TECHNICAL MANUAL

OPERATOR'S AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
FOR
DRIVER'S VISION ENHANCER (DVE)

AN/VAS-5A(V)2 (NSN 5855-01-475-9444) (EIC: N/A) FOR GENERATOR, SMOKE, M56

AN/VAS-5A(V)11 (NSN 5855-01-504-6079) (EIC: N/A) FOR FAMILY OF MEDIUM TACTICAL VEHICLES

AN/VAS-5A(V)12 (NSN 5855-01-504-9801) (EIC: N/A) FOR HEAVY EXPANDED MOBILE TACTICAL TRUCK

AN/VAS-5A(V)13 (NSN 5855-01-504-6080) (EIC: N/A) FOR MAXI-AMBULANCE HMMWV

AN/VAS-5A(V)14 (NSN 5855-01-505-2208) (EIC: N/A) FOR TOW HMMWV

AN/VAS-5A(V)15 (NSN 5855-01-505-2210) (EIC: N/A) FOR HARD TOP HMMWV

AN/VAS-5A(V)16 (NSN 5855-01-505-2209) (EIC: N/A) FOR PROPHET/SOFT-TOP HMMWV

DRAFT

HEADQUARTERS, DEPARTMENT OF THE ARMY
AND HEADQUARTERS, UNITED STATES MARINE CORPS
1 SEPTEMBER 2006

PCN 184 080668 00

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER.

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL.

4 SEND FOR HELP AS SOON AS POSSIBLE.

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

WARNING

HIGH VOLTAGE
is used in the operation of this equipment.

DEATH ON CONTACT
may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technicians are aided by operator's they must be warned about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 volt AC input connections when installing or operating the equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

Warning: Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

For artificial respiration, refer to FM 4-25.11

WARNING

You should be familiar with the requirements of TB 43-0129 before installing or operating this equipment. Failure to follow requirements of TB 43-0129 could result in injury or DEATH.

SAFETY SUMMARY DEFINITIONS

WARNINGS, CAUTIONS, AND NOTES

Warnings, cautions, and notes are placed strategically throughout the text of this manual before operating and maintenance procedures. Before starting any task, the warnings, cautions, and notes included in the text of that task to be performed shall be reviewed and understood. Refer to the following for the definition and identification of warnings, cautions, and notes.

WARNING

A warning is an operating or maintenance procedure, practice, or condition that, if not strictly followed, will result in injury to or death of personnel.

CAUTION

A caution is an operating or maintenance procedure, practice, or condition which, if not strictly followed, will result in damage to or destruction of equipment, or will result in loss of mission effectiveness.

NOTE

A note is a statement that clarifies the following or preceding procedures. A note cannot replace an essential operating or maintenance procedure.

CLEANING CHEMICALS REQUIRE SPECIAL CARE.

Keep cleaning chemicals in approved safety containers and in minimal quantities at the workstation. Some cleaning chemicals may irritate skin, eyes, and respiratory tract. Follow manufacturer's warning labels and safety directives. Use cleaning chemicals only in approved areas. Keep an approved fire extinguisher nearby and discard soiled cleaning cloths in approved safety containers. Provide ventilation, safety goggles, and necessary clothing required by label instructions. Provide an eyewash station and a wash basin facility in work area. Wash thoroughly when leaving work area. Do not eat or smoke until hands are washed thoroughly.

SAFETY SUMMARY
WARNINGS AND CAUTIONS CONTAINED WITHIN THE MANUAL.

The following warnings and cautions appear in the text of this manual and are repeated here for emphasis.

WARNING

If the DVE is being operated in dense fog, IR smoke, heavy rains, thermal neutral conditions, or during diurnal cycle/crossover periods, objects may not be readily detectable. If an object has exactly the same temperature as surrounding objects, it also may not be readily detectable. Infrared energy cannot be detected through most glass. Operators must maintain an awareness of environmental and weather conditions, and speeds must be reduced to suit the prevailing operating environment and terrain.

WARNING

There are two short periods each day called crossover periods or diurnal cycle when most natural objects are about the same temperature. This is when they have cooled down at night and as they are heating up in the early morning. Since objects are near the same temperature, there is not much temperature difference for the DVE to use, degrading the image display quality. This is also what happens when heavy rain or thermal neutral conditions make all natural objects close to the same temperature.

WARNING

During calibration the image may be blurred or loss of video could occur for a few seconds.

WARNING

If the display becomes degraded while driving the vehicle, such as the presence of dead pixels (the very small dots that make up the display image) and/or video noise that prevents the driver from performing his mission, then immediately bring the vehicle to a safe stop to avoid collision. If the problem cannot be fixed, report the situation to higher level of maintenance.

WARNING

The AUTO LEVEL and AUTO GAIN modes do not react instantly to rapidly changing scenery (shade to sun, sun to shade). The AUTO LEVEL and AUTO GAIN modes require one or two seconds to compensate. The automatic gain and level features will adjust faster than manual adjustments. If necessary, slow vehicle.

WARNING

Before operating the vehicle, ensure that the DVE azimuth and elevation controls are in the locked positions. Road wheel indicators appear on the display when azimuth and elevation controls are in the locked position. This will ensure that the DVE is looking straight ahead when operating the vehicle. Manually verify forward and lock position prior to operating the vehicle.

WARNING

Helmets must always be worn when driving with the DVE installed. The DVE display should be removed from its mount when not in use for extended driving operations to minimize the risk of head strike injuries.

WARNING

Do not touch, ingest or inhale particles of a broken lens (front window of DVE). This lens contains germanium, which is slightly toxic if ingested or inhaled. Glass may be sharp enough to cut personnel if touched. Dispose of germanium lenses through your DRMO in accordance with local environmental regulations.

WARNING

Do not ingest lens cleaning compound. Lens cleaning compound is poisonous and can cause illness or death, if ingested.

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

CAUTION

Do not use wiping cloth to clean the IR window or the display glass.

CAUTION

- Do not allow water to contact electrical pin connectors. Water causes mildew, corrosion, and electrical shorts.
- Do not use a high-pressure water hose to clean the DVE.

CAUTION

- Ensure that cleaning compound remains uncontaminated.
- Do not use excessive hand pressure when rubbing IR window or display glass.

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Current as of: 1 JUNE 2005

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. We'd prefer that you submit your recommended changes electronically, either by e-mail (AMSEL-LC-LEO-PUBS-CHG@mail1.monmouth.army.mil) or online (http://edm.monmouth.army.mil/pubs/2028.html). Alternatively, you may mail or fax your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028 located in back of this manual to: Commander, US Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, ATTN: AMSEL-LC-LEO-E-ED, Fort Monmouth, NJ 07703-5006. The fax number is 732-532-3421, DSN 992-3421.

Marine Corps units, submit NAVMC 10772 (Recommended Changes to Technical Publications) to: Commanding General, Marine Corps Logistics Base (Code 850), Albany, Georgia 31704-5000.

In any case, we will send you a reply.

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CHAPTER 1 GENERAL INFORMATION

Section I. General Information

1-1 SCOPE AND INTRODUCTION

This technical manual describes operator's and unit maintenance procedures for the Driver's Vision Enhancer (DVE). This manual contains equipment descriptions, operating instructions, and maintenance procedures. Chapters 1 through 3 provide material which applies to all DVE's. The remaining chapters describe each of the DVE's according to vehicle platform.

1-2 PURPOSE OF EQUIPMENT

The DVE is a compact, lightweight, uncooled, passive, thermal imaging system for use on a variety of combat and tactical wheeled vehicles during darkness or during periods of degraded visibility.

1-3 MAINTENANCE FORMS AND PROCEDURES

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8 The Army Maintenance Management System (TAMMS) Users Manual. Marine Corps personnel will use TM 4700-15/1 (Equipment Record Procedures).

1-4 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your equipment needs improvement, let us know. Send us an Equipment Improvement Recommendation (EIR). You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at Commander, U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, NJ 07703-5006. We'll send you a reply. Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10 (Quality Deficiency Report).

1-5 DESTRUCTION OF ARMY/MARINE CORPS MATERIEL TO PREVENT ENEMY USE

For instructions for destruction of equipment to prevent enemy use, refer to TM 750-244-2. Marine Corps personnel destroy by weapons fire, smashing, disassembly, burning, or any other means to render the equipment useless to the enemy.

1-6 CORROSION PREVENTION AND CONTROL

Corrosion prevention and control (CPC) of Army materiel is a continuing concern. It is important that corrosion problems with this equipment be reported so that the problem can be corrected and improvements made to prevent the problem in future equipment.

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

Marine Corps personnel refer to TM 4795-12/1, Corrosion Prevention and Control, for USMC equipment.

If a corrosion problem is identified, report it using SF 368, Product Quality Deficiency Report. Use words such as "corrosion", "deterioration", or "cracking" to ensure that the information is correctly identified as a corrosion problem. Submit the form to the address specified in DA PAM 750-8.

1-7 WARRANTY INFORMATION

1-7.1 General – Raytheon DVE System

The reliability and durability of the DVE are such that the manufacturer, Raytheon Company, includes an extended warranty on workmanship and materials. This warranty is provided for the first four years for the U.S. Army and the first nine and one half years for the U.S. Marine Corps, at no cost to the Government, on all AN/VAS-5A(V) systems delivered under the DVE Thermal Omnibus contract.

The warranty starts on the government acceptance date and expires four years hence. During the warranty period, Raytheon will repair or replace, at no cost to the Government, any DVE system or system component that fails under normal operation, while in storage, or during transportation, as defined in the Performance Specification MIL-PRF-49256 dated 29 May 1998. **(The warranty excludes equipment failures caused by combat damage, natural disaster, or misuse.)**

All replacement DVE systems or components will be issued with the full remaining warranty of the original failed unit. Also, as a minimum, any replacement DVE system supplied by Raytheon will have a three-month warranty. In other words, if a unit fails after 40 months, the Raytheon replacement will carry the remaining eight months

warranty of the original. If a unit fails in its 47-warrant month (113 warrant month, Marines only), the Raytheon replacement will carry a three-month warranty as a minimum.

1-7.1.1 Warranty Control

To control the warranty program, Raytheon will assign a serial number and government acceptance date (month and year) for each DVE system during production. Raytheon will use a tamper proof label and also bar-coded information during repair action for inventory and warranty control. Raytheon will ship each DVE system or component in a suitable container with clearly marked labels, as shown in Figure 1-1, specifying that this is a warranted item and providing direction to the servicing unit. In addition, the Direct Support Activity will provide a return-shipping label for use, or individual designated by the Army or Marine Corps, to return the failed DVE system or component to Raytheon. If the label is lost or missing, contact Raytheon at (888) 622-7969 or (972) 344-3166/3267 (International) for labeling instructions.

1-7.1.2 Warranty Implementation (US Army Only)

Once the unit is in the field and a failure occurs, the following procedures will be implemented:

a. Direct Support (DS) or a point of contact designated by the Government, notifies Raytheon Infrared Customer Product Support (CPS) that a DVE system failure has occurred. Notification can be made by electronic mail, E-Mail: ircrf@raytheon.com, Fax: (972) 344-5420 or Phone: (888) 622-7969. For international notification, phone (972) 344-3166/3267.

b. The individual will report the nomenclature and serial number of the DVE system or component, a brief description of the failure, the location, unit, address, phone number and shipping airbill number.

c. Raytheon will enter the above information into the customer service database, give the customer a return material authorization or service work order, and request that customer write this number on the outside of the box.

d. DS personnel or individual designated by the Army will contact the installation Warranty Control Officer (WARCO), fill out all required Government maintenance and warranty documentation, re-pack the DVE system or components in an appropriate container, **and expedite shipment to Raytheon** using the return label or contact Raytheon at (888) 622-7969 or (972) 344-3166/3267 (International) for labeling instructions. The activity has seven days to return the defective DVE system or components. **Raytheon expects the DS activity to make every effort to expedite shipment of the failed unit.**

e. Upon receipt of the notification, Raytheon will provide a replacement system/component. The replacement unit will arrive at the designated support point/servicing DS unit within a total time window of 48 hours from notification. Raytheon will notify personnel designated by the Government that shipping action has been accomplished, by electronic mail or phone.

WARRANTY - WARRANTY - WARRANTY - WARRANTY - WARRANTY
DVE-AN/VAS-5

***** ITEM UNDER WARRANTY *****

- COMPLETE WARRANTY PAPER WORK
- NOTIFY RAYTHEON - SEE WARRANTY PROCEDURES IN TM
  - PHONE: (888) 622-7969 (USA), (972) 344-3166/3267 (International)
  - FAX : (972) 344-5420
  - E-Mail: ircrf@raytheon.com
- RE-PACK DVE OR COMPONENT IN SUITABLE CONTAINER
- EXPEDITE SHIPMENT TO RAYTHEON COMPANY

WARRANTY - WARRANTY - WARRANTY - WARRANTY - WARRANTY

Figure 1-1. Raytheon DVE Warranty Label

1-7.2 General – DRS DVE Components

The reliability and durability of the DVE are such that the manufacturer, DRS, includes an extended warranty on workmanship and materials. This warranty is provided for the first six years for the U.S. Army at no cost to the Government, on all AN/VAS-5A(V) systems delivered under the DVE Thermal contract.

The warranty starts on the government acceptance date and expires six years hence. During the warranty period, DRS will repair or replace, at no cost to the Government, any DVE component that fails under normal operation, while in storage, or during transportation, as defined in the Performance Specification MIL-PRF-49256 dated 29 May 1998. **The warranty excludes equipment failures caused by combat damage, natural disaster, or misuse.**

All replacement DVE components will be issued with the full remaining warranty of the original failed component.

1-7.2.1 Warranty Control

To control the warranty program, DRS will assign a serial number and government acceptance date (month and year) for each DVE component during production. DRS will use a tamper proof label and also bar-coded information during repair action for inventory and warranty control. DRS will ship each DVE component in a suitable container with clearly marked labels, as shown in Figure 1-2, specifying that this is a warranted item and providing direction to the servicing unit.

1-7.2.2 Warranty Implementation

Once the unit is in the field and a failure occurs, the following procedures will be implemented:

a. DS personnel or individual designated by the Army will contact the installation Warranty Control Officer (WARCO), fill out all required Government maintenance and warranty documentation, and re-pack the DVE components in an appropriate container. Direct Support (DS) or a point of contact designated by the Government, notifies DRS that a DVE component failure has occurred. Notification can be made by electronic mail, E-Mail: DVEWarranty@drsoptronics.com, or Phone: 1-888-832-1460 (USA and International). DRS has to be notified before returning failed component.

b. The individual will report the nomenclature and serial number of the DVE component, a brief description of the failure, the location/unit, address, phone number and Point of Contact information.

c. DRS will enter the above information into the customer service database, provide the customer a Return Material Authorization (RMA), and request that customer write this number on the outside of the box. DRS will provide return shipping instructions at time of issuing RMA.

d. The DS activity has seven days to return the defective DVE component. The failed component must be packaged securely. **DRS expect the DS activity to make every effort to expedite shipment of the failed unit.** DS activity is to notify DRS that shipping action has been accomplished and provide returned components tracking numbers by electronic mail or phone.

e. Upon receipt of the notification, DRS will provide a replacement component. The replacement component will arrive at the designated support point/servicing DS unit within a total time window of 48 hours from notification. DRS will notify personnel designated by the Government that shipping action has been accomplished, by electronic mail or phone.

WARRANTY - WARRANTY - WARRANTY - WARRANTY - WARRANTY
DVE-AN/VAS-5

***** ITEM UNDER WARRANTY *****

- COMPLETE WARRANTY PAPER WORK
- NOTIFY DRS - SEE WARRANTY PROCEDURES IN TM
  - PHONE: 1-888-832-1460 (USA or International)
  - E-Mail: DVEWarranty@drsoptronics.com
- RE-PACK DVE OR COMPONENT IN SUITABLE CONTAINER
- EXPEDITE SHIPMENT TO DRS

WARRANTY - WARRANTY - WARRANTY - WARRANTY - WARRANTY

Figure 1-2. DRS DVE Warranty Label

1-8 NOMENCLATURE CROSS-REFERENCE LIST

Official Nomenclature	Common Name
AN/VAS-5A(V) Viewer, Infrared	Driver's Vision Enhancer (DVE)
System Interconnect Cable Assembly	SA/PTM Cable
Adapter Gasket	Environmental Seal

1-9 LIST OF ABBREVIATIONS

A	Automatic Mode
AAV	Assault Amphibious Vehicle
AMLCD	Active Matrix Liquid Crystal Display
AUTO	Automatic
BFVS	Bradley Fighting Vehicle System
BLK	Black
BNC	Bayonet Neill Concelman Connector
CAL	Calibration
CAGE	Contractor and Government Entity
CCW	Counterclockwise
CPC	Corrosion Prevention and Control
CPS	Customer Product Support
CV	Combat Vehicle
CW	Clockwise
DA	Department of the Army
DCM	Display Control Module
DRMO	Defense Reutilization Material Officer
DS	Direct Support
DVE	Driver's Vision Enhancer
DWGS	Drawings
EIR	Equipment Improvement Recommendation
EXT	External

FOR	Field of Regard
FOV	Field of View
FMTV	Family of Medium Tactical Vehicles
GE	General Electric
GSE	Government Supplied Equipment
HEMTT	Heavy Expanded Mobile Tactical Truck
HMMWV	High Mobility Multipurpose Wheeled Vehicle
IMA	Intermediate Maintenance Activity
IR	Infrared
LAV	Light Armored Vehicle
LED	Light-Emitting Diode
M	Manual Mode
MAC	Maintenance Allocation Chart
MC	Marine Corps
MCO	Marine Corps Order
NBC	Nuclear, Biological, and Chemical
NSN	National Stock Number
ORG	Organizational
PAM	Pamphlet
PICA	Primary Inventory Control Activity
PMCS	Preventive Maintenance Checks and Services
PTM	Pan and Tilt Module
RMA	Return Material Authorization
RPSTL	Repair Parts and Special Tools List
SA	Sensor Assembly
SF	Standard Form
SICA	Secondary Inventory Control Activity
SV	Smoke Vehicle
SOP	Standard Operating Procedures
TAMMS	The Army Maintenance Management System
TM	Technical Manual
TOW	Tube Launched, Optically Tracked, Wire Guided
TWV	Tactical Wheeled Vehicle
Vdc	Volts Direct Current
WHT	White

Section II. Equipment Description

1-10 EQUIPMENT CAPABILITIES AND CHARACTERISTICS

1-10.1 Characteristics

WARNING

If the DVE is being operated in dense fog, IR smoke, heavy rains, thermal neutral conditions, or during diurnal cycle/crossover periods, objects may not be readily detectable. If an object has exactly the same temperature as surrounding objects, it also may not be readily detectable. Infrared energy cannot be detected through most glass. Operators must maintain an awareness of environmental and weather conditions, and speeds must be reduced to suit the prevailing operating environment and terrain.

The DVE may be used on and off the battlefield to continue driving operations during darkness or during periods of degraded visibility caused by battlefield conditions such as smoke, dust, haze, and some weather-related conditions such as fog and rain. Under clear atmospheric conditions, the DVE is designed to detect a standing person or a 22-inch (55.9-centimeter) object at a distance of 360 feet (110 meters) or greater. During periods of degraded visibility or under conditions of low thermal contrast, drivers must use caution and reduce vehicle speed accordingly. A displayed IR scene is two-dimensional and, therefore, does not convey depth perception. Under any conditions, drivers must use all available cues and experience to drive safely.

1-10.2 Capabilities and Features

The DVE is capable of navigational assistance under conditions of limited visibility such as darkness, smoke, fog, dust, and haze. The DVE is effective during daylight.

1-11 EQUIPMENT DATA

1-11.1 Outline Dimensions, Weight, and Power Dissipation

Refer to Table 1-1 and Figure 1-3 for outline dimensions, weight, and power dissipation of the Display Control Module. Refer to the appropriate vehicle specific chapter for the outline dimensions, weight, and power dissipation of other major components of DVE.

1-11.2 Environmental Characteristics

The following paragraphs describe common characteristics of the DVE.

1-11.2.1 Shock and Vibration. The DVE withstands shock or vibration received during normal usage, handling, or transportation with no performance degradation.

1-11.2.2 Ambient Temperature. Operating and storage temperature limits of the DVE are:

a. Operating temperature from 120.2°F (49°C) to -34.6°F (-37°C).

b. Storage temperature from 159.8°F (71°C) to -50.8°F (-46°C).

1-11.2.3 Humidity. The DVE is not affected by external humidity conditions.

1-11.2.4 Corrosion. The sensor, display control module, and vehicle adapter are composed of aluminum alloys, hard anodized black per MIL-A-8625. The display control module can also be composed of plastic, GE black 7801 Ultem.

1-11.2.5 Altitude. The DVE is operable, with no performance degradation, at altitudes up to 15,000 feet (4.6 kilometers).

1-11.3 Electrical Characteristics

The DVE operates from a single input voltage of 16 to 32 volts direct current (Vdc).

1-11.4 Physical Characteristics

The Display Control Module is a 10.4 inch, 640×480, flat panel active matrix liquid crystal display (AMLCD). Refer to the appropriate vehicle specific chapter for physical characteristics of the other major components of DVE.

Table 1-1. DVE Display Control Module Outline Dimensions, Weight, and Power Dissipation

Characteristic	Specification
DCM (PN 3245325-1)	
Depth	4.19 inches (Maximum)
Width	10.47 inches (Maximum)
Height	8.98 inches (Maximum)
Weight	8.25 pounds (Maximum)
Power Dissipation	86 watts, (Maximum) (During warm-up)
	30 watts, (Maximum) (Nominal)
DCM (PN 6455160)	
Depth	4.19 inches (Maximum)
Width	10.47 inches (Maximum)
Height	8.98 inches (Maximum)
Weight	8.25 pounds (Maximum)
Power Dissipation	81 watts, (Maximum) (During warm-up)
	45 watts, (Maximum) (Nominal)

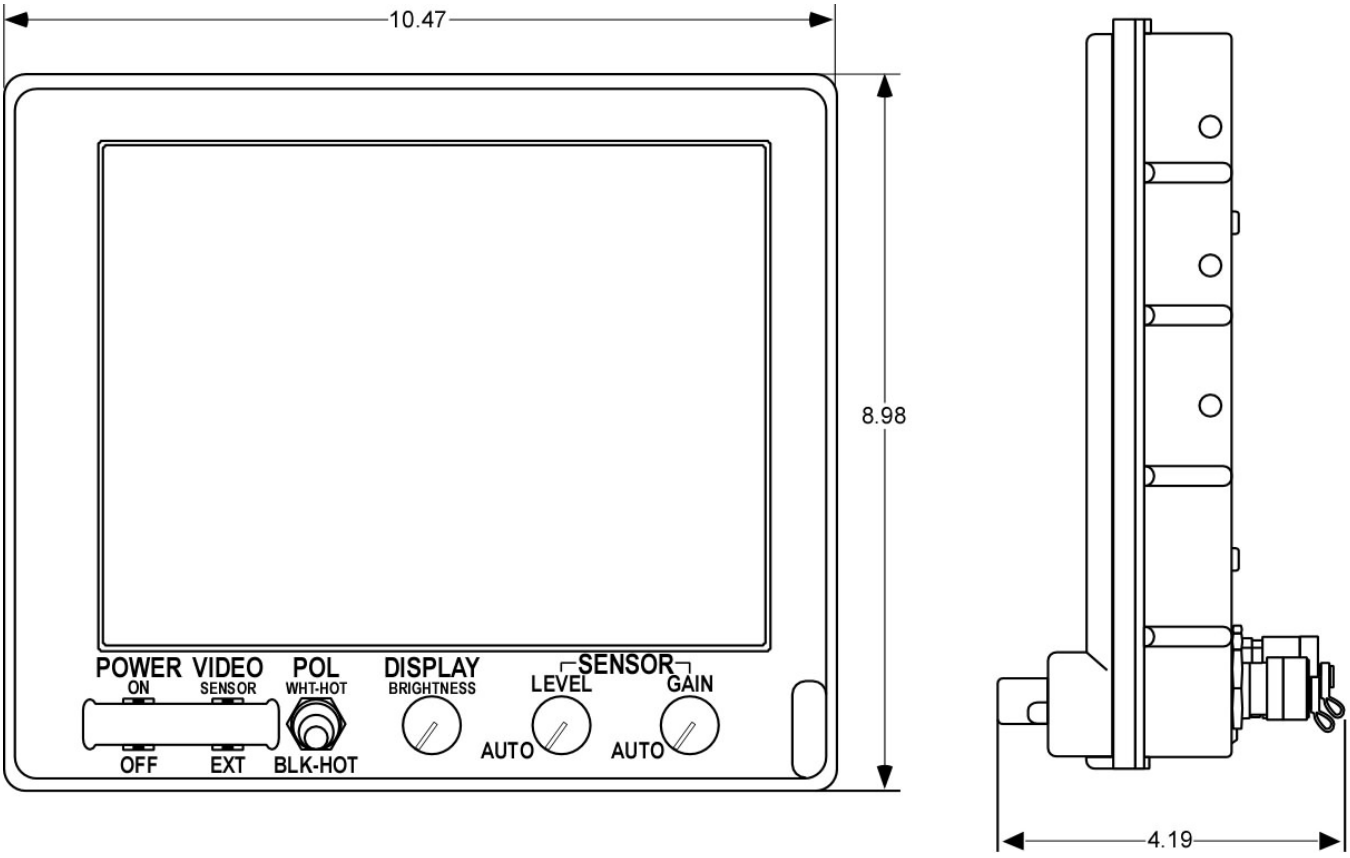


Figure 1-3. DVE Display Control Module Dimensions

Section III. Preparation for Use and Installation/Removal Instructions

1-12 INSPECTION

Inspect the DVE as follows:

a. Remove the DVE from the shipping container and/or transportation case.

b. Check the shipping ledger to ensure receipt of the proper equipment.

c. Inspect the DVE to ensure that the unit is in good physical condition; inspect all components for surface damage that may have occurred during shipment/storage, including the environmental seal, if applicable.

d. For missing or damaged components, refer to the Army forms and procedures used for equipment maintenance, as prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS). Marine Corps personnel are encouraged to submit SF 368 in accordance with MCO 4855.10 (Quality Deficiency Report).

1-13 INSTALLATION/REMOVAL INSTRUCTIONS

Refer to appropriate vehicle specific chapter for installation/removal instructions.

CHAPTER 2 OPERATING INSTRUCTIONS

Section I. Controls, Indicators, and Connectors

2-1 OPERATOR'S CONTROLS, INDICATORS, AND CONNECTORS

2-1.1 Description of Operator's Controls, Indicators and Connectors

Refer to Table 2-1 for functional description and Figure 2-1 for location of controls and indicators on DCM. Refer to Table 2-2 for description and Figure 2-2 for location of connectors on DCM. Refer to the appropriate vehicle specific chapter for description and location of unique controls, indicators, and connectors.

Table 2-1. Control and Indicators

Item	Control or Indicator	Functional Description
1	Polarity Indicator (PN 3253259-2, -6, -8)	Indicates BLK-HOT or WHT-HOT polarity. Coincides with first block of grayscale.
2	Power Indicator (LED)	Illuminates when power is applied.
3	POWER ON/OFF switch	Applies power to DVE when set to ON (up position). When power is applied, the LED power indicator is illuminated.
4	VIDEO SENSOR/EXT switch	In the SENSOR position, selects the sensor video in the DVE. In the EXT position, selects an external video input.
5	POL WHT-HOT/BLK-HOT switch	Reverses scene polarity: ●WHT-HOT (up position) displays hot objects as lighter than cooler objects. ●BLK-HOT (down position) displays hot objects as darker than cooler objects. Calibration (CAL) resets screen for optimum scene ●Manual Mode. "M" is displayed in the upper left corner indicating system in manual mode. ●Automatic mode. "A" is displayed in the upper left corner indicating system in automatic mode and will flash for ten seconds prior to performing calibration.
6	DISPLAY BRIGHTNESS control	Increases background lighting on the display with clockwise (cw) rotation of control and decreases background lighting on display with counterclockwise (ccw) rotation of control.
	SENSOR controls	Dual-action controls for choice of video dynamic range control: ●Automatic (full ccw detent position) ●Manual (cw out of detent position)
7	SENSOR LEVEL Manual AUTO	 Manual adjustment of video level Automatic adjustment of video level
8	SENSOR GAIN Manual AUTO	 Manual adjustment of video gain Automatic adjustment of video gain
9	GRAYSCALE (PN 3253259-2, -6, -8)	Eight-shade bar appears in lower portion of viewing area for 33 seconds when system turns on, indicating operability.
10	Road Wheel Indicators (M56 Only)	Indicates vehicle front wheel path (when in lock position).
11	NO SENSOR VIDEO CHECK VIDEO SWITCH	Indicated on display when VIDEO switch is in EXT position with no video applied or display circuitry has no video input.

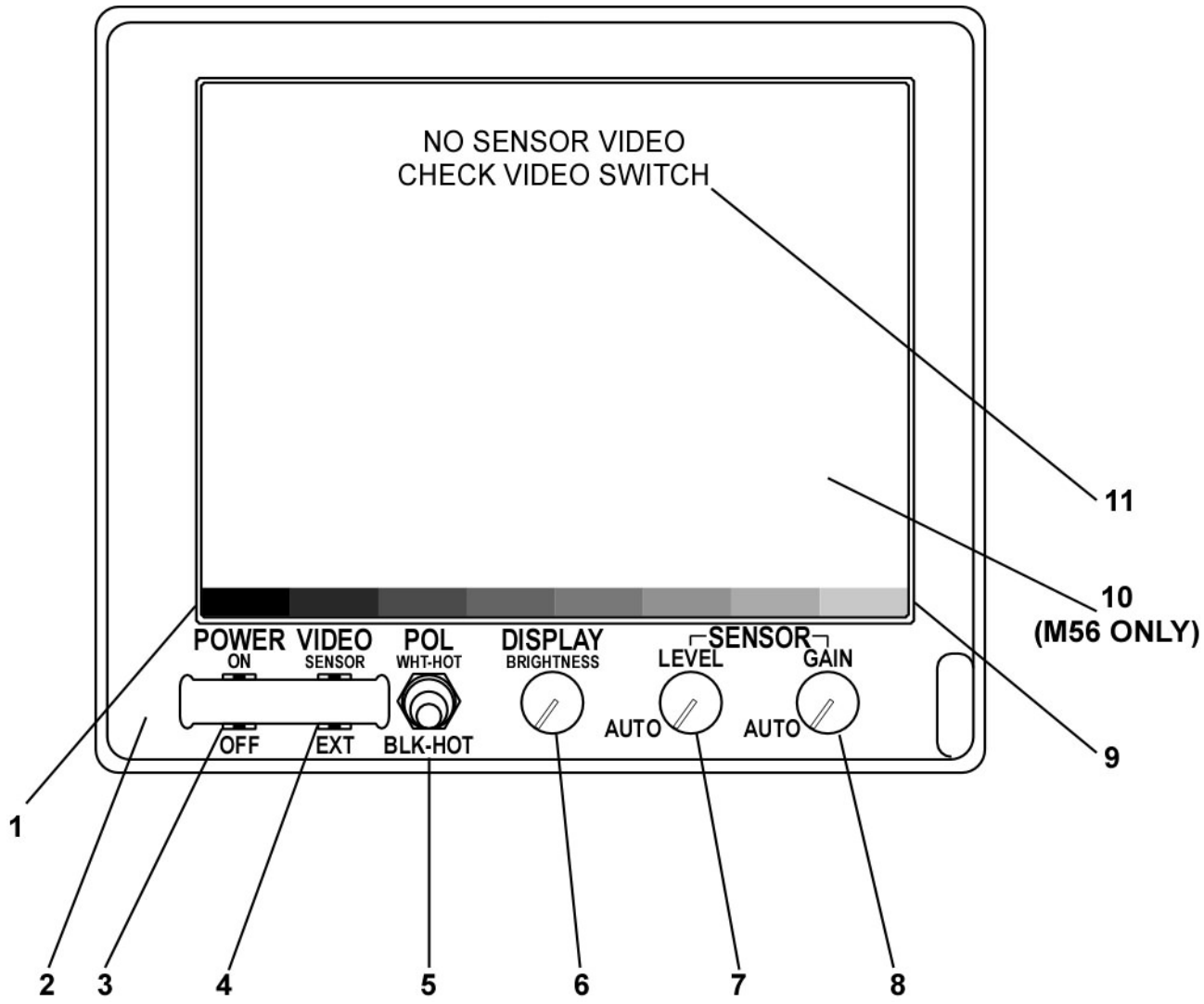


Figure 2-1. Display Controls and Indicators

Table 2-2. Connectors

Item	Connector	Functional Description
1	VIDEO OUT (A1J5)	Provides video output to auxiliary equipment.
2	DIGITAL INTERFACE (A1J4)	Provides for external control of Sensor Assembly.
3	SENSOR (A1J2)	Provides power input to Sensor Assembly.
4	EXT VIDEO IN (A1J3)	Provides for input of external video to display.
5	EXT VIDEO OUT (A1J6)	Provides for output of display video to auxiliary equipment.
6	POWER (A1J1)	Provides power input to display.

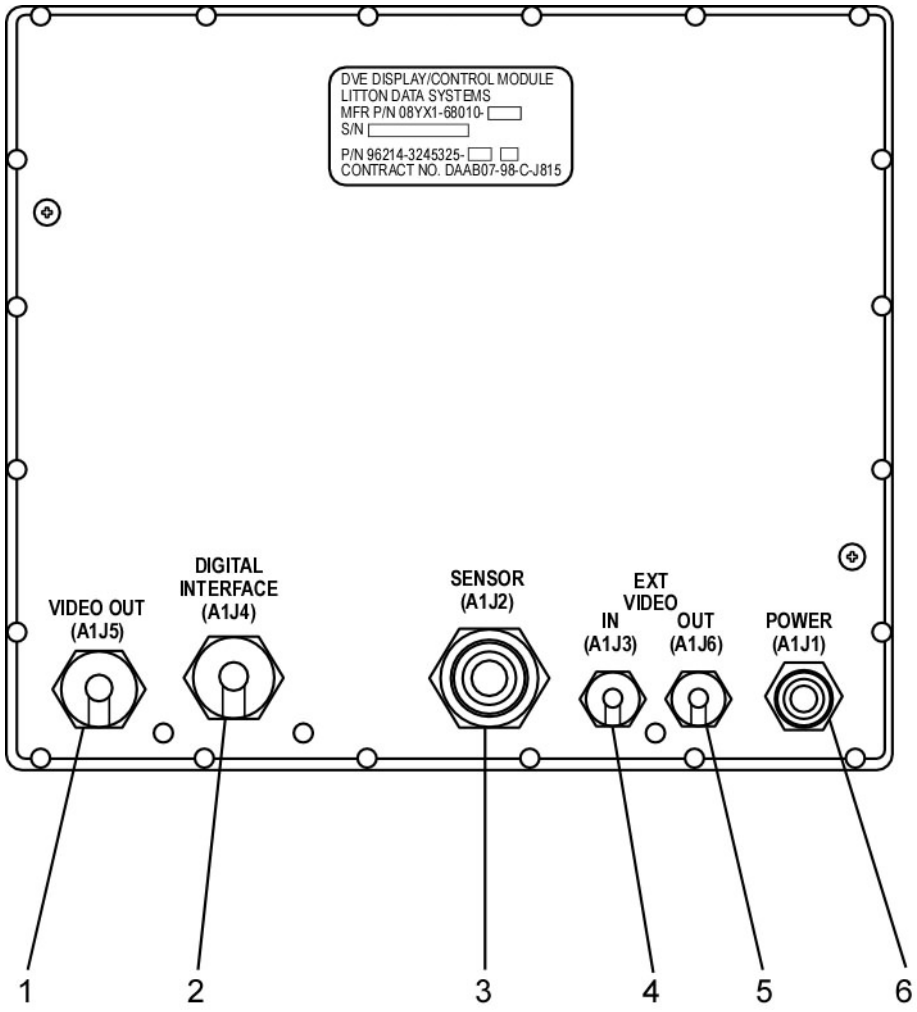


Figure 2-2. Connectors

2-1.2 Operation of Controls and Indicators

Refer to Table 2-1 for control functional description and to Figure 2-1 for control locations. Optimize the viewing image as described in the following steps.

NOTE

- The time necessary for the system electronics to stabilize depends on ambient temperature. As ambient temperature rises or cools, the stabilizing time changes slightly.
- Operator must check the vehicle logbook to determine which sensor is mounted on vehicle.
- The words “NO SENSOR VIDEO CHECK VIDEO SWITCH” will appear on the display only if the VIDEO switch is in the EXT position or the display circuitry has no video input. If the video returns, the words are removed.

1. Set POWER switch (3) to ON (up position); the power indicator (LED) will illuminate. Allow five minutes for system electronics to stabilize for maximum image clarity.
2. Leave the VIDEO switch in the SENSOR (up position) for sensing input from the Sensor Assembly to the display. For external input to the display, set switch to EXT (down position).
3. Adjust the seat height and/or Display Module to place the display at eye level. Refer to the appropriate vehicle specific chapter for adjustment instructions.

WARNING

If the display becomes degraded while driving the vehicle, such as the presence of dead pixels (the very small dots that make up the display image) and/or video noise that prevents the driver from performing his mission, then immediately bring the vehicle to a safe stop to avoid collision. If the problem cannot be fixed, report the situation to higher level of maintenance.

NOTE

- The DISPLAY BRIGHTNESS control should not be adjusted too high (saturated) or the scene may be uncomfortable to view and some useful video information may be lost. Also, with the control adjusted too high, you may reduce your eye’s night vision capability and compromise light discipline.
- If the ambient light within the vehicle changes, it may be necessary to compensate by readjusting the DISPLAY BRIGHTNESS control.

4. DISPLAY BRIGHTNESS Control - While viewing the display scene, adjust DISPLAY BRIGHTNESS control (6) until scene brightness is suitable for operator viewing. It may be helpful to readjust the Display Module tilt and/or seat height for best viewing.
5. SENSOR LEVEL Control - The SENSOR LEVEL control (7) is a dual-action control. The two functions are automatic and manual and are described below:

WARNING

The AUTO LEVEL and AUTO GAIN modes do not react instantly to rapidly changing scenery (shade to sun, sun to shade). The AUTO LEVEL and AUTO GAIN modes require one or two seconds to compensate. The automatic gain and level features will adjust faster than manual adjustments. If necessary, slow vehicle.

(a) AUTO LEVEL - The AUTO LEVEL position provides the best image for most driving conditions. For AUTO LEVEL mode, the control must be in the full ccw detent position. In the AUTO position, the sensor video brightness is adjusted automatically. In this position, the internal circuitry examines the IR video scene, determines the hottest and coldest extremes and centers the video level accordingly. The AUTO LEVEL mode should normally be used while driving the vehicle.

(b) Manual LEVEL Adjustment - When the vehicle is stationary, in some viewing conditions, it may be helpful to adjust the SENSOR LEVEL control. Rotate the SENSOR LEVEL control cw out of detent position. Choose a scene within DVE’s FOV. Adjust the SENSOR LEVEL control until the best image definition is obtained. The optimum level setting varies with the scene and background. This manual operation should only be used when the vehicle is stationary. It may be

useful for viewing imagery having very high thermal difference scenes, such as nearby vehicles, factories, or fires. It is also useful for viewing low thermal difference scenes, such as featureless desert terrains or wet fields during or following a rain, where increased LEVEL control (using manual operation) may improve detail resolution.

6. SENSOR GAIN Control - The SENSOR GAIN control (8) is a dual action control. The two functions are automatic and manual and are described below:

WARNING

The AUTO LEVEL and AUTO GAIN modes do not react instantly to rapidly changing scenery (shade to sun, sun to shade). The AUTO LEVEL and AUTO GAIN modes require one or two seconds to compensate. The automatic gain and level features will adjust faster than manual adjustments. If necessary, slow vehicle.

(a) AUTO GAIN - The AUTO GAIN position provides the best image for most driving conditions. For AUTO GAIN mode, the control must be in the full ccw detent position. In the AUTO position, the sensor video gain is adjusted automatically. In this position, the internal circuitry examines the IR video scene, determines the hottest and coldest extremes, and adjusts the video gain accordingly. The AUTO GAIN mode should normally be used while driving the vehicle.

(b) Manual GAIN adjustment - When the vehicle is stationary, in some viewing conditions, it may be helpful to adjust the SENSOR GAIN control. Rotate the SENSOR GAIN control cw out of detent position. Choose a scene within DVE's FOV. Adjust the SENSOR GAIN control until objects and background features range from near black to near white. At some settings it may be helpful to also make a slight readjustment of the SENSOR LEVEL control. The optimum gain setting varies with the scene and background. The manual operation should only be used when the vehicle is stationary. It may be useful for viewing imagery having very high thermal difference scenes, such as nearby vehicles, factories, or fires. It may also be useful for viewing low thermal difference scenes, such as featureless desert terrains or wet fields during or after a rain, where increased gain (using manual operation) may enhance detail resolution.

WARNING

There are two short periods each day called crossover periods or diurnal cycle when most natural objects are about the same temperature. This is when they have cooled down at night and as they are heating up in the early morning. Since objects are near the same temperature, there is not much temperature difference for the DVE to use, degrading the image display quality. This is also what happens when heavy rain or thermal neutral conditions make all natural objects close to the same temperature.

7. POL Switch - The scene polarity preference is selected by using the POL switch (5). With the switch in WHT-HOT (up position), hot objects in the scene appear lighter on a darker background. With the switch in BLK-HOT (down position), hot objects in the scene appear darker on a lighter background. A small rectangle in the lower left corner of the display indicates the switch position. A dark rectangle indicates the BLK-HOT switch position; a white rectangle indicates the WHT-HOT switch position.

NOTE

With sensor PN 6455000, in "white hot" when the level control is turned to right the display brightness increases, in "black hot" when the level control is turned to the right the display brightness will decrease

8. CAL – (Only Sensor PN 6455000) Calibration resets system to optimize the best quality scene on the screen.

WARNING

During calibration the image may be blurred or loss of video may occur for a few seconds.

(a) Auto CAL – Upon system activation the system shall come up in automatic calibration mode and will perform a calibration during start-up. "A" is displayed in the upper left corner indicating system is in automatic mode and will flash for ten seconds prior to performing calibration. Calibration is

performed every 5 minutes for the first 15 minutes; thereafter a calibration will be performed at 15-minute intervals.

NOTE

In Auto CAL mode a user can still perform a Manual CAL by toggling the polarity switch twice in .8 seconds.

(b) Manual CAL - 4 toggles of the polarity switch in a 2 second period will change system to manual mode. “M” is displayed in the upper left corner indicating system in manual mode. Calibration must be manually started. To perform a Manual CAL the user must toggle the polarity switch twice in .8 seconds.

NOTE

The system will order an auto cal as needed, when the temperature of the sensor moves between one of four factory-determined TCOMP temperature regions. If the system is in "A" mode, the "A" will flash for 10 seconds before the cal. If the system is in "M" mode, the "M" will flash indefinitely, until the user initiates a manual calibration.

9. Azimuth Movement - Refer to the appropriate vehicle specific chapter for azimuth movement.
10. Elevation Movement - Refer to the appropriate vehicle specific chapter for elevation movement.

Section II. Operating Instructions

2-2 OPERATING INSTRUCTIONS

Refer to Figure 2-1 for location of controls, indicators, and connectors identified in this section. For unique controls, indicators, and connectors, refer to the appropriate vehicle specific chapter.

2-2.1 Initial Setup

Before applying power to the unit, ensure that the following control positions are as indicated in the following steps.

WARNING

Before operating the vehicle, ensure that the DVE azimuth and elevation controls are in the locked positions. Road wheel indicators appear on the display when azimuth and elevation controls are in the locked position. This will ensure that the DVE is looking straight ahead when operating the vehicle. Manually verify forward and lock position prior to operating the vehicle.

WARNING

Helmets must always be worn when driving with the DVE installed. The DVE display should be removed from its mount when not in use for extended driving operations to minimize the risk of head strike injuries.

1. Rotate Sensor Assembly azimuth and elevation to straight-ahead and level 0° detent positions. Refer to appropriate vehicle specific chapter for location of controls.
2. Set DVE POWER switch (3) to OFF (down position).
3. Set VIDEO switch (4) to SENSOR (up position).
4. Set POL switch (5) to WHT-HOT (up position).
5. With DISPLAY BRIGHTNESS control (6) turned fully ccw, rotate knob approximately ¼ turn cw.
6. Set SENSOR LEVEL (7) and SENSOR GAIN (8) controls to full ccw (AUTO) detent position.

2-2.2 Operation

Refer to paragraph 2-1.2 for control functional description.

2-2.3 Shutdown

Refer to the following steps for shutdown procedures.

1. Set the Sensor Assembly azimuth and elevation controls to the locked azimuth straight ahead position and 0° elevation position.

2. Set SENSOR LEVEL (7) and SENSOR GAIN (8) controls to full ccw (AUTO) detent position.
3. With the DISPLAY BRIGHTNESS control (6) turned fully ccw, rotate the knob approximately ¼ turn cw.
4. Set POL switch (5) to WHT-HOT (up position).
5. Set VIDEO switch (4) to SENSOR (up position).
6. Set POWER switch (3) to OFF (down position).

2-2.4 Stowing

Refer to the appropriate vehicle specific chapter for equipment stowage instructions.

Section III. Operator's PMCS

2-3 INTRODUCTION

This section describes the common maintenance tasks required to ensure proper operation of the DVE. Operator maintenance consists of inspection, cleaning, and troubleshooting.

2-4 MATERIAL REQUIRED

Material necessary to clean the housing, display, and IR window is listed in Appendix F.

2-5 OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Preventive maintenance checks and services consist of a visual check for physical damage and routine cleaning services. Frequency of this task varies with the operating environment and should not require more than six minutes. Refer to Figure 2-1 for Display Controls and Indicators. Refer to the appropriate vehicle specific chapter for unique controls and indicators.

2-5.1 Inspection

Thoroughly inspect the DVE when it is installed in or removed from the vehicle. Inspect for existing damage or conditions that might result in further damage or malfunction. Inspect the unit, as described in Table 2-3, to ensure a complete examination. The inspection procedures may be performed in any sequence convenient to the inspector.

2-5.2 PMCS Table

The PMCS Table (Table 2-3) is divided into three main columns:

1. Interval – This column tells you when you must do the procedure in the procedure column. Before (B) procedures must be done before you operate or use the equipment for its intended mission. During (D) procedures must be done while the equipment is performing its intended mission. After (A) procedures must be done immediately after you have operated or used the equipment. An '●' in the column tells you when you are to perform a specific inspection.
2. Item(s) to be Inspected – This column identifies the item(s) to be inspected.
3. Inspection Procedure – This column provides the procedure you must use to check or inspect the item(s). You must do the procedure at the time stated in the interval column.

Table 2-3. Preventive Maintenance Checks and Services

Interval			Items to be inspected	Inspection Procedure
B	D	A		
●		●	Exterior surface	Inspect for dirt, dents, cracks, scratches, or other physical damage. If necessary, refer to paragraph 2-5.3 for cleaning instructions. If damaged, refer to a higher level of maintenance.
●		●	Environmental seal	If applicable, inspect for dirt, dents, cracks, scratches, tears, or any other physical damage that could prevent an effective environmental seal when the unit is installed. If defective, repair in accordance with vehicle specific removal/replacement procedure.
●		●	IR window	Inspect for cracks, chips, looseness, damage to optical coating, and evidence of foreign matter or smudges on surface. If necessary, clean the IR window per paragraph 2-5.4. If damaged, refer to a higher level of maintenance.
●		●	SA/PTM cable	Inspect SA/PTM cable for fraying, cuts, or loose connections. Ensure silver connector P1 on Sensor Assembly is locked by visual inspection or by gently pulling on the black molded end opposite the silver barrel. If any of the above is damaged, refer to a higher level of maintenance.
●		●	Cables and connectors	Inspect all cables and connectors for: a. Fraying, cuts, or damage to cable b. Dirt, moisture, or metal filings inside connector c. Improper mating of connector d. Mildew/corrosion e. Damaged or loose connector shell. If damaged, refer to higher level of maintenance.
●	●	●	Azimuth lock (If applicable)	Depressing the Azimuth Lock control completely releases PTM for smooth azimuth movement. Release Azimuth Lock and rotate PTM through center position. The PTM will automatically lock securely in center position. If damaged, refer to a higher level of maintenance.
●	●	●	Azimuth adjustment	Release Azimuth Lock and move Azimuth Control left and right. Movement shall be smooth for entire azimuth movement. To rotate in azimuth when locked in 0° straight ahead position, depress Azimuth Lock control until the Sensor Assembly rotates freely left or right for desired FOV. If damaged, refer to a higher level of maintenance.
●	●	●	Elevation lock (If applicable)	Depressing the Elevation Lock control completely releases Sensor Assembly for smooth elevation movement. Release Elevation Lock and rotate Sensor Assembly through center position. The Sensor Assembly will automatically lock securely in center position. If damaged, refer to a higher level of maintenance.
●	●	●	Elevation adjustment	Rotate elevation control up (turn left) and down (turn right) (M56 ONLY) or move joystick down (fore) and up (aft) to ensure the maximum elevation movement. Elevation movement should be smooth. If damaged, refer to a higher level of maintenance.
●	●	●	Display screen	Inspect for cracks, chips, looseness, evidence of foreign matter, or smudges on surface. If necessary, clean the screen per paragraph 2-5.4. If damaged, refer to a higher level of maintenance.

Table 2-3. Preventive Maintenance Checks and Services (Continued)

Interval			Items to be inspected	Inspection Procedure
B	D	A		
●	●	●	Controls, switches, indicators	Inspect DVE per applicable vehicle specific chapter. Inspect for physical damage such as missing or broken knobs If damaged or missing, refer to higher level of maintenance. Turn on DVE per paragraphs 2-2.1 and 2-2.2. Verify that all controls and indicators are functioning properly. If any control or indicator is not functioning properly, refer to a higher level of maintenance.
●	●	●	DCM mount (If applicable)	Refer to vehicle technical manual for inspection procedure.

2-5.3 Cleaning Exterior Surfaces Except IR Window

Clean exterior surfaces as follows: The DVE should be cleaned using only approved materials listed in Appendix F. If unit is not kept clean, performance may be degraded, and dust, grease or other foreign matter may hide relatively obvious defects that would be noted in a visual inspection.

CAUTION

Do not use wiping cloth to clean the infrared window or the display glass.

1. Use a dry, clean wiping cloth to remove dust, dirt, grease, moisture or other foreign matter from the exterior surface of the DVE.

CAUTION

- Do not allow water to contact electrical pin connectors. Water causes mildew, corrosion, and electrical shorts
- Do not use high pressure water hose to clean the DVE.

2. If the foreign matter cannot be removed using a dry wiping cloth, dampen a clean cloth with a solution of mild liquid general purpose detergent mixed in warm water and clean all DVE surfaces except for the IR window and display screen.
3. Dry with a clean, dry cloth.

2-5.4 Cleaning Optical Surfaces

Clean the optical surfaces as follows:

CAUTION

- Ensure that cleaning compound remains uncontaminated.
- Do not use excessive hand pressure when rubbing IR window or display glass.

1. Remove fingerprints, oil spots, and dirt by dabbing glass with lens tissue moistened (not saturated) with lens cleaning compound.
2. Start at center of IR window or display screen and wipe toward outside of glass. Keep clean area of lens tissue against glass surface by turning after each stroke or using a clean lens tissue after both sides have been used.
3. If the optical surface remains contaminated, use a clean lens tissue and repeat steps 1 and 2. Normal hand pressure may be used to rub glass when cleaning.

Section IV. Operator Troubleshooting

2-6 INTRODUCTION

This section describes the common troubleshooting required to ensure proper operation of the DVE. Refer to the appropriate vehicle specific chapter for vehicle unique troubleshooting.

2-7 OPERATOR TROUBLESHOOTING

Table 2-4 lists the common malfunctions that may occur. Table 2-4 does not list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault.

If the equipment malfunction is not listed or the actions listed do not correct the fault, forward the entire system, to include all items referenced in Appendix C, to higher level of maintenance.

Table 2-4. Operator Troubleshooting Table

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. POWER LED DOES NOT LIGHT WHEN POWER SWITCH IS ON
   a. Check power cable for correct installation.
      Install power cable correctly.
   b. Recycle power and recheck power LED.
      Refer to higher level of maintenance.
2. NO GRAYSCALE WITHIN FIVE MINUTES OF TURN-ON [-35° F(-37° C) TO 120° F (49° C)]. (FOR SENSOR PN 3253259-2, -6, -8 ONLY)
   a. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
      Connect SA/PTM cable correctly. Recycle POWER switch and check for grayscale.
   b. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
      Connect PTM/DCM cable correctly.
   c. Recycle POWER switch and check for grayscale.
      If grayscale is still not present, refer to higher level of maintenance.
3. NO IR SCENE DISPLAYED
   a. Adjust sensor gain and level controls to fully ccw (AUTO). Adjust brightness to ¼ turn cw.
      If IR scene is still not present, perform following checks.
   b. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
      Connect SA/PTM cable correctly. Recycle POWER switch and check for IR scene.
   c. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
      Connect PTM/DCM cable correctly.
   d. Recycle POWER switch and check for IR scene.
      If IR scene is still not present, refer to higher level of maintenance.
4. THE WORDS “NO SENSOR VIDEO CHECK VIDEO SWITCH” ARE DISPLAYED
   a. Ensure video switch is in SENSOR position.
      Place video switch in SENSOR position and recheck for words on display.
   b. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
      Connect SA/PTM cable correctly. Recycle POWER switch and check for words on display.
   c. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
      Connect PTM/DCM cable correctly.
   d. Recycle POWER switch and check for words on display.
      If words are still on display, refer to higher level of maintenance.
5. DCM CONTROLS DO NOT RESPOND
   Check controls for proper operation.
      Refer to higher level of maintenance.
6. PTM AZIMUTH AND/OR ELEVATION CONTROLS DO NOT FUNCTION PROPERLY
   Check controls for proper operation.
      Refer to higher level of maintenance.

CHAPTER 3 UNIT MAINTENANCE

Section I. Unit Troubleshooting Procedures

3-1 INTRODUCTION

This section contains troubleshooting procedures that are common to all TWV versions of the Driver's Vision Enhancer (DVE). Refer to the appropriate vehicle specific chapter for vehicle unique troubleshooting procedures.

3-2 UNIT TROUBLESHOOTING

Table 3-1 lists the common malfunctions that may occur. Table 3-1 does not list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or the actions listed do not correct the fault, forward the entire system, to include all items referenced in Appendix C, to higher level of maintenance.

Table 3-1. Unit Troubleshooting Table

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. POWER LED DOES NOT LIGHT WHEN POWER SWITCH IS ON
a. Check power cable for correct installation.
Install power cable correctly. Recycle POWER switch and recheck power LED.
b. Remove the connector from the POWER (A1J1) connector on back of DCM and check for 16 to 32 VDC at P1 connector of DVE power cable.
If voltage at P1 connector is incorrect, refer to vehicle maintenance manual to troubleshoot vehicle.
If voltage at P1 connector is correct, replace DCM.
2. NO GRAYSCALE WITHIN FIVE MINUTES OF TURN-ON [-35° F(-37° C) TO 120° F (49° C)] (FOR SENSOR PN 3253259-2, -6, -8 ONLY).
a. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
Connect SA/PTM cable correctly. Recycle POWER switch and check for grayscale.
b. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
Connect PTM/DCM cable correctly.
c. Recycle POWER switch and check for grayscale.
If grayscale is still not present, replace Sensor Assembly.
If replacing Sensor Assembly does not correct problem, replace DCM.
If replacing DCM does not correct problem, replace SA/PTM cable.
If replacing SA/PTM cable does not correct problem, troubleshoot PTM/DCM cable.
3 NO IR SCENE DISPLAYED
a. Adjust sensor gain and level controls to fully ccw (AUTO). Adjust brightness to ¼ turn cw.
If IR scene is still not present, perform following checks:
b. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
Connect SA/PTM cable correctly. Recycle POWER switch and check for IR scene.
c. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
Connect PTM/DCM cable correctly.
d. Recycle POWER switch and check for IR scene.
If IR scene is still not present, replace Sensor Assembly.
If replacing Sensor Assembly does not correct problem, replace DCM.
If replacing DCM does not correct problem, replace SA/PTM cable.
If replacing SA/PTM cable does not correct problem, troubleshoot PTM/DCM cable.

Table 3-1. Unit Troubleshooting Table (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. THE WORDS “NO SENSOR VIDEO CHECK VIDEO SWITCH” ARE DISPLAYED ON DISPLAY
a. Ensure video switch is in SENSOR position.
Place video switch in SENSOR position and recheck for words on display.
b. Check that SA/PTM cable is properly connected between Sensor Assembly and PTM Assembly.
Connect SA/PTM cable correctly. Recycle POWER switch and check for words on display.
c. Check that PTM/DCM cable is properly connected between PTM Assembly and DCM.
Connect PTM/DCM cable correctly.
d. Recycle POWER switch and check for words on display.
If words are still present, replace Sensor Assembly.
If replacing Sensor Assembly does not correct problem, replace DCM.
If replacing DCM does not correct problem, replace SA/PTM cable.
If replacing SA/PTM cable does not correct problem, troubleshoot PTM/DCM cable.
5. DCM CONTROLS DO NOT RESPOND
Check controls for proper operation.
Replace DCM.
6. PTM AZIMUTH AND/OR ELEVATION CONTROLS DO NOT FUNCTION PROPERLY
Check controls for proper operation.
Replace PTM Assembly.

Section II. Unit Maintenance Procedures

3-3 INTRODUCTION

This section contains maintenance procedures that are common to all TW versions of the Driver’s Vision Enhancer (DVE). Refer to the appropriate vehicle specific chapter for vehicle unique maintenance procedures.

3-4 KNOBS (Figure 3-1)

NOTE

If backside of DCM is reflected in Figure 3-2 use knob PN 68054-1, if backside of DCM is reflected in Figure 3-3 use knob PN 918575-001.

Tools: Tool Kit (Item 1 or 2, Appendix B)

Perform the following procedures to replace control knobs:

3-4.1 Knob Removal

1. When knob indicator line is in position shown, use a 0.050" hex head screw key to loosen two setscrews on knob.
2. Remove knob from control shaft.

3-4.2 Knob Replacement

1. Install knob onto control shaft.
2. With knob indicator line positioned as shown, tighten two setscrews on knob with a 0.050" hex head screw key.

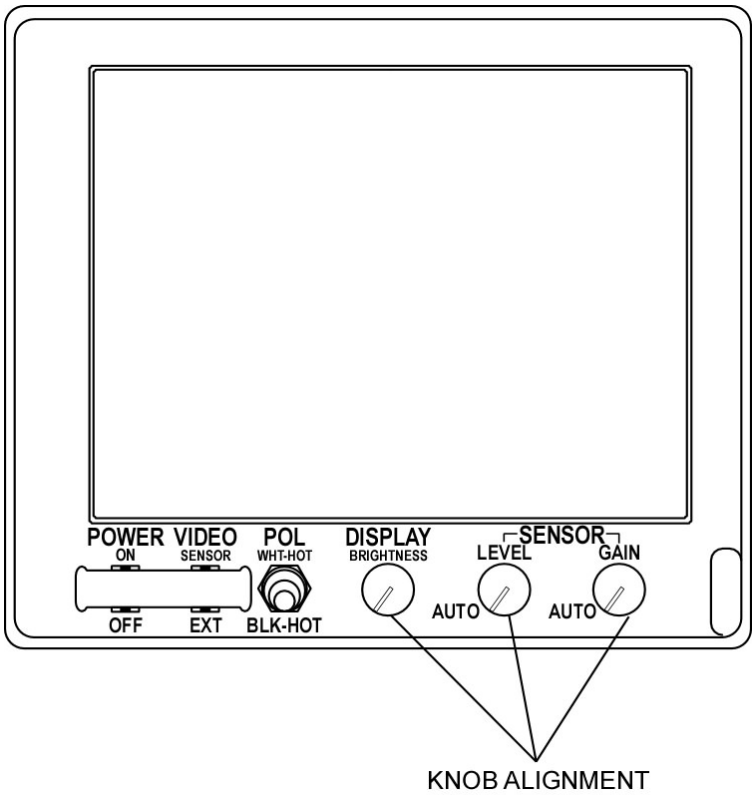


Figure 3-1. Display Control Module Knob Alignment

3-5 ELECTRICAL CONNECTOR COVERS (A1J4 OR A1J5) (Figure 3-2 and Figure 3-3)

Tools: Tool Kit (Item 1 or 2, Appendix B)

Perform the following procedures to replace electrical connector covers:

NOTE

Look at the backside of the DCM to determine appropriate Removal/Replacement procedures using Figures 3-2 and 3-3.

3-5.1 Electrical Connector Cover Removal

1. For Figure 3-2
   a. Using a #1 cross tip screwdriver, remove screw (1) holding electrical connector cover chain.
   b. Remove electrical connector cover by turning CCW.
2. For Figure 3-3
   a. Using a 7/8” wrench for A1J4 and a 1” for A1J5 unscrew nut.
   b. Remove BNC connector cover.

3-5.2 Electrical Connector Cover Replacement

1. For Figure 3-2
   a. Install cover on electrical connector by turning CW.
   b. Install screw (1) in end of electrical connector cover chain.
   c. Using #1 cross tip screwdriver, install screw (1) in back of DCM.
2. For Figure 3-3
   1. Install cover on BNC connector.
   2. Tighten nut onto BNC connector.

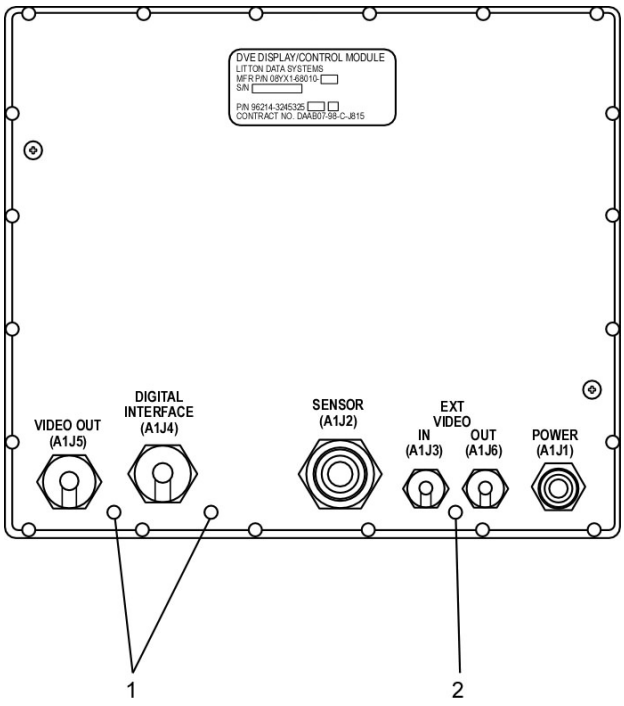


Figure 3-2. Connector Covers (Version 1)

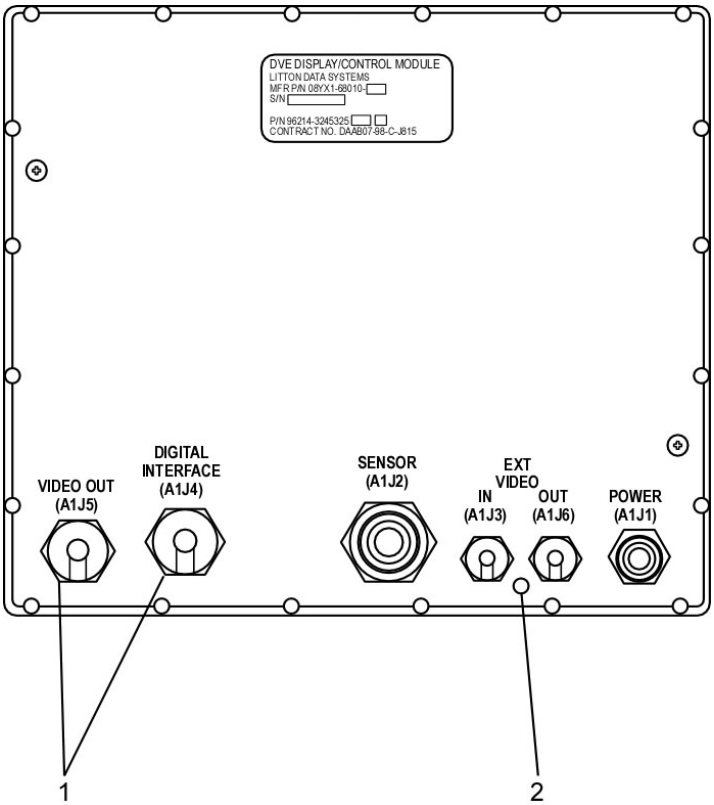


Figure 3-3. Connector Covers (Version 2)

3-6 BNC CONNECTOR COVERS (A1J3 OR A1J6) (Figure 3-2 and Figure 3-3)

Tools: Tool Kit (Item 1 or 2, Appendix B)

Perform the following procedures to replace electrical connector covers:

3-6.1 BNC Connector Cover Removal

1. Using a #1 cross tip screwdriver, remove screw (2) holding BNC connector cover chain.
2. Remove BNC connector cover.

3-6.2 BNC Connector Cover Replacement

1. Install cover on BNC connector.
2. Install screw (2) in end of BNC connector cover chains.
3. Using a #1 cross tip screwdriver, install screw in back of DCM.

3-7 SENSOR WINDOW COVER (Figure 3-4)

Tools: None

Perform the following procedures to replace sensor window cover:

3-7.1 Sensor Window Cover Removal

Remove sensor window cover (1) from sensor (2) by pulling window cover off of sensor.

3-7.2 Sensor Window Cover Replacement

Place sensor window cover (1) on sensor (2).

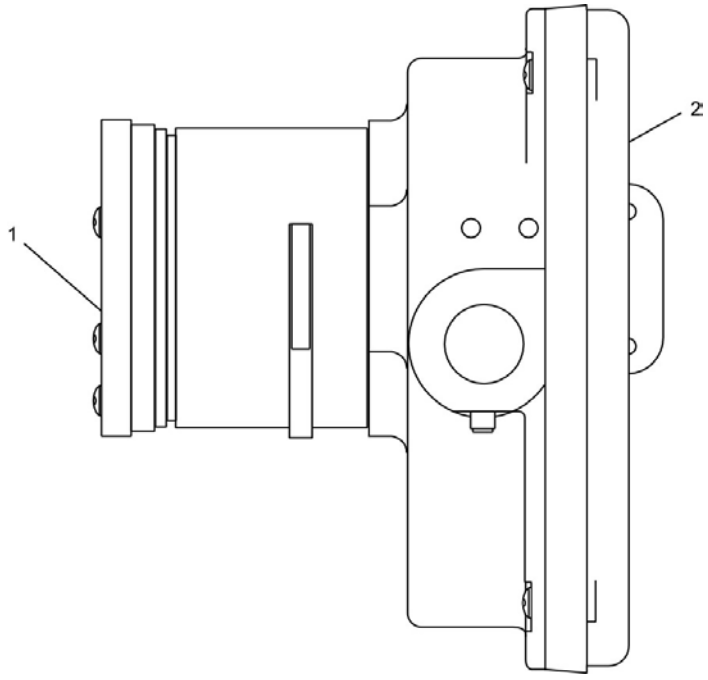


Figure 3-4. Sensor Assembly

CHAPTER 4 M56 DRIVER'S VISION ENHANCER, AN/VAS-5A(V)2

Section I. Introduction

This chapter contains equipment descriptions, operating instructions, and maintenance procedures specific to the M56 Driver's Vision Enhancer (DVE). Refer to Chapters 1 through 3 for general information that pertains to all DVE's.

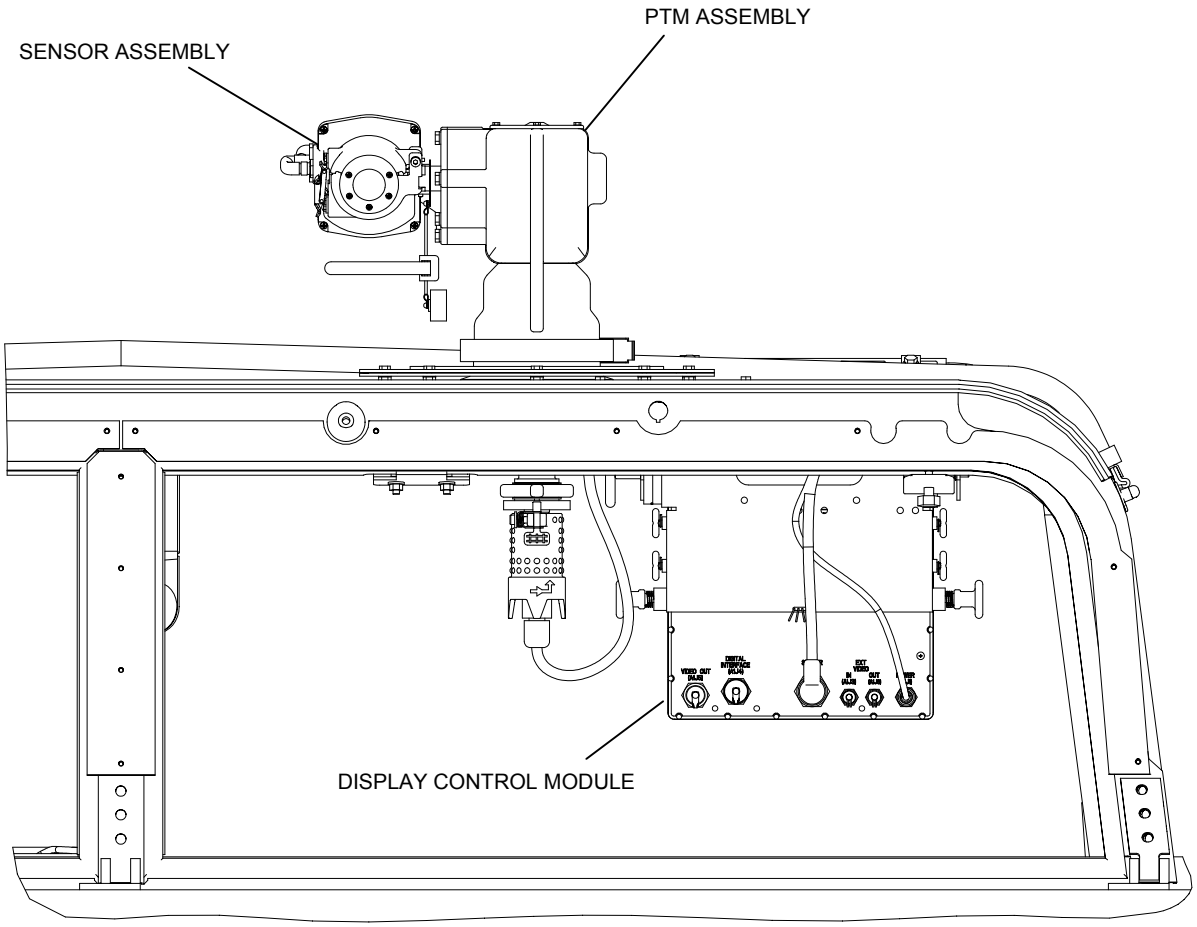


Figure 4-1. M56 Driver's Vision Enhancer (DVE), AN/VAS-5A(V)2

Section II. Equipment Description

4-1 EQUIPMENT DATA

4-1.1 Outline Dimensions, Weight, and Power Dissipation

Refer to Table 4-1, Figure 4-2, 4-3, and 4-4 for outline dimensions, weight, and power dissipation.

Table 4-1. M56 DVE Outline Dimensions, Weight, and Power Dissipation

Characteristic	Specification
Sensor Assembly PN325359-2, -6, -8 (Figure 4-2)	
Width	4.97 inches
Height	4.31 inches
Depth	4.90 inches
Weight	2.0 pounds (Maximum)
Power Dissipation	10 watts (Maximum)
Sensor Assembly PN 6455000 (Figure 4-3)	
Width	3.64 inches
Height	5.25 inches
Depth	3.88 inches
Weight	2.73 pounds (Maximum)
Power Dissipation	10 watts (Maximum)
PTM Assembly	
Width	12.87 inches (Maximum)
Height	19.85 inches (Maximum)
Depth	12.44 inches (Maximum)
Weight	20.58 pounds (Maximum)
Display Control Module	Refer to Chapter 1, Table 1-1, and Figure 1-3.

4-1.2 Physical Characteristics

Refer to Table 4-2 and Figure 4-5 for vehicle specific physical characteristics of the DVE.

Table 4-2. DVE Physical Characteristics

Characteristic	Specification
Sensor Assembly	
Field of View (FOV) (angular area visible through an optical instrument	40° azimuth/30° elevation
Field of Regard (FOR) (area that can be examined while slewing through normal left/right up/down limits)	±190° azimuth, +58° to -32° elevation
Focus	5 meters to infinity
Display Control Module	Refer to Chapter 1.

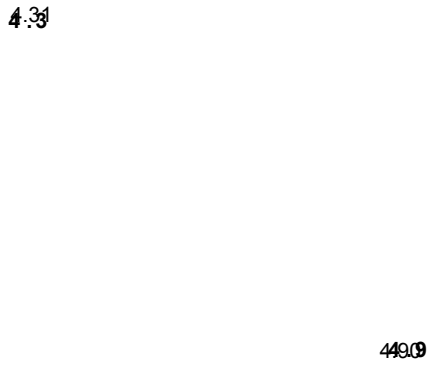


Figure 4-2. Sensor Assembly Outline Dimensions (PN325359-2, -6, -8)

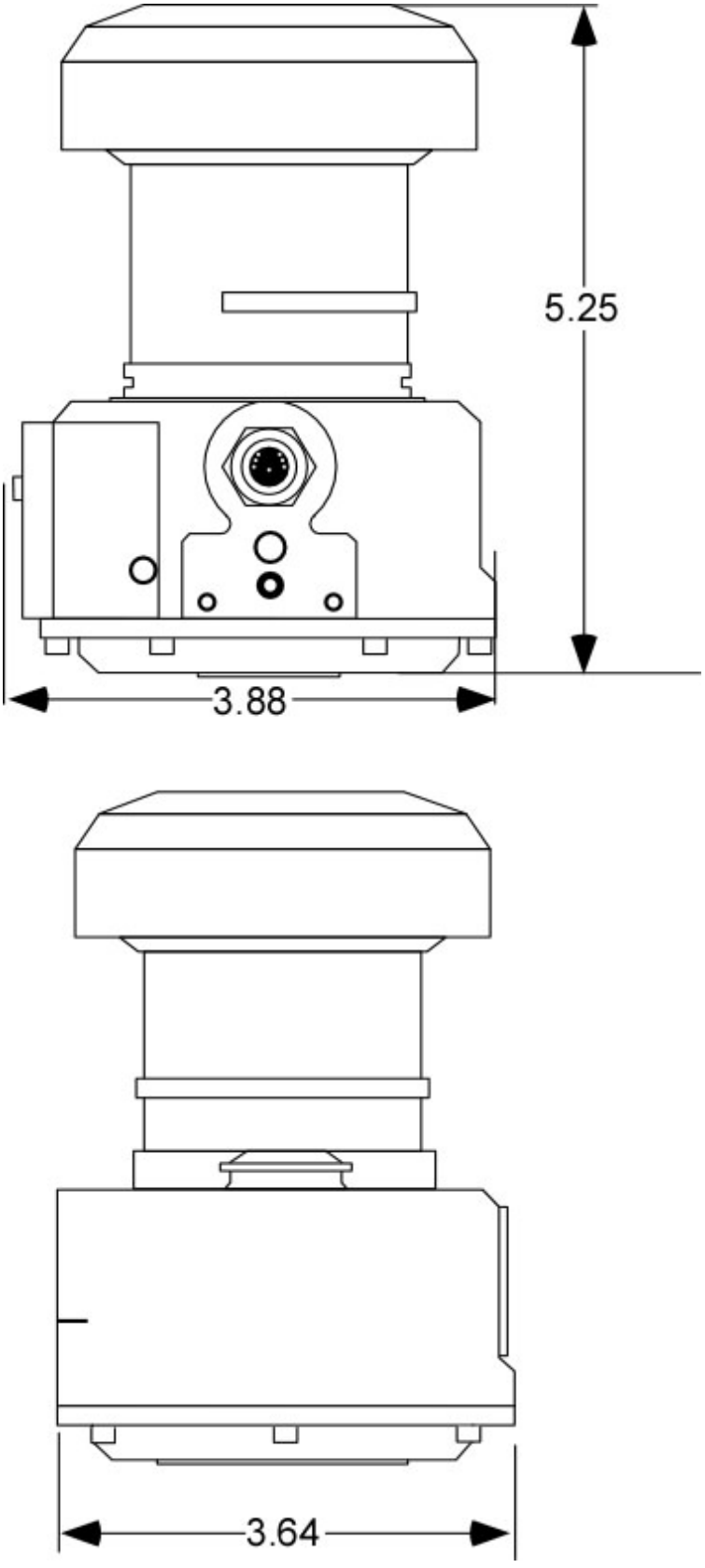


Figure 4-3. Sensor Assembly Outline Dimensions (PN 6455000)

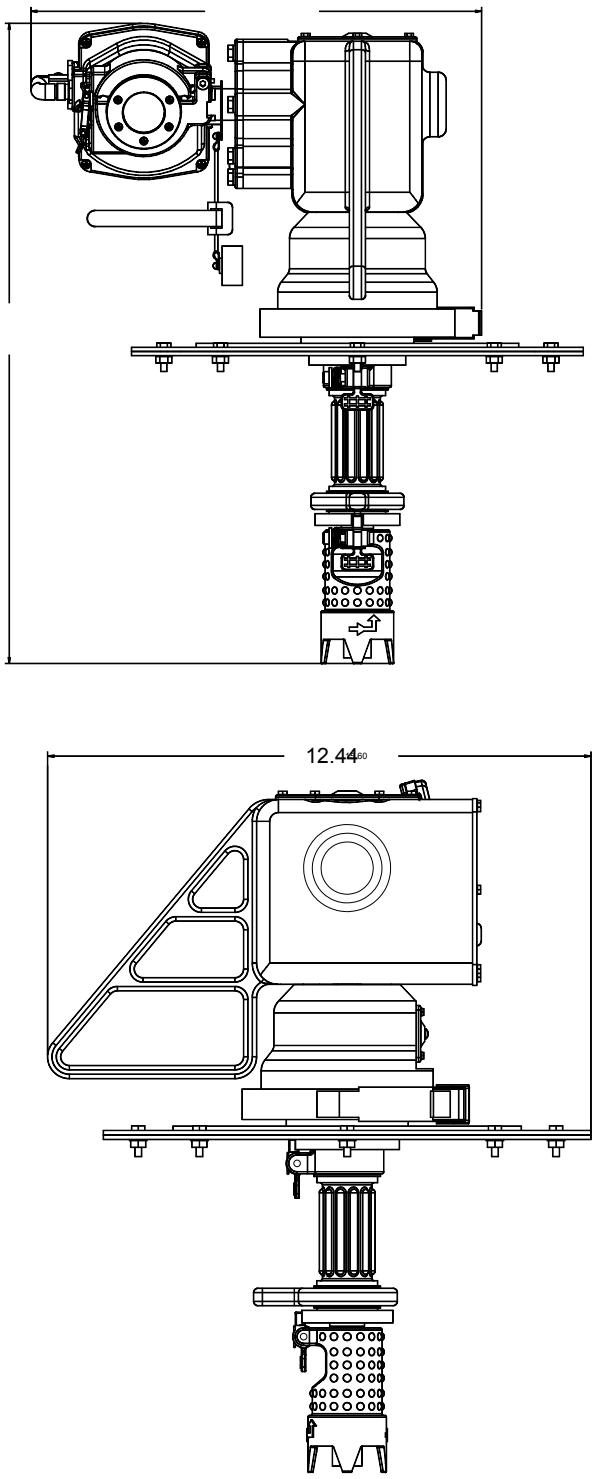


Figure 4-4. PTM Assembly Outline Dimensions

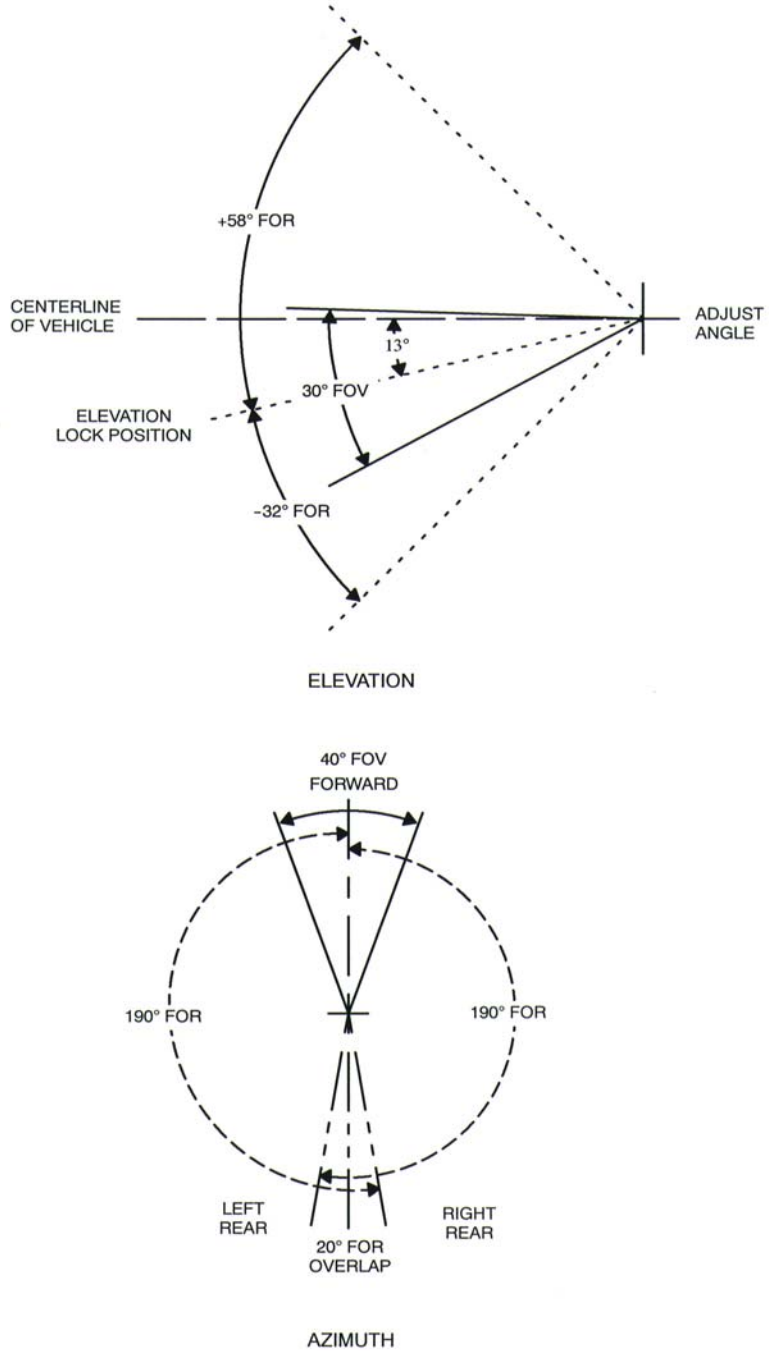


Figure 4-5. FOV/FOR Azimuth and Elevation

Section III. Installation/Removal Instructions

4-2 DVE INSTALLATION

The following procedures cover the installation of the DVE to the M56 Smoke Vehicle.

4-2.1 Pan and Tilt Module (PTM) Assembly Installation (Figure 4-6 and 4-7)

1. Press latch clip and pull V-Retainer Coupling handle (Figure 4-6) on rooftop PTM mounting ring. Pull handle out until V-Retainer Coupling comes loose.
2. Separate T-Bar from handle.
3. Spread V-Retainer Coupling and remove from mounting ring.
4. Remove Dummy PTM Plug and place in stowage pouch, which is above the stowed DCM.
5. Remove PTM Assembly from transportation case (Figure 4-7).
6. Place PTM Assembly in PTM mounting ring on vehicle roof with brush guard facing forward.
7. Match notch on mounting ring with notch in PTM Assembly base to ensure proper alignment.

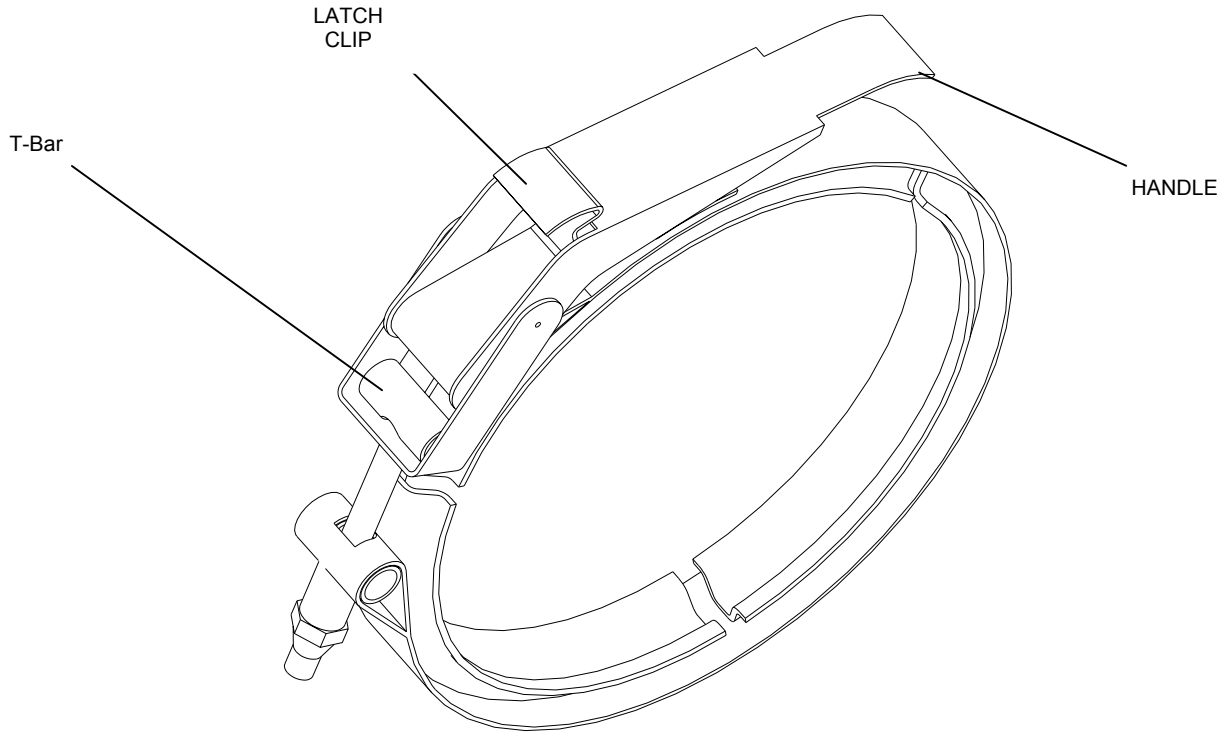


Figure 4-6 V-Retainer Coupling

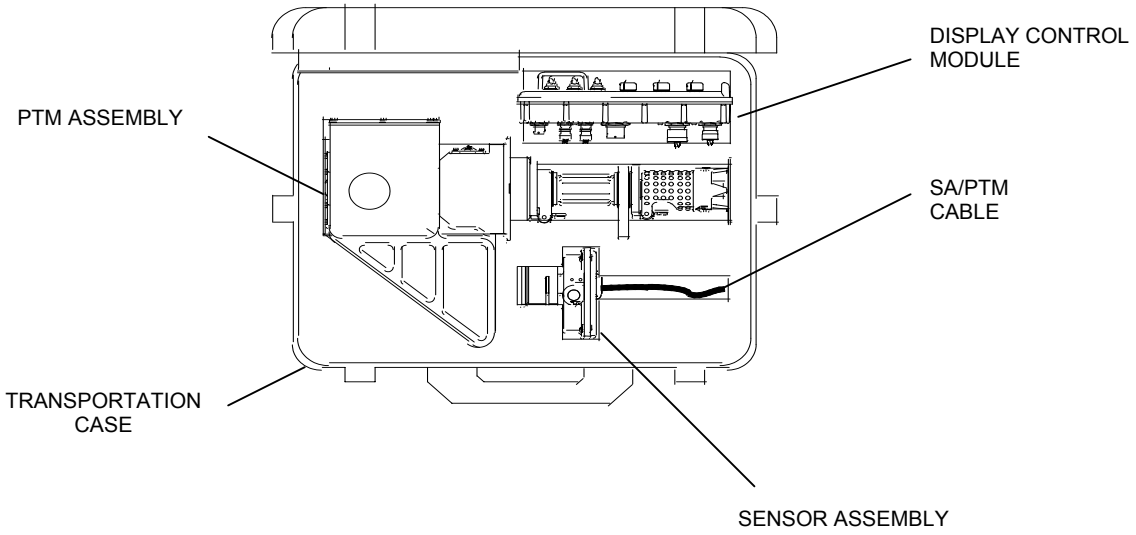


Figure 4-7. M56 DVE Storage

8. Spread V-Retainer Coupling and slide around base of PTM Assembly and lip of mounting ring.
9. Insert T-Bar in V-Retainer Coupling handle.
10. Ensure notch in base of PTM Assembly is aligned with notch on lip of mounting ring.
11. Turn T-Bar so that it remains in handle.
12. Rotate V-Retainer Coupling and T-Bar so that opening of V-Retainer Coupling faces forward with notches on PTM Assembly and mounting ring visible.
13. Hold V-Retainer Coupling and T-Bar, ensuring T-Bar remains in handle and close handle.
14. Check to ensure that notch on PTM Assembly is aligned with notch on lip of mounting ring.

4-2.2 Sensor Assembly (SA) Installation (Figure 4-8)

1. Install PTM Assembly per paragraph 4-2.1.
2. Open latch holding Sensor Clamp to Sensor Cradle.
3. Raise Sensor Clamp and install Sensor Assembly with window pointing forward and alignment ring pointing down.
4. Rotate Sensor Assembly CCW until it stops.
5. Close Sensor Clamp and Sensor Assembly will self-align.

6. Place bar over lip of latch and press handle to secure Sensor Assembly.
7. Remove connector cap from connector on PTM Assembly and install on dummy connector.
8. Align key and connect SA/PTM cable to PTM Assembly.
9. Remove lens cover and place in stowage pouch.

4-2.3 Display Control Module (DCM) Installation (Figure 4-9, 4-10, and 4-11)

1. Remove DCM from transportation case.
2. Loosen display locking knob, push in on stowage release knobs, and rotate bracket down.
3. Remove T-Bolts from bracket.
4. Line up holes on side of DCM with holes in bracket and install but do not tighten four T-bolts.
5. Once all four T-Bolts have been installed, tighten T-Bolts.
6. Ensure DCM POWER switch is set to OFF.
7. Remove the power cable connector from the dummy connector on the display bracket.
8. Align and install power cable to the POWER (A1J1) connector (Figure 4-10) on DCM.
9. Remove PTM/DCM cable from storage case.
10. Connect cable between DCM SENSOR (A1J2) connector and PTM connector in bottom of PTM Assembly.
11. Loosen display adjustment knob at top, position DCM fore (forward) and aft (backward), and retighten knob (Figure 4-11).
12. Rotate DCM to comfortable position and tighten display locking knob.

Figure 4-8. PTM and Sensor Installation

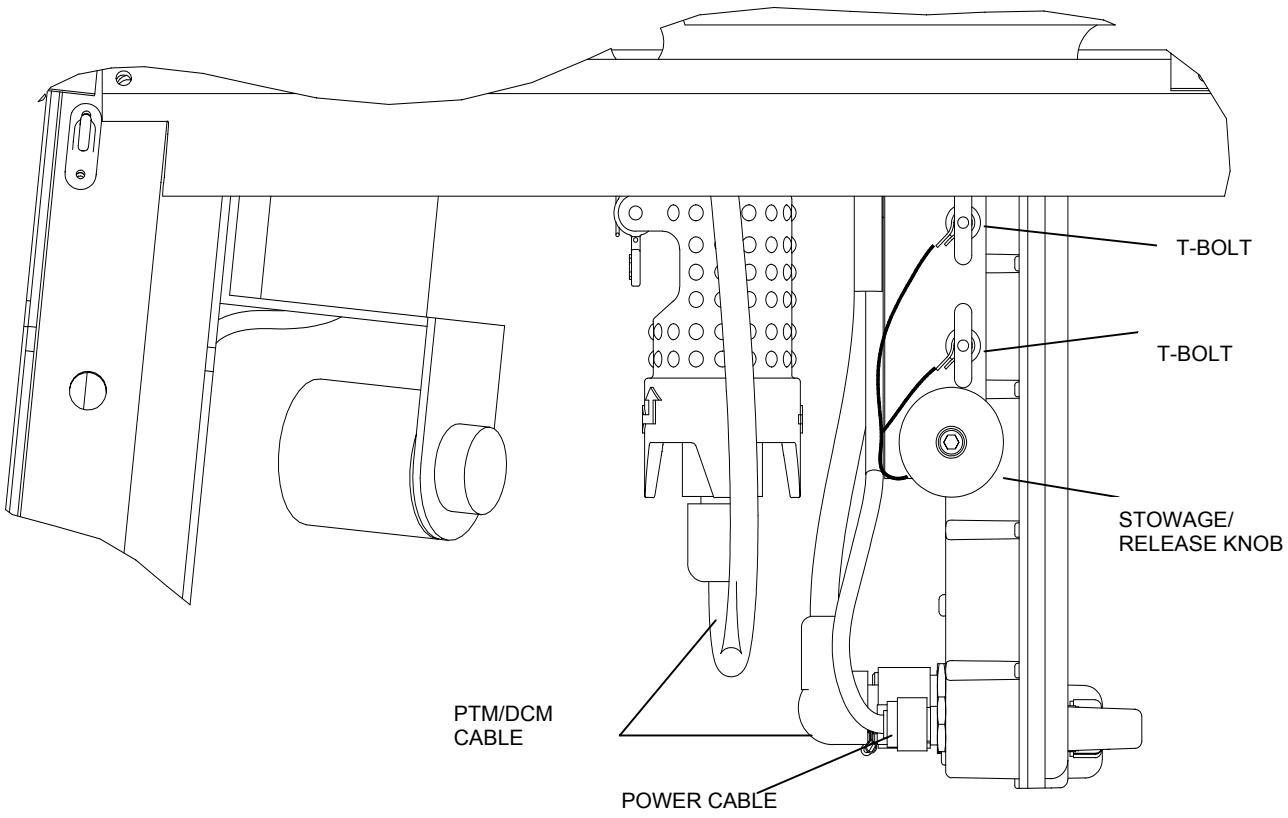


Figure 4-9. Display Control Module (Side View)

4-3 DVE REMOVAL.

The following procedures cover the removal of the DVE to the M56 Smoke Vehicle.

4-3.1 Display Control Module (DCM) Removal (Figure 4-9)

1. Loosen display locking knob, push in on stowage release knobs, and rotate bracket down.
2. Disconnect Power Cable and PTM/DCM Cable from connectors located on back of DCM and install on dummy connectors on display bracket.
3. While holding DCM, remove four T-Bolts holding the DCM on display bracket.
4. Remove DCM from display bracket.
5. Store T-Bolts in storage holes on display bracket.
6. Return display bracket to stow position.

4-3.2 Sensor Assembly (SA) Removal (Figure 4-8)

1. Disconnect SA/PTM interconnect cable from the PTM Assembly.
2. Remove connector cap on PTM Assembly dummy connector and install on PTM connector.
3. Release latch, raise sensor clamp, and remove sensor assembly.
4. Remove lens cover from stowage pouch and place on sensor window.
5. Close Sensor Clamp and latch.

4-3.3 PTM Assembly Removal (Figure 4-6 and 4-7)

1. Disconnect DCM/PTM interconnect cable assembly from bottom of PTM Assembly.
2. Ensure Sensor Assembly has been removed per paragraph 4-3.2.
3. Press latch clip and pull V-Retainer Coupling handle (Figure 4-6) on rooftop PTM mounting ring. Pull handle out until coupling comes loose.

4. Separate T-Bar from handle.
5. Spread V-Retainer Coupling and remove from mounting ring.
6. Lift PTM Assembly from mounting ring.
7. Store PTM Assembly in storage case.
8. Remove dummy PTM Plug from stowage pouch.
9. Install Dummy PTM Plug on mounting ring on rooftop taking care to align notches in plug with notches in mounting ring.
10. Spread V-Retainer Coupling and slide around plug and lip of mounting ring.
11. Insert T-Bar in V-Retainer Coupling handle.
12. Hold V-Retainer Coupling, ensuring T-Bar remains in handle, and close handle.

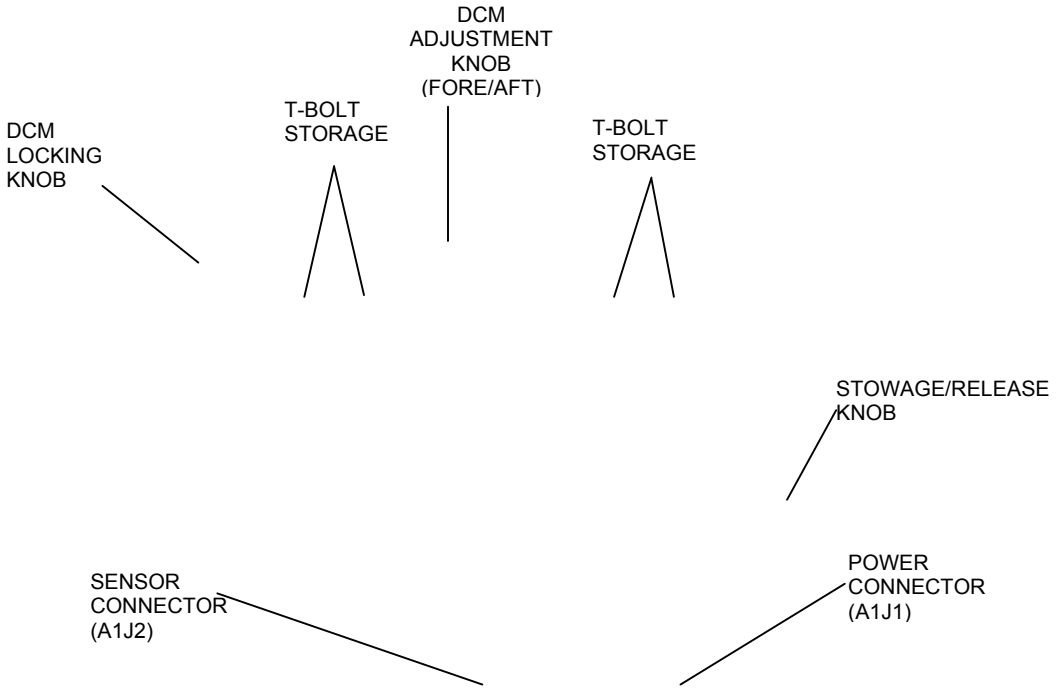


Figure 4-10. Display Control Module (Back View)

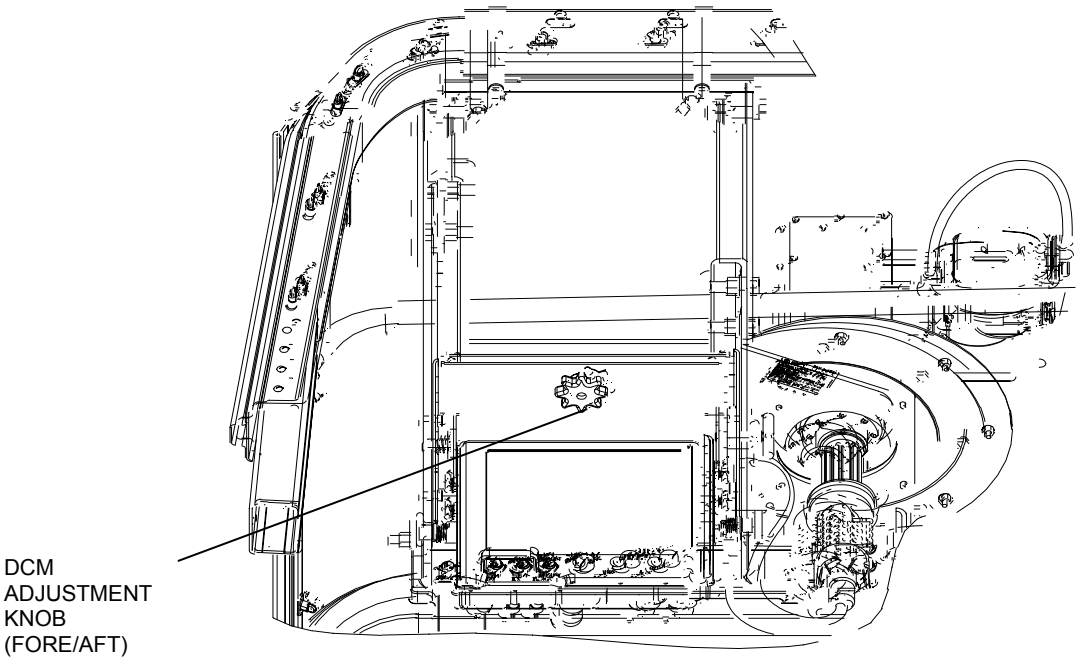


Figure 4-11. Large Adjustment Knob at Top

Section IV. Operating Instructions

4-4 POSITIONING CONTROLS

Table 4-3 lists and Figure 4-12 illustrates the controls on the DVE Pan and Tilt Module (PTM) Assembly. Refer to Table 2-1 for description and Figure 2-1 for location of controls and indicators on the Display Control Module. Refer to Table 2-2 for description and Figure 2-2 for location of connectors on the Display Control Module.

4-5 STOWING

Refer to Figure 4-7 for equipment storage.

Table 4-3. M56 DVE Control Descriptions

Control	Functional description
Azimuth control	Rotates PTM ±190°
Elevation control	Adjusts the Sensor Assembly elevation FOR from +58° to -32°
Azimuth lock	Locks PTM at 0° azimuth (driving) position when engaged.
Elevation lock	Locks Sensor Assembly at -15° elevation (driving) position when engaged.

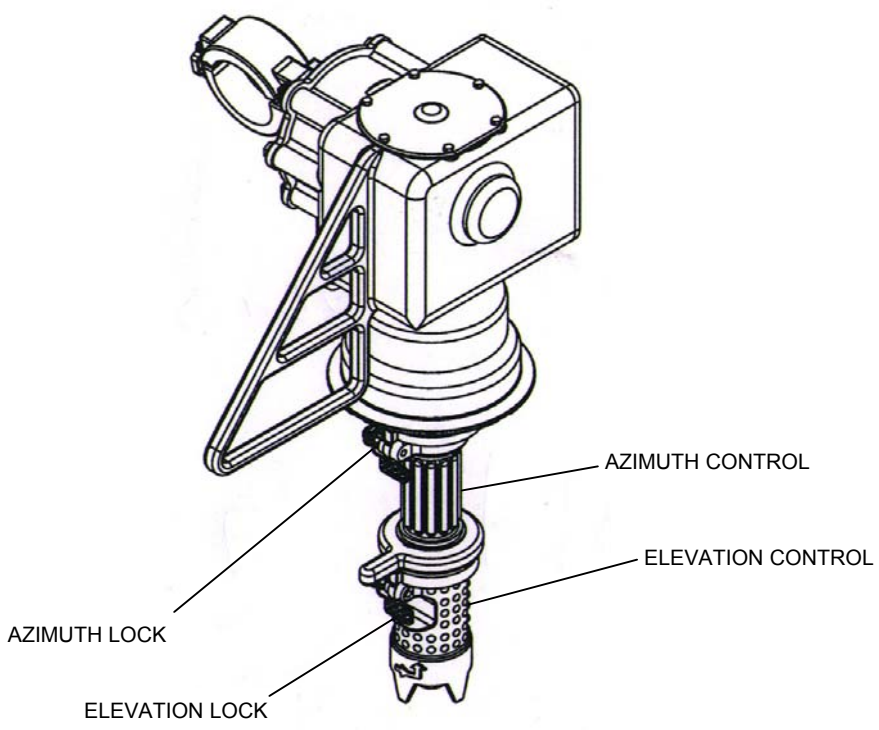


Figure 4-12. Location of Controls

Section V. Operator's and Unit Troubleshooting

4-6 INTRODUCTION

This section describes the vehicle unique troubleshooting tasks required to ensure proper operation of the M56 DVE. Refer to Chapter 3 for DVE common troubleshooting procedures.

4-7 UNIT TROUBLESHOOTING

The only unit troubleshooting consists of checking the voltage available at P1 of the power cable and checking continuity of the PTM/DCM cable. Refer to the wiring diagrams in Figure 4-13 and 4-14.

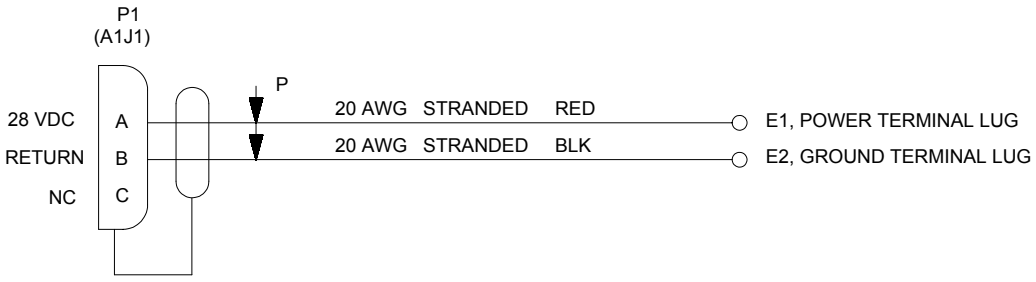


Figure 4-13. DVE Power Cable

Figure 4-14. PTM/DCM Cable

Section VI. Unit Maintenance

4-8 INTRODUCTION

This section describes the vehicle unique maintenance tasks required to ensure proper operation of the M56 DVE. Refer to Chapter 3 for DVE common maintenance procedures.

4-8.1. Sensor Assembly (SA) Replacement (Figure 4-8)

Tools: None

1. Disconnect SA/PTM interconnect cable from PTM Assembly.
2. Remove connector cap on PTM Assembly dummy connector and install on PTM Assembly connector.
3. Release latch, raise Sensor Clamp, and remove Sensor Assembly.
4. Upon receipt of the replacement Sensor Assembly, open latch and raise Sensor Clamp.
5. Install Sensor Assembly with window pointing forward.
6. Rotate sensor CCW until it stops.
7. Close Sensor Clamp.
8. Place bar over lip of latch and press handle to secure Sensor Assembly.
9. Remove connector cap from connector on PTM Assembly and install on dummy connector.
10. Connect SA/PTM interconnect cable to PTM Assembly.

4-8.2. Display Control Module (DCM) Replacement (Figure 4-9, 4-10, and 4-11)

Tools: None

1. Disconnect cables from the connectors located on the back of the DCM and install on the dummy connectors on the display bracket.
2. While holding DCM, remove four T-bolts holding the DCM on the display bracket.
3. Remove DCM from the display bracket.
4. Upon receipt of replacement DCM, line up holes on side of DCM with holes in bracket and install but do not tighten four T-bolts.
5. Once all four T-Bolts have been installed, tighten T-Bolts.
6. Remove the cable connectors from the dummy connectors on the display bracket and install them to the connector locations illustrated in Figure 4-10.
7. Position DCM fore and aft using large adjustment knob at top and retighten knob. See Figure 4-11.
8. Rotate DCM to comfortable position and tighten.

4-8.3. PTM Assembly Replacement (Figure 4-6, 4-7, and 4-8)

Tools: None

1. Ensure SA is removed per paragraph 4-8.1, steps 1 through 4.
2. Remove DCM/PTM interconnect cable from bottom of PTM Assembly.
3. Remove SA/PTM interconnect cable from PTM Assembly.
4. Remove locking pin from V-Retainer Coupling.
5. Pull handle out until V-Retainer Coupling comes loose.
6. Separate T-Bar from handle.
7. Spread V-Retainer Coupling and remove from mounting ring.
8. Lift PTM Assembly from mounting ring.
9. Upon receipt of replacement PTM Assembly, place PTM Assembly in PTM mounting ring on vehicle roof with brush guard facing forward.
10. Match notch on mounting ring with notch in PTM Assembly base to ensure proper alignment.
11. Spread V-Retainer Coupling and slide around base of PTM Assembly and lip of mounting ring.
12. Insert T-Bar in V-Retainer Coupling handle.

13. Ensure notch in base of PTM Assembly is aligned with notch on lip of mounting ring.
14. Turn T-Bar so that it remains in handle.
15. Rotate coupling and T-Bar so that opening of V-Retainer Coupling faces forward with notches on PTM Assembly and mounting ring visible.
16. Hold V-Retainer Coupling and T-Bar, ensuring T-Bar remains in handle and close handle.

4-8.4. Sensor Clamp and Sensor Cradle Replacement (Figure 4-15)

Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Unlatch Sensor Assembly Clamp (2) from Sensor Assembly Cradle (9).
2. Using a 9/16” sockethead wrench, remove hex screw (6) holding Sensor Assembly Clamp (2) and Sensor Assembly Cradle (9) to PTM Assembly (11).
3. Install new Sensor Assembly Clamp (2) and/or Sensor Assembly Cradle (9) on PTM Assembly using hex screw (6).
4. Use a 9/16” sockethead wrench to secure hex screw (6).

4-8.5. Dust Cap Replacement (Figure 4-15).

Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Unlatch Sensor Assembly Clamp (2) from Sensor Assembly Cradle (9).
2. Using a 9/16” sockethead wrench, remove hex screw (6) holding Sensor Assembly Clamp (2) and Sensor Assembly Cradle (9) to PTM Assembly (11).
3. Remove dust cap and install new dust cap.
4. Install Sensor Assembly Clamp (2) and Sensor Assembly Cradle (9) on PTM Assembly using hex screw (6).
5. Secure hex screw (6) with 9/16” sockethead wrench.

4-8.6. Catch and/or Strike Replacement (Figure 4-15).

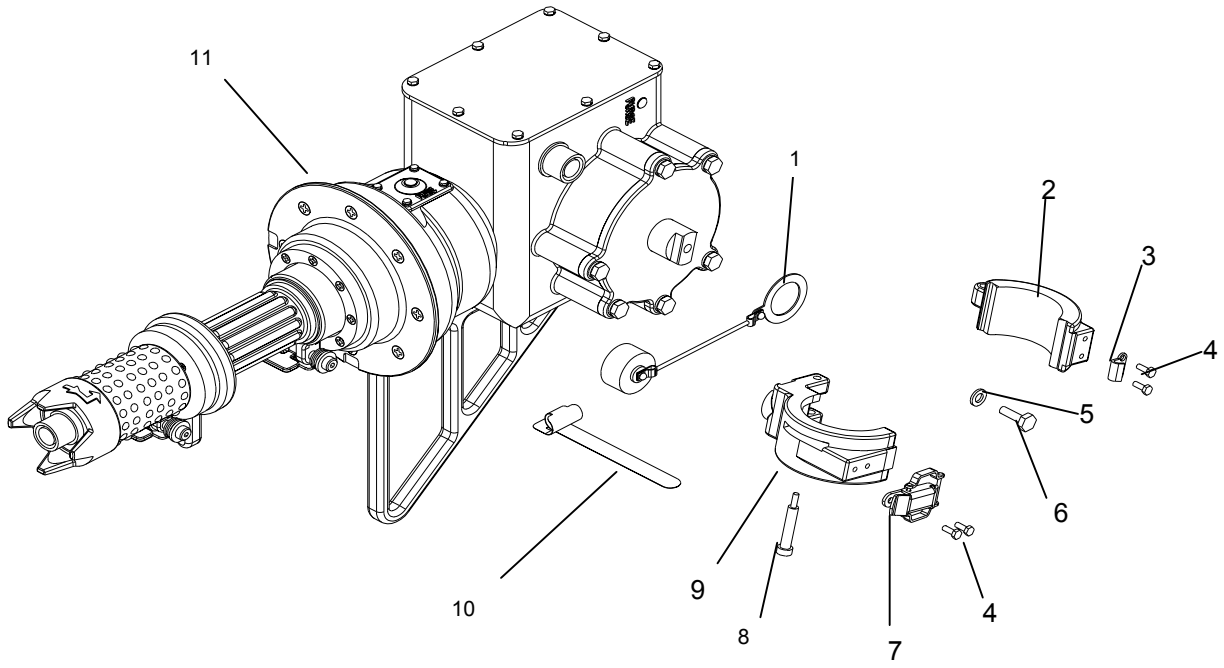
Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Unlatch Sensor Assembly Clamp (2) from Sensor Assembly Cradle (9).
2. Using a ½” sockethead wrench, remove two hex head screws (4) holding catch (3) and/or strike (7).
3. Install new catch (3) and/or strike (7) using two hex head screws (4).
4. Secure hex head screws (4) with ½” sockethead wrench.

4-8.7. Azimuth/Elevation Lock Replacement (Figure 4-16):

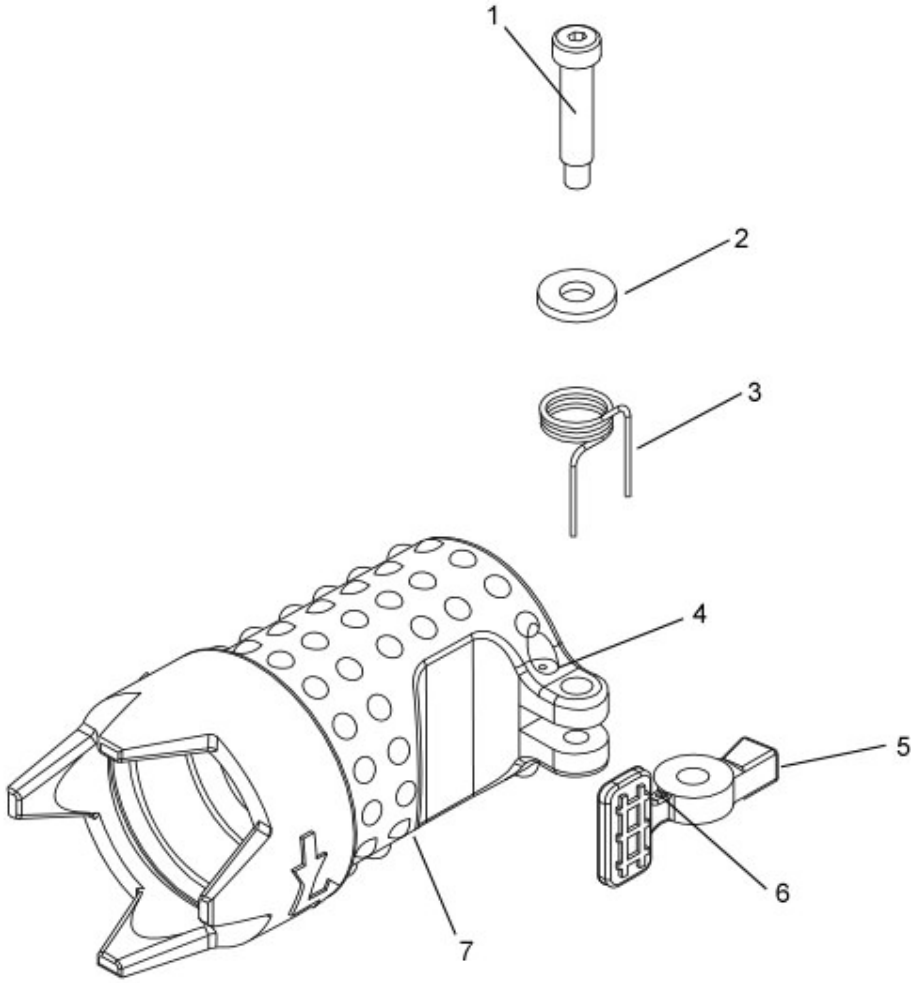
Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Using a 99-24 hex key, remove shoulder screw (1) with flat washer (2).
2. Remove az/el lock spring (3).
3. Remove Azimuth/Elevation Lock (5) from Elevation Handle (7).
4. Install new Azimuth/Elevation Lock (5) between holes on Elevation Handle (7).
5. Install az/el lock spring (3) with short leg in hole (4) on Elevation Handle (7) and long leg in hole (6) on Azimuth/Elevation Lock (5).
6. Install flat washer (2) on shoulder screw (1).
7. With loop of az/el lock spring (3) aligned with holes for shoulder screw (1), install shoulder screw (1), with flat washer (2) and secure using a 99-24 hex key.



1. DUST CAP
2. SENSOR ASSEMBLY CLAMP
3. CATCH
4. HEX HEAD SCREW
5. FLAT WASHER
6. HEX SCREW
7. STRIKE
8. SHOULDER SCREW
9. SENSOR ASSEMBLY CRADLE
10. CABLE TIE
11. PTM ASSEMBLY

Figure 4-15. PTM Assembly



1. SHOULDER SCREW
2. FLAT WASHER
3. AZ/EL LOCK SPRING
4. SPRING MOUNTING HOLE
5. AZIMUTH/ELEVATION LOCK
6. SPRING MOUNTING HOLE
7. ELEVATION HANDLE
   (OR AZIMUTH LOCK SUPPORT)

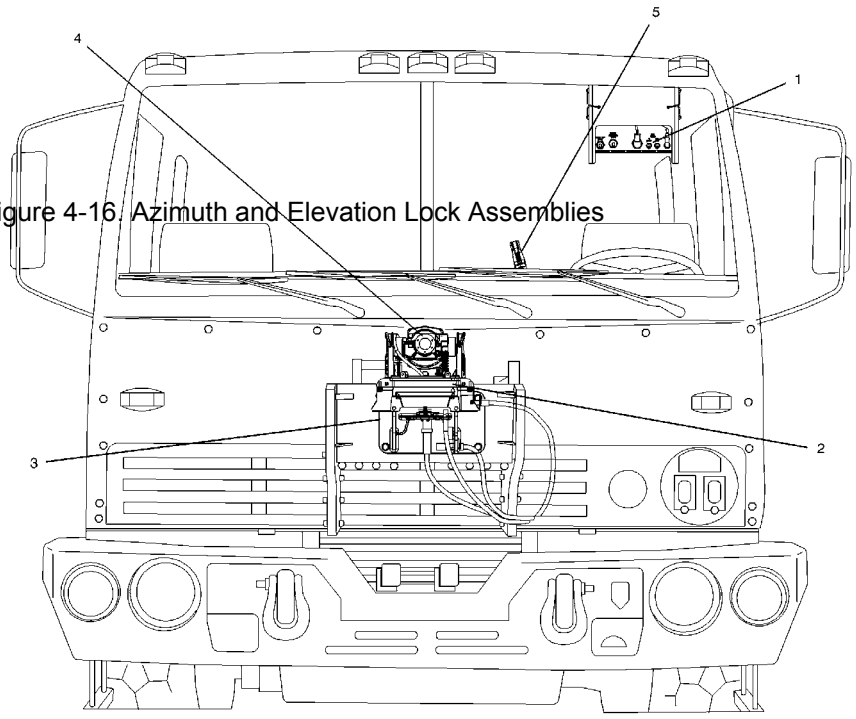
Figure 4-16. Azimuth and Elevation Lock Assemblies

CHAPTER 5
AN/VAS-5A(V)11, FAMILY OF MEDIUM TACTICAL VEHICLES DVE
AN/VAS-5A(V)12, HEAVY EXPANDED MOBILE TACTICAL TRUCK DVE
AN/VAS-5A(V)13, MAXI-AMBULANCE HMMWV DVE
AN/VAS-5A(V)14, TOW HMMWV DVE
AN/VAS-5A(V)15, HARD TOP HMMWV DVE
AN/VAS-5A(V)16, PROPHET/SOFT-TOP HMMWV DVE

Section I. Introduction

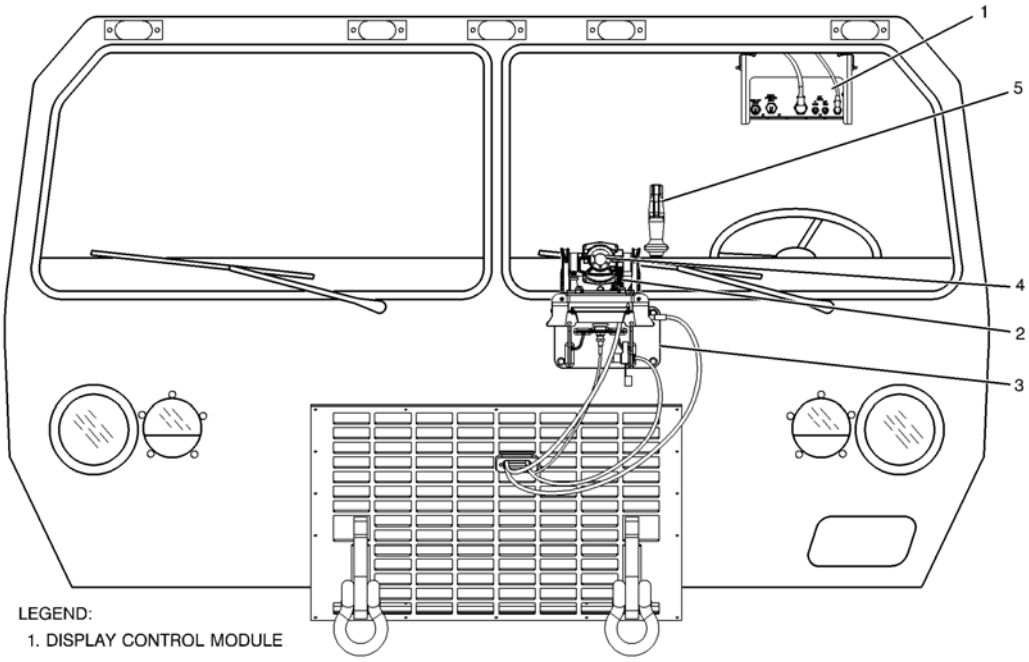
This chapter contains equipment descriptions, operating instructions, and maintenance procedures specific to the following TWV's (Tactical Wheeled Vehicle) Driver's Vision Enhancer (DVE). The FMTV (Family of Medium Tactical Vehicles), the HEMTT (Heavy Expanded Mobile Tactical Truck), the MAXI-AMBULANCE HMMWV (Highly Mobile Multipurpose Wheeled Vehicle), the TOW HMMWV, the Hard Top HMMWV, and the Prophet/Soft-top HMMWV (Figures 5-1, 5-2, 5-3, 5-4). Refer to Chapters 1 through 3 for general information that pertains to all DVEs.

Figure 4-16. Azimuth and Elevation Lock Assemblies



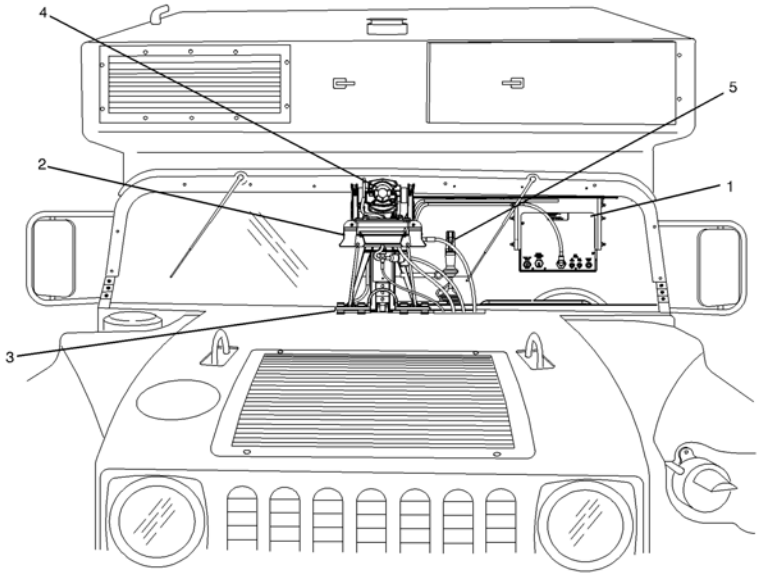
LEGEND:
1. DISPLAY CONTROL MODULE
2. PTM ASSEMBLY
3. PTM MOUNT ASSEMBLY
4. SENSOR ASSEMBLY
5. PTM CONTROL ASSEMBLY

Figure 5-1. AN/VAS-5A(V)11, FMTV DVE



LEGEND:
1. DISPLAY CONTROL MODULE
2. PTM ASSEMBLY
3. PTM MOUNT ASSEMBLY
4. SENSOR ASSEMBLY
5. PTM CONTROL ASSEMBLY

Figure 5-2. AN/VAS-5A(V)12, HEMTT DVE



LEGEND:
1. DISPLAY CONTROL MODULE
2. PTM ASSEMBLY
3. PTM MOUNT ASSEMBLY
4. SENSOR ASSEMBLY
5. PTM CONTROL ASSEMBLY

Figure 5-3. AN/VAS-5A(V)13, MAXI-AMBULANCE HMMWV DVE

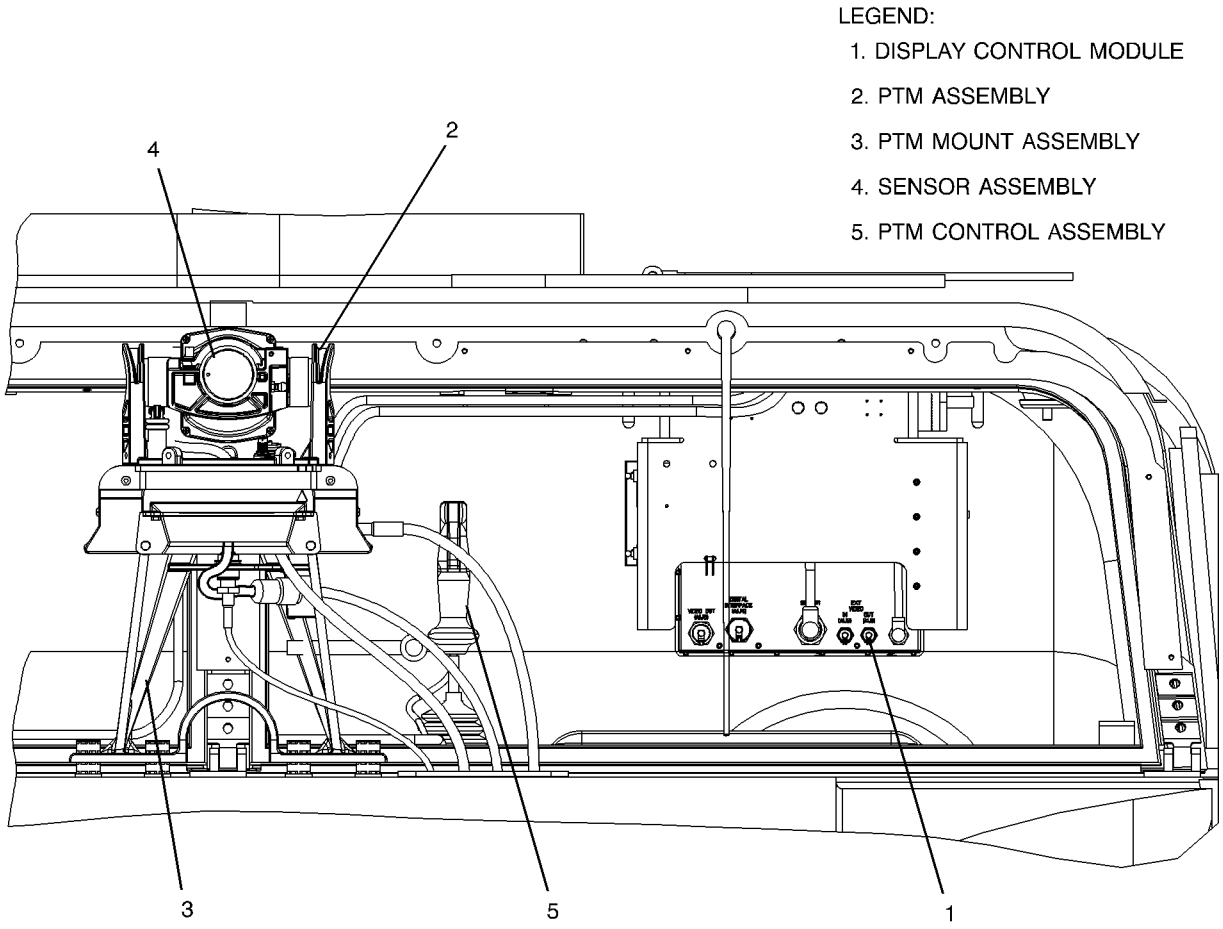


Figure 5-4. AN/VAS-5A(V)14, TOW HMMWV DVE, AN/VAS-5A(V)15, Hard Top HMMWV DVE, AN/VAS-5A(V)16, Prophet/Soft-Top HMMWV DVE

Section II. Equipment Description

5-1 EQUIPMENT DATA

5-1.1 Outline Dimensions, Weight, and Power Dissipation

Refer to Table 5-1, Figure 5-5, 5-6 and 5-7 for outline dimensions, weight, and power dissipation.

Table 5-1. FMTV DVE, HEMTT DVE, MAXI-AMBULANCE HMMWV, TOW HMMWV, Hard Top HMMWV, Prophet HMMWV, and Soft-Top HMMWV DVE Outline Dimensions, Weight, and Power Dissipation

Characteristic	Specification
Sensor Assembly PN 325359-2, -6, -8 (Figure 5-5)	
Width	4.97 inches
Height	4.31 inches
Depth	4.90 inches
Weight	2.0 pounds (Maximum)
Power Dissipation	10 watts (Maximum)
Sensor Assembly PN 6455000 (Figure 5-6)	
Width	3.64 inches
Height	5.25 inches
Depth	3.88 inches
Weight	2.73 pounds (Maximum)
Power Dissipation	10 watts (Maximum)
PTM Assembly	
Width	9.00 inches (Maximum)
Height	9.18 inches (Maximum)
Depth	4.31 inches (Maximum)
Weight	5.70 pounds (Maximum)
Display Control Module	Refer to Chapter 1, Table 1-1, Figure 1-3.

5-1.2 Physical Characteristics

Refer to Table 5-2 and Figure 5-8 for vehicle specific physical characteristics of the DVE.

Table 5-2. DVE Physical Characteristics

Characteristic	Specification
Sensor Assembly	
Field of View (FOV) (angular area visible through an optical instrument	40° azimuth/30° elevation
Field of Regard (FOR) (area that can be examined while slewing through normal left/right up/down limits)	±90° azimuth, +25° to –30° elevation
Focus	5 meters to infinity
Display Control Module	Refer to Chapter 1.

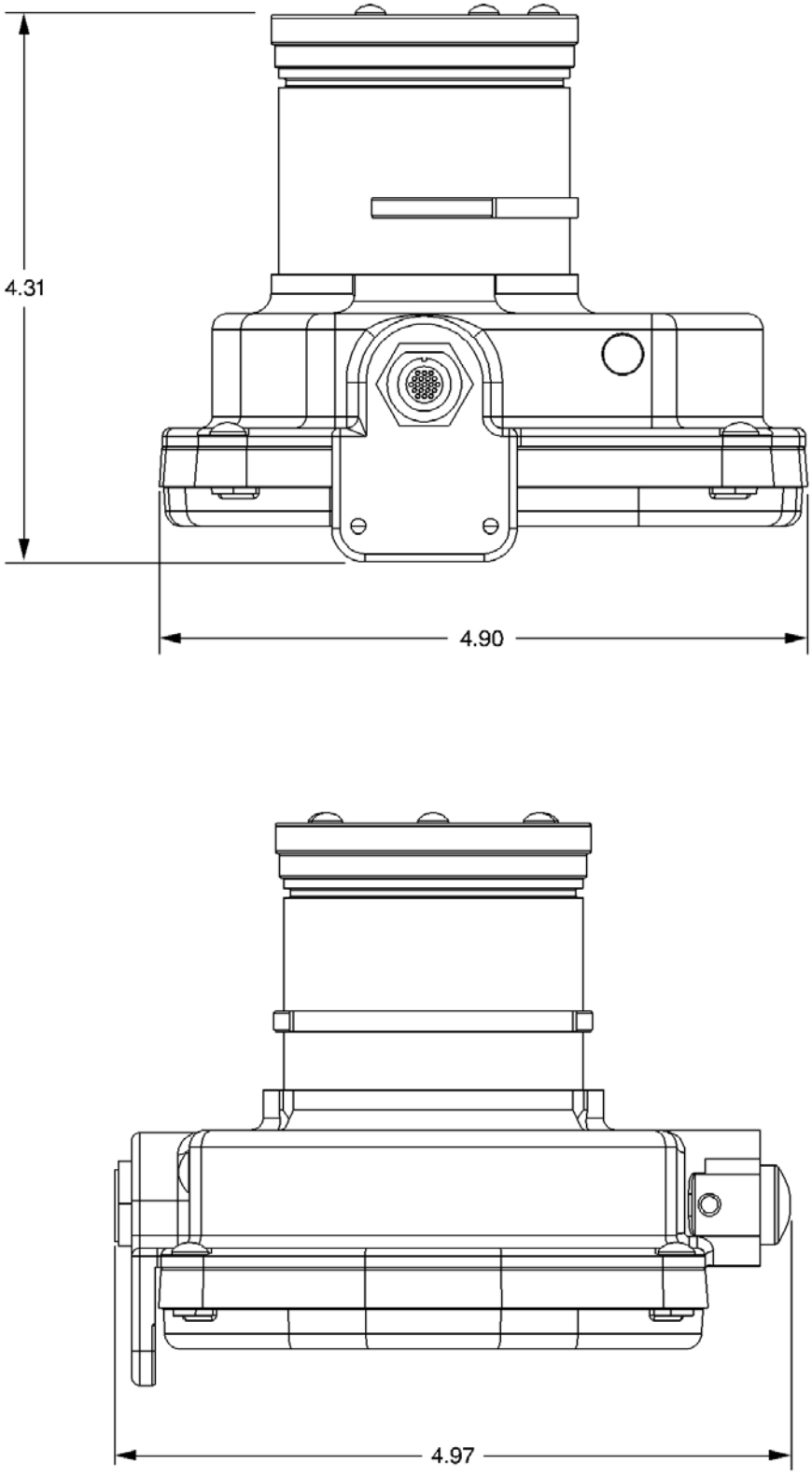


Figure 5-5. Sensor Assembly Outline Dimensions (PN 325359-2, -6, -8)

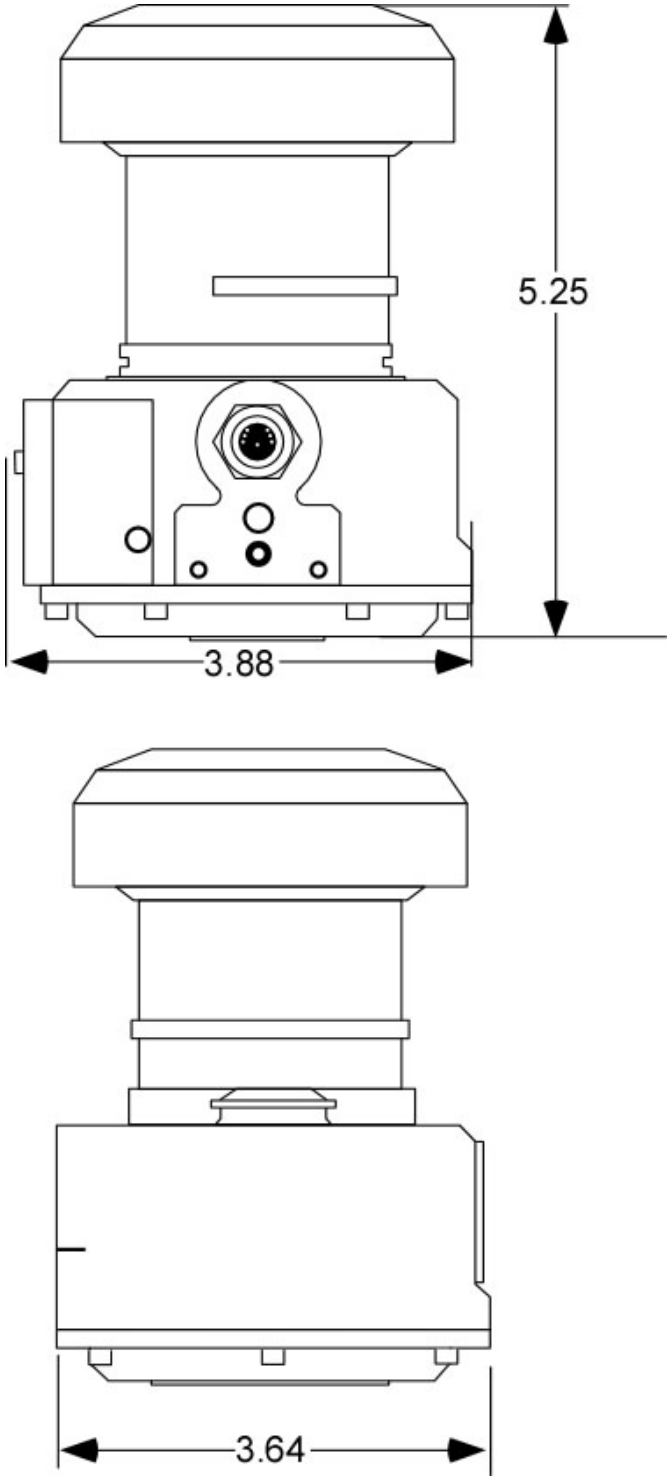


Figure 5-6. Sensor Assembly Outline Dimensions (PN 6455000)

Figure 5-7 PTM Assembly Outline Dimensions

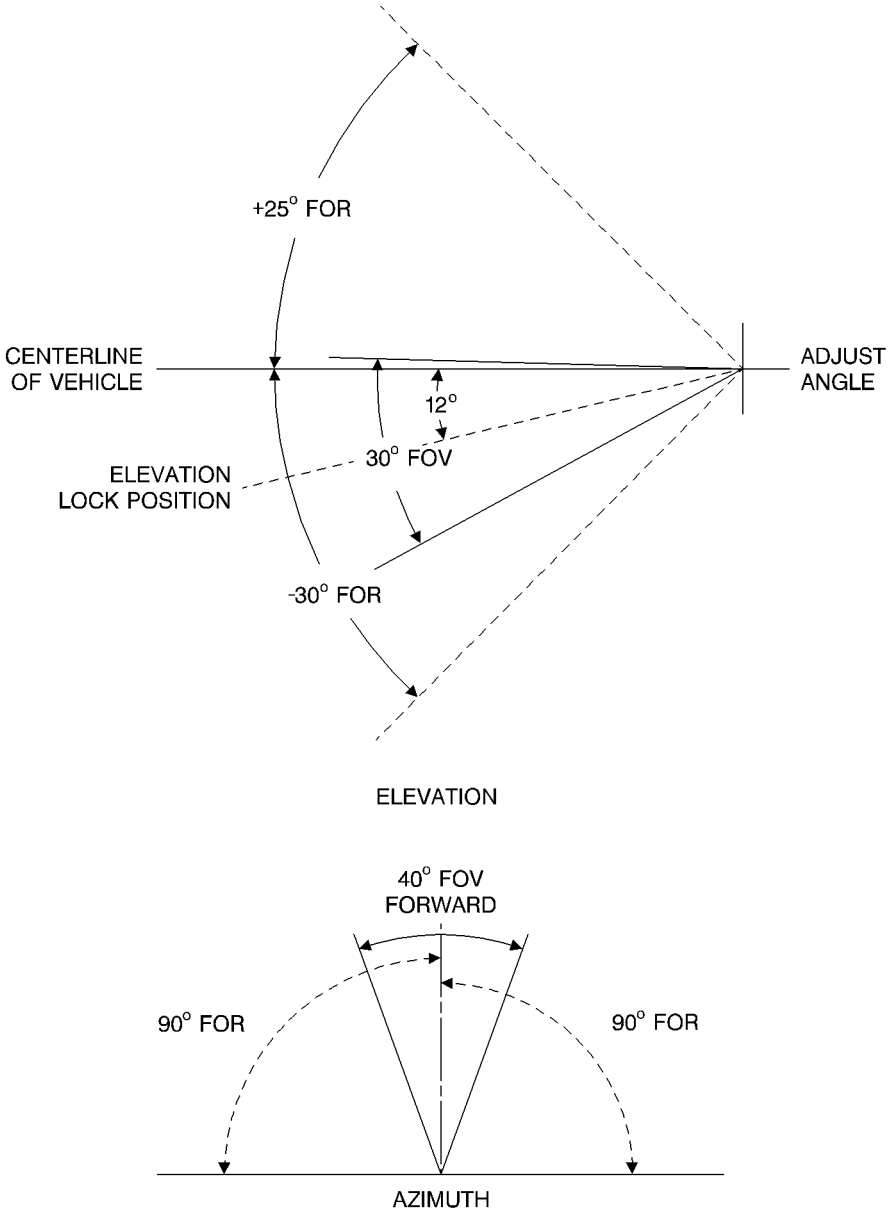


Figure 5-8. FOV/FOR Azimuth and Elevation

Section III. Installation/Removal Instructions

5-2 DVE INSTALLATION

The following procedures cover the installation of the DVE to the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the TOW HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV.

5-2.1 Pan and Tilt Module (PTM) Assembly Installation (Figure 5-9)

1. Verify joystick will not move fully side to side. With trigger disengaged, some small play is expected.
2. Remove PTM Assembly (3) from transportation case (1).
3. Place PTM assembly (3) in PTM mount assembly (24) ensuring that serial number plate is facing forward.
4. Close two latches (16) on sides of PTM assembly (3) securing PTM assembly (3) to PTM mount assembly (24).
5. Ensure elevation control cable retaining clip (11) is not covering hole (13) in azimuth platform.

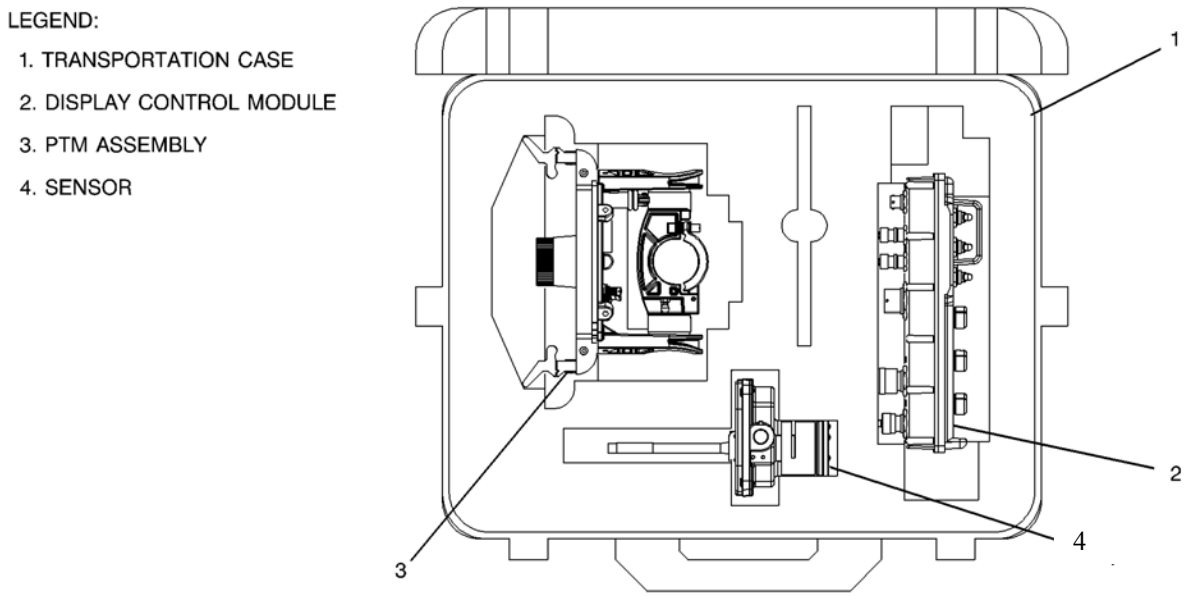


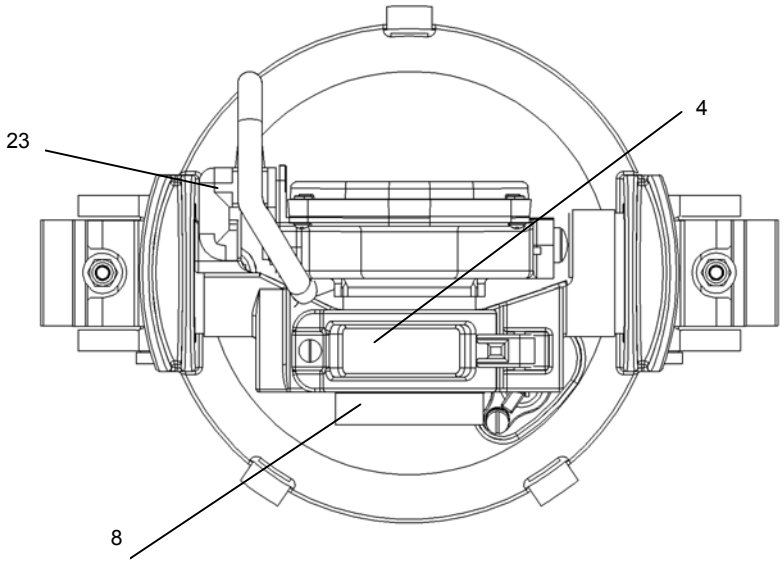
Figure 5-9. PTM and Sensor Installation (Sheet 1 of 3)

6. Pull down spring-loaded sleeve (10) and remove elevation cable (20) from dummy ball joint (25) on the PTM mount assembly (24). Feed elevation cable (20) through hole (12) in azimuth platform.
7. Pull down spring loaded sleeve (10) and orient slot in sleeve and hole in end of cable to ball joint (9), put cable end on ball joint (9), and release sleeve (10).
8. Slide lower groove of elevation cable collar (12) into hole notch (13), and turn elevation cable retaining clip (11) against cable to secure.

5-2.2 Sensor Assembly Installation

1. Unscrew thumbscrew (7) securing upper clamp (8) of sensor cradle and raise sensor cradle upper clamp (8).
2. Remove sensor (4) from transportation case (1).
3. Bend SA/PTM cable (23) over toward sensor front (4) then down left side of sensor.

4. Feed SA/PTM cable (23) through center hole in base of Azimuth platform while installing sensor (4) facing forward in lower half of sensor clamp ensuring key on bottom of sensor is positioned in lower clamp keyway. Cable should be positioned between sensor (4) and sensor cradle clamp (8).
5. Close sensor cradle upper clamp (8) and secure with thumbscrew (7).
6. Remove PTM/DCM interconnect cable connector dust cover (18).
7. Place SA/PTM cable (23) behind Azimuth lock cable (21), align key, and connect SA/PTM cable (23) to PTM/DCM interconnect cable connector (22).



TOP VIEW

Figure 5-9. PTM and Sensor Installation (Sheet 2 of 3)

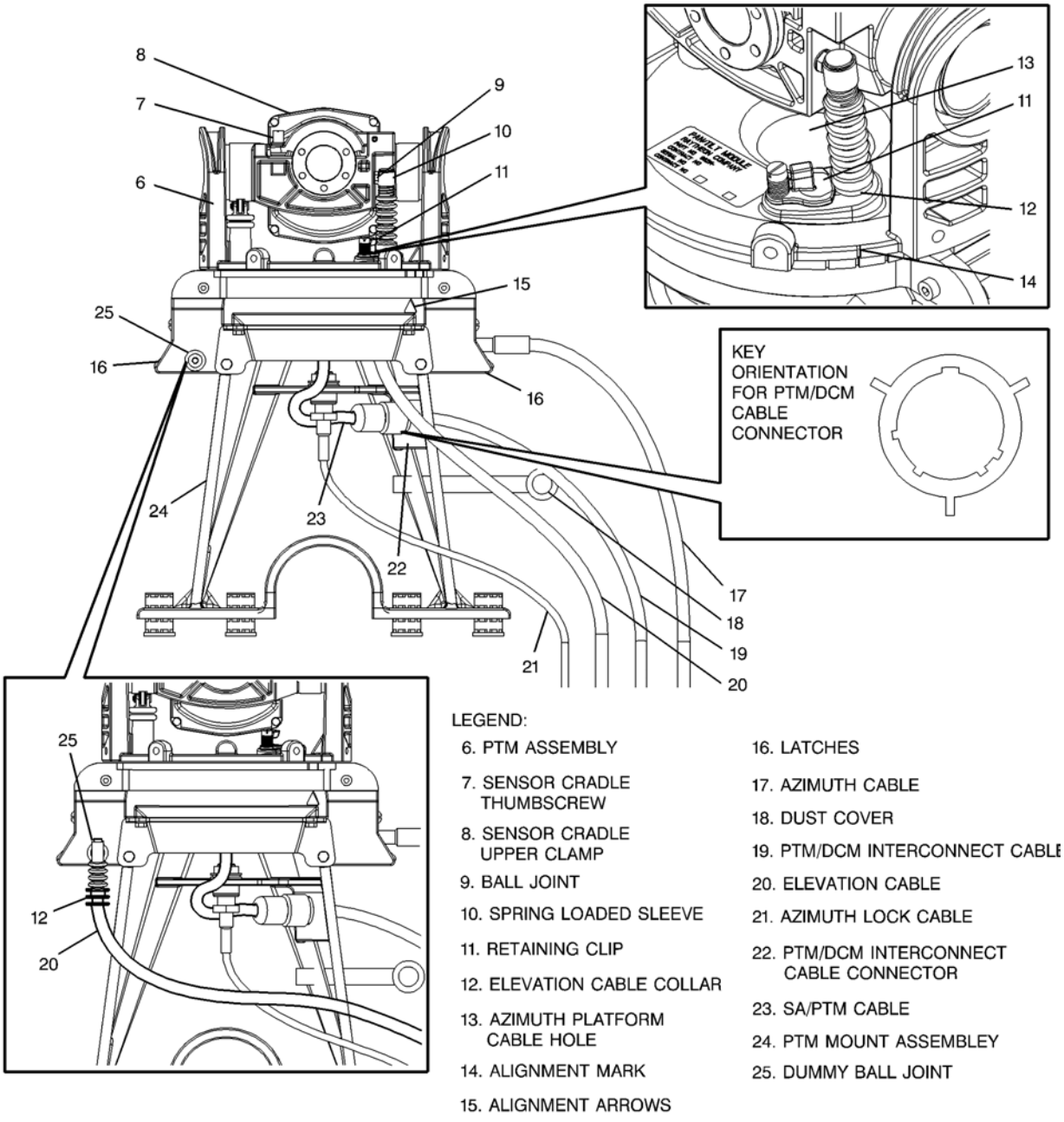


Figure 5-9. PTM and Sensor Installation (Sheet 3 of 3)

5-2.3 Display Control Module (DCM) Installation for the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Figure 5-10)

1. Remove T-bolts from stowed positions (10) on back of DCM mount.
2. Loosen two DCM locking knobs (5).
3. Push DCM mount to the right and lower mount.

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

4. Tighten two DCM locking knobs (5).
5. Remove the power cable from the dummy connector (6) and the PTM/DCM interconnect cable from the dummy PTM/DCM connector (7) on the DCM mount and allow to hang.
6. Remove DCM (2) from transportation case (1) (Figure 5-9).
7. If not installed, place DCM cover on DCM.
8. Ensure DCM POWER switch is set to OFF.
9. Align and install power cable to the POWER (A1J1) connector (2) on DCM.
10. Align and install PTM/DCM interconnect cable to the SENSOR (A1J2) connector (1) on the DCM.
11. Place DCM between DCM mount sides, line up holes on side of DCM with slots in DCM mount and install but do not tighten four T-bolts (8).
12. Once all four T-bolts (8) have been installed, pull DCM forward, raise or lower to preferred viewing position, and tighten all four T-bolts (8).
13. Loosen four T-handles (9) securing DCM mount to roof, slide DCM mount fore (forward) or aft (backward) until DCM is in comfortable position, and tighten four T-handles (9).

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

14. Loosen two DCM locking knobs (5) and tilt DCM to comfortable position. Tighten two DCM locking knobs (5).

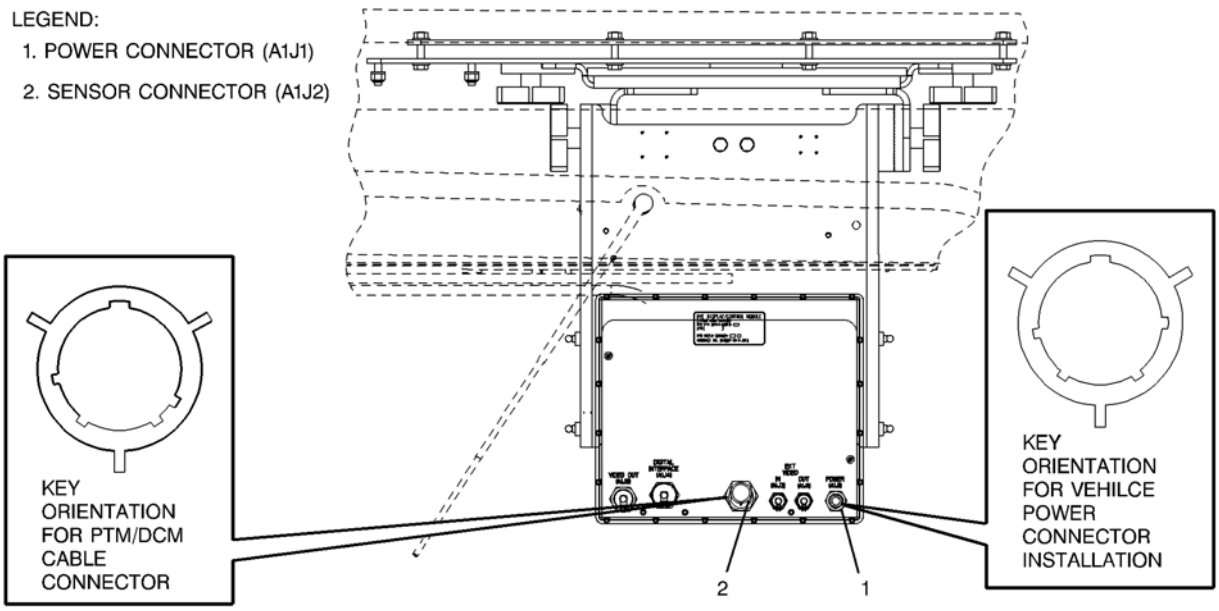


Figure 5-10. DCM Installation for the FMTV, the HEMMT, the Maxi-Ambulance HMMWV, the Hardtop HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Back View, Sheet 1 of 3)

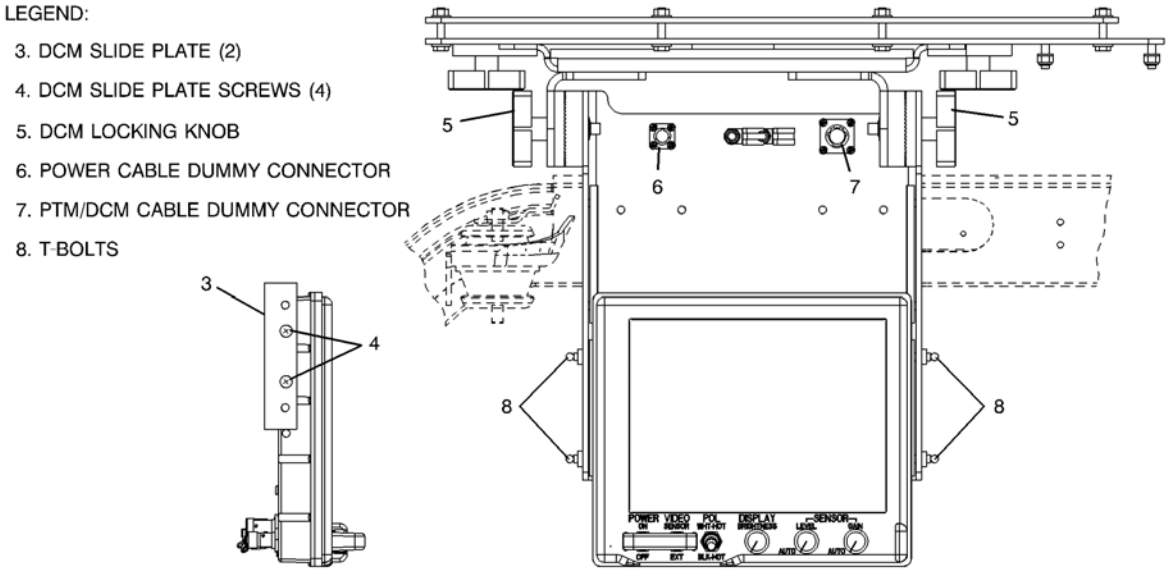


Figure 5-10. DCM Installation for the FMTV, the HEMMT, the Maxi-Ambulance HMMWV, the Hardtop HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Front View, Sheet 2 of 3)

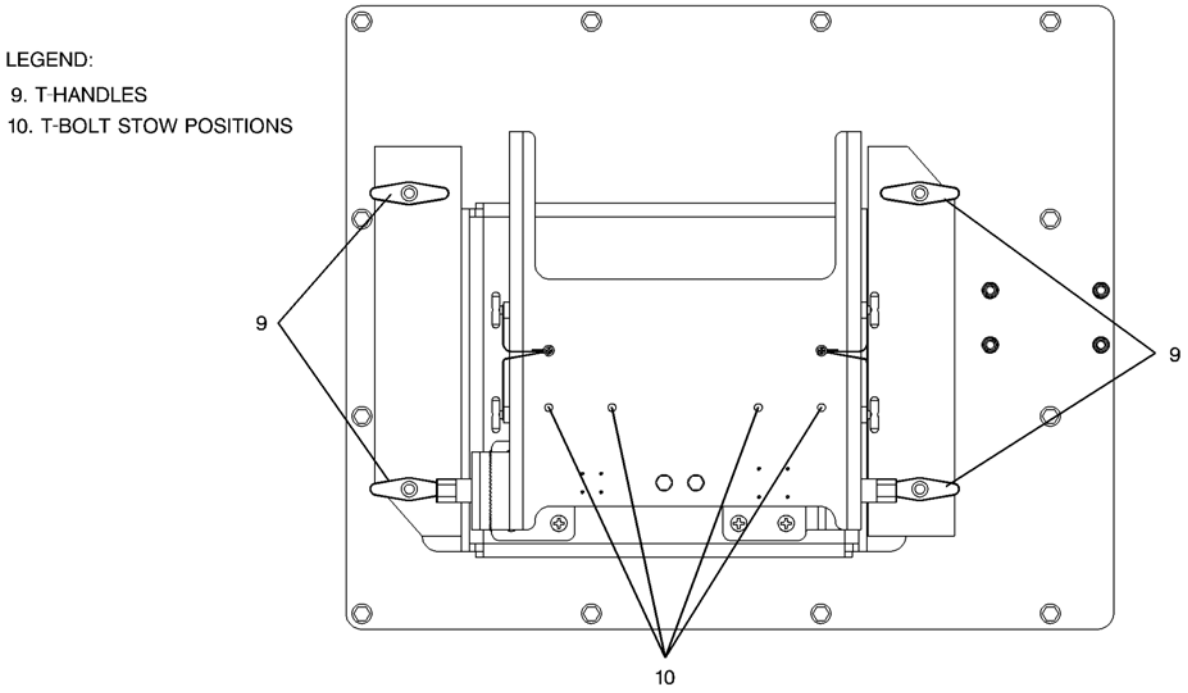


Figure 5-10. DCM Installation for the FMTV, the HEMMT, the Maxi-Ambulance HMMWV, the Hardtop HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Roof Mount, Sheet 3 of 3)

5-2.4 DCM Installation for TOW HMMWV (Figure 5-11)

1. Remove T-bolts (7) from stowed positions on back of DCM mount.
2. Loosen two DCM locking knobs (4).
3. Push DCM mount to the right and lower mount.

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

4. Tighten two DCM locking knobs (4).
5. Remove the power cable from the dummy connector (5) and the PTM/DCM interconnect cable from the dummy PTM/DCM connector (6) on the DCM mount and allow to hang.
6. Remove DCM (2) from transportation case (1) (Figure 5-9).
7. If not installed, place DCM cover on DCM.
8. Ensure DCM POWER switch is set to OFF.
9. Align and install power cable to the POWER (A1J1) connector (1) on DCM.
10. Align and install PTM/DCM interconnect cable to the SENSOR (A1J2) connector (2) on the DCM.
11. Install DCM into vehicle DCM mounting bracket by installing two t-bolts (7) into hinge on right side of DCM. Do not tighten.
12. While latch (3) is disengaged (horizontal) raise or lower DCM to comfortable viewing position, turn and press down latch (3). Hand tighten two t-bolts (7).
13. Loosen four T-handles (12) securing DCM mount to roof, slide DCM mount fore (forward) or aft (backward) until DCM is in comfortable position, and tighten four T-handles (12).

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

14. Loosen two DCM locking knobs (4) and tilt DCM to comfortable position. Tighten two DCM locking knobs (4).

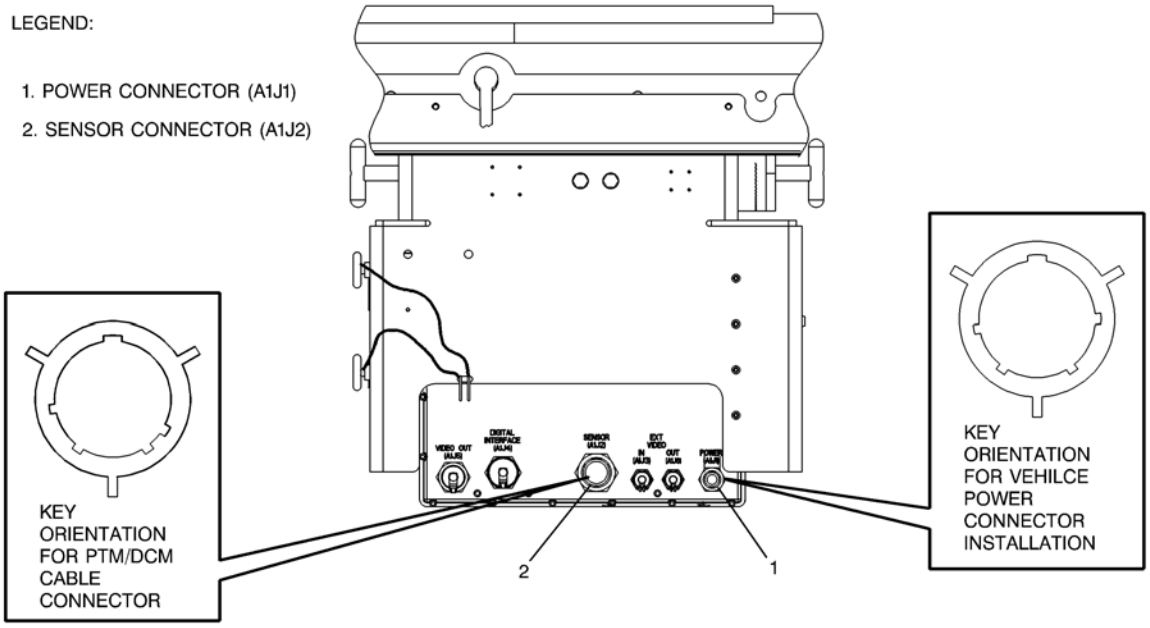


Figure 5-11. DCM Installation for the TOW HMMWV (Back View, Sheet 1 of 3)

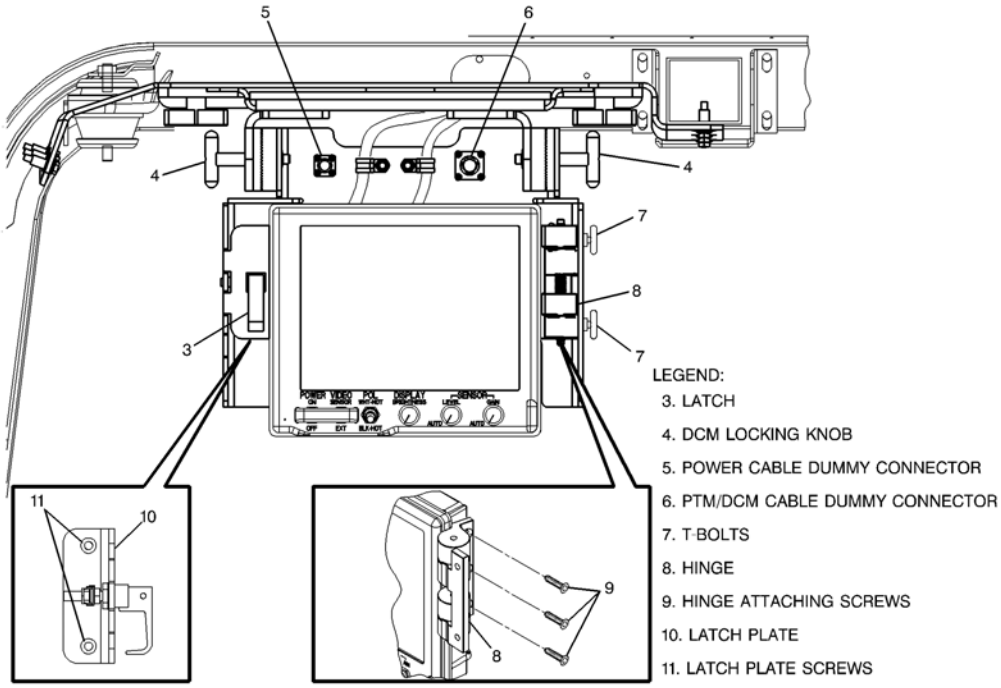


Figure 5-11. DCM Installation for the TOW HMMWV (Front View, Sheet 2 of 3)

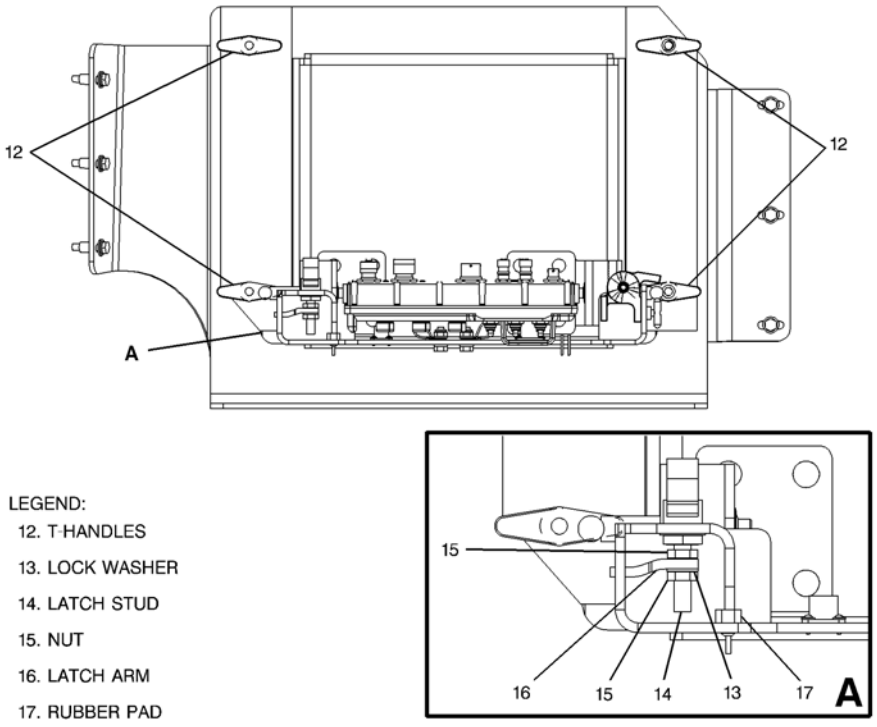


Figure 5-11. DCM Installation for TOW HMMWV (Roof Mount, Sheet 3 of 3)

5-3 DVE REMOVAL.

The following procedures cover the removal of the DVE from the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the TOW HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV.

5-3.1 Display Control Module (DCM) Removal for the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Figure 5-10)

1. Ensure DCM POWER switch is set to OFF.
2. Disconnect Power cable and PTM/DCM Interconnect Cable from connectors (1,2) located on back of DCM.
3. If DCM is in stowed position, loosen two DCM locking knobs (5), push DCM mount to the right, lower mount, and tighten two DCM locking knobs.
4. While holding DCM, remove four T-bolts (8) securing DCM to DCM mount.
5. Place DCM (2) in transportation case (1) (Figure 5-9).
6. Install Power cable and PTM/DCM Interconnect Cable on dummy connectors (6,7) on DCM mount.

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

7. Raise DCM mount to stowed position and tighten two locking knobs (5).
8. Screw four T-bolts (8) into stow positions on back of DCM mount (10).

5-3.2 DCM Removal for the TOW HMMWV (Figure 5-11)

1. If DCM is in stowed position, loosen two DCM locking knobs (4), push DCM mount to the right, lower mount, and tighten two DCM locking knobs (4).

2. Ensure DCM POWER switch is set to OFF.
3. Disconnect Power cable and PTM/DCM Interconnect Cable from connectors (1,2) located on back of DCM.
4. Pull up on latch (3) and turn disengaging from DCM mount.
5. While holding DCM, remove two T-bolts (7) securing DCM to DCM mount.
6. Place DCM (2) with latch assembly and hinge assembly in transportation case (1) (Figure 5-9).
7. Install Power cable and PTM/DCM Interconnect Cable on DCM mount dummy connectors (5,6).

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

8. Loosen two DCM locking knobs (4), push DCM mount to the right, raise DCM mount to stow position and tighten two DCM locking knobs (4).
9. Screw two T-bolts (7) into stow positions on back of DCM mount.

5-3.3 Sensor Assembly Removal (Figure 5-9)

1. Disconnect SA/PTM cable (23) from PTM/DCM interconnect cable connector (22).
2. Replace PTM/DCM interconnect cable connector dust cover (18).
3. Unscrew thumbscrew (7) securing upper half of sensor clamp (8) and raise sensor clamp (8).
4. Remove Sensor Assembly (4) from PTM Assembly (6) and place in transportation case (1).
5. Close sensor cradle upper clamp (8) and secure with thumbscrew (7).

5-3.4 PTM Assembly Removal (Figure 5-9)

1. Perform paragraph 5-3.3 Sensor Assembly Removal if sensor has not been removed.
2. Pull down spring-loaded sleeve (10) on cable end, pull end of cable from ball joint (9), and release sleeve (10).
3. Pull up and turn elevation cable retaining clip (11), pull elevation cable (20) from hole slot (12) in azimuth platform and pull cable downward from azimuth platform.
4. Secure elevation cable (20) to dummy ball joint (25) on PTM mount assembly (24).
5. Release two latches (16) on sides of PTM assembly (6).
6. Remove PTM assembly (6) from PTM mount assembly (24) and place in transportation case (1).

Section IV. Operating Instructions

5-4 OPERATOR'S CONTROLS

Table 5-3 lists and Figure 5-12 illustrates the controls on the DVE Pan and Tilt Module (PTM) Assembly for the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the TOW HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV. Refer to Table 2-1 for description and Figure 2-1 for location of controls and indicators on the Display Control Module. Refer to Table 2-2 for description and Figure 2-2 for location of connectors on the Display Control Module.

Table 5-3. FMTV, HEMTT, MAXI-AMBULANCE HMMWV, TOW HMMWV, Hard Top HMMWV, Prophet HMMWV, and Soft-Top HMMWV DVE Control Descriptions

Control	Functional description
Azimuth control	Rotates PTM ±90°
Elevation control	Adjusts the Sensor Assembly elevation FOR from +25° to -30°
Azimuth lock	Locks PTM at 0° azimuth (driving) position when engaged.
Elevation lock	Locks Sensor Assembly at -12° elevation (driving) position when engaged.

Figure 5-12. Location of Controls

5-5 STOWING

Refer to Figure 5-9 for equipment storage.

Section V. Operator's and Unit Troubleshooting

5-6 INTRODUCTION

This section describes the vehicle unique troubleshooting tasks required to ensure proper operation of the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the TOW HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV DVE. Refer to Chapter 2 for common operator troubleshooting and Chapter 3 for DVE common unit troubleshooting procedures.

5-7 UNIT TROUBLESHOOTING

The only unit troubleshooting consists of checking the voltage available at P1 of the power cable and checking continuity of the PTM/DCM interconnect cable. Refer to the wiring diagrams in Figure 5-13 and 5-14.

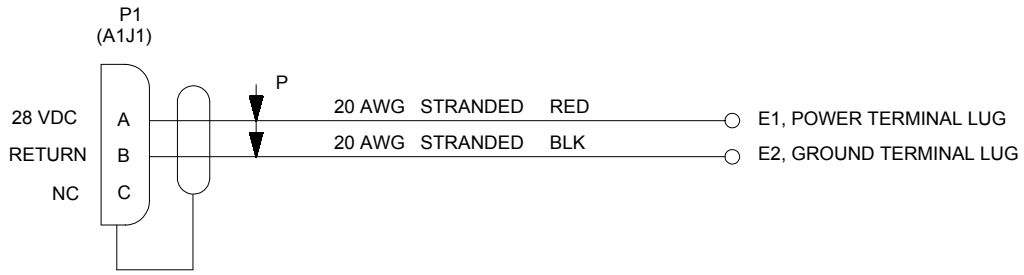


Figure 5-13. DVE Power Cable

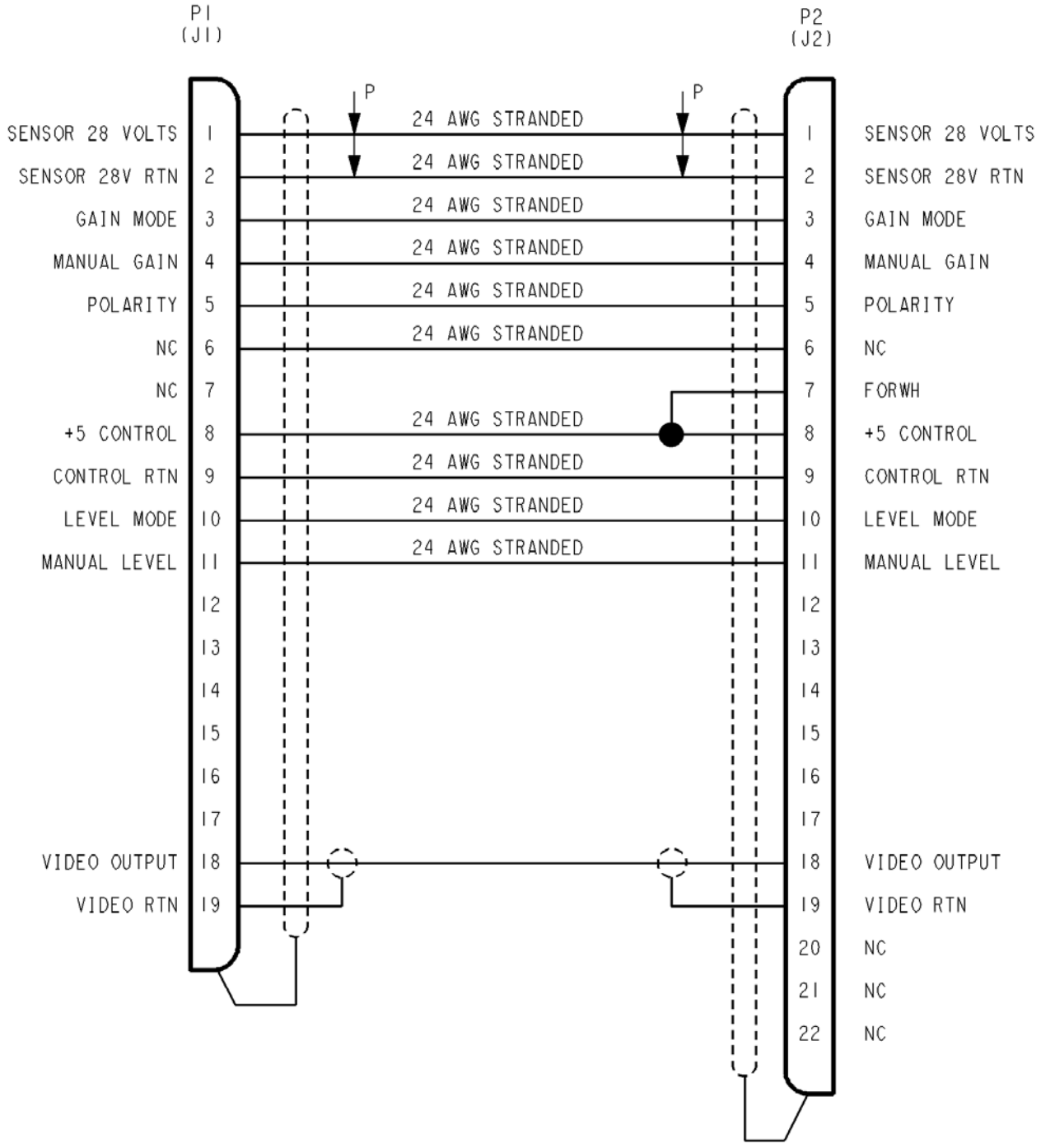


Figure 5-14. PTM/DCM Cable

Section VI. Operator's and Unit Maintenance

5-8 INTRODUCTION

This section describes the vehicle unique maintenance tasks required to ensure proper operation of the FMTV DVE, the HEMTT DVE, the MAXI-AMBULANCE HMMWV, the TOW HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV DVE. Refer to Chapters 2 and 3 for DVE common maintenance procedures.

5-8.1 Sensor Assembly (SA)/SA/PTM Cable Replacement (Figure 5-9)

Tools: None

1. Ensure DCM POWER switch is set to OFF.
2. Disconnect SA/PTM cable (23) from PTM/DCM interconnect cable connector (22).
3. Remove thumbscrew (7) securing sensor cradle upper clamp (8) and raise sensor clamp (8).
4. Remove sensor (4) from PTM Assembly (6).
5. Remove and retain two screws securing SA/PTM cable (23) to sensor (4) and pull silver back to remove cable (23).

NOTE

If unit troubleshooting has determined that the SA/PTM cable is defective replace the SA/PTM cable (23) and, if necessary, the two attaching screws.

CAUTION

Ensure SA/PTM cable key is properly aligned before installing cable onto sensor. The connector pins may be damaged if care is not taken.

6. Connect SA/PTM cable to replacement sensor using two screws.
7. Bend SA/PTM cable (23) over toward Sensor front (4) then down left side of sensor.
8. Feed SA/PTM cable (23) through center opening in base of Azimuth platform while installing sensor (4) facing forward in lower half of sensor clamp ensuring key on bottom of sensor is positioned in lower clamp keyway. Cable should be positioned between sensor (4) and clamp (8).
9. Close sensor cradle upper clamp (8) and secure with thumbscrew (7).
10. Place SA/PTM cable (23) behind Azimuth lock cable (21), align key, and connect SA/PTM cable (23) to PTM/DCM interconnect cable connector (22).

5-8.2 Display Control Module (DCM) Replacement for the FMTV, the HEMTT, the MAXI-AMBULANCE HMMWV, the Hard Top HMMWV, the Prophet HMMWV, and the Soft-Top HMMWV (Figure 5-10)

Tools: None

1. Ensure DCM POWER switch is set to OFF.
2. Disconnect Power cable and PTM/DCM Interconnect Cable from connectors (1,2) located on back of DCM.
3. If DCM is in stowed position, loosen two DCM locking knobs (5), push DCM mount to the right, lower mount, and tighten DCM locking knobs (5).
4. While holding DCM, remove four T-bolts (8) securing DCM to DCM mount.
5. Remove DCM from the DCM mount.

CAUTION

Ensure connector covers are removed and caution is taken when removing DCM cover. Failure to do so may cause damage to DCM cover.

6. Remove and retain DCM cover if installed.
7. Remove two screws (4) securing slide plates (3) to sides of DCM. Retain screws and slide plates.

NOTE

Ensure slide plates are oriented as shown in illustration when attached.

8. Place two slide plates (3) removed in previous step on new DCM and secure each with two screws (4).

CAUTION

Ensure connector covers are removed and caution is taken when installing DCM cover. Failure to do so may cause damage to DCM cover.

9. Install DCM cover.
10. Ensure DCM POWER switch is set to OFF on replacement DCM.
11. Align and install power cable to the POWER (A1J1) connector (2) on DCM.
12. Align and install PTM/DCM interconnect cable to the SENSOR (A1J2) connector (1) on the DCM.
13. Place DCM between DCM mount sides, line up holes on side of DCM with slots in DCM mount and install but do not tighten four T-bolts (8).
14. Once all four T-bolts (8) have been installed, pull DCM forward, raise or lower to preferred viewing position, and tighten four T-bolts (8).
15. Loosen four T-handles (9) securing DCM mount to roof, slide DCM mount fore (forward) or aft (backward) until DCM is in comfortable position, and tighten four T-handles (9).

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

16. Loosen two DCM locking knobs (5) and tilt DCM to comfortable position. Tighten two DCM locking knobs (5).

5-8.3 Display Control Module (DCM) Replacement for the TOW HMMWV (Figure 5-11)

Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Ensure DCM POWER switch is set to OFF.
2. Disconnect Power cable and PTM/DCM Interconnect Cable from connectors (1,2) located on back of DCM.
3. If DCM is in stowed position, loosen two DCM locking knobs (4), push DCM mount to the right, lower mount, and tighten DCM locking knobs (4).
4. While holding DCM remove two T-bolts (7) securing DCM to DCM mount.
5. Pull up on latch (3) and turn disengaging from DCM mount. Remove DCM.
6. Remove three screws (9) securing hinge (8) to right side of DCM and retain screws (9) and hinge (8).
7. Remove two nuts (15), lock washer (13), and latch arm (16) from latch stud (14) and remove latch (3). Retain all parts removed.
8. Remove three screws (11) securing latch plate (10) to DCM. Retain all parts removed.
9. Remove DCM cover if installed. Install DCM cover on new DCM if previously removed.
10. With latch plate (10) oriented as shown, line up holes on left side of DCM with holes in the latch plate (10) and install using three screws (11) removed in previous step. Hand tighten.
11. With hinge (8) oriented as shown, line up holes on right side of DCM with holes in hinge (8) and install using three screws (9) removed in previous step. Hand tighten.
12. Install DCM into vehicle DCM mounting bracket using two T-bolts (7) on right side of DCM. Do not tighten.
13. Place latch stud (14) into latch plate (10) and secure with one of two 5/16 nuts (15) onto the latch stud (14), followed by the latch arm (16) oriented as shown, lock washer (13), and the second 5/16 nut (15).
14. Adjust latch arm (16) up or down latch stud (14) until latch plate (10) is in firm contact with rubber pad (17) on DCM mount when latch (3) is closed. Hand tighten.
15. Pull up on latch (3) and turn disengaging from DCM mount.
16. Ensure DCM POWER switch is set to OFF.
17. Remove the power cable and PTM/DCM interconnect cable from the DCM mount dummy connectors (5,6) and allow both to hang loose.
18. Align and install power cable to the POWER (A1J1) connector (1) on DCM.

19. Align and install PTM/DCM interconnect cable to the SENSOR (A1J2) connector (2) on the DCM.
20. Raise or lower DCM to comfortable viewing position, tighten two t-bolts (7), and turn and press down latch (3).
21. Loosen four T-handles (12) securing DCM mount to roof, slide DCM mount fore (forward) or aft (backward) until DCM is in comfortable position, and tighten four T-handles (12).

WARNING

Ensure locking knob teeth are fully engaged. Failure to do so may cause injury to personnel.

22. Rotate DCM to comfortable viewing position, and tighten two DCM locking knobs (4).

5-8.4 PTM Assembly Replacement (Figure 5-9)

Tools: None

1. Perform paragraph 5-3.3 Sensor Assembly Removal if sensor has not been removed.
2. Pull down spring-loaded sleeve (10) on elevation cable end, pull end of cable from ball joint (9) and release sleeve (10).
3. Pull up and turn elevation cable retaining clip (11) releasing elevation cable (20) from hole slot (13) in azimuth platform and pull cable downward from azimuth platform.
4. Secure cable to dummy ball joint (25) on PTM mount assembly (24).
5. Release two latches (16) on sides of PTM assembly (6).
6. Remove PTM assembly (6) from PTM mount assembly (24).
7. Verify joystick will not move fully side to side. Some small play is expected with trigger disengaged.
8. Place replacement PTM assembly (6) in PTM mount assembly (24) ensuring that serial number plate is facing forward.
9. Close two latches (16) on sides of PTM assembly (6) securing PTM assembly (6) to PTM mount assembly (24).
10. Ensure elevation cable retaining clip (11) is not covering hole (13) in azimuth platform.
11. Remove elevation cable (20) from dummy ball joint (25) on the PTM mount assembly (24), feed cable up through hole (13) in azimuth platform, slide second groove on silver cable collar (12) into hole notch, and turn cable retaining clip (11) against cable to secure.
12. Pull down spring-loaded sleeve (10) and orient slot in sleeve and hole in end of cable to ball joint (9).
13. Put cable end on ball joint (9) and release sleeve (10).
14. Remove PTM/DCM interconnect cable connector dust cover (18).
15. Align key and connect SA/PTM cable (23) to PTM/DCM interconnect cable connector (22).

5-8.5 Sensor Clamp, Upper Half Replacement (Figure 5-15)

Tools: Tool Kit, Electronic Equipment, TK-101A/G

1. Perform paragraph 5-3.3 Sensor Assembly Removal.
2. Drive out and discard roll pin (12) securing clamp upper half (2) to lower half.
3. Insert replacement clamp upper half (2) into lower half and drive in roll pin (12) securing clamp upper half (2).
4. Perform paragraph 5-2.2 Sensor Assembly Installation, steps 3 through 7.

5-8.6 PTM Assembly Latch Assembly Replacement (Figure 5-9 and Figure 5-15)

Tools: Tool Kit, Electronics Equipment, TK-101A/G

Supplies:

Adhesive, Thread Loctite 222 (item 5, Appendix F)

1. Perform paragraph 5-3.4 PTM Assembly Removal, steps 1 through 5.
2. Remove PTM assembly (6) from vehicle.

3. Remove shoulder screw (6) securing latch assembly to PTM assembly and remove latch assembly. (Figure 5-15).
4. Clean shoulder screw (6) threads and apply adhesive loctite (Figure 5-15).
5. Install replacement latch assembly into PTM assembly and secure with shoulder screw (6). Torque to 45 +/- 1-inch pound. (Figure 5-15)

5-8.7 Elevation Bearing Replacement (Figure 5-15)

Tools: Tool Kit, Electronics Equipment, TK-101A/G

1. Perform paragraph 5-3.3 Sensor Assembly Removal.
2. Rotate sensor cradle (4) 180°.
3. Remove elevation bearing rubber boot (13), elevation bearing spring (14), and elevation bearing (15) from azimuth platform (11).
4. Replace elevation bearing rubber boot (13), elevation bearing spring (14), and elevation bearing (15) as needed.
5. Install elevation bearing rubber boot (13) on elevation bearing (15).
6. Place elevation bearing spring (14) into hole and place elevation bearing (15) and elevation bearing rubber boot (13) over elevation bearing spring (14) ensuring keys on elevation bearing are oriented to keyways in hole.

NOTE

Elevation bearing will require significant downward pressure to allow sensor cradle to be rotated into an upright position.

7. Press down on elevation bearing (15) and rotate sensor cradle (4) 180°. Sensor cradle upper clamp (2) should be on top position.

5-8.8 Elevation Retaining Clip Replacement (Figure 5-15)

Tools: Tool Kit, Electronics Equipment, TK-101A/G

1. Remove retaining clip screw (9), retaining clip spring (8), and elevation cable retaining clip (7) from azimuth platform (11).
2. Replace retaining clip screw (9), retaining clip spring (8), and/or elevation cable retaining clip (7) as needed.
3. Apply thin coat of adhesive to threaded portion of screw.
4. Install retaining clip screw (9), retaining clip spring (8), and elevation cable retaining clip (7) on azimuth platform (11). Torque screw to 25 +/- 3 in/lbs.

LEGEND:
1. SENSOR CRADLE CLAMP THUMBSCREW
2. SENSOR CRADLE UPPER CLAMP
3. SENSOR
4. SENSOR CRADLE
5. LATCH
6. SHOULDER SCREW
7. RETAINING CLIP
8. RETAINING CLIP SPRING
9. RETAINING CLIP SCREW
10. AZIMUTH PLATFORM CENTER HOLE
11. AZIMUTH PLATFORM
12. ROLL PIN
13. ELEVATION BEARING RUBBER BOOT
14. ELEVATION BEARING SPRING
15. ELEVATION BEARING

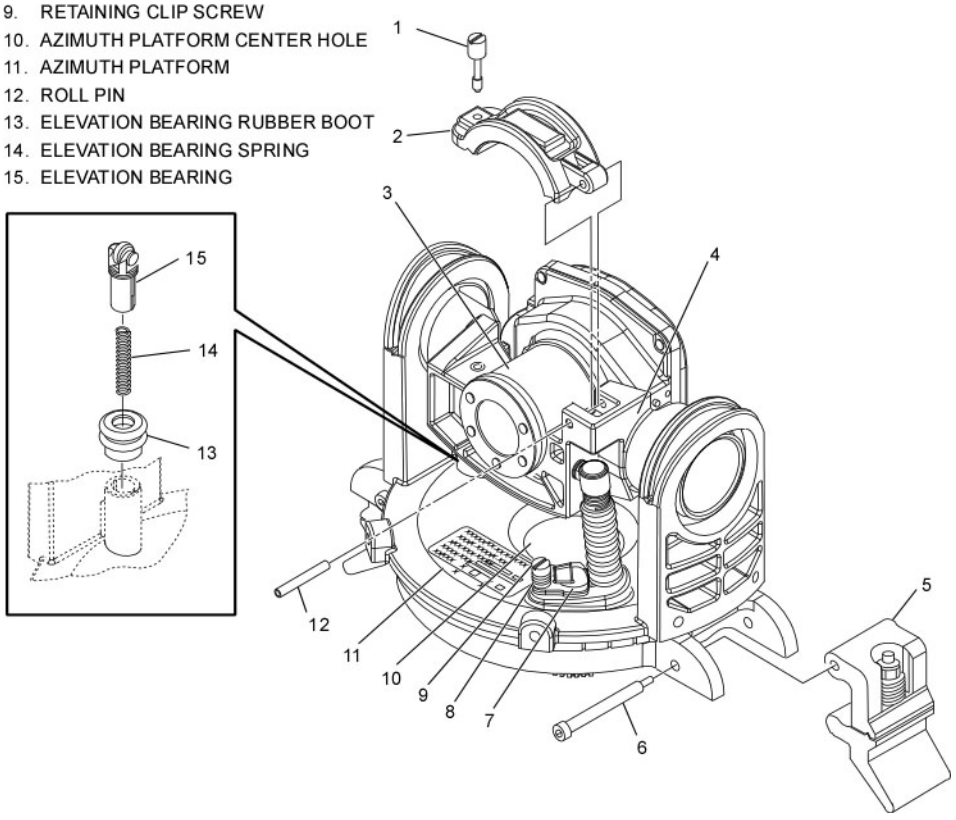


Figure 5-15. PTM Assembly

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

DA Form 2028	Recommended Changes To Publications And Blank Forms
DA Form 2404	Equipment Inspection And Maintenance Worksheet
DA Form 2408-9	Equipment Control Record
DA Form 5988E	Equipment Inspection and Maintenance Worksheet
SF Form 361	Transportation Discrepancy Report
SF Form 364	Report of Discrepancy (ROD)
SF Form 368	Product Quality Deficiency Report
NAVMC 10722	Recommended Changes to Publications/Logistics-Maintenance Data Coding Sheet

A-3. TECHNICAL MANUALS

TM 5-5420-202-10	Operator's Manual For Launcher And M60A1 Tank Chassis, Transporting For Bridge, Armored-Vehicle-Launched, Scissoring Type, Class 60 (NSN 5420-00-889-2020)
TM 9-2350-277-10	Operator's Manual For Carrier, Personnel, Full-Tracked, Armored, M113a3 (NSN 2350-01-219-7577) (EIC: AEY) Carrier, Command Post, Light Tracked, M577A3 (2350-01-369-6085) (EIC: AE7) Carrier, Smoke Generator, Full Tracked, M1059A3 (2350-01-369-6083) (EIC: AFA) Carrier, Mortar, 120-MM M121, Self Propelled, M1064A3 (2350-01-369-6082) (EIC: AE8) Carrier, Standardized Integrated Command Post System (SICPS) M1068A3 (2350-01-369-6086) (EIC: AFC) Carrier, Mechanized Smoke Obscurant M58 (2350-01-418-6654) (EIC: 5CG)
TM 9-2350-292-10	Operator's Manual For Recovery Vehicle, Heavy, Full-Tracked: M88A2 (NSN 2350-01-390-4683) (EIC: ACQ) {TM 07769B-10/1}
TM 750-244-2	Procedures For Destruction Of Electronics Material To Prevent Enemy Use (Electronics Command)
TM 4700-15/1	Ground Equipment Record Procedures
TM 4795-12/1	Organizational Corrosion Prevention and Control Procedures for USMC Equipment

A-4. OTHER PUBLICATIONS

AR 702-7	Product Quality Deficiency Report Program {DLAR 4155.24; SECNAVINST 4855.5A; AFR 74-6}
AR 702-7-1	Reporting Of Product Quality Deficiencies Within The US Army
AR 735-11-2	Reporting Of Supply Discrepancies {DLAI 4140-55; SECNAVINST 4355.18A; AFJMAN 23-215}
DA Pam 750-8	The Army Maintenance Management System (TAMMS) Users Manual
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (Except: Medical, Class V, Repair Parts And Heraldic Items
MCO 4855.10	Product Quality Deficiency Report (PQDR)

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. INTRODUCTION

a. This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

b. The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

(1). Field – Includes two subcolumns, Unit (C (operator/crew) and O (unit) maintenance) and Direct Support (F) maintenance

(2). Sustainment – includes two subcolumns, general support (H) and depot (D)

c. The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

d. The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

c. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms.

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

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

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

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

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

(1). Services: Inspect, test, service, adjust, align, calibrate, and/or replace.

(2). Fault location/troubleshooting: The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

(3). Disassembly/assembly: The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

(4). Actions: Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

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

B-3. EXPLANATION OF COLUMNS IN THE MAC

a. Column (1) Group Number. Column (1) lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

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

c. Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in Column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above.)

d. Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Operator or crew maintenance
O Unit maintenance
F Direct support maintenance

Sustainment:

H General support maintenance
D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

e. Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

f. Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

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

a. Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

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

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

d. Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

e. Column (5) Tool Number. The manufacturer's part number, model number, or type number.

B-5. EXPLANATION OF COLUMNS IN REMARKS

a. Column (1) Remarks Code. The code recorded in column (6) of the MAC.

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

Section II. MAC FOR DRIVER'S VISION ENHANCER, AN/VAS-5A(V)2, AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13 AN/VAS-5A(V)14, AN/VAS-5A(V)15, AN/VAS-5A(V)16

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINT-ENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	DVE AN/VAS-5A(V)	INSPECT	.2					1,2	A
		SERVICE	.2						B
		REPAIR	.2						D
		TEST		.3					F
		REPAIR		.1					C
01	SENSOR PN 325359-2, -6, -8	INSPECT		.1					A
		REPAIR		.1			X		E, H
01	SENSOR PN 6455000	INSPECT		.1					A
		REPAIR		.1			X		H
02	PTM	INSPECT		.1					A
		REPAIR		.1			X		G, H
03	DISPLAY PN 3245325-1, -2, -3	INSPECT		.1					A
		REPAIR		.1			X		E, H
03	DISPLAY PN 6455160	INSPECT		.1					A
		REPAIR		.1			X		H

Section III. TOOLS AND TEST EQUIPMENT FOR DRIVER'S VISION ENHANCER, AN/VAS-5A(V)2, AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13 AN/VAS-5A(V)14, AN/VAS-5A(V)15, AN/VAS-5A(V)16

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	Tool Kit, Electronic Equipment	5180-00-064-5178	TK-101A/G
2	O	Tool Kit, Electronic-Optical Repair	5180-01-382-1335	SL-3-09863A

Section IV. REMARKS
AN/VAS-5A(V)2, AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13 AN/VAS-5A(V)14, AN/VAS-5A(V)15, AN/VAS-5A(V)16

REMARKS CODE	REMARKS
A	Operator pre-operational, operational and post-operational checks by sight, sound, or feel. Operator will check for cleanliness, missing and damaged parts (knob(s)), BNC connector covers, electrical connector covers, sensor window cover, and tightness of cable connectors, operability of elevation control, azimuth lock, azimuth steering handle, DCM tilt knob, and DCM pivot knob. Operator will determine serviceability of the system by checking electronic status display (POWER LED, grayscale, and controls (POWER ON/OFF, VIDEO SENSOR/EXT, POL WHT-HOT/BLK-HOT, DISPLAY BRIGHTNESS, SENSOR LEVEL, and SENSOR GAIN.
B	Operator will clean sensor window and DCM display.
C	Remove and replace sensor, PTM or display and cables and attaching hardware
D	Operator will refer repair to higher level of maintenance.
E	Remove and replace knobs, connector covers, and sensor window cover
F	PTM/DCM cable continuity check
G	Remove and replace dust cap catch or strike, AZ/EL lock and attaching hardware
H	These items must be returned to the depot for all other repair actions.

APPENDIX C
COMPONENTS OF END ITEM LIST AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists COEI and BII for the DVE to help you inventory items for safe and efficient operation of the equipment.

C-2. GENERAL

The COEI and BII information is divided into the following lists:

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

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

C-3. Explanation of Columns in the COEI List and BII List

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

b. Column (2), National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

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

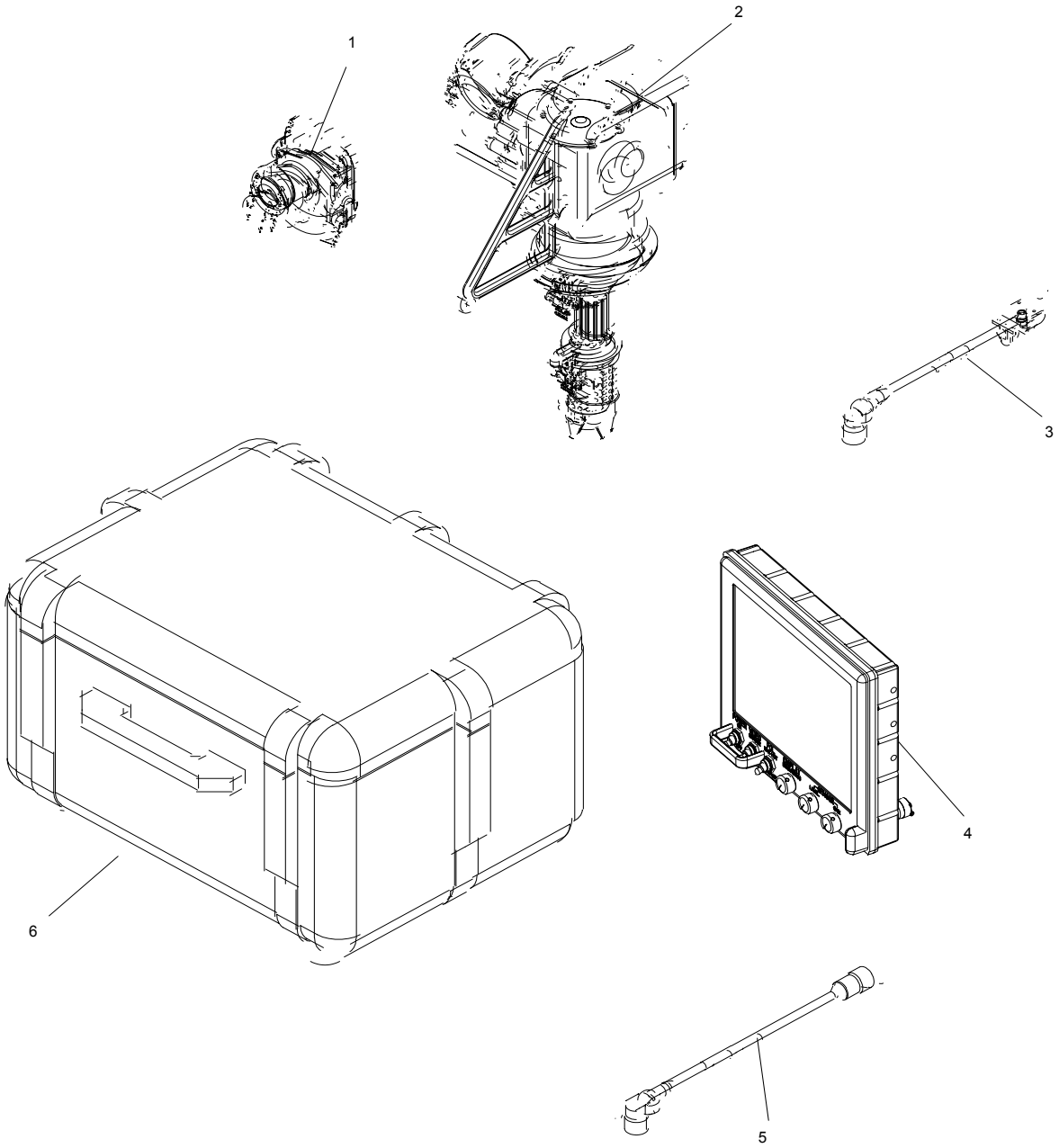
d. Column (4), Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

CODE	USED ON
39D	Driver's Vision Enhancer AN/VAS-5A(V)2
72Z	Driver's Vision Enhancer AN/VAS-5A(V)11
73A	Driver's Vision Enhancer AN/VAS-5A(V)12
73B	Driver's Vision Enhancer AN/VAS-5A(V)13
73C	Driver's Vision Enhancer AN/VAS-5A(V)14
73D	Driver's Vision Enhancer AN/VAS-5A(V)15
73E	Driver's Vision Enhancer AN/VAS-5A(V)16

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

f. Column (6) Qty Rqr. Indicates the quantity required.

Section II. COMPONENTS OF END ITEM



AN/VAS-5A(V)2, Viewer, Infrared

Figure C-1. Components of End Item

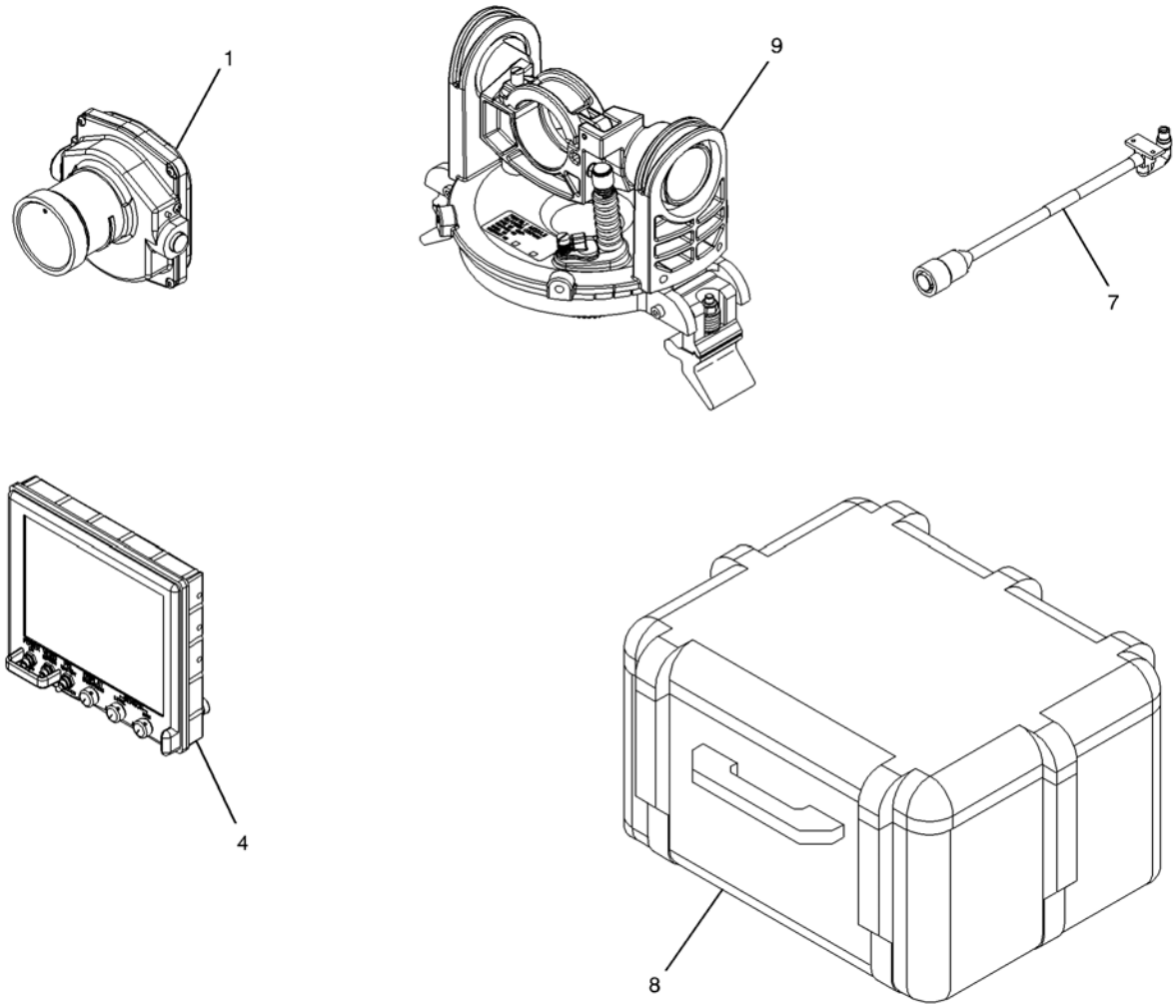
Section II. COMPONENTS OF END ITEM – Continued

8

AN/VAS-5A(V)14 Viewer, Infrared

Figure C-2. Components of End Item

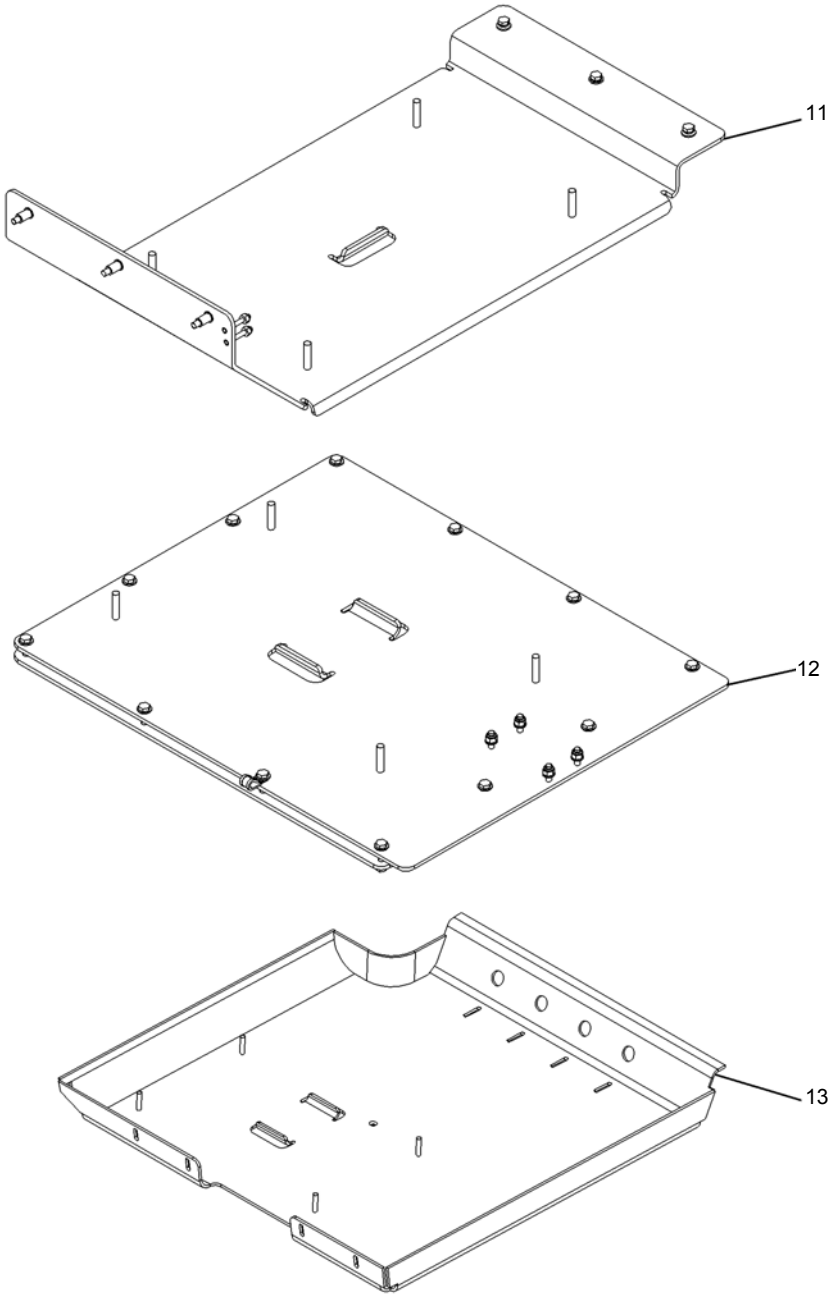
Section II. COMPONENTS OF END ITEM – Continued



AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13, AN/VAS-5A(V)15, AN/VAS-5A(V)16
Viewer, Infrared

Figure C-3. Components of End Item

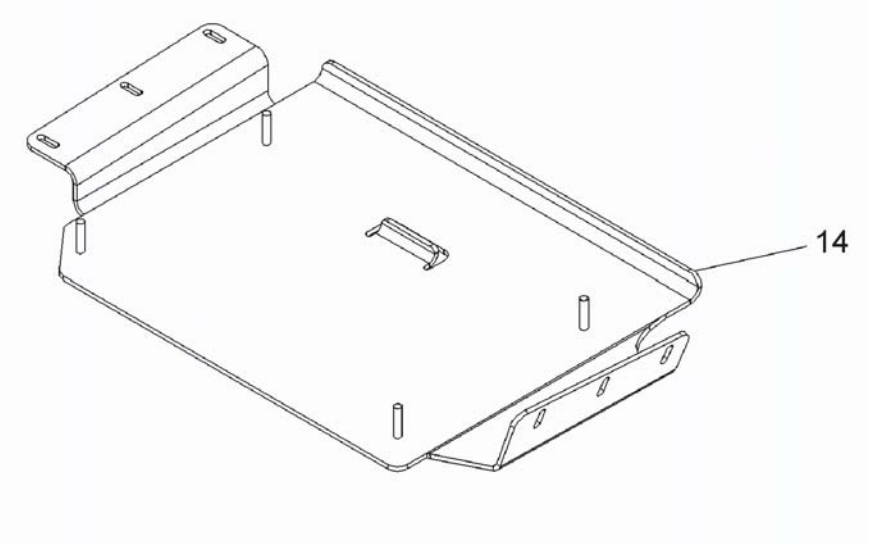
Section II. COMPONENTS OF END ITEM – Continued

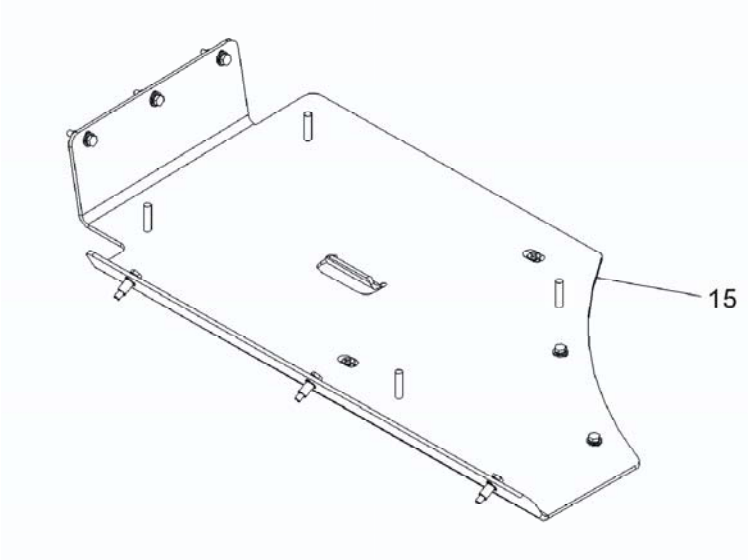


AN/VAS-5A(V)12, AN/VAS-5A(V)13, AN/VAS-5A(V)16 Viewer, Infrared

Figure C-4. Components of End Item

Section II. COMPONENTS OF END ITEM – Continued





AN/VAS-5A(V)15, AN/VAS-5A(V)11 Viewer, Infrared

Figure C-5. Components of End Item

Section II. COMPONENTS OF END ITEM – Continued

Driver's Vision Enhancer (DVE) – AN/VAS-5A(V)2, AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13, AN/VAS-5A(V)14, AN/VAS-5A(V)15, AN/VAS-5A(V)16

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	5855-01-480-4873 OR 5855-01-525-1631	SENSOR ASSEMBY (96214) 3253259-2, -6, -8, -10 SENSOR ASSEMBLY (32865) 6455000		EA EA	1 1
2	5855-01-480-6386	PAN AND TILT MODULE (96214) 3248127-1	39D	EA	1
3	5995-01-480-6388	SA/PTM INTERCONNECT CABLE (96214) 3221644-1	39D	EA	1
4	5980-01-480-4875 OR 5980-01-525-1688	DISPLAY CONTROL MODULE (96214) 3245325-1, -2, -3 DISPLAY CONTROL MODULE (32865) 6455160		EA EA	1 1
5	5995-01-480-6387	DCM/PTM INTERCONNECT CABLE (96214) 3221640-1	39D	EA	1
6	5895-01-481-2509	TRANSPORTATION CASE (96214) 3256880-1	39D	EA	1
7	5895-01-511-2668	SA/PTM INTERCONNECT CABLE (96214) 3220907-1		EA	1
8		TRANSPORTATION CASE (96214) 3236667-1	73C	EA	1
9	5855-01-511-2652	PAN AND TILT MODULE (96214) 3220904-1	72Z, 73A, 73B, 73C, 73D, 73E	EA	1
10		ROOF MOUNT/DCM ASSEMBLY (96214) 3236645-1	73C	EA	1
11		DCM MOUNTING ASSEMBLY (96214) 3248176-1	73A	EA	1
12		DCM ROOF MOUNT ASSEMBLY (96214) 3236631-1	73B	EA	1
13		ROOF MOUNT (96214) 3236680-1	73E	EA	1
14		ROOF MOUNT (96214) 3245781-1	73D	EA	1
15		DCM ROOF MOUNT ASSEMBLY (96214) 3221806-1	72Z	EA	1

Section III. BASIC ISSUE ITEMS

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1		OPERATOR'S AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) TM 11-5855-311-12&P-2		EA	1

APPENDIX D
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Section I. INTRODUCTION

D-1. SCOPE

This RPSTL lists and authorizes spares and repair parts, special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of operator and unit maintenance of the Driver's Vision Enhancer. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

D-2. GENERAL

In addition to the Section I Introduction, this RPSTL is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumerical sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK. Repair Parts kits are listed separately in their own functional group in this section. Repair parts for reparable special tools are also listed in this section. Items listed are shown on the associated illustrations.

b. Special Tools List (Not applicable). A list of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

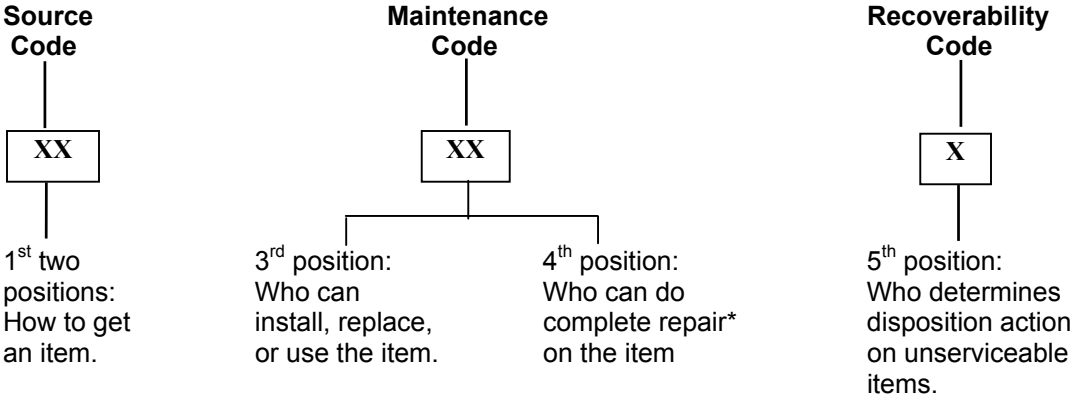
c. Section III.Cross-Reference Indexes. There are two cross-reference indexes in this RPSTL: The National Stock Number (NSN) Index and the Part Number (P/N) Index. The National Stock Number Index refers you to the figure and item number. The Part Number Index refers you to the figure and item number. Section II. REPAIR PARTS LIST

Section II. REPAIR PARTS LIST

D-3. EXPLANATION OF COLUMNS

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

b. SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instructions, as shown in the following breakout:



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

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

Table D-1 SMR Codes

SOURCE				MAINTENANCE			
				USE		REPAIR	
1ST POSITION		2ND POSITION		3RD POSITION		4TH POSITION	
P	PROCURE	A	REPLENISH	O	REPLACE OR USE AT ORG LEVEL	Z	NO REPAIR (CONSUMABLE)
		B	INSURANCE				
		C	CURE DATED				
		D	INITIAL	F H G	REPLACE OR USE AT INTERMEDIATE MAINTENANCE ACTIVITY (IMA)LEVEL	B	RECONDITION BY ADJUSTMENT, CALIBRATION, LUBRICATION, PLATING, ETC.
		E	END ITEM GSE/STOCKED				
		F	GSE/NOT STOCKED				
K	REPAIR KIT COMPONENT	F	ORG/IMA				
		D	DEPOT	L	REPLACE OR USE AT SPECIALIZED IMA	O	REPAIR AT ORGANIZATIONAL LEVEL
		B	BOTH KITS				
		O F H G D	ORG AFLOAT ASHORE BOTH DEPOT	D	REPLACE OR USE AT DEPOT	F H G	REPAIR AT IMA LEVEL
X	MISC	A	REQUEST NHA			L	REPAIR AT SPECIALIZED IMA
		B	OBTAIN FROM SALVAGE OR ONE TIME BUY	Z	NOT REQUIRED FOR THIS APPLICATION	D	REPAIR AT DEPOT OR COMMERCIAL
		C	DIAGRAMS, SCHEMATICS, INSTALL DWGS				

RECOVERABILITY		SERVICE OPTION	
Z	NONREPAIRABLE CONDEMN AT INDICATED IN POSITION 3	N	CONSUMABLE ITEM NOT CENTRALLY PROCURED OR STOCK NUMBERED
A	SPECIAL HANDLING FOR DISPOSAL	M	FLR ITEM WITH UNIT COST OVER $5,000. CHANGE 5TH POSITION TO “D”
O	REPAIRABLE ITEM CONDEMN AT ORGANIZATIONAL LEVEL	T	TRAINING DEVICE ITEM SOURCE CODED PD
H F G	REPAIRABLE ITEM CONDEMN AT IMA LEVEL	G	NORMALLY PROCURED COMMERCIAL, BUT ORGANIC CAPABILITY EXISTS FOR EMERGENCY STOP GAP REQUIREMENTS
		1 2 3	(APPLY TO ENGINES) (APPLIES TO 3RD POSITION) DESIGNATED LOWEST DEGREE OF IMA REPAIR AUTHORITY
L	REPAIRABLE ITEM CONDEMN AT SPECIALIZED MAINTENANCE ACTIVITY	4 5 6	(APPLY TO ENGINES) (APPLIES TO 3RD POSITION) SAME AS 1-2-3 EXCEPT ITEM IS FLR COSTING MORE THAN $5,000
D	REPAIRABLE AT DEPOT OR COMMERCIAL	E	END-TO-END TEST BY IMA REQUIRED PRIOR TO BOM
		J	FLR OR CONSUMABLE CHANGE 5TH POSITION TO “D” UNDER PICA/SICA PROGRAM (APPROVAL REQUIRED)

d. NSN (Column (3)) The NSN for the item is listed in this column.

e. CAGEC (Column (4)) The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

f. PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

g. DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

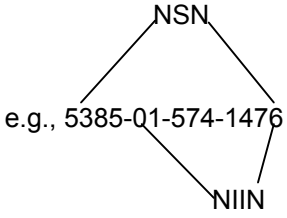
1. The federal item name, and when required, a minimum description to identify the item.
2. P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electrostatic pulse (EMP) damage during a nuclear attack.
4. The statement END OF Figure appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list .

h. QTY (Column (7)). The QTY (Quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A “V” appearing in this column instead of the quantity is variable and quantity may change from application to application.

D-4. EXPLANATION OF CROSS-REFERENCE INDEXES FORMAT AND COLUMNS

a. National Stock Number (NSN) Cross Reference Index.

(1). STOCK NUMBER Column. This column lists the NSN in National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN.



When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2). FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list .

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

b. Part Number (P/N)Cross Reference Index. P/Ns in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which replaces the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

(1). PART NUMBER Column. Indicates the P/N assigned to the item.

(2). FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list .

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

D-5. SPECIAL INFORMATION

a. UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC: ..." in the Description Column (justified left) on the first line under the applicable

item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

Code	Used on
39D	Driver's Vision Enhancer AN/VAS-5A(V)2 FOR GENERATOR, SMOKE, M56
72Z	Driver's Vision Enhancer AN/VAS-5A(V)11FOR FAMILY OF MEDIUM TACTICAL VEHICLES
73A	Driver's Vision Enhancer AN/VAS-5A(V)12 FOR HEAVY EXPANDED MOBILE TACTICAL TRUCK
73B	Driver's Vision Enhancer AN/VAS-5A(V)13 FOR MAXI-AMBULANCE HMMWV
73C	Driver's Vision Enhancer AN/VAS-5A(V)14 FOR TOW HMMWV
73D	Driver's Vision Enhancer AN/VAS-5A(V)15 FOR HARD TOP HMMWV
73E	Driver's Vision Enhancer AN/VAS-5A(V)16 FOR PROPHET/SOFT-TOP HMMWV

b. Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in TM 11-5855-311-12&P-2.

c. Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index and the bulk material list in the repair parts list."

D-6. HOW TO LOCATE REPAIR PARTS

(1). When NSNs or P/Ns Are Not Known.

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

(b). Second. Find the figure covering the functional group to which the item belongs.

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

(d). Fourth. Look in the repair parts list for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

(2). When the NSN is Known.

(a). First. If you have the NSN, look in the STOCK NUMBER column of the NSN index. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

(b). Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

(3). When the P/N is Known.

(a). First. If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index. Identify the figure and item number.

(b). Second. Look up the item on the figure in the applicable repair parts list.

D-7. ABBREVIATIONS

Abbreviation	Explanation

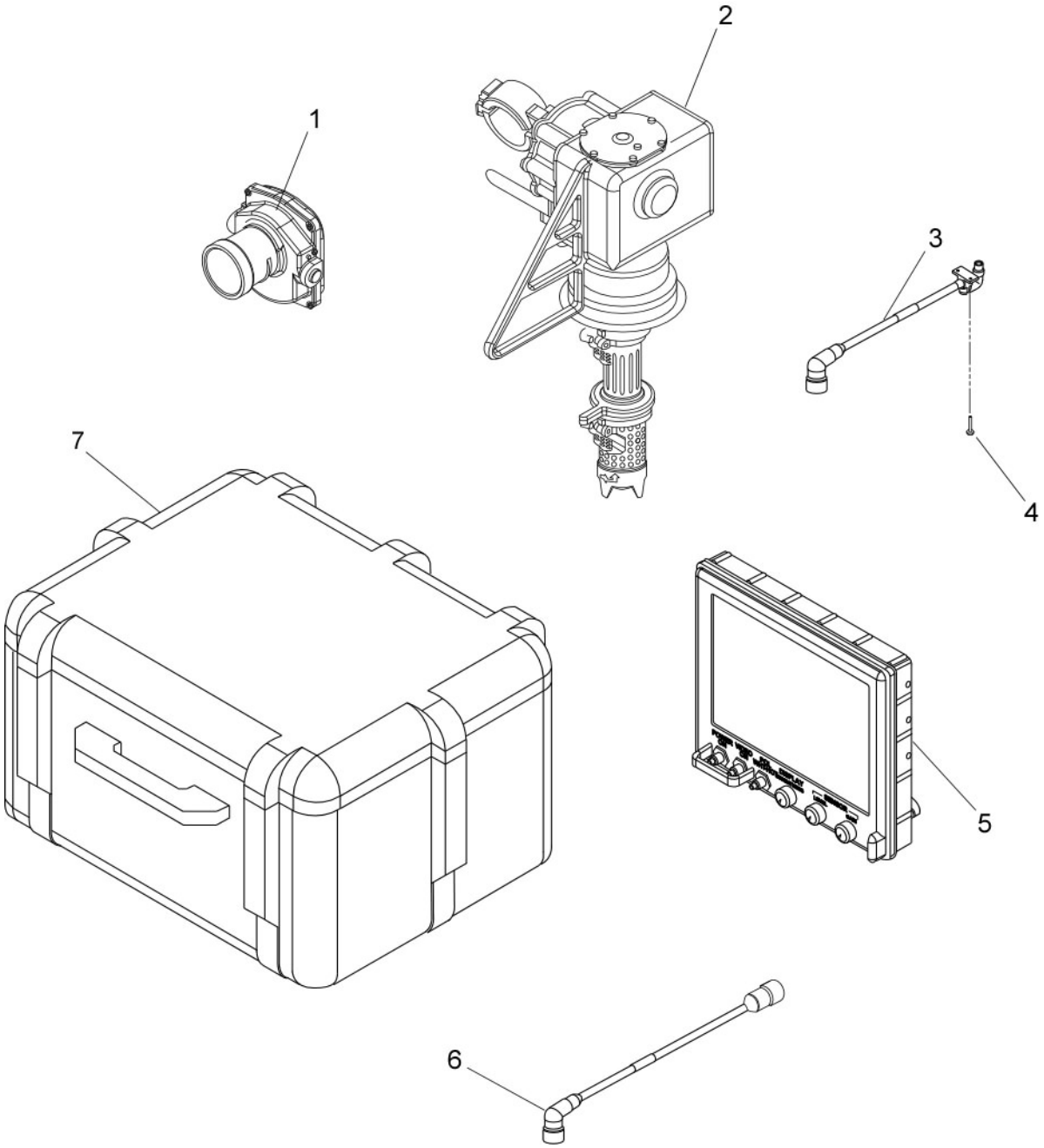


Figure D-1. Infrared Viewer, AN/VAS-5A(V)2

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					INFRARED VIEWER AN/VAS–5A(V)2 UOC: 39D GROUP 00 FIGURE D–1	
1	PAODD	5855–01–480–4873	96214	3253259–2 3253259–6 3253259–8 3253259–10	SENSOR ASSY. ITEM 1 IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–3 FOR PARTS BREAKDOWN.)	1
		OR				
	PAODD	5855–01–525–1631	32865	6455000	SENSOR ASSY. ITEM 1 IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–3 FOR PARTS BREAKDOWN.)	1
2	PAODD	5855–01–480–6386	96214	3248127–1	PAN AND TILT MODULE (SEE FIG D–4 FOR PARTS BREAKDOWN.)	1
3	PAOZZ	5995–01–480–6388	96214	3221644–1	SA/PTM INTERCONNECT CABLE	1
4	PAOZZ	5305–01–481–0388	96214	470786–20	SCREW, MACHINE	2
5	PAODD	5980–01–480–4875	96214	3245325-1 3245325-2 3245325-3	DISPLAY/CONTROL MODULE. ITEM 5 IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–6 FOR PARTS BREAKDOWN.)	1
		OR				
	PAODD	5980–01–525–1688	32865	6455160	DISPLAY/CONTROL MODULE. ITEM 5 IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–6 FOR PARTS BREAKDOWN.)	1
6	PAOZZ	5995–01–480–6387	96214	3221640-1	DCM/PTM INTERCONNECT CABLE	1
7	PAOZZ	5895–01–481–2509	96214	3256880–1	TRANSPORTATION CASE	1
					END OF FIGURE	

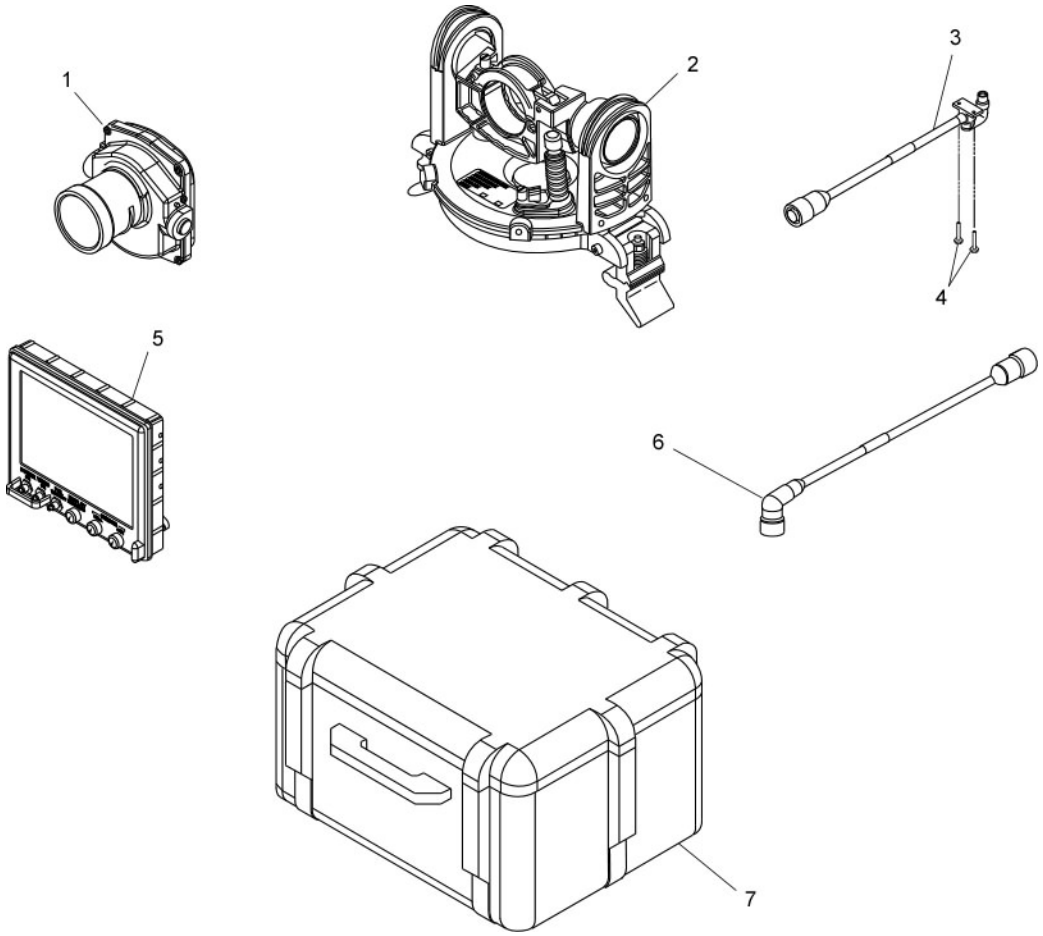


Figure D-2. Infrared Viewer, AN/VAS-5A(V)11, AN/VAS-5A(V)12, AN/VAS-5A(V)13 AN/VAS-5A(V)14, AN/VAS-5A(V)15, AN/VAS-5A(V)16

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					INFRARED VIEWER AN/VAS–5A(V)11 UOC: 72Z AN/VAS–5A(V)12 UOC: 73A AN/VAS–5A(V)13 UOC: 73B AN/VAS–5A(V)14 UOC: 73C AN/VAS–5A(V)15 UOC: 73D AN/VAS–5A(V)16 UOC: 73E GROUP 00 FIGURE D–2	
1	PAODD	5855–01–480–4873	96214	3253259–2 3253259–6 3253259–8 3253259–10	SENSOR ASSY IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–3 FOR PARTS BREAKDOWN.)	1
		OR				
	PAODD	5855–01–525–1631	32865	6455000	SENSOR ASSY IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D–3 FOR PARTS BREAKDOWN.)	1
2	PAOOO	5855-01-511-2652	96214	3220904-1	PAN AND TILT MODULE, THERMAL VISION (SEE FIG D-5 FOR PARTS BREAKDOWN.)	1
3	PAOZZ	5995-01-511-2668	96214	3220907-1	SA/PTM CABLE ASSEMBLY, SPECIAL PURPOSE	1
4	PAOZZ	5305–01–481–0388	96214	470786-20	SCREW, MACHINE	2
5	PAODD	5980–01–480–4875	96214	3245325-1 3245325-2 3245325-3	DISPLAY/CONTROL MODULE. IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D-6 FOR PARTS BREAKDOWN.)	1
		OR				
	PAODD	5980–01–525–1688	32865	6455160	DISPLAY/CONTROL MODULE. IS TWO-WAY INTERCHANGEABLE IN THE DVE SYSTEMS (SEE FIG D-6 FOR PARTS BREAKDOWN.)	1
6	PAOZZ	5995–01–511–2686	96214	3220915-2	DCM/PTM INTERCONNECT CABLE UOC: 72Z, 73A	1
	PAOZZ	5995–01–511–2696	96214	3220915-3	DCM/PTM INTERCONNECT CABLE UOC: 73B, 73C, 73D, 73E	1
7	PAOZZ		96214	3220918-1	TRANSPORTATION CASE	1
	PAOZZ		96214	3236667-1	TRANSPORTATION CASE UOC: 73C	1
					END OF FIGURE	

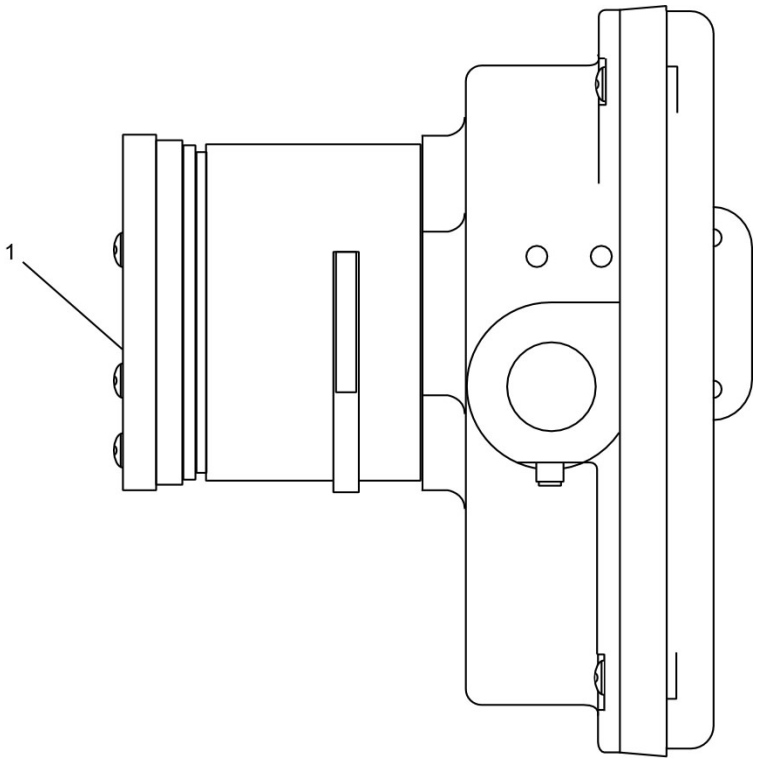


Figure D-3. Sensor Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					SENSOR ASSEMBLY GROUP 01 FIGURE D–3	
1	PAOZZ	5895–01–481–2510	96214	3236597–1	SENSOR WINDOW COVER	1
	PAOZZ		32865	6455144	SENSOR WINDOW COVER	1
					END OF FIGURE	

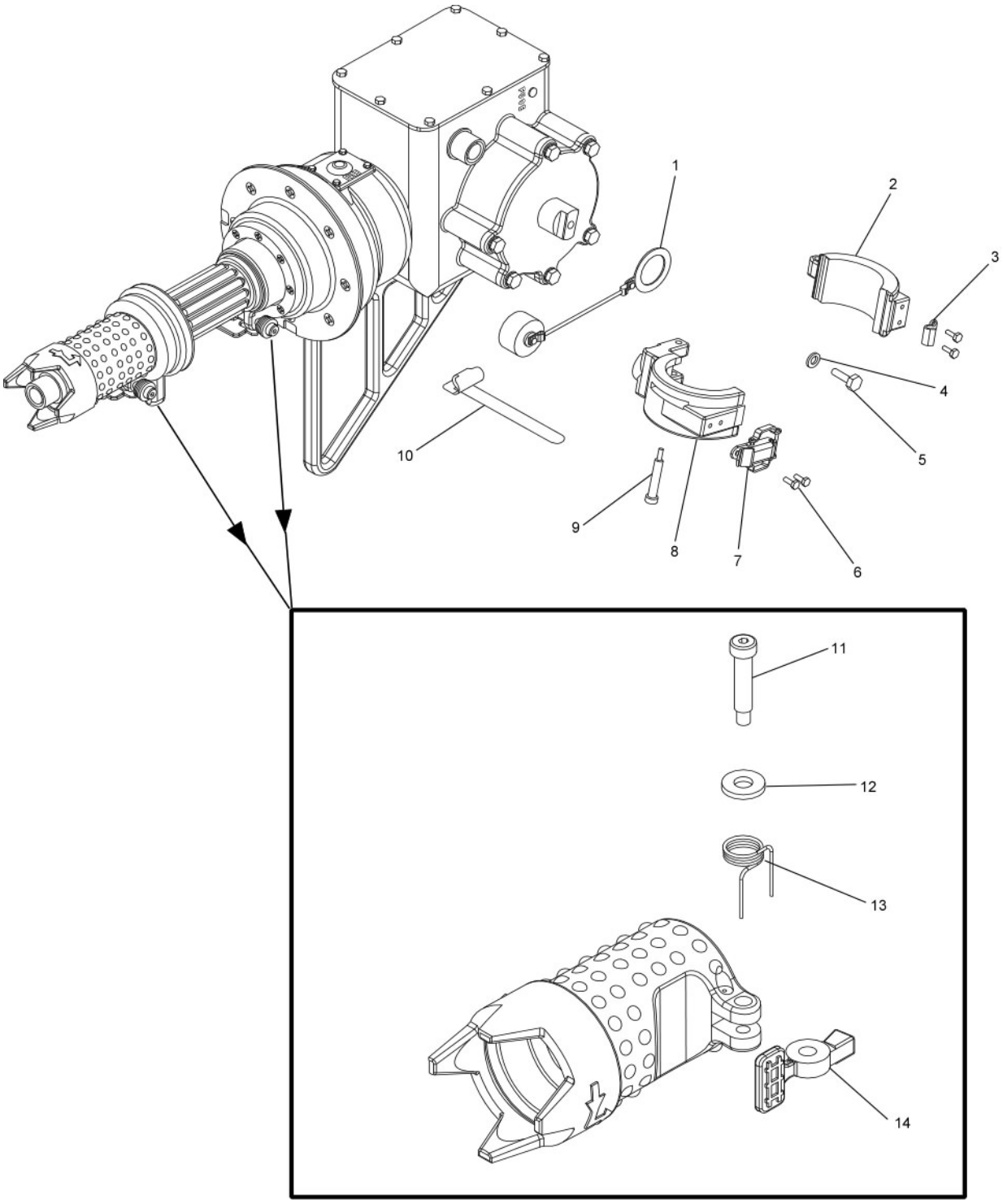


Figure D-4. Pan and Tilt Module

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					PAN AND TILT MODULE GROUP 02 FIGURE D–4	
1	PAOZZ	5935–01–279–8630	81349	D38999/ 33W13N	DUST CAP	1
2	PAOZZ	5340–01–481–0563	96214	3248143–1	SENSOR ASSEMBLY CLAMP	1
3	PAOZZ	5340–00–867–3265	98003	SCD20648SS	CATCH	1
4	PAOZZ	5310–01–352–9593	80205	NAS1149C04 63R	WASHER, FLAT	1
5	PAOZZ	5305–01–481–0385	39428	92240A106	SCREW, HEX HEAD	1
6	PAOZZ	5305–01–481–0598	39428	92314A144	SCREW, HEX HEAD	4
7	PAOZZ	5340–01–167–2593	98003	SCD20650-27SS	STRIKE	1
8	PAOZZ	5340–01–481–0565	96214	3248141–1	SENSOR CRADLE ASSEMBLY	1
9	PAOZZ	5305–01–481–0603	39428	90298A544	SHOULDER SCREW	1
10	PAOZZ	8315–01–481–4524	39428	6605K121	CABLE TIE HOOK	1
11	PAOZZ	5305–01–481–0588	29964	44D34	SHOULDER SCREW	2
12	PAOZZ	5310–00–582–5677	96906	MS15795–810	WASHER, FLAT	2
13	PAOZZ	5340–01–481–0359	96214	3256889–1	SPRING, AZ/EL LOCK	2
14	PAOZZ	5365–01–481–0630	96214	3248145–1	AZIMUTH/ELEVATION LOCK	2
					END OF FIGURE	

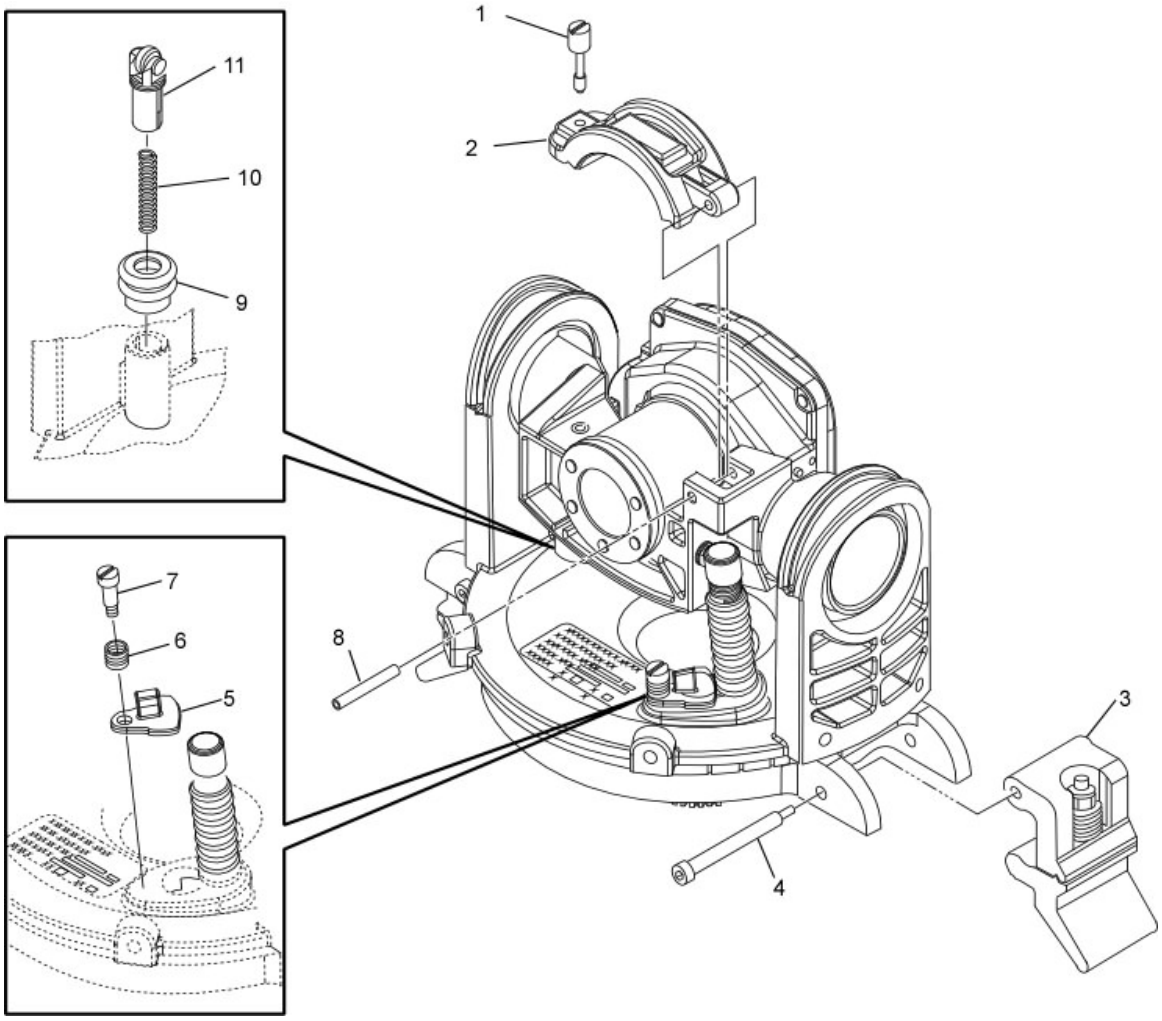


Figure D-5. Pan and Tilt Module

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					PAN AND TILT MODULE GROUP 02 FIGURE D–5	
1	PAOZZ		39428	91035A550	THUMBSCREW	1
2	PAOZZ		96214	3220932-1	SENSOR CLAMP	1
3	PAOZZ		96214	3258673-1	PTM CLAMP	2
4	PAOZZ		39428	90298A549	SHOULDER SCREW	2
5	PAOZZ		96214	3221009-1	CLIP, CABLE RETAINING	1
6	PAOZZ		39428	9435K74	SPRING	1
7	PAOZZ		39428	91829A537	SCREW, SHOULDER	1
8	PAOZZ	5315-00-587-2705	80205	MS16562-239	PIN, SPRING	1
9	PAOZZ		96214	3221019-1	BOOT, ELEVATION DETENT	1
10	PAOZZ		74197	C0300-051-2000-S	COMPRESSION SPRING	1
11	PAOZZ		96214	3258672-1	BEARING, ELEVATION	1
					END OF FIGURE	

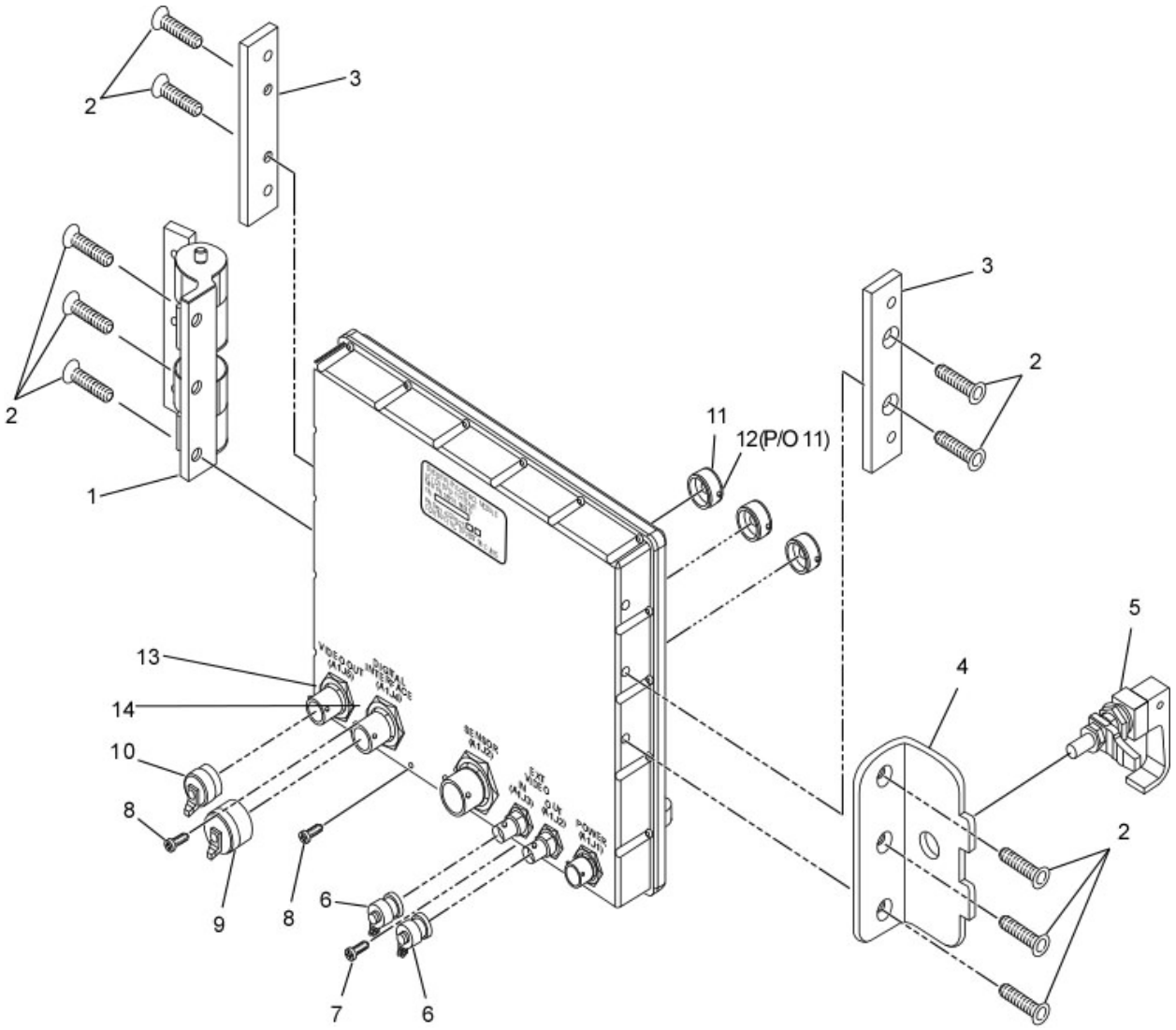


Figure D-6. Display/Control Module

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					DISPLAY/CONTROL MODULE GROUP 03 FIGURE D–6	
1	PAOZZ		96214	3236665	HINGE ASSEMBLY UOC: 73C	1
2	PAOZZ		96214	3256974	SCREW, FLATHEAD UOC: 73C	6
	PAOZZ		96214	3256974	SCREW, FLATHEAD	4
3	PAOZZ		96214	3221835	DCM ADAPTER	2
4	PAOZZ		96214	3236651	PLATE, LATCH UOC: 73C	1
5	PAOZZ	5340–01–462–2503	64106	1619A35	LATCH UOC: 73C	1
6	PAOZZ	5340–01–449–1999	53919	PE6013	COVER, BNC CONNECTOR	2
	PAOZZ		05257	917836-042	COVER, BNC CONNECTOR	2
7	PAOZZ	5305–00–880–8192	80205	NAS1301C4–5	SCREW, MACHINE	1
	PAOZZ	5305-00-054-6650	96906	MS51957-26	SCREW, MACHINE	1
8	PAOZZ	5305–01–132–3387	80205	NAS1301C4–4	SCREW, MACHINE	2
9	PAOZZ	5935–01–481–2443	06324	660–013NF11S3–06–102	COVER, ELECTRICAL	1
	PAOZZ		05257	915705-007	COVER, ELECTRICAL	1
10	PAOZZ	5935–01–481–2518	06324	660–024NF09S5–06–102	COVER, ELECTRICAL	1
	PAOZZ		81349	D38999/22W9N	COVER, ELECTRICAL (FOR APPLICATION SEE FIG 3-3)	1
11	PAOZZ	5355-01-481-1327	08YX1	68054–1	KNOB	3
	PAOZZ		05257	918575-001	KNOB (FOR APPLICATION SEE FIG 3-3)	3
12	PAOZZ	5305–01–042–3997	80205	MS51021-103	SCREW	6
13	PAOZZ	5310–00–224–0489	96906	MS3186A106W	NUT, HEX (FOR APPLICATION SEE FIG 3-3)	1
14	PAOZZ	5310–01–138–5506	96906	MS3186A108W	NUT, HEX (FOR APPLICATION SEE FIG 3-3)	1
					END OF FIGURE	

Section III. Cross Reference Indexes
National Stock Number Index

STOCK NUMBER	PART NUMBER	CAGEC	FIG.	ITEM
5305-00-880-8192	915985-015	05257	D-6	7
5305-00-880-8192	NAS1301C4-5	80205	D-6	7
5305-01-047-3997	68054-1	08YX1	D-6	11
5305-01-047-3997	918575-001	05257	D-6	11
5305-01-132-3387	NAS1301C4-4	80205	D-6	8
5305-01-481-0366	MS51021-103	6N920	D-6	12
5305-01-481-0385	92240A106	39428	D-4	5
5305-01-481-0388	470786-20	96214	D-1	4
5305-01-481-0388	470786-20	96214	D-2	4
5305-01-481-0588	44D34	29964	D-4	11
5305-01-481-0598	92314A144	39428	D-4	6
5305-01-481-0603	90298A544	39428	D-4	9
5310-00-224-0489	MS3189A106W	96906	D-6	13
5310-00-582-5677	MS15795-810	96906	D-4	12
5310-01-138-5506	MS3186A108W	96906	D-6	14
5310-01-352-9593	NAS1149C0463R	80205	D-4	4
5315-00-587-2705	MS171596	96906	D-5	8
5340-00-867-3265	SCD20648SS	98003	D-4	3
5340-01-167-2593	SCD20650-27SS	98003	D-4	7
5340-01-449-1999	917836-042	05257	D-6	6
5340-01-449-1999	PE6013	53919	D-6	6
5340-01-462-2503	1619A35	64106	D-6	5
5340-01-481-0359	3256889-1	96214	D-4	13
5340-01-481-0563	3248143-1	96214	D-4	2
5340-01-481-0565	3248141-1	96214	D-4	8
5365-01-481-0630	3248145-1	96214	D-4	14
5855-01-480-4873	3253259-10	96214	D-1	1
5855-01-480-4873	3253259-10	96214	D-2	1
5855-01-480-4873	3253259-2	96214	D-1	1
5855-01-480-4873	3253259-2	96214	D-2	1
5855-01-480-4873	3253259-6	96214	D-1	1
5855-01-480-4873	3253259-6	96214	D-2	1
5855-01-480-4873	3253259-8	96214	D-1	1
5855-01-480-4873	3253259-8	96214	D-2	1
5855-01-480-6386	3248127-1	96214	D-1	2
5855-01-511-2652	3220904-1	96214	D-2	2
5855-01-525-1631	6455000	32865	D-1	1
5855-01-525-1631	6455000	32865	D-2	1
5895-01-481-2509	3256880-1	96214	D-1	7
5895-01-481-2510	6455144	32865	D-3	1
5895-01-481-2510	3236597-2	96214	D-3	1
5935-01-279-8630	D38999/33W13N	81349	D-4	1
5935-01-481-2443	660-013NF11S3-06-102	06324	D-6	9
5935-01-481-2443	915705-007	05257	D-6	9
5935-01-481-2518	660-024NF09S5-06-102	06324	D-6	10
5935-01-481-2518	D38999/22W9N	81349	D-6	10
5980-01-480-4875	3245325-1	96214	D-1	5

STOCK NUMBER	PART NUMBER	CAGEC	FIG.	ITEM
5980-01-480-4875	3245325-1	96214	D-2	5
5980-01-480-4875	3245325-2	96214	D-1	5
5980-01-480-4875	3245325-2	96214	D-2	5
5980-01-480-4875	3245325-3	96214	D-1	5
5980-01-480-4875	3245325-3	96214	D-2	5
5980-01-525-1688	6455160	32865	D-1	5
5980-01-525-1688	6455160	32865	D-2	5
5995-01-480-6387	3221640-1	96214	D-1	6
5995-01-480-6388	3221644-1	96214	D-1	3
5995-01-511-2668	3220907-1	96214	D-2	3
5995-01-511-2686	3220915-2	96214	D-2	6
5995-01-511-2696	3220915-3	96214	D-2	6
8315-01-481-4524	6605K121	39428	D-4	10
	3221835		D-6	3
	3236651		D-6	4
	3236665	96214	D-6	1
	3256974	96214	D-6	2
	3220918-1	96214	D-2	7
	3220932-1	96214	D-5	2
	3221009-1	96214	D-5	5
	3221019-1	96214	D-5	9
	3236667-1	96214	D-2	7
	3258672-1	96214	D-5	11
	3258673-1	96214	D-5	3
	90298A549	39428	D-5	4
	91035A550	39428	D-5	1
	91829A537	39428	D-5	7
	9435K74	39428	D-5	6
	C0300-051-2000-S	74197	D-5	10

Section IV. Cross Reference Indexes
Part Number Index

PART NUMBER	STOCK NUMBER	CAGEC	FIG.	ITEM
3221835			D-6	3
3236651			D-6	4
3236665		96214	D-6	1
3256974		96214	D-6	2
6455000	5855-01-525-1631	32865	D-1	1
6455000	5855-01-525-1631	32865	D-2	1
6455144	5895-01-481-2510	32865	D-3	1
6455160	5980-01-525-1688	32865	D-1	5
6455160	5980-01-525-1688	32865	D-2	5
1619A35	5340-01-462-2503	64106	D-6	5
3220904-1	5855-01-511-2652	96214	D-2	2
3220907-1	5995-01-511-2668	96214	D-2	3
3220915-2	5995-01-511-2686	96214	D-2	6
3220915-3	5995-01-511-2696	96214	D-2	6
3220918-1		96214	D-2	7
3220932-1		96214	D-5	2
3221009-1		96214	D-5	5
3221019-1		96214	D-5	9
3221640-1	5995-01-480-6387	96214	D-1	6
3221644-1	5995-01-480-6388	96214	D-1	3
3236597-2	5895-01-481-2510	96214	D-3	1
3236667-1		96214	D-2	7
3245325-1	5980-01-480-4875	96214	D-1	5
3245325-1	5980-01-480-4875	96214	D-2	5
3245325-2	5980-01-480-4875	96214	D-1	5
3245325-2	5980-01-480-4875	96214	D-2	5
3245325-3	5980-01-480-4875	96214	D-1	5
3245325-3	5980-01-480-4875	96214	D-2	5
3248127-1	5855-01-480-6386	96214	D-1	2
3248141-1	5340-01-481-0565	96214	D-4	8
3248143-1	5340-01-481-0563	96214	D-4	2
3248145-1	5365-01-481-0630	96214	D-4	14
3253259-10	5855-01-480-4873	96214	D-1	1
3253259-10	5855-01-480-4873	96214	D-2	1
3253259-2	5855-01-480-4873	96214	D-1	1
3253259-2	5855-01-480-4873	96214	D-2	1
3253259-6	5855-01-480-4873	96214	D-1	1
3253259-6	5855-01-480-4873	96214	D-2	1
3253259-8	5855-01-480-4873	96214	D-1	1
3253259-8	5855-01-480-4873	96214	D-2	1
3256880-1	5895-01-481-2509	96214	D-1	7
3256889-1	5340-01-481-0359	96214	D-4	13
3258672-1		96214	D-5	11
3258673-1		96214	D-5	3
44D34	5305-01-481-0588	29964	D-4	11
470786-20	5305-01-481-0388	96214	D-1	4
470786-20	5305-01-481-0388	96214	D-2	4
660-013NF11S3-06-102	5935-01-481-2443	06324	D-6	9

Part Number Index cont.

PART NUMBER	STOCK NUMBER	CAGEC	FIG.	ITEM
660-024NF09S5-06-102	5935-01-481-2518	06324	D-6	10
6605K121	8315-01-481-4524	39428	D-4	10
68054-1	5305-01-047-3997	08YX1	D-6	11
90298A544	5305-01-481-0603	39428	D-4	9
90298A549		39428	D-5	4
91035A550		39428	D-5	1
915705-007	5935-01-481-2443	05257	D-6	9
915985-015	5305-00-880-8192	05257	D-6	7
917836-042	5340-01-449-1999	05257	D-6	6
91829A537		39428	D-5	7
918575-001	5305-01-047-3997	05257	D-6	11
92240A106	5305-01-481-0385	39428	D-4	5
92314A144	5305-01-481-0598	39428	D-4	6
9435K74		39428	D-5	6
C0300-051-2000-S		74197	D-5	10
D38999/22W9N	5935-01-481-2518	81349	D-6	10
D38999/33W13N	5935-01-279-8630	81349	D-4	1
MS15795-810	5310-00-582-5677	96906	D-4	12
MS171596	5315-00-587-2705	96906	D-5	8
MS3186A108W	5310-01-138-5506	96906	D-6	14
MS3189A106W	5310-00-224-0489	96906	D-6	13
MS51021-103	5305-01-481-0366	6N920	D-6	12
NAS1149C0463R	5310-01-352-9593	80205	D-4	4
NAS1301C4-4	5305-01-132-3387	80205	D-6	8
NAS1301C4-5	5305-00-880-8192	80205	D-6	7
PE6013	5340-01-449-1999	53919	D-6	6
SCD20648SS	5340-00-867-3265	98003	D-4	3
SCD20650-27SS	5340-01-167-2593	98003	D-4	7

APPENDIX E

ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists additional items you are authorized for the support of the DVE.

E-2. GENERAL

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

E-3. EXPLANATION OF COLUMNS IN THE AAL

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

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

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

Code	Used On
39D	Driver's Vision Enhancer AN/VAS-5A(V)2
72Z	Driver's Vision Enhancer AN/VAS-5A(V)11
73A	Driver's Vision Enhancer AN/VAS-5A(V)12
73B	Driver's Vision Enhancer AN/VAS-5A(V)13
73C	Driver's Vision Enhancer AN/VAS-5A(V)14
73D	Driver's Vision Enhancer AN/VAS-5A(V)15
73E	Driver's Vision Enhancer AN/VAS-5A(V)16

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

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

Section II. ADDITIONAL AUTHORIZED ITEMS LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC, AND PART NUMBER	(3) USABLE ON CODE	(4) U/I	(5) QTY RECM

APPENDIX F - EXPENDABLE AND DURABLE ITEMS LIST

Section I. INTRODUCTION

F-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the DVE. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

F-2. EXPLANATION OF COLUMNS

a. Column (1) Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., “Use brake fluid (item 5, WP 0098 00).”).

b. Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (O = Unit/AVUM).

c. Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

d. Column (4) Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). This column provides the other information you need to identify the item.

e Column (5) Unit of Issue (U/I). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (3).

Section II. EXPENDABLE AND DURABLE ITEMS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/I
1	O	9150-01-443-9573	LUBRICANT, GREASE, ACFT AND INST. PETROLEUM 5.3 OZ TUBE (71984) DOW 55	TU
2	O	7930-00-531-9715	DETERGENT, GENERAL PURPOSE 1 GALLON CONTAINER (81421) 7930-00-531-9715 OR EQUIVALENT	GL
3	O	7920-00-205-1711	CLOTH, WIPING, 50 LB BALE (58536) A-A-2522	BE
4	O	6850-00-227-1887	LENS TISSUE, 100 SHEETS (80244) NNN-P-40, TYPE 1, CLASS 4 OR EQUIVALENT	PG
5	O	6640-00-240-5851	LENS CLEANING COMPOUND, 1 QUART (81349) MIL-C-43454 OR EQUIVALENT	QT
6	O	8030-01-054-3968	ADHESIVE, THREAD LOCK LOCTITE 222	BT

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.

Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

DATE: 23 September 05

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*
Commander, CECOM
ATTN: AMSEL-LC-LEO-E-ED
Fort Monmouth, NJ 07703-5006

FROM: *(Activity and location) (Include ZIP Code)*
Cdr, Stateside Army Depot
ATTN: AMSUR-US
Anytown, US 22222-1234

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 5-1080-250-12&P	1 Jan 03	ULCANS Camo

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*
1.	1-13			1-5		Figure 1-5 should read Figure 1-6. Figure 1-5 appears on Page 1-9.
2.	1-14			1-6		Figure 1-6 should be Figure 1-7.

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
SSG I. M. DeSpiritof	DSN 999-1776	

DA FORM 1 FEB 74 **2028**

REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)*	DATE
Commander, CECOM ATTN: AMSEL-LC-LEO-E-ED Fort Monmouth, NJ 07703-5006	774th Maint Co 632 Any Street My Town, US 12345-6789	May 28, 01

PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 11-5840-340-20P	July 3, 1970	Radar Set, AN/PRC-76

PAGE NO.	COLM NO.	LINE NO.	FEDERAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPROTED	RECOMMENDED ACTION
25-1	4	14			25	14		See Remarks.

PART III - REMARKS *(Any additional remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

I tried to order this part but what I got was completely different. My supply person says I ordered correctly, but maybe the part number's been changed? Please give me a good part number so I can fix this radar.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
SFC Sam Fishkin	494-813-1951	Sam Fishkin, SFC

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS **For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.**	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*

** Reference to line numbers within the paragraph or subparagraph.*

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DA FORM 1 FEB 74 **2028**

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PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	FEDERAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPROTED	RECOMMENDED ACTION

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