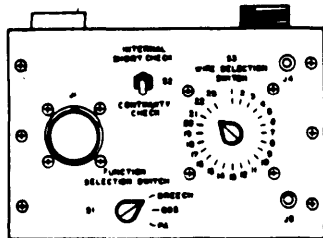
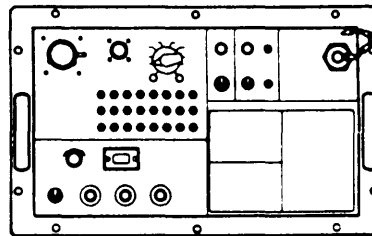


TECHNICAL MANUAL
OPERATOR, ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE MANUAL

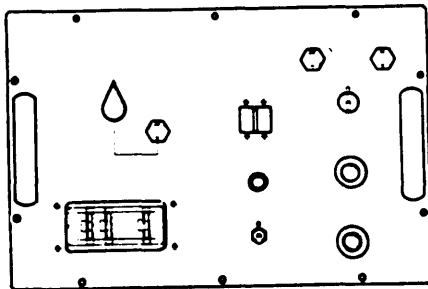
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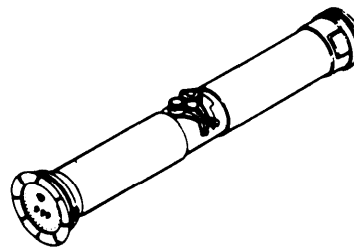
ELECTRICAL CABLE TEST SET AN/TSM-149 (6625-01-120-0027)



MISSILE GUIDANCE SET TEST SET AN/TSM-152 (4935-01-147-5999)



AMPLIFIER TEST SET AN/TAM-5 (5855-01-144-4837)



ELECTRICAL CIRCUIT TEST SET AN/TSM-158 (4935-01-119-3460)

TOW 2 HEAVY ANTITANK/ ASSAULT WEAPON SYSTEM

HOW TO USE THIS MANUAL	iii
CHAPTER 1	
INTRODUCTION	1-1
CHAPTER 2	
OPERATING INSTRUCTIONS	2-1
CHAPTER 3	
GENERAL MAINTENANCE INSTRUCTIONS	3-1
CHAPTER 4	
ELECTRICAL CIRCUIT TEST SET MAINTENANCE INSTRUCTIONS	4-1
CHAPTER 5	
ELECTRICAL CABLE TEST SET MAINTENANCE INSTRUCTIONS	5-1
CHAPTER 6	
MISSILE GUIDANCE SET TEST SET MAINTENANCE INSTRUCTIONS	6-1
CHAPTER 7	
AMPLIFIER TEST SET MAINTENANCE INSTRUCTIONS	7-1
APPENDICES A THRU F	
REFERENCES	A-1
MAINTENANCE ALLOCATION CHART	B-1
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS	C-1
ADDITIONAL AUTHORIZATION LIST	D-1
EXPENDABLE SUPPLIES AND MATERIALS LIST	E-1
SCHEMATICS AND WIRING DATA	F.1

Change
No. 7

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., 13 November 1990

OPERATOR, ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

FOR

ELECTRICAL CIRCUIT TEST SET,
AN/TSM-158 (4935-01-119-3460),

ELECTRICAL CABLE TEST SET,
AN/TSM-149 (6625-01-120-0027),

MISSILE GUIDANCE SET TEST SET,
AN/TSM-152 (4935-01-147-5999),

AMPLIFIER TEST SET,
AN/TAM-5 (5855-01-144-4837)

TOW 2 WEAPON SYSTEM

TM 9-4935-455-14, 28 May 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. Where a complete paragraph, chapter, section, or appendix is changed or added, a vertical line is placed in the margin by the title only. Changes to illustrations are indicated by miniature pointing hands. Changes to flow charts are indicated by a miniature hand pointing to the number of the step in which the change occurs.

<u>Remove Pages</u>	<u>Insert Pages</u>
6-25, 6-26	6-25, 6-26
7-65, 7-66	7-65, 7-66

2. This transmittal sheet should be filed in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

THOMAS F. SIKORA
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-32, Operator, Unit, Direct Support and General Support Maintenance requirements for TOW 2 Weapon System.



DANGEROUS VOLTAGE

HIGH VOLTAGE is used in this system. Death or injury can result if you are not careful to follow the safety instructions given.



SOLVENT AND ALCOHOL WILL BURN

Keep it away from heat and open flame.

Use only in area where there is plenty of fresh air.

If personnel are burned, get medical help right away.

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

**ELECTRICAL CIRCUIT TEST SET,
 AN/TSM-158 (4935-01-119-3460),**

**ELECTRICAL CABLE TEST SET,
 AN/TSM-149 (6625-01-120-0027),**

**MISSILE GUIDANCE SET TEST SET,
 AN/TSM-152 (4935-01-147-5999),**

**AMPLIFIER TEST SET,
 AN/TAM-5 (5855-01-144-4837)**

TOW 2 WEAPON SYSTEM

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Missile Command, ATTN: AMSMI-LC-ME-PM, Redstone Arsenal, AL 35898-5238. A reply will be sent to you.

	PAGE
HOW TO USE THIS MANUAL	iii
CHAPTER 1 INTRODUCTION	1-1
Section I General Information	1-1
Section II Equipment Description and Data	1-3
CHAPTER 2 OPERATING INSTRUCTIONS	2-1
CHAPTER 3 GENERAL MAINTENANCE INFORMATION	3-1
Section I Repair parts, Special Tools and Test Equipment	3-1
Section II Service Upon Receipt of Materiel	3-2
Section III Preventive Maintenance Checks and Services (PMCS)	3-3
CHAPTER 4 ELECTRICAL CIRCUIT TEST SET MAINTENANCE INSTRUCTIONS	4-1
Section I Electrical Circuit Test Set Troubleshooting Procedures	4-1
Section II Electrical Circuit Test Set Maintenance Procedures	4-32

CHAPTER 5	ELECTRICAL CABLE TEST SET MAINTENANCE INSTRUCTIONS	5-1
Section I	Electrical Cable Test Set Troubleshooting Procedures	5-1
Section II	Electrical Cable Test Set Maintenance Procedures	5-36
CHAPTER 6	MISSILE GUIDANCE SET TEST SET MAINTENANCE INSTRUCTIONS	6-1
Section I	Missile Guidance Set Test Set Troubleshooting Procedures.	6-1
Section II	Missile Guidance Set Test Set Maintenance Procedures	6-69
CHAPTER 7	AMPLIFIER TEST SET MAINTENANCE INSTRUCTIONS	7-1
Section I	Amplifier Test Set Troubleshooting Procedures	7-1
Section II	Amplifier Test Set Maintenance Procedures	7-56
APPENDIX A	REFERENCES	A-1
APPENDIX B	MAINTENANCE ALLOCATION CHART	B-1
APPENDIX C	COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS	C-1
APPENDIX D	ADDITIONAL AUTHORIZATION LIST	D-1
APPENDIX E	EXPENDABLE SUPPLIES AND MATERIALS LIST	E-1
APPENDIX F	SCHEMATICS AND WIRING DATA	F-1

HOW TO USE THIS MANUAL

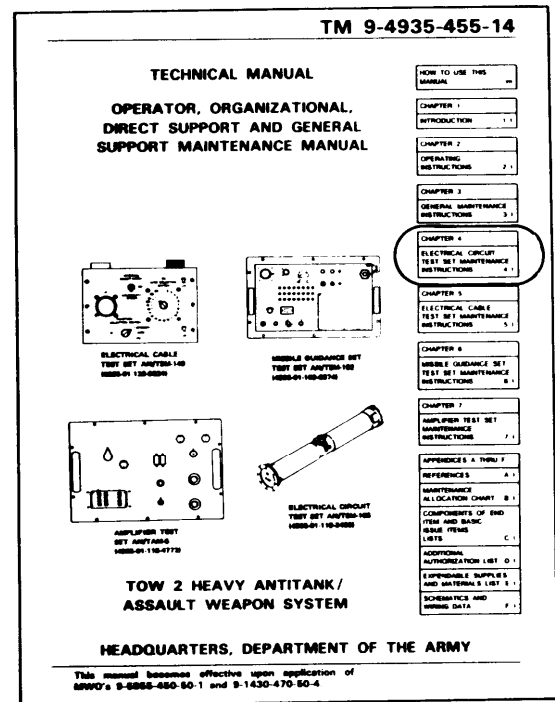
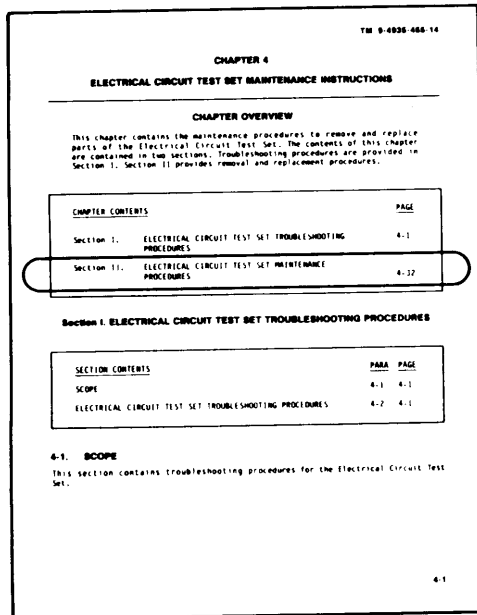
If you spend a few minutes looking through this manual, you will see that it has a new look that is very different from the manuals you have been using. The new look is not just to make this manual look good, but to make it easier for you to read and use so-you can do your job right. We got rid of as many big words as we could. Each chapter is set up to lead you through it step by step for ease of understanding. 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.

Like this:

1. Suppose you want to know how to remove the test panel in the Electrical Circuit Test Set.
2. Look at the cover, and you will see the chapter titles listed top to bottom. Find "ELECTRICAL CIRCUIT TEST SET MAINTENANCE INSTRUCTIONS."
3. You will see that "ELECTRICAL CIRCUIT TEST SET MAINTENANCE INSTRUCTIONS" is Chapter 4.



4. If you open the manual to page 4-1, you will find the beginning of Chapter 4.
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 II. ELECTRICAL CIRCUIT TEST SET MAINTENANCE PROCEDURES . . . 4-32.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)

7. Now that you have reached the section you want you will see the title of each paragraph, the paragraph number and the page number.
8. Now look down the list until you come to REMOVAL AND REPLACEMENT OF TEST PANEL and read across. The information you want is located in paragraph 4-4 on page 4-33. Now turn to page 4-33.

TM 9-4935-455-14

Section II. ELECTRICAL CIRCUIT TEST SET MAINTENANCE PROCEDURES

SECTION CONTENTS	PARA	PAGE
SCOPE	4-3	4-32
REMOVAL AND REPLACEMENT OF TEST PANEL	4-4	4-33
REMOVAL AND REPLACEMENT OF TEST POINT JACKS TP1 THRU TP16	4-5	4-34
REMOVAL AND REPLACEMENT OF ROTARY SWITCH S1	4-6	4-35
REMOVAL AND REPLACEMENT OF CREDIT SHEARERS CDS THRU CDS1	4-7	4-36
REMOVAL AND REPLACEMENT OF RESISTORS AT THE UT	4-8	4-37
REMOVAL AND REPLACEMENT OF RESISTOR R1	4-9	4-38

4-3 SCOPE

This section contains the removal and replacement procedures for the Electrical Circuit Test Set.

4-32

TM 9-4935-455-14

4-4. REMOVAL AND REPLACEMENT OF TEST PANEL

TOOLS

Soldering kit
5/32-inch socket-head screw key

STEP 1 REMOVAL

- A. Remove screw (1) and coupling (2).
- B. Remove exhaust nozzle (3).
- C. Remove test panel (4) and gasket (5).
- D. Tag and unsolder leads from test panel (4).

STEP 2 REPLACEMENT

- A. Solder leads to test panel (4) and untag.
- B. Align white marks on test panel (4) with white marks on nozzle (3).
- C. Install gasket (5), test panel (4), and exhaust nozzle (3).
- D. Install coupling (2) and screw (1).

END OF TASK

4-33

9. Now that you are at the paragraph you want you will find something else that's new. SOME PROCEDURES HAVE BOXES AROUND THEM. The boxed procedures and the pictures go together, so you don't have to look for a picture by number or look on other pages to find out what the test panel (4) looks like. In this TM, it's right there.

10. When you find procedures that are not boxed, you don't need to look for a picture. Either you've seen it before, and now know where the control (or whatever) is, or you just don't need one to do the job.
11. You can find procedures in other sections the same way. First, find the section you think the procedures should be in, open the manual to that section, and find the page number of the procedure from the list at the beginning of the section.
12. You can also use the table of contents on page i in the front of this manual.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)

13. Troubleshooting procedures are written in flow chart style. Each set of instructions is written in a box and the boxes are connected by arrows. By following the arrows you can work your way through the procedure. The following chart tells you what the various boxes mean.

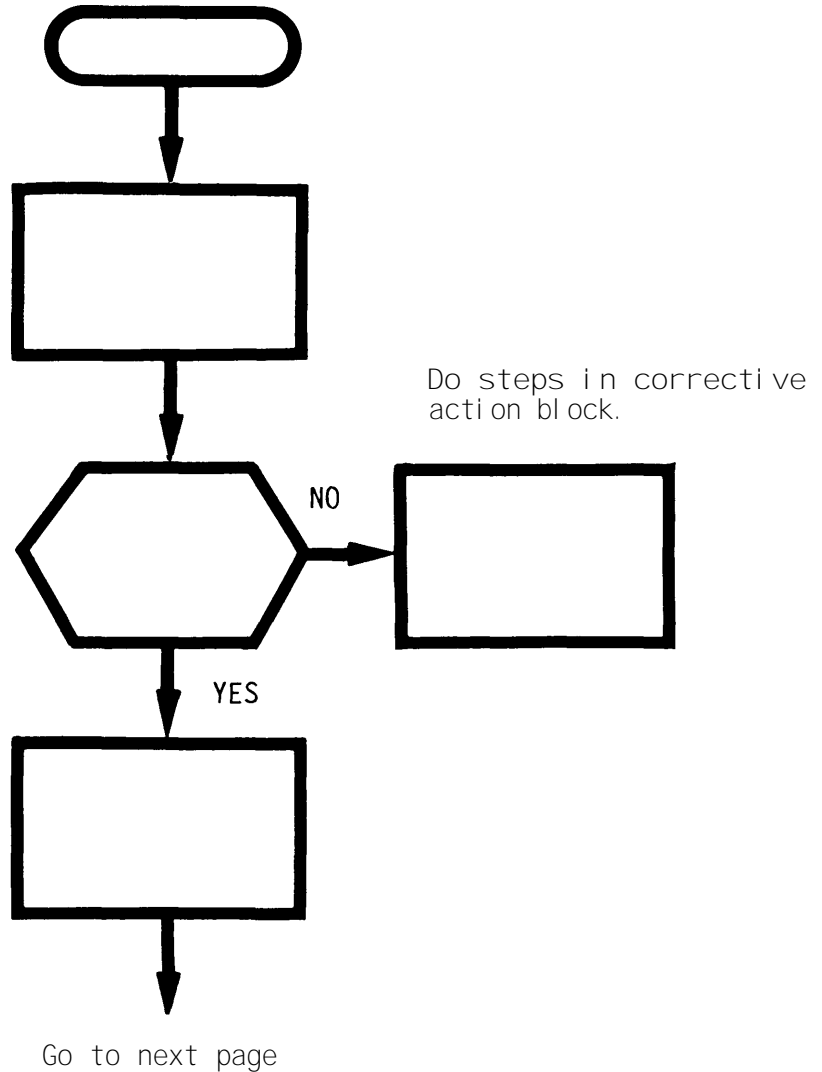
Beginning and ending of procedure.

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.

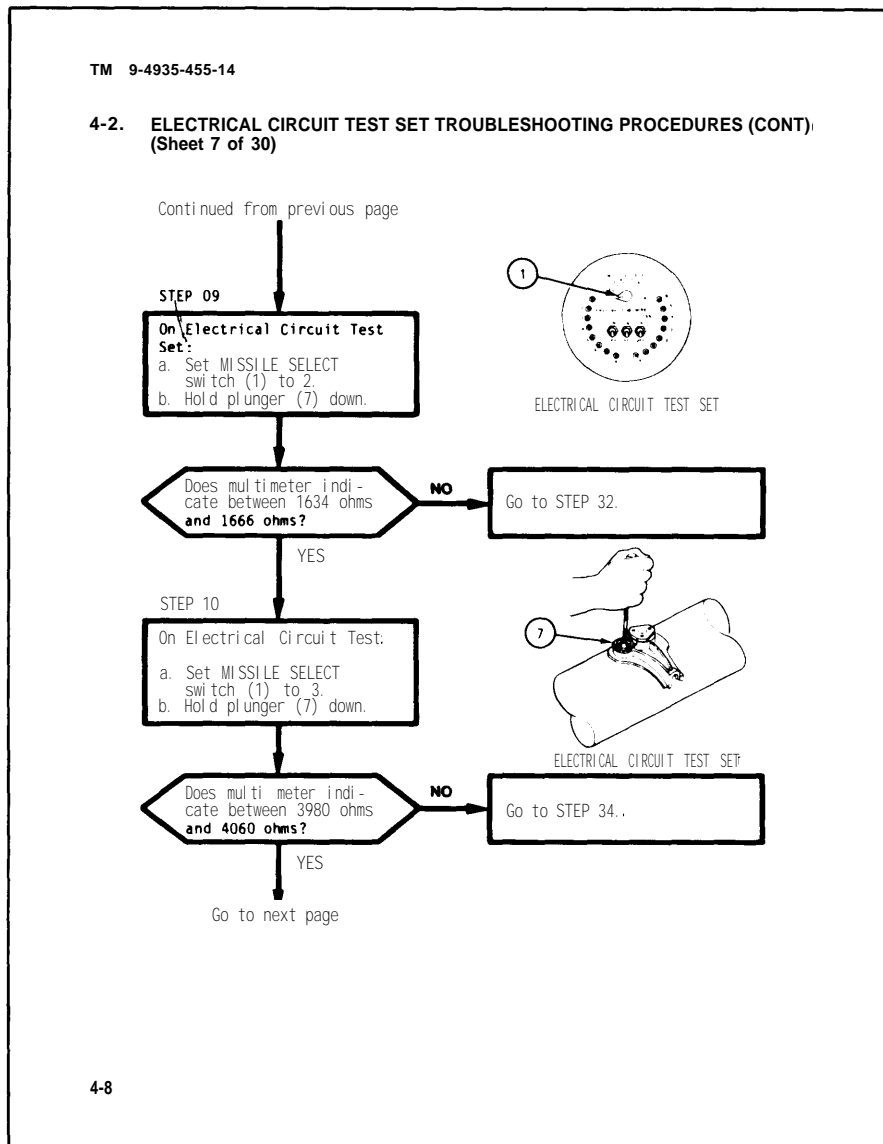
Go to next page and continue the procedure.



14. On the following pages you will find an example of the troubleshooting procedures from para 4-2 on page 4-8.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)



15 Suppose you started the troubleshooting procedures for the Electrical Circuit Test Set on page 4-2 and found nothing wrong until you got to STEP 10 on page 4-8. If you got a "NO" answer for STEP 10, you will find a set of maintenance procedures. There may be several procedures listed in the set. 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.

GO TO NEXT PAGE

HOW TO USE THIS MANUAL (CONT)

16. If you still get a "NO" answer at STEP 10, 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 the troubleshooting again at that point.
17. Once you get a "YES" answer at every step, you know the Electrical Circuit Test Set is working again.

**CHAPTER 1
INTRODUCTION**

CHAPTER OVERVIEW

This chapter contains information on maintenance forms and procedures for reporting equipment improvements. Also provided are descriptive data pertaining to the Electrical Cable Test Set, Missile Guidance Set Test Set, Electrical Circuit Test Set, and the Amplifier Test Set. These four test sets are referred to collectively within this technical manual as TOW 2 Guided Missile System Shop Equipment.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. GENERAL INFORMATION	1-1
Section II. EQUIPMENT DESCRIPTION AND DATA	1-3

Section I. GENERAL INFORMATION

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	1-1	1-1
MAINTENANCE FORMS AND RECORDS	1-2	1-2
REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)	1-3	1-2
DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE	1-4	1-2
ADMINISTRATIVE STORAGE	1-5	1-2

1-1. SCOPE

This manual contains checkout, troubleshooting, and maintenance procedures for the TOW 2 Guided Missile System Shop Equipment. These procedures are performed at the Direct Support/General Support (DS/GS) levels.

1-1. SCOPE (CONT)

The TOW 2 Guided Missile System Shop Equipment is made up of the following four test sets.

EQUIPMENT NAMES	PART NO.	NSN
ELECTRICAL CABLE TEST SET	13195112	6625-01-120-0027
MISSILE GUIDANCE SET TEST SET	13099749	4935-01-147-5999
ELECTRICAL CIRCUIT TEST SET	13195336	4935-01-119-3460
AMPLIFIER TEST SET	13099878	5855-01-144-4837

1-2. MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA PAM 738-750, The Army Maintenance Management System.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your equipment 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). Mail it to us at:

Commander
U.S. Army Missile Command
ATTN: AMSMI-QA-CF
Redstone Arsenal, AL 35898-5290

We'll send you a reply.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

For information on destruction of Army materiel to prevent enemy use, see TM 750-244-4-2.

1-5. ADMINISTRATIVE STORAGE

Information relative to the requirements and procedures for administrative storage of the TOW 2 Guided Missile System Shop Equipment are given in TM 740-90-1.

Section II. EQUIPMENT DESCRIPTION AND DATA

SECTION CONTENTS	PARA	PAGE
SCOPE	1-6	1-3
PURPOSE OF EQUIPMENT	1-7	1-3
DESCRIPTION OF EQUIPMENT	1-8	1-3
EQUIPMENT DATA	1-9	1-5

1-6. SCOPE

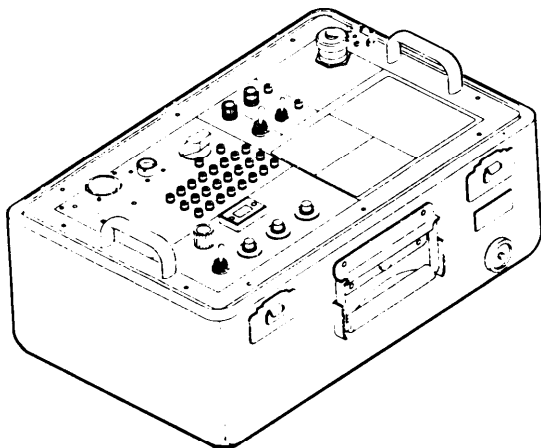
This section provides equipment data and a brief description of the four test sets which make up the TOW 2 Guided Missile System Shop Equipment.

1-7. PURPOSE OF EQUIPMENT

- a. MISSILE GUIDANCE SET TEST SET: The Missile Guidance Set Test Set is used during TOW 2 System test, checkout, and repair.
- b. ELECTRICAL CIRCUIT TEST SET: The Electrical Circuit Test Set is used for TOW 2 System checkout.
- c. ELECTRICAL CABLE TEST SET: The Electrical Cable Test Set is used to check out Traversing Unit cables (2W1 and 2W3).
- d. AMPLIFIER TEST SET: The Amplifier Test Set is used during checkout of the Night Sight, with the AN/TAM-3.

1-8. DESCRIPTION OF EQUIPMENT

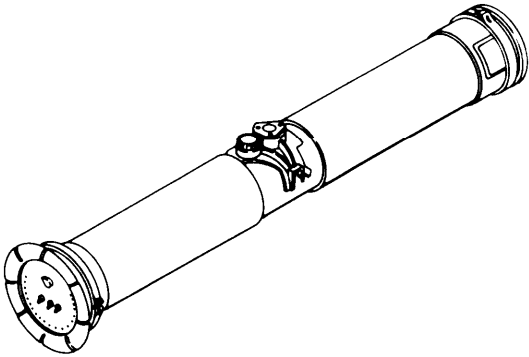
1. Missile Guidance Set Test Set - The Missile Guidance Set Test Set can isolate a Missile Guidance Set (MGS) failure to the printed circuit card level. The Test Set interfaces with the MGS test signals, and permits control of microprocessor fault diagnostic functions, generates necessary test signals, and provides a display of test results. The Test Set is also used in TOW 2 system verification.



MISSILE GUIDANCE SET TEST SET

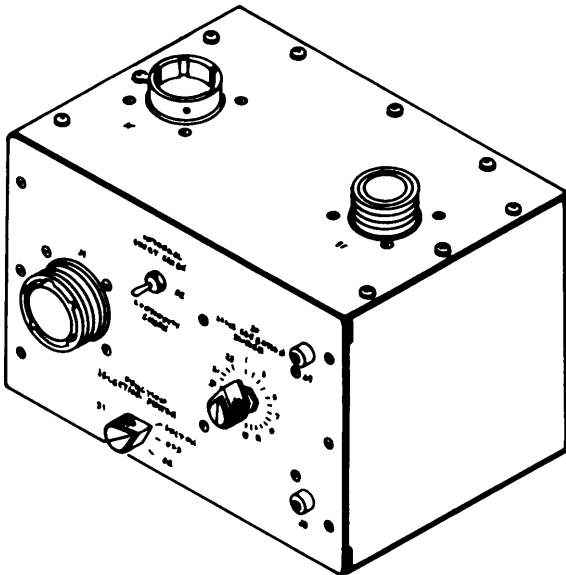
1-8. DESCRIPTION OF EQUIPMENT (CONT)

- 2. Electrical Circuit Test Set - The Electrical Circuit Test Set, when placed in the breech of the Traversing Unit, gives electrical access to the TOW 2 Weapon System umbilical interface. The Test Set simulates the missile electrical identifier signature as an aid to system testing.



ELECTRICAL CIRCUIT TEST SET

- 3. Electrical Cable Test Set - The Electrical Cable Test Set is used as a continuity/short tester for the Traversing Unit cables.

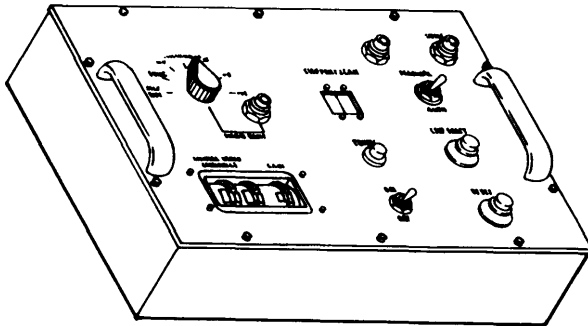


ELECTRICAL CABLE TEST SET

1-8. DESCRIPTION OF EQUIPMENT (CONT)

4. Amplifier Test Set -

The Amplifier Test Set is used to isolate a fault in the postamplifier assembly to a single replaceable subassembly, to gain-balance the Video buffers, and to align the Night Sight eyepiece reticle assembly.



AMPLIFIER TEST SET

1-9. EQUIPMENT DATA

Item	Length in. (cm)	Width in. (cm)	Height in. (cm)	Weight lb (kg)
Missile Guidance Set Test Set	20.52 (52.12)	15.48 (39.32)	12.48 (31.70)	38 (17.24)
Electrical Circuit Test Set	56.52 (143.56)	15.48 (39.32)	15.96 (40.54)	23 (10.43)
Electrical Cable Test Set	16.56 (42.06)	12.48 (31.70)	12.96 (32.92)	12 (5.44)
Amplifier Test Set	16.56 (42.06)	13.56 (34.44)	9.00 (22.86)	12 (5.44)

CHAPTER 2
OPERATING INSTRUCTIONS

CHAPTER OVERVIEW

Operating procedures for the Missile Guidance Set Test Set, Electrical Cable Test Set, and Electrical Circuit Test Set are contained in TM 9-1425-450-34-1. Operating instructions for the Amplifier Test Set are given in TM 9-5855-450-24.

CHAPTER 3
GENERAL MAINTENANCE INFORMATION

CHAPTER OVERVIEW

This chapter contains information about common tools and equipment, special tools and test equipment, and repair parts needed to repair the components of the TOW 2 Guided Missile System Shop Equipment.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. REPAIR PARTS, SPECIAL TOOLS AND TEST EQUIPMENT	3-1
Section II. SERVICE UPON RECEIPT OF MATERIEL	3-2
Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)	3-3

Section I. REPAIR PARTS, SPECIAL TOOLS AND TEST EQUIPMENT

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	3-1	3-1
COMMON TOOLS AND EQUIPMENT	3-2	3-1
SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT	3-3	3-2
REPAIR PARTS	3-4	3-2

3-1. SCOPE

This section contains information about common tools and equipment, special tools and test equipment, and repair parts for TOW 2 Guided Missile System Shop Equipment Support.

3-2. COMMON TOOLS AND EQUIPMENT

Common tools and equipment to be used by personnel in maintenance of the TOW 2 Guided Missile System are provided in the MOS 27E tool kit. The complete MOS 27E tool kit is listed and illustrated in SC 5180-95-CL-AS2.

3-3. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

a. Special Tools, TMDF and Test Equipment: No special tools are required. The following test equipment is required for troubleshooting the TOW 2 Guided Missile System Shop Equipment.

- Digital Voltmeter

b. Support Equipment No special support equipment is required.

3-4. REPAIR PARTS

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (TM 9-4935-455-24P for the Amplifier Test Set, TM 9-4935-451-24P for the Electrical Cable Test Set, and TM 9-4935-450-24P for the Electrical Circuit Test Set and Missile Guidance Set Test Set).

Section II. SERVICE UPON RECEIPT OF MATERIEL

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	3-5	3-2
SERVICE UPON RECEIPT CHECKLIST	3-6	3-2

3-5. SCOPE

When the Shop Equipment is first received by the using organization, it is necessary to perform receiving and inspection to determine whether the equipment is complete and in an operational condition.

3-6. SERVICE UPON RECEIPT CHECKLIST

a. When handling, inspecting, and maintaining the equipment, observe the following general instructions.

(1) Always handle the components with care; rough handling could cause a malfunction, inaccurate testing, or a possible safety hazard.

(2) Do not force levers, knobs, switches, or controls beyond their mechanical stops.

(3) Use only those tools and equipment items authorized for performance of maintenance as specified in maintenance allocation chart located in Appendix B.

(4) Use only those paints, cleaning agents, solvents, and other materials which are specifically authorized in expendable supplies and materials list located in Appendix E.

3-6. SERVICE UPON RECEIPT CHECKLIST (CONT)

b. Services

(1) Perform unpacking procedures.

(2) Make an initial inventory (See Appendix C) when the equipment is received. Note any missing items and report them promptly.

(3) Check stock numbers and serial numbers to insure that the correct items were received.

(4) Perform necessary cleaning in accordance with the procedures in paragraphs 3-9 thru 3-12.

(5) Perform an inspection of components in accordance with the procedures in paragraph 3-8.

(6) Report any deficiencies using applicable reports, records, and forms required for inventories and inspections.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	3-7	3-3
COLUMN ENTRIES USED IN PMCS	3-8	3-4
CLEANING	3-9	3-6
GENERAL CLEANING	3-10	3-6
CLEANING RUBBER PARTS	3-11	3-8
CLEANING CONNECTORS	3-12	3-10
PAINTING	3-13	3-11

3-7. SCOPE

This section tells how to do the preventive maintenance checks and services (PMCS) required for the TOW 2 Guided Missile System Shop Equipment. PMCS represent 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. Table 3-1 lists the PMCS to be performed.

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

b. Once every month, while equipment is in service, do all monthly (M) PMCS.

3-7. SCOPE (CONT)

If your equipment fails to operate, report any deficiencies using the proper forms. See TM 38-750.

3-8. COLUMN ENTRIES USED IN PMCS

- 1 Column 1 Item No. 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. 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
 - M - Once a month (monthly)
- 3 Column 3 Item to be checked. Identifies the part of the equipment to be checked.
- 4 Column 4 Procedure. Provide the procedures for performing the check.
- 5 Column 5 For readiness reporting equipment is not ready/available if. Column 5 contains the criteria which will cause the equipment to be unable to perform its primary mission.

Table 3-1. PMCS For TOW 2 Guided Missile System Shop Equipment

Item No.	Interval		Item to be Inspected	Procedure Check for and have repaired or adjusted as necessary	For readiness reporting, equipment is not ready/available if:
	B	M			
ELECTRICAL CABLE TEST SET					
1	●	●	Electrical Cable Test Set	Visually inspect test set for missing hardware or obvious damage.	
2	●	●	Connectors	Check for damage or dirt; clean if necessary. Refer to para 3-12 for a connector cleaning procedure.	Connectors are cracked or badly dented and can not be used.
ELECTRICAL CIRCUIT TEST SET					
1	●	●	Electrical Circuit Test Set	Visually inspect for missing hardware or obvious damage.	
2	●	●	Connector	Check for damage or dirt; clean if necessary. Refer to para 3-12 for a connector cleaning procedure.	Connector is cracked or badly dented and can not be used.
MISSILE GUIDANCE SET TEST SET					
1	●	●	Missile guidance Set Test Set	Visually inspect for missing hardware or obvious damage.	
2	●	●	Connectors	Check for damage or dirt, clean if necessary. Refer to para 3-12 for a connector cleaning procedure.	Connectors are cracked or badly dented and can not be used.

Table 3-1. PMCS For TOW 2 Guided Missile System Shop Equipment (Cont)

Item No.	Interval		Item to be Inspected	Procedure Check for and have repaired or adjusted as necessary	For readiness reporting, equipment is not ready/available if:
	B	M			
			AMPLIFIER TEST SET		
1	●	●	Amplifier Test Set	Visually inspect for missing hardware or obvious damage.	
2	●	●	Connectors	Check for damage or dirt; clean if necessary. Refer to para 3-12 for a connector cleaning procedure.	Connectors are cracked or badly dented and can not be used.
3	●	●	Self Test	Refer to para 7-2 to perform self test.	

3-9. CLEANING

Cleaning of TOW 2 Guided Missile System Shop Equipment is important to maintain good operation. If the equipment is not kept clean, damage may be hidden and would not be found during an initial inspection. General cleaning shall be done before spot painting.

3-10. GENERAL CLEANING

MATERIALS: Scrub brush (item 2, App E)
Toluene (item 9, App E)
Wiping rags (item 8, App E)



SOLVENT WILL BURN

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 by covering the fire so air cannot reach it.
If personnel are burned, get medical help right away.

3-10. GENERAL CLEANING (CONT)

SOLVENT CAN HARM EYES AND SKIN

Try not to get solvent on your bare 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 bare skin.



RUBBER PARTS OR SEALANTS

Do not get toluene on rubber parts or sealant.
Toluene can cause rubber parts to crack and sealants to melt.

GLASS SURFACES

Do not clean glass surfaces with rags or scrub brush.
These materials can scratch glass surfaces and cause the system not to work right.

NOTE

Before doing procedure below, check table for a specific cleaning procedure for the item you are cleaning. If no specific procedure is listed, do procedure listed below.

- A. Wipe area to be cleaned with wiping rag.
- B. For stubborn dirt, brush area to be cleaned with scrub brush.
- C. For grease or dirt that the scrub brush could not remove, wet a wiping rag with toluene.
- D. Wipe area to be cleaned with wet wiping rag.
- E. Clean off any toluene left with clean, dry wiping rag.

END OF TASK

3-11. CLEANING RUBBER PARTS

MATERIALS: Detergent (item 6, App E)
Scrub-brush (item 2, App E)
Wiping rag (item 8, App E)
Glycerol (item 7, App E)



RUBBER PARTS OR SEALANTS

Do not use alcohol or toluene on rubber parts or sealant. Alcohol or toluene can cause rubber parts to crack and sealants to melt.

1

The diagram shows a hand holding a scrub brush and cleaning a U-shaped rubber part of a hose assembly. An arrow labeled "SCRUB BRUSH" points to the brush, and another arrow labeled "RUBBER PARTS" points to the U-shaped section of the hose.

- A. Wipe rubber parts with wiping rags to clean off loose dirt and dust.
- B. For stubborn dirt, brush off dirt with scrub brush.

3-11. CLEANING RUBBER PARTS (CONT)**2**

NOTE

If detergent is not available, plain water can be used to clean rubber parts.

For cold weather operation (temperature below 0°C or +32°F), add glycerol to cleaning water.

Glycerol prevents water from freezing during use.

- A. For grease, or if scrub brush could not remove dirt, mix detergent with water.
- B. Wet a clean wiping rag with detergent and water mixture.
- C. Wipe rubber parts with wet wiping rag.
- D. Dry rubber parts using clean, dry wiping rag.

END OF TASK

3-12. CLEANING CONNECTORS

MATERIALS: Alcohol (item 1, App E)
Wiping rag (item 8; App E)



ALCOHOL WILL BURN

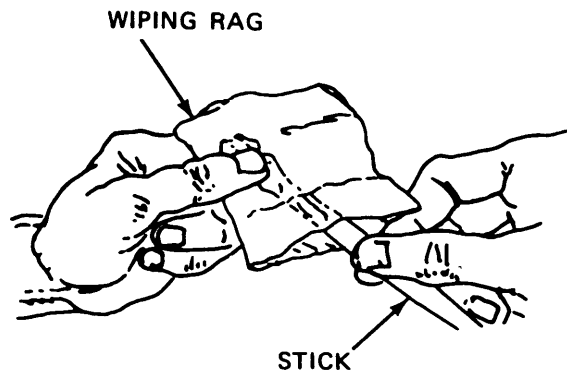
Keep it away from heat and open flame.
Use only in area where there is plenty of fresh air.
In case of fire, put it out with water or by covering fire so air cannot reach it.
If personnel are burned, get medical help right away.



RUBBER PARTS OR SEALANTS

Do not get alcohol on rubber parts or sealant.
Alcohol can cause rubber parts to crack and sealants to melt.

- A. Wrap clean wiping rag around a stick to form a swab.
- B. Wet swab with alcohol.
- C. Clean contact of connector with wet swab.
- D. Repeat steps A thru C until all the contacts of the connector are clean.



END OF TASK

3-13. PAINTING

Solvent used for cleaning areas to be painted is toxic and flammable. Keep away from heat and open flame. Use only in a well-ventilated area. Avoid prolonged or repeated breathing of the vapor. Avoid prolonged or repeated contact with the skin.

CAUTION

Bearings, rubber, or other components which might be damaged by cleaning, masking or paint must be removed before proceeding.

Use masking tape to insure that no paint is applied to the following: countersinks, counterbores, bolt holes, bearing surfaces, attaching surfaces, preformed packing grooves, and those areas treated with solid film lubricant.

DS/GS maintenance personnel are authorized to spot paint the TOW 2 Guided Missile System Shop Equipment. Spot painting detailed procedures are found in TM 43-0139. For spot painting, use quick-drying semi-gloss enamel No. 24087 for all olive drab surfaces and No. 27038 for all black front panels. Surfaces must be cleaned before any spot painting takes place.

CHAPTER 4

ELECTRICAL CIRCUIT TEST SET MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter contains the maintenance procedures to remove and replace parts of the Electrical Circuit Test Set. The contents of this chapter are contained in two sections. Troubleshooting procedures are provided in Section I. Section II provides removal and replacement procedures.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES	4-1
Section II. ELECTRICAL CIRCUIT TEST SET MAINTENANCE PROCEDURES	4-32

Section I. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	4-1	4-1
ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES	4-2	4-2

4-1. SCOPE

This section contains troubleshooting procedures for the Electrical Circuit Test Set.

**4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES
(Sheet 1 of 30)**

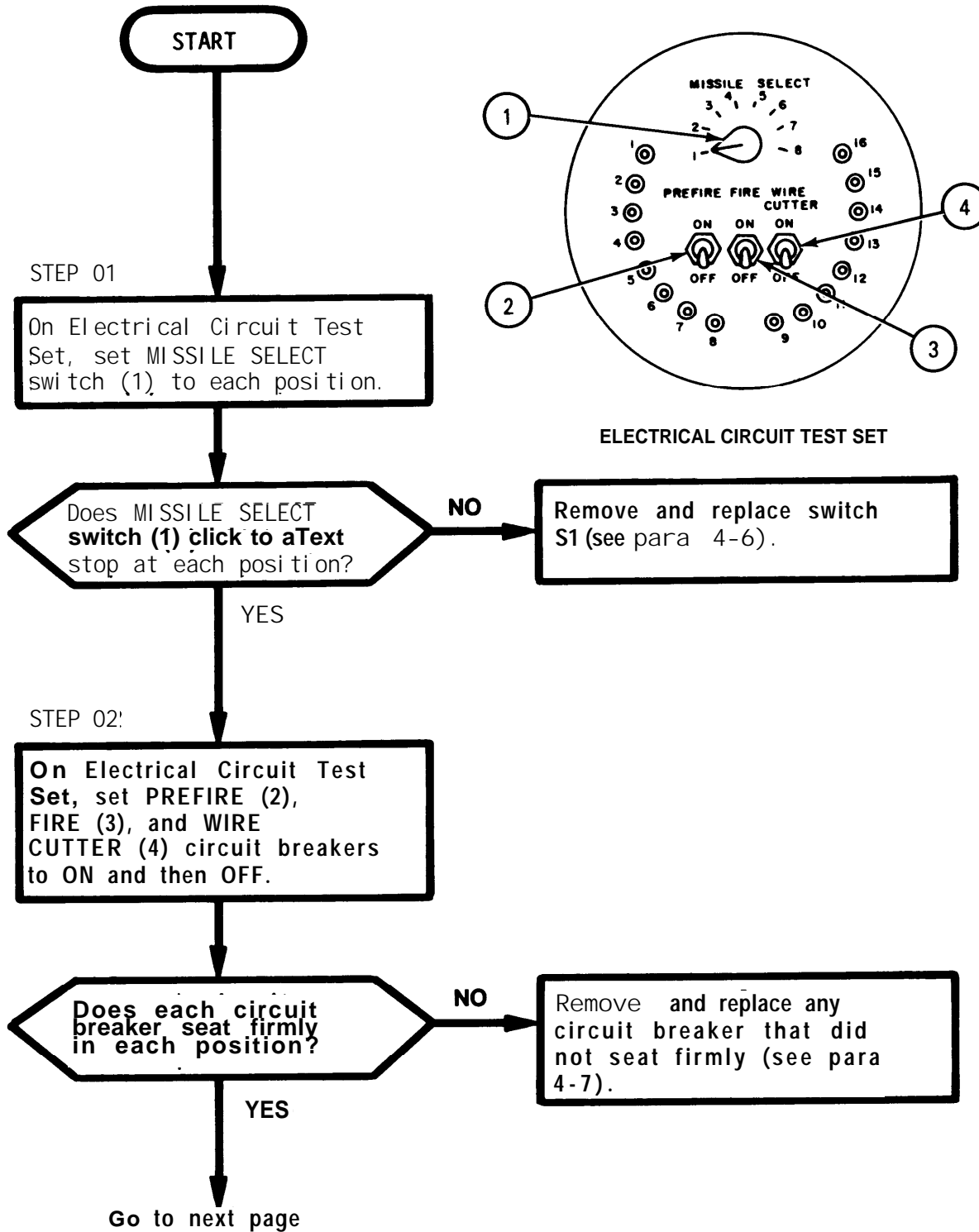
This paragraph provides troubleshooting procedures for the Electrical Circuit Test Set.

TEST EQUIPMENT: Multi meter

NOTE

- Follow steps in order given in the procedures. Do not skip any steps.
- When you enter the NO chain, do the procedure and/or repairs as instructed in the corrective action block.
- Unless otherwise specified, after performing the corrective action of the NO chain always return to the START of the procedure you were checking. When more than one corrective action may be required, do the first corrective action, return to START, and repeat the procedure. If the problem still exists, do the next corrective action and repeat.
- The wafers on wafer switches are listed alphabetically from front to rear.

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 2 of 30)



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES [CONT]
(Sheet 3 of 30)

Continued from previous page

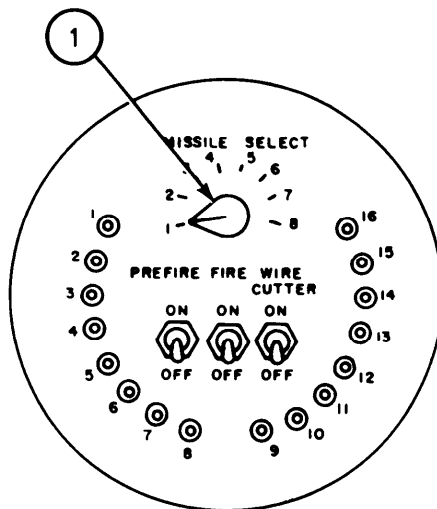
STEP 03

On Electrical Circuit Test Set, set MISSILE SELECT switch (1) to 1.

STEP 04

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to test points as indicated below.

Test Points	Normal Indication	
TP-1	TP-2	Continuity
TP-1	TP-3	Continuity
TP-1	TP-4	Continuity
TP-1	TP-5	Continuity
TP-1	TP-6	Continuity
TP-1	TP-7	Continuity
TP-1	TP-8	Continuity
TP-1	TP-9	Continuity
TP-1	TP-10	Continuity
TP-1	TP-11	Continuity
TP-1	TP-12	Continuity
TP-1	TP-13	Continuity
TP-1	TP-14	Continuity
TP-1	TP-15	Continuity
TP-1	TP-16	Continuity

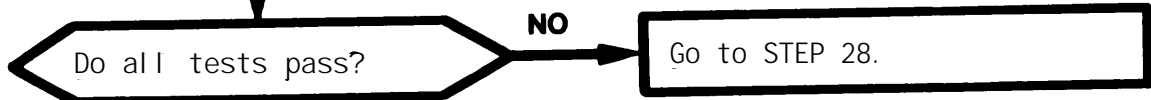


ELECTRICAL CIRCUIT TEST SET

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4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 4 of 30)

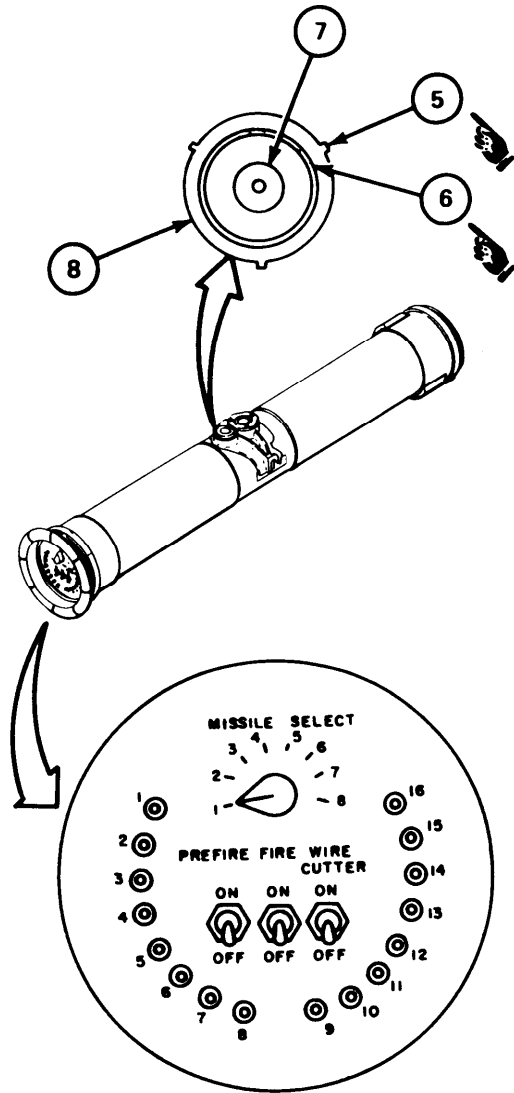
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NOTE
Master keyway (5) is the widest keyway.

STEP 05
On Electrical Circuit Test Set, connector J1 (8):
a. Locate master keyway (5). Pin 1 (6) is in line with master keyway. Pins 1 thru 20 are counterclockwise from master keyway when viewed from top.
b. Using 1/2-inch socket wrench, push plunger (7) down while reading all test points.

Go to next page



ELECTRICAL CIRCUIT TEST SET

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 5 of 30)

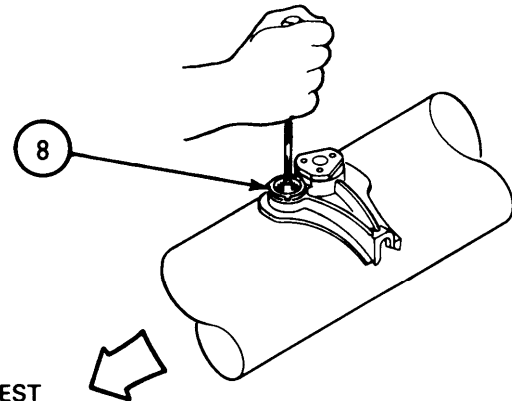
Continued from previous page

STEP 06

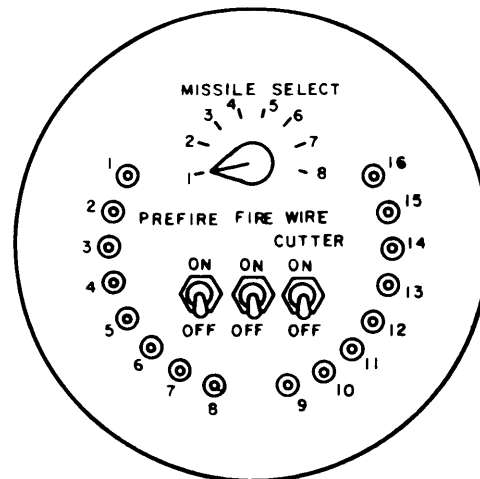
Connect multimeter to test points as indicated below.

Test Points	Normal Indication
TP-1 J1 (8)-1	Open
TP-13 J1 (8)-2	Continuity
TP-12 J1 (8)-3	Continuity
TP-10 J1 (8)-4	Continuity
TP-16 J1 (8)-5	Continuity
TP-9 J1 (8)-6	Continuity
TP-8 J1 (8)-7	Continuity
TP-7 J1 (8)-8	Continuity
TP-5 J1 (8)-9	Continuity
TP-6 J1 (8)-10	Continuity
TP-11 J1 (8)-11	Continuity
TP-15 J1 (8)-12	Continuity
TP-14 J1 (8)-13	Continuity
TP-4 J1 (8)-14	Continuity
TP-4 J1 (8)-15	Continuity
TP-2 J1 (8)-16	Continuity
TP-1 J1 (8)-17	Continuity
TP-2 J1 (8)-18	Continuity
TP-3 J1 (8)-19	Continuity
TP-3 J1 (8)-20	Continuity

Go to next page

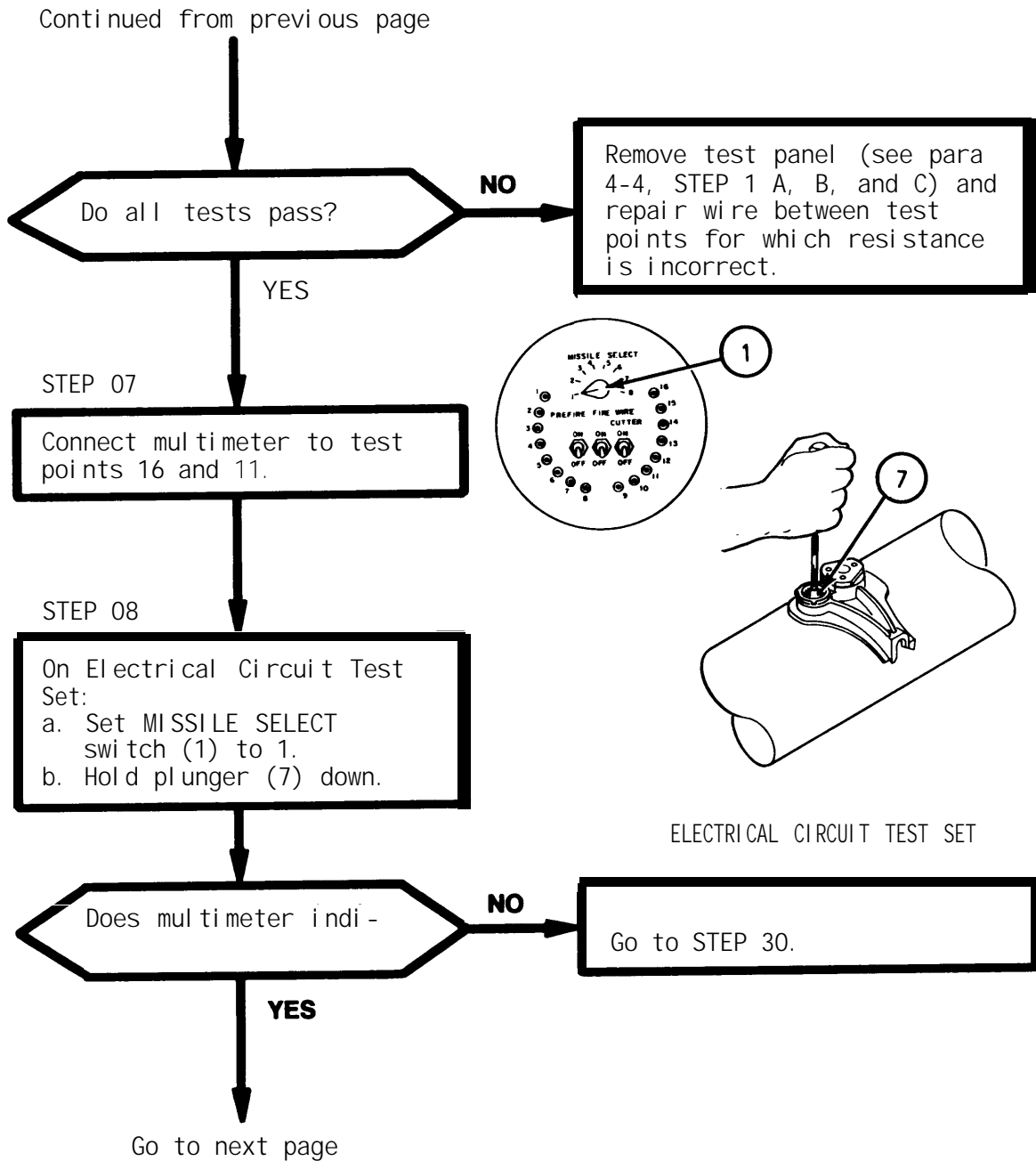


TEST PANEL



ELECTRICAL CIRCUIT TEST SET

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 6 of 30)

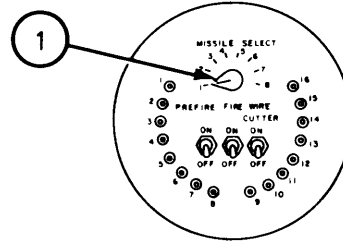


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 7 of 30)

Continued from previous page

STEP 09

On **Electrical Circuit Test Set**:
 a. Set **MISSILE SELECT** switch (1) to 2.
 b. Hold plunger (7) down.



ELECTRICAL CIRCUIT TEST SET

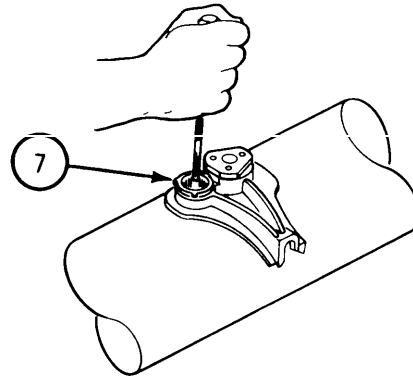
Does multimeter indicate between 1634 ohms and 1666 ohms?

NO → Go to step 32.

YES

STEP 10

On **Electrical Circuit Test Set**:
 a. Set **MISSILE SELECT** switch (1) to 3.
 b. Hold plunger (7) down.



ELECTRICAL CIRCUIT TEST SET

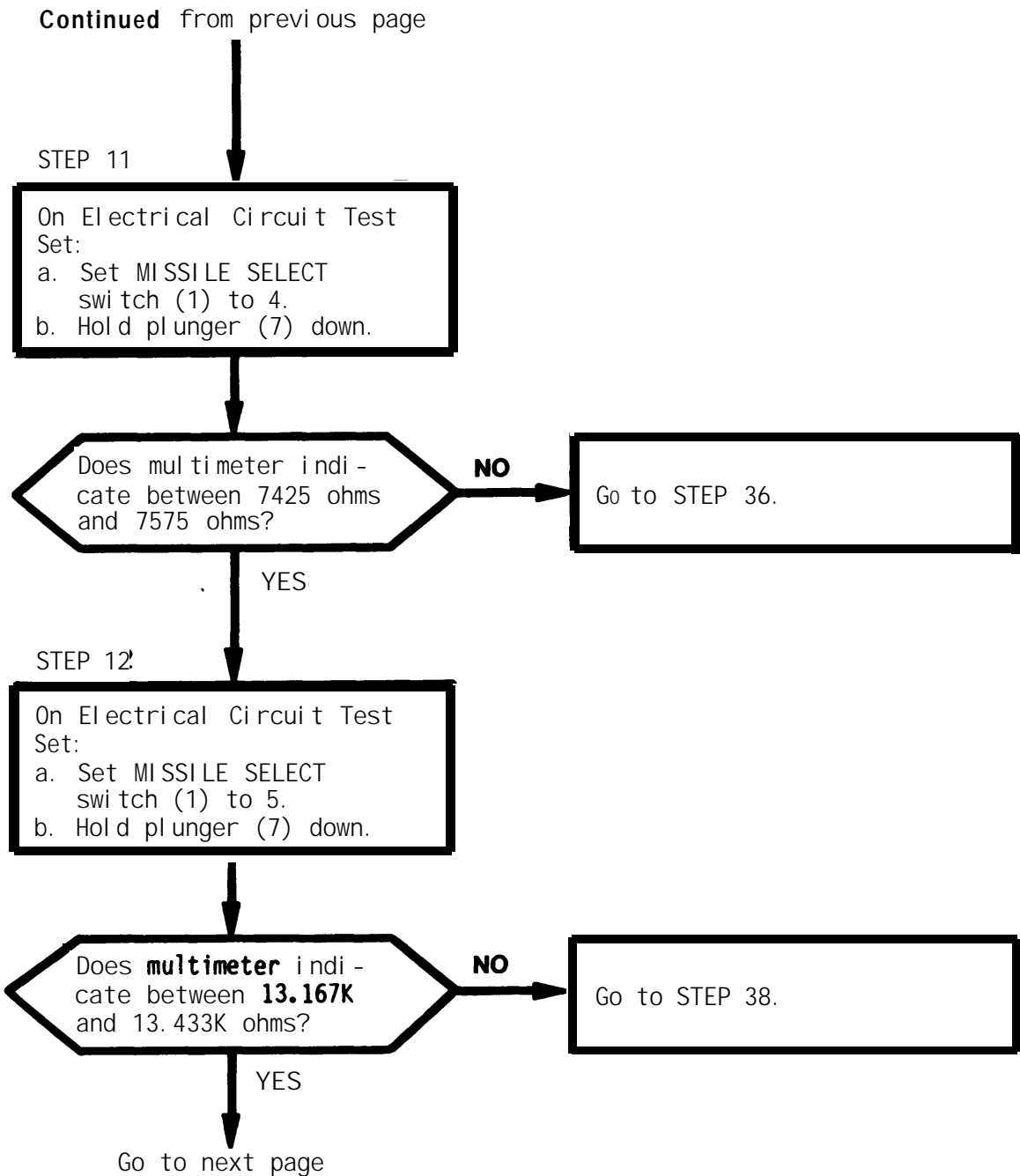
Does multimeter indicate between 3980 ohms and 4060 ohms?

NO → Go to STEP 34.

YES

Go to next page

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 8 of 30)

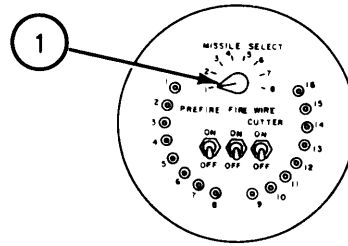


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 9 of 30)

Continued from previous page

STEP 13

On Electrical Circuit Test Set:
a. Set MISSILE SELECT switch (1) to 6.
b. Hold plunger (7) down.



ELECTRICAL CIRCUIT TEST SET

Does multimeter indicate between 24.651K and 25.149K ohms?

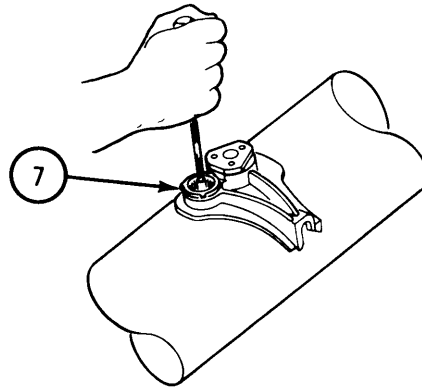
NO

Go to STEP 40.

YES

STEP 14

On Electrical Circuit Test Set:
a. Set MISSILE SELECT switch (1) to 7.
b. Hold plunger (7) down.



ELECTRICAL CIRCUIT TEST SET

Does multimeter indicate between 58.41K and 59.59K ohms?

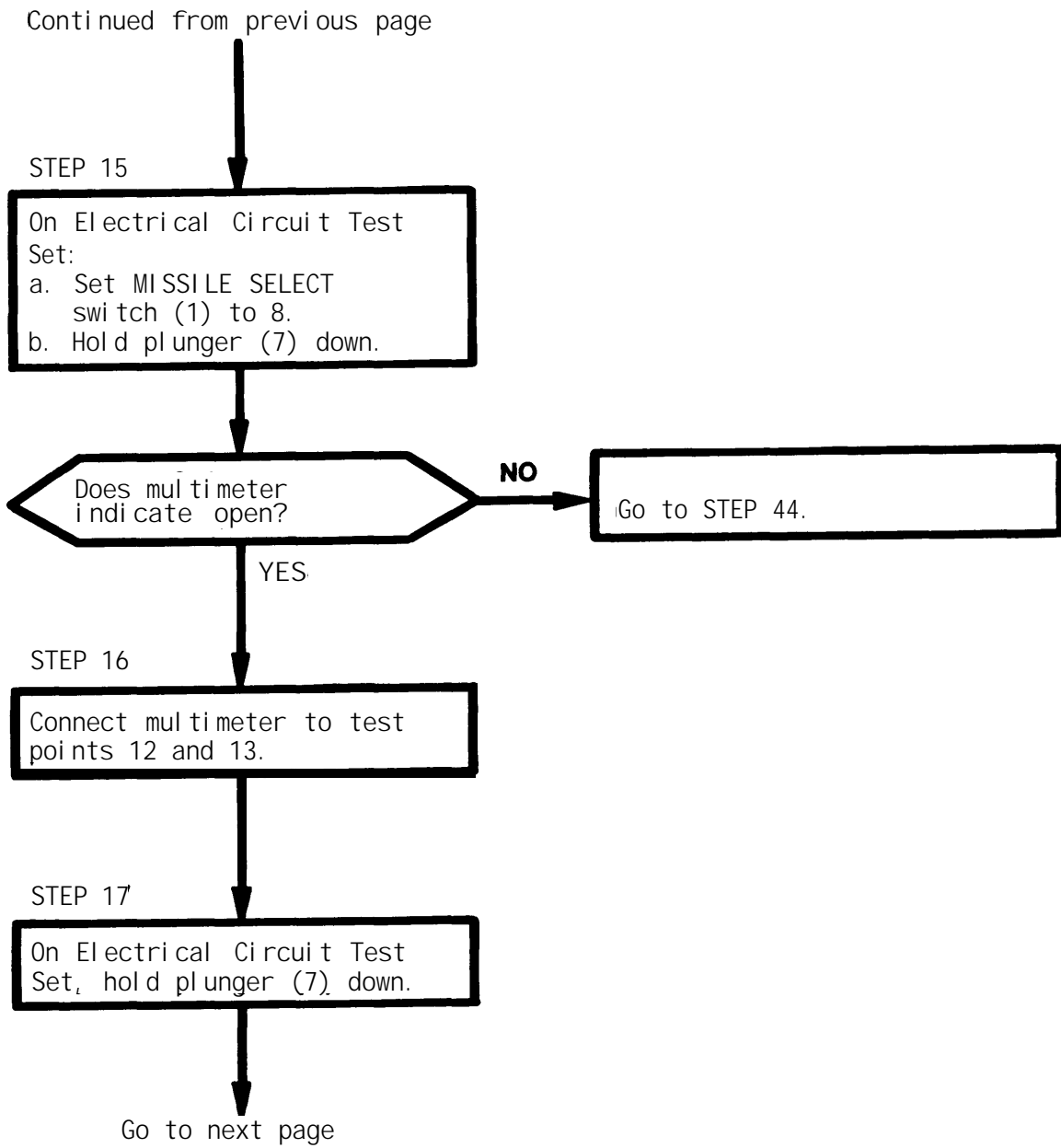
NO

Go to STEP 42.

YES

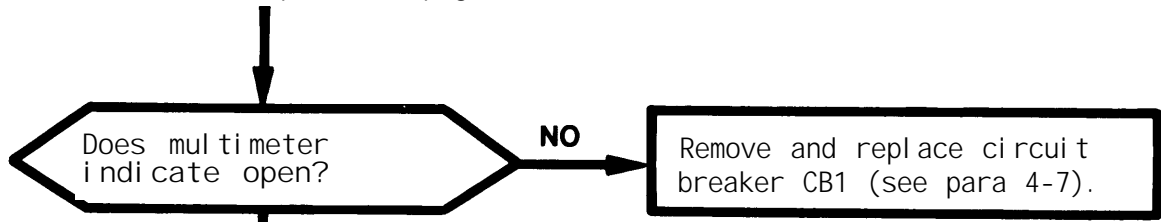
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4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 10 of 30)

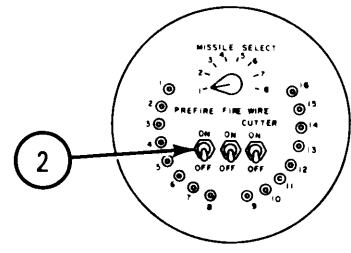


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 11 of 30)

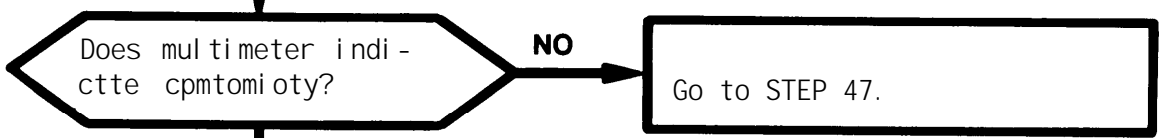
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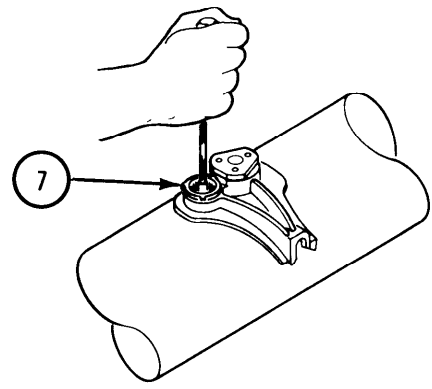
STEP 18
On Electrical Circuit Test Set:
a. Set PREFIRE circuit breaker (2) to ON.
b. Hold plunger (7) down.



ELECTRICAL CIRCUIT TEST SET



STEP 19
Connect multimeter to test points 14 and 15.

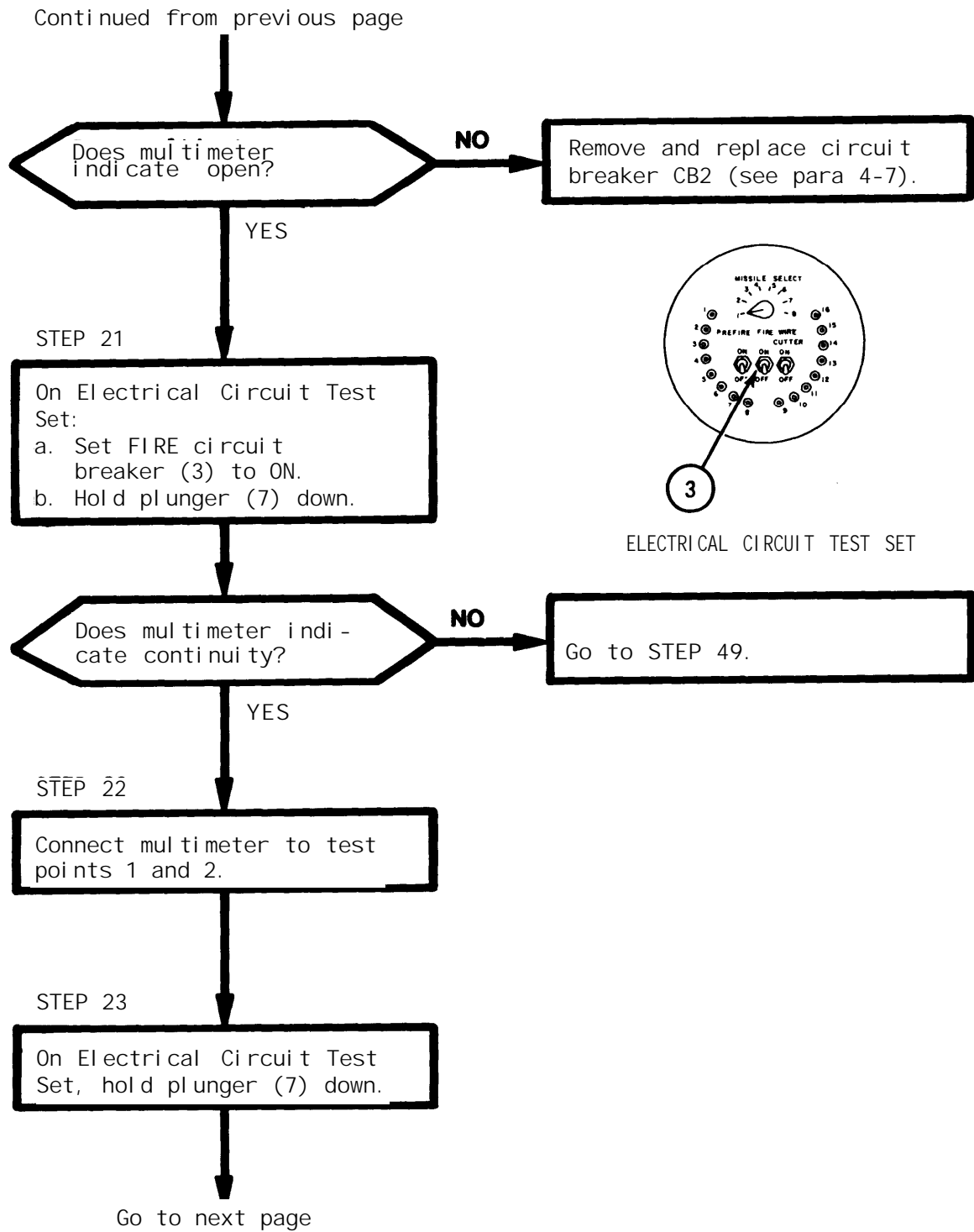


ELECTRICAL CIRCUIT TEST SET

STEP 20
On Electrical Circuit Test Set, hold plunger (7) down.

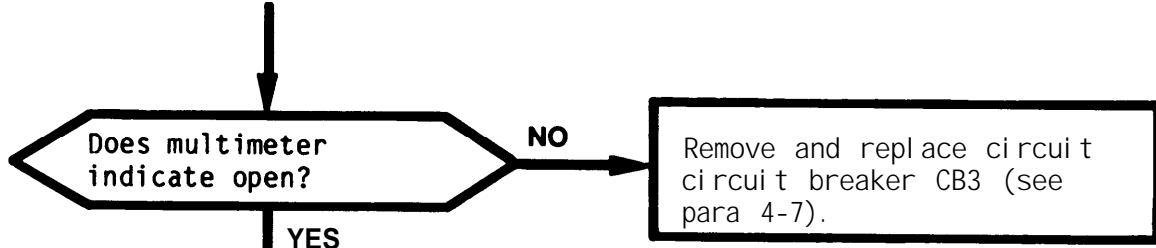
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4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 12 of 30)



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 13 of 30)

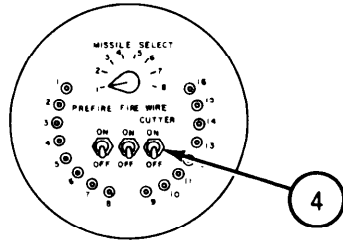
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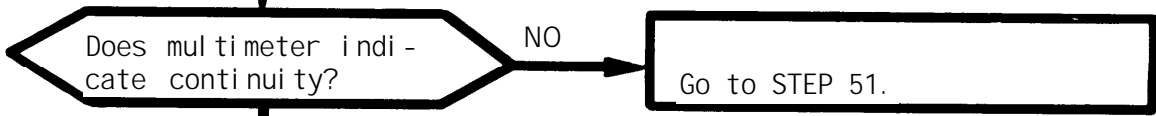
STEP 24

On Electrical Circuit Test Set:

- Set WIRE CUTTER circuit breaker (4) to ON.
- Hold plunger (7) down.

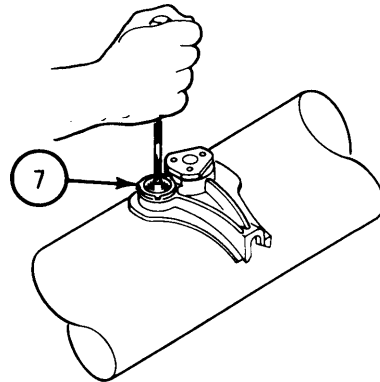


ELECTRICAL CIRCUIT TEST SET



STEP 25

Connect multimeter to test points 3 and 4.



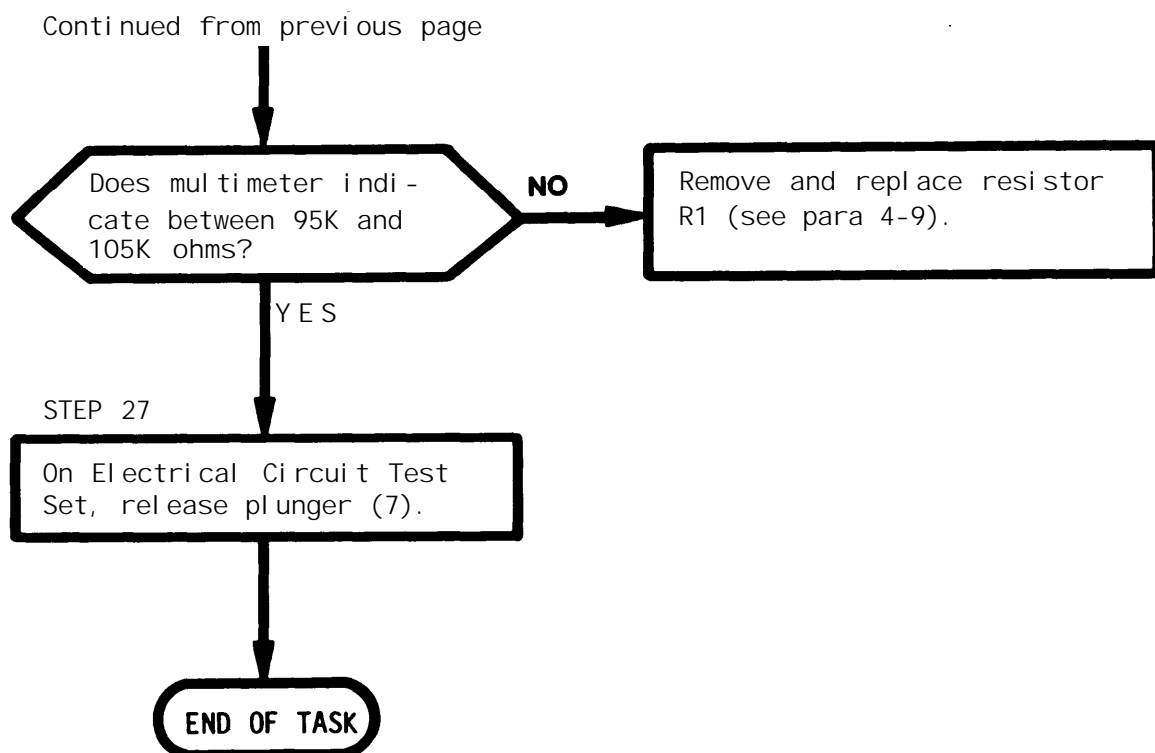
STEP 26

On Electrical Circuit Test Set, hold plunger (7) down.

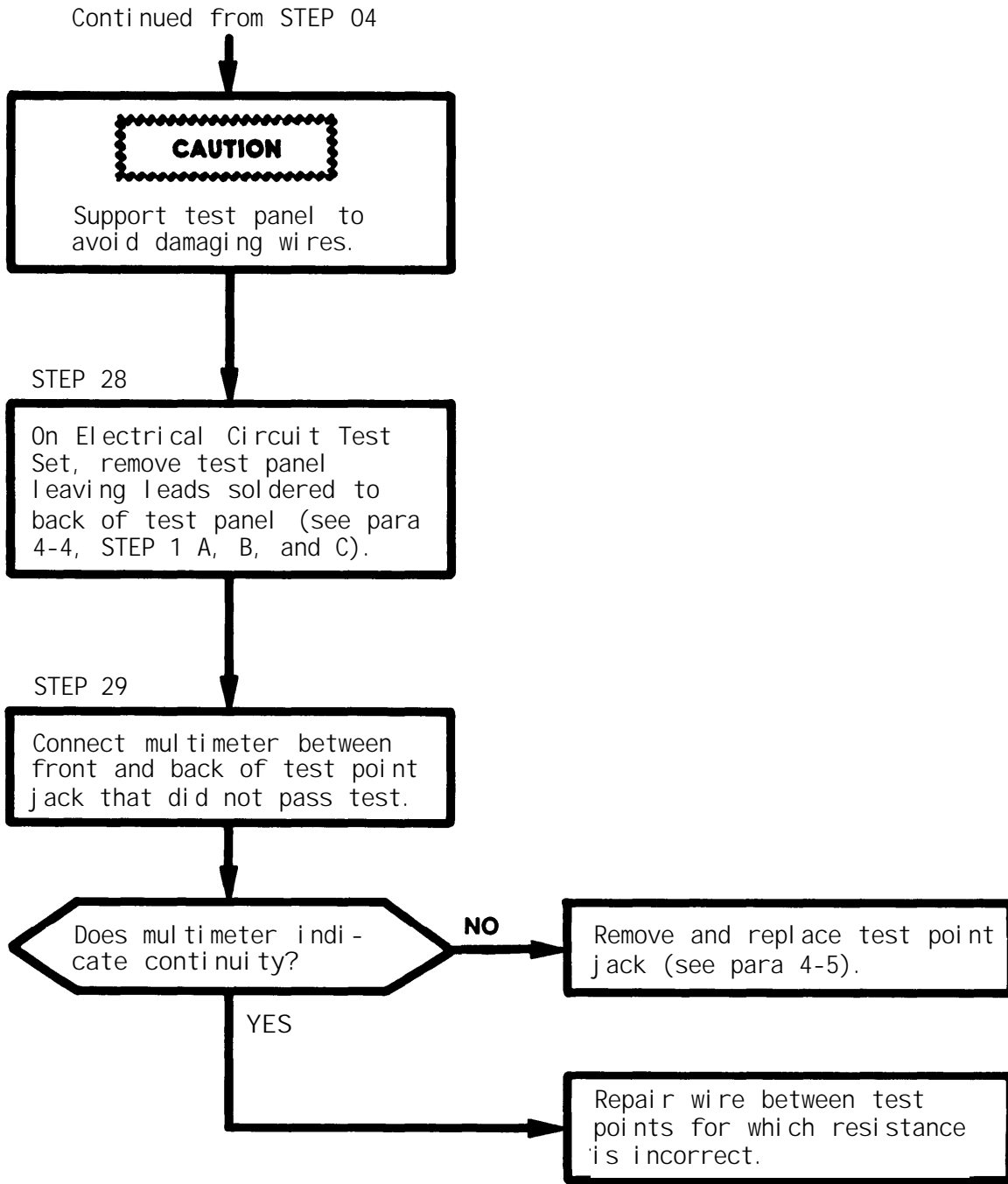
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ELECTRICAL CIRCUIT TEST SET

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 14 of 30)



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 15 of 30)

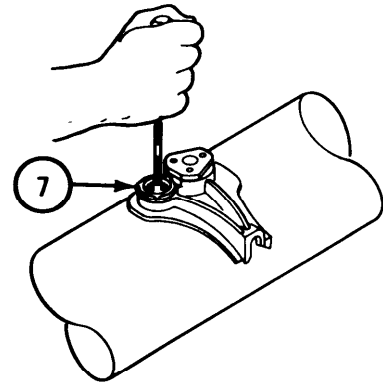


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 16 of 30)

Continued from STEP 08

CAUTION

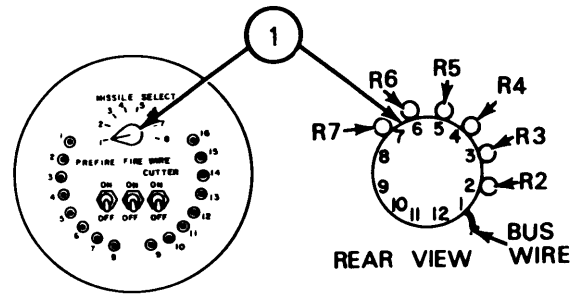
Support test panel to avoid damaging wires.



STEP 30

On Electrical Circuit Test Set:

- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set MISSILE SELECT switch (1) to 2.



STEP 31

Connect multimeter to test points as indicated below.

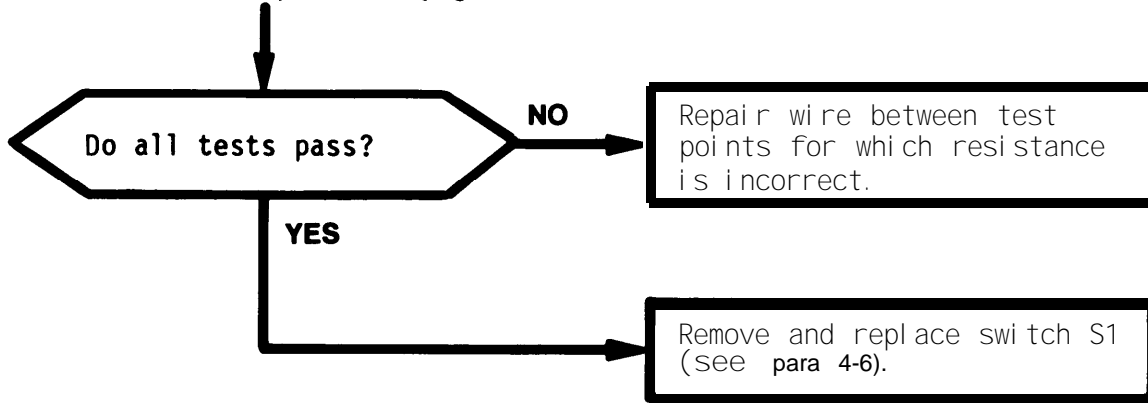
Test Points		Normal Indication
TP-11	S1B (1)-2	Continuity
TP-16	S1A (1)-2	Continuity
S1B (1)-1	S1A (1)-1	Continuity

Go to next page

ELECTRICAL CIRCUIT TEST SET

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 17 of 30)

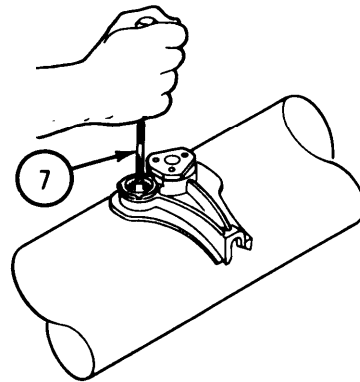
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Continued from STEP 09

CAUTION

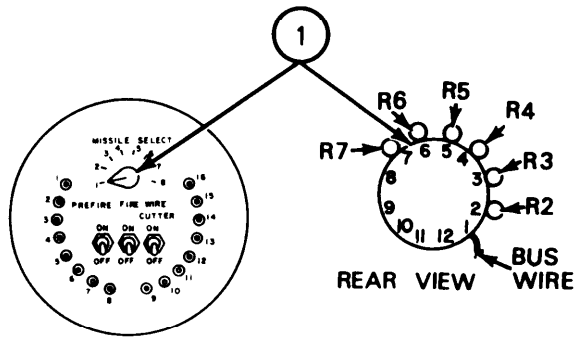
Support test panel to avoid damaging wires.



STEP 32

On Electrical Circuit Test Set:

- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set MISSILE SELECT switch (1) to 3.

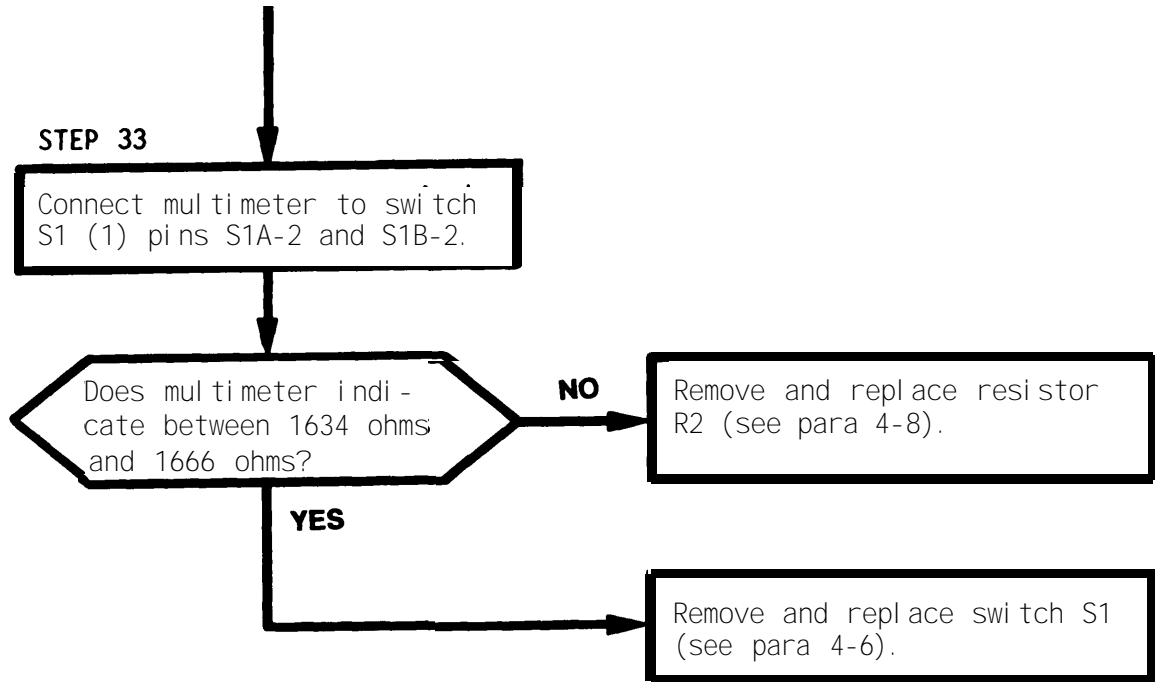


ELECTRICAL CIRCUIT TEST SET

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4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 18 of 30)

Continued from previous page

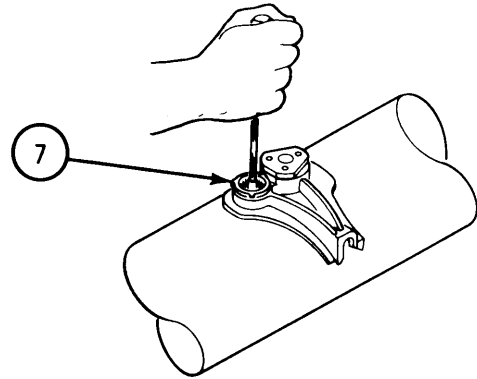


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 19 of 30)

Continued from STEP 10

CAUTION

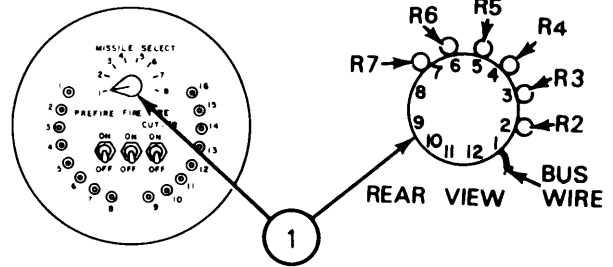
Support test panel to avoid damaging wires.



STEP 34

On Electrical Circuit Test Set:

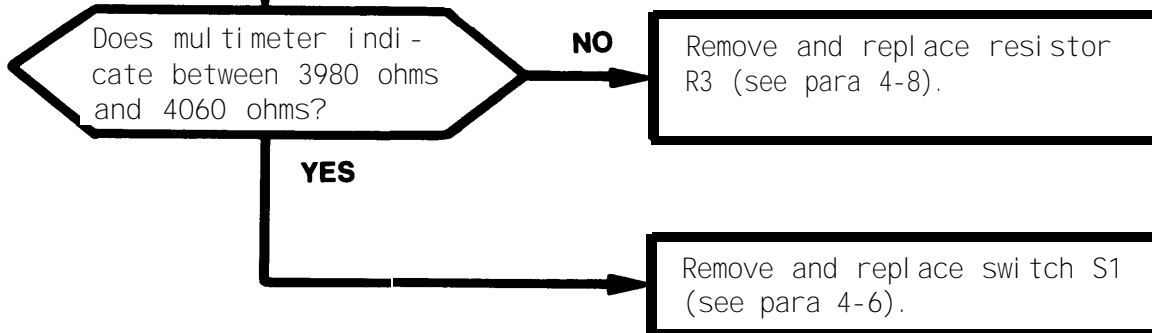
- Release plunger (7).
- Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- Set MISSILE SELECT switch (1) to 4.



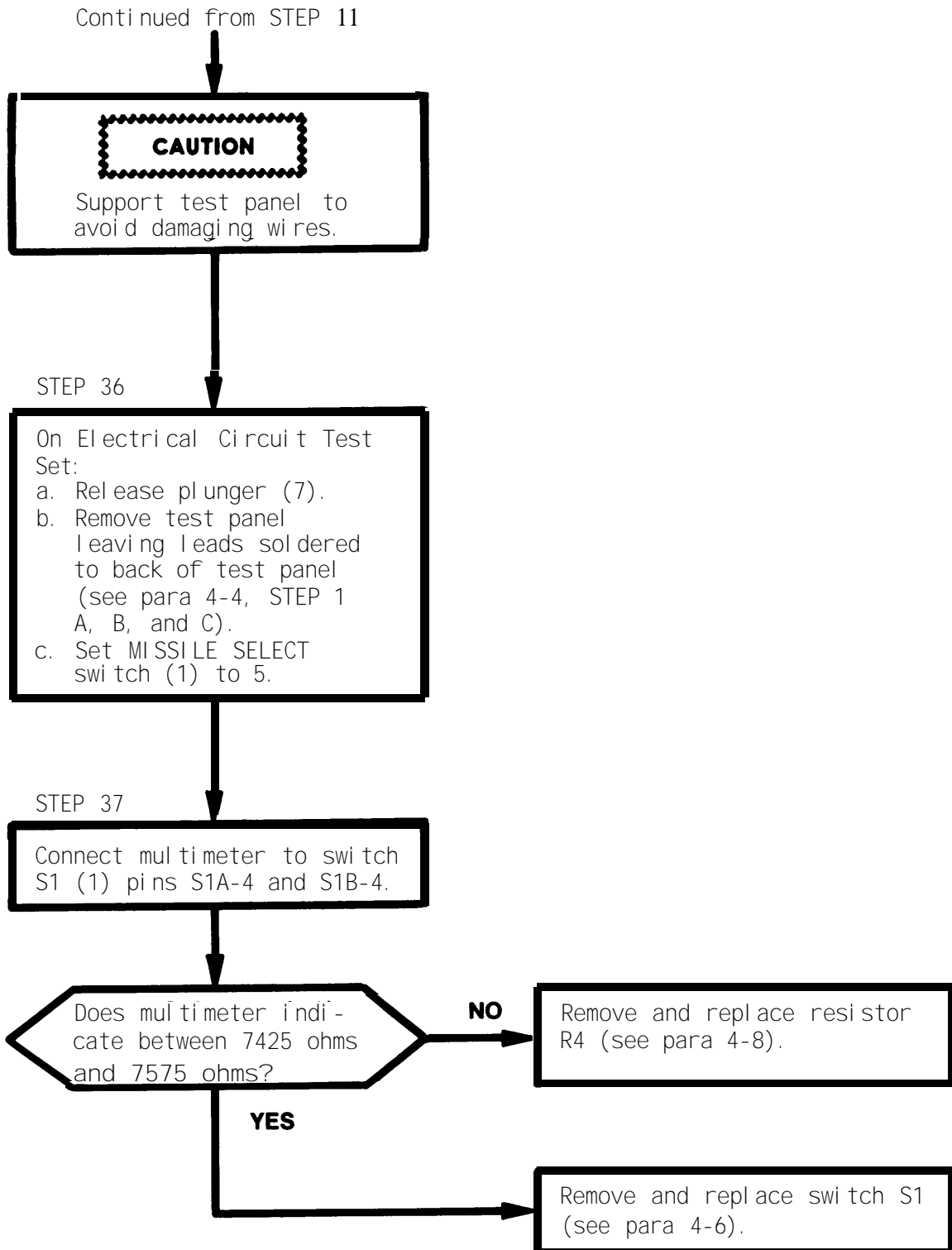
ELECTRICAL CIRCUIT TEST SET

STEP 35

Connect multimeter to switch S1 (1) pins S1A-3 and S1B-3.



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 20 of 30)

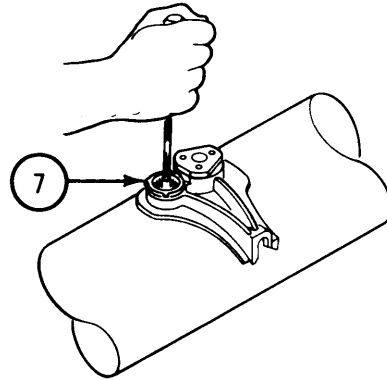


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 21 of 30)

Continued from STEP 12

CAUTION

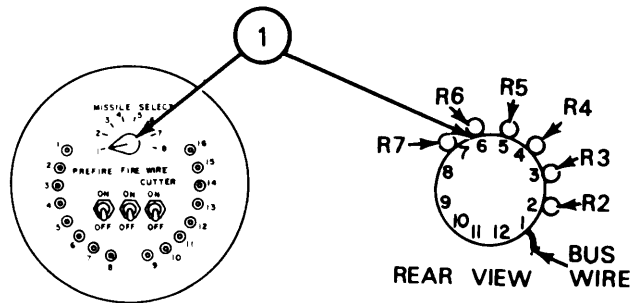
Support test panel to avoid damaging wires.



STEP 38

On Electrical Circuit Test Set:

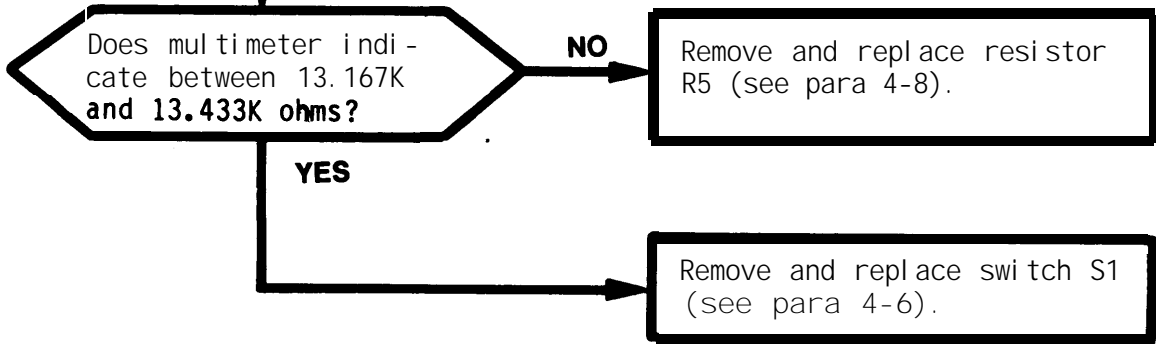
- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set MISSILE SELECT switch (1) to 6.



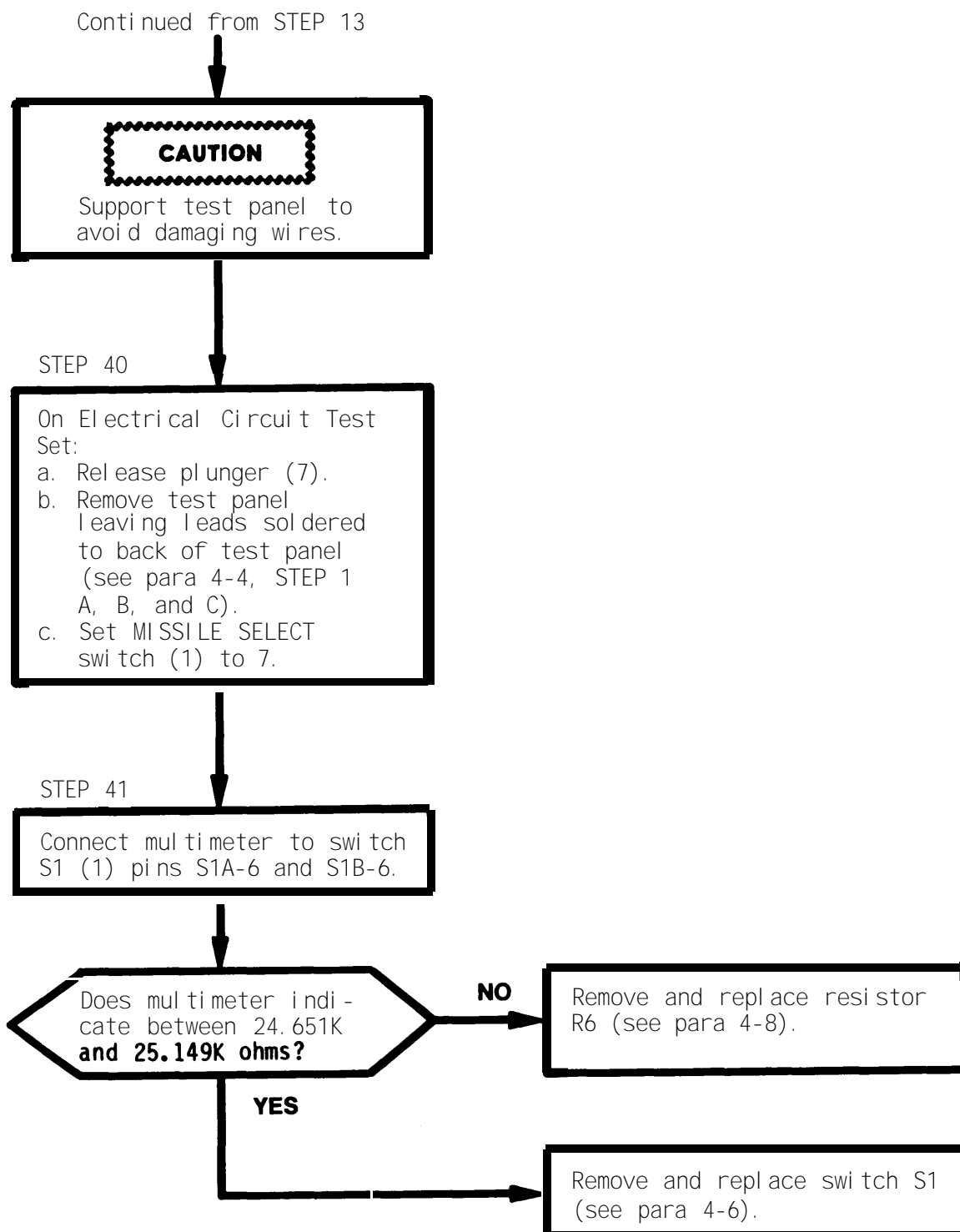
ELECTRICAL CIRCUIT TEST SET

STEP 39

Connect multimeter to switch S1 (1) pins S1A-5 and S1B-5.



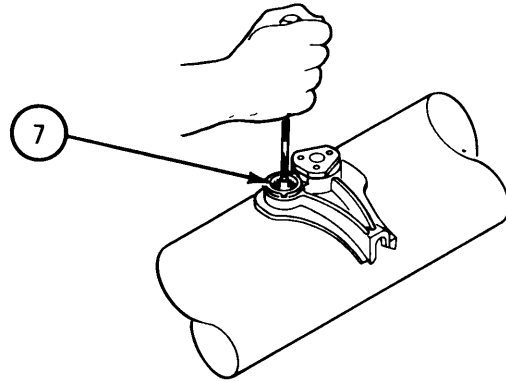
4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 22 of 30)



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 23 of 30)

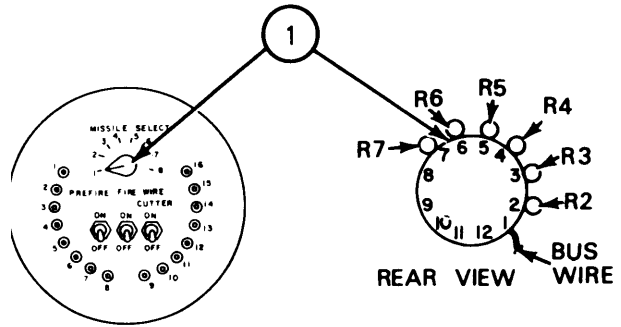
Continued from STEP 14

CAUTION
Support test panel to avoid damaging wires.



STEP 42

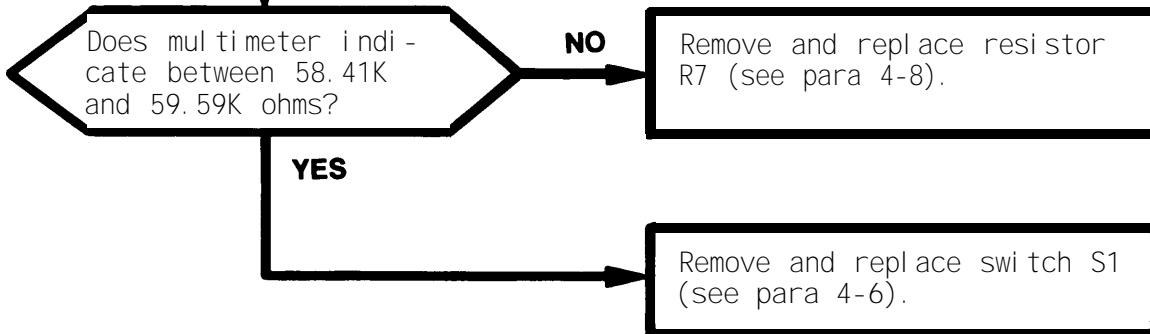
On Electrical Circuit Test Set:
a. Release plunger (7).
b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
c. Set MISSILE SELECT switch (1) to 8.



ELECTRICAL CIRCUIT TEST SET

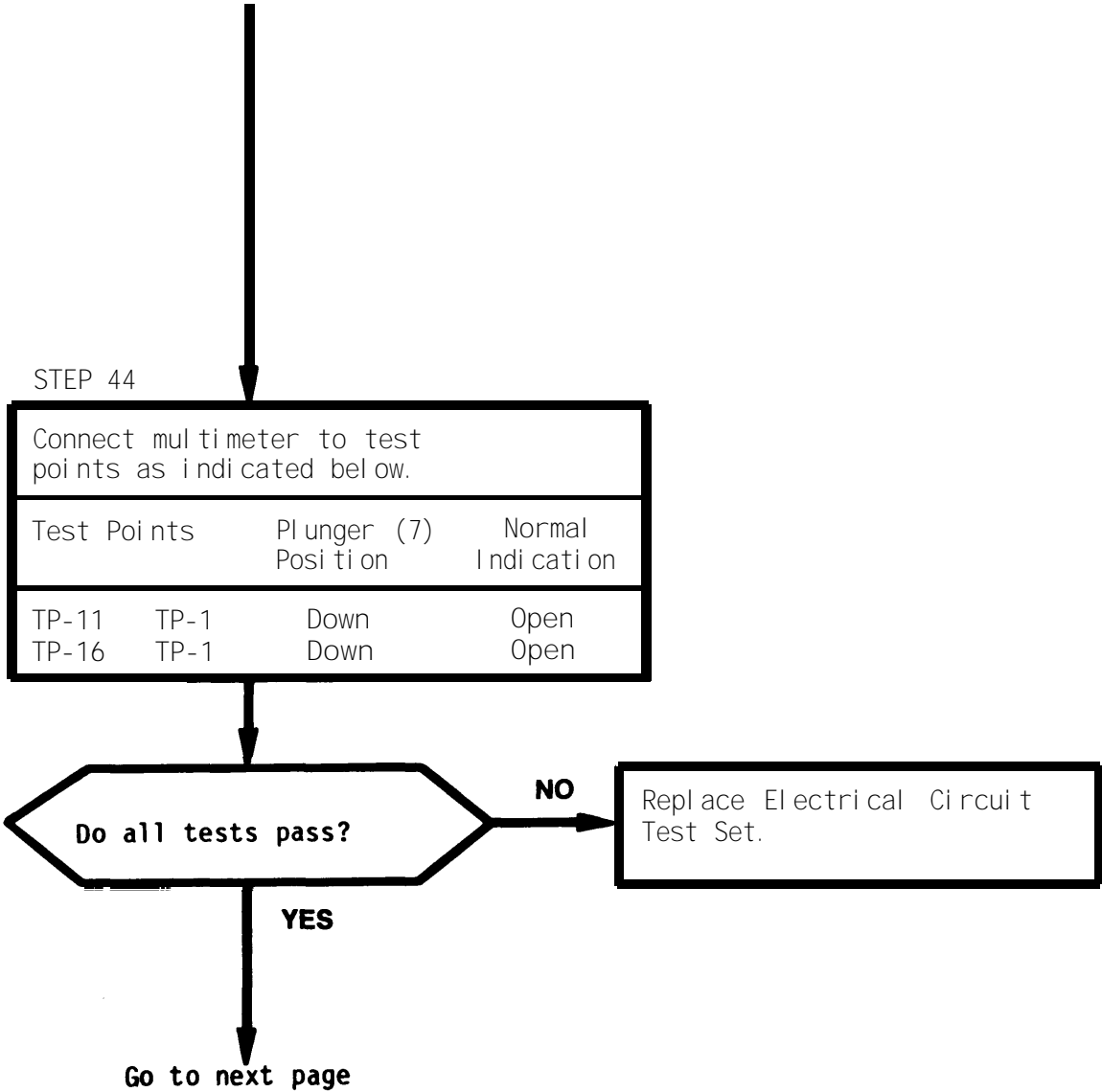
STEP 43

Connect multimeter to switch S1 (1) pins S1A-7 and S1B-7.



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 24 of 30)

Continued from STEP 15

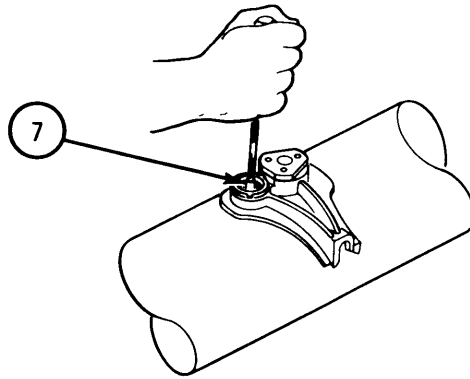


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 25 of 30)

Continued from previous page

CAUTION

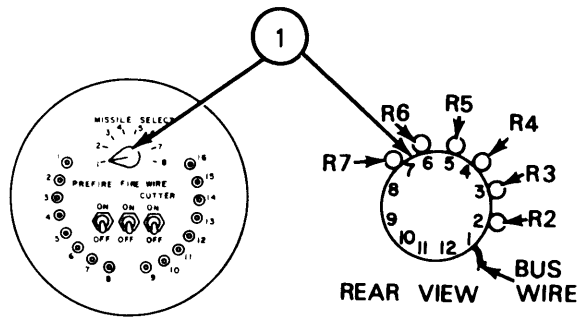
Support test panel to avoid damaging wires.



STEP 45

On Electrical Circuit Test Set:

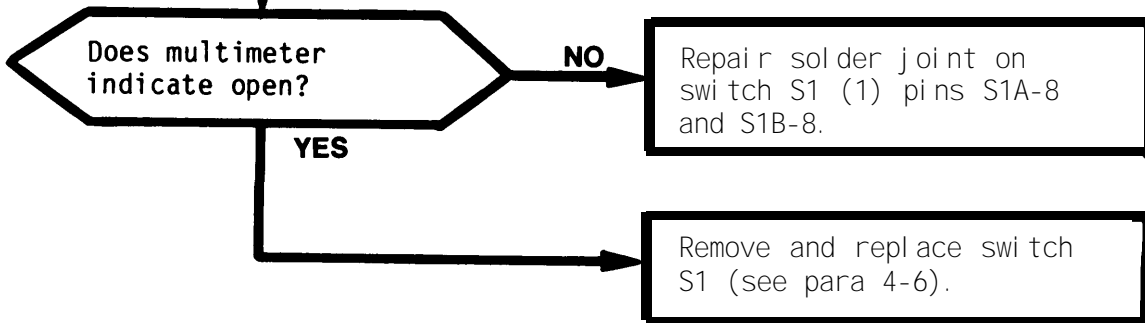
- a. Release plunger (7).
- b. Set MISSILE SELECT switch (1) to 1.
- c. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).



STEP 46

Connect multimeter to switch S1 (1) pins S1A-8 and S1B-8.

ELECTRICAL CIRCUIT TEST SET

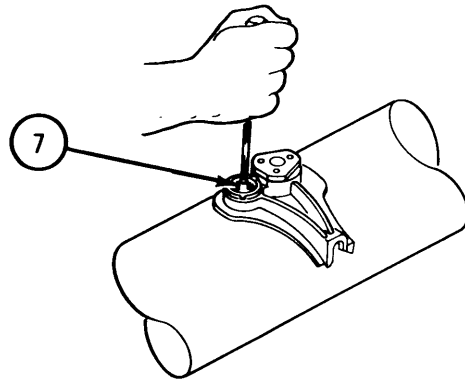


4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 26 of 30)

Continued from STEP 18

CAUTION

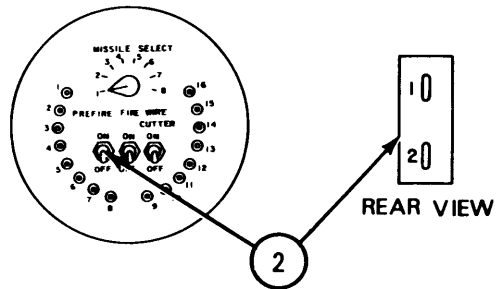
Support test panel to avoid damaging wires.



STEP 47

On Electrical Circuit Test Set:

- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set PREFIRE circuit breaker (2) to OFF.



STEP 48

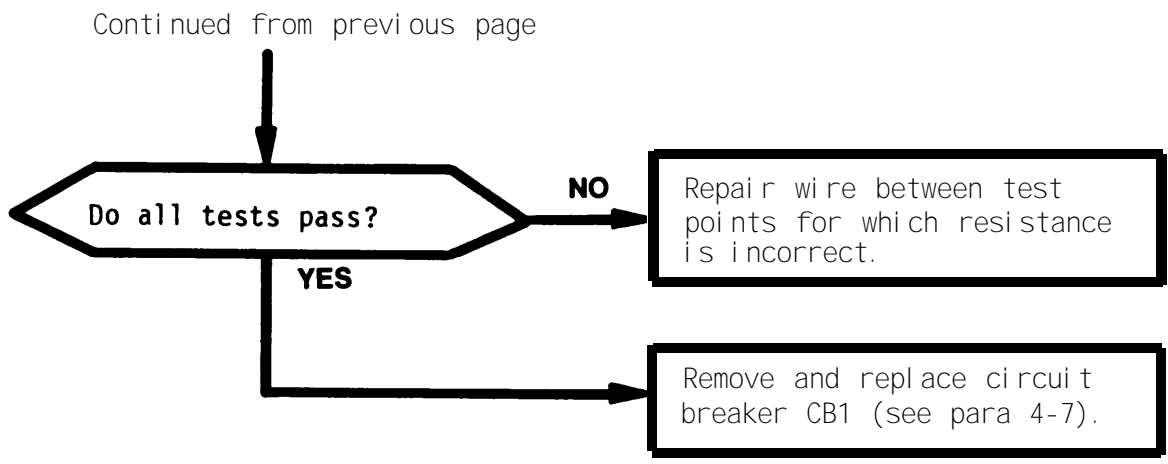
Connect multimeter to test points as indicated below.

Test Points	Normal Indication
TP-12 CB1 (2)-1	Continuity
TP-13 CB1 (2)-2	Continuity

ELECTRICAL CIRCUIT TEST SET

Go to next page

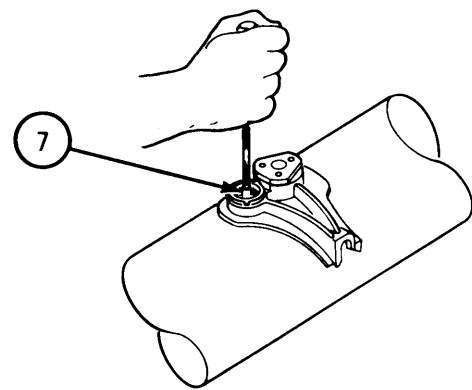
4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 27 of 30)



Continued from STEP 21

CAUTION

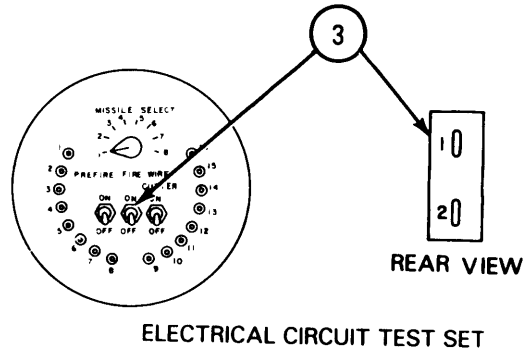
Support test panel to avoid damaging wires.



STEP 49

On Electrical Circuit Test Set:

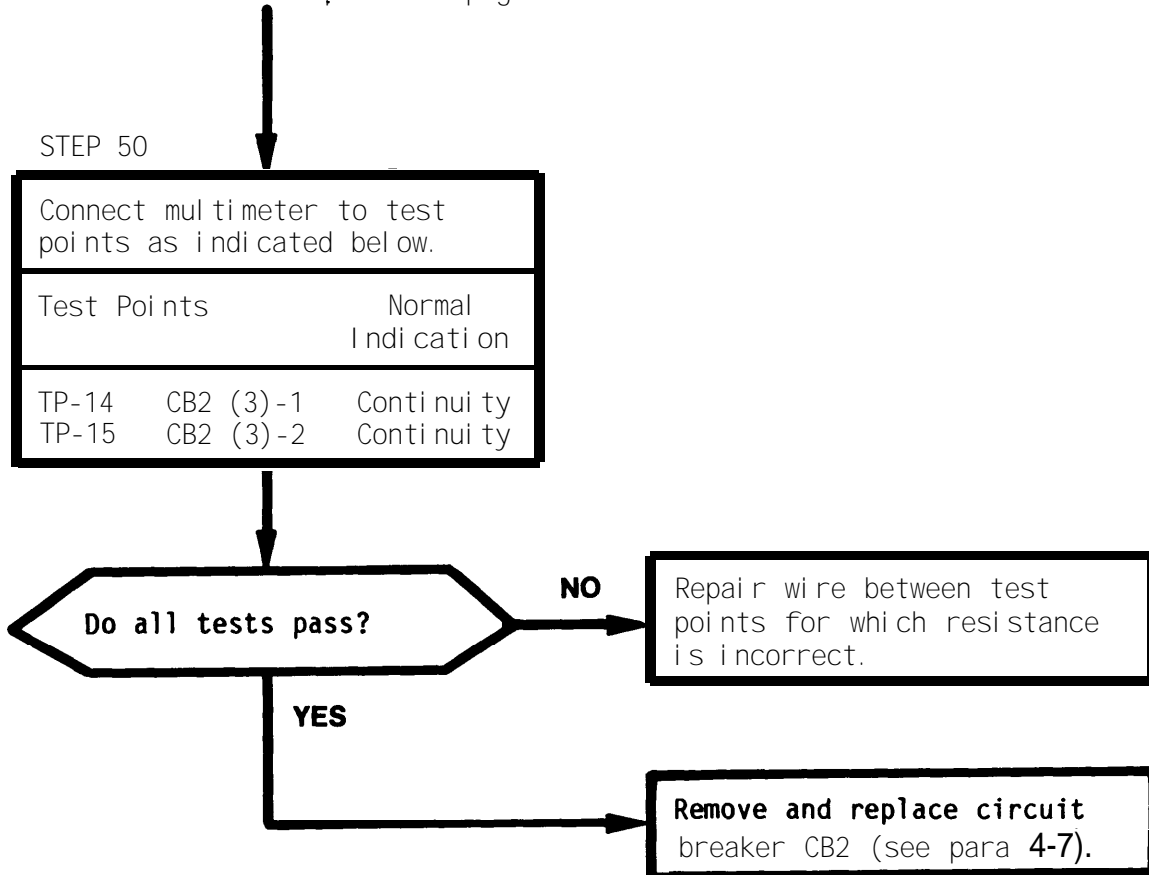
- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set FIRE circuit breaker (3) to OFF.



Go to next page

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 28 of 30)

Continued from previous page



4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 29 of 30)

Continued from STEP 24

CAUTION

Support test panel to avoid damaging wires.

STEP 51

On Electrical Circuit Test Set:

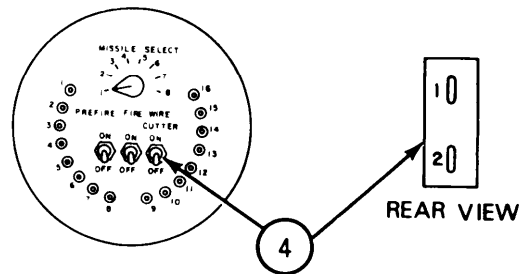
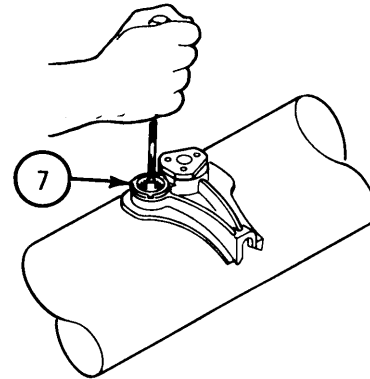
- a. Release plunger (7).
- b. Remove test panel leaving leads soldered to back of test panel (see para 4-4, STEP 1 A, B, and C).
- c. Set WIRE CUTTER circuit breaker (4) to OFF.

STEP 52

Connect multimeter to test points as indicated below.

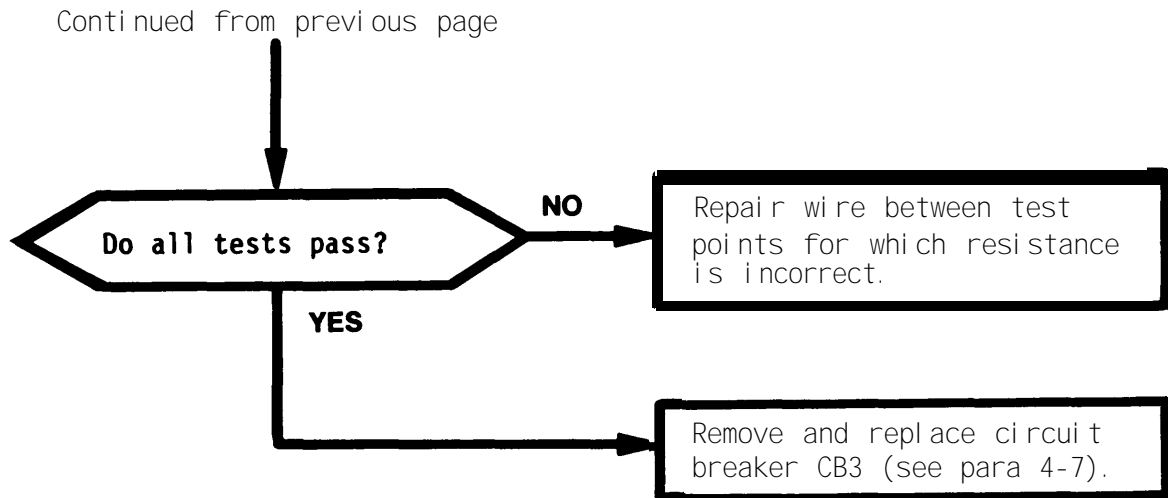
Test points	Normal	Indication
TP-1 CB3 (4)-2	Continuity	
TP-2 CB3 (4)-1	Continuity	

Go to next page



ELECTRICAL CIRCUIT TEST SET

4-2. ELECTRICAL CIRCUIT TEST SET TROUBLESHOOTING PROCEDURES (CONT)
 (Sheet 30 of 30)



Section II. ELECTRICAL CIRCUIT TEST SET MAINTENANCE PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	4-3	4-32
REMOVAL AND REPLACEMENT OF TEST PANEL	4-4	4-33
REMOVAL AND REPLACEMENT OF TEST POINT JACKS TP1 THRU TP16	4-5	4-34
REMOVAL AND REPLACEMENT OF ROTARY SWITCH S1	4-6	4-35
REMOVAL AND REPLACEMENT OF CIRCUIT BREAKERS CB1 THRU CB3	4-7	4-36
REMOVAL AND REPLACEMENT OF RESISTORS R2 THRU R7	4-8	4-37
REMOVAL AND REPLACEMENT OF RESISTOR R1	4-9	4-38

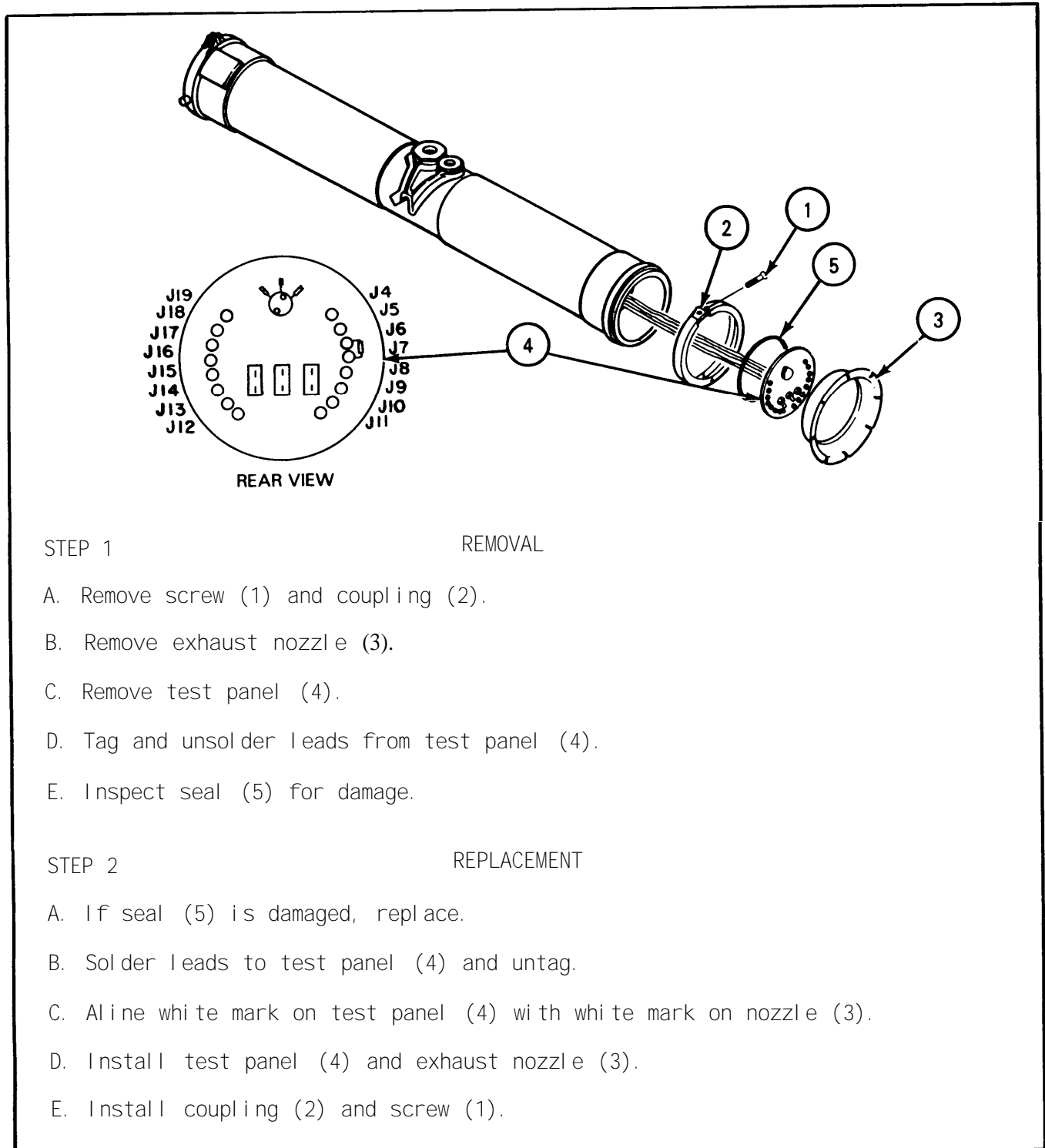
4-3. SCOPE

This section contains the removal and replacement procedures for the Electrical Circuit Test Set.

4-4. REMOVAL AND REPLACEMENT OF TEST PANEL

TOOLS:

- Soldering kit
- 5/32-inch socket-head screw key



END OF TASK

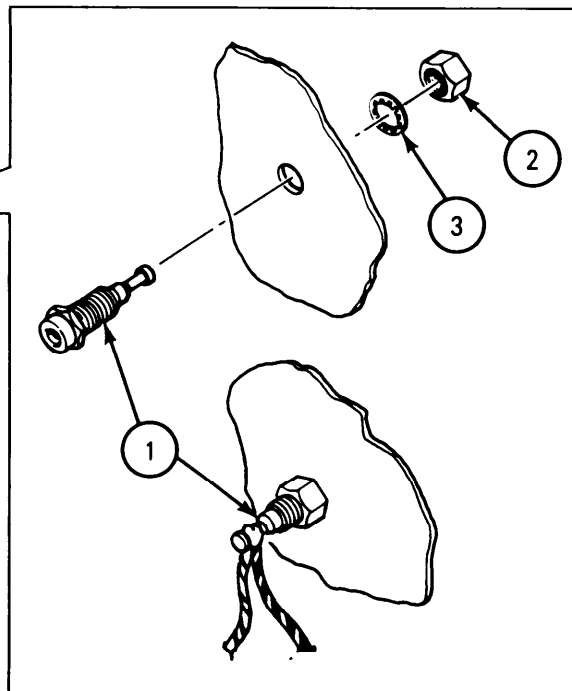
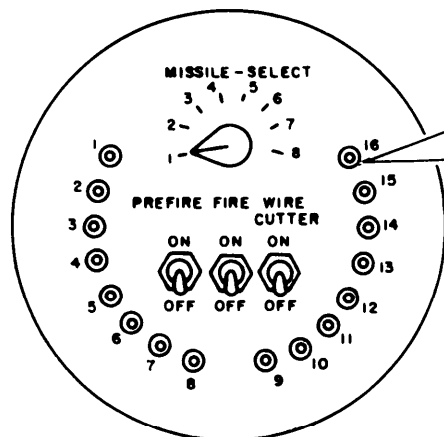
4-5. REMOVAL AND REPLACEMENT OF TEST POINT JACKS TP1 THRU TP16

TOOLS:

- Soldering kit
- 0.05-inch socket-head screw key
- 11/32-inch open-end wrench
- 5/16-inch socket wrench

EQUIPMENT CONDITION:

Test panel removed (para 4-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from test point (1).
- B. Remove nut (2), washer (3), and test point (1).

STEP 2

REPLACEMENT

- A. Install test point (1), washer (3), and nut (2).
- B. Solder leads to test point (1) and untag.
- C. Install test panel para 4-4).

END OF TASK

4-6. REMOVAL AND REPLACEMENT OF SWITCH S1

TOOLS:

- Soldering kit
- 0.05-inch socket-head screw key
- 9/16-inch open-end wrench

EQUIPMENT CONDITION:

Test panel removed (para 4-4)

STEP 1 **REMOVAL**

- A. Tag and unsolder leads from switch S1 (1).
- B. Loosen two setscrews (2) and remove knob (3).
- C. Remove nut (4), spacer (5), and switch S1 (1).
- D. Remove resistors R2 thru R7 (para 4-8).
- E. Tag and unsolder bus wire (6).

STEP 2 **REPLACEMENT**

- A. Solder and untag bus wire (6).
- B. Install resistors (para 4-8).
- C. Install switch S1 (1), spacer (5), and nut (4).
- D. Install knob (3) and tighten two setscrews (2).
- E. Solder leads to switch S1 (1) and untag.
- F. Install test panel (para 4-4).

END OF TASK

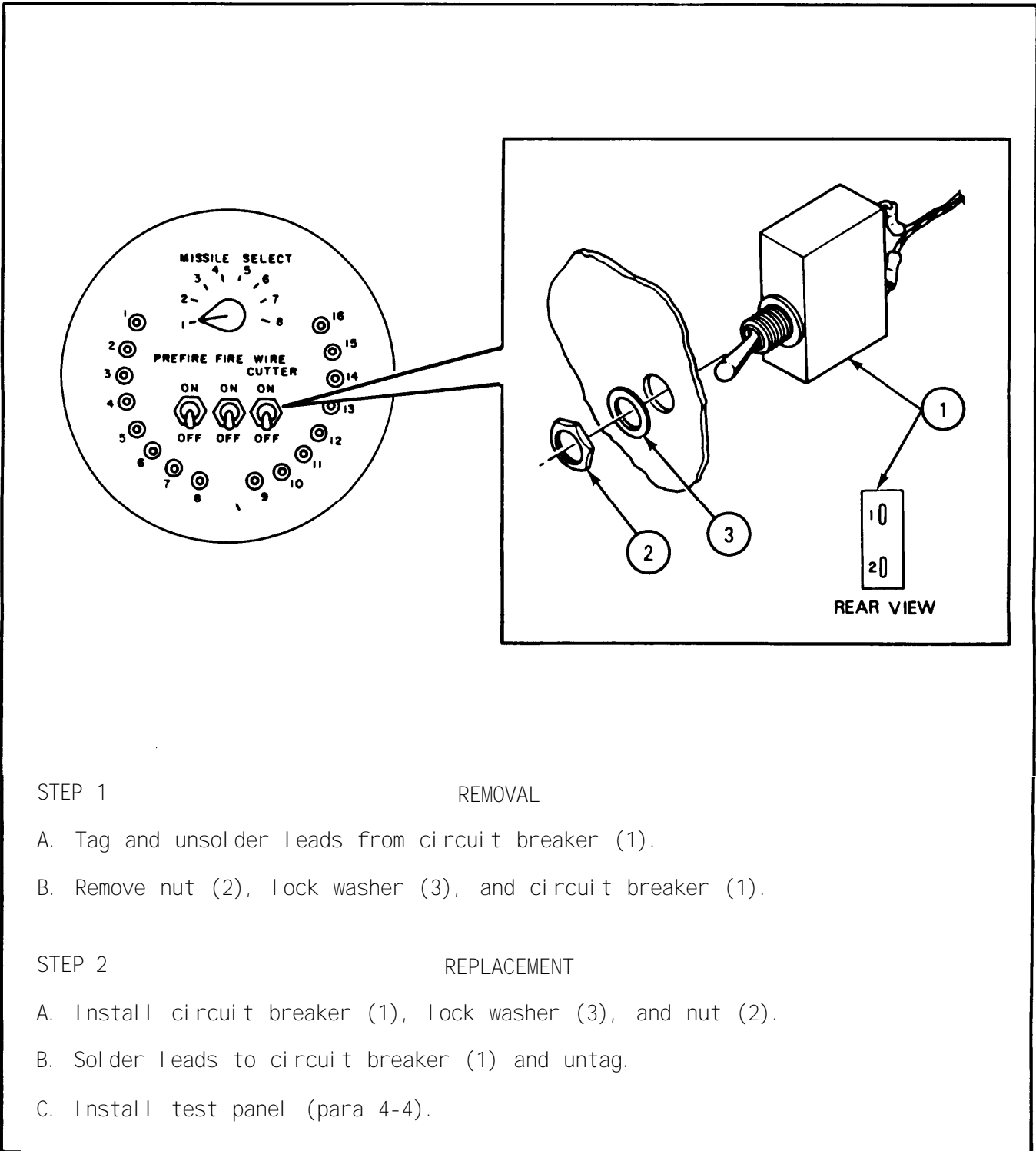
4-7. REMOVAL AND REPLACEMENT OF CIRCUIT BREAKERS CB1 THRU CB3

TOOLS:

- 1/2-inch open-end wrench
- Soldering kit

EQUIPMENT CONDITION:

- Test panel removed (para 4-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from circuit breaker (1).
- B. Remove nut (2), lock washer (3), and circuit breaker (1).

STEP 2

REPLACEMENT

- A. Install circuit breaker (1), lock washer (3), and nut (2).
- B. Solder leads to circuit breaker (1) and untag.
- C. Install test panel (para 4-4).

END OF TASK

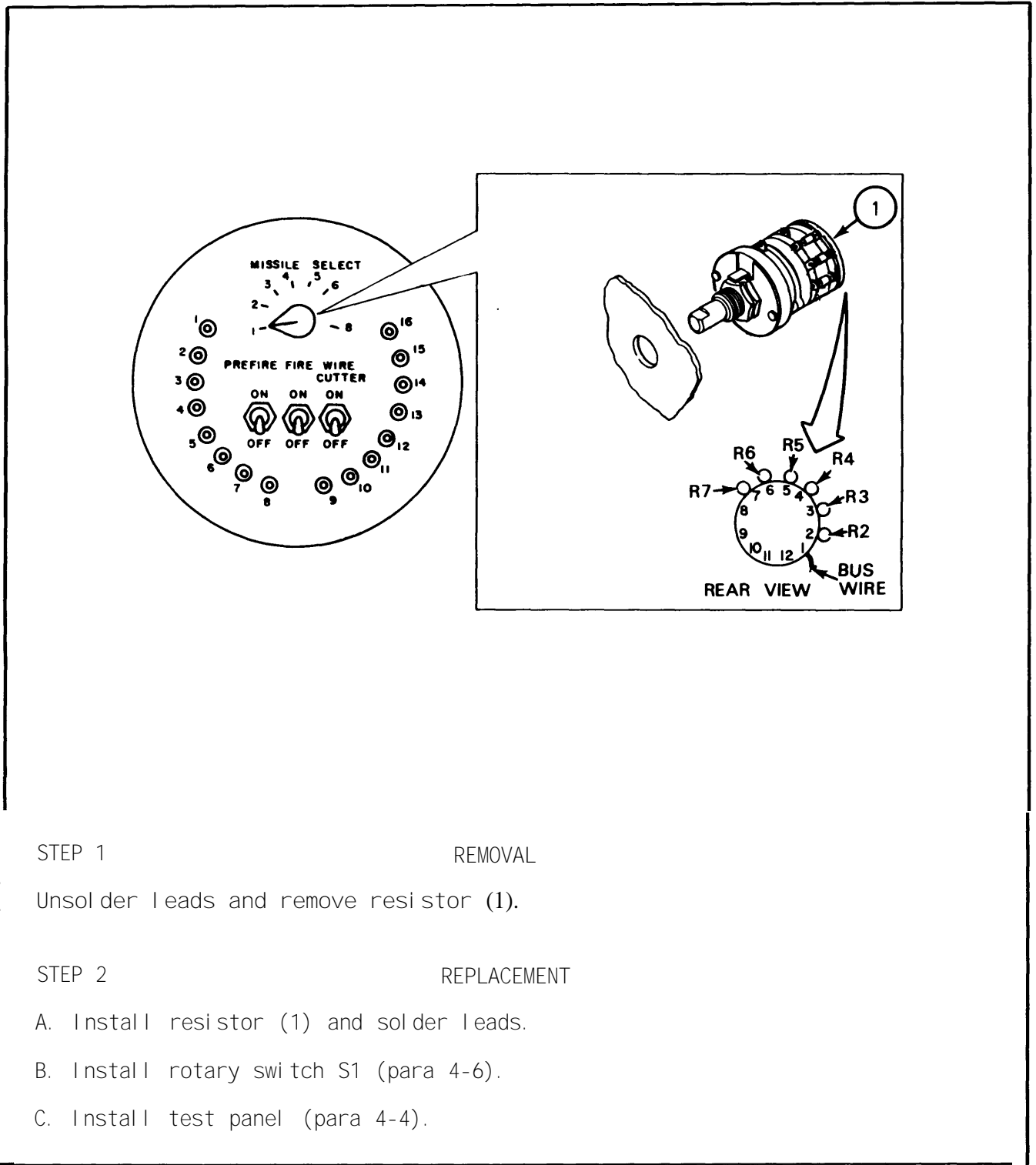
4-8. REMOVAL AND REPLACEMENT OF RESISTORS R2 THRU R7

TOOLS:

Soldering kit

EQUIPMENT CONDITION:

Switch S1 removed (para 4-6).



STEP 1 REMOVAL

Unsolder leads and remove resistor (1).

STEP 2 REPLACEMENT

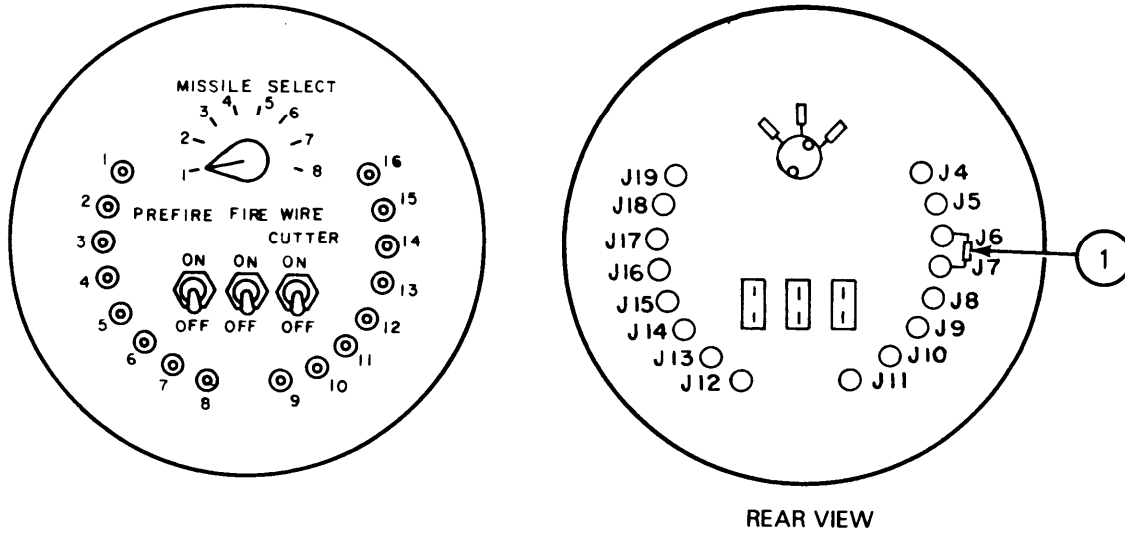
- A. Install resistor (1) and solder leads.
- B. Install rotary switch S1 (para 4-6).
- C. Install test panel (para 4-4).

END OF TASK

4-9. REMOVAL AND REPLACEMENT OF RESISTOR R1

TOOLS:
Soldering kit

EQUIPMENT CONDITION:
Test Panel removed (para 4-4).



STEP 1 REMOVAL

Unsolder leads and remove resistor R1 (1).

STEP 2 REPLACEMENT

- A. Install resistor R1 (1) and solder leads.
- B. Install test panel (para 4-4).

END OF TASK

CHAPTER 5
ELECTRICAL CABLE TEST SET MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter contains the maintenance procedures to remove and replace parts of the Electrical Cable Test Set. The contents of this chapter are contained in two sections. Troubleshooting procedures are provided in Section I. Section II provides removal and replacement procedures.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES	5-1
Section II. ELECTRICAL CABLE TEST SET MAINTENANCE PROCEDURES	5-36

Section 1. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	5-1	5-1
ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES	5-2	5-2

5-1. SCOPE

This section contains troubleshooting procedures for the Electrical Cable Test Set.

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (Sheet 1 of 34)

This paragraph provides troubleshooting procedures for the Electrical Cable Test Set.

TEST EQUIPMENT: Multimeter

NOTE

- Follow steps in order given in the procedures. Do not skip any steps.
- When you enter the NO chain, do the procedure and/or repairs as instructed in the corrective action block.
- Unless otherwise specified, after performing the corrective action of the NO chain, always return to the START of the procedure you were checking. When more than one corrective action may be required, do the first corrective action, return to START, and repeat the procedure. If the problem still exists, do the next corrective action and repeat.
- The wafers on wafer switches are listed alphabetically from front to rear.

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 2 of 34)

START

STEP 01

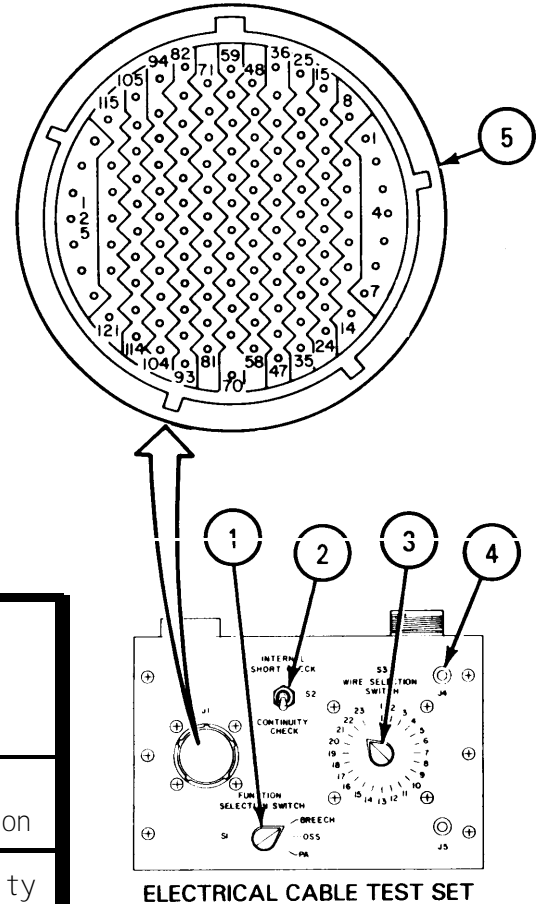
On Electrical Cable Test Set, set:
 a. Switch S1 (1) to BREECH.
 b. Switch S2 (2) to CONTINUITY CHECK.

STEP 02

a. Set multimeter to indicate ohms.
 b. Connect multimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J4 (4) J1 (5)-8	1	Continuity
J4 (4) J1 (5)-1	2	Continuity
J4 (4) J1 (5)-15	3	Continuity
J4 (4) J1 (5)-16	4	Continuity
J4 (4) J1 (5)-25	5	Continuity
J4 (4) J1 (5)-26	6	Continuity
J4 (4) J1 (5)-36	7	Continuity
J4 (4) J1 (5)-37	8	Continuity
J4 (4) J1 (5)-24	9	Continuity
J4 (4) J1 (5)-35	10	Continuity
J4 (4) J1 (5)-108	11	Continuity
J4 (4) J1 (5)-20	12	Continuity
J4 (4) J1 (5)-30	13	Continuity
J4 (4) J1 (5)-7	14	Continuity
J4 (4) J1 (5)-6	15	Continuity
J4 (4) J1 (5)-19	16	Continuity

Go to next page



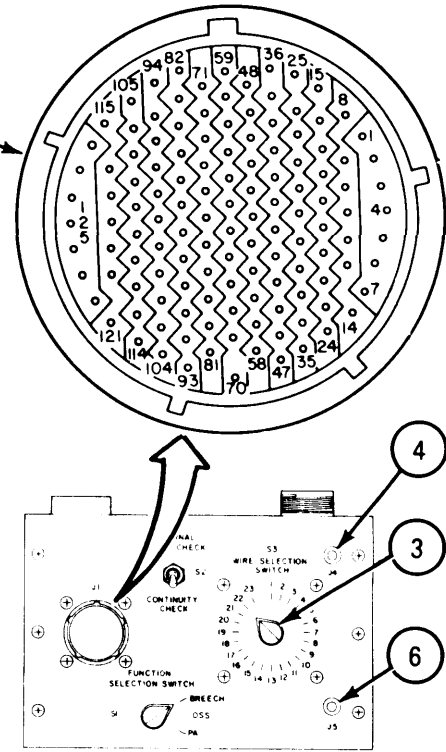
ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 3 of 34)

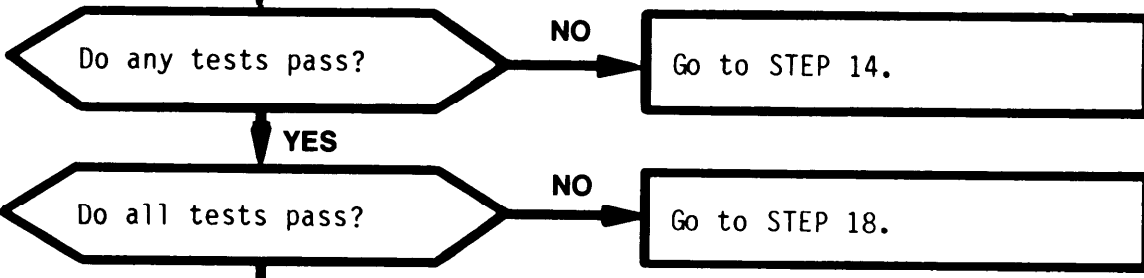
Continued from previous page

STEP 02
(CONT)

Test Points	Switch S3 (3) Position	Normal Indication
J4 (4) J1 (5)-40	17	Continuity
J4 (4) J1 (5)-122	18	Continuity
J4 (4) J1 (5)-4	19	Continuity
J4 (4) J1 (5)-5	20	Continuity
J4 (4) J1 (5)-107	21	Continuity
J4 (4) J1 (5)-55	22	Continuity



ELECTRICAL CABLE TEST SET



STEP 03

Connect multimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-3	1	Continuity
J5 (6) J1 (5)-2	2	Continuity
J5 (6) J1 (5)-9	3	Continuity

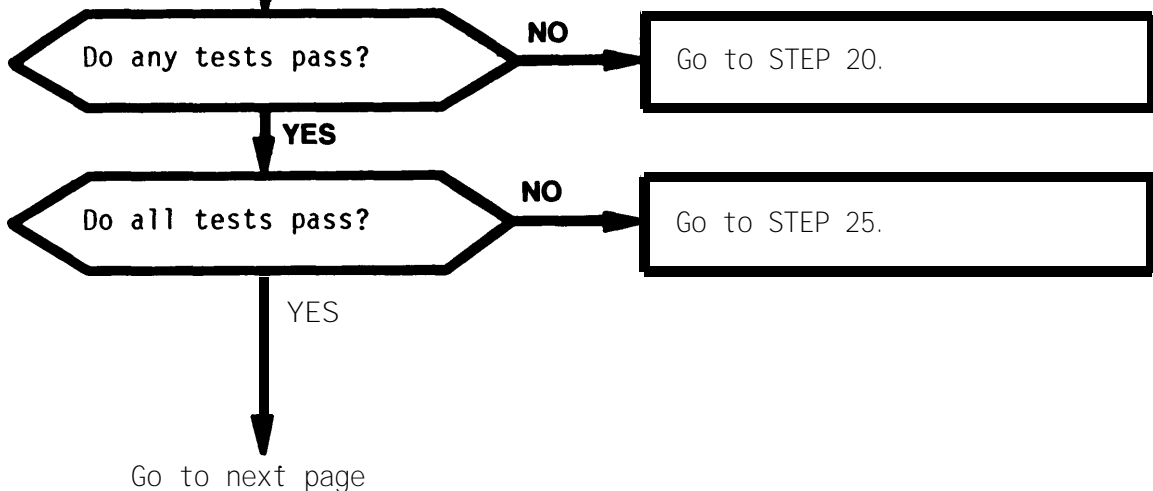
Go to next page

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 4 of 34)

Continued from previous page

STEP 03
 (CONT)

Test Points	Swi tch S3 (3) Posi ti on	Normal I ndi cati on
J5 (6) J1 (5)-10	4	Conti nui ty
J5 (6) J1 (5)-27	5	Conti nui ty
J5 (6) J1 (5)-28	6	Conti nui ty
J5 (6) J1 (5)-38	7	Conti nui ty
J5 (6) J1 (5)-39	8	Conti nui ty
J5 (6) J1 (5)-23	9	Conti nui ty
J5 (6) J1 (5)-34	10	Conti nui ty
J5 (6) J1 (5)-109	11	Conti nui ty
J5 (6) J1 (5)-108	12	Conti nui ty
J5 (6) J1 (5)-109	13	Conti nui ty
J5 (6) J1 (5)-21	14	Conti nui ty
J5 (6) J1 (5)-14	15	Conti nui ty
J5 (6) J1 (5)-115	16	Conti nui ty
J5 (6) J1 (5)-86	17	Conti nui ty
J5 (6) J1 (5)-33	18	Conti nui ty
J5 (6) J1 (5)-109	19	Conti nui ty
J5 (6) J1 (5)-108	20	Conti nui ty
J5 (6) J1 (5)-106	21	Conti nui ty
J5 (6) J1 (5)-78	22	Conti nui ty



5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 5 of 34)

Continued from previous page

STEP 04

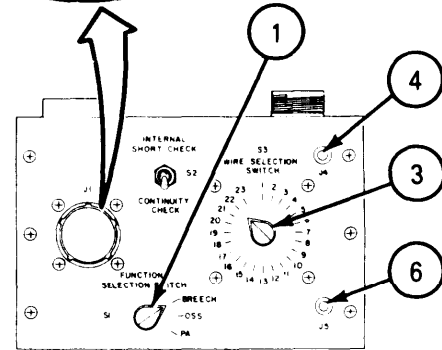
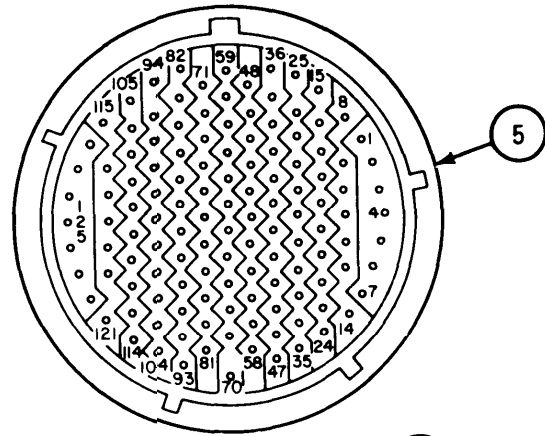
On Electrical Cable Test Set, set switch S1 (1) to OSS.

STEP 05

Connect multimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J4 (4) J1 (5)-97	1	Continuity
J4 (4) J1 (5)-101	2	Continuity
J4 (4) J1 (5)-121	3	Continuity
J4 (4) J1 (5)-90	4	Continuity
J4 (4) J1 (5)-114	5	Continuity
J4 (4) J1 (5)-102	6	Continuity
J4 (4) J1 (5)-116	7	Continuity
J4 (4) J1 (5)-104	8	Continuity
J4 (4) J1 (5)-22	9	Continuity
J4 (4) J1 (5)-31	10	Continuity
J4 (4) J1 (5)-122	11	Continuity
J4 (4) J1 (5)-92	12	Continuity
J4 (4) J1 (5)-47	13	Continuity
J4 (4) J1 (5)-123	14	Continuity
J4 (4) J1 (5)-119	15	Continuity
J4 (4) J1 (5)-118	16	Continuity
J4 (4) J1 (5)-125	17	Continuity
J4 (4) J1 (5)-11	18	Continuity
J4 (4) J1 (5)-12	19	Continuity
J4 (4) J1 (5)-18	20	Continuity
J4 (4) J1 (5)-96	21	Continuity
J4 (4) J1 (5)-90	22	Continuity

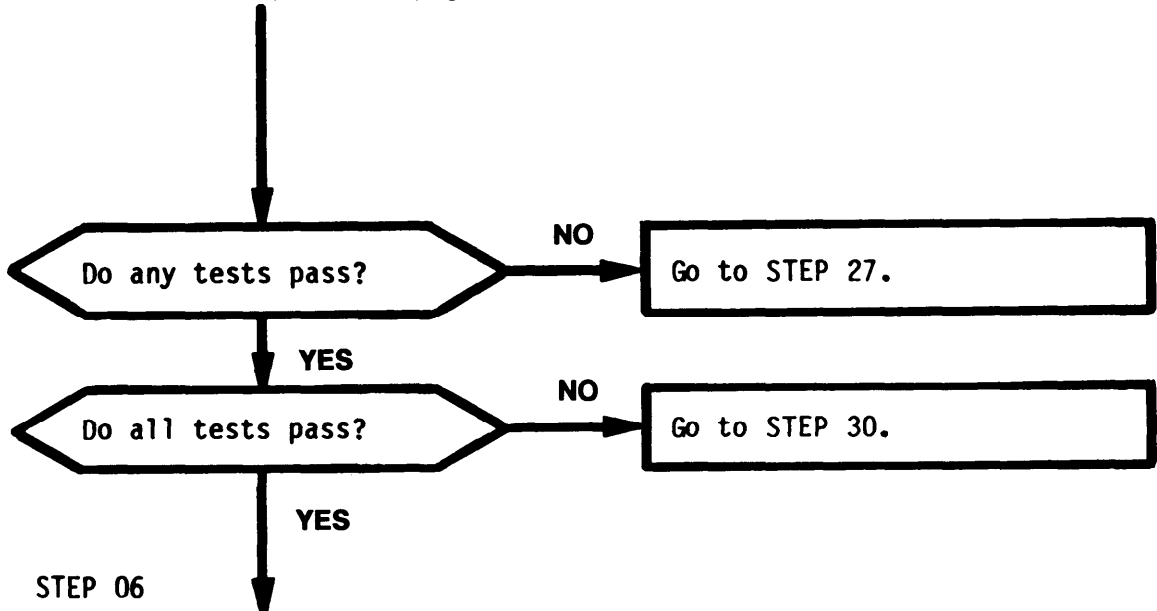
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ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 6 of 34)

Continued from previous page



STEP 06

Connect multimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-29	1	Continuity
J5 (6) J1 (5)-29	2	Continuity
J5 (6) J1 (5)-113	3	Continuity
J5 (6) J1 (5)-91	4	Continuity
J5 (6) J1 (5)-112	5	Continuity
J5 (6) J1 (5)-103	6	Continuity
J5 (6) J1 (5)-117	7	Continuity
J5 (6) J1 (5)-110	8	Continuity
J5 (6) J1 (5)-32	9	Continuity
J5 (6) J1 (5)-126	10	Continuity
J5 (6) J1 (5)-111	11	Continuity
J5 (6) J1 (5)-93	12	Continuity
J5 (6) J1 (5)-46	13	Continuity
J5 (6) J1 (5)-124	14	Continuity

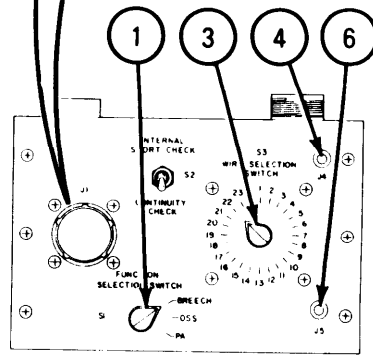
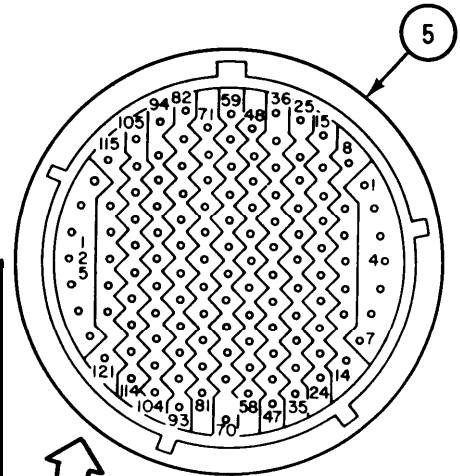
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5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 7 of 34)

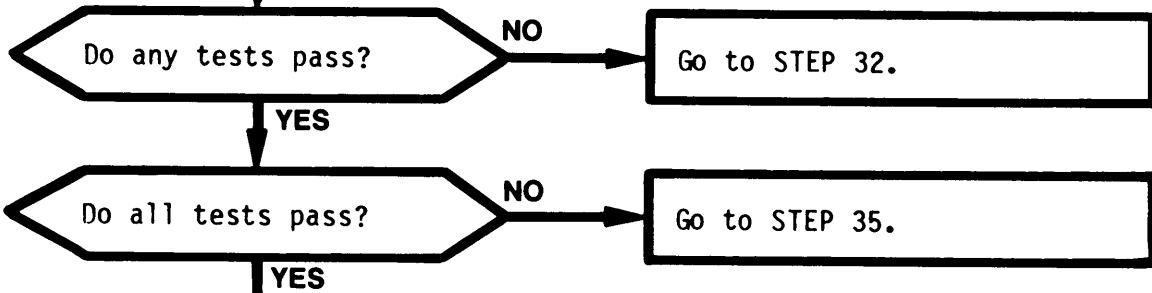
Continued from previous page

STEP 06
(CONT)

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-120	15	Continuity
J5 (6) J1 (5)-127	16	Continuity
J5 (6) J1 (5)-127	17	Continuity
J5 (6) J1 (5)-128	18	Continuity
J5 (6) J1 (5)-128	19	Continuity
J5 (6) J1 (5)-128	20	Continuity
J5 (6) J1 (5)-95	21	Continuity
J5 (6) J1 (5)-75	22	Continuity



ELECTRICAL CABLE TEST SET



STEP 07
On Electrical Cable Test Set, set switch S1 (1) to PA.

Go to next page

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 8 of 34)

Continued from previous page



STEP 08

Connect multimeter to test points as indicated below.

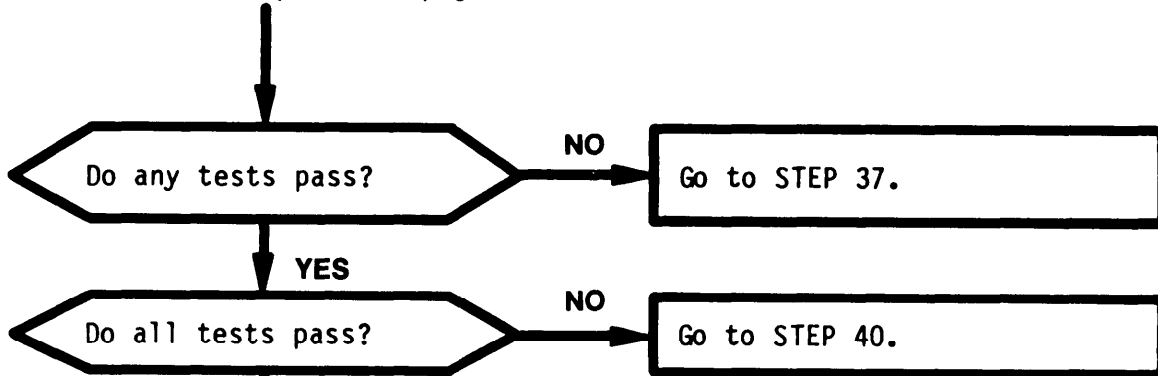
Test Points	Switch S3 (3) Position	Normal Indication
J4 (4) J1 (5)-58	1	Continuity
J4 (4) J1 (5)-57	2	Continuity
J4 (4) J1 (5)-56	3	Continuity
J4 (4) J1 (5)-69	4	Continuity
J4 (4) J1 (5)-67	5	Continuity
J4 (4) J1 (5)-79	6	Continuity
J4 (4) J1 (5)-80	7	Continuity
J4 (4) J1 (5)-81	8	Continuity
J4 (4) J1 (5)-50	9	Continuity
J4 (4) J1 (5)-61	10	Continuity
J4 (4) J1 (5)-72	11	Continuity
J4 (4) J1 (5)-83	12	Continuity
J4 (4) J1 (5)-52	13	Continuity
J4 (4) J1 (5)-63	14	Continuity
J4 (4) J1 (5)-74	15	Continuity
J4 (4) J1 (5)-41	16	Continuity
J4 (4) J1 (5)-85	17	Continuity
J4 (4) J1 (5)-88	18	Continuity
J4 (4) J1 (5)-99	19	Continuity
J4 (4) J1 (5)-76	20	Continuity
J4 (4) J1 (5)-59	21	Continuity
J4 (4) J1 (5)-45	22	Continuity



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5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 9 of 34)

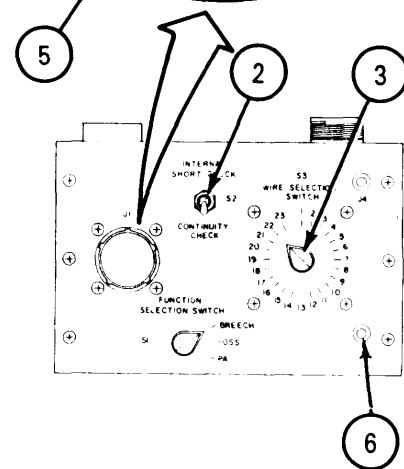
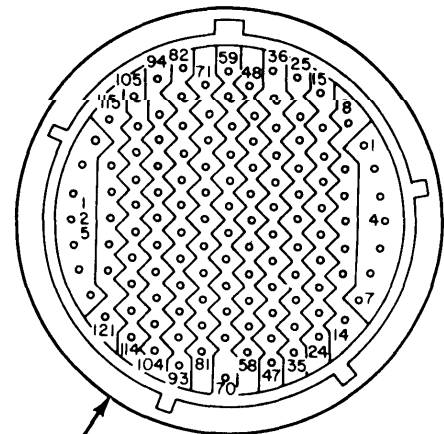
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STEP 09

Connect mmimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-105	1	Continuity
J5 (6) J1 (5)-87	2	Continuity
J5 (6) J1 (5)-48	3	Continuity
J5 (6) J1 (5)-42	4	Continuity
J5 (6) J1 (5)-43	5	Continuity
J5 (6) J1 (5)-44	6	Continuity
J5 (6) J1 (5)-53	7	Continuity
J5 (6) J1 (5)-54	8	Continuity
J5 (6) J1 (5)-49	9	Continuity
J5 (6) J1 (5)-60	10	Continuity
J5 (6) J1 (5)-71	11	Continuity
J5 (6) J1 (5)-82	12	Continuity
J5 (6) J1 (5)-51	13	Continuity
J5 (6) J1 (5)-62	14	Continuity
J5 (6) J1 (5)-73	15	Continuity
J5 (6) J1 (5)-84	16	Continuity
J5 (6) J1 (5)-64	17	Continuity
J5 (6) J1 (5)-89	18	Continuity



ELECTRICAL CABLE TEST SET

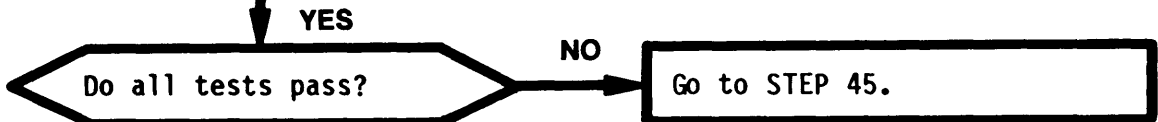
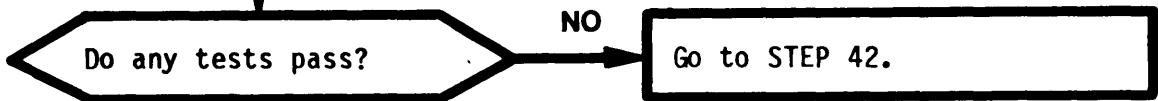
Go to next page

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 10 of 34)

Continued from previous page

**STEP 09
(CONT)**

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-100	19	Continuity
J5 (6) J1 (5)-77	20	Continuity
J5 (6) J1 (5)-65	21	Continuity
J5 (6) J1 (5)-66	22	Continuity



STEP 10
On Electrical Cable Test Set, set switch S2 (2) to INTERNAL SHORT CHECK.

Go to next page

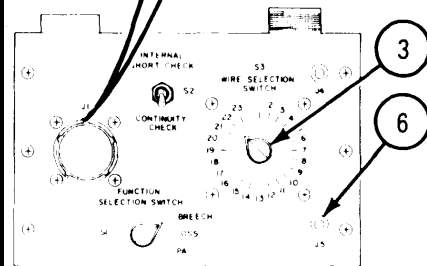
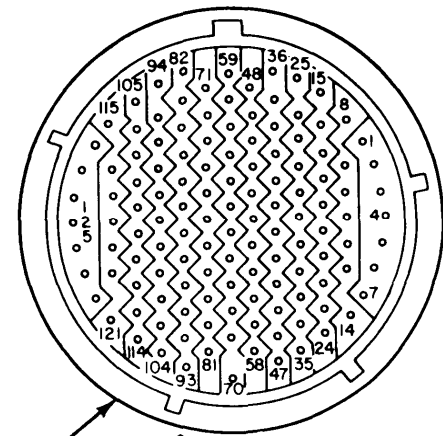
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 11 of 34)

Continued from previous page

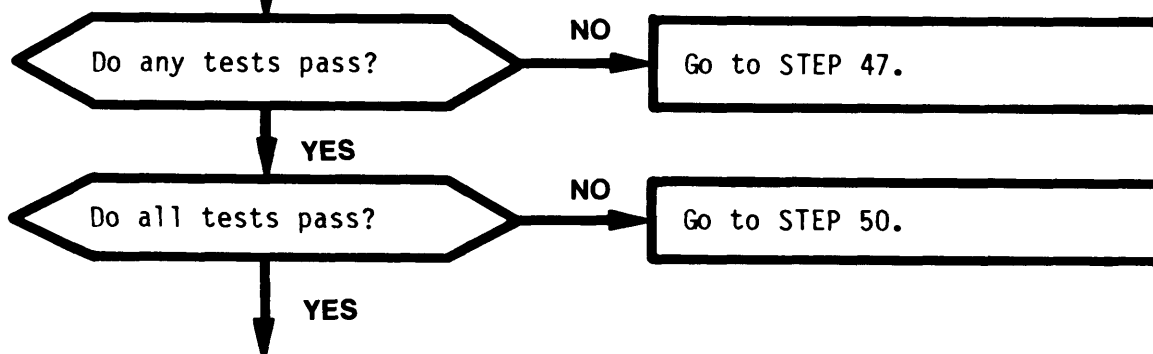
STEP 11

Connect multimeter to test points as indicated below.

Test Points	Switch S3 (3) Position	Normal Indication
J5 (6) J1 (5)-17	1	Continuity
J5 (6) J1 (5)-68	2	Continuity
J5 (6) J1 (5)-17	3	Continuity
J5 (6) J1 (5)-68	4	Continuity
J5 (6) J1 (5)-17	5	Continuity
J5 (6) J1 (5)-70	6	Continuity
J5 (6) J1 (5)-122	7	Continuity
J5 (6) J1 (5)-70	8	Continuity
J5 (6) J1 (5)-13	9	Continuity
J5 (6) J1 (5)-33	10	Continuity
J5 (6) J1 (5)-98	11	Continuity
J5 (6) J1 (5)-17	12	Continuity
J5 (6) J1 (5)-17	13	Continuity
J5 (6) J1 (5)-122	14	Continuity
J5 (6) J1 (5)-111	15	Continuity
J5 (6) J1 (5)-17	18	Continuity
J5 (6) J1 (5)-17	19	Continuity
J5 (6) J1 (5)-17	20	Continuity
J5 (6) J1 (5)-94	21	Continuity
J5 (6) J1 (5)-94	22	Continuity



ELECTRICAL CABLE TEST SET



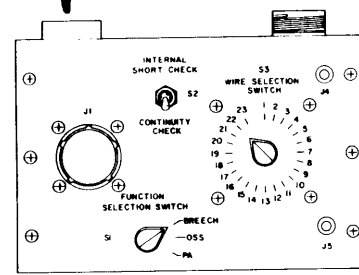
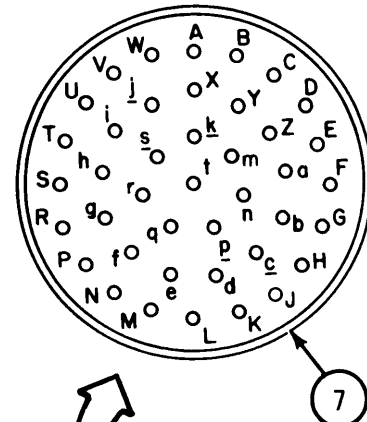
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 12 of 34)

Continued from previous page

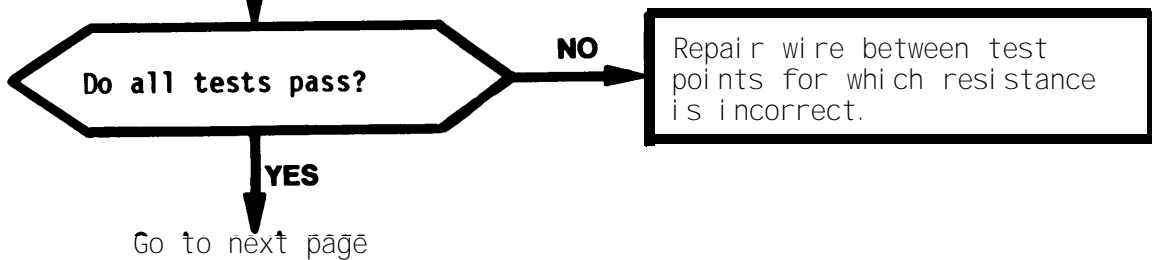
STEP 12

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J3 (7)-B	J3 (7)-S Continuity
J3 (7)-F	J3 (7)-e Continuity
J3 (7)-F	J3 (7)-N Continuity
J3 (7)-G	J3 (7)-j Continuity
J3 (7)-H	J3 (7)-D Continuity
J3 (7)-J	J3 (7)-p Continuity
J3 (7)-M	J3 (7)-P Continuity
J3 (7)-M	J3 (7)-R Continuity
J3 (7)-T	J3 (7)-q Continuity
J3 (7)-W	J3 (7)-Y Continuity
J3 (7)-X	J3 (7)-E Continuity
J3 (7)-Z	J3 (7)-L Continuity
J3 (7)-d	J3 (7)-r Continuity
J3 (7)-f	J3 (7)-b Continuity
J3 (7)-f	J3 (7)-c Continuity
J3 (7)-f	J3 (7)-g Continuity
J3 (7)-i	J3 (7)-a Continuity
J3 (7)-j	J3 (7)-h Continuity
J3 (7)-k	J3 (7)-A Continuity
J3 (7)-n	J3 (7)-U Continuity
J3 (7)-s	J3 (7)-m Continuity
J3 (7)-t	J3 (7)-K Continuity



ELECTRICAL CABLE TEST SET



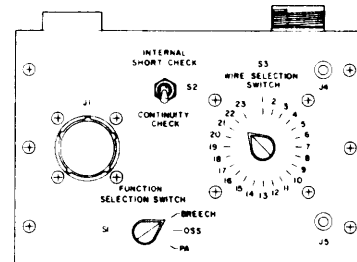
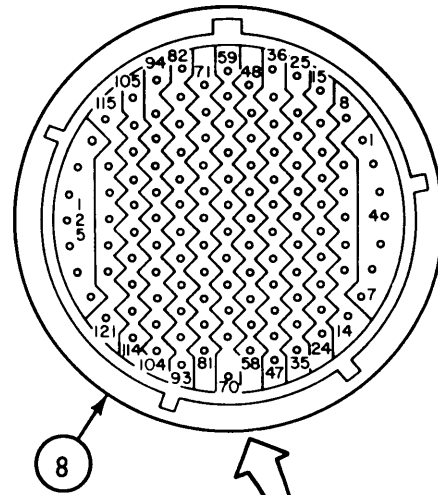
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 13 of 34)

Continued from previous page

STEP 13

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
J2 (8)-1	J2 (8)-2	Continuity
J2 (8)-3	J2 (8)-8	Continuity
J2 (8)-4	J2 (8)-109	Continuity
J2 (8)-4	J2 (8)-30	Continuity
J2 (8)-5	J2 (8)-108	Continuity
J2 (8)-5	J2 (8)-20	Continuity
J2 (8)-6	J2 (8)-14	Continuity
J2 (8)-7	J2 (8)-21	Continuity
J2 (8)-9	J2 (8)-15	Continuity
J2 (8)-10	J2 (8)-16	Continuity
J2 (8)-11	J2 (8)-12	Continuity
J2 (8)-11	J2 (8)-18	Continuity
J2 (8)-11	J2 (8)-128	Continuity
J2 (8)-19	J2 (8)-115	Continuity
J2 (8)-22	J2 (8)-32	Continuity
J2 (8)-23	J2 (8)-24	Continuity
J2 (8)-25	J2 (8)-27	Continuity
J2 (8)-26	J2 (8)-28	Continuity
J2 (8)-29	J2 (8)-97	Continuity
J2 (8)-29	J2 (8)-101	Continuity
J2 (8)-31	J2 (8)-126	Continuity
J2 (8)-34	J2 (8)-35	Continuity
J2 (8)-36	J2 (8)-38	Continuity
J2 (8)-37	J2 (8)-39	Continuity
J2 (8)-40	J2 (8)-86	Continuity
J2 (8)-41	J2 (8)-84	Continuity
J2 (8)-42	J2 (8)-69	Continuity
J2 (8)-43	J2 (8)-67	Continuity
J2 (8)-44	J2 (8)-79	Continuity



ELECTRICAL CABLE TEST SET

Go to next page

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 14 of 34)

Continued from previous page

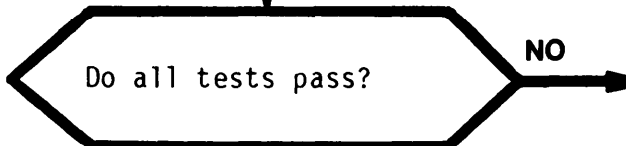
STEP 13
 (CONT)

Test Points	Normal Indication	
J2 (8)-45	J2 (8)-66	Continuity
J2 (8)-46	J2 (8)-47	Continuity
J2 (8)-48	J2 (8)-56	Continuity
J2 (8)-49	J2 (8)-50	Continuity
J2 (8)-51	J2 (8)-52	Continuity
J2 (8)-53	J2 (8)-80	Continuity
J2 (8)-54	J2 (8)-81	Continuity
J2 (8)-55	J2 (8)-78	Continuity
J2 (8)-57	J2 (8)-87	Continuity
J2 (8)-58	J2 (8)-105	Continuity
J2 (8)-59	J2 (8)-65	Continuity
J2 (8)-60	J2 (8)-61	Continuity
J2 (8)-62	J2 (8)-63	Continuity
J2 (8)-64	J2 (8)-85	Continuity
J2 (8)-71	J2 (8)-72	Continuity
J2 (8)-73	J2 (8)-74	Continuity
J2 (8)-75	J2 (8)-90	Continuity
J2 (8)-75	J2 (8)-91	Continuity
J2 (8)-76	J2 (8)-77	Continuity
J2 (8)-82	J2 (8)-83	Continuity
J2 (8)-88	J2 (8)-89	Continuity
J2 (8)-92	J2 (8)-93	Continuity
J2 (8)-95	J2 (8)-96	Continuity
J2 (8)-99	J2 (8)-100	Continuity
J2 (8)-102	J2 (8)-103	Continuity
J2 (8)-104	J2 (8)-110	Continuity
J2 (8)-106	J2 (8)-107	Continuity
J2 (8)-112	J2 (8)-114	Continuity
J2 (8)-113	J2 (8)-121	Continuity
J2 (8)-116	J2 (8)-117	Continuity
J2 (8)-119	J2 (8)-120	Continuity
J2 (8)-123	J2 (8)-124	Continuity
J2 (8)-125	J2 (8)-118	Continuity
J2 (8)-125	J2 (8)-127	Continuity

Go to next page

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 15 of 34)

Continued from previous page



NO

Repair wire between test points for which resistance is incorrect.

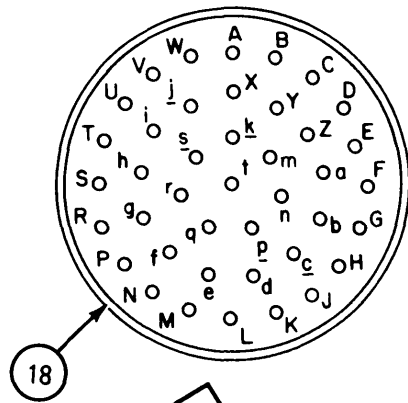
YES



STEP 13.1

Connect multimeter to continuity fixture test points as indicated below.

Tests Points	Normal Indication	
P1 (18)-A	P1 (18)-k	Continuity
P1 (18)-B	P1 (18)-S	Continuity
P1 (18)-D	P1 (18)-H	Continuity
P1 (18)-E	P1 (18)-X	Continuity
P1 (18)-F	P1 (18)-N	Continuity
P1 (18)-F	P1 (18)-e	Continuity
P1 (18)-G	P1 (18)-h	Continuity
P1 (18)-G	P1 (18)-j	Continuity
P1 (18)-J	P1 (18)-p	Continuity
P1 (18)-K	P1 (18)-t	Continuity
P1 (18)-L	P1 (18)-Z	Continuity
P1 (18)-M	P1 (18)-P	Continuity
P1 (18)-M	P1 (18)-R	Continuity
P1 (18)-T	P1 (18)-q	Continuity
P1 (18)-U	P1 (18)-n	Continuity
P1 (18)-W	P1 (18)-Y	Continuity
P1 (18)-a	P1 (18)-i	Continuity
P1 (18)-b	P1 (18)-c	Continuity
P1 (18)-b	P1 (18)-f	Continuity
P1 (18)-b	P1 (18)-g	Continuity
P1 (18)-d	P1 (18)-r	Continuity
P1 (18)-m	P1 (18)-s	Continuity



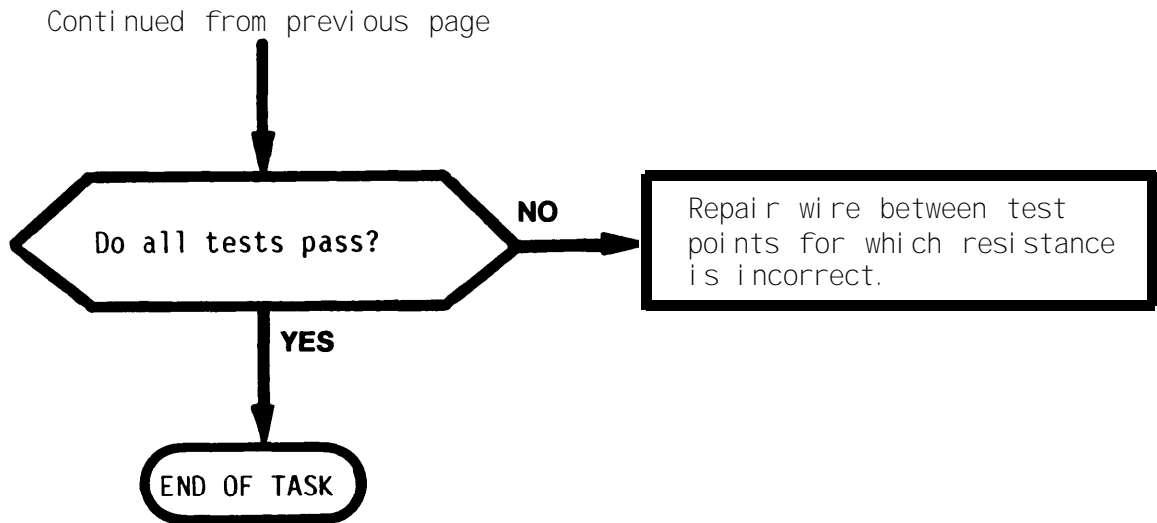
18



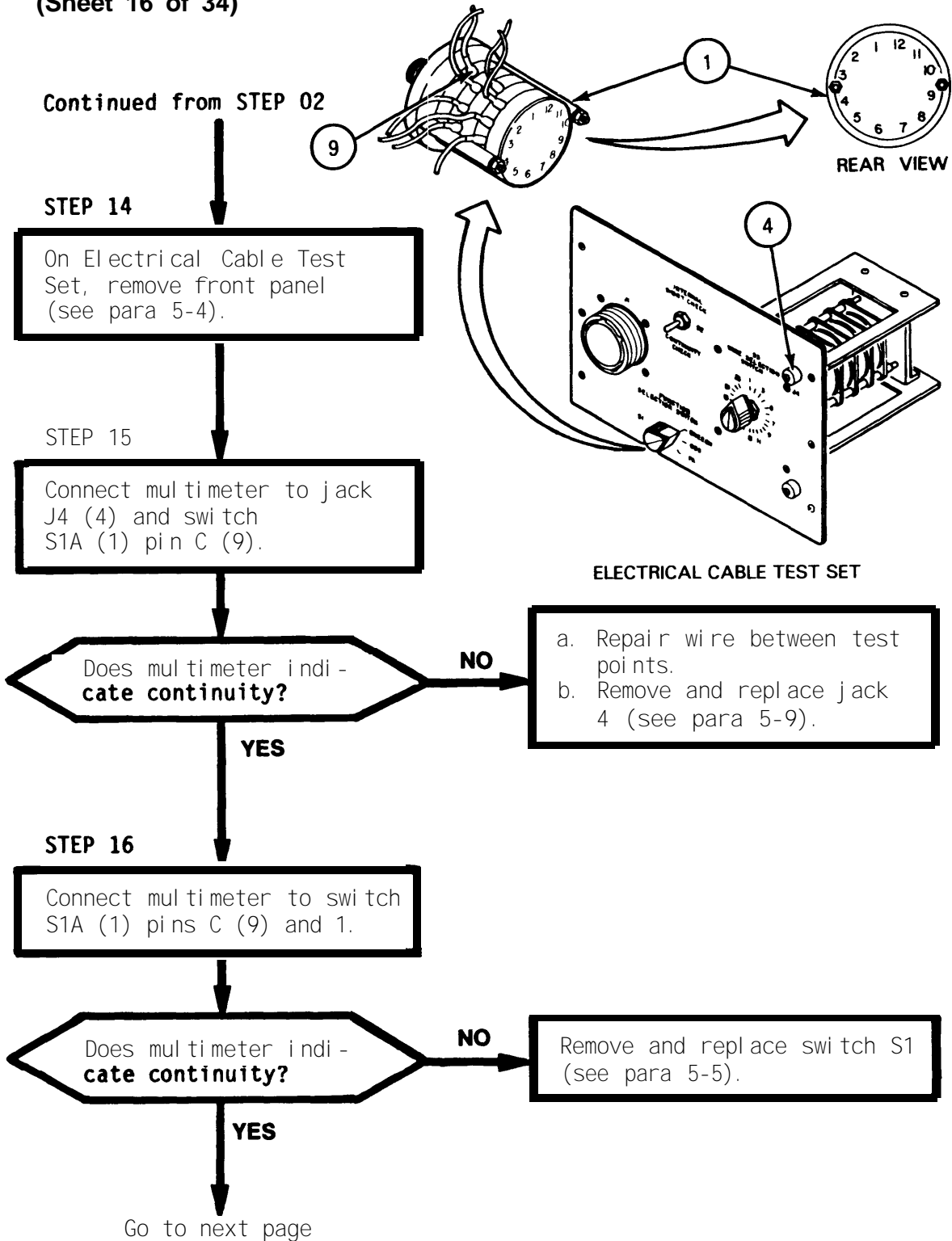
CONTINUITY FIXTURE

Go to next page

5.2 ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 15.1 of 34)



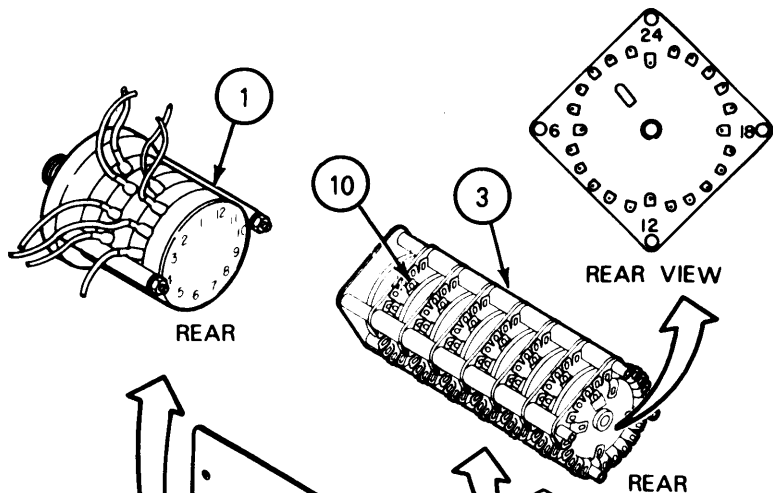
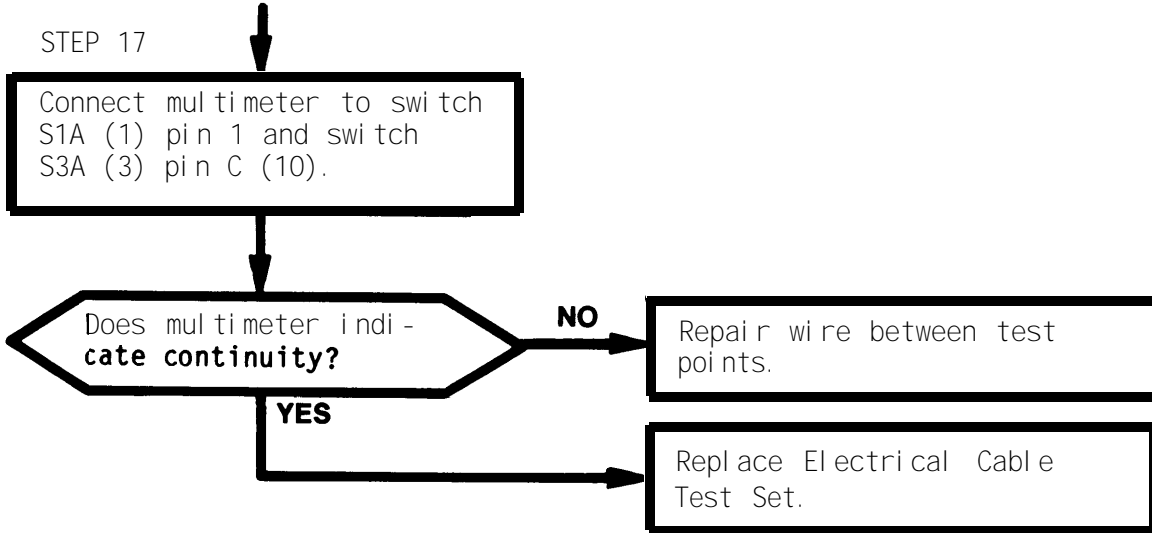
52. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 16 of 34)



5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT) (Sheet 17 of 34)

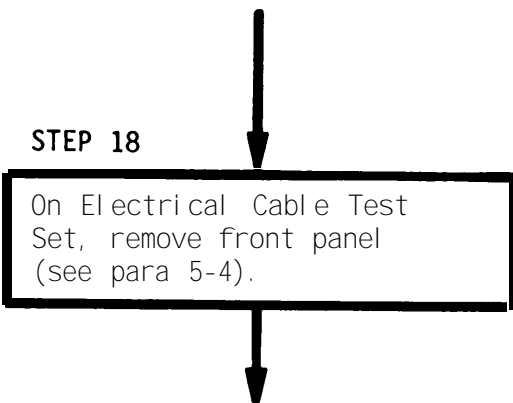
Continued from previous page

STEP 17

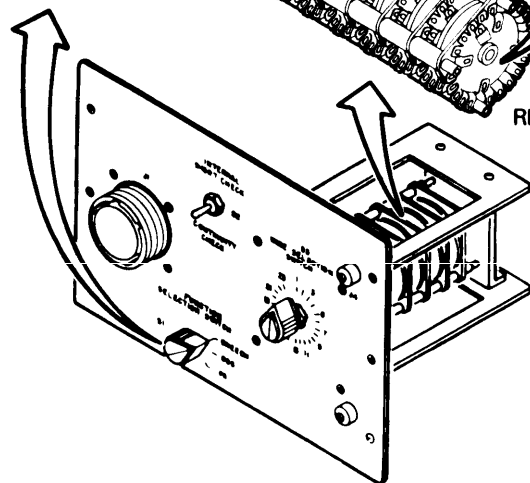


Continued from STEP 02

STEP 18



Go to next page



ELECTRICAL CABLE TEST SET

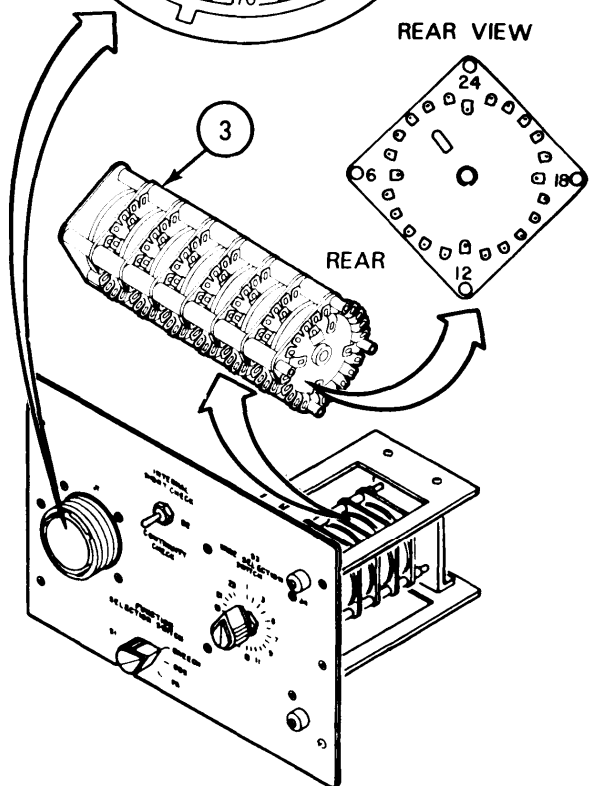
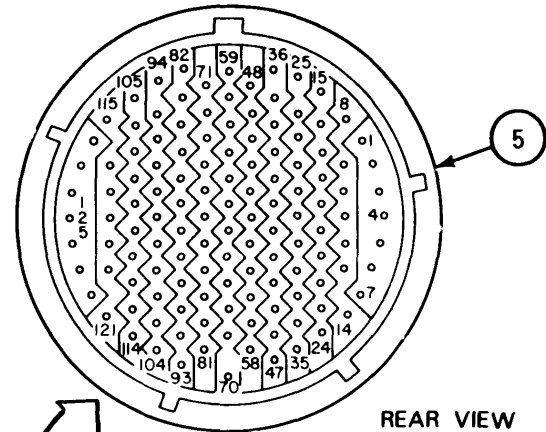
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 18 of 34)

Continued from previous page

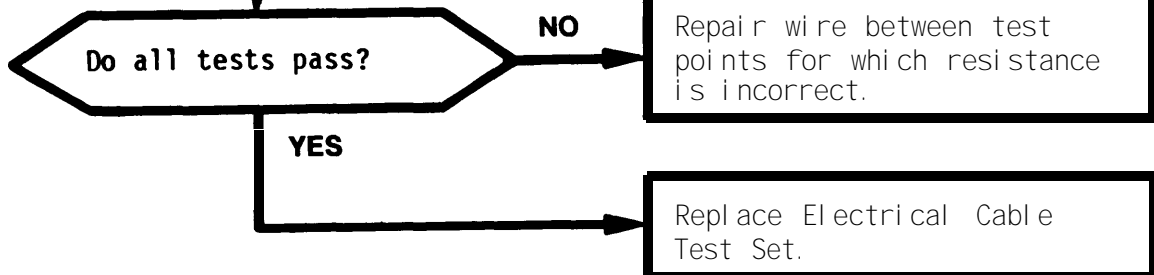
STEP 19

Connect multimeter to test points as indicated below.

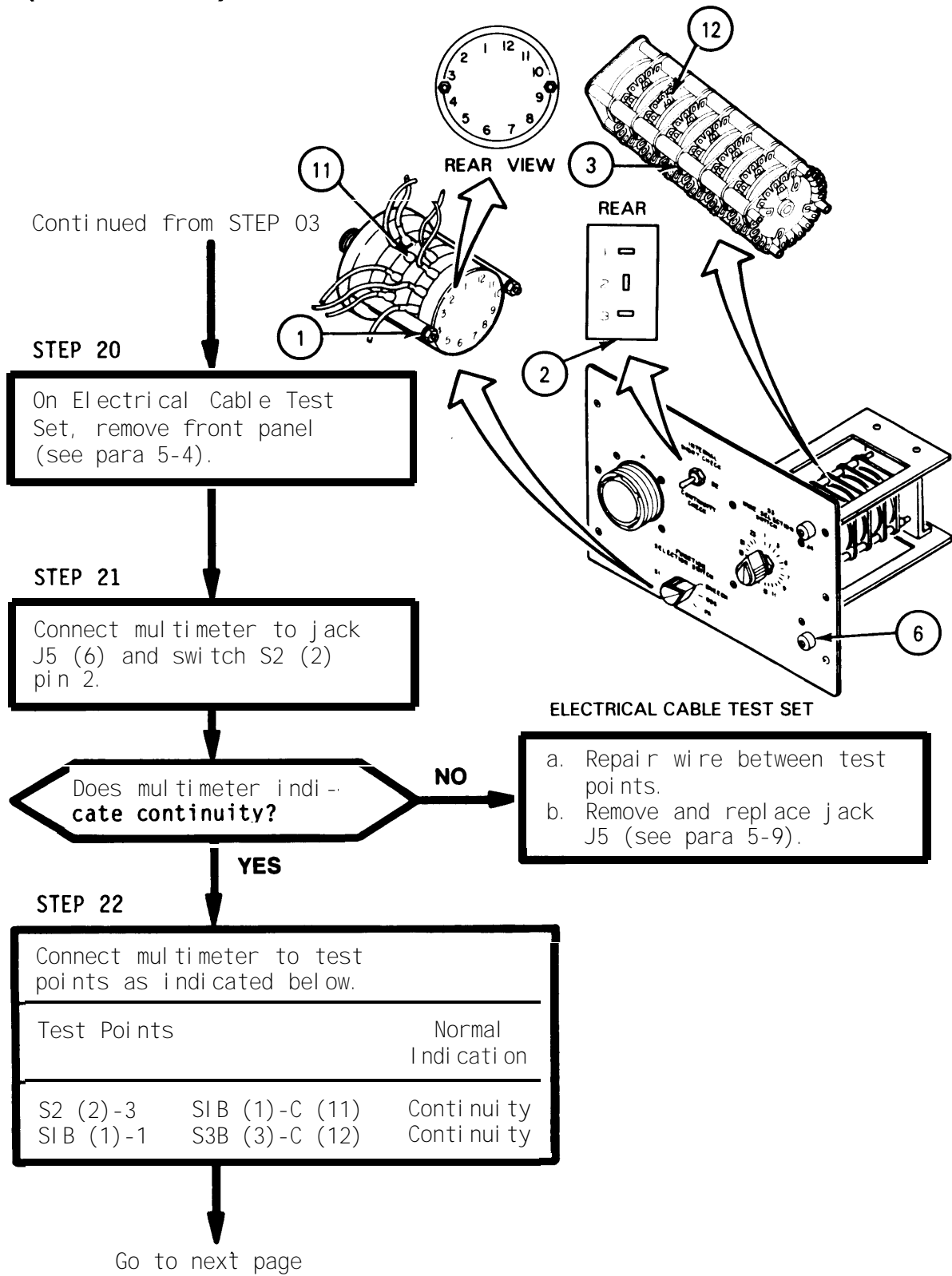
Test Points		Normal Indication
J1 (5)-8	S3A (3)-1	Continuity
J1 (5)-1	S3A (3)-2	Continuity
J1 (5)-15	S3A (3)-3	Continuity
J1 (5)-16	S3A (3)-4	Continuity
J1 (5)-25	S3A (3)-5	Continuity
J1 (5)-26	S3A (3)-6	Continuity
J1 (5)-36	S3A (3)-7	Continuity
J1 (5)-37	S3A (3)-8	Continuity
J1 (5)-24	S3A (3)-9	Continuity
J1 (5)-35	S3A (3)-10	Continuity
J1 (5)-108	S3A (3)-11	Continuity
J1 (5)-20	S3A (3)-12	Continuity
J1 (5)-30	S3A (3)-13	Continuity
J1 (5)-7	S3A (3)-14	Continuity
J1 (5)-6	S3A (3)-15	Continuity
J1 (5)-19	S3A (3)-16	Continuity
J1 (5)-40	S3A (3)-17	Continuity
J1 (5)-122	S3A (3)-18	Continuity
J1 (5)-4	S3A (3)-19	Continuity
J1 (5)-5	S3A (3)-20	Continuity
J1 (5)-107	S3A (3)-21	Continuity
J1 (5)-55	S3A (3)-22	Continuity



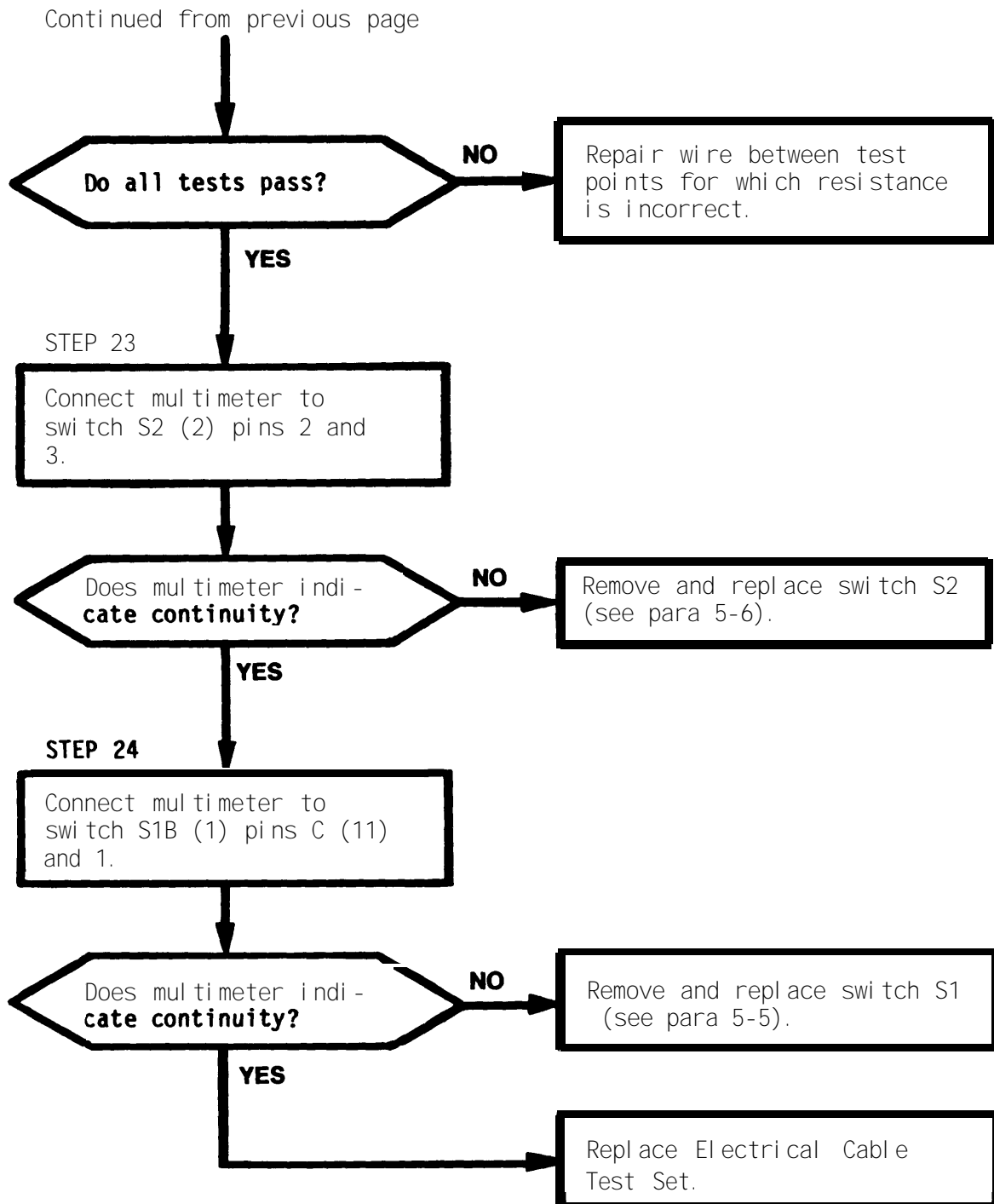
ELECTRICAL CABLE TEST SET



5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 19 of 34)



5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 20 of 34)

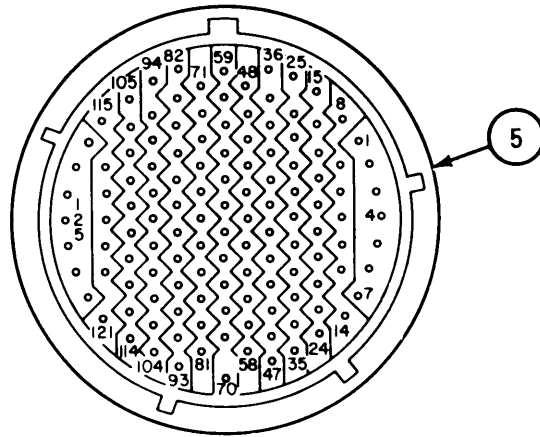


5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 21 of 34)

Continued from STEP 03

STEP 25

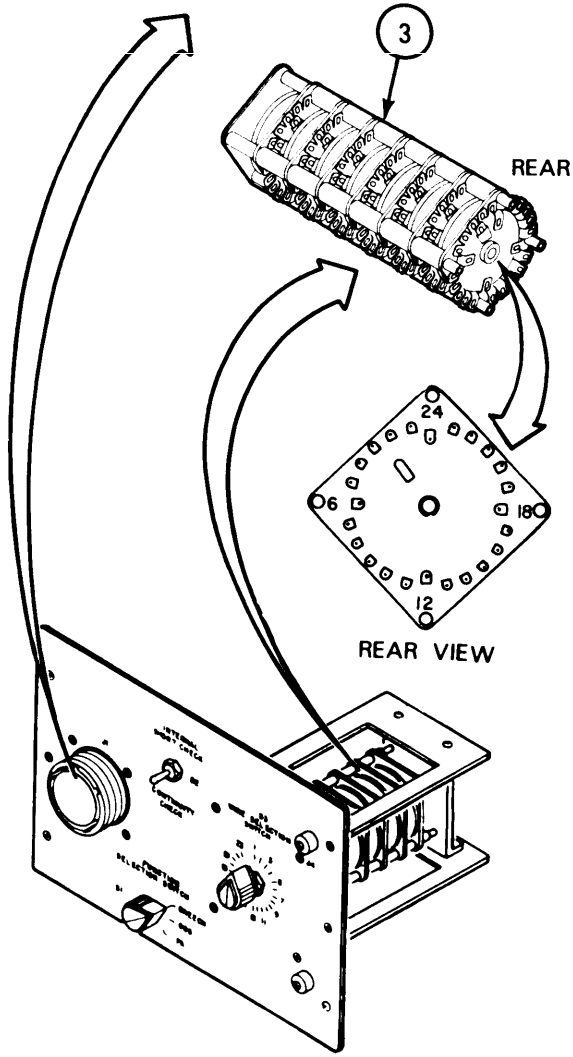
On Electrical Cable Test Set, remove front panel (see para 5-4).



STEP 26

Connect multimeter to test points as indicated below.

Test points	Normal Indication
J1 (5)-3	S3B (3)-1 Continuity
J1 (5)-2	S3B (3)-2 Continuity
J1 (5)-9	S3B (3)-3 Continuity
J1 (5)-10	S3B (3)-4 Continuity
J1 (5)-27	S3B (3)-5 Continuity
J1 (5)-28	S3B (3)-6 Continuity
J1 (5)-38	S3B (3)-7 Continuity
J1 (5)-39	S3B (3)-8 Continuity
J1 (5)-23	S3B (3)-9 Continuity
J1 (5)-34	S3B (3)-10 Continuity
J1 (5)-109	S3B (3)-11 Continuity
J1 (5)-108	S3B (3)-12 Continuity
J1 (5)-109	S3B (3)-13 Continuity
J1 (5)-21	S3B (3)-14 Continuity
J1 (5)-14	S3B (3)-15 Continuity
J1 (5)-115	S3B (3)-16 Continuity
J1 (5)-86	S3B (3)-17 Continuity
J1 (5)-33	S3B (3)-18 Continuity
J1 (5)-109	S3B (3)-19 Continuity
J1 (5)-108	S3B (3)-20 Continuity
J1 (5)-106	S3B (3)-21 Continuity
J1 (5)-78	S3B (3)-22 Continuity

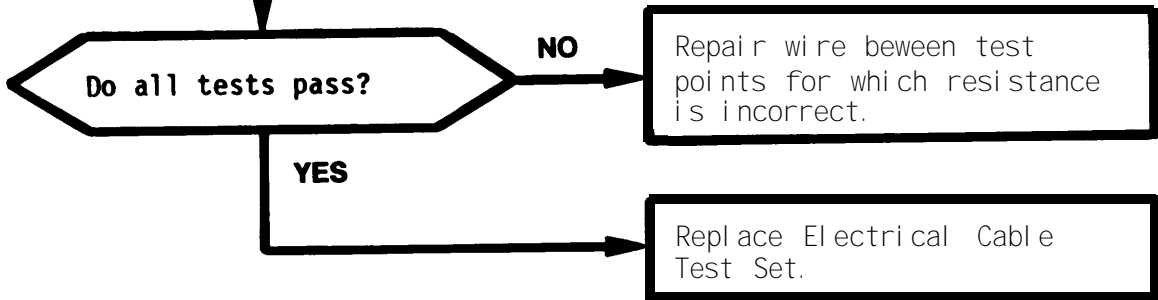


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ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 22 of 34)

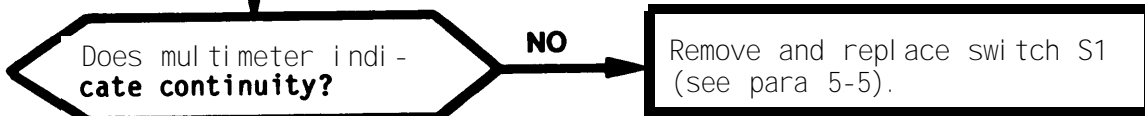
Continued from previous page



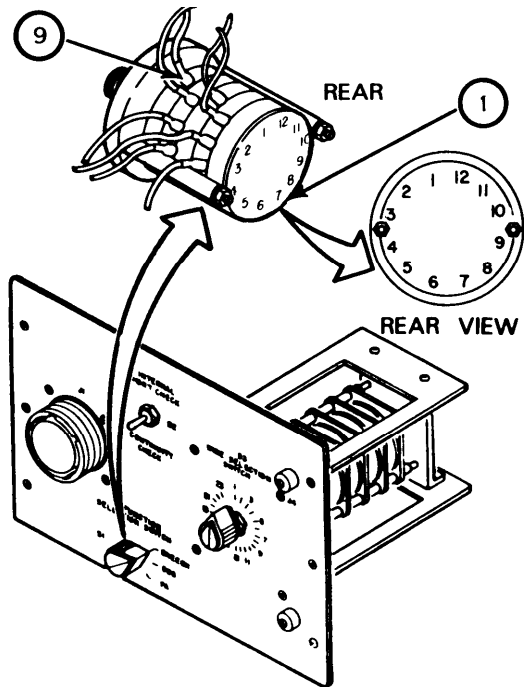
Continued from STEP 05

STEP 27
On Electrical Cable Test Set, remove front panel (see para 5-4).

STEP 28
Connect multimeter to switch S1A (1) pins C (9) and 2.



Go to next page



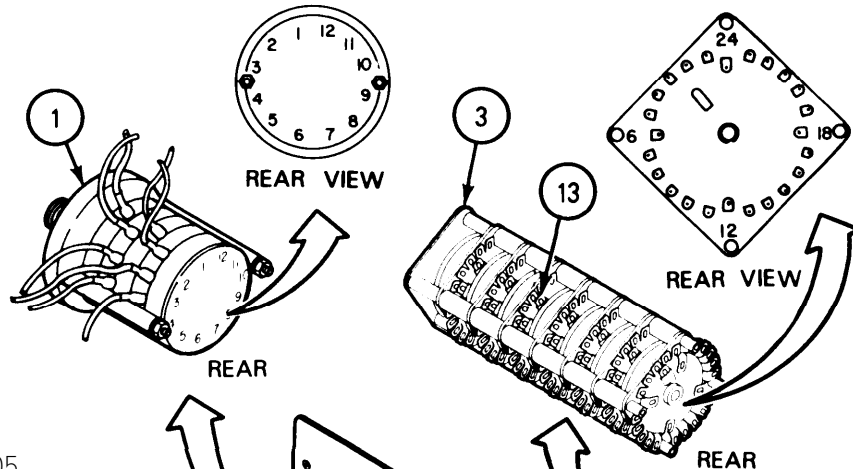
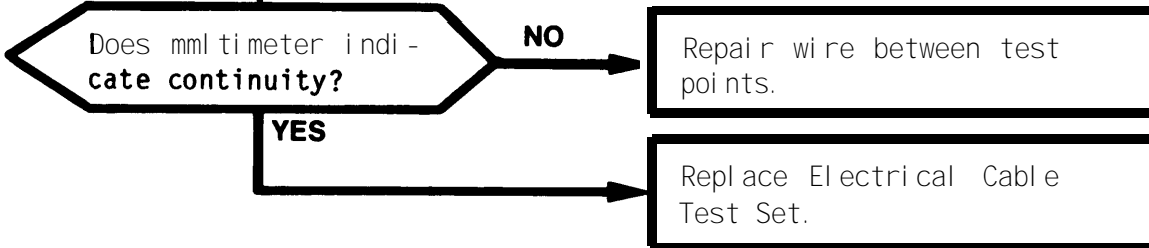
ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 23 of 34)

Continued from previous page

STEP 29

Connect multimeter to switch S1A (1) pin 2 and switch S3C (3) pin C (13).

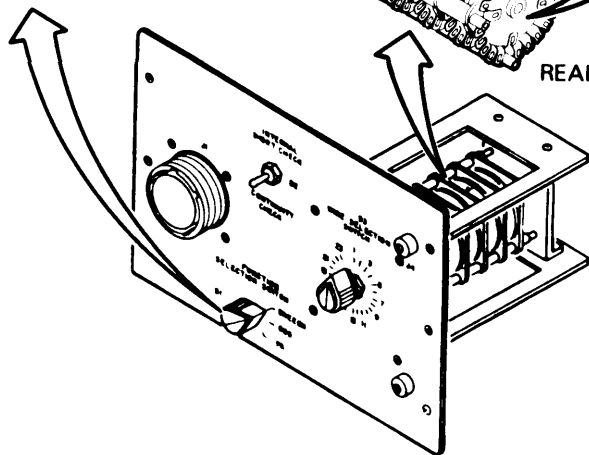


Continued from STEP 05

STEP 30

On Electrical Cable Test Set, remove front panel (see para 5-4).

Go to next page



ELECTRICAL CABLE TEST SET

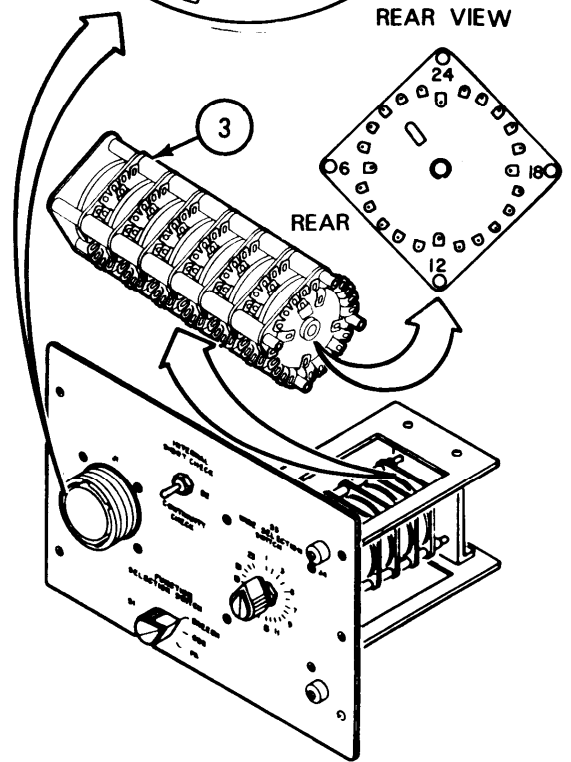
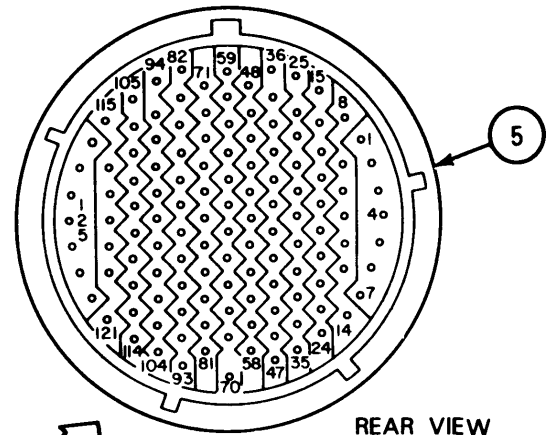
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 24 of 34)

Continued from previous page

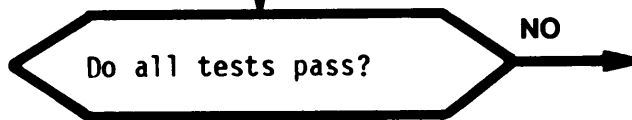
STEP 31

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J1 (5)-97	S3C (3)-1 Continuity
J1 (5)-101	S3C (3)-2 Continuity
J1 (5)-121	S3C (3)-3 Continuity
J1 (5)-90	S3C (3)-4 Continuity
J1 (5)-114	S3C (3)-5 Continuity
J1 (5)-102	S3C (3)-6 Continuity
J1 (5)-116	S3C (3)-7 Continuity
J1 (5)-104	S3C (3)-8 Continuity
J1 (5)-22	S3C (3)-9 Continuity
J1 (5)-31	S3C (3)-10 Continuity
J1 (5)-122	S3C (3)-11 Continuity
J1 (5)-92	S3C (3)-12 Continuity
J1 (5)-47	S3C (3)-13 Continuity
J1 (5)-123	S3C (3)-14 Continuity
J1 (5)-119	S3C (3)-15 Continuity
J1 (5)-118	S3C (3)-16 Continuity
J1 (5)-125	S3C (3)-17 Continuity
J1 (5)-11	S3C (3)-18 Continuity
J1 (5)-12	S3C (3)-19 Continuity
J1 (5)-18	S3C (3)-20 Continuity
J1 (5)-96	S3C (3)-21 Continuity
J1 (5)-90	S3C (3)-22 Continuity



ELECTRICAL CABLE TEST SET



NO

Repair wire between test points for which resistance is incorrect.

YES

Replace Electrical Cable Test Set.

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 25 of 34)

Continued from STEP 06

STEP 32

On Electrical Cable Test Set, remove front panel (see para 5-4).

STEP 33

Connect multimeter to switch S1B (1) pins C (11) and 2.

Does multimeter indicate continuity?

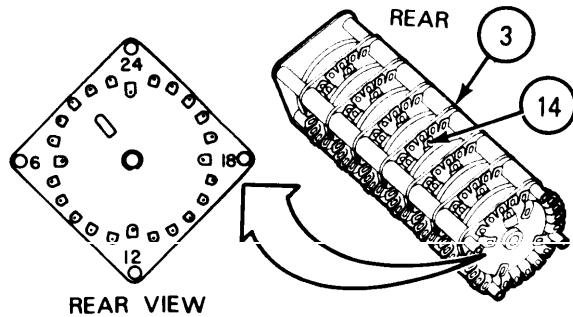
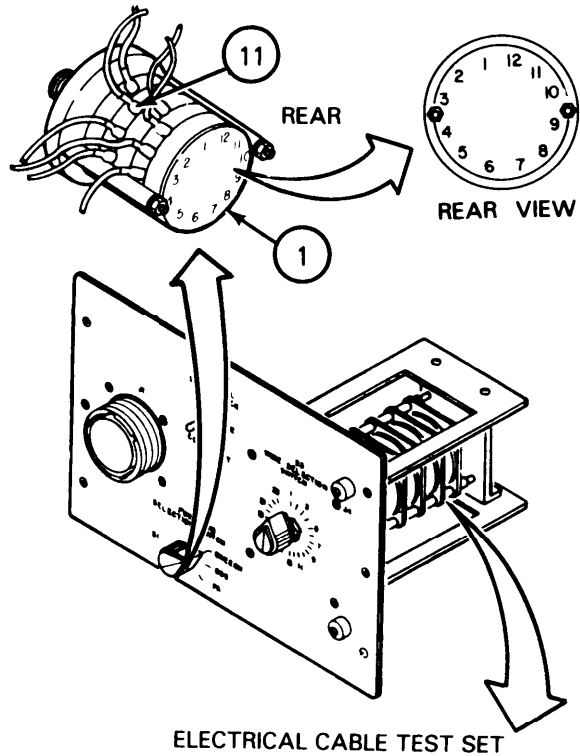
YES

STEP 34

Connect multimeter to switch S1B (1) pin 2 and switch S3D (3) pin C (14).

Does multimeter indicate continuity?

YES



Remove and replace switch S1 (see para 5-5).

Repair wire between test points.

Replace Electrical Cable Test Set.

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 26 of 34)

Continued from STEP 06

STEP 35

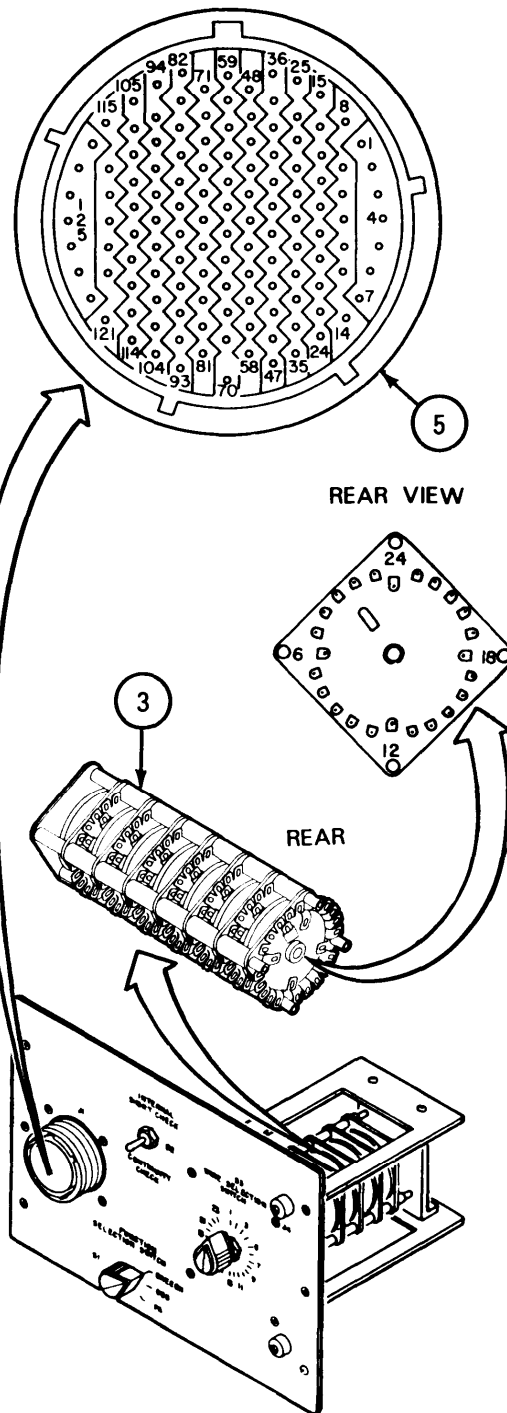
On Electrical Cable Test Set, remove front panel (see para 5-4).

STEP 36

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J1 (5)-29	S3D (3)-1 Continuity
J1 (5)-29	S3D (3)-2 Continuity
J1 (5)-113	S3D (3)-3 Continuity
J1 (5)-91	S3D (3)-4 Continuity
J1 (5)-112	S3D (3)-5 Continuity
J1 (5)-103	S3D (3)-6 Continuity
J1 (5)-117	S3D (3)-7 Continuity
J1 (5)-110	S3D (3)-8 Continuity
J1 (5)-32	S3D (3)-9 Continuity
J1 (5)-126	S3D (3)-10 Continuity
J1 (5)-111	S3D (3)-11 Continuity
J1 (5)-93	S3D (3)-12 Continuity
J1 (5)-46	S3D (3)-13 Continuity
J1 (5)-124	S3D (3)-14 Continuity
J1 (5)-120	S3D (3)-15 Continuity
J1 (5)-127	S3D (3)-16 Continuity
J1 (5)-127	S3D (3)-17 Continuity
J1 (5)-128	S3D (3)-18 Continuity
J1 (5)-128	S3D (3)-19 Continuity
J1 (5)-128	S3D (3)-20 Continuity
J1 (5)-95	S3D (3)-21 Continuity
J1 (5)-75	S3D (3)-22 Continuity

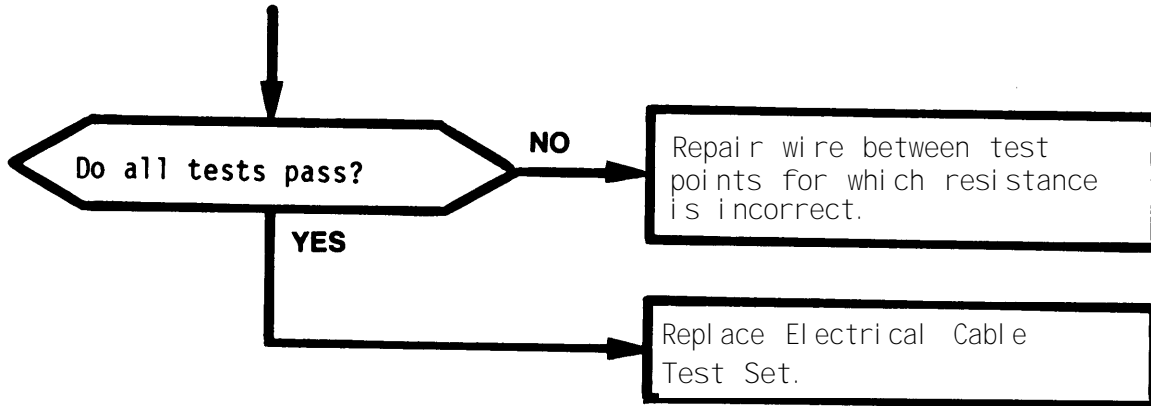
Go to next page



ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 27 of 34)

Continued from previous page



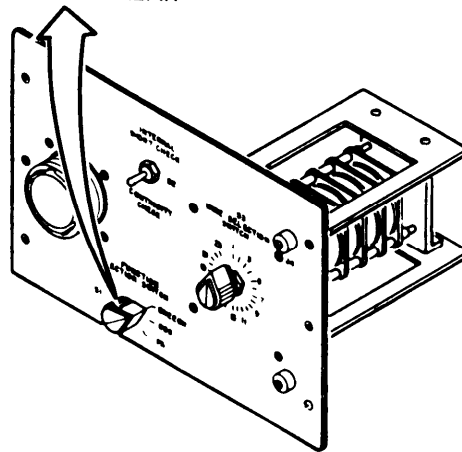
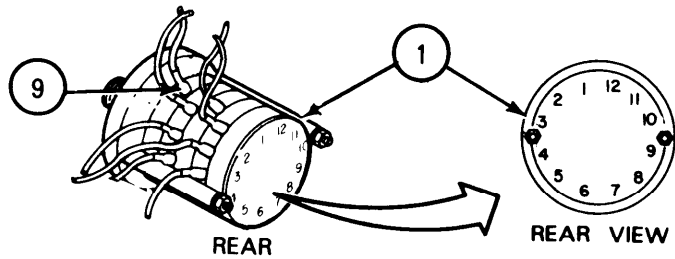
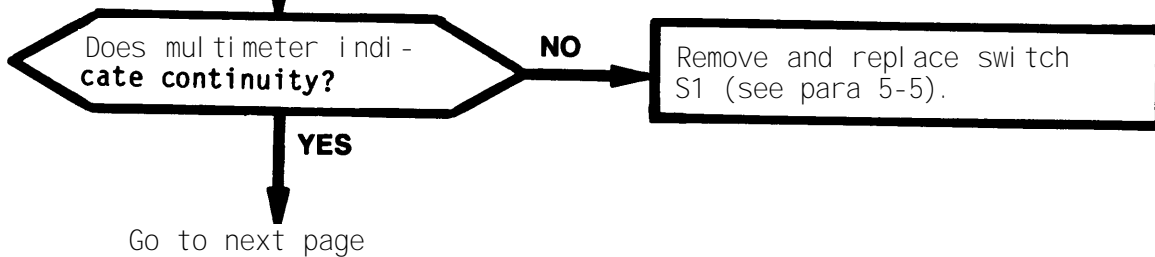
Continued from STEP 08

STEP 37

On Electrical Cable Test Set, remove front panel (see para 5-4).

STEP 38

Connect multimeter to switch switch S1A (1) pins C (9) and 3.



ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 28 of 34)

Continued from previous page

STEP 39

Connect multimeter to switch S1A (1) pin 3 and switch S3F (3) pin C (15).

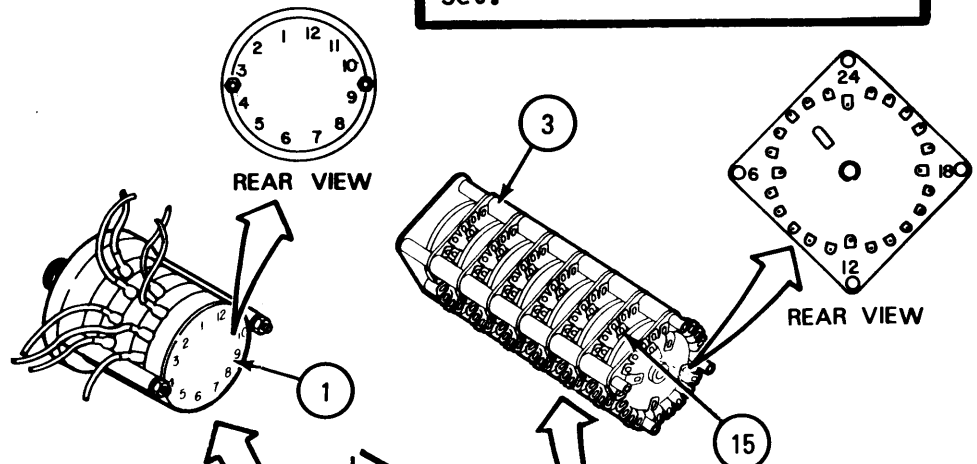
Does multimeter indicate continuity?

NO

Repair wire between test points.

YES

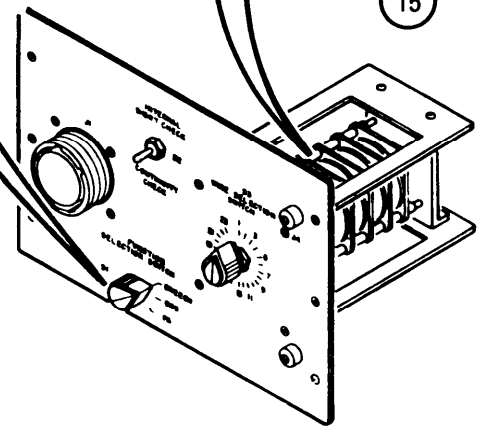
Replace Electrical Cable Test Set.



Continued from STEP 08

STEP 40

On Electrical Cable Test Set, remove front panel (See para 5-4).



ELECTRICAL CABLE TEST SET

Go to next page

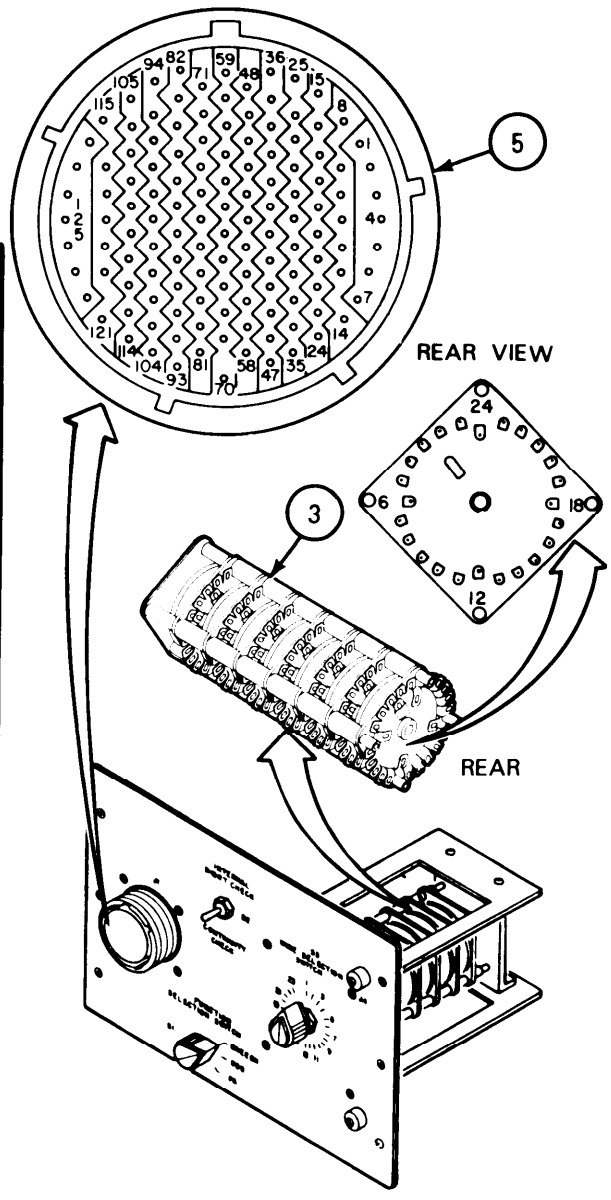
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 29 of 34)

Continued from previous page

STEP 41

Connect multimeter to test points as indicated below.

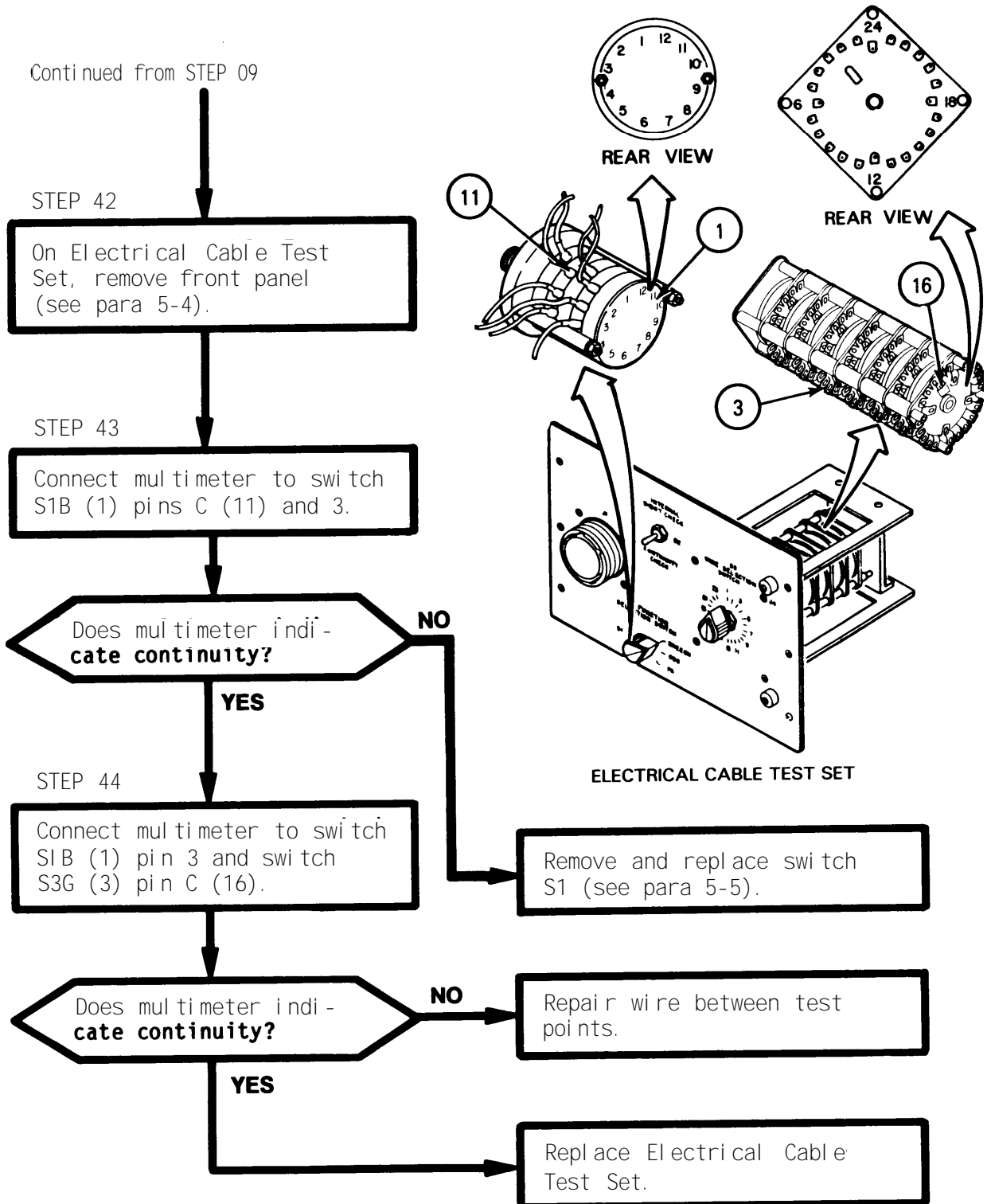
Test Points	Normal Indication
J1 (5)-58 S3F (3)-1	Continuity
J1 (5)-57 S3F (3)-2	Continuity
J1 (5)-56 S3F (3)-3	Continuity
J1 (5)-69 S3F (3)-4	Continuity
J1 (5)-67 S3F (3)-5	Continuity
J1 (5)-79 S3F (3)-6	Continuity
J1 (5)-80 S3F (3)-7	Continuity
J1 (5)-81 S3F (3)-8	Continuity
J1 (5)-50 S3F (3)-9	Continuity
J1 (5)-61 S3F (3)-10	Continuity
J1 (5)-72 S3F (3)-11	Continuity
J1 (5)-83 S3F (3)-12	Continuity
J1 (5)-52 S3F (3)-13	Continuity
J1 (5)-63 S3F (3)-14	Continuity
J1 (5)-74 S3F (3)-15	Continuity
J1 (5)-41 S3F (3)-16	Continuity
J1 (5)-85 S3F (3)-17	Continuity
J1 (5)-88 S3F (3)-18	Continuity
J1 (5)-99 S3F (3)-19	Continuity
J1 (5)-76 S3F (3)-20	Continuity
J1 (5)-59 S3F (3)-21	Continuity
J1 (5)-45 S3F (3)-22	Continuity



```

    graph TD
        Q{Do all tests pass?} -- NO --> A[Repair wire between test points for which resistance is incorrect.]
        Q -- YES --> B[Replace Electrical Cable Test Set.]
    
```

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 30 of 34)



5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 31 of 34)

Continued from STEP 09

STEP 45

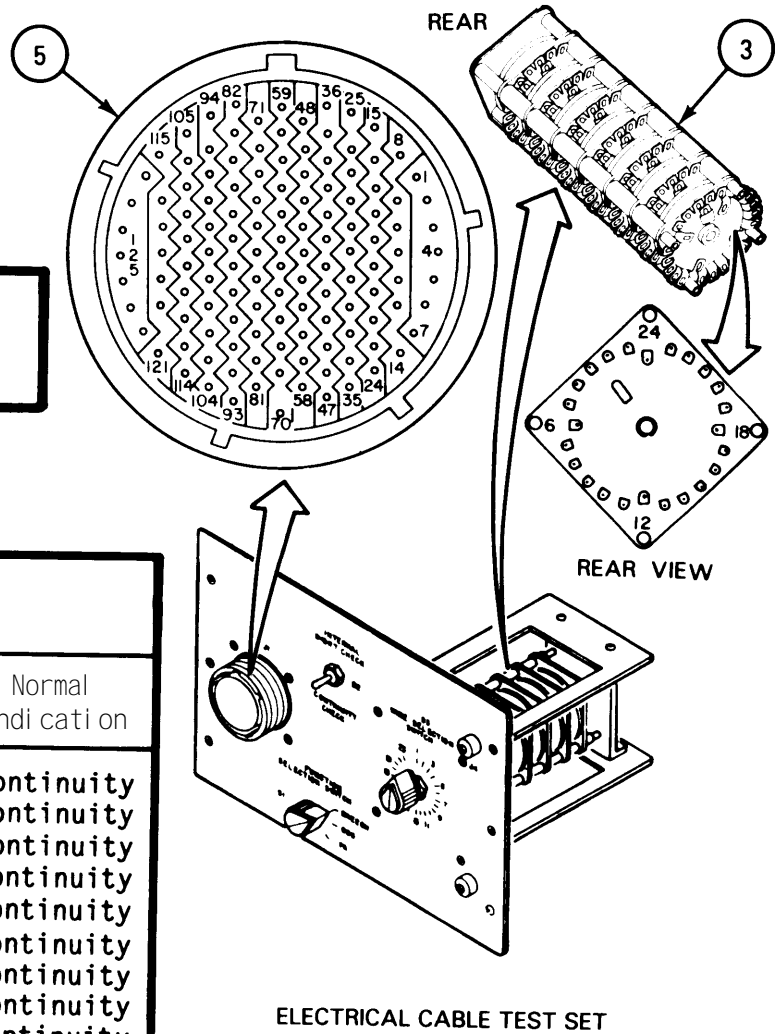
On Electrical Cable Test Set, remove front panel (see para 5-4).

STEP 46

Connect multimeter to test points as indicated below.

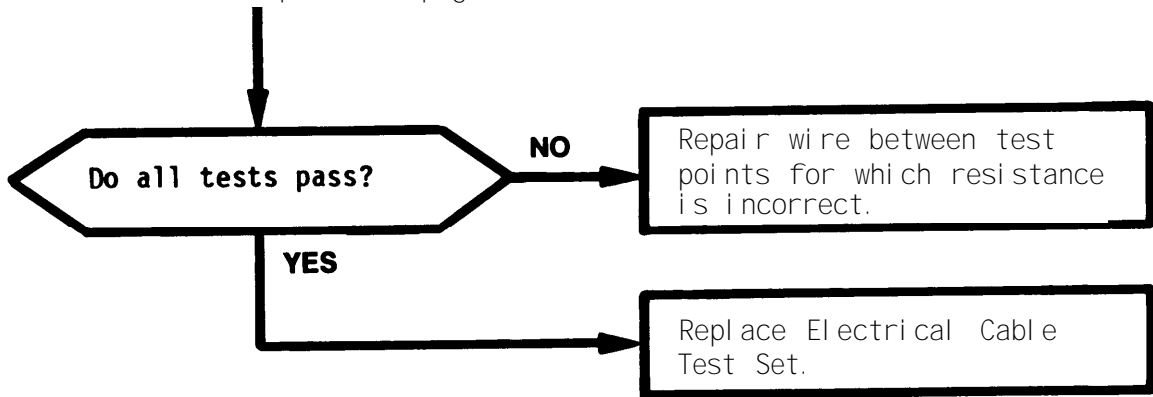
Test Points	Normal Indication
J1 (5)-105	S3G (3)-1 Continuity
J1 (5)-87	S3G (3)-2 Continuity
J1 (5)-48	S3G (3)-3 Continuity
J1 (5)-42	S3G (3)-4 Continuity
J1 (5)-43	S3G (3)-5 Continuity
J1 (5)-44	S3G (3)-6 Continuity
J1 (5)-53	S3G (3)-7 Continuity
J1 (5)-54	S3G (3)-8 Continuity
J1 (5)-49	S3G (3)-9 Continuity
J1 (5)-60	S3G (3)-10 Continuity
J1 (5)-71	S3G (3)-11 Continuity
J1 (5)-82	S3G (3)-12 Continuity
J1 (5)-51	S3G (3)-13 Continuity
J1 (5)-62	S3G (3)-14 Continuity
J1 (5)-73	S3G (3)-15 Continuity
J1 (5)-84	S3G (3)-16 Continuity
J1 (5)-64	S3G (3)-17 Continuity
J1 (5)-89	S3G (3)-18 Continuity
J1 (5)-100	S3G (3)-19 Continuity
J1 (5)-77	S3G (3)-20 Continuity
J1 (5)-65	S3G (3)-21 Continuity
J1 (5)-66	S3G (3)-22 Continuity

Go to next page

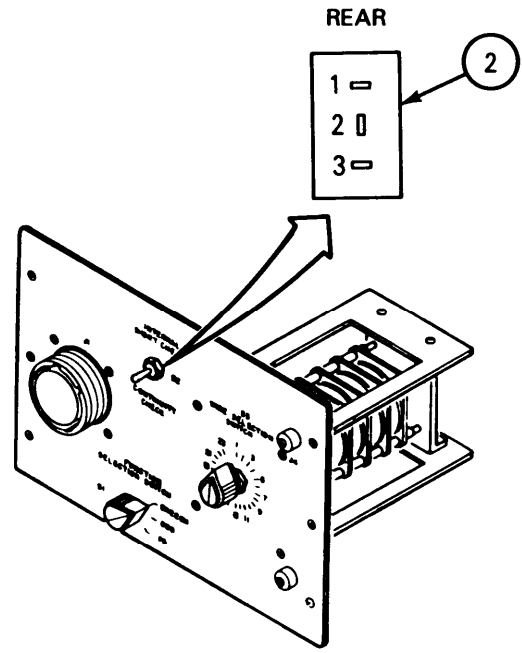
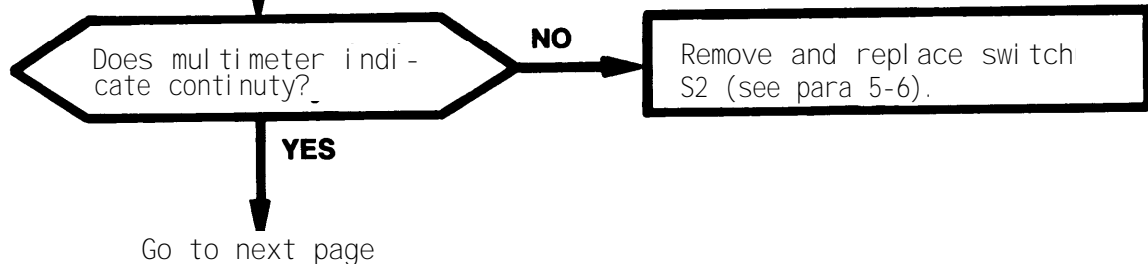
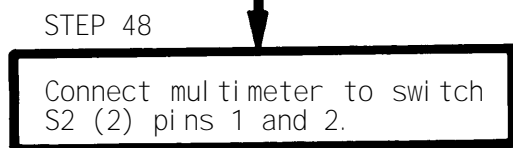
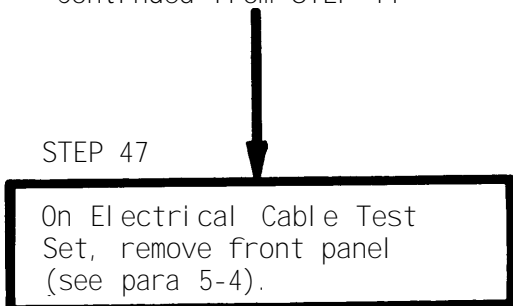


5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 32 of 34)

Continued from previous page



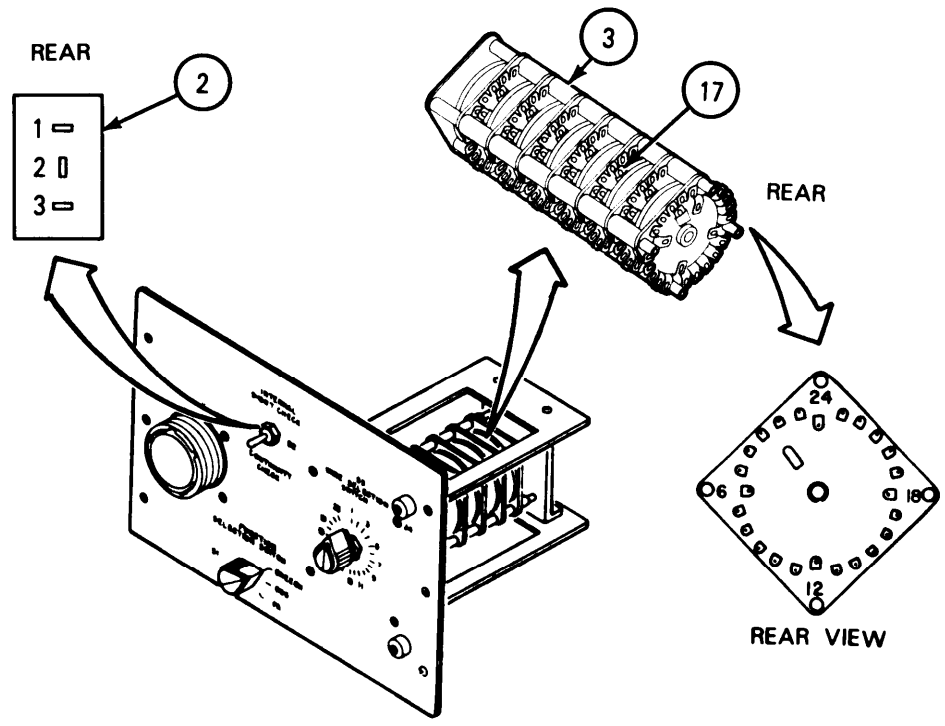
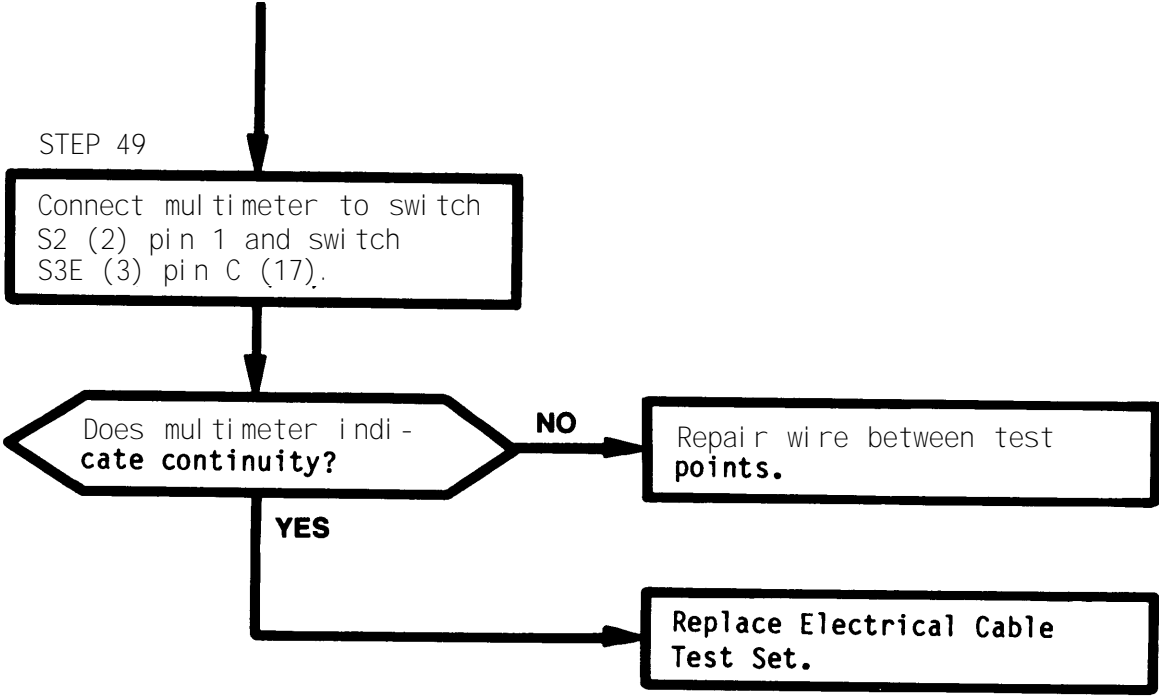
Continued from STEP 11



ELECTRICAL CABLE TEST SET

5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 33 of 34)

Continued from previous page



ELECTRICAL CABLE TEST SET

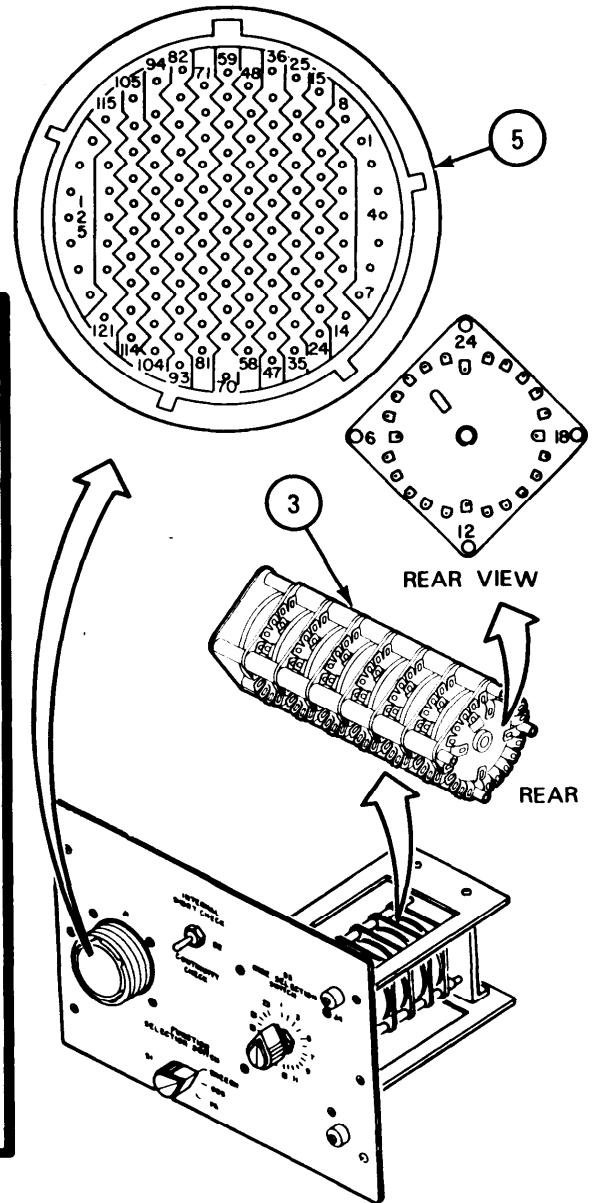
5-2. ELECTRICAL CABLE TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 34 of 34)

Continued from STEP 11

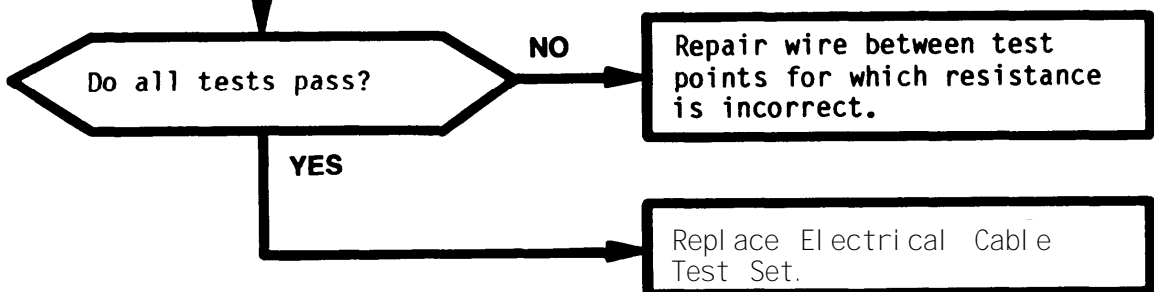
STEP 50

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J1 (5)-17 S3E (3)-1	Continuity
J1 (5)-68 S3E (3)-2	Continuity
J1 (5)-17 S3E (3)-3	Continuity
J1 (5)-68 S3E (3)-4	Continuity
J1 (5)-17 S3E (3)-5	Continuity
J1 (5)-70 S3E (3)-6	Continuity
J1 (5)-122 S3E (3)-7	Continuity
J1 (5)-70 S3E (3)-8	Continuity
J1 (5)-13 S3E (3)-9	Continuity
J1 (5)-33 S3E (3)-10	Continuity
J1 (5)-98 S3E (3)-11	Continuity
J1 (5)-17 S3E (3)-12	Continuity
J1 (5)-17 S3E (3)-13	Continuity
J1 (5)-122 S3E (3)-14	Continuity
J1 (5)-111 S3E (3)-15	Continuity
J1 (5)-17 S3E (3)-18	Continuity
J1 (5)-17 S3E (3)-19	Continuity
J1 (5)-17 S3E (3)-20	Continuity
J1 (5)-94 S3E (3)-21	Continuity
J1 (5)-94 S3E (3)-22	Continuity



ELECTRICAL CABLE TEST SET



Section II. ELECTRICAL CABLE TEST SET MAINTENANCE PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	5-3	5-36
REMOVAL AND REPLACEMENT OF FRONT PANEL	5-4	5-37
REMOVAL AND REPLACEMENT OF SWITCH S1	5-5	5-38
REMOVAL AND REPLACEMENT OF SWITCH S2	5-6	5-39
REMOVAL AND REPLACEMENT OF CONNECTOR J3	5-7	5-40
REMOVAL AND REPLACEMENT OF CONNECTOR J2	5-8	5-41
REMOVAL AND REPLACEMENT OF JACKS J4 AND J5	5-9	5-42
REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S1	5-10	5-43
REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S3	5-11	5-44

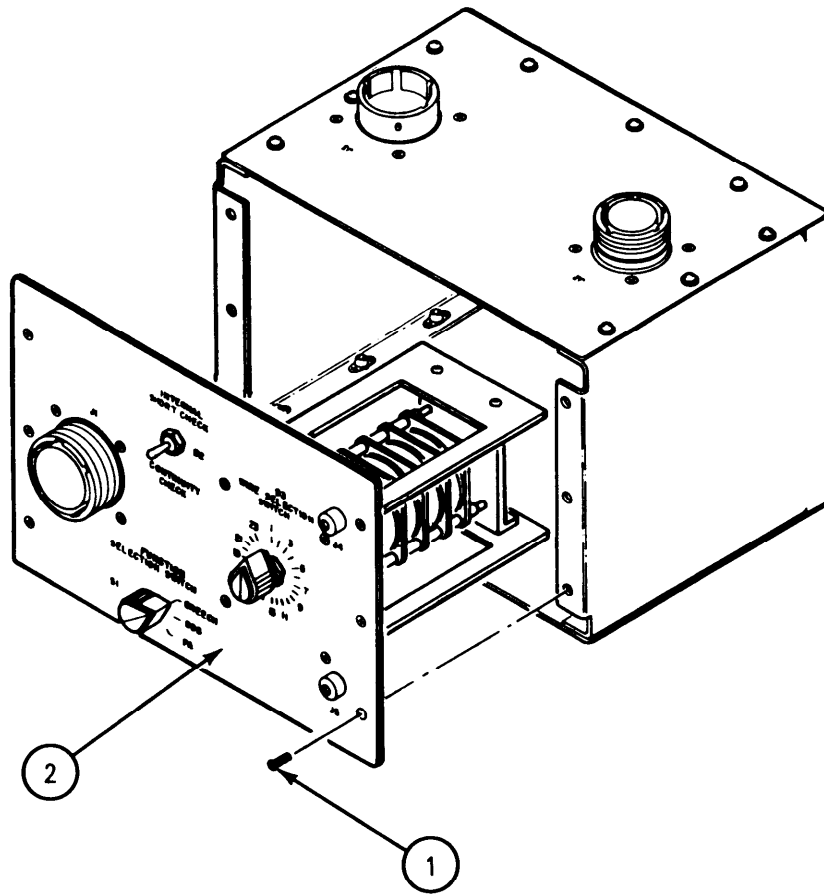
5-3. SCOPE

This section contains removal and replacement procedures for the Electrical Cable Test Set.

5-4. REMOVAL AND REPLACEMENT OF FRONT PANEL

TOOLS:

No. 2 cross-tip screwdriver



STEP 1

REMOVAL

- A. Remove six screws (1).
- B. Remove front panel (2).

STEP 2

REPLACEMENT

- A. Install front panel (2).
- B. Install six screws (1).

END OF TASK

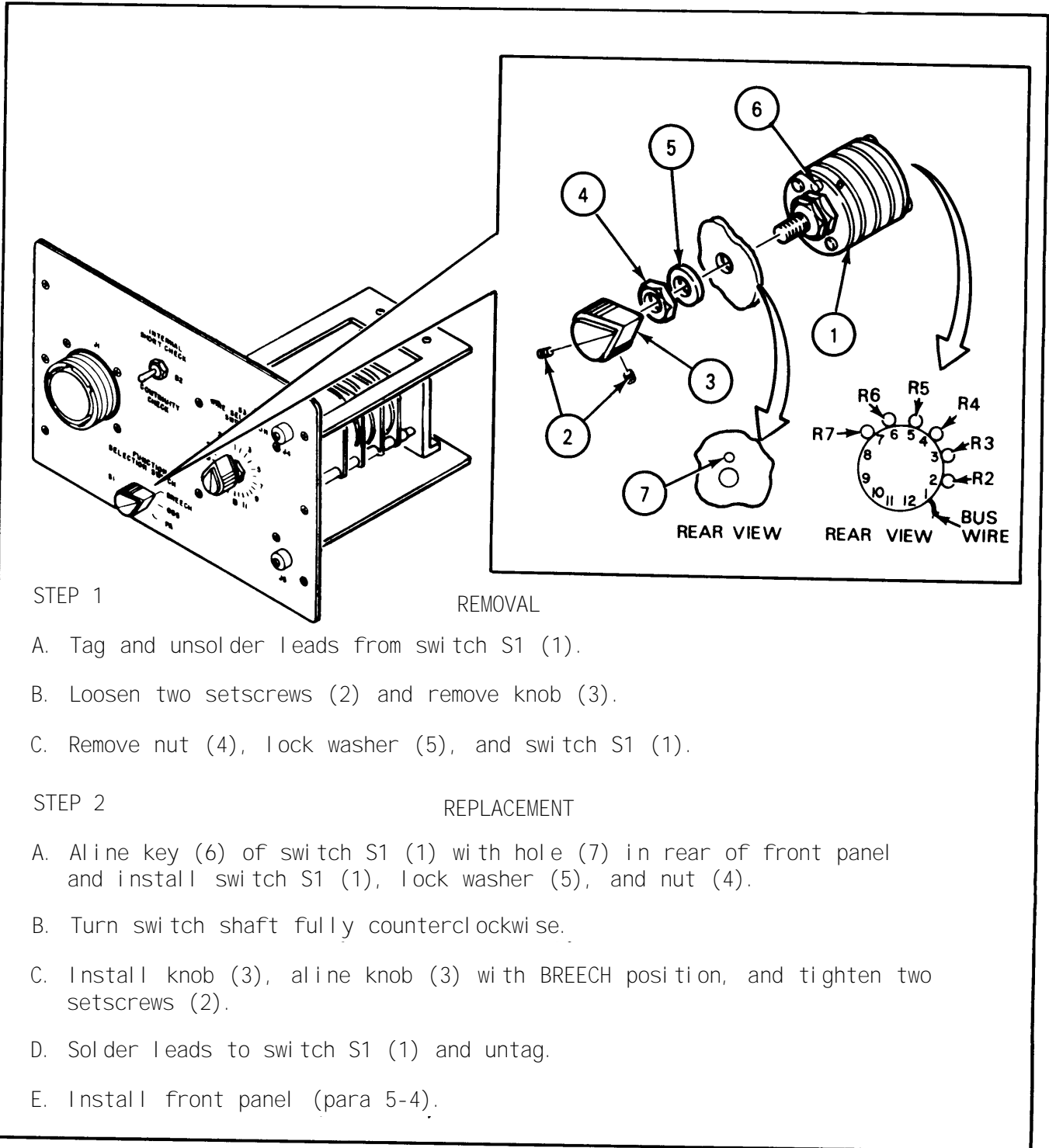
5-5. REMOVAL AND REPLACEMENT OF SWITCH S1

TOOLS:

- 0.05-inch socket-head screw key
- 9/16-inch open-end wrench
- Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 5-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from switch S1 (1).
- B. Loosen two setscrews (2) and remove knob (3).
- C. Remove nut (4), lock washer (5), and switch S1 (1).

STEP 2

REPLACEMENT

- A. Align key (6) of switch S1 (1) with hole (7) in rear of front panel and install switch S1 (1), lock washer (5), and nut (4).
- B. Turn switch shaft fully counterclockwise.
- C. Install knob (3), align knob (3) with BREECH position, and tighten two setscrews (2).
- D. Solder leads to switch S1 (1) and untag.
- E. Install front panel (para 5-4).

END OF TASK

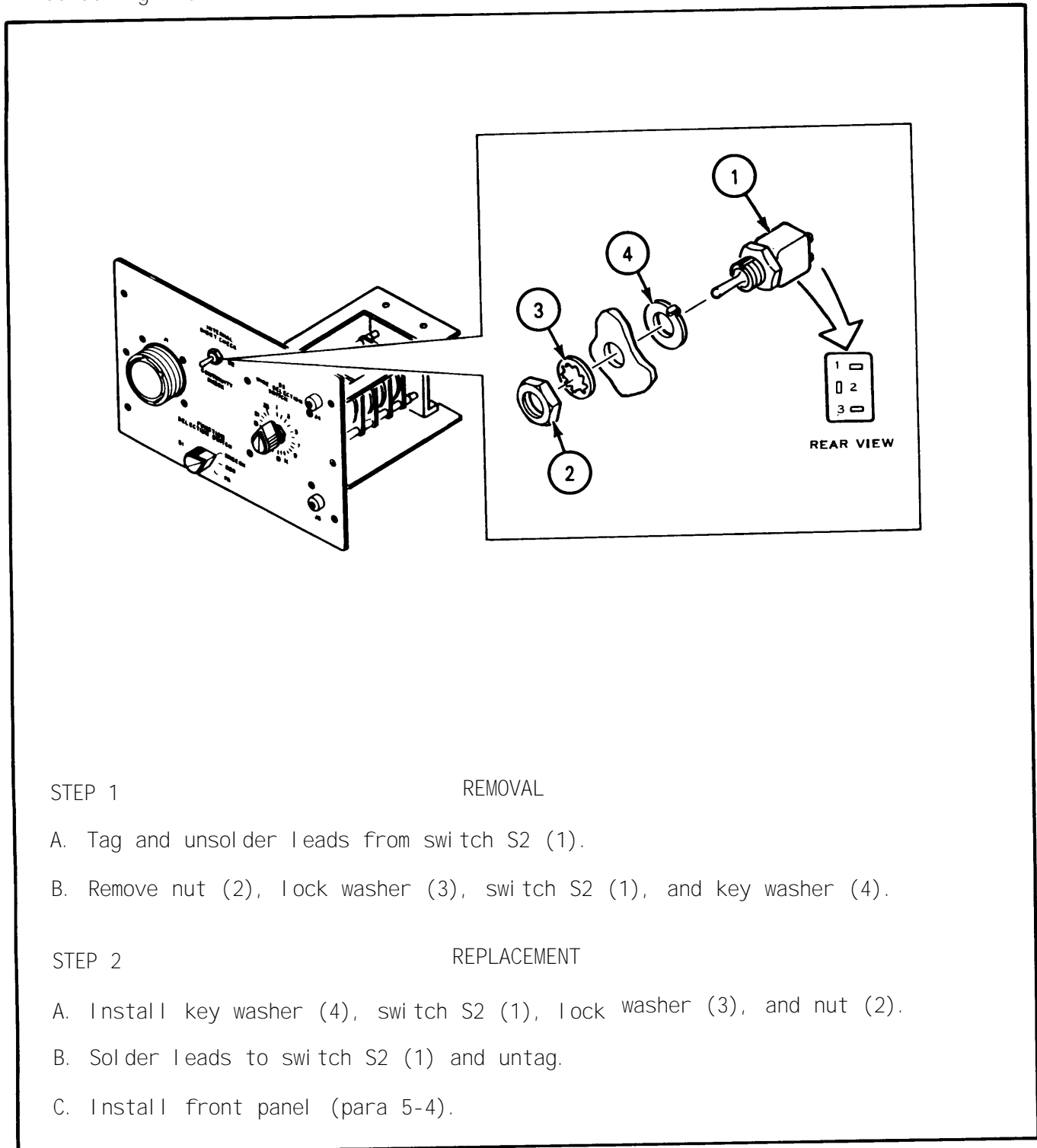
5-6. REMOVAL AND REPLACEMENT OF SWITCH S2

TOOLS:

9/16-inch open-end wrench
Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 5-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from switch S2 (1).
- B. Remove nut (2), lock washer (3), switch S2 (1), and key washer (4).

STEP 2

REPLACEMENT

- A. Install key washer (4), switch S2 (1), lock washer (3), and nut (2).
- B. Solder leads to switch S2 (1) and untag.
- C. Install front panel (para 5-4).

END OF TASK

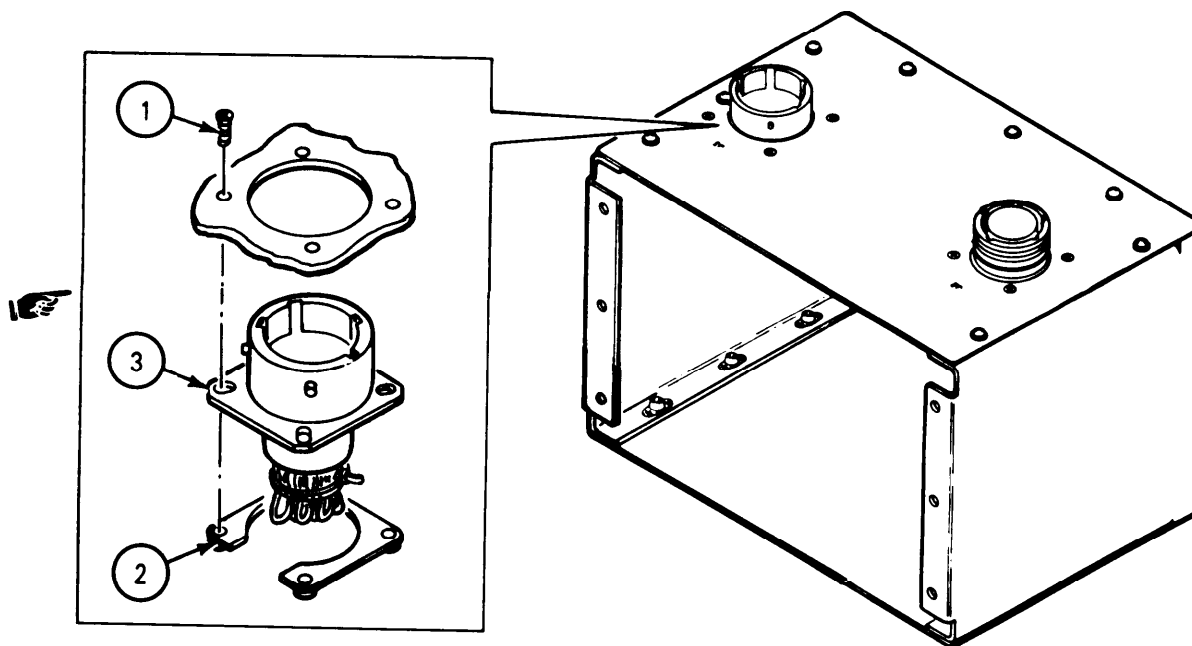
5-7. REMOVAL AND REPLACEMENT OF CONNECTOR J3

TOOLS:

No. 1 cross-tip screwdriver

EQUIPMENT CONDITION:

Front panel removed (para 5-4).



STEP 1

REMOVAL

Remove four screws (1), nut plate (2), and connector J3 (3).

STEP 2

REPLACEMENT

A. Install connector J3 (3) with master keyway aligned with yellow mark on panel, nut plate (2), and four screws (1).

B. Install front panel (para 5-4).

END OF TASK

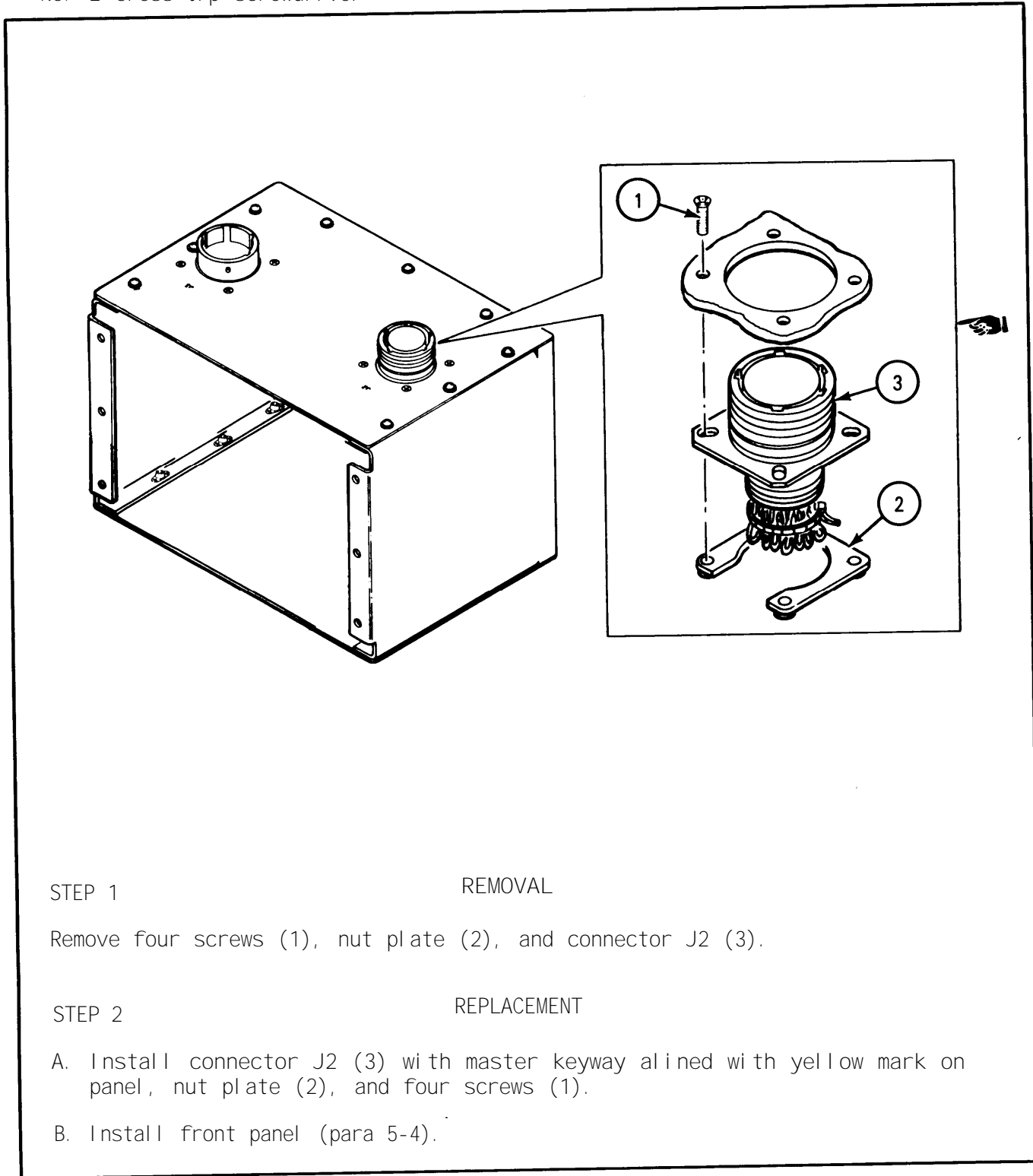
5-8. REMOVAL AND REPLACEMENT OF CONNECTOR J2

TOOLS:

No. 2 cross-tip screwdriver

EQUIPMENT CONDITION:

Front panel removed (para 5-4)



STEP 1 REMOVAL

Remove four screws (1), nut plate (2), and connector J2 (3).

STEP 2 REPLACEMENT

- A. Install connector J2 (3) with master keyway aligned with yellow mark on panel, nut plate (2), and four screws (1).
- B. Install front panel (para 5-4).

END OF TASK

5-9. REMOVAL AND REPLACEMENT OF JACKS J4 AND J5

TOOLS:

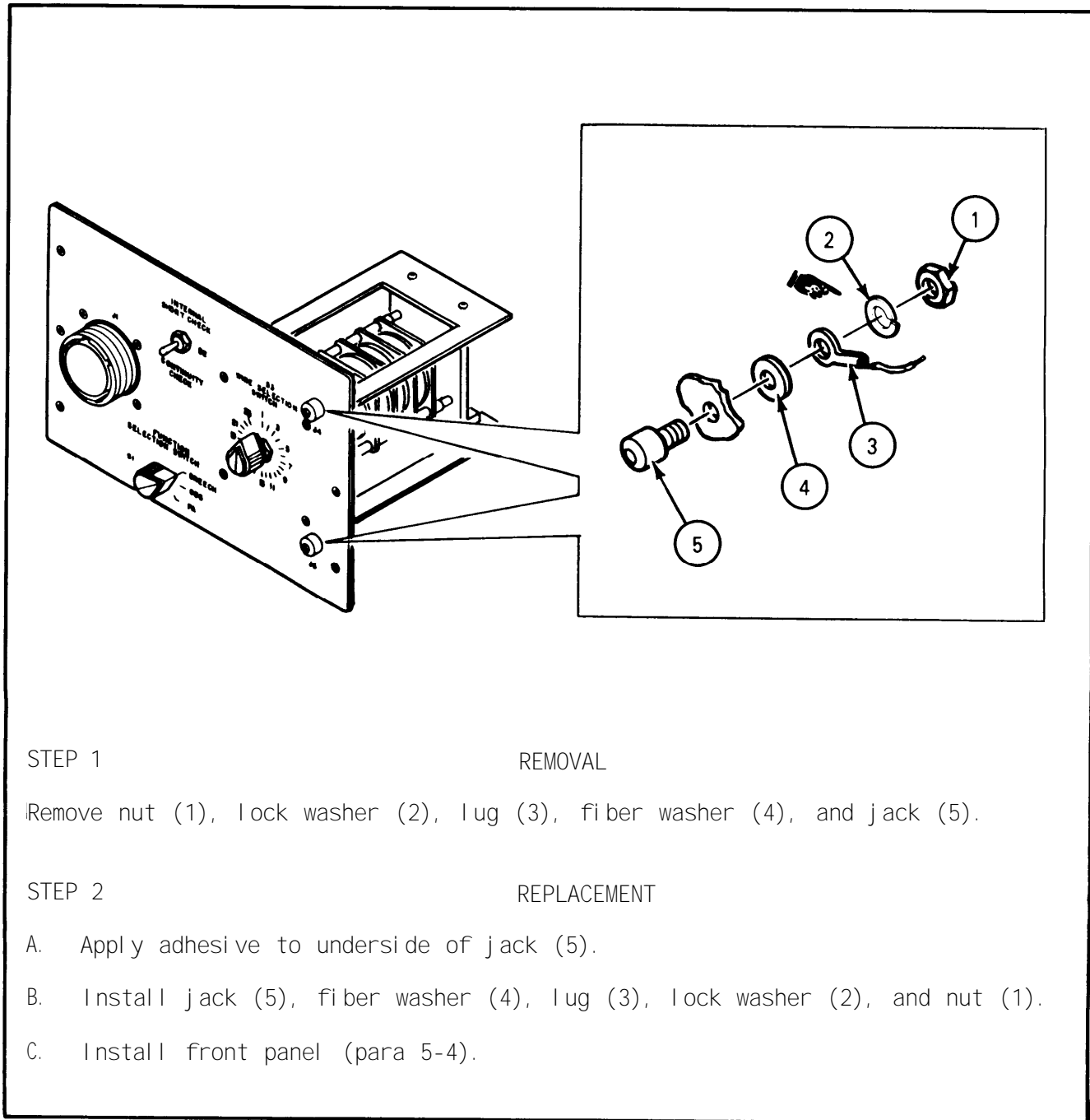
3/8-inch open-end wrench

EQUIPMENT CONDITION:

Front panel removed (para 5-4).

MATERIALS:

Adhesive (Item 13, Appendix E)

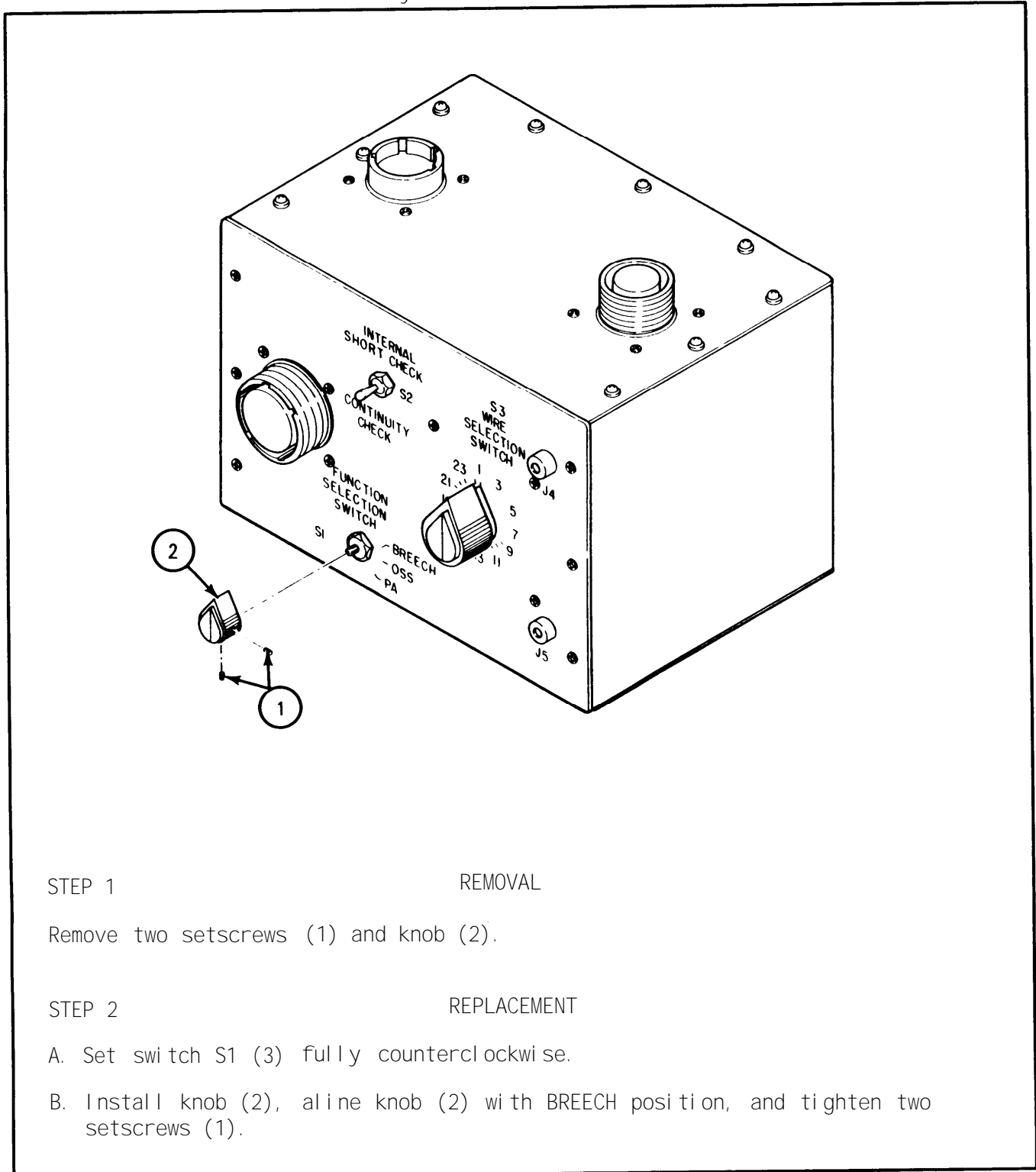


END OF TASK

5-10. REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S1

TOOLS:

0.05-inch socket-head screw key



STEP 1 REMOVAL

Remove two setscrews (1) and knob (2).

STEP 2 REPLACEMENT

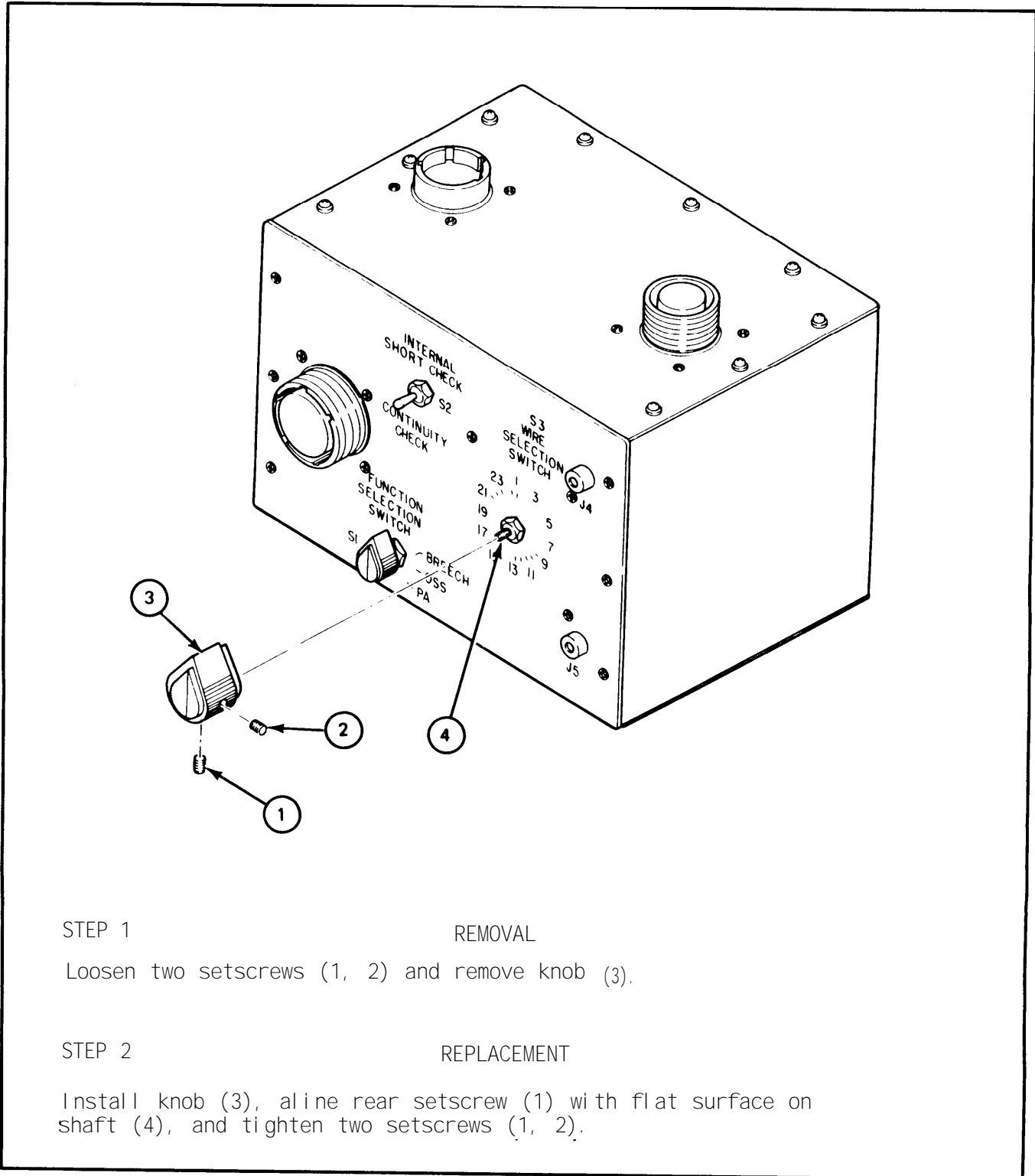
- A. Set switch S1 (3) fully counterclockwise.
- B. Install knob (2), align knob (2) with BREECH position, and tighten two setscrews (1).

END OF TASK

5-11. REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S3

TOOLS:

0.05-inch socket-head screw key



STEP 1 REMOVAL
Loosen two setscrews (1, 2) and remove knob (3).

STEP 2 REPLACEMENT
Install knob (3), align rear setscrew (1) with flat surface on shaft (4), and tighten two setscrews (1, 2).

END OF TASK

CHAPTER 6

MISSILE GUIDANCE SET TEST SET MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter contains the maintenance procedures to remove and replace parts of the Missile Guidance Set Test Set. The contents of this chapter are contained in two sections. Troubleshooting procedures are provided in Section I. Section II provides removal and replacement procedures.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES	6-1
Section II. MISSILE GUIDANCE SET TEST SET MAINTENANCE PROCEDURES	6-69

Section I. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	6-1	6-1
MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES	6-2	6-2

6-1. SCOPE

This section contains troubleshooting procedures for the Missile Guidance Set Test Set.

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURE (Sheet 1 of 67)

This paragraph provides troubleshooting procedures for the Missile Guidance Set Test Set.

TEST EQUIPMENT: Multimeter

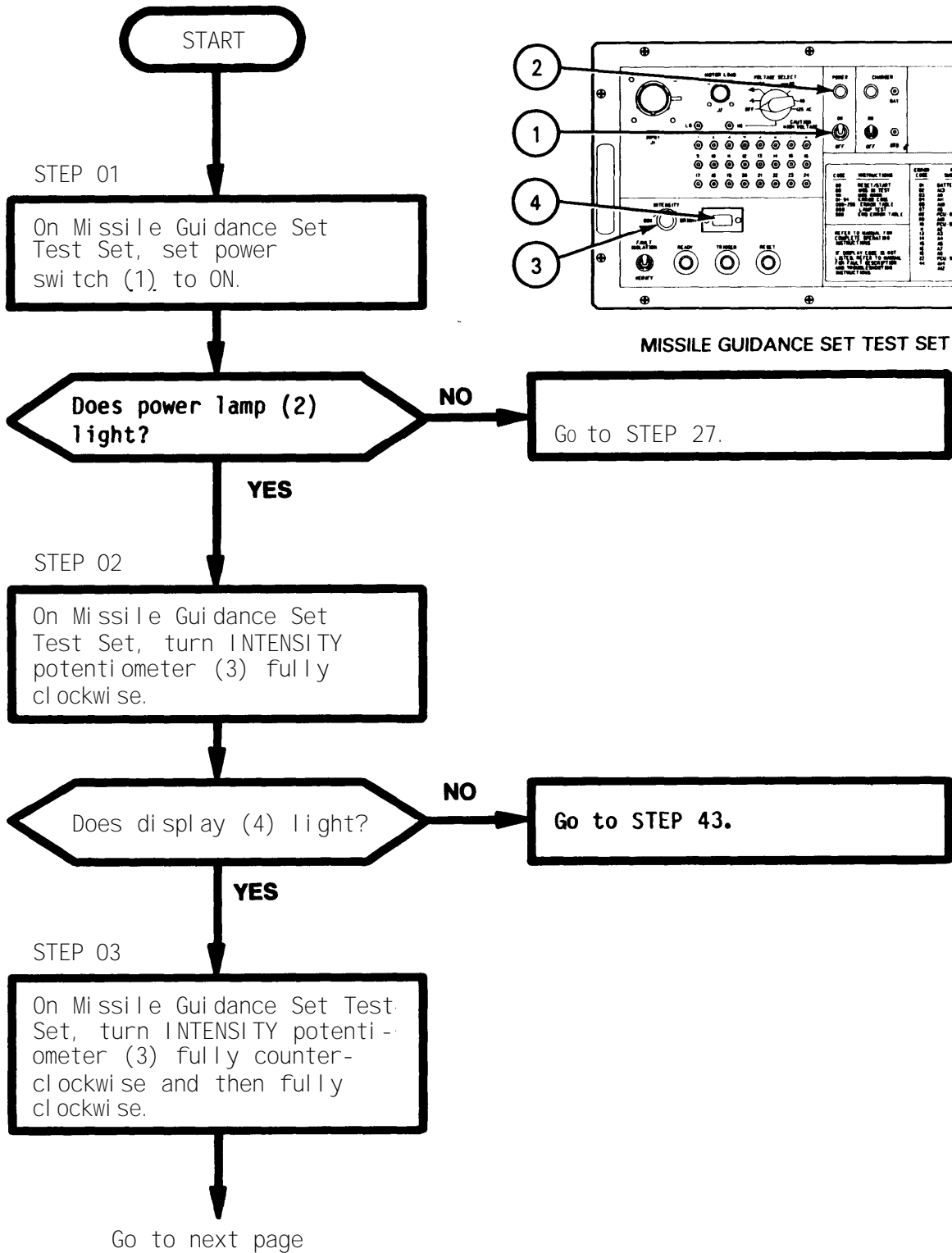


Remove power before removing and replacing any assembly, subassembly, or component. HIGH VOLTAGE is used in this system. Death or injury can result if you do not observe safety precautions.

NOTE

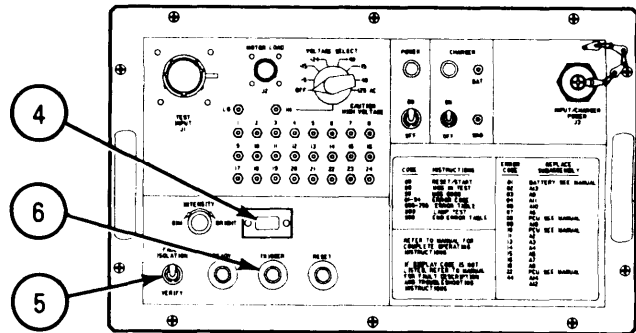
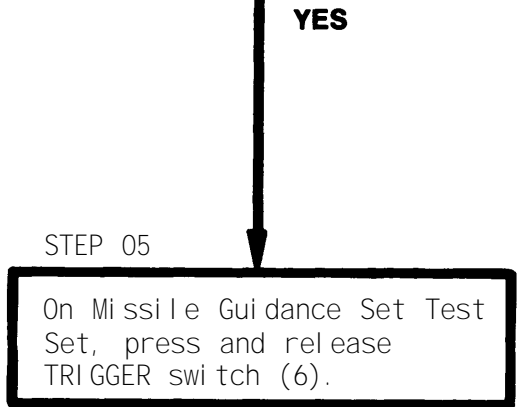
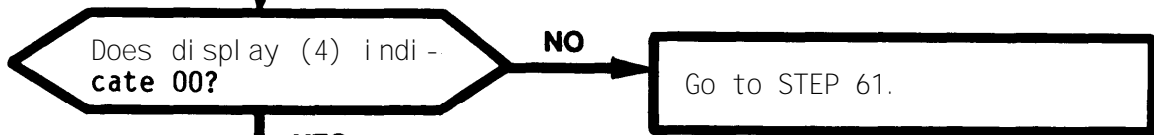
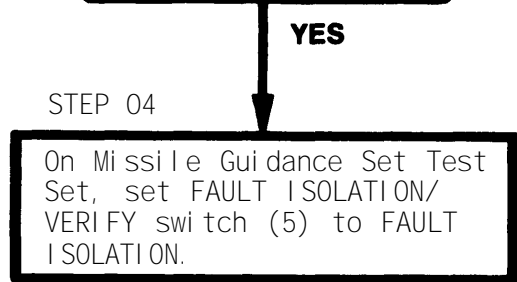
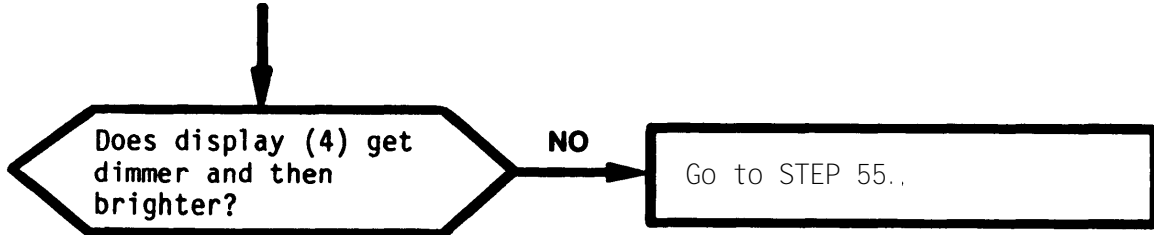
- Follow steps in order given in the procedures. Do not skip any steps.
- When you enter the NO chain, do the procedure and/or repairs as instructed in the corrective action block.
- Unless otherwise specified, after performing the corrective action of the NO chain always return to the START of the procedure you were checking. When more than one corrective action may be required, do the first corrective action, return to START, and repeat the procedure. If the problem still exists, do the next corrective action and repeat.
- The wafers on wafer switches are listed alphabetically from front to rear.

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 2 of 67)

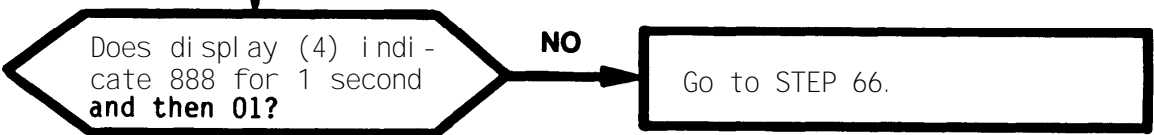


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 3 of 67)

Continued from previous page



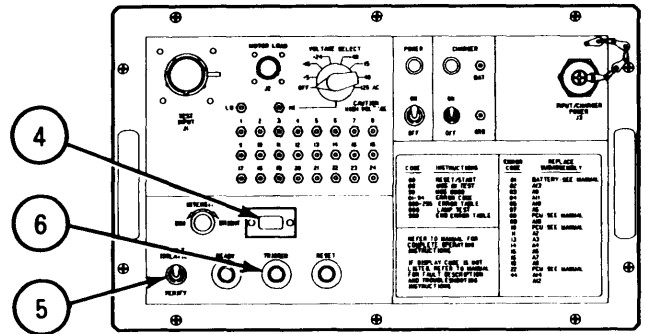
MISSILE GUIDANCE SET TEST SET



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 4 of 67)

Continued from previous page

STEP 06
On Missile Guidance Set Test Set, set FAULT ISOLATION/VERIFY switch (5) to VERIFY.



MISSILE GUIDANCE SET TEST SET

Does display (4) continue to indicate 01? **NO** → Go to STEP 73.

STEP 07
On Missile Guidance Set Test Set, press and hold TRIGGER switch (6).

Does display (4) indicate 00? **NO** → Remove and replace missile guidance test circuit card A1 (see para 6-5).

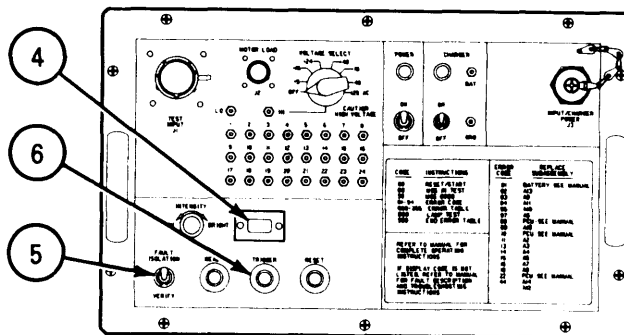
Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 5 of 67)

Continued from previous page

STEP 08

On Missile Guidance Set Test Set, release TRIGGER switch (6).



MISSILE GUIDANCE SET TEST SET

Does display (4) continue to indicate 00?

NO

Remove and replace missile guidance test circuit card A1 (see para 6-5).

YES

STEP 09

On Missile Guidance Set Test Set, set FAULT ISOLATION/VERIFY switch (5) to FAULT ISOLATION.

Does DISPLAY (4) indicate 01?

NO

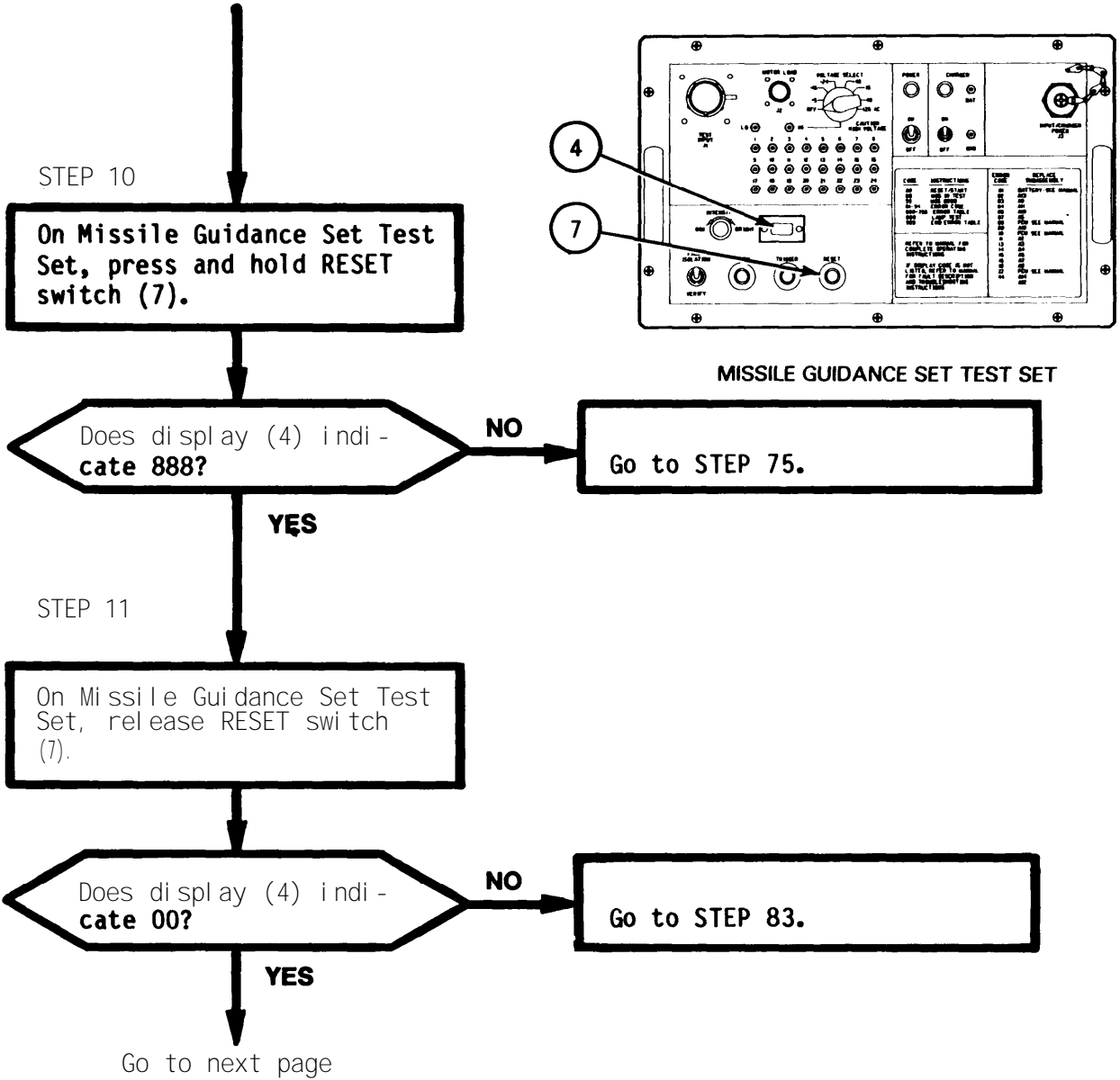
Remove and replace missile guidance test circuit card A1 (see para 6-5).

YES

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 6 of 67)

Continued from previous page



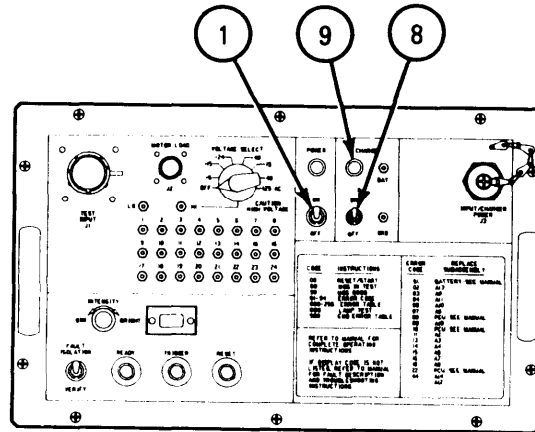
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 7 of 67)

Continued from previous page.

STEP 12

On Missile Guidance Set Test Set:

- Set power switch (1) to OFF.
- Connect to 115 V ac power source.
- Set CHARGER circuit breaker (8) to ON.



MISSILE GUIDANCE SET TEST SET

Does CHARGER lamp (9) light?

NO

- Replace lamp DS1 (see para 6-9) and repeat STEP 12.
- Go to STEP 88.

YES

STEP 13

On Missile Guidance Set Test Set:

- Set CHARGER circuit breaker (8) to OFF.
- Disconnect from 115 V ac power source.
- Remove front panel assembly (see para 6-4).
- Connect Missile Guidance Set Test Set to 115 V ac power source.
- Set CHARGER circuit breaker (8) to ON.

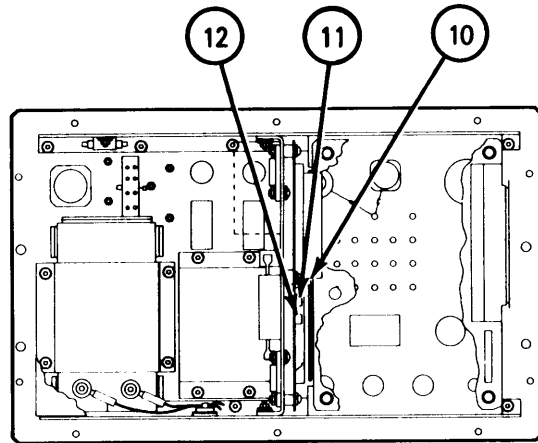
Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 8 of 67)

Continued from previous page

STEP 14

a. Set multimeter to indicate dc volts.
b. Connect multimeter to power supply circuit card A2 (10) test points J2 (12) and J3 (11).



MISSILE GUIDANCE SET TEST SET

Does multimeter indicate between 1.13 and 1.27 V dc?

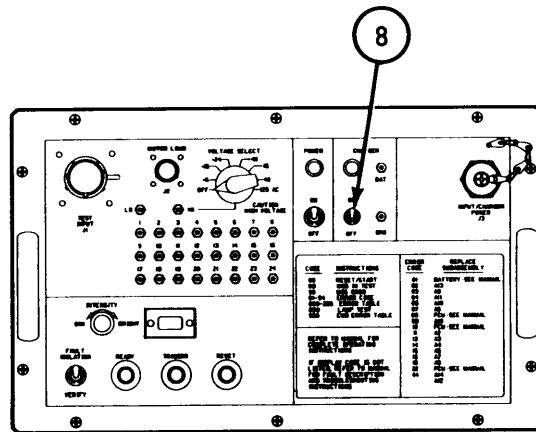
NO

Go to STEP 95.

YES

STEP 15

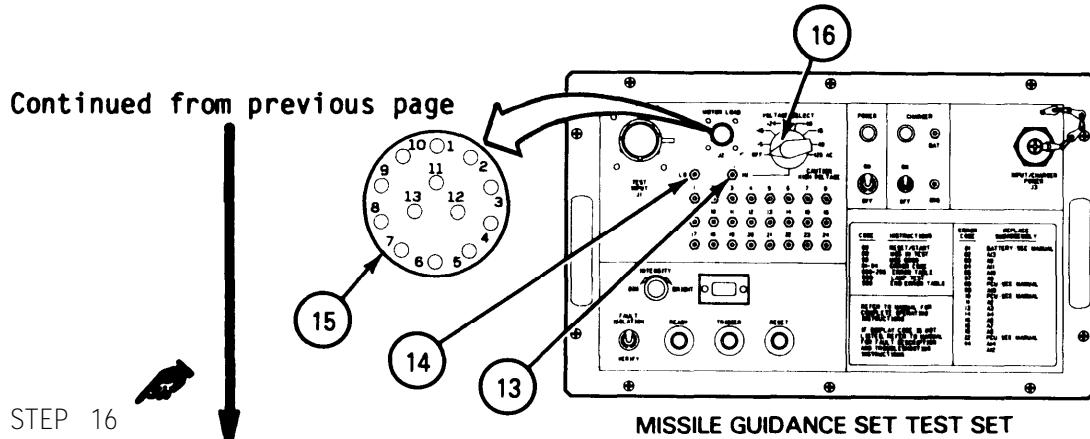
On Missile Guidance Set Test Set:
a. Set CHARGER circuit breaker (8) to OFF.
b. Disconnect from 115 V ac power source.



MISSILE GUIDANCE SET TEST SET

Go to next page

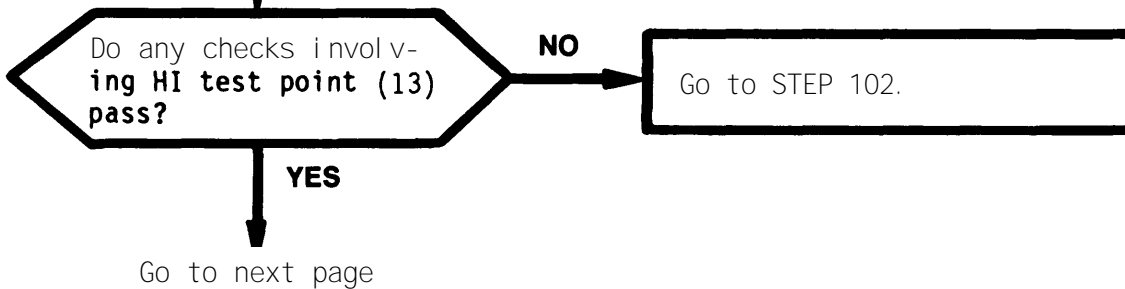
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 9 of 67)



STEP 16

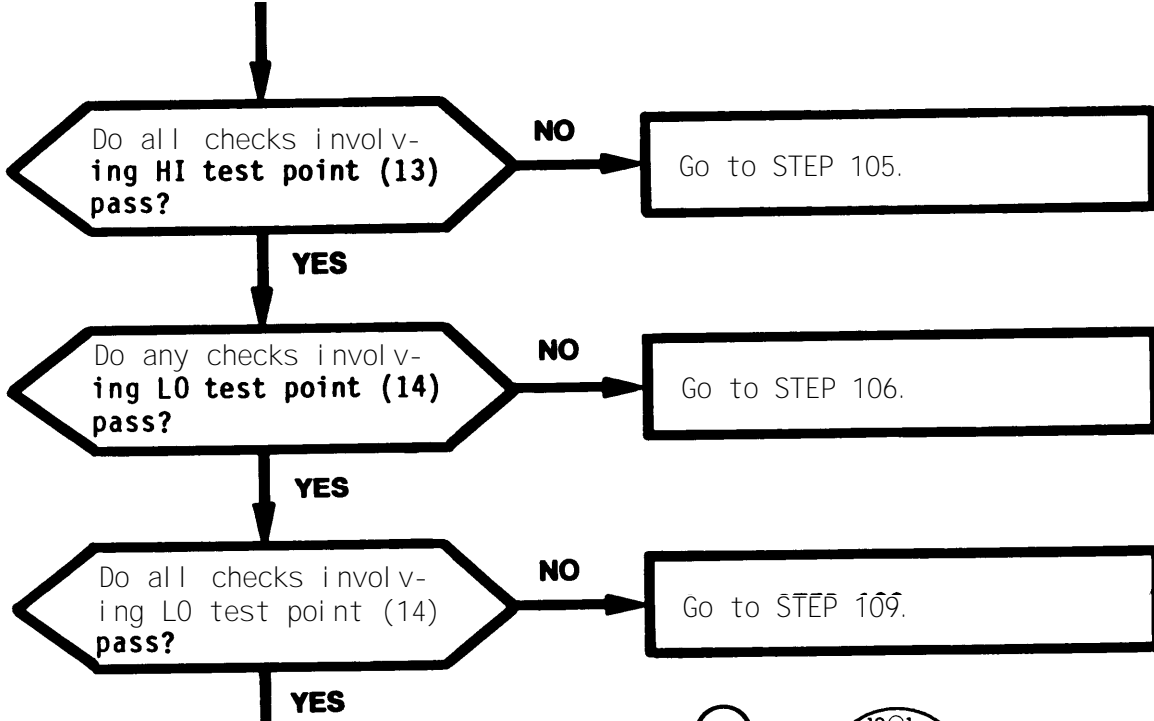
- a. Set multi meter to indicate ohms.
- b. Connect multi meter to test points as indicated below.

VOLTAGE SELECT Switch (16) Position	Test Points	Normal Indication
+5	HI test point (13) J2 (15)-4	9K to 11K ohms
+15	HI test point (13) J2 (15)-9	9K to 11K ohms
+24	HI test point (13) J2 (15)-11	9K to 11K ohms
+40	HI test point (13) J2 (15)-7	9K to 11K ohms
-15	HI test point (13) J2 (15)-13	9K to 11K ohms
-40	HI test point (13) J2 (15)-8	9K to 11K ohms
-40	LO test point (14) J2 (15)-12	Continuity
-15	LO test point (14) J2 (15)-12	Continuity
+40	LO test point (14) J2 (15)-12	Continuity
+24	LO test point (14) J2 (15)-5	Continuity
+15	LO test point (14) J2 (15)-12	Continuity
+5	LO test point (14) J2 (15)-5	Continuity
OFF	LO test point (14) J2 (15)-5	Continuity



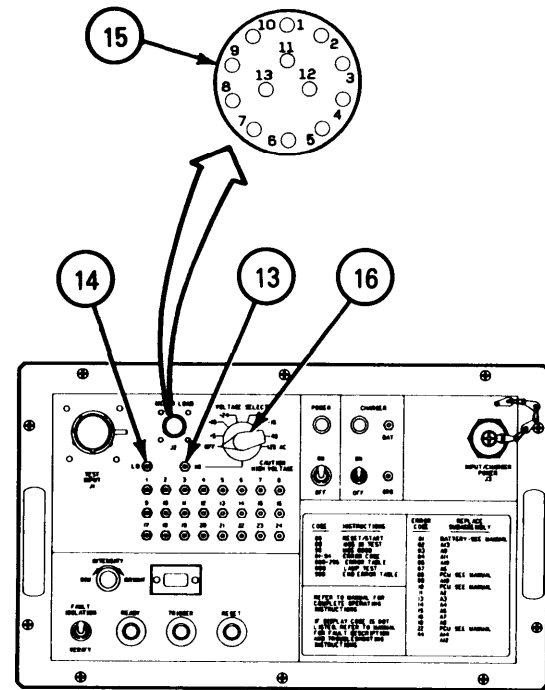
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 10 of 67)

Continued from previous page



STEP 17
On Missile Guidance Set Test Set, set VOLTAGE SELECT switch (16) to 125 AC.

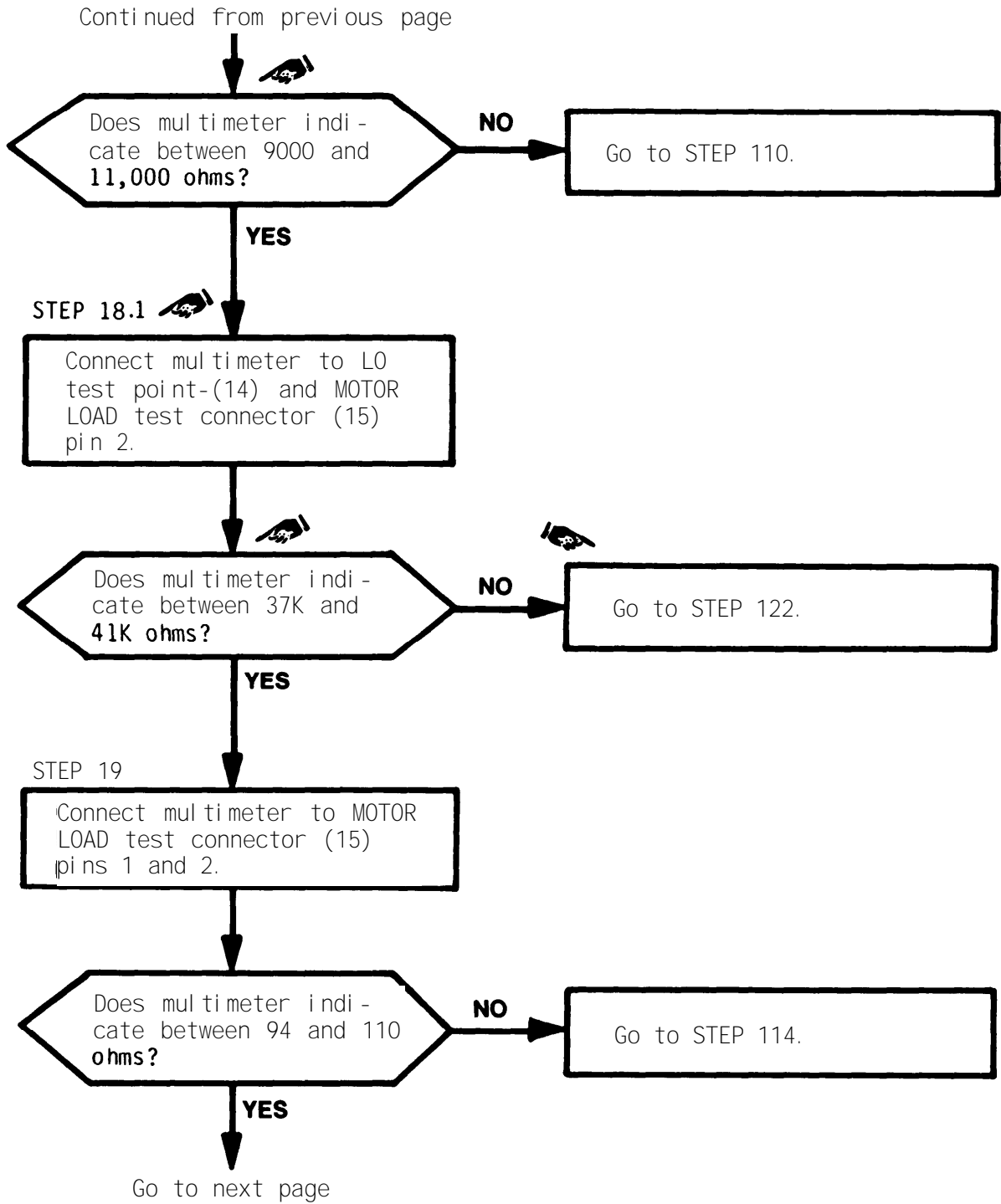
STEP 18
Connect multimeter to HI test point (13) and MOTOR LOAD test connector (15) pin 1.



MISSILE GUIDANCE SET TEST SET

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 11 of 67)



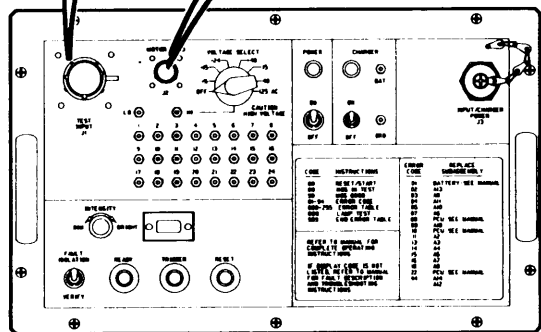
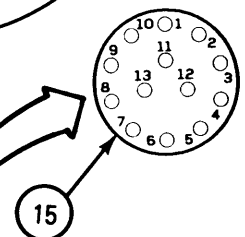
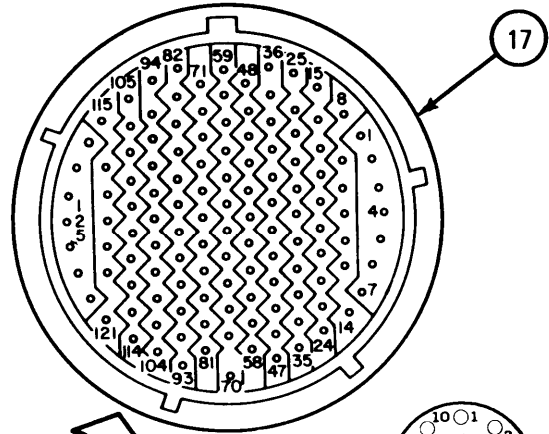
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 12 of 67)

Continued from previous page

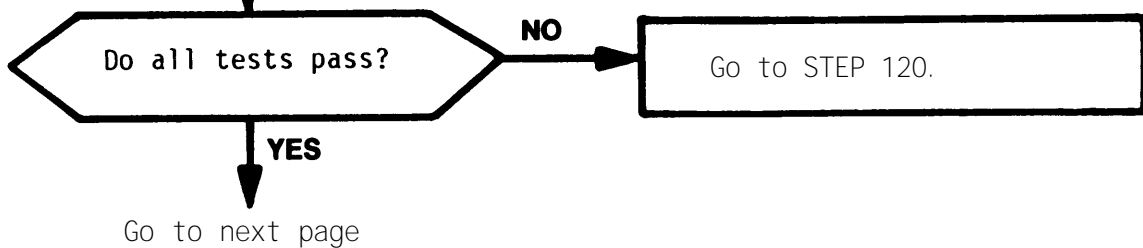
STEP 20

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J1 (17)-5 TP-1	Continuity
J1 (17)-3 TP-2	Continuity
J1 (17)-1 TP-3	Continuity
J1 (17)-8 TP-4	Continuity
J1 (17)-25 TP-5	Continuity
J1 (17)-27 TP-6	Continuity
J1 (17)-19 TP-7	Continuity
J1 (17)-53 TP-8	Continuity
J1 (17)-11 TP-9	Continuity
J1 (17)-10 TP-10	Continuity
J1 (17)-7 TP-11	Continuity
J1 (17)-12 TP-12	Continuity
J1 (17)-26 TP-13	Continuity
J1 (17)-28 TP-14	Continuity
J1 (17)-15 TP-15	Continuity
J1 (17)-54 TP-16	Continuity
J1 (17)-2 TP-17	Continuity
J1 (17)-4 TP-18	Continuity
J1 (17)-22 TP-19	Continuity
J1 (17)-24 TP-20	Continuity
J1 (17)-14 TP-21	Continuity
J1 (17)-6 TP-22	Continuity
J1 (17)-90 TP-23	Continuity
J1 (17)-65 TP-24	Continuity



MISSILE GUIDANCE SET TEST SET



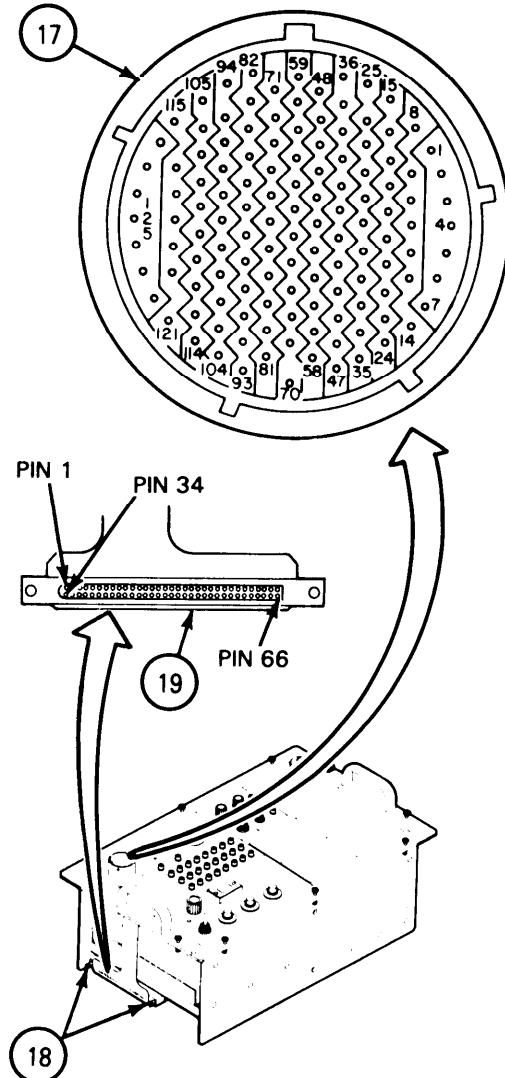
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 13 of 67)

Continued from previous page

STEP 21

- a. Loosen two screws (18) and disconnect connector W1P1 (19).
- b. Connect multimeter to test points as indicated below.

Test Points		Normal Indication
J1 (17)-88	W1P1 (19)-1	Continuity
J1 (17)-86	W1P1 (19)-2	Continuity
J1 (17)-29	W1P1 (19)-3	Continuity
J1 (17)-80	W1P1 (19)-4	Continuity
J1 (17)-61	W1P1 (19)-5	Continuity
J1 (17)-30	W1P1 (19)-6	Continuity
J1 (17)-49	W1P1 (19)-7	Continuity
J1 (17)-75	W1P1 (19)-8	Continuity
J1 (17)-31	W1P1 (19)-9	Continuity
J1 (17)-73	W1P1 (19)-10	Continuity
J1 (17)-84	W1P1 (19)-11	Continuity
J1 (17)-32	W1P1 (19)-12	Continuity
J1 (17)-85	W1P1 (19)-13	Continuity
J1 (17)-48	W1P1 (19)-14	Continuity
J1 (17)-33	W1P1 (19)-15	Continuity
J1 (17)-59	W1P1 (19)-16	Continuity
J1 (17)-82	W1P1 (19)-17	Continuity
J1 (17)-34	W1P1 (19)-18	Continuity
J1 (17)-21	W1P1 (19)-19	Continuity
J1 (17)-77	W1P1 (19)-20	Continuity
J1 (17)-78	W1P1 (19)-21	Continuity
J1 (17)-35	W1P1 (19)-22	Continuity
J1 (17)-83	W1P1 (19)-23	Continuity
J1 (17)-79	W1P1 (19)-24	Continuity
J1 (17)-36	W1P1 (19)-25	Continuity



MISSILE GUIDANCE SET TEST SET

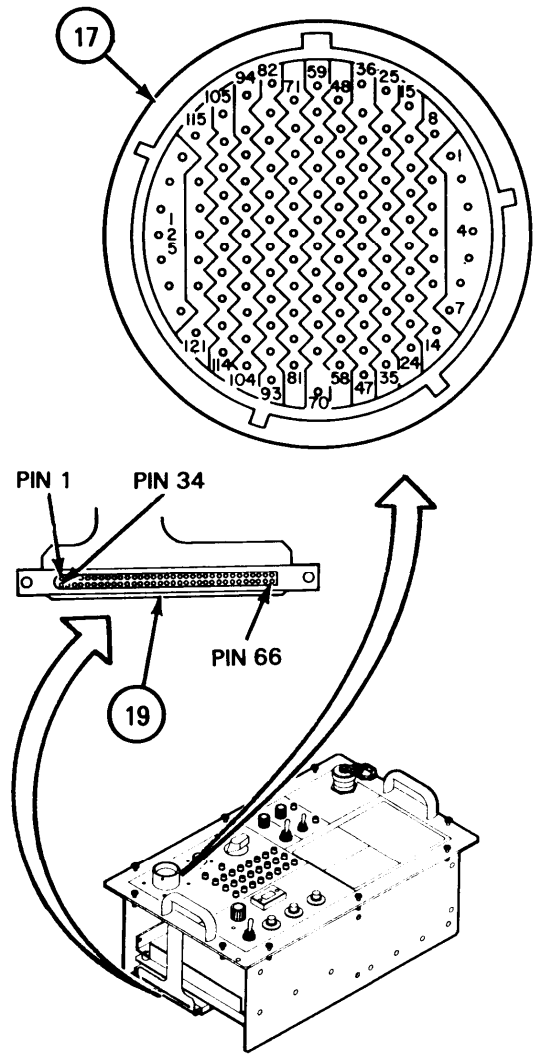
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6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 14 of 67)

Continued from previous page

STEP 21
(CONT)

Test Points		Normal Indication
J1 (17)-74	W1P1 (19)-26	Continuity
J1 (17)-81	W1P1 (19)-27	Continuity
J1 (17)-37	W1P1 (19)-28	Continuity
J1 (17)-71	W1P1 (19)-29	Continuity
J1 (17)-63	W1P1 (19)-30	Continuity
J1 (17)-50	W1P1 (19)-31	Continuity
J1 (17)-18	W1P1 (19)-32	Continuity
J1 (17)-17	W1P1 (19)-33	Continuity
J1 (17)-128	W1P1 (19)-34	Continuity
J1 (17)-127	W1P1 (19)-35	Continuity
J1 (17)-38	W1P1 (19)-36	Continuity
J1 (17)-111	W1P1 (19)-37	Continuity
J1 (17)-123	W1P1 (19)-38	Continuity
J1 (17)-39	W1P1 (19)-39	Continuity
J1 (17)-116	W1P1 (19)-40	Continuity
J1 (17)-117	W1P1 (19)-41	Continuity
J1 (17)-40	W1P1 (19)-42	Continuity
J1 (17)-98	W1P1 (19)-43	Continuity
J1 (17)-107	W1P1 (19)-44	Continuity
J1 (17)-41	W1P1 (19)-45	Continuity
J1 (17)-106	W1P1 (19)-46	Continuity
J1 (17)-95	W1P1 (19)-47	Continuity
J1 (17)-42	W1P1 (19)-48	Continuity
J1 (17)-105	W1P1 (19)-49	Continuity
J1 (17)-96	W1P1 (19)-50	Continuity
J1 (17)-43	W1P1 (19)-51	Continuity
J1 (17)-52	W1P1 (19)-52	Continuity
J1 (17)-110	W1P1 (19)-53	Continuity
J1 (17)-99	W1P1 (19)-54	Continuity
J1 (17)-44	W1P1 (19)-55	Continuity
J1 (17)-115	W1P1 (19)-56	Continuity
J1 (17)-100	W1P1 (19)-57	Continuity

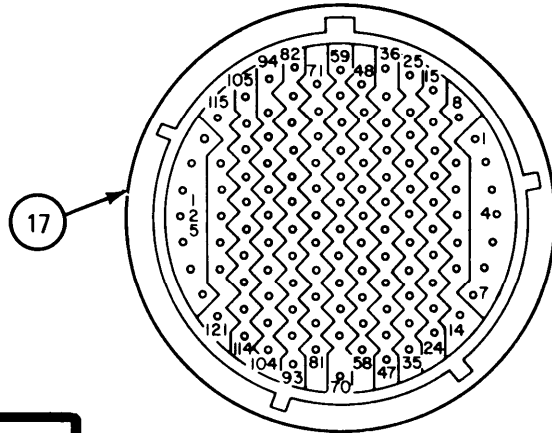


MISSILE GUIDANCE SET TEST SET

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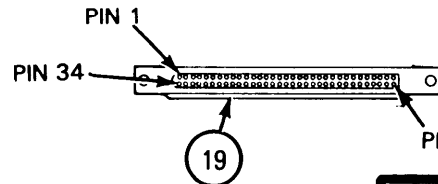
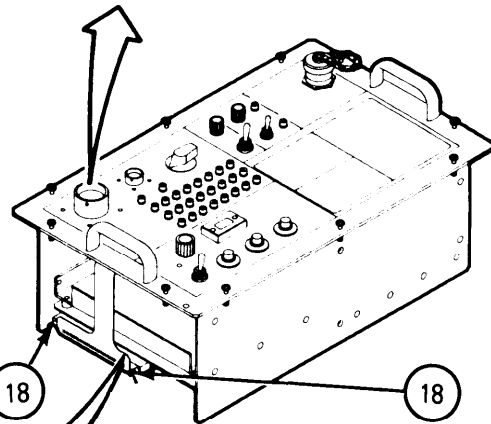
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 15 of 67)

Continued from previous page

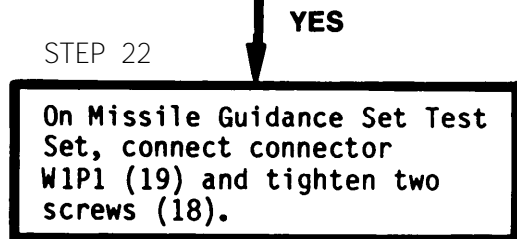
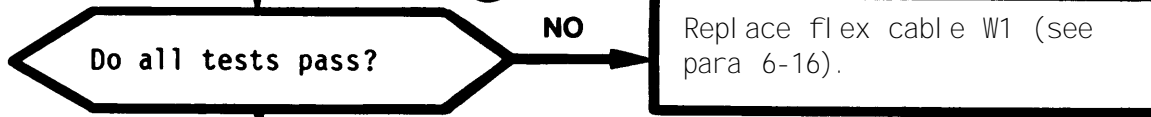


STEP 21
(CONT)

Test Points		Normal Indication
J1 (17)-45	W1P1 (19)-58	Continuity
J1 (17)-122	W1P1 (19)-59	Continuity
J1 (17)-120	W1P1 (19)-60	Continuity
J1 (17)-46	W1P1 (19)-61	Continuity
J1 (17)-62	W1P1 (19)-62	Continuity
J1 (17)-94	W1P1 (19)-63	Continuity
J1 (17)-64	W1P1 (19)-64	Continuity
J1 (17)-20	W1P1 (19)-65	Continuity
J1 (17)-16	W1P1 (19)-66	Continuity



MISSILE GUIDANCE SET TEST SET



Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 16 of 67)

Continued from previous page

STEP 23

Connect multimeter to switch S4 (20) pins 1 and 2.

Does multimeter indicate continuity?

NO

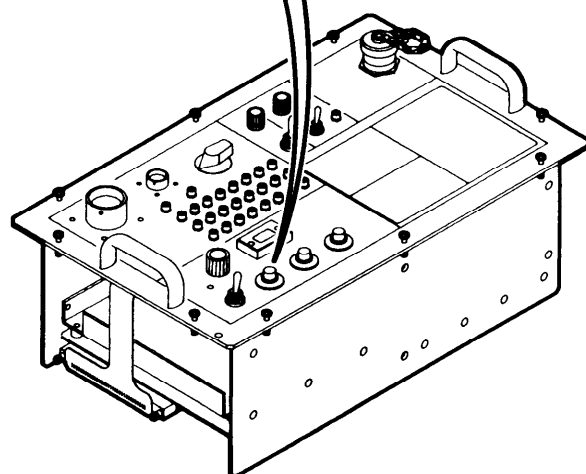
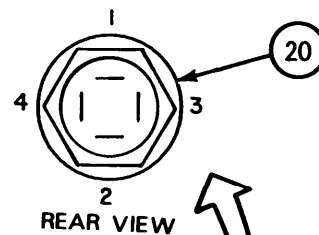
Remove and replace switch S4 (see para 6-6).

YES

STEP 24

Connect multimeter to switch S4 (20) pins 3 and 4.

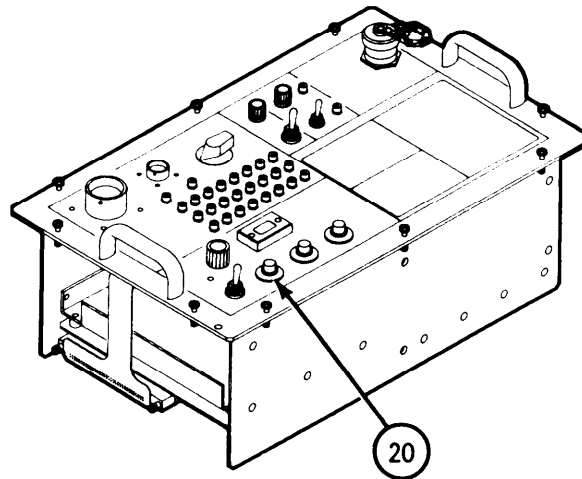
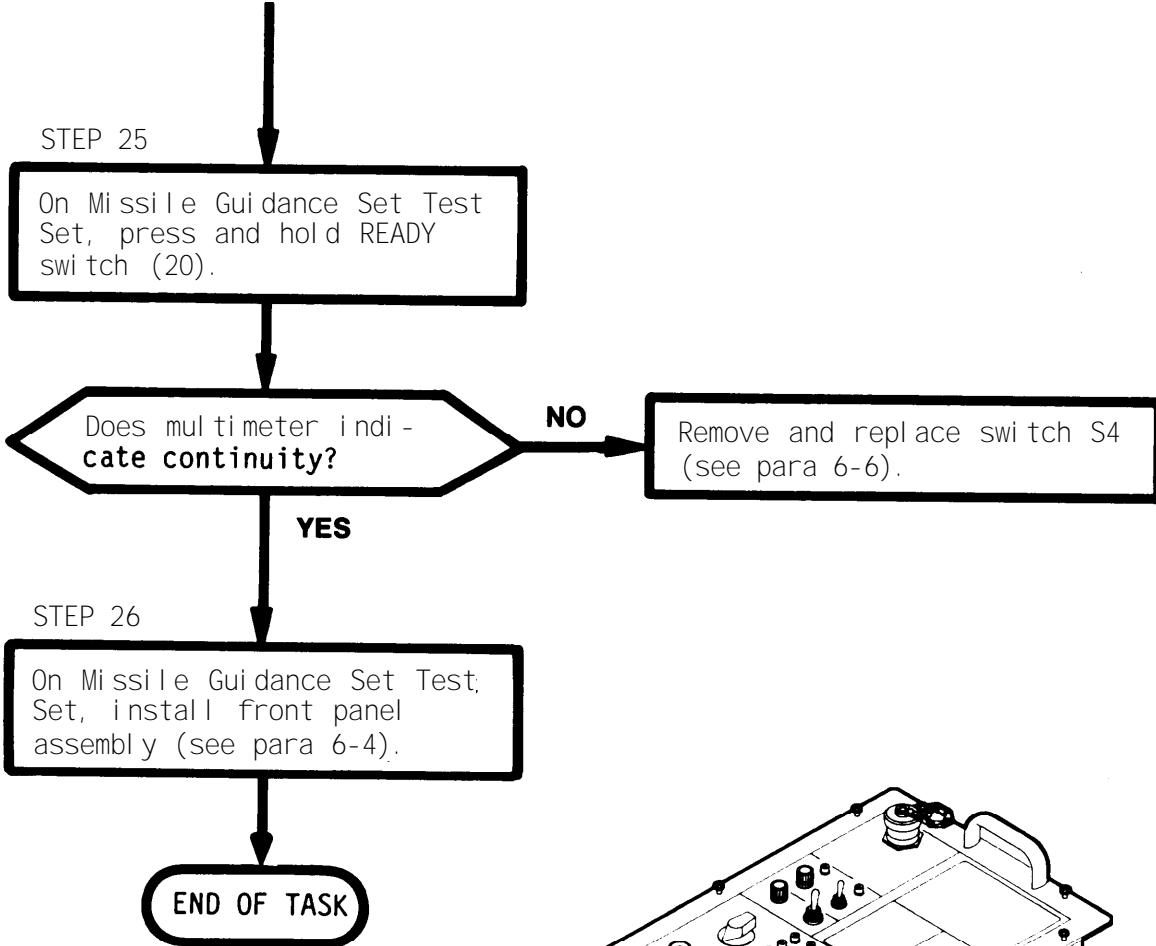
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MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 17 of 67)

Continued from previous page



MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 18 of 67)

Continued from STEP 01

STEP 27

- a. Set multi meter to indicate dc volts.
- b. Connect multimeter to BAT (21) and GRD (22) test points.

Does multimeter indicate between 9.2 and 11.2 V dc?

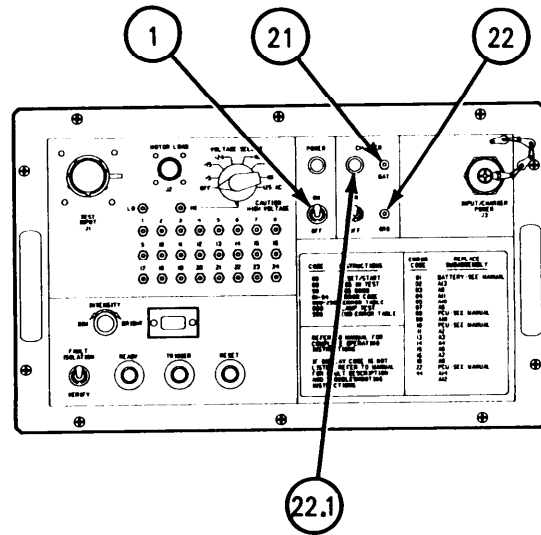
- a. Charge battery (see para 6-30), making sure that CHARGER indicator (22.1) lights.
- b. Replace CHARGER indicator lamp DS1 (see para 6-9).
- c. Replace fuse F1 (see para 6-29.1).
- d. Go to STEP 37

STEP 28

- On Missile Guidance Set Test Set:
- a. Set POWER switch (1) to OFF.
 - b. Remove indicator lamp DS2 (see para 6-9).

STEP 29

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to base of lamp.

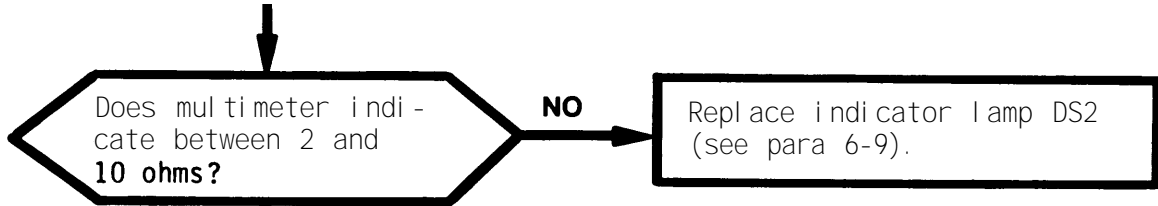


MISSILE GUIDANCE SET TEST SET

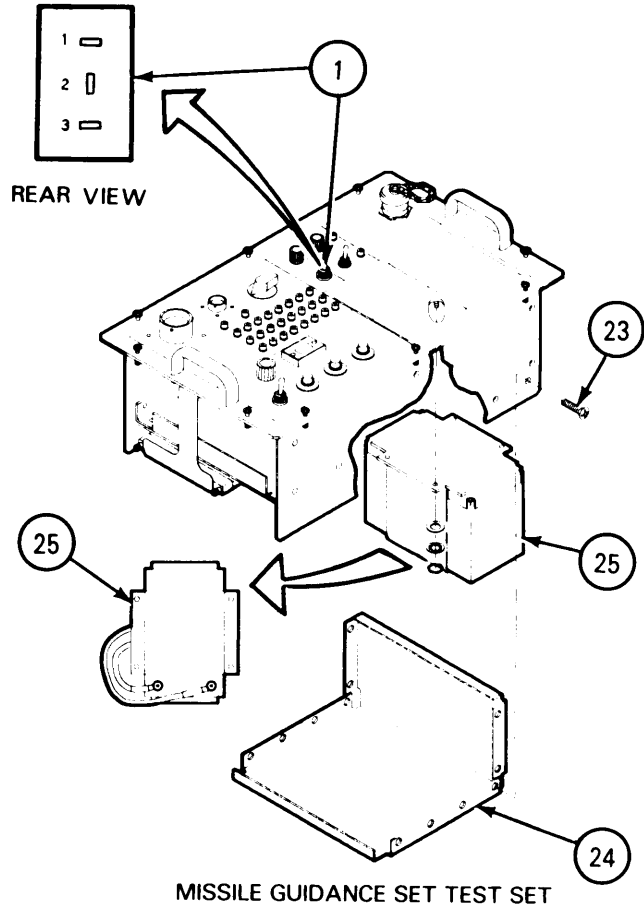
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6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 19 of 67)

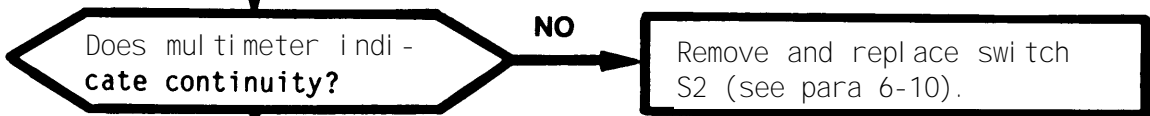
Continued from previous page



STEP 30
On Missile Guidance Set Test Set:
a. Re-install indicator lamp DS2 (see para 6-9).
b. Remove front panel assembly (see para 6-4).
c. Remove 12 screws (23) and high voltage cover (24).
d. Disconnect positive lead from battery BT1 (25).
e. Set power switch (1) to ON.



STEP 31
Connect multimeter to switch S2 (1) pins 1 and 2.



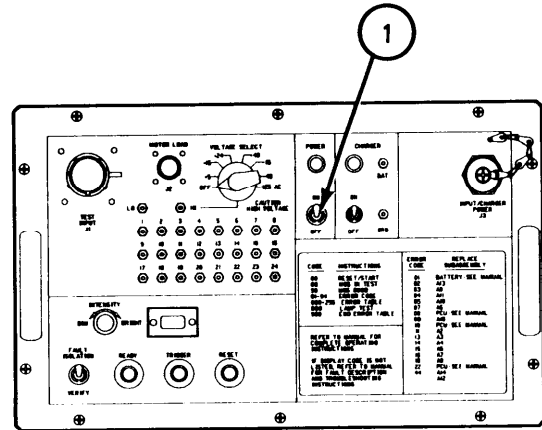
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 20 of 67)

Continued from previous page

STEP 32

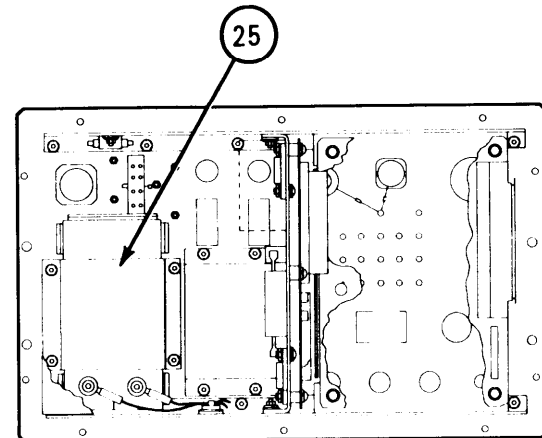
On Missile Guidance Set Test Set:

- a. Set power switch (1) to OFF.
- b. Connect positive lead to battery BT1 (25).
- c. Set power switch (1) to ON.

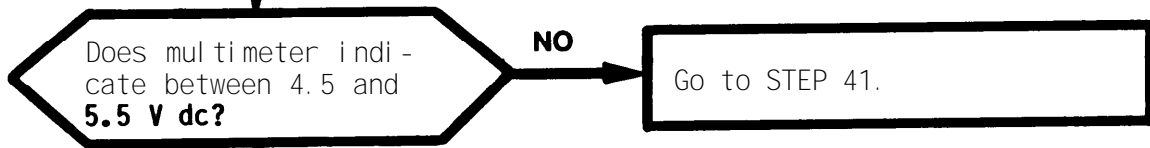


STEP 33

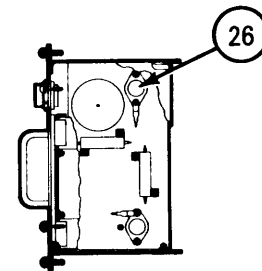
- a. Set multimeter to indicate dc volts.
- b. Connect multimeter to voltage regulator U1 (26) case and chassis ground.



MISSILE GUIDANCE SET TEST SET



YES
Go to next page



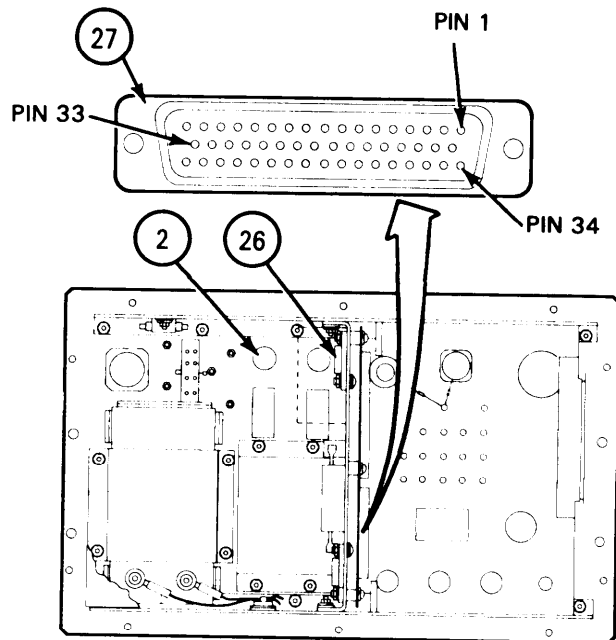
MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 21 of 67)

Continued from previous page

STEP 34

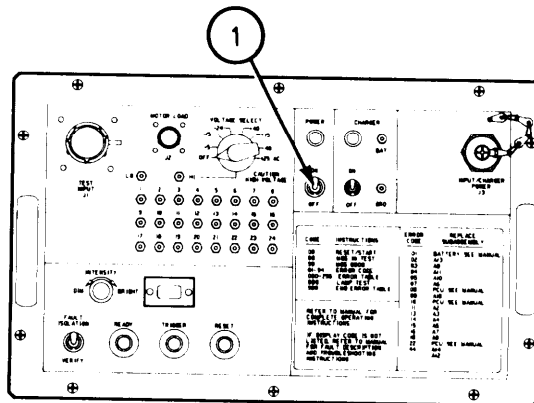
On Missile Guidance Set Test Set:
 a. Set power switch (1) to OFF.
 b. Remove power supply circuit card A2 (see para 6-7).



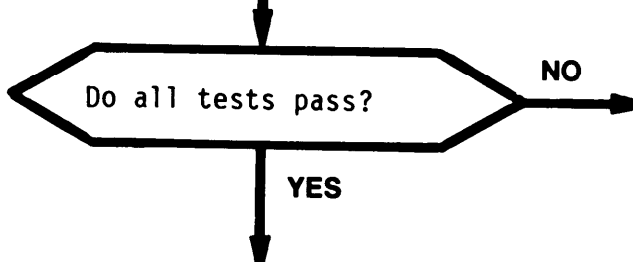
STEP 35

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
J32 (27)-5	DS2 (2)-1	Continuity
J32 (27)-6	DS2 (2)-2	Continuity
J32 (27)-7	U1 (26)-3	Continuity



MISSILE GUIDANCE SET TEST SET

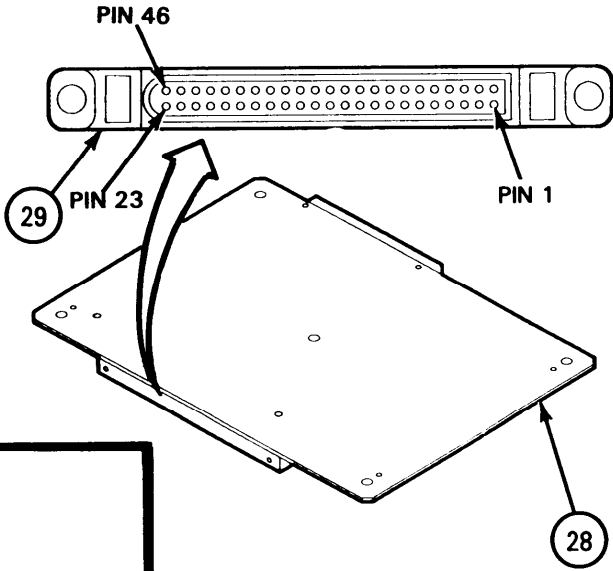


a. Repair wire between test points for which resistance is incorrect.
 b. Replace Missile Guidance Set Test Set.

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 22 of 67)

Continued from previous page

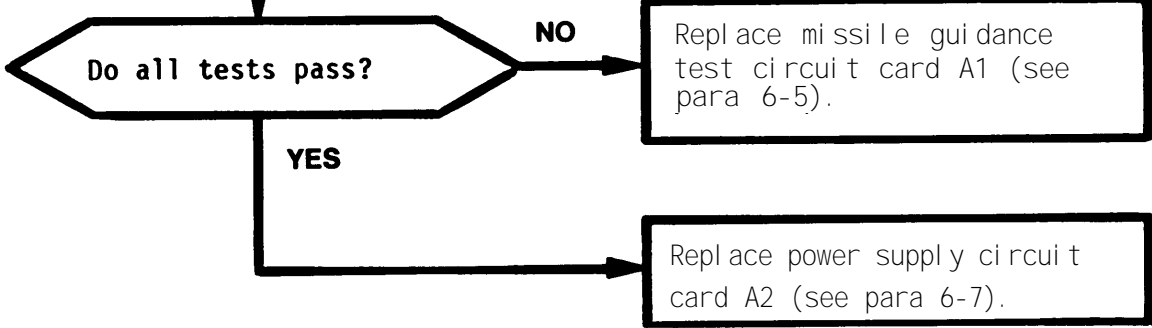


STEP 36

Connect multimeter to missile guidance test circuit card A1 (28) as indicated below.

Test Points	Normal Indication
A1P1 (29)-1 A1P1 (29)-10	Continuity
A1P1 (29)-26 A1P1 (29)-33	Continuity

MISSILE GUIDANCE TEST
CIRCUIT CARD A1



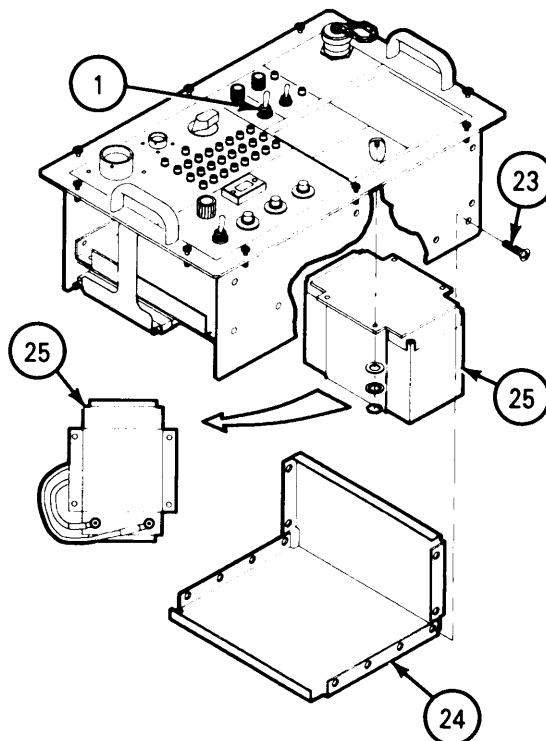
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING (Sheet 23 of 67)

Continued from STEP 27

STEP 37

On Missile Guidance Set Test Set:

- a. Set power switch (1) to OFF.
- b. Remove front panel assembly (see para 6-4).
- c. Remove 12 screws (23) and high voltage cover (24).



MISSILE GUIDANCE SET TEST SET

STEP 38

Connect multimeter to battery BT1 (25) terminals.

Does multimeter indicate between 9.2 and 11.2 V dc?

NO

Remove and replace battery BT1 (see para 6-8).

YES

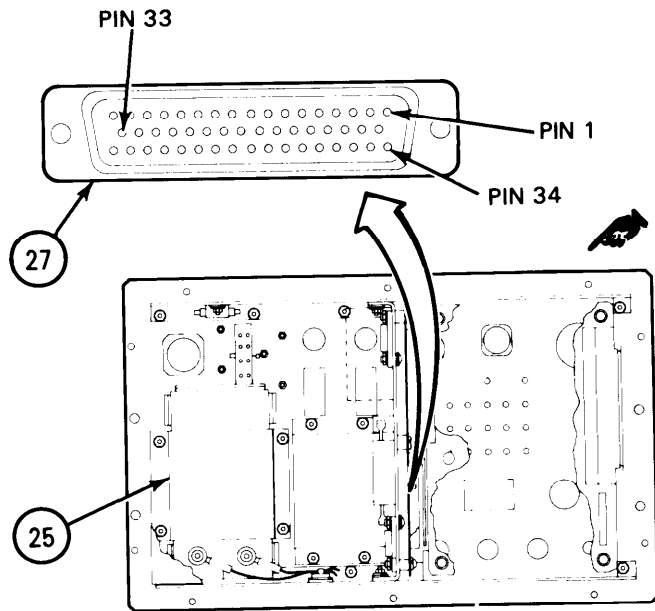
STEP 39

On Missile Guidance Set Test Set, remove power supply circuit card A2 (see para 6-7).

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 24 of 67)

Continued from previous page

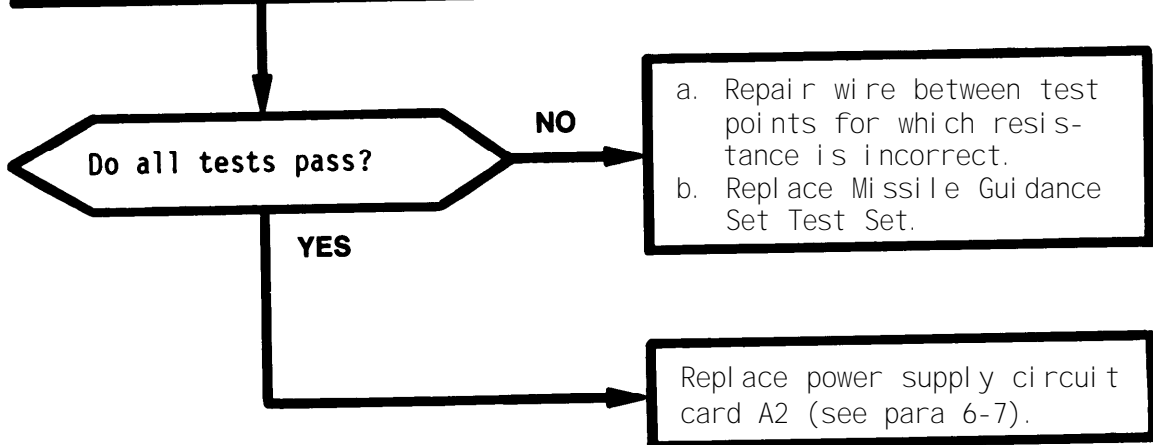


MISSILE GUIDANCE SET TEST SET

STEP 40

a. Set multimeter to indicate ohms.
b. Connect multimeter to test points as indicated below.

Test Points	Normal Indication
BT1 (25)-Positive J32 (27)-36	Continuity
BT1 (25)-Negative J32 (27)-37	Continuity

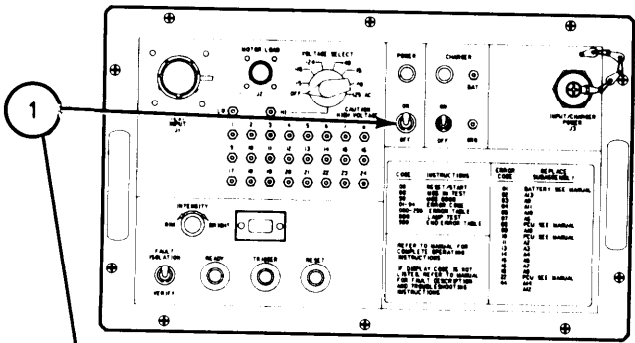


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 25 of 67)

Continued from STEP 33

STEP 41

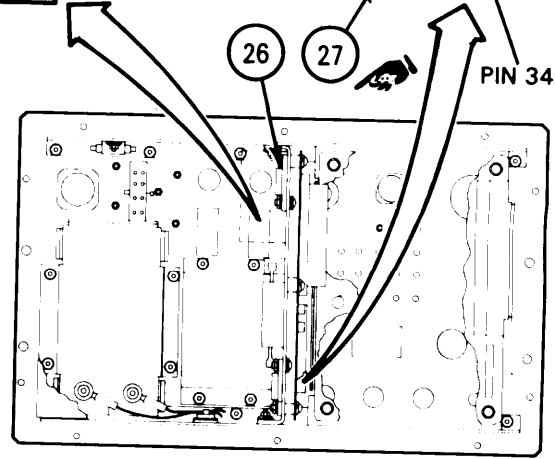
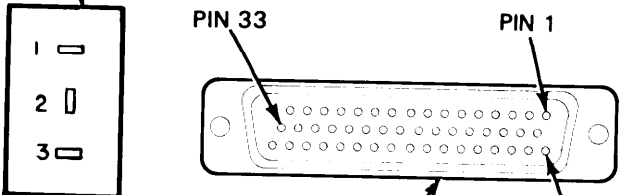
On Missile Guidance Set Test Set:
 a. Set power switch (1) to OFF.
 b. Remove power supply circuit card A2 (see para 6-7).



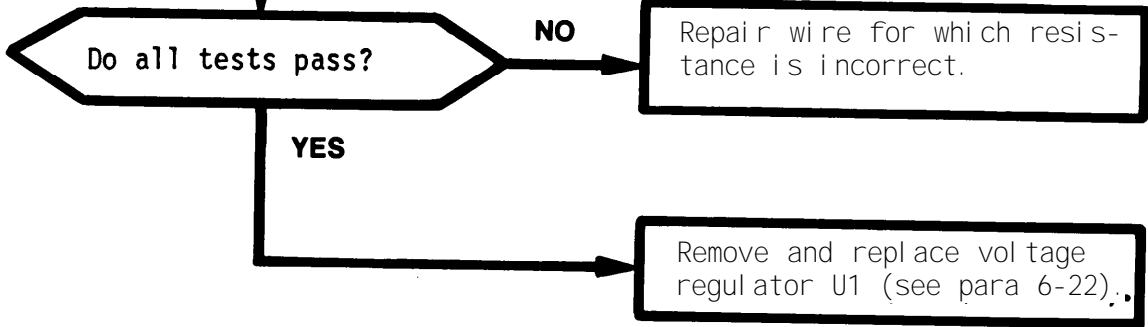
STEP 42

a. On Missile Guidance Set Test Set, set power switch (1) to ON.
 b. Set multimeter to indicate ohms.
 c. Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S2 (1)-1 J32 (27)-8	Continuity
S2 (1)-2 U1 (26)-2	Continuity
U1 (26)-1 J32 (27)-4	Continuity



MISSILE GUIDANCE SET TEST SET

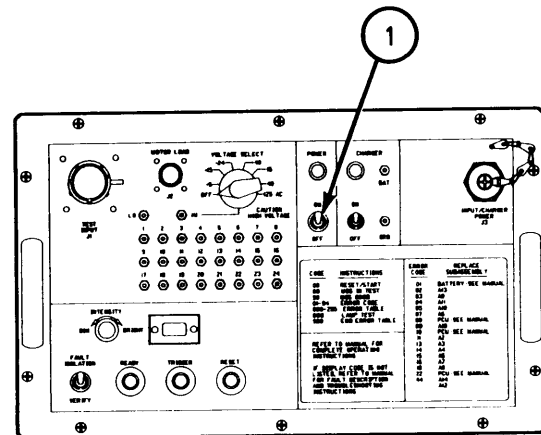


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 26 of 67)

Continued from STEP 02

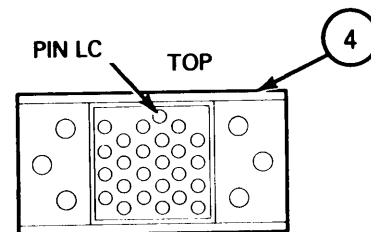
STEP 43

- On Missile Guidance Set Test Set:
- Set power switch (1) to OFF.
 - Remove front panel (see para 6-4).
 - Set power switch (1) to



STEP 44

- Set multimeter to indicate dc volts.
- Connect multimeter to display assembly DS3 (4) pin LC and ground.

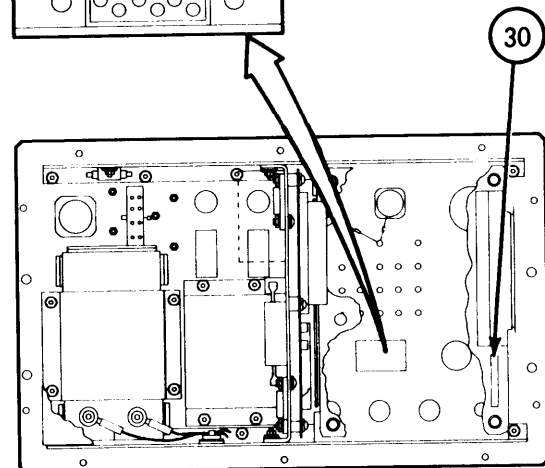


Does multimeter indicate less than 4.0 V dc?

YES

STEP 45

Connect multimeter to A1J2 (30) pin 14 and ground.



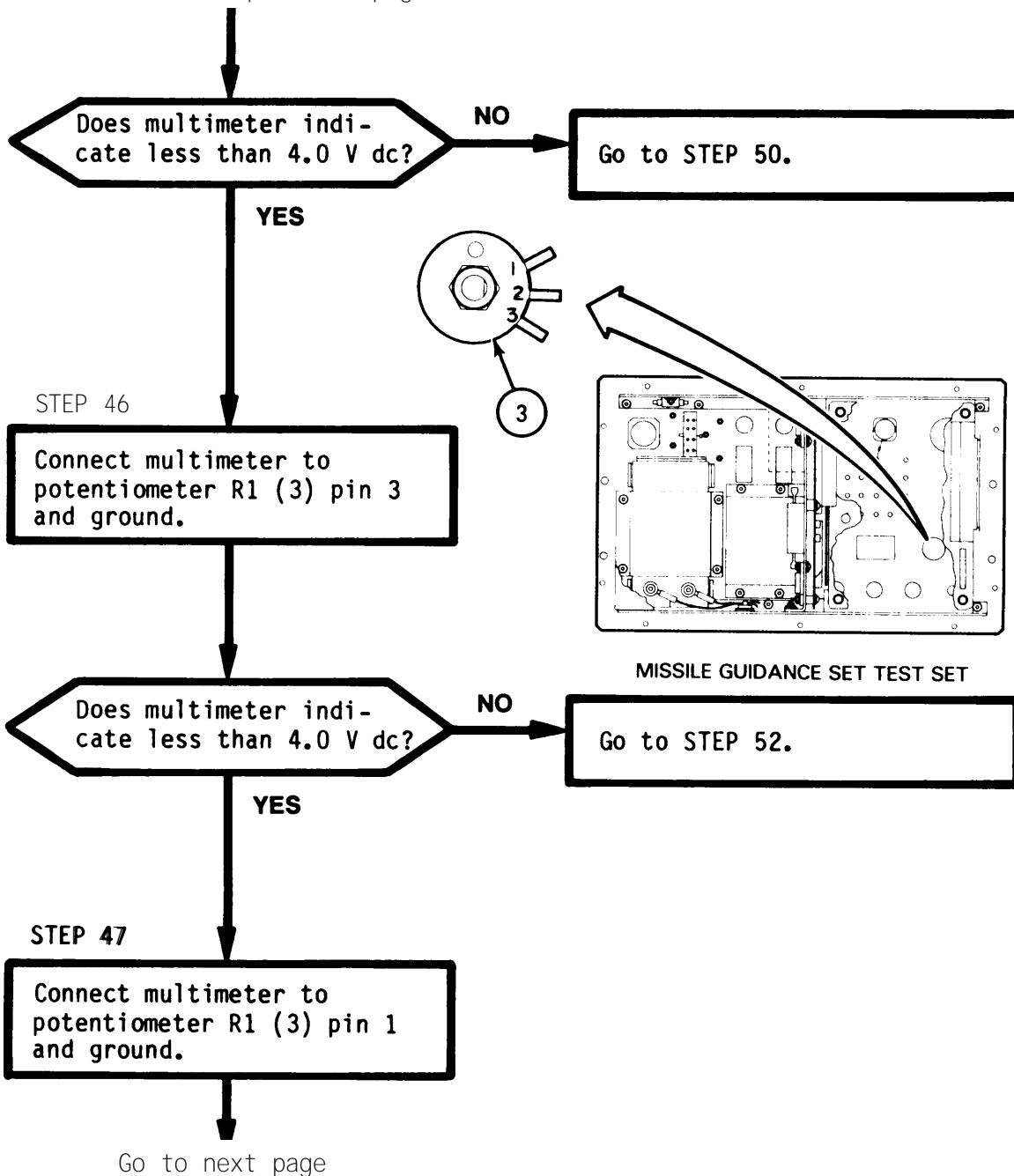
MISSILE GUIDANCE SET TEST SET

Remove and replace display assembly DS3 (see para 6-14).

Go to next page

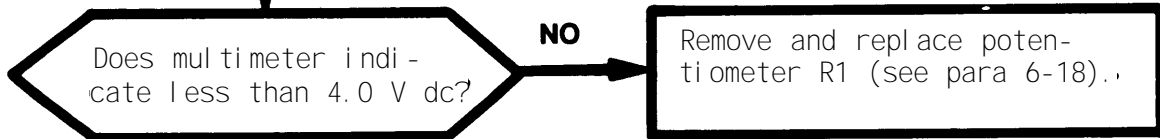
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 27 of 67)

Continued from previous page



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 28 of 67)

Continued from previous page



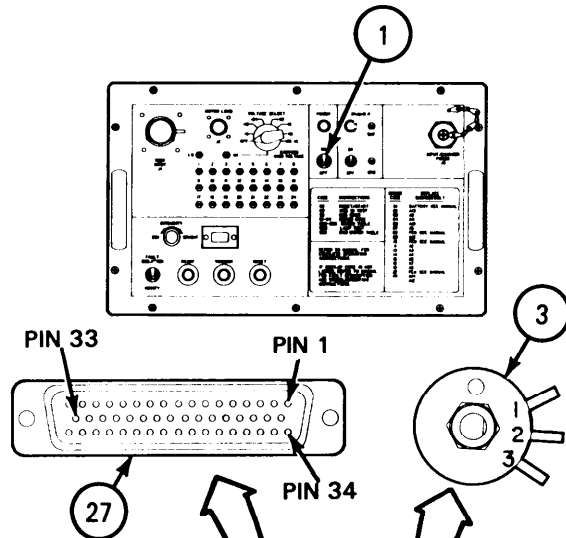
NO

Remove and replace potentiometer R1 (see para 6-18).

YES

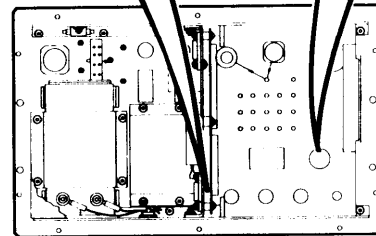
STEP 48

On Missile Guidance Set Test Set:
a. Set power switch (1) to OFF.
b. Remove power supply circuit card A2 (see para 6-7).

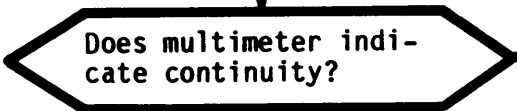


STEP 49

a. Set multimeter to indicate ohms.
b. Connect multimeter to potentiometer R1 (3) pin 1 and connector J32 (27) pin 43.



MISSILE GUIDANCE SET TEST SET



NO

a. Repair wire between test points.
b. Replace Missile Guidance Set Test Set.

YES

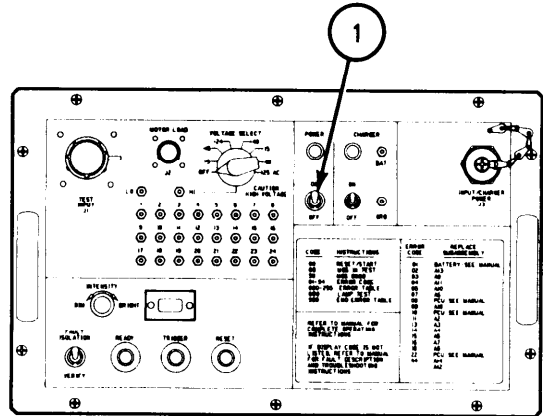
Replace power supply circuit card A2 (see para 6-7).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 29 of 67)

Continued from STEP 45

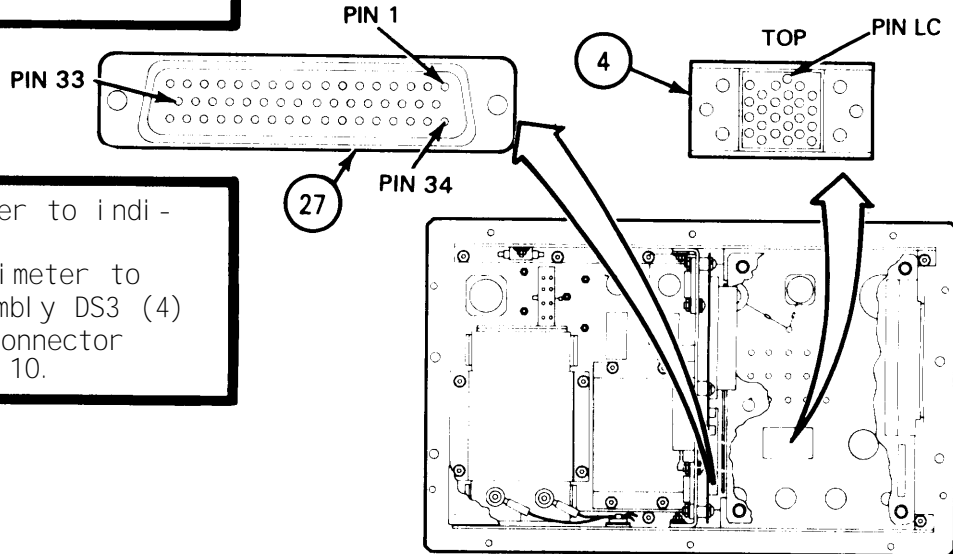
STEP 50

On Missile Guidance Set Test Set:
a. Set power switch (1) to OFF.
b. Remove power supply circuit card A2 (see para 6-7).



STEP 51

a. Set multimeter to indicate ohms.
b. Connect multimeter to display assembly DS3 (4) pin LC and connector J32 (27) pin 10.



MISSILE GUIDANCE SET TEST SET

Does multimeter indicate continuity?

NO

a. Repair wire between test points.
b. Replace Missile Guidance Set Test Set.

YES

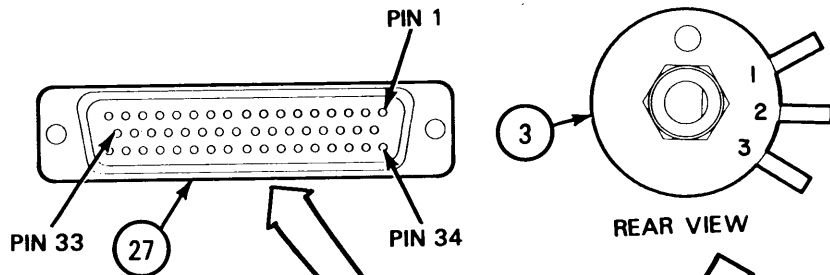
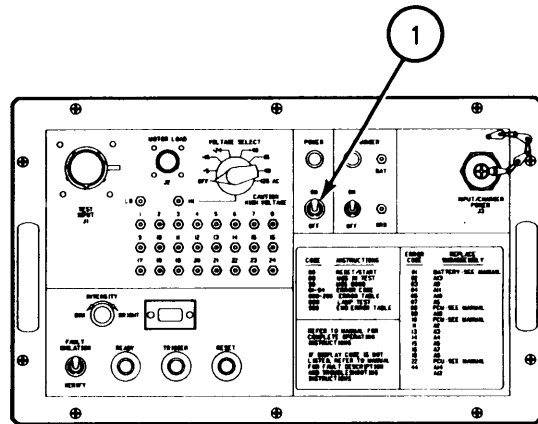
Replace power supply circuit card A2 (see para 6-7).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 30 of 67)

Continued from STEP 46

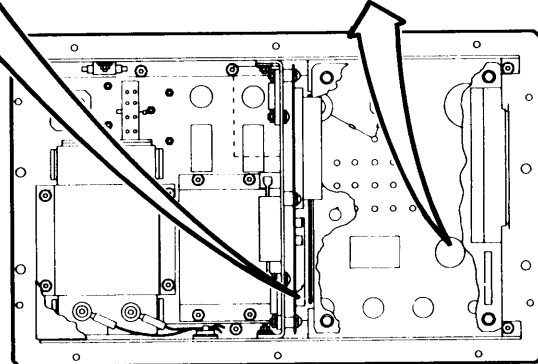
STEP 52

- On Missile Guidance Set Test Set:
- Set power switch (1) to OFF.
 - Remove power supply circuit card A2 (see para 6-7).



STEP 53

- Set multimeter to indicate ohms.
- Connect multimeter to potentiometer R1 (3) pin 2 and connector J32 (27) pin 26.



MISSILE GUIDANCE SET TEST SET

Does multimeter indicate continuity?

- Repair wire between test points.
- Replace Missile Guidance Set Test Set.

YES

NO

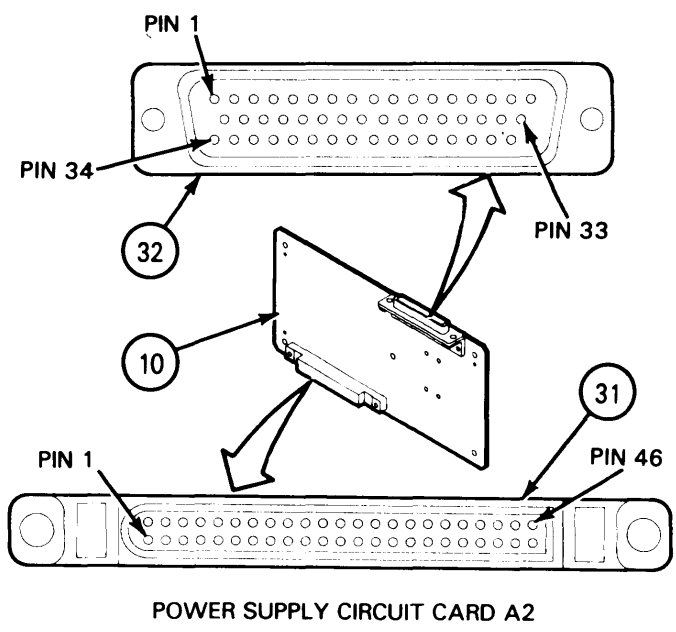
Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 31 of 67)

Continued from previous page

STEP 54

Connect multimeter to power supply circuit card A2 (10) connector A2J1 (31) pin 26 and connector A2P1 (32) pin 36.



POWER SUPPLY CIRCUIT CARD A2

Does multimeter indicate continuity?

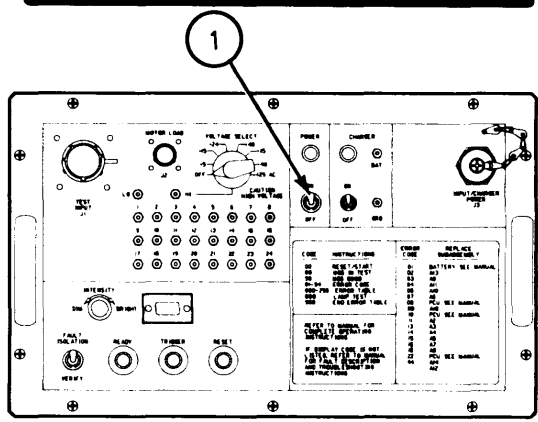
NO → Replace power supply circuit card A2 (see para 6-7).

YES → Replace missile guidance test circuit card A1 (see para 6-5).

Continued from STEP 03

STEP 55

On Missile Guidance Set Test Set:
a. Set power switch (1) to OFF.
b. Remove front panel (see para 6-4).



MISSILE GUIDANCE SET TEST SET

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 32 of 67)

Continued from previous page

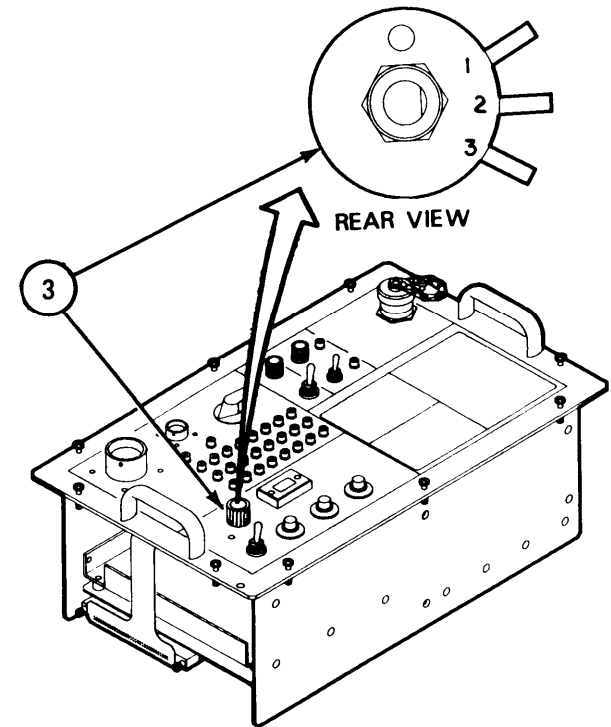
STEP 56

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to potentiometer R1 (3) pins 1 and 2.

STEP 57

On Missile Guidance Set Test Set, turn INTENSITY potentiometer (3) fully counterclockwise.

Does multimeter indication increase from 0 to between 225 and 275 ohms?



MISSILE GUIDANCE SET TEST SET

NO

Remove and replace potentiometer R1 (see para 6-18).

YES

STEP 58

On Missile Guidance Set Test Set, remove power supply circuit card A2 (see para 6-7).

Go to next page

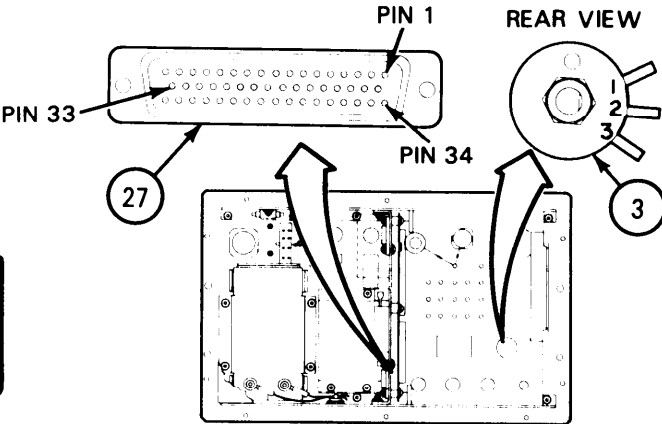
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 33 of 67)

Continued from previous page

STEP 59

Connect multimeter to potentiometer R1 (3) pin 3 and connector J32 (27) pin 9.

Does multimeter indicate continuity?



MISSILE GUIDANCE SET TEST SET

NO

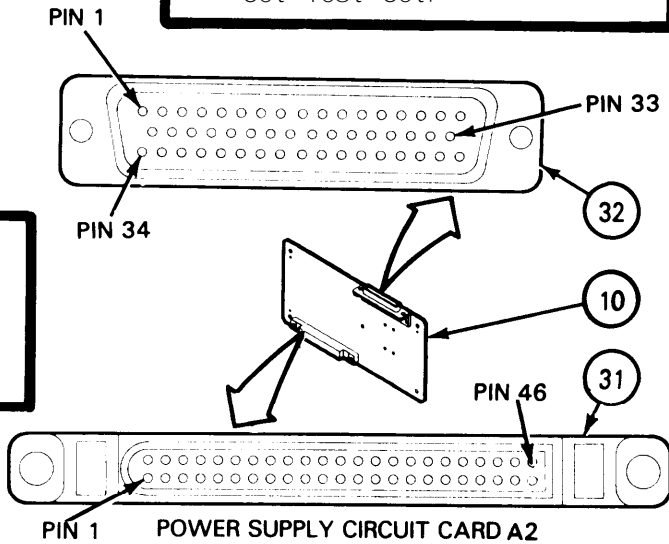
a. Repair wire between test points.
b. Replace Missile Guidance Set Test Set.

YES

STEP 60

Connect multimeter to power supply circuit card A2 (10) connector A2P1 (32) pin 9 and connector A2J1 (31) pin 34.

Does multimeter indicate continuity?



NO

Replace power supply circuit card A2 (see para 6-7).

YES

Replace missile guidance test circuit card A1 (see para 6-5).

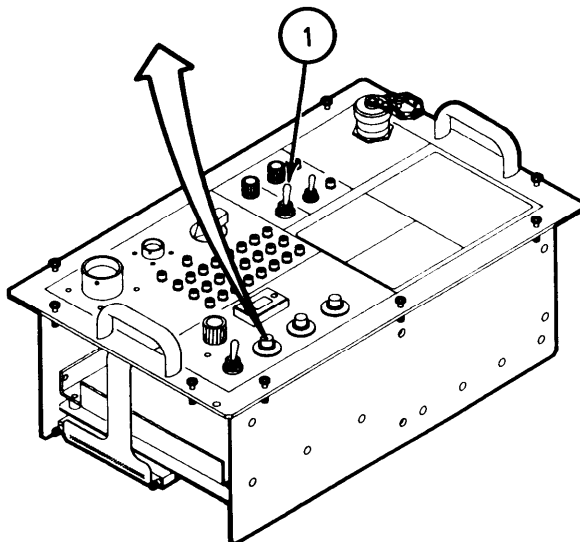
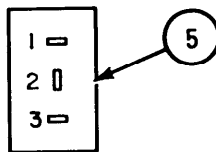
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 34 of 67)

Continued from STEP 04

STEP 61

On Missile Guidance Set Test Set:
 a. Set power switch (1) to OFF.
 b. Remove front panel assembly (see para 6-4).

REAR VIEW



MISSILE GUIDANCE SET TEST SET

STEP 62

a. Set multimeter to indicate ohms.
 b. Connect multimeter to switch S3 (5) pins 1 and 2.

Does multimeter indicate continuity?

NO

Remove and replace switch S3 (see para 6-12).

YES

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 35 of 67)

Continued from previous page

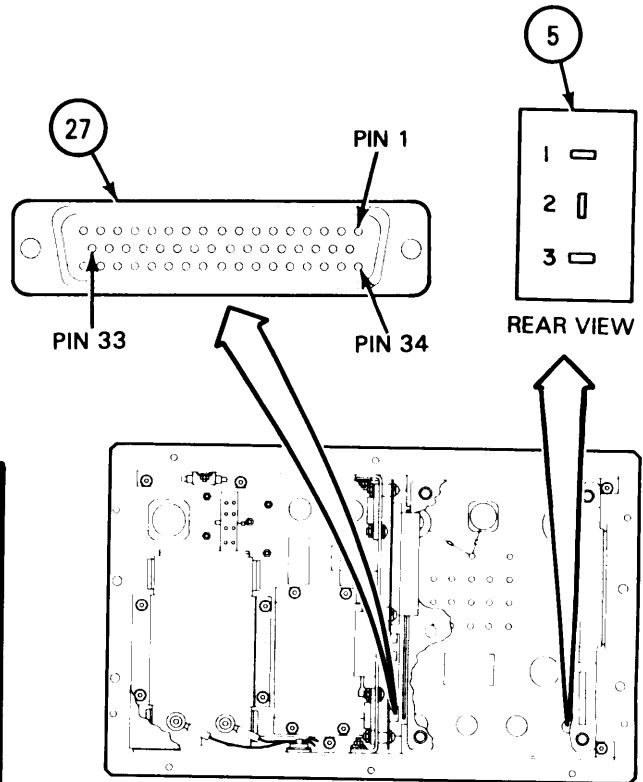
STEP 63

On Missile Guidance Set Test Set, remove power supply circuit card A2 (see para 6-7).

STEP 64

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S3 (5)-1 J32 (27)-39	Continuity
S3 (5)-2 J32 (27)-22	Continuity



MISSILE GUIDANCE SET TEST SET

Do all tests pass?

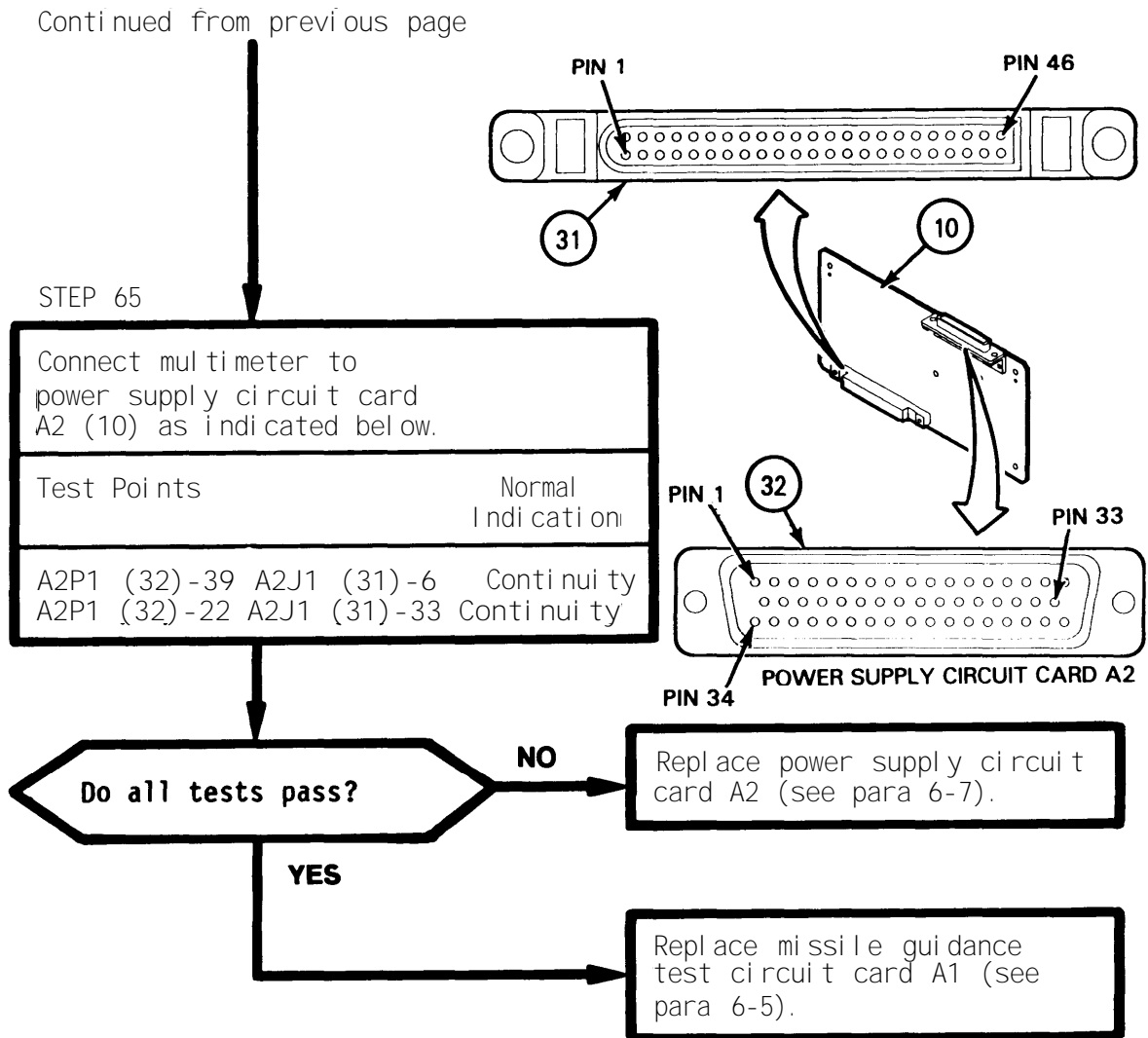
NO

- a. Repair wire between test points for which resistance is incorrect.
- b. Replace Missile Guidance Set Test Set.

YES

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 36 of 67)



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 37 of 67)

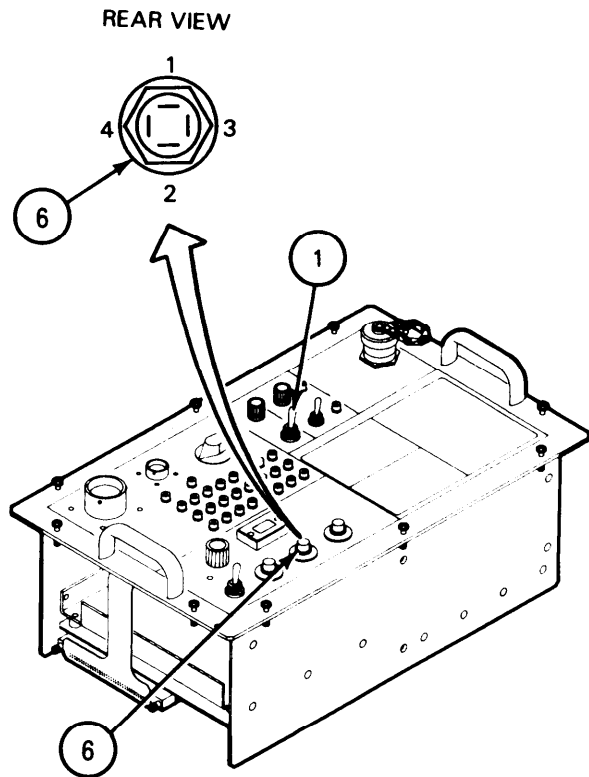
Continued from STEP 05

STEP 66

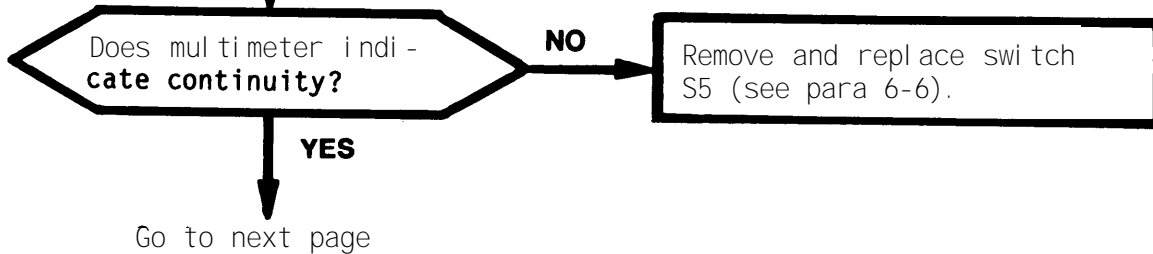
On Missile Guidance Set Test Set:
a. Set power switch (1) to OFF.
b. Remove front panel assembly (see para 6-4).

STEP 67

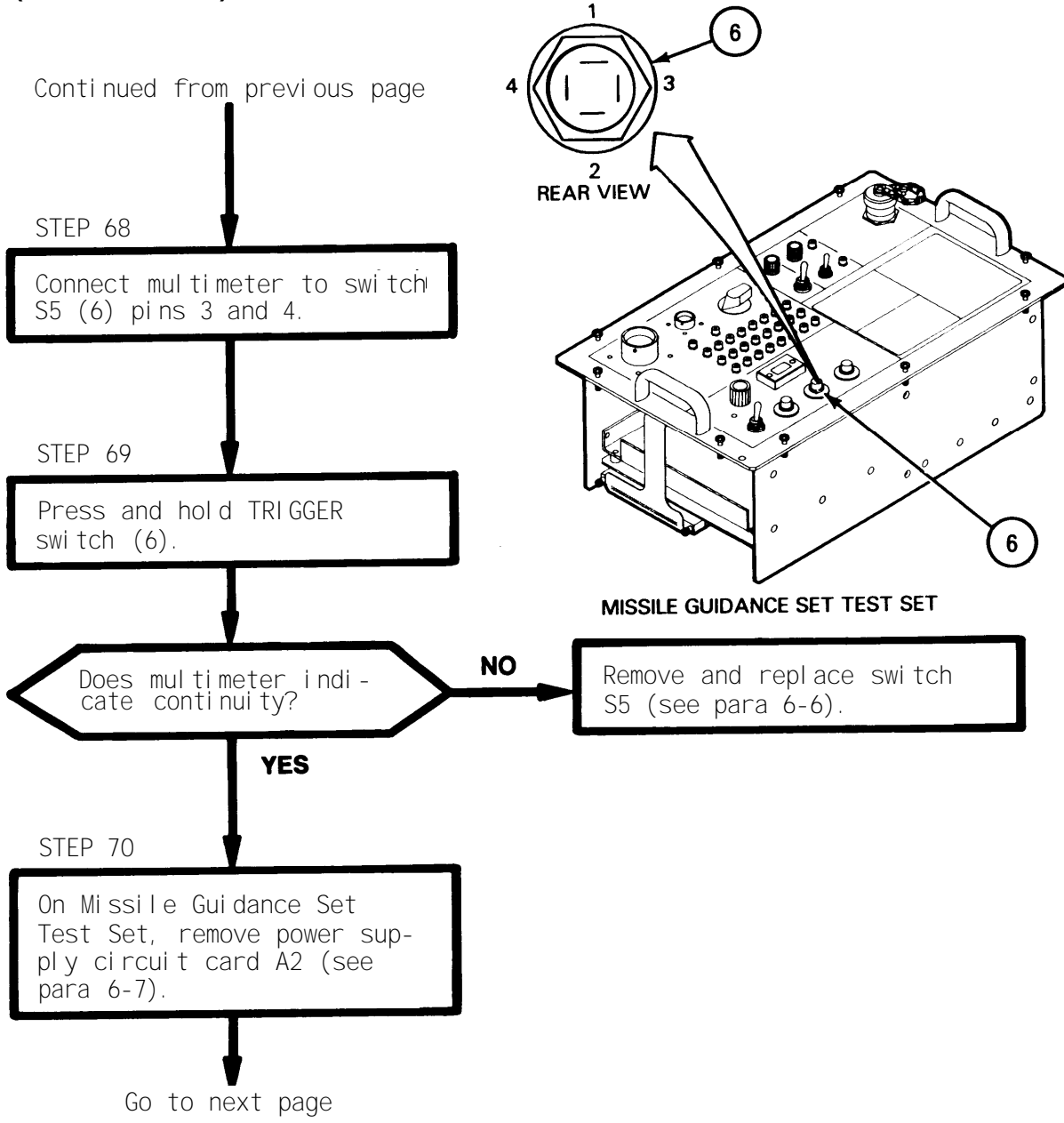
a. Set multimeter to indicate ohms.
b. Connect multimeter to switch S5 (6) pins 1 and 2.



MISSILE GUIDANCE SET TEST SET

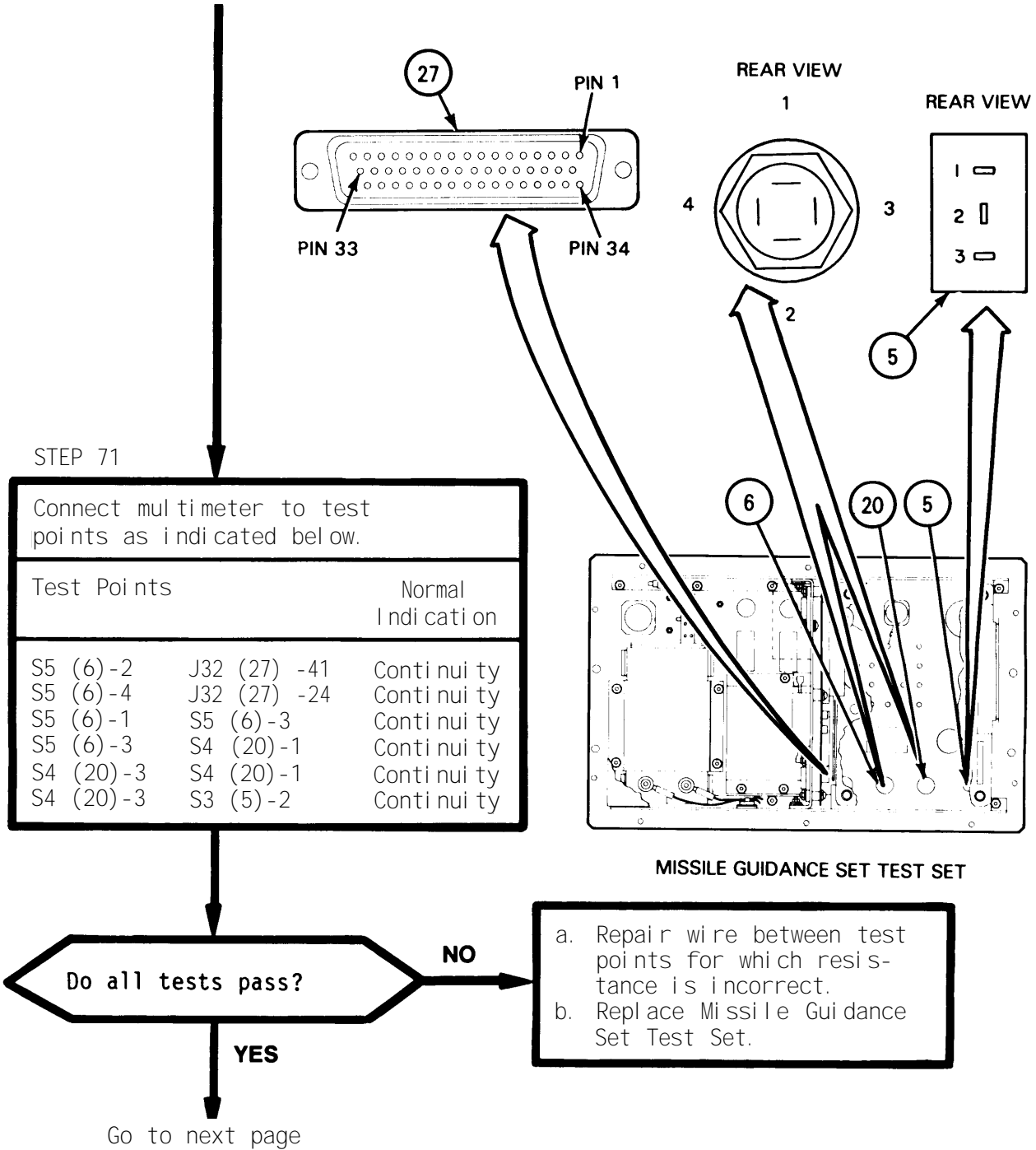


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 38 of 67)



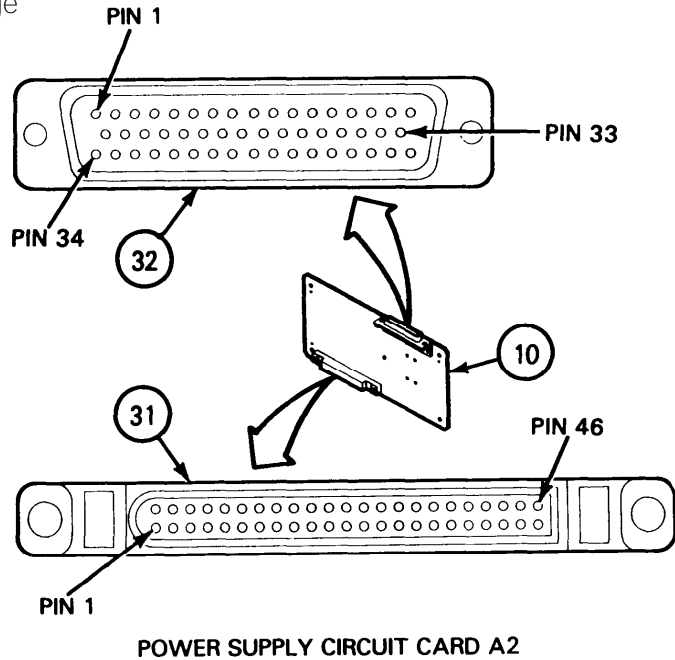
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 39 of 67)

Continued from previous page



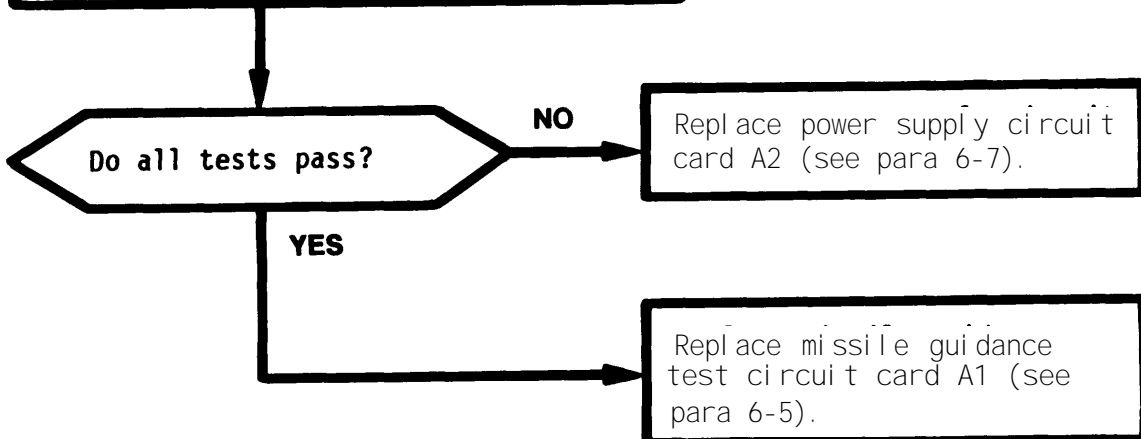
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 40 of 67)

Continued from previous page



STEP 72

Connect multimeter to power supply circuit card A2 (10) as indicated below.		
Test Points		Normal Indication
A2P1 (32)-41	A2J1 (31)-8	Continuity
A2P1 (32)-24	A2J1 (31)-31	Continuity

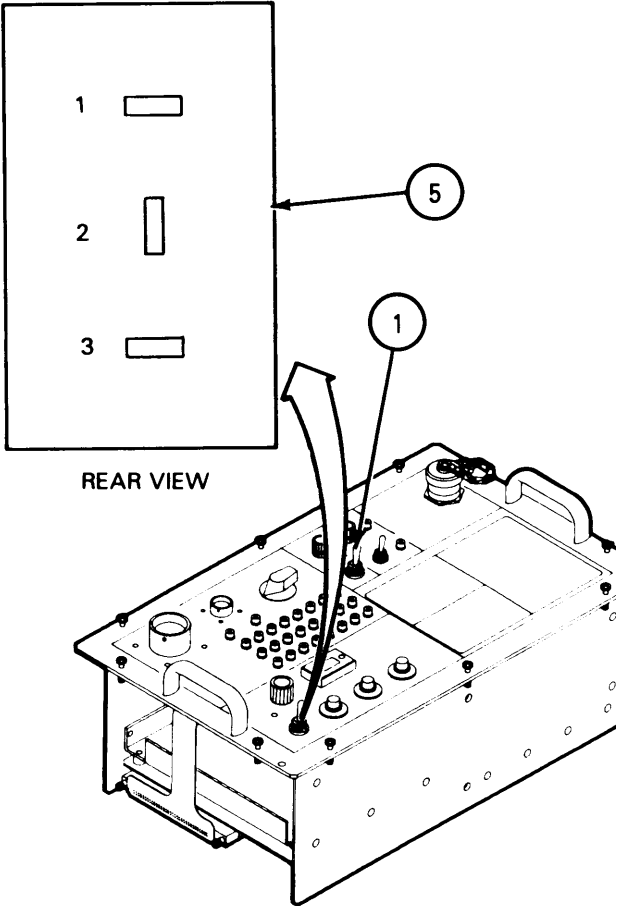


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 41 of 67)

Continued from STEP 06

STEP 73

On Missile Guidance Set Test Set:
 a. Set power switch (1) to OFF.
 b. Remove front panel assembly (see para 6-4).



REAR VIEW

MISSILE GUIDANCE SET TEST SET

STEP 74

a. Set multimeter to indicate ohms.
 b. Connect multimeter to switch S3 (5) pins 2 and 3.

Does multimeter indicate continuity?

NO

Remove and replace switch S3 (see para 6-12).

YES

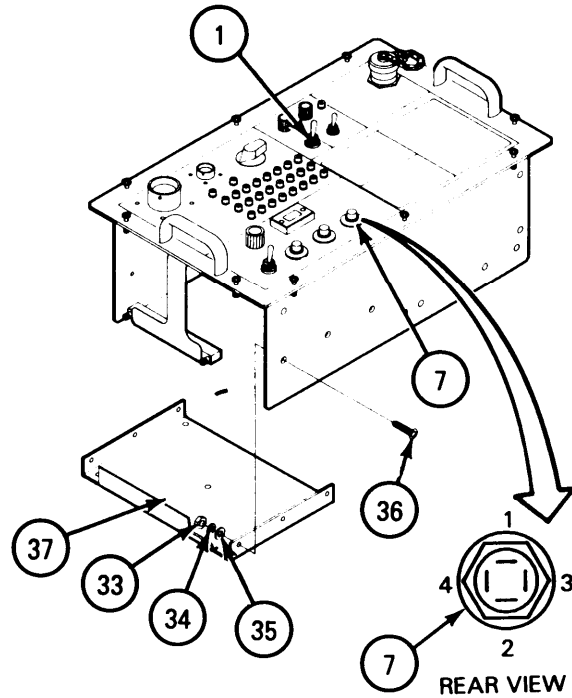
Remove and replace missile guidance test circuit card A1 (see para 6-5).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 42 of 67)

Continued from STEP 10

STEP 75

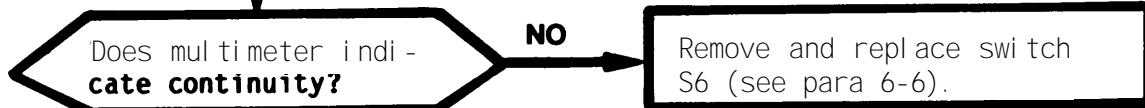
- On Missile Guidance Set Test Set:
- a. Release RESET switch (7).
 - b. Set POWER switch (1) to OFF.
 - c. Remove missile guidance test circuit card A1 (see para 6-5).
 - d. Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).



MISSILE GUIDANCE SET TEST SET

STEP 76

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to switch S6 (7) pins 1 and 2.



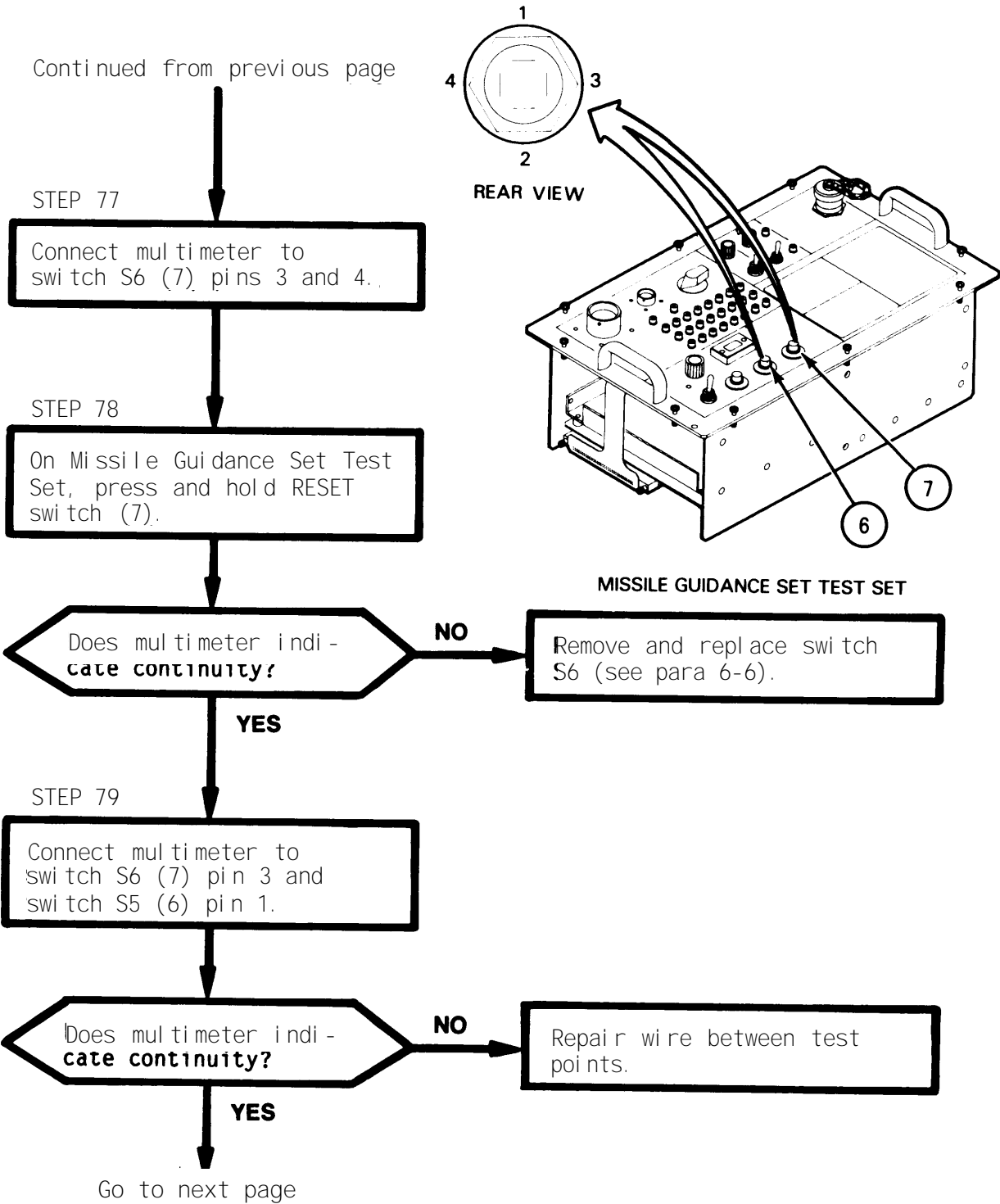
NO

Remove and replace switch S6 (see para 6-6).

YES

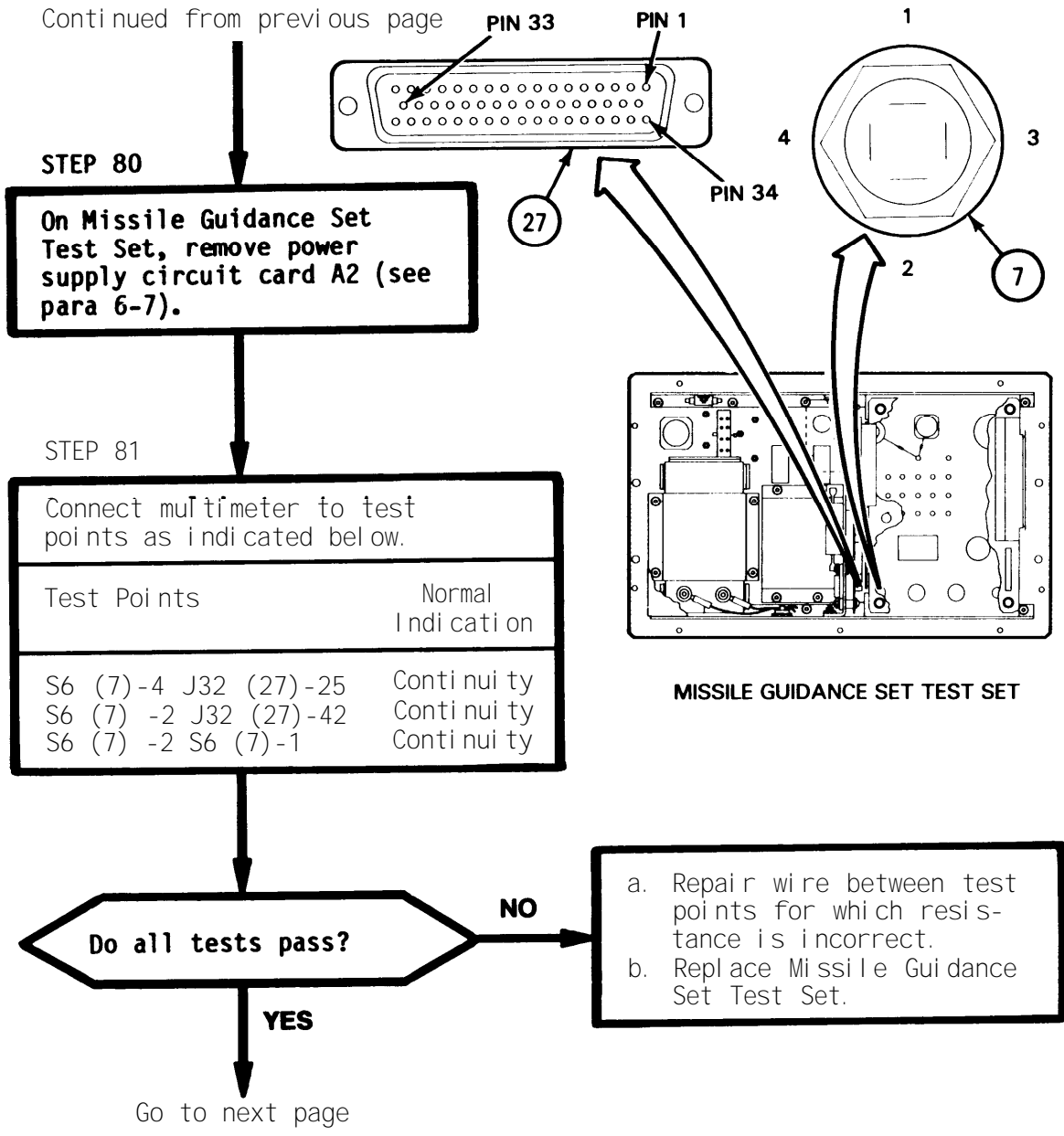
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6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 43 of 67)



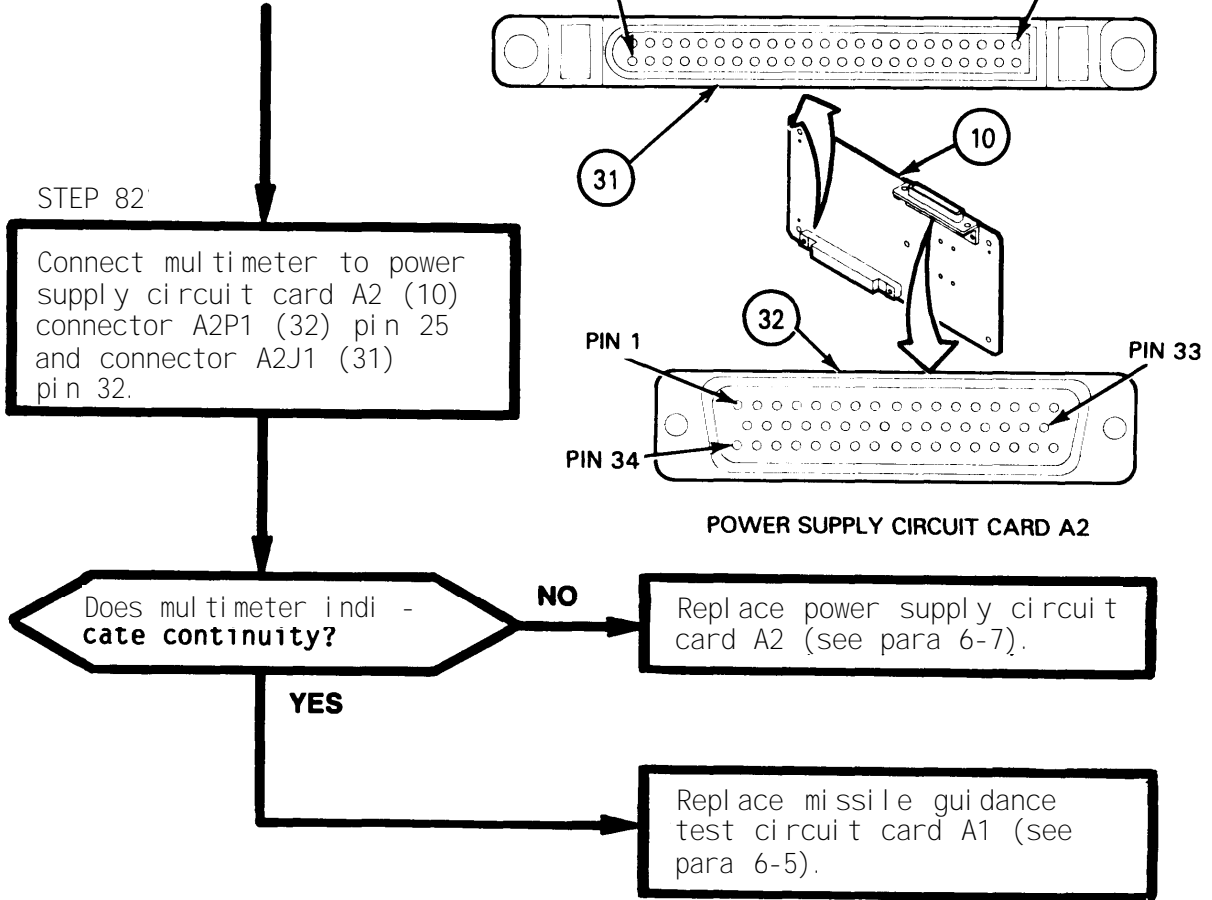
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 44 of 67)

Continued from previous page



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 45 of 67)

Continued from previous page



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 46 of 67)

Continued from STEP 11

STEP 83

On Missile Guidance Set Test Set:

- Set power switch (1) to OFF.
- Remove missile guidance test circuit card A1 (see para 6-5).
- Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).

STEP 84

- Set multimeter to indicate ohms.
- Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S6 (7)-1 S6 (7)-3	Continuity
S6 (7)-1 S6 (7)-2	Continuity

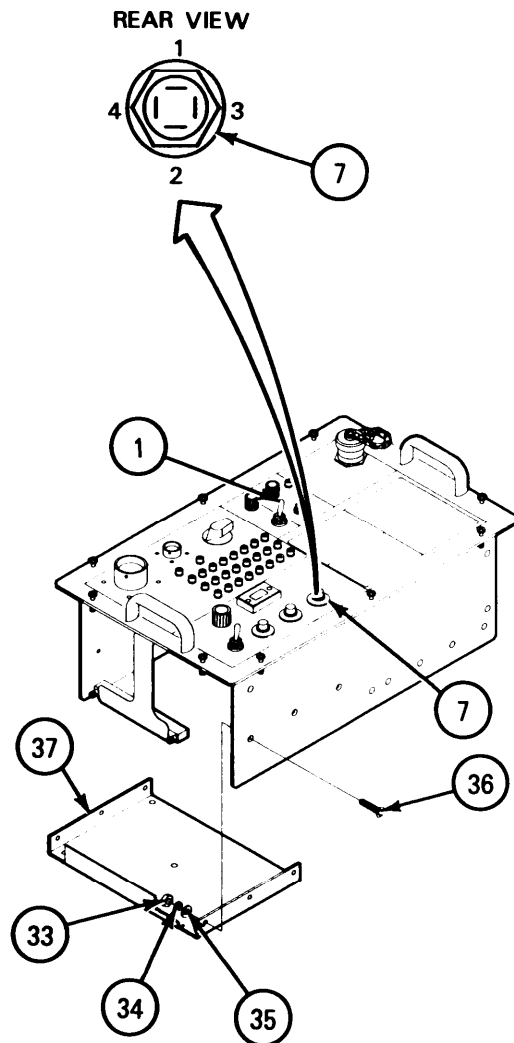
Do all tests pass?

NO

Remove and replace switch S6 (see para 6-6).

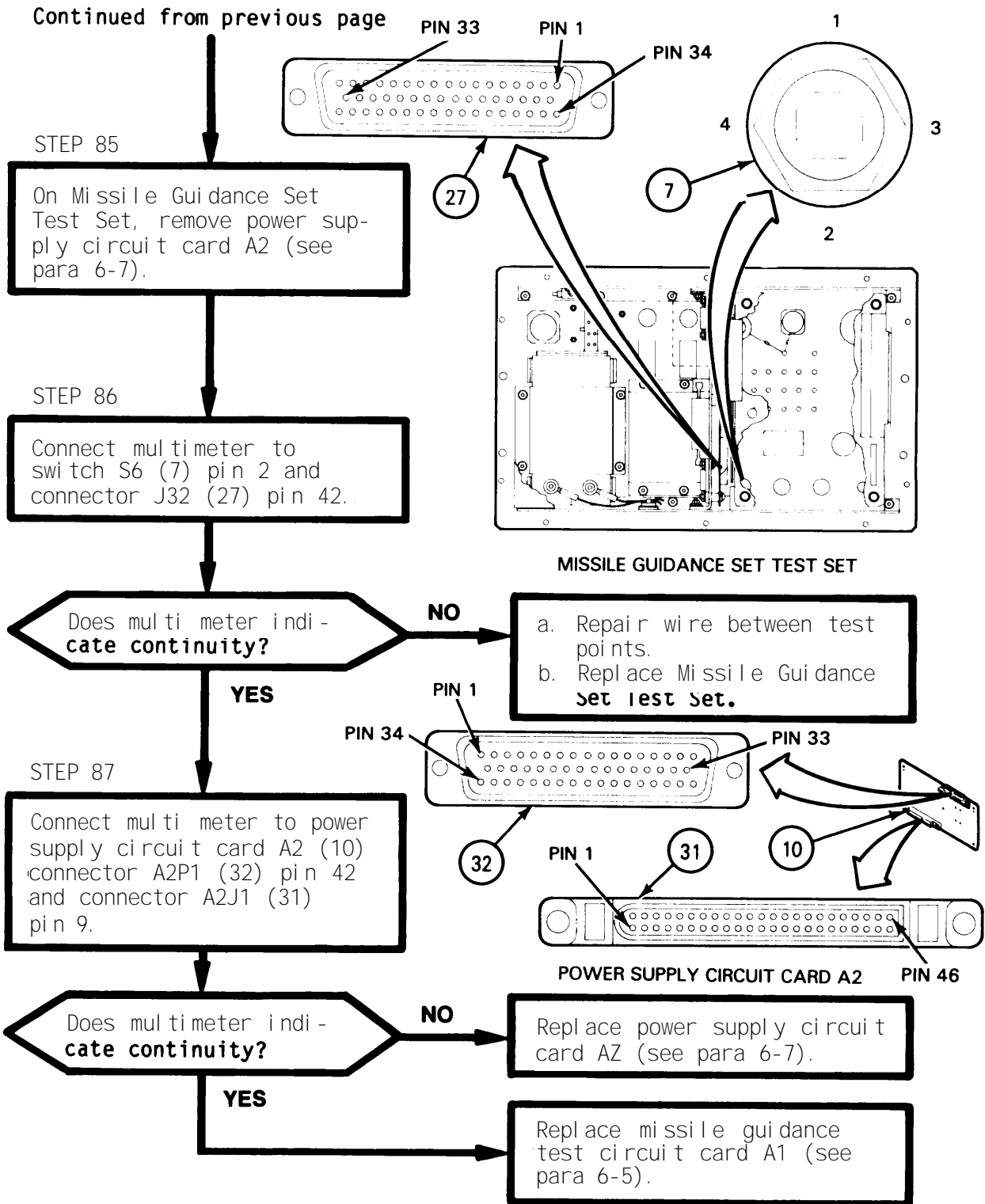
YES

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MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 47 of 67)



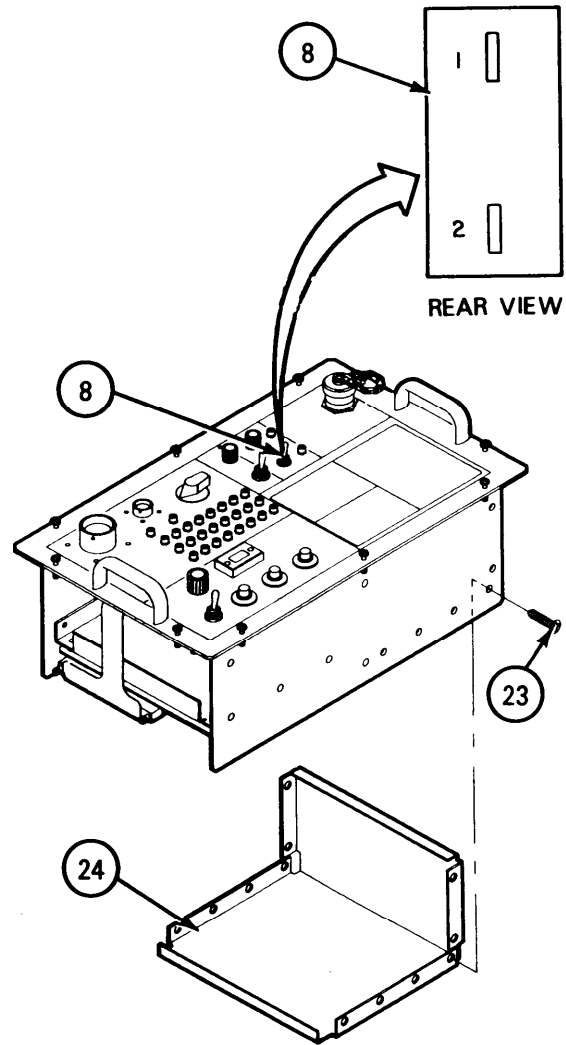
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 48 of 67)

Continued from STEP 12

STEP 88

On Missile Guidance Set Test Set:

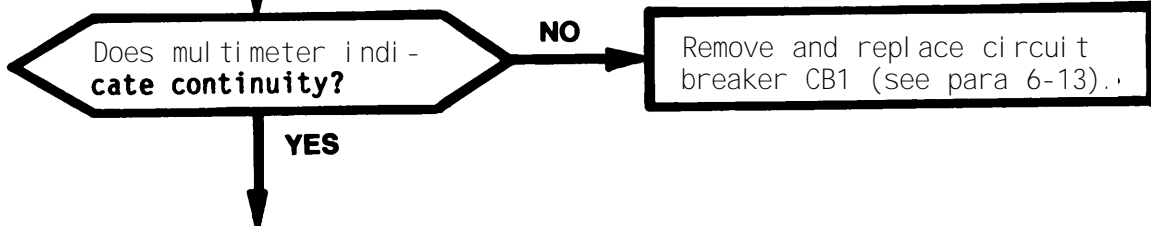
- a. Set CHARGER circuit breaker (8) to OFF.
- b. Disconnect from 115 V ac power source.
- c. Remove CHARGER lamp (see para 6-9).
- d. Remove front panel assembly (see para 6-4).
- e. Remove 12 screws (23) and high voltage cover (24).
- f. Set CHARGER circuit breaker (8) to ON.



MISSILE GUIDANCE SET TEST SET

STEP 89

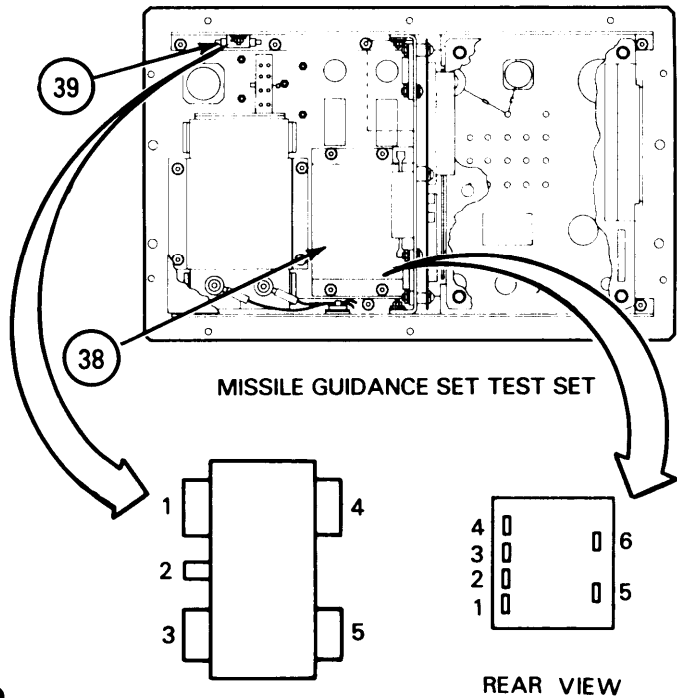
- a. Set multimeter to indicate ohms.
- b. Connect multimeter to circuit breaker CB1 (8) pins 1 and 2.



Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 49 of 67)

Continued from previous page



STEP 90
Connect multimeter to transformer T1 (38) pins 1 and 2.

Does multimeter indicate between 2 and 100 ohms?

NO

YES

Remove and replace transformer T1 (see para 6-17).

STEP 91
Connect multimeter to EMI filter FL1 (39) as indicated below.

Test Points	Normal Indication
FL1 (39)-1 FL1 (39)-4	Continuity
FL1 (39)-3 FL1 (39)-5	Continuity

Do all tests pass?

NO

YES

Replace EMI filter FL1 (see para 6-19).

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 50 of 67)

Continued from previous page

STEP 92

Connect multimeter to relay K1 (40) pins AZ and A3.

Does multimeter indicate continuity?

NO
Remove and replace relay K1 (see para 6-23).

YES

STEP 93

Connect multimeter to test points as indicated below.

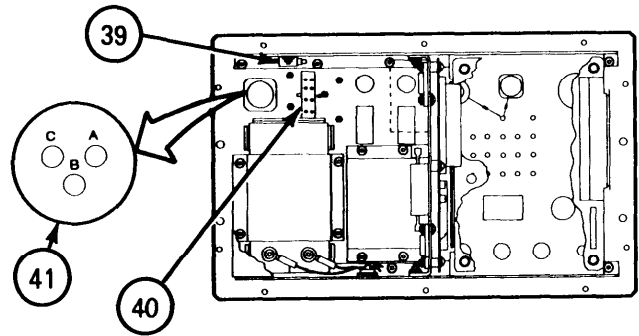
Test Points	Normal Indication
J3 (41)-A FL1 (39)-1	Continuity
J3 (41)-C FL1 (39)-3	Continuity

Do all tests pass?

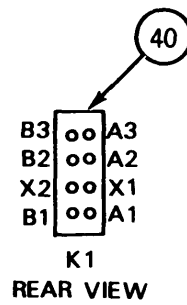
NO
a. Repair wire between test points for which resistance is incorrect.
b. Remove and replace connector J3 (see para 6-27).

YES

Go to next page



MISSILE GUIDANCE SET TEST SET



K1
REAR VIEW

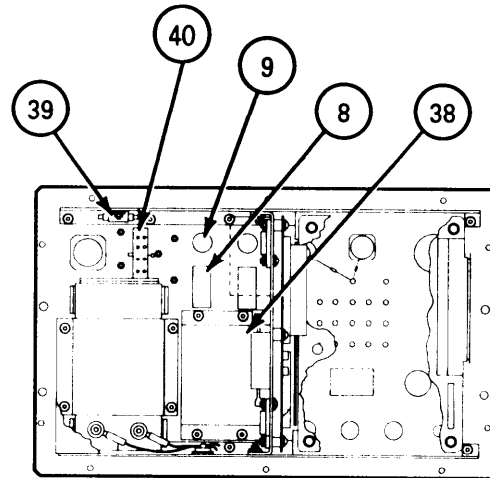
6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 51 of 67)

Continued from previous page

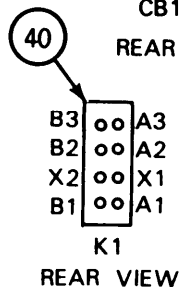
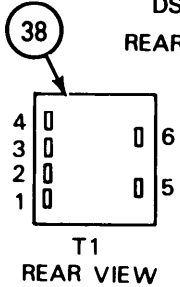
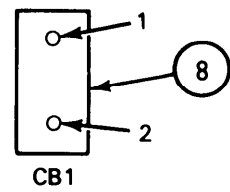
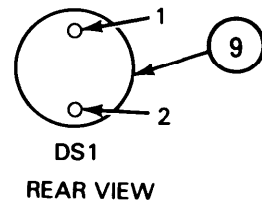
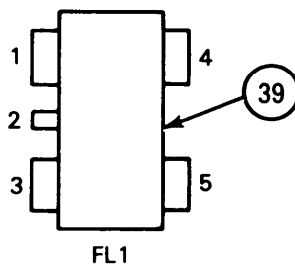
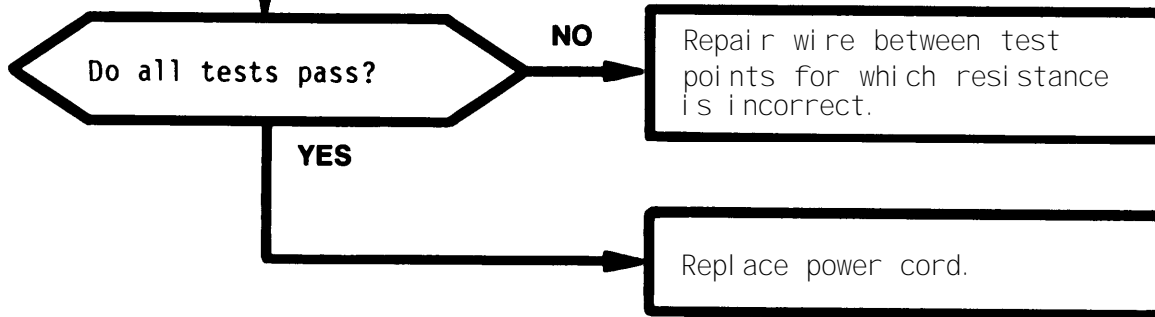
STEP 94

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
FL1 (39)-4 CB1 (8)-1	Continuity
FL1 (39)-5 K1 (40)-A3	Continuity
CB1 (8)-2 T1 (38)-1	Continuity
T1 (38)-2 K1 (40)-A2	Continuity
T1 (38)-2 DS1 (9)-1	Continuity
T1 (38)-1 DS1 (9)-2	Continuity



MISSILE GUIDANCE SET TEST SET

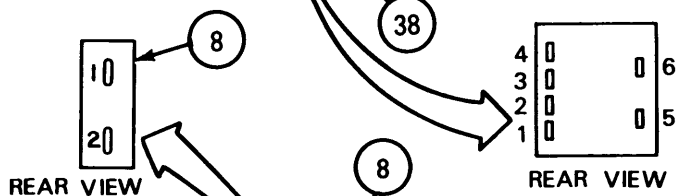
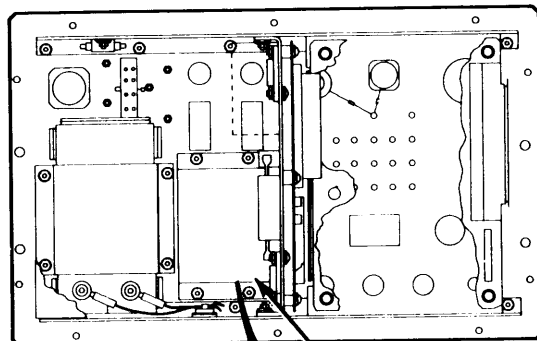


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 52 of 67)

Continued from STEP 14

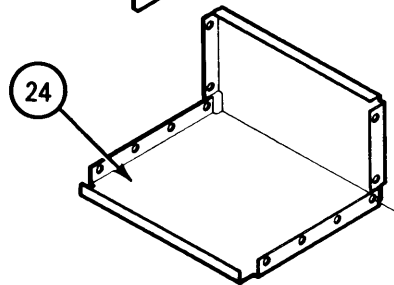
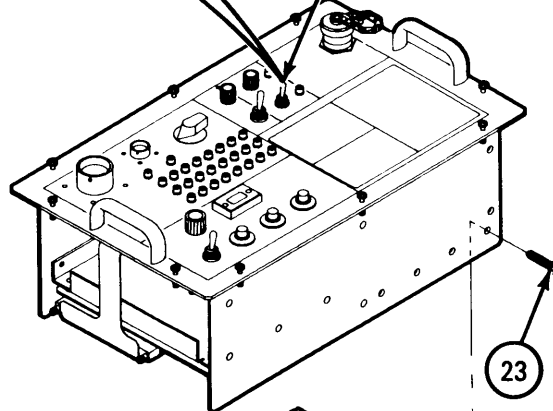
STEP 95

On Missile Guidance Set Test Set:
 a. Set CHARGER circuit breaker (8) to OFF.
 b. Disconnect from 115 V ac power source.
 c. Remove 12 screws (23) and high voltage cover (24).
 d. Connect to 115 V ac power source.
 e. Set CHARGER circuit breaker (8) to ON.



STEP 96

a. Set multimeter to indicate ac volts.
 b. Connect multimeter to transformer T1 (38) pins 5 and 6.



MISSILE GUIDANCE SET TEST SET

Does multimeter indicate between 15 and 25 V ac?

YES

Go to next page

NO

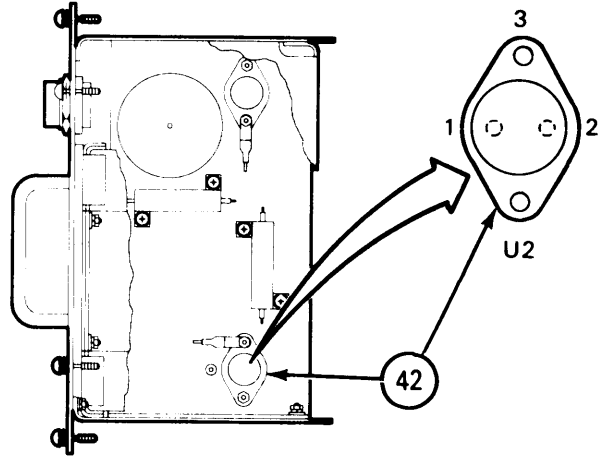
Remove and replace transformer T1 (see para 6-17).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 53 of 67)

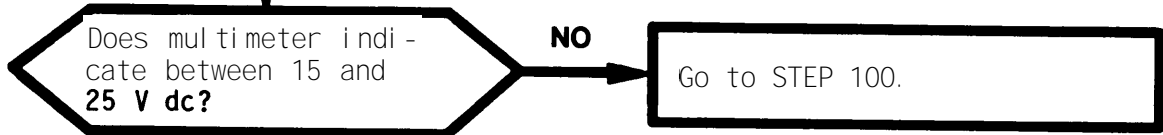
Continued from previous page

STEP 97

- a. Set multimeter to indicate dc volts.
- b. Connect multimeter to voltage regulator U2 (42) case and ground.



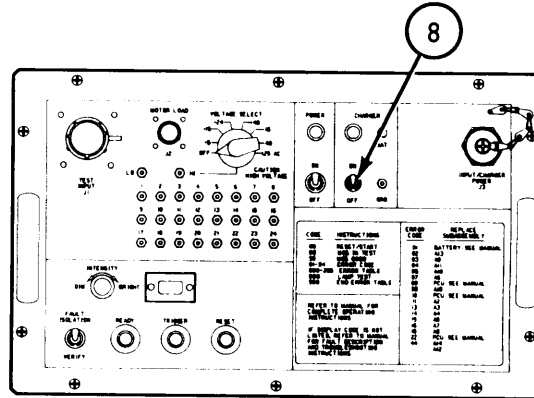
MISSILE GUIDANCE SET TEST SET



YES

STEP 98

- On Missile Guidance Set Test Set:
- a. Set CHARGER circuit breaker (8) to OFF.
 - b. Disconnect from 115 V ac power source.
 - c. Remove power supply circuit card A2 (see para 6-7).

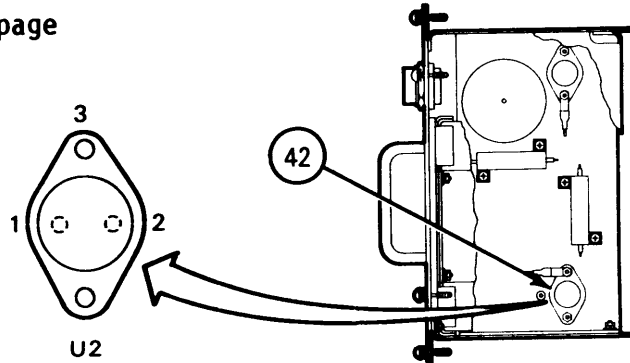


MISSILE GUIDANCE SET TEST SET

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6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 54 of 67)

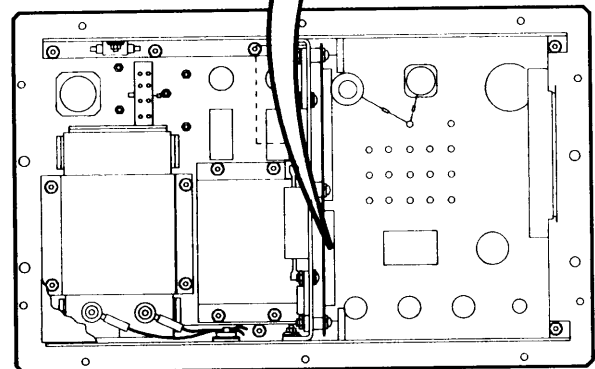
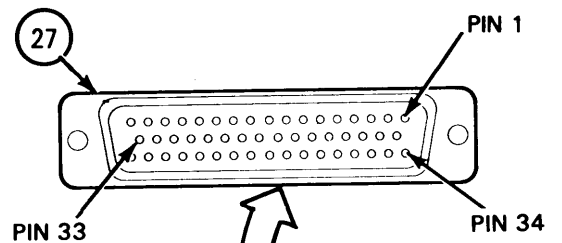
Continued from previous page



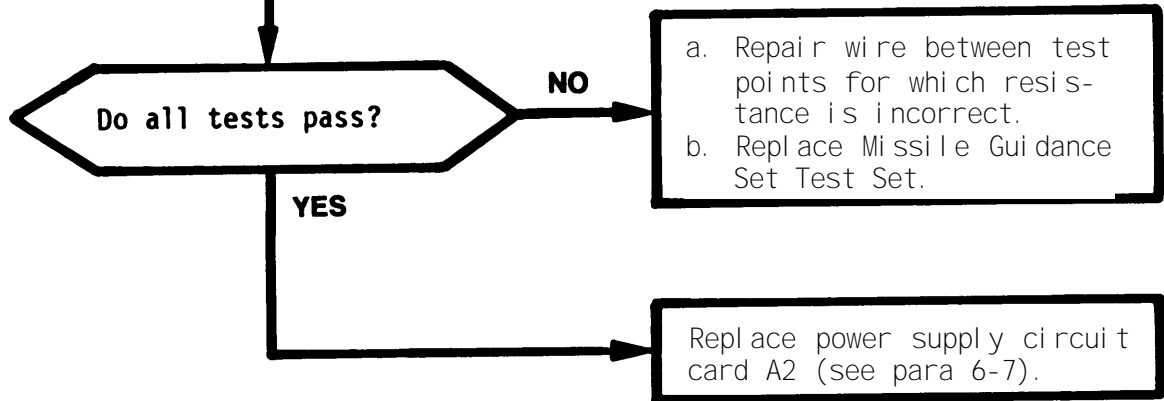
STEP 99

a. Set multimeter to indicate ohms.
b. Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J32 (27) -2 U2 (42) -1	Continuity
J32 (27) -18 U2 (42) -3	Continuity



MISSILE GUIDANCE SET TEST SET

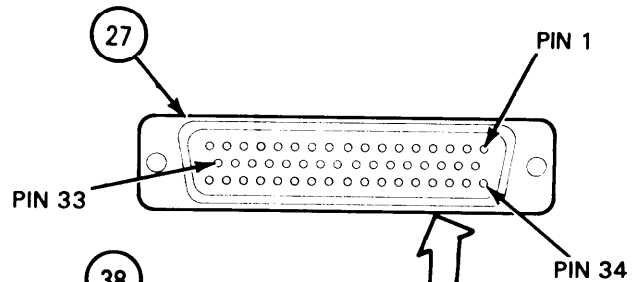
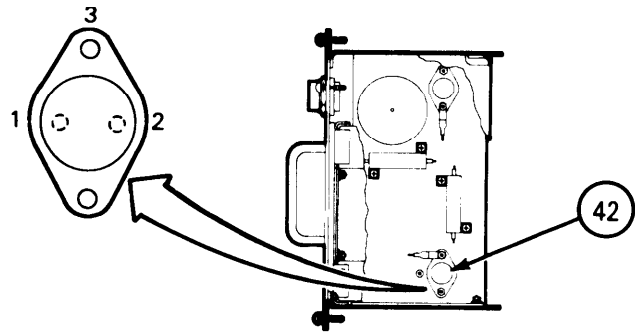


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 55 of 67)

Continued from Step 97

STEP 100

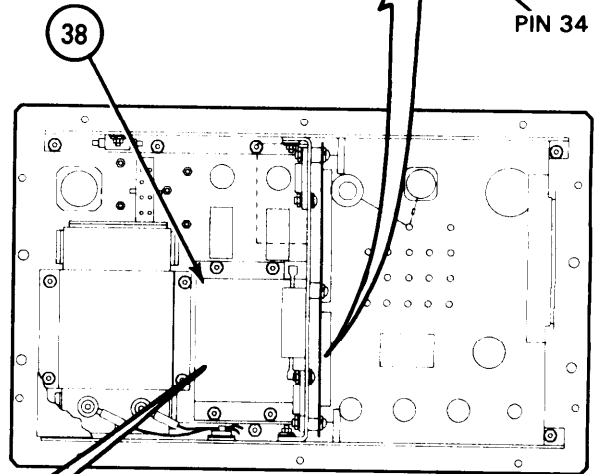
On Missile Guidance Set Test Set:
 a. Set CHARGER circuit breaker (8) to OFF.
 b. Disconnect from 115 V ac power source.
 c. Remove power supply circuit card AZ (see para 6-7).



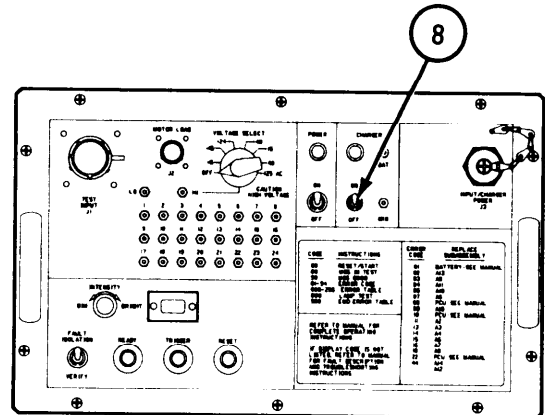
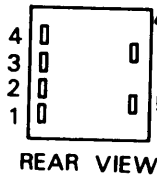
STEP 101

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J32 (27)-3 U2 (42)-2	Continuity
J32 (27)-34 U2 (42)-2	Continuity
J32 (27)-34 T1 (38)-6	Continuity



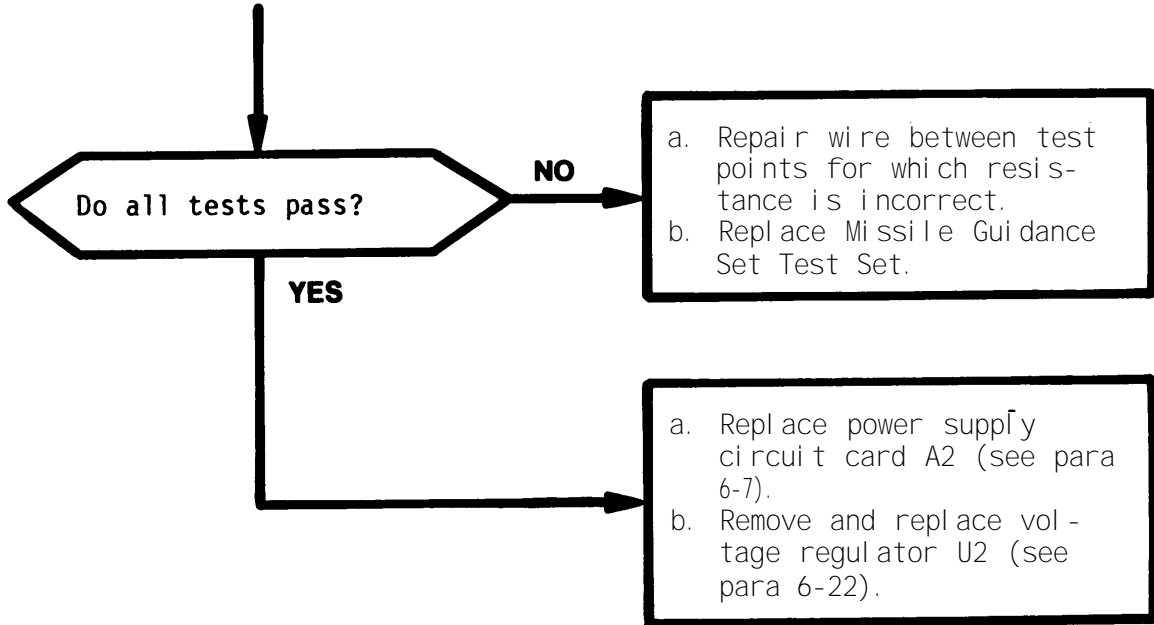
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MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 56 of 67)

Continued from previous page

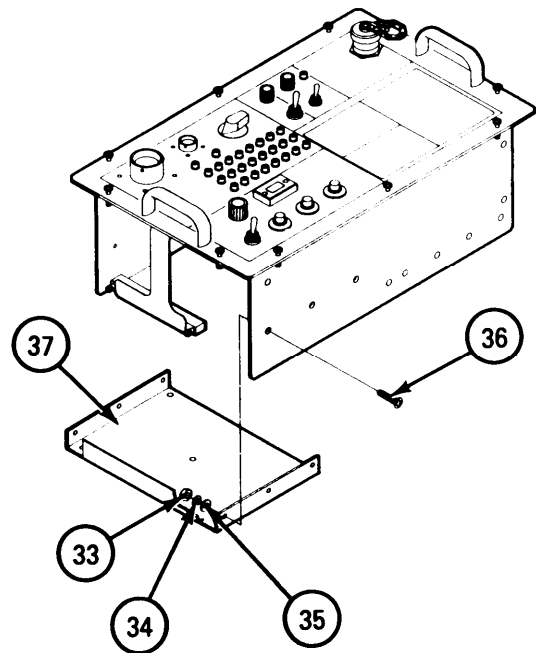


Continued from STEP 16

STEP 102

On Missile Guidance Set Test Set:

- a. Remove missile guidance test circuit card A1 (see para 6-5).
- b. Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).



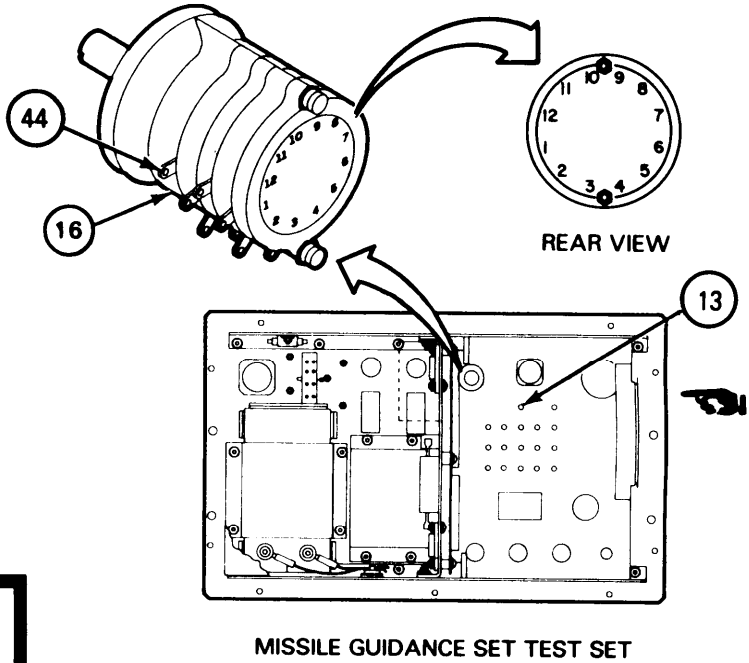
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6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 57 of 67)

Continued from previous page

STEP 103

DELETED



STEP 104

Connect multimeter to J4 (13) and S1A (16)-C (44).

Does multimeter indicate between 9.5K and 10.5K ohms?

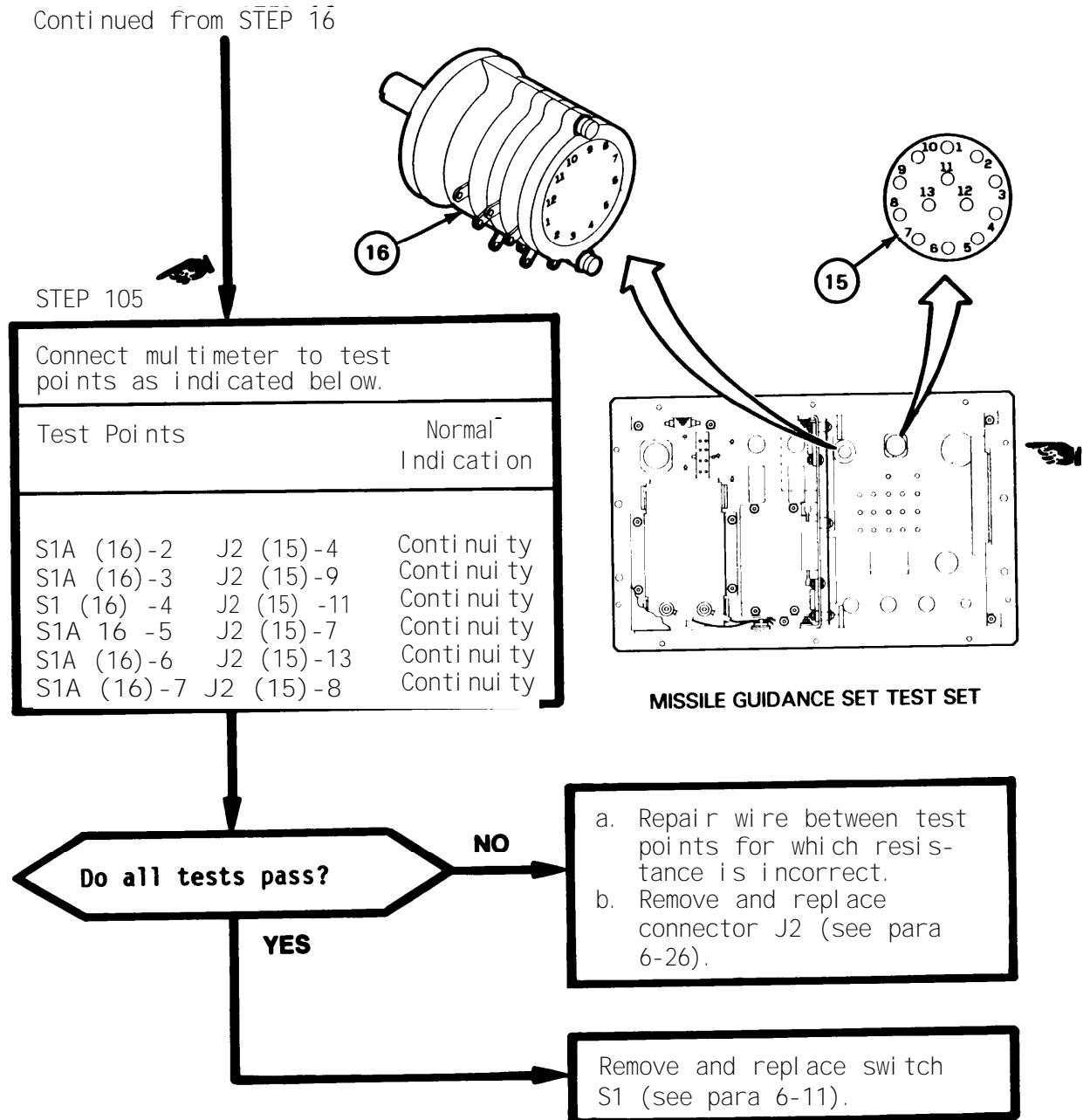
NO

- a. Remove and replace resistor R4 (see para 6-20.1).
- b. Repair wire between test points.

YES

Remove and replace switch S1 (see para 6-11).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 58 of 67)

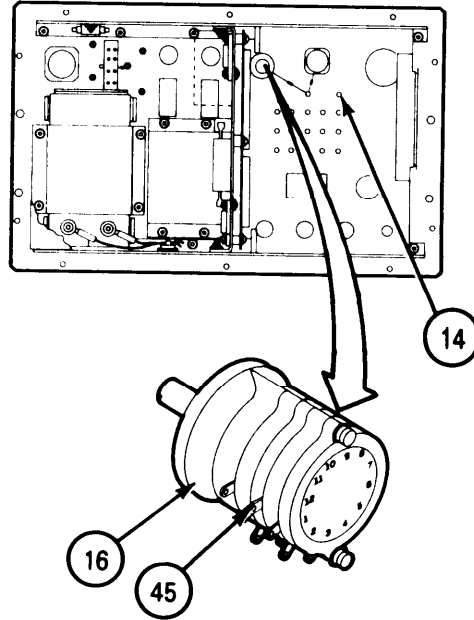


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 59 of 67)

Continued from STEP 16

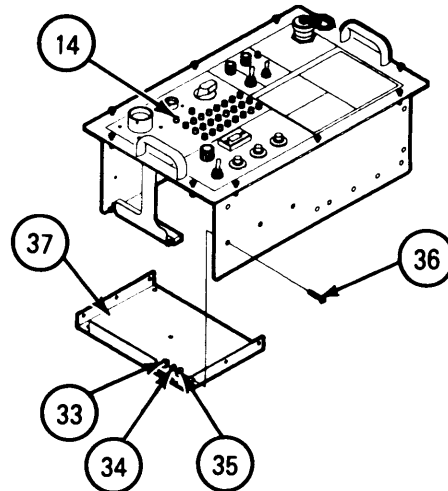
STEP 106

- On Missile Guidance Set Test Set:
- a. Remove missile guidance test circuit card A1 (see para 6-5).
 - b. Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).



STEP 107

Connect multimeter to L0 test point (14) jack and rear terminal.



Does multimeter indicate continuity?

NO

YES

STEP 108

Connect multimeter to J5 (14) rear terminal and switch SIB (16) pin C (45).

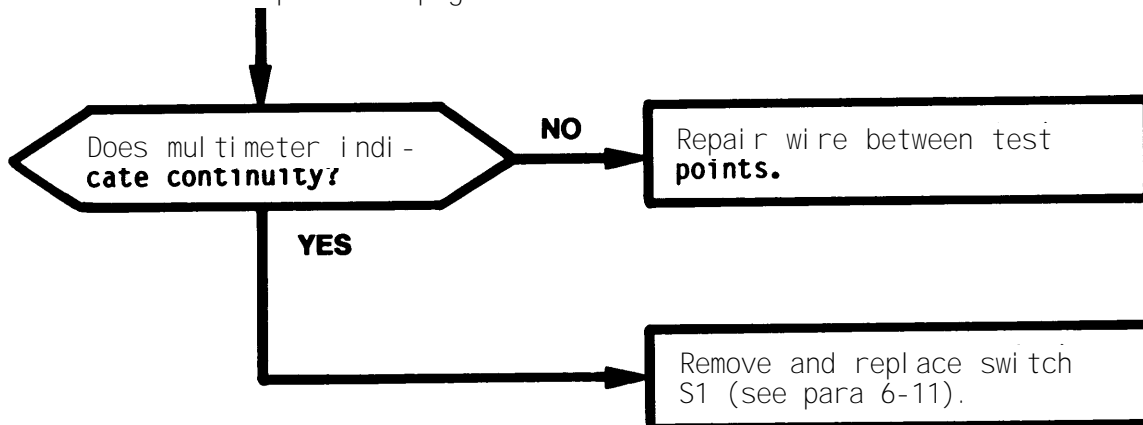
MISSILE GUIDANCE SET TEST SET

Remove and replace test point jack J5 (see para 6-15).

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 60 of 67)

Continued from previous page



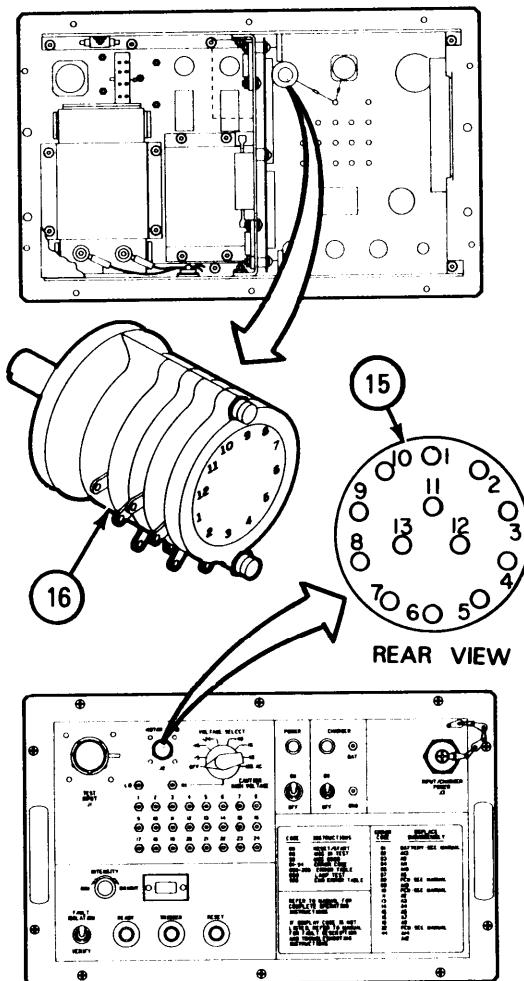
Continued from STEP 16

STEP 109

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
SIB (16)-1 J2 (15)-5	continuity
SIB (16)-2 J2 (15)-5	Continuity
SIB (16)-3 J2 (15)-12	Continuity
SIB (16)-4 J2 (15)-5	Continuity
SIB (16)-5 J2 (15)-12	Continuity
SIB (16)-6 J2 (15)-12	Continuity
SIB (16)-7 J2 (15)-12	Continuity
SIB (16)-8 J2 (15)-2	Continuity

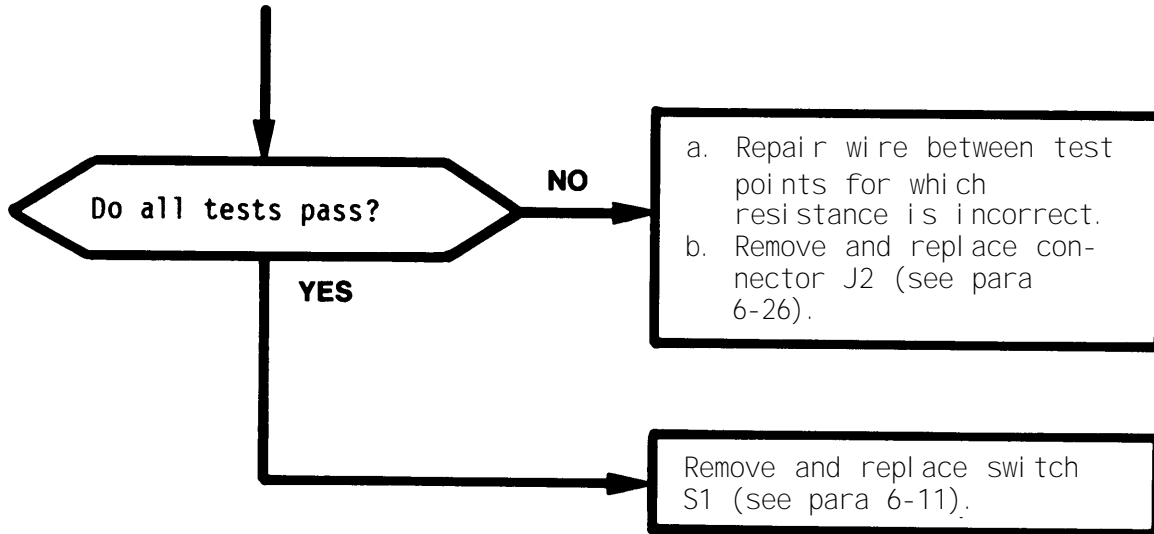
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MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 61 of 67)

Continued from previous page

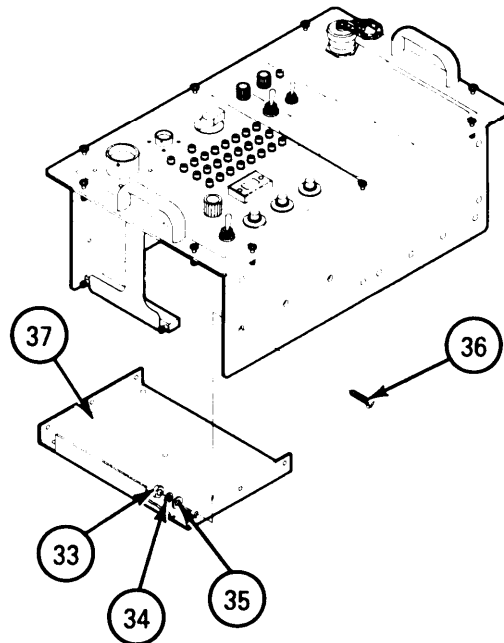


Continued from STEP 18

STEP 110

On Missile Guidance Set Test Set:

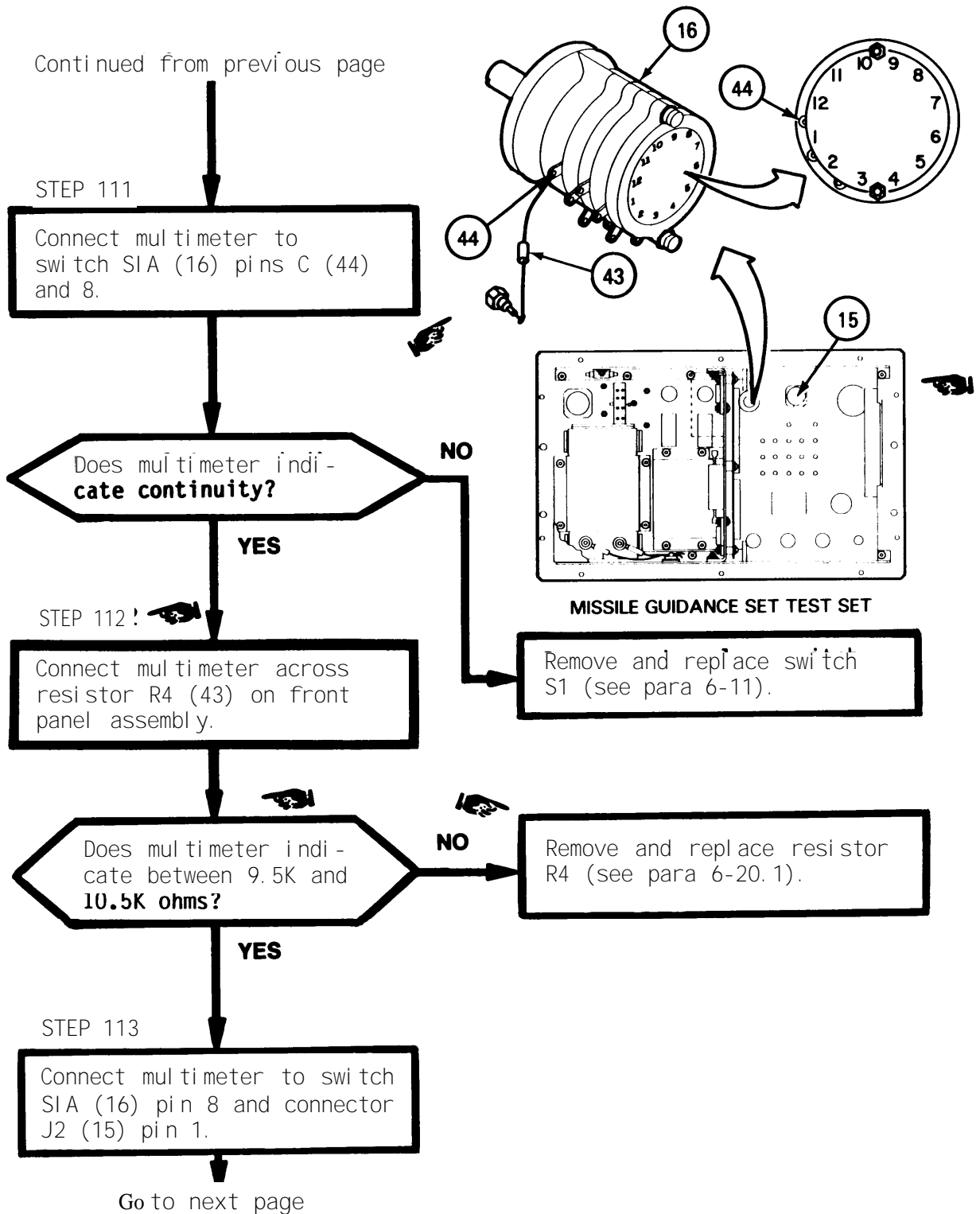
- a. Remove missile guidance test circuit card A1 (see para 6-5).
- b. Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).



MISSILE GUIDANCE SET TEST SET

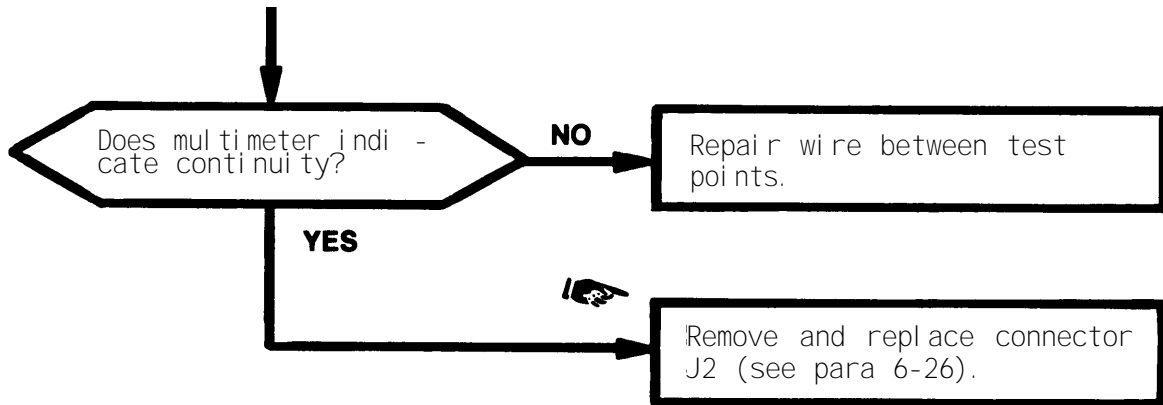
Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 62 of 67)



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 63 of 67)

Continued from previous page



Continued from STEP 19

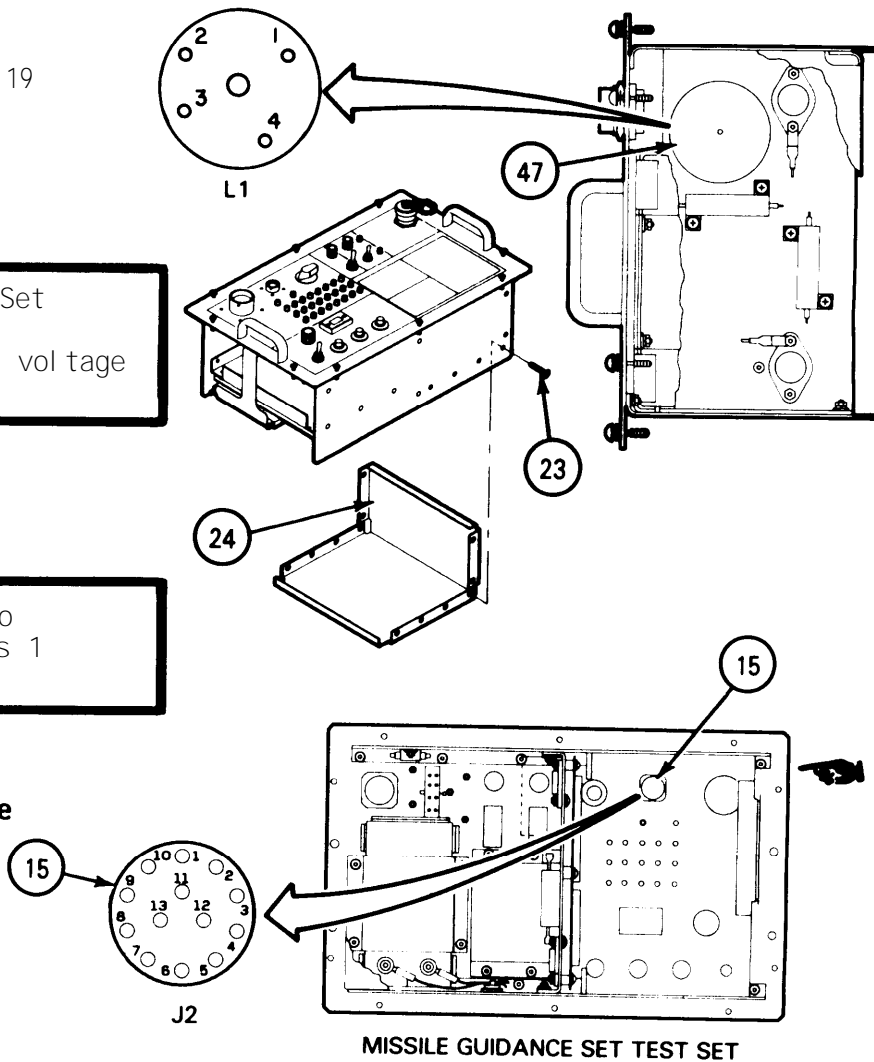
STEP 114

On Missile Guidance Set Test Set, remove 12 screws (23) and high voltage cover (24).

STEP 115

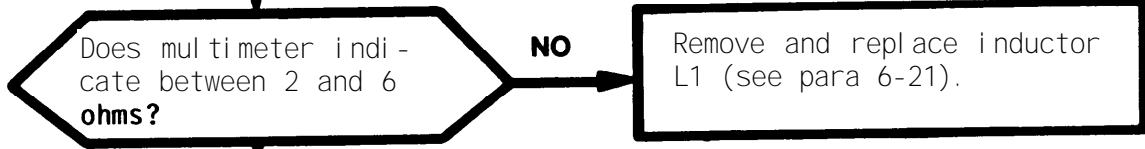
Connect multimeter to inductor L1 (47) pins 1 and 3.

Go to next page



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 64 of 67)

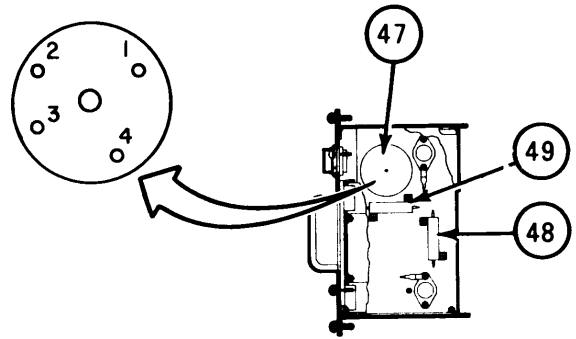
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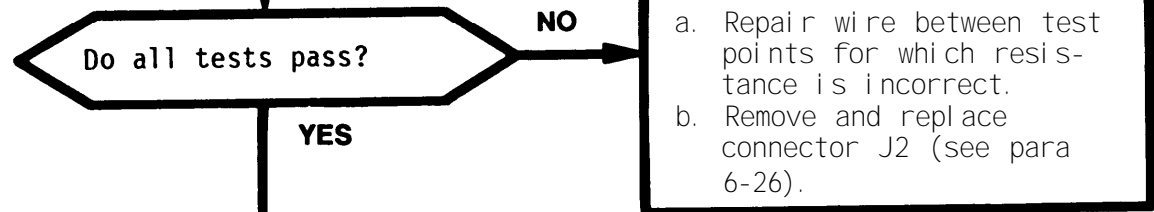
STEP 116

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
J2 (15)-1 R2 (48)	Continuity
J2 (15)-2 L1 (47)-3	Continuity



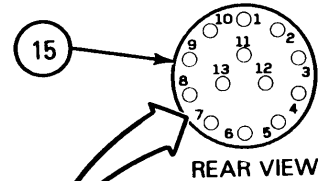
MISSILE GUIDANCE SET TEST SET



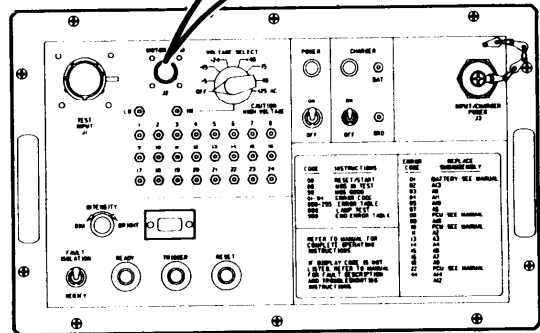
STEP 117

Connect multimeter to test points as indicated below.

Test points	Normal Indication
R2 (48) R3 (49)	Continuity
R2 (48) R3 (49)	Continuity
R2 (48) L1 (47)-1	Continuity



REAR VIEW

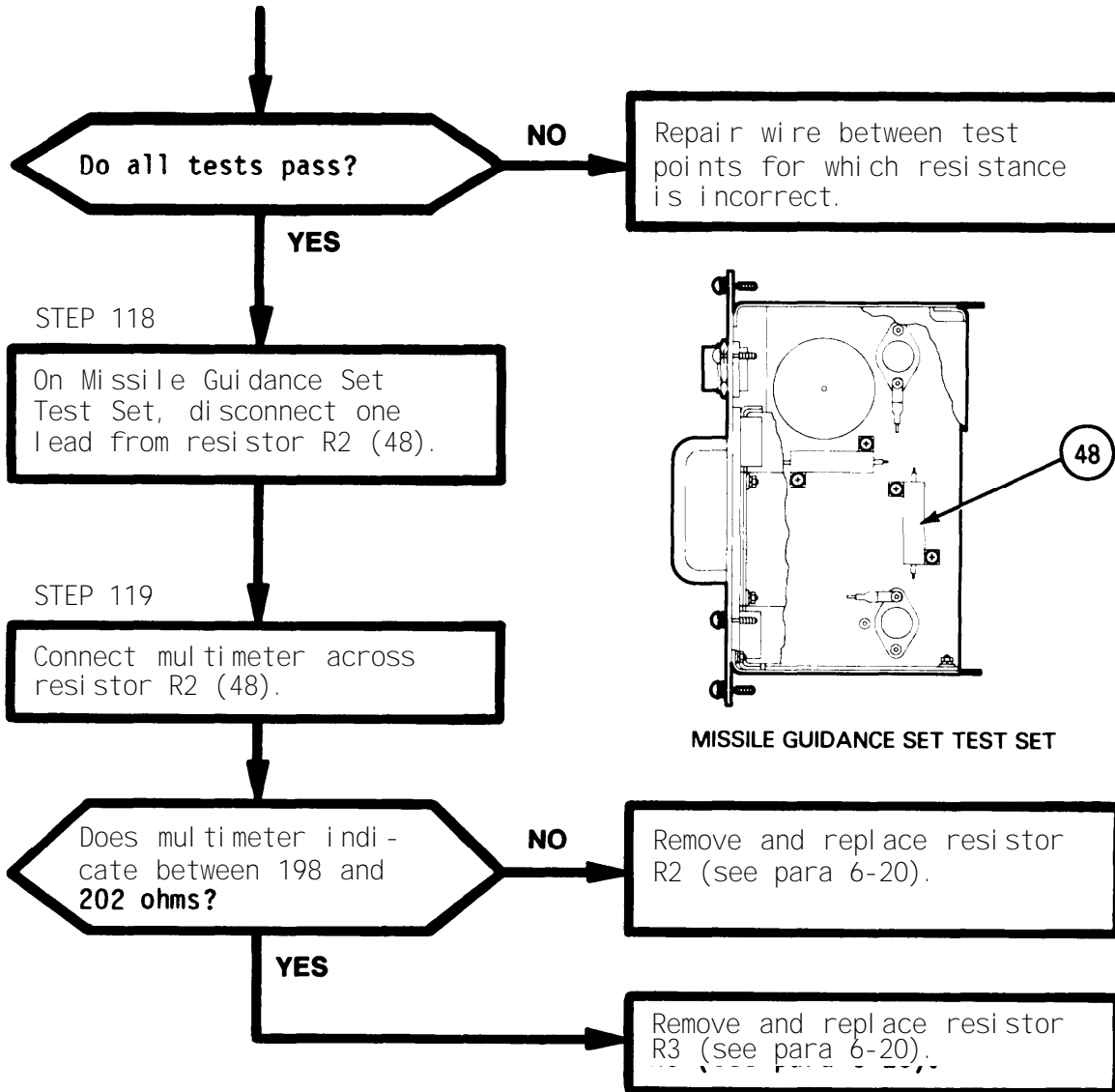


MISSILE GUIDANCE SET TEST SET

Go to next page

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 65 of 67)

Continued from previous page



6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 66 of 67)

Continued from STEP 20

STEP 120

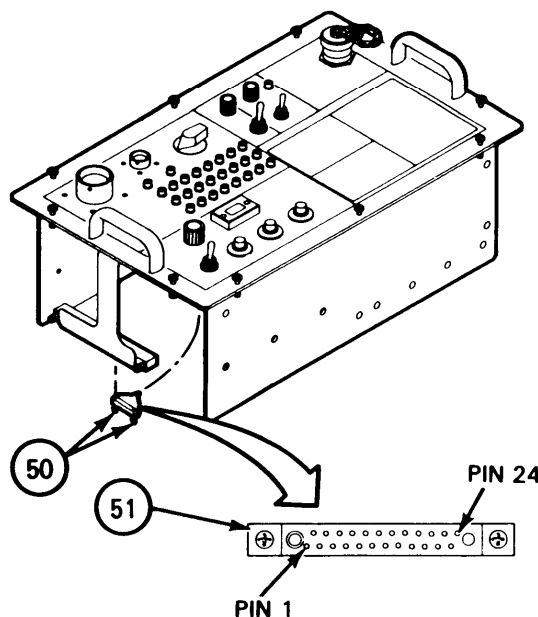
On Missile Guidance Set Test Set, loosen two screws (50) and disconnect connector P1 (51).

STEP 121

Connect multimeter to test points as indicated below.

Test Points	Normal Indication	
P1 (51)-1	TP-1	Continuity
P1 (51)-2	TP-2	Continuity
P1 (51)-3	TP-3	Continuity
P1 (51)-4	TP-4	Continuity
P1 (51)-5	TP-5	Continuity
P1 (51)-6	TP-6	Continuity
P1 (51)-7	TP-7	Continuity
P1 (51)-8	TP-8	Continuity
P1 (51)-9	TP-9	Continuity
P1 (51)-10	TP-10	Continuity
P1 (51)-11	TP-11	Continuity
P1 (51)-12	TP-12	Continuity
P1 (51)-13	TP-13	Continuity
P1 (51)-14	TP-14	Continuity
P1 (51)-15	TP-15	Continuity
P1 (51)-16	TP-16	Continuity
P1 (51)-17	TP-17	Continuity
P1 (51)-18	TP-18	Continuity
P1 (51)-19	TP-19	Continuity
P1 (51)-20	TP-20	Continuity

Go to next page



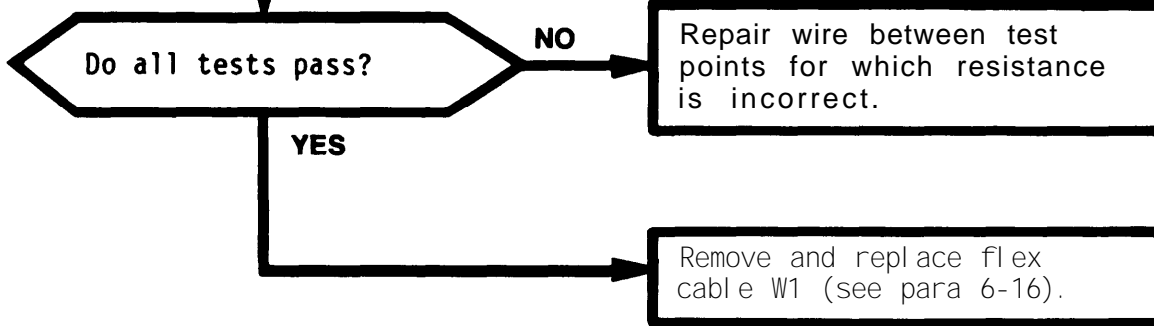
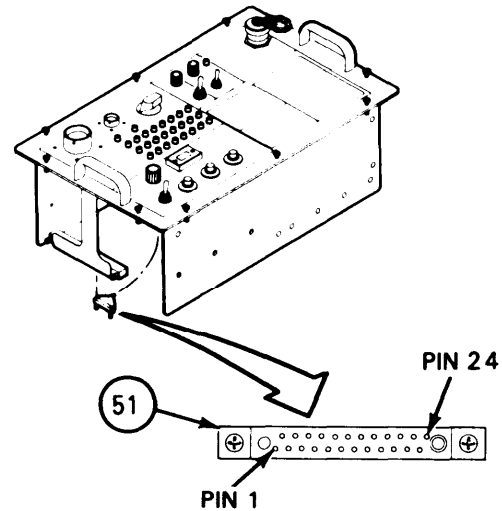
MISSILE GUIDANCE SET TEST SET

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
 (Sheet 66.1 of 67)

Continued from previous page

STEP 121
(CONT)

Test Points	Normal Indication
P1 (51)-21 TP-21	Continuity
P1 (51)-22 TP-22	Continuity
P1 (51)-23 TP-23	Continuity
P1 (51)-24 TP-24	Continuity

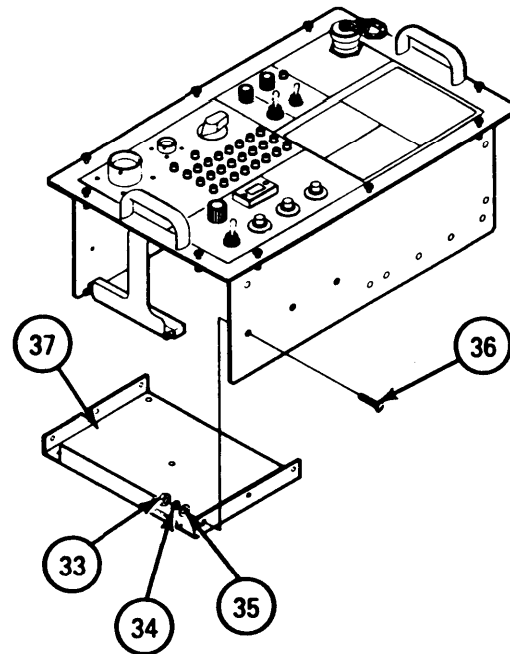


6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
 (Sheet 66.2 of 67)

Continued from STEP 18.1

STEP 122

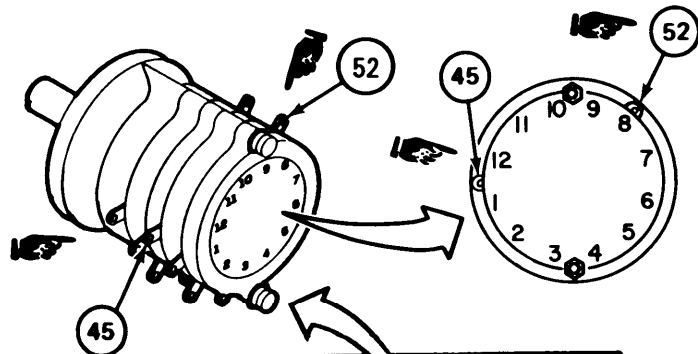
On Missile Guidance Set Test Set:
 a. Remove missile guidance test circuit card A1 (see para 6-5).
 b. Remove six nuts (33), six lock washers (34), six flat washers (35), six screws (36), and circuit card support shelf (37).



MISSILE GUIDANCE SET TEST SET

STEP 123

Connect multimeter to switch S1B pins C (45) and 8 (52).

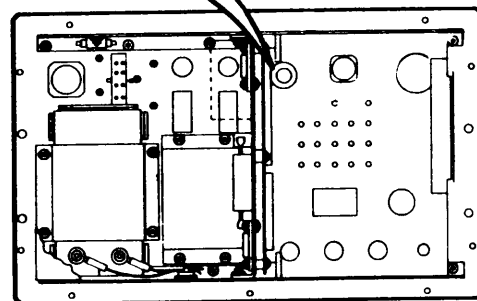


Does multimeter indicate continuity?

YES

Go to next page

NO

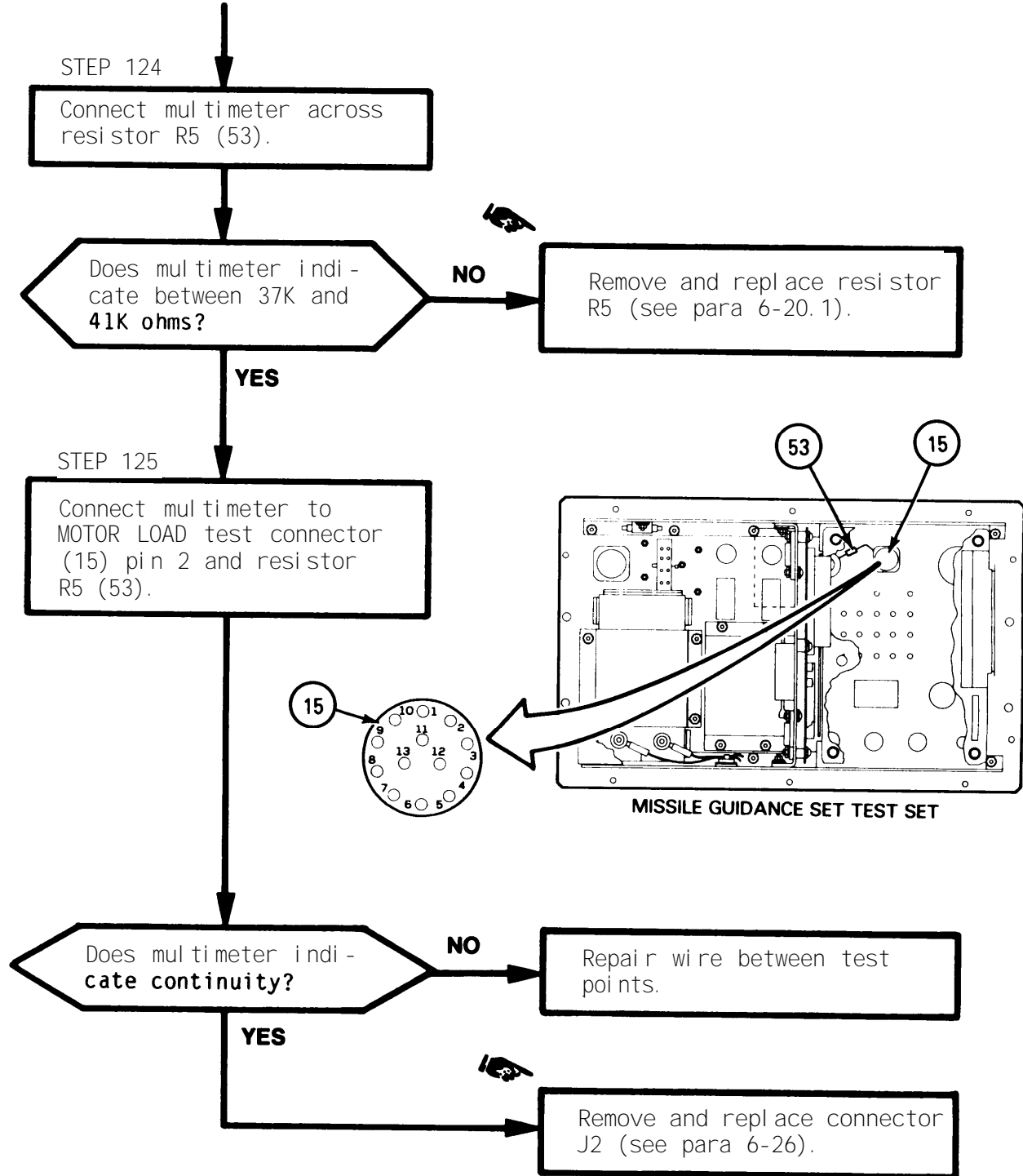


MISSILE GUIDANCE SET TEST SET

Remove and replace switch S1 (see para 6-11).

6-2. MISSILE GUIDANCE SET TEST SET TROUBLESHOOTING PROCEDURES (CONT)
 (Sheet 67 of 67)

Continued from previous page



Section II. MISSILE GUIDANCE SET TEST SET MAINTENANCE PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	6-3	6-70
REMOVAL AND REPLACEMENT OF FRONT PANEL ASSEMBLY	6-4	6-71
REMOVAL AND REPLACEMENT OF MISSILE GUIDANCE TEST CIRCUIT CARD A1	6-5	6-72
REMOVAL AND REPLACEMENT OF SWITCHES S4 THRU S6	6-6	6-73
REMOVAL AND REPLACEMENT OF POWER SUPPLY CIRCUIT CARD A2	6-7	6-74
REMOVAL AND REPLACEMENT OF BATTERY BT1	6-8	6-76
REMOVAL AND REPLACEMENT OF INDICATOR LAMPS DS1, DS2; AND LAMP HOLDERS XDS1, XDS2	6-9	6-78
REMOVAL AND REPLACEMENT OF SWITCH S2	6-10	6-80
REMOVAL AND REPLACEMENT OF SWITCH S1	6-11	6-82
REMOVAL AND REPLACEMENT OF SWITCH S3	6-12	6-84
REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER CB1	6-13	6-85
REMOVAL AND REPLACEMENT OF DISPLAY ASSEMBLY DS3	6-14	6-86
REMOVAL AND REPLACEMENT OF TEST POINT JACKS J4 THRU J24	6-15	6-88
REMOVAL AND REPLACEMENT OF FLEX CABLE ASSEMBLY W1	6-16	6-90
REMOVAL AND REPLACEMENT OF TRANSFORMER T1	6-17	6-92
REMOVAL AND REPLACEMENT OF POTENTIOMETER R1	6-18	6-94
REMOVAL AND REPLACEMENT OF EMI FILTER FL1	6-19	6-95
REMOVAL AND REPLACEMENT OF RESISTORS R2 AND R3	6-20	6-96
REMOVAL AND REPLACEMENT OF RESISTORS R4 AND R5	6-20.1	6-98
REMOVAL AND REPLACEMENT OF INDUCTOR L1	6-21	6-98.2
REMOVAL AND REPLACEMENT OF VOLTAGE REGULATORS U1 AND U2	6-22	6-100
REMOVAL AND REPLACEMENT OF RELAY K1	6-23	6-102
REMOVAL AND REPLACEMENT OF AC PLUG W2P1	6-24	6-103

Section II. MISSILE GUIDANCE SET TEST SET MAINTENANCE PROCEDURES (CONT)

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
REMOVAL AND REPLACEMENT OF TEST POINT JACKS J30 AND J31	6-25	6-104
REMOVAL AND REPLACEMENT OF CONNECTOR J2	6-26	6-105
REMOVAL AND REPLACEMENT OF CONNECTOR J3	6-27	6-106
REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S1	6-28	6-107
REMOVAL AND REPLACEMENT OF KNOB FOR POTENTIOMETER R1	6-29	6-108
REMOVAL AND REPLACEMENT OF FUSE F1	6-29.1	6-109
CHARGING OF BATTERY BT1	6-30	6-110

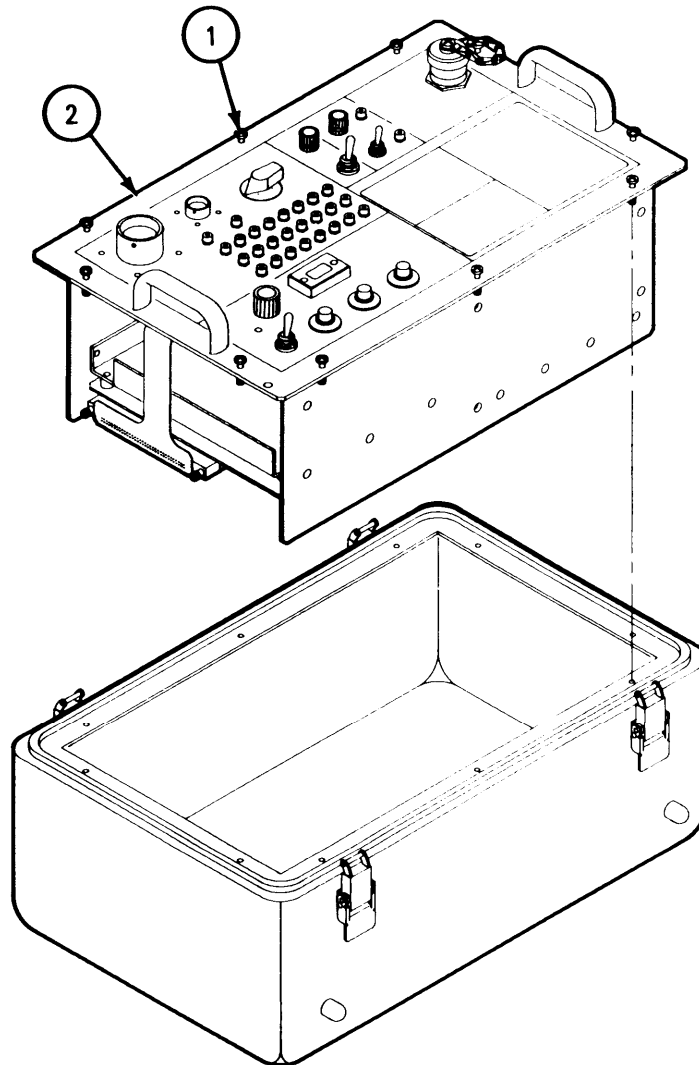
6-3. SCOPE

This section contains removal and replacement procedures for the Missile Guidance Set Test Set.

6-4. REMOVAL AND REPLACEMENT OF FRONT PANEL ASSEMBLY**TOOLS:**

No. 2 cross-tip screwdriver

Torque screwdriver, 0 to 30 inch-pounds, No. 2 cross-tip bit

**STEP 1****REMOVAL**

Loosen ten captive screws (1) and remove front panel assembly (2).

STEP 2**REPLACEMENT**

Install front panel assembly (2) and torque ten captive screws (1) to 20 to 22 inch-pounds.

END OF TASK

6-5. REMOVAL AND REPLACEMENT OF MISSILE GUIDANCE TEST CIRCUIT CARD A1

TOOLS:

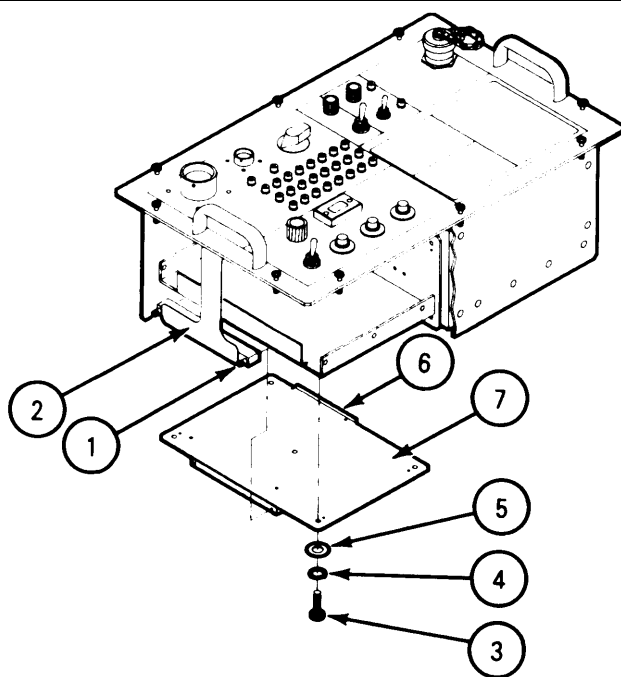
- 1/8-inch flat-tip screwdriver
- No. 2 cross-tip screwdriver

EQUIPMENT CONDITION:

- Front panel assembly removed (para 6-4),

MATERIALS:

- Sealing compound (Item 3.1, Appendix E)



STEP 1

REMOVAL

- A. Loosen two screws (1) and disconnect connector W1P1 (2)
- B. Remove five screws (3), five lock washers (4), and five flat washers (5).
- C. Disconnect connector (6) and remove missile guidance test circuit card A1 (7)

STEP 2

REPLACEMENT

- A. Connect connector (6) while installing missile guidance test circuit card A1 (7).
- B. Install five flat washers (5), five lock washers (4), and five screws (3).
- C. Apply sealing compound to threads of two screws (1).
- D. Connect connector W1P1 (2) and tighten two screws (1).
- E. Install front panel assembly (para 6-4).

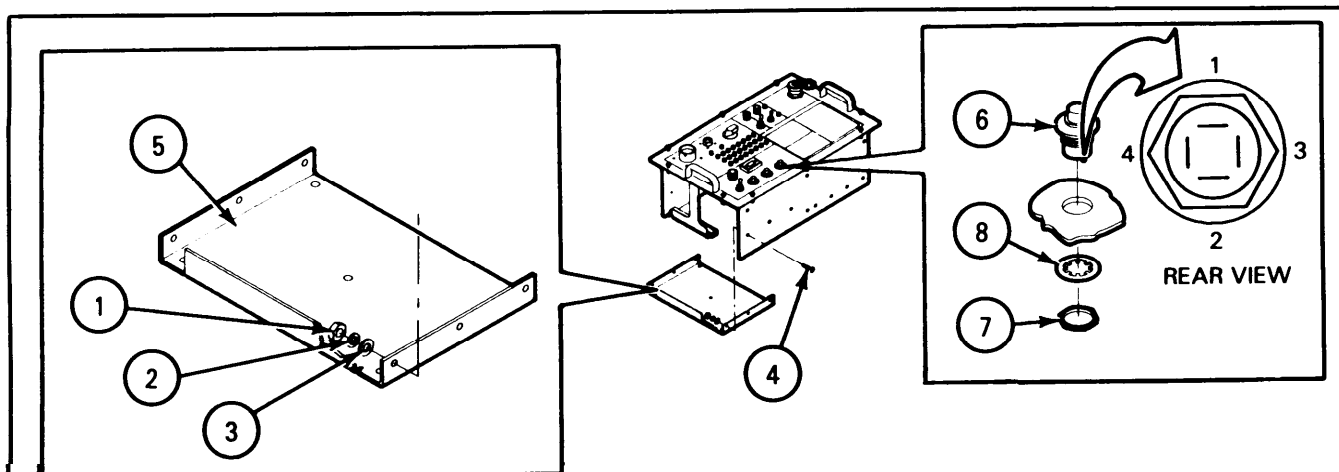
END OF TASK

6-6. REMOVAL AND REPLACEMENT OF SWITCHES S4 THRU S6**TOOLS:**

Soldering kit
 23/32-inch open-end wrench
 5/16-inch open-end wrench

EQUIPMENT CONDITION:

Missile guidance test circuit card
 A1 removed (para 6-5).

**STEP 1****REMOVAL**

- A. Using 5/16-inch open-end wrench, remove six nuts (1), six lock washers (2), six flat washers (3), six screws (4), and circuit card support shelf (5).
- B. Tag and unsolder leads from switch (6).
- C. Using 23/32-inch open-end wrench, remove nut (7), washer (8), and switch (6).

STEP 2**REPLACEMENT**

- A. On switch (6), solder 22 gage jumper wire between terminals 1 and 3.
- B. Install switch (6), washer (8) and nut (7) using 23/32-inch open-end wrench.
- C. Solder leads to switch (6) and untag.
- D. Install circuit card support shelf (5), six screws (4), six flat washers (3), six lock washers (2), and six nuts (1) -using 5/16-inch open-end wrench.
- E. Install missile guidance test circuit card A1 (para 6-5).
- F. Install front panel assembly (para 6-4).

END OF TASK

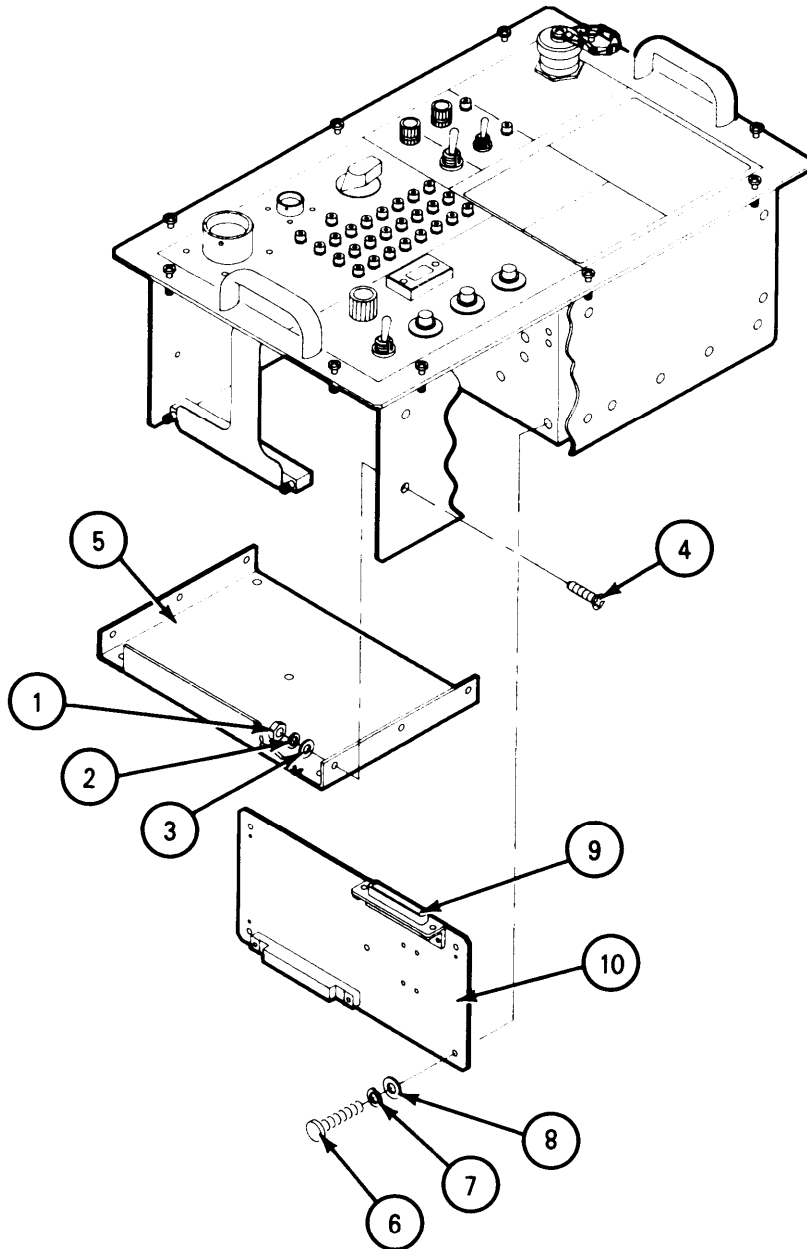
6-7. REMOVAL AND REPLACEMENT OF POWER SUPPLY CIRCUIT CARD A2 (Sheet 1 of 2)

TOOLS:

- No. 2 cross-tip screwdriver
- 5/16-inch open-end wrench
- Torque wrench (5 to 75 inch-pounds)

EQUIPMENT CONDITION:

- Missile guidance test circuit card A1 removed (para 6-5)



GO TO NEXT PAGE

6-7. REMOVAL AND REPLACEMENT OF POWER SUPPLY CIRCUIT CARD A2 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove six nuts (1), six lock washers (2), six flat washers (3), six screws (4) and circuit card support shelf (5).
- B. Remove five screws (6), five lock washers (7), and five flat washers (8).

CAUTION

Pull connector (9) straight out to prevent damage to connector pins.

- C. Disconnect connector (9) and carefully remove power supply circuit card A2 (10).

STEP 2

REPLACEMENT

CAUTION

Install connector (9) carefully to prevent damage to connector pins.

- A. Connect connector (9) while installing power supply circuit card A2 (10).
- B. Install five flat washers (8), five lock washers (7), and five screws (6). Torque screws (6) to 13 to 15 inch-pounds.
- C. Install circuit card support shelf (5), six screws (4), six flat washers (3), six lock washers (2), and six nuts (1).
- D. Install missile guidance test circuit card A1 (para 6-5).
- E. Install front panel assembly (para 6-4).

END OF TASK

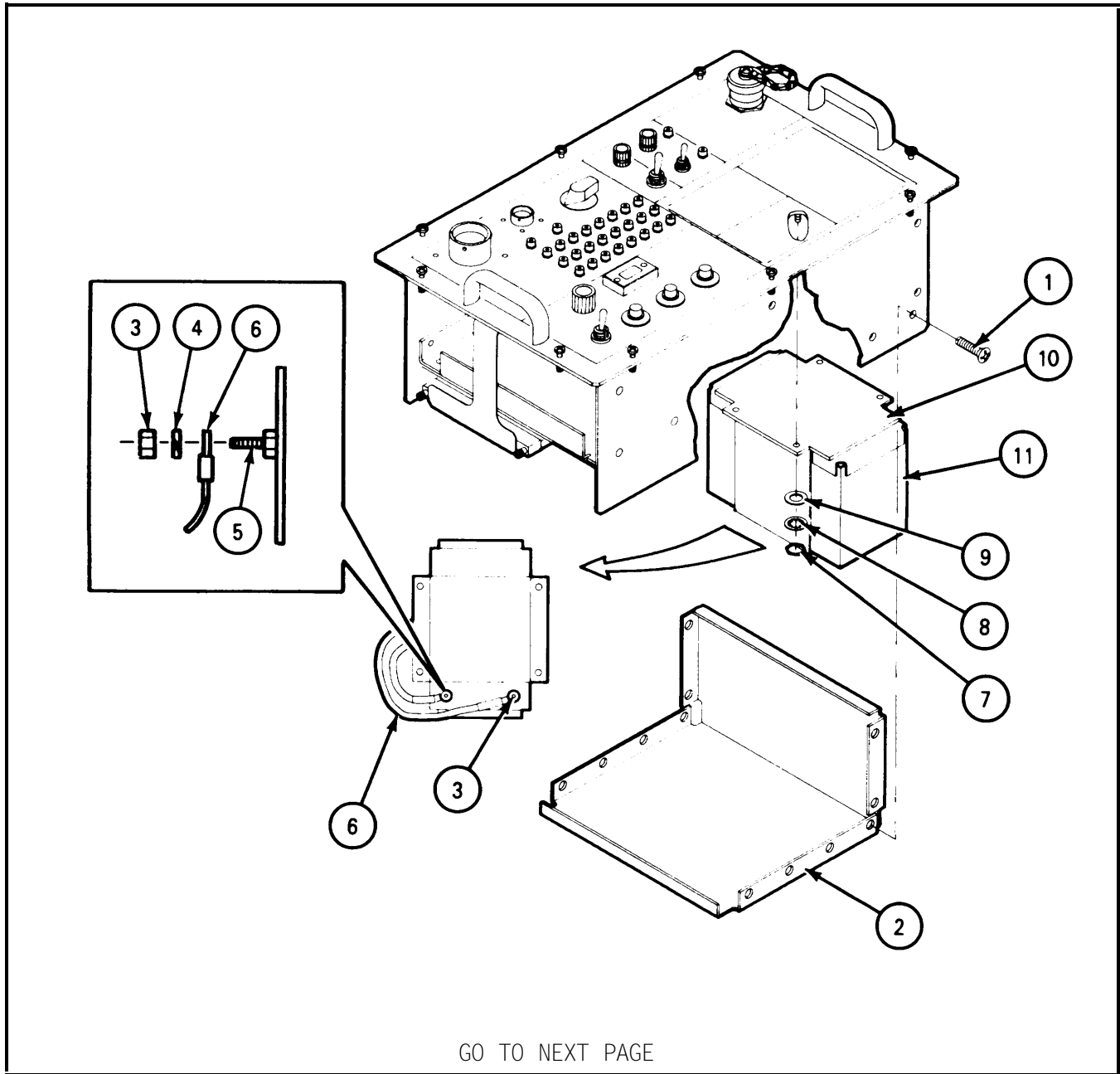
**6-8. REMOVAL AND REPLACEMENT OF BATTERY BT1
(Sheet 1 of 2)**

TOOLS:

- No. 2 cross-tip screwdriver
- 11/32-inch socket wrench
- 5/16-inch socket wrench
- Torque wrench (5 to 75 inch-pounds)

EQUIPMENT CONDITION:

Front panel assembly removed (para 6-4)



6-8. REMOVAL AND REPLACEMENT OF BATTERY BT1 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Using 5/16-inch socket wrench, remove two terminal nuts (3) and two flat washers (4) from battery terminals (5).
- C. Tag and disconnect two battery leads (6). Retain washers (4) and nuts (3) for installation of new battery.
- D. Using 11/32-inch socket wrench, remove four nuts (7), four lock washers (8), and four flat washers (9).
- E. Remove battery bracket (10) and battery BT1 (11).

STEP 2

REPLACEMENT



The battery may be damaged if the terminals come in contact with metal surfaces.

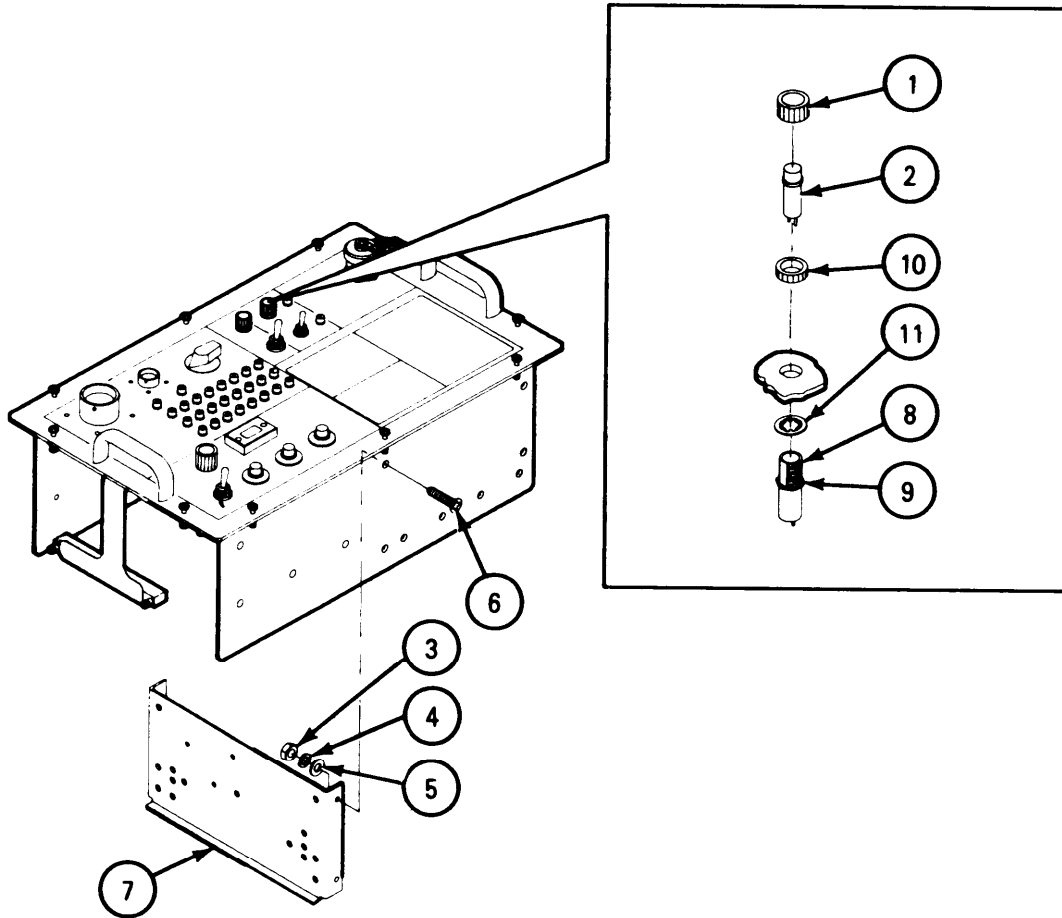
- A. Install new battery BT1 (11) and battery bracket (10).
- B. Using 11/32-inch socket wrench, install four flat washers (9), four lock washers (8), and four nuts (7).
- C. Connect two battery leads (5) and untag.
- D. Using 5/16-inch socket wrench, install two washers (4) and two terminal nuts (3) on terminals (5). Torque nuts (3) to 8 to 10 inch-pounds.
- E. Install high voltage cover (2) and 12 screws (1).
- F. Install front panel assembly (para 6-4).

END OF TASK

**6-9. REMOVAL AND REPLACEMENT OF INDICATOR LAMPS DS1, DS2;
AND LAMPHOLDERS XDS1, XDS2 (Sheet 1 of 2)**

TOOLS:

- Soldering kit
- 1/2-inch open-end wrench
- 5/16-inch open-end wrench
- No. 2 cross-tip screwdriver



STEP 1

REMOVAL

- A. Remove nut (1).
- B. Remove lamp (2) by pulling straight out.

GO TO NEXT PAGE

6-9. REMOVAL AND REPLACEMENT OF INDICATOR LAMPS DS1, DS2; AND LAMP HOLDERS XDS1, XDS2 (CONT)
(Sheet 2 of 2)

NOTE

Remainder of procedure is for removing lamp holders XDS1 and XDS2.

- C. Remove battery BT1 (para 6-8).
- D. Remove power supply circuit card A2 (para 6-7).
- E. Using 5/16-inch open-end wrench, remove four nuts (3), four lock washers (4), four flat washers (5), and four screws (6).
- F. Carefully, move cross brace (7) out of the way.
- G. Tag and unsolder leads from lamp holder (8).
- H. Using 1/2-inch open-end wrench, loosen nut (9).
- I. Remove nut (10), lock washer (11), and lamp holder (8).

STEP 2

REPLACEMENT

- A. Install lamp holder (8), lock washer (11), and nut (10).
- B. Using 1/2-inch open-end wrench, tighten nut (9).
- C. Solder leads to lamp holder (8) and untag.
- D. Install cross brace (7), four screws (6), four flat washers (5), four lock washers (4), and four nuts (3) using 5/16-inch open-end wrench.
- E. Install battery BT1 (para 6-8).
- F. Install power supply circuit card A2 (para 6-7).
- G. Install missile guidance test circuit card A1 (para 6-5).
- H. Install front panel assembly (para 6-4).
- I. Install lamp (2).
- J. Install nut (1).

END OF TASK

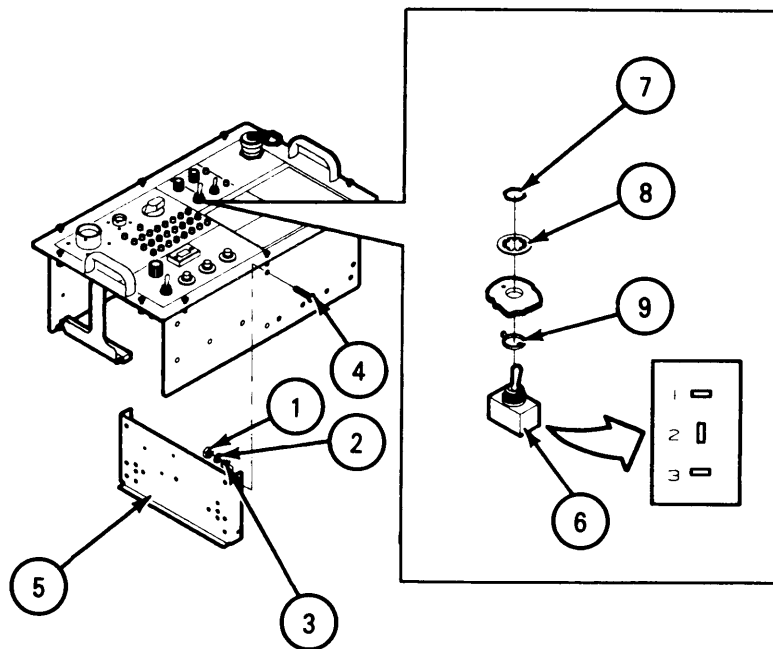
6-10. REMOVAL AND REPLACEMENT OF SWITCH S2 (Sheet 1 of 2)

TOOLS:

- Soldering kit
- 9/16-inch open-end wrench
- 5/16-inch open-end wrench
- No. 2 cross-tip screwdriver

EQUIPMENT CONDITION:

- Power supply circuit card AZ removed (para 6-7)
- Battery BT1 removed (para 6-8).



GO TO NEXT PAGE

6-10. REMOVAL AND REPLACEMENT OF SWITCH S2 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Using 5/16-inch open-end wrench, remove four nuts (1), four lock washers (2), four flat washers (3), and four screws (4).
- B. Carefully, move cross brace (5) out of the way.
- C. Tag and unsolder leads from switch S2 (6).
- D. Using 9/16-inch open-end wrench, remove nut (7), lock washer (8), switch S2 (6), and keylock (9).

STEP 2

REPLACEMENT

- A. Install keylock (9), switch S2 (6), lock washer (8), and nut (7) using 9/16-inch open-end wrench.
- B. Solder leads to switch S2 (9) and untag.
- C. Install cross brace (5), four screws (4), four flat washers (3), four lock washers (2), and four nuts (1) using 5/16-inch open-end wrench.
- D. Install battery BT1 (para 6-8).
- E. Install power supply circuit card A2 (para 6-7).
- F. Install missile guidance test circuit card A1 (para 6-5).
- G. Install front panel assembly (para 6-4).

END OF TASK

6-11. REMOVAL AND REPLACEMENT OF SWITCH S1 (Sheet 1 of 2)

TOOLS:

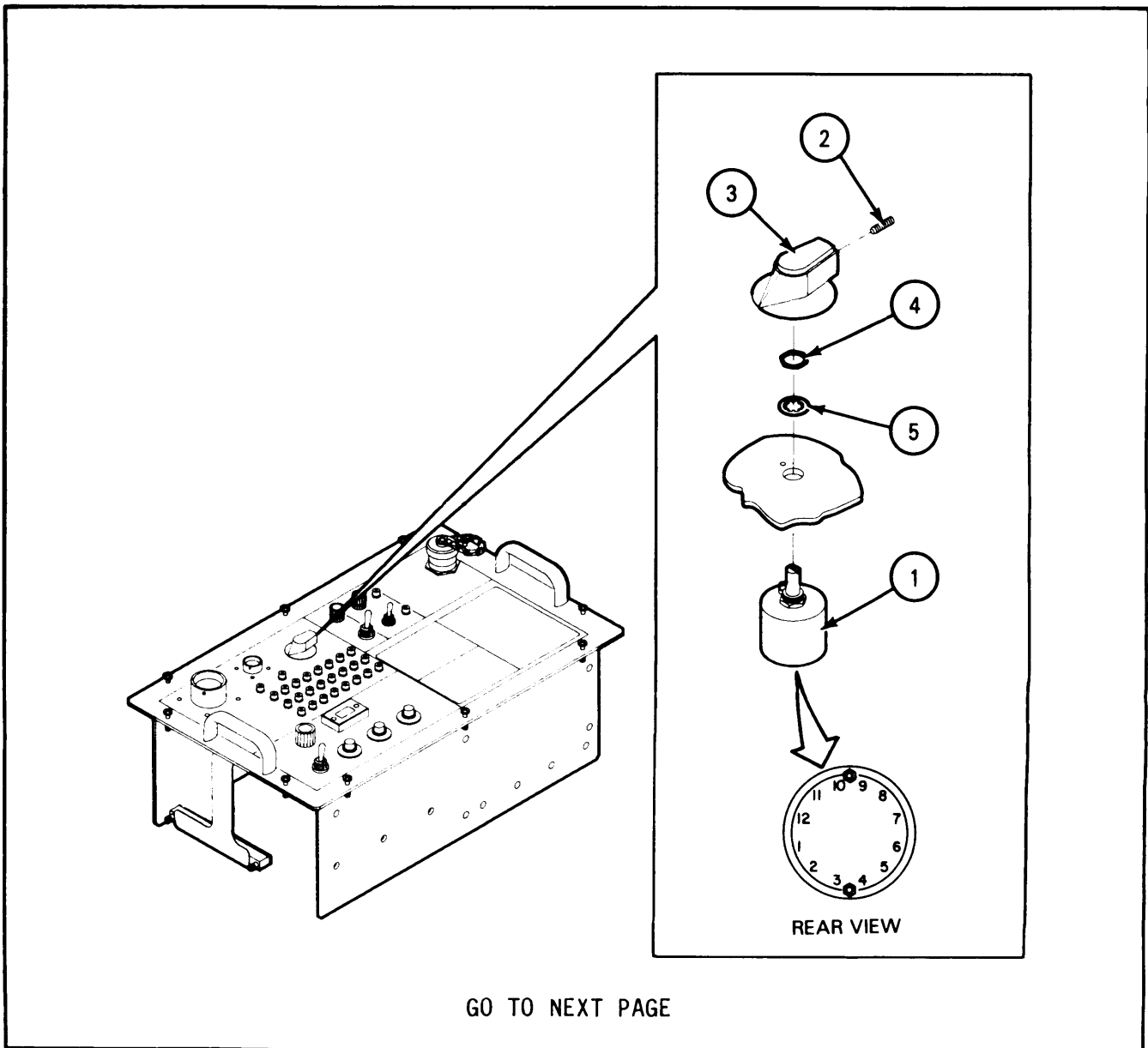
- Soldering kit
- No. 2 cross-tip screwdriver
- 0.05-inch socket-head screw key
- 9/16-inch open-end wrench

EQUIPMENT CONDITION:

- Power supply circuit card A2 removed (para 6-7).

MATERIALS:

- Solid electrical wire (Item 14, Appendix E)
- Insulation sleeving (Item 15, Appendix E)



6-11. REMOVAL AND REPLACEMENT OF SWITCH S1 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Tag and unsolder leads from switch S1 (1).
- B. Loosen two set screws (2) and remove knob (3).
- C. Remove nut (4), lock washer (5), and switch S1 (1).

STEP 2

REPLACEMENT

- A. On switch S1B (1), install 22 gage bare jumper wire between terminals 1 and 2, 5 and 6, and 6 and 7.
- B. On switch S1B (1) install 22 gage jumper wire, insulated with sleeving, between terminals 2 and 4, and 3 and 5.
- C. Align key and install switch S1 (1), lock washer (5), and nut (4).
- D. Set switch S1 (1) fully counterclockwise.
- E. Install knob (3).
- F. Align arrow on knob (3) with OFF position and tighten two set screws (2).
- G. Solder leads to switch S1 (1) and untag.
- H. Install power supply circuit card A2 (para 6-7).
- I. Install missile guidance test circuit card A1 (para 6-5).
- J. Install front panel assembly (para 6-4).

END OF TASK

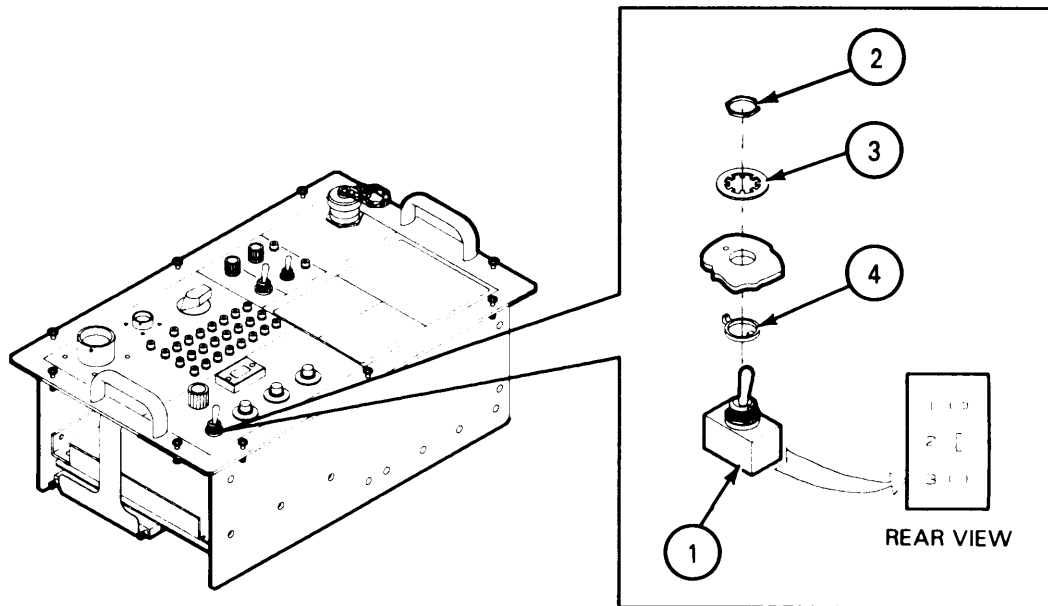
6-12. REMOVAL AND REPLACEMENT OF SWITCH S3

TOOLS:

Soldering kit
 9/16-inch open-end wrench

EQUIPMENT CONDITION:

Front panel assembly removed (para 6-4).



STEP 1 REMOVAL

- A. Tag and unsolder leads from switch S3 (1).
- B. Remove nut (2), lock washer (3), switch S3 (1), and keylock (4).

STEP 2 REPLACEMENT

- A. Install keylock (4), switch S3 (1), lock washer (3), and nut (2).
- B. Solder leads to switch S3 (1) and untag.
- C. Install front panel assembly (para 6-4).

END OF TASK

6-13. REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER CB1**TOOLS:**

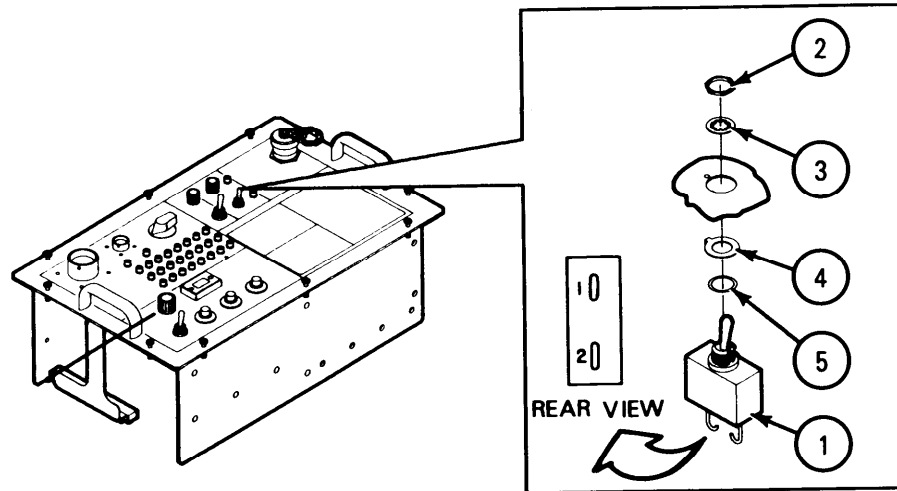
Soldering kit
1/2-inch open-end wrench

EQUIPMENT CONDITION:

Battery BT1 removed (para 6-8).

MATERIALS:

Insulating compound (Item 3,
Appendix E)

**STEP 1** REMOVAL

- A. Tag and unsolder leads from circuit breaker CB1 (1).
- B. Remove nut (2), lock washer (3), circuit breaker CB1 (1), keylock (4), and flat washer (5).

STEP 2 REPLACEMENT

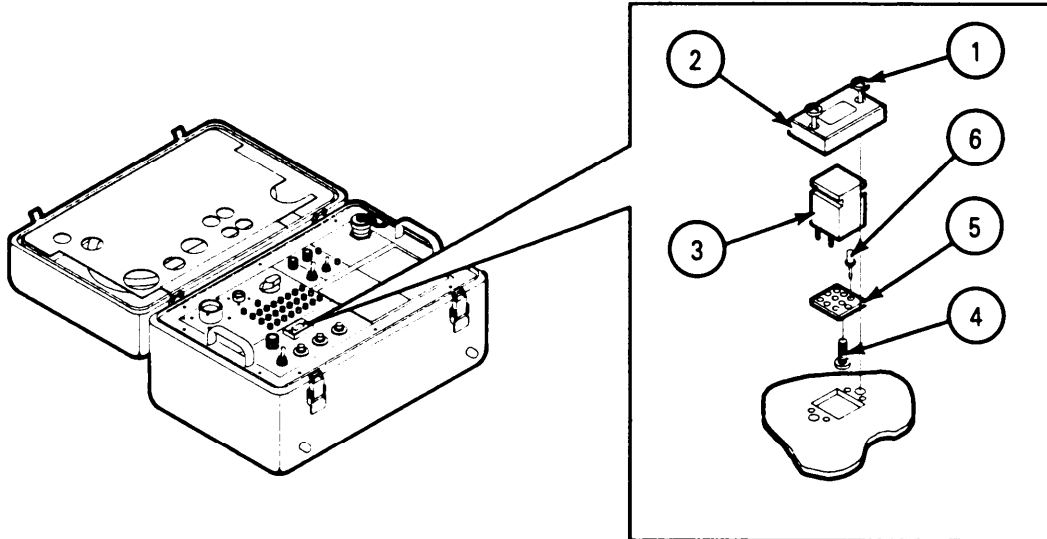
- A. Install flat washer (5), keylock (4), circuit breaker CB1 (1), lock washer (3), and nut (2).
- B. Solder leads to circuit breaker CB1 (1) and untag.
- C. On CB1 (1), coat terminals with insulating compound.
- D. Install battery BT1 (para 6-8).
- E. Install front panel assembly (para 6-4).

END OF TASK

**6-14. REMOVAL AND REPLACEMENT OF DISPLAY ASSEMBLY DS3
(Sheet 1 of 2)**

TOOLS:

- No. 0 cross-tip screwdriver
- 0.100-inch jeweler's screwdriver
- Craftman's tweezers



GO TO NEXT PAGE

6-14. REMOVAL AND REPLACEMENT OF DISPLAY ASSEMBLY DS3 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove two screws (1) and bezel (2).
- B. Remove display assembly (3) by pulling straight out.

NOTE

Steps C, D, and E are for removal of individual lamps.

- C. Remove four screws (4).
- D. Remove plate (5).
- E. Using tweezers, remove lamp (6).

STEP 2

REPLACEMENT

- A. Using tweezers, install lamp (6).
- B. Install plate (5) and four screws (4).
- C. Install display assembly DS3 (3).
- D. Install bezel (2) and two screws (1).

END OF TASK

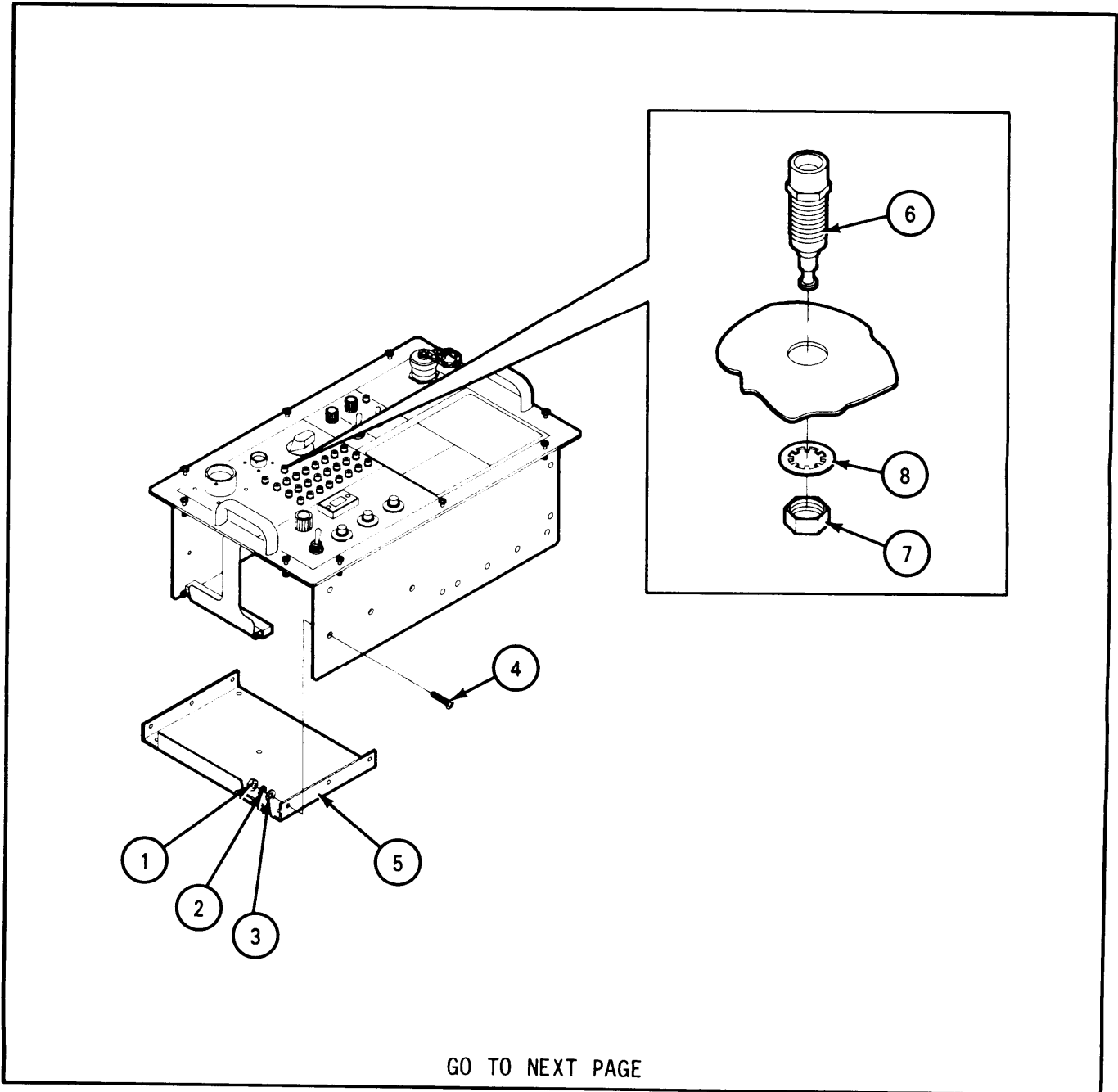
**6-15. REMOVAL AND REPLACEMENT OF TEST POINT JACKS J4 THRU J24
(Sheet 1 of 2)**

TOOLS:

- Soldering kit
- 5/16-inch open-end wrench
- No. 2 cross-tip screwdriver
- 3/8-inch socket wrench
- 5/16-inch socket wrench

EQUIPMENT CONDITION:

- Missile guidance test circuit card
A1 removed (para 6-5).



**6-15. REMOVAL AND REPLACEMENT OF TEST POINT JACKS J4 THRU J24 (CONT)
(Sheet 2 of 2)**

STEP 1

REMOVAL

- A. Using 5/16-inch open-end wrench, remove six nuts (1), six lock washers (2), six flat washers (3), six screws (4), and circuit card support shelf (5).
- B. Tag and unsolder lead from test point jack (6).
- C. Using 3/8-inch and 5/16-inch socket wrenches, remove nut (7), lock washer (8), and test point jack (6).

STEP 2

REPLACEMENT

- A. Using 3/8-inch and 5/16-inch socket wrenches, install test point jack (6), lock washer (8), and nut (7).
- B. Solder lead to test point jack (6) and untag.
- C. Install circuit card support shelf (5), six screws (4), six flat washers (3), six lock washers (2), and six nuts (1) using 5/16-inch open-end wrench.
- D. Install missile guidance test circuit card A1 (para 6-5).
- E. Install front panel assembly (para 6-4).

END OF TASK

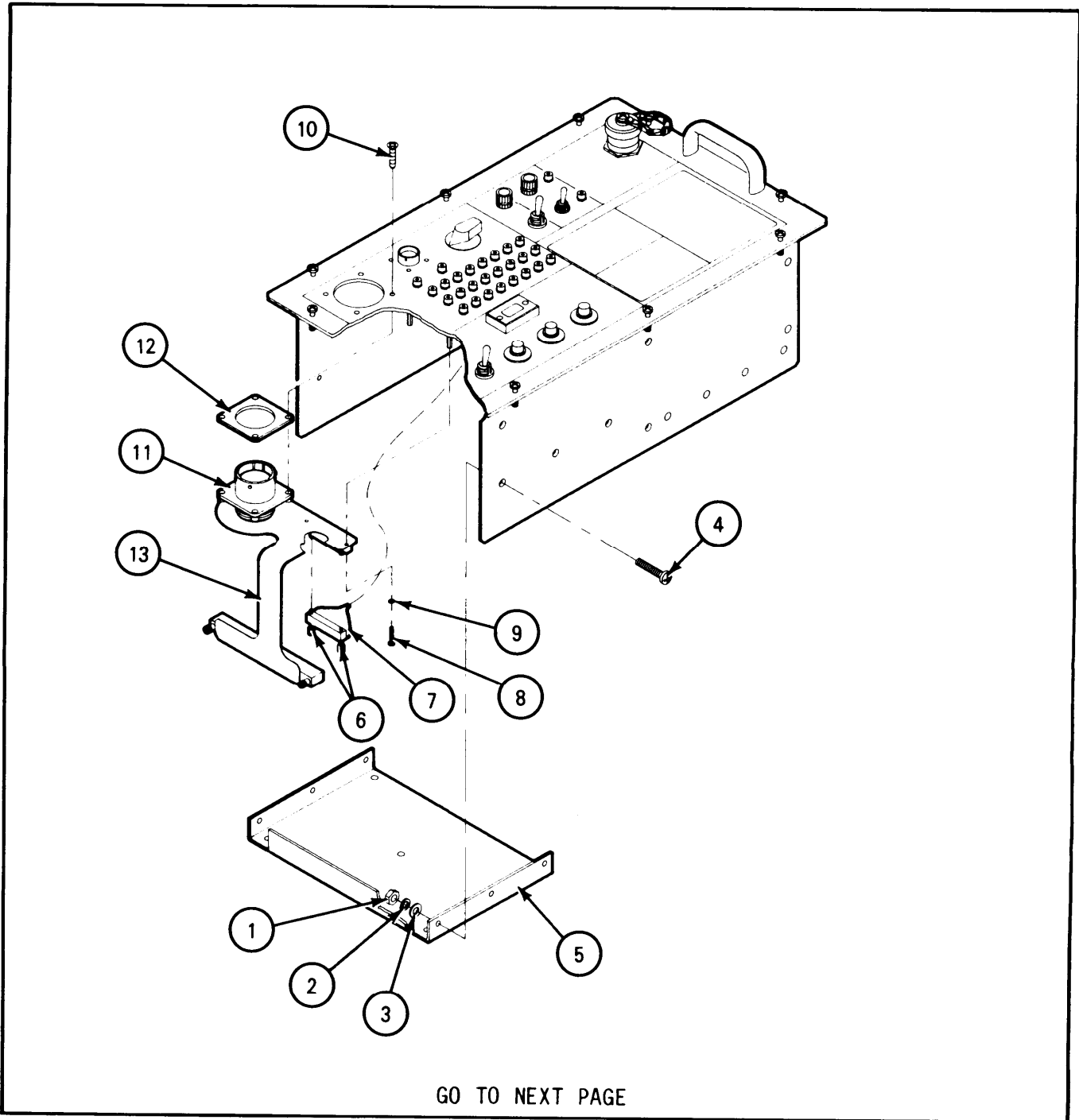
**6-16. REMOVAL AND REPLACEMENT OF FLEX CABLE ASSEMBLY W1
(Sheet 1 of 2)**

TOOLS:

- 1/8-inch flat-tip screwdriver
- No. 2 cross-tip screwdriver
- 5/16-inch open-end wrench

EQUIPMENT CONDITION:

- Missile guidance test circuit card
A1 removed (para 6-5).



6-16. REMOVAL AND REPLACEMENT OF FLEX CABLE ASSEMBLY W1 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove six nuts (1), six lock washers (2), six flat washers (3), six screws (4), and circuit card support shelf (5).



If screws (6) are not loosened alternately, the connector (7) may be damaged.

- B. Alternately loosen two screws (6) and disconnect connector (7).
- C. Remove two screws (8) and two lock washers (9).
- D. Remove four screws (10), connector J1 (11), gasket (12), and flex cable W1 (13).

STEP 2

REPLACEMENT

- A. Install flex cable W1 (13), gasket (12), connector J1 (11), and four screws (10).
- B. Install two lock washers (9) and two screws (8).
- C. Connect connector (7) and alternately tighten two screws (6).
- D. Install circuit card support shelf (5), six screws (4), six flat washers (3), six lock washers (2), and six nuts (1).
- E. Install missile guidance test circuit card A1 (para 6-5).
- F. Install front panel assembly (para 6-4).

END OF TASK

6-17. REMOVAL AND REPLACEMENT OF TRANSFORMER T1 (Sheet 1 of 2)

TOOLS:

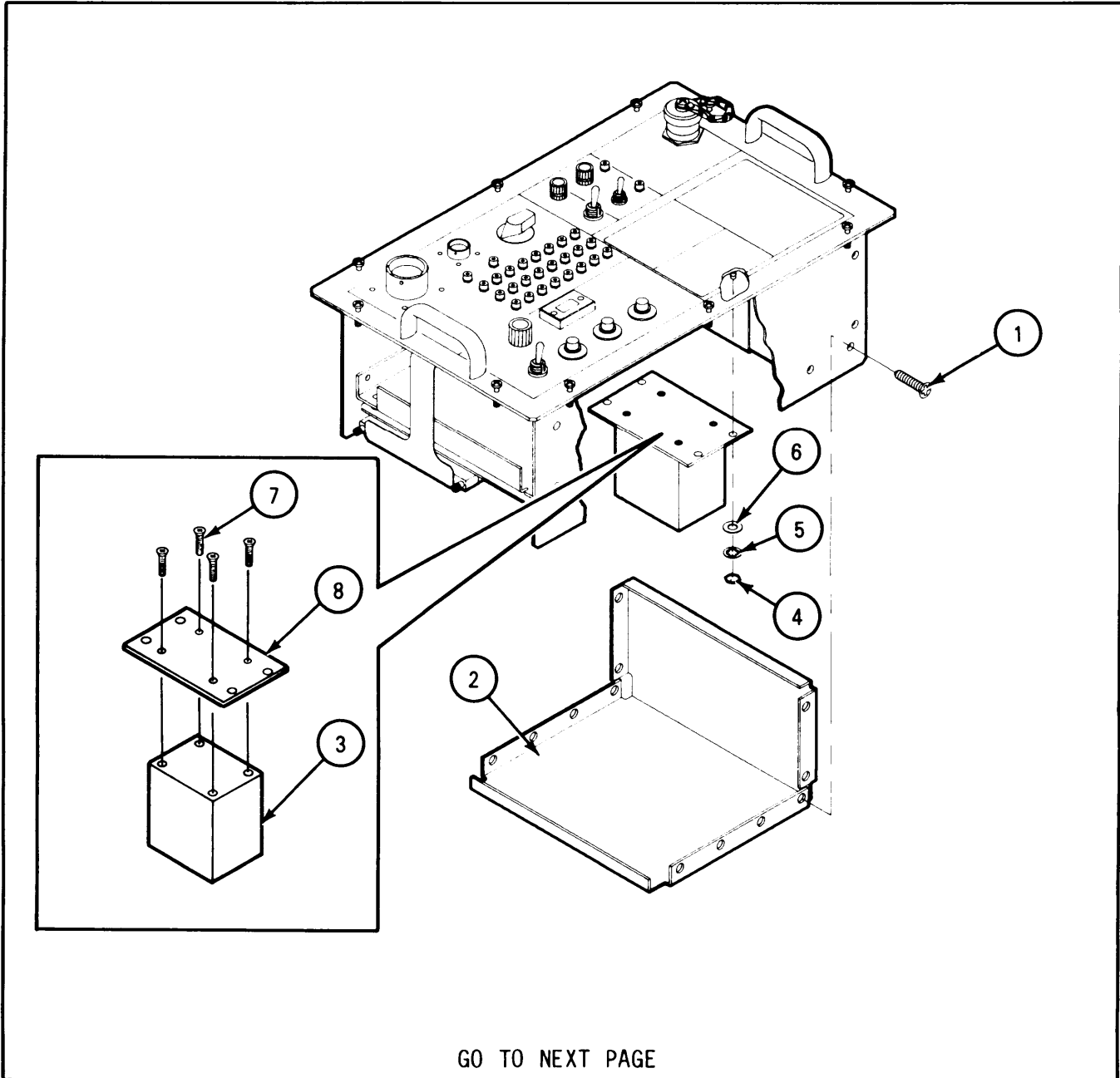
- No. 2 cross-tip screwdriver
- 11/32-inch socket wrench
- Soldering kit

EQUIPMENT CONDITION:

Front panel assembly removed (para 6-4).

MATERIALS:

- Insulating compound (Item 3, Appendix E)



6-17. REMOVAL AND REPLACEMENT OF TRANSFORMER T1 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Tag and unsolder leads from transformer T1 (3).
- C. Remove four nuts (4), four lock washers (5), and four flat washers (6).
- D. Remove transformer T1 (3).
- E. Remove four screws (7) and mounting bracket (8).

STEP 2

REPLACEMENT

- A. Install mounting bracket (8) and four screws (7).
- B. Install transformer T1 (3), four flat washers (6), four lock washers (5), and four nuts (4).
- C. Solder leads to transformer T1 (3) and untag.
- D. Coat terminals with insulating compound.
- E. Install high voltage cover (2) and 12 screws (1).
- F. Install front panel assembly (para 6-4).

END OF TASK

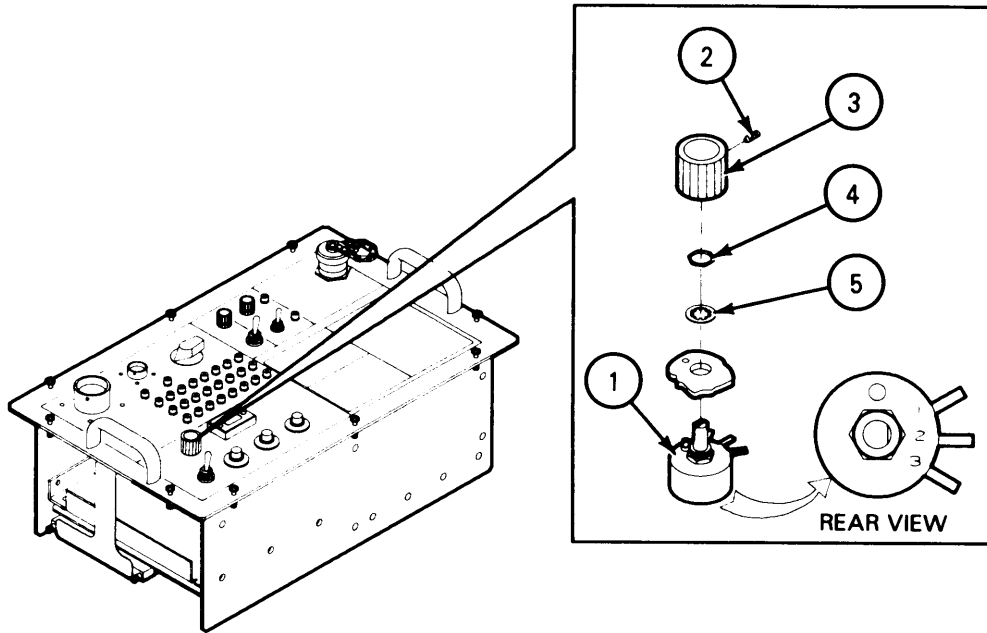
6-18. REMOVAL AND REPLACEMENT OF POTENTIOMETER R1

TOOLS:

- Soldering kit
- 9/16-inch open-end wrench
- 5/64-inch socket-head screw key

EQUIPMENT CONDITION:

Front panel assembly removed (para 6-4).



STEP 1 **REMOVAL**

- A. Tag and unsolder leads from potentiometer R1 (1).
- B. Loosen two setscrews (2) and remove knob (3).
- C. Remove nut (4), lock washer (5), and potentiometer R1 (1).

STEP 2 **REPLACEMENT**

- A. Aline key and install potentiometer R1 (1), lock washer (5), and nut (4).
- B. Install knob (3) and tighten two setscrews (2).
- C. Solder leads to potentiometer R1 (1) and untag.
- D. Install front panel assembly (para 6-4).

END OF TASK

6-19. REMOVAL AND REPLACEMENT OF EMI FILTER FL1

TOOLS:

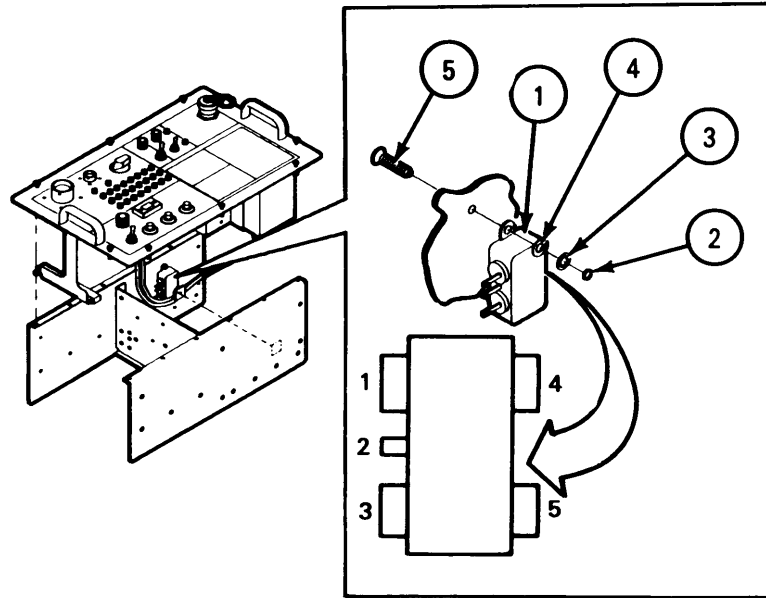
- No. 1 cross-tip screwdriver
- Soldering kit
- 5/16-inch open-end wrench

EQUIPMENT CONDITION:

Battery BT1 removed (para 6-8).

MATERIALS:

Insulating compound (Item 3, Appendix E)



STEP 1

REMOVAL

- A. Tag and unsolder leads from EMI filter (1).
- B. Remove two nuts (2), two lock washers (3), two flat washers (4), two screws (5), and EMI filter (1).

STEP 2

REPLACEMENT

- A. Install EMI filter (1), two screws (5), two flat washers (4), washers (3), and two nuts (2).
- B. Solder leads to EMI filter (1) and untag.
- C. Apply insulating compound to terminals.
- D. Install battery BT1 (para 6-8).
- E. Install front panel (para 6-4).

END OF TASK

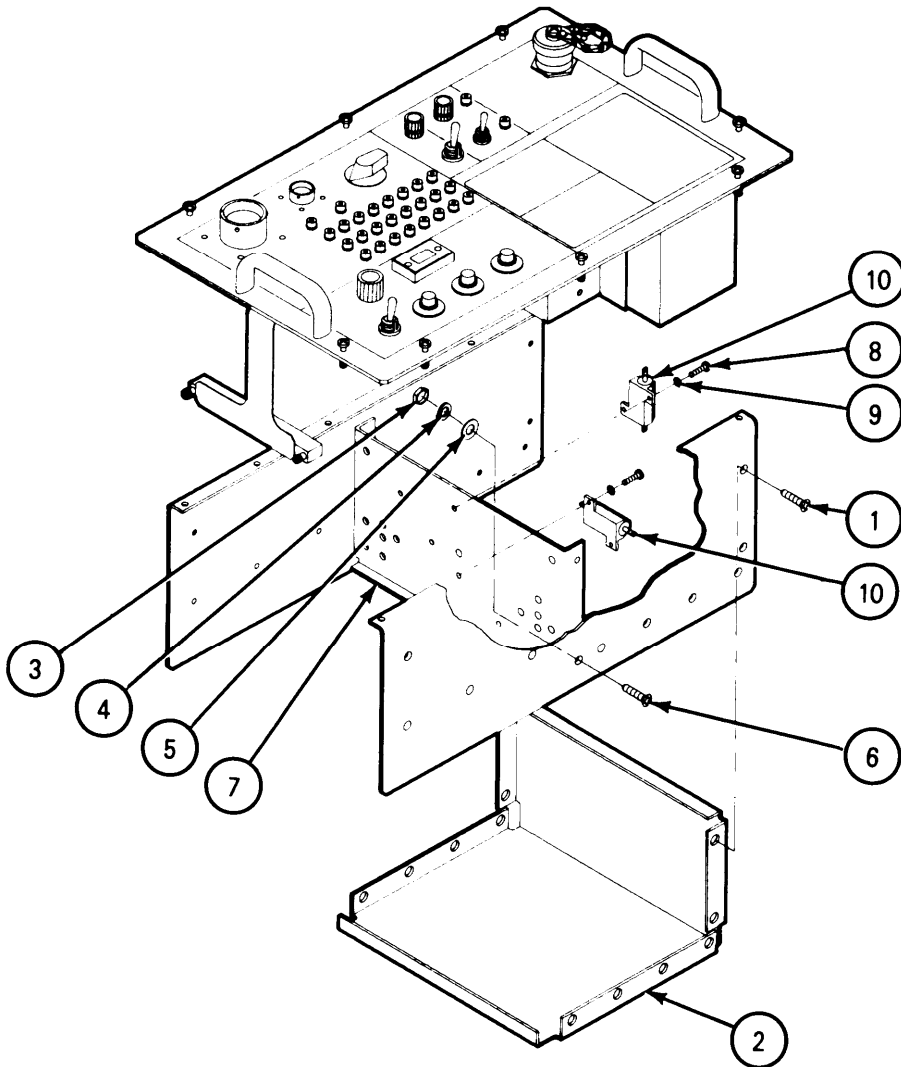
6-20. REMOVAL AND REPLACEMENT OF RESISTORS R2 AND R3 (Sheet 1 of 2)

TOOLS:

- Soldering kit
- No. 1 cross-tip screwdriver
- No. 2 cross-tip screwdriver
- 5/16-inch open-end wrench

EQUIPMENT CONDITION:

Power supply circuit card A2 removed (para 6-7).



GO TO NEXT PAGE

6-20. REMOVAL AND REPLACEMENT OF RESISTORS R2 AND R3 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Using no. 2 cross-tip screwdriver, remove 12 screws (1) and high voltage cover (2).
- B. Remove four nuts (3), four lock washers (4), four flat washers (5), and four screws (6) using no. 2 cross-tip screwdriver.
- C. Raise cross brace (7).
- D. Using no. 1 cross-tip screwdriver, remove two screws (8), two lock washers (9), and resistor (10).
- E. Tag and unsolder leads from resistor (10).

STEP 2

REPLACEMENT

- A. Solder leads to resistor (10) and untag.
- B. Install resistor (10), two lock washers (9), and two screws (8) using no. 1 cross-tip screwdriver.
- C. Using no. 2 cross-tip screwdriver, install cross brace (7), four screws (6), four flat washers (5), four lock washers (4), and four nuts (3).
- D. Using no. 2 cross-tip screwdriver, install high voltage cover (2) and 12 screws (1).
- E. Install power supply circuit card A2 (para 6-7).
- F. Install missile guidance test circuit card A1 (para 6-5).
- G. Install front panel assembly (para 6-4).

END OF TASK

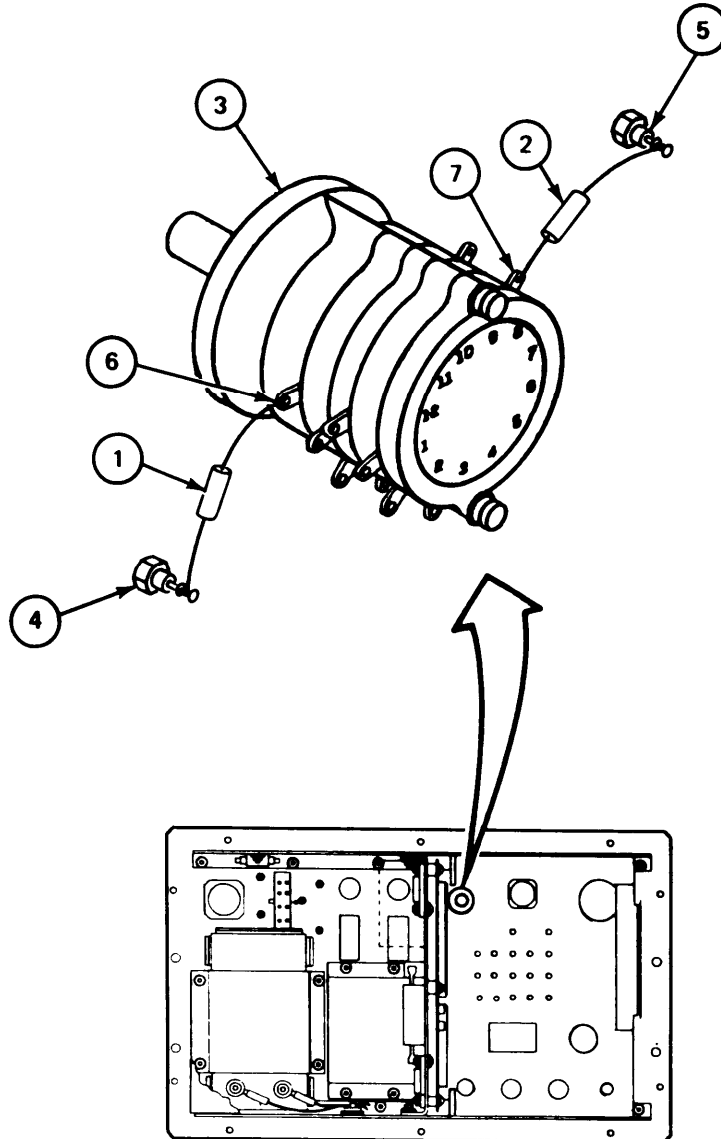
6-20.1. REMOVAL AND REPLACEMENT OF RESISTORS R4 AND R5
(Sheet 1 of 2)

TOOLS:

Soldering kit

EQUIPMENT CONDITION:

Power supply circuit card
A2 removed (para 6-7).



GO TO NEXT PAGE

6-21. REMOVAL AND REPLACEMENT OF INDUCTOR L1 (Sheet 1 of 2)

TOOLS:

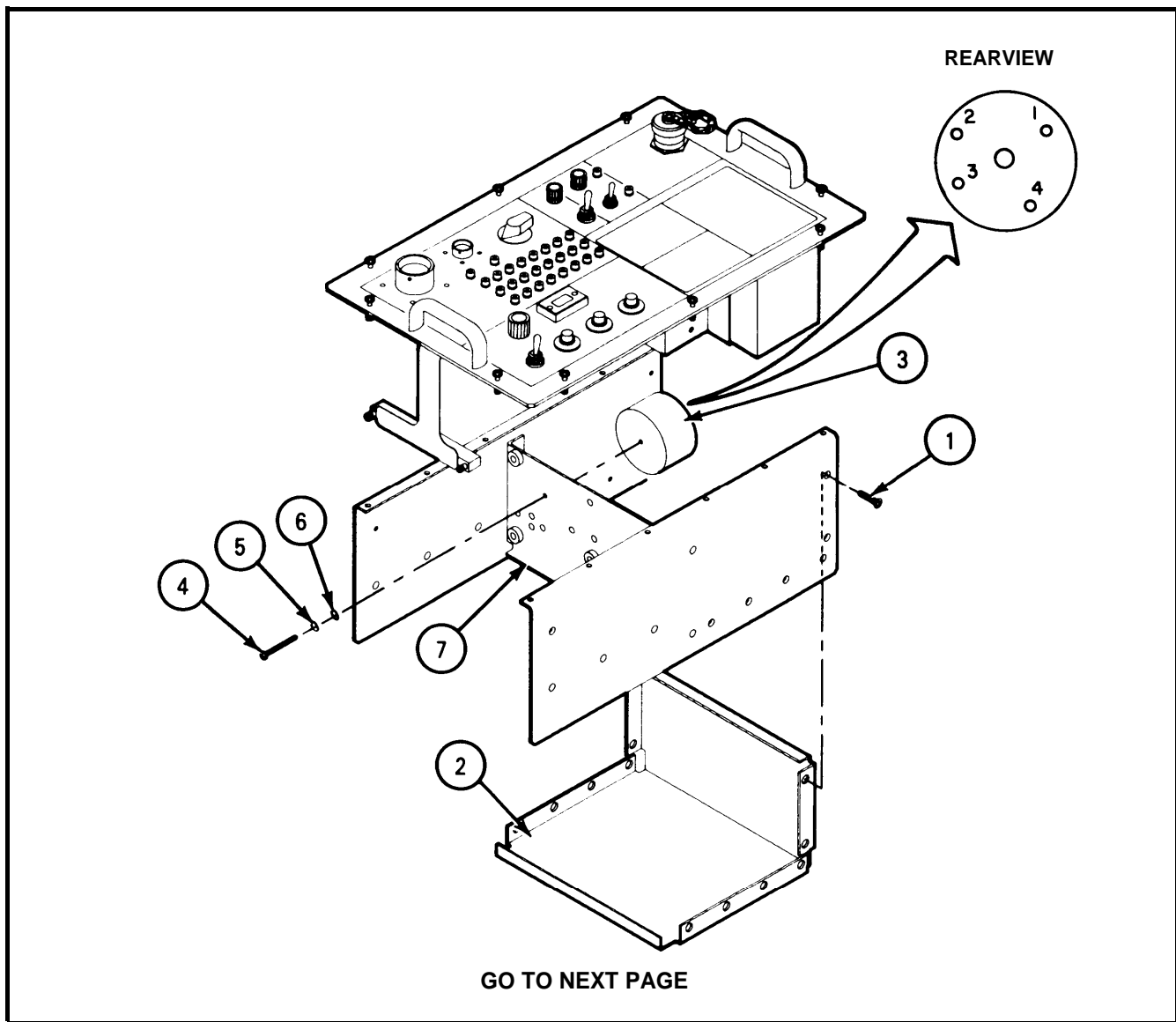
Soldering kit
No. 2 cross-tip screwdriver
Torque screwdriver, 0 to 30
inch-pounds, No. 2 cross-tip bit

EQUIPMENT CONDITION:

Power supply circuit card A2
removed (para 6-7).

MATERIALS:

Insulating compound (Item 3,
Appendix E)
Sealing compound (Item 4, Appendix E)
Sealing compound primer (Item 12,
Appendix E)



6-21. REMOVAL AND REPLACEMENT OF INDUCTOR L1 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Tag and unsolder leads from inductor L1 (3).
- C. Remove screw (4), lock washer (5), flat washer (6) and inductor L1 (3).

STEP 2

REPLACEMENT

- A. Clean threads of screw (4) and inductor L1 (3) using sealing compound primer.
- B. Apply sealing compound to threads of screw (4).
- C. Apply insulating compound and install inductor L1 (3) on cross brace (7).
- D. Secure inductor L1 (3) with flat washer (6), lock washer (5) and screw (4). Torque screw (4) to 18 to 20 inch-pounds.
- E. Solder leads to inductor L1 (3) and untag.
- F. Apply insulating compound to terminals.
- G. Install high voltage cover (2) and 12 screws (1).
- H. Install power supply circuit card A2 (para 6-7).
- I. Install missile guidance test circuit card A1 (para 6-5).
- J. Install front panel assembly (para 6-4).

END OF TASK

6-22. REMOVAL AND REPLACEMENT OF VOLTAGE REGULATORS U1 AND U2 (Sheet 1 of 2)

TOOLS:

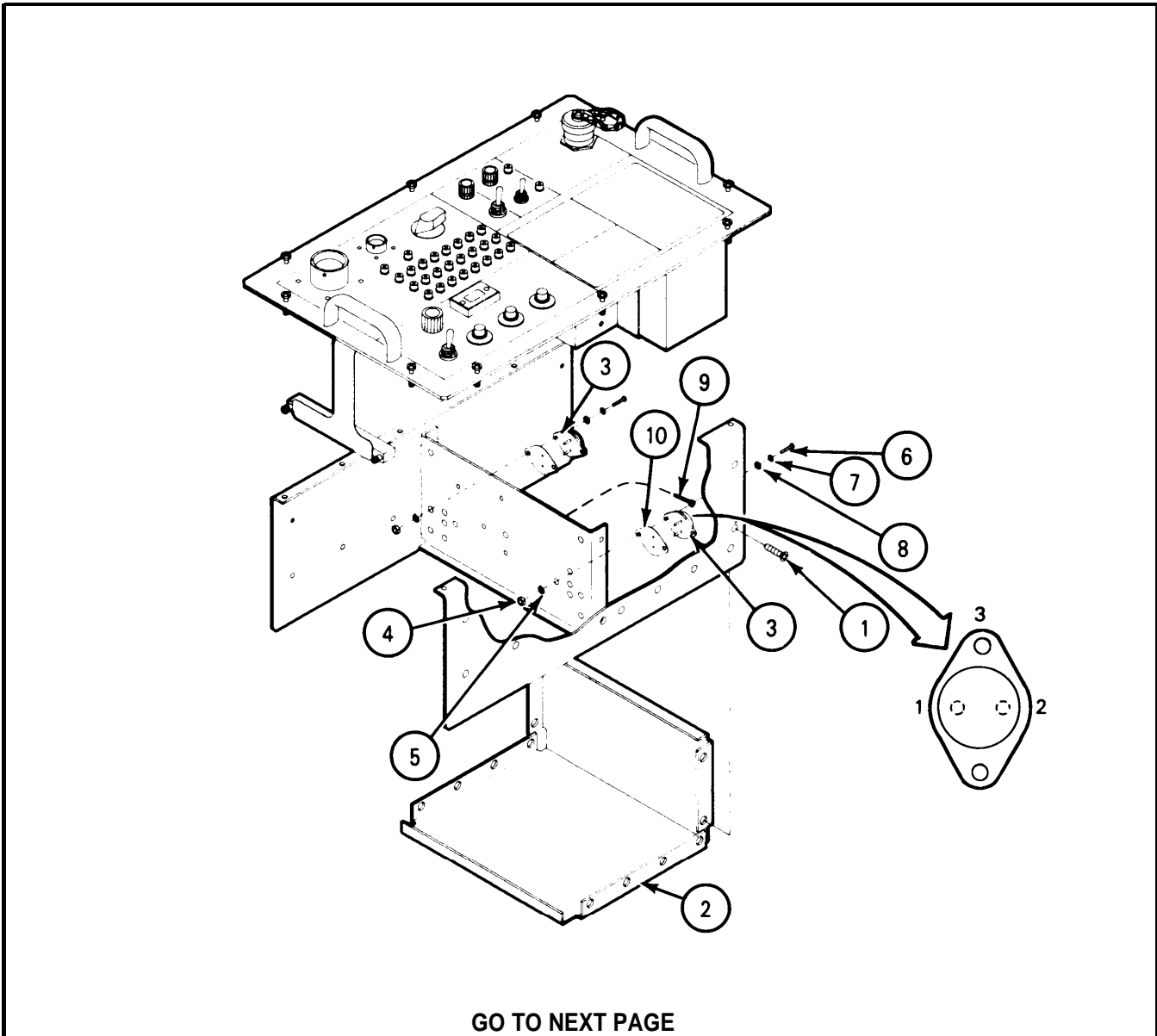
- No. 2 cross-tip screwdriver
- Soldering kit
- 5/16-inch open-end wrench
- Torque wrench (5 to 75 inch-pounds)

EQUIPMENT CONDITION:

Power supply circuit card A2 removed (para 6-7)

MATERIALS:

Silicone compound (Item 5, Appendix E)



6-22. REMOVAL AND REPLACEMENT OF VOLTAGE REGULATORS U1 AND U2 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Tag and unsolder leads from base of voltage regulator (3).
- C. Remove two nuts (4), two lock washers (5), two screws (6), two flat washers (7), two shoulder washers (8), and disconnect ground lug (9).
- D. Remove voltage regulator (3) and insulator (10).

STEP 2

REPLACEMENT

- A. Coat bottom of voltage regulator (3) with silicone compound.
- B. Install insulator (10), voltage regulator (3), two shoulder washers (8), two flat washers (7), two screws (6), ground lug (9), two lock washers (5), and two nuts (4). Torque screws (6) to 8 to 10 inch-pounds.
- C. Solder leads to voltage regulator (3) and untag.
- D. Install high voltage cover (2) and 12 screws (1).
- E. Install power supply circuit card A2 (para 6-7).
- F. Install missile guidance test circuit card A1 (para 6-5).
- G. Install front panel assembly (para 6-4).

END OF TASK

6-23. REMOVAL AND REPLACEMENT OF RELAY K1

TOOLS:

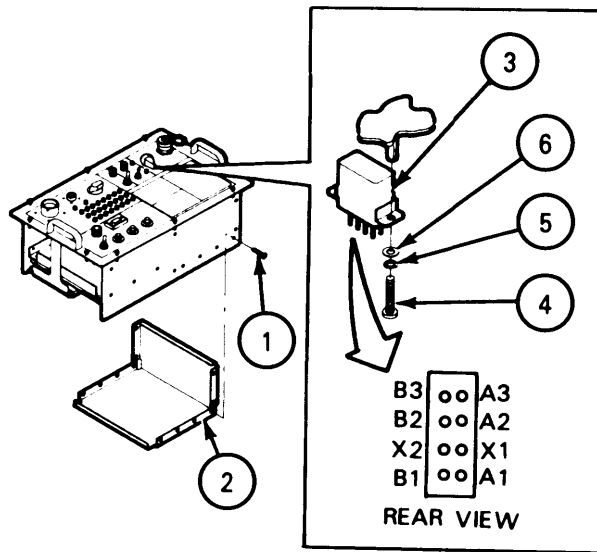
No. 2 cross-tip screwdriver
Soldering kit

EQUIPMENT CONDITION:

Front panel assembly removed (para 6-4).

MATERIALS:

Insulating compound (Item 3, Appendix E)



STEP 1

REMOVAL

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Tag and unsolder leads from relay K1 (3).
- C. Remove two screws (4), two lock washers (5), two flat washers (6), and relay K1 (3).

STEP 2

REPLACEMENT

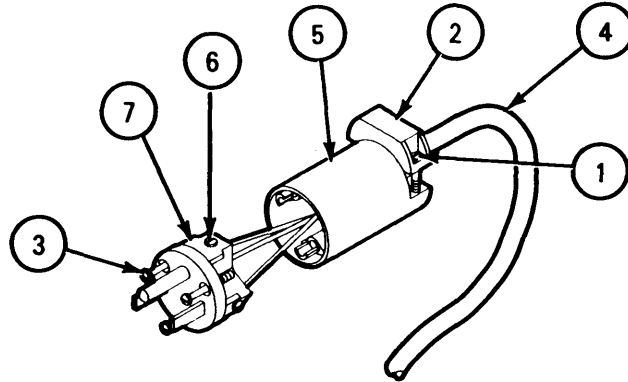
- A. Install relay K1 (3), two flat washers (6), two lock washers (5), and two screws (4).
- B. Solder leads to relay K1 (3) and untag.
- C. Apply insulating compound to terminals.
- D. Install high voltage cover (2) and 12 screws (1).
- E. Install front panel (para 6-4).

END OF TASK

6-24. REMOVAL AND REPLACEMENT OF AC PLUG W2P1**TOOLS:**

1/4-inch flat-tip screwdriver

1/8-inch flat-tip screwdriver

**STEP 1****REMOVAL**

- A. Using 1/4-inch flat-tip screwdriver, loosen two screws (1) and strain relief (2).
- B. Using 1/8-inch flat-tip screwdriver, loosen three screws (3) and push ac cord (4) through shell (5).
- C. Using 1/4-inch flat-tip screwdriver, loosen three screws (6) and remove ac cord (4).

STEP 2**REPLACEMENT**

- A. Install ac cord (4) through shell (5).

NOTE

Black lead goes to brass pin; white lead goes to white pin; and green lead goes to ground pin.

- B. Install three leads in plug (7) and tighten three screws (6) using 1/4-inch screwdriver.
- C. Align plug (7) in shell (5) and tighten three screws (3) using 1/8-inch screwdriver.
- D. Using 1/4-inch screwdriver, tighten two screws (1).

END OF TASK

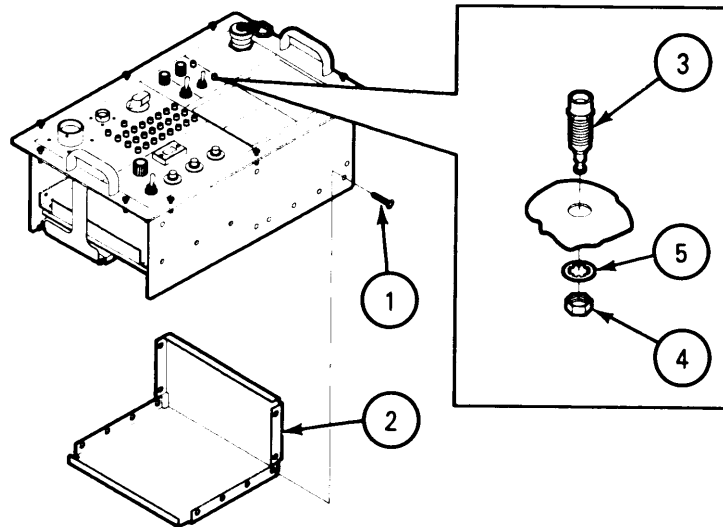
6-25. REMOVAL AND REPLACEMENT OF TEST POINT JACKS J30 AND J31

TOOLS:

Soldering kit
5/16-inch socket wrench
No. 2 cross-tip screwdriver
11/32-inch socket wrench
5/16-inch open-end wrench

EQUIPMENT CONDITION:

Front panel assembly removed
(para 6-4).



STEP 1

REMOVAL

1. Remove 12 screws (1) and high voltage cover (2).
2. Tag and unsolder lead from test point jack (3).
3. Using 5/16-inch or 11/32-inch socket wrench and 5/16-inch open-end wrench, remove nut (4), lock washer (5), and test point jack (3).

STEP 2

REPLACEMENT

1. Using 5/16-inch or 11/32-inch socket wrench and 5/16-inch open-end wrench, install test point jack (3), lock washer (5), and nut (4).
2. Solder lead to test point jack (3) and untag.
3. Install high voltage cover (2) and 12 screws (1).
4. Install front panel assembly (para 6-4).

END OF TASK

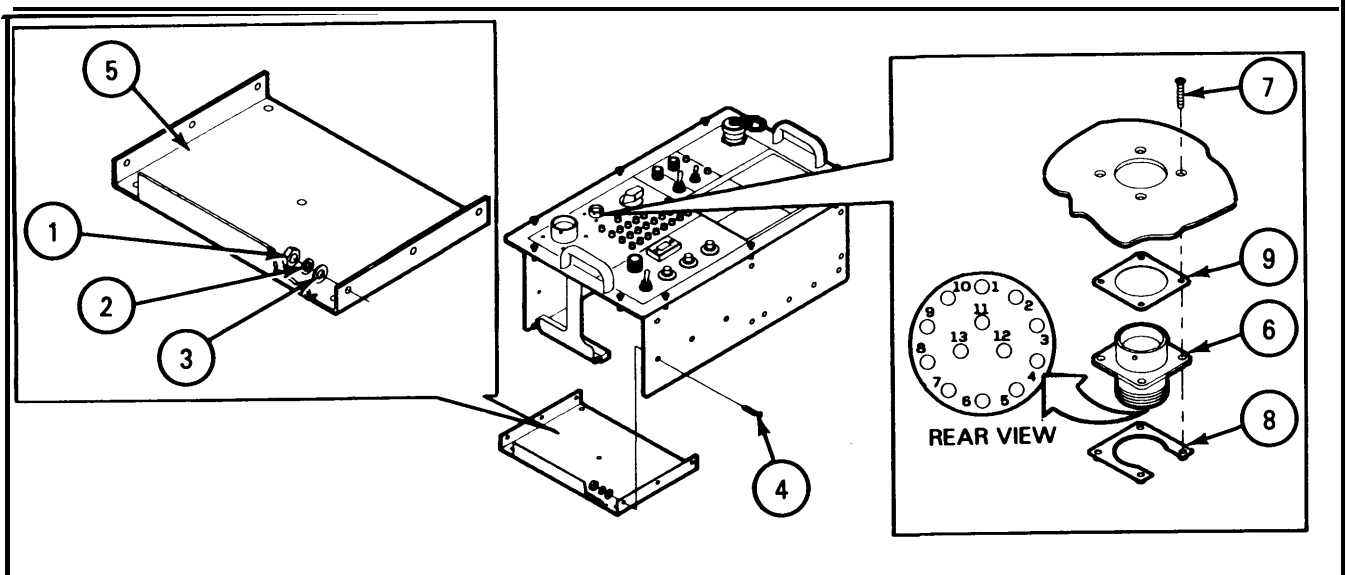
6-26. REMOVAL AND REPLACEMENT OF CONNECTOR J2

TOOLS:

Remove/install tool (part no. MS3447-16)
 No. 0 cross-tip-screwdriver
 5/16-inch open-end wrench

EQUIPMENT CONDITION:

Missile guidance test circuit card A1 removed (para 6-5).



STEP 1

REMOVAL

- A. Remove six nuts (1), six lock washers (2), six flat washers (3), six screws (4), and circuit card support shelf (5).
- B. Tag and remove leads from connector J2 (6).
- C. Remove four screws (7), nut plate (8), connector J2 (6), and gasket (9).

STEP 2

REPLACEMENT

- A. Install gasket (9), connector J2 (6), nut plate (8), and four screws (7).
- B. Install leads in connector J2 (6) and untag.
- C. Install circuit card support shelf (5), six screws (4), six flat washers (3), six lock washers (2), and six nuts (1).
- D. Install missile guidance test circuit card A1 (para 6-5).
- E. Install front panel assembly (para 6-4).

END OF TASK

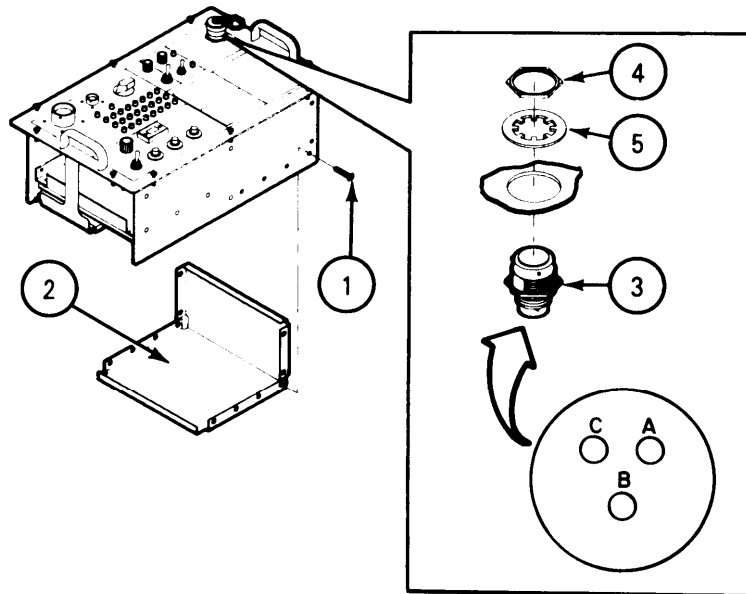
6-27. REMOVAL AND REPLACEMENT OF CONNECTOR J3

TOOLS:

Remove/install tool (part
no. MS3447-16)
No. 2 cross-tip screwdriver
Adjustable wrench

EQUIPMENT CONDITION:

Missile guidance test circuit card
A1 removed (para 6-5).



STEP 1

- A. Remove 12 screws (1) and high voltage cover (2).
- B. Tag and remove leads from connector J3 (3).
- C. Remove nut (4), lock washer (5), and connector J3 (3).

STEP 2

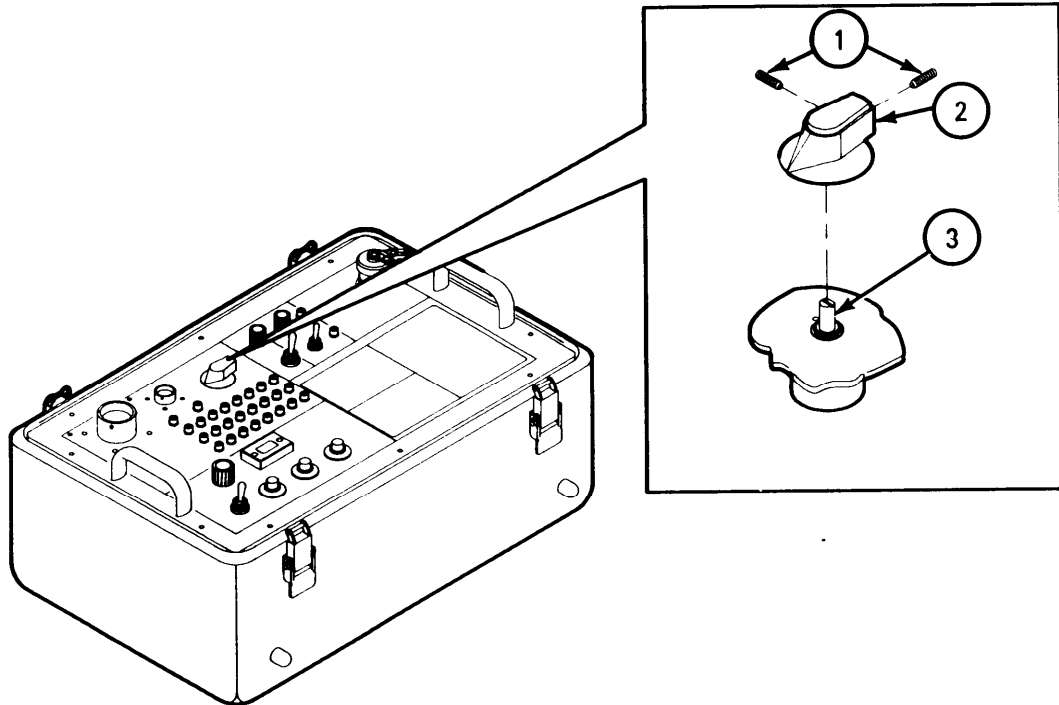
REPLACEMENT

- A. Install connector J3 (3), lock washer (5), and nut (4).
- B. Install leads in connector J3 (3) and untag.
- C. Install high voltage cover (2) and 12 screws (1).
- D. Install front panel assembly (para 6-4).

END OF TASK

6-28. REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S1**TOOLS:**

0.05-inch socket-head screw key

**STEP 1** REMOVAL

Loosen two setscrews (1) and remove knob (2).

STEP 2 REPLACEMENT

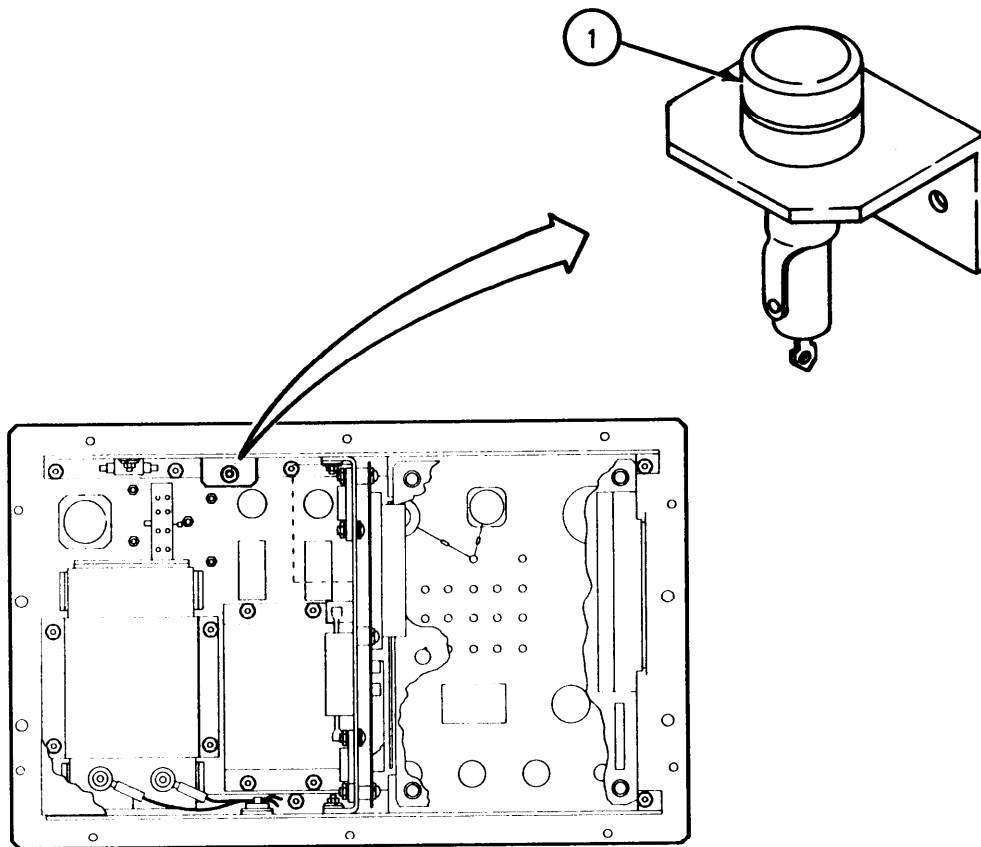
- A. Set switch S1 (3) fully counterclockwise.
- B. Install knob (2).
- C. Align arrow on knob (2) with OFF position and tighten two setscrews (1).

END OF TASK

6-29.1 REMOVAL AND REPLACEMENT OF FUSE F1

EQUIPMENT CONDITION:

Front panel assembly removed
(para 6-4)



MISSILE GUIDANCE SET TEST SET (BACK OF FRONT PANEL)

STEP 1 REMOVAL

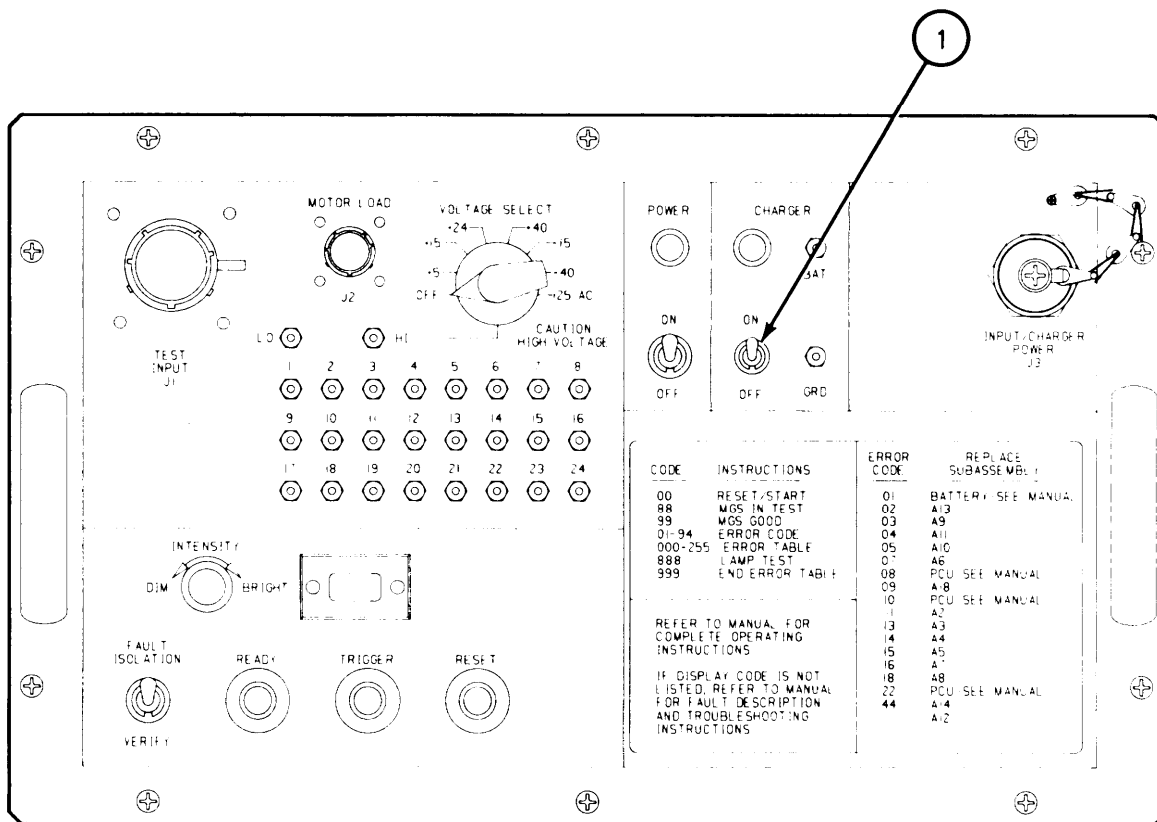
Unscrew cap of fuseholder (1) and remove fuse.

STEP 2 REPLACEMENT

- A. Install fuse and tighten cap of fuseholder (1)
- B. Install front panel assembly (para 6-4).

END OF TASK

6-30. CHARGING OF BATTERY BT1



- A. Connect Missile Guidance Set Test Set to 115 V ac or 230 V ac power source.
- B. Set CHARGER circuit breaker (1) to ON.
- C. Allow battery to charge for approximately 16 hours.
- D. Set CHARGER circuit breaker (1) to OFF.
- E. Disconnect Missile Guidance Set Test Set from power source.

END OF TASK

CHAPTER 7
AMPLIFIER TEST SET MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter contains the maintenance procedures to remove and replace parts of the Amplifier Test Set. The contents of this chapter are contained in two sections. Troubleshooting procedures are provided in Section I. Section II provides removal and replacement procedures.

<u>CHAPTER CONTENTS</u>	<u>PAGE</u>
Section I. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES	7-1
Section II. AMPLIFIER TEST SET MAINTENANCE PROCEDURES	7-56

Section I. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES

<u>SECTION CONTENTS</u>	<u>PARA</u>	<u>PAGE</u>
SCOPE	7-1	7-1
AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES	7-2	7-2

7-1. SCOPE

This section contains troubleshooting procedures for the Amplifier Test Set.

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (Sheet 1 of 54)

This paragraph provides troubleshooting procedures for the Amplifier Test Set.

TEST EQUIPMENT: Multi meter

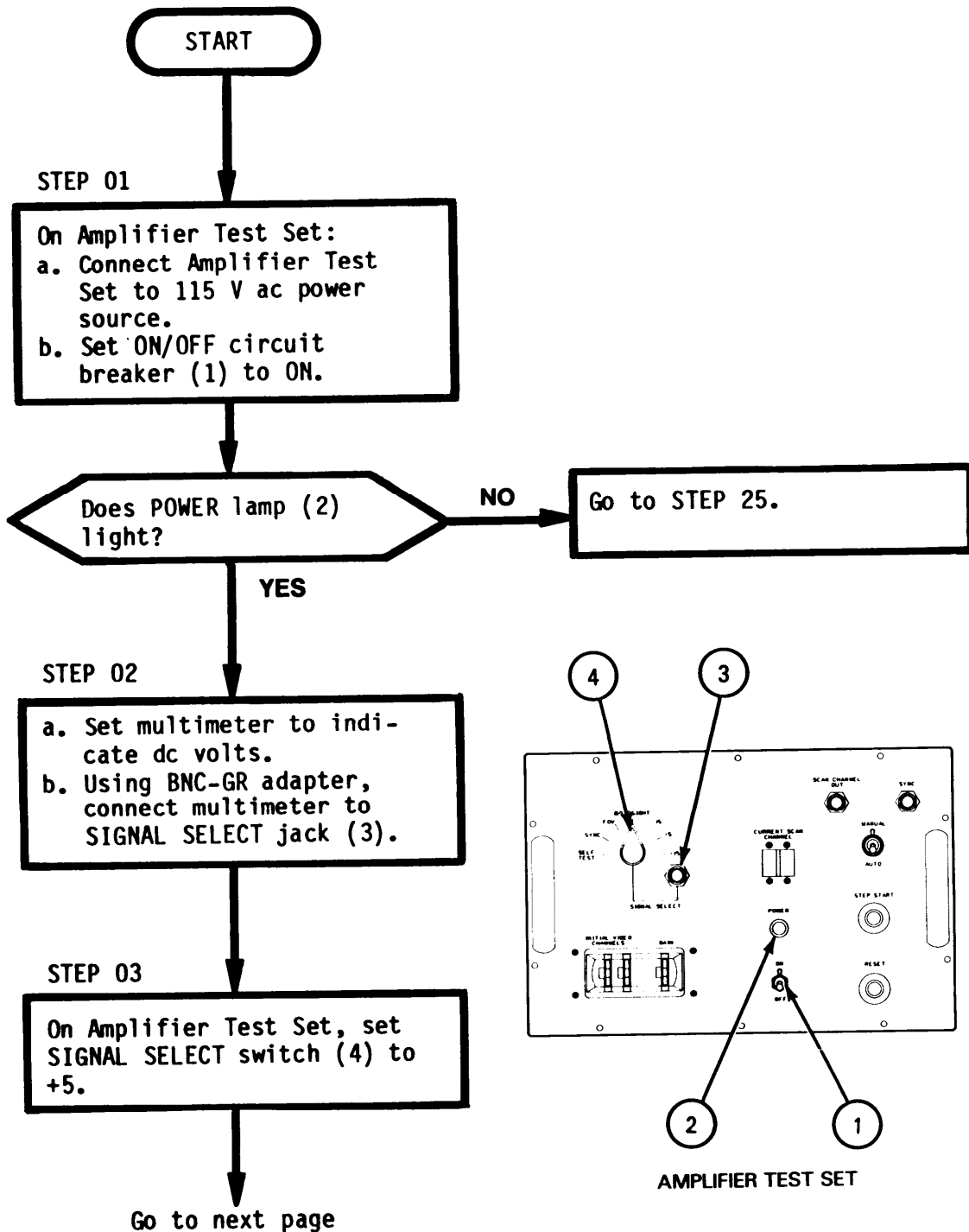


Remove power before removing and replacing any assembly, subassembly, or component. HIGH VOLTAGE is used in this system. Death or injury can result if you do not observe safety precautions.

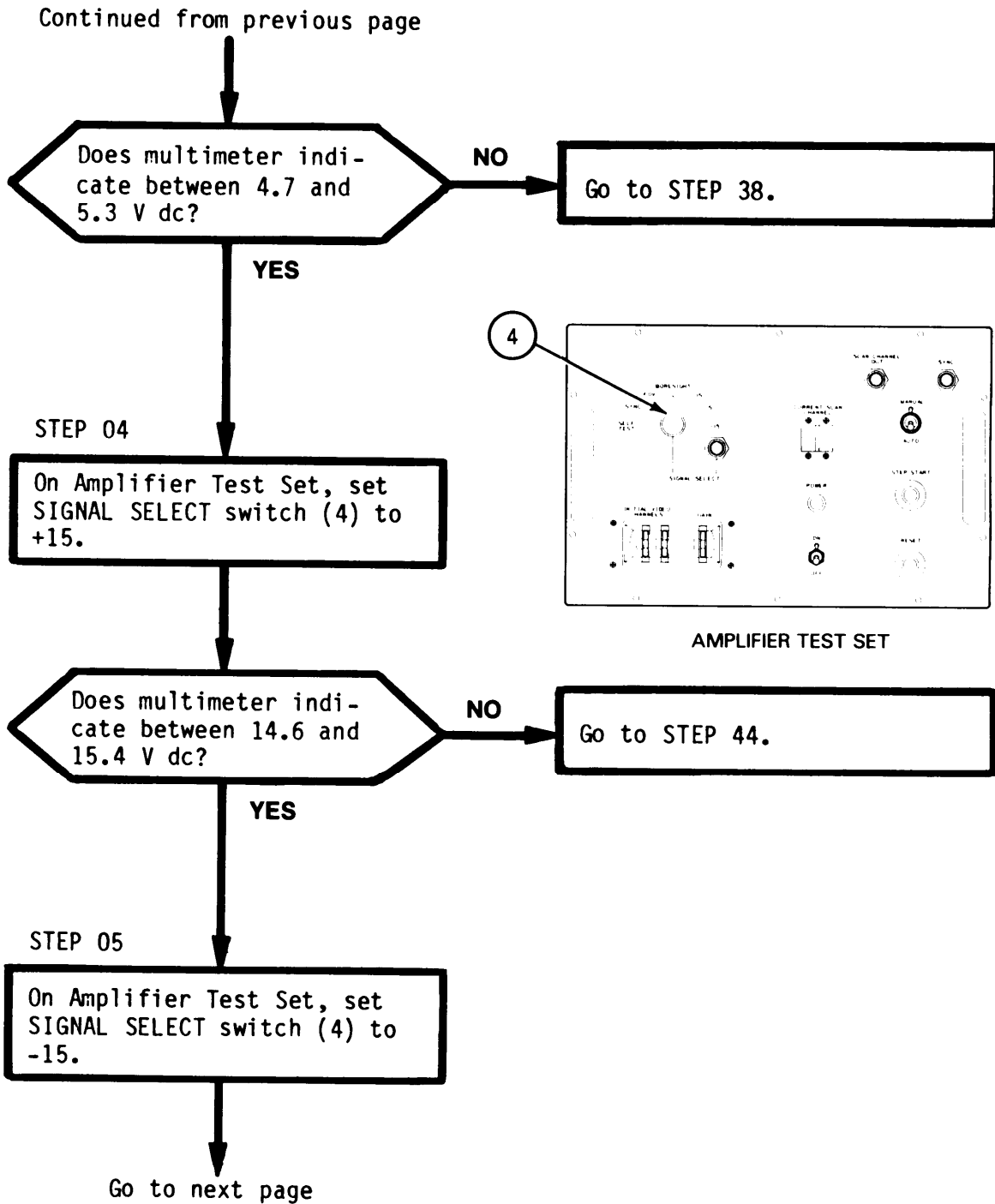
NOTE

- Follow steps in order given in the procedures. Do not skip any steps.
- When you enter the NO chain, do the procedure and/or repairs as instructed in the corrective action block.
- Unless otherwise specified, after performing the corrective action of the NO chain always return to the START of the procedure you were checking. When more than one corrective action may be required, do the first corrective action, return to START, and repeat the procedure. If the problem still exists, do the next corrective action and repeat.
- The wafers on wafer switches are listed alphabetically from front to rear.

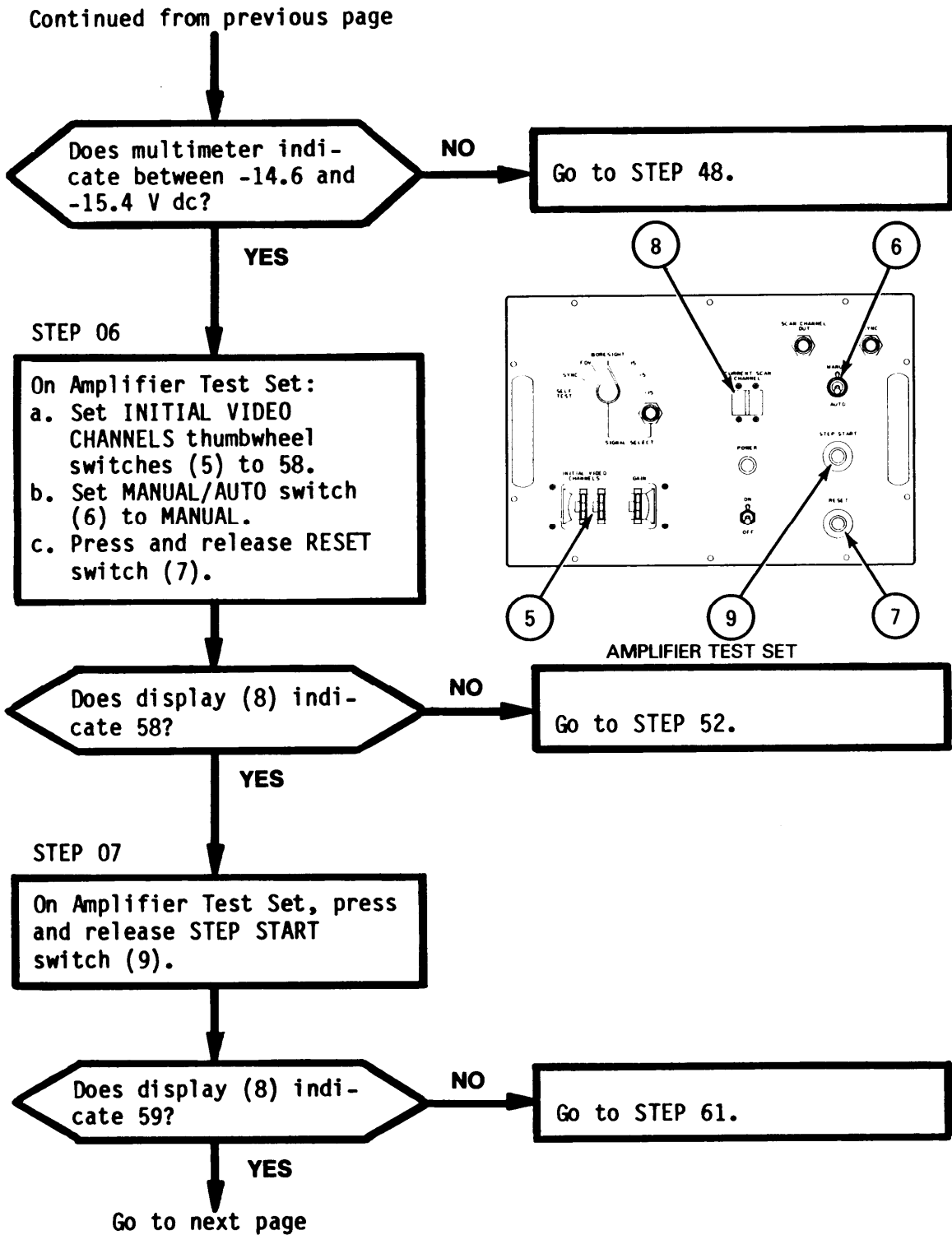
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 2 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 3 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 4 of 54)

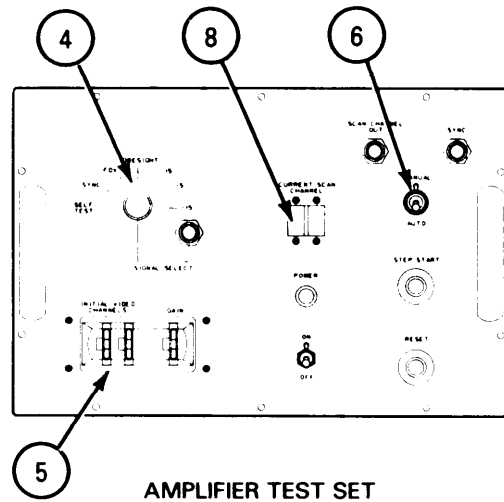


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 5 of 54)

Continued from previous page

STEP 08

On Amplifier Test Set, set MANUAL/AUTO switch (6) to AUTO.



Does display (8) count to 63 and then latch at 00?

NO → Go to STEP 67.

YES

STEP 09

On Amplifier Test Set:
a. Set GAIN thumbwheel switch (5) to 0.
b. Set SIGNAL SELECT switch (4) to SELF TEST.

Does multimeter indicate between 2.4 and 5.0 V dc?

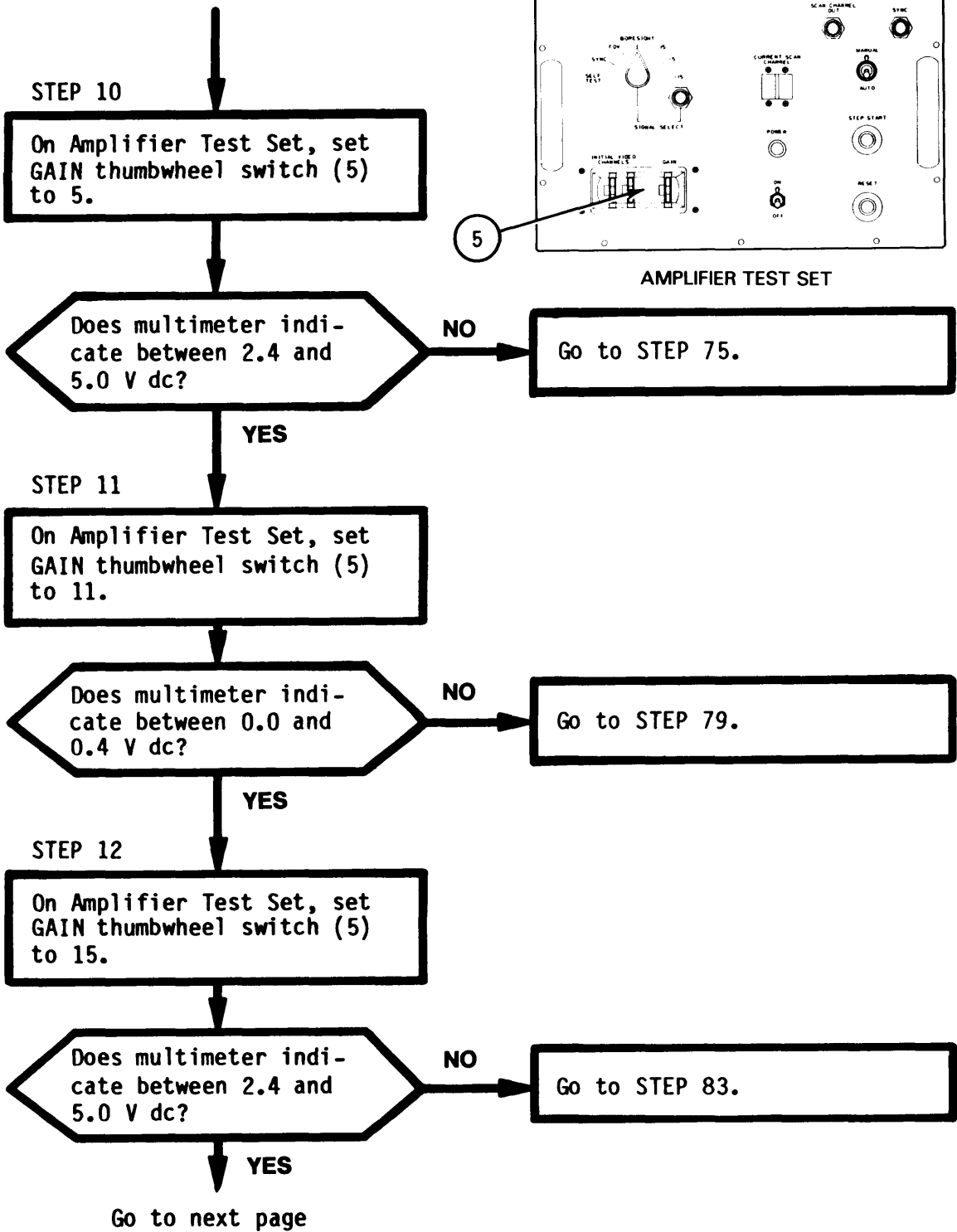
NO → Go to STEP 71.

YES

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 6 of 54)

Continued from previous page

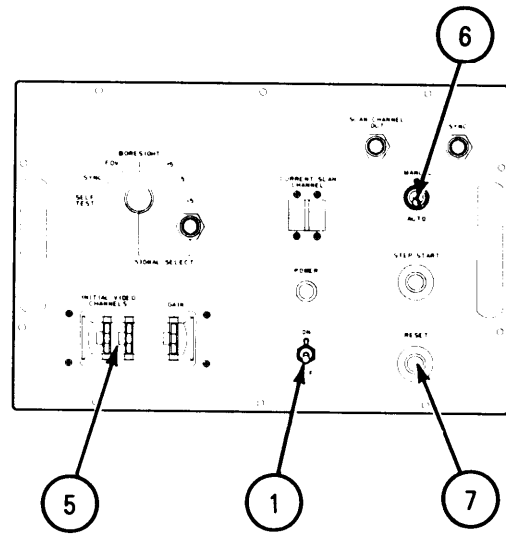


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 7 of 54)

Continued from previous page

STEP 13

On Amplifier Test Set:
 a. Set INITIAL VIDEO CHANNELS thumbwheel switches (5) to 02.
 b. Set MANUAL/AUTO switch (6) to MANUAL.
 c. Press and release RESET switch (7).



AMPLIFIER TEST SET

Does multimeter indicate between 0.0 and 0.4 V dc?

NO

Go to STEP 87.

YES

STEP 14

On Amplifier Test Set:
 a. Set INITIAL VIDEO CHANNELS thumbwheel switches (5) to 13.
 b. Press and release RESET switch (7).

Does multimeter indicate between 2.4 and 5.0 V dc?

NO

Go to STEP 91.

YES

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 8 of 54)

Continued from previous page

STEP 15

On Amplifier Test Set:
a. Set INITIAL VIDEO CHANNELS thumbwheel switches (5) to 22.
b. Press and release RESET switch (7).

Does multimeter indicate between 0.0 and 0.4 V dc?

NO

Go to STEP 95.

YES

STEP 16

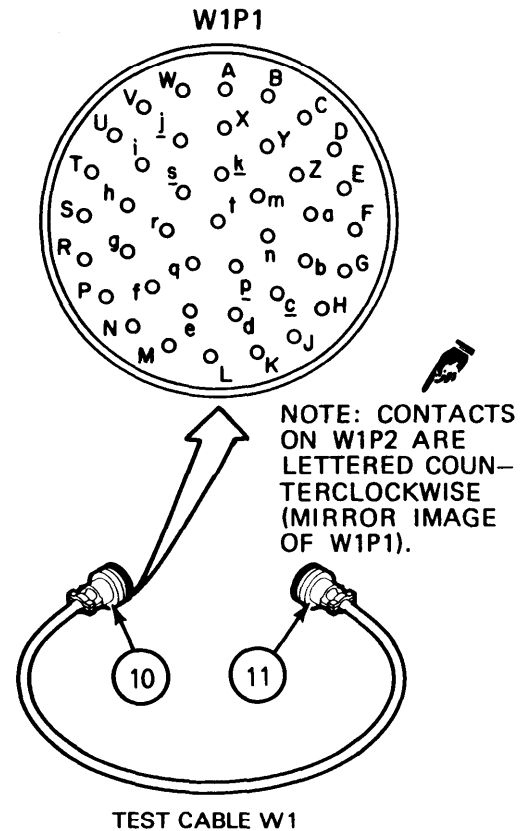
On Amplifier Test Set, set ON/OFF circuit breaker (1) to OFF.

STEP 17

a. Set multimeter to indicate ohms.
b. Connect multimeter to test points as indicated below.

Test Points	Normal Indication
W1P1 (10)-A W1P2 (11)-A	Continuity
W1P1 (10)-B W1P2 (11)-B	Continuity
W1P1 (10)-C W1P2 (11)-C	Continuity
W1P1 (10)-D W1P2 (11)-D	Continuity

Go to next page



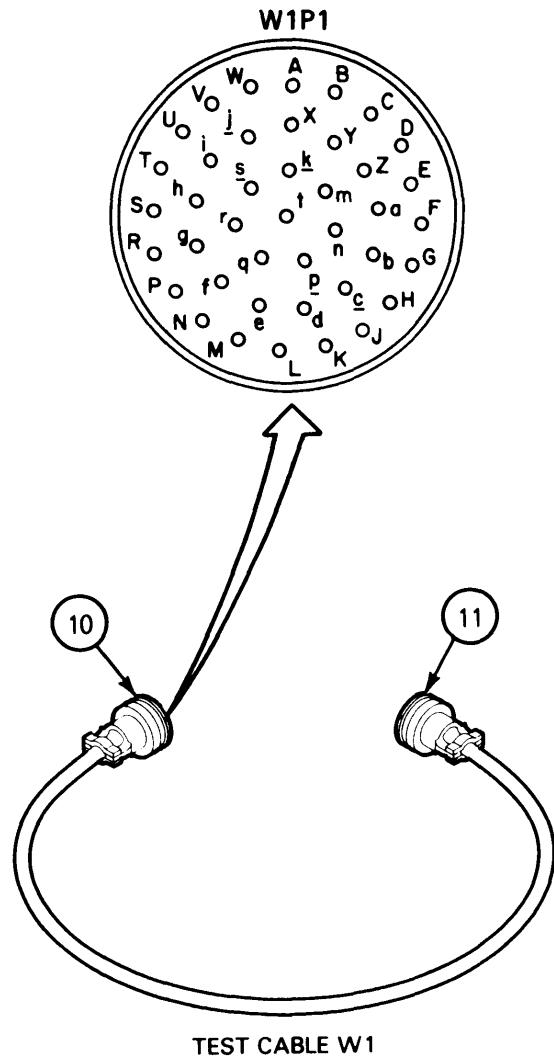
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 9 of 54)

Continued from previous page

STEP 17
(CONT)

Test Points		Normal Indication
W1P1 (10)-E	W1P2 (11)-E	Continuity
W1P1 (10)-F	W1P2 (11)-F	Continuity
W1P1 (10)-G	W1P2 (11)-G	Continuity
W1P1 (10)-H	W1P2 (11)-H	Continuity
W1P1 (10)-J	W1P2 (11)-J	Continuity
W1P1 (10)-K	W1P2 (11)-K	Continuity
W1P1 (10)-L	W1P2 (11)-L	Continuity
W1P1 (10)-M	W1P2 (11)-M	Continuity
W1P1 (10)-N	W1P2 (11)-N	Continuity
W1P1 (10)-P	W1P2 (11)-P	Continuity
W1P1 (10)-R	W1P2 (11)-R	Continuity
W1P1 (10)-S	W1P2 (11)-S	Continuity
W1P1 (10)-T	W1P2 (11)-T	Continuity
W1P1 (10)-U	W1P2 (11)-U	Continuity
W1P1 (10)-V	W1P2 (11)-V	Continuity
W1P1 (10)-W	W1P2 (11)-W	Continuity
W1P1 (10)-X	W1P2 (11)-X	Continuity
W1P1 (10)-Z	W1P2 (11)-Z	Continuity
W1P1 (10)-a	W1P2 (11)-a	Continuity
W1P1 (10)-b	W1P2 (11)-b	Continuity
W1P1 (10)-c	W1P2 (11)-c	Continuity
W1P1 (10)-d	W1P2 (11)-d	Continuity
W1P1 (10)-e	W1P2 (11)-e	Continuity
W1P1 (10)-f	W1P2 (11)-f	Continuity
W1P1 (10)-g	W1P2 (11)-g	Continuity
W1P1 (10)-h	W1P2 (11)-h	Continuity
W1P1 (10)-i	W1P2 (11)-i	Continuity
W1P1 (10)-j	W1P2 (11)-j	Continuity
W1P1 (10)-k	W1P2 (11)-k	Continuity
W1P1 (10)-m	W1P2 (11)-m	Continuity

NOTE: CONTACTS ON W1P2 ARE LETTERED COUNTERCLOCKWISE (MIRROR IMAGE OF W1P1).



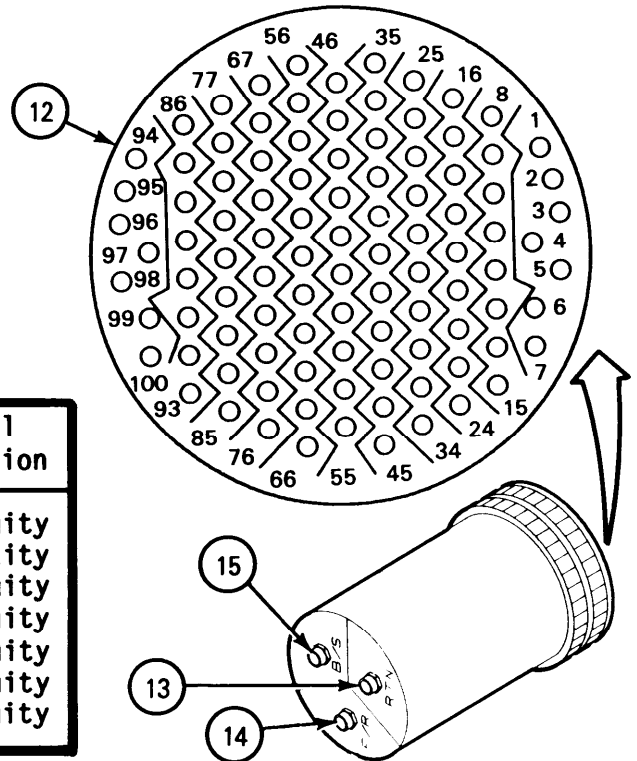
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7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 10 of 54)

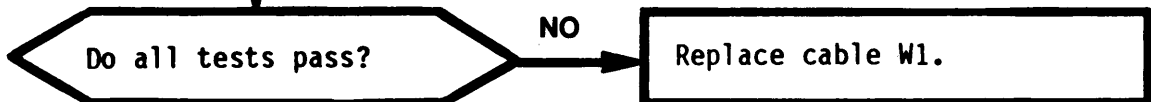
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STEP 17
(CONT)

Test Points		Normal Indication
W1P1 (10)-n	W1P2 (11)-n	Continuity
W1P1 (10)-p	W1P2 (11)-p	Continuity
W1P1 (10)-q	W1P2 (11)-q	Continuity
W1P1 (10)-r	W1P2 (11)-r	Continuity
W1P1 (10)-s	W1P2 (11)-s	Continuity
W1P1 (10)-t	W1P2 (11)-t	Continuity
W1P1 (10)-y	W1P2 (11)-y	Continuity



BORESIGHT ALINEMENT FIXTURE



YES

STEP 18

Test Points		Normal Indication
P1 (12)-21	RTN (13)	Continuity
P1 (12)-32	F/R (14)	Continuity
P1 (12)-22	B/S (15)	Continuity
P1 (12)-28	B/S (15)	14.250K to 15.750K ohms
P1 (12)-42	B/S (15)	446 to 494 ohms
P1 (12)-84	B/S (15)	14.250K to 15.750k ohms

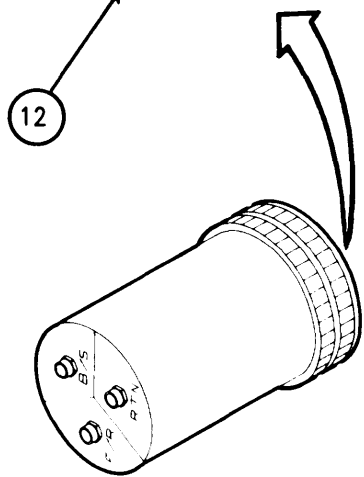
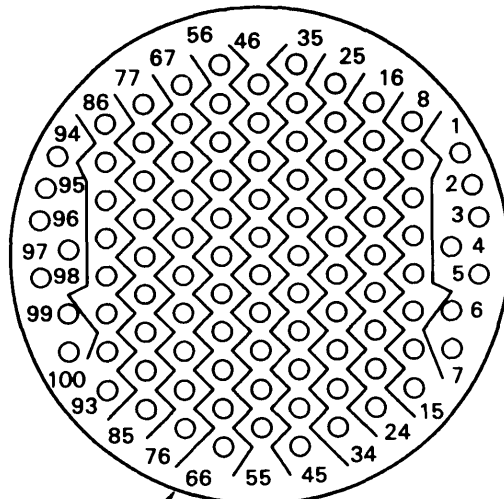
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7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 11 of 54)

Continued from previous page

STEP 18
(CONT)

Test Points		Normal Indication
P1 (12)-43	P1 (12)-1	Continuity
P1 (12)-43	P1 (12)-2	Continuity
P1 (12)-43	P1 (12)-3	Continuity
P1 (12)-43	P1 (12)-6	Continuity
P1 (12)-43	P1 (12)-7	Continuity
P1 (12)-43	P1 (12)-8	Continuity
P1 (12)-43	P1 (12)-9	Continuity
P1 (12)-43	P1 (12)-13	Continuity
P1 (12)-43	P1 (12)-14	Continuity
P1 (12)-43	P1 (12)-15	Continuity
P1 (12)-43	P1 (12)-16	Continuity
P1 (12)-43	P1 (12)-18	Continuity
P1 (12)-43	P1 (12)-24	Continuity
P1 (12)-43	P1 (12)-25	Continuity
P1 (12)-43	P1 (12)-26	Continuity
P1 (12)-43	P1 (12)-27	Continuity
P1 (12)-43	P1 (12)-33	Continuity
P1 (12)-43	P1 (12)-34	Continuity
P1 (12)-43	P1 (12)-35	Continuity
P1 (12)-43	P1 (12)-36	Continuity
P1 (12)-43	P1 (12)-37	Continuity
P1 (12)-43	P1 (12)-38	Continuity
P1 (12)-43	P1 (12)-44	Continuity
P1 (12)-43	P1 (12)-45	Continuity
P1 (12)-43	P1 (12)-46	Continuity
P1 (12)-43	P1 (12)-57	Continuity
P1 (12)-43	P1 (12)-58	Continuity
P1 (12)-43	P1 (12)-63	Continuity
P1 (12)-43	P1 (12)-65	Continuity
P1 (12)-43	P1 (12)-67	Continuity
P1 (12)-43	P1 (12)-68	Continuity
P1 (12)-43	P1 (12)-69	Continuity
P1 (12)-43	P1 (12)-70	Continuity
P1 (12)-43	P1 (12)-73	Continuity



BORESIGHT ALINEMENT FIXTURE

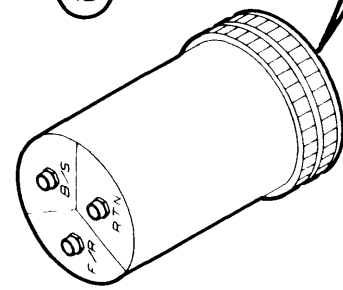
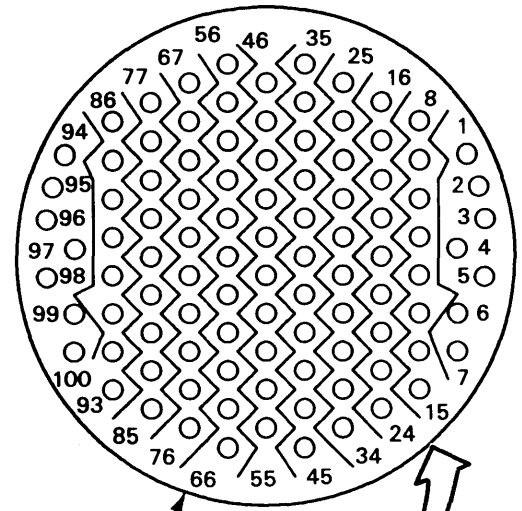
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7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 12 of 54)

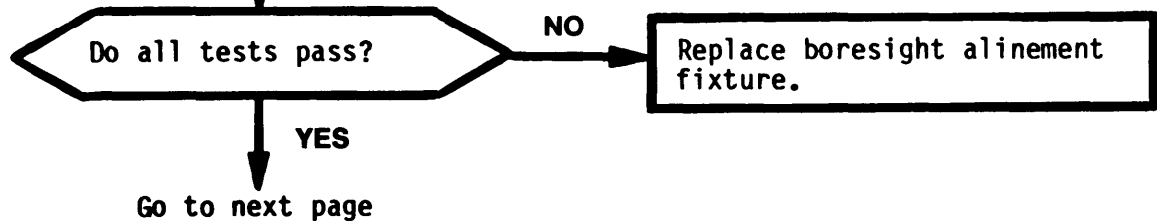
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STEP 18
(CONT)

Test Points		Normal Indication
P1 (12)-43	P1 (12)-74	Continuity
P1 (12)-43	P1 (12)-75	Continuity
P1 (12)-43	P1 (12)-76	Continuity
P1 (12)-43	P1 (12)-77	Continuity
P1 (12)-43	P1 (12)-78	Continuity
P1 (12)-43	P1 (12)-79	Continuity
P1 (12)-43	P1 (12)-80	Continuity
P1 (12)-43	P1 (12)-82	Continuity
P1 (12)-43	P1 (12)-83	Continuity
P1 (12)-43	P1 (12)-85	Continuity
P1 (12)-43	P1 (12)-86	Continuity
P1 (12)-43	P1 (12)-88	Continuity
P1 (12)-43	P1 (12)-89	Continuity
P1 (12)-43	P1 (12)-90	Continuity
P1 (12)-43	P1 (12)-91	Continuity
P1 (12)-43	P1 (12)-92	Continuity
P1 (12)-43	P1 (12)-94	Continuity
P1 (12)-43	P1 (12)-95	Continuity
P1 (12)-43	P1 (12)-99	Continuity
P1 (12)-43	P1 (12)-100	Continuity



BORESIGHT ALINEMENT FIXTURE



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 13 of 54)

Continued from previous page

STEP 19
On Amplifier Test Set:
a. Disconnect from 115 V ac power source.
b. Remove front panel (see para 7-4).
c. Alternately loosen two screws (16) and disconnect connector P1 (17).

STEP 20
Connect multimeter to SYNC connector (18) jack and circuit card connector P1 (17) pin 50.

Does multimeter indicate continuity?

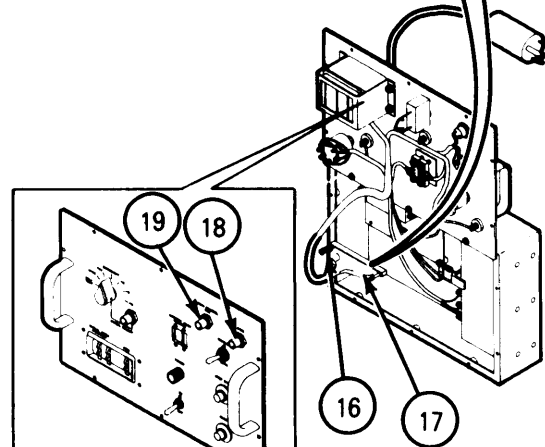
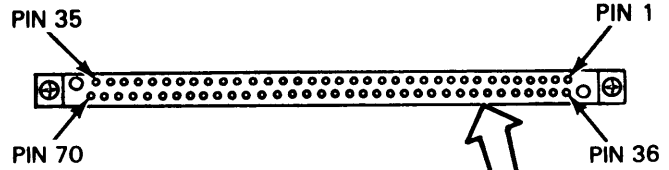
NO

Go to step 99.

YES

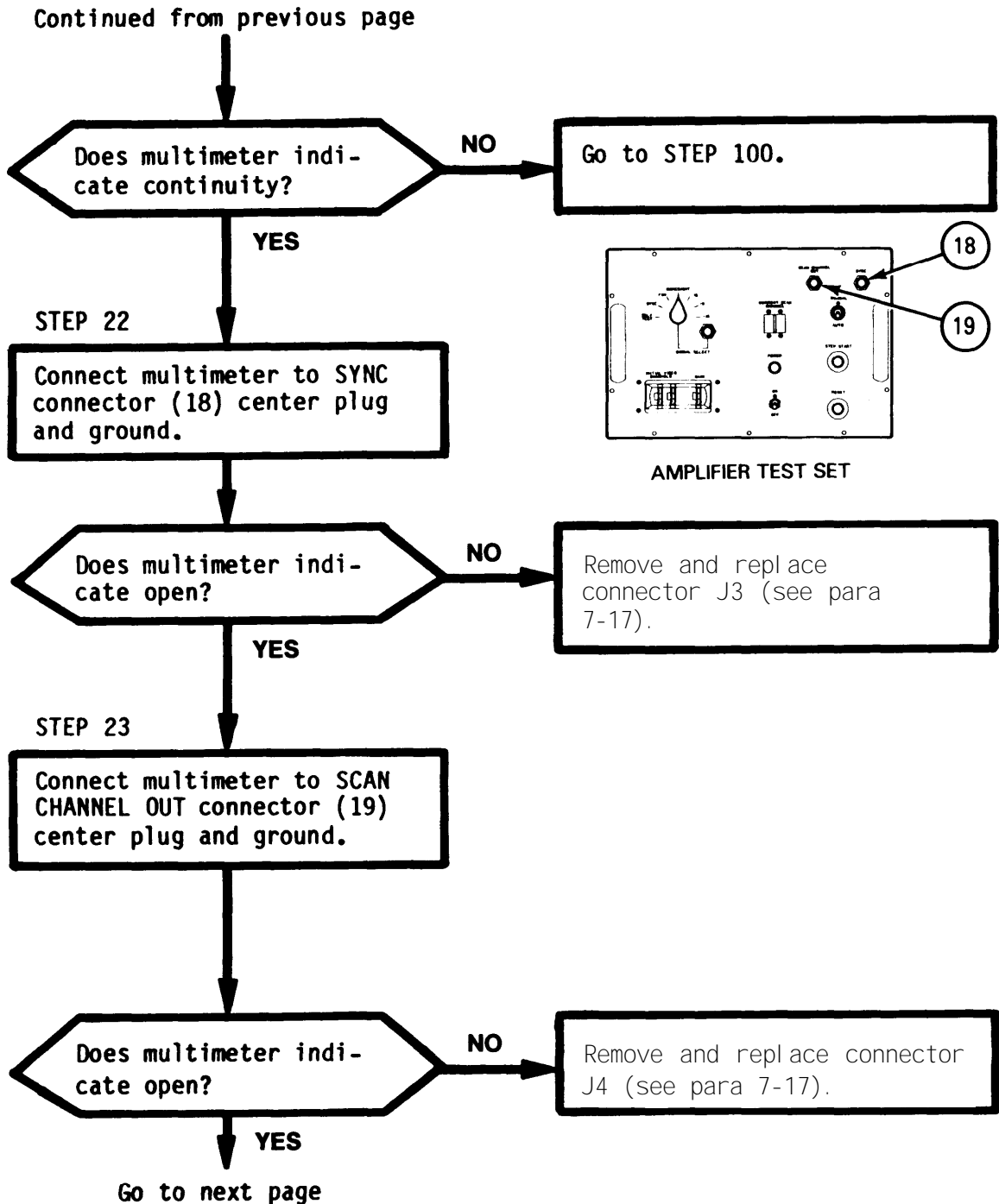
STEP 21
Connect multimeter to SCAN CHANNEL OUT connector (19) center plug and circuit card connector P1 (17) pin 60.

Go to next page



AMPLIFIER TEST SET

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 14 of 54)



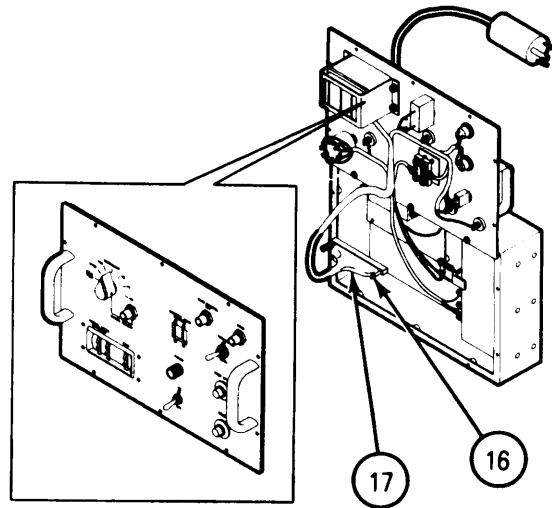
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 15 of 54)

Continued from previous page

STEP 24

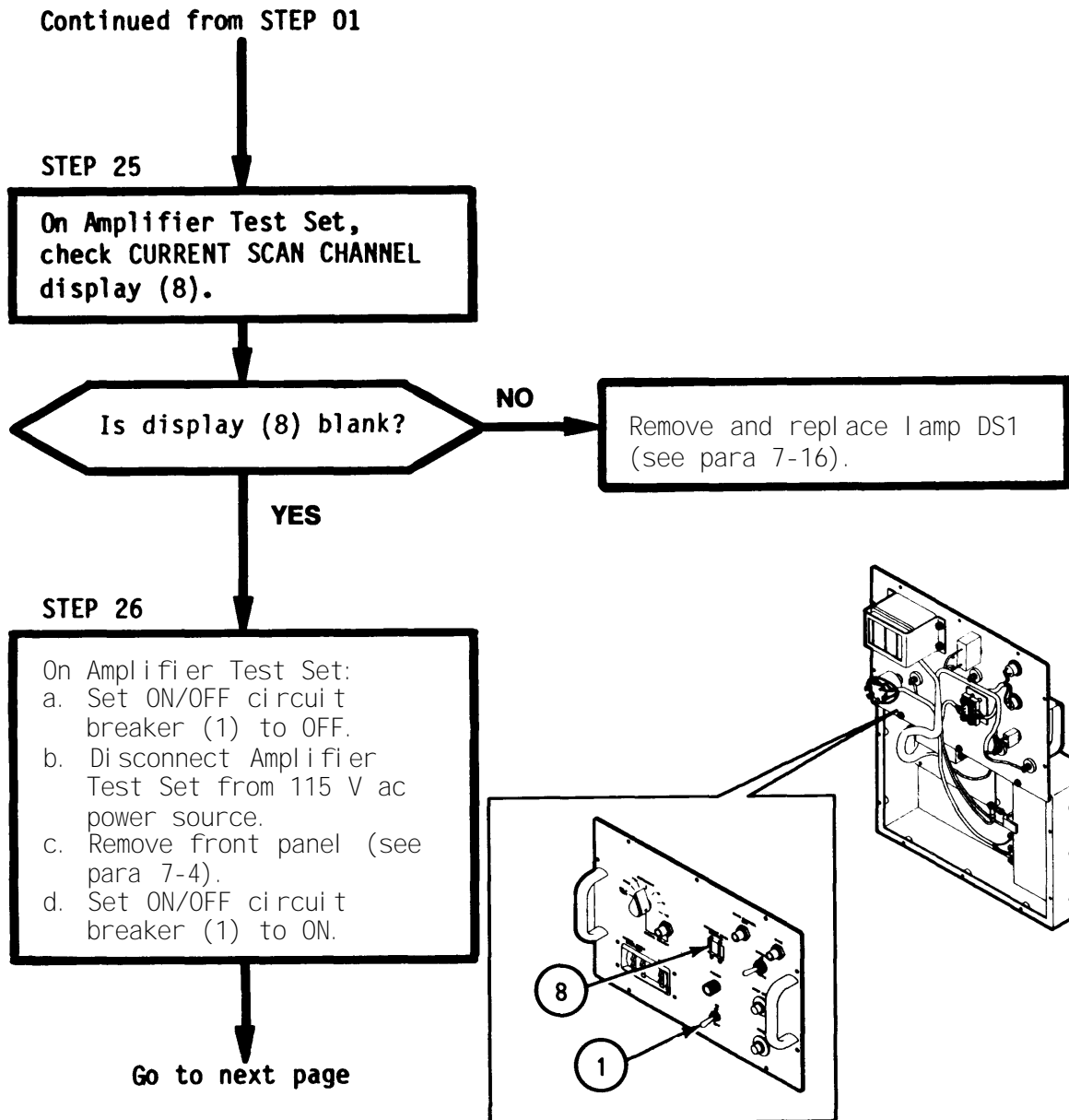
- On Amplifier Test Set:
- a. Connect connector P1 (17) and tighten two screws (16).
 - b. Install front panel (see para 7-4).

END OF TASK



AMPLIFIER TEST SET

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 16 of 54)



AMPLIFIER TEST SET

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 17 of 54)

Continued from previous page

STEP 27

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to ac plug (20) white pin and power supply A2 (21) both INPUT pins (alternately).

Does multimeter indicate continuity?

NO

YES

STEP 28

Connect multimeter to ac plug (20) brass pin and RF filter FL2 (22).

Does multimeter indicate continuity?

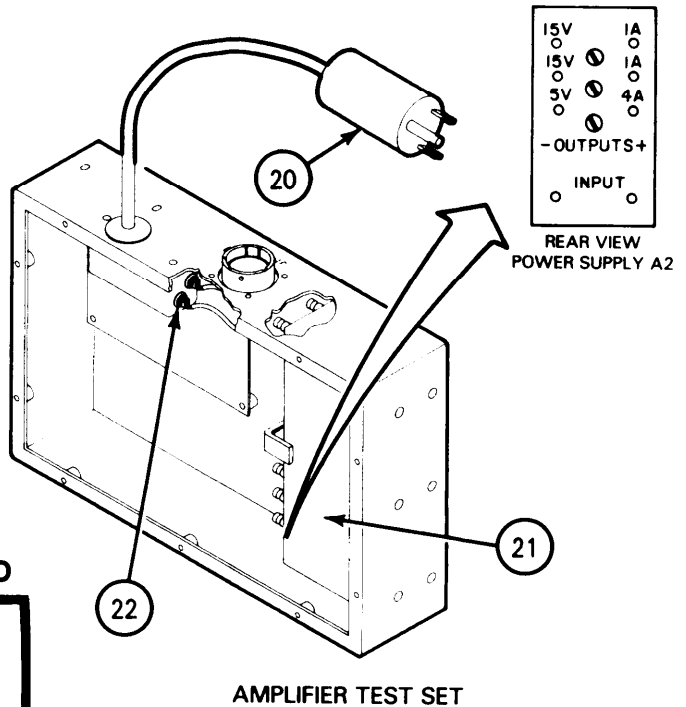
NO

YES

STEP 29

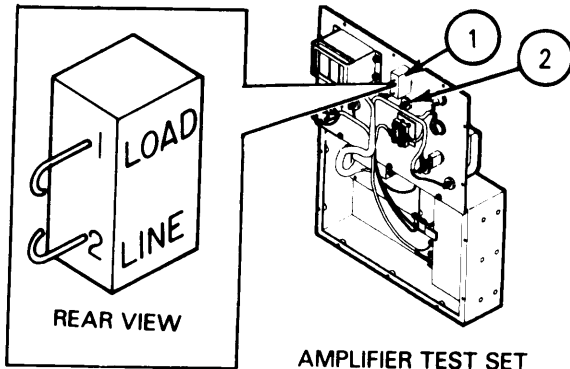
Connect multimeter to RF filter FL2 (22) and lamp DS1 (2) both pins (alternately).

Go to next page



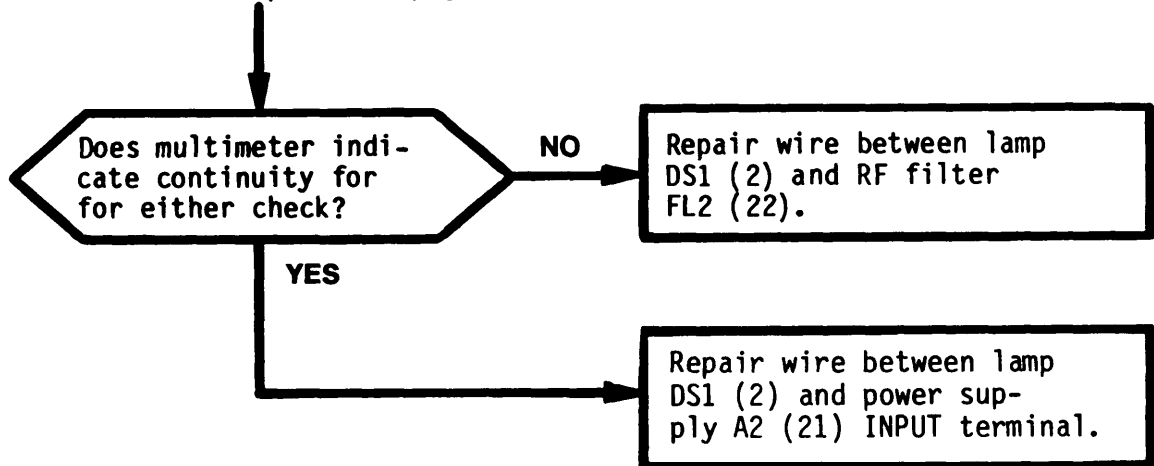
Go to STEP 30.

Go to STEP 34.

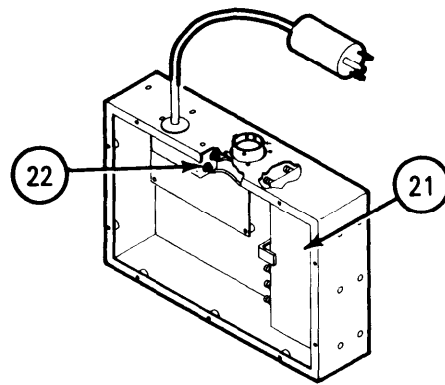
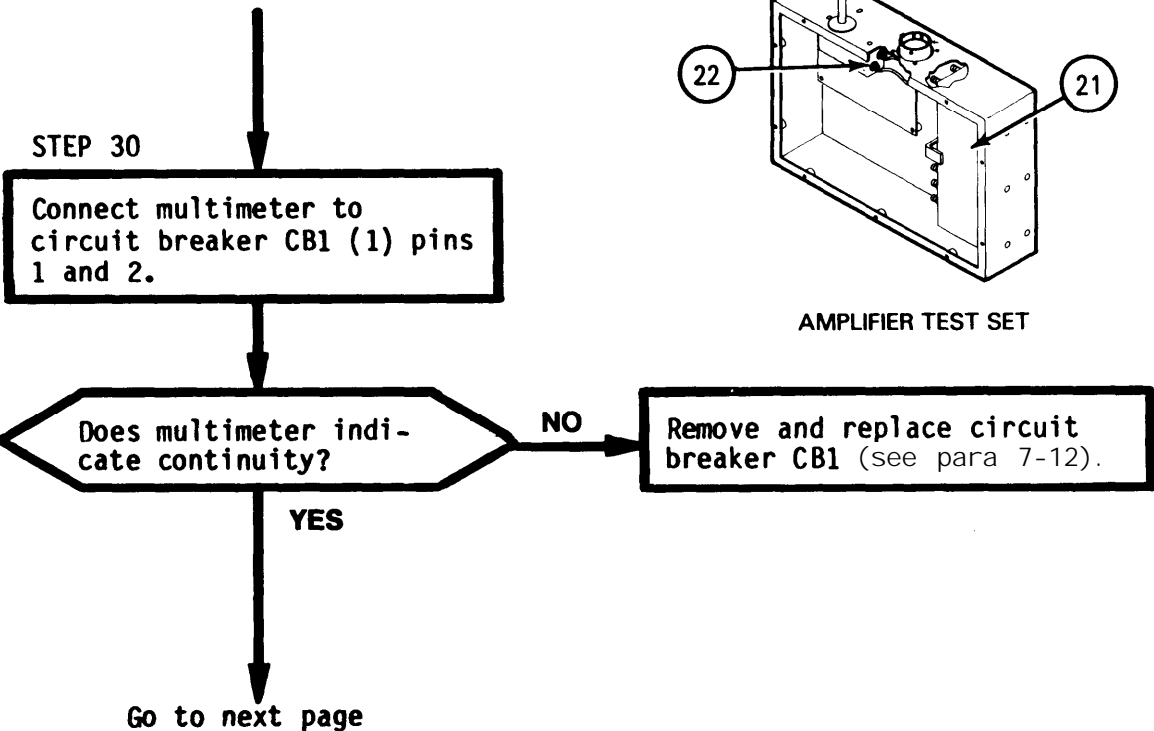


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 18 of 54)

Continued from previous page



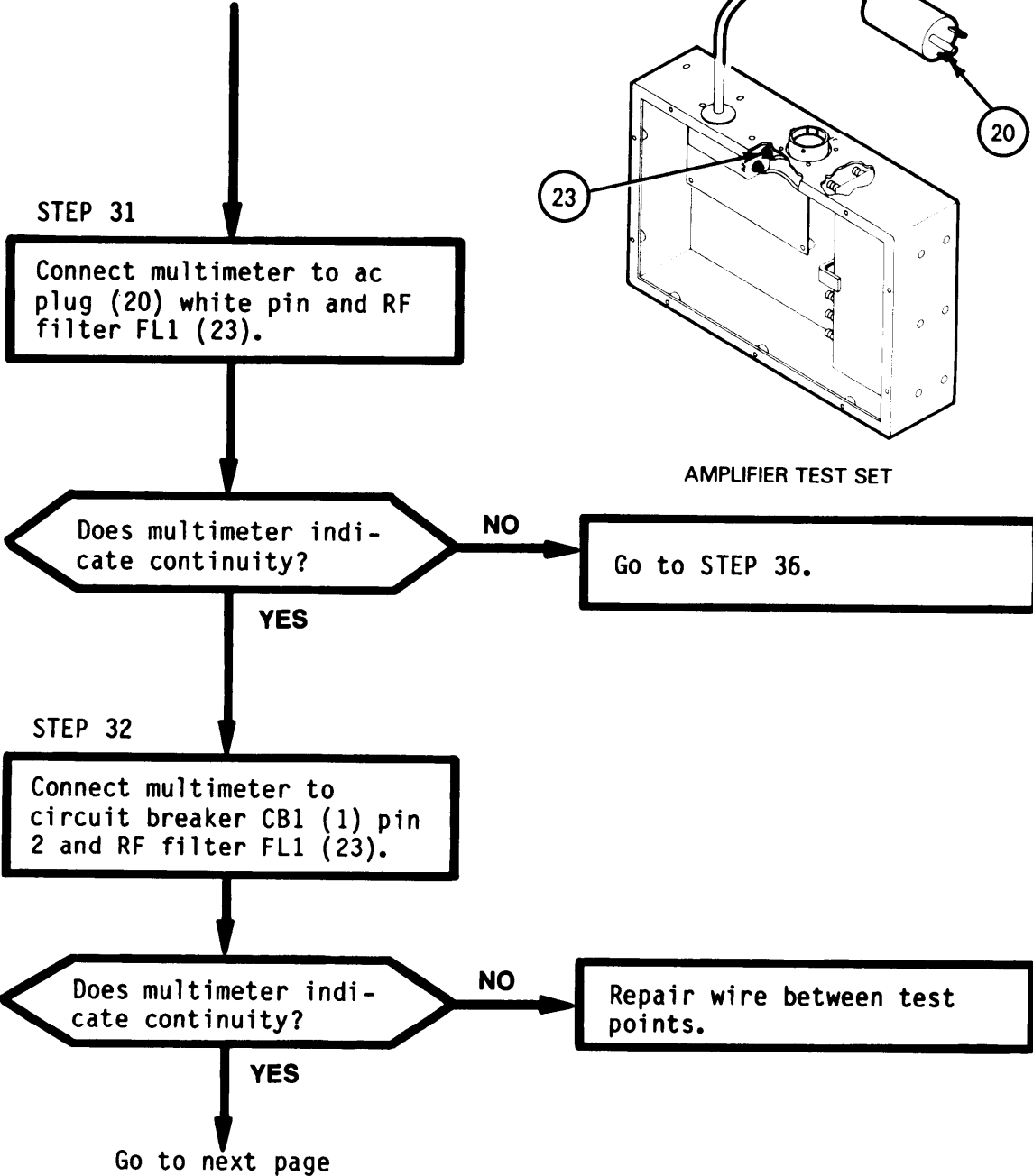
Continued from STEP 27



AMPLIFIER TEST SET

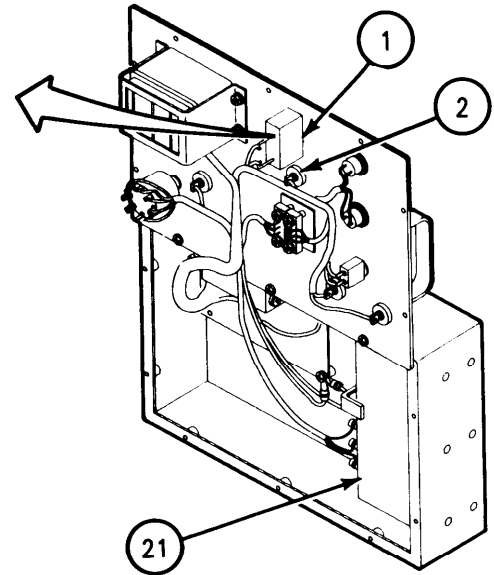
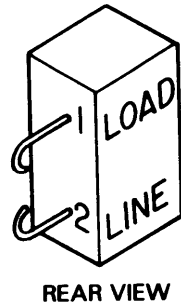
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 19 of 54)

Continued from previous page



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 20 of 54)

Continued from previous page



STEP 33

Connect multimeter to circuit breaker CB1 (1) pin 1 and lamp DS1 (2) both pins (alternately).

Does multimeter indicate continuity for either test?

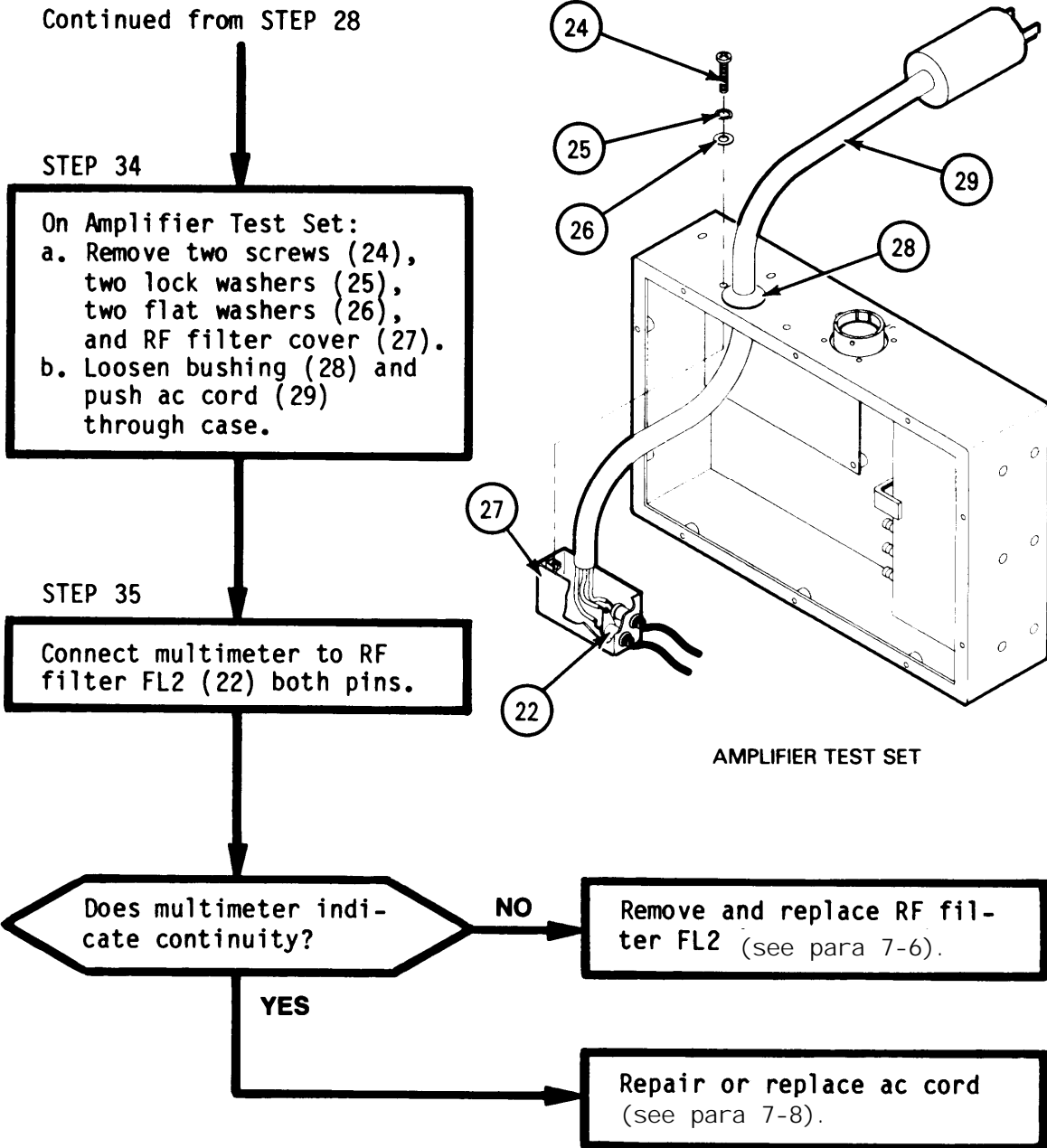
NO

Repair wire between circuit breaker CB1 (1) and lamp DS1 (2).

YES

Repair wire between lamp DS1 (2) and power supply A2 (21) INPUT terminal.

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 21 of 54)

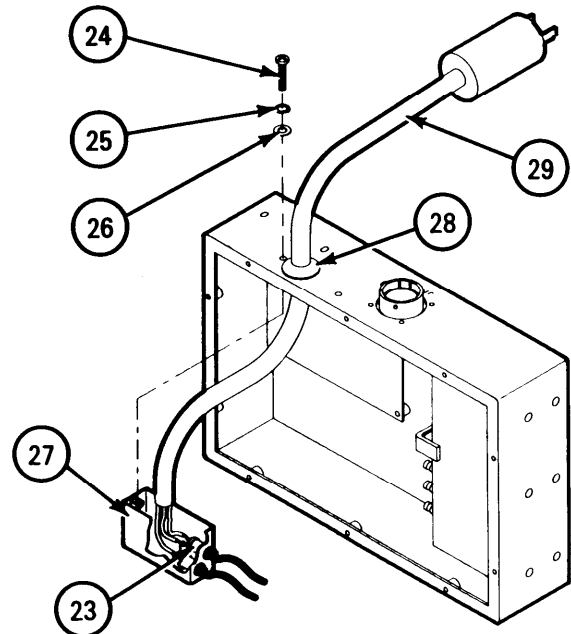


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 22 of 54)

Continued from STEP 31

STEP 36

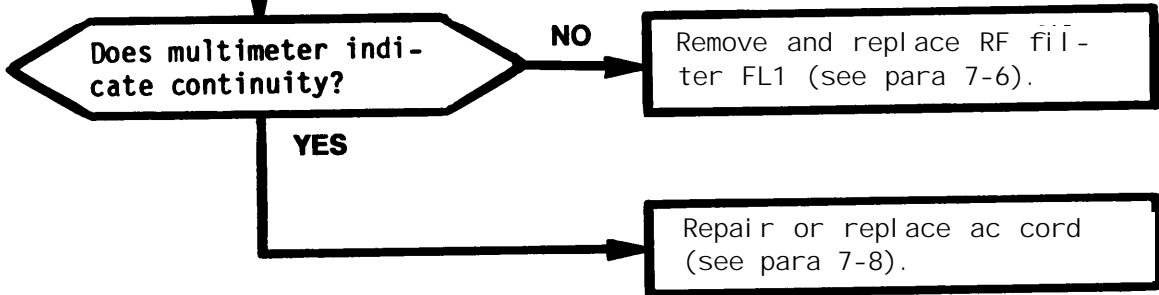
On Amplifier Test Set:
 a. Remove two screws (24),
 two lock washers (25),
 two flat washers (26),
 and RF filter cover (27).
 b. Loosen bushing (28) and
 push ac cord (29)
 through case.



AMPLIFIER TEST SET

STEP 37

Connect multimeter to RF
 filter FL1 (23) both leads.



Continued from STEP 03

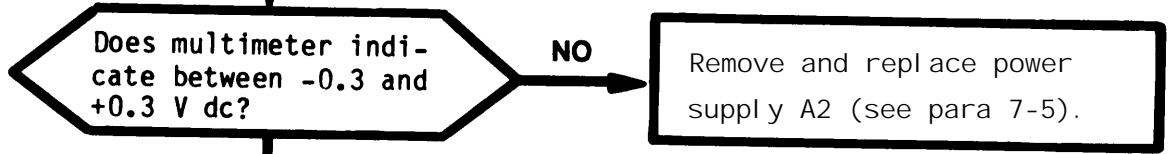
STEP 38

Check indication on multi-
 meter.

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 23 of 54)

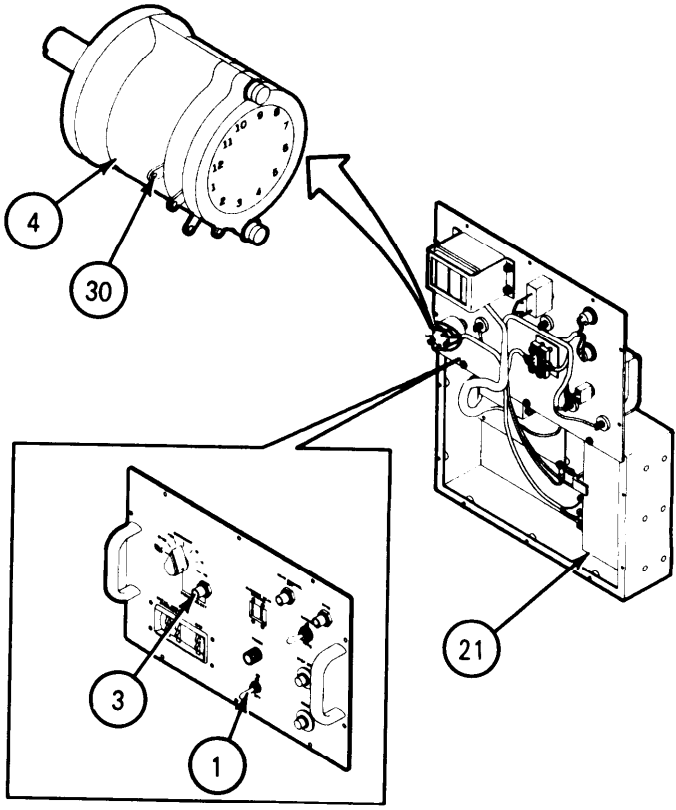
Continued from previous page



STEP 39

On Amplifier Test Set:

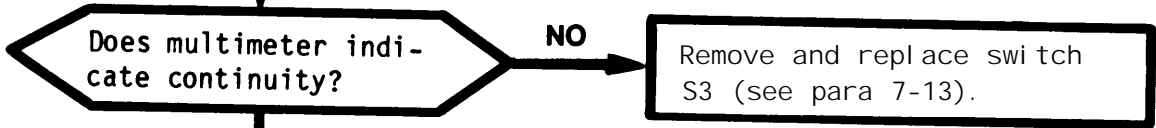
- Set ON/OFF circuit breaker (1) to OFF.
- Disconnect Amplifier Test Set from 115 V ac power source.
- Remove front panel (see para 7-4).



STEP 40

- Set multimeter to indicate ohms.
- Connect multimeter to switch S3 (4) pins 6 and C (30).

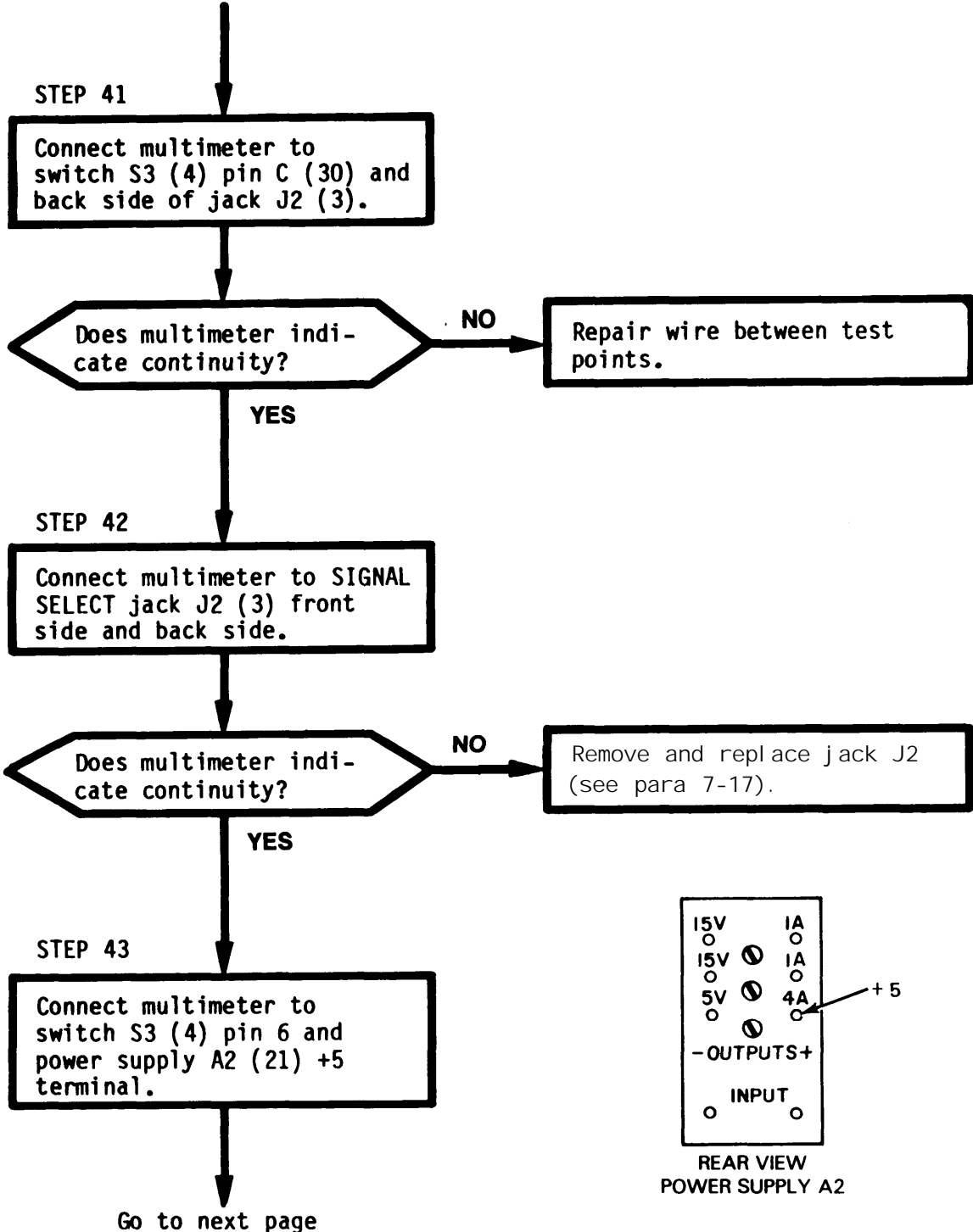
AMPLIFIER TEST SET



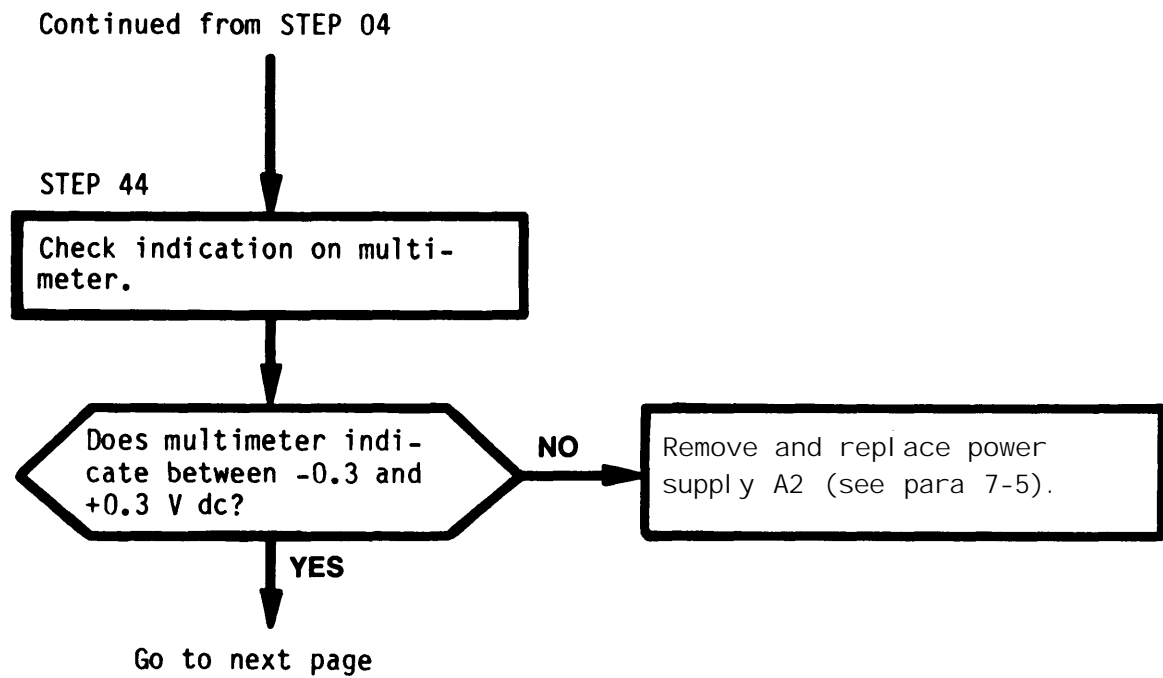
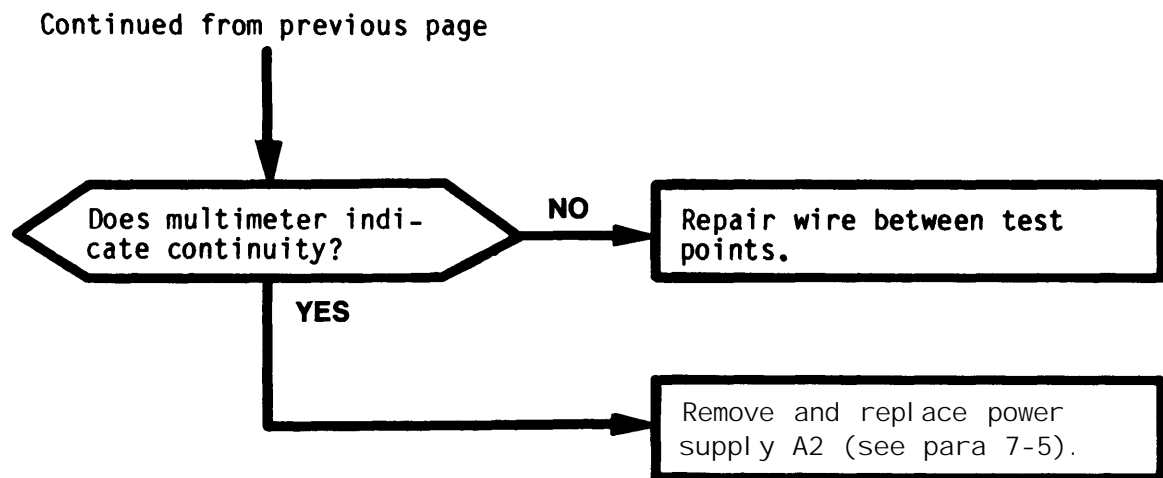
Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 24 of 54)

Continued from previous page



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 25 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 26 of 54)

Continued from previous page

STEP 45

- On Amplifier Test Set:
- Set ON/OFF circuit breaker (1) to OFF.
 - Disconnect Amplifier Test Set from 115 V ac power source.
 - Remove front panel (see para 7-4).

STEP 46

- Set multimeter to indicate ohms.
- Connect multimeter to switch S3 (4) pins 7 and C (30).

Does multimeter indicate continuity?

NO

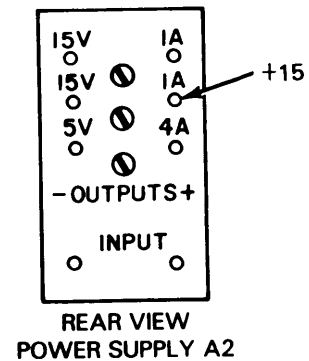
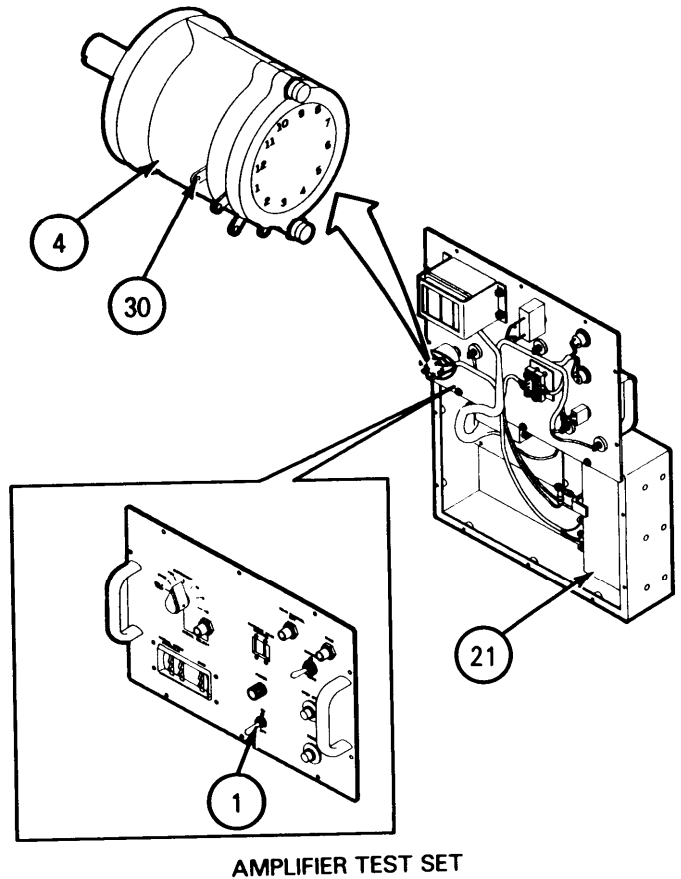
Remove and replace switch S3 (see para 7-13).

YES

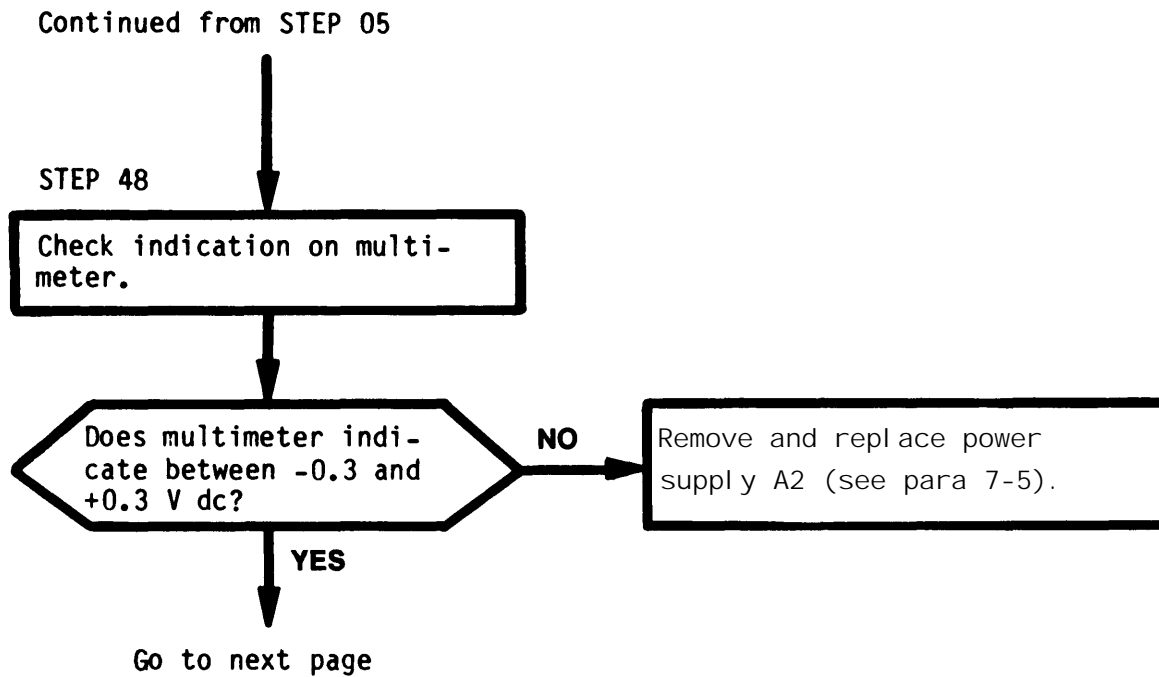
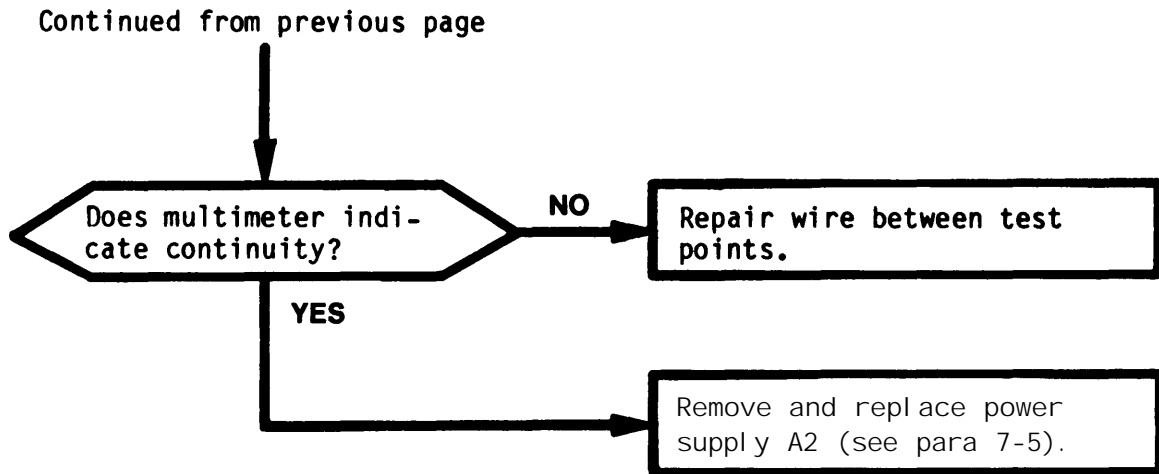
STEP 47

Connect multimeter to switch S3 (4) pin 7 and power supply A2 (21) +15 terminal.

Go to next page

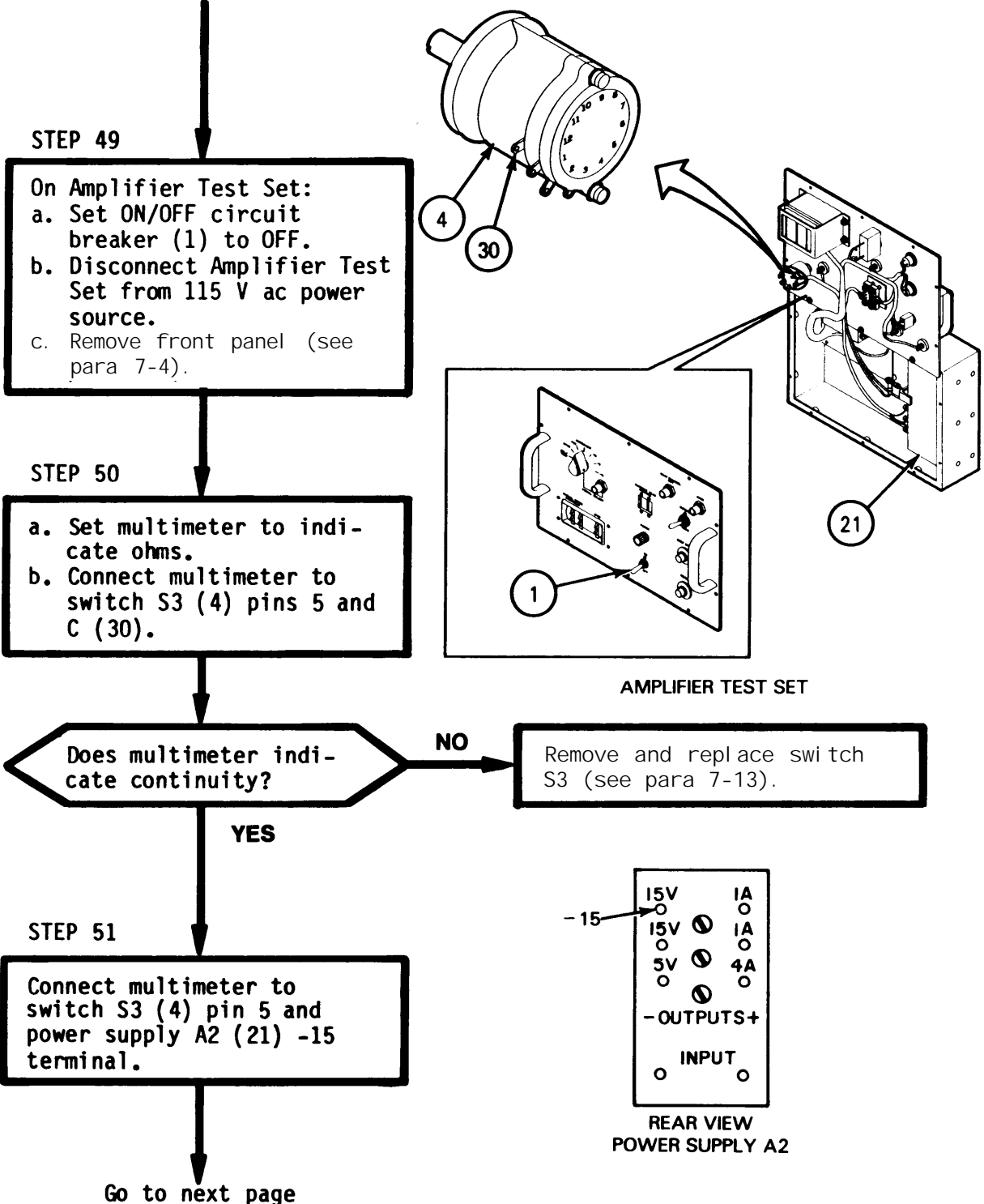


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 27 of 54)

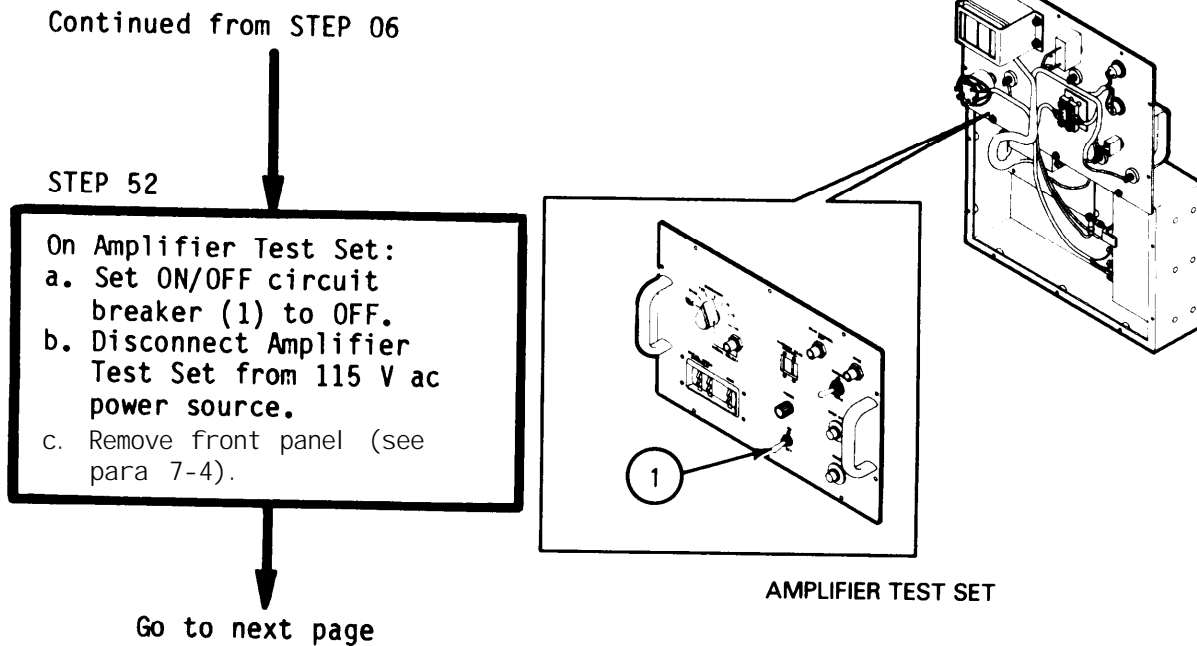
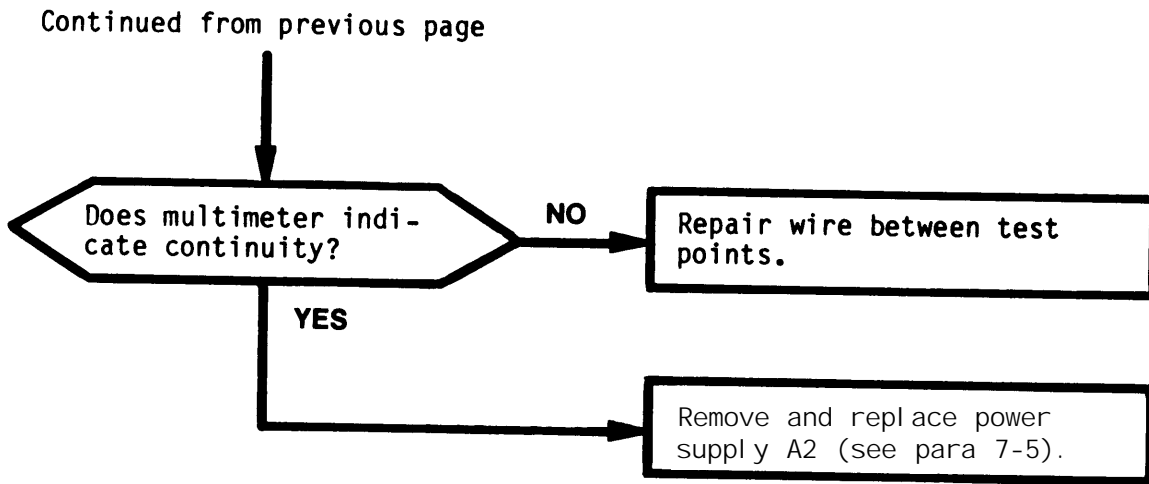


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 28 of 54)

Continued from previous page



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 29 of 54)



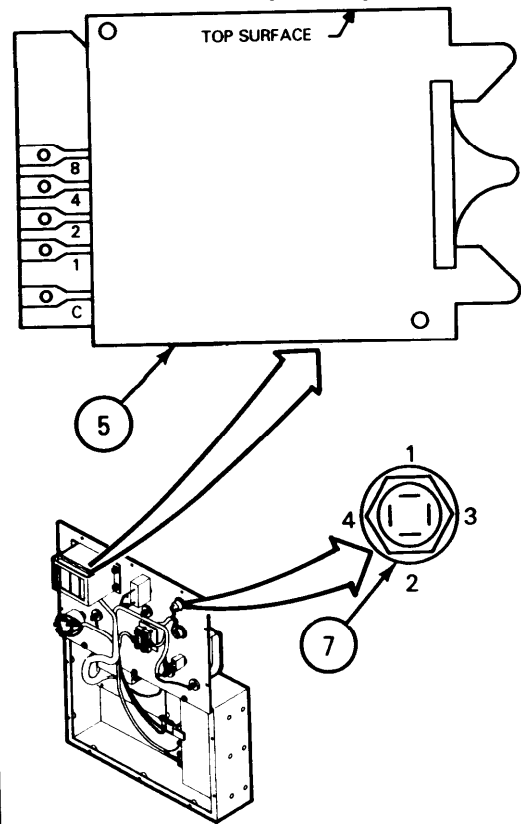
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 30 of 54)

Continued from previous page

STEP 53

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to thumbwheel switch S5 (5) as indicated below.

Test Points		Normal Indication
S5A (5)-C	S5A (5)-1	Continuity
S5A (5)-C	S5A (5)-2	Open
S5A (5)-C	S5A (5)-4	Continuity
S5A (5)-C	S5A (5)-8	Open
S5B (5)-C	S5B (5)-1	Open
S5B (5)-C	S5B (5)-2	Open
S5B (5)-C	S5B (5)-4	Open
S5B (5)-C	S5B (5)-8	Continuity



AMPLIFIER TEST SET

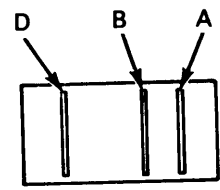
Do all tests pass?

NO
Remove and replace switch S5 (see para 7-14).

YES

STEP 54

Connect multimeter to switch S2 (7) pins 1 and 2.



REAR VIEW
S5

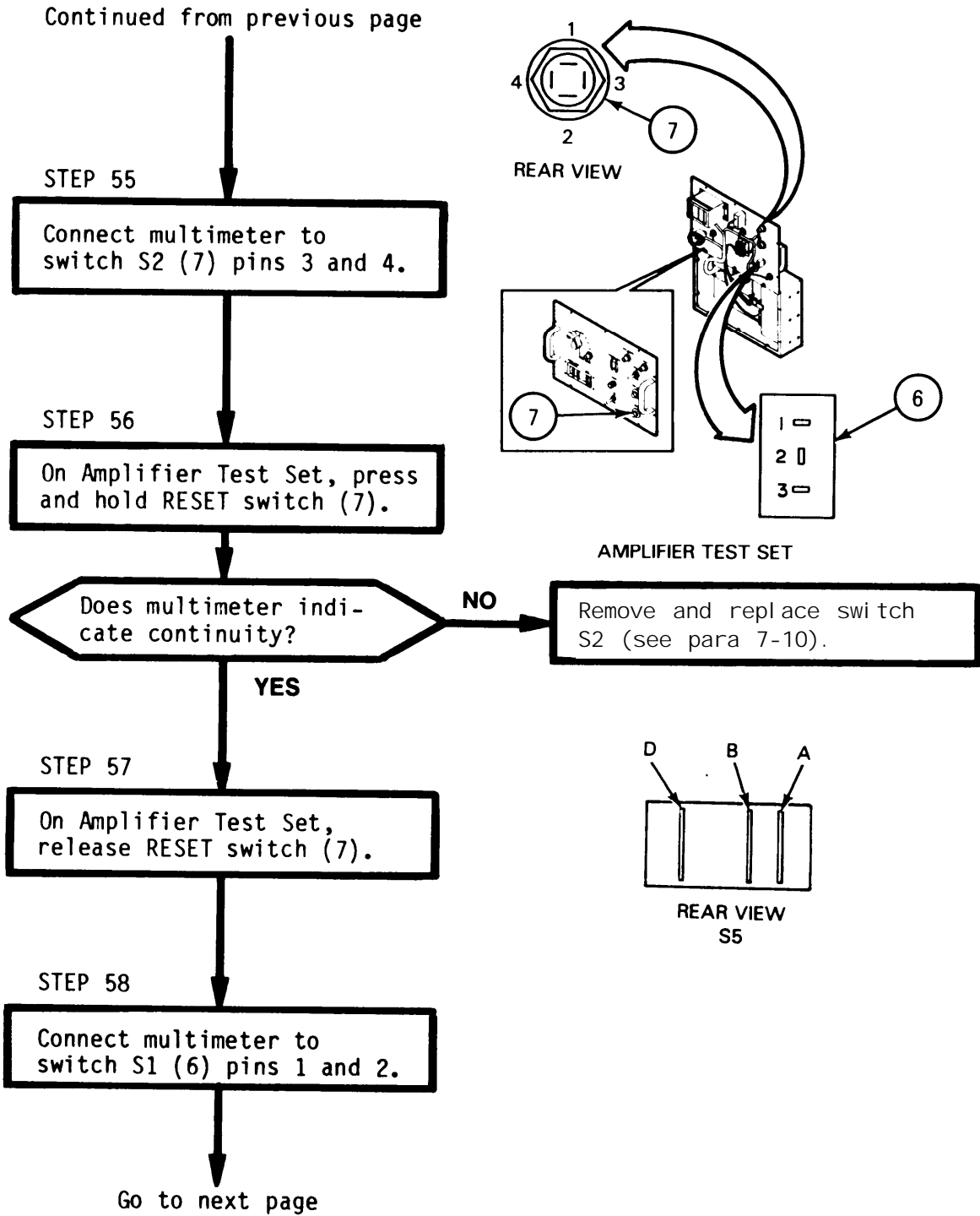
Does multimeter indicate continuity?

NO
Remove and replace switch S2 (see para 7-10).

YES

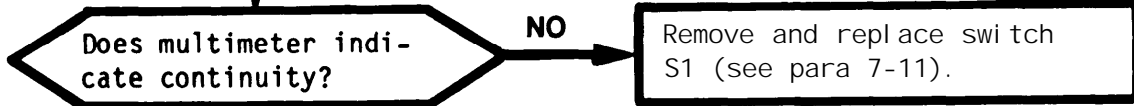
Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 31 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 32 of 54)

Continued from previous page



NO

Remove and replace switch S1 (see para 7-11).

YES

STEP 59

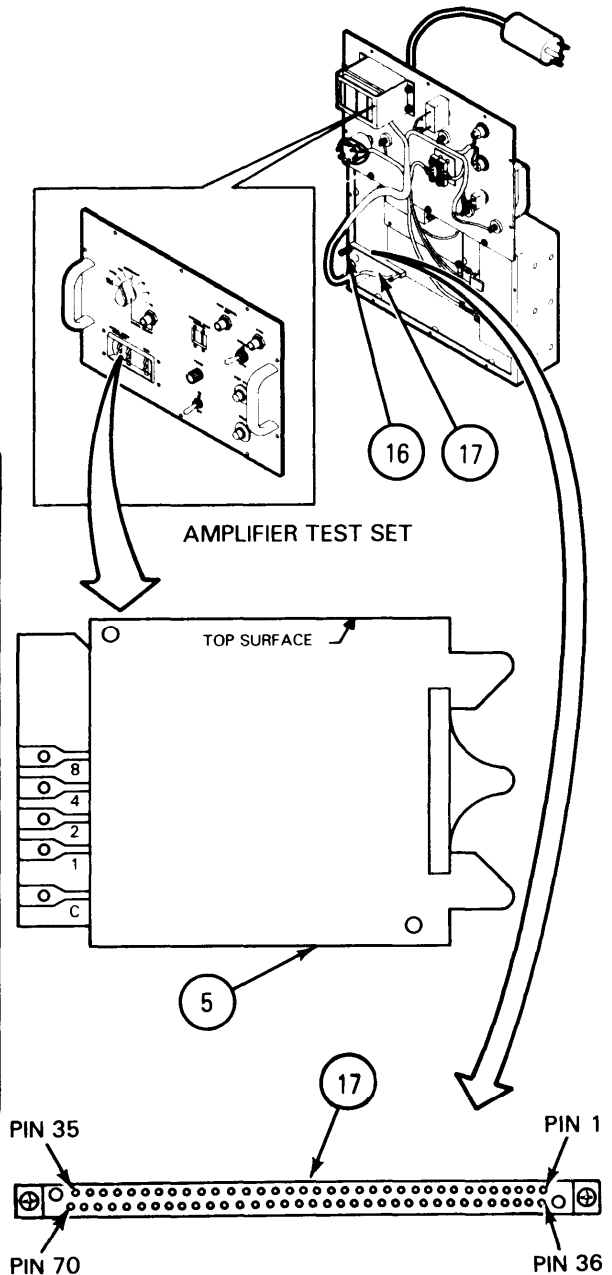
On Amplifier Test Set, loosen two screws (16) and disconnect connector P1 (17).

STEP 60

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5A (5)-1	P1 (17)-18	Continuity
S5A (5)-2	P1 (17)-17	Continuity
S5A (5)-4	P1 (17)-15	Continuity
S5A (5)-8	P1 (17)-14	Continuity
S5A (5)-C	P1 (17)-52	Continuity
S5B (5)-1	P1 (17)-22	Continuity
S5B (5)-2	P1 (17)-20	Continuity
S5B (5)-4	P1 (17)-21	Continuity
S5B (5)-8	P1 (17)-19	Continuity
S5B (5)-C	P1 (17)-52	Continuity
S2 (7)-1	P1 (17)-70	Continuity
S2 (7)-2	P1 (17)-67	Continuity
S2 (7)-3	P1 (17)-70	Continuity
S2 (7)-4	P1 (17)-34	Continuity

Go to next page

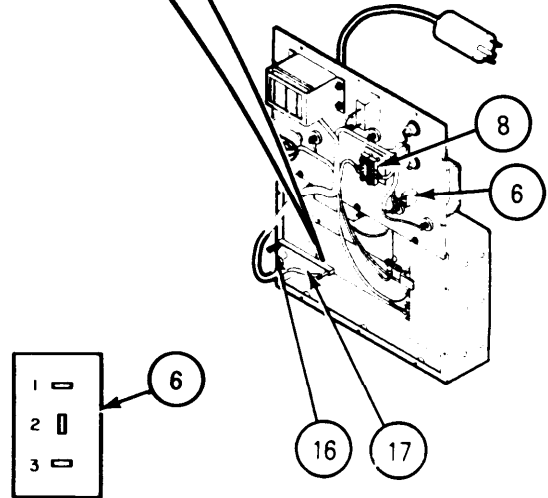
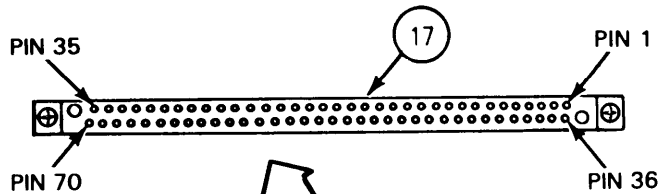


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 33 of 54)

Continued from previous page

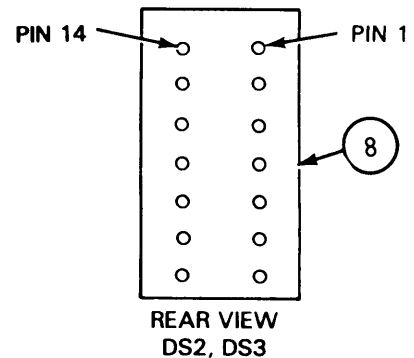
STEP 60
(CONT)

Test Points		Normal Indication
S1 (6)-1	P1 (17)-69	Continuity
S1 (6)-2	P1 (17)-70	Continuity
DS2 (8)-1	P1 (17)-38	Continuity
DS2 (8)-13	P1 (17)-37	Continuity
DS2 (8)-10	P1 (17)-36	Continuity
DS2 (8)-8	P1 (17)-4	Continuity
DS2 (8)-7	P1 (17)-3	Continuity
DS2 (8)-2	P1 (17)-5	Continuity
DS2 (8)-11	P1 (17)-39	Continuity
DS2 (8)-9	P1 (17)-70	Continuity
DS2 (8)-3	P1 (17)-70	Continuity
DS2 (8)-4	P1 (17)-70	Continuity
DS3 (8)-1	P1 (17)-42	Continuity
DS3 (8)-13	P1 (17)-43	Continuity
DS3 (8)-10	P1 (17)-44	Continuity
DS3 (8)-8	P1 (17)-45	Continuity
DS3 (8)-7	P1 (17)-2	Continuity
DS3 (8)-2	P1 (17)-40	Continuity
DS3 (8)-11	P1 (17)-41	Continuity
DS3 (8)-9	P1 (17)-52	Continuity
DS3 (8)-3	P1 (17)-52	Continuity
DS3 (8)-14	P1 (17)-52	Continuity

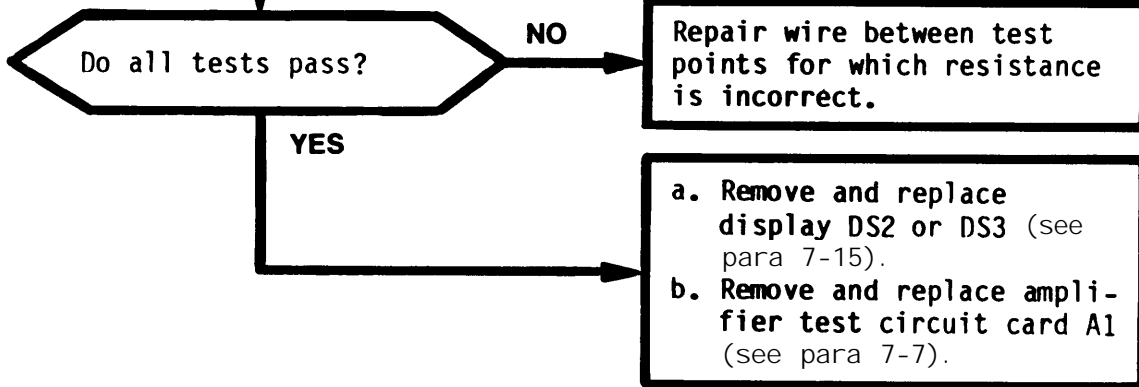


REAR VIEW
S1

AMPLIFIER TEST SET



REAR VIEW
DS2, DS3

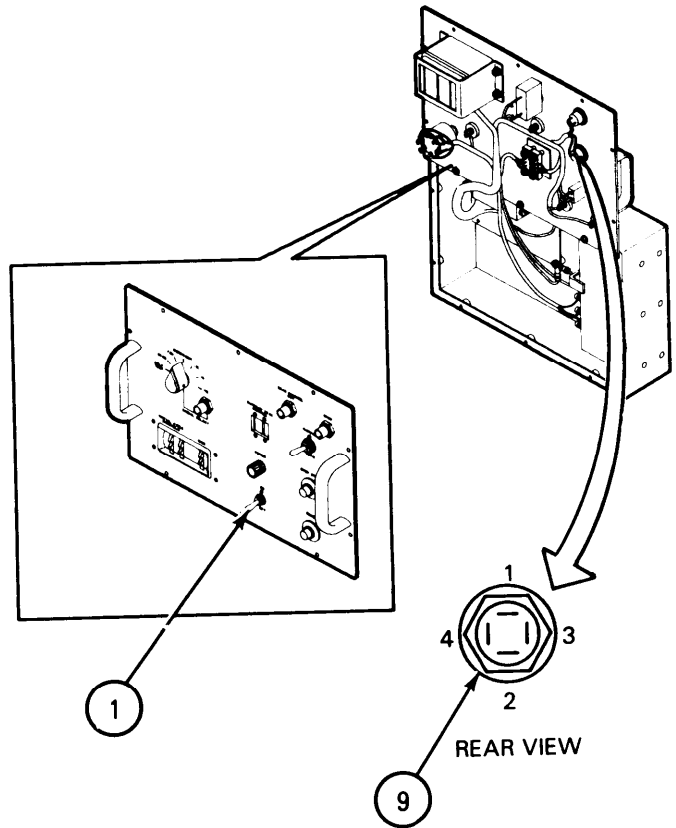


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 34 of 54)

Continued from STEP 07

STEP 61

On Amplifier Test Set:
 a. Set ON/OFF circuit breaker (1) to OFF.
 b. Disconnect Amplifier Test Set from 115 V ac power source.
 c. Remove front panel (see para 7-4).



AMPLIFIER TEST SET

STEP 62

a. Set multimeter to indicate ohms.
 b. Connect multimeter to switch S4 (9) pins 1 and 2.

Does multimeter indicate continuity?

NO

Remove and replace switch S4 (see para 7-10).

YES

STEP 63

Connect multimeter to switch S4 (9) pins 3 and 4.

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 35 of 54)

Continued from previous page

STEP 64

On Amplifier Test Set, press and hold STEP/START switch (9).

Does multimeter indicate continuity?

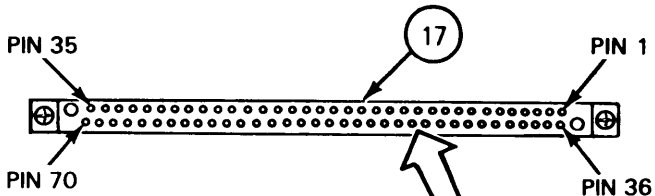
NO

Remove and replace switch S4 (see para 7-10).

YES

STEP 65

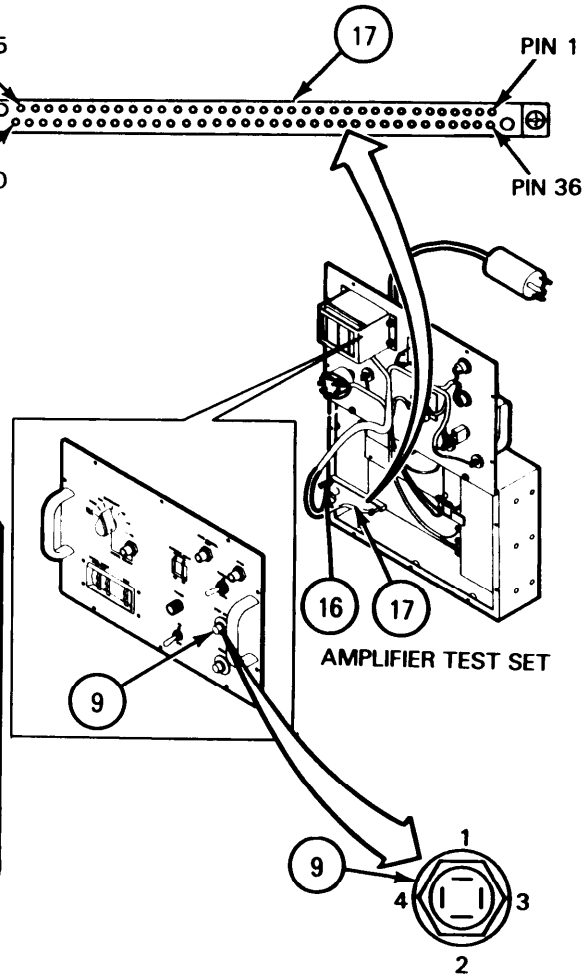
On Amplifier Test Set:
a. Release STEP/START switch (9).
b. Loosen two screws (16) and disconnect connector P1 (17).



STEP 66

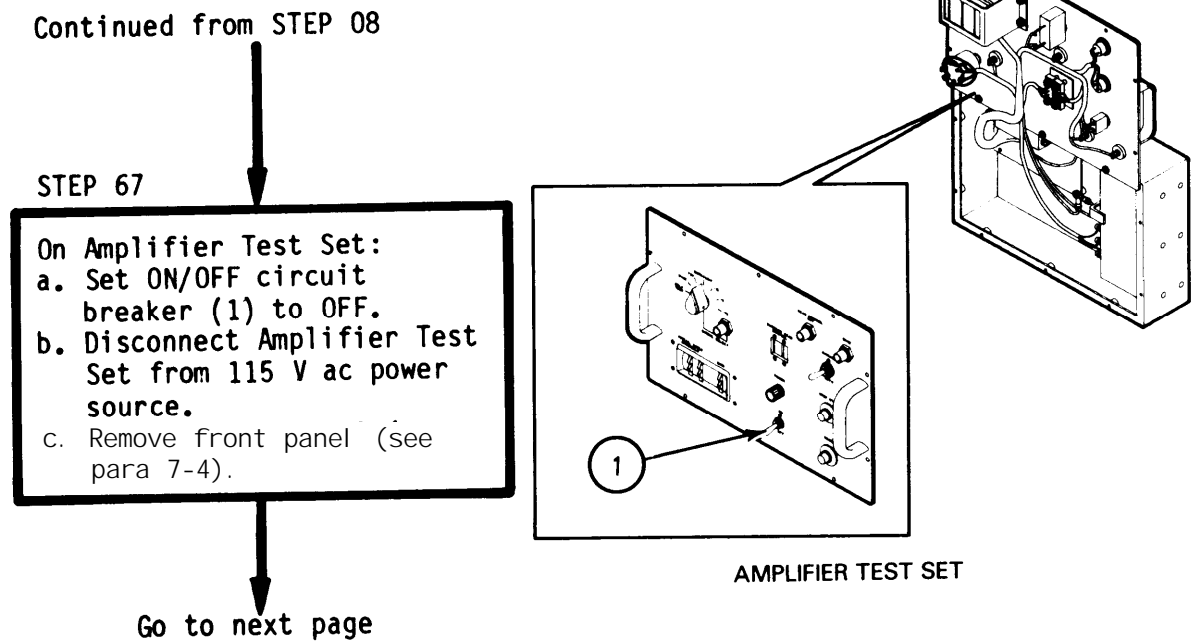
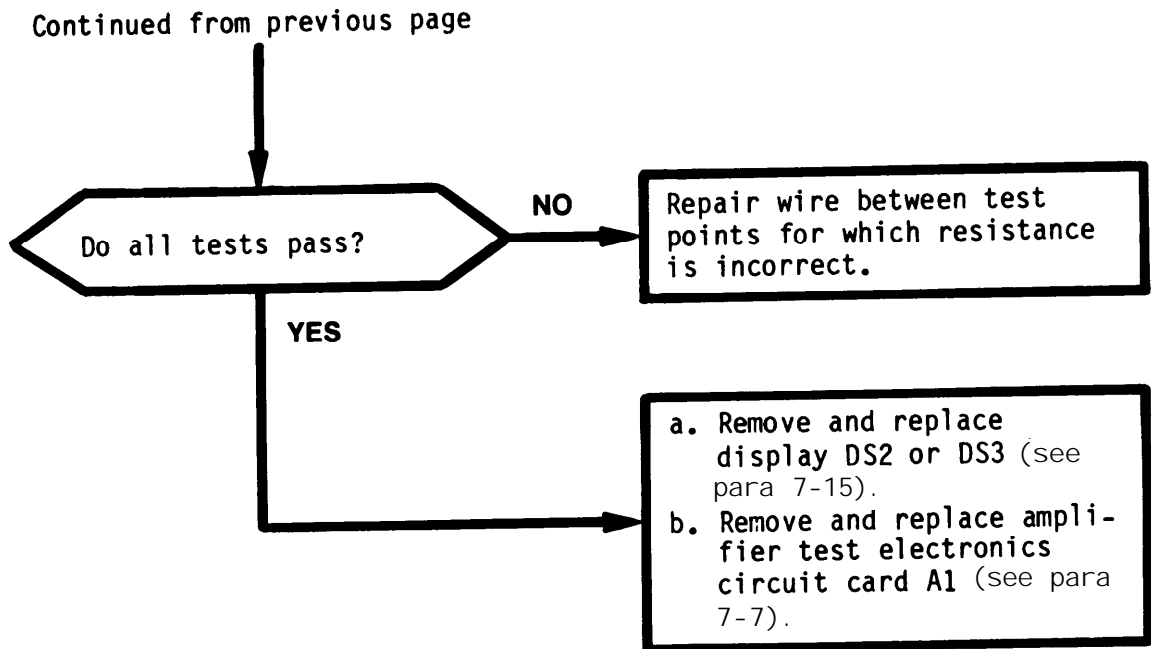
Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S4 (9)-1 P1 (17)-70	Continuity
S4 (9)-2 P1 (17)-33	Continuity
S4 (9)-3 P1 (17)-70	Continuity
S4 (9)-4 P1 (17)-32	Continuity



Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 36 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 37 of 54)

Continued from previous page

STEP 68

- a. Set multimeter to indicate ohms.
- b. Connect multimeter to switch S1 (6) pins 2 and 3.

Does multimeter indicate continuity?

NO

Remove and replace switch S1 (see para 7-11).

YES

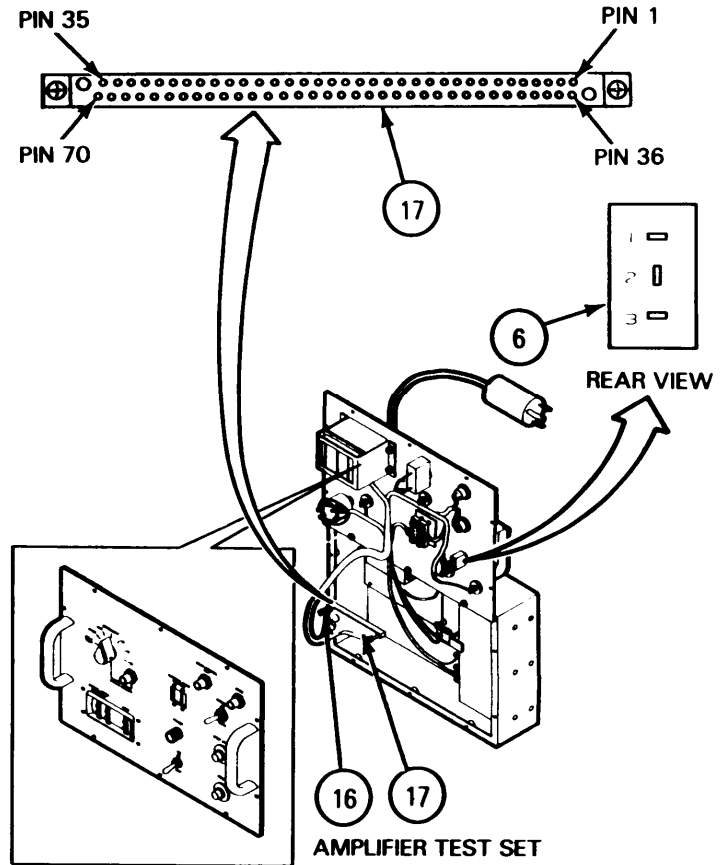
STEP 69

On Amplifier Test Set, loosen two screws (16) and disconnect connector P1 (17).

STEP 70

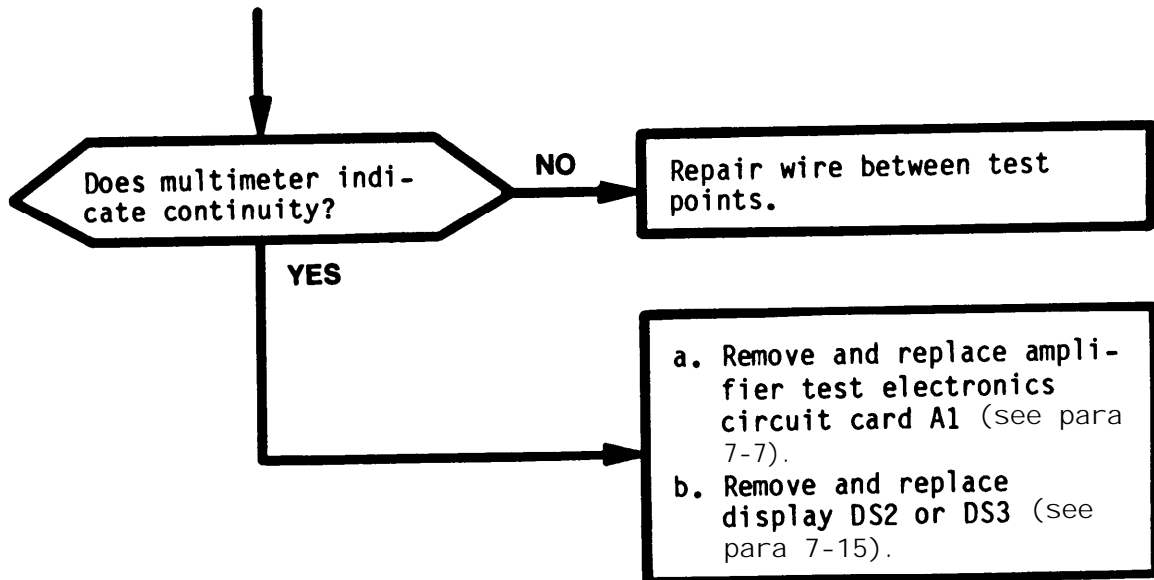
Connect multimeter to switch S1 (6) pin 3 and connector P1 (17) pin 68.

Go to next page



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 38 of 54)

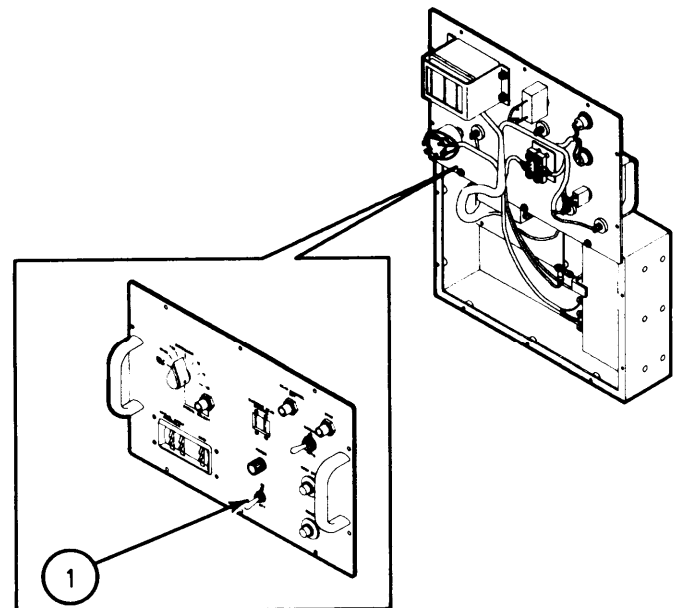
Continued from previous page



Continued from STEP 09

STEP 71

- On Amplifier Test Set:
- a. Set ON/OFF circuit breaker (1) to OFF.
 - b. Disconnect Amplifier Test Set from 115 V ac power source.
 - c. Remove front panel (see para 7-4).



AMPLIFIER TEST SET

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 39 of 54)

Continued from previous page

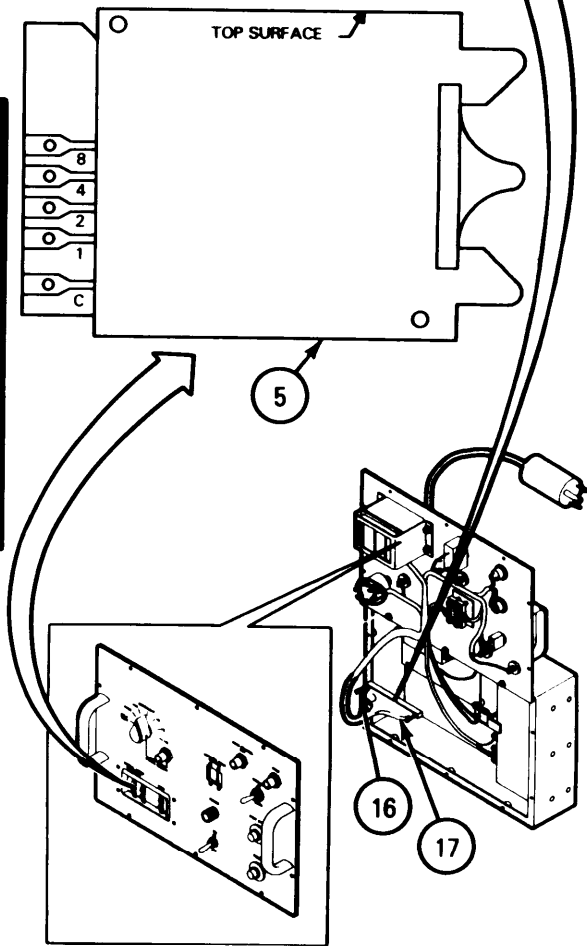
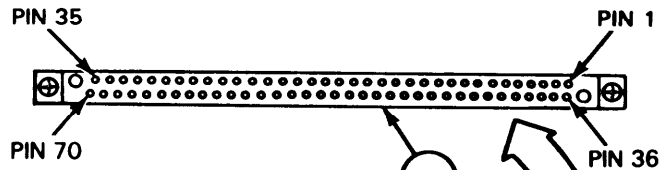
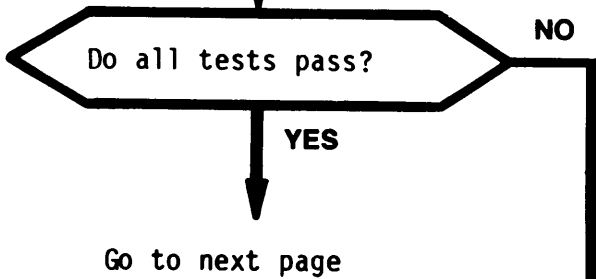
STEP 72

On Amplifier Test Set, loosen two screws (16) and disconnect connector P1 (17).

STEP 73

a. Set multimeter to indicate ohms.
b. Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5D (5)-1	S5D (5)-C	Open
S5D (5)-2	S5D (5)-C	Open
S5D (5)-4	S5D (5)-C	Open
S5D (5)-8	S5D (5)-C	Open



AMPLIFIER TEST SET

Remove and replace switch S5 (see para 7-14).

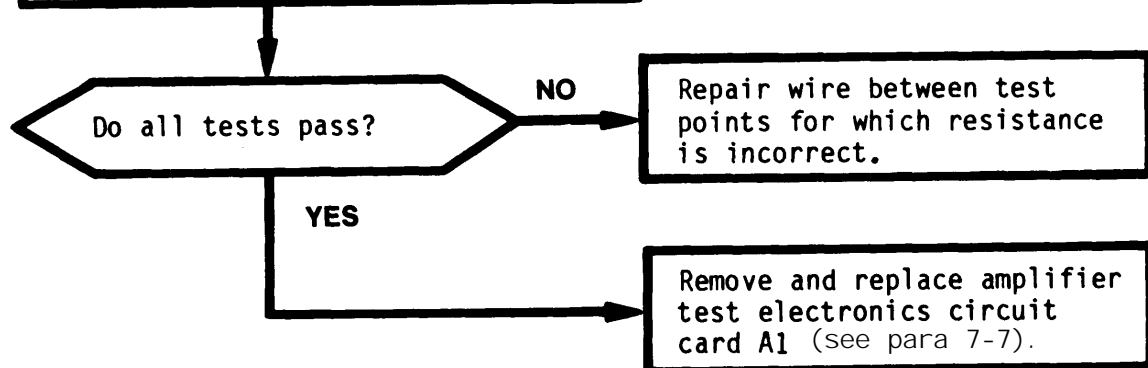
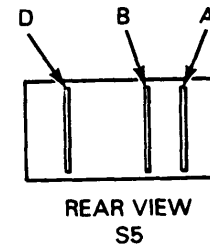
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 40 of 54)

Continued from previous page

STEP 74

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S5D (5)-1 P1 (17)-57	Continuity
S5D (5)-2 P1 (17)-56	Continuity
S5D (5)-4 P1 (17)-12	Continuity
S5D (5)-8 P1 (17)-13	Continuity
S5D (5)-C P1 (17)-70	Continuity

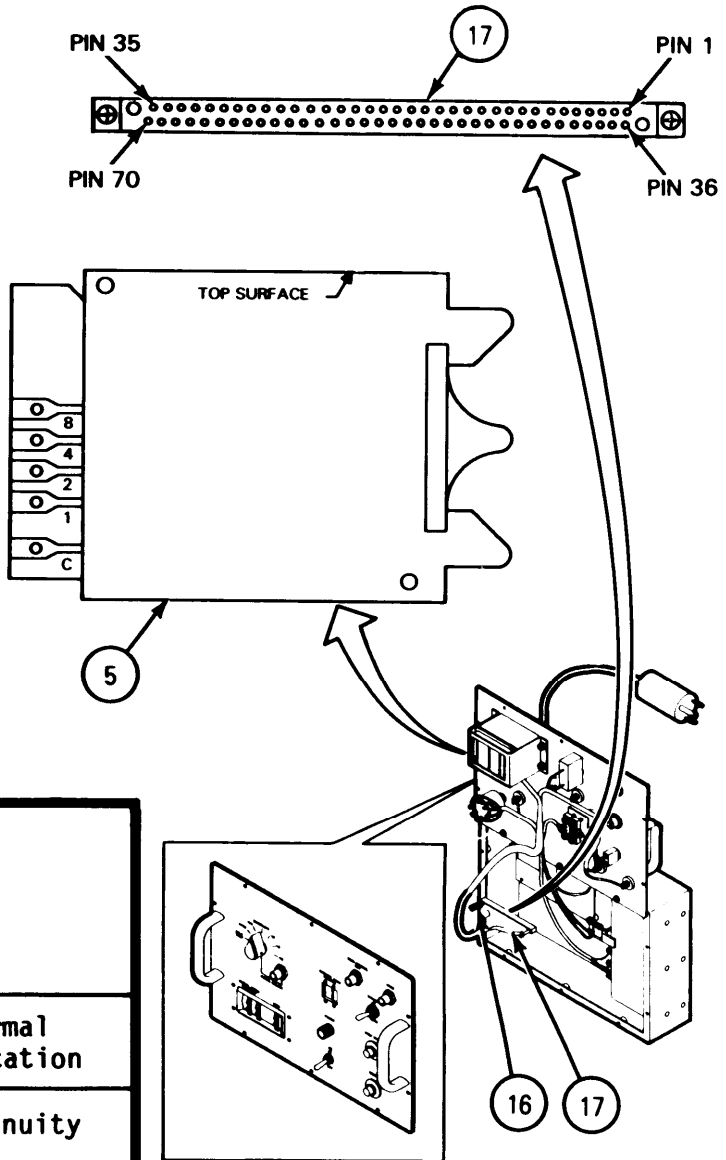


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 41 of 54)

Continued from STEP 10

STEP 75

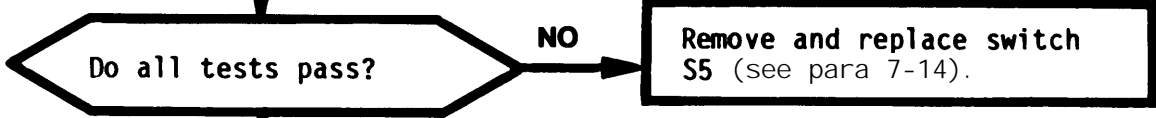
- On Amplifier Test Set:
- Set ON/OFF circuit breaker (1) to OFF.
 - Disconnect Amplifier Test Set from 115 V ac power source.
 - Remove front panel (see para 7-4).
 - Loosen two screws (16) and disconnect connector P1 (17).



STEP 76

- Set multimeter to indicate ohms.
- Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5D (5)-1	S5D (5)-C	Continuity
S5D (5)-2	S5D (5)-C	Open
S5D (5)-4	S5D (5)-C	Continuity
S5D (5)-8	S5D (5)-C	Open



YES


Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 42 of 54)

Continued from previous page

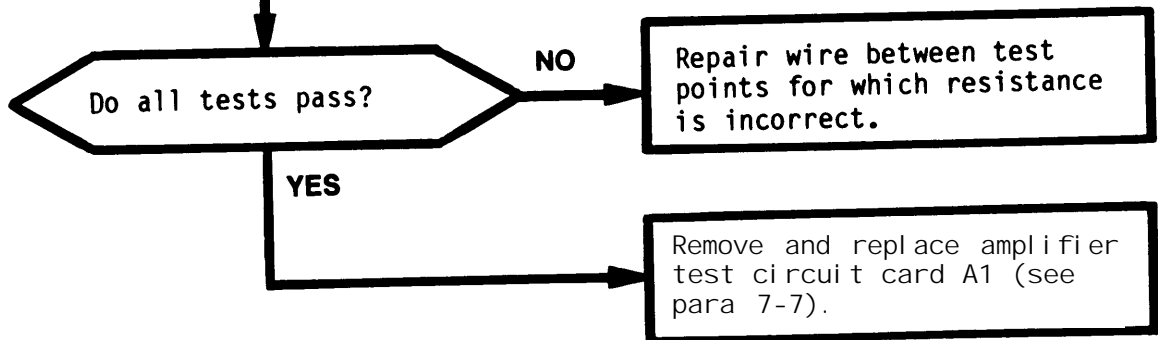
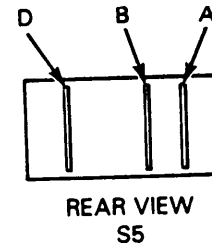
STEP 77 

DELETED

STEP 78 

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5D (5)-1	P1 (17)-57	Continuity
S5D (5)-2	P1 (17)-56	Continuity
S5D (5)-4	P1 (17)-12	Continuity
S5D (5)-8	P1 (17)-13	Continuity
S5D (5)-C	P1 (17)-70	Continuity

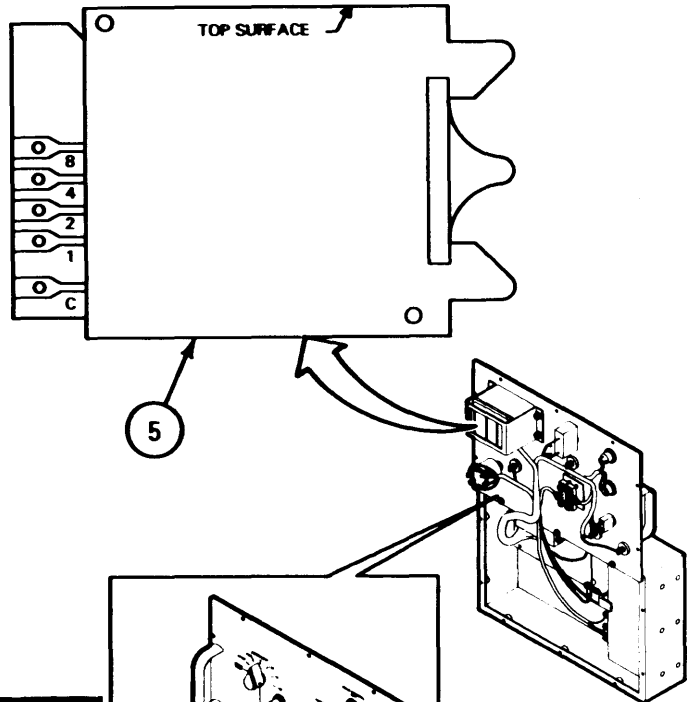


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 43 of 54)

Continued from STEP 11

STEP 79

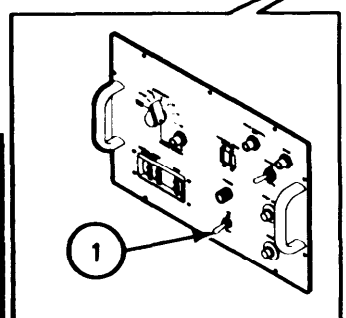
- On Amplifier Test Set:**
- Set ON/OFF circuit breaker (1) to OFF.
 - Disconnect Amplifier Test Set from 115 V ac power source.
 - Remove front panel (see para 7-4).
 - Loosen two screws (16) and disconnect connector P1 (17).



STEP 80

- Set multimeter to indicate ohms.
- Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S5D (5)-1 S5D (5)-C	Continuity
S5D (5)-2 S5D (5)-C	Continuity
S5D (5)-4 S5D (5)-C	Open
S5D (5)-8 S5D (5)-C	Continuity



AMPLIFIER TEST SET


Do all tests pass?

NO
Remove and replace switch S5 (see para 7-14).


YES
Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 44 of 54)

Continued from previous page

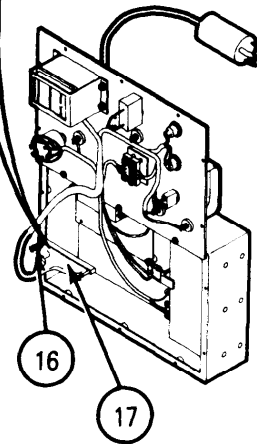
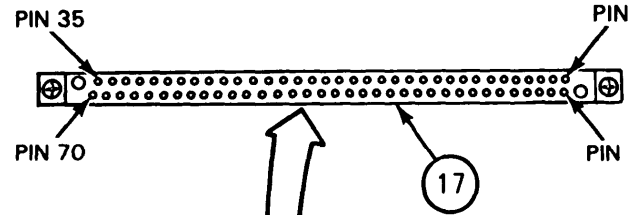
STEP 81 

DELETED

STEP 82 

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5D (5)-1	P1 (17)-57	Continuity
S5D (5)-2	P1 (17)-56	Continuity
S5D (5)-4	P1 (17)-12	Continuity
S5D (5)-8	P1 (17)-13	Continuity
S5D (5)-C	P1 (17)-70	Continuity



AMPLIFIER TEST SET

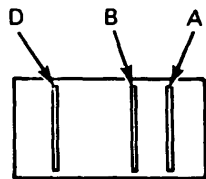
Do all tests pass?

NO

Repair wire between test points for which resistance is incorrect.

YES

Remove and replace amplifier test electronics circuit card A1 (see para 7-7).



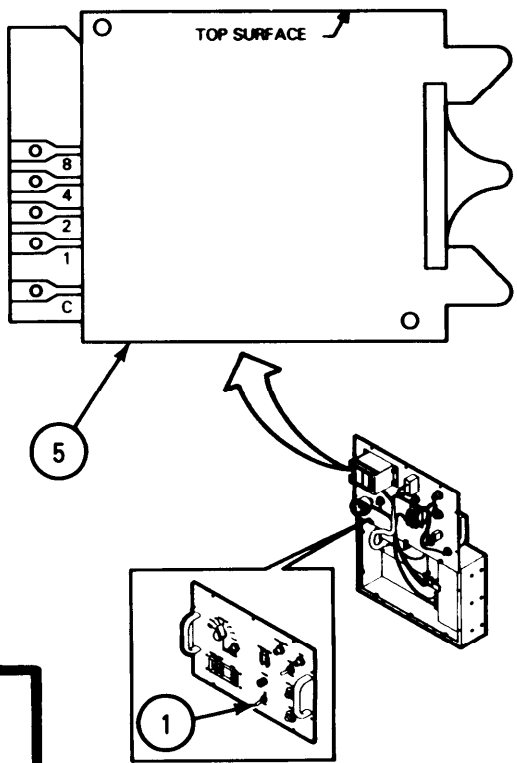
REAR VIEW
S5

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 45 of 54)

Continued from STEP 12

STEP 83

On Amplifier Test Set:
 a. Set ON/OFF circuit breaker (1) to OFF.
 b. Disconnect Amplifier Test Set from 115 V ac power source.
 c. Remove front panel (see para 7-4).
 d. Loosen two screws (16) and disconnect connector P1 (17).

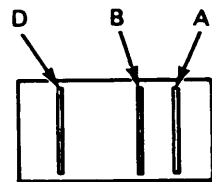


AMPLIFIER TEST SET

STEP 84

a. Set multimeter to indicate ohms.
 b. Connect multimeter to test points as indicated below.

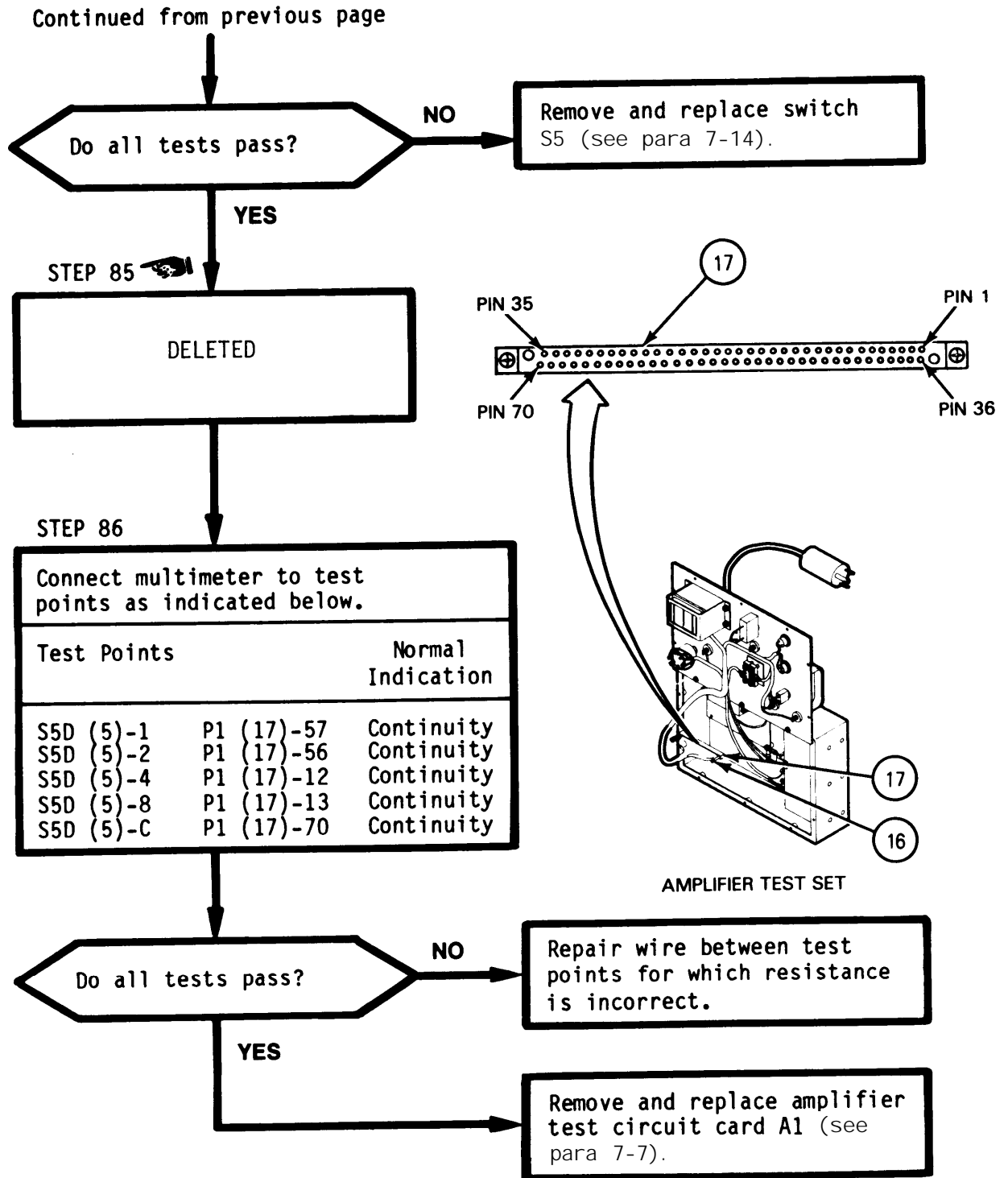
Test Points		Normal Indication
S5D (5)-1	S5D (5)-C	Continuity
S5D (5)-2	S5D (5)-C	Continuity
S5D (5)-4	S5D (5)-C	Continuity
S5D (5)-8	S5D (5)-C	Continuity



REAR VIEW
S5

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 46 of 54)



7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 47 of 54)

Continued from STEP 13

STEP 87

On Amplifier Test Set:

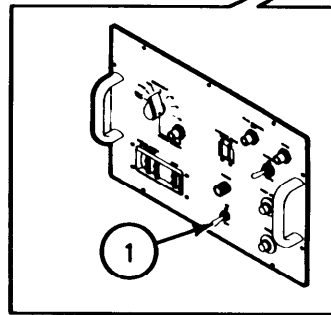
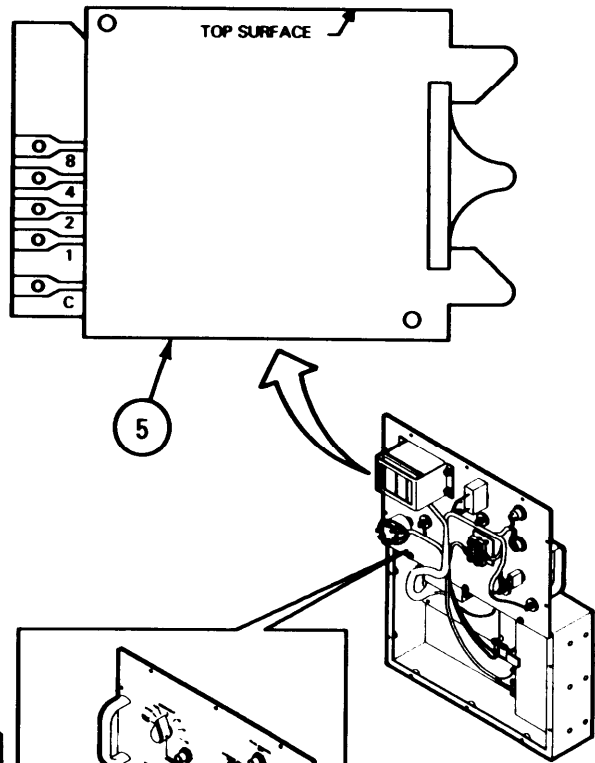
- Set ON/OFF circuit breaker (1) to OFF.
- Disconnect Amplifier Test Set from 115 V ac power source.
- Remove front panel (see para 7-4).
- Loosen two screws (16) and disconnect connector P1 (17).

STEP 88

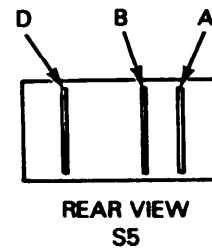
- Set multimeter to indicate ohms.
- Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5A (5)-1	S5A (5)-C	Open
S5A (5)-2	S5A (5)-C	Open
S5A (5)-4	S5A (5)-C	Open
S5A (5)-8	S5A (5)-C	Open
S5B (5)-1	S5B (5)-C	Open
S5B (5)-2	S5B (5)-C	Continuity
S5B (5)-4	S5B (5)-C	Open
S5B (5)-8	S5B (5)-C	Open

Go to next page



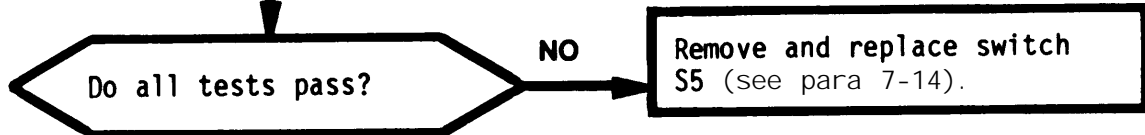
AMPLIFIER TEST SET



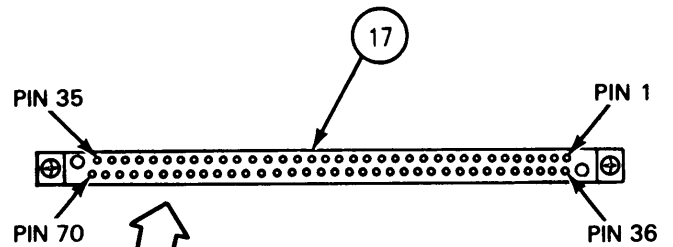
REAR VIEW
S5

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 48 of 54)

Continued from previous page



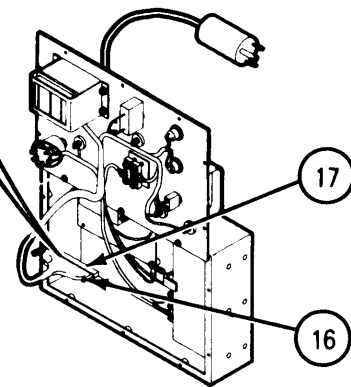
STEP 89 DELETED



STEP 90

Connect multimeter to test points as indicated below.

Test Points	Normal Indication
S5A (5)-1 P1 (17)-18	Continuity
S5A (5)-2 P1 (17)-17	Continuity
S5A (5)-4 P1 (17)-15	Continuity
S5A (5)-8 P1 (17)-14	Continuity
S5A (5)-C P1 (17)-52	Continuity
S5B (5)-1 P1 (17)-22	Continuity
S5B (5)-2 P1 (17)-20	Continuity
S5B (5)-4 P1 (17)-21	Continuity
S5B (5)-8 P1 (17)-19	Continuity
S5B (5)-C P1 (17)-52	Continuity

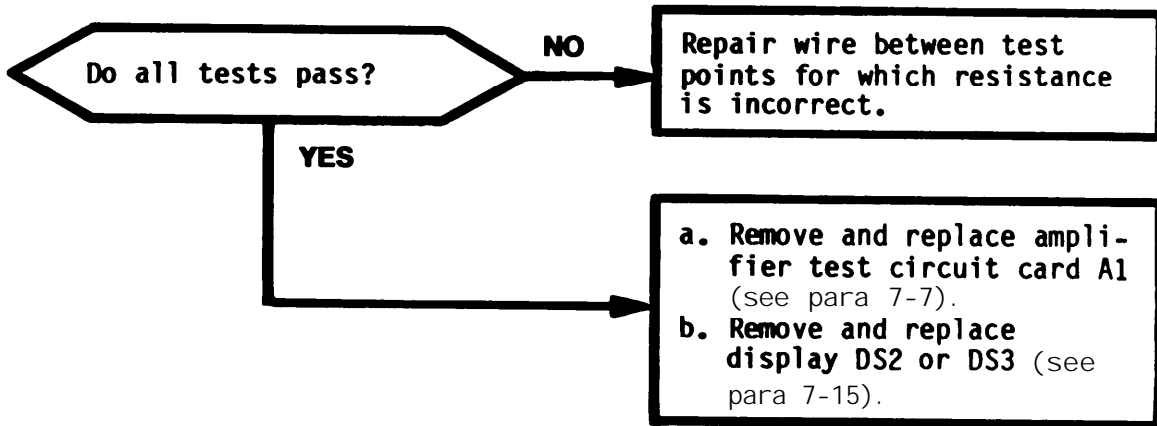


AMPLIFIER TEST SET

Go to next page

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 49 of 54)

Continued from previous page

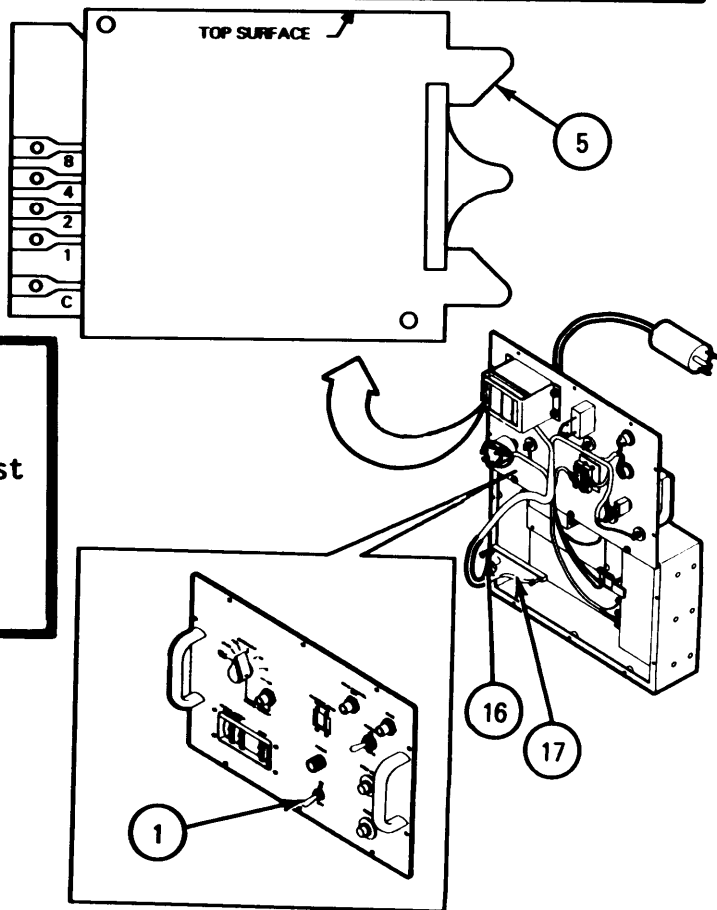


Continued from STEP 14

STEP 91

- On Amplifier Test Set:**
- a. Set ON/OFF circuit breaker (1) to OFF.
 - b. Disconnect Amplifier Test Set from 115 V ac power source.
 - c. Remove front panel (see para 7-4).


Go to next page




AMPLIFIER TEST SET

7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 50 of 54)

Continued from previous page

STEP 92 

On Amplifier Test Set, loosen two screws (16) and disconnect connector P1 (17).

STEP 93 

a. Set multimeter to indicate ohms.
b. Connect multimeter to test points as indicated below.

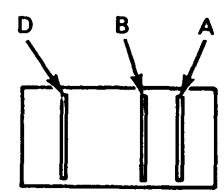
Test Points		Normal Indication
S5A (5)-1	S5A (5)-C	Continuity
S5A (5)-2	S5A (5)-C	Open
S5A (5)-4	S5A (5)-C	Open
S5A (5)-8	S5A (5)-C	Open
S5B (5)-1	S5B (5)-C	Continuity
S5B (5)-2	S5B (5)-C	Continuity
S5B (5)-4	S5B (5)-C	Open
S5B (5)-8	S5B (5)-C	Open

Do all tests pass?

NO → Remove and replace switch S5 see (para 7-14).

YES

Go to next page



REAR VIEW
S5

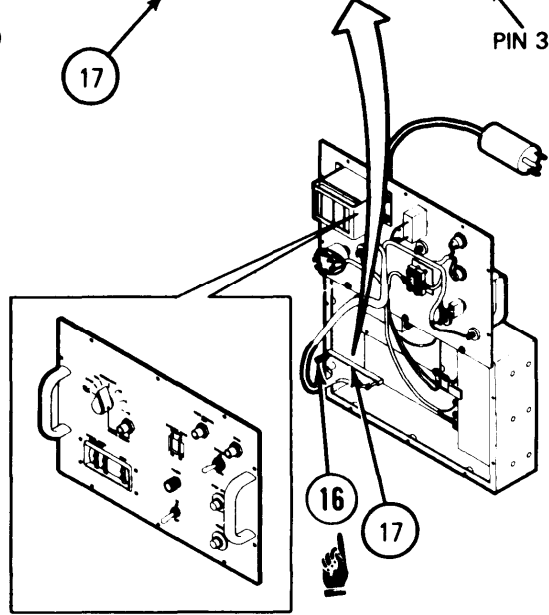
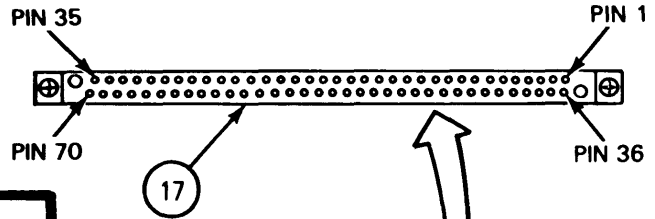
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 51 of 54)

Continued from previous page

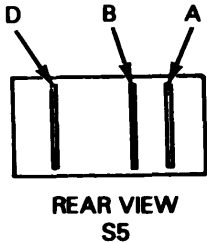
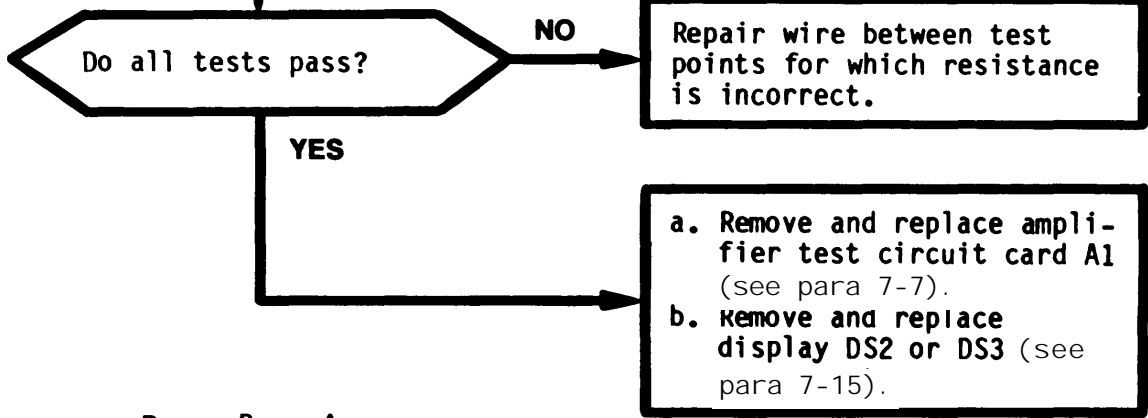
STEP 94

Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5A (5)-1	P1 (17)-18	Continuity
S5A (5)-2	P1 (17)-17	Continuity
S5A (5)-4	P1 (17)-15	Continuity
S5A (5)-8	P1 (17)-14	Continuity
S5A (5)-C	P1 (17)-52	Continuity
S5B (5)-1	P1 (17)-22	Continuity
S5B (5)-2	P1 (17)-20	Continuity
S5B (5)-4	P1 (17)-21	Continuity
S5B (5)-8	P1 (17)-19	Continuity
S5B (5)-C	P1 (17)-52	Continuity



AMPLIFIER TEST SET

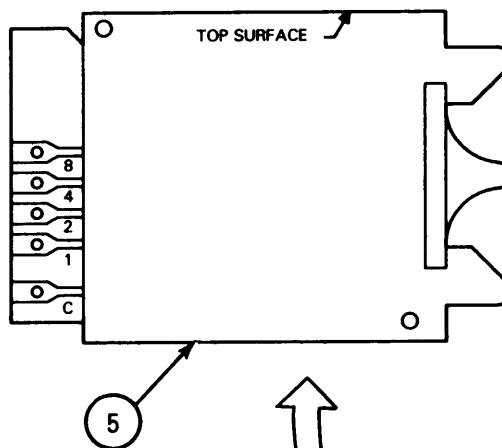


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 52 of 54)

Continued from STEP 15

STEP 95

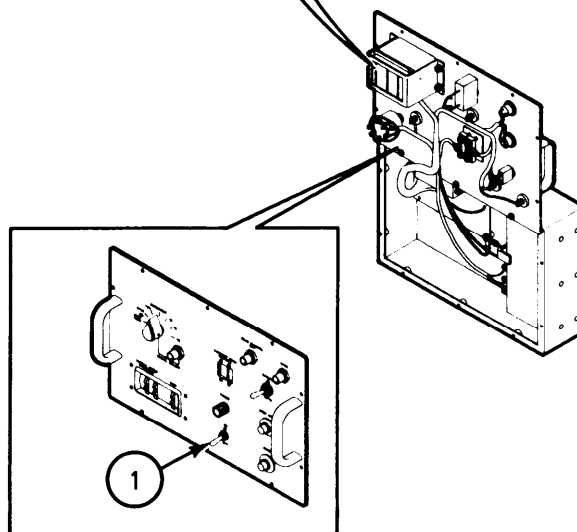
- On Amplifier Test Set:
- Set ON/OFF circuit breaker (1) to OFF.
 - Disconnect Amplifier Test Set from 115 V ac power source.
 - Remove front panel (see para 7-4).
 - Loosen two screws (16) and disconnect connector (17).



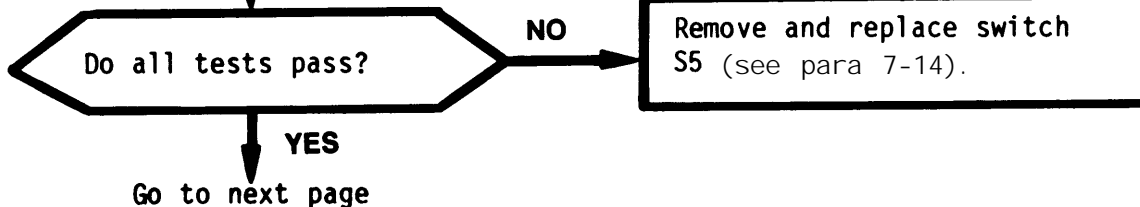
STEP 96

- Set multimeter to indicate ohms.
- Connect multimeter to test points as indicated below.

Test Points		Normal Indication
S5A (5)-1	S5A (5)-C	Open
S5A (5)-2	S5A (5)-C	Continuity
S5A (5)-4	S5A (5)-C	Open
S5A (5)-8	S5A (5)-C	Open
S5B (5)-1	S5B (5)-C	Open
S5B (5)-2	S5B (5)-C	Continuity
S5B (5)-4	S5B (5)-C	Open
S5B (5)-8	S5B (5)-C	Open

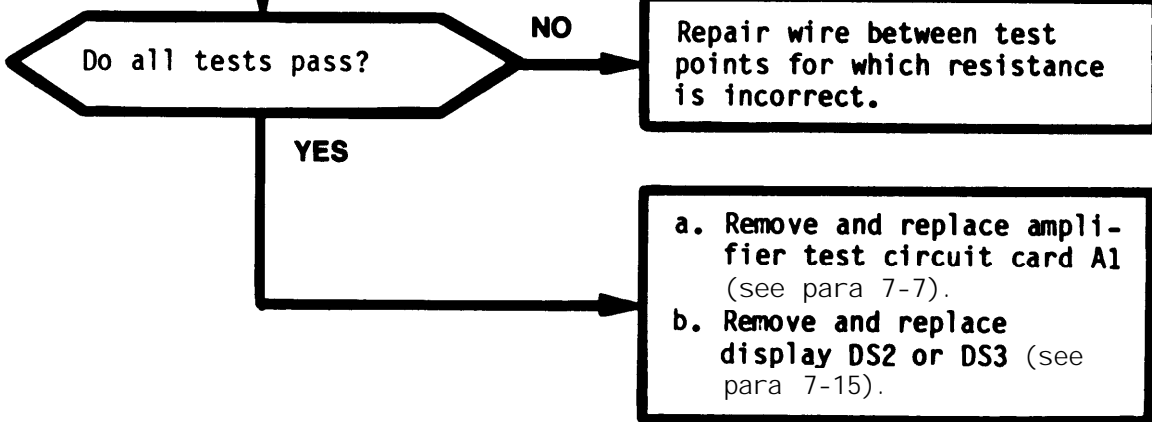
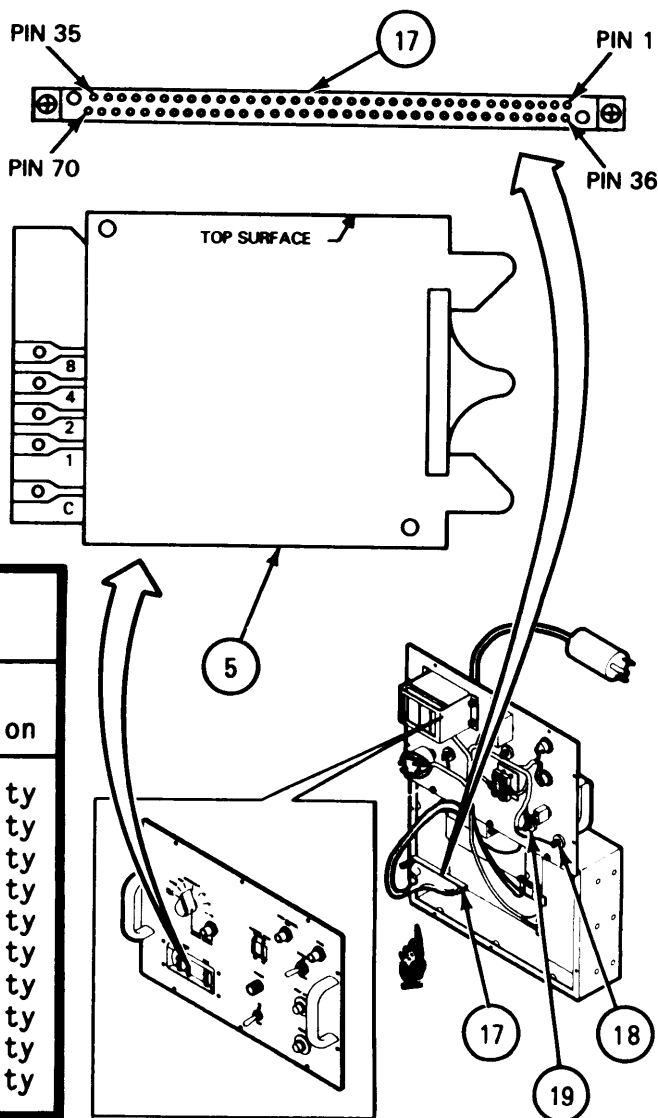
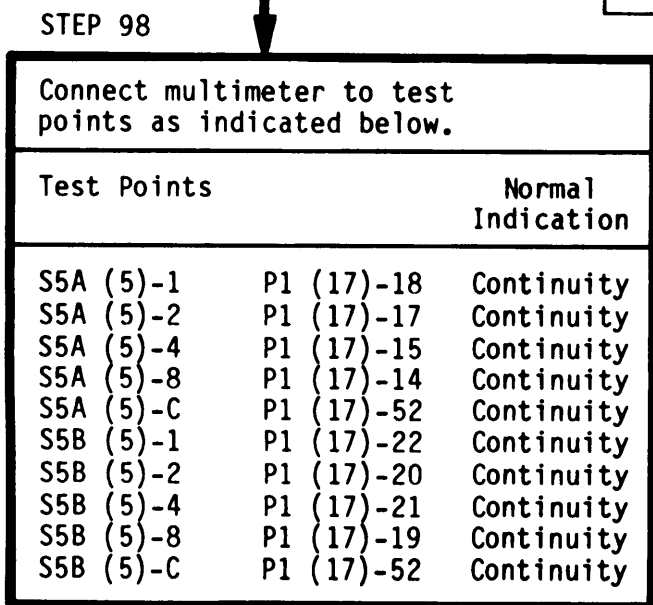
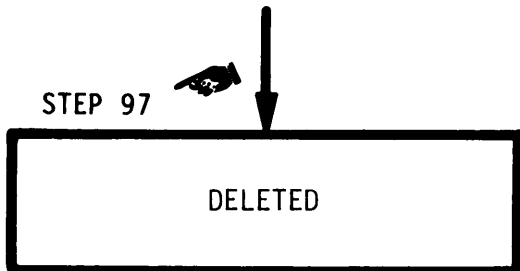


AMPLIFIER TEST SET



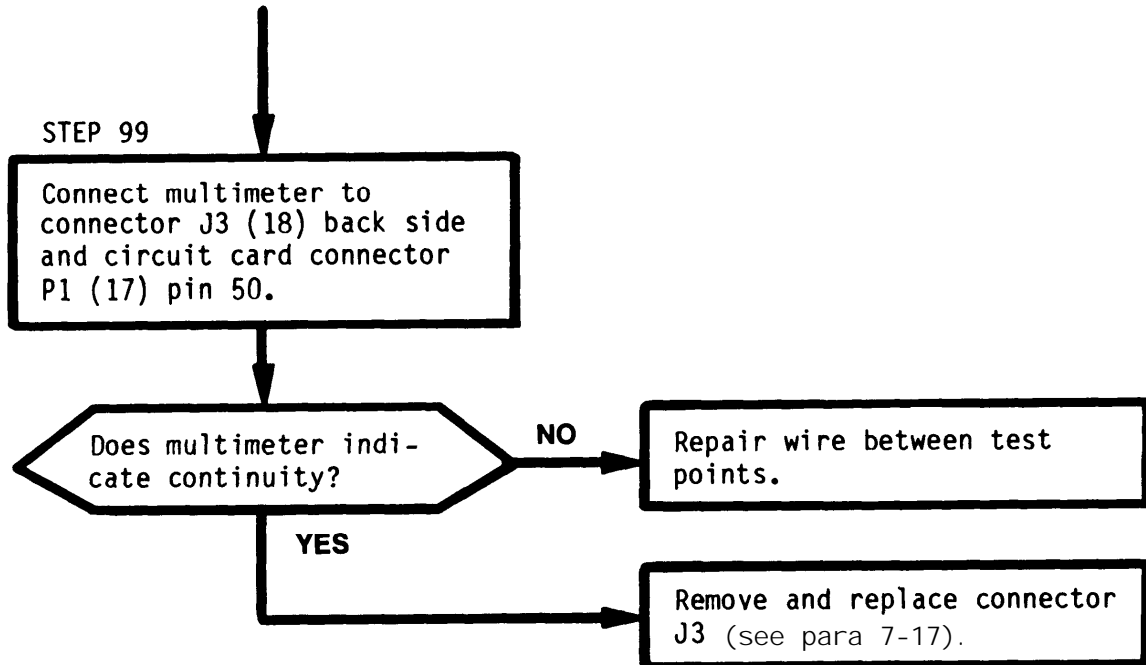
7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 53 of 54)

Continued from previous page

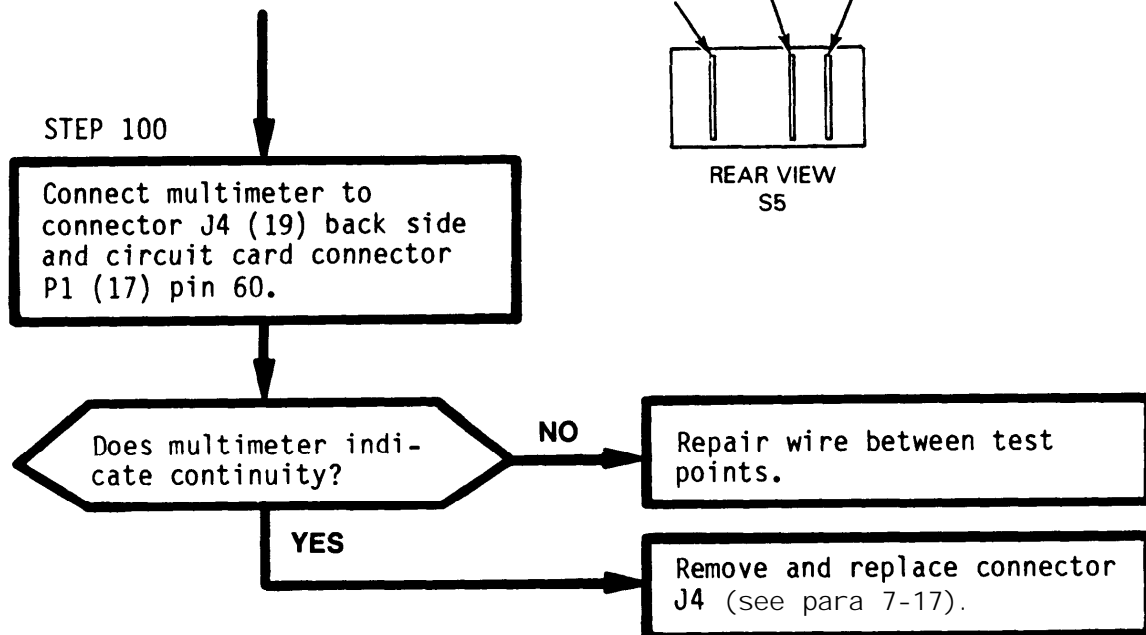


7-2. AMPLIFIER TEST SET TROUBLESHOOTING PROCEDURES (CONT)
(Sheet 54 of 54)

Continued from STEP 20



Continued from STEP 21



Section II. AMPLIFIER TEST SET MAINTENANCE PROCEDURES

<u>SECTION CONTENTS</u>	PARA	PAGE
SCOPE	7-3	7-56
REMOVAL AND REPLACEMENT OF FRONT PANEL	7-4	7-57
REMOVAL AND REPLACEMENT OF POWER SUPPLY A2	7-5	7-58
REMOVAL AND REPLACEMENT OF RF FILTERS FL1 AND FL2	7-6	7-60
REMOVAL AND REPLACEMENT OF AMPLIFIER TEST CIRCUIT CARD A1	7-7	7-62
REMOVAL AND REPLACEMENT OF AC CORD	7-8	7-64
REMOVAL AND REPLACEMENT OF AC PLUG P2	7-9	7-66
REMOVAL AND REPLACEMENT OF SWITCHES S2 AND S4	7-10	7-67
REMOVAL AND REPLACEMENT OF SWITCH S1	7-11	7-68
REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER CB1	7-12	7-69
REMOVAL AND REPLACEMENT OF SWITCH S3	7-13	7-70
REMOVAL AND REPLACEMENT OF SWITCH S5	7-14	7-71
REMOVAL AND REPLACEMENT OF LED DISPLAYS DS2 AND DS3	7-15	7-72
REMOVAL AND REPLACEMENT OF LAMP DS1 AND LAMPHOLDER	7-16	7-73
REMOVAL AND REPLACEMENT OF BNC CONNECTORS J2 THRU J4	7-17	7-74
REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S3	7-18	7-75

7-3. SCOPE

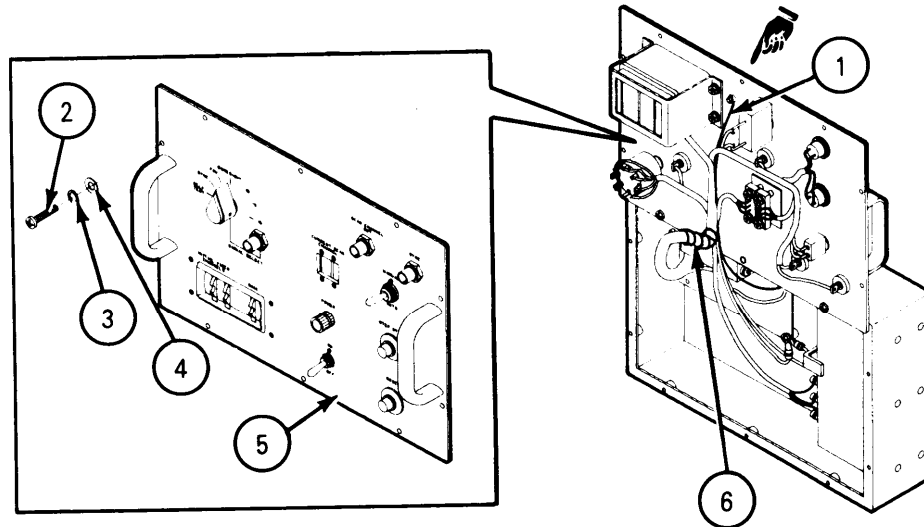
This section contains removal and replacement procedures for the Amplifier Test Set.

7-4. REMOVAL AND REPLACEMENT OF FRONT PANEL**TOOLS:**

No. 2 cross-tip screwdriver

MATERIALS:

Tape (Item 11, Appendix E)



If 115 V ac power will be applied to Amplifier Test Set while front panel is removed, insure that ground wire (1) from E4 on front panel to E1 on chassis assembly remains connected.

STEP 1**REMOVAL**

- A. Remove 10 screws (2), 10 lock washers (3) and 10 flat washers (4).
- B. Rotate panel (5) up and secure with two screws (2).

STEP 2**REPLACEMENT**

- A. Tape wires (6).
- B. Remove two screws (2) and rotate panel (5) down.
- C. Install front panel (5), 10 flat washers (4), 10 lock washers (3), and 10 screws (2).

END OF TASK

7-5. REMOVAL AND REPLACEMENT OF POWER SUPPLY A2 (Sheet 1 of 2)

TOOLS:

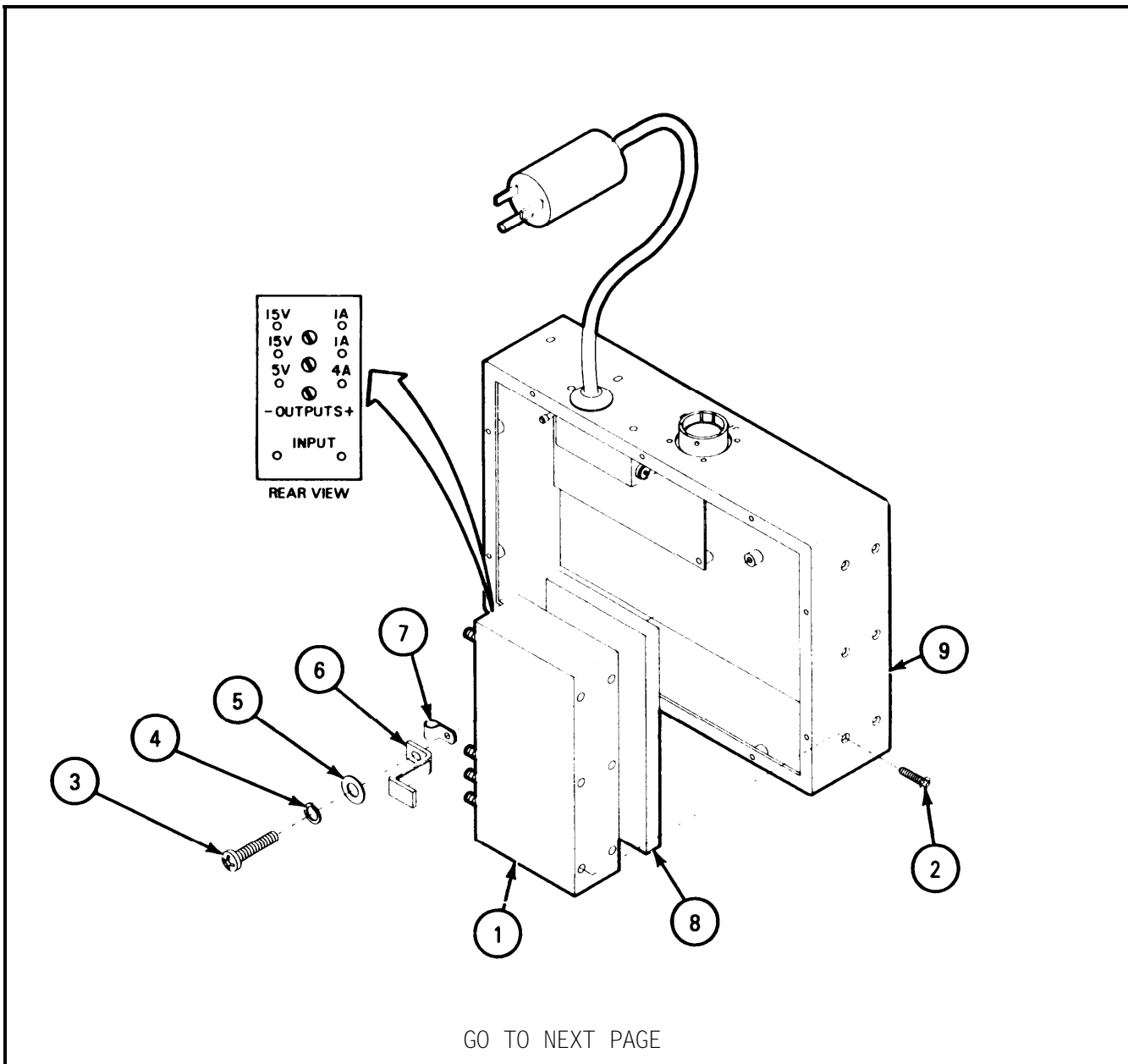
- Soldering kit
- No. 2 cross-tip screwdriver

EQUIPMENT CONDITION:

Front panel removed (para 7-4).

MATERIALS:

- Silicone compound (Item 5, Appendix E)
- Sealing compound (Item 4, Appendix E)
- Sealing compound primer (Item 12, Appendix E)



7-5. REMOVAL AND REPLACEMENT OF POWER SUPPLY MODULE A2 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove insulating compound from INPUT terminals.
- B. Tag and unsolder leads from power supply A2 (1).
- C. Remove six screws (2).
- D. Remove screw (3), lock washer (4), flat washer (5), hold down bracket (6), loop clamp (7), power supply A2 (1), and mounting pad (8).

STEP 2

REPLACEMENT

NOTE

Base of power supply is side with six screw holes.

- A. Coat base of power supply A2 (1) with silicone compound.
- B. Install mounting pad (8), power supply A2 (1), loop clamp (7), hold down bracket (6), flat washer (5), lock washer (4), and screw (3).
- B.1 Using silicone compound primer, clean threads of screws (2) and mating surfaces of Amplifier Test Set case (9).
- C. Apply sealing compound to threads of six screws (2), and to mating surfaces of Amplifier Test Set case (9).
- D. Install six screws (2).
- E. Solder leads to power supply A2 (1) and untag.
- F. Coat INPUT terminals with insulating compound.
- G. Install front panel (para 7-4).

END OF TASK

7-6. REMOVAL AND REPLACEMENT OF RF FILTERS FL1 AND FL2

TOOLS:

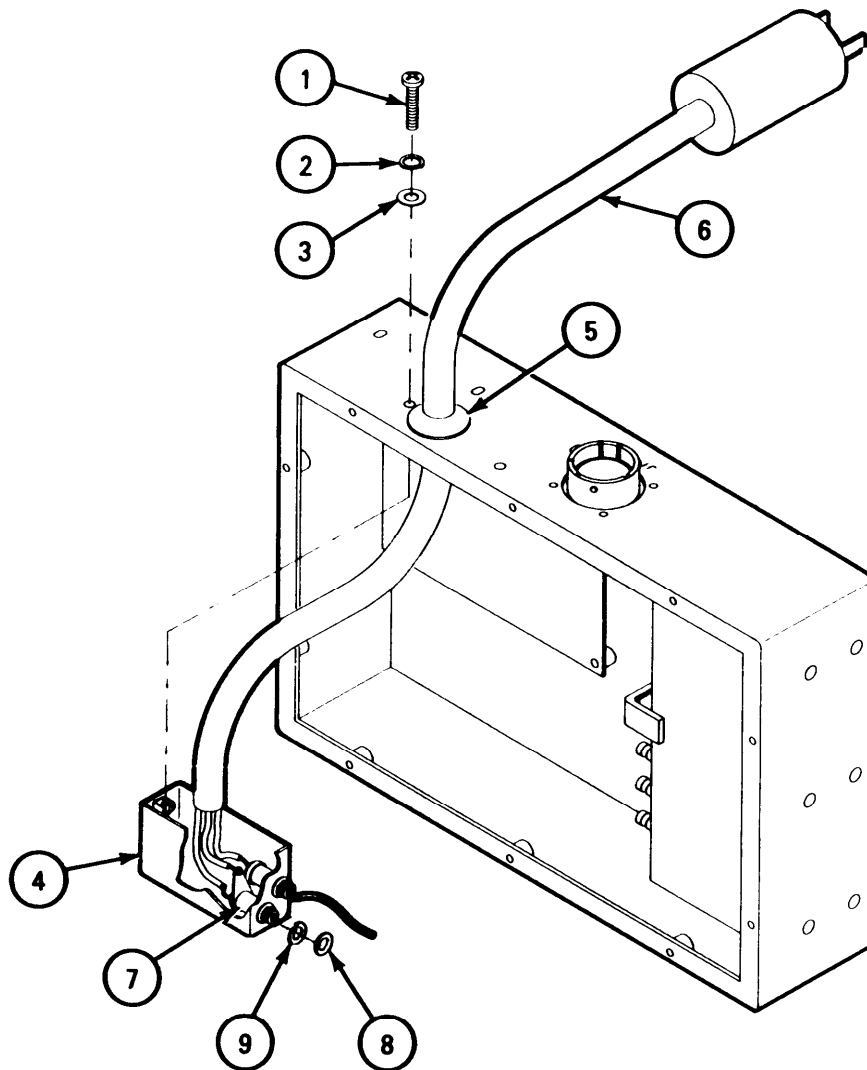
No. 1 cross-tip screwdriver
Soldering kit
5/16-inch open-end wrench

EQUIPMENT CONDITION:

Front panel removed (para 7-4).

MATERIALS:

Insulating compound (Item 3, Appendix E)



GO TO NEXT PAGE

7-6. REMOVAL AND REPLACEMENT OF RF FILTERS FL1 AND FL2 (CONT)
(Sheet 2 of 2)

STEP 1

REMOVAL

- A. Remove two screws (1), two lock washers (2), two flat washers (3), and RF filter cover (4).
- B. Loosen strain relief (5) and push ac cord (6) through case.
- C. Remove insulating compound from terminals of RF filter (7).
- D. Tag and unsolder leads from RF filter (7).
- E. Remove nut (8), lock washer (9), and RF filter (7).

STEP 2

REPLACEMENT

- A. Install RF filter (7), lock washer (9), and nut (8).
- B. Solder leads to RF filter (7) and untag.
- C. Coat terminals of RF filter (7) with insulating compound.
- D. Install RF filter cover (4), two flat washers (3), two lock washers (2), and two screws (1).
- E. Install strain relief (5).
- F. Install front panel (para 7-4).

END OF TASK

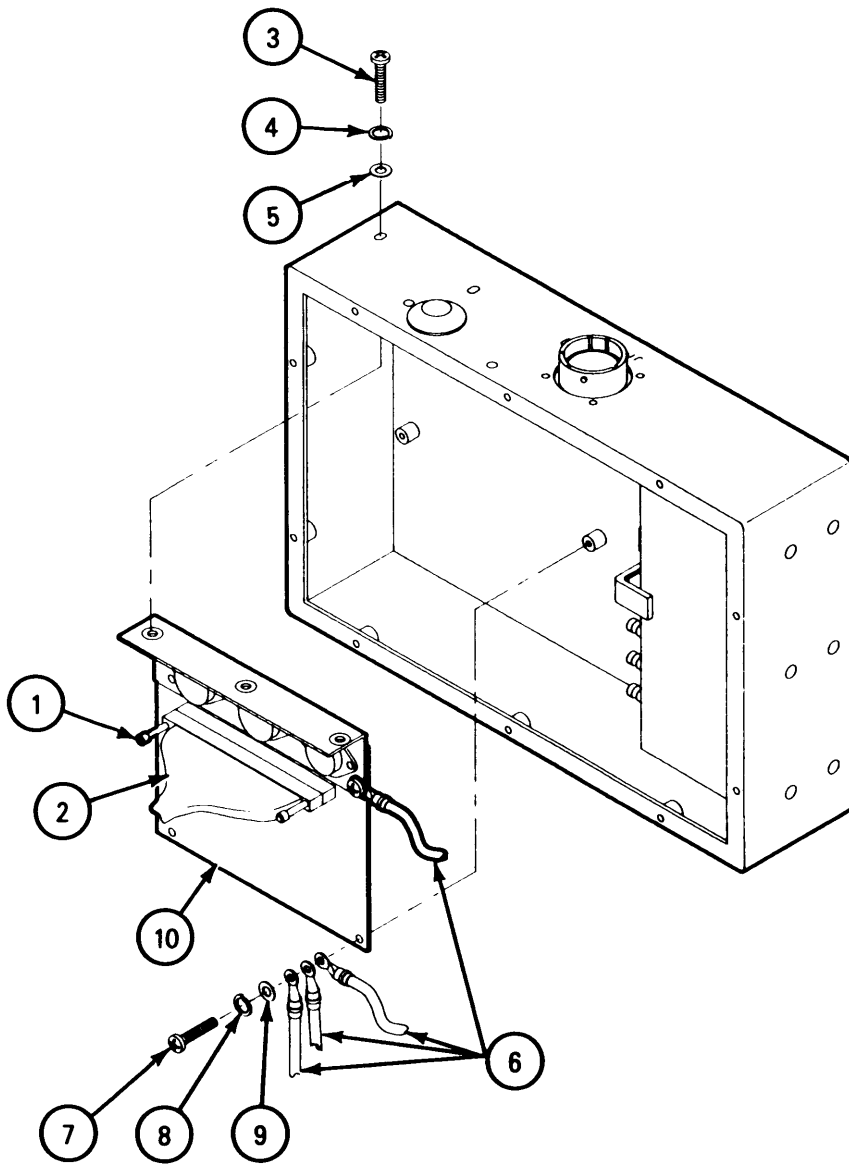
7-7. REMOVAL AND REPLACEMENT OF AMPLIFIER TEST CIRCUIT CARD A1 (Sheet 1 of 2)

TOOLS:

- No. 1 cross-tip screwdriver
- 1/4-inch flat-tip screwdriver

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



GO TO NEXT PAGE

7-7. REMOVAL AND REPLACEMENT OF AMPLIFIER TEST CIRCUIT CARD A1 (CONT) (Sheet 2 of 2)

STEP 1

REMOVAL



If jack screws (1) are not loosened alternately, the connector (2) may be damaged.

- A. Alternately loosen two jack screws (1) and disconnect connector (2).
- B. Remove three screws (3), three lock washers (4), and three flat washers (5).
- C. Tag four leads (6).
- D. Remove four screws (7), four lock washers (8), and four flat washers (9).
- E. Disconnect four leads (6) and remove amplifier test circuit card A1 (10).

STEP 2

REPLACEMENT

- A. Install amplifier test circuit card A1 (10) and connect four leads (6).
- B. Install four flat washers (9), four lock washers (8), and four screws (7).
- C. Untag four leads (6).
- D. Install three flat washers (5), three lock washers (4), and three screws (3).



If jack screws are not tightened alternately, the connector (2) may be damaged.

- E. Connect connector (2) and alternately tighten two jack screws (1).
- F. Install front panel (para 7-4).

END OF TASK

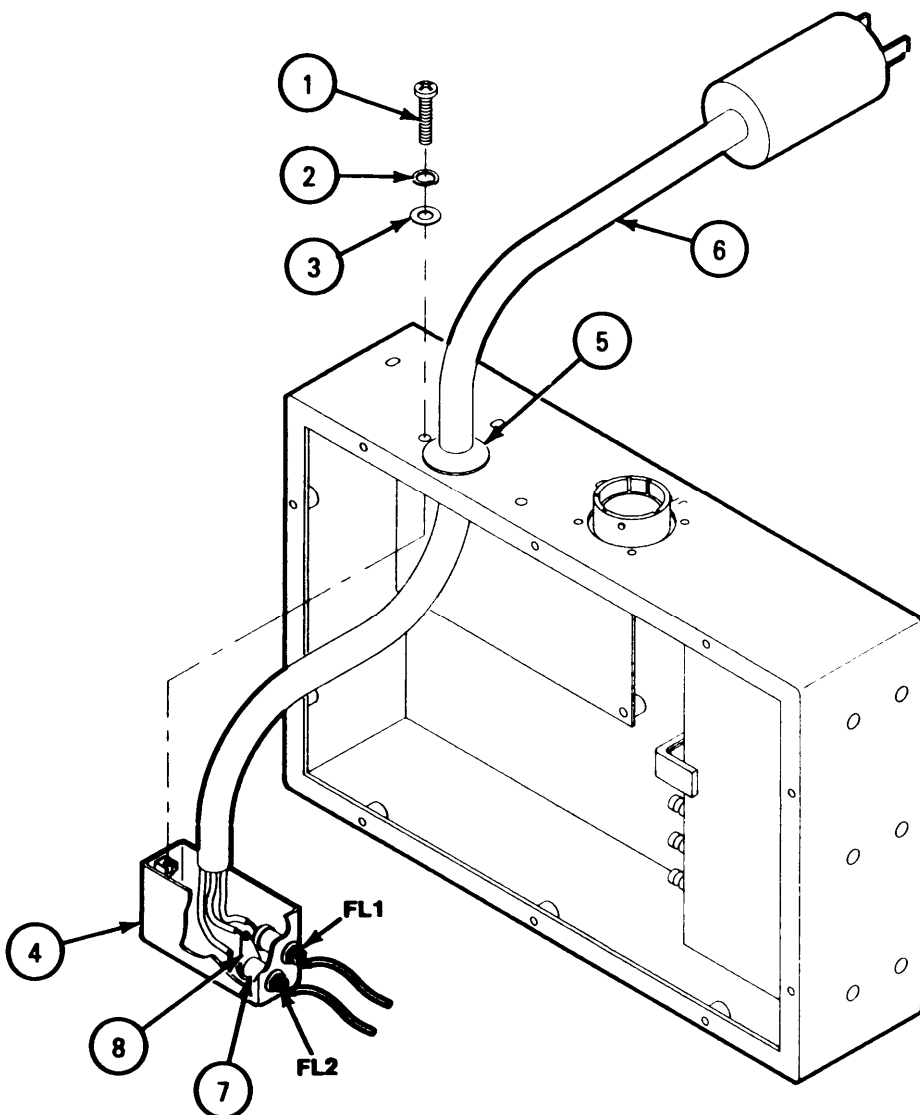
7-8. REMOVAL AND REPLACEMENT OF AC CORD (Sheet 1 of 2)

TOOLS:

No. 1 cross-tip screwdriver
Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



GO TO NEXT PAGE

7-8. REMOVAL AND REPLACEMENT OF AC CORD (CONT)
(Sheet 2 of 2)

NOTE

To repair ac cord, remove and replace ac plug (para 7-9).

STEP 1

REMOVAL

- A. Remove two screws (1), two lock washers (2), two flat washers (3), and RF filter cover (4).
- B. Remove strain relief (5) and push ac cord (6) through case.
- C. Unsolder ac cord (6) leads from RF filters (7) and ground lug (8).

STEP 2

REPLACEMENT

- A. Install ac cord (6) with strain relief (5).

NOTE

Black wire goes to FL1, green wire goes to ground lug, and white wire goes to FL2.

- B. Solder ac cord leads to RF filters (7) and ground lug (8).
- C. Install RF filter cover (4), two flat washers (3), two lock washers (2), and two screws (1).
- D. Install strain relief (5).
- E. Install front panel (see para 7-4).

END OF TASK

7-9. REMOVAL AND REPLACEMENT OF AC PLUG P2

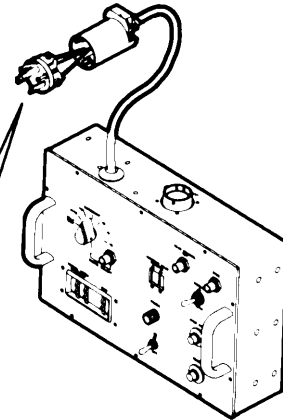
TOOLS:

- 1/4-inch flat-tip screwdriver
- 1/8-inch flat-tip screwdriver

STEP 1

REMOVAL

- A. Using 1/4-inch flat-tip screwdriver, loosen two screws (1) and strain relief (2).
- B. Using 1/8-inch flat-tip screwdriver, loosen three screws (3) and push ac cord (4) through shell (5).
- C. Using 1/4-inch flat-tip screwdriver, loosen three screws (6) and remove ac cord (4).



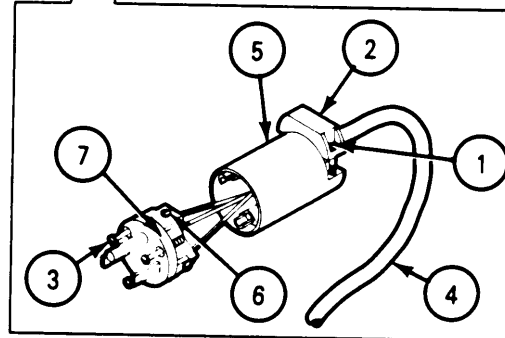
STEP 2

REPLACEMENT

- A. Install ac cord (4) through shell (5).

NOTE

Black lead goes to brass pin; white lead goes to white pin; and green lead goes to ground pin.



- B. Install three leads in plug (7) and tighten three screws (6) using 1/4-inch flat-tip screwdriver.

CAUTION

Strain relief (2) must secure insulated part of cord (4).

- C. Aline plug (7) in shell (5) and tighten three screws (3) using 1/8-inch flat-tip screwdriver.
- D. Using 1/4-inch flat-tip screwdriver, tighten two screws (1).

END OF TASK

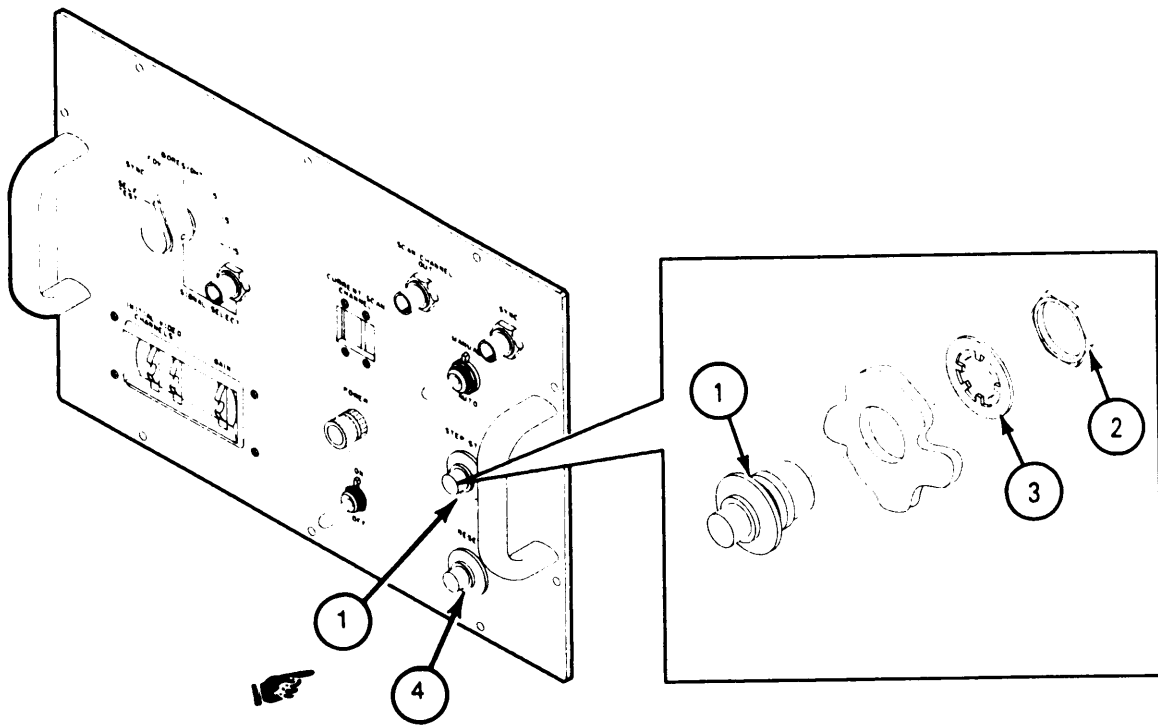
7-10. REMOVAL AND REPLACEMENT OF SWITCHES S2 AND S4

TOOLS:

3/4-inch open-end wrench
Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from switch S4(1) or S2(4).
- B. Remove nut (2), lock washer (3), and switch S4(1) or S2(4).

STEP 2

REPLACEMENT

- A. Install switch S4(1) or S2(4), lock washer (3), and nut (2).
- B. Solder leads to switch (1) or (4) and untag.
- C. Install front panel (para 7-4).

END OF TASK

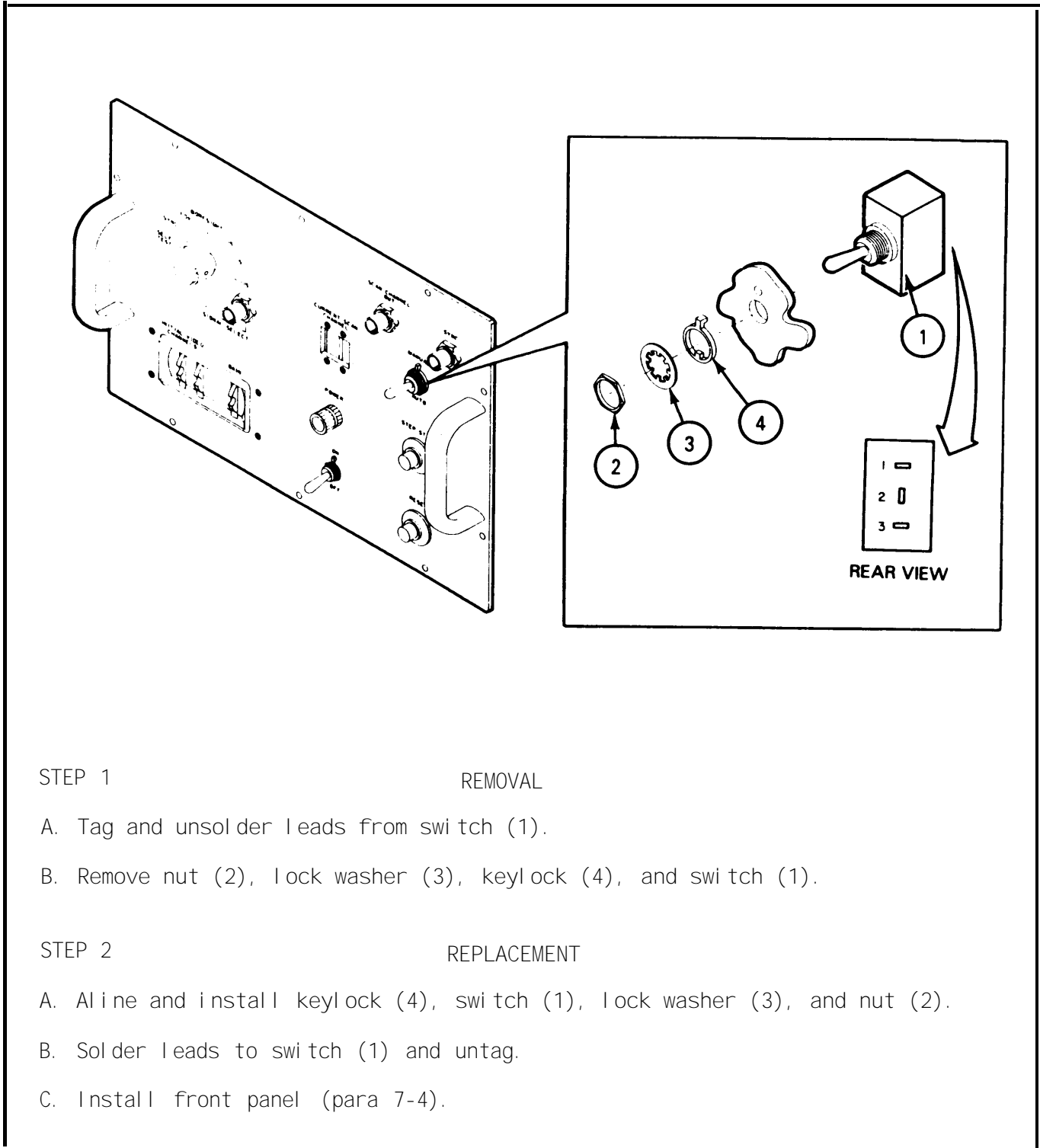
7-11. REMOVAL AND REPLACEMENT OF SWITCH S1

TOOLS:

9/16-inch open-end wrench
Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



STEP 1

REMOVAL

- A. Tag and unsolder leads from switch (1).
- B. Remove nut (2), lock washer (3), keylock (4), and switch (1).

STEP 2

REPLACEMENT

- A. Align and install keylock (4), switch (1), lock washer (3), and nut (2).
- B. Solder leads to switch (1) and untag.
- C. Install front panel (para 7-4).

END OF TASK

7-12. REMOVAL AND REPLACEMENT OF CIRCUIT BREAKER CB1

TOOLS:

1/2-inch open-end wrench

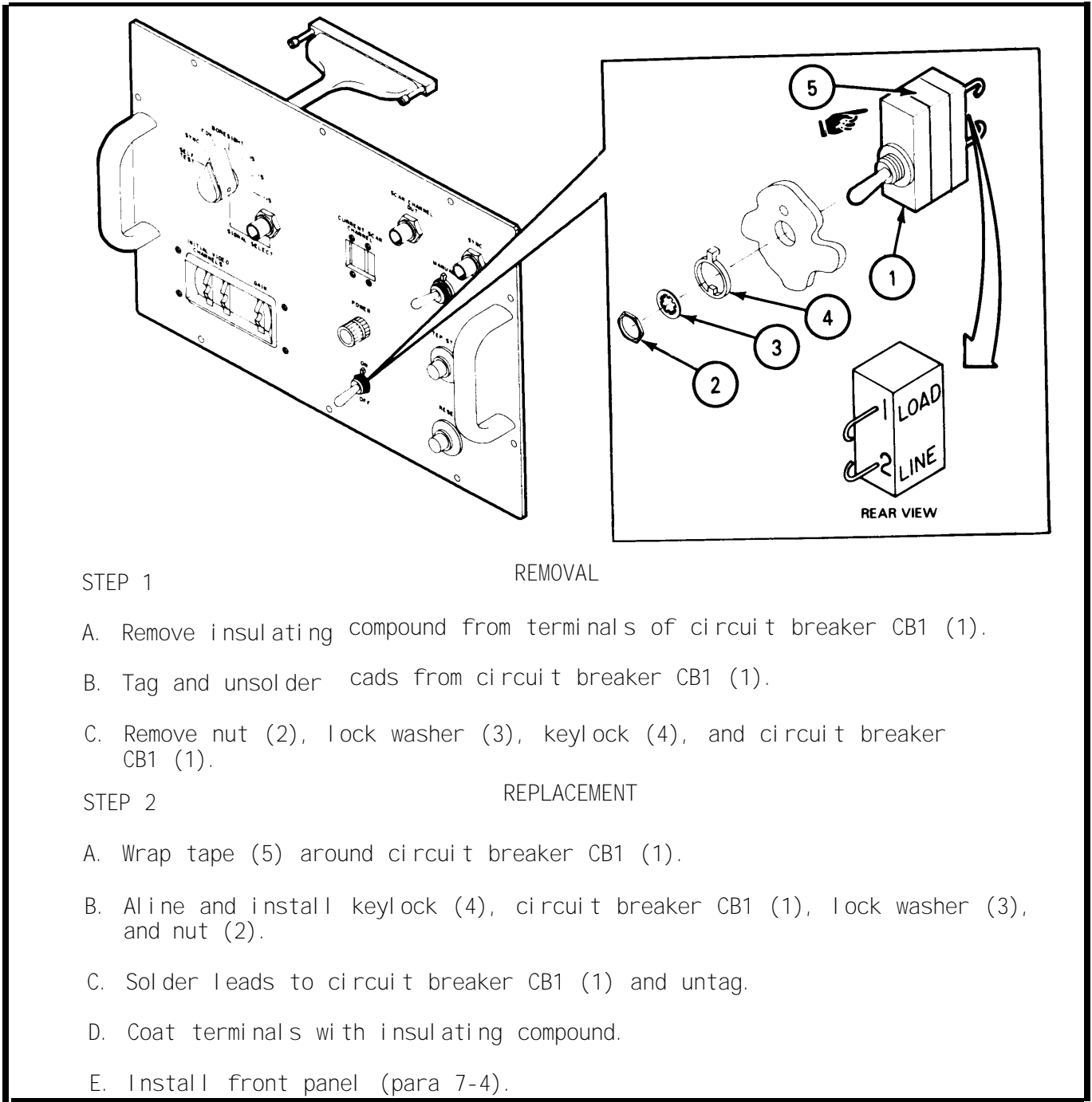
EQUIPMENT CONDITION:

Front panel removed (para 7-4)

MATERIALS:

Insulating compound (Item 3, Appendix E)

Tape (Item 10, Appendix E)



STEP 1

REMOVAL

- A. Remove insulating compound from terminals of circuit breaker CB1 (1).
- B. Tag and unsolder leads from circuit breaker CB1 (1).
- C. Remove nut (2), lock washer (3), keylock (4), and circuit breaker CB1 (1).

STEP 2

REPLACEMENT

- A. Wrap tape (5) around circuit breaker CB1 (1).
- B. Align and install keylock (4), circuit breaker CB1 (1), lock washer (3), and nut (2).
- C. Solder leads to circuit breaker CB1 (1) and untag.
- D. Coat terminals with insulating compound.
- E. Install front panel (para 7-4).

END OF TASK

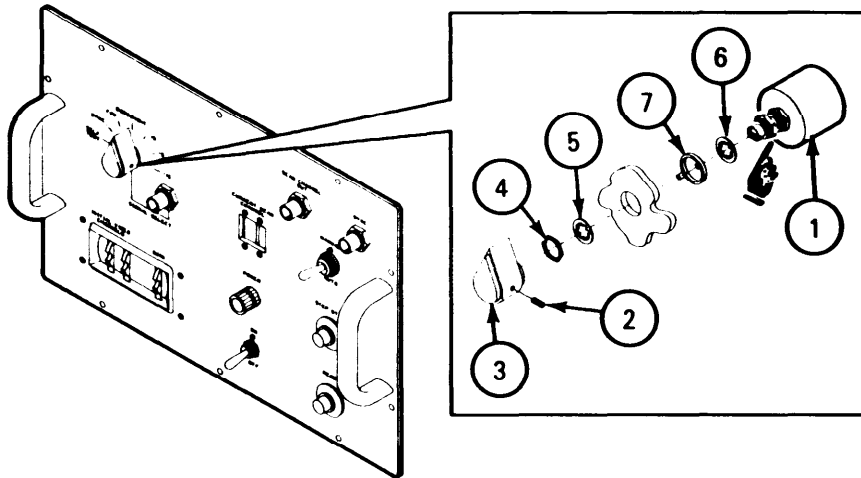
7-13. REMOVAL AND REPLACEMENT OF SWITCH S3

TOOLS:

- 0.05-inch socket-head screw key
- 9/16-inch open-end wrench
- Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4)



STEP 1

REMOVAL

- A. Tag and unsolder leads from switch S3 (1).
- B. Loosen two setscrews (2) and remove knob (3).
- C. Remove nut (4), lock washer (5), switch S3 (1), lock washer (6), and keylock (7).

STEP 2

REPLACEMENT

- A. Aline and install keylock (7), lock washer (6), switch S3 (1), lock washer (5), and nut (4).
- B. Install knob (3) (para 7-18).
- C. Solder leads to switch S3 (1) and untag.
- D. Install front panel (para 7-4).

END OF TASK

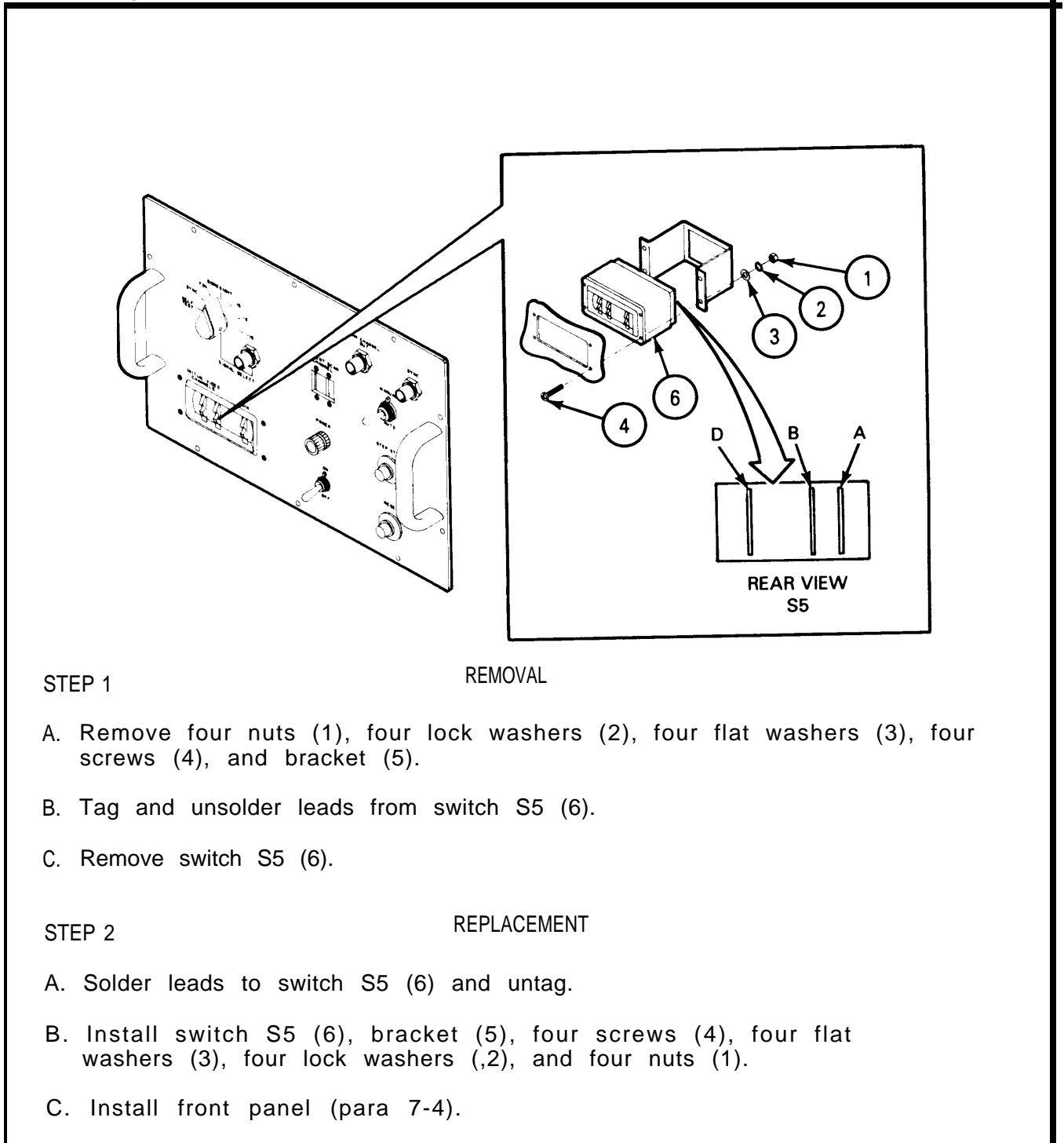
7-14. REMOVAL AND REPLACEMENT OF SWITCH S5

TOOLS:

- No. 1 cross-tip screwdriver
- 1/4-inch socket wrench
- Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



STEP 1

REMOVAL

- A. Remove four nuts (1), four lock washers (2), four flat washers (3), four screws (4), and bracket (5).
- B. Tag and unsolder leads from switch S5 (6).
- C. Remove switch S5 (6).

STEP 2

REPLACEMENT

- A. Solder leads to switch S5 (6) and untag.
- B. Install switch S5 (6), bracket (5), four screws (4), four flat washers (3), four lock washers (2), and four nuts (1).
- C. Install front panel (para 7-4).

END OF TASK

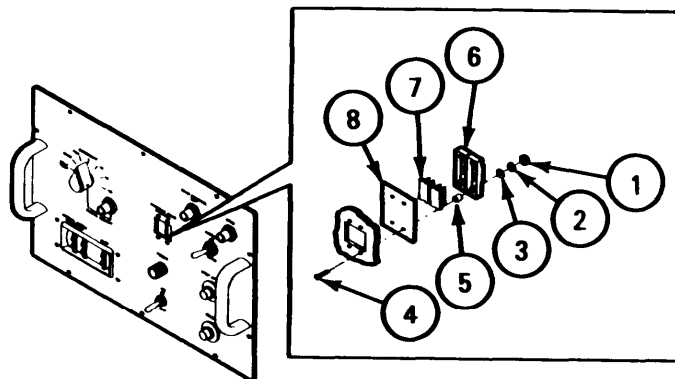
7-15. REMOVAL AND REPLACEMENT OF LED DISPLAYS DS2, DS3, AND FILTER

TOOLS:

No. 1 cross-tip screwdriver
1/4-inch socket wrench

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



STEP 1

REMOVAL

- A. Remove two nuts (1), two lock washers (2), two flat washers (3), two screws (4), two spacers (5), and socket (6).

NOTE

If only filter (8) is to be removed, skip step B.

- B. Remove display (7) from socket (6).

NOTE

To remove filter (8), both sockets (6) must first be removed.

- C. Remove filter (8).

STEP 2

REPLACEMENT

NOTE

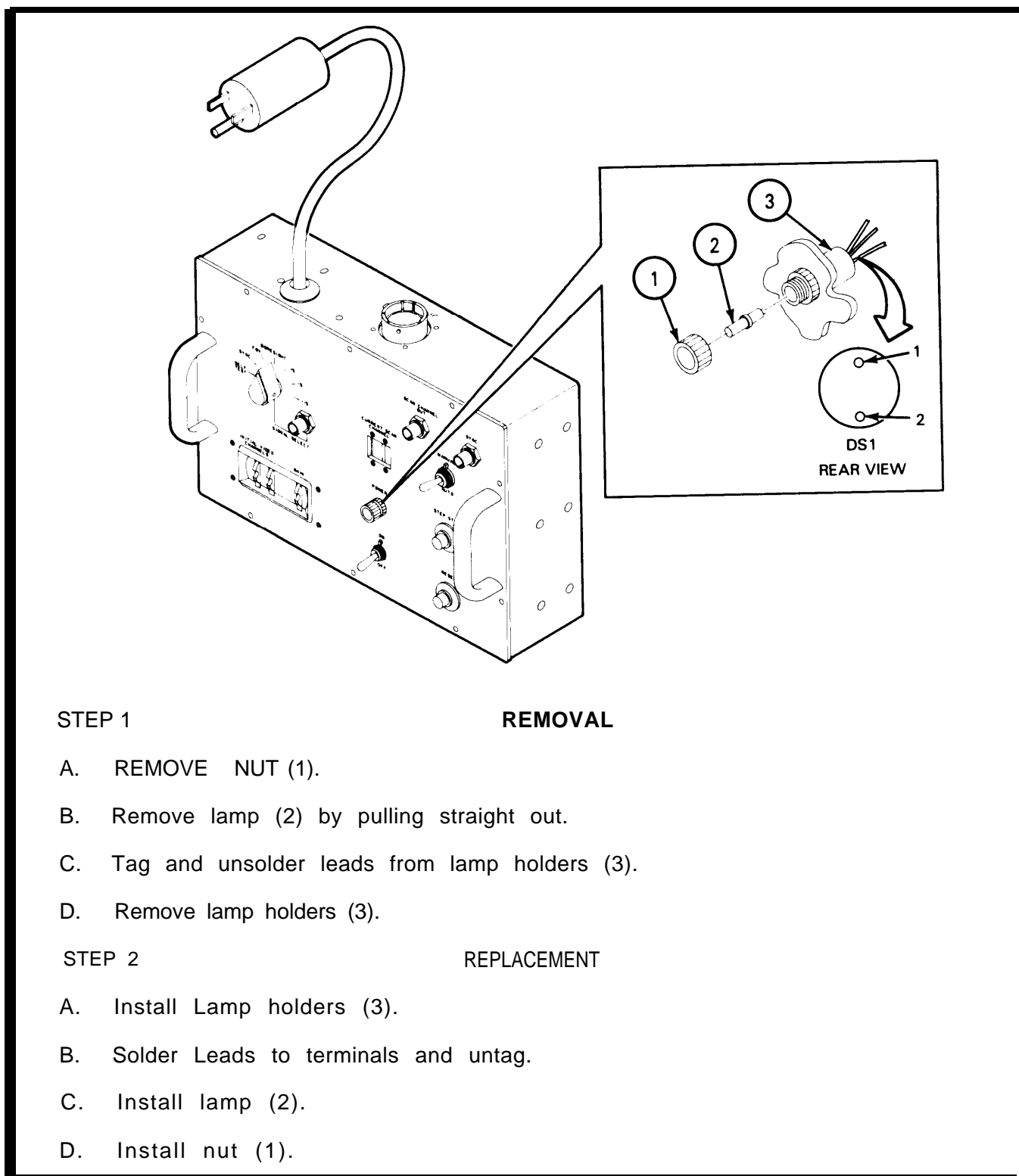
If only filter (8) was removed, skip step A.

- A. Install display (7) in socket (6).
- B. Install filter (8).
- C. Install two screws (4), two spacers (5), socket (6), two flat washers (3), two lock washers (2), and two nuts (1).
- D. Install front panel (para 7-4).

END OF TASK

7-16. REMOVAL AND REPLACEMENT OF LAMP DS1 AND LAMP HOLDER**TOOLS:**

Soldering Kit

**STEP 1****REMOVAL**

- A. REMOVE NUT (1).
- B. Remove lamp (2) by pulling straight out.
- C. Tag and unsolder leads from lamp holders (3).
- D. Remove lamp holders (3).

STEP 2**REPLACEMENT**

- A. Install Lamp holders (3).
- B. Solder Leads to terminals and untag.
- C. Install lamp (2).
- D. Install nut (1).

END OF TASK

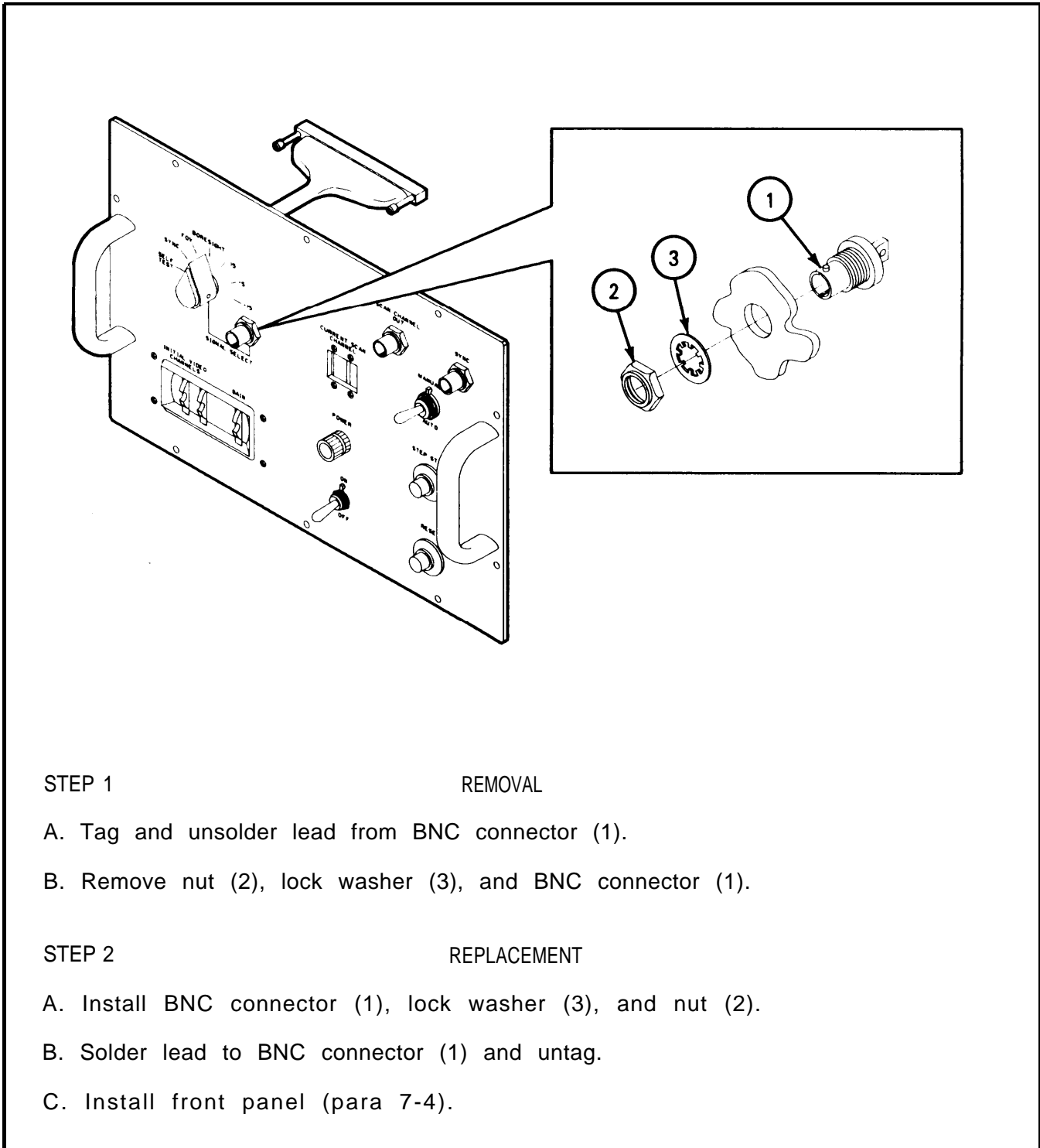
7-17. REMOVAL AND REPLACEMENT OF BNC CONNECTORS J2 THRU J4

TOOLS:

5/8-inch open-end wrench
Soldering kit

EQUIPMENT CONDITION:

Front panel removed (para 7-4).



STEP 1

REMOVAL

- A. Tag and unsolder lead from BNC connector (1).
- B. Remove nut (2), lock washer (3), and BNC connector (1).

STEP 2

REPLACEMENT

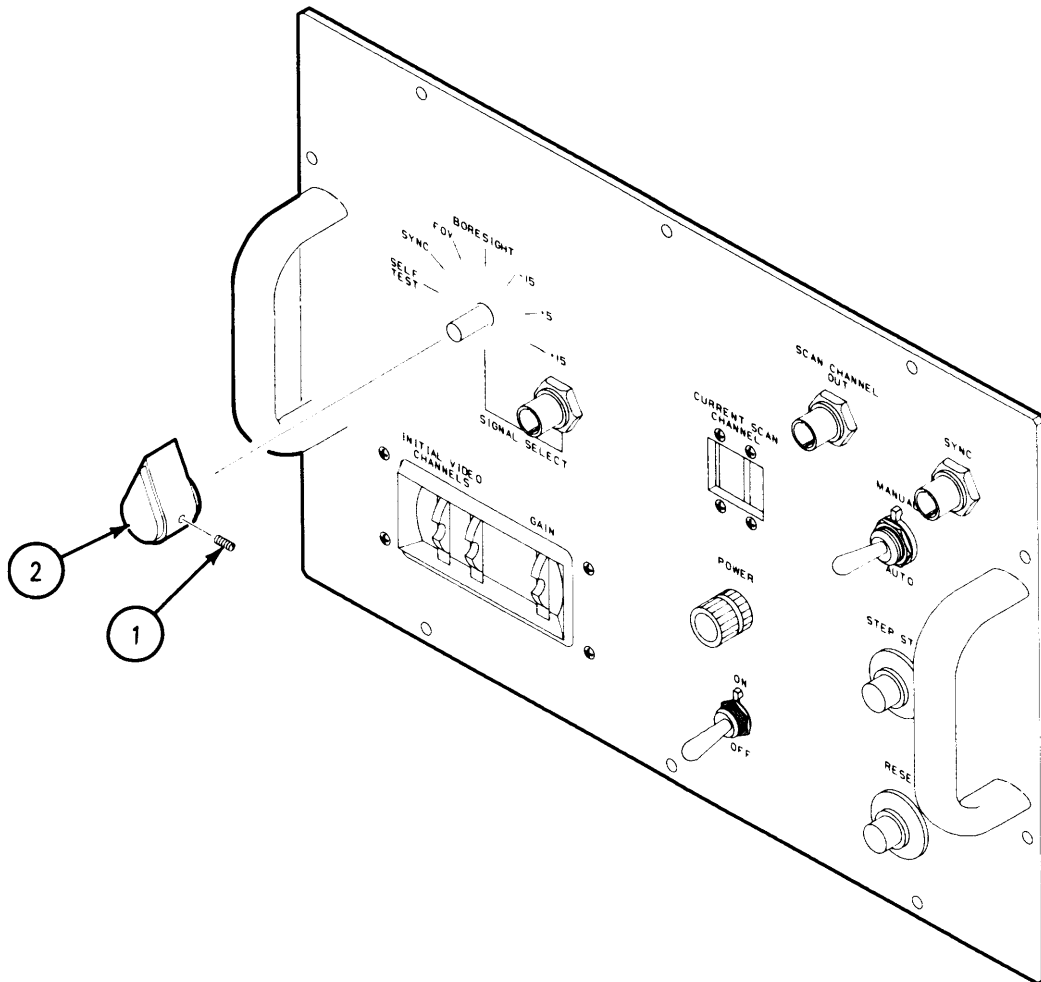
- A. Install BNC connector (1), lock washer (3), and nut (2).
- B. Solder lead to BNC connector (1) and untag.
- C. Install front panel (para 7-4).

END OF TASK

7-18. REMOVAL AND REPLACEMENT OF KNOB FOR SWITCH S3

TOOLS:

0.05-inch socket-head screw key



STEP 1 REMOVAL

A. Loosen two setscrews (1) and remove knob (2).

STEP 2 REPLACEMENT

A. Set switch Ss3 (3) fully counterclockwise.

B. Install knob (2) in SELF TEST position and tighten two setscrews (1).

END OF TASK

APPENDIX A REFERENCES

A-1. REFERENCES

A list of related manuals which may be needed to properly maintain the equipment covered in this manual can be found in TM 9-1425-450-L, List of Applicable Publications (LOAP) for TOW 2 Heavy Anti tank/Assault Weapon System.

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.

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

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

The maintenance functions will be limited to and defined as follows:

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

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

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

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

B-2. MAINTENANCE FUNCTIONS (CONT)

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 MAC (SECTION II) COLUMN ENTRIES

An explanation of columns used in the Maintenance Allocation Chart will be limited to those shown. Entries for these columns are explained below:

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

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

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).

B-3. EXPLANATION OF MAC (SECTION 11) COLUMN ENTRIES (CONT)

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, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains letter codes which are keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF TOOLS AND TEST EQUIPMENT REQUIREMENTS (SECTION III) COLUMN ENTRIES

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

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

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

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

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

B-5. EXPLANATION OF REMARKS (SECTION IV) COLUMN ENTRIES

- a. Column 1, Reference Codes. The code recorded in Column 6, Section II.
- b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

**Section II. MAINTENANCE ALLOCATION CHART
FOR
TEST SET, AMPLIFIER, AN/TAM-5**

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
10	AMPLIFIER TEST SET AN/TAM-5	Test Repair			0.1 1.5			1,2	
10	Fixture Assembly (boresight alinement)	Replace			0.1				
10	Cable Assembly, W1	Replace			0.1				
20	Power Supply (module)	Replace			0.5				
20	Filter, RF (qty 2)	Replace			0.2				
20	Connector (ATS output), J1	Replace					0.9		
20	Connector (printed circuit card to front panel), P1	Replace					1.4		
20	AC Cord (115 V ac)	Replace Repair			0.2				
20	AC Plug (115 V ac), P2	Replace			0.2				
40	Panel Assembly	Repair			0.5				
40	Connector (SCAN CHANNEL OUT), J3	Replace			0.1				
40	Connector (SYNC), J4	Replace			0.1				
40	Circuit Breaker (ON/OFF), CB1	Replace			0.4				
40	Switch, Toggle (MANUAL/AUTO), S1	Replace			0.2				
40	Switch (RESET), S2	Replace			0.2				
40	Switch (STEP/START), S4	Replace			0.2				

**Section II. MAINTENANCE ALLOCATION CHART
FOR
TEST SET, AMPLIFIER, AN/TAM-5 (CONT)**

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
40	Switch, Rotary (SIGNAL SELECT), S3	Replace			0.2				
40	Switch, Thumbwheel (INITIAL VIDEO CHANNEL/GAIN), S5	Replace			0.6				
40	Display, DS2, DS3	Replace			0.1				
40	Lamp (POWER), DS1	Replace			0.1				
60	Amplifier Test Circuit Card	Replace Repair			0.5		1.2		
60	Connector (SIGNAL SELECT), J2	Replace			0.1				

**Section II. MAINTENANCE ALLOCATION CHART
FOR
TEST SET, ELECTRICAL CIRCUIT, AN/TSM-158**

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
1600	ELECTRICAL CIRCUIT TEST SET AN/TSM-158	Test Repair			0.2 0.2			1,2	
1600	Tube, Missile, Modified	Replace			0.2				
1600	Front Panel Assembly	Repair			0.3				
1600	Circuit Breaker (PREFIRE), CB1	Replace			0.3				
1600	Circuit Breaker (FIRE), CB2	Replace			0.3				
1600	Circuit Breaker (WIRE CUTTER), CB3	Replace			0.3				
1600	Switch, Rotary (MISSILE ID), S1	Replace			0.4				
1600	Resistor (100K), R1	Replace			0.2				
1600	Resistor (1.62K), R2	Replace			0.2				
1600	Resistor (4.02K), R3	Replace			0.2				
1600	Resistor (7.5K), R4	Replace			0.2				
1600	Resistor (13.3K), R5	Replace			0.2				
1600	Resistor (24.9K), R6	Replace			0.2				
1600	Resistor (59K), R7	Replace			0.2				

Section II. MINTENANCE ALLOCATION CHART
FOR
TEST SET, MISSILE GUIDANCE SET, AN/TSM-152

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
1700	MISSILE GUIDANCE SET TEST SET AN/TSM-152	Test Repair			0.1 1.2			1,2	
1700	Battery, BT1	Replace			0.5				
1700	Cable Assembly, (TEST INPUT), W1	Replace			0.1				
1700	Cable Assembly (115 V ac), W2	Replace Repair			0.1 0.3				
1700	AC Plug, P1	Replace			0.1				
1700	Cable Assembly (MOTOR LOAD), W3	Replace			0.1				
1720	Front Panel Assembly	Repair			1.4				
1720	Switch (POWER ON/OFF), S2	Replace			0.4				
1720	Switch (FAULT ISOLA- TION/VERIFY), S3	Replace			0.4				
1720	Switch (READY), S4	Replace			0.4				
1720	Switch (TRIGGER), S5	Replace			0.4				
1720	Switch (RESET), S6	Replace			0.4				
1720	Circuit Breaker (ON/OFF), CB1	Replace			0.4				
1720	Lamp (CHARGER), 110V, DS1	Replace			0.1				
1720	Lamp (POWER), 6.3V, DS2	Replace			0.1				
1720	Switch (VOLTAGE SELECT), S1	Replace			0.1				

**Section II. MAINTENANCE ALLOCATION CHART
FOR
TEST SET, MISSILE GUIDANCE SET, AN/TSM-152 (CONT)**

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
1720	Potentiometer (INTENSITY), R1	Replace			0.5				
1720	Flex Cable Assembly, W1	Replace			0.4				
1720	Inductor, L1	Replace			0.4				
1720	Resistor, R2, R3	Replace			0.4				
1720	Display Unit, DS3	Replace Repair			0.1		0.5		
1720	Lamp Assembly for DS3	Replace			0.1				
1720	Bezel for DS3	Replace			0.1				
1720	EMI Filter, FL1	Replace			0.5				
1720	Relay, K1	Replace			0.5				
1720	Transformer, T1	Replace			0.5				
1720	LM 117, Voltage Regulator, U2	Replace			0.9				
1720	LM 150, Voltage Regulator, U1	Replace			0.9				
1720	Jack, Tip Red (qty 25)	Replace			0.3				
1720	Jack, Tip, Black (qty 3)	Replace			0.3				
1740	Power Supply Circuit Card	Replace Repair			0.5		1.1		
1760	Missile Guidance Test Circuit Card	Replace Repair			0.5		1.2		

**SECTION II. MAINTENANCE ALLOCATION CHART
FOR
TEST SET, ELECTRICAL CABLE, AN/TSM-149**

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS & EQPT.	(6) REMARKS
			C	O	F	H	D		
1800	ELECTRICAL CABLE TEST SET AN/TSM-149	Test Repair			0.9 2.7			1,2	
1800	Switch, Rotary, 3 position, (FUNCTION SELECT), S1	Replace			0.4				
1800	Switch, Toggle (SHORT/CONTINUITY), S2	Replace			0.2				
1800	Switch, Rotary 24 position (WIRE SELECT), S3	Replace					2.5		
1800	Connector, J1	Replace			0.1				
1800	Connector Assembly (loop), J2	Replace			0.1				
1800	Connector Assembly (loop), J3	Replace Repair			0.1		2.6		
1800	Continuity Fixture	Replace			0.1				

Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	F	Tool Kit, Guided Missile	5180-00-179-3574	
2	F	Digital Multimeter, Tektronix DM-501 or Digital Multimeter, Fluke 8000A	6625-00-500-6640 6625-00-210-7584	

Section IV. REMARKS

REFERENCE CODE	REMARKS

APPENDIX C COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items (BII) for the Guided Missile System Shop Equipment to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

Section II. Components of End Item. This listing is for informational purpose 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.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the Guided Missile System Shop Equipment in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the Guided Missile System Shop Equipment during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement BII based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number. Indicates the number of the illustration where the item is located.

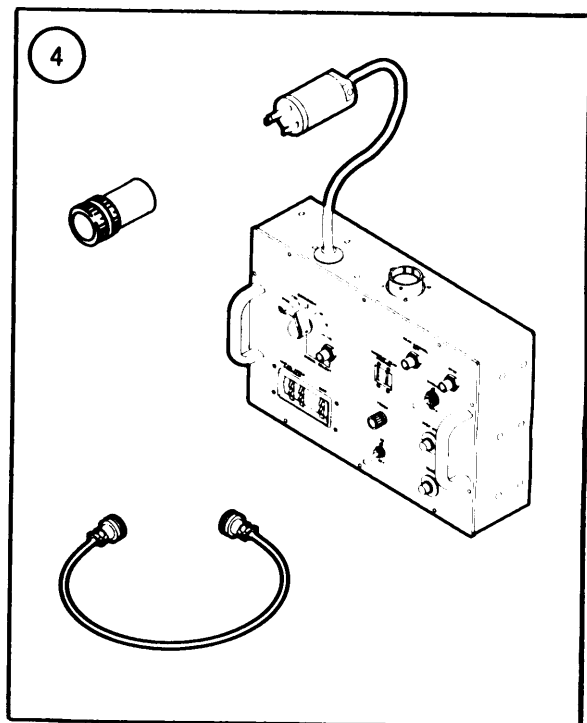
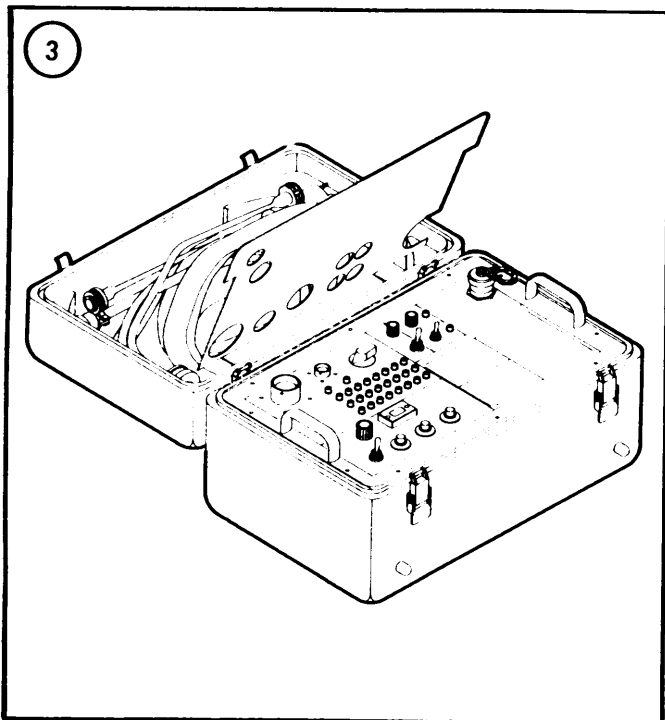
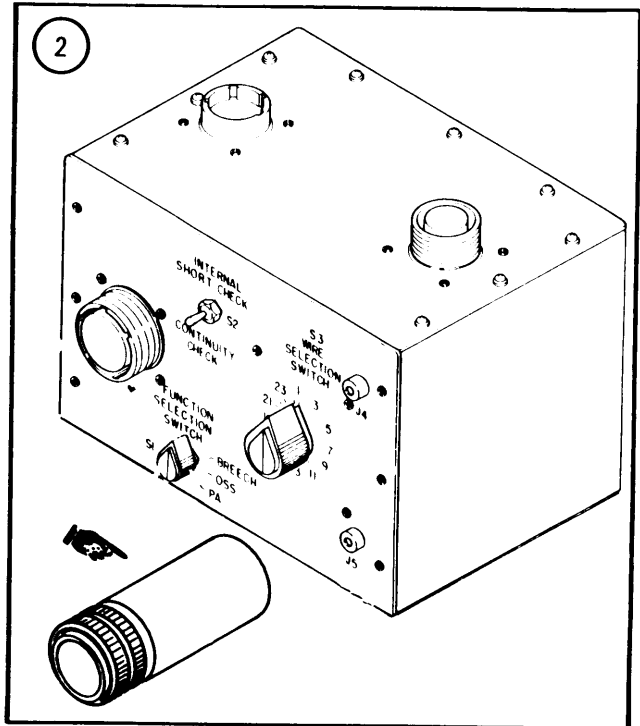
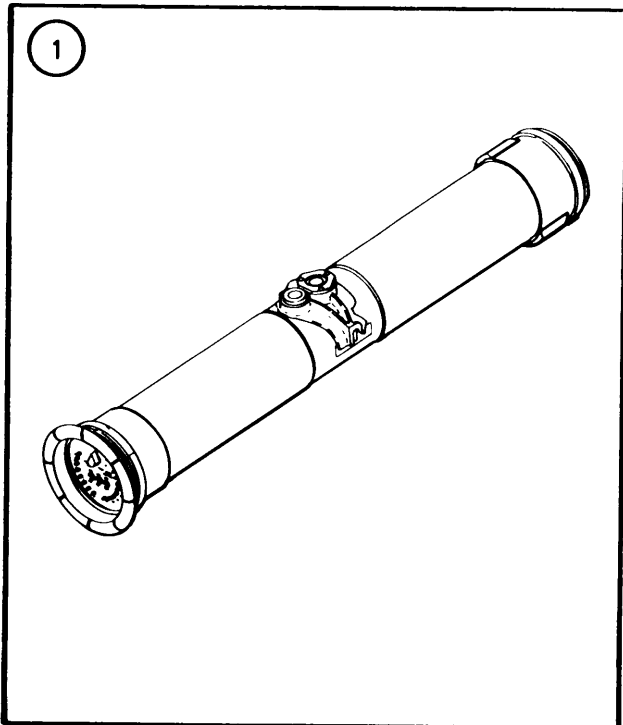
b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the National 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



Section II. COMPONENTS OF END ITEM (CONT)

ILLUS no.	NSN	Description FSCM or part number	U/M	Qty rqr
1	4935-01-119-3460	Test Set, Electrical Circuit: AN/TSM-158, P/N 13195336	ea	1
2	6625-01-120-0027	Test Set, Electrical Cable: AN/TSM-149, P/N 13195112	ea	1
		Continuity Fixture, P/N 13195214	ea	1
3	4935-01-147-5999	Test Set Missile Guidance Set: AN/TSM-152, P/N 13099749	ea	1
	4935-01-112-4247	Cable Assembly W1, P/N 13099787	ea	1
	4935-01-111-2409	Cable Assembly 1W2, P/N 13195312	ea	1
	4935-01-115-0527	Cable Assembly W3, P/N 13099785	ea	1
4	5855-01-144-4837	Test Set, Amplifier: AN/TAM-5, P/N 13099878	ea	1
	5855-01-120-2912	Fixture Assembly, P/N 13100609	ea	
	5855-01-120-2985	Cable Assembly W1, P/N 13195043	ea	1

Section III. BASIC ISSUE ITEMS

There are no Basic Issue Items necessary for the Guided Missile System Shop Equipment.

**APPENDIX D
ADDITIONAL AUTHORIZATION LIST**

There are no additional authorized items for the support of the Guided Missile System Shop Equipment.

APPENDIX E EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to repair the Guided Missile System Shop Equipment. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

E-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., sealing compound (item 4, App. E).

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.

Section II. EXPENDABLE SUPPLIES AND MATERIALS

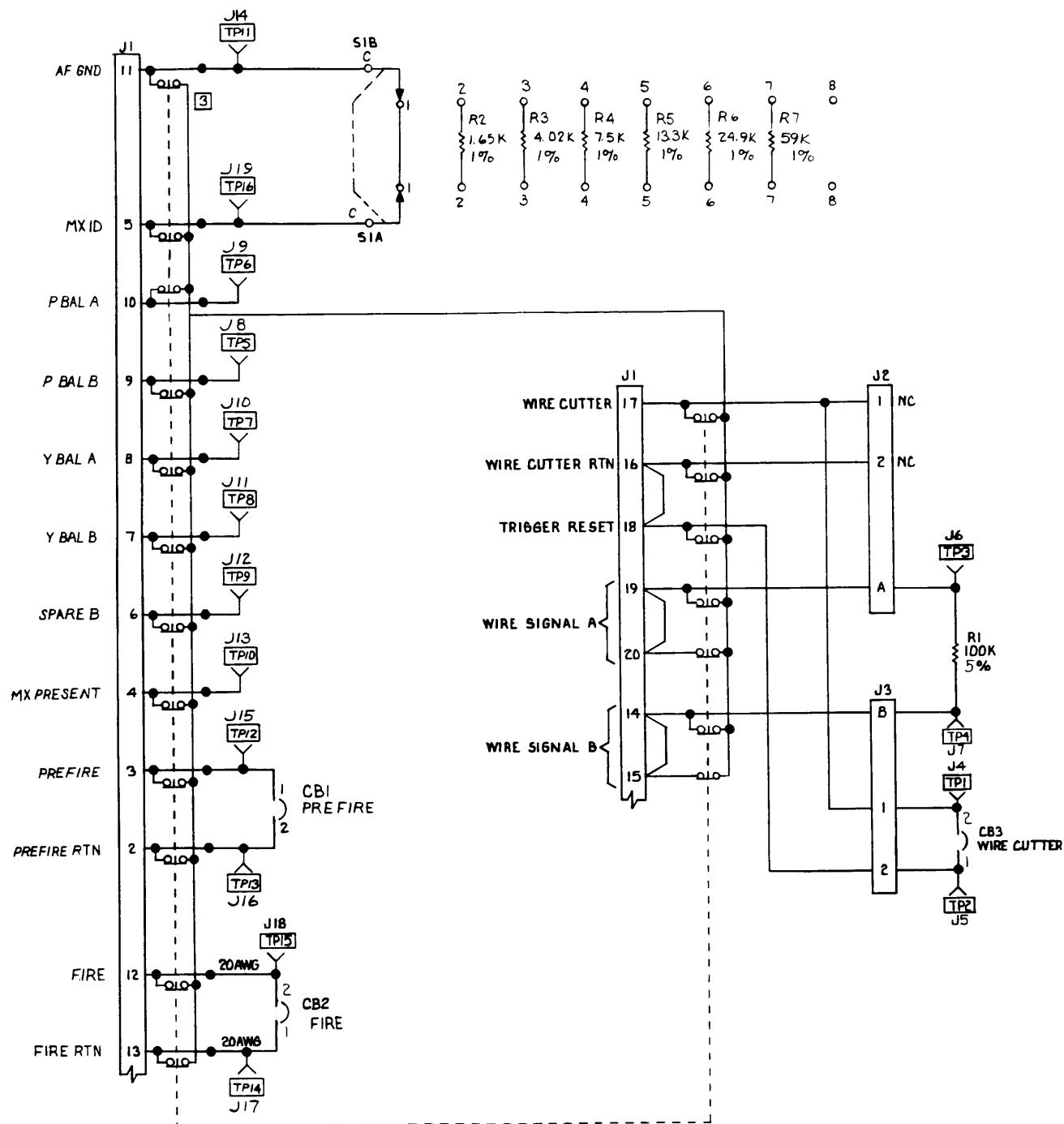
(1) ITEM NUMBER	(2) LEVEL	(3) SPECIFICATION/ NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	F	6810-00-201-0906	Alcohol, denatured	pt
2	F	7920-00-282-2470	Brush, scrub	ea
3	F	5970-01-144-4523	Compound, insulating, Type I, clear	
3.1	F	8030-00-081-2328	Compound, sealing, grade E	
4	F	8030-01-093-0968	Compound sealing	
5	F	6850-00-127-5094	Compound, silicone	
6	F	7930-00-282-9699	Detergent	ga
7	F	6810-00-264-6637	Glycerol, technical 0G491 (81348)	pt
8	F	7920-00-205-1711	Rag, wiping, cotton	bl
9	F	6810-00-257-2487	Toluene	pt
10	F	7510-01-159-7394	Tape, polyolefin	rl
11	F	7510-01-070-9934	Tape, pressure sensitive	rl
12	F	8030-00-963-0930 8030-01-092-9843	Compound, sealing (primer)	
13	F	8040-00-860-9772	Adhesive	
14	F	6145-00-150-4775	Wire, electrical, solid	
15	F	5970-01-079-2621	Insulation sleeving	

APPENDIX F SCHEMATICS AND WIRING DATA

Schematics needed to checkout and troubleshoot the Guided Missile System Shop Equipment are found in this appendix. Also included are wiring diagrams. These diagrams are included to aid you in the checkout and troubleshooting procedures. They are organized as follows:

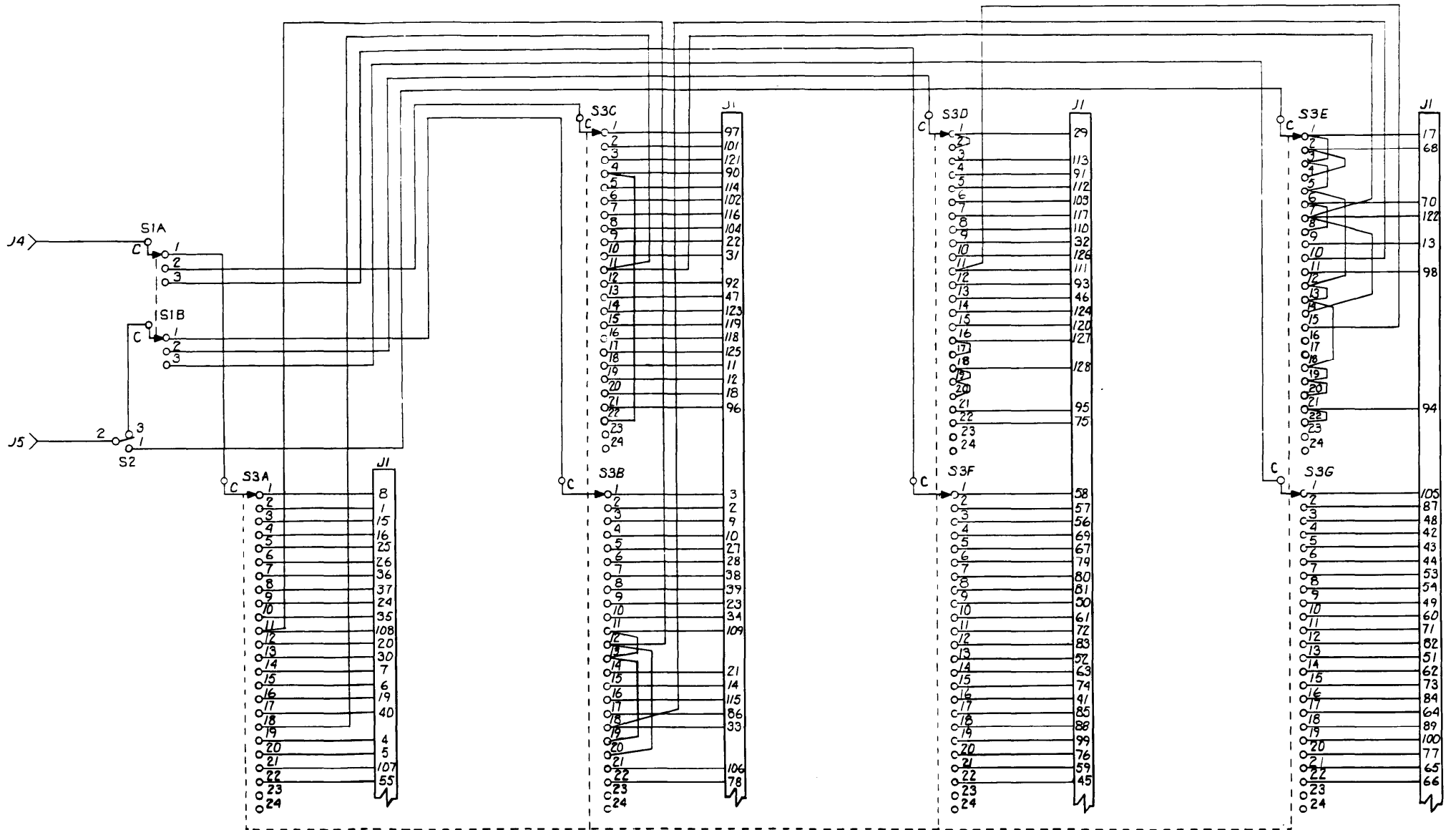
<u>Figure</u>	<u>Title</u>	<u>Page</u>
ELECTRICAL CIRCUIT TEST SET		
F0-1	Electrical Circuit Test Set Interconnection Diagram	F-3
ELECTRICAL CABLE TEST SET		
F0-2	Electrical Cable Test Set Interconnection Diagram	F-5
F0-3	Continuity Fixture Interconnection Diagram	F-9
MISSILE GUIDANCE SET TEST SET		
F0-4	Missile Guidance Set Test Set Interconnection Diagram	F-11
F0-5	Missile Guidance Set Test Set Special Purpose Electrical Cable Assembly (W1)	F-15
F0-6	Missile Guidance Set Test Set Flex Cable Assembly Interconnection Diagram	F-17
F0-7	Missile Guidance Set Test Set, Motor Load Cable Assembly, W3	F-19
AMPLIFIER TEST SET		
F0-8	Amplifier Test Set Interconnection Diagram	F-21
F0-9	Amplifier Test Set W1 Cable Assembly	F-23
F0-10	Amplifier Test Set, Reticle Alignment Fixture, Interconnection Diagram	F-25

- NOTES: UNLESS OTHERWISE SPECIFIED
 1. WIRES ARE 22 AWG
 2. RESISTANCE VALUES ARE IN OHMS
 3. SHORTING BAR IS OPENED WHEN TEST SET IS LOADED INTO BREACH AND ARMED
 4. REFERENCE DESIGNATION PREFIX A1

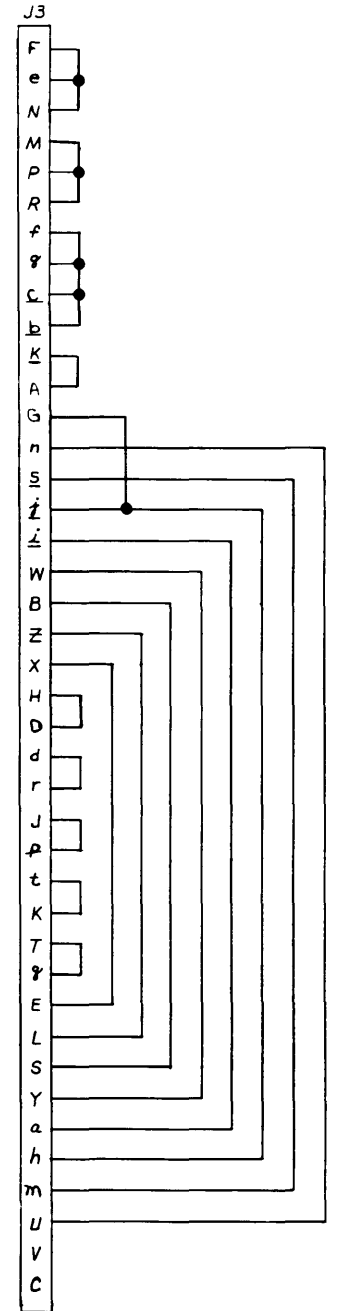
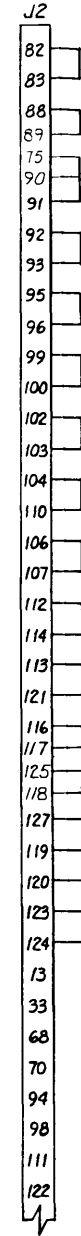
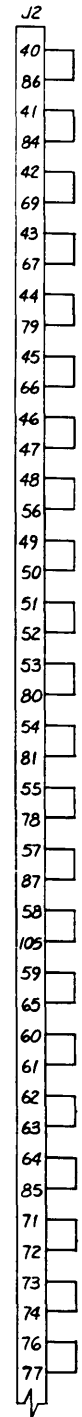
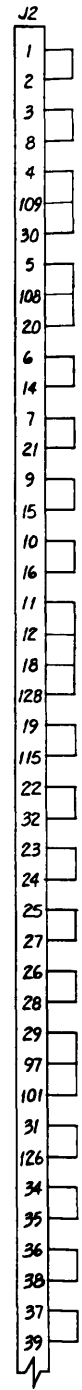


FO-1. Electrical Circuit Test Set
 Interconnection Diagram

NOTES: UNLESS OTHERWISE SPECIFIED
 1. REFERENCE DESIGNATION PREFIX AI
 2. WIRES ARE 24 AWG

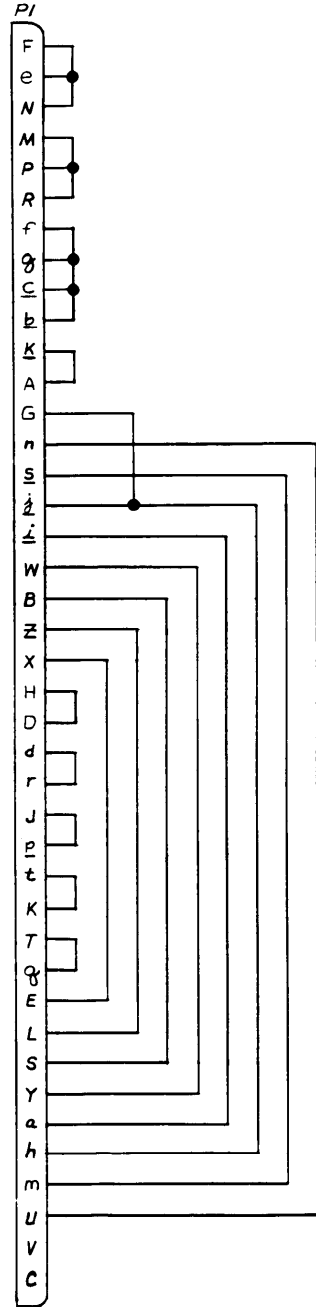


FO-2. Electrical Cable Test Set Interconnection Diagram (Sheet 1 of 2)



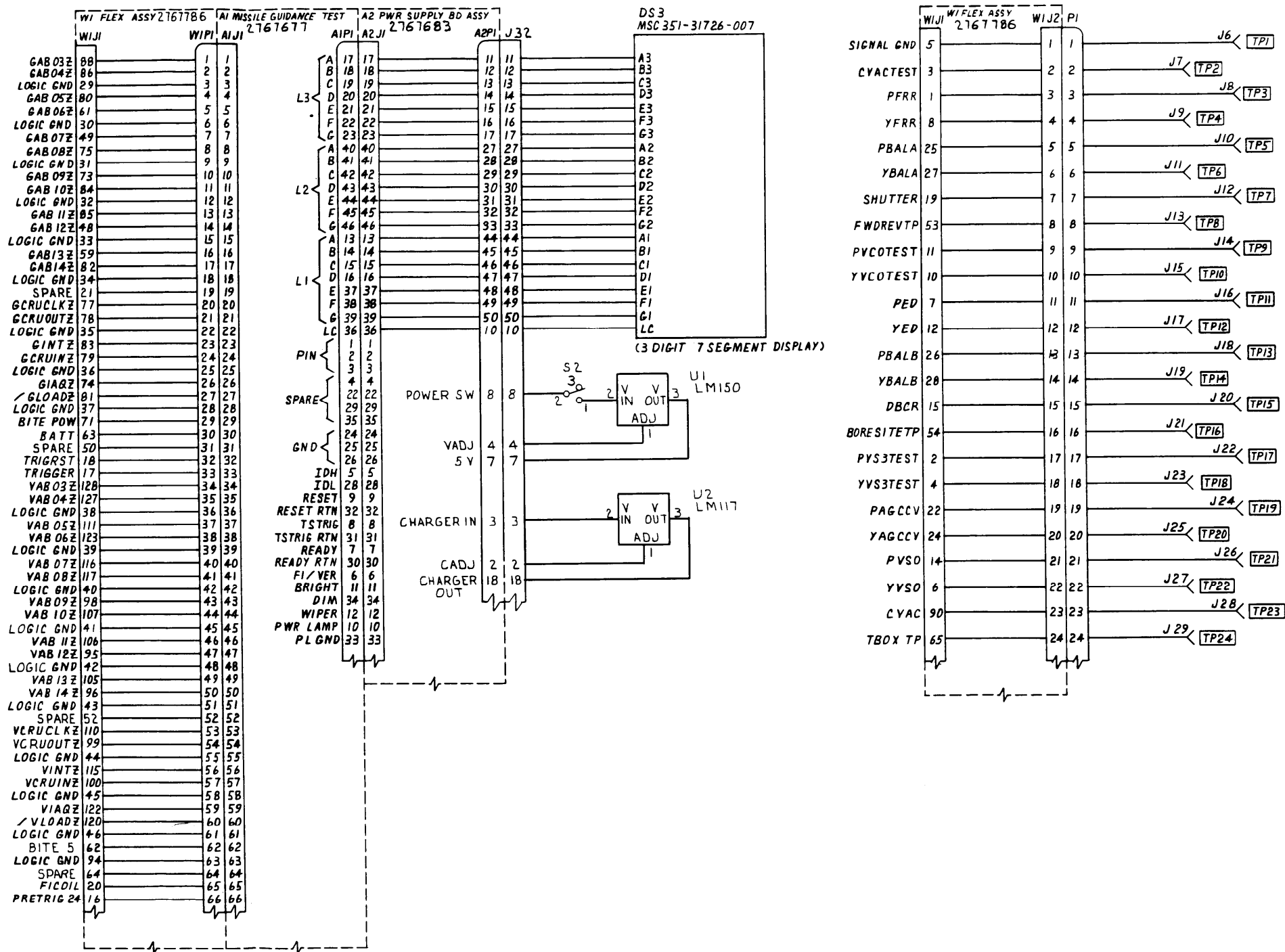
FO-2. Electrical Cable Test Set Interconnection Diagram (Sheet 2 of 2)

NOTES: UNLESS OTHERWISE SPECIFIED
1. WIRES ARE 22AWG
2. REFERENCE DESIGNATION PREFIX AIAZ

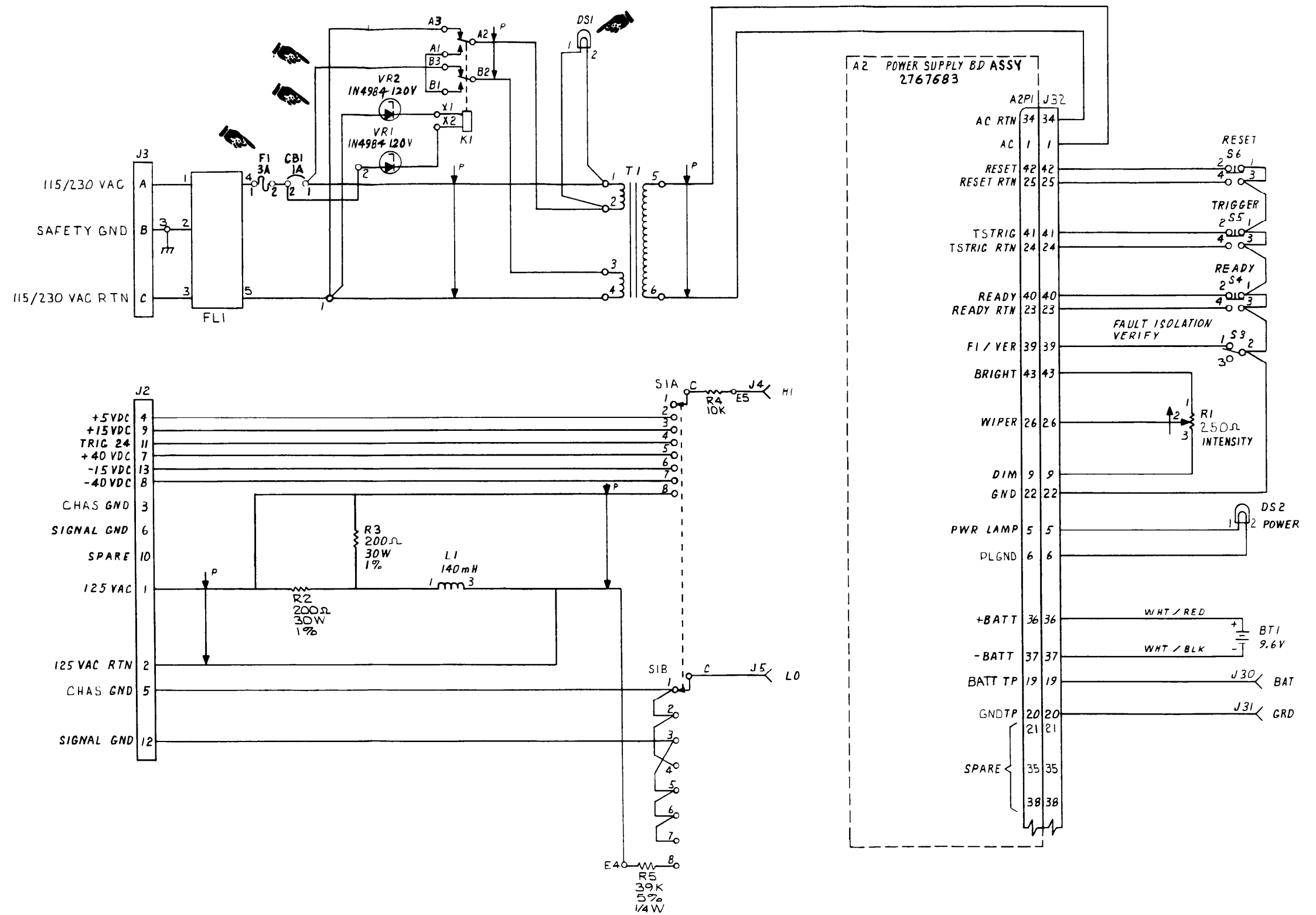


FO-3. Continuity Fixture Interconnection Diagram

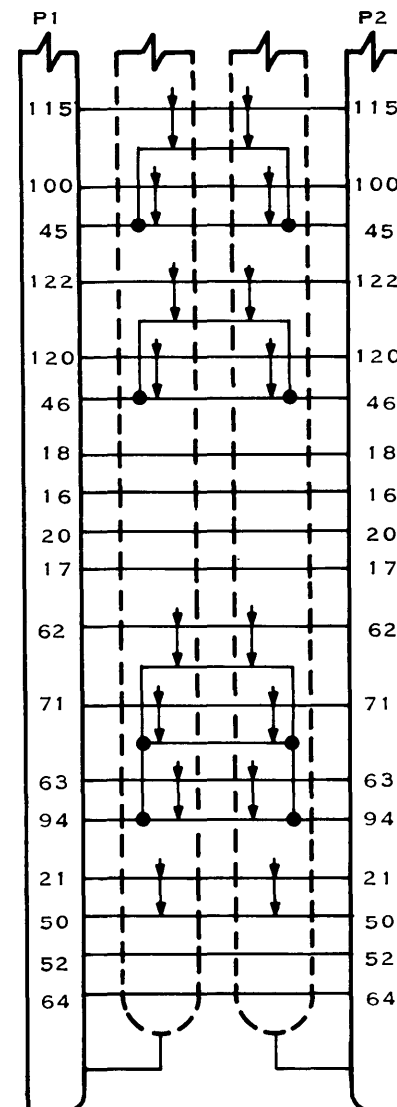
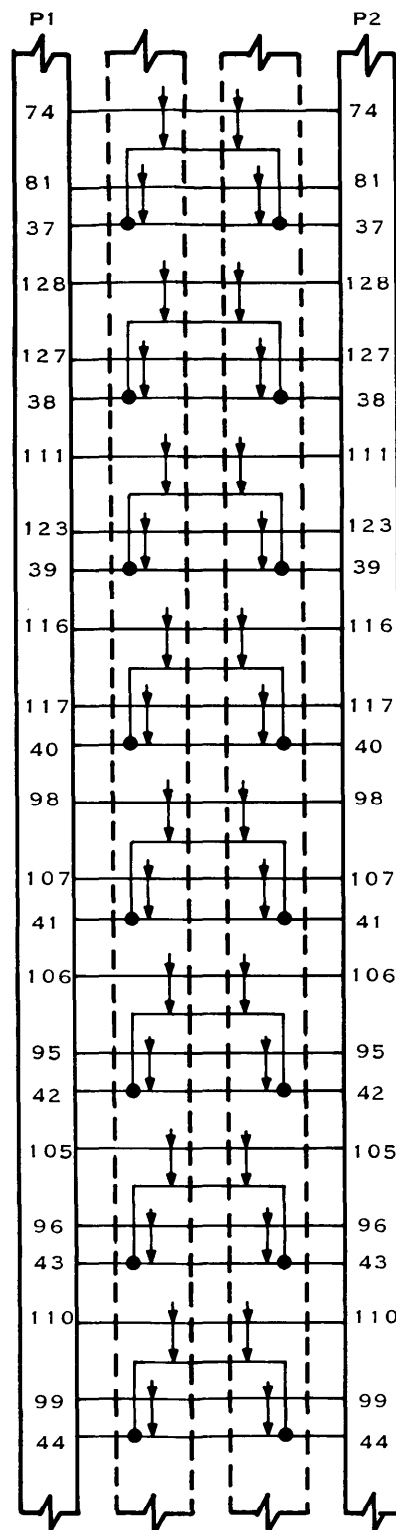
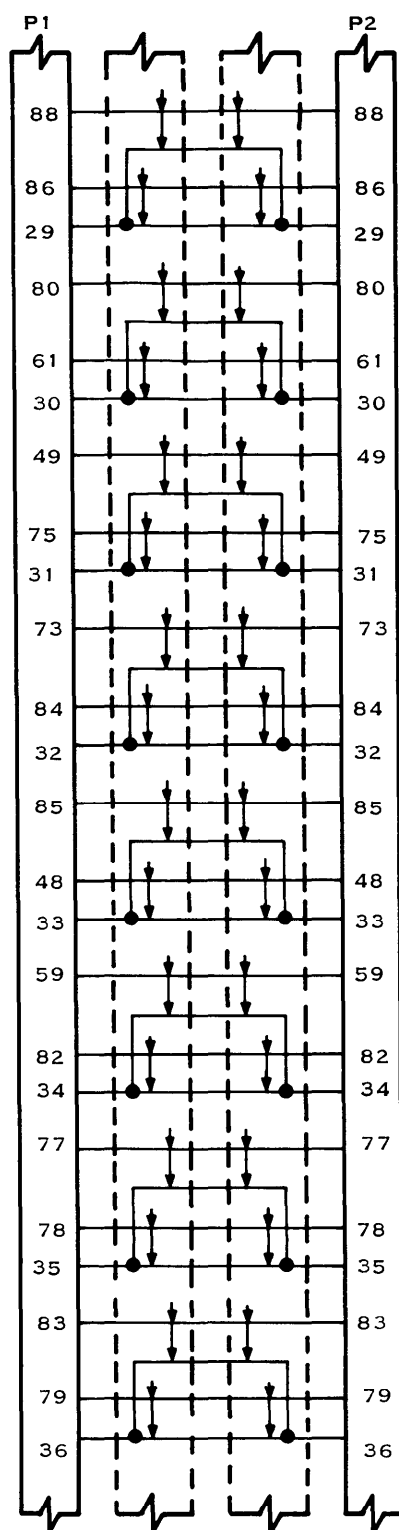
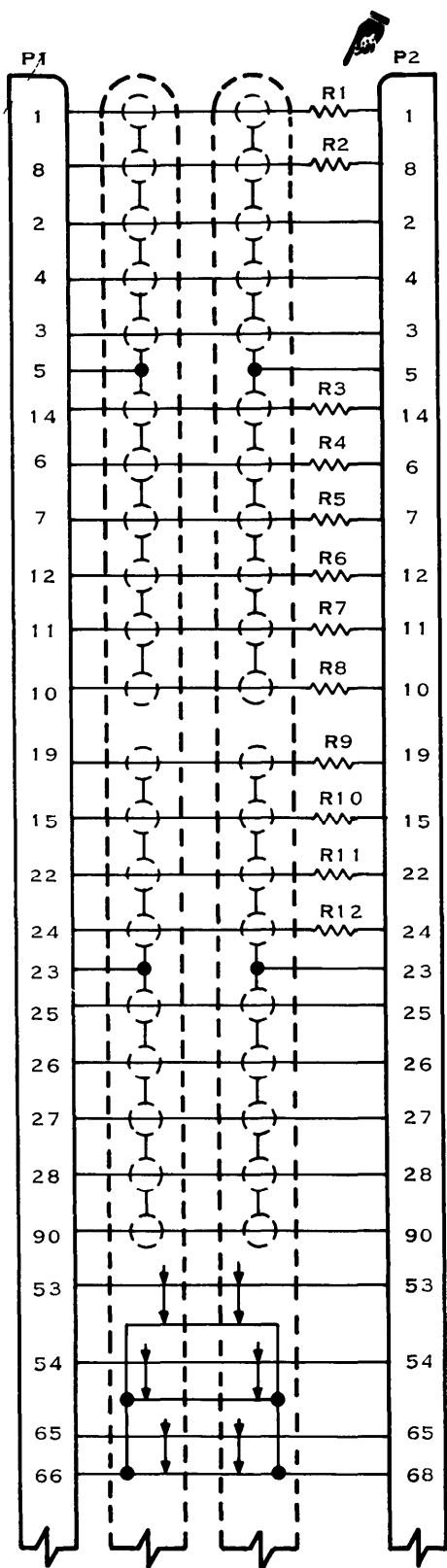
NOTES: UNLESS OTHERWISE SPECIFIED
1. REFERENCE DESIGNATION PREFIX: A1



FO-4. Missile Guidance Set Test Set
Interconnection Diagram (Sheet 1 of 2)

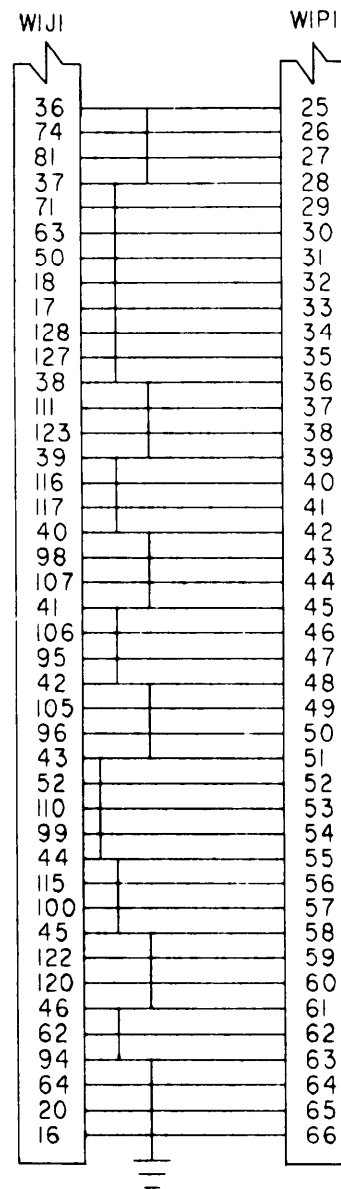
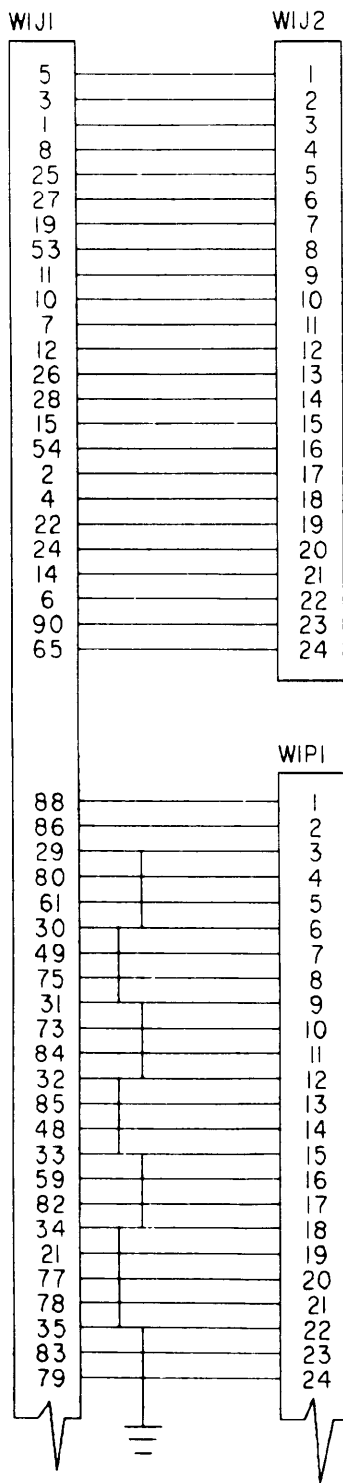


FO-4. Missile Guidance Set Test Set Interconnection Diagram (Sheet 2 of 2)

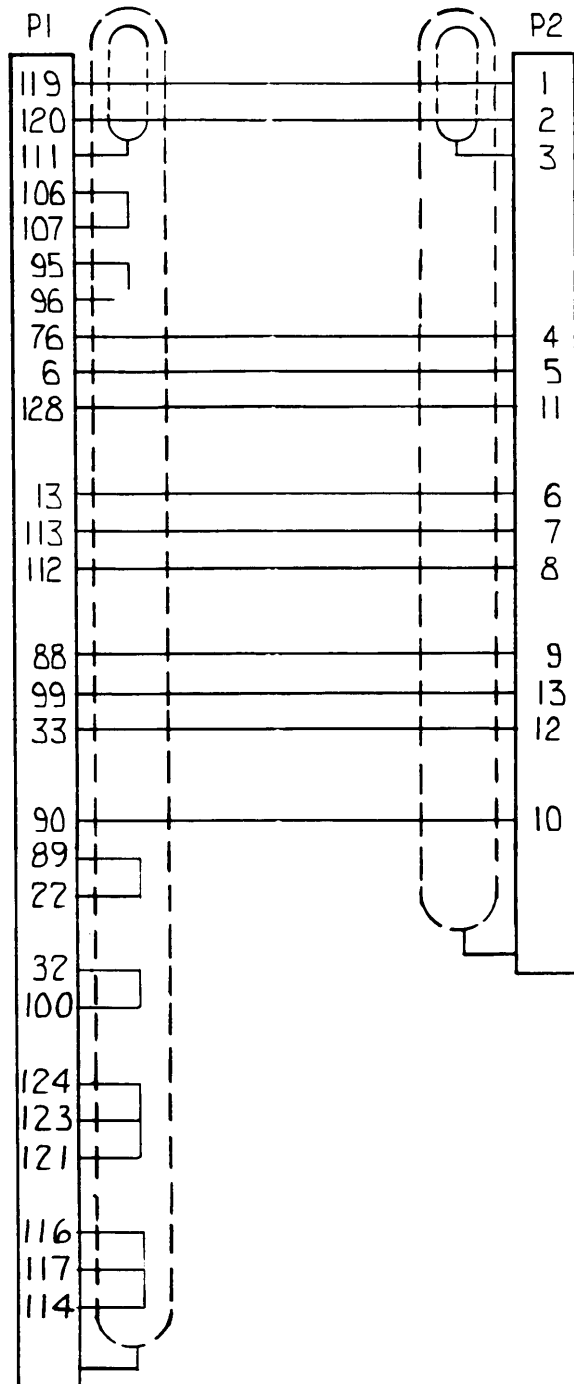


FO-5. Missile Guidance Set Test Set Special Purpose Electrical Cable Assembly (W1)

NOTES, UNLESS OTHERWISE SPECIFIED
 I. REFERENCE DESIGNATION PREFIX: AI

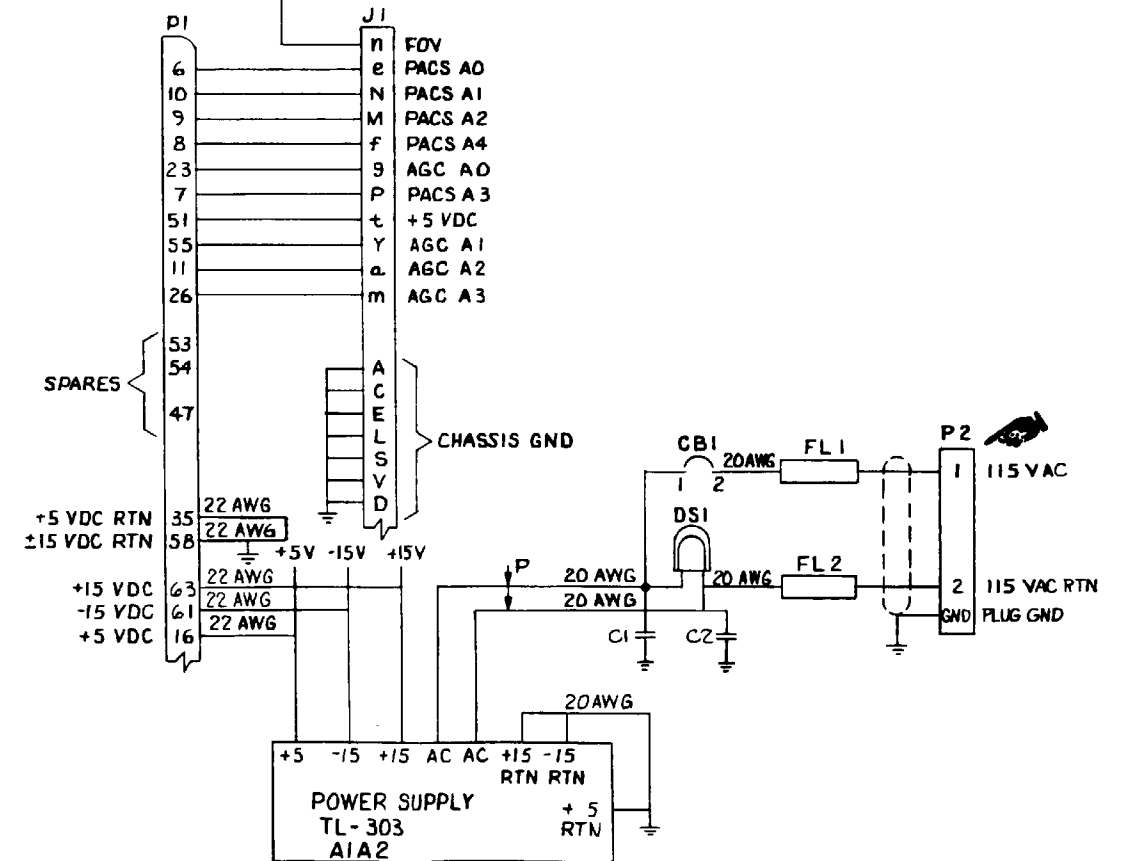
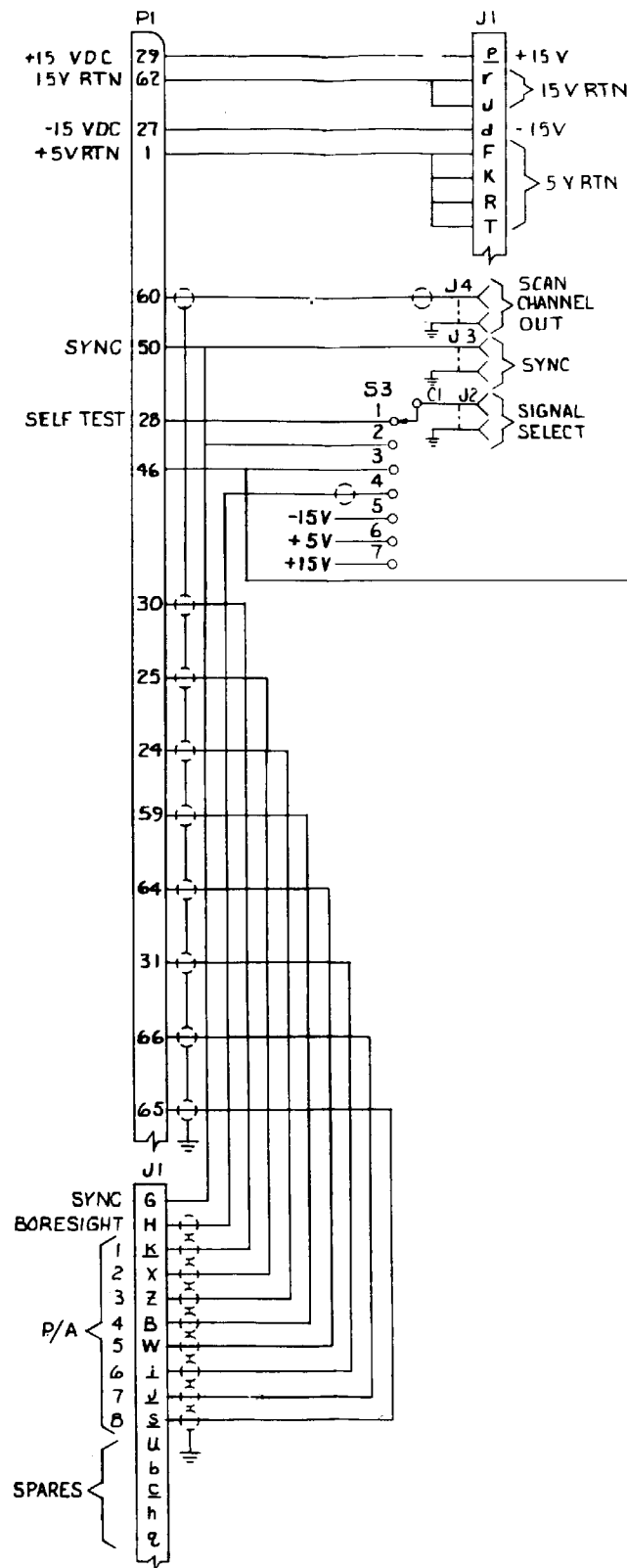
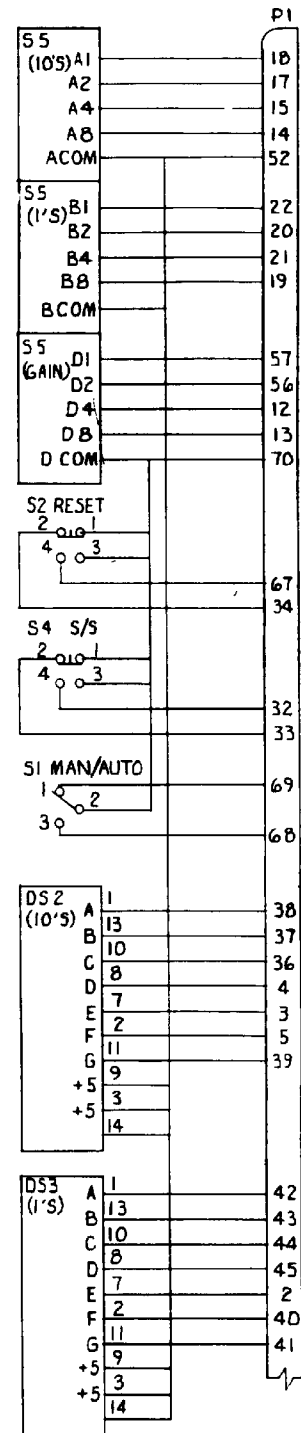


FO-6. Missile Guidance Set Test Set Flex Cable Assembly Interconnection Diagram

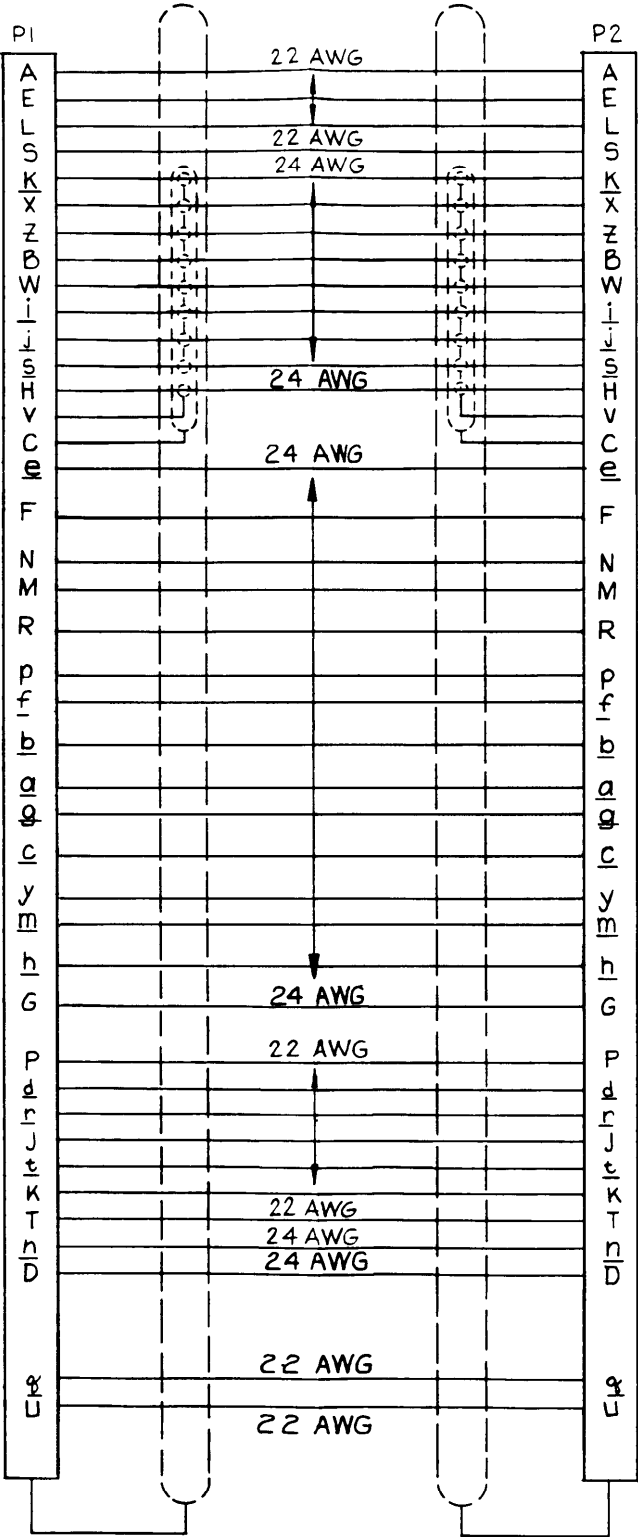


FO-7. Missile Guidance Set Test Set,
Motor Load Cable Assembly, W3

- NOTES: UNLESS OTHERWISE SPECIFIED
 1. REFERENCE DESIGNATION PREFIX A1
 2. ALL WIRES ARE 24 AWG
 3. ALL CAPACITORS ARE 1 MICROFARAD,
 400VDC, 5%

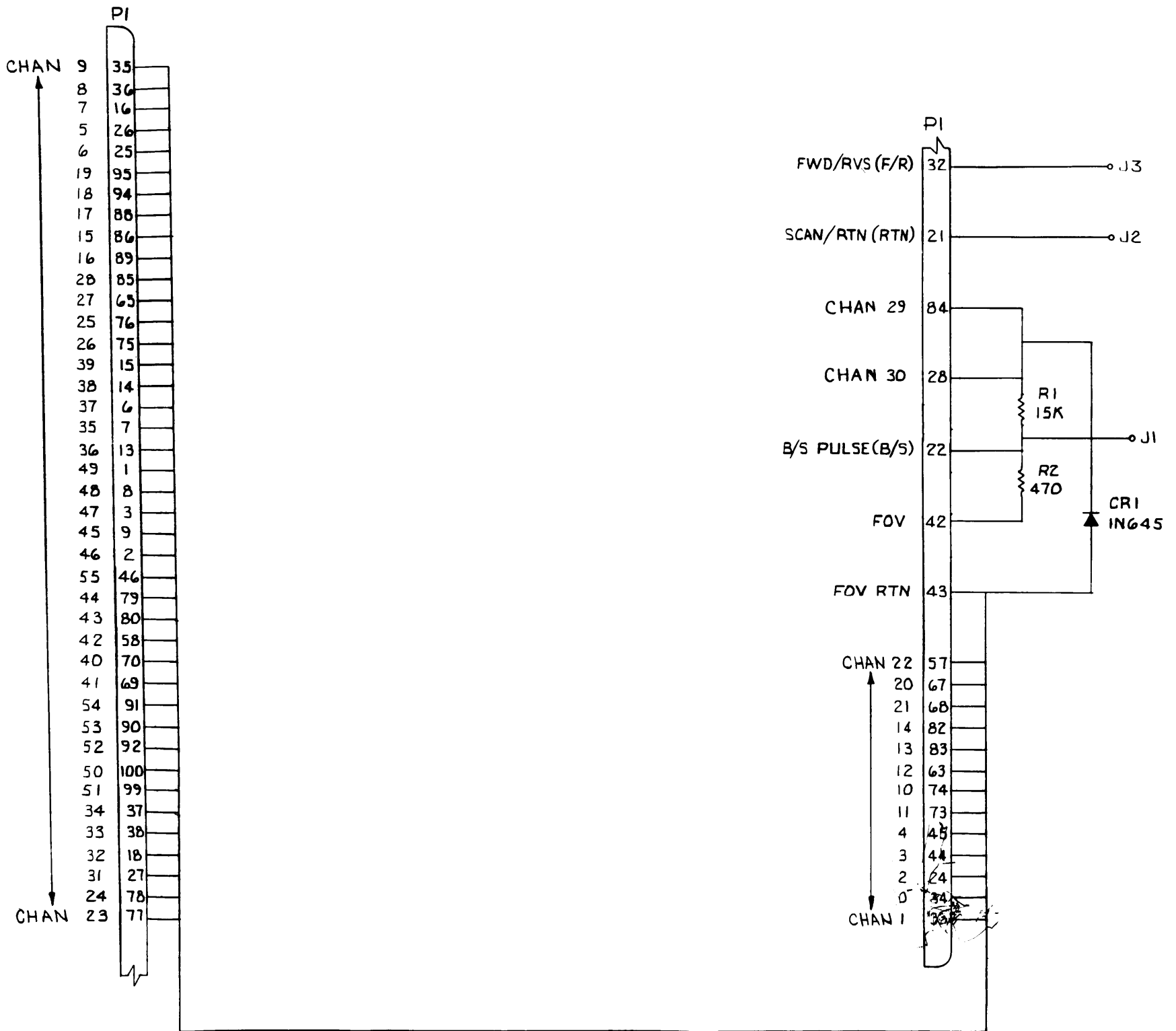


FO-8. Amplifier Test Set Interconnection Diagram



WIRING DIAGRAM

FO-9. Amplifier Test Set W 1 Cable Assembly



FO-10 Amplifier Test Set, Reticule Alignment Fixture, Interconnection Diagram

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DI STRI BUTI ON:

To be distributed in accordance with DA Form 12-32, Operator, Unit and Direct Support and General Support Maintenance Requirements for the TOW 2 Weapon System.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
 CDR, 1st Bn, 65th ADA
 ATTN: SP4 John Doe
 Key West, FL 33040

DATE SENT
 14 January 1979

PUBLICATION NUMBER
 TM 9-1430-550-34-1

PUBLICATION DATE
 7 Sep 72

PUBLICATION TITLE
 Unit of Radar Set
 AN/MPQ-50 Tested at the HFC

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
9-19		9-5	
21-2	step 1C		21-2

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

NOTE TO THE READER:

Your comments will go directly to the writer responsible for this manual, and he will prepare the reply that is returned to you. To help him in his evaluation of your recommendations, please explain the reason for each of your recommendations, unless the reason is obvious.

All comments will be appreciated, and will be given immediate attention. Handwritten comments are acceptable.

For your convenience, blank "tear out" forms, preprinted, addressed, and ready to mail, are included in this manual.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
 SP4 John Doe, Autovon 222-222

SIGN HERE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY CUT IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT... PIN-POINT WHERE IT IS

PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

CUT ALONG THIS LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

FILL IN YOUR
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY

CUT ALONG THIS LINE

Commander
U.S. Army Missile Command
ATTN: AMSMI-MMC-LS-LP
Redstone Arsenal, AL 35898-5238

THE METRIC SYSTEM AND EQUIVALENTS

WEIGHT MEASURE

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

WEIGHTS

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

LIQUID MEASURE

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

SQUARE MEASURE

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

CUBIC MEASURE

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

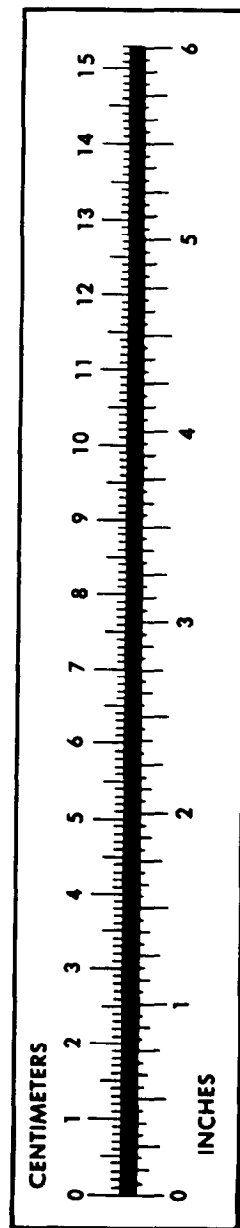
TEMPERATURE

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

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
its	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
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 053165-007