TO: ALL HOLDERS OF AILERON POWER CONTROL SPRING CARTRIDGE ASSEMBLY OVERHAUL MANUAL, 27-12-21

REVISION NO. 5, 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
Revised test compressed dimensions of 251A1065-1 used on 65-53788-6 and added new USE CODES	X			X		X						X	

AILERON POWER CONTROL SPRING CARTRIDGE ASSEMBLY

27-12-21

BOEING P/N 65-53788-2, -3, -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
		PRR 32121-10 PRR 38156	Jun 10/72 Jul 1/04

LIST OF EFFECTIVE PAGES

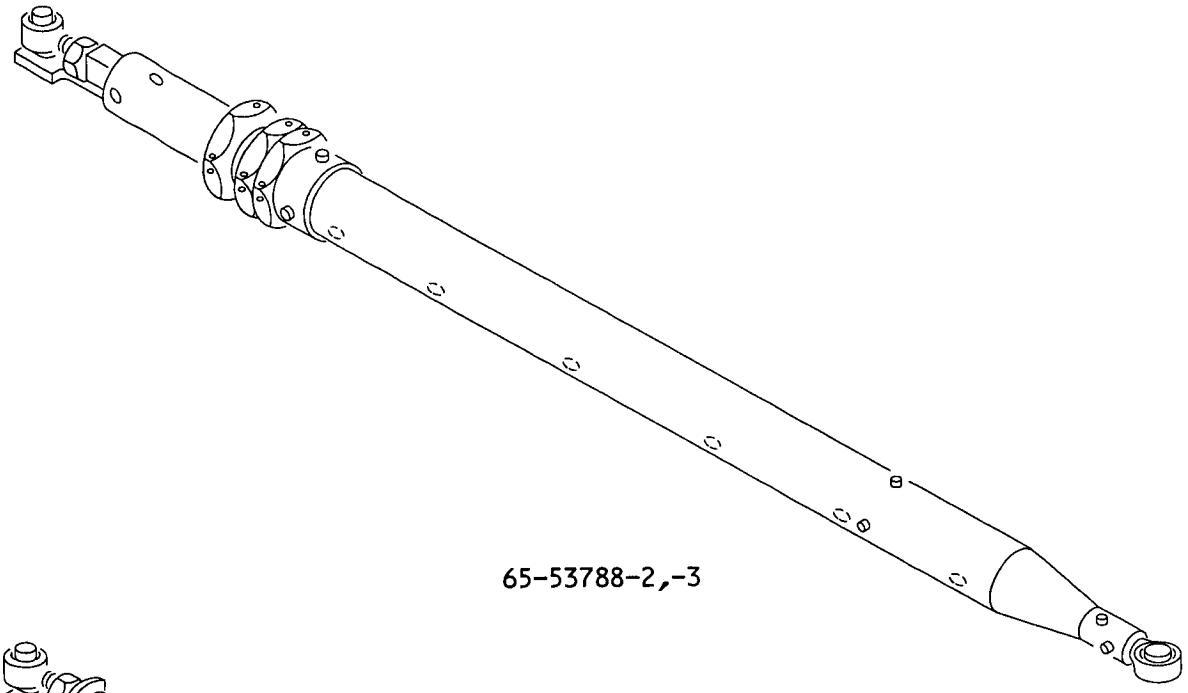
* Indicates pages revised, added or deleted in latest revision
F Indicates foldout pages - print one side only

	PAGE	DATE	PAGE	DATE	PAGE	DATE
27-12-21						
	T-1	Jul 1/04				
	T-2	BLANK				
*	LEP-1	Mar 1/08				
	LEP-2	BLANK				
	T/C-1	Jul 1/07				
	T/C-2	BLANK				
	1	Jul 1/04				
*	2	Mar 1/08				
*	3	Mar 1/08				
*	4	Mar 1/08				
*	5	Mar 1/08				
*	6	Mar 1/08				
	7	Mar 1/97				
	8	Sep 1/97				
*	9	Mar 1/08				
*	10	Mar 1/08				
	10A	BLANK				
	10B	Jul 1/07				
*	11	Mar 1/08				
	12	Jul 1/04				

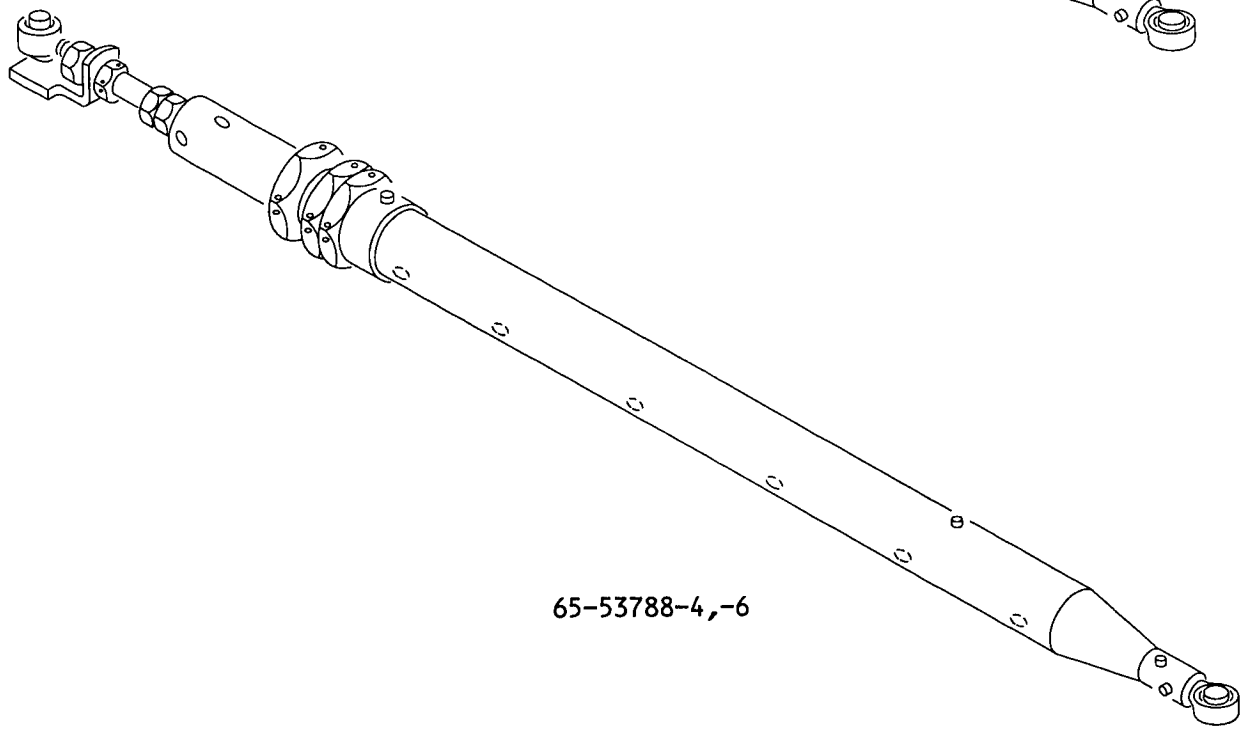
TABLE OF CONTENTS

OVERHAUL MANUAL

AILERON POWER CONTROL SPRING CARTRIDGE ASSEMBLY
Boeing Part Numbers; 65-53788-2 thru -6



65-53788-2,-3



65-53788-4,-6

Aileron Power Control Spring Cartridge Assembly
Figure 1

AILERON POWER CONTROL SPRING CARTRIDGE ASSEMBLY

1. DESCRIPTION AND OPERATION

A. Description

(1) The aileron power control spring cartridge assembly consists of a casing which encloses a sliding shaft assembly. The shaft assembly includes a compression spring, slides, stops, filler plugs, and attaching hardware.

B. Operation

(1) The aileron power control spring cartridge assembly provides lateral control input signals to the spoiler system. The cartridge assembly normally operates as a fixed link. If a jam occurs in the spoiler system, the spring in the cartridge will compress allowing aileron movement as necessary.

C. Leading Particulars

Length (measured between centerlines of rod end bearings)
Normal -- 32.63 inches
Maximum Extended -- 35.63 inches (65-53788-2,-3,-4), 35.88 inches (65-53788-6)
Minimum Compressed -- 29.63 inches (65-53788-2,-3,-4), 29.38 inches (65-53788-6)
Width -- 2.0 inches (approximately)
Weight -- 5.0 pounds (approximately)

2. DISASSEMBLY

CAUTION: CASING OF SPRING CARTRIDGE ASSEMBLY HAS 0.049 INCH WALL THICKNESS. DO NOT CLAMP IN A MANNER WHICH WILL CAUSE DEFORMATION OF CASING WALL. USE CAUTION DURING DISASSEMBLY TO PREVENT DAMAGE TO THREADED PARTS.

A. Remove all lockwiring.

B. On spring cartridge assembly (65-53788-2, -3)

(1) Remove rivets (1) and remove end fitting (2) from shaft (13).

(2) Loosen nut (3) and remove rod end fitting (4) from end fitting (2).

C. On spring cartridge assembly (65-53788-4, -6)

(1) Remove rivets (1) and remove sleeve (2D) from shaft (13)

(2) Loosen nut (3) and remove end fitting (2A) and rod end fitting (4) from sleeve (2B).

D. Loosen check nut (5); remove collar nut (6) and check nut (5) from casing assembly (14).

E. Separate shaft assembly (7) from casing assembly (14).

F. Remove rivets (8) and remove filler plugs (9), stops (10), slides (11), and compression spring (12) from shaft (13).

WARNING: SPRING (12) IS COMPRESSED TO APPROXIMATELY AN 80 POUND LOAD. USE CAUTION WHEN RELEASING LOAD.

G. Remove rivets (15, 17, 19) and remove rod end (16), end collar (18), and stop (20) from casing (21).

3. CLEANING

A. Clean all parts but bearings using procedures in SOPM 20-30-03.

B. Clean all bearings using procedures in SOPM 20-30-01.

4. INSPECTION/CHECK

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

B. Visually examine all threads for cross-threading or stripping.

C. Visually examine painted surfaces for blistering or flaking.

D. Visually examine casing (21) for dents which could cause restriction to movement of shaft assembly (7); check that drain holes are free of obstruction; check stencil for legibility.

E. Check that drain holes in shaft (13) are free of obstruction.

F. Examine bearings (4, 16) for roughness, binding, and excessive axial and radial play. Maximum allowable radial play is 0.0020 inch.

G. Check compression spring (12) as follows:

(1) 69-40287-1

(a) Load should be between 100 and 116 pounds when spring is compressed to 11.25-inch length.

(b) Load should be between 76 and 84 pounds when spring is compressed to 14.70-inch length.

(c) No permanent set should result when spring is compressed to 11.25-inch length.

(2) 251A1065-1

(a) Load should be between 112.5 to 137.5 pounds when spring is compressed to 10.5-inch length.

(b) Load should be between 96 to 104 pounds when spring is compressed to 13.75-inch length.

CAUTION: DO NOT COMPRESS SPRING MORE THAN TO 11.25-INCH LENGTH OR PERMANENT SET MAY RESULT.

H. Perform a magnetic particle examination on end fitting (2), sleeves (2B, 2D), check nut (5), collar nut (6), compression spring (12), end collar (18), and stop (20).

NOTE: For further information, refer to Magnetic Particle Inspection, SOPM 20-20-01.

J. Perform a penetrant check on stops (10), shaft (13), and casing (21).

NOTE: For further information, refer to Penetrant Methods of Inspection, SOPM 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

NOTE: Refer to SOPM 20-30-02 for stripping of protective finishes and to SOPM 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) End Fitting (2, P/N 69-22352-1) -- Cadmium plate (F-15.06). Material: 4340 steel bar (125-145 ksi).

(b) End Fitting (2, P/N 69-22352-2) -- Cadmium plate (F-15.06) and one coat BMS 10-11, Type 1 primer. Material: 4340 steel bar (125-145 ksi).

(c) Fitting (2A) -- Chemical treat interior and exterior surfaces and apply one coat BMS 10-11, Type 1 primer (F-18.06). Then apply one coat BMS 10-11, Type 2 enamel, color 702 white gloss (F-21.03). Material: Aluminum alloy.

(d) Inner sleeve (2B), and outer sleeve (2D) -- Cadmium plate (0.002-0.004 inch thick) (F-15.02). Material: 4340 steel bar (125-145 ksi).

(e) Check nut (5) and collar nut (6) -- Cadmium plate (0.002-0.004 inch thick) (F-15.02). Material: 4340 steel bar (150-170 ksi).

(f) Filler plug (9), stop (10) -- Chemical treat or chromic acid anodize. Apply one coat BMS 10-11, Type 1 primer (F-2.30). Material: Aluminum alloy.

(g) Spring (12) -- Cadmium plate and apply one coat BMS 10-11, Type 1 primer (F-16.03). Material: Spring steel (music wire).

(h) Shaft (13, P/N 65-53787-2) -- Colored film chemical treat interior and exterior surfaces and apply one coat BMS 10-11, Type 1 primer)(F-2.901). Material: Aluminum alloy.

(i) Shaft (13, P/N 65-53787-4) -- Colored film chemical treat interior and exterior surfaces, and apply one coat BMS 10-11, Type 1 primer (F-2.901). Also, apply BMS 10-60, Boeing color 702, white gloss enamel on exterior surface only (F-14.9812). Material: Aluminum alloy.

(j) Shaft (13, P/N 65-53787-6) -- Chemical treat interior and exterior surfaces and apply one coat BMS 10-11, Type 1 primer (F-18.07). Material: Aluminum alloy.

(k) End collar (18, P/N 66-16730-1) -- Cadmium plate (0.0002-0.0004 inch thick) (F-15.02). Material: 4340 steel bar (150-170 ksi).

(l) End collar (18, P/N 66-16730-2) -- Cadmium plate (0.0002-0.0004 inch thick) (F-15.02). Also, add on coat BMS 10-11, Type 1 primer (F-20.02) and apply BMS 10-60 Boeing color 702 white gloss enamel, on 1.65 diameter (SRF-14.9812) optional on hex. Material: 4340 steel bar (150-170 ksi).

(m) Stop (20) -- Cadmium plate (F-15.06). Material: 4340 steel bar.

(n) Casing (21, P/N 69-40286-2) -- Prepare surface and passivate (F-17.09). Material: 321 or 347 CRES seamless tubing.

(o) Casing (21, P/N 69-40286-3) -- Prepare surface and passivate all over (F-17.09). Apply one coat BMS 10-11, Type 1 primer (F-20.02) plus apply one coat BMS 10-11, Type 2 gloss enamel (SRF - 14.905-702) exterior surfaces only. Material: 321 or 347 CRES seamless tubing.

C. Replacement

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

(2) If stencil on casing (21) requires replacement, refinish with BMS 10-11, Type 1 primer and Type 2 enamel gloss per SOPM 20-41-02.

6. ASSEMBLY

A. Casing Assembly (Fig. 1A, 2)

(1) Assemble casing assembly (14) as follows:

(a) If using rod end (16, P/N BACB10AE10), fill hollow end with BMS 5-28, Type 3 epoxy cement.

(b) Install rod end (16) into casing (21) using wet BMS 5-95 sealant. When installing, make sure that bearing bore is parallel to drain holes within 5 degrees.

(c) Install rivets (15).

(d) Install stop (20) in casing (21) with rivets (19). Rivets (19) must be installed with head within 0.010-inch below to 0.020-inch above flush.

(e) Install end collar (18) on to casing (21) with wet BMS 10-11, Type 1 primer. Install rivets (17). Rivets (17) must be installed with head within 0.010-inch below to 0.020-inch above flush.

B. Shaft Assembly (Fig. 1A, 2)

(1) Install filler plug (9) and stop (10) with wet BMS 10-11, Type 1 primer. Install rivets (8) at end location on shaft (13).

(2) Position slides (11) and spring (12) on shaft (13).

WARNING: LOAD ON SPRING (12) IS APPROXIMATELY 80 POUNDS WHEN COMPRESSED TO LENGTH NECESSARY FOR INSTALLATION OF STOP (10). USE CAUTION TO PREVENT INJURY DUE TO SUDDEN RELEASE OF SPRING.

(3) Apply wet BMS 10-11, Type 1 primer to filler plug (9) and stop (10).

(4) Compress spring (12) and hold in place with clamp and install filler plug (9), stop (10), and rivets (8).

C. Spring Cartridge Assembly (Fig 1A, 2)

(1) Insert shaft assembly (7) in casing assembly (14); install check nut (5) on collar nut (6) and thread collar nut (6) into end collar (18) on casing assembly (14).

(2) Adjust collar nut (6) to 0.003-inch maximum end play in spring cartridge and tighten check nut (5) to within a torque range of 10 to 20 pound-inches.

(3) Lockwire collar nut (6) and check nut (5) to end collar (18) with lockwire MS20995NC32 (optional MS20995N32, MS20995F32).

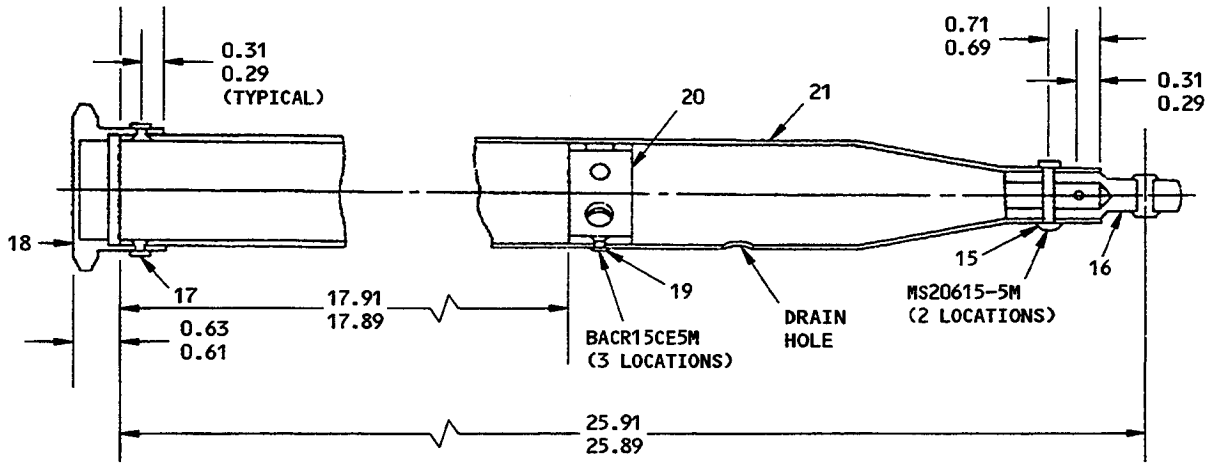
(4) Spring cartridge assembly (65-53788-2, -3)

(a) Fill non-threaded ID of fitting (2) with BMS 5-28, Type 3 epoxy cement.

(b) Insert end fitting (2) into shaft assembly (7) and install rivets (1).

(c) Apply a thin coat of MIL-C-16173, grade 2 corrosion preventive compound on both internal threads of end fitting (2) and external threads of rod end (4) before assembly of components.

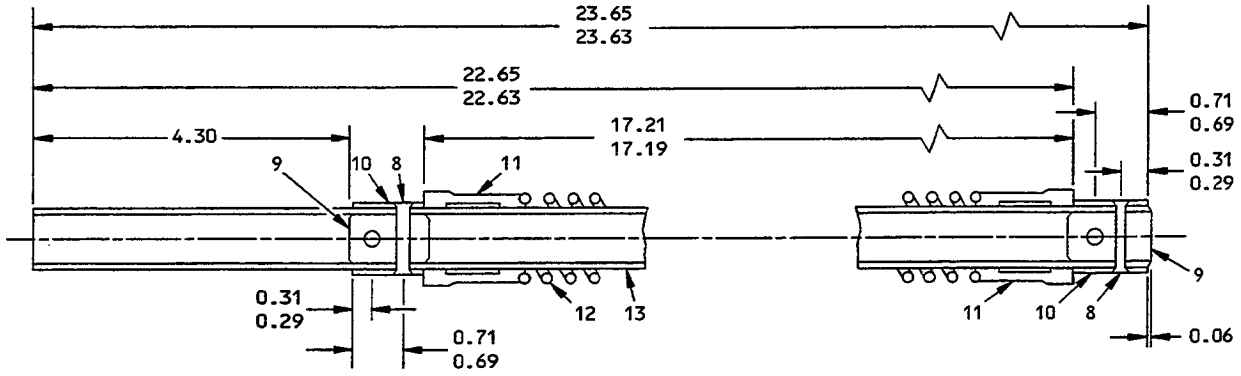
(d) Install nut (3) on rod end (4) and install rod end (4) into end fitting (2).



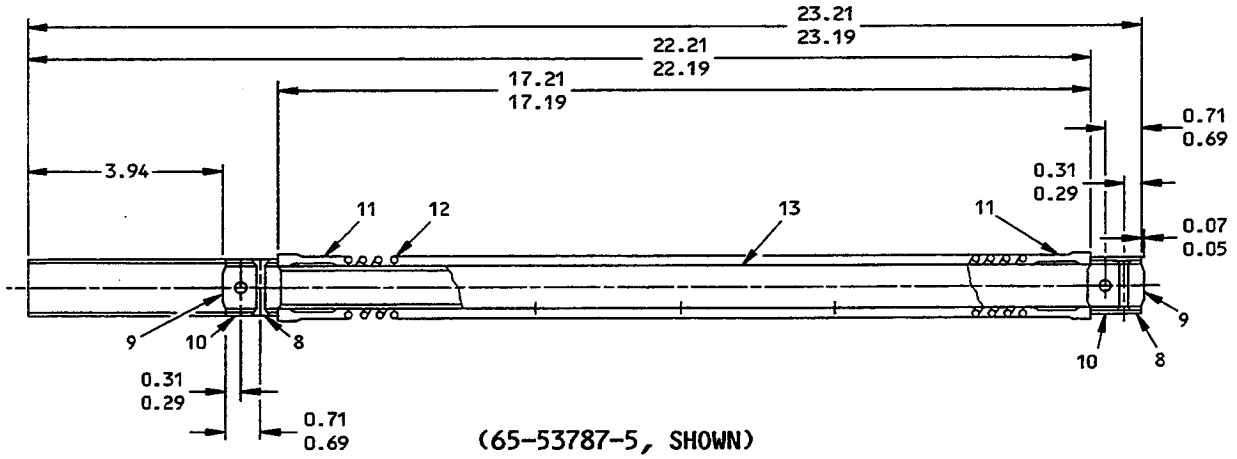
CASING ASSEMBLY (14)

Assembly Details
Figure 1A (Sheet 1)

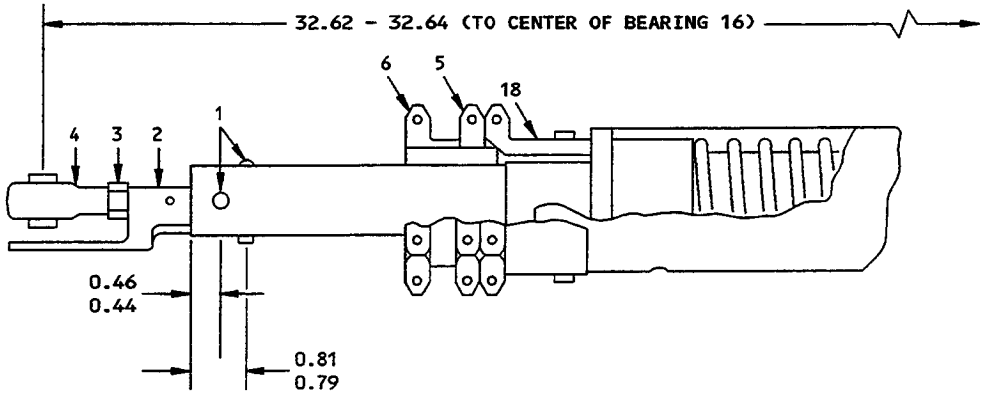
G36996



(65-53787-1,-3 SHOWN)
SHAFT ASSEMBLY (7)

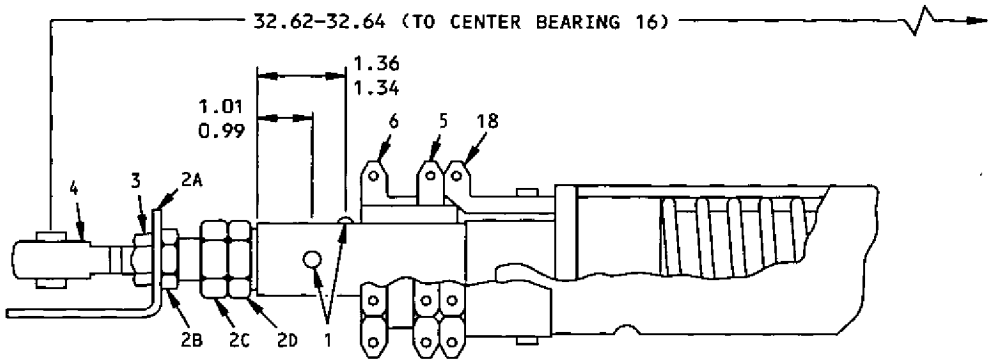


(65-53787-5, SHOWN)
SHAFT ASSEMBLY (7)



(65-53788-2,-3 SHOWN)
FINAL ASSEMBLY

Assembly Details
Figure 1A (Sheet 2)



(65-53788-4,-6 SHOWN)

FINAL ASSEMBLY

Assembly Details
Figure 1A (Sheet 3)

G37100

(5) Spring cartridge assembly (65-53788-4, -6)

(a) Fill non-threaded ID of fitting (2D) with BMS 5-28, Type 3 epoxy cement.

(b) Apply a thin coat of MIL-C-16173, grade 2 corrosion-preventive compound on internal threads of sleeve (2B), nut (2C) and external threads of rod end (4) before assembly of parts.

(c) Install inner sleeve (2B), nut (2C) and outer sleeve (2D) into shaft (7) and install rivets (1).

(d) Install nut (3) onto rod end (4).

(e) Install rod end (4) with fitting (2A) into sleeve (2B).

(6) Adjust length of spring cartridge assembly to 32.63 inches between centers of bearing bore in rod ends (4, 16). Tighten nut (3) to within a torque range of 10 to 20 pound-inches.

(7) Apply a 100-pound load to both extend and compress cartridge assembly and check that movement of shaft assembly is not restricted and spring is operating properly.

7. TESTING

A. Motion Test

(1) Verify that the distance between the rod end bearing (4 and 16) centers is 32.62-32.64 inches.

(2) Apply force between the rod end bearings (4 and 16), causing them to move toward and then away from each other. Verify that the motion is smooth and without binding.

(3) Remove the force between the rod end bearings (4 and 16) and verify that the distance between the rod end bearing (4 and 16) centers is 32.62-32.64 inches.

B. 65-53788-2, -3 and -4 Requirements

(1) The force required to begin rod end movement is approximately 100 pounds. No force measurement is required.

(2) The distance between the rod end bearing (4 and 16) centers with full compression and extension shall be 29.63 and 35.63 inches, respectively.

C. 65-53788-6 Requirements

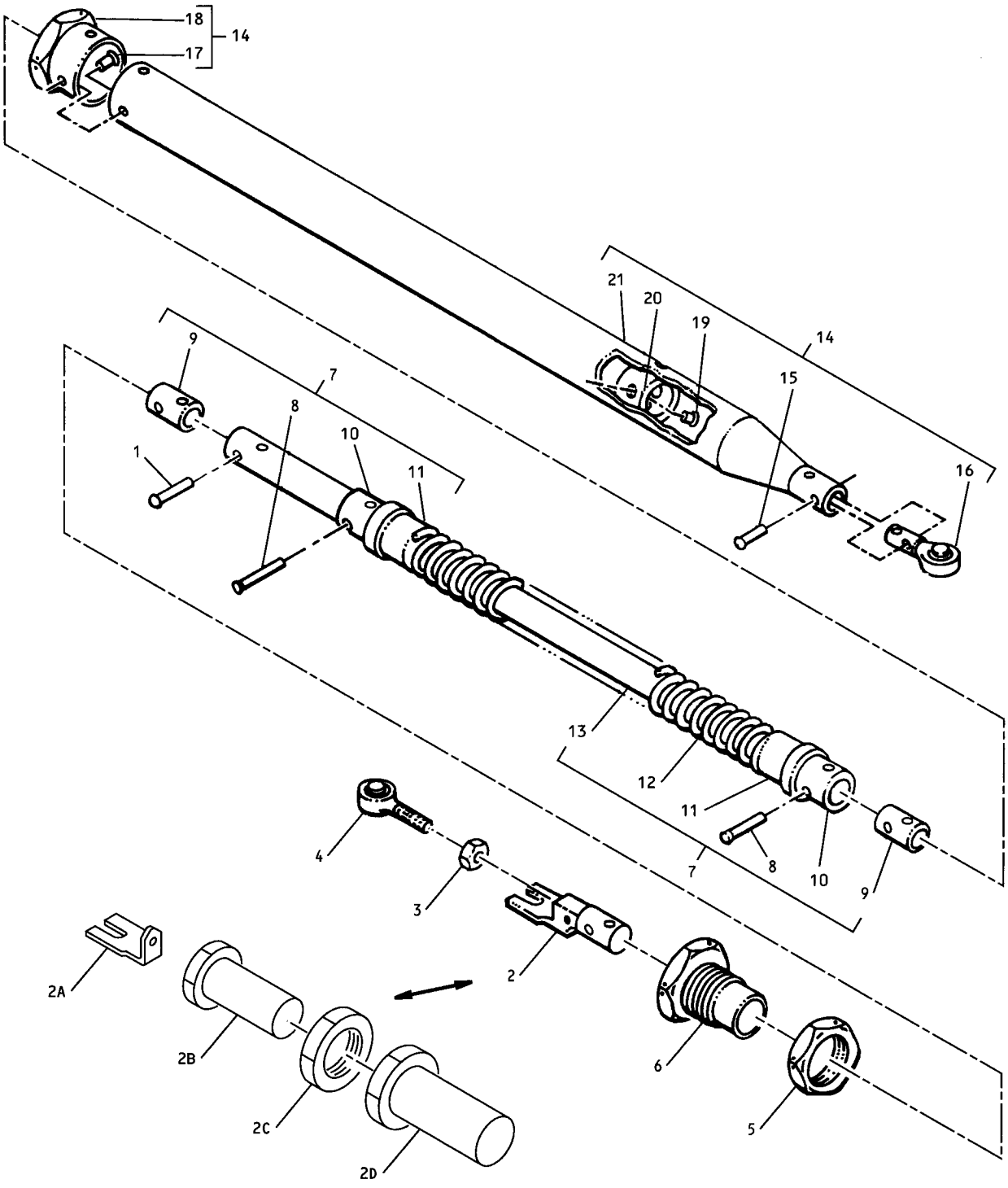
(1) Verify that the force required to begin rod end movement is 94-106 pounds.

(2) The distance between the rod end bearing (4 and 16) centers with full compression and extension shall be 29.38 and 35.88 inches, respectively.

(3) Verify that the force at full compression and extension is 112-138 pounds.

8. ILLUSTRATED PARTS LIST

A. Exploded View



Aileron Power Control Spring Cartridge Assembly
Figure 2

G37457

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
2-					
	65-53788-2		AILERON POWER CONTROL SPRING CARTRIDGE ASSY	A	RF
	65-53788-3		AILERON POWER CONTROL SPRING CARTRIDGE ASSY	B	RF
	65-53788-4		AILERON POWER CONTROL SPRING CARTRIDGE ASSY	C	RF
	65-53788-6		AILERON POWER CONTROL SPRING CARTRIDGE ASSY	D	RF
1	MS20470D5		. RIVET	AB	2
1	BACR15BB5D		. RIVET	CD	2
2	69-22352-1		. END FITTING	A	1
2	69-22352-2		. END FITTING	B	1
2A	69-78669-1		. FITTING	CD	1
2B	69-78668-1		. SLEEVE, INNER	CD	1
2C	NAS509-10		. NUT	CD	1
2D	69-78667-1		. SLEEVE, OUTER	CD	1
3	AN316-6R		. NUT	AB	1
3	NAS509-6		. NUT	CD	1
4	BACB10A75		. BEARING	AB	1
4	BACB10AD5K		. BEARING	CD	1
5	66-16731-1		. NUT, CHECK		1
6	66-16732-1		. NUT, COLLAR		1
7	65-53787-1		. SHAFT ASSY	A	1
7	65-53787-3		. SHAFT ASSY	B	1
7	65-53787-5		. SHAFT ASSY	C	1
7	65-53787-8		. SHAFT ASSY	D	1
8	MS20426D5		. . RIVET	AB	4
8	BACR15BA5D		. . RIVET	CD	4
9	66-16733-1		. . FILLER PLUG	AB	2
9	66-16733-2		. . FILLER PLUG	CD	2
10	66-16740-1		. . STOP		2
11	66-16734-1		. . SLIDE	ABC	2
11	66-16734-3		. . SLIDE	D	2
12	69-40287-1		. . SPRING, COMPRESSION	ABC	1
12	251A1065-1		. . SPRING, COMPRESSION	D	1
13	65-53787-2		. . SHAFT	A	1
13	65-53787-4		. . SHAFT	B	1
13	65-53787-6		. . SHAFT	C	1
13	65-53787-8		. . SHAFT	D	1
14	65-53786-2		. CASING ASSY	A	1
14	65-53786-3		. CASING ASSY	BC	1
14	65-53786-4		. CASING ASSY	D	1
15	MS20615-5M		. . RIVET		2
16	BACB10AE10A		. . ROD END (PRE)		1
16	BACB10AE10		. . ROD END (OPT)		1
17	BACR15CE5M		. . RIVET		4

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
2-					
18	66-16730-1		. . END COLLAR	A	1
18	66-16730-2		. . END COLLAR	BCD	1
19	BACR15CE5M		. . RIVET		3
20	66-16787-1		. . STOP		1
21	69-40286-2		. . CASING	A	1
21	69-40286-3		. . CASING	BCD	1