TO: ALL HOLDERS OF ENGINE CONTROLS DRUM & BRAKE ASSEMBLY OVERHAUL MANUAL, 76-14-21

REVISION NO. 5, DATED JUL 1/00

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
Revised spring check loads				X									
Revised test loads								X					
Clarified disassembly and assembly procedure		X				X							

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ENGINE CONTROLS DRUM AND BRAKE ASSEMBLY

76-14-21

BOEING P/N 65-79475-2, -3, -5, -6, -8, -9, -11, -12, -14, -15, -19, -20
65-79474-2

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
71-1041	TR 76-1	MC 3510-53K	Jan 5/77
		PRR 32636	Jan 5/78
31-1-24		PRR 32432	Jan 5/78
		PRR 32976	Mar 1/95

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
	76-14-21					
	T-1	Mar 1/95				
	T-2	BLANK				
*	LEP-1	Jul 1/00				
	LEP-2	BLANK				
	T/C-1	Mar 1/95				
	T/C-2	BLANK				
	1	Mar 1/95				
*	2	Jul 1/00				
	2A	Mar 1/95				
	2B	BLANK				
	3	Mar 1/95				
*	4	Jul 1/00				
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*	6	Jul 1/00				
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	8	Mar 1/95				
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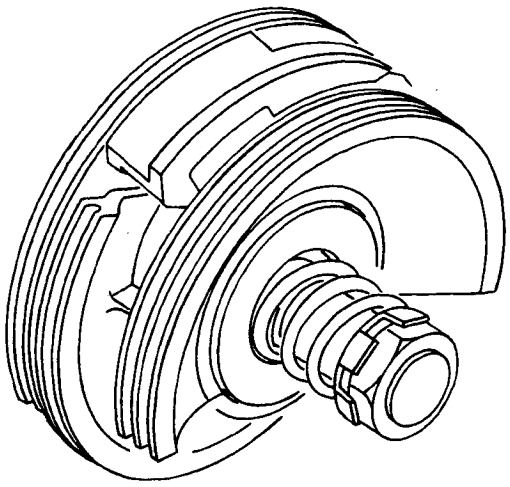
*[1] Special instructions not required. Use applicable procedures contained in 20-30-01, 20-30-03 and standard industry practices.

ENGINE CONTROLS DRUM AND BRAKE ASSEMBLY



Engine Controls Drum and Brake Assembly
Figure 1

1. DESCRIPTION AND OPERATION

A. The drum and brake assembly consists of a shaft and quadrant assembly, bearings, spring and braking surface, and switch actuating cam which mounts on the quadrant. The quadrant rotates about the shaft with the spring exerting a force against the braking surface to give the desired amount of friction.

B. Leading Particulars (Approximate)

Length -- 4.2 inches
Width -- 6.4 inches
Weight -- 5.1 pounds

2. DISASSEMBLY

A. On 65-79475-XX assemblies (Fig. 4):

(1) Remove parts (15 thru 35) and remove cam (5).

B. On 65-79474-1 assembly (Fig. 4):

(1) Straighten tang of washer (50) and remove nut (45).

(2) Remove parts (55, 60, 65) from shaft (70).

(3) Remove retainer (75) from shaft (70) and then remove shaft with bearings (85), retainer (80) and spacer (90) from quadrant assembly (95).

NOTE: Do not remove bearings (85) from shaft (70) unless repair or replacement is necessary.

C. On 65-79474-2 assembly (Fig. 5):

(1) Remove parts (315, 320) and remove cam (300).

(2) Straighten tang of washer (10) and remove nut (5).

(3) Remove parts (15, 20, 25) from shaft (30).

(4) Remove retainer (35) from shaft (30) and then remove shaft with bearings (45), retainer (40) and spacer (50) from quadrant assembly (55).

NOTE: Do not remove bearings (45) from shaft (30) unless repair or replacement is necessary.

3. INSPECTION/CHECK

A. Check all parts for obvious defects in accordance with standard industry practices.

B. Penetrant check per SOPM 20-20-02 -- Shaft (70, Fig. 4; 30, Fig. 5), retainer (55, Fig. 4; 15, Fig. 5), quadrant (100, Fig. 4; 60, Fig. 5).

C. Magnetic particle check per SOPM 20-20-01 -- Spring (60, Fig. 4; 20, Fig. 5), plate (65, Fig. 4; 25, Fig. 5), nut (45, Fig. 4; 5, Fig. 5).

D. Check spring (60, Fig. 4; 20, Fig. 5).

(1) Deflect spring to 1.33 in. and check that load is 63.8-77.8 lbs.

(2) Deflect spring to 1.15 in. and check that load is 92.2-114.2 lbs.

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4. REPAIR

A. Refinish

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

(1) Nut (45, Fig. 4; 50, Fig. 5) -- Phosphate coating (F-1.941) all over. Material: Steel, AMS 6381.

(2) Retainer (55, Fig. 4; 15, Fig. 5) -- Alodize (SRF-2.30) all over. Material: Al Alloy.

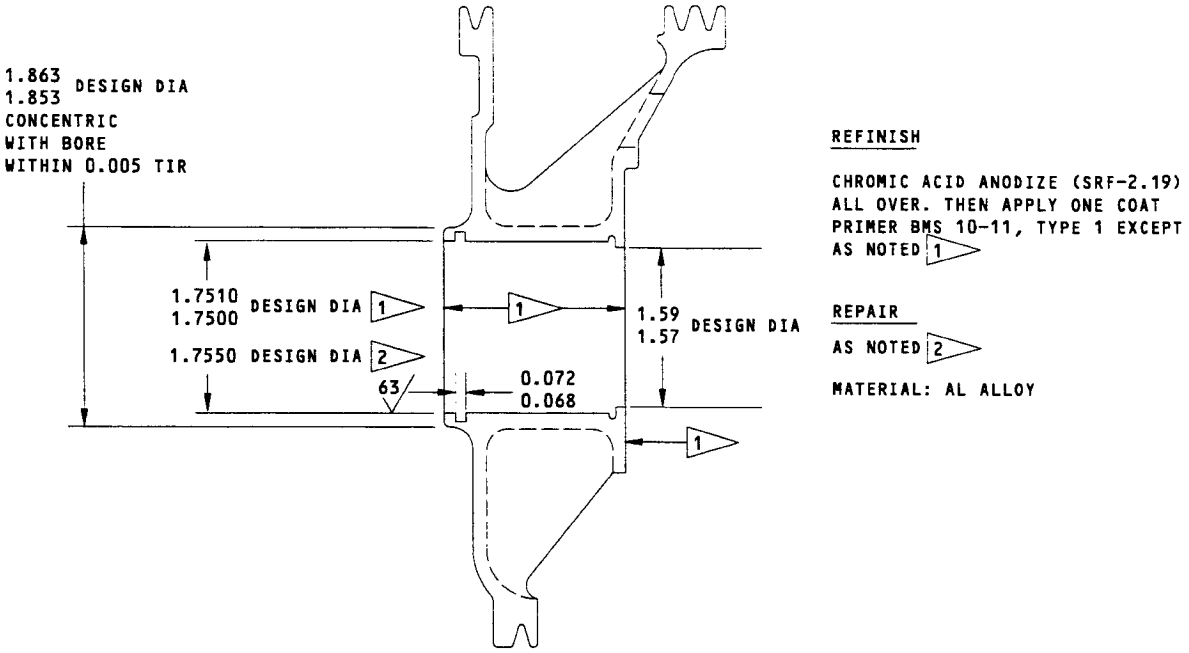
(3) Spring (60, Fig. 4; 20, Fig. 5) -- Apply two coats primer BMS 10-11, type 1 (SRF-12.206) all over. Material: Steel, 9254 Chrome Silica Alloy Wire.

(4) Plate (65, Fig. 4; 25, Fig. 5) -- Passivate (F-8.07) all over. Material: CRES, type 301.

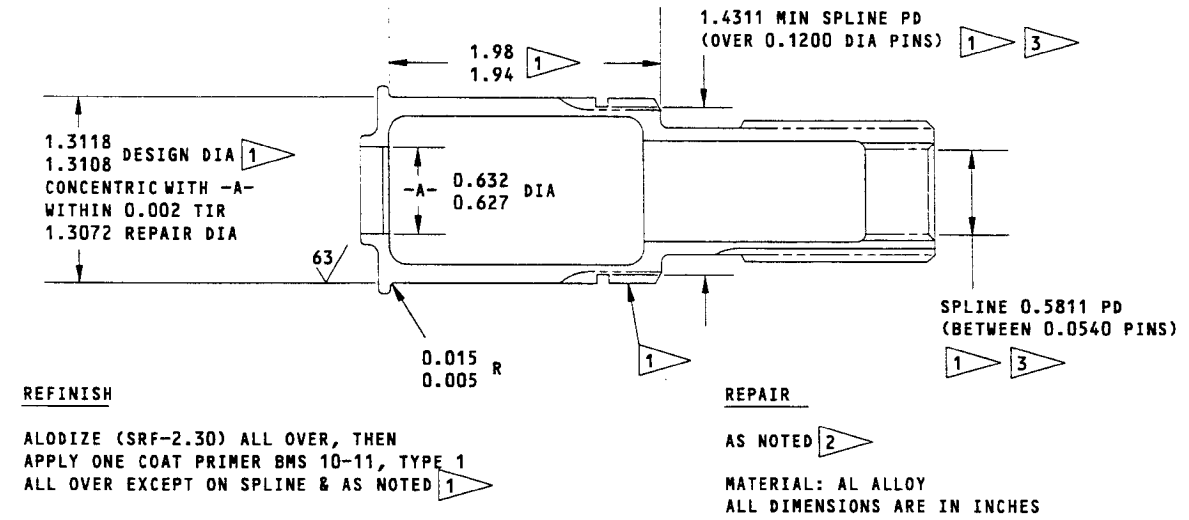
(5) Quadrant (100, Fig. 4), shaft (70, Fig. 4; 30, Fig. 5) -- Fig. 2.

(6) Cam (10, Fig. 4; 305, Fig. 5) -- No finish. Molded plastic.

(7) Quadrant (60, Fig. 5) -- Chromic acid anodize per MIL-A-8625, type 1 and apply one coat of BMS 10-11, type 1 primer per 20-41-02.



QUADRANT (100, FIG. 4)



SHAFT (70, FIG. 4; 30, FIG. 5)

1 OMIT PRIMER

2 BUILDUP WITH AL ALLOY PLASMA FLAME SPRAY (REF 20-10-05) & MACHINE TO DESIGN DIA

3 RESTORE WORN SPLINES BY HARD ANODIZE 0.0015 MAX THICK

E64965

Repair and Finish Diagram
Figure 2

B. Replacement

(1) Bearing (85, Fig. 4; 45, Fig. 5).

(a) Remove bearings from shaft.

(b) Install bearings per SOPM 20-50-03 using primer BMS 10-11, Type 1.

(2) Brake (105, Fig. 4; 65, Fig. 5).

(a) Remove worn brake surface.

(b) Bond new brake surface per SOPM 20-50-12, Type 38.

C. After bond has cured, burnish exposed surface of brake material by applying 15-30 pounds of force against a rotating disk for a minimum of 50 revolutions. The disk should be flat within 0.002 and have a 63-microinch finish.

D. Brake surface must be clean.

5. ASSEMBLY

A. On 65-79474-1 assembly (Fig. 4):

(1) Install shaft (70), with bearings (85), spacer (90) and retainer (80) in quadrant assembly (95). Install retainer (75).

(2) Install plate (65), spring (60), retainer (55) and fasteners (45, 50). Hand tighten nut.

(3) Check and adjust drum and brake assembly (40) per par. 7, TESTING.

B. On 65-79475-XX assemblies (Fig. 4):

(1) Install cam (5) on drum and brake assembly using fasteners (15, 20, 25) or (30, 35).

C. On 65-79474-2 assembly (Fig. 5):

(1) Install shaft (30), with bearings (45), spacer (50) and retainer (40) in quadrant assembly (55). Install retainer (35).

(2) Install plate (25), spring (20), retainer (15) and fasteners (5, 10). Hand tighten nut.

(3) Check and adjust drum and brake assembly per par. 7, TESTING.

(4) Install cam (300) on drum and brake assembly using fasteners (315, 320).

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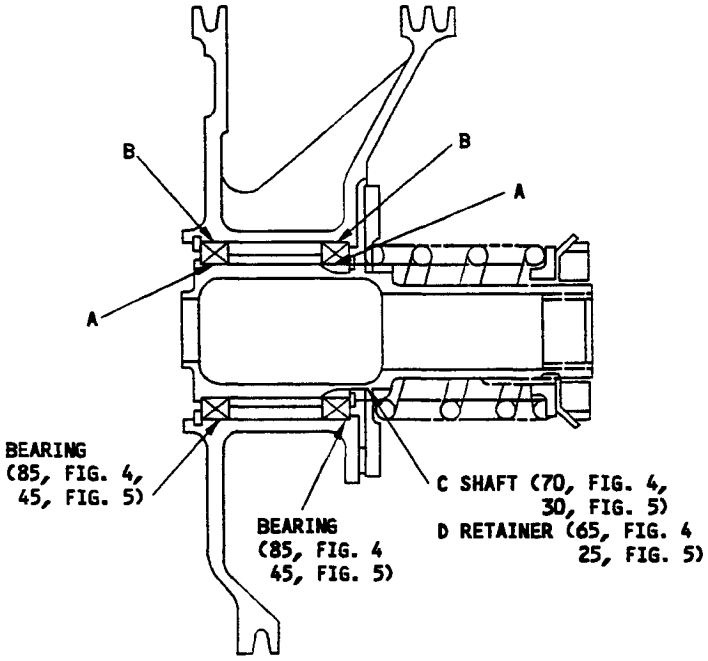
6. FITS AND CLEARANCES



Ref Letter Fig. 3	Design Dimensions						Service Wear Limits		
	Mating Item No. Fig. 4	Mating Item No. Fig. 5	Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inches)		Maximum Allowable Clearance (inch)
			Min	Max	Min	Max	Min	Max	
A	ID 85	ID 45	1.3118	1.3132	0.0000	0.0024			
	OD 70	OD 30	1.3108	1.3118					
B	ID 100	ID 60	1.7500	1.7510	0.0000	0.0020			
	OD 85	OD 45	1.7490	1.7500					
C	65 *[1]	25 *[1]		1.0985				1.0995	
D	70 *[2]	30 *[2]	1.4311				1.4301		

*[1] Measured between 0.1080 diameter pins. Mates with splines on shaft (70), (30).
*[2] Measured over 0.1200 diameter pins. Mates with splines on retainer (65), (25).

Fits and Clearances
Figure 3

E64014

7. TESTING

A. On 65-79474-1 assembly (Fig. 4):

(1) Mount drum and brake assembly in checking fixture that will hold shaft (70) in relation to quadrant (95).

(2) Attach a length of 3/32 cable to any of cable grooves on quadrant (95).

(3) Adjust nut (45) so that friction brake (105) will not slip when load of 5.5 lbs or less is applied to cable but will slip with a load of 8 lbs maximum.

(4) Bend one tang of washer (50) to secure nut (45).

B. On 65-79474-2 assembly (Fig. 5):

(1) Mount drum and brake assembly in checking fixture that will hold shaft (30) in relation to quadrant (55).

(2) Attach a length of 3/32 cable to any of cable grooves on quadrant (55).

(3) Adjust nut (5) so that friction brake (65) will not slip when load of 5.5 lbs or less is applied to cable but will slip with a load of 7 lbs or more.

(4) Bend one tang of washer (10) to secure nut (5).

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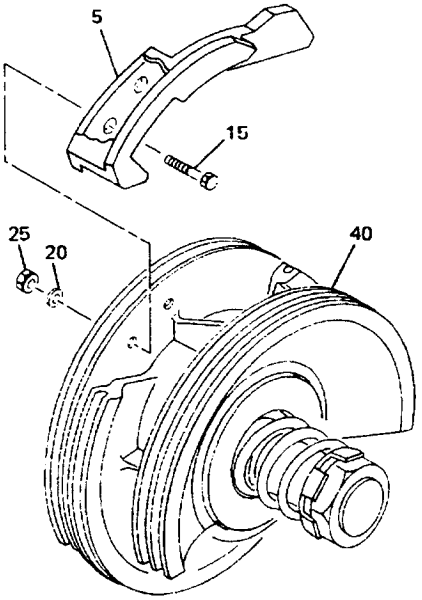
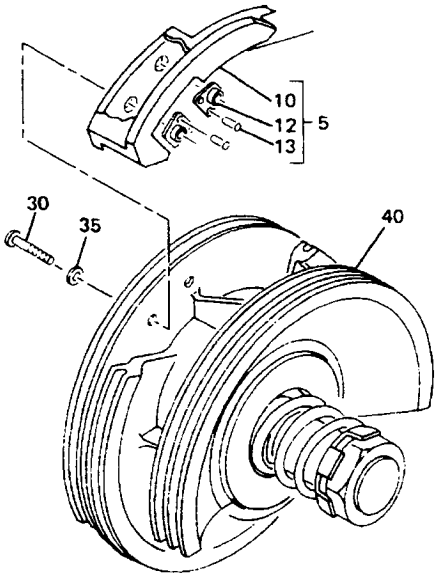
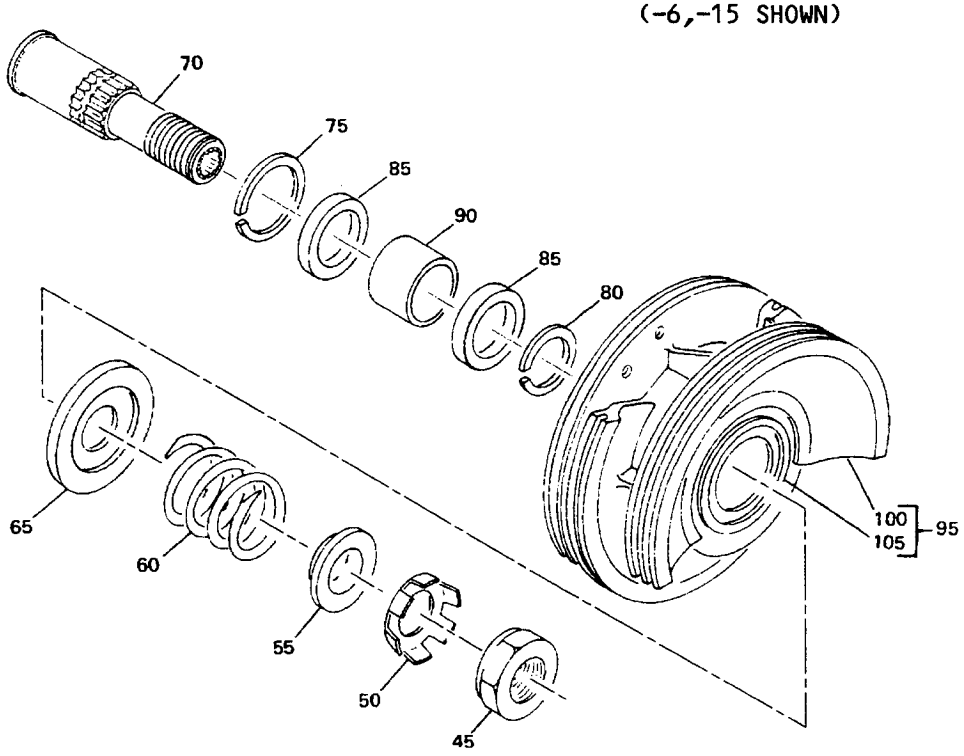
8. ILLUSTRATED PARTS LIST



65-79475-2,-3,-8,-9,-11,-12
(-3,-9,-12 SHOWN)



65-79475-5,-6,-14,-15
(-6,-15 SHOWN)



65-79474-1
Drum and Brake Assembly
Figure 4

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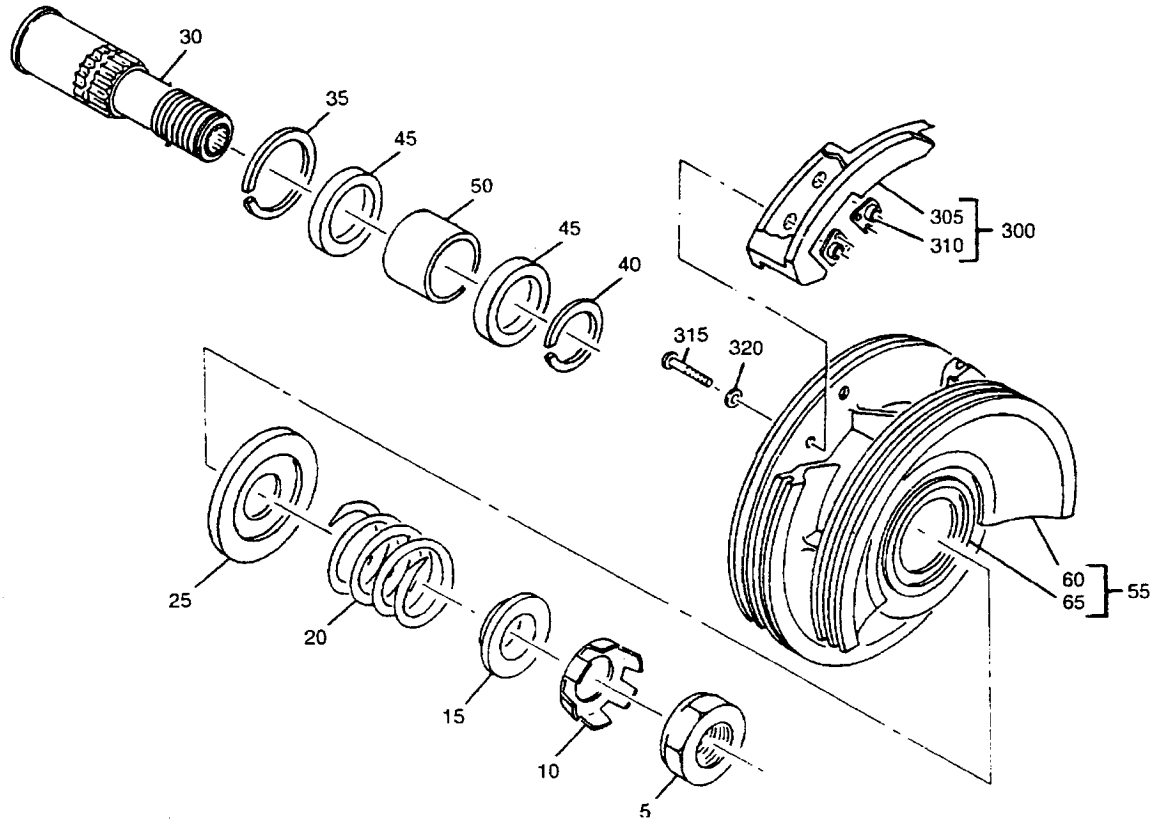
FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4-					
1	65-79475-2		DRUM AND BRAKE ASSY	A	RF
1	65-79475-3		DRUM AND BRAKE ASSY	B	RF
1	65-79475-5		DRUM AND BRAKE ASSY (SB 71-1041)	C	RF
1	65-79475-6		DRUM AND BRAKE ASSY (SB 71-1041)	D	RF
1	65-79475-8		DRUM AND BRAKE ASSY	E	RF
1	65-79475-9		DRUM AND BRAKE ASSY	F	RF
1	65-79475-11		DRUM AND BRAKE ASSY	G	RF
1	65-79475-12		DRUM AND BRAKE ASSY	H	RF
1	65-79475-14		DRUM AND BRAKE ASSY	I	RF
1	65-79475-15		DRUM AND BRAKE ASSY	J	RF
1	65-79475-19		DRUM AND BRAKE ASSY (SB 31-1024)	K	RF
1	65-79475-20		DRUM AND BRAKE ASSY (SB 31-1024)	L	RF
5	65-80023-1		. CAM	B	1
5	65-80023-2		. CAM	A	1
5	65-80023-3		. CAM	F	1
5	65-80023-4		. CAM	E	1
5	65-80023-7		. CAM ASSY	D	1
5	65-80023-7		. CAM ASSY (REPLS 69-67645-3)	J	1
5	65-80023-8		. CAM ASSY	C	1
5	65-80023-8		. CAM ASSY (REPLS 69-67645-4)	I	1
5	69-67645-3		. CAM	H	1
5	69-67645-4		. CAM	G	1
5	69-67645-5		. CAM	L	1
5	69-67645-6		. CAM	K	1
10	65-80023-9		. . CAM	DJ	1
10	65-80023-10		. . CAM	CI	1
12	BACN10KH3		. . NUTPLATE	CDIJ	2
13	BACR15BA3A		. . RIVET	CDIJ	4
15	BACB30FM6-4		. BOLT	ABE-H	2
20	AN960PD10L		. WASHER	ABE-H	2
25	BACN10JC3		. NUT	ABE-H	2
30	NAS623-3-4		. SCREW	CDIJ	2
35	AN960PD10L		. WASHER	CDIJ	2
40	65-79474-1		. DRUM AND BRAKE ASSY		
45	MS172329		. . NUT		1
50	MS172279		. . WASHER		1
55	69-61730-1		. . RETAINER		1
60	69-61731-1		. . SPRING		1
65	69-61725-1		. . PLATE		1
70	65-79471-1		. . SHAFT		1
75	RRN175		. . RETAINER (V80756)		1
80	RSN131		. . RETAINER (V80756)		1
85	BACB10A30DD		. . BEARING		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
4-					
90	69-61736-1		. . SPACER		1
95	65-79473-6		. . QUADRANT ASSY (PREF)		1
95	65-79473-1		. . QUADRANT ASSY (OPT)		1
100	65-79473-2		. . . QUADRANT		1
105	69-61734-1		. . . BRAKE (USED ON 65-79473-1)		1
105	69-61734-2		. . . BRAKE (USED ON 65-79473-6)		1



65-79474-2

Drum and Brake Assembly
Figure 5

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FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
5-					
1	65-79474-2		DRUM AND BRAKE ASSY	A	RF
5	MS172329		. NUT		1
10	MS172279		. WASHER		1
15	69-61730-1		. RETAINER		1
20	69-61731-1		. SPRING		1
25	69-61725-1		. PLATE		1
30	65-79471-1		. SHAFT		1
35	RRN175		. RETAINER (V80756)		1
40	RSN131		. RETAINER (V80756)		1
45	BACB10A30DD		. BEARING		2
50	69-61736-1		. SPACER		1
55	65-79473-7		. QUADRANT ASSY (PREF)		1
55	65-79473-5		. QUADRANT ASSY (OPT)		1
60	65-79473-4		. . QUADRANT		1
65	69-61734-2		. . BRAKE (USED ON 65-79473-7)		1
65	69-61734-1		. . BRAKE (USED ON 65-79473-5)		1
			INSTALLATION PARTS		
300	69-71556-2		CAM ASSY		1
305	69-71556-4		. CAM		1
310	69-71557-1		. NUTPLATE ASSY		1
315	NAS6603-6		SCREW		2
320	AN960XC10L		WASHER		2

VENDORS

V80756 RAMSEY CORP., P.O. BOX 513, ST. LOUIS, MISSOURI 63166