TM 9-4933-259-14&P

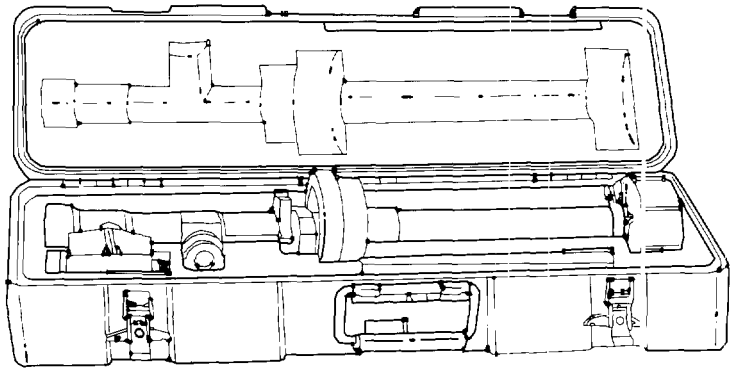
SUPERSEDES TM 9-4933-2349-24&P
DATED 9 JUL 85 AND
TM 9-4933-259-14&P DATED 12 APR 89

TECHNICAL MANUAL

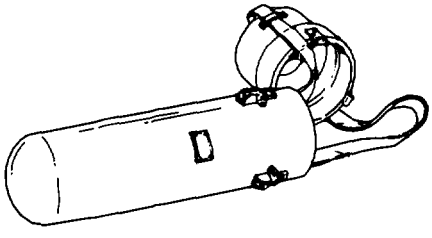
OPERATOR'S, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

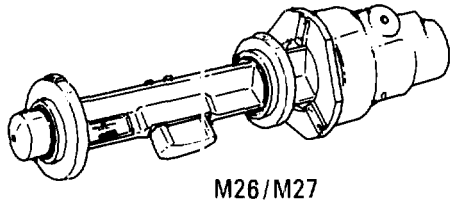
FOR

M26 MUZZLE BORESIGHT 105-MM W/CASE
(NSN 4933-01-141-0812),
M27 MUZZLE BORESIGHT 120-MM W/CASE
(NSN 4933-01-204-4307),
M26A1 MUZZLE BORESIGHT 105-MM W/CASE
(NSN 4933-01-236-2883),
AND
M27A1 MUZZLE BORESIGHT 120-MM W/CASE
(NSN 4933-01-236-2884)



M26A1/M27A1





M26/M27

Distribution Statement A. Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1990

WARNINGS

Failure to remove muzzle boresight from gun tube when weapon is fired may cause injury to personnel or damage to equipment.

Do not exceed pressures specified in maintenance procedure for purging and charging or injury to personnel can result.

Cleaning compounds and solvents are hazardous when not used in strict compliance with the manufacturer's instructions. Use these agents in a well-ventilated area away from heat source to avoid inhalation of toxic vapors. These agents will cause burns or skin irritation if protective clothing is not used. Eye protection should also be used.

Acetone can be hazardous if improperly used. Eye protection must be worn to prevent damage to the eyes. Acetone vapors are flammable, therefore use this solvent in a well-ventilated area away from heat.

Nitrogen gas bottles are color-coded gray with two black stripes. Use extreme caution not to mistakenly use some other gas which could create an explosive atmosphere in the work area. Secure bottles in an upright position.

Do not drop tank of compressed nitrogen gas. When using in confined areas, use extreme care. Nitrogen gas could cause asphyxiation.

Overexposure to sealing compounds can cause nausea, redness of skin, and dizziness. Use sealing compounds in a well-ventilated area and wear protective equipment to prevent contact with skin and eyes.

To avoid possible electrical shock, shut off power before removing light source from projector collimator.

FIRST AID

For further information on first aid, see FM 21-11.

Do not exceed pressures specified in the purging and charging procedures or injury to personnel can result.

Sealing compound burns easily and can give off harmful vapors. To avoid injury, keep away from open fire and use in a well-ventilated area.

TECHNICAL MANUAL

NO. 9-4933-259-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC 2 March 1990

OPERATORS, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR M26 MUZZLE BORESIGHT 105-MM W/CASE (NSN 4933-01-141-0812), M27 MUZZLE FORESIGHT 120-MM W/CASE (NSN 4933-01-204-4307), M26A1 MUZZLE BORESIGHT 105-MM W/CASE (NSN 4933-01-236-2883), AND M27A1 MUZZLE BORESIGHT 120-MM W/CASE (NSN 4933-01-236-2884)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes orif you know of a wayto improve the procedures, please let us know. Mail your letter or DAForm 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS-TA, Rock Island, IL 61299-6000. A reply will be furnished to you.

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*Supersedes TM 9-4933-249-24&P dated 9 Jul 85 and TM 9-4933-259-14&P dated 12 Apr 89.

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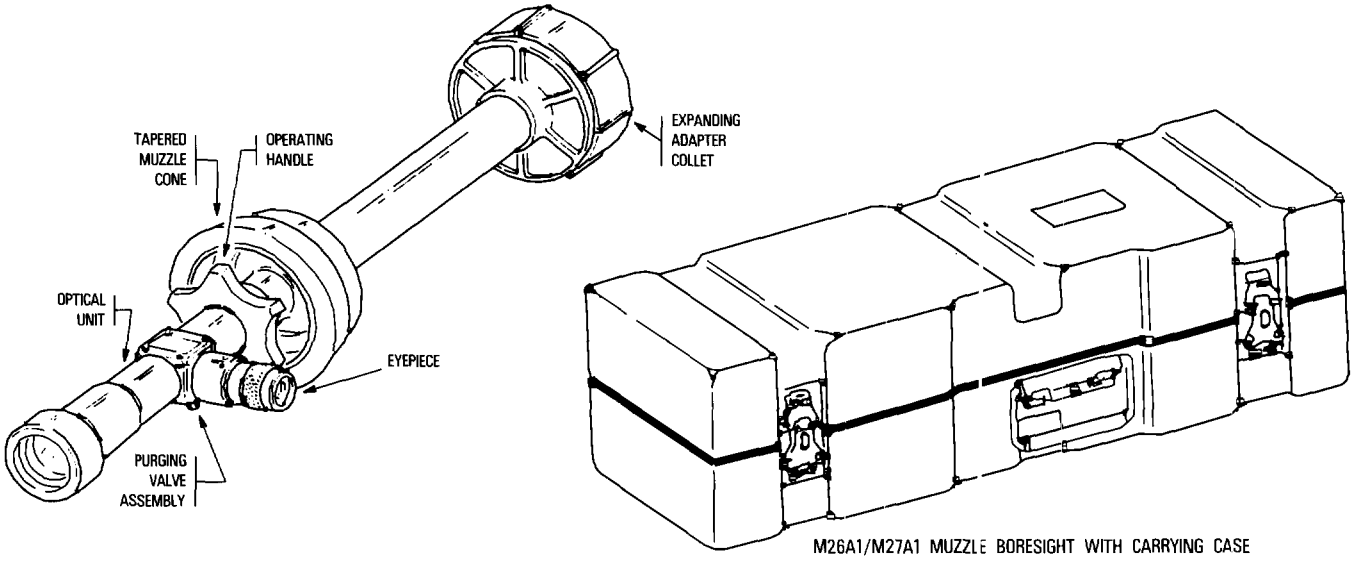
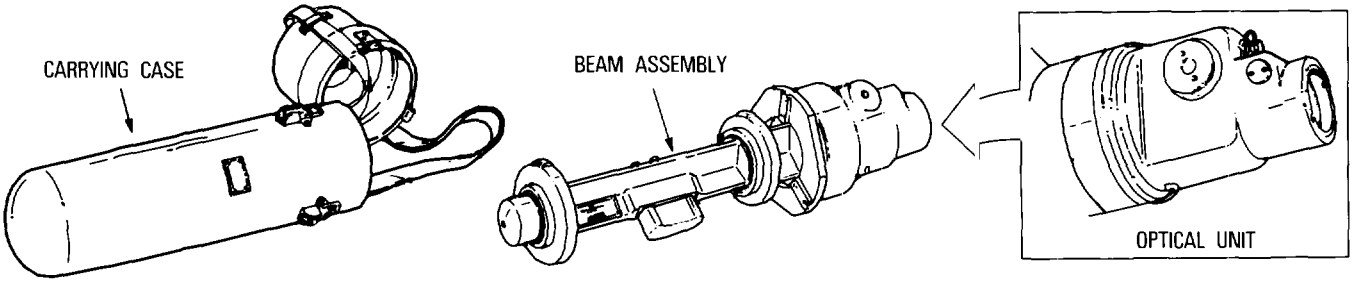
CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION



M26A1/M27A1 MUZZLE BORESIGHT WITH CARRYING CASE



M26/M27 MUZZLE BORESIGHT WITH CARRYING CASE

1-1. PURPOSE AND FUNCTION. The M26, M27, M26A1, and M27A1 muzzle boresights are optical instruments, that when used properly, provide a fast and easy method of alining the direct fire sight with the axis of the gun tube.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your muzzle boresight with case 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. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD, Rock Island, IL 61299-6000. We'll send you a reply.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Refer to TM 750-244-7.

1-5. CAPABILITIES. The M26A1\M27A1 muzzle boresight utilizes a two-stage tapered muzzle cone which allows it to be used in either a 105-mm or 120-mm gun tube. In addition, an expanding adapter collet is provided which, when expanded by the operating handle, secures the muzzle boresight firmly inside the gun tube.

1-6. PREPARATION FOR STORAGE OR SHIPMENT. To prepare boresight device:

a. Check device for moisture. If moisture is present, purge device (p 5-20).

b. Place device in accompanying case assembly (p 2-6).

c. Secure case assembly cover (p 5-25).

1-7. CORROSION. Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problem with this item be reported so that the problem can be corrected and improvements can be made to prevent problems in the future.

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

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as corrosion, rust, deterioration, or cracking will assure that the information is identified as a CPC problem. The form should be submitted to: Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD/Customer Feedback Center, Rock Island, IL 61299-6000.

1-8. PERFORMANCE CHARACTERISTICS.

a. The tapered muzzle cone and expanding adapter collet automatically locate the muzzle boresight to the center of the gun tube even with gun tube wear.

b. Reticle illumination is provided by daylight during daylight operation. A reticle illumination port is also provided to permit nighttime operation using a flashlight as an external light source.

c. A rugged, compact, waterproof carrying case is provided to protect muzzle boresight when not in use.

d. The replaceable expanding adapter collet on A1 models allows easy conversion from 105-mm to 120-mm gun tubes.

1-9. TABLE OF SPECIFICATIONS.

M26A1/M27A1

Muzzle Boresight:

Magnification	10X
Field of View	4.5 degrees (79.96 mils)
Focal Range	300 in. (762 cm)
Focusing Eyepiece	±4 diopters
Aperture	f 5.3
Weight	9.75 lb (4.42 kg) (w/o case)

Engagement Length:

105-mm tube	12.625 in. (32.07 cm)
120-mm tube	13.5 in. (34.29 cm)
Reticle	Crosshair with 1 milliradian circle, 0.06 milliradian line width

Carrying Case:

Weight	8.25 lb (3.74 kg)
Length	26.25 in. (66.68 cm)
Depth	8.50 in. (21.59 cm)
Height	7.50 in. (19.05 cm)

M26/M27

Magnification	7X
Field of View	6 degrees
Focal Length	4.09 in. (140.00 mm)
Focal Length of Eyepiece	0.61 in. (15.40 mm)
Eyepiece (Fixed Focus)	-1/2 to -1 diopter
Length	21 in. (53.34 cm)
Reticle	circle and dot
Circle Diameter	1 degree
Line Thickness	0.039 in. (0.010 mm)
Center Dot Diameter	0.059 in. (0.015 mm)

Section II. SAFETY PRECAUTIONS

1-10. GENERAL.

WARNING

Failure to remove muzzle boresight from gun tube when weapon is fired may cause injury to personnel or damage to equipment. Immediately after use of the muzzle boresight, remove from gun tube and store in carrying case.

Section III. GENERAL THEORY OF OPERATION

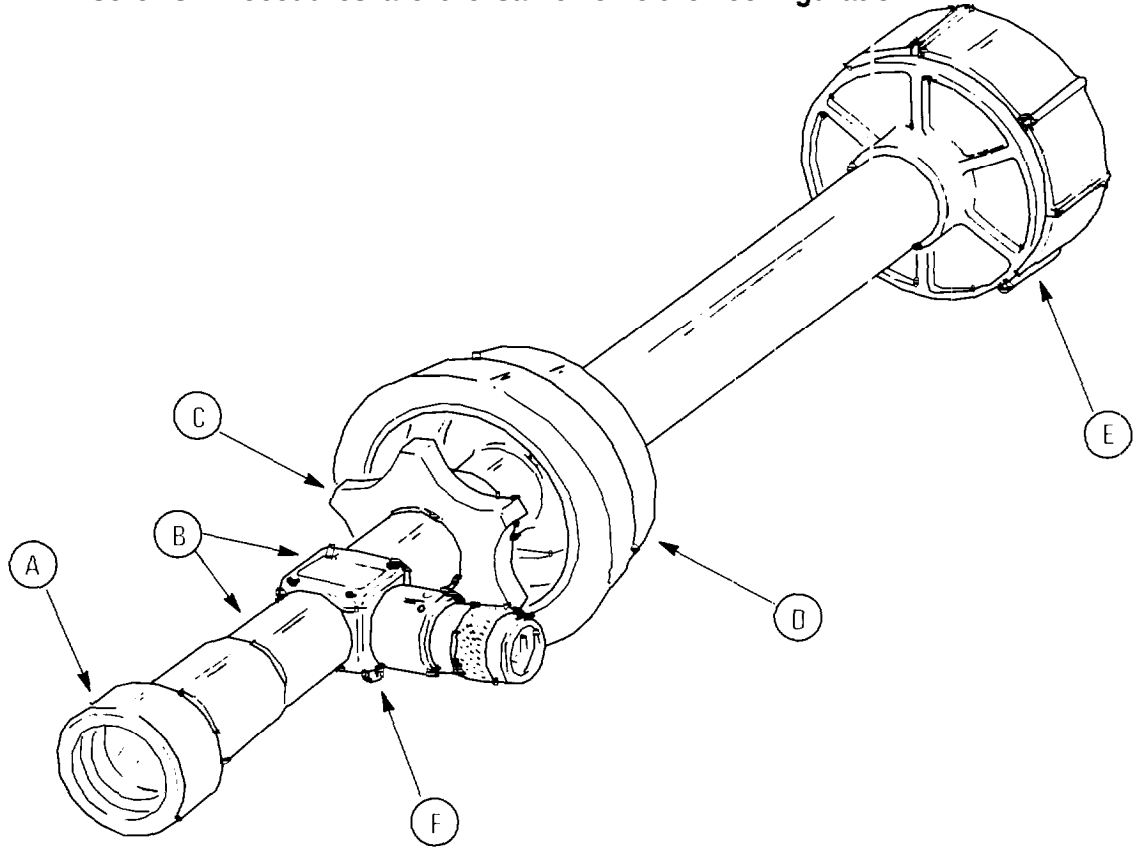
1-11. GENERAL. Boresighting is an alinement process by which the gun tube and optical sighting systems are referred to the same aiming point. Combat readiness is dependent upon the fire control system being calibrated to ensure maximum first round hit capability.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

NOTE

All illustrations show the M26A1/M27A1 model unless otherwise noted.

M26A1/M27A1 models may have either three or four reticle screws. Procedures are the same for either configuration.



(A) **OBJECTIVE ASSEMBLY.** Consists of objective lens and objective cell assembly.

(B) **OPTICAL UNIT.** Consists of a prism, reticle, and eyelens assembly.

(C) **OPERATING HANDLE.** Used to adjust the expanding adapter collet.

(D) **TAPERED MUZZLE CONE.** Consists of 120-mm and 105-mm muzzle cone.

(E) **EXPANDING ADAPTER COLLET.** Ensures gun tube centerline location even with gun tube wear.

(F) **PURGING VALVE ASSEMBLY.** Allows nitrogen purging and charging.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATION UNDER USUAL CONDITIONS

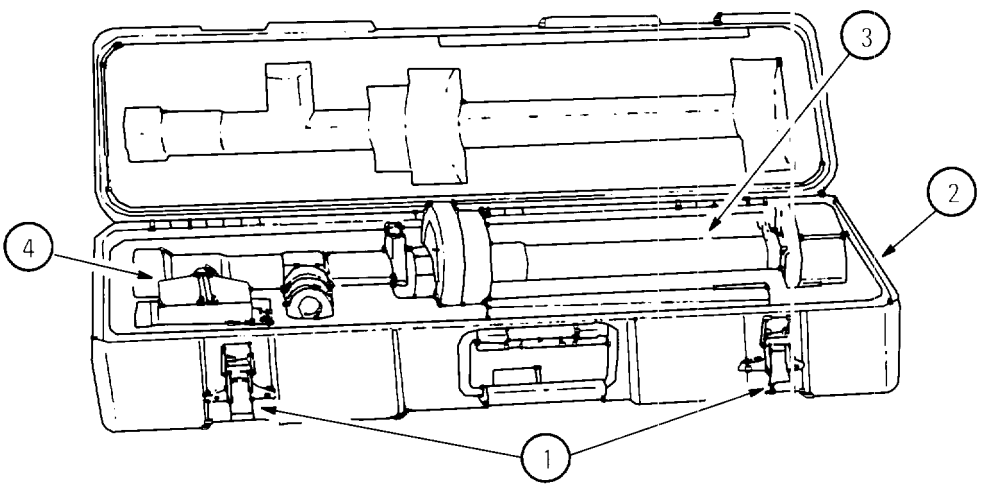
2-1. FORESIGHT PROCEDURES.

NOTE

The following procedures are to be used in conjunction with boresight procedures in TM 9-2350-255-10-2, TM 9-2350-258-10, TM 9-2350-260-10, TM 9-2350-257-10-2, TM 9-2350-215-10, TM 9-2350-253-10, and TM 9-2350-264-10-2. Two personnel are required to perform the following procedures.

Before operation, perform PMCS on page 3-1.

All illustrations show the M26A1/M27A1 model unless otherwise noted.



(1) Select a target (distant aiming point).

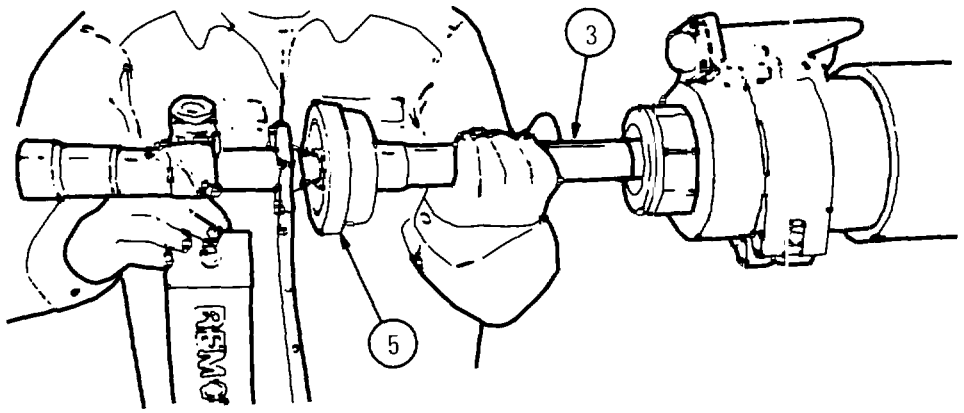
(2) Position tank on as level ground as possible with gun tube alined at target. Clear all weapons and leave main breech open.

(3) Remove muzzle plug from end of gun tube. Check inside of gun tube for foreign objects.

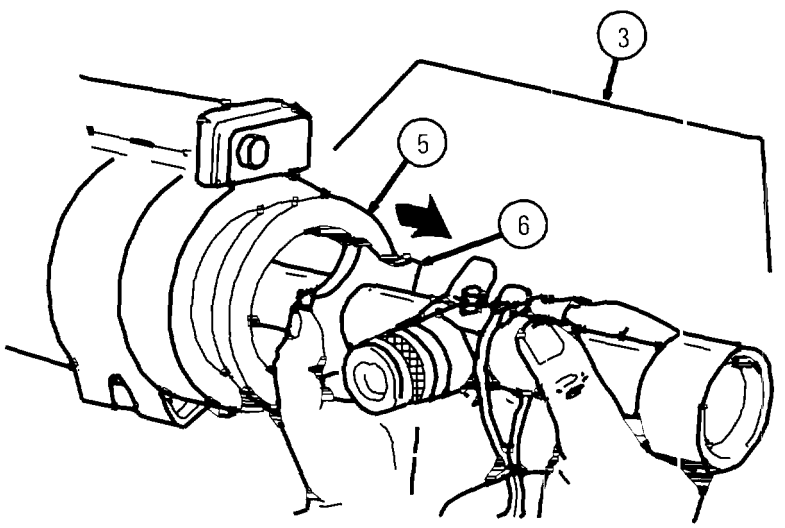
(4) Release latches (1) and open carrying case (2). Remove muzzle boresight (3) from carrying case (2).

(5) M26A1\M27A1, remove red flag (4) from carrying case and attach to muzzle boresight (3).

2-1. BORESIGHT PROCEDURES (cont).



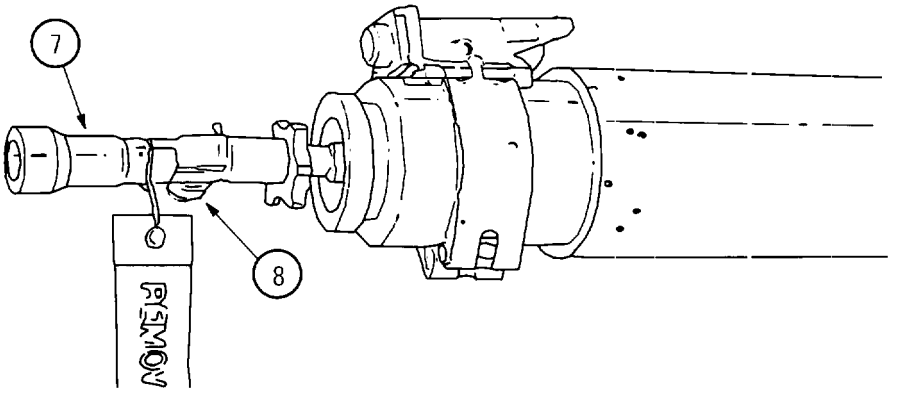
(6) Insert muzzle boresight (3) into muzzle end of gun tube by holding shaft and tapered muzzle cone (5) with mark on M26A1/M27A1 muzzle cone at 12 o'clock position and M26/M27 eyepiece at 9 o'clock position.



(7) While ensuring tapered muzzle cone (5) remains firmly seated, rotate operating handle (6) clockwise to secure muzzle boresight (3) in gun tube.

NOTE

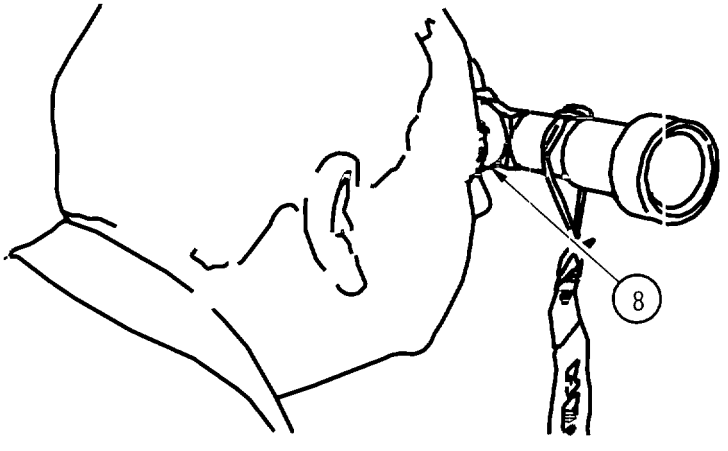
Once operating handle is tight, mark operating handle at 12 o'clock position with chalk. This will enable user to tighten operator's handle to approximately same spot each time. Once boresighting is completed erase mark. New mark should be used each time.



(8) Rotate optical unit (7) to position eyepiece (8) at the 3 o'clock position.

NOTE

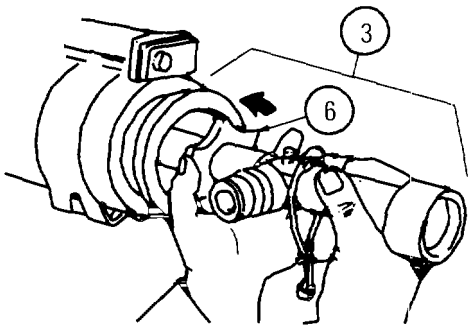
When alining muzzle boresight reticle to selected aiming point, manually traverse and elevate main gun. It is important that final lay of weapon be made upward, using standard US Army G-pattern.



(9) While looking through eyepiece (8) adjust eyepiece locus until reticle and target are clear and sharp.

(10) Without touching main gun or muzzle boresight, look through eyepiece (8) while other person traverses and elevates to aline the boresight cross on the selected aiming point.

2-1. BORESIGHT PROCEDURES (cont).



NOTE

Record first readings.

(11) Without disturbing main gun, adjust reticle of gunner's sight to selected aiming point.

(12) Re-lay weapon using gunner's sight and verify alinement of muzzle boresight and direct fire sight with selected aiming point. If either muzzle boresight reticle or gunner's primary sight reticle is not on the aiming point, notify support maintenance.

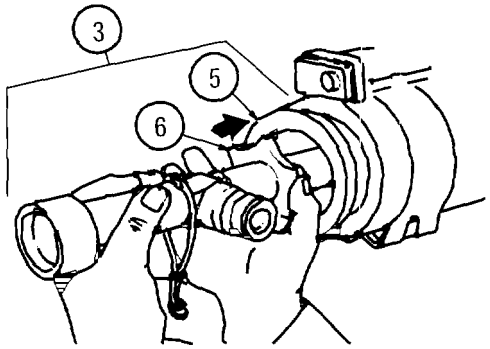
NOTE

Hold optical unit securely in one hand while rotating operating handle with other hand.

(13) Hold tapered muzzle cone (5) and rotate operating handle (6) counterclockwise approximately 3 to 5 turns to unseat muzzle boresight (3), then remove boresight (3) from end of gun tube.

NOTE

Chalk mark on operating handle should be alined with mark on the tapered muzzle cone at 6 o'clock.



(14) Rotate muzzle boresight (3) 180 degrees so mark on tapered muzzle cone (5) is at 6 o'clock position. Reposition boresight (3) into end of gun tube by holding tapered muzzle cone (5) and shaft.

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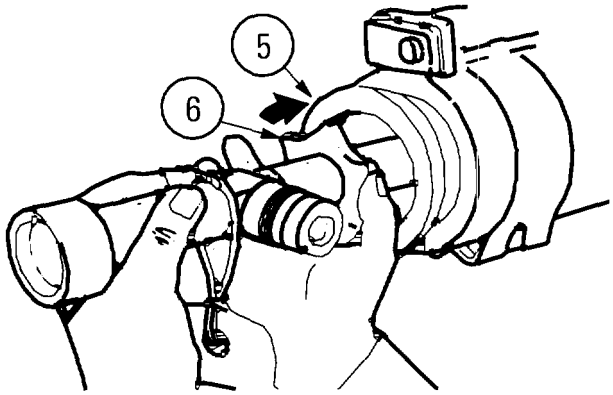
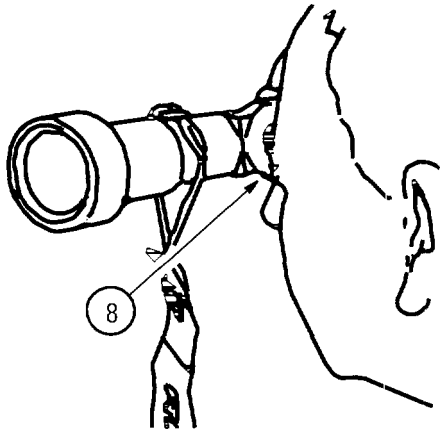


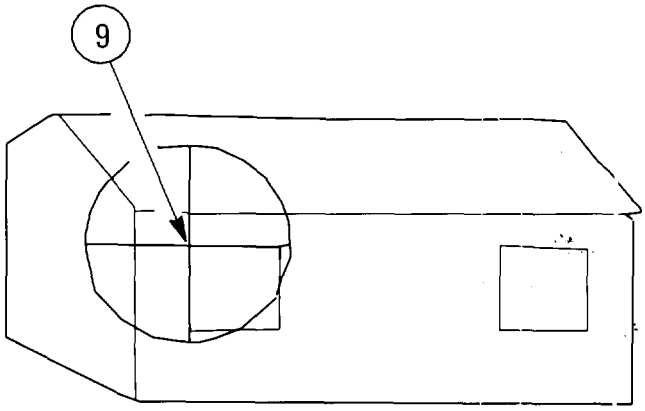
(15) Holding tapered muzzle cone (5), ensure device remains seated in gun tube and rotate operating handle (6) clockwise until it is hand tight.

NOTE

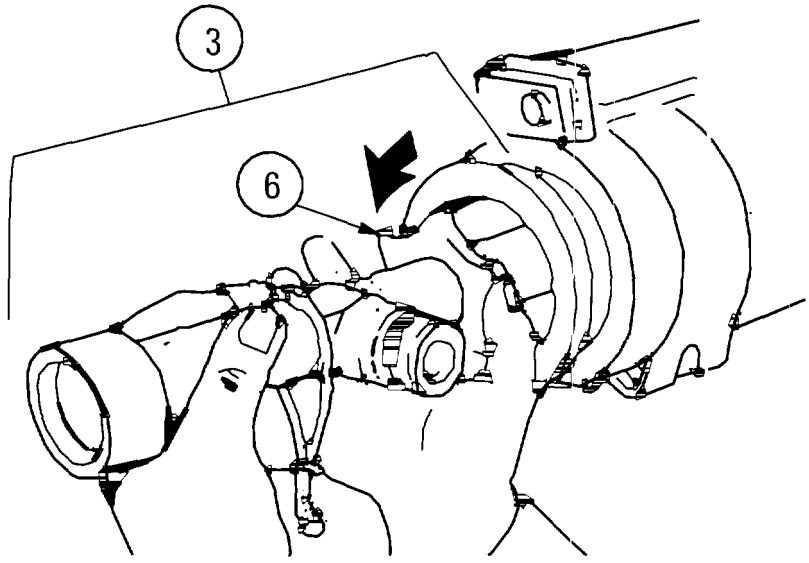
Chalk mark on operating handle (6) should be alined with mark on tapered muzzle cone at 6 o'clock.



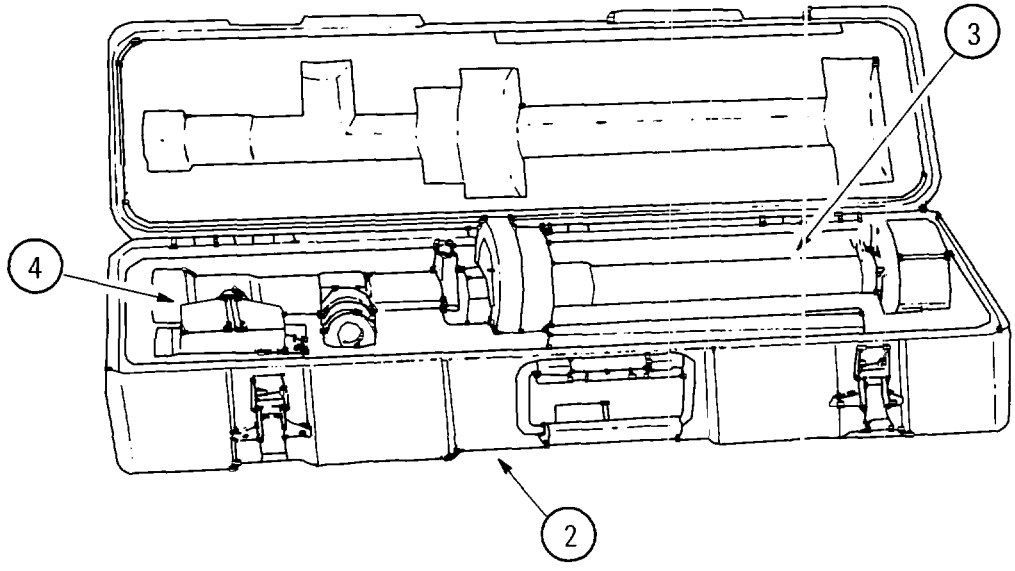
(16) Place optical unit at 9 o'clock position with reticle on same vertical and horizontal planes as target.



(17) Looking through eyepiece (8), the muzzle boresight cross should still be alined on selected aiming point (9). If not, go to appendix F (Boresight Centering Procedures).



Rotate operating handle (6) counterclockwise to loosen and remove muzzle boresight (3) from gun tube.



(19) Remove red flag (4) from muzzle boresight (3) and return red flag and muzzle boresight to carrying case (2).

(20) Stow muzzle boresight.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-2. GENERAL. In addition to performing all normal preventive maintenance services, special care must be taken in cleaning and lubrication when extremes in temperature, humidity, and terrain conditions are present or expected. Proper cleaning, lubrication, and storage and handling of oil and lubricants not only ensure proper operation and functioning, but also guard against excessive wear of working parts and deterioration of materiel.

2-3. EXTREME COLD WEATHER CONDITIONS.

a. When not in use, muzzle boresight should be kept covered in the carrying case or properly stowed.

b. Do not let snow or ice accumulate on equipment. Moving parts must be kept free of moisture.

c. Use only dry wiping rags (item 10, app C) and dry lens paper (item 9, app C) for cleaning.

2-4. OPERATION IN HOT, DAMP, AND SALTY ATMOSPHERES.

a. If moisture is present in optics, notify support maintenance to purge and charge muzzle boresight.

b. Salt deposits are especially harmful to optical surfaces. Deposits should be loosened by sponging with a clean wiping rag (item 10, app C). Deposits should not be rubbed.

2-5. UNUSUAL TERRAIN CONDITIONS - SAND, DUST, AND DIRT.

a. Be careful to keep sand and dust out of mechanisms when making adjustments and repairs.

b. Shield parts from flying sand and dust with tarpaulins during disassembly and assembly operations.

c. When operating in sandy or dusty areas, remove lubricants from exposed lubricated parts. Lubricants will pick up sand and dirt, forming an abrasive which will cause rapid wear. With surfaces dry, there is less wear than when they are coated with lubricant contaminated with sand or dirt.

CHAPTER 3

UNIT MAINTENANCE

Section I. SERVICE UPON RECEIPT

3-1. SCOPE. This section contains instructions for services to be performed by the using unit upon the receipt of a muzzle boresight with case.

3-2. CHECKING UNPACKED EQUIPMENT. The following actions will be taken as soon as possible upon receipt of the equipment:

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF Form 364, Report of Discrepancy (ROD).

b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-750.

3-3. SERVICE UPON RECEIPT. A muzzle boresight with case received from storage will be purged with nitrogen (p 5-20) before being placed in service if condensation is noticed.

Section II. PREVENTIVE AND CORRECTIVE MAINTENANCE

3-4. GENERAL. To ensure maximum operational readiness, the muzzle boresight with case will be inspected at regular intervals so defects may be discovered and corrected before they result in serious damage or failure. Any deficiencies discovered that are beyond unit authorization will be referred to general support maintenance for correction.

3-5. PREVENTIVE AND CORRECTIVE MAINTENANCE. Table 3-1 lists those preventive and corrective maintenance checks to be performed quarterly.

a. Column 1, Item to Be Inspected. The first column lists the item to be inspected.

b. Column 2, Procedures. The second column contains all the information required to accomplish the checks and services.

NOTE

All illustrations show the M26A1/M27A1 model unless otherwise noted.

M26A1/M27A1 models may have either three or four reticle screws. Procedures are the same for either configuration.

Table 3-1. Preventive and Corrective Maintenance Quarterly Schedule

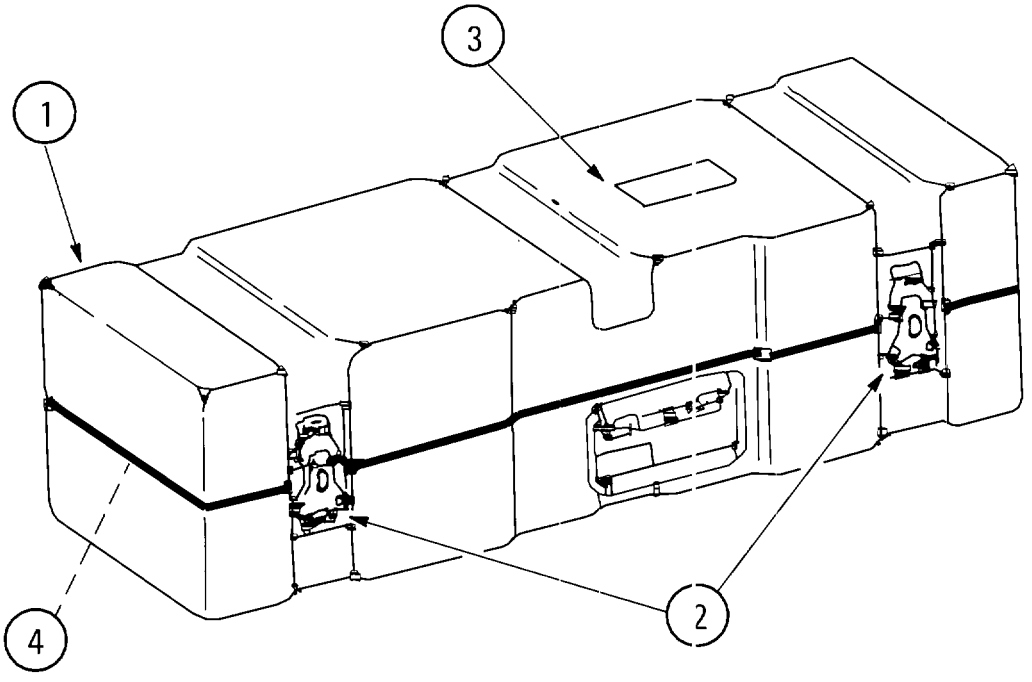
Item to Be Inspected	Procedures
Carrying Case	 Check carrying case (1) for: **a.** Cracks. **b.** Broken or missing latches (2). **c.** Illegible or damaged data plate (3). **d.** Damaged gasket (4). **NOTE** **If carrying case is cracked, latches are broken or missing, or if gasket is damaged, replace M26A1/M27A1 carrying case (app D) or return M26/M27 muzzle boresight with case for replacement of entire unit.**

Table 3-1. Preventive and Corrective Maintenance Quarterly Schedule (cont)

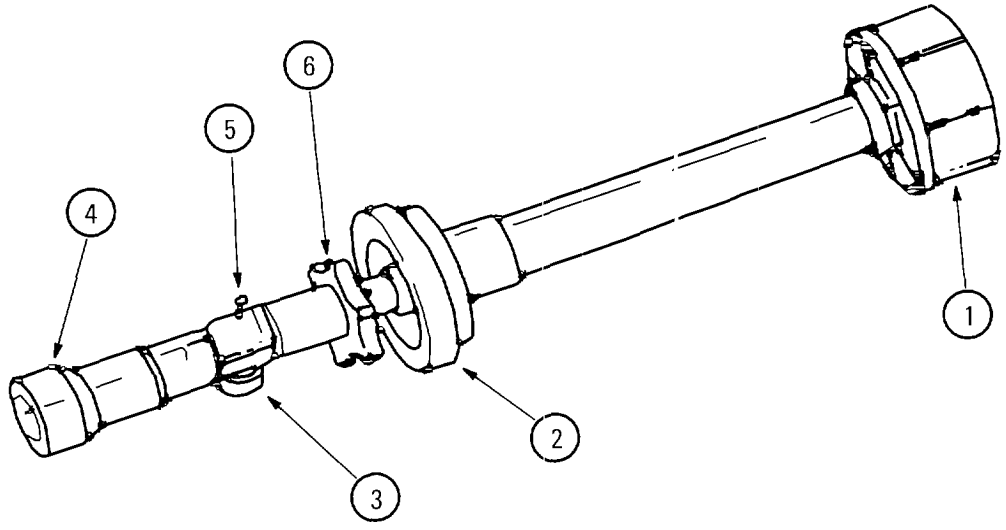
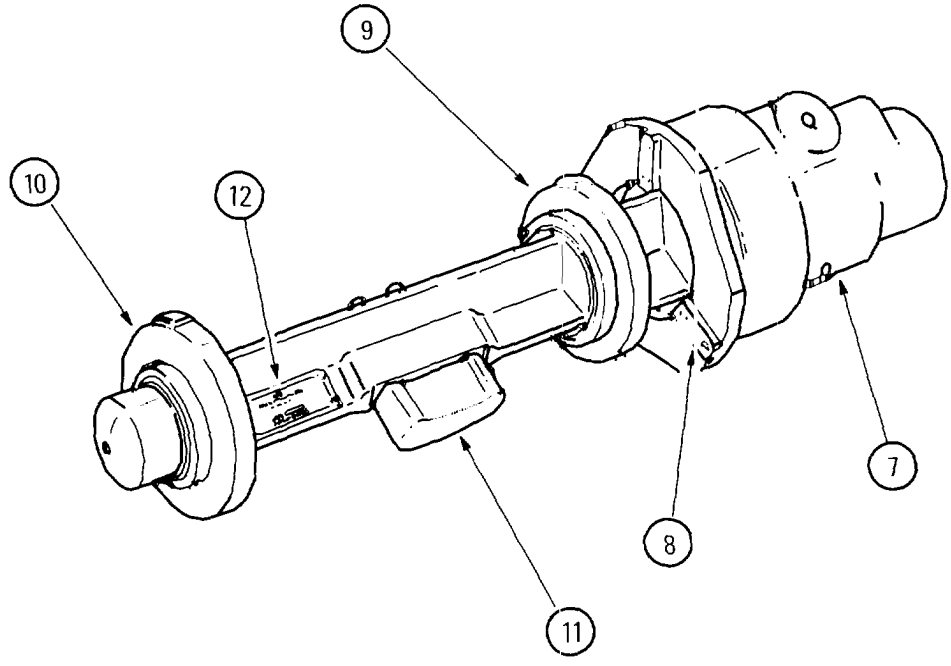
Item to Be Inspected	Procedures
Muzzle Boresight	 **a.** M26A1/M27A1, check expanding adapter collet (1) for nicks, gouges, and burrs. **b.** M26A1/M27A1, check tapered muzzle cone (2) for burrs and nicks. **c.** Check lens of eyepiece (3) for scratches, cracks, and condensation. **d.** Check optical unit (4) or window for scratches, cracks, and condensation. **e.** Check purge valve (5) for completeness (valve core and pneumatic valve cap present). **f.** M26A1/M27A1, check operating handle (6) for free movement.

Table 3-1. Preventive and Corrective Maintenance Quarterly Schedule (cent)

Item to Be Inspected	Procedures
Muzzle Boresight (Cont)	 **g.** M26\M27, check protective cover (7) for holes and deterioration. **h.** M26/M27, check three stop pads (8) for wear, cracks, or missing shoulder screws. **i.** M26/M27, check large foot (9) and small foot (10) for burrs. **j.** M26/M27, check tension by grasping locating block assembly (11) in one hand and attempting to compress by squeezing. Springs should not compress. **k.** M26/M27, check data plate (12) for illegibility or damage. **NOTE** **For corrective action to the preceding muzzle boresight deficiencies, notify unit maintenance.** **Equipment is not available if it does not pass inspection criteria.**

CHAPTER 4

DIRECT SUPPORT MAINTENANCE

There is no maintenance authorized at the direct support level.

CHAPTER 5

GENERAL SUPPORT MAINTENANCE

Section I. INITIAL INSPECTION

5-1. GENERAL.

a. The M26\M27 and M26A1\M27A1 muzzle boresight devices have a discard-at-failure maintenance philosophy. Therefore, any deficiencies discovered which are beyond general support maintenance capability will require replacement of the muzzle boresight (app D). The M26/M27 muzzle boresight will be replaced with the M26A1/M27A1 muzzle boresight (app D).

b. M26A1/M27A1 models may have either three or four reticle screws. Procedures are the same for either configuration.

5-2. CATEGORIES OF INSPECTION.

a. An initial inspection is performed immediately upon receipt of the equipment for maintenance. If this inspection does not reveal any deficiencies, refer to collimation procedures (p 5-18) for further testing. These procedures will determine the amount of work to be performed or whether the equipment should be replaced.

b. A pre-embarkation inspection is to be performed on the equipment in accordance with TB 9-2300-281-35.

Table 5-1. Initial Inspection

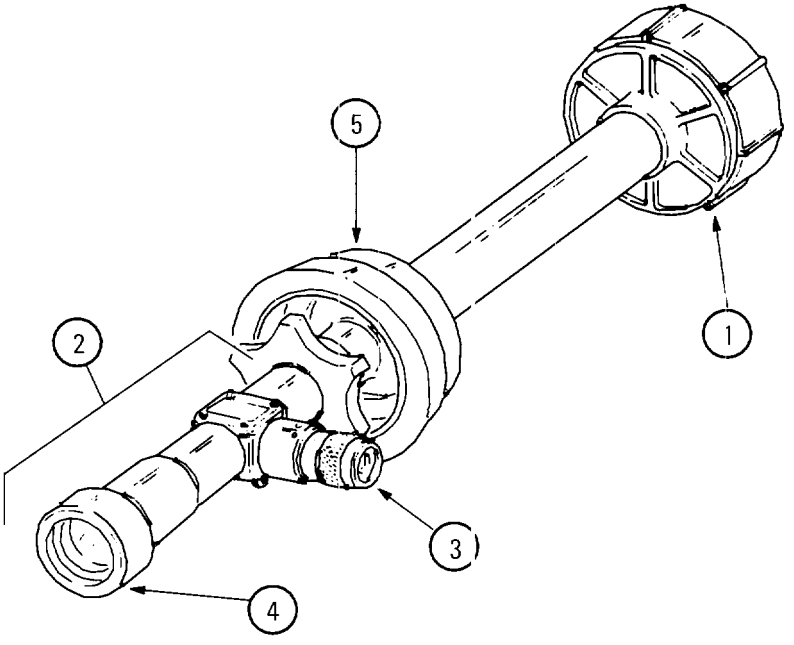
Item to be Inspected	Procedure
M26A1/M27A1	
Expanding Adapter Collet (1)	Visually inspect for burrs.
Optical Unit (2)	**a.** Look through eyepiece assembly (3) and objective end (4) of optical unit and inspect for moisture. **b.** Visually inspect for scratched or cracked optics.
Tapered Muzzle Cone (5)	Visually inspect for burrs.

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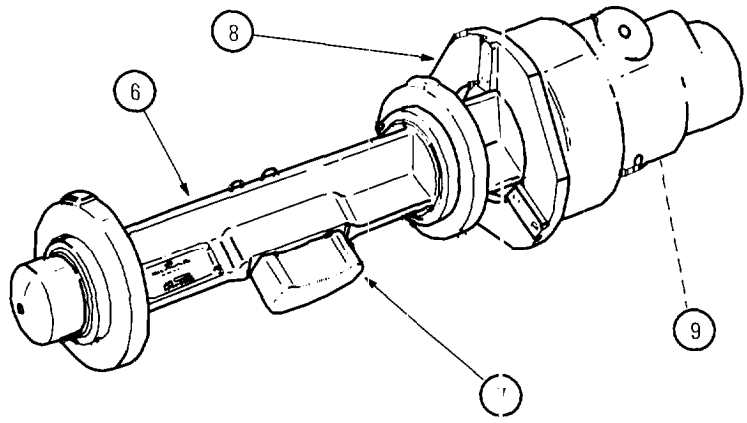
Table 5-1. Initial Inspection (Continued)

Item to be Inspected	Procedure
M26/M27	
Beam Assembly (6)	Check threads, wear plate, small foot, and large foot for burrs.
Locating Pad Assembly (7)	a. Check threads and block assembly for burrs. b. Check for broken, weak, or corroded springs. Position weapon to aline boresight reticle dot on a selected aiming point at least 3937 ft (1200 m) distant. Apply downward pressure of approximately 4.00 lb (1.81 kg) on optical unit, compressing springs in locating pad assembly. Release pressure and check that reticle dot realines on previous aiming point within 0.05 mil (1/3 of reticle dot diameter).
Small Ring Assembly (8)	a. Check threads for burrs. b. Check stop pads for deterioration and gouges.
Optical Unit (9)	Check all optics for definition, foreign matter, scratches, pits, moisture, and separation.

Section II. TROUBLESHOOTING

5-3. TROUBLESHOOTING INFORMATION.

a. The symptom index can be used as a quick guide to troubleshooting. Common malfunctions are listed in alphabetical order, with a page number reference to the trouble-shooting table where a test or inspection and corrective action are provided.

b. Table 5-2 lists the malfunction, the test or inspection indicating the malfunction, and corrective action needed. There are illustrations to show location of parts where required. Perform the tests\inspections and corrective actions in the order listed.

c. This manual cannot list all malfunctions that may occur, nor all tests, infections, or corrective actions. If a malfunction is not listed or if the malfunction still exists after all listed corrective actions have been performed, turn in muzzle boresight in accordance with army regulations.

NOTE

All illustrations show the M26A1/M27A1 model unless otherwise noted.

M26A1/M27A1 models may have either three or four reticle screws. Procedures are the same for either configurate on.

SYMPTOM INDEX

Table 5-2. Troubleshooting

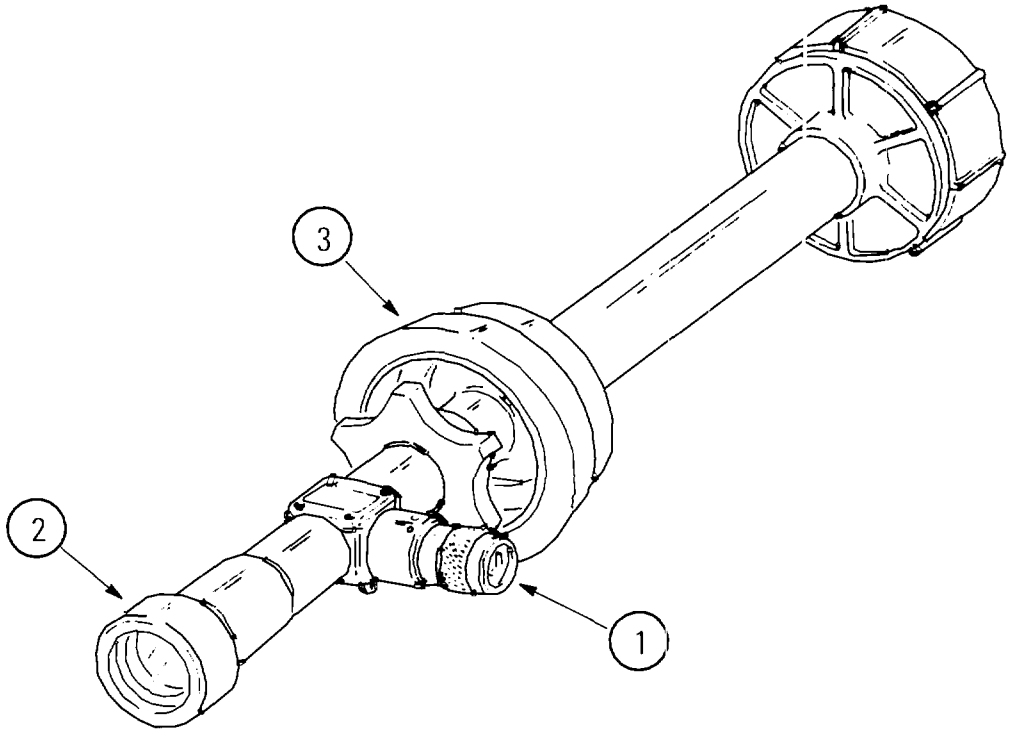
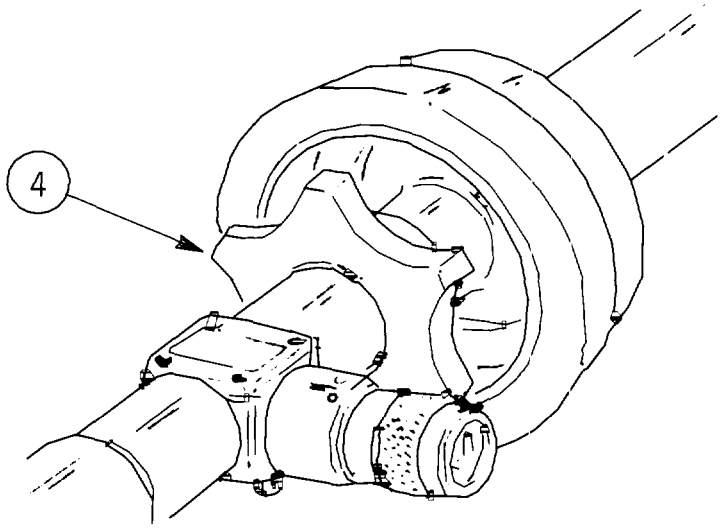
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. MUZZLE BORESIGHT HAS CONDENSATION PRESENT. Look through eyepiece (1) and objective end (2) of optical unit and inspect for moisture. **a.** If moisture is present, purge and charge (p 5-20). **b.** If moisture is still present after purging and charging, replace muzzle boresight (app D).
2. M26A1/M27A1, TAPERED MUZZLE CONE (3) DOES NOT FIT PROPERLY. Inspect visually for burrs. Refer to TM 9-254.
3. VISION IS IMPAIRED WHEN SIGHTING THROUGH OPTICAL UNIT. Inspect visually for scratched or cracked optics. If optics are damaged, replace muzzle boresight (app D).

Table 5-2. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



4. M26A1/M27A1, OPERATING HANDLE (4) FAILS TO TURN.

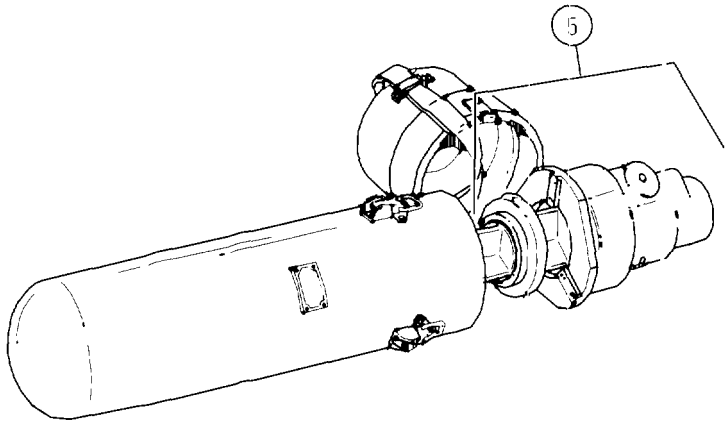
Turn operating handle to check for rotation.

If operating handle fails to turn, replace muzzle boresight (app D).

5. TARGET APPEARS DISTORTED WHEN SIGHTING THROUGH OPTICAL UNIT.

Inspect for parallax on telescope test fixture (p 5-10).

Adjust (p 5-10).



6. M26/M27, MUZZLE BORESIGHT (5) IS OUT OF ALINEMENT.

Inspect for alinement on telescope test fixture (p 5-10).

Aline (p 5-10).

Table 5-2. Troubleshooting (cont)

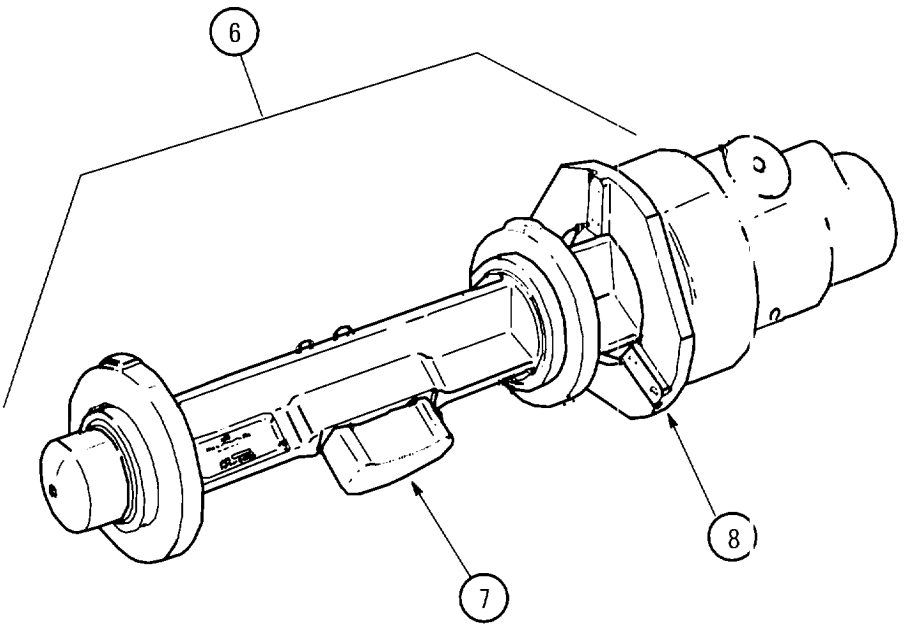
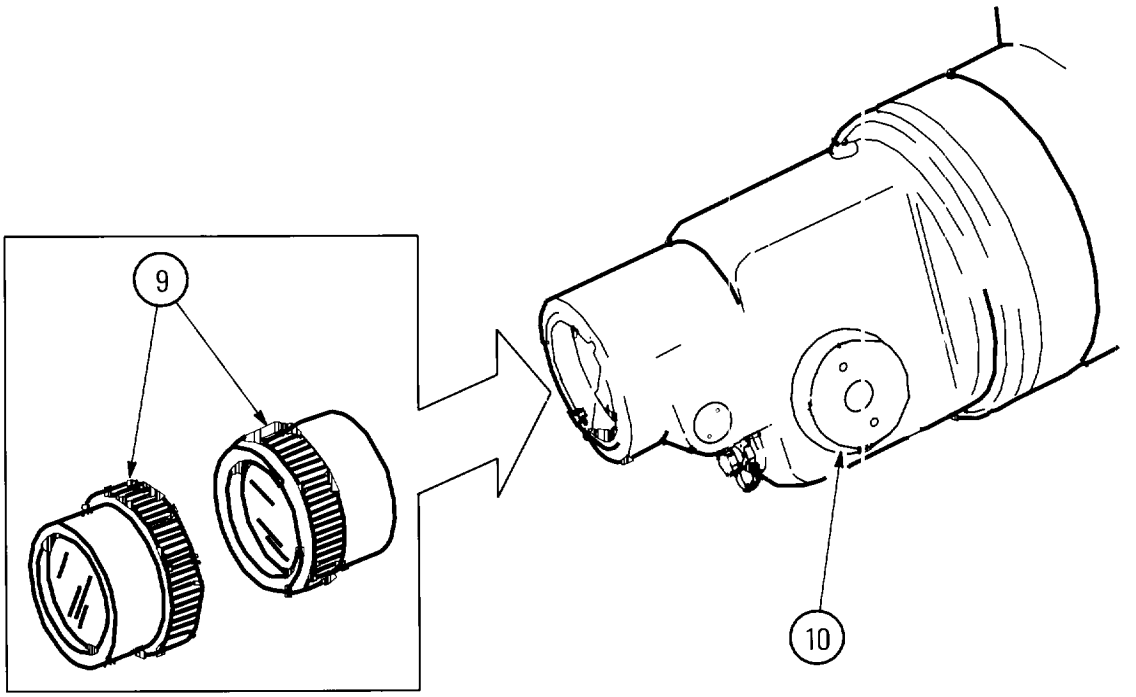
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

7. M26/M27, MUZZLE BORESIGHT FAILS TO CENTER IN GUN TUBE. Step 1. Inspect beam assembly (6) for burred parts. a. Remove burrs. b. Replace muzzle boresight (app D). Step 2. Inspect locating pad assembly (7) for burred parts or broken, weak, or corroded springs. a. Remove burrs. b. Inspect on telescope test fixture (p 5-10) and replace muzzle boresight (app D) if necessary. Step 3. Inspect small ring assembly (8) for burred threads cr deteriorated or gouged stop pads. a. Remove burrs. b. Replace muzzle boresight (app D).

Table 5-2. Troubleshooting (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



8. M26/M27, BACKLASH IS PRESENT IN WEDGE CELLS (9).

Rotate adjusting screws and inspect wedge cells visually.

Replace muzzle boresight (app D).

9. M26/M27, EYEPIECE (10) IS NOT FOCUSED BETWEEN -1/2 AND -1 DIOPTER.

Use dioptometer and inspect.

Replace muzzle boresight (app D).

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Section III. MAINTENANCE PROCEDURES

5-4. GENERAL MAINTENANCE INSTRUCTIONS.

WARNING

Cleaning compounds and solvents are hazardous when not used in strict compliance with the manufacturer instructions. Use these agents in a well-ventilated area away from heat source to avoid inhalation of toxic vapors. These agents will cause burns or skin irritation if protective clothing is not used. Eye protection should also be used.

Acetone can be hazardous if improperly used. Eye protection must be worn to prevent damage to the eyes. Acetone vapors are flammable, therefore use this solvent in a well-ventilated area away from heat.

a. Clean external optics with acetone (item 1, app C) and lens paper (item 9, app C). Clean all other components with cleaning compound (item 6, app C) and wiping rags (item 10, app C). File burrs in accordance with TM 9-254. Cover bare spots with paint (item 7, app C).

b. Inspect carrying case for damage. Replace M26A1/M27A1 case (app D) if required, or return M26/M27 muzzle boresight with case for replacement of entire unit.

NOTE

All illustrations show the M26A1/M27A1 model unless otherwise noted.

M26A1/M27A1 models may have either three or four reticle screws. Procedures are the same for either configuration.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-14 OPERATION IN EXTREME COLD (Below -25° F).

a. General. The generator set is designed to operate in ambient temperature as low as -25° F (-31 °C) without special winterization equipment. For operation at lower temperatures, the engine must be heated by either a fuel burning or electric winterizaton kit. Refer to paragraph 2-22 and 2-23 for operation instructions for these winterization kits.

(1) Cleaning. Keep the generator set and surrounding area as free of ice and snow as practical. Pay particular attention to the fuel tank cap and filler neck.

(2) Fuel System. Keep the fuel tank as full as possible to prevent condensation of moisture. Service the fuel tank with the proper grade of fuel for the existing ambient temperatures. Service the fuel strainer and filter assembly and secondary fuel filter at more frequent intervals. At the end of operation cycle, drain sediment from the fuel tank, fuel strainer and filter assembly, day tank, and secondary fuel filter.

(3) Engine Electrical System. Keep the batteries clean and inspect regularly for cracked and damaged cases. Keep the batteries fully charged at all times to avoid freezing. After adding distilled water to the batteries, operate the engine for at least an hour. Inspect the entire electrical system frequently for cracked, broken and frayed insulation. Tighten any loose connections and mounting damps.

(4) Lubrication. Make sure that lubricants used are as specified for the prevailing ambient temperature by the current Lubrication Order.

(5) Cooling System. Use a hydrometer to check the specific gravity of the coolant. Maintain the coolant specific gravity as specified for the prevailing ambient temperature in Table 2-1.

2-15 OPERATION IN EXTREME HEAT (Up to 125°F).

a. Cooling System. Check coolant level daily. Maintain coolant level approximately two inches below the radiator overflow pipe. Check that radiator louver control is operating properly. Check louvers and radiator air passages for obstructions frequently. Check fan belt for proper tension. Check coolant temperature gauge frequently for any indication of overheating.

b. Lubrication. Make sure that lubricants used are as specified for the prevailing ambient temperature in the current Lubrication Order.

c. Fuel System. When filling the fuel tank, allow sufficient space for fuel expansion.

d. Batteries. Check electrolyte level frequently. Add distilled water as required to compensate for evaporation.

e. Generator. Keep the generator clean and free of dirt. Make sure that the generator ventilating screen is free of obstructions which would inhibit airflow.

f. Engine. Keep the external surface of the engine as clean as possible.

2-16 OPERATION IN DUSTY OR SANDY AREAS.

a. General. If possible, provide a shelter for the generator set. Use available natural barriers to shield the generator set from blowing dust or sand. Keep all access doors closed as much as possible to prevent entry of dust and sand into the enclosure assembly. If water is available, wet down dusty surface areas around the set frequently.

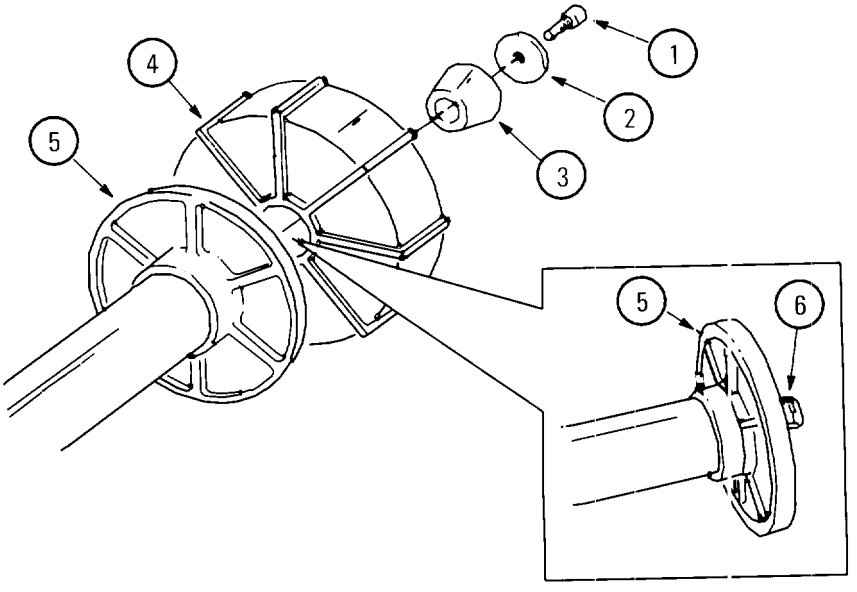
b. Cleaning. Wipe dust and sand from the generator set components frequently. When the generator set is not operating, the exterior surface should be thoroughly washed down with clean water.

c. Engine. Shorten the service interval for the engine air cleaner and oil filter to compensate for intake of additional dust or dirt. Keep the external surface of the engine as clean as possible.

d. Fuel System. Drain sediment from the fuel tank, fuel strainer, and fuel filters frequently. Be particularly careful to prevent dust or dirt from entering the fuel tank. Shorten the service intervals for the fuel filters appropriately.

e. Lubrication. Lubrication intervals must be shortened appropriately. Use particular care to keep lubricants from becoming contaminated with dust or dirt.

a. M26A1/M27A1, REMOVE/REPLACE EXPANDING ADAPTER COLLET.



(1) While tightly holding operating handle, remove socket head 3/16-in. screw (1), flat washer (2), collet taper plug (3), and expanding adapter collet (4) from base plate (5).

(2) Check for damaged, broken, or missing parts.

(3) Repair is by replacement of authorized parts (app D) which do not meet the inspection criteria.

NOTE

Do not remove solid film lubricant from base plate.

WARNING

Cleaning compounds and solvents are hazardous when not used in strict compliance with the manufacturer's instructions. Use these agents in a well-ventilated area away from heat source to avoid inhalation of toxic vapors. These agents will cause burns or skin irritation if protective clothing is not used. Eye protection should also be used.

(4) Clean collet mating surface with solvent cleaning compound and wiping rags.

(5) Lubricate O-ring (6) and drawbar with silicon grease.

(6) Install expanding adapter collet (4), collet taper plug (3), and flat washer (2).

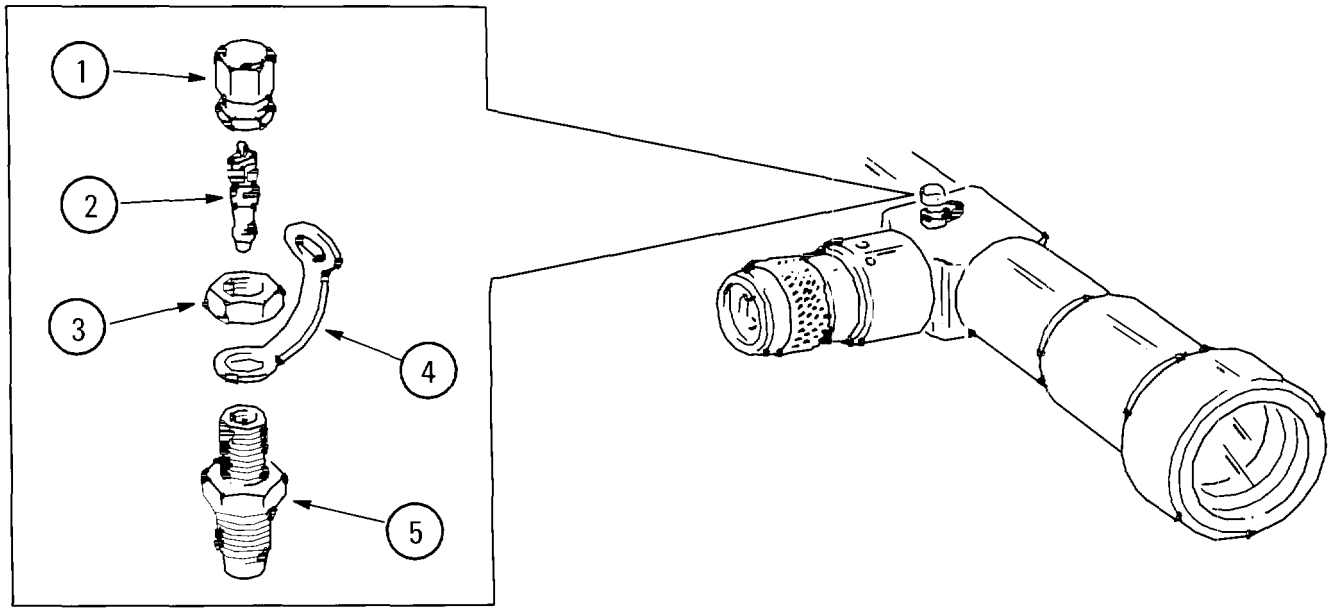
WARNING

Sealing compound burns easily and can give off harmful vapors. To avoid injury, keep away from open fire and use in a well-ventilated area.

(7) Apply sealing compound to socket head 3/16-in. screw (1) and install. Tighten socket head 3\16-in. screw until snug.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (CONT).

b. REMOVE/REPLACE PURGING VALVE ASSEMBLY.



CAUTION

Pressure must be released from optical unit before disassembly to prevent damage to internal components during disassembly.

NOTE

Remove valve stem only if damaged.

(1) To release pressure from optical unit, remove pneumatic valve cap (1) and depress valve core (2).

(2) Remove plain hex nut (3), valve cap strap (4), valve core (2), and valve stem (5).

(3) Check for damaged, broken, or missing parts.

(4) Repair is by replacement of authorized parts (app D) which do not meet the inspection criteria.

(5) Apply anti-seize tape to threads of valve stem (5).

(6) Install valve stem (5), valve core (2), valve cap strap (4), plain hex nut (3), and pneumatic valve cap (1).

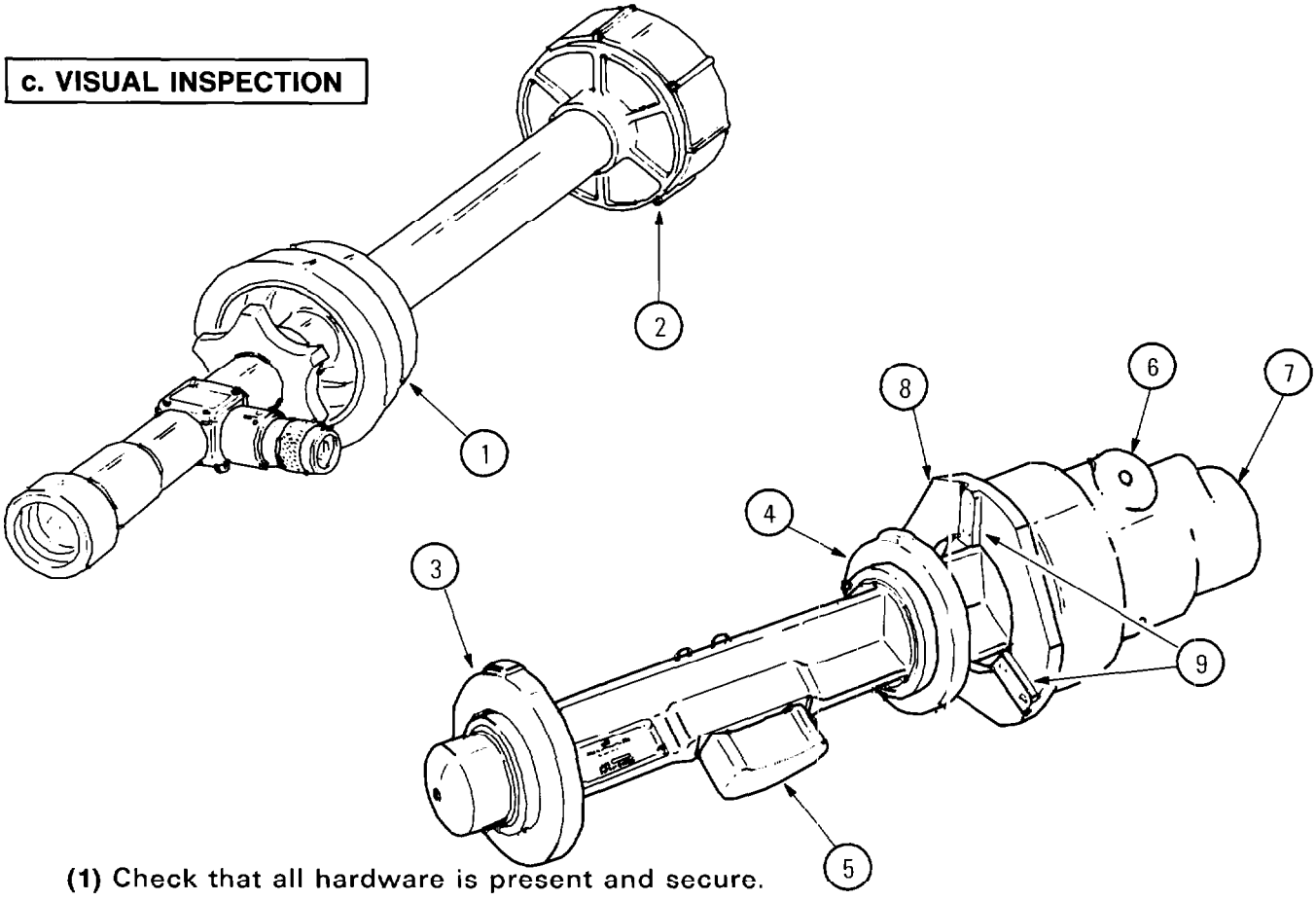
(7) Purge and charge muzzle boresight (p 5-30).

NOTE

The following procedures describe and illustrate collimation for the muzzle boresight. Collimation will be performed prior to returning the muzzle boresight to the using unit or to the supply system.

If the muzzle boresight being collimated fails to meet the required standards, make sure all maintenance authorized at the general support level has been performed correctly.

c. VISUAL INSPECTION



(1) Check that all hardware is present and secure.

(2) Check that paint is not chipped.

(3) M26A1/M27A1, check that the tapered muzzle cone (1) and expanding adapter collet (2) are clean and free of nicks and burrs.

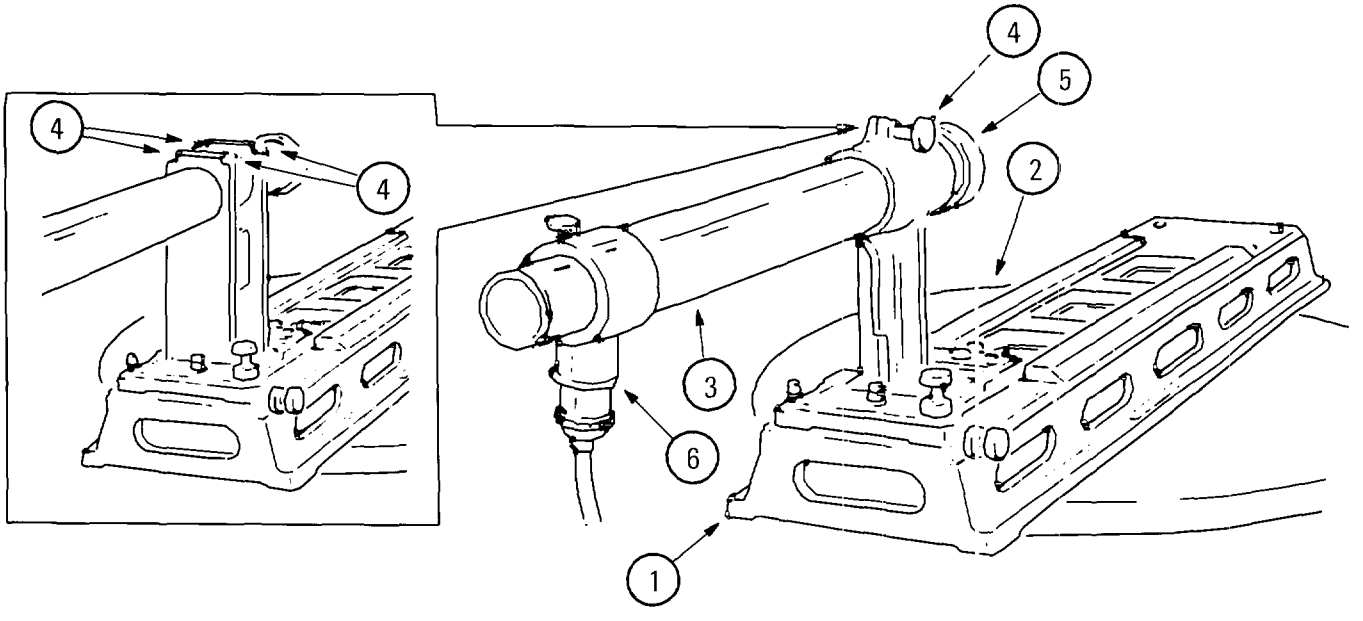
(4) M26/M27, check that small foot (3), large foot (4), and locating pad assembly (5) are clean and free of nicks and burrs.

(5) M26\M27, look through eyepiece (6) and objective end of optical unit (7) and check that no dirt or moisture is present on lenses.

(6) M26\M27, check that small ring assembly (8) is secure and stop pads (9) are not chipped or deteriorated.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

d. SETUP AND ADJUSTMENT OF TELESCOPE TEST FIXTURE.



(1) Secure telescope test fixture (1) on heavy steel test stand or other suitable platform (2) at height suitable for operation.

NOTE

Early model test stands will have four screws to secure the projector collimator.

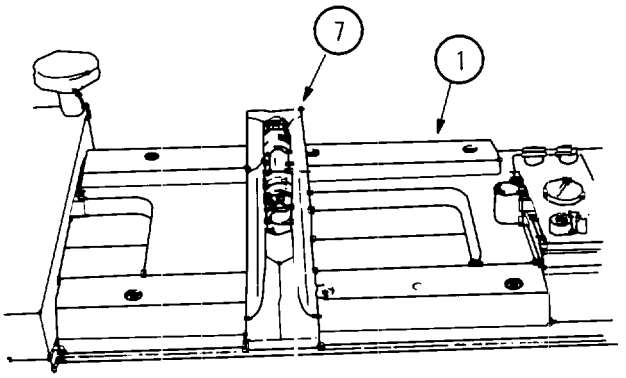
(2) Install projector collimator (3) in rearmost position on telescope test fixture (1); tighten projector collimator screw (4) and set at infinity by rotating objective end (5) of projector collimator (3).

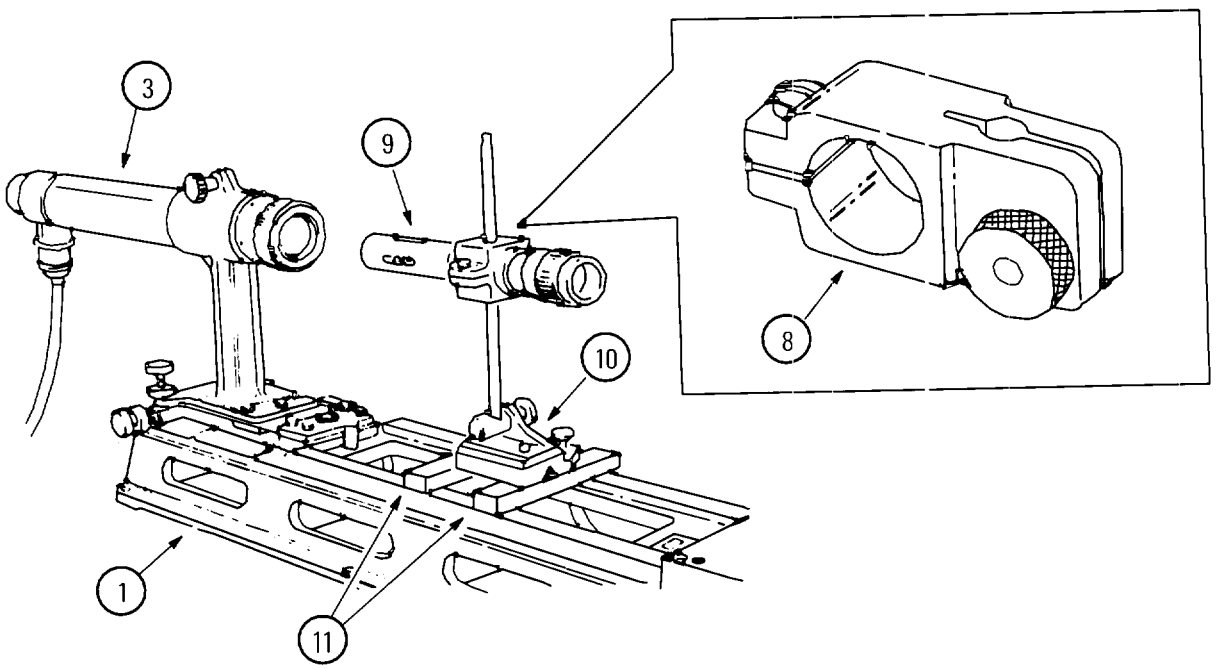
(3) Install light source (6) on projector collimator (3).

(4) Place precision level (7) on telescope test fixture (1).

(5) Adjust platform until precision level (7) is centered.

(6) Remove precision level (7).





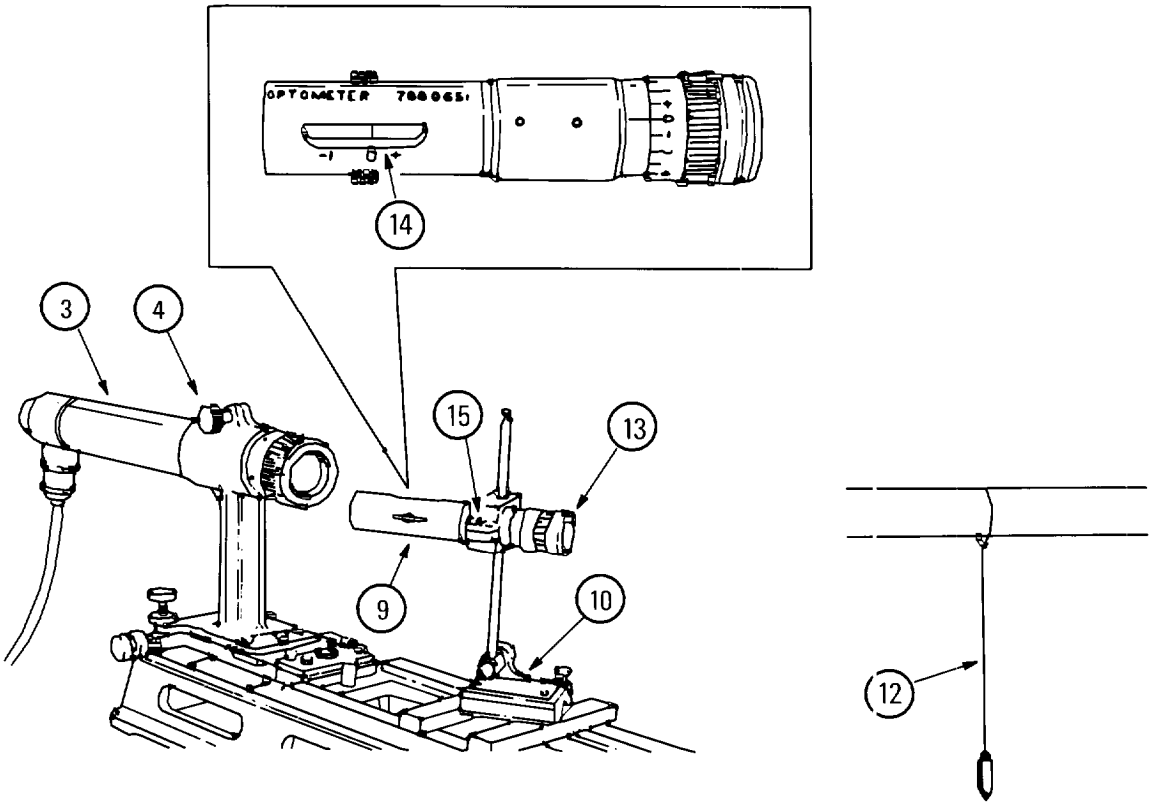
(7) Install telescope holder (8) and dioptometer (9) on surface gage (10).

(8) Set two parallel bars (11) and surface gage (10) on telescope test fixture (1).

(9) Turn surface gage (10) until dioptometer (9) line-of-sight is directed toward the projector collimator (3). Elevate if necessary.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

d. SETUP AND ADJUSTMENT OF TELESCOPE TEST FIXTURE (cont



(10) Suspend plumbline (12) off to one side of projector collimator (3).

(11) Direct line-of-sight of dioptometer (9) at plumbline (12).

(12) Focus dioptometer eyepiece (13) until the reticle is brought to its sharpest focus.

(13) Adjust the dioptometer range scale (14) until the vertical plumbline is in focus.

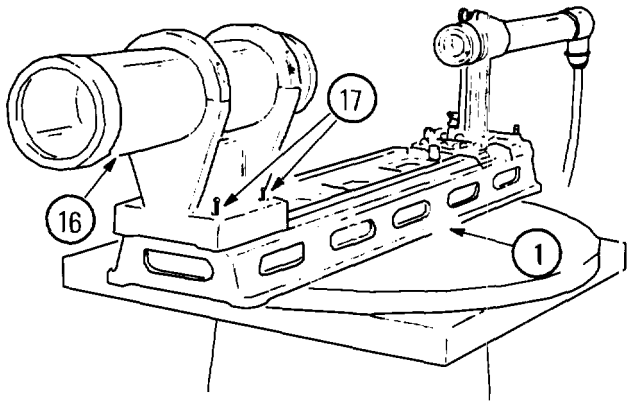
(14) Loosen telescope holder locking screw (15) and rotate dioptometer (9) until its vertical reticle line is superimposed on the vertical plumbline.

(15) Turn surface gage (10) until dioptometer (9) line-of-sight is directed toward the projector collimator (3).

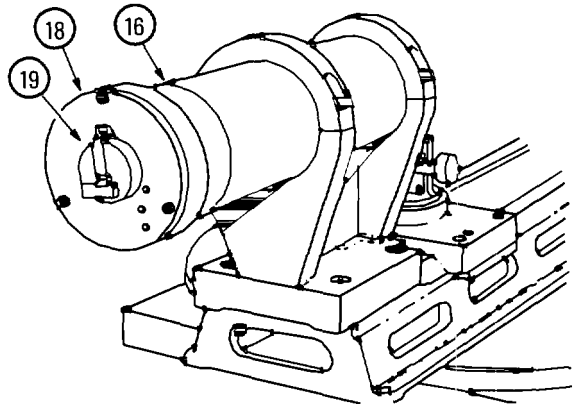
(16) Adjust the dioptometer range scale (14) until the projector collimator (3) vertical lines are in focus.

(17) Loosen projector collimator screw (4). Rotate projector collimator (3) until the reticle lines are plumb with the reticle lines of the dioptometer (9). Tighten projector collimator screw (4).

(18) Remove surface gage (10).

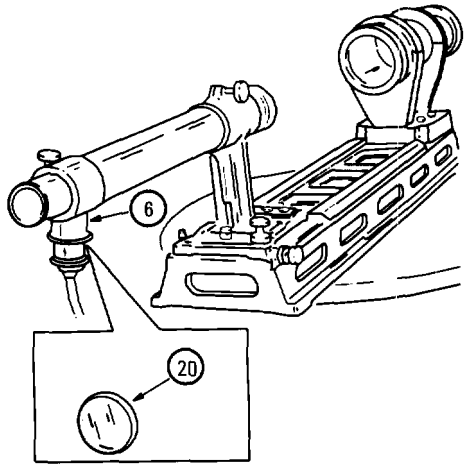


(19) Install alinement adapter (16) on telescope test fixture (1) and secure with four screws (17).



(20) Install mirror holder (18) to alinement adapter (16).

(21) Place test mirror (19) in mirror holder (18).



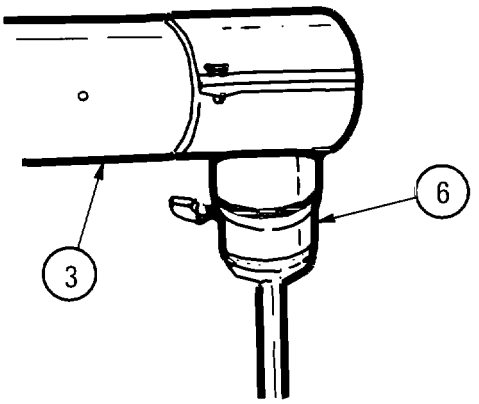
WARNING

To avoid possible electrical shock, shut off power before removing light source from projector collimator.

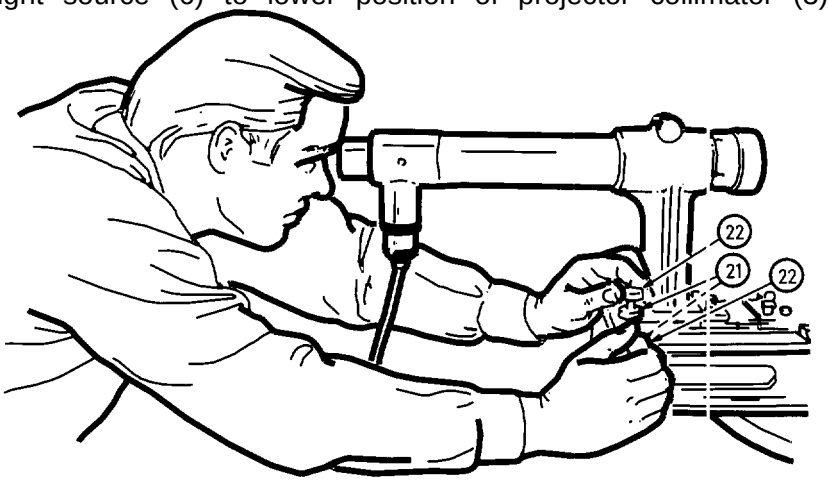
(22) Remove light source (6); remove diffuser (20) from light source.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

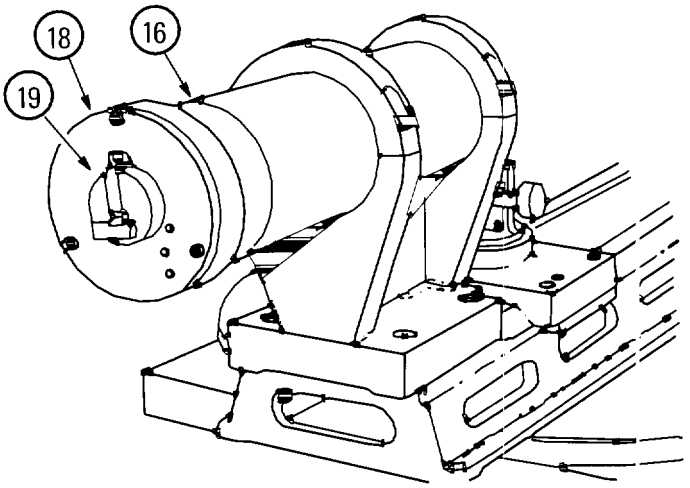
d. SETUP AND ADJUSTMENT OF TELESCOPE TEST FIXTURE (cont)



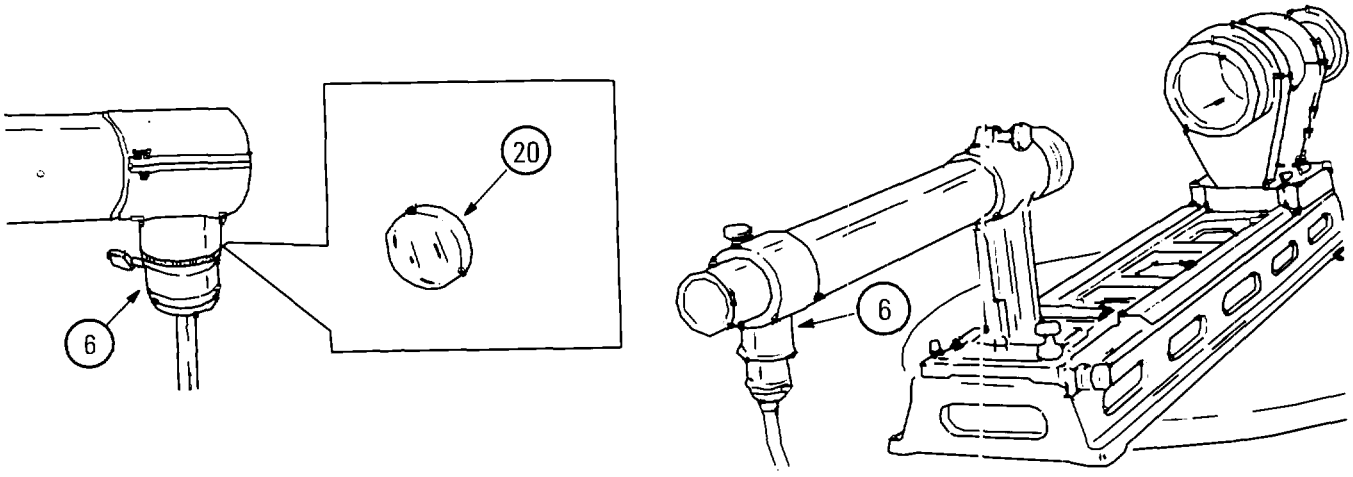
(23) Replace light source (6) to lower position of projector collimator (3).



(24) Loosen two locking nuts (21) on two adjusting screws (22) and adjust to autocollimate.



(25) Remove test mirror (19) and mirror holder (18) from alinernent adapter (16).

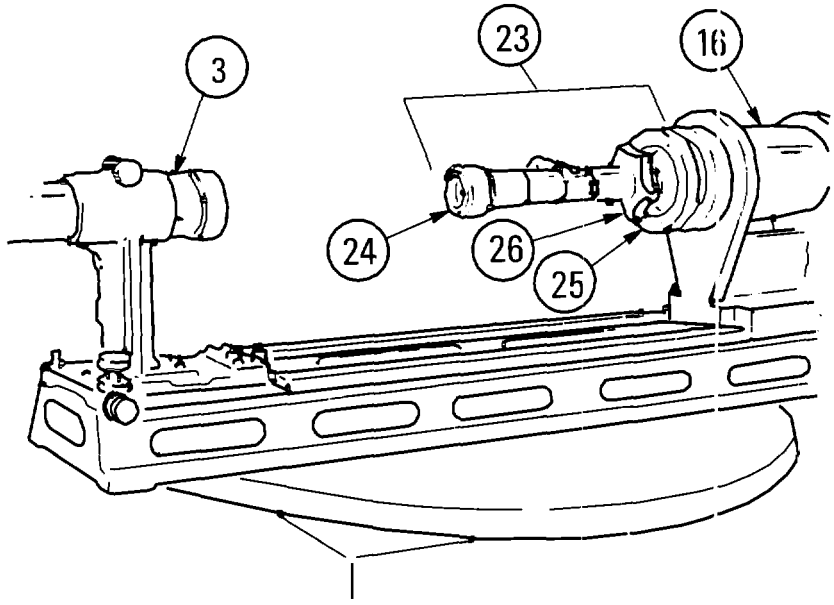


WARNING

To avoid possible electrical shock, shut off power before removing light source from projector collimator.

(26) Remove light source (6) and install diffuser (20).

(27) Replace light source (6).

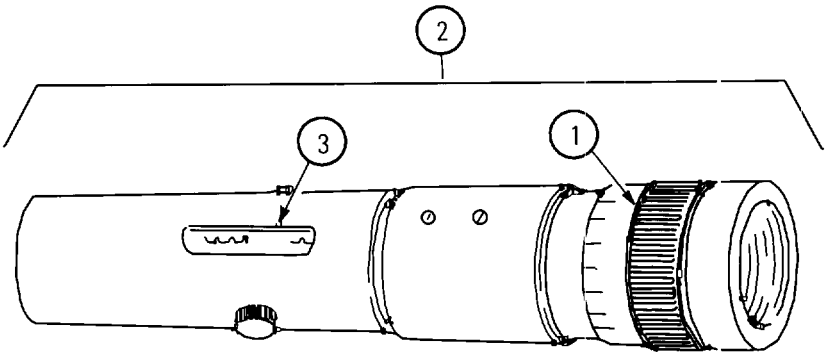


(28) Install muzzle boresight (23) in alinement adapter (16) with objective end (24) facing projector collimator (3) until tapered muzzle cone (25) is firmly sealed.

(29) While ensuring tapered muzzle cone (25) remains fully seated, rotate operating handle (26) clockwise to secure muzzle boresight (23) in alinement adapter (16).

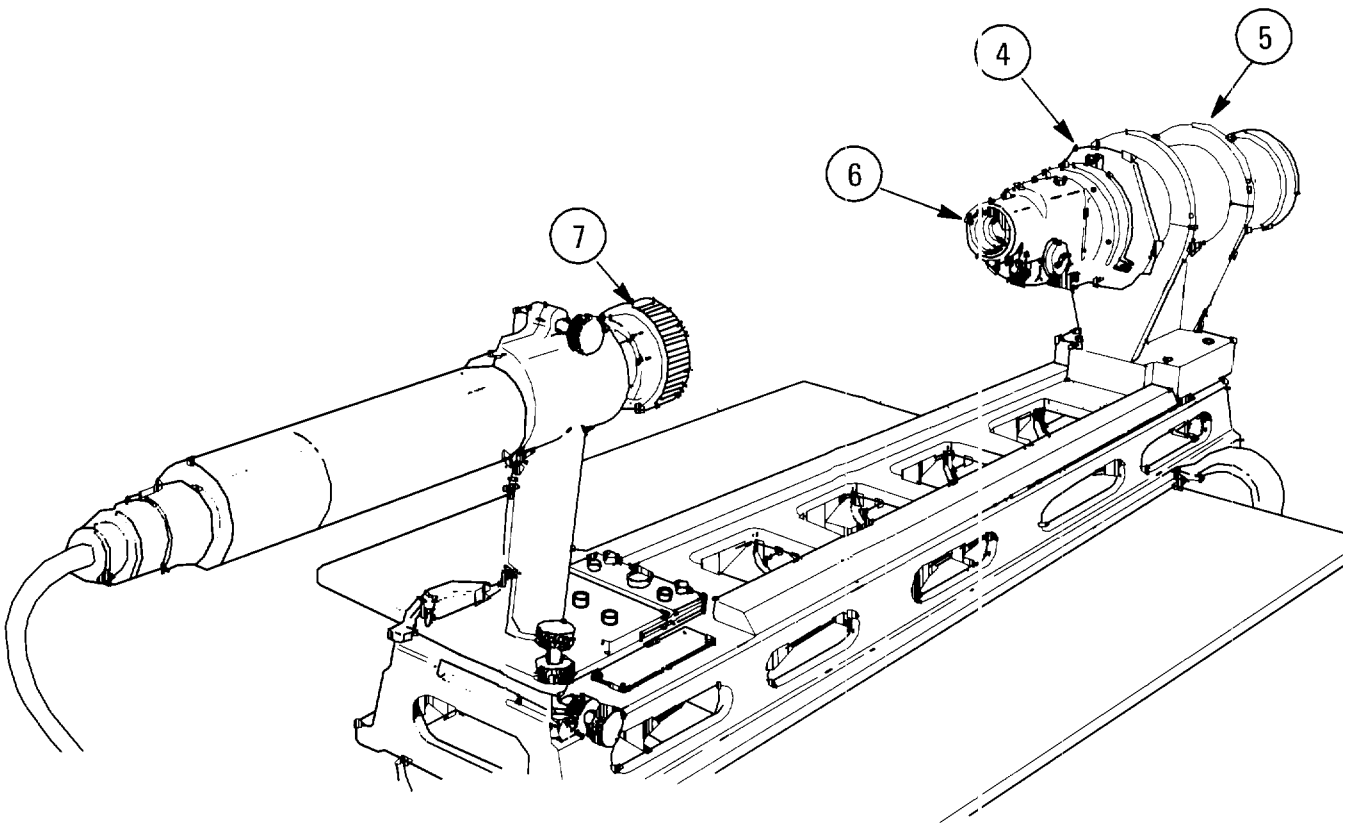
5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

e. M26/M27, EYEPIECE FOCUS INSPECTION

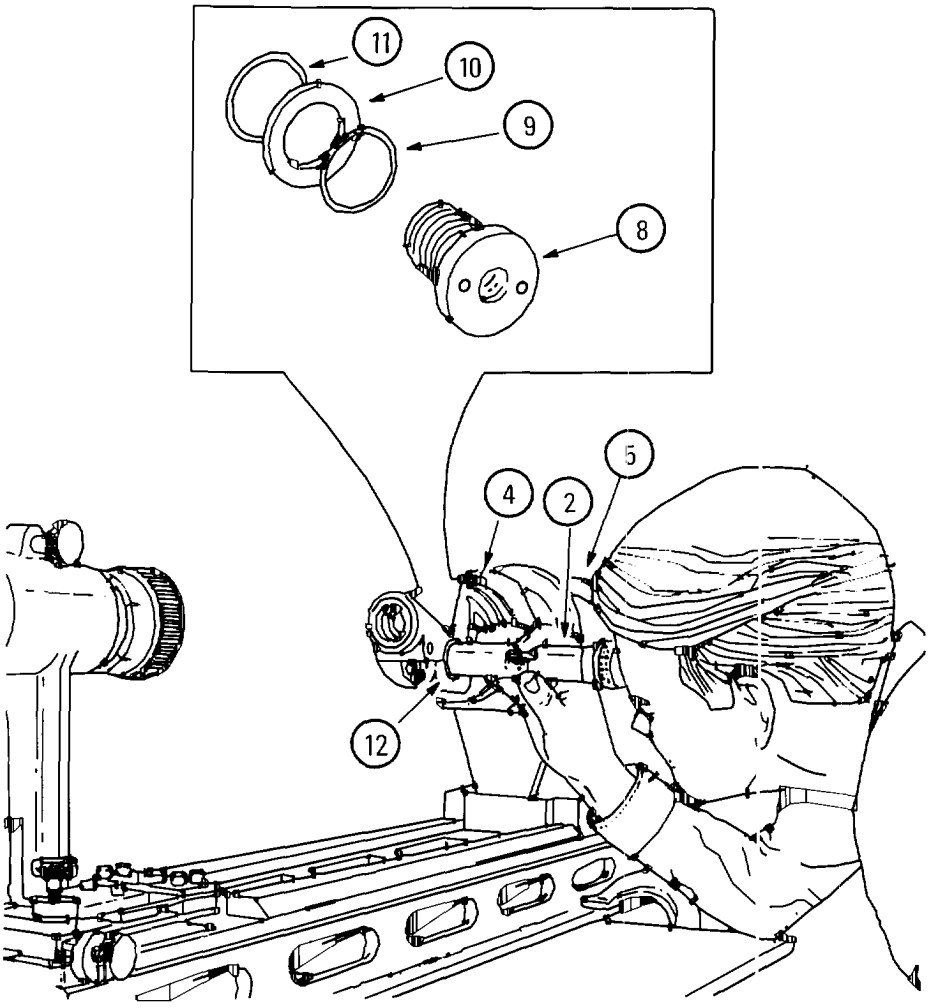


(1) Focus eyepiece (1) of dioptometer (2) on dioptometer reticle.

(2) Set dioptometer range scale (3) to -3/.4 diopter.



(3) Install muzzle boresight (4) in alinement adapter (5) with optical unit (6) facing telescope collimator (7).



(4) Position dioptometer (2) on eyepiece (8) of muzzle boresight (4).

(5) Focus dioptometer on muzzle boresight reticle dot. Muzzle boresight reticle dot should be sharp when dioptometer reads from -1/2 to -1 diopter, If muzzle boresight reticle dot focus is not within tolerance, perform steps 6 thru 14.

(6) Remove dioptometer (2), eyepiece (8), preformed packing (9), eyepiece mount washer (10), and preformed packing (11).

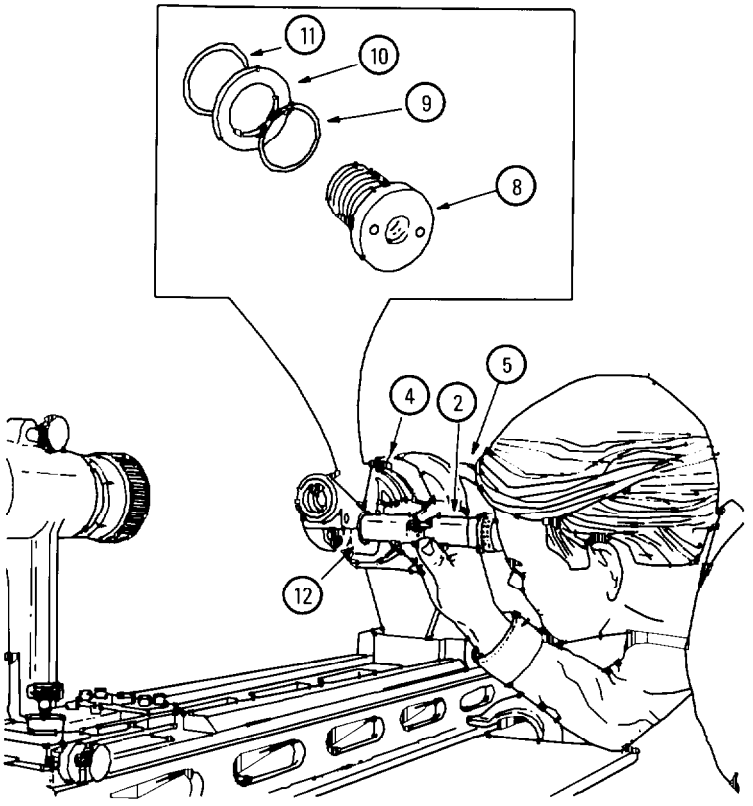
(7) Install eyepiece (8) and position dioptometer (2).

(8) Look through dioptometer (2) and turn eyepiece (8) until reticle dot in muzzle boresight (4) is sharp.

(9) Measure the distance between cover (12) on optical unit and eyepiece (8). This measurement is the distance by which eyepiece mount washer (10) must be reduced by peeling off laminations.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

e. M26/M27, EYEPIECE FOCUS INSPECTION (cont)



NOTE

If thickness of original eyepiece mount washer cannot be reduced, install new eyepiece mount washer in step 12.

(10) Remove eyepiece (8).

(11) Apply a light coat of silicone compound (item 2, app C) to new preformed packing (app D) (9) and install on eyepiece (8).

(12) Install eyepiece mount washer (10) on eyepiece (8).

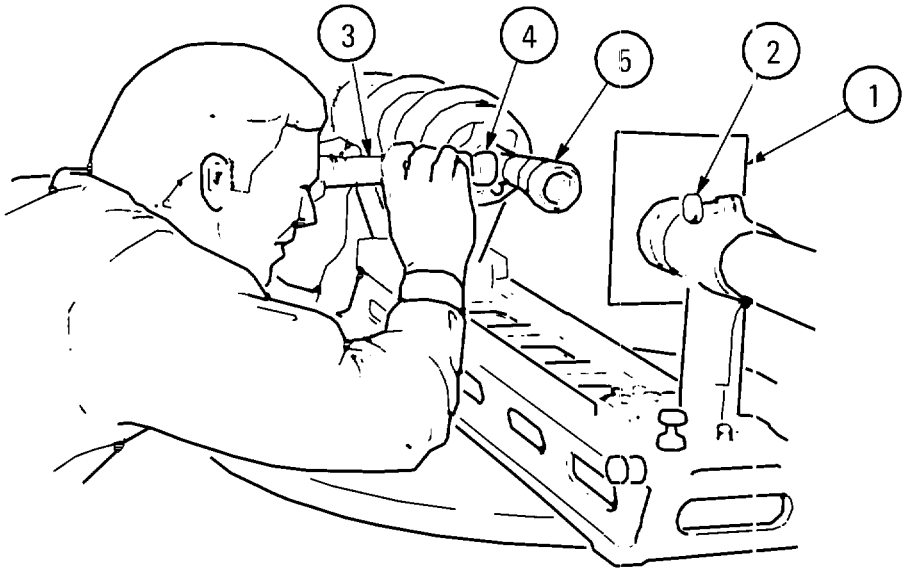
(13) Apply a light coat of silicone compound (item 2, app C) to new preformed packing (app D) (11) and install on eyepiece (8).

(14) Apply a light coat of grease to threads of eyepiece (8) and install.

(15) Repeat steps 5 thru 14 until reticle dot on muzzle boresight (4) is sharp when dioptometer (2) reads from -1/2 to -1 diopter.

(16) Remove muzzle boresight (4) from alinement adapter (5) if no further inspection is required.

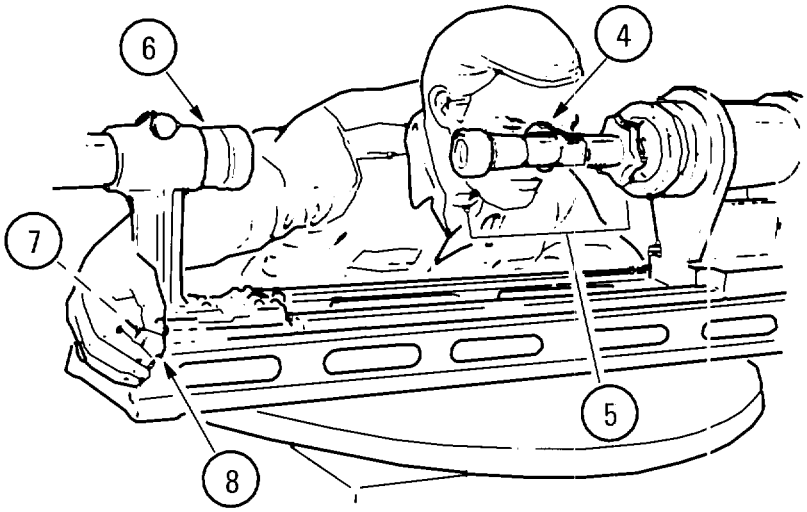
f. M26A1/M27A1 PARALLAX INSPECTION



(1) Place a piece of white paper (1) in front of the projector collimator objective (2).

(2) Using an adjusted dioptometer (3), focus eyepiece (4) on the muzzle boresight (5) until reticle inside the muzzle boresight is sharp and clear.

(3) Remove white paper (1) and dioptometer (3).



(4) Observe any displacement between reticle of muzzle boresight (5) and reticle of projector collimator (6).

(5) If the two reticles are not superimposed, loosen two locking nuts (7) on two adjusting screws (8) and adjust to superimpose the two retitles.

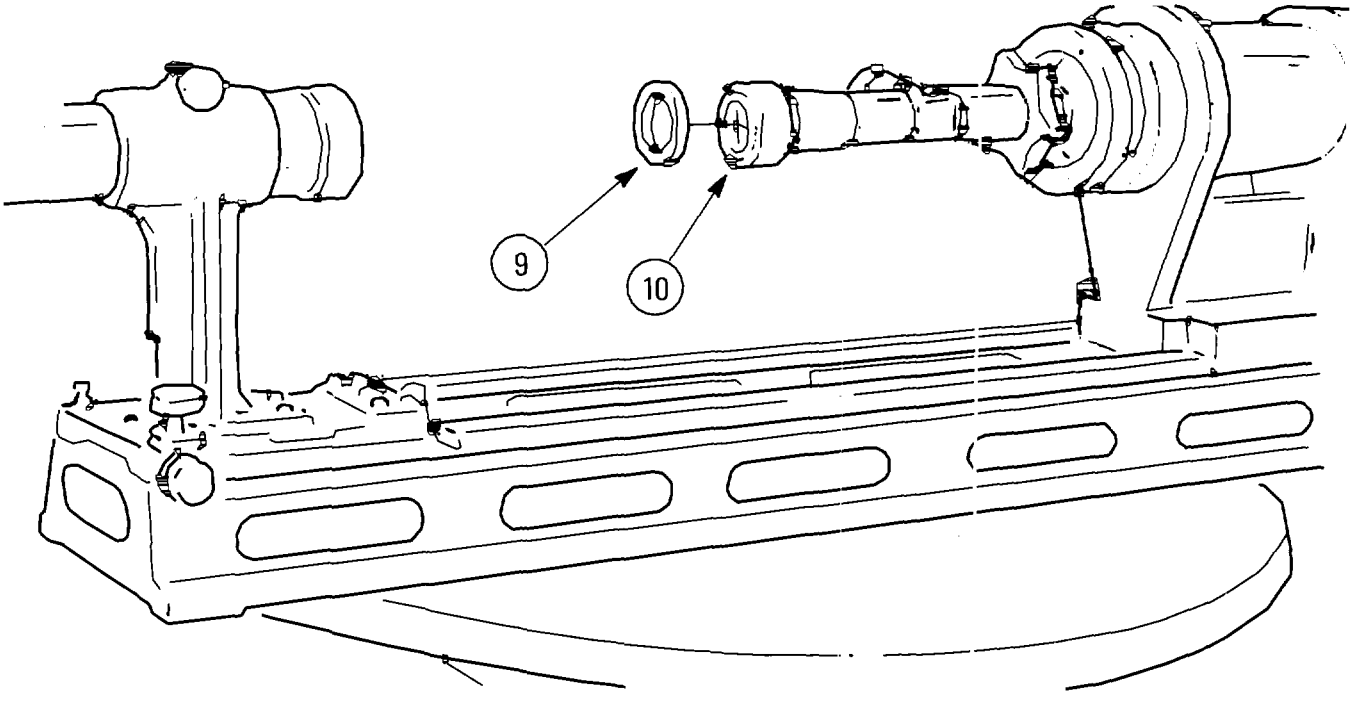
(6) Look through eyepiece (4) on muzzle boresight (5) and move your head from side to side. Muzzle boresight reticle should not appear to move more than 0.06 mils (one reticle line width).

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

f. **M26A1/M27A1 PARALLAX INSPECTION (cont)**

NOTE

If no parallax is observed, proceed to COLLIMATION INSPECTION on page 5-26. If parallax exceeds the tolerance, continue with steps 7 through 9.



(7) Remove locking ring (9) from the objective lens (10) using a spanner wrench.

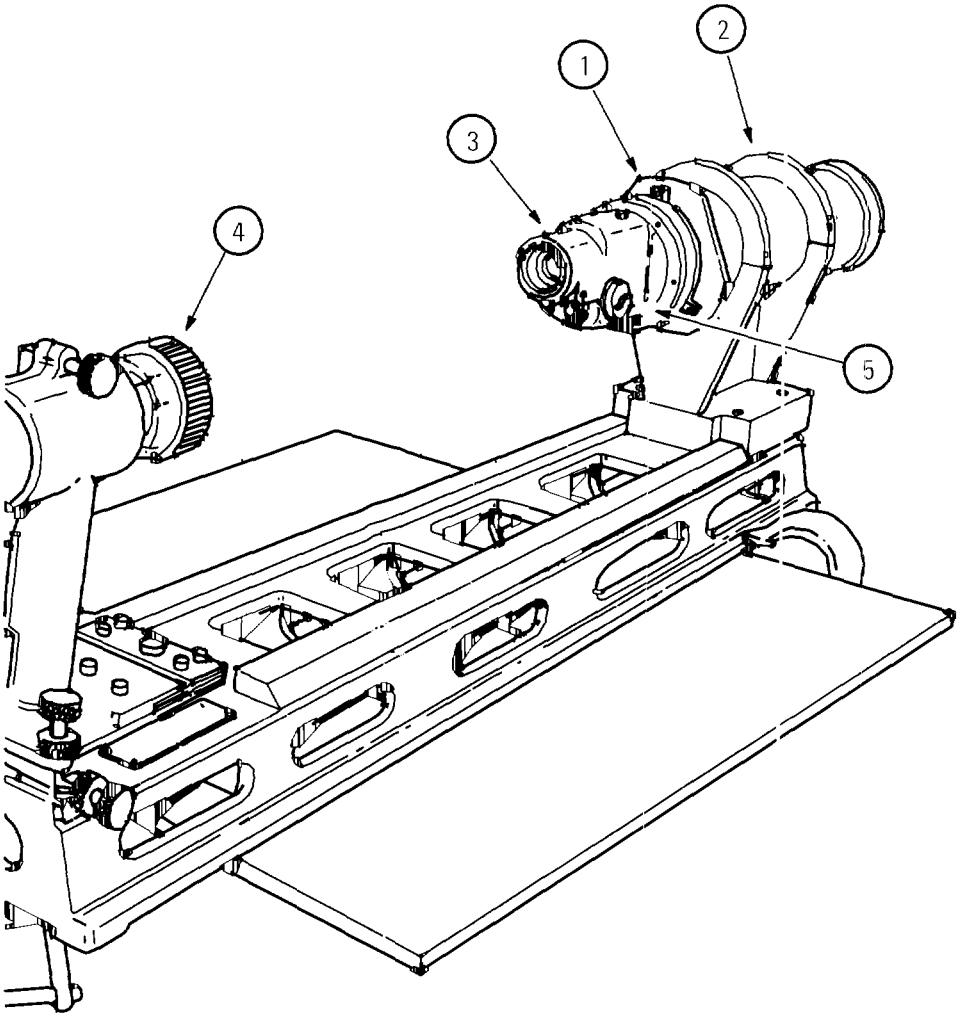
(8) Using with/out rule, observe direction of movement. If muzzle boresight reticle appears to move with your eye, rotate objective lens (10) counterclockwise (out) until no apparent movement is observed.

WARNING

Sealing compound burns easily and can give off harmful vapors. To avoid injury , keep away from open fire and use in a well-ventilated area.

(9) Apply sealing compound to threads of locking ring (9). Using a spanner wrench, install locking ring (9) until tight.

g. M26/M27, PARALLAX INSPECTION



(1) Install muzzle boresight (1) in alinement adapter (2) with optical unit (3) facing telescope collimator (4).

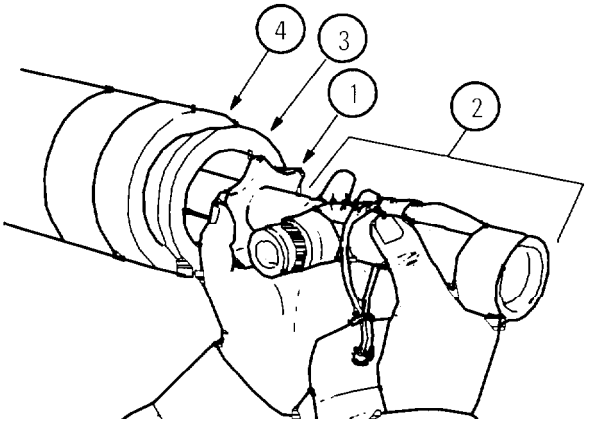
(2) Look through eyepiece (5) on muzzle boresight (1) and move your head from side to side. Muzzle boresight reticle dot should not appear to move more than 0.15 mil (thickness of boresight reticle dot).

(3) If parallax exceeds tolerance, remove prism mount from optical unit (3) and move objective cell in or out until parallax is within 0.15 mil.

(4) Remove muzzle boresight (1) from alinement adapter (2) if no further inspection is required.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

h. M26A1/M27A1, COLLIMATION INSPECTION (cont).



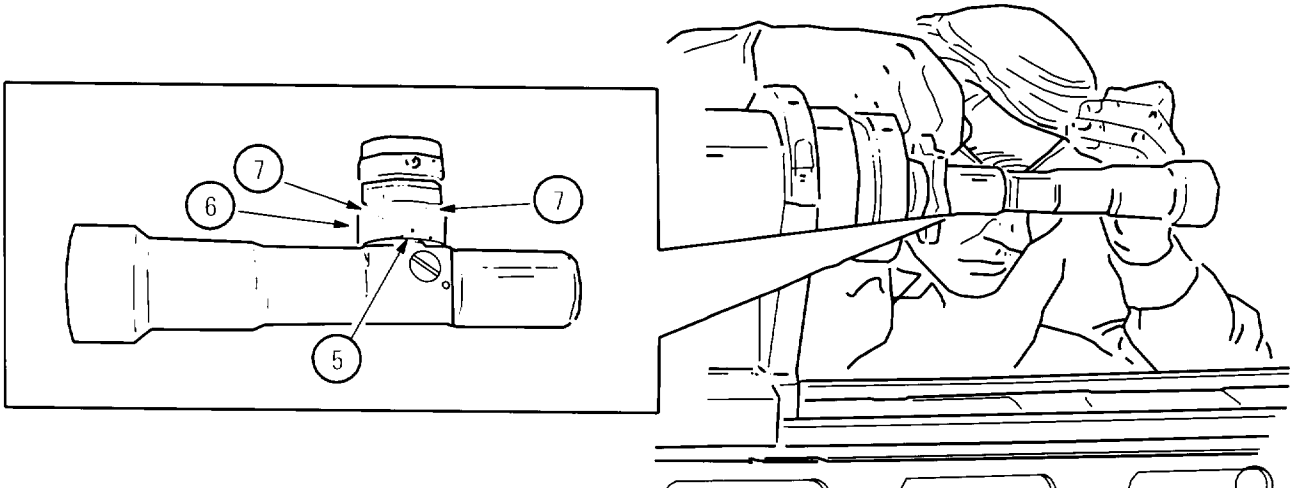
NOTE

Hold optical unit securely in one hand while rotating operating handle with other hand.

(1) Rotate operating handle (1) counterclockwise to unseat muzzle boresight (2).

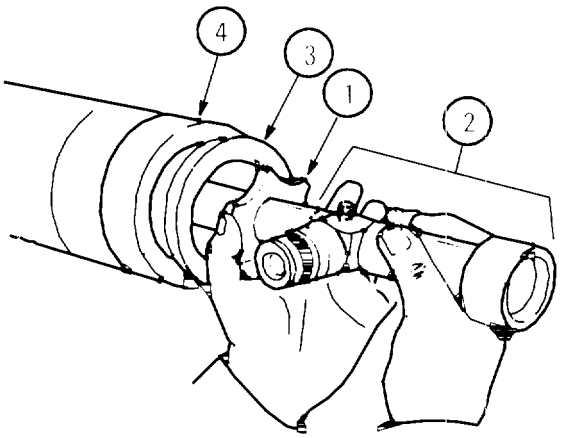
(2) Rotate tapered muzzle cone (3) 180 degrees. Reseat muzzle boresight in alinement adapter (4) by rotating operating handle (1) clockwise.

(3) Observe reticle displacement of muzzle boresight (2) relative to reticle of projector collimator.



(4) If two reticles are superimposed, proceed to step 12, page 5-27. If two reticles are still not superimposed, loosen socket head screw (5) on access cover (6) to expose reticle screws (7).

(5) Remove half the error by adjusting reticle screws (7).



NOTE

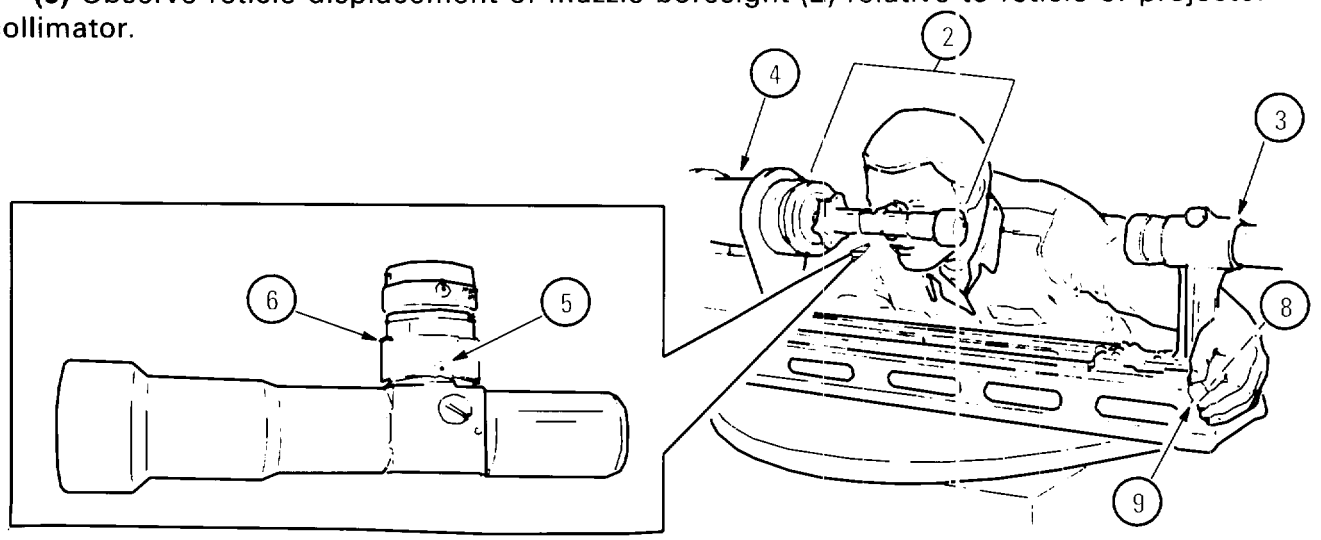
Ensure all reticle screws are tight.

Hold optical unit securely in one hand while rotating operating handle with other hand.

(6) Rotate operating handle (1) counterclockwise to unseat muzzle boresight (2).

(7) Rotate tapered muzzle cone (3) 180 degrees. Reseat muzzle boresight in alinement adapter (4) by rotating operating handle (1) clockwise.

(8) Observe reticle displacement of muzzle boresight (2) relative to reticle of projector collimator.



(9) Remove all of the error by superimposing the projector collimator (3) reticle on the muzzle boresight (2) reticle by loosening two locking nuts (8) and adjusting two adjusting screws (9).

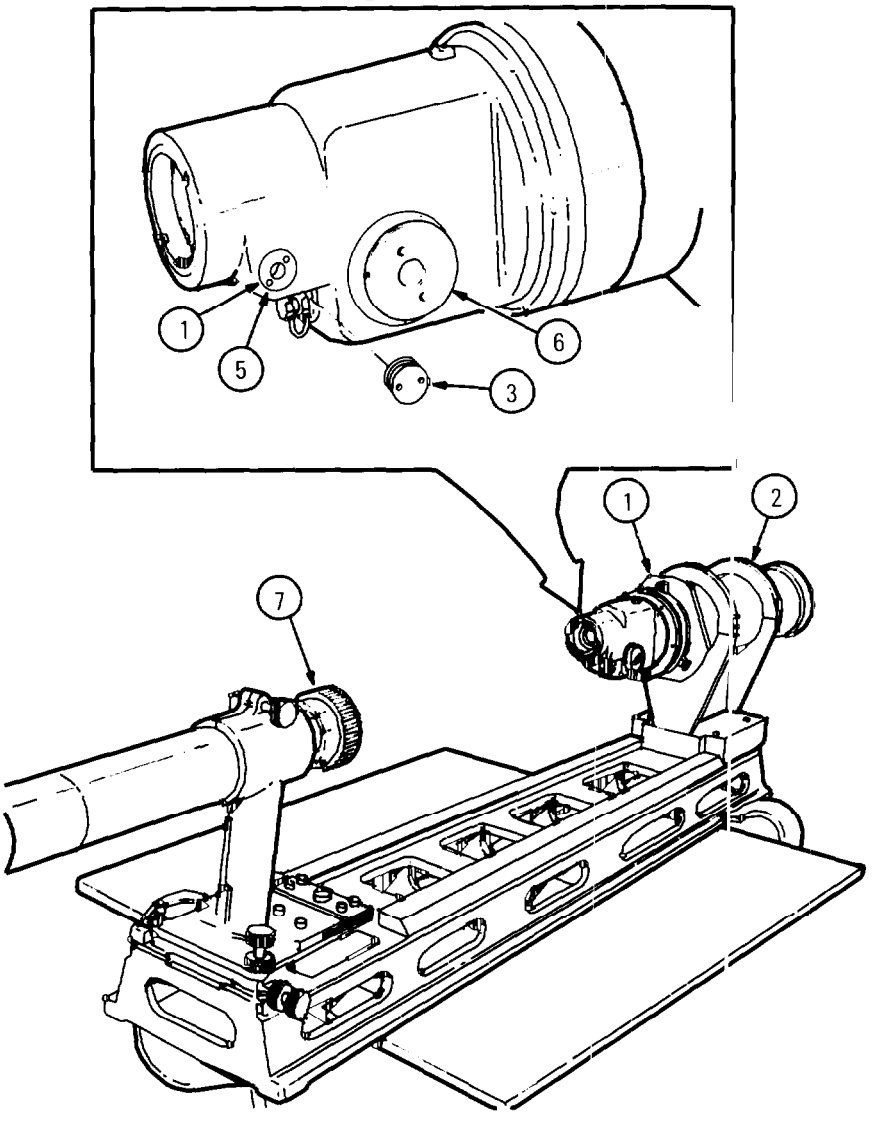
(10) Repeat steps 1 through 9 until there is no apparent collimation error. However, if collimation error exceeds 0.1 mils, turn in muzzle in accordance with Army regulations.

(11) Close access cover (6) and tighten socket head screw (5).

(12) Remove muzzle boresight (2) from alinement adapter (4) if no further inspection is required.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

i. M26/M27. COLLIMATION INSPECTION



(1) Install muzzle boresight (1) in alinement adapter (2).

(2) Remove two sealing plugs (3); loosen two retaining plugs (4) one-half turn. This allows two adjusting screws (5) (one on either side of wedge cells) to be moved.

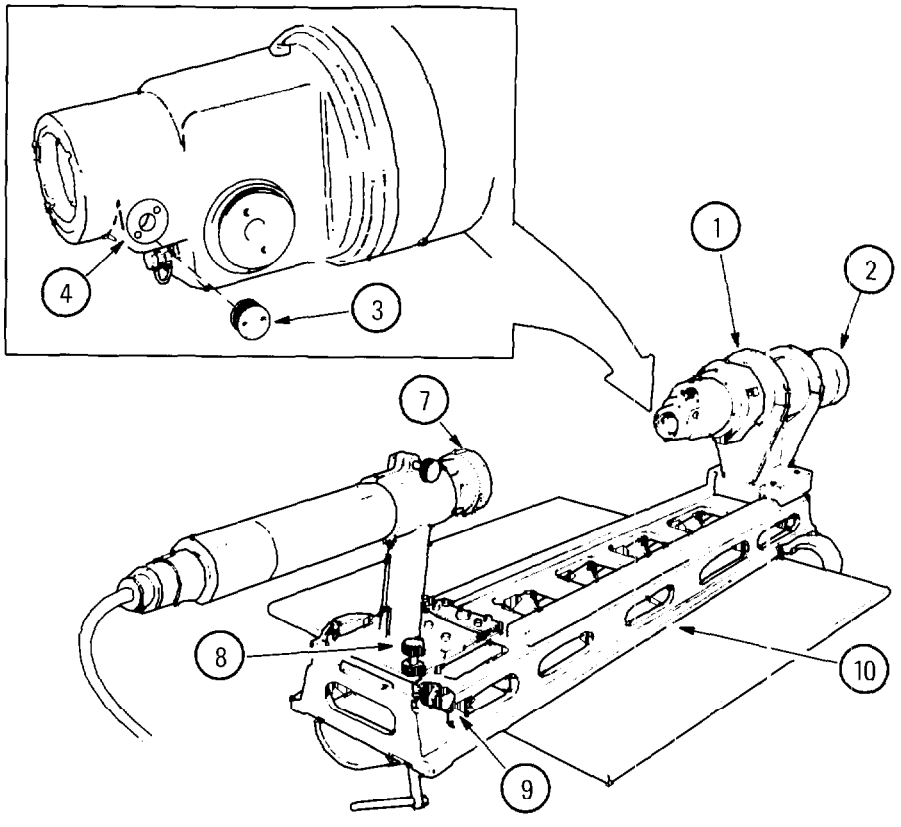
(3) Look through eyepiece (6) on muzzle boresight (1) and observe displacement of muzzle boresight reticle dot relative to center of reticle on telescope collimator (7).

NOTE

Diameter of muzzle boresight reticle dot is 0.15 mil.

(4) Turn each adjusting screw (5) until muzzle boresight reticle dot is centered on telescope collimator reticle.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).



(5) Rotate muzzle boresight (1) approximately 180 degrees.

(6) Observe displacement of muzzle boresight reticle dot relative to telescope collimator reticle.

NOTE

Displacement represents collimation error and amount of error is represented by one-half the amount of displacement.

(7) Adjust telescope collimator (7) in elevation and azimuth back towards muzzle boresight reticle dot one-half of the displacement by turning two screws (8 and 9) on telescope test fixture (10).

(8) Rotate muzzle boresight (1) approximately 180 degrees and repeat steps 4 and 5 by taking one-half of the error.

(9) Repeat steps 6. 7, and 8 until muzzle boresight reticle dot remains centered on reticle of telescope collimator (7) within 0.15 roil.

(10) Tighten two retaining plugs (4); install two sealing plugs (3) in muzzle boresight (1).

(11) Remove muzzle boresight (1) from alinement adapter (2) if no further inspection is required.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

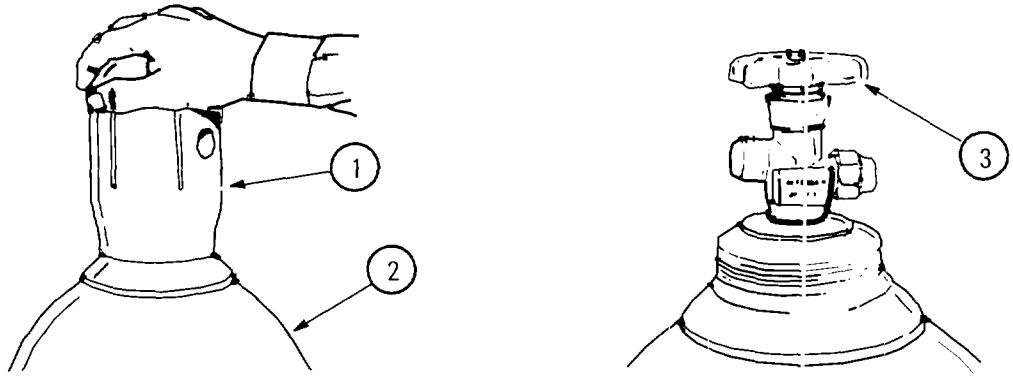
j. PURGING AND CHARGING

WARNINGS

Do not exceed pressures specified in the following purging and charging procedures or injury to personnel can result.

Nitrogen gas bottles are color-coded gray with two black stripes. Use extreme caution not to mistakenly use some other gas which could create an explosive atmosphere in the work area. Secure bottles in an upright position.

Do not drop tank of compressed nitrogen gas. When using in confined areas, use extreme care. Nitrogen gas could cause asphyxiation.

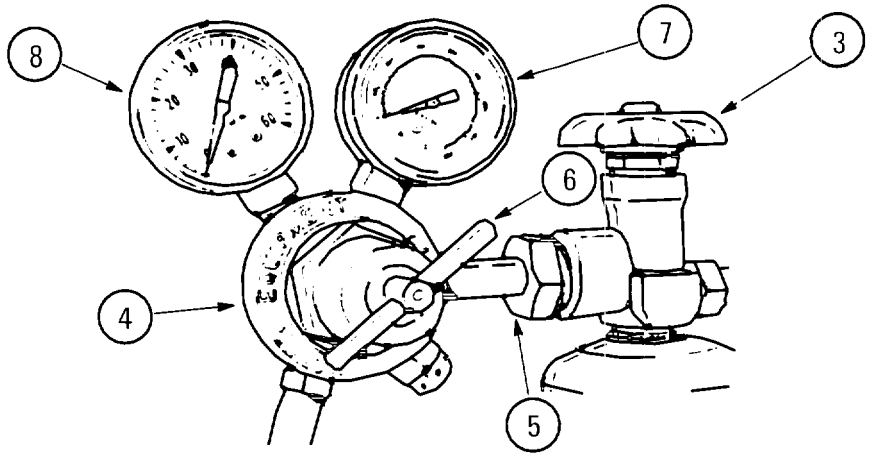


(1) Remove protective cover (1) from outlet of dry nitrogen tank (2).

CAUTION

Use regulator 5580992 or 11729749. With regulator 11729749, use a right-or left-hand threaded 9/16 in. x 18NF adapter as required, to avoid damage to equipment.

(2) Open tank valve (3) (just long enough to rid valve seat of any foreign matter) and close.



(3) Attach regulator (4) securely to tank valve (3), using appropriate adapter (5).

(4) Rotate pressure regulator valve (6) counterclockwise to extreme closed position.

(5) Open tank valve (3) slowly until the maximum tank pressure registers on high pressure gage (7).

(6) Slowly open pressure regulator valve (6) clockwise until approximately 5 psi (01.35 kg/cm^2) is registered on low pressure gage (8).

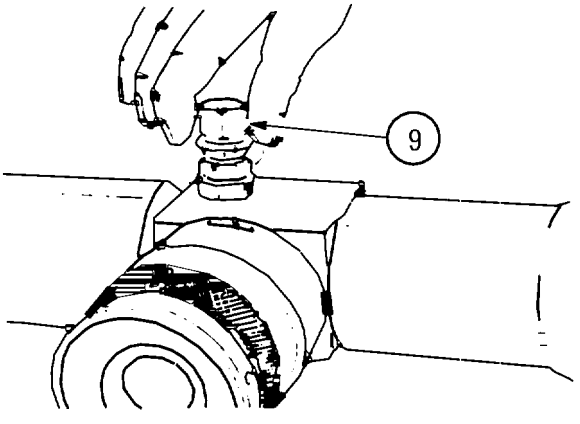
NOTE

If pressure indicated is less than 100 psi (7 kg/cm^2) replace dry nitrogen tank.

(6) Slowly open pressure regulator valve (6) clockwise until approximately 5 psi (0.35 kg\cm^2) is registered on low pressure gage (8).

(7) Check for and eliminate any interference.

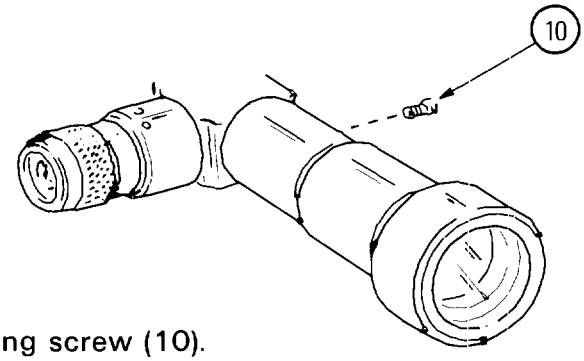
(8) Close pressure regulator valve (6).



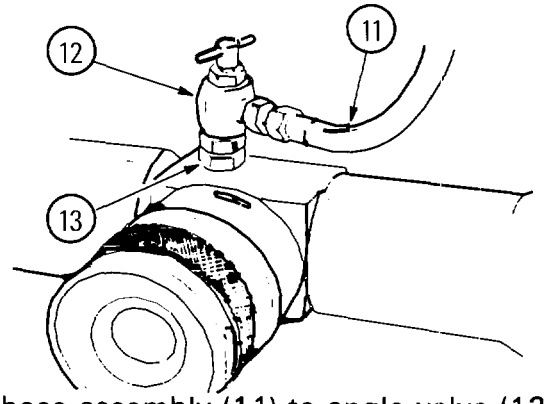
(9) Release pressure from optical unit by removing pneumatic valve cap (9) and depressing valve core.

5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

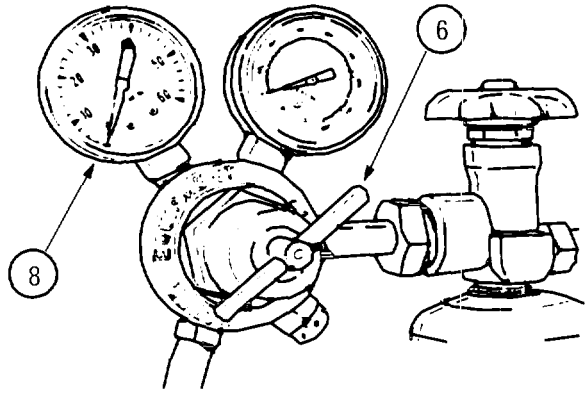
j. PURGING AND CHARGING (cont)



(10) Remove self-sealing screw (10).



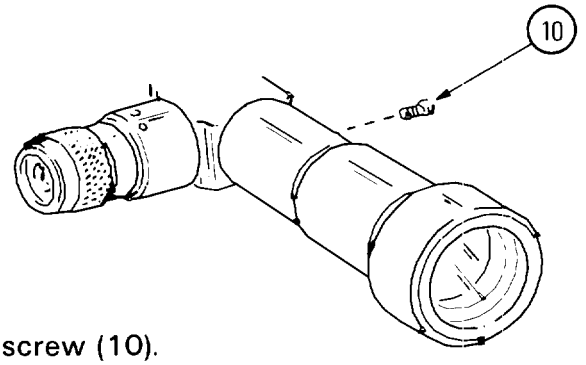
(11) Attach free end of hose assembly (11) to angle valve (12) and install on valve stem (13). Turn angle valve T clockwise until snug.



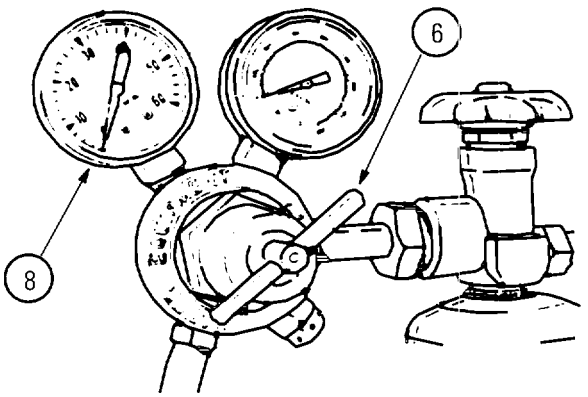
(12) Open pressure regulator valve (6) until 5 psi (0.35 kg/cm²) registers on low pressure gage (8).

(13) Maintain this pressure for 5 minutes or until all traces of moisture in optical unit are removed.

(14) Close pressure regulator valve (6).

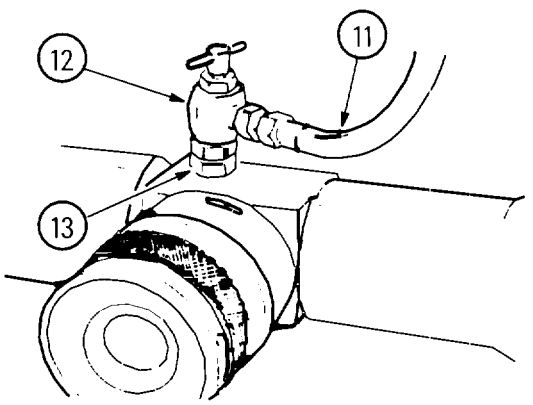


(15) Install self-sealing screw (10).



(16) Open pressure regulator valve (6) until 3 psi (0.211 kg/cm²) registers on low pressure gage (8). Maintain this pressure for 10 seconds.

(17) Close pressure regulator valve (6).



(18) Turn angle valve T counterclockwise until snug. Remove hose assembly (11) and angle valve (12) from valve stem (13).

(19) Apply liquid soap solution to valve core and self-sealing screw. If valve core and self-sealing screw leak, replace (p 5-12).

NOTE

If valve core still leaks after replacement, replace valve stem (p 5-12).

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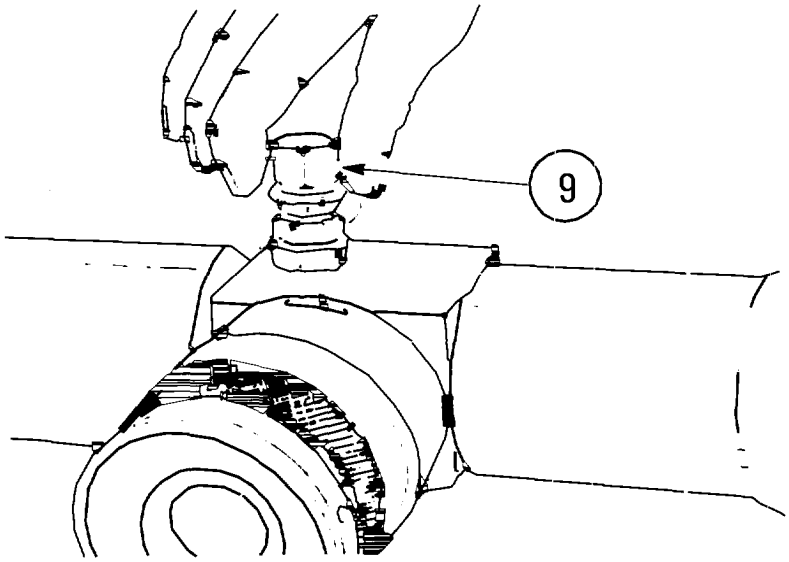
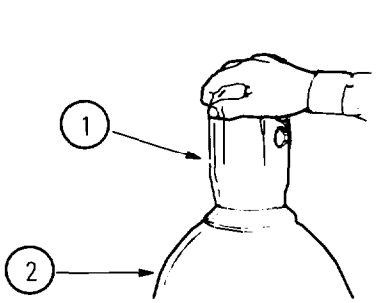
5-5. MUZZLE BORESIGHT - MAINTENANCE INSTRUCTIONS (cont).

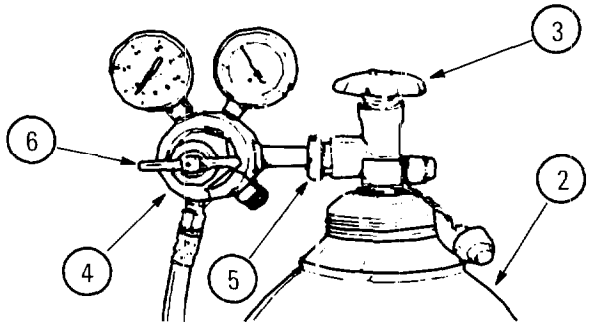
j. PURGING AND CHARGING (cont)



(20) Install pneumatic valve cap (9) on valve stem.

(21) Close tank valve (3).





(22) Open pressure regulator valve (6) clockwise to relieve pressure between dry nitrogen tank (2) and regulator (4).

(23) Remove regulator (4) and adapter (5) from dry nitrogen tank (2).

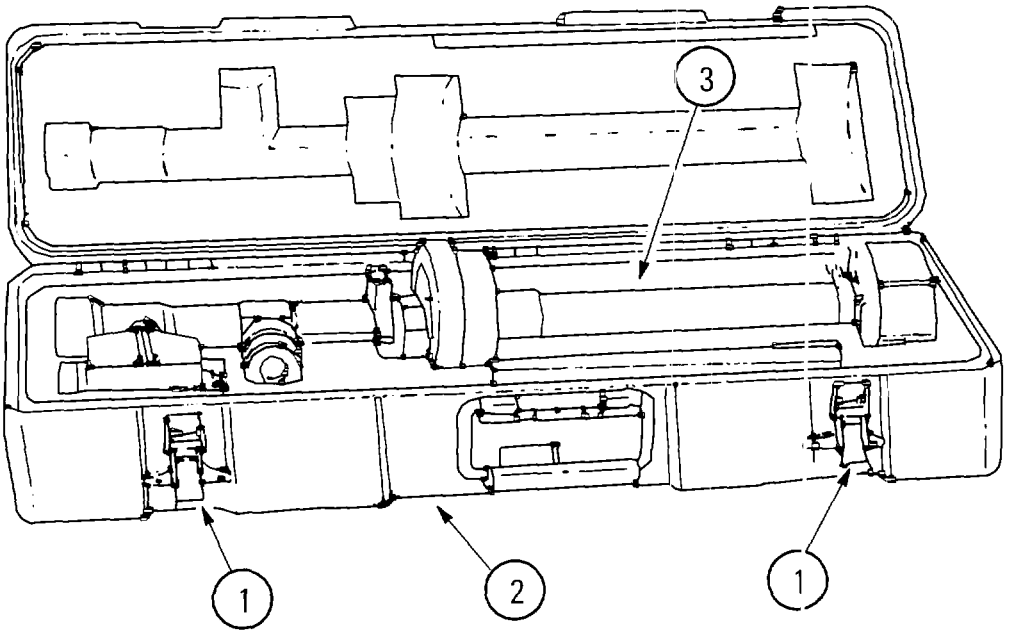
(24) Place protective cover (1) on dry nitrogen tank (2).

(25) Maintenance personnel will purge and charge the muzzle boresight when condensation is evident.

NOTE

If moisture is still present after purging and charging, replace muzzle boresight (app D).

k. CARRYING CASE - MAINTENANCE INSTRUCTIONS.



a. Release latches (1) and open carrying case (2).

b. Remove muzzle boresight (3) from carrying case (2).

c. Inspect carrying case for missing, broken, or damaged parts. If carrying case is damaged, replace it (app D).

d. Place muzzle boresight (3) in carrying case (2).

e. Close carrying case (2) and secure two latches (1).

APPENDIX A

REFERENCES

This appendix lists publications referred to in this manual.

Publication Number	Publication Title
A-1. TECHNICAL MANUALS	
TM 9-2350-215-10	Operator's Manual: Operator Controls and PMCS for Tank, Combat, Full-Tracked: 105-mm Gun, M60A1 and M60A1 (AOS)
TM 9-2350-253-10	Operator's Manual for Tank, Combat, Full-Tracked: 105-mm Gun, M60A3 TTS
TM 9-2350-255-10-2	Operator's Manual for Operation Under Usual and Unusual Conditions for Tank, Combat, Full-Tracked, 105-mm Gun, M1
TM 9-2350-257-10-2	Operator's Manual for Operation Under Usual and Unusual conditions for Tank, Combat, Full-Tracked, 105-mm Gun, M60A1 (Rise) ancl M60A1 (Rise Passive)
TM 9-2350-258-10	Operator's Manual for Tank, Combat, Full-Tracked, 105-mm Gun, M48A5
TM 9-2350-260-10	Operator's Manual: Operator's Controls and PMCS for Tank, Combat, Full-Tracked: 105-mm Gun, M60
TM 9-2350-264-10-2	Operator's Manual for Operation Under Usual and Unusual Conditions for Tank, Combat, FuIl-Tracked: 120-mm Gun, M1A1
TM 9-254	General Maintenance Procedures for Fire Control Materiel
TM 750-244-7	Procedures for Destruction of Equipment to Prevent Enemy Use
A-2. SUPPLY CATALOGS	
SC 4910-95-CL-A74	Automotive Maintenance and Repair Shop Equipment
SC 4931-95-CL-A07	Field Maintenance Instrument and Fire Control Shop Equipment

Publication Number	Publication Title

A-2. SUPPLY CATALOGS (Cont).

SC 4931-95-CL-A09	Field Maintenance Instrument ard Fire Control System Repair Shop Equipment
SC 4931-95-CL-J51	Fire Control Maintenance and Repair Shop Specialized Equipment Tool Set
SC 4931-95-CL-J54	Fire Control Purging Kit

A-3. FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DD Form 1348	DOD Single Line Item Requisition System Document
SF 364	Report of Discrepancy (ROD)
SF 368	Product Quality Deficiency Report

A-4. MISCELLANEOUS PUBLICATIONS.

DA PAM 738-750	The Army Maintenance Management System (TAMMS)
FM 21-11	First Aid for Soldiers
TB 9-2300-281-35	Standards for Overseas Shipment or Domestic Issue of Special Purpose Vehicles, Combat, Tactical, Construction and Selected Industrial and Troop Support, U.S. Army Tank-Automotive Materiel Readiness Command Managed Items

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This section (section 1) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section Ill lists the tools (both special tools and common tool sets) required for each maintenance function as referenced from section II.

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, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, 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 (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, 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.

B-2. MAINTENANCE FUNCTIONS (Cont).

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and and assigned maintenance level is shown as the 3rd position code of the SMR code.

i. Repair. The application of maintenance services (inspect, test, service, adjust, aline, calibrate, and\or replace), including fault location/troubleshooting, removal/installation, disassembly\assembly, and/or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, and resurfacing) to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable\operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). 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 those 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 equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

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

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

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure (expressed as manhours shown as whole numbers/decimals) in the appropriate subcolumn(s), the 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 level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. 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 (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenarce categories are as follows.

C . . . . . Operator or Crew
O . . . . . Unit 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, special TMDE, and special support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. Column 1, Tool Reference Code. The tool and test equipment reference code correlates with a number used in the MAC, section II, Column 5.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National stock number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Column 1, Reference Code. The code recorded in column 6, section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, section II.

Section II. MAINTENANCE ALLOCATION CHART FOR MUZZLE BORESIGHT AND RELATED COMPONENTS

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and EQPT	(6) Remarks
			Unit		Direct support	General Support	Depot		
			C	0	F	H	D		
00	Muzzle Boresight Device	Inspect	.1						
		Service				1		1,2	
		Repair				1		3,4	
01	Collet Assy	Replace				.5			
02	Valve	Inspect	.1						
		Repair		.1					
		Replace				1			
03	Cover Assembly (M26/M27)	Inspect	.1						
		Service		.1					
		Repair				1			

Section III. TOOLS FOR MUZZLE BORESIGHT AND RELATED COMPONENTS

Tool/Test Equipment Ref. Code	Maintenance Category	Nomenclature	National/ NATO Stock Number	Tool Number
1	H	Mirror Test		02MFG019
2	H	Fixture, Telescope	4931-00-508-5443	7573980
3	H	Adapter Alignment		9364961-1
4	H	Adapter Alignment		9364961-2

APPENDIX C

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

This appendix lists expendable supplies and materials you will need to operate and maintain the M26/M27 or M26A1\M27A1 muzzle boresight w\case.

Item Number	National Stock Number	Description	U/M
1	6810-00-753-4780	ACETONE, ACS, liquid 16-oz (0.47-1) bottle (81348) OC265	OZ
2	6850-00-664-4959	SILICONE COMPOUND (81349) MIL-C-21567	GL
3	8030-00-964-7537	SEALING COMPOUND (81349) MILS22473GRADECBLU	OZ
4	8020-00-262-9099	BRUSH, ARTIST (81348) H-B-118	EA
5	6850-00-227-1887	CLEANING COMPOUND, OPTICAL LENS, liquid 1-qt (0.95-1) container (81349) MIL-C-43454	QT
6	6850-00-597-9765	CLEANING COMPOUND, SOLVENT 1-gal (3.79-1) can (81349) MIL-C-18718	GL
7	8010-00-297-2124	ENAMEL, olive drab, semi-gloss, 1-gal (3.79-1) can (81348) TT-E-485	CN
8	8120-00-985-7275	NITROGEN, TECHNICAL (81348) R-R-C-901	CY
9	6640-00-663-0832	PAPER, LENS, sheet form, type 1 (81348) NNN-P-40	SH
10	7920-00-205-1711	RAG, WIPING, cotton, unbleached 50-lb (22.68-kg) bale (80244) DDD-R-30	BE
11	8520-00-228-0598	SOAP, TOILET LIQUID 1-gal (379-1) can or bottle (81348) P-S-624	GL
12	8030-00-889-3534	TAPE, ANTISEIZING (81349) MIL-T-27730	SP

APPENDIX D

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

D-1. SCOPE. This RPSTL lists and authorizes spares and repair parts, special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of unit, direct support maintenance and general support maintenance of the M26/M27 or M26A1/M27A1 muzzle boresight. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

D-2. GENERAL. In addition to Section I. Introduction, 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 by this RPSTL 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 ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed by item name in item name sequence. Repair parts kits are listed separately in their own functional group within section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/figure(s).

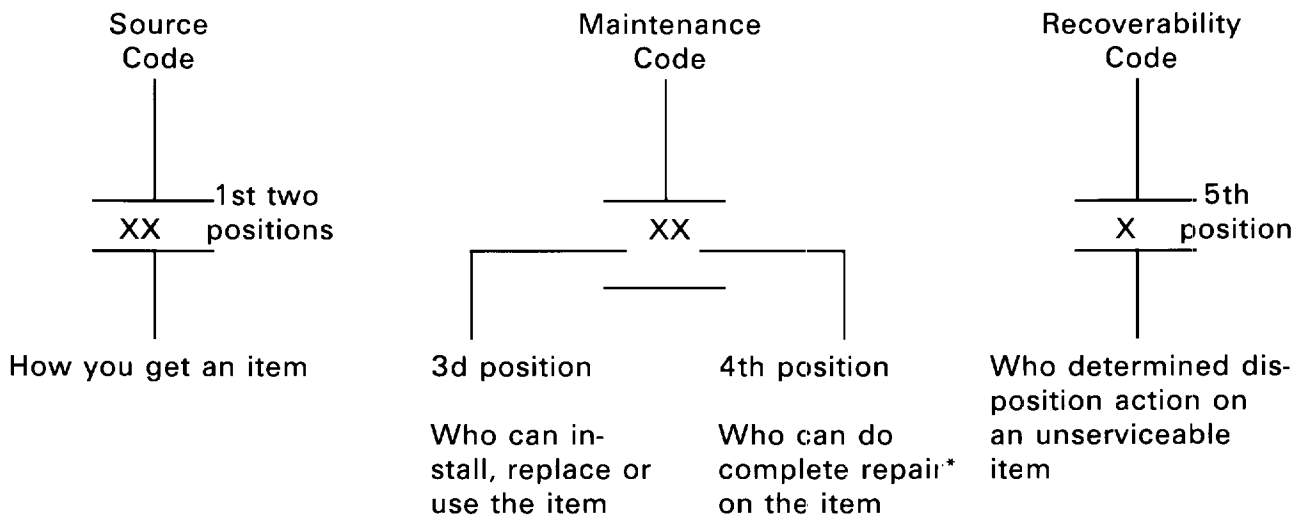
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. Section IV. Cross-Reference Indexes. A list, in National Item Identification Number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listing. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross-references NSN, FSCM, and part numbers.

D-3. EXPLANATION OF COLUMNS (SECTIONS II AND III).

a. Item No. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	Explanation
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN to request\requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3d position of the SMR code. **NOTE: Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.
MO - (Made at Org/ AVUM Level) MF - (Made at DS/ AVIM Level) MH - (Made at GS Level) ML - (Made at Specialized Repair Act (SRA) MD - (Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3d position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Code	Explanation
AO - (Assembled by Org/ AVUM Level) AF - (Assembled by DS/AVIM Level) AH - (Assembled by GS Category) AL - (Assembled by SRA) AD - (Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3d position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

XA - Do not requisition an "XA''-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
XB - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
XC - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD - Item is not stocked. Order an "XD''-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

(2) Maintenance Code. Maintenance codes tells you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance.

Code	Application/Explanation
C	Crew or operator maintenance done within organizational or aviation unit maintenance.
O	Organizational or aviation unit category can remove, replace, and use the item.
F	Direct support or aviation intermediate level can remove, replace, and use the item.
H	General support level can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may

be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	Organizational or aviation unit is the lowest level that can do complete repair of the item.
F	Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items, The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Code	Application/Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (e. g., precious metal content, high dollar value, critical material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM (Column (3)). The Federal Supply Code for Manufacture (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. Part Number (Column (4)). 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 you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. Description and Usable On Code (UOC) (Column (5)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The physical security classification of the item is not applicable.

(3) Items that are included in kits and sets are listed below the name of the kit or set.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).

(7) The usable on code, when applicable. (See paragraph 5, special information.)

(8) In the special tools list section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement “END OF FIGURE” appears just below the last item description in Column 5 for a given figure in both section II and section III.

f. Qty (Column (6)). The QTY (quantity per figure column) 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. A “V” appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

D-4. EXPLANATION OF COLUMNS (SECTION IV).

a. National Stock Number (NSN) Index.

(1) STOCK NUMBER column. This column lists the NISN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e., 5305 -01-674-1 467). When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) Fig. column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in section II and section III.

(3) Item column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. Part Number Index. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

(1) FSCM Column. The Federal Supply Code for Manufacturer FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(2) Part Number Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which control; 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.

(3) Stock Number Column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.

(4) Fig. Column. This column lists the number of the figure where the item is identified/located in sections II and Ill.

(5) Item Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. Figure and Item Number Index.

(1) FIG column. This column lists the number of the figure where the item is identified/located in section II and Ill.

(2) ITEM column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

(3) STOCK NUMBER column. This column lists the NSN for the item.

(4) FSCM column. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(5) PART NUMBER column. Indicates the primary number usec by the manufacturer (individual, firm, corporation, or Government activity), which control; 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.

D-5. SPECIAL INFORMATION. Usable On Code. The usable on code appears in the lower left corner of the description column heading. Usable on codes are shown as "UOC: . . . .' in the description column (justified left) on the first line applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in the RPSTL are:

Code	Used On	Code	Used On
U12	M26	U96	M26A1
U40	M27	U97	M27A1

D-6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Not Known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs, This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

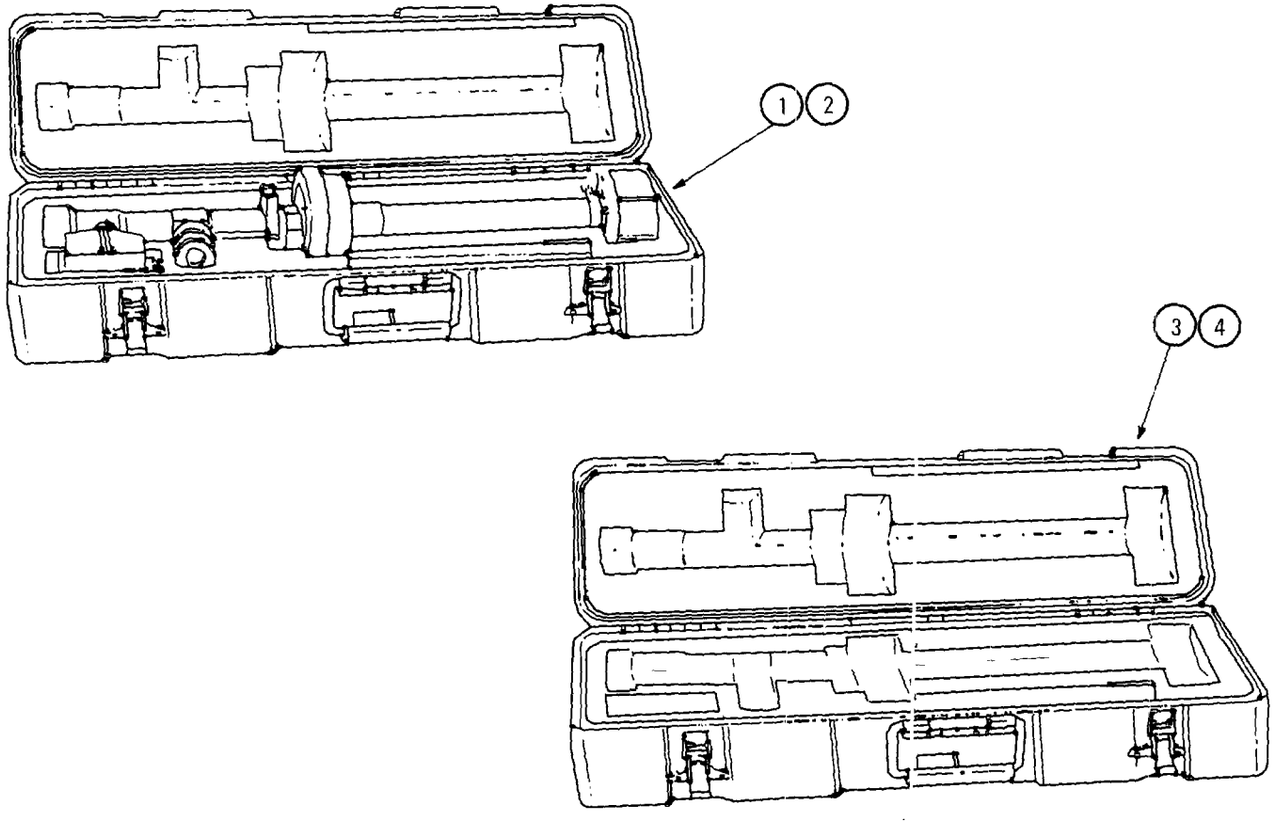
(3) Third. Identify the item on the figure and note the item number.

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

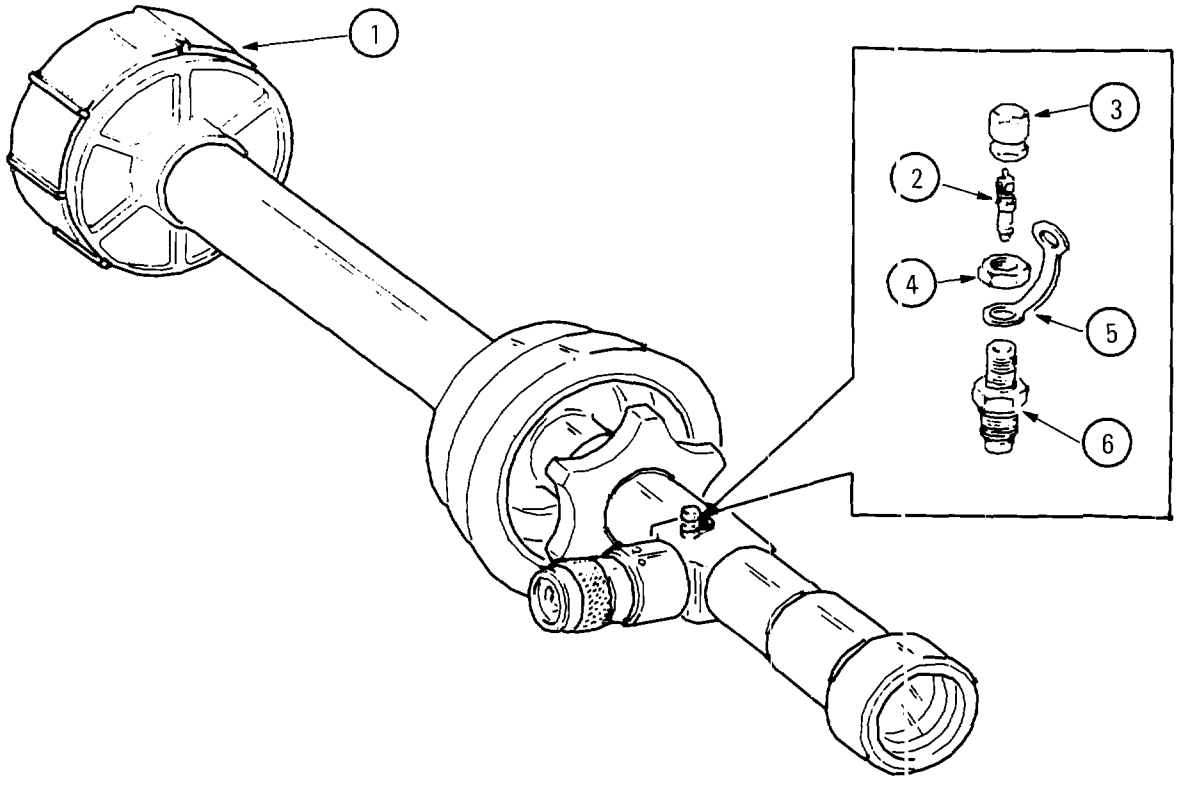
(1) First. Using the index of National stock numbers and part numbers, find the pertinent National stock number or part number. The NSN index is in National Item Identification Number (NIIN) sequence. (See 4.1(1).) The part numbers in the part number index are listed in ascending alphanumeric sequence. (See 4.b.) Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.

(2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

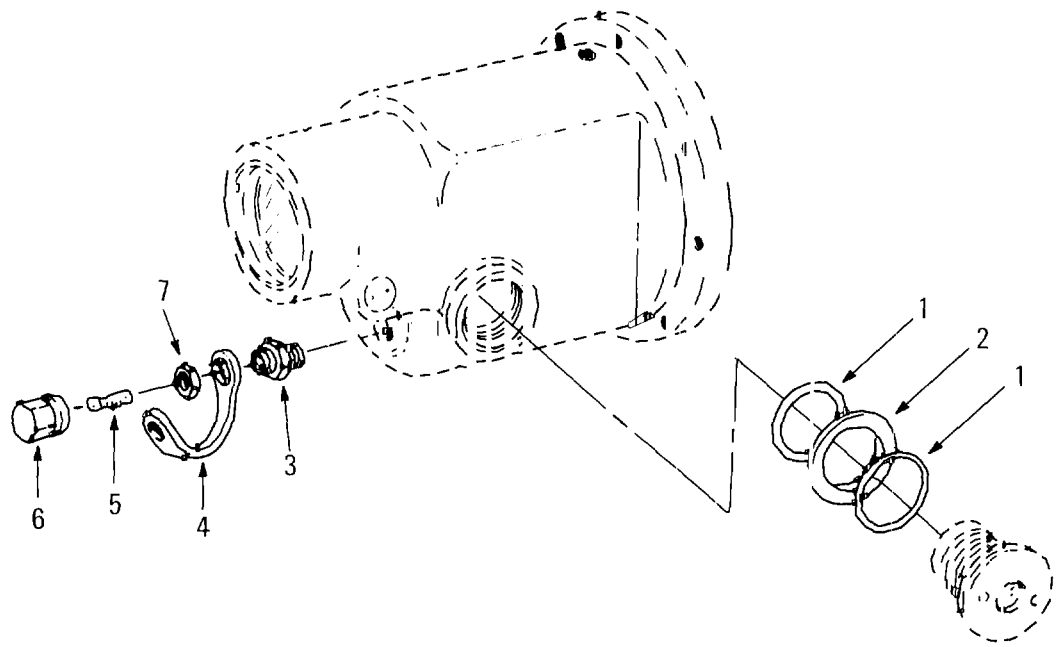
(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				FIG. D-1 GROUP 00 MUZZLE BORESIGHT W/CASE M26A1/M27A1 105MM/120MM	
1	XAOBH	53014	50	BORESIGHT DEVICE M26A1 UOC:U96	1
2	XAOBH	53014	50	BORESIGHT DEVICE M27A1 UOC:U97	1
3	XDOZZ	53014	50	CASE BORESIGHT 105 UOC:U96	1
4	XDOZZ	53014	50	CASE BORESIGHT 120 UOC:U97	1
				END OF FIG	



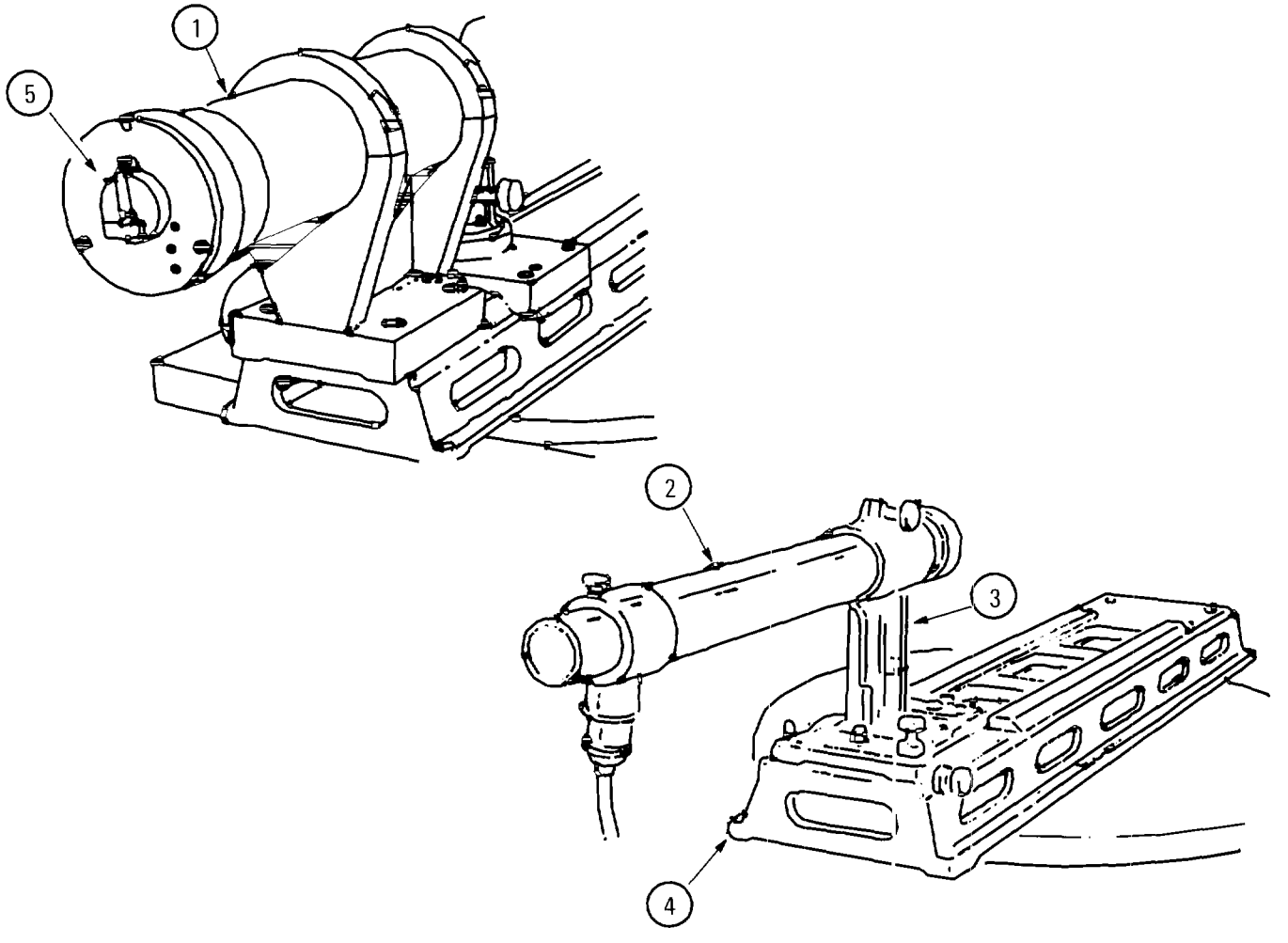
(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				FIG.D-2 GROUP 01 105MM/120MM COLLET	
1	XDHZZ	53014	50C1 1 10G4	COLLET ASSY 120MM UOC:U97	1
1	XDHZZ	53014	50 C1110G3	COLLET ASSY 105MM UOC:U96	1
2	PAOZZ	96906	MS51377-2	VALVE CORE	1
3	PAOZZ	19200	8200055	CAP,AIR VALVE	1
4	PAOZZ	19200	11737597	NUT,PLAIN,HEXAGON	1
5	PAOZZ	19200	10516567	STRAP,VALVE CAP	1
6	PAHZZ	96906	MS51607-1	VALVE STEM,PURGING	1
				END OF FIGURE	



(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				FIG.D-3 GROUP 03 M26 BORESIGHT COVER ASSEMBLY	
1	PCHZZ	19200	MS9021-021	PACKING, PREFORMED UOC:U12,U40	2
2	PAHZZ	19200	9364863	WASHER, FLAT UOC:U12,U40	1
3	PAHZZ	96906	MS51607-1	VALVE STEM, PURGING	1
4	PAOZZ	19200	10516567	STRAP, VALVE CAP	1
5	PAOZZ	96906	MS51377-2	VALVE CORE	1
6	PAOZZ	19200	8200055	CAP, AIR VALVE	1
7	PAOZZ	19200	11737597	NUT, PLAIN, HEXAGON	1
				END OF FIGURE	



(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				FIG. D-4 GROUP 9500 SPECIAL TOOLS	
1	XDHZZ	19200	9364961-1	ADAPTER ALIGNMENT M26A1 UOC:U96	1
1	XDHZZ	19200	9364961-2	ADAPTER ALIGNMENT M27A1 UOC:U97	1
2	PAHDZ	19200	7573291	COLLIMATOR,INFINITY M26A1,M27A1	1
3	PBHDD	19200	7573429	SUPPORT ASSEMBLY M26A1,M27A1	1
4	PAHDD	19200	7573980	FIXTURE,TELESCOPE M26A1, M27A1	1
5	PAHDD	19200	02 MFG019	MIRROR TEST M26A1,M27A1	1
				END OF FIGURE	



CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG	ITEM	STOCK NUMBER	FIG	ITEM
2640-00-060-3543	D-2	2			
	D-3	5			
5310-00-096-9728	D-2	4			
	D-3	7			
1240-00-114-1096	D-2	6			
	D-3	3			
1240-00-464-4792	D-2	5			
	D-3	4			
4931-00-508-5443	D-4	4			
1240-00-757-3291	D-4	2			
5310-01-191-0443	D-3	2			
1015-01-235-0223	D-2	3			
	D-3	6			

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NUMBER	FIG	ITEM
96906	MS51377-2	2640-00-060-3543	D-2	2
			D-3	5
96906	MS51607-1	1240-00-114-1096	D-2	6
			D-3	3
19200	MS9021-021		D-3	1
19200	02MFG019		D-4	5
19200	10516567	1240-00-464-4792	D-2	5
			D-3	4
19200	11737597	5310-00-096-9728	D-2	4
			D-3	7
53014	50C1110G3		D-2	1
53014	50C1110G4		D-2	1
53014	50D1438G1		D-1	1
53014	50D1438G2		D-1	2
53014	50D1443G1		D-1	3
53014	50D1443G2		D-1	4
19200	7573291	1240-00-757-3291	D-4	2
19200	7573429		D-4	3
19200	7573980	4931-00-508-5443	D-4	4
19200	8200055	1015-01-235-0223	D-2	3
			D-3	6
19200	9364863	5310-01-191-0443	D-3	2
19200	9364961-1		D-4	1
19200	9364961-2		D-4	1

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG	ITEM	STOCK NUMBER	FSCM	PART NUMBER
D-1	1		53014	50D1438G1
D-1	2		53014	50D1438G2
D-1	3		53014	50D1443G1
D-1	4		53014	50D1443G2
D-2	1		53014	50C1110G3
D-2	1		53014	50C1110G4
D-2	2	2640-00-060-3543	96906	MS51377-2
D-2	3	1015-01-235-0223	19200	8200055
D-2	4	5310-00-096-9728	19200	11737597
D-2	5	1240-00-464-4792	19200	10516567
D-2	6	1240-00-114-1096	96906	MS51607-1
D-3	1		19200	MS9021-021
D-3	2	5310-01-191-0443	19200	9364863
D-3	3	1240-00-114-1096	96906	MS51607-1
D-3	4	1240-00-464-4792	19200	10516567
D-3	5	2640-00-060-3543	96906	MS51377-2
D-3	6	1015-01-235-0223	19200	8200055
D-3	7	5310-00-096-9728	19200	11737597
D-4	1		19200	9364961-1
D-4	1		19200	9364961-2
D-4	2	1240-00-757-3291	19200	7573291
D-4	3		19200	7573429
D-4	4	4931-00-508-5443	19200	7573980
D-4	5		19200	02MFG019

APPENDIX E

TOOL REQUIREMENTS

This appendix lists tools necessary to perform general support maintenance on the M26/M27 or M26A1/M27A1 muzzle boresight w/case.

Nomenclature	National/NATO Stock Number	Tool Number
Angle Valve	4820-01-100-2093	--
Field Maintenance Instrument and Fire Control Shop Equipment	4931-00-754-0740	SC 4931-95-CL-A07
Field Maintenance Instrument Fire Control System Repair Shop Equipment	4931-00-947-8243	SC 4931-95-CL-A09
Fire Control Maintenance and Repair Shop Specialized Equipment Tool Set	4931-00-574-6433	SC 4931-95-CL-J51
Fire Control Purging Kit	4931-00-065-1110	SC 4931-95-CL-J54
Shop Equipment, Automotive Maintenance and Repair	4931-00-754-0654	SC 4910-95-CL-A74

APPENDIX F

BORESIGHT CENTERING PROCEDURES

SCOPE: This appendix provides procedures for use if muzzle boresight device reticle is not on target aiming point when performing step 17 of boresight procedures (chapter 2).

1. Without touching main gun or muzzle boresight device, look through eye piece and direct gunner to traverse and elevate to aline muzzle boresight device reticle on selected aiming point.

2. Without disturbing lay of main gun, have gunner adjust GPS reticle to selected aiming point.

3. Direct gunner to again record boresight readings.

4. Direct gunner to determine difference between the two boresight readings.

NOTE

Following steps are for determining tolerance of muzzle boresight device only.

a. If readings are same direction, subtract lowest number from highest number.

Example: Readings are in same direction.

First Reading:	AZ (R) 2.0	EL (J) .20
Second Reading:	AZ (R) 1.9	EL (J) .40
	.1	.20

b. If readings are in opposite directions, add first and second readings together.

Example: Readings are in opposite directions.

First Reading:	AZ(R) .10	EL(J).10
Second Reading:	AZ(L) .10	EL(D) .10
	.20	.20

NOTE

Tolerance must not exceed .2 in azimuth or elevation. If readings are greater than .2, turn device into unit maintenance.

5. If muzzle boresight device is in tolerance, direct gunner to determine average azimuth and elevation boresight readings.

NOTE

Following procedures are for determining tank's boresight adjustments.

a. If readings are in same direction, add first and second readings together and divide by 2.

Example: Readings are in same direction.

First Reading:	AZ (L) .40	EL (D) 0.70
Second Reading:	AZ (L) .50	EL (D) 0.90
	.90	1.60

Divide by 2: AZ = .90 divided by 2 = (L) .40
EL = 1.6 divided by 2 = (D) .80

b. If readings are in opposite directions, subtract smaller reading from larger reading and divide by 2.

Example: Readings are in opposite direction.

First Reading:	AZ(R) .15	EL (U) .20
Second Reading:	AZ (L) .05	EL (D) .00
	.10	.20

Divide by 2: AZ = .10 divided by 2 = (R) .05
EL = .20 divided by 2 = (U) .10

c. Round off final number to two digits. If third number is 4 or less, second number will remain the same (EX: .144 = .14). If third number is 5 or more, second number will increase by 1 (EX: .145 = .15).

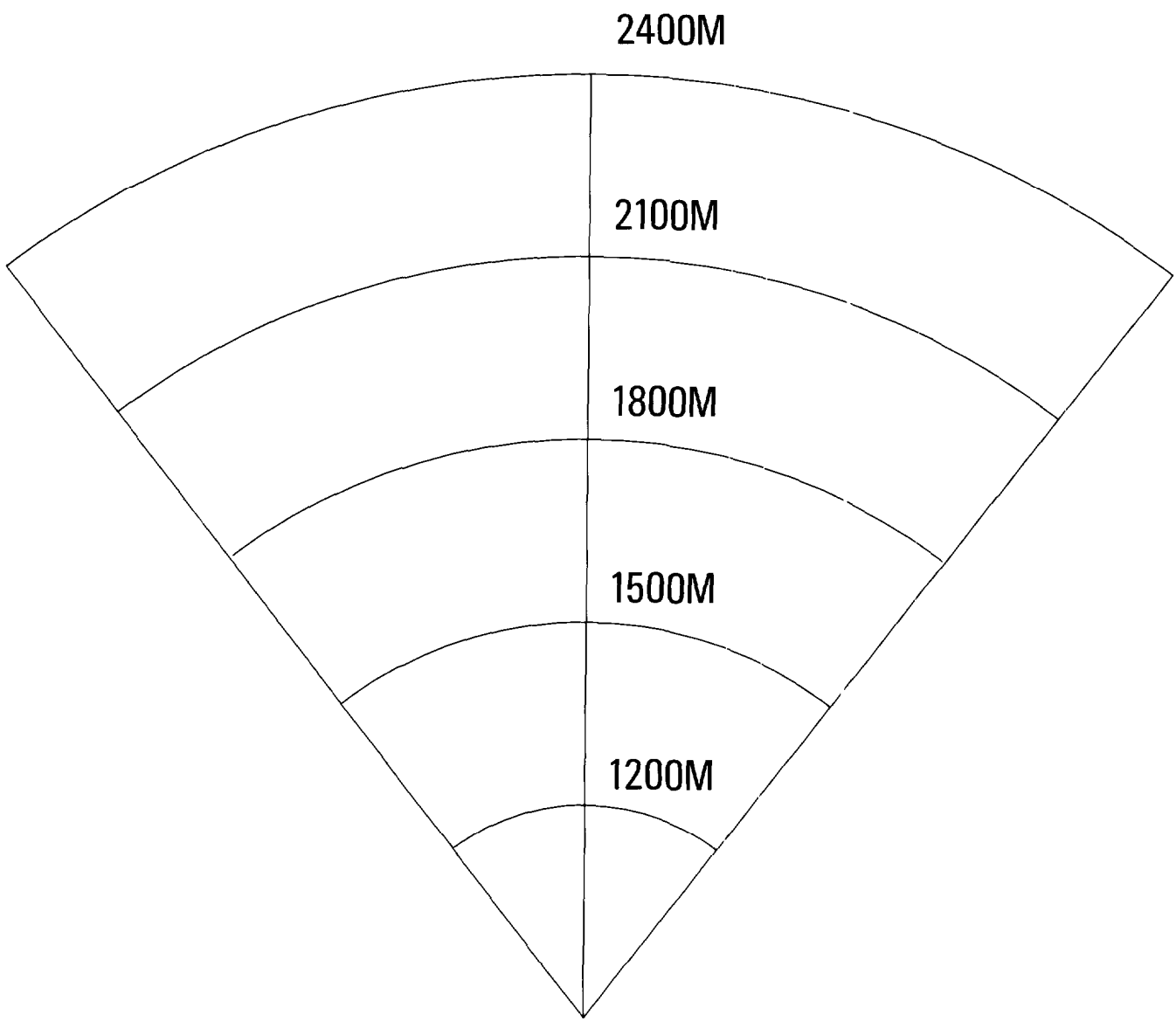
d. When readings are in opposite direction, direction of average AZ or EL will be determined by the larger of the two readings used to determine the average.

APPENDIX G

RANGE SKETCH CARD

SCOPE: This appendix provides a reproducible range sketch card which should be prepared as soon as the tank sets into a position. Range sketch cards are essential for the rapid engagement of targets during all visibility conditions and for rapid resumption of the mission in the event the gunner becomes a casualty, Range sketch cards also should be prepared for alternate and supplementary positions.

RANGE SKETCH CARD



Target	Range
1.	
2.	
3.	
4.	
5.	

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ALPHABETICAL INDEX

ALPHABETICAL INDEX (CONT)

SUBJECT **PAGE**

M

0

P

R

S

ALPHABETICAL INDEX (CONT)

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General, United States Army
Chief Of Staff

Official:

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

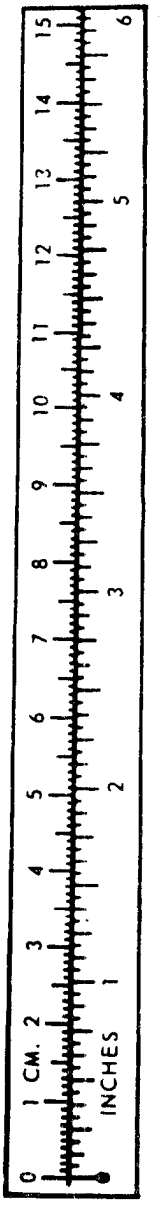
TEMPERATURE

$5/9\ (^0F - 32) = {}^0C$
212^0 Fahrenheit is equivalent to 100^0 Celsius
90^0 Fahrenheit is equivalent to 32.2^0 Celsius
32^0 Fahrenheit is equivalent to 0^0 Celsius
$9/5\ C^0 + 32 = F^0$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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