COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST MODULE ASSEMBLY, P5-19

PART NUMBER 69-37325–139, –140, –141, –142, –143, –144, –145, –146, –147, –148

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COMPONENT MAINTENANCE MANUAL

Revision No. 11
Jul 01/2009

To: All holders of FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST MODULE ASSEMBLY, P5-19 31-24-02.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

The COMPONENT MAINTENANCE MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

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Location of Change	Description of Change
	NO HIGHLIGHTS

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A = Added, R = Revised, D = Deleted, O = Overflow

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COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
69-37325-31-02		PRR 34766	MAR 05/92
		PRR 34766R	MAR 05/92

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

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COMPONENT MAINTENANCE MANUAL

All temporary revisions to this manual will be accompanied by a cover sheet bearing the temporary revision number. Enter the temporary revision number in numerical order, together with the temporary revision date, the date the temporary revision is inserted and the initials of the person filing.
When the temporary revision is incorporated or cancelled, and the pages are removed, enter the date the pages are removed and the initials of the person who removed the temporary revision.

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Refer to the Table of Contents for the page location of the applicable procedures.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. Verification:

FLIGHT RECORDER AND MACH AIRSPEED WARNING TESTS MODULE ASSEMBLY P5-19 - DESCRIPTION AND OPERATION

1. Description

A. The flight recorder and mach airspeed warning test module assembly is an electronic device located in the P5 captain's and first officer's overhead panel. The module may easily be removed for inspection or repair by loosening four quick-release screws on the baseplate and by disconnecting the primary power connector.

B. The module consists of a wire bundle assembly, a relay (or two relays), switches, and a printed circuit assembly. The printed circuit assembly functions as a power and ground seeking master caution sensor.

2. Operation

CAUTION: OBEY THE PROCEDURE IN SUBJECT 20-12-02, HANDLING OF ELECTROSTATIC SENSITIVE DEVICES. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THIS COMPONENT.

A. Power, through relay K1 contacts, can be applied to the flight recorder for test purposes by actuating switch S2. The mach airspeed warning circuitry test switch is located in the P5-19 module. Ground, or power, inputs to the module trigger master caution circuitry contained in the printed circuit assembly. The crew is alerted to a flight recorder off condition by a lamp contained on the module. The input to this lamp also triggers the master caution circuitry.

3. Functional Description

A. Circuit power, +28 volts dc, is connected to pin 19 for the indicator lamp; to pin 7 for K1 relay coil and for A1 relay control. Circuit ground is connected to pin 23.

B. The printed circuit assembly provides a ground path at pin 30 for the master caution lamp. (Refer to CMM 33-15-13 for theory of operation of printed circuit assembly A1.)

C. Malfunction inputs are as follows:

(1) Pin 27 - Ground input to indicate stall warning. (Pin 2 is used for second stall warning indicator.)

(2) Pin 20 - Ground input to indicate flight recorder off. This input also illuminates the indicator lamp. (Refer to paragraph E for flight recorder circuitry on assemblies 69-37325-144 and -148.)

(3) Pin 24 - Ground input to indicate passenger oxygen on.

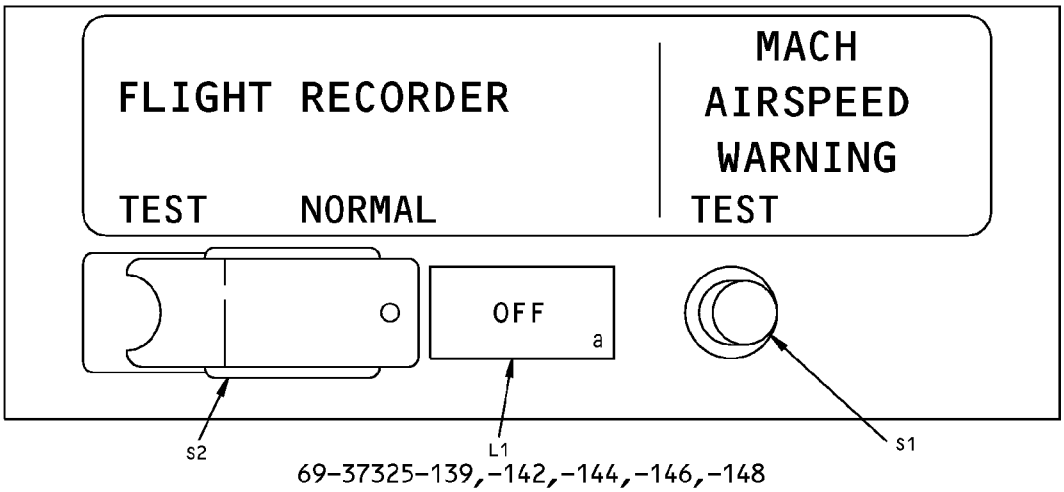
(4) Pin 8 - Power input to indicate emergency exit not armed.

(5) Pin 28 - Power input to indicate equipment bay cooling forced air failure.

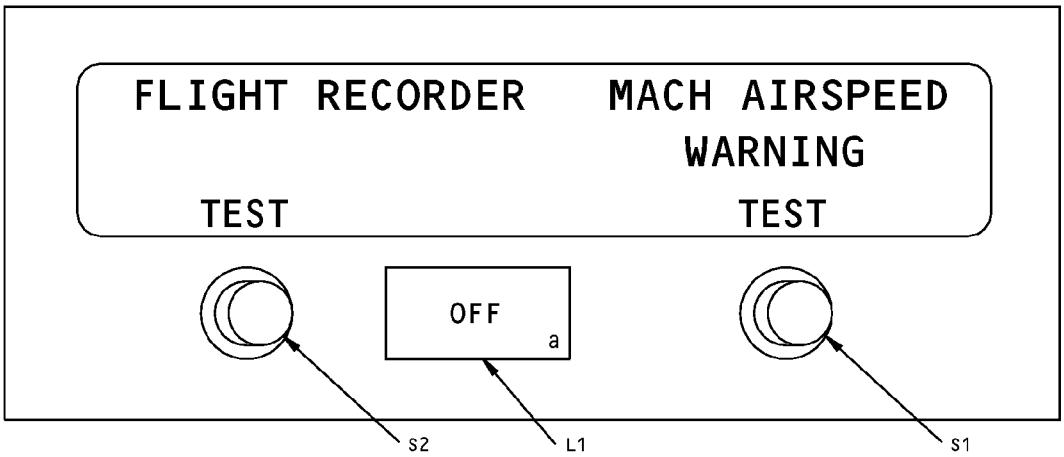
(6) Pins 21 and 1 - Ground inputs to indicate thrust reverser fault. (69-37325-141 thru -148 only)

(7) Pin 22 receives a ground input form master test. Pin 26 receives the recall input (ground) to retrigger the SCR.

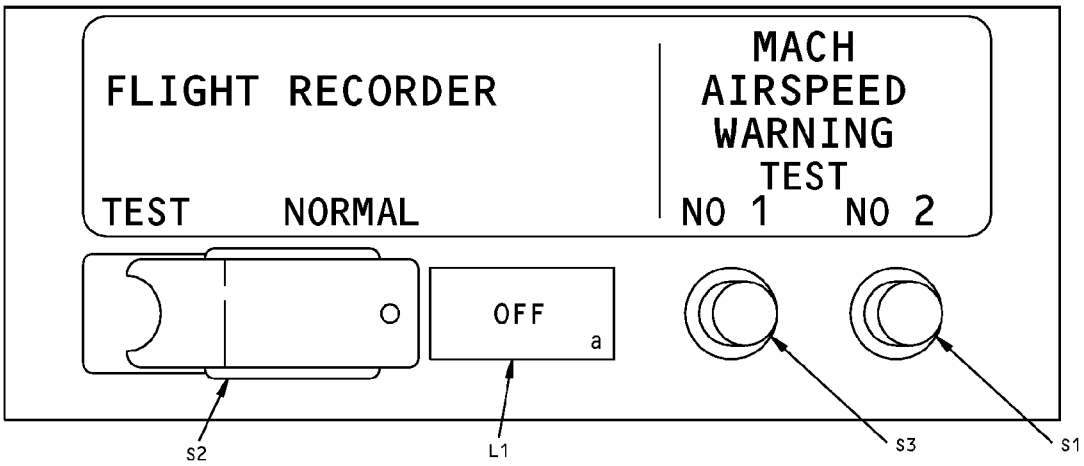
(8) (69-37325-144 and -148 only) - Power for relay K2, +28 volts dc, is connected to pin 13. Ground for the relay is connected to pin 31, and the relay is actuated as long as the flight recorder is on. The flight recorder off condition results in an absence of ground at pin 31 which releases relay K2. Relay K2 contacts then provides a ground from pin 23 to both the warning lamp and to the master caution trigger circuitry.



69-37325-139,-142,-144,-146,-148



69-37325-140,-141,-145



69-37325-143,-147

Component Identification
Figure 1

TESTING AND FAULT ISOLATION

1. Testing

A. Test Equipment (Refer to TESTING AND FAULT ISOLATION, Table 101 for a list of test equipment)

NOTE: Equivalent substitute may be used.

Table 101: Test Equipment

TEST EQUIPMENT	ASSEMBLY 69-37325		
	-139, -140	-141 THRU -143, -145 THRU -147	-144, -148
Multimeter, model 260 simpson voltmeter, STD-3946	1	1	1
Power Supply, 28 Vdc power supply, STD-4543	1	1	1
Connector BACC45FT18-31S (J1)	1	1	1
Switches: SPST SPDT	10	11 1	16
Capacitor 1 UF, 35 volts (C1)		1	
Resistor 330 ohms (± 5%) 0.5 w (R1)		1	
Diode Part No. 1N4385 (CR1) *[1]		1	
Test Lamp 28v dc, 440 mA (L3)	1	1	1

*[1] General Instrument Corp., Power Semi-Conductor Division 600 West John Street, Hicksville, New York 11802

2. Functional Test

CAUTION: OBEY THE PROCEDURES IN SOPM 20-12-02, HANDLI NG OF ELECTROSTATIC SENSITIVE DEVICES. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THIS COMPONENT.

A. Assemblies 69-37325-139 thru -143, -145 thru -147

(1) Remove screws (1) and cover (5). Measure forward resistance of CR1 diode across terminals E2(+) and E1(-). Verify less than 15 ohms. Replace cover (5) and secure with screws (1).

(2) Verify continuity between pins 16 and 17 and no continuity between pins 15 and 16.

(3) Press NO. 1 MACH AIRSPEED WARNING TEST switch and verify continuity between pins 15 and 16 and no continuity between pins 16 and 17.

(4) Verify continuity between pins 3 and 6 and no cintinuity between pins 4 and 6 (69-37325-143, -147 only).

(5) Press NO. 2 MACH AIRSPEED WARNING TEST switch and verify continuity between pins 4 and 6 and no continuity between pins 3 and 6 (69-37325-143, -147 only).

(6) Verify continuity between pin 10 and 11 and between 13 and 14. Verify no continuity between pins 9 and 10 and between 12 and 13.

(7) Release FLIGHT RECORDER TEST switch or set it to OFF.

(8) Connect assembly to test setup as shown in TESTING AND FAULT ISOLATION, Figure 101. Set all switches to OFF. Turn on power supply.

(9) Set switch S1 and S2 to ON. Verify continuity between pins 9 and 10 and between 12 and 13. There shall be no continuity between pins 10 and 11 nor between 13 and 14.

(10) Test the following circuits:

(a) Assemblies 69-37325-140, -141, -145

1) Press FLIGHT RECORDER TEST switch. Verify continuity between pins 10 and 11 and between 13 and 14. There shall be no continuity between pins 9 and 10 nor between 12 and 13.

2) Release FLIGHT RECORDER TEST switch. Verify continuity between pins 9 and 10 and between 12 and 13. There shall be no continuity between pins 10 and 11 nor between 13 and 14.

(b) Assemblies 69-37325-139, -142, -143, -146, -147

1) Set FLIGHT RECORDER TEST switch to ON. Verify continuity between pins 10 and 11 and between 13 and 14. There shall be no continuity between pins 9 and 10 nor between 12 and 13.

2) Set FLIGHT RECORDER TEST switch to OFF. Verify continuity between pins 9 and 10 and between 12 and 13. There shall be no continuity between pins 10 and 11 nor between 13 and 14.

(11) Press and release FLIGHT RECORDER OFF indicator on assembly. Indicator shall illuminate when pressed and shall extinguish when released.

(12) Set S3 to ON. FLIGHT RECORDER OFF indicator on module assembly and lamp L3 shall illuminate.

(13) Set S3 to OFF. FLIGHT RECORDER OFF indicator and lamp L3 shall extinguish.

(14) Set switches as listed and verify indications as specified in TESTING AND FAULT ISOLATION, Table 102. Any deviation constitutes a failure. Leave all switches in last specified position.

Table 102: Test Procedures - 69-37325-139 thru -143, -145, -146, -147 Assemblies

TEST SWITCHES			TEST LAMP INDICATIONS		
STEP	**NUMBER**	**POSITION**	**ILLUMINATED**	**NOT ILLUMINATED**	**V**
A	1 and 2	ON			
B	4	ON	L3		
C	4	OFF		L3	
D	5	ON	L3		
E	5	OFF		L3	
F	6	ON	L3		
G	6	OFF		L3	
H	7	ON	L3		
I	7	OFF		L3	
J	8	ON	L3 *[1]		
K	8	OFF		L3 *[1]	

Table 102: Test Procedures - 69-37325-139 thru -143, -145, -146, -147 Assemblies (Continued)

TEST SWITCHES			TEST LAMP INDICATIONS		
STEP	NUMBER	POSITION	ILLUMINATED	NOT ILLUMINATED	V
L	12	ON	L3		
M	12	OFF		L3	
N	13	ON	L3		
O	13	OFF		L3	
P	4 thru 7, 12, 13	ON	L3		
Q	2	OFF		L3	
R	2	ON		L3	
S	8	ON	L3 *[1]		
T	2	OFF	*[1]	L3	
U	2	ON	*[1]	L3	
V.(1)	4 thru 7, 12, 13	OFF	*[1]	L3	
V.(2)	8	OFF		L3 *[1]	
W *[2]	15	ON		L3	18 (±3)V
X	14	ON	L3		18 (±3)V
Y	15	OFF		L3	18 (±3)V
Z	14	OFF		L3	18 (±3)V

*[1] FLIGHT RECORDER OFF indicator on module

*[2] Complete steps W through Z only when testing 69-37325-141 thru -143, -145 thru -147 assemblies

(15) Turn off power supply and disconnect assembly from test setup.

B. Assemblies 69-37325-144 and -148

(1) Verify less than 15 ohms resistance from pin 23(+) to following pins: 26, 24, 2, 20, and 27.

(2) Verify less than 15 ohms from pin 31(+) to 13.

(3) Measure less than 15 ohms resistance between diode terminal E2(+) and E1(-).

(4) Verify continuity between pins 16 and 17 and no continuity between 15 and 16.

(5) Press MACH AIRSPEED WARNING TEST switch and verify continuity between pins 15 and 16 and no continuity between 16 and 17.

(6) Verify continuity between pins 20(+) and 23.

(7) Verify continuity between pins 10 and 11 and between 13 and 14. There shall be no continuity between pins 9 and 10 nor between 12 and 13.

(8) Set "FLIGHT RECORDER TEST" switch to the left position. Verify 15 ohms maximum from pin 23 (+) to pins 5 and 18. There shall be 15K minimum between pins 5(+) and 23(-) and between pins 18(+) and 23(-) (back diode test).

(9) Set FLIGHT RECORDER TEST switch to the right.

(10) Connect assembly to test setup shown in TESTING AND FAULT ISOLATION, Figure 102. Set all switches to OFF. Turn on power supply.

(11) Set S1 and S12 to ON.

(12) Set S11 to ON. Press cap of "FLIGHT RECORDER OFF" (L1). Light shall illuminate. Release cap. Light shall extinguish.

(13) Set S12 to OFF. L1 shall illuminate.

(14) Set S12 to ON. L1 shall extinguish.

(15) Set S13 to ON. L1 shall illuminate.

(16) Set S13 to OFF. L1 shall extinguish.

(17) Set S11 and S12 to OFF. Disregard L1 for remainder of the test.

(18) Set S11 to ON. Verify continuity between pins 9 and 10 and between 12 and 13. There shall be no continuity between pins 10 and 11 nor between 13 and 14.

(19) Set S11 to OFF. Verify continuity between pins 10 and 11 and between 13 and 14. There shall be no continuity between pins 9 and 10 nor between 12 and 13.

(20) Set switches as listed and verify indications as specified in TESTING AND FAULT ISOLATION, Table 103. Any deviation constitutes a failure. Leave all switches in last specified position.

NOTE: V shall indicate 18 volts dc from step B.(20) through remainder of test.

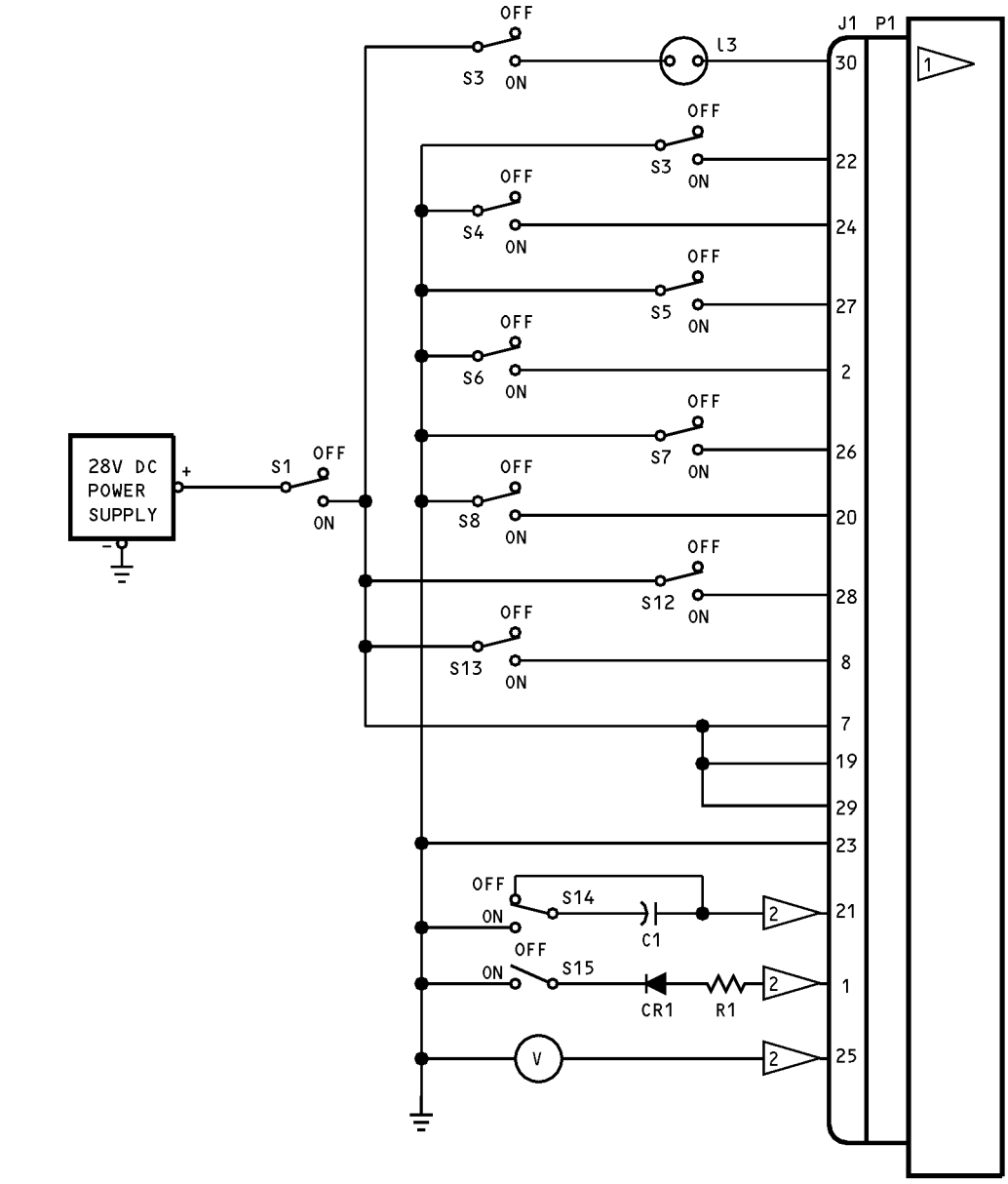
Table 103: Test Procedures - 69-37325-144 thru -148 Assemblies

TEST SWITCHES			TEST LAMP INDICATIONS	
STEP	**NUMBER**	**POSITION**	**ILLUMINATED**	**NOT ILLUMINATED**
A	S1, S12	ON		L3
B	S16, S11	ON		L3
C	S10	ON	L3	
D	S16	OFF		L3
E	S16	ON		L3
F	S9	ON	L3	
G	S16	OFF		L3
H	S16	ON		L3
I	S4	ON	L3	
J	S16	OFF		L3
K	S16	ON		L3
L	S7	ON	L3	
M	S16	OFF		L3
N	S16	ON		L3
O	S8	ON	L3	
P	S16	OFF		L3
Q	S16	ON		L3
R	S13	ON	L3	

Table 103: Test Procedures - 69-37325-144 thru -148 Assemblies (Continued)

TEST SWITCHES			TEST LAMP INDICATIONS	
STEP	**NUMBER**	**POSITION**	**ILLUMINATED**	**NOT ILLUMINATED**
S	S16	OFF		L3
T	S16	ON		L3
U	S2	ON	L3	
V	S4, S7, S8, S9, S10, S13, S16	OFF		L3
W	S16	ON		L3
X	S3	ON	L3	
Y	S3, S2	OFF		L3
Z	S14	ON	L3	
AA	S14	OFF		L3
AB	S15	ON	L3	
AC	S1-S16	OFF		

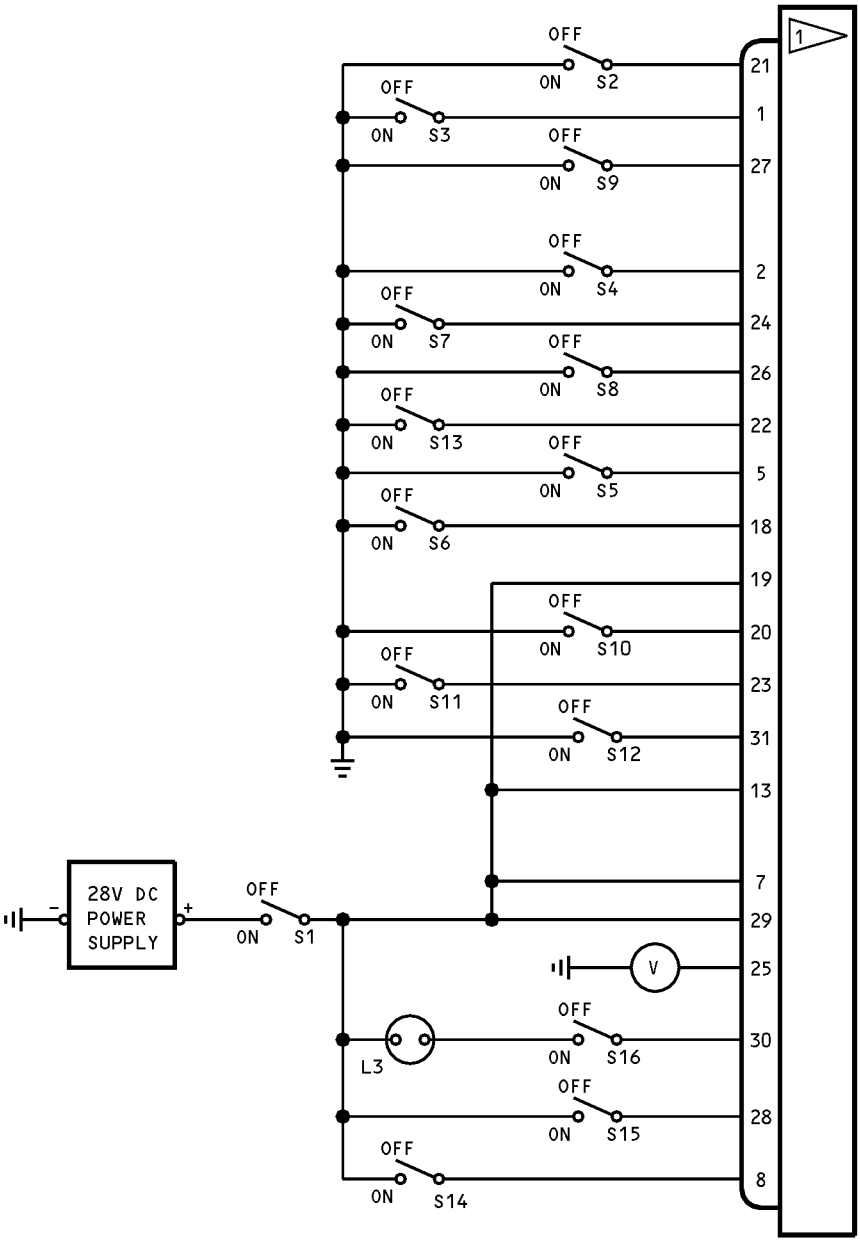
(21) Turn off power supply and disconnect assembly from test setup.



1 FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST MODULE ASSEMBLY

2 REQUIRED FOR 69-37325-141,-142, -143,-145,-146,-147

Test Setup Assemblies 69-37325-139 thru -143,-145,-146,-147
Figure 101



1 FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST MODULE ASSEMBLY

Test Setup Assemblies 69-37325-144 and -148
Figure 102

3. Trouble Shooting

A. If failure of a test occurs, check for defective connections and incorrect wiring connections, prior to replacement of components

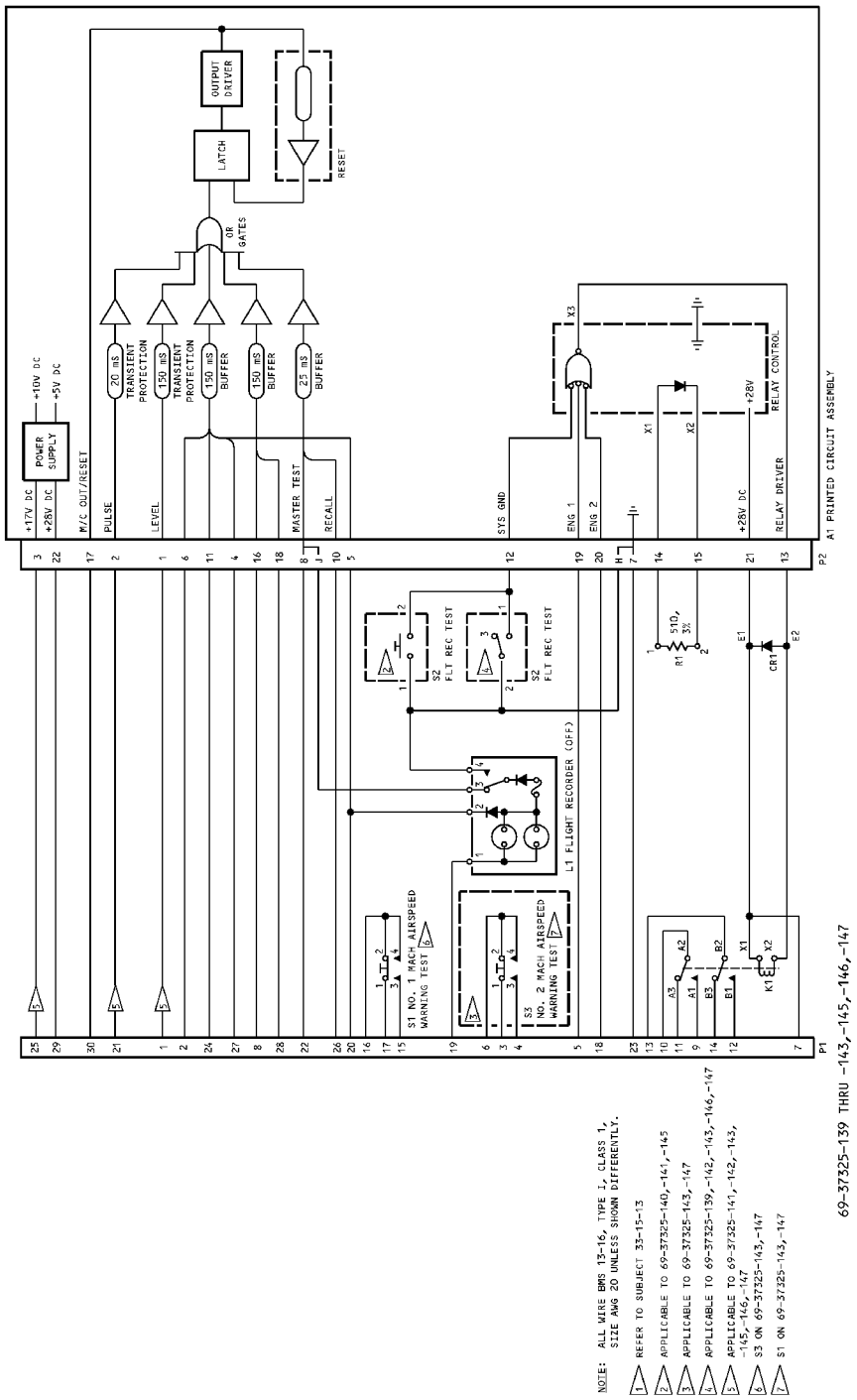
NOTE: Trouble shooting is keyed to functional test procedures.

Table 104: Trouble Shooting

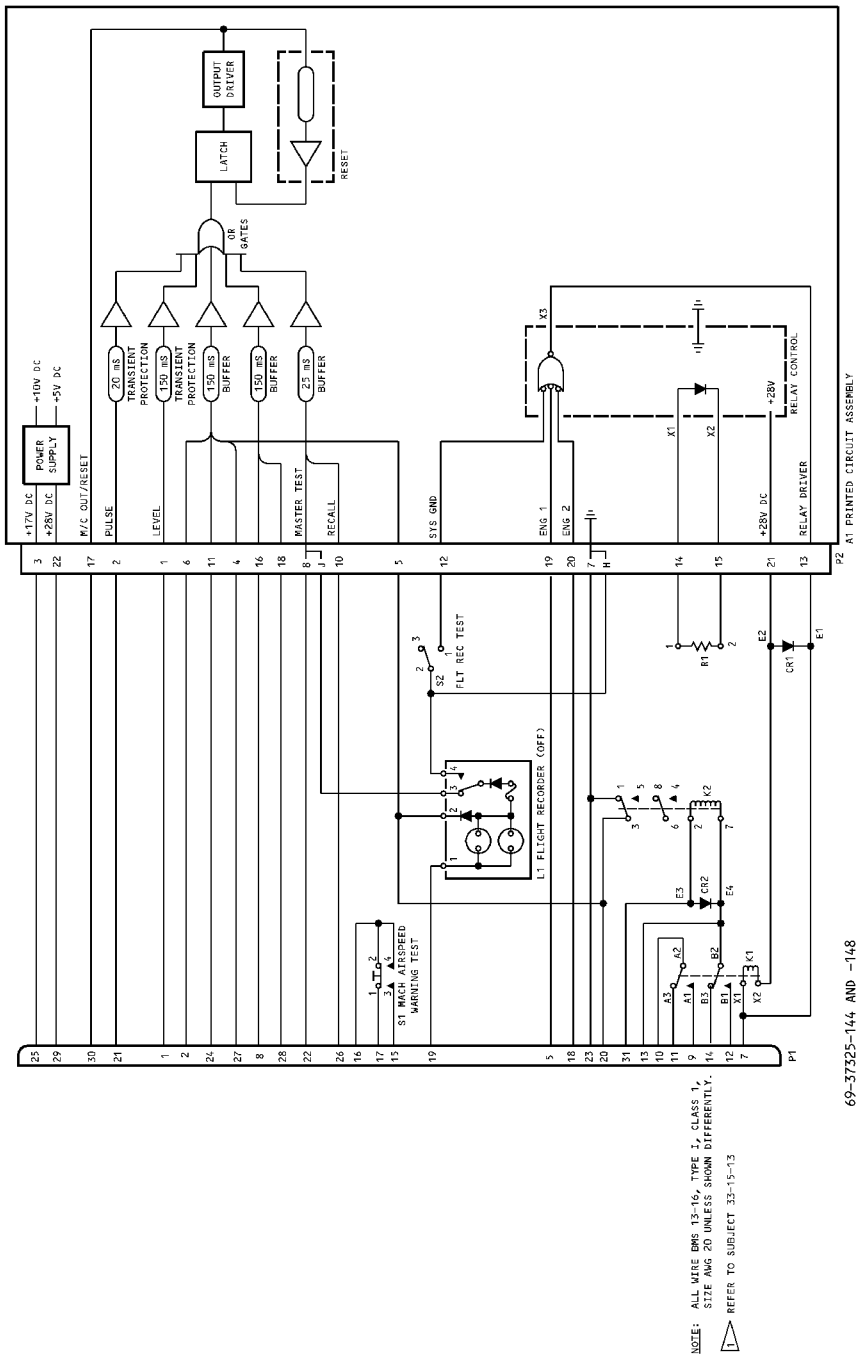
Trouble	Possible Cause	Correction
69-37325-139 thru -143, -145, -146, -147 Assemblies		
TESTING AND FAULT ISOLATION, Paragraph 2.A.		
Step (1)	CR1	Replace CR1
Step (2) or (3)	Switch	Replace Switch
Step (4) or (5)	Switch	Replace Switch
Step (6)	K1	Replace K1
Step (9)	K1 or A1	Replace defective component
Step (10)	K1 or A1	Replace defective component
Step (11)	L1	Replace L1
Step (12)	A1, R1, or L1	Replace defective component
Step (13)	A1	Replace A1
TESTING AND FAULT ISOLATION, Table 102		
Steps B through H	A1	Replace A1
Step J		
L3 extinguished	A1	Replace A1
Indicator L1 extinguished	L1	Replace L1
Steps L through Z	A1	Replace A1
69-37325-144 thru -148 Assemblies		
TESTING AND FAULT ISOLATION, Paragraph 2.B.		
Step (2)	CR2	Replace CR2
Step (3)	CR1	Replace CR1
Step (4) or (5)	S1	Replace S1
Step (6)	K2	Replace K2
Step (8)	A1	Replace A1
Step (12) Light illuminates without pressing cap	K2	Replace K2
Light does not illuminate when pressing cap	L1	Replace L1

Table 104: Trouble Shooting (Continued)

Trouble	Possible Cause	Correction
Step (13)	L1 or K2	Replace defective component
Step (14)	K2	Replace K2
Step (15) or (16)	L1	Replace L1
Step (18)	K1 or A1	Replace defective component
Step (19)	K1	Replace K1
TESTING AND FAULT ISOLATION, Table 103		
Step C	A1 or R1	Replace defective component
Step E to end	A1	Replace A1



Schematic Diagram
Figure 103



Schematic Diagram
Figure 104

(NOT APPLICABLE)

(NOT APPLICABLE)

(NOT APPLICABLE)

REPAIR

1. Procedures

CAUTION: OBEY THE PROCEDURES IN SOPM 20-12-02, HANDLI NG OF ELECTROSTATIC SENSITIVE DEVICES. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THIS COMPONENT.

A. All repair can be accomplished with standard industry practices and instructions contained in SOPM 20-11-04 except as noted in paragraphs below:

B. If keying plugs (IPL Figure 1, Item 115) require replacement, insert as follows:

(1) Install keying plug into contact position 9.

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ASSEMBLY

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FITS AND CLEARANCES

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COMPONENT MAINTENANCE MANUAL

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

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ILLUSTRATED PARTS LIST

1. Introduction

A. The Illustrated Parts List (IPL) contains an illustration and a list of component parts you can repair or replace. The Illustrated Parts Catalog (IPC) shows how to use the Boeing part number system.

B. This shows how parts are related: The relation of each item to its next higher assembly (NHA) is shown in the NOMENCLATURE column. Use the indenture system that follows:

1 2 3 4 5 6 7

. Assembly

. Attaching parts for assembly

. . Detail parts for assembly

. . Subassembly

. . Attaching parts for subassembly

. . . Detail parts for subassembly

. . . Sub-subassembly

. . . Attaching parts for subassembly

. . . . . Details parts for sub-subassembly

Detail Installation Parts (Included only if installation parts may be sent to the shop as part of assembly)

C. Each top assembly is given one use code letter (A, B, C, etc.) in the USAGE CODE column. All subsequent component parts in the list can have one or more of the use code letters to show effectivity to top assemblies. A component part without a use code applies to all top assemblies.

D. An alphabetical letter is added after the item number for optional parts, parts changed by a Service Bulletin, configuration differences (except left-handed and right-handed parts), last engineering releases, and parts added between item numbers in a sequence. The alphabetical letter will not be shown on the illustration for equivalent parts of the same part number.

E. Color-coded parts are identified with a single digit alpha following the dash number or with ''SP'' suffix. If the ''SP'' suffix is used, it represents consolidation of all color codes applicable for a given usage which are not separately listed. Orders for color-coded parts should include the registry number of the airplane for which the parts are ordered.

F. If a part number is 15 characters long but will not fit in the part number column, the part number will be displayed with a ''~'' at the end of the line and will be continued on the next line. The ''~'' denotes that the part number continues on the next line.

G. Parts changed by a Service Bulletin are shown by PRE SB XXXX and POST SB XXXX added to the NOMENCLATURE column.

(1) When a new top assembly is added by a Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the top assembly level only. The configuration differences at the detail part level are shown by use code letters.

(2) When the top assembly part number is not changed by the Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the detail level.

H. Interchangeable Parts

Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES, REPLACED BY)	The part replaces and is interchangeable with, or is an alternative to, the initial part.

VENDOR CODES

Code	Name
00213	MSD INC 700 ORANGE ST DARLINGTON, SOUTH CAROLINA 29532 FORMERLY V01350; FORMERLY 78290; FORMERLY NYTRONICS COMPONENTS GROUP
00779	TYCO ELECTRONICS CORP 2800 FULLING MILL ROAD PO BOX 3608 MIDDLETOWN, PENNSYLVANIA 17057 FORMERLY AMP INC; FORMERLY V04618 FORMERLY GENICOM COMP V01526
14936	GENERAL INSTRUMENT CORP POWER SEMICONDUCTOR DIV 600 WEST JOHN STREET HICKSVILLE, NEW YORK 11802 FORMERLY GENERAL INSTRUMENT CORP DISCRETE SEMICONDUCTOR DIV
35344	Replaced: [V35344] LEACH CORP RELAY DIV SEE LEACH CORP CONTROL PROD DIV V58657 by Code: Name and Address below 58657: LEACH INTERNATIONAL OF NORTH AMERICA 6900 ORANGETHORPE AVE PO BOX 5032 BUENA PARK, CALIFORNIA 90622-5032 FORMERLY LEACH CORP V35344 AND V00614 FORMERLY LEACH CORP

Code	Name
72914	HONEYWELL/GRIMES AEROSPACE 550 STATE RT 55 URBANA, OHIO 43078 FORMERLY AERO-FLOW V70128; MIDLAND-ROSS JANITROL AERO DIV; FORMERLY FL AEROSP CORP V89513; ALLIEDSIGNAL/GRIMES AEROSP FORMERLY GRIMES AEROSPACE V00672 AND HONEYWELL V60187
81590	KORRY ELECTRONIC INC SUB OF CRITON CORP 901 DEXTER AVENUE NORTH SEATTLE, WASHINGTON 98109-3515 FORMERLY KORRY, BORIS VB0021 AND KORRY MFG CO
81640	EATON CORP AEROSPACE AND COMMERCIAL CONTROLS DIV 2250 WHITFIELD AVENUE EAST SARASOTA, FLORIDA 34243-9703 FORMERLY SINGER CO CONTROLS DIV AND CONTROLS CO OF AMERICA AND CONTROL SWITCH A CUTLER-HAMMER CO AND EATON CORP CUTLER-HAMMER GROUP V97198, V81641 IN FOLCROFT, PENNSYLVANIA INFO FROMVDR THRU M2880 FEB 1987 SWITCHES
82050	ESTERLINE ELECTRONICS CORP COSTA MESA. CALIFORNIA 92626-1437 FACILITIES DISCONTINUED FORMERLY BABCOCK ELECTRONIC CORP ELECTRONIC PRODUCTS
88245	WINCHESTER ELECTRONICS LITTON SYSTEMS INC USECO DIV 13536 SATICOY STREET VAN NUYS, CALIFORNIA 91409 FORMERLY U.S. ENGINEERING CO V88245 AND LITTON PRECISION PRODUCTS INC USECO DIV LITTON IND AND LITTON SYSTEMS INC USECO DIV
89954	BAE SYSTEMS CONTROL 600 MAIN STREET JOHNSON CITY, NEW YORK 13790 FORMERLY MARTIN MARIETTA AIRCRAFT CONTROL SYSTEMS; FORMERLY LOCKHEED MARTIN CONTROL SYSTEMS

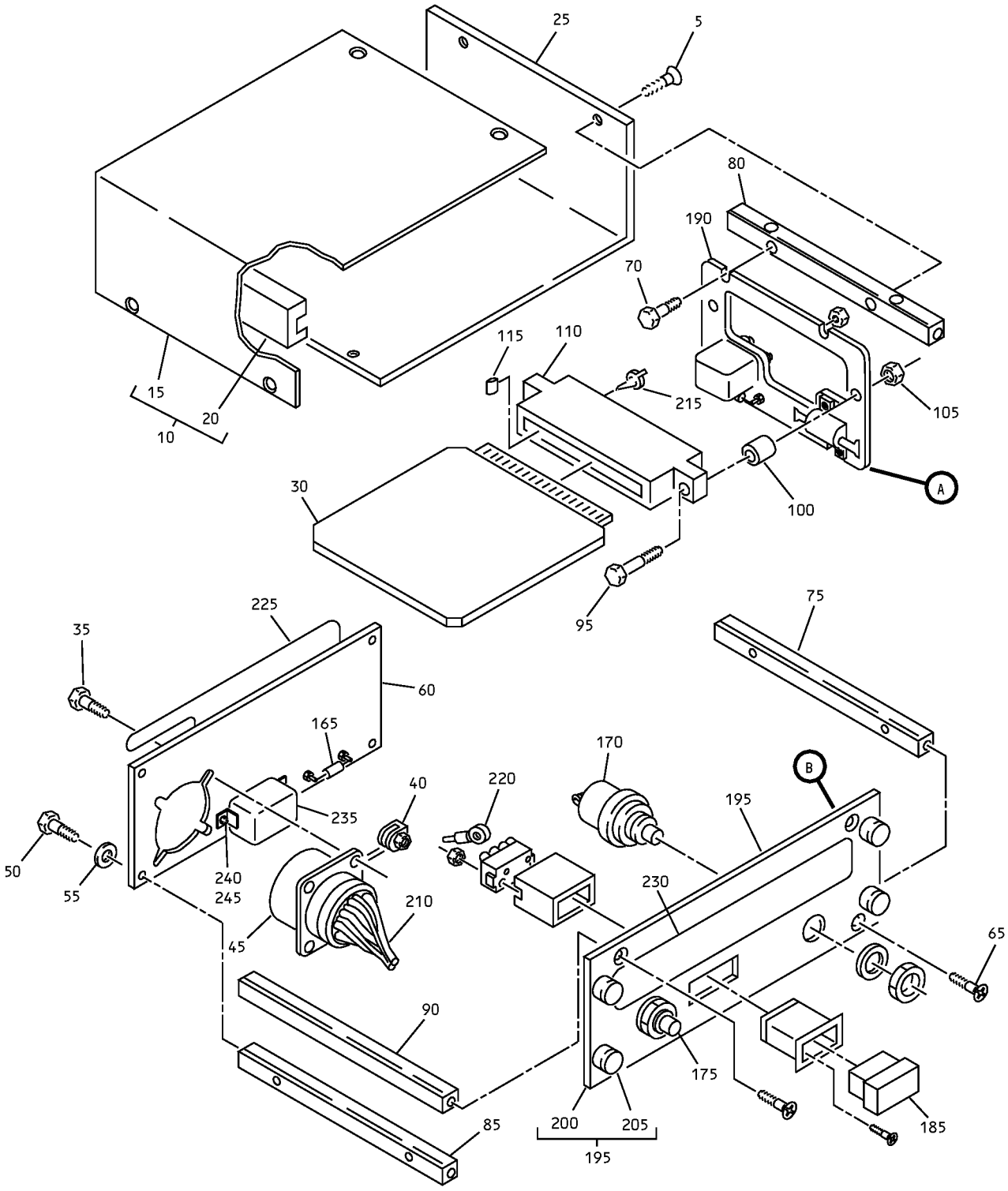
Code	Name
91637	VISHAY DALE ELECTRONICS VISHAY AMERICAS INC DBA VISHAY 1122 23RD STREET PO BOX 609 COLUMUS, NEBRASKA 68602-0609

NUMERICAL INDEX

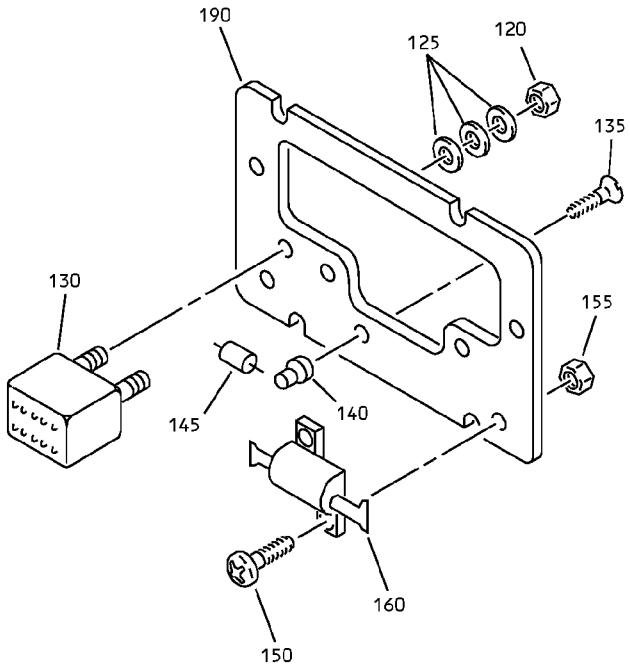
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
10-61305-12		1	185	1
10-61803-12		1	185A	1
11170-1		1	180	1
1491A		1	140	2
		1	140A	4
1625-4-12		1	140B	2
		1	140C	4
1N4384		1	145	4
1N4385		1	165	1
3105M510-3		1	160A	1
319-619-1001-007		1	185	1
319-619-1001-008		1	185A	1
582557-1		1	110	1
		1	115	1
66143-2		1	215	AR
69-37325-10		1	195	1
69-37325-13		1	210	1
69-37325-139		1	1	1
69-37325-140		1	1A	1
69-37325-141		1	1B	1
69-37325-142		1	1C	1
69-37325-143		1	1D	1
69-37325-144		1	1E	1
69-37325-145		1	1F	1
69-37325-146		1	1G	1
69-37325-147		1	1H	RF
69-37325-148		1	1I	RF
69-37325-18		1	195A	1
69-37325-21		1	195B	1
69-37325-22		1	210A	1
69-37325-30		1	210B	1
69-37325-31		1	210D	1
69-37325-32		1	210C	1
69-37325-34		1	210E	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-37325-5		1	75	1
69-37325-8		1	80	1
69-37326-13		1	85	1
69-37326-14		1	90	1
69-43948-11		1	15A	1
		1	25A	1
69-43948-12		1	60	1
69-43948-15		1	10A	1
69-43948-16		1	20A	1
69-43948-17		1	190	1
		1	190A	1
69-43948-18		1	60A	1
69-43948-19		1	15	1
		1	25	1
69-43948-20		1	10	1
69-43948-21		1	20	1
69-78287-1		1	30	1
AN960PD6		1	125	6
BAC27DCC239		1	225	1
BAC27DCC458		1	230B	1
		1	230D	1
BAC27DCC459		1	230A	1
BAC27DCC570		1	230E	1
BAC27DCC571		1	230C	1
		1	230F	1
BAC27DCC572		1	230G	1
BAC27DCC98		1	230	1
BACC45FN18-31P		1	45	1
BACN10DN26		1	155	2
BACN10NW1		1	40	2
BACP10U0225G		1	200	1
BACR13CF4		1	130	1
BACS12BE02-3		1	135	2
		1	135A	4
BACS12BE02-5		1	150	2

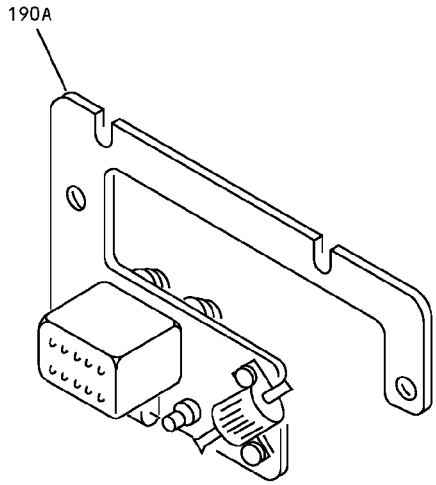
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
BACS12CB04-4		1	70	4
		1	70A	3
BACS12CB04-5		1	35	2
		1	245	2
BACS12CB06-14		1	95	2
BACS12CB06-5		1	50	4
BACS21DD1G		1	205	4
BACT12S		1	220	1
BCREF0002		1	235	1
BCREF4039		1	185	1
BCREF4040		1	185A	1
BR16-900B11-		1	235A	2
BR16-900B11-26VRR0		1	235	1
JG2A		1	130A	1
MS24523-23		1	175A	1
MS35337-41		1	55	4
MS35338-41		1	55A	4
NAS43DD1-17		1	100	2
NAS514P440-4		1	5	8
NAS514P632-5		1	65	4
NAS679A04W		1	240	2
NAS679A06W		1	105	2
		1	120	2
RH5-510		1	160	1
W20161-01		1	175	1
W20161-03		1	170	1
		1	170A	2



Flight Recorder and Mach Airspeed Warning Test Module Assembly, P5-19
IPL Figure 1 (Sheet 1 of 2)



69-37325-139 THRU -142,-144,-146,-148



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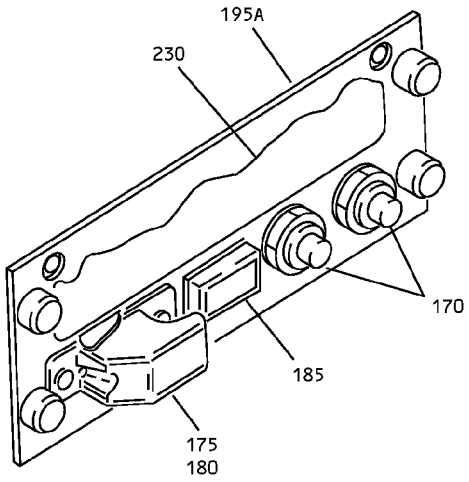

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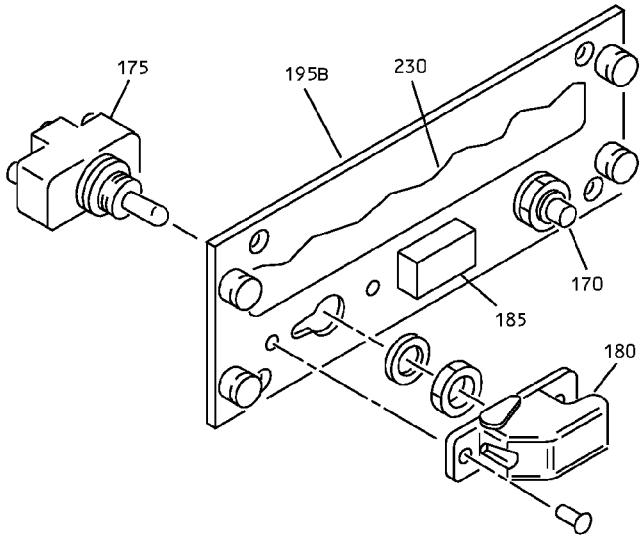

69-37325-139,-142,-144,-146,-148

B

Flight Recorder and Mach Airspeed Warning Test Module Assembly, P5-19
IPL Figure 1 (Sheet 2 of 2)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
1	69-37325-139		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	A	
1A	69-37325-140		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	B	
1B	69-37325-141		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	C	
1C	69-37325-142		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	D	
1D	69-37325-143		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	E	
1E	69-37325-144		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	F	
1F	69-37325-145		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	G	
1G	69-37325-146		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	H	
1H	69-37325-147		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	I	RF
1I	69-37325-148		MODULE ASSY-FLIGHT RECORDER AND MACH AIRSPEED WARNING TEST P5-19 (POST SB 69-37325-31-02) (STATIC SENSITIVE PART)	J	RF
5	NAS514P440-4		. SCREW		8

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
10	69-43948-20		. COVER ASSY		1
10A	69-43948-15		. COVER ASSY (OPT ITEM 10)	C-F	1
15	69-43948-19		. . COVER		1
15A	69-43948-11		. . COVER (OPT ITEM 15)	C-F	1
20	69-43948-21		. . FOAM		1
20A	69-43948-16		. . FOAM (OPT ITEM 20)	C-F	1
25	69-43948-19		. COVER		1
25A	69-43948-11		. COVER (OPT ITEM 25)	C-F	1
30	69-78287-1		PRINTED CIRCUIT ASSY (V89954) (STATIC SENSITIVE PART)		1
35	BACS12CB04-5		. SCREW		2
40	BACN10NW1		. CLIP NUT		2
45	BACC45FN18-31P		. CONNECTOR		1
50	BACS12CB06-5		. SCREW		4
55	MS35337-41		. WASHER	B, C, G	4
55A	MS35338-41		. WASHER	A, D-J	
60	69-43948-12		. BACKPLATE	A-E, G, H, I	1
60A	69-43948-18		. BACKPLATE	F-J	1
65	NAS514P632-5		. SCREW		4
70	BACS12CB04-4		. SCREW	A-D, F-H, J	4
70A	BACS12CB04-4		. SCREW	E, I	3
75	69-37325-5		. STANDOFF		1
80	69-37325-8		. STANDOFF		1
85	69-37326-13		. STANDOFF		1
90	69-37326-14		. STANDOFF		1
95	BACS12CB06-14		. SCREW		2
100	NAS43DD1-17		. SPACER		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
105	NAS679A06W		. NUT		2
110	582557-1		. CONNECTOR (V00779)		1
115	582557-1		. CONNECTOR (V00779)		1
120	NAS679A06W		. NUT		2
125	AN960PD6		. WASHER		6
130	BACR13CF4		. RELAY (PREFERED)		1
130A	JG2A		. RELAY (OPT ITEM 130) (V35344)		1
135	BACS12BE02-3		. SCREW	A-E, G-I	2
135A	BACS12BE02-3		. SCREW	F, J	4
140	1491A		. INSULATED TERMINAL (V88245) (OPT ITEM 140B)	A-E, G-I	2
140A	1491A		. INSULATED TERMINAL (V88245) (OPT ITEM 140C)	F, J	4
–140B	1625-4-12		. INSULATED TERMINAL (V88245) (OPT ITEM 140)	A-E, G-I	2
–140C	1625-4-12		. INSULATED TERMINAL (V88245) (OPT ITEM 140A)	F, J	4
145	1N4384		. DIODE (V14936)		4
150	BACS12BE02-5		. SCREW		2
155	BACN10DN26		. NUT		2
160	RH5-510		. RESISTOR-510 OHMS +/-3%, 5 W (V91637) (PREFERED)		1
160A	3105M510-3		. RESISTOR-510 OHMS +/-3%, 5 W (V00213) (OPT ITEM 160)		1
165	1N4385		. DIODE (V14936)	F, J	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
170	W20161-03		. SWITCH (V81640)	A-D, F-H, J	1
170A	W20161-03		. SWITCH (V81640)	E, I	2
175	W20161-01		. SWITCH (V81640)	B, C, G	1
175A	MS24523-23		. SWITCH	A, D-F, H-J	1
180	11170-1		. SWITCH GUARD (V72914)	A, D-F, H-J	1
185	BCREF4039		. INDICATOR LIGHT ASSY (V81590) (319-619-1001-007) (SPEC 10-61305-12)	A-F	1
185A	BCREF4040		. INDICATOR LIGHT ASSY (V81590) (319-619-1001-008) (SPEC 10-61803-12)	G-J	1
190	69-43948-17		. SUPPORT PLATE	A-D, F-H, J	1
190A	69-43948-17		. SUPPORT PLATE	E, I	1
195	69-37325-10		. BASEPLATE ASSY	B, C, G	1
195A	69-37325-18		. BASEPLATE ASSY	E, I	1
195B	69-37325-21		. BASEPLATE ASSY	A, D, F, H, J	1
200	BACP10U0225G		. . BASEPLATE ASSY		1
205	BACS21DD1G		. . STUD ASSY		4
210	69-37325-13		. WIRE BUNDLE ASSY	B	1
210A	69-37325-22		. WIRE BUNDLE ASSY	A	1
210B	69-37325-30		. WIRE BUNDLE ASSY	C, G	1
210C	69-37325-32		. WIRE BUNDLE ASSY	D, H	1
210D	69-37325-31		. WIRE BUNDLE ASSY	E, I	1
210E	69-37325-34		. WIRE BUNDLE ASSY	F, J	1
215	66143-2		. TAB TERMINAL (V00779)		AR
220	BACT12S		. TERMINAL LUG		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
225	BAC27DCC239		. ALUMINUM FOIL MARKER		1
230	BAC27DCC98		. ALUMINUM FOIL MARKER	B, C	1
230A	BAC27DCC459		. ALUMINUM FOIL MARKER	E	1
230B	BAC27DCC458		. ALUMINUM FOIL MARKER	A, F	1
230C	BAC27DCC571		. ALUMINUM FOIL MARKER (PREFERED)	D	1
230D	BAC27DCC458		. ALUMINUM FOIL MARKER (OPT ITEM 230C)	D	1
230E	BAC27DCC570		. ALUMINUM FOIL MARKER	G	1
230F	BAC27DCC571		. ALUMINUM FOIL MARKER	H, J	1
230G	BAC27DCC572		. ALUMINUM FOIL MARKER	I	1
235	BCREF0002		. RELAY (V82050) (BR16-900B11-26VRR0) (PREFERED)	F, J	1
235A	BR16-900B11-		. RELAY (V82050) (OPT ITEM 235)	F, J	2
240	NAS679A04W		. SCREW	F, J	2
245	BACS12CB04-5		. SCREW	F, J	2

–Item not Illustrated