

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

FLIGHT INSTRUMENT MODULE ASSEMBLIES

31-36-86

BOEING P/N 65-86054-4, -5, -6, -7, -8

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		MR 39118-17	Dec 25/73

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

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
31-36-86					
* T-1	Mar 25/75				
T-2	BLANK				
* LEP-1	Mar 25/75				
LEP-2	BLANK				
T/C-1	Dec 25/73				
T/C-2	BLANK				
1	Dec 25/73				
2	Dec 25/73				
3	Dec 25/73				
4	Dec 25/73				
5	Dec 25/73				
6	Dec 25/73				
7	Dec 25/73				
8	BLANK				
9	Dec 25/73				
10	BLANK				
11	Dec 25/73				
12	BLANK				
13	Dec 25/73				
14	BLANK				
15	Dec 25/73				
16	Dec 25/73				
17	Dec 25/73				
18	Dec 25/73				
19	Dec 25/73				
20	Dec 25/73				
21	Dec 25/73				
22	Dec 25/73				
23	Dec 25/73				
24	Dec 25/73				
25	Dec 25/73				
26	Dec 25/73				

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

TABLE OF CONTENTS

<u>Paragraph Title</u>	<u>Page</u>
Description and Operation	1
Disassembly*[1]	
Cleaning.*[1]	
Inspection/Check.*[1]	
Repair.*[1]	
Assembly.*[2]	
Fits and Clearances (not applicable)	
Testing	1
Trouble Shooting.*[2]	
Storage Instructions.*[1]	
Special Tools, Fixtures, and Equipment.*[1]	
Illustrated Parts List.	15

*[1] Use applicable procedures in 31-10-01 and standard industry practices.

*[2] Special instructions not required.

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

FLIGHT INSTRUMENT MODULE ASSEMBLIES

1. DESCRIPTION AND OPERATION

- A. The flight instrument module assemblies contain instrument mountings, switches, indicators, and photocells on the pilot's and first officers instrument panels. Quick-disconnect studs are provided for panel mounting. Indexing pins are provided for alignment of rear-mounted connectors.

2. TESTING

A. Test Equipment

- (1) Test equipment requirements are listed in Fig. 1. Identify and tag pigtail leads on test connectors. Label upper connector A and lower connector B on those modules having two connectors. Prefixes A and B with pin numbers will be used throughout testing instead of reference designators.
- (2) All test connectors are BACC45FT with the shell, pin, and indexing identifiers given in Fig. 1.

Equipment	65-86054				
	-4	-5	-6	-7	-8
Power Supply, 28 volt dc		x	x	x	x
Power Supply, 6.3 volt dc or ac	x				x
Multimeter, Simpson 260 or equivalent	x	x	x	x	x
Upper Connector	16-24S6		22-55S	12-12S6	12-12S
Lower Connector		18-31S	22-19S	16-24S7	12-12S8

Test Equipment List
Figure 1

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

65-86054

B. Functional Test

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

Component Tested	Procedure	Required Results
L335	<p style="text-align: center;"><u>Assembly 65-86054-4</u></p> <p>Connect pin 5 to 6.3 volts Connect pin 4 to ground Depress each cap, clear, amber, and blue in turn, release Disconnect pin 4 Connect pin 9 to ground Connect pin 3 to ground Connect pin 10 to ground Depress each cap, clear, amber and blue in turn, release</p> <p>Remove all connections</p>	<p>Lamps extinguished Clear, amber, and blue illuminated while depressed</p> <p>Clear cap illuminated Amber cap illuminated Blue cap illuminated Clear, amber, and blue extinguished while depressed</p>
L338	<p>Connect pin 13 to pin 14 Connect pin 11 to 28 volts dc Connect pin 12 to ground Depress L338, release</p> <p>Remove all connections</p>	<p>L338 extinguished L338 illuminated while depressed</p>
M379 and M377	<p style="text-align: center;"><u>Assembly 65-86054-5</u></p> <p>Perform test twice, using pin numbers in parentheses (M377) the second time: Connect ohmmeter from pin 9 (11) to pin 10 (12) Expose photocell to ambient room light Cover photocell (total darkness)</p> <p>Remove all connections</p>	<p>200 ohms maximum 300k minimum</p>

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

Component Tested	Procedure	Required Results
L734	<p style="text-align: center;"><u>Assembly 65-86054-5 (cont)</u></p> <p>Connect pin 24 to 28 v dc Connect pin 25 to ground Disconnect pin 25 Connect pin 26 to ground Depress L734, release</p> <p>Disconnect pin 26 Connect pin 27 to ground Depress L734, release</p> <p>Remove all connections Connect pin 24 to ground Momentarily connect each of pins 25 and 26 to 28 v dc Remove all connections</p>	<p>L734 illuminated L734 extinguished L734 illuminated L734 extinguished while depressed L734 extinguished L734 extinguished L734 illuminated while depressed L734 extinguished</p>
L337	<p>Verify continuity from pin 2 to L337 center post Verify continuity from pin 1 to L337 rim Verify no continuity from pin 1 to pin 2</p>	
	<p style="text-align: center;"><u>Assembly 65-86054-6</u></p> <p>Set S270 to center (BRT) Measure between listed pins:</p>	
S270	<p>A-9 to A-11 A-9 to A-10 A-14 to A-13 A-14 to B-34 A-8 to A-9 B-36 to B-37 B-36 to B-35</p>	<p>Continuity No Continuity Continuity No Continuity No continuity Continuity No Continuity</p>
S257	<p>B-3 to B-4 B-14 to B-5 B-13 to B-6 B-1 to B-2</p>	<p>Continuity No Continuity No Continuity No Continuity</p>
S330	<p>A-6 to A-7 A-4 to A-5</p>	<p>No Continuity No Continuity</p>
S289	<p>A-15 to A-16</p>	<p>No Continuity</p>
S316	<p>A-16 to A-17</p>	<p>No Continuity</p>
	<p>B-54 to B-55</p>	<p>No Continuity</p>
S315	<p>A-17 to B-55</p>	<p>No Continuity</p>

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

65-86054

Component Tested	Procedure	Required Results
	<u>Assembly 65-86054-6 (cont)</u>	
S315	Depress S315	A-17 to B-55 Continuity
S316	Depress S316	B-54 to B-55 Continuity
		A-16 to A-17 Continuity
S289	Depress S289	A-16 to A-15 Continuity
S300	Depress S300	A-6 to A-7 Continuity
		A-4 to A-5 Continuity
S257	Set S257 to TEST (right)	
		B-3 to B-4 No Continuity
		B-14 to B-5 Continuity
		B-13 to B-6 Continuity
		B-1 to B-2 Continuity
S270	Set S270 to DIM (down)	
		A-9 to A-8 No Continuity
		B-36 to B-37 No Continuity
		B-36 to B-35 Continuity
		A-14 to A-13 No Continuity
		A-14 to B-34 Continuity
		A-9 to A-11 No Continuity
		A-9 to A-10 Continuity
	Set S270 to TEST (up)	
		A-8 to A-9 Continuity
L334	Connect B-9 to ground Connect B-7 to 28 volts dc Depress L334, release	L334 extinguished L334 illuminated while depressed
	Disconnect B-7 Connect B-19 to 28 volts dc Depress L334, release	L334 illuminated L334 extinguished while depressed
	Disconnect B-19 Connect B-8 to 28 volts dc Remove all connections Connect B-9 to 28 volts dc Momentarily connect each of pins B-19 and B-8 to ground Remove all connections	L334 extinguished L334 illuminated L334 extinguished L334 illuminated L334 extinguished L334 extinguished

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

Component Tested	Procedure	Required Results
	<u>Assembly 65-86054-6 (cont)</u>	
L441 and L442	Connect pin B-15 to 28 volts dc Connect pin B-27 to ground Depress L441 and L442, release	L441, L442 illuminated Each extinguished while de- pressed
L441	Disconnect pin B-27 Connect pin B-12 to ground Disconnect pin 12	L441, L442 extinguished L441 illuminated L441 extinguished
L442	Connect pin B-17 to ground Remove all connections	L442 illuminated L442 extinguished
L441 and L442	Connect pin B-15 to 28 volts dc Connect each of following pin momentarily to ground: B-12, B-17, B-27 Remove all connections	L441, L442 extinguished
	<u>Assembly 65-86054-7</u>	
M378 and M380	Perform test twice. Use pin num- bers in parentheses (M380) the second time: Connect ohmmeter pin A-19 (A-10) to pin A-18 (A-9) Expose photocell to ambient room light Cover photocell (total darkness)	200 ohms maximum 300k minimum
L377	Verify continuity from pin A-2 to L377 center post Verify continuity from pin A-1 to L377 rim Verify no continuity from pin A-1 to A-2	

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

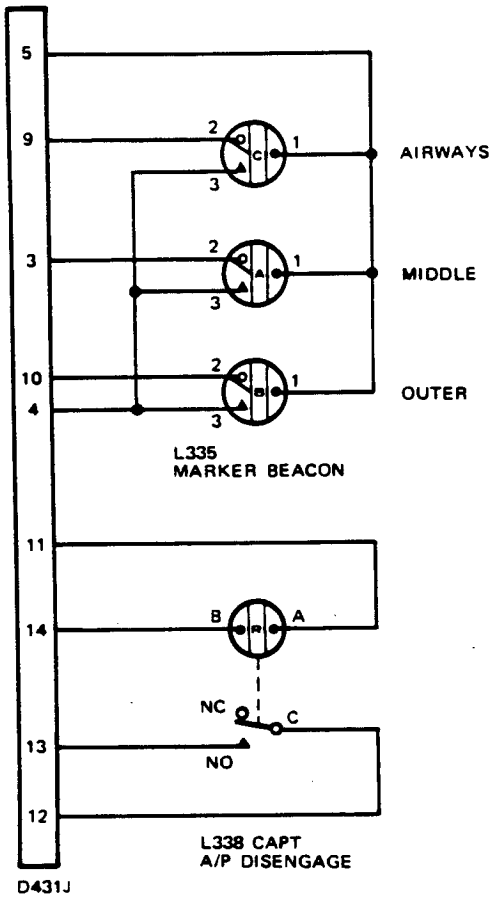
65-86054

Component Tested	Procedure	Required Results
L376	<p style="text-align: center;"><u>Assembly 65-86054-7 (cont)</u></p> <p>Connect pin B-3 to 28 volts dc Connect pin B-4 to ground Disconnect pin B-4 Connect pin B-5 to ground Depress L376, release</p> <p>Disconnect pin B-5 Connect pin B-6 to ground Depress L376, release</p> <p>Remove all connections</p> <p>Connect pin B-3 to ground Momentarily connect each of pins B-4 and B-5 to 28 v dc Remove all connections</p>	<p>L376 illuminated L376 extinguished L376 illuminated L376 extinguished while depressed L376 extinguished L376 extinguished L376 illuminated while depressed</p> <p>L376 extinguished</p>
L735	<p style="text-align: center;"><u>Assembly 65-86054-8</u></p> <p>Connect pin A-4 to 28 volts dc Connect pin A-5 to ground Disconnect A-5 Connect A-10 to ground Depress L735, release</p> <p>Disconnect A-10 Connect A-11 to ground Depress L735, release</p> <p>Remove all connections</p> <p>Connect A-4 to ground Momentarily connect each of pins A-5 and A-10 to 28 volts dc Remove all connections</p>	<p>L735 illuminated L735 illuminated L735 extinguished while depressed L735 extinguished L735 extinguished L735 illuminated while depressed</p> <p>L735 extinguished</p>
L339	<p>Connect pin A-12 to A-8 Connect A-7 to 28 volts dc Connect A-6 to ground Depress L339, release</p> <p>Remove all connections</p>	<p>L339 extinguished L339 illuminated while depressed</p>

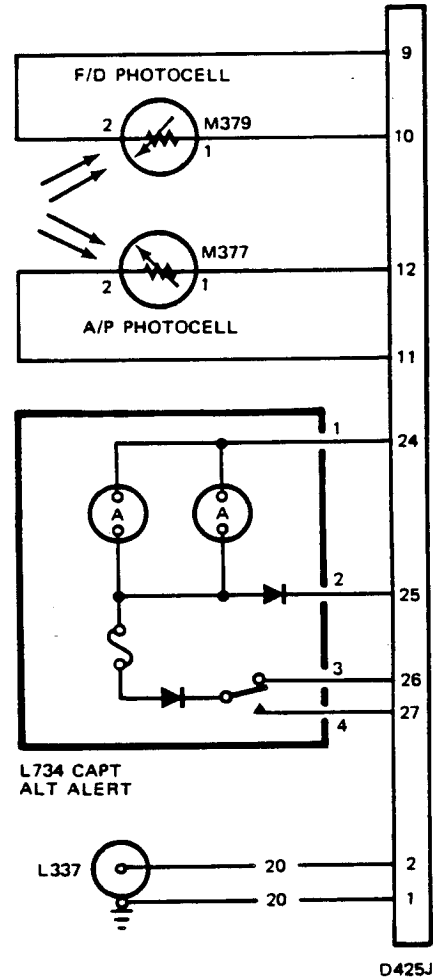
BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

Component Tested	Procedure	Required Results
L336	<u>Assembly 65-86054-8 (cont)</u> Connect pin B-5 to 6.3 volts Connect B-4 to ground Depress each cap, clear, amber, and blue; release Disconnect B-4 Connect B-9 to ground Connect B-3 to ground Connect B-10 to ground Depress each cap, clear, amber, and blue; release	L336 extinguished Each illuminated while depressed Clear cap illuminated Amber cap illuminated Blue cap illuminated Each extinguished while depressed

Component Test
 Figure 2 (Sheet 6)



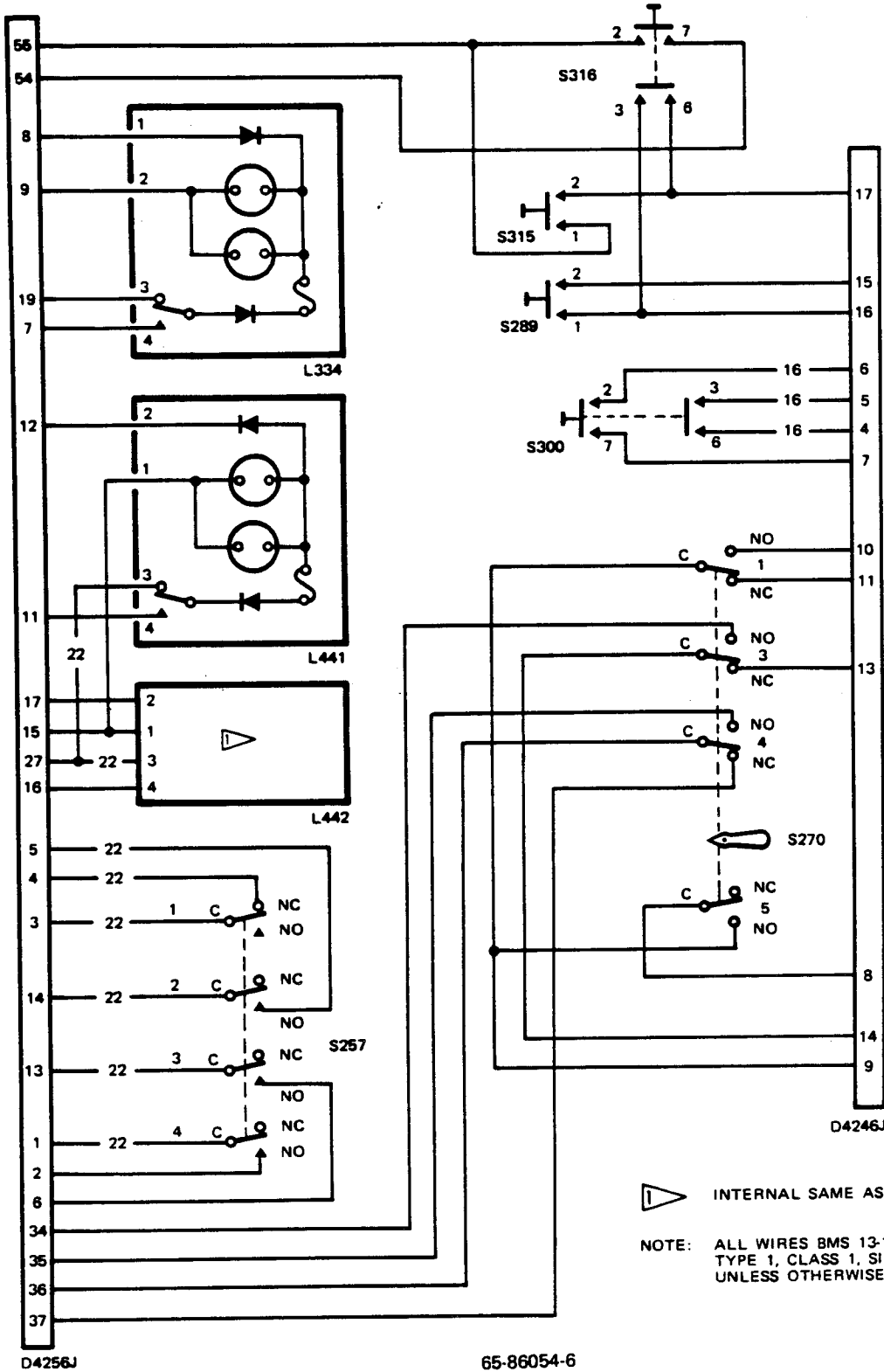
65-86054-4

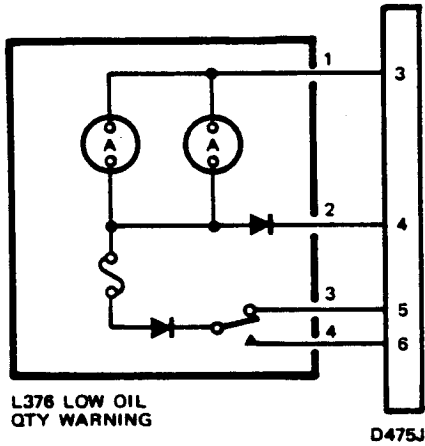
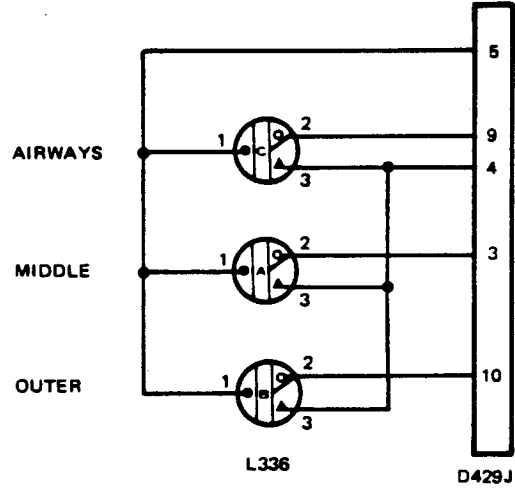
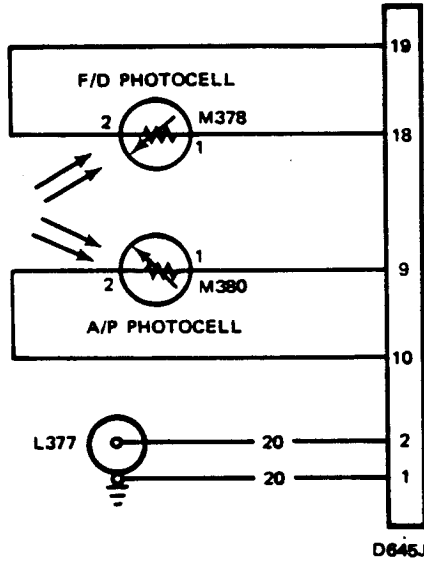


65-86054-5

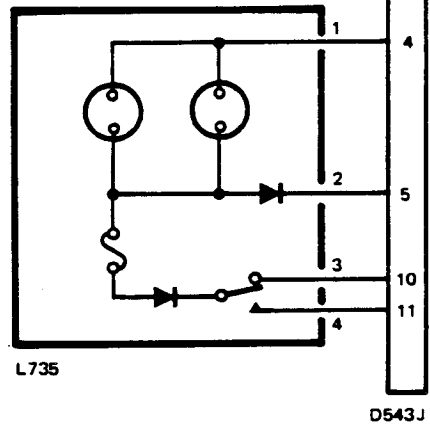
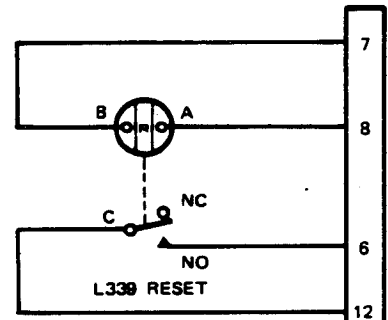
NOTE: ALL WIRES SIZE AWG 22
 BMS 13-16 TYPE 1, CLASS 1
 EXCEPT AS NOTED.

BOEING
COMMERCIAL JET
OVERHAUL MANUAL





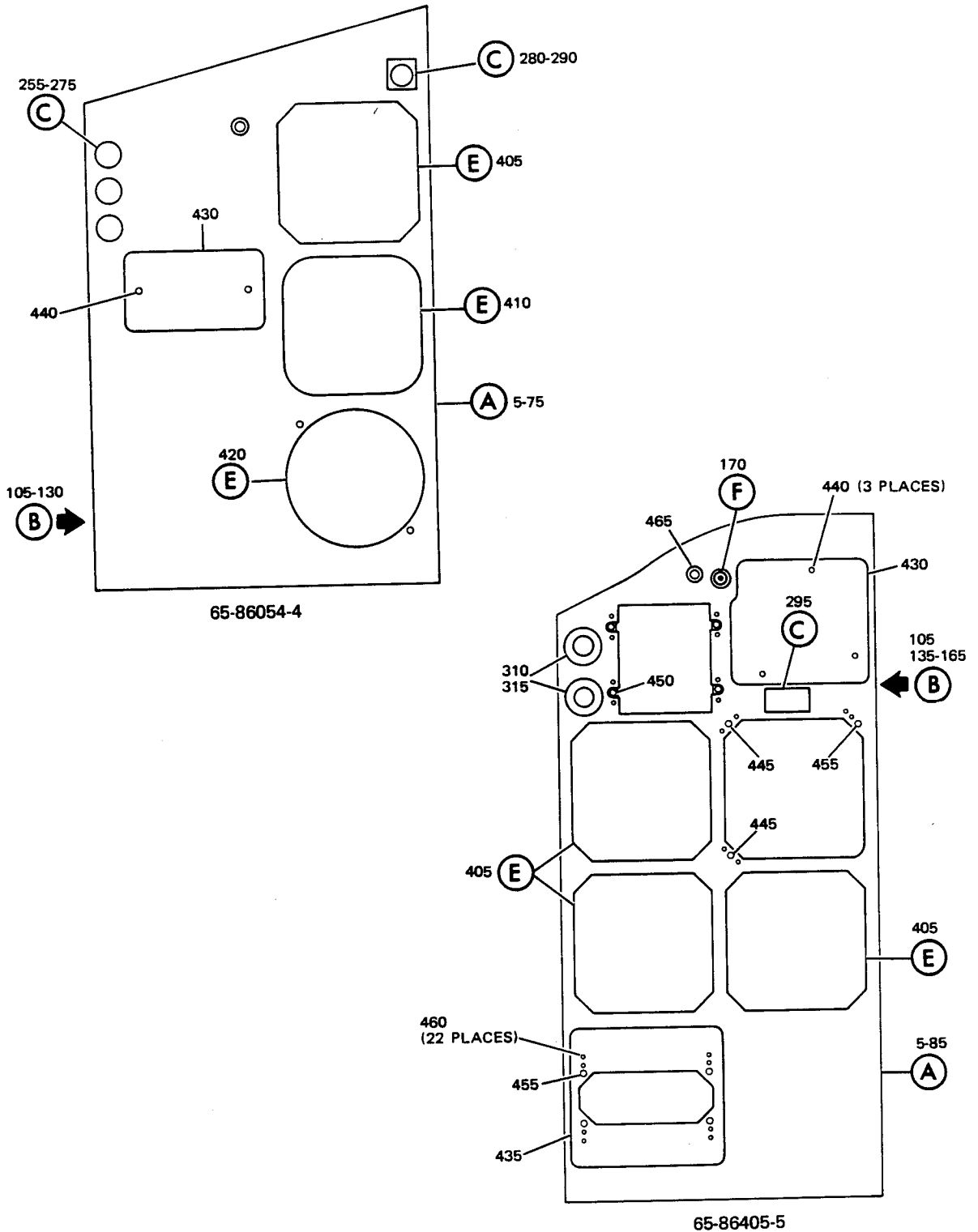
65-86054-7



65-86054-8

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

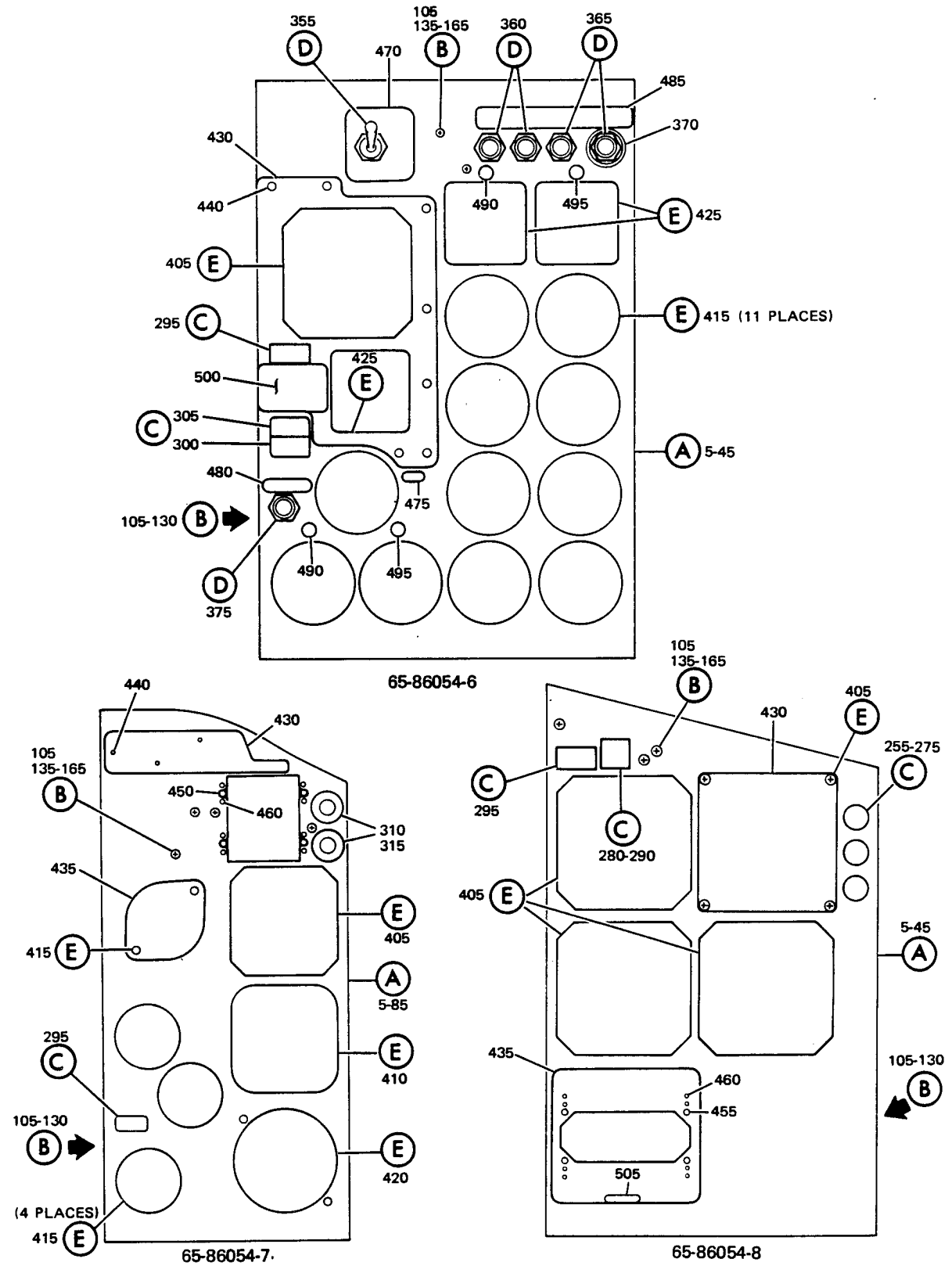
3. ILLUSTRATED PARTS LIST



Flight Instrument Module Assemblies
 Figure 4 (Sheet 1)

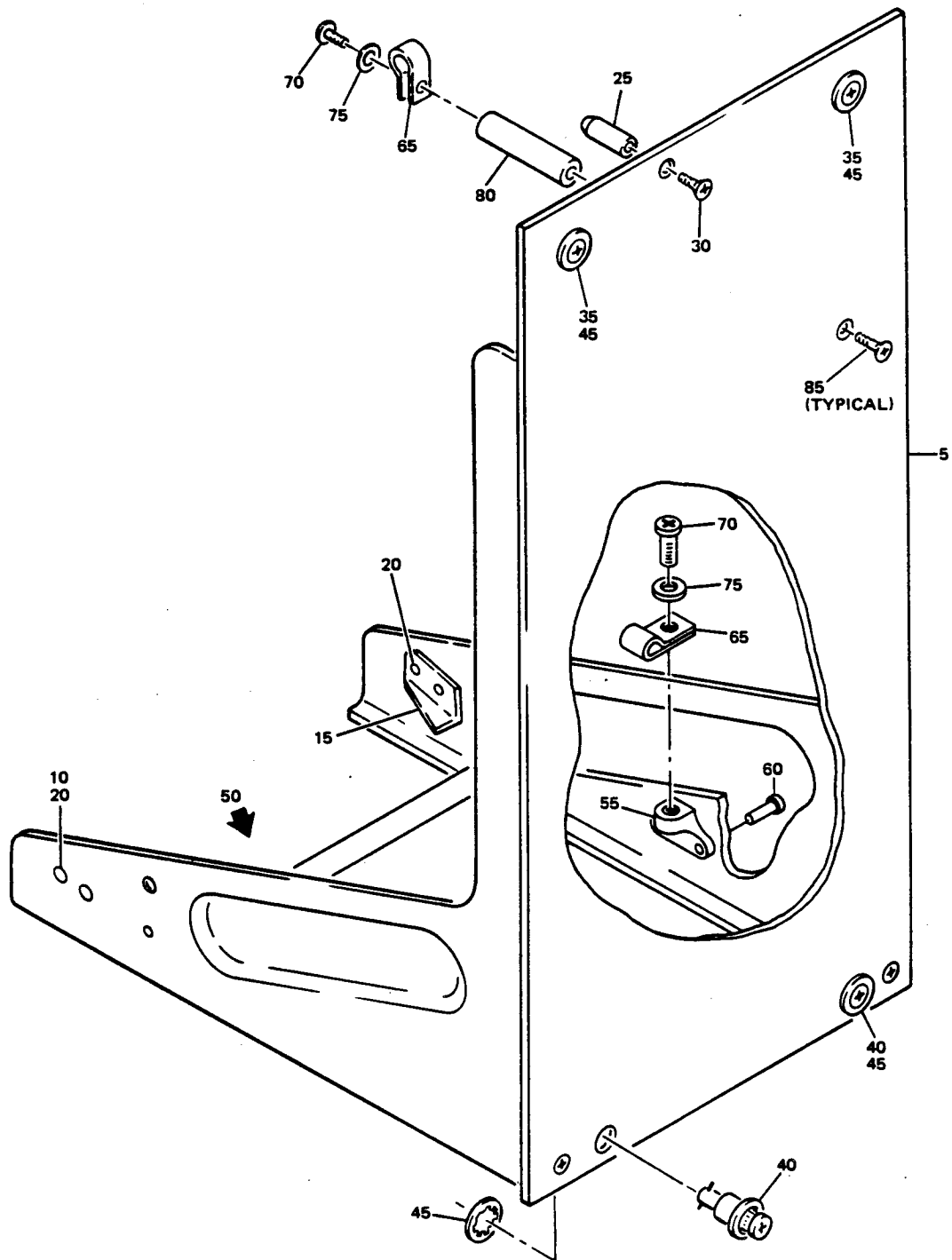
BOEING
COMMERCIAL JET
OVERHAUL MANUAL

65-86054



Flight Instrument Module Assemblies
 Figure 4 (Sheet 2)

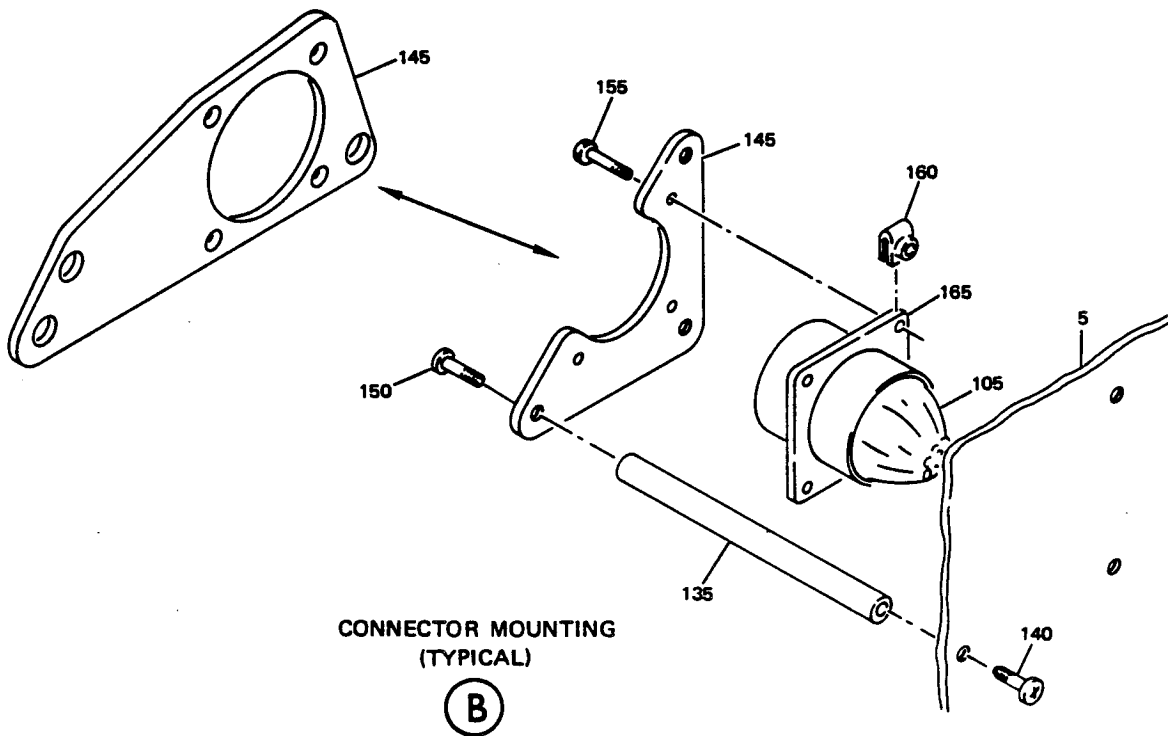
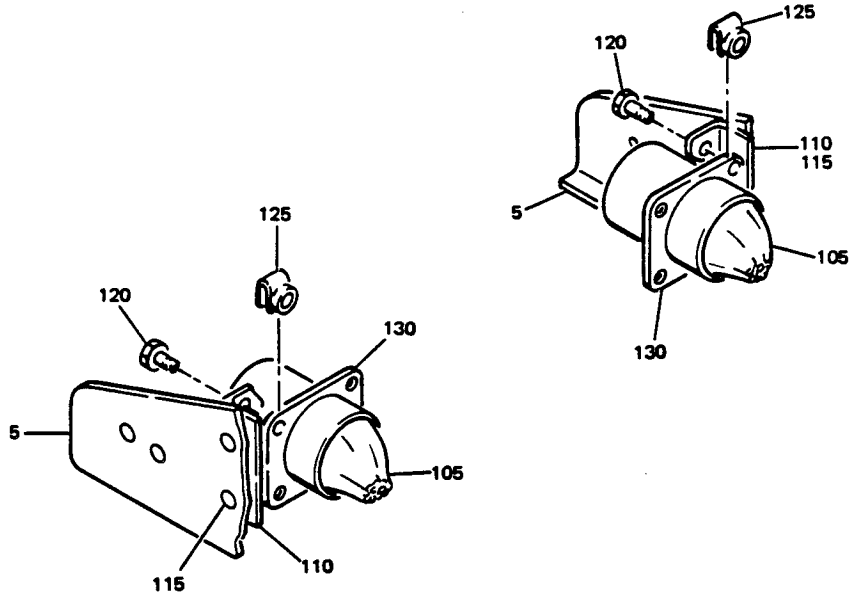
BOEING 
COMMERCIAL JET
OVERHAUL MANUAL



BASIC FRAME

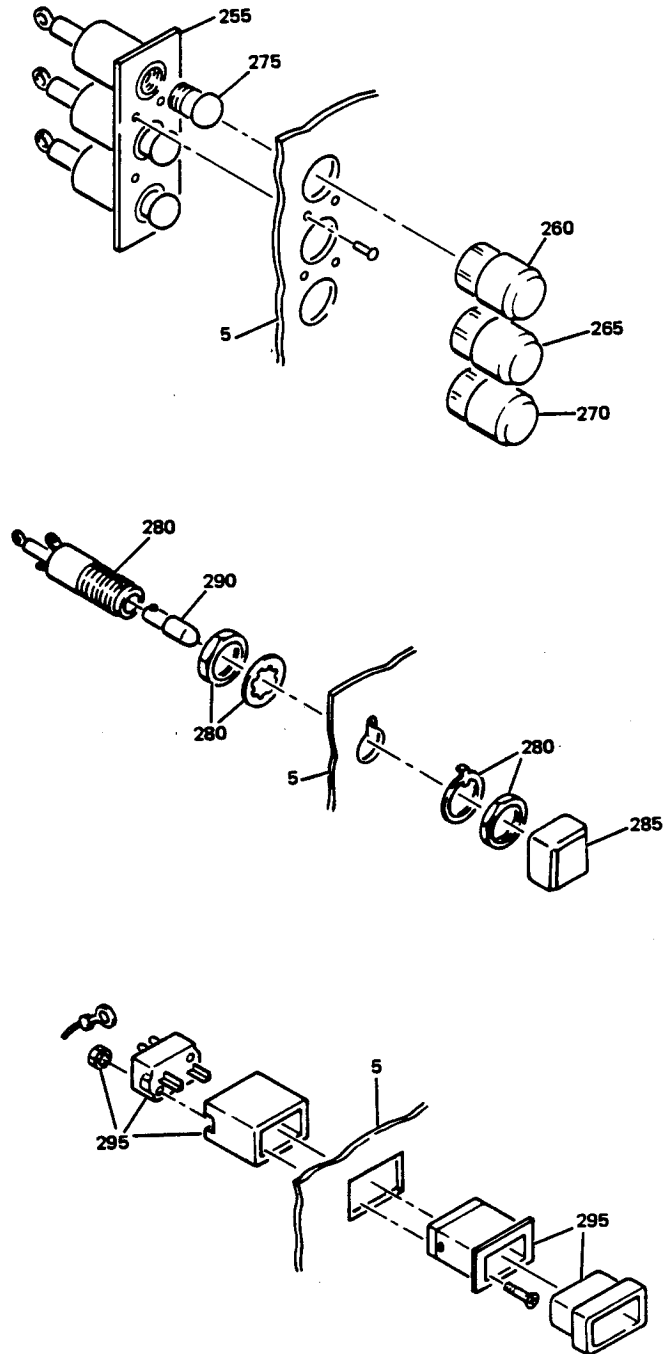


Flight Instrument Module Assemblies
Figure 4 (Sheet 3)



Flight Instrument Module Assemblies
 Figure 4 (Sheet 4)

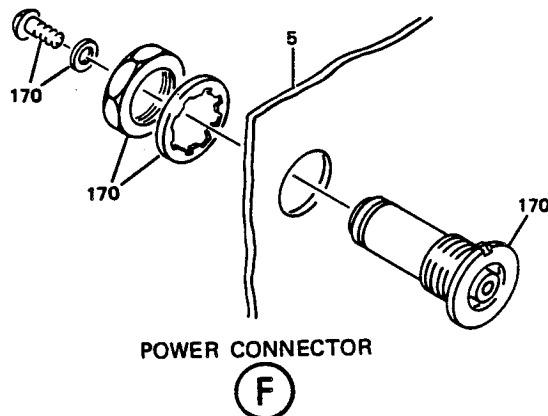
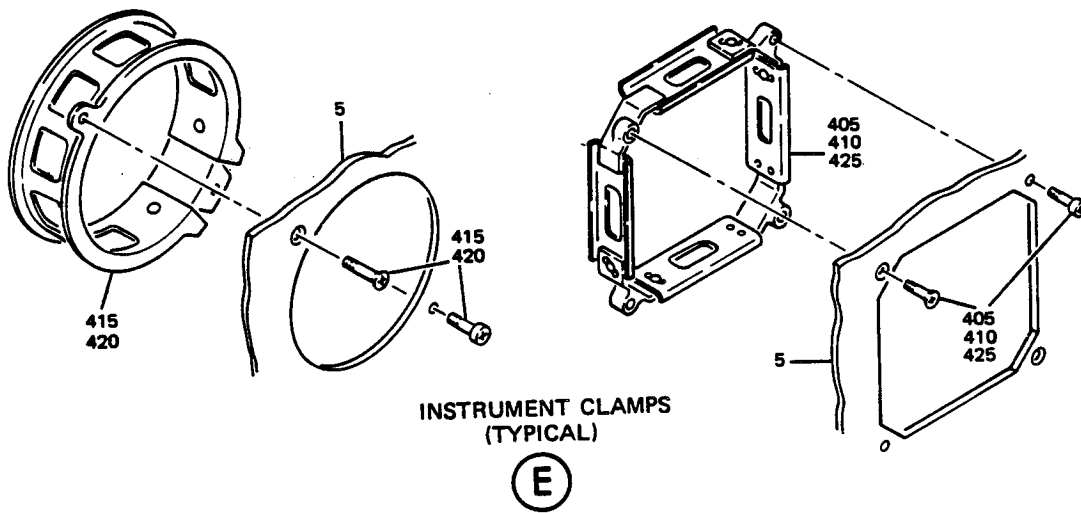
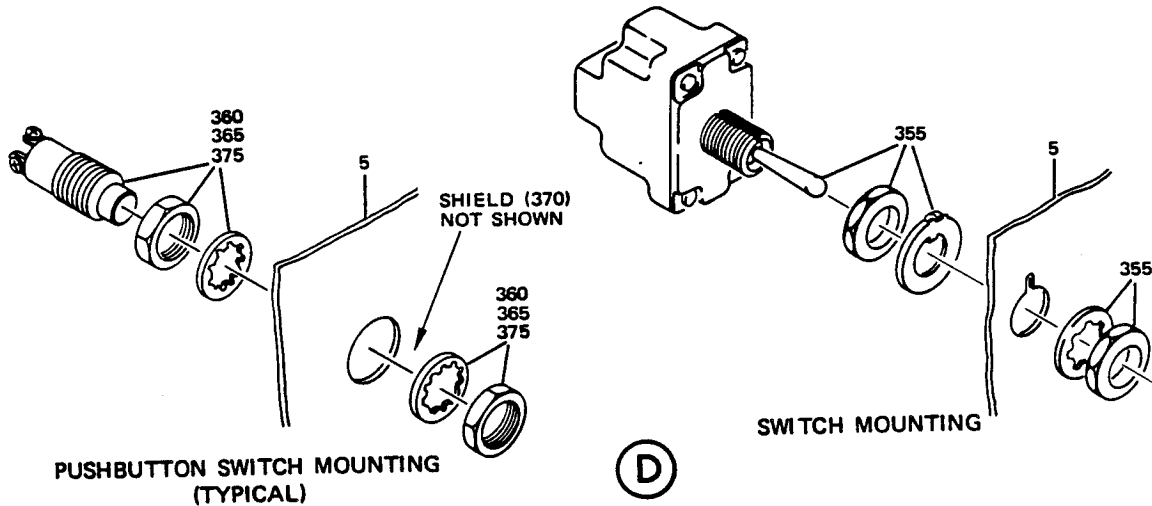
BOEING 
COMMERCIAL JET
OVERHAUL MANUAL



INDICATOR LIGHT



Flight Instrument Module Assemblies
Figure 4 (Sheet 5)



Flight Instrument Module Assemblies
 Figure 4 (Sheet 6)

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	N O M E N C L A T U R E							USE CODE	QTY PER ASSY
			1	2	3	4	5	6	7		
4-1	65-80654-4									A	
1	65-80654-5									B	
1	65-80654-6									C	
1	65-80654-7									D	
1	65-80654-8									E	
			<u>BASIC FRAME (ITEMS 5 THRU 100)</u>								
5	69-37300-32									A	1
5	69-37302-43									B	1
5	69-37304-98									C	1
5	69-37308-99									D	1
5	69-37310-38									E	1
10	69-43831-1										1
15	69-43831-2										1
20	BACR15BA4D										2
25	69-42739-1										2
30	NAS514P832-6										2
35	26S55-6AB										2
40	26S55-5AB										2
45	BACW10X4										4
-50	BACN10MK3-45									A	1
-50	BACN10MS3-12									B	1
55	BACN10MK3-45									B	1
60	BACR15BA3D									A	2
60	BACR15BA3D									B	4
65	BACC10DK									A	1
65	BACC10DK									B	4
65	BACC10DK									D	3
70	BACS12CB3									A	1
70	BACS12CB3									B	4
70	BACS12CB3									D	3
75	AN96ODL									A	1
75	AN96ODL									B	4
75	AN96ODL									D	3
80	66-13524-3									D	2
85	NAS514P632-6									D	2
90 thru 100	NOT USED										

*[1] Cutouts modified per MR39118

- Item not illustrated

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

65-86054

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	N O M E N C L A T U R E							USE CODE	QTY PER ASSY
			1	2	3	4	5	6	7		
4-			<u>WIRE BUNDLES AND CONNECTORS (ITEMS 105 - 250)</u>								
105	61-30033-009		. WIRE BUNDLE							A	1
105	61-30037-030		. WIRE BUNDLE							B	1
105	61-30064-007		. WIRE BUNDLE							C	1
105	61-30039-022		. WIRE BUNDLE							D	1
105	61-30045-023		. WIRE BUNDLE							E	1
110	69-43873-3		. SUPPORT, CONNECTOR							A	1
110	69-43873-9		. SUPPORT, CONNECTOR							C	1
110	69-43873-5		. SUPPORT, CONNECTOR							D	1
115	BACR15BA5D		. RIVET							ACDE	2
120	BACS12CB04-6		. SCREW							ACDE	3
125	BACN10NW1		. CLIPNUT							ACDE	3
130	BACC45FN16-24P6		. CONNECTOR							A	1
130	BACC45FN22-55P		. CONNECTOR							C	1
130	BACC45FN12-12P6		. CONNECTOR							D	1
130	BACC45FN12-12P		. CONNECTOR							E	1
135	66-13524-6		. SPACER							BD	3
135	66-13524-12		. SPACER							C	3
135	66-13524-7		. SPACER							E	3
140	NAS514P632-6		. SCREW							BCDE	3
145	69-43873-4		. SUPPORT							B	1
145	69-49743-2		. SUPPORT							C	1
145	69-49743-7		. SUPPORT							DE	1
145	69-49743-1		. SUPPORT							E	1
150	BACS12CB06-5		. SCREW							BCD	3
150	BACS12CB06-6		. SCREW							E	3
155	BACS12CB04-6		. SCREW							BCDE	3
160	BACN10NW1		. CLIPNUT							BCDE	3
165	BACC45FN18-31P		. CONNECTOR							B	1
165	BACC45FN22-19P		. CONNECTOR							C	1
165	BACC45FN16-24P7		. CONNECTOR							D	1
165	BACC45FN12-12P8		. CONNECTOR							E	1
170	SCN001		. POWER CONNECTOR, V26742							B	1
175 thru 250	NOT USED										

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	N O M E N C L A T U R E							USE CODE	QTY PER ASSY
			1	2	3	4	5	6	7		
4-			<u>INDICATORS (ITEMS 255 thru 350)</u>								
255	074-1012-002		. INDICATOR LIGHT, V81590							AE	1
260	539-1012-002		. CAP, AIRWAYS, V81590							AE	1
265	539-1012-003		. CAP, MIDDLE, V81590							AE	1
270	539-1012-004		. CAP, OUTER, V81590							AE	1
275	MS15571-2		. BULB							AE	3
280	088-1031-003		. INDICATOR LIGHT, V81590							AE	1
285	515-1031-003		. CAP, V81590							AE	1
290	1864		. BULB							AE	1
295	318-630-1001-137		. INDICATOR LIGHT, V81590 (BOEING 10-61803-176)							BE	1
295	319-619-1002-005		. INDICATOR LIGHT, V81590 (BOEING 10-61305-19)							C	1
295	319-619-1001-005		. INDICATOR LIGHT, V81590 (BOEING 10-61305-10)							D	1
300	319-619-1001-068		. INDICATOR LIGHT, V81590 (BOEING 10-61305-89)							C	1
305	319-619-1001-069		. INDICATOR LIGHT, V81590 (BOEING 10-61305-90)							C	1
310	8346-1CODE1-131		. PHOTOCELL, V82219							B	2
310	21K187		. PHOTOCELL, V81590 (opt)							BD	2
315	346-1001-001		. RECEPTACLE, V81590							BD	2
320 thru 350	NOT USED										
			<u>SWITCHES (ITEMS 355 thru 400)</u>								
355	68AT11-1		. SWITCH, V91929							C	1
360	W20161-01		. SWITCH, PUSHBUTTON, V81640							C	2
365	W20163-03		. SWITCH, PUSHBUTTON, V81640							C	2
370	A120-017		. SHIELD, V81640							C	1
375	4PB11-T2		. SWITCH, V91929							C	1
380 thru 400	NOT USED										

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

65-86054

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	N O M E N C L A T U R E							USE CODE	QTY PER ASSY
			1	2	3	4	5	6	7		
4-			INSTRUMENT MOUNTINGS, MARKERS, AND MISCELLANEOUS (ITEMS 405 AND ON)								
405	123-3		.							ACD	1
405	9963		.							ACD	1
405	54621		.							ACD	1
405	123-3		.							BE	3
405	9963		.							BE	3
405	54621		.							BE	3
405	123-3		.							E	4
405	9963		.							E	4
405	54621		.							E	4
410	52321		.							AD	1
415	BACC10EL3		.							C	11
415	BACC10EL3		.							D	4
420	BACC10EL4		.							AD	1
425	19748		.							C	3
430	69-64990-4		.							A	1
430	69-64990-3		.							B	1
430	69-64990-1		.							C	1
430	69-64990-5		.							D	1
430	66-18905-1		.							E	1
435	69-64990-2		.							BE	1
435	63-10103-2		.							D	1
440	BACR15BA5D		.							A	2
440	BACR15BA5D		.							BD	3
440	BACR15BA5D		.							C	9
445	BACN10JP06A		.							B	2
450	NAS697A04L		.							BD	4
455	BACN10JP06B		.							E	4
455	BACN10JP06B		.							B	5
460	BACR15BA3D		.							B	22
460	BACR15BA3D		.							DE	8
465	BACN10PA06-12		.							B	2
470	BAC27DCC31		.							C	1
475	BAC27DCC16		.							C	1
480	BAC27DCC65		.							C	1
485	BAC27DCC266		.							C	1
490	BACM10N00-2S		.							C	2
495	BACM10N00-2T		.							C	2
500	BAC27DCC751		.							C	1
505	BAC27DCC96		.							E	1

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

Reference Designation Index (See Schematic Diagram)		
Reference Designation	Part Number	Item No.
D425J	BACC45FN18-31P	165
D429J	BACC45FN12-12P	130
D431J	BACC45FN16-24P6	130
D475J	BACC45FN12-12P6	130
D543J	BACC45FN12-12P8	165
D645J	BACC45FN16-24P7	165
D4246J	BACC45FN22-19P	165
D4256J	BACC45FN12-55P	130
L334	319-619-1002-005	295
L335, L336	074-1012-002	255
L337	SCN001	170
L338, L339	088-1031-003	280
L376	319-619-1001-005	295
L441	319-619-1001-068	300
L442	319-619-1001-069	305
L734, L735	318-630-1001-137	295
M377-M380	346-1007-001	315
S257	4FB11-T2	375
S270	68AT11-1	355
S289, S315	W20161-01	360
S300, S316	W20163-03	365

BOEING 
COMMERCIAL JET
OVERHAUL MANUAL

65-80654

VENDORS

V01378 DEL ELECTRONICS CORP., 250 EAST SANFORD BLVD., MT. VERNON, NEW YORK
10550

V26742 METHODE ELECTRONICS INCORPORATED, 7447 WEST WILSON AVE., CHICAGO
ILLINOIS 60656

V71286 REX CAHINBELT INC., CAMLOC DIVISION, 22 SPRING VALLEY ROAD, PARAMUS,
NEW JERSEY 07652

V81590 KORRY MANUFACTURING CO., 223 - 8TH AVE. NO., SEATTLE, WASHINGTON
98109

V81640 CONTROL SWITCH DIVISION, CONTROLS CO. OF AMERICA, 1420 DELMAR DRIVE,
FOLCROFT, PENNSYLVANIA 19032

V82219 SYLVANIA ELECTRIC PRODUCTS INC., TUBE DIVISION, EMPORIUM,
PENNSYLVANIA 15834

V91893 MARION SCREW PRODUCTS CO., 200 WEST SHERMAN STREET, INDIANAPOLIS,
INDIANA 46206

V91929 HONEYWELL INC., MICRO SWITCH DIVISION, CHICAGO AND SPRING STREETS,
FREEPORT, ILLINOIS 61032

V98625 AEROQUIP CORPORATION, MARMAN DIVISION, 11214 EXPOSITION BLVD.,
LOS ANGELES, CALIFORNIA 90064