**This copy is a reprint which includes current pages from Changes 1 through 3.**

**TECHNICAL MANUAL**

# DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

**PERISCOPE, TANK M35E1 (1240-00-348-8442)**



**Headquarters, Department of the Army**
**NOVEMBER 1980**

Change

No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 6 February 1987

**DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL**

**PERISCOPE, TANK: M35E1**
**(NSN 1240-00-348-8442)**

TM 9-1240-382-34, 14 November 1980, is changed as follows:

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| A-1 | A-1(A-2 Blank) |
| B-1 and B-2 | B-1 and B-2 |
| Index 1 and Index 2 | Index 1 and Index 2 |

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CHANGE

NO. 2

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DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

PERISCOPE, TANK: M35E1
(NSN 1240-00-348-8442)

TM 9-1240-382-34, 14 November 1980, is changed as follows:

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CHANGE
NO. 1

**DIRECT SUPPORT AND GENERAL MAINTENANCE**

**MAINTENANCE MANUAL**

**PERISCOPE, TANK: M35E1**

**(NSN 1240-00-348-8442)**

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**DIRECT SUPPORT AND GENERAL SUPPORT**
**MAINTENANCE MANUAL**
**PERISCOPE, TANK: R3tE1**
**NSNI 12441 341 l44**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENT**

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

## HOW TO USE THIS MANUAL

This manual provides information on how to perform direct and general support maintenance on the M35E1 Tank Periscope. A chapter overview describes briefly the information or instructions included in each chapter.

This manual consists of:

1. Chapter 1 is an introductory chapter.

a. Section I. General Information. Explains the scope of the manual and identifies other manuals to be used in conjunction with this manual.

b. Section II Equipment Description and Data. Describes the physical makeup and function of each of the three major assemblies that comprise the periscope, and their relationship to each other.

c. Section III. Repair Parts, Special Tools, TMDE and Support Equipment. Refers to TM 9-1240-382-34P for information pertaining to spare parts and special tools, and lists those special tools and equipment necessary to perform the maintenance instructions contained in this manual.

2. Chapter 2. This chapter contains maintenance instructions authorized to be performed by direct and general support maintenance personnel.

a. Section I. Service Upon Receipt of Materiel. Refers to TM 9-2350-253-20-2 for service instructions upon receipt of a new or overhauled periscope.

b. Section II. Troubleshooting. This section contains a symptom index, and an illustrated trouble shooting guide.

c. Section III. Maintenance Procedures.

(1) A list of tasks to be performed with the maintenance instructions contained in each paragraph is included at the beginning of each paragraph.

(2) An initial Setup section is also included at the beginning of each paragraph and covers the following items.

(a) Applicable Configuration. Indicates when there is more than one model of a periscope to which the paragraph or section applies. There is only one model of this periscope currently in use.

(b) Test Equipment. Test equipment required to perform specific tasks are listed.

(c) Special Tools. All special tools required to perform specific tasks are listed.

(d) Materials/Parts. Listed are materials necessary to effect repairs, or to use during reassembly. If the maintenance procedure is directed toward replacement of a specific part, the part is also listed.

(e) Procedures. Procedures to be performed by general support are indicated by a GS following the procedure.

(f) Personnel Required. Only one fire control repairman is required to perform direct and general support maintenance.

(g) References. Other publications that should be available when performing the maintenance task are listed.

(h) Troubleshooting References. References that should be available to the fire control repairman when he is troubleshooting the periscope are the Operator's manual TM 9-2350-253-10 and the organizational Maintenance Manual TM 9-2350-253-20-2

(i) Equipment Condition. States whether or not the periscope is assembled or disassembled. If partially disassembled, lists components that are removed.

(j) Special Environmental Conditions. The normal clean environment for servicing optical equipment is required.

(k) General Safety Instructions. There are no general safety instructions necessary for performing maintenance of the periscope.

(l) Approximate Time Required. Time required to perform each maintenance task is listed in the Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

(3) Use the following procedures as applicable for each major component is accordance with the Maintenance Allocation Chart (MAC). The procedures are removal, disassembly, cleaning, inspection, repair, reassembly, adjustment, and installation.

3. Chapter 3. This chapter contains the inspections to be performed after the periscope has been repaired, and preembarkation inspection of materiel in units alerted for overseas movement.

4. Appendices. The appendices contain the following information.

a. Appendix A. Contains a list of references.

b. Appendix B. A list of expendable supplies and materiels.

c. Appendix C. Schematic Diagram.

d. Appendix D. Illustrations of spanner wrenches.

5. Index. An index is included in the back of this manual.

# CHAPTER 1

# INTRODUCTION

**CHAPTER OVERVIEW**

This chapter contains a. general information, b. equipment description and data, c. repair parts, special tools, TMDE and support equipment for the periscope.

## SECTION I. GENERAL INFORMATION

1-1. SCOPE
Type of Manual: Type-34 Direct Support and General Support Maintenance Manual
Model Number and Equipment Name:
M35E1 - Periscope. Tank
Purpose of Equipment: Daylight and night sighting as part of tank fire control systems.

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 be Management System.

1-3 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S). EIR's will be prepared on SF form 368, duality Deficiency Report for preparing EIR's are provided in DA PAM 738-750, The Army Maintenance Management System. EIR's should mailed directly to Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD, Rock Island, IL -61299-6000. A reply will be furnished directly to you.

## SECTION II. EQUIPMENT DESCRIPTION AND DATA

1-4. PURPOSE OF THE M35E1 PERISCOPE, TANK
Designed for daylight and night sighting and observing as part of the fire control system in the Tank, Combat, Full Tracked 105MM Gun, M60A3.

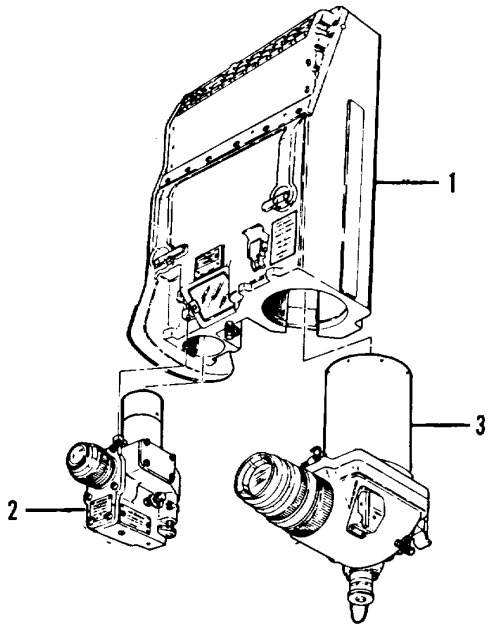
1-5. CAPABILITIES AND FEATURES

a. Optical capability
(1) Unity power system (lx) ..... for wide and close in vision of terrain.
(2) Eight power system (8x) ..... for visible light sighting of targets
(3) Image intensifier system (7.1x)... for night sighting of targets

b. Major Components
(1) Head Assembly
(2) Daylight Body Assembly
(3) Elbow Assembly

1-6 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. The following illustration shows the location, identification, and relative position of the major components of the M35E1 Periscope.

Head Assembly (1)
Daylight Body Assembly (2)
Passive Elbow Assembly (3)



## SECTION III. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

1-7. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment refer to. the Modified Table of organization and Equipment (MTOE) applicable to your unit.are listed below.

1-8. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT Spares and repair parts are listed in TM 9-1240-382-34P. Special Tools required for direct and general support are listed below.

*Table 1-1. Special Tools and Equipment*

| Nomenclature | National/NATO stock number | Use |
|---|---|---|
| PURGING KIT: fire control | 4931-00-065-1110 | Used with nitrogen gas to purge and charge the head assembly, body assembly, or elbow assembly. |
| NITROGEN TECHNICAL: tank | 6830-00-782-2641 | Used to supply dry nitrogen to purge and charge the head assembly, body assembly, or elbow assembly. |
| WRENCH: spanner, pin-face adjustable | 5120-00-595-8996 | Used to remove and install externally relieved body screw. |
| GUN: sealing, | 4931-00-764-8117 | Used to inject sealing compound, and form "spaghetti." |
| DIOPTO-METER: | 4931-00-536-5557 | Used to check definition of body or elbow. |
| EXTRACTOR: Tube | 1240-01-054-5789 | Used to remove intensifier tube from elbow assembly. |
| SPANNER WRENCH: (Figure D2, Appendix D) | | Used to remove and install the retaining ring for the eyepiece on the daylight body assembly. |
| SPANNER WRENCH: (Figure D1, Appendix D) | | Used to remove the locking ring from the cell assembly in the eyepiece on the daylight body assembly. |

# CHAPTER 2

# MAINTENANCE INSTRUCTIONS

**CHAPTER OVERVIEW**

This chapter contains information and instructions necessary to keep the M35E1 Periscope in serviceable condition. Contents include a. service upon receipt, b. troubleshooting, and c. maintenance procedures.

## SECTION I. SERVICE UPON RECEIPT OF MATERIEL

2-1 GENERAL. Normally it is not necessary to open the shipping container at the direct support or general support level if weapon is new or depot overhauled. The instructions for service on receipt of materiel are found in TM 9-2350-253-20-2 and will be used along with the instructions on pages for inspection of the assembled periscope.

## SECTION II. TROUBLESHOOTING

2-2 GENERAL. Troubleshooting is the application of a definite procedure, in a logical sequence, to isolate a malfunction or locate a defective component. Always look first for the obvious causes that are most easily corrected and require the least amount of disassembly. Troubleshooting procedures performed at lower maintenance levels are contained in with the instructions on pages for inspection of the assembled periscope. TM 9-2350-253-10 and TM 9-2350-253-20-2. Trouble-shooting procedures are contained in the trouble-shooting table. Procedures are included to determine the cause of a malfunction and action necessary to correct the trouble. An electrical schematic diagram is included in Appendix C for additional assistance in troubleshooting.

SYMPTOM INDEX

**MALFUNCTION**
**TEST OR INSPECTION**
**CORRECTIVE ACTION**

1. **LOSS OF BORESIGHT**

Step 1. Ensure that boresight knobs are fully engaged with their positive clutches.

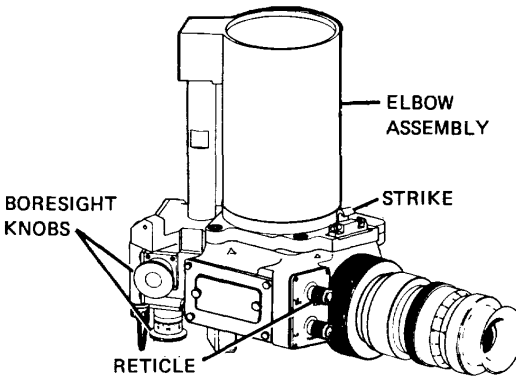
a. If a knob cannot be engaged, repair or replace spring in boresight knob (p 2-15- 2-18).

b. If boresight knobs operate properly, proceed to step 2.

Step 2. Ensure that the elbow assembly is properly seated in the head.

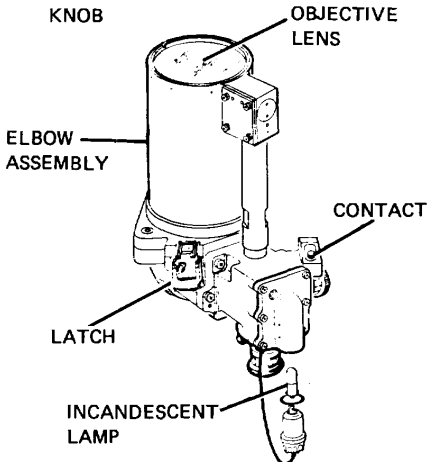
a. Remove the elbow assembly and check for foreign matter around locating pads or for work or damaged catches or strikes, and replace, clean or repair as necessary (p 2-9 - 2-11).

b. If boresight capability is not restored, replace head or elbow assembly as required.




**2. POOR OR NO ILLUMINATION OF NIGHT RETICLE**

**NOTE**
**Cover objective lens and apply 24 volts dc power to the elbow assembly.**




Step 1. Ensure that RETICLE control knob is properly adjusted.
a. Operate RETICLE control knob.
b. If reticle cannot be lighted, proceed to step 2.

Step 2. Check for damaged or defective incandescent lamp or lampholder.
a. If lamp is damaged or defective, replace lamp (p 2-10- 2-11).
b. If lampholder is defective, replace lampholder (p 2-10-2-11).
c. If lamp and lampholder are satisfactory, proceed to step 3.

Step 3. Ensure that contact is not corroded.
a. If contact is corroded, clean the contact. (p 2-10).
b. If contact is not defective, proceed to step 4.

Step 4. With objective lens covered to simulate darkness, move shutter switch to the ON position (reset if necessary) and operate TUBE control knob.
a. If image intensifier tube lights, replace RETICLE variable resistor (p 2-12-2-15).

b. If tube does not light, replace regulator assembly (p 2-11 - 2-12).
c. If malfunction is not corrected, replace elbow assembly.

**3. NO NIGHT CHANNEL IMAGE, LOW BRILLIANCE OF NIGHT IMAGE, OR NIGHT IMAGE FLICKERS OR MOVES.**

**NOTE**
**Cover objective lens and apply 24 volts dc power to the elbow assembly.**

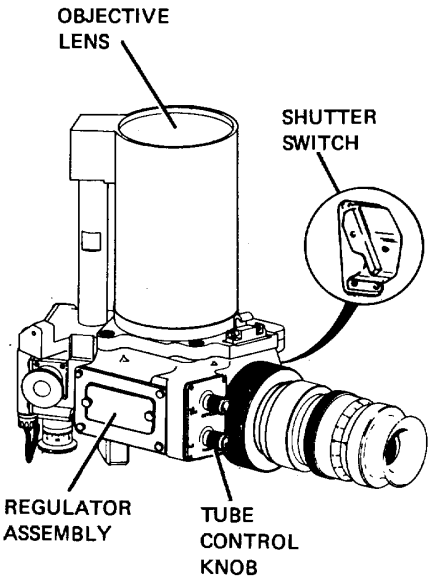
Step 1. Check the shutter switch.
a. Move switch to ON position.
b. If malfunction is not corrected, proceed to step 2.

Step 2. Ensure that TUBE control knob is properly adjusted.
a. Turn control to obtain sufficient image brightness.
b. If malfunction is not corrected, proceed to step 3.

Step 3. Ensure that contact is not corroded.
a. If contact is corroded, clean the contact (p 2-10).
b. If contact is not defective, proceed to step 4.

Step 4. Check that image intensifier tube is not defective.
a. Replace image intensifier tube (p 2-6- 2-7).
b. If malfunction is not corrected, proceed to step 5.

Step 5. Check continuity of TUBE variable resistor (R3) and resistor R1. (p 2-12 - 2-15).
a. If continuity check fails, replace variable resistor or resistor (or both as necessary.
b. If malfunction is not corrected, replace the elbow assembly.



**MALFUNCTION**
**TEST OR INSPECTION**
**CORRECTIVE ACTION**

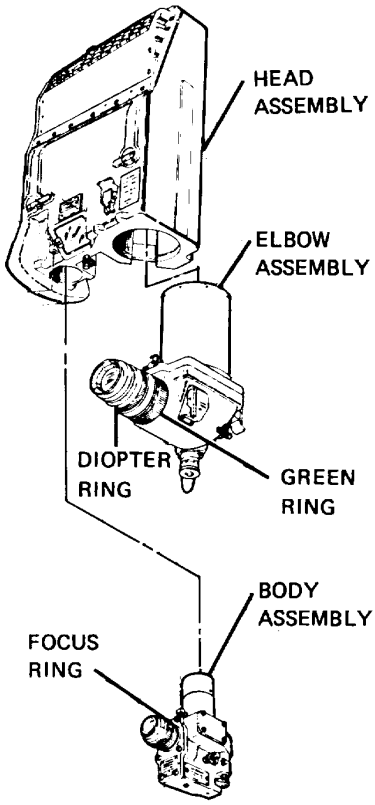
**4. FOGGY VISION THROUGH IMAGE INTENSIFIER ELBOW.**

**NOTE**
**Cover objective lens and apply 24 volts dc power to the elbow assembly.**

Step 1. Check for proper focus adjustment using the green ring and diopter ring.
a. Adjust either ring.
b. If vision is still foggy proceed to step 2.

Step 2. Check for fingerprints or dirt on all exposed optical surfaces.
a. Clean optics as required.
b. If vision is still foggy, proceed to step 3.

Step 3. Check for condensation inside head or elbow.
a. If moisture is present, check for defective sealing or a defective valve.
b. If valve is defective, replace valve (p 2-26 - 2-27).
c. If sealing is defective, repair where authorized or replace elbow.
d. Purge and charge assembly (p 2-30).




**5. FOGGY VISION THROUGH DAYLIGHT BODY.**

Step 1. Check for proper focus adjustment.
a. Adjust focus ring.
b. If vision is still foggy, proceed to step 2.

Step 2. Check for dirt or fingerprints on all exposed optical surfaces.
a. Clean optics as required.
b. If vision is still foggy, proceed to step 3.

Step 3. Check for condensation inside head or body.
a. If moisture is present, check for defective sealing or a defective valve.
b. If valve is defective, replace valve (p 2-19 - 2-20).
c. If sealing is defective, repair where authorized or replace body.
d. Purge and charge assembly (p 2-30).

**6. NO ELECTRICAL POWER WHEN EMERGENCY POWER IS CONNECTED**

Step 1. Check emergency power source.
Step 2. Check diode for open circuit (p 2-12).

## SECTION III. MAINTENANCE PROCEDURES

### 2-3 REMOVAL OF MAJOR COMPONENTS

This task covers:

Removal

INITIAL SETUP

Applicable Configurations
All

Test Equipment
None

Special Tools
None

Materials/Parts
None

Personnel Required
1

References
None

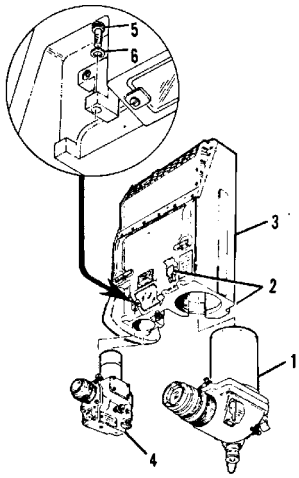
Troubleshooting References
None

Equipment Condition
None

Special Environmental Conditions
None

General Safety Instructions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2.

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REMOVAL** | | | |
| Periscope | Major Components | | |
| | Elbow (1)<br>Latch (2)<br>Head (3)<br>Body (4)<br>Screw (5)<br>Lockwasher (6) |  | Support the elbow assembly (1) by hand and release the latches (2). Carefully slide the elbow assembly from its position in the head assembly (3). Support the daylight body assembly (4) by hand and remove the two screws (5) and lockwashers (6). Carefully slide the body assembly out of the head assembly (3). |

## 2-4 ELBOW ASSEMBLY

This task covers:

Removal
Disassembly
Cleaning
Inspection/Repair
Reassembly
Installation/Adjustment

INITIAL SETUP

Applicable Configuration
All

Test Equipment
TS- 3 5 2 B/U Multimeter

Special Tools (p 1-3)

Tube Extractor 1240-01-054-5789

Material/Parts (App B)
Grease MIL-G-4343
Sealing Compound MIL-S-11031
Silicone Adhesive (RTV) MIL-A-46106
Solder QQ-S-571
Alcohol MIL-STD-1201
Solvent P-D-680
Lens Tissue

Personnel Required
1

References
None

Troubleshooting References
TM 9-2350-253-10
TM 9-2350253-20-2
Page 2-1 thru 2-4 of this manual

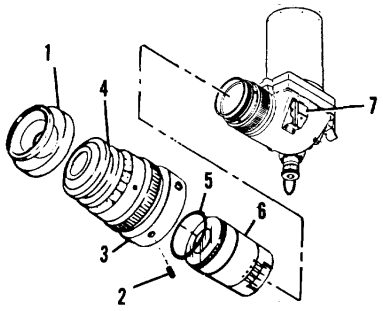
Equipment Condition

None

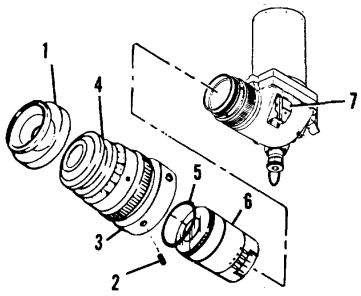
Special Environment Conditions
None

General Safety Instructions
None

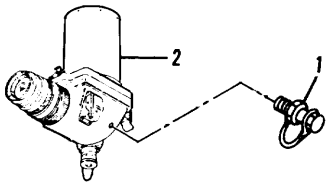
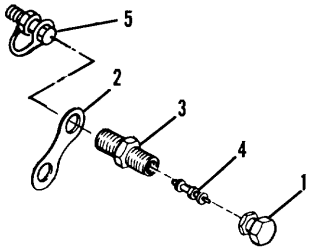
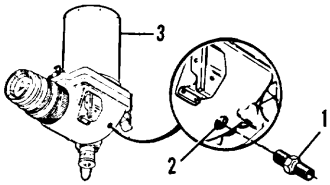
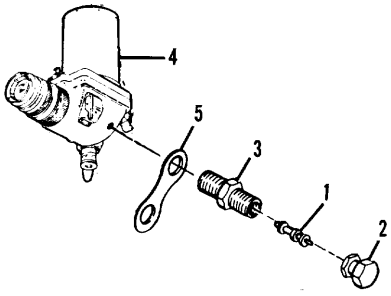
Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

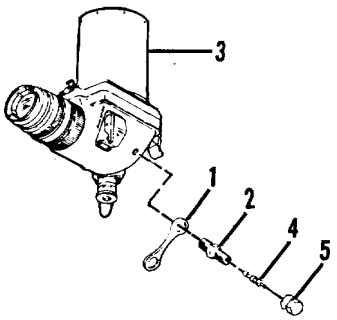
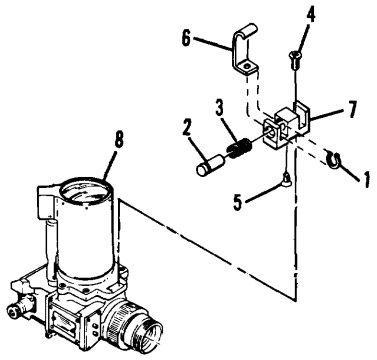
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **DISASSEMBLY** | | | |
| Elbow Assembly Tube | Image Intensifier |  Eyeshield (1)<br>Setscrew (2)<br>Locking Ring (3)<br>Eyepiece Assembly (4’<br>Packing (5)<br>Image<br>Intensifier Tube (6)<br>Shutter Switch (7) | **CAUTION**<br>**The image intensifier tube may be damaged if exposed to bright sunlight or brought into close proximity with high intensity artificial light. Keep shutter switch in off position while working on Elbow.** | Remove eyeshield (1). Loosen two set screws (2) on locking ring (3) of eyepiece assembly (4). Remove eyepiece assembly (4) by unscrewing locking ring (3). Remove the packing (5) from the slot in the rear of the eyepiece assembly (4) covered by locking ring (3). Use the tube extractor, (p 1-3), and engage the threads on the tube extractor with the threads on the image intensifier tube (6) and pull straight back. Disengage the extractor tool from the tube. Protect ends of tube with lens tissue. (App. B) |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **CLEANING** | | | |
| Elbow Assembly | Eyepiece Assembly (4)<br>Locking Ring (3)<br>Image intensifier tube (6)<br>Elbow Assembly (7) | | Clean dirt and grime from all threads with lint-free cloth. Use a clean camel hair brush to remove dust, lint, or other particles from the lenses. Remove oil or grease from optical surfaces with a swab moistened in alcohol (MIL-STD-1201) (App. B) and wipe the surfaces dry with lens tissue. |
| **INSPECTION/REPAIR** | | | |
| Elbow Assembly | Eyepiece Assembly (4)<br>Locking Ring (3)<br>Intensifier Tube (6)<br>Elbow Assembly (7)<br>Packing (5)<br>Image Intensifier tube (6)<br>Eyeshield (1) | | Inspect threaded components (3, 4, 6, and 7) for damaged threads. Inspect packing (5) for serviceable condition. Check general condition of image tube (6) and eyeshield (1). Inspect optical components for chips, cracks, or damage that may interfere with operation of periscope. Repair is limited to replacement of missing, defective, or damaged parts. |
| **REASSEMBLY** | | | |
| Elbow Assembly | Intensifier tube (6)<br>Elbow Assembly (7)<br>Packing (5)<br>Eyepiece Assembly (4)<br>Locking Ring (3)<br>Setscrews (2)<br>Eyeshield (1)<br>Strike (8) | **CAUTION**<br>**Overtightening of set-screws will damage adapter threads.** | Install tube extractor (p 1-3) on image intensifier tube, and insert intensifier tube (6) in the elbow (7). Coat packing (5) with a light coat of grease MIL-G-4343 (App B)and insert packing in eyepiece assembly (4). Install eyepiece assembly (4) on elbow assembly (7) with index facing the strike (8) and tighten locking ring (3) snugly by hand. Tighten setscrew (2). Install eyeshield (1). |

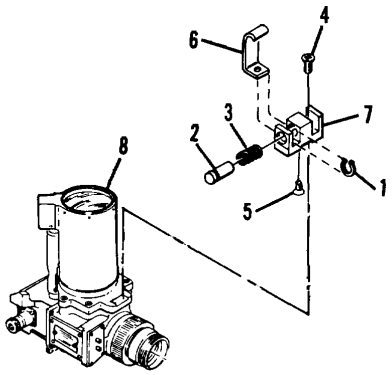
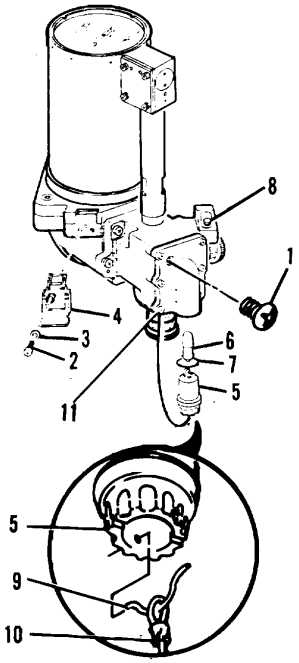


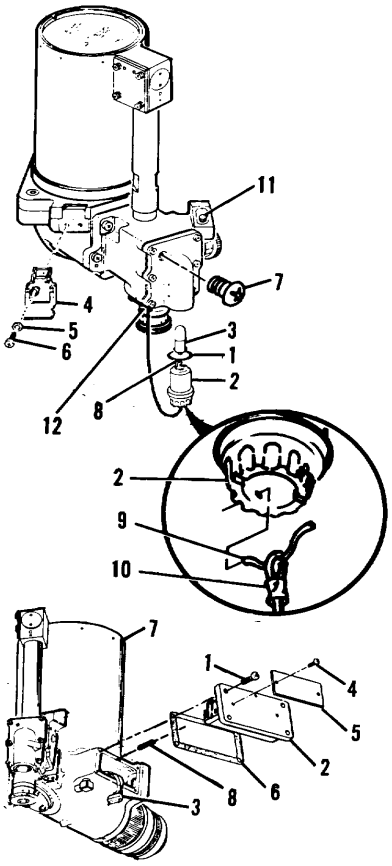
**2-4 ELBOW ASSEMBLY - CONTINUED**

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REMOVAL** | | | |
| **Elbow** Assembly | Purging Valve<br><br>Purging Valve (1)<br>Elbow Assembly (2) |  | Remove the purging valve (1) from the elbow assembly (2) as a complete unit. |
| **DISASSEMBLY** | | | |
| Purging Valve | Cap (1)<br>Strap (2)<br>Stem (3)<br>Core (4)<br>Purging Valve (5) |  | Remove the cap (1). Detach strap (2) from cap (1) and stem (3). Remove core (4) from stem (3). |
| **CLEANING** | | | |
| Elbow Assembly | Purging Valve<br>Valve Stem (1)<br>Mounting Hole (2)<br>Elbow Assembly (3) |  <br>  | Holding elbow (3) upright to prevent sealant from falling inside, remove dirt and grime from all threads. Remove all traces of sealing compound from the valve stem (1) and mounting hole (2) in the elbow assembly (3). |
| **INSPECTION/REPAIR** | | | |
| Elbow Assembly | Purging Valve<br><br>Valve Core (1)<br>Cap (2)<br>Stem (3)<br>Elbow (4)<br>Strap, (5) | | Inspect all parts for deterioration. Inspect the sealing area of the core (1) to see that it is smooth and free of any defects such as nicks, scratches, or cuts that would cause a leak. Inspect the cap (2), stem (3) and mounting hole in the elbow (4) for worn or damaged threads. Inspect the strap (5) for deterioration or tears and that it holds the cap firmly. Repair is limited to replacement of missing, defective, or damaged parts. |

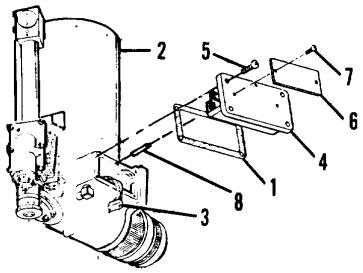
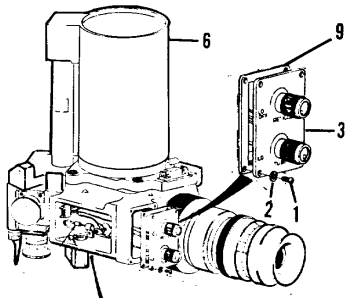
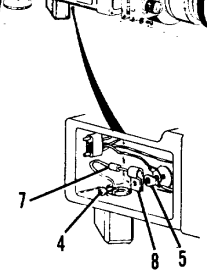
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION** | | | |
| Elbow Assembly | Purging Valve<br><br>Strap (1)<br>Stem (2)<br>Elbow (3)<br>Valve Core (4)<br>Cap (5) |  | Install strap (1) on stem (2). Apply sealing compound,MIL-S-11031 (App B) on threads of the valve stem (2) and install the valve stem (2) in the elbow (3). Install the valve core (4) in the stem (2). Attach the cap (5) to the strap (1) and screw the cap onto the valve stem. |
| **REMOVAL** | | | |
| Elbow Assembly | Alinement Key and Strike | **WARNING**<br>Care must be exercised when removing the plunger (2) which is under spring pressure. | Remove the snap ring (1) from the groove in the plunger (2) while pressing a screwdriver against the plunger to relieve spring pressure. Remove the plunger (2) and spring (3). Remove the two screws (4) and remove the strike and key as an assembly. Remove the screw (5) to separate the strike (6) from the key (7). |
| | Snap Ring (1)<br>Plunger (2)<br>Spring (3)<br>Screw (4)<br>Screw (5)<br>Strike (6)<br>Key (7)<br>Elbow (8) |  | Clean all parts in solvent P-D-680 (App B) and blow or wipe dry.<br><br>Inspect parts for looseness or damage. Check screws for worn or damaged threads. Inspect spring for loss of tension, cracks or breaks. Repair is limited to replacement of missing, defective, or damaged parts. |
| **CLEANING** | | | |
| Elbow Assembly and strike | Components of Alinement key | | |
| **INSPECTION/REPAIR** | | | |
| Elbow Assembly | Components of Alinement key and strike | | |

## 2-4 ELBOW ASSEMBLY - CONTINUED

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION** | | | |
| Elbow Assembly and strike | Components of Alinement key<br><br>Strike (1)<br>Key (2)<br>Screw (3)<br>Elbow (4)<br>Screw (5)<br>Spring (6)<br>Plunger (7)<br>Snap Ring (8) |  | Assemble strike (1i to key (2) by installing screw (3). Install the key and strike assembly on the elbow (4) using two screws (5). Install the spring (6). Insert plunger (7) halfway into key (2) and install snap ring (8) on plunger (7). Depress plunger and slide snap ring into groove on plunger. |
| **REMOVAL** | | | |
| Elbow Assembly | Purging Screw, Latch, Reticle Lamp, Cable, and Lampholder<br><br>Purging Screw (1)<br>Screw (2)<br>Lockwasher (3)<br>Latch (4)<br>Lampholder (5)<br>Lamp (6)<br>Packing (7)<br>Contact (8)<br>Locking Valve(9)<br>Cable (10)<br>Attaching Screw (11) |  | Remove the purging screw (1). Remove screws (2), lockwashers (3) and latch (4). Unfasten lampholder (5) and remove lamp (6) and packing (7). Remove the attaching screw (11) that connects the cable (10). Remove the locking wire (9) from the lampholder (5). |
| **CLEANING** | | | |
| Elbow Assembly Lamp | Purging Screw, Latch, Reticle | | Clean dirt and grime from all threads. Polish and clean the contact point (8) with 240 emery paper (App. B) and wipe off any collection of dust. |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION/REPAIR** | | | |
| Elbow Assembly Lamp and Contact | Purging Screw, Latch, Reticle |  | Inspect all parts for deterioration. Check screws for worn or damaged threads. Check contact (11) and lampholder (2) for corrosion. Check ear (8) on lampholder for bent condition, or missing part. Repair is limited to replacement of missing, defective, or damaged parts. |
| **INSTALLATION** | | | |
| Elbow Assembly Lamp, Cable, | Purging Screw, Latch, Reticle<br>and Lampholder<br><br>Packing (1)<br>Lampholder (2)<br>Lamp (3)<br>Latch (4)<br>Lockwasher (5)<br>Screw (6)<br>Purging Screw (7)<br>Lampholder Ear (8)<br>Locking wire (9)<br>Cable (10)<br>Contact (11)<br>Screw (12) | | Install Packing (1) on lampholder (2).Install lamp (3) in bayonet base of lampholder (2). Install lampholder in housing. Install latch (4) and secure with lockwashers (5) and screws (6). Install purging screw (7). Insert the attaching screw (12) through the terminal lug in one end of the cable (10). Install the attaching screw. Insert the locking wire through the terminal lug in the opposite end of the cable (10) and install the locking wire (9) in the lampholder (2). |
| **REMOVAL** | | | |
| Elbow Assembly | Regulator, Identification Plate<br>Screw (1)<br>Regulator (2)<br>Electrical Connector (3)<br><br>Screw (4)<br>Identification Plate (5)<br>Gasket (6)<br>Elbow (7)<br>Pin (8) | | If troubleshooting (p 2-2, 4b) has indicated that the regulator requires replacement, remove four screws (1). Pull the regulator assembly (2) and pin (8) out carefully and unplug electrical connector (3). Remove two screws (4) and identification plate (5). Remove gasket (6). |
| **CLEANING** | | | |
| Elbow Assembly | Regulator | | Clean dirt and grime from all threads. Clean the areas on the elbow (7) and regulator assembly (2) that will contact the gasket (6) when it is installed. |

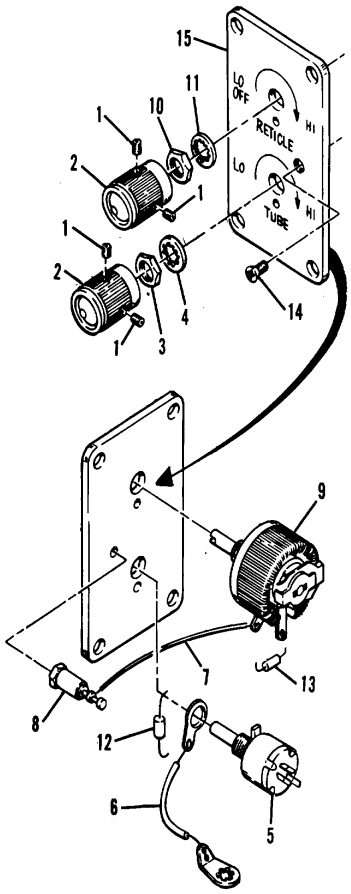
## 2-4 ELBOW ASSEMBLY - CONTINUED

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION/REPAIR** | | | |
| Elbow-Assembly Plate | Regulator, Identification |  | Inspect the gasket for deterioration or damage. Inspect all threads for damage. Inspect the identification plate for legibility. Repair is limited to replacement of missing, defective, or damaged parts. |
| **INSTALLATION** | | | |
| Elbow Assembly | Regulator,<br>Identification Plate<br>Gasket (1)<br>Elbow (2)<br>Connector (3)<br>Regulator (4)<br>Screw (5)<br>Identification Plate (6)<br>Screw (7)<br>Pin (8) |  | Position the gasket (1) on the elbow assembly (2). Orient the regulator (4) with the connector toward the objective end of the elbow, and plug electrical connector (3) into the regulator (4). Install regulator with pin (8) and secure it with four screws (5). Install identification plate (6) and secure with two screws (7). |
| **REMOVAL. GS** | | | |
| Elbow Assembly | Switch Assembly, Blocking Diode |  | Remove four screws (1) and lockwashers (2). Pull the switch assembly (3) out gently as far as possible without straining attached wires. Remove the gasket (9). Remove regulator (p 2-11). |
| | Screw (1)<br>Lockwasher (2)<br>Switch Assembly (3)<br>Screw (4)<br>Ground Wire (5)<br>Elbow Assembly (6)<br>Diode (7)<br>Clamp (8)<br>Gasket (9) | | Remove the screw (4) to disconnect the white ground wire (5) from the elbow assembly (6). Unsolder the six wires connected to the switch assembly .Locate the diode (7) in the red wire from the electrical connector for emergency power. Remove the insulation sleeving from the solder connections to diode (7). Check diode for low resistance in direction of current flow and high resistance in opposite direction, and for open circuit. If diode is defective, unsolder and remove the diode (7) and clamp (8). |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|

**DISASSEMBLY**

Elbow Assembly — Switch Assembly




Setscrew (1)
Knob (2)
Nut (3)
Lockwasher (4)
Variable Resistor (5)
Ground Wire (6)
Jumper (7)
Terminal (8)
Variable Resistor (9)
Nut (10)
Lockwasher (11)
Resistor (12)
Resistor (13)
Screw (14)
Cover Plate (15)

Loosen the two setscrews (1) holding each knob (2) and remove the knobs. Remove nut (3), and lockwasher (4). Remove variable resistor (5) and ground wire (6). Unsolder jumper (7) from terminal (8) and variable resistor (9). Remove nut (10), lockwasher (11) and variable resistor (9). Unsolder resistor (12) from variable resistor (5). Unsolder resistor (13) from variable resistor (9). Remove screw (14) and terminal (8).

Clean dirt and grime from all threads. Remove silicone (RTV) adhesive (App B) from small holes in switch cover plate (15).

**CLEANING**

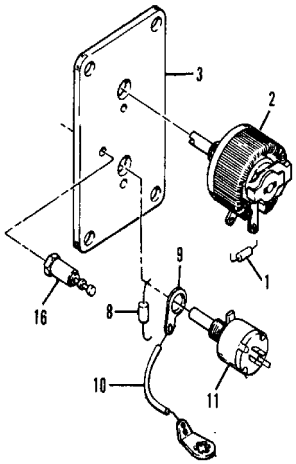
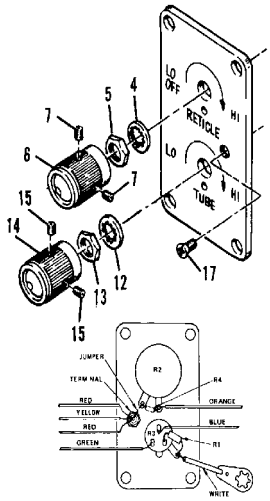
Elbow Assembly — Switch Assembly

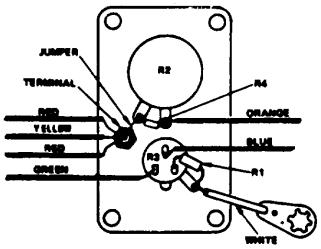
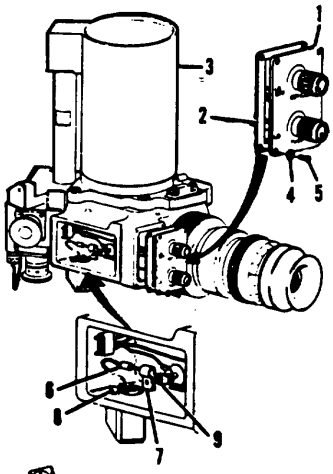
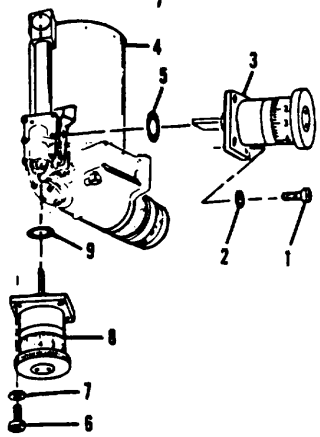
Inspect all parts for deterioration. Wiring insulation must be free of signs of wear, cuts, or burns. The variable resistors should turn smoothly throughout their range. Threaded components should be free of burrs and evidence of cross threading. Repair is limited to replacement of missing, defective, or damaged parts.

**INSPECTION/REPAIR**

Elbow Assembly — Switch Assembly

**2-4 ELBOW ASSEMBLY - CONTINUED**

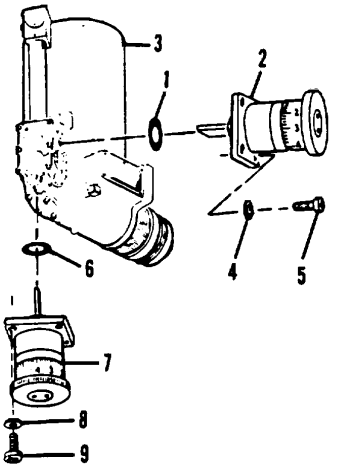
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REASSEMBLY** | | | |
| Elbow Assembly | Switch Assembly |  | Using solder QQ-S-571 (App B), solder resistor (1, R4) to Variable Resistor (2). Insert Variable Resistor (2, R2) through the upper hold in cover plate (3). Install lockwasher (4) and nut (5). Install knob (6) and secure by tightening setscrews (7). Using solder QQ-S-571 (App B) solder one end of resistor (8, R1) to terminal (9) of ground wire (10). Position terminal (9) on the shaft of variable resistor (11, R3). Insert variable resistor (11, R3) through the lower hole in cover plate (3) and install lockwasher (12), and nut (13). Install knob (14) and secure by tightening setscrews (15). Position the terminal (16) against the cover plate (3) and secure with screw (17). |
| | Resistor (1)<br>Variable Resistor (2)<br>Cover Plate (3)<br>Lockwasher (4)<br>Nut (5)<br>Knob (6)<br>Setscrew (7)<br>Resistor (8)<br>Terminal (9)<br>Ground Wire (10)<br>Variable Resistor (11)<br>Lockwasher (12)<br>Nut (13)<br>Knob (14)<br>Setscrew (15)<br>Terminal (16)<br>Screw (17) |  | Using solder OQ-S-571 (App B), solder the loose end of resistor (8, R1) to variable resistor (11, R3). Using new wire, solder a jumper between variable resistor (2, R2) and the terminal. |
| | | **NOTE**<br>**Refer to the electrical schematic in Appendix C for additional wiring information.** | |
| | Resistor (R1)<br>Variable Resistor (R2)<br>Variable Resistor (R3)<br>Resistor (R4) | | |

| LOCATON | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION** | | | |
| Elbow Assembly | Switch Assembly, Blocking Diode |  | Using solder (OS571 (App 8) solder the wires to the switch assembly (1) #*town. Carefully maneuver a new gasket (2) over the switch assembly (1) and position the gasket on the elbow (3). Position the switch assembly (1 on the elbow (3) and secure the gasket and switch assembly with lockwashers (4) and screws (5). If diode (6) was removed. slide insulation sleeving over both sections of the red wire from the emergency power connector. Solder diode (6) between the two sections of red wire and cover the soldered connections with sleeving. Position the clamp (7) over the diode (6) and install the screw (8) through the clamp (7) and terminal lugs (9) of the white ground wires with lugs under the clamp. Tighten the screw (8). Fill the two small holes in the switch cover plate with white silicone (RTV) adhesive. MIL-A-46106 (App B). Install regulator (p 2-12). |
| | Switch Assembly (1)<br>Gasket (2)<br>Elbow Assembly (3)<br>Lockwasher (4)<br>Screw (5)<br>Diode (6)<br>Clamp(7)<br>Screw (8)<br>Terminal Lug (9) |  | |
| **REMOVAL** | | | |
| Elbow Assembly | Boresight Knobs |  | Remove the four screws (1), lockwashers (2), and remove the deflection boresight knob assembly (3) from the elbow (4).Remove the packing (5).Remove the screws (6), lockwashers (7), and remove the elevation boresight knob assembly (8) from the elbow (4). Remove the packing (9). |
| | Screw (1)<br>Lockwasher (2)<br>Knob Assembly (3)<br>Elbow (4)<br>Packing (53<br>Screw (6)<br>Lockwasher (7)<br>Knob Assembly (8)<br>Packing (9) | | |

All Information on pages 2-16 and 2-1 7, including disassembly, cleaning, inspection/repair, and reassembly procedures, deleted.

**2-4 ELBOW ASSEMBLY - CONTINUED**

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION/ADJUSTMENT** | | | |
| Elbow Assembly | Boresight Knobs | | |

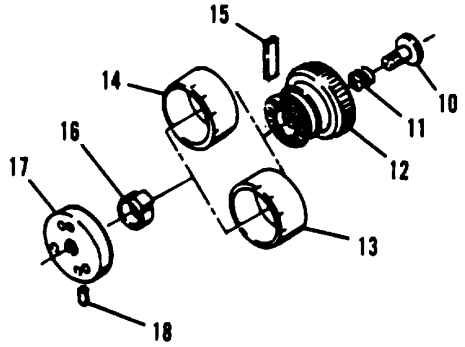



Packing (1)
Knob (2)
Elbow (3)
Lockwasher (4)
Screw (5)
Packing (6)
Knob (7)
Lockwasher (8)
Screw (9)
Screw (10)
Spring (11)
Knob (12)
Scale, Elevation (13)
Scale, Deflection (14)
Spring (15)
Stop (16)
Clutch (17)
Pin (18)

Coat packing (1) lightly with grease MIL-G-4343 (App B), and Install packing in grooved recess of knob (2). Turn the knob to extend the adjuster so that blade lust touches the reticle housing when knob assembly (2) is pushed into position In the elbow (3). (See note in remarks column). Install lockwashers (4) and screws (5). With knob (2) in elbow (3), use wrench (p 1-3) to remove screw 110), spring (11) and knob with-scale attached. Set stop l16) against right-hand side of pin (18). Replace knob so that pin In knob is as close to the left hand side of stop (16) as possible. Install spring (15) and
screw (10). Coat packing (6) lightly with grease MIL-G-4343 (App B) and install packing in grooved recess of knob (7). Turn knob to extend adjuster blade so that blade just touches the reticle housing when knob assembly (21 is pushed Into position in the elbow (3) (See rote In remarks column.) Install lockwashers (8) and screws (9). With knob assembly (7) In elbow (3), use wrench (p 1-3) to remove screw (10), spring 111 , and knob with scale attached. Set stop (16)against right-hand side of pin(18) Replace knob so that pin In knob is as close to the left-hand side of stop 116) as possible. In-stall spring (15) and screw ( I C).

**NOTE**

**If the adjuster blade is extended too far, the spring pressure of the reticle will not allow the knob assembly to seat against the reticle housing.**



## 2-5 DAYLIGHT BODY ASSEMBLY

This task covers:

| | |
|---|---|
| Removal | Inspection/Repair |
| Disassembly | Reassembly |
| Cleaning | Installation/Adjustment |

**INITIAL SETUP**

Applicable Configuration
All

Test Equipment
None

Special Tools (p 1-3)
Dioptometer 4931-00-536-5557
Spanner Wrenches

Materials Parts (App B)
Sealing Compound MI L-S-11031
Sealing Compound MIL-S-11030
Solvent P-D-680
Adhesive MIL-A-5092, Type II
Trichlorothane

Personnel Required

References
None

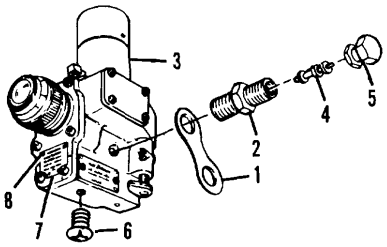
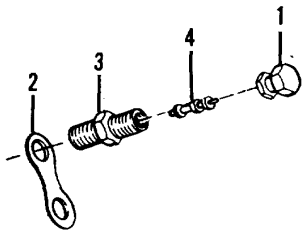
Troubleshooting References
TM 9-2350-253-10
TM 9-2350-253-20-2
Page 2-1 thru 2-4 of this manual

Equipment Condition
None

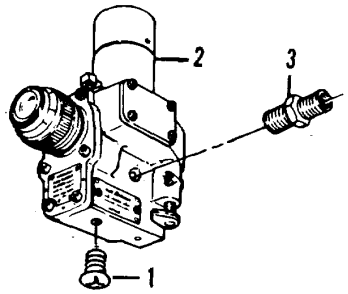
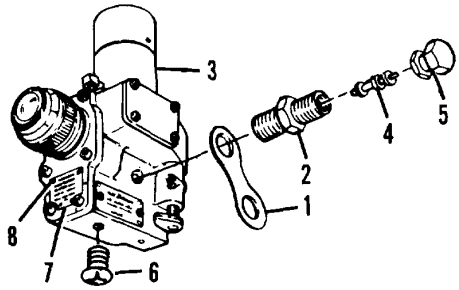
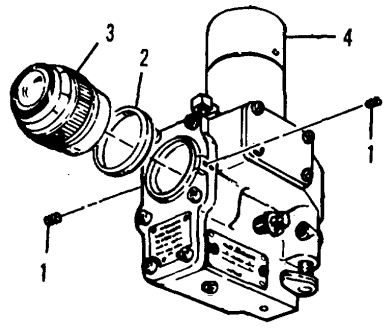
Special Environmental Conditions
None

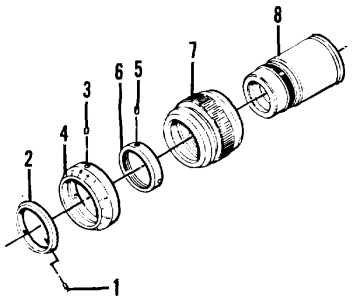
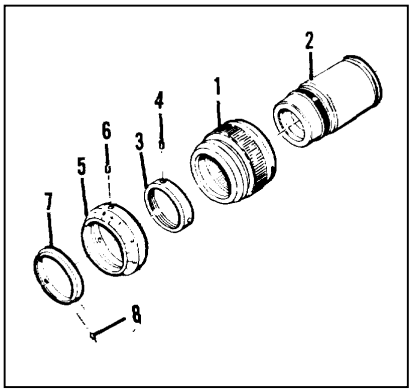
General Safety Instructions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2.

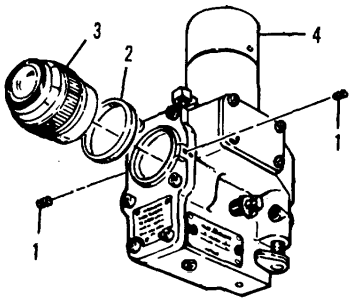
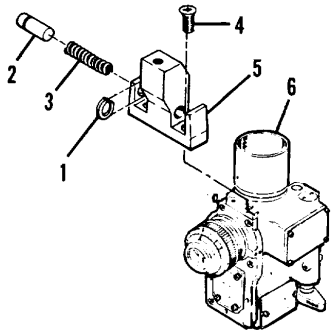
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REMOVAL** | | | |
| Daylight Body Assembly | Purging Screw, Purging Valve<br><br>Purging Screw (1)<br>Purging Valve (2)<br>Body Assembly (3)<br>Screw (4)<br>Instruction Plate (5) |  | Remove purging screw (1). Remove purging valve (2) from the body assembly (3) as a complete unit. Remove the screws (4) and instruction plate (5). |
| **DISASSEMBLY** | | | |
| Daylight Body Assembly | Purging Screw, Purging Valve<br><br>Cap (1)<br>Strap (2)<br>Stem (3)<br>Core (4) |  | Remove the cap (1). Detach the strap (2) from cap (1) and stem (3). Remove core (4) from stem (3) |

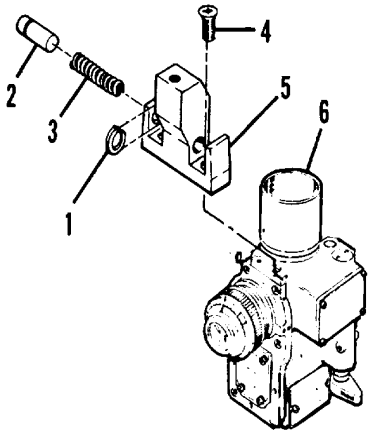
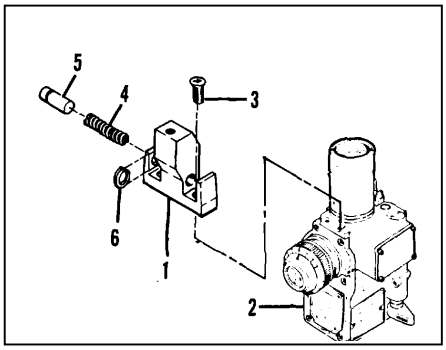
## 2-5 DAYLIGHT BODY ASSEMBLY - CONTINUED

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **CLEANING** | | | |
| Daylight Body Assembly | Purging Screw, Purging Valve<br><br>Purging Screw (1)<br>Body Assembly (2)<br>Stem (3) |  | Clean all traces of sealing compound from the purging screw (1) and mating threads in the body assembly (2). Clean sealing compound from the stem (3) and mounting hole in the body. Clean dirt and grime from all other threads.<br><br>Inspect all parts for deterioration. Pay particular attention to the valve core; ensure that it operates smoothly and is free of corrosion. Inspect the cap and stem for worn or damaged threads. Inspect the strap for tears and check that it holds the cap firmly. Repair is limited to replacement of missing, defective, or damaged parts. |
| **INSPECTION/REPAIR** | | | |
| Daylight Body Assembly | Purging Screw, Purging Valve | | |
| **INSTALLATION** | | | |
| Daylight Body Assembly | Purging Screw, Purging Valve<br><br>Strap (1)<br>Stem (2)<br>Body Assembly (3)<br>Core (4)<br>Cap (5)<br>Purging Screw (6)<br>Instruction Plate (7)<br>Screw (8) |  | Install strap (1) on cap (5) and stem (2). Apply sealing compound MIL-S-11031 (App B) on threads of the valve stem and install the stem (2) in the mounting hole in the body assembly (3). Screw the valve core (4) into the stem (2). Thread the cap onto the stem (2). Install the purging screw (6) in the body assembly (3). Install instruction plate (7) and screws (8).<br><br>**NOTE**<br>**May require strap wrench to remove eyepiece.** |
| **REMOVAL** | | | |
| Daylight Body Assembly | Eyepiece Assembly<br><br>Setscrew (1)<br>Retaining Ring (2)<br>Eyepiece Assembly (3)<br>Body Assembly (4) |  | Loosen the two setscrews (1). Use spanner wrench (App. D, Fig. D2) to loosen retaining ring (2). Position the body assembly with eyepiece assembly face downward and remove retaining ring (2) and eyepiece assembly (3) from body assembly (4). Place body assembly on a smooth surface with opening of eyepiece facing downward |

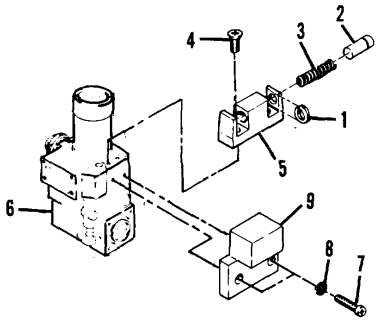
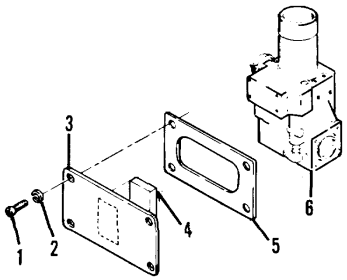
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **DISASSEMBLY** | | | |
| Daylight Body Assembly | Eyepiece Assembly<br><br>Setscrew (1)<br>Index (2)<br>Setscrew (3)<br>Scale (4)<br>Setscrew (5)<br>Locking Ring (6)<br>Adapter (7)<br>Cell Assembly (8) |  | Loosen the two setscrews (1) remove index (2). Loosen *three setscrews (3) and remove* scale (4). Loosen setscrew (5) and use spanner wrench (App. D, Fig. D 1) to remove locking ring (6). Remove adapter (7) from cell assembly (8) |
| **CLEANING** | | | |
| Daylight Body Assembly | Eyepiece Assembly | | Hold the body assembly with the opening for the Eyepiece assembly facing downward and thoroughly clean the groove in the body assembly. Clean all traces of sealing compound from the cell. Use a cotton swab and Trichloroethane (App B) to remove any sealing compound particles that may have fallen on the prism. Clean dirt and grime from all threads. |
| **INSPECTION/REPAIR** | | | |
| Daylight Body Assembly | Eyepiece Assembly |  | Inspect all parts for deterioration. Inspect threaded components for burrs, cross- threading, and cracks. Check cell for damage that would affect the optical performance of the periscope. Repair is limited to replacement of missing, defective, or damaged parts. |
| **REASSEMBLY** | | | |
| Daylight Body | Eyepiece Assembly<br>Assembly<br>Adapter (1)<br>Cell Assembly (2)<br>Locking Ring (3)<br>Setscrew (4)<br>Scale (5)<br>Setscrew (6)<br>'Index (7)<br>Setscrew (8) | | Install adapter (1) on cell assembly (2). Install locking ring (3) and secure with set screw (4). Install scale (5) and secure but do not tighten three setscrews (6). Install index (7) and secure with two setscrews (8). |

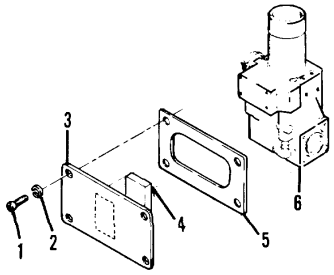
**2-5 DAYLIGHT BODY ASSEMBLY - CONTINUED**

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION/ADJUSTMENT** | | | |
| Daylight Body Assembly | Eyepiece Assembly |  | Thread the retainer ring (1) onto the eyepiece assembly (2). Screw the eyepiece assembly (2) into the body assembly (3) only enough to ensure that it will not fall off. Set the diopter ring (4) in the center of its travel. While viewing a target at minimum of 600 meters away, use a dioptometer (p 1-3) set at zero, and screw the eyepiece assembly (2) into the body assembly (3)until the target is clear. Lock the eyepiece assembly (2) in position with locking ring (1). While holding the eyepiece assembly to prevent movement, loosen setscrews (8) and set the index arrow toward the objective of the daylight body and tighten setscrews (8). Loosen set screws (6) and set diopter scale (5) on zero and tighten setscrews (6). Tighten the retainer ring (1) using a spanner wrench (App. D. Fig.D2). Remove the setscrew (9) and inject sealing compound MIL-S-11030 (App B) through the setscrew hole. Reinstall the setscrew (9). |
| | Retainer Ring (1)<br>Eyepiece Assembly (2)<br>Body Assembly (3)<br>Diopter Ring (4)<br>Diopter Scale (5)<br>Setscrew (6)<br>Index (7)<br>Setscrew (8)<br>Setscrew (9) | | |
| **REMOVAL** | | | |
| Daylight Body Assembly | Front Alinement Key |  | Remove retaining ring (1) from the groove in plunger (2) while pressing the blade of a screwdriver against the plunger to relieve spring pressure. Remove the plunger (2) and spring (3). Remove screws (4) and remove the alinement key (5) from the body assembly (6). |
| | Retaining Ring (1)<br>Plunger (2)<br>Spring (3)<br>Screw (4)<br>Key (5)<br>Body Assembly (6) | **WARNING**<br>**Care must be exercised in removing plunger (2) which is under spring pressure.** | |
| **CLEANING** | | | |
| Daylight Body Assembly | Front Alinement Key | | Clean all components in solvent P-D-680 (App B) and dry thoroughtly. |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION/REPAIR** | | | |
| Daylight Body Assembly | Front Alinement Key | | Check all parts for deterioration. Check screws for worn or damaged threads. Check spring for resiliency. Repair is limited to replacement of missing, defective, or damaged parts. |
| **INSTALLATION** | | | |
| Daylight Body Assembly | Front Alinement Key<br><br>Key (1)<br>Body Assembly (2)<br>Screw (3)<br>Spring (4)<br>Plunger (5)<br>Retaining Ring (6) |  | Secure alinement key (1) to body assembly (2) with two screws (3).Install spring (4). Insert plunger (5) halfway into key (1) and install snap ring (6) on plunger (5). Depress plunger and slide snap ring into groove on plunger. |
| **REMOVAL** | | | |
| Daylight Body Assembly | Rear Alinement Key and Block<br><br>Retaining Ring (1)<br>Plunger (2)<br>Spring (3)<br>Screw (4)<br>Key (5)<br>Body Assembly (6)<br>Screw (7)<br>Lockwasher (8)<br>Block (9) |  <br>**WARNING**<br>**Care must be exercised in removing plunger (2) which is under spring pressure**. | Remove retaining ring (1) from the groove in plunger (2) while pressing the blade of a screwdriver against the plunger to relieve spring pressure. Remove the plunger (2) and spring (3). Remove screws (4) and remove the alinement key (5) from the body assembly (6). Remove two screws (7), lockwashers (8) and block (9). Repair is limited to replacement of missing, defective, or damaged parts. Clean all components in Solvent P-D-680 (App B) and dry thoroughly. |
| **CLEANING** | | | |
| Daylight Body Assembly | Rear Alinement Key and Block | | |
| **INSPECTION/REPAIR** | | | |
| Daylight Body Assembly | Rear Alinement Key and Block | | Check all parts for deterioration. Check screws for worn or damaged threads. Check spring for resiliency. Repair is limited to replacement of missing, defective, or damaged parts. |

## 2-5 DAYLIGHT BODY ASSEMBLY - CONTINUED

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION** | | | |
| Daylight Body Assembly | Rear Alinement Key and Block<br><br>Block (1)<br>Body Assembly (2)<br>Lockwasher (3)<br>Screw (4)<br>Key (5)<br>Screw (6)<br>Spring (7)<br>Plunger (8)<br>Snap Ring (9) |  | Secure block (1) to body assembly (2) using two lockwashers (3) and screws (4). Install alinement key (5) on body assembly (2) with screws (6). Install spring (7). Insert plunger (8) halfway into key (5) and install snap ring (9) on plunger (8). Depress plunger and slide snap ring into groove on plunger. |
| **REMOVAL** | | | |
| Daylight Body Assembly | Rubber Pad<br><br>Screw (1)<br>Lockwasher (2)<br>Cover (3)<br>Pad (4)<br>Gasket (5)<br>Body Assembly (6) |  | Remove screws (1), lockwasher (2) and remove the cover (3) with pad (4) attached. from body assembly (6). Remove the gasket (5). |
| **CLEANING** | | | |
| Daylight Body Assembly | Rubber Pad | **CAUTION**<br>**Do not clean the cover with solvent when the bonded rubber pad is attached.** | Clean the screws and washers with solvent P-D-680 (App B) and dry thoroughly. Wipe the cover clean with a lint-free cloth. |
| **INSPECTION/REPAIR** | | | |
| Daylight Body Assembly | Rubber Pad | **NOTE**<br>**Ensure that the cover is clean, free of grease and dry before bonding a new pad to cover.** | Inspect the bonded rubber pad for deterioration, chipped, torn or unbonded condition. If the rubber pad requires replacement, remove the pad and clean all traces of the old bonding compound from the cover. Use adhesive MIL-A-5092, Type 11, (App B) and bond a new pad to the cover. Repair is limited to replacement of missing, defective, or damaged parts. |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSTALLATION** | | | |
| Daylight Body Assembly | Rubber Pad<br><br>Gasket (1)<br>Cover (2)<br>Body Assembly (3)<br>Lockwasher (4)<br>Screw (5)<br>Pad (6) |  | Install a new gasket (1). Position the cover and pad assembly (2 and 6) on the body assembly (3) and secure with lockwashers (4) and screws (5). |

## 2-6 HEAD ASSEMBLY

This task covers:

| | |
|---|---|
| Removal | Inspection/Repair |
| Disassembly | Reassembly |
| Cleaning | Installation |

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools (p 1-3)
Sealing Gun 4931-00-764-8117

Materials/Parts (App B)
Solvent, P-D-680
Sealing Compound MIL-S-11031

Personnel Required

References
None

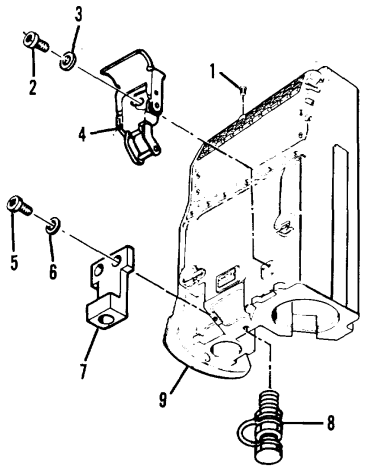
Troubleshooting References
TM 9-2350-253-10
TM 9-2350-253-20-2
Page 2-1 thru 2-4 of this manual

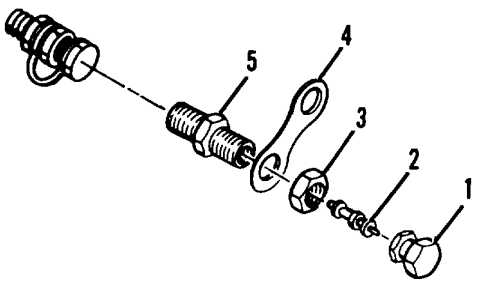
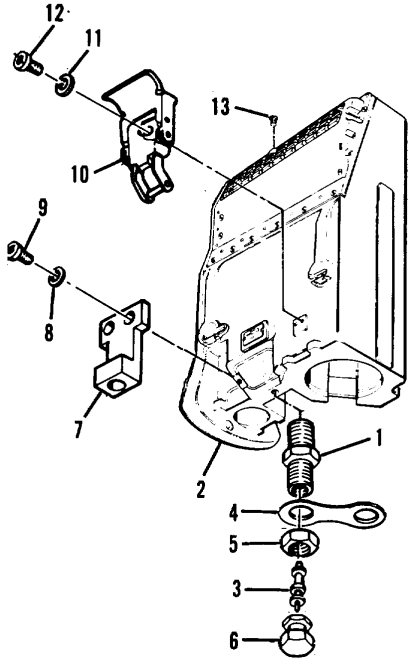
Equipment Condition
None

Special Environmental Conditions
None

General Safety Instructions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| REMOVAL<br><br>Head Assembly Purging Valve | Purging Screw,<br>Latch, Bracket,<br><br>Purging Screw (1)<br>Screw (2)<br>Lockwasher (3)<br>Latch (4)<br>Screw (5)<br>Lockwasher (6)<br>Bracket (7)<br>Purging Valve (8)<br>Head Assembly (9) |  | Remove the purging screw (1) Remove the screws (2), lockwashers (3), and latch (4). Remove screws (5), lock washers (6) and bracket (7). Remove the purging valve (8) from the head (9) as a complete unit. |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **DISASSEMBLY** | | | |
| Head Assembly | Purging Valve<br><br>Cap (1)<br>Core (2)<br>Nut (3)<br>Strap (4)<br>Stem (5) |  | Remove the cap (1), valve core (2), nut (3), and strap (4) from valve stem (5). Detach the strap (4) from the cap (1).<br><br>Clean dirt and grime from all threads. Clean all traces of sealing, compound from stem and mounting hole. |
| **CLEANING** | | | |
| Head Assembly | Purging Screw, Latch, Bracket, Purging Valve | | Inspect all parts for deterioration. Pay particular attention to the valve core; ensure that it operates smoothly and is free of corrosion. Inspect the cap and stem for worn or damaged threads. Inspect the strap for tears and check that it holds the cap securely. Repair is limited to replacement of missing, defective, or damaged parts. |
| **INSPECTION/REPAIR** | | | |
| Head Assembly | Purging Screw, Latch, Bracket, Purging Valve | | |
| **REASSEMBLY** | | | |
| Head Assembly | Purging Valve, Bracket, Latch, Purging Screw<br><br>Stem (1)<br>Head Assembly (2)<br>Core (3)<br>Strap (4)<br>Nut (5)<br>Cap (6)<br>Bracket (7)<br>Lockwasher (8)<br>Screw (9)<br>Latch (10)<br>Lockwasher (11)<br>Screw (12)<br>Purging Screw (13) |  | Apply sealing compound MIL-S-11031 (App B) to threads of valve stem (1) and install the stem in head assembly (2). Install valve core (3) in stem (1). Install strap (4) on stem (1) and secure with nut (5). Attach cap (6) to strap (4) and thread cap onto valve stem. Install bracket (7) and secure with lockwashers (8) and screws (9). Install latch (10) and secure with lockwashers (11) and screws (12). Install the purging screw (13) in the head assembly (2). |

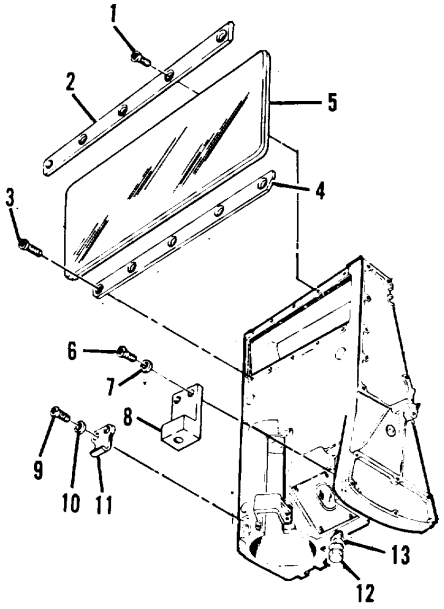
**2-6 HEAD ASSEMBLY-CONTINUED**

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|

**REMOVAL, GS**

Head Assembly

Window, Bracket, Strike




Screw (1)
Strip (2)
Screw (3)
Strip (4)
Window (5)
Screw (6)
Lockwasher (7)
Bracket (8)
Screw (9)
Lockwasher (10)
Strike (11)
Cap (12)
Purging Valve (13)

**NOTE**

Do not remove window (5) unless it is unserviceable. To remove a broken window, remove screws (1), strip (2), screws (3), and strip (4). Remove sealing compound from perimeter of window (5), and cover window with tape. Pry out the broken pieces and remove all fragments from inside the head. Remove screws (6), lockwashers (7), and bracket (8). Remove screws (9), lockwashers (10) and strike (11).

**WARNING**

**Care must be exercised when window (5) to prevent personal injury.**

**WARNING**

**When using compressed air to remove glass fragments from the head assembly, care must be exercised to safeguard personnel from flying glass particles**

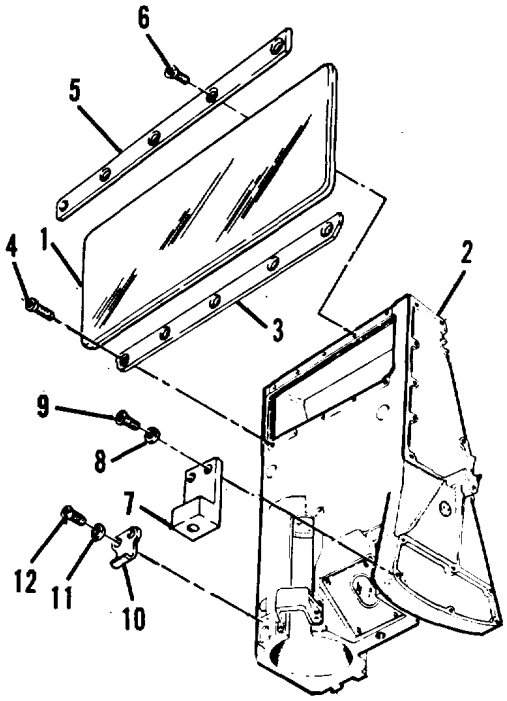
Clean all parts except the window with solvent P-D-680 (App B). Remove old sealing compound from recess in housing and from strips used to hold window. Clean dirt and grime from all threads. If widow has shattered, ensure that interior of head assembly is free of
glass chips or particles by blowing out interior of head with compressed air at approximately 5-8 psi.

**CLEANING, GSI**

Head Assembly

Strike, Bracket, Strip, Attaching Hardware

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REMOVAL, GS** | | | |
| Head Assembly Strike | Window, Bracket, | | |
| **INSTALLATION, GS** | | | |
| Head Assembly Strike | Window, Bracket, | | |




Window (1)
Head Assembly (2)
Strip (3)
Screw (4)
Strip (5)
Screw (6)
Bracket (7)
Lockwasher (8)
Screw (9)
Strike (10)
Lockwasher (11)
Screw (12)

Inspect all parts for deterioration. Check screws for worn or damaged threads. Ensure that replacement window is free of chips, cracks, scratches, and discoloration. Repair is limited to replacement of missing, defective, or damaged parts. et window (1) in place in head assembly (2) and using sealing gun (p 1-3) apply sealing compound MIL-S 11031 (App B) in beveled recess around circumferences of window. Secure the window at the bottom by installing strip (3) and screws (4). Install strip (5) and screws (6). Install bracket (7), lock-washers (8), and screws (9). Install strike (10), lockwashers (11) and screws (12).

## 2-7 PURGING AND CHARGING

**This task covers:**
Purging and charging

**INITIAL SETUP:**

Applicable Configuration
All

Test Equipment
None

Special Tools (p 1-3)
Purging Kit 4931-00-065-1110

Materials/Parts
Nitrogen, Technical (App B)

Personnel Required
1

References
TM 750-116

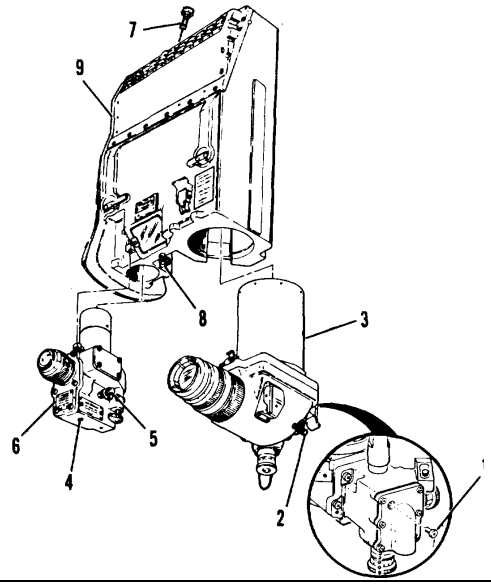
Troubleshooting References
None

Equipment Conditions
None

Special Environmental Conditions
None

General Safety Instructions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **PURGING/CHARGING** | | | |
| Periscope Major Components | Purging Screw (1)<br>Purging Valve (2)<br>Elbow Assembly (3)<br>Purging Screw (4)<br>Purging Valve (5)<br>Body Assembly (6)<br>Purging Screw (7)<br>Purging Valve (8)<br>Head Assembly (9) |  | Refer to TM 750-116 and perform purging and charging procedures as pertains to the M35E1 Periscope.<br><br>**NOTE**<br><br>**The periscope shall be purged and charged in three steps: elbow assembly; body assembly; and head assembly.** |

## 2-31 INSTALLATION OF MAJOR COMPONENTS

This task covers:

Reassembly

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools
None

Materials/Parts
None

Personnel Required
1

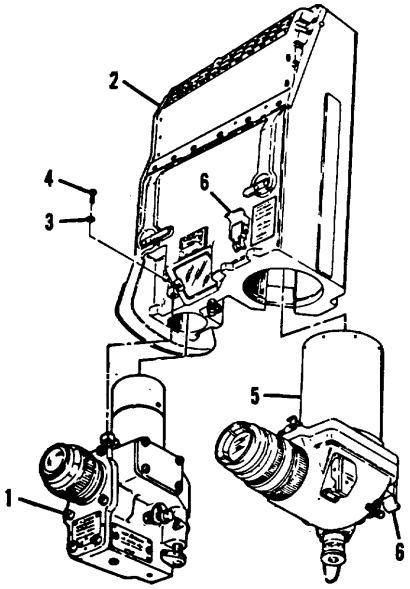
References
None

Troubleshooting References
None

Equipment Condition
None

Special Environmental Conditions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **REASSEMBLY** | | | |
| Periscope | Major Components<br><br>Body Assembly (1)<br>Head Assembly (2)<br>Washers (3)<br>Screws (4)<br>Elbow Assembly (5)<br>Latches (6) |  | Carefully slide the body assembly (1) into the head assembly (2), and while supporting the body assembly by hand install the two washers (3) and screws (4). Carefully slide the elbow assembly (5) into the head assembly (2) and while supporting the elbow assembly, engage the two latches (6). |

## SECTION IV. PREPARATION FOR STORAGE AND SHIPMENT

### 2-8. PREPARATION FOR STORAGE AND SHIPMENT.

a. Because it is a very expensive and delicate item, the periscope must be carefully protected even If it is being returned for repairs. It is strongly recommended that when a replacement periscope Is received, that the packaging materials in which it arrives be used to package, store and ship the old periscope.

b. If the above packaging materials are not available, the following procedure should be used:

(1) The eyepiece should be removed, wrapped In cushioning material (Item 2) and placed In a bag (Item 1). Heat seal or tape closed (Item 3).

(2) Immobilize all moving parts, such as the arm, with tape (Item 3)

.

(3) Wrap periscope in wrapping paper (Item 4) and cushion (Item 2). Place the cushioned periscope In a bag, either of plastic or other barrier material (Item 1). Heat seal or tape closed (Item 3).

(4) Place the telescope and eyepiece in a fiberboard box of appropriate size. Fill all voids with cushioning (Item 2). Tape box closed (Item 3) and apply proper marking.

**PACKAGING MATERIALS**

| Item | Nomenclature | NSN | U/M |
|---|---|---|---|
| 1. | Barrier Material<br>MIL-B-121<br>36" X 100 yard | 8135-00-292-9719 | RO |
| 2. | Cushioning,<br>cellulosic<br>1" thick, 20" X<br>60 feet | 8135-00-664-6958 | RO |
| 3. | Tape, water<br>resistant, paper,<br>PPP-T-76 | 7510-00-297-6655 | RO |
| 4. | Wrapping paper,<br>Chemically Neutral<br>MIL-P-1 7667<br>36" X 600 feet | 8135-00-558-1242 | RO |

# CHAPTER 3

# INSPECTION

**CHAPTER OVERVIEW**

This chapter contains a. general information, b. final inspection, and c. preembarkation inspection procedures.

## SECTION I. GENERAL

3-1 SCOPE. This section provides specific instructions for technical inspection of the periscope by direct support and general support maintenance personnel. In general, if the periscope is complete and performs its intended function properly, if all modification work orders classified as urgent have been completed, and if all defects disclosed by the inspection have been corrected, the periscope may be considered serviceable.

## SECTION II. FINAL INSPECTION OF PERISCOPE

### 3-2 FINAL INSPECTION

This task covers:
Inspection

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools (p 1-3)
Dioptometer 4931-00-536-5557

Materials/Parts
None

Personnel Required
1

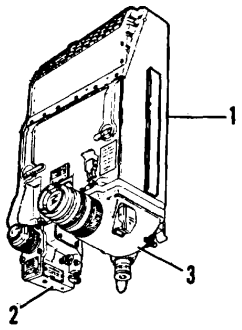
References
None

Troubleshooting References
TM 9-2350-253-10
TM 9-2350-253-202
Page 2-1 thru 2-4 of this manual

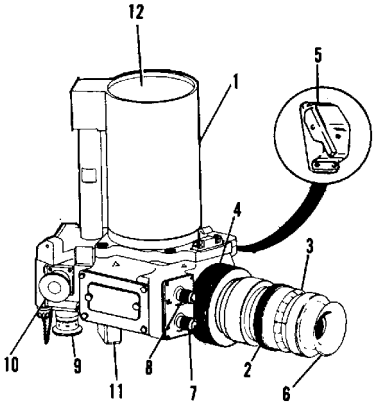
Equipment Condition
None

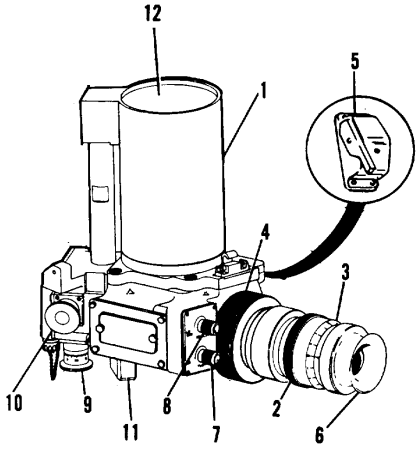
Special Environmental Conditions
None

Approximate Time Required
See Maintenance Allocation Chart (MAC) in TM 9-2350-253-20-2

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION** | | | |
| Periscope | Head Assembly, Daylight Body Assembly, Elbow Assembly | | Inspect the head assembly (1),daylight body assembly (2), and elbow assembly (3) for completeness. Each major component must be complete with all screws, nuts and washers in place and secured. Replace missing parts. When looking through the periscope there shall be no evidence of moisture or fungus growth, or damage to windows or lenses. If moisture is present, purge and pressurize (Pg 2-30). If fungus or physical damage is present, return to depot for repair. |
| | Head Assembly (1)<br>Daylight Body Assembly (2)<br>Elbow Assembly (3) |  | |

**3-2 FINAL INSPECTION - Continued**

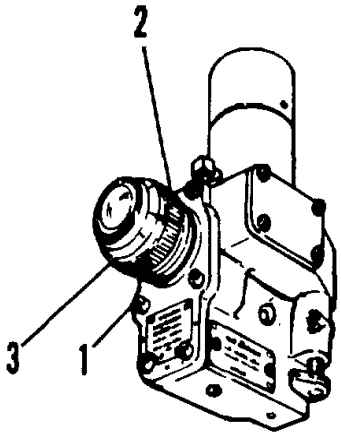
| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION-Continued** | | | |
| Periscope | Elbow Assembly | **NOTE**<br>**Daylight Body Assembly and Elbow Assembly can be inspected either mounted in the Head Assembly or removed from the Head Assembly. Removal instructions are on page 2-5.** | Connect the elbow assembly at contact point (12) to a 24 volt power source by placing negative wire to elbow latch and positive wire to contact (12). Cover the entrance window (13) with a dark cloth allowing only a small amount of light in. Move the shutter switch (5) to the ON position. Rotate the RETICLE switch (8) and TUBE SWITCH (7) UNTIL THE RETICLE APPEARS. (See CAUTION in remarks column). Viewing through a dioptometer (p 1-3, rotate the diopter ring (2) to bring the reticle of the face of the image intensifier tube into best focus. The diopter scale (3) should index at zero within plus or minus 1/4 diopter. If scale is not within 1/4 diopter return to depot for repair. |
| | Elbow Assembly (1)<br>Ring (2)<br>Scale (3)<br>Ring (4)<br>Shuttle Control Switch (5)<br>Eyepiece(6)12<br>Tube Control Switch (7)<br>Control<br>Reticle Control Switch (8)<br>Elevation Boresight Knob(9)<br>Defection Boresight Knob(10)<br>Emergency Power Receptacle (11)<br>Contact Point (12)<br>Entrance Window (13) |  <br><br>**CAUTION**<br>**Do not leave The RETICLE switch at a high setting or the image intensifier tube will be damaged.** | Rotate the TUBE switch (7) clockwise throughout its range from LO to HI while observing the image through eyepiece (6) of the elbow assembly (1) . Be sure that the light level increases and decreases as the TUBE control switch (7) is turned clockwise and counterclockwise and counterclockwise, respectively. If light level fails to perform refer to page 2-3. |

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION - Continued** | | | |
| Periscope | Elbow Assembly | | Rotate the RETICLE switch (8) clockwise from OFF and LO to HI. The image of the reticle should appear as you look into the eyepiece (6) of the elbow assembly (1). The image should grow brighter as you rotate the switch (8) towards HI; it should become dimmer as you return the RETICLE switch (8) to LO, and should disappear when you turn the RETICLE switch (8) to OFF. Move the shutter switch (5) to OFF. If reticle fails to operate, refer to page 2-2. |
| | | Elbow Assembly (1)<br>Diopter Ring (2)<br>Diopter Scale (3)<br>Focus Ring (4)<br>Shutter Control Switch (5)<br>Eyepiece (6)<br>Tube Control Switch (7)<br>Reticle Control Switch (8)<br>Elevation Boresight Knob (9)<br>Deflection Boresight Knob (10)<br>Emergency Power Receptacle ( 11)<br>Entrance Window (12)<br>  <br> | The boresight knobs (9 and 10) will be rotated through their full range of travel without binding and shall engage the metallic stops at each end of travel. If knobs fail to perform refer to page 2-2.<br><br>Utilize the M30 instrument light to energize the emergency power receptacle (11). Cover the entrance window (12) with a dark cloth allowing only a small amount of light in. Move the shutter switch (5) to the ON position. Rotate the TUBE and RETICLE switches (7 and 8) until an image and phosphor grain appears. Turn the RETICLE switch (8) and shutter switch (5) to OFF and the TUBE switch (7) to LO. Remove the M30 instrument light. If tube and reticle fail to operate check diode (page 2-12) and clean contact in receptacle (11). If either fails to operate now return to depot for repair. |
| | | **CAUTION**<br><br>Do not leave the RETICLE switch at a high setting or the image intensifier tube will be damaged. | **NOTE**<br><br>**A power supply with applicable leads may be utilized in lieu of the M30 instrument light. DC voltage to be applied to receptacle (11) shall be 3 volts DC ± 0.3 volt.** |
| | | **CAUTION**<br>24 Volt power shall be shut off to determine operability of the emergency power receptacle (11). | |

**3-2 FINAL INSPECTION - Continued**

| LOCATION | ITEM | REMARKS | ACTION |
|---|---|---|---|
| **INSPECTION - Continued** | | | |
| Periscope | Daylight Body Assembly | | While viewing a target a minimum of 600 meters away, use a dioptometer set on zero (p 1-3) to look thru the eyepiece, rotate the diopter ring (2) to bring the target into best focus. The diopter scale (3) should index zero plus or minus 1/4 diopter. If desired reading is not obtained, perform applicable content of action procedures p 2-22. |

Daylight Body Assembly (1)
Diopter Ring (2)
Diopter Scale (3)



## SECTION III. PREEMBARKATION INSPECTION OF MATERIEL IN UNITS ALERTED FOR OVERSEAS MOVEMENT

3 -3 GENERAL. This inspection is performed on materiel in the hands of troops alerted for overseas duty to ensure that such materiel will not become unserviceable or worn out in a relatively short time. It prescribes a higher percentage of remaining useable life in serviceable materiel to meet a specific need beyond minimum serviceability.

a. General Information.

(1) Examine the periscope to ensure that all component parts are present. Check particularly for missing pins, screws, and other attaching components.

(2) Check exterior for damaged, cracked, or dented surfaces, bent or broken parts, moisture or corrosion, and other evidence of misuse that might indicate a need for repair.

(3) Inspect all sealed portions of the periscope to insure that sealing is still intact.

(4) Inspect nameplates to insure that all numbering and lettering is clearly defined and easily read.

(5) Inspect diopter scales to insure that they are clearly defined and easily read.

(6) Inspect periscope for bare spots or damaged finish which would expose metal surfaces and might lead to corrosion.

(7) Test alinement and looseness of body and elbow assemblies by checking latches, strikes, plunger, and bracket.

(8) Without pulling out on either of the boresight knobs, check that each is firmly seated against fixed clutch.

(9) After recording setting of each boresight knob, disengage knob from fixed clutch and rotate knob through its complete range. Operation shall be smooth throughout. When finished, reset knob to the position recorded before disengaging.

b. Inspection of Optical Elements.

(1) Lenses and windows must be free from scratches, pits, dirt, smears, digs, fractures, and chips that may interfere with or affect the optical performance of the periscope.

(2) Any breakdown or excessive discoloration of cement between elements of compound lenses that affects optical performance in the field is cause for rejection of the instrument.

(3) When looking through the periscope, there shall be no evidence of moisture or fungus growth.

(4) When sighting through the periscope, the image and reticle must be clearly defined. There must be no indication of parallax, double vision, or aberration. Definition, image tilt, aberration, and parallax are defined in TM 9-258.

c. Inspection of Electrical Components.

(1) Electrical and power materiel will be visually inspected for evidence of circuit faults or possible sources of trouble as indicated by the conditions below.

(a) Burned or carbonized insulation.
(b) Improperly soldered connections.
(c) High-voltage arcs or short circuits.
(d) Electrical contacts not making connection.
(e) Burned out incandescent lamp.

(2) The image intensifier system will be checked for evidence of the malfunctions listed below.

(a) Visible flicker.
(b) Image movement.
(c) Audible sparking.

**STANDARDS FOR PREEMBARKATION INSPECTION OF M35E1 PERISCOPE IN UNITS ALERTED FOR OVERSEAS MOVEMENT**

| ITEM | STANDARD |
|---|---|
| Filter Selector | Must engage and move each filter through its full range of movement. |
| Shutter Control | Must fully open and close the shutter |
| Boresight Knobs | Each knob must rotate smoothly through its full range of travel without binding. |
| Tube Control Switch | Must turn smoothly through its full range of movement, and increase and decrease the light level. |
| Reticle Control Switch | Must turn smoothly through its full range of movement, and increase and decrease the intensity of the image. |

# APPENDIX A
# REFERENCES

## A-1 TECHNICAL MANUALS.

| | |
|---|---|
| TM 750-116 | Purging and Charging of Fire Control Instruments |
| TM 9-2350-253-1 | 0perator's Manual: Tank, Combat, Full Tracked: 10 5-MM Gun, M60A3 |
| TM 9-2350-253-2062 | Organizational Maintenance Manual: Tank, Combat Full Tracked: 105-MM Gun, M60A3 |
| TM 9-1240-382-34P | Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Parts and Special Tools) for Periscope, Tank: M35E1 |
| TM 9-258 | Elementary Optics and Application to Fire Control Instruments |

## A-2 ARMY REGULATIONS

| | |
|---|---|
| AR 190-11 | Physical Security of Weapons. Ammunition and Explosives |
| AR 385-40 | Accident Reporting and Records |

## A-3 OTHER

| | |
|---|---|
| DA PAM 738-750 | The Army Maintenance Management System (TAMMS) |

# APPENDIX B
# EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

**B-1. Scope.**

Table B-1 in this appendix lists expendable supplies and materials you will need to operate and maintain the periscope. This listing is for informational purposes only and is not authority to requisition the listed item. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100 Army Medical Department Expendable/Durable Items

**B-2. Explanation of Column**

a Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material cleaning compound, item 2, App. B).

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal Item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

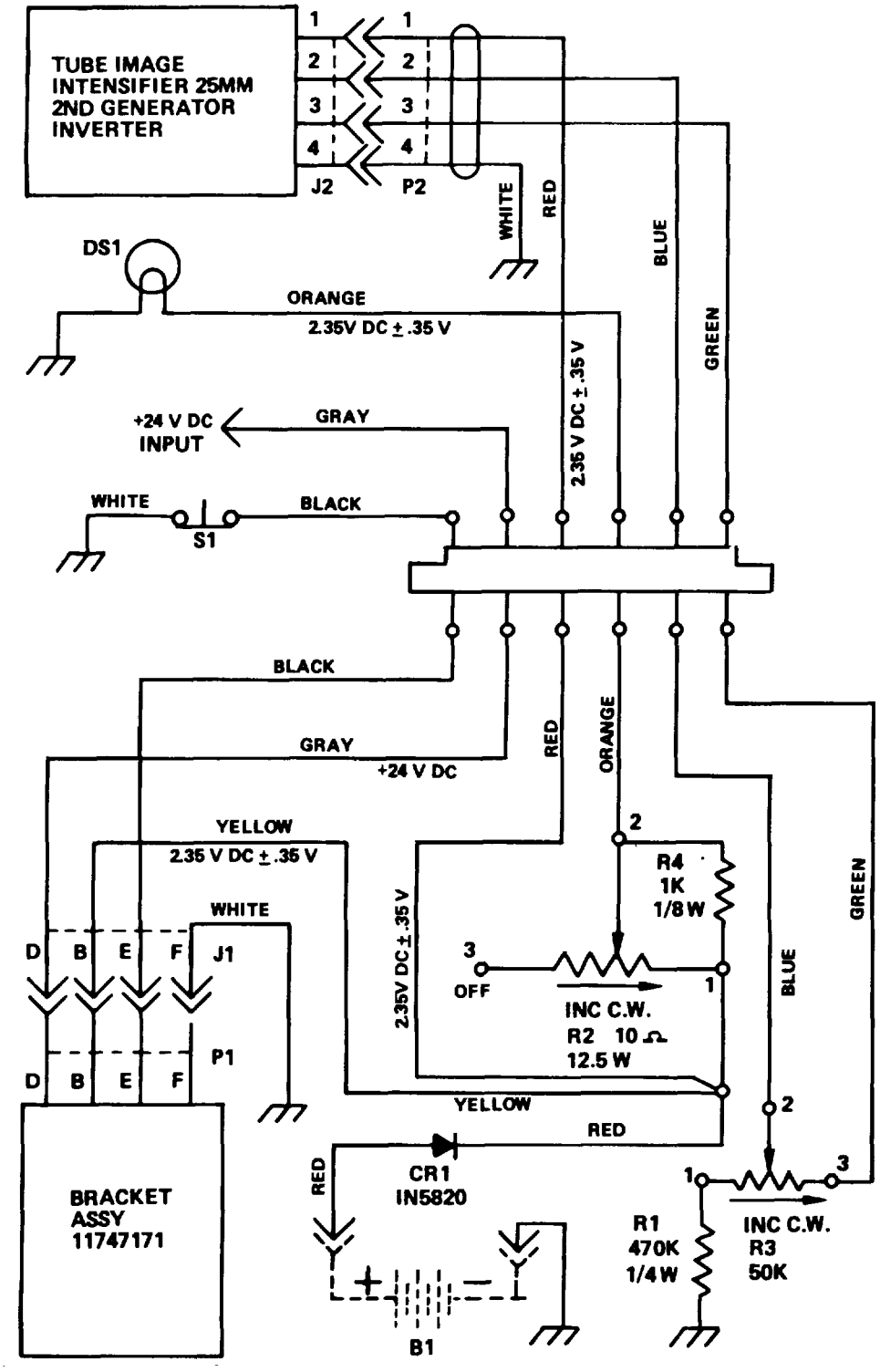
e. Column 5 - Unit of Measure (U/M). Indicates the unit of measure in which the item is usually packaged. If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

*Table B-1. Expendable/Durable Supplies and Materials List*

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) DESCRIPTION PART NO. AND FSCM | (5) UNIT OF MEAS. |
|---|---|---|---|---|
| 1 | F | ---- | ALCOHOL, DENATURED AND ETHYL, TECHNICAL, MIL-STD-1201 | GAL |
| 2 | F | 6850-00-281-1985 | DRY-CLEANING SOLVENT: P-D-680 | GAL |
| 3 | F | —— | GREASE, PNEUMATIC SYSTEMS, MIL-G-4343 | LB |
| 4 | F | 6830-00-264-9086 | NITROGEN, TECHNICAL: BB-N-411 | TANK |
| 5 | F | ------ | 240 EMERY PAPER | SH |
| 6 | F | 8030-00-275-8110 | SEALING COMPOUND, ADHESIVE, CURING (POLYSULFIDE BASE) MIL-S-11031 | OZ |
| 7 | F | 3439-00-453-5472 | SOLDFR, TIN ALLOY, LEAD-TIN ALLOY, AND LEAD ALLOY: QQ-S-571 SN60WRMAP2, dia 0.036, 1 lb | LB |
| 8 | F | --------- | TRICHLOROETHANE-1,1,1, TECHNICAL, INHIBITED (METHYL CHLOROFORM): O-T-620 | GAL |
| 9 | F | --------- | SILICONE, ADHESIVE (RTV) WHITE MIL-A-46106 | OZ |
| 10 | F | 9150-00-269-8255 | SEALING.COMPOUND; MIL -S- 11031 | OZ |
| 11 | H | ------- | ADHESIVE, MIL- A - 5092, TYPE II | OZ |
| 12 | F | 8030-00-242-3194 | SEALING COMPOUND, MIL -S- 11030 | OZ |
| 13 | F | 6640-00-597-6745 | LENS TISSUE | SHTS. |

## APPENDIX C

## SCHEMATIC DIAGRAM



## APPENDIX D

## SPANNER WRENCHES

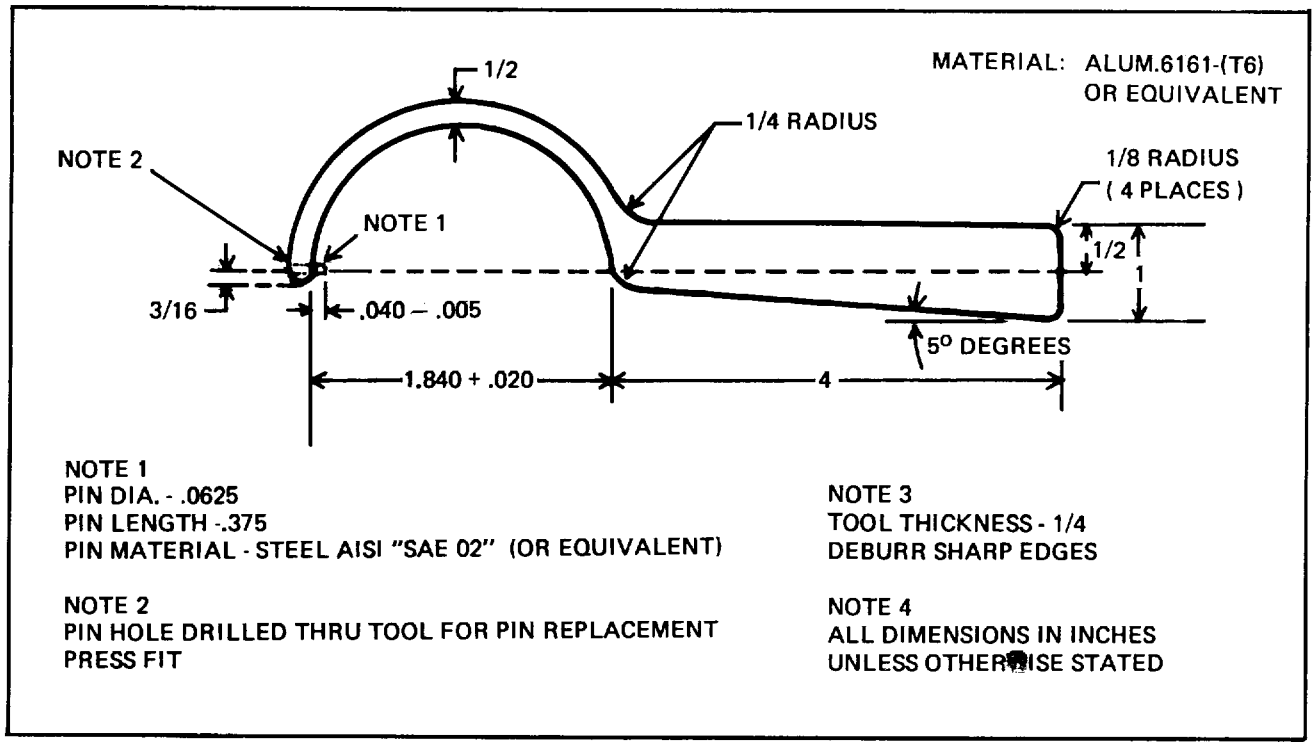



*Figure D1. Spanner Wrench (Eyepiece Assembly)*

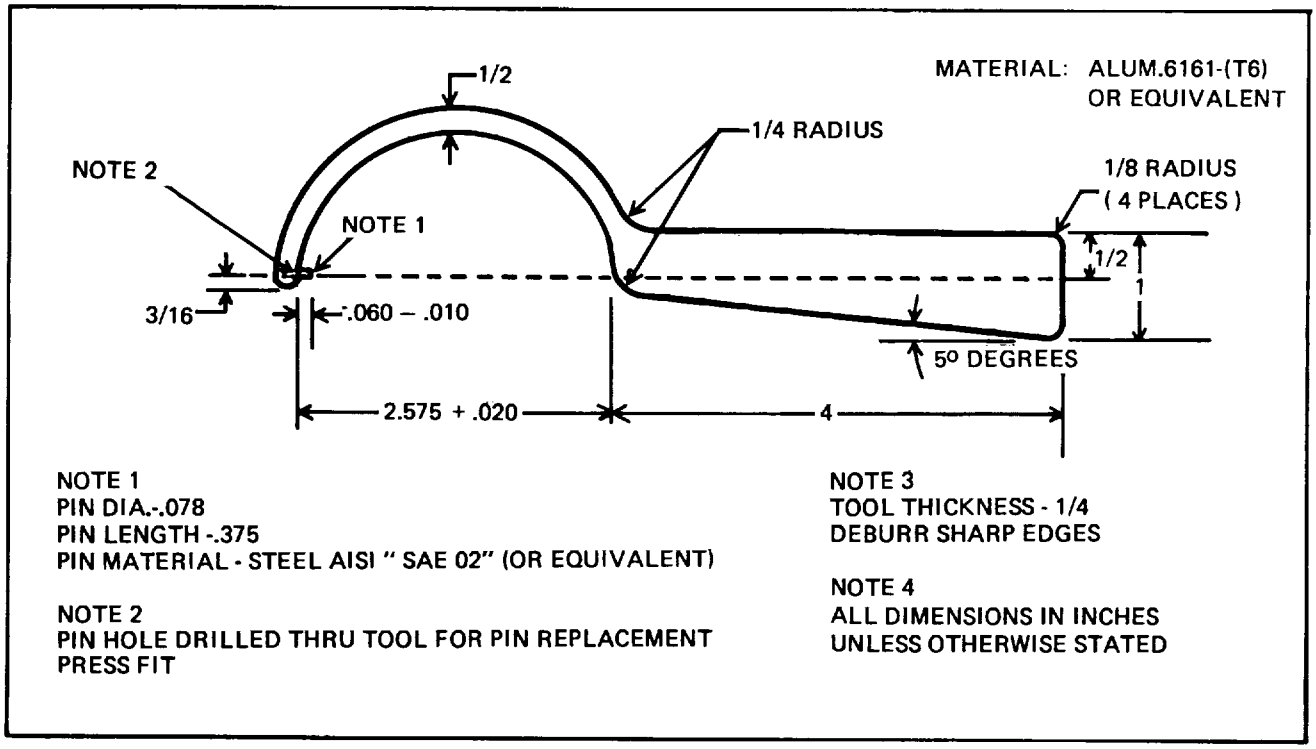



*Figure D2. Spanner Wrench (Retaining Ring Eyepiece Assembly)*

# INDEX

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