TO: ALL HOLDERS OF POWER INTERRUPTION FLAG DELAY MODULE M1240 AND DFDR/QAR POWER SWITCH MODULE ASSEMBLY M1079, OVERHAUL MANUAL, 34-21-06

REVISION NO. 3, DATED DEC 5/84

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED													
	D&O	D/Assy	Cleaning	Insp/Chk	Repair	Assy	F/C	Test	T/Shooting	S/Tools	Storage	IPL	L/Overhaul
Added assembly P/N 65-89347-6 per basic release								X				X	

POWER INTERRUPTION FLAG DELAY MODULE M1240 AND DFDR/QAR POWER SWITCH MODULE ASSEMBLY M1079

34-21-06

BOEING P/N 65-89347-1, -4, -6

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
34-134		PRR 24498	May 10/81

LIST OF EFFECTIVE PAGES

* Indicates pages revised, added or deleted in latest revision

F Indicates foldout pages - print one side only

PAGE	DATE	PAGE	DATE	PAGE	DATE
34-21-06					
* T-1	Dec 5/84				
T-2	BLANK				
* LEP-1	Dec 5/84				
LEP-2	BLANK				
* T/C-1	Dec 5/84				
T/C-2	BLANK				
* 1	Dec 5/84				
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*[1] Use applicable procedures in 20-11-04, 31-10-01 and standard industry practices.

*[2] Special instructions not required.

POWER INTERRUPTION FLAG DELAY MODULE M1240 AND DFDR/QAR POWER SWITCH MODULE ASSEMBLY M1079

1. DESCRIPTION AND OPERATION

A. Description

(1) P/N 65-89347-1, -4 - The power interruption flag delay module contains a printed circuit assembly, relay, wire bundle, and a connector.

(2) P/N 65-89347-6 - The DFDR/QAR power switch module assembly contains five relays, a wire bundle and a connector.

B. Operation P/N 65-89347-1, -4 (See schematic diagram, Fig. 5)

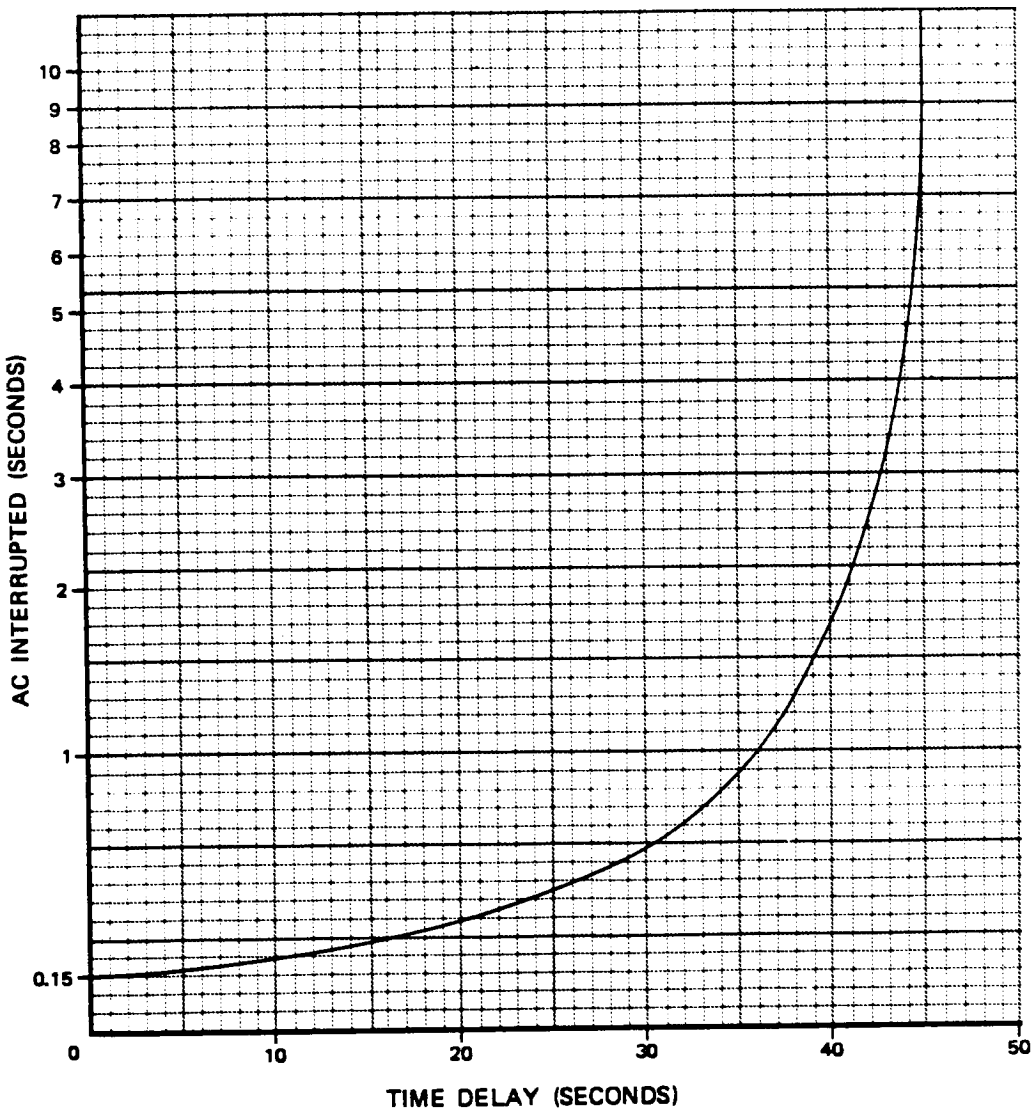
(1) Certain information in the navigation system is not valid after a power interruption until the power has been restored for a period of time. The time period varies with the length of the interruption. The power interruption flag delay module monitors power, provides a valid signal, removes the valid signal during a power interruption, and delays return of the valid signal after power restoration. The delay length is proportional to the period of interruption. A short-term interruption will not cause removal of the valid signal. Figure 1 shows the approximate delay period after return of ac power prior to return of the valid output signal.

(2) The circuit has two power inputs, ac and dc. Interruption of either will cause removal of the valid output signal. However, the time delay is required only after interruption of the ac power. If both power sources are interrupted, the time delay commences after restoration of the second source.

(3) The 28-volt ac input at pin 1 is filtered by CR1/R2/C1 and limited by zener diode CR2 (20 volts). The resultant dc provides 20 volts bias at AR1 pin 7, and approximately 10 volts at AR1 pin 2 (inverting input). On some modules, the 28 volt ac signal is passed through relay K2 to the circuit card. When power is interrupted at the 115 volt ac input the 28 volt ac is also interrupted.

(4) The 28-volt dc input at pin 5 is dropped thru R1 and also limited to 20 volts by zener diode CR2. The dc input places 20-volt bias voltage at AR2 pin 7, approximately 7.5 volts at AR2 pin 2 (inverting input) and approximately 15 volts at AR1 pin 3 (non-inverting input). Since the 15 volts at pin 3 exceeds the 10 volts at pin 2 on AR1, AR1 output will be generated.

(5) The AR1 output charges C4 and C3, and when the charge is greater than the 7.5 volts at AR2 pin 2, AR2 output will be generated and transistor Q1 will be turned on. Q1 provides a ground path for the relay and the information valid signal is passed through the relay contacts.



Circuit Time Delay Curve
Figure 1

(6) When the ac is interrupted, AR1 loses its bias voltage at AR1 pin 7, AR1 output ceases, AR2 output ceases, and Q1 is turned off to release the relay.

(7) A short term ac interruption (up to approximately 150 milliseconds) will not change the circuit state. Bias voltage at AR1 pin 7 is sustained for a short period by the discharge of C4 and C3 thru CR7 and R6/R7/R8. This is aided by residual charge on C1.

(8) A longer interruption of the ac results in discharge of C3/C4 until the AR2 pin 3 input is too low to sustain AR2 output at a level sufficient to hold Q1 on, and the relay is released. If the ac power is restored at some time under 10 seconds, C3 and C4 will recharge to raise the AR2 output to Q1 turn-on point in some time less than 45 seconds (Fig. 1). If the interruption is 10 seconds or longer, approximately 45 seconds will be required to turn Q1 back on and again energize the relay.

(9) If the dc input alone is interrupted, AR2 bias voltage is lost and AR2 output ceases to hold Q1 on. AR1 output is not lost since it is fed back through CR6 to the dc circuit and sustains the AR1 pin 3 input. Therefore the capacitors retain their charge, and the valid signal output is instantly restored upon restoration of the dc power.

(10) If both the ac and dc are interrupted and restored with the ac power returning first, the time delay is not initiated until the dc power is restored. With ac power only present, AR1 pin 3 input is missing and the charging of the capacitors cannot commence until the dc is restored.

2. REPAIR

A. All repair may be accomplished with standard industry practices and procedures contained in 20-11-04 except as noted in the following:

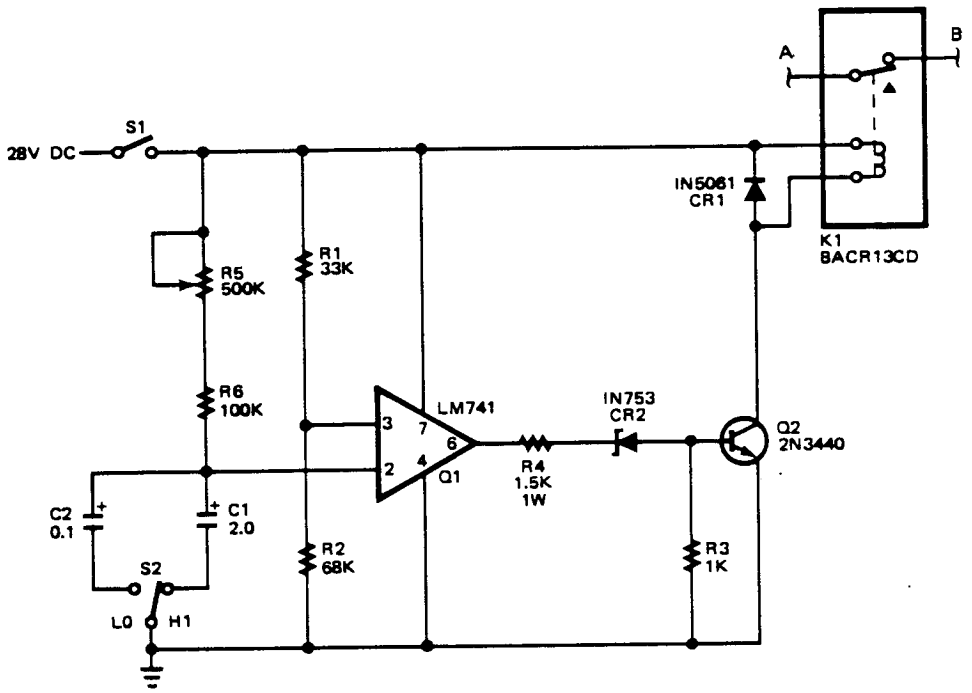
(1) If replacement of the printed circuit assembly keying plug (180, Fig. 6) is required, insert at connector position 10 and L.

3. TESTING

A. Test Equipment

TEST EQUIPMENT	65-89347		
	-1	-4	-6
Circuit Interrupter, capable of 60 millisecond to 1 second interruptions (Fig. 2 or equivalent)	1	1	-
Multimeter: Simpson 260 or equivalent	1	1	1
Power Supplies:			
28 volt ac, 400 Hz	1	1	
28 volt dc	1	1	1
15 volt ac	-	1	1
Oscilloscope	1	1	-
Switches:			
SPST	2 (S1,S2)	3(S1,S3)	-
Lamp: 40 milliamp at 28 volts	1	1	-
Test Connector: (with pigtail leads):			
BACC45FT12-12S	1	1	-
BACC45FT18-31S	-	-	1

Test Equipment
Figure 1A



NOTE: UNLESS OTHERWISE NOTED
RESISTANCE = OHMS ±5%, 1/4 W
CAPACITANCE = UF ±20%, 35 WVDC

INSTRUCTIONS

MONITOR RELAY CONTACTS WITH OSCILLOSCOPE
SET S2 TO RANGE DESIRED
CLOSE S1, MEASURE PULSE
ADJUST R5 TO OBTAIN INTERRUPTION PULSE DESIRED

Circuit Interrupter
Figure 2

B. Functional Test (65-89347-1, -4)

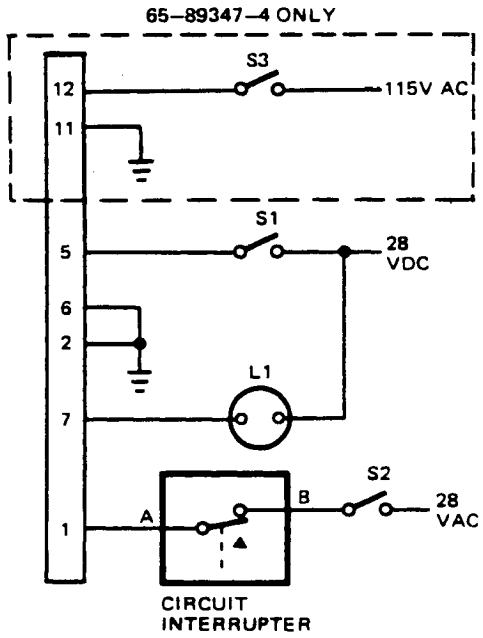
(1) Connect module and test connector. Identify and tag pigtail leads.

(2) Perform test steps listed in Fig. 3.

Step	Procedure	Required Results
1	Measure between pins: 2(+) to 1	50k minimum
	2(+) to 5	560 ohms minimum
	3 to 10	Continuity
	3 to 9	No Continuity
	6 to 8	Continuity
	6 to 7	No Continuity
2	Connect test setup per Fig. 4 with switches set to OFF.	L1 extinguished
3	Set S1 (and S3 for 65-89347-4) to ON	L1 extinguished
4	Set S2 to ON, commence timing	L1 illuminated at 45 ±10 seconds
5	Measure between pins: 3 to 10	No Continuity
	3 to 9	Continuity
	6 to 8	No Continuity
6	Set S1 to OFF	L1 extinguished
7	Set S1 to ON	L1 illuminated, no delay
8	Set S2 to OFF	L1 extinguished
9	Adjust circuit interrupter for 60-millisecond interruption	
10	Set S2 to ON	Wait for L1 illumination
11	Interrupt ac input for 60 ms	L1 remains illuminated
12	Set S2 to OFF	L1 extinguished
13	Adjust circuit interrupter for 1-second interruption	
14	Set S2 to ON	Wait for L 1 illumination
15	Interrupt ac input for 1 second, commence timing at end of interruption.	L1 extinguished. L1 illuminated at 36 ±10 seconds.
16	Set S1, S2 to OFF, wait 10 seconds.	L1 extinguished
17	Set S2 to ON. Wait 20 seconds.	L1 extinguished
18	Set S1 to On, commence timing.	L1 illuminated at 45 ±10 seconds.
	65-89347-4 only	
19	Set S3 to OFF, wait 10 seconds.	L1 off
20	Set S3 to ON, commence timing.	L1 on after 45 ±10 seconds.

Step	Procedure	Required Results
21	All Assemblies Set S1, S2, S3 to OFF, disconnect test setup.	
22	65-89347-1 only Measure between pins: 11(+) to 4 4(+) to 11	40 ohms maximum 50k minimum

Test Procedures
Figure 3 (Sheet 2)



Test Setup
Figure 4

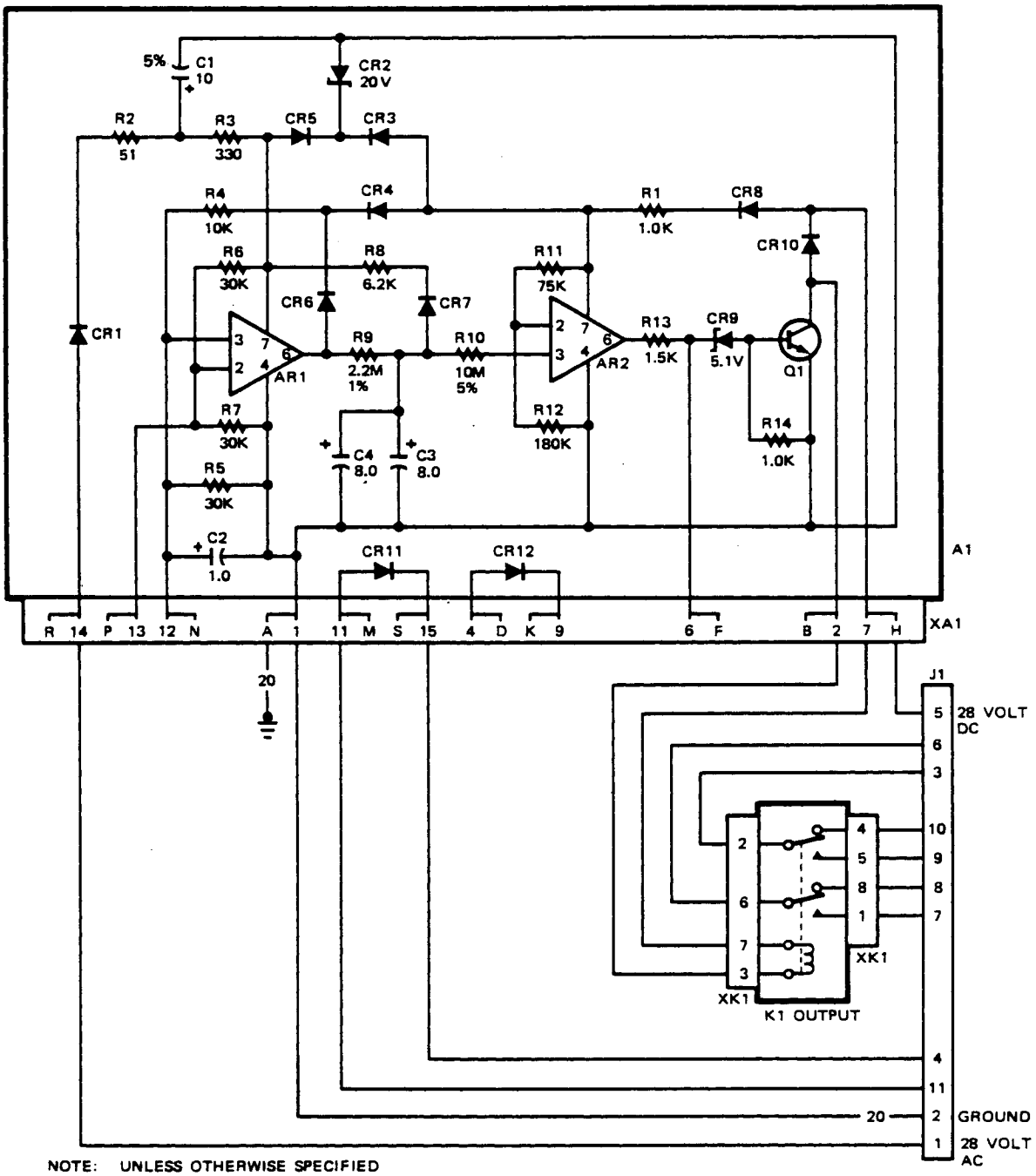
C. Functional Test (65-89347-6)

(1) Connect module and test connector. Identify and tag pigtail leads.

(2) Perform test steps listed in Fig. 4A.

Step	Procedure	Required Results	Component Tested
1	Measure resistance between pins:		
	1 to 15	Con	K1
	2 to 3	Con	K1
	4 to 3	No Con	K1
2	Connect pins 5 (High) and 16 (Low) to 115 volts ac		
3	Measure resistance between pins:		
	1 to 15	No Con	K1,K2,K5
	2 to 3	No Con	K1
	4 to 3	Con	K1
4	Connect 28 volts DC to pins 10 (+) and 14 (-)		
5	Measure resistance between pins 2 and 3	Con	K2
6	Disconnect 28 volts DC from pins 10 and 14		
7	Connect 28 volts dc to pins 8 (+) and 9 (-)		
8	Measure resistance between pins:		
	1 and 15	Con	K5
	6 and 7	Con	K5
9	Disconnect 28 volts dc from pins 8 and 9		
10	Disconnect 115 volts AC from pins 5 and 6		
11	Measure resistance between pins:		
	6 and 7	No Con	K5
	10 and 13	No Con	K3,K4
12	Connect 28 volts DC to pins 12 (+) and 14 (-)		
13	Measure resistance between pins 10 and 13	Con	K3
14	Disconnect 28 volts dc from pins 12 and 14		
15	Connect 28 volts DC to pins 11 (+) and 14 (-)		
16	Measure resistance between pins 10 and 13	Con	K4
17	Disconnect all test connections		

Relay Tests
Figure 4A

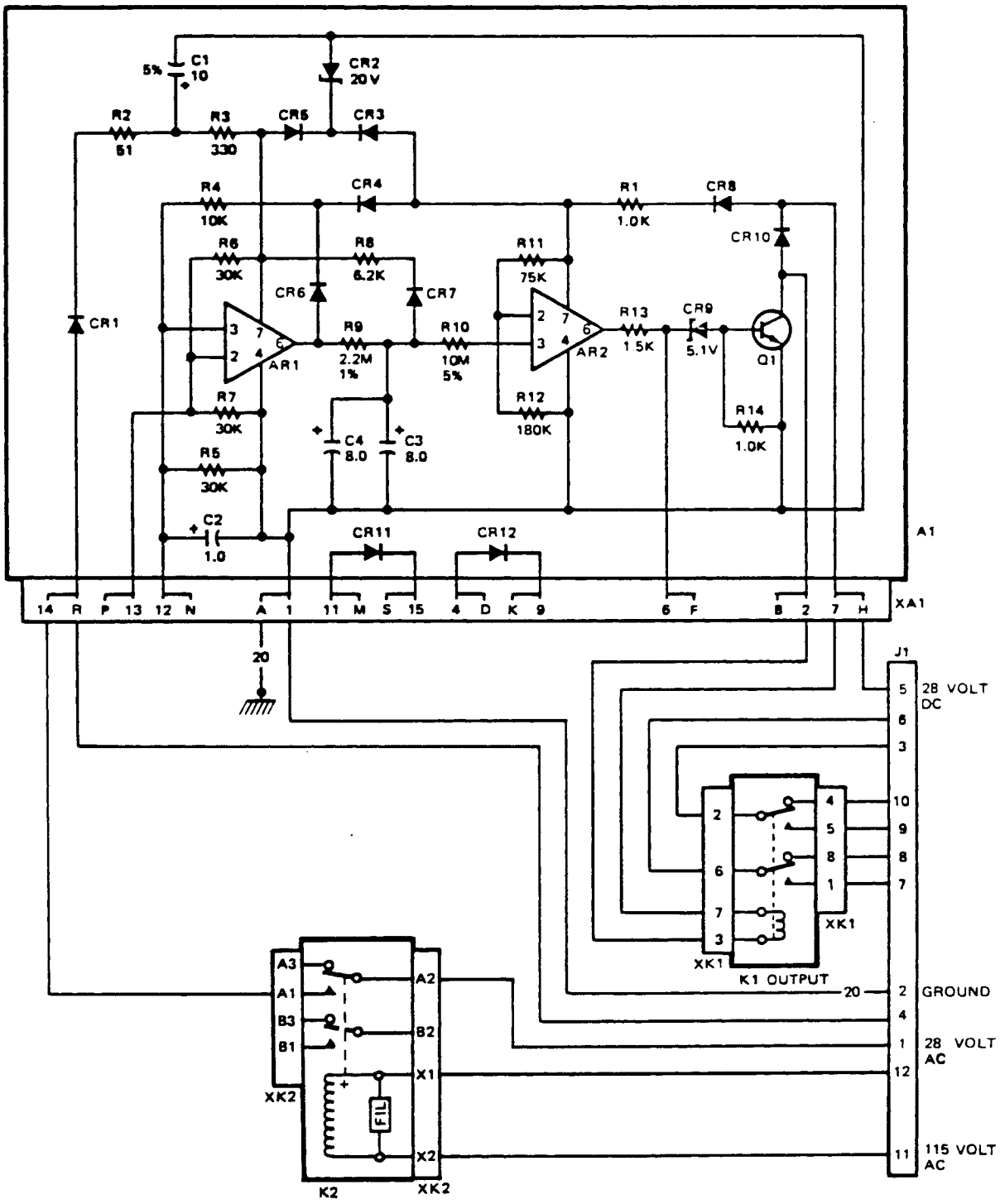


NOTE: UNLESS OTHERWISE SPECIFIED
RESISTANCE = OHMS ±2%
CAPACITANCE = UF ±10%

NOTE: ALL WIRE BMS 13-16 TYPE 1 CLASS 1
SIZE AWG 22 EXCEPT AS NOTED

65-89347-1

Schematic Diagram
Figure 5

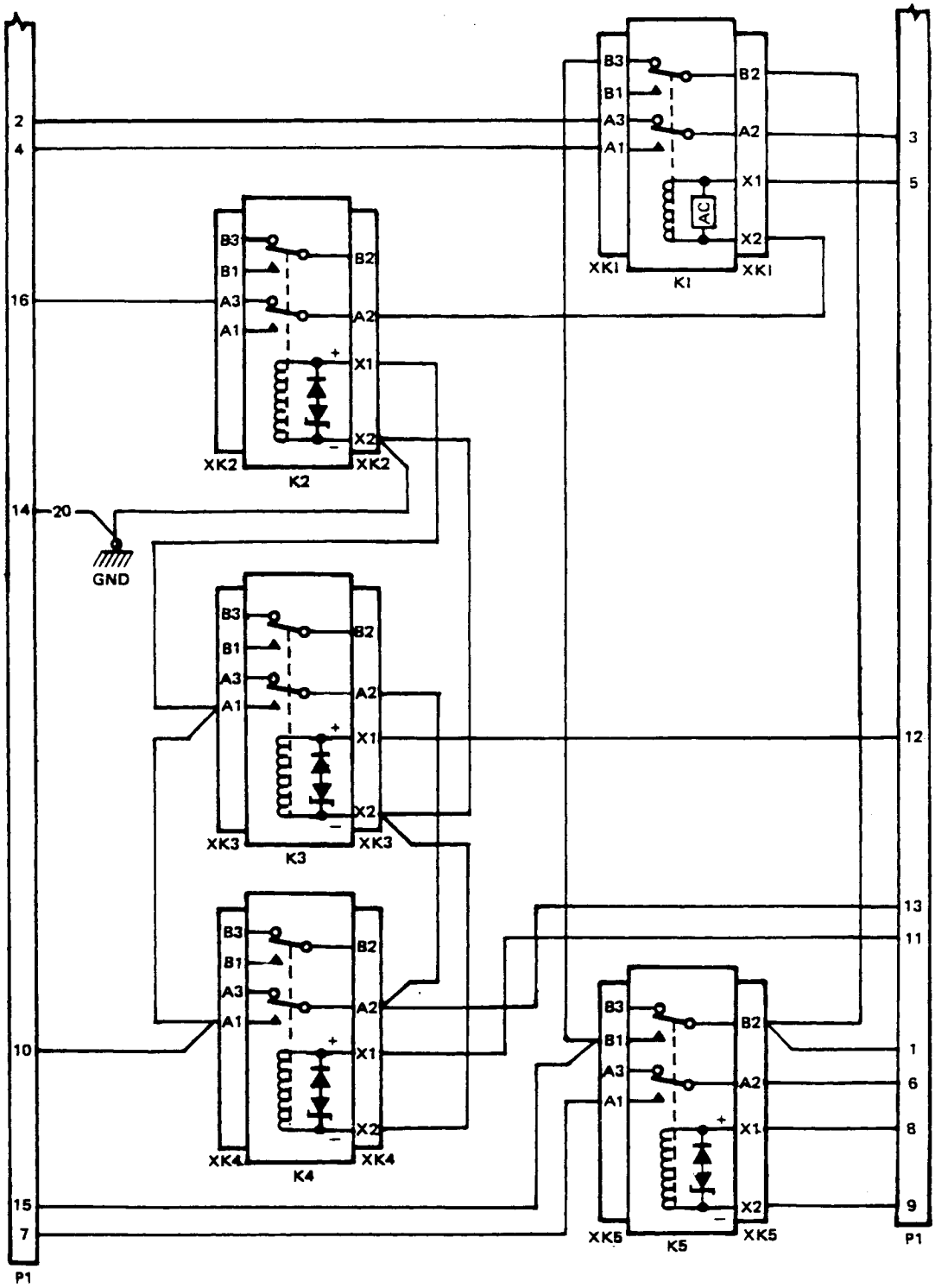


NOTE: UNLESS OTHERWISE SPECIFIED
RESISTANCE = OHMS +2%
CAPACITANCE = UF +10%

NOTE: ALL WIRE BMS 13-16 TYPE 1 CLASS 1 SIZE AWG 22 EXCEPT AS NOTED

65-89347-4

Schematic Diagram
Figure 5A



NOTE: ALL WIRE BMS 13-16 TYPE 1 CLASS 1 SIZE AWG 22 EXCEPT AS NOTED

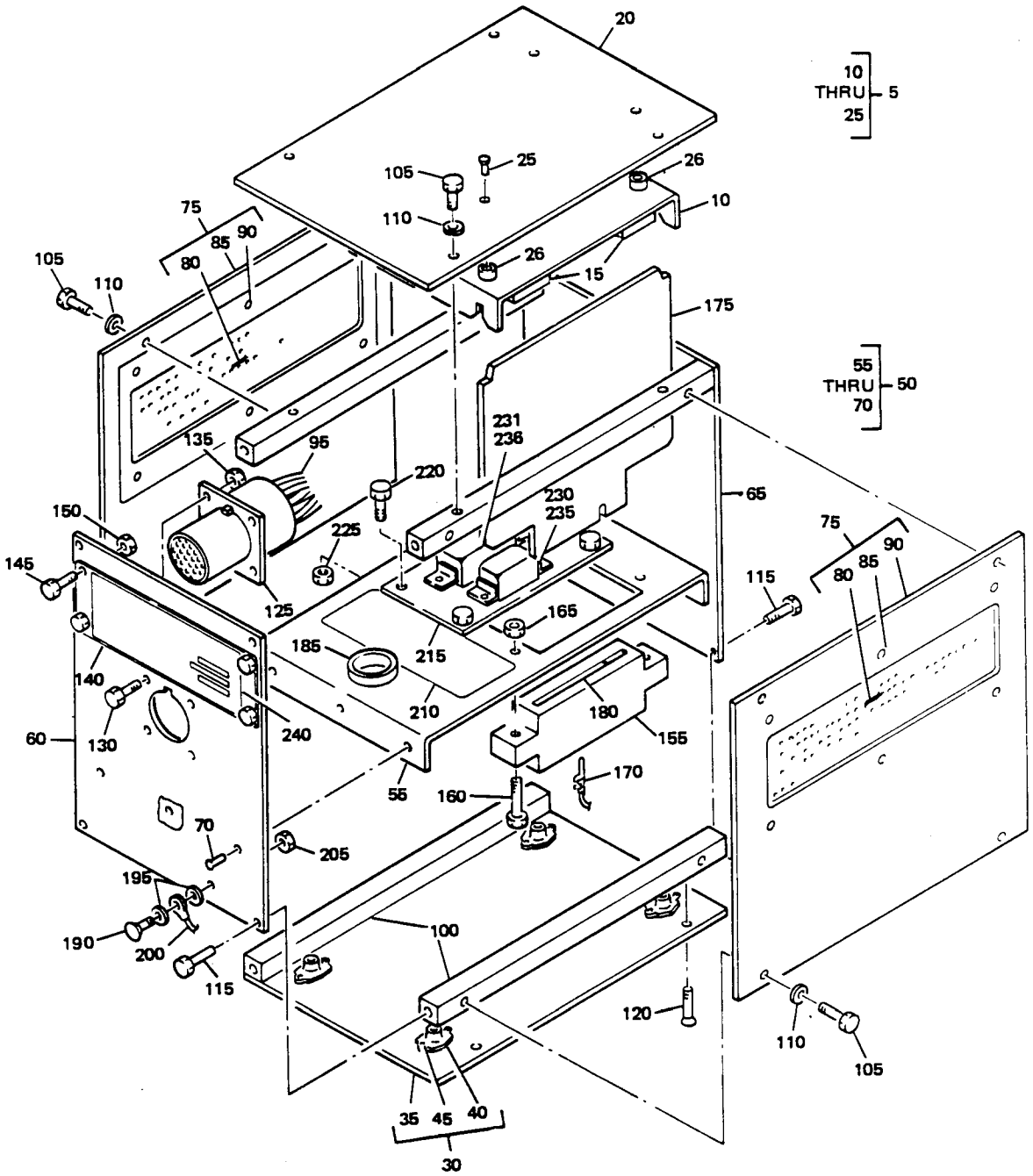
65-89347-6

Schematic Diagram
Figure 5B

4. ILLUSTRATED PARTS LIST

VENDORS

V00779	AMP INCORPORATED, P.O. BOX 3608, HARRISBURG, PENNSYLVANIA 17105
V91663	ARMEL ELECTRONICS, 1601 - 75TH ST, NORTH BERGEN, NEW JERSEY 07047



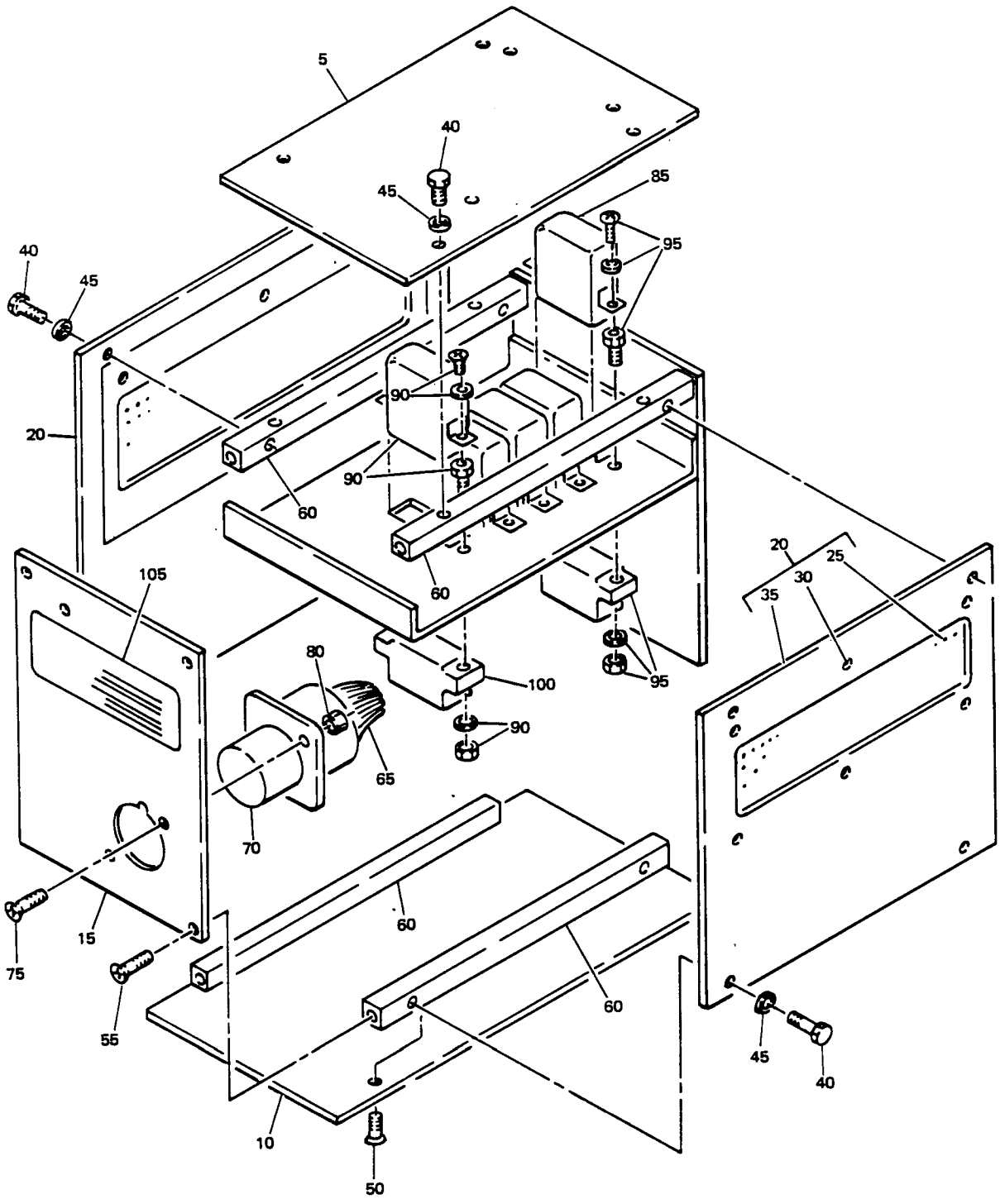
Power Interruption Flap Delay Module M1240
Figure 6

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-					
	65-89347-1		MODULE ASSY, POWER INTERRUPTION FLAG DELAY, M1240	A	
	65-89347-4		MODULE ASSY, POWER INTERRUPTION FLAG DELAY, M1240	B	
5	65-86224-2		. COVER ASSY, TOP		1
10	65-86224-5		. . CARD RETAINER		1
15	65-86224-9		. . PAD, RUBBER		2
20	65-86224-10		. . PLATE, TOP		1
25	BACR15BA3D		. . RIVET		4
26	NAS43DD3-14		. . SPACER		4
30	65-86224-3		. COVER ASSY, BOTTOM		1
35	65-86224-14		. . COVER, BOTTOM		1
40	BACN10JN3		. . NUTPLATE		4
45	BACR15BA3D		. . RIVET		8
50	65-86224-4		. COVER ASSY, FRONT, REAR		1
55	65-86224-7		. . RECEPTACLE HOLDER		1
60	65-86224-11		. . PLATE, FRONT		1
65	65-86224-12		. . PLATE, REAR		1
70	BACR15BA3D		. . RIVET		4
75	65-86224-6		. COVER ASSY, SIDE		2
80	65-86224-8		. . SCREEN		1
85	65-86224-13		. . COVER, SIDE		1
90	BACR15BB4D		. . RIVET		6
95	65-89347-2		. WIRE BUNDLE	A	1
95	65-89347-5		. WIRE BUNDLE	B	1
100	69-37268-21		. STANDOFF		4
105	BACS12CB04-5		. SCREW		12
110	MS35338-40		. WASHER		12
115	BACS12CB06-5		. SCREW		8
120	NAS514P440-5		. SCREW		4
125	BACC45FN12-12P		. CONNECTOR	A	1
125	BACC45FN12-12P6		. CONNECTOR	B	1
130	BACS12CB04-4		. SCREW		4
135	BACN10DN40		. NUT		4
140	65-86224-16		. COVER, RECEPTACLE		1
145	BACS12CB04-3		. SCREW		4
150	BACN10DN40		. NUT		4
155	582553-1		. CONNECTOR, V00779		1
160	NAS601-9P		. SCREW		2
165	BACN10JC06		. NUT		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-					
170	66143-2LP		. TERMINAL TAB, V00779	A	AR
170	66168-2		. TERMINAL TAB, V00779	B	AR
175	69-66783-1		. PRINTED CIRCUIT ASSY (REF 34-21-07)		1
180	582507-1		. KEYING PLUG, V00779		1
185	NAS557-8B		. GROMMET		1
190	NAS514P632		. SCREW		1
195	AN960D6L		. WASHER		2
200	BACT12AC		. TERMINAL		1
205	BACN10JC06		. NUT		1
210	BAC27DEX-1216		. MARKER		1
215	65-86224-17		. SUPPORT, RELAY	A	1
215	69-58261-2		. SUPPORT, RELAY	B	1
220	BACS12CB06-4		. SCREW		4
225	BACN10JC06		. NUT		4
230	BACR13CD2		. RELAY		1
231	BACR13CJ2E		. RELAY	B	1
235	HRTS17KM		. SOCKET, RELAY, V91663		1
236	BACS16X3		. SOCKET, RELAY	B	1
240	BACC27DEX1996		. MARKER		1

FIG. 6 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)

REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
A1	69-66783-1	175
J1	BACC45FN12-12P	125
J1	BACC45FN12-12P6	125
K1	BACR13CD2	230
K2	BACR13CJ2E	231
XA1	582553-1	155
XK1	HRTS17KM	235
XK2	BACS16X3	236



DFDR/QAR Power Switch Module Assembly M1079
Figure 7

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
7-1	65-89347-6		MODULE ASSY, DFDR/QAR POWER SWITCH, M1079		
5	65-87224-10		. COVER		1
10	65-86224-18		. COVER		1
15	65-86224-23		. COVER ASSY, FRONT		1
20	65-86224-6		. COVER ASSY, SIDE		2
25	65-86224-8		. . SCREEN		1
30	BACR15BB4D		. . RIVET		6
35	65-86224-13		. . COVER, SIDE		1
40	NAS1801-04-5		. SCREW		12
45	MS35338-40		. LOCKWASHER		12
50	NAS514P440-6		. SCREW		4
55	NAS1801-06-5		. SCREW		8
60	69-37268-21		. STANDOFF		4
65	65-89347-7		. WIRE BUNDLE ASSY		1
70	BACC45FN18-31P		. . CONNECTOR		1
75	NAS600-5P		. SCREW		2
80	BACN10JC04		. NUT		2
85	BACR13CJ2E		. RELAY		1
90	BACR13CF2AB		. RELAY		4
95	BACS16X3		. SOCKET, RELAY		1
100	BACS16X1		. SOCKET, RELAY		4
105	BAC27DEX4662		. MARKER, AL FOIL		1

FIGURE 7 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)

REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
K1	BACR13CJ2E	85
K2-K5	BACR13CF2AB	90
P1	BACC45FN18-31P	70
XK1	BACS16X3	95
XK2-XK5	BACS16X1	100