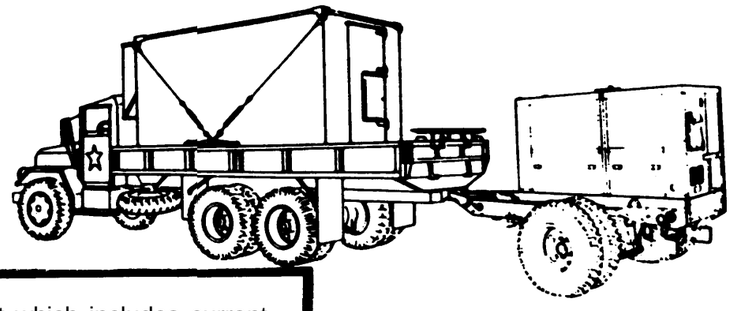
TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

SHOP EQUIPMENT
GUIDED MISSILE AN/TSM-153
IMPROVED CONTACT
SUPPORT SET (ICSS)
(4940-01-154-3957)



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

FOR
TOW 2 HEAVY ANTITANK/ASSAULT WEAPON SYSTEM
DRAGON MEDIUM ANTITANK/ASSAULT WEAPON SYSTEM
TOW SUBSYSTEM, BRADLEY FIGHTING VEHICLE SYSTEM

HEADQUARTERS, DEPARTMENT OF THE ARMY

12 AUGUST 1983

Change
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 12 November 1997

OPERATOR, ORGANIZATIONAL,
DIRECT SUPPORT, AND
GENERAL SUPPORT
MAINTENANCE MANUAL
SHOP EQUIPMENT GUIDED MISSILE AN/TSM-153
IMPROVED CONTACT SUPPORT SET (ICSS)
(4940-01-154-3957)
FOR
TOW 2 HEAVY ANTITANK/ASSAULT WEAPON SYSTEM
DRAGON MEDIUM ANTITANK/ASSAULT WEAPON SYSTEM
TOW SUBSYSTEM, BRADLEY FIGHTING VEHICLE SYSTEM

TM 9-4935-451-14, 12 August 1983, is changed as follows:

1. The pages affected by this change, appearing in the following listing, are to be inserted in the manual. New or changed text is indicated by a vertical bar in the margin of the page. Changes to illustrations are indicated by a miniature pointing hand. New or affected material in flow chart procedures is indicated by a pointing hand at the affected block or illustration. Where a complete chapter, section, appendix, paragraph, etc., is changed or added, a vertical line is placed in the margin by the title only.

Remove Pages	Insert Pages
i, ii	i, ii
1-7, 1-8	1-7, 1-8
1-13/(1-14 blank)	1-13/(1-14 blank)
3-13,3-14	3-13,3-14
3-33/(3-34 blank)	3-33,3-34
A-1/(A-2 blank)	A-1/(A-2 blank)
C-3 thru C-5/(C-6 blank)	C-3 thru C-5/C-6 blank)
F-1, F-2	F-1, F-2

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

By Order of the Secretary of the Army:

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

Official:

JOEL B. HUDSON
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Secretary of the Army
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NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., 31 August 1993

OPERATOR, ORGANIZATIONAL
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
SHOP EQUIPMENT GUIDED MISSILE AN/TSM-153
IMPROVED CONTACT SUPPORT SET (ICSS)
(4940-01-1 54-3957)
FOR
TOW 2 HEAVY ANTITANK/ASSAULT WEAPON SYSTEM
DRAGON MEDIUM ANTITANK/ASSAULT WEAPON SYSTEM
TOW SUBSYSTEM, BRADLEY FIGHTING VEHICLE SYSTEM

TM 9-4935-451-14, 12 August 1983, is changed as follows:

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Remove Pages	Insert Pages
i, ii	i, ii
1-1 thru 1-4	1-1 thru 1-4
2-17, 2-18	2-17,2-18
3-1,3-2	3-1, 3-2
4-3 thru 4-24	4-3 thru 4-24
4-27, 4-28	4-27, 4-28
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C-1 thru C-5/(C-6 blank)	C-1 thru C-5/(C-6 blank)
F-1, F-2	F-1, F-2

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GORDON R. SULLIVAN
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05195

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PIN: 054001-004

HIGH VOLTAGE is used in this system. Death or injury can result if you do not observe the safety precautions given in the instructions.

LOW VOLTAGE can also be dangerous. DON'T be misled by this term. Potentials as low as 50 volts may cause death under certain circumstances.

The shelter must be grounded before power is connected to the shelter.

Installation of ground rod must be completed before power is connected to the shelter.

Before making connections, ensure that commercial power lines, or generator power lines have been turned off.

SOLVENT AND ALCOHOL WILL BURN

Solvent and alcohol can explode and cause death or serious injury. BE SURE to follow these precautions for safety of personnel.

- Keep it away from open flame.
- Use only in area where there is plenty of fresh air.
- In case of fire, put it out with water or cover the fire so air cannot reach it.
- Try not to get solvent on your skin.
- If solvent gets in your eyes, wash them with plenty of water and get medical help right away.
- After using solvent, wash carefully so that there is no solvent on your skin.

The anti-reflective coating on AN/TAS-4 infrared optics contains thorium fluoride which is slightly radioactive. The only potential hazard involves ingestion (swallowing or inhaling) of this coating material. Dispose of broken lens, etc., in accordance with AR 385-11.

HEAVY EQUIPMENT

The test set group, tracker test set, nitrogen bottle, and BSA holding fixture are extremely heavy.

- Two people are required to safely lift or move this equipment.
- Remove BSA holding fixture before lifting transport case.

To avoid injury to personnel and damage to equipment during mounting of shelter, only personnel required for loading operations should be near truck and lifting device.

To prevent slipping and injury to personnel going into and coming out of shelter, the tailgate, ladder steps, and rear quarter of truck bed should be painted with nonskid paint.

Noise from Basic Sight Assembly can permanently damage hearing of soldiers. All personnel MUST WEAR HEARING PROTECTION when BSA cooler is operated. Hearing protection devices must be properly worn to provide effective protection.

If HEARING PROTECTION is not worn the safe level of noise exposure will be exceeded. Hearing loss occurs gradually. Each noise exposure that exceeds the ear protection guidelines below will cause a temporary hearing loss. Over time the loss in hearing will become permanent. Plan each day's operation, and be sure all maintenance personnel have the required ear protectors. Spare earplugs must be available.

EAR PROTECTION GUIDELINES: MAINTENANCE PERSONNEL must wear 4240-00-022-2946 sound protectors when the BSA cooler is operated.

TECHNICAL MANUAL
No. 9-4935-451-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 12 August 1983

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

SHOP EQUIPMENT GUIDED MISSILE AN/TSM-153 IPROVED CONTACT SUPPORT SET (CSS) (4940-01-154-3957) FOR TOW 2 HEAVY ANTITANK/ASSAULT WEAPON SYSTEM DRAGON MEDIUM ANTITANK/ASSAULT WEAPON SYSTEM TOW SUBSYSTEM, BRADLEY FIGHTING VEHICLE SYSTEM

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of any way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-PS, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you.

You may also send in your comments electronically to our e-mail address: Is-lp@redstone.army.mil or by fax 205-842-6546/DSN788-6546.

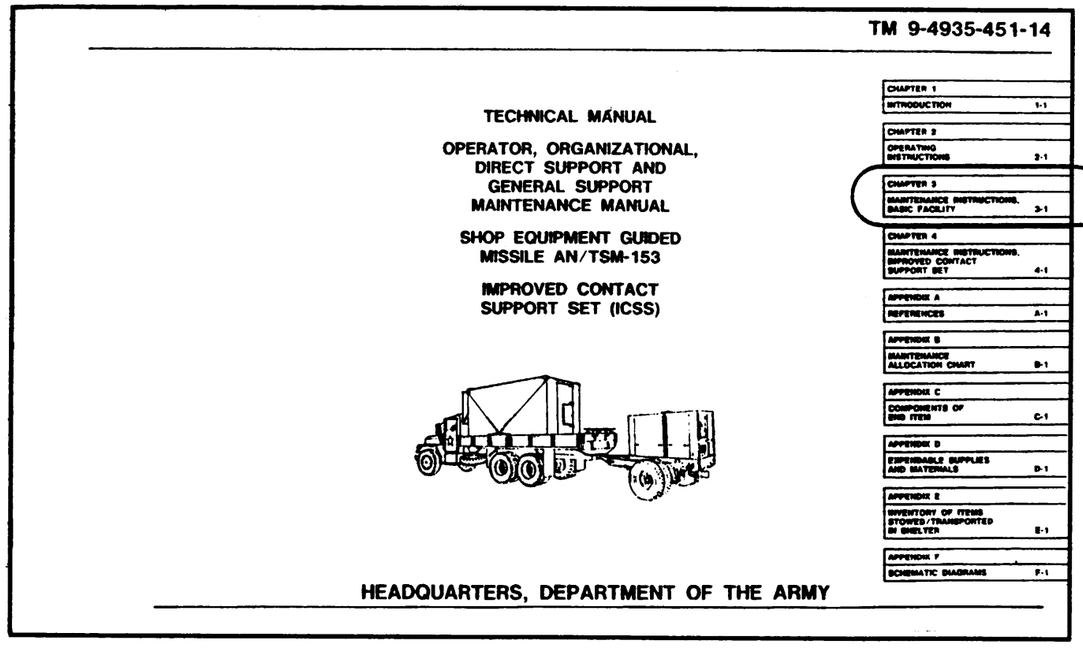
Page

HOW TO USE THIS MANUAL

If you spend a few minutes looking through this manual, you will see that it has a new look that is very different from the manuals you have been using. 'The new look is not just to make this manual look better, but to make it easier for you to read and use. We got rid of as many big words as we could. New methods are used to make it easier for you to find and perform the procedures you need. So HOW DO YOU USE THIS MANUAL?

NOTE

The examples used in this section are samples only. The samples given will not always match the pages in this manual.



TM 9-4935-451-14

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

SHOP EQUIPMENT GUIDED MISSILE AN/TSM-153

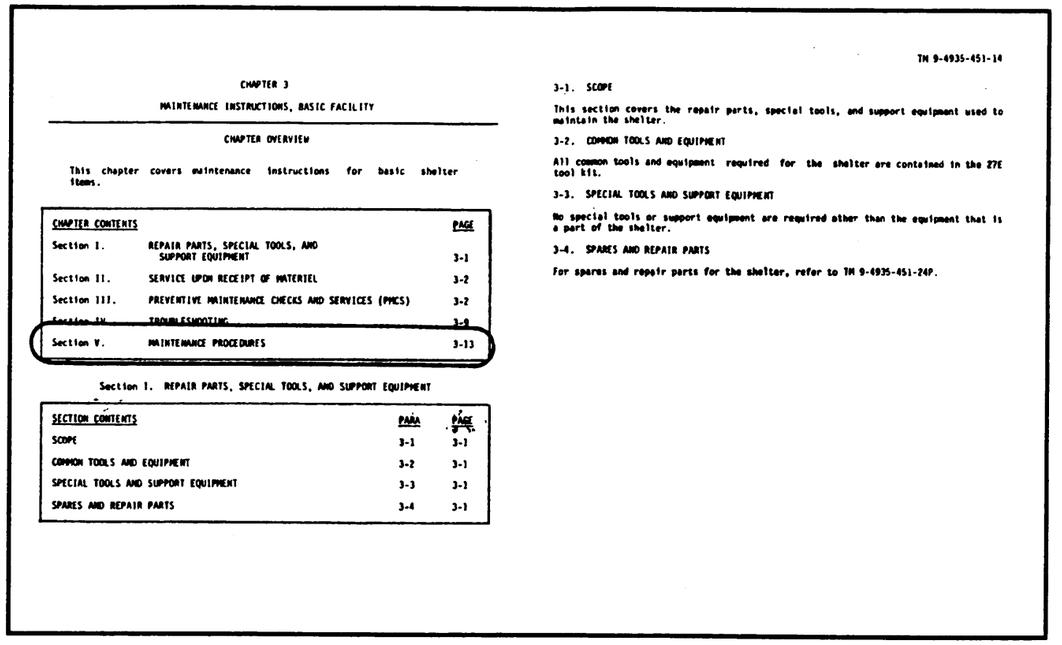
IMPROVED CONTACT SUPPORT SET (ICSS)

HEADQUARTERS, DEPARTMENT OF THE ARMY

MS016607

1. Suppose the electrical circuitry needs repair. If you know what is wrong with it, you will go to the section on maintenance procedures. If you do not know what is wrong with it, you will go to the section on troubleshooting procedures for the electrical circuitry. The following paragraphs show in more detail how you would proceed.

2. Look at the cover and you will see that the chapter titles are listed top to bottom. Find "MAINTENANCE INSTRUCTIONS, BASE FACILITY."



TM 9-4935-451-14

CHAPTER 3

MAINTENANCE INSTRUCTIONS, BASIC FACILITY

CHAPTER OVERVIEW

This chapter covers maintenance instructions for basic shelter items.

Section I. REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT

TM 9-4935-451-14

3-1. SCOPE

This section covers the repair parts, special tools, and support equipment used to maintain the shelter.

3-2. COMMON TOOLS AND EQUIPMENT

All common tools and equipment required for the shelter are contained in the 27E tool kit.

3-3. SPECIAL TOOLS AND SUPPORT EQUIPMENT

No special tools or support equipment are required other than the equipment that is a part of the shelter.

3-4. SPARES AND REPAIR PARTS

For spares and repair parts for the shelter, refer to TM 9-4935-451-24P.

MS016657

3. You will see that "MAINTENANCE INSTRUCTIONS, BASIC FACILITY" is in chapter 3.

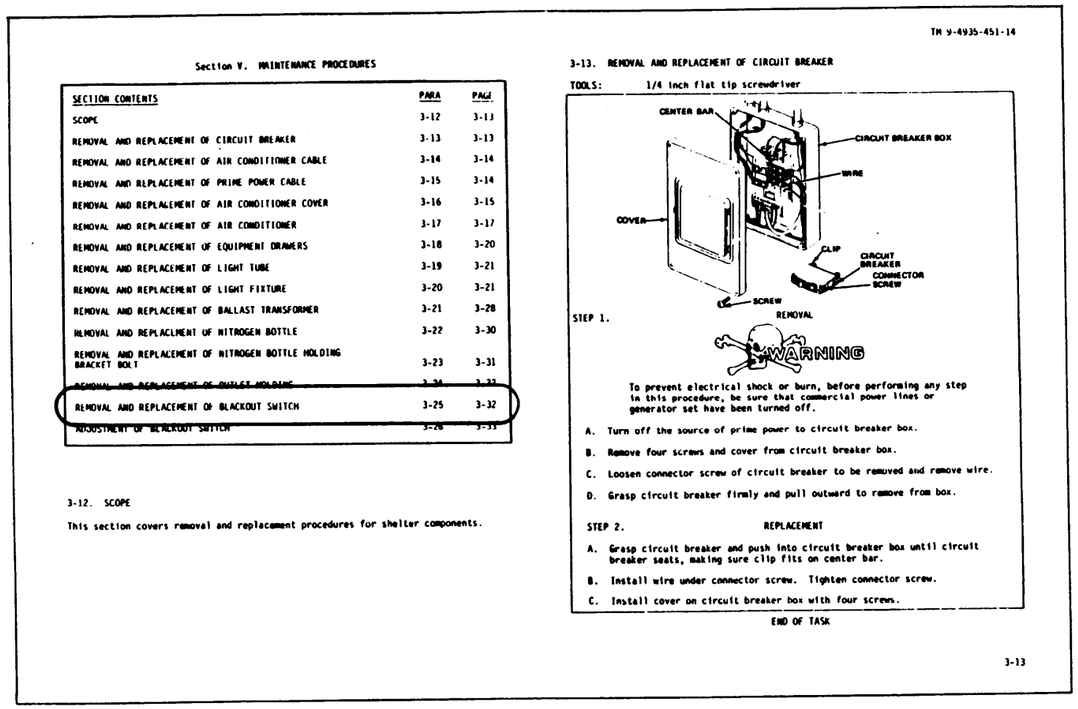
4. If you open the manual to page 3-1, you will find the beginning of chapter 3.

5. Right under the chapter title you will see a list of all the sections by title and page number.

6. Look down the list until you come to "Section V. MAINTENANCE PROCEDURES 3-13". This section contains procedures to check out and repair items in the shelter. Now go to page 3-13.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)



TM 9-4935-451-14

Section V. MAINTENANCE PROCEDURES

SECTION CONTENTS	PARA	PAGE
SCOPE	3-12	3-13
REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER	3-13	3-13
REMOVAL AND REPLACEMENT OF AIR CONDITIONER CABLE	3-14	3-14
REMOVAL AND REPLACEMENT OF PRIME POWER CABLE	3-15	3-14
REMOVAL AND REPLACEMENT OF AIR CONDITIONER COVER	3-16	3-15
REMOVAL AND REPLACEMENT OF AIR CONDITIONER	3-17	3-17
REMOVAL AND REPLACEMENT OF EQUIPMENT DRAWERS	3-18	3-20
REMOVAL AND REPLACEMENT OF LIGHT TUBE	3-19	3-21
REMOVAL AND REPLACEMENT OF LIGHT FIXTURE	3-20	3-21
REMOVAL AND REPLACEMENT OF BALLAST TRANSFORMER	3-21	3-28
REMOVAL AND REPLACEMENT OF NITROGEN BOTTLE	3-22	3-30
REMOVAL AND REPLACEMENT OF NITROGEN BOTTLE HOLDING BRACKET BOLT	3-23	3-31
REMOVAL AND REPLACEMENT OF OUTLET MOLDING	3-24	3-32
REMOVAL AND REPLACEMENT OF BLACKOUT SWITCH	3-25	3-32
ADJUSTMENT OF BLACKOUT SWITCH	3-26	3-33

3-12. SCOPE

This section covers removal and replacement procedures for shelter components.

3-13. REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER

TOOLS: 1/4 inch flat tip screwdriver

STEP 1. REMOVAL

WARNING

To prevent electrical shock or burn, before performing any step in this procedure, be sure that commercial power lines or generator set have been turned off.

A. Turn off the source of prime power to circuit breaker box.
B. Remove four screws and cover from circuit breaker box.
C. Loosen connector screw of circuit breaker to be removed and remove wire.
D. Grasp circuit breaker firmly and pull outward to remove from box.

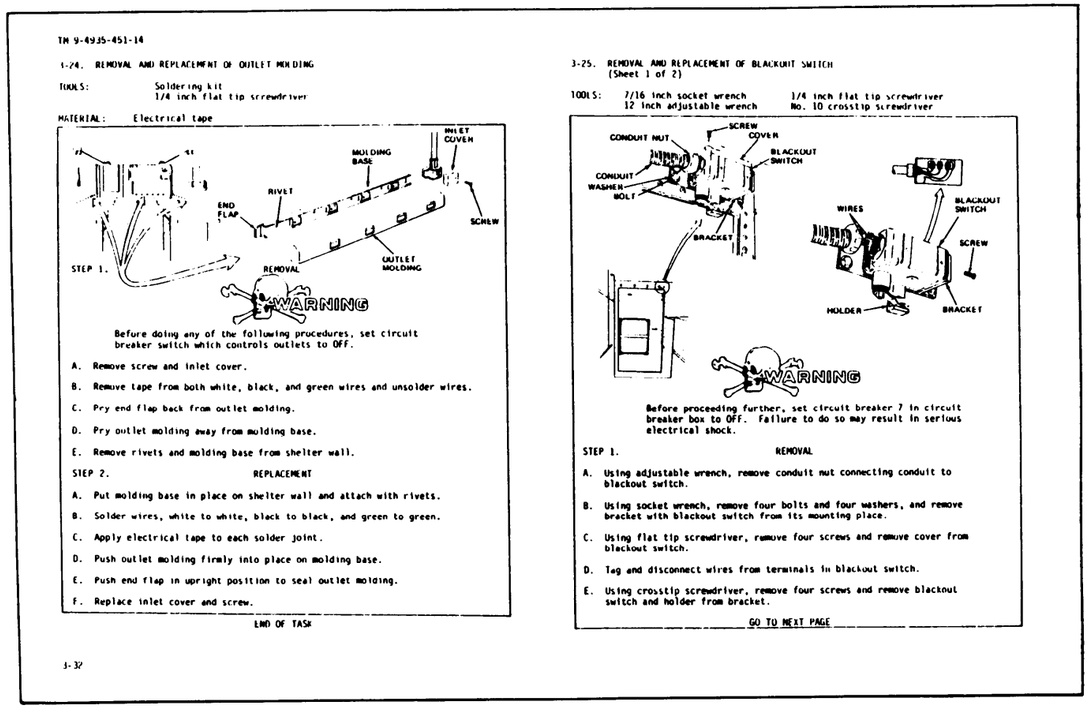
STEP 2. REPLACEMENT

A. Grasp circuit breaker and push into circuit breaker box until circuit breaker seats, making sure clip fits on center bar.
B. Install wire under connector screw. Tighten connector screw.
C. Install cover on circuit breaker box with four screws.

END OF TASK

3-13

7. ON page 3-13 you will find the contents of Section V listed. Suppose you know that the blackout switch is bad. Look down the "SECTION CONTENTS" list for "REMOVAL AND REPLACEMENT OF BLACKOUT SWITCH" and read across. The information you want is located in paragraph 3-25 on page 3-32. Now turn to page 3-32.



TM 9-4935-451-14

3-24. REMOVAL AND REPLACEMENT OF OUTLET MOLDING

TOOLS: Soldering kit
1/4 inch flat tip screwdriver

MATERIAL: Electrical tape

WARNING

Before doing any of the following procedures, set circuit breaker switch which controls outlets to OFF.

A. Remove screw and inlet cover.
B. Remove tape from both white, black, and green wires and unsolder wires.
C. Pry end flap back from outlet molding.
D. Pry outlet molding away from molding base.
E. Remove rivets and molding base from shelter wall.

STEP 2. REPLACEMENT

A. Put molding base in place on shelter wall and attach with rivets.
B. Solder wires, white to white, black to black, and green to green.
C. Apply electrical tape to each solder joint.
D. Push outlet molding firmly into place on molding base.
E. Push end flap in upright position to seal outlet molding.
F. Replace inlet cover and screw.

END OF TASK

3-25. REMOVAL AND REPLACEMENT OF BLACKOUT SWITCH (Sheet 1 of 2)

TOOLS: 7/16 inch socket wrench
12 inch adjustable wrench
1/4 inch flat tip screwdriver
No. 10 crosstip screwdriver

WARNING

Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

STEP 1. REMOVAL

A. Using adjustable wrench, remove conduit nut connecting conduit to blackout switch.
B. Using socket wrench, remove four bolts and four washers, and remove bracket with blackout switch from its mounting place.
C. Using flat tip screwdriver, remove four screws and remove cover from blackout switch.
D. Tag and disconnect wires from terminals in blackout switch.
E. Using crosstip screwdriver, remove four screws and remove blackout switch and holder from bracket.

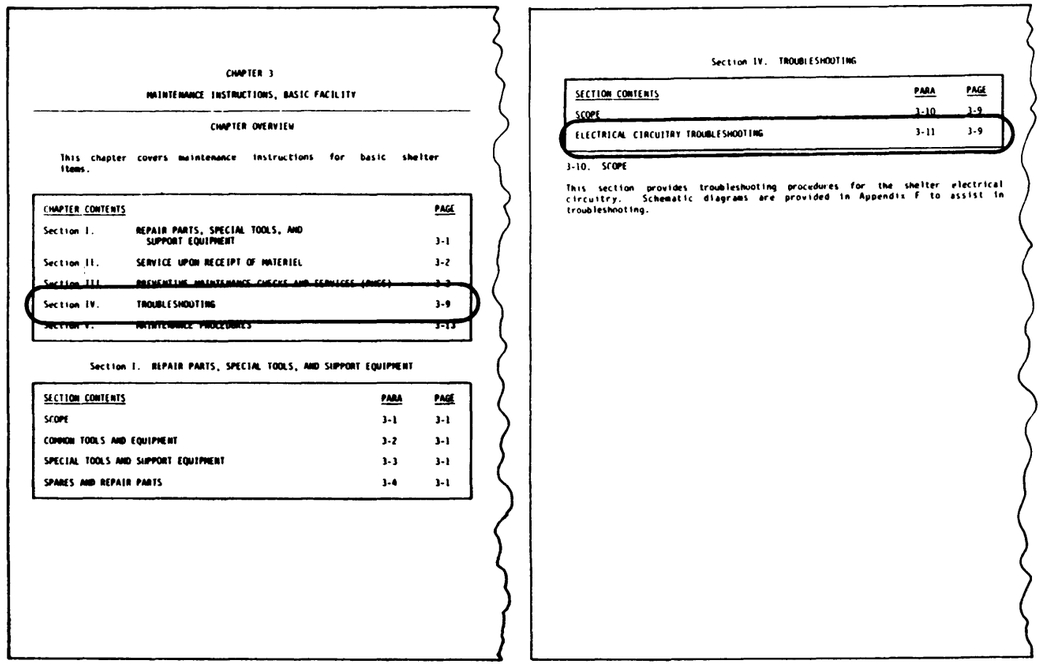
GO TO NEXT PAGE

3-32

8. On page 3-32 you will find the start of paragraph 3-25. To remove the blackout switch, do STEP 1. To install the new blackout switch, do STEP 2.

GO TO NEXT PAGE

HOW TO USE THIS MANIJAL (CONT)



CHAPTER 3

MAINTENANCE INSTRUCTIONS, BASIC FACILITY

CHAPTER OVERVIEW

This chapter covers maintenance instructions for basic shelter items.

CHAPTER CONTENTS		PAGE
Section I.	REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT	3-1
Section II.	SERVICE UPON RECEIPT OF MATERIEL	3-2
Section III.	PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)	3-3
Section IV.	TROUBLESHOOTING	3-9
Section V.	MAINTENANCE PROCEDURES	3-13

Section I. REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT

SECTION CONTENTS	PARA	PAGE
SCOPE	3-1	3-1
COMMON TOOLS AND EQUIPMENT	3-2	3-1
SPECIAL TOOLS AND SUPPORT EQUIPMENT	3-3	3-1
SPARES AND REPAIR PARTS	3-4	3-1

Section IV. TROUBLESHOOTING

SECTION CONTENTS	PARA	PAGE
SCOPE	3-10	3-9
ELECTRICAL CIRCUITRY TROUBLESHOOTING	3-11	3-9

3-10. SCOPE

This section provides troubleshooting procedures for the shelter electrical circuitry. Schematic diagrams are provided in Appendix F to assist in troubleshooting.

9. If you do not know what is wrong with the electrical circuitry, go back to "CHAPTER 3, MAINTENANCE INSTRUCTIONS, BASIC FACILITY" on page 3-1.

10. Look down the chapter contents for "SECTION IV. TROUBLESHOOTING 3-9". This section contains procedures for troubleshooting the items in the shelter. Now go to page 3-9.

11. On page 3-9 you will find the contents of Section IV listed. Look for "ELECTRICAL CIRCUITRY TROUBLESHOOTING" and read across. The information you want is in paragraph 3-11 on page 3-9.

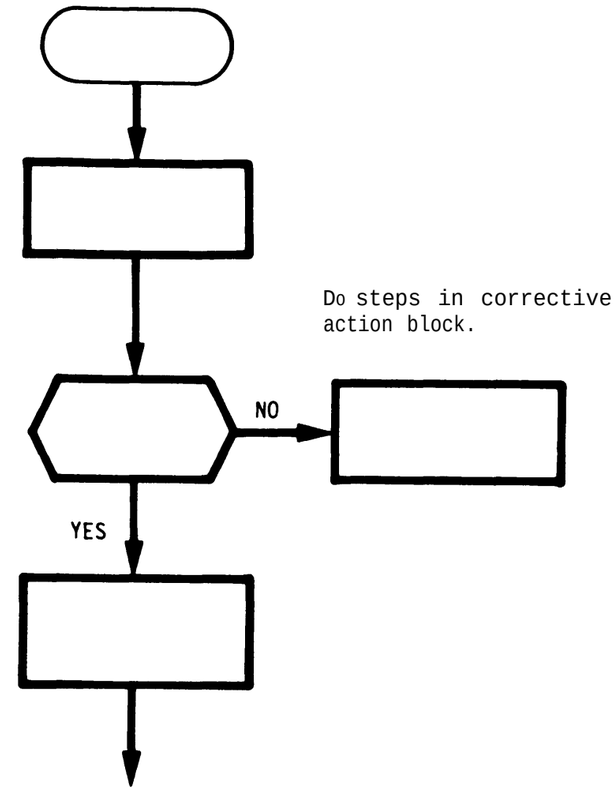
Beginning and ending of procedure.

Do instruction before looking for an indication.

Look for a YES or NO indication. For a NO indication go to corrective action block.

Do steps following YES indication.

Go to next page and continue the procedure.



GO TO NEXT PAGE

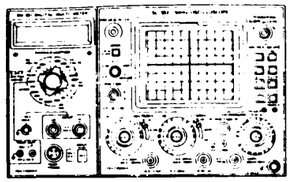
12. Before you get started on troubleshooting you should become familiar with the symbols and format used in the troubleshooting procedures. The above symbols are used throughout the manual.

13. On the following page you will find an example of the troubleshooting procedures from para 3-11 on page 3-11.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)

3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT)
(Sheet 3 of 4)



Continued from previous page

STEP 05
Set lighting circuit breaker to ON.

STEP 06
Set the 3 light switches to ON.

Do all 6 lights come on?
NO
YES

Does any light come on?
NO
YES

Set lighting circuit breaker to OFF, set the light switch for the bad light to off, and replace light.

Go back to step 05.

a. Repair lighting circuit breaker (para 3-13).
b. Go back to step 05.

STEP 07
Check blackout switch (located over shelter door) by pulling out on the actuator arm and wheel, pushing up on the holder, and then releasing the actuator arm and wheel so that wheel will go against door.

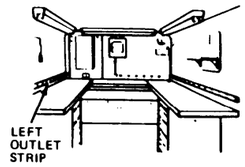
Do all 6 lights remain on?
NO
YES

a. Perform blackout switch adjustment procedure (para 3-26).
b. Go back to step 06.

STEP 08
Open the shelter door about 1/4 inch.

Do all 6 lights go out?
NO
YES

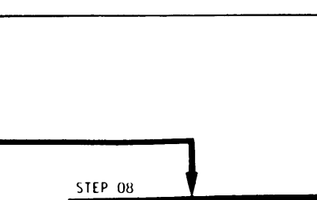
a. Perform blackout switch adjustment procedure (para 3-26).
b. Repair blackout switch.
c. Go back to step 07.

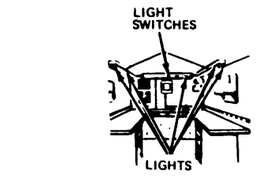


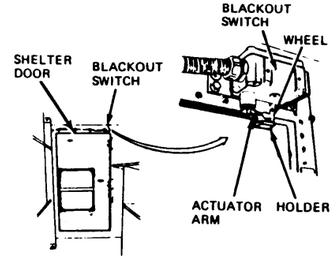
STEP 09
Set circuit breaker for left outlet molding to ON.

STEP 10
Using DIGITAL MULTIMETER, plug it into each jack in the left outlet molding and measure voltage.

Go to next page







3-11

14. Suppose you started the troubleshooting procedures for the electrical circuitry on page 3-9 and found nothing wrong until you got to STEP 08 on page 3-11. If you got a "NO" answer for STEP 08, you will find a set of maintenance procedures. There may be several procedures listed in the box. YOU MAY NOT HAVE TO DO THEM ALL. Start with the first procedure. After doing this procedure, return to the first step and start the troubleshooting again at that point.

15. If you still get a "NO" answer at STEP 08, do the second procedure listed. Note that you may have to turn to another part of the book to do a maintenance procedure. If so you will be told where to turn. After finishing, return to the troubleshooting procedure. Go back to the first step and start troubleshooting again at that point.

16. Once you get a "YES" answer at every step, you know the electrical circuitry is working again.

CHAPTER 1
INTRODUCTION

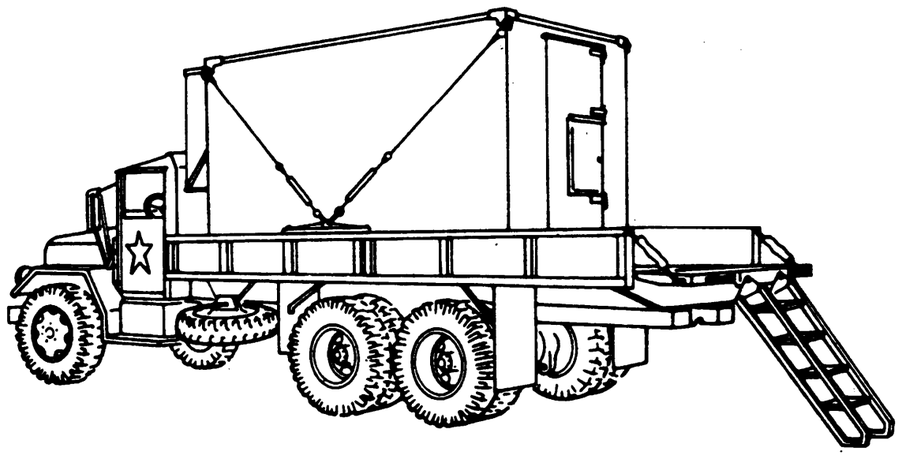
CHAPTER OVERVIEW

This chapter contains information on maintenance forms and the procedure to follow to report equipment improvements. It also describes the Improved Contact Support Set (ICSS), and the equipment contained within.

Section I. GENERAL INFORMATION

1-1. SCOPE

This manual covers ICSS operation and maintenance. The ICSS is used at the general support area in support of the TOW 2 and DRAGON weapon systems, the Manportable Common Thermal Night Sight (MCTNS), and the Bradley Fighting Vehicle System (BFVS) Basic Sight Assembly (BSA)/TOW Subsystem Test Set (TSSTS). The shelter, when mounted on a 5-ton truck, looks like this:



MS016608

Improved Contact Support Set (ICSS)

1-2. MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those listed in DA PAM 738-750, The Army Maintenance Management Systems (TAMMS). The DA PAM is published in the Maintenance Management Update. Units may subscribe to Maintenance Management Update by submitting a completed DA Form 12-13.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS)

If your ICSS needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Main it to us at:

Commander
U.S. Army Missile Command
ATTN: AMSMI-MMC-CS-C
Redstone Arsenal, AL 35898-5290

We'll send you a reply.

Section II. EQUIPMENT DESCRIPTION

1-4. SCOPE

This section describes the associated end item and major components of the end item required to make the ICSS fully functional.

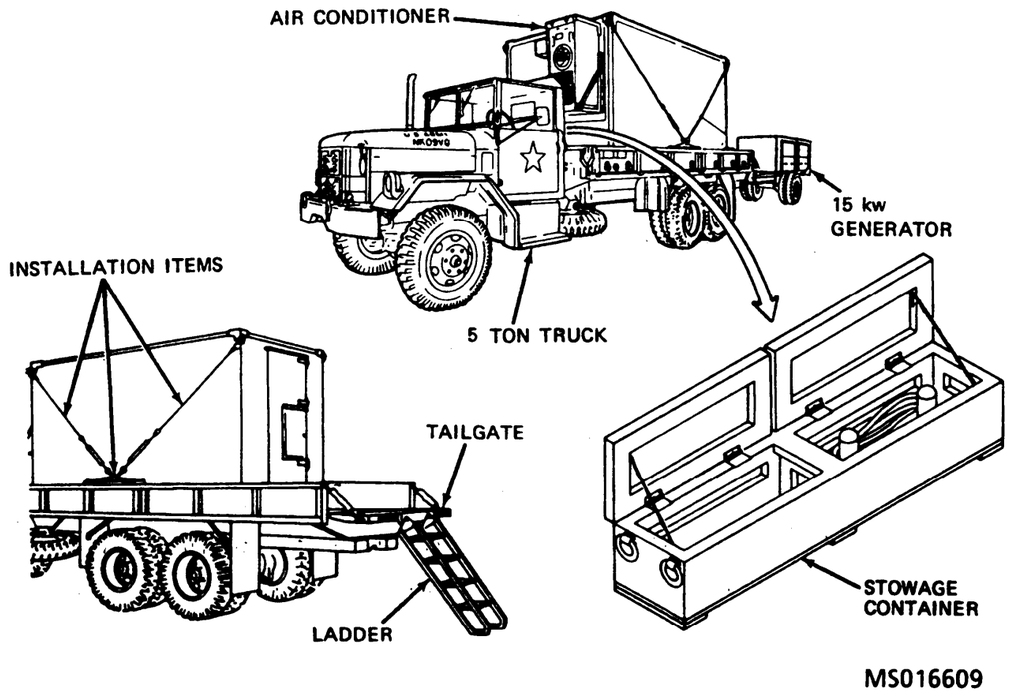
1-5. SHELTER APPLICATION

The ICSS is authorized one per brigade and one per missile support unit at division level. The ICSS is designed to meet the mobile army requirements. Its prime mover is an m927 XLB 5-ton truck. The power requirements are supplied by a 15 kW 60 Hz PU405 generator, wheel mounted. In a fixed base operation, the ICSS can be operated from commercial power.

1-6. LOCATION AND DESCRIPTION OF GENERAL SHELTER COMPONENTS (Sheet 1 of 5)

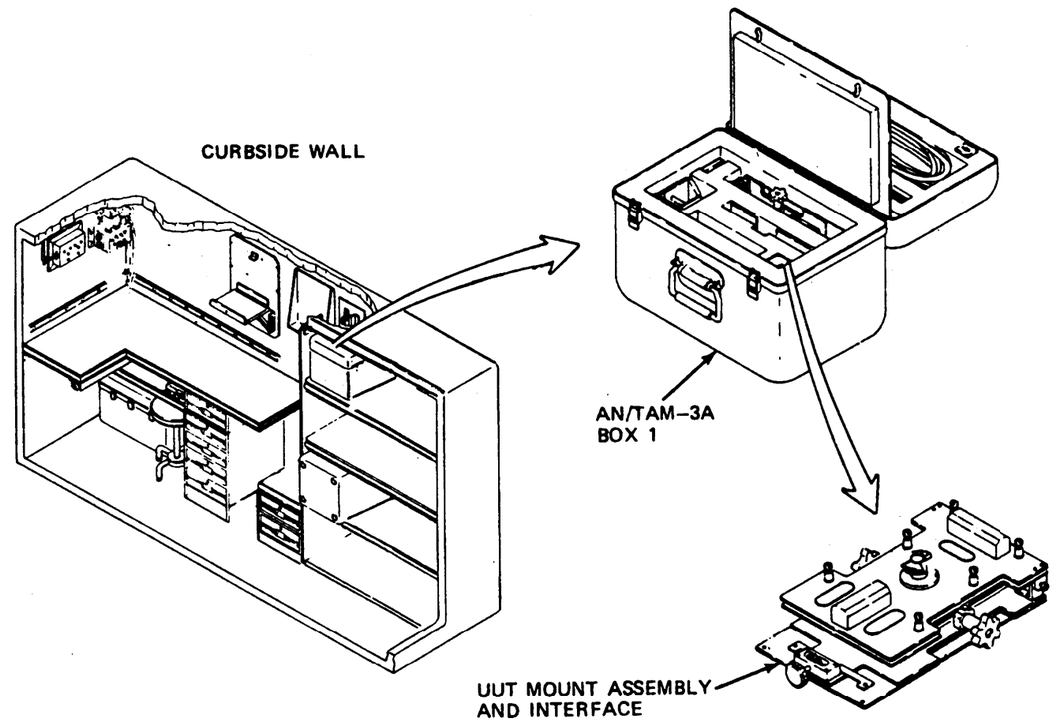
a. Major components outside of the ICSS shelter are listed and shown below.

Components
M927 5-ton truck XLB
Air conditioner
Stowage container
Installation items (for attaching shelter to truck)
Tailgate
Generator 15KW 60Hz



1-6. LOCATION AND DESCRIPTION OF GENERAL SHELTER COMPONENTS (CONT) (Sheet 2 of 5)

a. The interior of the shelter should have the equipment described below no matter which weapon system is supported. TEST SET, NIGHT VISION SIGHT AN/AM-3A

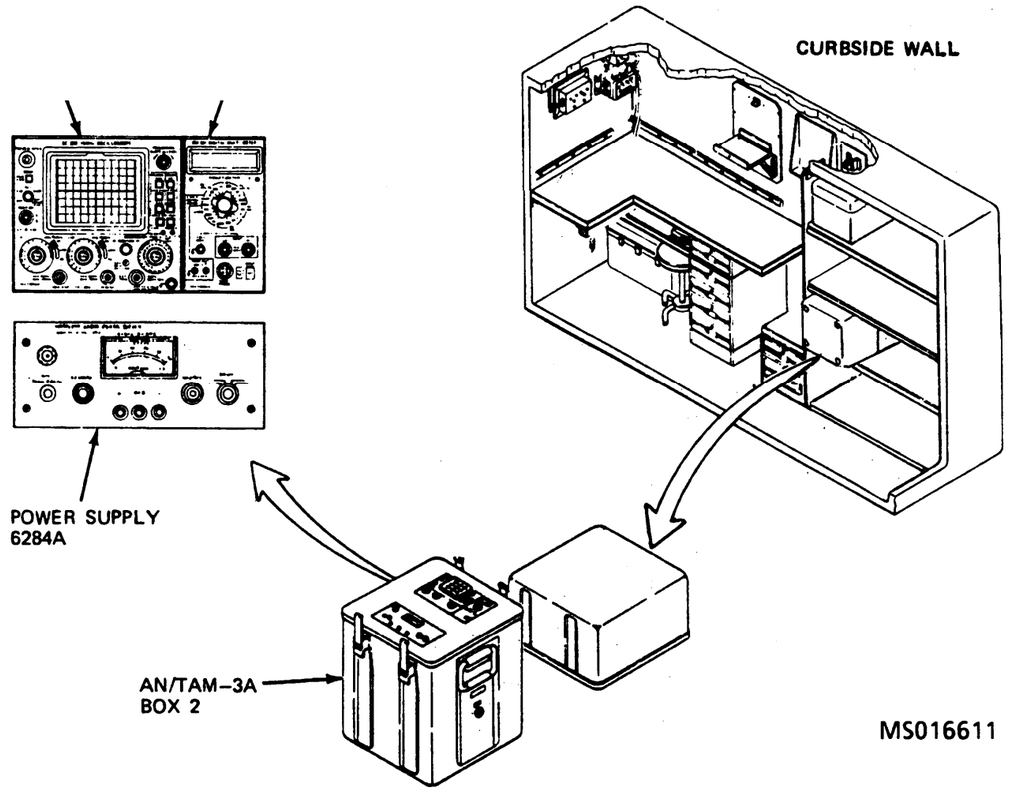


NOTE

The AN/TAM-3 test set may be used instead of the AN/TAM-3A to support all night sights except the TOW 2 (AN/TAS-4A) night sight. The only difference between the two test sets is that the AN/TAM-3 collimator container does not contain a closed cycle cooler test set.

● AN/TAM-3A Box 1 (Special Tools Container)

There is one AN/TAM-3A special tools container in the ICSS. It provides storage for the UUT mount assembly and interface, and other special tools and equipment needed to test and repair the night sights.



● AN/TAM-3A Box 2 (Electronic Test Equipment Container)

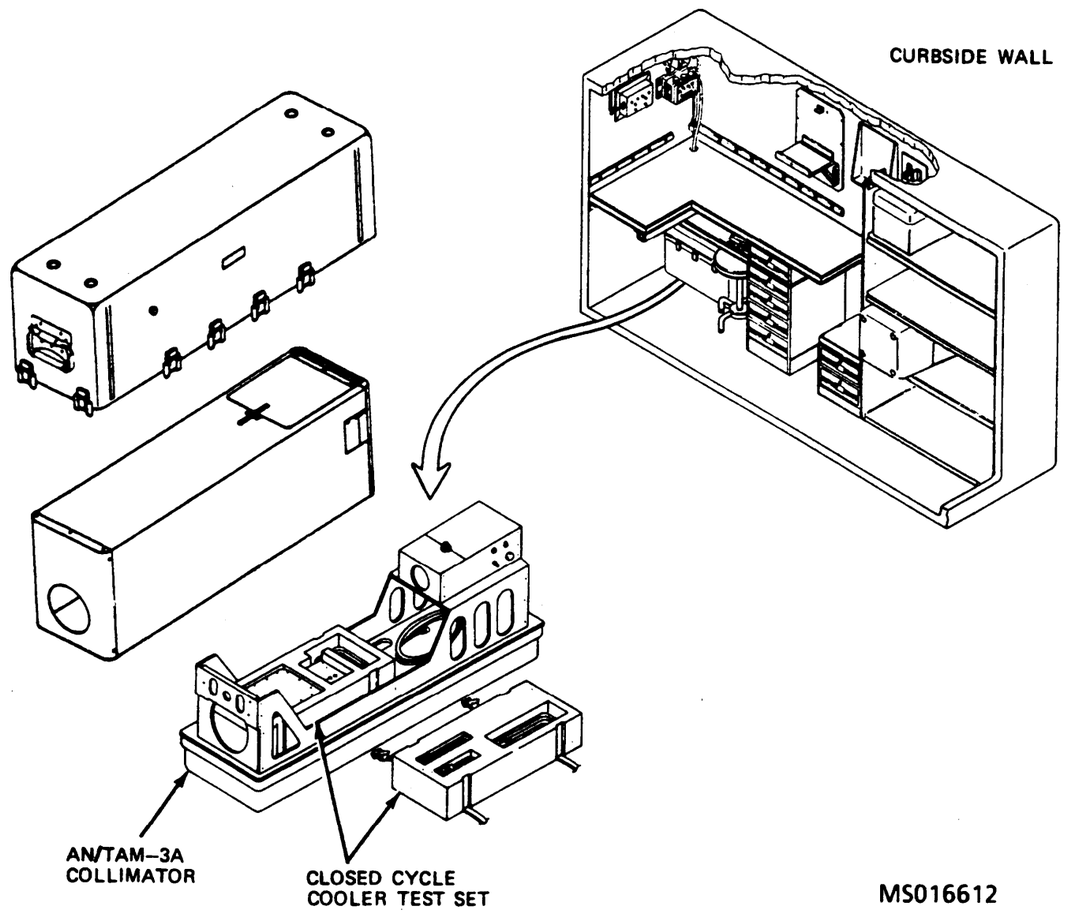
There is one AN/TAM-3A electronic test equipment container in the ICSS. It contains a digital multimeter, oscilloscope, mainframe, and power supply.

The tektronix DM 501 digital multimeter is a small lightweight meter that can read out voltage, current, or ohms. The meter will show a plus or minus sign next to the readout, and will place the decimal point in the right spot. The meter is protected from overloads.

The Tektronix SC 502 is a two-channel oscilloscope. The commercial manual tells how to use and maintain the oscilloscope.

The Hewlett-Packard 6284A power supply has an output voltage of 0 to 24 volts and an output current of 0 to 3 amps. It operates from an input of 115 VAC ± 10 percent, between 48 and 440 Hz.

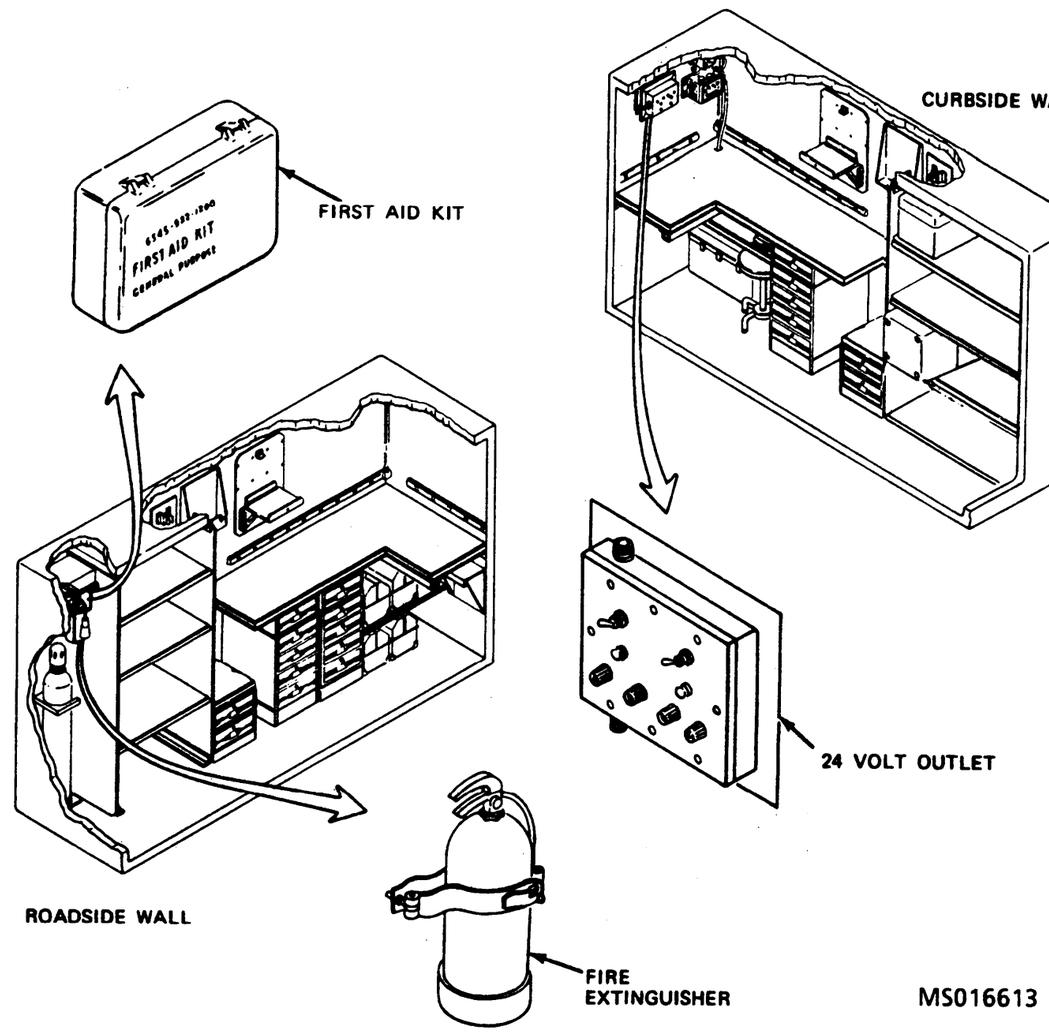
1-6. LOCATION AND DESCRIPTION OF GENERAL SHELTER COMPONENTS
(Sheet 3 of 5)



a. AN/TAM-3 or AN/TAM-3A Thermal Sight Collimator and Closed Cycle Cooler Test Set

There is one collimator container in the ICSS. It houses the AN/TAM-3 or AN/TAM-3A thermal sight collimator and the closed cycle cooler test set. The collimator is used to provide an IR target for the night sights. The closed cycle cooler test set contains a vehicle power conditioner, load assembly, and test cables for the TOW 2 closed cycle cooler night sight.

For operation and maintenance of the AN/TAM-3 or AN/TAM-3A test set, refer to TM 9-5855-255-14 and TM 9-5855-255-24P.



FIRST AID KIT

A first aid kit and storage rack are provided in the shelter.

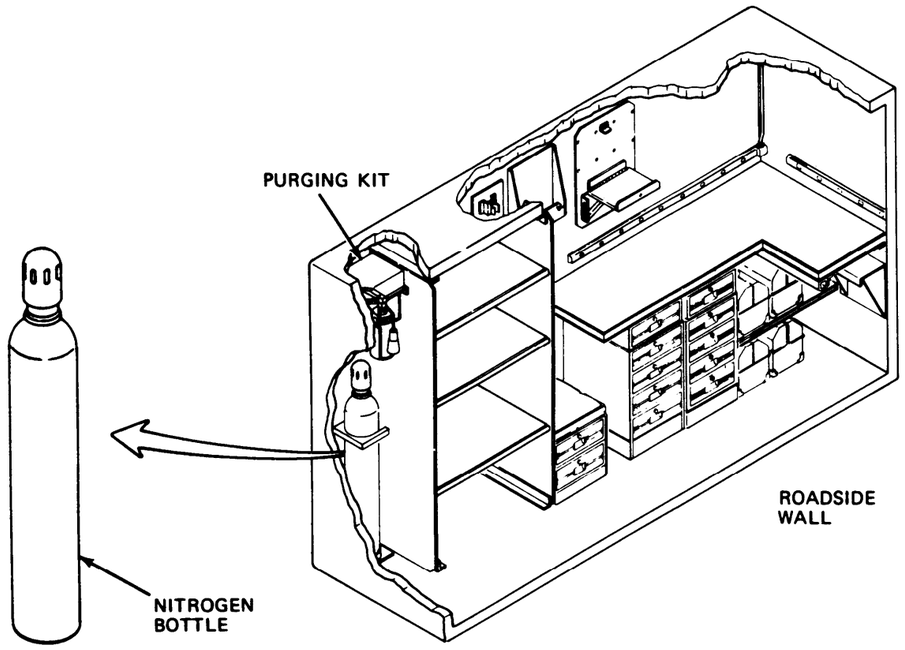
FIRE EXTINGUISHER

A fire extinguisher and holding bracket are provided in the shelter.

24 VOLT OUTLET

The 24 volt outlet provides two sources of 24 volts DC to interior of shelter.

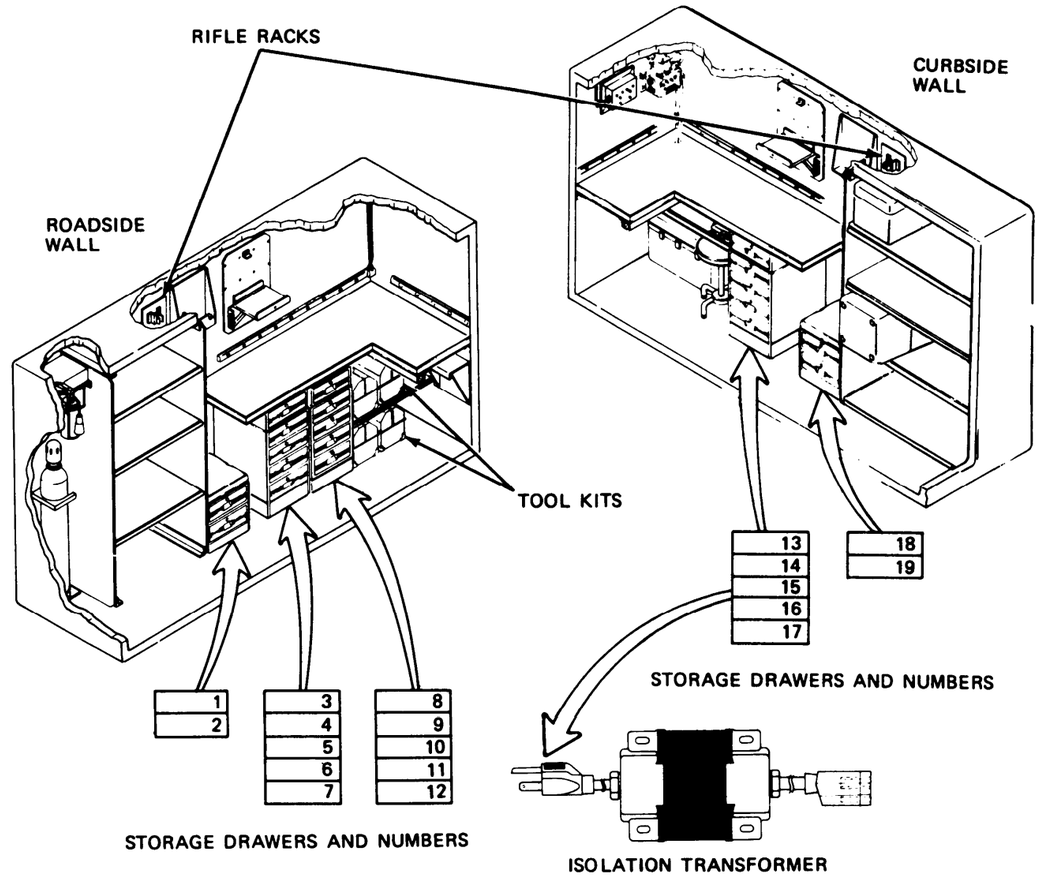
1-6. LOCATION AND DESCRIPTION OF GENERAL SHELTER COMPONENTS (CONT) (Sheet 4 of 5)



Nitrogen bottle is extremely heavy. Two people are required to safely lift or move nitrogen bottle.

PURGING EQUIPMENT

The purging equipment consists of a purging kit and a nitrogen bottle. The purging kit is used along with the nitrogen bottle to fill the weapon system sight with dry nitrogen. The kit has a regulator, valve, hose and adapter. TOW 2 optical sight purging procedures are in TM 9-1425-450-34-1. DRAGON IR Tracker and Night Tracker (AN/TAS-5) purging procedures are identical, and can be found in TM 9-1425-481-34.



RIFLE RACKS

There are two rifle racks in the shelter, one on each side wall. Each rifle rack can hold one rifle.

TOOL KITS

Two tool kits (four tool boxes) are provided under the work bench.

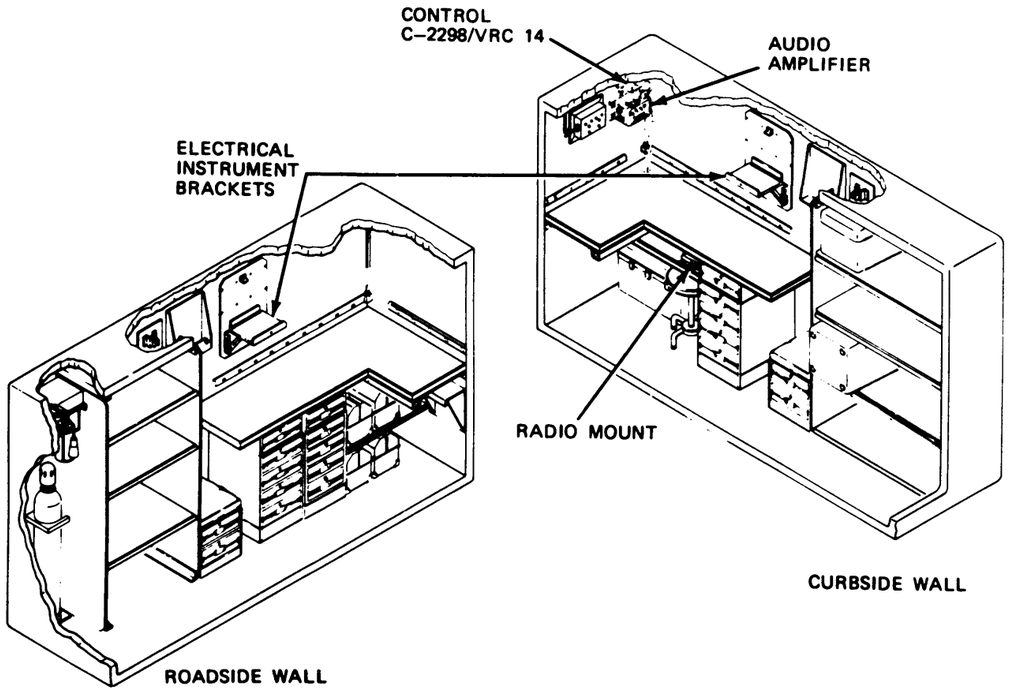
STORAGE DRAWERS

Nineteen storage drawers are provided in the shelter.

ISOLATION TRANSFORMER

The isolation transformer is stored in storage drawer 15 and must be connected between the amplifier test set or BSA controller and 115 VAC power.

1-6. LOCATION AND DESCRIPTION OF GENERAL SHELTER COMPONENTS (CONT) (Sheet 5 of 5)



ELECTRICAL INSTRUMENT BRACKETS

Two platform brackets are provided on which to set the oscilloscope, digital multimeter, or power supply during testing procedures.

CONTROL C-2298/VRC 14

The control C-2298/VRC 14 is part of the radio. See TM 11-5820-401-10-1 for operation.

AUDIO AMPLIFIER

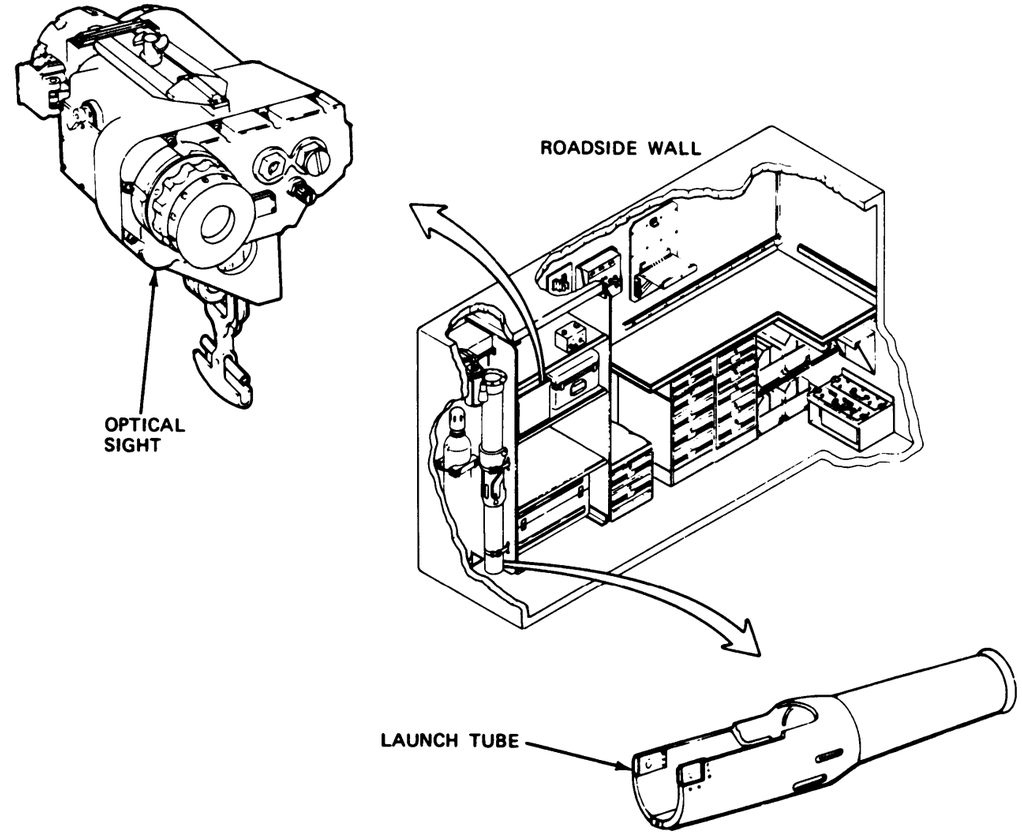
The audio amplifier is a radio controlled unit for operation of the communication system. See TM 11-5820-401-10-1 for operation.

RADIO MOUNT

The radio mount is for the AN/VRC-46 radio transceiver.

1-7. LOCATION AND DESCRIPTION OF TOW 2 SUPPORT EQUIPMENT (Sheet 1 of 4)

In order to support the TOW 2 weapon system, the shelter should have the equipment described in para 1-6 and the equipment described below.



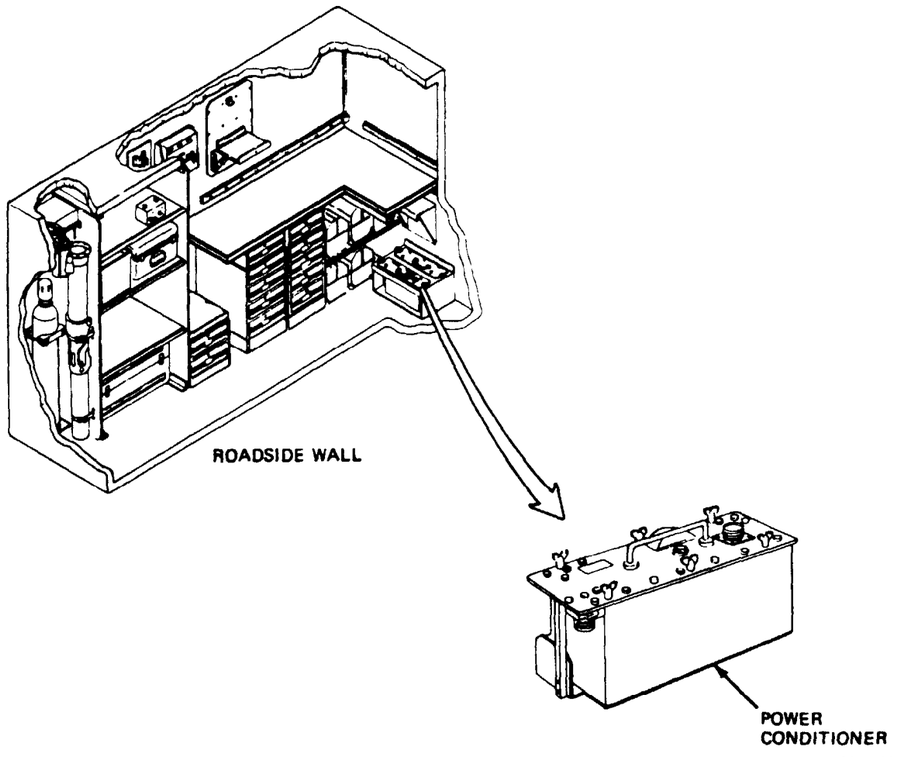
OPTICAL SIGHT

The optical sight allows the TOW 2 gunner to see the target and gets the infrared signal from a TOW 2 missile in flight.

LAUNCH TUBE

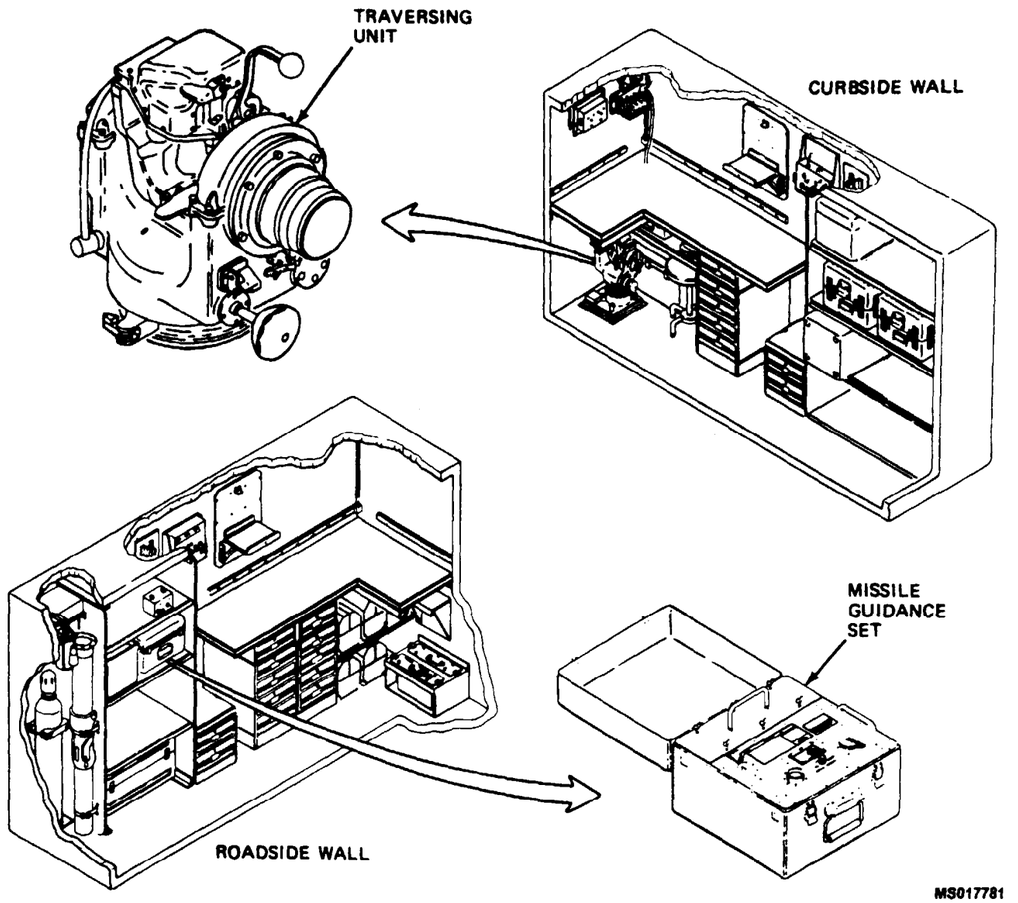
The launch tube fits onto the TOW 2 traversing unit and normally holds the TOW 2 missile during firing. In the ICSS, the launch tube is used to hold the electrical circuit test set during testing of the TOW 2 weapon system.

1-7. LOCATION AND DESCRIPTION OF TOW 2 SUPPORT EQUIPMENT (CONT) (Sheet 2 of 4)



POWER CONDITIONER

The power conditioner is used to convert shelter vehicle power needed to run the missile guidance set. The power conditioner provides the same power leek as the TOW 2 battery assembly.



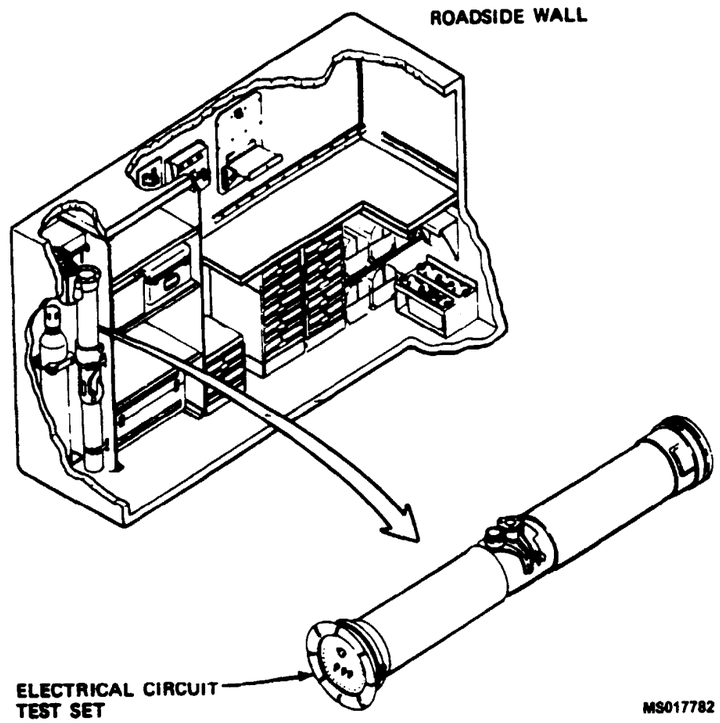
TRAVERSING UNIT

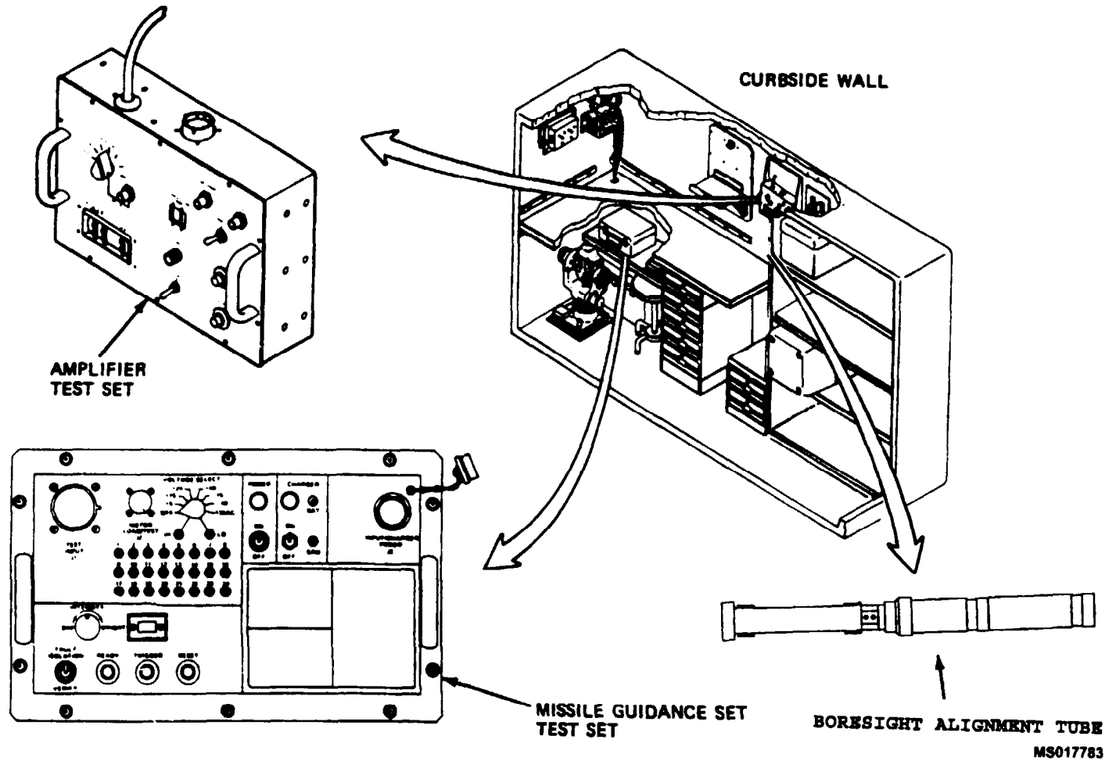
The traversing unit has controls which enable the gunner to aim and fire a TOW 2 missile. The traversing unit also provides for electrical interconnection between the TOW 2 missile guidance set, optical sight, and missile or electrical circuit test set.

MISSILE GUIDANCE SET

The missile guidance set contains the electronic circuits which guide the flight of a TOW 2 missile. The missile guidance set operates off a TOW battery assembly or power conditioner, which is pressed into the opening of the missile guidance set.

1-7. LOCATION AND DESCRIPTION OF TOW 2 SUPPORT EQUIPMENT (CONT) (Sheet 3 of 4)





ELECTRICAL CIRCUIT TEST SET

The electrical circuit test set is loaded into the TOW 2 launch tube just like an encased missile. It contains test points to check continuity of the guidance and control signals. See TM 9-1425-450-34-1 for operation, and TM 9-4935-455-14 for maintenance.

BORESIGHT ALIGNMENT TUBE

The boresight alignment tube (BSAT) is used to boresight the Ground TOW 2 traversing unit. The boresight procedures in TM 9-1425-450-34-1 allow the use of either the BSAT or the scope from the Boresight Collimator Test Set (TS-3784/TAS).

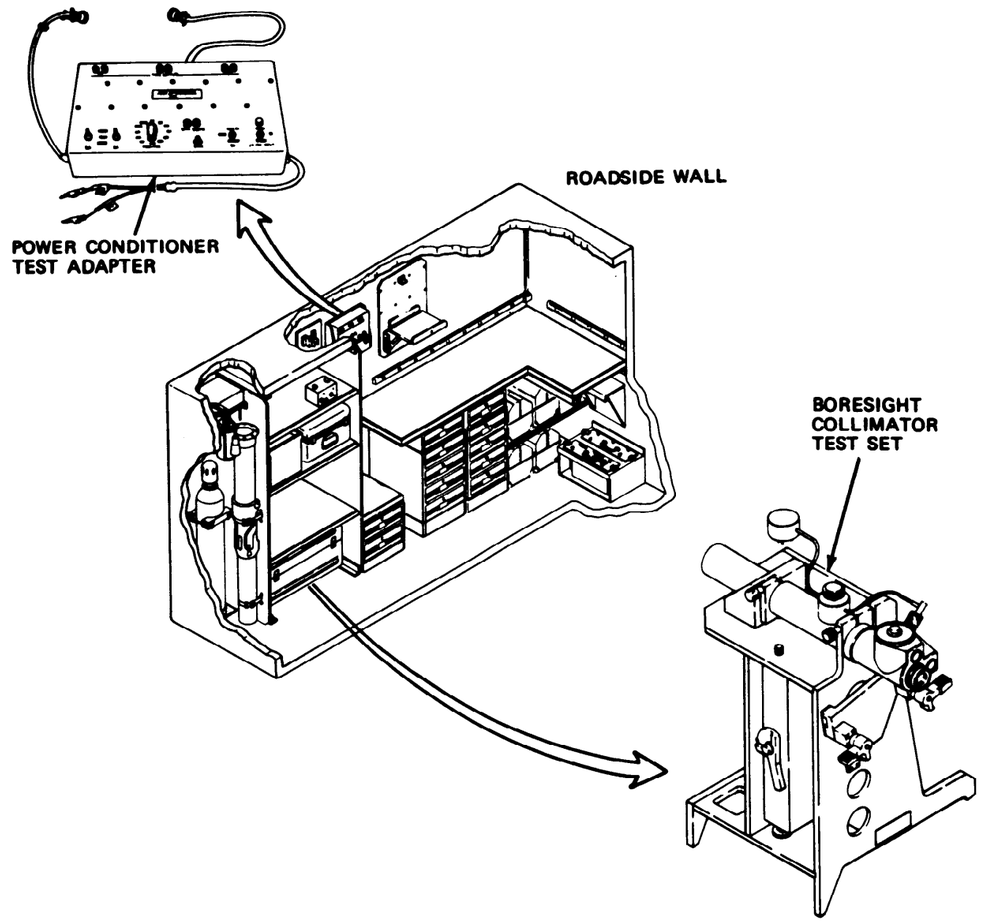
AMPLIFIER TEST SET

The amplifier test Set is used in conjunction with the AN/TAM-3A to verify the operation of the AN/TAS-4A postamplifier. See TM 9-5855-450-24 for operation and TM 9-4935-455-14 for maintenance. The amplifier test set is stored in storage drawer 13 for transporting.

MISSILE GUIDANCE TEST SET

The Missile Guidance Set Test Set (MGSTS) provides the capability of rapidly isolating a TOW 2 missile guidance set failure to the printed circuit card level. See TM 9-1425-450-34-1 for operation and TM 9-4935-455-14 for maintenance

1-7. LOCATION AND DESCRIPTION OF TOW 2 SUPPORT EQUIPMENT (CONT)
(Sheet 4 of 4)

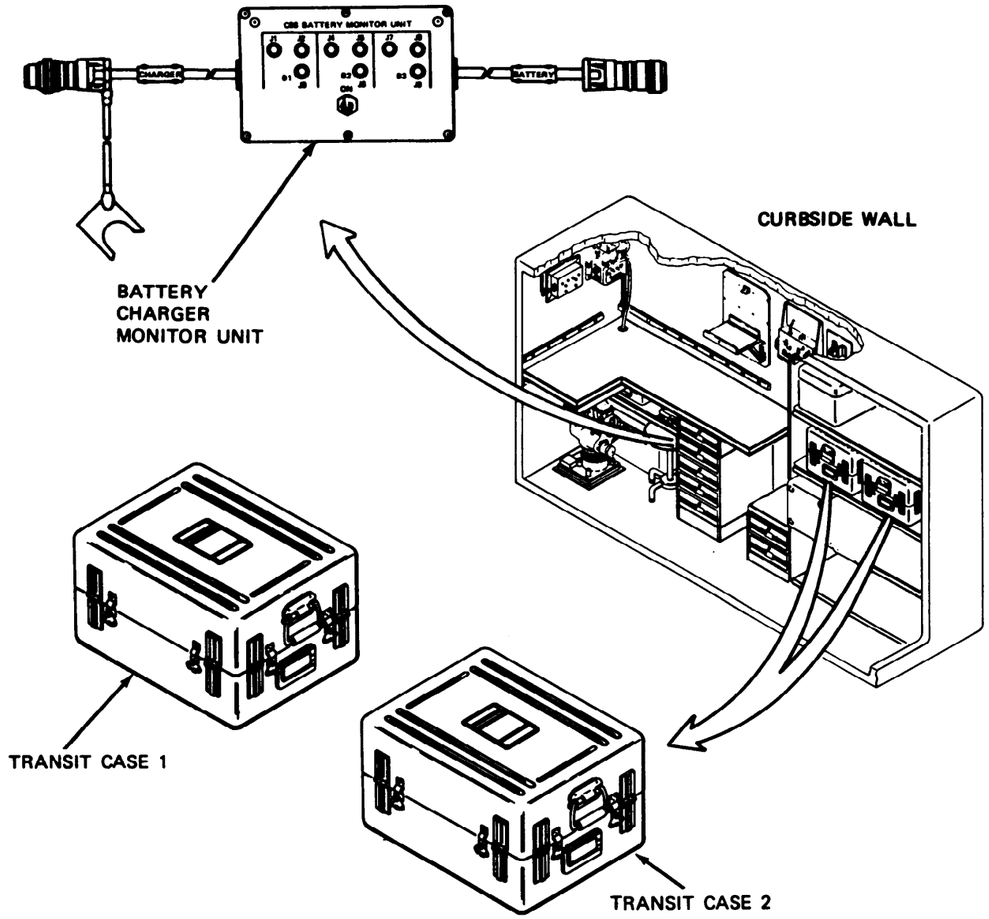


POWER CONDITIONER TEST ADAPTER

The power conditioner test adapter is used to troubleshoot the power conditioner. See TM 9-1425-450-34-1 for operation.

BORESIGHT COLLIMATOR TEST SET

The Boresight Collimator Test Set (BSCTS) TS-3784/TAS is used in support maintenance and depot alinement of the boresight collimator.



BATTERY CHARGER MONITOR UNIT

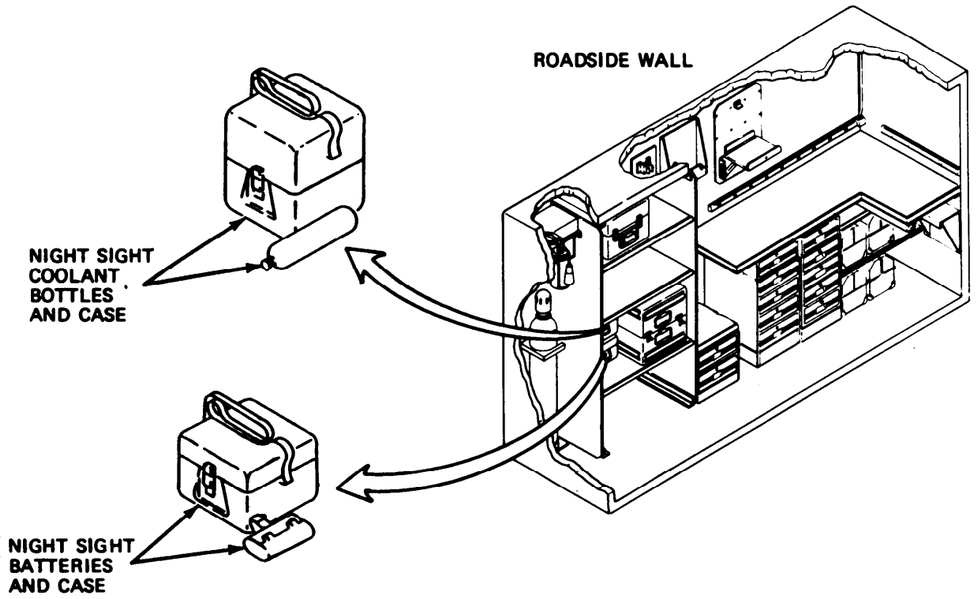
The battery charger monitor unit is stored in storage drawer 14 and is used for checkout of the battery charger. See TM 9-1425-450-34-1 for operation.

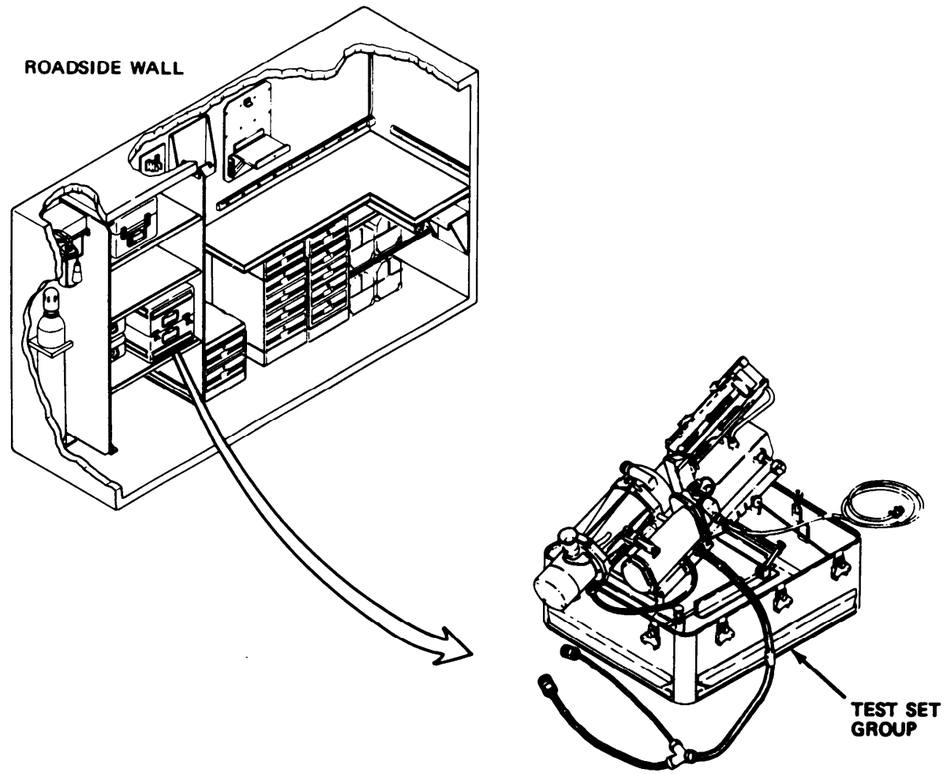
TA-20 TRANSIT CASE 1 AND 2

TA-20 transit cases 1 and 2 are stored and used in the ICSS for maintenance and alinement of the TOW Traversing Unit (TU). These items are also used with the TOW Field Test Set (TFTS) to repair and aline the TU. The BSCTS autocollimator is used with the TA 20/20 fixture for alinement of the TU.

1-8. LOCATION AND DESCRIPTION OF DRAGON SUPPORT EQUIPMENT (Sheet 1 of 2)

In order to support the DRAGON weapon system, the shelter must have the equipment described in para 1-6 and the equipment described below.





NIGHT SIGHT COOLANT BOTTLES (5-pack)

CAUTION

A coolant bottle must be installed on the night sight at all times.

When a DRAGON night tracker or night sight without a closed cycle cooler is being tested or operated, a night sight coolant bottle is used to send cooling air through the image intensifier. The night sight coolant bottle 5-pack is shown with one bottle out of its case.

NIGHT SIGHT BATTERIES (5-pack)

A night sight battery is the power supply used when a DRAGON night tracker or a night sight without a closed cycle cooler is being tested or operated. In some cases, the night sight battery is also used as the power supply for the boresight collimator. The night sight battery 5-pack is shown with one battery out of its case.

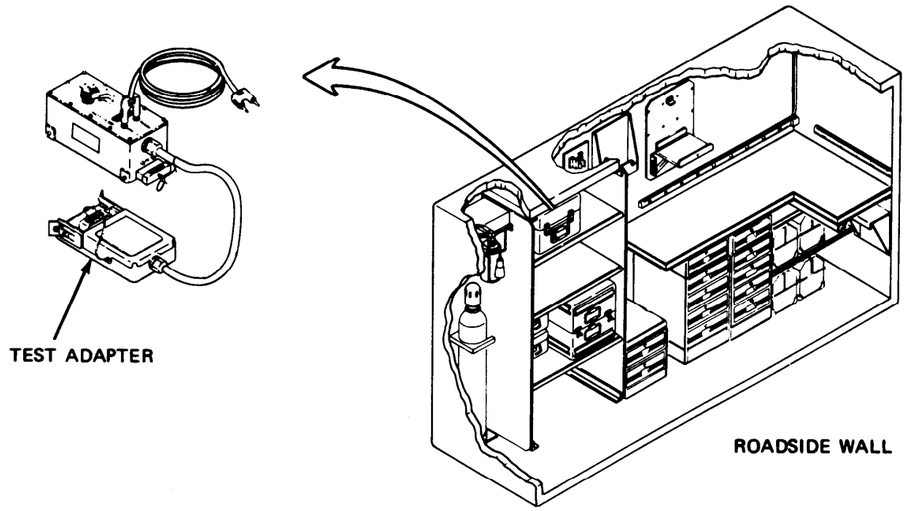
WARNING

The test set group is heavy. Two people are required to safely lift or move the test set group.

TEST SET GROUP

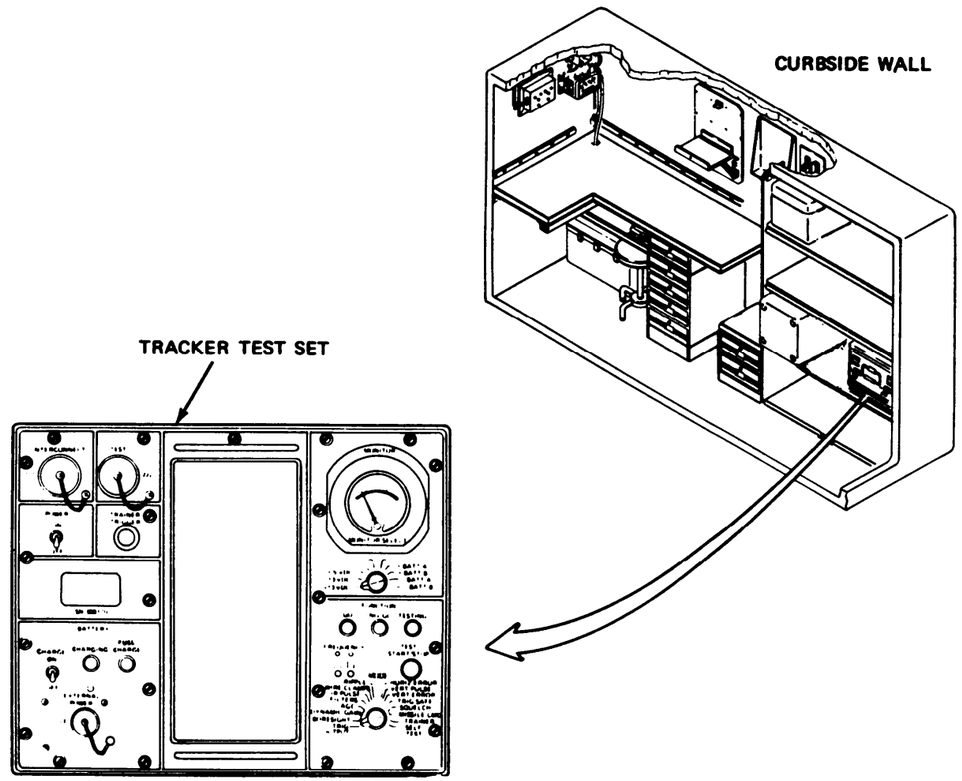
The test set group, GM infrared tracker OQ-278/TSM-114 is used to check out the DRAGON tracker assemblies. See TM 9-4935-484-14 for operation and maintenance.

1-8. LOCATION AND DESCRIPTION OF DRAGON SUPPORT EQUIPMENT (CONT) (Sheet 2 of 2)



TEST ADAPTER

The test adapter MX-10078/G is used to check out and troubleshoot the guided missile launcher mount M175 wiring harness and remote firing mechanism. See TM 9-4935-484-14 for operation and maintenance.



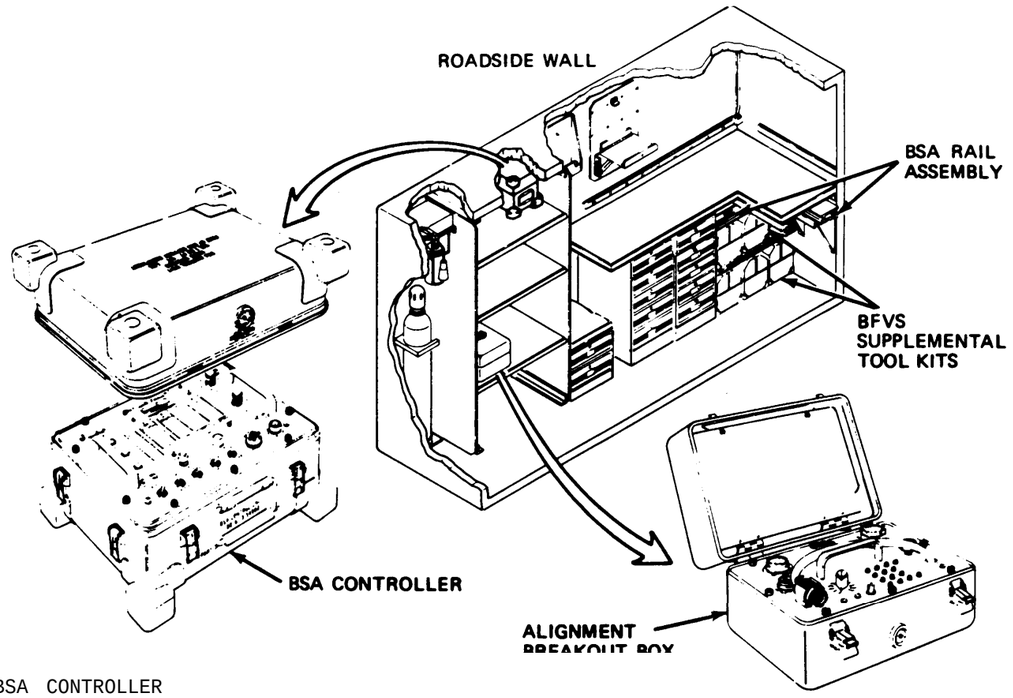
The tracker test set is heavy. Two people are required to safely lift or move the tracker test set.

TRACKER TEST SET

The Tracker Test Set (TTS) is used to support the DRAGON tracker, Launch Effects Trainer (LET), and the monitoring set. The TTS provides operational go or no-go checks of the tracker, and provides signals to check the LET and monitoring set. See TM 9-4935-484-14 for operation and maintenance of the TTS.

1-9. LOCATION AND DESCRIPTION OF BFVS SUPPORT EQUIPMENT

In order to support the Bradley Fighting Vehicle System (BFVS) Basic Sight Assembly (BSA) and the TOM Subsystem Test Set (TSSTS), the shelter must have the equipment described in para 1-6 and the equipment described below.



BSA CONTROLLER

The BSA Controller (BSAC) provides the power supplies, controls, and test access required to test the BSA. See TM 9-4935-474-14 for operation and maintenance.

ALIGNMENT BREAKOUT BOX

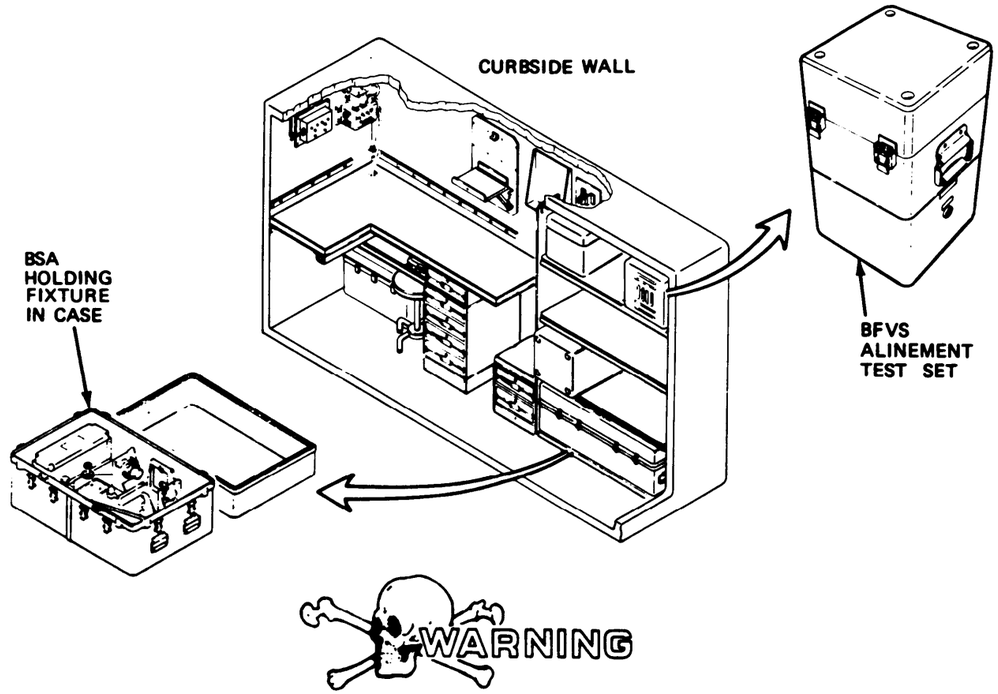
The Alignment Breakout Box (ABOB) facilitates testing and fault isolation of the TSSTS units and associated cables. See TM-9-4935-474-14 for operation and maintenance.

BSA RAIL ASSEMBLY

The BSA rail assembly, which consists of two sections, provides a reference mounting plane for the BSA holding fixture and AN/TAM-3A collimator, which are secured with clamping hardware. See TM 9-4935-474-14 for operation and maintenance.

BFVS SUPPLEMENTAL TOOL KITS

Two BFVS supplemental tool kits are provided in the shelter.



The BSA holding fixture is extremely heavy.

- Remove BSA holding fixture before lifting transport case.
- Two people are required to safely lift or move BSA holding fixture.

BSA HOLDING FIXTURE

The BSA Holding Fixture (BSAHF) provides a secure and accurate means of mounting a BSA unit for testing and repair work. It is mounted on a rail assembly that also provides mounting for the AN/TAM-3A collimator. The BSAHF includes a set of augmented optics for viewing the BSA LED display, a translation/rotation stage for detector/dewar alinement, and a flat mirror that is used for checking the holding fixture alinement. See TM 9-4935-474-14 for operation and maintenance.

BFVS ALINEMENT TEST SET

The BFVS alinement test set provides supplemental TMDE required to test and fault isolate the TSSTS units and associated cables. It consists of the following equipment stored in a transit case:

- Function generator, Tektronix FG 501A
- Mainframe, TM 503
- Counter timer, Tektronix DC 503A
- Infrared mini-viewer
- Assorted cables

1-10. EQUIPMENT DATA

The following table of characteristics gives the size, weight, and power needs of each shelter.

Characteristics	Data
Length	147 in./373.38 cm
Width	87 in./221 .00 cm
Height	83-3/8 in./211.77 cm
Weight	1310 lbs/593.43 kg
Weight with shipping crate	TBD
Volume	614 cu ft/17.19 m^3
Power needed	220V 3-phase 60 Hz
Power used by neon lights	40 watts
Power used by air conditioner/ heater assembly	208V 3-phase 60 Hz
Storage Limitations*	-54 °F to + 120 °F (-48 °C to + 49 °C)
Test Equipment	-54 °F to 120 °F (-48 °C to + 49 °C)
Normal Operating Temperature	55 °F to 95 °F (13 °C to 35 °C)

*CAUTION - Movement of unheated shelter in extremely cold weather may damage components. Before shelter is moved, temperature inside shelter must be raised to at least -25 °F (-31 °C).

CHAPTER 2

OPERATING INSTRUCTIONS

CHAPTER OVERVIEW

This chapter tells how to prepare the shelter for operation and also provides the operating instructions for items in the shelter.

Section 1. PREPARING SHELTER FOR OPERATION

2-1. SCOPE

This section tells how to mount and remove the shelter on and off the truck. This chapter also tells how to shut down power and secure ladder for transit.

CAUTION

Movement of unheated shelter in extremely cold weather may damage components. Before shelter is moved, temperature inside shelter must be raised to at least -25°F (-31°C).

2-2. MOUNTING SHELTER ON TRUCK AND ATTACHING LADDER (Sheet 1 of 5)

TOOLS : Breaker bar or rod
Two 12-inch adjustable wrenches

MATERIALS : Wooden bumpers (item 1, App. D)
Nonskid Paint (item 2, App. D)

PERSONNEL: Two MOS 27E (Soldier A and Soldier B)

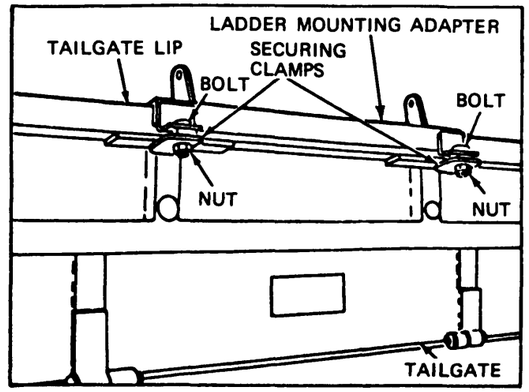
CAUTION

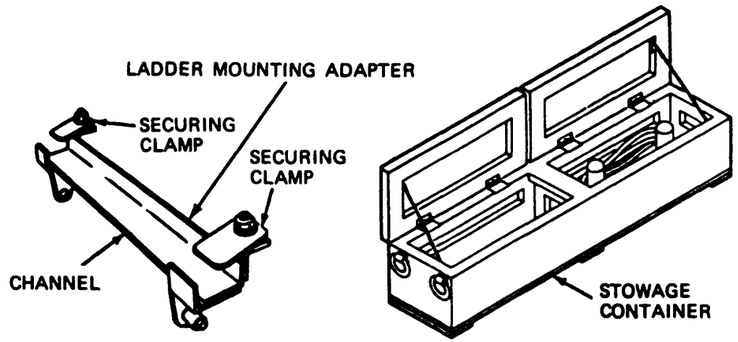
Be sure that the device which lifts the shelter is able to lift at least 5 tons.

NOTE

Soldier A and Soldier B do all tasks.

1





A. Remove ladder mounting adapter from stowage container.

NOTE

Do steps B thru D on both sides of truck.

B. With the tailgate in the up secured position, lift the ladder mounting adapter and place it, channel down, over the tailgate.

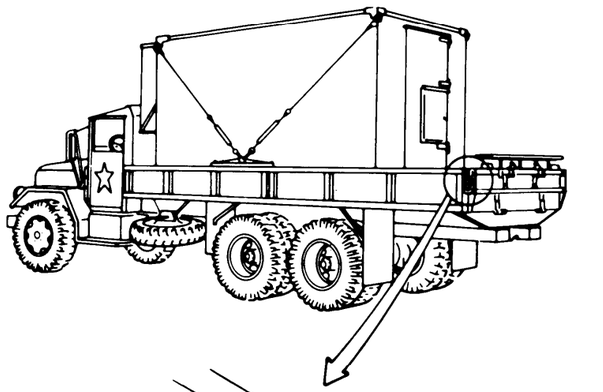
C. Center the ladder mounting adapter on the tailgate.

D. Line UP the securing clamps under the lip of the tailgate and tiqhten the two nuts and bolts until the mounting adapter is tight and cannot be moved.

GO TO NEXT PAGE

2-2. MOUNTING SHELTER ON TRUCK AND ATTACHING LADDER (CONT) (Sheet 2 of 5)

2

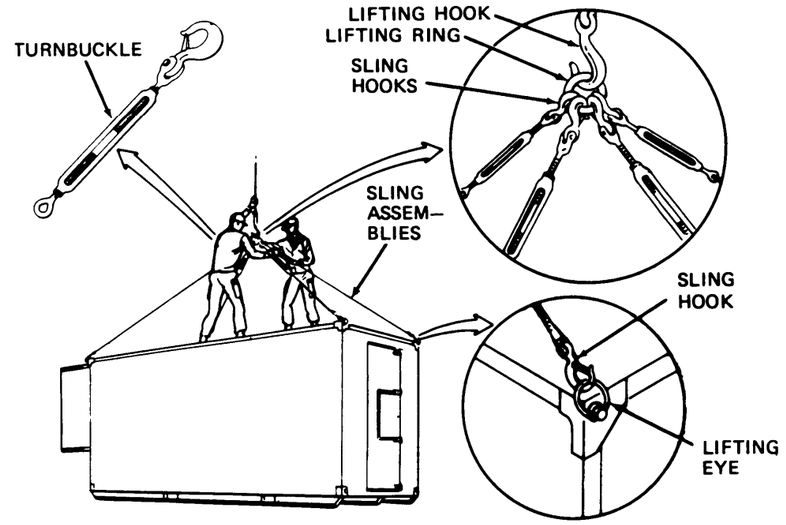


A. To lower the tailgate position, station one soldier on each side of the rear end of the truck bed.

B. Remove the two securing hooks from upper securing slots and lower the tailgate enough to slip the securing hooks into slots on each side of the tailgate.

C. Lower tailgate to the level position.

3



A. Remove sling assemblies and lifting ring from stowage container. Place on top of shelter

B. Station two soldiers on top of the shelter for sling assembly hook-up.

CAUTION

Standard rigging safety precautions call for sling hooks to be installed from inside out.

C. Connect four sling hooks to four lifting eyes, hooking from inside out.

CAUTION

To prevent possible damage to equipment and shelter, make sure that turnbuckles are set to the same length so weight is even on all four sling assemblies. If not, turn turnbuckles by hand until they are.

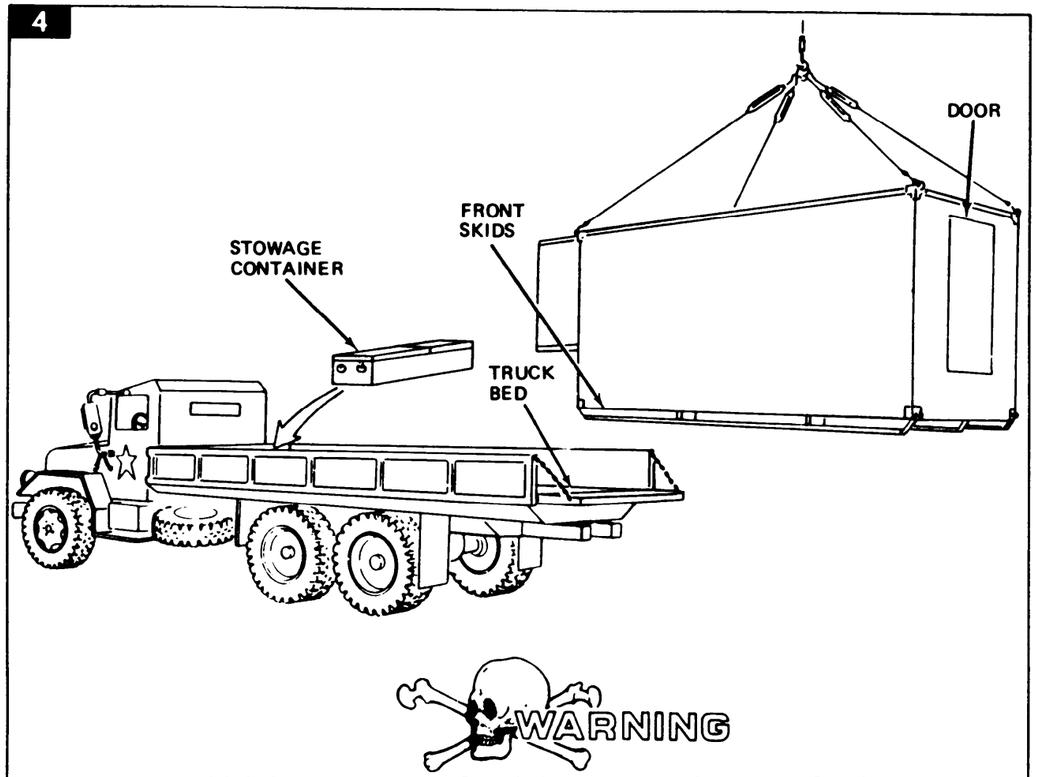
D. Connect the four sling hooks to the lifting ring.

E. Hook the lifting ring to the lifting hook of the lifting device.

GO TO NEXT PAGE

2-2. MOUNTING SHELTER ON TRUCK AND ATTACHING LADDER (CONT) (Sheet 3 of 5)

4



To avoid injury to personnel and damage to equipment, only the personnel doing the loading are to be near the truck and lifting device.

A. Check truck bed to see that all tools, sideboards, and troopseats are removed and that tailgate and brackets are installed.

B. Install stowage container across the front of truck bed.

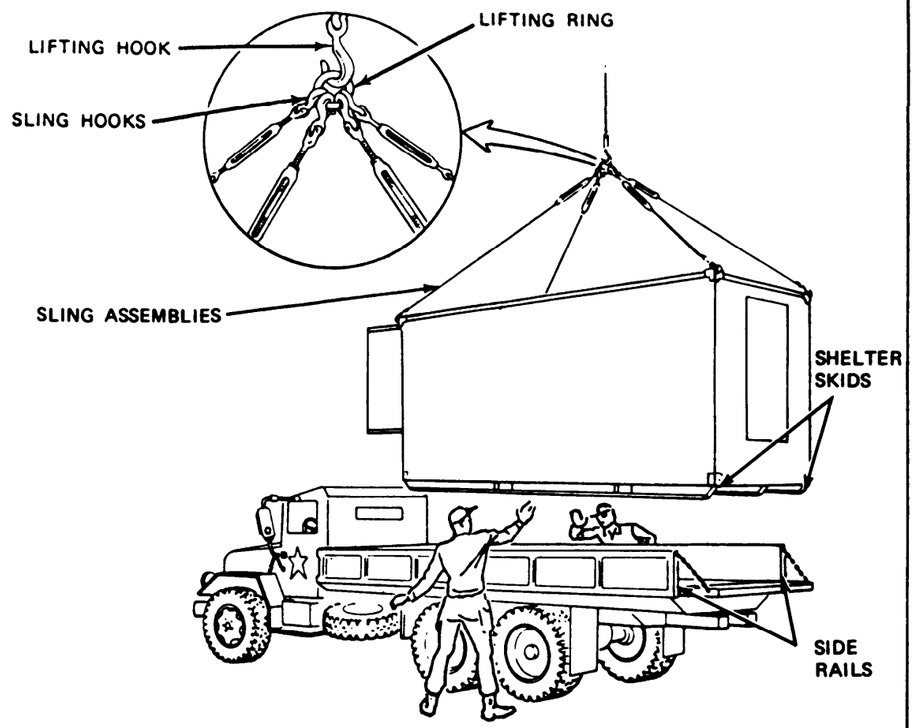
C. Remove the two soldiers from the top of the shelter and station one soldier on each side of shelter to guide shelter into position on truck bed.

D. Slowly lift the shelter high enough to clear the truck bed.

NOTE

The door of the shelter must be at the rear of the truck, and the front skids of the shelter must be against the stowage container.

5



All personnel not required for loading operation must stay away from the truck while the shelter is being lowered into place.

A. Back the truck into position under the shelter.

B. As shelter is lowered slowly onto truck bed, the two soldiers guiding shelter must position it so there is an equal mount of space between side rail and shelter skid on each side.

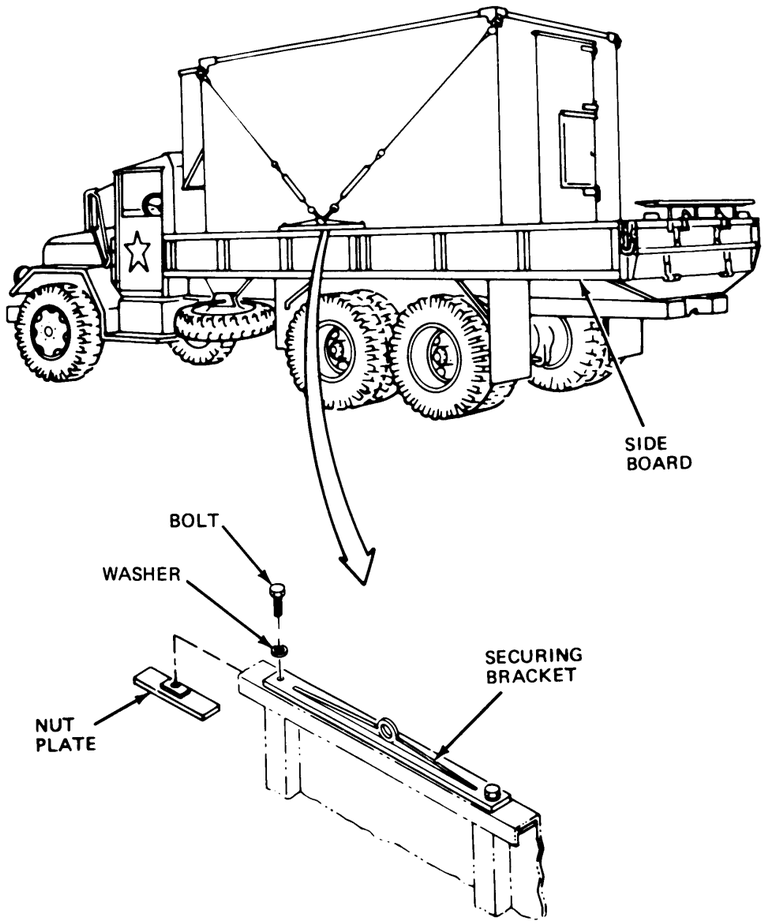
C. Remove the lifting ring from the lifting hook and remove the sling hooks from the lifting ring.

D. Position all sling assemblies so they hang straight down each corner of the shelter.

GO TO NEXT PAGE

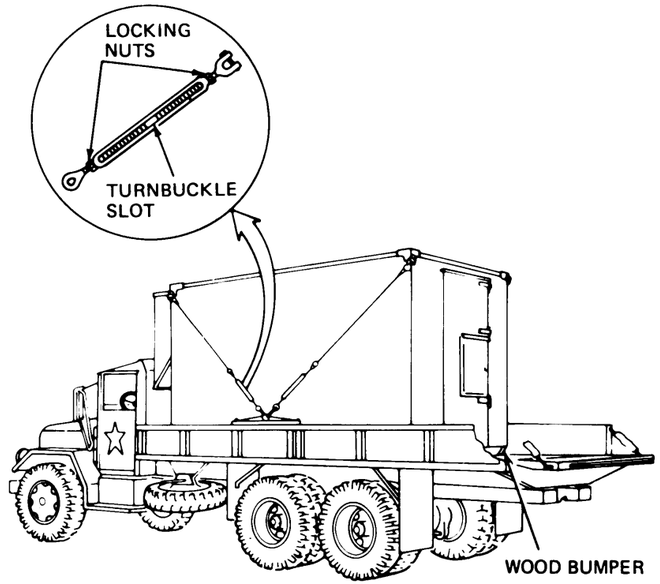
2-2. MOUNTING SHELTER ON TRUCK AND ATTACHING LADDER (CONT) (Sheet 4 of 5)

6



Install shelter securing brackets to left and right side rails by installing four 3 x 3/4 inch bolts and four washers thru securing brackets and into nut plates.

7



A. Secure the sling assemblies to the securing bracks on each cargo bed side rail.

CAUTION

Do not overtighten turnbuckles. Overtightening turnbuckles may damage shelter lifting rings.

B. Tighten turnbuckles evenly by hand as tight as possible and then turn each turnbuckle one more turn with a bar or rod in the turnbuckle slot.

C. Tighten the two locking nuts on each of the four turnbuckles.

CAUTION

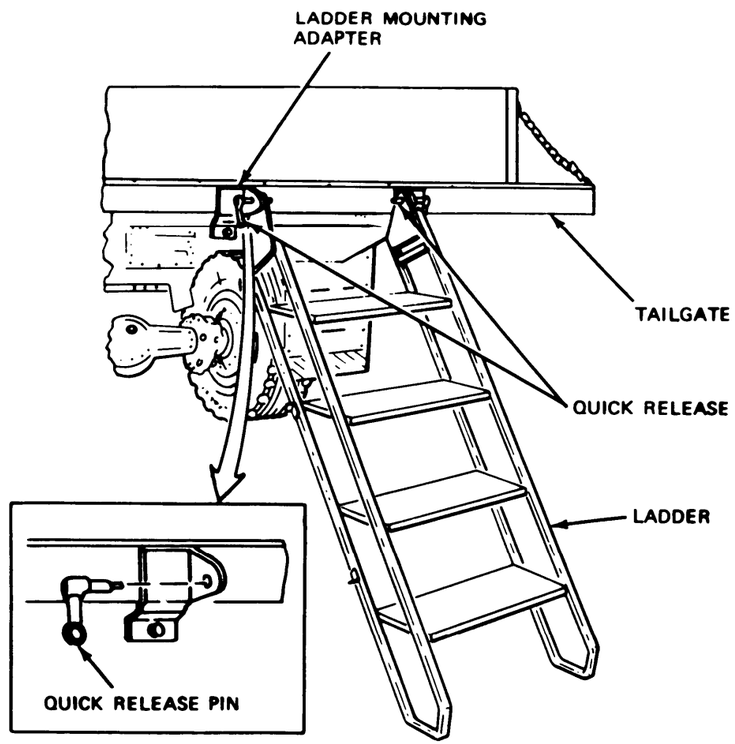
To prevent side motion and possible damage to shelter, wooden bumpers must be installed between shelter skid and truck side panel. Size of bumper will differ from truck to truck.

D. Install wood bumpers between shelter skids and bed of truck.

GO TO NEXT PAGE

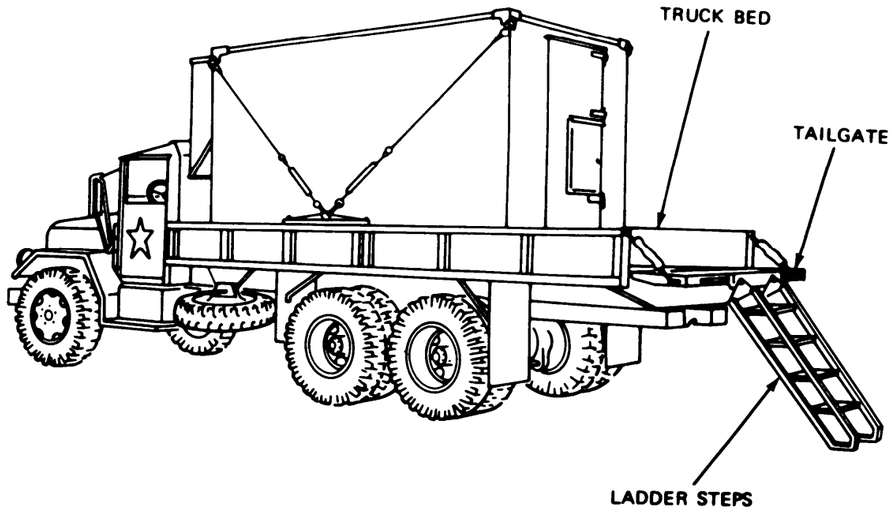
2-2. MOUNTING SHELTER ON TRUCK AND ATTACHING LADDER (CONT) (Sheet 5 of 5)

8



Using two quick release pins, attach ladder to ladder mounting adapter on tailgate.

9



To prevent slipping and injury to personnel going into and coming out of the shelter, the tailgate, ladder steps and rear quarter of the truck bed should be painted with nonskid paint.

Apply a coat of nonskid paint to exposed truck bed, tailgate, and ladder steps.

END OF TASK

2-3. PREPARATION OF SHELTER FOR TRANSIT
(Sheet 1 of 2)

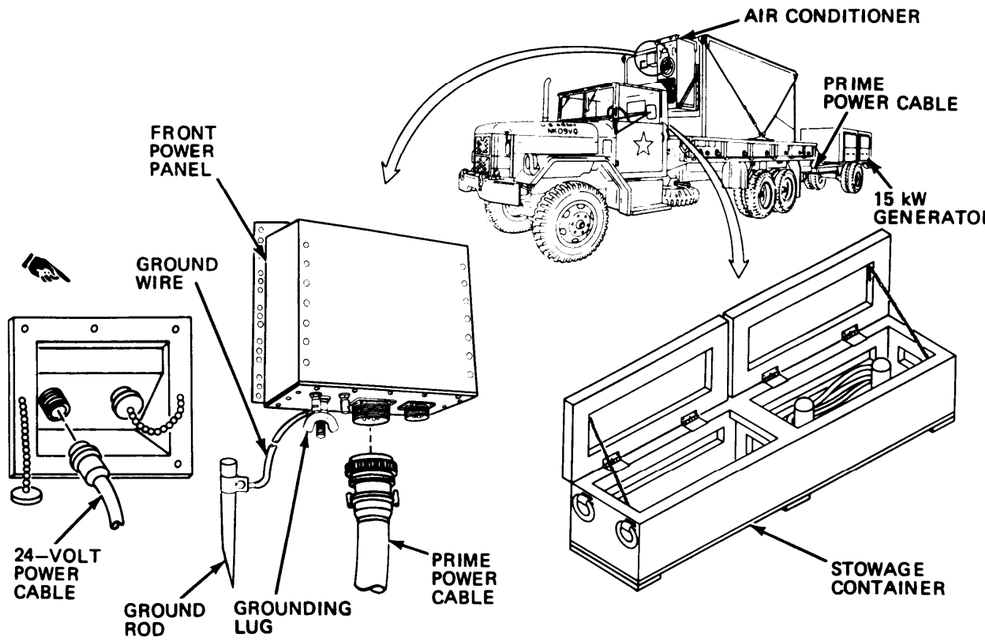
TOOLS: Two 12-inch adjustable wrenches

PERSONNEL: Two MOS 27E (Soldier A and Soldier B)

NOTE

Soldier A and Soldier B do all tasks unless stated otherwise.

1



A. Mount shelter on truck (para 2-2).

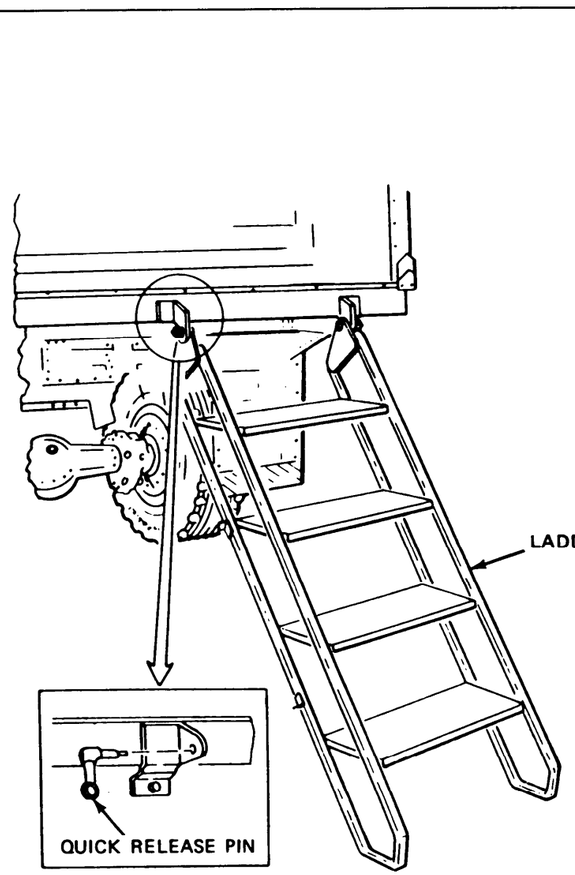
B. Shut off prime power, remove prime power cable from 15 kW generator or other primary power source and from front power panel, and stow cable in stowage container.

C. Remove 24-volt power cable from shelter and from 24-volt vehicle battery.

D. Pull up ground rod, disconnect ground wire from grounding lug on front power panel, and stow ground rod and wire in stowage container.

E. (Soldier A) Close zipper closure around front of air conditioner.

2

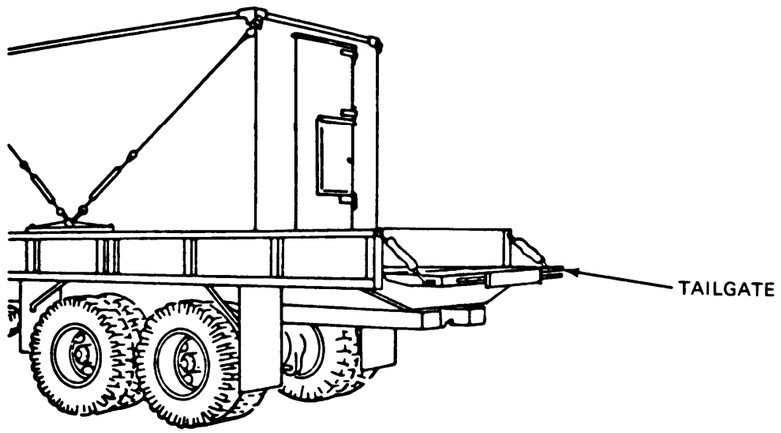


Remove ladder by removing two quick release pins.

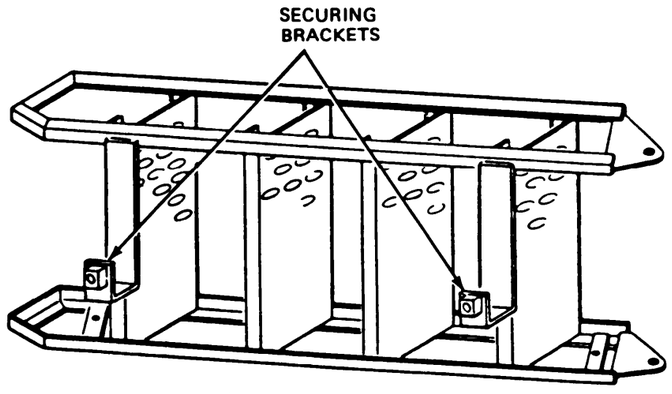
GO TO NEXT PAGE

2-3. PREPARATION OF SHELTER FOR TRANSIT (CONT) (Sheet 2 of 2)

3



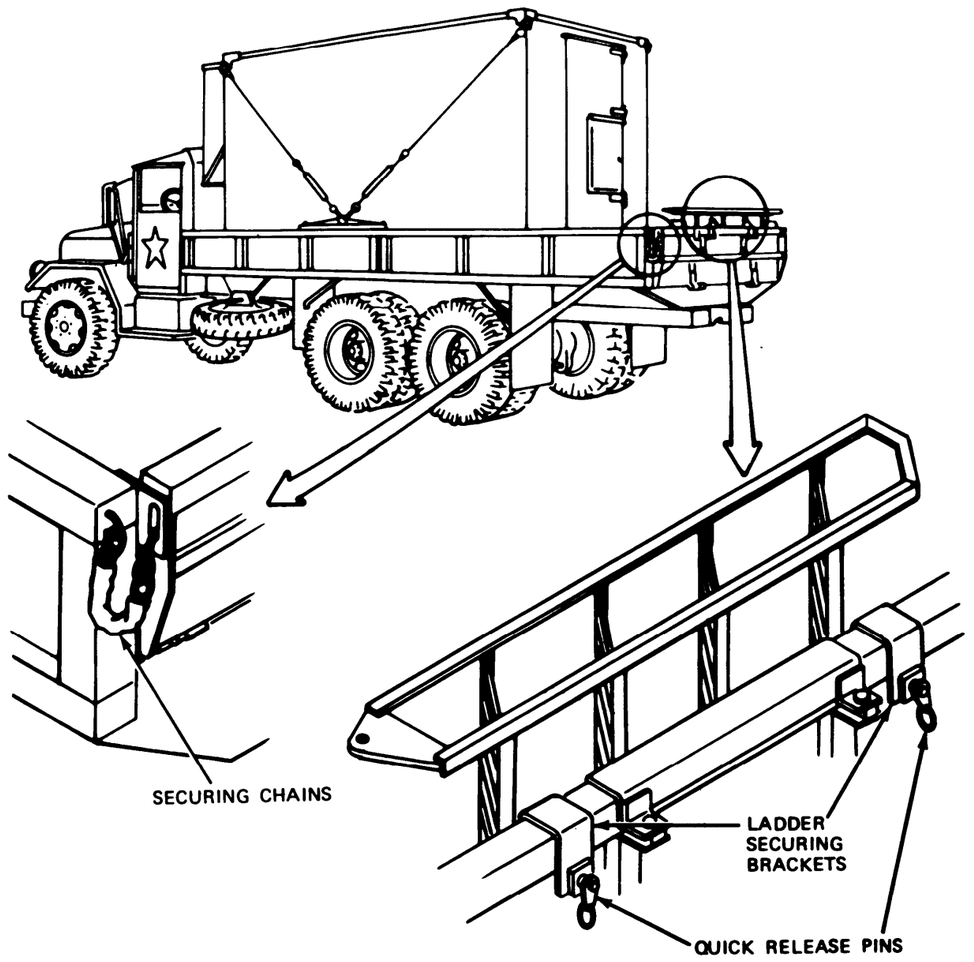
SECURING BRACKETS



A. Place ladder, with securing brackets down and to the rear, on tailgate of truck.

B. Slide ladder forward until securing brackets are over tailgate.

4



A. Lift the tailgate and install the two securing chains.

B. Install two quick release pins in ladder securing brackets.

END OF TASK

2-4. REMOVAL OF SHELTER (Sheet 1 of 4)

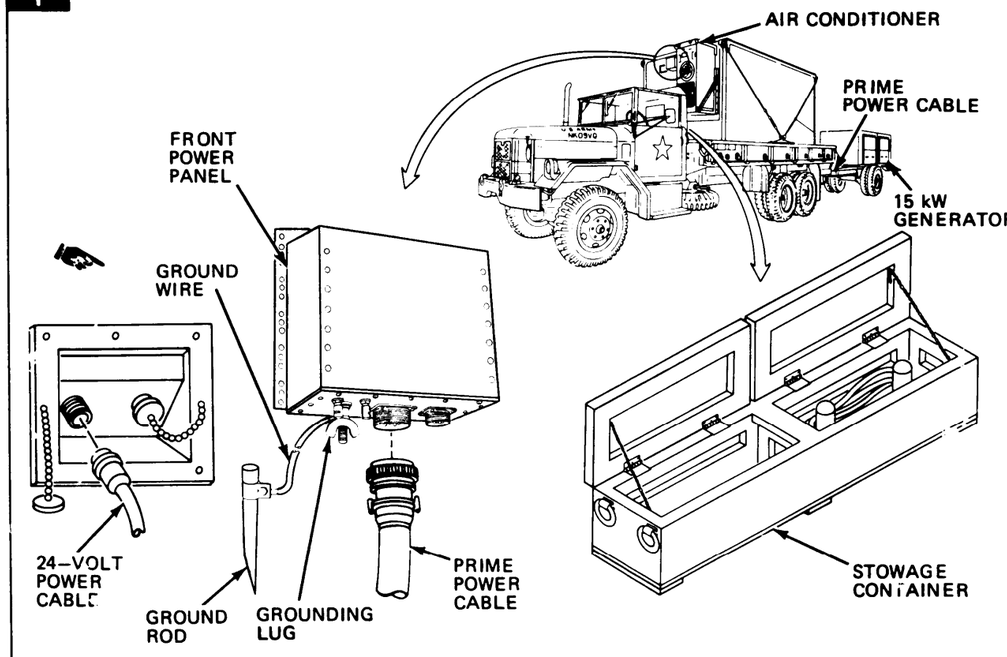
TOOLS : Two 12-inch adjustable wrenches

PERSONNEL: Two MOS 27E (Soldier A and Soldier B)

NOTE

Soldier A and Soldier B do all tasks unless stated otherwise.

1



A. Shut off prime power, remove prime power cable from 15 kW generator or other primary power source and from front power panel, and stow cable in stowage container.

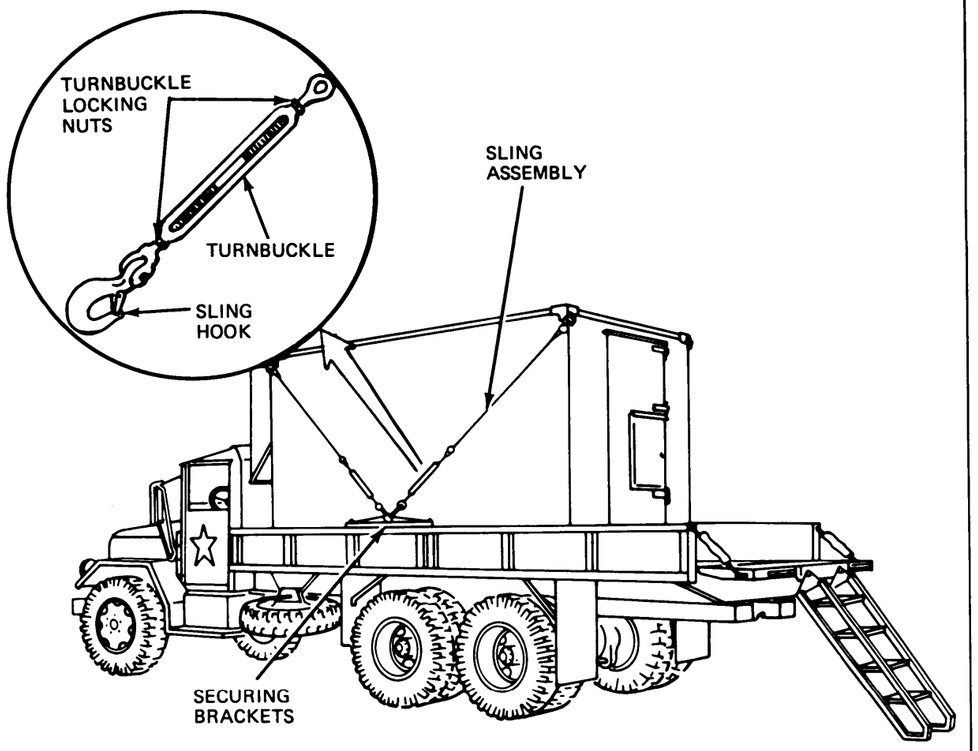
B. Remove 24-volt power cable from shelter and from 24-volt vehicle battery.

C. Pull up ground rod, disconnect ground wire from grounding lug on front power panel, and stow ground rod and wire in stowage container.

D. (Soldier A) Close zipper closure around front of air conditioner.

E. (Soldier A) Close and lock shelter door after making sure all gear inside the shelter is secure in proper place.

2



A. Loosen turnbuckle locking nuts.

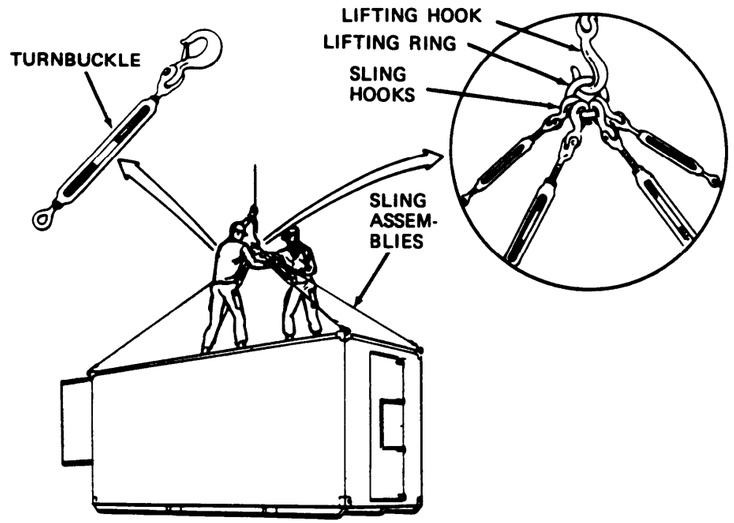
B. Loosen turnbuckles until sling hooks can be unsnapped from securing brackets.

C. Let each sling assembly swing to its corner as it is unsnapped.

GO TO NEXT PAGE

2-4. REMOVAL OF SHELTER (CONT) (Sheet 2 of 4)

3



A. Station two soldiers on top of the shelter for sling assembly hook-up.

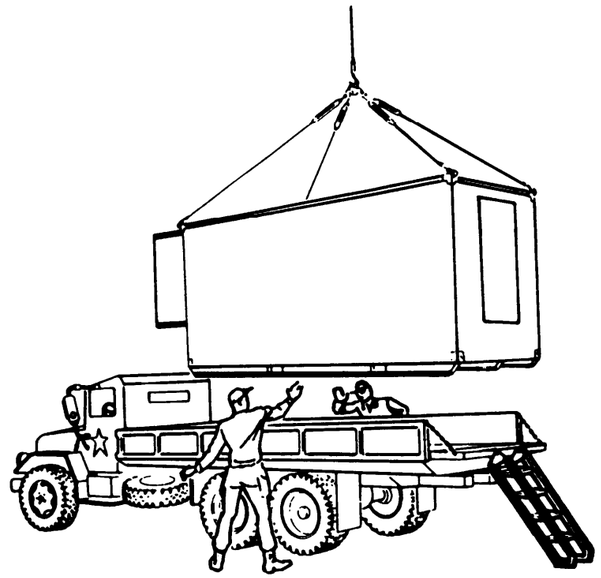
CAUTION

- Make sure sling hooks are hooked to shelter from inside out.
- To prevent possible damage to equipment and shelter, make sure that turnbuckles are set to the same length so weight is even on all four sling assemblies. If not, turn turnbuckles by hand until they are.

B. Connect the four sling hooks to the lifting ring.

C. Hook the lifting ring to the lifting hook of the lifting device.

4

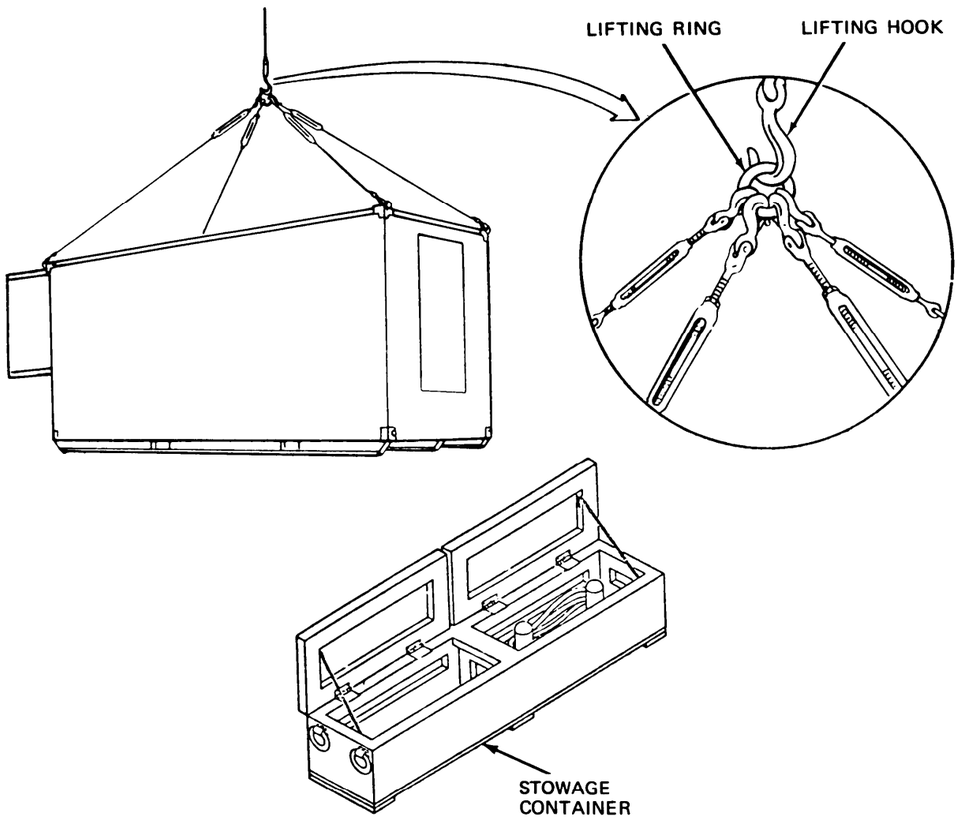


Remove the two soldiers from the top of shelter and station them alongside truck to guide shelter as it is lifted off.

GO TO NEXT PAGE

2-4. REMOVAL OF SHELTER (CONT)
(Sheet 3 of 4)

5

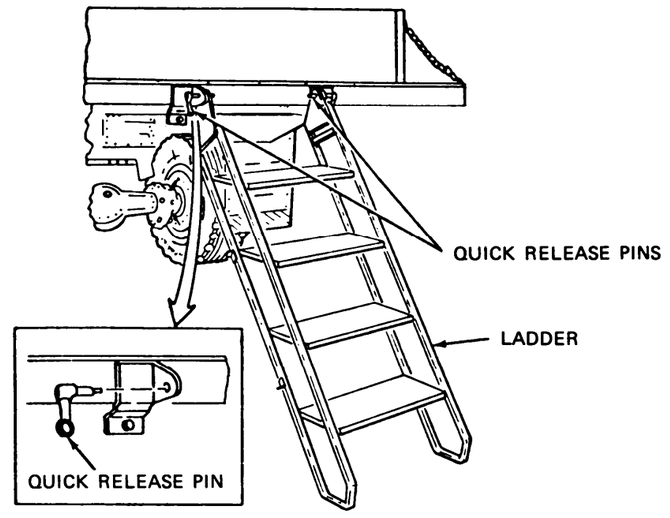


A. Set shelter in any level area desired.

B. Remove lifting ring from lifting hook.

C. Unhook sling assemblies at each corner of shelter and place sling assemblies and lifting ring in stowage container on the truck.

6



NOTE

If another shelter is to be loaded right away on the same truck, proceed to para 2-1.

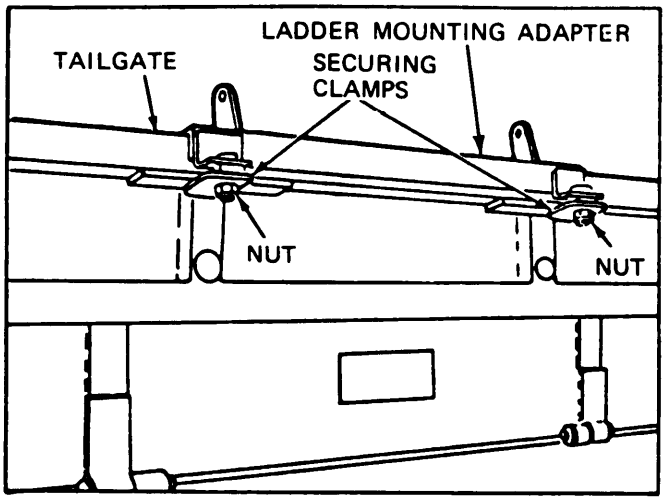
A. Remove ladder by removing two quick release pins.

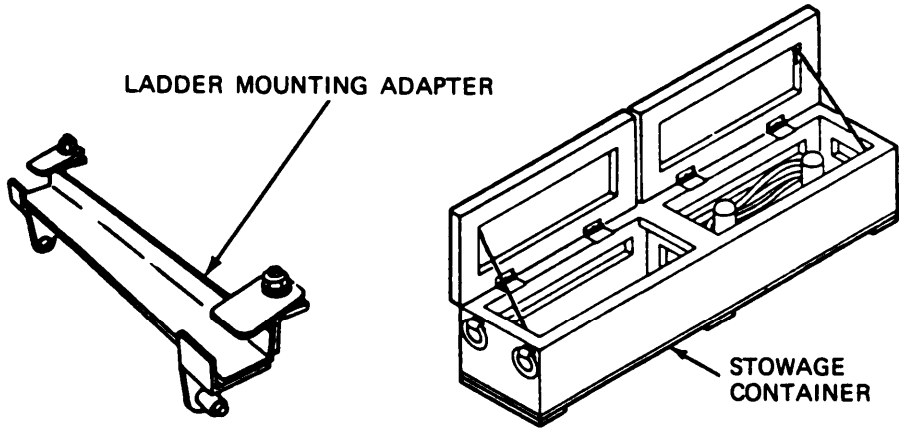
B. Remove ladder from truck area.

GO TO NEXT PAGE

2-4. REMOVAL OF SHELTER (Sheet 4 of 4)

7





A. Remove ladder mounting adapter from tailgate by loosening two nuts until securing clamps swing free.

B. Lift ladder mounting adapter from tailgate and put in stowage container.

END OF TASK

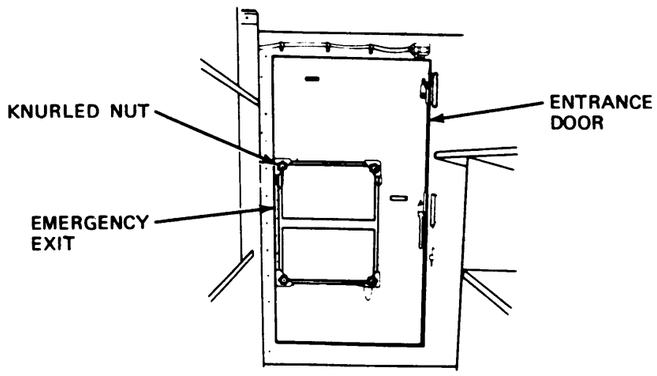
Section II. OPERATING PROCEDURES

2-5. SCOPE

This section tells how to apply power to the shelter and operate the air conditioner and purging equipment.

NOTE

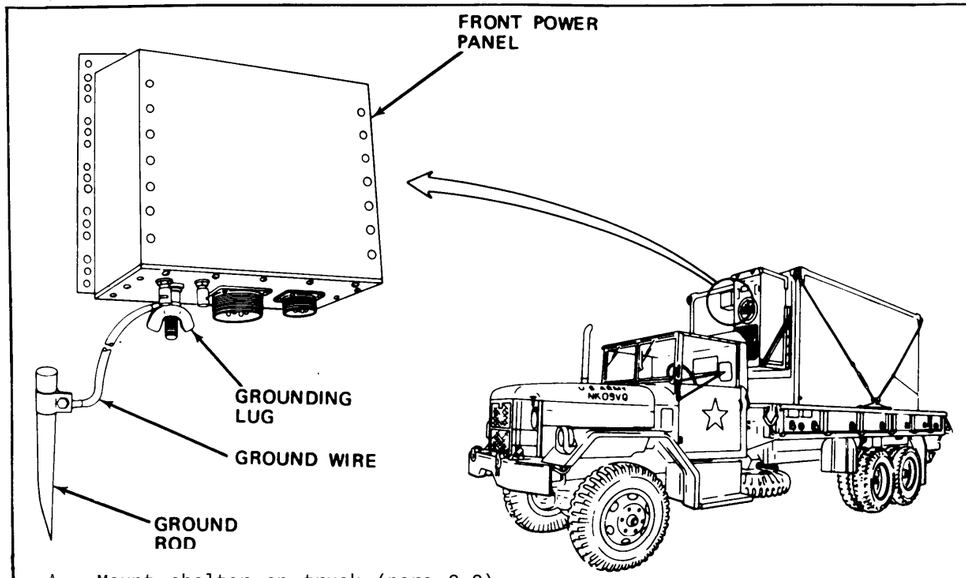
An emergency exit is located in the shelter entrance door and can be opened by removing four knurled nuts and pushing outward.



INSIDE REAR OF SHELTER

2-6. GROUND FOR SHELTER

TOOLS: 5 lb. sledge hammer



A. Mount shelter on truck (para 2-2).

WARNING

The shelter must be grounded before power is connected.

B. Choose the lowest, dampest site within 10 feet of the front power panel, preferably in clay-like soil, and scoop out small hole about six inches deep.

C. Remove any paint or grease from the ground rod.

D. Using a 5 lb. sledge hammer, drive the rod into the hole until its top is about 12 inches above ground level.

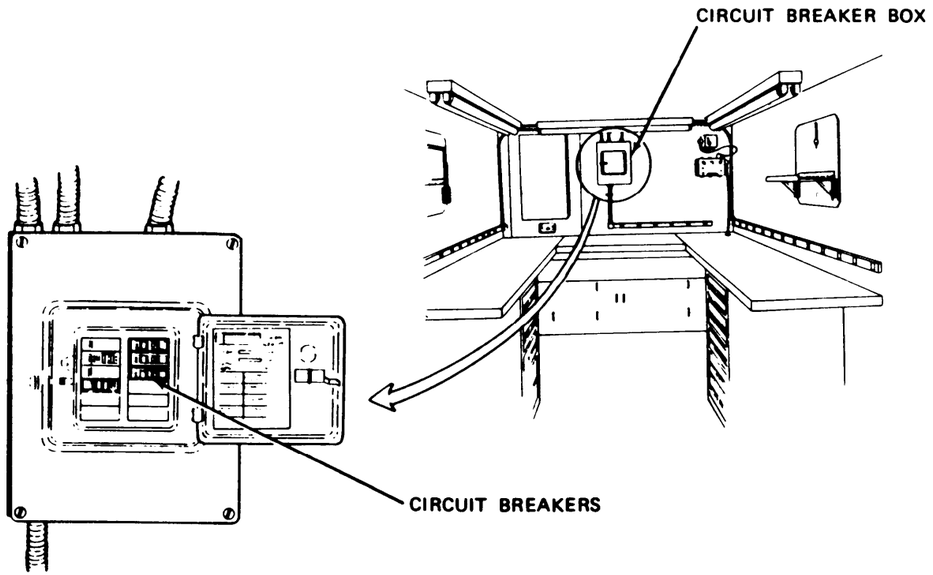
E. Water ground around the rod to keep it moist.

F. Connect one end of the ground wire to the ground rod and the other end to the grounding lug at the front power panel.

END OF TASK

2-7. TURN ON SHELTER POWER (Sheet 1 of 3)

1

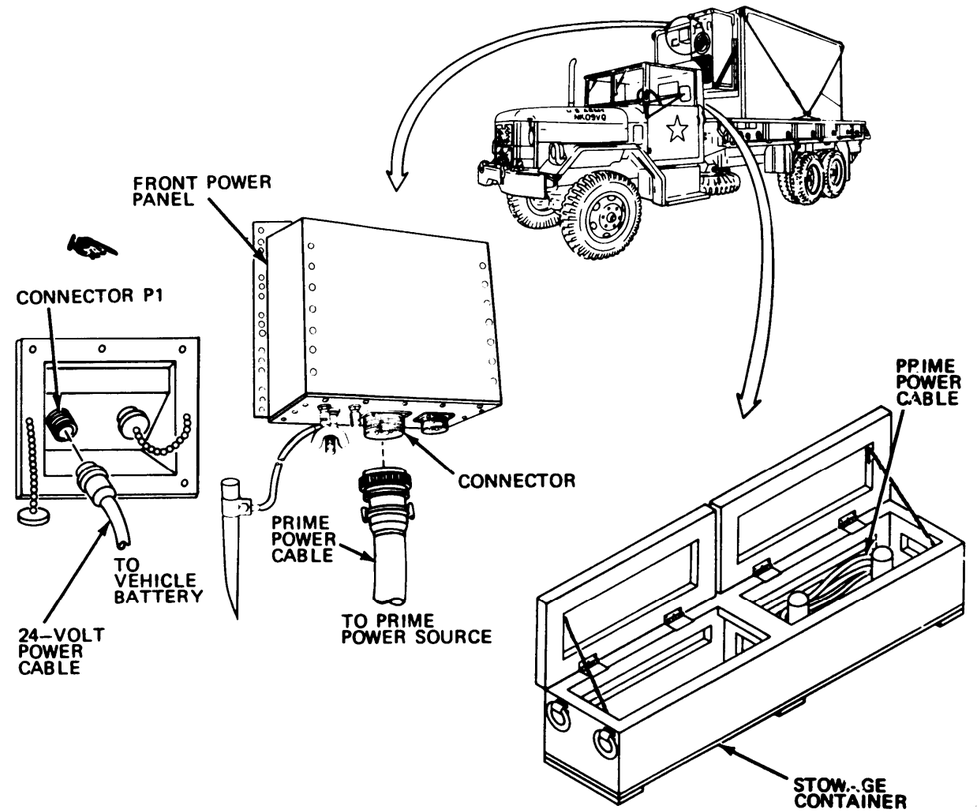


WARNING

- Ground rod (para 2-6) must be installed before prime power cable is connected to the shelter.
- Before making connections, make sure commercial power or prime power source (15 kW generator) has been turned off.

Set all circuit breakers in the circuit breaker box to OFF.

2



A. Connect 24-volt power cable to connector P1 on front wall of shelter.

B. Connect terminals at other end of 24-volt power cable to 24-volt vehicle battery.

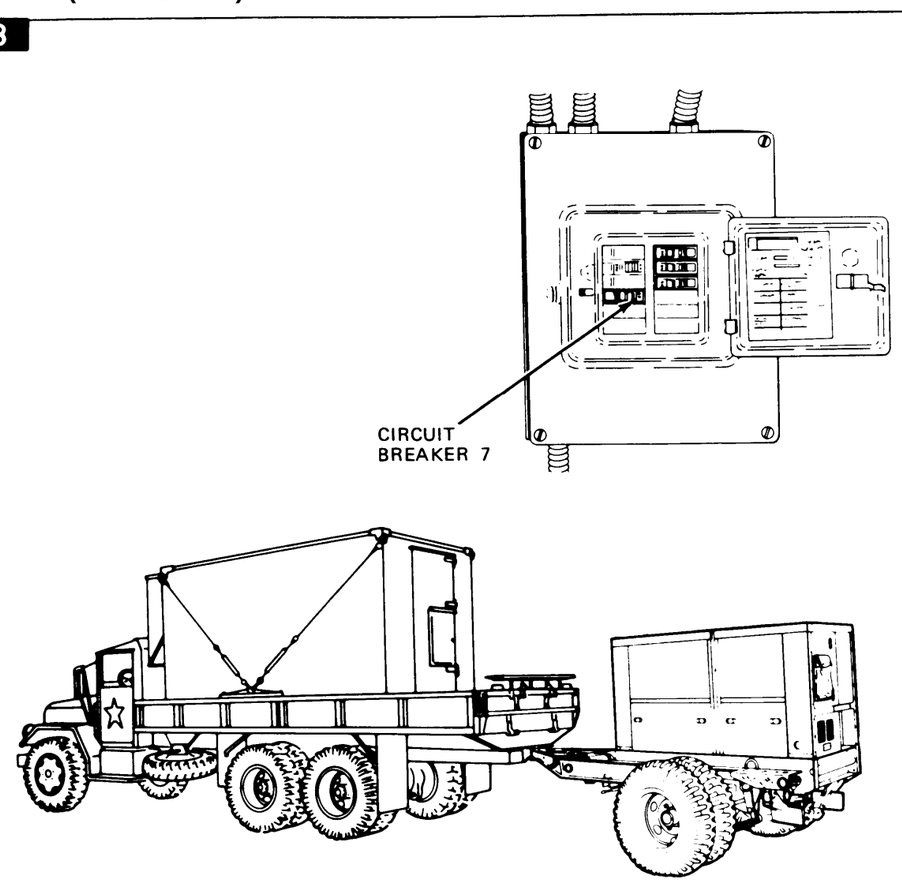
C. Take prime power cable out of stowage container.

D. At shelter front power panel, connect prime power cable to connector.

GO TO NEXT PAGE

2-7. TURN ON SHELTER POWER (CONT) (Sheet 2 of 3)

3



NOTE

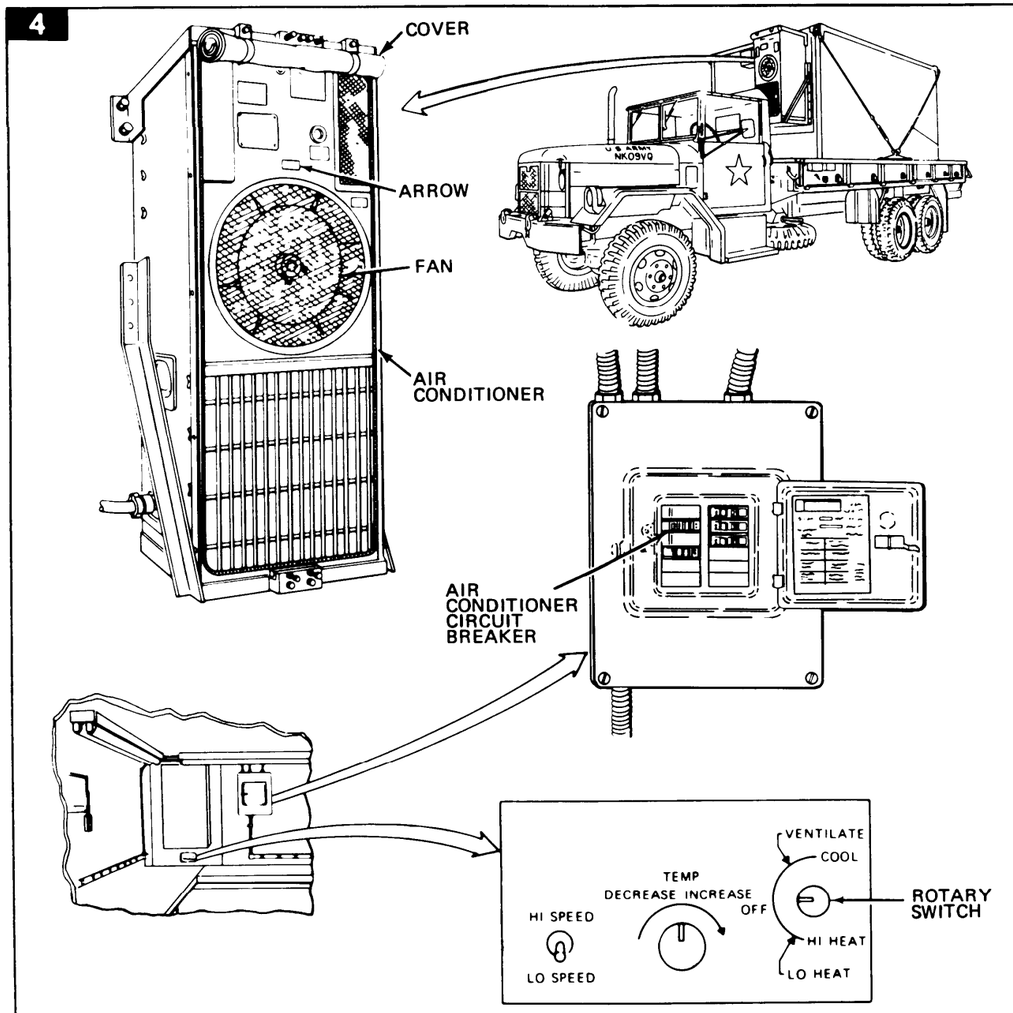
For connections to 15 kW generator, refer to para 3-15.

A. Connect shelter and prime power cable to prime power source. Turn on prime power source.

B. Set circuit breaker 7 to ON.

C. Turn on three lights inside shelter by pulling the light switch chain.

4



A. Unzip cover on air conditioner, roll it up, and secure it with straps.

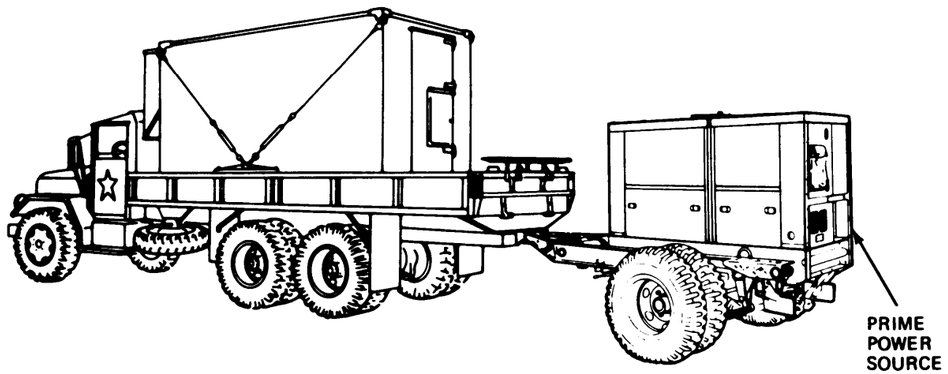
B. Station soldier outside the shelter to look at fan rotation.

C. In the shelter, set air conditioner circuit breaker to ON, set rotary switch to any position except OFF, and have soldier look at which way fan turns. If fan turns against the arrow (arrow shows correct direction of turning), turn off air conditioning circuit breaker and go to step 5A. If fan turns properly, skip step 5.

GO TO NEXT PAGE

2-7. TURN ON SHELTER POWER (CONT) (Sheet 3 of 3)

5



NOTE

Do steps A and B only if air conditioner fan turned against its arrow (step 4C).

A. Turn off prime power source.

B. Switch white and black wires on prime power source and repeat step 4B.

END OF TASK

2-8. OPERATION OF AIR CONDITIONER (Sheet 1 of 2)

There are three ways the air conditioner can be operated. They are listed in the following subparagraphs:

a. Cooling Shelter

b. Heating Shelter

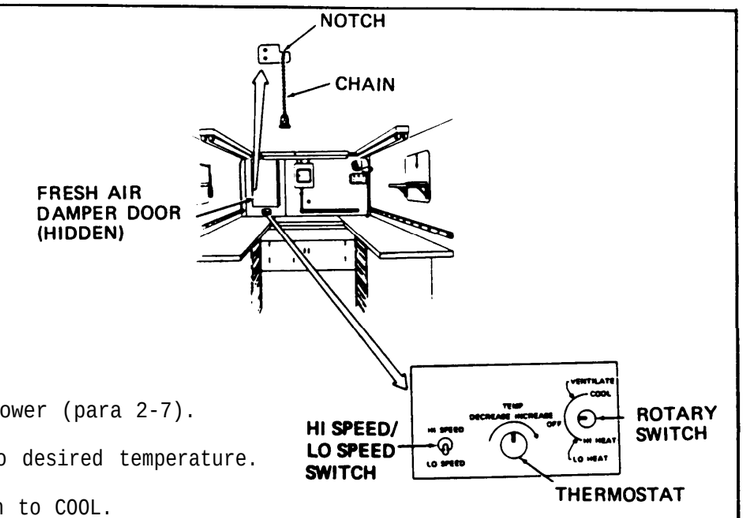
c. Ventilating Shelter

NOTE

- If shelter power is already on, make sure that cover is rolled up and secured at top of air conditioner (para 2-7, step 4).
- Turn off air conditioner when using AN/TAM-3A or AN/TAM-3 collimator. Vibration from air conditioner interferes with test equipment.

a. Cooling Shelter

1



A. Turn on shelter power (para 2-7).

B. Set thermostat to desired temperature.

C. Set rotary switch to COOL.

D. For cooling with only recirculated air, close fresh air damper door by pulling chain and setting into notch.

E. For cooling with fresh air, open fresh air damper door by taking chain out of notch.

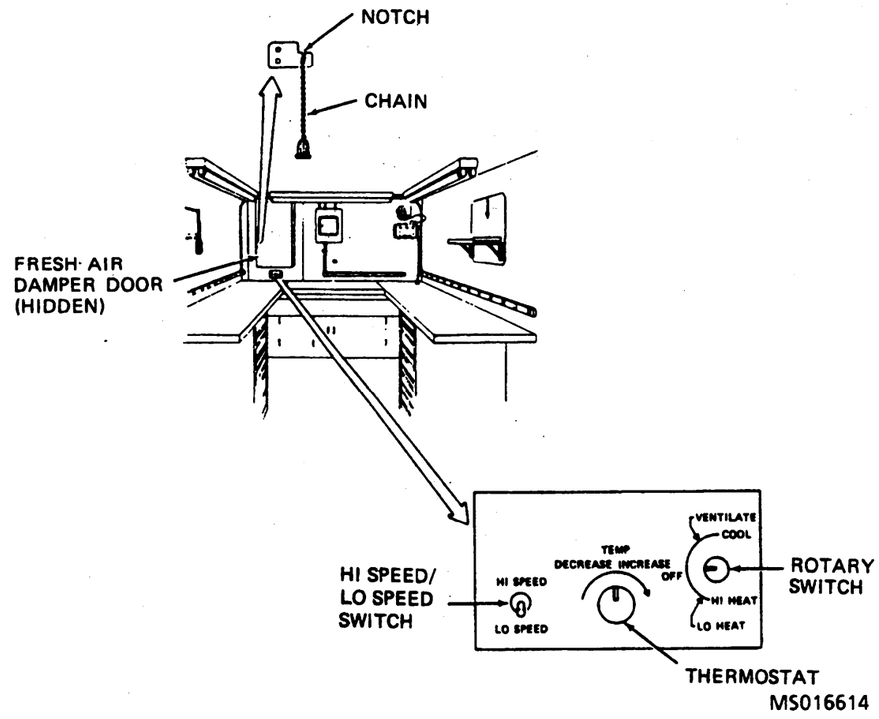
F. Adjust HI SPEED/LO SPEED switch for more or less circulation of cooling air.

GO TO NEXT PAGE

2-8. OPERATION OF AIR CONDITIONER (CONT)
(Sheet 2 of 2)

b. Heating Shelter

2



A. Turn on shelter power (para 2-7).

B. Set thermostat to desired temperature.

C. Set rotary switch to LO HEAT or HI HEAT.

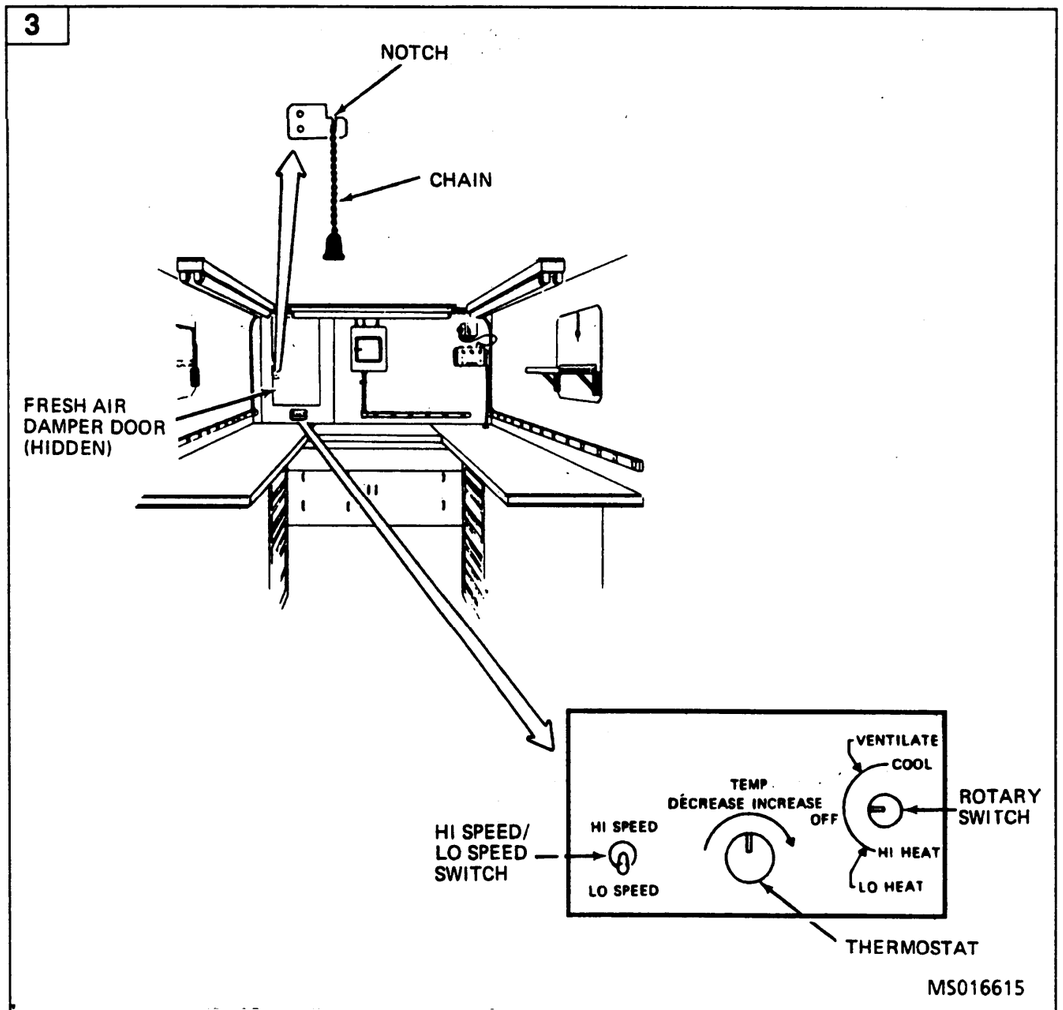
D. For heating with only recirculated air, close fresh air damper door by pulling chain and setting notch.

E. For heating with fresh air, open fresh air damper door by taking chain out of notch.

F. Adjust HI SPEED/LO SPEED switch for more or less circulation of heated air.

c. Ventilating Shelter

3



A. Turn on shelter power (para 2-7).

B. Set rotary switch to VENTILATE.

C. Open fresh air damper door by taking chain out of notch, and close intake grille damper by pushing down on lever.

D. Adjust HI SPEED/LO SPEED switch for more or less amount of ventilation.

END OF TASK

2-9. OPERATION OF PURGING EQUIPMENT

To operate the purging equipment with the TOW 2 optical sight, refer to TM 9-1425-450-34-1. To operate the purging equipment with the DRAGON IR tracker and night tracker (AN/TAS-5), refer to TM 9-1425-481-34.

CHAPTER 3
MAINTENANCE INSTRUCTIONS, BASIC FACILITY

CHAPTER OVERVIEW

This chapter covers maintenance instructions for basic shelter items.

CHAPTER CONTENTS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT

SECTION CONTENTS

3-1. SCOPE

This section covers the repair parts, special tools, and support equipment used to maintain the shelter.

3-2. COMMON TOOLS AND EQUIPMENT

All common tools and equipment required for the shelter are contained in the 27E tool kit.

3-3. SPECIAL TOOLS AND SUPPORT EQUIPMENT

No special tools or support equipment are required other than the equipment that is a part of the shelter.

3-4. SPARES AND REPAIR PARTS

For spares and repair parts for the shelter, refer to TM 9-4935-451-24P.

Section II. SERVICE UPON RECEIPT OF MATERIAL

3-5. SCOPE

This section covers the required service upon receipt to insure that the ICSS shelter is complete (in accordance with packing list) and in a ready condition. It is the responsibility of the unit commander to see that the required receiving inspection and installations are accomplished.

3-6. SERVICE UPON RECEIPT CHECKLIST

The receiving organization performs the receiving inspection to determine that the shelter is complete and in a ready condition. When handling, inspecting, and maintaining the equipment, observe the general instructions which follow:

a. Make an initial inventory when the equipment is received. Note any missing items, and report them promptly. The Components of End Item list, Appendix C, lists and illustrated the integral components of the shelter. Additional components used to support specific weapon systems are listed in Appendix E.

b. Check stock numbers and serial numbers against packing list to make sure that the correct items were received.

c. Check to see that all modification work orders published against the equipment have been incorporated.

d. Check all tags and stenciled information for correctness and completeness.

e. Perform a visual inspection of components to make sure that the shelter and components are in good condition.

f. Install the shelter on the truck (para 2-2), and perform an initial checkout of items within the shelter.

g. Do not make any adjustments or repairs unless specifically authorized by the Maintenance Allocation Chart in Appendix B. If a component cannot be adjusted or repaired in accordance with authorized procedures, refer the problem to a higher category of maintenance.

h. Use only those tools, parts, cleaning agents, solvents, and other materials specifically authorized.

i. Report any deficiencies, using applicable reports, records, and forms required for inventories, inspections, and maintenance.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-7. SCOPE

This section tells how to do the preventive maintenance checks and services (PMSC) required for the common shelter items that should be performed before operations. PMCS represents the minimum number of essential checks. Before you begin the PMCS, keep in mind the following general information which is just as important as the specific checks.

a. Before you operate - before operating any equipment, do all the before (B) PMCS. Be sure to keep in mind all CAUTIONS and WARNINGS.

b. Weekly - once a week while equipment is in service, do all weekly (W) PMCS.

c. Monthly - once a month while equipment is in service, do all monthly (M) PMCS.

d. If your equipment fails to operate - troubleshoot with proper equipment. Report any deficiencies using the proper forms (See DA PAM 738-750).

3-8. COLUMN ENTRIES USED IN PMCS

B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
1	●			Connector J1	Check for damage or dirt.	Connector is cracked or badly dented and cannot be used.

1. Column 1, Item No. Column 1 numbers the checks and services to be performed in chronological order. This column will also be used as a source of item numbers for the "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance worksheet, in recording results of PMCS.

2. Column 2, Interval. Column 2 specifies the intervals at which the PMCS will be performed. A dot (●) in any "Interval" column indicates when you are to perform that PMCS. The letters indicate the interval as follows:

B - Before operation

W - Once a week (weekly)

M - Once a month (monthly)

3. Column 3, Item to be Inspected. Column 3 identifies the part of the equipment to be checked.

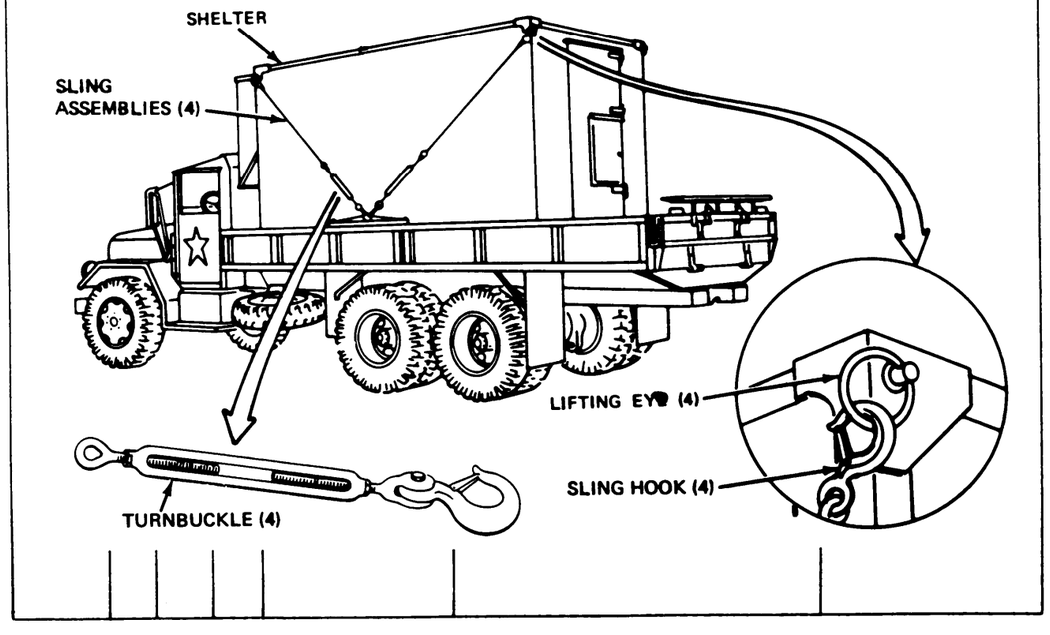
4. Column 4, Procedures. Column 4 provides the procedures for permitting the check.

5. Column 5, Equipment Is Not Ready/Available If. Column 5 contains the criteria which will cause the equipment to be unable to perform its primary mission.

3-9. SHELTER PMCS
(Sheet 1 of 6)

B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				SHELTER		
1.			●	Shelter	Secured on 2-1/2 ton truck.	
2.			●	Sling Assemblies	Not cut, broken, or badly damaged.	
3.			●	Lifting Eyes and Sling Hooks	Not damaged, broken, or loose.	
4.			●	Turnbuckles	Not damaged, broken, or loose (tighten if loose).	



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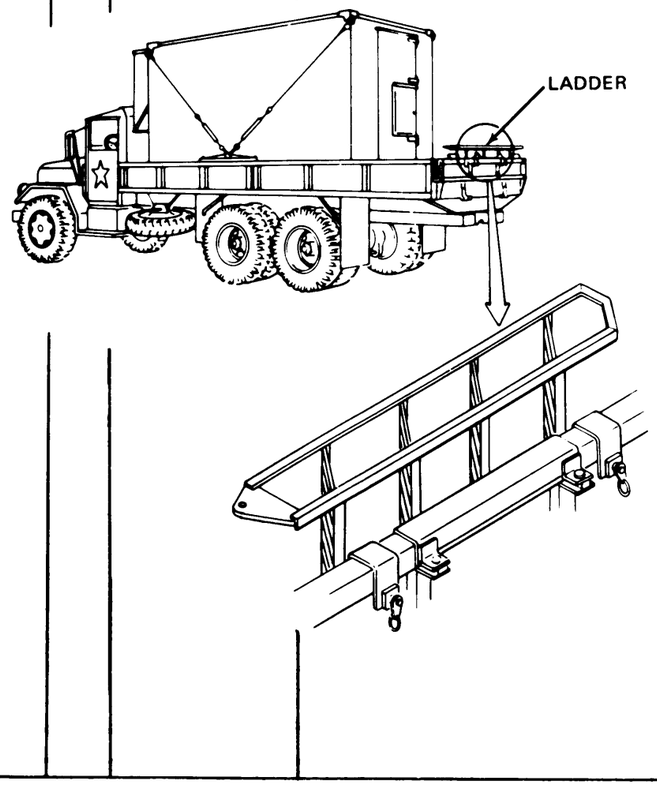
3-9. SHELTER PMCS (CONT) (Sheet 2 of 6)

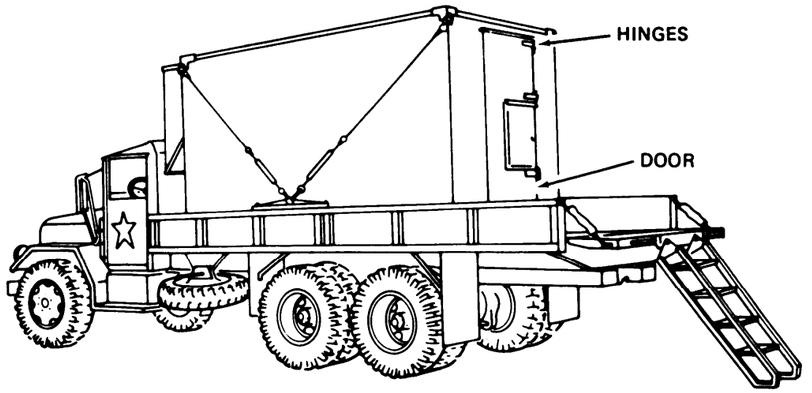
B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
5.			•	Ladder	Check for damage, and that ladder mounts snugly in holders.	



B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
6.			•	Door	Check that door is not bent, warped, or out of alinement.	
7.			•	Hinges	Check that hinges do not squeak and are not badly damaged (lubricate with general automotive oil as required.	
8.		•		Shelter	Ventilate for 12 hours when not in use.	



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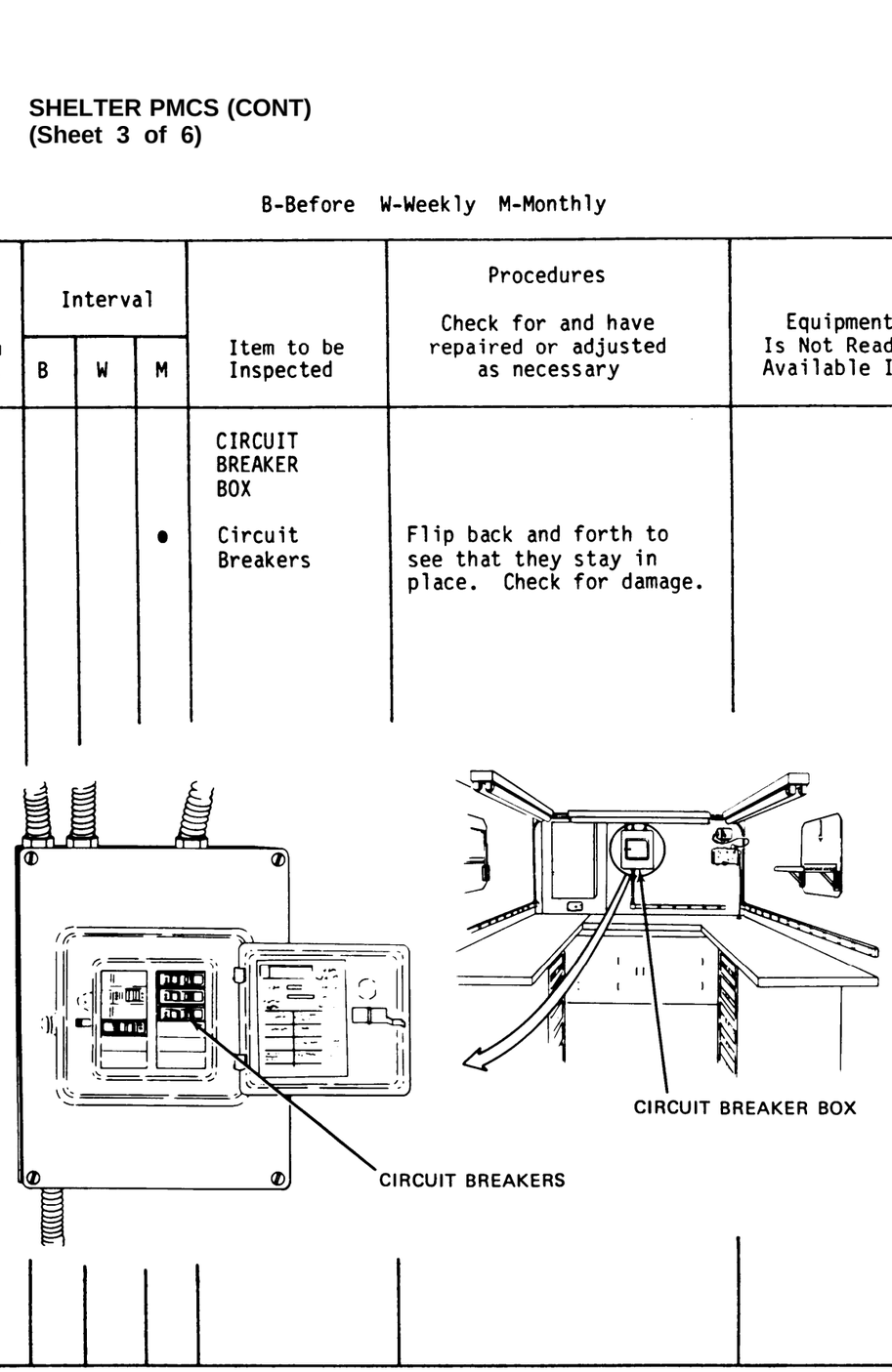
3-9. SHELTER PMCS (CONT)
(Sheet 3 of 6)

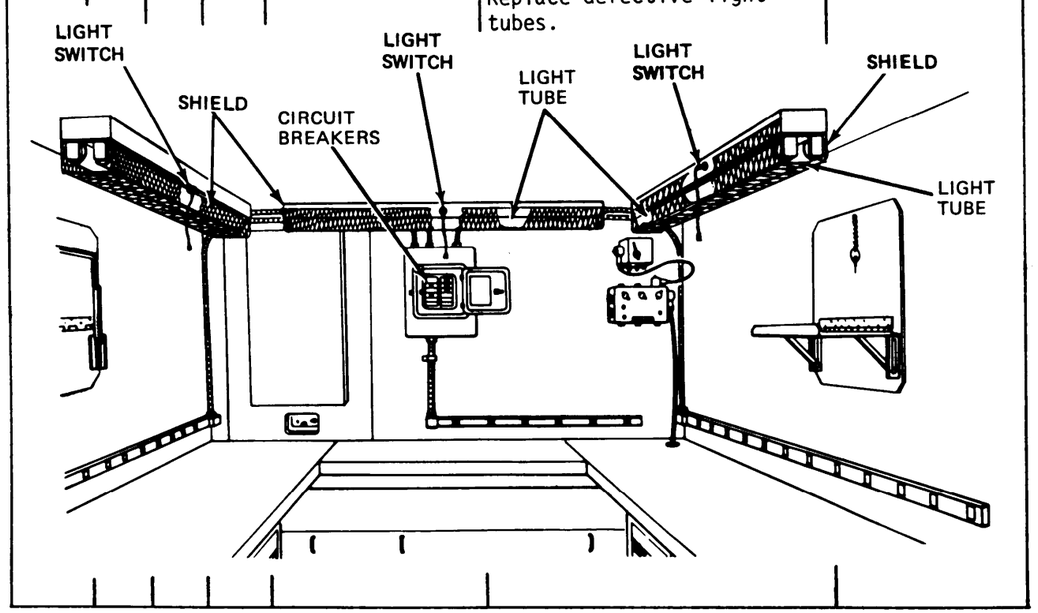
B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				CIRCUIT BREAKER BOX		
9.			•	Circuit Breakers	Flip back and forth to see that they stay in place. Check for damage.	



B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				LIGHT FIXTURE	**NOTE** Apply power to shelter (para 2-7) .	
10.			•	Light Tubes	Check to see if light tubes are secured in place. Set circuit breakers and individual light switches to on to see if lights come on. Make sure shields are fastened securely. Replace defective light tubes.	



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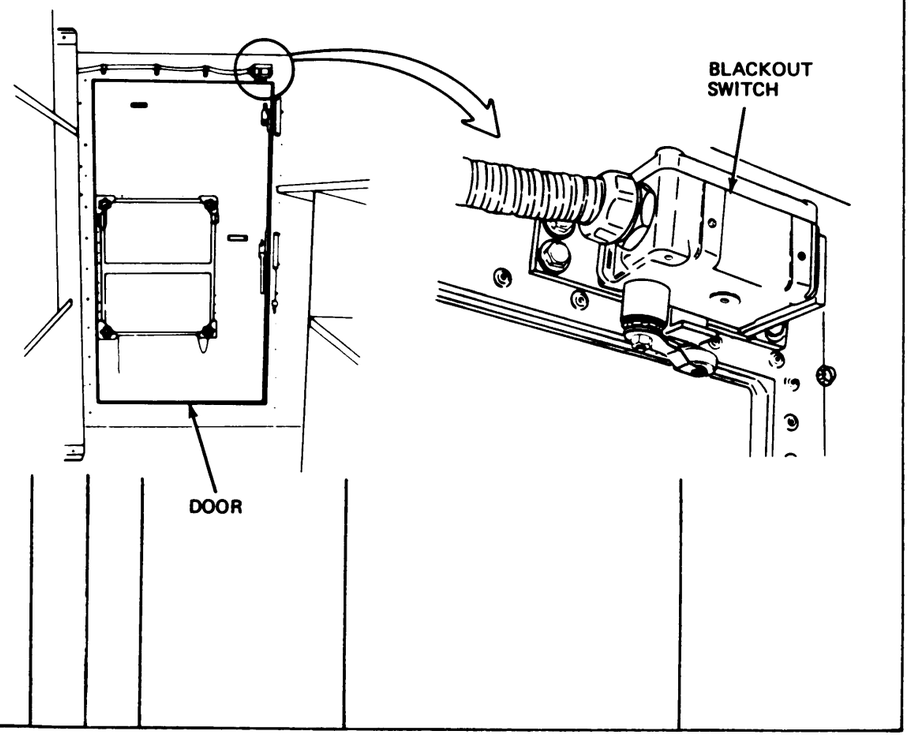
3-9. SHELTER PMCS (CONT)
(Sheet 4 of 6)

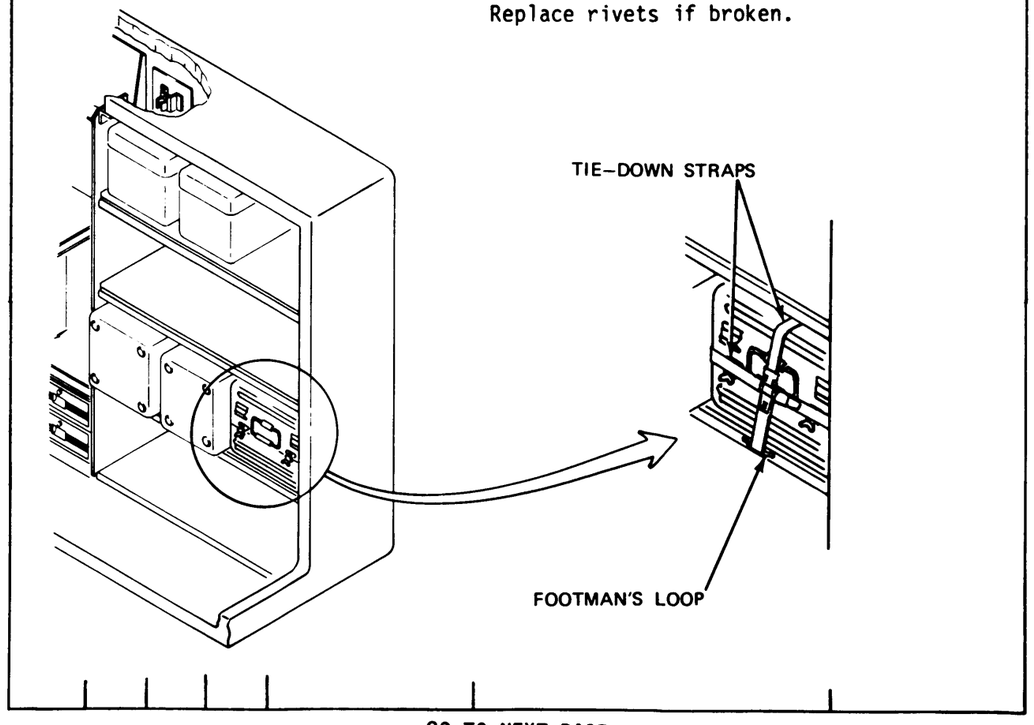
B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				BLACKOUT SWITCH		
11.			•	Switch	Check that blackout switch works by opening door.	



B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				TIE-DOWN STRAPS		
12.			•	Tie-down straps	Check for cuts, frayed ends, or broken straps. Check for loose connections. Tighten all loose straps.	
13.			•	Footman's Loops	Check for loose footman's loops or broken rivets. Replace rivets if broken.	



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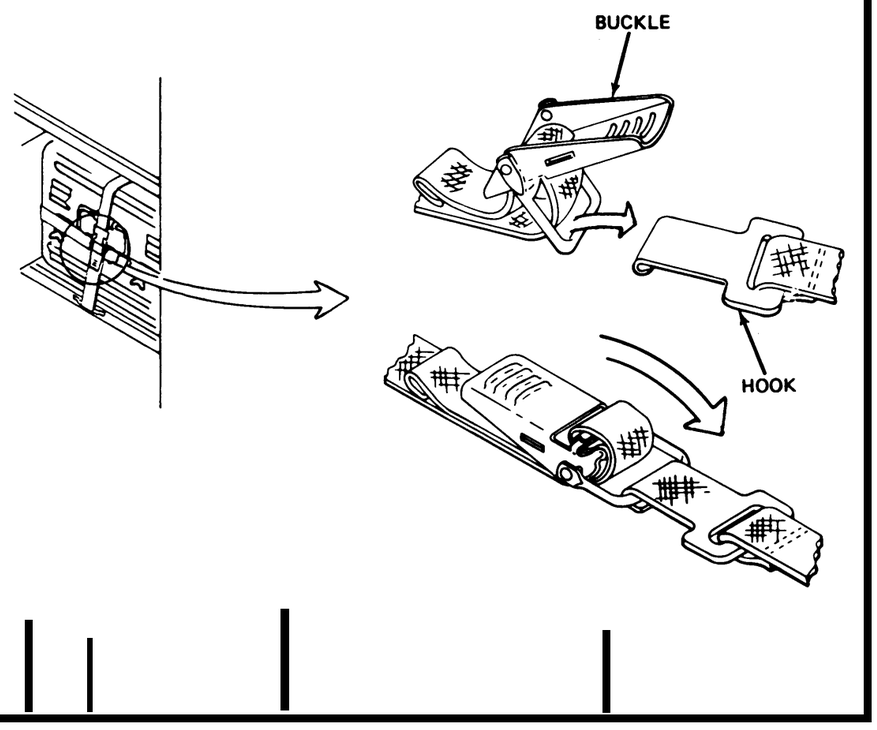
3-9. SHELTER PMCS (CONT) (Sheet 5 of 6)

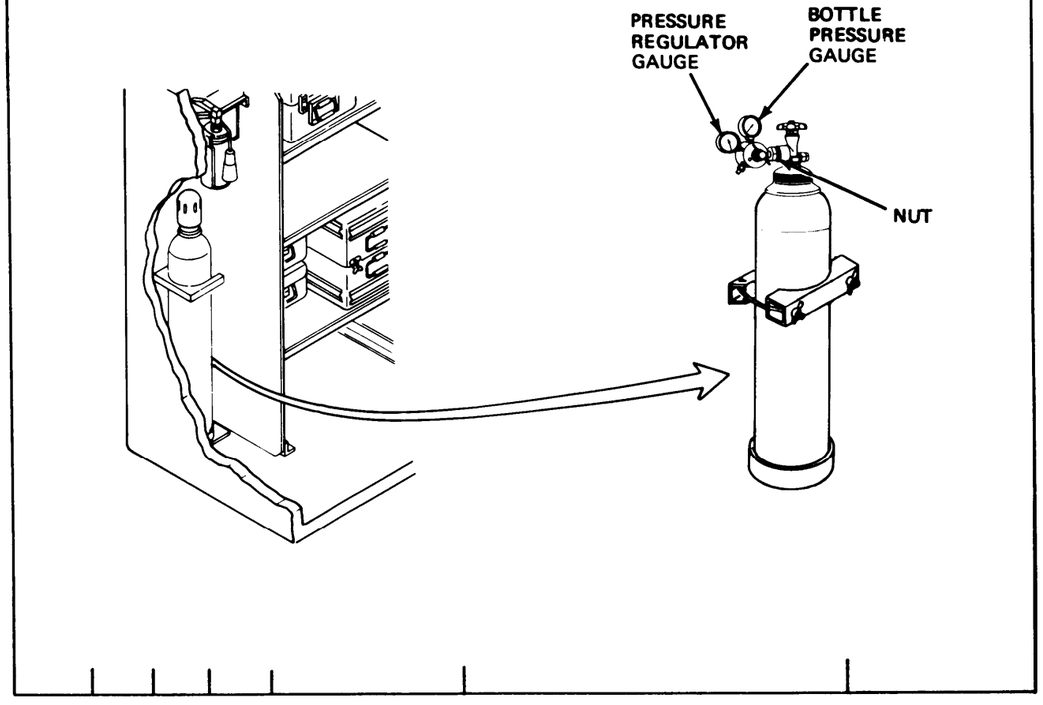
B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
14.			●	Buckles and Hooks	Check tie-down strap buckles and hooks for damage. Replace any damaged straps, buckles, or hooks .	



B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				NITROGEN PURGING BOTTLE		
15.		●		Gauges	Check for damage, and that bottle pressure gauge is indicating approximately 650 psi.	
16.			●	Nut	Check that nut is tight.	



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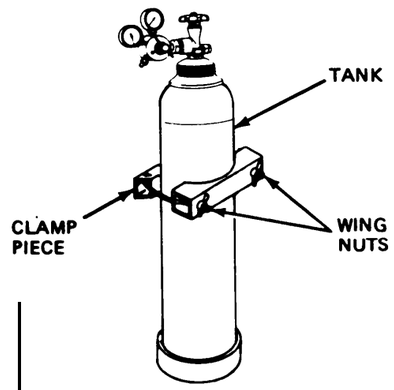
3-9. SHELTER PMCS (CONT) (Sheet 6 of 6)

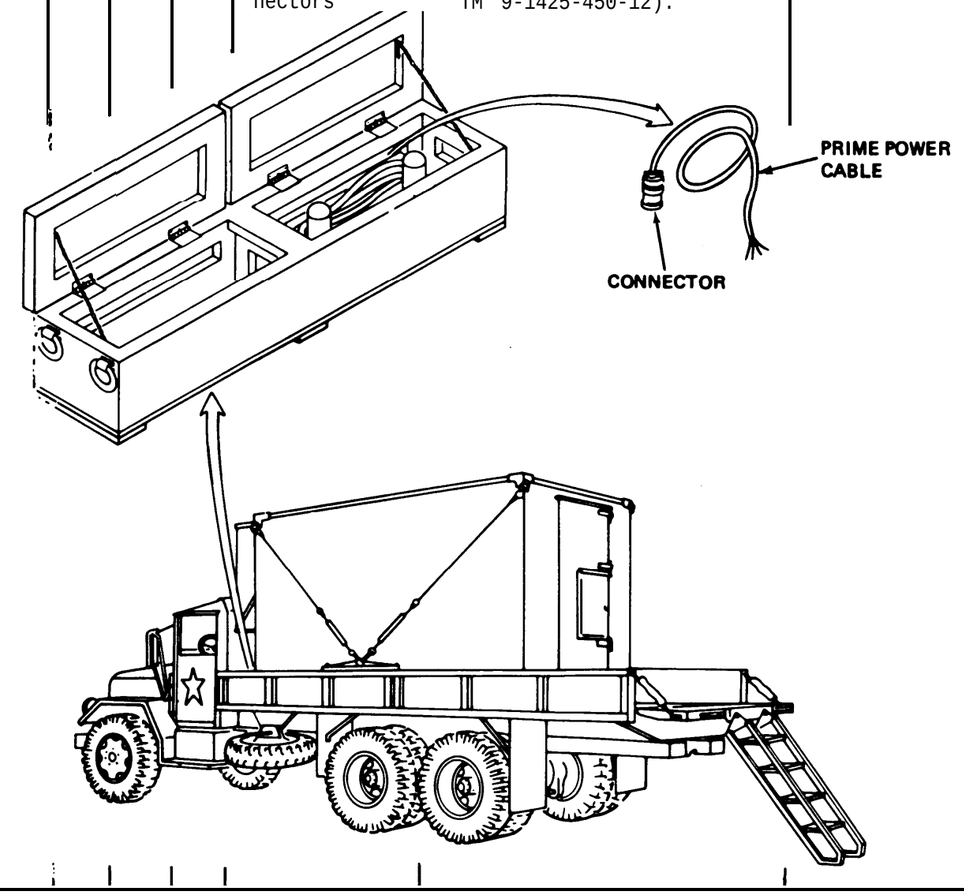
B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
17.			•	Wing Nuts	Check that wing nuts are tight.	
18.			•	Clamp Piece	Check for damage.	
19.			•	Tank	Check that tank is properly secured to the shelter.	



B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				PRIME POWER CABLE		
20.	•			Prime Power Cable Connectors	Check for damage or dirt. If necessary, clean TM 9-1425-450-12).	



END OF TASK

Section IV. TROUBLESHOOTING

3-10. SCOPE

This section provides troubleshooting procedures for the shelter electrical circuitry. Schematic diagrams are provided in Appendix G to assist in troubleshooting.

3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (Sheet 1 of 9)

TEST EQUIPMENT: DIGITAL MULTIMETER
1/4 inch flat tip screwdriver

MATERIAL: Test leads

PERSONNEL: Two MOS 27E (Soldier A and Soldier B)

- To prevent electrical shock or burn, make sure prime power source is turned off before performing any removal or replacement procedure.
- Be careful not to touch exposed wiring or electrical components when prime power source is turned on.

NOTE

- Soldier A does all tasks unless stated otherwise.
- Follow steps in order given in the procedures. Do not skip any steps.
- When entering the NO chain, do the procedure and/or repairs as instructed in the corrective action blocks.
- After performing a corrective action in the NO chain, always return to the START of the troubleshooting procedure. When more than one corrective action is required, do the first corrective action then return to START and repeat the procedure. If the problem still exists, do the next corrective action and return to START.

3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 2 of 9)

START

STEP 01

Turn on shelter power (para 2-7).

STEP 02

a. (Soldier B) Pull open cover on air conditioner.
b. (Soldier B) Stand outside shelter to look at air conditioner fan and which way arrow points.

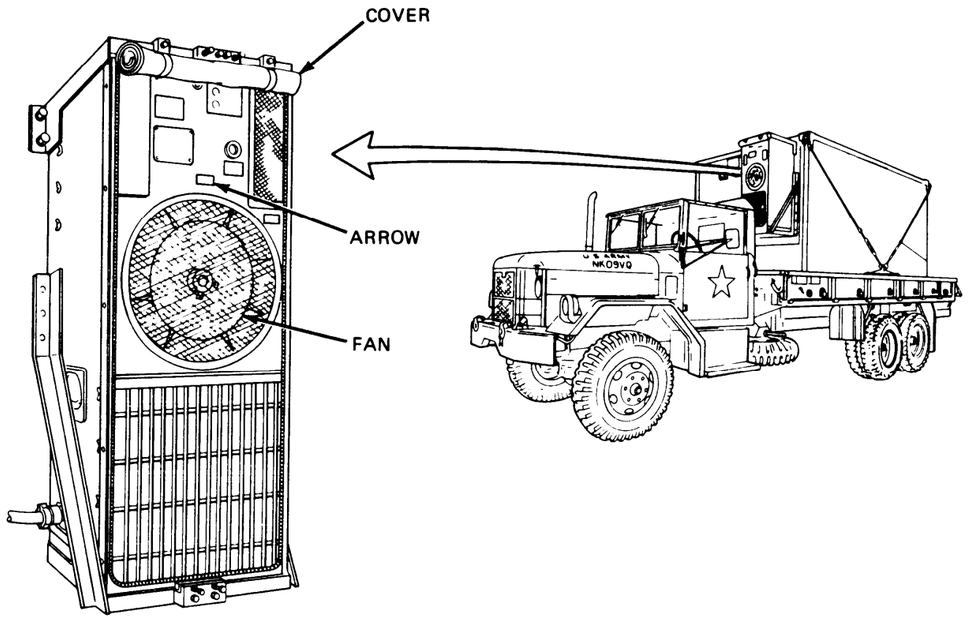
STEP 03

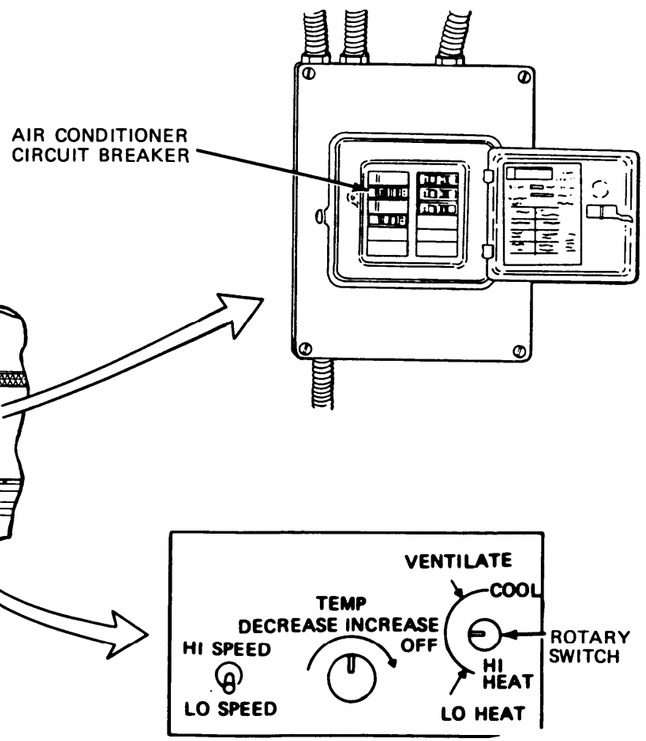
Set air conditioner circuit breaker to ON.

STEP 04

Set rotary switch to any position other than OFF.

Go to next page





3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT)
(Sheet 3 of 9)

Continued from previous page

(Soldier B) Does air conditioner fan turn the same way that arrow points?

NO

(Soldier B) Does fan turn, but against arrow?

NO

a. Set rotary switch to OFF.
b. Set air conditioner circuit breaker to OFF.
c. Set air conditioner circuit breaker back to ON.
d. Go back to step 04.
e. If fan still does not turn, perform steps f thru j.

Go to page 3-12.3

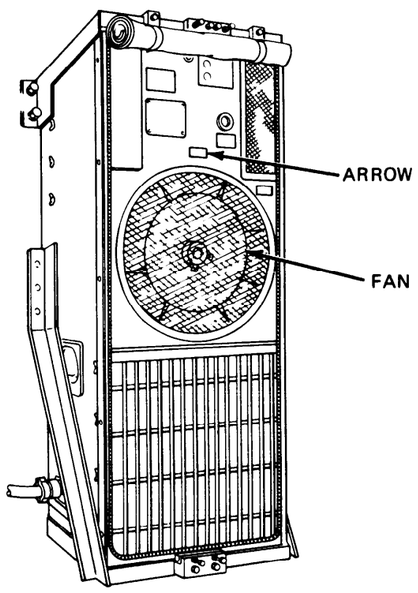
YES

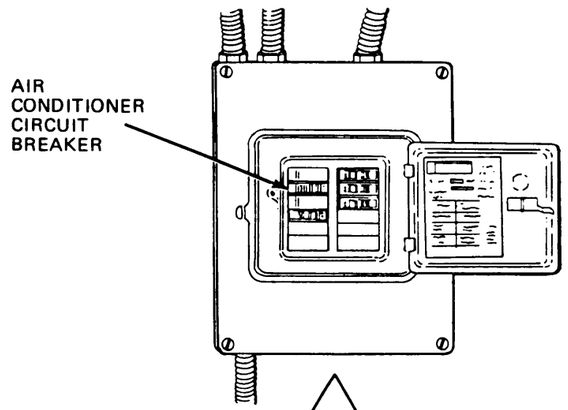
Go to next page

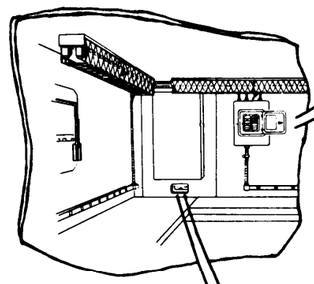
YES

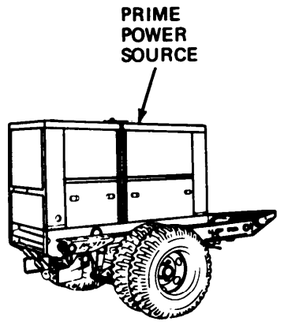
To prevent electrical shock or burn, turn off prime power source before performing any corrective action.

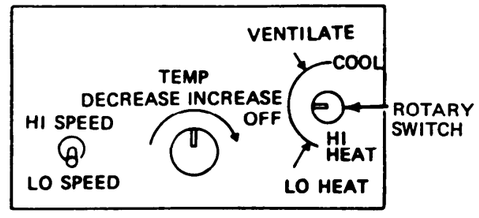
a. Turn off prime power source and air conditioner circuit breaker.
b. Switch prime power cable wires on prime power source terminals L1 and L2.
c. Turn on prime power source.
d. Go back to step 02.











3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 4 of 9)

Continued from previous page

STEP 05

Set lighting circuit breaker to ON.

STEP 06

Set the 3 light switches to on.

Do all 6 lights come on?

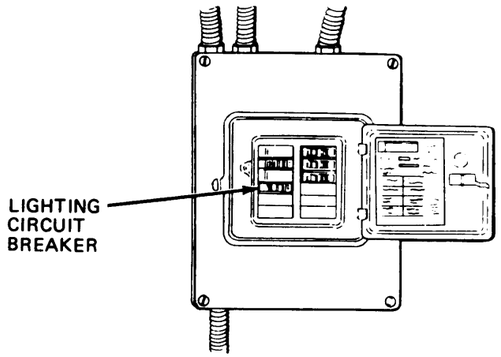
NO → **Do any of the lights come on?**

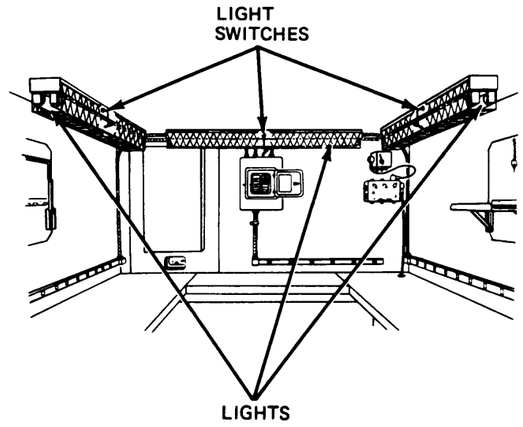
NO → Remove and replace lighting circuit breaker (para 3-13).

YES → **Do any of the lights come on?**

YES →

a. Set lighting circuit breaker to OFF, set light switch for the bad light to off, and replace light tube (para 3-19).
b. Remove and replace ballast transformer (para 3-21).
c. Remove and replace light fixture (para 3-20).





STEP 07

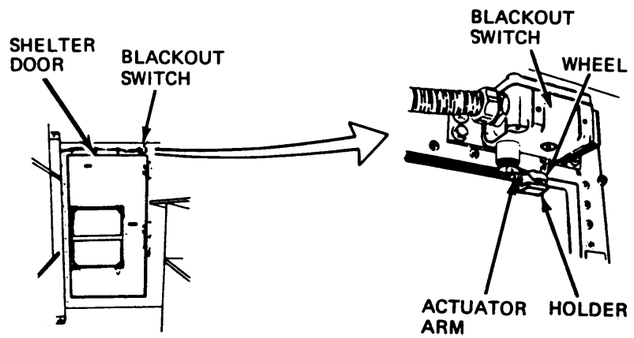
Check blackout switch (located over shelter door) by pulling out on actuator arm and wheel, pushing up on holder, and then releasing actuator arm and wheel so that wheel will go against door.

Do all 6 lights remain on?

NO →

a. Perform blackout switch adjustment procedure (para 3-26).
b. Go back to step 06.

YES → Go to next page



3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 5 of 9)

Continued from previous page

STEP 08

Open shelter door about 1/4 inch.

Do all 6 lights go out?

NO

a. Perform blackout switch adjustment procedure (para 3-26).
b. Remove and replace blackout switch (para 3-25).

YES

STEP 09

Set left outlet molding circuit breaker to ON.

STEP 10

Using DIGITAL MULTIMETER, plug it into each jack in left outlet molding and measure voltage.

Does DIGITAL MULTI-METER indicate 110 to 120 VAC for all 10 jacks?

NO

Does DIGITAL MULTI-METER indicate 110 to 120 VAC for any of the jacks?

NO

Remove and replace left outlet molding circuit breaker (para 3-13).

YES

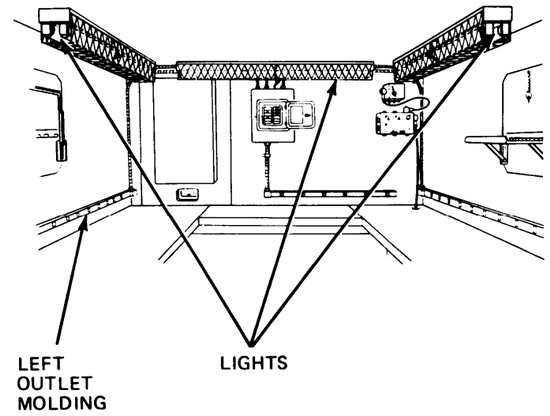
Remove and replace left outlet molding (para 3-24).

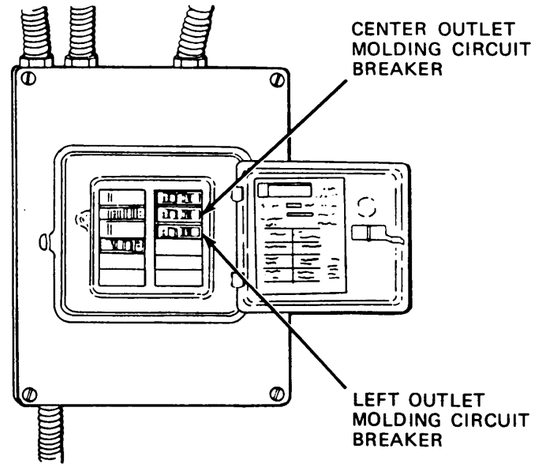
YES

STEP 11

Set center outlet molding circuit breaker to ON.

Go to next page





3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 6 of 9)

Continued from previous page

STEP 12

Using DIGITAL MULTIMETER, plug it into each jack in center outlet molding and measure voltage.

Does DIGITAL MULTIMETER indicate 110 to 120 VAC for all 6 jacks?

NO

Does DIGITAL MULTIMETER indicate 110 to 120 VAC for any of the jacks?

NO

Remove and replace center outlet molding circuit breaker (para 3-13).

YES

Remove and replace center outlet molding (para 3-24).

STEP 13

Set right outlet molding circuit breaker to ON.

STEP 14

Using DIGITAL MULTIMETER, plug it into each jack in right outlet molding and measure voltage.

Does DIGITAL MULTIMETER indicate 110 to 120 VAC for all 10 jacks?

NO

Does DIGITAL MULTIMETER indicate 110 to 120 VAC for any of the jacks?

NO

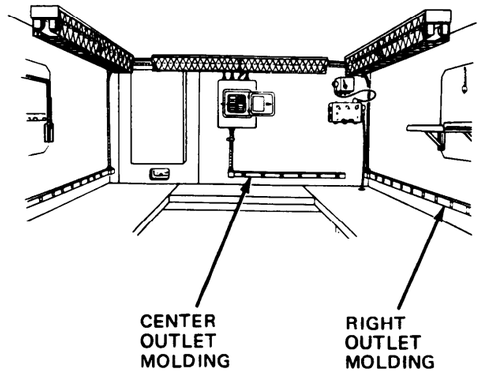
Remove and replace right outlet molding circuit breaker (para 3-13).

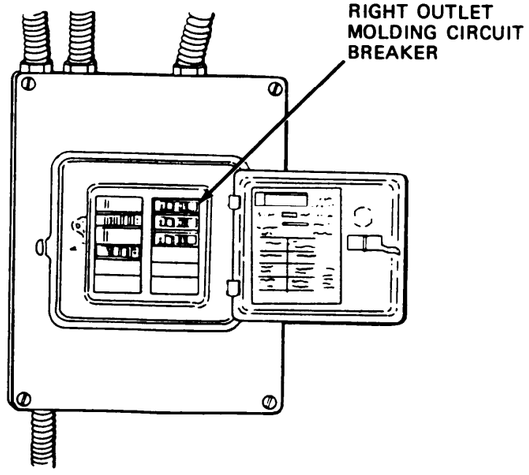
YES

END OF TASK

YES

Remove and replace right outlet molding (para 3-24).





3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT)
(Sheet 7 of 9)

Continued from page 3-11

WARNING

To prevent electrical shock or burn, turn off prime power source before removing cover from circuit breaker box.

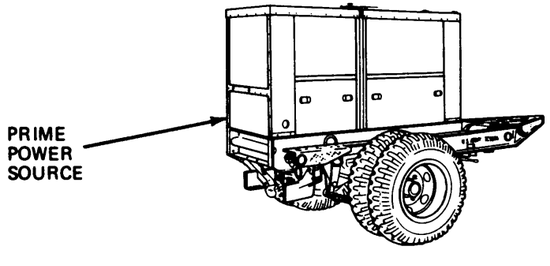
f. Turn off prime power source and set air conditioner circuit breaker to OFF.
g. Remove 4 screws and cover from circuit breaker box.

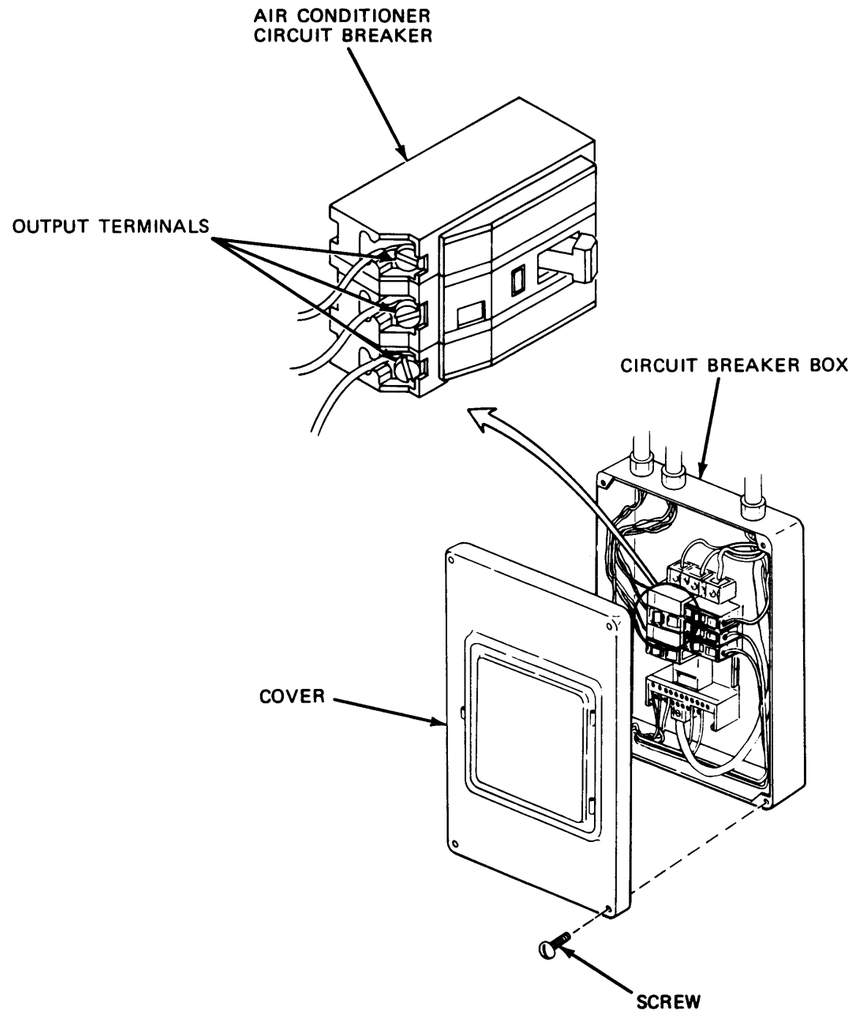
WARNING

To prevent electrical shock or burn, do not touch exposed wiring or electrical contacts except with DIGITAL MULTIMETER test leads.

h. Turn on prime power source.
i. Set air conditioner circuit breaker to ON.
j. Using DIGITAL MULTIMETER, check voltage between each output terminal on air conditioner circuit breaker and side of circuit breaker box (ground).

Go to next page





3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 8 of 9)

Continued from previous page

Does DIGITAL MULTIMETER indicate 110 to 120 VAC for all 3 terminals?

NO

a. Set lighting circuit breaker to ON.
b. Set the 3 light switches to on.

Go to next page

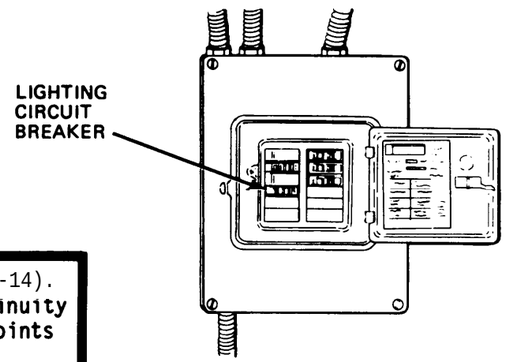
YES

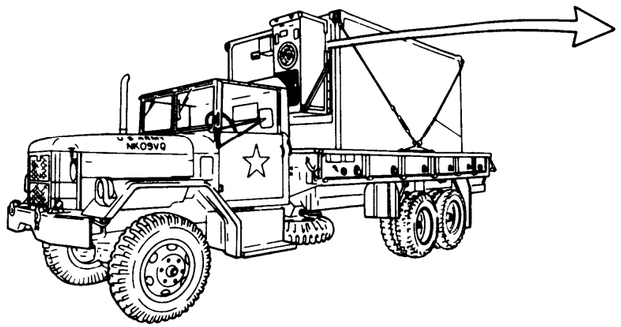
WARNING

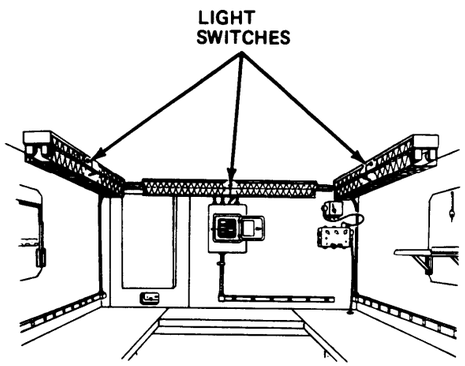
To prevent electrical shock or burn, turn off prime power source before removing cable.

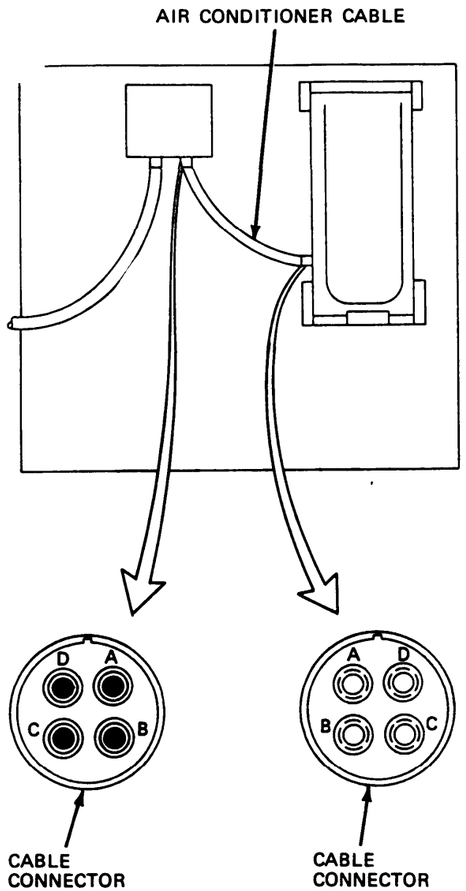
a. Remove air conditioner cable (para 3-14).
b. Using DIGITAL MULTIMETER, check continuity between air conditioner cable test points given below:

Connections		Reading in ohms
On connector at shelter end of cable:	On connector at air conditioner end of cable:	
Pin A	Pin A	Less than 0.5
Pin B	Pin B	Less than 0.5
Pin C	Pin C	Less than 0.5
Pin D	Pin D	Less than 0.5









Is the reading in ohms correct for each pair of test points?

NO

Remove and replace air conditioner cable (para 3-14).

YES

Remove and replace air conditioner (para 3-17).

3-11. ELECTRICAL CIRCUITRY TROUBLESHOOTING (CONT) (Sheet 9 of 9)

Continued from previous page

Do shelter lights come on?

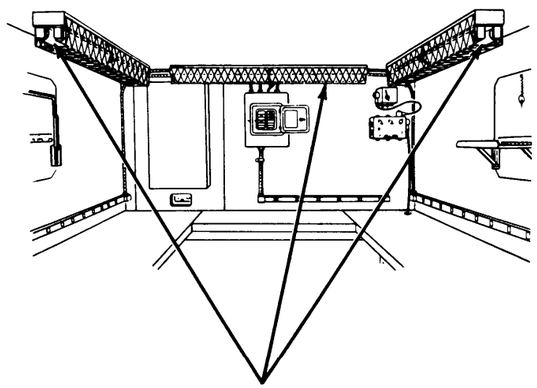
NO

WARNING

To prevent electrical shock or burn, turn off prime power source before removing cable.

YES

Remove and replace air conditioner circuit breaker (para 3-13).



a. Turn off prime power source.
b. Remove prime power cable from shelter front power panel (para 3-14).
b. Using DIGITAL MULTIMETER, check continuity between test points given below:

Connections		Reading in ohms
On prime power cable connector P2:	On prime power source:	
Pin A	Terminal L1	Less than 0.5
Pin B	Terminal L2	Less than 0.5
Pin C	Terminal L3	Less than 0.5
Pin D	Terminal LO	Less than 0.5

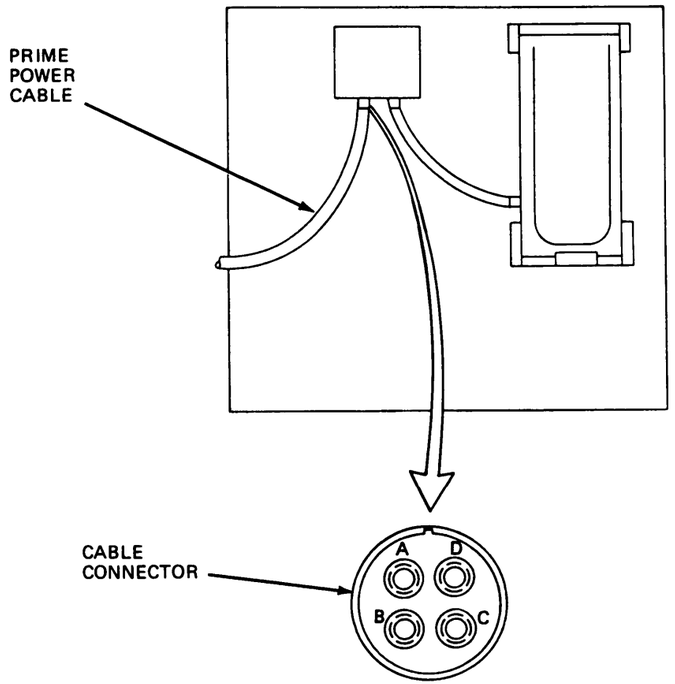
Is the reading in ohms correct for each pair of test points?

NO

Remove and replace prime power cable (para 3-14).

YES

Remove and replace prime power source.



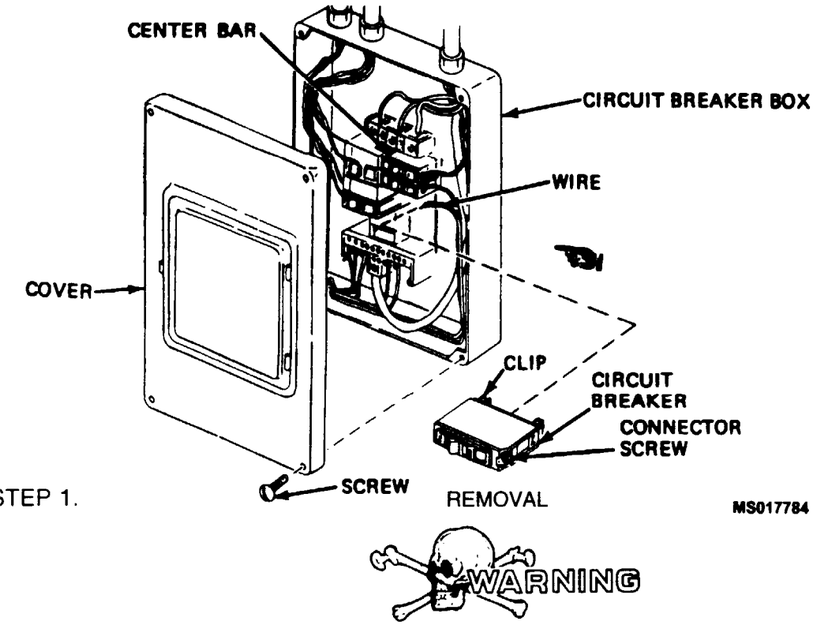
Section V. MAINTENANCE PROCEDURES

3-12. SCOPE

This section covers removal and replacement procedures for shelter components.

3-13. REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER

TOOLS: 1/4 inch flat tip screwdriver



STEP 1. REMOVAL

To prevent electrical shock or burn, before performing any step in this procedure, be sure that commercial power lines or generator set have been turned off.

A. Turn off the source of prime power to circuit breaker box.

B. Remove four screws and cover from circuit breaker box.

C. Loosen connector screw of circuit breaker to be removed and remove wire.

D. Grasp circuit breaker firmly and pull outward to remove from box

STEP 2. REPLACEMENT

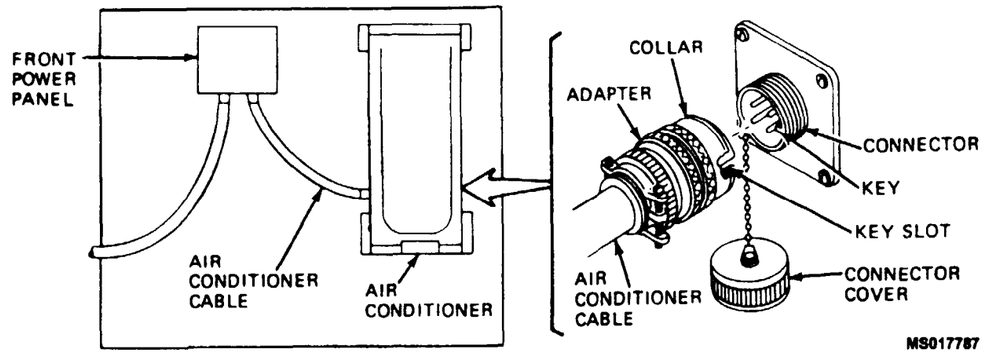
A. Grasp circuit breaker and push into circuit breaker box until circuit breaker seats, making sure clip fits on center bar.

B. Install wire under connector screw. Tighten connector screw.

C. Install cover on circuit breaker box with four screws,

END OF TASK

3-14. REMOVAL AND REPLACEMENT OF AIR CONDITIONER CABLE



To prevent electrical shock or burn, before performing any step in this procedure, be sure that commercial power lines or generator set have been turned off.

STEP 1. REMOVAL

A. Remove air conditioner cable from air conditioner by turning collar on adapter counterclockwise until collar is loose from connector.

B. Pull adapter off connector.

C. To protect connector from dirt, screw connector cover on connector.

D. Remove air conditioner cable from front power panel by repeating steps A and B.

STEP 2. REPLACEMENT

A. Unscrew connector cover from connector.

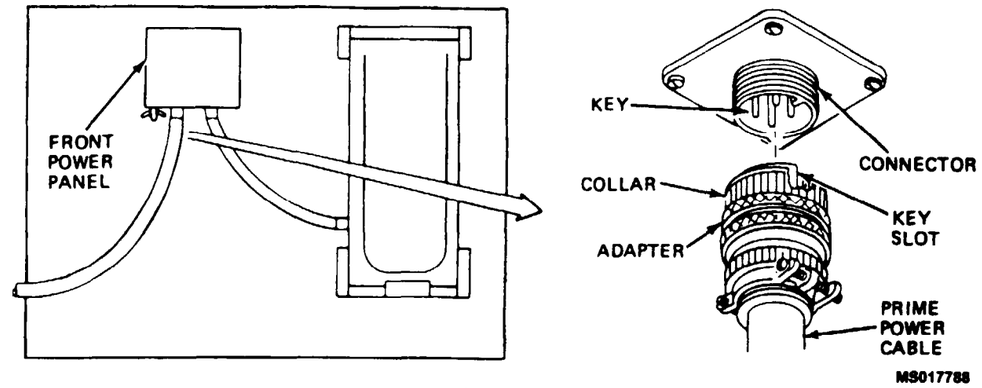
B. Line up key slot on adapter with key on connector.

C. Push adapter onto connector and turn collar clockwise until snug.

D. Repeat steps B and C to attach other end of cable to connector on front power panel.

END OF TASK

3-15. REMOVAL AND REPLACEMENT OF PRIME POWER CABLE



To prevent electrical shock or burn, before performing any step in this procedure, be sure that commercial power lines or generator set have been turned off.

STEP 1. REMOVAL

A. Remove prime power cable from shelter front power panel by turning collar counterclockwise until loose.

B. Pull down on adapter to remove from connector.

C. Remove other end of prime power cable from prime power source by disconnecting cable wires from prime power source terminals.

STEP 2. REPLACEMENT

NOTE

In order to determine which wire is connected to each pin on cable connector, it may be necessary to perform continuity check of prime power cable using DIGITAL MULTIMETER.

A. Attach prime power cable wires to prime power source by connecting pin A wire to terminal L1, pin B wire to terminal L2, pin C wire to terminal L3, and pin D wire to terminal LO on prime power source.

B. Line up key slot on cable connector adapter with key on shelter front power panel connector.

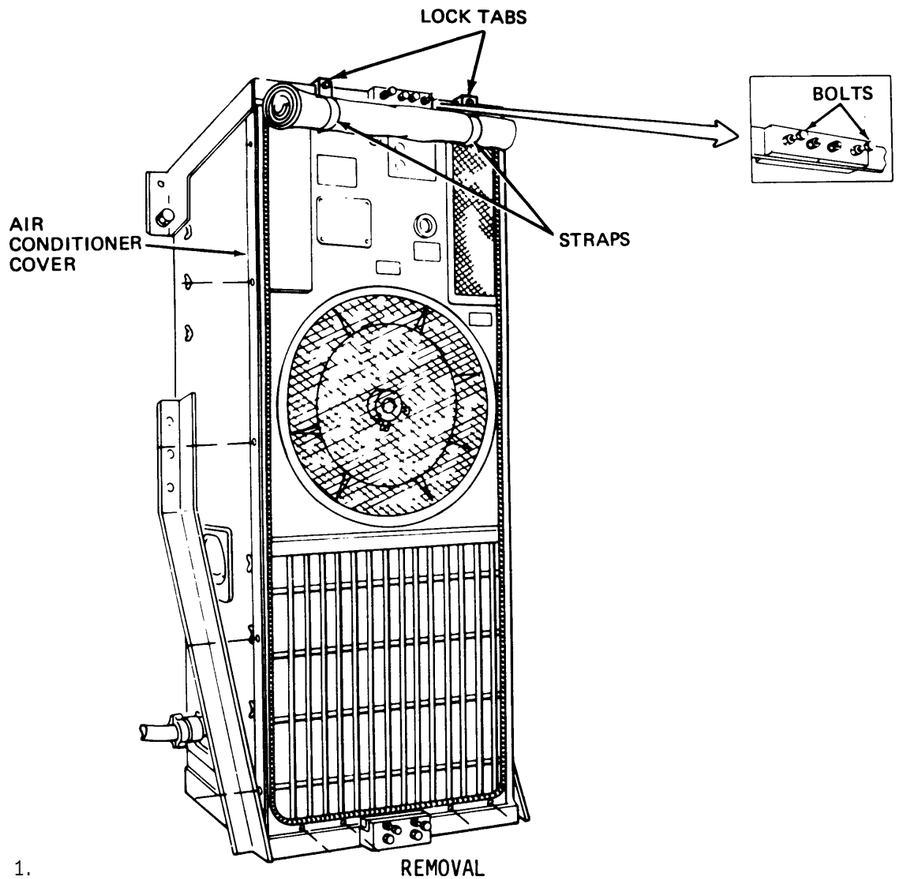
C. Push adapter onto connector and turn collar clockwise until snug.

END OF TASK

3-16. REMOVAL AND REPLACEMENT OF AIR CONDITIONER COVER (Sheet 1 of 3)

TOOLS: 9/16 inch socket wrench (2 each)
3/4 inch socket wrench
No. 2 crosstip screwdriver

PERSONNEL: Two MOS 27E
(Soldier A and
(Soldier B



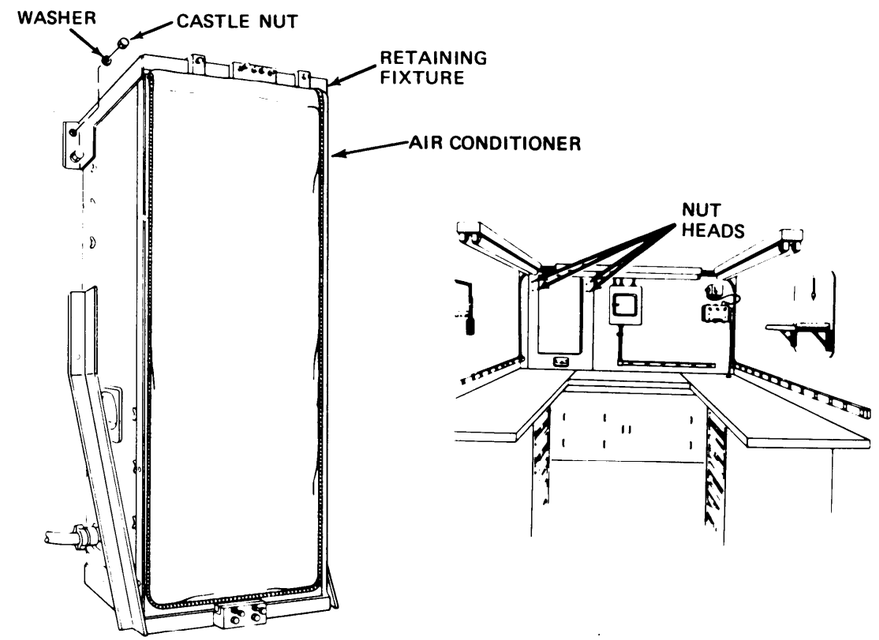
STEP 1. **REMOVAL**

NOTE

Soldier A does all tasks unless stated otherwise.

A. If air conditioner cover is rolled up, turn two lock tabs to straight up-and-down position and unfasten two straps from tabs.

B. Back out bolts two complete turns.



STEP 1. (Continued)

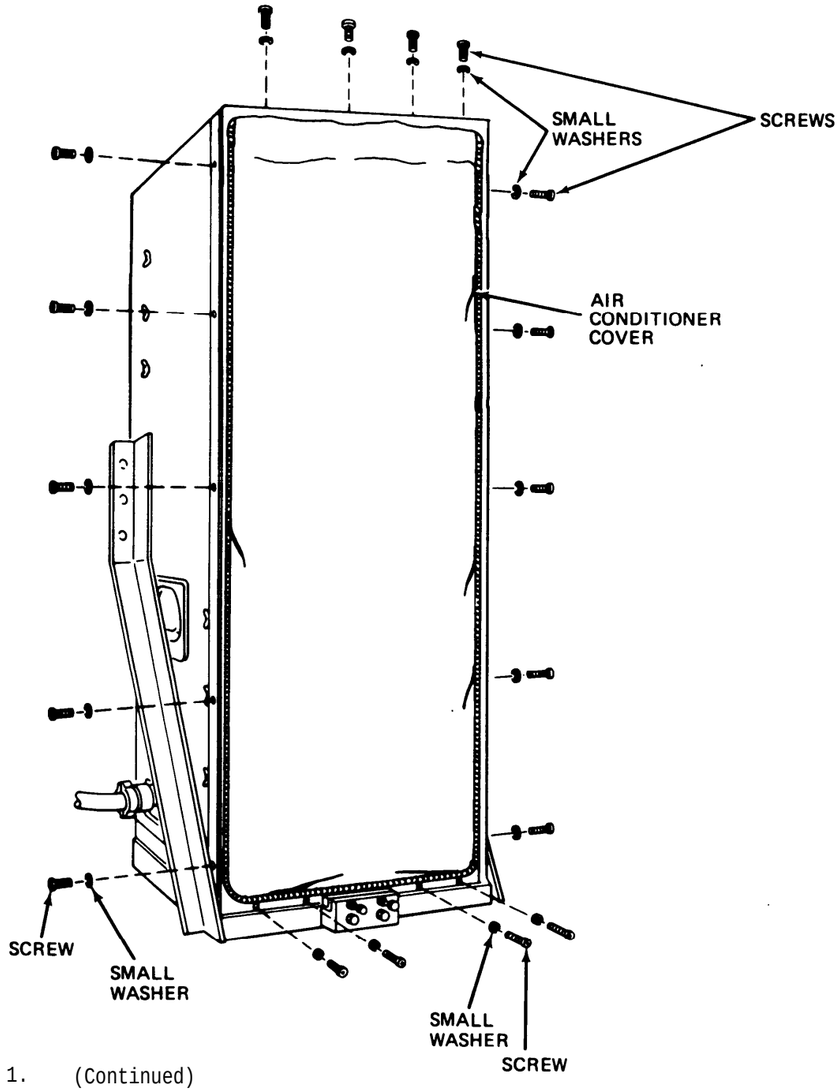
C. (Soldier B) Inside shelter, put 9/16 inch socket wrench on one of four nut heads.

D. Using 9/16 inch socket wrench on same place as Soldier B inside shelter, remove four castle nuts and four washers.

E. Remove retaining fixture from air conditioner.

GO TO NEXT PAGE

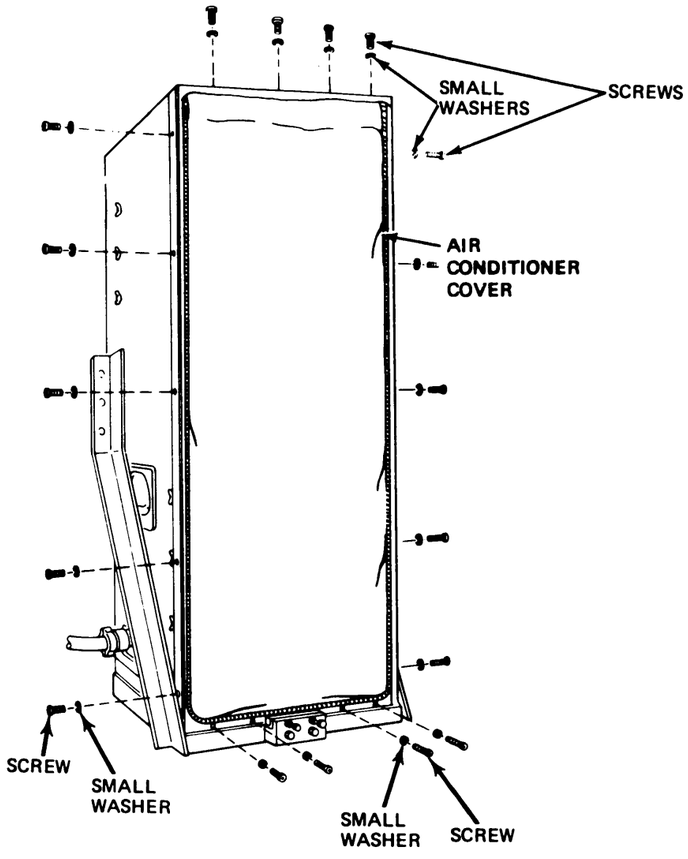
3-16. REMOVAL AND REPLACEMENT OF AIR CONDITIONER COVER (CONT) (Sheet 2 of 3)



STEP 1. (Continued)

F. Remove 18 screws and 18 small washers from air conditioner cover.

G. Remove air conditioner cover.



STEP 2. REPLACEMENT

NOTE

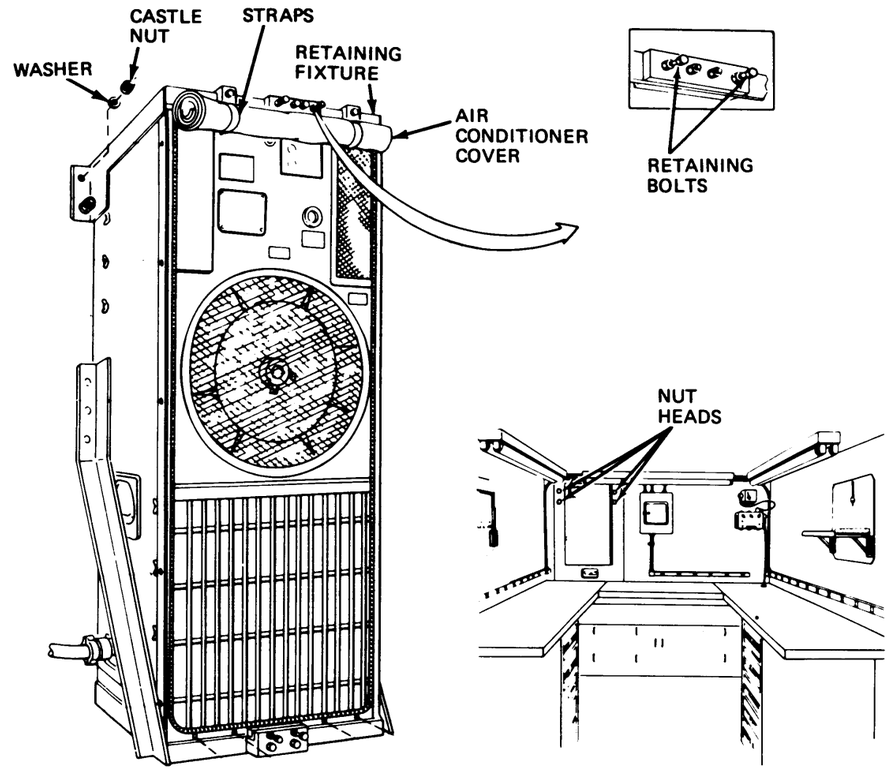
Soldier A does all tasks unless stated otherwise.

A. Place air conditioner cover on air conditioner.

B. Attach air conditioner cover to air conditioner with 18 small washers and 18 screws.

GO TO NEXT PAGE

3-16. REMOVAL AND REPLACEMENT OF AIR CONDITIONER COVER (CONT) (Sheet 3 of 3)



STEP 2. (Continued)

c. Place retaining fixture on air conditioner.

D. (Soldier B) Inside shelter, put 9/16 inch socket wrench on one of four nut heads.

E. Using 9/16 inch socket wrench on same place as Soldier B inside shelter, attach retaining fixture to shelter with four washers and four castle nuts.

F. Using 3/4 inch socket wrench, tighten two retaining bolts until snug against air conditioner.

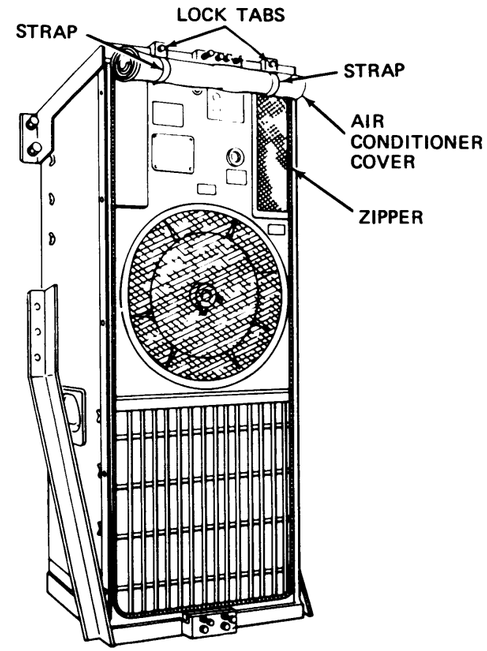
G. Zip cover closed with zipper or roll up and secure with straps.

END OF TASK

3-17. REMOVAL AND REPLACEMENT OF AIR CONDITIONER (Sheet 1 of 4)

TOOLS: 3/4 inch socket wrench
1/2 inch socket wrench
5/8 inch socket wrench
9/16 inch socket wrench (2 each)

PERSONNEL: Two MOS 27E (Soldier A and Soldier B)



STEP 1. REMOVAL

NOTE

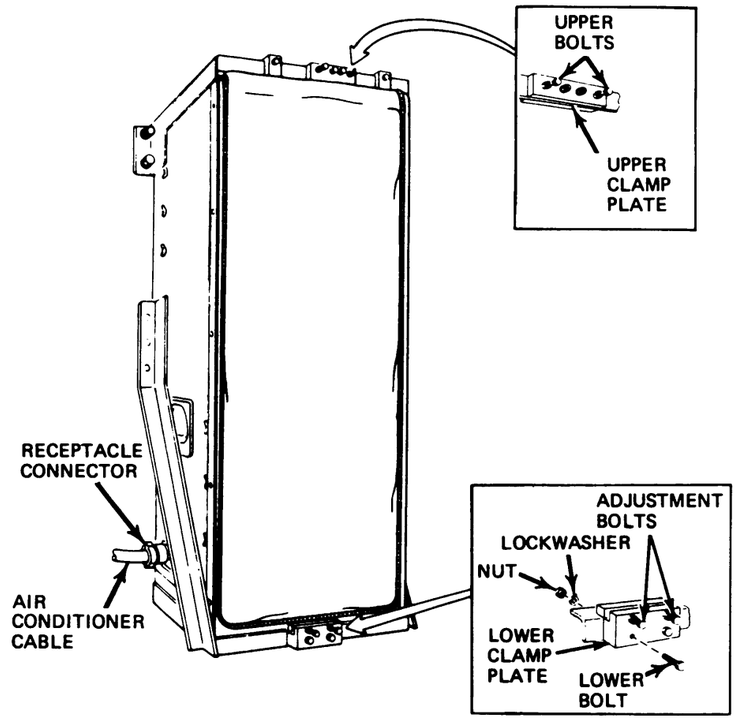
Soldier A does all tasks unless stated otherwise.

A. If air conditioner cover is rolled up, turn two lock tabs to straight up-and-down position to release straps.

B. Roll air conditioner cover down and zip shut with zipper.

GO TO NEXT PAGE

3-17. REMOVAL AND REPLACEMENT OF AIR CONDITIONER (CONT) (Sheet 2 of 4)



STEP 1. (Continued)

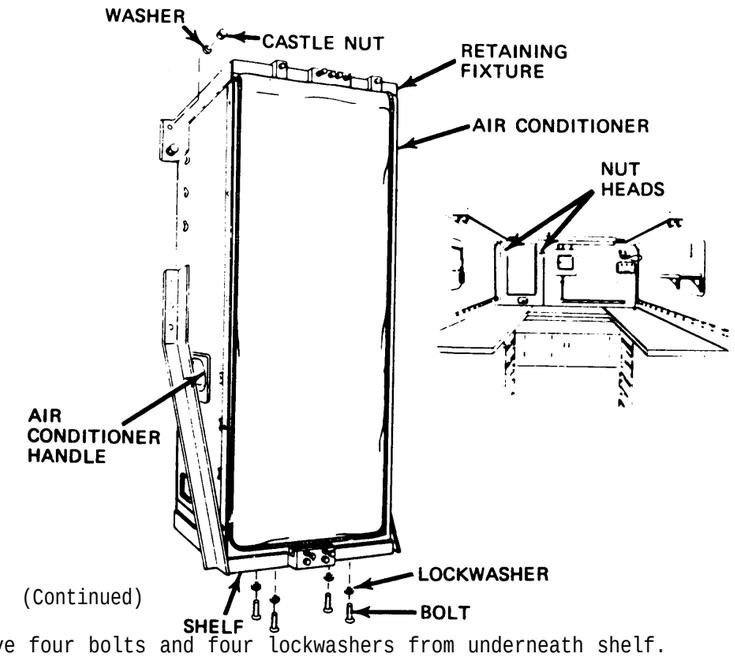
To prevent electrical shock or burn, before performing any step in this procedure, be sure that commercial power lines or generator set have been turned off.

C. Remove air conditioner cable from receptacle connector (para 3-14).

D. Back off upper bolts two complete turns to loosen upper clamp plate.

E. Back off adjustment bolts two complete turns to loosen lower clamp plate.

F. Remove two lower bolts, two nuts, and two lockwashers, and remove lower clamp plate.



STEP 1. (Continued)

G. Remove four bolts and four lockwashers from underneath shelf.

H. (Soldier B) Inside shelter put 9/16 inch socket wrench on one of the four nut heads.

I. Using 9/16 inch socket wrench on same place as Soldier B inside shelter, remove four castle nuts and four washers.

J. Remove retaining fixture from air conditioner unit.

NOTE

Air conditioner may be removed from shelf in a number of ways:

Air conditioner may be slid off shelf onto forklift.

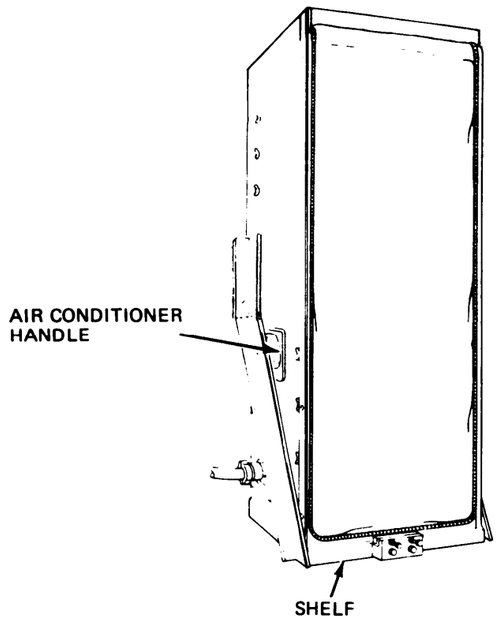
Hooks may be attached to air conditioner handles and air conditioner removed with crane.

Two or more soldiers may lift and remove air conditioner using handles on side of unit.

K. Remove air conditioner from shelf.

GO TO NEXT PAGE

3-17. REMOVAL AND REPLACEMENT OF AIR CONDITIONER (CONT) (Sheet 3 of 4)

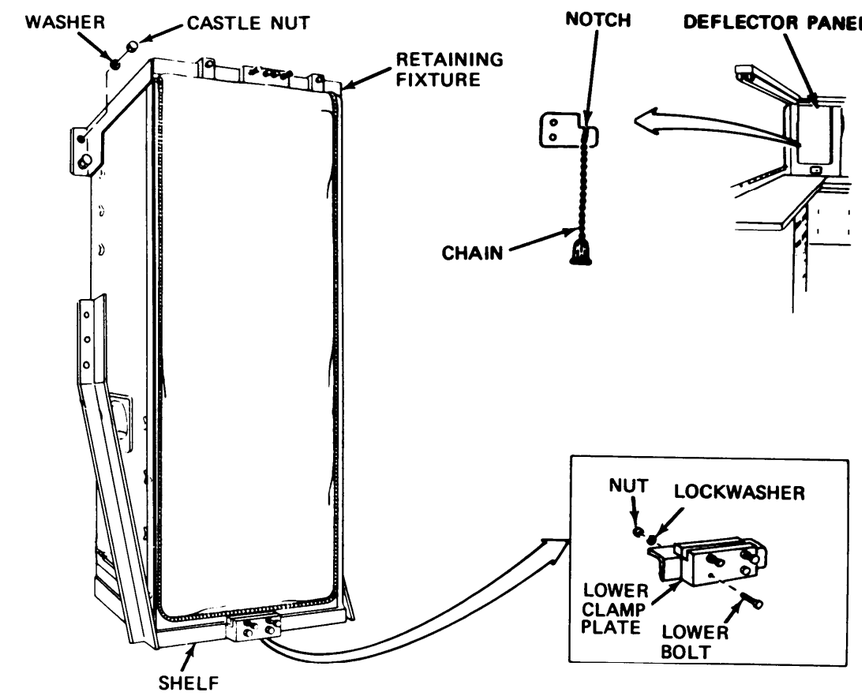


STEP 2. REPLACEMENT

NOTE

- Soldier A does all tasks unless stated otherwise.
- Air conditioner may be positioned on shelf in a number of ways:
  - Air conditioner may be placed on shelf from a forklift.
  - Hooks may be attached to air conditioner handles and air conditioner positioned with crane.
  - Two or more soldiers may lift and position air conditioner manually, using handles on side of unit.

A. Position air conditioner on shelf.



STEP 2. (Continued)

B. (Soldier B) From inside of shelter, reach into deflector panel and pull chain through panel and hang chain in notch.

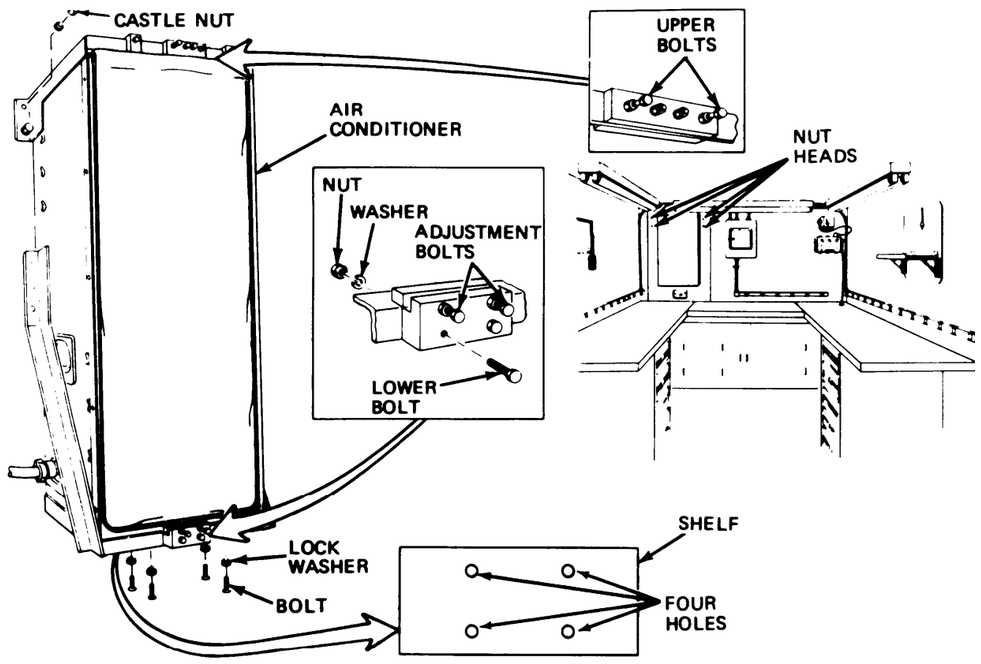
C. Place retaining fixture on air conditioner unit and install four washers and four castle nuts loosely.

D. Attach lower clamp plate with two lower bolts, two lockwashers, and two nuts.

E. Tighten lower bolts using 9/16 inch wrench on bolts and 9/16 inch wrench on nuts.

GO TO NEXT PAGE

3-17. REMOVAL AND REPLACEMENT OF AIR CONDITIONER (CONT) (Sheet 4 of 4)



STEP 2. (Continued)

F. Move air conditioner until four holes on air conditioner shelf line up with holes on air conditioner unit.

G. Using 5/8 inch socket wrench, attach four lock washers and bolts loosely.

H. (Soldier B) Inside shelter put 9/16 inch wrench on one of the four nut heads.

I. Using 9/16 inch wrench on same place as soldier B inside shelter, tighten four castle nuts securely.

J. Adjust air conditioner unit to get a tight seal between unit and wall. Using 3/4 inch wrench, tighten two upper bolts.

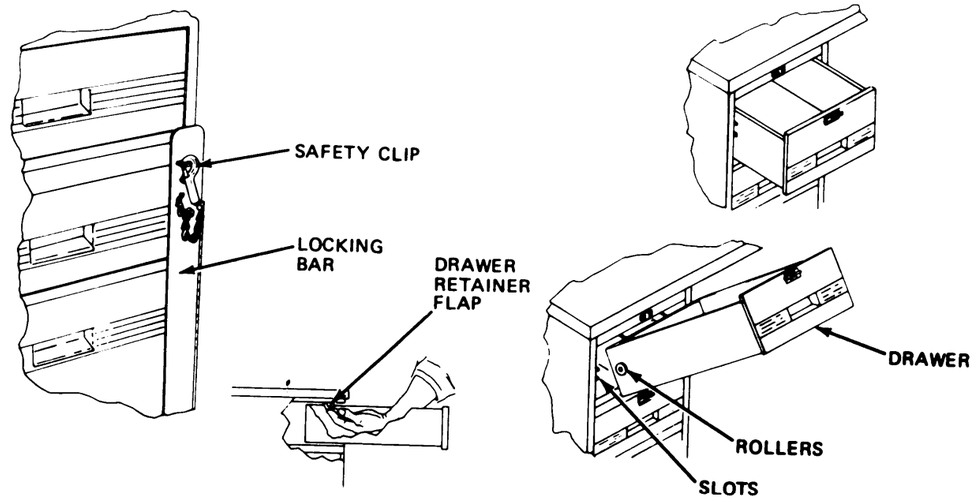
K. Using 1/2 inch wrench, tighten two adjustment bolts.

L. Using 5/8 inch socket wrench, tighten four bolts tightly.

M. Replace air conditioner cable (para 3-14).

END OF TASK

3-18. REMOVAL AND REPLACEMENT OF EQUIPMENT DRAWERS



STEP 1. REMOVAL

A. Remove safety clip, and lift and open locking bar.

B. Slide drawer about three-quarters the way out of cabinet. Reach hand into drawer, palm up, directly under latch, until hand is fully under workbench.

C. Feel with fingers to find movable drawer retainer flap.

D. Push flap backwards towards wall.

E. While holding flap in rear position, slowly slide drawer out being careful not to strike the fingers holding flap with the moving drawer.

F. When drawer is fully in out position, tilt end of drawer up in direction of arrow and remove drawer from cabinet.

STEP 2. REPLACEMENT

A. Tilt drawer upwards.

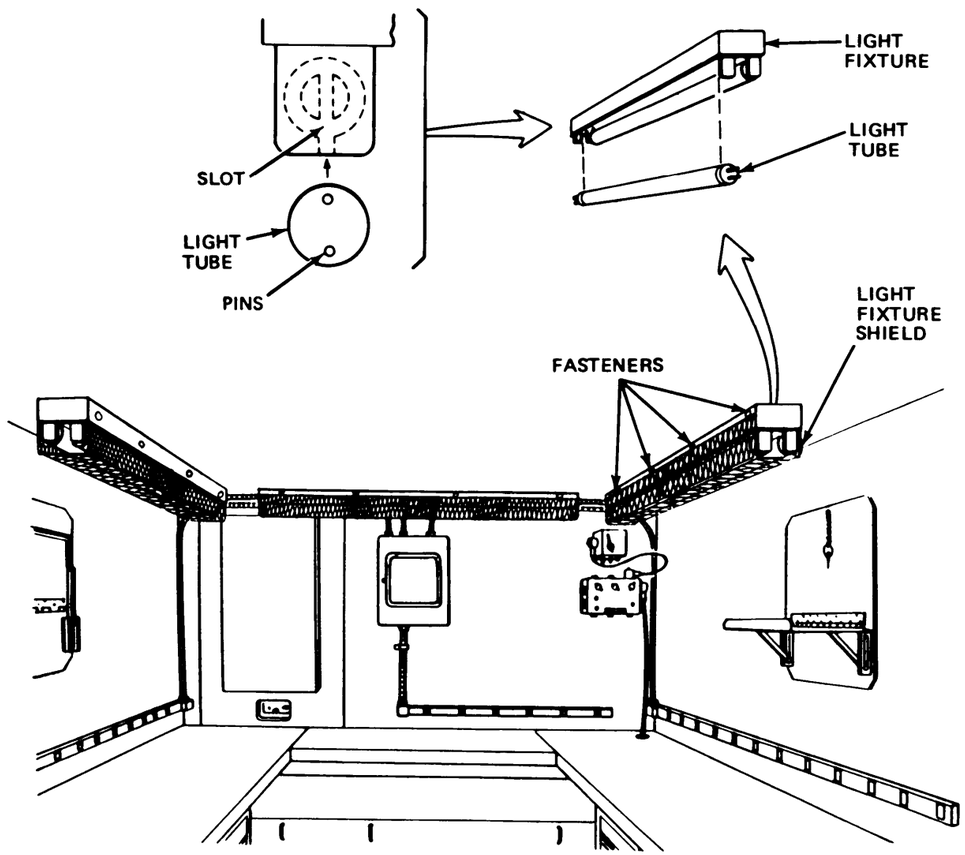
B. Line up rollers on each side of drawer with slots on each side of cabinet.

C. Slide drawer all the way into cabinet.

D. Close and lock locking bar, attach safety clip.

END OF TASK

3-19. REMOVAL AND REPLACEMENT OF LIGHT TUBE



STEP 1. REMOVAL

A. Loosen four fasteners and swing light fixture shield down and out of the way.

B. Grasp light tube with both hands and turn tube until loose. Lower tube out of fixture.

STEP 2 REPLACEMENT

A. Line up pins at end of tube with slot on light fixture. Push tube up into place and turn until locked.

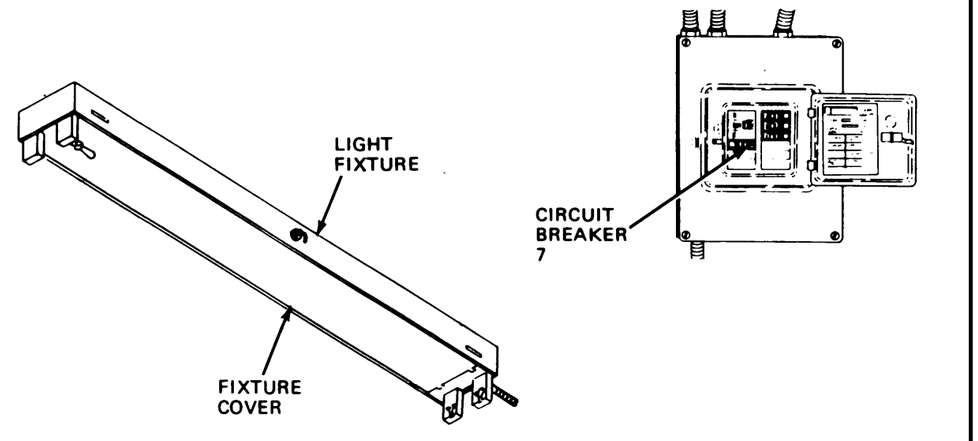
B. Swing light fixture shield up and secure with four fasteners.

END OF TASK

3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (Sheet 1 of 8)

TOOLS:
- 3/8 inch socket wrench
- Soldering kit
- Slip joint pliers
- 1/4 inch flat tip screwdriver
- Wire cutters
- Electrical drill
- 3/16 inch drill bit
- Pop rivet tool

MATERIALS:
- Blind rivets (item 12, App. D)
- Electrical tape



STEP 1. REMOVAL

A. Plug extension cord with lantern into shelter outlet and position to provide lighting for following procedures.

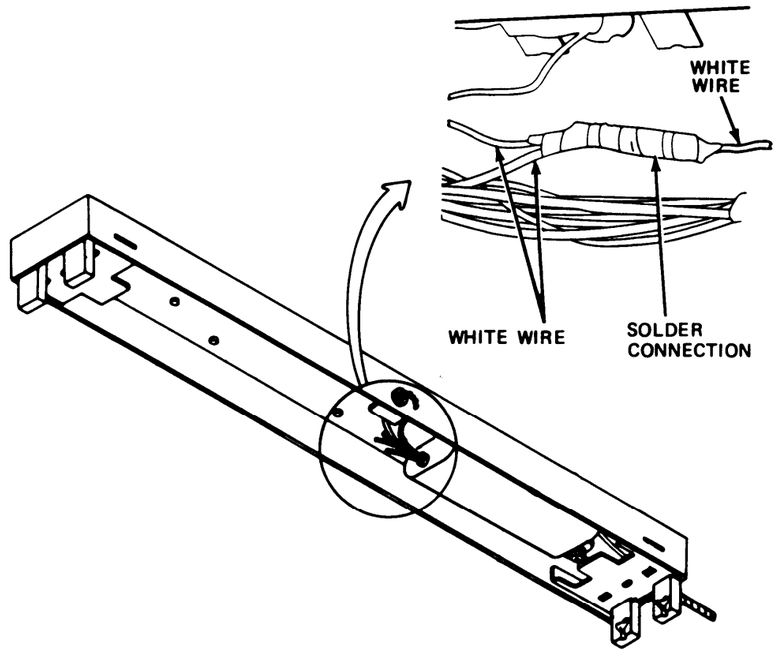
Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

B. Remove light tubes (para 3-19).

C. Remove fixture cover from light fixture.

GO TO NEXT PAGE

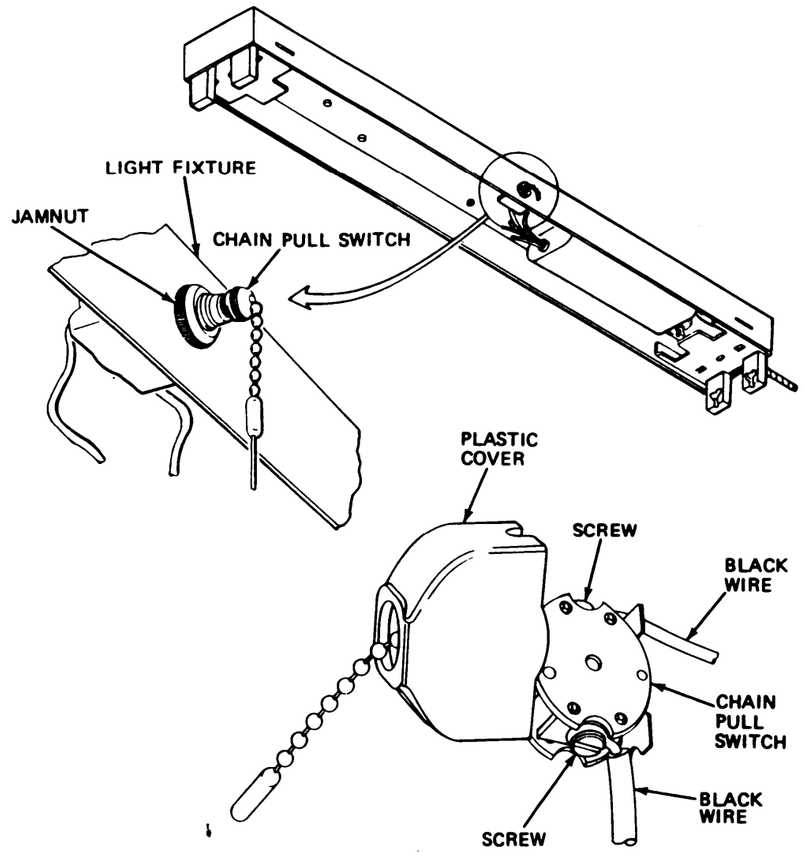
3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 2 of 8)



STEP 1. (Continued)

D. Remove tape from solder connection.

E. Tag and cut apart three white wires.



STEP 1. (Continued)

F. Turn jamnut counterclockwise and remove.

G. Pull chain pull switch out of light fixture.

H. Remove plastic cover from chain pull switch.

I. Tag two black wires attached to two screws at sides of chain pull switch.

J. Loosen and remove two screws.

K. Remove two black wires from chain pull switch.

GO TO NEXT PAGE

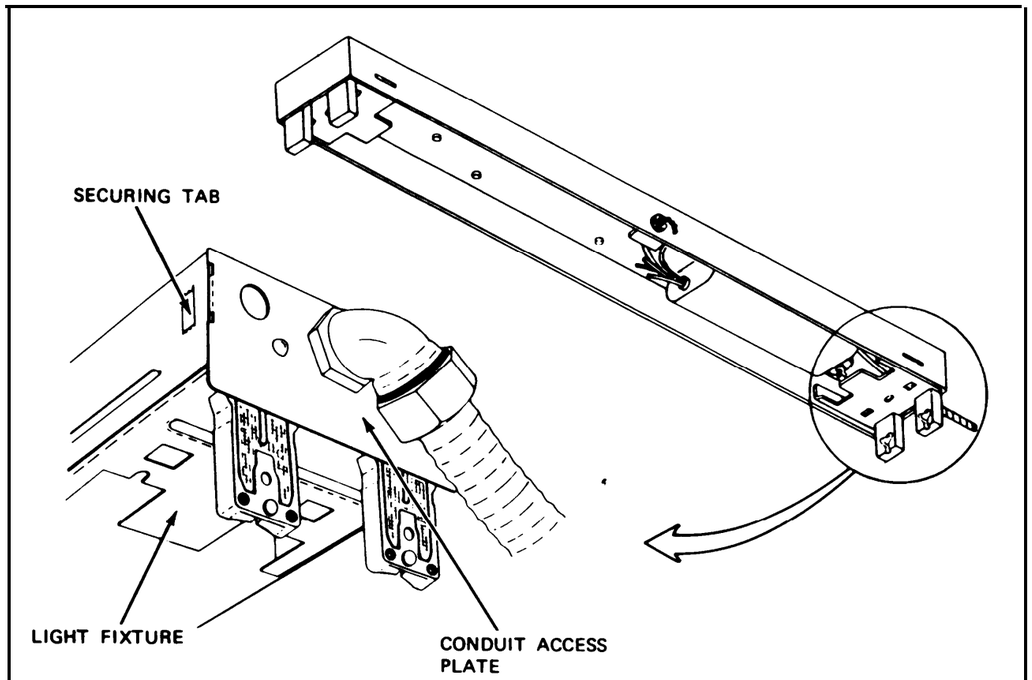
3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 3 of 8)

NOTE

For removal of roadside light fixture, refer to L and M of step 1, then proceed to W.

For removal of curbside light fixture, refer to N thru P of step 1, then proceed to W.

For removal of front light fixture, refer to Q thru V of step 1, then proceed to W.



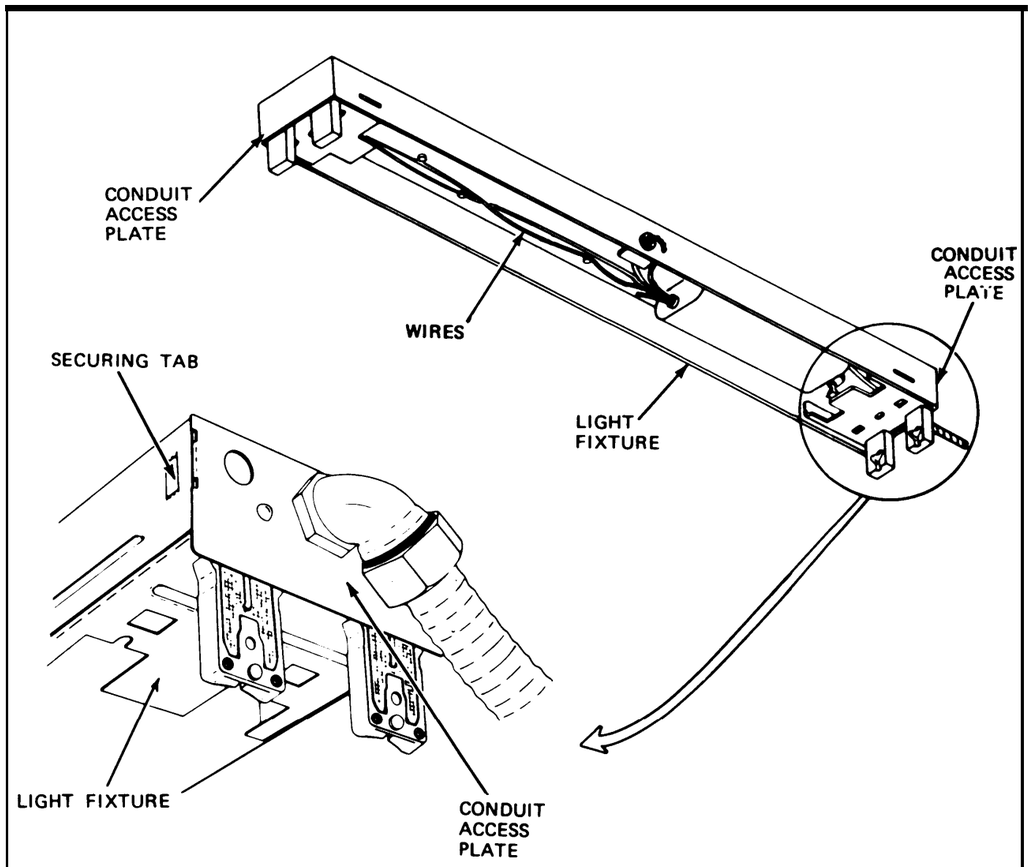
STEP 1. (Continued)

NOTE

Remove any tape holding bundles of wire together.

L. Using flat tip screwdriver, push in on securing tab.

M. Pull conduit access plate away from light fixture.



STEP 1. (Continued)

N. Tag and cut wires coming into light fixture approximately 12 inches from conduit access plates.

NOTE

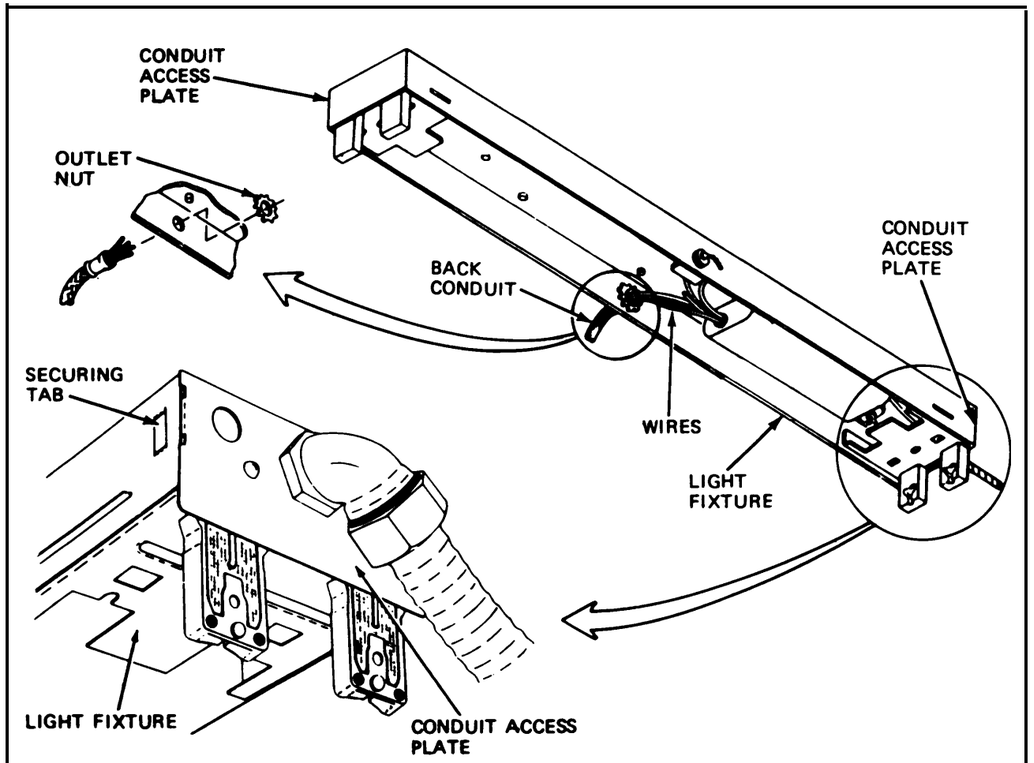
Remove any tape holding bundles of wire together.

O. Using flat tip screwdriver, push in on securing tab.

P. Pull conduit access plates away from light fixture.

GO TO NEXT PAGE

3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 4 of 8)



STEP 1. (Continued)

Q. Tag wires coming into light fixture.

R. Cut wires coming into light fixture approximately 12 inches from conduit access plates and back conduit.

NOTE

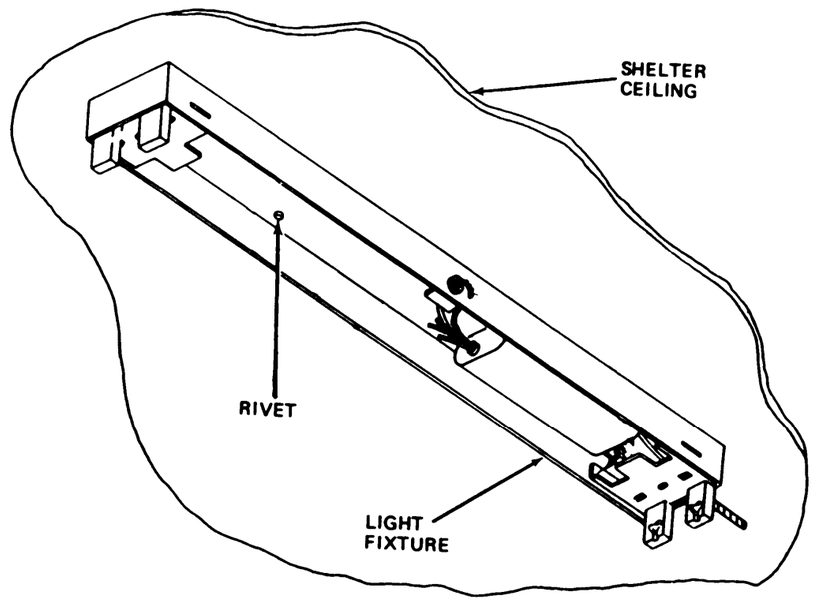
Remove any tape holding bundles of wire together.

S. Using flat tip screwdriver, push in on securing tab.

T. Pull conduit access plates away from light fixture.

U. Turn outlet nut counterclockwise and remove from light fixture.

V. Remove back conduit from light fixture.



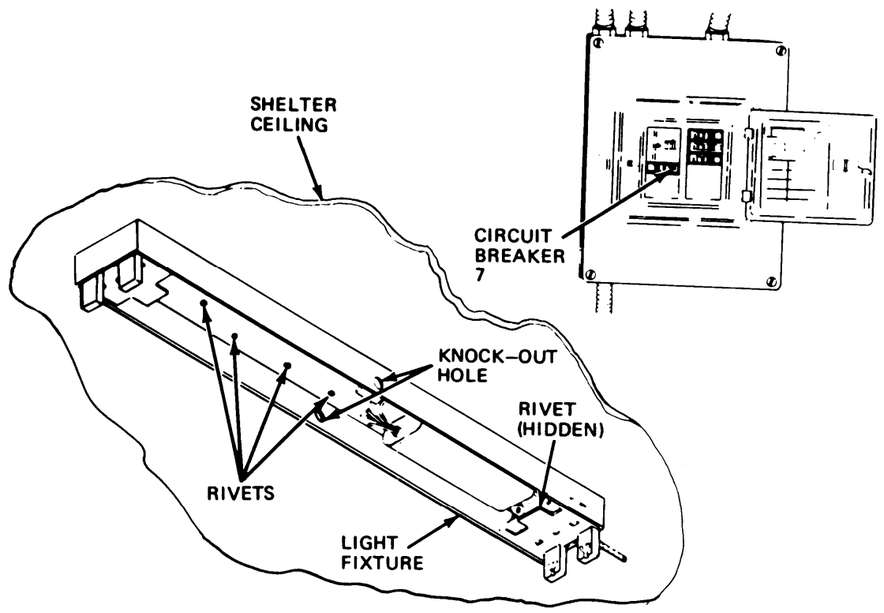
STEP 1. (Continued)

W. Remove rivets holding light fixture to shelter ceiling.

X. Remove light fixture from shelter ceiling.

GO TO NEXT PAGE

3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 5 of 8)



STEP 2. REPLACEMENT

WARNING

Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

A. Check that light fixture knock-out holes have been placed in middle of light fixture. If not, use screwdriver to remove knock-out tabs.

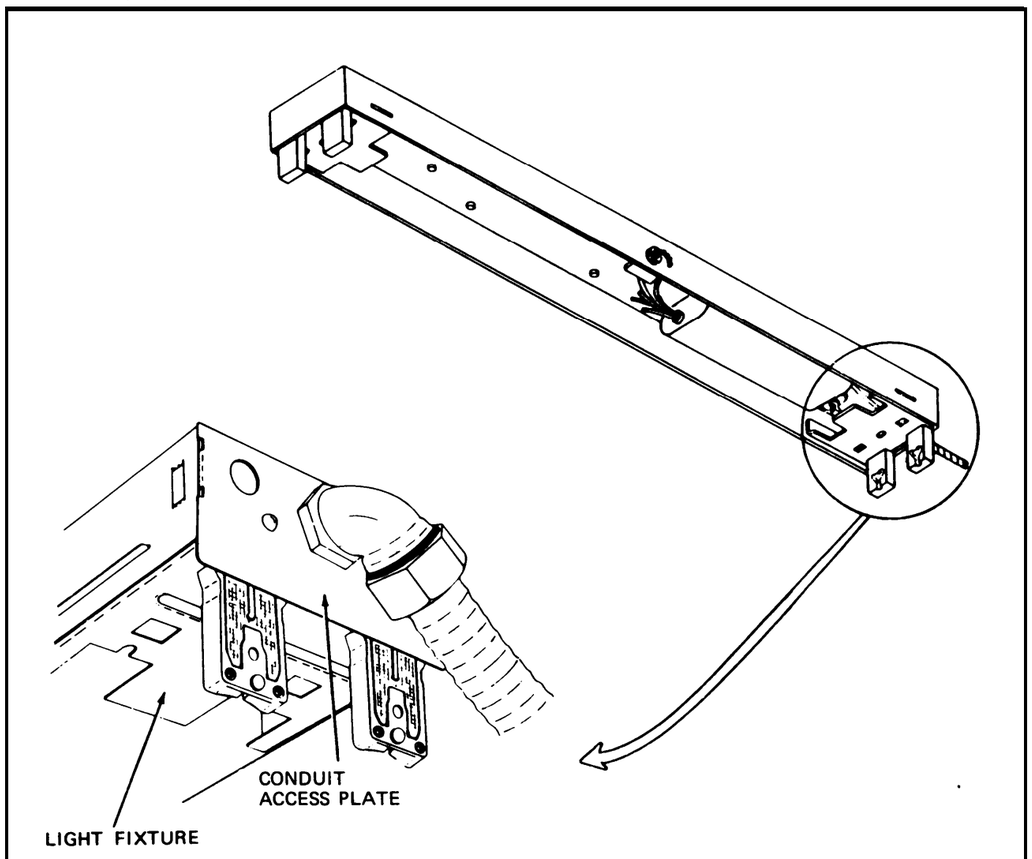
B. Install rivets to attach light fixture to shelter ceiling.

NOTE

For replacement of roadside light fixture, refer to C of step 2, then proceed to M.

For replacement of curbside light fixture, refer to D thru F of step 2, then proceed to M.

For replacement of front light fixture, refer to G thru L of step 2, then proceed to M.



STEP 2. (Continued)

C. Replace conduit access plate on end of light fixture.

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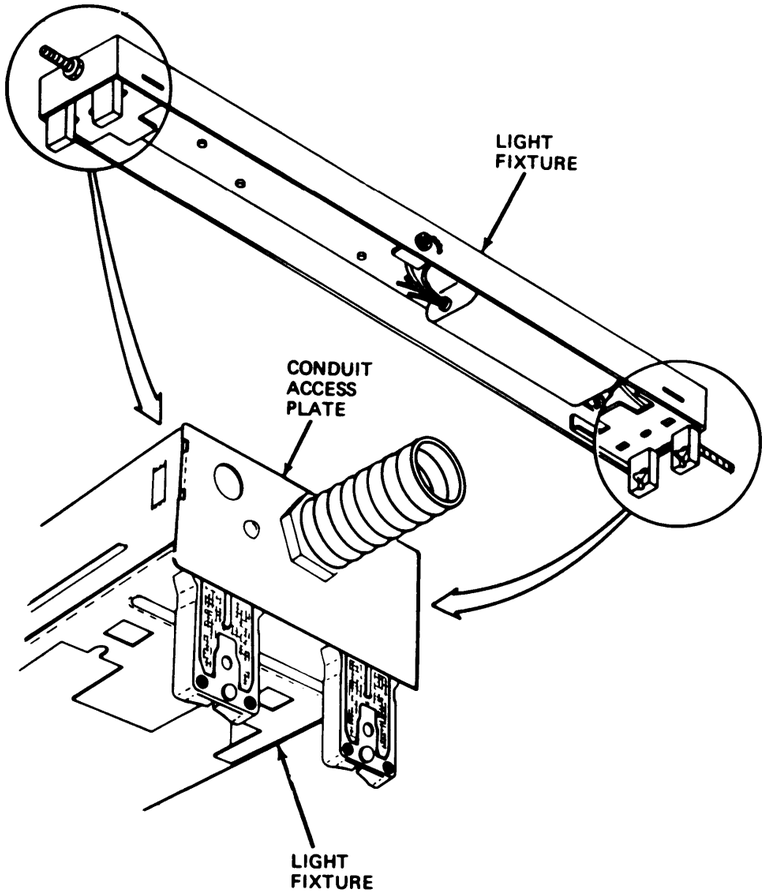
3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 6 of 8)

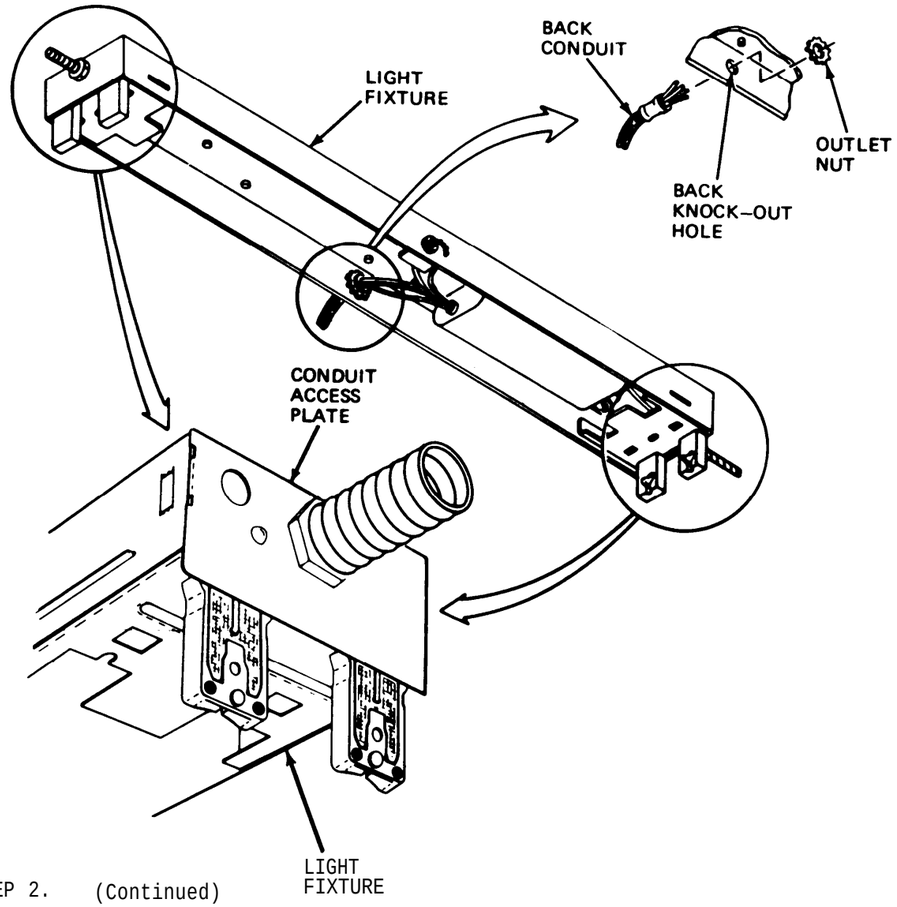


STEP 2. (Continued)

D. Replace conduit access plate on each end of light fixture.

E. Splice and untag wires coming into light fixture with wires in light fixture.

F. Solder and cover exposed wire with electrical tape.



STEP 2. (Continued)

G. Replace conduit access plate on each end of light fixture.

H. Place back conduit into back knock-out hole in light fixture.

I. Place outlet nut on back conduit.

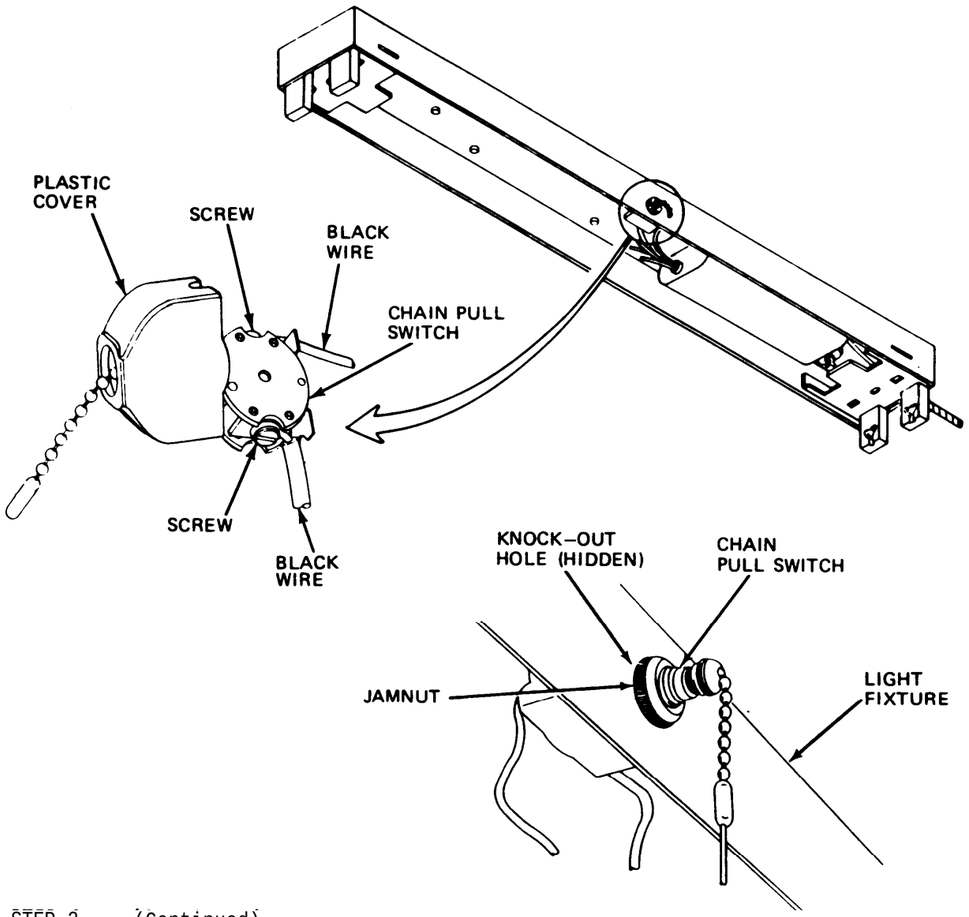
J. Turn outlet nut clockwise to tighten.

K. Splice tagged wires in light fixture.

L. Solder and cover exposed wires with electrical tape.

GO TO NEXT PAGE

3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 7 of 8)



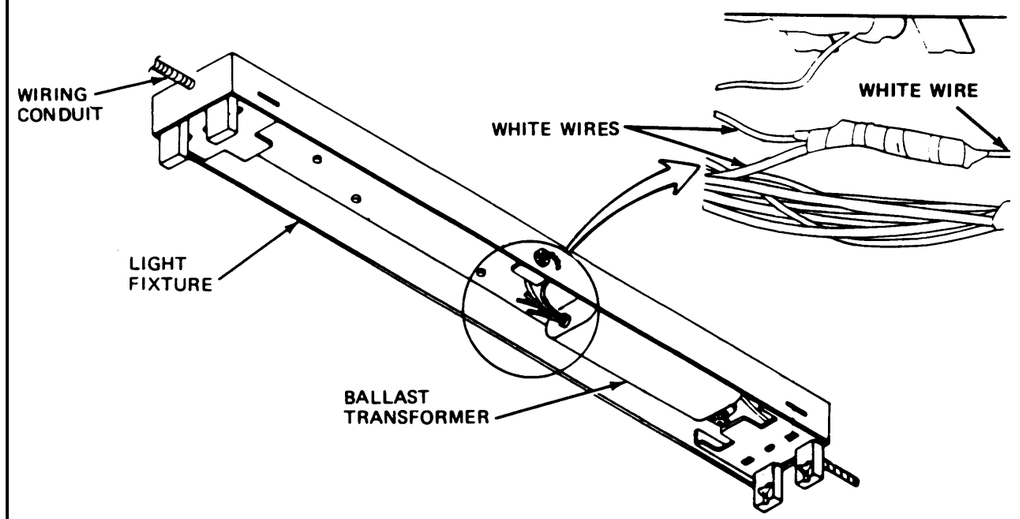
STEP 2. (Continued)

M. Install two tagged black wires and two screws on sides of chain pull switch.

N. Install plastic cover on chain pull switch.

O. Place chain pull switch in knock-out hole in light fixture.

P. Install jamnut on chain pull switch to hold it to light fixture.



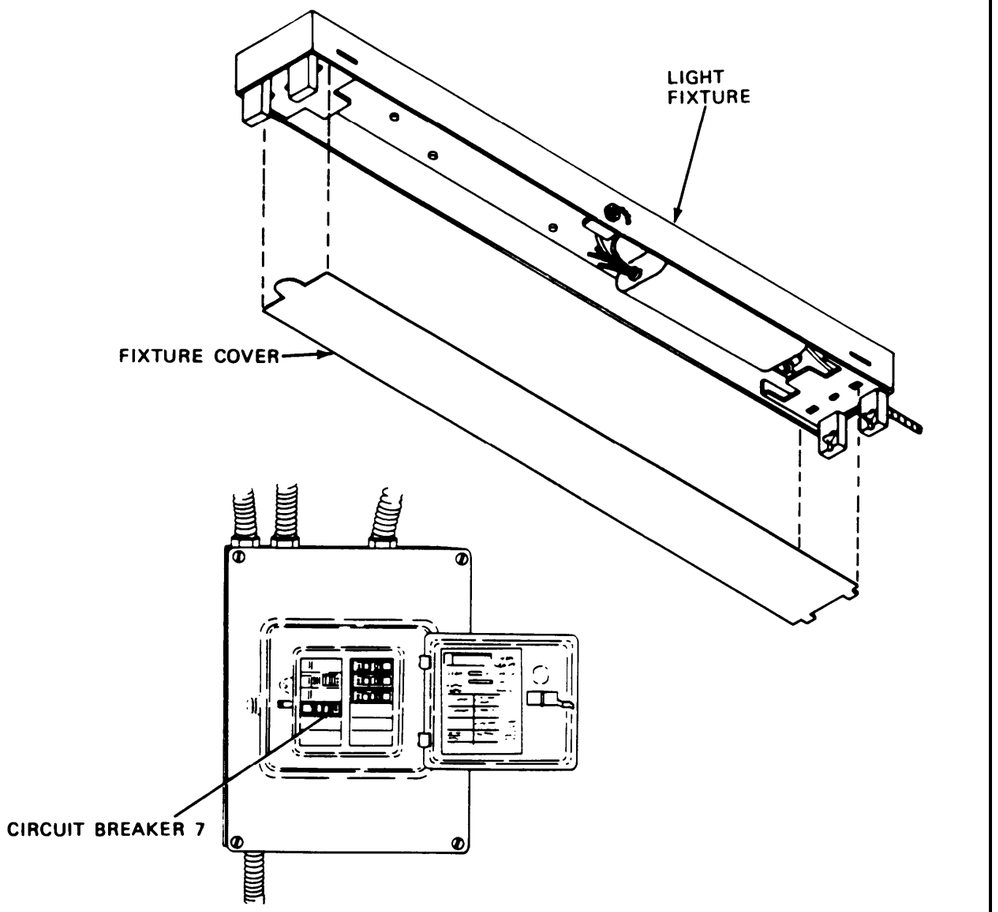
STEP 2. (Continued)

Q. Solder and untag white wires running from wiring conduits to white wire running from ballast transformer.

R. Cover exposed wire with electrical tape.

GO TO NEXT PAGE

3-20. REMOVAL AND REPLACEMENT OF LIGHT FIXTURE (CONT) (Sheet 8 of 8)



STEP 2. (Continued)

S. Replace fixture cover on light fixture.

T. Install light tubes (para 3-19).

U. Set circuit breaker 7 to ON.

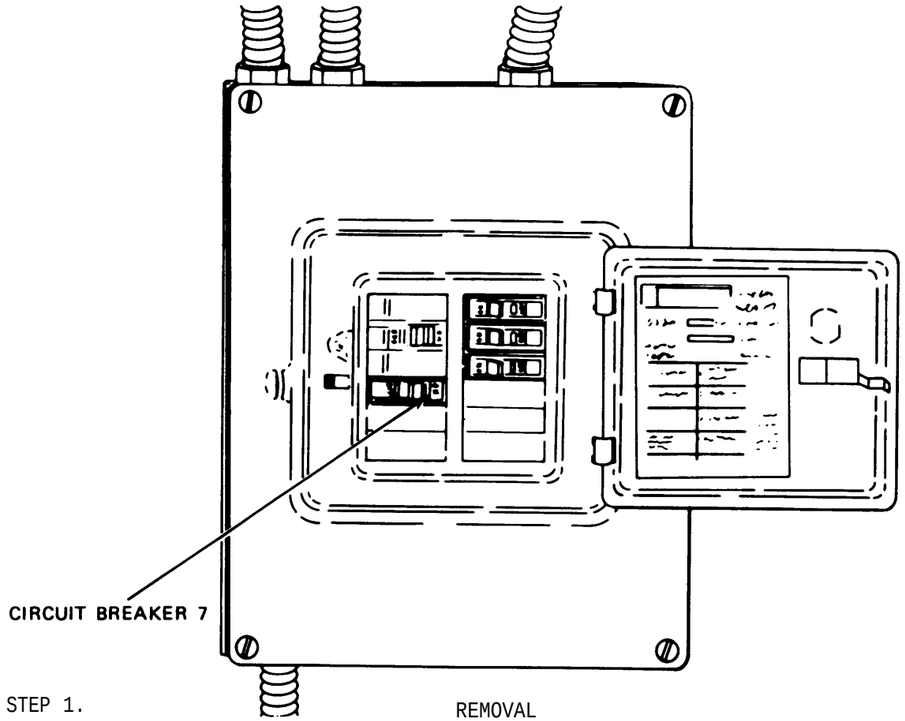
V. Remove extension cord from shelter outlet.

END OF TASK

3-21. REMOVAL AND REPLACEMENT OF BALLAST TRANSFORMER (Sheet 1 of 3)

TOOLS: Wire cutters; Slip joint pliers; 1/4 inch flat tip screwdriver; 3/8 inch socket wrench

MATERIAL: Electrical tape



STEP 1. REMOVAL

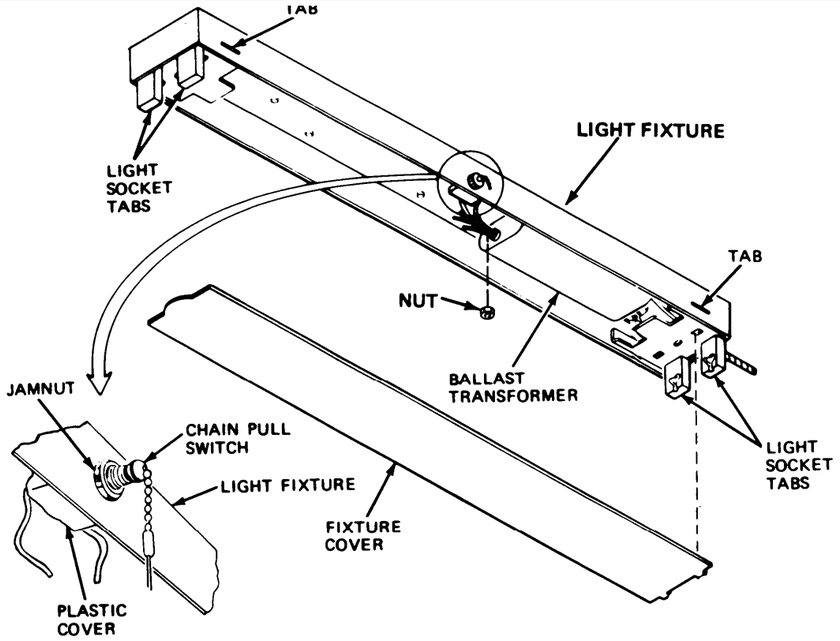
A. Plug extension cord with lantern into shelter outlet and position to provide lighting for the following procedures.

Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

B. Remove light tubes (para 3-19).

GO TO NEXT PAGE

3-21. REMOVAL AND REPLACEMENT OF BALLAST TRANSFORMER (CONT) (Sheet 2 of 3)



STEP 1. (Continued)

C. Pull down on fixture cover to remove.

D. Remove jamnut from chain pull switch and remove switch from fixture.

E. Slide plastic cover from switch.

F. Remove thin black wire between ballast transformer and switch.

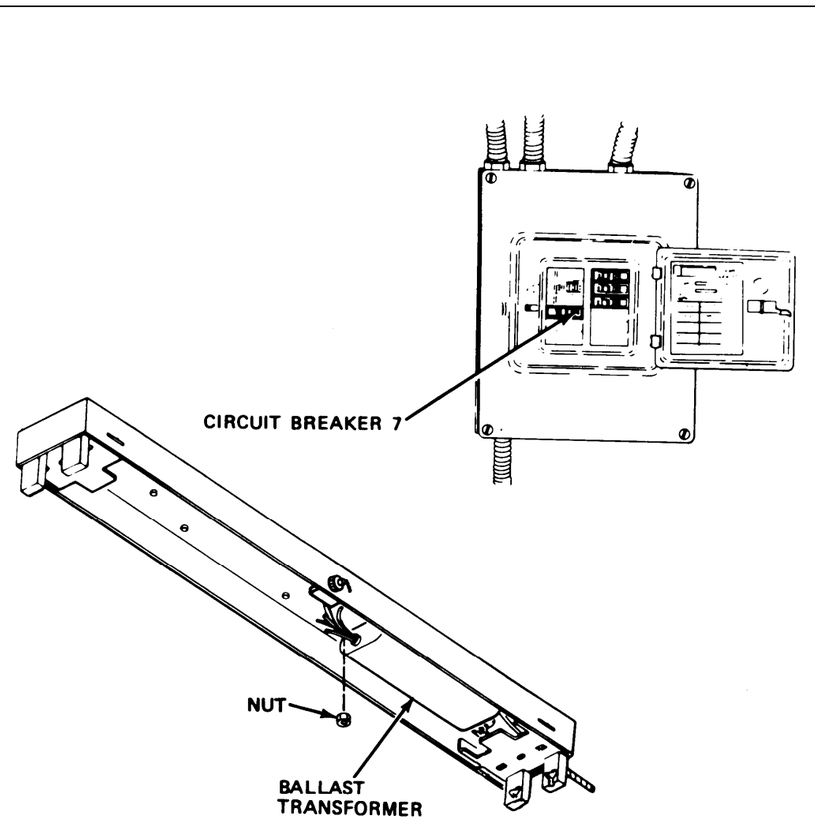
NOTE

When cutting wires, make sure that enough wire is left over to splice.

G. Cut thin white wire coming from ballast transformer.

H. Slide tab on each end of light fixture to center of fixture while pulling down on light socket tabs. Let light socket tabs hang until ballast transformer is removed.

I. Remove nut from ballast transformer and remove light socket tabs and ballast transformer from light fixture.



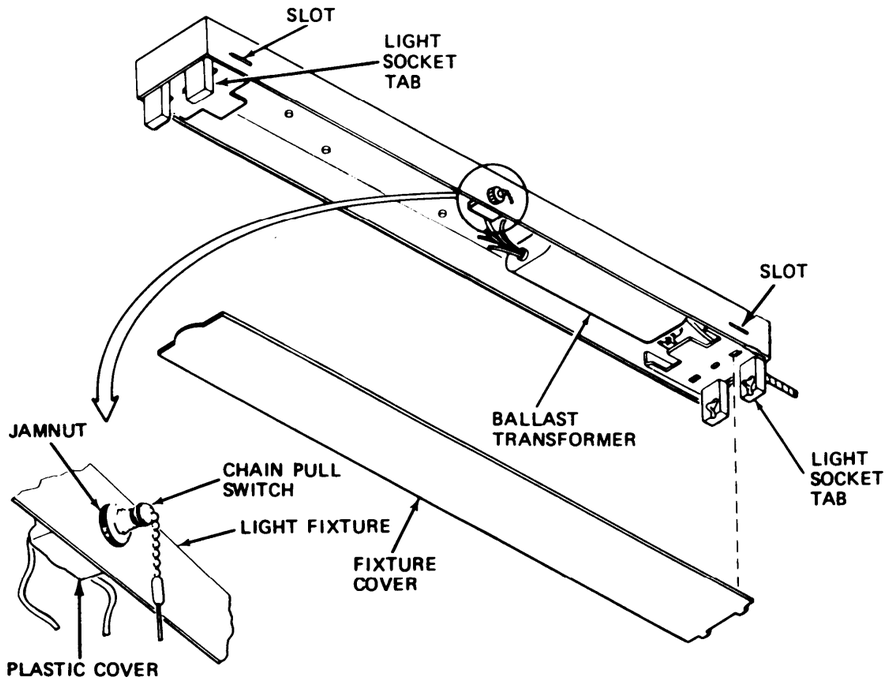
STEP 2. REPLACEMENT

Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

A. Slide ballast transformer into position and attach nut loosely.

GO TO NEXT PAGE

3-21. REMOVAL AND REPLACEMENT OF BALLAST TRANSFORMER (CONT) (Sheet 3 of 3)



STEP 2. (Continued)

C. Install light socket tabs into slots at both ends of light fixture.

D. Attach thin black wire from ballast transformer to chain pull switch.

E. Remove insulation from ends of white wires and splice wires together.

F. Solder and cover splice with electrical tape.

G. Install plastic cover on chain pull switch.

H. Place chain pull switch in light fixture and tighten jamnut to hold switch in place.

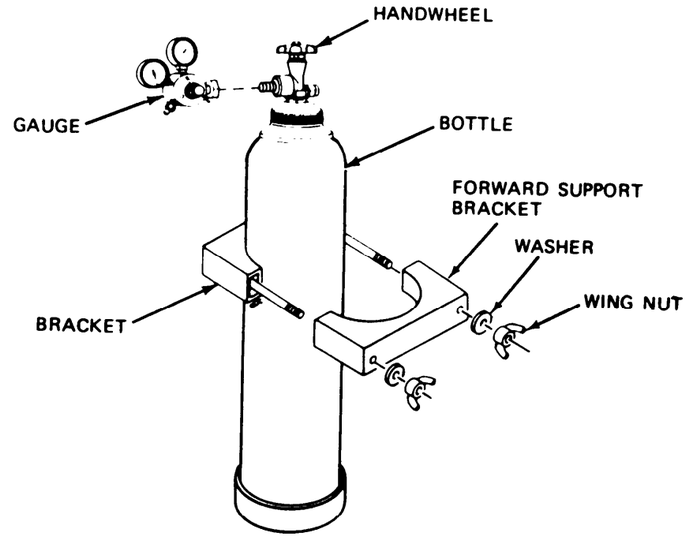
I. Replace fixture cover on light fixture.

J. Replace light tubes (para 3-19).

END OF TASK

3-22. REMOVAL AND REPLACEMENT OF NITROGEN BOTTLE (Sheet 1 of 2)

TOOLS: 12 inch adjustable wrench



STEP 1. REMOVAL

A. Turn handwheel clockwise to close off bottle.

CAUTION

Be careful not to damage regulator gauges.

B. Remove gauges.

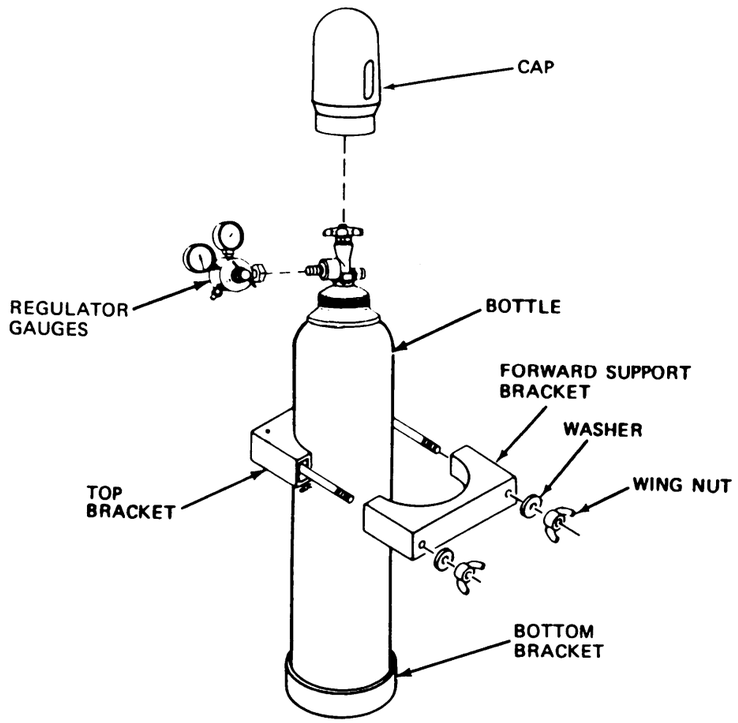
C. Using wrench, remove two wing nuts and two washers and forward support bracket.

Nitrogen bottle is heavy. Two people are required to safely lift or move nitrogen bottle.

D. Remove bottle from bracket.

GO TO NEXT PAGE

3-22. REMOVAL AND REPLACEMENT OF NITROGEN BOTTLE (CONT) (Sheet 2 of 2)



STEP 2. REPLACEMENT

A. Unscrew cap from new bottle and place on old bottle.

B. Place new bottle in top and bottom brackets.

C. Install forward support bracket in place with two wing nuts and two washers.

CAUTION

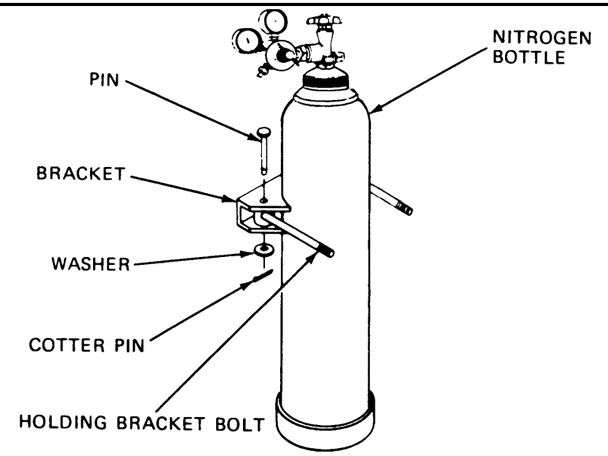
When replacing regulator gauges on nitrogen bottle, be careful not to damage regulator gauges.

D. Install regulator gauges on bottle.

END OF TASK

3-23. REMOVAL AND REPLACEMENT OF NITROGEN BOTTLE HOLDING BRACKET BOLT

TOOLS: 6 inch round nose pliers
12 inch adjustable wrench



STEP 1. REMOVAL

A. Remove nitrogen bottle (para 3-22).

B. Remove cotter pin and washer.

C. Lift up and remove pin.

D. Remove holding bracket bolt from bracket.

STEP 2. REPLACEMENT

A. Tilt holding bracket bolt to install in bracket.

B. Install pin.

C. Attach washer and cotter pin.

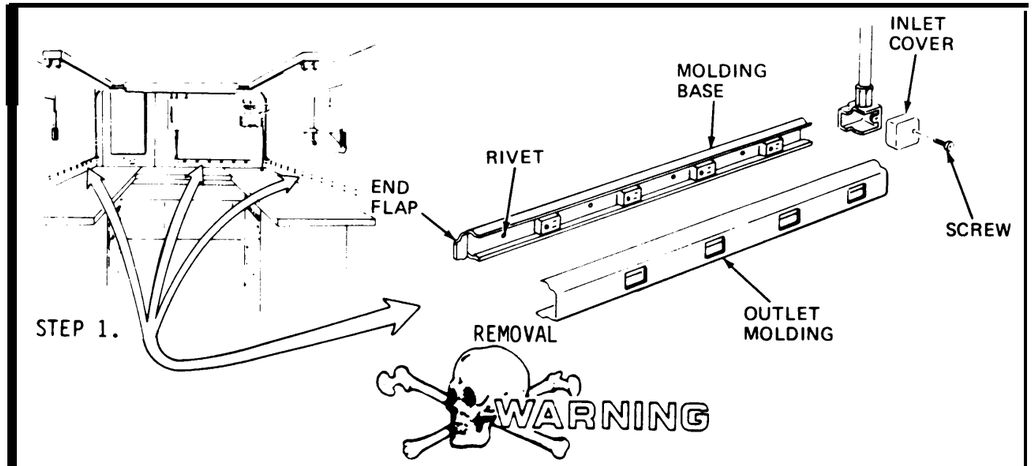
D. Replace nitrogen bottle (para 3-22).

END OF TASK

3-24. REMOVAL AND REPLACEMENT OF OUTLET MOLDING

TOOLS: Soldering kit
1/4 inch flat tip screwdriver

MATERIAL: Electrical tape



Before doing any of the following procedures, set circuit breaker switch which controls outlets to OFF.

A. Remove screw and inlet cover.

B. Remove tape from both white, black, and green wires and unsolder wires.

C. Pry end flap back from outlet molding.

D. Pry outlet molding away from molding base.

E. Remove rivets and molding base from shelter wall.

STEP 2. REPLACEMENT

A. Put molding base in place on shelter wall and attach with rivets.

B. Solder wires, white to white, black to black, and green to green.

C. Apply electrical tape to each solder joint.

D. Push outlet molding firmly into place on molding base.

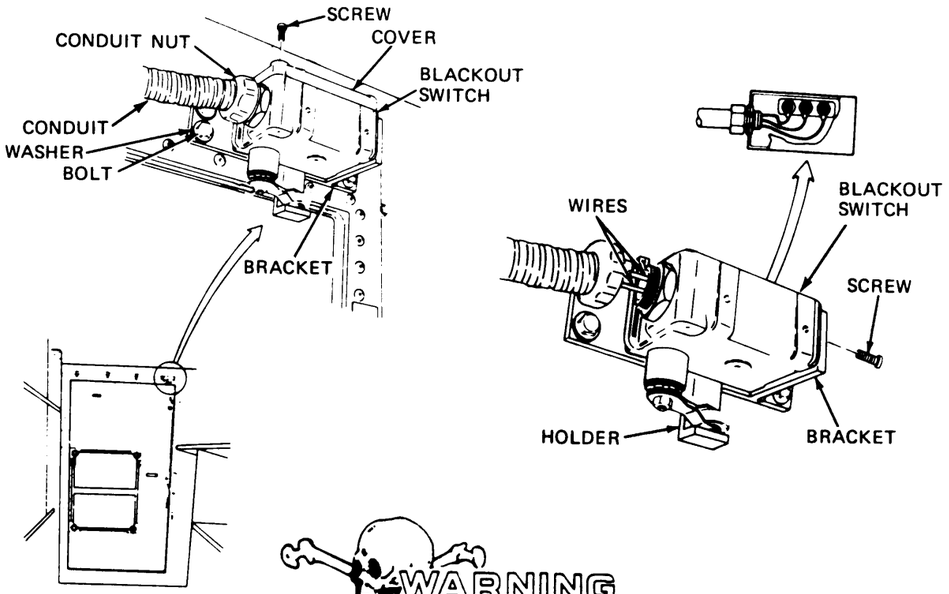
E. Push end flap in upright position to seal outlet molding.

F. Replace inlet cover and screw.

END OF TASK

3-25. REMOVAL AND REPLACEMENT OF BLACKOUT SWITCH (Sheet 1 of 2)

TOOLS: 7/16 inch socket wrench
12 inch adjustable wrench
1/4 inch flat tip screwdriver
No. 10 crosstip screwdriver



Before proceeding further, set circuit breaker 7 in circuit breaker box to OFF. Failure to do so may result in serious electrical shock.

STEP 1. REMOVAL

A. Using adjustable wrench, remove conduit nut connecting conduit to blackout switch.

B. Using socket wrench, remove four bolts and four washers, and remove bracket with blackout switch from its mounting place.

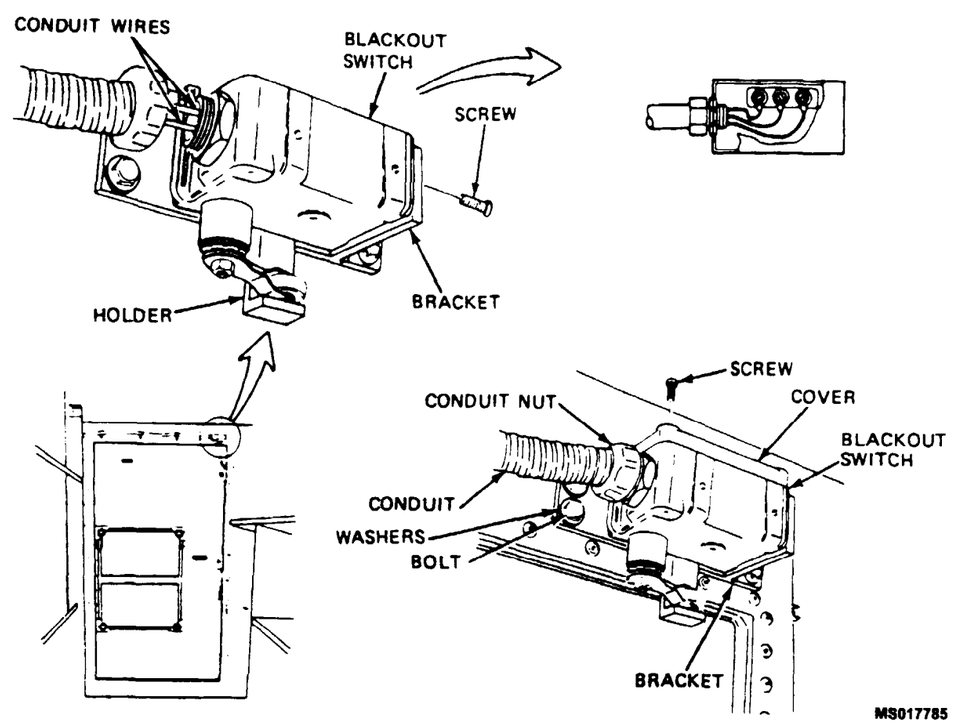
C. Using flat tip screwdriver, remove four screws and remove cover from blackout switch.

D. Tag and disconnect wires from terminals in blackout switch.

E. Using crosstip screwdriver, remove four screws and remove blackout switch and holder from bracket.

GO TO NEXT PAGE

3-25. REMOVAL AND REPLACEMENT OF BLACKOUT SWITCH (CONT) (Sheet 2 of 2)



STEP 2. REPLACEMENT

A. Using crosstip screwdriver, secure blackout switch and holder to bracket with four screws.

B. insert conduit wires through hole of blackout switch.

C. Connect wires to terminals inside blackout switch and remove tags.

D. Using flat tip screwdriver, install cover on blackout switch and remove tags.

E. Using socket wrench, install four bolts and four washers to replace bracket to its mounting place.

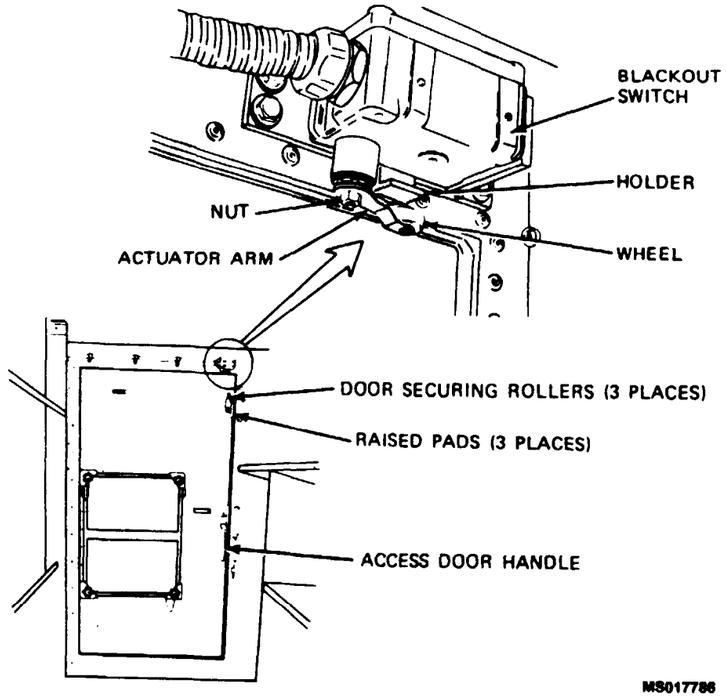
F. Using adjustable wrench, secure conduit to blackout switch with conduit nut.

G. Adjust blackout switch (para 3-26).

END OF TASK

3-26. ADJUSTMENT OF BLACKOUT SWITCH

TOOL: 3/8 inch open end wrench



A. Turn on shelter power (para 2-7).

B. Close and latch shelter door.

C. Move holder up so that wheel rests against shelter door.

D. Move shelter access door handle slowly downward until door securing rollers are at the thinnest portion of the raised pads.

E. Loosen nut at actuator arm pivot and move actuator arm until lights go out. Tighten nut.

F. Pull up on access door handle until lights come on.

G. Lights should go on and off with about a 1/4 inch travel of the door securing rollers.

H. Repeat steps B thru F until the requirements of step G are met.

END OF TASK

3-27. REMOVAL AND REPLACEMENT OF BORESIGHT ALIGNMENT TUBE STORAGE BRACKETS

TOOLS: 27E tool kit

STEP 1. REMOVAL

Remove bracket by removing the two screws and nuts holding the brackets.

STEP 2. REPLACEMENT

Replace bracket by installing the two screws in the bracket. Install bracket with screws in side of shelving, secure and tighten two nuts.

END OF TASK

CHAPTER 4

MAINTENANCE INSTRUCTIONS, IMPROVED CONTACT SUPPORT SET

CHAPTER OVERVIEW

The Improved Contact Support Set (ICSS) consists of a basic S280 shelter plus added items necessary to make a repair facility. The ICSS is used to support maintenance of the TOW 2 weapon system, DRAGON weapon system, Man-portable Common Thermal Night Sight (MCTNS), and Bradley Fighting Vehicle System (BFVS) Basic Sight Assembly (BSA) and TOW Subsystem Test Set (TSSTS). This chapter contains maintenance instructions for the equipment in the ICSS and how to use the equipment to support the prime systems.

CHAPTER CONTENTS

Section I. TOW 2 WEAPON SYSTEM

SECTION CONTENTS

4-1. SCOPE

This section covers the maintenance of the TOW 2 weapon system test equipment located in the ICSS. Reference is made to the applicable manuals for maintenance of the prime items of the TOW 2 weapon system.

4-2. REPAIR PARTS

Repair parts for the TOW 2 weapon system are described in TM 9-1425-450-24P.

4-3. SPECIAL TOOLS AND SUPPORT EQUIPMENT (Sheet 1 of 2)

a. Breakout Boxes

Two breakout boxes are stored in the ICSS: the battery charger monitor unit and the power conditioner test adapter. The battery charger monitor unit checks out the TOW 2 battery charger. The power conditioner test adapter troubleshoots the TOW 2 power conditioner. Test procedures using the breakout boxes are contained in TM 9-1425-450-34-1.

4-3. SPECIAL TOOLS AND SUPPORT EQUIPMENT (CONT) (Sheet 2 of 2)

b. Oscilloscope, Digital Multimeter, and Power Supply

The oscilloscope, digital multimeter, and power supply are part of the test set, night vision sight AN/TAM-3A. They are described and shown in para 1-6b.

c. 27E Tool Kit

The 27E tool kit comes equipped with all the tools required to service and maintain the TOW 2 weapon system. See SC 5180-95-CL-A52 for complete list of tools in 27E tool kit.

4-4. TOW 2 WEAPON SYSTEM ITEMS

a. Missile Guidance Set

See TM 9-1425-450-34-1.

b. Optical Sight

See TM 9-1425-450-34-1.

c. Traversing Unit

See TM 9-1425-450-34-1.

d. Battery Assemblies

See TM 9-1425-450-34-1.

e. Night Sight

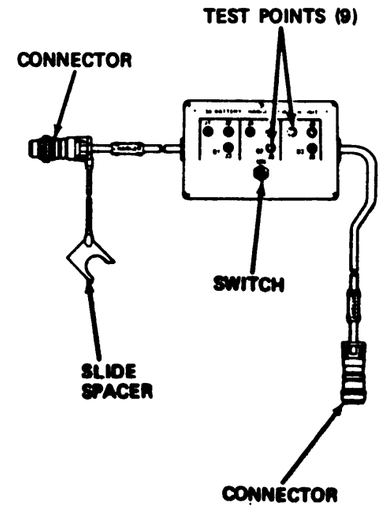
See TM 9-5855-450-24.

4-5. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Sheet 1 of 2)

For explanation of columns, see para 3-8.

B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
1.			•	BATTERY CHARGER MONITOR UNIT Battery Charger Monitor Unit	Check for damage and dirt. If necessary clean.	



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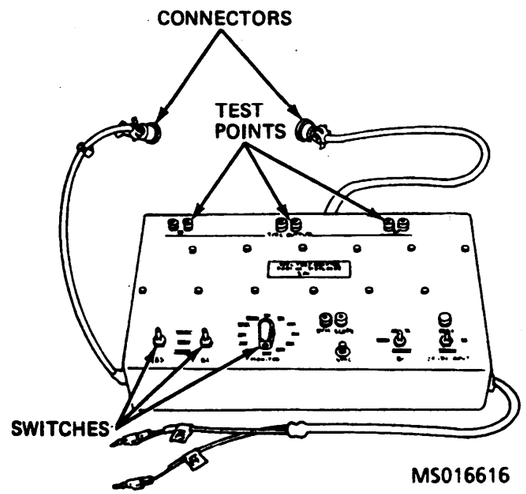
4-5. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (CONT) (Sheet 2 of 2)

B-Before W-Weekly M-Monthly

Item No.	Interval B	Interval W	Interval M	Item to be inspected	Procedures: Check for and have repaired or adjusted as necessary	Equipment Is Not Ready/ Available If:
				POWER CONDITIONER TEST ADAPTER		
2.	●			Connector	Check for damage or dirt. If necessary clean TM 9-1425-450-12).	
3.		●		Swtches	Check for damage or dirt.	
4.	●			Test Points	Check for damage. If necessary clean.	



For TOW 2 Test, Maintenance, and Diagnostic Equipment (TMDE) PMCS, see the following:

- Missile guidance set test set - see TM 9-4935-455-14.
- Electrical cable test set - see TM 9-4935-455-14.
- Electrical circuit test set - see TM 9-4935-455-14.
- Amplifier test set - see TM 9-4935-455-14.

4-6. TROUBLESHOOTING

For troubleshooting of the battery charger monitor unit, see para 4-7. For troubleshooting of the power conditioner test adapter, see para 4-8.

Troubleshooting for the TOW 2 TMDE is contained in the following manuals.

- Missile guidance test set - see TM 9-4935-455-14.
- Electrical cable test set - see TM 9-4935-455-14.
- Electrical circuit test set - TM 9-4935-455-14,
- Amplifier test set - see TM 9-4935-455-14.

END OF TASK

4-7. BATTERY CHARGER MONITOR UNIT CHECKOUT AND TROUBLESHOOTING PROCEDURES (Sheet 1 of 2)

TEST EQUIPMENT: Digital Multimeter

START

STEP 01

Connect test leads between DIGITAL MULTIMETER and test points given below:

Connections		Position of S1 switch (8):	Reading in ohms
On Connector P1 (6):	On Connector P2 (7):		
Pin 2	Pin 2	S1 OFF	Infinite
		S1 ON	0.9 to 1.1
Pin 3	Pin 3	.....	Less than 0.5
Pin 4	Pin 4	S1 OFF	Infinite
		S1 ON	0.9 to 1.1
Pin 5	Pin 5	.....	Less than 0.5
Pin 6	Pin 6	S1 OFF	Infinite
		S1 ON	0.9 to 1.1
Pin 7	Pin 7	.....	Less than 0.5

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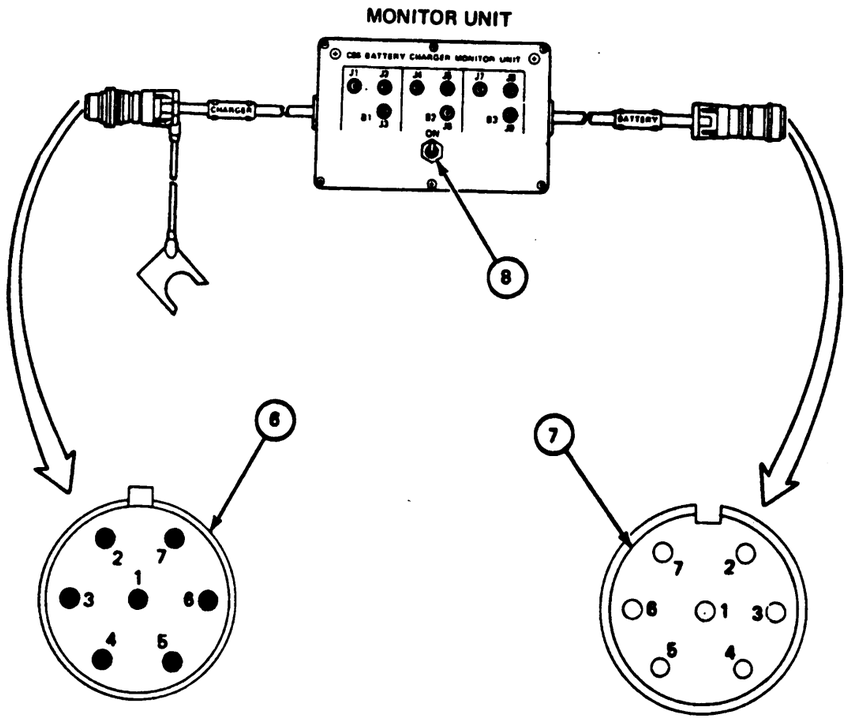


4-7. BATTERY CHARGER MONITOR UNIT CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 2 of 2)

Continued from previous page

Are the readings in ohms correct for each connection of step 1?

NO

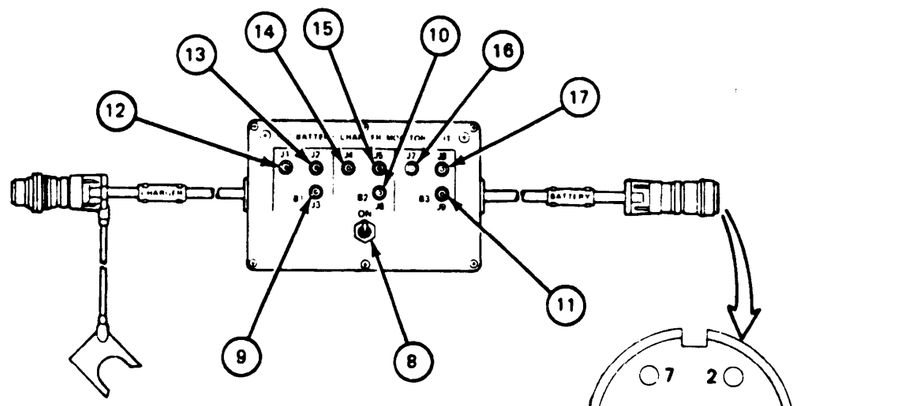
a. Check for broken wire between each pair of pins that failed.
b. Check for burned out resistor between pins 2, 4, or 6.
c. Remove and replace switch (para 4-10b).
d. After repair, go back to step 01.

YES

STEP 02

Continue with test point reading of step 01

Connections		
On face of monitor unit	On connector P1 (6)	Reading in ohms
Test point J3 (9)	Pin 3	Less than 0.5
Test point J6 (10)	Pin 5	Less than 0.5
Test point J9 (11)	Pin 7	Less than 0.5



Are the readings in ohms correct for each connection of step 02?

NO

a. Check for broken wire between each pair of connections that failed.
b. After repair, go back to step 02.

YES

STEP 03

Set S1 switch (8) to OFF.

STEP 04

Continue with test point reading of step 02.

Connections		Reading in ohms
On face of monitor unit	On face of monitor unit	
Test point J1 (12)	Test point J2 (13)	0.9 to 1.1
Test point J4 (14)	Test point J5 (15)	0.9 to 1.1
Test point J7 (16)	Test point J8 (17)	0.9 to 1.1

Are the readings in ohms correct for each connection of step 4?

NO

a. Check for broken wire between each pair of test points that failed.
b. After repair, go back to step 03.

YES

END OF TASK

MS016619

4-6. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (Sheet 1 of 19)

TEST EQUIPMENT: Digital Multimeter
Power Supply

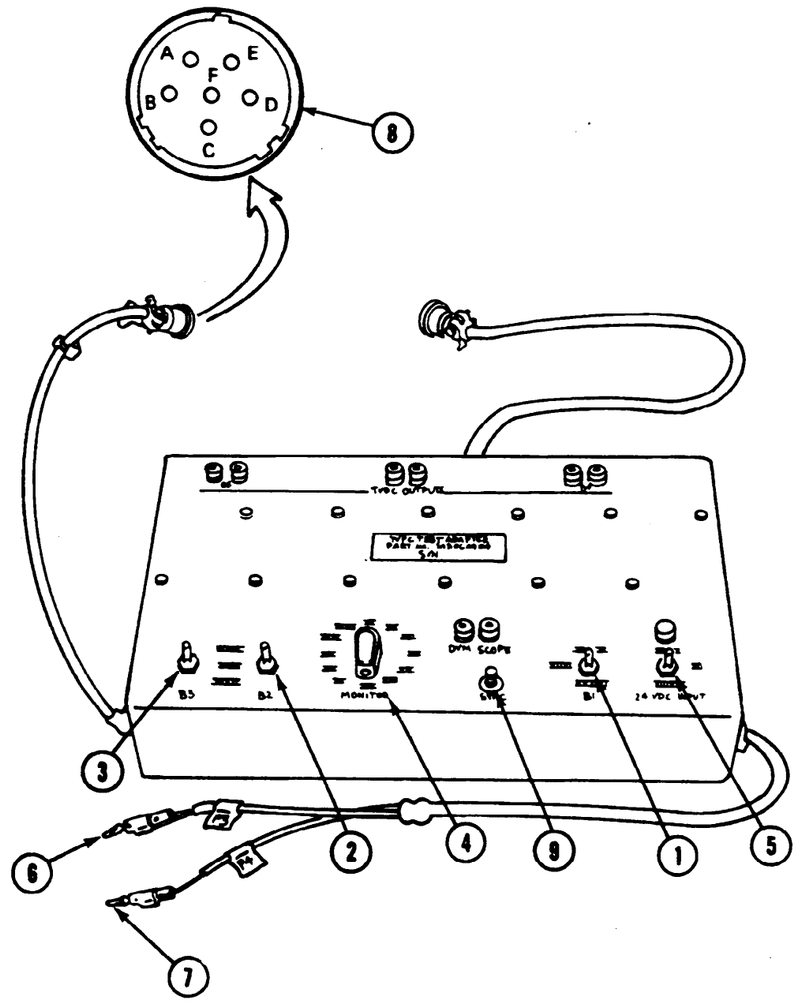
START

STEP 01

On POWER CONDITIONER TEST ADAPTER set:
a. Switch B1 (1) to NO LOAD.
b. Switch B2 (2) to NO LOAD.
c. Switch B3 (3) to NO LOAD.
d. Set MONITOR switch (4) to OFF.

STEP 02

On DIGITAL MULTIMETER:
a. Set power switch to ON.
b. Set to read ohms.
c. Set to read 0.1 Ω range.



STEP 03

Connect test leads to DIGITAL MULTIMETER INPUT V-Ω terminal and COMMON terminal, and test between points given below. NOTE: 24 VDC INPUT switch S1 will remain in REVERSE position only if held.

Connections		Set 24 VDC INPUT switch S1 (5) as follows:	Reading in ohms
P3 (6)	P4 (7)	OFF	Offscale
P1-A (8)	P4 (7)	NORMAL	Offscale
		OFF	Offscale
		REVERSED	0.0 to 0.5
	P3 (6)	NORMAL	0.0 to 0.5
		OFF	Offscale
		REVERSED	Offscale
	P1-C (8)	NORMAL	Offscale
		OFF	Offscale
		REVERSED	Offscale
	P1-B (8)	OFF	0.0 to 0.5
	P1-E (8)	OFF	0.0 to 0.5
P1-C (8)	P3 (6)	NORMAL	Offscale
		OFF	Offscale
	P4 (7)	OFF	Offscale
		REVERSED	Offscale
	P1-D (8)	OFF	0.0 to 0.5
	P1-F (8)	OFF	0.0 to 0.5
	SYNC Jack Center Pin (9)	NORMAL	0.0 to 0.5

Does DIGITAL MULTIMETER read the value in "reading in ohms" column?

NO →
a. Repair wire between points being tested.
b. Remove and replace switch S1 (5) (para 4-11d).
c. After repair, return to step 03.

YES

Go to next page

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44-7. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 2 of 19)

Continued from previous page

STEP 04

Connect test leads to DIGITAL MULTIMETER INPUT V-Ω terminal and COMMON terminal, and test between points given below:

Connections		Set Switch S1(5) as follows	Reading in Ohms
P1-C (8)	P3 (6)	REVERSED	0 to 0.5
	P4 (7)	NORMAL	0 to 0.5
	SYNC jack outer shell (9)	NORMAL	0 to 0.5

Does DIGITAL MULTIMETER read between 0 and 0.5 Ω?

NO

a. Repair wire between points being tested.
b. Remove and replace resistor R1 (para 4-11i).
c. Remove and replace switch S1(5) (para 4-11d).
d. After repair, return to step 03.

YES

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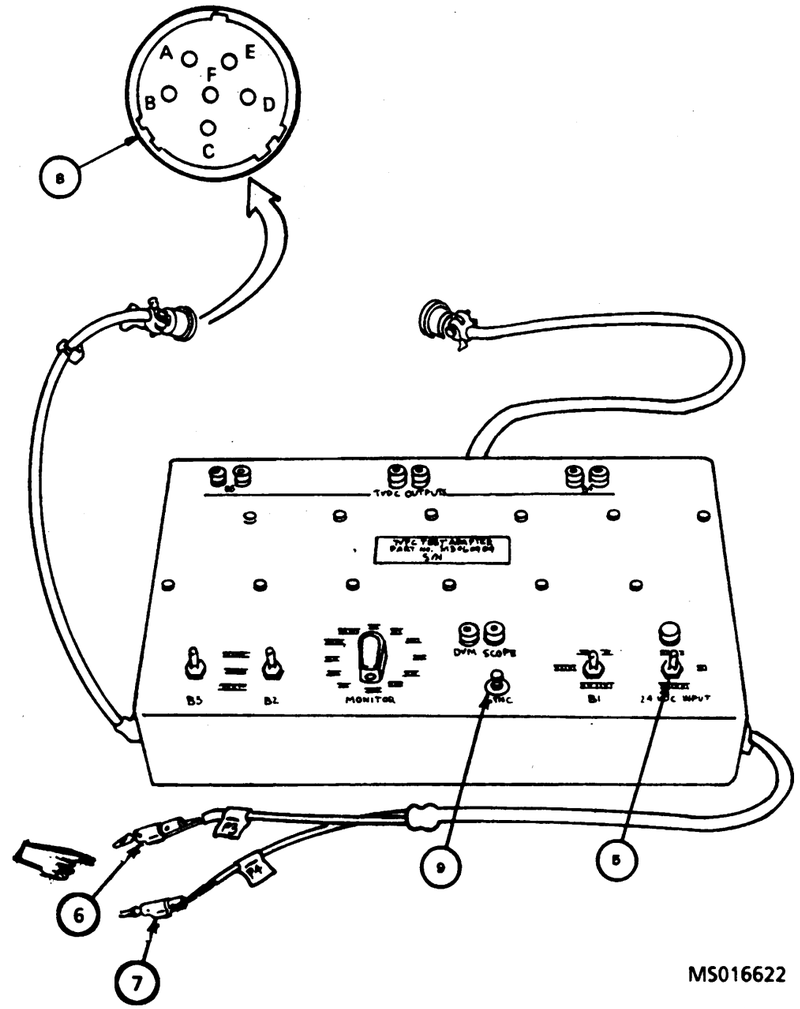

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4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 3 of 19)

Continued from previous page

STEP 05

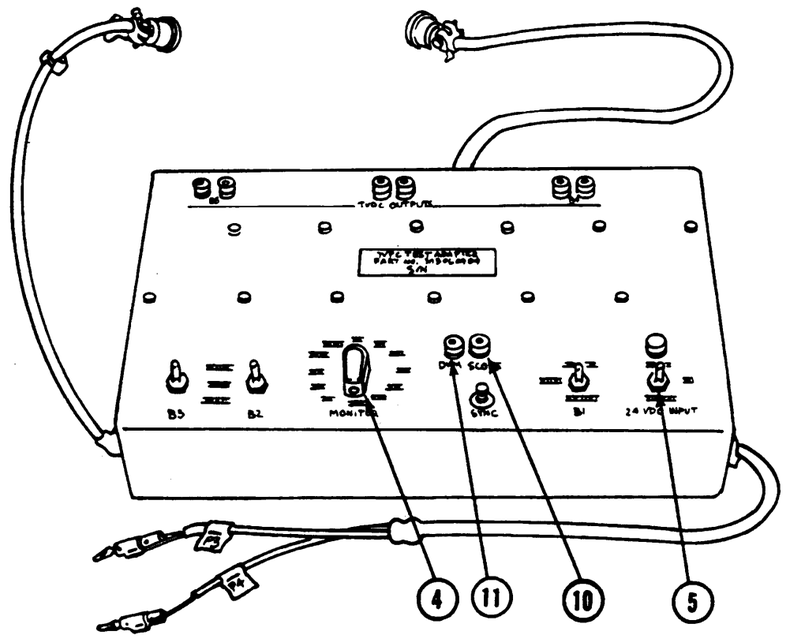
On POWER CONDITIONER TEST ADAPTER set 24 VDC INPUT switch S1(5) to OFF.

STEP 06

Set to read 1Ω range.

STEP 07

On DIGITAL MULTIMETER:
a. Connect test lead from COMMON terminal to DVM/SCOPE LO jack (10) on POWER CONDITIONER TEST ADAPTER.
b. Connect test lead from V-Ω INPUT terminal to DVM/SCOPE HI jack (11) on POWER CONDITIONER TEST ADAPTER.



STEP 08

Set MONITOR switch (4) to positions in left column. Right column indicates normal reading on DIGITAL MULTIMETER.

Monitor Switch Position	Reading in Ohms
B1-V	Off scale
B2-V	Off scale
B3-V	Off scale
INPUT-V	Off scale
OFF	Off scale

Did DIGITAL MULTIMETER read off scale?

NO

a. Repair wire between switch S5(4) and circuit.
b. Remove and replace switch S5(4) (Para 4-11e).
c. After repair, return to step 07.

YES

Go to next page

MS016623

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 4 of 19)

Continued from previous page

STEP 09

Set MONITOR switch (4) to positions in left column. For each position, place a jumper between points indicated. After taking each reading, remove the jumper before going to the next position or step.

MONITOR Switch Position	Jumper placed between these points		Reading in Ohms
B1-V	B1-V +24 jack (12)	B1-V +24 RTN jack (13)	Less than 0.5
B2-V	B2-V +50 jack (14)	B2-V +50 RTN jack (15)	Less than 0.5
B3-V	B3-V -50 jack (16)	B3-V -50 RTN jack (17)	Less than 0.5
INPUT-A	SYNC jack center pin (9)	SYNC jack outer shell (9)	Less than 0.5
INPUT-V	P1-A (8)	P1-C (8)	Less than 0.5

Did DIGITAL MULTIMETER read less than 0.5Ω?

NO

a. Repair wire between switch S5 (4) and circuit.
b. Remove and replace appropriate test point (para 4-11b).
c. Remove and replace switch S5(4) (para 4-11e).
d. After repair return to step 07.

YES

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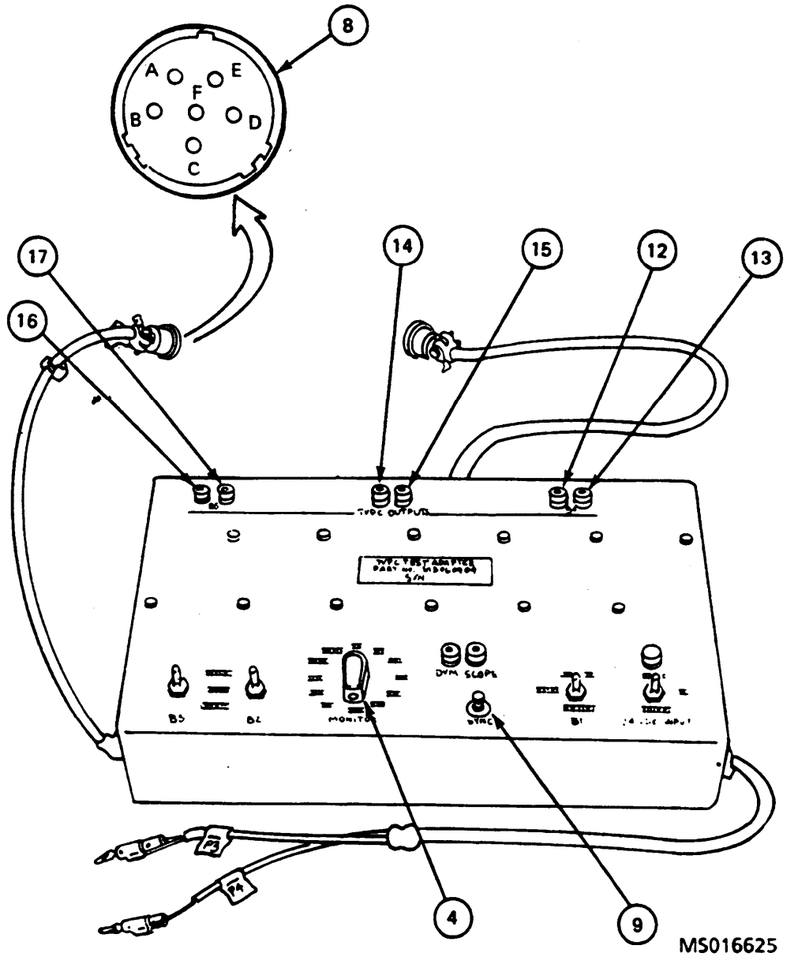

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STEP 10

Set MONITOR switch (4) to INPUT-A.

Did DIGITAL MULTIMETER read between 0 and 0.5Ω ?

NO

a. Repair wire between switch S5(4) and resistor R1.
b. Remove and replace resistor R1 (para 4-11i).
c. Remove and replace switch S5(4) (para 4-11e).
d. After repair, return to step 07.

YES

STEP 11

Set MONITOR switch (4) to B1-A.

Did DIGITAL MULTIMETER read between 1.0 and 1.5Ω ?

NO

a. Repair wire between switch S5(4) and resistor R2.
b. Remove and replace resistor R2 (para 4-11i).
c. Remove and replace switch S5(4) (para 4-11e).
d. After repair, return to step 07.

YES

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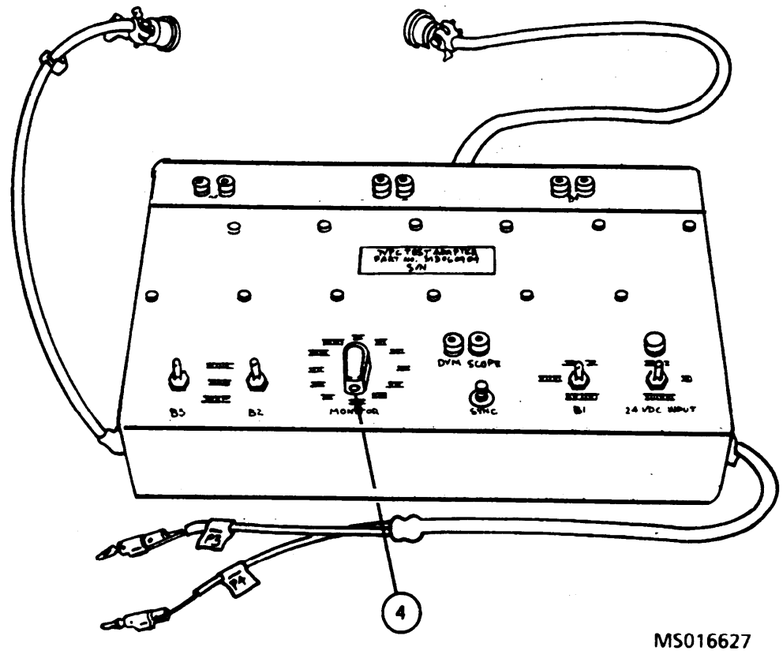

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4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 6 of 19)

Continued from previous page

STEP 12

Set MONITOR switch (4) to B2-A.

Did DIGITAL MULTIMETER read between 1.0 and 1.5Ω ?

NO

a. Repair wire between switch S5(4) and resistor R3.
b. Remove and replace resistor R3 (para 4-11i).
c. Remove and replace switch S5(4) (para 4-11e).
d. After repair, return to step 07.

YES

STEP 13

Set MONITOR switch (4) to B3-A.

Did DIGITAL MULTIMETER read between 1.0 and 1.5Ω ?

NO

a. Repair wire between switch S5(4) and resistor R4.
b. Remove and replace resistor R4 (para 4-11i).
c. Remove and replace switch S5(4) (para 4-11e).
d. After repair, return to step 07.

YES

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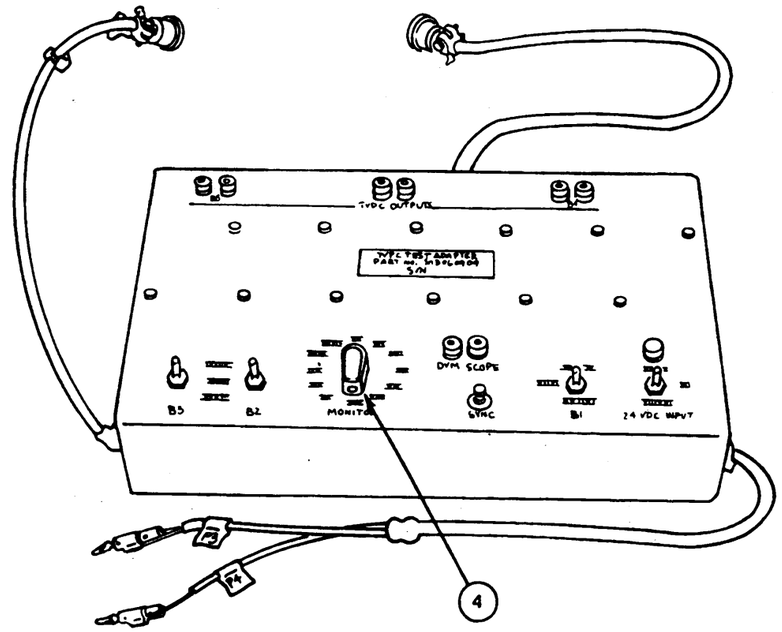
MS016628



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■4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 7 of 19)

Continued from previous page

STEP 14

On POWER CONDITIONER TEST ADAPTER set MONITOR switch S5(4) to OFF.

STEP 15

On DIGITAL MULTIMETER
a. Connect test leads from INPUT V-Ω terminal and COMMON terminal to pins P2-2 and P2-3 on plug P2 (18).
b. Set to read between 9 and 20Ω.

Did DIGITAL MULTIMETER read off scale?

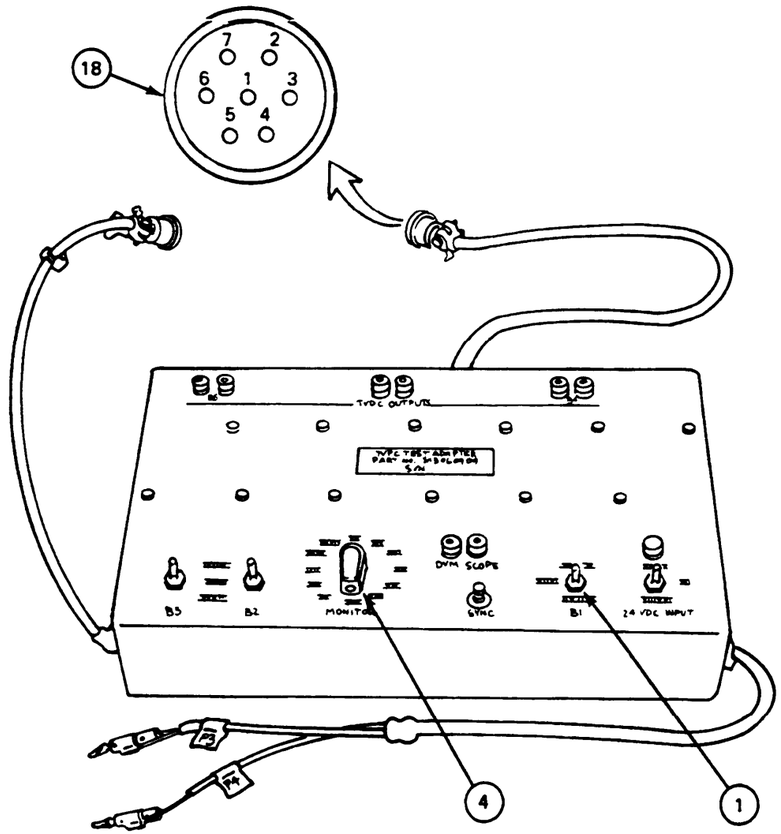
NO

a. Repair wire in B1 circuit.
b. Remove and replace switch S2(1) (para 4-11d).
c. After repair, return to step 15.

YES

STEP 16

Set switch B1(1) to FULL LOAD.



Did DIGITAL MULTIMETER read between 9.07 and 9.44Ω?

NO

a. Repair wire in B1 circuit.
b. Remove and replace resistors R5 and R6 (para 4-11c).
c. Remove and replace switch S2(1) (para 4-11d.
d. After repair, return to step 15.

YES

STEP 17

Set switch B1(1) to HALF LOAD.

Did DIGITAL MULTIMETER read between 18.13 and 18.87Ω?

NO

a. Repair wire in B1 circuit.
b. Remove and replace resistor R7 (para 4-11i).
c. Remove and replace switch S2(1) (para 4-11d)
d. After repair, return to step 15.

YES

Go to next page

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4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 9 of 19)

Continued from previous page

STEP 18

Connect a jumper between B1-V +24 jack (12) and B1-V +24 RTN jack (13).

YES

Did DIGITAL MULTIMETER read between 0 and 0.5Ω ?

NO

a. Repair wire in B1 circuit.
b. After repair, return to step 15.

STEP 19

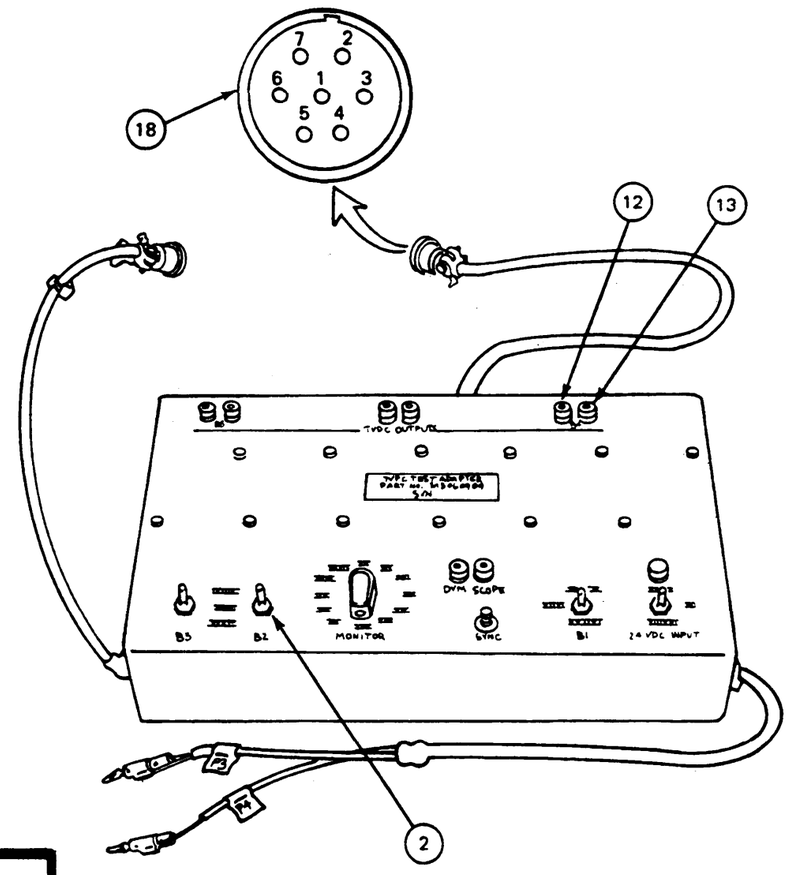
On DIGITAL MULTIMETER:
a. Connect test leads from INPUT V-Ω terminal to pins P2-4 and P2-5 on plug P2 (18).
b. Set to read between 100 and 201Ω.

Did DIGITAL MULTIMETER read off scale?

NO

a. Repair wire in B2 circuit.
b. Remove and replace switch S3(2) (para 4-11d).
c. After repair, return to step 19.

YES



STEP 20

Set switch B2(2) to FULL LOAD.

Did DIGITAL MULTIMETER read between 99 and 103Ω?

NO

a. Repair wire in B2 circuit.
b. Remove and replace resistor R8 (para 4-11c).
c. Remove and replace switch S3(2) (para 4-11d).
d. After repair, return to step 19.

YES

Go to next page

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 9 of 19)

Continued from previous page

STEP 21

Set switch B2(2) to HALF LOAD.

Did DIGITAL MULTIMETER read between 197 and 205Ω?

NO →
a. Repair wire in B2 circuit.
b. Remove and replace resistor R9 (para 4-11c).
c. Remove and replace switch S3(2) (para 4-11d).
d. After repair, return to step 19.

YES

STEP 22

Connect a jumper between B2-V +50 jack (14) and B2-V +50 RTN jack (15).

Did DIGITAL MULTIMETER read between 0 and 0.5Ω ?

NO →
a. Repair wire in B2 circuit
b. After repair, return to step 19.

YES

STEP 23

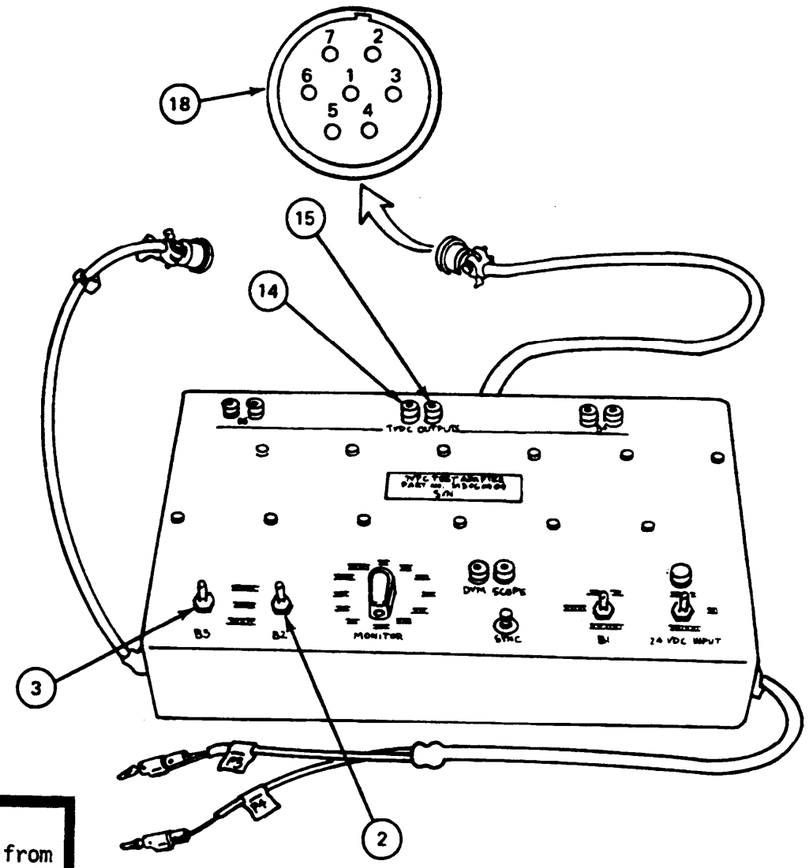
On DIGITAL MULTIMETER
a. Connect test leads from INPUT V-Ω terminal and COMMON terminal to pins P2-6 and P2-7 on plug P2 (18).
b. Set to read between 100 and 201Ω.

Did DIGITAL MULTIMETER read off scale?

NO →
a. Repair wire in B3 circuit.
b. Remove and replace switch S4(3) (para 4-11d).
c. After repair, return to step 23.

YES

Go to next page



MS016632

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 10 of 19)

Continued from previous page

STEP 24

Set switch B3(3) to FULL LOAD.

Did DIGITAL MULTIMETER read between 99 and 103Ω?

NO →
a. Repair wire in B3 circuit.
b. Remove and replace resistor R10 (para 4-11c).
c. Remove and replace switch S4 (3) (para 4-11d).
d. After repair, return to step 23.

YES

STEP 25

Set switch B3 (3) to HALF LOAD.

Did DIGITAL MULTIMETER read between 197 and 205Ω?

NO →
a. Repair wire in B3 circuit.
b. Remove and replace resistor R11 (para 4-11c).
c. Remove and replace switch S4(3) (para 4-11d).
d. After repair, return to step 23.

YES

STEP 26

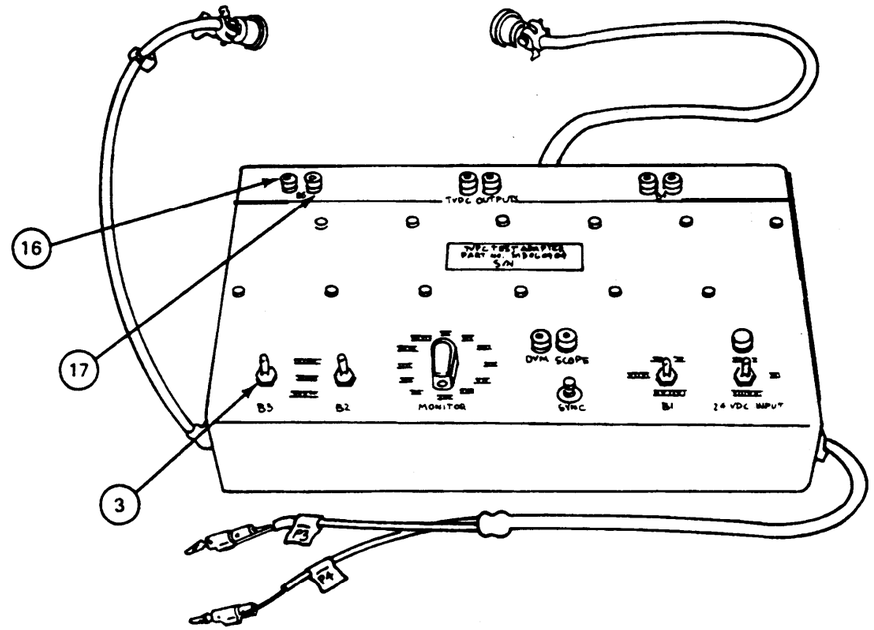
Connect a jumper between BV-3 -50 jack (16) and BV-3 -50 RTN jack (17).

Did DIGITAL MULTIMETER read between 0 and 0.5Ω ?

NO →
a. Repair wire in B3 circuit.
b. After repair, return to step 23.

YES

Go to next page



MS016633

4-6. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 11 of 19)

Continued from previous page

STEP 27

Set 24 VDC INPUT switch (5) to NORMAL.

STEP 28

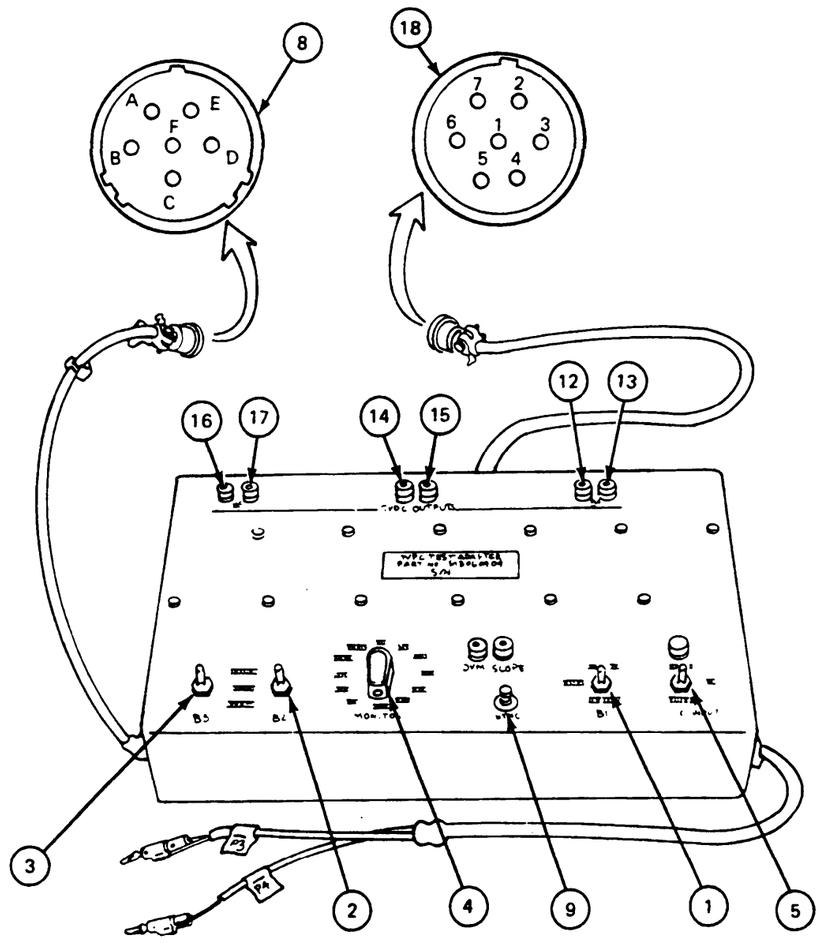
On DIGITAL MULTIMETER:
a. Connect test leads from INPUT V-Ω terminal and COMMON terminal to SYNC jack center post (9) and SYNC jack outer shell (9).
b. Set to read 0.1 ohms.

Did DIGITAL MULTIMETER read between 0.1 and 0.5Ω ?

NO

a. Repair wire between jack J1(9) and switch S2(5).
b. Repair wire between jack J1(9) and switch S5(4).
c. Remove and replace SYNC jack J1(9) (para 4-11f)
d. After repair, return to step 28.

YES



STEP 29

On POWER CONDITIONER TEST ADAPTER set:
a. 24 VDC INPUT switch (5) to OFF.
b. B1 switch (1) to FULL LOAD.
c. B2 switch (2) to FULL LOAD.
d. B3 switch (3) to FULL LOAD.

STEP 30

On POWER CONDITIONER TEST ADAPTER,
a. Remove all jumpers from POWER CONDITIONER OUTPUTS (12 thru 17),
b. Connect the following pairs of points with jumpers:

On Plug P1 (8)	On Plug P2 (18)
P1-A	P2-2
P1-B	P2-4
P1-C	P2-3
P1-D	P2-5
P1-E	P2-6
P1-F	P2-7

Go to next page

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4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 12 of 19)

Continued from previous page

STEP 31

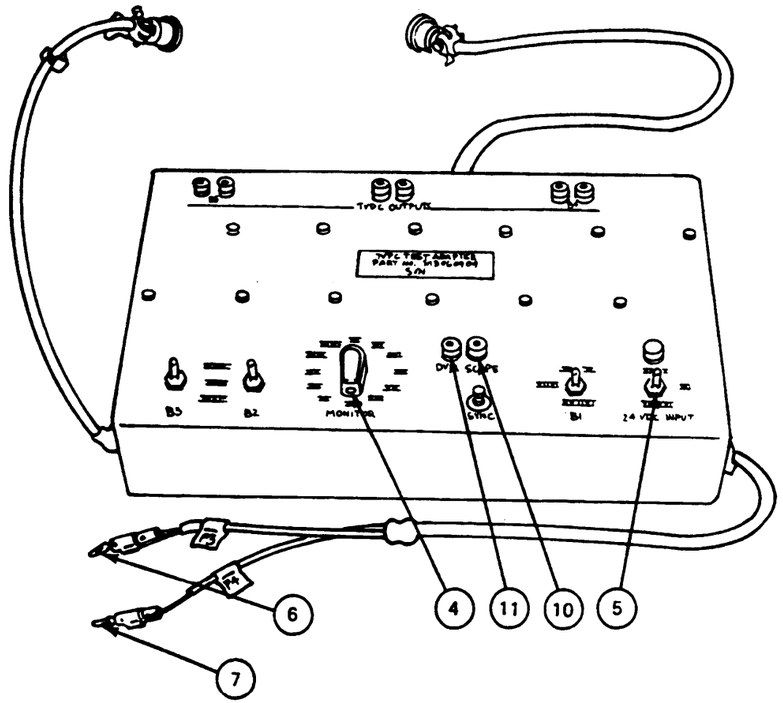
On DIGITAL MULTIMETER:
a. Set to measure volts.
b. select scale to read in 0.1 to 28 volt range.
c. Connect test lead from INPUT V-Ω terminal to DVM/SCOPE HI jack (11).
d. Connect test lead from COMMON terminal to DVM/SCOPE LO jack (10).

STEP 32

Connect power supply to POWER CONDITIONER TEST ADAPTER. Connect P3(6) to the positive (+) terminal and P4(7) to the negative (-) terminal.

STEP 33

Set MONITOR switch (4) to INPUT-V.



STEP 34

Set 24 VDC INPUT switch (5) to NORMAL.

STEP 35

Turn on power supply. Adjust for 20 ± 0.1 VDC on DIGITAL MULTIMETER.

Did 24 VDC INPUT LED light?

NO

a. Remove and replace resistor R12 (para 4-11j).
b. Remove and replace LED (para 4-11h).
c. After repair, return to step 35.

YES

STEP 36

Set 24 VDC INPUT switch (5) to REVERSE and hold.

Did LED go out? Did indicator on DIGITAL MULTIMETER change from "+" to "-"?

NO

a. Remove and replace LED (para 4-11h).
b. Remove and replace switch S1(5) (para 4-11d)
c. After repair, return to step 35.

YES

Go to next page

MS016635

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT)
(Sheet 13 of 19)

Continued from previous page

STEP 37

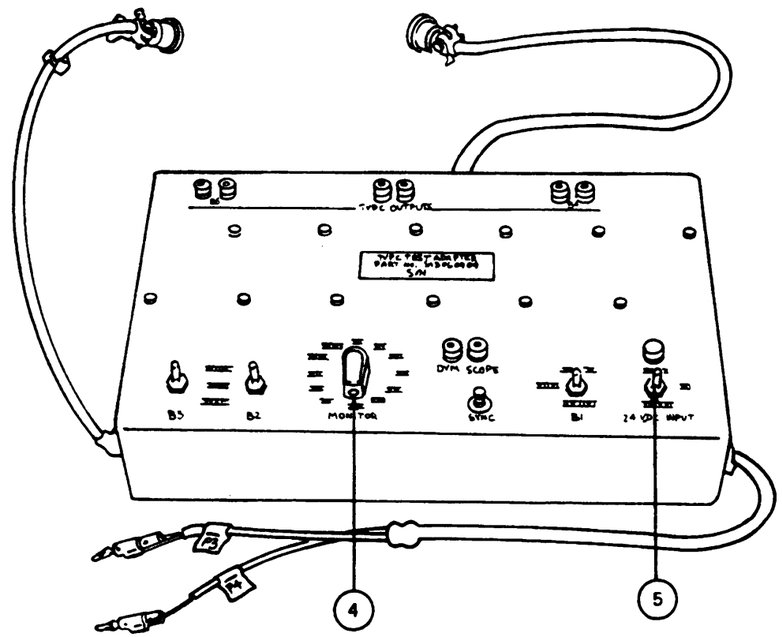
On TEST ADAPTER set:
a. 24 VDC INPUT switch (5) to NORMAL.
b. MONITOR switch (4) to B1-V.

STEP 38

Adjust power supply for 20 + 0.1 VDC on DIGITAL MULTIMETER.

STEP 39

Set MONITOR switch (4) to B3-A.



STEP 40

Record value on DIGITAL MULTIMETER as value "A" as a positive number without regard to negative sign.

STEP 41

Set MONITOR switch (4) to B2-A.

STEP 42

Record value on DIGITAL MULTIMETER as value "B"

STEP 43

Set MONITOR switch (4) to B1-A.

STEP 44

Record value on DIGITAL MULTIMETER as value "C".

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MS016636

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 14 of 19)

Continued from previous page

STEP 45

Set MONITOR switch (4) to INPUT-A.

STEP 46

Record value on DIGITAL MULTIMETER as value "D".

STEP 47

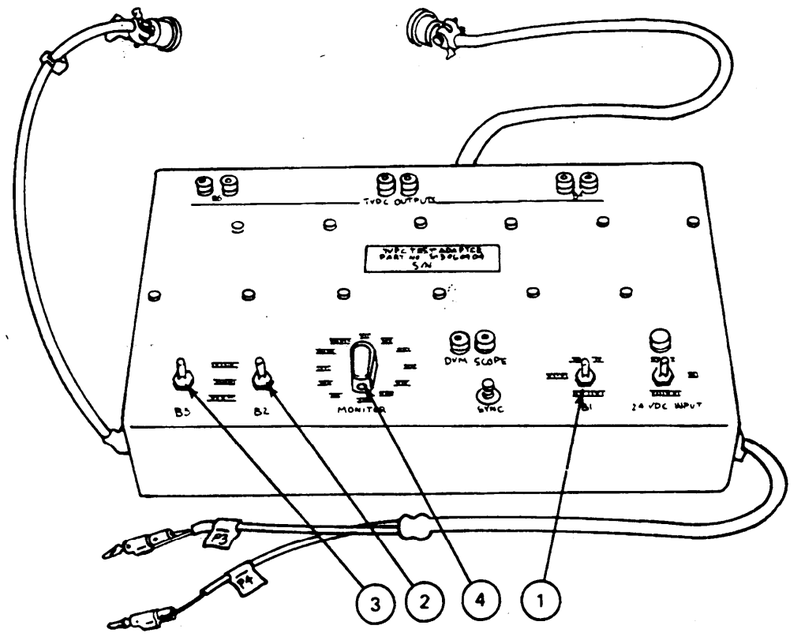
Sum values A, B, and C and record as value "E":

A + B + C = E

STEP 48

Multiply value "E" by ten and record as value "F".

E x 10 = F



STEP 49

Multiply value "D" by one hundred and record as value "G":

D x 100 = G

STEP 50

Subtract value "F" from value "G" and record as value "H":

G - F = H

Is value "H" between +D and -D?

NO

a. Repeat steps 47 thru 50.
b. Remove and replace resistor R1. (para 4-11i).
c. Remove and replace resistor R2 (para 4-11i).
d. Remove and replace resistor R3 (para 4-11i).
e. Remove and replace resistor R4 (para 4-11i).
f. After repair, return to step 37.

YES

STEP 51

On TEST ADAPTER set:
a. B1 switch (1) to NO LOAD.
b. B2 switch (2) to NO LOAD.
c. B3 switch (3) to NO LOAD.
d. MONITOR switch (4) to B1-V.

Go to next page

MS016637

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 15 of 19)

STEP 52

Adjust power supply for 20 + 0.5 VDC on DIGITAL MULTIMETER.

STEP 53

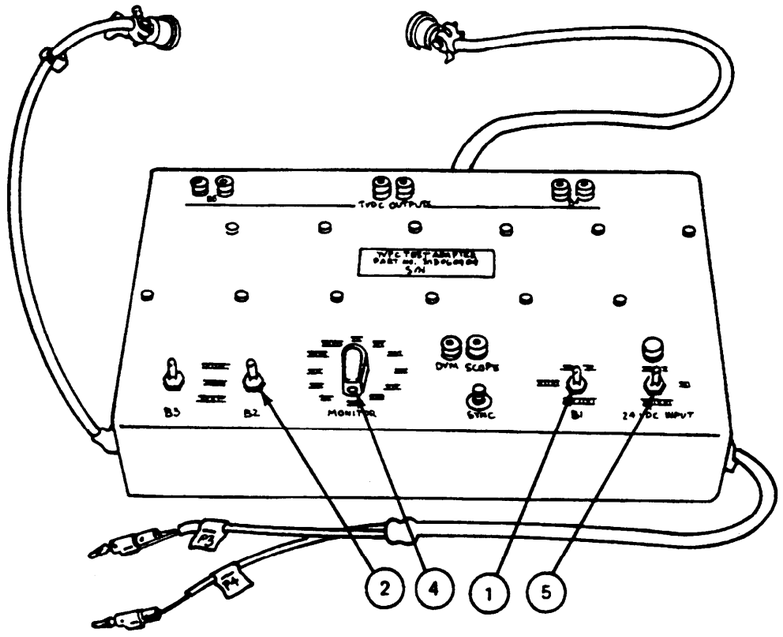
Set MONITOR switch (4) to B1-A.

Did DIGITAL MULTIMETER read between -0.5 and +0.5 VDC?

NO

a. Remove and replace switch S2(1) (para 4-11d).
b. After repair, return to step 37.

YES



STEP 54

Set MONITOR switch (4) to B2-V.

STEP 55

Adjust power supply for 20 + 0.5 VDC on DIGITAL MULTIMETER.

STEP 56

Set MONITOR switch (4) to B2-A.

Did DIGITAL MULTIMETER read between -0.5 and +0.5 VDC?

NO

a. Remove and replace switch S3(2) (para 4-11d).
b. After repair, return to step 37.

YES

Go to next page

■ 4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLSHOOTING PROCEDURE (CONT)
(Sheet 16 of 19)

Continued from previous page

STEP 57

Set MONITOR switch (4) to B3-V.

STEP 58

Adjust power supply for 2.0 + 0.5 VDC on DIGITAL MULTIMETER.

STEP 59

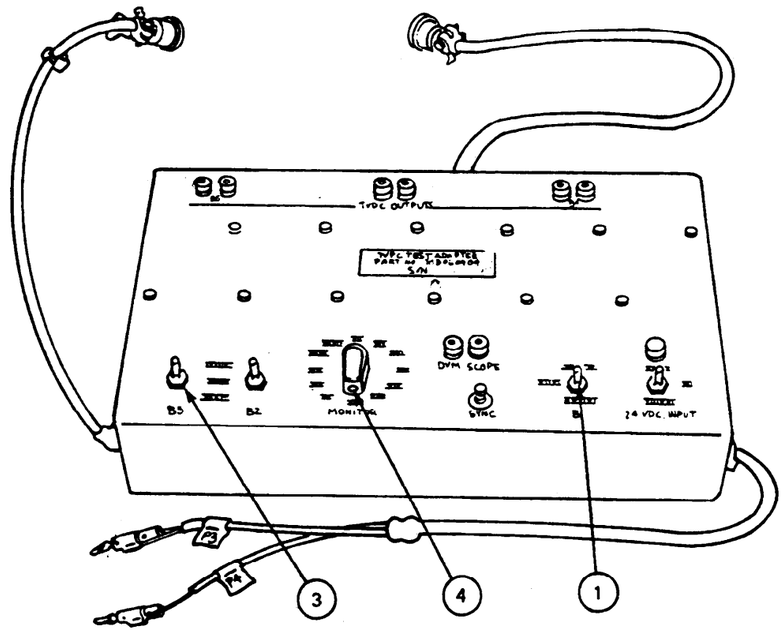
Set MONITOR switch (4) to B3-A.

Did DIGITAL MULTIMETER read between -0.5 and +0.5 VDC?

NO

a. Remove and-replace switch S4 (3) (para 4-11d).
b. After repair, return to step 37.

YES



STEP 60

Set B1 switch (1) to FULL LOAD. Set MONITOR switch (4) to B1-V.

STEP 61

Adjust power supply for 2.0 + 0.01 VDC on DIGITAL MULTIMETER.

STEP 62

Set MONITOR switch (4) to B1-A.

Did DIGITAL MULTIMETER read between 2.97 and 3.03 VDC?

NO

a. Remove and replace resistors R5 and R6 (para 4-11c).
b. After repair, return to step 37.

YES

Go to next page

MS016639

■ 4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 17 of 19)

Continued from previous page

STEP 63

Set B1 switch (1) to HALF LOAD. Set MONITOR switch (1) to B1-V.

STEP 64

Adjust power supply for 20+_ 0.01 VDC on DIGITAL MULTIMETER.

STEP 65

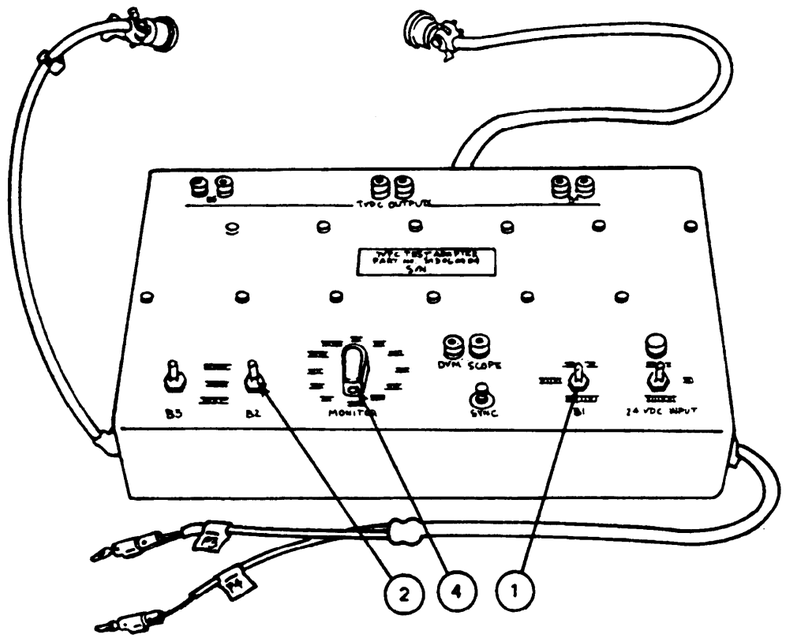
Set MONITOR switch (4) to B1-A.

Did DIGITAL MULTI-METER read between 1.48 and 1.54 VDC?

NO

a. Remove and replace resistor R7 (para 4-11i).
b. After repair, return to step 37.

YES



STEP 66

Set B2 switch (2) to FULL LOAD. Set MONITOR switch (4) to B2-V.

STEP 67

Adjust power supply for 20 + 0.01 VDC on DIGITAL MULTIMETER.

STEP 68

Set MONITOR switch (4) to B2-A.

Did DIGITAL MULTI-METER read between 0.272 and 0.283 VDC?

NO

a. Remove and replace resistor R8 (para 4-11c)
b. After repair, return to step 37

YES

Go to next page

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4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 18 of 19)

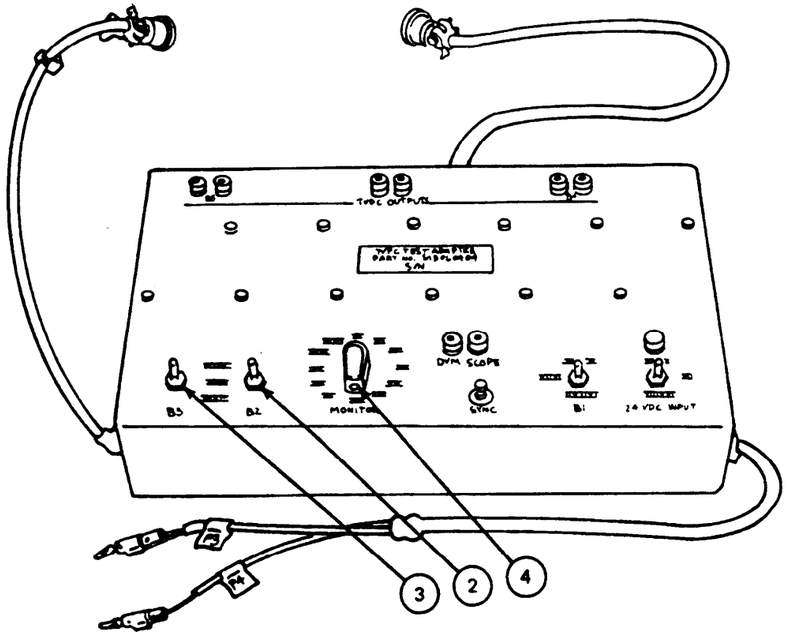
Continued from previous page

STEP 69

Set B2 switch (2) to HALF LOAD. Set MONITOR switch (4) to B2-V.

STEP 70

Adjust power supply for 20 + 0.01 VDC on DIGITAL MULTIMETER.



STEP 71

Set MONITOR switch (4) to B2-A.

Did DIGITAL MULTIMETER read between 0.137 and 0.142 VDC?

NO

a. Remove and replace resistor R9 (para 4-11c).
b. After repair, return to step 37.

YES

STEP 72

Set B3 switch (3) to FULL LOAD. Set MONITOR switch (4) to B3-V.

STEP 73

Adjust power supply for 20 + 0.01 VDC on DIGITAL MULTIMETER.

STEP 74

Set MONITOR switch (4) to B3-A.

Did DIGITAL MULTIMETER read between -0.272 and -0.283 VDC?

NO

a. Remove and replace resistor R10 (para 4-11c).
b. After repair, return to step 37.

YES

MS016641

Go to next page

4-8. POWER CONDITIONER TEST ADAPTER CHECKOUT AND TROUBLESHOOTING PROCEDURE (CONT) (Sheet 19 of 19)

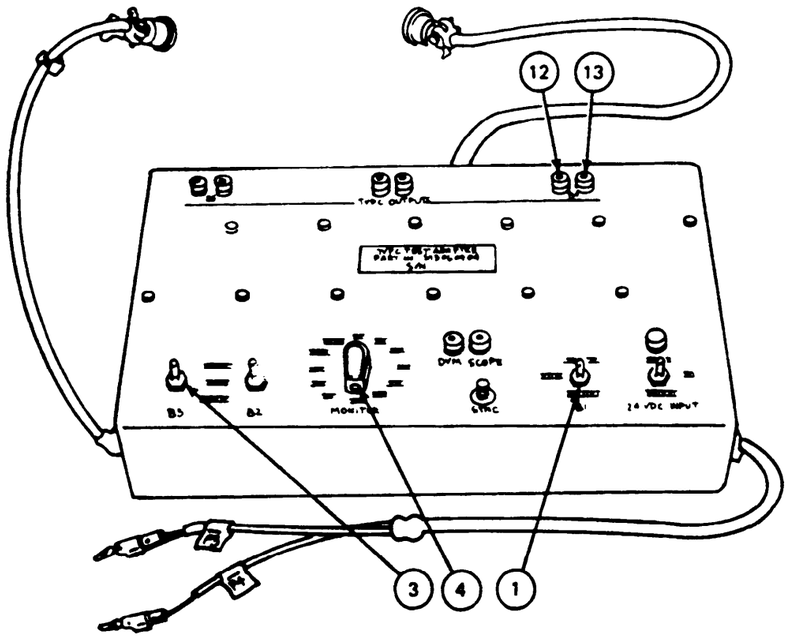
Continued from previous page

STEP 75

Set B3 switch (3) to HALF LOAD. Set MONITOR switch (4) to B3-V.

STEP 76

Adjust power supply for 20 + 0.01 VDC on DIGITAL MULTIMETER.



STEP 77

Set MONITOR switch (4) to B3-A.

Did DIGITAL MULTIMETER read between -0.137 and -0.142 VDC?

NO

a. Remove and replace resistor R11 (para 4-11c).
b. After repair, return to step 37.

YES

STEP 78

Set B1 switch (1) to NO LOAD. Set MONITOR switch (4) to OFF.

STEP 79

a. Connect test lead from DIGITAL MULTIMETER INPUT V-Ω terminal to B1-V +24 jack (12).
b. Connect test lead from DIGITAL MULTIMETER COMMON terminal to B1-V +24 RTN jack (13).

STEP 80

Adjust power supply for 20 + 0.5 VDC on DIGITAL MULTIMETER.

STEP 81

Set MONITOR switch (4) to B1-S.

Did DIGITAL MULTIMETER read between 27.5 and 28.5 VDC?

NO

a. Remove and replace relay K1 (para 4-11g).
b. After repair, return to step 78.

YES

END OF TASK

MS016642

4-9. TOW 2 TEST EQUIPMENT MAINTENANCE PROCEDURES

For maintenance procedures for the battery charger monitor unit, see para 4-10. For maintenance procedures for the power conditioner test adapter, see para 4-11.

Maintenance procedures for the TOW 2 TMDE are contained in the following manuals:

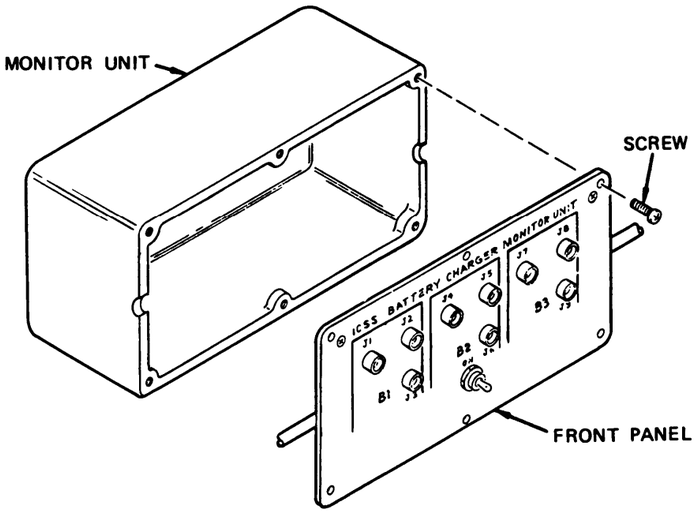
- Missile guidance set test set - see TM 9-4935-455-14.
- Electrical cable test set - see TM 9-4935-455-14.
- Electrical circuit test set - see TM 9-4935-455-14.
- Amplifier test set - see TM 9-4935-455-14.

4-10. BATTERY CHARGER MONITOR UNIT MAINTENANCE PROCEDURES (Sheet 1 of 2)

Index to Procedures

a. Removal and Replacement of Front Panel

TOOLS: No. 2 cross tip screwdriver



STEP 1. REMOVAL

Remove six screws and monitor unit front panel.

STEP 2. REPLACEMENT

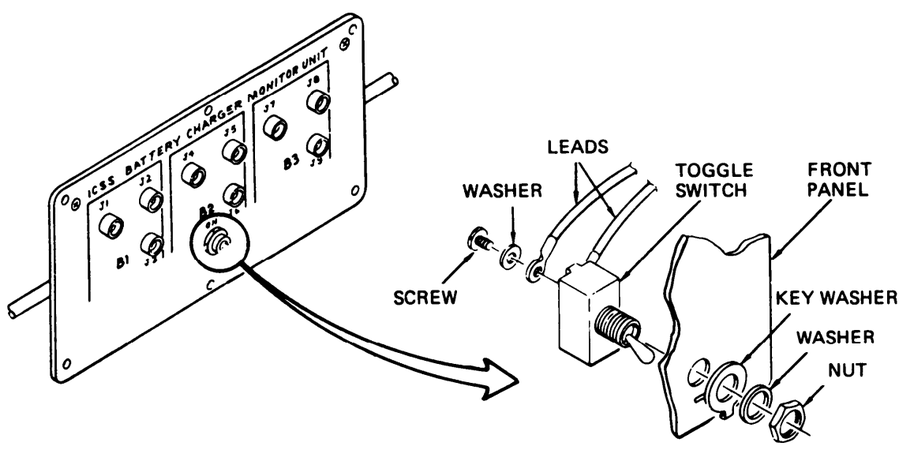
Install front panel on monitor unit with six screws.

END OF TASK

4-10. BATTERY CHARGER MONITOR UNIT MAINTENANCE PROCEDURES (CONT) (Sheet 2 of 2)

b. Removal and Replacement of Toggle Switch

TOOLS: 1/4 inch flat tip screwdriver
1/2 inch open end wrench



STEP 1. REMOVAL

A. Remove monitor unit front panel (para 4-10a, step 1).

B. Tag two leads at back of switch.

C. Remove two screws, two washers and two leads.

D. Remove nut, washer and keywasher from switch.

E. Remove switch from panel.

STEP 2. REPLACEMENT

A. Install toggle switch into panel.

B. Line key on keywasher up with hole on panel and install keywasher, washer, and nut on toggle switch.

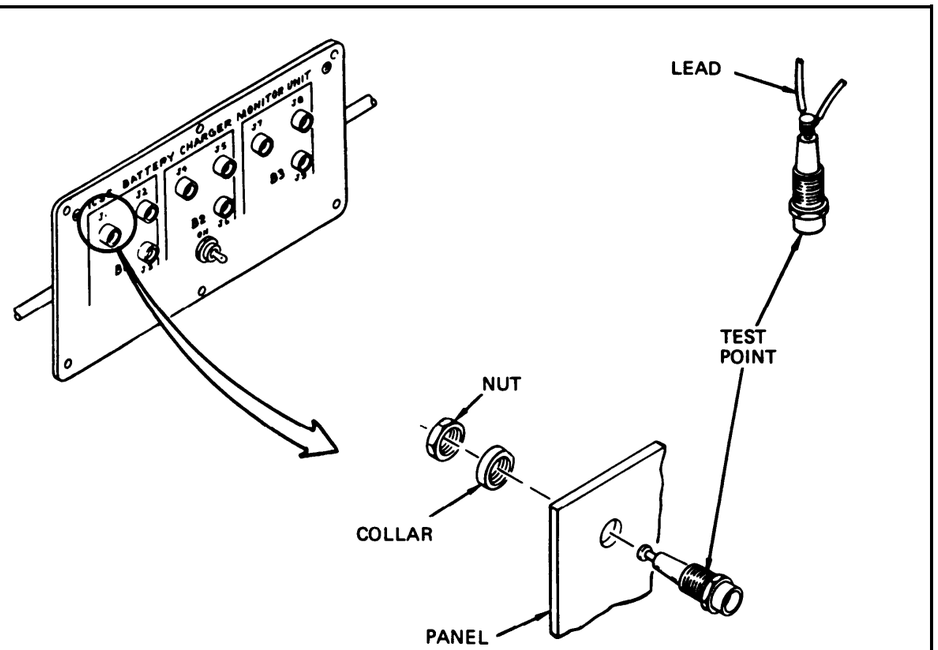
C. Install two tagged leads, two washers, and two screws on switch.

D. Replace monitor unit front panel (para 4-10a, step 2).

END OF TASK

c. Removal and Replacement of Test Points

TOOLS : Soldering iron
7/16 inch open end wrench



STEP 1. REMOVAL

A. Remove monitor unit front panel (para 4-10a, step 1).

B. Tag and unsolder two leads at back of test point.

C. Remove nut and collar from test point.

D. Slide test point out of panel.

STEP 2. REPLACEMENT

A. Install test point in panel.

B. Install collar and nut on test point.

C. Solder two tagged leads to back of test point.

D. Replace monitor unit front panel (para 4-10a, step 2).

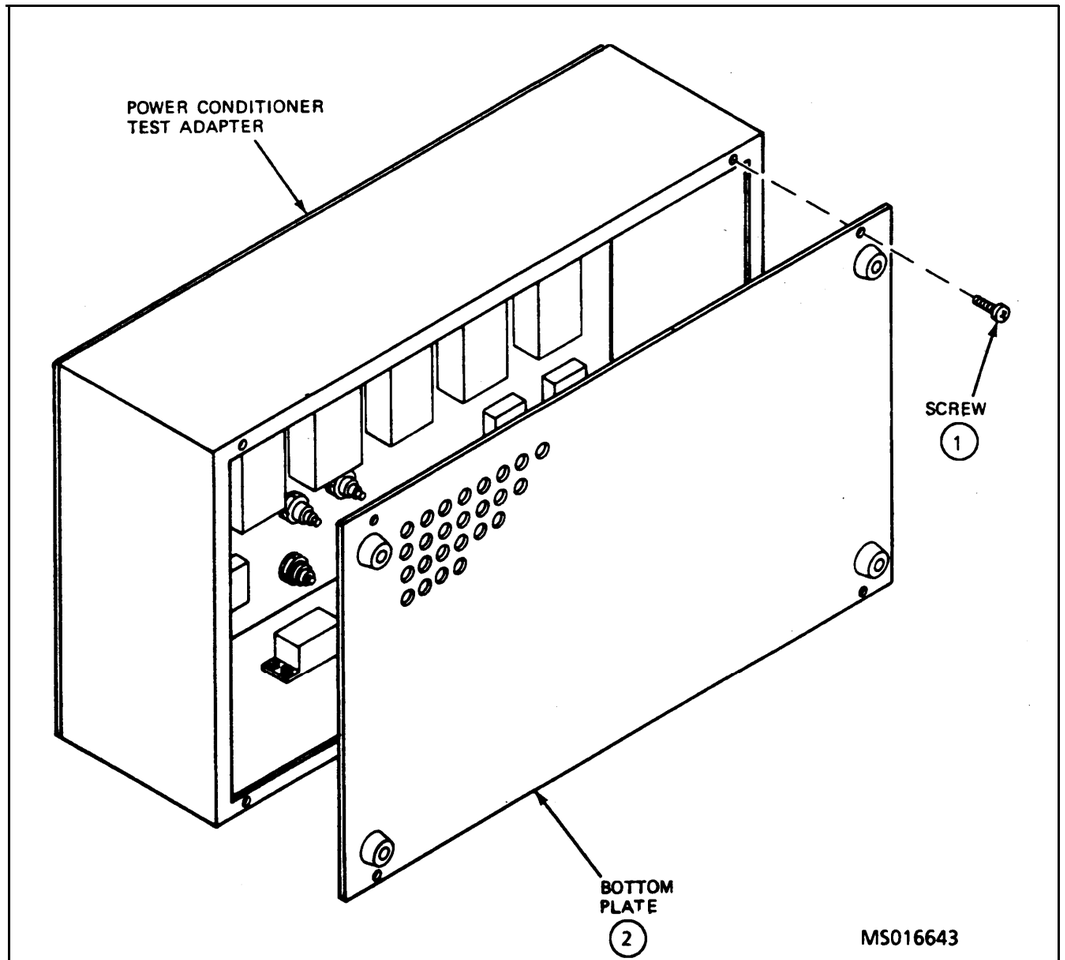
END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (Sheet 1 of 8)

Index to Procedures

a. Removal and Replacement of Bottom Plate

TOOLS: Screwdriver



STEP 1. REMOVAL

Remove four screws (1) and bottom plate (2) from power conditioner test adapter.

STEP 2 REPLACEMENT

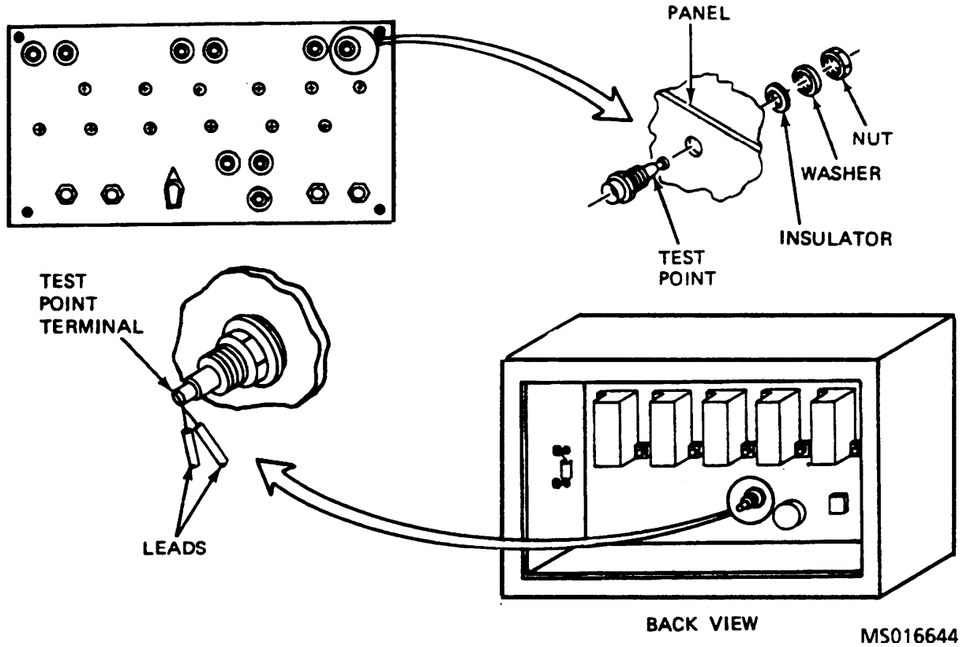
Install bottom plate (2) on power conditioner test adapter with four screws (1).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 2 of 8)

b. Removal and Replacement of Test Points

TOOLS: Soldering iron
Socket wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag and unsolder leads from test point terminal.

C. Remove nut, washer, and insulator from test point.

D. Remove test point from power conditioner test adapter.

STEP 2. REPLACEMENT

A. Slide test point into panel.

B. Install insulator, washer, and nut on test point.

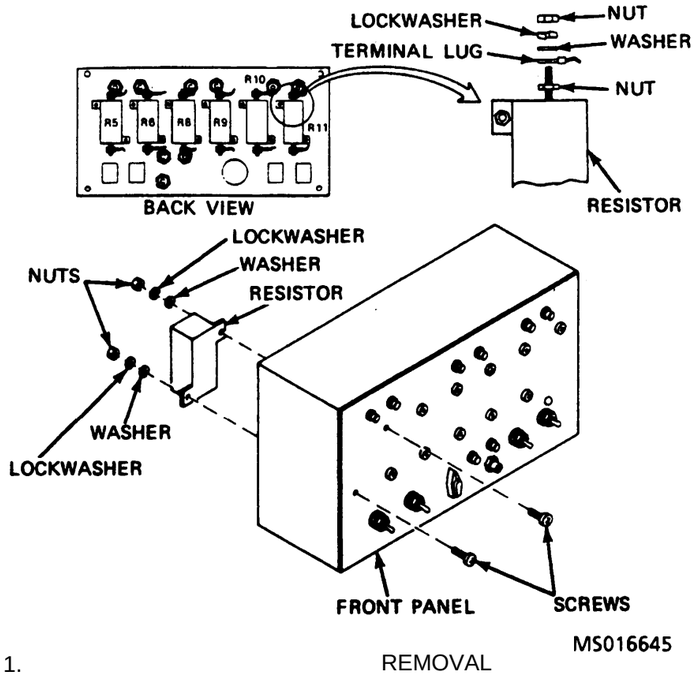
C. Solder tagged leads to test point terminal. Remove tags.

D. Replace bottom plate (para 4-11a, step 2).

END OF TASK

c. Removal and Replacement of Resistors R5, R6, R8, R9, R10, and R11

TOOLS: Screwdriver
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag connecting wires to top and bottom terminals of resistor.

C. Remove nut, lockwasher, washer, and terminal lug from top and bottom terminals.

D. Remove two screws, two nuts, two lockwashers and two washers and remove resistor.

STEP 2. REPLACEMENT

A. Position resistor on back of front panel so that mounting holes are aligned. Install two screws, two lockwashers, two washers and two nuts to hold resistor in place.

B. Place terminal lug of connecting wires on resistor terminals and install washer, lockwasher, and nut on each terminal. Remove tags.

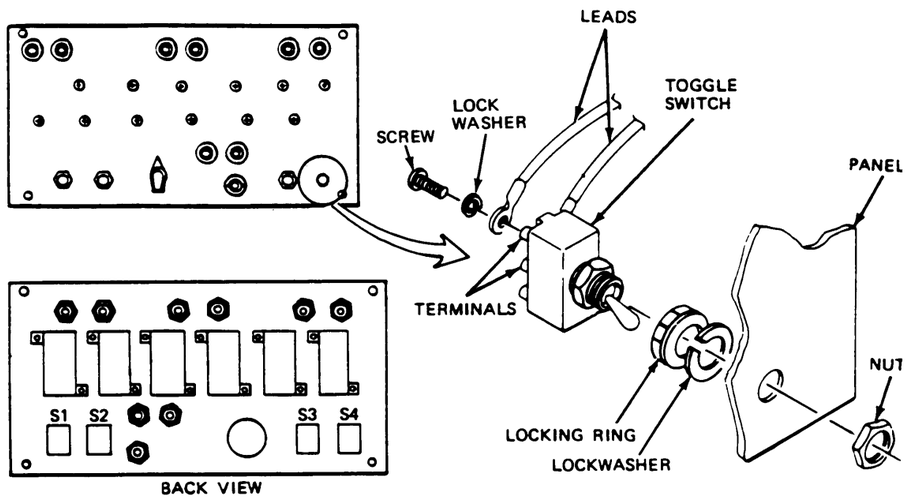
C. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 3 of 8)

d. Removal and Replacement of Toggle Switches S1, S2, S3, and S4

TOOLS: Screwdriver
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag leads and remove screws, lockwasher, and terminals.

C. Remove nut.

D. Remove toggle switch, lockwasher, and locking ring.

STEP 2. REPLACEMENT

A. Install locking ring and lockwasher on toggle switch.

B. Slide toggle switch into panel.

C. Install nut on toggle switch.

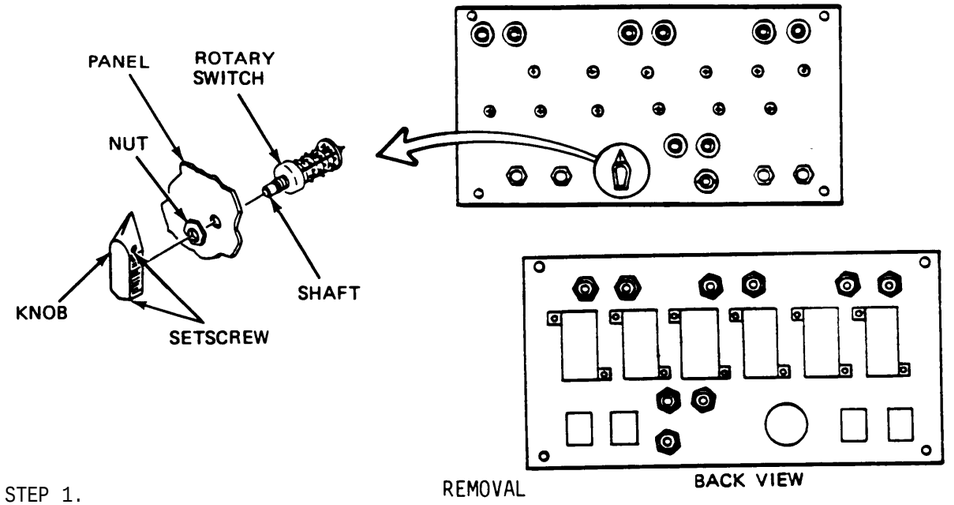
D. Install terminals, washer, and screw on toggle switch. Remove tags.

E. Replace bottom plate (4-11a, step 2).

END OF TASK

e. Removal and Replacement of Rotary Switch S5

TOOLS: Soldering iron
Socket head screw key
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag and unsolder leads from terminals.

C. Loosen two setscrews and slide knob off rotary switch shaft.

D. Remove nut from rotary switch shaft.

E. Slide rotary switch out of panel.

STEP 2. REPLACEMENT

A. Slide rotary switch into panel.

B. Install nut on rotary switch.

C. Install knob on rotary switch shaft and tighten two setscrews.

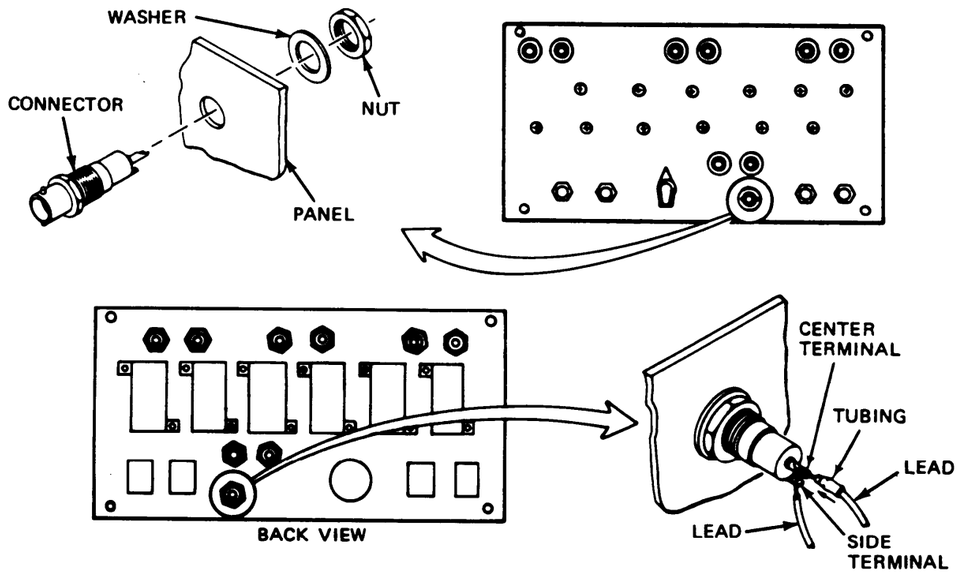
D. Solder tagged leads to terminals. Remove tags.

E. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 4 of 8)

f. Removal and Replacement of Connector



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Slide protective tubing off connector center terminal and onto lead.

C. Tag and unsolder lead from center terminal and lead from side terminal.

D. Remove nut and washer from connector.

E. Slide connector out of panel.

STEP 2. REPLACEMENT

A. Slide connector into panel.

B. Install washer and nut on connector.

C. Solder tagged leads to terminals. Remove tags.

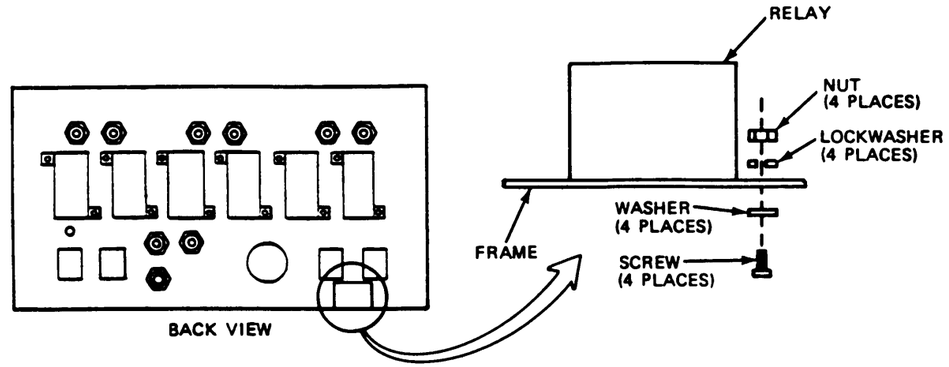
D. Slide protective tubing down wire and onto center terminal.

E. Replace bottom plate (para 4-11a, step 2).

END OF TASK

g. Removal and Replacement of Relay

TOOLS: Soldering iron
Screwdriver
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag and unsolder connecting leads.

C. Remove four screws, four washers, four lockwashers and four nuts and remove relay.

STEP 2. REPLACEMENT

A. Position relay on frame so that mounting holes are lined up.

B. Install four screws, four washers, four lockwashers, and four nuts.

C. Solder tagged leads to terminals. Remove tags.

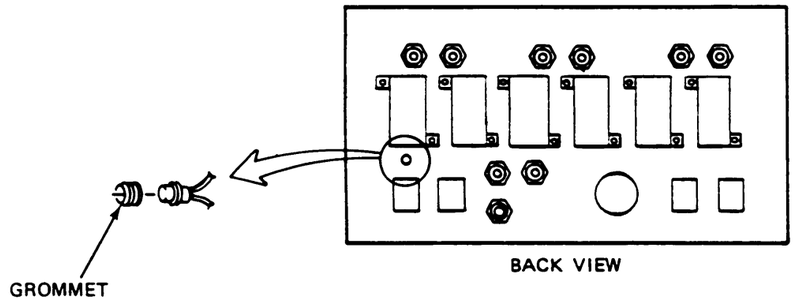
D. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 5 of 8)

h. Removal and Replacement of LED

TOOLS: Soldering iron



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag and unsolder connecting leads.

C. Push LED and grommet out of mounting hole.

STEP 2. REPLACEMENT

A. Install grommet into mounting hole from rear of panel.

B. Solder connecting leads in place. Remove tags.

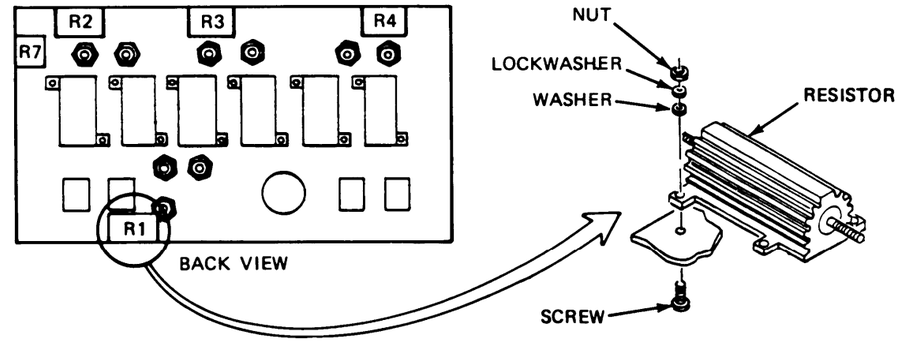
C. Install LED through grommet from rear of panel.

D. Replace bottom plate (para 4-11, step 2).

END OF TASK

i. Removal and Replacement of Resistors R1, R2, R3, R4, and R7

TOOLS: Soldering iron
screwdriver
wrench



STEP 1. REMOVAL

A. Remove bottom panel (para 4-11a, step 1).

B. Tag and unsolder connecting leads.

C. Remove two screws, two washers, two lockwashers, and two nuts.

D. Remove resistor.

STEP 2. REPLACEMENT

A. Position resistor on frame so that mounting holes are lined up.

B. Install two screws, two washers, two lockwashers, and two nuts to hold resistor in place.

C. Solder tagged leads to resistor terminals. Remove tags.

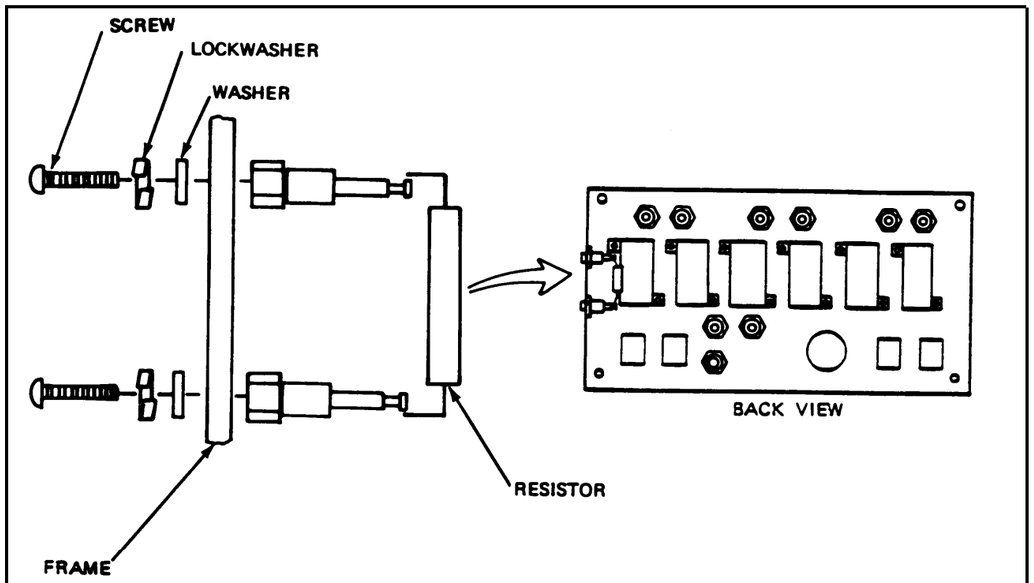
D. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 6 of 8)

j. Removal and Replacement of Resistor R12 and Terminal

TOOLS: Soldering iron
Screwdriver
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Tag and unsolder leads and resistor from terminal and remove resistor.

C. Remove two screws, two lockwashers, two washers, and two terminals.

STEP 2. REPLACEMENT

A. Install two screws, two lockwashers, two washers, and two terminals.

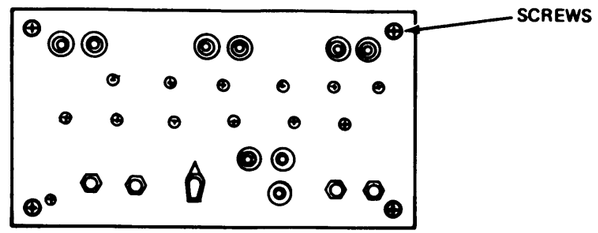
B. Solder resistor and leads to terminal. Remove tags.

C. Install back plate (para 4-11a, step 2).

END OF TASK

k. Removal and Replacement of Top Panel

TOOLS: Screwdriver
Wrench



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Remove test points (para 4-11b, step 1).

C. Remove resistors R5, R6, R8, R9, R10, and R11 (para 4-11c, step 1).

D. Remove toggle switches S1, S2, S3, and S4 (para 4-11d, step 1).

E. Remove rotary switch S5 (para 4-11e, step 1).

F. Remove connector (para 4-11f, step 1).

G. Remove LED (para 4-11h, step 1).

H. Remove four screws and remove front panel.

STEP 2. REPLACEMENT

A. Position front panel so that mounting holes line up and install four screws.

B. Replace LED (para 4-11h, step 2).

C. Replace connector (para 4-11f, step 2).

D. Replace rotary switch S5 (para 4-11e, step 2).

E. Replace toggle switches S1, S2, S3, and S4 (para 4-11d, step 2).

F. Replace resistors R5, R6, R8, R9, R10, and R11 (para 4-11c, step 2).

G. Replace test points (para 4-11b, step 2).

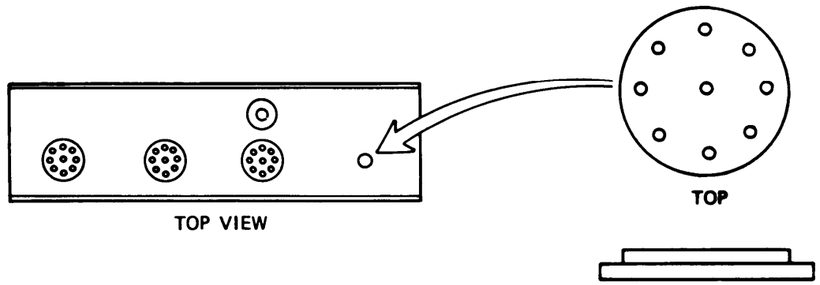
H. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 7 of 8)

l. Removal and Replacement of Vent Plugs

TOOLS: Screwdriver



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Grasp vent plug from behind, squeeze toward center and push out through hole.

STEP 2. REPLACEMENT

A. Position vent plug in front of mounting hole. Reach through hole and squeeze rear portion toward center and pull through mounting hole to seat vent plug.

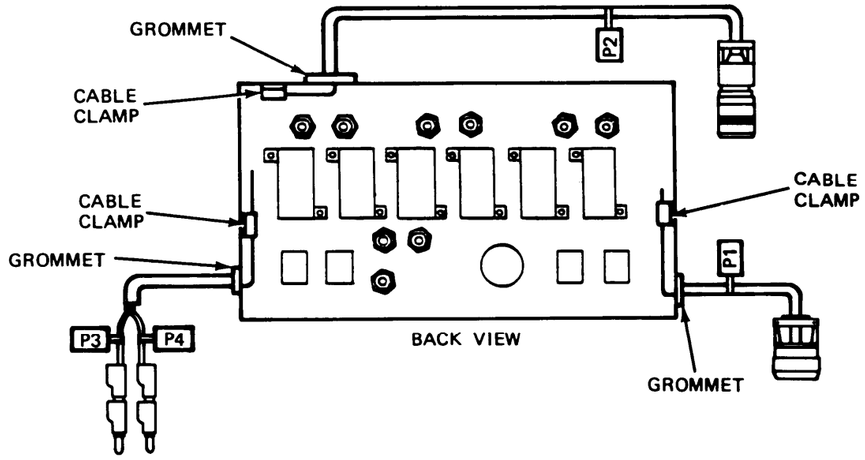
B. Replace bottom plate (para 4-11a, step 2).

END OF TASK

m. Removal and Replacement of Cables

TOOLS: Soldering iron, Wrench, Screwdriver, Heat gun

MATERIALS: Nylon sleeving (item 9, App. D)
Shrink sleeving (item 10, App. D)
Cable ties (item 11, App. D)



STEP 1. REMOVAL

A. Remove bottom plate (para 4-11a, step 1).

B. Cut shrink sleeving from solder joints.

C. Tag and unsolder wires.

D. Cut or remove cable ties as necessary.

E. Remove cable clamp.

F. Carefully pull cable out through hole.

G. Remove rubber grommet.

H. Remove nylon sleeving from cable.

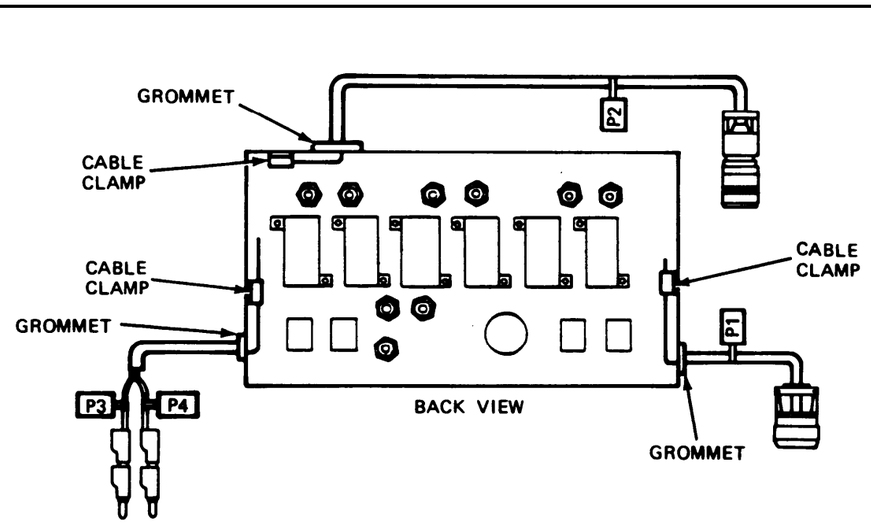
I. Replace any damaged wire with a wire of the same size and length.

J. Replace nylon sleeving on cable.

GO TO NEXT PAGE

4-11. POWER CONDITIONER TEST ADAPTER MAINTENANCE PROCEDURES (CONT) (Sheet 8 of 8)

m. Removal and Replacement of Cables (Cont)



STEP 2. REPLACEMENT

A. Replace rubber grommet.

B. Thread cable through hole in frame.

C. Slide shrink sleeving onto wires clear of soldering area.

D. Solder tagged wires in place. Remove tags.

E. Slide shrink sleeving down over solder joint and shrink.

F. Replace cable ties.

G. Replace cable clamp.

H. Replace bottom plate (para 4-11a, step 2).

END OF TASK

4-12. TOW 2 WEAPON SYSTEM MAINTENANCE PROCEDURES

For maintenance of the TOW 2 weapon system, refer to TM 9-1425-450-34-1.

Section II. DRAGON WEAPON SYSTEM

4-13. SCOPE

This section contains references to the applicable manuals for operation and maintenance of the DRAGON weapon system.

4-14. OPERATION

For operating instructions on the DRAGON weapon system, see the following manuals:

TM 9-1425-484-10
TM 9-6920-484-12
TM 9-4935-484-14

4-15. OPERATIONAL

See TM 9-4935-484-14.

4-16. REPAIR PROCEDURES

See TM 9-1425-484-24.

Section III. MANPORTABLE COMMON THERMAL NIGHT SIGHT (MCTNS)

4-17. SCOPE

This section contains references to the applicable manuals for operation and maintenance of the Manportable Common Thermal Night Sight (MCTNS) AN/TAS-4A, AN/TAS-5, and AN/TAS-6.

4-18. REPAIR PARTS

Repair parts for the MCTNS are listed in TM9-5655-247-24P-1.

4-19. SPECIAL TOOLS AND SUPPORT EQUIPMENT

a. Boresight Collimator Test Set (BSCTS)

See TM 9-5855-286-14 and TM 9-5855-288-24P.

b. Test Set, Night Vision Sight AN/TAM-3, AN/TAM-3A, and AN/TAM-3B.

See TM 9-5855-255-14 and TM 9-5855-255-24P.

4-20. MCTNS COMPONENT ITEMS

a. AN/TAS-4A (TOW 2 Night Sight)

See TM 9-5855-450-24.

b. AN/TAS-5 (DRAGON Night Tracker)

See TM 9-5855-247-24 and TM 9-5855-247-24P-1.

c. AN/TAS-6 (Night Observation Device-Long Range (NOD-LR))

See TM 9-5855-247-24 and TM 9-5855-247-24P-2.

4-21. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

For AN/TAS-4A PMCS, see TM 9-5855-450-24. For AN/TAS-5 or AN/TAS-6 PMCS, see TM 9-5855-247-24.

4-22. TROUBLESHOOTING

For AN/TAS-4A troubleshooting, see TM 9-5855-450-24. For AN/TAS-5 or AN/TAS-6 troubleshooting, see TM9-5855-247-24.

4-23. MCTNS TEST EQUIPMENT MAINTENANCE PROCEDURES

See TM 9-5855-255-14, TM 9-5855-255-24P, TM 9-5855-247-24, TM 9-5855-247-24P-1 and TM 9-5855-247-24P-2.

4-24. MCTNS AND TRAINING EQUIPMENT MAINTENANCE PROCEDURES

For AN/TAS-4A maintenance, see TM 9-5855-450-24. For AN/TAS-5, AN/TAS-6, or training equipment maintenance, see TM9-5855-247-24.

NOTE

TM 9-1425-484-24 contains some repair procedures for the DRAGON Night Tracker AN/TAS-5. Purging procedures for the DRAGON Night Tracker are the same as those for the DRAGON IR Tracker and are contained in TM 9-1425-481-34.

Section IV. BFVS BASIC SIGHT ASSEMBLY (BSA) AND TOW SUBSYSTEM TEST SET (TSSTS)

4-25. SCOPE

This section contains references to the applicable manuals for operation and maintenance of the Bradley Fighting Vehicle System (BFVS) Basic Sight Assembly (BSA) and TW Subsystem Test Set (TSSTS).

4-26. REPAIR PARTS

Repair parts for the BSA are listed in TM 9-1240-394-34P. Repair parts for the TSSTS are listed in TM 9-4935-474-24P-1.

4-27. SPECIAL TOOLS AND SUPPORT EQUIPMENT

a. BSA Support Equipment and Alignment Breakout Box (ABOB)

See TM 9-4935-474-14.

b. Test Set, Night Vision Sight AN/TAM-3A

See TM 9-5855-255-14 and TM 9-5855-255-24P.

c. BFVS Alinement Test Set

See TM 9-4935-474-14.

4-28. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

For BSA PMCS, see TM 9-2350-252-10-2. For TSSTS PMCS, see TM 9-4935-474-14.

4-29. TROUBLESHOOTING

See TM 9-1425-474-34-2 for troubleshooting of the BSA. For TSSTS troubleshooting, see TM 9-4935-474-14.

4-30. TEST EQUIPMENT MAINTENANCE PROCEDURES

a. BSA Support Equipment and Alignment Breakout Box (ABOB)

See TM 9-4935-474-14.

b. Test Set, Night Vision Sight AN/TAM-3A

See TM 9-5855-255-14 and TM 9-5855-255-24P.

c. BFVS Alinement Test Set

See TM 9-4935-474-14.

4-31. BSA AND TSSTS MAINTENANCE PROCEDURES

See TM 9-1425-474-34-1 and -2 for maintenance of the BSA. See TM 9-4935-474-14 for maintenance of the TSSTS.

APPENDIX A

REFERENCES

REFERENCE LIST

Lists of related manuals which may be needed to properly maintain the equipment covered in this manual can be found in the following publications:

TM 9-1425-453-L	List of Applicable Publications (LOAP) for Bradley Fighting Vehicle TOW/TOW 2 Subsystem
TM 9-1425-450-L	List of Applicable Publications (LOAP) for TOW 2 Heavy Antitank/Assault Weapon System
TM 9-1425-480-L	List of Applicable Publications (LOAP) for DRAGON Medium Antitank/Assault Weapon System
TM 9-1425-882-L	List of Applicable Publications (LOAP) for THERMAL IMAGERY

The following forms and manuals may also be needed.

DA Form 2028	Recommended Changes to Publications
DA Form 2028-2	Recommended Changes to Equipment Technical Manuals
SF 361	Report of Damaged or Improper Shipment
SF 368	Quality Deficiency Report
DA PAM 738-750	The Army Maintenance Management System (TAMMS)

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

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

B-2. MAINTENANCE FUNCTIONS. Maintenance functions will delimited to and defined as follows: (except for ammunition MAC)

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

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

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

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

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments 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 is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, and 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.

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

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

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

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

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

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

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time),

troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C ..... Operator or Crew

O ..... Organizational Maintenance

F ..... Direct Support Maintenance

H ..... General Support Maintenance

D ..... Depot Maintenance

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

Section II. MAINTENANCE ALLOCATION CHART FOR IMPROVED CONTACT SUPPORT SET (ICSS)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT
00	Shelter	Inspect Replace			0.3			
01	Slide Workbench	Replace			2.0			
02	Front Workbench	Replace			2.0			
03	Circuit Breaker Box	Inspect Test Replace			0.2 1.0 0.2			
04	Air Conditioner	Test Replace			1.0 2.0			
0401	Air Conditioner Cable	Replace			0.5			
0402	Power Cable	Inspect Replace			0.2 0.5			
0403	Air Conditioner Cover	Replace			0.2			
05	Equipment Drawers	Replace			0.5			
06	Light Fixture (Curbside Wall)	Inspect Test Replace			0.2 1.0 1.0			
0601	Light Tube	Replace			0.2			
0602	Ballast	Replace			0.2			

*C-operator/crew O-organizational F-direct support H-general support D-depot

Section II. MAINTENANCE ALLOCATION CHART FOR IMPROVED CONTACT SUPPORT SET (ICSS) (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT
07	Light Fixture (Roadside Wall)	Inspect Test Replace			0.2 1.0 1.0			
0701	Light Tube	Replace			0.2			
0702	Ballast	Replace			0.2			
08	Light Fixture (Front Wall)	Inspect Test Replace			0.2 1.0 l.O			
0801	Light Tube	Replace			0.2			
0802	Ballast	Replace			0.2			
09	Nitrogen Purging Bottle	Inspect Replace			0.2 0.5			
0901	Nitrogen Purging Bottle Holding Bracket Bolt	Replace			0.5			
10	Straps	Inspect Replace			0.3 1.5			
11	Blackout Switch	Inspect Test Adjust Replace			0.2 0.5 0.5 1.0			

*C-operator/crew O-organizational F-direct support H-general support D-depot

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT
14	Battery Charger Monitor Unit	Test			2.0			
1401	Front Panel	Panel			0.2			
1402	Toggle Switch	Inspect Replace			0.2 0.5			
1403	Test Points	Inspect Replace			0.2 0.5			
1404	Connector	Inspect			0.2			
1405	Slide Spacer	Inspect			0.2			
15	Power Conditioner Test Adapter	Test			2.0			
1501	Bottom Plate	Inspect Replace			0.2 0.5			
1502	Test Points	Inspect Replace			0.2 0.5			
1503	Resistors	Replace			0.8			
1504	Toggle Switches	Inspect Replace			0.2 0.5			
1505	Rotary Switch	Inspect Replace			0.2 0.5			
1506	Connector	Inspect Replace			0.2 0.5			
1507	Relay	Replace			0.5			

*C-operator/crew O-organizational F-direct support H-general support D-depot

Section II. MAINTENANCE ALLOCATION CHART FOR IMPROVED CONTACT SUPPORT SET (ICSS) (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	0	F	H	D	(5) TOOLS AND EQUIPMENT
1508	LED	Replace			0.5			
1509	Top Panel	Inspect Replace			0.2 0.5			
1510	Vent Plugs	Inspect Replace			0.2 0.5			
1511	Cables	Inspect Replace			0.2 0.5			
1512	Rubber Feet	Inspect Replace			0.1 0.3			

*C-operator/crew O-organizational F-direct support H-general support D-depot

APPENDIX C

COMPONENTS OF END ITEM

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item for the Improved Contact Support Set (ICSS) to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item listing is contained in Section II. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

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

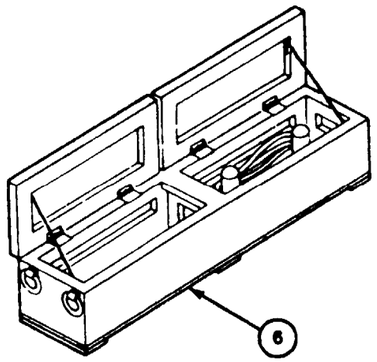
d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

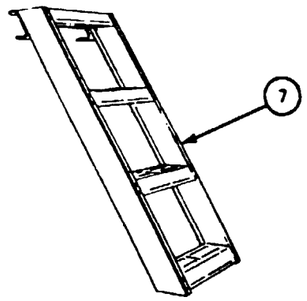
e. Column (5) - Quantity Required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

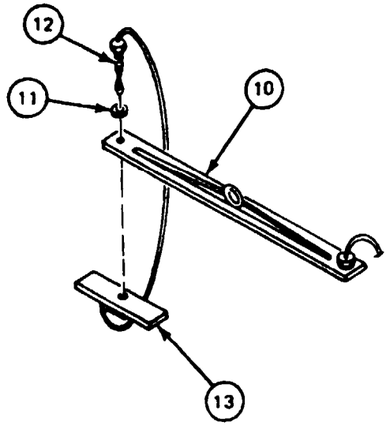
Section II. COMPONENTS OF END ITEM LIST

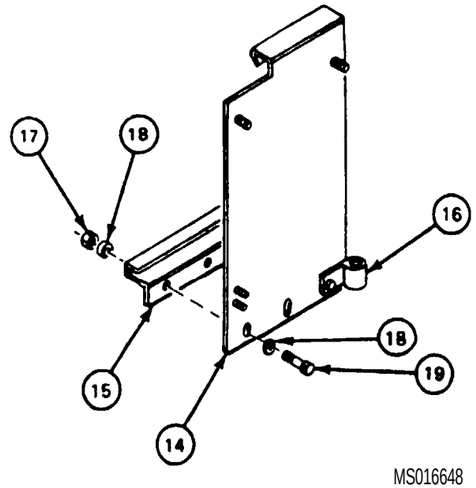
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
1	4940-01-154-3957	AN/TSM-153 Shop Equip GM ICSS, 13221306	EA	1
2		Grounding Rod (3-3 ft See) Fed Spec W-R-550, Type Ill, Class B	EA	1
3	4940-01-208-7844	Ground Cable, 20 ft 13044679	EA	1
4	4935-01-L65-0483	Cable, Air Conditioner, Power 13044604	EA	1
*	6150-01-237-6639	Cable, 24 Volt, 10 ft 13044622	EA	1
5	1435-01-167-4690	Cable, Generator Hookup, 100 ft (Prime Power Cable), 13044681	EA	1

Section II. COMPONENTS OF END ITEM (CONT)

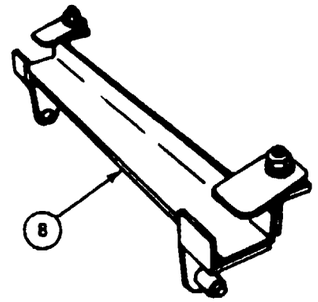


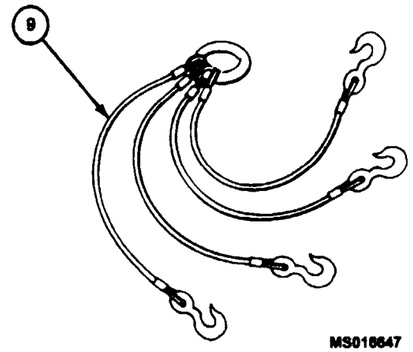






MS016648



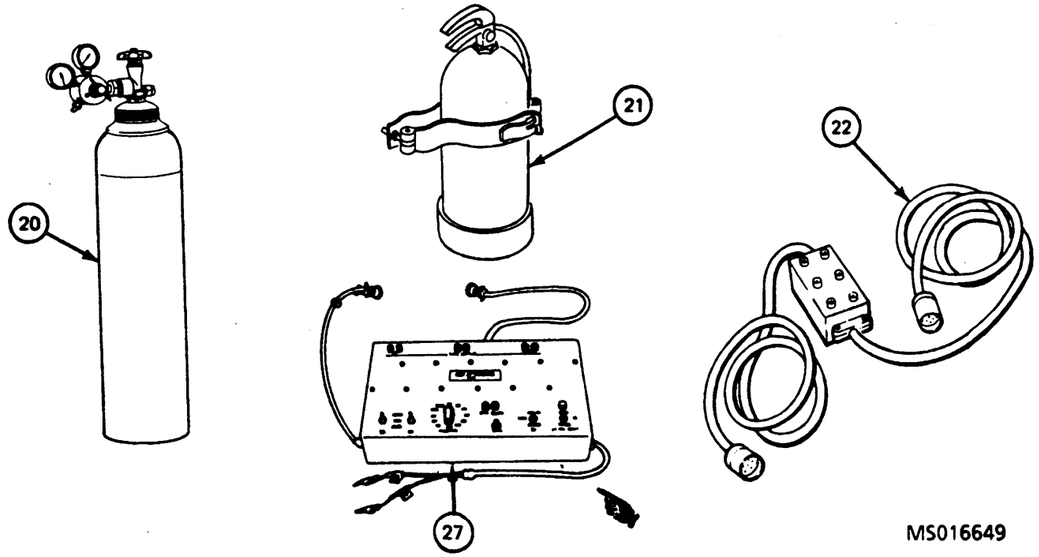


MS016647

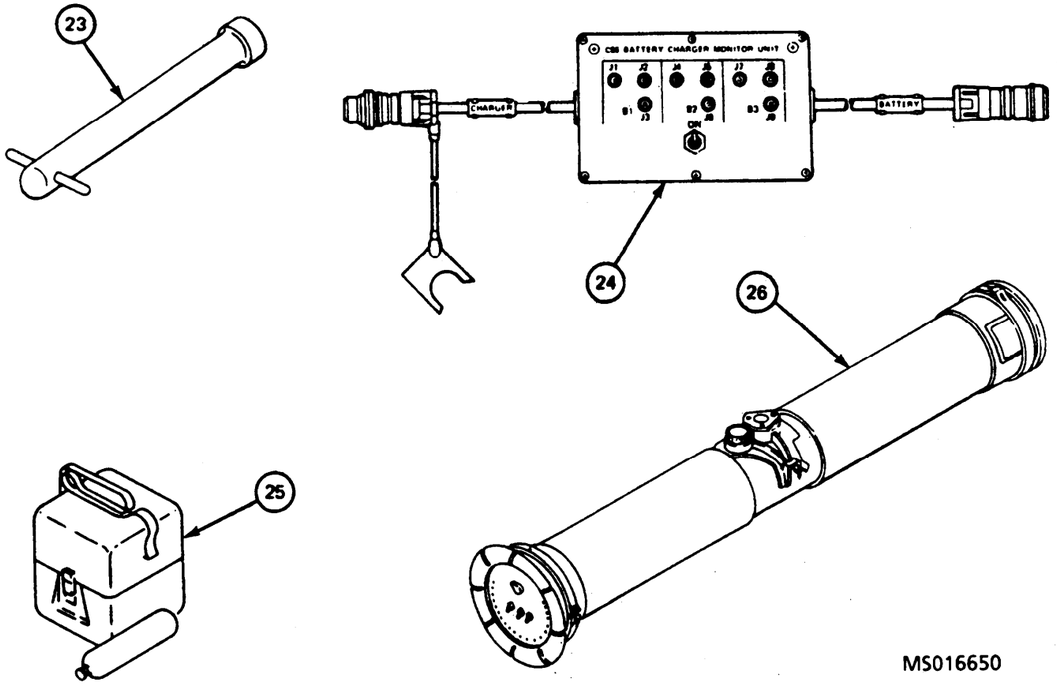
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
6		Cable Storage Box, 13044618	EA	1
7	2540-00-854-4445	Ladder Assembly, 8722222	EA	1
8		Bracket Assembly, Ladder Support, - Tail Gate, 13044651		
	3940-00-805-5533	Tie Down and Sling Assembly	EA	1

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
10	4935-01-084-9404	Tie Down, 13044588	EA	2
11	5310-00-937-0454	Lock Washer, MS35338-146	EA	4
12		Bolt, 13044587-2	EA	4
13		Plate, 13044587-2	EA	4
14	4935-01-085-4030	Bracket, Intercom Mount, 13044509	EA	1
15	4935-01-084-9380	Clamp, Intercom Mount, 13044510	EA	1
16	5340-00-088-6655	Clamp, Loop, Steel, Cushioned, MS21 333-101	EA	4
17		5310-00-298-2747 Nut, Lock, MS 20500-428	EA	3
18	5310-00-550-5054	Washer, Flat, Plain, MS15795-809	EA	6
19	5305-00-685-3511	Bolt, Hex Head, MS 35308-306	EA	3

Section II. COMPONENTS OF END ITEM (CONT)



MS016649

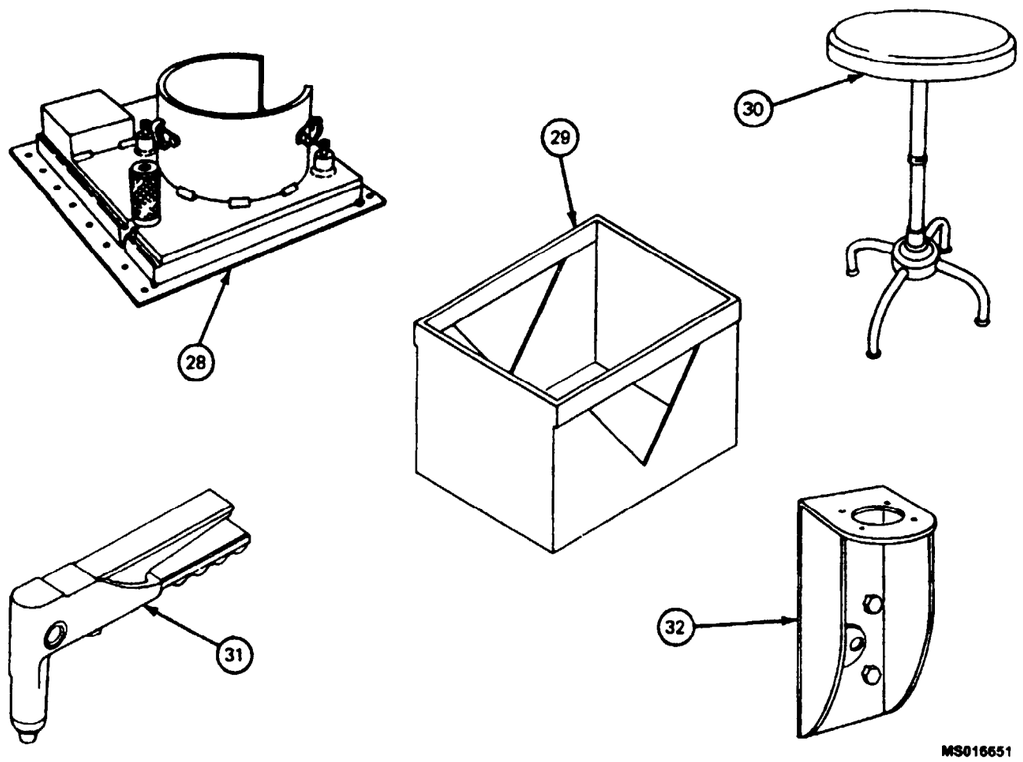


MS016650

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
20	8120-00-159-5062	Cylinder, Compressed Gas, ICSS, with Cap and N_2 Gas, MS 39224-7	EA	1
21	5421-00-555-8837	Fire Extinguisher with Bracket	EA	1
22	4935-00-150-7845	Power Monitor Cable, 10698107	EA	1
23	5120-00-169-4813	Spanner Wrench, 10682902	EA	1
24	4935-01-128-4773	Battery Charger Monitor Unit, 13060888	EA	1

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
25	5855-01-047-2136	Coolant Cartridge 5-Pack, SM-C-804439	EA	1
26	4935-01-119-3460	Test Set, Electrical Circuit AN/TSM-158, 13195336	EA	1
27	4935-01-112-3068	Test Adapter, Power Conditioner, 13060899	EA	1

Section II. COMPONENTS OF END ITEM (CONT)



(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
28	4940-01-159-3931	Mounting Assembly, Traversing Unit, 13221358	EA	1
29		Container Assembly, TOW Sight Storage, 13044660	EA	1
30	5410-00-084-9379	Stool, 13044660	EA	1
31	5120-00-771-5644	Rivet Gun, GGR-R-0395, Size 1, Style 1, Class 1	EA	1
32	5820-00-740-1780	Antenna Mount (mounted on shelter) SC-D-189023	EA	1

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
*	3439-00-346-7538	Soldering Iron, W-S-570, Type I, Class 2	EA	1
*	7125-01-093-3750	Plastic Tray A201, Item No. 36	EA	2
*	7125-01-093-3750	Plastic Tray A201, Item No. 36	EA	2
*	7125-01-097-4517	Plastic Tray A806, Item No. 37	EA	2
*	7125-01-011-8611	Plastic Tray A618, Item No. 38	EA	2
*	7125-01-095-3751	Plastic Tray A812, Item No. 39	EA	2
*	7125-01-039-4136	Plastic Tray A502, Item No. 40.	EA	1
		Technical Manual, TM 9-4935-451-14	EA	1
		Technical Manual, TM 9-4935-451-24P	EA	1
*	5120-00-264-3796	Wrench, Adj, 12 in.	EA	1
*	4931-00-065-1110	Purging Kit, consisting of:	KT	1
*	4931-00-936-4283	Adapter Assy Kit	KT	
*	4720-00-561-0713	Purge Line	EA	1
*	4820-00-001-7749	Regulator	EA	1
*	6545-00-922-1200	First Aid Kit	KT	1
*	5950-01-200-4046	Isolation Transformer 23V365, 13221382	EA	1
*	2640-00-204-2279	Valve Extension, 6 in.	EA	
*	1440-01-115-3405	Traversing Unit, 13194972	EA	1
*	1430-01-143-9408	Msl Guidance Set, 13099890	EA	1
*	1440-00-140-1529	Optical Sight. 10085145	EA	1
*	1450-01-111-4743	Vehicle Power Conditioner (TVPC), 10360918	EA	1

Section II. COMPONENTS OF END ITEM (CONT)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
*	4935-01-182-8311	TU Test Fixture No. 1 (part of TA-20), 10682875 Consisting of:	EA	1
		TA20/4 Gage Switch Adj., 10682913		
	5120-00-175-9703	TA2015 Bearing Removal Tool, 10682914		
		TA20/6 Anvil, 10682918		
	5305-00-416-9226	TA20/9 Screw, 10682698		
	4935-00-493-9139	TA20/10 Torquing Tool, 10282796		
		TA20/11 Gauge, Rotation Angle, 10682780		
	1935-00-493-9133	TA20/14 Fixture, Holdback Test, 10682724		
	1935-01-144-2943	TA20/15 Fixture, Connector, 10682750		
	3625-01-120-0027	TA20/16 T/S Electrical Cable, 13195112		
	5985-00-231-7545	TA20/17 Plug, Shorting, 10682826		
		TA20/22 Keeper, 10692971		
		TA20/23 Equilibrator Remover, 10682740		
		TA20/24 Fixture, Alignment Umbilical Linkage, 10682851		
	5120-00-227-8170	Extension, A-A-2170		
	5120-00-242-3330	Socket, A-A-1404		
	5120-00-415-1504	Spacer, 10682726-1		
	5340-00-415-1505	Spacer, 10682726-2		
	5340-00-415-1503	Spacer, 10682726-3		
*	4935-01-184-3909	TU Test Fixture No. 2 (part TA-20), 10682876 Consisting of:	EA	1
	4935-01-328-7848	TA20/2 Bell Crank Holding Fixture. 10682945		
		TA20/3 Wheel Puller, 10682912		
	5120-01-324-2845	TA20/8 Adapter, Wrench, 10682697		
	4935-00-482-6025	TA20/12 Arm, Indicator, 10682696		
		TA20/13 Indicator Assy, 10682842		
		TA20/18 Colimator, Fixture, 10682809		
		TA20/19 Reflector Assy, 10682859		
		TA20/20 Boresight Assy, Fixture, 13227956		
	4935-01-328-8349	TA20/21 Gage, Latch, 10682865		
	5120-01-324-2845	Adapter, Wrench, 10682865		
	5120-00-683-8597	Driver Hex Head		
	5120-01-435-3163	Socket, Socket Wrench, 13569467		
*	4935-01-087-2534	Adapter, Test, MX-10078/G, 10276909	EA	1
	5855-01-144-4837	Test Set, Amplifier, AN/TAM-5, 13099878	EA	1
	4935-01-147-5999	MGS Test Set, AN/TSM-152, 13099749	EA	1
*	6150-00-933-6703	Test Lead	EA	1
*	6625-01-092-1089	Test Lead	EA	1
	5935-00-053-9454	Adapter	EA	1
	6625-00-528-8734	Cable	EA	1
	5120-01-198-0054	Special Tool 13012618	EA	1
	4935-00-551-3034	Adapter TA-418 (Purge) 10684335	EA	1

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the items in the shelter. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. EXPLANATION OF COLUMNS

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material; e.g., Paint (item 2, App. D).

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

F - Direct Support Maintenance
H - General Support Maintenance

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

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

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	F		Bumpers, Wooden	
2	F	5610-00-782-5556	Paint, MIL-D-23003 Olive Drab, Nonskid	Gallon
3	F	8040-00-990-9912	Sealant, RTV MIL-R-47211, Type III	
4	F		Tape, Electrical	
5	F	6640-00-597-6745	Tissue, Lens	BX
6	F	6810-00-257-2487	Toluene, 00265	
7	F	7920-00-965-1709	Towels, Disposable	
8	F		Nitrogen,	
		6830-00-782-2643	B Grade	
		6830-00-577-4623	A Grade	
9	F		Sleeving, Nylon	
10	F	5970-00-944-1328	Sleeving, Shrink M23053/5-112-O	FT
11	F		Ties, Cable	
12	F		Rivets, Blind, 13044498-8	

APPENDIX E

INVENTORY OF ITEMS STORED/TRANSPORTED IN SHELTER

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists the items which should be stowed or transported in the shelter. It is to be used as an inventory list to make sure you have all items necessary to support a particular weapon system.

E-2. GENERAL

The inventory list is divided into the following sections:

a. Section II - List of Items Stowed/Transported in Shelter

1. Entries in this list are arranged by weapon system as follows:

- GENERAL - Items required regardless of which weapon system is supported.
- TOW 2 WEAPON SYSTEM - Items required to support the TOW 2 weapon system.
- DRAG0N WEAPON SYSTEM - Items required to support the DRAGON weapon system.
- BFVS BASIC SIGHT ASSEMBLY (BSA) AND TOW SUBSYSTEM TEST SET (TSSTS) - Items required to support the Bradley Fighting Vehicle System (BFVS) Basic Sight Assembly (BSA) and TOW Subsystem Test Set (TSSTS).

2. Columns appearing in this list provide a description and means of identification (for requisitioning) of each item, as well as the quantity of each item required in the shelter. The "Fielding Code" column refers to entries in the Section III list, which explains the fielding of items in the shelter.

b. Section III - Fielding of Items in Shelter

This list explains how each item in the shelter is fielded. Entries are by "Fielding Code" number appearing in the Section II list.

Section II. LIST OF ITEMS STOWED/TRANSPORTED IN SHELTER

Item	Description	NSN/Part No/Spec	Qty Req	Fielding Code	Insp	Rec
	GENERAL					
1	AN/TSN-152 Shop Equip GM ICSS Serial No.	4949-01-154-3957 P/N 13221306	1			
2	Cable Assembly, 14 ft	5995-00-985-8090 CX4722A/VRC	1	1		
3	Cable Assy	5995-00-926-0778 CX7060A/VRC	1	1		
4	Control Intercom Set	5820-00-892-3334 C2298/VRC	1	1		
5	Plastic Tray	7125-01-093-3750 A201 Item No. 36	2	1		
6	Plastic Tray	7125-01-097-4817 A806 Item No. 37	2	1		
7	Plastic Tray	7125-01-011-8611 A618 Item No. 38	2	1		
8	Plastic Tray	7125-01-095-3751 A812 Item No. 39	2	1		
9	Plastic Tray	7120-01-039-4136 A602 Item No. 40	2	1		
10	Rivet Gun	5120-00-357-6065 GGR-R-00395, Size I, Style I, Class I	1	1		
11	Stool	7195-01-084-9379 13044660	1	1		
12	Soldering Iron	3439-000-346-7536 W-S-570, Type I, Class 2	1	1		
13	Purging Kit, consisting of:	4931-00-065-1110	1	1		

Section II. LIST OF ITEMS STOWED/TRANSPORTED IN SHELTER (CONT)

Item	Description	NSN/Part No/Spec	Qty Req	Fielding Code	Insp	Rec
	GENERAL (cont)					
14	Adapter Assy Kit	4931-00-936-4283	1	1		
15	Purge Line	4720-00-561-0713	1	1		
16	Regulator	4820-00-001-7749	1	1		
17	Cylinder, Compressed Gas, ICSS, with Cap and N_2 Gas	8120-00-159-5062 MS 39224-7	1	1		
18	Fire Extinguisher with Bracket	5421-00-555-8837	1	1		
19	Valve Extension, 6 in.	2640-00-204-2279	1	1		
20	Storage Box	P/N 13044618	1	1		
21	Tie Down and Sling Assembly	3940-00-846-9858	1	1		
22	Grounding Rod (3-3 ft Sec)	Fed Spec W-R-550 Type III, Class B	1	1		
23	Ground Cable, 20 ft	P/N 13044679 1435-01-167-4690	1	1		
24	Cable, Generator Hookup, 100 ft (Pime Power Cable)	1435-01-167-4690 P/N 13044681	1	1		
25	Cable, Air Conditioner	4935-01-165-0483 P/N 13044604	1	1		
26	Cable, 24 Volt, 10 ft	6150-01-237-6639 P/N 13044622	1	1		
27	Bracket, Intercom Mount	4935-01-085-4030 P/N 13044509	1	1		
28	Clamp, Intercom Mount	4935-01-084-9380 P/N 13044510	1	1		
29	Bracket Assembly, Ladder Support-Tail Gate	P/N 13044651	1	1		

Section II. LIST OF ITEMS STOWED/TRANSPORTED IN SHELTER (CONT)

Item	Description	NSN/Part No/Spec	Qty Req	Fielding Code	Insp	Rec
	GENERAL (cont)					
30	Tie Down	4935-01-084-9404 P/N 13044588	2	1		
31	Ladder Assembly	2540-00-854-4445 P/N 13221357	1	1		
32	Lock Washer	5310-00-937-0454 MS 35338-146	4	1		
33	Bolt	P/N 13044587-1	4	1		
34	Plate	P/N 13044587-2	4	1		
35	Sealing Compound, RTV	MIL-R-47211, Type III	1	1		
36	Clamp, Loop, Steel, Cushioned	5340-00-088-6655 MS 21333-101	4	1		
37	Nut, Lock	5310-00-298-2747 MS 20500-428	3	1		
38	Washer, Flat, Plain	5310-00-550-5054 MS 15795-809	6	1		
39	Bolt, Hex Head	5305-00-685-3511 MS 35308-306	3	1		
40	Antenna Mount (mounted on shelter	5820-00-740-1780 SC-D-1890 23	1	1		
41	Power Monitor Cable	4935-00-150 7845 P/N 10698107	1	1		
42	Spanner Wrench	5120-00-169-4813 P/N 10682901	1	1		

Section II. LIST OF ITEMS STOWED/TRANSPORTED IN SHELTER (CONT)

Item	Description	NSN/Part No/Spec	Qty Req	Fielding Code	Insp	Rec
	GENERAL (cont)					
*	Test Set, AN/TAM-3	5855-01-037-7341 P/N SM-774995	1	1		
	OR					
43	Test Set, AN/TAM-3A, consisting of:	5855-01-054-3871 P/N SM-C-806808	1	1		
44	Thermal Sight Collimator, AN/TAM-3A	5855-01-077-4523 P/N SM-D-805691	1	1		
45	Test Set, AN/TAM-3A, Box 1	5855-01-071-9200 P/N SM-D-807420	1	1		
46	Test Set, AN/TAM-3A, Box 2	5855-01-072-0410 P/N SM-C-804369	1	1		
47	Closed Cycle Cooler Test Set	5855-01-152-8782 P/N W-D-968941	1	1,9		
48	Technical Manual TM 9-4935-451-14		1			
49	Technical Manual TM 9-4935-451-24P		1			
50	Radio Set, AN/VRC-46	5820-00-223-7433	1	1		
51	Mount MT-1029/VRC	5820-00-893-1323	1	1		
52	Speech Security Equipment	5810-00-434-3644 P/N TSEC/KY-57	1	1		
53	Antenna Matching Unit	5820-00-906-1115 P/N MX-6707/VRC	1	1		
54	Radio Support Equipment		1	1		
55	Antenna Tiedown Assy	5820-00-908-6416	1	1		
56	Antenna Tip Cap	5820-00-437-2358	1	1		
57	Audio Support Kit	5820-00-856-9166	1	1		
	GENERAL (cont)					
58	Clamp Strap Kit	5820-00-752-5738	2	1		
59	Guard Assy	5820-00-856-7819	1	1		
60	Head Set	5965-00-892-1010 P/N H-140	1	1		
	OR					
61	Head Set	5965-00-825-4871 P/N H-161 GR	1	1		
62	Loud Speaker	5965-00-876-2375 P/N LS-454/U	1	1		
63	Microphone	5965-00-179-7762 P/NM-80/U	1	1		
64	Amplifier	5820-00-892-3342 P/N AM-1780/VRC	1	1		
65	Control	5820-00-892-3339 P/NC-2298/VRC	1	1		
66	Telephone	5805-00-543-0012 P/N TA312	1	1		
67	AN/TAM-3 Retrofit Kit	5855-01-152-8782 P/N SM-D-968941	1	1		
68	Tool Kit, 27E	5180-00-179-3574	1	1,8		
69	Purge Adapter	4935-00-551-3034 P/N 10684335	1	1		
70	Environmental Control Unit	4120-00-168-1781 OR 4120-00-089-4053	1	1		
71	First Aid Kit	6545-00-922-1200	1	1		
72	Isolation Transformer	5950-01-200-4046 P/N 23V365, 13221382	1	1		

Section II. LIST OF ITEMS STOWED/TRANSPORTED IN SHELTER (CONT)

Item	Description	NSN/Part No/Spec	Qty Req	Fielding Code	Insp	Rec
	TOW 2 WEAPON SYSTEM					
73	Mounting Assembly, Traversing Unit	P/N 13044615	1	1		
74	Container Assembly, TOW Sight Stowage	P/N 13044656	1	1		
75	Battery Charger Monitor Unit	4935-01-128-4773 P/N 13060888	1	1		
76	Test Set, Electrical Circuit AN/TSM-158	4935-01-119-3460 P/N 13195336	1	1		
77	Tube, Guided Missile Launcher-M22	1440-00-196-0038 PIN 11486778	1	2		
78	Traversing Unit	1440-01-115-3405 P/N 13194972	1	2		
79	Missile Guidance Set	1430-01-143-9408 P/N 13099890	1	2		
80	Optical Sight	1440-00-140-1529 P/N 10085145	1	2		
81	Power Conditioner (TVPC)	1450-01-111-4743 P/N 13060918	1	3		
82	Extractor, Module, Conditioner, Power	5120-01-126-4482 P/N 13060903	1	3		
83	Adapter, Test, Conditioner, Power	4935-01-112-3068 P/N 13060899	1	3		
84	TU Test Fixture No. 1 (part of TA-20)	4935-01-182-8311 P/N 10682875	1	2		
85	TU Test Fixture No. 2 (part of TA-20)	4935-01-184-3909 P/N 10682876	1	2		
86	Boresight Collimator Test Set TS-3784/TAS	5855-01-161-8964 P/N SM-C-772320	1	4		
87	Test Set, Amplifier, AN/TAM-5	5855-01-144-4837 P/N 13099878	1	5		
88	Missile Guidance Set Test Set AN/TSM-152	4935-01-147-5999 P/N 13195161	1	5		
	DRAGON WEAPON SYSTEM					
89	Coolant Cartridge 5-Pack	5855-01-047-2136 P/N SM-C-804439	1	1		
90	Tracker Test Set V79430(6)	4935-00-124-5585 P/N 10277930	1	6		
91	Test Set Group, GM Infrared Tracker OQ-278/TSM-114	4935-01-063-9784 P/N 10276700	1	6		
92	Adapter, Test, MX-10078/G	4935-01-087-2534 P/N 10276909	1	6		
	BFVS BASIC SIGHT ASSEMBLY (BSA) AND TOW SUBSYSTEM TEST SET (TSSTS)					
93	BFVS Basic Sight Assembly Support Equipment consisting of:	4935-01-108-2968 P/N 13143606	1	7		
94	BSA Holding Fixture	4935-01-110-2127 P/N 13143618	1	7		
95	BSA Controller	4935-01-133-0566 P/N 13154980	1	7		
96	Rail Assembly	4940-01-160-6997 PIN 13143717	1	7		
97	Alinement Test Set, BFVS	4935-01-143-3186 P/N 13012576	1	7		
98	Alignment Breakout Box, BFVS	4935-01-107-7619 P/N 13143607	1	7		
99	Tool Kit, BFVS Supplemental	5180-01-128-5446 P/N 12308512	2	7,10		

Section III. FIELDING OF ITEMS IN SHELTER

Fielding Code*	Explanation
1	These items are furnished with the AN/TSM-153.
2	These items are shipped from depot direct to the site and are to be installed by the hand-off team.
3	These items are fielded with the power conditioner to user.
4	This item is a separate fielding plan. In some cases, the user will have this item on hand prior to ICSS fielding.
5	These items will be fielded with the ICSS with TOW 2 fielding.
6	These items are fielded with DRAGON night tracker fielding and will be installed by fielding team.
7	These items will be fielded with BFVS fielding only.
8	The 27E Tool Kit is issued separately to MOS 27E and is not issued with shelter. Storage only in shelter.
9	Used with AN/TAM3-A only.
10	The BFVS Supplemental Tool Kit is issued separately to MQS 27E and is not issued with shelter. Storage only in shelter.

*See Section II for items to which fielding codes apply.

APPENDIX F

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists additional items you are authorized for the support of the Improved Contact Support Set.

E-2. GENERAL

This list identifies items that do not have to accompany the Improved Contact Support Set and that 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 LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request additional items you require to support this equipment.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	(3) U/M	(4) QTY AUTH
1935-00-1224-5585	Tracker Test Set V79430(6) 10277930	EA	1
4935-01-063-9784	Test Set Group, GM Infrared Tracker QQ-278/TSM-114; 1027		
5855-01-063-9784	Boresight Collimator Test Set TS-3784/TAS, SM-S-772320		
5855-01-037-7341	Test Set, Night Vision Sight, AN/TAM-3 consisting of the following: Thermal Sight Collimator Test Set, Box 1 of 2 Test Set, Box 2 of 2 OR	SE	1
5855-01-054-3871	Test Set, Night Vision Sight, AN/TAM-3A consisting of the following: Thermal Sight Collimator Test Set, Box 1 of 2 Test Set, Box 2 of 2 Test Set, Closed Cycle Cooler OR	SE	1
	Test Set, Night Vision Sight, AN/TAM-3B consisting of Thermal Sight Collimator Test Set, Box 1 Test Set, Box 2 of 2 Test Set, Closed Cycle Cooler	SE	1
5850-01-263-6704	Thermal Sight Collimator, Part of AN/TAM-3, AN/TAM-3A, and AN/TAM-3B, 13282632	EA	1
5855-01-071-9200	Test Set, Box 1 of 2, Part of AN/TAM-3 and AN/TAM-3A, SM-D-807420	EA	1
	Test Set, Box 1 of 2, Part of AN/TAM-3B, 13265192	EA	1
5855-01-152-8782	Test Set, Closed Cycle Cooler, Part of AN/TAM-3A and AN/TAM-3B, SM-D-968941	EA	1

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	(3) U/M	(4) QTY AUTH
4935-01-108-2968	BFVS Basic Sight Assy Supt Eq, 13143606, consisting of:	EA	1
4935-01-110-2127	BSA Holding Fixture	EA	1
4935-01-133-0566	BSA Controller, 13154980	EA	1
4935-01-160-6997	Rail Assembly, 13143717	EA	1
4935-01-143-3186	Alignment Test Set, BFVS, 13012576	EA	1
4935-01-107-7619	Alignment Breakout Box, BFVS, 13143607	EA	1
4120-00-168-1781 OR	Environmental Control Unit, 18,000 BTU	EA	1
5820-00-223-7433	Radio Set, AN/VRC-46	EA	1
5995-00-985-7618	Cable Assembly 14 ft, CX4722A/VRC		
5995-00-985-7551	Cable Assembly 14 ft, CG1773B/U RF		
5995-00-823-2726	Power Cable Assembly 8 ft, CS4720/VRC		
5995-00-823-2835	Cable Assembly 9 ft, CS4723/U		
5995-00-889-0911	Cable Assembly 14 ft, SM-D-415560		
5995-00-823-2784	Cable Assembly 7 ft, CX8060A/VRC		
5895-00-892-3342	Amplifier, AM-1780/VRC		
5820-00-908-6416	Antenna Tie Down Assy		
5820-00-437-2358	Antenna Tip Cap		
5820-00-856-9166	Audio Support Kit		
5820-00-752-5738	Clamp Strap Kit		
5820-00-892-3339	Control, C-2298/VRC		
5820-00-856-7819	Guard Assy		
5965-00-892-1010	Head Set, H-140		
5965-00-825-4871	Head Set, J161GR		
5965-00-876-2375	Loud Speaker		
5965-00-179-7762	Microphone, M80/U		
5820-00-893-7323	Mount MT-1029/VRC		
5820-01-304-2045	SINCGARS Radio		
5810-00-434-3644	Speech Security Equipment TSEC/KY-57	EA	1
5805-00-543-0012	Telephone, TA 312	EA	1
5180-01-128-5446	Tool Kit, BFVS Supplemental 12308512	KT	2
5180-00-179-3574	Tool Kit, 27E	KT	2
5820-00-906-1115	Antenna Matching Unit, MX-6707/VRC	EA	1
6115-00-394-9577	Generator 15 KW PU405	EA	1
2320-01-206-4089	Truck 5 Ton XLB OR	EA	1
2320-01-047-8771	Truck 5 Ton XLB	EA	1
4940-00-438-1605	Heat Gun, 200/300 Degrees	EA	1
4935-00-491-5215	Nozzle Adapter, Heat Gun	EA	1
4935-00-221-9336	Baffle Plate, Heat Gun	EA	1

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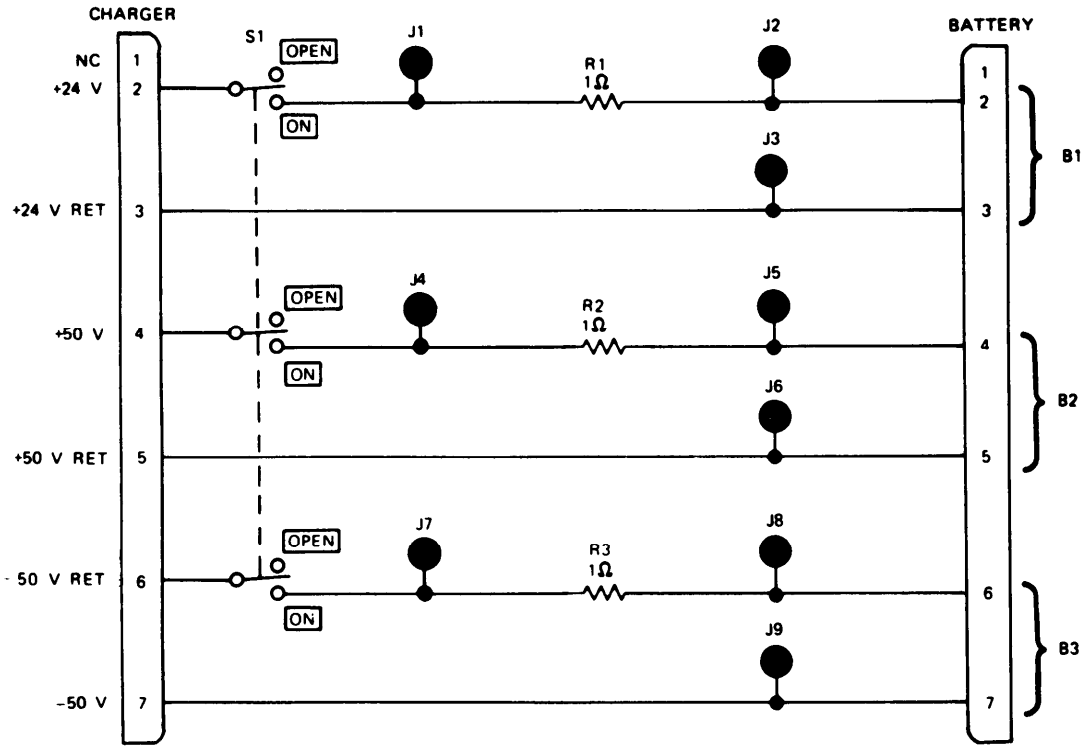
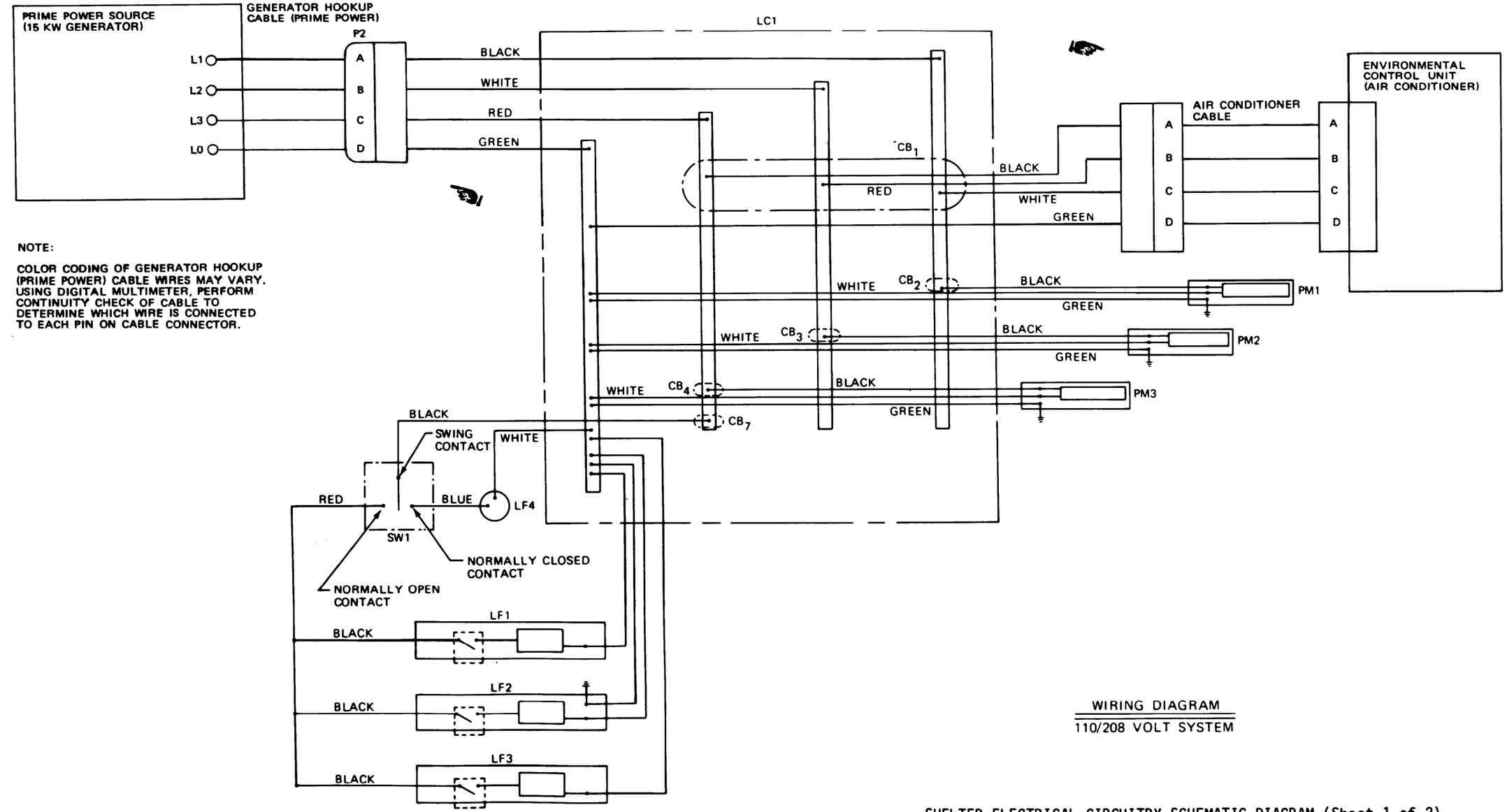


BATTERY CHARGER MONITOR UNIT SCHEMATIC DIAGRAM

APPENDIX G

SCHEMATIC DIAGRAMS

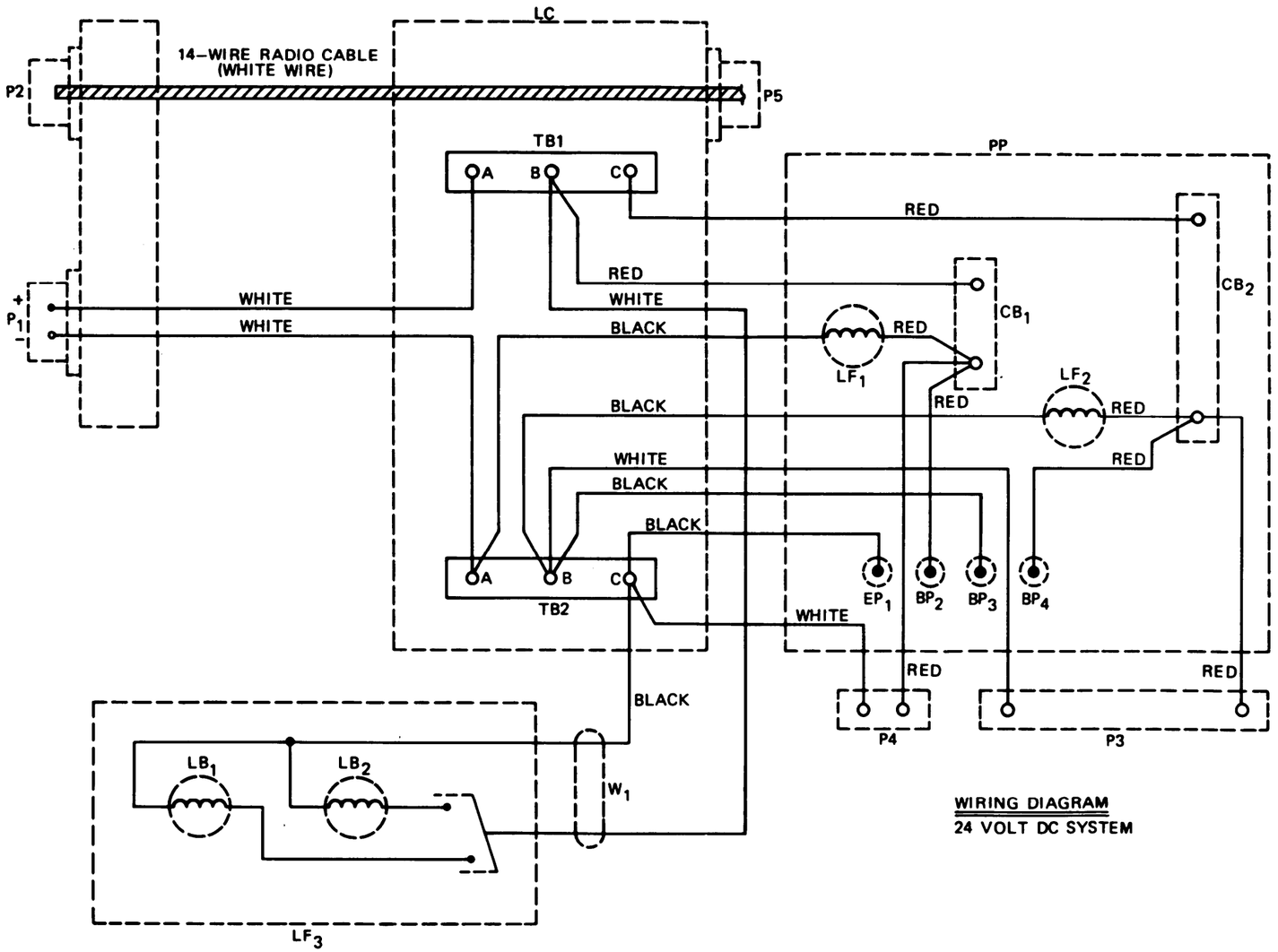


NOTE:

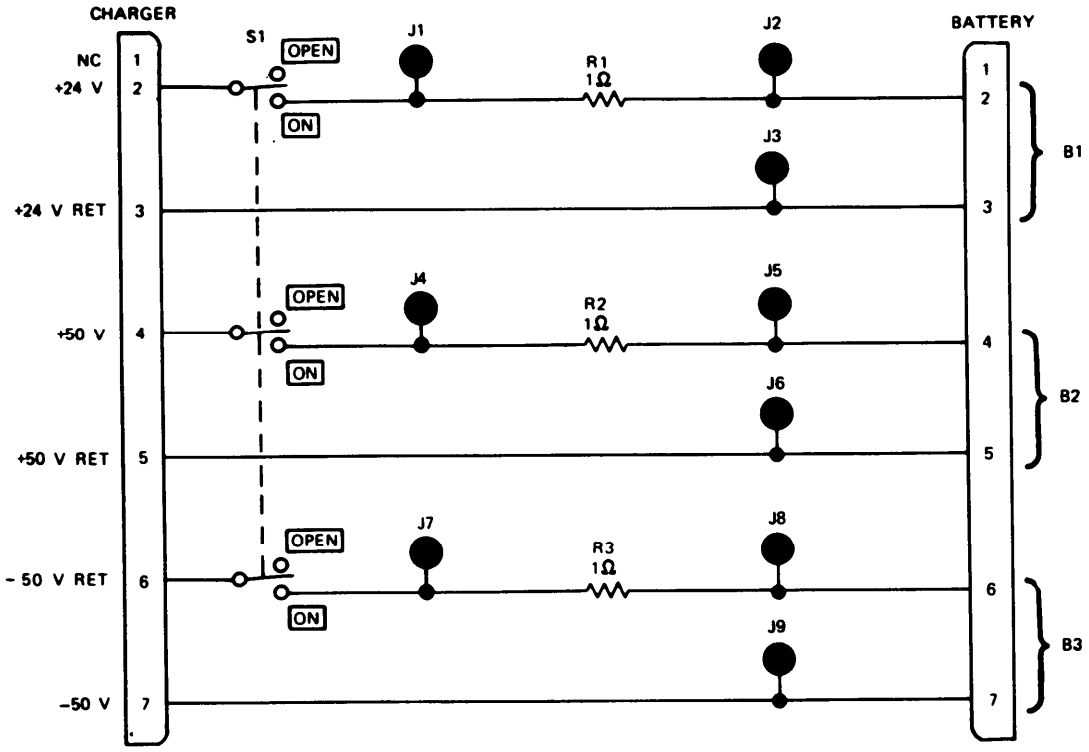
COLOR CODING OF GENERATOR HOOKUP (PRIME POWER) CABLE WIRES MAY VARY. USING DIGITAL MULTIMETER, PERFORM CONTINUITY CHECK OF CABLE TO DETERMINE WHICH WIRE IS CONNECTED TO EACH PIN ON CABLE CONNECTOR.

WIRING DIAGRAM
110/208 VOLT SYSTEM

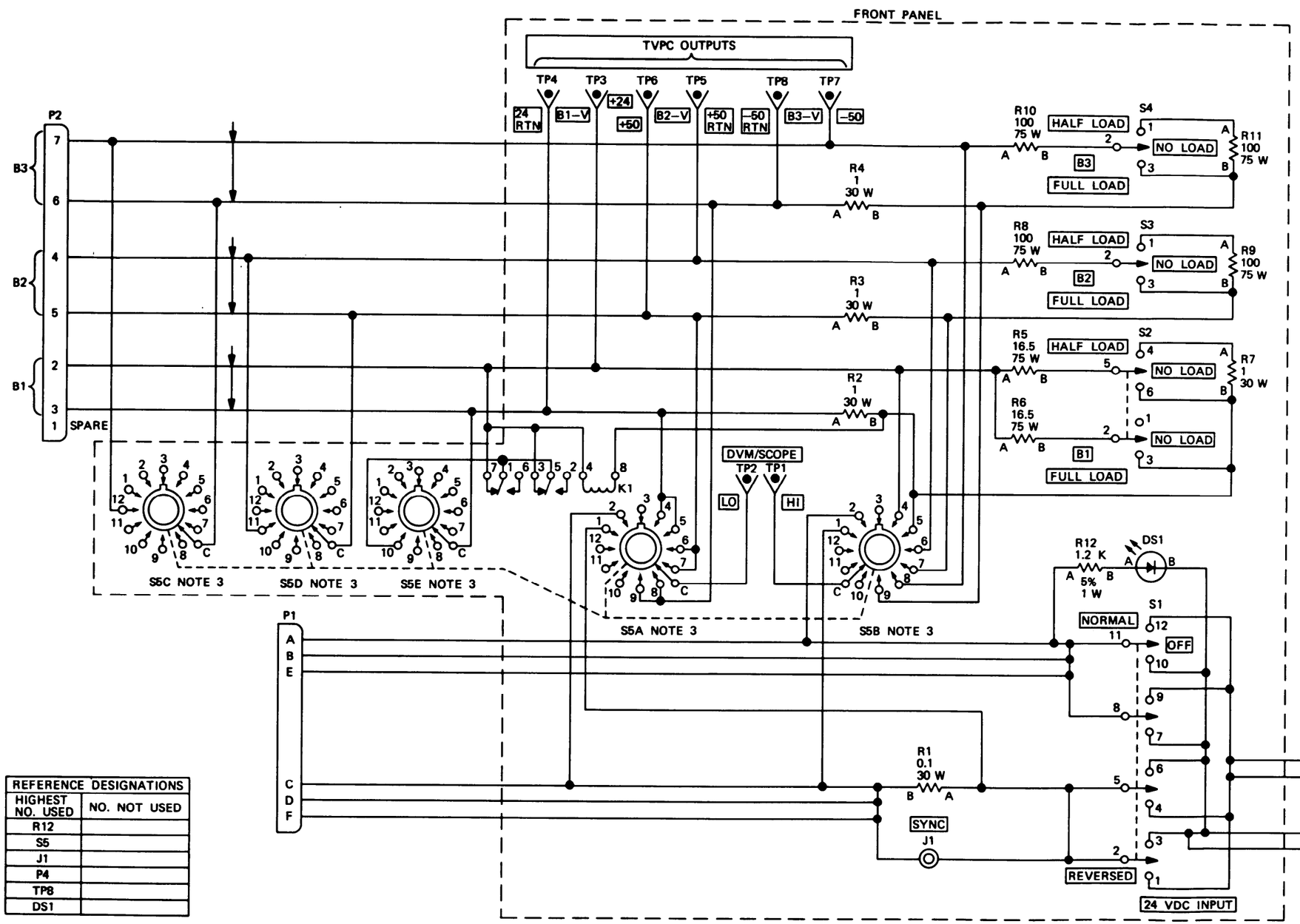
SHELTER ELECTRICAL CIRCUITRY SCHEMATIC DIAGRAM (Sheet 1 of 2)



SHELTER ELECTRICAL CIRCUITRY SCHEMATIC DIAGRAM (Sheet 2 of 2)



BATTERY CHARGER MONITOR UNIT SCHEMATIC DIAGRAM



NOTES:

1. RESISTANCE IS IN OHMS ±1 %.
2. [ ] INDICATES MARKING ON FRONT PANEL.
3. [MONITOR] SWITCH S5 MARKINGS ARE AS FOLLOWS:

POSITION	MARKING
1	INPUT–A
2	INPUT–V
3	OFF
4	B1–V
5	B1–A
6	B2–V
7	B2–A
8	B3–V
9	B3–A
10	B1 SHORT TEST
11	B2 SHORT TEST
12	B3 SHORT TEST

4. ALL WIRES ARE AWG NO. 18.

REFERENCE DESIGNATIONS	
HIGHEST NO. USED	NO. NOT USED
R12	
S5	
J1	
P4	
TP8	
DS1	

POWER CONDITIONER TEST ADAPTER SCHEMATIC DIAGRAM

By Order of the Secretary of the Army:

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

Official:

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

Distribution:

To be distributed in accordance with DA Form 12-32, Section II, Direct and General Support Maintenance requirements for TOW 2 and DRAGON Weapon Systems.

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THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

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

'VEIGHTS

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

LIQUID MEASURE

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

SQUARE MEASURE

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

CUBIC MEASURE

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

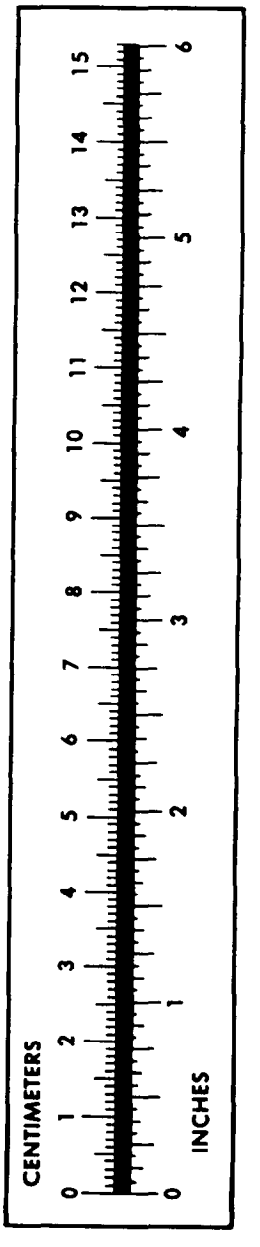
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

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

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



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