OPERATOR, AVIATION UNIT AND AVIATION INTERMEDIATE

MAINTENANCE MANUAL INCLUDING

REPAIR PARTS FOR SPECIAL TOOLS LIST

FOR

INSTRUMENT DISPLAY SYSTEM LINE TEST SET 476-853 NSN 4920-01-112-5906

"Approved for public release; distribution is unlimited."

*This manual supersedes TM 55-4920-413-12&P, dated July 1979, including all changes.

HEADQUARTERS, DEPARTMENT OF THE ARMY
1 NOVEMBER 1986

CHANGE

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 30 April 1993

Operator, Aviation Unit and Aviation Intermediate

Maintenance Manual Including Repair Parts for Special Tools List for Instrument Display System Line Test Set 476-853 NSN 4920-01-112-5906

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TM 55-4920-413-13&P, 1 November 1986, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
1-1/(1-2 blank)	1-1/(1-2 blank)
B-3 and B-4	B-3 and B-4
C-5 through C-22	C-5 through C-22
C-25 and C-26	C-25 and C-26

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

04210

DISTRIBUTION :

To be distributed in accordance with DA Form 12-31-E, block no. 1379, requirements for TM 55-4920-413-13&P.

CHANGE NO. 1

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

Operator, Aviation Unit
and Aviation Intermediate

Maintenance Manual
Including
Repair Parts for Special Tools List
for
Instrument Display System Line
Test Set
476-853
NSN 4920-01-112-5906

TM 55-4920-413-13&P, 1 November 1986, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
1-1/1-2	1-1/1-2
2-1 and 2-2	2-1 and 2-2
4-3 and 4-4	4-3 and 4-4
4-23 through 4-33/4-34	4-23 through 4-33/4-34
A-1/A-2	A-1/A-2
C-7 through C-22	C-7 through C-22
C-24	C-24
C-25 and C-26	C-25 and C-26
C-29 and C-30	C-29 and C-30
FP-1 through FP-7/FP-8	FP-1 through FP-7/FP-8
FP-19/FP-20	FP-19/FP-20
2028's and envelopes	2028's and envelopes
Cover 1/2	Cover 1/2

2. Retain this sheet in front of the manual for reference purposes.

By Order of the Secretary of the Army:

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

Official:

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

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, -10 & CL, AVUM, AVIM Maintenance requirements for UH-60A Helicopter, Utility (BLACKHAWK).

WARNING

Personnel performing operations, procedures, and practices which are included or implied in this technical manual shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, or death.

Warnings, cautions, and notes are used to emphasize important and critical instructions and shall be used for the following conditions:

WARNING

An operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.

CAUTION

An operating procedure, practice, etc., which if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which it is essential to highlight.

OPERATOR AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

INCLUDING
REPAIR DISPLAY SYSTEM LINE TEST SET

FOR

INSTRUMENT DISPLAY SYSTEM LINE TEST SET
476-853
NSN 4920-01-112-5906

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or 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 2082-2 located in the back of this manual direct to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont)

LIST OF ILLUSTRATIONS

LIST OF TABLES

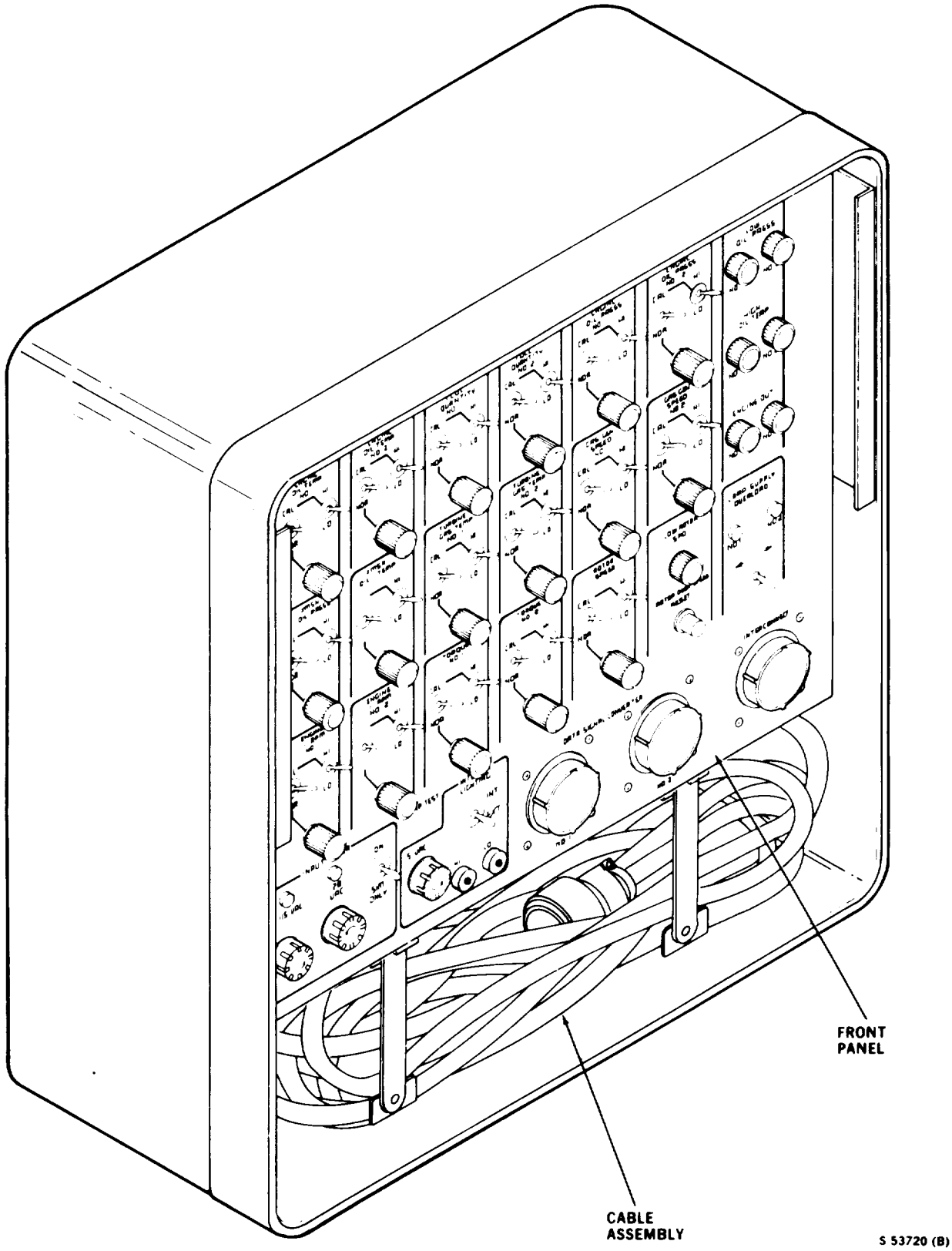


Figure 1-1. Instrument Display System Line Test Set

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual describe Line Test Set/Vertical Instrument Display System (VIDS) (Figure 1-1 and provides instructions for operation, aviation unit and intermediate maintenance. It includes instruction for operation and replacement of parts available to the operator, aviation unit and intermediate repairmen. The aviation unit and intermediate maintenance repair parts and special tools list is in Appendix C.

1-2. Maintenance Forms, Records, and Reports.

Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA PAM 738-751.

1-3. Destruction of Army Materiel to Prevent Enemy Use.

Refer to TM 750-244-2, Procedures for Destruction of Electronic Materiel to Prevent Enemy Use.

1-4. Preparation for Storage or Shipment.

For administrative storage, refer to TM 55-1500-204-25/1, and Chapter 4.

1-5. Quality Assurance/Quality Control (QA/AC).

Refer to FM 55-411 for information about quality assurance and quality control.

1-6. Equipment Improvement Recommendations (EIR).

EIR can and must be sumitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to do a procedure; just simply tell why the design is unfavorable of why a procedure is difficult. EIR may be submitted on SF 368 (Quality Deficiency Report). Mail directly to Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MDO 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. Purpose and Use.

Line Test Set/vertical Instrument Display\System (VIDS) provides the necessary power, inputs, controls and displays to operate and test the Vertical Instrument Display System. The control, mounted on the Line Test Set, allow the operator to select simulated signals and specific test conditions required for maintenance of the test set.

1-8. Description.

a. The Line Test Set, Vertical Instrument Display System is a box-shaped unit having a front panel on which are mounted controls, indicators, connectors, and fuses a cover attached to the rear of the test set has a slot opening for storage of test and power cables. It is housed in a fiber glass, rectangular light weight case. The case consists of top and bottom sections hinged together so that the two sections may be separated. The bottom section has two rectangular bars to store the power and test cables.

1-9. Equipment Data.

Refer to Table 1-1 for equipment data.

Table 1-1, Equipment Data

AC voltage input	115 vac, single-phase, 400 Hz
DC voltage input	28 ± 0.5 vdc
outputs	All necessary ac and dc power and control voltages and simulated signals for the parameter to be tested.
Dimensions	
Length	39 cm (15.38 inches)
Width	37.8cm (14.88 inches)
Height	24.8cm (9.76 inches)
Weight	11.7 kg (26lbs)

CHAPTER 2

SERVICE UPON RECEIPT

Section I. SITE AND SHELTER REQUIREMENTS

2-1. Siting.

The test set operates in the helicopter environment by being connected to the vertical instrument display system.

Section II. SERVICE UPON RECEIPT OF MATERIEL

2-2. Unpacking.

a. Packing Data. When received, the Line Test Set vertical Instrument Display System is packaged in a carton. The test set carton is 54.61cm (21.5 inches) long by 52.07cm (20.5 inches) wide by 39.37cm (15.5 inches) deep. The volume of the carton is 0.1 cubic meter (4.0 cubic feet), and its total weight when packed for shipment is about 17.1 kg (38 pounds). A typical shipping carton and contents are shown in Figure 2.1.

b. Removing Contents.

(1) Cut or remove gummed tape from top of carton, and open top.

(2) Remove polyethylene cushioning material.

(3) Lift test set from carton and remove remaining polyethylene cushioning material.

2-3. Checking Unpacked Equipment.

CAUTION

To open the Line Test Set, release air pressure by opening the air release valve.

a. Inspect equipment for damage caused during shipment. If equipment has been damaged, report it on DD Form 6 in accordance with instructions in AR 700-58.

b. Check equipment against component listing in operator's manual and packing slip, to see if shipment is complete. Report all discrepancies per instructions of DA PAM 738-751. Equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

c. Check to see whether equipment has been modified. (Equipment which has been modified will have MWO number on front panel, near nomenclature plate). Check also to see whether all current applicable MWO have been applied. (Current MWO applicable to equipment are listed in DA PAM 25-30.

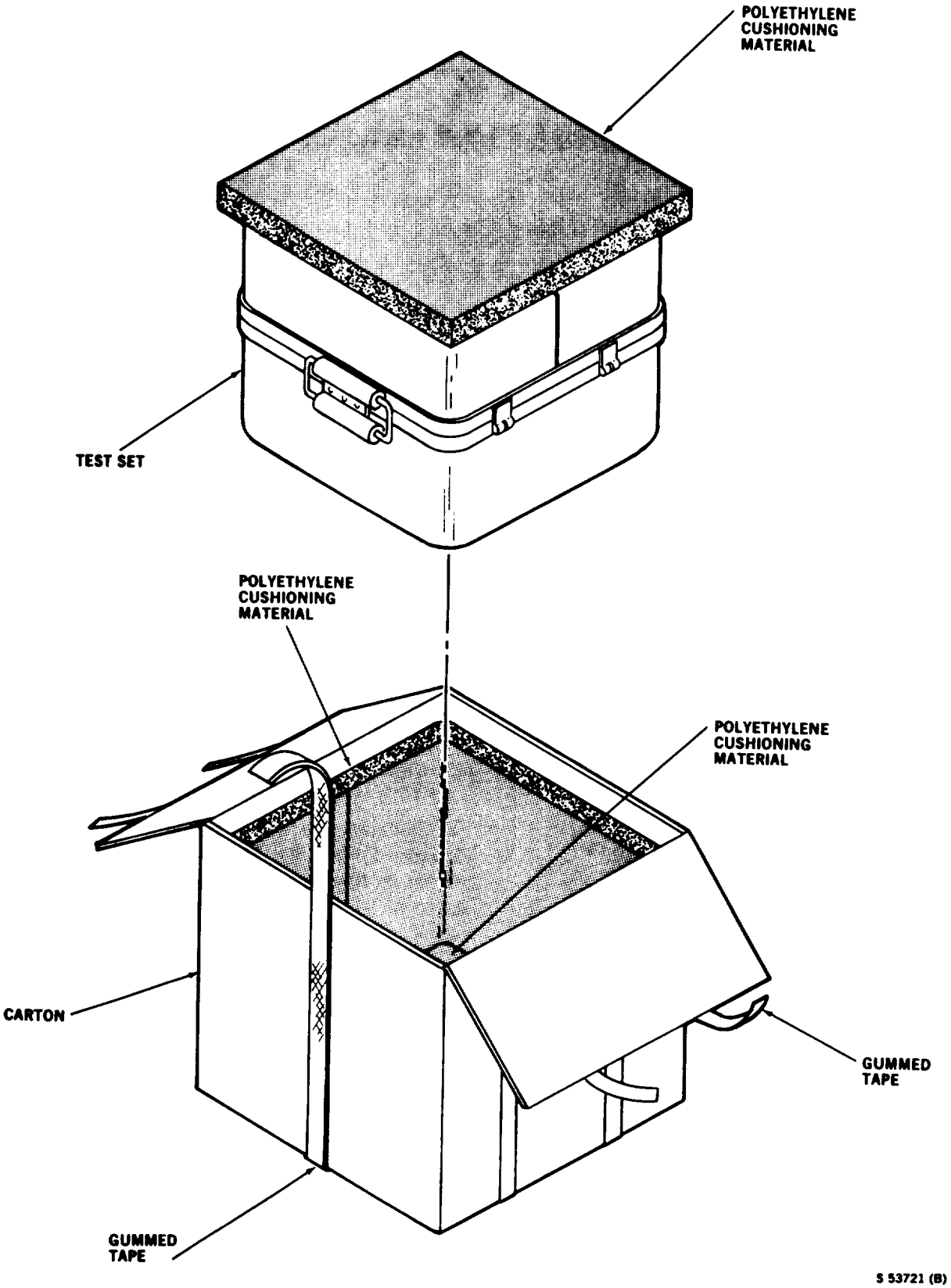


Figure 2-1. Typical Packaging

SECTION III. INSTALLATION INSTRUCTIONS

2-4. Installation of Equipment.

Connect harness assemblies to test set as shown in Figure 2-2.

2-5. Seating of Fuses and Lamps.

Line Test Set/Vertical Instrument Display System is shipped with fuses and lamps in place. Check that these fuses and lamps are installed and not damaged.

a. l15 VAC 2A

b. 28 VDC 8A

c. 5 VAC 8A

d. 115 VAC Power-on Lamp

e. 28 VDC Power-on-Lamp

f. Warning Lamps

(1) LOW OIL PRESS NO. 1

(2) LOW OIL PRESS NO. 2

(3) HIGH OIL TEMP NO. 1

(4) HIGH OIL TEMP NO. 2

(5) ENGINE OUT NO. 1

(6) ENGINE OUT NO. 2

(7) LOW ROTOR SPD

(8) LAMP SUPPLY OVERLOAD NO. 1

(9) LAMP SUPPLY OVERLOAD NO. 2

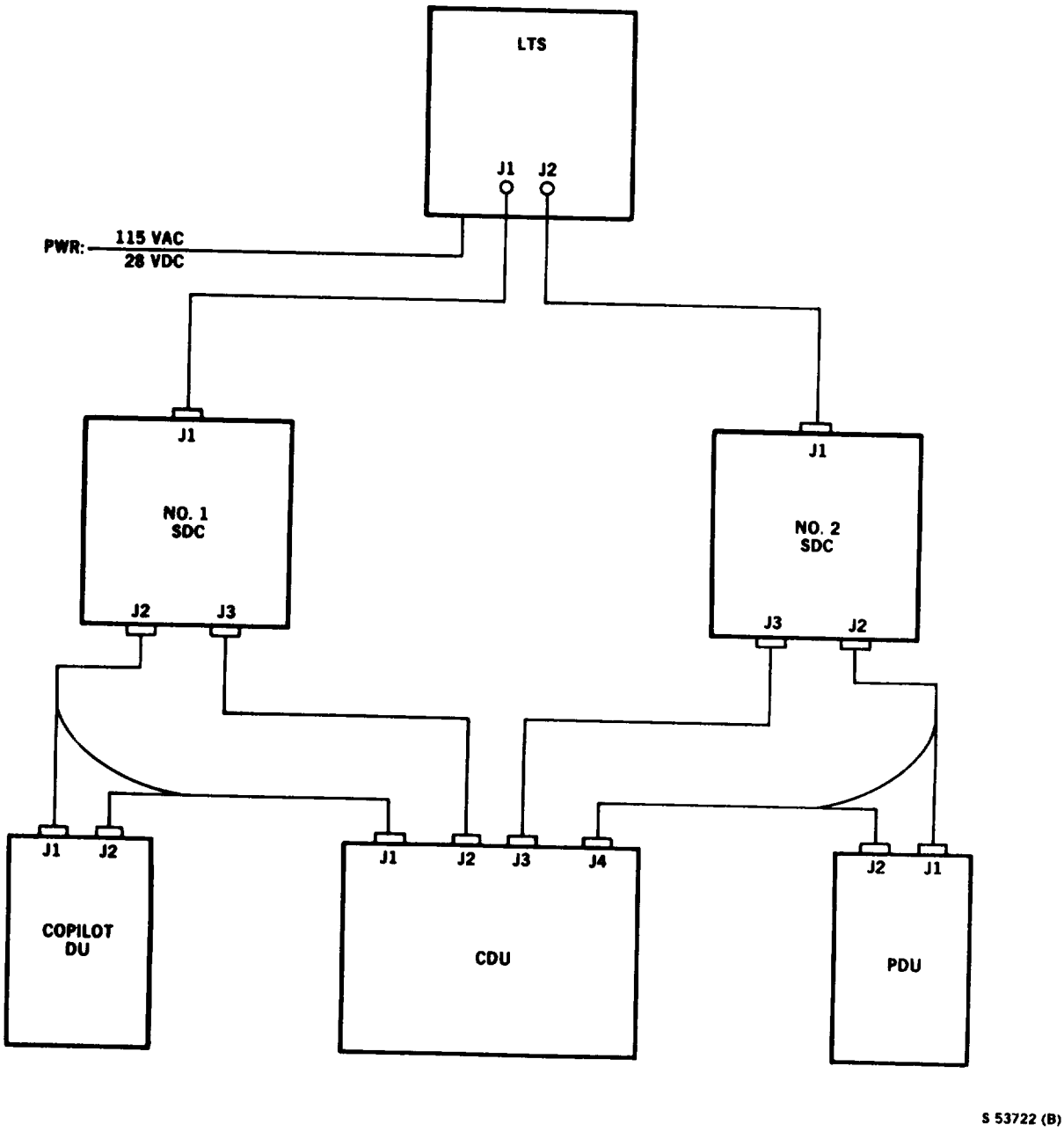


Figure 2-2. Test Setup

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND INDICATORS

3-1. Operator's Controls.

All operator's controls and indicators are shown in Figure 3-1 and listed and described in Table 3-1.

Section II. OPERATION UNDER USUAL CONDITIONS

3-2. Preliminary Starting Procedure.

a. Place all test set switches to OFF, NOR, or LO.

b. Connect test set as shown in Figure 2-2.

c. Do an operational check (TM 55-1520-237-23-3).

3-3. Procedures for Shutdown.

a. Press ROTOR OVERSPEED RESET to reset rotor overspeed warning indicators.

b. Place all test set switches to OFF, NOR, or LO.

c. Disconnect cable assemblies.

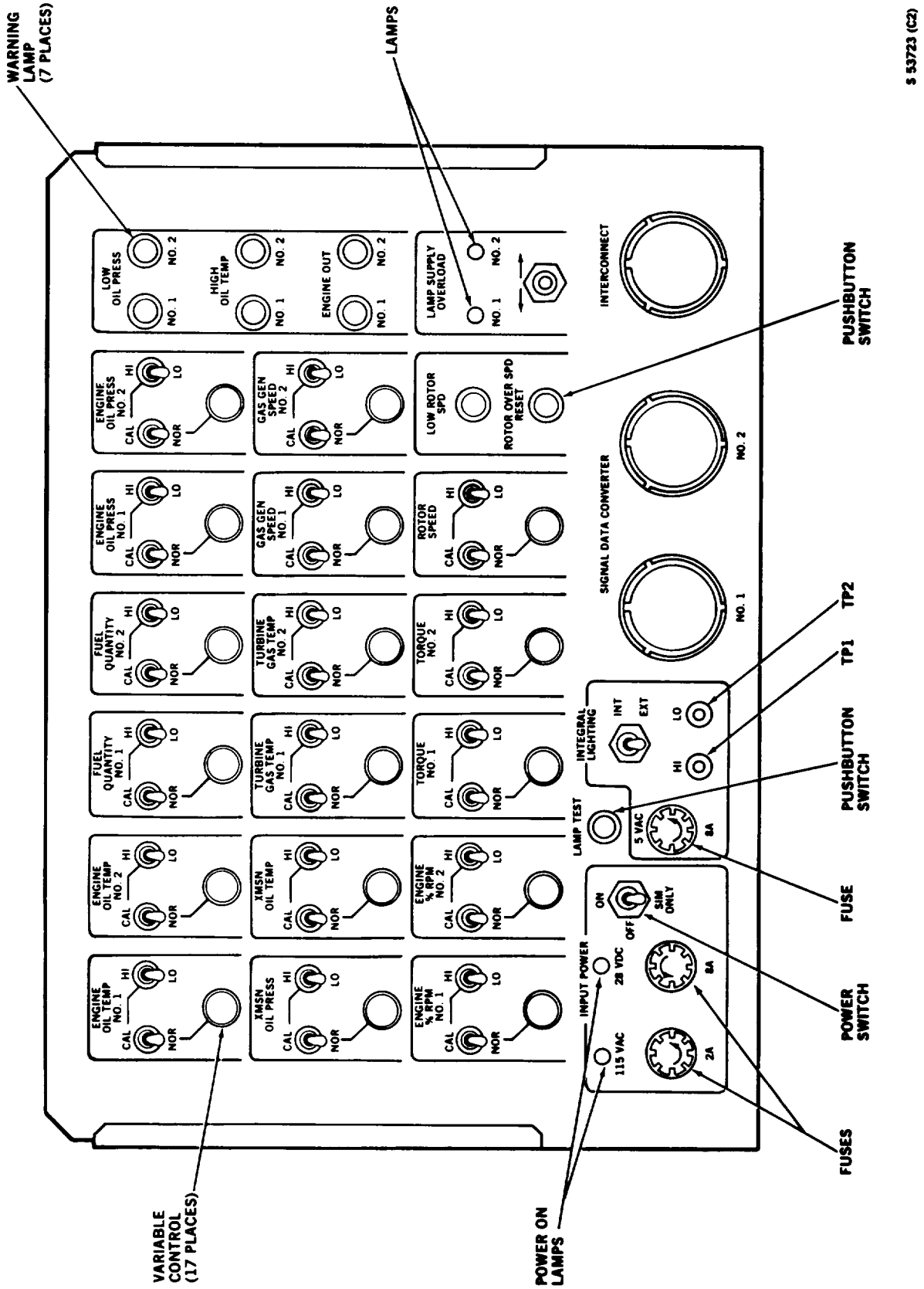


Figure 3-1. Line Test Set Controls and Indicators

Table 3-1. Operator's Controls

Control, indicator, or connector	Function
ENGINE OIL TEMP NO. 1	
NOR CAL switch	Used to select testing mode of engine oil temperature #1 indicator in either normal or calibrating functions.
HI LO switch	Used to select high and low calibration points for #1 engine oil temperature indicator when NOR CAL switch is at CAL.
Variable control	Used to check full range of operation of #1 engine oil temperature #1 indicator when NOR CAL switch is placed to NOR.
ENGINE OIL TEMP NO. 2	
NOR CAL switch	Permits selection of testing mode of engine oil temperature #2 indicator in normal or calibration functions.
HI LO switch	Permits selection of high and low calibration points for #2 engine oil temperature indicator when NOR CAL switch is at CAL.
Variable control	Permits checking of full range of operation of #2 engine oil temperature indicator when NOR CAL is at NOR.
FUEL QUANTITY NO. 1	
NOR CAL switch	Permits selection of mode of testing normal or calibration of fuel quantity #1 indicator.
HI LO switch	Used to select high and low calibration points of #1 fuel quantity indicator when NOR CAL switch is at CAL.
Variable control	Used to check range of operation of #1 fuel quantity indicator when NOR CAL switch is at NOR.
FUEL QUANTITY NO. 2	
NOR CAL switch	Used to select mode of operation testing - normal or calibration of fuel quantity #2 indicator.
HI LO switch	Permits selection of high and low calibration points of #2 fuel quantity system indicator when NOR CAL switch is at CAL.
Variable control	Permits checking of range of operation of #2 fuel quantity indicator when NOR CAL switch is at NOR.
ENGINE OIL PRESS NO. 1	
NOR CAL switch	Used to select testing mode between fixed calibration and variable (controllable) operation.
HI LO switch	Used to select high and low fixed calibration points for #1 engine oil pressure indicator when NOR CAL switch is placed to CAL.
Variable control	Used to check full range of operation of #1 engine oil pressure indicator when NOR CAL switch is placed to NOR.
ENGINE OIL PRESS NO. 2	
NOR CAL switch	Used to select testing mode: either fixed calibration or variable (controllable) operation.
HI LO switch	Used to select high and low fixed calibration points for #2 engine oil pressure indicator when NOR CAL switch is placed to CAL.

Table 3-1. Operator's Controls (Cont)

Control, indicator or connector	Function
Variable control	Used to check complete range of operation of #2 engine oil pressure when NOR CAL switch is placed to NOR.
LOW OIL PRESS NO. 1 LOW OIL PRESS NO. 2	Used to indicate simulated conditions exist on appropriate parameter tests.
XMSN OIL PRESS	
NOR CAL switch	Used to select testing mode: either fixed calibration operation or variable (controllable) operation.
HI LO switch	Used to select high and low fixed calibration points for transmission pressure indicator when NOR CAL switch is placed to CAL.
Variable control	Used to check complete range of operation of transmission pressure indicator when NOR CAL switch is placed to NOR.
XMSN OIL TEMP	
NOR CAL switch	Used to select testing mode of transmission oil temperature indicator in either normal or calibrating functions.
HI LO switch	Used to select high and low calibration points for transmission oil temperature indicator, when NOR CAL switch is placed to CAL.
Variable control	Used to check full range of transmission oil temperature indicator when NOR CAL switch is placed to NOR.
TURBINE GAS TEMP NO. 1	
NOR CAL switch	Permits selection of mode of operation testing - normal or calibration of TGT #1 indicator.
HI LO switch	Used to select high and low calibration points of TGT #1 system indicator when NOR CAL switch is placed to CAL.
Variable control	Used to check full range of operation of TGT #1 system indicator when NOR CAL switch is placed to NOR.
TURBINE GAS TEMP NO. 2	
NOR CAL switch	Used to select mode of operation for testing - normal or calibration of TGT #2 indicator.
HI LO switch	Permits selection of high and low calibration points of TGT #2 system indicator when NOR CAL switch is placed to CAL.
Variable control	Permits checking full range of operation of TGT #2 system indicator when NOR CAL is placed to NOR.
GAS GEN SPEED NO. 1	
NOR CAL switch	Selects mode of operation for Ng #1 indicator in normal or calibration.
HI LO switch	Used to select high and low calibration points for Ng #l indicater when NOR CAL switch is placed to CAL.
Variable control	Permits checking of Ng #1 indicator over its range of operation when NOR CAL switch is placed to CAL.

Table 3-1. Operator's Controls (Cont)

Control, indicator or connector	Function
GAS GEN SPEED NO. 2	
NOR CAL switch	Permits selection of mode of operation for equipment testing of Ng #2 indicator.
HI LO switch	Permits selection of high and low calibration tests for Ng #2 indicator when NOR CAL switch is placed to CAL.
Variable control	Used to check range of operation of Ng #2 indicator when NOR CAL switch is placed to NOR.
HIGH OIL TEMP NO. 1 **HIGH OIL TEMP NO. 2**	Used to indicate simulated conditions which exist on appropriate parameter tests.
ENGINE OUT NO. 1 ENGINE OUT NO. 2	
ENGINE % RPM NO. 1	
NOR CAL switch	Used to select mode of operation: normal or calibration of % RPM #1 indicator.
HI LO switch	Used to select high and low speed calibration points of % RPM #l indicator when NOR CAL switch is placed to CAL.
Variable control	Used when NOR CAL switch is placed to NOR, to check operation of % RPM Engine #l indicator over its range.
ENGINE % RPM NO. 2	
NOR CAL switch	Selects mode of operation for % RPM #2 indicator - normal or calibration.
HI LO switch	Used to select high and low calibration points for % RPM #2 indicator when NOR CAL switch is placed to CAL.
Variable control	Used when NOR CAL switch is placed to NOR, to check operation of % RPM #2 indicator over its range.
TORQUE NO. 1	
NOR CAL switch	Used to select mode of testing - normal or calibration of % TRQ #1 indicator.
HI LO switch	Permits selection of high and low calibration of % TRQ #1 indicator checks when NOR CAL switch is placed to CAL.
Variable control	Permits testing of range of operation of the % TRQ #1 indicator system when NOR CAL switch is at NOR.
TORQUE NO. 2	
NOR CAL switch	Used to select mode of testing - normal or calibration of % TRQ #2 indicator.
HI LO switch	Permits selection of high and low calibration checks of % TRQ #2 indicator when NOR CAL switch is placed to CAL,
Variable control	Permits testing of range of operation of % TRQ #2 indicator system when NOR CAL switch is at NOR.

Table 3-1. Operator's Controls (Cont)

Control, indicator or connector	Function
ROTOR SPEED	
NOR CAL	Selects mode of operation - normal or calibration for checking % RPM R indicator.
HI LO	When ROTOR NOR CAL switch is set to CAL, HI LO switch allows high and low calibration points of % RPM R indicator to be checked.
Variable control	Used when NOR CAL switch is at NOR, to check operation of Rotor Speed indicator as simulated % RPM rotor speed signals cover range from minimum to maximum.
LOW ROTOR SPD	Indicates operation of ROTOR SPEED LO switch.
ROTOR OVER SPD RESET switch	Used to reset rotor overspeed warning indicator,
LAMP SUPPLY OVERLOAD NO. 1	Indicates operation of LAMP SUPPLY OVERLOAD switch.
LAMP SUPPLY OVERLOAD NO. 2	
LAMP SUPPLY OVERLOAD switch	Used to select NO. 1 and NO. 2 lamp supply overload conditions.
INPUT POWER Lamps:	When lighted they indicate this:
115 VAC	AC input power is applied.
28 VDC	DC input power is applied,
INPUT POWER switch	Three-position switch that controls application of 115 vac and 28 vdc power. At ON, input power is connected.
	At OFF, input power is disconnected, At SIM ONLY, input power to interconnect connector (J5) is removed. This removes power from Unit Tester, de-energizing it without removing power from SIMULATOR.
LAMP TEST switch	NO. 2 Low Oil Pressures, NO. 1 and NO. 2 High Oil Temperature, Low Rotor Speed, NO. 1 and NO. 2 Engine Out, and both Lamp Supply Overload lamps on LTS.
INTEGRAL LIGHTING switch	To select internal or external integral lighting power.
115 VAC 2A fuse	AC power line fuse. Fuse blows if primary circuits of transformers T1, T2, T3, T4 become overloaded due to circuit malfunction.
28 VDC 8A fuse	DC input power fuse, protects 28 vdc circuits.
5 VAC 8A fuse	Protects 5 vac lighting circuits.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-1. General.

Preventive maintenance checks and services consist of a visual inspection to be done at each operation of the test set, operational check, any troubleshooting required, and the repair required to correct any malfunctions. If your equipment does not operate, troubleshoot with proper equipment. Report any deficiencies using the proper forms, see DA PAM 738-751.

4-2. Inspections.

Do inspections as shown in Table 4-1.

Table 4-1. Operation/Aviation Unit Preventive Maintenance Checks and Services.

NOTE: Within designated interval, these checks are to be done in the order listed.

B – Before
D – During
A – After

Item No.	Internal B	D	A	W	M	C	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment is not ready/ available if:
1	•		•				Cables	Check for broken wires, burnt insulation, damage or dirt in connectors.	
2	•						Controls and Switches	Positive action and freedom of movement.	
3		•					Indicator Lights	Check operation of lights.	

Section II. TROUBLESHOOTING (AVUM)

4-3. Scope.

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the LTS. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance.

c. Table 4-2 lists the common malfunctions that you may find during the operation or maintenance of the LTS or its components. You should do the tests/inspections and corrective actions in the order listed.

Table 4-2. Troubleshooting (AVUM)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. INPUT POWER INDICATORS DO NOT GOON WITH INPUT POWER SWITCH PLACED ON.
Step 1. Place INPUT POWER switch ON. INPUT POWER 115 VAC and 28 VDC indicators should go on.
a. If both indicators do not go on, forward LTS to higher maintenance.
b. If only one indicator does not go on, check/replace corresponding fuse, paragraph 4-7.
c. If fuse is good, replace lamp, paragraph 4-9.
2. INDICATORS DO NOT GO ON WHEN LAMP TEST SWITCH IS PRESSED.
Step 1. Press LAMP TEST Switch, LOW OIL PRESS NO. 1 and NO. 2, HIGH OIL TEMP NO. 1 and NO. 2, ENGINE OUT NO. 1 and NO. 2, LAMP SUPPLY OVERLOAD NO. 1 and NO. 2, and LOW ROTOR SPD indicators should go on.
a. If no indicators go on, send LTS to higher maintenance.
b. If only one indicator does not go on, replace lamp, paragraph 4-9.

Section III. REPAINTING AND REFINISHING INSTRUCTIONS

WARNING

Observe all cautions and warnings on containers when using consumables. When applicable, wear necessary protective gear during handling and use. If a consumable is flammable or explosive, MAKE CERTAIN consumable and its vapors are kept away from heat, spark, and flame. MAKE CERTAIN helicopter is properly grounded and firefighting equipment is readily available prior to use.

4-4. Cleaning Instructions.

a. Remove dust and loose dirt with a clean, soft cloth, item 4, App D.

b. Remove grease, fungus, and ground-in dirt with cloth dampened with dry-cleaning solvent, item 3, App D.

c. Remove moisture with a dry cloth.

4-5. Repainting and Refinishing Instructions.

NOTE

Refer to TB 746-10, Field Instructions for Painting and Preserving Electronics Equipment.

a. Repaint test set using these colors:

(1) Case (exterior). Finish with two coats of yellow baked enamel, item 1, App D.

(2) Front panel. Retouch using instrument black enamel, item 2, App D.

Section IV. MAINTENANCE (AVUM)

4-6. Scope.

The scope of corrective maintenance is the replacement of knobs, fuses, and indicator lamps and lenses, and the cable assemblies.

4-7. Fuse Replacement.

a. Make certain INPUT POWER switch is OFF.

b. Disconnect LTS/VIDS from power source.

c. Unscrew fuse holder cap and remove fuse.

d. Insert new fuse and replace fuse holder cap.

4-8. Knob Replacement.

a. Loosen setscrew holding knob to shaft.

b. Slide knob off shaft.

c. Place new knob on shaft, making certain knob is fully on shaft and indexed correctly.

d. Tighten setscrew.

4-9. Indicator Lamp Replacement.

NOTE

This applies to the seven warning lamps only.

a. Make certain INPUT POWER switch is OFF.

b. Remove lens cover.

c. Remove lamp,

d. Install new lamp,

e. Replace lens cover.

4-10. Cable Assemblies.

Remove cable assembly from LTS case and ship to higher maintenance.

4-11. Lubrication.

None is required.

Section V. MAINTENANCE: Authorized REPAIR AND REPLACEMENT OF PARTS (ATST)

NOTE

Authorized repair of the IDSL Test Set by Aviation Intermediate Maintenance (ATST) personnel is indicated in Appendix B, Maintenance Allocation Chart.

NOTE

Aviation Intermediate Maintenance (ATST) will perform only the authorized maintenance which includes replacement and repair of components and end items which can be accomplished efficiently with available skills, tools, and test equipment. Evacuate, circuit boards, components and end items beyond capability of ATST to the Depot.

NOTE

Perform Paras 4-12 and 4-13 as directed by Troubleshooting Tables 4-5 through 4-17 and circuits troubleshooting schematics FO-1 through FO-5. Do not replace circuit board if repair can be accomplished by authorized replacement of components on board.

NOTE

Remove Keying Plug from circuit boards before inserting extender board in assembly connector (Plugs in each circuit board). Be sure to reinstall keying plugs after maintenance has been completed.

CAUTION

Place INPUT POWER switch OFF before removing or installing printer circuit boards and connections.

4-12. Troubleshooting and Repair (ATST).

a. General. This paragraph contains general repair information, maintenance instructions, troubleshooting procedures and component replacement procedures. Test equipment and accessories required are listed in Tables 4-3 and 4-4. IDSL Test Set cable assemblies and circuit wiring diagrams are shown in Fig ure FO-5. Troubleshooting schematics are shown in FO-1 through FO-5. Troubleshooting Tables are 4-5 through 4-17.

Table 4-3. Test Equipment

Common Name	Manufacturer and Model (Part Number) or (Equivalent)
AUTOTRANSFORMER	General Radio, Model W10MT3AS3 (7910809)
DC POWER SUPPLY	NJE, Model CS36CR30D2 (7907346-2)
DIGITAL VOLTMETER[1]	FLUKE 8840A
FREQUENCY COUNTER	Hewlett-Packard, Model 5345A MIS-28754/1, Type 1)
OSCILLOSCOPE	Tektronix, Type R5440 (MIS-28706/1 TYPE 1) w/5A48 (MIS-28706/3) and 5B42 (MIS-28706/4)
PRECISION OSCILLATOR	HEWLETT PACKARD 8116A
POWER SUPPLY	Tektronic, PS503A

Table 4-4. Accessories Required

Common Name	Description (Part Number)
ADAPTER’	BNC plug to double banana jacks (7907401)
ADAPTER	Single banana jack to pin plug (black) (7907528)
ADAPTER BOX	BAN jack terminations (79161 13) (SKD4850-3)
EXTENDER BOARD	Canadian Marconi, P/N 220-419916-000
LEAD	24-in., No. 18; single banana plug terminations (red) (7907497)
LEAD’	24-in., No. 18; single banana plug terminations (black) (7907498)
LEAD[2]	Pin jack to single banana plug (7921032)
LEAD’	32-in., single banana plug to test hook (red) (7915941-1)
LEAD	2 single banana plug to ac power plug (7907551)

[1]Two required.

[2]Five required.

b. Equipment Setup.

(1) Set ON-OFF-SIM ONLY switch to OFF.

(2) Connect equipment as shown in Figure 4-1.

(3) Adjust Autotransformer output for 115V.

(4) Connect digital voltmeter to dc power supply using leads and adjust dc power supply for a 28V output indication on digital voltmeter.

(5) Disconnect digital voltmeter from equipment setup.

(6) Set ON-OFF-SIM ONLY switch to ON and allow at least 30 minutes for warm up.

(7) Set ON-OFF-SIM ONLY to OFF.

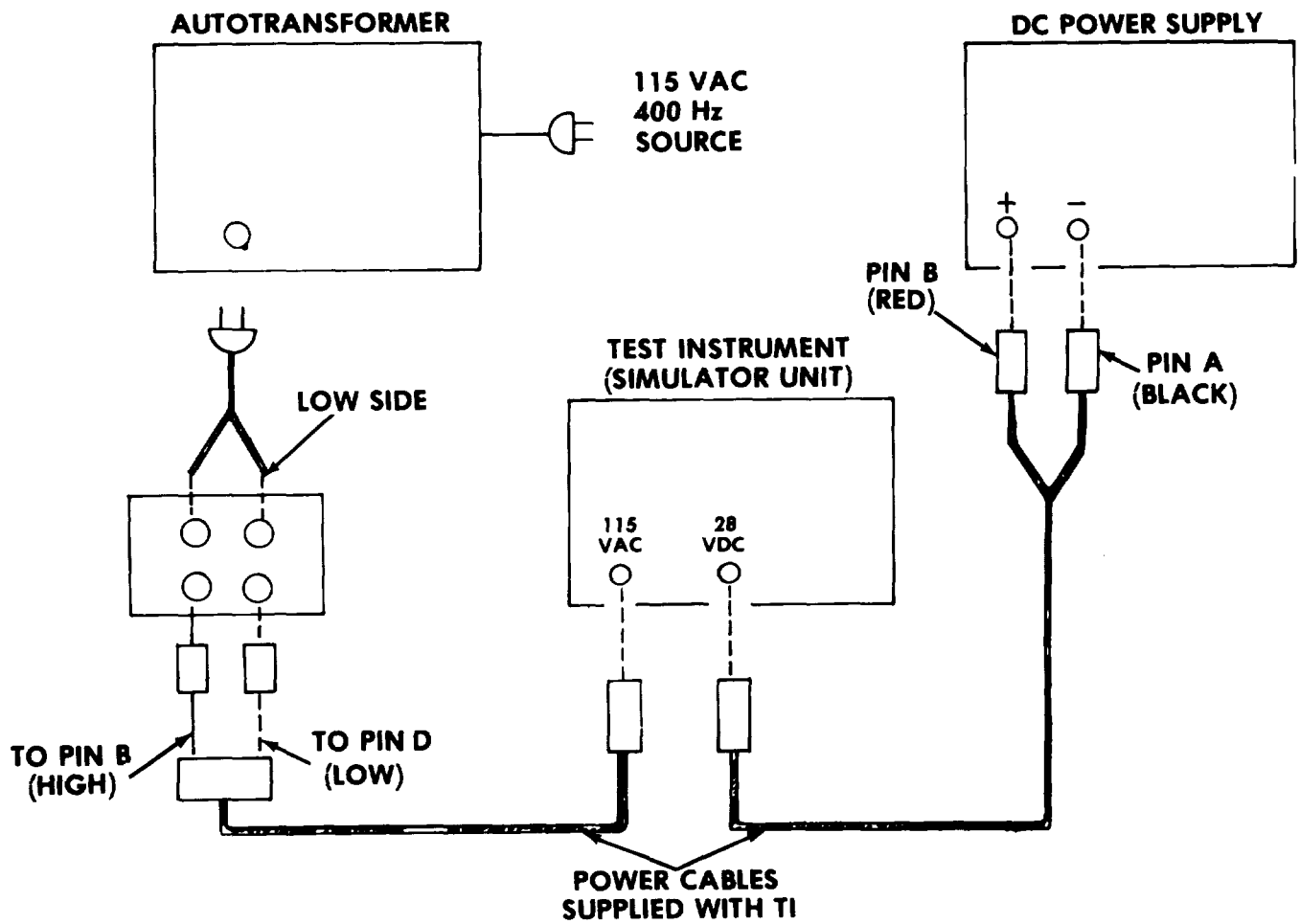


Figure 4-1. Power Supply - Equipment Setup.

4-13. IDSL Test Set Circuits.

a. Lamp Circuit.

(1) Set INPUT POWER switch to SIM ONLY and test equipment power to ON.

(2) Observe that the 115vac indicator lamp lights is on. If not, perform Troubleshooting Table 4-5.

(3) Observe that the 28vdc indicator lamplights are on. If not, perform Troubleshooting Table 4-5.

(4) Press LAMP TEST Switch all warning lamps will light. If not, perform Troubleshooting Table 4-5.

(5) Connect 5vdc power supply (current limited to 25 ma) between J1 connector pins U, V (+) and EE (-).

(6) LAMP SUPPLY OVERLOAD NO. 1 warning lamp will go ON. Set LAMP SUPPLY OVERLOAD switch to left, lamp will go OFF. If not, see Troubleshooting Table 4-5.

(7) Disconnect dc power supply from J1 connector pins and connect to J2 connector pins U, V (+) and EE (-).

(8) LAMP SUPPLY OVERLOAD NO. 2 warning lamp will go ON. Set LAMP SUPPLY OVERLOAD switch to right, lamp will go OFF. If not, see Troubleshooting Table 4-5.

(9) Disconnect dc power supply from J2 connector.

(10) INTEGRAL LIGHTING INT/EXT circuit. Connector digital voltmeter between J1 pin HH (LOW) and FF(HI). Refer to Figure 4-2 for pin locations.

(11) Observe that ON-OFF-SIM ONLY switch is set to SIM ONLY and INTEGRAL LIGHTING is set to INT digital voltmeter will indicate between 4.0 and 6.0 vac, If not, perform Troubleshooting Table 4-5.

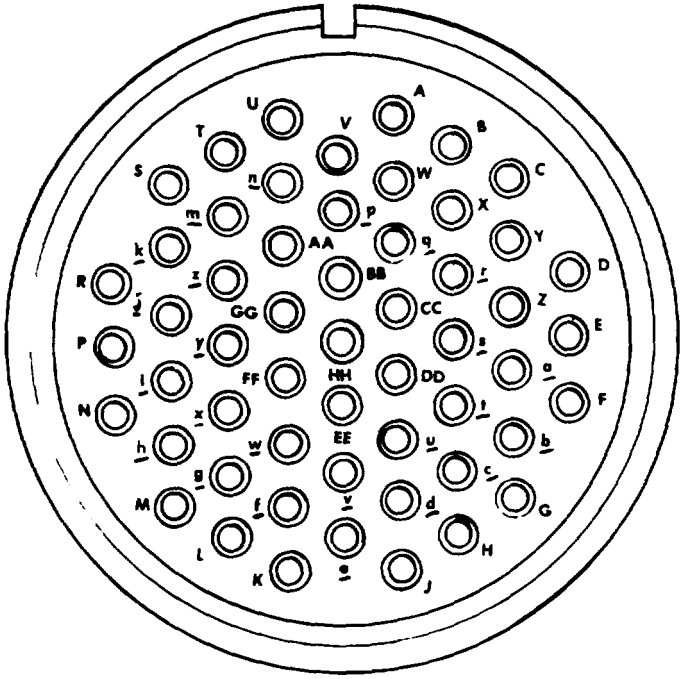


Figure 4-2. Signal Data Converter Connectors NO 1 and NO 2

Table 4-5. Troubleshooting Lamp Test Circuit (AVIM).

NOTE

Before performing troubleshooting, remove oil pressure (A2) board and reconnect using extender board.

Trouble	Probable Cause	Remedy
l15vac Indicator lamp does not light	F1 Fuse (2 amp) S1, T4, DS1	Replace defective components FO-5
28vdc Indicator lamp does not light	F2 Fuse (8 amp) S1, 330 ohm 330 ohm resistor 2W, DS2	Replace defective components FO-5
Low Oil Press NO 1 and NO 2 Lamps do not light	DS5/DS6 CR8/CR7	Replace defective components, Figure 4-12, FO-4 and FO-5
High Oil Temp NO 1 and NO 2 lamps do not light	DS7/DS8 CR6/CR5	Replace defective components, Figure 4-12, FO-4 and FO-5.
Engine Out NO 1 and NO 2 do not light	DS9/DSl0 CR4/CR3	Replace defective components, Figures 4-12, FO-4 and FO-5
Lamp Supply Overload NO 1 and NO 2 do not light	DS3/DS4 S19, CR12/CRll	Replace defective components, Figures 4-12, FO-4 and FO-5
Low Rotor SPD does not light	DS1l CR2	Replace defective components, Figures 4-12, FO-4 and FO-5
All Indicator Lamps do not light	Lamp Test Switch S8	Replace defective components, Figures 4-12, FO-4 and FO-5
INTEGRAL LIGHTING INT Position indicates no vac	8 amp Fuse (F3) S39, T4	Replace defective components, Figure FO-5

b. Power Supply Circuit (Input Voltage to A1 Board).

(1) Set all Power to OFF.

(2) Remove power supply board (A1) Figure 4-3 and recon nect, using extender board.

(3) Connect digital voltmeter positive to loop 2 and negative to loop 8 on extender board, using two leads.

(4) Observe that ON-OFF-SIM ONLY switch is set to SIM ONLY and set equipment POWER is ON. Digital voltmeter will indicate between 21 and 27 vac. If not, perform Troubleshooting Table 4-6.

(5) Disconnect lead from loop 2 and connect to loop 4. Digital voltmeter will indicate between 21 and 27 vac. If not, perform Troubleshooting Table 4-6.

(6) Disconnect lead from loop 4 and connect to loop 29 and disconnect negative lead from loop 8 and connect to loop 43. Digital voltmeter will indicate between 7 and 9 vac. If not, perform Troubleshooting Table 4-6.

(7) Disconnect lead from loop 29 and connect to loop 53 and disconnect negative lead from 43 and connect to loop 49. Digital voltmeter will indicate between 7 and 9 vac. If not, perform Troubleshooting Table 4-6.

(8) Disconnect lead from loop 53 and connect to loop 7 and disconnect negative lead from loop 49 and connect to loop 11. Digital voltmeter will indicate between 23 and 29 vac. If not, perform Troubleshooting Table 4-6.

c. Power Supply Circuit (Voltage Output A1 Board).

(1) Connect digital voltmeter positive lead to loop 47 and negative lead to loop 63. Digital voltmeter will indicate between 4.9 and 5.1 vdc. If not, perform Troubleshooting Table 4-6.

(2) Disconnect leads from loops 47 and 63. Connect digital voltmeter positive lead to loop 23 and negative lead to loop 27. Digital voltmeter will indicate between 4.9 and 5.1 vdc. If not, perform Troubleshooting Table 4-6.

(3) Disconnect leads from loops 23 and 27. Connect digital voltmeter positive lead to loop 5 and negative lead to loop 14. Digital voltmeter will indicate between 14 and 16 vdc. If not, perform Troubleshooting Table 4-6.

(4) Disconnect positive lead from loop 5 and connect to loop 3. Digital voltmeter will indicate between -14 and -15 vdc. If not, perform Troubleshooting Table 4-6.

(5) Disconnect positive lead from loop 3 and connect to loop 1, digital voltmeter will indicate between 33 and 41 vdc. If not, perform Troubleshooting Table 4-6.

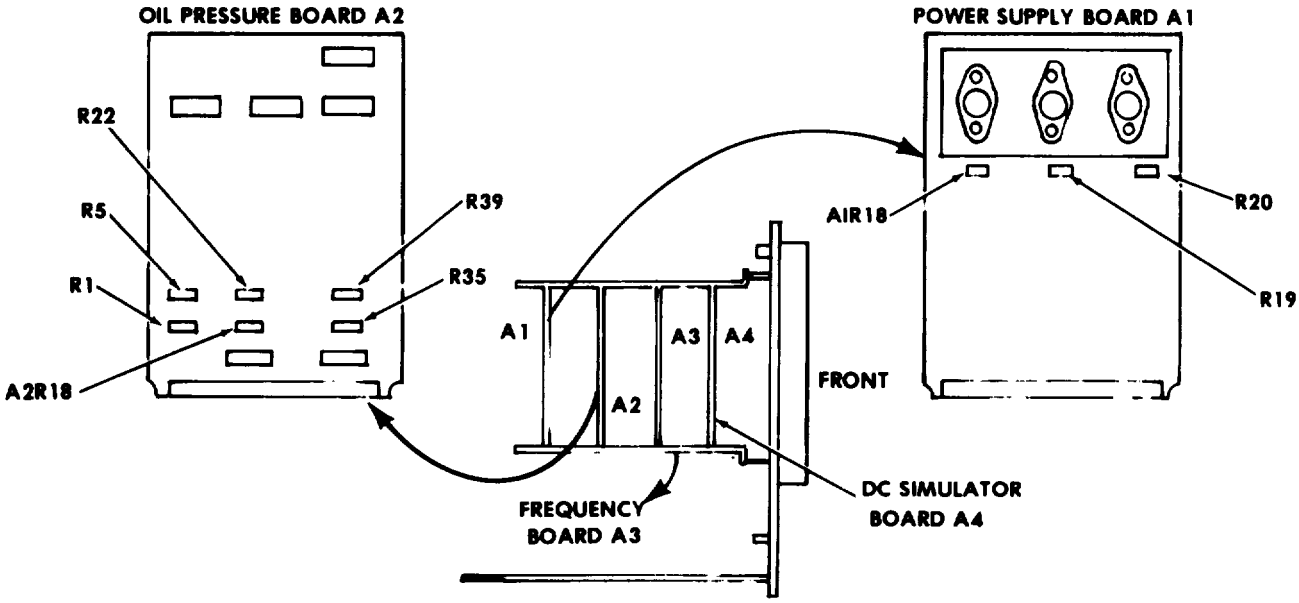


Figure 4-3. Simulator Unit - Internal Left View

(6) Disconnect positive lead from loop 1 and connect to loop 19. Digital voltmeter will indicate between -33 and –41 vdc. If not, perform Troubleshooting Table 4-6.

(7) Disconnect positive lead from loop 19 and connect to loop 18. Digital voltmeter will indicate between 11.5 and 12.5 vdc. If not, perform Troubleshooting Table 4-6.

(8) Disconnect positive lead from loop 18 and connect to loop 46. Digital voltmeter will indicate between 11.5 and 12.5 vdc. If not, perform Troubleshooting Table 4-6.

(9) Disconnect positive lead from loop 46 and connect to loop 13. Digital voltmeter will indicate between -11.5 and -12.5 vdc. If not, perform Troubleshooting Table 4-6.

Table 4-6. Troubleshooting Power Supply Circuit (AVIM).

NOTE

Before performing troubleshooting, remove power supply Al board and reconnect using extender board.

Trouble	Probable Cause	Remedy
No AC inputs to Al board	Fuse F1, S1, T1 Transformer	Replace defective components, Figure 4-4, 4-5, FO-1, FO-5, or replace Al board.
5 VFL NO 1 and NO 2 vdc reading out of tolerance	NO 1 – (R3) NO 2 – (R6)	(R3) or (R6) are Fixed Resistors use decade Resistor Box, and check or replace, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
5 VFL NO 1 and NO 2 no vdc or shows excessive reading after trim resistors (R3) or (R6) checked or replaced	NO 1 – CR1, C7, U1 NO 2 – CR2, C8, U2	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
15 vdc reading out of tolerance	CR4, R8, CR6, C6, C13	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
–15 vdc vdc reading out of tolerance	CR3, R7, CR5 C9, C10	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace Al board.
37 vdc vdc reading out of tolerance	CR4, CR6, C3, R8 C6, C13	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace Al board.
–37 vdc vdc reading out of tolerance	CR3, R7, CR5 C9, C10	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
12 vdc NO 1 and NO 2 vdc reading out of tolerance	R19 R18	Adjust (R18) or (R19) if defective use decade resistor box check or replace, Figure 4-4, 4-5, FO-1, FO-5
12 vdc NO 1 and NO 2 vdc reading out of tolerance after trim resistors (R19) or (R18) (R19) or (R18) checked or replaced	NO 1 – Q2, U3, CR7, CR1O NO 2 – Ql, U4, CR7, CR1O	Replace defective components, figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
12 vdc NO 1 and NO 2 no vdc or shows excessive reading after trim resistors checked or replaced	NO 1 – C14, C29, U3, C21, C19, C25, R1O NO 2 – U4, C28, C20, C18, C24, C20, R9	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.
-12 vdc vdc reading out of tolerance	R20	Adjust (R20) if defective use decade resistor box and check or replace, Figures 4-4, 4-5, FO-1, FO-5 or replace Al board.
– 12 vdc vdc reading out of tolerance after trim resistor (R20) checks or replaced	U5, CR8, CR9	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace Al board.
– 12 vdc no vdc reading out or shows excessive reading after trim resistor checked	C26, R23, C27, C25, C22, C23, U5, R11	Replace defective components, Figures 4-4, 4-5, FO-1, FO-5 or replace A1 board.

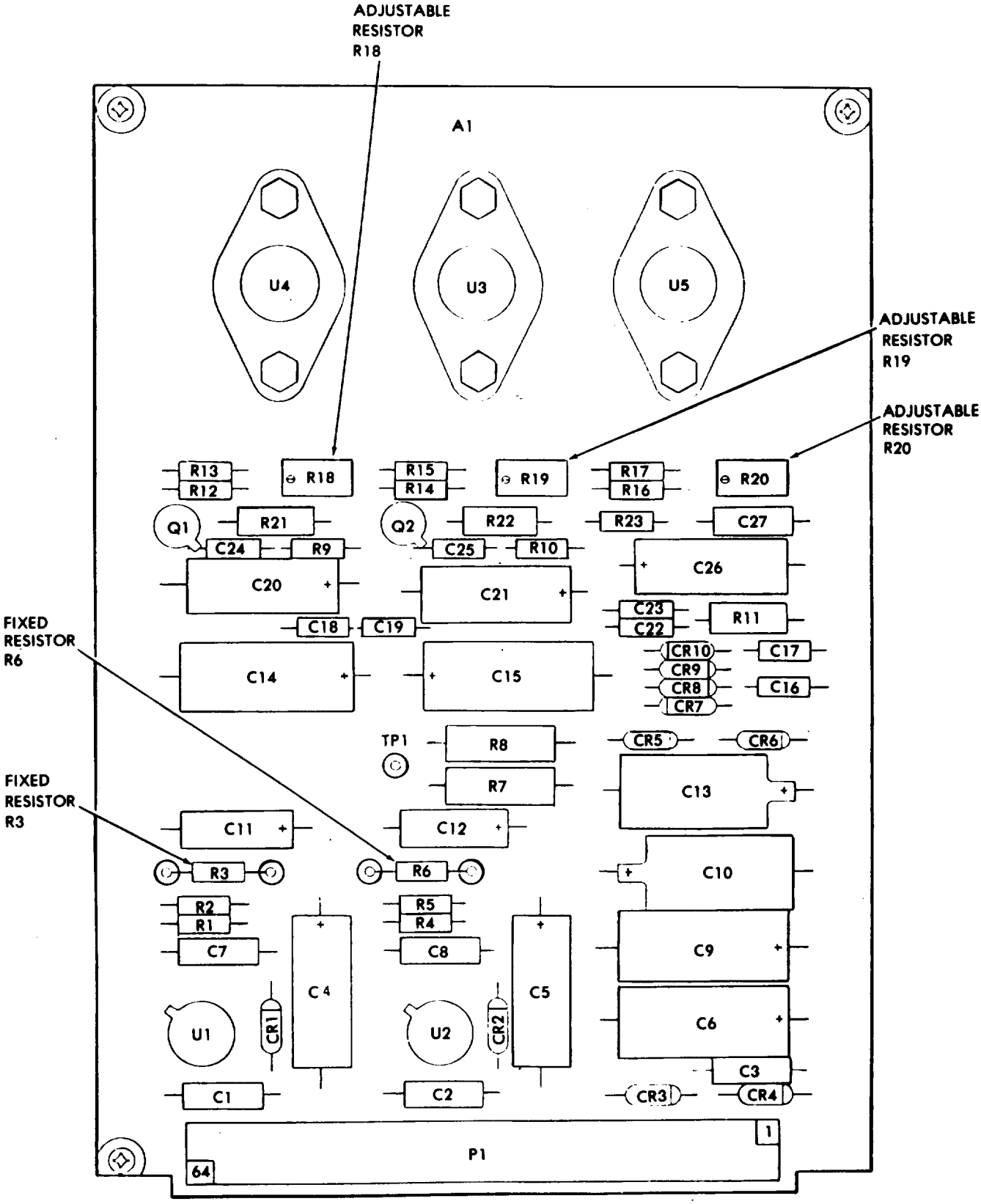


Figure 4-4. A1 Power Supply Board

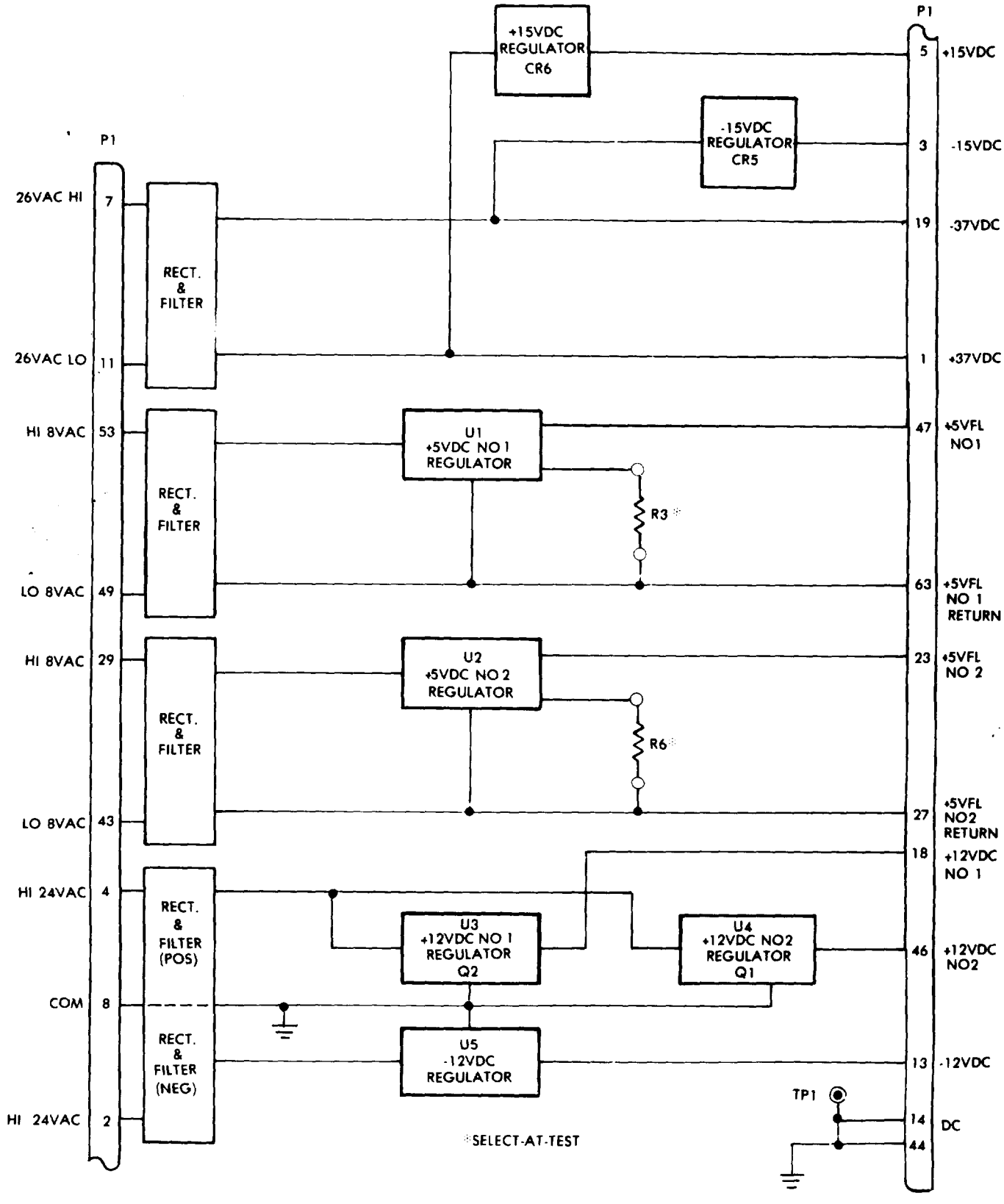


Figure 4-5. Simulator Power Supply Assembly A1, Block Diagram

d. Torque NO 1 and NO 2.

(1) Set ON-OFF-SIM ONLY switch to OFF.

(2) Connect digital voltmeter to T1 connector NO 1 pins E (HI) and F (LOW), using two leads (B7). Refer to Figure 4-2 for pin locations.

(3) Set TORQUE NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. Digital voltmeter will indicate between 3.6 and 3.8 vdc. If not, perform Troubleshooting Table 4-7.

(5) Set TORQUE NO 1 HI/LO switch to LO. Digital voltmeter will indicate between -0.1 and +0.1 vdc. If not, perform Troubleshooting Table 4-7.

(6) Set TORQUE NO 1 CAL/NOR switch to NOR and turn variable control fully CCW. Digital voltmeter will indicate between –0.1 and +0.1 vdc. If not, perform Troubleshooting Table 4-7.

(7) Adjust variable control fully CW. Digital voltmeter will indicate 5.415 vdc minimum. If not, perform Troubleshooting Table 4-7.

(8) Set ON-OFF-SIM ONLY switch to OFF.

(9) Disconnect leads from connector NO 1 pins E (HI) and F (LOW) and connect to connector NO 2 pins a (HI) and b (LOW).

(10) Repeat (3) thru (8) above, except use TORQUE NO 2 controls.

Table 4-7. Troubleshooting Torque NO 1 or NO 2 (AVIM).

NOTE

Before troubleshooting, remove DC simulator A4 board and reconnect using extender board.

Trouble	**Probable Cause**	Remedy
Torque No HI-CAL VOLTAGE	C11, C12, R52, CR5 (6.2 vdc), also NO 1 (R45) NO 2 (R48)	First check loops 18 (+) and 14 (-) for input 12 vdc ±5 vdc, Replace defective components, Figure 4-6, 4-7, FO-2, FO-5 or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance	Trim Resistors NO 1 – (R46, R51) NO 2 – (R49, R50)	Use decade resistor box, and check or replace malfunctioning components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance after trim resistors checked or replaced	NO 1 – CR5, R44, R45, S34 or S35, NO 2 – CR5, R48, R47, S36, or S37	If trim resistors do not bring reading in tolerance replace malfunctioning components, Figures 4-5, 4-7, FO-2, FO-6 or replace A4 board.
LO-CAL Indication out of tolerance	NO 1 – (S34) NO 2 – (S35)	Replace malfunctioning components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
Indication out of tolerance in NOR-FULLY GCW	NO 1 (R16) NO 2 (R17)	Replace malfunctioning components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
In NOR-FULLY CW	NO 1 (R16) (R44) NO 2 (R17) (R47)	Replace malfunctioning component, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.

NOTE

Voltage checks are also listed on figure 4-7.

e. Fuel Quantity NO 1 and NO 2.

(1) Connect digital voltmeter to connector NO 1 pins G (HI) and H (LOW), using two leads.

(2) Set FUEL QUANTITY NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Dig ital voltmeter will indicate between 6.08 and 6.18 vdc. If not, perform Troubleshooting Table 4-8.

(4) Set FUEL QUANTITY NO 1 HI/LO switch to LO, Digital voltmeter will indicate between -0.1 and +0. 1 vdc. If not, perform Troubleshooting Table 4-8.

(5) Set FUEL QUANTITY NO 1 CAL/NOR switch to NOR and adjust variable control fully CCW. Digital voltmeter will indicate between –0.1 and +0.1 vdc. If not, perform Troubleshooting Table 4-8.

(6) Adjust variable control fully CW. Digital voltmeter will indicate .63 vdc minimum. If not, perform Troubleshoot-ing Table 4-8.

(7) Set ON-OFF-SIM ONLY switch to OFF.

(8) Disconnect leads from T1 connector NO 1 pins G (HI) and H (LOW and connect to connector NO 2 pins G (HI) and H (LOW).

(9) Repeat (2) through (7) above, except use FUEL QUANTITY NO 2 controls.

Table 4-8. Troubleshooting FUEL QUANTITY NO 1 or NO 2 (AVIM).

NOTE

Before performing troubleshooting, remove DC simulator A4 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
Fuel Quantity No HI-CAL VOLTAGE	CR1, C3, Ul, R8, T2, R9, Cl, NO 1 – (R2) or NO 2 – (R5)	First check loops 7 (+) and 8 (-) for input 15 vac ±.5 vat. Check T2 if no voltage. Replace defective compo-nents, Figure 4-6, 4-7, FO-2, FO-5 or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance	Trim Resistors NO 1 – (R3) NO 2 – (R6)	Remedy, use decade resistor box, and replace malfunctioning components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance after trim resistors checked or replaced (R3) or (R6)	NO 1 – (R56) or (R9) NO 2 – (R55)	Output of U1 should read between 11.9 and 12.1 at TP1, Figures 4-6, 4-7, FO-2, FO-5 or replace A4 board.
LO-CAL VOLTAGE Indication out of tolerance	NO 1 – (S26) NO 2 – (S28)	Replace malfunctioning components, A4 Board, Figures 4-6,4-7, FO-2, FO-5.
LO-CAL VOLTAGE Indication out of tolerance in NOR-FULLY CCW	NO 1 – (R12) NO 2 – (R13)	Replace malfunctioning component A4 Board, Figures 4-6,4-7, FO-2, FO-5
In NOR-FULLY CW	NO 1 (R1) (R12) NO 2 (R13) (R55)	Replace malfunctioning components A4 Board, Figures 4-6,4-7, FO-2, FO-5

NOTE

Voltage checks are also listed on figure 4-7.

f. Turbine Gas Temp NO 1 and NO 2.

(1) Connect digital voltmeter to connector NO 1 pins L (HI) and M (LOW), using two leads.

(2) Set TURBINE GAS TEMP NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Digital voltmeter will indicate between 33.65 and 33.95 mvdc. If not, perform Troubleshooting Table 4-9.

(4) Set TURBINE GAS TEMP NO 1 HI/LO switch to LO. Digital voltmeter will indicate between –0.5 and +0.5 mvdc. If not, perform Troubleshooting Table 4-9.

(5) Set TURBINE GAS TEMP NO 1 CAL/NOR switch to NOR and adjust variable control fully CCW. Digital voltmeter will indicate between -0.5 and +0.5 mvdc. If not, perform Troubleshooting Table 4-9.

(6) Adjust variable control fully CW. Digital voltmeter will indicate 41.3 mvdc minimum. If not, perform Troubleshooting Table 4-9.

(7) Set ON-OFF-SIM ONLY switch to OFF.

(8) Disconnect leads from connector NO 1 pins L (HI) and M (LOW) and connect to connector NO 2 pins L (HI) and M (LOW).

(9) Repeat (2) through (7) above, except use TURBINE GAS TEMP NO 2 controls.

Table 4-9. Troubleshooting Turbine Gas Temp NO 1 or No 2 (AVIM)

NOTE

Before performing troubleshooting, remove DC simulator A4 board and reconnect using extender board

Trouble	Probable Cause	Remedy
No HI-CAL VOLTAGE	NO 1 – (CR2), T3, (U2) NO 2 – (CR3), T3, (U3) associated resistors and capacitors NO 1 – TGT-U1 NO 2 – TGT-U2	First check loops 56 (+) and 58 (-) NO 1 for input 15 vac ±.5 vac and loops 27 (+) and 30 (–) NO 2 for 15 vac ±.5 vac. Check T3 if no voltage. Replace defective components, Figure 4-6, 4-7, FO-2, FO-5, or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance	NO 1 – (R13) NO 2 – (R20)	Use decade resistor box, and check or replace malfunctioning components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
HI-CAL VOLTAGE Indication out of tolerance after trim resistors checked or replaced (R13) or (R20)	NO 1 – (R54) or (R1O) (Ul) NO 2 – (R53) (R17) or (U3)	If trim resistors do not bring reading in tolerance replace malfunctioning components, Figures 4-6, 4-7, FO-2, FO-5 or replace A4 board.
LO-CAL VOLTAGE Indication out of tolerance	NO 1 – (S30) NO 2 – (S32)	Replace malfunctioning components, Figures 4-6, 4-7, FO-2, FO-5, or redate A4 board.
Indication out of tolerance In NOR-FULLY CCW	NO 1 – (R20) NO 2 – (R21)	Replace malfunctioning component, Figures 4-6, 4-7, FO-2, FO-5 or replace A4 board.
In NOR-FULLY CW	NO 1 (R14) (R20) NO 2 (R14) (R21)	Replace malfunctioning components, Figures 4-6, 4-7, FO-2, FO-5 or replace A4 board.

NOTE

Voltage checks are also listed on figure 4-7.

g. Engine Oil Temp NO 1 and NO 2.

(1) Connect digital voltmeter to connector NO 1 pins G (HI) and H (LOW), using two leads.

(2) Set ENGINE OIL TEMP NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

NOTE

Measure resistance of test leads and subtact from resistance indications.

(3) Measure resistance. Digital voltmeter will indicate between 148 and 154 ohms. If not, perform Troubleshooting Table 4-10.

(4) Set ENGINE OIL TEMP NO 1 HI/LO switch to LO. Digital voltmeter will indicate between 71 and 77 ohms. If not, perform Troubleshooting Table 4-10.

(5) Set ENGINE OIL TEMP NO 1 CAL/NOR switch to NOR and adjust variable control from fully CCW to fully CW. Digital voltmeter indication will vary from 77 ohms or less to 148 ohms or more. If not, perform Troubleshooting Table 4-10.

(6) Disconnect leads from connector NO 1 pins G (HI) and H (LOW) and connect to connector NO 2 pins G (HI) and H (LOW).

(7) Repeat (2) through (5) above, except use ENGINE OIL TEMP NO 2 controls,

Table 4-10. Troubleshooting Engine Oil Temp NO 1 or NO 2 (AVIM).

NOTE

Before performing troubleshooting, remove DC simulator A4 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
No HI-CAL Resistance	Eng Oil Temp NO 1 (S20) (21) (R41) Eng Oil Temp NO 2 (S22) (S23) (R38)	Replace defective components, Figures 4-6,4-7, FO-2, FO-5, or replace A4 board.
HI-CAL Resistance Indication out of tolerance	Trim resistors NO 1 – (R42) NO 2 – (R39)	Use decade resistor box, and check or replace defective component, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
HI-CAL Resistance Indication out of tolerance after trim resistors checked or replaced (R42) or (R39)	NO 1 – (R41) (R43) (S20) or (S21) NO 2 – (R33) (R40) (S22) (S23)	Replace defective components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
LO-CAL Resistance Indication out of tolerance	NO 1 – (S20) NO 2 – (S22)	Replace defective components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
NOR-FULLY CCW Resistance out of tolerance	NO 1 – (R9) NO 2 – (R1O)	Replace defective components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.
NOR-FULLY CW Resistance out of tolerance	NO 1 (R9) NO 2 (R1O)	Replace defective components, Figures 4-6,4-7, FO-2, FO-5 or replace A4 board.

NOTE

Not all components listed for circuits above are indicated in Table. Refer to applicable circuits and Troubleshoot using information provided in Table.

NOTE

Resistance checks are also listed on figure 4-7.

h. XMSN Oil Temp.

(1) Connect digital voltmeter to connector NO 2 pins J (HI) and K (LOW), using two leads.

(2) Set XMSN OIL TEMP CAL/NOR switch to CAL and HI/LO switch to HI.

NOTE

Measure resistance of test leads and subtract from resistance indications.

(3) Measure resistance. Digital voltmeter will indicate between 224 and 236 ohms. If not, perform Troubleshooting Table 4-11.

(4) Set XMSN OIL TEMP HI/LO switch to LO. Digital voltmeter will indicate between 79 and 91 ohms. If not, perform Troubleshooting Table 4-11.

(5) Set XMSN OIL TEMP CAL/NOR switch to NOR and adjust variable control from fully CCW to fully CW. Digital voltmeter will vary from 88 ohms or less to 270 ohms or *more.* If not, perform Troubleshooting Table 4-11.

Table 4-11. Troubleshooting Xmsn Oil Temp (AVIM).

NOTE

Before performing troubleshooting, remove DC simulator A4 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
NO HI-CAL Resistance	S23 or S24	Replace defective components, Figures 4-6, 4-7, FO-2, FO-5 or replace A4 board.
HI-CAL Resistance Indication out of tolerance	Trim resistors R37	Use decade resistor box, and check or replace defective component, Figures 4-6, 4-7, FO-1, FO-5 or replace A4 board.
HI-CAL Resistance Indication out of tolerance after trim resistors replaced	S22 or R36	Replace defective components, Figures 4-6, 4-7, FO-1, FO-5 or replace A4 board.
LO-CAL Resistance Indication out of tolerance after trim resistor checked or replaced	S23, S24, or R34	Replace defective components. Figures 4-6, 4-7, FO-1, FO-5 or replace A4 board.
NOR-FULLY CCW Resistance out of tolerance	NOR Control R11	Replace defective component, Figures 4-6, 4-7, FO-1, FO-5 or replace A4 board.
NOR-FULLY CW Resistance out of tolerance	R11 or R19	Replace defective components, Figures 4-6,4 -7, FO-1, FO-5 or replace A4 board.

NOTE

Resistance checks are also listed on figure 4-7.

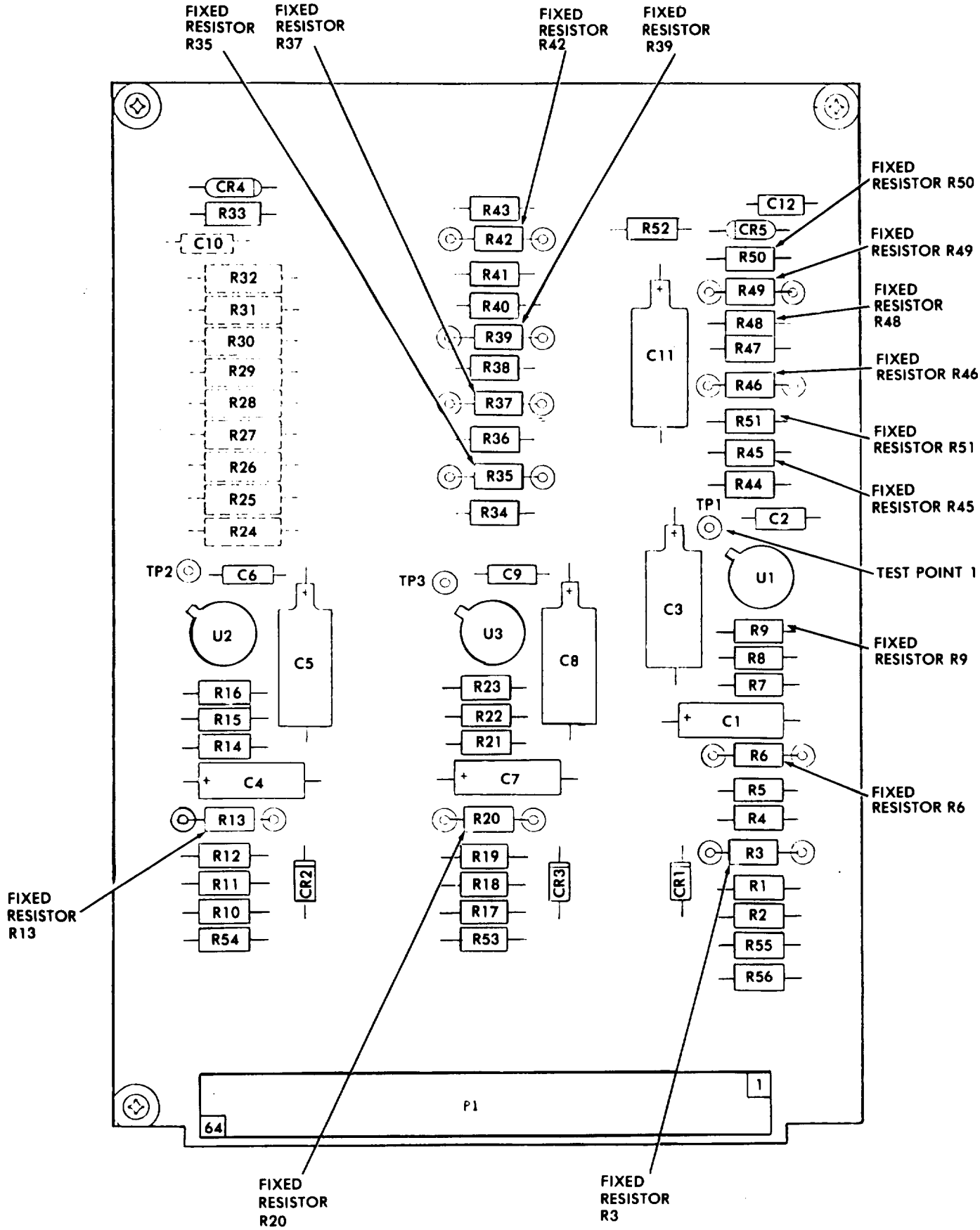


Figure 4-6. DC Simulator A4 Board

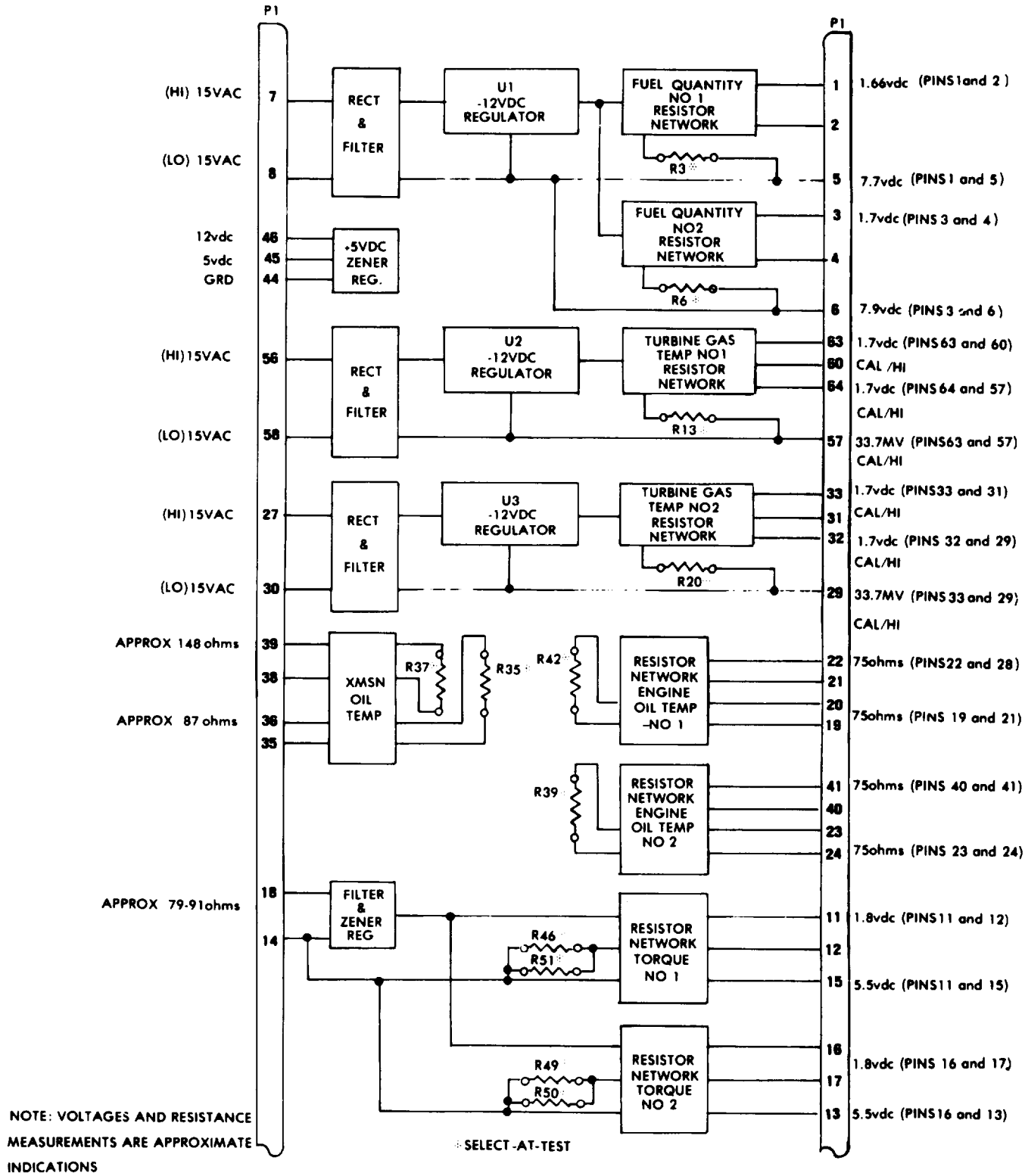


Figure 4-7. DC Input Simulator Assembly A4, Block Diagram (Sheet 1 of 2)

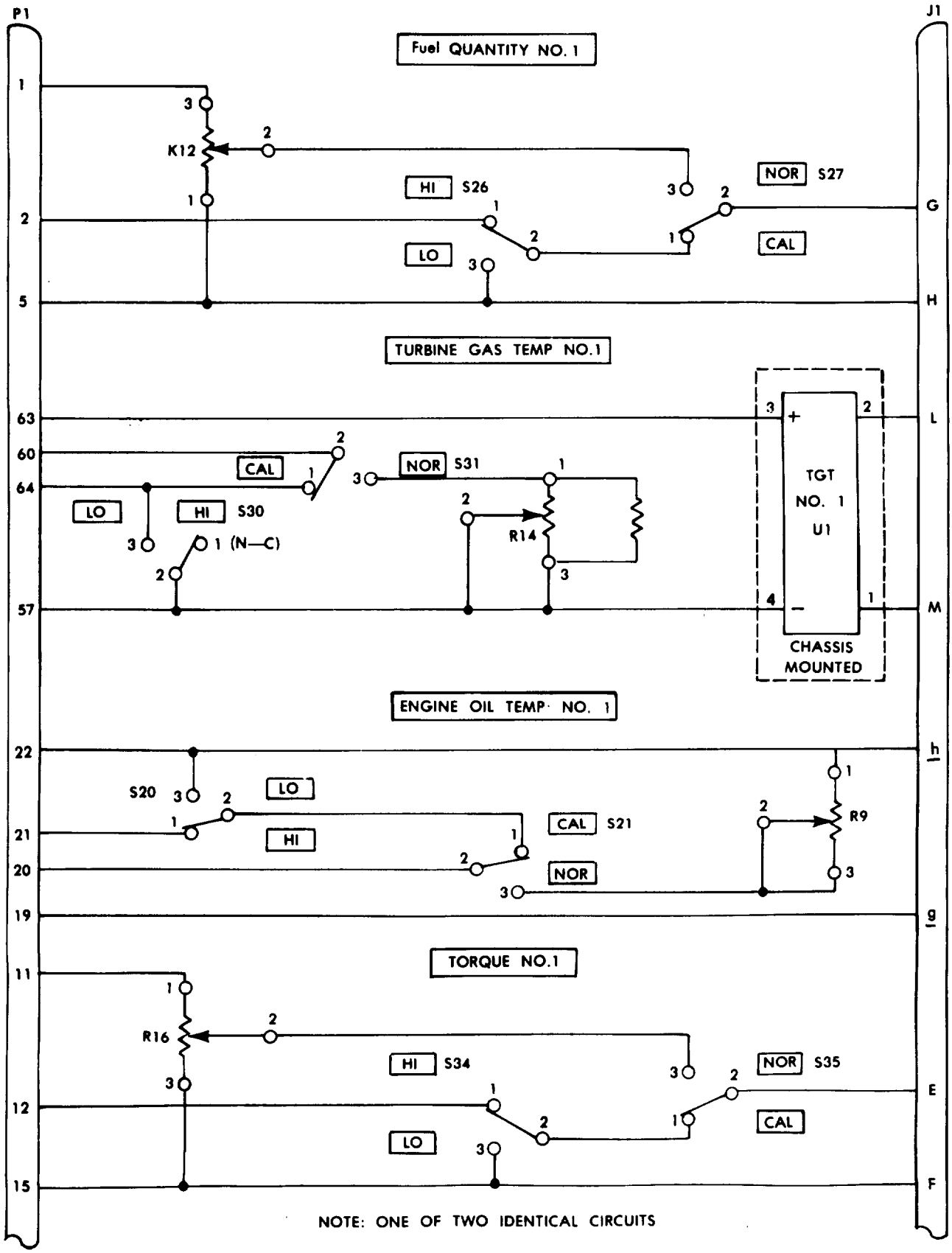


Figure 4-7. DC Input Simulator Assembly A4, Block Diagram (Sheet 2 of 2)

i. Rotor Speed.

NOTE

Observe amplitude limitations of frequency counter, unattenuated inputs can cause damage.

(1) Connect frequency counter to connector NO 1 pins A (HI) and B (LOW), using two leads and adapter.

(2) Set ROTOR SPEED CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY.

(4) Measure frequency. Frequency counter will indicate between 11,190 and 11,302 Hz. If not, perform Troubleshooting Table 4-12.

(5) Set ROTOR SPEED HI/LO switch to LO. Frequency counter will indicate O. (Disregard residual noise count.) If not, perform Troubleshooting Table 4-12.

(6) Set ROTOR SPEED CAL/NOR to NOR and adiust ROTOR SPEED variable control from fully CCW to full. Frequency counter indication will vary from O to 17,200 Hz minimum. If not, perform Troubleshooting Table 4-12.

(7) Set ON-OFF-SIM ONLY switch to OFF.

Table 4-12. Troubleshooting Rotor Speed (Hz) (AVIM).

NOTE

Before performing troubleshooting, remove frequency simulator A3 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
HI-CAL – No Frequency Output	U4 pin 13 (337 Hz ±5 Hz) US pin, 4, -5 (675 Hz ±5 Hz)	First check loops 44 (-) and 5 (+) for 11)246 Hz ±56 Hz and check U12 pin 7 (HI), U8 pins 4 HI, 5 HI, U12 pin 7 HI. Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
LO-CAL indicates Frequency (Hz) greater than 0 HZ	HI/LOW Switch (S9)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CCW Frequency indication greater than 0 HZ	NOR Control (R4) (R5) (R8) or Q1	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CW NO Frequency Output	NOR Control (R4) Ql, Q6, Q11, or U1A (U1A, C6 or R6 amplitude)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-Frequency indication out of tolerance	Trim Resistor R1	Use decade resistor box and check or replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.

j. Engine % RPM NO 1 and NO 2.

(1) Connect frequency counter to connector NO 1 pins C (HI) and D (LOW), using two leads and adapter.

(2) Set ENGINE % RPM NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Frequency counter will indicate between 1308 and 1362 Hz. If not, perform Troubleshooting Table 4-13.

(4) Set ENGINE % RPM NO 1 HI/LO switch to LO. Frequency counter will indicate O. If not, perform Troubleshooting Table 4-13.

(5) Set ENGINE % RPM NO 1 CAL/NOR to NOR and adjust ENGINE % RPM NO 1 variable control from fully CCW to fully CW. Frequency counter indication will vary from O to 1830 Hz minimum. If not, perform Troubleshooting Table 4-13.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Disconnect leads from connector NO 1 pins C (HI) and D (LOW) and connect to connector NO 2 pins Y (HI) and Z (LOW).

(8) Repeat (2) through (6) above, except use ENGINE % RPM NO 2 controls.

Table 4-13. Troubleshooting Engine % RPM NO 1 and NO 2 (AVIM).

NOTE

Before performing troubleshooting, remove Frequency simulator A3 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
HI-CAL % RPM indicates no Frequency Output	NO 1 – U5 pin 7(61,342 Hz ± 27 Hz) U13 pin 7 (61,134 Hz ±27 Hz)	First check loops 44 (-) and (3 HI) NO 1 for 1335 Hz ±27 Hz and check U15 pin 7 (HI), U14 pin 7 (HI), U13 pin 7 (HI), U5 pin 7 (HI). Figures 4-9, 4-10, FO-3, FO-5, or replace A3 board.
LO-CAL Frequency greater than 0 HZ	NO 1 – (S11) NO 2 – (S13)	Replace defective components A3 board, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CCW Frequency greater than 0 HZ	NO 1 – (R5) (R14) (R17) NO 2 (R6) (R30) (R27)	Replace defective components A3 board, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CW NO Frequency Output	NO 1 – (R5) (Q2) (Q7) (Q12) (U18) NO 2 – (R5) (Q3) (Q8) (Q13) (U2A)	Replace defective components A3 board, Figures 4-8, 4-9, FO-3, FO-5 or replace A3 board.
NOR-Frequency out of tolerance	Trim Resistor NO 1 – (R4) NO 2 – (R23)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
Frequency out of tolerance after trim resistors checked or replaced	NO 1 – (R3(C4) (Q7) (R18) NO 2 – (R24) (C13) (Q8) (R31)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
Low Amplitude effecting Frequency	NO 1 – (U18) (C7) (R15) NO 2 (U2A) (C18) (R28)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.

k. Gas Gen Speed NO 1 and NO 2.

(1) Connect frequency counter to connector NO 1 pins C (HI) and D (LOW), using two leads and adapter.

(2) Set GAS GEN SPEED NO 1 CAL/NOR switch to CAL and HI/LO switch to HI.

(3) Set ON-OFF-SIM ONLY switch to SIM ONLY. Frequency counter will indicate between 2125 and 2145 Hz. If not, perform Troubleshooting Table 4-14.

(4) Set GAS GEN SPEED NO 1 HI/LO switch to LO. Frequency counter will indicate O. If not, perform Troubleshooting Table 4-14.

(5) Set GAS GEN SPEED NO 1 CAL/NOR switch to NOR and adjust GAS GEN SPEED NO 1 variable control from fully CCW to fully CW. Frequency counter indication will vary from O to 2400 Hz minimum. If not, perform Troubleshooting Table 4-14.

(6) Set ON-OFF-SIM ONLY switch to OFF.

(7) Disconnect leads from connector NO 1 pins C (HI) and D (LOW) and connect to connector NO 2 pins C (HI) and D (LOW).

(8) Repeat (2) through (6) above, except use GAS GEN SPEED NO 2 controls.

Table 4-14. Troubleshooting GAS GEN SPEED NO 1 and NO 2 (AVIM).

NOTE

Before performing troubleshooting, remove Frequency Simulator A3 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
HI-CAL No Frequency Output or out of tolerance	NO 1– U4 U 10 Pin 7 (34,165 Hz ± 10 Hz) U11 pin 7 (4,271 Hz ± 1O Hz) U8C pin 3 (34,165 Hz ± 10 Hz)	First check loops 44 (-) and 17 (+) for 2.130 KHz ± 10 Hz NO 1 and NO 2 check, U8C in 3 (HI) U10 pin 7 (HI), U11 pin 7 (HI). NO 1 check U4 pin 13 (HI). Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or redate A3 board.
HI-CAL amplitude affecting Frequency	NO 1 – (U4B) (C32) (R57) (R56) NO 2 – (U4B) (C31) (R57) (R56)	Replace defective components A3 board, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
LO/CAL indicates Frequency greater than 0 HZ	NO 1 – (S15) NO 2 – (S17)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CCW indicates Frequency greater than 0 Hz	NO 1 – (R7) (R36) (R30) NO 2 (R8) (Q5) (R27)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-FULLY CW indicates NO Frequency Output	NO 1 – (R7) (Q4) (Q9) (Q14) (U2B) NO 2 – (R8) (Q5) (Q1O) (Q15) (U3A)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
NOR-Frequency out of tolerance	Trim Resistor NO 1 – (R26) NO 2 – (R46)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
Low Amplitude affecting Frequency	NO 1 – (U2B) (C19) (R37) NO 2 (U3A) (C28) (R48)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.
Frequency out of tolerance after trim resistors replaced	NO 1 – (R25) (C16) (Q9) (R40) NO 2 – (R45) (C25) (Q1O) (R51)	Replace defective components, Figures 4-8, 4-9, FO-3, FO-5, or replace A3 board.

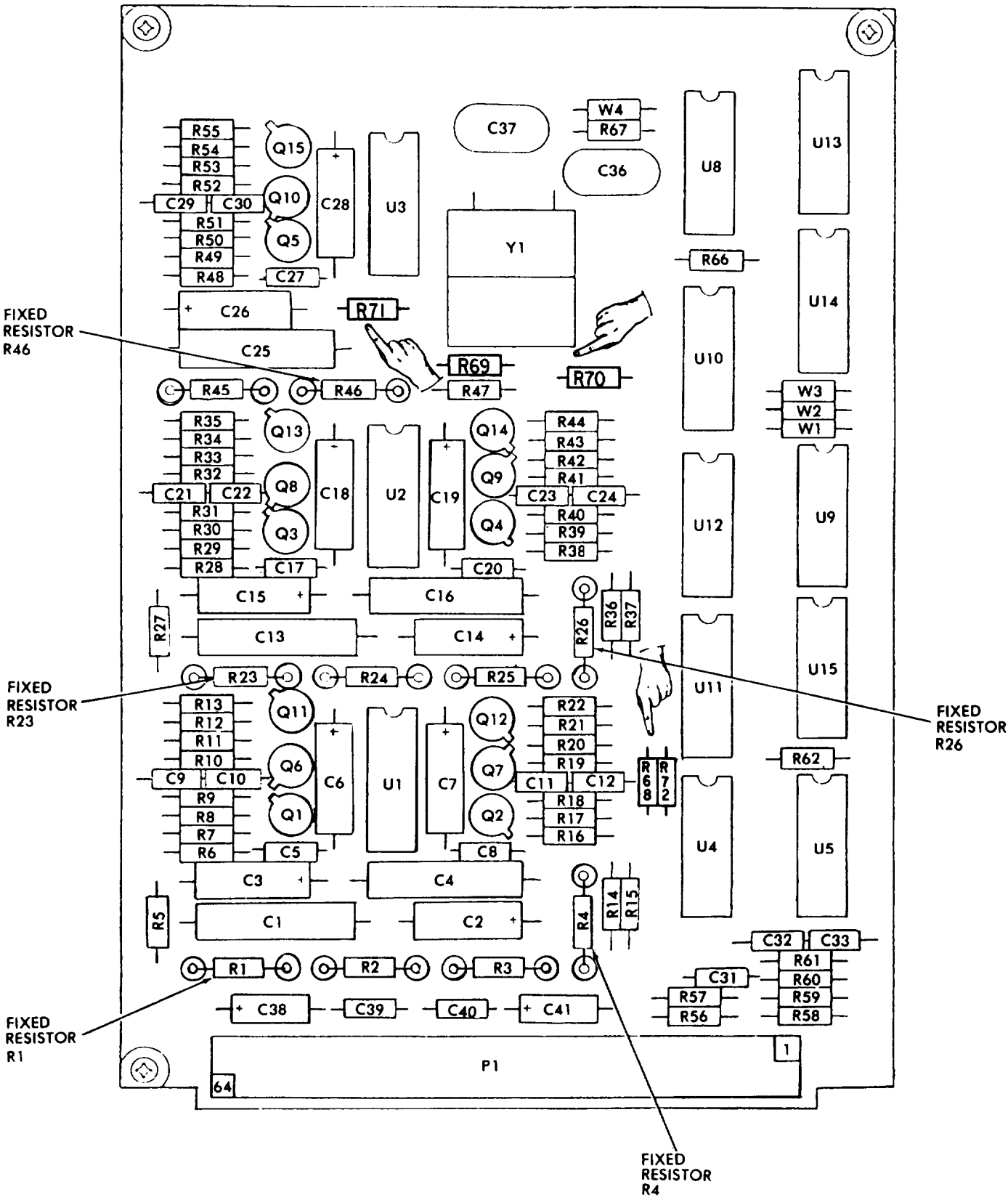


Figure 4-8. Frequency Simulator A3 Board

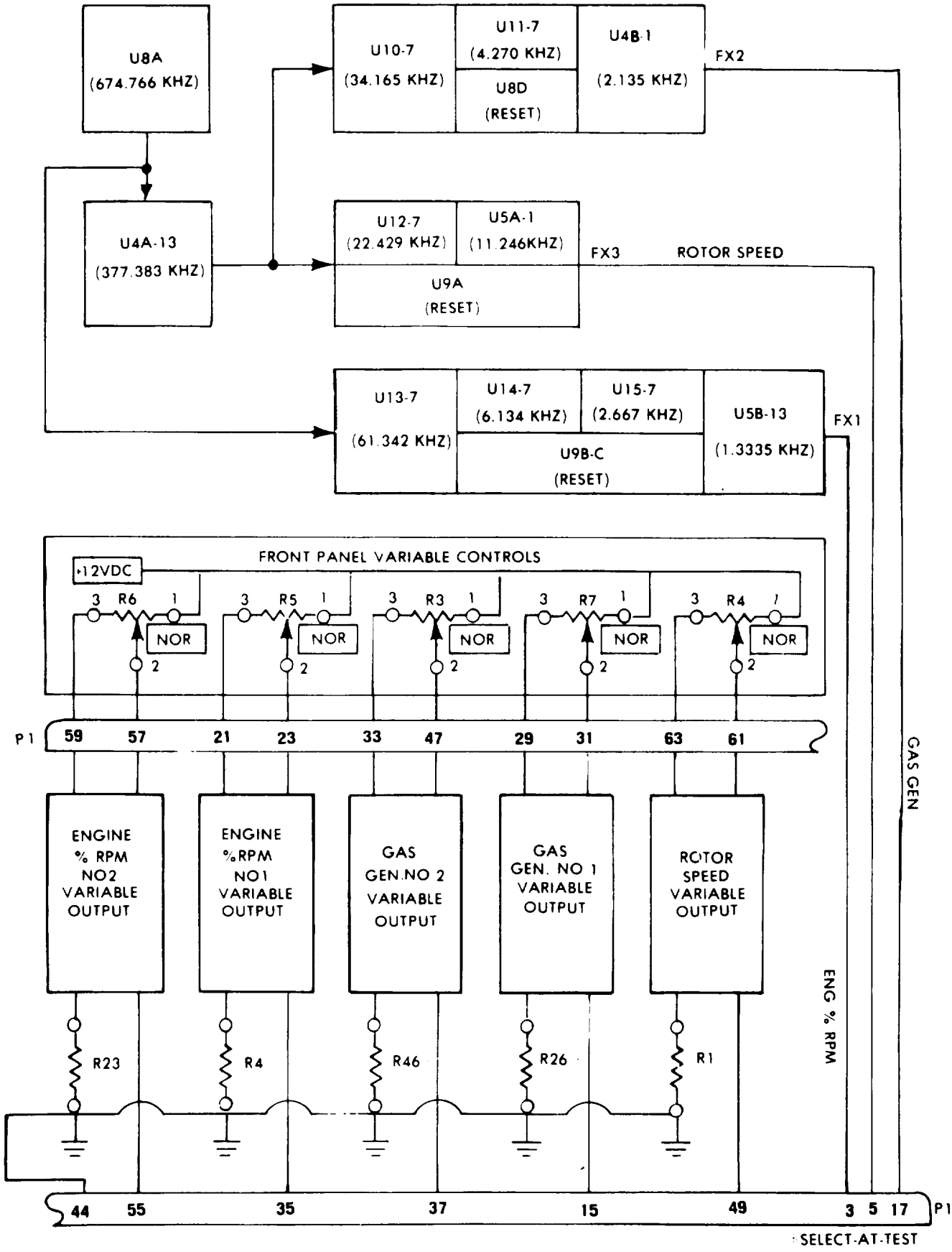


Figure 4-9. Frequency Input Simulator Assembly A3, Block Diagram (Sheet 1 of 2)

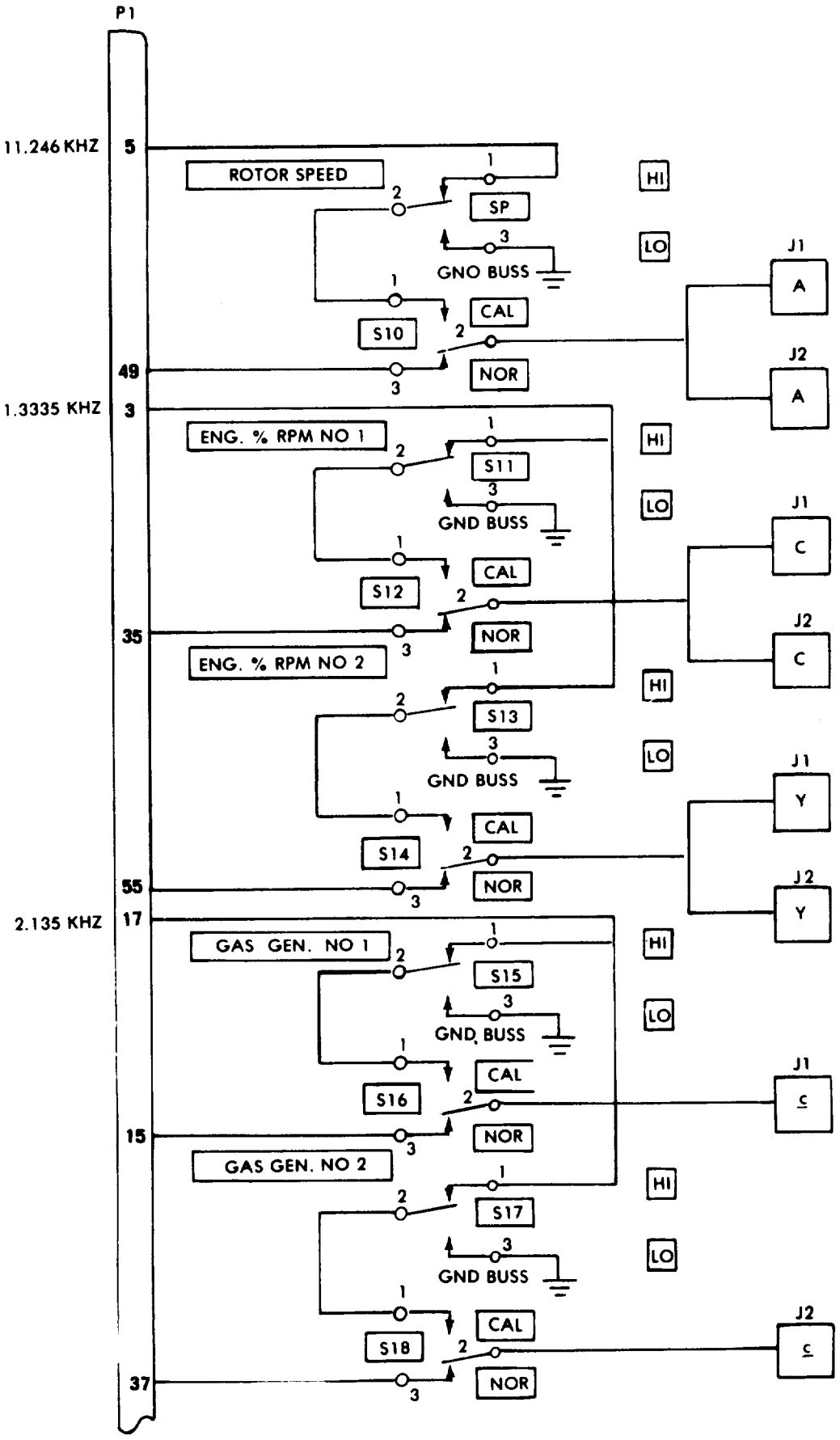


Figure 4-9. Frequency Input Simulator Assembly A3, Block Diagram (Sheet 2 of 2)

1. Engine Oil Press NO 1 and NO 2.

(1) Connect equipment as shown in Figure 4-10, connection A for connector NO 1. Do not disconnect equipment connected in Figure 4-1.

(2) Set ENGINE OIL PRESS NO 1 CAL/NOR switch to CAL and HI/LO switch to LO.

(3) Set precision oscillator for 6.00 Vrms at 400 +/- 10Hz.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. If digital voltmeter does not indicate between 3.447 and 3.735 vac, perform (a) through (d) below. If still defective, perform Troubleshooting Table 4-15.

(a) Set autotransformer, dc power supply (A2), and precision oscillator to OFF.

(b) Remove oil pressure board A2 (Figure 4-11 and reinstall, using extender board).

(c) Set autotransformer, dc power supply, and precision oscillator power to ON. Allow equipment to stabilize and most importantly: maintain the precision oscillator output level at 6.00 Vrms throughout these tests.

(d) Adjust RS (Figure 4-11) for a 3.591 vac indication on digital voltmeter (out NO. 1).

(5) Set ENGINE OIL PRESS NO 1 HI/LO switch to HI. Digital voltmeter will indicate between 2.770 and 3.058 vat. If not, perform Troubleshooting Table 4-15.

(6) Set ENGINE OIL PRESS NO 1 CAL/NOR switch to NOR and adjust ENGINE OIL PRESS NO 1 variable control from fully CCW to fully CW. If digital voltmeter does not indicate from more than 3.447 to less than 2.770 vat, perform adjustments (4) (a) through (c) above and 6 (a) and (b) below.

(a) Turn ENGINE OIL PRESS NO 1 variable control fully CCW.

(b) Adjust R1 (Figure 4-11) for a 3.591 vac indication on digital voltmeter.

Table 4-15. Troubleshooting Engine Oil Press NO 1 and NO 2 (AVIM).

NOTE

Before performing troubleshooting, remove oil pressure simulator A2 board and reconnect using extender board.

Trouble	Probable Cause	Remedy
LO/NOR Fully CW indication out of tolerance	NO 1 – (R5) NO 2 – (R22)	First check loops 61(+) and 14 (-) for 15 vdc and then NO 2 loop 40(+) for 15 vdc. Check loop 3 for -15 vdc. Replace defective components, Figures 4-11, 4-12, FO-4 FO-5, or replace A2 board.
LO/NOR Fully CW indication out of tolerance after adjustment (R5) or (R22)	NO 1 – R3, R4, R5, U1, L3, S6, S7 (Front Panel) NO 2 – (R2) (R21) (R22) (U2) (L2) S4/S5 (Front Panel)	Replace defective components,) Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL Fully CCW indication out of tolerance	NO 1 – (R1) NO 2 – (R18)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/NOR Fully CCW indication out of tolerance after adjustment (R1) or (R18)	NO 1 – (R3) (U1) NO 2 – (R2) (U2)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL indication out of tolerance	NO 1 – (R9) NO 2 – (R26)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL indication out of tolerance after adjustment (R9) or (R26)	ENG OIL PRESS NO 1 HI/LOW switch R8, R2, C5, C6, C7, U4 ENG OIL PRESS NO 2 HI/LOW switch R25, R19, C11, C12, U4	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
HI/CAL indication out of tolerance	NO 1 – (R7) NO 2 – (RX)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
HI/CAL indication out of tolerance after adjustment (R7) or (R24)	NO 1 – R6, R3, U1 NO 2 – R23, R20, U2	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.

NOTE

Check input voltage to (A2) board from (A1) board before troubleshooting (A2) board. Voltage checks also listed in Table 4-17, using figure 4-10 connections.

(7) Set ON-OFF-SIM ONLY switch to OFF and precision oscillator switch to OFF.

(8) Connect equipment as shown in Figure 4-10, connection A, for connector NO 2.

(9) Repeat (2) through (4) above except use ENGINE OIL PRESS NO 2 controls. If not within tolerance in (4) above, perform (4) (a) through (c) and (a) below. If not in tolerance in (6) above, perform (4) (a) through (c) above and 9 (b) and (c) below.

(a) Adjust R22 (figure 4-11) for a 3.591 vac indications on digital voltmeter.

(b) Turn ENGINE OIL PRESSURE NO 2 variable control fully CCW.

(c) Adjust R18 (fig 4-11) for a 3.591 vac indication on digital voltmeter.

m. XMSN Oil Press.

(1) Connect equipment as shown in Figure 4-10, connection B, for connector NO 2. Do not disconnect equipment connected in Figure 4-1.

(2) Set XMSN OIL PRESS CAL/NOR switch to CAL and HI/LO switch to LO.

(3) Set precision oscillator (A6) is 6.00 Vrms at 400 +/- 10Hz.

(4) Set ON-OFF-SIM ONLY switch to SIM ONLY. If digital voltmeter does not indicate between 3.447 and 3.735 vat, perform (a) through (d) below. If still defective, perform Troubleshooting Table 4-16.

(a) Set autotransformer, dc power supply, and precision oscillator power to OFF.

(b) Remove pressure board A2 (Figure 4-11) and reinstall, using extender board (B4).

Table 4-16. Troubleshooting XMSN OIL PRESS (AVIM).

NOTE

Before performing troubleshooting, remove frequency simulator A2 board and reconnect using extender board,

Trouble	Probable Cause	Remedy
LO/NOR Fully CW indication out of tolerance	R39	First check loops 5 (+) and 14(-) for 15 vdc ±5 vdc. Then loop 3 for -15 vdc. If voltages are present proceed below. Replace defective components, Fig-m-es 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/NOR Fully CW indication out of tolerance after adjustment (R39)	R13, R39, R38, U3, L1, or S2/S3 (Front Panel)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/NOR Fully CCW indication out of tolerance	R35	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/NOR Fully CCW indication out of tolerance after adjustment (R35)	R35, R1	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL indication out of tolerance	R43 NO 2 – (R26)	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL indication out of tolerance after adjustment (R43)	HI/LOW switch R42 R36, C15, C16, Cl?, U4, U3	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
LO/CAL indication out of tolerance after adjustment (R43)	HI/LOW switch R42, R36 C15, C16, C17, U4, U3	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
HI/CAL indication out of tolerance	R41	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.
HI/CAL indication out of tolerance after adjustment (R41)	R40 or R37 U3	Replace defective components, Figures 4-11, 4-12, FO-4, FO-5, or replace A2 board.

NOTE

Check input voltage to (A2) board from (A1) board before troubleshooting (A2) board. Voltage checks are listed in Table 4-17, using figure 4-10 connections.

(c) Set autotransformer, dc power supply, and precision oscillator power to ON. Allow equipment to stabilize, and most importantly: maintain the precision oscillator output level at 6.00 Vrms throughout these tests.

(d) Adjust R39 (Figure 4-11) for a 3.591 vac indication on digital voltmeter (R).

(5) Set XMSN OIL PRESS HI/LO switch to HI. Digital voltmeter will indicate between 2.696 and 2.984 Vrms. If not, perform Troubleshooting Table 4-16.

(6) Set XMSN CAL/NOR switch to NOR and adjust XMSN variable control from fully CCW to fully CW. If digital voltmeter does not indicate from more than 3.447 to less than **2.770 vat**, perform 4 (a) through (c) above and 6 (a) and (b) below.

(a) Turn XMSN 01 L PRESS variable control fully CCW.

(b) Adjust R35 (figure 4-11) for 3.591 vac indication on digital voltmeter.

Table 4-17. Troubleshooting Oil and XMSN Pressure Voltage Checks (A2) Board (AVIM).

Extender Board and Oil Pressure (A2) Board Pin Connections	Switch Positions	Voltmeter indications (vat) Approx readings expected
OIL PRESS NO 1 – 59 NO 2 - 43 XMSN – 17	CAL/LO CW and CCW	1.178 vac
	CAL/HI CW and CCW	0.5 vac
	NOR/HI CCW	1.19 vac
	NOR/LO CCW	1.19 vac
OIL PRESS NO 1 – 53 NO 2 - 37 XMSN – 11	CAL/LO CW and CCW	1.288 vac
	CAL/HI CW and CCW	1.288 vac
	NOR/HI CW and CCW	1.288 vac
	NOR/LOW CW and Ccw	1.288 vac
OIL PRESS NO 1 – 54,60 NO 2 – 46. 34 XMSN – 20,8		Ground Loop
OIL PRESS NO 1 – 55 N0 2 - 39 XMSN – 13	ALL POSITIONS	6VAC
OIL PRESS NO 1 – 51 NO 2 -35 XMSN – 9	ALL POSITIONS	.55 vac
OIL PRESS NO 1 – 49 N0 2 - 33 XMSN – 7	CAL/LO CW and CCW	1.17 vac
	CAL/HI CW and CCW	1.46 vac
	NOR/HI CW and CCW	1.46 vac
	NOR/LO CW and CCW	1.46 vac
OIL PRESS NO 1 – 61 NO 2 - 40 XMSN – 19		15 vdc

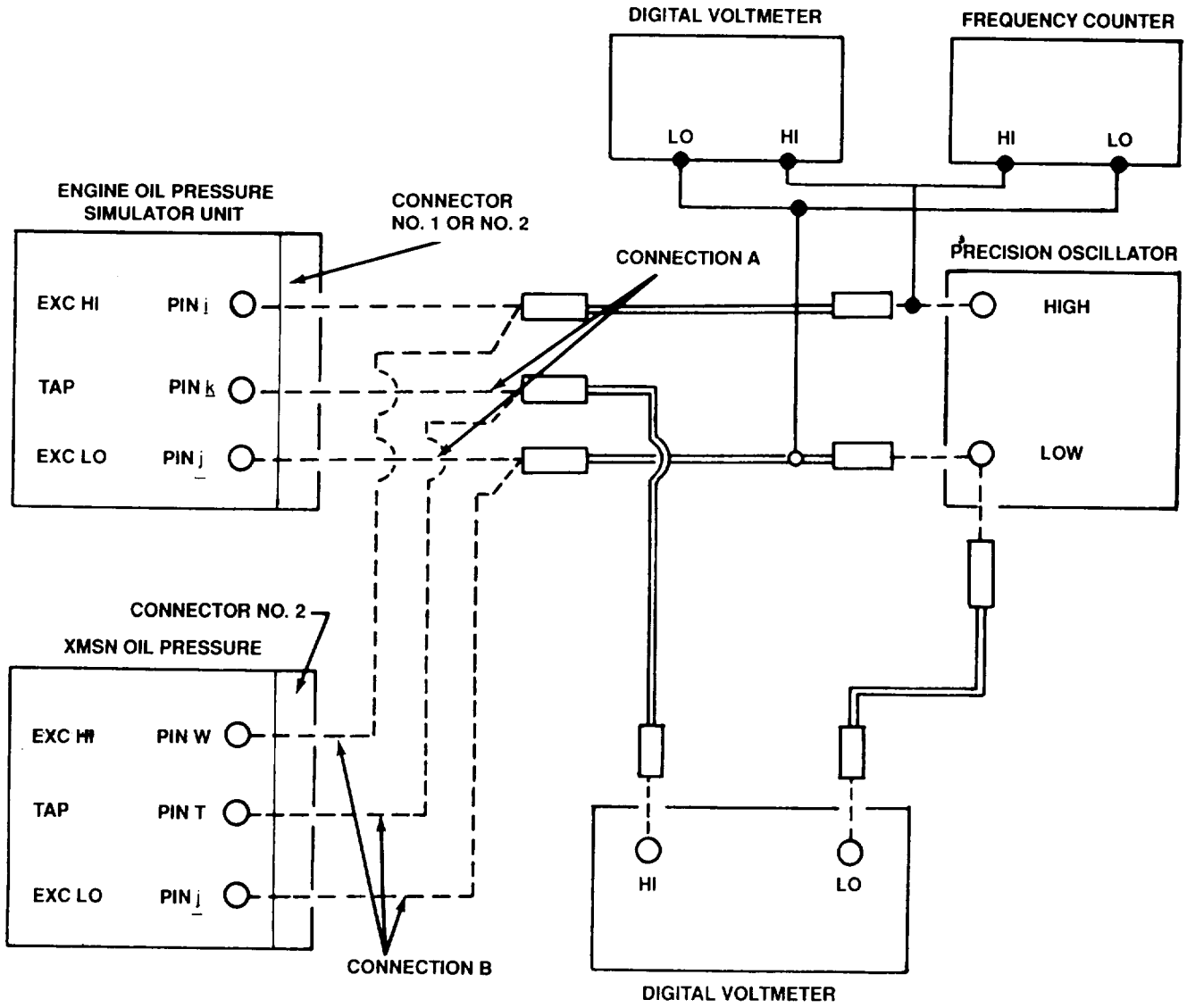
Table 4-17. Troubleshooting Oil and XMSN Pressure Voltage Cheeks (A2) Board (AVIM) (continued).

Extender Board and Oil Pressure (A2) Board Pin Connections	Switch Positions	Voltmeter indications (vat) Approx readings expected
OIL PRESS NO 1 – 57 N0 2 - 41 XMSN – 15	CAL/LO CW and CCW	14.3 vdc
	CAL/HI CW and CCW	O vdc
	NOR/HI CW and CCW	14.3 vdc
	NOR/LO CW and CCW	14.3 vdc
OIL PRESS NO 1 – 63 OIL PRESS NO 2 – 45 XMSN – 21	CAL/LO CAL/HI	3.44 to 3.73 vac 2.77 to 3.05 vac

NOTE

NOTE: See figure 4-12 and FO-4.

Voltage check using figure 4-10 connections



NOTE

TEST EQUIPMENT ITEM NUMBER
REFER TO TABLE 3-4

Figure 4-10. Engine and XMSN Oil Pressure - Equipment Setup

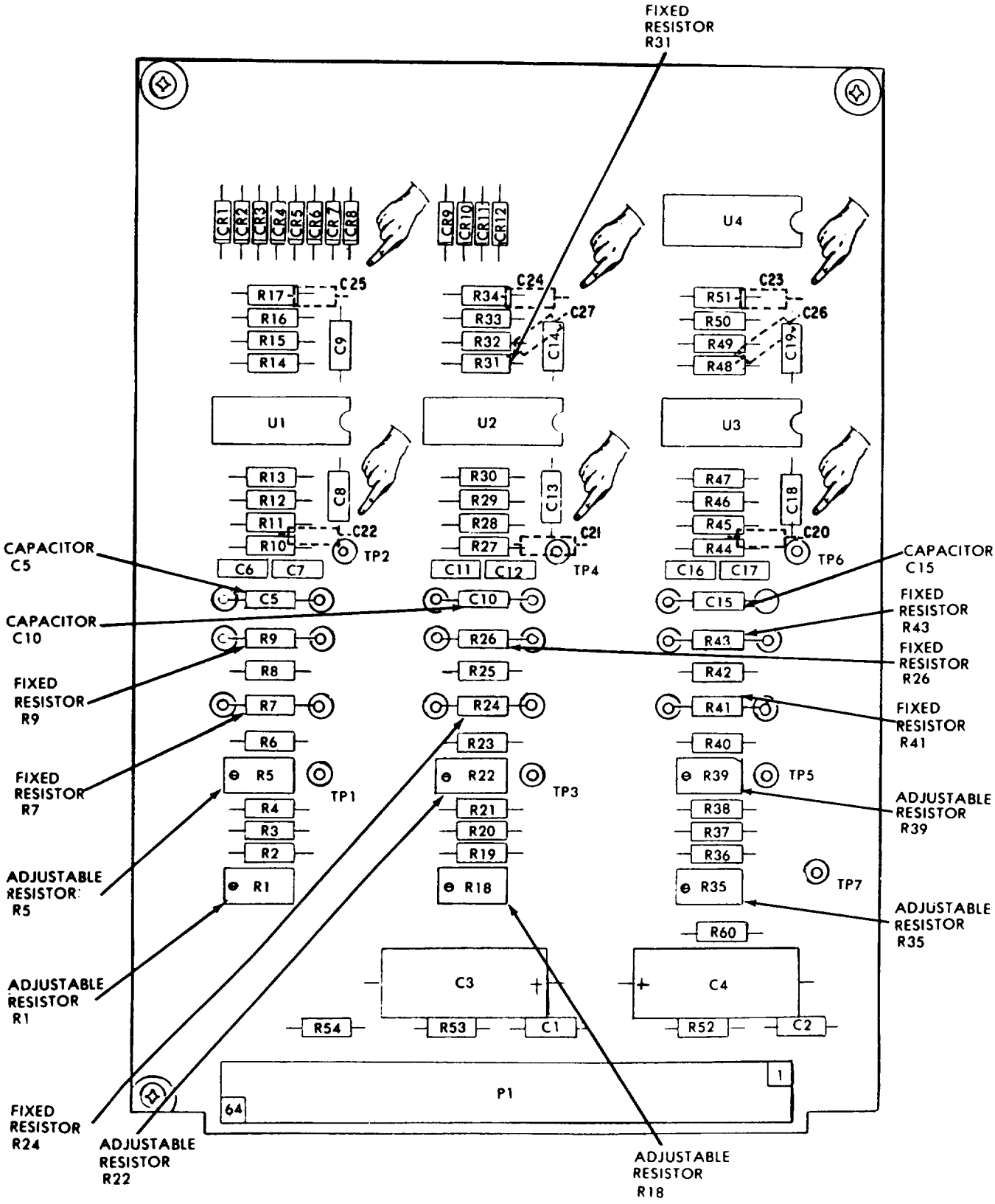


Figure 4-11. Oil Pressure Simulator A2 Board

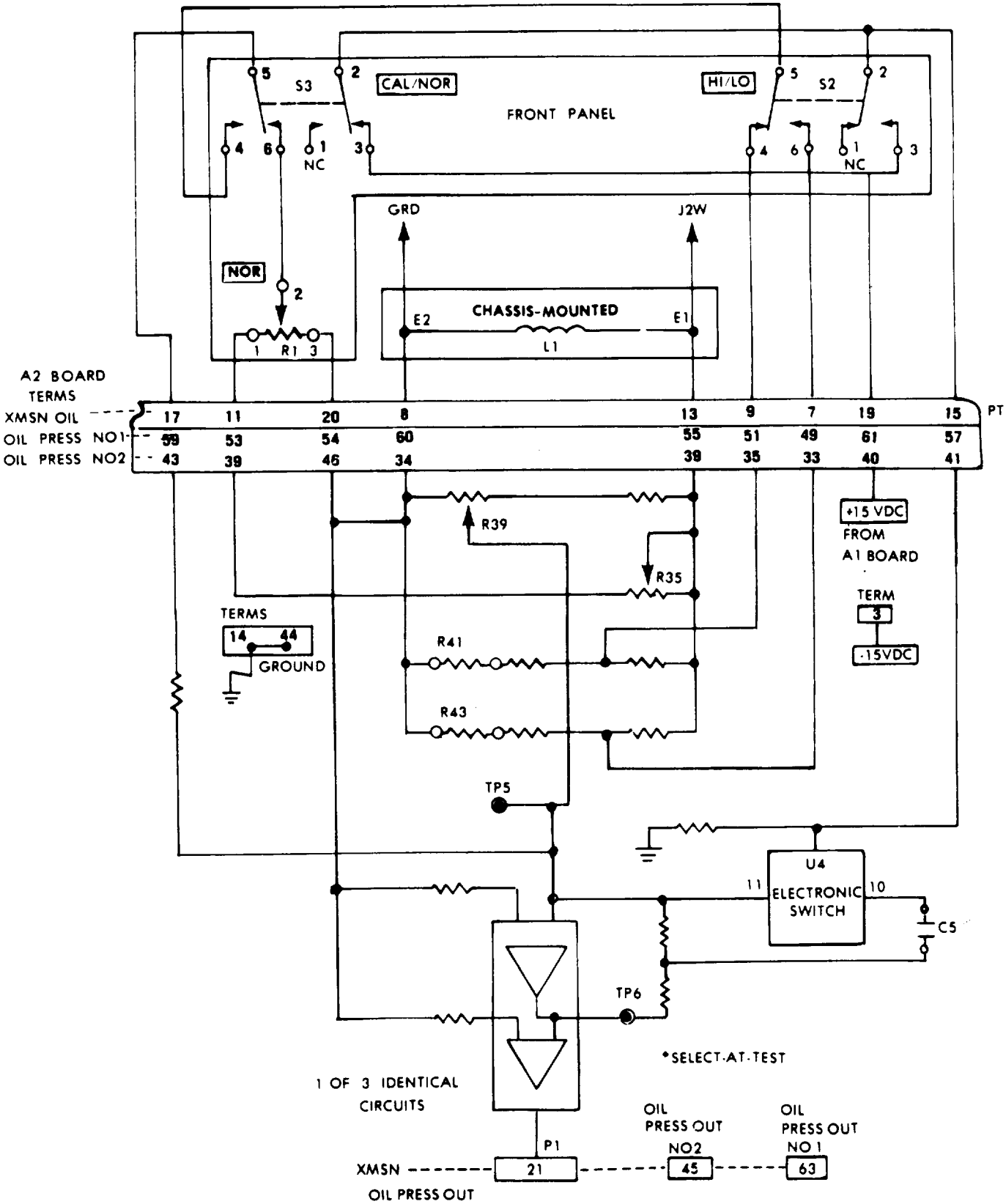


Figure 4-12. Oil Pressure Simulator Assembly A2, Block Diagram

Section VI. PREPARATION FOR SHIPMENT AND STORAGE

4-14. General.

Preparation for shipment and/or storage depends upon whether test set is retained in unit area or evacuated. Storage in unit area, when authorized, is on a rotational basis and is known as Administrative Storage. For Administrative Storage see TM 55-1500-204-25/1.

4-15. Levels of Protection.

Select the level of protection which best suits the circumstances and follow the instructions for that level.

a. Level A. Use this level if shipment in into or out of a combat theater or is destined for outdoor storage or is destined for indoor storage exceeding five years.

b. Level B. Use this level if the shipment involves overseas surface transit and/or is destined for indoor storage up to five years.

c. Level C. Use this level if shipment is entirely within CONUS and storage will not exceed two years.

4-16. Procedures.

a. For All Levels. Clean the test set thoroughly of all contamination and debris. Use no cleaning fluids or preservative materials. Package each test set individually. Each individual package can be shipped without packing. Cushion the test set in 2 inches of one pound density polyethylene foam conforming to PPP-C-1752 and include eight units of desiccant conforming to MIL-D-3464 within the unit.

b. Unit Container. Provide a snug fitting unit container as follows:

(1) Level A. Wood-cleated, plywood conforming to style I, overseas type of PPP-B-601.

(2) Level B. Weather-resistant fiberboard container conforming to PPP-B-636.

(3) Level C. Domenstic class fiberboard container conforming to PPP-B-636.

c. Marking. Mark all shipments in accordance with MIL-STD-129.

APPENDIX A

REFERENCES

A-1. Publication Index.

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms.
DA PAM 738-751	Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A).

A-2. Logistics and Storage.

TM 55-1500-204-25/1	General Aircraft Maintenance Manual

A-3. Maintenance of Supplies and Equipment.

AR 700-68	Packaging Improvement Report

A-4. Other Publications.

TB 43-180	Index of Calibration Bulletins
TM 55-1520-237-T	Aircraft Fault Isolation Procedures Manual
FM 55-411	Maintenance Quality Control and Technical Inspection Guide for Army Aircraft
TM 750-244-2	Procedures for Destruction of Electronic Material to Prevent Enemy Use (Electronics Command)

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section L INTRODUCTION

B-1. MAINTENANCE ALLOCATION CHART.

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance concept for army aircraft. These maintenance levels Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM) and Depot Maintenance are depicted on the MAC as:

AVUM WHICH CORRESPONDS TO THE O CODE IN THE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

AVIM WHICH CORRESPONDS TO THE F CODE IN THE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

DEPOT WHICH CORRESPONDS TO THE D CODE IN THE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

b. The maintenance to be performed below depot and in the field is described as follows

(1) Aviation Unit Maintenance (AVUM) - AVUM activities will be staffed and equipped to perform high frequency "On-Equipment" maintenance tasks required to retain or return equipment to a serviceable condition. The maintenance capability of the AVUM will be governed by the MAC and limited by the amount and complexity of support equipment, facilities required, and number of spaces and critical skills available. The range and quantity of authorized spare modules/components will be consistent with the mobility requirements dictated by the air mobility concept. (Assignment of maintenance tasks to divisional company size aviation units will consider the overall maintenance capability of the division, the requirement to conserve personnel and equipment resources and air mobility requirements).

(a) Company Size Aviation Units Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of equipment operational readiness. Perform maintenance inspections and servicing to include daily, intermediate, periodic and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, Built-In-Test Equipment (BITE), installed instruments, or easy to use Test Measurement and Diagnostic Equipment (TMDE). Replace worn or damaged modules/compnents which do not require complex adjustments or system alignment and which can be removed/installed with available skills, tools and equipment. Perform operational and continuity checks and make minor repairs. Perform servicing, functional adjustments, and minor repair/replacement. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(b) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters and detachment size units are normally small and have less than ten aircraft assigned. Maintenance tasks performed by the aircraft crew chief or assigned aircraft repairman will normally be limited to preventive maintenance, inspections, servicing, spot painting, stop drilling, minor adjustments, module/component fault diagnosis and replacement of selected modules/components. Repair functions wil normally be accomplished by the supporting AVIM unit.

B-2. USE OF THE MAINTENANCE ALLOCATION CHART.

a. The MAC assigns maintenance functions to the lowest level of maintenance based on past experience and the following consideration:

(1) Skills available.

(2) Time required.

(3) Tools and test equipment required and/or available.

b. Only the lowest level of maintenance authorized to perform a maintenance function is indicated. If the lowest level of maintenance cannot perform all tasks of

any single maintenance function (e.g., test, repair), then the higher maintenance level(s) that can accomplish additional tasks will also be indicated.

c. A maintenance function assigned to a maintenance level will automatically be authorized to be performed at any higher maintenance level.

d. A maintenance function that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the next higher maintenance organization. Higher maintenance levels will perform the maintenance functions of lower maintenance levels when required or directed by the appropriate commander.

e. The assignment of a maintenance function will not be construed as authorization to carry the associated repair parts in stock. Authority to requisition, stock, or otherwise secure necessary repair parts will be as specified in the repair parts and special tools list appendix.

f. Normally there will be no deviation from the assigned level of maintenance. In cases of operational necessity, maintenance functions assigned to a maintenance level may, on a one-time basis and at the request of the lower maintenance level, be specifically authorized by the maintenance officer of the level of maintenance to which the function is assigned. The special tools, equipment, etc. required by the lower level of maintenance to perform this function will be furnished by the maintenance level to which the function is assigned. This transfer of a maintenance function to a lower maintenance level does not relieve the higher maintenance level of the responsibility of the function. The higher level of maintenance will provide technical supervision and inspection of the function being performed at the lower level.

g. Organizational through depot maintenance of the US Army Electronics Command equipment will be performed by designated US Army Electronics Command personnel.

h. Changes to the MAC will be based on continuing evaluation and analysis by responsible technical personnel and on reports received from field activities.

B-3. DEFINITIONS.

a. Inspect. To determine serviceability of an item by comparing its physical, mechanical and electrical characteristics with established standards.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents and air.

d. Adjust. To rectify to the extent necessary to bring into proper operating range.

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

f. Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison 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 or test equipment being compared with the certified standard.

g. Install. To set up for use in an operational environment such as an emplacement, site or vehicle.

h. Replace. To replace unserviceable items with serviceable assemblies, subassemblies or parts.

i. Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.

j. Overhaul. To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards ‘prepared and published for the specific item to be overhauled.

k. Rebuild. To restore an item to a standard as nearly as possible to the original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

B-4. FUNCTIONAL GROUPS.

Standard functional groupings are not considered feasible for aviation ground support equipment due to variation and complexity. Therefore, variations to functional groupings **may occur.**

B-5. MAINTENANCE CATEGORIES AND WORK TIMES.

The maintenance categories (levels) AVUM, AVIM, and DEPOT are listed on the Maintenance Allocation

Chart with individual columns that indicate the work times for maintenance functions at each maintenance level. Work time presentations such as 0.1 indicate the average time it requires a maintenance level to perform a specified maintenance function. If a work time has not been established, the columnar presentation shall indicate "_•_". Maintenance levels higher than the level of maintenance indicated are authorized to perform the indicated function.

B-6. TOOLS AND TEST EQUIPMENT (Section Ill).

Common tool sets (not individual tools), special tools, test and support equipment required to perform maintenance functions are listed alphabetically with a reference number to permit cross-referencing to column 5 in the MAC. In addition, the maintenance category authorized to use the device is listed along with the item National stock Number (NSN) and, if applicable, the tool number to aid in identifying the tool/device.

Section II. Maintenance Allocation Chart

Nomenclature of End Item

INSTRUMENT DISPLAY SYSTEM LINE TEST SET

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Category	(4) Maintenance Category AVUM	(4) * AVIM	(4) DEPOT	(5) TOOLS and Equip (note)	(6) Remakes
01	Instrument Display System Lime Test Set	Test	.1		1.0		
		Repair		.5	.5		
		Csilbrutton		1.0	1.0	TB430180	*Refer to
	Cable Assembly	Repair	.01				
	Lamp	Replace	.1				
	Fuse-2 Amps	Replace	.05				
	Fuse-8 Amps	Replace	.05				
	Knob	Replace	.01				
	Power Supply Card	Replace		.5			
	(Al)	Repair		.5	1.0		
	Oil Press Sim.Card	Replace		.5			
	(A2)	Repair		.5	1.0		
	Frequency Input	Replace		.5			
	Sim. Card (A3)	Repair		.5	1.0		
	D.C. Input Sim.	Replace		.5			
	Card (A4)	Repair		.5	1.0		
	Switch, Toggle (S9	Test		.2			
	thru S37)	Replace		.5			
	Switch, Push (S8)	Test		.2			
		Replace		.5			
	Switch, Tome (52	Test		.2			
	thtu S7)	Replace		.5			
	Resistor, variable						
	(R1 thru R8, R16,	Test		.2			
	R17)	Replace		.5			
	Resistor, variable	Test		.2			
	(R12 & 13)	Replace		.5			
	Resistor, variable	Test		.2			
	R9 & R10)	Replace		.5			
	Switch, toggle (S19)	Test		.2			
		Replace		.5			
	Switch,toggle (S38)	Test		.2			
		Replace		.5			
	Switch, toggle (S39)	Test		.2			
		Replace		.5			
	Switch, toggle (S1)	Test		.2			
		Replace		.5			

°Maintenance Performed by USATSG- US Army Test Measurement, and Diagnostic Equipment Support Group
NOTE: Use Electrical Repairmen's Tool Kit, NSN 5180-00-323-4915. Change 2

APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope

This manual lists spares and repair parts required for performance of Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) of the Instrument Display System Line Test Set. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

2. General

This Repair Parts and Special Tools List is divided into the following sections

a. Section II. Repair Parts List. A list of spares and repair parts authorized for use in the performance of maintenance. Parts are listed in figure and item number sequence. Items are indented when required to indicate the relationship to the next higher assembly.

b. Section III. Special Tools List. (Not Applicable.)

c. Section IV. National Stock Number and Part Number lndex. A list, in descending National Item Identification Number (NIIN) sequence, of all National Stock Numbers (NSN), or Management Control Numbers (MCN) appearing in the listings, followed by a list in alphanumeric sequence, of all part numbers appearing in the listings. National Stock Numbers or Management Control Numbers and part numbers are cross--referenced to each illustration figure and item number appearance.

3. Explanation of Columns.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure number of the illustration in which the item is shown.

(2) Item Number. The number used to identify each item called out in the illustration.

b. Source, Maintenance, and Recoverability Codes (SMR).

(1) Source Code. Source codes are assigned to support items to indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
AD	Item to be assembled at depot maintenance level.

NOTE

Cannnibalization or salvage maybe used as a source of supply for any items source coded above except aircraft support items as restricted by AR 700-42.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate the following level of maintenance:

Code	Application/Explanation
0	Support item is removed, replaced, used at the Aviation Unit Maintenance (AVUM) level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identities the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain the following maintenance code:

Code	Application/Explanation
Z	--- Nonreparable. No repair is authorized.

(3) Recoverability Code. Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Code	Definition
Z	--- Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.

c. National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes. Note: NSNS have not as yet been assigned to all those items that require them, i.e., all “P” source coded items. Until such time as NSNS are assigned, these parts may be requisitioned by part number and Federal Supply Code for Manufacturers, or Management Control Number (MCN).

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

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM), The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description Indicates the Federal item name and any additional description required to identify the item. Basis of Issue (BOI) for Special Tools, Ground Support, and Flyaway Equipment.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item required for one assembly only, including instances when similar assemblies are broken down together. A “ V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc.).

4. How to Locate Repair Parts.

a. When National Stock Number, or Management Control Number, or Part Number is Unknown:

(1) First. Find the illustration covering the assembly group to which the repair part belongs.

(2) Second. Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(3) Third. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National Stock Number, or Management Control Number, or Part Number is Known:

(1) First. Using the Index of National Stock Numbers or Management Control Numbers and Part Numbers, find the pertinent National Stock Number, Management Control Number or part number. This index is in descending National Item Identification Number (NIIN) sequence followed by a list of part numbers in descending alphanumeric sequence, cross-referenced to the illustrations figure number and item number.

(2) Second. After finding the figure and item number, locate the figure and item number in the Repair Parts List.

5. ABBREVIATIONS. (Not Applicable).

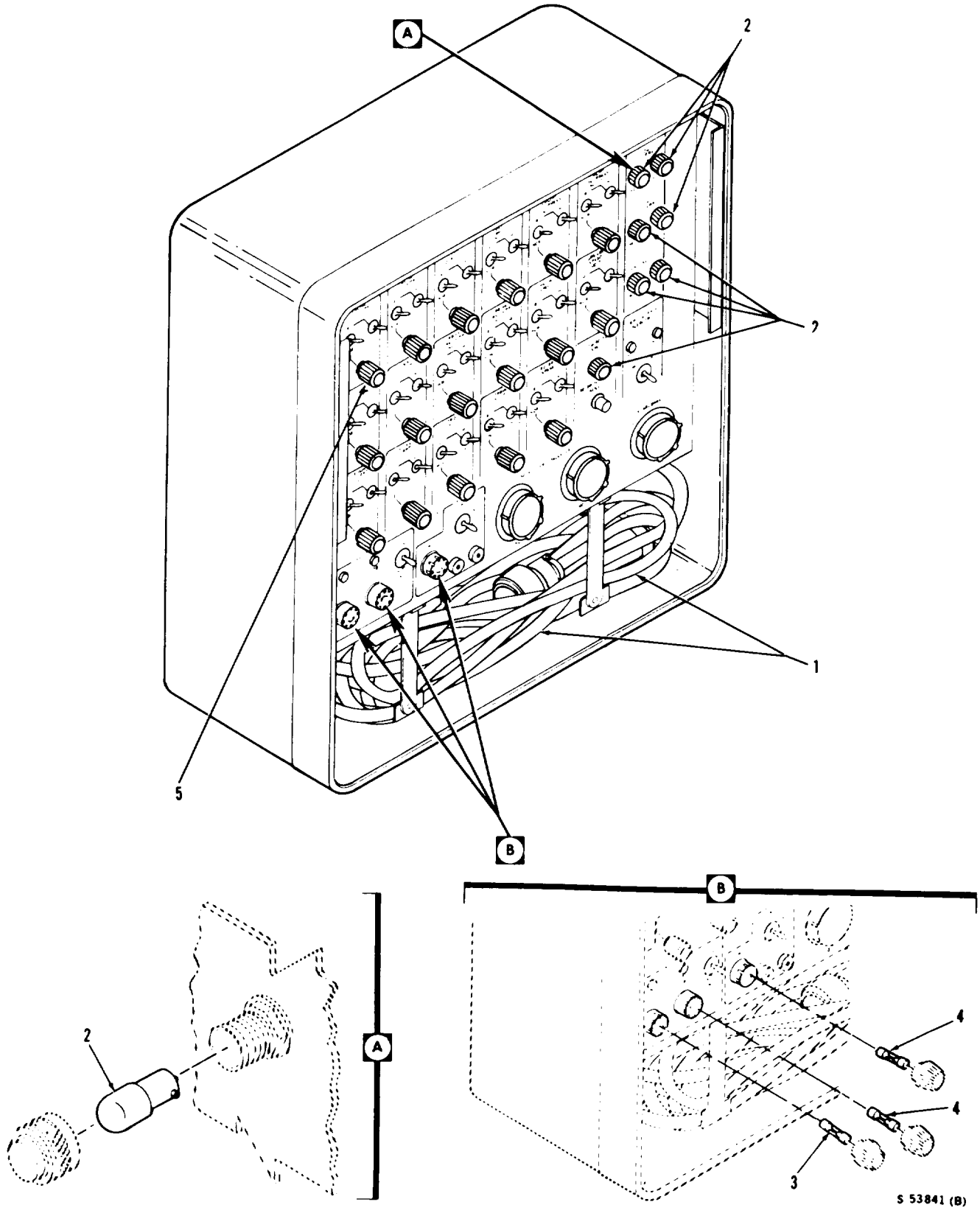


Figure C-1. Instrument Display System Line Test Set

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
						GROUP 01 LINE TEST SET		
C-1	1	XDOZZ		90073	217-419741-000	CABLE ASSEMBLY,LTS/VIDS TO SDC	EA	2
C-1	2	PAOZZ	6210-00-690-1569	72619	508-7538-504	LAMP	EA	7
C-1	3	PAOZZ	5920-00-054-0173	81340	FM01-125V2A	FUSE, 2A	EA	1
C-1	4	PAOZZ	5920-00-557-5033	81349	F03A250V8A	FUSE,8A	EA	2
C-1	5	PAOZZ	5355-00-133-2459	95146	K500B1/8	KNOB	EA	17

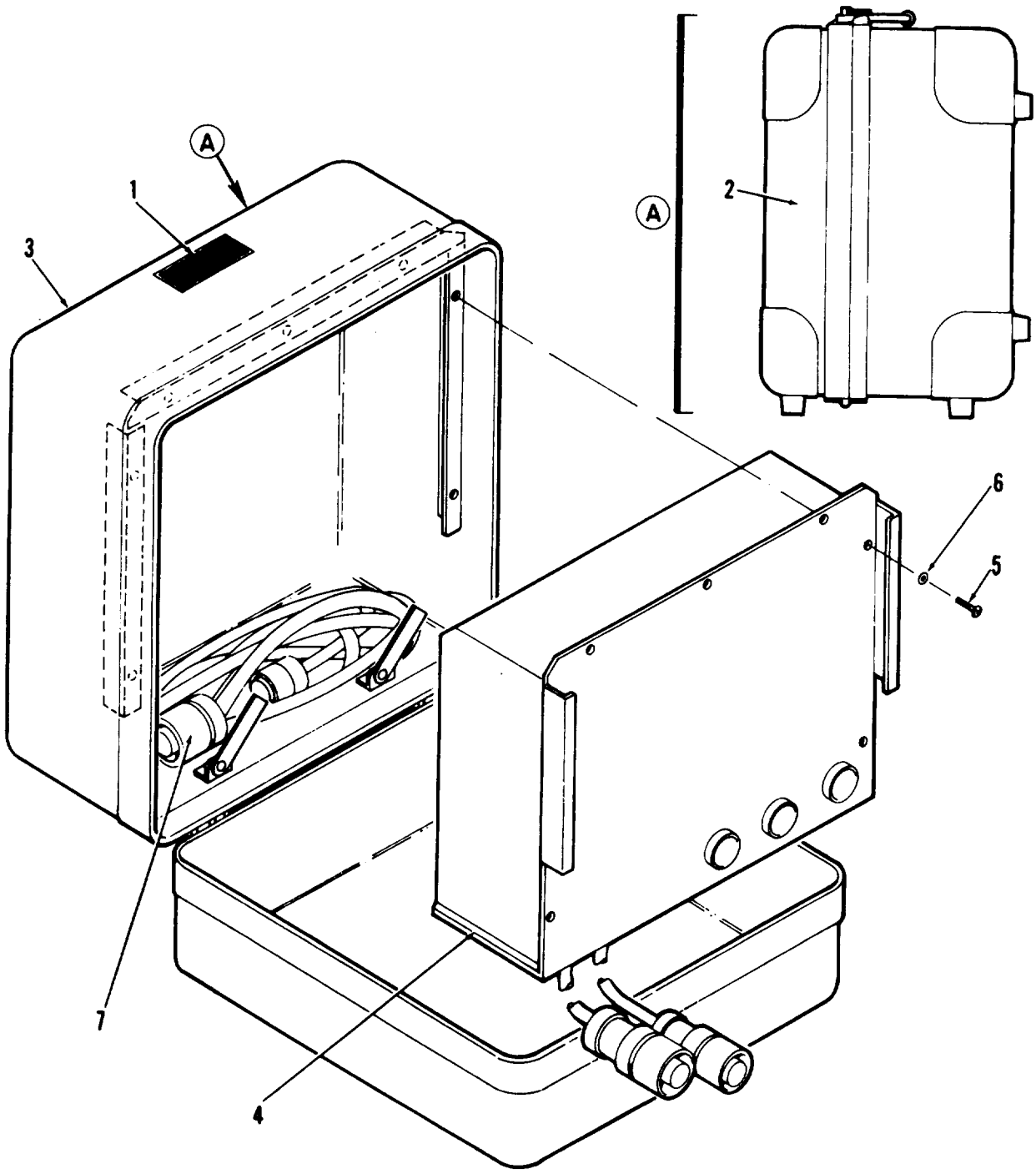


Figure *C-2*. Line Test Set - Exploded View

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-2		PBODD	4920-01-112-5906	90073	245-476853-000	LINE,TEST SET	EA	1
C-2	1	XDFZZ		90073	624-354095-000	PLATE,IDENTIFICATION	EA	1
C-2	2	XAODD		90073	244-459654-000	LINE,TEST SET,ASSEMBLY	EA	1
C-2	3	XDFFF		90073	538-473878-000	CASE,LINE,TEST SET (C,FIGURE C-3 FOR BRKDWN)	EA	1
C-2	4	XAFFF		90073	244-476862-001	SIMULATOR (SEE FIGURE C-4 FOR BRKDWN)	EA	1
C-2	5	PAFZZ	5305-00-054-6654	96906	MS51957-30	SCREW,MACHINE	EA	7
C-2	6	PAFZZ	5310-00-773-7624	80205	NAS620C6	WASHER,FLAT	EA	7
C-2	7	XDOZZ		90073	217-419741-000	CABLE,ASSEMBLY SIMULATOR TO SDC (SEE FIGURE C-9 FOR BRKDWN)	EA	2

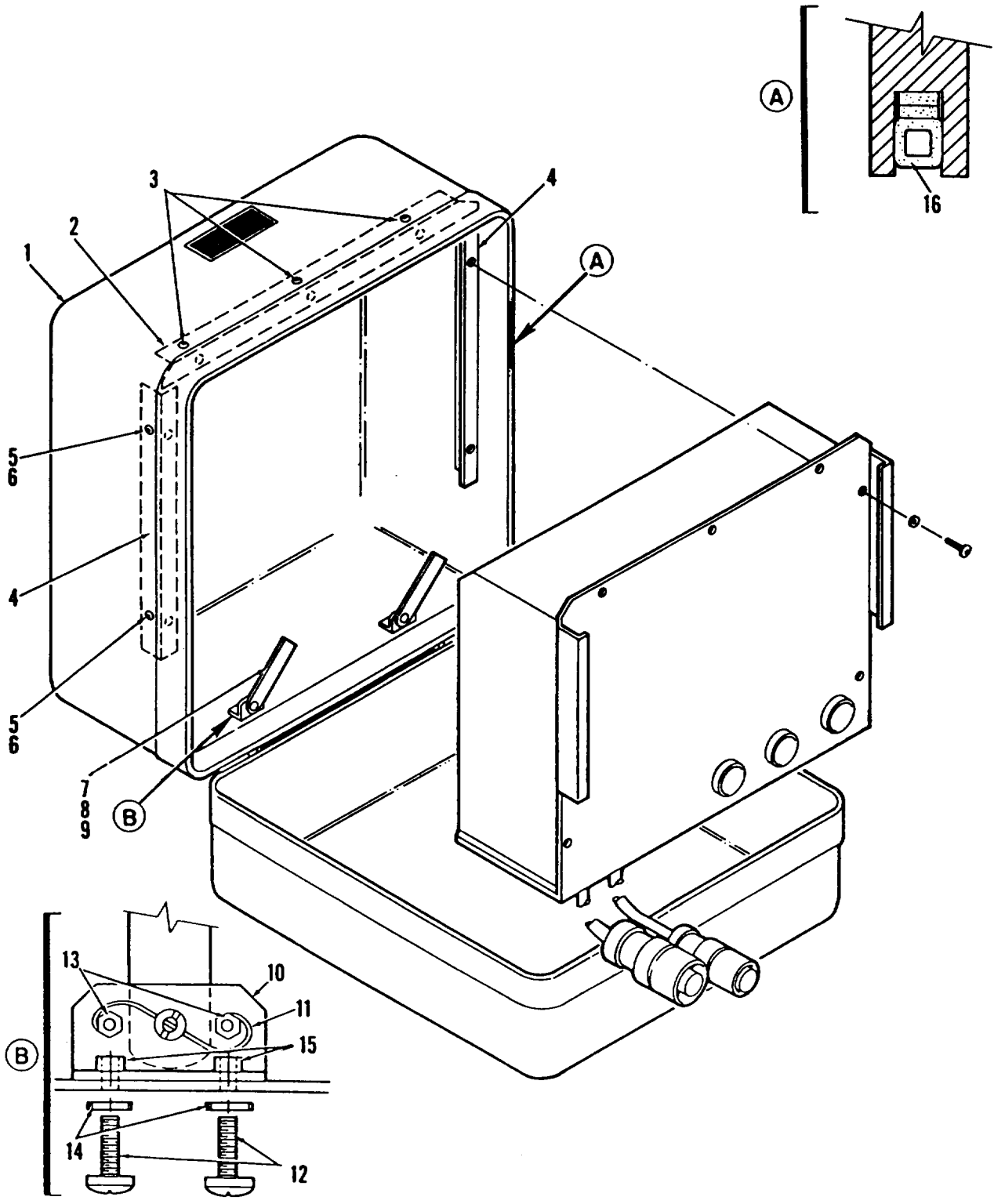


Figure C-3. Case, Line Test Set - Exploded View

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-3		XDFFF		90073	538-473878-000	CASE,LINE TEST SET (SEE FIGURE C-2 FOR NHA)	REF	REF
C-3	1	XDFZZ		90073	538-473942-000	CASE,LINE TEST SET	EA	1
C-3	2	XDFZZ		90073	524-354066-000	BRACKET,ANGLE,TOP	EA	1
C-3	3	PAFZZ	5305-00-054-6667	96906	MS51957-42	SCREW,MACHINE	EA	3
C-3	4	XDFZZ		90073	524-354067-000	BRACKET,ANGLE,SIDE	EA	2
C-3	5	PAFZZ	5305-00-054-5638	96906	MS51957-42	SCREW,MACHINE	EA	4
C-3	6	XDFZZ		90073	732-355264-000	SHIM	EA	4
C-3	7	XDFZZ		90073	619-354346-000	BAR,RETAINER	EA	2
C-3	8	PAFZZ	5325-00-282-8138	72794	AJ3-25	STUD,OVAL HEAD,LONG. UNDERCUT	EA	2
C-3	9	PAFZZ	5325-00-638-4301	72794	GH3	GROMMET	EA	2
C-3	10	XDFZZ		90073	524-354344-000	BRACKET,RETAINER	EA	2
C-3	11	PAFZZ	5325-00-171-4680	72794	53-175	SPRING	EA	2
C-3	12	PAFZZ	5325-00-054-6651	96906	MS51957-27	SCREW,MACHINE	EA	4
C-3	13	PAFZZ	5325-00-727-8833	96906	MS51959-3	SCREW,MACHINE	EA	4
C-3	14	PAFZZ	5325-00-043-4708	80205	NAS620C2	WASHER,FLAT	EA	4
C-3	15	PAFZZ	5325-00-725-8270	72962	LH3858-26	NUT,SELF-LOCKING	EA	4
C-3	16	XDFZZ		90073	728-354688-000	GASKET	EA	2

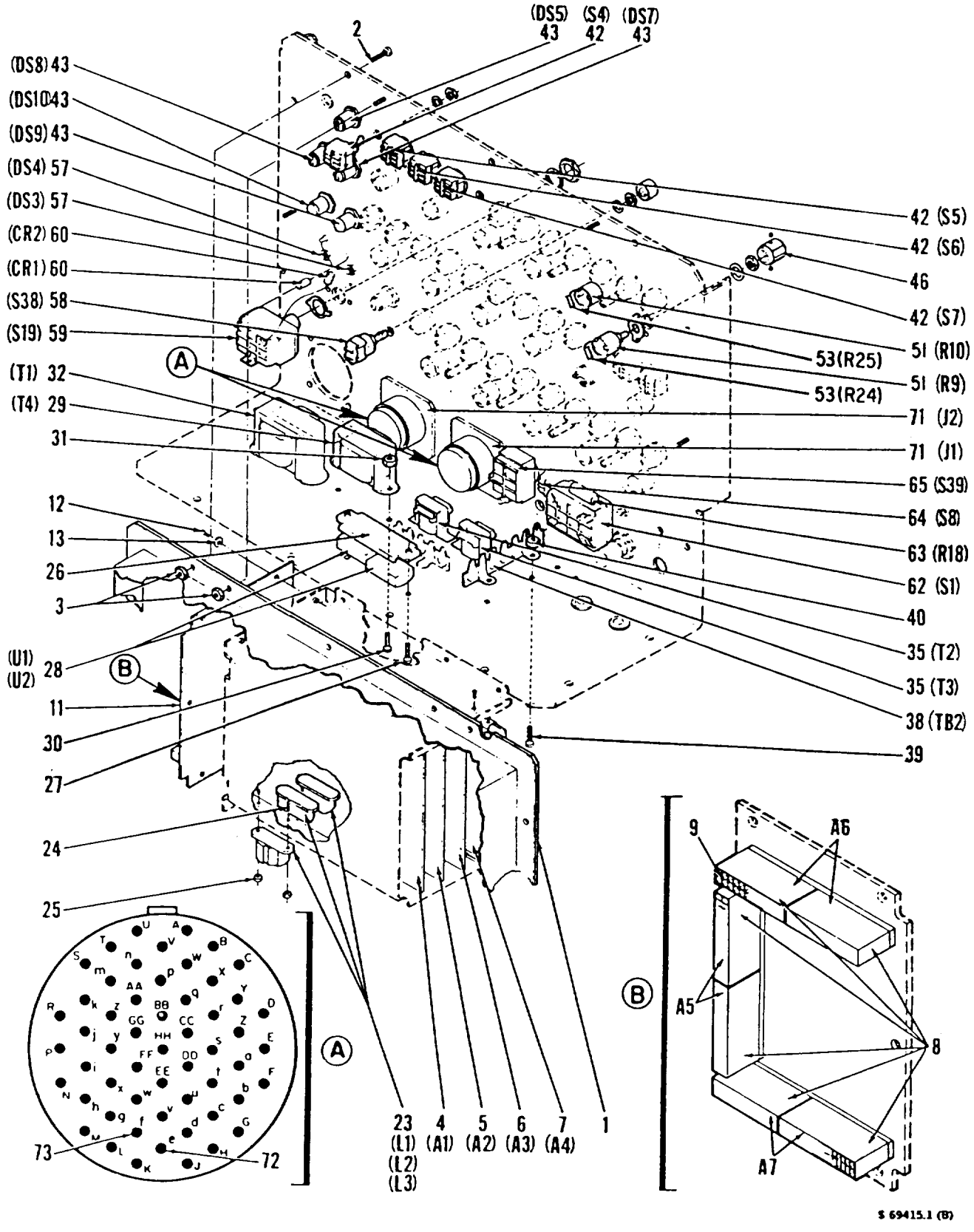


Figure *C-4*. Simulator - Exploded View (Sheet 1 of 3)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-4		XAFFF		90073	244-476862-001	SIMULATOR (SEE FIGURE C-2 FOR NHA)	REF	REF
C-4	1	XDFZZ		90073	656-47839-000	SHIELD,SIMULATOR	EA	1
C-4	2	PAFZZ	5305-00-054-6652	96906	MS51957-28	SCREW,MACHINE	EA	8
C-4	3	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	4
C-4	4	PBFFF	5999-01-116-2636	90073	220-419918-000	POWER,SUPPLY CARD (SEE FIGURE C-5 FOR BRKDWN)	EA	1
C-4	5	PBFFF	5999-01-116-2633	90073	220-419920-000	OIL PRESSURE SIMULATOR CARD (SEE FIGURE C-6 FOR BRKDWN)	EA	1
C-4	6	PBFFF	5999-01-116-2639	90073	220-419922-000	FREQUENCY INPUT SIMULATOR CARD (SEE FIGURE C-7 FOR BRKDWON)	EA	1
C-4	7	PBFFF	5999-01-116-2638	90073	220-419924-000	DC INPUT SIMULATOR CAED (SEE FIGURE C-8 FOR BRKDWN)	EA	1
C-4	8	PAFZZ	5935-00-828-1856	00779	86148-7	CONNECTOR,RECEPTACLE, ELECTRICAL 32-CONTACT. FEMALE	EA	6
C-4	9	PAFZZ	5999-01-063-1866	00779	102128-1	CONTACT,ELECTRICAL (FOR AMP 86148 CONNECTOR)	EA	186
C-4	10	PAFZZ	5935-00-426-3083	00779	86286-1	KEYING PLUG	EA	5
C-4	11	PAFDD	5999-01-116-2637	90073	220-419914-000	SIMULATOR INTERCONNECTING BOARD	EA	1
C-4	12	PAFZZ	5305-00-054-5648	96906	MS51957-14	SCREW,MACHINE	EA	5
C-4	13	PAFZZ	5310-00-595-6211	96906	MS15795-803	WASHER,FLAT	EA	5
C-4	14	XDFZZ		90073	664-473814-000	SUPORT MOUNTING GUIDE	EA	1
C-4	15	PAFZZ	5305-00-054-5648	96906	MS51957-14	SCREW,MACHINE	EA	7
C-4	16	PAFZZ	5310-00-933-8118	96906	MS35338-135	WASHER,LOCK	EA	8
C-4	17	PAFZZ	5340-00-792-0943	59730	TY-33M	CLAMP,CABLE,SELF-LOCKING	EA	1
C-4	18	PAFZZ	5305-00-054-5651	96906	MS51957-17	SCREW,MACHINE	EA	1
C-4	19	PAFZZ	5310-00-595-6211	96906	MS15795-803	WASHER,FLAT	EA	1
C-4	20	XDFZZ		33962	35-1B-2-11-3	RETAINER,PCB	EA	8
C-4	21	PAFZZ	5305-00-929-6421	80205	NAS1635-00-3	SCREW,MACHINE	EA	16
C-4	22	PAFZZ	5310-00-405-9866	72962	92-1660-00	NUT,HEX,MINIATURE,0-80	EA	16
C-4	23	PAFZZ	5950-01-097-4883	90073	260-475350-000	CHOKE	EA	3
C-4	24	PAFZZ	5305-00-054-5638	96906	MS51957-4	SCREW,MACHINE	EA	6

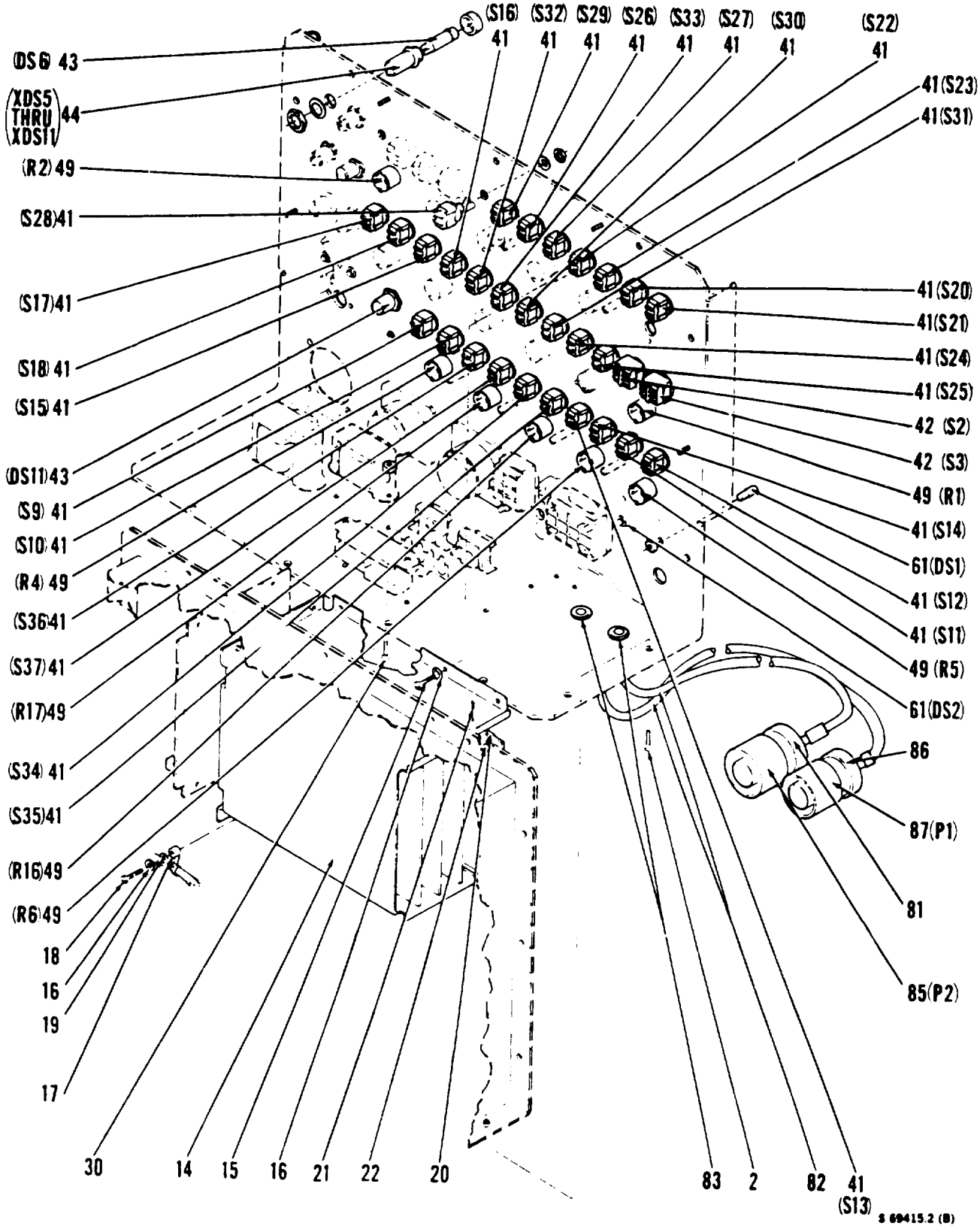


Figure C-4. Simulator - Exploded View (Sheet 2 of 3)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-4	25	PAFZZ	5310-00-727-0725	80205	NAS1291-C02	NUT,HEX	EA	6
C-4	26	PAFZZ	6620-01-087-4361	90073	628-354273-000	PLATE,RETAINING, THERMOCUOUPLE,DUAL	EA	1
C-4	27	PAFZZ	5305-00-054-5651	96906	MS51957-17	SCREW,MACHINE	EA	2
C-4	28	PBFZZ	6685-01-878-3291	51578	NC150LKOC	THERMOCOUPLE REFERENCE JUNCTION SUBMIN, FULLBRIDGE COMPENSATORS	EA	2
C-4	29	XDFZZ		90073	322-215856-000	TRANSFORMER,POWER	EA	1
C-4	30	PAFZZ	5305-00-054-6651	96906	MS51957-27	SCREW,MACHINE	EA	2
C-4	31	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	2
C-4	32	XDFZZ		90073	322-215856-000	TRANSFORMER,POWER	EA	1
C-4	33	PAFZZ	5305-00-054-6651	96906	MS51957-27	SCREW,MACHINE	EA	2
C-4	34	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	2
C-4	35	XDFZZ		90073	322-215854-000	TRANSFORMER,POWER	EA	2
C-4	36	PAFZZ	5305-00-054-5648	96906	MS51957-14	SCREW,MACHINE	EA	4
C-4	37	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	4
C-4	38	XDFZZ		90073	666-131065-009	TERMINAL STRIP	EA	1
C-4	39	PAFZZ	5305-00-054-6651	96906	MS51957-27	SCREW,MACHINE	EA	2
C-4	40	PAFZZ	5310-00-878-3291	969006	MS21043-06	NUT,SELF-LOCKING	EA	2
C-4	41	PAFZZ	5930-00-105-8202	95146	MTE-106D	SWITCH,TOGGLE, WATERPROOF,SPDT	EA	28
C-4	42	PAFZZ	5930-00-471-4902	95146	MTE-206N	SWITCH,TOGGLE, WATERPROOF,SPDT	EA	6
C-4	43	PAOZZ	6240-00573-0629	72619	507-3917-1471500	LAMP,INCANDESCENT, RED,28V	EA	7
C-4	44	XDFZZ		72619	508-7538-504	LAMP,HOLDER	EA	7
C-4	45					(DELETED)		
C-4	46	PBOZZ	5355-00-133-2459	95146	K-500B 1-8	KNOB	EA	2
C-4	47	XDFZZ		32997	3862C162-502A	RESISTOR,VARIABLE,CERMET	EA	2
C-4	48	PAOZZ	5355-00-133-2459	95146	K-500B 1-8	KNOB	EA	2
C-4	49	XDFZZ		32997	3862C162-103A	RESISTOR,VARIABLE,CERMET	EA	10
C-4	50	PAOZZ	5355-00-133-2459	95146	K-500B 1-8	KNOB	EA	10
C-4	51	XDFZZ		32997	3862C162-502A	RESISTOR,VARIABLE,CERMET	EA	3
C-4	52	PAOZZ	5355-00-133-2459	95146	K-500B 1-8	KNOB	EA	1
C-4	53	XAFZZ	5905-00-412-0772	81349	RN55C5103F THROUGH RN555603F	RESISTOR,FIXED,FILM, SELECT ON TEST	EA	5
C-4	54	XDFZZ		32997	3862C162-501A	RESISTOR,VARIABLE,CERMET	EA	2
C-4	55	PAOZZ	5355-00-133-2459	95146	K-500B 1-8	KNOB	EA	2
C-4	56	PAFZZ	5905-00-468-3019	81349	RN55C2671F	RESISTOR,FIXED,FILM,	EA	2
C-4	57	PAFZZ	6210-00-064-2998	96906	MS25446-5	LIGHTS,IND.ENCAP	EA	2
C-4	58	PAFZZ	5930-01-068-5556	95146	MPE-106F	SWITCH,PUSHBUTTON,SPDT	EA	1
C-4	59	PAFZZ	5930-00-615-7882	96906	MS35059-27	SWITCH,TOGGLE	EA	1
C-4	60	PAFZZ	5961-00-938-1135	81349	JAN1N4148	SEMICONDUCTOR DEVICE, DIODE	EA	2
C-4	61	PAFZZ	6210-00-978-2546	96906	MS25446-6	LIGHTS,IND,ENCAP	EA	2
C-4	62	PAFZZ	5930-00-615-7883	969006	MS25068-21	SWITCH,TOGGLE 4PDT	EA	1
C-4	63	PAFZZ	5905-00-689-4716	81349	RCR42G331JS	RESISTOR,FIXED, COMPOSITION	EA	1
C-4	64	PAFZZ	5930-00-105-5551	95146	MPE-206R	SWITCH,PUSHBUTTON DPDT	EA	1

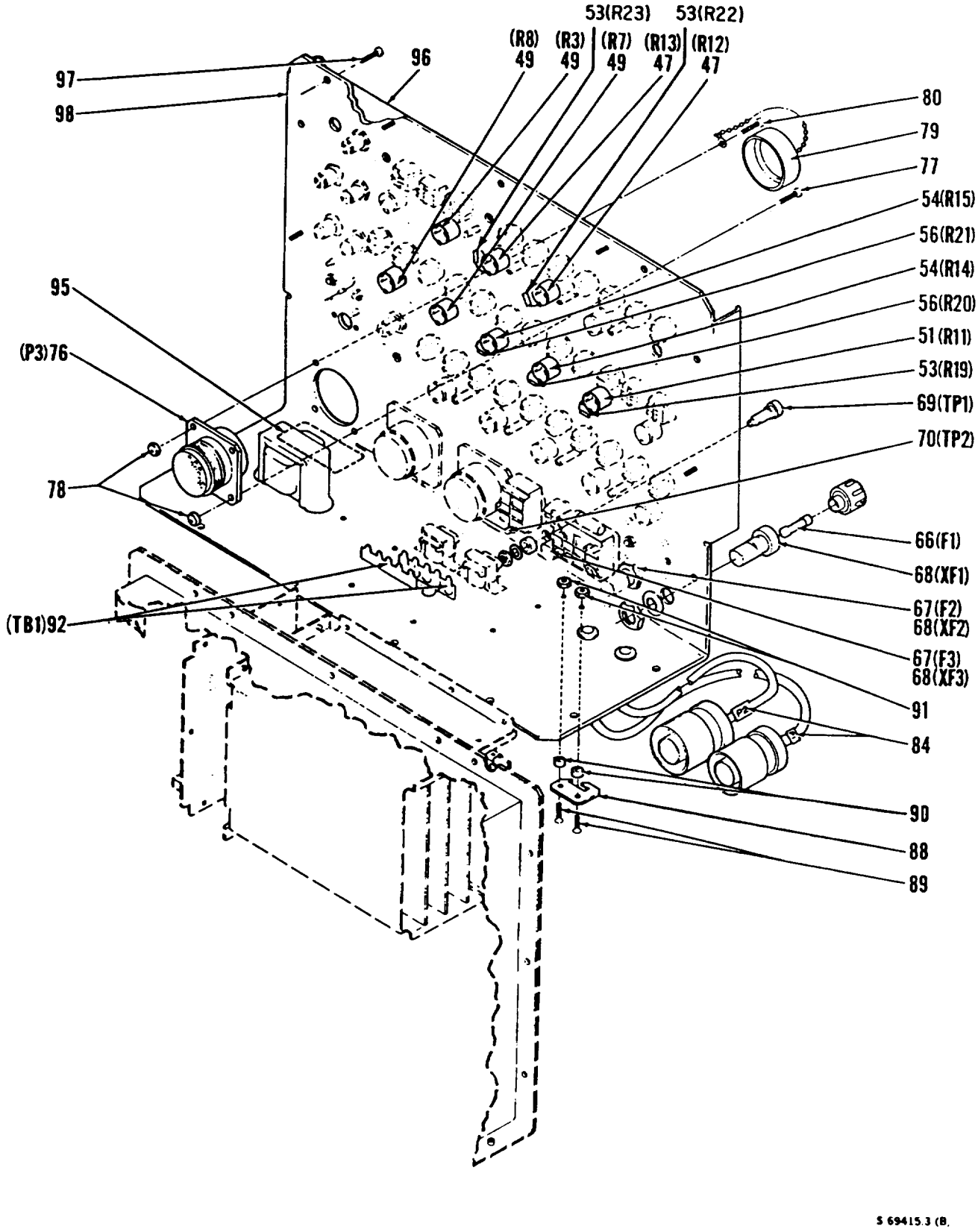
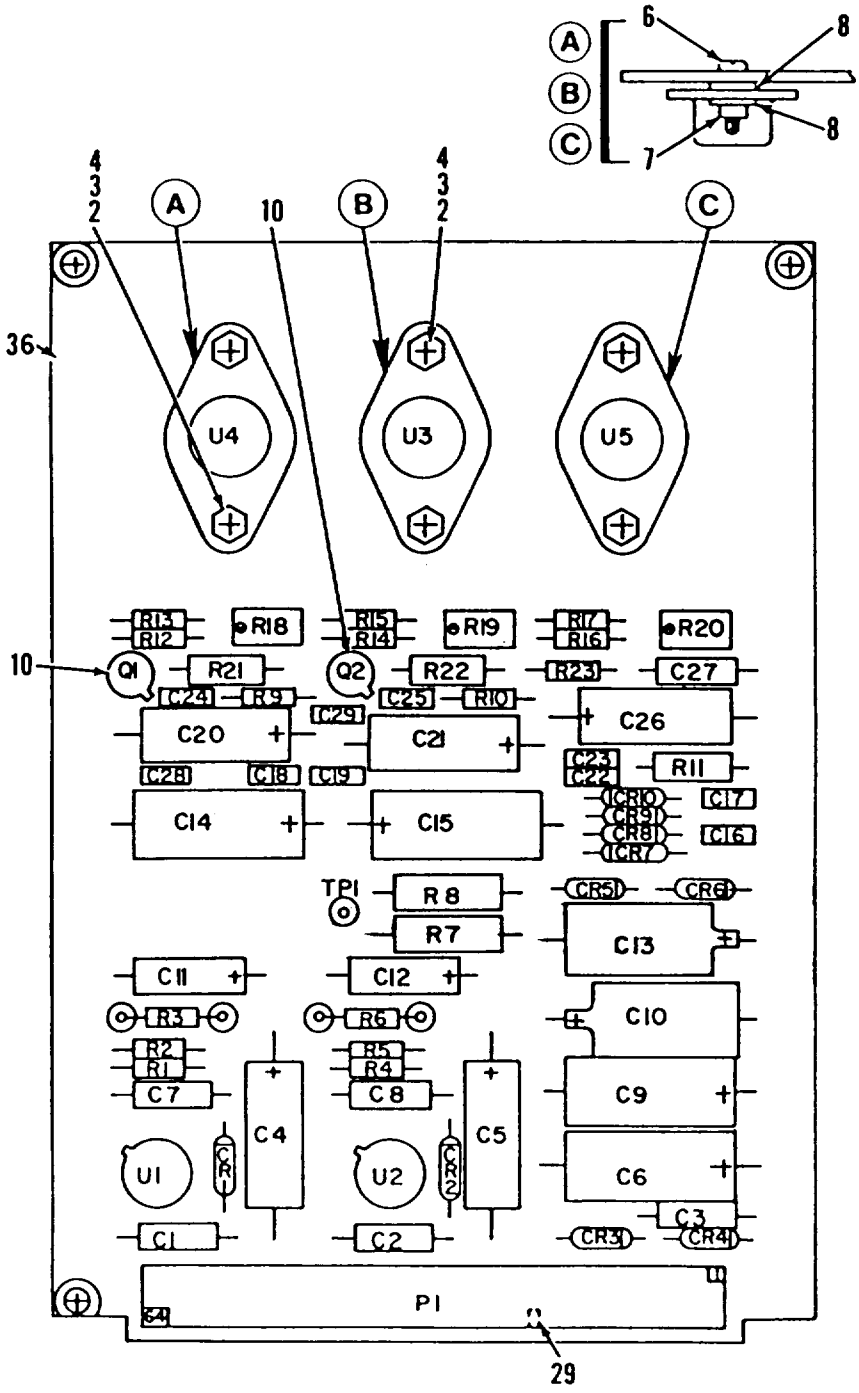


Figure *C-4*. Simulator - Exploded View (Sheet 3 of 3)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-4	65	PAFZZ	5930-00-105-5551	95146	MS35059-27	SWITCH,TOGGLE	EA	1
C-4	66	PAOZZ	5920-00-280-4960	75915	312002	FUSE,3AG,(FAST BLO)	EA	1
C-4	67	PAOZZ	5920-00-557-5033	71400	ABC8	FUSE	EA	2
C-4	68	PAFZZ	5920-00-556-0144	81349	FHN20G	FUSEHOLDER	EA	3
C-4	69	PAFZZ	5935-00-039-5219	03902	930-176-101	JACK (RED)	EA	1
C-4	70	XDFZZ		03902	930-176-100	JACK (BLACK)	EA	1
C-4	71	PAFZZ	5935-01-061-9237	96906	MS3472L22-55P	CONNECTOR,RECEPTACLE, ELECTRICAL	EA	2
C-4	72	PAFZZ	5999-01-059-2243	17419	0641-14-2001	CONTACT PIN, ELECTRICAL,CHROMEL	EA	2
C-4	73	PAFZZ	5999-01-058-8965	17419	0641-15-2001	CONTACT PIN,ELECTRICAL, CHROMEL	EA	2
C-4	74	PAFZZ	5305-00-054-6652	96906	MS51957-28	SCREW,MACHINE	EA	8
C-4	75	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	8
C-4	76	PAFZZ	5935-00-518-3458	96906	MS3472L22-55P	CONNECTOR, RECEPTACLE,ELECTRICAL	EA	1
C-4	77	PAFZZ	5305-00-054-6652	96906	MS51957-28	SCREW,MACHINE	EA	3
C-4	78	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	4
C-4	79	PAFZZ	5935-00-823-0986	77820	10-101960-225	CAP,RECEPTACLE PROTECTION	EA	1
C-4	80	PAFZZ	5305-00-054-6653	96906	MS51957-29	SCREW,MACHINE	EA	1
C-4	81	PAFZZ	5935-01-012-4000	96906	MS3417-20N	CLAMP,STRAIN-REFIEF	EA	1
C-4	82	PAFZZ		16428	8453	CABLE,UNSHIELDED	EA	2
C-4	83	PAFZZ		28520	SB-375-4	BUSHING,SNAP	EA	2
C-4	84	PAFZZ		22421	TY-51M	MARKER,PLATE	EA	2
C-4	85	XDFZZ	5935-01-070-7469	96906	MS3456L20-4P	CONNECTOR,PLUG ELECTRICAL	EA	1
C-4	86	XDFZZ	5935-00-528-9302	96906	MS3417-16W	CLAMP,STRAIN-RELIEF	EA	1
C-4	87	PAFZZ	5935-01-117-0512	96906	MS3456L16-11P	CONNECTOR,PLUG ELECTRICAL	EA	1
C-4	88	PAFZZ		90073	628-354345-000	PLATE,RETAINER	EA	2
C-4	89	PAFZZ	5305-00-066-7328	96906	MS24693C27	SCREW,MACHINE	EA	4
C-4	90	XDFZZ		90073	734-109096-001	SPACER,TUBULAR	EA	4
C-4	91	PAFZZ	5310-00-878-7328	96906	MS21043-06	NUT,SELF-LOCKING	EA	4
C-4	92	XDFZZ		90073	666-131065-009	TERMINAL STRIP	EA	2
C-4	93	PAFZZ	5310-00-054-6651	96906	MS51957-27	SCREW,MACHINE	EA	2
C-4	94	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	2
C-4	95	XDFZZ		90073	624-354093-000	PLATE,IDENTIFICATION	EA	1
C-4	96	XDFZZ		90073	624-459669-000	PANNEL,FRONT,MARKING	EA	1
C-4	97	PAFZZ	5305-00-940-9442	80205	NAS1635-00-2	SCREW,MACHINE	EA	4
C-4	98	XDFZZ		90073	626-459667-000	PLATE,FRONT,SUBASSEMBLY	EA	1



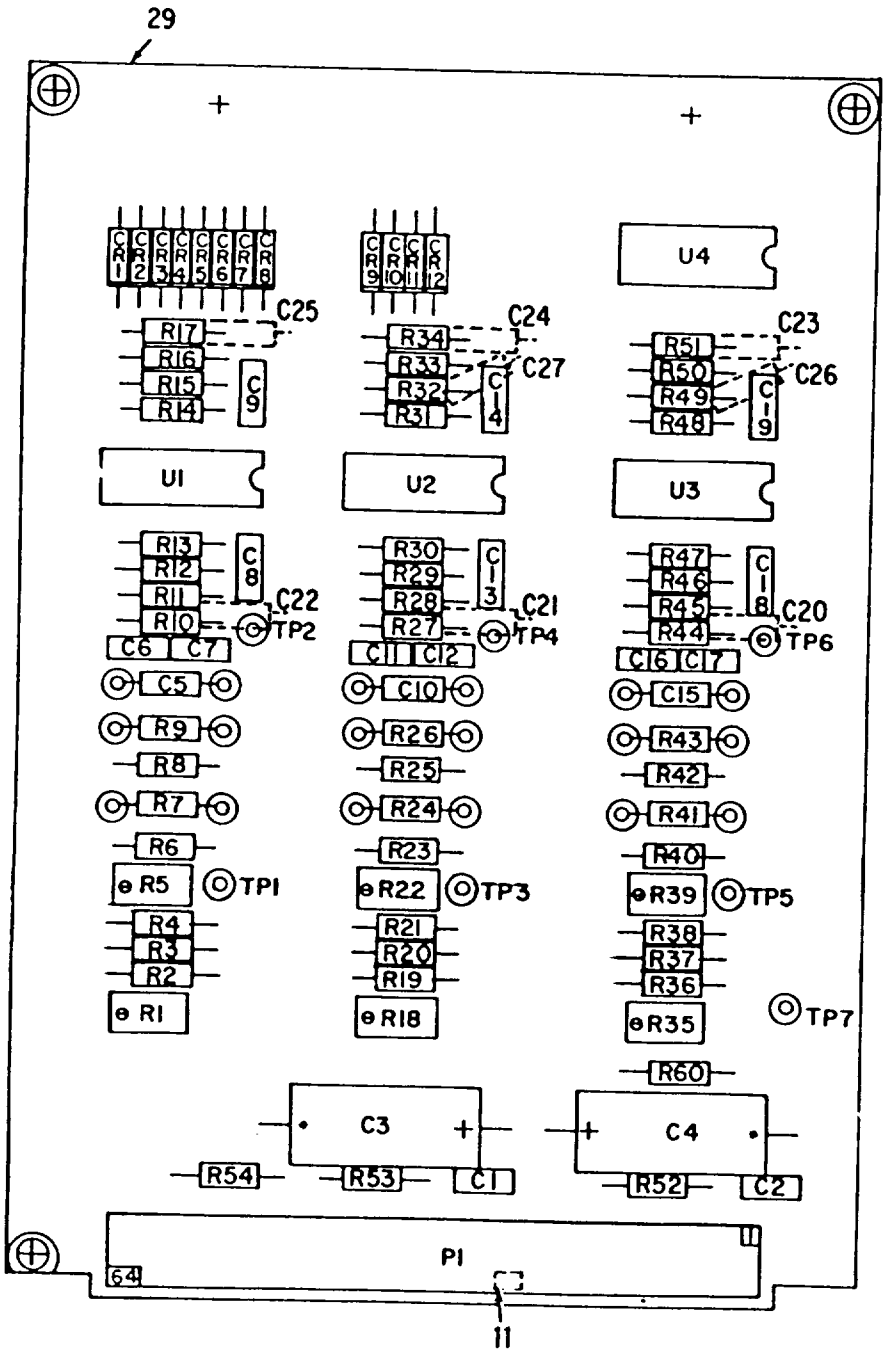
(KEYING PLUG IN SOCKET 10)

REF DES	INDEX NO.	REF DES	INDEX NO.
CR1	26	C26	17
CR2	26	C27	16
CR3	26	C28	18
CR4	26	C29	18
CR5	21	P1	27
CR6	21	Q1	10
CR7	20	Q2	10
CR8	20	R1	31
CR9	20	R2	32
CR10	20	R3	33
C1	16	R4	31
C2	16	R5	32
C3	16	R6	33
C4	28	R7	23
C5	28	R8	23
C6	24	R9	35
C7	16	R10	35
C8	16	R11	14
C9	24	R12	13
C10	22	R13	12
C11	25	R14	13
C12	25	R15	12
C13	22	R16	13
C14	34	R17	12
C15	34	R18	9
C16	16	R19	9
C17	16	R20	9
C18	16	R21	14
C19	16	R22	14
C20	17	R23	15
C21	17	U1	30
C22	19	U2	30
C23	18	U3	1
C24	18	U4	1
C25	18	U5	5

S E9416 (B)

Figure *C-5*. Power Supply Card

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-5		PFBFFF	5999-01-116-2636	90073	220-419918-000	POWER SUPPLY CARD (SEE FIGURE C-4 FOR NGA)	REF	REF
C-5	1	XAFZZ		04713	MC1569R	INTEGRATED CKT,LINEAR, VOLTAGE REGULATOR	EA	2
C-5	2	PAFZZ	5305-00-054-6652	96906	MS51957-28	SCREW,MACHINE	EA	4
C-5	3	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	4
C-5	4	PAFZZ	5310-00-878-3291	80205	NAS620C6	WASHER,FLAT	EA	8
C-5	5	PAFZZ	5962-00-451-5843	04713	MC1563R	INTERGRATED CKT,LINEAR, VOLTAGE REGULATOR	EA	1
C-5	6	PAFZZ	5305-00-054-6652	96906	MS51957-28	SCREW,MACHINE	EA	2
C-5	7	PAFZZ	5310-00-878-3291	96906	MS21043-06	NUT,SELF-LOCKING	EA	2
C-5	8	PAFZZ	5310-00-878-7624	80205	NAS620C6	WASHER,FLAT	EA	4
C-5	9	PAFZZ	5905-00-931-2025	81349	RT24C2W102	RESISTOR,VARIABLE	EA	3
C-5	10	PAFZZ	5961-00-951-8757	81349	JAN2N2222A	TRANSISTOR	EA	2
C-5	11	PAFZZ	5970-01-116-2637	90073	606-202049-000	INSULATOR DISK	EA	2
C-5	12	PAFZZ	5305-01-469-4697	81349	RN55E1692B	RESISTOR,FIXED,FILM	EA	3
C-5	13	PAFZZ	5905-00-982-0932	81349	RN55C6811F	RESISTOR,FIXED,FILM	EA	3
C-5	14	PAFZZ	5905-00-104-5755	81349	RCR20G100JS	RESISTOR,FIXED,COMPOSITION	EA	3
C-5	15	PAFZZ	5905-00-116-8556	81349	RCR07G223JS	RESISTOR,FIXED,COMPOSITION	EA	3
C-5	16	PAFZZ	5910-00-111-4811	81349	CK05BX103K	CAPACITOR,FIXED,CERAMIC	EA	10
C-5	17	PAFZZ	5910-00-236-8766	81349	M39003/01-2374	CAPACITOR,FIXED, ELECTROLYTRIC	EA	3
C-5	18	PAFZZ	5910-00-893-6745	81349	CK05BX102K	CAPACITOR,FIXED,CERAMIC	EA	5
C-5	19	PAFZZ	5910-00-113-7672	81349	CK05BX104K	CAPACITOR,FIXED,CERAMIC	EA	1
C-5	20	PAFZZ	5961-00-723-3602	81349	1N4004	SEMICONDUCTOR DEVICE, DIODE,RECTIFIER	EA	4
C-5	21	PAFZZ	5961-00-022-7632	04713	1N4744A	SEMICONDUCTOR DEVICE, DIODE,ZENER	EA	2
C-5	22	PAFZZ	5910-01-117-8139	90073	211-469009-105	CAPACITOR,FIXED,NON-SOLD ELECTRICAL,TANTALLUM	EA	2
C-5	23	PAFZZ	5305-00-931-1587	81349	RW81U5110F	RESISTOR,FIXED,COMPOSITION	EA	2
C-5	24	PAFZZ	5910-00-236-8767	81349	M39003/01-2380	CAPACITOR,FIXED, ELECTROLYTRIC	EA	2
C-5	25	PAFZZ	5910-00-144-4381	81349	M39003/01-2304	CAPACITOR,FIXED, ELECTROLYTRIC	EA	2
C-5	26	PAFZZ	5961-00-985-4900	81349	JAN1N647	SEMICONDUCTOR DEVICE, DIODE,RECTIFIER	EA	4
C-5	27	PAFZZ	5935-00-131-1261	00779	2-85930-6	CONNECTOR,RECEPTACLE, ELECTRICAL	EA	1
C-5	28	PAFZZ	5910-00-144-4383	81349	M39003/01-2306	CAPACITOR,FIXED, ELECTROLYTRIC	EA	2
C-5	29	PAFZZ	5935-00-426-3083	00779	86286-1	KEYING PLUG	EA	1
C-5	30	PAFZZ	5962-00-486-6059	27014	LM105H	INTERGRATED CKT,LINEAR, VOLTAGE REGULATOR	EA	2
C-5	31	PAFZZ	5905-00-107-0656	81349	RCR20G100JS	RESISTOR,FIXED,COMPOSITION	EA	2
C-5	32	PAFZZ	5905-00-904-4400	81349	RN55C5901F	RESISTOR,FIXED,FILM	EA	2
C-5	33	XAFZZ		81349	RN55C2491E THROUGH RN55C2481F	RESISTOR,FIXED,FILM SELECT ON TEST	EA	2
C-5	34	XDFZZ		90073	211-469009-111	CAPACITOR,FIXED,NON-SOLID ELECTRICAL,TANTALUM	EA	2
C-5	35	PAFZZ	5905-00-105-7764	81349	RCR07G222JS	RESISTOR,FIXED,COMPOSITION	EA	2
C-5	36	XAFZZ		90073	636-419917-000	PRINTED WIRING BOARD	EA	1



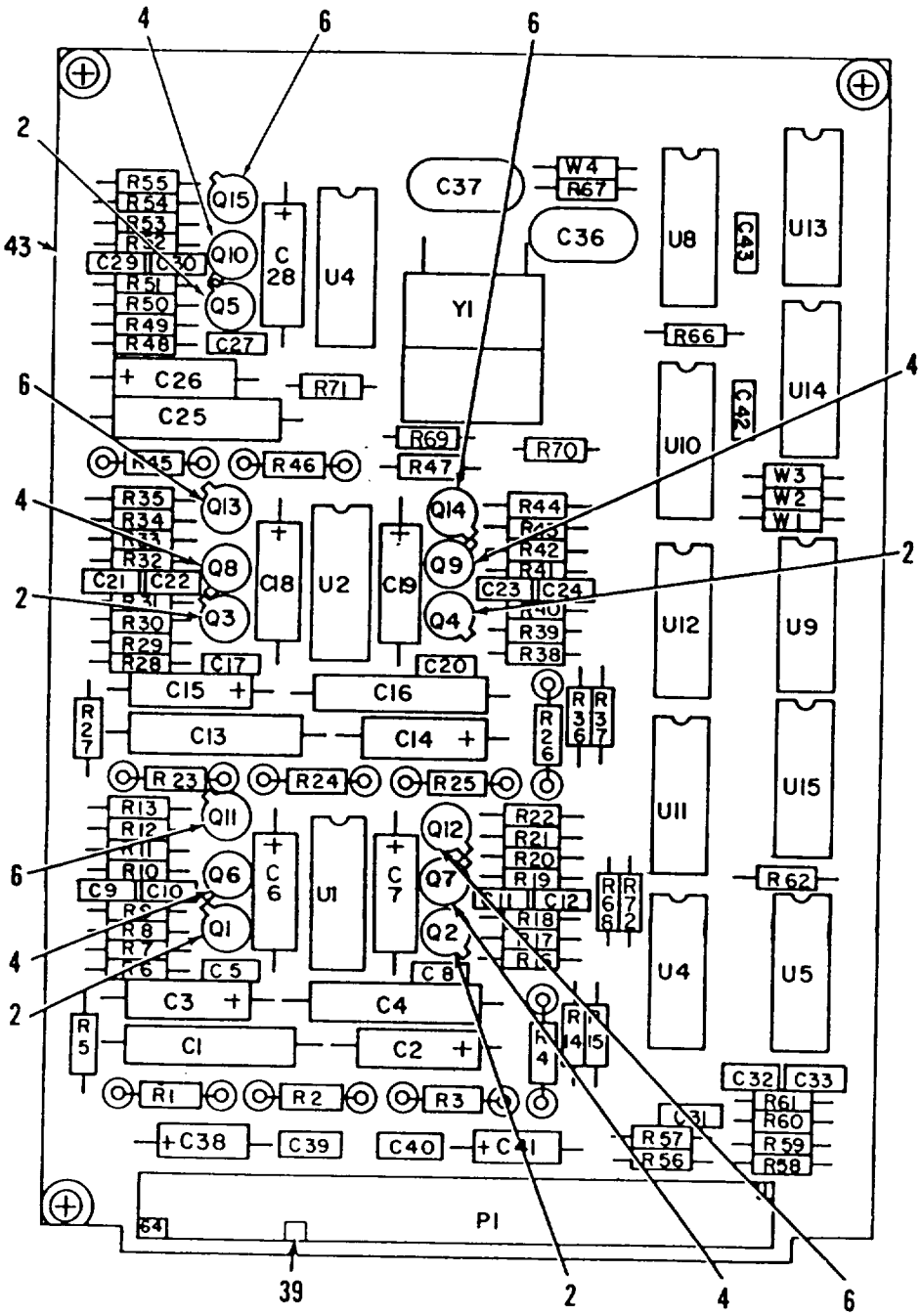
(KEYING PLUG IN SOCKET 26)

REF DES	INDEX NO.	REF DES	INDEX NO.
CR1	13	R11	16
CR2	13	R12	16
CR3	13	R13	4
CR4	13	R14	4
CR5	13	R15	15
CR6	13	R16	14
CR7	13	R17	14
CR8	13	R18	9
CR9	13	R19	22
CR10	13	R20	22
CR11	13	R21	21
CR12	13	R22	8
C1	1	R23	25
C2	1	R24	7
C3	10	R25	19
C4	10	R26	7
C5	18	R27	17
C6	6	R28	16
C7	5	R29	16
C8	1	R30	4
C9	1	R31	4
C10	18	R32	15
C11	6	R33	14
C12	5	R34	14
C13	1	R35	9
C14	1	R36	22
C15	18	R37	22
C16	6	R38	21
C17	5	R39	8
C18	1	R40	20
C19	1	R41	7
C20	26	R42	19
C21	26	R43	7
C22	26	R44	17
C23	27	R45	16
C24	27	R46	16
C25	27	R47	4
C26	28	R48	4
C27	28	R49	15
P1	12	R50	14
R1	9	R51	14
R2	22	R52	24
R3	22	R53	24
R4	21	R54	24
R5	8	R60	23
R6	25	U1	2
R7	7	U2	2
R8	19	U3	2
R9	7	U4	3
R10	17		

S 69469 (B)

Figure *C-6*. Oil Pressure Simulator Card

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-6		PBFFF	5999-01-116-2633	90073	220-419920-000	OIL PRESSURE SIMULATOR CARD (SEE FIGURE C-4 FOR NHA)	REF	REF
C-6	1	PAFZZ	5910-00-113-7672	81349	CK05BX104K	CAPACITOR,FIXED,CERAMIC, DIELECTRIC	EA	8
C-6	2	PAFZZ	5962-01-091-4456	07263	UA747DM	INTERGRATED CKT,LINEAR, OPERATIONAL AMP,DUAL FREQ COMP	EA	3
C-6	3	PAFZZ	5962-01-113-6179	81349	M28510/05802BCB	INTERGRATED CKT,CMOS, QUAD,BILATERAL SWITCH	EA	1
C-6	4	PAFZZ	5905-00-284-8928	81349	RN55E5002B	RESISTOR,FIXED,FILM	EA	6
C-6	5	PAFZZ	5910-01-058-9590	81349	CM05ED240J03	CAPACITOR,FIXED, MICA DIELECTRIC	EA	3
C-6	6	PAFZZ	5910-00-702-8057	81349	CM05FD331F03	CAPACITOR,FIXED, MICA DIELECTRIC	EA	3
C-6	7	XAFZZ		81349	RN55E1001B THROUGH RN55E7871B	RESISTOR,FIXED,FILM SELECT ON TEST	EA	6
C-6	8	PAFZZ	5905-00-412-3622	81349	RJ24C2W203	RESISTOR,VARIABLE	EA	3
C-6	9	PAFZZ	5905-01-037-9673	81349	RJ24FW503	RESISTOR,VARIABLE	EA	3
C-6	10	PAFZZ	5910-00-236-8767	81349	M39003/01-2380	CAPACITOR,FIXED, ELECTROLYTRIC	EA	2
C-6	11	PAFZZ	5935-00-426-3083	00779	86286-1	KEYING PLUG	EA	1
C-6	12	PAFZZ	5935-00-131-1261	00779	2-85930-6	CONNECTOR,RECEPTACLE, ELECTRICAL	EA	1
C-6	13	PAFZZ	5961-00-938-1135	81349	JAN1N4148	SEMICONDUCTOR DEVICE, DIODE SWITCHING	EA	12
C-6	14	PAFZZ	5905-01-072-5266	81349	RN55E4002B	RESISTOR,FIXED,FILM	EA	6
C-6	15	PAFZZ	5905-00-228-5510	81349	RN55E2002B	RESISTOR,FIXED,FILM	EA	3
C-6	16	PAFZZ	5905-00-943-6449	81349	RN55E1003F	RESISTOR,FIXED,FILM	EA	6
C-6	17	PAFZZ	5905-00-263-0895	81349	RN55C4992F	RESISTOR,FIXED,FILM	EA	3
C-6	18	XAFZZ		81349	CM04CD100D03 THROUGH CM04FD101F03	CAPACITOR,FIXED,MICA DIELECTRIC,SELECT ON TEST	EA	3
C-6	19	PAFZZ	5905-00-982-8296	81349	RN55C2742F	RESISTOR,FIXED,FILM	EA	3
C-6	20	PAFZZ	5905-00-468-3019	81349	RN55C6191F	RESISTOR,FIXED,FILM	EA	1
C-6	21	PAFZZ	5905-00-982-0214	81349	RN55E1502F	RESISTOR,FIXED,FILM	EA	3
C-6	22	PAFZZ	5905-00-982-0198	81349	RN55C1003F	RESISTOR,FIXED,FILM	EA	6
C-6	23	PAFZZ	5905-00-043-1338	81349	RW80U2150F	RESISTOR,FIXED,WW	EA	1
C-6	24	PAFZZ	5905-00-116-8556	81349	RCR07G223JS	RESISTOR,FIXED,COMPOSITION	EA	3
C-6	25	PAFZZ	5905-00-934-2868	81349	RN55C9761F	RESISTOR,FIXED,FILM	EA	2
C-6	26	PAFZZ	5910-00-113-5488	81349	CKR11BX103KL	CAPACITOR,FIXED,CERAMIC, DIELECTRIC	EA	3
C-6	27	PAFZZ	5910-00-010-9166	81349	M39014/05-2207	CAPACITOR,FIXED,CERAMIC, DIELECTRIC	EA	3
C-6	28	PAFZZ	5910-00-098-9281	81349	CK12BX102K	CAPACITOR,FIXED,CERAMIC, DIELECTRIC	EA	2
C-6	29	XAFZZ		90073	636-419919-000	PRINTED WIRING BOARD	EA	1



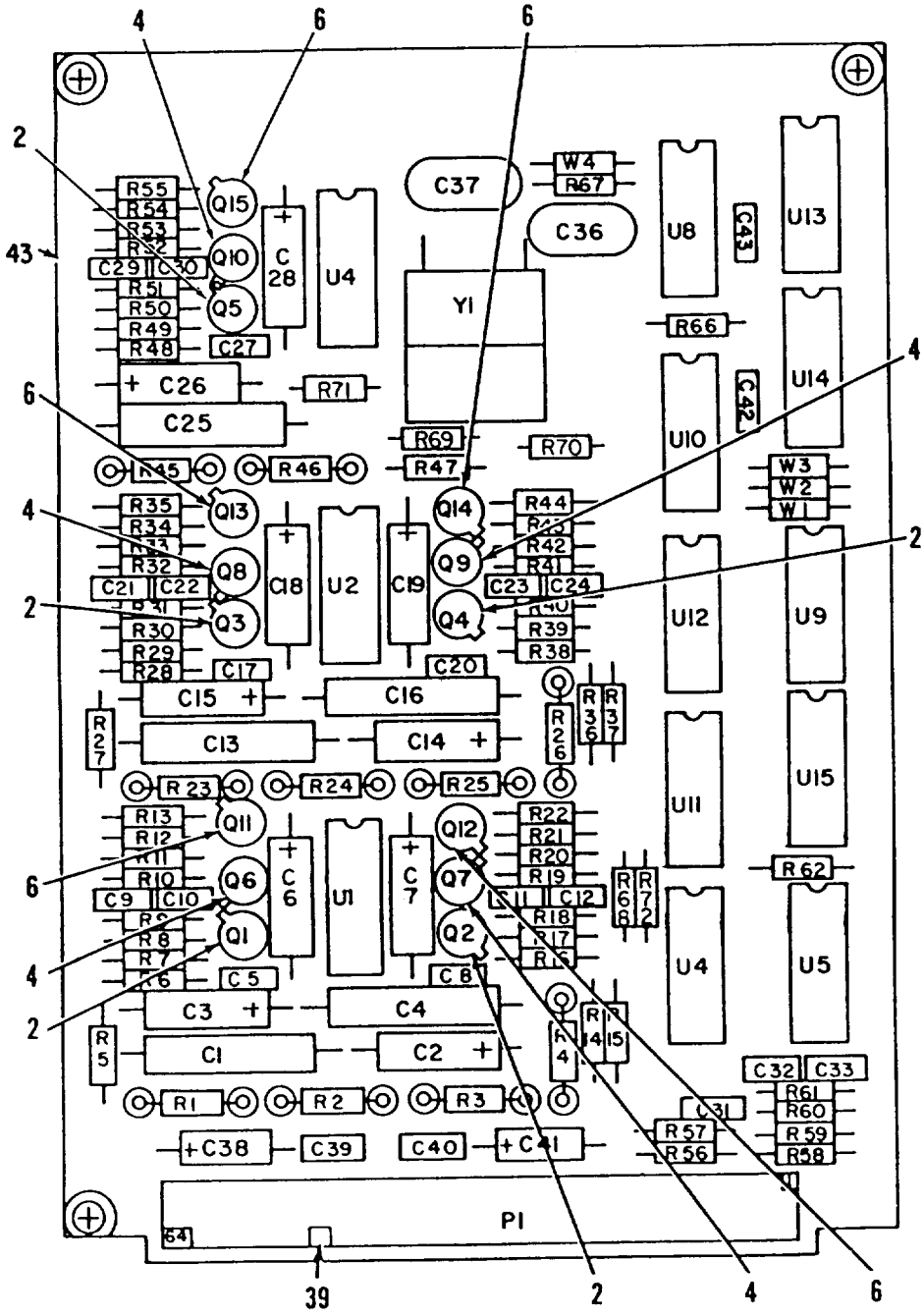
(KEYING PLUG IN SOCKET 42)

REF DES	INDEX NO.	REF DES	INDEX NO.
C1	27	C31	15
C2	22	C32	15
C3	22	C33	15
C4	26	C36	13
C5	19	C37	9
C6	7	C38	7
C7	7	C39	15
C8	19	C40	15
C9	40	C41	7
C10	18	C42	15
C11	18	C43	15
C12	18	P1	38
C13	26	Q1	1
C14	22	Q2	1
C15	22	Q3	1
C16	20	Q4	1
C17	19	Q5	1
C18	7	Q6	3
C19	7	Q7	3
C20	19	Q8	3
C21	18	Q9	3
C22	18	Q10	3
C23	18	Q11	5
C24	18	Q12	5
C25	20	Q13	5
C26	22	Q14	5
C27	19	Q15	5
C28	7	R1	21
C29	18	R2	21
C30	18	R3	21

(TABLE CONTINUED ON SHEET 2)

S 69418.1 (B)

Figure C-7. Frequency Input Simulator Card (Sheet 1 of 2)



(KEYING PLUG IN SOCKET 42)

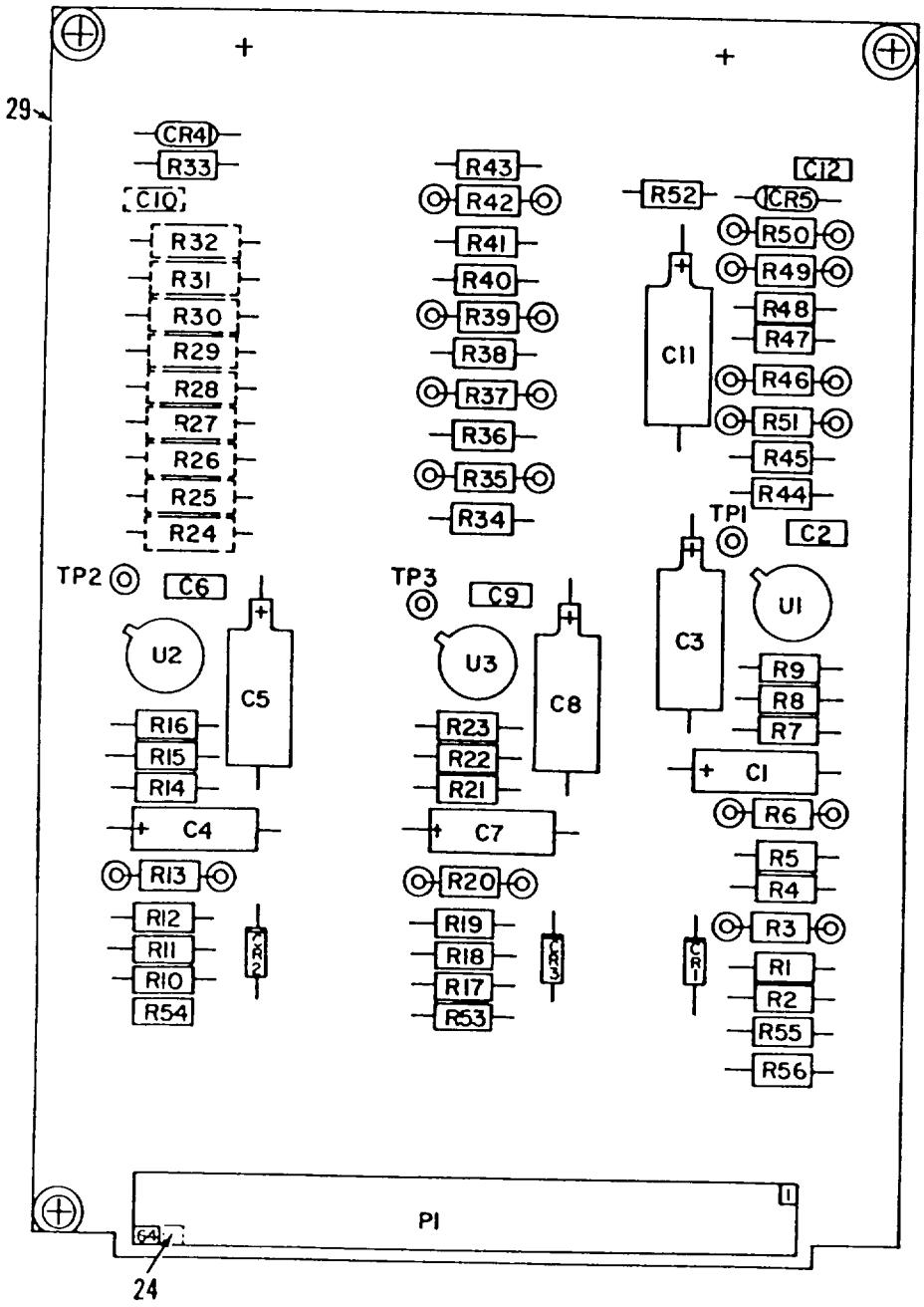
REF DES	INDEX NO.	REF DES	INDEX NO.
R4	21	R46	21
R5	33	R47	33
R6	35	R48	35
R7	32	R49	32
R8	34	R50	34
R9	31	R51	31
R10	41	R52	30
R11	29	R53	29
R12	32	R54	32
R13	28	R55	28
R14	37	R56	25
R15	35	R57	36
R16	32	R58	24
R17	34	R59	36
R18	31	R60	23
R19	30	R61	36
R20	29	R62	28
R21	32	R66	16
R22	28	R67	12
R23	21	R68	42
R24	21	R69	42
R25	21	R70	42
R26	21	R71	42
R27	37	R72	42
R28	35	U1	8
R29	32	U2	8
R30	34	U3	8
R31	31	U4	8
R32	30	U5	8
R33	29	U8	14
R34	32	U9	14
R35	28	U10	17
R36	33	U11	17
R37	35	U12	17
R38	32	U13	17
R39	34	U14	17
R40	31	U15	17
R41	30	W1	11
R42	29	W2	11
R43	32	W3	11
R44	28	W4	11
R45	21	Y1	10

W = WIRE JUMPER
Y = CRYSTAL

S 69418 2 (B)

Figure C-7. Frequency Input Simulator Card (Sheet 2 of 2)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-7		PBFFF	5999-01-116-2639	90073	220-419920-000	FREQUENCY INPUT SIMULATOR CARD(SEE FIGURE C-4 FOR NHA)	REF	REF
C-7	1	PAFZZ	5961-00-925-3777	81349	JAN2N2907A	TRANSISTOR	EA	5
C-7	2	PAFZZ	5970-01-091-8535	90073	606-202049-000	INSULATOR DISK	EA	5
C-7	3	PAFZZ	5961-00-761-4504	81349	JAN2N54949	TRANSISTOR	EA	5
C-7	4	PAFZZ	5970-01-091-8535	90073	606-202049-000	INSULATOR DISK	EA	5
C-7	5	PAFZZ	5961-00-951-8757	81349	JAN2N2222A	TRANSISTOR,SWITCHING, NPN,SILICON	EA	5
C-7	6	PAFZZ	5970-01-091-8535	90073	606-202049-000	INSULATOR DISK	EA	5
C-7	7	PAFZZ	5910-00-997-4079	81349	M39003/01-2271	CAPACITOR,FIXED, ELECTROLYTRIC	EA	7
C-7	8	PAFZZ	5962-01-109-9231	14933	7901101CB	INTERGRATED CKT,CMOS, DUAL-D FLIP-FLOP W/RESET	EA	5
C-7	9	PAFZZ	5910-01-061-3210	81349	CM05ED560F03	CAPACITOR,FIXED, MICA DIELECTRIC	EA	1
C-7	10	PAFZZ	5955-00-079-5733	81349	CR-65/U25.954160MHZ	CRYSTAL,UNIT,QUARTZ	EA	1
C-7	11	PAFZZ	6680-01-182-4139	90073	267-200199-000	JUMPER,CIRCUIT	EA	4
C-7	12	PAFZZ	5905-00-121-9919	81349	RCR07G106JS	RESISTOR,FIXED,COMPOSITION	EA	1
C-7	13	PAFZZ	5910-00-497-9194	81349	CM05FD201F03	CAPACITOR,FIXED, MICA DIELECTRIC	EA	1
C-7	14	PAFZZ	5462-01-164-5092	81349	M38510/05252BCB	INTERGRATED CKT,CMOS,QUAD, 2-INP NOR GATE	EA	2
C-7	15	PAFZZ	5910-00-113-7622	81349	CK05BX104K	CAPACITOR,FIXED,CERAMIC DIELECTRIC	EA	7
C-7	16	PAFZZ	5905-00-982-0476	81349	RN55C2001F	RESISTOR,FIXED,FILM	EA	1
C-7	17	PAFZZ	5462-01-003-2226	04713	MC14029BAL	INTERGRATED CKT,CMOS, BINARY,OR BDC DECADE COUNTER	EA	6
C-7	18	PAFZZ	5910-00-113-7671	81349	CK05BX473K	CAPACITOR,FIXED,CERAMIC DIELECTRIC	EA	9
C-7	19	PAFZZ	5910-00-111-4811	81349	CK05BX103K	CAPACITOR,FIXED,CERAMIC DIELECTRIC	EA	5
C-7	20	PAFZZ	5905-00-981-2649	81349	RN55C1021F	RESISTOR,FIXED,FILM	EA	1
C-7	21	XADZZ		81349	RN55C4990F THROUGH RN55C7871F	RESISTOR,FIXED,FILM, SELECT ON TEST	EA	10
C-7	22	PAFZZ	5910-00-144-4381	81349	M39003/01-2304	CAPACITOR,FIXED,FILM	EA	5
C-7	23	XAFZZ	5905-00-981-2649	81349	RN55C1021F	RESISTOR,FIXED,FILM	EA	1
C-7	24	PAFZZ	5905-00-975-1647	81349	RN55C1152F	RESISTOR,FIXED,FILM	EA	1
C-7	25	PAFZZ	5905-00-945-5146	81349	RN55C1331F	RESISTOR,FIXED,FILM	EA	1
C-7	26	PAFZZ	5910-00-058-9682	81349	M83421/01-6113M	CAPACITOR,FIXED,FILM	EA	2
C-7	27	PAFZZ	5910-00-071-7399	81349	CM05FD152F03	CAPACITOR,FIXED, MICA DIELECTRIC	EA	1
C-7	28	PAFZZ	5905-00-106-3666	81349	RCR07G103JS	RESISTOR,FIXED,COMPOSITION	EA	6
C-7	29	PAFZZ	5905-00-135-3073	81349	RCR07G221JS	RESISTOR,FIXED,COMPOSITION	EA	5
C-7	30	PAFZZ	5905-00-982-0466	81349	RN55C1000F	RESISTOR,FIXED,FILM	EA	4
C-7	31	PAFZZ	5905-00-982-0209	81349	RN55C4750F	RESISTOR,FIXED,FILM	EA	5
C-7	32	PAFZZ	5905-00-107-0656	81349	RCR07G100JS	RESISTOR,FIXED,COMPOSITION	EA	10
C-7	33	PAFZZ	5905-00-088-2726	81349	RN55C2492F	RESISTOR,FIXED,FILM	EA	3
C-7	34	PAFZZ	5905-00-410-1577	81349	RN55C2211F	RESISTOR,FIXED,FILM	EA	5
C-7	35	PAFZZ	5905-00-114-0711	81349	RCR07G472JS	RESISTOR,FIXED,FILM	EA	5
C-7	36	PAFZZ	5905-00-982-0928	81349	RN55C9091F	RESISTOR,FIXED,FILM	EA	3
C-7	37	PAFZZ	5905-00-982-0933	81349	RN55C1302F	RESISTOR,FIXED,FILM	EA	2
C-7	38	PAFZZ	5935-00-131-1261	00779	2-85930-6	CONNECTOR,RECEPTACLE, ELECTRICAL	EA	1
C-7	39	PAFZZ	5935-00-426-3083	00779	86286-1	KEYING PLUG	EA	1
C-7	40	PAFZZ	5910-00-096-5160	81349	M39014/01-1359	CAPACITOR,FIXED,CERAMIC DIELECTRIC	EA	1
C-7	41	PAFZZ	5905-00-135-6045	81349	RCR07G330JS	RESISTOR,FIXED,COMPOSITION	EA	1
C-7	42	PAFZZ	5905-00-116-8556	81349	RCR07G22JS	RESISTOR,FIXED,COMPOSITION	EA	5
C-7	43	XAFZZ		90073	636-419921-000	PRINTED WIRING BOARD	EA	1



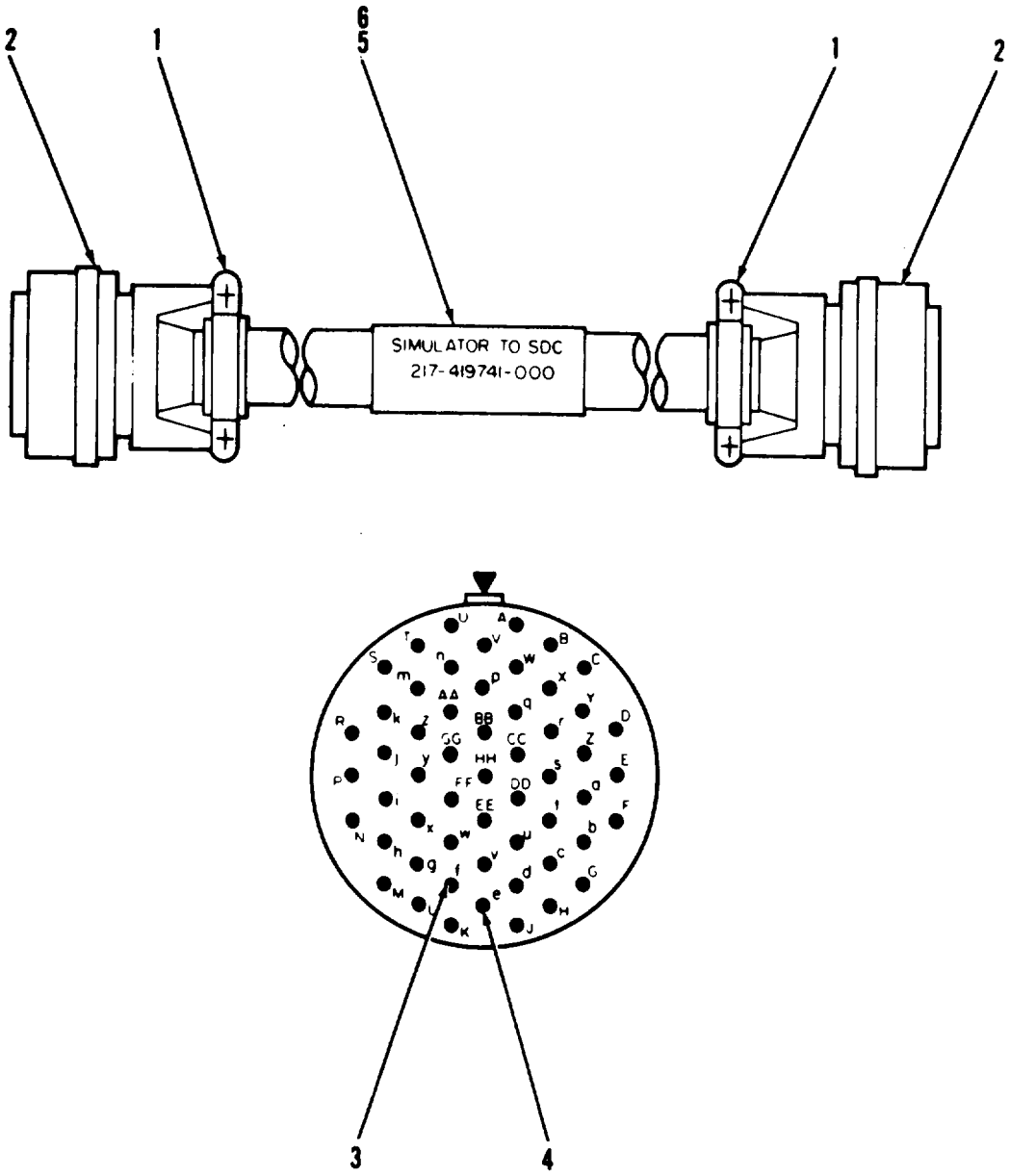
(KEYING PLUG IN SOCKET 62)

REF DES	INDEX NO.	REF DES	INDEX NO.
CR1	22	R18	27
CR2	22	R19	28
CR3	22	R20	4
CR4	2	R21	18
CR5	10	R22	17
C1	19	R23	16
C2	14	R33	1
C3	9	R34	3
C4	19	R35	4
C5	9	R36	7
C6	14	R37	4
C7	19	R38	6
C8	9	R39	4
C9	14	R40	5
C11	9	R41	6
C12	11	R42	4
P1	23	R43	5
R1	21	R44	13
R2	20	R45	12
R3	4	R46	4
R4	21	R47	13
R5	20	R48	12
R6	4	R49	4
R7	18	R50	4
R8	17	R51	4
R9	16	R52	8
R10	26	R53	25
R11	27	R54	25
R12	28	R55	20
R13	4	R56	20
R14	18	U1	15
R15	17	U2	15
R16	16	U3	15
R17	26		

S 69419 (B)

Figure *C-8*. DC Input Simulator Card

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-8		PBFFF	5999-01-116-2638	90073	220-419924-000	DC INPUT SIMULATOR CARD (SEE FIGURE C-4 FOR NHA)	REF	REF
C-8	1	PAFZZ	5905-00-105-7764	81349	RCR07G222JS	RESISTOR,FIXED,COMPOSITION	EA	1
C-8	2	PAFZZ	5961-00-938-2310	81349	JAN1N752A	SEMICONDUCTOR DEVICE, DIODE	EA	1
C-8	3	PAFZZ	5905-00-975-1642	81349	RN55C90R9F	RESISTOR,FIXED,FILM	EA	1
C-8	4	XADZZ	5905-00-412-0772	81349	RN55C49R9F THROUGH RN55C1052F	RESISTOR,FIXED,FILM, SELECT ON TEST	EA	12
C-8	5	PAFZZ	5905-00-903-5706	81349	RN55C81R6F	RESISTOR,FIXED,FILM	EA	2
C-8	6	PAFZZ	5905-00-728-3276	81349	RN55E75R0B	RESISTOR,FIXED,FILM	EA	2
C-8	7	PAFZZ	5905-00-905-7711	81349	RN55C1670F	RESISTOR,FIXED,FILM	EA	1
C-8	8	PAFZZ	5905-00-982-0908	81349	RN55C5620F	RESISTOR,FIXED,FILM	EA	1
C-8	9	PAFZZ	5905-00-154-0547	81349	M39003-01-2312	CAPACITOR,FIXED, ELECTROLYTIC	EA	4
C-8	10	PAFZZ	5961-00-950-9887	81349	JAN1N827	SEMICONDUCTOR DEVICE, DIODE	EA	1
C-8	11	PAFZZ	5910-00-113-7672	81349	CK05BX104K	CAPACITOR,FIXED, MICA DIELECTRIC	EA	1
C-8	12	PAFZZ	5962-00-486-6059	27014	LM105H	INTERGRATED CKT,LINEAR, VOLTAGE REGULATOR	EA	2
C-8	13	PAFZZ	5905-00-480-4023	81349	RN55C1051F	RESISTOR,FIXED,FILM	EA	2
C-8	14	PAFZZ	5905-00-045-4225	81349	CM05ED470G03	CAPACITOR,FIXED,MICA	EA	3
C-8	15	PAFZZ	5962-00-486-6059	27014	LM105H	INTERGRATED CKT,LINEAR, VOLTAGE REGULATOR	EA	3
C-8	16	PAFZZ	5905-00-992-5347	81349	RN55C2151B	RESISTOR,FIXED,FILM	EA	3
C-8	17	PAFZZ	5905-00-992-5341	81349	RN55C1332B	RESISTOR,FIXED,FILM	EA	3
C-8	18	PAFZZ	5905-00-135-3972	81349	RCR07G200JS	RESISTOR,FIXED,COMPOSITION	EA	3
C-8	19	PAFZZ	5905-00-144-4381	81349	M39003-01-2304	CAPACITOR,FIXED, ELECTROLYTIC	EA	3
C-8	20	PAFZZ	5905-00-228-3510	81349	RN55E2002B	RESISTOR,FIXED,FILM	EA	4
C-8	21	PAFZZ	5905-00-403-4447	81349	RN55C2261F	RESISTOR,FIXED,FILM	EA	2
C-8	22	PAFZZ	5961-00-938-1135	81349	JAN1N4148	SEMICONDUCTOR DEVICE, DIODE	EA	3
C-8	23	PAFZZ	5935-00-131-1261	00779	2-85930-6	CONNECTOR,RECEPTACLE, ELECTRICAL 64-CONTACT	EA	1
C-8	24	PAFZZ	5935-00-426-3083	00779	86286-1	KEYING PLUG	EA	1
C-8	25	PAFZZ	5905-00-011-3377	81349	RN55C3400F	RESISTOR,FIXED,FILM	EA	2
C-8	26	PAFZZ	5905-00-982-0465	81349	RN55C49R9F	RESISTOR,FIXED,FILM	EA	2
C-8	27	PAFZZ	5905-00-984-1467	81349	RN55C2491F	RESISTOR,FIXED,FILM	EA	2
C-8	28	PAFZZ	5905-00-900-9670	81349	RN55C1581F	RESISTOR,FIXED,FILM	EA	2
C-8	29	XAFZZ		90073	636-419923-000	PRINTED WIRING BOARD	EA	1



S 69487 (B)

Figure *C-9*. Cable Assembly Simulator to SDC (217-419741-000)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
C-9		XDOZZ		90073	217-419741-000	CABLE ASSYMBLY (SEE FIGURE C-2 FOR NHA)	REF	REF
C-9	1	PAFZZ	5935-01-010-6222	96906	MS3417-22N	CLAMP,STRAIN-RELIEF	EA	2
C-9	2	PAFZZ	5935-00-728-6769	96906	MS3476L22-55S	CONNECTOR, PLUG, ELECTRICAL, 55-CONTACT	EA	2
C-9	3	PAFZZ	5999-01-091-1778	81349	M39029/102020C3	CONTACT SOCKET, ELECTRICAL, ALUMEL	EA	2
C-9	4	PAFZZ	5999-01-089-6567	81349	M39029/102020C4	CONTACT SOCKET, ELECTRICAL CAROMEL	EA	2
C-9	5	PAFZZ	9905-00-115-5035	59730	TC-226	MARKER PLATE	EA	1
C-9	6	PAFZZ	5975-01-727-5153	22421	TY23M	CLAMP CABLE, NYLON	EA	3

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5905-00-011-3377	C-8	25	5961-00-490-0318	C-7	3
5905-00-043-1338	C-6	23	5910-00-497-9194	C-7	13
5310-00-043-4708	C-3	14	5935-00-518-3458	C-4	76
5305-00-054-5638	C-3	5	5935-00-528-9302	C-4	86
5305-00-054-5638	C-4	24	6145-00-538-8445	C-4	82
5305-00-054-5648	C-4	12	5920-00-556-0144	C-4	68
5305-00-054-5648	C-4	15	5920-00-557-5033	C-4	67
5305-00-054-5648	C-4	36	6240-00-573-0629	C-4	43
5305-00-054-5651	C-4	18	5310-00-595-6211	C-4	13
5305-00-054-5651	C-4	27	5310-00-595-6211	C-4	19
5305-00-054-6651	C-3	12	5930-00-615-7882	C-4	59
5305-00-054-6651	C-4	2	5930-00-615-7883	C-4	62
5305-00-054-6651	C-4	30	5325-00-638-4301	C-3	9
5305-00-054-6651	C-4	33	5930-00-655-1582	C-4	65
5305-00-054-6651	C-4	39	5995-00-667-2722	C-7	10
5305-00-054-6651	C-4	93	5910-00-702-8057	-6	6
5305-00-054-6652	C-4	74	5935-00-716-2019	C-4	69
5305-00-054-6652	C-4	77	5935-00-716-2019	C-4	70
5305-00-054-6652	C-5	2	5961-00-723-3602	C-5	20
5305-00-054-6652	C-5	6	5310-00-725-8270	C-3	15
5305-00-054-6653	C-4	80	5310-00-727-0725	C-4	25
5305-00-054-6654	C-2	5	5305-00-727-8833	C-3	13
5305-00-054-6667	C-3	3	5905-00-728-3276	C-8	6
5910-00-061-3210	C-6	5	5905-00-728-6124	C-5	31
5910-00-061-3210	C-7	9	5905-00-728-6124	C-7	32
6210-00-064-2998	C-4	57	5905-00-728-6138	C-7	29
5305-00-066-7328	C-4	89	5905-00-728-6139	C-8	1
5910-00-071-7399	C-7	27	5905-00-728-6141	C-5	15
5905-00-078-7059	C-5	14	5905-00-728-6141	C-6	24
5905-00-088-2726	C-7	33	5935-00-728-6769	C-9	2
5930-00-105-5551	C-4	64	5905-00-734-1003	C-7	28
5930-00-105-8202	C-4	41	5905-00-734-1046	C-7	35
5910-00-111-4811	C-5	16	5905-00-734-2221	C-7	12
5910-00-111-4811	C-5	16	5961-00-752-6163	C-5	21
5910-00-111-4811	C-7	19	5310-77-773-7624	C-2	6
5910-00-113-7622	C-7	15	5310-00-773-7624	C-5	4
5910-00-113-7671	C-7	18	5310-00-773-7624	C-5	8
5910-00-113-7672	C-5	19	5340-00-792-0943	C-4	17
5910-00-113-7672	C-6	1	5905-00-813-5880	C-8	18
5910-00-113-7672	C-8	11	5935-00-823-0986	C-4	79
9905-00-115-5035	C-9	5	5935-00-828-1856	C-4	8
5935-00-131-1261	C-5	27	5310-00-878-3291	C-4	3
5935-00-131-1261	C-6	12	5310-00-878-3291	C-4	31
5935-00-131-1261	C-7	38	5310-00-878-3291	C-4	34
5935-00-131-1261	C-8	23	5310-00-878-3291	C-4	40
5355-00-133-2459	C-4	46	5310-00-878-3291	C-4	75
5355-00-133-2459	C-4	48	5310-00-878-3291	C-4	78
5355-00-133-2459	C-4	50	5310-00-878-3291	C-4	91
5355-00-133-2459	C-4	52	5310-00-878-3291	C-4	94
5355-00-133-2459	C-4	55	5310-00-878-3291	C-5	3
5910-00-144-4381	C-5	25	5310-00-878-3291	C-5	7
5910-00-144-4381	C-7	22	5310-00-878-3292	C-4	37
5910-00-144-4381	C-8	19	5910-00-893-6745	C-5	18
5910-00-144-4383	C-5	28	5905-00-900-9670	C-8	28
5910-00-154-0547	C-8	9	5905-00-903-5706	C-8	5
5325-00-171-4680	C-3	11	5905-00-904-4400	C-5	32
5905-00-228-3510	C-8	20	5905-00-905-7711	C-8	7
5905-00-228-5510	C-6	15	5961-00-925-3777	C-7	1
5905-00-236-0895	C-6	17	5305-00-929-6421	C-4	21
5910-00-236-8766	C-5	17	5905-00-931-2025	C-5	9
5910-00-236-8767	C-5	24	5310-00-933-8118	C-4	16
5910-00-236-8767	C-6	10	5905-00-934-2868	C-6	25
5920-00-280-4960	C-4	66	5961-00-938-1135	C-4	60
5325-00-282-8138	C-3	8	5961-00-938-1135	C-6	13
5905-00-284-8928	C-6	4	5961-00-938-1135	C-8	22
5310-00-405-9866	C-4	22	5305-00-940-9442	C-4	97
5905-00-410-1577	C-7	34	5905-00-943-6449	C-6	16
5905-00-412-0772	C-4	53	5905-00-945-5146	C-7	25
5905-00-412-3622	C-6	8	5961-00-950-9987	C-8	10
5935-00-426-3083	C-4	10	5961-00-951-8757	C-5	10
5935-00-426-3083	C-5	29	5961-00-951-8757	C-7	5
5935-00-426-3083	C-6	11	5905-00-946-0395	C-8	21
5935-00-426-3083	C-7	39	5905-00-975-1642	C-8	3
5935-00-426-3083	C-8	24	5905-00-975-1647	C-7	24
5962-00-451-5843	C-5	5	6210-00-978-2546	C-4	61
5905-00-468-3019	C-4	56	5905-00-981-2649	C-7	23
5905-00-468-3019	C-6	20	5905-00-982-0198	C-6	22
5905-00-469-4697	C-5	12	5905-00-982-0209	C-7	31
5930-00-471-4962	C-4	42	5905-00-982-0214	C-6	21
5905-00-483-6940	C-5	23	5905-00-982-0465	C-8	26
5962-00-486-6059	C-5	30	5905-00-982-0466	C-7	30
5962-00-486-6059	C-8	15	5905-00-982-0471	C-8	13

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5905-00-982-0476	C-7	16	5910-01-073-9879	C-7	20
5905-00-982-0476	C-8	12	6685-01-075-7866	C-4	28
5905-00-982-0908	C-8	8	6620-01-087-4361	C-4	26
5905-00-982-0928	C-7	36	5999-01-089-6567	C-9	4
5905-00-982-0932	C-5	13	5999-01-091-1778	C-9	3
5905-00-982-0933	C-7	37	5962-01-091-4456	C-6	2
5905-00-982-8296	C-6	19	5970-01-091-8535	C-5	11
5805-00-984-1467	C-8	27	5970-01-091-8535	C-7	2
5961-00-985-4900	C-5	26	5950-01-097-4883	C-4	23
5905-00-992-5341	C-8	17	4920-01-112-5906	C-2	
5905-00-992-5347	C-8	16	5962-01-113-6179	C-6	3
5961-00-995-2310	C-8	2	5999-01-116-2633	C-4	5
5910-00-997-4079	C-7	7	5999-01-116-2636	C-4	4
5935-01-010-6222	C-9	1	5999-01-116-2636	C-5	
5935-01-012-4000	C-4	81	5999-01-116-2637	C-4	11
4935-01-021-7254	C-7	8	5999-01-116-2638	C-4	7
4935-01-021-7255	C-7	14	5999-01-116-2539	C-4	6
5910-01-045-4225	C-8	14	5970-01-091-8535	C-7	4
5905-01-047-6842	C-4	63	5970-01-091-8535	C-7	6
5999-01-858-8965	C-4	73	5999-01-116-2633	C-6	
5910-01-058-9682	C-7	26	5999-01-116-2638	C-8	
5999-01-059-2243	C-4	72	5999-01-116-2639	C-7	
5935-01-061-9237	C-4	71	5935-01-117-0512	C-4	87
5999-01-063-1866	C-4	9	5910-01-117-8139	C-5	22
5930-01-068-5556	C-4	58	5962-01-136-6638	C-7	17
5935-01-070-7469	C-4	85	6680-01-182-4139	C-7	11
5905-01-072-5266	C-6	14	5975-01-727-5153	C-9	6

PART NUMBER INDEX

PART NUMBER	FSCM	FIGURE NO.	ITEM NO.	PART NUMBER	FSCM	FIGURE NO.	ITEM NO.
ABC8	71400	C-4	67	MC14029BAL	04713	C-7	17
AJ3-25	72794	C-3	8	MC1563R	04713	C-5	5
CD4001BF	02735	C-7	14	MPE-106F	95146	C-4	58
CD4013BF	02735	C-7	8	MPE-206R	95146	C-4	64
CD4029AF	02735	C-7	17	MS15795-803	96906	C-4	13
CD4066BF	02735	C-6	3	MS15795-803	96906	C-4	19
CK05BX102K	81349	C-5	18	MS21043-04	96906	C-4	37
CK05BX103K	81349	C-5	16	MS21043-06	96906	C-4	3
CK05BX103K	81349	C-7	19	MS21043-06	96906	C-4	31
CK05BX104K	81349	C-5	19	MS21043-06	96906	C-4	34
CK05BX104K	81349	C-6	1	MS21043-06	96906	C-4	40
CK05BX104K	81349	C-7	15	MS21043-06	96906	C-4	75
CK05BX104K	81349	C-8	11	MS21043-06	96906	C-4	78
CK05BX122K	81349	C-7	40	MS21043-06	96906	C-4	91
CK05BX473K	81349	C-7	18	MS21043-06	96906	C-4	94
CK12BX102K	81349	C-6	28	MS21043-06	96906	C-5	3
CK12BX103K	81349	C-6	26	MS21043-06	96905	C-5	7
CK12BX220K	81349	C-6	27	MS24693C27	96906	C-4	89
CM05ED240J03	81349	C-6	5	MS25068-21	96906	C-4	62
CM05ED470G03	81349	C-8	14	MS25446-5	96906	C-4	57
CM05ED560F03	81349	C-6	5	MS25446-6	96906	C-4	61
CM05ED560F03	81349	C-7	9	MS3417-16W	96906	C-4	86
CM05FD201F03	81349	C-7	13	MS3417-20N	96906	C-4	81
CM05FD331F03	81349	C-6	6	MS3417-22N	96906	C-9	1
CM06FD152F03	81349	C-7	27	MS3456L16-11P	96906	C4	87
FHN20G	81349	C-4	68	MS3456L20-4P	96906	C-4	85
GH3	72794	C-3	9	MS2472L22-55P	96906	C-4	71
HC6/U	80058	C-7	10	MS347212-55S	96906	C-4	76
JAN1N4148	81349	C-4	60	MS3476L22-55S	96906	C-9	2
JAN1N4148	81349	C-6	13	MS35059-23	96906	C-4	65
JAN1N4148	81349	C-8	22	MS35059-27	96905	C-4	59
JAN1N647	81349	C-5	26	MS35338-135	96906	C-4	16
JAN1N752A	81349	C-8	2	MS51957-14	96906	C-4	12
JAN1N827	81349	C-8	10	MS51957-14	96906	C-4	15
JAN1N965B	81349	C-5	21	MS51957-14	96906	C-4	36
JAN2N2222A	81349	C-5	10	MS51957-14	96906	C-4	18
JAN2N2222A	81349	C-7	5	MS51957-17	96906	C-4	27
JAN2N2907A	81349	C-7	1	MS51957-27	96906	C-3	12
JAN2N4948	81349	C-7	3	MS51957-27	96906	C-4	30
JAN2N5431	81349	C-7	3	MS51957-27	96906	C-4	33
K-500B1-8	95146	C-4	46	MS51957-27	96906	C-4	39
K-500B1-8	91546	C-4	48	MS51957-27	96906	C-4	93
K-500B1-8	95146	C-4	50	MS51957-28	96906	C-4	2
K-500B1-8	95146	C-4	52	MS51957-28	96906	C-4	74
K-500B1-8	95146	C-4	55	MS51957-28	96906	C-4	77
LH3858-26	72962	C-3	15	MS51957-28	96906	C-5	2
LM105H	27014	C-5	30	MS51957-28	96906	C-5	6
LM105H	27014	C-8	5	MS51957-29	96906	C-4	80

PART NUMBER INDEX

Part Number	FSCM	Figure No.	Item No.	Part Number	FSCM	Figure No.	Item No.
MS51957-30	96906	C-2	5	RN55C5620F	81349	C-8	8
MS51957-42	96906	C-3	3	RN55C5901F	81349	C-5	32
MS51957-42	96906	C-3	5	RN55C6191F	81349	C-6	20
MS51957-4	96906	C-4	24	RN55C681F	81349	C-5	13
MS51959-3	96906	C-3	13	RN55C81R6F	81349	C-8	5
MTE-106D	95146	C-4	41	RN55C9091F	81349	C-7	36
MTE-206N	95146	C-4	42	RN55C90R9F	81349	C-8	3
M39003-01-2271	81349	C-7	7	RN55C9761F	81349	C-6	25
M39003/01-2304	81349	C-5	25	RN55E1003B	81349	C-6	16
M39003/01-2304	81349	C-7	22	RN55E1692B	81349	C-5	12
M39003-10-2304	81349	C-8	19	RN55E2002B	81349	C-8	20
M39003/01-2306	81349	C-5	28	RN55E2002B	81349	C-6	15
M39003-01-2312	81349	C-8	9	RN55E4002B	81349	C-6	14
M39003/01-2374	81349	C-5	17	RN55E5002B	81349	C-6	4
M39003/01-2380	81349	C-5	24	RN55E75R0B	81349	C-8	6
M39003/01-2380	81349	C-6	10	RT24C2W102	81349	C-5	9
M39029/102020C3	81349	C-9	3	RW80U2150F	81349	C-6	23
M39029/102020C4	81349	C-9	4	RW81U5110F	81349	C-5	23
M83421/01-6089M	81349	C-7	20	53-175	72794	C-3	11
M83421/01-6113M	81349	C-7	26	TC-226	59730	C-9	5
NAS1291-C02	80205	C-4	25	TY-23M	22421	C-9	6
NAS1635-00-2	80205	C-4	97	TY-33M	59730	C-4	17
NAS1635-00-3	80205	C-4	21	UA747DM	07263	C-6	2
NAS620C2	80205	C-3	14	59901-059		C-4	72
AS620C6	80205	C-2	6	0641-15-2001	17419	C-4	73
NAS620C6	80205	C-5	4	1N4004	81349	C-5	20
NAS620C6	80205	C-5	8	1N4744A	04713	C-5	21
NC150LK0C	51578	C-4	28	10-101960-225	77820	C-4	79
RCR07G100JS	81349	C-5	31	102128-1	00779	C-3	9
RCR07G100JS	81349	C-7	32	2-85930-6	00779	C-5	27
RCR07G103JS	81349	C-7	28	2-85930-6	00779	C-6	12
RCR07G106JS	81349	C-7	12	2-85930-6	00779	C-7	38
RCR07G200JS	81349	C-8	18	2-85930-6	00779	C-8	23
RCR07G221JS	81349	C-7	29	211-469009-105	90073	C-5	22
RCR07G222JS	81349	C-5	35	220-419914-000	90073	C-4	11
RCR07G222JS	81349	C-8	1	220-419918-000	90073	C-4	4
RCR07G223JS	81349	C-5	15	220-419918-000	90073	C-5	5
RCR07G223JS	81349	C-6	24	220-419920-000	90073	C-4	5
RCR07G223JS	81349	C-7	42	220-419920-000	90073	C-6	
RCR07G330JS	81349	C-7	41	220-419922-000	90073	C-4	6
RCR07G472JS	81349	C-7	35	220-419922-000	90073	C-7	
RCR20G100JS	81349	C-5	14	220-419924-000	90073	C-4	7
RCR32G112JS	81349	C-5	23	220-419924-000	90073	C-8	
RCR42G331JS	81349	C-4	63	238-601015-000	90073	C-7	10
RJ24C2W203	81349	C-6	8	244-459654-000	90073	C-2	2
RJ24FW503	81349	C-6	9	245-476853-000	90073	C-2	
RN55C1000F	81349	C-7	30	260-475350-000	90073	C-4	23
RN55C1003F	81349	C-6	22	267-200199-000	90073	C-7	11
RN55C1021F	81349	C-7	23	312002	75915	C-4	66
RN55C1051F	81349	C-8	13	3862C162-103A	32997	C-4	49
RN55C1152F	81349	C-7	24	3862C162-251A	32997	C-4	51
RN55C1211F	81349	C-8	13	3862C162-501A	32997	C-4	54
RN55C1302F	81349	C-7	37	3862C162-502A	32997	C-4	47
RN55C1331F	81349	C-7	25	507-3917-1471500	72619	C-4	43
RN55C1332F	81349	C-8	17	538-473942-000	90073	C-3	1
RN55C1502F	81349	C-6	21	606-202049-000	90073	C-5	11
RN55C1581F	81349	C-8	28	606-202049-000	90073	C-7	2
RN55C1670F	81349	C-8	7	606-202049-000	90073	C-7	4
RN55C2001F	81349	C-7	16	606-202049-000	90073	C-7	6
RN55C2001F	81349	C-8	12	628-354273-000	90073	C-4	26
RN55C2141B	81349	C-8	16	636-419917-000	90073	C-5	36
RN55C2211F	81349	C-7	34	636-419919-000	90073	C-6	29
RN55C2261F	81349	C-8	21	636-419921-000	90073	C-7	43
RN55C2491F	81349	C-8	27	8453	16428	C-4	82
RN55C2492F	81349	C-7	33	86148-7	00779	C-4	8
RN55C2671F	81349	C-4	56	86286-1	00779	C-4	10
RN55C2671F	81349	C-4	56	86286-1	00779	C-5	29
RN55C2741F	81349	C-8	21	86286-1	00779	C-6	11
RN55C2742F	81349	C-6	19	86286-1	00779	C-7	39
RN55C2400F	81349	C-8	25	86286-1	00779	C-8	24
RN55C4750F	81349	C-7	31	92-1660-00	72962	C-4	22
RN55C4992F	81349	C-6	17	930-176-100	03902	C-4	70
RN55C49R9F	81349	C-8	26	930-176-101	03902	C-4	69
RN55C5103F	81349	C-4	53				
THRU							
RN55C5602F							

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

1. Scope.

This appendix lists expendable supplies and materials you will need to operate and maintain the LTS. These items are authorized to you by CTA 50-970. Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

2. Explanation of Columns.

a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

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

(enter as applicable)

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

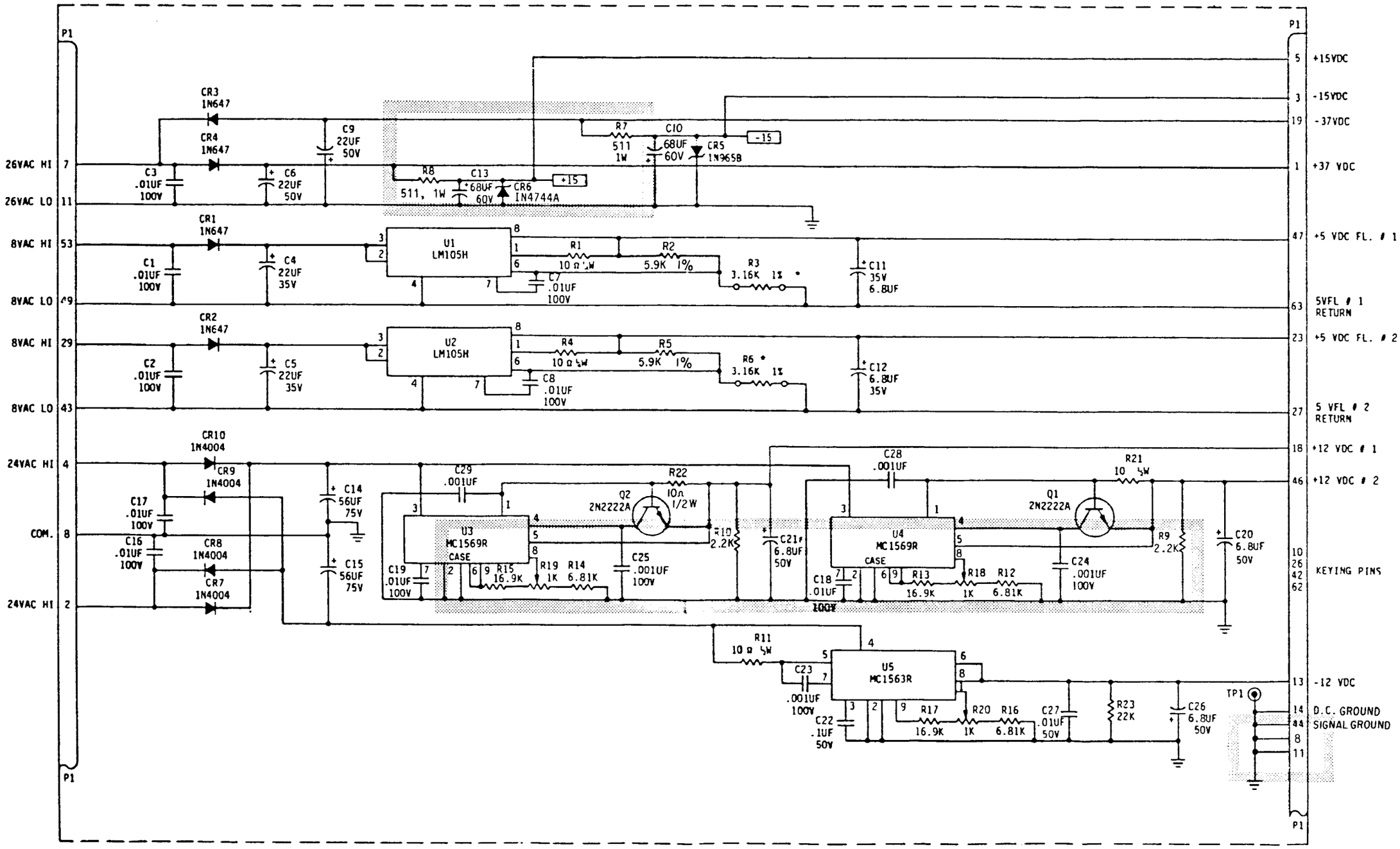
c. Column 3 - *National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

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

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

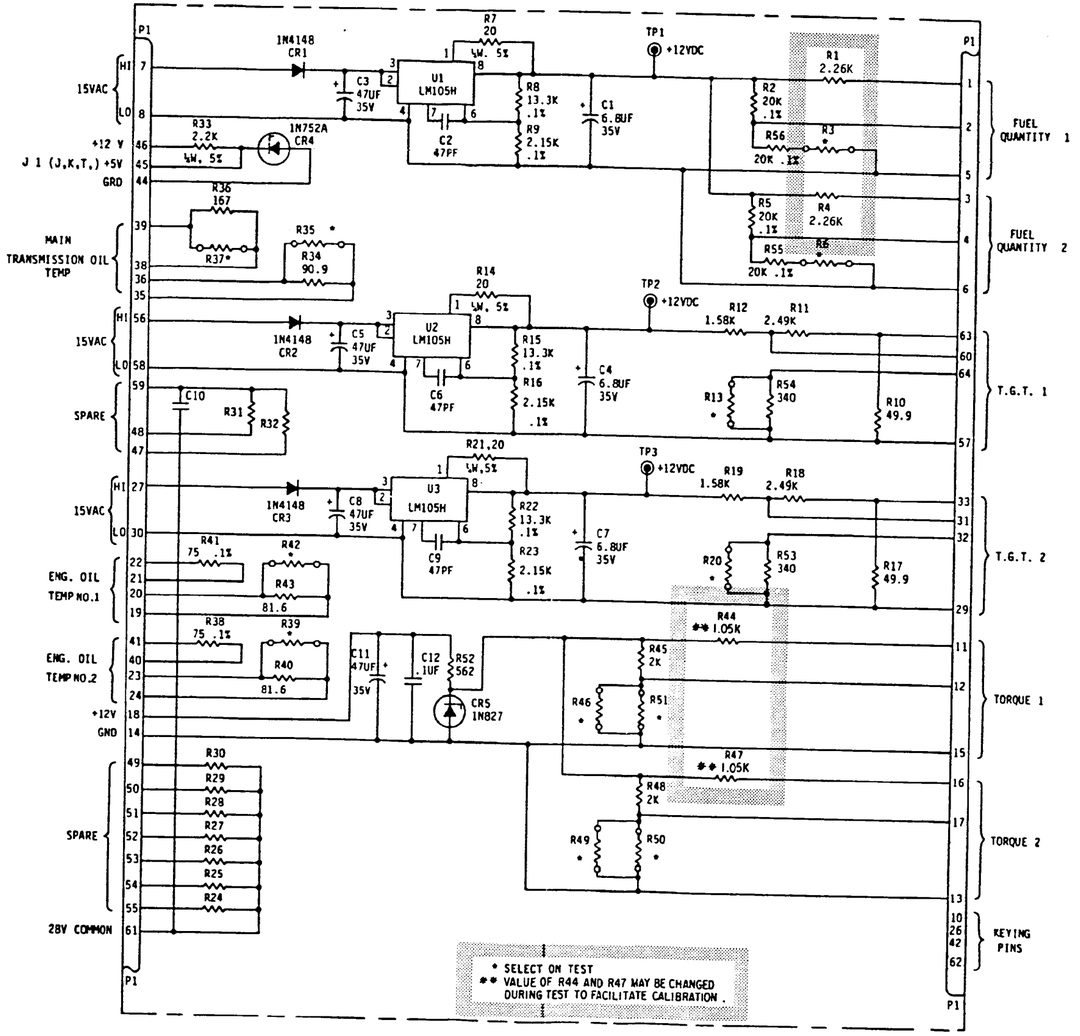
(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	0	8010-00-286-7758	Paint, Fed Std 595 #13538	QT
2	0	8010-00-527-2884	Paint, Fed Std 595 #37038	GL
3	0	6850-00-285-8011	Solvent, Dry-Cleaning, P-D-680, Type II	GL
4	0	8305-00-267-3015	Cloth, CCC-C-440	FT

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981—765-035/391



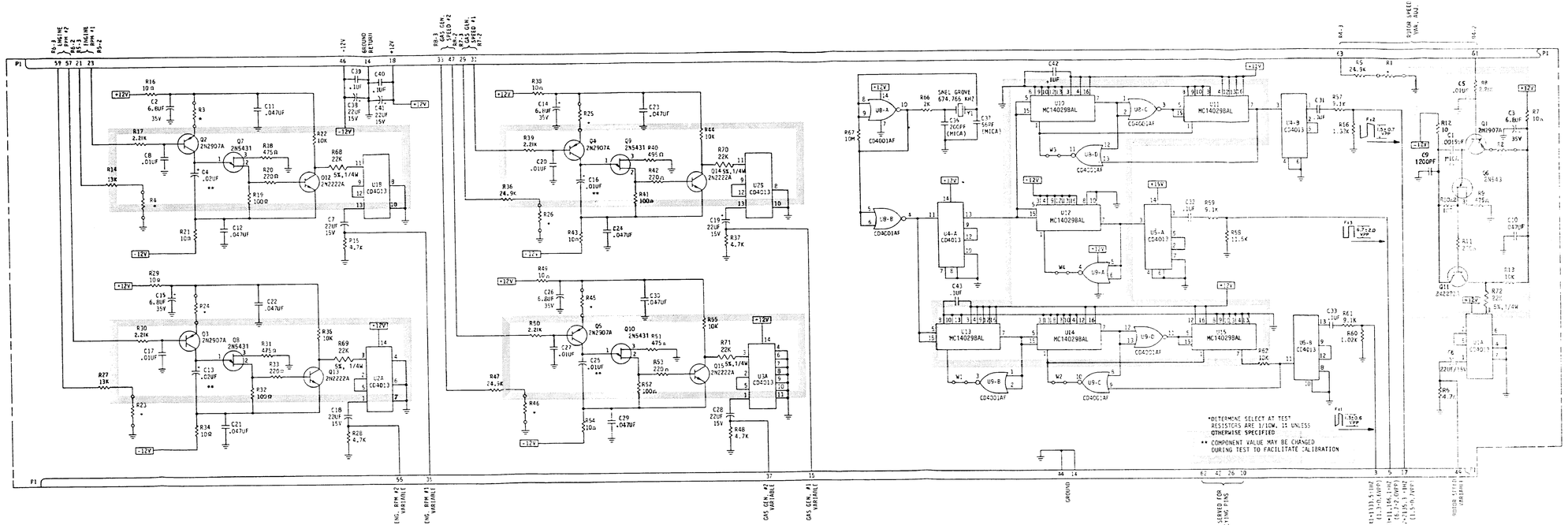
S 69494 (B)

FO-1. Power Supply Assembly A1, Schematic Diagram



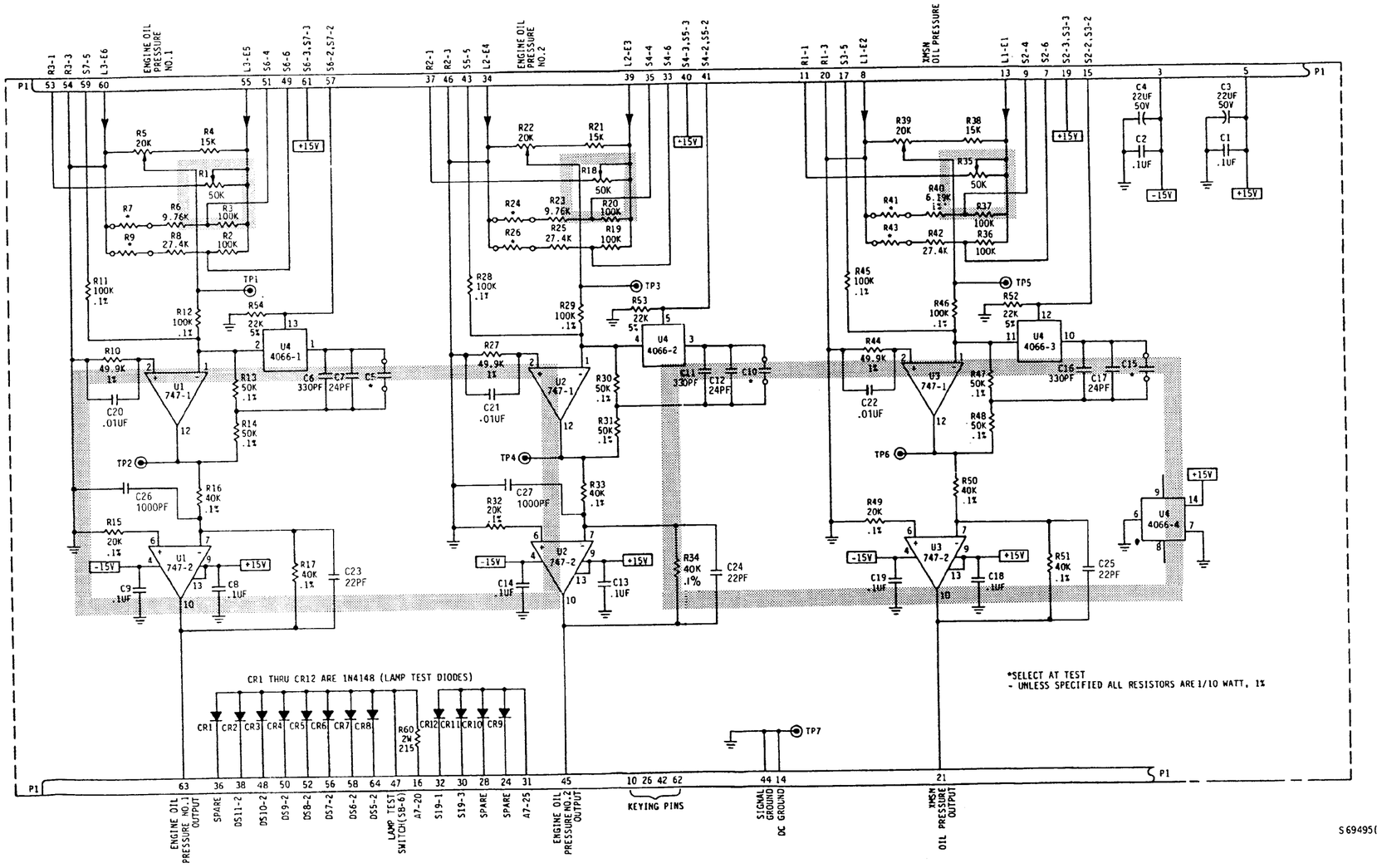
S 69497 (B)

FO-2. DC Input Simulator Assembly A4, Schematic Diagram

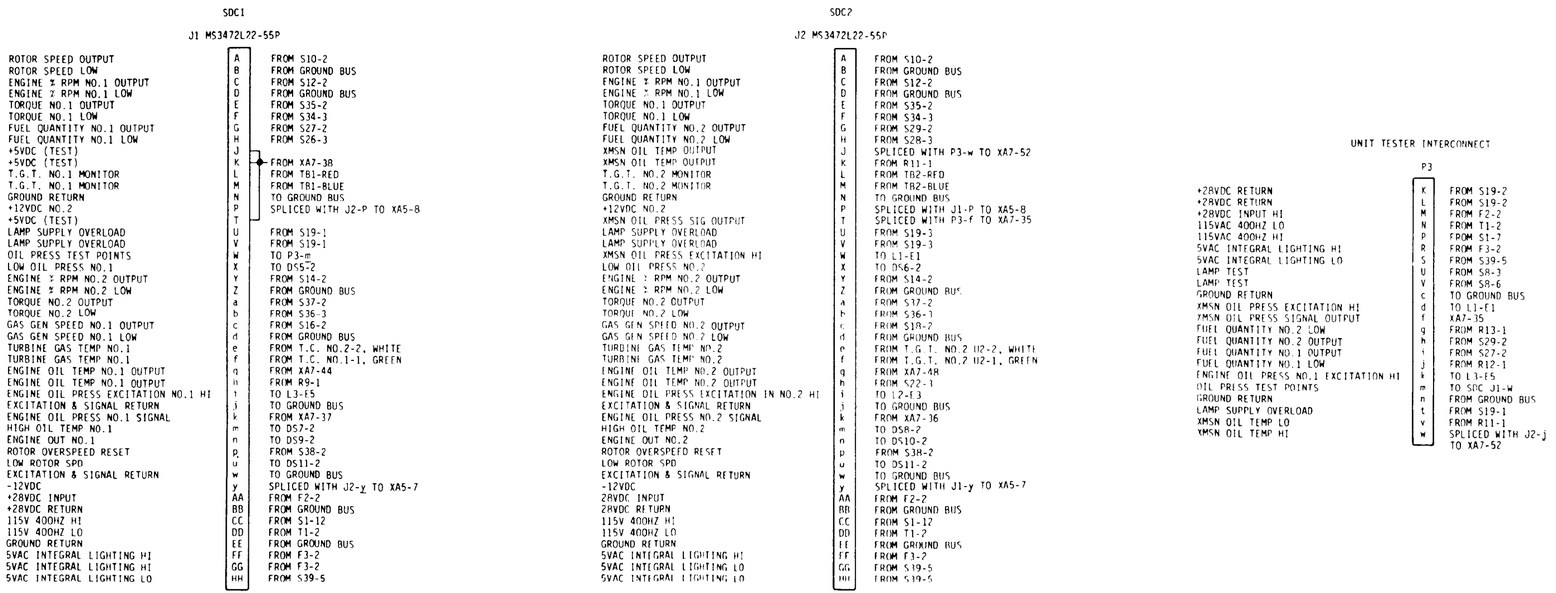


S 69496 (R)

FO-3. Frequency Input Simulator Assembly A3, Schematic Diagram



FO-4. Oil Pressure Simulator Assembly A2, Schematic Diagram



S 69493.1 (B)

FO-5. Interwiring Diagram, Simulator (Sheet 1 of 6)

POWER SUPPLY CARD

XA1 (MOTHERBOARD)

+37VDC OUTPUT	1	TO XA5-15 SPARE
24VAC HI INPUT	2	FROM XA6-9 (T1-9)
-15VDC OUTPUT	3	TO XA2-3, XA5-17
24VAC HI INPUT	4	FROM XA6-7 (T1-7)
+15VDC OUTPUT	5	TO XA2-5
26VAC HI INPUT	7	FROM XA6-1 (T1-5)
24VAC COMMON	8	FROM XA6-8 (T1-8)
KEYING PIN	10	
26VAC LO INPUT	11	FROM XA6-10, 19, 2, XA2-8, XA4-61
-12VDC OUTPUT	13	TO XA3-46, XA5-7
DC GND	14	FROM XA6-11 (GND BUS)
+12VDC NO.1 OUTPUT	18	TO XA7-60 XA5-9, XA3-18
-37VDC OUTPUT	19	TO XA5-16 (SPARE)
+5VFL NO. 2 OUTPUT	23	TO XA5-11 (TB2-BRN T.G.T. U2-5 BROWN)
SPARE	26	
+5VFL NO.2 RETURN	27	TO XA5-19 (TB2-YEL T.G.T. U2-6 YELLOW)
8VAC HI INPUT	29	FROM XA6-5 (T1-12)
SPARE	42	
8VAC LO INPUT	43	FROM XA6-6 (T1-13)
SIGNAL GND	44	FROM XA6-12 (GND BUS)
+12VDC NO.2 OUTPUT	46	TO XA5-8, XA4-18, 46
+5VFL NO.1 OUTPUT	47	TO XA5-13 (TB1-BRN T.G.T. U1-5 BROWN)
8VAC LO INPUT	49	FROM XA6-4 (T1-11)
8VAC HI INPUT	53	FROM XA6-3 (T1-10)
SPARE	62	
+5VFL NO.1 RETURN	63	TO XA5-12 (TB1-YEL T.G.T. U1-6 YELLOW)

OIL PRESSURE SIMULATOR CARD

XA2 (MOTHERBOARD)

-15VDC	3	FROM XA1-3
+15VDC	5	FROM XA1-5
XMSN OIL PRESS CAL LO OUTPUT	7	TO XA6-16 (S2-6)
XMSN OIL PRESS EXCITATION LO	8	FROM XA6-19 (L1-E2)
XMSN OIL PRESS CAL HI OUTPUT	9	TO XA6-17 (S2-4)
XMSN OIL PRESS VAR CONT EXC HI	11	TO XA6-22 (R1-1)
+28VDC (NOT USED)	12	FROM XA6-13 (XA4-59)
XMSN OIL PRESS EXCITATION HI	13	FROM XA6-18 (L1-E1)
GND	14	FROM XA6-11 (GND BUS)
SWITCHED +15VDC TO U4-12	15	FROM XA6-14
+28VDC LAMP TEST	16	FROM XA7-20 (F2-2)
XMSN OIL PRESS CAL/NOR INPUT	17	FROM XA6-20 (S3-5)
+15VDC	19	TO XA6-15 (S2-3)
XMSN OIL PRESS VAR CONT EXC LO	20	TO XA6-21 (R1-3)
XMSN OIL PRESS SIGNAL OUTPUT	21	TO XA7-35 (P3-f, J2-t)
KEYING PIN	26	
SPARE	28	XA7-21
CR11 CATHODE (LAMP TEST)	30	TO XA7-23 (DS4-1)
SWITCHED +28VDC LAMP TEST	31	TO XA7-25
CR12 CATHODE (LAMP TEST)	32	TO XA7-24 (DS3-1)
ENGINE OIL PRESS NO.2 CAL LO OUTPUT	33	TO XA7-3 (S4-6)
ENGINE OIL PRESS NO.2 EXCITATION LO	34	FROM XA7-6 (L2-E4 GND)
ENGINE OIL PRESS NO.2 CAL HI OUTPUT	35	TO XA7-4 (S4-4)
SPARE	36	TO XA7-34
ENGINE OIL PRESS NO.2 VAR CONT EXC HI	37	TO XA7-9 (R2-1)
CR2 CATHODE (LAMP TEST)	38	TO XA7-33 (DS11-2)
ENGINE OIL PRESS NO.2 EXCITATION HI	39	FROM XA7-5 (L2-E3)
+15VDC	40	TO XA7-2 (S4-3)
SWITCHED +15VDC TO U4-5	41	FROM XA7-1 (S4-2)
ENGINE OIL PRESS NO.2 CAL/NOR INPUT	43	FROM XA7-7 (S5-5)
GND	44	FROM XA6-12 (GND BUS)
ENGINE OIL PRESS NO.2 SIGNAL OUTPUT	45	TO XA7-36 (J2-k)
ENGINE OIL PRESS NO.2 VAR CONT EXC LO	46	TO XA7-8 (R2-3)
+28VDC LAMP TEST	47	FROM XA7-26 (S8-6)
CR3 CATHODE (LAMP TEST)	48	TO XA7-32 (DS10-2)
ENGINE OIL PRESS NO.1 CAL LO OUTPUT	49	TO XA7-12 (S6-6)
CR4 CATHODE (LAMP TEST)	50	TO XA7-31 (DS9-2)
ENGINE OIL PRESS NO.1 CAL HI OUTPUT	51	TO XA7-13 (S6-4)
CR5 CATHODE (LAMP TEST)	52	TO XA7-30 (DS8-2)
ENGINE OIL PRESS NO.1 VAR CONT EXC HI	53	TO XA7-18 (R3-1)
ENGINE OIL PRESS NO.1 VAR CONT EXC LO	54	TO XA7-17 (R3-3)
ENGINE OIL PRESS NO.1 EXCITATION HI	55	FROM XA7-14 (L5-E5)
CR6 CATHODE (LAMP TEST)	56	TO XA7-29 (DS7-2)
SWITCHED +15VDC TO U4-13	57	FROM XA7-10 (S6-2)
CR7 CATHODE (LAMP TEST)	58	TO XA7-28 (DS6-2)
ENGINE OIL PRESS NO.1 CAL/NOR INPUT	59	FROM XA7-16 (S7-5)
ENGINE OIL PRESS NO.1 EXCITATION LO	60	FROM XA7-15 (L3-E6)
+15VDC	61	TO XA7-11 (S6-3)
ENGINE OIL PRESS NO.1 SIGNAL OUTPUT	63	TO XA7-37 (J1-k)
CR8 CATHODE (LAMP TEST)	64	TO XA7-27 (DS5-2)

FREQUENCY SIMULATOR CARD

XA3 (MOTHERBOARD)

ENGINE % RPM NO.1, NO.2 FX1 OUTPUT	3	TO XA6-40 (S11-1)
ROTOR SPEED FX3 OUTPUT	5	TO XA6-39 (S9-1)
GND	14,44	FROM XA6-11 12 TO GND BUS
GAS GEN SPEED NO.1 VARIABLE FREQUENCY OUTPUT	15	TO XA6-36 (S16-3)
GAS GEN SPEED NO.1, NO.2 FX2 OUTPUT	17	TO XA6-38 (S15-1)
+12VDC NO.1	18	FROM XA1-18
ENGINE % RPM NO.1 VARIABLE CONTROL RETURN	21	FROM XA6-26 (R5-3)
ENGINE % RPM NO.1 VARIABLE FREQUENCY CONTROL INPUT	23	FROM XA6-25 (R5-2)
GAS GEN SPEED NO.1 VARIABLE CONTROL RETURN	29	FROM XA6-30 (R7-3)
GAS GEN SPEED NO.1 VARIABLE FREQUENCY CONTROL INPUT	31	FROM XA6-29 (R7-2)
GAS GEN SPEED NO.2 VARIABLE CONTROL RETURN	33	FROM XA6-32 (R8-3)
ENGINE % RPM NO.1 VARIABLE FREQUENCY OUTPUT	35	TO XA6-34 (S12-3)
GAS GEN SPEED NO.2 VARIABLE FREQUENCY OUTPUT	37	TC XA6-37 (S18-3)
KEYING PIN	42	
-12VDC	46	FROM XA1-13
GAS GEN SPEED NO.2 VARIABLE FREQUENCY CONTROL INPUT	47	FROM XA6-31 (R8-2)
ROTOR SPEED VARIABLE SPEED OUTPUT	49	TO XA6-33 (S10-3)
ENGINE % RPM NO.2 VARIABLE FREQUENCY OUTPUT	55	TO XA6-35 (S14-3)
ENGINE % RPM NO.2 VARIABLE FREQUENCY CONTROL INPUT	57	FROM XA6-27 (R6-2)
ENGINE % RPM NO.2 VARIABLE CONTROL RETURN	59	FROM XA6-28 (R6-3)
ROTOR SPEED VARIABLE FREQUENCY CONTROL INPUT	61	FROM XA6-23 (R4-2)
ROTOR SPEED VARIABLE CONTROL RETURN	63	FROM XA6-24 (R4-3)

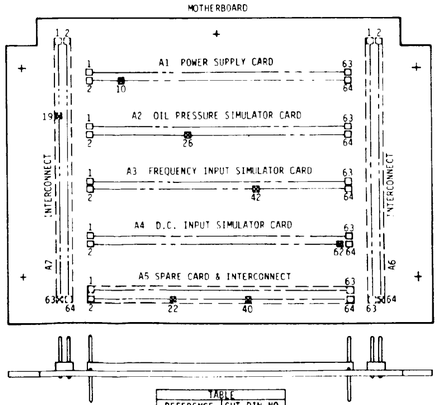


TABLE	
REFERENCE DESIGNATION	CUT PIN NO. SEE NOTE 2
A1	10
A2	26
A3	42
A4	62
A5	22,40
A6	64
A7	19,63

S 69493 2 (B)

FO-5. Interwiring Diagram, Simulator (Sheet 2 of 6)

D.C. SIMULATOR CARD

XA4 (MOTHERBOARD)

FUEL QUANTITY NO. 1 VARIABLE CONTROL HI	1	TO XA6-47 (R12-3)
FUEL QUANTITY NO. 1 CAL HI	2	TO XA6-48 (S26-1)
FUEL QUANTITY NO. 2 VARIABLE CONTROL HI	3	TO XA6-50 (R13-3)
FUEL QUANTITY NO. 2 CAL HI	4	TO XA6-51 (S28-1)
FUEL QUANTITY NO. 1 VARIABLE CONTROL LO	5	TO XA6-49 (R12-1)
FUEL QUANTITY NO. 2 VARIABLE CONTROL LO	6	TO XA6-52 (R13-1)
15VAC HI	7	FROM XA6-41 (T2-3)
15VAC LO	8	FROM XA6-42 (T2-4)
TORQUE NO. 1 VARIABLE CONTROL HI	11	TO XA5-1 (R16-3)
TORQUE NO. 1 CAL HI	12	TO XA5-2 (S34-1)
TORQUE NO. 2 CAL LO	13	TO XA5-6 (S36-3)
GND	14	XA6-11 (FROM GND BUS)
TORQUE NO. 1 CAL LO	15	TO XA5-3 (S34-3)
TORQUE NO. 2 VARIABLE CONTROL HI	16	TO XA5-4 (R17-3)
TORQUE NO. 2 CAL HI	17	TO XA5-5 (S36-1)
+12V NO. 2	18	FROM XA1-46
ENGINE OIL TEMP NO. 1 CAL/NOR OUTPUT	19	TO XA7-44 (J1-g)
ENGINE OIL TEMP NO. 1 CAL/NOR	20	FROM XA7-43 (S21-2)
ENGINE OIL TEMP NO. 1 CAL HI	21	TO XA7-42 (S20-1)
ENGINE OIL TEMP NO. 1 CAL LO	22	TO XA7-41 (S20-3)
ENGINE OIL TEMP NO. 2 CAL/NOR	23	FROM XA7-47 (S23-2)
ENGINE OIL TEMP NO. 2 CAL/NOR OUTPUT	24	TO XA7-48 (J2-g)
15VAC HI	27	FROM XA6-45 (T3-5)
TURBINE GAS TEMP NO. 2 LO	29	TO XA6-58 (S32-2)
15VAC LO	30	FROM XA6-46 (T3-6)
TURBINE GAS TEMP NO. 2	31	FROM XA6-59 (S33-2)
TURBINE GAS TEMP NO. 2 CAL LO	32	TO XA6-60 (S32-3)
TURBINE GAS TEMP NO. 2	33	TO XA6-57 (T.G.T NO. 2, U2-3)
MAIN XMSN OIL TEMP CAL/NOR OUTPUT	35	TO XA7-52 (P3-w)
MAIN XMSN OIL TEMP CAL/NOR	36	FROM XA7-51 (S25-2)
MAIN XMSN OIL TEMP CAL HI	38	TO XA7-50 (S24-1)
MAIN XMSN OIL TEMP CAL LO	39	TO XA7-49 (S24-3)
ENGINE OIL TEMP NO. 2 CAL HI	40	TO XA7-46 (S22-1)
ENGINE OIL TEMP NO. 2 CAL LO	41	TO XA7-45 (S22-3)
GND	44	FROM XA6-12 (FROM GND BUS)
+5VDC (TEST)	45	TO XA7-38 (J1-J-K-T)
+12VDC NO. 2	46	FROM XA1-46
SPARE	47	FROM XA7-40
SPARE	48	
15VAC HI	56	FROM XA6-43 (T3-3)
TURBINE GAS TEMP NO. 1 LO	57	TO XA6-54 (S30-2)
15VAC LO	58	FROM XA6-44 (T3-4)
28VDC (NOT USED)	59	FROM XA6-13 (F2-2)
TURBINE GAS TEMP NO. 1 CAL/NOR	60	TO XA6-55 (S31-2)
GND	61	FROM XA6-10 (GND BUS)
KEYING PIN	62	
TURBINE GAS TEMP NO. 1	63	TO XA6-53 (TB1, U1-3 (RED))
TURBINE GAS TEMP NO. 1 CAL HI/LO	64	TO XA6-56 (S30-3)

SPARE CARD

XA5 (MOTHERBOARD)

TORQUE NO.1 VARIABLE CONTROL HI	1	TO R16-3 (XA4-11)
TORQUE NO.1 CAL HI	2	TO S34-1 (XA4-12)
TORQUE NO.1 CAL LO	3	TO S34-3 (XA4-15)
TORQUE NO.2 VARIABLE CONTROL HI	4	TO R17-3 (XA4-16)
TORQUE NO.2 CAL HI	5	TO S36-1 (XA4-17)
TORQUE NO.2 CAL LO	6	TO S36-3 (XA4-13)
-12 VDC	7	TO J1-y
+12 VDC NO.2	8	TO J2-F, J1-P (XA1-46)
ROTOR SPEED VARIABLE CONTROL HI	9	TO R4-1 (+12 VDC NO. 1)
T.G.T. NO.2 TEMP COMP EXCITATION HI	11	TO TB2-5 BRN U2-5 (+5 VFL NO. 2) (XA1-23)
T.G.T. NO.1 TEMP COMP EXCITATION LO	12	TO TB1-4 YEL U1-6 (+5 VFL NO. 1 RETURN) (XA1-63)
T.G.T. NO.1 TEMP COMP EXCITATION HI	13	TO TB1-5 BRN U1-5 (+5 VFL NO. 1) (XA1-47)
GND	14	TO GND BUS
+37 VDC	15	SPARE (XA1-1)
-37 VDC	16	SPARE (XA4-19)
-15 VDC	17	SPARE (XA1-3)
+15 VDC	18	SPARE
T.G.T. NO.2 TEMP COMP EXCITATION LO	19	TO TB2-4 YEL U2-6 (+5 VFL NO. 2 RETURN) (XA1-27)
GROUND RETURN	44	TO GND BUS

26VAC HI	1	FROM T1-5 (XA1-7)
26VAC LO	2	FROM T1-6 (XA1-11)
8VAC HI	3	FROM T1-10 (XA1-53)
8VAC LO	4	FROM T1-11 (XA1-49)
8VAC HI	5	FROM T1-12 (XA1-29)
8VAC LO	6	FROM T1-13 (XA1-43)
24VAC HI	7	FROM T1-7 (XA1-4)
24VAC LO COMMON	8	FROM T1-8 CENTER TAP (XA1-8)
24VAC HI	9	FROM T1-9 (XA1-2)
GROUND RETURN	10	FROM GND BUS (XA4-61) (XA1-11) (XA2-14)
GROUND RETURN	11	FROM GND BUS (XA4-14) (XA1-14)
GROUND RETURN	12	FROM GND BUS (XA4-44) (XA1-44) (XA2-44)
+28VDC INPUT	13	FROM F2-2 (XA4-59) (XA2-12)
XMSN OIL PRESS SWITCH VOLTAGE	14	FROM S2-2 (XA2-15)
XMSN OIL PRESS +15VDC SWITCH SUPPLY	15	TO S3-3 (XA2-19)
XMSN OIL PRESS LO	16	TO S2-6 (XA2-7)
XMSN OIL PRESS HI	17	TO S2-4 (XA2-9)
XMSN OIL PRESS EXCITATION INPUT HI	18	FROM L1-E1 (XA2-13)
XMSN OIL PRESS EXCITATION INPUT LO	19	FROM L1-E2 (XA2-8)
XMSN OIL PRESS CAL/NORMAL SELECT	20	FROM S3-5 (XA2-17)
XMSN OIL PRESS NORMAL LO	21	TO R1-3 (XA2-20)
XMSN OIL PRESS NORMAL HI	22	TO R1-1 (XA2-11)
ROTOR SPEED VARIABLE CONTROL	23	FROM R4-2 (XA3-61)
ROTOR SPEED VARIABLE CONTROL LO	24	TO R4-3 (XA3-63)
ENGINE % RPM NO.1 VARIABLE CONTROL	25	FROM R5-2 (XA3-23)
ENGINE % RPM NO.1 VARIABLE CONTROL LO	26	TO R5-3 (XA3-21)
ENGINE % RPM NO.2 VARIABLE CONTROL	27	FROM R6-2 (XA3-57)
ENGINE % RPM NO.2 VARIABLE CONTROL LO	28	TO R6-3 (XA3-59)
GAS GEN SPEED NO.1 VARIABLE CONTROL	29	FROM R7-2 (XA3-31)
GAS GEN SPEED NO.1 VARIABLE CONTROL LO	30	TO R7-3 (XA3-29)
GAS GEN SPEED NO.2 VARIABLE CONTROL	31	FROM R8-2 (XA3-47)
GAS GEN SPEED NO.2 VARIABLE CONTROL LO	32	TO R8-3 (XA3-33)
ROTOR SPEED VARIABLE OUTPUT	33	TO S10-3 (XA3-49)
ENGINE % RPM NO.1 VARIABLE OUTPUT	34	TO S12-3 (XA3-35)
ENGINE % RPM NO.2 VARIABLE OUTPUT	35	TO S14-3 (XA3-55)
GAS GEN SPEED NO.1 VARIABLE OUTPUT	36	TO S16-3 (XA3-15)
GAS GEN SPEED NO.2 VARIABLE OUTPUT	37	TO S18-3 (XA3-37)
FX2= 2135 HZ OUTPUT	38	TO S15-1 (XA3-17)
FX3= 11246 HZ OUTPUT	39	TO S9-1 (XA3-5)
FX1= 1333.5 HZ OUTPUT	40	TO S11-1 (XA3-3)
15VAC HI	41	FROM T2-2 (XA4-7)
15VAC LO	42	FROM T2-4 (XA4-8)
15VAC HI	43	FROM T3-3 (XA4-56)
15VAC LO	44	FROM T3-4 (XA4-58)
15VAC HI	45	FROM T3-5 (XA4-27)
15VAC LO	46	FROM T3-6 (XA4-30)
FUEL QUANTITY NO.1 VARIABLE CONTROL HI	47	TO R12-3 (XA4-1)
FUEL QUANTITY NO.1 CAL HI	48	TO S26-1 (XA4-2)
FUEL QUANTITY NO.1 VARIABLE CONTROL LO	49	TO R12-1 (XA4-5)
FUEL QUANTITY NO.2 VARIABLE CONTROL HI	50	TO R13-3 (XA4-3)
FUEL QUANTITY NO.2 CAL HI	51	TO S28-1 (XA4-4)
FUEL QUANTITY NO.2 VARIABLE CONTROL LO	52	TO R13-1 (XA4-6)
TURBINE GAS TEMP NO.1 TEMP COMP U1-3	53	TO TB1-3-RED INPUT PIN 3 (XA4-63)
TURBINE GAS TEMP NO.1 CAL HI-LO	54	TO S30-2 (XA4-57) (XA6-62)
TURBINE GAS TEMP NO.1 CAL/NOR	55	TO S31-2 (XA6-55)
TURBINE GAS TEMP NO.1 CAL LO	56	TO S30-3 (XA6-64)
TURBINE GAS TEMP NO.2 TEMP COMP U2-3	57	TO TB2-RED INPUT PIN 3 (XA4-33)
TURBINE GAS TEMP NO.2 CAL HI-LO	58	TO S32-2(XA4-29) (XA6-61)
TURBINE GAS TEMP NO.2 CAL/NOR	59	TO S33-2 (XA4-31)
TURBINE GAS TEMP NO.2 CAL LO	60	TO S32-3 (XA4-32)
TURBINE GAS TEMP NO.2 MONITOR	61	TO TB2-1-BLUE (J2-M) (XA6-58)
TURBINE GAS TEMP NO.1 MONITOR	62	TO TB1-1-BLUE (J1-M) (XA6-54)

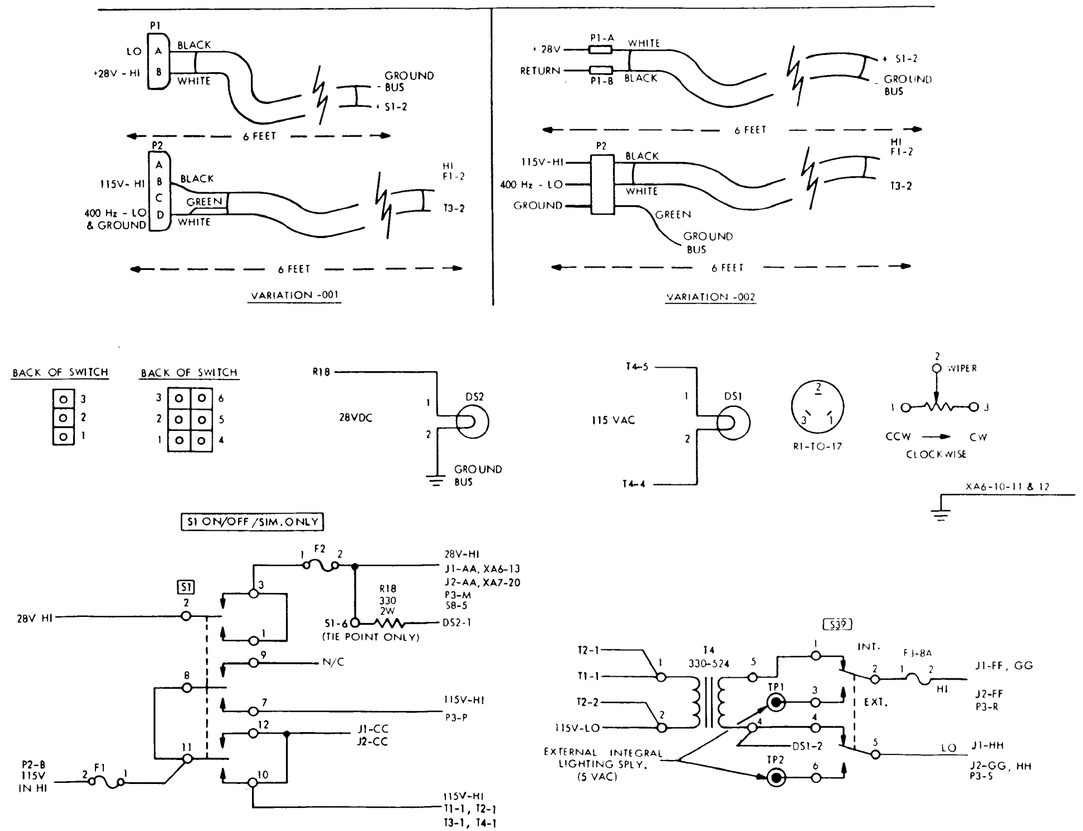
XA6 MOTHERBOARD (INTERCONNECT)

XA7 MOTHERBOARD (INTERCONNECT)

ENGINE OIL PRESS NO.2 U4 SWITCH VOLTAGE	1	FROM S4-2 (XA2-41)
ENGINE OIL PRESS NO.2 U4 SWITCH VOLTAGE SUPPLY	2	TO S4-3 (XA2-40)
ENGINE OIL PRESS NO.2 CAL HI	3	TO S4-6 (XA2-33)
ENGINE OIL PRESS NO.2 CAL LO	4	TO S4-4 (XA2-35)
ENGINE OIL PRESS NO.2 EXCITATION HI	5	FROM L2-E3 (XA2-39)
ENGINE OIL PRESS NO.2 EXCITATION LO	6	FROM L2-E4 (GND) (XA2-34)
ENGINE OIL PRESS NO.2 CAL/NOR INPUT	7	FROM S5-5 (XA2-43)
ENGINE OIL PRESS NO.2 VARIABLE CONTROL LO	8	TO R2-3 (XA2-46)
ENGINE OIL PRESS NO.2 VARIABLE CONTROL HI	9	TO R2-1 (XA2-37)
ENGINE OIL PRESS NO.1 U4 SWITCH VOLTAGE	10	FROM S6-2 (XA2-57)
ENGINE OIL PRESS NO.1 U4 VOLTAGE SUPPLY	11	TO S6-3 (XA2-61)
ENGINE OIL PRESS NO.1 CAL HI	12	TO S6-6 (XA2-49)
ENGINE OIL PRESS NO.1 CAL LO	13	TO S6-4 (XA2-51)
ENGINE OIL PRESS NO.1 EXCITATION HI	14	FROM L3-E5 (XA2-55)
ENGINE OIL PRESS NO.1 EXCITATION LO	15	FROM L3-E6 (GND) (XA2-60)
ENGINE OIL PRESS NO.1 CAL/NOR INPUT	16	FROM S7-5 (XA 2-59)
ENGINE OIL PRESS NO.1 VARIABLE CONTROL LO	17	TO R3-3 (XA2-54)
ENGINE OIL PRESS NO.1 VARIABLE CONTROL HI	18	TO R3-1 (XA2-53)
+28 VDC LAMP TEST	20	XA2-16
SPARE	21	XA2-28
SPARE	22	JUMPER
LAMP SUPPLY OVERLOAD NO.2	23	TO DS4-1 (XA2-30)
LAMP SUPPLY OVERLOAD NO.1	24	TO DS3-1 (XA2-32)
+28 VDC LAMP TEST	25	XA2-31
LAMP TEST (XA2-47)	26	FROM S8-6 (XA2-47)
LOW OIL PRESS NO.1 HI INPUT	27	TO DS5-2 (XA2-64)
LOW OIL PRESS NO.2 HI INPUT	28	TO DS6-2 (XA2-58)
HIGH OIL TEMP NO.1 HI INPUT	29	TO DS7-2 (XA2-56)
HIGH OIL TEMP NO.2 HI INPUT	30	TO DS8-2 (XA2-52)
ENGINE OUT NO.1 HI INPUT	31	TO DS9-2 (XA2-50)
ENGINE OUT NO.2 HI INPUT	32	TO DS10-2 (XA2-48)
LOW ROTOR SPD HI INPUT	33	TO DS11-2 (XA2-38)
SPARE	34	XA2-36
XMSN OIL PRESS SIGNAL OUTPUT	35	TO P3-f, J2-T (XA2-21)
ENGINE OIL PRESS NO.2 SIGNAL OUTPUT	36	TO J2-k, (XA2-45)
ENGINE OIL PRESS NO.1 SIGNAL OUTPUT	37	TO J1-k, (XA2-63)
+5 VDC (TEST)	38	TO J1-J, K, T (XA4-45)
SPARE	39	
SPARE	40	XA4-47
ENGINE OIL TEMP NO.1 CAL LO	41	TO S20-3 (XA4-22)
ENGINE OIL TEMP NO.1 CAL HI	42	TO S20-1 (XA4-21)
ENGINE OIL TEMP NO.1 CAL/NOR	43	FROM S21-2 (XA4-20)
ENGINE OIL TEMP NO.1 HI	44	TO J1-g (XA4-19)
ENGINE OIL TEMP NO.2 CAL LO	45	TO S22-3 (XA4-41)
ENGINE OIL TEMP NO.2 CAL HI	46	TO S22-1 (XA4-40)
ENGINE OIL TEMP NO.2 CAL/NOR	47	TO S23-2 (XA4-23)
ENGINE OIL TEMP NO.2 HI	48	TO J2-g (XA4-24)
XMSN OIL TEMP CAL LO	49	TO S24-3 (XA4-39)
XMSN OIL TEMP CAL HI	50	TO S24-1 (XA4-38)
XMSN OIL TEMP CAL/NOR	51	TO S25-2 (XA4-36)
XMSN OIL TEMP HI	52	TO P3-w (XA4-35)
	53	XA4-49
	54	XA4-50
	55	XA4-51
	56	XA4-52
	57	XA4-53
	58	XA4-54
	59	XA4-55
+12 VDC NO. 1	60	TO R4-1 (XA1-18)

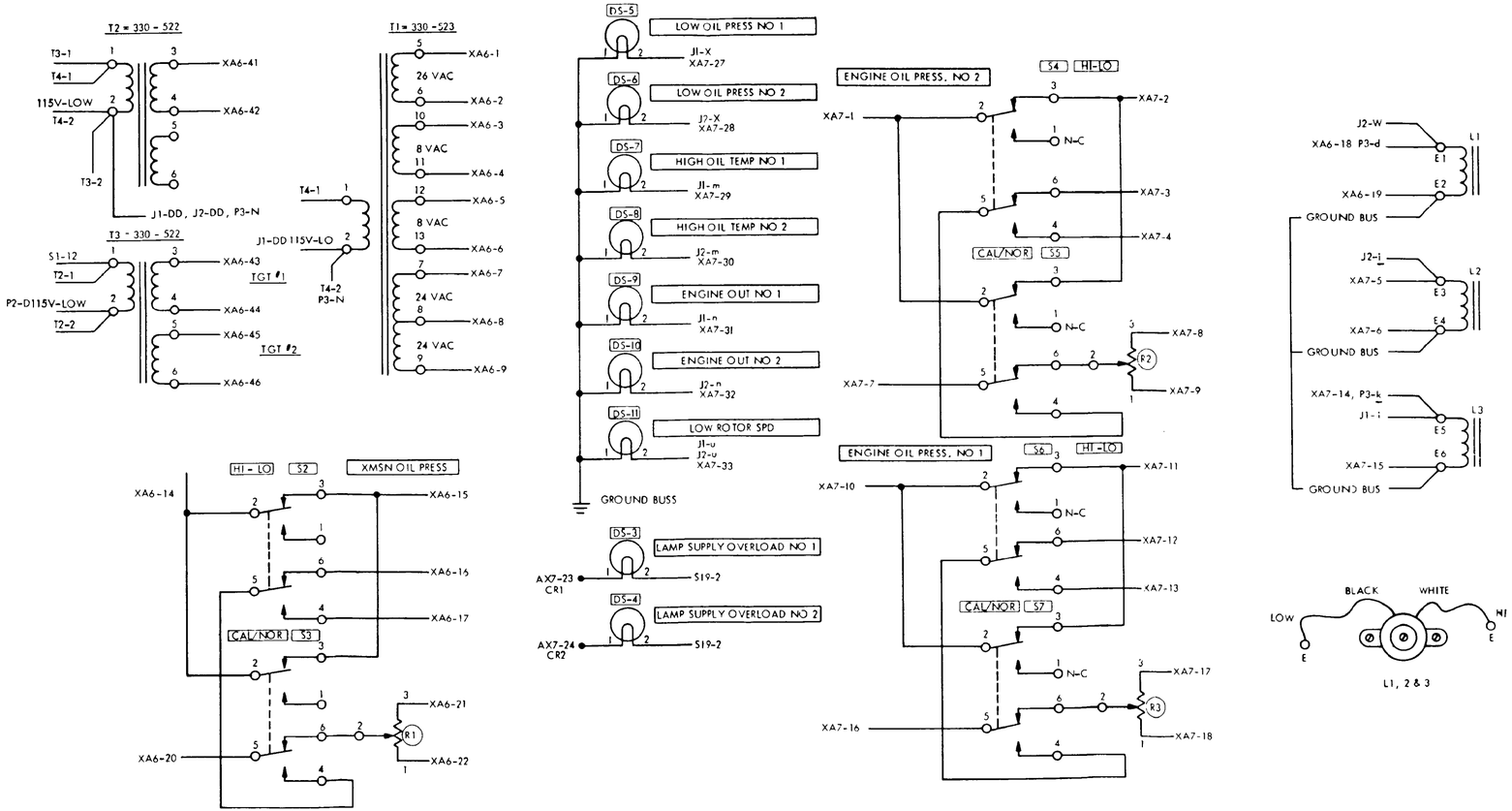
S 69493 3 (B)

FO-5. Interwiring Diagram, Simulator (Sheet 3 of 6)



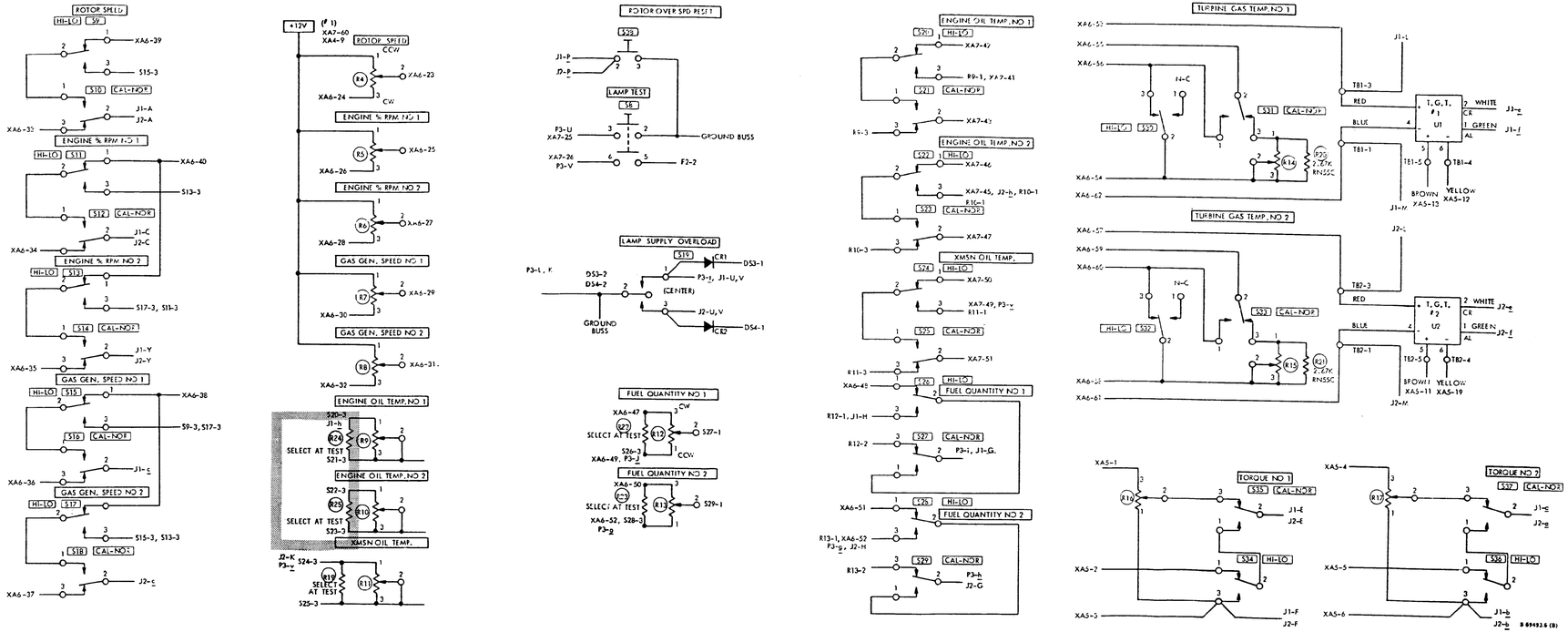
S 69493 4 (B)

FO-5. Interwiring Diagram, Simulator (Sheet 4 of 6)



S 69493 5 (B)

FO-5. Interwiring Diagram, Simulator (Sheet 5 of 6)



FO-5. Interwiring Diagram, Simulator (Sheet 6 of 6)

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, Operator, AVIM and AVUM Maintenance requirements for Fixed Wing and Rotary Wing Aircraft.

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 752-122/40041

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, Operator, AVIM and AVUM Maintenance requirements for Fixed Wing and Rotary Wing Aircraft.

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 752-122/40041

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-4920-413-13&P	1 Nov 1986	INSTRUMENT DISPLAY SYSTEM LINE TEST SET

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNITS ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICAL BUSINESS

COMMANDER
U.S. ARMY AVIATION AND TROOP COMMAND
ATTN: AMSAT-I-MP
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.C00	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	♦264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 061046-002