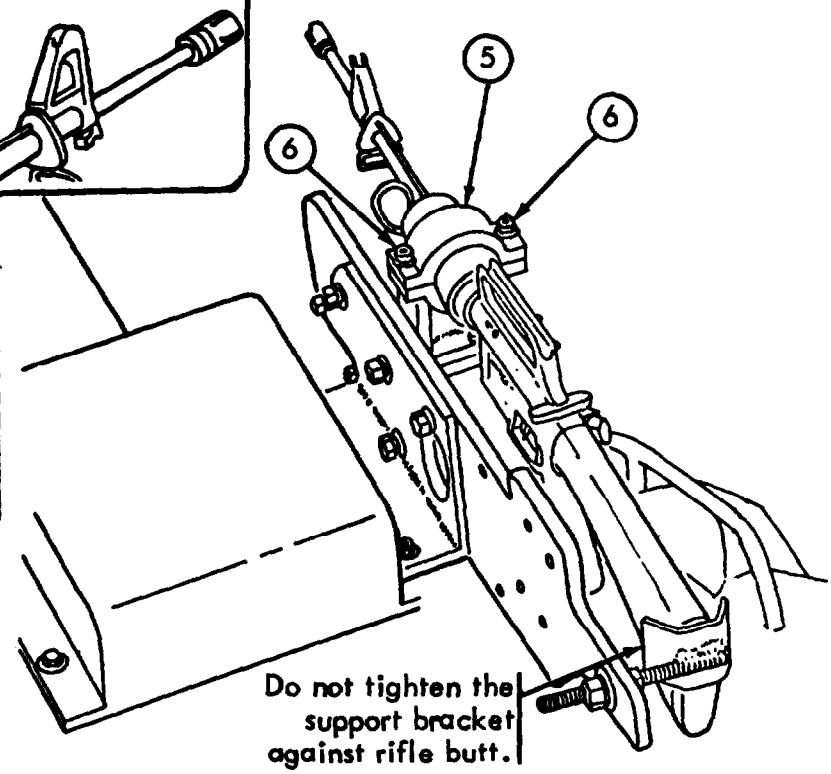




2 Put solenoid into its housing and tighten two set screws (1).

3 Place solenoid and housing inside rifle trigger guard as shown above. The housing's bottom edge must be even with the tip of the trigger. Turn solenoid until pawl (2) will apply pressure to trigger. Tighten setscrew (3).

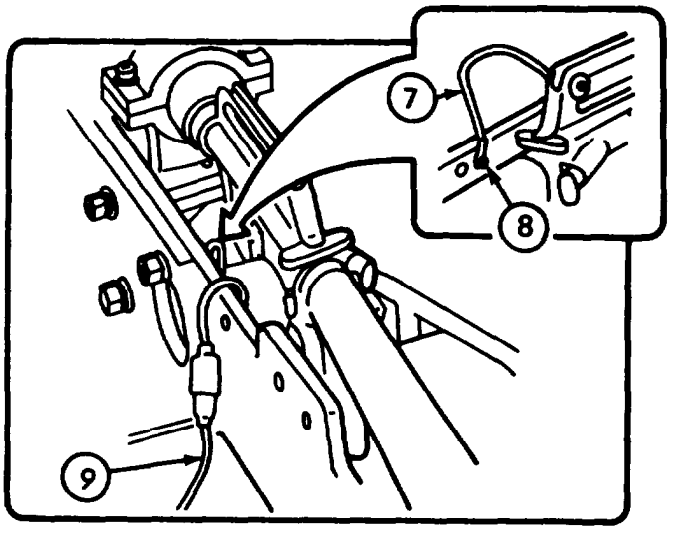




4 Place mounting block (4) and rifle in front mount. Make sure rifle is fully forward in mounting block as shown. Replace retainer (5) and tighten screws (6).

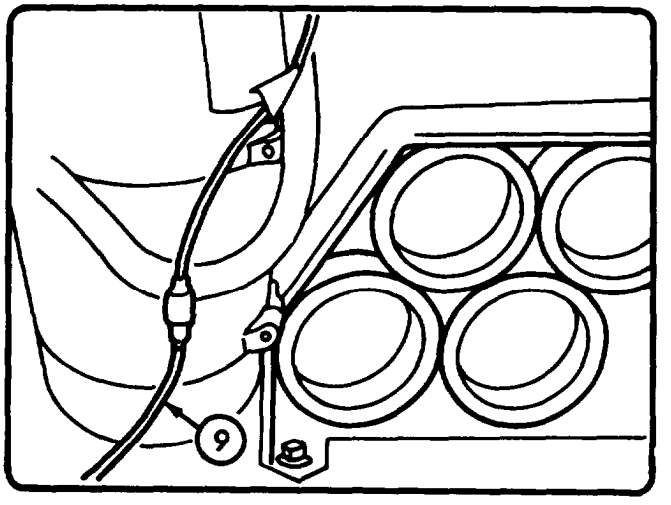
M551A1: PREPARING THE WEAPONS FOR FIRING - con't

M16 RIFLE



5 Attach solenoid ground wire (7) to mount. Tighten screw (8).

6 Plug wiring harness (9) into the solenoid cable and run it into the turret through the coax port.



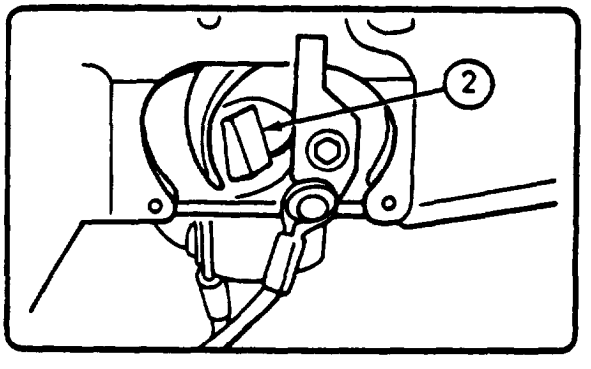
7 Plug the wiring harness (9) into the coax firing circuit.

Note: Ground wire (7) must connect solenoid to mount.

8 Turn on turret power. Gunner, inside turret, places armament selector to COAX.

9 Gunner fires rifle using the gunner's control handle, while a second crew member checks outside to see that solenoid pawl (2) moves and fires rifle.

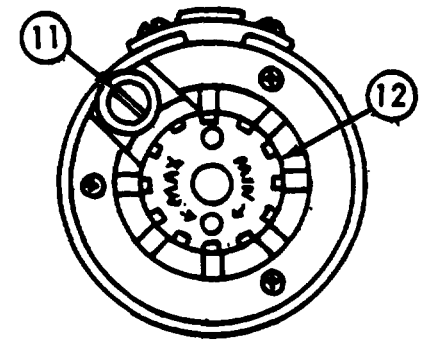
- If solenoid pawl (2) pushes back trigger and fires rifle, skip to page 2-10.
- If solenoid pawl (2) moves but doesn't fire rifle, do solenoid adjustment on next page.
- If solenoid doesn't "click" and pawl (2) doesn't move, go to step 3 of the Troubleshooting Table on page 3-1.



Note: Check to make sure you haven't installed solenoid pawl (2) too close to the trigger. The trigger must be all the way forward or it won't fire the rifle.

M551A1: PREPARING THE WEAPONS FOR FIRING - con't

M16 RIFLE - ADJUSTING SOLENOID



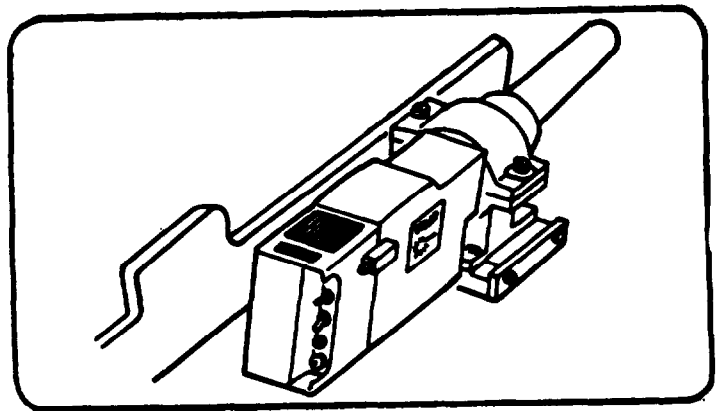
10 Loosen energizer lockscrew (11).

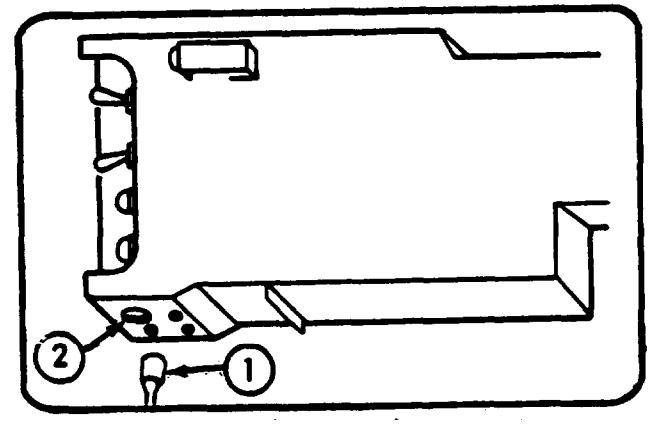
11 Press in and turn energizer cap (12) toward minimum (clockwise) as far as it will go.

12 Now turn energizer cap (12) toward maximum (counterclockwise) one notch at a time. Try to fire after each click until rifle fires.

13 After rifle fires, turn cap (12) toward maximum (counterclockwise) three more notches and tighten lockscrew (11).

M55 LASER

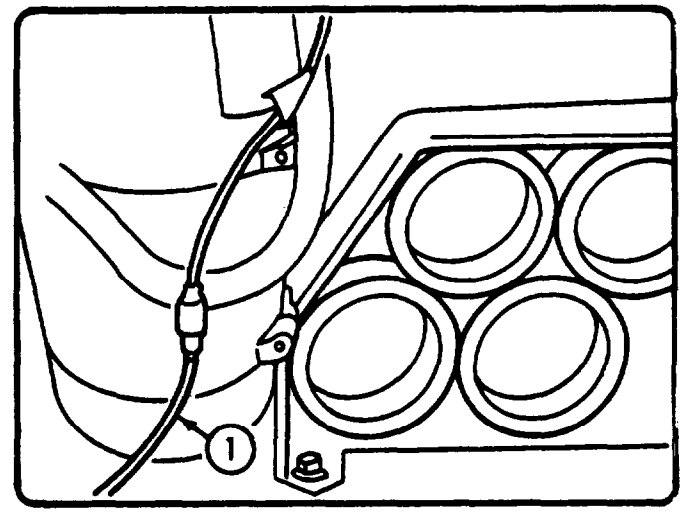




1 Place the laser trainer in the mounting collar as shown above. Make sure the mounting ring on the trainer barrel fits in the groove on the mounting collar.

2 Plug the wiring harness (1) into laser receptacle (J1) (2), run the harness through the coax port into the turret and plug it into the coax firing circuit.

Note: Laser may have to be energized a few minutes before it will emit a pulse of light.



M551A1: BORESIGHTING

Note: The boresight procedure which follows is written for a tank gunner already familiar with tank main gun boresight procedures. If you are not familiar with these procedures, refer to your tank operator's manual.

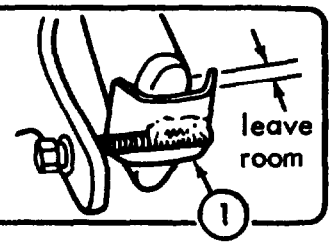
Note: If the telescope is zeroed for main gun, record the settings before turning knobs. Return to this zero after training.

M16 RIFLE

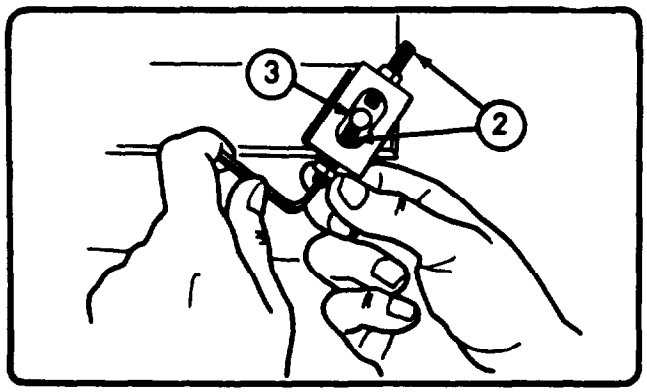
1 Turn the primary sight boresight knobs to center of travel.

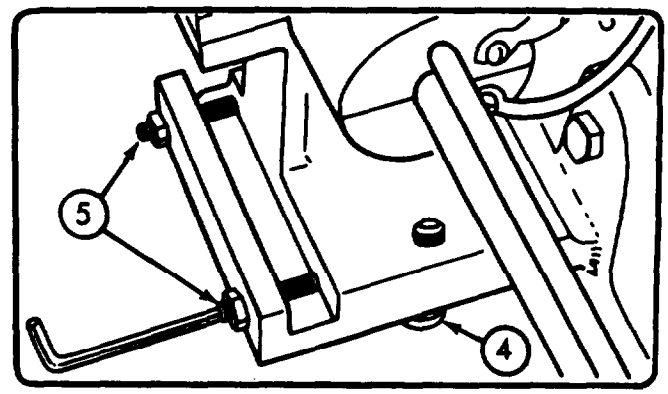
2 Place a scaled boresight target at midpoint of the range and use turret controls to lay the 120m aiming point of M127/M119 telescope reticle on the target.

CAUTION: The support bracket (1) has to be loose when you're boresighting. If it's tight against the rifle butt you'll mess up your boresight and probably snap the support bracket bolt.



Note: To boresight one crew member looks through rifle sights while another crew member adjusts boresight adjusting screws.





3 Tighten/loosen elevating boresight screws (2) to bring rifle sights on target. Always remember that tightening one screw won't move the rifle unless you loosen the opposite screw. When sights are right for elevation, tighten both screws (2) against elevation bolt (3).

4 Loosen screws (4).

5 Tighten/loosen traversing boresight screws (5) to center rifle sights on target. Remember again that tightening one screw won't move the rifle unless you also loosen the opposite screw. When rifle sights are on target, tighten both screws (5) and then screws (4).

6 Now adjust the support bracket (1) so it's firmly seated against rifle butt.

M551A1: BORESIGHTING - con't

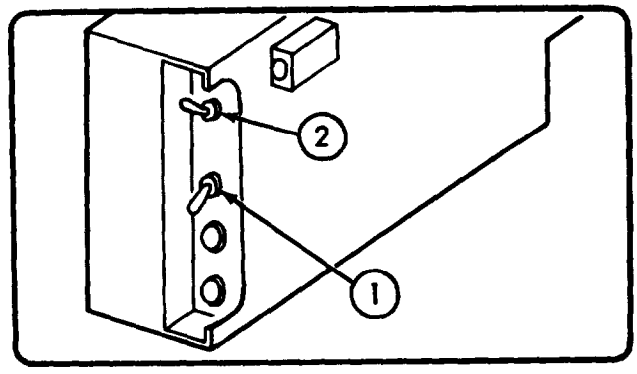
M55 LASER

1 Turn the primary sight boresight knobs to center of travel.

2 Use a 3 X 3 foot retroreflective panel at midrange for boresighting.

3 Use turret controls to place the 1200m aiming point of M127/M119 telescope reticle on the boresight panel. Use a precise aiming point the loader can see.

WARNING: The M55 laser is not eyesafe in the continuous mode. Don't look into the barrel.



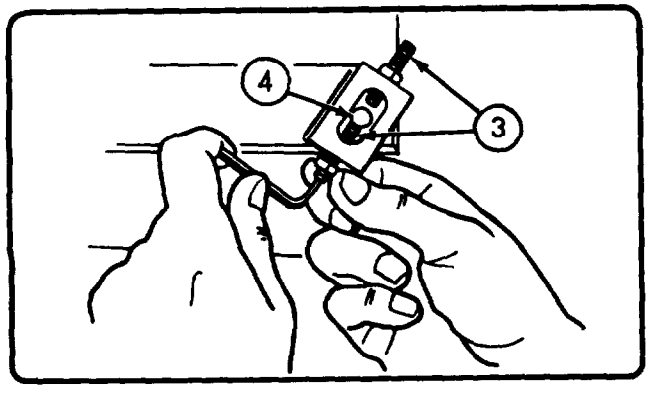
4 Set switch (1) on M55 laser to CONT (continuous mode).

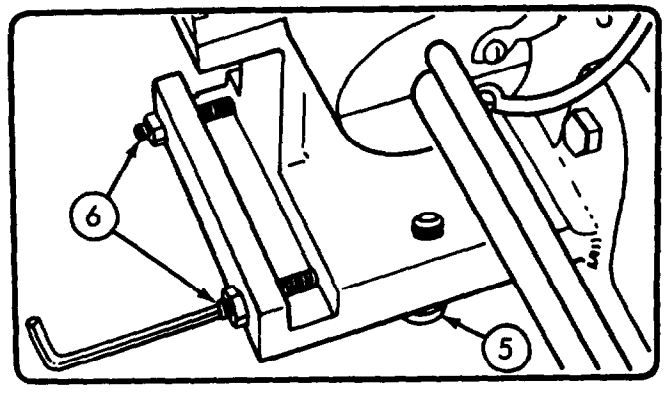
5 Set switch (2) on M55 laser to FIRE.

6 Gunner, inside turret, sets armament selector to COAX and depresses the firing trigger on gun controls to fire laser.

Note: The laser beam will be continuous as long as the firing trigger on the gun controls is held down, and switch (1) on M55 laser is set to CONT (continuous mode).

Note: To boresight, one crew member looks over the top of the laser while another crew member adjusts boresight adjusting screws.





7 Tighten/loosen elevating boresight screws (3) until you see laser beam strike the aiming point. Always remember that tightening one screw won't move the laser unless you loosen the opposite screw; When laser is right for elevation, tighten both screws (3) against elevation bolt (4).

8 Loosen screws (5).

9 Tighten/loosen traversing boresight screws (6) to center laser beam on aiming point. Remember that tightening one screw won't move the loser unless you also loosen the opposite screw. When laser beam is on aiming point, tighten both screws (6) and then screws (5).

M551A1: ZEROING

M16 RIFLE

1 Load rifle.

2 Fire a 3 round shot group at boresight target using firing trigger on main gun controls.

3 By turning boresight knob, move M127/M119 telescope reticle to the center of the shot group. Now, using the "G" pattern, relay center mass and fire a confirmation round.

> **Note:** If you didn't boresight properly and the telescope reticle won't move far enough to reach the shot group, you must:

4 Turn telescope boresight and zero knobs to center of travel.

5 As shown on page 2-19, adjust the boresight adjusting screws the estimated amount of distance to allow the shot group to be reached by the telescope reticle.

6 Repeat steps 2 and 3.

M55 LASER

You zeroed the laser when you boresighted it.

SHUT-DOWN

> **WARNING:** After firing, always unload and inspect chamber to clear the rifle. Don't let anyone in front of the rifle until this is done.

1 After turning off power, disconnect wiring harness and unmount the device.

2 Put the tank back like it was. . . don't forget to reconnect the firing circuit wires.

3 Cleaning procedures for the device are on page 2-3. The only after operation PMCS check you make is to n-inspect the wiring harness for cracked or frayed insulation. If the wiring harness is bad, notify TASC or whoever you are giving the device.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

After cleaning, dry and rub down metal surfaces with a light coat of GP oil. Do not apply any oil to wiring harness or solenoid.

Section II. TROUBLESHOOTING PROCEDURES

The table lists the common malfunctions which you may find during operation or maintenance of the M180/M181 Training Device. 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 or corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 3-1. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
WARNING: Make sure M16 Rifle is unloaded and clear of ammo.
AFTER FINAL SET-UP, THE M16 RIFLE WON'T FIRE
Step 1. One soldier attempts to fire from inside turret, while a second soldier checks rifle solenoid and listens for a "click" from the solenoid.
Step 2. If solenoid "clicks", check that it is tight in trigger housing and properly adjusted.
Tighten solenoid retainer screw.
Redo the solenoid adjustment on page 2-9.
Step 3. If solenoid doesn't "click", recheck the wiring hook-up . . . especially the ground (no paint).
If necessary, file paint away from where you are grounding the solenoid.
Replace broken cables or cables with bent connectors.

Table 3-1. Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
AFTER FINAL SET-UP, THE M16 RIFLE WON'T FIRE - Continued	
Step 4. If solenoid still doesn't "click", check your vehicle firing circuit.	If the circuit checks out, turn the solenoid in to TASC and draw another one.
AFTER FINAL SET-UP, THE M55 LASER WON'T FIRE	**WARNING:** Do not look directly into Laser Beam.
Step 1. Disconnect the M55 Laser from the firing circuit. Connect the M16 Rifle firing solenoid (issued by TASC with your Subcaliber Mount) into the firing circuit. Make sure the solenoid ground wire is connected to mount.	
Step 2. One soldier attempts to fire from inside turret, while a second soldier listens for a "click" from the solenoid.	
Step 3. If solenoid doesn't "click", recheck the wiring hook-up . . . especially the ground (no paint) and the vehicle firing circuit.	If the circuit checks out, replace the wiring harness. If the circuit is faulty, refer to your tank operator's manual for troubleshooting.
Step 4. If solenoid "clicks", your M55 Laser is probably defective.	Refer to TM 9-6920-357-10 for troubleshooting the Laser.
SUBCALIBER MOUNT WILL NOT MAINTAIN BORESIGHT	
Step 1. Check the searchlight mounting balls (M60 Series Tanks), or the bolts (M551A1) holding the Subcaliber Mount to the Tank.	Tighten.

Table 3-1. Troubleshooting - Continued.

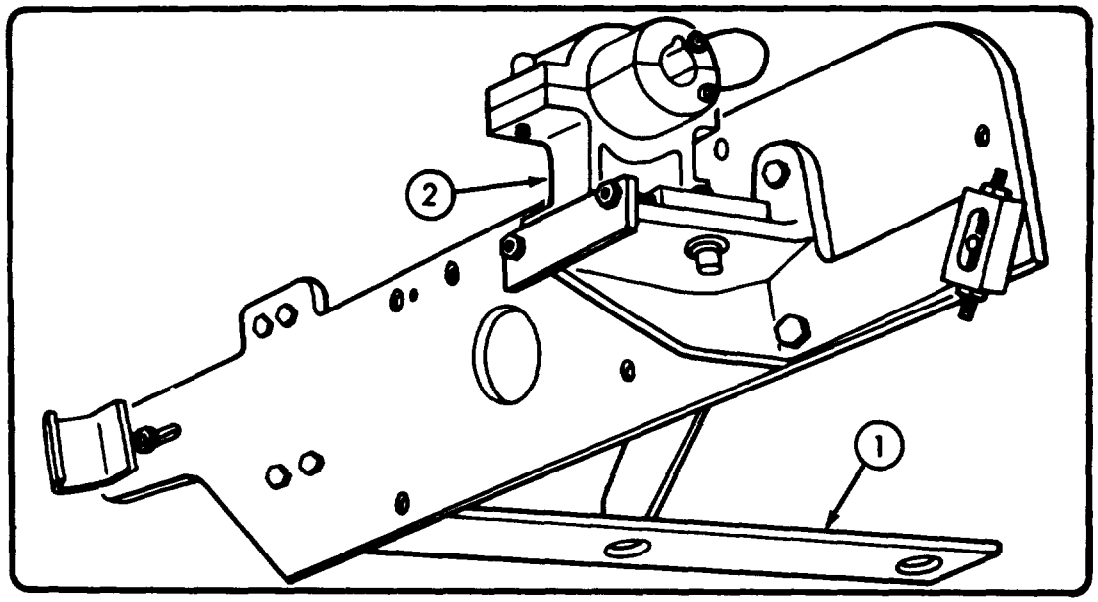
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
SUBCALIBER MOUNT WILL NOT MAINTAIN BORESIGHT - Continued	
Step 2. Check the bolts holding the front mount to the Universal Mounting Plate and the bolts on the front mount collar.	Tighten.
Step 3. Check the bolts holding the Universal Mounting Plate to the adapter bracket.	Tighten.
Step 4. If you still can not maintain boresight, turn the Subcaliber Mount in to TASC and draw another one.	
Note: If you can not maintain your zero, go through steps 1 through 3 above first, then check your vehicle fire control equipment before turning in the Subcaliber Mount.	

SECTION III. MAINTENANCE PROCEDURES

ASSEMBLING THE DEVICE

Use the two exploded views on pages C-4 (M180) and C-6 (M181), together with the illustration below to assemble the Training Device. Note the following:

- Since you'll be using it for assembly, the exploded view on page C-4 shows every hexagon head screw needed to assemble the device. All nuts and washers aren't shown because there isn't room in the illustration.
- Attach the brace (1) first, then the coaxial mount (2).
- For correct torque, tighten the nut until the lock washer flattens out. Then back off a quarter turn. The big washer and the lock washer both go on the side with the nut.



Note: You may hove noticed holes in the universal plate which aren't used for assembling either the M60 series or M551A1 configuration. There was originally a M60A2 configuration.

The maintenance procedures which follow are in the same order as the MAC.

All maintenance inspections are covered in the PMCS Section on pages 2-3 and 2-4.

All services consist of cleaning and applying a light coat of GP oil to external metal surfaces.

Replacement refers to ordering the assembly and has no special procedure.

MOUNT, SUBCALIBER, M80 AND M81

Installation is on page 2-5 (M180) or 2-13 (M181).

Repair consists of replacing defective parts. Use the illustration on page C-4 (M180) or C-6 (M181) for disassembly and reassembly. You don't need any step-by-step instructions.

COAXIAL MOUNT ASSEMBLY

Adjustment is on page 2-10 (M180) or 2-18 (M181).

Repair consists of replacing defective parts. Use the illustration on page C-8 for disassembly or reassembly. You don't need any step-by-step instructions.

UNIVERSAL PLATE ASSEMBLY

Adjustment of the support bracket is on page 2-10 (M180) or 2-18 (M181).

Repair consists of replacing defective parts. Use the illustration on page C-10 for disassembly and reassembly. You don't need any step-by-step instructions.

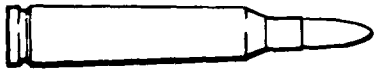
SOLENOID ASSEMBLY

Adjustment is on page 2-9 (M180) or 2-17 (M181).

Repair consists of replacing defective parts. Use the illustration on page C-11 for disassembly and reassembly. You don't need any step-by-step instructions.

CHAPTER 4
AMMUNITION

You should use either of the two types of 5.56mm ammunition shown below. Use only authorized ammo that is manufactured to U.S. specs.



BALL, M193

TRACER, M196

With the M261 Rimfire conversion kit you should use standard long rifle cal .22 ammunition.

BALL, M24

RIMFIRE TRACER, M861

CAUTION

Continuous firing (400-1000 rounds per weapon) of M861 Cal .22 Rimfire tracer ammo will result in lead particles fouling the M16A1 Rifle gas system. This will cause the weapon not to fire in either semi-automatic or automatic mode. However, firing regular M193 5.56 mm ball ammo will clear the gas system. You should therefore do the following to prevent permanent blockage of the gas system and to clear the rifle of fouling:

- At the end of each training session (typically 400-1000 rounds per weapon) remove the Rimfire Adapter and reinstall the bolt carrier. Fire a 20/30 round magazine of 5.56 mm M193 ball ammo in the automatic mode in short bursts of 4 to 5 rounds.

- If the rifle won't fire in either semi or automatic mode, you will have to manually recharge and fire the weapon (using 5.56 mm ball ammo) for up to 10 rounds. You should then fire an entire magazine as described above. This will clean the gas system so you can resume sub-caliber firing.

APPENDIX A
REFERENCES

A-1. Publication Indexes.

The following indexes should be consulted frequently for latest changes or revisions of references given in this Appendix and for new publications relating to material covered in this Technical Manual:

AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviations and Brevity Codes
DA Pam 310-1	Consolidated Index of Army Publications and Forms
TM 38-750	The Army Maintenance Management System

A-2. Publication References

The following is a list of publications and forms referenced in this manual and/or likely to be required by the manual user:

AR 385-40	Accident Reporting and Records
AR 385-63	Regulation Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat
AR 75-1	Malfunctions Involving Ammunition and Explosives
AR 725-50	Requisitioning, Receipt, and Issue System
DA Form 2028	Recommended Changes to DA Technical Manual, Parts List, or Supply Manual 7, 8 or 9
TM 9-2350-230-10 . . .	Operator's Manual (Crew) for Armored Reconnaissance/Aerial Assault Vehicle (AR/AAV) M551/M551A1 (Sheridan).
TM 9-2350-253-10 . . .	Operator's Manual Tank, Combat, Full-Tracked: 105MM Gun, M60A3
TM 9-2350-257-10-1 . .	Operator% Manual: Operator Controls and PMCS for Tank, Combat, Full-Tracked: 105MM Gun M60A1 (RISE)
TM 9-2350-257-10-2 . .	Operator's Manual for Operation Under Usual and Unusual Conditions for Tank, Combat, Full-Tracked: 105MM Gun M60A1 (RISE)

REFERENCES - con't

TM 9-2350-257-10-3 . . Operator's Manual: Troubleshooting and Maintenance for Tank, Combat, Full-Tracked: 105MM Gun M60A1 (RISE)
TM 9-2350-260-10-1 . . Operator's Manual: Operator's Controls and PMCS for Tank, Combat, Full- Tracked : 105MM Gun M60
TM 9-2350-260-10-2 . . Operator's Manual: Operations Under Usual and Unusual Conditions for Tank, Combat, Full-Tracked: 105MM Gun M60
TM 9-2350-260-10-3 . . Operator's Manual: Troubleshooting and Maintenance for Tank, Combat, Full-Tracked: 105MM Gun M60
TM 9-2350-258-10 . . . Operator's Manual for Tank, Combat, fill-Tracked: 105MM Gun, M48A5
TM 9-6920-363-12&P . Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List For Conversion Kit (Caliber .22 Rimfire Adapter) M261 For Rifle, 5.56MM, M16 and M16A1
TM 9-1005-249-10 . . . Operator's Manual: M16A1 Rifle
TM 9-1005-249-20 . . . Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Rifle 5.56MM, M116A1 W/E; Rifle: 5.56MM, M16 and Bipod, Rifle, M3 W/Carrying Case
TM 9-6920-357-10 . . . Operator's Manual: Laser, Gunnery Trainer M55

APPENDIX B
MAINTENANCE ALLOCATION CHART
Section 1. INTRODUCTION

B-1. General.

This maintenance allocation chart designates overall responsibility for the performance of maintenance functions on the M180/M181 Training Device.

B-2. Maintenance Functions.

Maintenance Functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance,

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable-like type part, subassembly or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure of a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards

(i.e., DMWR) in appropriate technical publication. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of services/ actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. Column Entries.

Columns used in the maintenance allocation chart are explained below:

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in Column 2.

d. Column 4, Maintenance Category.

(1) Column 4 specifies, by the listing of a Work Time figure in the appropriate subcolumn(the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate Work Time figures will be shown for each category. The number of man-hours specified by the Work Time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform specific tasks identified for the maintenance functions authorized in the maintenance allocation chart.

(2) The subcolumn categories under Column 4 are as follows:

C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies by code those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which is pertinent to the item opposite the particular code.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equip	(6) Remarks
00	Mount, Subcaliber. M180 and M181	Inspect	0.1						
		Service	0.1						
		Adjust	0.1						
		Replace		0.3					
		Repair		0.8					
01	Coaxial Mount Assembly	Inspect	0.1						
		Service	0.1						
		Adjust	0.1						
		Replace		0.1					
		Repair		0.2					
02	Universal Plate Assembly	Inspect	0.1						
		Service	0.1						
		Adjust	0.1						
		Replace		0.1					
		Repair		0.2					
03	Solenoid Assembly	Inspect	0.1						
		Service	0.1						
		Adjust	0.1						
		Replace		0.2					
		Repair		0.2					
04	Wiring Harness Assembly	Inspect	0.1						
		Replace		0.1					

APPENDIX C
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Current as of 4 January 1983

Section I. INTRODUCTION

1. SCOPE.

This manual lists spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for the performance of organizational maintenance of the Mount, Gun: Subcaliber, M180/M181. It authorizes the requisitioning and Issue of spares and repair parts as Indicated by the source and maintenance codes.

2. GENERAL.

This Repair Parts and Special Tools List is divided Into the following sections :

a. Section II. Repair Parts List. A list of spares and repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts In each group listed in figure and item number sequence.

b. Section III. Special Tools List. There are no special tools authorized for the M180/M181.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list In alphameric sequence of all part numbers appearing In the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and Item number appearance.

3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the Item is shown.

(2) *Item number.* The number used to Identify item called out in the Illustration.

b. Source, Maintenance, and Recoverability (SMR) Codes.

(1) *Source code.* Source codes Indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered In the first and second positions of the Uniform SMR Code format as follows :

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative In nature.
AO	Item to be assembled at organizational level.

Code	Definition
XA	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA and aircraft support items as restricted by AR 700-42.

(2) ***Maintenance code.*** Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support Items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will Indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will Indicate one of the following levels of maintenance:

Code	Application/explanation
O	Support item is removed, replaced, used at the organizational level.

(b) The maintenance code entered In the fourth position Indicates whether the item is to be repaired and Identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

Code	Application/explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
Z	Nonreparable. No repair is authorized.

(3) ***Recoverability code.*** Recoverability codes are assigned to support Items to Indicate the disposition action on unserviceable items. The recoverability code is entered In the fifth position of the Uniform SMR Code format as follows:

Rscoverability Code	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.

c. National Stock Number. Indiates the National stock number assigned to the Item and which will be used for requisitioning.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

e. Part Number. Indicates the primary number used by the manufacturer (Individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the Item by means of Its engineering drawings, specifications, standards, and Inspection requirements to Identify an item or range of Items.

NOTE

When a stock numbered item is requisitionad, the item received may have a different part number than the part being replaced.

f. Description. Indicates the Federal item name and, If required, a minimum description to identify the Item.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed Item as used In performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, In., pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of Issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the Item used In the breakout shown on the Illustration figure, which is prepared for a functional group, subfunctional group or an assembly.

4. SPECIAL INFORMATION.

Usable on codes are shown in the description column. Uncoded Items are applicable to all models. Identification of the usable on codes used in this publication are:

Code	Used On
J75	Subcaliber Mount M180
J76	Subcaliber Mount M181

5. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Unknown:

(1) ***First.*** Using the table of contents, determine the functional group within which the item belongs. This is necessary since illustrations are prepared for functional groups, and listings are divided Into the same groups.

(2) ***Second.*** Find the illustration covering the functional group to which the Item belongs.

(3) ***Third.*** Identify the item on the Illustration and note the Illustration figure and Item number of the item.

(4) ***Fourth.*** Using the repair parts listing, find the figure and Item number noted on the illustration.

b. When National Stock Number or Part Number is Known:

(1) ***First.*** Using the Index of National Stock Numbers and part numbers, find the pertinent National stock number or part number. This Index is in NIIN sequence followed by a list of part numbers in alphameric sequence, cross-referenced to the Illustration figure number and Item number.

(2) ***Second.*** After finding the figure and Item number, locate the figure and item number In the repair, parts list.

6. ABBREVIATIONS. Not applicable.

Section II. REPAIR PARTS LIST

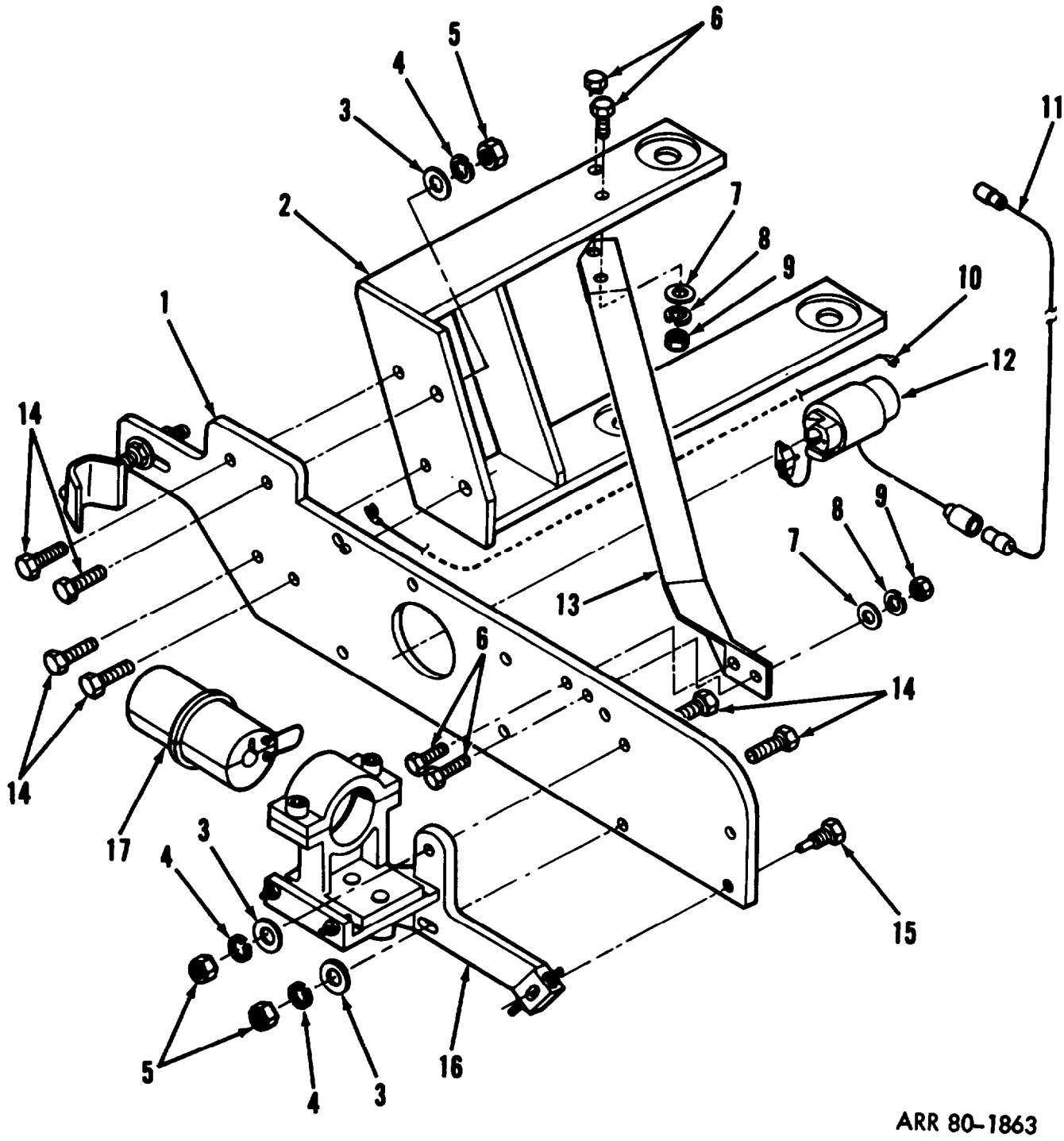


Figure C-1. Subcaliber Mount, M180.

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 00 SUBCALIBER MOUNT M180 9332818		
C-1	1	A0000		19200	11784991	PLATE ASSEMBLY, UNIVERSAL J75	EA	1
C-1	2	PAOZZ	6920-01-116-3837	19200	9332811	ADAPTOR, SUBCALIBER MOUNT, M60A1 TANK J75	EA	1
C-1	3	PAOZZ	9310-00-614-3506	96906	MS15795-817	WASHER, FLAT J75	EA	6
C-1	4	PAOZZ	9310-00-933-8778	96906	MS35338-143	WASHER, LOCK J75	EA	6
C-1	5	PAOZZ	9310-00-768-0321	96906	MS51971-5	NUT, PLAIN, HEXAGON J75	EA	6
C-1	6	PAOZZ	5305-00-208-1429	96906	MS35307-363	SCREW, CAP, HEXAGON HEAD J75	EA	4
C-1	7	PAOZZ	5310-00-067-7493	96906	MS15795-213	WASHER, FLAT J75	EA	4
C-1	8	PAOZZ	5310-00-794-2005	96906	MS35338-52	WASHER, LOCK J75	EA	4
C-1	9	PAOZZ	5310-00931-8881	96906	MS51971-3	NUT, PLAIN, HEXAGON J75	EA	4
C-1	10	PCOZZ	5940-01-115-5582	19200	1178489	WIRE, GROUND J75	EA	1
C-1	11	PCOZZ	6920-01-123-1837	19200	9332800	WIRING HARNESS ASSEMBLY J75	EA	1
C-1	12	A0000		19200	9332825	SOLENDID AND HOLDER ASSEMBLY J75	EA	1
C-1	13	PA0ZZ	6920-01-116-3835		9332805	BRACE, M60A1 J75	EA	1
C-1	14	PAOZZ	5305-00-727-6804	96906	MS35307-414	SCREW CAP HEXAGON HEAD J75	EA	6
C-1	15	PAOZZ	5305-01-116-4797	19200	9332797-01	SCREW, PILOT J75	EA	1
C-1	16	PA000	6920-01-129-0127	19200		COAXIAL, MOUNT ASSEMBLY J75	EA	1
C-1			6920-01-116-3836	19200		MOUNTING BLOCK ASSEMBLY J75	EA	1

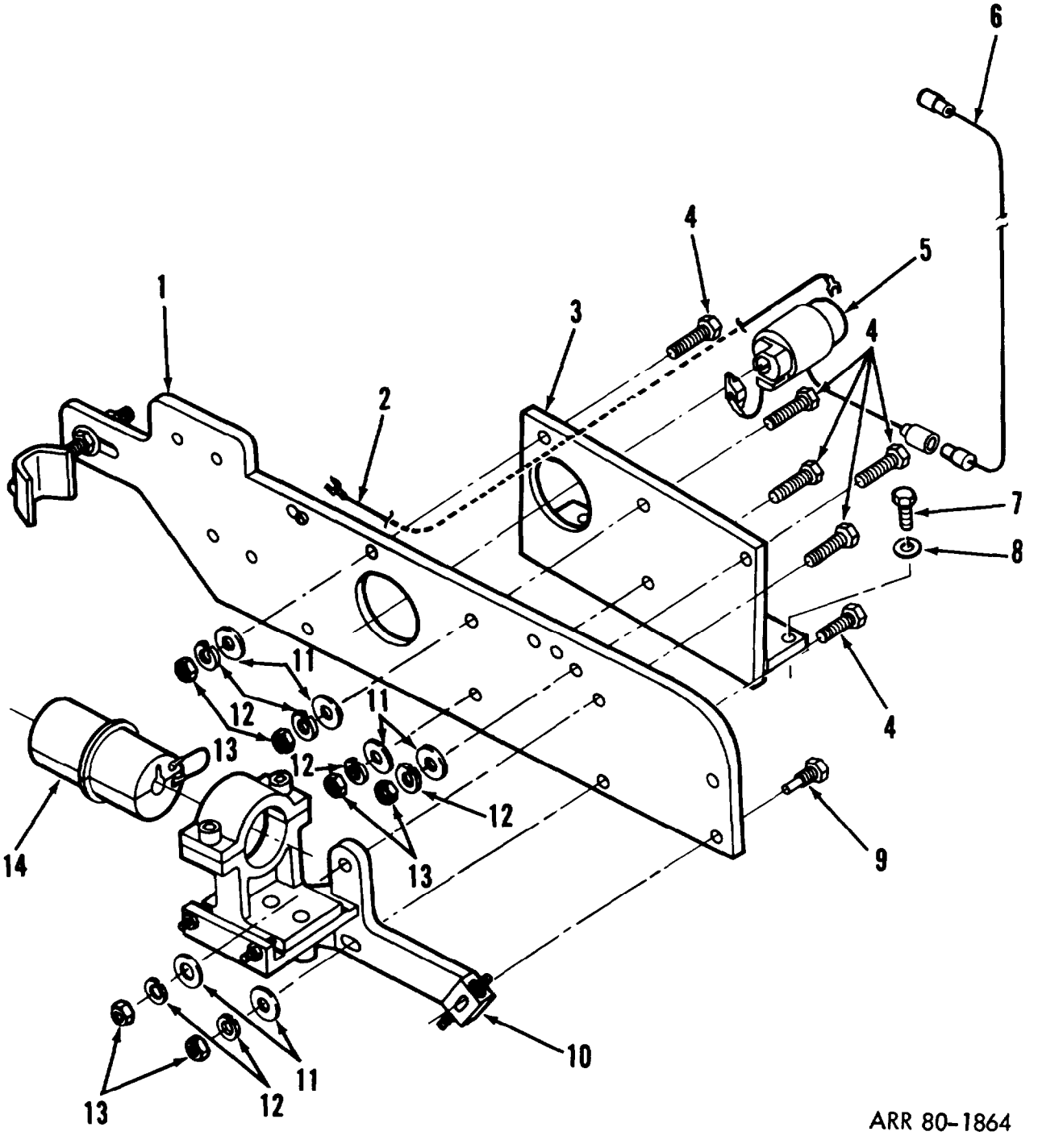


Figure C-2. Subcaliber Mount, M181.

(1) ILLUSTRATION (A) FIG. NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 00 SUBCALIBER MOUNT M181 9332820		
C-2	1	AOOOO		19200	11784991	PLATE, ASSEMBLY, UNIVERSAL J93	EA	1
C-2	2	PCOZZ	5940-01-115-5582	19200	11784989	WIRE, GROUND J93	EA	1
C-2	3	PAOZZ	5340-01-122-9746	19200	9332814	ADAPTER, SUBCALIBER MOUNT, M551A1 J93	EA	1
C-2	4	PAOZZ	5305-00-727-6804	96906	MS35307-414	SCREW, CP, HEXAGON J93	EA	6
C-2	5	AOOOO		19200	9332825	SOLENOID AND HOLDER ASSEMBLY J93	EA	1
C-2	6	PCOZZ	6920-01-123-1837	19200	9332800	WIRING HARNESS ASSEMBLY J93	EA	1
C-2	7	PAOZZ	5305-00-717-5467	96906	MS35307-362	SCREW, CAP, HEXAGON J93	EA	4
C-2	8	PAOZZ	5310-00-802-4701	96906	MS15795-813	WASHER, FLAT J93	EA	4
C-2	9	PAOZZ	5305-01-116-4797	1920	9332797-01	SCREW, PILOT J93	EA	1
C-2	10	PAOOO	6920-01-129-0127	19200	9332824	COAXIAL MOUNT ASSEMBLY J93	EA	1
C-2	11	PAOZZ	5310-00-614-3506	96906	MS15795-817	WASHER, FLAT J93	EA	6
C-2	12	PAOZZ	5310-00-933-8778	96906	MS35338-143	WASHER, LOCK J93	EA	6
C-2	13	PAOZZ	5310-00-768-0321	96906	MS51971-5	NUT, PLAIN HEXAGON J93	EA	6
C-2	14	PAOZZ	6920-01-116-3836	19200	9332807	MOUNTING BLOCK ASSEMBLY J93	EA	1

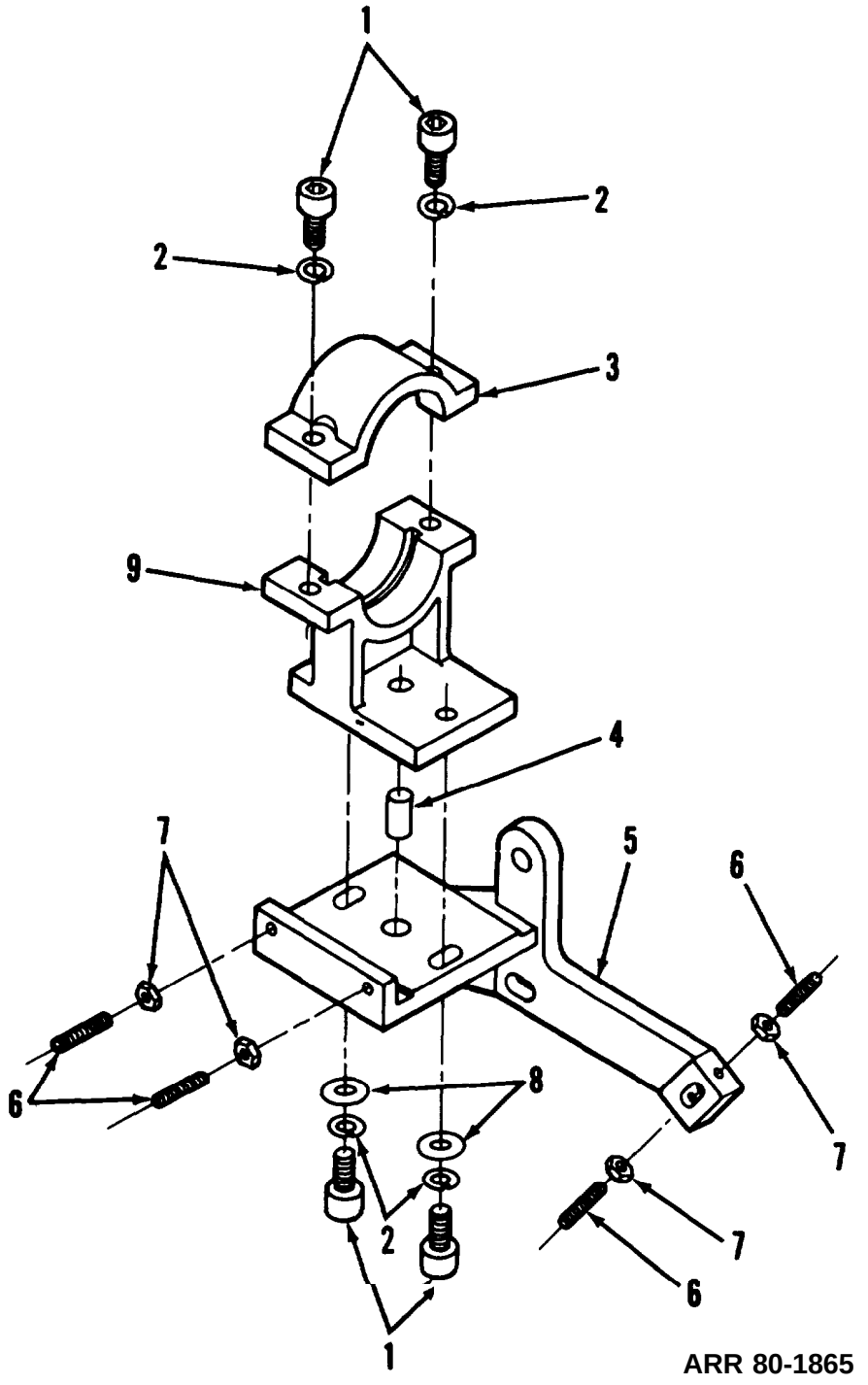


Figure C-3. Coaxial Mount Assembly

(1) ILLUSTRATION (A) FIG. NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 01 COAXIAL MOUNT ASSEMBLY 9332824		
C-3	1	PAOZZ	5305-00-717-7869	96906	MS16996-41	SCREW, CAP, SOCKET HEAD	EA	4
C-3	2	PAOZZ	5310-00-754-2005	96906	MS35338-52	WASHER, LOCK	EA	4
C-3	3	XAOZZ		19200	9332801	RETAINER, CAP	EA	1
C-3	4	XAOZZ		96906	MS16555-677	PIN, DOWEL	EA	1
C-3	5	XAOZZ		19200	9332803	MOUNTING BRACKET	EA	1
C-3	6	PAOZZ	5305-00-724-5819	96906	MS51964-72	SETSCREW HEAD	EA	4
C-3	7	PAOZZ	5310-01-140-1408	96906	MS35691-87	NUT	EA	4
C-3	8	PAOZZ	5310-00-802-4701	96906	MS15795-813	WASHER, FLAT	EA	2
C-3	9	XAOZZ		19200	9332802	SWIVEL BRACKET	EA	1

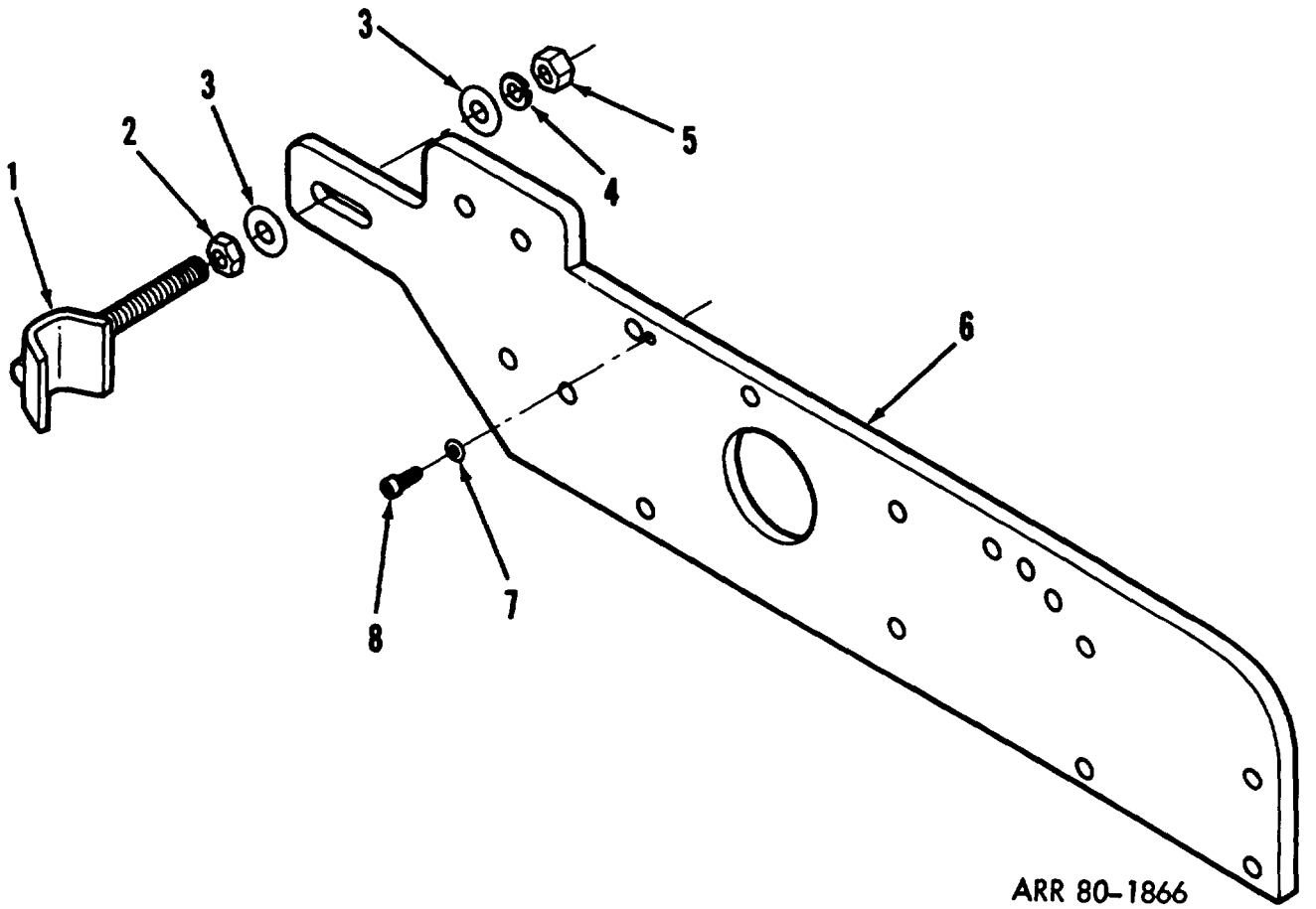


Figure C-4. Universal Plate Assembly

(1) ILLUSTRATION (A) FIG. NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 02 UNIVERSAL PLATE ASSEMBLY 11784991		
C-4	1	PAOZZ	6920-01-115-0927	19200	9332798	SUPPORT BRACKET	EA	1
C-4	2	PAOZZ	5310-00-989-5945	96906	MS35691-35	NUT, PLAIN, HEXAGON, JAM	EA	1
C-4	3	PAOZZ	5310-00-614-3506	96906	MS15795-817	WASHER, FLAT	EA	2
C-4	4	PAOZZ	530-00-933-8778	96906	MS35338-143	WASHER, LOCK	EA	1
C-4	5	PAOZZ	5310-00-768-0321	96906	MS51971-5	NUT, PLAIN, HEXAGON	EA	1
C-4	6	PAOZZ	6920-01-122-9886	19200	9332806	UNIVERSAL MOUNTING PLATE	EA	1
C-4	7	PAOZZ	5310-00-883-9384	96906	MS15795-842	WASHER, FLAT	EA	1
C-4	8	PAOZZ	5305-00-988-7608	96906	MS16995-36	SCREW, CAP, SOCKET, HEAD	EA	1

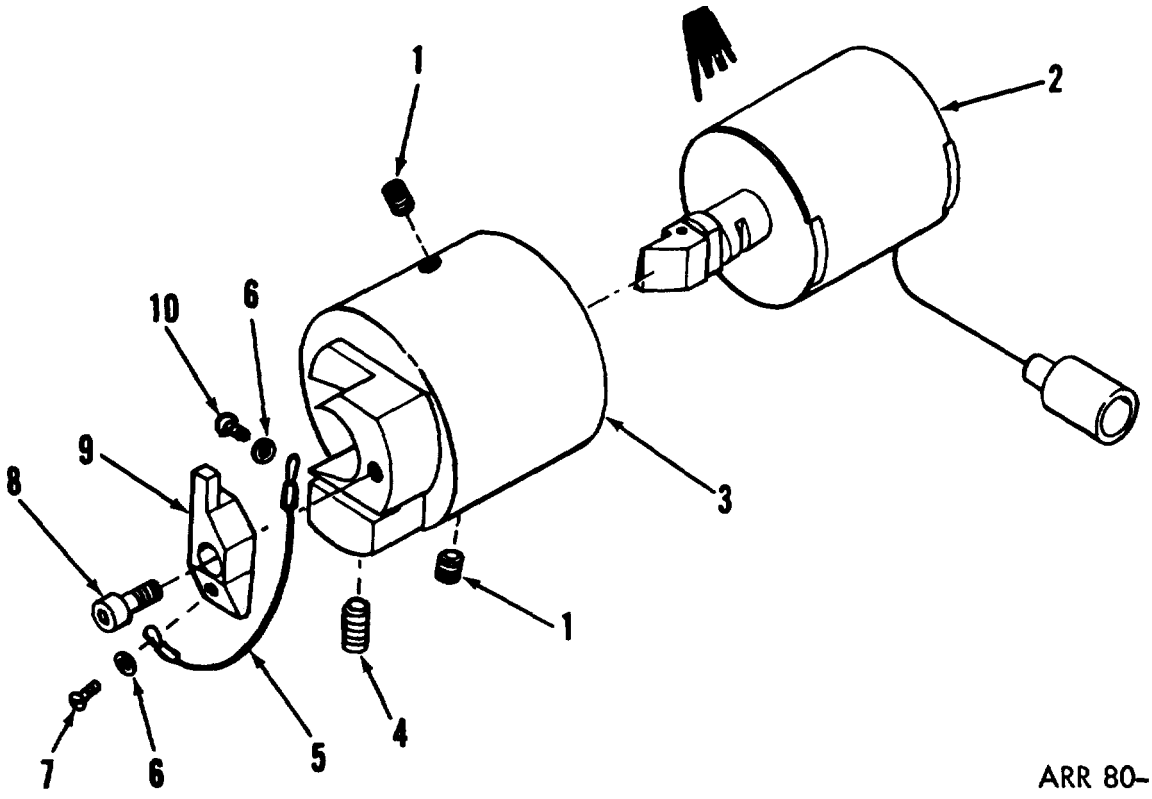


Figure C-5. Solenoid Assembly

(1) ILLUSTRATION (A) FIG. NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 03 SOLENOID ASSEMBLY 9332825		
C-5	1	PAOZZ	5305-00-723-9387	96906	MS51963-63	SETSCREW	EA	2
C-5	2	PAOZZ		89297	1178994	SOLENOID, ELECTRICAL	EA	1
C-5	3	PAOZZ	6920-01-117-1990	19200	9332792	HOLDER ASSEMBLY	EA	1
C-5	4	PAOZZ	5305-00-723-9385	96906	MS51963-65	SETSCREW	EA	1
C-5	5	PAOZZ	4010-01-121-9802	19200	9332795	WIRE ROPE ASSEMBLY	EA	1
C-5	6	PAOZZ	5310-00-722-3998	96906	MS15795-805	WASHER, FLAT	EA	2
C-5	7	PAOZZ	5305-00-850-5841	96906	MS21318-37	SCREW, DRIVE	EA	1
C-5	8	PAOZZ	6920-01-118-8947	19200	9332794	SCREW, SPECIAL	EA	1
C-5	9	PAOZZ	6920-01-117-1991	19200	9332793	RETAINER, SOLENOID	EA	1
C-5	10	PAOZZ	5305-00-253-5620	96906	MS21318-29	SCREW, DRIVE	EA	1

Section III. SPECIAL TOOLS LIST

The M180/M181 doesn't need any special tools.

Section IV. NSN, PART NO. INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5310-00-087-7493	C-1	7	5310-00-933-8778	C-2	12
5305-00-208-1429	C-1	6	5310-00-933-8778	C-4	4
5305-00-253-5620	C-5	10	5305-00-988-7608	C-4	8
5310-00-614-3506	C-1	3	5310-00-989-5945	C-4	2
5310-00-614-3506	C-2	11	6920-01-115-0927	C-4	1
5310-00-614-3506	C-4	3	5940-01-115-5582	C-1	10
5305-00-717-5467	C-2	7	5940-01-115-5582	C-2	2
5305-00-717-7869	C-3	1	6920-01-116-3835	C-1	13
5310-00-722-5998	C-5	6	6920-01-116-3836	C-1	17
5305-00-723-9385	C-5	4	6920-01-116-3836	C-2	14
5305-00-723-9387	C-5	1	6920-01-116-3837	C-1	2
5305-00-724-5819	C-3	6	5305-01-116-4797	C-1	15
5305-00-727-6804	C-1	14	5305-01-116-4797	C-2	9
5305-00-727-6804	C-2	4	6920-01-117-1990	C-5	3
5310-00-754-2005	C-1	8	6920-01-117-1991	C-5	9
5310-00-754-2005	C-3	2	6920-01-118-8947	C-5	8
5310-00-768-0321	C-1	5	4010-01-121-9802	C-5	5
5310-00-768-0321	C-2	13	5340-01-122-9746	C-2	3
5310-00-768-0321	C-4	5	6920-01-122-9886	C-4	6
5310-00-802-4701	C-2	8	6920-01-123-1837	C-1	11
5310-00-802-4701	C-3	8	6920-01-123-1837	C-2	6
5305-00-850-5841	C-5	7	6920-01-129-0127	C-1	16
5310-00-883-9384	C-4	7	6920-01-129-0127	C-2	10
5310-00-913-8681	C-1	9	5310-01-140-1408	C-3	7
5310-00-933-8778	C-1	4			

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
96906	MS15795-805	C-5	6	96906	MS51971-5	C-2	13
96906	MS15795-813	C-2	8	96906	MS51971-5	C-4	5
96906	MS15795-813	C-3	8	19200	11784989	C-1	10
96906	MS15795-817	C-1	3	19200	11784989	C-2	2
96906	MS15795-817	C-2	11	19200	11784991	C-1	1
96906	MS15795-817	C-4	3	19200	11784991	C-2	1
96906	MS15795-842	C-4	7	89297	1178994	C-5	2
96906	MS16555-677	C-3	4	19200	9332792	C-5	3
96906	MS16995-36	C-4	8	19200	9332793	C-5	9
96906	MS16996-41	C-3	1	19200	9332794	C-5	8
96906	MS21318-29	C-5	10	19200	9332795	C-5	5
96906	MS21318-37	C-5	7	19200	9332797-01	C-1	15
96906	MS27183-13	C-1	7	19200	9332797-01	C-2	9
96906	MS35307-362	C-2	7	19200	9332798	C-4	1
96906	MS35307-363	C-1	6	19200	9332800	C-1	11
96906	MS35307-414	C-1	14	19200	9332800	C-2	6
96906	MS35307-414	C-2	4	19200	9332801	C-3	3
96906	MS35338-143	C-1	4	19200	9332802	C-3	9
96906	MS35338-143	C-2	12	19200	9332803	C-3	5
96906	MS35338-143	C-4	4	19200	9332805	C-1	13
96906	MS35338-52	C-1	8	19200	9332806	C-4	6
96906	MS35338-52	C-3	2	19200	9332807	C-1	17
96906	MS35691-87	C-3	7	19200	9332807	C-2	14
96906	MS35691-35	C-4	2	19200	9332811	C-1	2
96906	MS51963-63	C-5	1	19200	9332814	C-2	3
96906	MS51963-65	C-5	4	19200	9332824	C-1	16
96906	MS51964-72	C-3	6	19200	9332824	C-2	10
96906	MS51971-3	C-1	9	19200	9332825	C-1	12
96906	MS51971-5	C-1	5	19200	9332825	C-2	5

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Chief of Staff

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