COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

TE FLAP DRIVE COMPONENTS

PART NUMBER 113A2610–1, –2, 113A2612–1, –2, 113A2620–1, –2, 113A2630–1, –3

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COMPONENT MAINTENANCE MANUAL

Revision No. 10
Jul 01/2009

To: All holders of TE FLAP DRIVE COMPONENTS 27-55-66.

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.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

ATTENTION

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Location of Change	Description of Change
	NO HIGHLIGHTS

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COMPONENT MAINTENANCE MANUAL

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

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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

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	
Number	Date	Date	Initials	Number	Date	Date	Initials

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

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All temporary revisions to this manual will be accompanied by a cover sheet bearing the temporary revision number. Enter the temporary revision number in numerical order, together with the temporary revision date, the date the temporary revision is inserted and the initials of the person filing.
When the temporary revision is incorporated or cancelled, and the pages are removed, enter the date the pages are removed and the initials of the person who removed the temporary revision.

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

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.

TRAILING EDGE FLAP DRIVE COMPONENTS - DESCRIPTION AND OPERATION

1. Description

A. This manual contains repair data for some of the components of the Trailing Edge Flap Drive installation.

2. Operation

A. The trailing edge flap drive components attach the trailing edge flap drive system to the trailing edge flaps.

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COMPONENT MAINTENANCE MANUAL

TESTING AND FAULT ISOLATION

(NOT APPLICABLE)

(NOT APPLICABLE)

(NOT APPLICABLE)

(NOT APPLICABLE)

REPAIR

1. **General**
   A. Each separate repair includes, as applicable, check, repair, refinish and replacement instructions.
   B. The check instructions for the part replacement procedures can be referenced in the repair/refinish sections.
2. **Content**
   A. Instructions for repair, refinish and replacement procedures are divided into procedures as follows:

PART NUMBER	NAME	REPAIR
113A2610	Inboard Bellcrank Assembly	1-1, 1-2
113A2612	Outboard Bellcrank Assembly	2-1, 2-2
113A2620	Crankshaft Assembly	3-1, 3-2
113A2630	Pushrod Assembly	4-1

3. **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)
∅	DIAMETER
S ∅	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 THIS FEATURE 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

EXAMPLES

— | 0.002	STRAIGHT WITHIN 0.002
⊥ | 0.002 | B	PERPENDICULAR TO DATUM B WITHIN 0.002
// | 0.002 | A	PARALLEL TO DATUM 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 A
⌓ | 0.020 | A	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.020 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ | ∅ 0.0005 | C	CONCENTRIC TO DATUM C WITHIN 0.0005 DIAMETER
⌯ | 0.010 | A	SYMMETRICAL WITH DATUM A WITHIN 0.010
∠ | 0.005 | A	ANGULAR TOLERANCE 0.005 WITH DATUM A
⌖ | ∅ 0.002 Ⓢ | B	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
⊥ | ∅ 0.010 Ⓜ | A 0.510 Ⓟ	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010 INCH DIAMETER, PERPENDICULAR TO DATUM A, AND EXTENDING 0.510 INCH ABOVE DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

True Position Dimensioning Symbols
Figure 601

INBOARD BELLCRANK ASSEMBLY - REPAIR 1-1

113A2610–1, –2

1. General

A. This procedure has the data necessary to replace the bushings and the bearings on the bellcrank assembly (1A, 5).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 1 for item numbers.

2. Bearing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For general cleaning procedure, refer to SOPM 20-30-03. For miscellaneous materials, refer to SOPM 20-60-04

(1) Remove the bearing (55) from the bellcrank (60, 65).

(2) Install the replacement bearing (55) with sealant, A00247 using the roller swage procedure per SOPM 20-50-03.

3. Bushing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

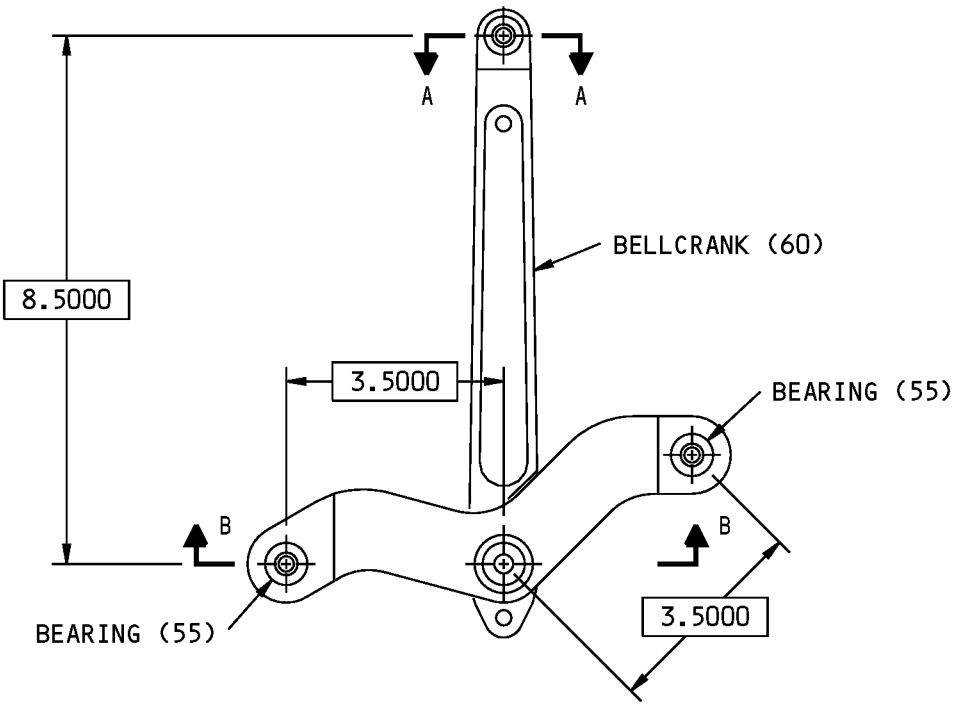
NOTE: For general cleaning procedure, refer to SOPM 20-30-03. For miscellaneous materials, refer to SOPM 20-60-04

(1) Remove bushings (40, 45, 50) from the bellcrank (60, 65).

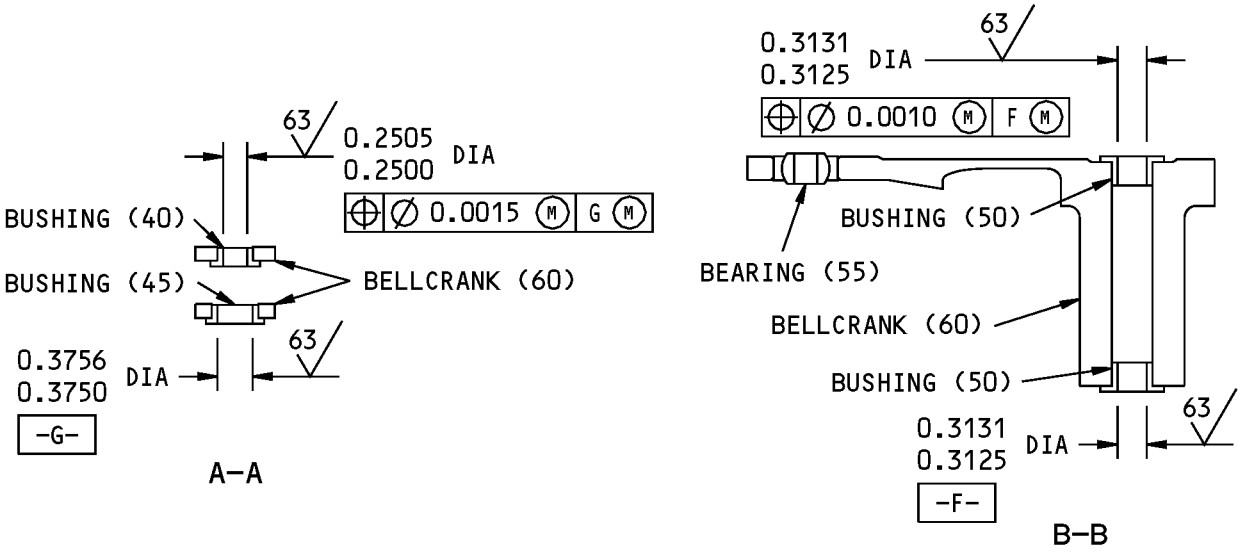
(2) Install replacement bushings (40, 45, 50) or oversize bushings with sealant, A00247 using shrink-fit method per SOPM 20-50-03. See REPAIR 1-2 for manufacture of oversize bushings.

(a) Apply corrosion fillet seal using sealant, A00247 around perimeter of bushing flanges as shown in REPAIR 1-1, Figure 601.

(3) Drill inside diameter of replacement or oversize bushings to dimensions shown in REPAIR 1-1, Figure 601.



113A2610-1 SHOWN
113A2610-2 OPPOSITE



BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

113A2610-1,-2 Inboard Bellcrank Assembly Bushing and Bearing Replacement
Figure 601

INBOARD BELLCRANK - REPAIR 1-2

113A2610–3, –4

1. General

A. This procedure has the data necessary to repair and refinish the bellcrank (60, 65).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 1 for item numbers.

E. General repair details:

(1) Material: Aluminum alloy

2. Check

A. References

Reference	Title
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Use standard industry procedures to examine all parts for defects.

(2) Do a penetrant check (SOPM 20-20-02) of these parts if you find signs of defects when you visually examine the parts:

(a) Bellcrank (60, 65)

3. Bellcrank Repair

A. Procedure

NOTE: For general cleaning procedure, refer to SOPM 20-30-03. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine worn or damaged holes for bushings (40, 45, 50) to remove defects, cracks and/or corrosion up to the limits shown in REPAIR 1-2, Figure 601.

(2) Break all sharp edges (SOPM 20-10-03).

(3) Do a penetrant check (SOPM 20-20-02).

(4) Apply Alodine to machined holes using (F-17.10).

(5) Make the repair bushings as shown in REPAIR 1-2, Figure 602 as follows:

(a) Bushing material: see REPAIR 1-2, Figure 602.

(b) Break all the sharp edges.

(c) Apply cadmium plate finish (F-15.06). Plating optional on ID.

(6) Install repair bushings as shown in REPAIR 1-1, Paragraph 3.C.(2) and REPAIR 1-1, Paragraph 3.C.(3).

4. Bellcrank Refinish

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I

B. References

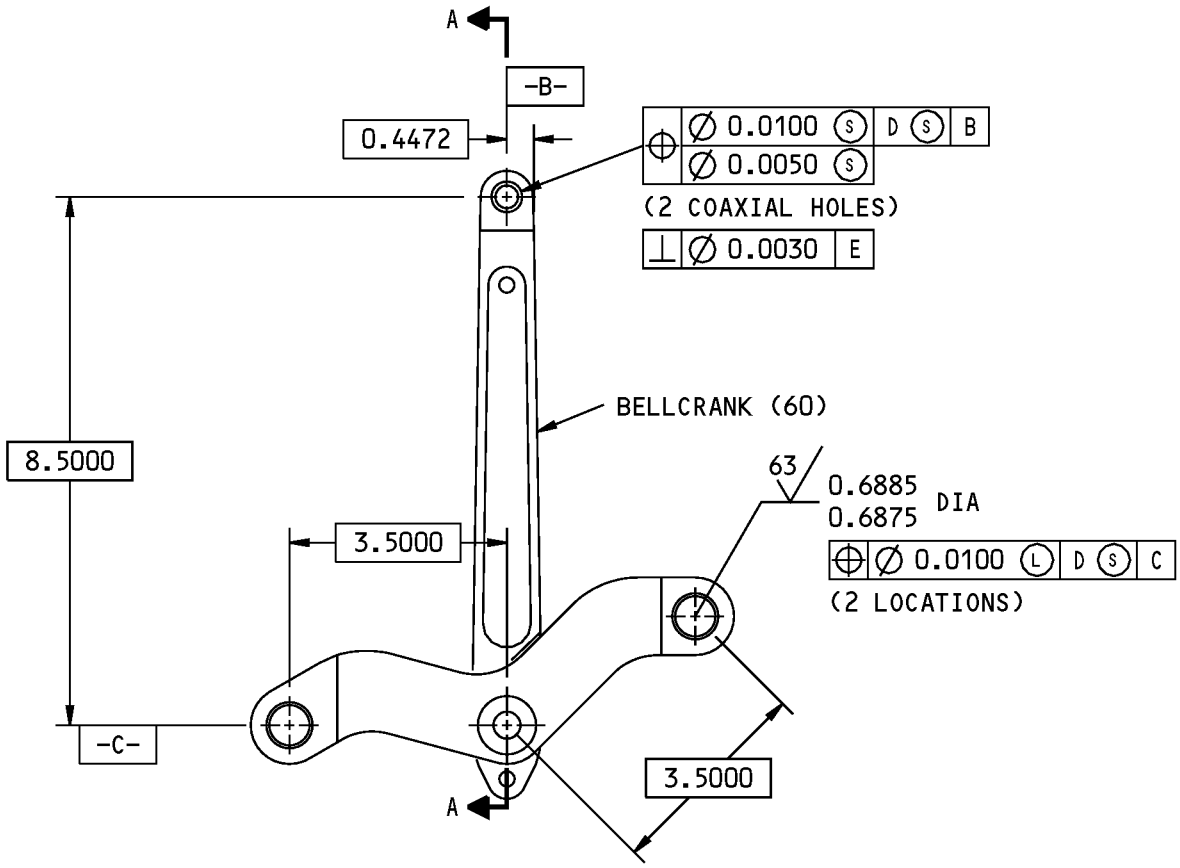
Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure (REPAIR 1-2, Figure 601)

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedure, refer to SOPM 20-30-03. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02.

(1) Chromic acid anodize and seal in dilute chromate solution (F-17.31).

(2) Apply primer, C00259 (F-20.02) as shown in REPAIR 1-2, Figure 601.



113A2610-3 SHOWN
113A2610-4 OPPOSITE

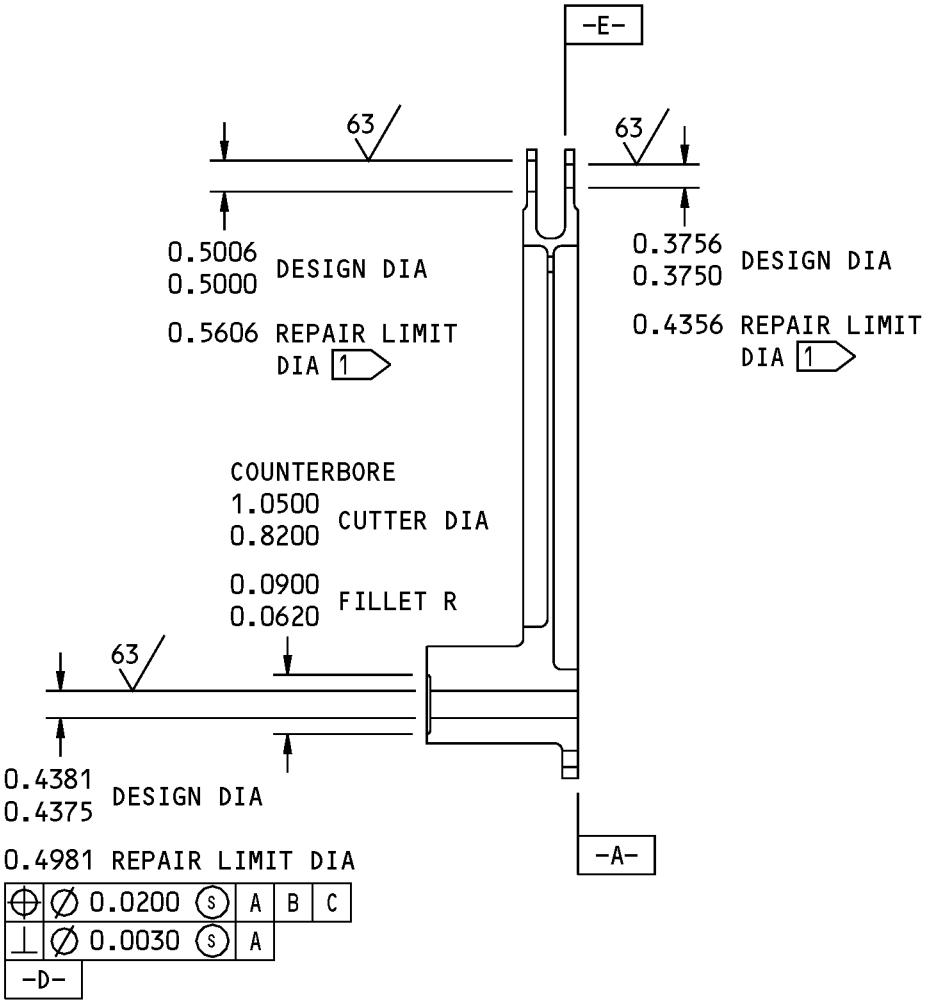
1 NO PRIMER ON THE BORE SURFACE

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

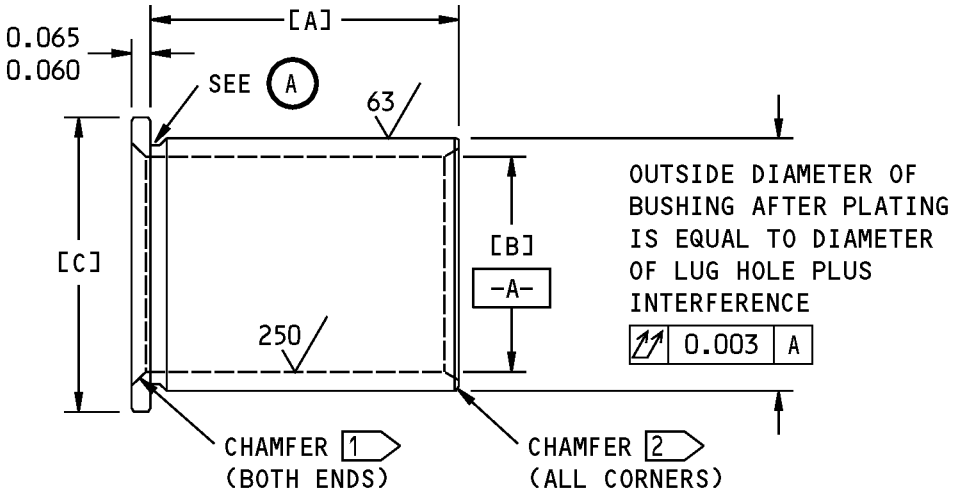
ALL DIMENSIONS ARE IN INCHES

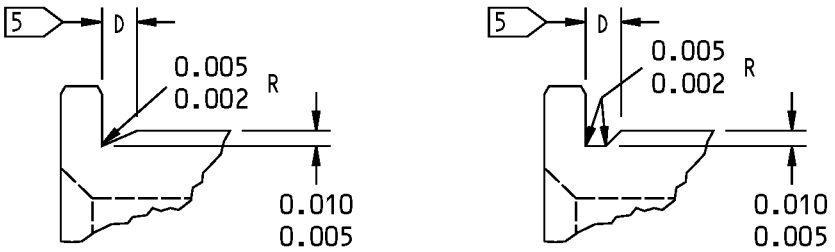
113A2610-3,-4 Inboard Bellcrank Repair and Refinish
Figure 601 (Sheet 1 of 2)



A–A

113A2610-3,-4 Inboard Bellcrank Repair and Refinish
Figure 601 (Sheet 2 of 2)





RELIEF TYPES

A

Repair Bushing Details
Figure 602 (Sheet 1 of 2)

BUSHING TO BE REPLACED (IPL FIG. 1)	[A]	[B]	[C]	RELIEF TYPE	INTER-FERENCE	MATERIAL
40	0.140 0.135	0.241 0.234	0.540 0.530	1 OR 2	0.0014 0.0003	4
45	0.140 0.135	0.366 0.359	0.630 0.620	1 OR 2	0.0015 0.0004	3
50	0.250 0.245	0.303 0.297	0.690 0.680	1 OR 2	0.0014 0.0003	4

1. CHAMFER ID 0.015–0.025 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (40) 0.015–0.025 X 50° / 40°
2. CHAMFER OD 0.005–0.015 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (40) 0.005–0.015 X 50° / 40°
3. AL-NI-BRONZE PER AMS 4640
4. 17-4PH CRES PER AMS 5643
5. D = NOT REQUIRED FOR [A] ≤0.140
   D = 0.015 TO 0.030 FOR 0.150 ≤[A] ≤0.240
   D = 0.030 TO 0.060 FOR [A] ≥0.250

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ALL DIMENSIONS ARE IN INCHES

Repair Bushing Details
Figure 602 (Sheet 2 of 2)

OUTBOARD BELLCRANK ASSEMBLY - REPAIR 2-1

113A2612–1, –2

1. General

A. This procedure has the data necessary to replace the bushings and the bearings on the bellcrank assembly (1A, 5).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

2. Bearing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the bearing (25) from the bellcrank (30, 35).

(2) Install the replacement bearing (25) with sealant, A00247 using the roller swage procedure (SOPM 20-50-03).

3. Bushing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

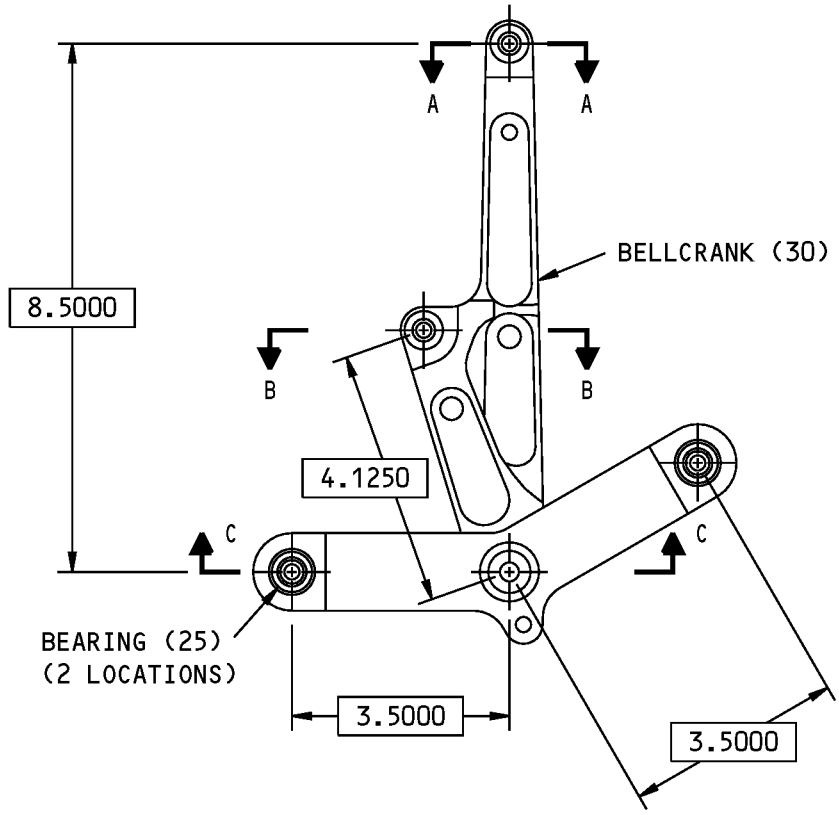
NOTE: For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove bushings (10, 12, 15, 20) from the bellcrank (30, 35).

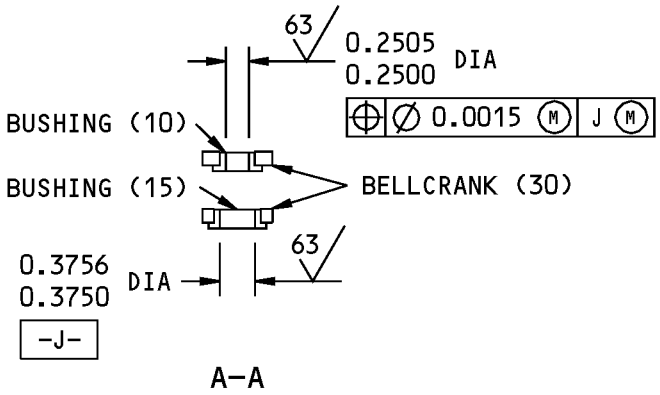
(2) Install replacement bushings (10, 12, 15, 20) or oversize bushings with sealant, A00247 using shrink-fit method per SOPM 20-50-03. See REPAIR 2-2 for manufacture of oversize bushings.

(a) Apply corrosion fillet seal using sealant, A00247 per around perimeter of bushing flanges as shown in REPAIR 2-1, Figure 601.

(3) Drill inside diameter of replacement or oversize bushings to dimensions shown in REPAIR 2-1, Figure 601.



113A2612-1 SHOWN
113A2612-2 OPPOSITE



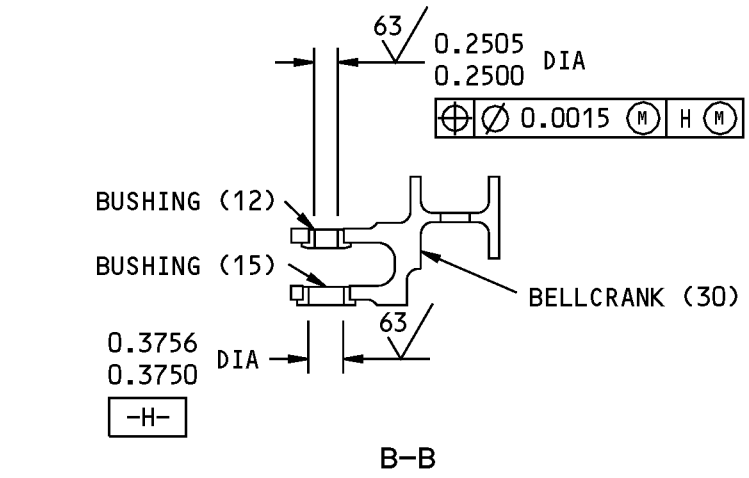
A-A

BREAK ALL SHARP EDGES

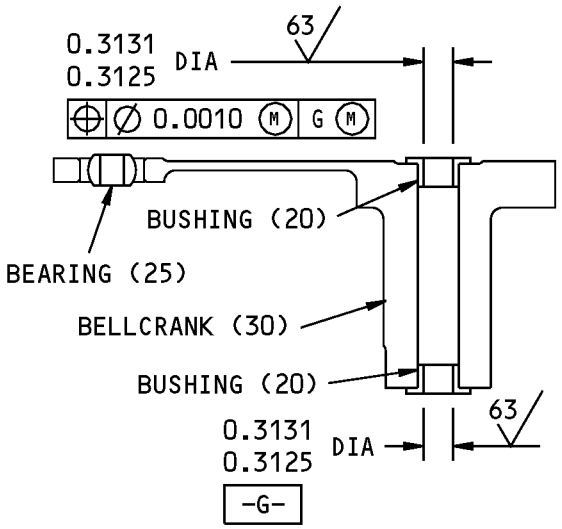
ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

113A2612-1,-2 Outboard Bellcrank Assembly Bushing and Bearing Replacement
Figure 601 (Sheet 1 of 2)



B–B



C–C

113A2612-1,-2 Outboard Bellcrank Assembly Bushing and Bearing Replacement
Figure 601 (Sheet 2 of 2)

OUTBOARD BELLCRANK - REPAIR 2-2

113A2612–3, –4

1. General

A. This procedure has the data necessary to repair and refinish the bellcrank (30, 35).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

E. General repair details:

(1) Material: Aluminum alloy

2. Check

A. References

Reference	Title
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Use standard industry procedures to examine all parts for defects.

(2) Do a penetrant check (SOPM 20-20-02) of these parts if you find signs of defects when you visually examine the parts:

(a) Bellcrank (30, 35)

3. Bellcrank Repair

A. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine worn or damaged holes for bushings (10, 12, 15, 20) to remove defects, cracks and/or corrosion up to the limits shown in REPAIR 2-2, Figure 601.

(2) Break all sharp edges (SOPM 20-10-03).

(3) Do a penetrant check (SOPM 20-20-02).

(4) Alodine machined holes (F-17.10).

(5) Make the repair bushings as shown in REPAIR 2-2, Figure 602 as follows:

(a) Bushing material: see REPAIR 2-2, Figure 602.

(b) Break all the sharp edges (SOPM 20-10-03).

(c) Apply cadmium plate finish (F-15.06). Plating optional on ID.

(6) Install repair bushings as shown in REPAIR 2-1, Paragraph 3.C.(2) and REPAIR 2-1, Paragraph 3.C.(3).

4. Bellcrank Refinish

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I

B. References

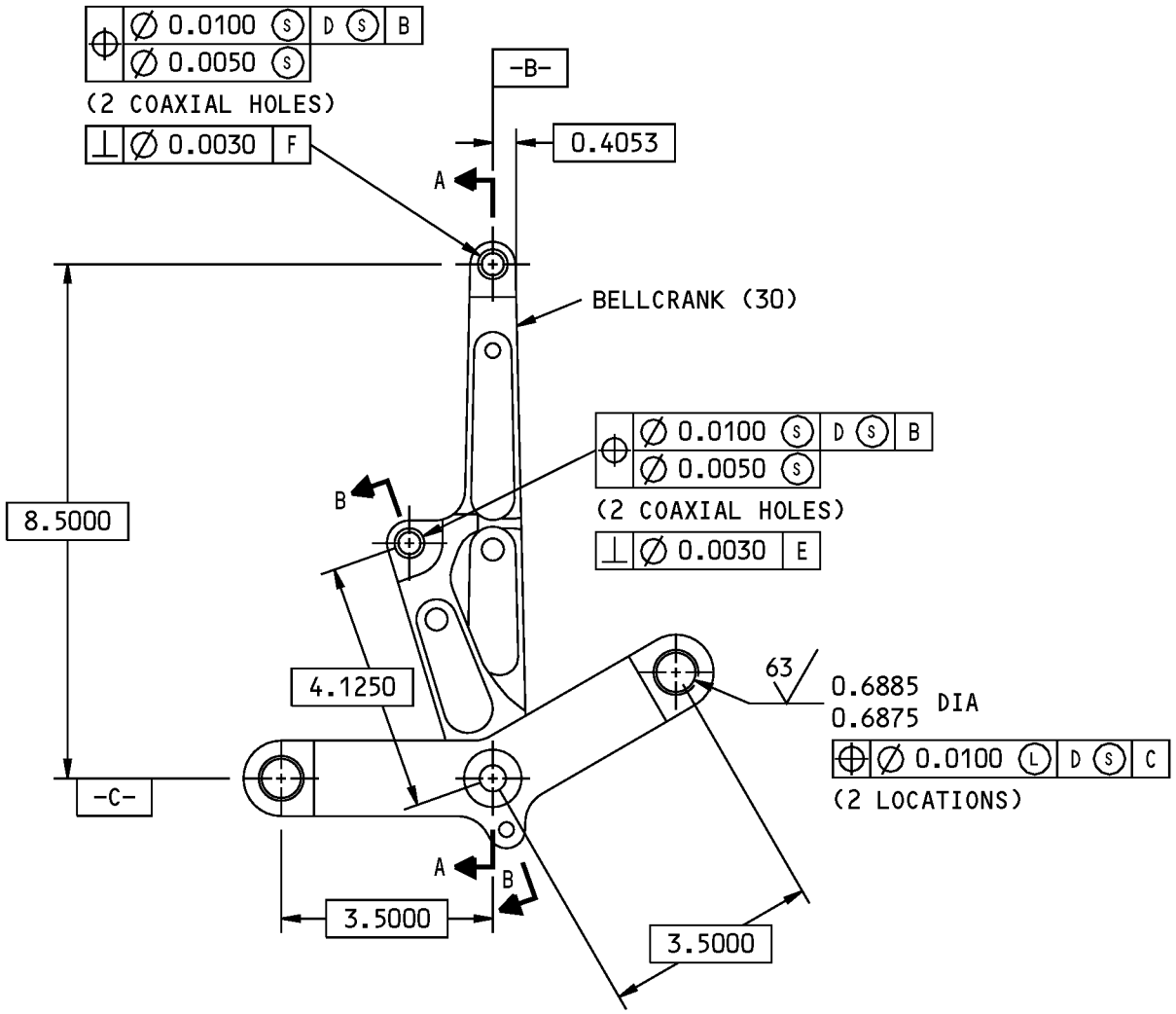
Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure (REPAIR 2-2, Figure 601)

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedure, refer to SOPM 20-30-03. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02.

(1) Chromic acid anodize and seal in dilute chromate solution (F-17.31).

(2) Apply primer, C00259 (F-20.02) as shown in REPAIR 2-2, Figure 601.



113A2612-3 SHOWN
113A2612-4 OPPOSITE

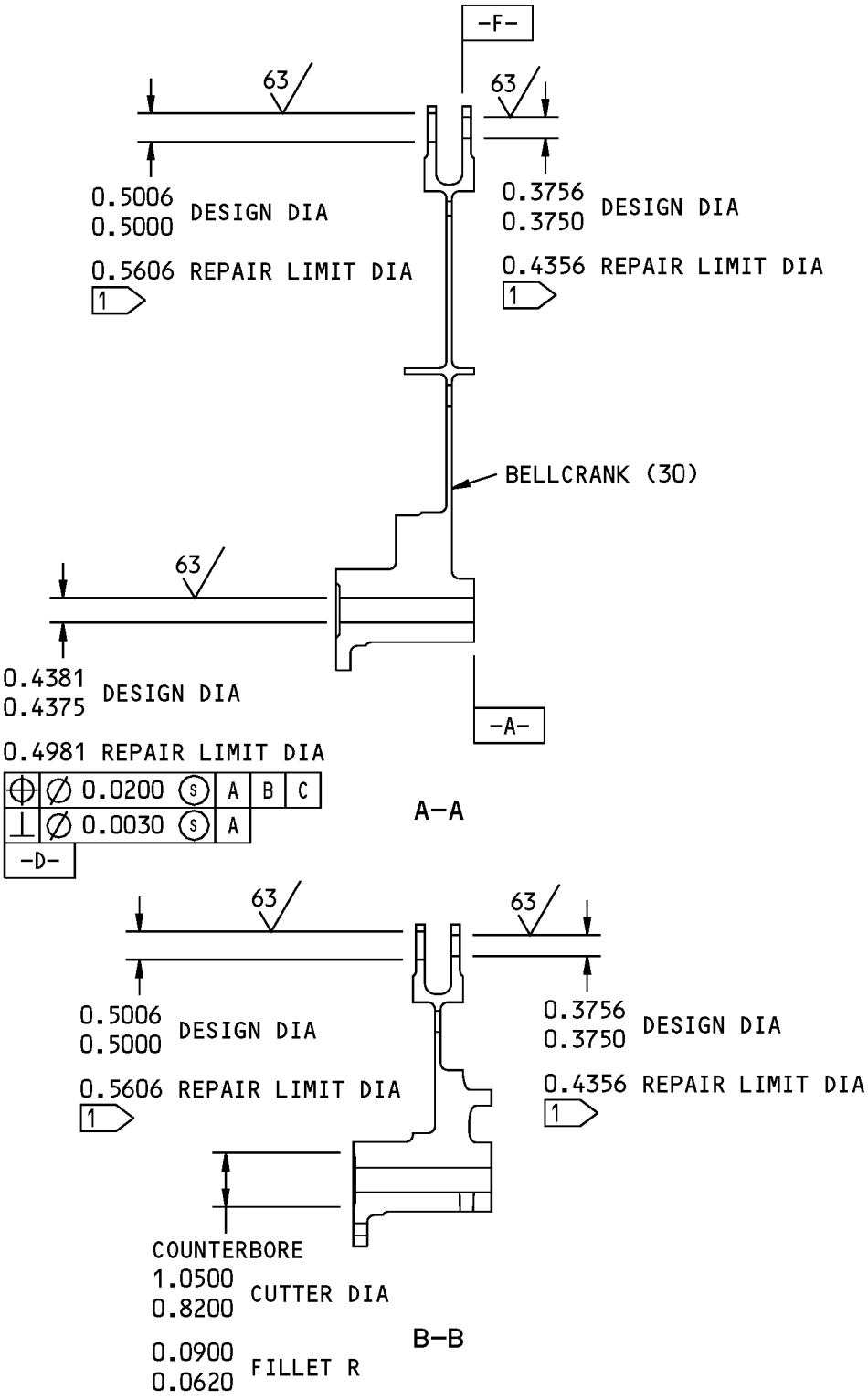
1 NO PRIMER ON THE BORE SURFACE

BREAK ALL SHARP EDGES

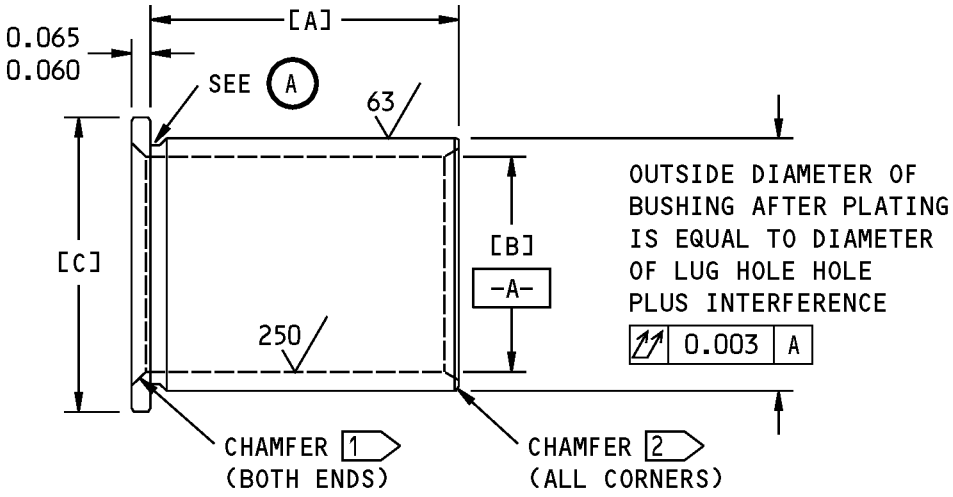
ITEM NUMBERS REFER TO IPL FIG. 2

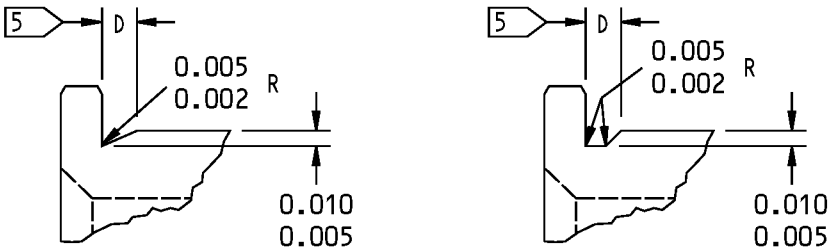
ALL DIMENSIONS ARE IN INCHES

113A2612-3,-4 Outboard Bellcrank Repair and Refinish
Figure 601 (Sheet 1 of 2)



113A2612-3,-4 Outboard Bellcrank Repair and Refinish
Figure 601 (Sheet 2 of 2)





RELIEF TYPES

A

Repair Bushing Details
Figure 602 (Sheet 1 of 2)

BUSHING TO BE REPLACED (IPL FIG. 2)	[A]	[B]	[C]	RELIEF TYPE	INTER-FERENCE	MATERIAL
15	0.140 0.135	0.366 0.359	0.630 0.620	1 OR 2	0.0015 0.0004	3
10,12	0.140 0.135	0.241 0.234	0.540 0.530	1 OR 2	0.0014 0.0003	4
20	0.250 0.245	0.303 0.297	0.690 0.680	1 OR 2	0.0014 0.0003	4

1. CHAMFER ID 0.015-0.025 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (10,12) 0.015-0.025 X 50° / 40°
2. CHAMFER OD 0.005-0.015 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (10,12) 0.005-0.015 X 50° / 40°
3. AL-NI-BRONZE PER AMS 4640
4. 17-4PH CRES PER AMS 5643
5. D = NOT REQUIRED FOR [A] ≤0.140
   D = 0.015 TO 0.030 FOR 0.150 ≤[A] ≤0.240
   D = 0.030 TO 0.060 FOR [A] ≥0.250

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ALL DIMENSIONS ARE IN INCHES

Repair Bushing Details
Figure 602 (Sheet 2 of 2)

CRANKSHAFT ASSEMBLY - REPAIR 3-1

113A2620–1, –2

1. General

A. This procedure has the data necessary to replace the bushings on the crankshaft assembly (1A, 5).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 3 for item numbers.

2. Bushing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

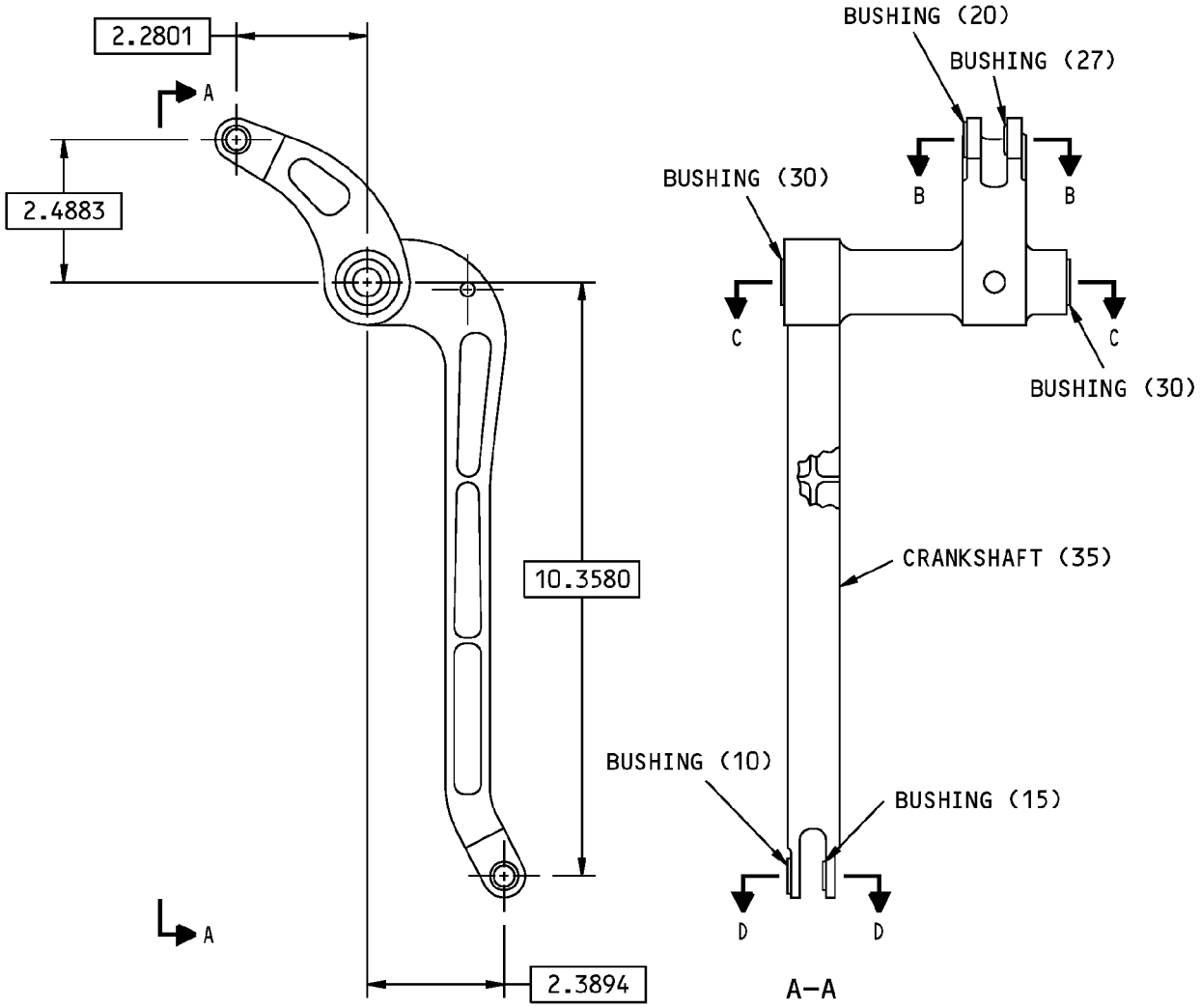
NOTE: For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove bushings (10, 15, 20, 27, 30) from the crankshaft (35, 40).

(2) Install replacement bushings (10, 15, 20, 27, 30) or oversize bushings with sealant, A00247 using shrink-fit method per SOPM 20-50-03. See REPAIR 3-2 for manufacture of oversize bushings.

(a) Apply corrosion fillet seal using sealant, A00247 around perimeter of bushing flanges as shown in REPAIR 3-1, Figure 601.

(3) Drill inside diameter of replacement or oversize bushings to dimensions shown in REPAIR 3-1, Figure 601.



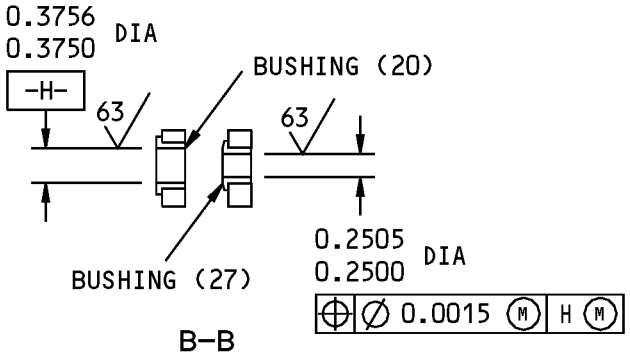
113A2620–1 SHOWN
113A2620–2 OPPOSITE

BREAK ALL SHARP EDGES

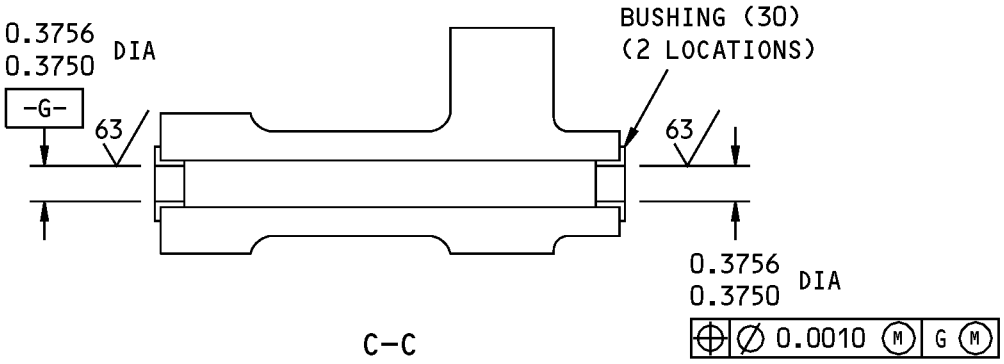
ITEM NUMBERS REFER TO IPL FIG. 3

ALL DIMENSIONS ARE IN INCHES

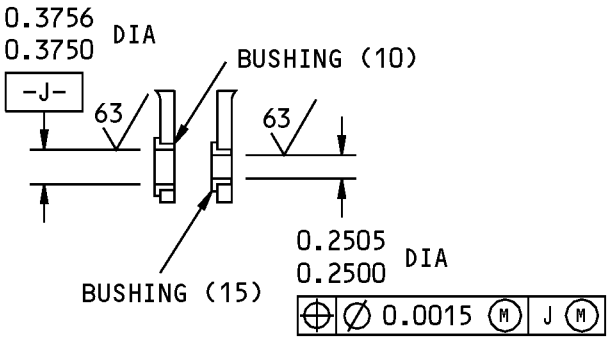
113A2620-1,-2 Crankshaft Assembly Bushing Replacement
Figure 601 (Sheet 1 of 2)



B–B



C–C



D–D

113A2620-1,-2 Crankshaft Assembly Bushing Replacement
Figure 601 (Sheet 2 of 2)

CRANKSHAFT - REPAIR 3-2

113A2620–3, –4

1. General

A. This procedure has the data necessary to repair and refinish the crankshaft (35, 40).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 3 for item numbers.

E. General repair details:

(1) Material: Aluminum alloy

2. Check

A. References

Reference	Title
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Use standard industry procedures to examine all parts for defects.

(2) Do a penetrant check (SOPM 20-20-02) of these parts if you find signs of defects when you visually examine the parts.

(a) Crankshaft (35, 40)

3. Crankshaft Repai

A. References

Reference	Title
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine worn or damaged holes for bushings (10, 15, 20, 27, 30) to remove defects, cracks and/or corrosion up to the limits shown in REPAIR 3-2, Figure 601.

(2) Break all sharp edges (SOPM 20-10-03).

(3) Do a penetrant check (SOPM 20-20-02).

(4) Alodine machined holes (F-17.10).

(5) Make the repair bushings as shown in REPAIR 3-2, Figure 602 as follows:

(a) Bushing material: see REPAIR 3-2, Figure 602.

(b) Break all the sharp edges (SOPM 20-10-03).

(c) Apply cadmium plate finish (F-15.06). Plating optional on ID.

(6) Install repair bushings as shown in REPAIR 3-1, Paragraph 2.C.(2) and REPAIR 3-1, Paragraph 2.C.(3).

4. Crankshaft Refinish

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00033	Coating - Exterior Protective Enamel, Flexibility Use	BMS10-60, Type II
C00175	Primer - Urethane Compatible, Corrosion Resistant (Less Than 1% Aromatic Amines)	BMS10-79, Type III

B. References

Reference	Title
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 20-60-02	FINISHING MATERIALS

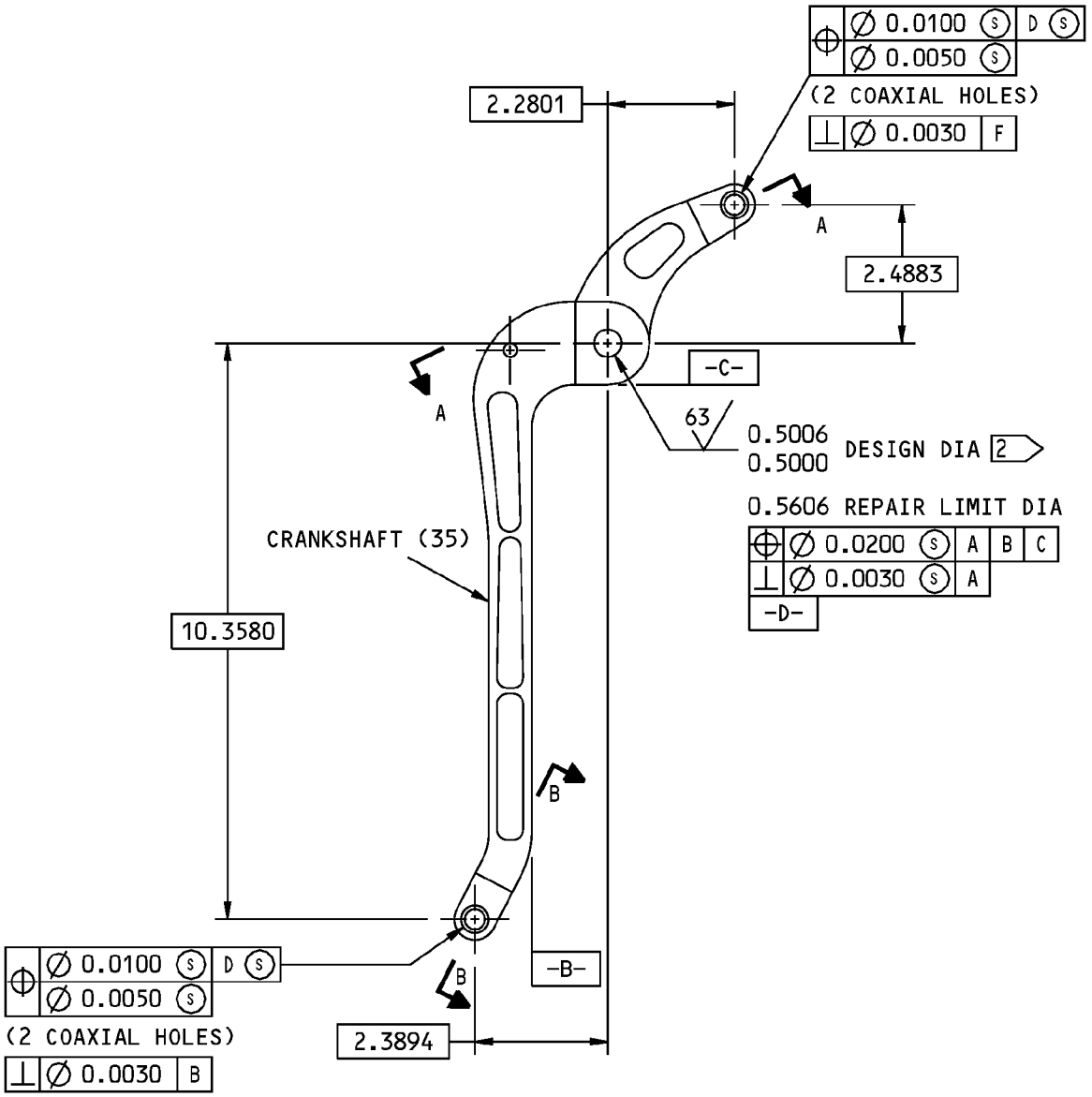
C. Procedure (REPAIR 3-2, Figure 601)

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedure, refer to SOPM 20-30-03. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02.

(1) Chromic acid anodize and seal in dilute chromate solution (F-17.31).

(2) Apply primer, C00175 (F-19.47) as shown in REPAIR 3-2, Figure 601.

(3) Apply of enamel coating, C00033 (F-19.39-707) as shown in REPAIR 3-2, Figure 601.



113A2620-3 SHOWN
113A2620-4 OPPOSITE

1 NO PRIMER AND ENAMEL ON THE BORE SURFACE

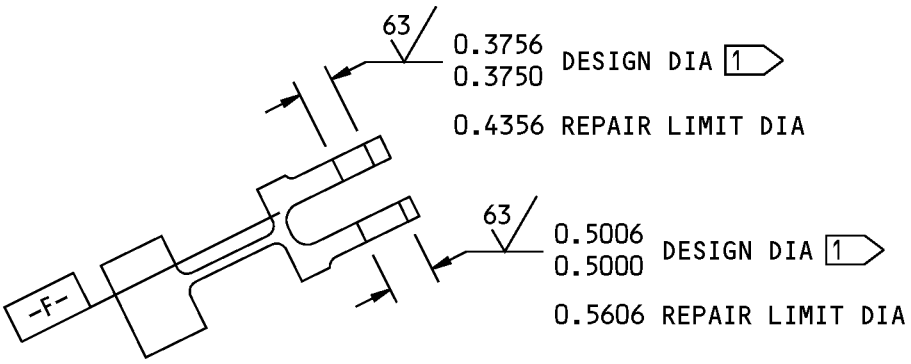
2 NO ENAMEL ON THE BORE SURFACE

BREAK ALL SHARP EDGES

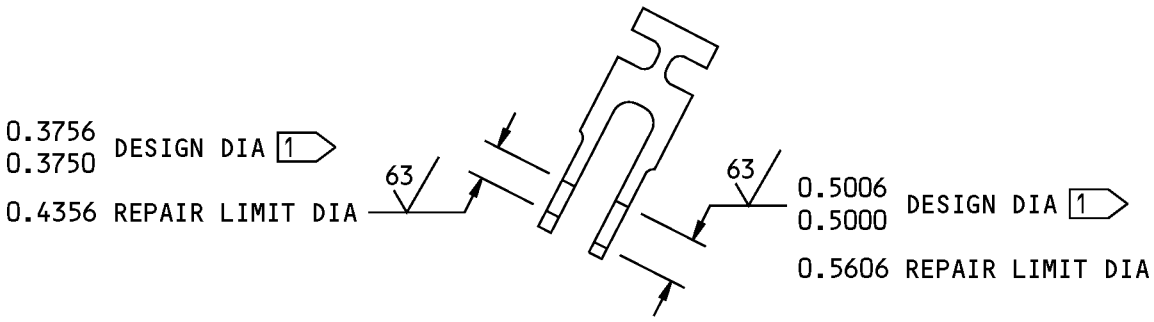
ITEM NUMBERS REFER TO IPL FIG. 3

ALL DIMENSIONS ARE IN INCHES

113A2620-3,-4 Crankshaft Repair and Refinish
Figure 601 (Sheet 1 of 2)

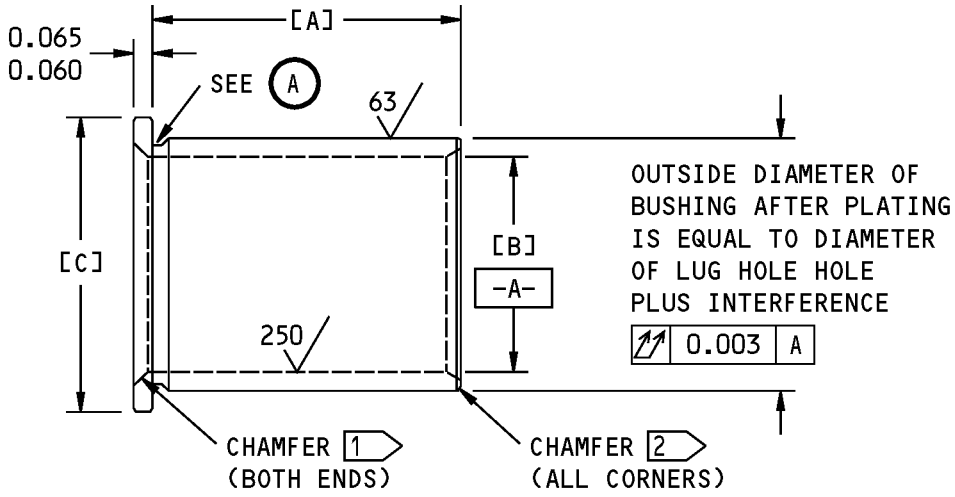


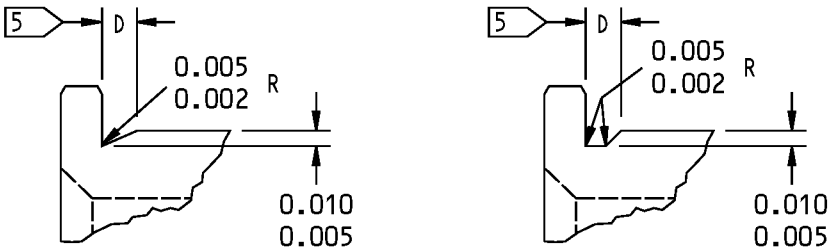
A–A



B–B

113A2620-3,-4 Crankshaft Repair and Refinish
Figure 601 (Sheet 2 of 2)





RELIEF TYPES

A

Repair Bushing Details
Figure 602 (Sheet 1 of 2)

BUSHING TO BE REPLACED (IPL FIG. 1)	[A]	[B]	[C]	RELIEF TYPE	INTER-FERENCE	MATERIAL
10	0.140 0.135	0.366 0.359	0.630 0.620	1 OR 2	0.0015 0.0004	3
15	0.140 0.135	0.241 0.234	0.540 0.530	1 OR 2	0.0014 0.0003	4
20	0.240 0.235	0.366 0.359	0.630 0.620	1 OR 2	0.0015 0.0004	3
27	0.240 0.235	0.241 0.234	0.540 0.530	1 OR 2	0.0014 0.0003	4
30	0.250 0.245	0.366 0.359	0.810 0.800	1 OR 2	0.0016 0.0004	4

1. CHAMFER ID 0.015-0.025 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (15,27) 0.015-0.025 X 50° / 40°
2. CHAMFER OD 0.005-0.015 X 45°
   EXCEPT AS FOLLOWS:
   BUSHING (15,27) 0.005-0.015 X 50° / 40°
3. AL-NI-BRONZE PER AMS 4640
4. 17-4PH CRES PER AMS 5643
5. D = NOT REQUIRED FOR [A] ≤0.140
   D = 0.015 TO 0.030 FOR 0.150 ≤[A] ≤0.240
   D = 0.030 TO 0.060 FOR [A] ≥0.250

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ALL DIMENSIONS ARE IN INCHES

Repair Bushing Details
Figure 602 (Sheet 2 of 2)

PUSHROD ASSEMBLY - REPAIR 4-1

113A2630–1, –3

1. General

A. This procedure has the data necessary to replace the rod end on the pushrod assembly (1A, 5).

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

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 4 for item numbers.

2. Check

A. References

Reference	Title
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION

B. Procedure

(1) Use standard industry procedures to examine all parts for defects.

(2) Do a magnetic check (SOPM 20-20-01) of these parts if you find signs of defects when you visually examine the parts.

(a) Pushrod (35, 40)

3. Rod End Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS 3-27

B. References

Reference	Title
SOPM 20-60-02	FINISHING MATERIALS

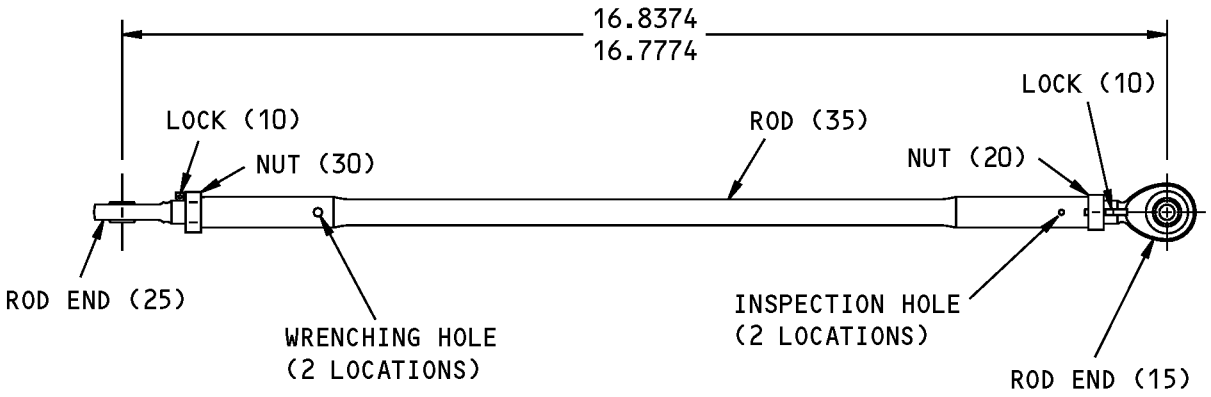
C. Procedure

NOTE: For finishing materials, refer to SOPM 20-60-02.

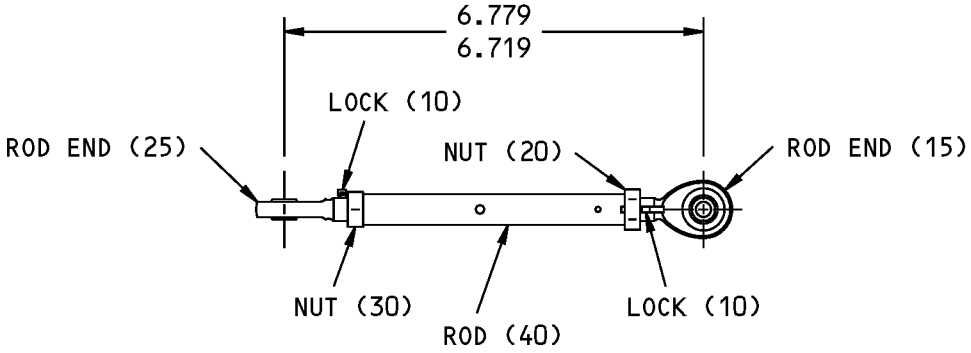
(1) Remove the lock (10), rod end (15, 25) and nut (20, 30) from the pushrod (35, 40).

(2) Apply a thin coat of compound, C00913 to threads of rod end (15, 25) and install with lock (10) and nut (20, 30) in pushrod (35, 40) to the dimensions shown in REPAIR 4-1, Figure 601.

NOTE: Use the inspection hole to make sure there is minimum thread engagement.



113A2630-1



113A2630-3

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 4

ALL DIMENSIONS ARE IN INCHES

113A2630-1,-3 Push Rod Assembly Rodend Replacement
Figure 601

BOEING®

COMPONENT MAINTENANCE MANUAL

ASSEMBLY

(NOT APPLICABLE)

COMPONENT MAINTENANCE MANUAL

FITS AND CLEARANCES

(NOT APPLICABLE)

BOEING®

COMPONENT MAINTENANCE MANUAL

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

(NOT APPLICABLE)

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.

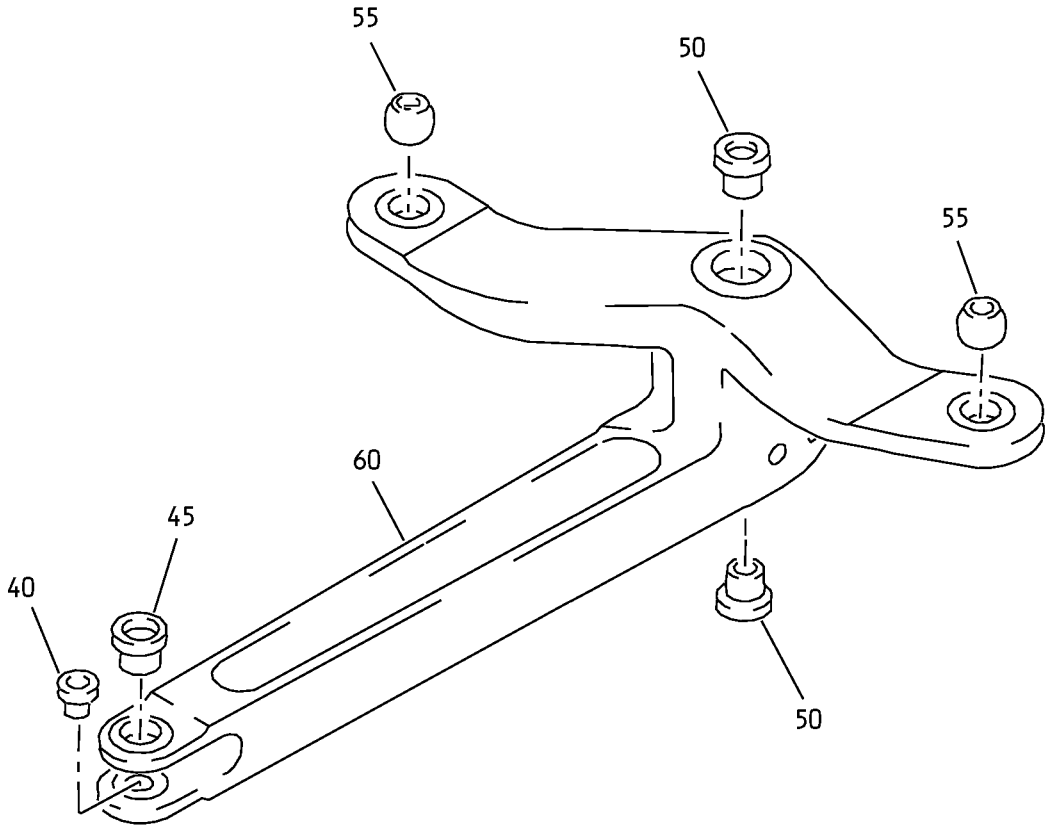
VENDOR CODES

Code	Name
50632	KAMATICS CORP SUB OF KAMAN CORP 1335 BLUE HILLS ROAD BLOOMFIELD, CONNECTICUT 06002-1304

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
113A2610-1		1	1A	RF
113A2610-2		1	5	RF
113A2610-3		1	60	1
113A2610-4		1	65	1
113A2612-1		1	10	RF
		2	1A	RF
113A2612-2		1	15	RF
		2	5	RF
113A2612-3		2	30	1
113A2612-4		2	35	1
113A2620-1		1	20	RF
		3	1A	RF
113A2620-2		1	25	RF
		3	5	RF
113A2620-3		3	35	1
113A2620-4		3	40	1
113A2630-1		1	30	RF
		4	1A	RF
113A2630-3		1	35	RF
		4	5	RF
113A2630-5		4	35	1
113A2630-7		4	40	1
113A2653-15		2	12	1
113A2653-17		3	27	1
BACB28AP04P014		1	40	1
		2	10	1
		3	15	1
BACB28AT06B014C		1	45	1
		2	15	2
		3	10	1
BACB28AT06B024C		3	20	1
BACB28AX05C025		1	50	2
		2	20	2
BACB28AX06C025		3	30	2

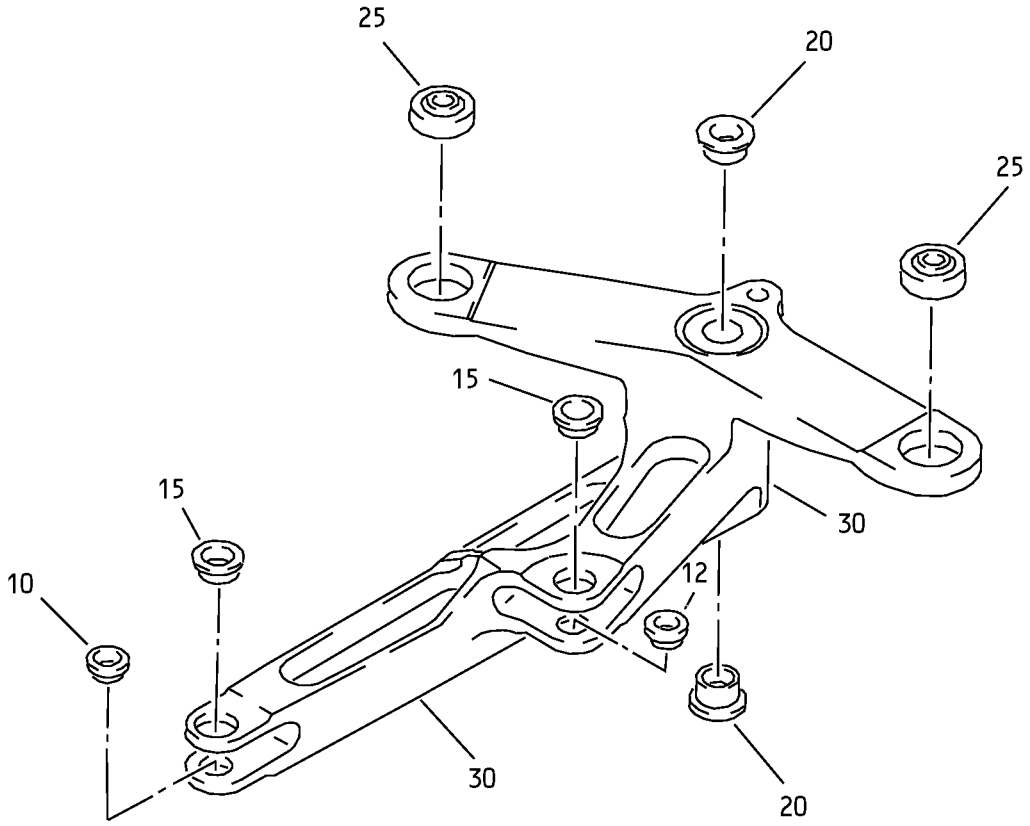
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
BCREF12178		4	15	1
KSC267900B04C		1	55	2
		2	25	2
NAS509-6C		4	30	1
NAS509L6C		4	20	1
NAS559-2		4	10	2
S012T238-104-789		4	15	1
S012T238-104-79		4	25	1



Inboard Bellcrank 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–					
–1A	113A2610-1		BELLCRANK ASSY-INBD	A	RF
–5	113A2610-2		BELLCRANK ASSY-INBD	B	RF
–10	113A2612-1		BELLCRANK ASSY-OUTBD (FOR DETAILS SEE FIG. 2)	C	RF
–15	113A2612-2		BELLCRANK ASSY-OUTBD (FOR DETAILS SEE FIG. 2)	D	RF
–20	113A2620-1		CRANKSHAFT ASSY (FOR DETAILS SEE FIG. 3)	E	RF
–25	113A2620-2		CRANKSHAFT ASSY (FOR DETAILS SEE FIG. 3)	F	RF
–30	113A2630-1		PUSH ROD ASSY (FOR DETAILS SEE FIG. 4)	G	RF
–35	113A2630-3		PUSH ROD ASSY (FOR DETAILS SEE FIG. 4)	H	RF
40	BACB28AP04P014		. BUSHING	A, B	1
45	BACB28AT06B014C		. BUSHING	A, B	1
50	BACB28AX05C025		. BUSHING	A, B	2
55	KSC267900B04C		. BEARING-SPHER (V50632)	A, B	2
60	113A2610-3		. BELLCRANK	A	1
–65	113A2610-4		. BELLCRANK	B	1

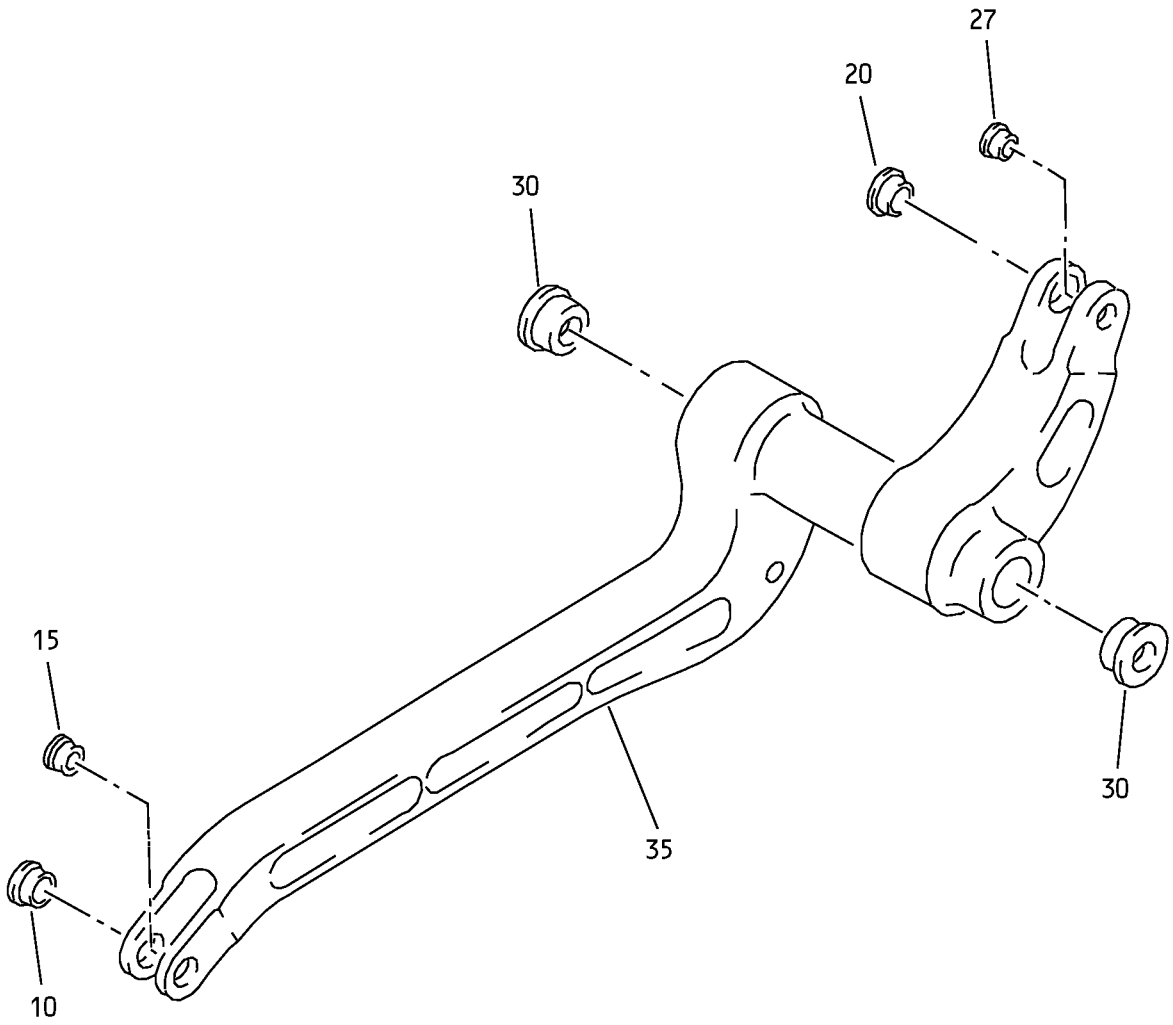
–Item not Illustrated



Outboard Bellcrank 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–					
–1A	113A2612-1		BELLCRANK ASSY-OUTBD	C	RF
–5	113A2612-2		BELLCRANK ASSY-OUTBD	D	RF
10	BACB28AP04P014		. BUSHING	C, D	1
12	113A2653-15		. BUSHING	C, D	1
15	BACB28AT06B014C		. BUSHING	C, D	2
20	BACB28AX05C025		. BUSHING	C, D	2
25	KSC267900B04C		. BEARING-SPHER (V50632)	C, D	2
30	113A2612-3		. BELLCRANK	C	1
–35	113A2612-4		. BELLCRANK	D	1

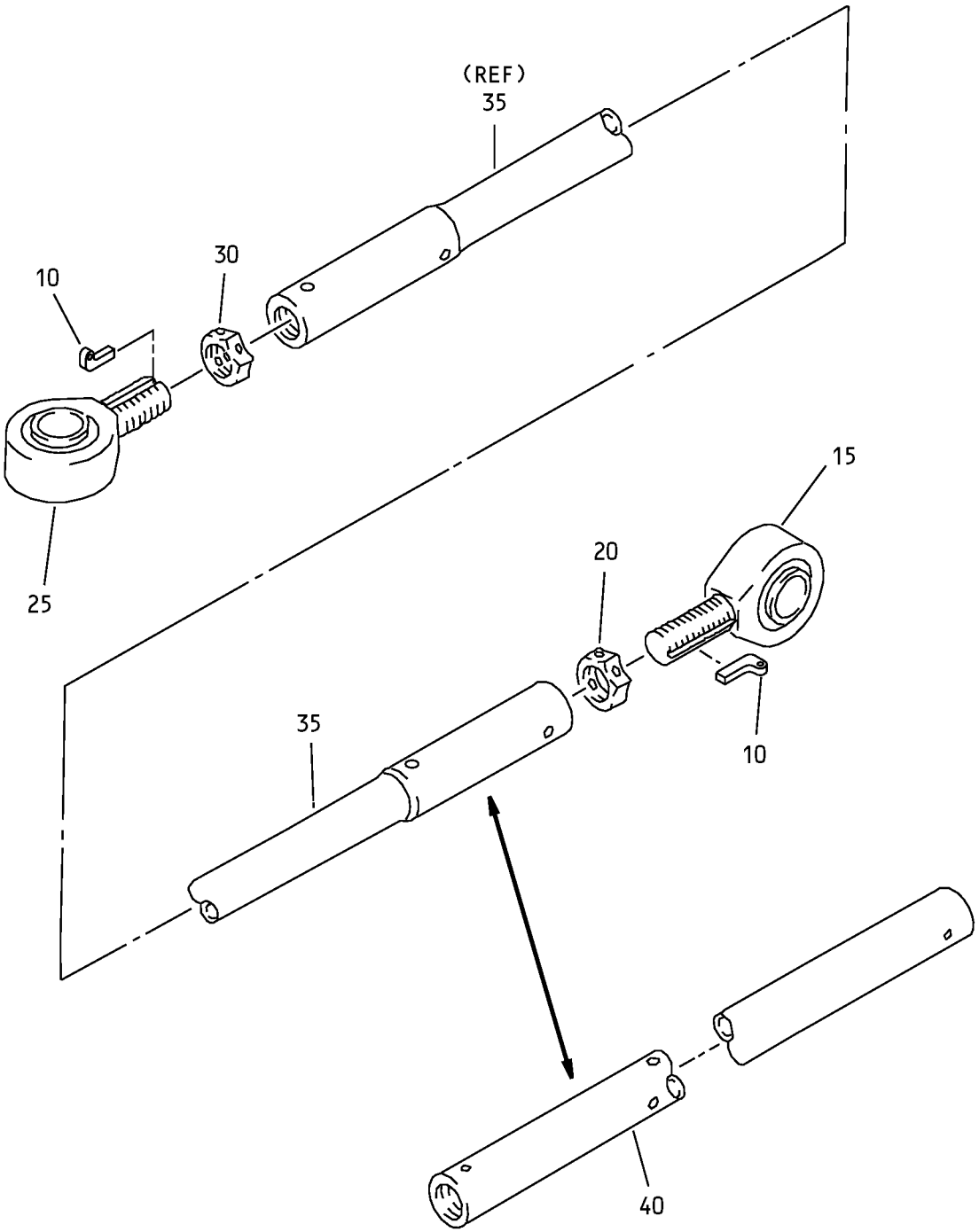
–Item not Illustrated



Crankshaft Assembly
IPL Figure 3

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
3–					
–1A	113A2620-1		CRANKSHAFT ASSY	E	RF
–5	113A2620-2		CRANKSHAFT ASSY	F	RF
10	BACB28AT06B014C		. BUSHING	E, F	1
15	BACB28AP04P014		. BUSHING	E, F	1
20	BACB28AT06B024C		. BUSHING	E, F	1
25	BACB28AP04P024		DELETED		
27	113A2653-17		. BUSHING	E, F	1
30	BACB28AX06C025		. BUSHING	E, F	2
35	113A2620-3		. CRANKSHAFT	E	1
–40	113A2620-4		. CRANKSHAFT	F	1

–Item not Illustrated



Push Rod Assembly
IPL Figure 4

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
4–					
–1A	113A2630-1		PUSH ROD ASSY	G	RF
–5	113A2630-3		PUSH ROD ASSY	H	RF
10	NAS559-2		. LOCK	G, H	2
15	BCREF12178		. ROD END-LH THD (S012T238-104-789)	G, H	1
20	NAS509L6C		. NUT	G, H	1
25	S012T238-104-79		. ROD END-RH THD	G, H	1
30	NAS509-6C		. NUT	G, H	1
35	113A2630-5		. ROD	G	1
40	113A2630-7		. ROD	G	1

–Item not Illustrated