TM 750-116

SUPERSEDES COPY DATED 14 MAY 1984

TECHNICAL MANUAL

GENERAL PROCEDURES
FOR
PURGING AND CHARGING
OF
FIRE CONTROL INSTRUMENTS

HEADQUARTERS, DEPARTMENT OF THE ARMY
MAY 1993

WARNING

High pressure nitrogen gas is used during purging and charging of this equipment. Keep face and body clear of release valves. Failure to observe safety precautions may result in severe injury or death.

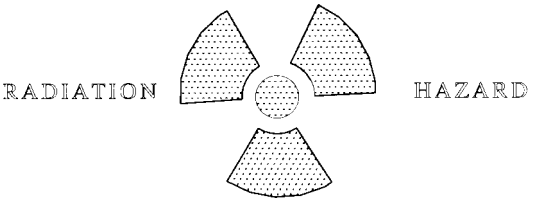
WARNING

When using compressed nitrogen gas in confined areas, use extreme care; gas could cause asphyxiation.

WARNING

Do not store compressed nitrogen gas tanks in upright position without securing in a rack or chaining to a wall or support. Do not drop tank of compressed gas.

WARNING



TRITIUM GAS (H3)

Handle instruments with radioluminous light source with care. To avoid possible radioactive contamination. do not purge or charge an instrument that has a damaged or inoperative radioluminous light source. Immediately wrap instrument in plastic and notify the local Radiation Protection Officer (RPO).

WARNING

Solvent vapors are toxic. Do not use solvent in a confined space. Avoid long periods of breathing solvent vapors and/or contact with skin.

Compressed air presents a serious hazard. Its use for cleaning and drying purposes should be permitted only where all other methods have failed. When it is necessary to use compressed air for cleaning or drying, adequate controls must be provided to protect the user, adjacent operators, and other personnel in the area. The minimum amount of air pressure required to perform the specific operations must be used. All users of compressed air must wear eye protection. Compressed air will not be used for cleaning purposes except where reduced to less than 30 psig.

HEADQUARTERS
Department of the Army
Washington D.C., 24 November 1995

Change
No. 1

GENERAL PROCEDURES FOR PURGING AND CHARGING OF FIRE CONTROL INSTRUMENTS

TM 750-116, dated 5 May 1993 is changed as follows:

1. Remove old pages and insert new pages as indicated below.

Remove Pages	Insert Pages
2-1 thru 2-4	2-1 thru 2-4

2. New or changed material is indicated by a vertical bar in the margin of the page. Illustration changes are indicated by a pointing hand adjacent to the illustrations.

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

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:
YVONNE M. HARRISON
Administrative Assistant to the
Secretary of the Army
00995

DISTRIBUTION: To be distributed in accordance with DA Form 12-34-E, block 0899 requirements for TM 750-116.

TECHNICAL MANUAL
NO. TM 750-116

HEADQUARTERS
DEPARTMENT OF ARMY
Washington, DC 5 May 1993

GENERAL PROCEDURES FOR PURGING AND CHARGING OF FIRE CONTROL INSTRUMENTS

This manual is current as of 1 January 1993

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS, Rock Island, IL 61299-6000. A reply will be furnished to you.

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CHAPTER 1
INTRODUCTION

SECTION I
GENERAL INFORMATION

1-1. SCOPE. This manual provides general instructions for purging and charging fire control instruments with dry nitrogen. If specific instructions are provided in a technical publication pertaining to a specific fire control item, this publication does not attempt to take precedence over that publication.

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.

1-3. DESTRUCTION OF ARMY MATERIALS TO PREVENT ENEMY USE. Refer to TM 750-244-3 and TM 750-244-1-4 for procedures concerning the destruction of this material.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If the equipment used in these procedures needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know what you do not like about the design or performance. Put it on an SF 368 (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 will send you a reply.

SECTION II
EQUIPMENT DESCRIPTION AND DATA

1-5. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. Port Identification. Purging and charging ports of new production and overhauled fire control instruments are color coded. The color code system provides for painting of a gray band around the inlet port and a yellow band around the outlet port.

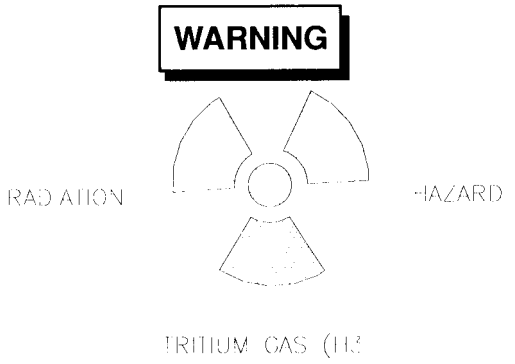
b. Port Location. Illustrations for fire control instruments that are purged and charged in this manual are included to show the location of inlet and outlet ports as well as associated hardware.

1-6. SAFETY, CARE, AND HANDLING. The following safety precautions are listed for the protection of personnel performing the procedures contained in this manual.

a. First Aid. Serious injury may occur at any time during the performance of these procedures. Prior to performing the work requirements, personnel should familiarize themselves with first aid information contained in FM21-11.

b. Compressed Gas. Compressed nitrogen gas is used for purging and charging. Death or severe injury may result if personnel fail to observe safety precautions.

c. Radioactive Material.



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO). CONTACT THE BASE SAFETY OFFICE FOR THE NAME AND TELEPHONE NUMBER OF YOUR LOCAL RPO:
LOCAL RPO:_____
TELEPHONE: _____

(1) Safety Procedures for Nuclear Regulatory Commission (NRC) Licensed Tritium Fire Control Devices.

(a) Purpose: To implement mandatory license requirements for use and maintenance of tritium radioluminous fire control instruments used on howitzers, mortars, tanks, and rifles.

(b) Scope: This procedure is applicable to all personnel working with tritium devices, including organizational, direct support, general support maintenance and operator levels.

(c) Radiological Hazard: The beta radiation emitted by tritium presents no external radiation hazard. However, if taken internally, it can damge soft tissue. If a capsule is broken, the tritium gas will dissipate into the surrounding air and surfaces near the vicinity of the break may become contaminated. Tritium can be taken into the body by inhalation, ingestion, or percutaneous (skin) absorption/ injection.

(2) Safety Precautions.

(a) Check for illumination in low light or darkroom prior to use or service. If not illuminated, do not repair. Double wrap the entire instrument in plastic (item 1, appx B) and notify the local RPO.

(b) Removal of the radioluminous source from the instrument is prohibited except at authorized depots. No eating, drinking, smoking or applying cosmetics will be allowed in tritium device work areas.

(3) Emergency Procedures. If a tritium source breaks, inform other personnel to vacate the area or move upwind. If skin contact is made with any area contaminated with tritium, wash immediately with nonabrasive soap and water. Report the incident to the local RPO. Actions below will be taken under supervision or direction of the local RPO.

(a) Personnel handling the instrument should wear rubber or latex gloves. Instrument must be immediately double wrapped in plastic (item 1, appx B), sealed, packaged and evacuated to depot. Outside package must be identified as "Broken Tritium Device - Do Not Open." Dispose of used gloves as radioactive waste per instructions from local RPO and wash hands well.

(b) Personnel who may have handled the broken tritium instrument should report to health clinic for tritium bioassay. Optimum bioassay sample is at least four hours after exposure.

(c) Broken tritium sources indoors may result in tritium contamination in the area, such as workbench or table. The area must be cordoned off, restricted until wipe tests indicate no contamination.

(4) Further Information.

(a) Requirements for safe handling, maintenance, storage and training are located in TM 9-254, General Maintenance Procedures for Fire Control Materiel.

(b) If assistance is needed, contact your local or major command (MACOM) safety office(s) for information on safe handling, shipping, storage, maintenance, or disposal of radioactive instruments.

(c) The licensee/AMCCOM RPO may be contacted by writing to Commander, U.S. Army Armament, Munitions and Chemical Command (AMCCOM), ATTN: AMSMC-SFS, Rock Island, IL 61299-6000, or telephone: DSN 793-2965/2995, Commercial (309) 782-2965/2995, Fax extension 2289, E-Mail SFO1@RIA-EMH1.ARMY.MIL. After work hours, the AMCCOM RPO may be contacted through the staff duty office at DSN 793-6001, Commercial (309) 782-6001.

1-7. CORROSION PREVENTION AND CONTROL (CPC).

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with these items be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using Standard Form 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.

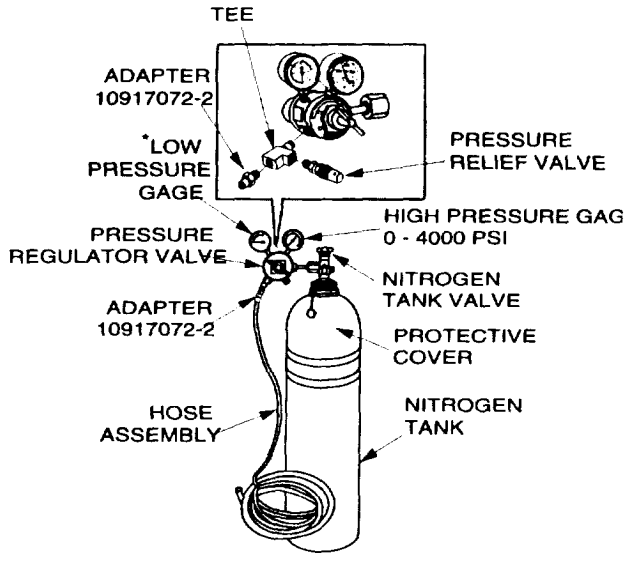
CHAPTER 2

GENERAL PROCEDURES

2-1. SCOPE. This chapter describes genera! procedures for the setup of purging and charging equipment time cycles.

2-2. SETUP OF PURGING AND CHARGING EQUIPMENT, (figs. 2-1 and 2-2).

a. Setup for Single Stage Fixture(fig. 2-1)



*0-15, 0-30, 0-60 gages are authorized but must be in 1 psi incr

Figure 2-1 Setup for Single Stage Fixture, PN SC4931-95J54

(1) Obtain a tank of water pumped dry nitrogen and remove threaded protective cover from the outlet of the tank. Open tank valve momentarily to rid valve seat of any foreign material.

(1.1) Remove the adapter from the regulator install tee into the regulator. Install valve relief into tee in the 3 o'clock position. install the adapter into tee in the 6 o'clock position.

WARNING

DO NOT DROP TANK OF COMPRESSED NITROGEN GAS. WHEN USING IN CONFINED AREAS, USE EXTREME CARE; GAS COULD CAUSE ASPHYXIATION.

(2) Securely attach regulator to tank valve using appropriate adapter supplied with purging kit if necessary.

(3) Securely attach hose assembly to the adapter.

NOTE

When using regulator 11729749, adapter 10917072-2 is required to connect hose assembly to low pressure to low pressure port of regulator.

(4) Close pressure regulator valve counterclockwise (CCW) to the extreme closed position.

(5) Open the nitrogen tank valve (CCW) slowly until the maximum tank pressure is registered on the high pressure gage.

NOTE

If pressure indicated is less than 100 psi, obtain and use replacement tank.

(6) SIowly open pressure regulator valve clockwise (CCW) until approximately 5 psi is registered on the low pressure gage. Check for and eliminate any interference; close pressure regulator valve (CCW).

(7) For bleed down procedures, refer to para 2-3a.

b. Setup for Two Stage Fixture (fig. 2–2).

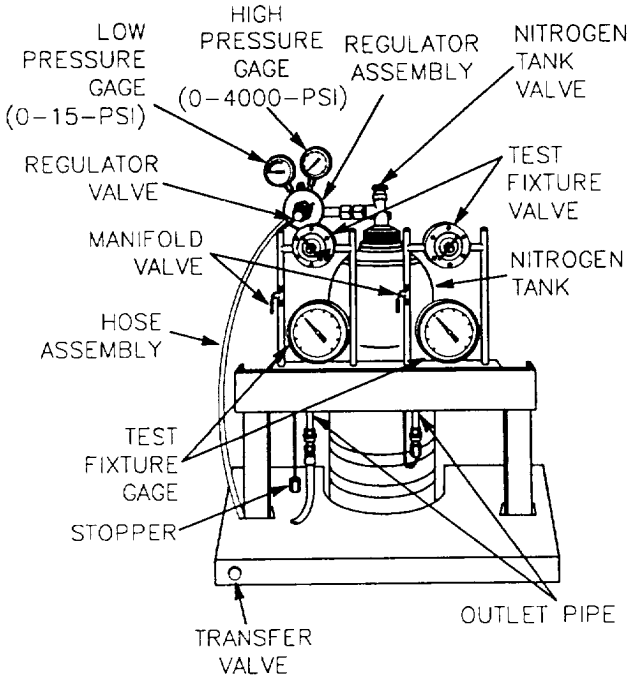


Figure 2–2 Setup for Two–Stage Fixture, PN 8565556

(1) Place a tank of dry nitrogen in a vertical position in the back of the fixture so that the tank is lodged in the structural steel "V" formation of the fixture and secure with the strap and clamping screw arrangement provided.

(2) Secure regulator assembly to the tank. Make certain pressure regulator valve is turned counterclockwise (CCW) to off. Open nitrogen tank valve (CCW) until maximum tank pressure is registered on the high pressure gage.

NOTE

If pressure indicated is less than 100 psi, obtain and use a replacement tank.

(3) Connect hose assembly to regulator assembly. Open manifold valve.

CAUTION

At no time should the pressure be permitted to exceed 15 psi. Pressure greater than 15 psi could damage the unit.

(4) Open transfer valve by pulling it to the outermost position.

(5) Close test fixture valve(s) and ensure low pressure gage indicates 0 psi.

(6) Open pressure regulator valve clockwise (CW) until low pressure gage indicates 15 psi.

(7) Open test fixture valve(s) until test fixture gage(s) indicate(s) proper pressure.

(8) Close manifold valve(s) and check pressure reading on test fixture gage(s) .

(9) Remove stopper(s) from outlet pipe(s). Open manifold valve(s) and check the pressure on test fixture gage(s). Adjust fixture valve(s) if necessary.

(10) Close manifold valve(s) and attach feeder tube(s) to outlet pipe(s).

(11) For bleed down procedures, refer to para 2-3.b.

2-3. BLEED DOWN OF PURGING AND CHARGING EQUIPMENT (fig. 2-1 and 2-2).

WARNING

DO NOT REMOVE REGULATOR ASSEMBLY, ADAPTER, OR HOSE BEFORE FIRST PERFORMING ENTIRE BLEED DOWN PROCEDURE. INJURY COULD RESULT FROM SUDDEN RELEASE OF HIGH PRESSURE GAS.

a. Bleed Down for Single Stage Fixture (fig. 2–1).

(1) Close pressure regulator valve counterclockwise (CCW).

(2) Close tank valve clockwise (CW).

(3) Slowly open pressure regulator valve (CW) until low pressure gage and high pressure gage both indicate zero.

(4) Close pressure regulator valve (CCW).

CAUTION

Pressure regulator valve should be left in the closed position when not in use. Leaving valve in the open position could damage regulator diaphragm.

b. Bleed Down for Two Stage Fixture (fig. 2-2).

(1) Close pressure regulator valve and test fixture valve(s) counterclockwise (CCW).

(2) Close tank valve clockwise (CW).

(3) Open transfer valve by pulling it to the outermost position.

(4) Rotate pressure regulator valve CW until low pressure gage indicates 15 psi.

(5) With manifold valve(s) open, slowly rotate test fixture valve(s) CW until low pressure gage, high pressure gage and test fixture gage(s) indicate zero.

(6) Close pressure regulator valve and test fixture valve(s) CCW.

CAUTION

Pressure regulator valve and test fixture valve(s) should be left in the closed position when not in use. Leaving valves open could result in damage to unit diaphragms.

2-4. TIME CYCLES.

a. Maintenance personnel will purge and charge tank fire control items every 180 days and artillery fire control items every 90 days or when condensation is evident in the instrument.

NOTE

The 180-day cycle does not apply to rangefinders which are purged and charged once a year. However, a visual inspection is required every 90 days for evidence of moisture. The electrical components of M21 Ballistic Computer System to include the Ammo Select Unit, Cant Angle Sensor, Computer Unit, Output Unit and Rate Tachometer and the Laser Rangefinder, AN/VVG–2, Electronics Unit require purging every 180 days, when unit is opened for maintenance, or when evidence of moisture is present.

b. Maintenance personnel will purge and charge fire control materiel being repaired whenever the repair function affects internal sealing.

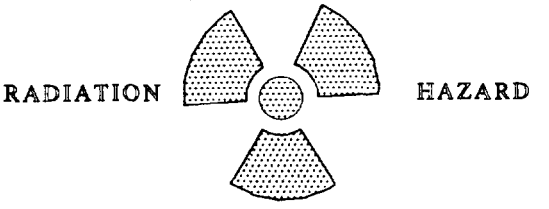
c. For maintenance of material in storage refer to applicable equipment manuals.

d. NSN's 4820-01-384-9005 and 4730-00-277-9615 are mandatory for purging artillery fire control.

2-5. PURGING AND CHARGING PROCEDURES.

a. Purge and Charge: Inlet Port Entry, Relief Valve Exit. This procedure is used when instrument is designed to hold a charge.

WARNING



TRITIUM GAS (H3)

HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY WRAP DEVICE IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Remove inlet port cap of instrument to be purged and charged.

(2) Inspect inlet port for cleanliness and presence of valve core. Remove any dirt or foreign matter.

CAUTION

Ensure regulator valve is closed (counter-clockwise - CCW) or damage may occur to regulator.

CAUTION

To avoid damage to instruments being purged and charged, do not exceed maximum pressure. Unless otherwise noted for specific instrument, maximum pressure is 10 psi.

(3) Connect hose assembly to inlet pert on instrument.

(4) Open main valve on nitrogen tank (CCW).

(5) Open regulator valve (clockwise - CW) until specified purge pressure is indicated on low pressure gage.

(6) Watch low pressure gage and listen for purge relief valve to open.

(a) Relief valve should open between specified pressures.

(b) If relief valve does not open before pressure reaches maximum range, immediately turn off regulator valve (CCW). Replace pressure relief valve on instrument. Repeat procedure.

(7) Purge instrument for specified time. If moisture is still present, a longer purge time may be required.

(8) Close the regulator valve (CCW).

(9) Watch low pressure gage and listen for purge relief valve to close.

(a) Relief valve should close at specified pressure.

(b) If pressure relief valve does not close before reaching the lowest pressure indicated, replace the pressure relief valve and repeat procedure.

(10) Leak test by allowing instrument to stand for specified time.

(a) Watch low pressure gage for indication of nitrogen leaks. (Low pressure gage will indicate decreasing pressure.) If no leak is indicated, go to step 11.

(b) If pressure reduces, perform leak check:

— Apply a soap solution to all sealed joints and screws.

— Open regulator valve (CW) until specified pressure registers on low pressure gage.

— When pressure relief valve opens, close regulator valve (CCW).

— Watch for bubbles to appear around seals and screws.

— Refer to appropriate maintenance manuals to replace defective seals.

— When defective seals are replaced, repeat purge and charge procedure.

(11) If no leaks are found on instrument, perform leak test on purge kit and hose connection while still connected to instrument. Repeat procedure until all leaks are eliminated.

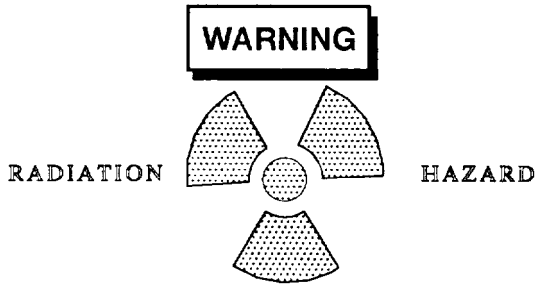
(12) Remove hose assembly.

(13) Close main tank valve (CW). Apply soap solution to the valve core. If a leak is found, replace valve core of instrument and repeat purge and charge procedure.

(14) Install inlet port cap on instrument.

(15) For bleed down procedures, refer to para 2-3.

b. Purge and Charge - Inlet Port Entry, Outlet Port Screw(s) This procedure is used when instrument is designed to hold a charge.



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY WRAP DEVICE IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Remove inlet port cap of instrument to be purged and charged.

(2) Inspect valve stem for cleanliness and presence of valve core. Remove any dirt or foreign matter.

CAUTION

Ensure regulator valve is closed (counterclockwise - (CCW) or damage may occur to regulator.

CAUTION

To avoid damage to instruments being purged and charged, do not exceed maximum pressure. Unless otherwise noted for specific instrument, maximum pressure is 10 psi.

(3) Connect hose assembly to valve stem on instrument.

(4) Open main valve on nitrogen tank (CCW).

(5) Remove outlet port screw(s) (unless otherwise directed for specific instrument) and any accompanying gasket/preformed packing.

(6) Open regulator valve clockwise (CW) until specified purge pressure is indicated on low pressure gage.

(7) Watch low pressure gage and listen for gas escaping from outlet port. Do not allow pressure to exceed maximum specified pressure.

(8) Purge instrument for specified time. If moisture is still present, a longer purge time may be required.

(9) Reduce pressure to 1 psi.

☆U.S. GOVERNMENT PRINTING OFFICE: 1995-746-045/20065

(10) Check outlet port screw to ensure seal on screw is serviceable. Replace self-sealing screw if necessary. If other than self-sealing screw is used, sealing compound, (item 6, appx B, unless otherwise specified) must be applied to screw before installing.

(11) Install outlet port screw(s) and any accompanying gasket/preformed packing.

(12) Increase pressure to specified charge pressure for specified time.

(13) Close regulator valve (CCW).

(14) Leak test by allowing instrument to stand for specified time.

(a) Watch low pressure gage for indication of nitrogen leaks (low pressure gage will indicate decreasing pressure). If no leaks occur, proceed to step 15.

(b) If pressure reduces, perform leak check:

- Apply a soap solution to all sealed joints and screws.
- Open regulator valve (CW) to increase internal pressure to instrument's charge pressure.
- Close regulator valve (CCW).
- Watch for bubbles to appear around seals and screws.
- Refer to appropriate maintenance manuals to replace defective seals.
- When defective seals are replaced, repeat purge and charge procedure.

(15) If no leaks are found on the instrument, perform a leak test on the purge kit and hose connection while still connected to the equipment. Repeat procedure until all leaks are eliminated.

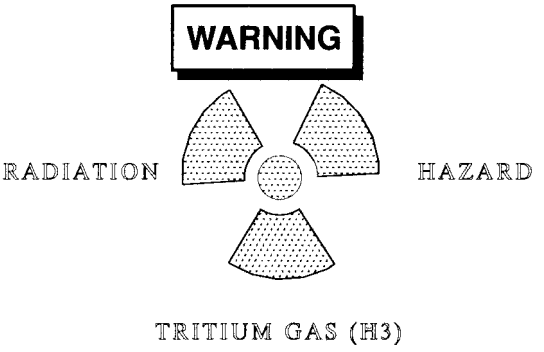
(16) Remove hose assembly.

(17) Close main tank valve (CW). Apply soap solution to valve core. If a leak is found, replace valve core of instrument and repeat purge and charge procedure.

(18) Install inlet port cap on instrument.

(19) For bleed down procedures, refer to para **2-3.**

c. Purge Only, Inlet Port Entry, Outlet Port Screw. This procedure is used when instrument does not hold a charge.



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Remove inlet port cap from instrument to be purged.

(2) Inspect inlet port for cleanliness and presence of valve core. Remove any dirt or foreign matter.

CAUTION

Ensure regulator valve is closed (counterclockwise - CCW) or damage may occur to regulator.

CAUTION

To avoid damage to instruments being purged, do not exceed maximum pressure. Unless otherwise noted for specific instrument, maximum pressure is 10 psi.

(3) Connect hose assembly to inlet port valve stem on instrument.

(4) Open main valve on nitrogen tank (CCW).

(5) Remove outlet port screw (unless otherwise directed for specific instrument) with any accompanying gasket/preformed packing.

(6) Open regulator valve (clockwise - CW) until specified purge pressure is indicated on low pressure gage.

(7) Watch low pressure gage and listen for gas escaping from outlet port. Do not allow pressure to exceed maximum specified pressure.

(8) Purge instrument for specified time. If moisture is still present, a longer purge time may be required.

(9) Close the regulator valve (CCW).

(10) Check outlet port screw to ensure seal on screw is serviceable. Replace self-sealing screw if necessary. If other than self-sealing screw is used, sealing compound (item 6, appx B, unless otherwise specified) must be applied to screw before installing.

(11) Install outlet port screw with any accompanying gasket/preformed packing.

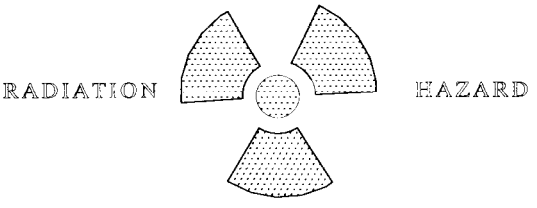
(12) Remove hose assembly.

(13) Install inlet port cap.

(14) For bleed down procedures, refer to para **2-3.**

d. Purge Only - Inlet Port Screw, Outlet Port Screw(s). This procedure is used when instrument does not hold a charge.

WARNING



TRITIUM GAS (H3)

HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Remove inlet port screw from instrument to be purged.

(2) Inspect inlet port for cleanliness. Remove any dirt or foreign matter.

CAUTION

Ensure regulator valve is closed (counter-clockwise - CCW) or damage may occur to regulator.

CAUTION

To **avoid damage to instruments being purged, do not exceed maximum pressure. Unless otherwise noted for specific instrument, maximum pressure is 10 psi.**

(3) Install specified purge adapter in inlet port.

(4) Connect hose assembly to purge adapter on the instrument.

(5) Open main valve on nitrogen tank (CCW).

(6) Remove outlet screw(s) (unless otherwise directed for specific instrument) and any accompanying gasket/preformed packing.

(7) Open regulator valve (clockwise - CW) until specified purge pressure is indicated on low pressure gage.

(8) Watch low pressure gage and listen for gas escaping from outlet port(s). (Do not allow pressure to exceed maximum specified pressure.

(9) Purge instrument for specified time. If moisture is still present, a longer purge time may be required.

(10) Close the regulator valve (CCW).

(11) Check inlet and outlet port screws to ensure seals on screws are serviceable. Replace self-sealing screws if necessary. (If other than self-sealing screws are used, sealing compound (item 6, appx B, unless otherwise specified) must be applied to screw before installing.

(12) Install outlet screw(s) and any accompanying gasket/preformed packing (if required).

(13) Remove hose assembly and adapter.

(14) Install inlet screw.

(15) For bleed down procedures, refer to para **2-3.**

CHAPTER 3
PURGING AND CHARGING SPECIFIC INSTRUMENTS

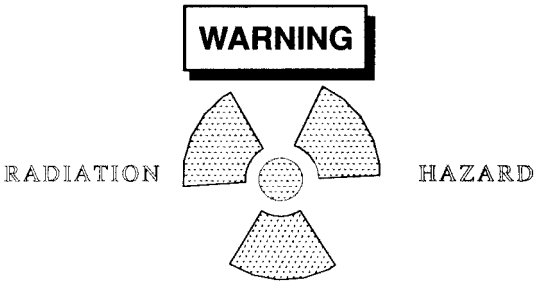
SECTION I
GENERAL INFORMATION

3-1. SCOPE.

a. This chapter presents purging, charging, and leak testing pressures and times for specific fire control instruments. Refer to paragraph 2-2 for initial setup information and paragraph 2-5 for general purging and charging procedures.

b. Also included are instructions for separation of major assemblies, leak checking pressures, time durations, use of inlet port adapters, and any specific notes, cautions or warnings applicable to the specific instrument. Each procedure refers to a partially exploded illustration showing location of inlet and outlet ports.

c. For presentation purposes, specific instrument procedures are arranged in categories: Aiming Circle, Alinement Devices, Binoculars, Collimators, Computers, Mounts, Periscopes, Quadrants, Rangefinders, Sights, Telescopes, and Reticle Projector Unit. Under each of these categories the specific instruments are listed alphanumerically.



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

NOTE

If the outlet port screw or purging inlet screw is lost or damaged, replace with the appropriate screw as listed in Appendix C or in appropriate technical manual.

The soap solution used in general procedures in chapter 2 is a mixture of soap (item 7, appx B) and water. Leak-Tee may also be used if available.

SECTION II
SPECIFIC INSTRUMENTS

WARNING

DO NOT EXCEED THE PRESSURES INDICATED THROUGHOUT THE FOLLOWING PROCEDURES.

3-2. AIMING CIRCLE, M2A2 (fig. 3-1).

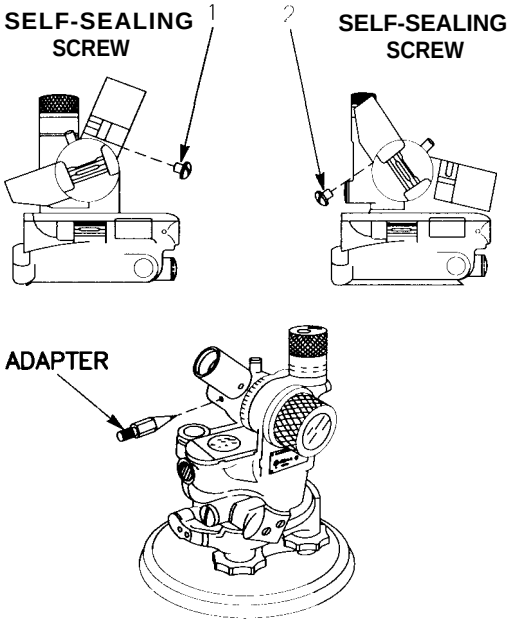


Figure 3-1 M2A2 Aiming Circle

a. Perform purging procedure para **2-5.d.**

b. Depress elbow telescope to about 400 mils.

c. Remove self-sealing screw (1).

d. Elevate elbow telescope until self-sealing screw (2) is accessible.

e. Remove self-sealing screw (2).

NOTE

On aiming circle with only one self-sealing screw, remove one of the reticle setscrews to purge. Apply sealing compound (item 6, appx B) to setscrew to reinstall.

f. Install adapter assembly with 8-32 UNC-2A threads.

g. Purge instrument at 5 psig for 5 minutes.

h. Remove adapter assembly and install self-sealing screw (2).

i. Elevate elbow telescope to about 800 mils.

j. Install self-sealing screw (1).

k. Return elbow telescope to zero mils.

3-3. BINOCULAR, M19 (fig. 3-2)

NOTE

Both sides of the binocular must be purged individually. Repeat procedure para **2-5.d.** for both sides.

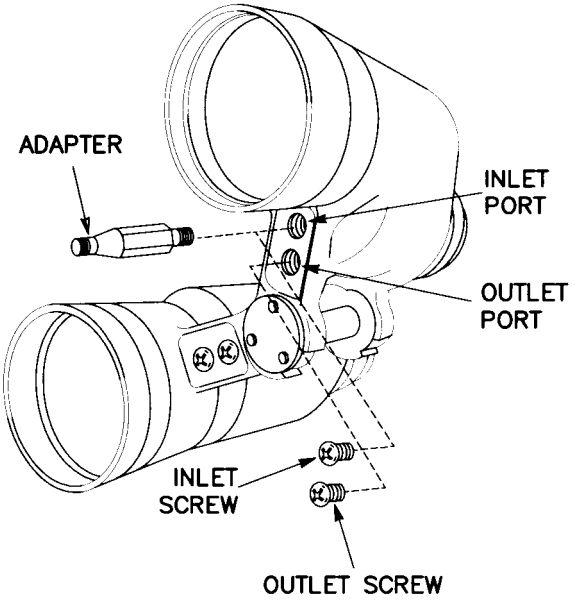
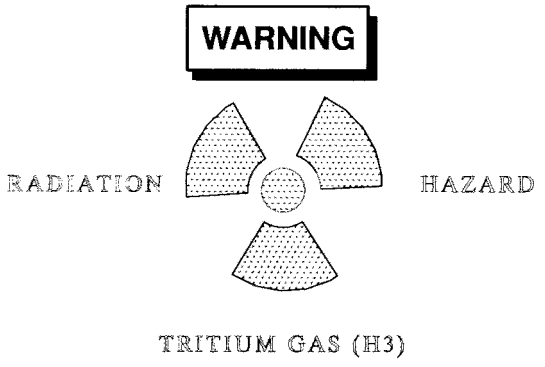


Figure 3-2 M19 Binocular

a. Perform purging procedure para **2-5.d.**

b. Purge instrument at 5 psig for 5 minutes.

3-4. COLLIMATOR, M1A1 (fig. 3-3).



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

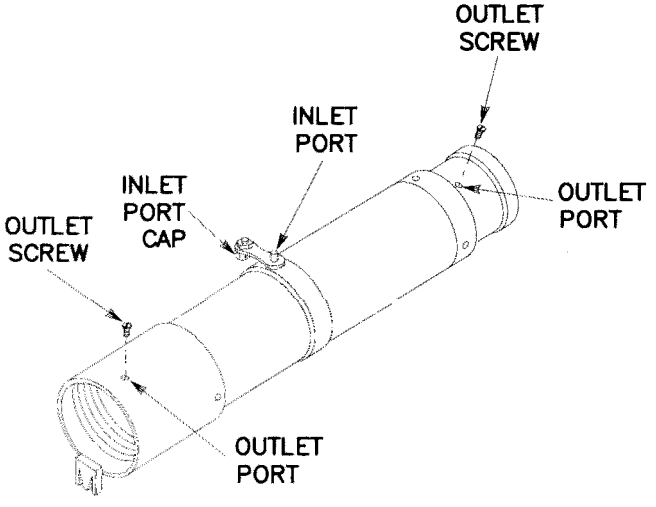


Figure 3-3 M1A1 Collimator

NOTE

Actual location of outlet port screws may vary from location shown in illustration due to collimator adjustments.

NOTE

For sealing the collimator, the two stage fixture is required (refer to para **2-2.b.).** For regular purging and charging, the single stage fixture may be used (refer to para **2-2.a.).**

a. Perform purging and charging procedure para **2-5.b.**

b. Purge instrument at 3 psig for 5 minutes.

c. Check to be sure nitrogen is escaping from both outlet ports.

d. Charge instrument at 3 psig maintaining pressure for 10 seconds.

e. Leak test for a minimum of 5 minutes.

f. Remove hose assembly and release all pressure by depressing inlet port valve stem.

g. Reconnect hose assembly and charge instrument at 1 psig for 10 seconds.

h. Install inlet port cap.

3-5. COMPUTER, M21 ELECTRONIC (figs. 3-4 through 3-9).

a. Ammo Select Unit - two each (fig. 3-4).

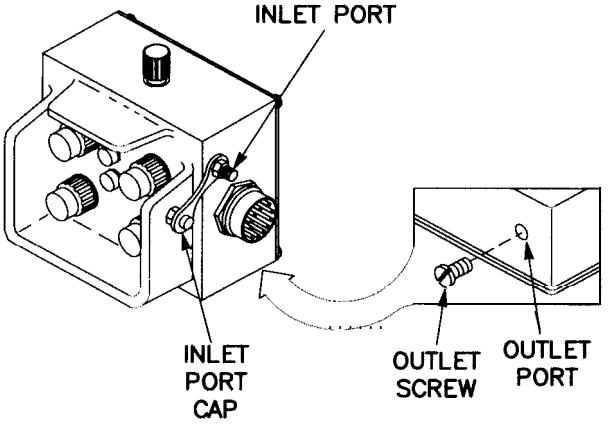


Figure 3-4 Ammo Select Unit

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge each unit at 8 psig for 5 minutes.

(3) Charge each unit at 1 psig maintaining pressure for 10 seconds.

(4) Leak test for a minimum of 5 minutes.

b. Cant Angle Sensor (fig. 3-5). Refer to para **3-5.a** for procedures.

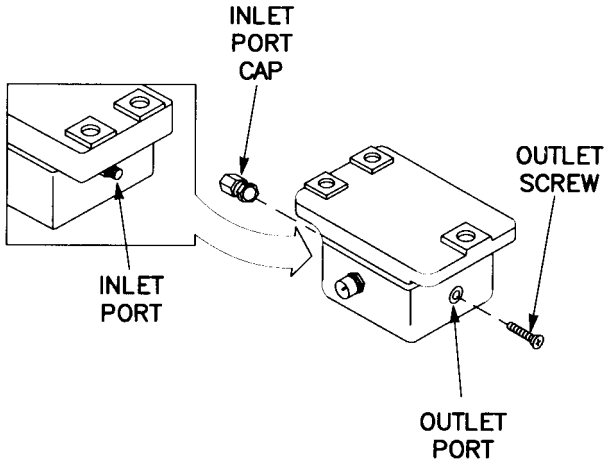


Figure 3-5 Cant Angle Sensor

c. Computer Unit (fig 3-6). Refer to para **3-5.a.** for procedures.

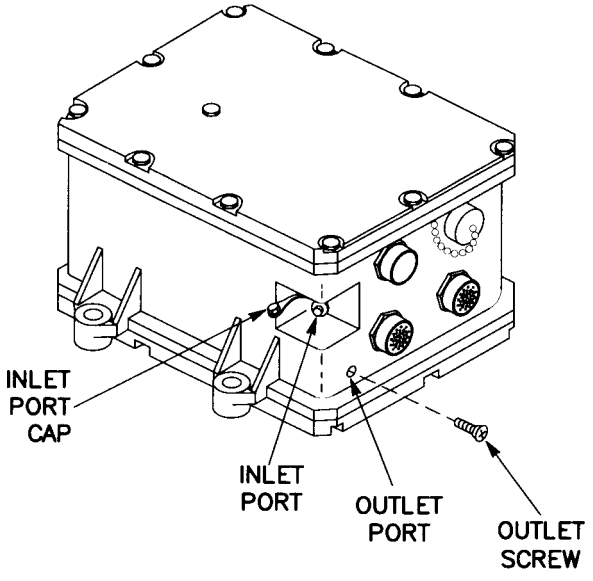


Figure 3-6 Computer Unit

d. Gunner's Control Unit (fig. 3-7). Refer to para **3-5.a.** for procedures.

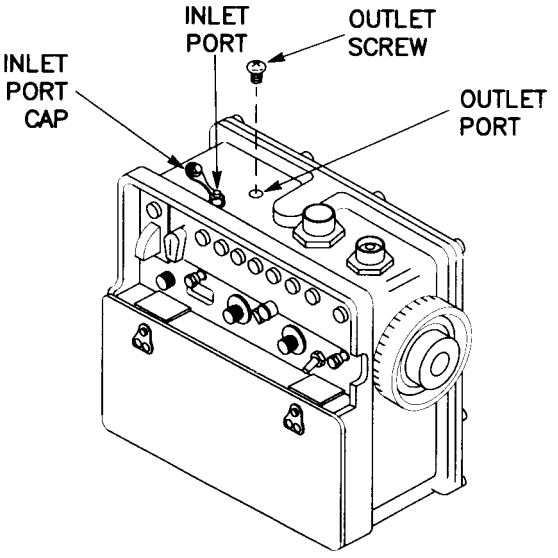


Figure 3-7 Gunner's Control Unit

e. Output Unit (fig. 3-8). Refer to para **3-5.a.** for procedures.

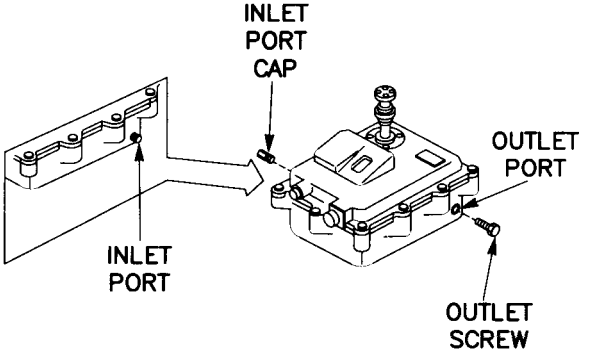


Figure 3-8 Output Unit

f. Rate Tachometer (fig. 3-9). Refer to para **3-5.a.** for procedures.

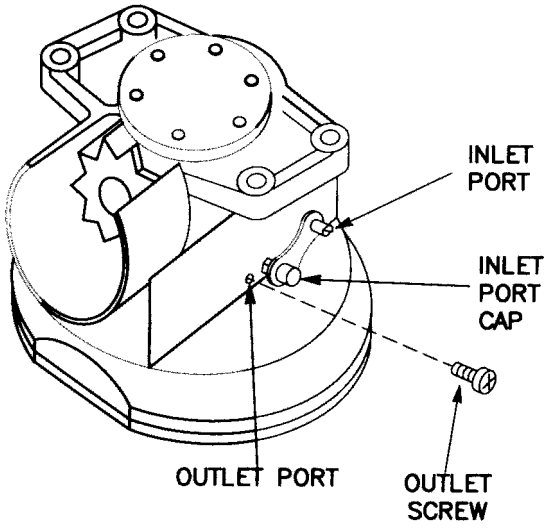


Figure 3-9 Rate Tachometer

3-6. DEVICE, ALINEMENT, M139/M140, (fig. 3-10).

WARNING

RADIATION HAZARD

TRITIUM GAS (H3)

HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

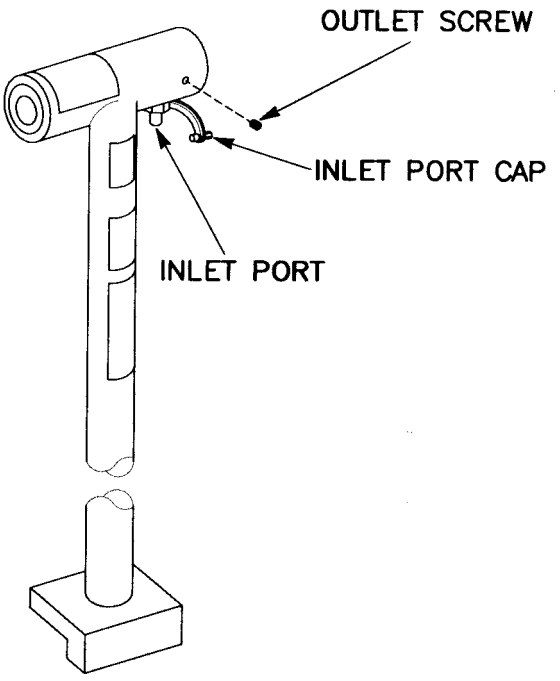


Figure 3-10 M139/M140 Alinement Device

a. Perform purging and charging procedure para **2-5.b.**

b. Purge instrument at 7 psig for 5 minutes.

c. Charge instrument at 1 psig maintaining pressure for 10 seconds.

d. Leak test for minimum of 5 minutes.

3-7. DEVICES, BORESIGHT.

a. M26/M27 Boresight (fig. 3-11).

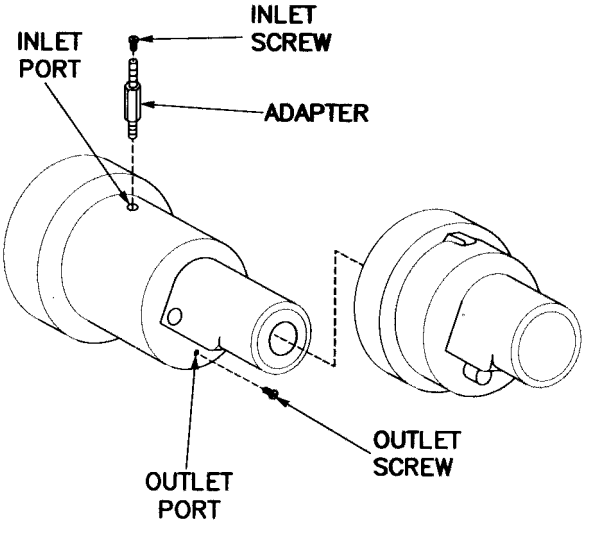


Figure 3-11 M26/M27 Boresight Device

(1) Remove the rubber protective head cover.

NOTE

Some early manufacture boresight inlet ports were equipped with metric threads. To attach the hose asembly to these units, it is necessary to use the 10-32 adapter supplied with the purging kit. Insert the adapter carefully and do not force the adapter past its binding point.

(2) Perform purging procedure para **2-5.d.**

(3) Purge instrument at 5 psig for 5 minutes.

(4) Install the rubber protective head cover on the boresight.

b. M26A1/M27A1 Muzzle Boresight (fig. 3-12).

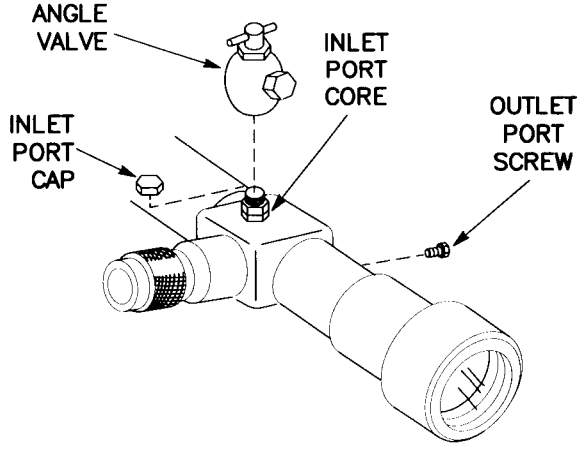


Figure 3-12 M26A1/M27A1 Muzzle Boresight

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

(2) Attach hose assembly to angle valve (special tool, TM9-4933-259-14&P) and install angle valve on inlet port.

(3) Turn angle valve T clockwise (CW) until snug.

(4) Perform purging and charging procedure para **2-5.b.**

(5) Purge instrument at 5 psig for 5 minutes or until all traces of moisture in optical unit are removed.

(6) Charge instrument at 3 psig maintaining pressure for 10 seconds.

(7) Turn angle valve T counterclockwise (CCW) until snug.

(8) Remove hose assembly and angle valve from inlet port core.

(9) Leak test for minimum of 5 minutes.

3-8. MOUNTS, TELESCOPE.

a. Telescope Mount, M137 (fig. 3-13).

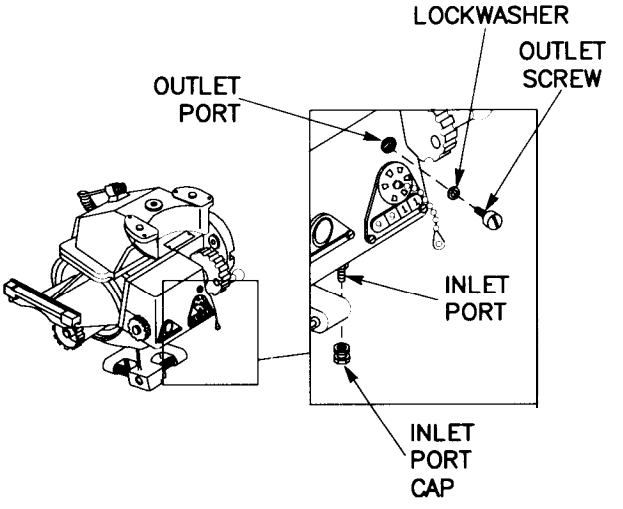


Figure 3-13 M137 Telescope Mount

(1) Perform purging procedure para **2-5.c.**

(2) Purge instrument at 5 psig for 5 minutes.

b. Telescope Mount, M145/M145A1 (fig. 3-14).

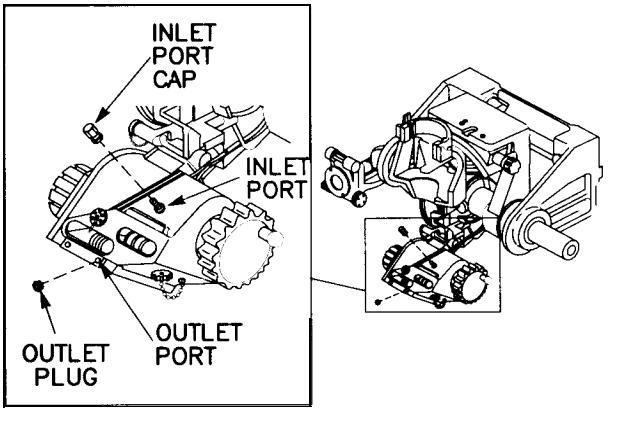


Figure 3-14 M145/M145A1 Telescope Mount

(1) Perform purging procedure para **2-5.c.**

(2) Purge instrument at 5 psig for 5 minutes.

c. Telescope Mount, M149/M149E1 (fig. 3-15).

NOTE

Mount must be removed from installed position for purging and charging operations. Refer to appendix A for a listing of applicable publications.

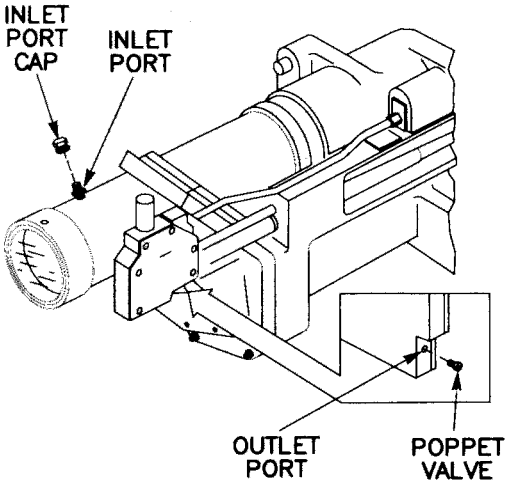


Figure 3-15 M149/M149E1 Telescope Mount

(1) Remove inlet port cap and outlet screw on M149 Telescope Mount. Do not remove poppet valve on M149E1 Telescope Mount.

(2) Perform purging and charging procedure para **2-5.b** for M149 and para **2-5.a** for M149A1.

(3) Purge M149 Telescope Mount at 5 psig and M149E1 Telescope Mount at 3 psig. Maintain pressure for 10 minutes.

(4) Charge instrument at 1 psig for 40 seconds.

(5) Leak test for a minimum of 5 minutes.

d. Telescope, Mount, M187 (fig. 3-16).

WARNING

RADIATION HAZARD

TRITIUM GAS (H3)

HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

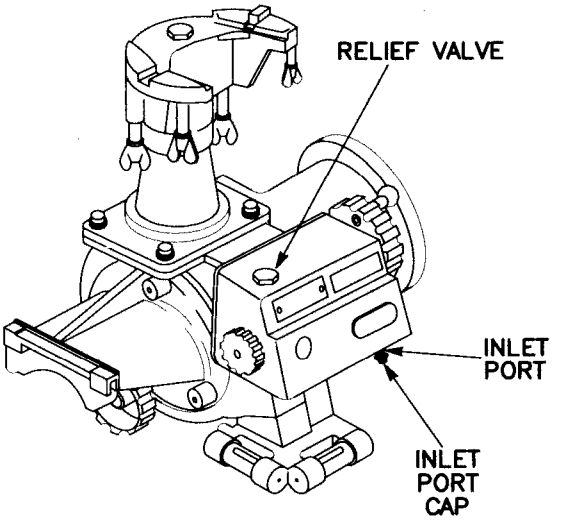


Figure 3-16 M187 Telescope Mount

(1) Perform purging and charging procedure para **2-5.a.**

(2) Relief valve should open between 3-10 psig.

(3) Purge instrument for 5 minutes.

(4) Relief valve should close between 1-5 psig.

(5) Leak test for minimum of 5 minutes.

3-9. PERISCOPE, M65 BATTERY COMMANDER'S (fig. 3-17).

NOTE

Both tubes of the Battery Commander's Periscope must be purged and charged separately. Repeat procedure for each tube assembly.

Ensure that nitrogen is escaping from both outlet ports before proceeding with charging procedures.

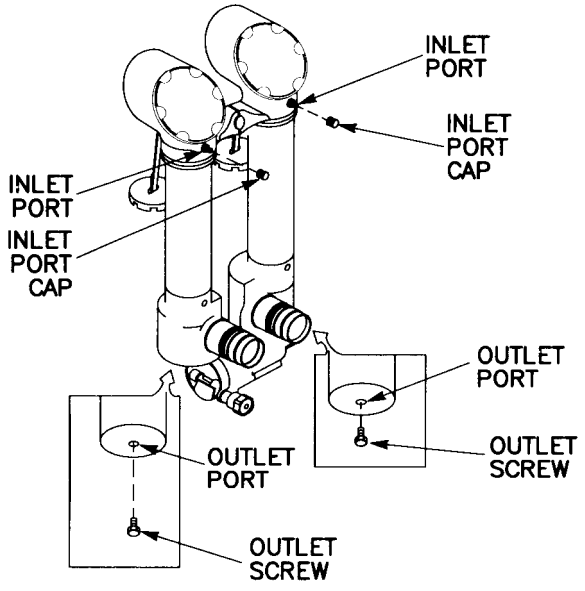


Figure 3-17 M65 Battery Commander's Periscope

a. Perform purging and charging procedure para **2-5.b.**

b. Purge instrument at 5 psig for 10 minutes.

c. Charge instrument at 1 psig maintaining pressure for 20 seconds.

d. Leak test for minimum of 5 minutes.

3-10. PERISCOPES, TANK.

a. Periscope, M28C Tank (fig. 3-18).

NOTE

The eyeshield must be removed to provide access to outlet screw.

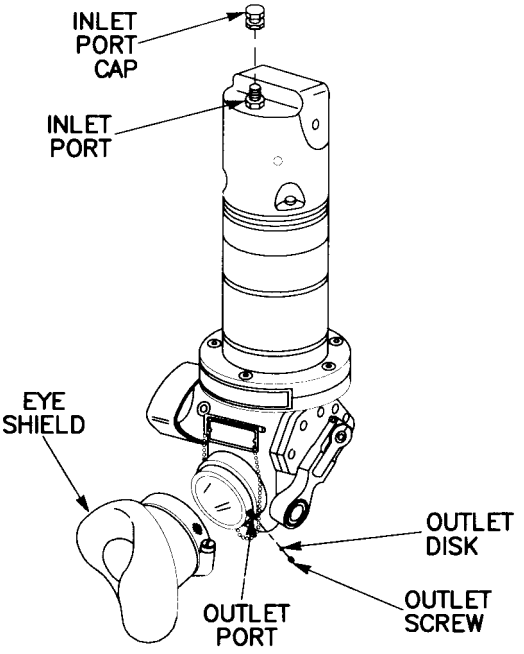


Figure 3-18 M28C Tank Periscope

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 10 minutes.

(3) Charge instrument at 1 psig maintaining pressure for 10 seconds.

(4) Leak test for minimum of 5 minutes.

b. Periscope, M30C Tank (fig. 3-19).

NOTE

The periscope must be removed from installed position for purging and charging operations. Refer to appendix A for a listing of applicable publications.

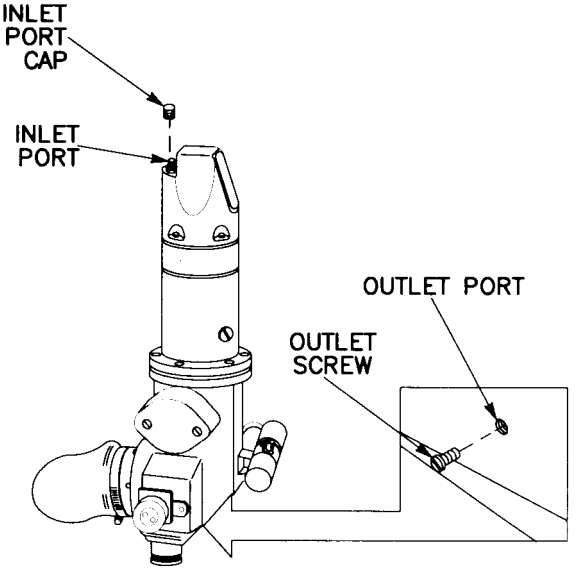


Figure 3-19 M30C Tank Periscope

(1) Perform purging and charging procedure para 2-5.b.

(2) Purge instrument at 5 psig for 10 minutes.

(3) Charge instrument at 1 psig maintaining pressure for 20 seconds.

(4) Leak test for minimum of 5 minutes.

c. Periscope, M32E1 Tank (figs. 3-20 through 3-22).

WARNING

ENSURE THAT 1.5V-OFF-24V SWITCH ON BOTTOM OF THE INFRARED BODY ASSEMBLY IS SET TO OFF; THIS UNIT CARRIES 16,000 VDC.

CAUTION

Do not purge and charge the infrared body assembly in bright light; prolonged exposure can cause damage to the image conversion tube.

NOTE

Periscope must be removed from installed position for purging and charging operations. Refer to appendix A for listing of applicable public a-

(1) Head Assembly (fig. 3-20).

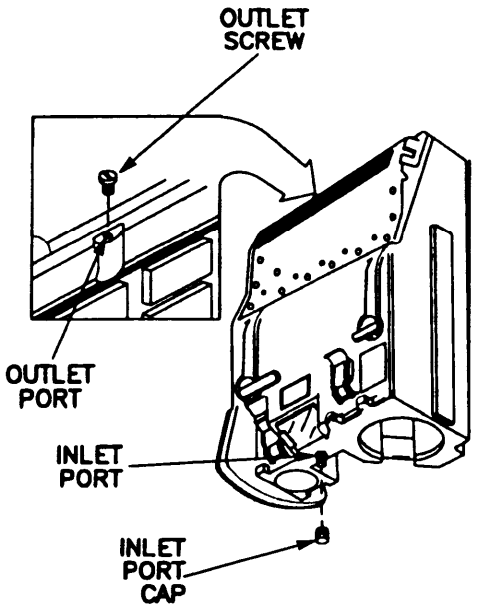


Figure 3-20 M32E1 Head Assembly

(a) Perform purging and charging procedure para 2-5.b.

(b) Purge instrument at 8 psig for 5 minutes.

(c) Charge instrument at 1 psig maintaining pressure for 10 seconds.

(d) Leak test for minimum of 5 minutes.

(2) Daylight Body Assembly (fig. 3-21).

NOTE

The daylight body assembly must be removed from head assembly for purging and charging operations. Refer to appendix A for a listing of applicable publications.

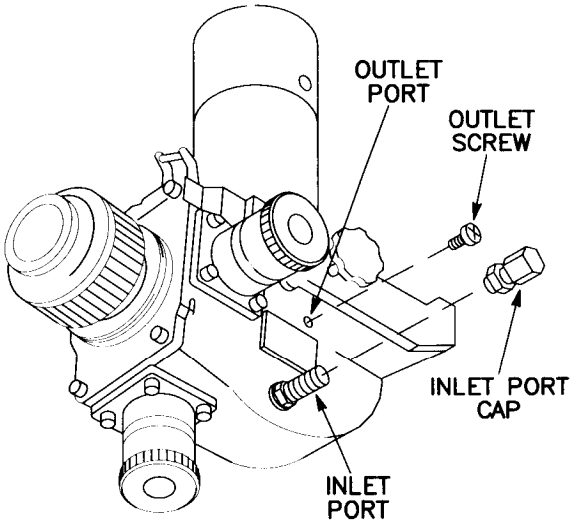


Figure 3-21 M32E1 Daylight Body Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 8 psig for 5 minutes.

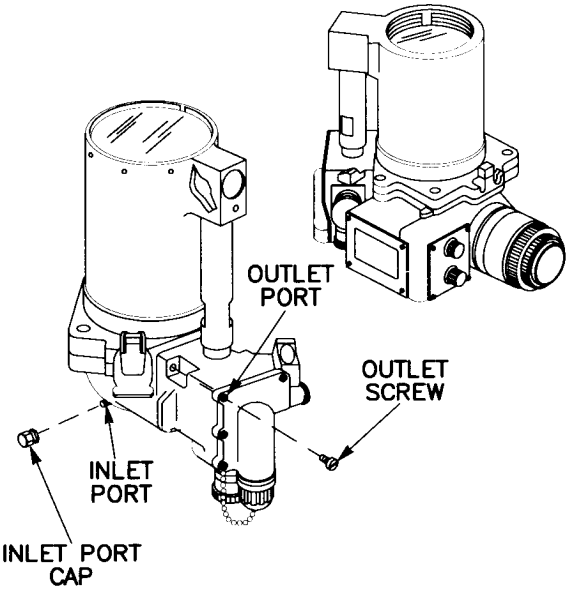
(c) Charge instrument at 1 psig maintaining pressure for 20 seconds.

(d) Leak test for a minimum of 5 minutes.

(3) Passive Elbow Assembly (fig. 3-22).

NOTE

The passive elbow assembly must be removed from head assembly for purging and charging operations. Refer to appendix A for a listing of applicable publications.



NOTE: TWO VIEWS SHOWN FOR CLARITY

Figure 3-22 M32E1 Passive Elbow Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 8 psig for 5 minutes.

(c) Charge instrument at 1 psig maintaining pressure for 20 seconds.

(d) Leak test for minimum of 5 minutes.

d. Periscope, M32CE1 Tank (figs. 3-20 through 3-22. Refer to para **3-10.c.** for procedures.

e. Periscope, M35E1 Tank (figs. 3-20 through 3-22). Refer to para **3-10.c.** for procedures.

f. Periscope, M36 Tank (figs. 3-23 through 3-26).

WARNING

ENSURE THAT 1.5-OFF-24V SWITCH ON THE BOTTOM OF THE INFRARED BODY ASSEMBLY IS SET TO OFF; THIS UNIT CARRIES 16,000 VDC.

CAUTION

Do not purge and charge the infrared body assembly in bright light; prolonged exposure can cause damage to the image conversion tube.

NOTE

The periscope must be removed from the installed position for purging and charging operations. Refer to appendix A for a listing of applicable publications.

(1) Head Assembly (fig. 3-23).

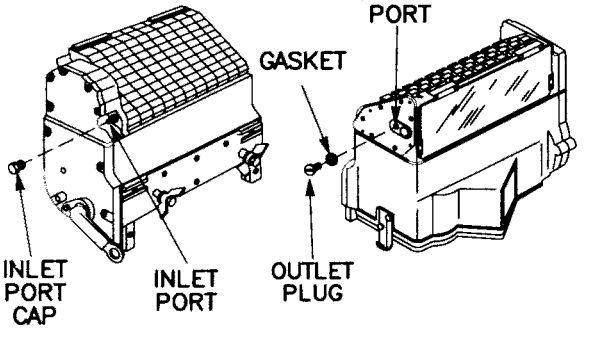


Figure 3-23 M36 Head Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 8 psig for 5 minutes.

(c) Charge instrument at 1 psig for 10 seconds.

(d) Leak test for minimum of 5 minutes.

(2) Daylight Body Assembly (fig. 3-24).

NOTE

The daylight body assembly and the infrared body assembly must be removed from the head assembly for purging and charging procedures. Refer to appendix A for a listing of applicable publications.

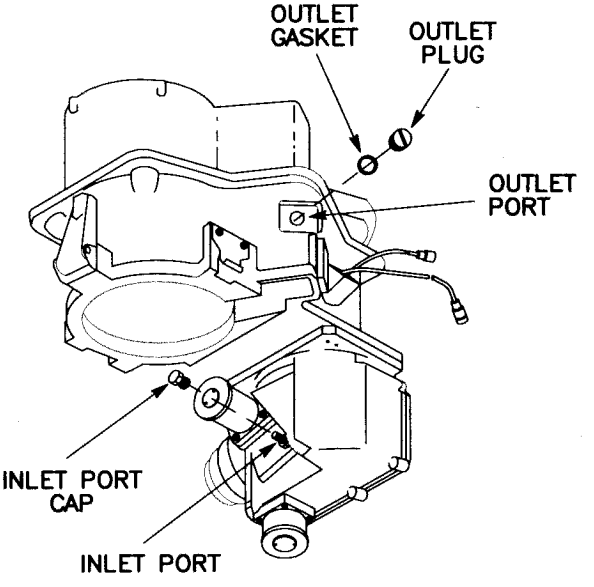


Figure 3-24 M36 Daylight Body Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 8 psig for 5 minutes.

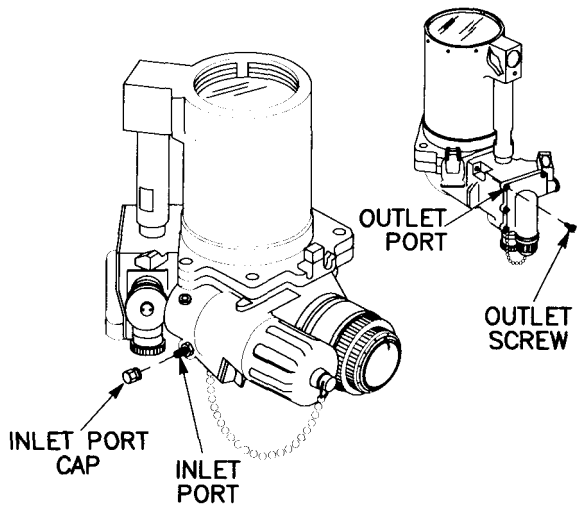
(C) Charge instrument at 1 psig for 20 seconds.

(d) Leak test for a minimum of 5 minutes.

(3) Infrared Body Assembly (fig. 3-25).

NOTE

The infrared body assembly must be removed from the head assembly for purging and charging operations. Refer to appendix A for a listing of applicable publications.



NOTE: TWO VIEWS SHOWN FOR CLARITY

Figure 3-25 M36 Infrared Body Assembly

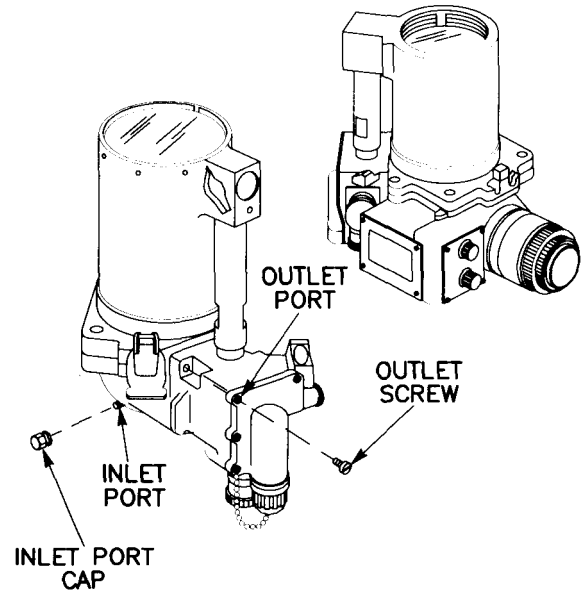
(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 8 psig for 5 minutes.

(c) Charge instrument at 1 psig for 20 seconds.

(d) Leak test for a minimum of 5 minutes.

(4) Passive Elbow Assembly (fig. 3-26). Refer to para **3-10.f.(3)** for procedures.



NOTE: TWO VIEWS SHOWN FOR CLARITY

Figure 3-26 M36 Passive Elbow Assembly

g. Periscope, M36E1 Tank (figs. 3-23 through 3-26). Refer to para **3-10.f.** for procedures.

h. Tank Periscope, M42 Tank (fig. 3-27).

NOTE

Early, later, and modified production periscopes must be removed for purging and charging procedures. Refer to appendix A for a listing of applicable publications.

(1) Early Production (fig. 3-27).

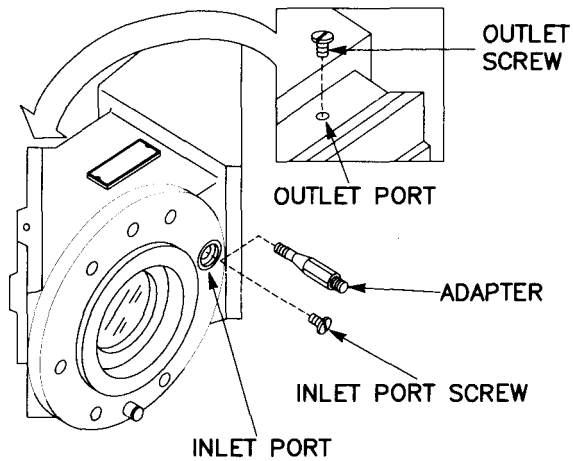


Figure 3-27 M42 Tank Periscope - Early Production

(a) Perform purging procedure para **2-5.d.**

(b) Purge instrument at 5 psig for 5 minutes.

(2) Late Production (fig. 3-28).

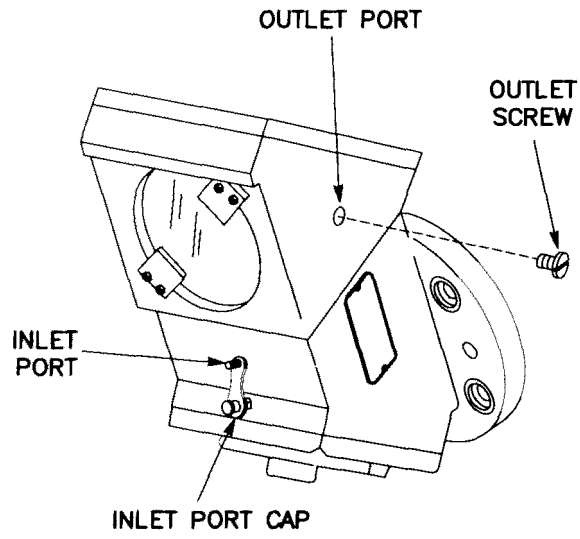


Figure 3-28 M42 Tank Periscope - Late Production

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 5 psig for 5 minutes.

(c) Charge instrument at 1 psig for 10 seconds.

(d) Leak test for minimum of 5 minutes.

(3) Modified Production (fig. 3-29). Refer to para **3-10.h.(2)** above for procedures.

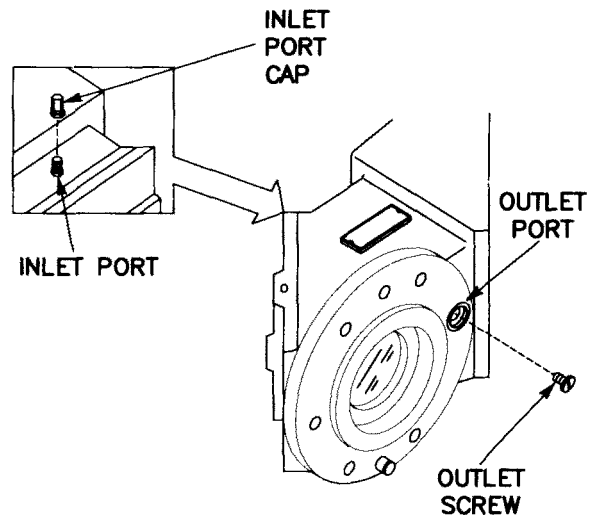


Figure 3-29 M42 Tank Periscope - Modified Production

i. Periscope, M44A Tank (figs. 3-30 through 3-32.

WARNING

ENSURE THAT THE VEHICLE MASTER SWITCH AND THE PERISCOPE EMERGENCY SWITCH ARE IN THE OFF POSITION. THE HIGH VOLTAGE AND LOW AMPERAGE OF THE POWER PACK IS NOT DANGEROUS; HOWEVER, IF THE HIGH VOLTAGE PARTS ARE TAMPERED WITH, AN ELECTRICAL SHOCK MAY RESULT.

CAUTION

Do not expose periscope to bright light; prolonged exposure may cause damage to image conversion tube.

NOTE

Special plate assemblies are provided for purging and charging when the head assembly and body assembly are separated. These plates are also used for shipment and storage of the periscope.

(1) Purging and Charging in the Installed Position (fig. 3-30).

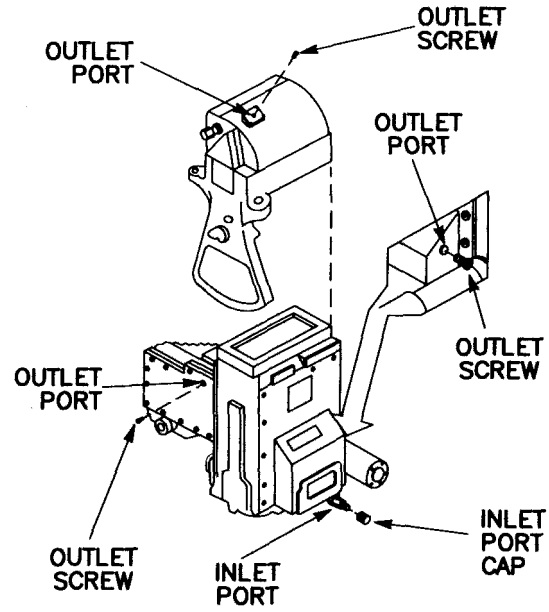


Figure 3-30 M44A Series Tank Periscope

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 5 psig for 10 minutes.

(c) Charge instrument at 1 psig for 20 seconds.

(d) Leak test for minimum of 5 minutes.

(2) Purging and Charging the Head Assembly (fig. 3-31).

NOTE

Install plate 10542087 before performing purging and charging procedures.

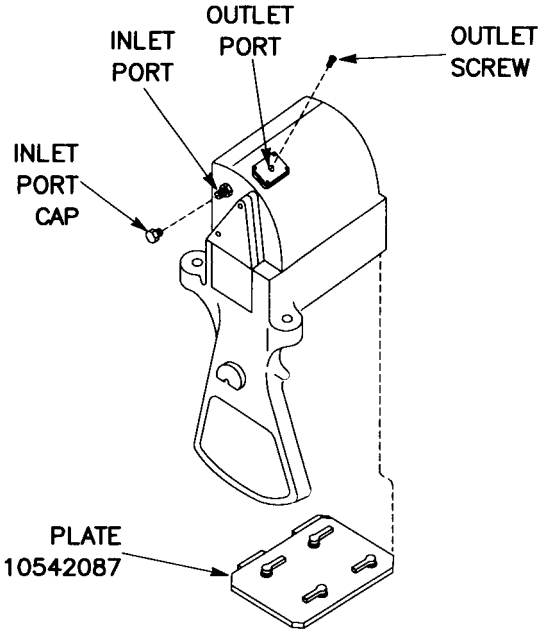


Figure 3-31 M44A Head Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 5 psig for 10 minutes.

(c) Charge instrument at 1 psig for 20 seconds.

(d) Leak test for minimum of 5 minutes.

(3) Purging and Charging the Body Assembly (fig. 3-32).

NOTE

Mount plate 10549705 before proceeding with purging and charging operations.

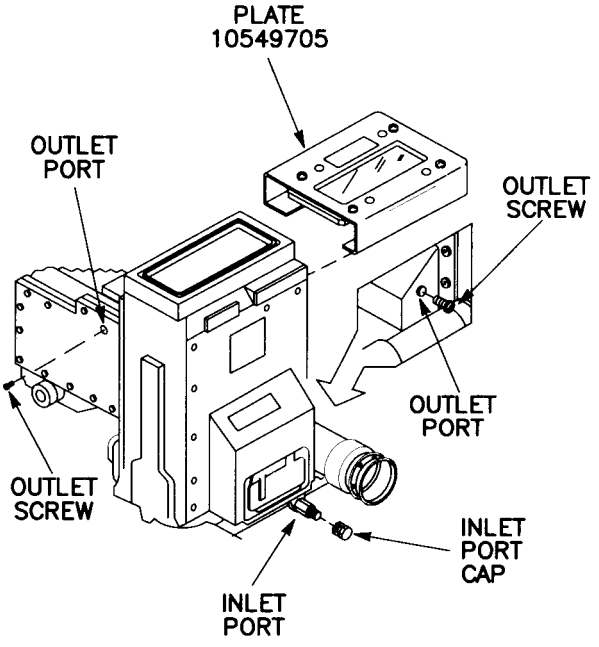


Figure 3-32 M44A Body Assembly

(a) Perform purging and charging procedure para **2-5.b.**

(b) Purge instrument at 5 psig for 10 minutes.

(C) Charge instrument at 1 psig for 20 seconds.

(d) Leak test for minimum of 5 minutes.

j. Periscope, M44A2 Tank (figs. 3-30 through 3-32). Refer to para **3-10.i.** for procedures.

k. Periscope, M44A3 Tank (figs. 3-30 through 3-32). Refer to para **3-10.i.** for procedures.

l. Periscope, M44A4 Tank (figs. 3-30 through 3-32). Refer to para **3-10.i.** for procedures.

m. Periscope, M44A1E1 Tank (figs. 3-30 through 3-32). Refer to para **3-10.i.** for procedures.

n. Periscope, M44A2E1 Tank (figs. 3-30 through 3-32). Refer to para **3-10.i.** for procedures.

o. Periscope, M47 Tank (fig. 3-33).

NOTE

The periscope body assembly must be separated from the head assembly or removed from storage for purging and charging procedures. Refer to appendix A for a listing of applicable publications.

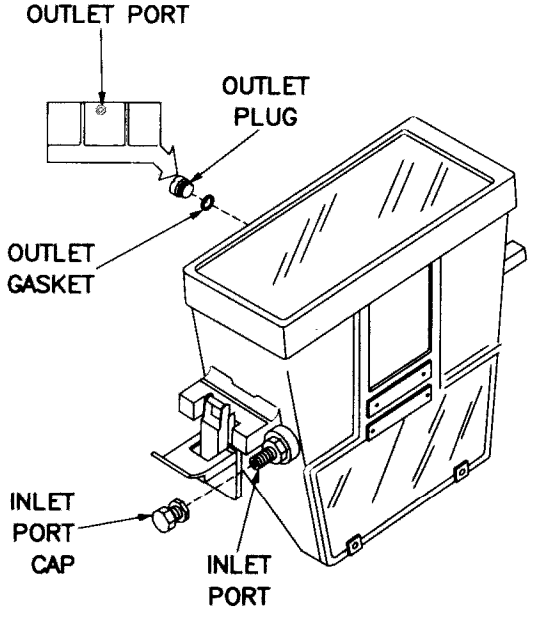


Figure 3-33 M47 Tank Periscope Body Assembly

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 1 psig for 10 seconds.

(4) Leak test for minimum of 5 minutes.

p. Periscope M48 Tank (fig. 3-34).

WARNING

ENSURE THAT VEHICLE MASTER SWITCH IS IN OFF POSITION. THE HIGH VOLTAGE AND LOW AMPERAGE OF THE POWER PACK IS NOT DANGEROUS; HOWEVER, IF THE HIGH VOLTAGE PARTS ARE TAMPERED WITH, AN ELECTRIC SHOCK CAN RESULT.

CAUTION

Do not purge and charge the infrared body assembly in bright light; prolonged exposure may cause damage to the image conversion tube.

NOTE

The periscope body assembly must be separated from the head assembly or removed from vehicle storage for purging and charging procedures. Refer to appendix A for a listing of applicable publications.

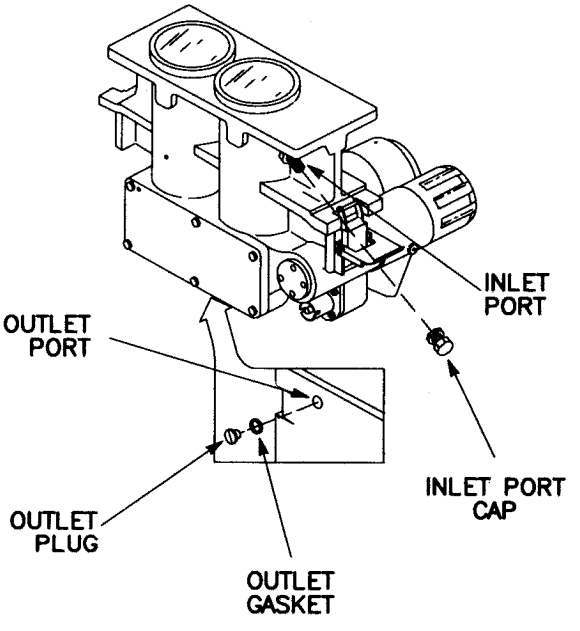


Figure 3-34 M48 Periscope Body Assembly

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 1 psig for 10 seconds.

(4) Leak test for minimum of 5 minutes,

q. Periscope, M901 (fig 3-35).

NOTE

Desiccant must be replaced every time unit is purged. Do not check pressure at any time other than during the pressurizing cycle. Loss of pressure resulting from such attempts will shorten the time between maintenance actions. Refer to appendix A for listing of applicable publications.

(1) Upper Section.

CAUTION

Pressurizing in excess of 10 psig (68.95 kPa) can cause damage to seals.

(a) Remove desiccator by unscrewing container part (hex head) from tank periscope body.

(b) Hold container part upright and remove slotted cap of desiccator by turning counterclockwise using screwdriver and discard old desiccant.

CAUTION

To prevent damage to tank periscope, purge charging lines by blowing pressurized nitrogen through lines. This will remove any contamination in lines.

(c) Close pressure regulator valve (CCW). Open nitrogen tank valve and observe nitrogen tank pressure gauge, indicating tank is pressurized.

(d) Remove dust cap on filler valve. Install hose assembly and loosen self-sealing screws in both upper and lower sections.

(e) Open pressure regulator valve (CW) to purge pressure of 4-5 psig (27.5 to 34.4 kPa) on low pressure gage. Check that nitrogen is being discharged from self-sealing screw holes.

(f) Alternately open and close self-sealing screw holes so one hole is open and another is closed every 15 minutes.

(g) Purge until humidity indicator is blue (approximately 30 minutes).

(h) Close pressure regulator valve (CCW).

(i) Remove desiccator from tank periscope body. Remove slotted cap and install new desiccant.

(j) Lubricate preformed packing on desiccant cap lightly with grease or silicone compound and install cap and desiccator. Torque cap to 20 to 30 in lb. (2 to 3 Nm).

(k) Slowly open pressure regulator valve (CW) and pressurize upper section for 10 seconds to value given below for ambient air temperatures.

(l) Close nitrogen tank supply valve (CW) and remove hose assembly. Install dust cap on filler valve.

Ambient Air Temperature List

Air Temp.	Pressurize to:
Above +110°F (43°C)	4.0 psig
+85°F to +110°F (25°C to 43°C)	3.0 psig
+55°F to +85°F (13°C to 29°C)	2.0 psig
+30°F to +55°F (-1°C to 13°C)	1.0 psig
+5°F to +30°F (-15°C to -l°C)	0.5 psig
Below +5°F (-15°C)	0 psig

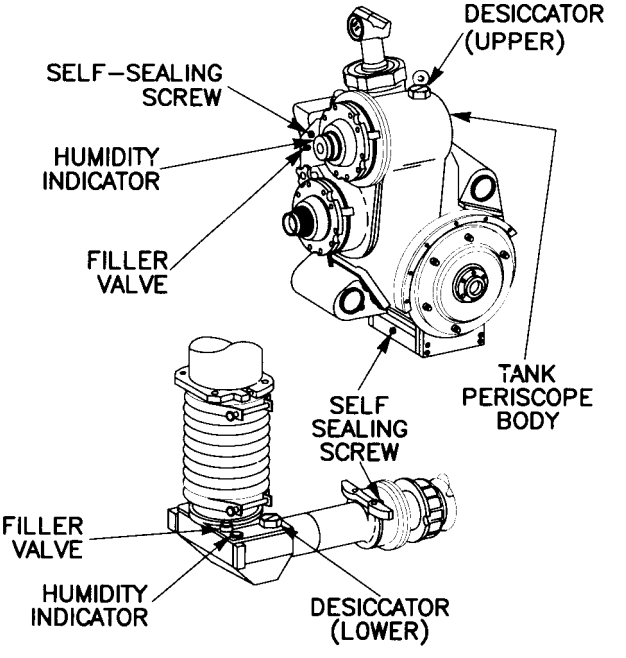


Figure 3-35 M901/M981 Tank Periscope

(2) Lower Section.

CAUTION

Pressurizing assemblies in excess of 10 psig (68.95 kPa) can cause damage to seals.

(a) Remove desiccant cap and old desiccant from desiccant container and install desiccant cap.

(b) Close pressure regulator valve (CCW). Open main valve on nitrogen tank and observe nitrogen tank pressure gage indicating tank is pressurized.

(c) Remove dust cap on filler valve and install valve extension and hose.

(d) Remove l/4-inch upper and lower self-sealing screws.

(e) Open pressure regulator valve (CW) to purge pressure of 4-5 psig (27.5 to 34.4 kPa) on low pressure gage.. Check that nitrogen is being discharged from self-sealing screw holes.

(f) Alternately open and close self-sealing screw holes so one hole is open and other is closed every 15 minutes.

(g) Purge until humidity indicator is blue. During purge, lubricate self-sealing screw preformed packing lightly with silicone compound.

(h) Close pressure regulator (CCW) and reinstall two self-sealing screws.

(i) Remove desiccant cap and insert new desiccant from sealed package immediately into desiccant container.

(j) Lubricate preformed packing on desiccant cap lightly with grease or silicone compound and reinstall cap. Torque cap to 20 to 30 lb in. (2 to 3 Nm).

(k) Slowly open regulator valve (CW) and charge lower section for 10 seconds to value given in ambient air temperature chart in para 3-10.q.

(l) Close nitrogen tank valve. Remove hose and valve extension and install dust cap.

r. Periscope, M981 Tank (fig. 3-35). Refer to para 3-10.q.. for procedures.

3-11. Quadrants.

a. Quadrant, M14 (fig. 3-36).

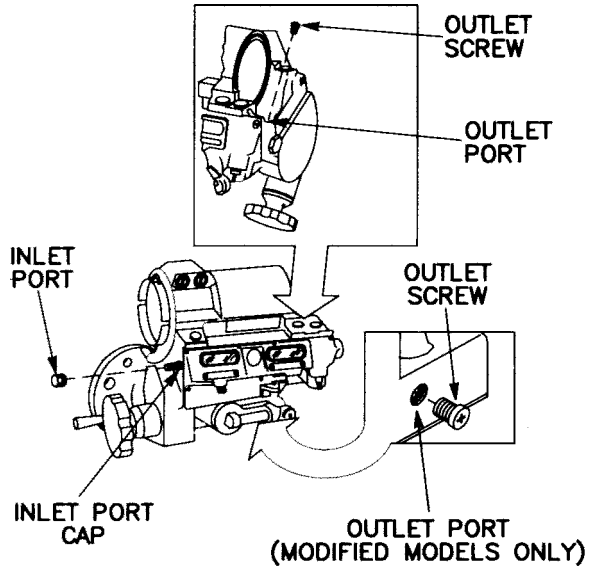


Figure 3-36 M14 and M14A1 Quadrants

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 1 psig for 10 seconds.

(4) Leak test for minimum of 5 minutes.

b. Quadrant, M14A1 (fig. 3-36). Refer to para **3-11.a.** for procedures.

c. Quadrant, M15 (figs. 3-37 and 3-38).

NOTE

For old configuration units, refer to figure 3-37. New configuration units are illustrated in figure 3-38.

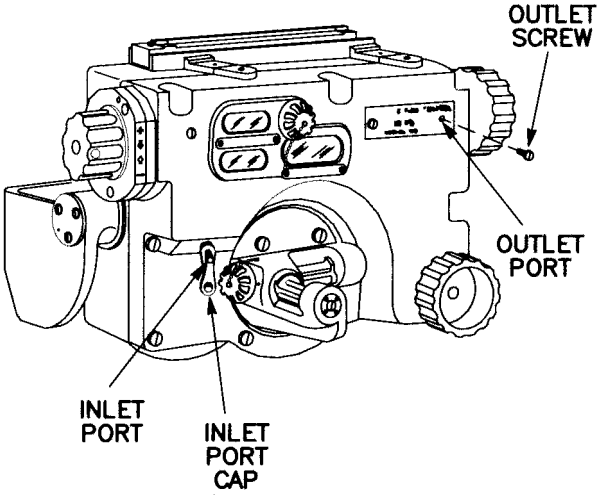


Figure 3-37 M15 Quadrant - Old Configuration

(1) Perform purging procedure para **2-5.d.**

(2) Purge instrument at 5 psig for 5 minutes.

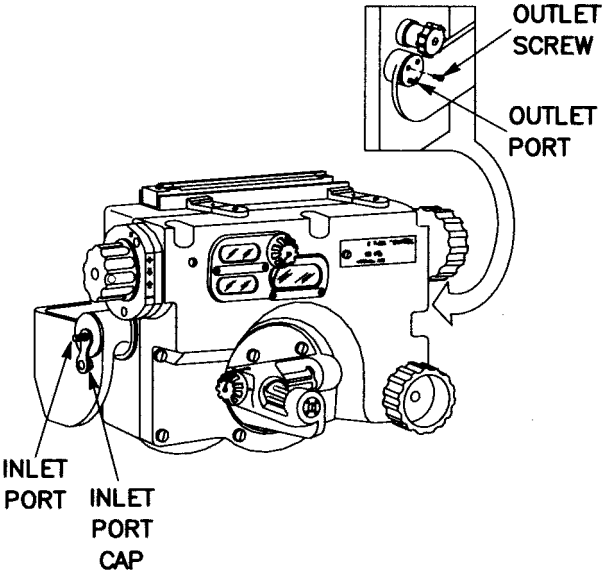


Figure 3-38 M15 Quadrant - New Configuration

d. Quadrant, M17, (fig. 3-39).

NOTE

While purging the quadrant, ensure the pressure relief valve is working by checking for nitrogen gas escaping from the valve.

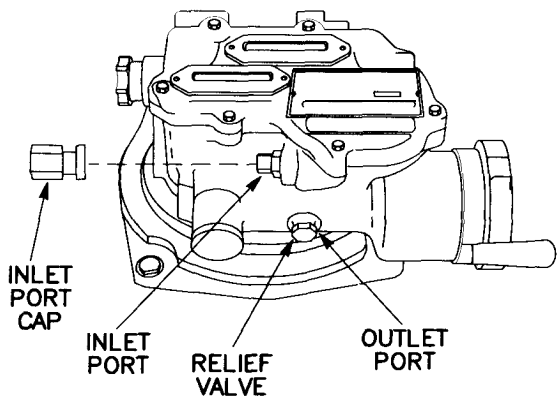


Figure 3-39 M17 and M18 Quadrants

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 7 psig for 5 minutes.

(3) Turn pressure regulator off (CCW) and note when relief valve closes.

(4) If relief valve closes before reaching 1 psig, remove hose assembly and depress valve core until all pressure has escaped.

(5) Charge instrument at 1 psig for 60 seconds.

(6) Leak test for a minimum of 5 minutes.

e. Quadrant, M18 (fig. 3-39). Refer to para **3-11. d.** for procedures.

3-12. RANGEFINDERS.

a. Laser.

(1) Optical Cavity (fig. 3-40).

NOTE

See appendix C for Service Kit containing replacement parts for M1 and M1A1 Tanks.

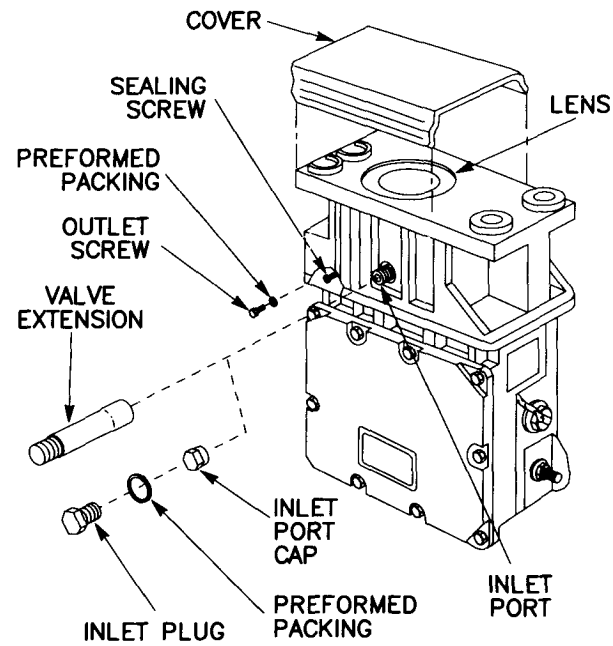


Figure 3-40 Laser Rangefinder Optical Cavity

(a) Remove cover and check lens for cracks and breaks. If damage is evident, do not attempt purging and charging procedure.

(b) Perform purging procedure para **2-5.c.**

(c) Remove inlet plug and preformed packing.

(d) Install valve extension on inlet port.

(e) Attach hose assembly to valve extension.

(f) Loosen, but do not remove sealing screw.

(g) Purge instrument at 5 psig for 5 minutes.

(h) While purging, leak test lens area.

(i) Remove hose assembly and valve extension from inlet port.

(j) Reassemble by tightening sealing screw and installing cover.

(k) Install inlet port cap. Install inlet plug with preformed packing attached and outlet screw with preformed packing attached.

(2) Electronic Cavity (fig. 3-41).

NOTE

See appendix C for Service Kit containing replacement parts for M1 and M1Al Tanks.

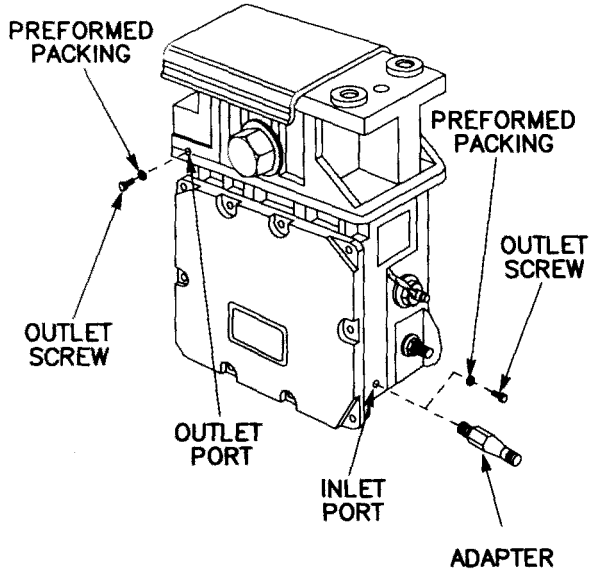


Figure 3-41 Laser Rangefinder Electronics Cavity

(a) Remove inlet screw with preformed packing attached.

(b) Remove outlet screw with preformed packing attached.

(c) Perform purging procedure para **2-5.d.**

(d) Purge instrument at 5 psig for 5 minutes.

b. AN/VVG-2 Laser (fig. 3-42).

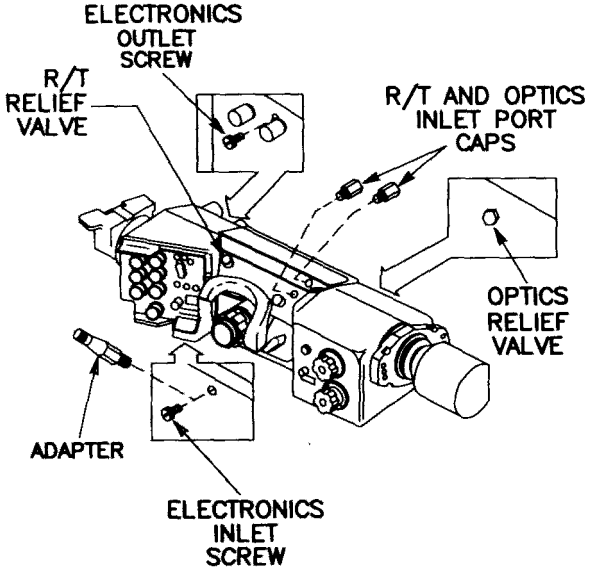


Figure 3-42 AN/VVG-2 Receiver - Transmitter

(1) Electronics Compartment.

(a) Perform purging procedure para **2-5.d.**

(b) Purge electronics compartment at 8 psig for 5 minutes.

(2) Receiver-Transmitter (R/T) Compartment. Refer to para **4-12.b.(1)** for procedures.

NOTE

Ensure nitrogen is escaping from the relief valve. If not, repair as necessary.

(3) Optics Compartment. Refer to para **3-12.b.(1)** for procedures.

(4) Laser Electronics Unit (fig. 3-43).

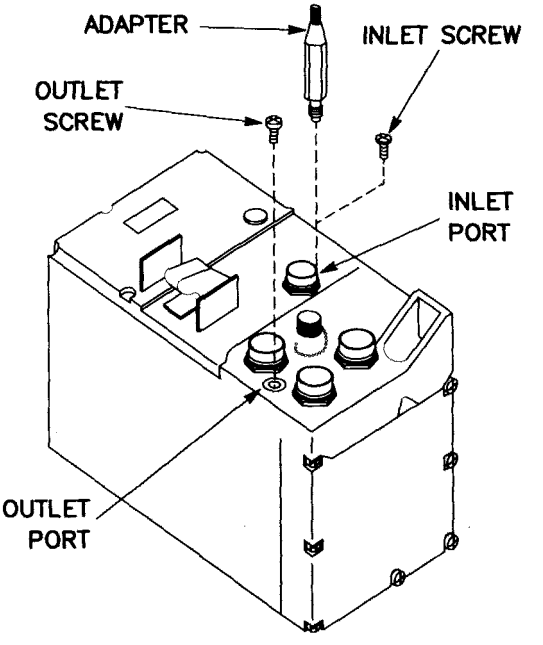


Figure 3-43 AN/VVG-2 Electronics Unit

(a) Perform purging procedure para **2-5.d.**

(b) Purge instrument at 8 psig for 5 minutes.

c. M17A1, M17B1C, and M17C, (figs. 3-44 through 3-46).

NOTE

Rangefinder end housings are purged and charged on a yearly basis; however, they must be visually inspected every 90 days.

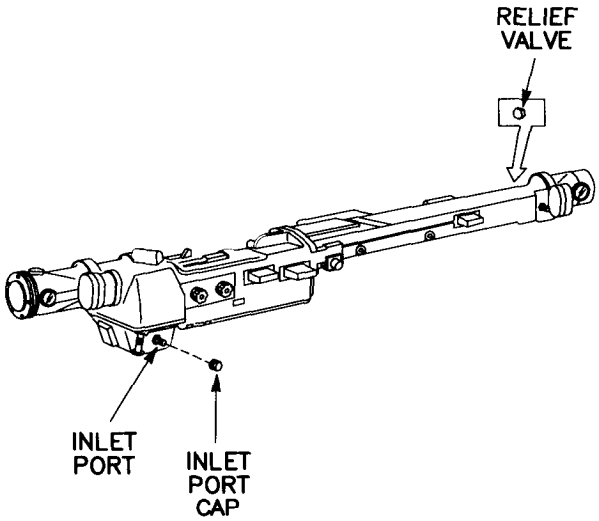


Figure 3-44 M17A1 Body Assembly

(1) Body Assembly (fig. 3-44)

(a) Perform purging and charging procedure para **2-5.a.**

(b) Purge instrument at 8 psig for 30 minutes.

(c) Ensure relief valve closes at 5 psig.

(d) Leak test for a minimum of 5 minutes.

(2) End Housing Assemblies (figs. 3-45 and 3-46).

NOTE

Blister and splatter shields must be removed for end housing assembly purging and charging procedures.

Some end housings have a relief valve instead of an outlet screw. When there is a relief valve, disregard the procedure that removes the outlet screw.

Purging pressure for end housings with relief valves must be increased to 8 psig to open the relief valve and keep it open during purging. Charging pressure for housings with relief valves is the 5 psig at which the relief valve seats.

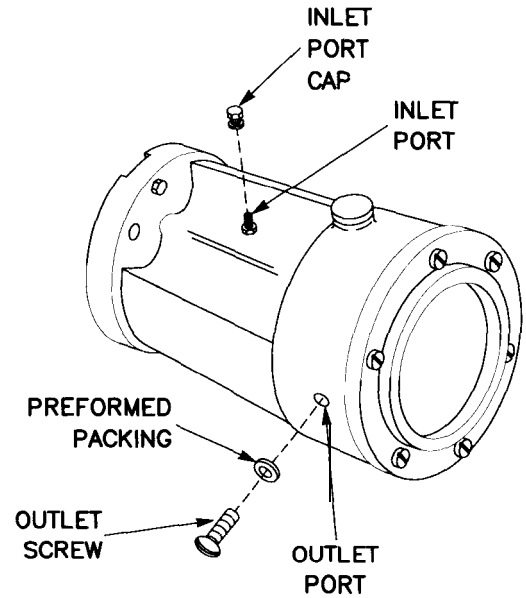


Figure 3-45 M17A1 and M17C End Assembly

(a) Remove inlet port cap and outlet screw with preformed packing attached.

(b) Perform purging and charging procedure para **2-5.b.**

(c) Purge instrument at 5 psig for 5 minutes.

(d) Charge instrument at 1 psig for 10 seconds.

(e) Leak test for minimum of 5 minutes.

NOTE

The end assembly for the M17BlC (fig. 3-46) is purged and charged in the same manner as the M17A1 and M17C with the exception of removing two outlet screws instead of one. Refer to para **3-12.c.(2)** for procedures.

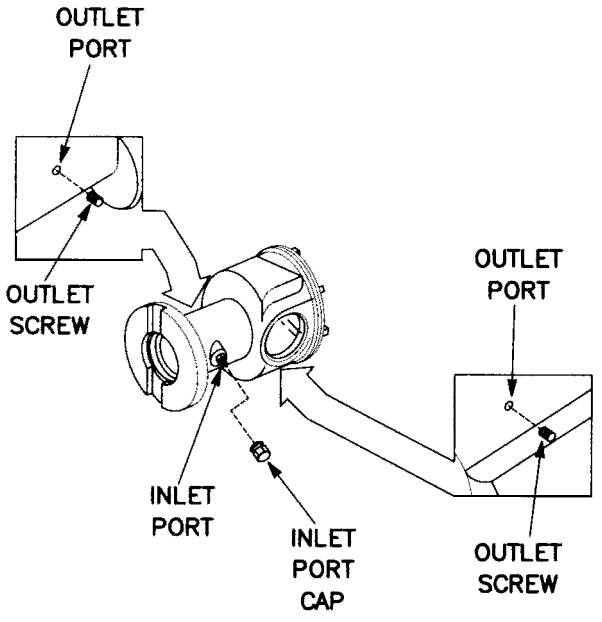


Figure 3-46 M17B1C End Assembly

3-13. SIGHTS.

a. BFV TOW/TOW2 SUBSYSTEM (M2, M3, M2A1, M3A1, M2A2, AND M3A2 (figs. 3-47 through 3- 52).

(1) Backup Sight, PN 12316793, (fig. 3-47).

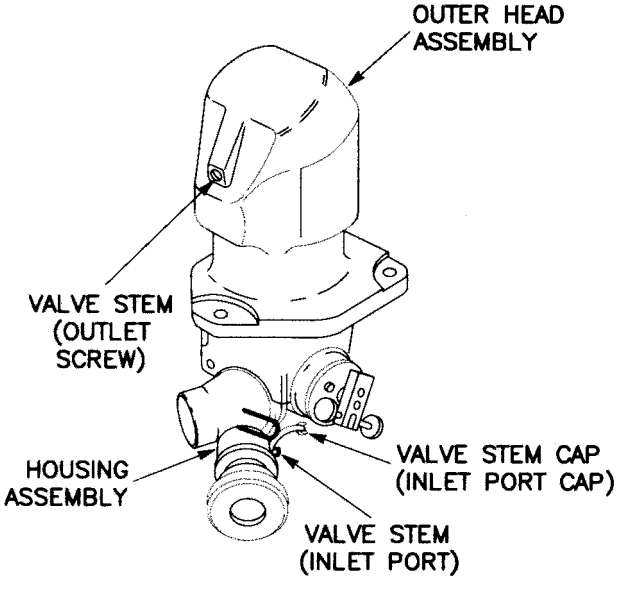


Figure 3-47 Backup Sight, PN 12316793

NOTE

The backup sight must be moved to gunner's position and the commander's hatch cover opened and secured before purging and charging. Refer to TM 9–2350-252-10-2.

(a) Perform purging and charging procedure para **2-5.b.**

(b) Open valve stem (outlet screw) on outer head assembly onlv three turns for purge procedure.

(c) Purge instrument at 5 psig for 5 minutes.

(d) Close valve stem (outlet screw) on outer head assembly.

(e) Charge instrument at 5 psig.

(f) Leak test for minimum of 5 minutes.

(g) Close hatch and secure commander's hatch cover.

(2) Integrated Sight Unit (figs. 3-48 and 3-49).

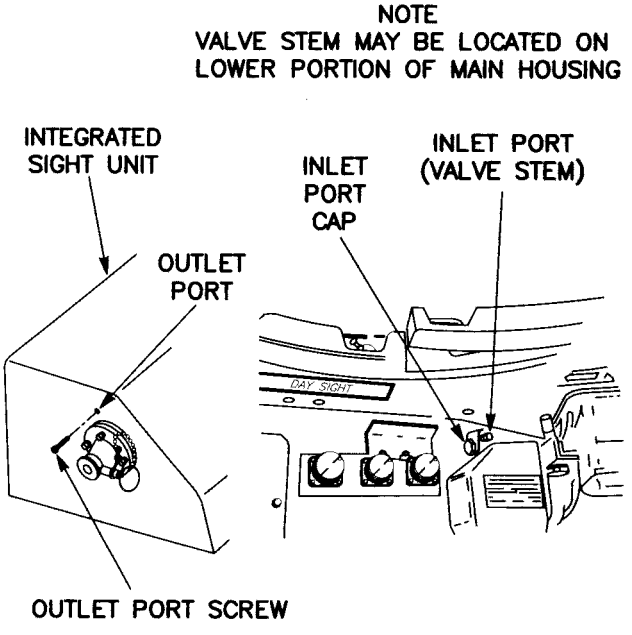


Figure 3-48 Integrated Sight Unit

CAUTION

ISU seals could rupture if **pressure is too high. Never let low pressure gage get higher than 4 psig.**

(a) Open and secure gunner's hatch cover. (Refer to TM 9-2350-252-l0-2 for M2, M3, M2A1, and M3A1 or TM 9-2350-282-l0-2 for M2A2 and M3A2.)

(b) For M2, M3, M2A1, and M3A1 only, open sight shield assembly per TM 9-2350-252-20–2-3.

(c) For M2A2 and M3A2 only, remove ballistic sight shield assembly per TM 9-2350-284-20-2-3.

(d) Perform purging and charging procedure para **2-5.b.**

(e) Remove outlet port screw and discard.

(f) Purge instrument at 4 psig for 10 minutes or until all visible traces of moisture are gone.

(g) Apply thin coat of lubricant (item 3, appx B) to o-ring of replacement outlet port screw and install.

(h) Torque outlet port screw to 24-28 in-lb (28-32 cm kg).

(i) Charge instrument at 4 psig for 10 minutes.

(j) Leak test instrument for minimum of 10 minutes. If leak is detected, repair per table 3-1.

Table 3-1 Leak Test, Integrated Sight Unit

Part leak detected from	Manual referred for M2, M3, M2A1, and M3A1 vehicles	Manual referred for M2A2 and M3A2 vehicles
lamp window collar assembly	TM9-2350-252-20-2-3	TM9-2350-284-20-2-3
lampholder assembly cover	TM9-2350-252-20-2-3	—
valve assembly	TM9-2350-252-20-2-3	TM9-2350-284-20-2-3
all other parts of ISU	TM9-1425-474-34-1 (M2/M3) TM9-1425-453-34-1 (M2A1/M3A1)	TM9-1425-453-34-1

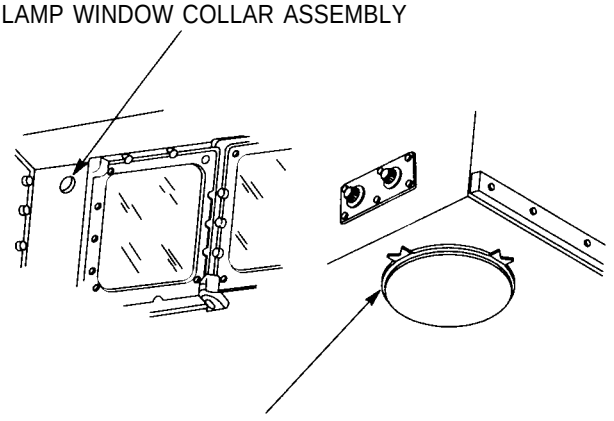


Figure 3-49 Lamp Assembly

(k) For M2A1, M3A1, M2A2, and M3A2 only, reduce pressure from 4 psig to approximately 1.5 psig.

(l) For M2, M3, M2A1, and M3A1 only, close sight shield assembly per TM 9-2350-252-20-2-3.

(m) For M2A2 and M3A2 only, install ballistic sight shield assembly per TM 9-2350-284-20-2-3.

(n) Close and secure gunner's hatch cover per TM 9-2350-252-10-2 (for M2, M3, M2A1, and M3A1 only) or TM 9-2350-284-10-2 (for M2A2 and M3A2 only).

(3) Commander's Relay Assembly (figs. 3-50 and 3-51).

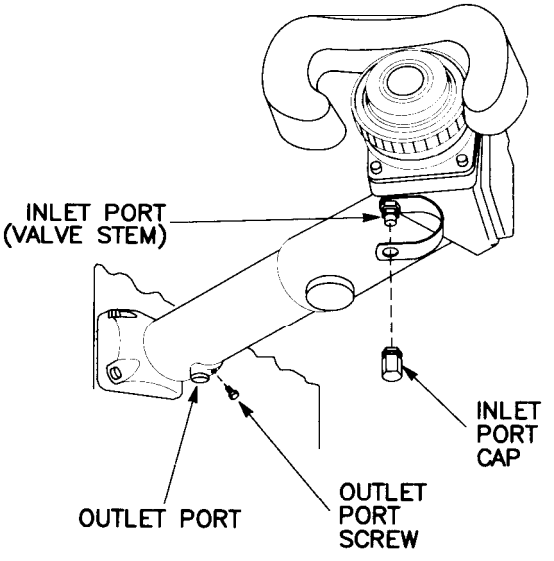


Figure 3-50 Commander's Relay Assembly

CAUTION

Commander's Relay Assembly seals could rupture if pressure is too high. Never let low pressure gage get higher than 4 psig.

(a) Open and secure gunner's hatch cover per TM 9-2350-252-10-2 (for M2, M3, M2A1, and M3A1 only) or TM 9-2350-284-10-2 (for M2A2 and M3A2 only).

NOTE

Shim(s) may or may not be present between night sight cover support and turret.

(b) For M2A2 and M3A2 only, remove two screws, washers, shim(s), and night sight cover actuator handle/support.

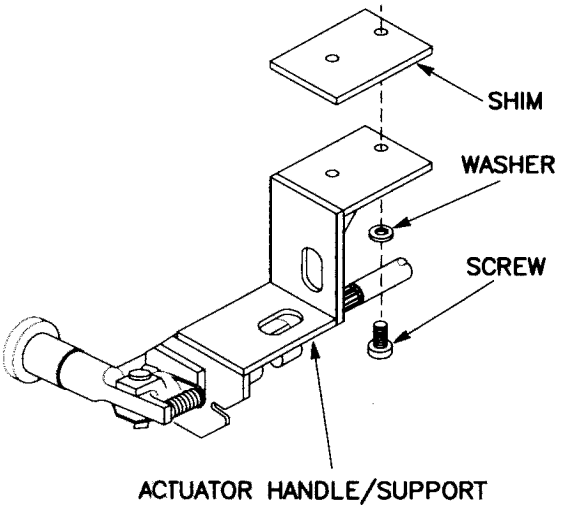


Figure 3-51 Night Sight Cover Actuator Handle/Support

(c) Perform purging and charging procedure para **2-5.b.**

(d) Remove outlet port screw and discard.

(e) Purge instrument at 4 psig for 3-5 minutes or until all visible traces of moisture are gone.

(f) Apply thin coat of lubricant (item 3, appx B) to o-rings of replacement outlet port screw and install.

(g) Torque outlet port screw to 10-12 in-lb (12-14 cm kg).

(h) Charge instrument at 4 psig for 10 minutes.

(i) Leak test instrument for minimum of l0 minutes. If leak is detected, repair per table 3-2.

Table 3-2 Leak Test, Commander's Relay Assembly

Part leak detected from	Manual referred for M2, M3, M2A1, and M3A1 vehicles	Manual referred for M2A2 and M3A2 vehicles
valve assembly	TM9-2350-252-20-2-3	TM9-2350-284-20-2-3
commander's eyepiece assembly	TM9-1425-474-34-1 (M2/M3) TM9-1425-453-34-1 (M2A1/ M3A1)	TM9-1425-453-34-1
all other parts of commander's relay asembly	DMWR 9-1240-394 (M2, M3) DMWR 9-1240-399-1 (M2A1, M3A1)	DMWR 9-1240-399-1

(j) For M2A2 and M3A2 only, apply primer item 4, appx B) and sealing compound (item 5, appx B) to threads of two screws. Position shim(s), night sight cover actuator handle/support and install two washers and screws.

(k) Close and secure gunner's hatch cover per TM 9-2350-252-10-2 (for M2, M3, M2A1, and M3A1 only) or TM 9-2350-282-10-2 (for M2A2 and M3A2 only).

b. 8635466 Infinity Sight (fig. 3-52).

NOTE

Infinity sights 8635466 are identified as early and late production models. The procedures for purging and charging apply to later production models only.

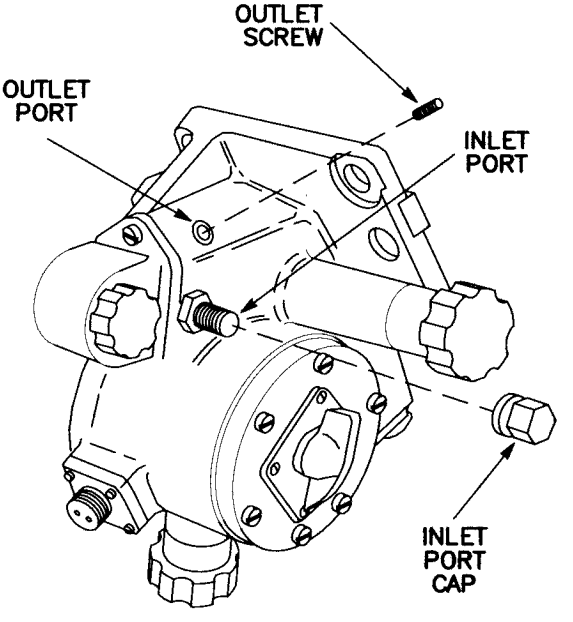


Figure 3-52 8635466 Infinity Sight

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 1 psig for 10 seconds.

(4) Leak test for a minimum of 5 minutes.

c. M44C Infinity Sight (fig. 3-53).

NOTE

M44C sights are equipped with two types of inlet ports. Some sights require the use of an adapter. If this is the case, use purging procedure para **3-5.e.)**

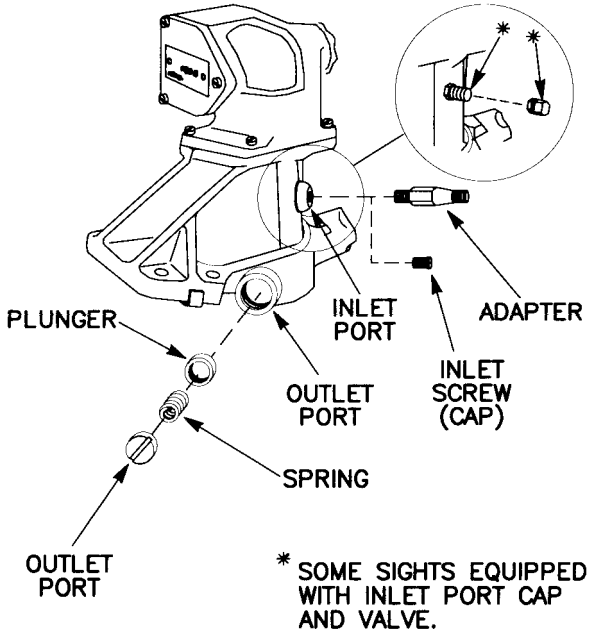


Figure 3-53 M44C Infinity Sight

(1) Remove outlet plug, spring, and plunger.

(2) Perform purging procedure para **2-5.c**

(3) Purge instrument at 5 psig for 5 minutes.

d. M61 Computing Sight (fig . 3–54).

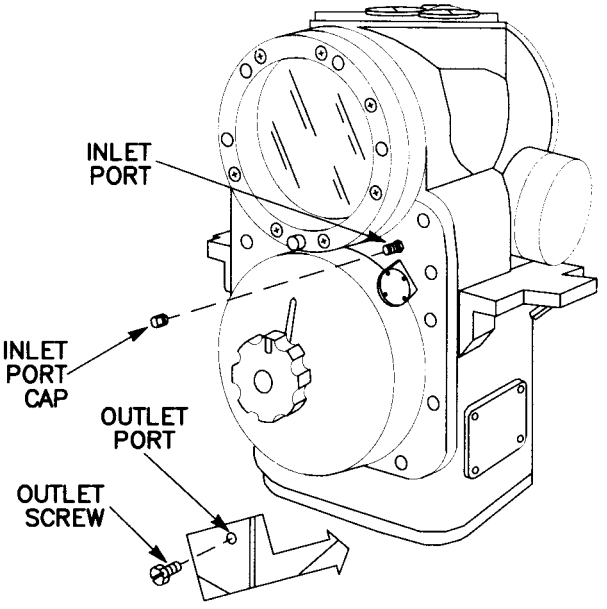


Figure 3-54 M61 Computing Sight

(1) Perform purging procedure para **2.5.b**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 5 psig for 5 minutes.

(4) Leak test for a minimum of 10 minutes.

e. Commander's Extension, PN 12285300 (fig. 3-55).

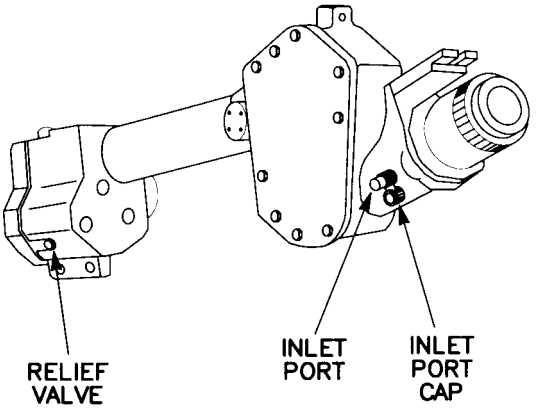


Figure 3-55 Commander's Extension PN 12285300

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 8 psig for 5 minutes.

(3) Ensure relief valve closes at 5 psig.

(4) Leak test for a minimum of 5 minutes.

f. Control Unit, Image (fig. 3-56).

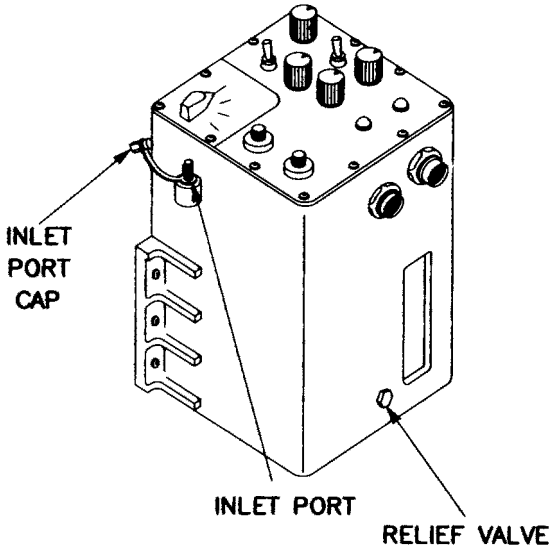


Figure 3-56 Image Control Unit

(1) Loosen, but do not remove setscrews in the contrast knob, reticle knob, sensitivity knob, symbols knob, unit test pattern knob, and two boresight knobs from the front panel.

(2) Remove all knobs from the unit.

(3) Perform purging and charging procedure para **2-5.a.**

(4) Purge instrument at 10 psig for 3 minutes.

(5) Ensure relief valve closes at 5 psig.

(6) Leak test all sealed joints, screws, control shafts, purging valve, and relief valve for minimum of 15 minutes.

(7) Install knobs on front panel.

g. Gunner's Auxiliary Sight, PN 12278900 (fig. 3-57).

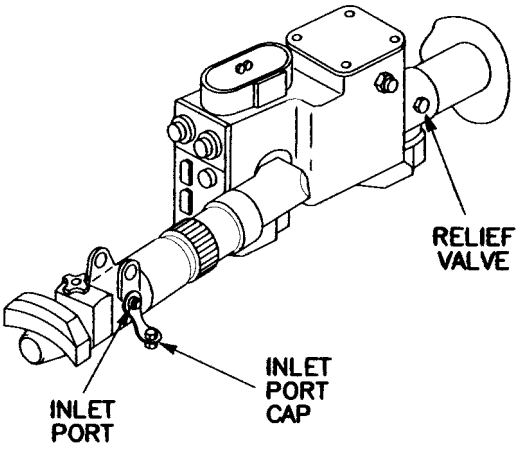


Figure 3-57 Gunner's Auxiliary Sight PN 12278900

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 8 psig for 10 minutes.

(3) Ensure relief valve closes at 5 psig.

(4) Leak test for a minimum of 5 minutes.

h. Gunner's Primary Sight, PN 12282140, PN 12549761-2, PN 12549761-3, and PN 9377279-2 (fig. 3-58).

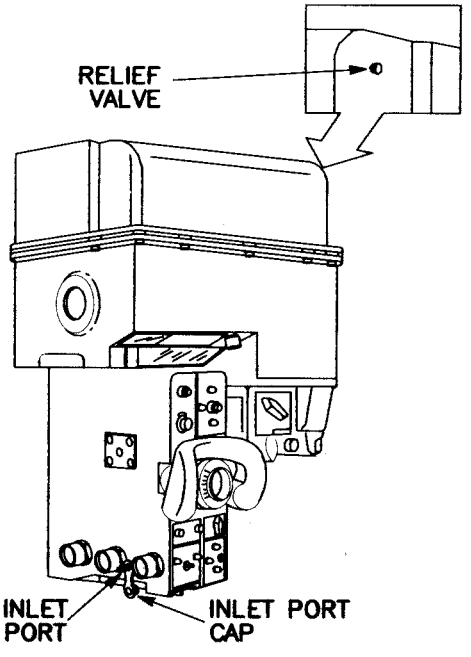


Figure 3-58 Gunner's Primary Sight PN 12282140, PN 12549761-2, PN 12549761-3, PN 9377279-2

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 6 psig for 5 minutes.

(3) Ensure relief valve closes at 5 psig.

(4) Leak test for minimum of 5 minutes.

i. **Tank Thermal Sight,**

(1) Commander's Display (fig. 3-59)

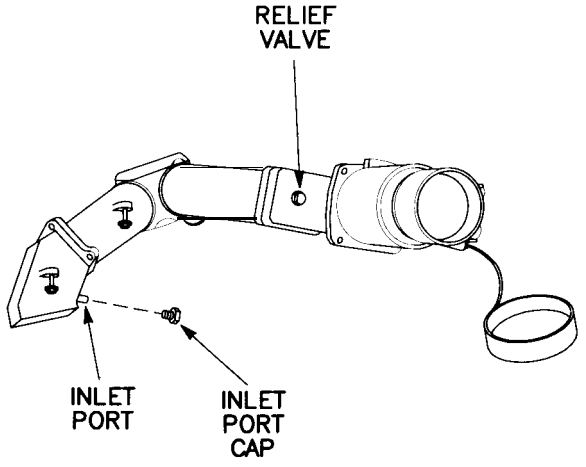


Figure 3–59 Commander's Display

(a) Perform purging and charging procedure para **2-5.a.**

(b) Purge instrument at 8 psig for 5 minutes.

(c) Ensure relief valve closes at 5 psig.

(d) Leak test for minimum of 5 minutes.

(2) Gunner's Display (fig. 3-60). Refer to para **3-13.i.(1)** for procedures.

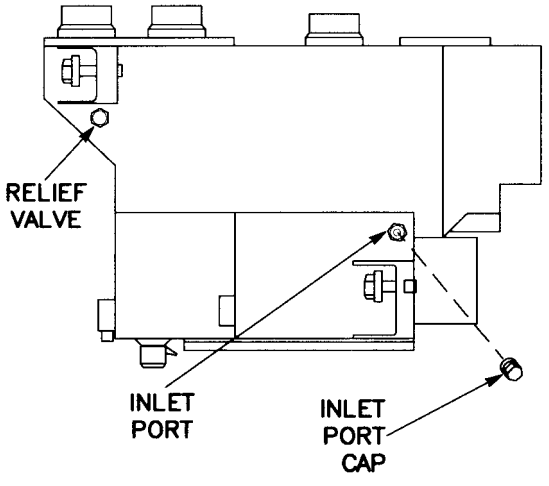


Figure 3-60 Gunner's Display

(3) Head Assembly (fig. 3-61). Refer to para **3-13.i.(1)** for procedures.

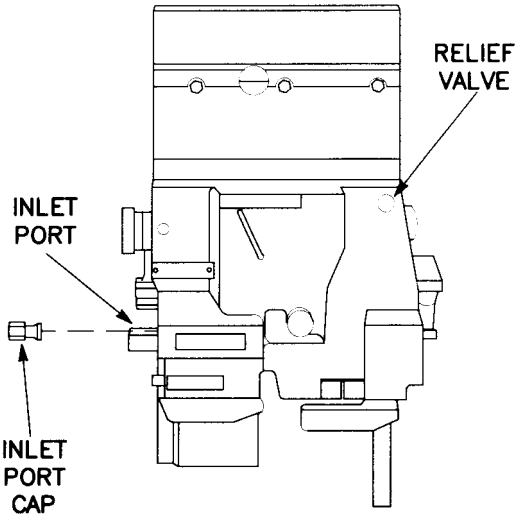


Figure 3-61 Head Assembly

(4) Power Converter (fig. 3-62). Refer to para **3-13.i.(1)** for procedures.

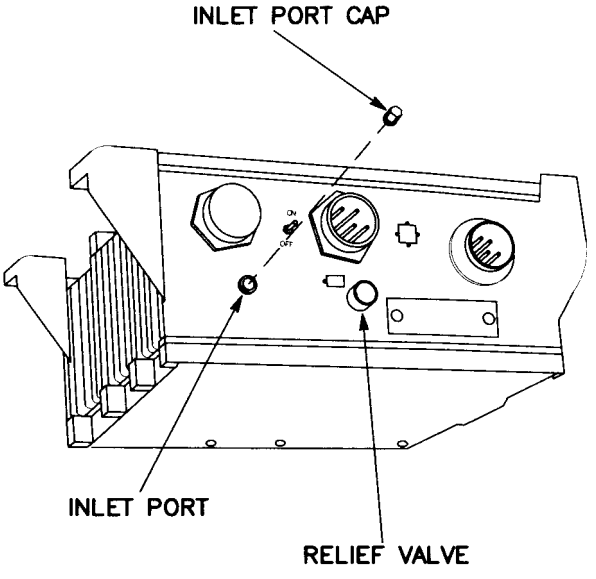


Figure 3-62 Power Converter

j. Weapon Sight, PN 12279200 (fig. 3-63).

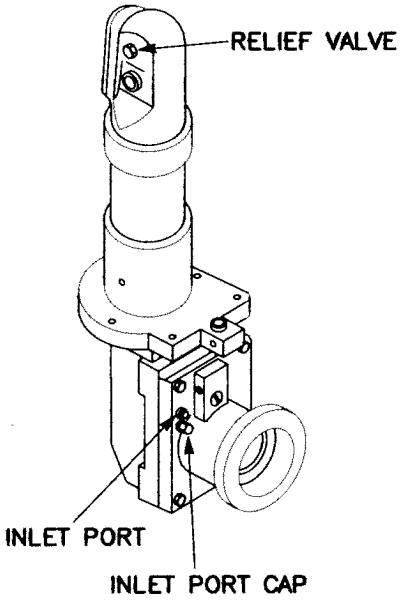


Figure 3-63 Weapon Sight, PN 12279200

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 7 psig for 5 minutes.

(3) Ensure relief valve closes at 5 psig.

(4) Leak test for minimum of 5 minutes.

3-14. Telescopes, Articulated.

a. Articulated Telescope, M105D (fig. 3-64).

NOTE

The telescope must be removed from the installed position for purging and charging procedures. Refer to appendix A for a listing of applicable publications.

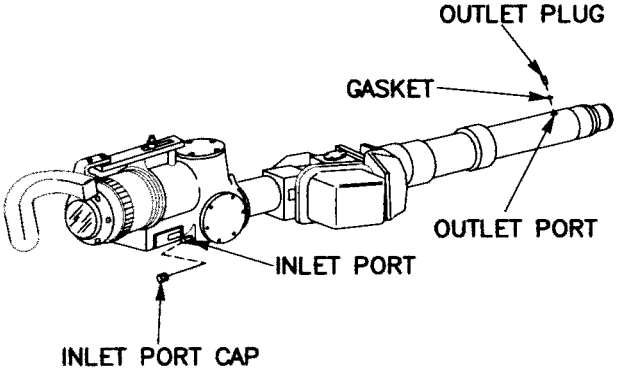


Figure 3-64 M105D Series Telescope

(1) Remove inlet port cap and outlet plug with gasket attached.

(2) Perform purging and charging procedure para **2-5.b.**

(3) Purge instrument at 5 psig for 10 minutes.

(4) Charge instrument at 1 psig for 40 seconds.

(5) Leak test for minimum of 5 minutes.

b. Articulated Telescope, M105F (fig. 3-64). Refer to para **3-14.a.** for procedures.

c. Articulated Telescope, M127 (fig. 3-65).

(1) Eyepiece Assembly.

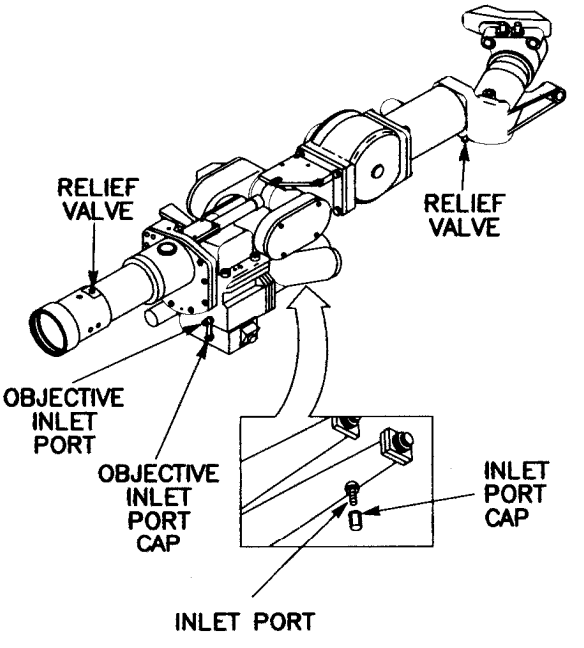


Figure 3-65 M127 Articulated Telescope

(a) Perform purging and charging procedure para **2-5.a.**

(b) Purge instrument at 8 psig for 10 minutes.

(c) Ensure relief valves close at 5 psig.

(d) Leak test for minimum of 5 minutes.

(2) Objective Assembly. Refer to para **3-14.c.(1)** for procedures.

d. Articulated Telescope, M127A1 (fig. 3-61). Refer to para **3-14.a.** for procedures.

3-15. Telescopes, Elbow.

a. Elbow Telescope, M114 (fig. 3-66).

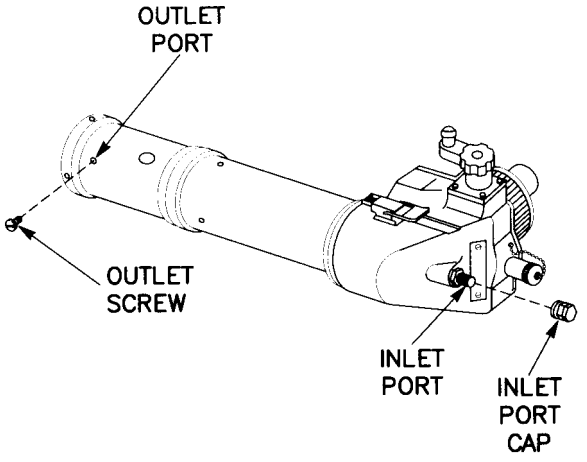


Figure 3-66 M114 Elbow Telescope

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 5 minutes.

(3) Charge instrument at 1 psig for 10 seconds.

(4) Leak test for minimum of 5 minutes.

b. Elbow Telescope, M114A1 (fig. 3-66). Refer to para **3-15.a.** for procedures.

c. Elbow Telescope, M16 and M116 Series (fig. 3-69). Refer to para **3-15.f.** for procedures.

d. Elbow Telescope, M118 Series (fig. 3-67).

NOTE

The telescope must be removed from the installed position for purging and charging procedures. Refer to appendix A for a listing of applicable end item manuals.

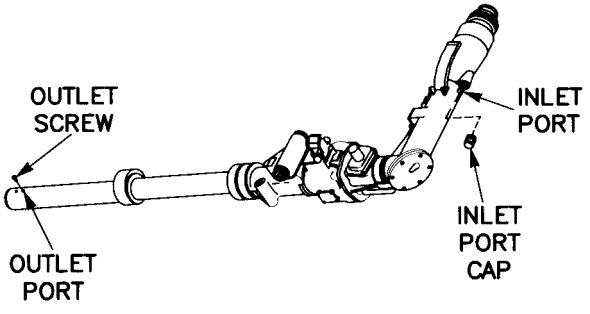


Figure 3-67 *M118A2/M118A3 Elbow Telescope*

(1) Perform purging and charging procedure para **2-5.b.**

(2) Purge instrument at 5 psig for 15 minutes.

(3) Charge instrument at 1 psig for 1 minute.

(4) Leak test for minimum of 5 minutes.

e. Elbow Telescope, M138 (fig. 3-68).

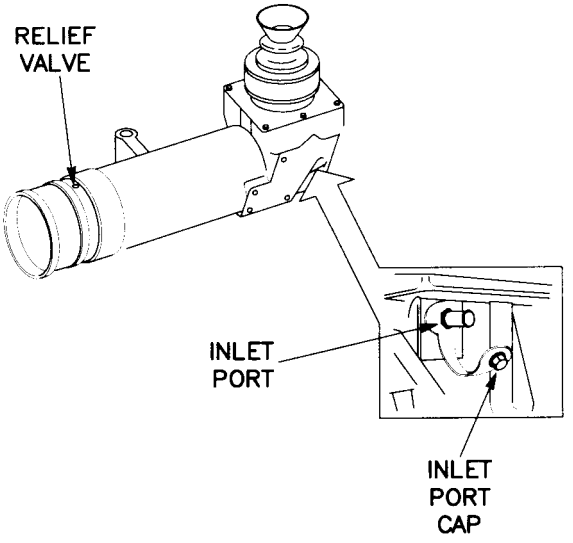


Figure 3-68 M138 Elbow Telescope

(1) Perform purging and charging procedure para **2-5.a.**

(2) Purge instrument at 8 psig for 5 minutes.

(3) Ensure relief valve closes at 5 psig.

(4) Leak test for minimum of 5 minutes.

f. Elbow Telescope, M139 (fig. 3-69).

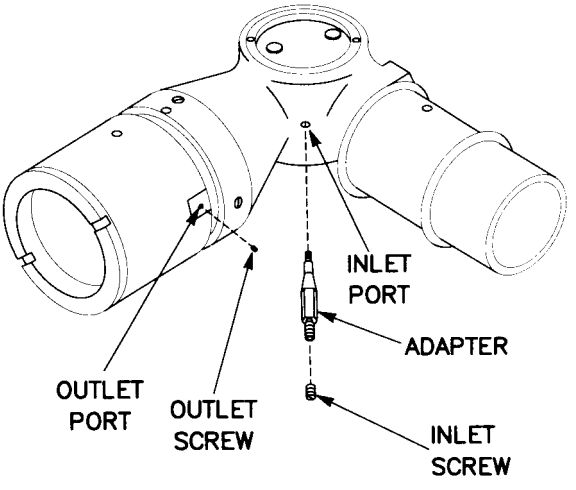


Figure 3-69 M139 Elbow Telescope

(1) Perform purging procedure para **2-5.d.**

(2) Purge instrument at 5 psig for 5 minutes.

3-16. Telescopes, Panoramic.

a. Panoramic Telescope, M12A7Q (fig. 3-70).

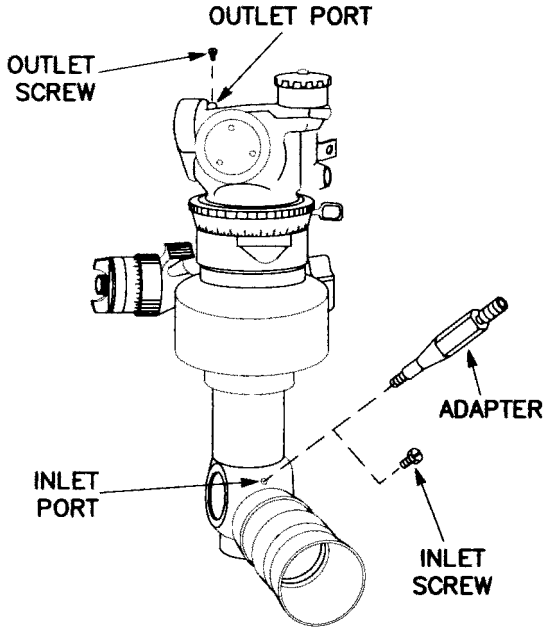


Figure 3-70 M12A7Q Panoramic Telescope

(1) Perform purging procedure **2-5.d.**

(2) Purge instrument at 5 psig for 5 minutes.

b. Panoramic Telescope, M12A7S (fig. 3-70). Refer to para **3-16.a.** for procedures.

c. Panoramic Telescope, M113 and M113A1 (fig. 3-71).

(1) Counter Box Assembly.

(a) Remove counter box inlet port cap and outlet port cap.

(b) Perform purging procedure para **2-5.c.**

(c) Purge instrument at 5 psig for 5 minutes.

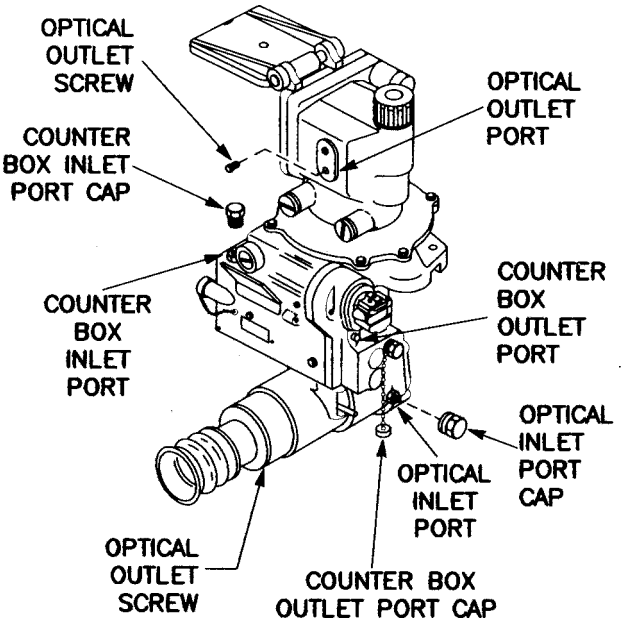


Figure 3-71 M113 and M113A1 Panoramic Telescope

(2) Optical Assembly (fig. 3-71).

(a) Remove optical inlet port cap and optical outlet screw.

(b) Perform purging and charging procedure para **2-5.b.**

(c) Purge instrument at 5 psig for 5 minutes.

(d) Charge instrument at 3 psig for 10 seconds.

(e) Leak test for minimum of 5 minutes.

d. Panoramic Telescope, M115 (fig. 3-72).

(1) Counter Box Assembly.

(a) Remove counter box inlet port cap and outlet port cap.

(b) Perform purging procedure para **2-5.c.**

(c) Purge instrument at 5 psig for 5 minutes.

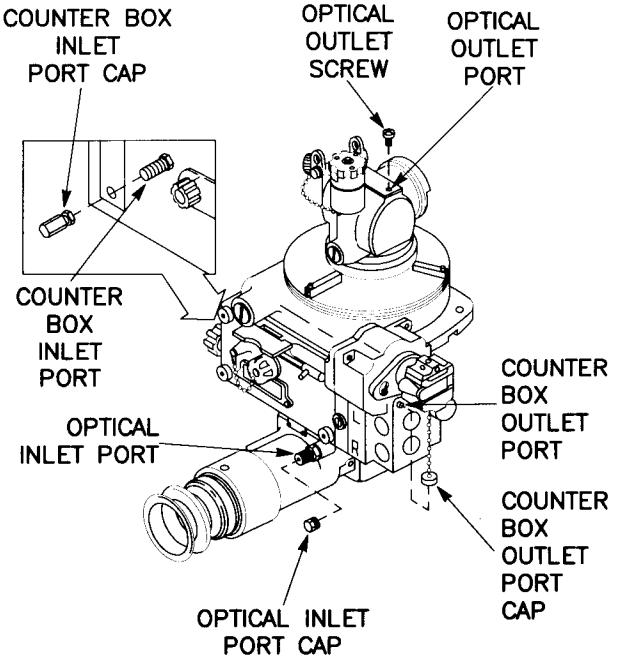


Figure 3-72 M115 Panoramic Telescope

(2) Optical Assembly.

(a) Remove optical system inlet port cap and outlet screw.

(b) Perform purging and charging procedure para **2-5.b.**

(c) Purge instrument at 5 psig for 5 minutes.

(d) Charge instrument at 1 psig for 10 seconds.

(e) Leak test for minimum of 5 minutes.

e. Panoramic Telescope, M117/M117A1 (fig. 3-73).

(1) Counter Box.

(a) Remove counter box inlet port cap and outlet port cap.

(b) Perform purging procedure para **2-5.c.**

(c) Purge instrument at 5 psig for 5 minutes.

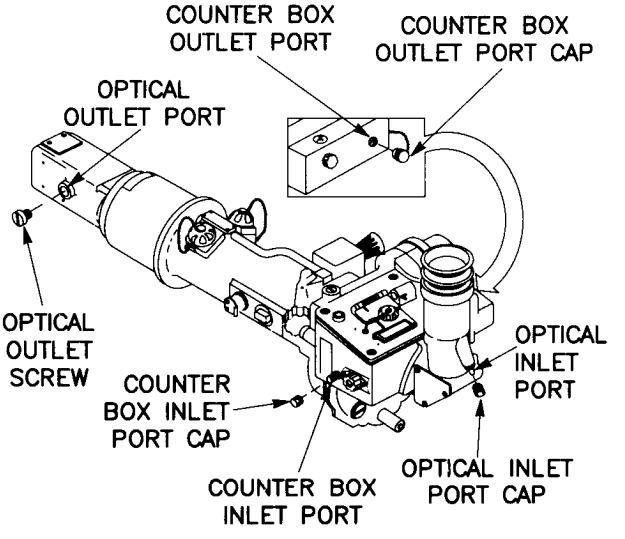


Figure 3-73 M117/M117A2 Panoramic Telescope

(2) Optical System.

(a) Remove optical system inlet port cap and outlet screw.

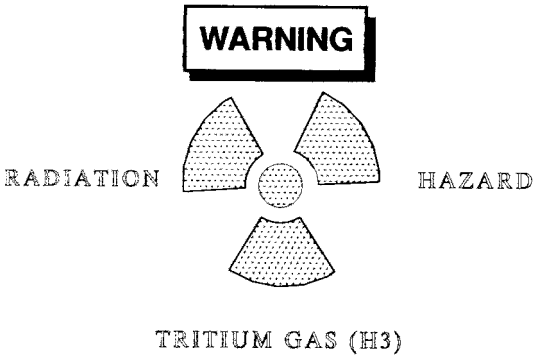
(b) Perform purging and charging procedure para **2-5.b.**

(c) Purge instrument at 5 psig for 5 minutes.

(d) Charge instrument at 1 psig for 10 seconds.

(e) Leak test for minimum of 5 minutes.

f. Panoramic Telescope M137 (fig. 3-74).



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Counter Box.

(a) Remove counter box inlet port cap.

(b) Perform purging and charging procedure para **2-5.a.**

(c) Purge instrument at 7 psig for 5 minutes.

(d) Ensure relief valve closes at 5 psig.

(e) Leak test for minimum of 5 minutes.

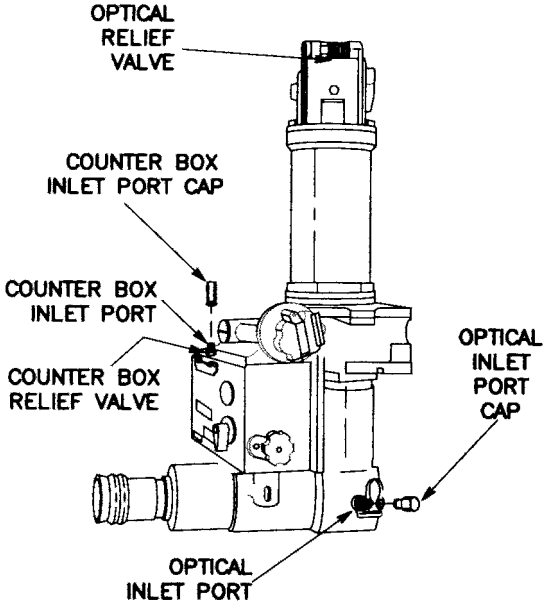


Figure 3-74 M137 Panoramic Telescope

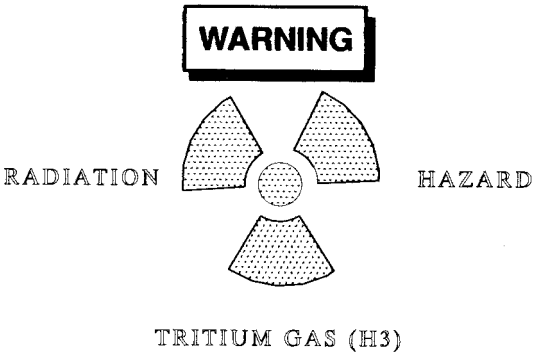
(2) Optical Assembly.

(a) Remove optical inlet port cap.

(b) Perform purging procedure para **2-5.a**

(c) Purge instrument at 7 psig for 5 minutes.

g. Panoramic Telescope, M137A1 (fig. 3-75).



HANDLE WITH CARE. IN THE EVENT THE RADIOLUMINOUS SOURCE IS BROKEN, CRACKED, OR SUDDENLY LOSES ILLUMINATION, DO NOT ATTEMPT TO REPAIR. IMMEDIATELY DOUBLE WRAP INSTRUMENT IN PLASTIC AND NOTIFY THE LOCAL RADIATION PROTECTION OFFICER (RPO).

(1) Counter Box.

(a) Perform purging and charging procedure para **2-5.a.**

(b) Relief valve should open between 3-10 psig.

(c) Purge instrument at 7 psig for 5 minutes.

(d) Ensure relief valve closes between 1-5 psig.

(e) Leak test for minimum of 5 minutes.

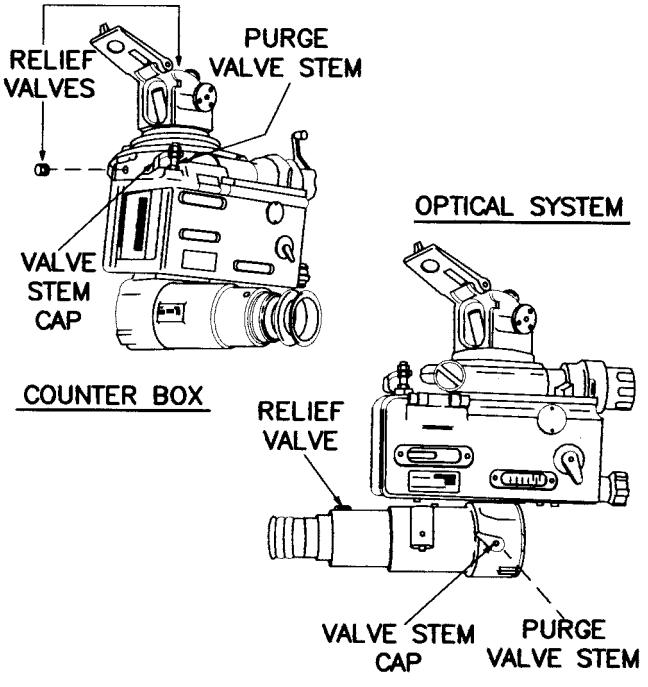


Figure 3-75 M137A1 Panoramic Telescope

(2) Optical System.

(a) Perform purging and charging procedure para **2-5.a.**

(b) Relief valve should open between 3-10 psig.

(c) Purge instrument at 7 psig for 5 minutes.

(d) Ensure relief valve closes between 1-5 psig.

(e) Leak test for minimum of 5 minutes.

h. Panoramic Telescope, M901A1 (fig. 3–76).

NOTE

Purge panoramic telescope when the internal optical surfaces are fogged over. Replace the desiccant and two preformed packings every time the unit is purged. Do not attempt to check the pressure in the panoramic telescope at any other time than during the pressurization cycle. Loss of pressure resulting from such attempts will shorten the time between maintenance actions.

(1) Remove desiccator by unscrewing container part (hex head) from telescope body.

(2) Hold container part upright and remove slotted cap of desiccator.

(3) Discard old desiccant. Discard two preformed packings from desiccator. Install desiccator.

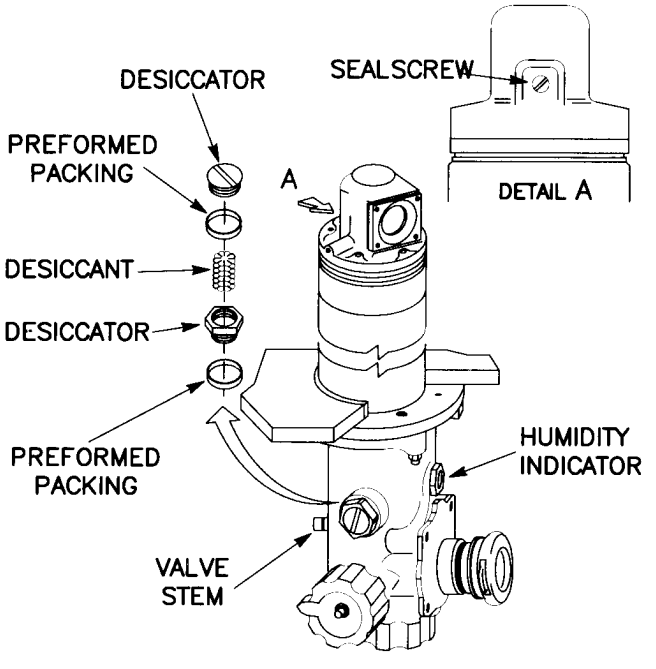


Figure 3-76 Panoramic Telescope, M901A1

(4) Close nitrogen tank valve and pressure regulator valve.

CAUTION

Contamination can damage the telescope. Blow pressurized nitrogen through the charging lines to remove contamination.

(5) Open tank supply valve and observe high pressure gauge indicating that tank is pressurized.

(6) Remove lockwire and cap from valve stem.

CAUTION

The sealscrew is a captive screw and must not be removed. Removal of the screw damages equipment.

(7) Install hose assembly on valve stem and loosen setscrew.

(8) Adjust pressure regulator to 4-5 psig (28 to 34 kPa) as indicated on low pressure gauge.

(9) Verify nitrogen is being vented from sealscrew hole and observe humidity indicator.

(10) Purge telescope until all sections of indicator are blue. During purge, lubricate preformed packings lightly with silicone compound.

(11) Close pressure regultor valve and tighten setscrew.

(12) Remove dessicator from telescope body and refill desiccator to level slightly below threads.

(13) Lightly lubricate preformed packing on top part of desiccator with grease or silicone compound.

(14) Install top part of desiccator to bottom.

(15) Lightly lubricate preformed packing with grease or silicone compound.

(16) Install desiccator on telescope body and tighten to 20 to 30 in lb. (2.25 to 3.39 Nm).

(17) Slowly open pressure regulator valve and charge instrument to 2.0 + or - .0.5 psig (14 + or - 3 kPa). Tighten setscrew when pressure regulator gauge stabilizes.

(18) If overpressurization occurs, slowly open setscrew, adjust pressure regulator to 2.0 + or - 0.5 psig; then tighten setscrew when pressure regulator gauge stabilizes.

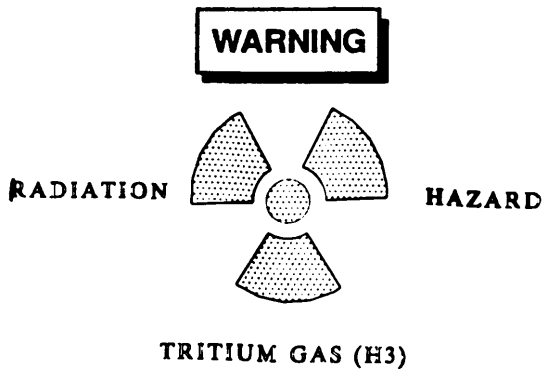
(19) Close pressure regulator gauge. Remove hose assembly and replace cap on nut of valve and install lockwire.

(20) Close tank supply valve and verify on high pressure gage.

i. Panoramic Telescope, M981 FISTV (fig. 3-76). Refer to 3-16.h. for procedures.

3-17. Telescopes, Straight.

a. M90A2 Straight Telescope (fig. 3-77).



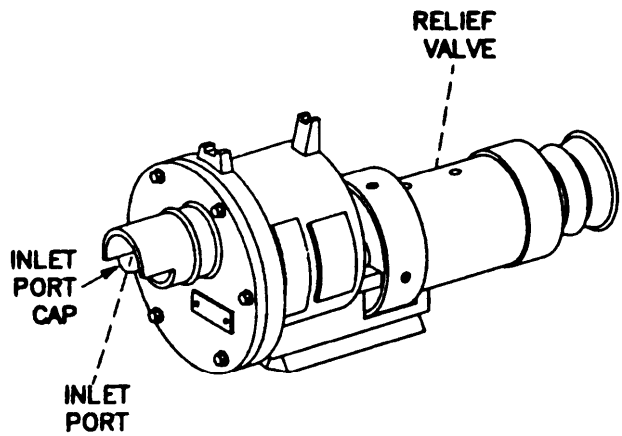


Figure 3-77 M90A2 *Straight Telescope*

(1) Perform purging and charging procedure para 2-5.a.

(2) Relief valve should open between 3-10 psig.

(3) Purge instrument for 5 minutes.

(4) Relief valve should close between 1-5 psig.

(5) Leak test for a minimum of 5 minutes.

b. M134 Straight Telescope (fig. 3-78).

NOTE

The telescope must be removed from the vehicle or the vehicle storage area before beginning purging procedures. Refer to appendix A for a listing of applicable publications.

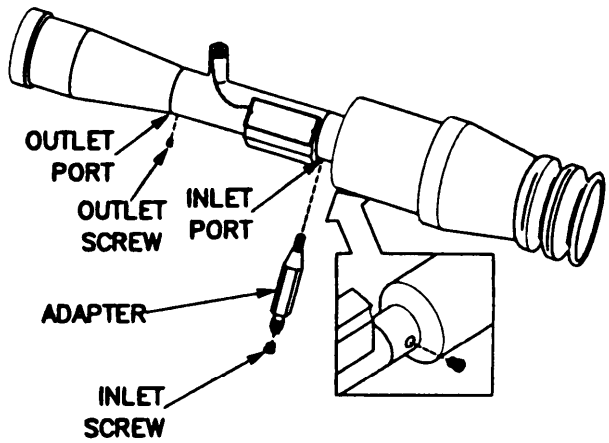


Figure 3-78 *M134 Straight Telescope*

(1) Perform purging procedure para 2-5.d.

(2) Purge instrument at 5 psig for 5 minutes.

3-18. Test Set, Receiver/Transmitter (fig. 3-79).

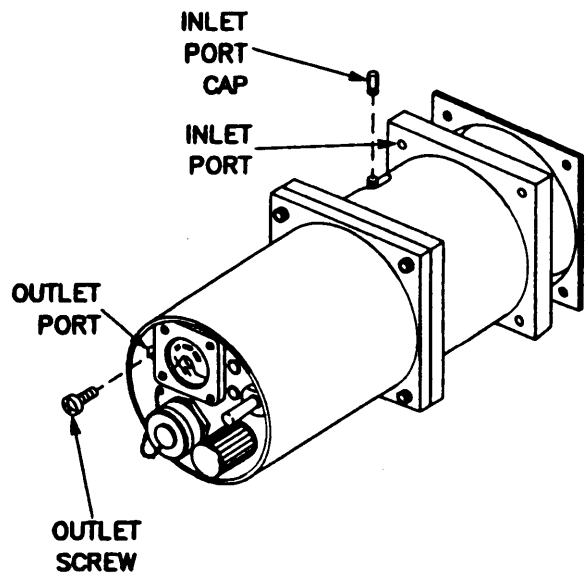


Figure 3-79 Receiver/Transmitter Test Set

a. Perform purging and charging procedure para 2-5.b.

b. Purge instrument at 10 psig for 15 minutes.

c. Charge instrument at 1 psig for 10 minutes.

d. Leak test for minimum of 5 minutes.

3-19. Trainer, M55 Laser (figs. 3–80 and 3-81).

a. Barrel Assembly (fig. 3-80).

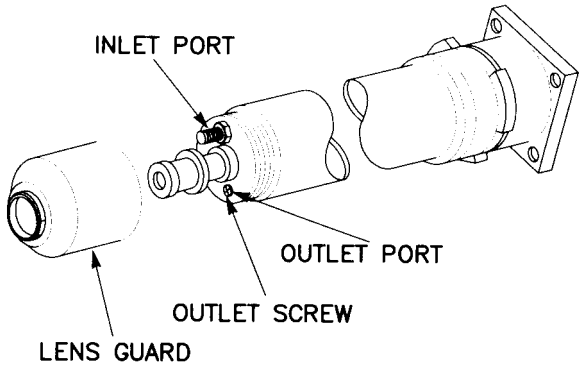


Figure 3-80 M55 Barrel Assembly

(1) If necessary, remove the barrel extension by turning it counterclockwise.

(2) Remove the lens guard and loosen the outlet screw.

(3) Perform purging and charging procedure para **2-5.b.**

(4) Purge instrument at 5 psig for 2 minutes.

(5) Charge instrument at 1 psig for 1 minute.

(6) Leak test for minimum of 5 minutes.

(7) Tighten outlet screw and install lens guard.

b. Deflector Optical Assembly (fig. 3-81).

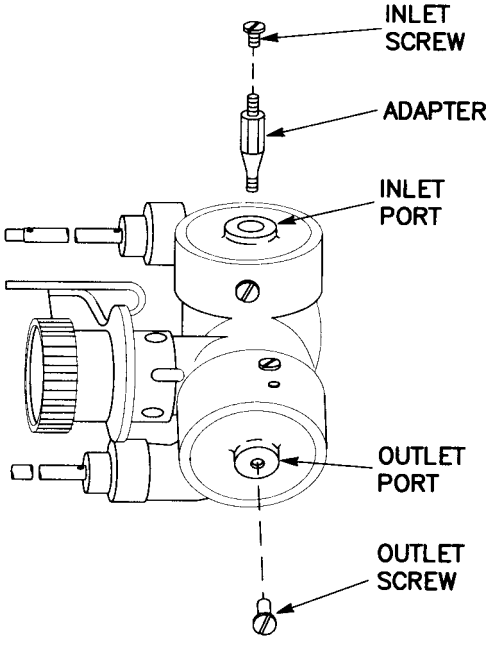


Figure 3-81 M55 Deflector Optical Assembly

(1) Perform purging procedure para **2-5.d.**

(2) Purge instrument at 5 psig for 2 minutes.

3–20. Unit, Reticle Projector (fig. 3-82).

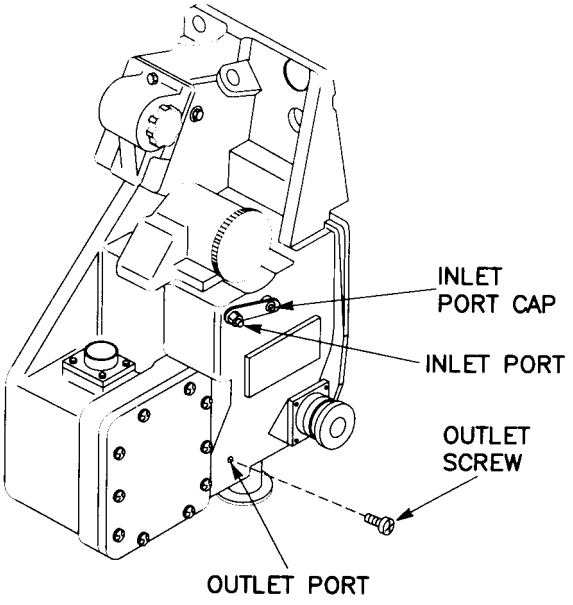


Figure 3-82 Reticle Projector Unit

a. Perform purging procedure para **2-5.c.**

b. Purge instrument at 8 psig for 5 minutes.

APPENDIX A
REFERENCES

A-1. SCOPE.
This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.
Recommended Changes to Publications . . . .DA Form 2028
Recommended Changes to Publications . . . . DA Form 2028-2
Quality Deficiency Report . . . .SF 368

A-3. FIELD MANUALS.
First Aid for Soldiers . . . .FM 21-11

A-4. TECHNICAL MANUALS.
General Maintenance Procedures for Fire Control Materiel ....TM 9-254
Procedures for Destruction of Aviation General Support Equipment to Prevent Enemy Use . . . . TM 750-244-1-4
Procedures for Destruction of Equipment to Prevent Enemy Use . . . .TM 750-244-3

The following publications should be referred to for removal and installation instructions.

FIRE CONTROL		END ITEM	
INSTRUMENT	**TM REFERENCE**	**APPLICATION**	**TM REFERENCE**
Aiming Circle, M2A2	9-1290-262-24		
Backup Sight		BFVS M2/M3	9-2350-252-10-2
Collimator, M1Al	9-1240-324-34&P		
Commander's Relay Assy.		BFVS M2/M3/M2A1/M3A1	9-2350-252-l0-2 9-2350-252-20-3 9-1425-474-34-l(M2/M3) 9-1425-453–34-l (M2A1/M3Al)
Commander's Relay Assy.		BFVS M2A2/M3A2	9-2350-284-10-2 9-2350-284-20-2-3 9-1425-453-34-1
Integrated Sight Unit		BFVS M2/M3/M2Al/M3Al	9-2350-252-10-2 9-2350-252-20-2-3 9-1425-474-34-l(M2/M3) 9-1425-453-34-1 (M2A1/M3Al)
Integrated Sight Unit		BFVS M2A2/M3A2	9-2350-284-10-2 9-2350-284-20-2-3 9-1425453–34-1
Mount, M137	9-1240-400-34	M11OA2	9-2350-304-20-2
Mount, M145/M145Al	9-1240-401-34&P	M109A2/A3/A4/A5	9-2350-311-20-2

A-4. TECHNICAL MANUALS – continued

FIRE CONTROL		END ITEM	
Mount, M149/M149A1	9-1240-312-34	M551/M551Al	9-2350-230-20-2
Muzzle Boresight M26A1/M27Al	9-4933-259-14&P		
Periscope, M30C		M48A5	9-2350-258-20-2
Periscope, M32E1	9-1240-313-34	M48A5	9-2350-258-20-2
Periscope, M32CE1/M35El	9-1240-313-34	M60/M60A1	9-2350-222-2 Series
Periscope, M36 Series	9-1240-314-34	CEV M728 M60/M60A1	9-2350-222-20-2 Series 9-2350-257-20-2 Series
Periscope, M42	9-1240-401-34	M109A2/A3/A4/A5	9-2350-31l-20-2
Periscope, M47	9-6650-221-35	M551/M551Al	9-2350-230-20-l
Periscope, M48	9-6650-222-35	M551/M551A1	9-2350-230-20-l
Periscope, M65, Battery Commander's	9-1240-368-34		
Quadrant, M15	9-1290-322-34&P	M109A2/A3/A4/A5	9-2350-311-20-2
Telescope, M105D	9-1240-262-34	M60A1 M60A3 M60A1 Rise/ M60A2Rise Passive M48A5 Tank M60 Tank	9-2350-215-20-2 Series 9-2350-252-20-2 9-2350-257-20-2 Series 9-2350-258-20-2 9-2350-260-20-2 Series
Telescope, M105F	9-1240-262-34	CEV M728	9-2350-222-20-2 Series
Telescope, Panoramic, M115	9-1240-400-34	M11OA2	9-2350-304-20-2
Telescope, Panoramic, Ml17/Ml17A2	9-1240-401-34&P	M109A2/A3/A4/A5 M109A6	9-2350-311-10 9-2350-314-10
Telescope, Ml18A2/Ml18A3	9-1240-401-34&P	M109A2/A3/A4/A5	9-2350-311-10
Telescope, M134	9-1240-318-35	Vulcan SP, M163A1 Vulcan, Towed M167A1 Towed Pivads M167A2	9-2350-300-10 9-2350-286-10 9-1005-318-10

A-5. SUPPLY CATALOGS.

Purging Kit, Fire Control: Organizational, Direct and General Support Maintenance and Hand Receipt . . . . SC 4931-95-J54

A-6. MISCELLANEOUS PUBLICATIONS.

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

APPENDIX B
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

B-1. SCOPE.

This appendix lists expendable supplies and materials you will need to purge and charge fire control instruments. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

B-2. EXPLANATION OF COLUMNS.

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 (e.g., "Use sealing compound, item ....., appendix B").

b. Column (2) - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

c. Column (3) - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Contactor and Government Entity Code (CAGEC) in parentheses followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U/M
1	8105-00-150-6256	Bag, plastic, general purpose, 44 x 32 inches	BX
2	6830-00–782-2641	Nitrogen, technical, oil–free, Gas form, (81348), Type 1, BB-N-411, Grade B, Class 1	CF
3	1240-01-189-4372	Lubricant (18876), MIS-23546	QT
4	8030-00-900-2373	Sealing Compound, Primer (05972), MIL-S-22473, Grade N, Form R; MIL-R-46082, Grade F MIL-S-46162, Grade N; 764-55	OZ
5	8030-01-166-0575	Sealing Compound (05972), 567-47	ML
6	8030-00-275-8114	Sealing Compound, adhesive, noncuring, polysulfide base, type 1, (80064), 1941316	PT
7	8520-00-228-0598	Soap, toilet, liquid, l–gallon container: (81348) P-S-624	GL

APPENDIX C

ADDITIONAL SUPPLIES

C-1. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment, required to perform the operations described in this manual refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

C-2. OUTLET PORT SCREWS AND PLUGS. Table C-1 lists replacement self-sealing screws and plugs for outlet ports. Select replacement hardware by determining the thread size and depth of the port requiring hardware.

Table C-1. Self-Sealing Outlet Screws and Plugs

Part No.	National Stock No.	Thread	Length (inches)
AN505-4R5	5305-00-639-7518	4-4OUNC, Screw, Machine	5/16
FFS92	5305-00-011-0499	10-24UNC, Screw, Machine	3/8
MS3212-1	5305-00-738-0624	40-UNC-2A, Screw, Machine	1/4
MS3212-21	5305-00-433-3707	8-32UNC, Screw, Machine	1/4
MS3212-31	5305-00-855-2989	10-32UNF, Screw, Machine	3/8
MS3212-39	5305-00-085-4056	24UNC, Screw, Machine	3/8
MS5103-33	5305-00-724-3439	8-36UNF, Setscrew	1/8
MS I 6996-40	5305-00-068-8202	10-24UNF, Screw, Cap, Socket Head	1
MS35266-61	5305-00-543-2753	10-32UNF, Screw, Machine	3/8
MS35375-239	5305-00-939-9219	8-32UNC, Screw, Machine	1/8
MS49005-2	4730-00-01 8–9566	1/8 NPT, Plug, Pipe	1/4
MS51957-13	5305-00-054-5647	4-4OUNC, Screw, Machine	1/4
MS51957-59	5305-00-050-9225	10-24UNC, Screw, Machine	1/4
MS51958-24	5305-0>964-0310	6-4OUNC, Screw, Machine	1/8
0228372	5305-00-003-7126	8-32UNC, Screw, Machine	1/2
100697	5305-00-010-0697	6-32UNC, Screw, Machine	1/4
10541671	5305-00-997-4604	4-4OUNC, Screw, Shoulder	3/1 6
105551 57–1	5305-00-085-3706	4-4OUNC, Screw, Machine	3/1 6
105551 57–2	5305-00-606-8179	4-40UNC, Screw, Machine	1/4
10555157-4	5305-00-955-2941	6-32UNC, Screw, Machine	3/16
10555157-6	5305-00-41 9–3378	6-32UNC, Screw, Machine	5/16
10555157-7	5305-00-740-8890	6-32UNC, Screw, Machine	3/8
105551 57–8	5305-01-057-9300	8-32UNC, Screw, Machine	1/4
105551 57–11	5305-00-1 82–7302	10-32UNF, Screw, Machine	1/4
105551 57–14	5305-00-524-0709	10-24UNC, Screw, Machine	1/4
11737540-2	5305-00-245-5157	10-32UNC, Screw, Self-locking	3/8
11737718	5305-00-111 –5540	8-32UNC, Screw, Machine	3/4

Table C-1. Self-Sealing Outlet Screws and Plugs (continued)

8574881	5305-00-684-4401	3/8-32UNF, Plug, Machine Thread	1/6
8624877	5305-00-857-5190	8-32UNC, Screw, Machine	1/4
8626469	5305-00-959-6865	4-4OUNC, Screw, Self-locking	5/32
8643632	5305-00-930-1808	8-32UNC, Screw, Machine	1/4

C-3. INLET PORT SCREWS. Table C-2 lists replacement screws for purging inlet ports. Select replacement hardware by determining the thread size and depth of the port requiring hardware.

Table C-2. Self-Sealing Screws, Inlet

Part Number	National Stock Number	Thread	Length (inches)
MS3212-21	5305-00-433-3707	8-32UNC, Screw, Machine	1/4
MS3212-31	5305-00-855-2989	10-32UNC, Screw, Machine	3/8
MS16996-40	5305-00-068-8202	10-24UNC, Screw Cap, Socket Head	1
8624877	5305-00-857-5190	8-32UNC, Screw, Machine	1/4
11737540-1	5305-00-262-0077	6-32UNC, Screw, Self–locking	3/16
11737540-2	5305-00-245-5157	10-32UNF, Screw, Self-locking	3/8

C-4. PNEUMATIC VALVES. Table C-3 lists replacement pneumatic valves for inlet and outlet ports. Select replacement hardware by determining the thread size and depth of the port requiring hardware.

Table C-3. Pneumatic Valves Assemblies/Components

Part Number	National Stock Number	Description
MS51607-1	1240-00-114-1096	Valve Stem
MS51377-2	2640-00-060-3543	Valve Core
MS20813-1	2644-00-222-4525	Cap
SM-C-805978-1	4820-00-427-5047	Schroeder
SM-C-805845	5885-01-063-1403	Schroeder
10556186	4820-01-053-0223	Relief, 5 psig
8200055	2640-00-507-9260	Cap
10516567	1240-00-464-4792	Strap
11737597	5310-00-096-9728	Nut, plain hexagon

C-5. PARTS KITS. Table C-4 lists the parts kits to be used for specific applications.

Table C-4. Parts Kits

Part Number	National Stock Number	Application
5705155*	1240–01–114-3070	Laser Rangefinder for M1/M1A1 Tank

*For M1 Tank, this kit is part of Service Kit, Laser; Part No. 5705438, NSN 2540-01-255-3347.
For M1A1 Tank, this kit is part of Service Kit, Laser; Part No. 5705137, NSN 3640-01-117-7942.

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INDEX - Continued

SUBJECT PAGE

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Chief of Staff

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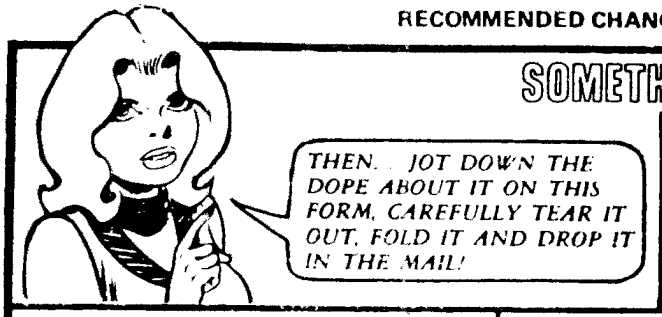

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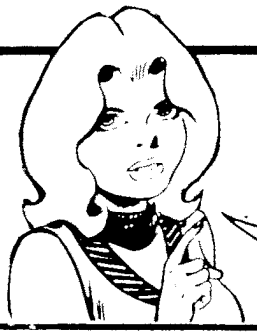

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