TECHNICAL MANUAL

OPERATOR'S, AVIATION UNIT, AND INTERMEDIATE MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

TEST BOX ASSEMBLY PILOT ASSIST 70700-20678-041 **WITH NULLING FIXTURE ASSEMBLY** SAS ACTUATOR 70700-20675-041

This manual supersedes TM 55-4920-414-13&P, 4 December 1979, including all changes.

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 NOVEMBER 1986

CHANGE NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 May 1989

Operator's, Aviation Unit, and Intermediate Maintenance Manual
Including Repair Parts and Special Tools List

for

TEST BOX ASSEMBLY PILOT ASSIST
70700-20678-041
WITH NULLING FIXTURE ASSEMBLY
SAS ACTUATOR 70700-20675-041

TM 55-4920-414-13&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 and 1-2	1-1 and 1-2
A-1/A-2	A-1/A-2
FP-1/FP-2	FP-1/FP-2

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

By Order of the Secretary of the Army:

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DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, –10, AVUM and AVIM Maintenance requirements for All Fixed and Rotary Wing Aircraft.

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 equipment is properly grounded and firefighting equipment is readily available prior to use.

CAUTION

Make certain that hydraulic test stand uses hydraulic fluid consistent with each operating environment.

OPERATOR'S, AVIATION UNIT, AND INTERMEDIATE MAINTENANCE MANUAL

TEST BOX ASSEMBLY PILOT ASSIST 70700-20678-041 WITH NULLING FIXTURE ASSEMBLY SAS ACTUATOR 70700-20675-041 NSN 4920-01-088-3225

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help **improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct** to: **Commander, US Army Aviation Systems Command, ATTN:** AMSAV-MMD, 4300 **Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.**

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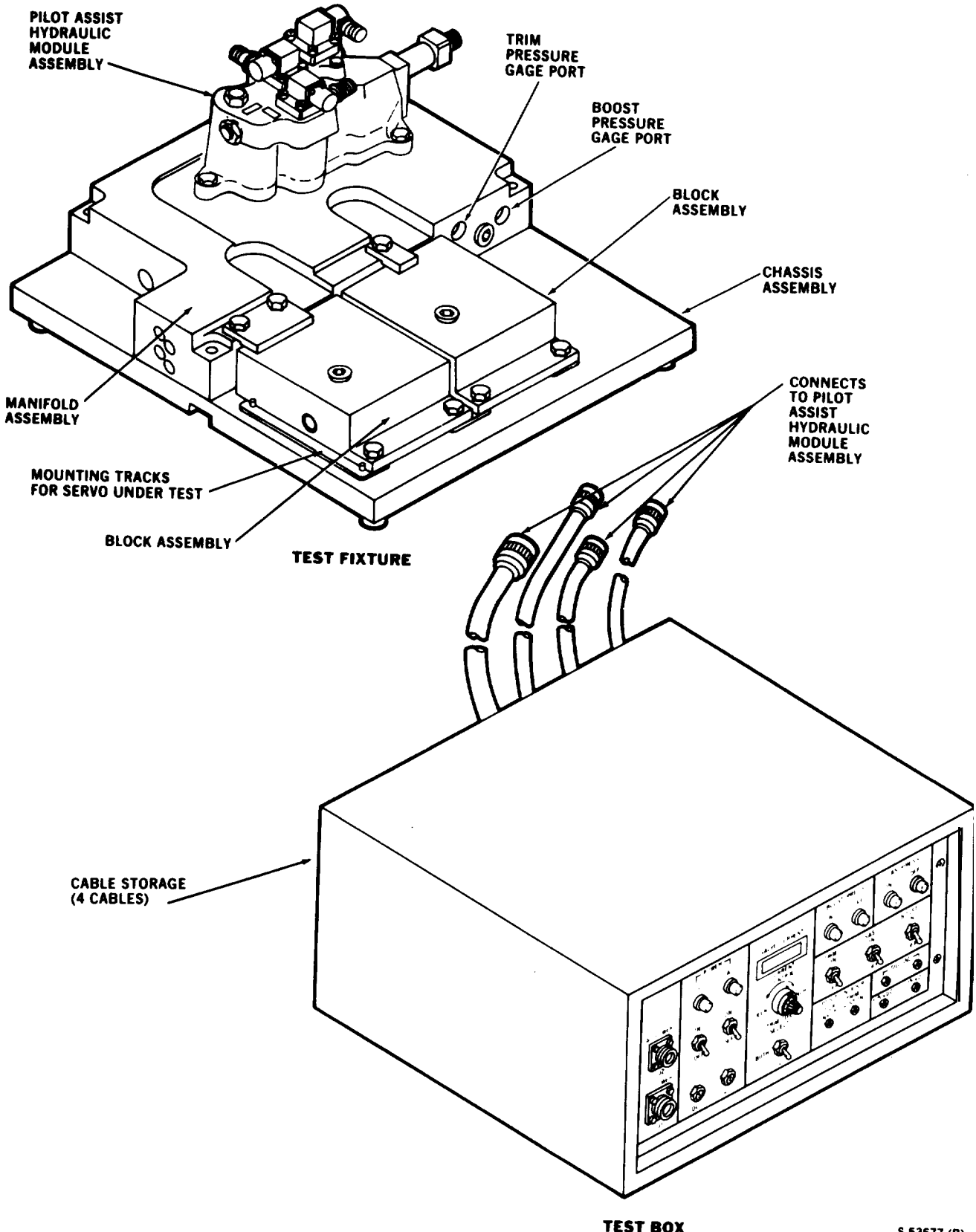


Figure 1-1. Test Box Assembly Pilot Assist/Nulling Fixture Assembly SAS Actuator, Major Components

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. scope

This **manual describes the Test Box Assembly Pilot As-** b sist/Nulling (Test **Box)** and Nulling Fixture Assembly SAS Actuator (Test Fixture) (Figure l-l) and provides instructions for operation, aviation unit, and intermediate maintenance. It includes instructions for replacement of parts available to the operators and aviation unit, and intermediate repairmen and a repair parts and special tools list (RPSTL).

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

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

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 general technical Information on preparation for storage and shipment refer to TM 55-1500-204-25/1. For regulatory requirements pertaining to equipment placed in admin istrat ive storage refer lo AR 750-1.

1-5. Quality Assurancce/Quality Control (QA/QC).

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

1-6. Equipment Improvement Recommendation (EIR).

EIR can and must be submitted 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 or why a procedure is difficult. EIR may be submitted on SF 368 (Quality Deficiency Report). Mail directly to Commander, US Army Aviation Systems Command, ATTN: AMSAV-MPSD, 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.

The test set provides the facility for functional testing and nulling of hydraulic servo components in the UH-60A helicopter flight control system. It is used in a bench-top environment to test the Servo Assembly Boost (part No. 70410-02900) and the Pilot Assist Hydraulic Module Assembly (part No. 70410-02620).

Additional capabilities include the testing and nulling of the following assemblies:

a. Roll SAS assembly (part No. 70410-02450).

b. Pitch/Trim assembly (part No. 70410-02760).

c. Yaw Boost Servo assembly (part No. 70410-02910).

d. Collective Servo assembly (part No. 70410-02920).

e. Pilot Assist Hydraulic Module assembly (part No. 70410-02620).

1-8. Description

a. The test set (Figure 1- 1) is comprised of two major assemblies: the Teat Box and the Teat Fixture. The Teat Fixture consists of a Chassis assembly, a Manifold assembly, and a Pilot Assist Hydraulic Module assembly.

b. The Test Box components are contained in a bench-top enclosure equipped with a tilt stand for ease of viewing the front panel controls and indicators.

c. Four accessory cables are stored behind a hinged door in a cable storage compartment at the rear panel of the Teat Box, These cables are:

(1) AC power cable (part No. 70700-20646-042).

(2) DC power cable (part No. 70700-20633-041).

(3) Pitch Trim Actuator cable (part No. 70700-20682-041).

d. Roll SAS cable (part No. 70700-20682-042).

e. Part Number 70700-30675-041, NSN 4920-01-088-3226 is the total "Pilot Assist Nulling Test Set." It consists of the following parts:

(1)	70700-20678-041	Electronic Indicator/control box
(2)	70700-20646-042	Cable Assy
(3)	70700-20676-042	Block Assy
(4)	70700-20676-044	Teat Block Assy
(5)	70700-20676-046	Test Block Assy
(6)	70700-20677-041	Chassis Assy
(7)	70700-20682-041	Cable Assy
(8)	70700-20682-042	Cable Assy

f. The rear panel of the Teat Box also contains four hard mounted cables used to connect electrically with the Pilot Assist Hydraulic Module on the Teat Fixture during normal operation. An additional receptacle (J3), at the rear panel of the Test Box, provides the means for electrical connection to the servo components under test using appropriate cables (stowed in the rear panel compartment).

g. The front panel of the Test Box contains input power receptacles (J1 and J2), and the controls, indicators and test jacks necessary for performing and monitoring results of the various testing and nulling procedures. Test jacks on the front panel provide the test points for checking internal power supply status.

h. The Test Fixture consists of three subassemblies: Chassis assembly, Manifold assembly, and Pilot Assist Hydraulic Module assembly. The Test Fixture provides the facilities for mounting the servo components under test while providing the means for selective application of pressurized hydraulic fluid using electrical control signals from the Test Box.

i. While the Pilot Assist Hydraulic Module assembly is a necessary operating component of the Test Fixture, it is equipped with quick-disconnect hydraulic fittings and electrical connectors for easy removal. The Test Fixture pilot assist module is removed from the Test Fixture manifold when an off-equipment module is to be tested in its place.

j. The Test Fixture manifold assembly accepts hydraulic pressure and return lines from the external hydraulic test stand at indicated ports located at the Test Fixture manifold rear. The Test Fixture manifold distributes the pressurized hydraulic fluid to the Pilot Assist Hydraulic Module assembly which, under electrical signal command from the Test Box, routes the fluid to the appropriate parts at the front apron of the Test Fixture manifold, The Test Fixture manifold block is internally channelized to direct the pressurized hydraulic fluid, using electrically operated valves, from the Pilot Assist Hydraulic Module assembly to the selected servo under test. Servo components under test are placed on the appropriate Test Fixture chassis track and pushed forward to mate with the self-sealing hydraulic couplings provided on the Test Fixture manifold. Servo component under test are electrically interconnected with the Test Box using special cables (stored in Test Box).

1-9. Equipment Data.

Refer to Table 1-1 for equipment data,

Table 1-1. Equipment Data

AC **voltage input**	**115** vat, single phase 60 Hz, 2 amps
DC voltage input	28 vdc, 5 amps
Hydraulic pressure input	3000 psi, 6 gpm
Dimensions	
Test Fixture:	
Length	39.37 cm (15.5 inches)
Width	45.72 cm (18.0 inches)
Height	15.24 cm (6 inches)
Weight	33.75 kg (75 lbs)
Test Box:	
Length	43.18 cm (17.0 inches)
Width	40.64 cm (16.0 inches)
Height	24,13 cm (9.5 inches)
Weight	12.15 kg (27 lbs)

CHAPTER 2
SERVICE UPON RECEIPT

Section I. SITE AND SHELTER REQUIREMENTS

2-1. Siting.

The Pilot Assist Nulling Fixture Assembly operates in the bench environment and requires 28 vdc and 115 vat, single-phase, 60 Hz power and 3000 psi, 6 gpm, hydraulic source.

Section II. SERVICE UPON RECEIPT OF MATERIEL

2-2. **Checking Unpacked Equipment.**

a. Inspect equipment for damage caused during shipment. If equipment has been damaged, report damage on DD Form 6 in accordance with instructions in AR 700-53.

b. Check equipment against component listing in operators' manual and packing slip to see if shipment is complete. Report all discrepancies in accordance with the 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 currently applicable MWOs have been applied. (Current MWO applicable to equipment are listed in DA PAM 310-7).

Section III. INSTALLATION INSTRUCTIONS

2-3. **Power Requirements.**

a. 115 vat, 60 Hz, single-phase.

b. 28 vdc, ± 0.5 vdc.

2-4. **Installation Instructions.**

The Test Box is shipped with lamps in place. Check that these lamps are installed and not damaged on the Test Box

a. DC POWER Lamp.

b. AC POWER Lamp.

c. BOOST PRESS ON Lamp.

d. BOOST PRESS OFF Lamp.

e. SAS PRESS ON Lamp.

f. SAS PRESS OFF Lamp.

2-5. **Switch Positions:**

a. POWER DC switch OFF.

b. POWER AC switch OFF.

c. TRIM switch OFF.

d. SAS switch OFF.

e. BOOST switch OFF.

f. TRIM COIL SELECT switch BOTH.

2-6. Connections.

Cable and hydraulic line connections are shown in Figure 2-1.

CAUTION

When using the Roll SAS cable part No. 70700-20682-042, make certain that the connectors marked PRESS SWITCH and SAS ACTUATOR are correctly connected to the unit under test. If an incorrect connection is made, damage may occur to the actuator.

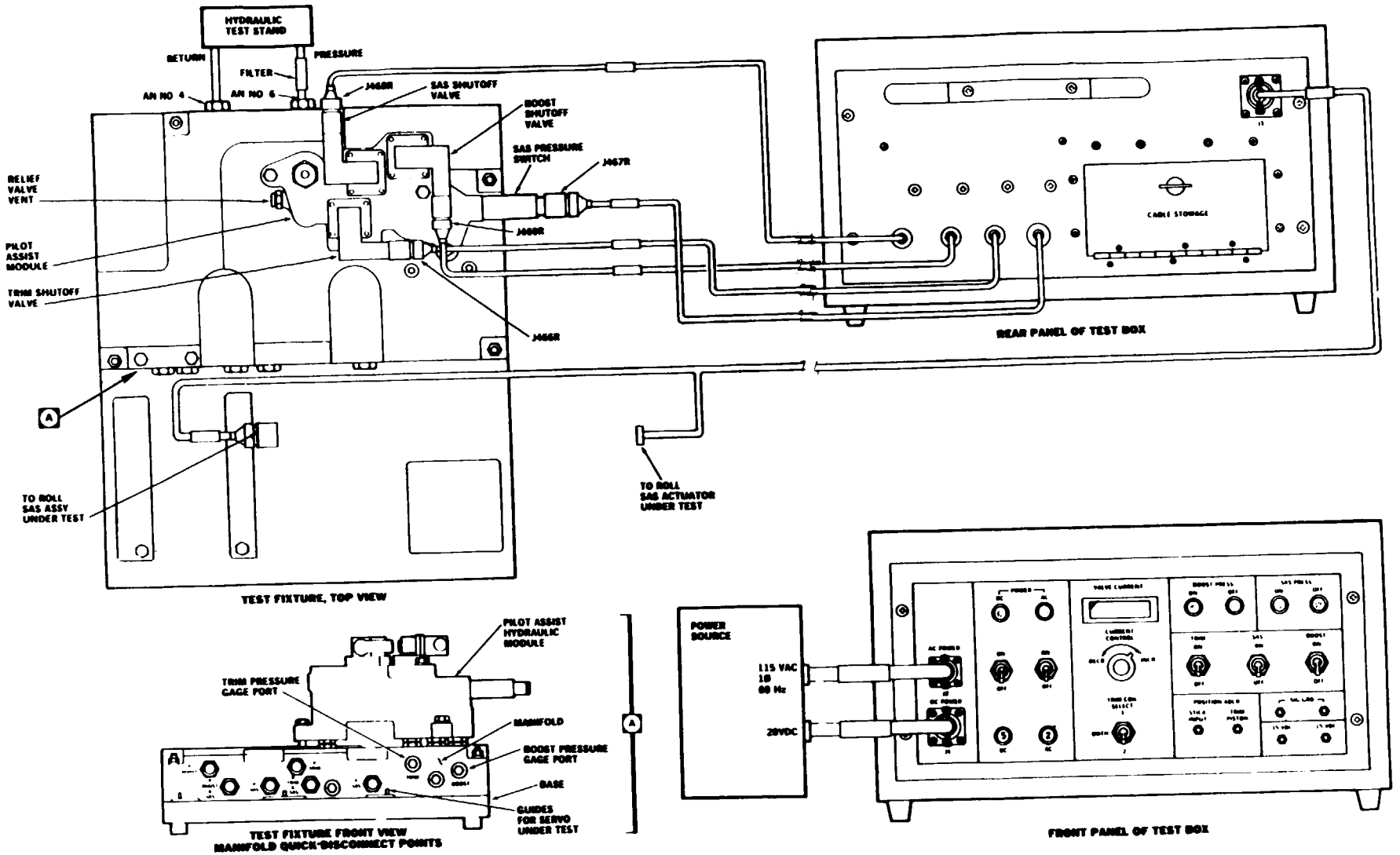


Figure 2-1. Test Box and Test Fixture Test Setup

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

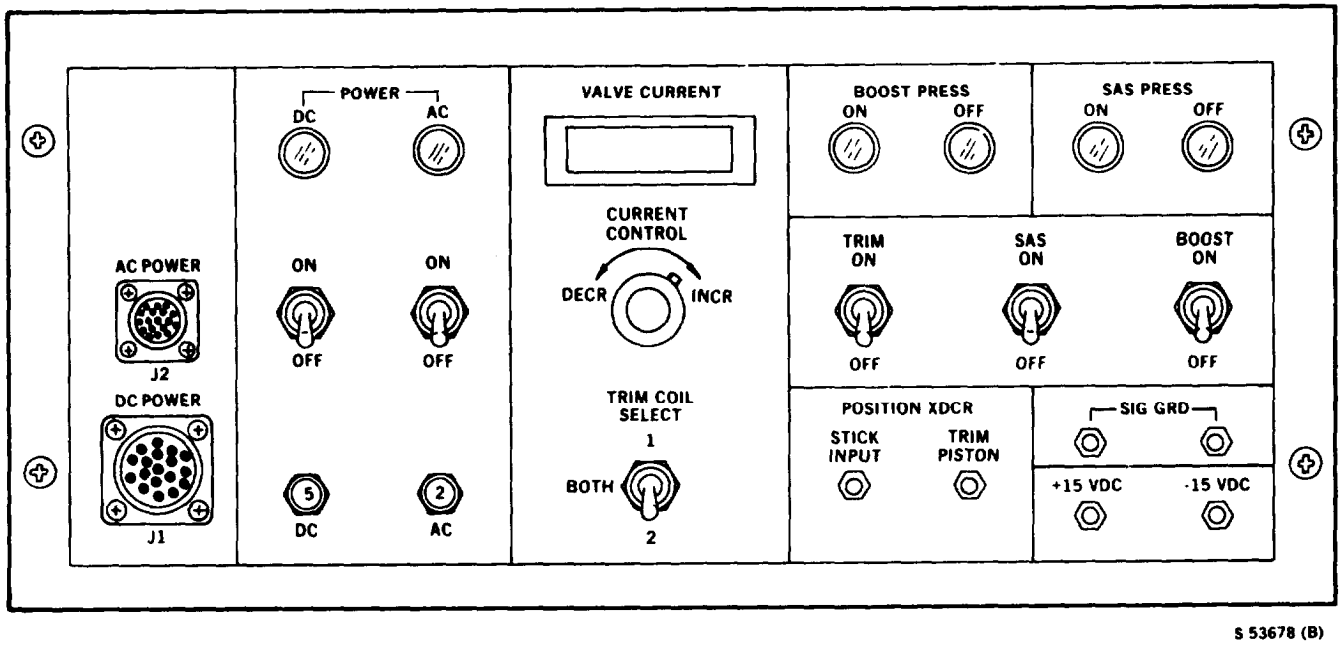


Figure 3-1. Test Box Operator's Controls and Indicators

3-1. Operator's **Controls.**

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

Table 3-1. operator's Controls

Control, indicator, or connector	Function
POWER DC indicator	Lights green when J1 is connected to 28 vdc and POWER switch is ON and DC circuit breaker is pushed in.
POWER AC indicator	Lights red when J2 is connected to 115 vac and POWER switch is ON and AC circuit breaker is pushed in.
VALVE CURRENT digital meter	Indicates current applied to pitch trim and SAS servo valves during nulling procedure.
BOOST PRESS ON indicator	Lights green when external boost pressure switch is activated (pressurized).
BOOST PRESS OFF indicator	Lights green when external boost pressure switch is not activated (not pressurized).
SAS PRESS ON indicator	Lights green when pilot assist module SAS pressure switch is activated (pressurized).
SAS PRESS OFF indicator	Lights green when pilot assist module **SAS** pressure switch is not activated (not pressurized).
AC POWER connector J2	Accepts cable to provide test set with source of 115 vat, 60 Hz single-phase power.
POWER DC ON-OFF switch	Controls application of 28 vdc to test set.
POWER AC ON-OFF switch	Controls application of 115 vac to test set.
CURRENT CONTROL DECR-INCR potentiometer.	Increases or decreases current level to servo valves on SAS actuator or pitch trim actuator. The control has a friction lock.
TRIM switch:	
ON position	Opens normally - closed trim turn-on valve.
OFF position	Closes normally - closed trim turn-on valve.
SAS switch:	
ON position	Opens normally - open SAS shutoff valve.
OFF position	Closes normally - open SAS shutoff valve.
BOOST switch:	
ON position	***Opens*** normally - open boost shutoff valve.
OFF position	Closes normally - open boost shutoff valve.
DC POWER connector J1	Accepts cable to provide test set with source of 28 vdc power.
DC circuit breaker	Opens 28 vdc power input on loads over 5 amps. Reset by pushing in.
AC circuit breaker	Open 115 vac power input on loads over 2 amps. Reset by pushing in.
TRIM COIL SELECT 1-BOTH-2 switch	Selects one, two, or both trim solenoid coils for actuation.
POSITION XDCR test jacks:	
STICK INPUT	Provides point of test for pitch trim servo stick input position transducer output.
TRIM PISTON	Provides point of test for pitch trim servo trim piston position transducer output.
+15 VDC, -15 VDC, and SIG GRD test jacks	Provides point of test for internal +15 VDC and -15 VDC power supplies.
J3 (Rear of Test Box)	Accepts cables allowing outputs from and inputs to Test Box from unit under test.

3-2. Pilot Assist/Nulling Test Box Theory of Operations

a. **28** ***VDC Power Circuit.*** The purpose of this circuit is to supply voltage to, or remove voltage from, three valves (trim turn on, SAS shutoff and boost shut off). This circuit also sup plies excitation voltage to three pressure switches (SAS, yaw boost and collective boost).

b. **115** ***VAC Power*** Circuit. This circuit has only one purpose in this test set, that is to supply input voltage for power supplies **PSI (+ 15 VDC) and PS2 (+5 VDC output).**

c. ± VDC Power Circuit This circuit has three purposes. First, it supplies circuit card power to the 70700-20687-041 circuit card assembly. Second, it supplies ± 15 VDC to the meter as a reference voltage. The third purpose for these voltages is as excitation voltages for the stick input and trim piston position transducers located inside the pitch trim assembly (when connected).

d. +5 ***VDC Power Circuit. This*** circuit has only one function in this test set, that is to supply power for the meter's internal circuitry and digital display.

e. Circuit ***Card Assembly.*** This card has two purposes. First, it **supplies valve current (milliamps) for one of the following servo valves; pitch SAS, yaw SAS, roll SAS or pitch trim (when connected).** Secondly, this card produces a voltage (millivolts) for the meter. The number of millivolts sent to the meter is equal to the number of milliamps sent to the servo valves. This is accomplished by two parallel circuits. Both utilizing the output of RI (current control). The circuit utilizing amplfier AR1 produces millivolts for the meter. The circuit for the valves, contains amplifer AR2 and an array of power transistors Q1 thru Q4. When RI is varied, both circuits respond simultaneously to produce the above mentioned outputs.

f. Meter. The meter is a 3 1/2 digit millivolt meter, The full scale deflection of this meter is from – 199.99 mV to + 199.9 mV. A small set screw is located on the front of the meter (recessed). This screw is used to adjust for a full scale reading (+ or - 199.99) when a calibrated voltage source is connected to the meter input. This screw has no effect on measurements near zero, such as our application of – 10.5 mV to +10.5 mV.

Section II. OPERATION UNDER USUAL Conditions

3-3. **Preliminary Starting Procedure.**

Refer to Figure 2-1 and proceed as follows:

a. On Test Box front panel, set all toggle switches OFF, and set TRIM COIL SELECT switch to BOTH.

WARNING

Position Test Fixture or, bench so that Pilot Assist module relief valve cannot vent on working personnel during overpressure conditions.

CAUTION

Make certain that hydraulic test stand uses hydraulic fluid consistent with each operating environment.

b. Connect hydraulic lines from deactivated hydraulic test stand to PRESSURE (AN No. 4) and RETURN (AN No. 6) ports at rear of Test Fixture manifold.

c. Connect plugs of four Test Box cables to appropriate receptacles of Pilot Assist Module (on Test Fixture) as follows:

Pilot Assist Module Component	Receptacle
Pitch/Trim shutoff valve	J466R
SAS pressure switch	J467R
SAS shutoff valve	J468R
Boost shutoff valve	J469R

d. Remove cables from stowage compartment at rear panel of Test Box.

e. Connect ac power cable (part No. 70700-20646-042) between receptacle J2 on test box and 115 vac, 60 Hz power source.

f. Connect DC power cable (part No. 70700-20633-041) between receptacle J1 on test box and 28 vdc power source.

g. Wipe all self-sealing hydraulic couplings clean of foreign materials using low-lint cloth (item 4 App D).

h. Install servo assembly to be tested on appropriate track guide on Test Fixture base, and slide servo toward manifold to engage self-sealing hydraulic couplers.

NOTE

When testing a pilot assist hydraulic module, refer to paragraph 4-17 for instructions on removal and installation from test fixture.

i. Bolt servo assembly to be tested to Test Fixture manifold.

j. Install 0-4000 psi direct read pressure gages in Test Fixture ports marked TRIM and BOOST.

NOTE

For roll, yaw, and collective servo assemblies, connect cable (part No. 70700-20682-042) between test box J3 and servo under test. Use cable (part No. 70700-20682-041) to test pitch trim servo.

k. Activate hydraulic test stand, and set fluid pressure for 3000 psi at 2 gpm.

1. Check all hydraulic coupling points for leaks.

3-4. **Operating Procedure.**

Refer to Figures 3-1, 3-2, Table 3-1, and manual TM 551520-237-23-3 for detailed test and nulling procedures for the flight control system servo assemblies.

Assembly	Part Number
Pilot Assist Hydraulic Module assembly	**70410-02620**
Collective Servo assembly	70410-02920
Roll SAS assembly	70410-02450
Pitch/Trim assembly	70410-02760
Yaw Boost Servo assembly	**70410-02910**

3-5. Procedures for Shutdown.

a. Place POWER AC and DC switches OFF.

b. Set hydraulic fluid pressure to zero, and deactivate hydraulic test stand.

c. Remove servo assembly under test.

d. Disconnect ac and dc power cables from power source, and store in cable stowage compartment with test cables removed from servo under test.

e. Disconnect PRESSURE and RETURN lines from Test Fixture ports.

f. Install protective covers on lines and ports.

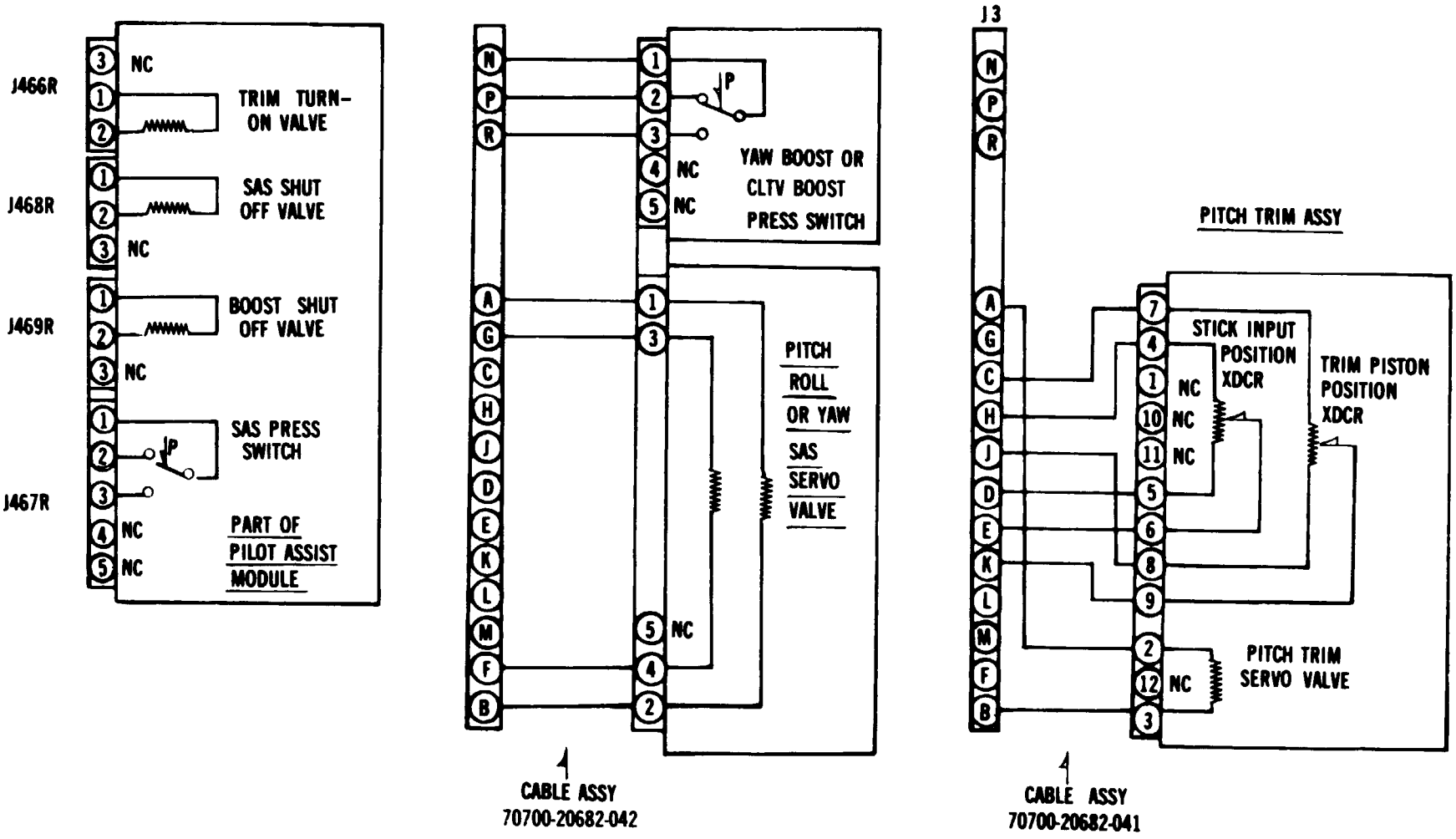


Figure 3-2 SCHEMATIC SERVOS TESTED /NULLED WITH TEST BOX

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. Operator/Aviation Unit Maintenance 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					Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment is not ready/ available if:
	B	D	A	W	M			
1	•		•			Cables	Check for broken wires, burned insulation, damage or dirt in connectors.	
2	•					Controls and Switches	Positive action and freedom of movement.	
3		•				Indicator Lights	Check operation of lights.	
4		•				Test Fixture	Check for hydraulic leaks.	

Section II. TROUBLESHOOTING

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 either the Test Box or the Test Fixture. 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 teats 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. You should do the tests/inspections and corrective actions in the order listed.

4-4. Troubleshooting Test Box.

Table 4-2 lists the common malfunctions that you may find during the operation or maintenance of the Test Box. Before attempting troubleshooting, do the following test setup.

a. Pull out POWER DC and AC circuit breakers.

b. Place TRIM, POWER AC, and POWER DC switch OFF. Place SAS and BOOST switches ON.

c. Remove ac and dc power cables from cable stowage compartment at rear of Test Box, and mate with appropriate connectors (J1 and J2) at front panel.

d. Connect power cables to source of 115 vac, 60 Hz and 28 vdc power.

4-5. Troubleshooting loot Fixture.

Table 4-3 lists the common malfunctions that you may find during the operation or maintenance of the Test Fixture. Connect Test Fixture and Test Box as indicated in paragraph 3-3. Do this test setup:

WARNING

Position Teat Fixture on bench so that relief valve cannot vent on personnel during overpressure conditions.

CAUTION

Make certain that hydraulic test stand uses hydraulic fluid consistent with each operating environment.

a. On Test Box place all switches OFF.

b. Place TRIM COIL SELECT switch to BOTH.

c. On Test Fixture manifold, install 0-4000 psi hydraulic pressure gages in BOOST and TRIM pressure outlet ports.

d. Push in POWER AC and DC circuit breakers.

NOTE

Wipe all hydraulic fittings dry of surface fluid.

Table 4-2. Troubleshooting - Test Box

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. POWER DC INDICATOR AND/OR MULTIMETER INDICATIONS NOT CORRECT WITH POWER DC SWITCH ON AND TRIM SWITCH ON.
Step 1. Place POWER DC switch OFF.
Step 2. Connect multimeter between pins 1 (+) and 2 (-) of cable plug marked “TO J466R".
Step 3. Place TRIM switch ON.
Step 4. Push in POWER DC circuit breaker.
Step 5. Place POWER DC switch ON. POWER DC indicator shall light green and multimeter shall indicate 28 vdc.
a. If both indications are incorrect, check dc input power cable (Table 4-1). If cable is good, send Test Box to higher maintenance. If cable is not good, replace cable, paragraph 4-20.
b. If POWER DC indicator is on but multimeter indication is incorrect, send Test Box to higher maintenance.
c. If multimeter indication is correct but POWER DC indicator is off, replace bulb, paragraph 4-10.
Step 6. Place TRIM switch OFF. Multimeter shall indicate O vdc.
a. If multimeter does not indicate O vdc, send Test Box to higher maintenance.
2. MULTIMETER DOES NOT INDICATE DC LINE VOLTAGE WITH SAS SWITCH OFF.
Step 1. Place POWER DC switch OFF.
Step 2. Connect mulitmeter between pins 1 (+) and 2 (-) of cable plug marked “TO J468R".
Step 3. Place SAS switch OFF.
Step 4. Place POWER DC switch ON. Multimeter shall indicate 28 vdc.
a. If multimeter does not indicate 28 vdc, send test box to higher maintenance.
Step 5. Place SAS switch ON. Multimeter shall indicate O vdc.
a. If multimeter does not indicate O vdc, send to higher maintenance.
3. MULTIMETER DOES NOT INCLUDE DC LINE VOLTAGE WITH BOOST SWITCH OFF.
Step 1. Place POWER DC switch OFF.
Step 2. Connect multimeter between pins 1 (+) and 2 (-) of cable plug marked “TO J469R".
Step 3. Place BOOST switch OFF.
Step 4. Place POWER DC switch ON. Multimeter shall indicate 28 vdc.
a. If multimeter does not indicate 28 vdc, send test box to higher maintenance.
Step 5. Place BOOST switch ON. Multimeter shall indicate O vdc.
a. If multimeter does not indicate O vdc, send to higher maintenance.
4. SAS PRESS OFF AND/OR SAS PRESS ON INDICATOR DO NOT COME ON.
Step 1. Place POWER DC switch OFF.
Step 2. Connect jumper wire between pins 1 and 2 of cable plug marked “TO J467R".
Step 3. Place POWER DC switch ON. SAS PRESS OFF indicator shall light green.
a. If SAS PRESS OFF indicator does not light, replace bulb, paragraph 4-10. If indicator still doesn’t light, send test box to higher maintenance.
Step 4. Place POWER DC switch OFF.
Step 5. Remove jumper lead from pin 2 and connect to pin 3.

Table 4-2. Troubleshooting - Test Box (Cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 6. Place POWER DC switch ON. SAS PRESS ON indicator shall light green.

a. If SAS PRESS ON indicator does not light, replace bulb, paragraph 4-10. If indicator still doesn't light, send test box to higher maintenance.

Step 7. Remove jumper wire.

5. POWER AC INDICATOR DOES NOT LIGHT WITH POWER AC SWITCH ON.

Step 1. Place POWER DC switch OFF.

Step 2. Push in POWER AC circuit breaker.

Step 3. Place POWER AC switch ON. POWER AC indicator shall light red.

a. If POWER AC indicator does not light, replace bulb, paragraph 4-10.

b. If indicator still doesn't light, check ac input power cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 4. Place POWER AC switch OFF. POWER AC indicator goes off.

a. If indicator stays on, send Test Box to higher maintenance.

6. MULTIMETER INDICATIONS OF +15 VDC AND/OR -15 VDC NOT PRESENT WITH POWER AC SWITCH ON.

Step 1. Connect multimeter between +15 VDC and SIG GRD test jacks.

Step 2. Place POWER AC switch ON. Multimeter shall indicate between +14.5 and +1 5.5 vdc.

a. If multimeter indication is not correct, send Test Box to higher maintenance.

Step 3. Connect multirneter between -15 VDC and SIG GRD test jacks. Multimeter shall indicate between -14.5 and -15.5 vdc.

a. If multimeter indication is not correct, send Test Box to higher maintenance.

Step 4. Place POWER AC switch OFF. Connect test cable W 1 to receptacle J3 on rear of Test Box.

Step 5. Connect multimeter between pin 4 on test cable plug marked "PITCH TRIM ACTUATOR" and Test Box SIG GND test jack.

Step 6. Place POWER AC switch ON. Multimeter shall indicate between +14.5 and +15.5 vdc.

a. If mulitmeter indication is not correct, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 7. Place POWER AC switch OFF. Disconnect mulitmeter from pin 4 and connect to pin 7.

Step 8. Place POWER AC switch ON. Multimeter shall indicate between+ 14.5 and +15.5 vdc.

a. If multimeter indication is not correct, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 9. Place POWER AC switch OFF. Disconnect multimeter from pin 7 and connect to pin 8.

Step 10. Place POWER AC switch ON. Multimeter shall indicate between -14.5 and -15.5 vdc.

a. If multimeter indication is not correct, check cable (Table **4-1).** If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 11. Place POWER AC switch OFF. Disconnect multimeter from pin 8 and connect to pin 5.

Step 12. Place POWER AC switch ON. Multimeter shall indicate between -14.5 and -15.5 vdc.

a. If multimeter indication is not correct, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 13. Place POWER AC switch OFF. Disconnect multimeter from pin 5 and connect to test box POSITION XDCR TRIM PISTON test jack. Connect jumper wire from pin 5 to pin 9.

Table 4-2. Troubleshooting - Test Box (Cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 14. Place POWER AC switch ON. Multimeter shall indicate between -14.5 and -15.5 vdc.

a. If multimeter indication is not correct, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 15. Place POWER AC switch OFF.

Step 16. Connect jumper wire from pin 5 to pin 6.

Step 17. Disconnect multimeter from POSITION XDCR TRIM PISTON test jack and connect to POSITION XDCR STICK INPUT test jack.

Step 18. Place POWER AC switch ON. Multimeter shall indicate between -14.5 and -15.5 vdc.

a. If multimeter indication is not correct, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 19. Disconnect multimeter leads.

Step 20. Place POWER AC switch OFF. Remove test cable WI.

Step 21. Make continuity check bet ween pin A of plug marked “TO TEST SET J3" and pin 2 of plug marked “PITCH TRIM ACTUATOR.

a. If there is no continuity, replace cable (Table 4-1), paragraph 4-20.

Step 22. Make continuity check between pin B of plug marked “TO TEST SET J3" and pin 3 of plug marked “PITCH TRIM ACTUATOR’.

a. If there is no continuity, replace cable (Table 4-1), paragraph 4-20.

7. BOOST PRESS OFF AND/OR BOOST PRESS ON INDICATORS DO NOT GO ON.

Step 1. Connect test cable W2 to connector J3 on rear of Test Box.

Step 2. Connect jumper wire between pin 1 and pin 2 on test cable plug marked “PRESSURE SWITCH”.

Step 3. Place POWER DC switch ON. BOOST PRESS OFF indicator shall light green.

a. If indicator does not light, replace bulb, paragraph 4-10.

b. If indicator still doesn’t light, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 4. Place POWER DC switch OFF.

Step 5. Disconnect jumper wire from pin 2 and connect to pin 3.

Step 6. Place POWER DC switch ON. BOOST PRESS ON indicator shall light green.

a. If indicator does not light, replace bulb, paragraph 4-10.

b. If indicator still does not light, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Step 7. Place POWER DC switch OFF and remove jumper wire.

8. VALVE CURRENT METER DOES NOT RESPOND CORRECTLY WHEN CURRENT CONTROL IS TURNED.

Step 1. Connect one 1,000 ohm, 1/2 watt resistor between pins 3 and 4 and another between pins 1 and 2 on test cable plug marked "SAS ACTUATOR’.

Step 2. Place POWER AC switch ON.

Step 3. Place TRIM COIL, SELECT switch to BOTH and allow 1 minute circuit warm-up time.

Step 4. Turn CURRENT CONTROL to extreme position toward INCR (clockwise). VALVE CURRENT meter shall indicate between -10.00 and -11.00 ma.

a. If meter does not indicate anything, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.

Table 4-2. Troubleshooting - Test Box (Cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
b. If reading is out of tolerance, send Test Box to higher maintenance.
Step 5. Turn CURRENT CONTROL to extreme position toward DECR (counterclockwise). VALVE CURRENT meter shall indicate between +10.00 and +11.00 ma.
a. If meter does not indicate anything, check cable (Table 4-1). If cable is not good, replace cable, paragraph 4-20. If cable is good, send Test Box to higher maintenance.
b. If reading is out of tolerance, send Test Box to higher maintenance.
Step 6. Place TRIM COIL SELECT switch to 1. VALVE CURRENT meter shall indicate between +06.50 and +07.50 ma.
a. If reading is out of tolerance, send Test Box to higher maintenance.
Step 7. Turn CURRENT CONTROL to extreme position toward INCR. VALVE CURRENT meter shall indicate between -06.50 and -07.50 ma.
a. If reading is out of tolerance, send Test Box to higher maintenance.
Step 8. Place TRIM COIL SELECT switch to 2. VALVE CURRENT meter shall indicate between -06.50 and -07.50 ma.
a. If reading is out of tolerance, send Test Box to higher maintenance.
Step 9. Turn CURRENT CONTROL to extreme position toward DECR. VALVE CURRENT meter shall indicate between +06.50 and +07.50 ma.
a. If reading is out of tolerance, send Test Box to higher maintenance.
Step 10. Place POWER AC switch OFF.
Step 11. Disconnect and stow all cables.

Table 4-3. Troubleshooting - Test Fixture

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. HYDRAULIC FLUID LEAKAGE.
Step 1. Place Test Box POWER DC switch ON.
Step **2.** Set hydraulic test stand output pressure control to zero, then turn on hydraulic test stand and set fluid pressure for 2000 psi at 2 gpm.
a. If quick-disconnect couplings leak, replace coupling, paragraphs 4-18 and 4-19.
b. If thermal switch leaks, replace thermal switch, paragraph 4-16.
Step **3.** Increase hydraulic test stand fluid pressure to 3000 psi.
a. Replace any leaking item.
Step **4.** Place Test Box TRIM, SAS, and BOOST switches ON. TRIM pressure gage shall indicate between 950 and 1050 psi. SAS PRESS ON indicator shall light. BOOST pressure gage shall indicate between 2500 and 3050 psi.
a. If TRIM pressure gage reading is zero, replace TRIM SHUTOFF VALVE, paragraph 4-13.
b. If TRIM pressure gage reading is out of tolerance, replace pressure reducer, paragraph 4-14.
c. If BOOST pressure gage reading is incorrect, replace BOOST SHUT-OFF three-way valve, paragraph 4-13.
d. If SAS PRESS ON indicator does not light, replace SAS pressure switch, paragraph 4-15.
Step 5. Place Test Box SAS switch OFF. TRIM pressure gage shall indicate between 950 and 1050 psi. SAS PRESS OFF indicator shall light. BOOST pressure gage shall indicate between 2500 and 3050 psi.
a. If SAS PRESS OFF indicator does not light, replace SAS pressure switch, paragraph 4-15.
Step 6. Place Test Box BOOST switch OFF. TRIM pressure gage shall indicate between 950 and 1050 psi. SAS PRESS OFF indicator shall light. BOOST pressure gage shall indicate zero.
a. If BOOST pressure gage reading is incorrect, replace BOOST SHUT-OFF three-way valve, paragraph 4-13.
Step 7. Place Test Box TRIM switch OFF, SAS switch ON, and BOOST switch ON, TRIM pressure gage shall indicate zero. SAS PRESS ON indicator shall light. BOOST pressure gage shall indicate between 2500 and 3050 psi.
a. If TRIM pressure gage does not indicate zero, replace TRIM SHUT-OFF VALVE, paragraph 4-13.
2. SAS PRESS ON AND SAS PRESS OFF INDICATORS RESPOND TO INCORRECT PRESSURES.
Step 1. Place Test Box TRIM switch OFF, SAS switch ON, and BOOST switch OFF.
Step 2. Reduce hydraulic test stand pressure to a value between 1900 and 2050 psi. SAS PRESS OFF indicator shall light green.
a. If SAS PRESS OFF indicator does not light, replace SAS pressure switch, paragraph 4-15.
Step 3. Slowly increase hydraulic test stand pressure toward 3000 psi until SAS PRESS ON indicator lights green. Hydraulic test stand pressure gage should not indicate more than 2400 psi.
a. If SAS PRESS ON indicator does not light, replace SAS pressure switch, paragraph 4-15.
Step 4. Reduce pressure to zero psi and shut off hydraulic test stand.
Step 5. Remove hydraulic lines from Test Fixture.
Step 6. Remove pressure gages from Test Fixture.
Step 7. Place Test Box POWER DC switch OFF.
Step 8. Remove and stow all test and power cables.

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 equipment is properly grounded and firefighting equipment is readily available prior to use.

4-6. **Cleaning instructions.**

a. Remove dust and loose dirt with a clean, low-lint cloth (item 4, App. D).

b. Remove grease, fungus, and ground-in dirt with cloth dampened with dry-cleaning solvent (item 6, App D).

c. Remove moisture with a dry cloth.

4-7. **Repainting and Refinishing instructions.**

NOTE

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

a. Repaint test set case (exterior) with two coats of yellow baked enamel (item 1, App D).

Section IV. MAINTENANCE

4-8. **Scope.**

The scope of corrective maintenance is the replacement of lamps and lens, knobs, three-way valves, shut off valve, pressure reducer, SAS pressure switch, thermal relief valve, pilot assist hydraulic module, male quick-disconnect couplings, and female quick-disconnect couplings.

4-9. **Test Box Maintenance.**

4-10. indicator Lamps/Lens Replacement.

a. Make certain POWER DC and AC switches are OFF.

b. Remove lens cover (Figure 4-1).

c. Remove lamp.

d. Install new lamp.

e. Install new lens cover.

4-11. Knob Replacement.

a. Loosen setscrews holding knob to shaft (Figure 4-1).

b. Slide knob off shaft.

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

d. Tighten setscrews.

4-12. **Test Fixture Maintenance.**

4-13. Three-way and Shut-off Valve Replacement.

CAUTION

To keep dirt from Pilot Assist Hydraulic Module assembly, make sure Pilot Assist Hydraulic Module assembly is clean before maintenance. Replace three-way valves and shut off valve only in a clean place. Have replacement valve ready for installation before malfunctioned valve is removed. It is not necessary to remove Module assembly from manifold on Test Fixture.

a. Make certain POWER DC and AC switches are OFF and hydraulic test stand is off.

b. Disconnect electrical connector from malfunctioned valve.

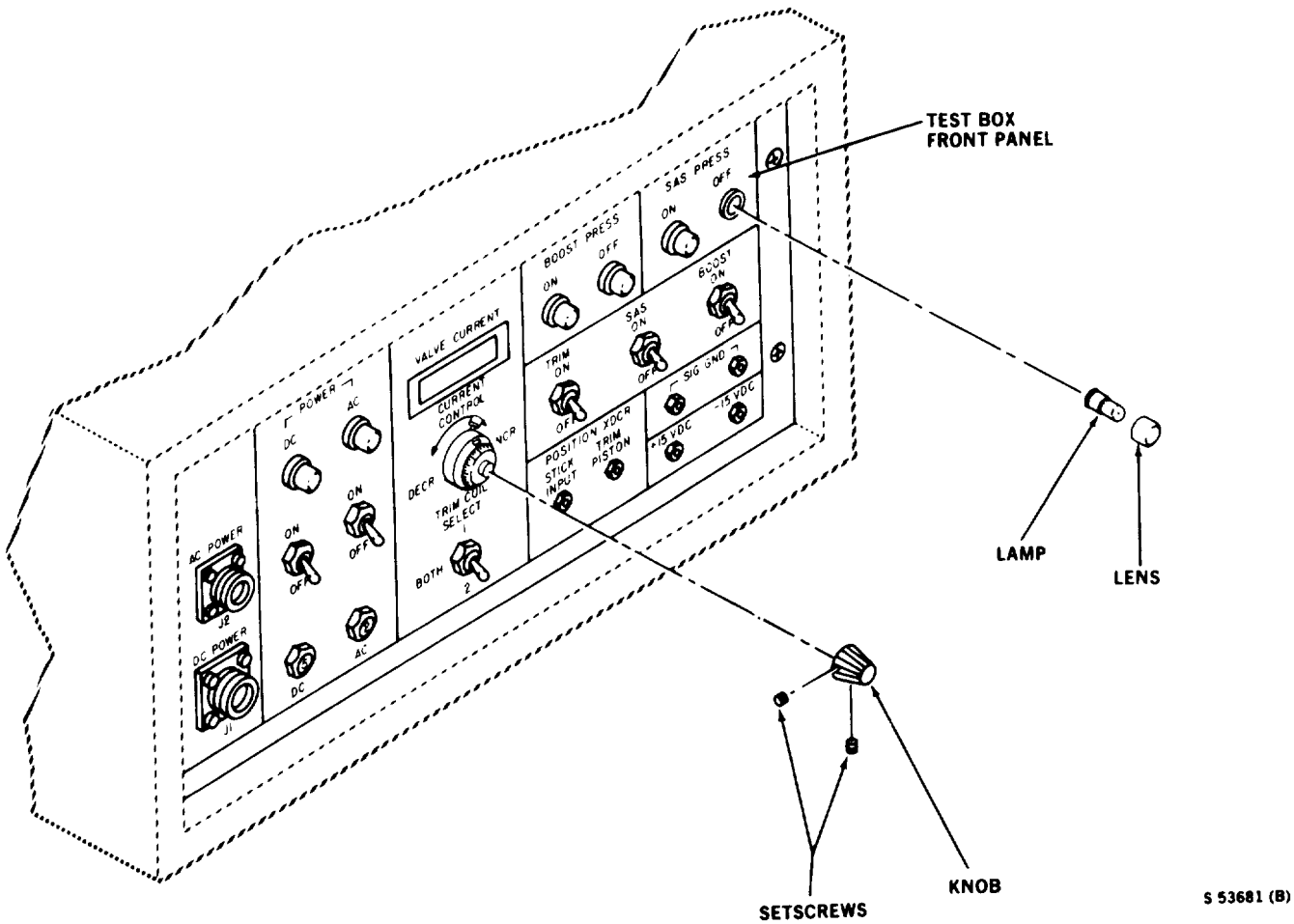


Figure 4-1. Panel Lamp, Lens, and Knob Removal and Replacement

c. Remove lockwire.

d. **Unscrew malfunctioned three-way valve (BOOST** SHUTOFF, TRIM SHUTOFF, or SAS SHUTOFF, as necessary) from Pilot Assist Hydraulic Module assembly (Figure 4-2). Pull up valve and remove from module.

e. Remove packings from TRIM SHUTOFF VALVE, or packings and seals from SAS or BOOST SHUTOFF VALVES.

f. Coat new packings and new seals with hydraulic fluid (item 3, App D), before installing.

g. If TRIM SHUTOFF VALVE is being replaced, install new packings on valve. If BOOST or SAS shutoff valves are being replaced, install new packings and new seals on valve.

h. Install valve in Module assembly. Install screws. Torque screws to 19-2 I inch-pounds.

i. Install Iockwire (item 7, App D). Refer to TM 55-1500-204-25/1.

4-14. **Pressure Reducer Replacement.**

CAUTION

To keep dirt from Pilot Assist Hydraulic Module assembly, make sure Pilot Assist Hydraulic Module assembly is clean before disassembly. Replace pressure reducer only in a clean place. Have replacement reducer ready for installation before malfunctioned reducer is removed. It is not necessary to remove assembly from manifold on Test Fixture.

a. Remove lockwire between pressure reducer valve and thermal relief valve.

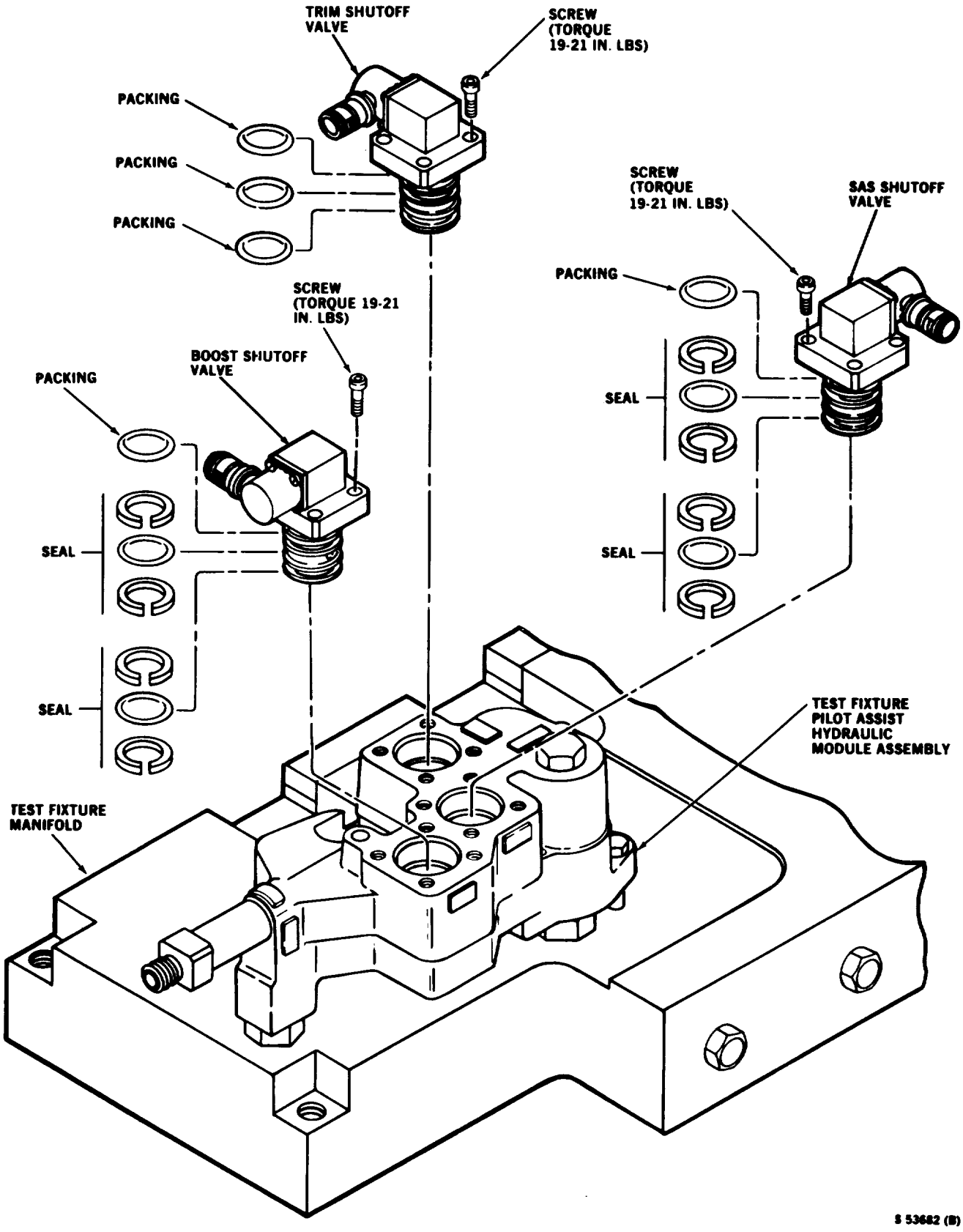


Figure 4-2. Three-Way and Shutoff Valve Removal and Replacement

b. Unscrew malfunctioned pressure reducer from Pilot Assist Hydraulic Module assembly (Figure 4-3).

c. Coat new packings, seal and threads of replacement pressure reducer with hydraulic fluid (item 3, App D), before installing.

d. Install new packings and new seal on replacement pressure reducer.

e. Screw replacement pressure reducer into Pilot Assist Hydraulic Module assembly. Torque to 238 - 262 inch-pounds.

f. Install Iockwire (item 7, App D) between pressure reducer valve and thermal relief valve. Refer to TM 55- 1500-204-25/ 1.

4-15. SAS Pressure Switch **Replacement.**

CAUTION

To keep dirt from Pilot Assist Hydraulic Module assembly, and prevent fluid loss, make sure Pilot Assist Hydraulic Module assembly is clean before maintenance. Replace SAS Pressure switch only in a clean place. Have replacement switch ready for installation before malfunctioned switch is removed. It is not necessary to remove Pilot Assist Hydraulic Module assembly from Test Fixture manifold.

a. Remove Iockwire.

b. Disconnect electrical connector from malfunctioned SAS pressure switch (Figure 4-4).

c. Have container of at least 1 quart to catch hydraulic fluid.

d. Remove pressure switch and packings from Pilot Assist Hydraulic Module assembly.

e. Coat new packings and packing seats with hydraulic fluid (item 3, App D).

f. Install new packings on SAS pressure switch. Install new switch in Pilot Assist Hydraulic Module assembly. Torque to 175 inch-pounds.

g. Install lockwire (item 7, App D). Refer to TM 55-1500-204-25/1.

4-16. Thermal Relief Valve Replacement

CAUTION

To keep dirt from Pilot Assist Hydraulic Module assembly, make sure Pilot Assist Hydraulic Module assembly is clean before maintenance. Replace relief valve only in a clean place. Have replacement valve ready for installation before malfunctioned valve is removed. It is not necessary to remove Module assembly from Test Fixture manifold.

a. Remove lockwire between pressure reducer valve and thermal relief valve.

b. Unscrew malfunctioned pressure reducer from Pilot Assist Hydraulic Module assembly (Figure 4-5).

c. Coat new packing of replacement valve with hydraulic fluid (item 3, App D), before installing.

d. Install new packing on replacement valve.

e. Screw replacement valve into Pilot Assist Hydraulic Module assembly. Torque to 75 inch-pounds.

f. Install lockwire (item 7, App D) between pressure reducer valve and thermal relief valve. Refer to TM 55-1500-204-25/1.

4-17. Pilot Assist Hydraulic Module Assembly Replacement.

CAUTION

To keep Pilot Assist Hydraulic Module assembly free of dirt during repair, make sure all ports are covered. Remove Module assembly only in a clean place.

a. Disconnect electrical connector from shut-off valves (Figure 4-6).

b. Disconnect electrical connector from SAS pressure switch.

c. Unbolt and remove Pilot Assist Hydraulic Module assembly from Test Fixture manifold by pulling straight up on module.

d. Clean top surfaces of female couplings with low-lint cloth (item 4, App D). Flush with Clean All D (item 5, App D).

e. Position Pilot Assist Hydraulic Module assembly on Test Fixture manifold making sure quick-disconnect couplings on Module assembly line up with Test Fixture manifold.

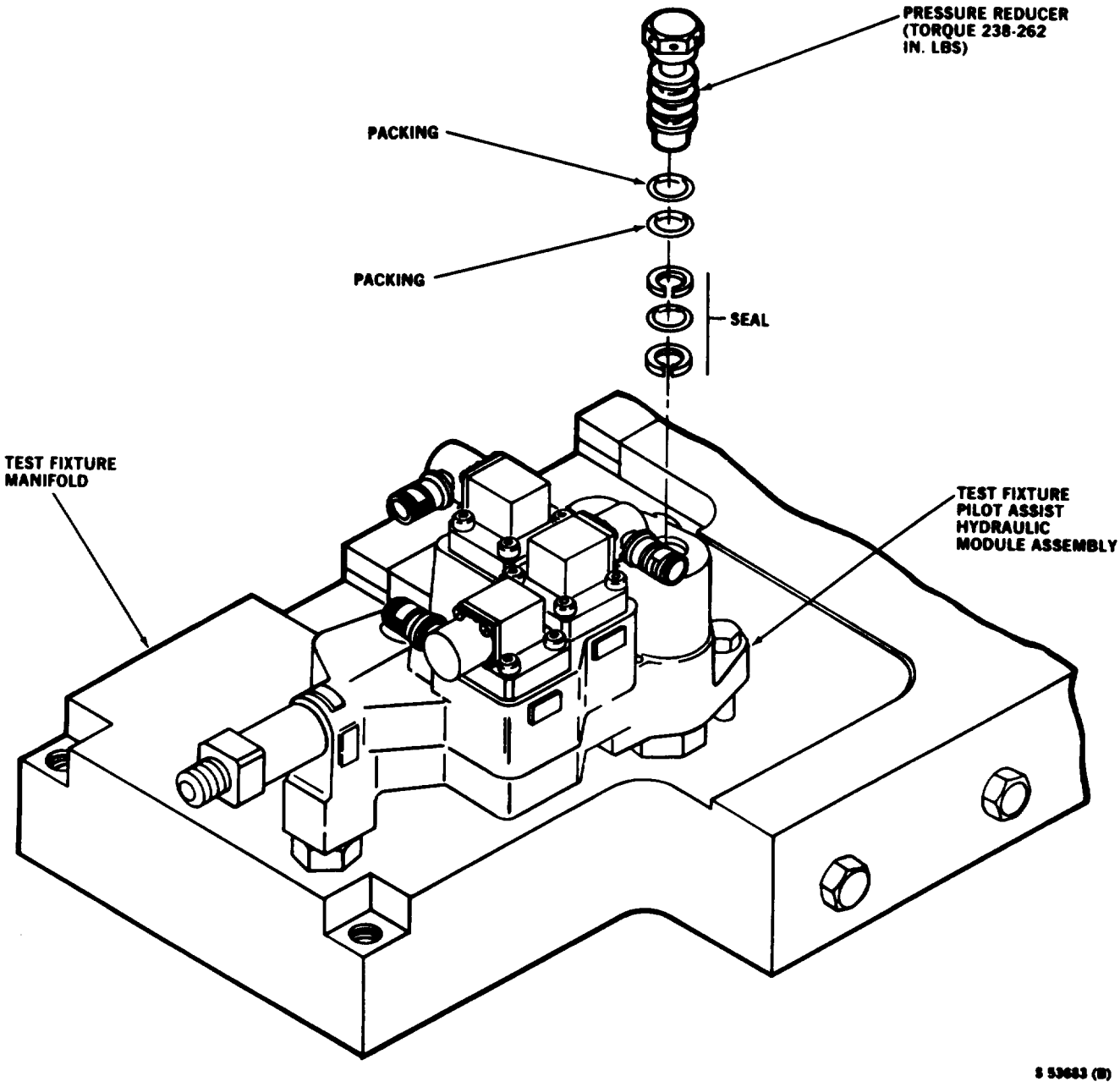


Figure 4-3. Pressure Reducer Removal and Replacement

f. Push straight down on Module assembly, and install bolts, spacers, and washers. Torque bolts to 180 -200 **inch-pounds,**

g. Connect connectors to shut-off valves.

4-18. Male Quick-Disconnect Couplings Replacement.

a. Remove Pilot Assist Hydraulic Module assembly from Test Fixture manifold, paragraph 4-17, to get to couplings.

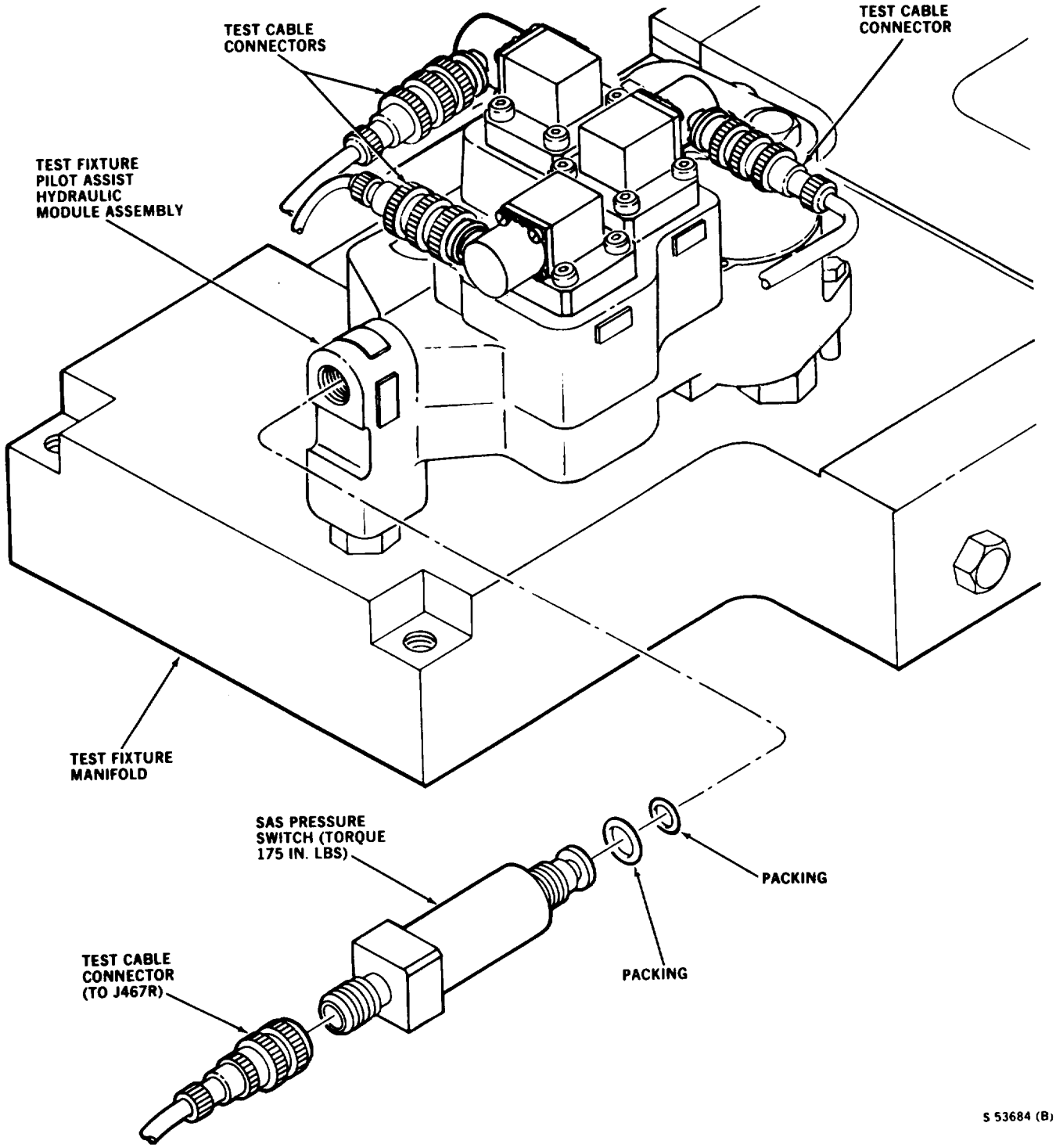


Figure 4-4. SA S Pressure Switch Removal and Replacement

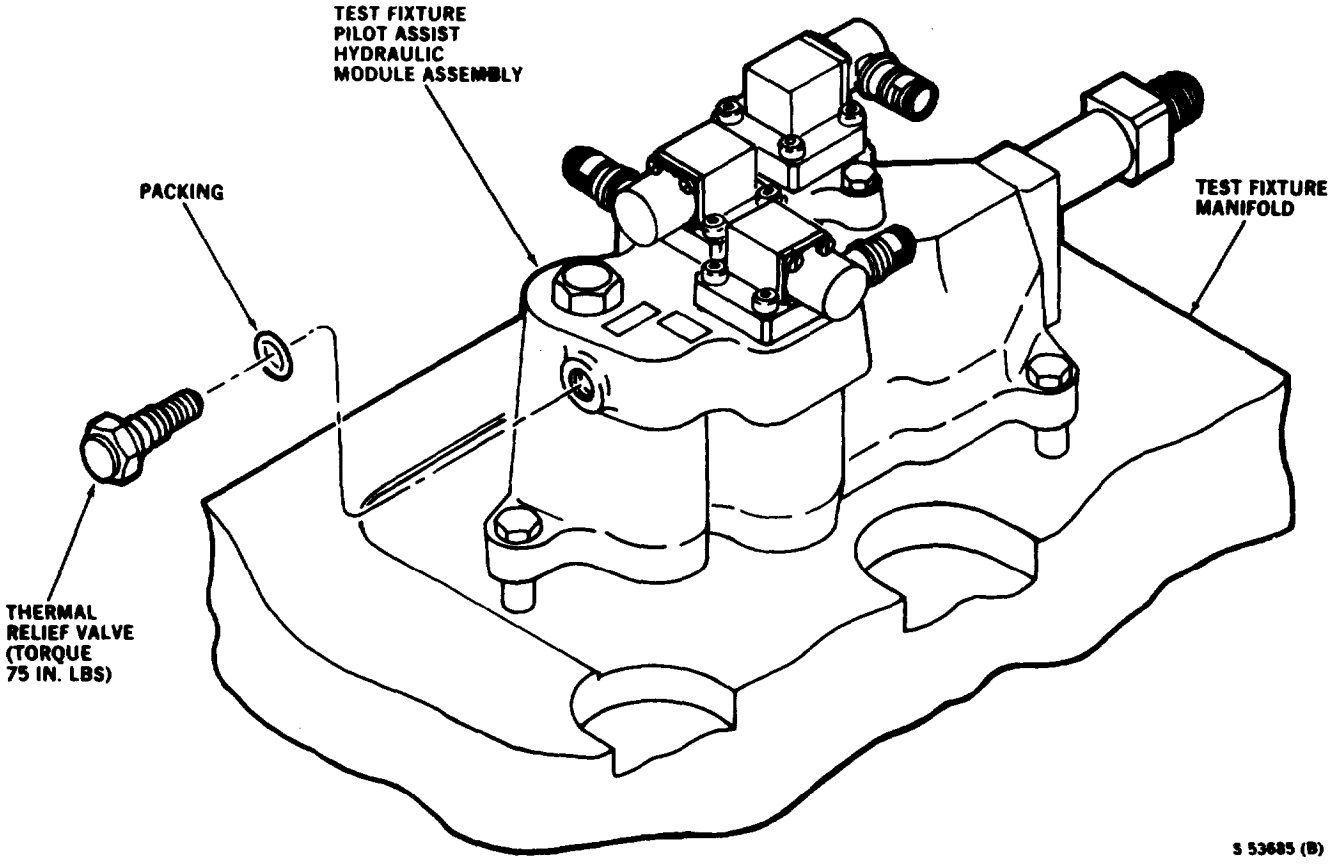


Figure 4-5. Thermal Relief Valve Removal and Replacement

b. Cover Test Fixture manifold to prevent contamination.

CAUTION

To keep dirt from Module assembly self-seal coupling should be removed in a clean place.

c. Use clean, low-lint cloth (item 4, App D) to clean coupling area. Flush with Clean **All** D (item 5, App D).

d. Remove self-seal coupling, rings, and packing from module assembly, Figure 4-7.

e. Coat new seals and coupling threads with hydraulic fluid (item 3, App D), before installing.

f. Install large self-seal coupling and seal in module assembly. Torque to 285-315 inch-pounds.

g. Install small self-seal coupling and seal in module assembly. Torque to 142- 157 inch-pounds.

h. Install repaired Module assembly in Test Fixture manifold (paragraph 4-17).

4-19. Female Quick-Disconnect Couplings Replacement.

a. Remove Pilot Assist Hydraulic Module assembly from Test Fixture manifold, paragraph 4-17, to get to couplings.

b. Cover Pilot Assist Hydraulic Module assembly and Test Fixture manifold open ports to prevent contamination,

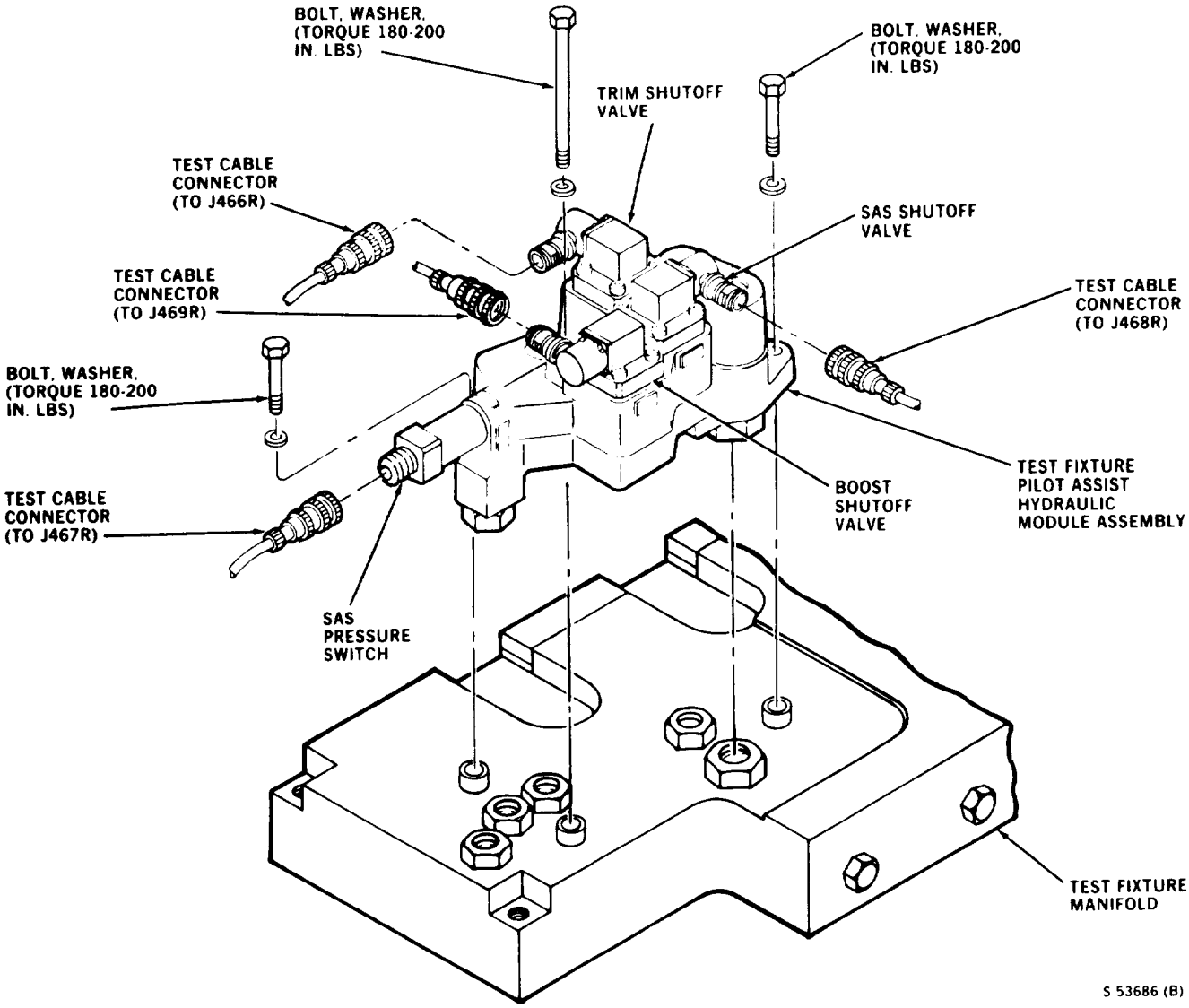


Figure 4-6. Pilot Assist Hydraulic Module Assembly Removal and Replacement

CAUTION

To keep dirt for Test Fixture manifold, have replacement self-seal coupling ready for immediate installation. 'Make sure area around coupling is clean.

a. Use clean, low-lint cloth (item 4, App D), to clean installed couplings and manifold. Flush with Clean All D (item 5, App D).

b. Remove self-seal coupling and seal from Test Fixture manifold, Figure 4-8.

c. Coat new seals and coupling threads with hydraulic fluid (item 3, App D), before installing.

d. Install large self-seal coupling and seal in Test Fixture manifold. Torque to 285-315 inch-pounds.

e. Install small self-seal coupling and seal in Test Fixture manifold. Torque to 142-157 inch-pounds.

f. Install Pilot Assist Hydraulic Module in Test Fixture manifold (paragraph 4-17).

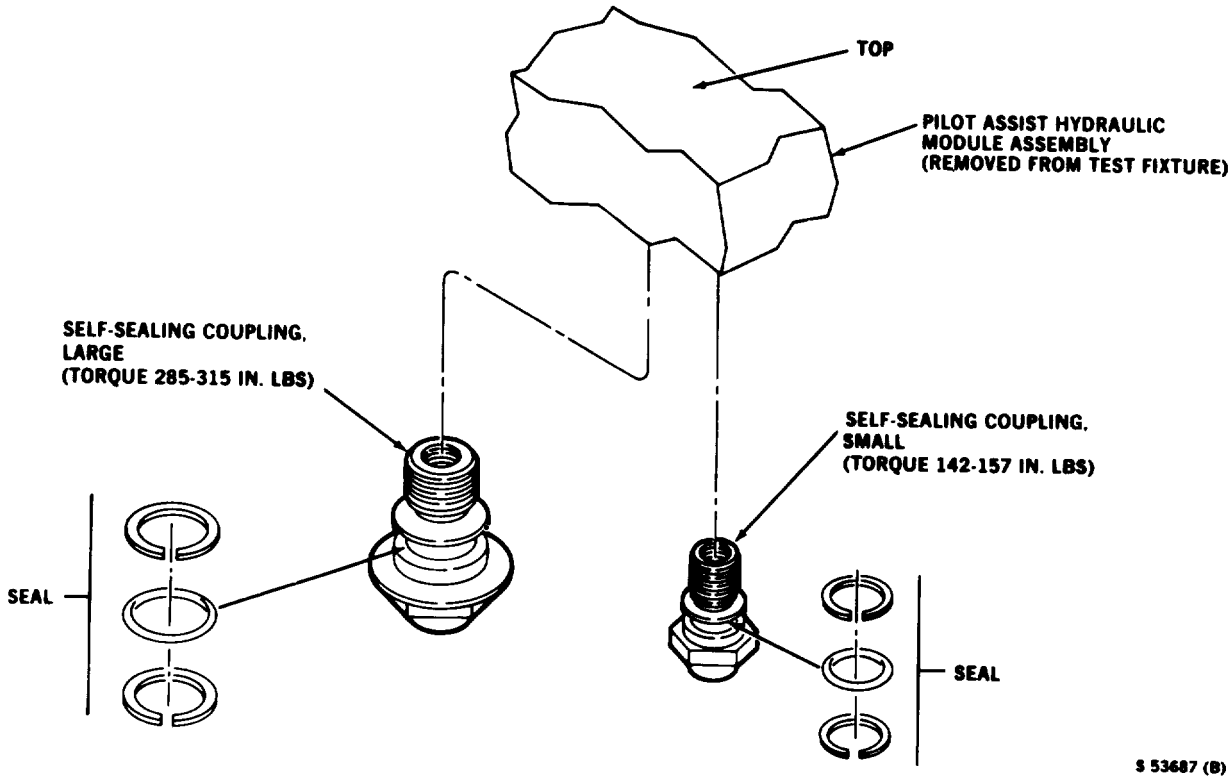


Figure 4-7. Male Quick-Disconnect Couplings Removal and Replacement

4-20. Cable Assemblies.

Remove cable assembly and send to higher maintenance.

4-21. Lubrication.

None is required.

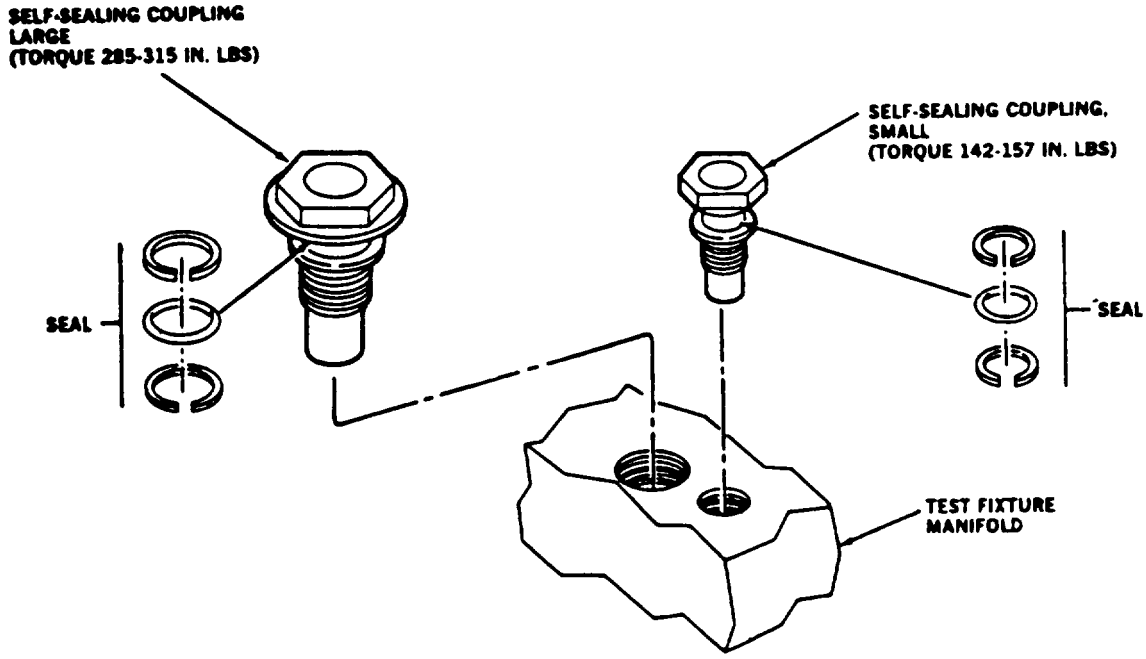


Figure 4-8. ***Female Quick-Disconnect Couplings Removal and Replacement***

NOTE

Authorized repair of the test Box Assembly Pilot Assist by Aviation Intermediate Maintenance (CRC) personnel is indicated in App. B Maintenance Allocation Chart.

NOTE

Aviation Intermediate Maintenance (ATST) will perform only the authorized maintenance which includes replacement and repair of component and end items which can be accomplished efficiently with available skills, tools, and test equipment.

NOTE

Perform para 4-23 as directed by Troubleshooting Table 4-8, Troubleshooting charts FO3, schematics FO1, wiring diagram F02, chassis wiring with PS1 and PS2 power supply **terminals figure 4-9, circuit** board (Al) figure 4-19 and wiring run list Table 4-5.

4-22. Troubleshooting & Repair (ATST).

Paras 4-22 and 428 contains general repair information, maintenance instructions, troubleshooting procedures and component replacement procedures. Test equipment required are listed in Table 4-4. Test box cable assemblies are shown in Figures 4-10,4-11, and Test Box exploded view Figure 4-12.

Table 4-4. Test Equipment

Common Name	Manufacturer and Model (part number)
AUTOTRANSFORMER	General Radio, Model W1OMT3AS3 (7910809) or equivalent
DC POWER SUPPLY	NJE, Model CS36CR30D2 (7907346-2) or equivalent
DIGITAL VOLTMETER	Tektronix, Type DM501A (DM501A) or equivalent
ADAPTER	Single banana jack to pin plug (black) (7907528)
ADAPTER	Single banana jack to pin plug (red) (7907517)
LEAD	24-in., No. 18; single banana plug (black) (7907498)
LEAD	24-in., No. 18; single banana plug (red) (7907497)
LEAD[1]	Miniature pin jack with 12-in., No. 16 wire attached (fabricate locally)
LEAD[2]	Pin jack to single banana plug (7921032)

[1] Two required.
[2] Three required.

Table 4-5. Test Box Wiring Run List

FROM	TO	WIRE NUMBER	FROM	TO	WIRE NUMBER
A1-E6	R1-3	24A22	J3-F	S4-4	15A2Z
A1-E16	R1-1	25A22	J3-G	A1-E56	18A22
AI-E25	R1-2	23A22	J3-H	J8	7C22
A1-E38	P4-A1	8C22	J3-J	J9	10C22
A1-E38	PS1-5	8B22	J3-K	J5	20A22
A1-E44	P4-A14	1A22	J3-N	TB1-3	11F22
A1-E45	J3-A	17A22	J3-P	XDS4-1	21A22
A1-E56	J3-G	18A22	J3-R	XDS3-1	22A22
A1-E58	PS1-4	10A22	J4	J3-E	19A22
A1-E58	J3-D	10D22	J5	J3-K	20A22
A1-E59	J7	8G22	J6	J7	8E22
A1-E60	PS1-6	7A22	J6	E l	8H22
A1-E60	J8	7B22	J6	PS2-5	8D22
A1-E62	S4-2	14A22	J7	J6	8E22
CB1-1	J2-C	1A20	J7	P4-A15	8F22

Table 4-5 Test Box Wiring Run List (Cont)

FROM	TO	WIRE NUMBER	FROM	To	WIRE NUMBER
CB1-2	S5-2	4A20	J7	A1-E59	8G22
CB2-1	J1-B	3A20	J8	A1-E60	7B22
CB2-2	S6-2	31A20	J8	J3-H	7C22
E l	J2-B	9A20	J8	J3-C	7D22
E l	XDS1-2	9B22	J9	PS1-4	10B22
E l	J6	8H22	J9	J 3 J	10C22
E2	E3	9N22	J9	P4-A3	10E22
E2	TB1-6	9L22	PS1-1	PS2-1	5C22
E3	E2	9N22	Psi-l	XDS2-1	5B22
E3	J1-A	9P20	PS1-2	PS2-2	6C22
J1-A	E3	9P20	PS1-2	XDS2-2	6B22
J1-B	CB2-1	3A20	PS14	J9	10B22
J2-A	S5-5	2A20	PS1-4	A1-E58	10A22
J2-B	E l	9A20	PS1-5	PS2-5	8A22
J2-C	CB1-I	lA20	PS1-5	A1-E38	8B22
J3-A	A1-E45	17A22	PS1-6	A1-E60	7A22
J3-B	84-3	16A22	PS2-1	Psi-l	5C22
J3-C	J8	7D22	PS2-2	PS1-2	6C22
J3-D	A1-E58	10D22	PS2-5	PS1-5	8A22
J3-E	J4	19A22	PS2-5	J6	8D22
			PS2-6	P4A2	13M2
P4-A1	A1-E38	8C22	S5-2	CB1-2	4A20
P4-A2	PS2-6	13A22	S5-3	XDS2-1	5A22
P4-A3	J9	10E22	S5-5	J2-A	2A20
P4-A14	A1-E44	12A22	S5-6	XDS2-2	6A22
P4-A15	J7	8F22 ,	S6-2	CB2-2	31A20
P466R-1	TB1-9	80B20	S6-3	XDS1-1	11A22
P466R-2	TB1-8	91C20	S6-3	83-2	11B22
P466R-3	NC	36A20	TB1-1	P467R-3	27B20
P467R-1	TB1-3	11G20	TB1-I	XDS5-1	27A20
P467R-2	TB1-2	26B20	TB1-2	P467R-2	26B20
P467R-3	TBI-1	27B20	TB1-2	XDS6-1	26A22
P467R4	NC	88A20	TB1-3	P467R-1	11G20
P467R-5	NC	32A20	TB1-3	S1-2	11E22
P468R-1	TB1-7	29B20	TB1-3	J3-N	11F22
P468R-2	TB1-6	9M20	TB14	P469R-1	28B20

Table 4-5. Test Box Wiring Run List (Cont.)

FROM	To	WIRE NUMBER
P46SR-3	NC	36A20
P469R-1	TB14	28B20
P469R-2	TB1-5	9H2Q
P469R-3	NC	**34A20**
R1-1	A1-E16	25A22
R1-2	A1-E2S	23A22
R1-3	A1-E6	**24A22**
S1-1	TB1-4	28A22
S1-2	TB1-3	11E22
S1-2	S2-2	11D22
S2-1	TB1-7	29A22
32-2	S1-2	11D22
S2-2	S3-2	11C22
S3-2	**S6-3**	11B22
S3-2	S2-2	11C22
S3-3	TB1-9	30A22
S4-2	A1-E62	14A22
S4-3	J3-B	16A22
S4-4	J3-F	15A22

FROM	TO	WIRE NUMBER
TB1-4	S1-1	2SA22
TB1-6	P469R-2	9H20
TB1-5	XDS6-2	9G22
TB1-6	P46SR-2	9M20
TB1-6	E2	9L22
TB1-6	TB1-8	9J22
TB1-7	P46SR-1	29B20
TB1-7	S2-1	29A22
TB1-8	P466R-2	9K20
TB1-S	TB1-6	9J22
TB1-9	P466R-1	30B20
TB1-9	33-3	30A22
XDS1-1	W 3	11A22
XDS1-2	E l	9B22
XDS1-2	XDS3-2	**9C22**
XDS2-1	S5-3	5A22
XDS2-1	Psi-l	5B22
XDS2-2	**S5-6**	6A22
XDS3-2	PS1-2	6B23
XDS3-1	J3-R	**22A22**
XDS3-2	XDS1-2	9C22
XDS3-2	XDS42	9D22

FROM	TO	WIRE NUMBER
XDS4-1	**J3-P**	21A22
XDS4-2	XDS2-2	9D22
XDS4-2	XDSS-2	9E22
XDS5-1	TB1-1	27422
XDS6-2	XDS4-2	9E22
XDS6-2	XDS6-2	9F22
XDS6-1	TB1-2	26A22
XDS6-2	XDS5-2	9F22
XDS6-2	TB1-5	9G22

JUMPER LIST

FROM	TO	JUMPER NUMBER
P4-A16	P4-B15	1
P4-A1	P4-B1	2
P4-A2	P4-B2	3
P4-B7	P4-B10	4
P4-A14	P4-B14	5
S4-2	S4-5	6

WIRING NOTES

1. P4 is the Connector for the " ital Meter. It has two rows of 15 Pins each (Row A and Row B). Each Row connects to one aide of the Contact Board that extends out T the Digital Meter. Since the upper and lower Contacts are joined inside the Meter, Jumpers (1 thru 5) are used on Pins of the same number (i.e., P4-A14 and P4-B14) for redundancy. The P/N for P4 is 3VH15-1JN6, the FSCM is 05574 and the NSN 6936-00 -139-8928,

2. Al is the reference designationassigned to Circuit Card Assembly 70700-20687-041.

9. The last 2 digits of a wire number indicates the gauge of that wire.

4. Switch S4 Contact Pattern — Switch Position — *Contacts Made*

Switch Position	*Contacts Made*
1 (Keying Side)	1-2 and 4-5
Both (Center)	2-3 and 4-5
2 (Opposite Key Side)	2-3 and 5-6

4-23. **Test Box Circuits.**

a. DC Power Circuit.

(1) Position controls as listed in (a) through (f) below:

(a) AC POWER switch to OFF.

(b) DC POWER switch to OFF.

(C) TRIM switch to OFF.

(d) SAS switch to OFF.

(e) BOOST switch to OFF.

(f) POWER AC and DC circuit breakers to IN.

(2) Connect autotransformer to AC POWER connector, using cable supplied with test box.

(3) Connect autotransformer to a 115-V ac, 60-Hz power source and adjust for 1 15-V ac output.

(4) Connect dc power supply positive terminal to DC POW-E R connector pin B and negative terminal to pin A, using two leads.

(5) Connect digital voltmeter to dc power supply, using leads.

(6) Adjust dc power supply for a 28-V dc indication **on dig** ital voltmeter and then disconnect digital voltmeter from equipment setup.

(7) Set DC POWER switch to ON. DC power green light shall come on. If not, replace lamp. If lamp does not light, go to Troubleshooting Chart, trouble No. 1, FO-3 and FO-1.

(8) Push in AC POWER switch to ON position.

(9) Place AC POWER switch to ON. AC power red light shall come on. If not, replace lamp. If lamp does not light go to Troubleshooting Chart, trouble No. 2, FO-3 and FO-1.

(10) Place AC POWER switch to OFF. AC POWER red light goes off. If not, replace AC power switch S5.

b. Trim valve voltage circuit:

(1) Set AC POWER and DC POWER switches to OFF.

(2) Connect digital voltmeter to connector J466R pin 1 (+) and pin 2 (–), using two leads.

(3) Set AC POWER, DC POWER and TRIM switches to ON. Digital voltmeter will indicate between 27.5 and 28.5 V dc. lf not, perform troubleshooting Table 4-8, see FO-3.

(4) Set TRIM switches to OFF. Digital voltmeter will indicate O vdc. If not, replace trim switch S3.

(5) Set DC POWER switch to OFF.

c. SAS Shut-off valve voltage test.

(1) Disconnect leads from J466R and connect to J468R pin 1(+) and pin 2(-).

(2) Set DC POWE R switch to ON. Digital voltmeter will indicate between 27.5 and 28.5 Vdc. If not, do continuity checks on SAS Switch S2, FO-1, Terminal board TB1, and connector P468R, FO-2.

(3) Place SAS switch to ON, Digital voltmeter will indicate O vdc. If not, replace SAS switch ***S2.***

d. Boost DC power valve voltage test.

(1) Place DC POWER switch to OFF

(2) Disconnect leads from J468R and connect to J469R pins 1(+) and 2(-).

(3) Place BOOST switch to OFF.

(4) Place DC POWER switch to ON. Digital voltmeter will indicate between 27.5 and 28.5 vdc. If not, perform troubleshooting Table 4-8, see FO-3.

(5) Place BOOST switch to ON. Digital voltmeter will indicate O vdc. If not, replace BOOST switch S1.

e. SAS Pressure Indicator Test:

(1) Place DC POWER switch to OFF.

(2) Connect jumper lead between pins 1 and 2 of cable connector J467R.

(3) Place DC POWER switch to ON. SAS PRESS OFF green light will light. If not, replace lamp. If ***lamp*** does not light; see troubleshooting Table 4-8, see FO-1.

(4) Place DC POWER switch to OFF and remove jumper lead from pin 2 and reconnect to pin 3.

(5) Place DC POWER switch to ON and SAS PRESS ON; green light will light. If not, replace lamp. If lamp does not Iight check cable assembly J467R and TB1.

(6) Place DC POWE R switch to OFF.

(7) Remove jumper lead between pins 1 and 3 of cable connector J467R.

f. DC Power Supply Voltage Test.

(1) Connect digital voltmeter positive side to+ 15 vdc and negative side to SIG GRD (front panel), using adapters and leads.

(2) Set AC POWER switch to ON. Digital voltmeter will indicate between 14.5 and 15.5 vdc. If not, perform troubleshooting Table 4-8, see Troubleshooting Chart, trouble No. 3, FO-3 and FO-1.

(3) Set AC POWER switch to OFF.

(4) Disconnect adapter and lead from +15 vdc and connect to -15 vdc.

(5) Set AC POWER switch to ON. Digital voltmeter will indicate between -14.5 vdc and -15.5 vdc. If not, perform troubleshooting Table 4-8 and see Troubleshooting Chart, trouble No. 3, FO-3 and FO-1.

(6) Set AC POWER switch to OFF.

(7) Connect cable W1 supplied with test box to connector J3 (rear).

(8) Connect digital voltmeter positive side to pin 4 (at other end of cable W1) marked to PITCH TRIM ACTUATOR, using lead. Connect digital voltmeter negative side to SIG GRD, using lead and adapters.

(9) Set AC POWER switch to ON. Digital voltmeter will indicate between 14.5 and 15.5 vdc. If not, perform troubleshooting Table 4-8 and FO-1.

(10) Repeat technique of(6), (8), and (9) above at connection listed in Table 4-6. Digital voltmeter will indicate within limits specified.

(11) Set AC POWER switch to OFF and disconnect cable W1 from test box.

g. Boost Pressure Indicator Test.

(1) Connect jumper between pin N and pin R of connector J3.

(2) Push in POWER DC circuit breaker.

(3) Place POWER DC switch ON. BOOST PRESS ON green light shall come on. If not, check the following:

(a) Replace lamp.

(b) Check for +28 vdc at pin N of connector J3.

(c) If +28 vdc is absent, replace wiring between pin N and contact 2 of BOOST switch S1.

(d) If +28 vdc is present, do continuity checks on indicator light and associated wiring (FO-1). Replace indicator light or repair/replace wiring (FO-2).

(4) Place POWER DC switch OFF.

(5) Remove jumper.

(6) Connect jumper between pin N and pin P of connector J3.

Table 4-6. Position XDCR Output Voltage

Test Instrument		Digital Multimeter Indications (v dc)	
To Pitch Trim Actuator Connector	Test Points Position XDCR	Min	Max
Pin 7	---	+14.5	+15.5
Pin 8	---	-14.5	-15.5
Pin 5	---	-14.5	-15.5
Jumper pins 5 & 9[1]	Trim position[2]	-14.5	-15.5
Jumper pins 5 & 6[1]	Stick input[2]	-14.5	-15.5

[1] Use two leads.

[2] Use adapter and lead.

(7) Place POWER DC switch ON. RESULT BOOST PRESS OFF green light shall ***come*** on. If not, check the following

(a) Replace lamp.

(b) Perform continuity checks on indicator and associated wiring (FO-1). Replace indicator light or repair/replace wiring (FO-2).

(8) Remove jumper.

(9) Turn POWER DC switch OFF.

h. Variable Current Supply Test.

(1) Connect cable W2 (supplied with test box) to connector J3.

(2) Connect digital multimeter mA terminal to pin 2 of SAS ACTUATOR end cable W2, and LOW terminal to pin 1, using two leads.

(3) Set TRIM COIL SELECT switch to BOTH.

(4) Set AC POWER switch to ON.

(5) Adjust CURRENT CONTROL cw toward INCR until valve current meter indicates – 10.00 mA. If digital multimeter does not indicate between –9.50 and -10.50, perform the following adjustments

(a) Set AC POWER switch to OFF.

(b) Remove T1 from protective case.

(C) Set AC POWER switch to ON.

(d) Adjust CURRENT CONTROL until digital multimeter indicates 0.000.

(e) Adjust R15 (under circuit board, right front) until valve current meter indicates 00.00 with flashing polarity.

(6) If adjustment cannot be made above perform troubleshooting Table 4-8, Trouble No. 4, FO-3 and FO-1 as required. When repairs are completed repeat para 4-23h (5), (7) and (8) above.

(7) Set AC POWER switch to OFF.

(8) Repeat technique of (2) through (5) above at connection and switch positions listed in Table 4-7. Digital multimeter will indicate within limits specified. If not, perform (6) above.

Table 4-7. Valve Current Meter

Digital Multimeter Connections to SAS ACTUATOR end of Cable W2		TRIM COIL SELECT switch positions	Digital Multimeter Indications (ma)	
mA	LOW		Min	Max
Pin 2	**Pin 1**	1	**-9.50**	**-10.50**
Pin 2	**Pin 1**	**2**	0.0	0.0
Pin 2	Pin 1	[1] BOTH	+9.50	+ 10.50
Pin 4	Pin 3	[1] BOTH	+9.50	+ 10.50
Pin 4	Pin 3	[2] BOTH	-9.50	-10.50

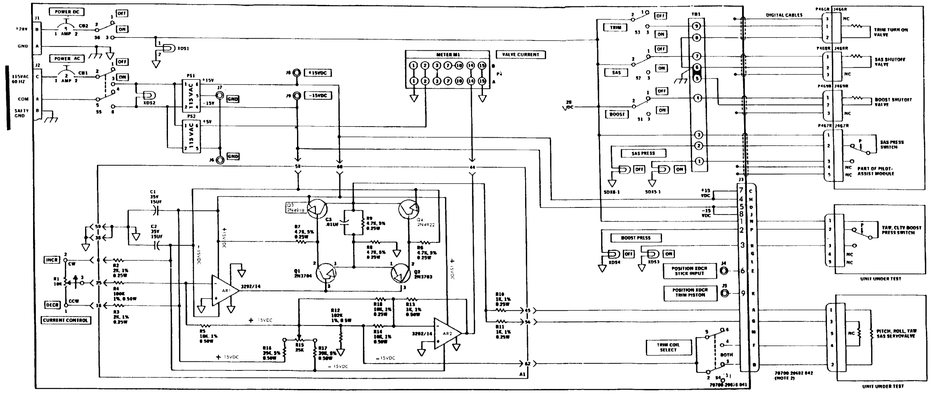
NOTE:

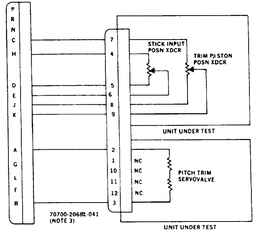
[1] Adjust CURRENT CONTROL toward DECR until valve current meter indicates + 10.00 mA.

[2] Adjust CURRENT CONTROL toward INCR until valve current meter indicates – 10.00 mA.

Table 4-8. Test Box Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
No Trim S3 28 vdc voltage (paragraph 4-23 a. and b.)	CB2, S6, S3, TB1, Cable Assembly J466R, J1 Cable Connector	Replace malfunctioning component associated with DC power circuit and (Trim) FO-1.
No SAS S2 28 vdc voltage (paragraph 4-23c)	CB2, S6, S2, TB1, Cable Assembly J468R	Replace malfunctioning component associated with DC power circuit (SAS) FO-1.
No Boost S1 28 vdc voltage (paragraph 4-23d)	CB2, S6, S1, TB1, Cable Assembly J469R	Replace malfunctioning component associated with DC power circuit (Boost) FO-1.
No SAS Press 28 vdc voltage (paragraph 4-23e)	CB2, S6, TB1, Cable Assembly J467R	Replace malfunctioning component associated with DC power circuit (SAS PRESS) FO-1.
No 115 vat, 60 Hz power (paragraph 4-23a)	CB1, S5	Replace malfunctioning component associated with AC Power circuit FO-1.
No +15V or -15vdc out of PSI power supply (paragraph 4-23f)	CB1, S5, PSI	Replace malfunctioning component associated with AC Power circuit (PSI) FO-1.
No +5 vdc out of PS2 power supply	CB1, S5, PS2	Replace malfunctioning component associated with AC power circuit (PS2) FO-1.
No variable current indicator on meter Ml (paragraph 4-23h) or Meter Ml has malfunction	PS1, PS2, Ml, AR2 Q1 thru Q4, AR1, S4 R1, and associated resistors and capacitors on component board (Al) figures 4-12 and 4-13.	Replace malfunctioning component associated with meter circuit FO-1 or (A-1) board as applicable





NOTES
1. POWER AC INDICATES EQUIPMENT MARKINGS.
2. 70700-20682-042 CABLE HARNESS IS USED TO TEST PITCH, ROLL, OR YAW SAS SERVOVALVE AND YAW OR CLTV BOOST PRESSURE SWITCH.
3. 70700-20682-041 CABLE HARNESS IS USED TO TEST PITCH TRIM SERVO VALVE, TRIM PISTON POSN XDCR, AND STICK INPUT POSN XDCR.

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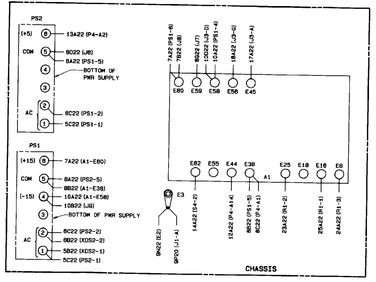
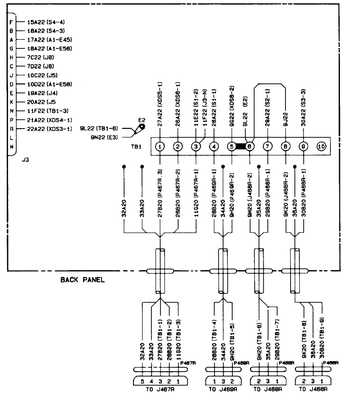
FO-1 TEST BOX SCHEMATIC

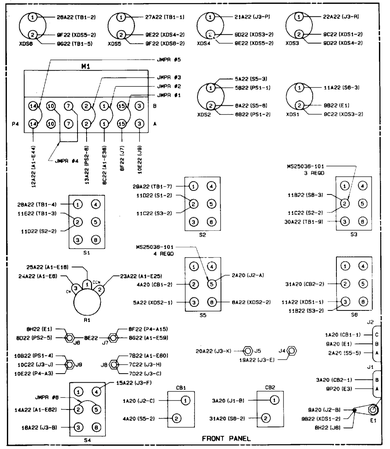
PIN: 035372-008



NOTE

WIRES ARE DESIGNATED THUS:
DESTINATION
2A20 (S5-5)
WIRE NUMBER
COMPONENT DESIGNATION AND NUMBER
TERMINAL IDENTIFICATION





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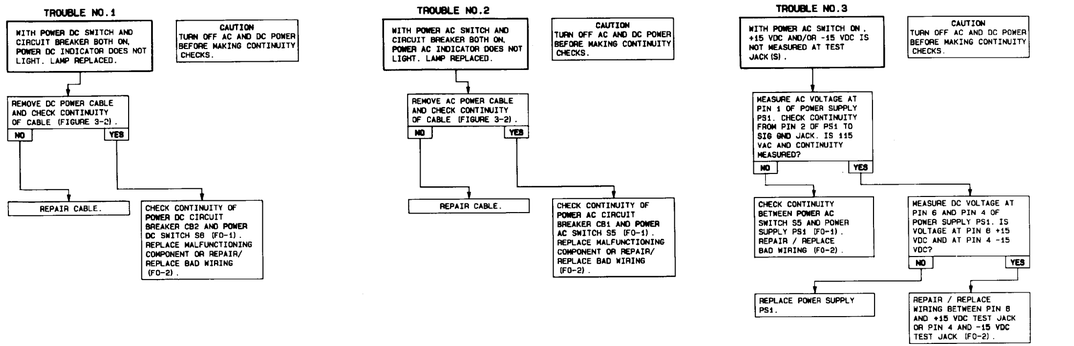
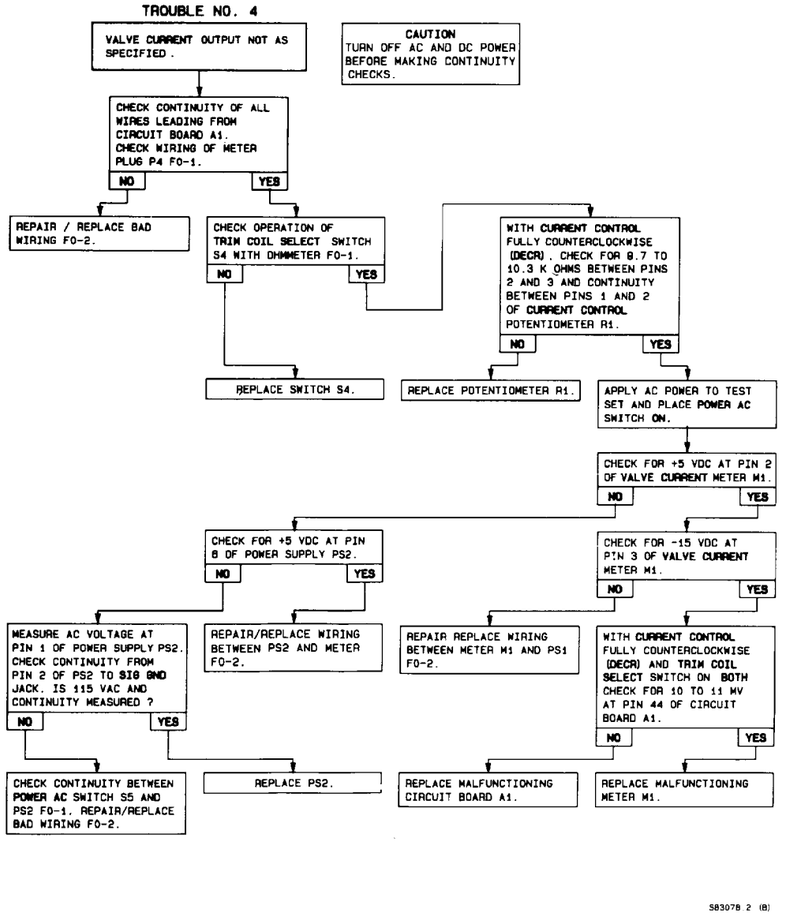
FO-2. Test Box Wiring Diagram



FO-3. Troubleshooting Charts (Sheet 1 of 2)



FO-3. Troubleshooting Charts (Sheet 2 of 2)

Section V. PREPARATION FOR SHIPMENT AND STORAGE

4-24. 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 740-90-1.

4-25. 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 is into or out of a combat theater or is destined for outdoor storage or is destined for indoor storage beyond 6 years.

b. Level B. Use this level if the shipment involves overseas surface transit and/or is destined for indoor storage up to 5 years.

c. Level C. Use this level if shipment is entirely within CONUS and storage will not be over 2 years.

4-26. Procedures.

a. Package the two components of the test set separately, but combine in a single Method IA-14 of MIL-P-116 as follows:

(1) Level A.

(a) Wrap bare items with chemically-neutral paper conforming to MIL-P-17667.

(b) Cushion each component in a fiberboard container conforming to W5s of W5c of PPP-B-636.

(c) Have 2 inches of cushioning on all sides, top and bottom, using l-pound density polyethylene foam conforming to PPP-C-1752. Seal box with PPP-T-60 tape.

(d) Bag each box in a bag made of material conforming to MIL-B-137. Heat-seal bag.

(e) Place both fiberboard boxes in a wood-cleated plywood container conforming to style 1, overseas type of PPP-B-601.

(2) Level B. Requirements for this level are the same as for level A, except that the fiberboard containers are changed to domestic class of PPP-B-636 and the plywood container is changed to V2s or V13C of PPP-B-636.

(3) Level C. Requirements for this level are the same as for level B, except that commercially-available substitutions may be made for the chemically-neutral wrap.

b. Packing. Not required.

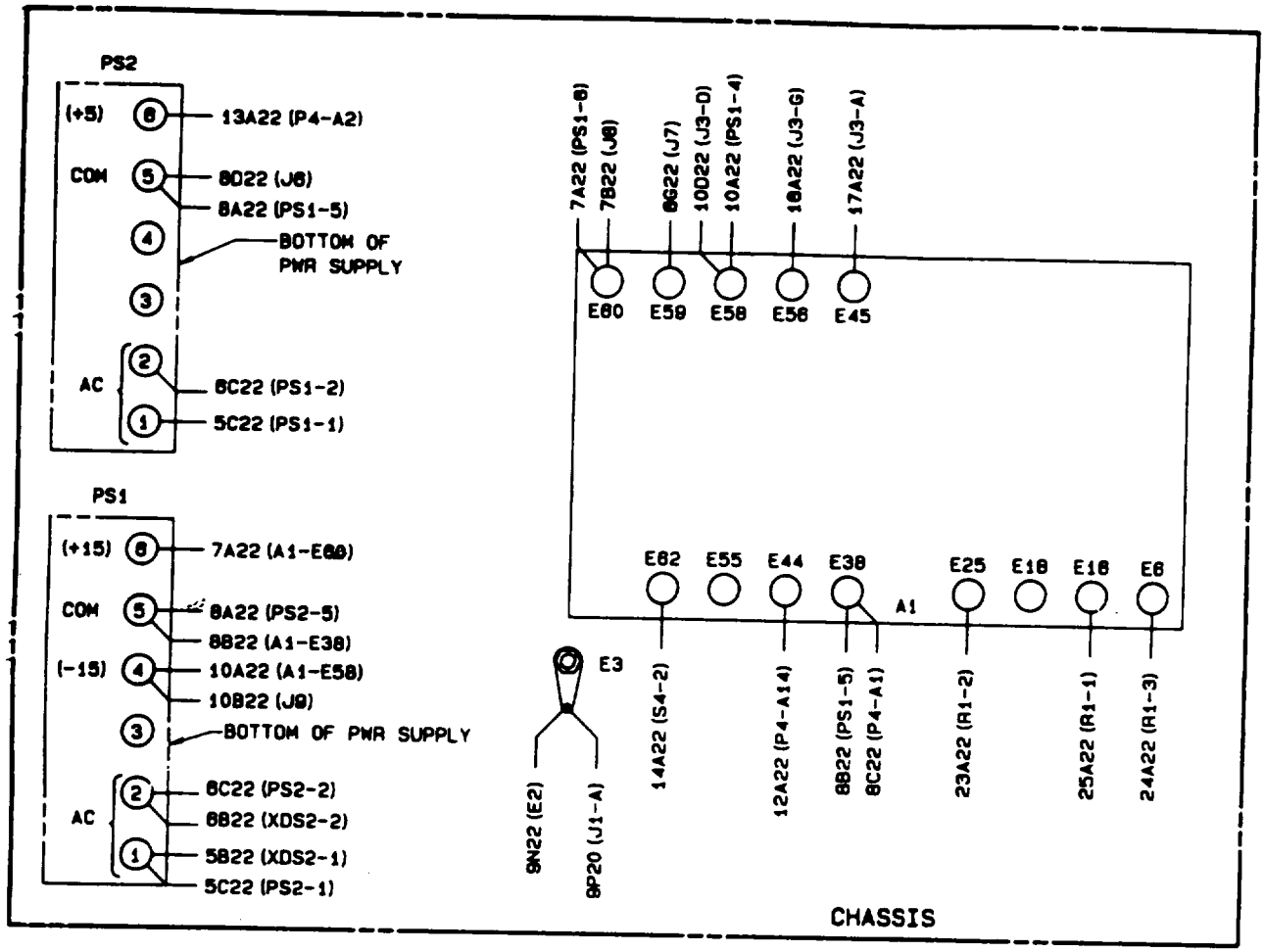
c. Marking. Mark each unit container for shipment in accordance with MIL-STD-129 unless it is for level C. For level C, only these markings are required:

(a) NSN

(b) Noun nomenclature

(c) Quantity and unit of issue

(d) Names and addresses of shipper and addressee



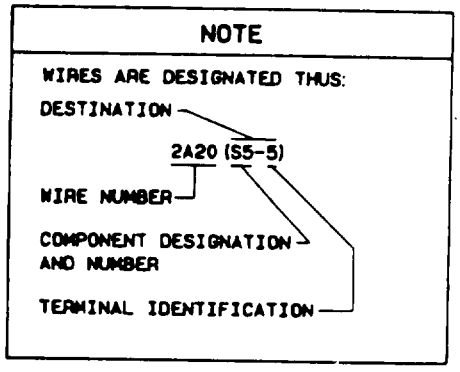


Figure 4-9. Chassis Wiring and PS1 and PS2 Power Supply Terminals

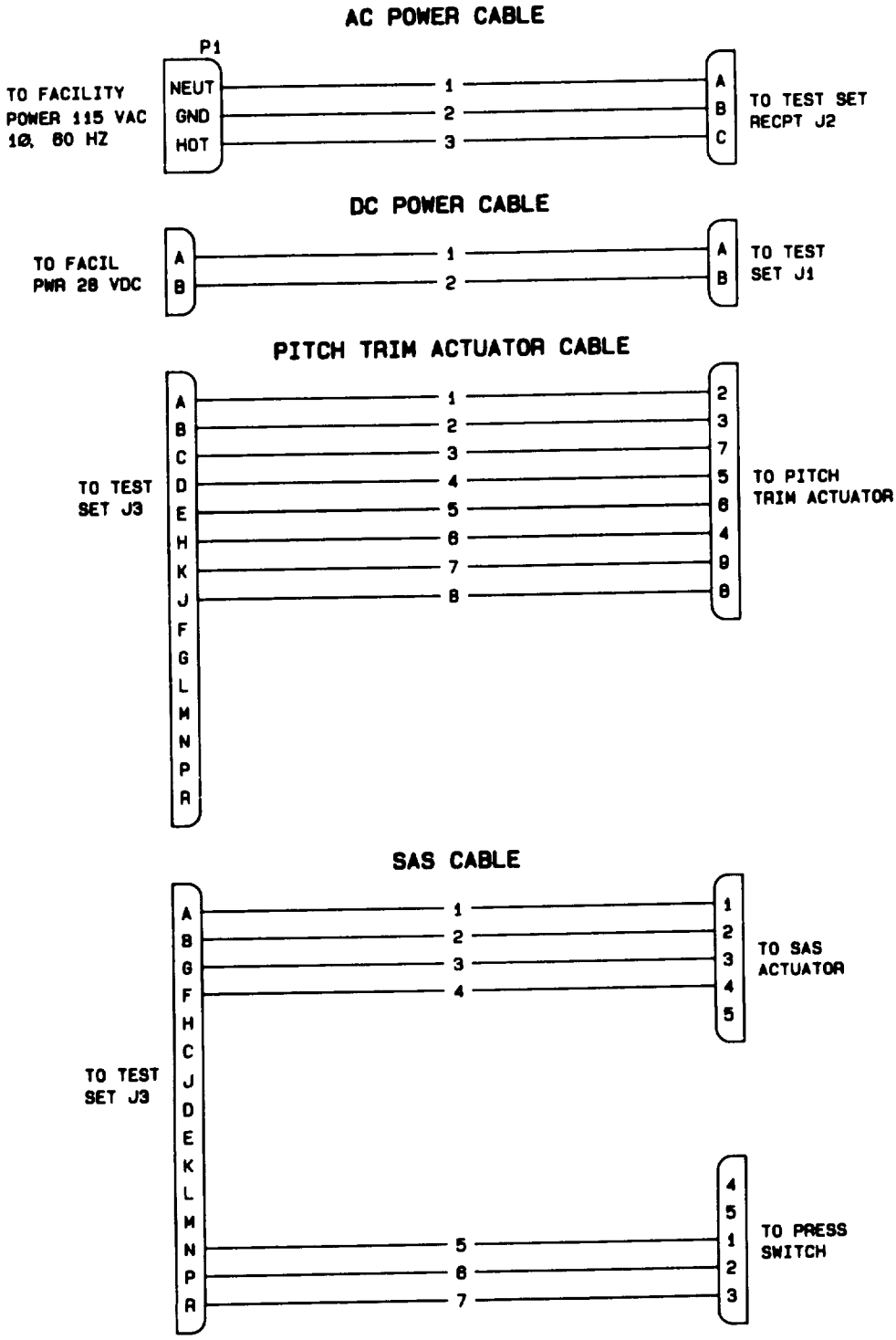


Figure 4-10. Cable Assembly Schematics

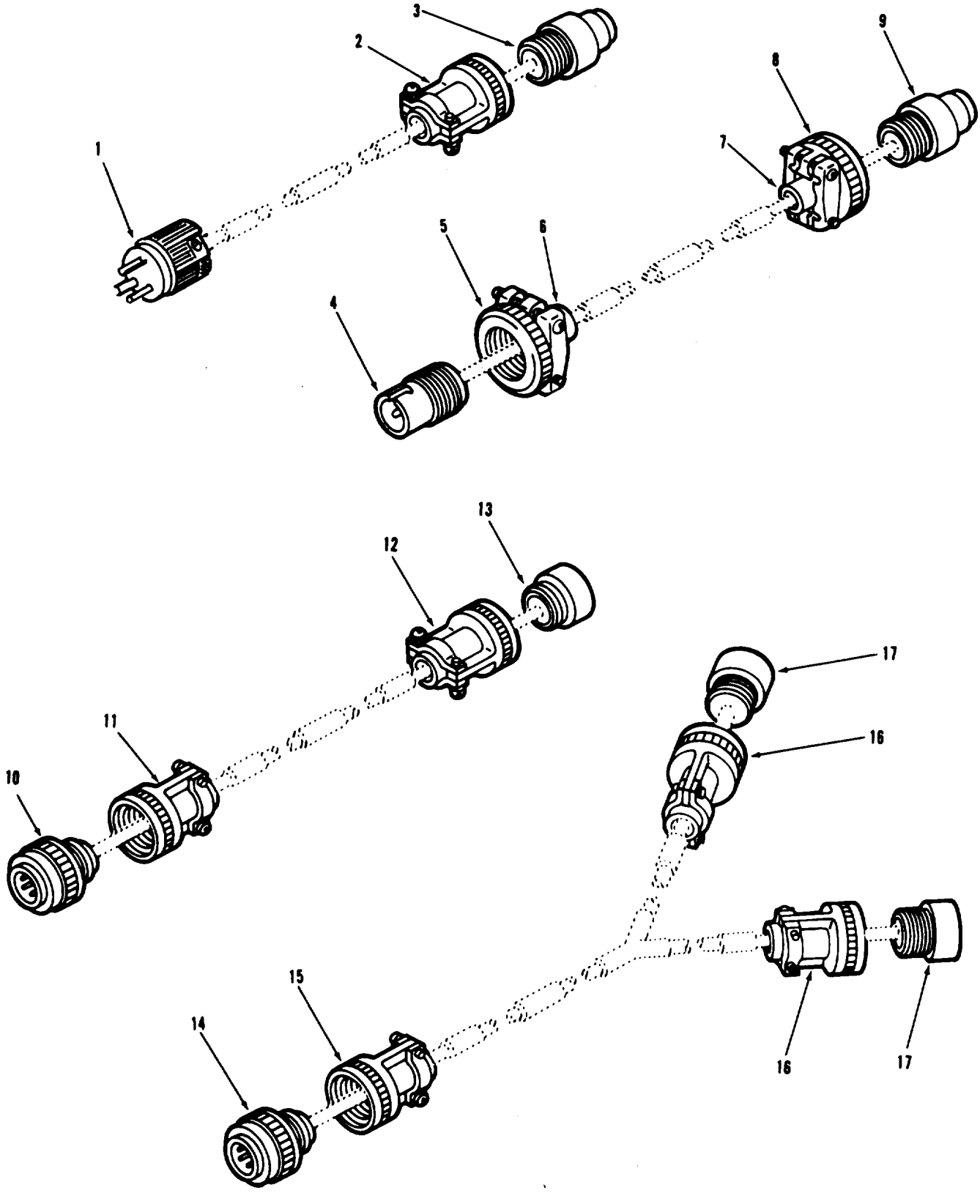


Figure 4-11. Cable Assemblies Exploded View

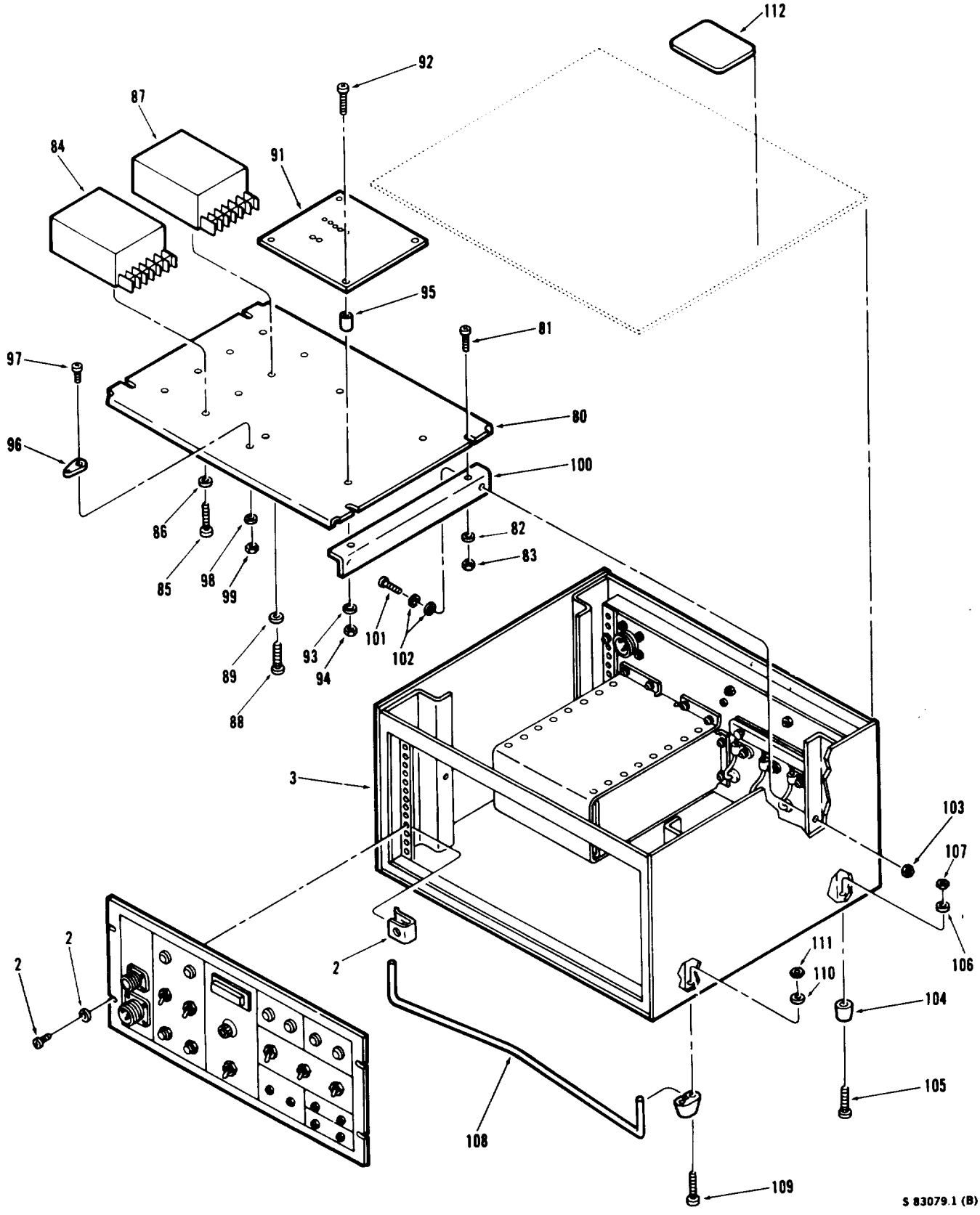


Figure 4-12. Test Box Exploded View (Sheet 1 of 3)

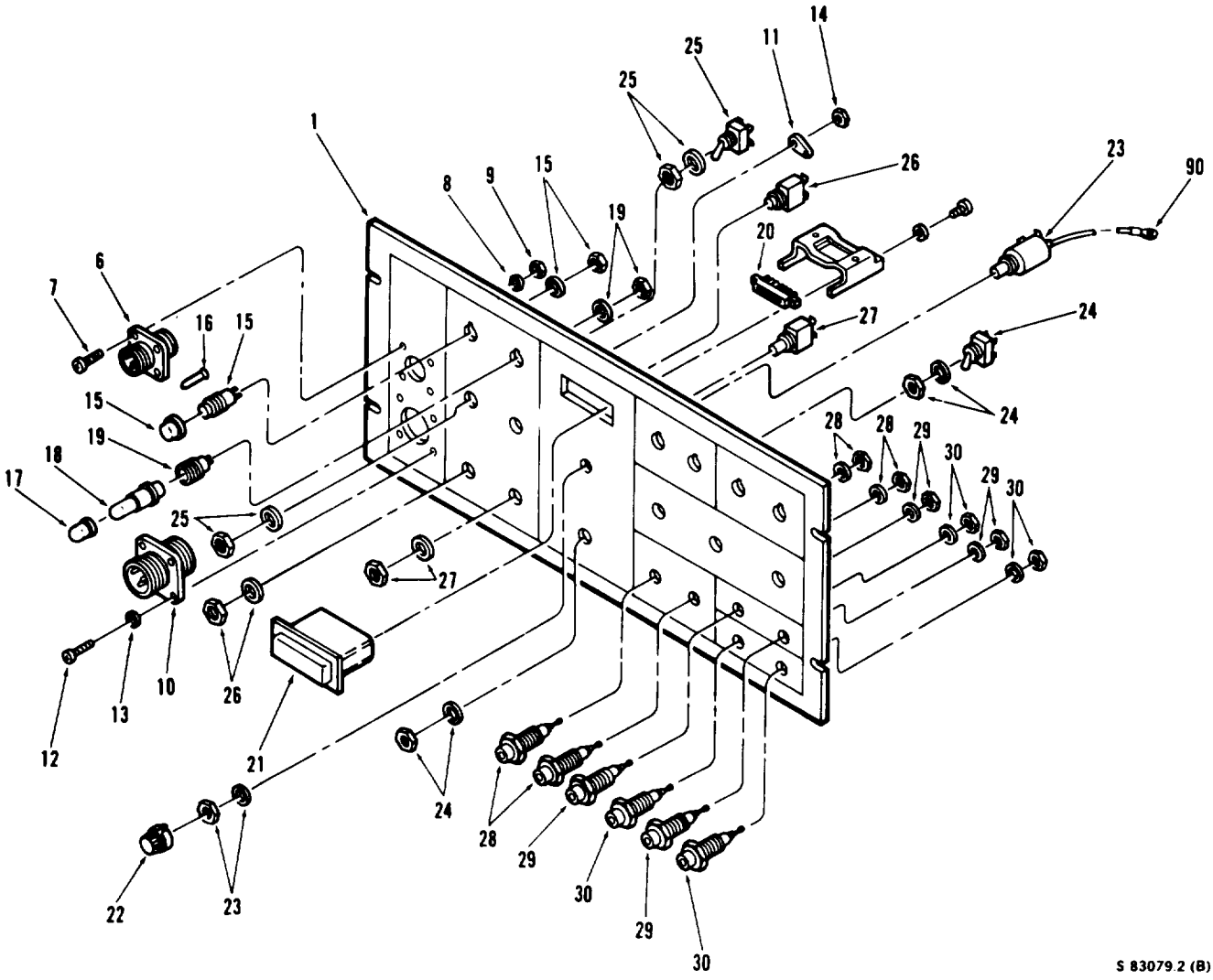


Figure 4-12. Test Box Exploded View (Sheet 2 of 3)

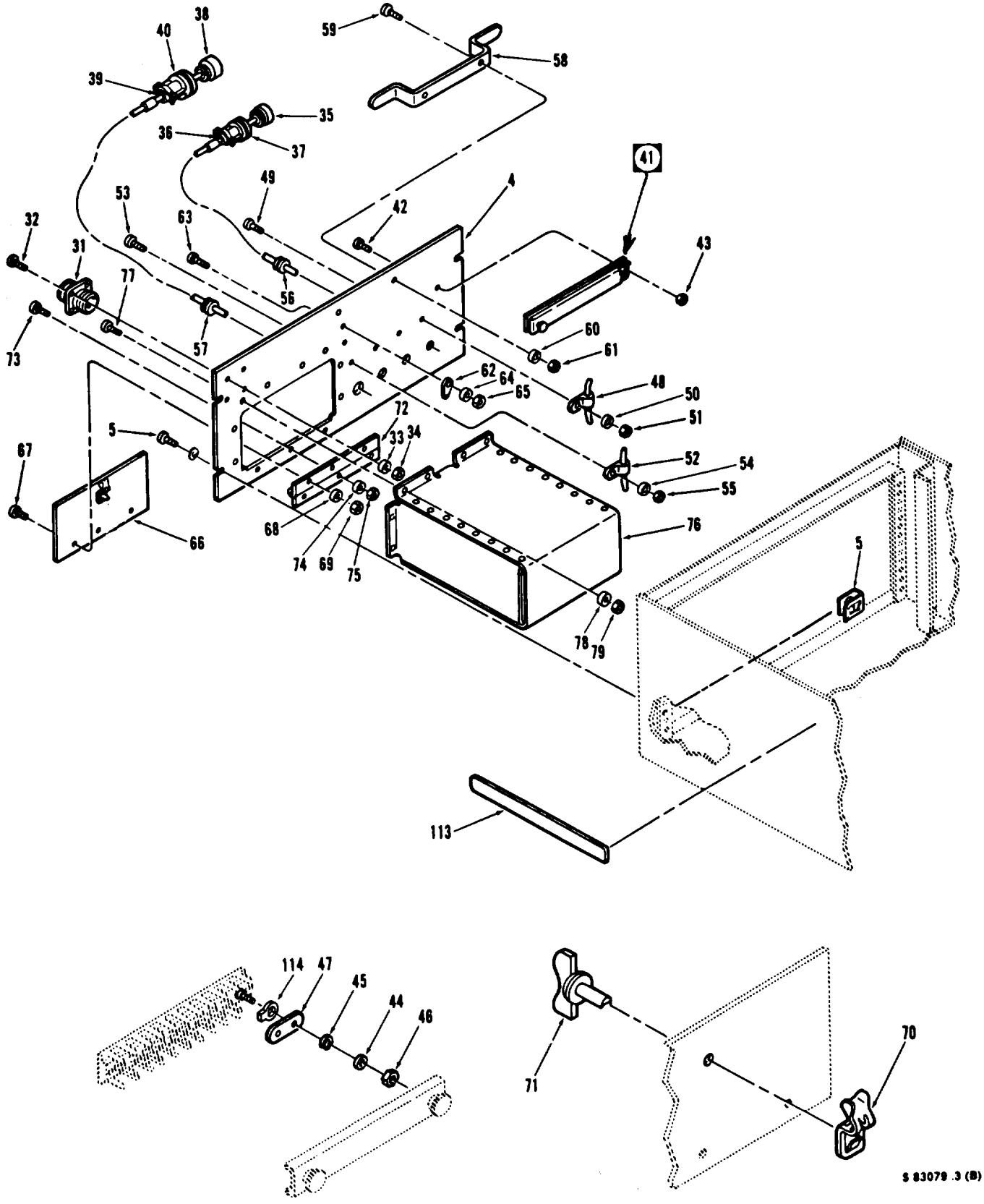


Figure 4-12. Test Box Exploded View (Sheet 3 of 3)

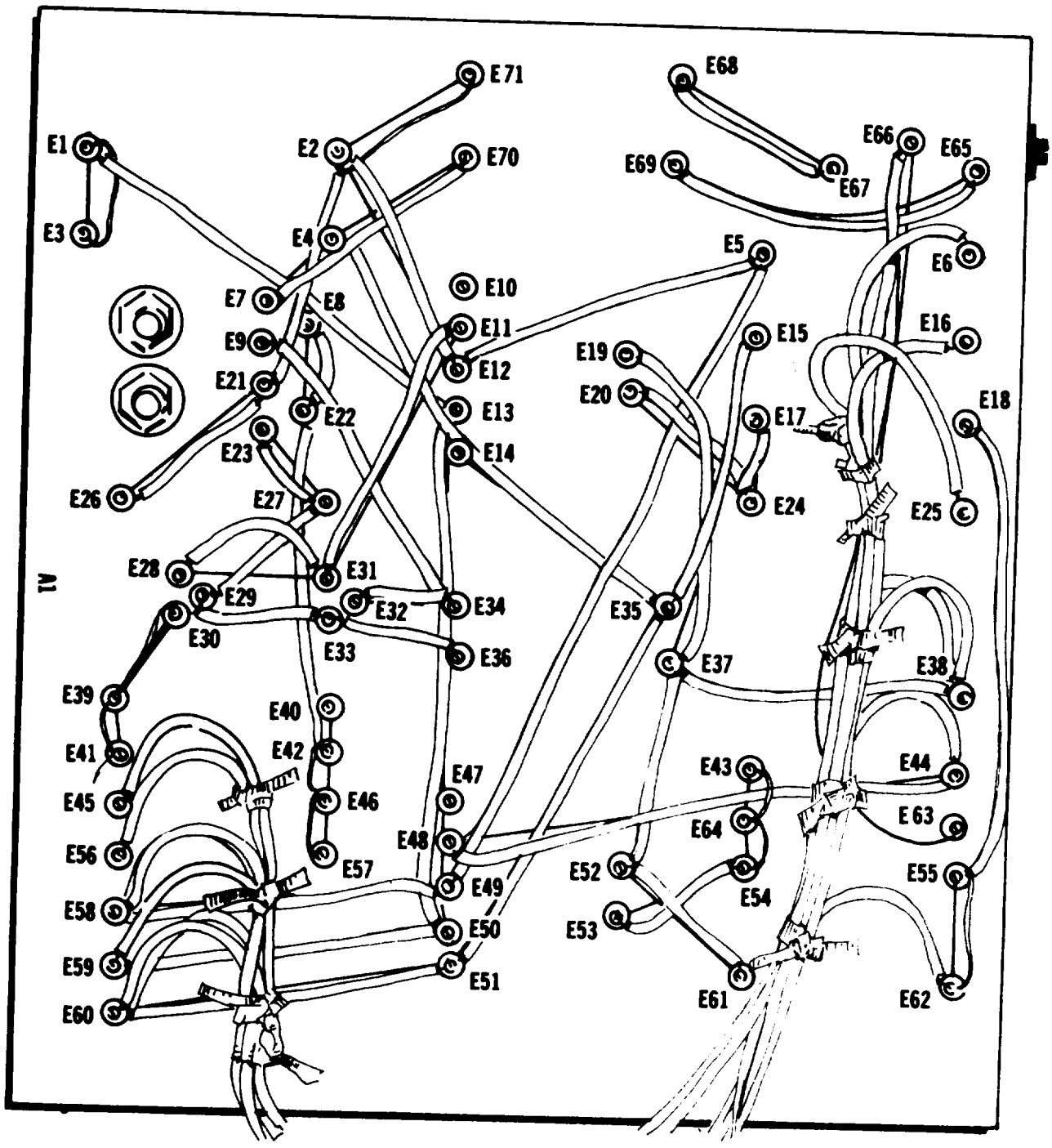


Figure 4-13. Component Board A-1, Front View (Sheet 1 of 2)

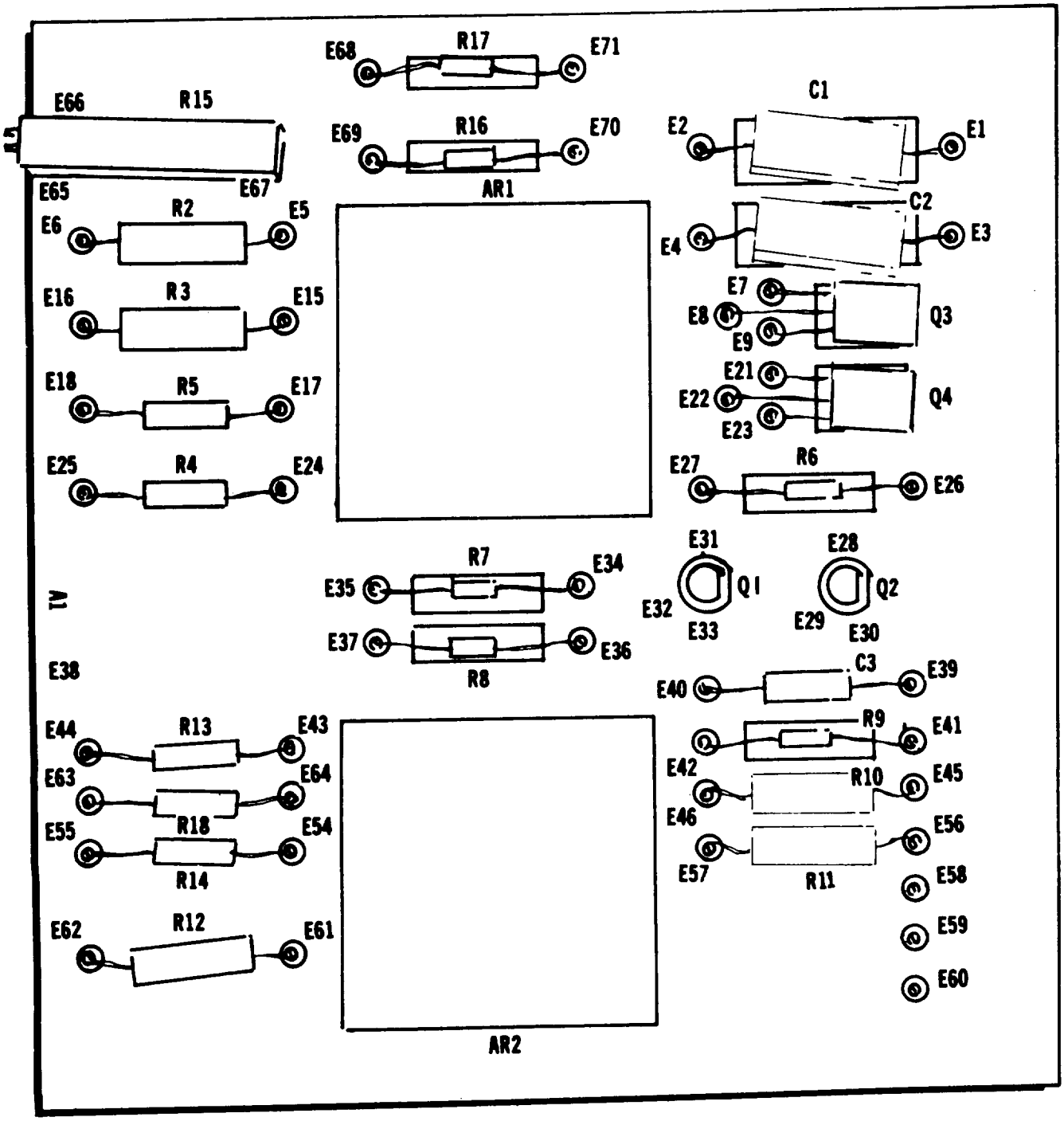


Figure 4-13. Component Board A-1, Rear View (Sheet 2 of 2)

APPENDIX A

REFERENCES

A-1. Publication Index.

DA PAM 310-1	Consolidated Index of Army Publications and Blank Forms
DA PAM 310-7	US Army Equipment Index of Modification Work Orders

A-2. Logistics and Storage.

TM 740-90-1	Administrative Storage of Equipment

A-3. Maintenance of Supplies and Equipment.

AR 700-58	Packaging Improvement Report
AR 750-1	Army Material Maintenance Concepts and Policies
AR 750-50	
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System-Aviation (TAMMS-A)

A-4. Other Publications.

TB 43-180	Index of Calibration Bulletins
TB 746-10	Field Instructions for Painting and Preserving Electronics Equipment
TM 55-1500-204-25/1	General Aircraft Maintenance Manual
TM 55-1520-237-23-3	Aircraft Fault Isolation Procedure 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 1. 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 (RBT)

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

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

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

(1) Aviation Unit Maintenance (AVUM) - AVUM activities will be staffed and equipped to do 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 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/components 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 will normally be accomplished by the supporting AVIM unit.

(2) Aviation Intermediate Maintenance (AVIM) - AVIM provides mobile, responsive "One Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance). Performs all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment. Establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. Inspects, troubleshoots, tests, diagnoses, repairs, adjusts, calibrates, and aligns system modules/components. Module/component disassembly and repair will support the DX program and will normally

be limited to tasks requiring cleaning and the replacement of seals, fittings and items of common hardware. Unserviceable reparable modules/ components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance. This level will perform special inspections which exceed AVUM capability. Provides quick response maintenance support, on-the-job training, and technical assistance through the use of mobile maintenance contract teams. Maintains authorized operational readiness float. Provides collections and classification services for serviceable/unserviceable material. Operates a cannibaliztion activity in accordance with AR 750-50. (The aircraft maintenance company within the maintenance battalion of a division will perform AVIM functions consistent with air mobility requirements and conservation of personnel and equipment resources. Additional intermediate maintenance support will be provided by the supporting non-divisional 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 III).

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

PILOT ASSIST/NULLING FIXTURE ASSEMBLY

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category			(5) Tools and Equip (Note)	(6) Remarks
			AVUM	AVIM	DEPOT		
	Test Box Assy Pilot Assist.	Test		*1.0		*4	
		Repair		*1.5	1.5		
	SAS Actuator	Calibrate*		*1.0			*Refer to TB43-180
	Test Box	Repair		*2.0	4.0		
	Cable Assy	Replace	0.1				
	Cable Assy	Replace	0.1				
	Cable Assy	Replace	0.1				
	Cable Assy	Replace	0.1				
	Lamp/Lens	Replace	0.1			1	
	Knob	Replace	0.1			1	
	Nulling Fixture Assy	Repair		2.5		3	
	Male Quick Disconnect Couplings	Replace		.5		2	
	Female Quick Disconnect Couplings	Replace		.5		2	
	Pilot Assist Hydraulic Module Assembly	Replace		.5		2	
	Three-Way Valve	Replace		.5		2	
	Pressure Reducer	Replace		.5		2	
	SAS Pressure Switch	Replace		.5		2	
	Thermal Relief Valve	Replace		.5		2	

NOTES: 1. Use Electrical Repairman's Toolkit, NSN 5130-00-323-4915.
2. Use Pneumatic Repairman Tool kit, NSN 5130-00-323-4391.
3. Digital Multimeter, AN/USM-451, Hydraulic Test Stand, 3000 psi, Hydraulic Pressure gages (2) 04500 psi: 2-1000 ohm 1/2 watt resistors
4. See table 4-4 for ATST Test Equipment

*ATST Area TMDE Support Team

Section II. MAINTENANCE ALLOCATiON CHART

Nomenclature of end item

PILOT ASSIST/NULLING FIXTURE ASSEMBLY TEST SET

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category			(5) Tools and Equip (Note)	(6) Remarks
			AVUM	*AVIM	DEPOT		
	Meter (M1)	Test Adjust Replace		.2 .3 .5			
	Component Board Assy	Test Repair Replace		.5 1.0 .5			
	Transistor, (Q1 thru Q4)	Test Replace		.2 .5			
	Power Supply (PS1)	Test Replace		.2 .6			
	Power Supply (PS2)	Test Replace		.2 .6			
	Switch, toggle (S1 thru S6)	Test Replace		.1 .3			
	Potentiometer (R1)	Test Replace		.2 .5			
	Circuit Breaker (CB-1 & CB-2)	Test Replace		.2 .4			

*ATST

APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

Section 1. INTRODUCTION

C-1. Scope.

This manual lists spares and repair parts required for performance of Aviation Intermediate Maintenance (AVIM) of the Pilot Assist/Nulling Fixture Assembly. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

C-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 Index. 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.

C-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.
PC	--- Item procured and stocked and which otherwise would be coded PA except that it can deteriorate.
AD	--- Item to be assembled at depot Maintenance level.

NOTE

Cannibalization or salvage may be 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
F	--- Support item is removed, replaced, used at the Aviation Intermediate Maintenance (AVIM) level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies 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
D	--- The lowest maintenance level capable of complete repair of the support item is the depot level, performed by depot, mobile depot or specialized repair activity.
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.
D	--- Reparable item. When beyond lower level repair capability, send to depot.
	--- Condemnation and disposal not authorized below depot level,

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 related.

e. Federal Support 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 decription 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.).

C-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 illustration's 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.

C-5. Abbreviations. (Not Applicable)

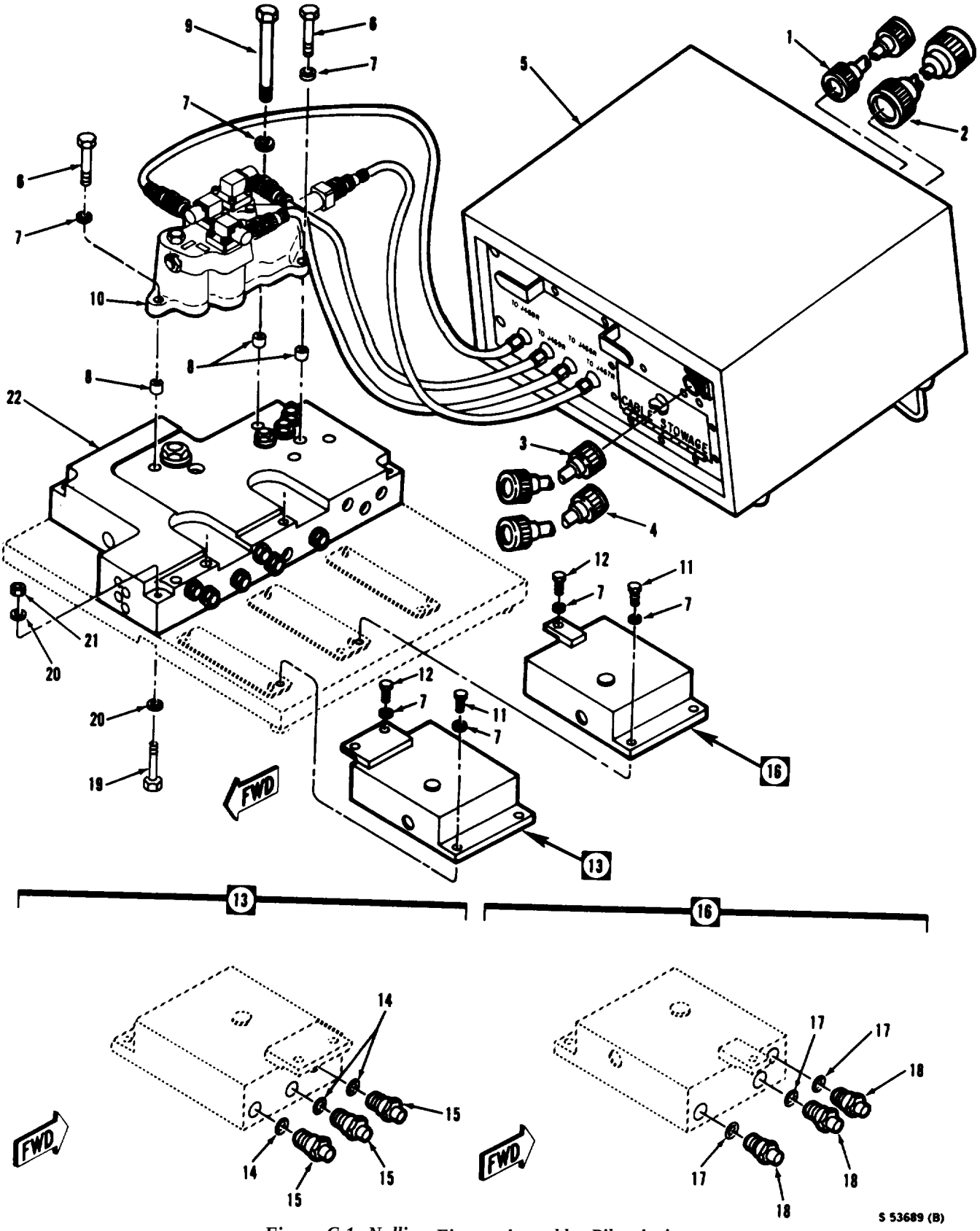


Figure C-1. Nulling Fixture Assembly, Pilot Assist

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-1		PAFFF	4920-01-088-3225	78286	70700-20675-041	NULLING FIXTURE ASSY, PILOT ASSIST	EA	1
C-1	1	XDFZZ		78286	70700-20646-042	CABLE ASSY, AC POWER	EA	1
C-1	2	XDFZZ		78286	70700-20633-041	CABLE ASY, DC POWER	EA	1
C-1	3	PBFZZ	4920-01-193-4374	78286	70700-20682-041	CABLE ASSY	EA	1
C-1	4	PBFZZ	4920-01-193-4375	78286	70700-20682-042	CABLE ASSY	EA	1
C-1	5	XDFFF		78286	70700-20678-041	BOX ASSY,PILOT ASSIST/NULLING TEST SEE FIG. C-2 FOR BREAKDOWN	EA	1
C-1	6	PAFZZ	5306-00-145-7036	88044	AN5-10A	BOLT,MACHINE	EA	2
C-1	7	PAFZZ	5310-00-187-2399	88044	AN960PD516	WASHER,FLAT	EA	10
C-1	8	XDFZZ		78286	70700-20676-106	SPACER	EA	3
C-1	9	PAFZZ	5306-00-150-9235	88044	AN5-36A	BOLT,MACHINE	EA	1
C-1	10	PBFDD	1560-01-106-1905	78286	70652-02620-046	MODULE ASSY,PILOT ASSIST HYDRAULIC SEE FIG. C-3 FOR BREAKDOWN	EA	1
C-1	11	PAFZZ	5306-00-150-9102	88044	AN5-7A	BOLT,MACHINE	EA	4
C-1	12	PAFZZ	5306-00-150-9101	88044	AN5-6A	BOLT,MACHINE	EA	3
C-1	13	XDFFF		78286	70700-20676-044	BLOCK ASSY NOTE 1	EA	1
C-1	14	PAFZZ	5330-01-096-9181	07060	CEC4981-113	SEAL	EA	1
C-1	15	PAFZZ	4730-01-092-8095	78286	SS65-104S-1	COUPLING,SELF-SEALING	EA	3
C-1	16	XDFZZ		78286	70700-20676-046	BLOCK ASSY NOTE 2	EA	1
C-1	17	PAFZZ	5330-01-096-9181	07060	CEC4981-113	SEAL	EA	3
C-1	18	PAFZZ	4730-01-092-8095	78286	SS65-104S-1	COUPLING,SELF-SEALING	EA	3
C-1	19	PAFZZ	5306-00-151-1409	88044	AN4-27A	BOLTING,MACHINE	EA	4
C-1	20	PAFZZ	5310-00-187-2354	88044	AN960PD416	WASHER,FLAT	EA	3
C-1	21	PAFZZ	5310-00-857-4960	96906	MS21044N4	NUT,SELF-LOCKING	EA	4
C-1	22	XDFFF		78286	70700-20676-041	MANIFOLD ASSY,PILOT ASSIST/NULLING FIXTURE ASSY SEE FIG. C-4 FOR BREAKDOWN	EA	1

NOTE 1: TO BE USES WHILE TESTING 70652-02620-046 PILOT ASSIST MODULE WHEN 70410-02910-047,70410-02910-051 YAW SERVO OR 70410-02900-101 COLLECTIVE SERVO ARE NOT AVAILABLE.

NOTE 2: TO BE USED WHILE TESTING 70652-02620-046 PILOT ASSIST MODULE WHEN 70410-02760-044,70410-02760-045 PITCH SERVO OR 70410-02450-046 ROLL SERVO ARE NOT AVAILABLE.

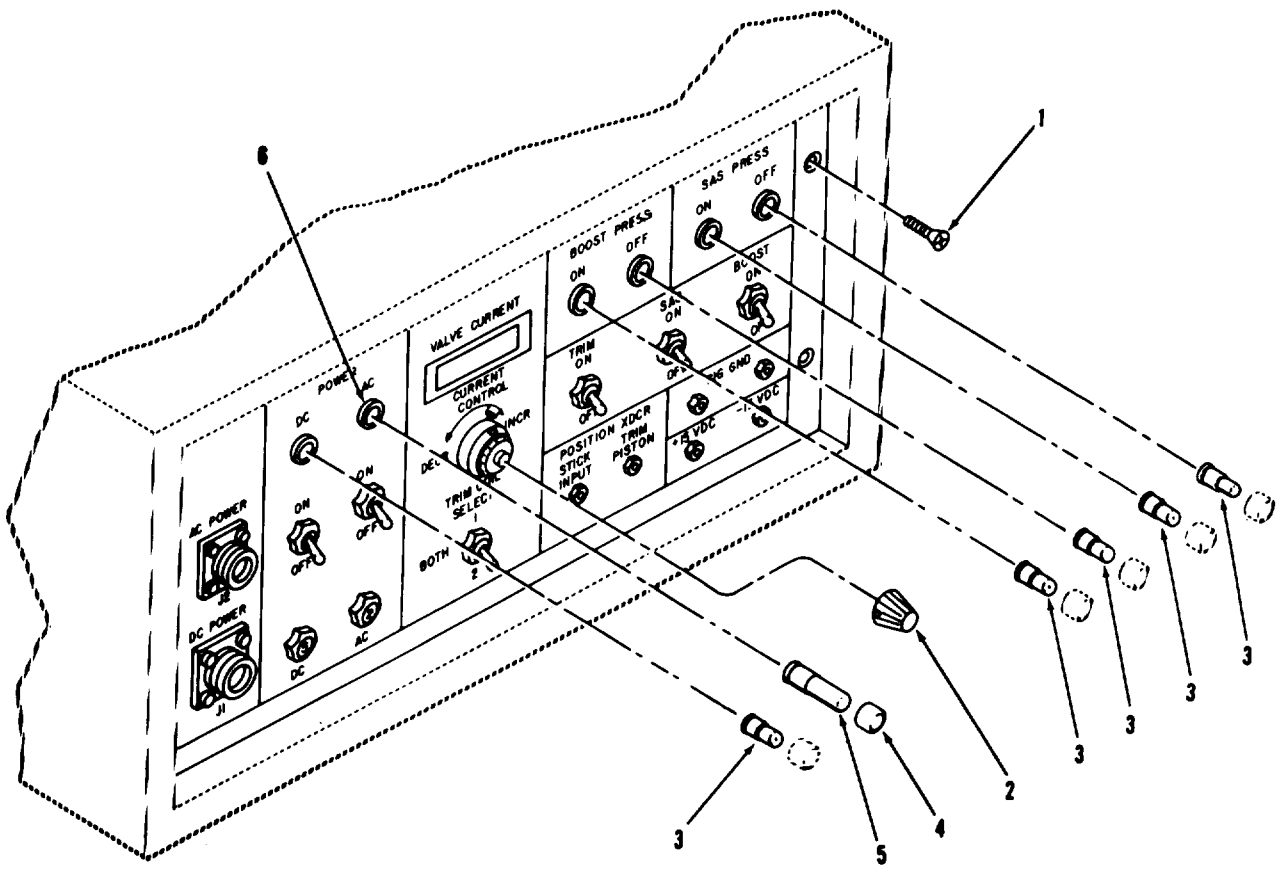


Figure C-2. Box Assembly, Pilot Assist/Nulling Test

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-2		PBFDD	4920-01-193-4769	78286	70700-20678-041	BOX ASSY, PILOT ASSIST/NULLING TEST SEE FIG.C-1 FOR NHA	EA	REF
C-2	1	PAFZZ	5325-01-123-0858	02954	HW14	SCREW	EA	4
C-2	2	XBFZZ		78286	65700-90444-101	KNOB	EA	1
C-2	3	PAFZZ	6240-00-155-7836	96906	MS25237-327	LAMP,INCANDESCENT	EA	5
C-2	4	PAFZZ	6210-00-978-8463	1349	LC13RN2	LENS	EA	1
C-2	5	PAFZZ	6240-00-892-4420	96906	MS25252-C7A	LIGHT,NEON	EA	1
C-2	6	PAFZZ	6210-00-809-4274	81349	LH74/1	HOLDER,LAMP	EA	1

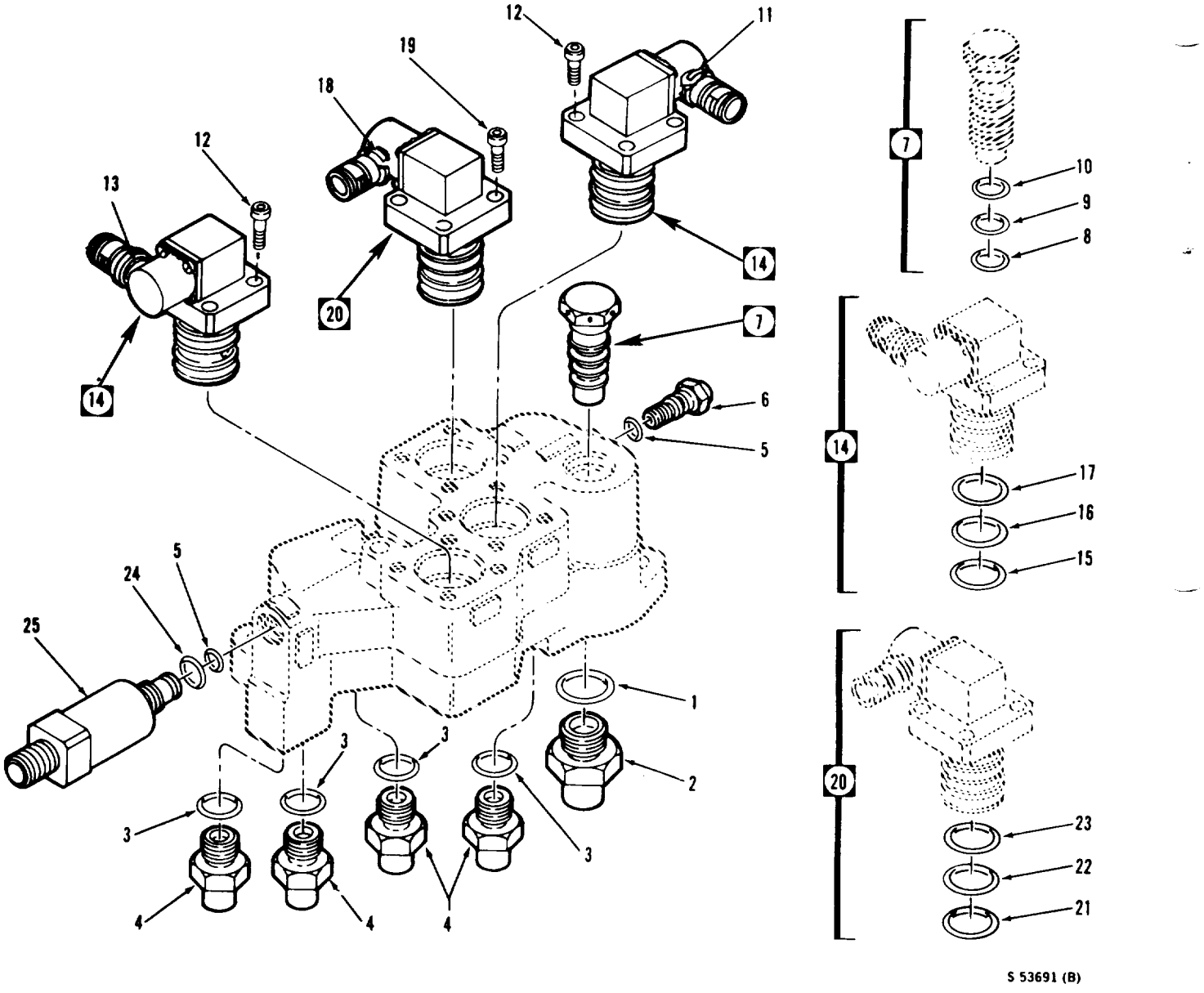


Figure C-3. Module Assembly, Pilot Assist Hydraulic

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-3		PBFFF	1560-01-106-1905	78286	70652-02620-046	MODULE ASSY,PILOT ASSIST HYDRAULIC SEE FIG.C-1 FOR NHA	EA	REF
C-3	1	PAFZZ	5330-01-098-6005	07060	CEC4981-213	SEAL	EA	1
C-3	2	PAFZZ	4730-01-095-7013	78286	SS65-108G-1	COUPLING,SELF-SEALING	EA	1
C-3	3	PCFZZ	5330-01-096-9181	07060	CEC4981-113	SEAK	EA	4
C-3	4	PAFZZ	4730-01-092-8095	78286	SS65-104S-1	COUPLING,SELF-SEALING	EA	4
C-3	5	PAFZZ	5330-01-047-0435	81349	M83461/1-011	PACKING,PERFORMED	EA	2
C-3	6	XDFZZ		78286	70410-02330-042	VALVE,THERMAL RELIEF	EA	1
C-3	6	XDFZZ		78286	70410-02330-041	VALVE,THERMAL RELIEF/ALTERNATE FOR 70410-02330-042	EA	1
C-3	7	PBFZZ	1650-01-095-7215	78286	70652-02617-105	VALVE,PRESSURE REDUCER	EA	1
C-3	8	PCFZZ	5330-01-098-6006	07060	CEC4981-114	SEAL	EA	1
C-3	9	PCFZZ	5330-01-107-4954	81349	M83461/1-114	PACKING,PREFORMED	EA	1
C-3	10	PCFZZ	5330-01-110-1412	81349	M83461/1-116	PACKING,PREFORMED	EA	1
C-3	11	XDFZZ		78286	SS9014J468R	PLATE,IDENT	EA	1
C-3	12	PAFZZ	5305-01-168-4482	80205	NAS1351C4H15	SCREW,CAP	EA	8
C-3	13	XDFZZ		78286	SS9014J469R	PLATE,IDENT	EA	1
C-3	14	PBFFF	4810-01-096-1056	81996	70652-02450-109	VALVE,TWO POSITION,THREE-WAY	EA	2
C-3	15	PAFZZ	5330-01-098-6005	07060	CEC4981-213	SEAL	EA	1
C-3	16	PCFZZ	5330-01-113-5756	07060	CEC4981-214	SEAL	EA	1
C-3	17	PCFZZ	5330-01-090-1552	81349	M83461/1-215	PACKING,PREFORMED	EA	1
C-3	18	XDFZZ		78286	SS9014J466R	PLATE,IDENT	EA	1
C-3	19	PAFZZ	5305-00-682-7948	80205	NAS1351C4H12	SCREW,CAP	EA	4
C-3	20	PBFFF	4810-01-096-1055	78286	70652-02450-106	VALVE,TWO-POSITION,THREE-WAY	EA	1
C-3	21	PCFZZ	5330-01-123-3299	81349	M83461/1-119	PACKING,PREFORMED	EA	1
C-3	22	PCFZZ	5330-01-117-1075	81349	M83461/1-120	PACKING,PREFORMED	EA	1
C-3	23	PCFZZ	5330-01-129-6536	81349	M83461/1-121	PACKING,PREFORMED	EA	1
C-3	24	PAFZZ	5330-00-804-5695	96906	MS28778-6	PACKING,PREFORMED	EA	1
C-3	25	PAFZZ	5930-01-091-3787	78286	70652-02451-133	SWITCH,HYDRAULIC PRESSURE	EA	1

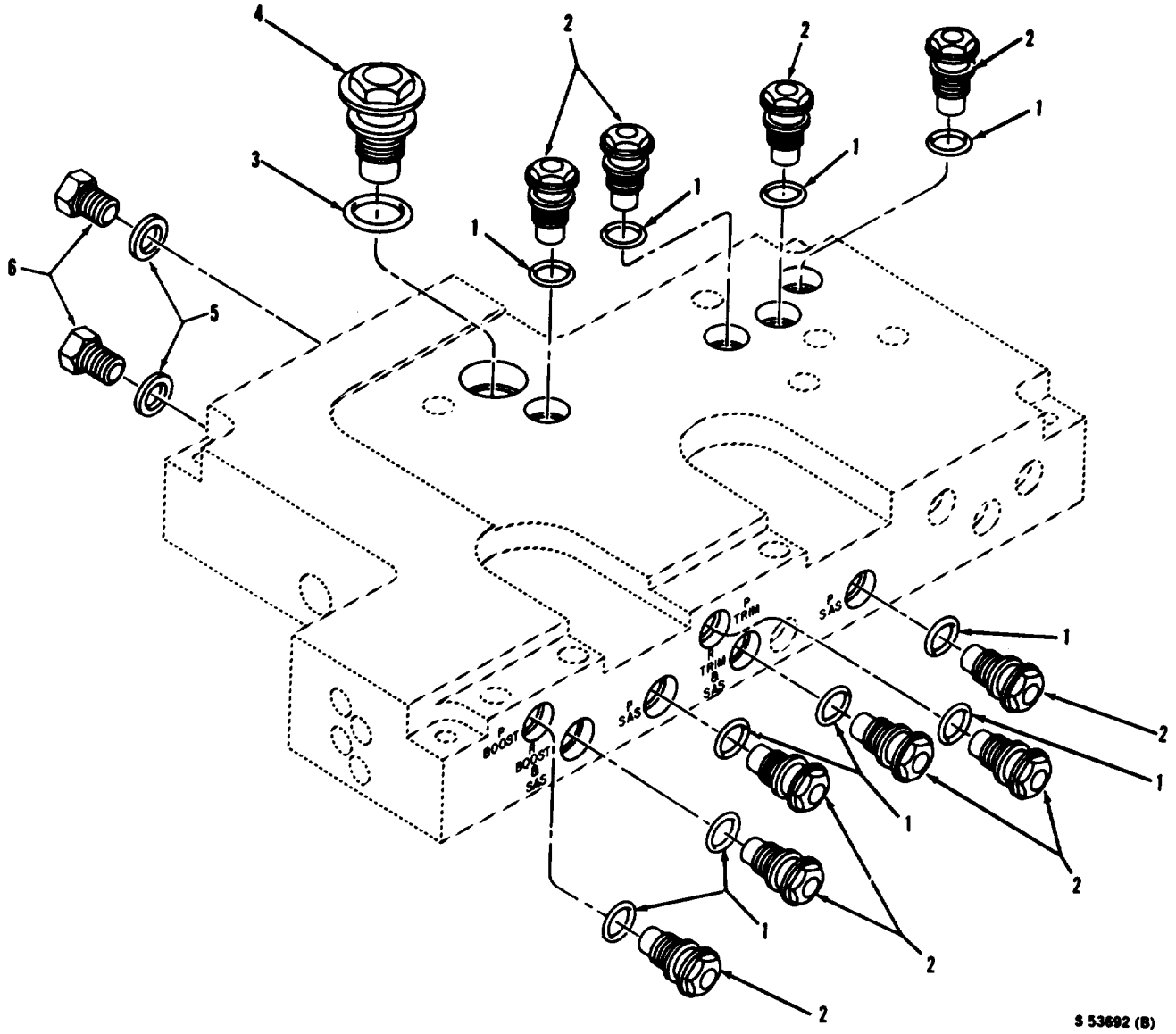


Figure C-4. Manifold Assembly, Pilot Assist/Nulling Fixture Assembly

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-4		XDFDD		78286	70700-20676-041	MANIFOLD ASSY,PILOT ASSIST/NULLING FIXTURE ASSY SEE FIG.C-1 FOR NHA	EA	REF
C-4	1	PCFZZ	5330-01-096-9181	07060	CEC4981-113	SEAL	EA	10
C-4	2	PAFZZ	4730-01-142-2980	78286	SS65-204T-2	COUPLING,SELF-SEALING	EA	10
C-4	3	PAFZZ	5330-01-098-6005	07060	CEC4981-213	SEAL	EA	1
C-4	4	PAFZZ	4730-01-143-1420	78286	SS65-208T-2	COUPLING,SELF-SEALING	EA	1
C-4	5	PAFZZ	5330-00-808-0794	96906	MS28778-8	PACKING,PREFORMED	EA	2
C-4	6	XDFZZ	4730-00-202-8341	96906	MS21913-8	PLUG	EA	2

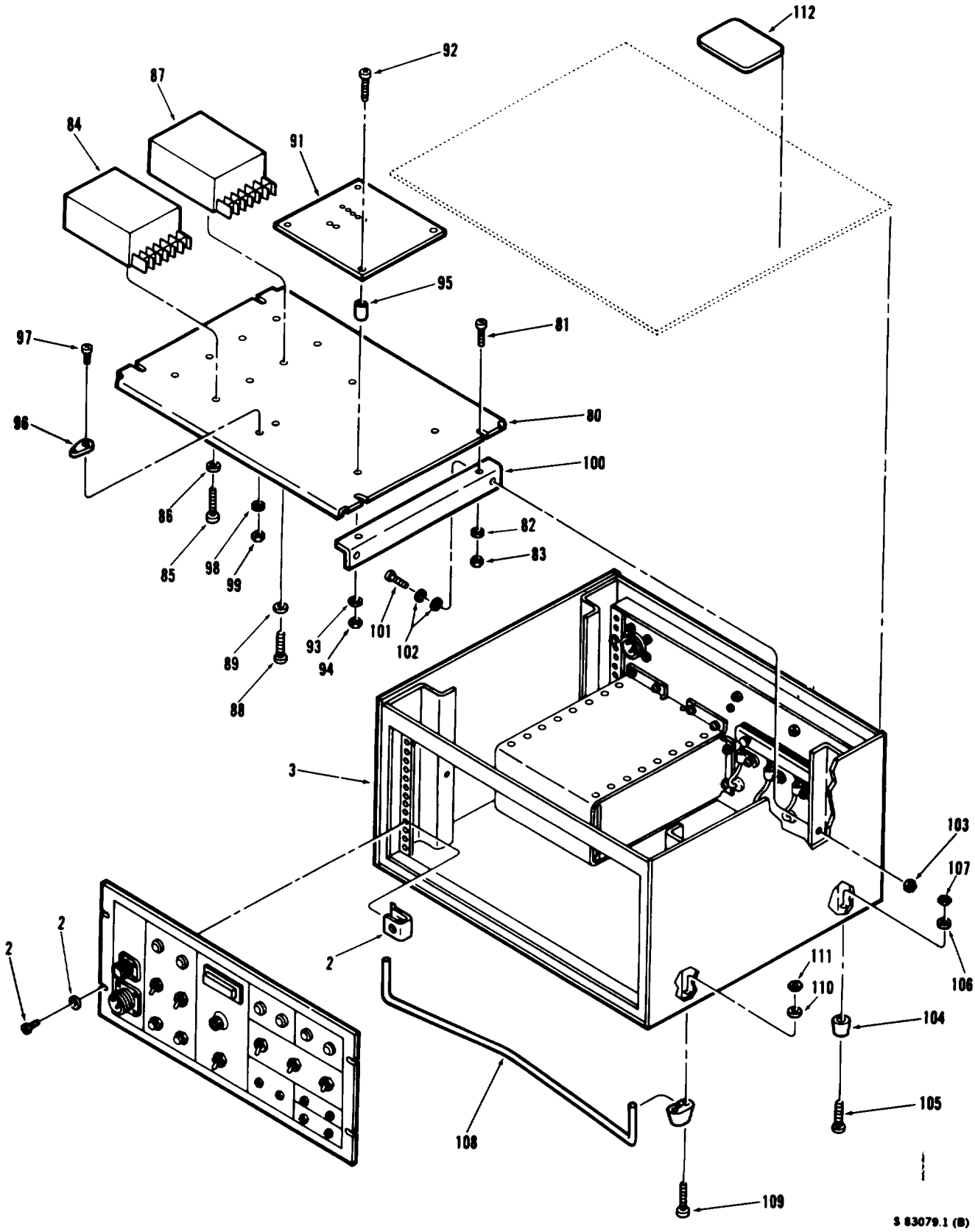


Figure C-5. Test Box Exploded View (Sheet 1 of 3).

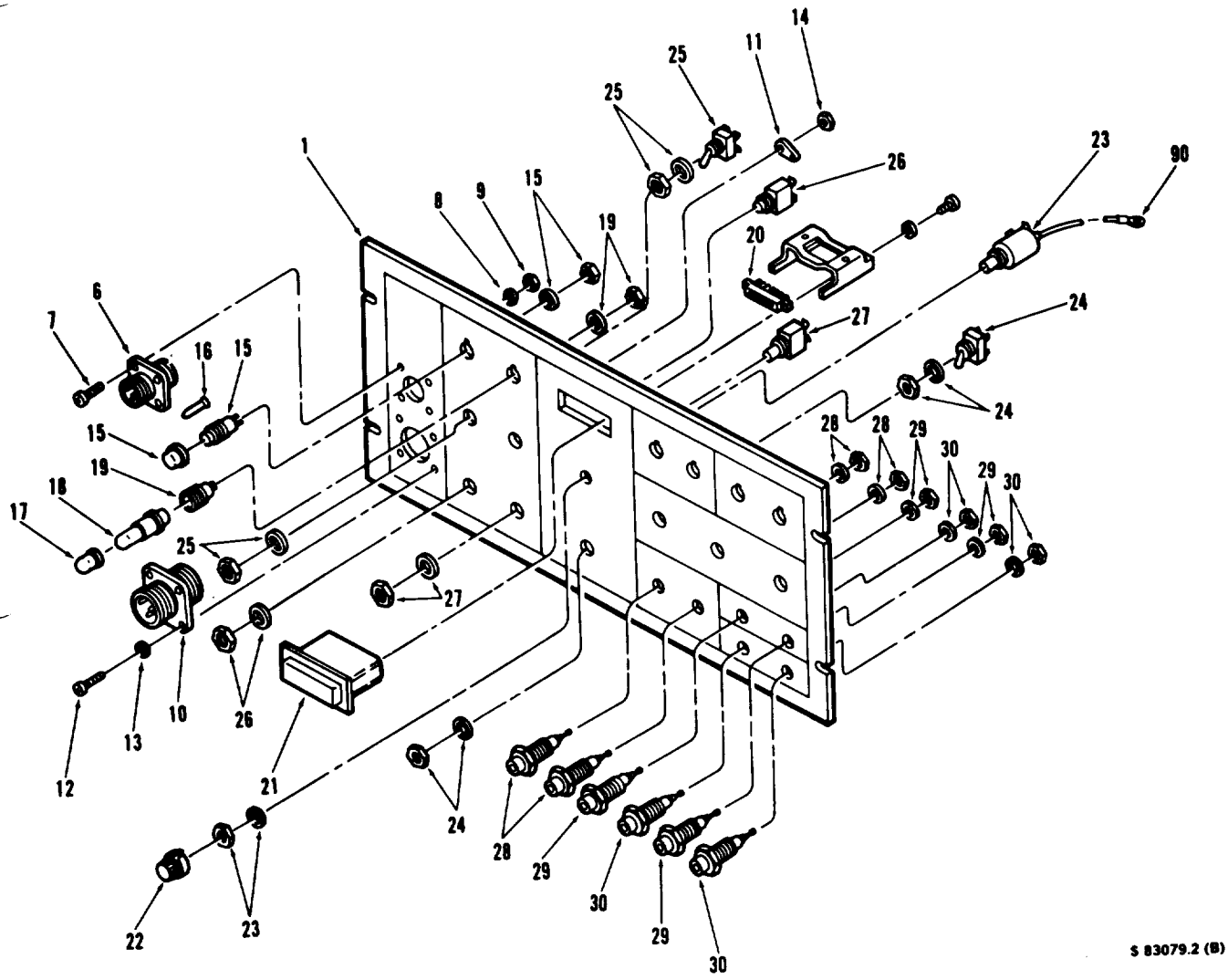


Figure C-5. Test Box Exploded View (Sheet 2 of 3).

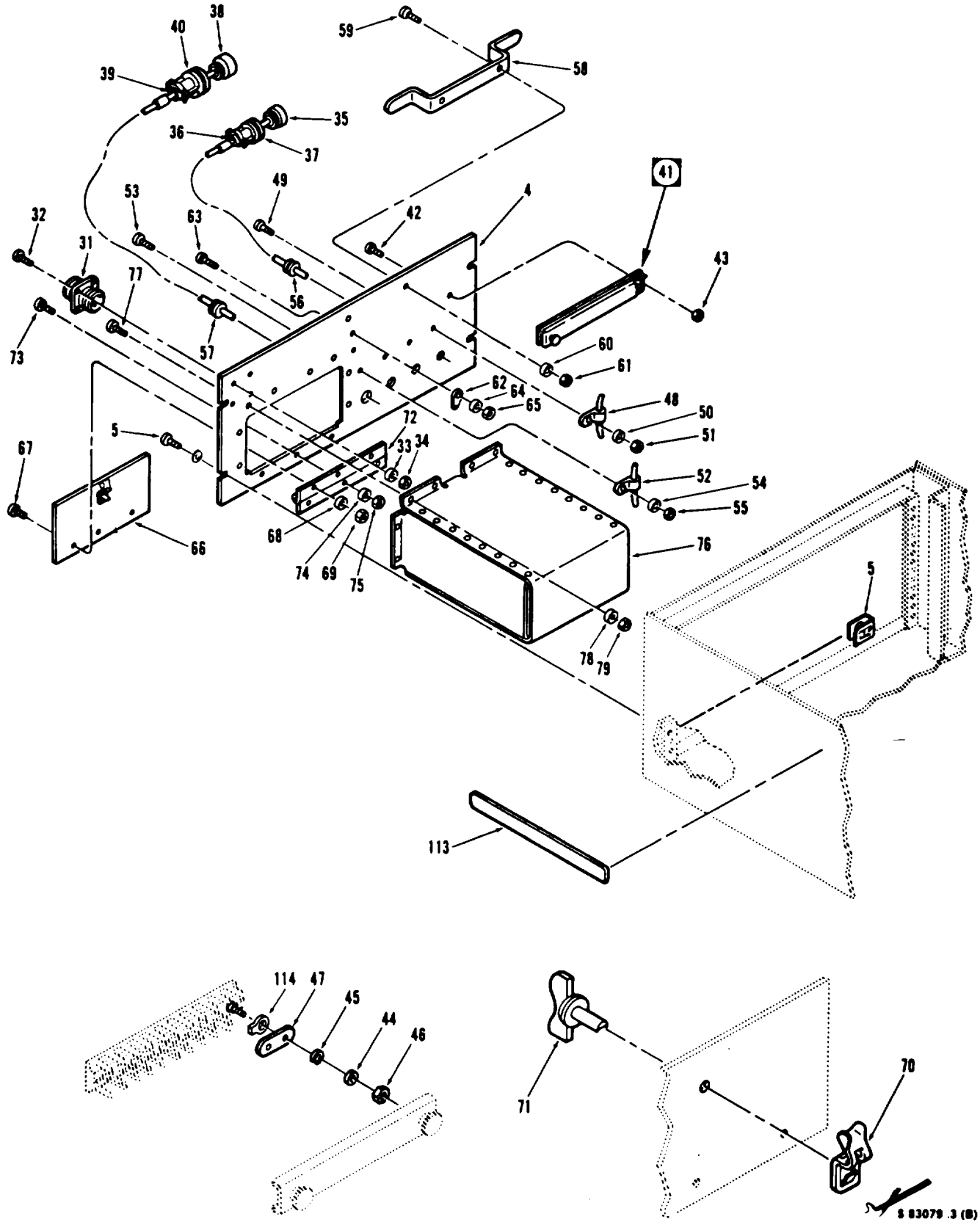


Figure C-5. Test Box Exploded View (Sheet 3 of 3).

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-5		PBFFF	4920-01-193-4769	78286	70700-20678-041	TEST BOX ASSEMBLY,PILOT-ASSIST/NULLING	EA	1
C-5	1	XDFZZ		78286	70700-20679-101	PANEL,FRONT	EA	1
C-5	2	PAFZZ	5325-01-123-0858	02954	HW-14	PANEL,FASTENER SET	EA	1
C-5	3	XDFZZ		02954	TIC071513-642	CASE	EA	1
C-5	4	MDFZZ		78286	70700-20680-105	PANEL,REAR	EA	1
C-5	5	PBFZZ	5310-00-550-1772	78553	A5910-621	PANEL,FASTENER SET	EA	1
C-5	6	PAFZZ	5935-00-726-0709	96906	MS3102R10SL-3P	CONNECTOR(J2)	EA	1
C-5	7	PAFZZ	5305-00-983-6730	96906	MS35206-218	SCREW,MACHINE	EA	4
C-5	8	PAFZZ	5310-00-187-2397	88044	AN960PD4L	WASHER,FLAT	EA	4
C-5	9	PAFZZ	5310-00-088-0551	96906	MS21044N04	NUT,SELF-LOCKING	EA	4
C-5	10	PAFZZ	5935-00-938-1561	96906	MS3102R14S-9P	CONNECTOR(J1)	EA	1
C-5	11	PAFZZ	5940-00-903-4571	78286	65700-90109-103	LUG,TERMINAL(E1)	EA	1
C-5	12	PAFZZ	5305-00-983-6730	96906	MS35206-218	SCREW,MACHINE	EA	4
C-5	13	PAFZZ	5310-00-187-2397	88044	AN960PD4L	WASHER,FLAT	EA	4
C-5	14	PAFZZ	5310-00-088-0551	96906	MS21044N04	NUT,SELF-LOCKING	EA	4
C-5	15	PAFZZ	6210-00-806-9421	96906	MS25256-4	LIGHT,INDICATOR(XDS3 TO XDS6)	EA	5
C-5	16	PAFZZ	6240-00-155-7836	96906	MS25237-327	LAMP,INCANDESCENT	EA	5
C-5	17	PAFZZ	6210-00-978-8463	81349	LC13RN2	LENS	EA	1
C-5	18	PAFZZ	6240-00-892-4420	96906	MS25252-C7A	LAMP,NEON	EA	1
C-5	19	PAFZZ	6210-00-809-4274	81349	LH74/1	LAMPHOLDER	EA	1
C-5	20	PAFZZ	5935-00-139-8928	05574	3VH15/1JN5	CONNECTOR(P4)	EA	1
C-5	21	XDFZZ		32570	36A-1	METER M1,DIGITAL	EA	1
C-5	22	XDFZZ		78286	65700-90444-101	COUNTER,10 TURN	EA	1
C-5	23	PAFZZ	5905-00-177-7191	80294	3500S-2-103	POTENTIOMETER (R1)	EA	1
C-5	24	PAFZZ	5930-00-789-6024	96906	MS27407-1	SWITCH,TOGGLE(S4)	EA	1
C-5	25	PAFZZ	5930-00-655-4241	96906	MS24524-23	SWITCH,TOGGLE(S1,S2,S3,S5,S6)	EA	5
C-5	26	PAFZZ	5925-00-452-1270	96906	MS3320-5	CIRCUIT BREAKER,(5,CB2)	EA	1
C-5	27	PAFZZ	5925-00-224-7425	96906	MS3320-2	CIRCUIT BREAKER,(2A,CB1)	EA	1
C-5	28	PAFZZ	5935-00-776-4617	81349	MS39024/10-07	CONNECTOR,TEST JACK(J4,J5)	EA	2
C-5	29	PAFZZ	5935-00-762-0312	81349	MS39024/10-03	CONNECTOR,TEST JACK(J6,J7)	EA	2
C-5	30	PAFZZ	5935-00-813-5874	81349	MS39024/10-06	CONNECTOR,TEST JACK(J8,J9)	EA	2
C-5	31	PAFZZ	5935-01-114-5209	96906	MS3472L14-15S	CONNECTOR(J3)	EA	1
C-5	32	PAFZZ	5305-00-889-3000	96906	MS35206-230	SCREW,MACHINE	EA	4
C-5	33	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	4
C-5	34	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	4
C-5	35	PAFZZ	5935-01-105-8903	81349	M83723/86R0803N	CONNECTOR(P466R,P468R,P469R)	EA	3
C-5	36	PAFZZ	5365-00-598-5417	96906	MS3420-3	BUTHING	EA	3
C-5	37	PAFZZ	5935-00-632-4733	96906	MS3417-8N	CLAMP,STRAIN RELIEF	EA	3
C-5	38	PAFZZ	5935-00-785-9526	80349	M83723/86R1005N	CONNECTOR(P467R)	EA	1
C-5	39	PAFZZ	5365-00-598-5282	96906	MS3420-4	BUSHING	EA	1
C-5	40	PAFZZ	5935-00-359-9018	96906	MS3417-10N	CLAMP,STRAIN RELIEF	EA	1
C-5	41	PAFZZ	5940-00-950-1610	96906	MS27212-1-10	TERMINAL BOARD ASSEMBLY(TB1)	EA	1
C-5	42	PAFZZ	5305-00-889-2998	96906	MS35206-216	SCREW,MACHINE	EA	2
C-5	43	PAFZZ	5310-00-088-0551	96906	MS21044N04	NUT,SELF-LOCKING	EA	2
C-5	44	PAFZZ	5310-01-031-5404	96906	MS14151-1	WASHER,FLAT	EA	10
C-5	45	PAFZZ	5310-00-929-6395	96906	MS35338-136	LOCKWASHER	EA	10
C-5	46	PAFZZ	5310-00-934-9761	96906	MS35649-264	HEXNUT	EA	10
C-5	47	PAFZZ	6150-00-600-6258	96906	MS25226-2-2	LINK	EA	1
C-5	48	PAFZZ	5340-00-254-5016	96906	MS21105-2	CLAMP,CABLE	EA	3
C-5	49	PAFZZ	5305-00-925-9674	96906	MS27039-1-10	SCREW,MACHINE	EA	1
C-5	50	PAFZZ	5310-00-167-0753	88044	AN960PD10L	WASHER,FLAT	EA	1
C-5	51	PAFZZ	5310-00-877-5797	96906	MS21044N3	NUT,SELF-LOCKING	EA	1
C-5	52	PAFZZ	5340-00-254-5026	96906	MS21105-3	CLAMP,CABLE	EA	1
C-5	53	PAFZZ	5305-00-925-9674	96906	MS27039-1-10	SCREW,MACHINE	EA	1
C-5	54	PAFZZ	5310-00-167-0753	88044	AN960PD10L	WASHER,FLAT	EA	1
C-5	55	PAFZZ	5310-00-877-5797	96906	MS21044N3	NUT,SELF-LOCKING	EA	1
C-5	56	PCFZZ	5325-00-185-0012	96906	MS35489-35	GROMMET	EA	1
C-5	57	PCFZZ	5325-00-582-3601	96906	MS35489-38	GROMMENT	EA	1
C-5	58	MDFZZ		78286	70700-20680-103	CABLE WRAP	EA	1
C-5	59	PAFZZ	5305-00-925-9675	96906	MS27039-0809	SCREW,MACHINE	EA	2
C-5	60	PAFZZ	5310-00-184-9002	88044	AN960PD8L	WASHER,FLAT	EA	2
C-5	61	PAFZZ	5310-00-811-3494	96906	MS21044N08	NUT,SELF-LOCKING	EA	2
C-5	62	PAFZZ	5940-00-204-7800	71002	194	LUG,TERMINAL(E2)	EA	1
C-5	63	PAFZZ	5305-00-984-4989	96906	MS35206-229	SCREW,MACHINE	EA	1
C-5	64	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	1
C-5	65	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	1
C-5	66	MDFZZ		78286	70700-20680-104	DOOR,CABLE STOWAGE	EA	1
C-5	67	PAFZZ	5305-00-889-2998	96906	MS35206-216	SCREW,MACHINE	EA	3
C-5	68	PAFZZ	5310-00-187-2397	88044	AN960PD4L	WASHER,FLAT	EA	3
C-5	69	PAFZZ	5310-00-088-0551	96906	MS21044N04	NUT,SELF-LOCKING	EA	3
C-5	70	PAFZZ	5325-01-091-8691	72794	DP137-1W	STUD	EA	1
C-5	71	XDFZZ		72794	DP137-2S	PAWL	EA	1
C-5	72	MFFZZ		78286	70700-20680-108	HINGE	EA	1
C-5	73	PAFZZ	5305-00-889-2998	96906	MS35206-216	SCREW,MACHINE	EA	3
C-5	74	PAFZZ	5310-00-187-2397	88044	AN960PD47L	WASHER,FLAT	EA	3
C-5	75	PAFZZ	5310-00-088-0551	96906	MS21044N04	NUT,SELF-LOCKING	EA	3
C-5	76	XDFZZ		78286	70700-20680-041	BOX ASSEMBLY,CABLE STORAGE	EA	1
C-5	77	PAFZZ	5305-00-889-3000	96906	MS35206-230	SCREW,MACHINE	EA	8
C-5	78	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	8

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-5	79	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	8
C-5	80	MDFZZ		78286	70700-20680-101	CHASSIS	EA	1
C-5	81	PAFZZ	5303-00-921-0918	96906	MS27039-0808	SCREW	EA	4
C-5	82	PAFZZ	5310-00-184-9002	88044	AN960PD8L	WASHER,FLAT	EA	4
C-5	83	PAFZZ	5310-00-811-3494	96906	MS21044N08	NUT,SELF-LOCKING	EA	4
C-5	84	PBFZZ	6130-01-129-2303	18655	PM365	POWER SUPPLY(PS1)	EA	1
C-5	85	PAFZZ	5310-00-811-3494	96906	MS21044N08	NUT,SELF-LOCKING	EA	4
C-5	86	PAFZZ	5310-00-187-2397	88044	AN960PD4L	WASHER,FLAT	EA	4
C-5	87	PBFZZ	6130-01-059-0651	18655	PM334	POWER SUPPLY(PS2)	EA	1
C-5	88	PAFZZ	5305-00-115-6127	96906	MS21090-0409	SCREW,SELF-LOCKING	EA	4
C-5	89	PAFZZ	5310-00-187-2397	88044	AN960PD4L	WASHER,FLAT	EA	4
C-5	90	PAFZZ	5940-00-813-0698	96906	MS25036-101	LUG,TERMINAL	EA	44
C-5	91	PAFZZ	5940-01-163-5558	78286	70700-20684-041	COMPONENT BOARD ASSEMBLY(A1)	EA	1
C-5	92	PAFZZ	5305-00-984-6221	96906	MS35206-234	SCREW,MACHINE	EA	4
C-5	93	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	4
C-5	94	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	4
C-5	95	PAFZZ	5365-00-698-3422	80205	NAS43DD1-40	SPACER	EA	4
C-5	96	PAFZZ	5940-00-204-7800	71002	194	LUG,TERMINAL(E3)	EA	1
C-5	97	PAFZZ	5305-00-984-4984	96906	MS35206-227	SCREW,MACHINE	EA	1
C-5	98	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	1
C-5	99	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	1
C-5	100	MDFZZ		78286	70700-20680-102	BRACKET,SIDE SUPPORT	EA	2
C-5	101	PAFZZ	5305-00-984-6210	96906	MS35206-263	SCREW,MACHINE	EA	2
C-5	102	PAFZZ	5310-00-167-0753	88044	AN960PD10L	WASHER,FLAT	EA	4
C-5	103	PAFZZ	5310-00-877-5797	96906	MS21044N3	NUT,SELF-LOCKING	EA	2
C-5	104	PAFZZ	5340-00-550-8485	83330	2193	FOOT,CASE	EA	2
C-5	105	PAFZZ	5305-00-889-3118	96906	MS35206-203	SCREW,MACHINE	EA	1
C-5	106	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	1
C-5	107	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	1
C-5	108	XDFZZ		02954	TTS-15-19	TILT STAND	EA	1
C-5	109	PAFZZ	5305-00-889-3001	96906	MS35206-231	SCREW,MACHINE	EA	4
C-5	110	PAFZZ	5310-00-187-2398	88044	AN960PD6L	WASHER,FLAT	EA	4
C-5	111	PAFZZ	5310-00-081-8087	96906	MS21044N06	NUT,SELF-LOCKING	EA	4
C-5	112	MDFZZ		78286	SS9064B-46	NAMEPLATE	EA	1
C-5	113	MDFZZ		78286	SS9013-063	IDENTIFICATION PLATE	EA	1
C-5	114	PAFZZ	5970-00-426-1583	96906	MS3373-A1	INSULATOR	EA	2

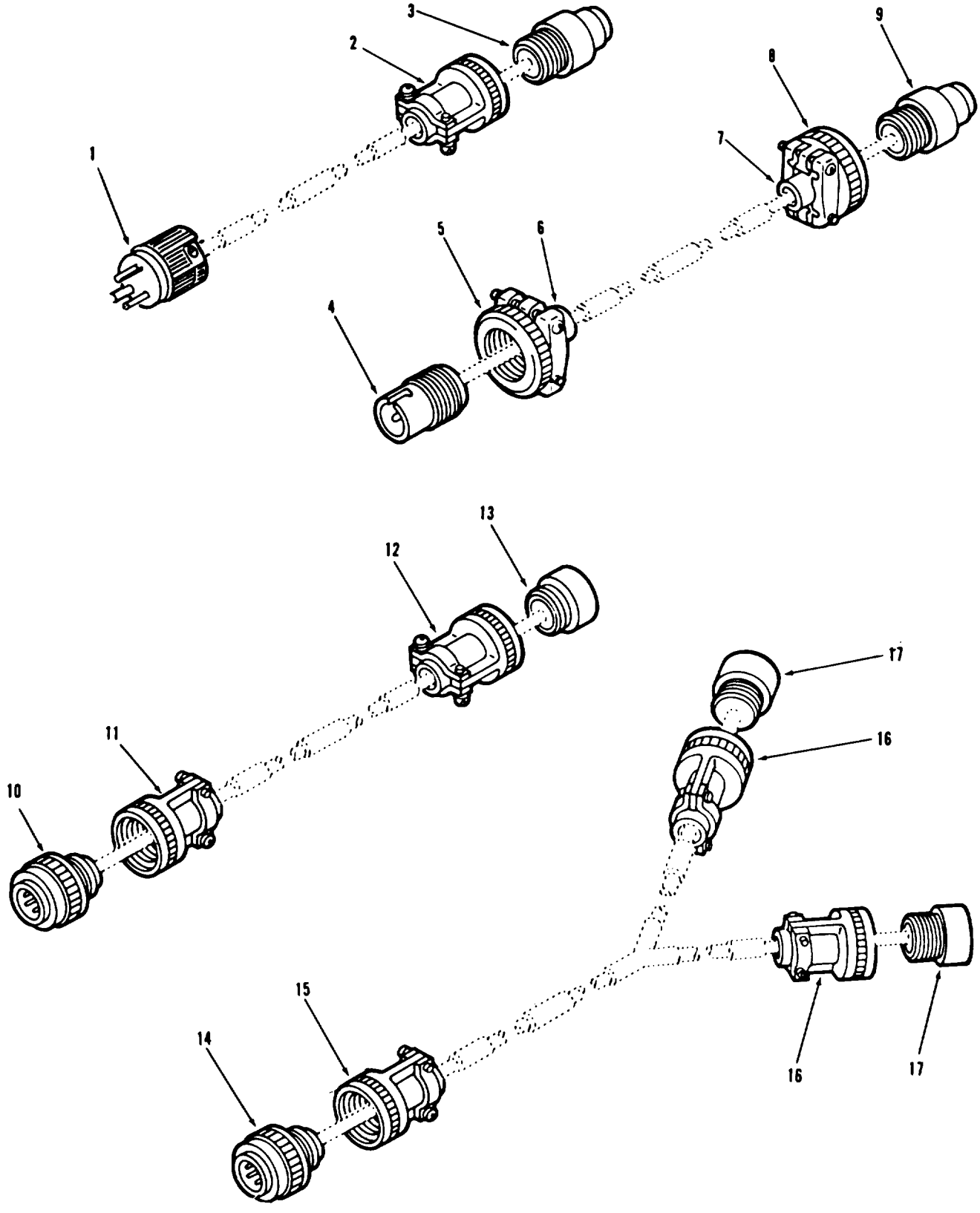


Figure C-6. Cable Assemblies Exploded View.

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-6		AFFFF			70700-20646-042	CABLE ASSEMBLY,AC POWER	EA	1
C-6	1	PAFZZ	5935-00-878-9477	74545	5208	PLUG,P1	EA	1
C-6	2	PAFZZ	5935-00-359-9018	96906	MS3417-10N	CLAMP,STRAIN RELIEF	EA	2
C-6	3	PAFZZ	5935-00-539-2650	96906	MS3106A-10SL3S	CONNECTOR	EA	2
C-6		AFFFF		78286	70700-20633-041	CABLE ASSEMBLY,DC POWER	EA	1
C-6	4	PAFZZ	5935-00-060-6320	96906	MS3107A16-11P	CONNECTOR	EA	1
C-6	5	PAFZZ	5935-00-688-4026	96906	MS3057-8A	CLAMP	EA	1
C-6	6	PAFZZ	5365-00-820-4535	96906	MS3420-6	BUSHING	EA	2
C-6	7	PAFZZ	5935-00-936-7377	96906	MS3420-8	BUSHING	EA	1
C-6	8	PAFZZ	5935-00-280-2195	96906	MS3057-6A	CLAMP	EA	1
C-6	9	PAFZZ	5935-00-274-0041	96906	MS3106F145-9S	CONNECTOR	EA	1
C-6		PBFZZ	4920-01-193-4374	78286	70700-20682-041	CABLE ASSEMBLY,PITCH TRIM ACTUATOR	EA	1
C-6	10	PAFZZ	5935-00-761-6837	96906	MS3476L14-15P	CONNECTOR	EA	1
C-6	11	PAFZZ	5935-00-622-2723	96906	MS3417-14N	CLAMP,STRAIN RELIEF	EA	1
C-6	12	PAFZZ	5935-01-025-4360	96906	MS3417-12N	CLAMP,STRAIN RELIEF	EA	1
C-6	13	PAFZZ	5935-00-236-3993	81349	M83723/86R1212N	CONNECTOR	EA	1
C-6		PBFZZ	4920-01-193-4375	78286	70700-20682-042	CABLE ASSEMBLY,SAS	EA	1
C-6	14	PAFZZ	5935-00-761-6837	96906	MS3476L14-15P	CONNECTOR	EA	1
C-6	15	PAFZZ	5935-00-622-2723	96906	MS3417-14N	CLAMP,STRAIN RELIEF	EA	1
C-6	16	PAFZZ	5935-00-359-9018	96906	MS3417-10N	CLAMP,STRAIN RELIEF	EA	2
C-6	17	PAFZZ	5935-00-785-9526	81349	M83723/86R1005N	CONNECTOR	EA	2

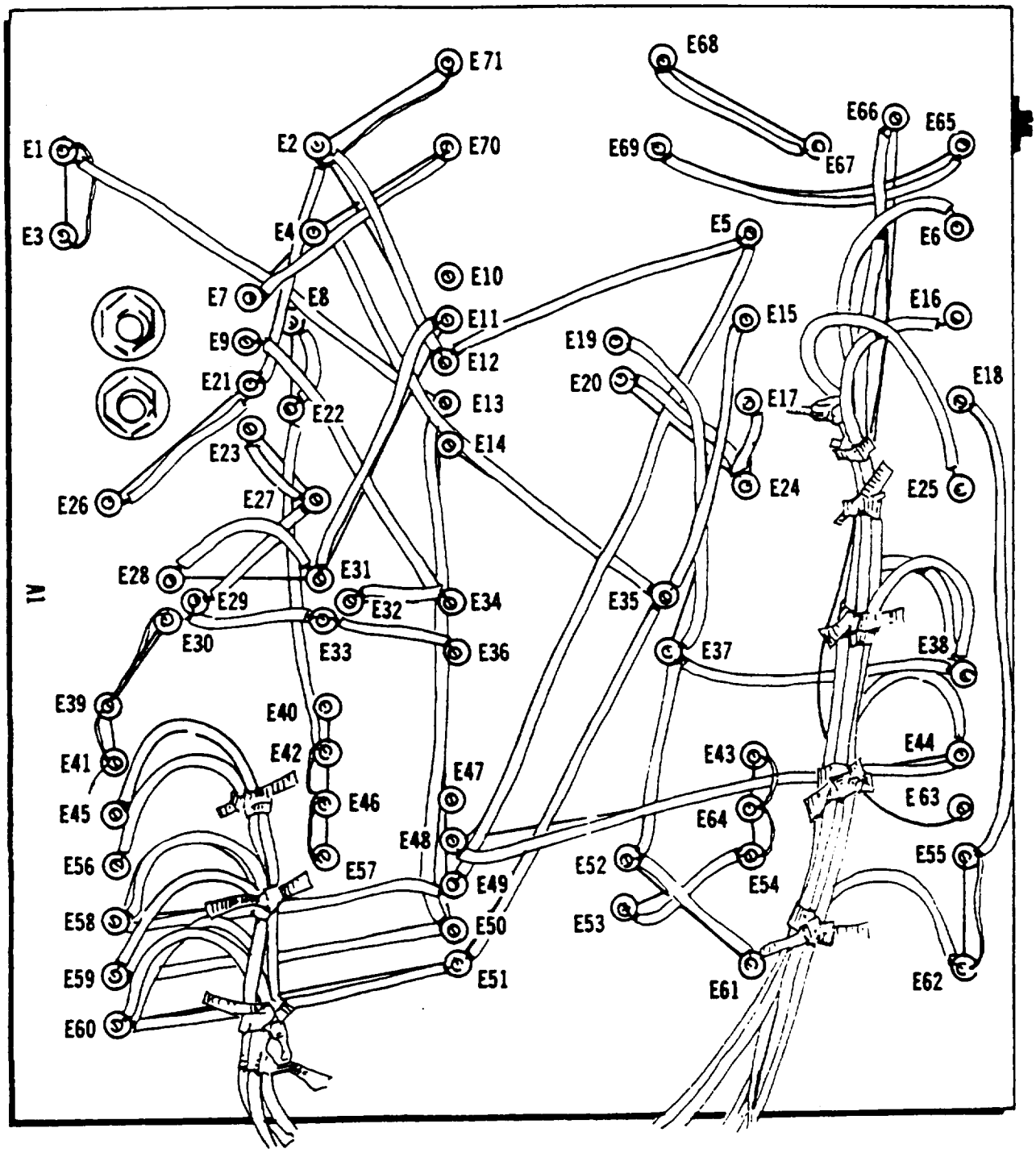


Figure C-7. Component Board A-1, Front View (Sheet 1 of 2)

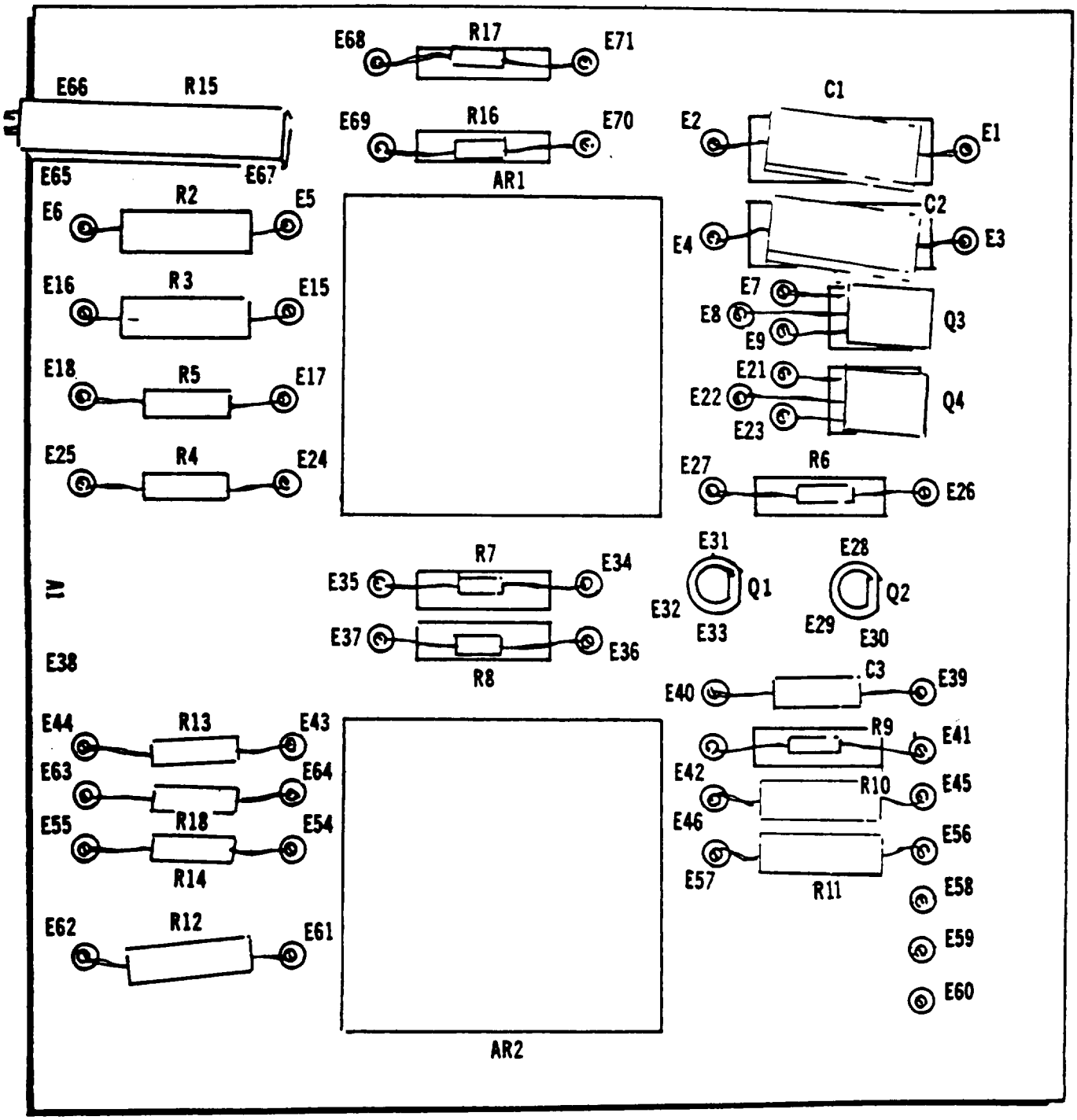


Figure C-7. Component Board A-1, Rear View (Sheet 2 of 2)

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-7	1	PBFZZ	5940-01-163-5558	78286	70700-20684-041	COMPONENT BOARD (A1)	EA	1
C-7	2	PAFZZ	5962-01-017-3493	21877	143036	AMPLIFIER(AR1,AR2)	EA	1
C-7	3	PAFZZ	5925-00-224-7425	96906	MS3320-2	CIRCUIT BREAKER(CB1)	EA	1
C-7	4	PAFZZ	5925-00-452-1270	96906	MS3320-5	CIRCUIT BREAKER(CB2)	EA	1
C-7	5	XDFZZ		90201	TT150U04A0L3P	CAPACITOR(C1,C2)	EA	1
C-7	6	PAFZZ	5910-00-236-7841	96733	CW1103J	CAPACITOR (C3)	EA	1
C-7	7	XDFZZ		32570	36A-1	METER	EA	1
C-7	8	PBFZZ	6130-01-129-2303	18655	PM365	POWER SUPPLY(PS1)	EA	1
C-7	9	PBFZZ	6130-01-059-0651	18655	PM334	POWER SUPPLY (PS2)	EA	1
C-7	10	PAFZZ	5961-00-912-9419	01295	2N3704	TRANSISTOR (Q1)	EA	1
C-7	11	PAFZZ	5961-00-840-5316	01295	2N3703	TRANSISTOR (Q2)	EA	1
C-7	12	PAFZZ	5961-00-436-8953	04713	2N4919	TRANSISTOR(Q3)	EA	1
C-7	13	PAFZZ	5961-00-107-2571	04713	2N4922	TRANSISTOR(Q4)	EA	1
C-7	14	PAFZZ	5905-00-177-7191	80294	3500S-2-103	POTENTIOMETER(R1)	EA	1
C-7	15	PAFZZ	5905-00-151-4515	81349	RNR65K2001FM	RESISTOR(R2,R3)	EA	1
C-7	16	PAFZZ	5905-00-192-7199	81349	RNR60K1003FM	RESISTOR(R4)	EA	1
C-7	17	PAFZZ	5905-00-433-6219	81349	RNR60H1002FS	RESISTOR(R5,R14,R18)	EA	1
C-7	18	PAFZZ	5905-00-734-1046	81349	RCR07G472JM	RESISTOR(R6,R7,R8,R9)	EA	1
C-7	19	PAFZZ	5905-00-175-4246	81349	RNR65K1001FS	RESISTOR(R10,R11)	EA	1
C-7	20	PAFZZ	5905-00-173-1236	81349	RNR65J1020BM	RESISTOR(R12)	EA	1
C-7	21	PAFZZ	5905-00-192-7192	81349	RNR60K1001FM	RESISTOR(R13)	EA	1
C-7	22	PAFZZ	5905-00-464-9931	80294	200P-1-253	POTENTIOMETER (R15)	EA	1
C-7	23	PAFZZ	5905-00-734-4525	81349	RCR07G393JM	RESISTOR(R16,R17,S1,S2,S3)	EA	1
C-7	24	PAFZZ	5930-00-655-4241	96906	MS24524-23	SWITCH(S5,S6)	EA	1
C-7	25	PAFZZ	5930-00-789-6024	96906	MS27407-1	SWITCH(S4)	EA	1
C-7	26	PAFZZ	5940-00-950-1610	96906	MS27212-1-10	TERMINAL BOARD(TB1)	EA	1
C-7	27	PAFZZ	6240-00-155-7836	96906	MS25237-327	LAMP (XDS1,XDS3,XDS4,XDS5,XDS6)	EA	1
C-7	28	PAFZZ	6240-00-892-4420	96906	MS25252-C7A	LAMP(XDS2)	EA	1

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5935-00-060-6320	C-6	4	5935-00-761-6837	C-6	14
5310-00-081-8087	C-5	34	5935-00-762-0312	C-5	29
5310-00-081-8087	C-5	65	5935-00-785-9526	C-6	17
5310-00-081-8087	C-5	94	5935-00-776-4617	C-5	28
5310-00-081-8087	C-5	99	5935-00-785-9526	C-5	38
5310-00-081-8087	C-5	111	5930-00-789-6024	C-5	24
5310-00-081-8087	C-5	79	5930-00-789-6024	C-7	
5310-00-081-8087	C-5	107	5330-00-804-5695	C-3	24
5310-00-088-0551	C-5	9	6210-00-806-9421	C-5	15
5310-00-088-0551	C-5	14	5330-00-808-0794	C-4	5
5310-00-088-0551	C-5	43	6210-00-809-4274	C-2	6
5310-00-088-0551	C-5	69	6210-00-809-4274	C-5	19
5310-00-088-0551	C-5	75	5310-00-811-3494	C-5	61
5961-00-107-2571	C-7		5310-00-811-3494	C-5	83
5305-00-115-6127	C-5	88	5310-00-811-3494	C-5	85
5935-00-139-8928	C-5	20	5940-00-813-0698	C-5	90
5306-00-145-7036	C-1	6	5935-00-813-5874	C-5	30
5306-00-150-9101	C-1	12	5365-00-820-4535	C-6	6
5306-00-150-9102	C-1	11	5961-00-840-5316	C-7	
5306-00-150-9235	C-1	9	5310-00-857-4960	C-1	21
5306-00-151-1409	C-1	19	5310-00-877-5797	C-5	55
5905-00-151-4515	C-7		5310-00-877-5797	C-5	51
6240-00-155-7356	C-5	16	5310-00-877-5797	C-5	103
6240-00-155-7836	C-2	3	5935-00-878-9477	C-6	1
6240-00-155-7836	C-7		5305-00-889-2998	C-5	67
5310-00-167-0753	C-5	50	5305-00-889-2998	C-5	42
5310-00-167-0753	C-5	54	5305-00-889-2998	C-5	73
5310-00-167-0753	C-5	102	5305-00-889-3000	C-5	32
5905-00-173-1236	C-7		5305-00-889-3000	C-5	77
5905-00-175-4246	C-7		5305-00-889-3001	C-5	109
5905-00-177-7191	C-5	23	5305-00-889-3118	C-5	105
5905-00-177-7191	C-7		6240-00-892-4420	C-2	5
5310-00-184-9002	C-5	60	6240-00-892-4420	C-5	18
5310-00-184-9002	C-5	82	6240-00-892-4420	C-7	
5325-00-185-0012	C-5	56	5940-00-903-4571	C-5	11
5310-00-187-2354	C-1	20	5961-00-912-9419	C-7	
5310-00-187-2399	C-1	7	5305-00-921-0918	C-5	81
5310-00-187-2397	C-5	8	5305-00-925-9674	C-5	49
5310-00-187-2397	C-5	13	5305-00-925-9674	C-5	53
5310-00-187-2397	C-5	68	5305-00-925-9675	C-5	59
5310-00-187-2397	C-5	74	5310-00-929-6395	C-5	45
5310-00-187-2397	C-5	86	5310-00-934-9761	C-5	46
5310-00-187-2397	C-5	89	5935-00-936-7377	C-6	7
5310-00-187-2398	C-5	33	5935-00-938-1561	C-5	10
5310-00-187-2398	C-5	64	5940-00-950-1610	C-5	41
5310-00-187-2398	C-5	78	5940-00-950-1610	C-7	
5310-00-187-2398	C-5	93	6210-00-978-8463	C-2	4
5310-00-187-2398	C-5	106	6210-00-978-8463	C-5	17
5310-00-187-2398	C-5	98	5305-00-983-6730	C-5	7
5310-00-187-2398	C-5	110	5305-00-983-6730	C-5	12
5905-00-192-7192	C-7		5305-00-984-4984	C-5	97
5905-00-192-7199	C-7		5305-00-984-4989	C-5	63
4730-00-202-8341	C-4	6	5305-00-984-6210	C-5	101
5940-00-204-7800	C-5	62	5305-00-984-6221	C-5	92
5940-00-204-7800	C-5	96	5305-00-993-1851	C-5	5
5925-00-224-7425	C-5	27	5962-01-017-3493	C-7	
5925-00-224-7425	C-7		5935-01-025-4360	C-6	12
5935-00-236-3993	C-6	13	5310-01-031-5404	C-5	44
5910-00-236-7841	C-7		5330-01-047-0435	C-3	5
5340-00-254-5016	C-5	48	6130-01-059-0651	C-7	
5340-00-254-5026	C-5	52	6130-01-059-0651	C-5	87
5935-00-274-0041	C-6	9	4920-01-088-3225	C-1	
5935-00-280-2195	C-6	8	5330-01-090-1552	C-3	17
5935-00-359-9018	C-6	2	5930-01-091-3787	C-3	25
5935-00-359-9018	C-6	16	5325-01-091-8619	C-5	70
5935-00-359-9018	C-5	40	4730-01-092-8095	C-1	15
5970-00-426-1583	C-5	114	4730-01-092-8095	C-1	18
5905-00-433-6219	C-7		4730-01-092-8095	C-3	4
5961-00-436-8953	C-7		4730-01-095-7013	C-3	2
5925-00-452-1270	C-5	26	1650-01-095-7215	C-3	7
5925-00-452-1270	C-7		4810-01-096-1055	C-3	20
5905-00-464-9931	C-7		4810-01-096-1056	C-3	14
5935-00-539-2650	C-6	3	5330-01-096-9181	C-1	14
5325-00-582-3601	C-5	57	5330-01-096-9181	C-1	17
5365-00-598-5282	C-5	39	5330-01-096-9181	C-3	3
5365-00-598-5417	C-5	36	5330-01-096-9181	C-4	1
6150-00-600-6258	C-5	47	5330-01-098-6005	C-3	1
5935-00-622-2723	C-6	11	5330-01-098-6005	C-3	15

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIGURE NO.	FIGURE NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5935-00-622-2723	C-6	15	5330-01-098-6005	C-4	3
5935-00-632-4733	C-5	37	5330-01-098-6006	C-3	8
5930-00-655-4241	C-5	25	5935-01-105-8903	C-5	35
5930-00-655-4241	C-7		1560-01-106-1905	C-1	10
5305-00-682-7948	C-3	19	1560-01-106-1905	C-3	
5935-00-688-4026	C-6	5	5330-01-107-4954	C-3	9
5365-00-698-3422	C-5	95	5330-01-110-1412	C-3	10
5935-00-726-0708	C-5	6	5330-01-113-5756	C-3	16
5905-00-734-1046	C-7		5935-01-114-5209	C-5	31
5905-00-734-4525	C-7		5330-01-117-1075	C-3	22
5935-00-761-6837	C-6	10	5325-01-123-0858	C-2	1
5325-01-123-0858	C-5	2	5305-01-168-4428	C-3	12
5330-01-123-3299	C-3	21	4730-01-143-1420	C-4	4
6130-01-129-2303	C-5	84	4920-01-193-4374	C-1	3
6130-01-129-2303	C-7		4920-01-193-4374	C-6	
5330-01-129-6536	C-3	23	4920-01-193-4375	C-1	4
5330-01-129-6536	C-3	23	4920-01-193-4375	C-6	
4730-01-142-2980	C-4	2	4920-01-193-4769	C-2	
5940-01-163-5558	C-7		4920-01-193-4769	C-5	
5940-01-163-5558	C-5	91			

National Stock Number and Part Number Index (Continued)

Part Number	FSCM	Fig. No.	Item No.	Part Number	FSCM	Fig. No.	Item No.
AN4-27A	88044	C-1	19	MS21044N06	96906	C-5	65
AN5-10A	88044	C-1	6	MS21044N06	96906	C-5	79
AN5-36A	88044	C-1	9	MS21044N06	96906	C-5	94
AN5-6A	88044	C-1	12	MS21044N06	96906	C-5	99
AN5-7A	88044	C-1	11	MS21044N06	96906	C-5	107
AN960PD10L	88044	C-5	50	MS21044N06	96906	C-5	111
AN960PD10L	88044	C-5	54	MS21044N08	96906	C-5	61
AN960PD10L	88044	C-5	102	MS21044N08	96906	C-5	83
AN960PD4L	88044	C-5	8	MS21044N08	96906	C-5	85
AN960PD4L	88044	C-5	13	MS21044N3	96906	C-5	51
AN960PD4L	88044	C-5	68	MS21044N3	96906	C-5	55
AN960PD4L	88044	C-5	74	MS21044N3	96906	C-5	103
AN960PD4L	88044	C-5	86	MS21044N4	96906	C-1	21
AN960PD4L	88044	C-5	89	MS21090-0409	96906	C-5	88
AN960PD416	88044	C-1	20	MS21105-2	96906	C-5	48
AN960PD516	88044	C-1	7	MS21105-3	96906	C-5	52
AN960PD6L	88044	C-5	33	MS21913-8	96906	C-4	6
AN960PD6L	88044	C-5	64	MS24524-23	96906	C-5	25
AN960PD6L	88044	C-5	78	MS24524-23	96906	C-7	
AN960PD6L	88044	C-5	93	MS25036-101	96906	C-5	90
AN960PD6L	88044	C-5	98	MS25226-2-2	96906	C-5	47
AN960PD6L	88044	C-5	106	MS25237-327	96906	C-2	3
AN960PD6L	88044	C-5	110	MS25237-327	96906	C-5	16
AN960PD8L	88044	C-5	60	MS25237-327	96906	C-7	
AN960PD8L	88044	C-5	82	MS25252-C7A	96906	C-2	5
CEC4981-113	07060	C-1	14	MS25252-C7A	96906	C-5	18
CEC4981-113	07060	C-1	17	MS25252-C7A	96906	C-7	
CEC4981-113	07060	C-3	3	MS25256-4	96906	C-5	15
CEC4981-113	07060	C-4	1	MS27039-0808	96906	C-5	81
CEC4981-114	07060	C-3	8	MS27039-0809	96906	C-5	59
CEC4981-213	07060	C-3	1	MS27039-1-10	96906	C-5	53
CEC4981-213	07060	C-3	15	MS27039-1-10	96906	C-5	49
CEC4981-213	07060	C-4	3	MS27212-1-10	96906	C-5	41
CEC4981-214	07060	C-3	16	MS27212-1-10	96906	C-7	
CW1103J	96733	C-7		MS27407-1	96906	C-5	27
DP137-1W	72794	C-5	70	MS27407-1	96906	C-7	
DP137-2S	72794	C-5	71	MS28778-6	96906	C-3	24
HW14	02954	C-2	1	MS28778-8	96906	C-4	5
HW14	02954	C-5	2	MS3057-6A	96906	C-6	8
LC13RN2	81349	C-2	4	MS3057-8A	96906	C-6	5
LC13RN2	81349	C-5	17	MS3102R10SL-3P	96906	C-5	6
LH74/1	81349	C-2	6	MS3102R14S-9P	96906	C-5	10
LH74/1	81349	C-5	19	MS3102R14S-9P	96906	C-5	10
MS14151-1	96906	C-5	44	MS3106A-10SL3S	96906	C-6	3
MS21044N04	96906	C-5	9	MS3106F145-9S	96906	C-6	9
MS21044N04	96906	C-5	14	MS3107A16-11P	96906	C-6	4
MS21044N04	96906	C-5	43	MS3320-2	96906	C-5	27
MS21044N04	96906	C-5	69	MS3320-2	96906	C-7	
MS21044N04	96906	C-5	75	MS3320-5	96906	C-5	26
MS21044N06	96906	C-5	34	MS3320-5	96906	C-7	
				MS3373-A1	96906	C-5	114

National Stock Number and Part Number Index (Continued)

Part Number	FSCM	Fig. No.	Item No.	Part Number	FSCM	Fig. No.	Item No.
MS3417-8N	96906	C-5	37	SS65-104S-1	78286	C-3	4
MS3417-10N	96906	C-5	40	SS65-108G-1	78286	C-3	2
MS3417-10N	96906	C-6	2	SS65-204T-2	78286	C-4	2
MS3417-10N	96906	C-6	16	SS65-208T-2	78286	C-4	4
MS3417-12N	96906	C-6	12	SS9013-063	78286	C-5	113
MS3417-14N	96906	C-6	11	SS9014J466R	78286	C-3	18
MS3417-14N	96906	C-6	15	SS9014J468R	78286	C-3	11
MS3420-3	96906	C-5	36	SS9014J469R	78286	C-3	13
MS3420-4	96906	C-5	39	SS9064B-46	78286	C-5	112
MS3420-6	96906	C-6	6	TTS-15-19	02954	C-5	108
MS3420-8	96906	C-6	7	TT150U04A0L3P	90201	C-7	
MS3472L14-15S	96906	C-5	31	T1C071513-642	02954	C-5	3
MS3476L14-15P	96906	C-6	10	143036	21877	C-7	
MS3476L14-15P	96906	C-6	14	194	71002	C-5	62
MS35206-203	96906	C-5	105	194	71002	C-5	96
MS35206-216	96906	C-5	42	200P-1-253	80294	C-7	
MS35206-216	96906	C-5	67	2N3703	01295	C-7	
MS35206-216	96906	C-5	73	2N3704	01295	C-7	
MS35206-218	96906	C-5	7	2N4919	04713	C-7	
MS35206-218	96906	C-5	12	2N4922	04713	C-7	
MS35206-227	96906	C-5	97	3VH15/1JN5	05574	C-5	20
MS35206-229	96906	C-5	63	3500S-2-103	80294	C-5	23
MS35206-230	96906	C-5	32	3500S-2-103	80294	C-7	
MS35206-230	96906	C-5	77	36A-1	32570	C-5	21
MS35206-231	96906	C-5	109	36A-1	32570	C-7	
MS35206-234	96906	C-5	92	5208	74545	C-6	1
MS35206-263	96906	C-5	101	65700-90109-103	78286	C-5	11
MS35207-267	96906	C-5	5	65700-90444-101	78286	C-2	2
MS35338-136	96906	C-5	45	65700-90444-101	78286	C-5	22
MS35489-35	96906	C-5	56	70410-02330-041	78286	C-3	6
MS35489-38	96906	-5	57	70410-02330-042	78286	C-3	6
MS35649-264	96906	C-5	46	70652-02450-106	78286	C-3	20
M39024/10-03	81349	C-5	29	70652-02450-109	81996	C-3	14
M39024/10-06	81349	C-5	30	70652-02451-133	78286	C-3	25
M39024/10-07	81349	C-5	28	70652-02617-105	78286	C-3	7
M83461/1-011	81349	C-3	5	70652-02620-046	78286	C-1	10
M83461/1-114	81349	C-3	9	70652-02620-046	78286	C-3	
M83461/1-215	81349	C-3	17	70700-20633-041	78286	3C-1	2
M83461/1-116	81349	C-3	10	70700-20633-041	78286	C-6	
M83461/1-119	81349	C-3	21	70700-20646-042	78286	C-1	1
M83461/1-120	81349	C-3	22	70700-20646-042	78286	C-6	
M83461/1-121	81349	C-3	23	70700-20675-041	78286	C-1	
M83723/86R0803N	81349	C-5	35	70700-20676-041	78286	C-1	22
M83723/86R1005N	81349	C-5	38	70700-20676-041	78286	C-4	
M83723/86R1005N	81349	C-6	17	70700-20676-044	78286	C-1	13
M83723/86R1212N	81349	C-6	13	70700-20676-046	78286	C-1	16
NAS1351C4H12	80205	C-3	19	70700-20676-106	78286	C-1	8
NAS1351C4H15	80205	C-3	12	70700-20678-041	78286	C-1	5
NAS43DD1-40	80205	C-5	95	70700-20678-041	78286	C-5	
PM334	18655	C-5	87	70700-20678-041	78086	C-2	
PM334	18655	C-7		70700-20679-101	78286	C-5	1
PM365	78655	3C-5	84	70700-20680-041	78286	C-5	76
PM365	18655	C-7		70700-20680-101	78286	C-5	80
RCR07G393JM	81349	C-7		70700-20680-102	78286	C-5	100
RCR07G472JM	81349	C-7		70700-20680-103	78286	C-5	58
RNR60H1002FS	81349	C-7		70700-20680-104	78286	C-5	66
RNR60K1001FM	81349	C-7		70700-20680-105	78286	C-5	4
RNR60K1003FM	81349	C-7		70700-20680-108	78286	C-5	72
RNR65J1020BM	81349	C-7		70700-20682-041	78286	C-1	3
RNR65K1001FS	81349	C-7		70700-20682-041	78286	C-6	
RNR65K2001FM	81349	C-7		70700-20682-042	78286	C-1	4
SS65-104S-1	78286	C-1	15	70700-20682-042	78286	C-6	
SS65-104S-1	78286	C-1	18	70700-20684	78286	C-5	91
				70700-20684-041	78286	C-7	

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section 1. INTRODUCTION

D-1. Scope.

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

D-2. Explanation of Columns.

a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "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)

F - Aviation Intermediate 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)	(2)	(3)	(4)	(5)
ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	F	8010-00-286-7758	Paint, Fed. Std 595 #13538 TT-C-489	QT
2	F	5350-00-224-7215	Sandpaper, 600 GRIT	PG
3	F	9150-00-149-7432	Hydraulic fluid, MIL-H-83282	GL
4	F	8305-00-267-3015	Cloth, CCC-C-440	FT
5	F	Not available	Clean All D, FSCM 96401	
6	F	6850-00-285-8011	Solvent, Dry-Cleaning P-D-680, Type II	GL
7	F		Lockwire MS20995C20	

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

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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 milliliters = .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	1.609	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	1.365	metric tons	short tons	1.102
pound-inches	mewton-meters	.11375			

Temperature (Exact)

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

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