

OVERHAUL MANUAL

TO: ALL HOLDERS OF AUTO THROTTLE CLUTCH AND CAM ASSEMBLY OVERHAUL MANUAL,  
 22-34-02

REVISION NO. 8, DATED MAR 5/84

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D & O	D / A s s y	C l e a n i n g	I n s p / C h k	R e p a i r	A s s y	F / C	T e s t	T / S h o o t i n g	S / T o o l s	S t o r a g e	I P L	L / O v e r h a u l
Added 65-42354-10 clutch assembly per SB 737-22-1053												X	

# AUTO THROTTLE CLUTCH AND CAM ASSEMBLY

## 22-34-02

BOEING P/N 65-42355-1 thru -8, -17 thru -20, -27 thru -32, -34, -36 thru  
 -39, -41 thru -44, -47 thru -68  
 65-80025-4 thru -9  
 65C14098-11 thru -13, -15 thru -17  
 65V18297-101, -104 thru -108, -201 thru -206, -211 thru -216

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 30253	May 15/67
		PRR 30431	May 15/67
		PRR 30747	Nov 15/68
		PRR 30789	Nov 15/68
		PRR 31113	Nov 15/68
71-1016, Rev 1(737)		MC 3510-4K	Feb 10/70
27-102, Rev 2 (727)		PRR 22340, -1	Feb 10/70
22-40 (727)		PRR 23174	Feb 10/70
22-1003, Rev 1(737)		PRR 31301-1	Feb 10/70
22-1008(737)		PRR 31579	Feb 10/70
		PRR 31789	Feb 10/70
		PRR 31883	Feb 10/70
27-1031, Rev 2(737)		PRR 31910	Aug 10/70
22-1011(737)			Aug 10/71
22-1012(737)			Aug 10/71
		PRR 23480-16	Mar 10/72
		PRR 23721-2	Aug 10/74
		PRR 23795	Feb 10/75

**BOEING**   
**COMMERCIAL JET**

OVERHAUL MANUAL

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 24037	Nov 10/77
		PRR 32636	Nov 10/77
31-1024(737)		PRR 32432R	Jan 5/78
		PRR 24031	Jan 5/78
27-171(727)		PRR 24031R	May 10/78
31-26(727)		PRR 24037R	May 10/79
31-36(727)		MC 2910-111	May 10/79
27-171R1(727)		PRR 24031R	May 10/79
71-1053(737)		MC 3510-14K	Jul 5/79
22-1053 (737)		PRR 32900-3	Jul 5/80
		PRR 32912-2	Jul 5/80
		MC 2910-136	Jul 5/80
22-1053 (737)			Mar 5/84

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
22-34-02					
* T-1	Mar 5/84				
* T-2	Mar 5/84				
* LEP-1	Mar 5/84				
LEP-2	BLANK				
T/C-1	Nov 10/76				
T/C-2	BLANK				
1	Jul 5/80				
2	Jul 5/80				
3	Jul 5/80				
4	Jul 5/80				
5	Jul 5/80				
6	Jul 5/80				
7	Jul 5/80				
8	Jul 5/80				
9	Jul 5/80				
10	Jul 5/80				
* 11	Mar 5/84				
12	BLANK				

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

TABLE OF CONTENTS

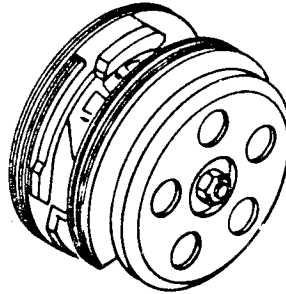
<u>Paragraph Title</u>	<u>Page</u>
Description and Operation . . . . .	1
Disassembly . . . . .	2
Cleaning. . . . .*[1]	
Inspection/Check. . . . .*[1]	
Repair. . . . .	2
Assembly. . . . .	3
Fits and Clearances (not applicable)	
Testing (not applicable)	
Trouble Shooting (not applicable)	
Storage Instructions. . . . .*[1]	
Special Tools, Fixtures and Equipment (not applicable)	
Illustrated Parts List. . . . .	4

\*[1] Special instructions not required. Use standard industry practices.

65-42355  
65-80025  
65C14098  
65C18297

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

AUTO THROTTLE CLUTCH AND CAM ASSEMBLY



Auto Throttle Clutch and Cam Assembly  
Figure 1

1. DESCRIPTION AND OPERATION

- A. The auto throttle clutch and cam assembly is part of the auto throttle clutch system which connects the autopilot with the throttle system. The assembly consists of two nonadjustable cams, one adjustable cam and a ball-type clutch.
- B. During manual operation the input quadrant of the clutch releases the clutch mechanism and directly drives the clutch output quadrant. During auto throttle operation a servomotor drives the clutch, which drives both input and output quadrants. The cams actuate control and warning horn switches during both manual and auto throttle operation.

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

65-42355  
65-80025  
65C14098  
65C18297

C. Leading Particulars (Approximate)

Length -- 4.3 inches  
Diameter -- 6.4 inches  
Weight -- 6 pounds

2. DISASSEMBLY (Fig. 2)

- A. Remove screws (1), washers (2), and cam (3) from cam (6).
- B. Remove screws (4) and washers (5) and withdraw cam (6) from clutch (14).

NOTE: Do not remove inserts (8, 9) from cam (7) unless repair or replacement is necessary.

- C. Remove nuts (10), washers (11), bolts (12), and cam (13) from clutch (14). Use Allen wrench in shank of bolt (12) to hold bolt while removing nut (10).

NOTE: Do not disassemble cam assy (13) (if used) unless repair or replacement is necessary.

- D. Refer to 22-34-11 for overhaul of clutch (14).

3. REPAIR (Fig. 2)

- A. Repair minor defects using standard industry practices.
- B. Refinish

NOTE: Refer to 20-30-02 for stripping of protective finishes and to 20-41-01 for explanation of F and SRF codes.

- (1) Cams (3, 7) -- Chromic acid anodize (F-2.20) all over. Material: Alum alloy.
- (2) Cams (13, 13A) -- Chromic acid anodize (F-2.20) all over for 69-53132 and 69-63586 cams made of aluminum as optional material. No finish on cams made of Delrin 500 or Nylon 6/6.
- (3) Plate (13D) -- Chromic acid anodize and apply primer, BMS 10-11, type 1 (F-18.13). Material: Alum alloy.

65-42355  
65-80025  
65C14098  
65C18297

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

C. Replacement

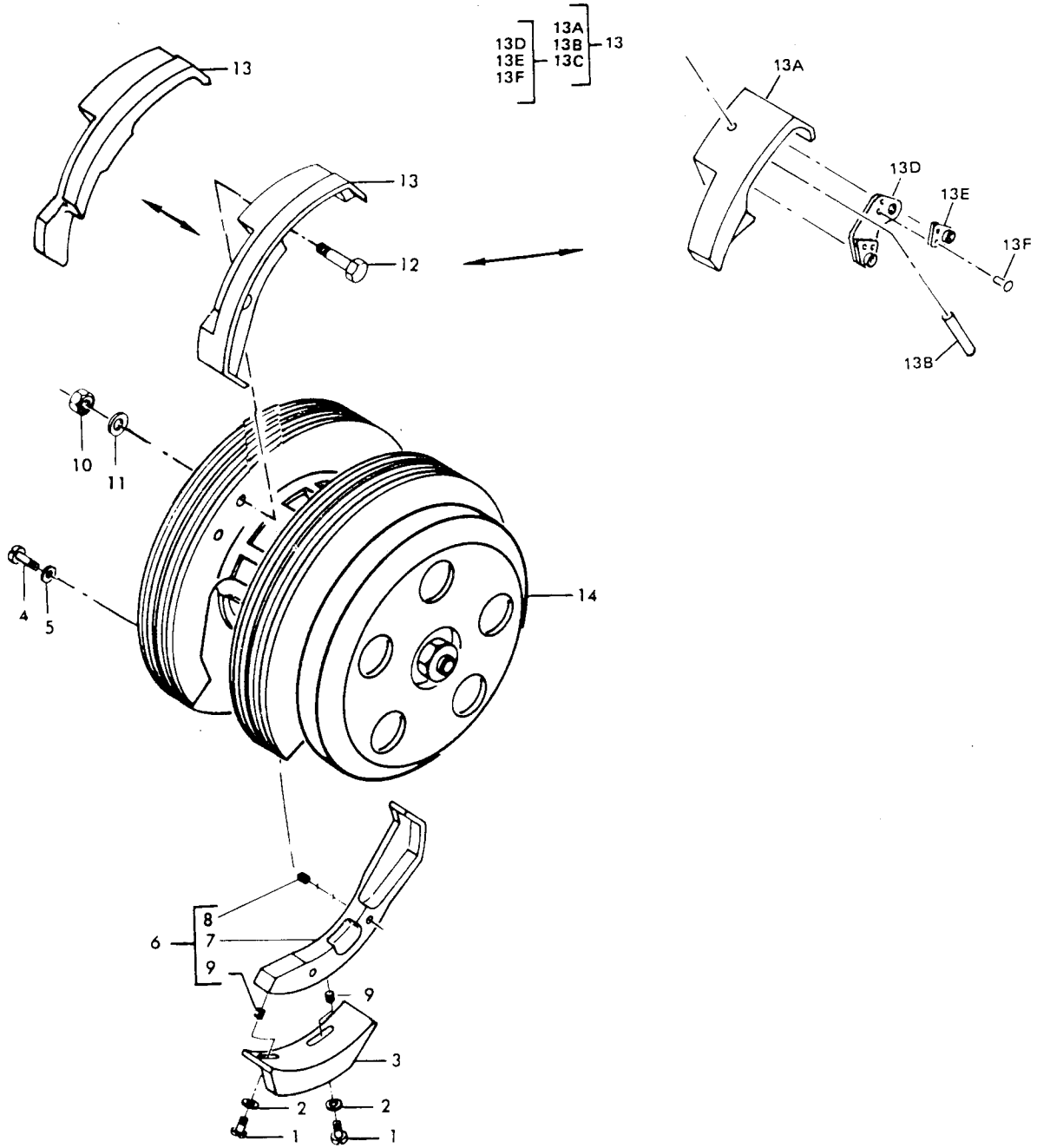
- (1) Inserts (8, 9)
  - (a) Remove insert from cam.
  - (b) Clean and check condition of bore in cam.
  - (c) Apply primer, BMS 10-11, type 1, in bore and on insert.
  - (d) Install insert in bore while primer is wet, 3/4 to 1-1/2 turns below surface of cam. Remove tang.
- (2) Cam assy (13) (69-71556-1, -2)
  - (a) Drive out pin (13B) and separate nutplate assy (13C) from cam (13A).
  - (b) Drill out rivets (13F). Install new nutplate (13E) with new rivets.
  - (c) Install nutplate assy (13C) and pin (13B). Drive pin into cam until inside end is flush to 0.02 inch below inner surface of cam.

4. ASSEMBLY (Fig. 2)

- A. Install cam (13), bolts (12), washers (11), and nuts (10) on new or overhauled clutch (14). Use Allen wrench in end of shank on bolts (12) to hold bolt while tightening nuts (10). Profile of cam must coincide with outer periphery of adjacent quadrant within 0.010 inch.
- B. Install cam (6), washers (5) and screws (4) on clutch (14). Profile of cam must coincide with outer periphery of adjacent quadrant within 0.010 inch.
- C. Install cam (3), washers (2) and screws (1) on cam (6). Profile of cam (3) must coincide with outer periphery of adjacent quadrant within 0.010 inch.



5. ILLUSTRATED PARTS LIST



Auto Throttle Clutch and Cam Assembly  
 Figure 2

65-42355  
 65-80025  
 65C14098  
 65C18297

**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		
2-	65-42355-1									A	RF
	65-42355-2									B	RF
	65-42355-3									C	RF
	65-42355-4									D	RF
	65-42355-5									E	RF
	65-42355-6									F	RF
	65-42355-7									G	RF
	65-42355-8									H	RF
	65-42355-17									I	RF
											(SB 27-102)
	65-42355-18									J	RF
	65-42355-19									K	RF
	65-42355-20									L	RF
	65-42355-27									M	RF
	65-42355-28									N	RF
	65-42355-29									O	RF
	65-42355-30									P	RF
	65-42355-31									Q	RF
											(SB 71-1016)
	65-42355-32									R	RF
											(SB 71-1016)
	65-42355-34									S	RF
											(SB 22-1003)
	65-42355-36									T	RF
											(SB 22-1003)
	65-42355-37									U	RF
											(SB 22-40)
	65-42355-38									V	RF
											(SB 22-40)
	65-42355-39									W	RF
											(SB 22-40)
	65-42355-41									X	RF
											(SB 22-1008)
	65-42355-42									Y	RF
											(SB 22-1008)
	65-42355-43									Z	RF
											(SB 22-1008)
	65-42355-44									BA	RF
											(SB 22-1008)
	65-42355-47									CA	RF
	65-42355-48									DA	RF
	65-42355-49									EA	RF
											(SB 22-1012)
	65-42355-50									FA	RF

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

65-42355  
65-80025  
65C14098  
65C18297

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		
2-	65-42355-51									GA	RF
	65-42355-52									HA	RF
	65-42355-53									IA	RF
	65-42355-54									JA	RF
	65-42355-55									KA	RF
	65-42355-56									LA	RF
	65-42355-57									MA	RF
	65-42355-58									NA	RF
	65-80025-4									OA	RF
	65-80025-5									PA	RF
	65-80025-6									QA	RF
	65-80025-7									RA	RF
	65-80025-8									SA	RF
	65-80025-9									TA	RF
	65-42355-59									UA	RF
	65-42355-60									VA	RF
	65-42355-61									WA	RF
	65-42355-62									XA	RF
	65-42355-63									YA	RF
	65-42355-64									ZA	RF
	65C18297-104									CB	RF
	65C18297-105									DB	RF
	65C18297-106									EB	RF
	65C18297-107									FB	RF
	65C18297-108									GB	RF
	65C18297-211									HB	RF
	65C18297-212									IB	RF

65-42355  
 65-80025  
 65C14098  
 65C18297

**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
2	65C18297-213		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 31-1024) *[1]						JB	RF	
	65C18297-214		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 31-1024) *[2]						KB	RF	
	65C18297-215		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 31-1024) *[2]						LB	RF	
	65C18297-216		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 31-1024) *[2]						MB	RF	
	65C18297-101		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 27-171, 31-36)						NB	RF	
	65C18297-201		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171)						OB	RF	
	65C18297-202		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171)						PB	RF	
	65C18297-203		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171)						QB	RF	
	65C18297-204		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171)						RB	RF	
	65C18297-205		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171)						SB	RF	
	65C18297-206		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 27-121, 31-26, 27-171, 31-36)						TB	RF	
	65C14098-11		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[1]						UB	RF	
	65C14098-12		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[2]						VB	RF	
	65C14098-13		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[3]						WB	RF	
	65C14098-15		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[2]						XB	RF	
	65C14098-16		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[3]						YB	RF	
	65C14098-17		CLUTCH AND CAM ASSY - AUTO THROTTLE (SB 71-1053) *[2]						ZB	RF	
		65-42355-65		CLUTCH AND CAM ASSY - AUTO THROTTLE						DC	RF
		65-42355-66		CLUTCH AND CAM ASSY - AUTO THROTTLE						EC	RF
		65-42355-67		CLUTCH AND CAM ASSY - AUTO THROTTLE						FC	RF
	65-42355-68		CLUTCH AND CAM ASSY - AUTO THROTTLE						GC	RF	
1	NAS601-6		. SCREW						EA -JA	2	
2	AN960PD6L		. WASHER						CB-TB EA-JA CB-MB	2	
3	69-33689-1		. CAM (USED ON 65-42355-1, -3, -5, -7, -18, -3, -55; 65C18297-101)							1	

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

65-42355 65C14098  
65-80025 65C18297

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		
2-3	69-33689-2		. CAM (USED ON 65-42355-2, -4, -6, -8, -17, -19, -20, -38, -39, -56; 65C18297-201 thru -206)								1
3	69-33689-5		. CAM (USED ON 65-42355-27, -29, -31, -41, -43, -47, -49, -51, -53; 65-80025-4, -6, -8; 65C18297-104 THRU -108; 65C14098-11, -12, -13)								1
3	69-33689-6		. CAM (DELETED BY SB 22-1003) (USED ON 65-42355-28, -30, -32; 65-80025-5, -6; 65C18297-213, -214)								1
3	69-33689-8		. CAM (ADDED BY SB 22-1003)							NPR	1
3	69-33689-8		. CAM (USED ON 65-42355-34, -36, -42, -44, -48, -50, -52, -54; 65-80025-5, -7, -9; 65C18297-211, -212, -215, -216; 65C14098-15, -16, -17)								1
3	69-33689-9		. CAM (USED ON 65-42355-57, -59, -61, -63)								1
3	69-33689-10		. CAM (USED ON 65-42355-58, -60, -62, -64)								1
4	NAS623-3-2		. SCREW								2
5	AN960 PD10L		. WASHER								2
6	69-34759-1		. CAM ASSY (USED ON 65-42355-1, 3, -7, -18, -27, -29, -37, -41, -43, -49, -51, -55, -57, -61, -63; 65-80025-4, -6; 65C18297-101, -104, -106, -107; 65C14098-11, -12, -13)								1
6	69-34759-2		. CAM ASSY (DELETED BY SB 22-1003) (USED ON 65-42355-2, -4, -6, -8, -17, -19, -20, -28, -30, -32, -37, -38, -56, -58; 65-80025-5, -7; 65C18297-201 THRU -206, -213, -214)								1
6	69-34759-6		. CAM ASSY (ADDED BY SB 22-1003)							NPR	1
6	69-34759-6		. CAM ASSY (USED ON 65-42355-34, -36, -42, -43, -50, -52; 65-80025-5, -7; 65C18297-211, -215; 65C14098-15, -16, -17)								1

65-42355  
 65-80025  
 65C14098  
 65C18297

**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		
2-6	69-61753-1		.	.	.	.	.	.	.		1
6	69-61753-2		.	.	.	.	.	.	.		1
6	69-67423-1		.	.	.	.	.	.	UA		1
6	69-67423-2		.	.	.	.	.	.	VA		1
7	69-34759-3		.	.	.	.	.	.			1
7	69-34759-4		.	.	.	.	.	.			1
7	69-34759-5		.	.	.	.	.	.			1
7	69-61753-3		.	.	.	.	.	.			1
7	69-34759-3		.	.	.	.	.	.			1
7	69-61753-4		.	.	.	.	.	.			1
7	69-34759-5		.	.	.	.	.	.			1
7	69-67423-3		.	.	.	.	.	.			1
7	69-67423-4		.	.	.	.	.	.			1
8	MS21209F1-20		.	.	.	.	.	.			2
9	MS21209C06-20		.	.	.	.	.	.			2
10	BACN10JC3		.	.	.	.	.	.			2
11	AN960PD10L		.	.	.	.	.	.			2
12	BACB30FM6-4		.	.	.	.	.	.	A-EC		2
12	NAS6603-6		.	.	.	.	.	.	FC GC		2
13	69-33919-3		.	.	.	.	.	.	ACEGJ		1
13	69-33919-4		.	.	.	.	.	.	U		1
13	69-53132-1		.	.	.	.	.	.	BDFHK		1
13	69-55904-1		.	.	.	.	.	.	V		1
13	69-55904-2		.	.	.	.	.	.	ILW		1
13	69-55904-3		.	.	.	.	.	.	MOX		1
13	69-55904-4		.	.	.	.	.	.	NPSY		1
13	69-55904-5		.	.	.	.	.	.	QZ		1
13	69-55904-6		.	.	.	.	.	.	RT BA		1
13	65-80023-1		.	.	.	.	.	.	CA		1
13	65-80023-2		.	.	.	.	.	.	DA		1
13	65-80023-3		.	.	.	.	.	.	EA OA		1
13	65-80023-4		.	.	.	.	.	.	FA PA		1
13	65-80023-5		.	.	.	.	.	.	GA QA		1
13	65-80023-6		.	.	.	.	.	.	HA RA		1
13	65-80023-7		.	.	.	.	.	.	LA SA		1
13	65-80023-8		.	.	.	.	.	.	JA TA		1
13	69-63586-1		.	.	.	.	.	.	UB-WB		1
			.	.	.	.	.	.	XB-ZB		1
			.	.	.	.	.	.	LA NA		1
			.	.	.	.	.	.	VA		1

**BOEING**   
**COMMERCIAL JET**  
**OVERHAUL MANUAL**

65-42355  
65-80025  
65C14098  
65C18297

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					
2-13	69-63586-2		.	C	A	M					KA MA UA	1		
13	69-67645-3		.	C	A	M					WA	1		
13	69-67645-4		.	C	A	M					XA	1		
13	69-67645-5		.	C	A	M					YA	1		
13	69-67645-6		.	C	A	M					CB-GB NB DC ZA EC HB-MB OB-TB	1		
13	69-71556-1		.	C	A	M	A	S	S		FC	1		
13	69-71556-2		.	C	A	M	A	S	S		GC	1		
13A	69-71556-3		.	.	C	A	M	(USED ON 69-712556-1)				1		
13A	69-71556-4		.	.	C	A	M	(USED ON 69-71556-2)				1		
13B	MS16562-20		.	.	P	I	N	(USED ON 69-71556-1, -2)				1		
13C	69-71557-1		.	.	N	U	T	P	L	A	S	S	(USED ON 69-71556-1)	1
13C	69-71557-2		.	.	N	U	T	P	L	A	S	S	(USED ON 69-71556-2)	1
13D	69-71557-3		.	.	.	P	L	A	T	E	(USED ON 69-71557-1)		1	
13D	69-71557-4		.	.	.	P	L	A	T	E	(USED ON 69-71557-2)		1	
13E	BACN10JP3D		.	.	.	N	U	T	P	L	A	T	2	
13F	BACR15BA3A		.	.	.	R	I	V	E	T			4	
14	65-42354-1		.	C	L	U	T	C	H	A	S	S	(REF 22-34-11)	1
14	65-42354-2		.	C	L	U	T	C	H	A	S	S	(REF 22-34-11)	1
14	65-42354-4		.	C	L	U	T	C	H	A	S	S	(REF 22-34-11)	1
14	65-42354-3		.	C	L	U	T	C	H	A	S	S	(OPT TO 65-42354-4) (REF 22-34-11)	1
14	65-42354-5		.	C	L	U	T	C	H	A	S	S	(REF 22-34-11)(REPLD BY 65-42354-7 PER SB 22-1008)	1
											AB OB CD PB E-IMN OA PA EB JB RB EFI QB J-L O-T OA RA SB			

65-42355  
 65-80025  
 65C14098  
 65C18297



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																		
2- 14	65-42354-5		.	CLUTCH	ASSY	(REF	22-34-11)	(OPT	TO	65-42354-7)	(REPLD	BY	65-42354-7	PER	SB	22-1008)	CA	DA	SA	TA	FB	GB	KB	LB	MB		1
14	65-42354-7		.	CLUTCH	ASSY	(REF	22-34-11)	(REPLS	65-42354-5	PER	SB	22-1008)	J-L						O-T								1
14	65-42354-7		.	CLUTCH	ASSY	(REF	22-34-11)												CA	DA	OA	TA	U-ZA			1	
14	65-42354-7		.	CLUTCH	ASSY	(REF	22-34-11)												DB	FB	HB	IB	NB	TB-ZB		1	
14	65-42354-10		.	CLUTCH	ASSY	(REF	22-34-11)												DC-GC							1	
14	65-42354-10		.	CLUTCH	ASSY	(REF	22-34-11)												DC-GC							1	

- \*[1] WITHOUT LUBE DECAL (REF 22-34-11)
- \*[2] WITH NON LUBE DECAL (REF 22-34-11)
- \*[3] WITH LUBE DECAL (REF 22-34-11)