TO: ALL HOLDERS OF FLIGHT ENGINEER'S LIGHTING PANEL ASSEMBLY, M18, COMPONENT MAINTENANCE MANUAL 33 11 15

REVISION NO. 1 DATED JUL 01/01

HIGHLIGHTS

Pages which have been added or revised are outlined below together with the highlights of the revision. Remove and insert the affected pages as listed and enter Revision No. and date to the Record of Revision Sheet.

CHAPTER/SECTION AND PAGE NO.	DESCRIPTION OF CHANGE
105	Deleted extra word on Fig. 101.

BOEING

COMPONENT
MAINTENANCE MANUAL

FLIGHT ENGINEERS LIGHTING PANEL ASSEMBLY, M18

PART NUMBER 233T4242-1

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

L76062

REVISION RECORD

- Retain this record in front of manual. On receipt of revision, insert revised pages in the manual, and enter revision number, date inserted and initial.

REVISION NUMBER	REVISION DATE	DATE FILED	BY

REVISION NUMBER	REVISION DATE	DATE FILED	BY

L76063

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL

PAGE	DATE	CODE
33-11-15		
TITLE PAGE		
1	MAR 01/01	01
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REVISION RECORD		
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TR & SB RECORD		
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LIST OF EFFECTIVE PAGES		
*1	JUL 01/01	01
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101	MAR 01/01	01
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103	MAR 01/01	01
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106	BLANK	
REPAIR-GENERAL		
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1001	MAR 01/01	01
1002	MAR 01/01	01
1003	MAR 01/01	01
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1005	MAR 01/01	01
1006	MAR 01/01	01
1007	MAR 01/01	01
1008	MAR 01/01	01
1009	MAR 01/01	01
1010	MAR 01/01	01

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

*[1] Use applicable procedures in SOPM 20-11-04 and standard industry practices.
*[2] Special instructions not required.

INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions including test, fault isolation, and replacement of defective components.

This manual is divided into separate sections:

1. Title Page
2. Record of Revisions
3. Temporary Revision & Service Bulletin Record
4. List of Effective Pages
5. Table of Contents
6. Introduction
7. Procedures & IPL Sections

Refer to the Table of Contents for the page location of applicable sections.

An explanation of the use of the Illustrated Parts List is provided in the Introduction to that section.

All weights and measurements used in the manual are in English units, unless otherwise stated. When metric equivalents are given they will be in parentheses following the English units.

Design changes, optional parts, configuration differences and Service Bulletin modifications create alternate part numbers. These are identified in the Illustrated Parts List (IPL) by adding an alphabetical character to the basic item number. The resulting item number is called an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless otherwise indicated.

Verification:

Testing/TS

FLIGHT ENGINEER LIGHTING, M18 PANEL ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The Flight Engineers Lighting Panel Assembly, M18 (Fig. 1) on panel P61 provides high/low and variable lighting to crewmembers. The lights are Map Light Control Rheostat R1, Panel Light Control Potentiometer R2, Flood Light Control Potentiometer R3, Master Test switch S1, and Master Dim/Bright switch S2.

2. Operation

   A. Map Light Control Rheostat R1

      (1) Control light for map reading.

   B. Panel Light Control Potentiometer R2

      (1) Allow the lights to be turned on/off and dimmed on the overhead panel P61.

   C. Floodlight Control Potentiometer R3

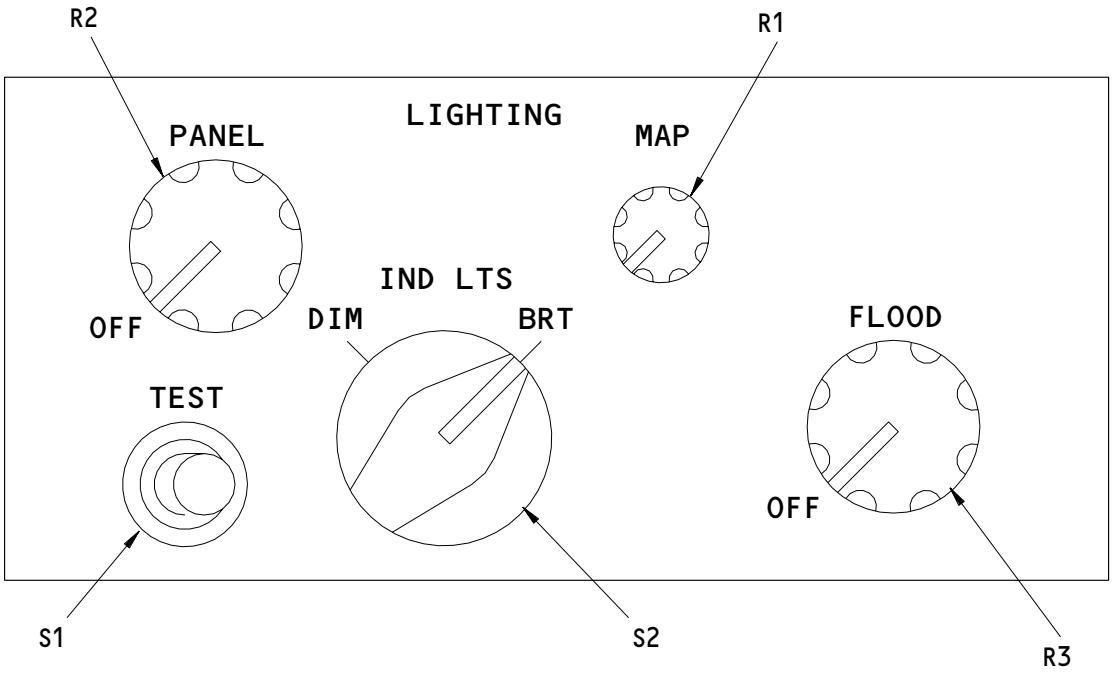
      (1) Provide starting and dimming voltage for the fluorescent lights.

   D. Master Test switch S1

      (1) Allow the crew to test all annunciator lights in the flight compartment.

   E. Master Dim/Bright switch S2

      (1) Allow the crew to set the lights in the flight compartment to dim or to bright.



Component Locations
Figure 1

L76066

TESTING AND TROUBLE SHOOTING

1. Test Equipment

NOTE: Equivalent substitutes may be used.

A. Test Connector: Boeing A33003-2 breakout box may be used along with test cable listed in the Table 101 below.

Test Connector	Mate With	Test Cable
BACC45FT12-12S6	J1	A33003-167
BACC45FT14-15S7	J2	A33003-20

Table 101

B. Multimeter: Simpson 260P

2. Functional Test

A. See Component Location Fig. 1.

B. See Schematic Fig. 101.

C. See Table 102 for Functional Test.

STAT NUMBER	PROCEDURE	REQUIRED RESULTS	SUSPECT COMPONENT(S)
1	Connect panel assembly with test connector.		
2	Verify the continuity between baseplate and J1-2.	3 ohms max	J3,wiring connection
3	Verify the continuity between the Center of connector J3 and J1-1.	3 ohms max	J3,wiring connection
4	Verify the open circuit between J1-1 and J1-2.	15 Kohms min	J3,wiring connection
5	Set switch S2 to BRT position.		
6	Verify the resistance between J1-7 and J1-8.	15 Kohms min	S2
7	Set switch S2 to DIM position.		
8	Verify the resistance between J1-7 and J1-8.	3 ohms max	S2
9	Depress switch S1 (TEST).		
10	Verify the resistance between J2-5 and J2-6.	3 ohms max	S1
11	Depress switch S1 again (OFF).		

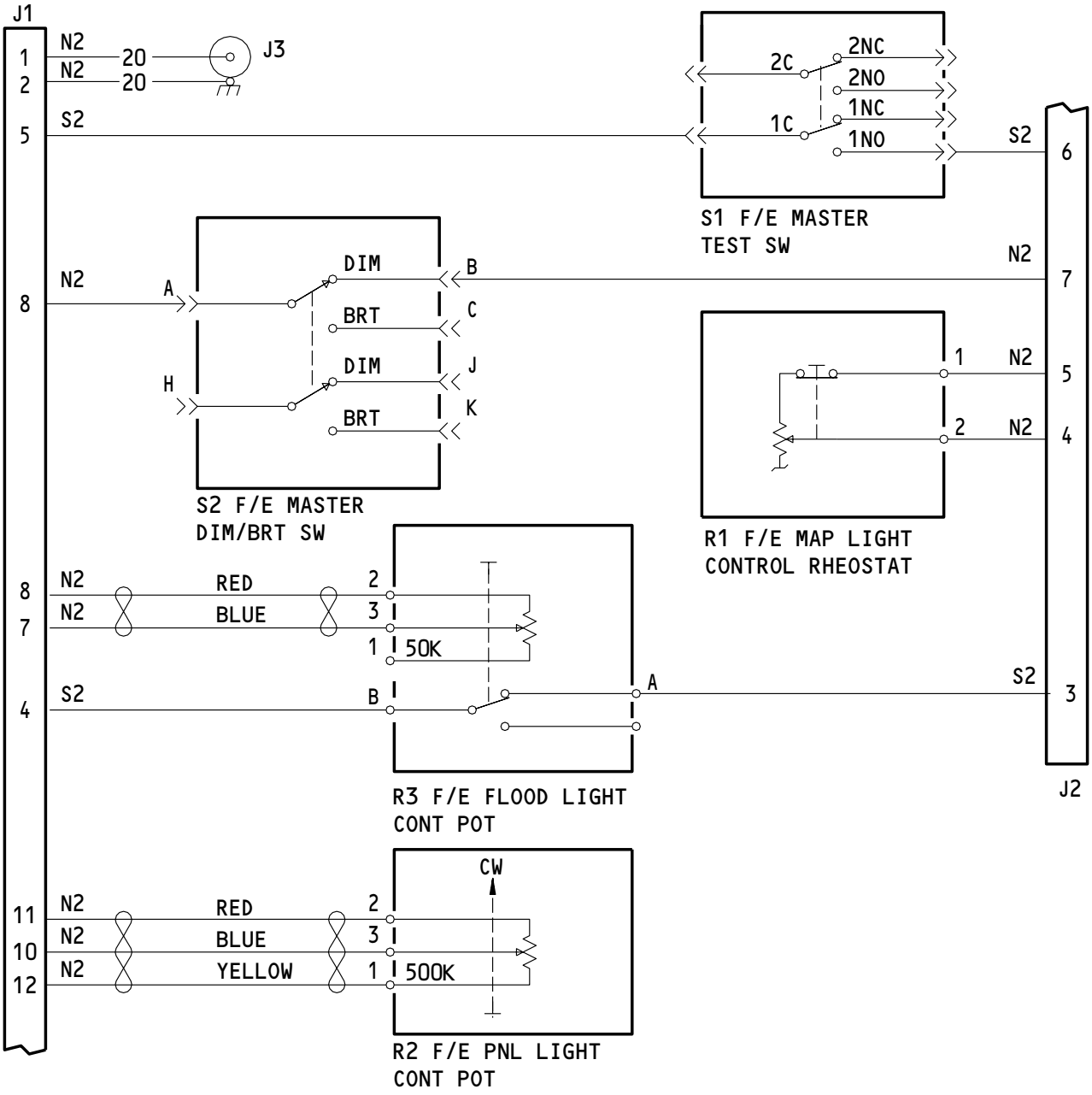
Functional Test
Table 102 (Sheet 1)

STAT NUMBER	PROCEDURE	REQUIRED RESULTS	SUSPECT COMPONENT(S)
12	Verify the resistance between J2-5 and J2-6.	15 Kohms min	S1
13	Rotate R1 fully clockwise (CW).		
14	Verify the resistance between J1-4 and J1-5 with shaft pulled out.	3 ohms max	R1
15	Verify the resistance between J1-4 and J1-5 with shaft pushed in.	15 Kohms min	R1
16	Rotate R1 to fully counter-clockwise (CCW).		
17	Verify the resistance between J1-4 and J1-5 with shaft pulled out.	The resistance increases to maximum (between 70 to 80 ohms) when R1 is fully CCW	R1
18	Rotate R2 to fully CW.		
19	Verify the resistance between J1-10 and J1-11.	3 ohms max	R2

Functional Test
Table 102 (Sheet 2)

STAT NUMBER	PROCEDURE	REQUIRED RESULTS	SUSPECT COMPONENT(S)
20	Verify the resistance between J1-10 and J1-12.	450 to 550 Kohms	R2
21	Rotate R2 to fully CCW.		
22	Verify the resistance between J1-10 and J1-12.	The resistance decreases from 500 Kohms to 0 ohm	R2
23	Verify the resistance between J1-10 and J1-11.	450 to 500 Kohms	R2
24	Rotate R3 to fully CCW.		
25	Verify the resistance between J2-3 and J2-4.	15 Kohms min	R3
26	Verify the resistance between J2-7 and J2-8.	45 to 55 Kohms	R3
27	Rotate R3 to fully CW.		
28	Verify the resistance between J2-3 and J2-4.	3 ohms max	R3
29	Verify the resistance between J2-7 and J2-8.	The resistance decreases from 50 Kohms to 0 ohm	R3
	Remove all connections.		
	END OF TEST		

Functional Test
Table 102 (Sheet 3)



NOTE: ALL WIRES BMS 13-16, TYPE I, CLASS 1, (OPTIONAL TYPE I, CLASS 2, OR TYPE I, CLASS 3) AWG 22.
SEE REPAIR FOR WIRE SEPARATION DATA.

Flight Engineers Lighting, M18 Schematic Diagram
Figure 101

L76104

REPAIR

1. Material

   A. Loctite sealant, type 242 or 222 without primer (Loctite Corp., 705 North Mounting Road, Newington, Connecticut 06111-1411)

   B. Primer: BMS 10-11, type I (SOPM 20-60-02)

   C. Enamel: Hi-speed Lacquer, Boeing color 8328

   D. Varglas non-fray type HO or HP sleeving (Varflex Corporation, 512 W. Court Street, Rome, New York, 13440)

2. All repair can be done with standard industry practices and procedures contained in SOPM 20-11-05 except as follows:

   A. When replacing the wires, separate all wires noted by categories S2, N2 labeled in the schematic. A minimum of one-quarter (1/4) inch spacing must be maintained between bundles of different categories. 63-9273-2 separators and/or Varglas non-fray type HO or HP sleeving may be used to assure proper separation. If more than one category attaches to a single component, then sleeve one or more of the categories to maintain proper separation. Those wires labeled with N2 may be bundles with any other wire category. Wire bundles color code categories are N2 (White) and S2 (Blue).

   B. Apply loctite sealant (type 242 or 222 without primer) to the threaded parts of the screws (Fig. 1-35).

      (1) After tightening the screws, touch up the screwheads as follows:

         (a) Apply one coat of BMS 10-11, type I primer (SOPM 20-41-02).

         (b) Prepare the surface and apply two coats of Hi-speed Lacquer, Boeing color 8328, flat per SOPM 20-41-04.

ILLUSTRATED PARTS LIST

1. This section lists and illustrates replaceable or repairable component parts. The Illustrated Parts Catalog contains a complete explanation of the Boeing part numbering system.

2. Indentures show parts relationships as follows:

    Assembly
      Detail Parts for Assembly
      Subassembly
      Attaching Parts for Subassembly
        Detail Parts for Subassembly

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

3. One use code letter (A, B, C, etc.) is assigned in the EFF CODE column for each variation of top assembly. All listed parts are used on all top assemblies except when limitations are shown by use code letter opposite individual part entries.

4. Letter suffixes (alpha-variants) are added to item numbers for optional parts, Service Bulletin modification parts, configuration differences (Except left- and right-hand parts), product improvement parts, and parts added between two sequential item numbers. The alpha-variant is not shown on illustrations when appearance and location of all variants of the part is the same.

5. Service Bulletin modifications are shown by the notations PRE SB XXXX and POST SB XXXX.

    A. When a new top assembly part number is assigned by Service Bulletin, the notations appear at the top assembly level only. The configuration differences at detail part level are then shown by use code letter.

    B. When the top assembly part number is not changed by the Service Bulletin, the notations appear at the detail part level.

6. Parts Interchangeability

Optional (OPT)	The parts are optional to and interchangeable with other parts having the same item number.
Supersedes, Superseded By (SUPSDS, SUPSD BY)	The part supersedes and is not interchangeable with the original part.
Replaces, Replaced By (REPLS, REPLD BY)	The part replaces and is interchangeable with, or is an alternate to, the original part.

7. The MOD level codes in the nomenclature column, such as MOD A and MOD B, identify interchangeable top assemblies which have the same part number but which have differences at the subassembly or component levels. The IPL identifies each MOD level of a top assembly with a different item number and use code. The nameplate label identifies the MOD level of each assembly in the MOD LEVEL block.

8. Use substitute parts only as specified in the document D906-10182, Electrical/Electronic/Electromechanical and Mechanical Parts Substitution.

VENDORS

05617 IDD AEROSPACE CORP
18225 NORTHEAST 76TH STREET PO BOX 97056
REDMOND, WASHINGTON 98073-9756
FORMERLY FARWEST ELEC INC;FORMERY IN BELLEVUE, WA;
FORMERLY BELL IND FARWEST MFG DIV;FORMERLY BELL IND
ILLUMINATED DISPLAYS DIV

12324 DUPREE INC STAKE FASTENER CO
14395 RAMONA PO BOX 1797
CHINO, CALIFORNIA 91708
FORMERLY DUPREE MFG CO IN SOUTH EL MONTE, CALIFORNIA
FORMERLY STAKE FASTENER CO DIV OF DUPREE INC

15653 FAIRCHILD FASTENERS KAYNAR PRODUCTS DIV
800 S STATE COLLEGE BLVD
FULLERTON, CALIFORNIA 92831-3001
FORMERLY VK6405 MICRODOT AEROSP LTD; FORMERLY KAYNAR TECH
KAYNAR DIV

18342 AMP INC SYSCOM DIV USE V00779

34263 CTS CORP IN TEXAS DBA CTS ELECTRONIC CORP
1100 ROOSEVELT STREET PO BOX 2420
BROWNSVILLE, TEXAS 78521
FORMERLY CTS OF BROWNSVILLE INC

60119 MONADNOCK CO THE
18301 ARENTH AVENUE PO BOX 1222
CITY OF INDUSTRY, CALIFORNIA 91749
FORMERLY UNITED CARR FASTENER CORP VB0051 VB0056 VB0076
FORMERLY TRW ELECTRONIC COMPONENTS CINCH-MONADNOCK DIV
FORMERLY CINCH-MONADNOCK DIV OF TRW INC V76530

72962 HARVARD INDUSTRIES INC
3 WERNER WAY SUITE 210
LEBANON, NEW JERSEY 08833
FORMERLY AMERACE CORP ESNA DIV
FORMERLY ELASTIC STOP NUT IN UNION, NJ

91812 JANCO CORPORATION
3111 WINONA AVENUE,PO BOX 3038
BURBANK, CALIFORNIA 91504-2543

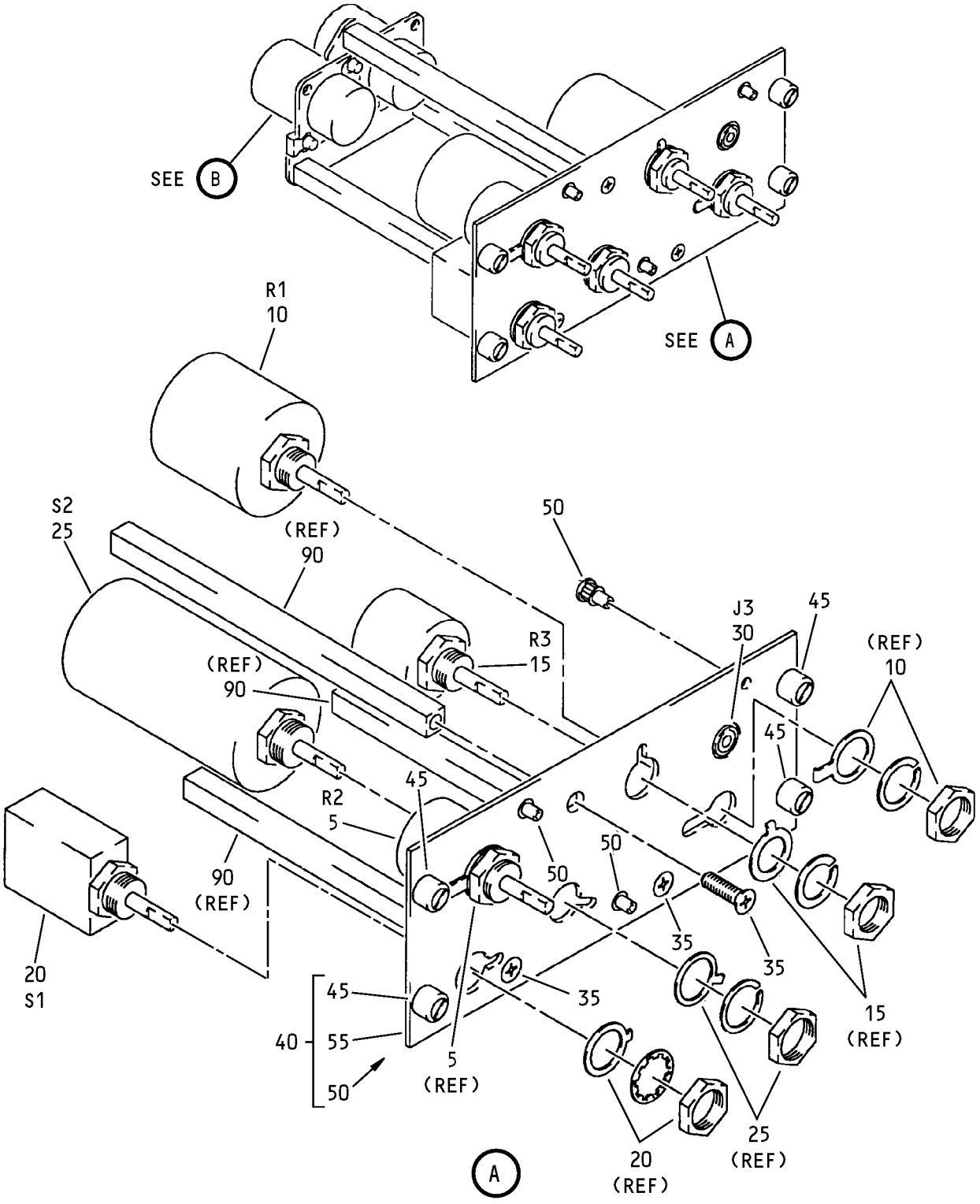
VENDORS

91929 HONEYWELL INC MICRO SWITCH DIV
11 WEST SPRING STREET
FREEPORT, ILLINOIS 61032
FORMERLY MICRO SWITCH A DIV OF HONEYWELL
FORMERLY V74059 AND V40228

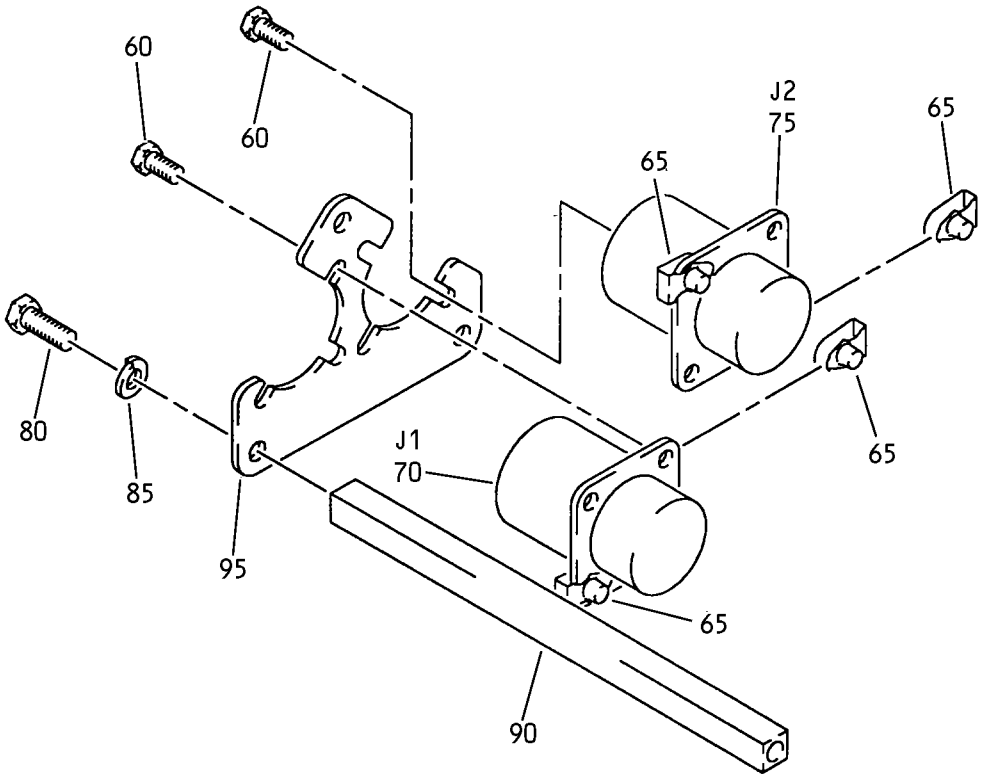
95266 O E C O CORP
4607 SE INTERNATIONAL WAY
MILWAUKIE, OREGON 97222
FORMERLY OSBOURNE ELECTRIC IN PORTLAND, OREGON

REFERENCE DESIGNATOR INDEX (SEE SCHEMATIC DIAGRAM)		
REFERENCE DESIGNATOR	PART NUMBER	FIG-ITEM
J1	BACC45FN12-12P6	1-70
J2	BACC45FN14-15P7	75
J3	800000121-1	30
R1	26405	10
R2	WA03923A	5
R3	WB04060A	15
S1	82PB19H58	20
S2	AC90-0002-1	25A
S2	AC90-0002-2	25

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AC90-0002-1		1	25A	1
BACC45FN12-12P6		1	70	1
BACC45FN14-15P7		1	75	1
BACN10NW1		1	65	4
BACN10PA06-6		1	50	3
BACP10U0262N		1	55	1
BACS12CB04-5		1	60	4
BACS12CB06-5		1	80	3
BACS22DD1B		1	45	4
K19798-04		1	65	4
MS35338-41		1	85	3
M39029-1-16-20		1	105	3
NAS514P632-5		1	35	3
RMA4812-160-40		1	65	4
SF6G6CBB5D		1	50	3
WA03923A		1	5	1
WB04060A		1	15	1
233T4242-1		1	1A	RF
233T4242-2		1	40	1
233T4242-3		1	100	1
233T6200-37		1	95	1
26405		1	10	1
293162		1	65	4
60790-1		1	110	2
69B46200-12		1	90	3
800000121-1		1	30	1
82PB19H58		1	20	1



Flight Engineers Lighting Panel Assembly, M18
Figure 1 (Sheet 1)



Flight Engineers Lighting Panel Assembly, M18
Figure 1 (Sheet 2)

L80721

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1A	233T4242-1		PANEL ASSY-FLT ENGR LTG, (M18)		RF
5	WA03923A		.RHEOSTAT- (V34263) (R2)		1
10	26405		.RHEOSTAT- (V95266) (R1)		1
15	WB04060A		.RHEOSTAT- (V34263) (R3)		1
20	82PB19H58		.SWITCH-PUSH BUTTON (V91929) (S1)		1
25	AC90-0002-2		.SWITCH-ROTARY (V91812) (S2) (OPT ITEM 25A)		1
-25A	AC90-0002-1		.SWITCH-ROTARY (V91812) (S2) (OPT ITEM 25)		1
30	800000121-1		.CONNECTOR-PWR (V05617) (J3)		1
35	NAS514P632-5		.SCREW		3
40	233T4242-2		.BASEPLATE ASSY		1
45	BACS22DD1B		..STUD ASSY		4
50	SF6G6CBB5D		..NUT- (V12324) (SPEC BACN10PA06-6)		3
55	BACP10U0262N		..BASEPLATE		1
60	BACS12CB04-5		.SCREW		4
65	K19798-04		.NUT- (V15653) (SPEC BACN10NW1) (OPT RMA4812-160-40 (V72962)) (OPT 293162 (V60119))		4

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
70	BACC45FN12-12P6		.CONNECTOR- (J1)		1
75	BACC45FN14-15P7		.CONNECTOR- (J2)		1
80	BACS12CB06-5		.SCREW		3
85	MS35338-41		.WASHER		3
90	69B46200-12		.STANDOFF		3
95	233T6200-37		.BRACKET-SPRT		1
-100	233T4242-3		.WIRE BUNDLE ASSY		1
-105	M39029-1-16-20		..CONTACT-PIN		3
-110	60790-1		..PIN-CONTACT (V18342)		2
			BOEING LETTER HISTORY		

- Item Not Illustrated