COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

OUTBOARD GROUND SPOILER ACTUATOR ASSEMBLY

PART NUMBER 251A1510–3, 65-44960–23, –24, –25, –27, –28, 65C26864–1, –2, –3

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COMPONENT MAINTENANCE MANUAL

Revision No. 28
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To: All holders of OUTBOARD GROUND SPOILER ACTUATOR ASSEMBLY 27-62-71.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

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COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR 33371	MAR 05/84
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Revision		Filed	
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Temporary Revision		Inserted		Removed	
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Temporary Revision		Inserted		Removed	
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INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Components that can be repaired have a different repair number for each specified repair. To find the repair number location of a component, look in the Repair-General procedure at the beginning of the REPAIR section. The Repair-General procedure also has an explanation of the True Position Dimension symbols used.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. The tool reference numbers found in the individual procedures and in the Special Tools, Fixtures, and Equipment section are used to identify if a tool is a standard tool (STD-XXXX), a commercial tool (COM-XXXX), or a Special Tool (SPL-XXXX). This reference number is also used to distinguish between tools with similar names in the same procedure. These reference numbers are for use in the documentation only. They are not to be used for ordering tools.

OUTBOARD GROUND SPOILER ACTUATOR ASSEMBLY - DESCRIPTION AND OPERATION

1. **Description**

   A. The outboard ground spoiler actuator assembly consists of a hydraulic actuator assembly, hydraulic tubing and fittings, and bracket and clamps to support the tubing.

   B. The hydraulic actuator assembly consists of an aluminum housing containing a piston with attached rod end, a lock sleeve, and a spring-loaded locking device.

2. **Operation**

   A. The actuator assembly positions the outboard (No. 0, 1, 8 and 9) spoiler panels on the 737-300 and the outboard (No. 1 and 12) spoiler panels on the 737-700 airplane. The actuator is trunnion mounted to wing structure and attaches to the spoiler panel through the piston rod end.

   B. With the piston retracted, a set of pawls act on an inner sleeve to lock the actuator, preventing the spoiler from lifting under external forces. The actuator unlocks when hydraulic pressure overcomes the spring load in the locking device, permitting the spoiler panel to be raised.

3. **Leading Particulars (Approximate)**

   A. Length – 8 in. (retracted); 12 in. (extended)

   B. Width – 5 in.

   C. Height – 4 in.

   D. Weight – 5 lb

   E. Operating fluid – Hydraulic fluid, BMS 3-11, fluid, D00153

TESTING AND FAULT ISOLATION

1. General

A. This procedure has the data necessary to do a test of the outboard ground spoiler actuator assembly after an overhaul or for fault isolation.

B. Refer to the Standard Overhaul Practice Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 for item numbers.

2. Test Equipment and Materials

NOTE: Equivalent substitutes may be used.

A. Hydraulic test bench capable of delivering graduated hydraulic pressure up to 4500 psi.

B. Suitable fixture to apply up to 4000-pound tension load to piston rod.

C. Hydraulic fluid, BMS 3-11, at room temperature.

3. Preparation for Test

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

B. Test setup

(1) Attach test unit to hydraulic test bench. Note UP (extend) and DN (retract) port identification engraved in actuator housing.

(2) Fill actuator assembly with fluid, D00153. Bleed off air from unit by cycling piston.

4. Functional Tests

CAUTION: DO NOT APPLY COMPRESSED AIR TO PORTS AT ANY TIME OR DAMAGE TO PARTS MAY RESULT.

A. Perform proof pressure test.

(1) With retract port open, apply 4500 psi to extend port for 2 minutes.

(2) Reduce pressure to 3-7 psi and hold for 2 minutes.

(3) Check that there is no evidence of external leakage or permanent set.

(4) Repeat test with extend port open and pressure applied to retract port.

B. Check external leakage.

(1) Apply 3000 psi alternately to extend and retract ports, cycling unit 25 times.

(2) Check that external leakage does not exceed one drop.

C. Check piston stroke.

(1) Cycle unit with 3000 psi hydraulic pressure.

(2) Check that piston stroke is 3.76-3.80 in.

D. Check piston free play.

(1) Retract piston completely and reduce hydraulic pressure to zero.

(2) Check that piston free play in locked position is 0.002-0.010 inch.

E. Check unlock pressure.

(1) Install unit in loading fixture.

(2) Retract piston completely and maintain zero hydraulic pressure.

(3) Check that unit remains locked with 4000 pounds for, 65C26864-1, -2, 3, tension load applied to piston.

(4) Maintain 4000 pounds, for 65C26864-1, -2, -3, tension load and gradually increase hydraulic pressure at extend port until unit unlocks. Check that unlock pressure does not exceed 1000 psi.

(5) Remove tension load from piston. Reduce hydraulic pressure to zero and retract piston completely.

(6) Apply gradually increasing pressure to extend port until unit unlocks. Check that unlock pressure is not less than 100 psi.

5. Post-Test Procedures

A. Disconnect test unit from hydraulic test stand and remove from load fixture.

B. Store unit per ASSEMBLY, Paragraph 3..

6. Corrective Procedures (IPL Figure 2)

A. Refer to TESTING AND FAULT ISOLATION, Table 101 for probable cause and corrective procedure for any test failure.

Table 101: Trouble Shooting Chart

TROUBLE	PROBABLE CAUSE	CORRECTION
Leakage at static seals or around piston rod	Defective packings (40,50) or seal (35)	Replace packings or seal as required
Piston fails to lock	Defective spring (85); excessive friction from seals (35,110A), rings (90,110), or packings (40,95,115); defective pawl or lock assembly (100,100A) piston (75,75A,75B)	Replace defective parts
	Excessive friction between piston (105,105A) and lock piston (75,75A,75B)	Repair or replace parts per manufacturer's instructions
	Clogged 0.070 dia hole in piston (105,105A)	Clean 0.070 dia hole
Unlock pressure incorrect	Excessive friction from seals (35,110A), rings (90,110), or packings (40, 95,115)	Replace parts as required
	Defective spring (85)	Replace spring

Table 101: Trouble Shooting Chart (Continued)

TROUBLE	PROBABLE CAUSE	CORRECTION
	Defective pawl or lock assembly (100,100A) or lock piston (75,75A,75B); excessive friction between piston (105,105A) and lock piston (75,75A,75B)	Repair or replace parts Repair or replace parts per manufacturer's instructions
	Clogged 0.070 dia hole in piston (105,105A)	Clean 0.070 dia hole

DISASSEMBLY

1. **General**

   A. Refer to TESTING AND FAULT ISOLATION to establish the condition of the component or most probable cause of its malfuction. This is to determine the extent of disassembly required without completely tearing down and rebuilding the component.

2. **Parts Replacement (IPL Figure 2)**

   NOTE: The following parts are recommended for replacement. Unless otherwise noted, actual replacement of parts may be based on in-service experience.

   A. Packings (40, 50, 95, 115, 120)

   B. Retainers (55, 125)

   C. Scraper (25)

   D. Foot seal (35) or seal assembly (35A)

   E. Cap ring (110) or seal assembly (110A)

   F. Glyd ring (90)

3. **Disassembly**

   A. Disassemble actuator assembly (IPL Figure 1)

      (1) On actuator assemblies 65-44960-23, -24, -25, -27, -28, remove parts (5 thru 22), then remove tube assemblies (25, 27, 30, 32) from hydraulic actuator assembly (75).

      NOTE: Do not disassemble tube assemblies. Replace as units.

      (2) On actuator assembly 251A1510-3, remove tube assemblies (25C, 30C) if attached. Tube assemblies (25C, 30C) are installation parts.

      NOTE: Do not disassemble tube assemblies. Replace as units.

      (3) On actuator assemblies 65-44960-23, -24, -25, -27, -28, remove lockwire from bolts (35, 37), then remove parts (35 thru 72).

      NOTE: Do not remove nutplates (50, 52) from bracket assembly (45, 47) unless replacement is necessary.

      (4) On actuator assembly 251A1510-3, remove bolts (35A), washers (40A), union (65), restrictor (67) and packing (70).

   B. Disassemble hydraulic actuator assembly (IPL Figure 2)

      (1) Loosen nut (5) and remove key (10) from groove in rod end assembly (15). Unscrew rod end and remove nut.

      NOTE: Refer to manufacturer's instructions for servicing of rod end assembly.

      (2) Remove lockwire from nut (20), then remove nut using spanner wrench, SPL-5689 . Remove scraper (25) from nut.

      CAUTION: TAKE CARE TO PREVENT PAWLS OR LOCK ASSEMBLY (100, 100A) OR (80) FROM DROPPING OUT AND BEING DAMAGED.

      (3) Pull out piston assembly (70) with sleeve (60), shim (65), and other attached parts (30 thru 55).

      (4) Remove end bearing (45) from piston and parts (30 thru 40, 50, 55).

(5) Remove piston assembly from sleeve, then remove parts (75 thru 100A) from piston (105, 105A).

NOTE: Pawls or lock assembly (100, 100A) make up a matched set. Place parts in a plastic bag to avoid loss or mix-up.

(6) Remove parts (110, 115) from piston and parts (120, 125) from housing assembly (130).

NOTE: Do not remove marker (150) or disassemble housing assembly unless necessary for repair or replacement.

CLEANING

1. General

A. This procedure contains the data necessary to clean special parts.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

2. Cleaning

A. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES

B. Procedure

(1) Clean all parts using standard industry practices and information contained in SOPM 20-30-03.

CHECK

1. General

A. This procedure has the data necessary to find defects in the material of the specified parts.

B. Refer to FITS AND CLEARANCES for the design dimension and wear limits.

C. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Check

A. References

Reference	Title
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Check all parts for obvious defects in accordance with standard industry practices.

(2) Penetrant check the following parts (IPL Figure 2) per SOPM 20-20-02.

(a) Nut (20)

(b) Seal retainer (30)

(c) End bearing (45)

(d) Housing assembly (130) without inserts (140)

(3) Magnetic particle check the following parts (IPL Figure 2) per SOPM 20-20-01.

(a) Rod end (15)

(b) Sleeve (60)

(c) Lock piston (75, 75A, 75B)

(d) Pawl or lock assembly (100, 100A)

(e) Piston (105, 105A)

(4) Check spring (85, IPL Figure 2).

(a) Check that spring (85, P/N 1211244-208) free length is 1.632 in. and spring (85A, P/N 20377) is 4.447 in.

(b) Compress spring (85) to 1.28 in. and check that load is 16.1-19.9 lbs.

(c) Compress spring (85) to 1.05 in. and check that load is 28.4-31.4 lbs.

(d) Compress spring (85A) to 3.080 in. and check that load is 40-42 lbs.

(5) Check lock assembly (100A, IPL Figure 2).

(a) Lock assembly should not show grooves or damage (a slight polishing can be expected and is acceptable).

REPAIR

1. **Content**

   A. Instructions for repair, refinish, and replacement of the specified subassembly parts are included in each REPAIR when applicable:

Table 601:

P/N	NAME	REPAIR
65C26863	HOUSING	1-1
69-55409	BEARING, END	2-1
BAC27DHY0300 BAC27DHY357	MARKER	3-1
- - -	MISC PARTS REFINISH	4-1

2. **Standard Practices**

   A. Refer to the following standard practices as applicable, for details of procedures in individual repairs.
   - SOPM 20-11-03 Repair of Electrical Terminations and Electrical Bonding Areas
   - SOPM 20-30-02 Stripping of Protective Finishes
   - SOPM 20-30-03 General Cleaning Procedures
   - SOPM 20-41-01 Decoding Table for Boeing Finish Codes
   - SOPM 20-41-02 Application of Chemical and Solvent Resistant Finishes
   - SOPM 20-42-03 Hard Chrome Plating
   - SOPM 20-42-05 Bright Cadmium Plating
   - SOPM 20-43-01 Chromic Acid Anodizing
   - SOPM 20-60-02 Finishing Materials
   - SOPM 20-60-03 Lubricants
   - SOPM 20-60-04 Miscellaneous Materials

3. **Materials**

   NOTE: Equivalent substitutes may be used.

   A. Primer – DC 1200 primer, C00580 Dow Corning 1200 red

   B. Sealant – sealant, A00160 BMS 5-63 (2 part)

   C. Sealant – Dow Corning 93-006-1 sealant, A00900 Dow Corning 93-006

   D. Primer – primer, C00259 BMS 10-11, type 1

   E. Enamel –

      (1) coating, C00260 BMS 10-11, Type 2

      (2) coating, C00700 BMS 10-60, color BAC 707 gray gloss

   F. Sealant – sealant, A00247 BMS 5-95

   G. Topcoating – coating, B00571 Type 41, Clear Skydrol resistant

   H. Tubing – tubing, G50409 Thermoshrink

4. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in REPAIR-GENERAL, Figure 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
⌵	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
Ø	DIAMETER
S Ø	SPHERICAL DIAMETER
R	RADIUS
SR	SPHERICAL RADIUS
()	REFERENCE
BASIC (BSC) OR [DIM]	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE FROM WHICH PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓛ	LEAST MATERIAL CONDITION (LMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT
TIR	TOTAL INDICATOR READING

EXAMPLES

[— | 0.002]	STRAIGHT WITHIN 0.002
[⊥ | 0.002 | B]	PERPENDICULAR TO B WITHIN 0.002
[// | 0.002 | A]	PARALLEL TO A WITHIN 0.002
[○ | 0.002]	ROUND WITHIN 0.002
[⌭ | 0.010]	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
[⌒ | 0.006 | A]	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM PLANE A
[⌓ | 0.020 | A]	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
[◎ | Ø 0.0005 | C]	CONCENTRIC TO C WITHIN 0.0005 DIAMETER
[⌯ | 0.010 | A]	SYMMETRICAL WITH A WITHIN 0.010
[∠ | 0.005 | A]	ANGULAR TOLERANCE 0.005 WITH A
[⌖ | Ø 0.002 Ⓢ | B]	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
[⊥ | Ø 0.010 Ⓜ | A] [0.510 Ⓟ]	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010-INCH DIAMETER, PERPENDICULAR TO, AND EXTENDING 0.510-INCH ABOVE, DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

NOTE: DATUM MAY APPEAR AT EITHER SIDE OF TOLERANCE FRAME [0.020 | A] [A | 0.020]

True Position Dimensioning Symbols
Figure 601

HOUSING ASSEMBLY - REPAIR 1-1

65C26863–1, –6

1. General

A. This procedure has the data necessary to refinish the housing assembly (IPL Figure 2, 130, 130A).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Trunnion Bushing Replacement (IPL Figure 2)

A. Remove damaged or worn bushing (135).

B. Apply sealant, A00160 or DC 1200 primer, C00580 (used with Dow Corning 93-006-1 sealant, A00900) to faying surfaces of housing (145) and repair bushing.

C. Heat bushing to 425-475°F.

D. Apply sealant, sealant, A00160 or Dow Corning 93-006-1 sealant, A00900, to housing trunnion just prior to bushing installation, then install hot bushing. Check that sealant is observed squeezing out around flange.

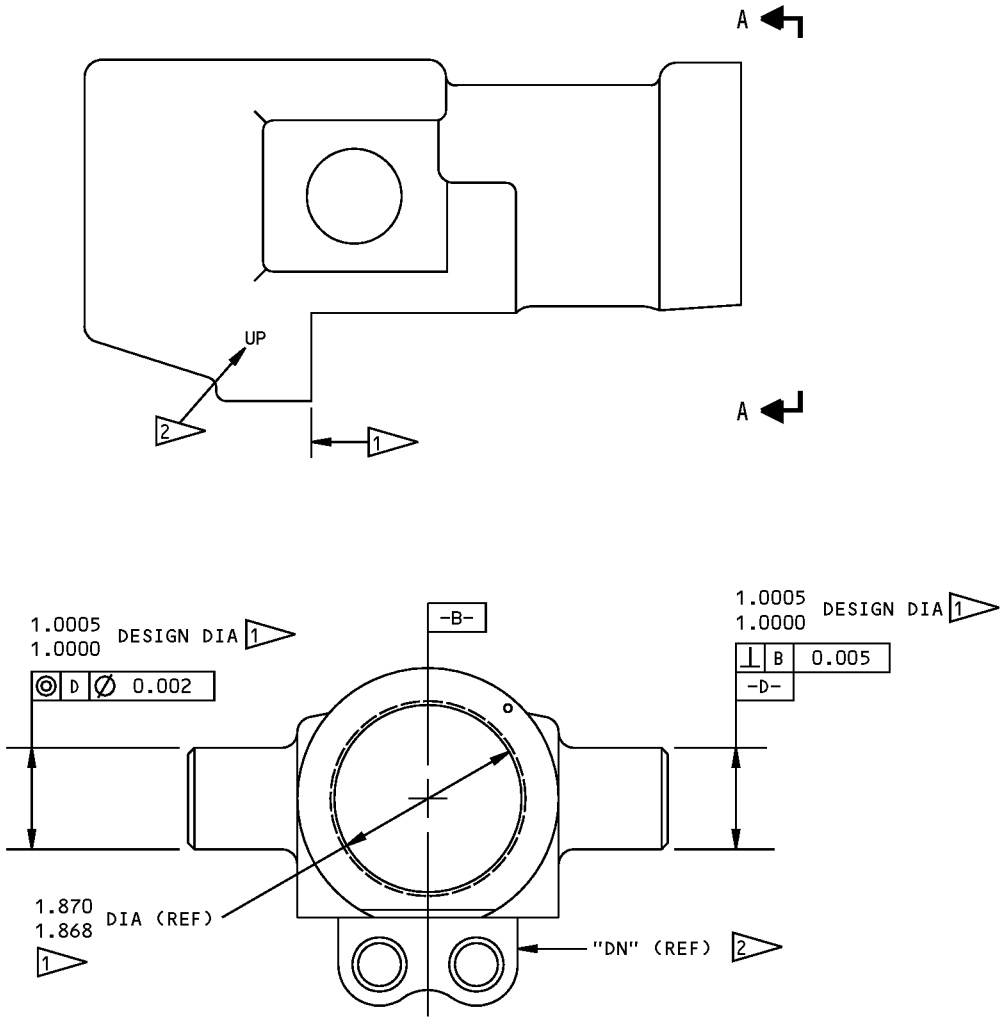
E. Apply fillet seal around bushing flange.

3. Housing Refinish (IPL Figure 2)

CAUTION: DO NOT REMOVE BUSHINGS (135). INSTALLED BUSHINGS CANNOT BE REUSED ONCE REMOVED.

A. Mask bushings (135).

B. Refinish housing per REPAIR 1-1, Figure 601.



A-A

REFINISH

HOUSING (145) -- CHROMIC ACID ANODIZE (F-17.04) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) AND ENAMEL, BMS 10-60, COLOR BAC707 GRAY GLOSS (SRF-14.9813) EXCEPT ON INTERNAL SURFACES, THREADS, AND AS NOTED

RUBBER STAMP PORT IDENTIFICATION WITH BLACK INK AS NOTED, AND APPLY CLEAR SKYDROL-RESISTANT TOP COATING

1 OMIT PRIMER AND ENAMEL THIS SURFACE

2 IDENTIFY PORTS WITH BLACK INK

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

65C26863-1,-6

Housing Refinish
Figure 601

END BEARING - REPAIR 2-1

69-55409–1

1. General

A. This procedure has the data necessary to refinish the end bearing (IPL Figure 2, 45).

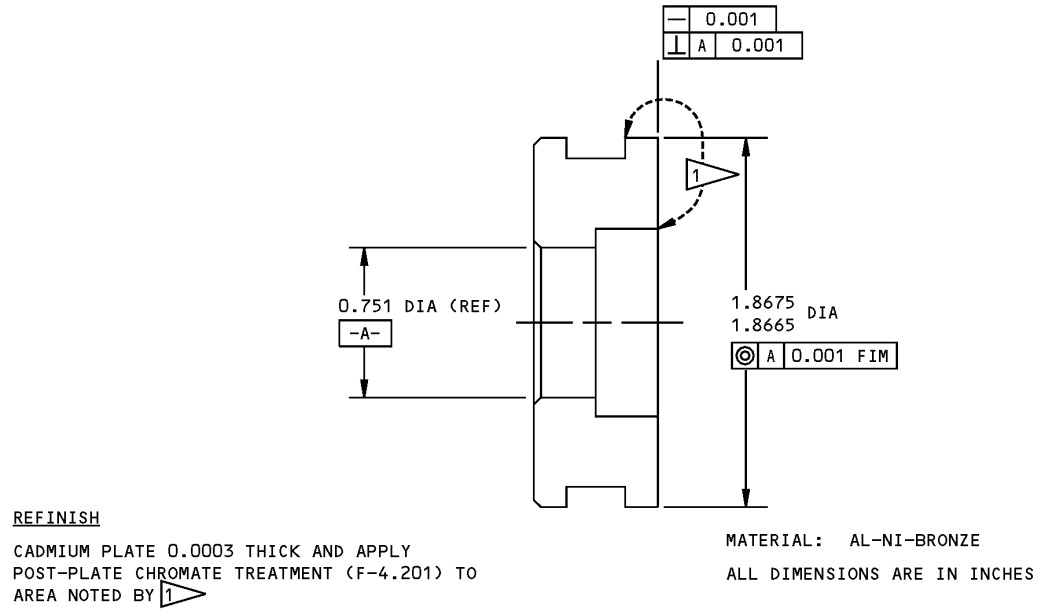
B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer tolPL Figure 2 for item numbers.

2. Plating Repair

A. Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in REPAIR 2-1, Figure 601.



End Bearing Refinish
Figure 601

MARKER - REPAIR 3-1

BAC27DHY0300, BAC27DHY357

1. General

A. This procedure has the data necessary to replacement of makers (IPL Figure 2, 150, 150A).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Marker Replacement (IPL Figure 2)

A. Remove damaged or defective marker (150).

B. Steel stamp assembly dash no. and serial no. on replacement marker.

C. Install BAC27DHY0300 marker (150)

(1) Install marker on actuator housing assembly (130) with fay seal using sealant, A00247.

(2) Cover exposed or extruded sealant with type 41 topcoating coating, B00571.

D. Install BAC27DHY357 marker (150A)

(1) Place the adhesive backed marker on the housing assembly (130).

(2) Install thermoshrink tubing, G50409 (155) over housing assembly (130) and marker (150A) per SOPM 20-11-03.

MISCELLANEOUS PARTS REFINISH - REPAIR 4-1

1. **Procedure**

A. Repair of parts listed in REPAIR 4-1, Table 601consists of restoration of the original finish.

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Tube (25,30)	Steel tubing per BMS 7-185	Prepare surface and passivate (F-17.09). Apply primer, C00259 (F-20.02). Apply coating, C00260 (F-21.03).
Tube (25A,25B,27, 30A,30B,32)	Steel tubing per BMS 7-185	Apply primer, C00259 (F-20.02) and apply coating, C00260 (F-21.03).
Bracket (60,62)	Al alloy	Chromic acid anodize and apply primer, C00259 (F-18.13).
Restrictor (67, 68)	15-5 CRES 180-200 ksi	Prepare surface and passivate (F-17.09).
Fig. 2		
Key (10)	4340 Steel 125-145 ksi	Cadmium plate (F-15.06).
Nut (20), Seal retainer (30)	Al alloy	Chromic acid anodize (F-2.26).
Sleeve (60A)	4330 M Steel per BMS 7-122	Part may be refinished if small surface scratches do not exceed chrome plate thickness. Strip chrome plate per SOPM 20-30-02 and replate per SOPM 20-42-03, class 2 for 0.003"-0.005" thickness.
Piston (105A)	4340 Steel per BMS 7-28	Part may be refinished if small surface scratches do not exceed chrome plate thickness. Strip chrome plate per SOPM 20-30-02 and replate per SOPM 20-42-03, class 2 for 0.003"-0.005" thickness and class 4 for 0.00005"-0.0007" thickness.

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the outboard ground spoiler actuator assembly.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 for item numbers.

2. Assembly

NOTE: For cleaning materials, refer to SOPM 20-60-01. For finishing materials, refer to SOPM 20-60-02. For lubricants, refer to SOPM 20-60-03. For miscellaneous materials, refer to SOPM 20-60-04.

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5689	Wrench - Spanner, Lug (Part #: F80106-2, Supplier: 81205)

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A00551	Sealant - Fuel Tank	BAC5010, Type 44 (BMS5-44, BMS5-45)
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS 3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
D50105	Grease - (Batco 8401)	
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995˜C32

C. References

Reference	Title
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-60-01	CLEANING MATERIALS
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-03	LUBRICANTS
SOPM 20-60-04	MISCELLANEOUS MATERIALS

D. Lubrication

(1) Lightly lubricate all internally installed parts and all packings and retainers with hydraulic fluid, D00153 or assembly lube MCS 352B fluid, D00054 as parts are installed and assembled, except as specified in ASSEMBLY, Paragraph 2.D.(2).

(2) Lightly coat threads on nut (20, IPL Figure 2) with grease, D50105.

E. Assemble hydraulic actuator assembly (IPL Figure 2)

(1) Install packing (120) and retainers (125) in housing assembly (130).

(2) Install cap ring (110) and packing (115) on piston (105, 105A).

(3) Install ring (90) and packing (95) on lock piston (75). Install spring (85), lock piston and rollers (80), and pawls or lock assembly (100, 100A) in piston (105, 105A). Install pawls or lock assembly (100, 100A) with chamfered edge of pawls or lock assembly facing piston rod (ASSEMBLY, Figure 701).

(4) Install shim (65) on sleeve (60), then install piston assembly (70) in sleeve. Press lock piston into piston until pawls or lock assembly can be depressed flush, allowing piston to be inserted part-way into sleeve.

NOTE: Piston is unlocked and pushed into sleeve to ensure retention of parts.

(5) Insert sleeve with shim and piston assembly into housing assembly (130).

(6) Install packing (50) and retainers (55) on end bearing (45), then slide end bearing with parts (30 thru 40) onto piston (105, 105A) shaft.

(7) Install scraper (25) in nut (20), then install nut in housing to engage approximately two threads. Apply a light coat of grease to exposed threads. Avoid grease on slotted area where sealant will be applied. Use spanner wrench, SPL-5689 to tighten nut snugly.

(8) Retract piston into housing until locking device engages. Check that free play of piston is 0.002-0.010 in. If free play is out of range, disassemble actuator and adjust shim (65) width. Reduction of shim width will result in equivalent reduction in free play.

NOTE: Rod end assembly (15) may be installed to aid free play measurement.

(9) After free play has been adjusted, use spanner wrench, SPL-5689 and tighten nut (20) to 1000-1200 lb-in. Lockwire nut to housing with lockwire, G01048 per SOPM 20-50-02, double twist method.

NOTE: Optional procedure to prevent corrosion to piston (105, 105A) and rod end assembly (15), consists of completely filling piston (105, 105A) cavity with grease before inserting rod end assembly (15) into piston (105, 105A).

(10) Install nut (5) on rod end assembly (15) and run nut up completely on threads. Start rod end into piston (105, 105A) to engage approximately two threads. Apply a light coat of grease, D50105 to exposed threads. Screw rod end into piston (105, 105A) to obtain approximately 5.36 in. distance between rod end and trunnion centers with piston locked.

(11) Install key (10) in rod end groove, then rotate rod end until key engages slot in end of piston. Screw down nut (5) and tighten to 50 lb-in. Do not install lockwire on nut.

F. Functional test

(1) Functionally test unit per TESTING AND FAULT ISOLATION.

G. Apply corrosion protection to hydraulic actuator assembly (IPL Figure 2)

(1) Wipe off excess grease from around rod end assembly (15) and nut (20).

(2) Clean joint between housing (145) and nut (20) and between piston (105, 105A) and rod end assembly, and clean slots on nut (20) and piston and exposed portion of keyway on rod end assembly using solvent, B00148.

(3) Apply a bead of sealant, A00247 or sealant, A00551 to the cleaned joints, slots, and keyway.

(4) Allow sealant to cure and check that sealant has bonded to the surfaces.

H. Assemble actuator assembly (IPL Figure 1)

(1) Install packings (70, 72) on union (65, 66) and restrictor (67, 68), then install union and restrictor in hydraulic actuator assembly (75).

NOTE: Ensure that restrictor (67, 68) is installed in the UP port of the actuator assembly.

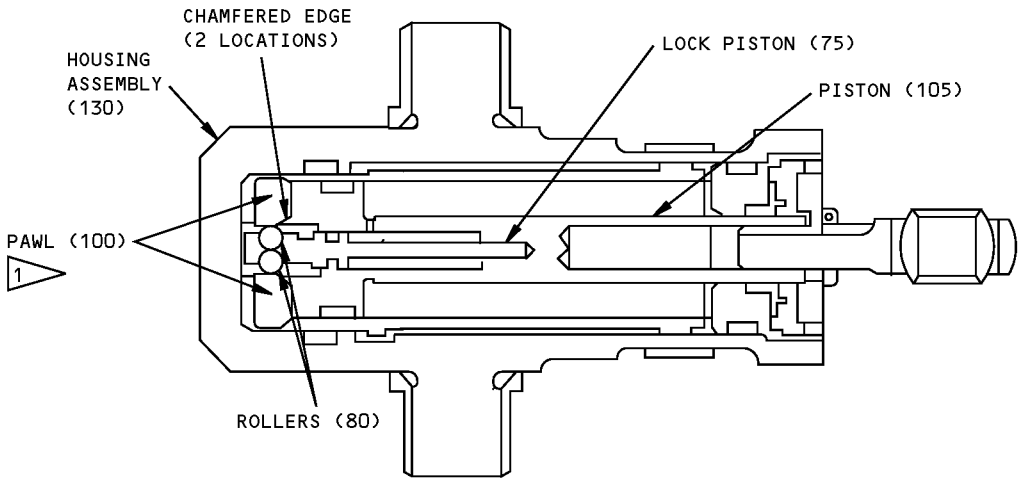
(2) On actuator assemblies 65-44960-23, -24, -25, -27, -28: attach bracket assembly (45, 47) to actuator with bolts (35, 37) and washers (40, 42). Lockwire bolts with lockwire, G01048 per SOPM 20-50-02, double-twist method.

CAUTION: BMS 3-27 CORROSION INHIBITING COMPOUND CONTAINS SOLVENTS, CHROMATES, AND A SMALL AMOUNT OF BOUND ASBESTOS. CONSULT THE APPLICABLE SAFETY STANDARDS FOR APPROVED HANDLING PROCEDURES. BMS 3-27 COMPOUND IS USED ONLY IN STATIC JOINTS WHERE GREASE CANNOT BE APPLIED. BMS 3-27 COMPOUNDS IN DYNAMIC JOINTS WILL NOT LET THEM MOVE FREELY.

(3) On actuator assemble 251A1510-3: apply corrosion inhibiting compound, C00913 to threads of bolts (35A). Install bolts (35A) and washers (40A) onto actuator (75).

(4) On actuator assemblies 65-44960-23, -24, -25, -27, -28: install tube assemblies (25, 27, 30, 32). Secure tubes to bracket assembly with clamps (15, 17, 20, 22) attached with bolts (5, 7) and washers (10).

(5) Optional, on actuator assemble 251A1510-3: install tube assemblies (25C, 30C). Tube assemblies (25C, 30C) are installation parts. Final adjustment will be done when the actuator is installed on the airplane.

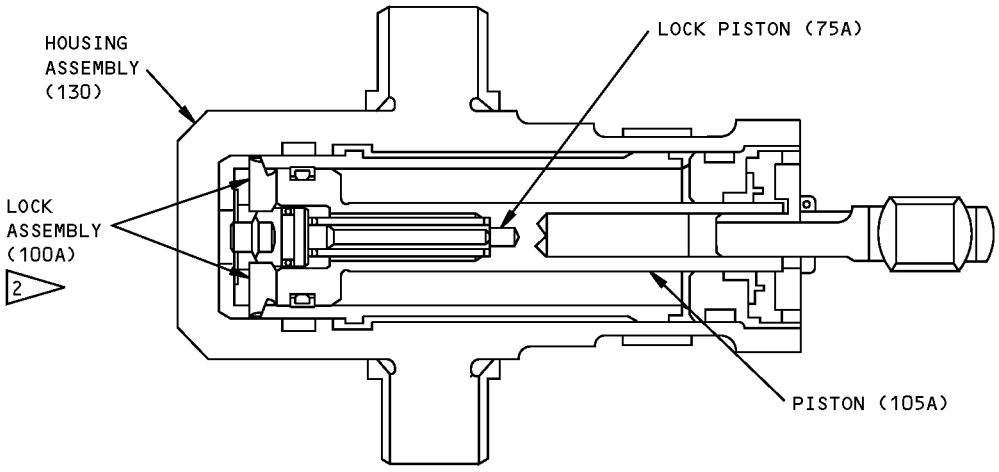


ITEM NUMBERS REFER TO IPL FIG. 2

1 INSTALL THE PAWLS WITH CHAMFERED EDGE OF THE PAWLS FACING THE PISTON ROD

65C26864-1,-2

Actuator Assembly
Figure 701 (Sheet 1 of 2)



2 INSTALL LOCK ASSEMBLY WITH CHAMFERED EDGE FACING THE PISTON

ITEM NUMBERS REFER TO IPL FIG. 2

65C26864-3

Actuator Assembly
Figure 701 (Sheet 2 of 2)

3. Storage

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

B. References

Reference	Title
SOPM 20-44-02	TEMPORARY PROTECTIVE COATINGS
SOPM 20-60-03	LUBRICANTS

C. Procedure

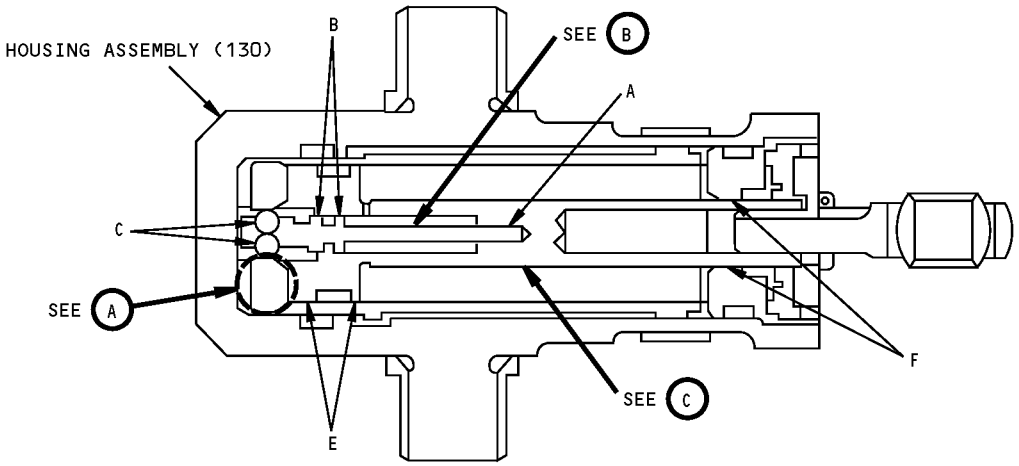
NOTE: For lubricants, refer to SOPM 20-60-03.

(1) On actuator assemblies 65-44960-23, -24, -25, -27, -28: partially fill unit with hydraulic fluid, D00153, and cap ends of tube assemblies with hydraulic fluid resistant plugs.

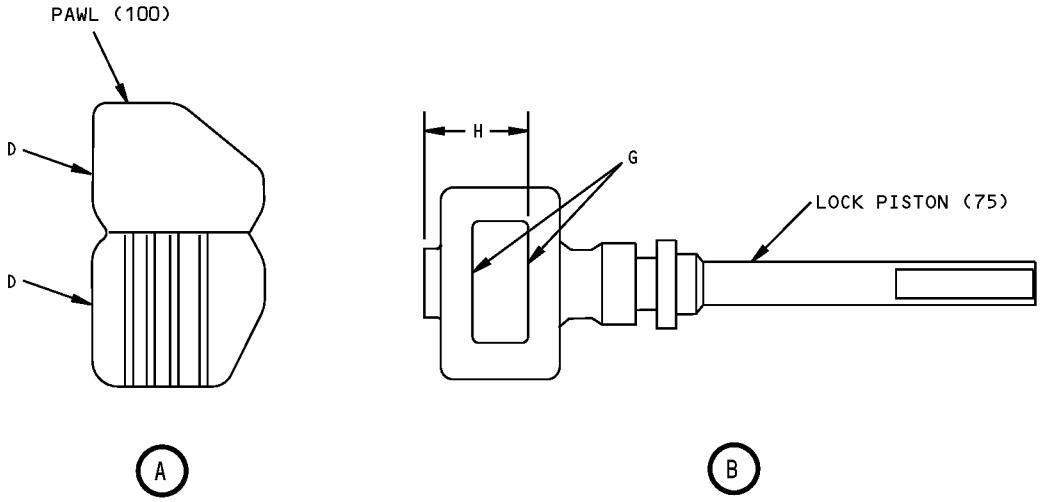
(2) On actuator assemblies 251A1510-3: partially fill unit with hydraulic fluid, D00153. Cap union (65) and restrictor (67) with hydraulic fluid resistant plugs or cap ends of tube assemblies, if installed.

(3) Store this component using standard industry practices and information in SOPM 20-44-02.

FITS AND CLEARANCES

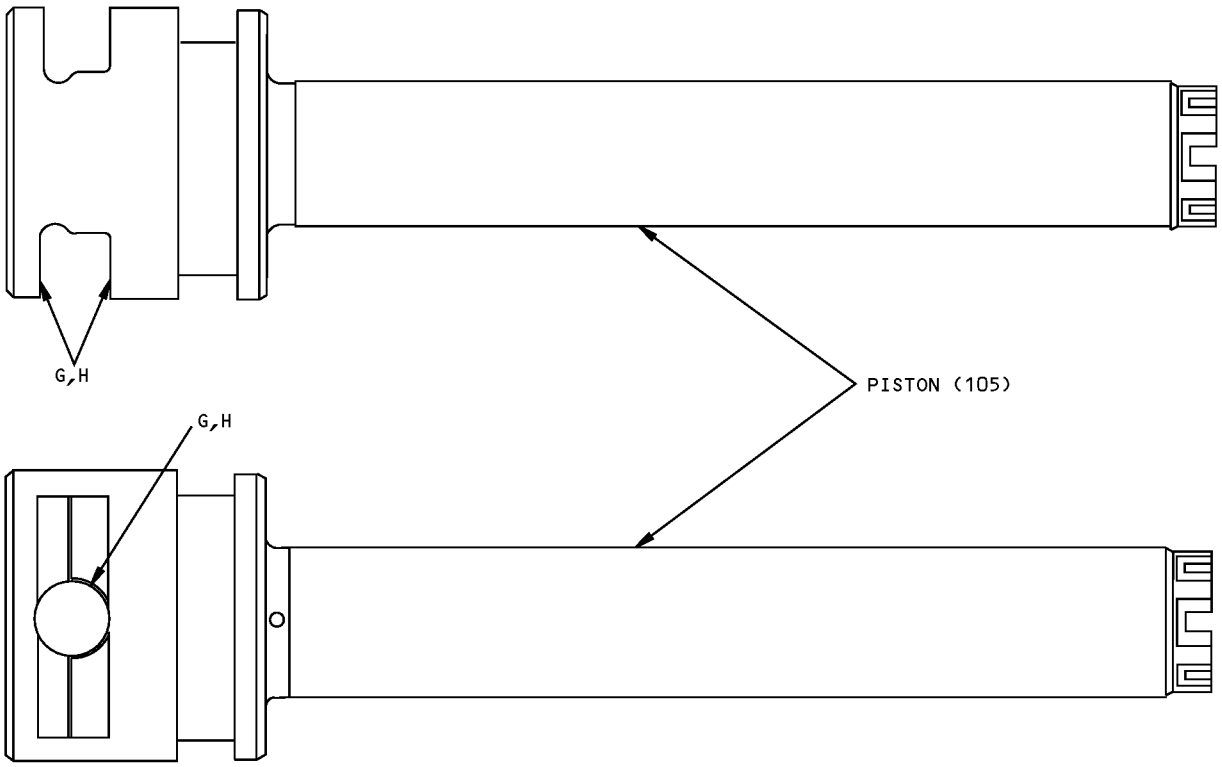


65C26864-1,-2



ITEM NUMBERS REFER TO IPL FIG. 2

Fits and Clearances
Figure 801 (Sheet 1 of 6)



ITEM NUMBERS REFER TO IPL FIG. 2

65C26864-1,-2

Fits and Clearances
Figure 801 (Sheet 2 of 6)

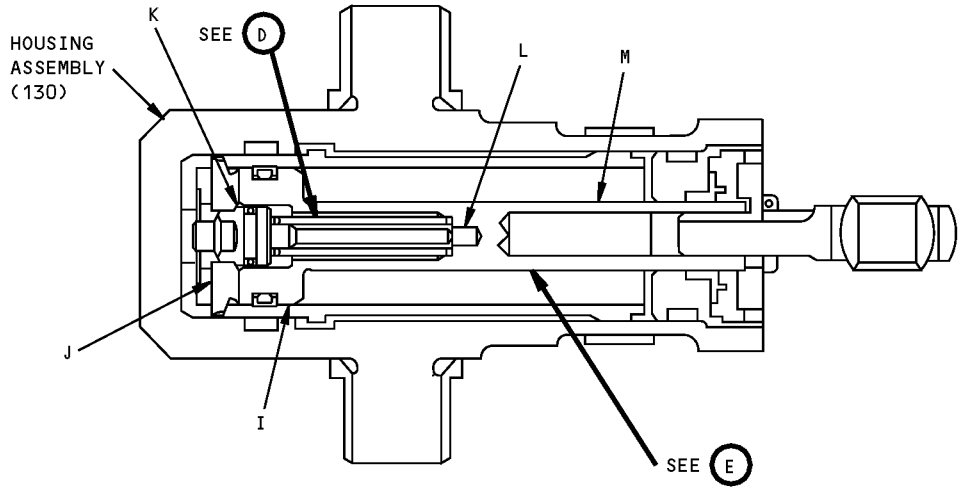
Ref Letter Fig.801	Mating Item No. IPL Fig.2	Design Dimensions				Service Wear Limits		
		Dimensions		Assembly Clearance		Dimensions		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 105 OD 75	0.1870 0.1810	0.1890 0.1830	0.004	0.008	0.1800	0.1900	0.010
B	ID 105 OD 75	0.360 0.357	0.361 0.358	0.002	0.004	0.3565	0.3615	0.004
C	80 [1] 75 [2]	0.2498 0.2525	0.2500 0.2505			0.2496	0.2530	
D	100 [3] 100 [4]	0.3575 0.3585	0.3580 0.3590			0.3570 0.3580		
E	ID 60 OD 105	1.4910 1.4880	1.4930 1.4890	0.002	0.005	1.4875	1.4940	0.0065
F	ID 45 OD 105	0.7490 0.7450	0.751 0.747	0.002	0.006	0.7445	0.7515	0.007
G	75 [5] 105 [6]	0.2505 0.3595	0.2525 0.3600				0.2530 0.3605	
H	105 [7] 75 [8]	0.3595 0.4520	0.3600 0.4560			0.4510	0.3605	

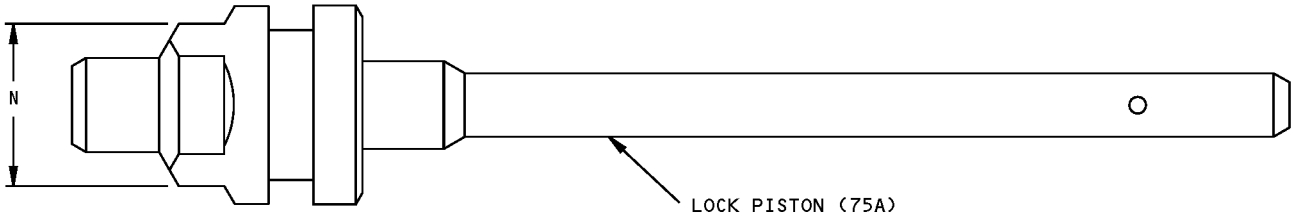
[1] ROLLER DIAMETER
[2] PISTON-LOCK SLOT WIDTH
[3] PAWL WIDTH
[4] PAWL DIAMETER
[5] PISTON-LOCK SLOT WIDTH
[6] PAWL HOLE DIAMETER
[7] PAWL SLOT WIDTH
[8] DIMENSION FROM FRONT OF SLOT TO END OF PART ON THE PISTON-LOCK

ALL DIMENSIONS ARE IN INCHES

65C26864-1,-2

Fits and Clearances
Figure 801 (Sheet 3 of 6)



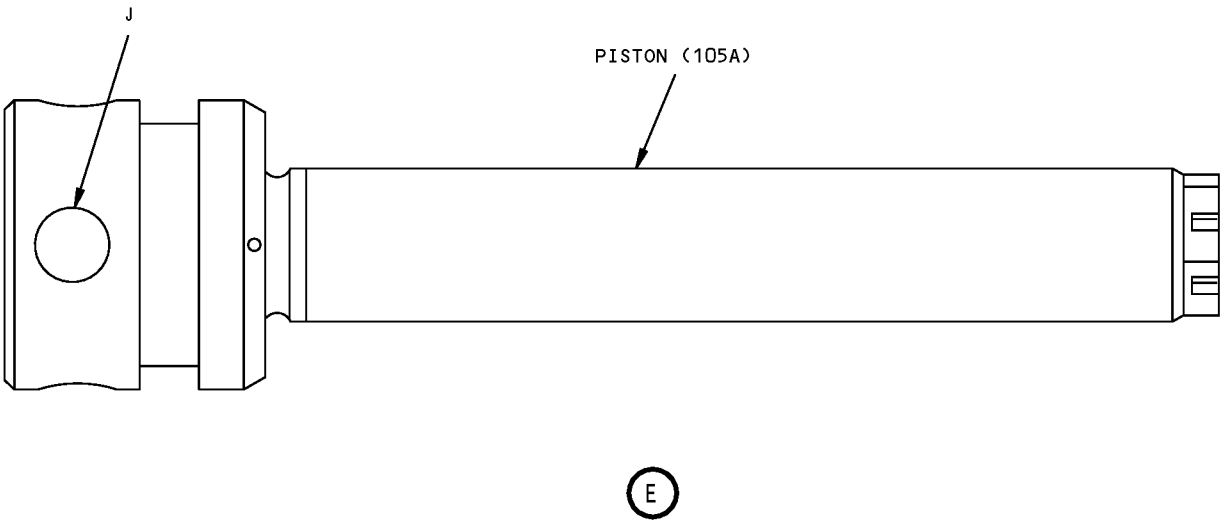


D

ITEM NUMBERS REFER TO IPL FIG. 2

65C26864-3

Fits and Clearances
Figure 801 (Sheet 4 of 6)



ITEM NUMBERS REFER TO IPL FIG. 2

Fits and Clearances
Figure 801 (Sheet 5 of 6)

Ref Letter Fig.801	Mating Item No. IPL Fig.2	Design Dimensions				Service Wear Limits		
		Dimensions		Assembly Clearance		Dimensions		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
I	ID 60A	1.491	1.493	0.002	0.005		1.494	0.0065
	OD 105A	1.488	1.489			1.4875		
J	ID 105A	0.3700	0.3705	0.0005	0.0015		0.3710	0.0025
	OD 100A	0.3690	0.3695			0.3685		
K	ID 105A	0.675	0.677	0.002	0.005		0.6775	0.006
	OD 75A	0.672	0.673			0.6715		
L	ID 105A	0.202	0.205	0.004	0.009		0.206	0.011
	OD 75A	0.196	0.198			0.195		
M	OD 105A	0.745	0.747			0.7445		
N	OD 75A	0.570	0.571			0.5696		

ALL DIMENSIONS ARE IN INCHES

65C26864-3

Fits and Clearances
Figure 801 (Sheet 6 of 6)

REF IPL		NAME	TORQUE*	
FIG. NO.	ITEM NO.		POUND-INCHES	POUND-FEET
2	5	Nut	50	
2	20	Nut	1000-1200	

* REFER TO SOPM 20-50-01 FOR TORQUE VALUES OF STANDARD FASTENERS.

Torque Table
Figure 802

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. General

A. This section lists the special tools, fixtures, and equipment necessary for maintenance.

NOTE: Equivalent substitutes may be used.

Special Tools

Reference	Description	Part Number	Supplier
SPL-5689	Wrench - Spanner, Lug	F80106-2	81205

Tool Supplier Information

CAGE Code	Supplier Name	Supplier Address
81205	THE BOEING COMPANY	17930 INTERNATIONAL BLVD. SOUTH SEATAC, WA 98188-4321 Telephone: 206-662-6650 Facsimile: 206-662-7145

ILLUSTRATED PARTS LIST

1. Introduction

A. The Illustrated Parts List (IPL) contains an illustration and a list of component parts you can repair or replace. The Illustrated Parts Catalog (IPC) shows how to use the Boeing part number system.

B. This shows how parts are related: The relation of each item to its next higher assembly (NHA) is shown in the NOMENCLATURE column. Use the indenture system that follows:

1 2 3 4 5 6 7

. Assembly

. Attaching parts for assembly

. . Detail parts for assembly

. . Subassembly

. . Attaching parts for subassembly

. . . Detail parts for subassembly

. . . Sub-subassembly

. . . Attaching parts for subassembly

. . . . . Details parts for sub-subassembly

Detail Installation Parts (Included only if installation parts may be sent to the shop as part of assembly)

C. Each top assembly is given one use code letter (A, B, C, etc.) in the USAGE CODE column. All subsequent component parts in the list can have one or more of the use code letters to show effectivity to top assemblies. A component part without a use code applies to all top assemblies.

D. An alphabetical letter is added after the item number for optional parts, parts changed by a Service Bulletin, configuration differences (except left-handed and right-handed parts), last engineering releases, and parts added between item numbers in a sequence. The alphabetical letter will not be shown on the illustration for equivalent parts of the same part number.

E. Color-coded parts are identified with a single digit alpha following the dash number or with ''SP'' suffix. If the ''SP'' suffix is used, it represents consolidation of all color codes applicable for a given usage which are not separately listed. Orders for color-coded parts should include the registry number of the airplane for which the parts are ordered.

F. If a part number is 15 characters long but will not fit in the part number column, the part number will be displayed with a ''~'' at the end of the line and will be continued on the next line. The ''~'' denotes that the part number continues on the next line.

G. Parts changed by a Service Bulletin are shown by PRE SB XXXX and POST SB XXXX added to the NOMENCLATURE column.

(1) When a new top assembly is added by a Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the top assembly level only. The configuration differences at the detail part level are shown by use code letters.

(2) When the top assembly part number is not changed by the Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the detail level.

H. Interchangeable Parts

Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES, REPLACED BY)	The part replaces and is interchangeable with, or is an alternative to, the initial part.

VENDOR CODES

Code	Name
09455	RBC TRANSPORT DYNAMICS CORP 3131 W SEGERSTROM AVE SANTA ANA, CALIFORNIA 92704-5872 FORMERLY TRANSPORT DYNAMICS AEROSPACE DIV; FABROID DIV TRANSPORT DYNAMICS V17571 & LEAR SEIGLER INC TRANSPORT DIV V98076; FORMERLY BFM TRANSPORT DYNAMICS
15860	NEW HAMPSHIRE BALL BEARINGS, INC ASTRO DIVISION 155 LEXINGTON AVENUE LACONIA, NEW HAMPSHIRE 03246-2937 FORMERLY ASTRO BEARING CORP, LOS ANGELES, CALIF.
21335	TIMKEN US CORPORATION DIV FAFNIR 336 MECHANIC STREET LEBANON, NH 03766-0267 FORMERLY FAFNIR BRG AND TEXTRON INC FAFNIR DIV IN NEW BRITAIN, CONNECTICUT ; FORMERLY TORRINGTON CO THE SPECIAL PRODUCTS DIV SUB OF THE INGERSOLL-RAND CO V8D210 FORMERLY TORRINGTON CO FAFNIR BEARING DIV IN TORRINGTON, CT
50294	NEW HAMPSHIRE BALL BEARINGS, INC PRECISION DIVISION 9700 INDEPENDENCE AVENUE CHATSWORTH, CALIFORNIA 91311 FORMERLY NIPPON MINATURE BEARING CORP V23589 AND NMB AMERICA INC AND NMB INC
50632	KAMATICS CORP SUB OF KAMAN CORP 1335 BLUE HILLS ROAD BLOOMFIELD, CONNECTICUT 06002-1304

Code	Name
61898	EFS AEROSPACE INC 24910 TIBBETTS AVENUE VALENCIA, CALIFORNIA 91355 FORMERLY EMCO FLUID SYSTEMS INC
72902	Replaced: [V72902] PALMETTO INC SEE GREEN TWEED & CO V5F573 by Code: Name and Address below 5F573: GREENE TWEED AND CO INC 2075 DETWILER RD P.O. BOX 305 KULPSVILLE, PENNSYLVANIA 19443-0305
73134	ROLLER BEARING COMPANYOF AMER DBA HEIM BEARINGS DIV 60 ROUND HILL RD FAIRFIELD, CONNECTICUT 06430-0000 FORMERLY INCOM INTL HEIM DIV; HEIM UNIVERSAL CORP INCOM; FORMERLY HEIM DIV INCOM INTL; IMO IND HEIM BEARINGS DIV
77896	REXNORD INC BEARING OPERATION 2400 CURTIS STREET DOWNERS GROVE, ILLINOIS 60515-4005 FORMERLY SHAEFER BEARING DIV REX CHAINBELT FORMERLY REX CHAINBELT INC BEARING DIV.
81376	SMITH ACQUISITION COMPANY 2240 BUENA VISTA BALDWIN PARK, CALIFORNIA 91706
97613	SARGENT CONTROLS & AEROSPACE/KAHR BEARING DIV 5675 W BURLINGAME RD TUCSON, ARIZONA 85743 FORMERLY AETNA STEEL PROD KAHR BEARING DIV V96579 FORMERLY SARGENT IND KAHR BEARING DIV, BURBANK, CALIFORNIA
97820	BUSAK AND SHAMBAN INC BEARING DIV 711 MITCHELL ROAD PO BOX 665 NEWBURY PARK, CALIFORNIA 91320-2214 FORMERLY IN CULVER CITY, CALIF; FORMERLY SHAMBAN W S & CO
98391	ARKWIN INDUSTRIES INC 686 MAIN STREET WESTBURY, NEW YORK, 11590-5018

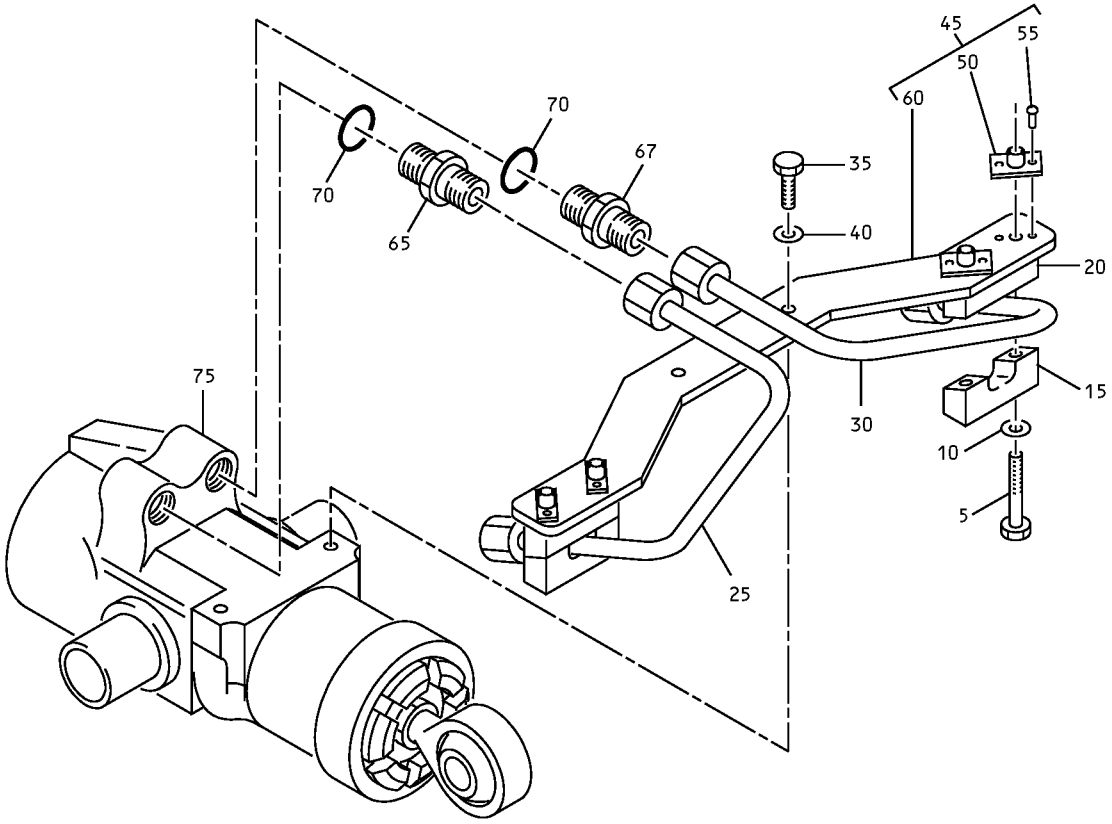
NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
01-820-10E003		2	15	1
10-60779-184		2	15A	1
10-60779-184A		2	15	1
10-62063-1		2	70	1
10-62063-2		2	60	1
10-62063-3		2	65	1
10-62224-1		2	70A	1
10-62224-2		2	60A	1
10-62224-3		2	65A	1
1211243-207		2	100	2
1211243-208		2	80	2
1211244-205		2	75	1
1211244-208		2	85	1
1211244-209		2	65	1
1211278-202		2	105	1
1211278-203		2	60	1
1211278-700		2	70	1
177292		2	15A	1
20208		2	75B	1
20369		2	70A	1
20373		2	105A	1
20374		2	100A	4
20375		2	75A	1
20376		2	60A	1
20377		2	85A	1
20378		2	65A	1
251A1510-3		1	1G	RF
4TM217		2	15A	1
65-44960-23		1	1B	RF
65-44960-24		1	1C	RF
65-44960-25		1	1D	RF
65-44960-27		1	1E	RF
65-44960-28		1	1F	RF
65C26863-1		2	130	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
65C26863-2		2	145	1
65C26863-4		2	145A	1
65C26863-6		2	130A	1
65C26863-7		2	145B	1
65C26864-1		1	75	1
		2	1	RF
65C26864-2		1	75A	1
		2	1A	RF
65C26864-3		1	75B	1
		2	1B	RF
69-35863-1		1	15A	2
		1	15B	2
		1	17	2
69-35959-2		2	10	1
69-35961-1		2	30	1
69-54540-218		2	110	1
		2	110B	1
69-54578-3005		1	25	1
69-54578-3006		1	30	1
69-55409-1		2	45	1
69-55410-1		2	20	1
69-74317-1		2	135	2
69-74317-2		2	135A	2
69-74420-1		1	45	1
69-74420-2		1	60	1
69-74421-1		1	15	2
69-74421-2		1	20	2
69-75956-1		1	67	1
		1	68	1
69-77390-1		1	47	1
69-77390-2		1	62	1
69-77398-1		1	22	2
69-77398-2		1	20A	2
		1	20B	2
69-77400-1		1	32	1

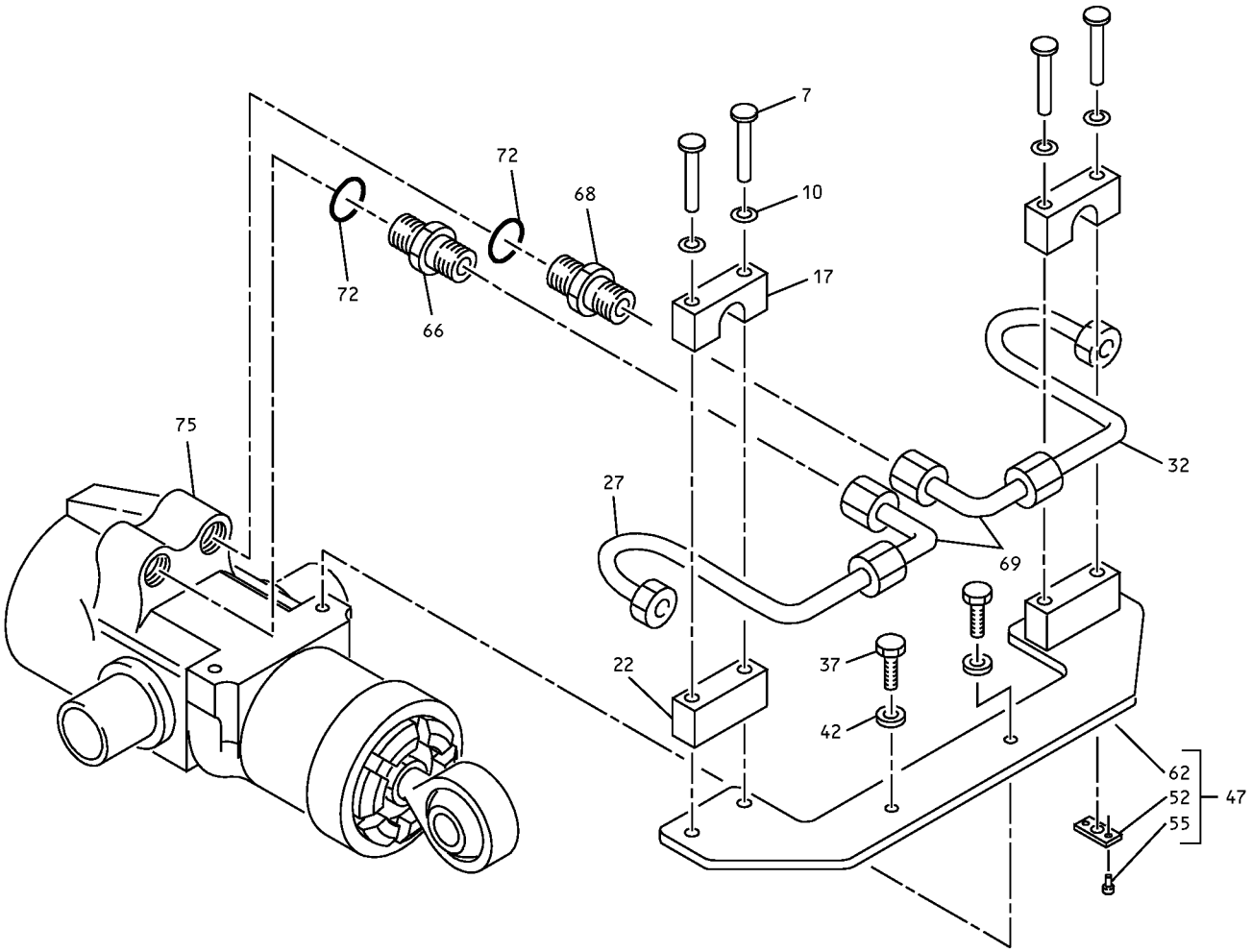
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-77400-2		1	27	1
69-77400-3		1	30A	1
		1	30B	1
69-77400-4		1	25A	1
		1	25B	1
69-77400-5		1	30C	1
69-77400-6		1	25C	1
7218MT952T		2	110A	1
ADNE10-207		2	15	1
AN960PD10L		1	10	4
		1	40	2
		1	42	2
ANM10-101		2	15	1
ART10E103		2	15A	1
BAC27DHY0300		2	150	1
BAC27DHY357		2	150A	1
BACB30NM3K1		1	35A	2
BACE21AW0404JM		1	69	2
BACN10JA3		1	52	4
BACN10JN3		1	50	4
BACR15BA3D		1	55	8
BACS11AA116A		2	35	1
BACS34A5A		2	25	1
BACW10BN3AC		1	40A	2
DREM10-198		2	15A	1
GTC5394C116		2	35A	1
KBDE10-14		2	15A	1
KSR114010B		2	15	1
MS20995NC32		1	80	AR
MS21209F1-15		2	140	2
MS21902-4		1	65	1
		1	66	1
MS28783-1		2	55	2
MS28783-2		2	125	2
MSSKR108-24BAC		2	15A	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
MSSKRR108-24BAC		2	15	1
NAS1423-8		2	5	1
NAS1611-009		2	95	1
NAS1611-112		2	95A	1
NAS1611-116		2	40	1
NAS1611-218		2	115	1
		2	115A	1
NAS1611-223		2	50	1
NAS1611-224		2	120	1
NAS1612-4		1	70	2
		1	72	2
NAS1801-3-21		1	7	4
NAS1801-3-24		1	5	4
NAS1801-3-31		1	5A	4
		1	5B	4
NAS6603H2		1	35	2
		1	37	2
NHNE10-207		2	15A	1
REMS20ATC16H		2	15A	1
RNF100TYP2		2	155	1
S12068-010		2	90	1
S30660-112		2	90A	1
S34582-218H99N		2	110D	1



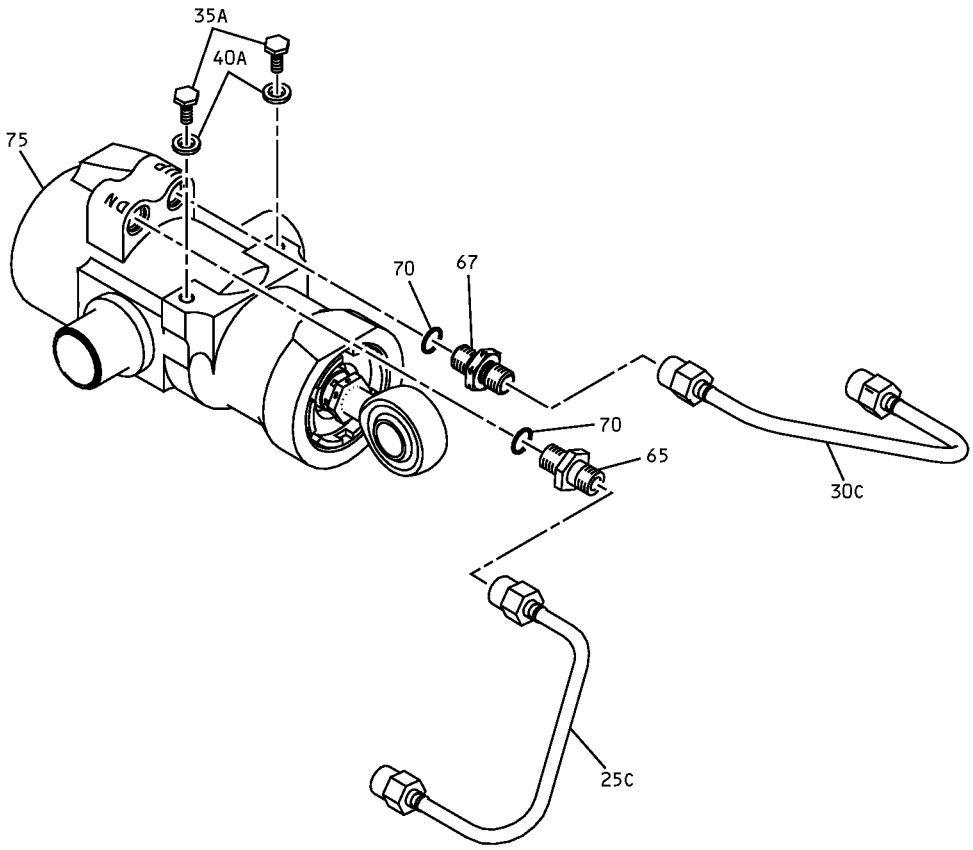
ASSEMBLIES 65-44960-23,-24,-27,-28

Outboard Ground Spoiler Actuator Assembly
IPL Figure 1 (Sheet 1 of 3)



ASSEMBLIES 65-44960-25

Outboard Ground Spoiler Actuator Assembly
IPL Figure 1 (Sheet 2 of 3)



ASSEMBLIES 251A1510-3

Outboard Ground Spoiler Actuator Assembly
IPL Figure 1 (Sheet 3 of 3)

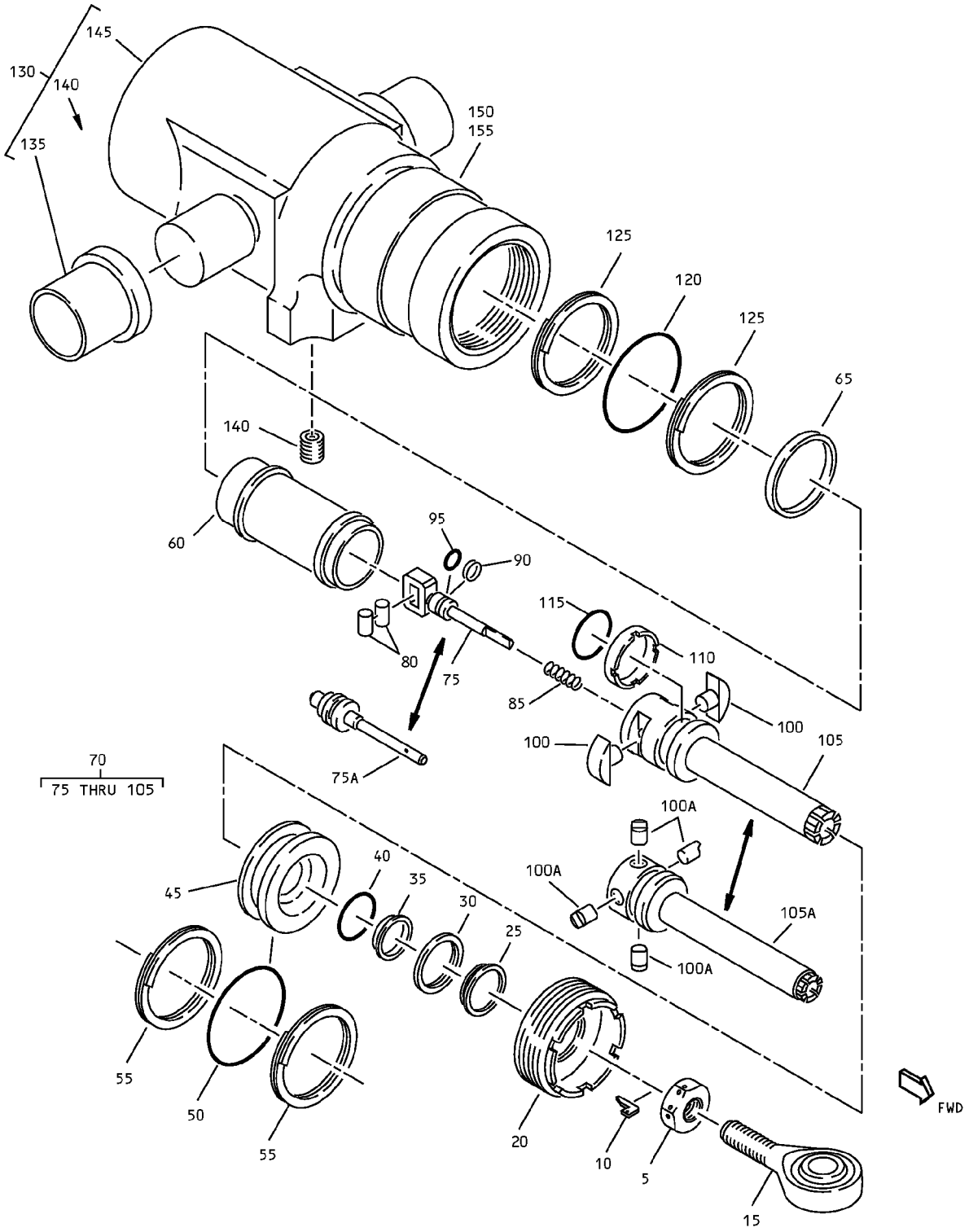
FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1	65-44960-16		DELETED		
–1A	65-44960-18		DELETED		
–1B	65-44960-23		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	A	RF
–1C	65-44960-24		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	B	RF
–1D	65-44960-25		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	C	RF
–1E	65-44960-27		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	D	RF
–1F	65-44960-28		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	E	RF
–1G	251A1510-3		ACTUATOR ASSY-OUTBOARD GROUND SPOILER	F	RF
5	NAS1801-3-24		. BOLT (PRE SB 737-27-1157)	A, B	4
–5A	NAS1801-3-31		. BOLT	D, E	4
–5B	NAS1801-3-31		. BOLT (POST SB 737-27-1157)	A, B	4
7	NAS1801-3-21		. BOLT	C	4
10	AN960PD10L		. WASHER	A, B, C, D, E	4
15	69-74421-1		. CLAMP-TUBE SUPPORT (PRE SB 737-27-1157)	A, B	2
–15A	69-35863-1		. CLAMP-TUBE SUPPORT	D, E	2
–15B	69-35863-1		. CLAMP-TUBE SUPPORT (POST SB 737-27-1157)	A, B	2
17	69-35863-1		. CLAMP-TUBE SUPPORT	C	2
20	69-74421-2		. CLAMP-TUBE SUPPORT (PRE SB 737-27-1157)	A, B	2
–20A	69-77398-2		. CLAMP-TUBE SUPPORT	D, E	2
–20B	69-77398-2		. CLAMP-TUBE SUPPORT (POST SB 737-27-1157)	A, B	2
22	69-77398-1		. CLAMP-TUBE SUPPORT	C	2

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
25	69-54578-3005		. TUBE ASSY (PRE SB 737-27-1157)	A, B	1
–25A	69-77400-4		. TUBE ASSY	D, E	1
–25B	69-77400-4		. TUBE ASSY (POST SB 737-27-1157)	A, B	1
–25C	69-77400-6		. TUBE ASSY (INSTALLATION PART)	F	1
27	69-77400-2		. TUBE ASSY	C	1
30	69-54578-3006		. TUBE ASSY (PRE SB 737-27-1157)	A, B	1
–30A	69-77400-3		. TUBE ASSY	D, E	1
–30B	69-77400-3		. TUBE ASSY (POST SB 737-27-1157)	A, B	1
–30C	69-77400-5		. TUBE ASSY (INSTALLATION PART)	F	1
32	69-77400-1		. TUBE ASSY	C	1
35	NAS6603H2		. BOLT	A, B, D, E	2
–35A	BACB30NM3K1		. BOLT	F	2
37	NAS6603H2		. BOLT	C	2
40	AN960PD10L		. WASHER	A, B, D, E	2
–40A	BACW10BN3AC		. WASHER	F	2
42	AN960PD10L		. WASHER	C	2
45	69-74420-1		. BRACKET ASSY	A, B, D, E	1
47	69-77390-1		. BRACKET ASSY	C	1
50	BACN10JN3		. . NUTPLATE	A, B, D, E	4
52	BACN10JA3		. . NUTPLATE	C	4
55	BACR15BA3D		. . RIVET	A-E	8
60	69-74420-2		. . BRACKET	A, B, D, E	1
62	69-77390-2		. . BRACKET	C	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
65	MS21902-4		. UNION	A, B, D, E, F	1
66	MS21902-4		. UNION	C	1
67	69-75956-1		. RESTRICTOR	A, B, D, E, F	1
68	69-75956-1		. RESTRICTOR	C	1
69	BACE21AW0404JM		. REDUCER, SWIVEL	C	2
70	NAS1612-4		. PACKING	A, B, D, E, F	2
72	NAS1612-4		. PACKING	C	2
75	65C26864-1		. ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC (FOR DETAILS SEE FIG. 2)	A	1
–75A	65C26864-2		. ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC (FOR DETAILS SEE FIG. 2)	B, C, D	1
–75B	65C26864-3		. ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC (FOR DETAILS SEE FIG. 2)	E F	1
80	MS20995NC32		. LOCK WIRE	A, B, C, D, E	AR

–Item not Illustrated



Outboard Ground Spoiler Hydraulic Actuator Assembly
IPL Figure 2

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–1	65C26864-1		ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC	A	RF
–1A	65C26864-2		ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC	B	RF
–1B	65C26864-3		ACTUATOR ASSY-OUTBOARD GROUND SPOILER HYDRAULIC	C	RF
5	NAS1423-8		. NUT		1
10	69-35959-2		. KEY		1
15	ADNE10-207		. ROD END ASSY (V15860) (SPEC 10-60779-184A) (OPT ANM10-101 (V50294)) (OPT KSR114010B (V50632)) (OPT MSSKRR108-24BAC (V73134)) (OPT 01-820-10E003 (V09455)) (OPT ITEM 15A)		1
–15A	ART10E103		. ROD END ASSY (V50294) (SPEC 10-60779-184) (OPT DREM10-198 (V81376)) (OPT KBDE10-14 (V97613)) (OPT MSSKR108-24BAC (V73134)) (OPT NHNE10-207 (V15860)) (OPT REMS20ATC16H (V21335)) (OPT 177292 (V09455)) (OPT 4TM217 (V77896)) (OPT ITEM 15)	A	1
20	69-55410-1		. NUT		1
25	BACS34A5A		. SCRAPER		1
30	69-35961-1		. RETAINER-SEAL		1
35	BACS11AA116A		. SEAL-FOOT (USED WITH ITEM 40) (OPT ITEM 35A)		1
–35A	GTC5394C116		. SEAL ASSY (V72902) (OPT ITEM 35)		1
40	NAS1611-116		. PACKING (USED WITH ITEM 35)		1
45	69-55409-1		. BEARING-END		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
50	NAS1611-223		. PACKING		1
55	MS28783-1		. RETAINER		2
60	1211278-203		. SLEEVE (V98391) (SPEC 10-62063-2)	A, B	1
–60A	20376		. SLEEVE (SPEC 10-62224-2) (V61898)	C	1
65	1211244-209		. SHIM (SPEC 10-62063-3) (V98391)	A, B	1
–65A	20378		. SHIM (SPEC 10-62224-3) (V61898)	C	1
70	1211278-700		. PISTON ASSY (V98391) (SPEC 10-62063-1)	A, B	1
–70A	20369		. PISTON ASSY (SPEC 10-62224-1) (V61898)	C	1
75	1211244-205		. . PISTON-LOCK	A, B	1
75A	20375		. . PISTON-LOCK	C	1
75B	20208		. . PISTON-LOCK (OPT ITEM 75A)	C	1
80	1211243-208		. . ROLLER	A, B	2
85	1211244-208		. . SPRING	A, B	1
85A	20377		. . SPRING	C	1
90	S12068-010		. . GLYD-RING- (V97820)	A, B	1
–90A	S30660-112		. . CAP RING	C	1
95	NAS1611-009		. . PACKING	A, B	1
–95A	NAS1611-112		. . O-RING	C	1
100	1211243-207		. . PAWL (MATCHED SET)	A, B	2
100A	20374		. . LOCK ASSEMBLY	C	4
105	1211278-202		. . PISTON	A, B	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
105A	20373		. . PISTON	C	1
110	69-54540-218		. RING CAP (USED WITH ITEM 115) (OPT ITEM 110A)	A, B	1
–110A	7218MT952T		. SEAL ASSY (V72902) (OPT ITEM 110)	A, B	1
–110B	69-54540-218		. RING CAP (USED WITH ITEM 115A) (OPT ITEM 110C)	C	1
–110C	S34750-218H99		DELETED		
–110D	S34582-218H99N		. SEAL (V97820) (OPT ITEM 110B)	C	1
115	NAS1611-218		. PACKING (USED WITH ITEM 110)	A, B	1
–115A	NAS1611-218		. PACKING (USED WITH ITEM 110B) (OPT ITEM 115B)	C	1
–115B	S33157-218-99C		DELETED		
120	NAS1611-224		. PACKING		1
125	MS28783-2		. RETAINER		2
130	65C26863-1		. HOUSING ASSY	A	1
–130A	65C26863-6		. HOUSING ASSY	B, C	1
135	69-74317-1		. . BUSHING-TRUNNION	A	2
–135A	69-74317-2		. . BUSHING-TRUNNION	B, C	2
140	MS21209F1-15		. . INSERT		2
145	65C26863-2		. . HOUSING	A	1
–145A	65C26863-4		. . HOUSING (OPT ITEM 145B)	B, C	1
–145B	65C26863-7		. . HOUSING (OPT ITEM 145A)	B, C	1
150	BAC27DHY0300		. MARKER (OPT ITEM 150A)		1
–150A	BAC27DHY357		. MARKER (OPT ITEM 150) (USED WITH ITEM 155)	C	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2– 155	RNF100TYP2		. TUBE-THERMOSHRINK (USED WITH ITEM 150A)	C	1

–Item not Illustrated