

**BOEING**  
*Commercial Jet*  
**OVERHAUL MANUAL**

TO: ALL HOLDERS OF AFT AIRSTAIRS GOVERNOR ASSEMBLY OVERHAUL MANUAL, 52-64-02

REVISION NO. 1, DATED JUL 5/76

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
<p style="text-align: center;"><u>NOTE</u></p> <p>Beginning with this revision separate consecutively numbered highlight sheets will be provided whenever this subject is revised.</p> <p>Changed step D.(4) of Testing procedure to clarify operating requirement</p>								X					

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## AFT AIRSTAIRS GOVERNOR ASSEMBLY

52-64-02

BOEING P/N 65-59642-1 AND -2

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
52-1027 52-1031		PRR 30012 PRR 31792	Nov 15/68 Sep 25/73 Sep 25/73

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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
52-64-02					
T-1	Sep 25/73				
T-2	BLANK				
* LEP-1	Jul 5/76				
LEP-2	BLANK				
T/C-1	Sep 25/73				
T/C-2	BLANK				
1	Sep 25/73				
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* 10	Jul 5/76				
11	Sep 25/73				
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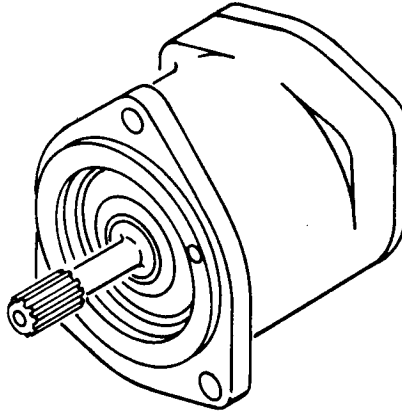
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AFT AIRSTAIRS GOVERNOR ASSEMBLY



Aft Airstairs Governor Assembly  
Figure 1

1. DESCRIPTION AND OPERATION

A. Description

- (1) The aft airstairs governor assembly consists of two spring-loaded brake shoe assemblies mounted on a shaft, which in turn is supported in bearings within a housing assembly.

B. Operation

- (1) Rotation of the shaft above the brake-engage speed causes the brake shoes to expand, contacting the liner in the housing. The braking action produced tends to limit, or govern, the rotational speed of the shaft.

2. DISASSEMBLY

A. Procedures (Fig. 4)

- (1) Remove bolt (1), washer (2), and end cap (3).
- (2) Carefully slide shaft (4), with brake shoe assemblies (9) attached, out of housing assembly (18).

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- (3) Detach springs (5) from brake shoe assemblies (9).
- (4) Remove cotter pins (6) and washers (7). Remove pins (8) to free brake shoe assemblies (9). Slide springs (5) from pins (8) as pins (8) are withdrawn.
- (5) Do not remove rivets (10) and brake linings (11) unless replacement is required.
- (6) Do not remove bushing (12) from brake shoe (13) unless replacement is required.
- (7) Remove liner (14) and key (15) from housing assembly (18). Remove bearing (16) from end cap (3) and bearing (17) from housing assembly (18).

NOTE: Do not remove pin (19) or insert (20) from housing (21) unless replacement is required.

### 3. CLEANING

#### A. General

- (1) Clean all metal parts except bearings in solvent, Specification P-D-680, or equivalent. Remove stubborn accumulations of foreign matter with a stiff-bristle brush.
- (2) Dry parts with clean, lint-free cloth or moisture-free air.

NOTE: For further information refer to 20-30-03, General Cleaning Procedures.

#### B. Bearings

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

### 4. INSPECTION/CHECK

#### A. Visual Check

- (1) Examine all metal parts for pits, scratches, cracks, corrosion and damage using strong light and a minimum of 10-power magnification.
- (2) Examine all painted or plated surfaces for blisters and flaking.
- (3) For parts subjected to wear, check for wear beyond allowable limits shown in Fits and Clearances.

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- (4) Examine bearings for excessive radial or axial play.
- (5) Examine bearing, bushing and bolt holes for excessive or eccentric wear.

B. Special Check (Fig. 4)

CAUTION: Deleted.

NOTE: Deleted.

- (1) If visual examination reveals evidence of defects in parts listed below, perform following checks:
  - (a) Penetrant Check -- End cap (3), brake shoe (13), and housing (21).
  - (b) Magnetic Particle Check -- Shaft (4).

C. Spring Check (See figure 4.)

- (1) Check springs (5) for free length and for loaded length as shown in Fig. 2.

NOTE: All lengths are measured to inside of hooks.

5. REPAIR:

A. Repair

- (1) Remove minor scratches, nicks, and corrosion with abrasive cloth, 220 grit or finer. Refinish as necessary to protect against corrosion.

Index No. Fig (4)	Approximate Free Length (Inches)	Test Length (Inches)	Test Load (Pounds)
5 (69-46677-2)	1.13	1.40 1.558	9.46 to 9.96 15.15 to 15.65
5 (69-61256-2)	1.27	1.56	15.15 to 15.65

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- (2) Repair minor defects on splines by light filing or using an abrasive.
- (3) Clean up minor defects in threads with a small triangular file or thread chaser.

B. Refinish (Fig. 4)

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) If plated or painted surfaces on listed parts are worn or chipped, refinish as follows:
  - (a) End Cap (3) -- Apply F-2.26 all over, plus SRF-12.205 on exterior surfaces only. Omit primer from mating face of flange.
  - (b) Shaft (4) -- Apply F-1.1926 on external surfaces, except 0.0002 to 0.0003-inch single plating thickness on splines. Apply SRF-12.206 plus F-14.13 in 0.1875-inch diameter hole.
  - (c) Spring (5) -- Apply SRF-1.92 (69-46677-2) or SRF-12.205 (69-61256-2) all over.
  - (d) Pin (8)
    - 1) P/N 69-46676-1 -- Apply F-1.842 all over, minimum thickness 0.002 inch, except 0.0003 to 0.0005 inch thickness on shank. Refinished diameter of shank should be 0.2485 to 0.2495 inch.
    - 2) P/N 69-46676-2 -- Apply F-1.1926 all over.
  - (e) Bushing (12) -- Apply F-2.20 all over.
  - (f) Brake Shoe (13) -- Apply F-2.26 all over.
  - (g) Liner (14) -- Apply F-1.842 all over. Outside diameter of refinished liner should be 3.205 to 3.210 inches. Inside diameter should be 3.000 to 3.005 inches. Both surfaces should have a 63 microinch or better finish. Refinish keyway slot with F-1.1926. Depth of refinished slot should be 0.062 to 0.063 inches, and width should be 0.125 to 0.126 inches.
  - (h) Housing (21) -- Apply F-2.26 all over, plus SRF-12.205 on exterior surfaces only. Omit primer from mating faces of flanges.

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C. Replacement (Fig. 4)

- (1) Replace all cotter pins at each overhaul.
- (2) Replace all parts damaged beyond simple repair.
- (3) If brake linings (11) require replacing, drill out rivets (10) to remove work lining and attach new brake lining (11) to brake shoe (13) as follows:
  - (a) Drill four holes in brake lining (11), using brake shoe (13) as a guide.
  - (b) Counterbore holes in lining (on braking surface side)
    - 1) Diameter
      - a) 65-59357-4 -- 0.38 to 0.42 inch
      - b) 65-61239-3 -- 0.22 to 0.25 inch
    - 2) Depth -- Leave 0.50 to 0.55 inch of material beneath counterbore
    - 3) Fillet radius -- 0.01 to 0.02 inch
  - (c) Install lining (11) with rivets (10). Insert rivet with manufactured head in counterbore of lining.
  - (d) Chamfer/bevel lining
    - 1) 65-59357-4 -- chamfer heel 40 to 50 degrees by 0.08 inch. Bevel toe to 0.11 to 0.12 inch thickness over 0.38 inch width.
    - 2) 65-61239-3 -- Chamfer heel and toe 40 to 50 degrees by 0.08 inch.
- (4) If bushings (12) need to be replaced, carefully press out old bushings and install new ones with wet BMS 10-11, type 1 primer.

CAUTION: GIVE ADEQUATE SUPPORT TO BRAKE SHOE (13) TO PREVENT DAMAGE WHEN BUSHING (12) IS REMOVED.
- (5) If pin (19) needs to be replaced, carefully drill out old pin and shrink-fit new pin in housing (21).
- (6) If inserts (20) need to be replaced, remove old inserts and install new ones with corrosion-preventive compound, MIL-C-11796, class 3. Adjust depth so that outer end of insert is 1/4 to 1/2 turn below surface of flange. Remove tang.

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6. ASSEMBLY

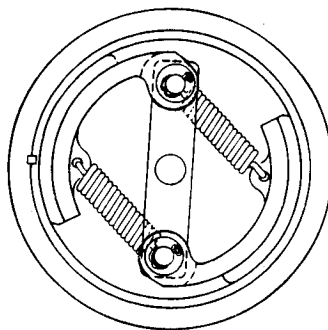
A. Procedures (Fig. 4)

- (1) Install bearing (17) in housing assembly (18), and bearing (16) in end cap (3). Coat faying surfaces of bearings and bores with primer, BMS 10-11, type 1, and install wet.
- (2) Insert key (15) and liner (14) in housing assembly (18).
- (3) Deleted.
- (4) Install brake shoe assemblies (9) with pins (8), washers (7), and cotter pins (6).

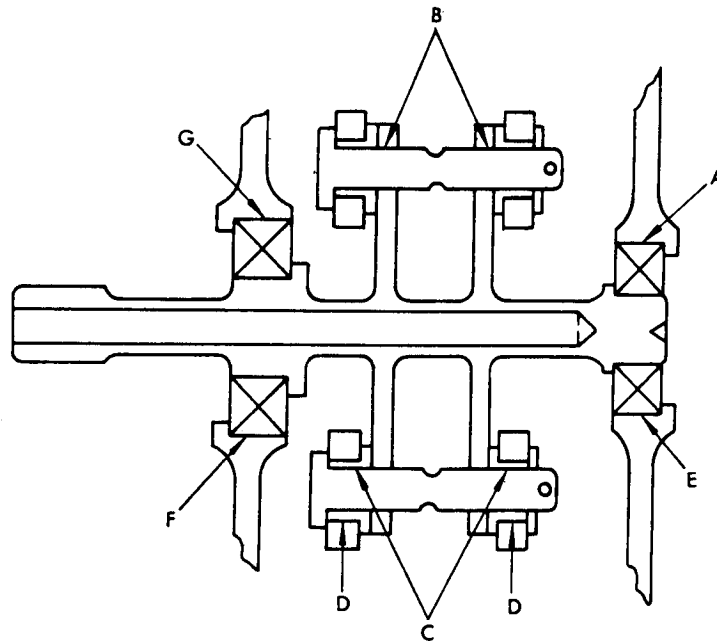
**CAUTION:** BRAKE SHOE ASSEMBLIES MUST BE INSTALLED AS SHOWN IN FIG. 3.

**NOTE:** Install pins (8) so head is toward splined end of shaft (4). Slide one end of spring (5) over shaft of pin (8) after pin is inserted through one bushing of brake shoe assembly (9) and fitting of shaft (4).

- (5) Attach free end of spring (5) to brake shoe assembly (9).
- (6) Insert splined end of shaft (4) through bearing (17) in housing assembly (18).
- (7) Install end cap (3) with washers (2) and bolts (1). Coat bolts with corrosion-preventive compound, MIL-C-11796, class 3, prior to assembly. Tighten to within a torque range of 22 to 28 pound-inches.



END CAP VIEW (END CAP REMOVED)

**7. FITS AND CLEARANCES (Fig. 3A)**

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		Design Dimensions				Service Wear Limits		
Ref Letter Fig.3A	Mating Item No. Fig.4	Dimensions (inches)		Assembly Clearance (inch)		Dimension Limits (inches)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
A	ID 3	1.0236	1.0244	0.00	0.0012	1.0232	1.0244	0.0012
	OD 16	1.0232	1.0236					
B	ID 4	0.2495	0.2505	0.00	0.002	0.2479	0.2505	0.0026
	OD 8	0.2485	0.2495					
C	ID 12	0.2500	0.2515	0.0005	0.0030	0.2479	0.2515	0.0036
	OD 8	0.2485	0.2495					
D	ID 13	0.3748	0.3754	-0.0013	-0.0002	0.3756	0.3754	-0.0002
	OD 12	0.3756	0.3761					
E	ID 16	0.3934	0.3937	-0.0004	0.0002	0.3932	0.3937	0.0005
	OD 4	0.3935	0.3937					
F	ID 17	0.5903	0.5906	-0.0003	0.0003	0.5900	0.5906	0.0006
	OD 4	0.5903	0.5906					
G	ID 21	1.2598	1.2608	0.00	0.0015	1.2593	1.2608	0.0015
	OD 17	1.2593	1.2598					
	ID 14	3.000	3.005			*[1]	3.025	
	OD 11							

\*[1] Wear to rivet maximum

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## 8. TESTING

### A. Test Equipment

- (1) Governor assembly test fixture, AG65-59642-2
- (2) Deleted.
- (3) Deleted.

### B. Preparation for Test

- (1) Attach governor assembly to test fixture.
- (2) Attach temperature sensing device to outside of housing (21, Fig. 4).
- (3) If new brake linings were installed, run them in by rotating at 2800 rpm (65-59642-1) or 5100 rpm (65-59642-2) for 10 seconds. Release, and allow to cool to 100°F maximum. Repeat cycle ten times.

### C. Functional Test Assembly 65-59642-1

- (1) Rotate shaft both directions. Minimum brake-engage speed should be 2200 rpm.
- (2) Torque to drive the unit at 2000 rpm should not exceed 0.40 pound-inches.
- (3) Rotate shaft clockwise (stair-extend) to 2800 rpm. Maintain speed for 10 seconds.
  - (a) Torque should remain constant.
  - (b) Housing temperature should not exceed 250°F.
  - (c) Operation should be smooth, with no grabbing or stalling.
- (4) Increase rotation speed to 3000 rpm. Torque should be within limits of 19 to 31 pound-inches.

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D. Functional Test Assembly 65-59642-2

- (1) Rotate shaft both directions. Minimum brake-engage speed should be 4200 rpm.

CAUTION: DO NOT OPERATE GOVERNOR CONTINUOUSLY FOR MORE THAN 15 SECONDS. ALLOW HOUSING TO COOL TO 100°F MAXIMUM PRIOR TO EACH OPERATION.

- (2) Torque to drive the unit at 4000 rpm should not exceed 0.40 pound-inches.
- (3) Rotate shaft clockwise (stair-extend) 5100 rpm. Maintain speed for 10 seconds.
  - (a) Torque should remain constant.
  - (b) Housing temperature should not exceed 250°F.
  - (c) Operation should be smooth, with no grabbing or stalling.
- (4) Rotate shaft clockwise to 4900 rpm. Torque should be 11 pound-inches or less.
- (5) Increase rotation speed to 5400 rpm. Torque should be 11 pound-inches or greater.

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9. TROUBLE SHOOTING

A. Trouble during test after overhaul. (See figure 4.)

<u>Trouble</u>	<u>Possible Cause</u>	<u>Correction</u>
(1) Brake-engage speed low	Defective springs (5)	Disassemble, recheck springs, replace defective parts
(2) Excessive torque at 2000 rpm (65-59642-1) or 4000 rpm (65-59642-2)	Defective bearing (16 or 17)	Check bearings, replace defective part
	Dragging brake lining (11)	Dress down or replace defective part
(3) Irregular torque at 2800 rpm (65-59642-1) or 5100 rpm (65-59642-2)	Defective bearing (16 or 17)	Check bearings, replace defective part
	Binding brake shoe assembly (9)	Check, correct cause
(4) Excessive temperature at 2800 rpm (65-59642-1) or 5100 rpm (65-59642-2)	Brake linings improperly run-in	Repeat run-in
	Insufficient cooling time from prior test	Cool properly
	Improper finish on liner (11)	Refinish to 63-microinch or better
(5) Torque out of tolerance at 3000 rpm (65-59642-1) or 5400 rpm (65-59642-2)	Defective brake linings	Replace defective lining
	Defective springs	Check springs, replace defective part

A. Wrap assembly in vapor barrier paper and tag with date.

A. See Testing.

This exploded view diagram illustrates the assembly of a mechanical component, likely a pump or motor housing. The parts are numbered as follows:

- 1:** Small cylindrical pin or plug.
- 2:** Small cylindrical pin or plug.
- 3:** Flange or housing component.
- 4:** Long shaft or rod.
- 5:** Spring or coiled wire.
- 6:** Small pin or clip.
- 7:** Small cylindrical pin or plug.
- 8:** Small cylindrical pin or plug.
- 9:** Bracket or mounting plate.
- 10:** Small cylindrical pin or plug.
- 11:** Small cylindrical pin or plug.
- 12:** Small cylindrical pin or plug.
- 13:** Small cylindrical pin or plug.
- 14:** Large cylindrical component, possibly a rotor or stator.
- 15:** Small cylindrical pin or plug.
- 16:** Small cylindrical pin or plug.
- 17:** Small cylindrical pin or plug.
- 18:** Small cylindrical pin or plug.
- 19:** Small cylindrical pin or plug.
- 20:** Small cylindrical pin or plug.
- 21:** Small cylindrical pin or plug.

The diagram shows the relative positions and assembly sequence of these parts, with dashed lines indicating the alignment and fit of the components.

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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-	65-59642-1 65-59642-2		AFT AIRSTAIRS GOVERNOR ASSEMBLY AFT AIRSTAIRS GOVERNOR ASSEMBLY (SB 52-1027 or 52-1031)							A	
1	NAS623-3-3		. BOLT							B	3
2	AN960-10L		. WASHER								3
3	65-58247-1		. END CAP								1
4	69-46675-1		. SHAFT								1
5	69-61256-2		. SPRING (preferred)(SB 52-1027 or 52-1031)								2
5	69-46677-2		. SPRING (opt to 69-61256-2)							A	2
6	MS24665-134		. PIN, Cotter								2
7	NAS620-416L		. WASHER								2
8	69-46676-1		. PIN							A	2
8	69-46676-2		. PIN (SB 52-1027 or 52-1031)							B	2
9	65-59357-1		. SHOE ASSEMBLY, Brake							A	2
9	65-61239-1		. SHOE ASSEMBLY, Brake (SB 52-1027 or 52-1031)							B	2
10	MS20450C12B12		. . RIVET (used on 65-59357-1)								4
10	MS20450C8B7		. . RIVET (used on 65-61239-1)								4
11	65-59357-4		. . LINING (used on 65-59357-1)								1
11	65-61239-3		. . LINING (used on 65-61239-1)								1
12	NAS77A4-15		. . BUSHING								2
13	65-59357-5		. . SHOE (used on 65-59357-1)								1
13	65-61239-2		. . SHOE (used on 65-61239-1)								1
14	69-46870-1		. LINER								1
15	MS20067-60		. KEY								1
16	BACB10A522		. BEARING								1
17	BACB10A523		. BEARING								1
18	65-59356-1		. HOUSING ASSEMBLY								1
19	NAS607-3-4P		. . PIN, Dowel								1
20	MS21209F1-20		. . INSERT, Helical coil								3
21	65-59356-2		. . HOUSING								1