TO: ALL HOLDERS OF AILERON CONTROL SHAFT ASSEMBLY OVERHAUL MANUAL, 27-17-02

REVISION NO. 11, DATED MAR 1/08

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
Changed date for Page 8 to Mar 1/00 in LEP	X												

AILERON CONTROL SHAFT ASSEMBLY

27-17-02

BOEING P/N 65-49582-2, -6, -8 thru -12, -16 thru -23

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 32070-9	Jun 10/72
		PRR 32121-10	Jun 10/72
		PRR 32070-24	Jan 5/80
		PRR 35037	Jun 5/92

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
	27-17-02					
	T-1	Jun 5/92				
	T-2	BLANK				
*	LEP-1	Mar 1/08				
	LEP-2	BLANK				
	T/C-1	Mar 5/86				
	T/C-2	BLANK				
	1	Jan 5/80				
	2	Mar 5/90				
	3	Mar 5/90				
	4	Mar 5/90				
	4A	Mar 5/90				
	4B	Mar 1/00				
	4C	Nov 1/07				
	4D	BLANK				
	5	Nov 1/07				
	6	Nov 1/07				
	6A	Mar 1/00				
	6B	BLANK				
	7	Nov 1/07				
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	12	Sep 1/94				

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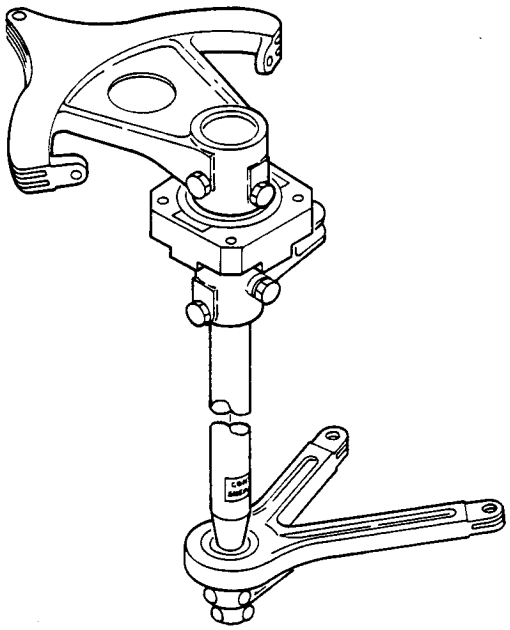
AILERON CONTROL SHAFT ASSEMBLY



Aileron Control Shaft Assembly
Figure 1

1. DESCRIPTION AND OPERATION

A. Description

(1) The aileron control shaft assembly consists of a shaft, quadrant assembly, bearing housing assembly, levers, support assembly, and a collar riveted to the shaft.

B. Operation

(1) Rotation of the aileron control wheels transmits motion through the aileron control system linkage to the aileron control shaft assembly. The resulting motion of the shaft assembly positions the spoiler ratio changer input rod on the spoiler mixer which in turn causes the flight spoilers on the wings to operate as required.

C. Leading Particulars

Length -- 20.25 inches (approximately)
Width -- 10.75 inches (approximately)
Height -- 10.60 inches (approximately)
Weight -- 4.6 pounds (approximately)

2. DISASSEMBLY

A. Remove nuts (1, Fig. 6), washers (2), bolts (3), and quadrant assembly (4).

NOTE: Do not remove rivet (5) and spacers (6) from quadrant (7) unless repair or replacement makes it necessary.

B. Remove rivets (8) and collar (9).

C. Remove rivets (10) and lever (11).

D. Remove support assembly (12).

NOTE: Do not remove bearing (13) from support (14) unless repair or replacement makes it necessary.

E. Remove nuts (15) washers (16), bolts (17), and lever (18).

F. Remove bearing housing assembly (19).

G. Remove packing (26) from seal housing (20).

NOTE: Do not remove pin (24), seal housing (20), bearing (21), and housing (22) from housing (25) unless repair or replacement makes it necessary.

H. Remove seal ring (27).

J. Remove seal disc (28).

CAUTION: SEAL DISC (28) IS CEMENTED TO SHAFT (29). PREVENT DAMAGE TO SEAL DISC OR SHAFT DURING DISASSEMBLY.

2. CLEANING

A. General

(1) Wash and rinse parts, except bearings (13 and 21), in dry cleaning solvent, Specification P-D-680 or equivalent, and dry parts with clean lint-free cloth or moisture-free compressed air.

(2) Clean all bores, holes, threads, passages, and chambers with a stiff-bristle brush.

(3) For further information, refer to General Cleaning Procedures, 20-30-03.

B. Bearings

(1) Clean all bearings per Cleaning and Relubricating Anti-Friction Bearings, 20-30-01.

4. INSPECTION/CHECK

A. Visual Check (Fig. 6)

(1) Visually examine all parts for cracks, scratches, nicks, burrs, pitting, and corrosion using strong light and 10-power magnification.

(2) Visually examine all threads for cross-threading or stripping.

(3) Check all painted and plated surfaces for blistering, flaking, and continuity of plating surfaces.

(4) Check that 0.096-inch diameter hole in shaft (29) is free from obstruction.

(5) Examine bearing (13 and 21) for roughness, binding, and excessive radial or axial play.

B. Special Check (Fig. 6)

(1) If visual examination discloses evidence of defects in any of listed parts, perform following checks:

(a) Dye Penetrant Check -- Quadrant (7), lever (11), support (14), lever (18), seal housing (20), housing (22), housing (25), and shaft (29).

NOTE: For further information, refer to Penetrant Methods of Inspection, 20-20-02.

5. REPAIR

A. Repair

(1) Remove corrosion and minor defects from metal parts by polishing lightly with abrasive cloth 220 grit or finer. Refinish as required for protection against corrosion.

(2) Remove minor defects from threads with small triangular file or thread chaser.

B. Refinish (Fig. 6)

NOTE: Refer to 20-30-02 for stripping of protective finishes, and to 20-41-01 for decoding of F and SRF finish symbols and their BAC equivalents.

(1) If plated or painted surfaces are worn or chipped, refinish the following parts as indicated:

(a) Quadrant (7, 65-46992-2, -6, -8) -- Chromic acid anodize and apply 1 coat of BMS 10-11, Type 1 primer (SRF-2.19) all over except no primer in 1.75-inch bore or 0.25-inch bolt holes. Apply additional coat of BMS 10-11, Type 1 primer (SRF-12.205) in cable grooves only, overspray permitted. Material: Al alloy.

(b) Collar (9) -- Alodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.901) all over. Material: Al alloy.

(c) Levers (11, 18) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over except no primer in large bores. Material: Al alloy.

(d) Housing (20, 22) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over except no primer on surfaces indicated in Fig. 2. Material: Al alloy.

(e) Pin (24) -- Cadmium plate (0.0002-0.0004) with post-plate chromate treatment and bake 3 hours minimum at 350-400°F (F-1.1926). Material: CRES, 150-170K psi.

(f) Housing (25) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over except no primer on 2.950 inch spherical diameter. Material: Al alloy.

(g) Seal disk (28) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over. Material: Al alloy.

(h) Shaft (29) -- Alodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.901) all over except no primer on surfaces indicated in Fig. 2. Apply one coat of BMS 10-60, 702 white gloss enamel (SRF-14.9812) to primed surfaces. Material: Al alloy.

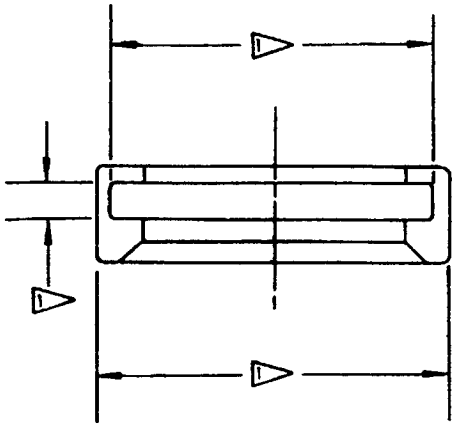
(i) Housing assembly (19) -- Apply one coat of BMS 10-60, 702 white gloss enamel (SRF-14.9812) to all external surfaces except bearings.

(j) Quadrant (7, 65-46992-10) -- Anodize and apply 1 coat of primer, BMS 10-11, Type 1 (F-18.04) except omit primer in 1.75-inch bore or 0.25-inch boltholes. Apply additional coat of primer (F-20.02) in cable grooves only, overspray permitted. Material: Al alloy.

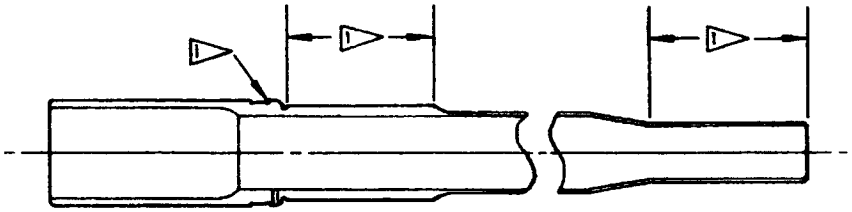
(k) Support (14, 65-52916-2, -5) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over except no primer on surfaces indicated in Fig. 3. Material: Al alloy.

(l) Support (14, 65-52916-8) -- Alodize or chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (SRF-2.30) all over except no primer on surfaces indicated in Fig. 3. Then apply BMS 10-60, 702 white gloss enamel (SRF-14.9812) over primer only. Material: Al alloy.

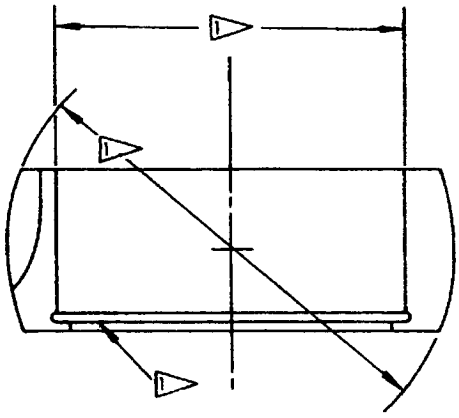
(m) Support (14, 65-52916-10) -- Chromic acid anodize and apply one coat of BMS 10-11, Type 1 primer (F-18.13) all over except no primer on surfaces indicated in Fig. 3. Then apply BMS 10-60, 702 white gloss enamel (SRF-14.9812) over primer except no enamel on surfaces indicated in Fig. 3. Material: Al alloy.



HOUSING – SEAL (20)



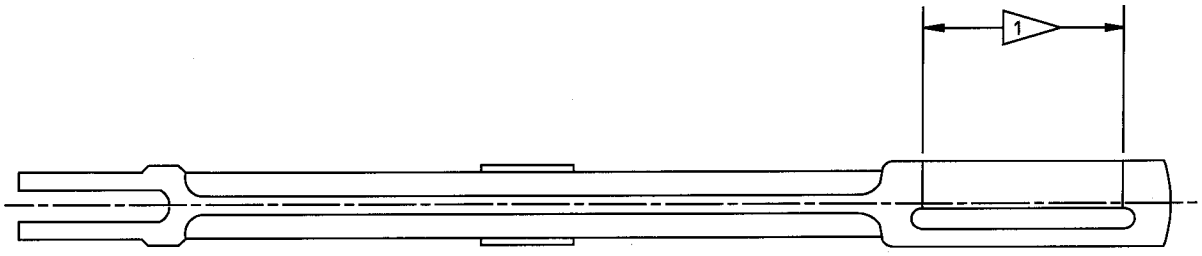
SHAFT (29)



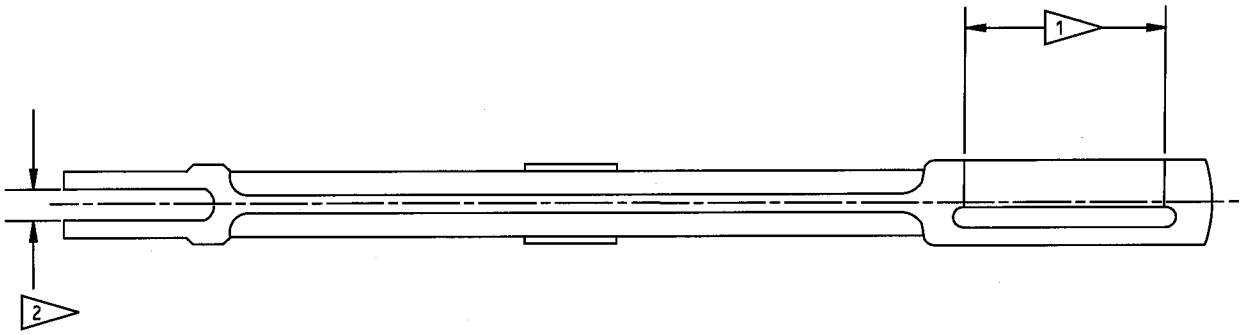
HOUSING (22)

NO PRIMER ON THESE SURFACES

Refinish Diagram
Figure 2



SUPPORT (14, 65-52916-2,-5,-8)



SUPPORT (14, 65-52916-10)

1 NO PRIMER OR ENAMEL ON THESE SURFACES

2 NO ENAMEL ON THESE SURFACES

Refinish Diagram
Figure 3

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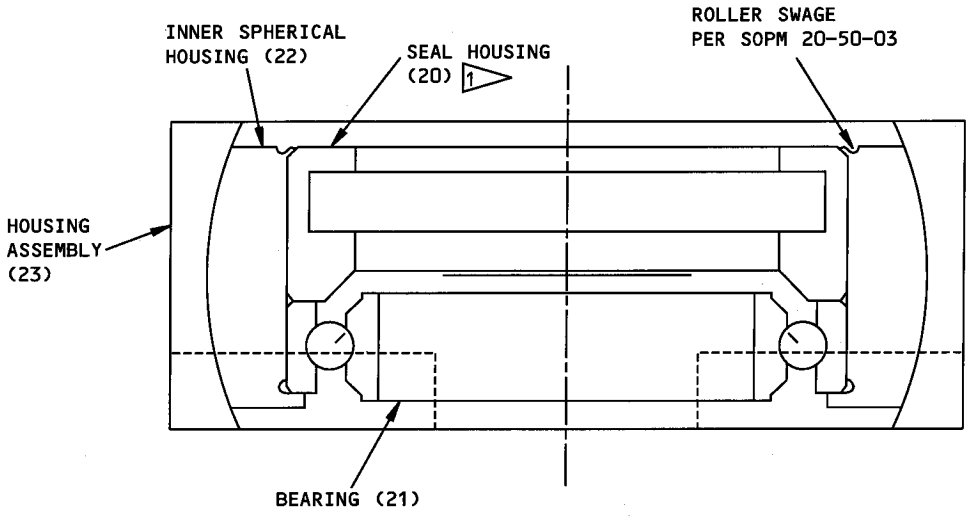


BEARING REPLACEMENT (21)

1 ENSURE PROPER ORIENTATION

Housing Assembly (19)
Figure 3A

C. Replacement (Fig. 6)

(1) Replace parts if unserviceable or damaged beyond simple repair.

(2) Replace packing (26) and seal ring (27) at each overhaul.

NOTE: For further information, refer to Installation of O-Rings and Teflon Seals, SOPM 20-50-06.

(3) If necessary to replace bearing (13), apply BMS 10-11, Type 1 primer to faying surfaces of bearing and housing, install bearing and roller stake per 20-50-03.

(4) If necessary to replace bearing (21), proceed as follows:

(a) Apply BMS 10-11, Type 1 primer to faying surfaces of bearing (21), seal housing (20), and housing (22). Install bearing and seal housing in housing (22) and roller swage per SOPM 20-50-03, as shown in Fig. 3A.

(b) Apply MIL-C-11796, class 3 corrosion-preventive compound on faying surfaces and install housing (22) in housing (25). Install pin (24) in housing (25) with wet BMS 10-11, Type 1 primer. Make sure housing (22) does not bind in housing (25).

(5) If necessary to replace marker BAC27DCT-13 shown on Fig. 6, apply new marker per SOPM 20-50-05.

(6) If necessary to replace marker BAC27DCT0492 shown on Fig. 6, apply new marker per SOPM 20-50-12. Use application method Type 89 to attach marker, optional to use application method Type 71. Edge squeeze out and 100% fay surface coverage required.

(7) Materials

(a) Primer -- BMS 10-11, Type 1

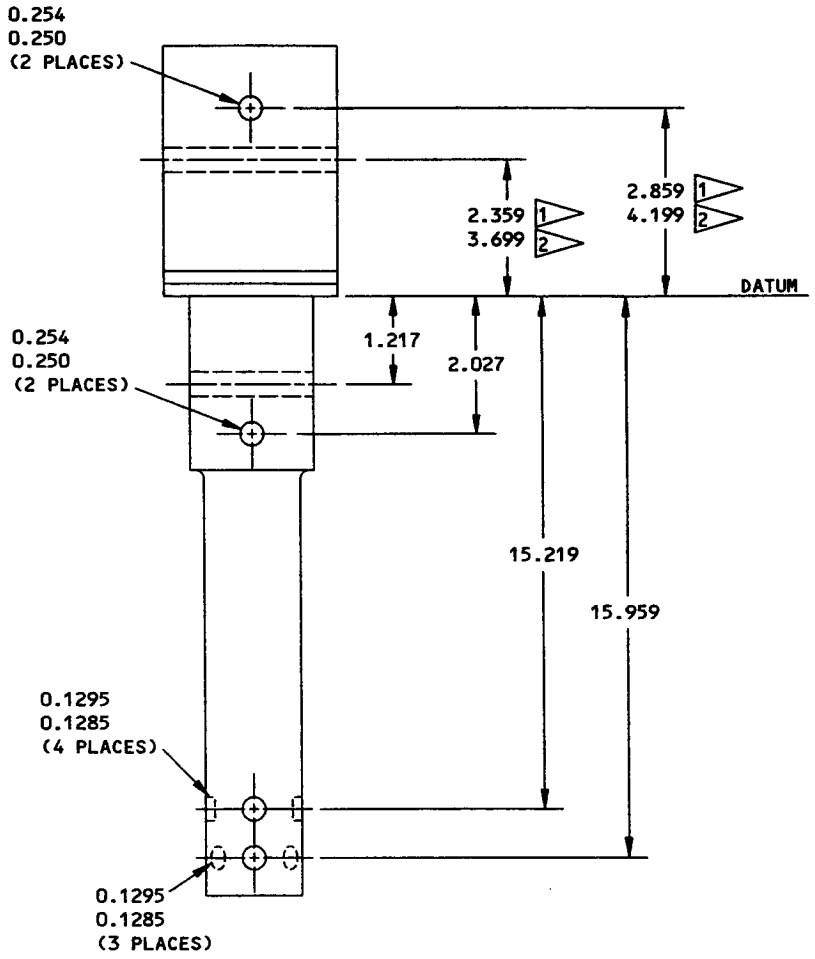
(b) Corrosion-Preventive Compound -- MIL-C-11796, class 3

6. ASSEMBLY

A. Install seal ring (27, Fig. 6) on shaft (29). If a new shaft (29) is to be installed, drill holes according to reference dimensions found in Fig. 4 or by using the existing, old shaft as a guide template. These methods of determining upon installation of the aileron control shaft assembly within the airplane.

NOTE: The diametric dimensions of the holes in the attaching parts must not be oversized when drilling the shaft. Because of the high number of rotation cycles experienced by the control shaft assembly, any excessive clearance between components assembled on the shaft and the securing bolts would reduce the service life of the aileron control shaft assembly.

B. Install packing (26) in seal housing (20) and install housing assembly (19). Make sure shaft (29) rotates in housing assembly (19) with no more than 5 pound-inches of torque.



NOTE: DIMENSIONS FOR HOLE LOCATIONS ARE FOR REFERENCE, WITH EXACT HOLE LOCATIONS DETERMINED UPON INSTALLATION.

1 > 65-56665-1,-2,-3

2 > 65-56665-4

SHAFT (29)

Assembly Holes Locations (Reference only)
Figure 4

C. Install lever (18) on shaft (29); install bolts (17), washers (16), and nuts (15) and tighten to within a torque range of 30 to 35 pound-inches.

D. Install support assembly (12) on shaft (29).

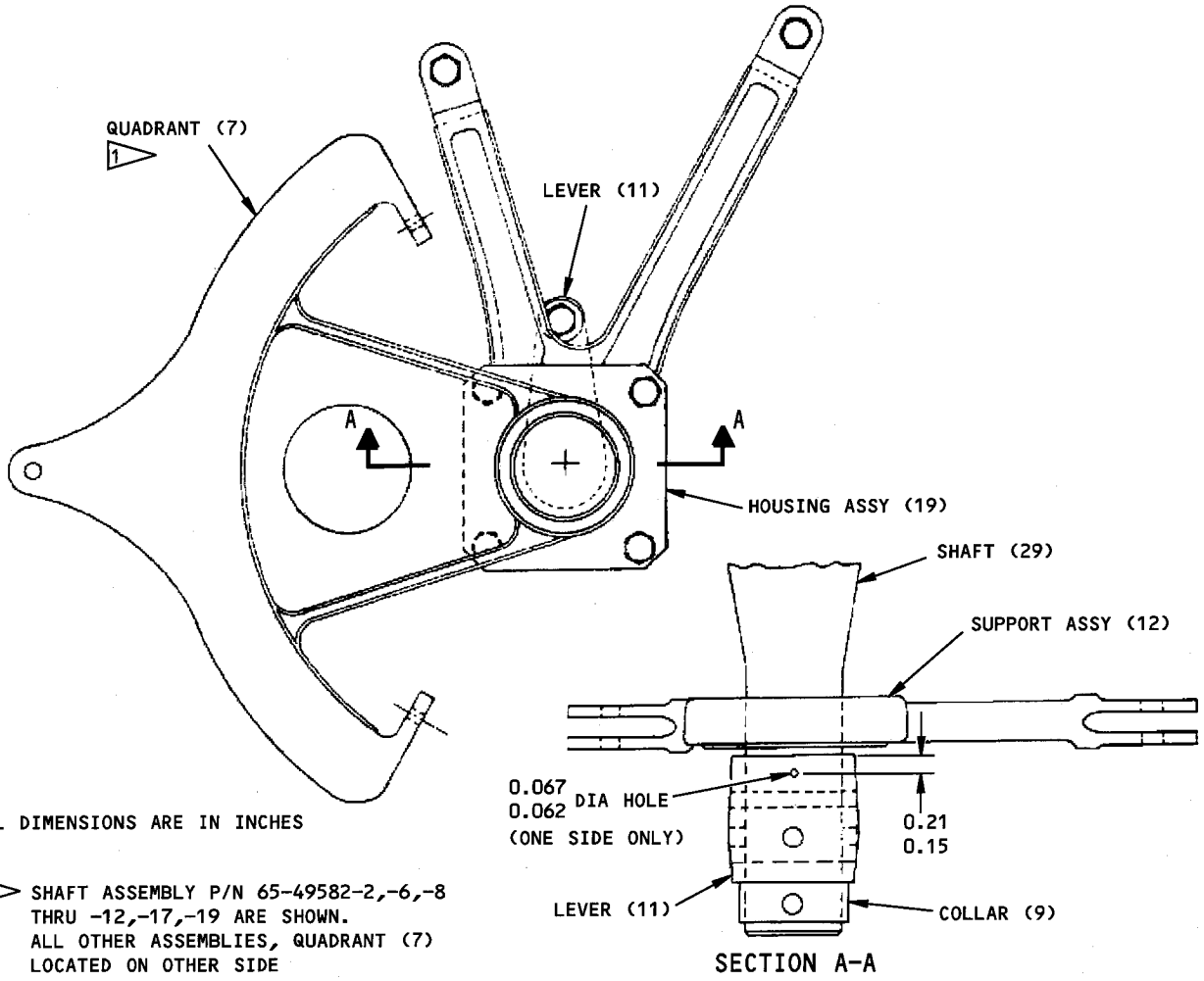
E. Install lever (11) on shaft (29) and install rivets (10). If new lever (11) and shaft (29) are to be installed, drill witness hole as shown in Fig. 4A.

CAUTION: RIVETS (10) PROVIDE A SHEAR-OUT CAPABILITY. DO NOT SUBSTITUTE RIVETS.

F. Install collar (9) on shaft (29) and install rivets (8).

G. Install quadrant assembly (4) on shaft (29); install bolts (3), washers (2), and nuts (1), and tighten to within a torque range of 30 to 35 pound-inches. See Fig. 4A, flagnote [1] for quadrant (7) position.

H. Cement seal disk (28) to shaft (29) using BMS 5-79 Sealant.



Witness Hole Location
Figure 4A

L07810

J. Materials

(1) Pressure, Environmental and Fuel Cavity Sealant -- BMS 5-79

7. FITS AND CLEARANCES

A. The fits and clearances table lists design dimensions and service wear limits for close tolerance parts of the assembly that are subject to wear or corrosion. Unless otherwise specified, parts should be returned to the design dimensions whenever rework is accomplished.

B. Clearances are given to aid assembly of the components. The values given in the Maximum Allowable Clearance column are the maximum permitted to ensure proper functioning of the unit. If assembled parts fail to meet this requirement, one or more of the parts must be rejected. Parts that are rejected should be reworked if within the rework limits given in the Repair procedure; if not within rework limits, the parts should be scrapped. It is recommended that the design clearances be used as the guiding assembly criteria when newly reworked parts are assembled.

		Design Dimensions				Service Wear Limits		
Ref Letter Fig.	Mating Item No. Fig. 3	Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inches)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
	ID 13	0.999	1.000	0.000	0.002		1.000 *[1]	0.003
	OD 29	0.998	0.999			0.997		
	ID 21	1.5620	1.5630	0.000	0.002		1.5630 *[1]	0.003
	OD 29	1.5610	1.5620			1.5600		
	ID 23	2.950	2.951	0.001	0.003		2.953	0.007
	OD 22	2.948	2.949			2.946		

*[1] Maximum allowable radial play of bearing 0.0020 inch.

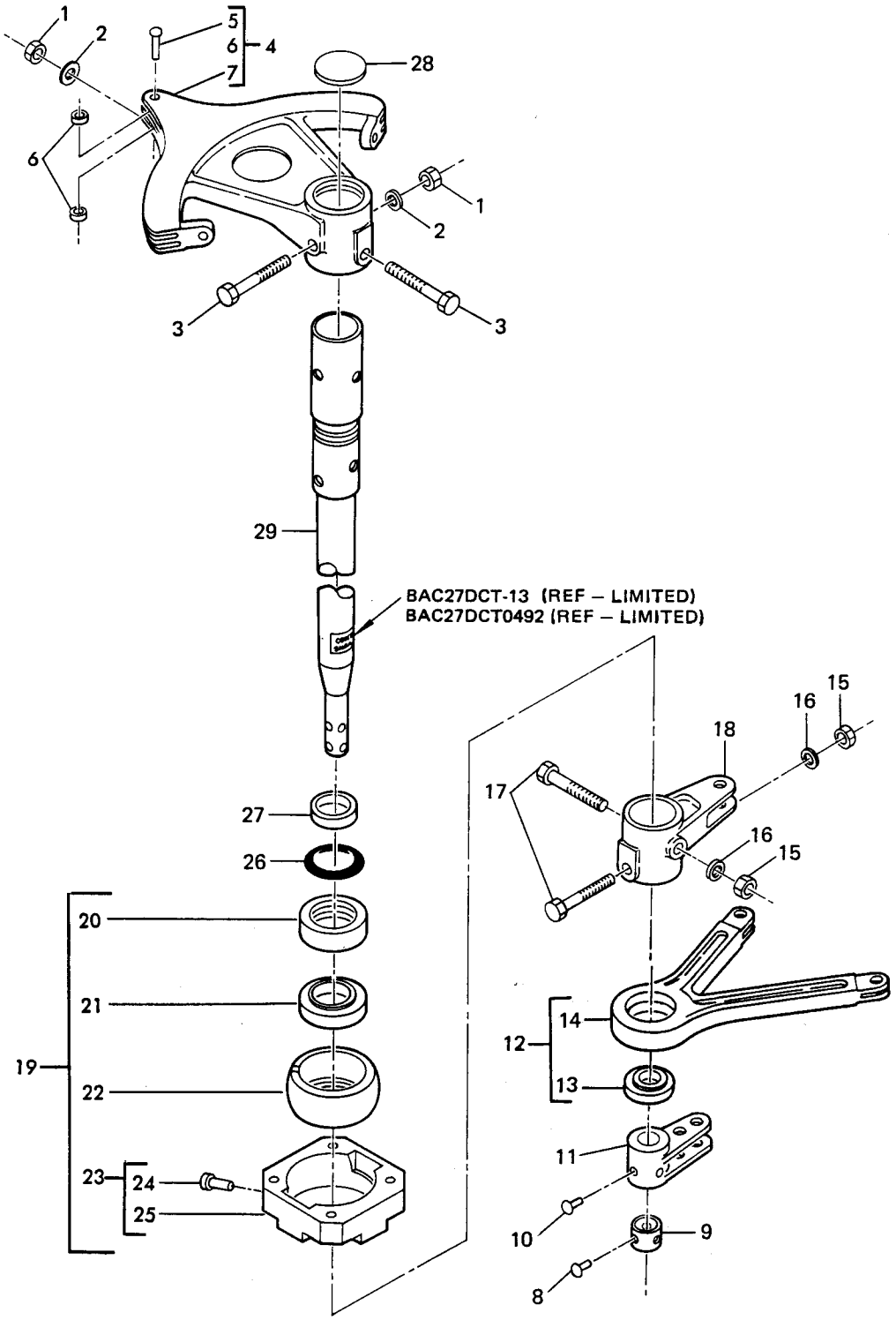
Fits and Clearances
Figure 5

8. STORAGE INSTRUCTIONS

A. Wrap aileron control shaft assembly in vapor barrier paper; place in a container to prevent handling damage. Tag with identifying assembly part number and cure date of O-ring packing.

B. For further information, refer to Temporary Protective Coatings, Subject 20-44-02.

9. ILLUSTRATED PARTS LIST



Aileron Control Shaft Assembly
Figure 6

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-					
	65-49582-2		SHAFT ASSY, AILERON CONTROL	A	RF
	65-49582-6		SHAFT ASSY, AILERON CONTROL	B	RF
	65-49582-8		SHAFT ASSY, AILERON CONTROL	C	RF
	65-49582-9		SHAFT ASSY, AILERON CONTROL	D	RF
	65-49582-10		SHAFT ASSY, AILERON CONTROL	E	RF
	65-49582-11		SHAFT ASSY, AILERON CONTROL	F	RF
	65-49582-12		SHAFT ASSY, AILERON CONTROL	G	RF
	65-49582-14		DELETED		
	65-49582-16		SHAFT ASSY, AILERON CONTROL	H	RF
	65-49582-17		SHAFT ASSY, AILERON CONTROL	I	RF
	65-49582-18		SHAFT ASSY, AILERON CONTROL	J	RF
	65-49582-19		SHAFT ASSY, AILERON CONTROL	K	RF
	65-49582-20		SHAFT ASSY, AILERON CONTROL	L	RF
	65-49582-21		SHAFT ASSY, AILERON CONTROL	M	RF
	65-49582-22		SHAFT ASSY, AILERON CONTROL	N	RF
	65-49582-23		SHAFT ASSY, AILERON CONTROL	O	RF
1	BACN10JC4		. NUT (REPLS NAS679A4W)		2
2	AN960PD416		. WASHER		2
3	BACB30NE4-38		. BOLT (REPLS NAS1104-38)	A-GIK	2
3	BACB30NF4-38		. BOLT	HJLMNO	2
4	65-46992-1		. QUADRANT ASSY	A	1
4	65-46992-4		. QUADRANT ASSY	BCD	1
4	65-46992-5		. QUADRANT ASSY	EFGIK	1
4	65-46992-9		. QUADRANT ASSY (OPT)	GIK	1
4	65-46992-9		. QUADRANT ASSY	HJLMNO	1
5	MS20470D4		. . RIVET	A	1
5	BACR15BA4D		. . RIVET	B-O	1
6	NAS42DD4-18		. . SPACER		2
7	65-46992-2		. . QUADRANT (USED ON 65-46992-1,-4)		1
7	65-46992-6		. . QUADRANT (USED ON 65-46992-5)		1
7	65-46992-8		. . QUADRANT (OPT)(USED ON 65-46992-5)		1
7	65-46992-10		. . QUADRANT (USED ON 65-46992-9)		1
8	MS20470D4		. RIVET	A-GIK	3
8	BACR15BB4D		. RIVET	HJLMNO	3
9	69-41206-1		. COLLAR	ABC	1
9	69-41206-2		. COLLAR	D-O	1
10	MS20470D4		. RIVET	A-GIK	4
10	BACR15BB4D		. RIVET	HJLMNO	4
11	65-54407-3		. LEVER	ABC	1
11	65-54407-4		. LEVER	D-O	1
12	65-52916-1		. SUPPORT ASSY	AB	1
12	65-52916-4		. SUPPORT ASSY	C	1
12	65-52916-7		. SUPPORT ASSY	D-L	1
12	65-52916-9		. SUPPORT ASSY (OPT)	D-L	1
12	65-52916-11		. SUPPORT ASSY (OPT)	D-L	1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-					
12	65-52916-9		. SUPPORT ASSY	MN	1
12	65-52916-11		. SUPPORT ASSY	0	1
13	BACB10A827		. . BEARING	A-N	1
13	BACB10FV16G		. . BEARING (OPT)	A-N	1
13	BACB10FV16G		. . BEARING	0	1
14	65-52916-2		. . SUPPORT	AB	1
14	65-52916-5		. . SUPPORT	C	1
14	65-52916-8		. . SUPPORT	D-L	1
14	65-52916-10		. . SUPPORT	MNO	1
15	BACN10JC4		. NUT (REPLS NAS679A4W)		2
16	AN960PD416		. WASHER		2
17	BACB30NE4-34		. BOLT (REPLS NAS1104-34)	A-GIK	2
17	BACB30NF4-34		. BOLT	HJLMNO	2
18	65-52998-1		. LEVER	ABC	1
18	65-52998-3		. LEVER	D-O	1
19	69-38714-1		. HOUSING ASSY	ABC	1
19	69-38714-2		. HOUSING ASSY	DEF	1
19	69-38714-3		. HOUSING ASSY	GH	1
19	69-38714-4		. HOUSING ASSY	IJ	1
19	69-38714-5		. HOUSING ASSY	KLM	1
19	69-38714-6		. HOUSING ASSY (OPT)	KLM	1
19	69-38714-6		. HOUSING ASSY	NO	1
20	69-38713-1		. . HOUSING	A-H	1
20	69-38713-2		. . HOUSING	I-LNO	1
21	BACB10BW25		. . BEARING (REPLS BACB10A824)		1
22	69-38712-1		. . HOUSING		1
23	69-38711-1		. . HOUSING ASSY	A-F	1
23	69-38711-3		. . HOUSING ASSY	G-J	1
23	69-38711-5		. . HOUSING ASSY	K-M	1
23	69-38711-7		. . HOUSING ASSY	NO	1
24	66-24199-1		. . . PIN		1
25	69-38711-2		. . . HOUSING	A-F	1
25	69-38711-4		. . . HOUSING	G-J	1
25	69-38711-6		. . . HOUSING	K-M	1
25	69-38711-8		. . . HOUSING	NO	1
26	AN6227B30		. PACKING (REPLS AN6227-30)	A-GIK	1
26	NAS1611-327		. PACKING	HJLMNO	1
27	69-16695-5		. RING		1
28	65-49582-3		. DISK	A-GI K-O	1
29	65-56665-1		. SHAFT	ABC	1
29	65-56665-2		. SHAFT	DE	1
29	65-56665-3		. SHAFT	FGIK	1
29	65-56665-4		. SHAFT	HJLMNO	1