COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

THRUST REVERSER LOCKING ACTUATOR ASSEMBLY

PART NUMBER 315A1801–14, –15, –18, –19, –22, –23, –26, –27

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COMPONENT MAINTENANCE MANUAL

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To: All holders of THRUST REVERSER LOCKING ACTUATOR ASSEMBLY 78-31-02.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

The COMPONENT MAINTENANCE MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

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A = Added, R = Revised, D = Deleted, O = Overflow

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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR 33573	JUN 05/84
		PRR 33643	SEP 05/84
		PRR 33962	MAR 05/86
	78-5		DEC 05/88

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed		Revision		Filed	
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Temporary Revision		Inserted		Removed	
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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.

THRUST REVERSER LOCKING ACTUATOR ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The thrust reverser locking actuator assembly consists of the actuator from 78-31-04 with attached rod end, bellcrank, fitting, leaf spring and bushings.

2. Leading Particulars (approximate)

A. Length - 24 inches (retracted) - 44 inches (extended)

B. Width - 5 inches

C. Height - 5 inches

D. Weight - 21 pounds (dry)

(NOT APPLICABLE)

DISASSEMBLY

1. **General**

   A. Disassemble this component sufficiently to isolate the defects, do the necessary repairs, and put the component back to a serviceable condition.

2. **Parts Replacement**

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

   A. Lockwire

   B. Rivets

   C. Lock tab (10)

3. **Disassembly (IPL Figure 1)**

   A. Straighten ears of lock tab (10). Remove from head of bolt (15) and discard.

   B. Remove nut (25), bolt (15), washer (20), and bushing (35). Bushings (30, 40) are pressed into clevis. Do not remove unless necessary for repair or replacement. Separate rod (65) from clevis of actuator (195A).

   C. Remove collar (55), washers (50), bushing (60) and lockbolt (45). Separate rod (65) from bellcrank (125). Do not disassemble rod (65) unless repair or replacement is required.

   D. Remove collar (115), lockbolt (105), washers (107, 110), bushing (120) and bellcrank (125). Do not remove bushings from bellcrank unless repair or replacement is required.

   E. Remove screws (170), washers (175) and spring (160) from fitting (190).

   F. Remove screws (180), washers (185) and fitting (190) from actuator (195A). Refer to 78-31-04 for overhaul of actuator (195A).

(NOT APPLICABLE)

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 1) 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) Magnetic particle check per SOPM 20-20-01 – Plates (145), leaf spring (160 or 165), rod (100A) (IPL Figure 1)

(2) Penetrant check per SOPM 20-20-02 – Rod (100), washer (110), bellcrank (155), fitting (190), Ball (101) (IPL Figure 1).

REPAIR

1. **Content**

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

Table 601:

P/N	NAME	REPAIR
315A1897	BELLCRANK ASSEMBLY	1-1, 1-2
315A1899	FITTING	2-1
315A1902	ROD ASSEMBLY	3-1
- - -	MISCELLANEOUS PARTS REFINISH	4-1
- -	BUSHING SEALING	5-1

2. **Standard Practices**

   A. Refer to the following standard practices, as applicable, for details of procedures in individual repairs.
   - 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 20-43-01 Chromic Acid Anodizing
   - SOPM 20-50-03 Bearing Installation and Retention

3. **Materials**

   NOTE: Equivalent substitutes may be used.

   A. Primer – primer, C00259 BMS 10-11 type 1 (Ref 20-60-02)

   B. Enamel – coating, C50069 BMS 10-11 type 2, color 702 gloss white

   C. Enamel – coating, C50050 BMS 10-60

   D. Sealant – sealant, A00247 BMS 5-95

   E. Sealant – sealant, A00247 BMS 5-95 (optional BMS 5-79)

   F. Lubricant – Everlube 967 lubricant, D00543 Everlube 967

4. **Dimensioning Symbols**

   A. Standard True Position Dimensioning symbols used in 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

BELLCRANK ASSEMBLY - REPAIR 1-1

315A1897–5

1. General

A. This procedure has the data necessary to refinish the bellcrank assembly (125,IPL Figure 1).

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 1. for item numbers.

2. Bushing Replacement (REPAIR 1-1, Figure 601)

A. Remove bushings.

B. Install new bushings using shrink-fit method, with sealant, A00247 on faying surfaces.

C. Check dimensions and machine as necessary.

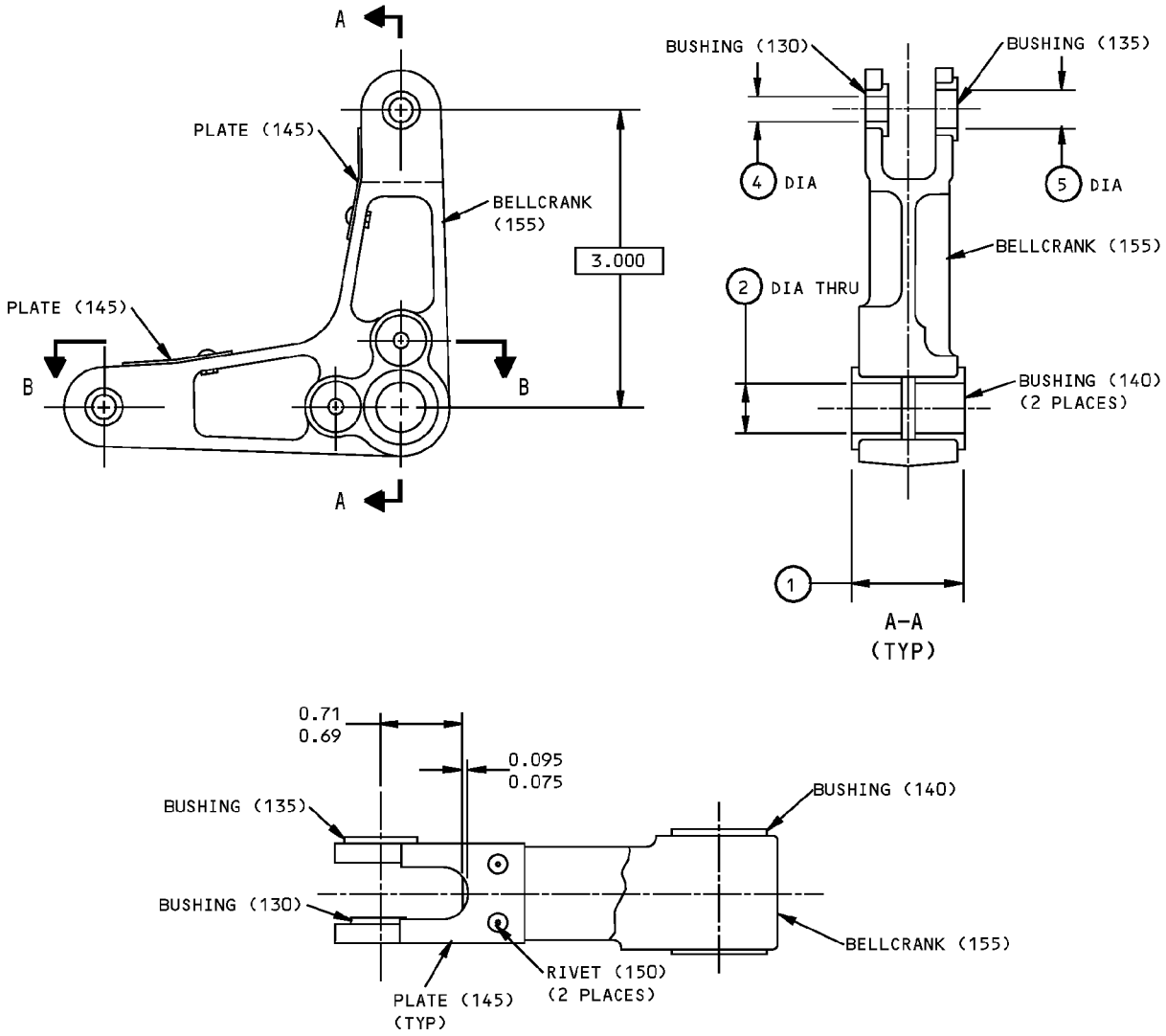
NOTE: Machining of bushings after installation is not required if bushings used are per parts list or are manufactured per REPAIR 1-2.

D. Seal bushings per REPAIR 5-1.

3. Plate Replacement (REPAIR 1-1, Figure 601)

A. Remove plate and rivets.

B. Install new plate. Install rivets with sealant, A00247. After installation, rivet heads shall be flush with plate within 0.01 inch.



	1	2 ▷1	4 ▷1	5 ▷1
DESIGN DIM	1.111 1.091	0.5015 0.4990	0.2515 0.2494	0.3765 0.3742

▷1 MACHINING MAY NOT BE REQUIRED AFTER INSTL (BUSHING IS PREMACHINED TO OBTAIN DESIGN DIM AFTER INSTL)

315A1897-5 Bushing and Plate Replacement
Figure 601

BELLCRANK - REPAIR 1-2

315A1897–2

1. General

A. This procedure has the data necessary to refinish the bellcrank (155, IPL Figure 1).

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

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

D. Refer to IPL Figure 1 for item numbers.

2. Lug Faces and Holes (REPAIR 1-2, Figure 601)

A. Installation of Oversize Bushings

(1) Machine as required, within repair limits, to remove defects.

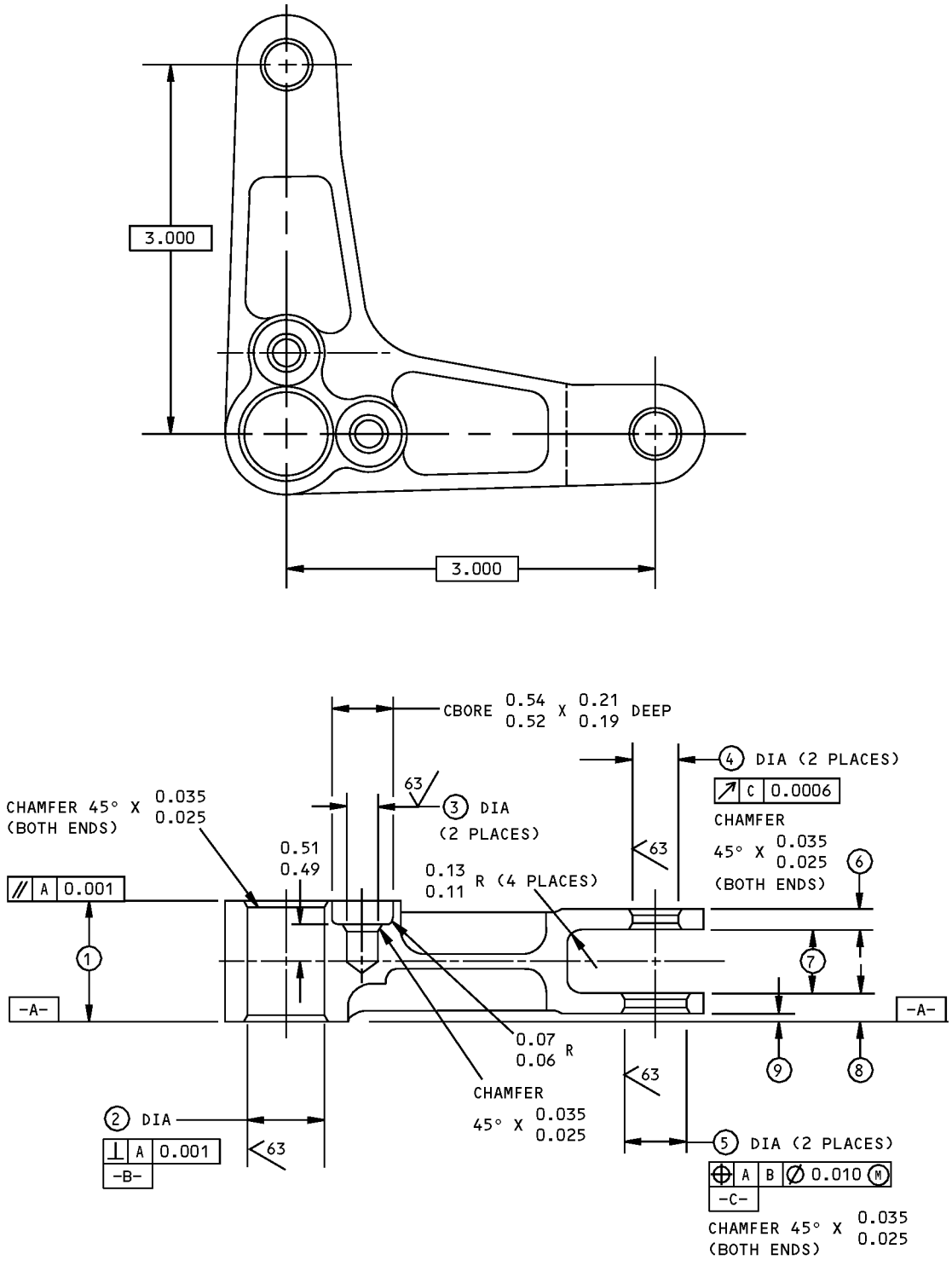
(2) Shot peen, alodize and apply primer, C00259.

(3) Manufacture bushings (REPAIR 1-2, Figure 602), as required, to compensate for amount of material removed in REPAIR 1-2, Paragraph 2.A.(1).

(4) Install bushings per REPAIR 1-1.

3. Refinish

A. For repair of surfaces which may require only restoration of original finish, refer to Refinish instructions, REPAIR 1-2, Figure 601.



315A1897-2 Bellcrank Repair and Refinish
Figure 601 (Sheet 1 of 2)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DESIGN DIM	0.987 0.977	0.6256 0.6250	0.2505 0.2500	0.3756 0.3750	0.5006 0.5000	0.16 0.15	0.567 0.557	0.215 0.205	0.065 0.055
REPAIR LIMIT 1	---	0.6856	---	0.4356	0.5606	---	---	---	---

REFINISH

CHROMIC ACID ANODIZE (F-2.20)
AFTER BUSHING INSTL APPLY PRIMER,
BMS 10-11, TYPE I (F-20.02) AND ENAMEL,
BMS 10-60 (SRF-14.9813) EXCEPT ON BUSHINGS.

REPAIR

REF 1

125 MACHINE FINISH EXCEPT AS NOTED

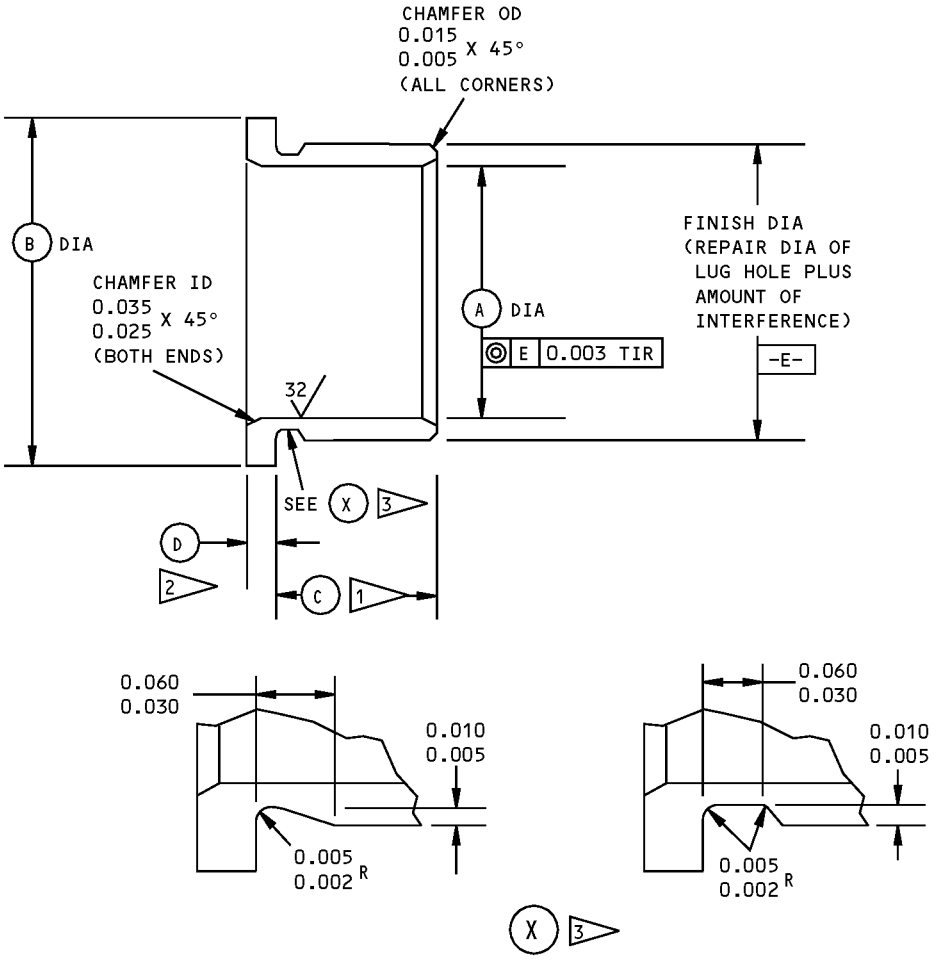
SHOT PEEN: 0.023-0.028 SHOT SIZE
0.008 A2 INTENSITY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

1 LIMIT FOR INSTL OF OVERSIZE BUSHING

315A1897-2 Bellcrank Repair and Refinish
Figure 601 (Sheet 2 of 2)



LOCATION (FIG. 601)	REPLACES BUSHING	A	B	C 1	D 2	INTERFERENCE
4	(130) BACB28X4M014	0.2515 0.2500	0.510 0.490	0.140 0.135	0.062 0.057	0.0011 0
5	(135) BACB28X6M014	0.3765 0.3750	0.635 0.615	0.140 0.135	0.062 0.057	0.0013 0
2	(140) BACB28X8M040	0.5015 0.5000	0.760 0.740	0.400 0.395	0.062 0.057	0.0015 0.0001

63 MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.010-0.020R

CADMIUM PLATE (F-15.06) EXCEPT IN BORE

MATERIAL: AL-NI-BRZ PER AMS 4640 OR 4880

ALL DIMENSIONS ARE IN INCHES

ALL DIMENSIONS APPLY AFTER PLATING

1 MINUS AMOUNT REMOVED FROM LUG FACE

2 PLUS AMOUNT REMOVED FROM LUG FACE

3 UNDERCUT APPLICABLE TO BUSHING (140) BACB28XM040 ONLY

Oversize Bushing Details
Figure 602

FITTING - REPAIR 2-1

315A1899–7

1. General

A. This procedure has the data necessary to refinish the fitting (190, IPL Figure 1).

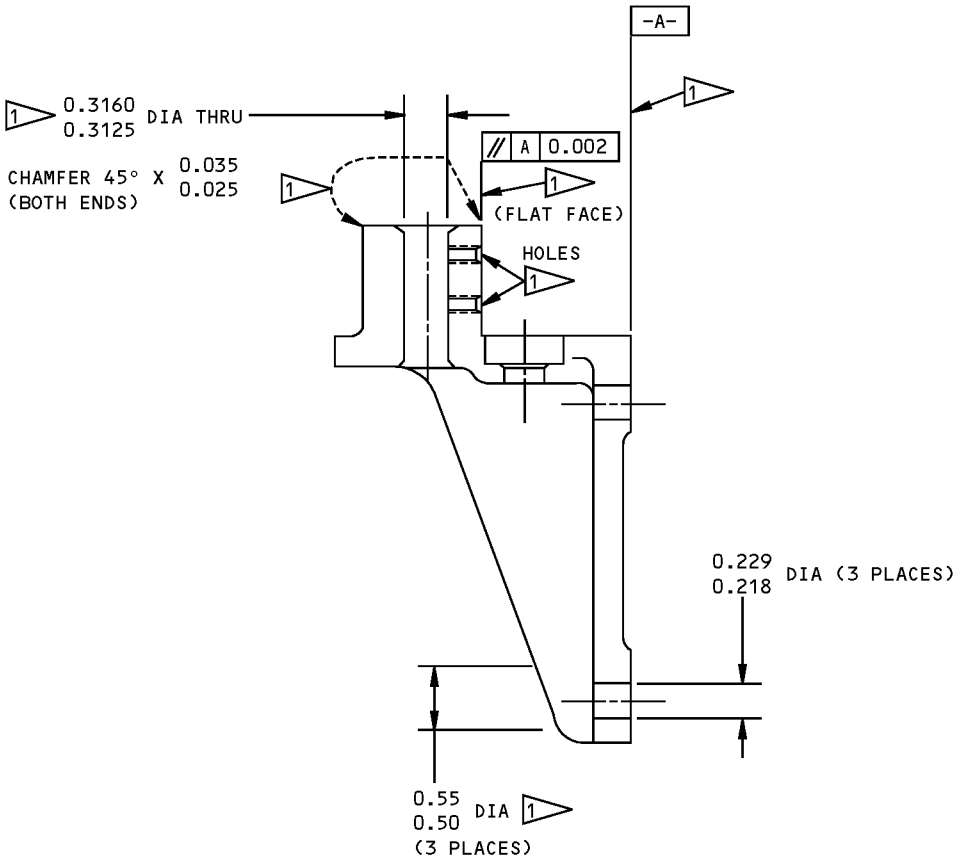
B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

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

D. Refer to IPL Figure 1 for item numbers.

2. Plating Repair

A. Repair consists of restoration of original finish. Refer to Refinish instructions, REPAIR 2-1, Figure 601.



REFINISH

ANODIZE (F-17.05) AND APPLY PRIMER, BMS 10-11, TYPE 1 (F-20.02) FOLLOWED BY ENAMEL, BMS 10-60 (SRF-14.9813), EXCEPT OMIT ENAMEL IN AREAS NOTED BY 1

1 NO ENAMEL THESE SURFACES

REPAIR

(SAME AS REFINISH)

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

315A1899-7 Fitting Refinish
Figure 601

ROD ASSEMBLY - REPAIR 3-1

315A1902–2

1. General

A. This procedure has the data necessary to refinish the rod assembly (65, IPL Figure 1).

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

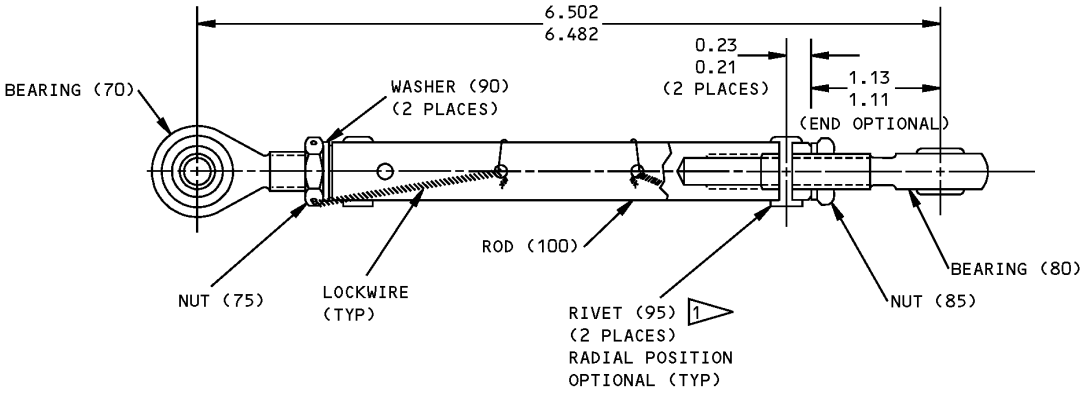
C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 1 for item numbers.

2. Parts Replacement (REPAIR 3-1, Figure 601)

A. Replace parts as necessary per REPAIR 3-1, Figure 601. Install replacement rivets with sealant, A00247.

B. For refinish of rod (100) refer to REPAIR 4-1.



315A1902-2 Replacement Diagram
Figure 601

MISCELLANEOUS PARTS REFINISH - REPAIR 4-1

1. General

A. This procedure has the data necessary for miscellaneous parts refinish.

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.

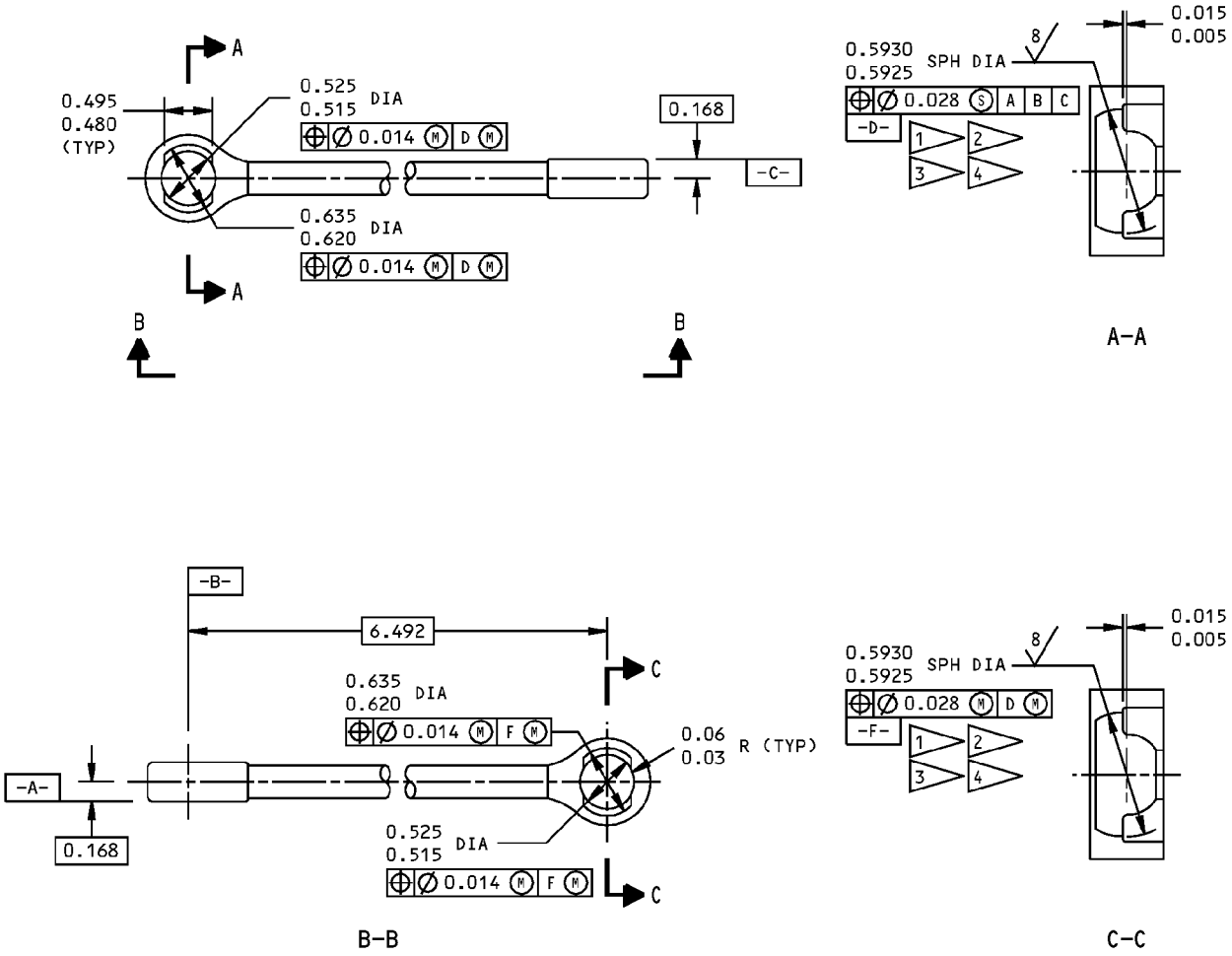
D. Refer to IPL Figure 1 for item numbers

2. Refinish

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

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Lock tab (10)	302 CRES	Passivate (F-17.09)
Washer (110)	A286 CRES, 140 ksi minimum	Cadmium plate (F-1.1929)
Plate (145), leaf spring (160,165)	17-7PH CRES	Passivate (F-17.09)
Rod (100)	Al alloy	Chromic acid anodize (F-17.04). Apply primer, C00259 (F-20.02) followed by enamel coating, C00700 (SRF-14.9813) except omit primer and enamel on threads.
Rod (100A)	17-4PH CRES	Passivate (F-17.09) prior to malcomizing spherical I.D. and entry 0.004-0.007 inch deep at 1000 degrees F. See REPAIR 4-1, Figure 601.



1. DIAMETERS TO BE MALCOMIZED MUST BE WITHIN 0.0015 OF FINISH SIZE AND 63 MICRO INCH FINISH
2. OBTAIN SPHERICAL ID SIZE AND FINISH BEFORE AND AFTER MALCOMIZING BY LAPPING.
3. MALCOMIZE SPHERICAL ID AND ENTRY 0.004-0.007 INCH DEEP AT 1000 DEGREES F. 0.002 INCH MINIMUM CASE DEPTH AFTER LAPPING.
4. DRI-FILM WITH EVERLUBE 967, 0.0003 INCH THICKNESS.

315A1902-4 Refinish Details
Figure 601

BUSHING SEALING - REPAIR 5-1

1. General

A. This procedure has the data necessary for bushing sealing (REPAIR 5-1, Figure 601).

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.

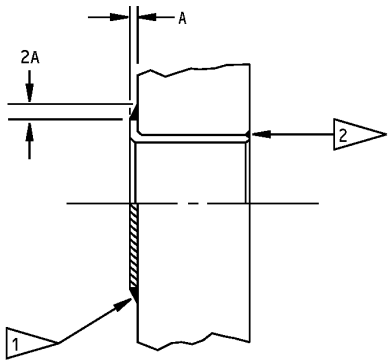
2. Procedure

A. All paint application must be completed, including final gray topcoat, prior to sealant application.

B. Solvent clean area to be sealed and surrounding area per SOPM 20-30-03

C. Apply fillet of sealant, A00247 (BMS 5-79 optional) as shown in applicable figure.

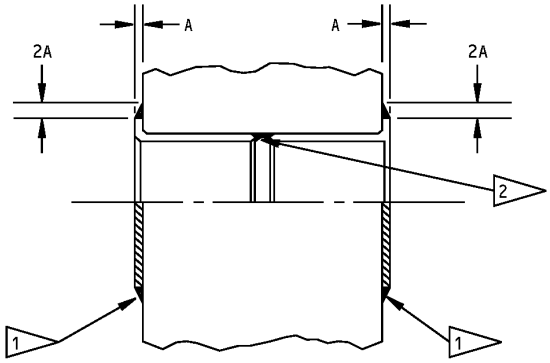
D. Apply coating, C00700 (SRF-14.9813) over sealant and areas around sealant. Use caution not to apply overcoat to bushing flange faces.



1 FILLET SHALL EXTEND TO TOP OF BUSHING FLANGE EDGE AND BE PROPORTIONED AS SHOWN. DO NOT APPLY SEALANT TO BUSHING FACE.

2 FILL ENTIRE CAVITY AROUND BUSHING MAKING SURE SEALANT IS FLUSH WITH SURFACE.

Bushing Sealing Details
Figure 601



1 FILLET SHALL EXTEND TO TOP OF BUSHING FLANGE EDGE AND BE PROPORTIONED AS SHOWN. DO NOT APPLY SEALANT TO BUSHING FACE

2 FILL CAVITY BETWEEN BUSHINGS AS SHOWN. SEALANT SHALL NOT EXTEND PAST BORE DIA OF BUSHINGS. OMIT PAINT FROM THIS SEALANT.

Bushing Sealing Details
Figure 602

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the thrust reverser locking actuator assembly.

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

C. Refer to IPL Figure 1 for the item numbers.

2. Assembly

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5357	T/R Locking Actuator Assembly Overhaul - Pin Tool (Part #: B78013-17, Supplier: 81205)
SPL-5358	T/R Locking Actuator Assembly Overhaul - Bellcrank Positioning Tool (Part #: B78013-5, Supplier: 81205)
STD-4233	Pin, Rig, 0.3125 in (7.938 mm)

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
G50347	Lockwire - Nickel-copper, 0.032 inch diameter	NASM20995N˜ C32

C. References

Reference	Title
78-31-04	Component Maintenance Manual
CMM 78-31-13	FAN DUCT AND THRUST REV (CFM-56) COWL ASSEMBLY

D. Procedure

(1) Install rod (65) and bushing (60) in appropriate end of bellcrank (125). Install bolt (45A), washers (50), and collar (55).

(2) Install bushings (30, 40) in clevis at end of actuator (195). Position flange of bushing (40) inside clevis, and position flange of bushing (30) outside clevis.

(3) Install fitting (190) on actuator (195) with screws (180) and washers (185). Tighten screws (180) to 27-33 pound-inch. Do not install lockwire at this time.

(4) Temporarily install bellcrank (125) on fitting (190) with bolt (105), washers (107, 110), and bushing (120). Do not install collar (115). (Parts will be removed after dimensional check.)

(5) Fully retract actuator (195A) and install 0.3125 in (7.938 mm) rig pin, STD-4233, 1.5 inches long.

(6) Install free end of rod (65) into clevis of actuator (195A). Install lock tab (10) and one washer (20) on bolt (15). Insert bolt thru actuator clevis from the bushing (40) side, then install bushing (35) and remaining washer (20). Install nut (25) and tighten to 50-90 pound-inch.

(7) Crimp ears of lock tab (10) around actuator clevis, making sure that ears do not interfere with rod (65). Rotate bolt (15) to locate remaining ear of lock tab (10) parallel to a flat, then crimp ear over bolt head.

(8) Install Bellcrank Positioning Tool, SPL-5358 on actuator. Apply a small tension load to rod (65) to eliminate backlash from linkage, then check that tool pin Pin Tool, SPL-5357 passes through bellcrank bushings and slot in Bellcrank Positioning Tool, SPL-5358. If Pin Tool, SPL-5357 will not pass through, loosen screw (180) and adjust position of fitting (190) until Pin Tool, SPL-5357 will pass through tool slot in Bellcrank Positioning Tool, SPL-5358. Retighten screws (180) to 27-33 pound-inch and install lockwire, G50347 (opt MS20995N32). Remove tools Bellcrank Positioning Tool, SPL-5358 and Pin Tool, SPL-5357 from actuator.

(9) Remove bolt (105), washers (107, 110) and bushing (120). Swing bellcrank (125) away from fitting (190).

(10) Install leaf spring (160 or 165) on fitting (190) with washers (175), screws (170). Tighten screws (170) to 18-22 lb-in. and install lockwire, G50347 (opt MS20995N32). Make sure that spring does not interfere with housing of actuator.

(11) Remove 0.3125 in (7.938 mm) rig pin, STD-4233 from actuator. Extend actuator to approximately mid-stroke position.

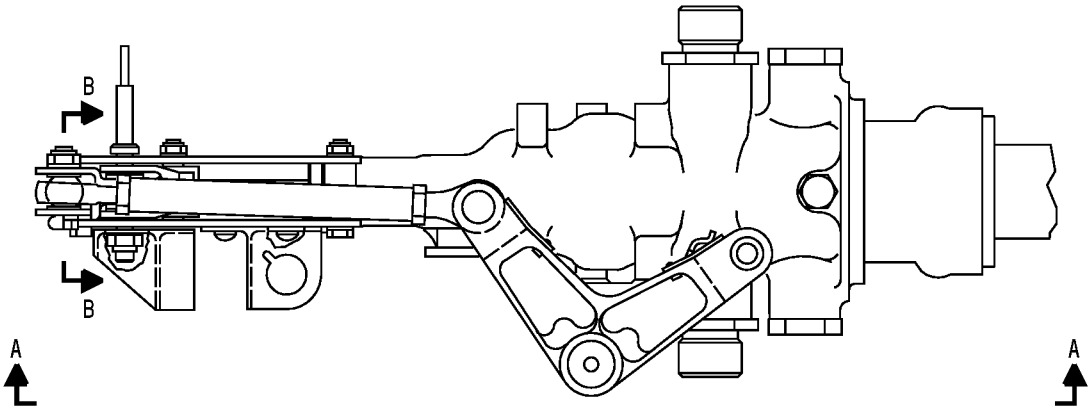
(12) Swing bellcrank (125) back onto fitting (190). Install bushing (120), bolt (105), washers (107, 110) thru fitting (190) from underside. Check that leaf spring engages bellcrank, then secure fasteners with collar (115).

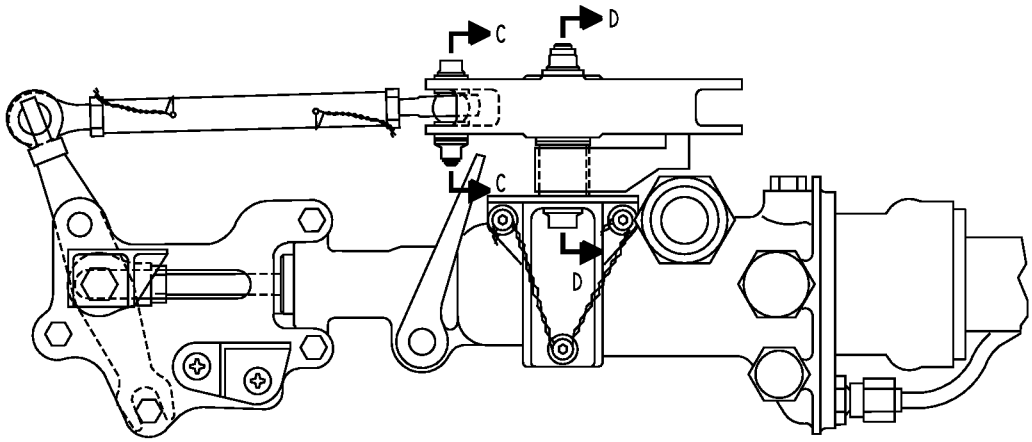
NOTE: If the installation parts, union (300) and packing (305) or valve restrictor (300A) and packing (305) were installed on the actuator assembly, they are to be installed when you assemble the actuator assemblies and tube assemblies as shown in CMM 78-31-13.

(13) Refer to 78-31-04 for testing and/or rigging of actuator assembly (195A).

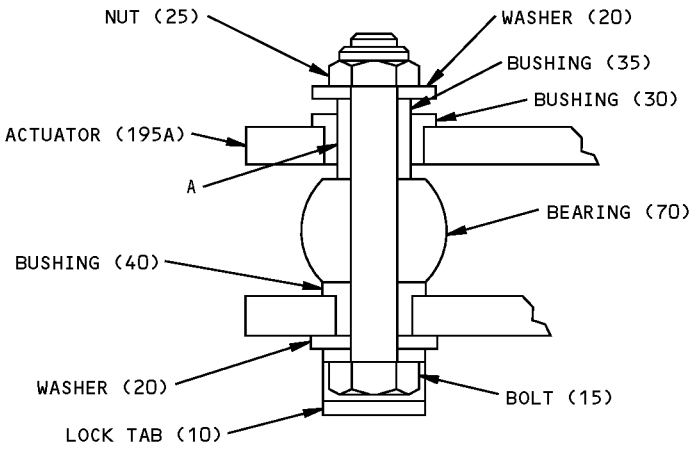
(14) Protect and store unit in accordance with standard industry practices.

FITS AND CLEARANCES



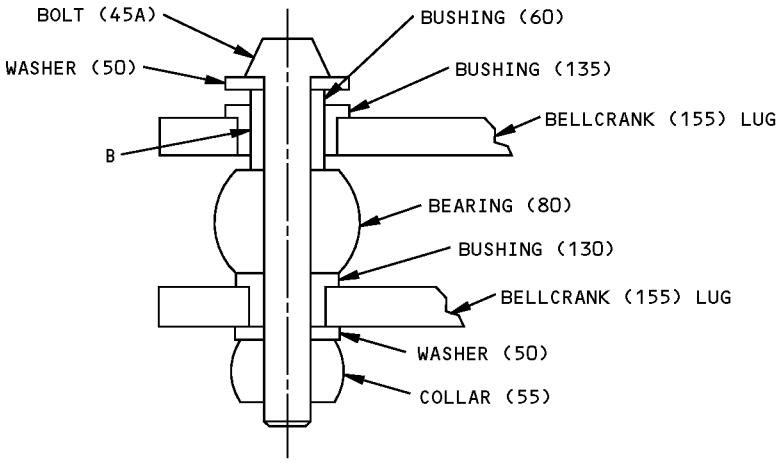


A–A

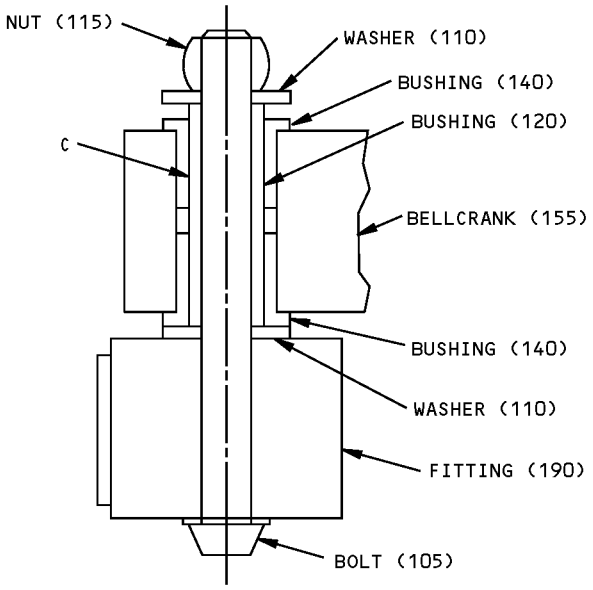


B–B

Fits and Clearances
Figure 801 (Sheet 1 of 3)



C-C



D-D

Fits and Clearances
Figure 801 (Sheet 2 of 3)

Ref Letter Fig.801	Mating Item No. IPL Fig.1	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 30 OD 35	0.3750 0.3740	0.3765 0.3745	0.0005	0.0025	0.365	0.386	0.021
B	ID 135 OD 60	0.3750 0.3740	0.3765 0.3745	0.0005	0.0025	0.365	0.386	0.021
C	ID 140 OD 120	0.5000 0.4970	0.5015 0.4980	0.0020	0.0045	0.490	0.505	0.015

ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801 (Sheet 3 of 3)

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-5357	T/R Locking Actuator Assembly Overhaul - Pin Tool	B78013-17	81205
SPL-5358	T/R Locking Actuator Assembly Overhaul - Bellcrank Positioning Tool	B78013-5	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.

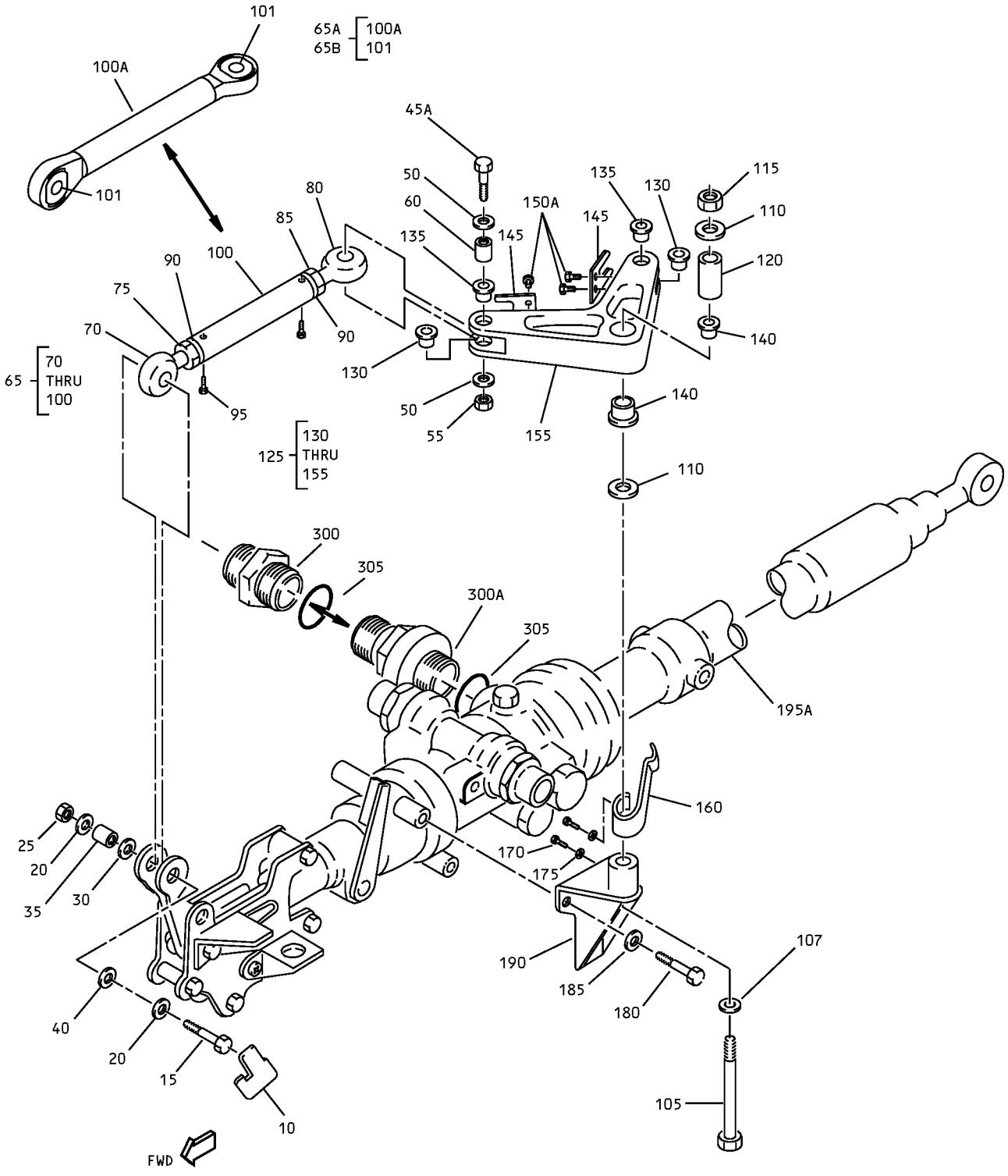
H. Interchangeable Parts

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.

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
315A1801-13		1	195A	1
315A1801-14		1	1A	RF
315A1801-15		1	5A	RF
315A1801-17		1	195B	1
315A1801-18		1	1B	RF
315A1801-19		1	5B	RF
315A1801-21		1	195C	1
315A1801-22		1	1C	RF
315A1801-23		1	5C	RF
315A1801-25		1	195D	1
315A1801-26		1	1D	RF
315A1801-27		1	5D	RF
315A1846-1		1	160	1
315A1846-2		1	165	1
315A1846-3		1	145	2
315A1897-2		1	155	1
315A1897-5		1	125	1
315A1898-1		1	110	2
315A1899-7		1	190	1
315A1902-2		1	65	1
315A1902-3		1	65A	1
		1	65B	1
315A1902-4		1	100A	1
315A1902-5		1	101	2
315A1904-1		1	100	1
315A1913-1		1	10	1
9R3544		1	300A	1
AN960-516		1	90	2
BACB10Y4LM		1	70	1
BACB10Y4M		1	80	1
BACB28AK04-030		1	35	1
BACB28AK04-032		1	60	1
BACB28X4M011		1	40	1
BACB28X4M014		1	130	2

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
BACB28X6M014		1	135	2
BACB28X6M018		1	30	1
BACB28X8M040		1	140	2
BACB30DX10A36		1	105	1
BACB30DX8A18		1	45A	1
BACB30LJ4-17		1	15	1
BACN10JC4		1	25	1
BACR15BB4AD11		1	95A	2
BACR15BB4D11		1	95	2
BACW10BN3SP		1	185	3
BACW10BN4SP		1	20	2
		1	50	2
BACW10BN5SP		1	107	AR
MS20470A3-5		1	150A	4
MS21902J8		1	300	1
NAS1080-08		1	55	1
NAS1080UK10		1	115	1
NAS1351C3H10P		1	180	3
NAS1352-08H4P		1	170	2
NAS1612-8		1	305	1
NAS509-5		1	85	1
NAS509L5		1	75	1
NAS620-8		1	175	2
NAS72-5E102		1	120	1



Thrust Reverser Locking Actuator Assembly
IPL Figure 1

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1	315A1801-10		DELETED		
–1A	315A1801-14		ACTUATOR ASSY-THRUST REVERSER, LOCKING (LH)	A	RF
–1B	315A1801-18		ACTUATOR ASSY-THRUST REVERSER, LOCKING (LH)	C	RF
–1C	315A1801-22		ACTUATOR ASSY-THRUST REVERSER, LOCKING (LH)	E	RF
–1D	315A1801-26		ACTUATOR ASSY-THRUST REVERSER, LOCKING (LH)	G	RF
–5	315A1801-11		DELETED		
–5A	315A1801-15		ACTUATOR ASSY-THRUST REVERSER, LOCKING (RH)	B	RF
–5B	315A1801-19		ACTUATOR ASSY-THRUST REVERSER, LOCKING (RH)	D	RF
–5C	315A1801-23		ACTUATOR ASSY-THRUST REVERSER, LOCKING (RH)	F	RF
–5D	315A1801-27		ACTUATOR ASSY-THRUST REVERSER, LOCKING (RH)	H	RF
10	315A1913-1		. TAB-LOCK		1
15	BACB30LJ4-17		. BOLT		1
20	BACW10BN4SP		. WASHER		2
25	BACN10JC4		. NUT		1
30	BACB28X6M018		. BUSHING		1
35	BACB28AK04-030		. BUSHING		1
40	BACB28X4M011		. BUSHING		1
–45	BACB30DX8A20		DELETED		
45A	BACB30DX8A18		. BOLT-LOCK		1
50	BACW10BN4SP		. WASHER		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
55	NAS1080-08		. COLLAR		1
60	BACB28AK04-032		. BUSHING		1
65	315A1902-2		. ROD ASSY (OPT ITEM 65A)	A-F	1
–65A	315A1902-3		. ROD ASSY (PREFERED)	A-F	1
–65B	315A1902-3		. ROD ASSY	G, H	1
70	BACB10Y4LM		. . BEARING (USED ON ITEM 65)		1
75	NAS509L5		. . NUT (USED ON ITEM 65)		1
80	BACB10Y4M		. . BEARING (USED ON ITEM 65)		1
85	NAS509-5		. . NUT (USED ON ITEM 65)		1
90	AN960-516		. . WASHER (USED ON ITEM 65)		2
95	BACR15BB4D11		. . RIVET (USED ON ITEM 65)		2
–95A	BACR15BB4AD11		. . RIVET (OPT ITEM 95) (USED ON ITEM 65)		2
100	315A1904-1		. . ROD (USED ON ITEM 65)		1
100A	315A1902-4		. . ROD (USED ON ITEM 65A,65B)		1
101	315A1902-5		. . BALL (USED ON ITEM 65A,65B)		2
105	BACB30DX10A36		. BOLT		1
107	BACW10BN5SP		. WASHER		AR
110	315A1898-1		. WASHER		2
115	NAS1080UK10		. COLLAR		1
120	NAS72-5E102		. BUSHING		1
125	315A1897-5		. BELLCRANK ASSY		1
130	BACB28X4M014		. . BUSHING		2
135	BACB28X6M014		. . BUSHING		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
140	BACB28X8M040		. . BUSHING		2
145	315A1846-3		. . PLATE		2
–150	MS20605M3W3		DELETED		
150A	MS20470A3-5		. . RIVET		4
155	315A1897-2		. . BELLCRANK		1
160	315A1846-1		. SPRING-LEAF	A, C, E, G	1
–165	315A1846-2		. SPRING-LEAF	B, D, F, H	1
170	NAS1352-08H4P		. SCREW		2
175	NAS620-8		. WASHER		2
180	NAS1351C3H10P		. SCREW		3
185	BACW10BN3SP		. WASHER		3
190	315A1899-7		. FITTING		1
–195	315A1801-9		DELETED		
195A	315A1801-13		. ACTUATOR ASSY (REFER TO CMM 78-31-04)	A, B	1
–195B	315A1801-17		. ACTUATOR ASSY (REFER TO CMM 78-31-04)	C, D	1
–195C	315A1801-21		. ACTUATOR ASSY (REFER TO CMM 78-31-04)	E, F	1
–195D	315A1801-25		. ACTUATOR ASSY (REFER TO CMM 78-31-04)	G, H	1
			INSTALLATION PARTS		
300	MS21902J8		UNION (SEE CMM 78-31-13 FOR ASSEMBLY OF THESE PARTS.)		1
300A	9R3544		VALVE RESTRICTOR (SEE CMM 78-31-13 FOR ASSEMBLY OF THESE PARTS.)		1
305	NAS1612-8		PACKING (SEE CMM 78-31-13 FOR ASSEMBLY OF THESE PARTS.)		1

–Item not Illustrated