COMPONENT
MAINTENANCE MANUAL

ENGINE FIRE CONTROL MODULE ASSEMBLY

PART NUMBER 233T6210-1

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

L03035

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

L03033

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

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

PAGE	DATE	CODE
26-21-11		
TITLE PAGE		
1	MAR 01/00	01
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REVISION RECORD		
1	MAR 01/00	01
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TR & SB RECORD		
1	MAR 01/00	01
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LIST OF EFFECTIVE PAGES		
1	MAR 01/00	01
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1009	MAR 01/00	01
1010	MAR 01/00	01

* = REVISED, ADDED OR DELETED

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*[1] Use applicable procedures in 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

DESCRIPTION AND OPERATION

1. Description

A. The engine fire control module assembly contains light indicators and fire switches. External connectors are made through two connectors mounted in the rear of the assembly.

TESTING AND FAULT ISOLATION

1. Test Equipment

   A. Power Supply: 28V dc ±1V, 1 amp

   B. Multimeter: Fluke 8020A or equivalent

   C. Test Connector: BACC45FT10-5S6 for J1 and BACC45FT12-12S7 for J2 with pigtail leads

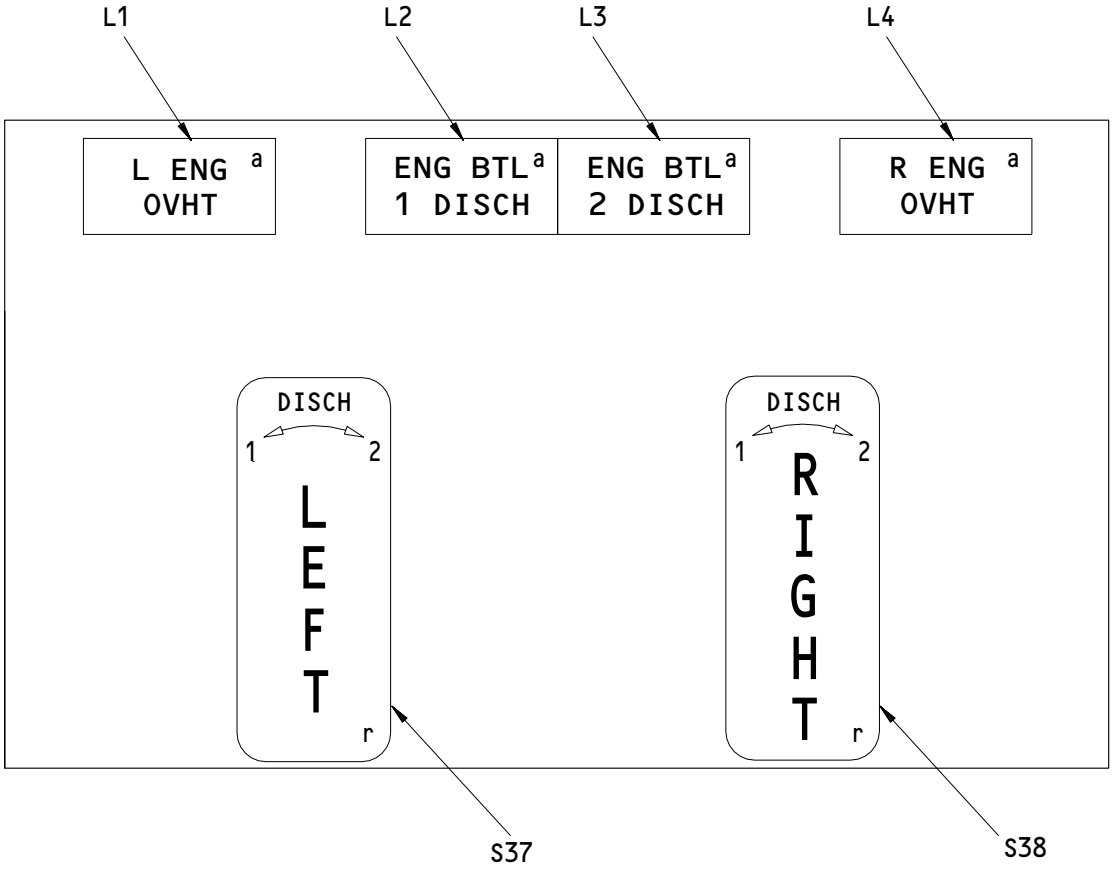
2. Functional Test

   A. Connect the module to the test connectors. Do functional test shown in Table 101. Figure 101 shows the component locations, and Fig. 102 contains the schematic diagram of this module.

3. Supplier Switch Operational Test

   A. For the engine fire switchs (S37, S38), do the operational test shown in Table 102. Table 102 may be used to verify the correct electrical operation of the switches. If the switches are known to be defective or the status of the switches is unkown, the supplier CMM should be used. See OHM/CMM Index, D6-47081 to find the supplier CMM for the switches. See Fig. 103 for the switch schematic diagram. Use test connect BACC45FT20-41S6 for S37 and BACC45FT20-41S for S38.

      NOTE: Continuity is defined as 3 ohms max, and Open is defined as 900K ohms min.



233T6210-1
Engine Fire Control Panel
Figure 101

L03039

STEP NO.	TEST PROCEDURE	REQUIRED RESULTS	SUSPECTED COMPONENTS
	This test procedure is for 233T6210-1.		
1	Apply 28V dc to J1-3 and ground to J1-4.	L1 L ENG OVHT, L2 ENG BTL 1 DISCH lighted	L1,L2
2	Apply 28V dc to J1-3 and ground to J1-1.	L1 L ENG OVHT lighted	L1
3	Apply 28V dc to J1-3 and ground to J1-2.	L2 ENG BTL 1 DISCH lighted	L2
4	Apply 28V dc to J2-3 and ground to J2-4.	L4 R ENG OVHT, L3 ENG BTL 2 DISCH lighted	L4,L3
5	Apply 28V dc to J2-3 and ground to J2-1.	L4 R ENG OVHT lighted	L4
6	Apply 28V dc to J2-3 and ground to J2-2.	L3 ENG BTL 2 DISCH lighted	L3
	Remove All Connections.		

233T6210-1
Functional Test
Table 101

TEST STEP	PROCEDURE	REQUIRED RESULTS
1.0	INSULATION RESISTANCE AND CHASSIS GROUND CHECK	
1.1	Measure ohms between Pin 24 and all other pins (Pins 1 thru 23, 25, 28 thru 41) one pair at a time.	Open
1.2	Measure ohms between Pin 24 and the chassis.	Continuity
2.0	HANDLE ILLUMINATION CHECK	
2.1	Apply 28 ±0.5V dc to Pin 1 (+) and Pin 2 (−).	
2.2	Monitor the switch handle legend.	Evenly illuminated
2.3	Remove 28V dc from Pins 1 and 2.	
3.0	NORMAL POSITION (HANDLE IN) CHECK	
	Measure ohms between the pins shown below:	
	(+) (−)	
3.1	Pin 3 Pin 12	Continuity
3.2	Pin 3 Pin 11	Open
3.3	Pin 17 Pin 35	Continuity
3.4	Pin 17 Pin 34	Open
3.5	Pin 14 Pin 31	Continuity
3.6	Pin 14 Pin 30	Open
3.7	Pin 15 Pin 5	Continuity
3.8	Pin 15 Pin 4	Open
3.9	Pin 21 Pin 41	Continuity
3.10	Pin 21 Pin 40	Open

Engine Fire Switch Operational Test
Table 102 (Sheet 1)

TEST STEP	PROCEDURE	REQUIRED RESULTS
3.11	Pin 13 Pin 29	Continuity
3.12	Pin 13 Pin 28	Open
3.13	Pin 18 Pin 37	Continuity
3.14	Pin 18 Pin 36	Open
3.15	Pin 19 Pin 7	Continuity
3.16	Pin 19 Pin 6	Open
3.17	Pin 20 Pin 39	Continuity
3.18	Pin 20 Pin 38	Open
3.19	Pin 16 Pin 33	Continuity
3.20	Pin 16 Pin 32	Open
4.0	SOLENOID CHECK	
4.1	Apply 28 ±0.5V dc, 5A max to Pin 10 (+) and Pin 25 (−).	
4.2	Pull the switch shaft out as far as it will go.	
5.0	FIRE POSITION (HANDLE OUT) CHECK	
5.1	Non-Discharge Position Check	
	Measure ohms between the pins shown below:	
	(+) (−)	
5.1.1	Pin 3 Pin 12	Open
5.1.2	Pin 3 Pin 11	Continuity
5.1.3	Pin 17 Pin 35	Open
5.1.4	Pin 17 Pin 34	Continuity
5.1.5	Pin 14 Pin 31	Open

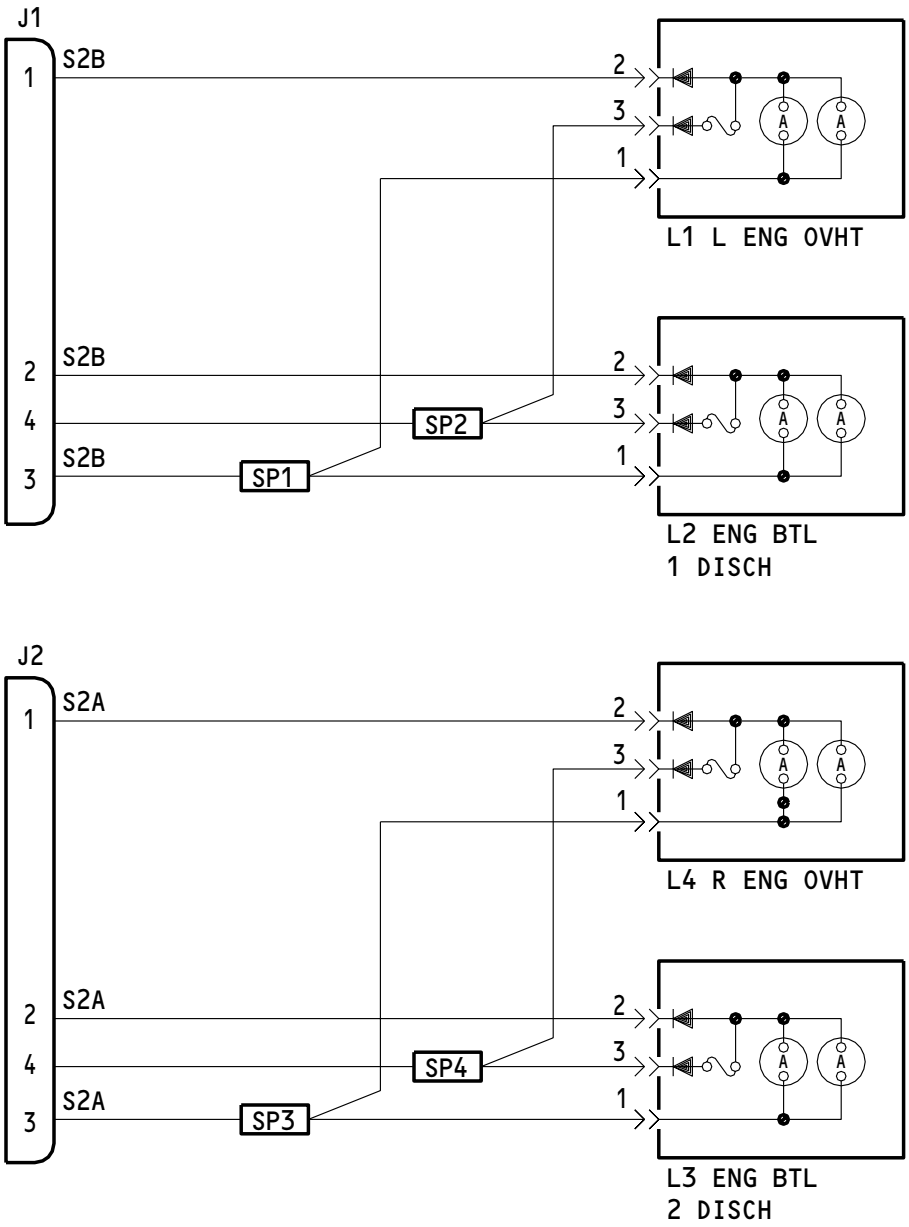
Engine Fire Switch Operational Test
Table 102 (Sheet 2)

TEST STEP	PROCEDURE	REQUIRED RESULTS
5.1.6	Pin 14 Pin 30	Continuity
5.1.7	Pin 15 Pin 5	Open
5.1.8	Pin 15 Pin 4	Continuity
5.1.9	Pin 21 Pin 41	Open
5.1.10	Pin 21 Pin 40	Continuity
5.1.11	Pin 13 Pin 29	Open
5.1.12	Pin 13 Pin 28	Continuity
5.1.13	Pin 18 Pin 37	Open
5.1.14	Pin 18 Pin 36	Continuity
5.1.15	Pin 19 Pin 7	Open
5.1.16	Pin 19 Pin 6	Continuity
5.1.17	Pin 20 Pin 39	Open
5.1.18	Pin 20 Pin 38	Continuity
5.1.19	Pin 16 Pin 33	Open
5.1.20	Pin 16 Pin 32	Continuity
5.2	Discharge Position Check	
5.2.1	Measure ohms between Pin 8 and Pin 9 with the switch shaft rotated as far as it will go in a clockwise direction and held in this position.	Continuity
5.2.2	Measure ohms between Pin 22 and Pin 23 with the switch shaft rotated as far as it will go in a counterclockwise direction and held in this position.	Continuity
5.2.3	Rotate the switch shaft back to the middle position and push it in as far as it will go.	
5.2.4	Remove 28V dc from Pins 10 and 25.	

Engine Fire Switch Operational Test
Table 102 (Sheet 3)

TEST STEP	PROCEDURE	REQUIRED RESULTS
6.0	SOLENOID OVERRIDE BUTTON CHECK	
6.1	Pull the switch shaft out as far as it will go while pressing the solenoid override button. Measure ohms between the pins shown below: Measure ohms between the pins shown below:	
	(+) (−)	
6.2	Pin 3 Pin 12	Open
6.3	Pin 3 Pin 11	Continuity
6.4	Pin 17 Pin 35	Open
6.5	Pin 17 Pin 34	Continuity
6.6	Pin 14 Pin 31	Open
6.7	Pin 14 Pin 30	Continuity
6.8	Pin 15 Pin 5	Open
6.9	Pin 15 Pin 4	Continuity
6.10	Pin 21 Pin 41	Open
6.11	Pin 21 Pin 40	Continuity
6.12	Pin 13 Pin 29	Open
6.13	Pin 13 Pin 28	Continuity
6.14	Pin 18 Pin 37	Open
6.15	Pin 18 Pin 36	Continuity
6.16	Pin 19 Pin 7	Open
6.17	Pin 19 Pin 6	Continuity
6.18	Pin 20 Pin 39	Open
6.19	Pin 20 Pin 38	Continuity
6.20	Pin 16 Pin 33	Open
6.21	Pin 16 Pin 32	Continuity
7.0	Remove all connections.	

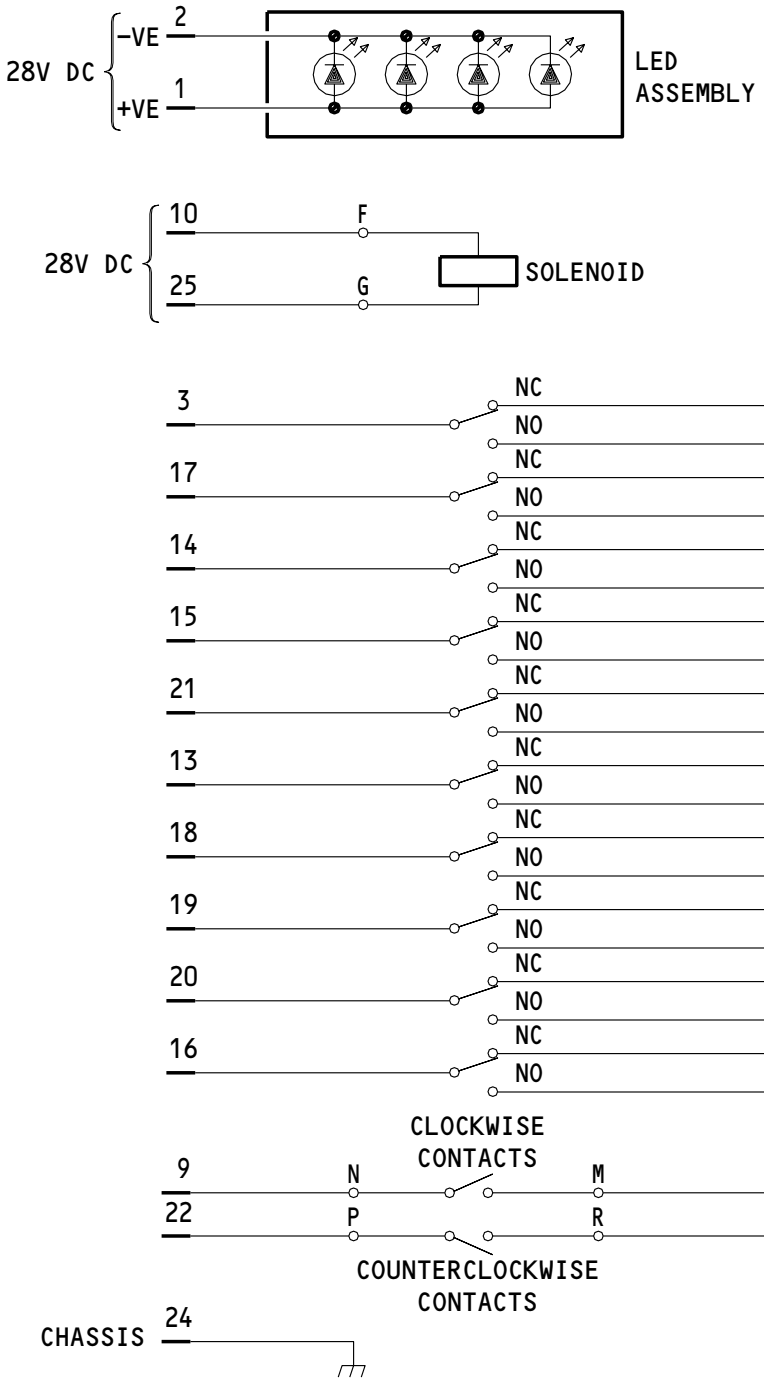
Engine Fire Switch Operational Test
Table 102 (Sheet 4)



NOTE: ALL WIRES ARE AWG 22 UNLESS SHOWN DIFFERENTLY.
SEE REPAIR FOR WIRE SEPARATION (ALL SEPARATION CATEGORIES ARE N2 UNLESS SHOWN DIFFERENTLY).

233T6210-1
Engine Fire Control Module Schematic Wiring Diagram
Figure 102

L03081



NOTE: THE LED ASSEMBLY CONTAINS CURRENT LIMITING CIRCUITRY.

Engine Fire Switch Schematic Diagram
Figure 103

L07247

REPAIR - GENERAL

1. Material

   A. Varglas, non-gray type HO or HP (V79074: Varflex Corporation, 512 West Court Street P.O. Box 551, Rome, New York 13440-4010).

2. All repair may be accomplished with standard industry practices and procedures contained in SOPM 20-11-04 except as follows:

   A. When you replace wires, make sure that the wires are installed per the followings:

      (1) Separate wire bundles by air separation (by a neutral bundle) or by use of shielded wires (Varglas sleeving should be used in the pressurized area).

      (2) Maintain the wire separation color coding per Table 601. Wire bundles that are not sleeved or shielded or that are shielded for purpose other than separation are color-coded to identify the functional separation category:

FUNCTIONAL SEPARATION CATEGORY	WIRE BUNDLE TYING MATERIAL COLOR
L (Left Power System)	Red
R (Right Power System)	Green
C (Center Bus Power)	Yellow
A (APU Power and Ground)	Orange
S (Battery Power)	Blue
N (Non-Redundant, Non-Power)	White

Wire Separation Color Code
Table 601

      (3) Install wire bundles with 0.25 inch (0.635 cm) minimum spacing when air space is the means of separation between categories. Wire bundles may be kept separated by using spacers P/N BACS45A ( ) or 63-9273-( ). Spacers must be tied to wire bundle(s) with lacing tape.

      (4) Apply the following when wire bundles of different separation categories are routed and tied together:

         (a) Two or more bundles, all sleeved: Use white lacing tape.

(b) One or more sleeved and one unsleeved bundle: Use lacing tape color of unsleeved bundle.

(c) One or more neutral bundles and one color-coded bundle: Use lacing tape color of color-coded bundle.

(5) Make sure to maintain wire bundle and wire segment sleeving and clamping following any repair.

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

K0673 PAGE AEROSPACE LTD
FORGE LANE
SUNBURY-ON-THAMES, MIDDLESEX TW16 6EQ ENGLAND

12324 DUPREE INC STAKE FASTENER CO
14395 RAMONA PO BOX 1797
CHINO, CALIFORNIA 91708

15653 KAYNAR TECHNOLOGY KAYNAR DIV
800 SOUTH STATE COLLEGE BLVD PO BOX 3001
FULLERTON, CALIFORNIA 92634-3001

60119 MONADNOCK CO THE
18301 ARENTH AVENUE PO BOX 1222
CITY OF INDUSTRY, CALIFORNIA 91749

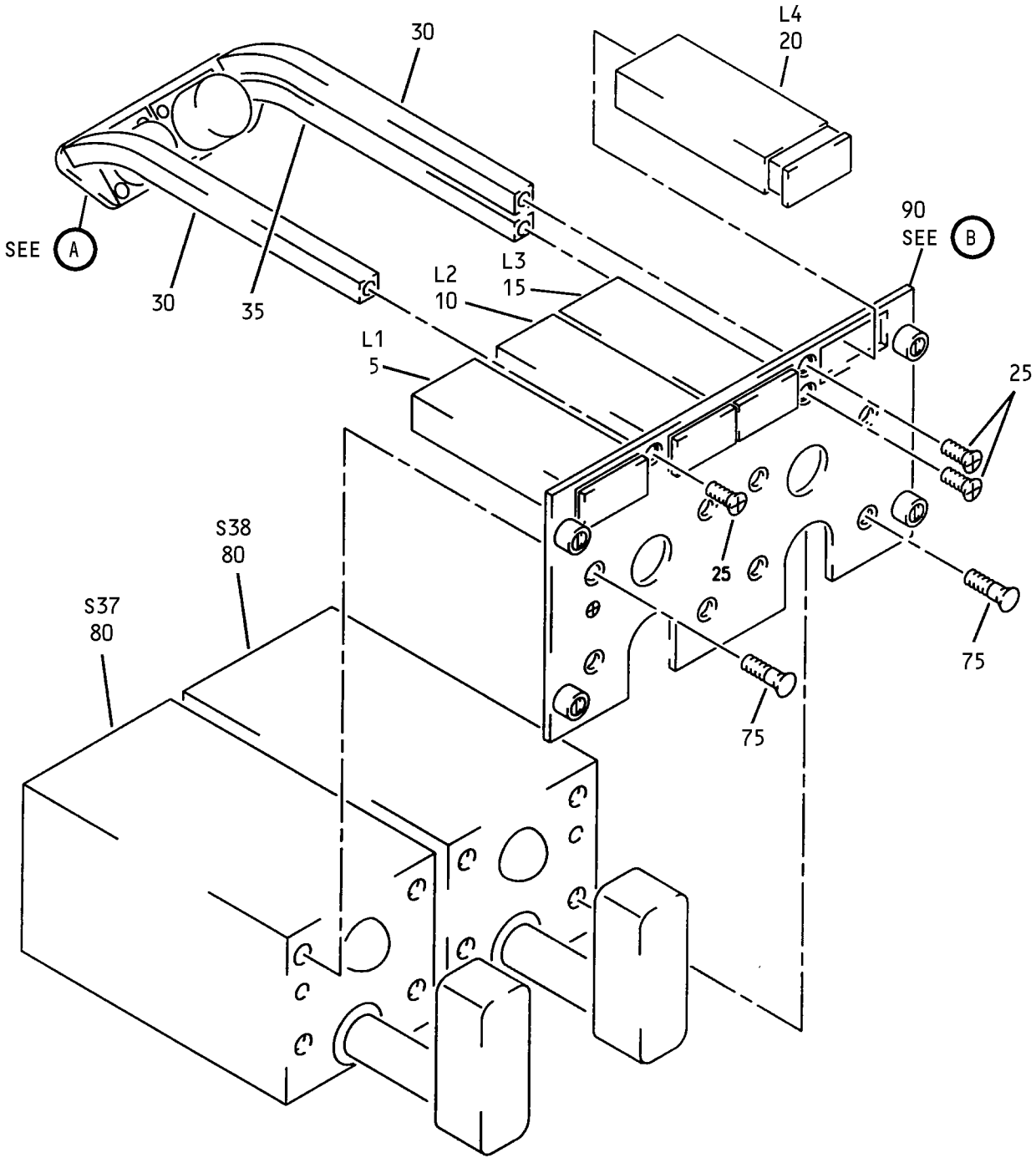
72794 DZUS FASTENER COMPANY, INCORPORATED
425 UNION BOULEVARD
WEST ISLIP, NEW YORK 11795-3123

72962 HARVARD INDUSTRIES INC
3 WERNER WAY SUITE 210
LEBANON, NEW JERSEY 08833

81590 KORRY ELECTRONIC INC SUB OF CRITON CORP
901 DEXTER AVENUE NORTH
SEATTLE, WASHINGTON 98109-3515

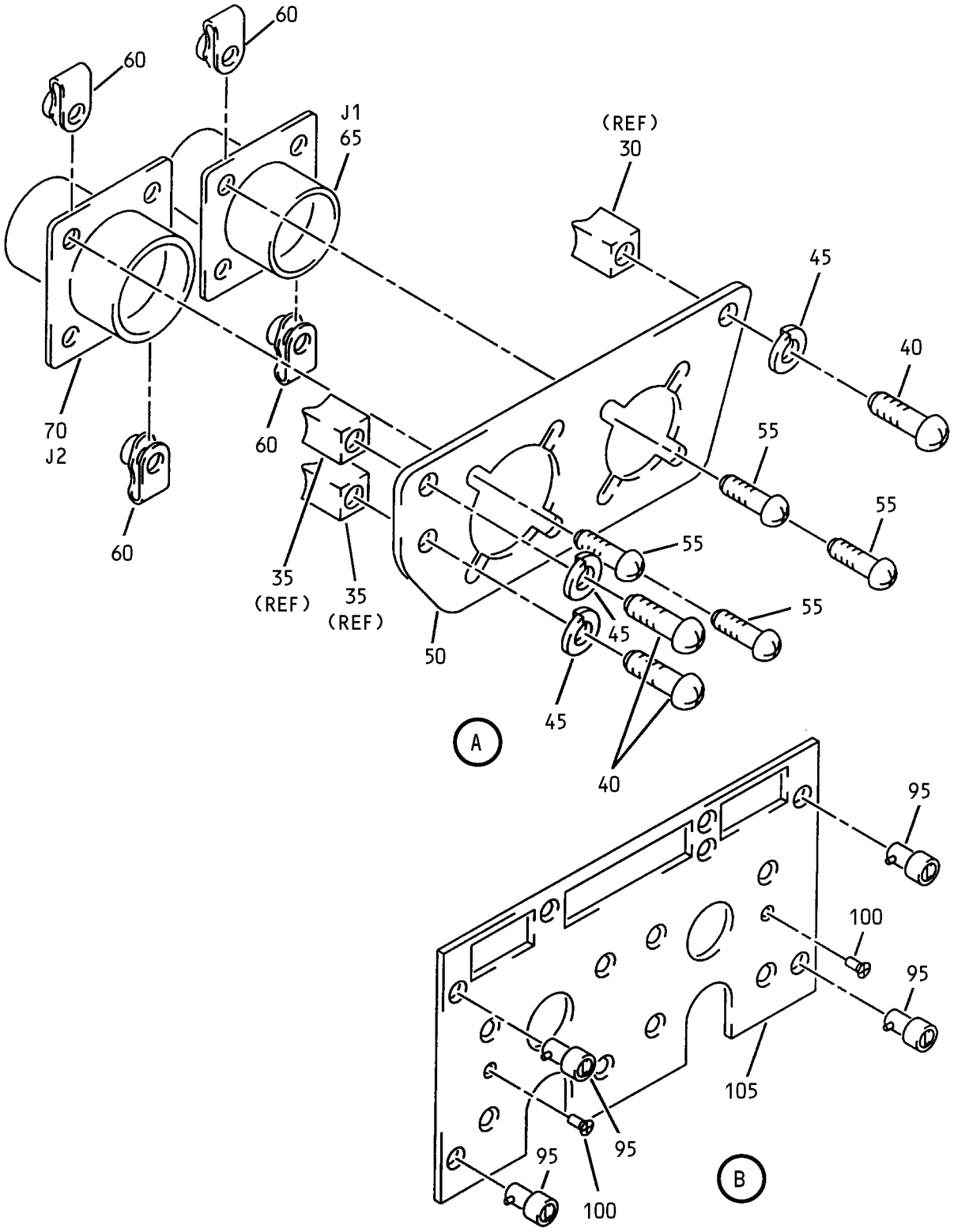
REFERENCE DESIGNATOR INDEX (SEE SCHEMATIC DIAGRAM)		
REFERENCE DESIGNATOR	PART NUMBER	FIG-ITEM
J1	BACC45FN10-5P6	1-65
J2	BACC45FN12-12P7	70
L1	BCREF8536	5
L2	BCREF8529	10
L3	BCREF8530	15
L4	BCREF8544	20
S00037	D455-24-001	80
S00038	D455-25-001	85

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
BACC45FN10-5P6		1	65	1
BACC45FN12-12P7		1	70	1
BACN10NW1		1	60	4
BACS21DX1B		1	95	4
BCREF8529		1	10	1
BCREF8530		1	15	1
BCREF8536		1	5	1
BCREF8544		1	20	1
D455-24-001		1	80	1
D455-25-001		1	85	1
FH6C5CPL12BN		1	25	3
FH8C8CPL12BN		1	75	8
K19798-04		1	60	4
MS35338-136		1	45	3
MS51957-14		1	55	4
MS51957-27		1	40	3
PFSC35-38ASEMB		1	95	4
RMA4812-160-40		1	60	4
SF6GXBAS8D		1	100	2
S231T300-2016		1	10	1
S231T300-2017		1	15	1
S231T300-2056		1	5	1
S231T300-2097		1	20	1
10-61318-51		1	80	1
10-61318-52		1	85	1
233T6200-231		1	50	1
233T6210-1		1	1A	RF
233T6210-2		1	90	1
233T6210-3		1	105	1
233T6210-4		1	110	1
293162		1	60	4
434-674-1031-20		1	10	1
434-674-1031-20		1	15	1
434-674-1031-20		1	5	1
434-674-1031-20		1	20	1
69B46200-41		1	30	2
69B46200-42		1	35	1



Engine Fire Control Module Assembly
Figure 1 (Sheet 1)

L03088



Engine Fire Control Module Assembly
Figure 1 (Sheet 2)

L03092

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1A	233T6210-1		MODULE ASSY-ENG FIRE CONT		RF
5	BCREF8536		.LIGHT ASSY-IND (V81590) (434-674-1031-2056) (L1) (SPEC S231T300-2056)		1
10	BCREF8529		.LIGHT ASSY-IND (V81590) (434-674-1031-2016) (L2) (SPEC S231T300-2016)		1
15	BCREF8530		.LIGHT ASSY-IND (V81590) (434-674-1031-2017) (L3) (SPEC S231T300-2017)		1
20	BCREF8544		.LIGHT ASSY-IND (V81590) (434-674-1031-2097) (L4) (SPEC S231T300-2097)		1
25	FH6C5CPL12BN		.SCREW- (V12324)		3
30	69B46200-41		.STANDOFF		2
35	69B46200-42		.STANDOFF		1
40	MS51957-27		.SCREW		3
45	MS35338-136		.WASHER		3
50	233T6200-231		.BRACKET-SPRT		1
55	MS51957-14		.SCREW		4
60	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-					
65	BACC45FN10-5P6		.CONNECTOR- (J1)		1
70	BACC45FN12-12P7		.CONNECTOR- (J2)		1
75	FH8C8CPL12BN		.SCREW- (V12324)		8
80	D455-24-001		.SWITCH- (VK0673) (S00037) (SPEC 10-61318-51)		1
85	D455-25-001		.SWITCH- (VK0673) (S00038) (SPEC 10-61318-52)		1
90	233T6210-2		.BASEPLATE ASSY		1
95	PFSC35-38ASEMB		..STUD ASSY- (V72794) (SPEC BACS21DX1B)		4
100	SF6GXBAS8D		..PIN-LOCATOR (V12324)		2
105	233T6210-3		..BASEPLATE		1
-110	233T6210-4		.WIRE BUNDLE ASSY		1

- Item Not Illustrated