

 **BOEING**  
COMPONENT  
MAINTENANCE MANUAL

TO: ALL HOLDERS OF RUDDER CONTROL FEEL CENTERING AND TRIM INSTALLATION  
COMPONENT MAINTENANCE MANUAL 27-21-59

REVISION NO. 11 DATED DEC 01/95

HIGHLIGHTS

Pages which have been added or revised are outlined below together with the highlights of the revision. Remove and insert the affected pages as listed and enter Revision No. and date on the Record of Revision Sheet.

CHAPTER/SECTION

AND PAGE NO.

TITLE PAGE

1

301

1007-1009

DESCRIPTION OF CHANGE

Added top assembly 251T3216-10 with bearing P/N  
AE66111.

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HIGHLIGHTS

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# RUDDER CONTROL FEEL CENTERING AND TRIM INSTALLATION COMPONENTS

PART NUMBER 251T3216-3,-5,-7 THRU -10  
251T3220-7,-8  
251T3238-1,-2,-3,-5

COMPONENT MAINTENANCE MANUAL  
WITH  
ILLUSTRATED PARTS LIST

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REVISION RECORD

- Retain this record in front of manual. On receipt of revision, insert revised pages in the manual, and enter revision number, date inserted and initial.

| REVISION NUMBER | REVISION DATE | DATE FILED | BY | REVISION NUMBER | REVISION DATE | DATE FILED | BY |
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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

| BOEING<br>SERVICE<br>BULLETIN | BOEING<br>TEMPORARY<br>REVISION | OTHER<br>DIRECTIVE             | DATE OF<br>INCORPORATION<br>INTO MANUAL |
|-------------------------------|---------------------------------|--------------------------------|---|
| 27-15                         |                                 | PRR B10929<br><br>PRR B11799-1 | JUL 10/83<br>APR 10/84<br>JUL 01/88     |

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TR & SB RECORD

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## INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions including test, fault isolation, and replacement of defective components.

This manual is divided into separate sections:

- |   |                                |
|---|--------------------------------|
| 1. Title Page                                       | 4. List of Effective Pages     |
| 2. Record of Revisions                              | 5. Table of Contents           |
| 3. Temporary Revisions &<br>Service Bulletin Record | 6. Introduction                |
|   | 7. Procedures and IPL Sections |

Refer to the Table of Contents for the page location of applicable sections.

An explanation of the use of the Illustrated Parts List is provided in the introduction to that section.

All weights and measurements used in the manual are in English units unless otherwise stated. When metric equivalents are given they will be in parentheses following the English units.

Design changes, optional parts, configuration differences and Service Bulletin modifications create alternate part numbers. These are identified in the Illustrated Parts List (IPL) by adding an alphabetical character to the basic item number. The resulting item number is called an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless otherwise indicated.

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INTRODUCTION

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| RUDDER CONTROL FEEL CENTERING AND TRIM INSTALLATION COMPONENTS

DESCRIPTION AND OPERATION

NOTE: This manual contains overhaul data for various components of the rudder control feel centering and trim installation. Overhaul functions which cannot be performed by use of standard industry practices are included in repair instructions for each component.

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DESCRIPTION & OPERATION

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DISASSEMBLY

1. Disassembly

A. Disassemble arm assembly (1, 5, 6, 7, IPL Fig. 1) as follows:

**NOTE:** Do not remove bearing (95), bearing retainer (90), rivets (85, 105, 110) and doublers (115) from arm (120) unless necessary for repair or replacement.

On assemblies 251T3216-7, -8, -9, -10 do not remove bushings (104 or 125) unless necessary for repair or replacement.

(1) Remove inner bolt (40), outer hollow bolt (50), washers (60, 65) and nuts (70, 75).

(2) Remove bearing (80) from arm assembly (100).

B. Disassemble spring arm assembly (1, 5, IPL Fig. 2) as follows:

(1) Remove bolts (30), collars (35) and rivets (70).

(2) Separate arm assemblies (75, 75A or 80 from 115, 115A or 120) and remove actuator fitting assembly (20 or 25).

**NOTE:** Do not remove rivets (50, 85, 95, 100, 135, 140) bearing seat (90), arm (110, 150), doublers (105, 145), bearing (40, 125), bushings (10, 15) and sleeves (45, 130) unless necessary for repair or replacement.

C. Disassemble springarm assembly (1, IPL Fig. 3) as follows:

(1) Remove bolts (30, 32A), washers (33), collars (35), nuts (37A) and rivets (70).

(2) Separate arm assemblies (75, 110). Remove actuator fitting assembly (20 or 25).

**NOTE:** Do not remove rivets (80, 90, 95, 125, 130), bearing (40, 115), bearing seat (85), bushings (10, 15), doublers (100, 135) and arm (105, 140) unless necessary for repair or replacement.

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CLEANING

1. Clean all parts using standard industry practices and information contained in 20-30-03, except as noted in par. 2.
2. Clean sealed bearings (80, 95, IPL Fig. 1; 40, 125, IPL Fig. 2; 40, 115, IPL Fig. 3) per manufacturer's instructions.

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CHECK

1. Check all parts for obvious defects in accordance with standard industry practices.
2. Penetrant check the following parts per 20-20-02.
  - A. Arm assembly (100 IPL Fig. 1)
  - B. Outer hollow bolt (50, IPL Fig. 1)
  - C. Arm (120, IPL Fig. 1; 110, 110A, 150, 150A, IPL Fig. 2; 105, 140, IPL Fig. 3)
  - D. Bearing seat (90, IPL Fig. 2; 85, IPL Fig. 3)
  - E. Fitting (55, 60, 65, IPL Fig. 2; Fig. 3)

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REPAIR – GENERAL

1. Content

A. Repair, refinish and replacement procedures are included in separate repair sections as follows:

| <u>P/N</u>           | <u>NAME</u>        | <u>REPAIR</u> |
|----------------------|--------------------|---------------|
| NO ASSIGNED P/N      | ARM                | 1-1           |
| 251T3220             | SPRINGARM          | 2-1           |
| 251T3221-12, -14     | ARM                | 3-1           |
| 251T3221-11, -13     | ARM                | 4-1           |
| 251T3238             | SPRINGARM          | 5-1           |
| 251T3223<br>251N3225 | FITTING, ACTUATOR  | 6-1           |
| 251T3239-2           | ARM                | 7-1           |
| 251T3239-1, -7       | ARM                | 8-1           |
|                      | MISC PART REFINISH | 9-1           |
| 251T3216             | ARM                | 10-1          |
| 251T3271             | FITTING, ACTUATOR  | 11-1          |

2. Standard Practices

A. Refer to the following standard practices as applicable, for details of procedures in individual repairs.

- 20-30-02 Stripping of Protective Finishes
- 20-30-03 General Cleaning Procedures
- 20-41-01 Decoding Table for Boeing Finish Codes
- 20-41-02 Application of Chemical and Solvent Resistant Finishes
- 20-43-01 Chromic Acid Anodizing

3. Materials

NOTE: Equivalent substitutes may be used.

- A. Primer -- BMS 10-11, Type 1 (Ref 20-60-02)
- B. Sealant -- BMS 5-95 (Ref 20-60-04)

| ARM ASSEMBLY – REPAIR 1-1

NO ASSIGNED PART NUMBER

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

| 1. Bearing Replacement (IPL Fig. 1)

- A. Remove rivets (85). Remove bearing retainer (90) from arm assembly (100).
- B. Remove bearing (95).
- C. Install bearing (95) per 20-50-03.
- D. Install bearing retainer (90) on arm assembly (100) and secure with rivets (85).

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SPRINGARM ASSEMBLY - REPAIR 2-1

251T3220-7, -8

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bushing Replacement (IPL Fig. 2)

CAUTION: REMOVE BUSHINGS (10) WITH CARE TO AVOID DAMAGE TO ARM ASSEMBLY (75 or 80, 115 or 120).

- A. Remove bushings (10) by machining one flange and pressing out.
- B. Remove bushing (15).
- C. Install bushing (15) per 20-50-03 except use wet sealant.
- D. Install bushing (10) per 20-50-03, except use wet sealant, and stake to form second flange using staking tool ST922C-4.
- E. Fillet seal bushing flanges with sealant.

2. Refinish

- A. Springarm assembly (1, 5) -- Apply yellow epoxy primer (SRF-14.995). Mask bearing face and bore prior to refinishing. Apply alodine (F-14.05) on 0.5000 dia. Material: aluminum alloy.

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REPAIR 2-1

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| ARM ASSEMBLY – REPAIR 3-1

251T3221-12, -14

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bearing Replacement (IPL Fig. 2)

- A. Remove bearing (125) and sleeve (130).
- B. Install new bearing (125) and roller swage sleeve per 20-50-03 except use wet sealant.

2. Refinish

- A. Arm assembly (115, 115A, 120) -- Apply yellow epoxy primer (SRF-14.995). Mask bearing face and bore prior to refinishing. Material: aluminum alloy.
- B. Arm (150) -- Chromic acid or sulfuric acid anodize (F-17.05) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Mask holes prior to refinishing. Material: aluminum alloy.
- C. Arm (150A) -- Chromic acid anodize (F-17.04) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Mask holes prior to refinishing. Material: aluminum alloy.
- D. Doubler (145) -- Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06). Mask hole prior to refinishing. Material: aluminum alloy.

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ARM ASSEMBLY – REPAIR 4-1

251T3221-11, -13

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bearing Seat Replacement (IPL Fig. 2)

- A. Remove rivets (85).
- B. Remove bearing seat (90) from arm assembly (75 or 80).
- C. Install bearing seat (90) on arm assembly (75 or 80).
- D. Fillet seal bearing seat flange with sealant.

2. Refinish

- A. Arm assembly (75, 75A, 80) -- Apply yellow epoxy primer (SRF-14.995). Mask holes prior to refinishing. Material: aluminum alloy.
- B. Arm (110) -- Chromic acid or sulfuric acid anodize (F-17.05). Apply two coats of primer BMS 10-11, type (F-20.03). Mask holes prior refinishing. Material: aluminum alloy.
- C. Arm (110A) -- Chromic acid anodize (F-17.04). Apply two coats of primer BMS 10-11, type 1 (F-20.03). Mask holes prior to refinishing. Material: aluminum alloy.
- D. Doubler (105) -- Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06). Mask holes prior to refinishing. Material: aluminum alloy.
- E. Bearing seat (90) -- Chromic acid anodize (F-17.04) and apply two coats of primer BMS 10-11, type 1 (F-20.03) all over except omit primer in bearing bore. Material: Al alloy.

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SPRINGARM ASSY - REPAIR 5-1

251T3238-1, -2, -3, -5

NOTE: Refer to REPAIR GEN for list of applicable standard practices.

1. Bushing Replacement (IPL Fig. 3)

CAUTION: REMOVE BUSHING (10) WITH CARE TO AVOID DAMAGE TO ARM ASSEMBLY (75).

- A. Remove bushing (10) by machining one flange and pressing out.
- B. Remove bushing (15).
- C. Install bushing (10) and stake using tool ST922C-4 per 20-50-03 except use wet sealant, and stake to form second flange using staking tool.
- D. Install bushing (15) per 20-50-03 except use wet sealant.
- E. Fillet seal bushing flanges with wet sealant.

2. Refinish

- A. Springarm (1) -- Apply yellow epoxy primer (SRF-14.995). Mask bearing face and bore prior to refinishing. Chemical treat (F-17.10) 0.5000 inch dia. holes. Material: aluminum alloy.

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| ACTUATOR FITTING ASSEMBLY – REPAIR 6-1

251T3223-1  
251N3225-4

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bearing Replacement (IPL Fig. 2, Fig. 3)

- A. Remove bearing (40) and sleeve (45).
- B. Install bearing (40) and roller swage sleeve over bearing per 20-50-03 except use wet sealant.

2. Refinish

- | A. Actuator fitting assembly (20) -- Chemical treat (F-17.10) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Mask bearing face and bore prior to refinishing. Material: aluminum alloy.
- | B. Actuator fitting assembly (25) -- Apply yellow epoxy primer (SRF-14.995). Mask bearing face and bore prior to refinishing. Material: aluminum alloy.
- C. Fitting (65) -- Chromic acid anodize (F-17.04) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Material: aluminum alloy.
- D. Fitting (55, 60) -- Chromic acid anodize and apply one coat of primer BMS 10-11, type 1 (F-18.13). Material: aluminum alloy.

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ARM ASSEMBLY – REPAIR 7-1

251T3239-2

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bearing Replacement (IPL Fig. 3)

- A. Remove bearing (115) and sleeve (120).
- B. Install bearing (115) and roller swage sleeve per 20-50-03 except use wet sealant.

2. Refinish

- A. Arm (140) -- Chromic acid or sulfuric acid anodize (F-17.05). Apply two coats of primer BMS 10-11, type 1 (F-20.03) all over except omit primer from bore. Material: Aluminum alloy.
- B. Doubler (135) -- Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06). Mask holes prior to refinishing. Material: aluminum alloy.

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ARM ASSEMBLY - REPAIR 8-1

251T3239-1, -7

| 1. Bearing Seat Replacement (IPL Fig. 3)

- A. Remove rivets (80). Remove bearing seat (85) from arm (105).
- B. Install bearing seat (85) on arm (105) using rivets (80).
- C. Fillet seal bearing seat flange with wet sealant.

2. Refinish

- A. Arm (105) -- Chromic acid or sulfuric acid anodize (F-17.05). Apply two coats of primer BMS 10-11, type 1 (F-20.03) all over except omit primer from bore. Material: aluminum alloy.
- B. Doubler (100) -- Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06). Mask holes prior to refinishing. Material: aluminum alloy.
- C. Bearing seat (85) -- Chromic acid anodize (F-17.04) and apply two coats of primer BMS 10-11, type 1 (F-20.03) all over except omit primer from 0.8753-0.8758 inch dia. and 0.9985-0.9990 inch dia. Material: aluminum alloy.

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MISCELLANEOUS PARTS REFINISH – REPAIR 9-1

1. Repair of parts listed in Fig. 601 consists of restoration of the original finish.

| IPL FIG. & ITEM  | MATERIAL   | FINISH  |
|--|--|---|
| <u>Fig. 1</u><br><br>Arm (120, 120A)<br><br><br><br><br><br>Doubler (115, 115A)<br><br><br><br><br><br>Bearing retainer (90) | Al alloy<br><br><br><br><br><br>Al alloy<br><br><br><br><br><br>Al alloy | Chromic acid anodize (F-17.04). Apply two coats of primer BMS 10-11, type 1 (F-20.03) all over except no primer in holes. Chemical treat (F-17.10) bolt hole, 0.72 inch dia. and counterbores.<br><br><br>Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06) all over except no primer in holes.<br><br><br>Chemical treat (colored film) and apply one coat of primer BMS 10-11, type 1 (F-18.06). |

Refinish Details  
 Figure 601

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ARM ASSEMBLY – REPAIR 10-1

251T3216-6, -8

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bushing Replacement (Fig. 601, IPL Fig. 1)

- A. Remove bushings (104 or 125).
- B. Install bushings (104 or 125) per 20-50-03 except use sealant.
- C. Machine bushing bore per Fig. 601.

2. Refinish

- A. See Repair 9-1.

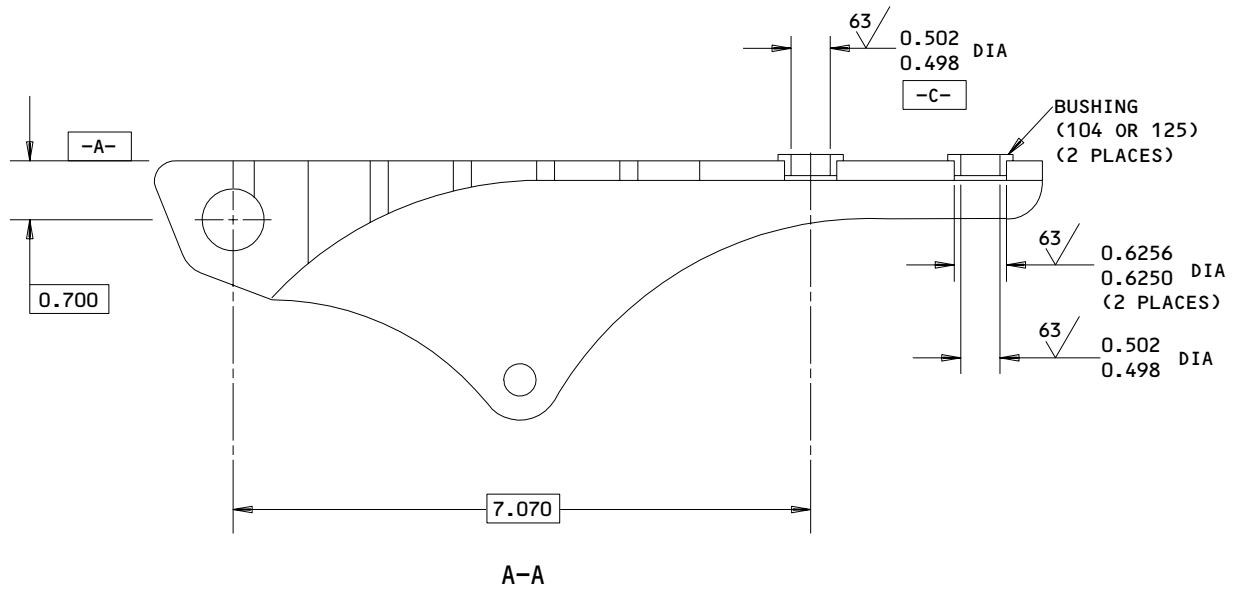
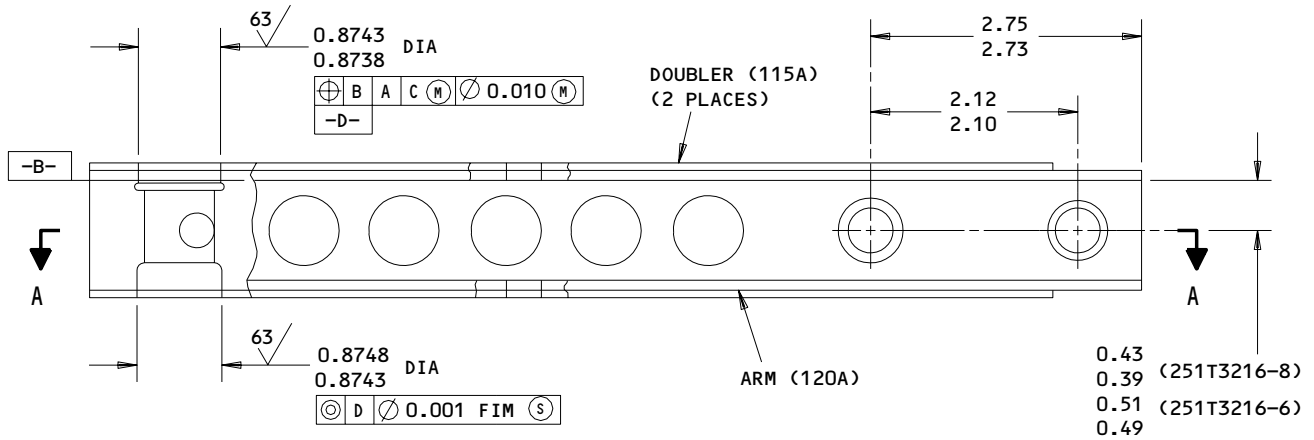
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MATERIAL: AL ALLOY  
 ALL DIMENSIONS ARE IN INCHES  
 ITEM NUMBER REFERS TO IPL FIG.1

251T3216-6 SHOWN  
 251T3216-8 SIMILAR  
 Arm Assembly Repair  
 Figure 601

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ACTUATOR FITTING ASSEMBLY - REPAIR 11-1

251T3271-1

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

1. Bearing Replacement (IPL Fig. 3)

- A. Remove bearing (40) and sleeve (45).
- B. Install bearing (40) and roller swage sleeve over bearing per 20-50-03 except use wet sealant.

2. Refinish

- A. Actuator fitting assembly (20A) -- Chemical treat (F-17.10) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Mask bearing face and bore prior to refinishing. Material: aluminum alloy.
- B. Fitting (65A) -- Chromic acid anodize (F-17.04) and apply two coats of primer BMS 10-11, type 1 (F-20.03). Material: aluminum alloy.

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ASSEMBLY

1. Material

NOTE: Equivalent substitutes may be used.

A. Grease -- MIL-G-23827 (Ref 20-60-03)

B. Sealant -- BMS 5-95 (Ref 20-60-04)

2. Assembly

A. Assemble arm assembly (1, 5, IPL Fig. 1) as follows:

(1) Install bearing (80) on arm assembly (100) per 20-50-03.

(2) Apply grease to shaft of bolt assembly (30, 35). Install shaft assembly (30, 35), bearing (80), washers (60) and nut (70) on arm assembly (100). Tighten nut (70) to 60-80 lb-in.

CAUTION: DO NOT RESET TORQUE VALUE OF NUT (70) WHEN TIGHTENING NUT (75).

(3) Install inner washer (65) and nut (75). Tighten nut (75) to 15-20 lb-in.

B. Assemble springarm assembly (1, 5, IPL Fig. 2) as follows:

(1) Use standard industry practices for assembly of arm assemblies (75, 75A, 80, 115, 115A, 120) and actuator fitting assembly (20 or 25) and additional procedure in step (2).

(2) Apply wet sealant to faying surfaces between doublers (105, 145), arms (110, 110A, 150, 150A) and fittings (55, 60, 65).

(3) Apply wet sealant to faying surface of arm assemblies (75 or 75A or 80, 115 or 115A or 120) and actuator fitting assembly (20 or 25).

(4) Position actuator fitting assembly (20 or 25) between arm assemblies (75 or 75A or 80, 115 or 115A or 120) and secure with bolts (30) and collars (35). Install bolts (30) with sealant.

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C. Assemble springarm assembly (1, IPL Fig. 3) as follows:

- (1) Use standard industry practices for assembly of arm assemblies (75, 110) and actuator fitting assembly (20 or 25) and additional procedure in step (2).
- (2) Apply wet sealant to faying surfaces between doublers (100, 135), arms (105, 140) and fittings (55, 60, 65).
- (3) Apply wet sealant to faying surfaces of arm assemblies (75, 110) and actuator fitting assembly (20 or 25).
- (4) Position actuator fitting assembly (20 or 25) between arm assemblies (75, 110) and secure with bolts (30, 32A), washer (33), collars (35), and nut (37A). Install bolts (30, 32A) with sealant.

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FITS AND CLEARANCES

| FOR TORQUE VALUES OF STANDARD FASTENERS. REFER TO 20-50-01 |      |              |            |
|--|------|--------------|------------|
| ITEM NO.<br>FIG. 1   | NAME | TORQUE       |            |
|  |      | POUND-INCHES | POUND-FEET |
| 70   | Nut  | 60-80        |            |
| 75   | Nut  | 15-20        |            |

Torque Table  
 Figure 801

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251T3216  
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251T3238



SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes may be used for listed item.

|ST922C-4 -- Staking tool and bushings

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SPECIAL TOOLS

01.1

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ILLUSTRATED PARTS LIST

1. This section lists and illustrates replaceable or repairable component parts. The Illustrated Parts Catalog contains a complete explanation of the Boeing part numbering system.

2. Indentures show parts relationships as follows:

Assembly

Detail Parts for Assembly

Subassembly

Attaching Parts for Subassembly

Detail Parts for Subassembly

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

3. One use code letter (A, B, C, etc.) is assigned in the EFF CODE column for each variation of top assembly. All listed parts are used on all top assemblies except when limitations are shown by use code letter opposite individual part entries.

4. Letter suffixes (alpha-variants) are added to item numbers for optional parts, Service Bulletin modification parts, configuration differences (except left- and right-hand parts), product improvement parts, and parts added between two sequential item numbers. The alpha-variant is not shown on illustrations when appearance and location of all variants of the part are the same.

5. Service Bulletin modifications are shown by the notations PRE SB XXXX and POST SB XXXX.

A. When a new top assembly part number is assigned by Service Bulletin, the notations appear at the top assembly level only. The configuration differences at detail part level are then shown by use code letter.

B. When the top assembly part number is not changed by the Service Bulletin, the notations appear at the detail part level.

6. Parts Interchangeability

Optional  
(OPT)

The parts are optional to and interchangeable with other parts having the same item number.

Supersedes, Superseded By  
(SUPSDS, SUPSD BY)

The part supersedes and is not interchangeable with the original part.

Replaces, Replaced By  
(REPLS, REPLD BY)

The part replaces and is interchangeable with, or is an alternate to, the original part.

VENDORS

11815 TOWNSEND DIV OF TEXTRON INC CHERRY FASTENER UNIT  
BOX 2157 1224 EAST WARNER AVENUE  
SANTA ANA, CALIFORNIA 92707

21335 TEXTRON INC FAFNIR BEARING DIVISION  
37 BOOTH STREET  
NEW BRITAIN, CONNECTICUT 06050

23294 AVALON MACHINE PRODUCTS INC  
15337 ALLEN STREET  
PARAMOUNT, CALIFORNIA 90723

29666 HUCK MANUFACTURING CO SUB OF FEDERAL-MOGUL CORP  
6 THOMAS  
IRVINE, CALIFORNIA 92714

30163 DAYRON CORP  
333 MAGUIRE BLVD PO BOX 20394  
ORLANDO, FLORIDA 32814

38443 TRW INC BEARING DIV  
402 CHANDLER STREET  
JAMESTOWN, NEW YORK 14701

43991 FAG BEARING INCORPORATED  
HAMILTON AVENUE  
STAMFORD, CONNECTICUT 06904

60380 TORRINGTON CO BEARINGS DIV SUBSIDIARY OF INGERSOLL-RAND CORP  
59 FIELD STREET  
TORRINGTON, CONNECTICUT 06790

70265 ALL POWER MANUFACTURING COMPANY  
13141 MOLETTE STREET

90255 DAHLSTROM INDUSTRIES INC  
9508 WINONA AVENUE  
SCHILLER PARK, ILLINOIS 60176

92563 MCGILL MFG CO INC BEARINGS DIV  
907 LAFAYETTE STREET  
VALPARAISO, INDIANA 46383

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251T3216  
251T3220  
251T3238



VENDORS

94892      MASTER MACHINE PRODUCTS CORPORATION  
             2069 RANDOLPH STREET  
             HUNTINGTON PARK, CALIFORNIA 90255

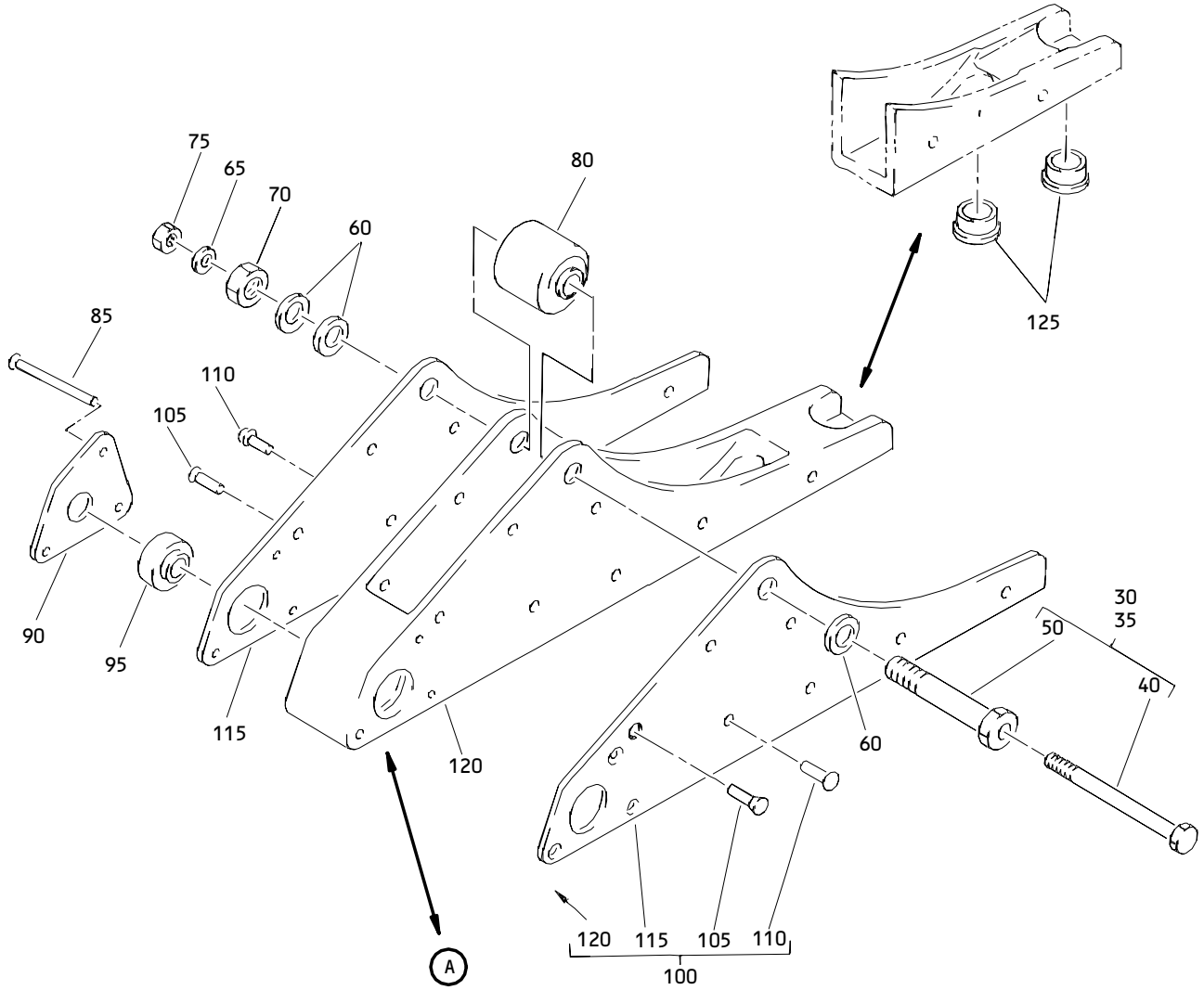
|

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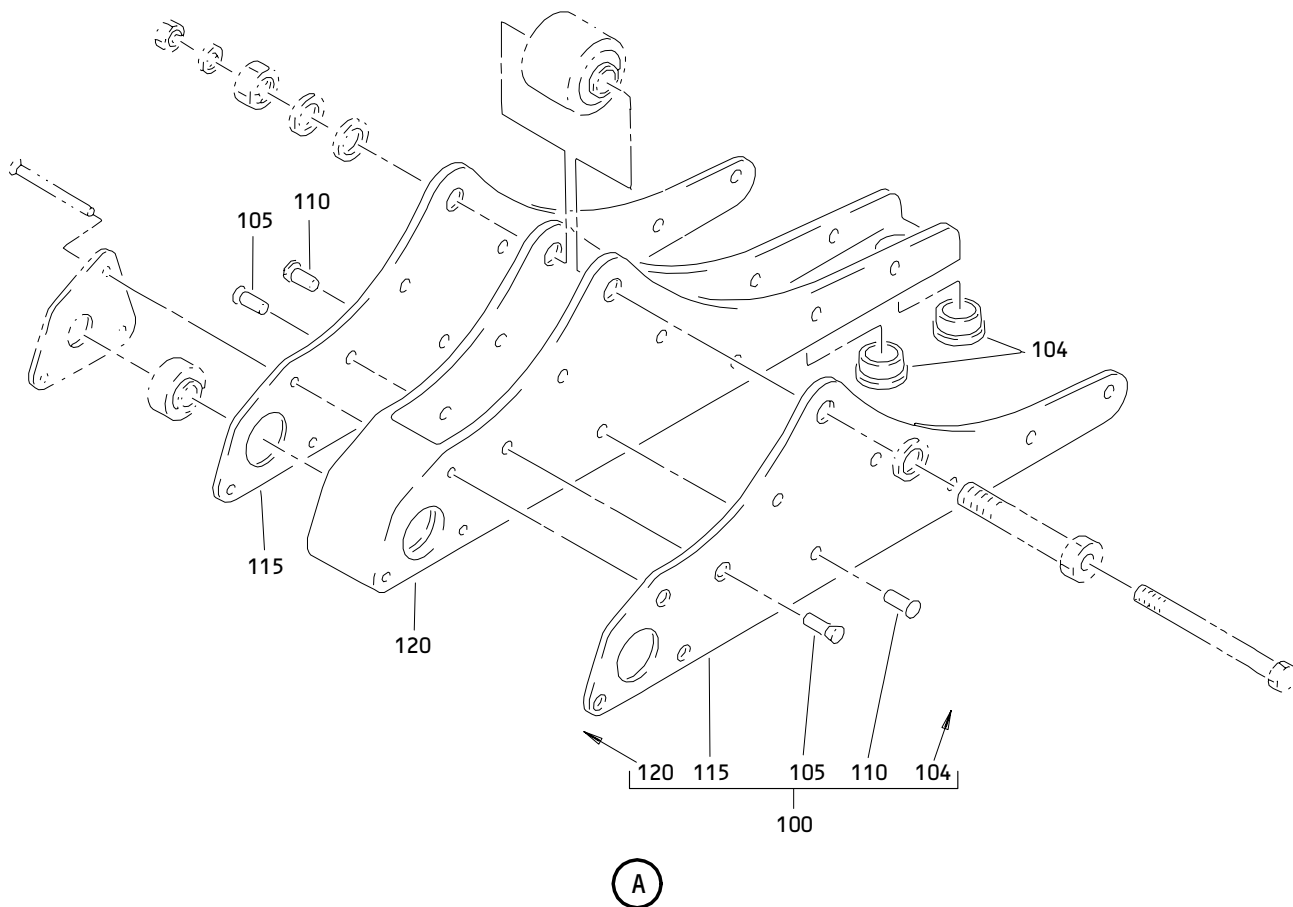
251T3216  
251T3220  
251T3238



Rudder Control Feel and Trim Cam Roller Arm Assembly  
Figure 1 (Sheet 1)

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Rudder Control Feel and Trim Cam Roller Arm Assembly  
Figure 1 (Sheet 2)

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251T3220  
251T3238

**BOEING**  
COMPONENT  
MAINTENANCE MANUAL

| FIG. & ITEM | PART NO.    | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE | QTY PER ASSY |
|-------------|-------------|---------------------|--|----------|--------------|
| 01-<br>-1   | 251T3216-3  |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER (PRE SB 27-15)      | A        | RF           |
| -5          | 251T3216-5  |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER (PRE SB 27-15)      | B        | RF           |
| -6          | 251T3216-7  |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER                     | G        | RF           |
| -6A         | 251T3216-10 |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER                     | M        | RF           |
| -7          | 251T3216-8  |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER (POST SB 27-15)     | H        | RF           |
| -9          | 251T3216-9  |                     | ARM ASSY-RUD CONT FEEL AND TRIM CAM ROLLER                     | L        | RF           |
| -10         | 251T3220-7  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 2) | C        | RF           |
| -15         | 251T3220-8  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 2) | D        | RF           |
| -20         | 251T3238-1  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 3) | E        | RF           |
| -25         | 251T3238-2  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 3) | F        | RF           |
| -25A        | 251T3238-3  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 3) | J        | RF           |
| -25B        | 251T3238-5  |                     | SPRINGARM ASSY-RUD CONT FEEL AND TRIM (FOR DETAILS SEE FIG. 3) | K        | RF           |
| 30          | 251T0200-17 |                     | .BOLT ASSY   | A        | 1            |
| 30A         | 251T0200-17 |                     | .BOLT ASSY (OPT ITEM 35A)                                      | H        | 1            |
| 35          | 251T0200-51 |                     | .BOLT ASSY   | BGLM     | 1            |
| 35A         | 251T0200-51 |                     | .BOLT ASSY (OPT ITEM 30A)                                      | H        | 1            |
| 40          | 251T0200-42 |                     | ..BOLT-INNER (OPT ITEM 40A)                                    | A        | 1            |

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| FIG. & ITEM | PART NO.                   | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE   | QTY PER ASSY |
|-------------|----------------------------|---------------------|--|------------|--------------|
| 01-<br>-40A | NAS6703U36                 |                     | ..BOLT-INNER<br>(OPT ITEM 40,40B)  | AH         | 1            |
| -40B        | 251T0200-42                |                     | ..BOLT-INNER<br>(USED ON ITEM 30A)<br>(OPT ITEM 40A)   | H          | 1            |
| -45<br>-45A | NAS6703U34<br>NAS6703U34   |                     | ..BOLT-INNER<br>..BOLT-INNER<br>(USED ON ITEM 35A)   | BGLM       | 1<br>1       |
| 50<br>-50A  | 251T0200-18<br>251T0200-18 |                     | ..BOLT-OUTER HOLLOW<br>..BOLT-OUTER HOLLOW<br>(USED ON ITEM 30A)                             | A          | 1<br>1       |
| -55<br>-55A | 251T0200-52<br>251T0200-52 |                     | ..BOLT-OUTER HOLLOW<br>..BOLT-OUTER HOLLOW<br>(USED ON ITEM 35A)                             | BGLM       | 1<br>1       |
| 60          | AN960PD616                 |                     | .WASHER  | ABGHL<br>M | 3            |
| 65          | AN960PD10                  |                     | .WASHER  | ABGHL<br>M | 1            |
| 70          | BACN10JC6                  |                     | .NUT   | ABGHL<br>M | 1            |
| 75          | BACN10JC3                  |                     | .NUT   | ABGHL<br>M | 1            |
| 80          | ATL6                       |                     | .BEARING-<br>(V60380)<br>(SPEC BACB10EU06)<br>(OPT 6AL1618<br>(V92563))<br>(OPT TO ITEM 80B) | ABGH<br>M  | 1            |
| 80A         | AE66111                    |                     | .BEARING-<br>(V60380)<br>(SPEC 60B00178-665)   | LM         | 1            |
| 80B         | AE66111                    |                     | .BEARING-<br>(V60380)<br>(SPEC 60B00178-665)<br>(OPT TO ITEM 80)                             | B          | 1            |
| 85          | BACR15BA5KE                |                     | .RIVET-  | ABGHL<br>M | 3            |
| 90          | 251T3219-1                 |                     | .RETAINER-BRG  | ABGHL<br>M | 1            |

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251T3216  
251T3220  
251T3238

 **BOEING**  
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MAINTENANCE MANUAL

| FIG. & ITEM | PART NO.     | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE   | QTY PER ASSY |
|-------------|--------------|---------------------|--|------------|--------------|
| 01-95       | KSP6A        |                     | .BEARING-<br>(V38443)<br>(SPEC BACB10AC6A)<br>(OPT HHKSP6A<br>(V38443))<br>(OPT KSP6AE9440A<br>(V21335))<br>(OPT KSP6AFS428<br>(V21335))<br>(OPT KSP6A2TS<br>(V43991))<br>(OPT KSP6AG27<br>(V30163)) | ABGHL<br>M | 1            |
| 100         | 251T3216-4   |                     | .ARM ASSY  | ABHL       | 1            |
| 100A        | 251T3216-6   |                     | .ARM ASSY  | GM         | 1            |
| 104         | BACB28W8B023 |                     | ..BUSHING  | GM         | 2            |
| 105         | BACR15BA5KE  |                     | ..RIVET-   | ABGHL<br>M | 2            |
| 110         | BACR15FT5KE  |                     | ..RIVET-   | ABGHL<br>M | 12           |
| 115         | 251T3218-1   |                     | ..DOUBLER  | ABHL       | 2            |
| 115A        | 251T3218-2   |                     | ..DOUBLER  | GM         | 2            |
| 120         | 251T3217-1   |                     | ..ARM  | ABHL       | 1            |
| 120A        | 251T3217-2   |                     | ..ARM  | GM         | 1            |
| 125         | BACB28W8B023 |                     | .BUSHING   | H          | 2            |

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251T3220  
251T3238

**BOEING**  
COMPONENT  
MAINTENANCE MANUAL

| FIG. & ITEM | PART NO.      | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567   | EFF CODE | QTY PER ASSY |
|-------------|---------------|---------------------|---|----------|--------------|
| 02-<br>-1   | 251T3220-7    |                     | SPRINGARM ASSY-RUD CONT<br>FEEL AND TRIM  | A        | RF           |
| -5          | 251T3220-8    |                     | SPRINGARM ASSY-RUD CONT<br>FEEL AND TRIM  | B        | RF           |
| 10          | BACB28B6-521P |                     | .BUSHING-<br>(V23294)<br>(SPEC BACB28B6-521P)<br>(OPT BACB28B6-521P<br>(V70265))<br>(OPT BACB28B6-521P<br>(V94892))   |          | 2            |
| 15          | BACB28X6C019  |                     | .BUSHING-<br>(V23294)<br>(SPEC BACB28X6C019)<br>(OPT BACB28X6C019<br>(V70265))<br>(OPT BACB28X6C019<br>(V90255))  |          | 1            |
| 20          | 251T3223-1    |                     | .FITTING ASSY-ACTUATOR  | A        | 1            |
| 25          | 251N3225-4    |                     | .FITTING ASSY-ACTUATOR<br>ATTACHING PARTS   | B        | 1            |
| 30          | 2LPYT6-31     |                     | .BOLT-<br>(V11815)<br>(SPEC BACB30DX6-31)<br>(OPT 2LPYT6-31<br>(V29666))  |          | 3            |
| 35          | NAS1080-6     |                     | .COLLAR<br>-----*   |          | 3            |
| 40          | KSP6A         |                     | ..BEARING-<br>(V38443)<br>(SPEC BACB10AC6A)<br>(OPT HHKSP6A<br>(V38443))<br>(OPT KSP6AE9440A<br>(V21335))<br>(OPT KSP6AFS428<br>(V21335))<br>(OPT KSP6A2TS<br>(V43991)) |          | 1            |
| 45          | 69-38919-19   |                     | ..SLEEVE-   |          | 1            |

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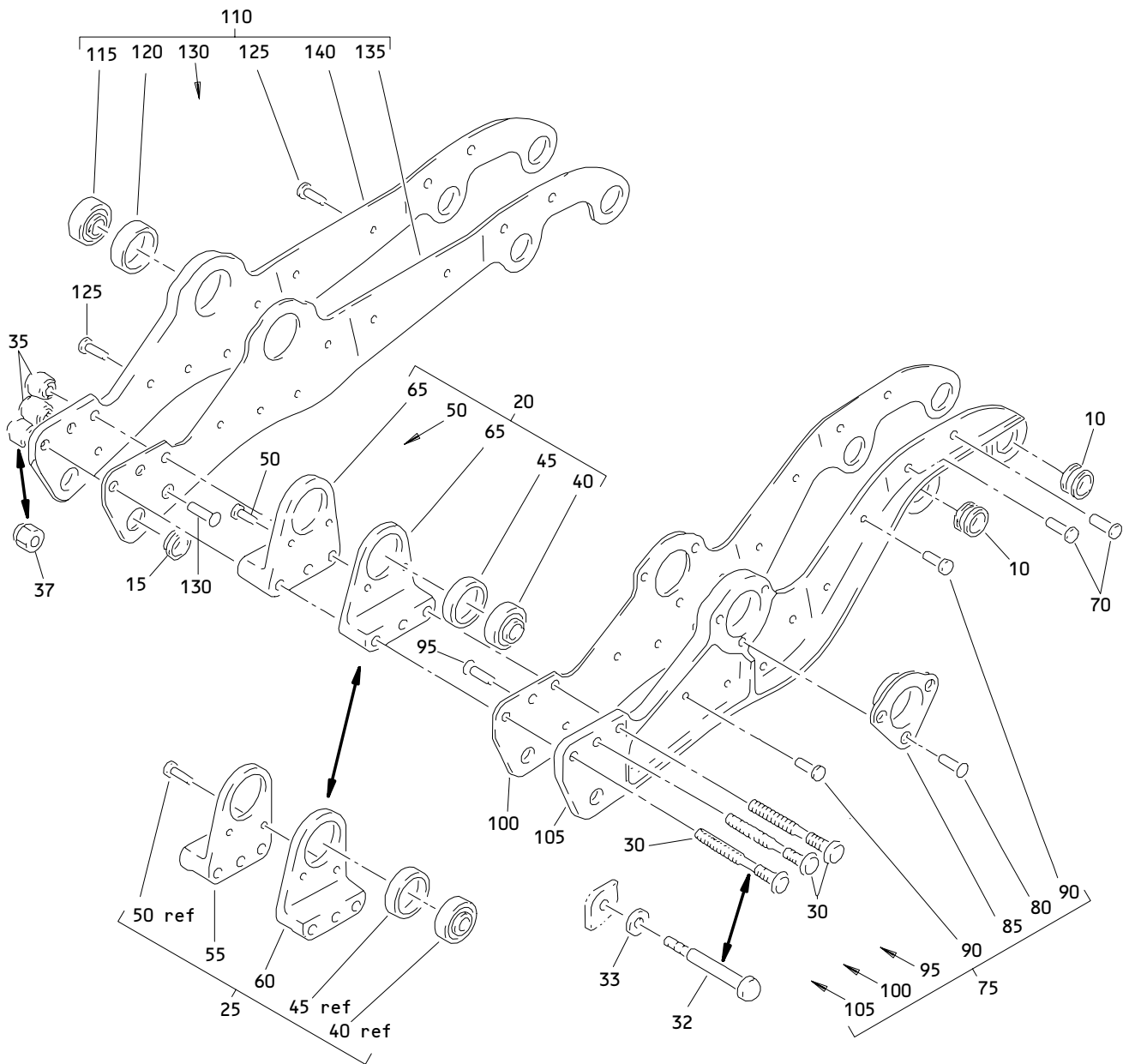
ILLUSTRATED PARTS LIST  
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| FIG. & ITEM | PART NO.    | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE | QTY PER ASSY |
|-------------|-------------|---------------------|--------------------------|----------|--------------|
| 02-         |             |                     |                          |          |              |
| 50          | BACR15BB4D  |                     | ..RIVET-                 |          | 2            |
| 55          | 251N3225-6  |                     | ..FITTING                | B        | 1            |
| 60          | 251N3225-5  |                     | ..FITTING                | B        | 1            |
| 65          | 251T3223-2  |                     | ..FITTING                | A        | 2            |
| 70          | BACR15FT5KE |                     | .RIVET-                  |          | 3            |
| 75          | 251T3221-11 |                     | .ARM ASSY-               | A        | 1            |
|             |             |                     | (OPT ITEM 75A)           |          |              |
| -75A        | 251T3221-13 |                     | .ARM ASSY-               | A        | 1            |
|             |             |                     | (OPT ITEM 75)            |          |              |
| -80         | 251T3221-11 |                     | .ARM ASSY                | B        | 1            |
| 85          | BACR15BA4KE |                     | ..RIVET-                 |          | 3            |
| 90          | 251T3230-1  |                     | ..SEAT-BRG               |          | 1            |
| 95          | BACR15BA5KE |                     | ..RIVET-                 |          | 3            |
| 100         | BACR15FT5KE |                     | ..RIVET-                 |          | 6            |
| 105         | 251T3222-1  |                     | ..DOUBLER                |          | 1            |
| 110         | 251T3221-5  |                     | ..ARM-                   |          | 1            |
|             |             |                     | (USED ON ITEMS 75, 80)   |          |              |
| -110A       | 251T3221-9  |                     | ..ARM-                   |          | 1            |
|             |             |                     | (USED ON ITEM 75A)       |          |              |
| 115         | 251T3221-12 |                     | .ARM ASSY-               | A        | 1            |
|             |             |                     | (OPT ITEM 115A)          |          |              |
| -115A       | 251T3221-14 |                     | .ARM ASSY-               | A        | 1            |
|             |             |                     | (OPT ITEM 115)           |          |              |
| -120        | 251T3221-12 |                     | .ARM ASSY                | B        | 1            |
| 125         | KSP6A       |                     | ..BEARING-               |          | 1            |
|             |             |                     | (V38443)                 |          |              |
|             |             |                     | (SPEC BACB10AC6A)        |          |              |
|             |             |                     | (SEE ITEM 40)            |          |              |
|             |             |                     | FOR OPT PART 5)          |          |              |
| 130         | 69-38919-19 |                     | ..SLEEVE-                |          | 1            |
| 135         | BACR15BA5KE |                     | ..RIVET-                 |          | 3            |
| 140         | BACR15FT5AD |                     | ..RIVET-                 |          | 6            |
| 145         | 251T3222-2  |                     | ..DOUBLER                |          | 1            |
| 150         | 251T3221-6  |                     | ..ARM-                   |          | 1            |
|             |             |                     | (USED ON ITEMS 115, 120) |          |              |
| -150A       | 251T3221-10 |                     | ..ARM-                   |          | 1            |
|             |             |                     | (USED ON ITEM 115A)      |          |              |

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Rudder Control Feel and Trim Springarm Assembly  
 Figure 3

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251T3216  
251T3220  
251T3238

**BOEING**  
COMPONENT  
MAINTENANCE MANUAL

| FIG. & ITEM | PART NO.      | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE | QTY PER ASSY |
|-------------|---------------|---------------------|--|----------|--------------|
| 03-<br>-1   | 251T3238-1    |                     | SPRING ARM ASSY-RUD CONT<br>FEEL AND TRIM  | A        | RF           |
| -1A         | 251T3238-2    |                     | SPRING ARM ASSY-RUD CONT<br>FEEL AND TRIM  | B        | RF           |
| -1B         | 251T3238-3    |                     | SPRING ARM ASSY-RUD CONT<br>FEEL AND TRIM  | C        | RF           |
| -1C         | 251T3238-5    |                     | SPRING ARM ASSY-RUD CONT<br>FEEL AND TRIM  | D        | RF           |
| -5          | 251T3238-2    |                     | DELETED  |          |              |
| 10          | BACB28B6-461P |                     | .BUSHING   |          | 2            |
| 15          | BACB28X6C019  |                     | .BUSHING-<br>(V23294)<br>(SPEC BACB28X6C019)<br>(OPT BACB28X6C019<br>(V70265))<br>(OPT BACB28X6C019<br>(V90255)) |          | 1            |
| 20          | 251T3223-1    |                     | .FITTING ASSY-ACTUATOR   | A        | 1            |
| -20A        | 251T3271-1    |                     | .FITTING ASSY-ACTUATOR   | D        | 1            |
| 25          | 251N3225-4    |                     | .FITTING ASSY-ACTUATOR<br>ATTACHING PARTS  | BC       | 1            |
| 30          | 2LPYT6-31     |                     | .BOLT-<br>(V11815)<br>(SPEC BACB30DX6-31)<br>(OPT 2LPYT6-31<br>(V29666))   | AB       | 3            |
| -30A        | 2LPYT6-31     |                     | .BOLT-<br>(V11815)<br>(SPEC BACB30DX6-31)<br>(OPT 2LPYT6-31<br>(V29666))   | C        | 2            |
| -30B        | BACB30UB6K31  |                     | .BOLT  | D        | 3            |
| 32          | 2LPYT5-31     |                     | DELETED  |          |              |
| 32A         | NAS623-2-32   |                     | .BOLT  | C        | 1            |
| 33          | AN960KD8      |                     | .WASHER  | C        | 1            |

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| FIG. & ITEM | PART NO.      | AIRLINE PART NUMBER | NOMENCLATURE<br>1234567  | EFF CODE | QTY PER ASSY |
|-------------|---------------|---------------------|--|----------|--------------|
| 03-         |               |                     |  |          |              |
| 35          | NAS1080-6     |                     | . COLLAR   | AB       | 3            |
| -35A        | NAS1080-6     |                     | . COLLAR   | C        | 2            |
| -35B        | BACC30BF6     |                     | . COLLAR   | D        | 3            |
| 37          | NAS1080-5     |                     | DELETED  |          |              |
| 37A         | BACN10JC08    |                     | . NUT  | C        | 1            |
|             |               |                     | -----*-----  |          |              |
| 40          | KSP6A         |                     | .. BEARING-<br>(V38443)<br>(SPEC BACB10AC6A)<br>(OPT HHKSP6A<br>(V38443))<br>(OPT KSP6AE9440A<br>(V21335))<br>(OPT KSP6AFS428<br>(V21335))<br>(OPT KSP6A2TS<br>(V43991)) |          | 1            |
| 45          | 69-38919-19   |                     | .. SLEEVE  |          | 1            |
| 50          | BACR15BB4D    |                     | .. RIVET   |          | 2            |
| 55          | 251N3225-6    |                     | .. FITTING   | BC       | 1            |
| 60          | 251N3225-5    |                     | .. FITTING   | BC       | 1            |
| 65          | 251T3223-2    |                     | .. FITTING   | A        | 2            |
| -65A        | 251T3271-2    |                     | .. FITTING   | D        | 2            |
| 70          | BACR15FT5KE8C |                     | . RIVET  |          | 2            |
| 75          | 251T3239-1    |                     | . ARM ASSY   | ABC      | 1            |
| -75A        | 251T3239-7    |                     | . ARM ASSY<br>(REPLD BY ITEM 75B)  | D        | 1            |
| 75B         | 251T3239-8    |                     | . ARM ASSY<br>(REPLS ITEM 75A)   | D        | 1            |
| 80          | BACR15BA4KE8  |                     | .. RIVET   |          | 3            |
| 85          | 251T3230-1    |                     | .. SEAT-BRG  | ABC      | 1            |
| -85A        | 251T3230-2    |                     | .. SEAT-BRG  | D        | 1            |
| 90          | BACR15FT5KE6C |                     | .. RIVET   |          | 6            |
| 95          | BACR15BA5KE6  |                     | .. RIVET   |          | 1            |
| 100         | 251T3240-1    |                     | .. DOUBLER   |          | 1            |
| 105         | 251T3239-3    |                     | .. ARM   |          | 1            |
| 110         | 251T3239-2    |                     | . ARM ASSY   |          | 1            |
| 115         | KSP6A         |                     | .. BEARING-<br>(V38443)<br>(SPEC BACB10AC6A)<br>(SEE ITEM 40<br>FOR OPT PARTS)   |          | 1            |

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251T3216  
251T3220  
251T3238

 **BOEING**  
COMPONENT  
MAINTENANCE MANUAL

| FIG.<br>&<br>ITEM | PART NO.      | AIRLINE<br>PART<br>NUMBER | NOMENCLATURE<br>1234567 | EFF<br>CODE | QTY<br>PER<br>ASSY |
|-------------------|---------------|---------------------------|-------------------------|-------------|--------------------|
| 03-               |               |                           |                         |             |                    |
| 120               | 69-38919-19   |                           | ..SLEEVE                |             | 1                  |
| 125               | BACR15FT5KE6C |                           | ..RIVET                 |             | 6                  |
| 130               | BACR15BA5KE6  |                           | ..RIVET                 |             | 1                  |
| 135               | 251T3240-2    |                           | ..DOUBLER               |             | 1                  |
| 140               | 251T3239-4    |                           | ..ARM                   |             | 1                  |

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