COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

AILERON CONTROL QUADRANT ASSEMBLY

PART NUMBER 251A1111–1, –2

PUBLISHED BY BOEING COMMERCIAL AIRPLANES GROUP, SEATTLE, WASHINGTON, USA
A DIVISION OF THE BOEING COMPANY
PAGE DATE: Jul 01/2009

COMPONENT MAINTENANCE MANUAL

Revision No. 7
Jul 01/2009

To: All holders of AILERON CONTROL QUADRANT ASSEMBLY 27-11-33.

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

IF YOU RECEIVE PRINTED REVISIONS, PLEASE VERIFY THAT YOU HAVE RECEIVED AND FILED THE PREVIOUS REVISION. BOEING MUST BE NOTIFIED WITHIN 30 DAYS IF YOU HAVE NOT RECEIVED THE PREVIOUS REVISION. REQUESTS FOR REVISIONS OTHER THAN THE PREVIOUS REVISION WILL REQUIRE A COMPLETE MANUAL REPRINT SUBJECT TO REPRINT CHARGES SHOWN IN THE DATA AND SERVICES CATALOG.

Location of Change	Description of Change
27-11-33 ASSEMBLY	Changed the data in the Consumable Materials list.

BOEING®

COMPONENT MAINTENANCE MANUAL

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

TABLE OF CONTENTS

BOEING®

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	
Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

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

BOEING®

COMPONENT MAINTENANCE MANUAL

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.

AILERON CONTROL QUADRANT ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The aileron control quadrant assembly consists of a machined aluminum quadrant assembly that has bushings and bearings, a rod, and a support assembly.

2. Operation

A. The aileron control quadrant assembly moves the aileron by receiving cable movements that are caused by the aileron power control unit. It also gives input to the aileron position sensor via a connecting rod.

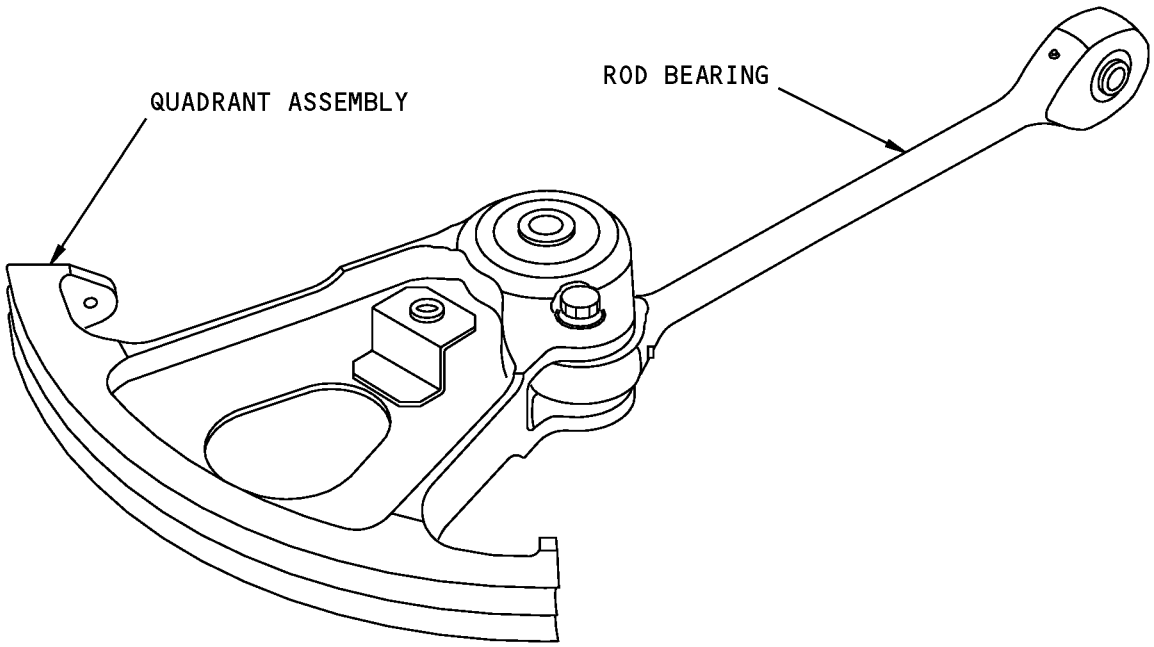
3. Leading Particulars (Approximate)

A. Length – 20.3 inches

B. Width – 12.1 inches

C. Height – 2.4 inches

D. Weight – 4.9 pounds



Aileron Control Quadrant Assembly
Figure 1

(NOT APPLICABLE)

DISASSEMBLY

1. General

A. This procedure has the data necessary to disassemble the aileron control quadrant assembly (1A, 5).

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

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. Disassembly

A. References

Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT

B. Part Replacement

(1) NOTE: The parts which follow are recommended for replacement. Unless a procedure tells you to replace a part, replacement is optional.

(a) Cotter pin (50)

C. Procedure

(1) Use standard industry procedures and the steps shown below to disassemble this component.

(2) Remove the bolt (55A), washers (57, 60), bushing (67), and nut (65), then remove the rod (70) from the quadrant assembly.

(3) Remove the rivets (10), then remove the support assembly (15) from the quadrant assembly.

(4) Remove the bearings (40) from the quadrant assembly (SOPM 20-50-03).

CLEANING

1. General

A. This procedure has the data necessary to clean the aileron control quadrant assembly (1A, 5).

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

C. Refer to IPL Figure 1 for item numbers.

2. Cleaning

A. References

Reference	Title
SOPM 20-30-01	CLEANING AND RELUBRICATING BEARINGS
SOPM 20-30-03	GENERAL CLEANING PROCEDURES

B. Procedure

(1) Clean the bearings (40) as specified in SOPM 20-30-01.

(2) Clean all the parts, other than the bearings (40), as specified by standard industry practices (SOPM 20-30-03).

CHECK

1. General

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

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

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

D. Refer to IPL Figure 1 for item numbers.

2. Check

A. References

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

B. Procedure

(1) Use standard industry procedures to do a visual check of all the parts for defects. Do the penetrant or magnetic particle check if the visual check shows possible damage or if you suspect possible damage on the parts listed below:

(2) Do a penetrant check (SOPM 20-20-02) of these parts:

(a) Quadrant (95, 100)

(b) Support (35)

REPAIR

1. General

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

Table 601:

PART NUMBER	NAME	REPAIR
—	REFINISH OF OTHER PARTS	1-1
251A1111	QUADRANT ASSEMBLY	2-1, 2-2
251A1111	SUPPORT ASSEMBLY	3-1, 3-2

2. 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

REFINISH OF OTHER PARTS - REPAIR 1-1

1. General

A. This procedure has the data necessary to refinish the parts which are not given in the specified repairs.

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

C. Refer to IPL Figure 1 for item numbers.

2. Refinish of Other Parts

A. General

(1) Instructions for the repair of the parts listed in REPAIR 1-1, Table 601 is for repair of the initial finish.

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
None at this time		

QUADRANT ASSEMBLY - REPAIR 2-1

251A1111–3, –4

1. General

A. This procedure has the data necessary to replace the bushings (85, 90) in the quadrant assembly (75, 80).

B. Refer to the Standard Overhaul Practice Manual (SOPM) for the SOPM subjects 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. 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

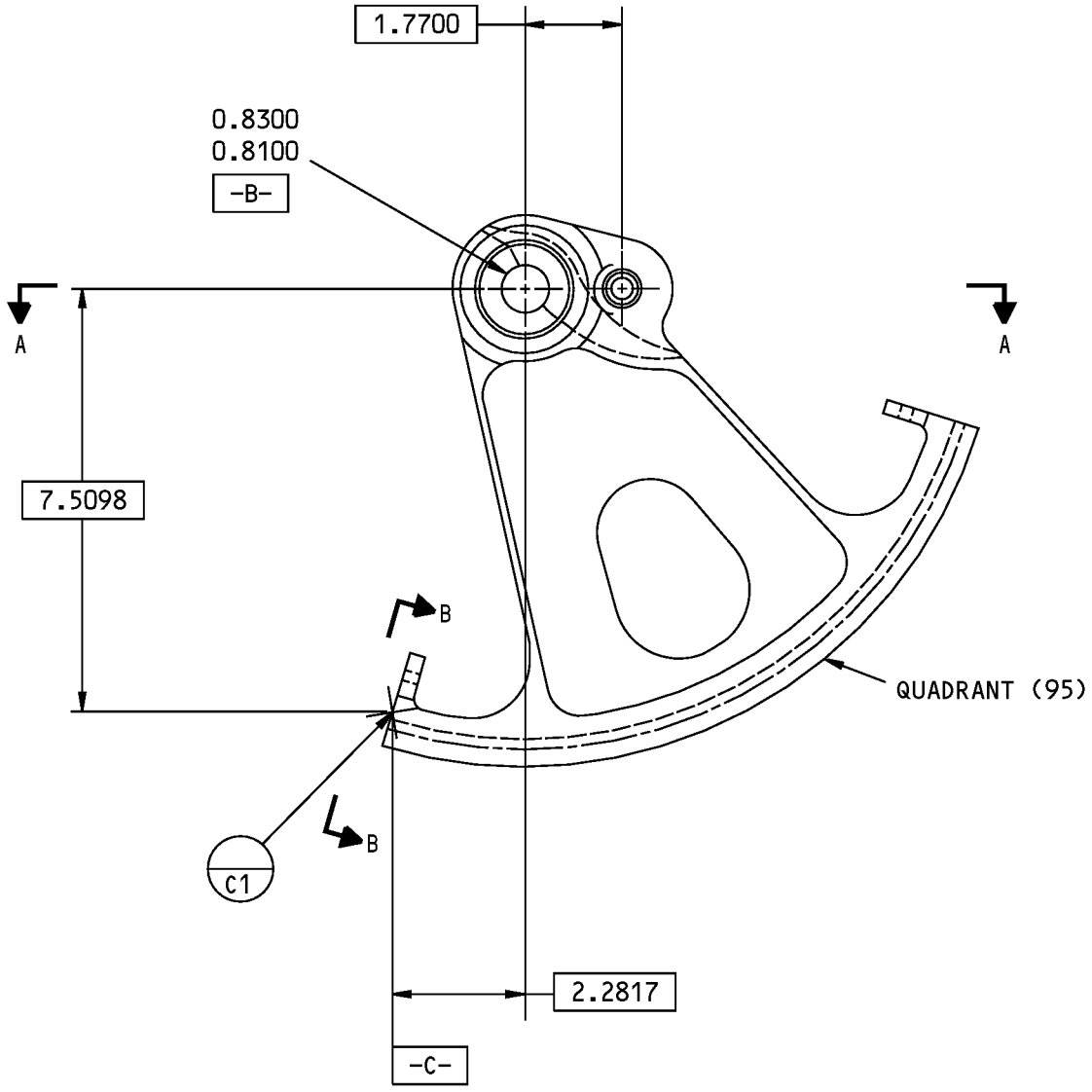
C. Procedure

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

(1) Remove the bushings (85, 90) from the quadrant (95, 100) (SOPM 20-50-03).

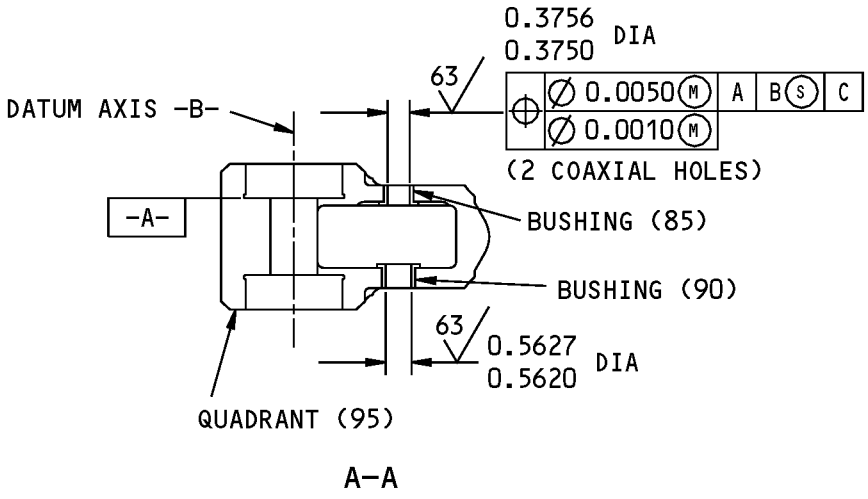
(2) Install the new bushings (85, 90) with sealant, A00247 using the shrink fit method as specified in SOPM 20-50-03.

(3) Machine the bushings (85, 90) to the design diameter as shown in REPAIR 2-1, Figure 601.

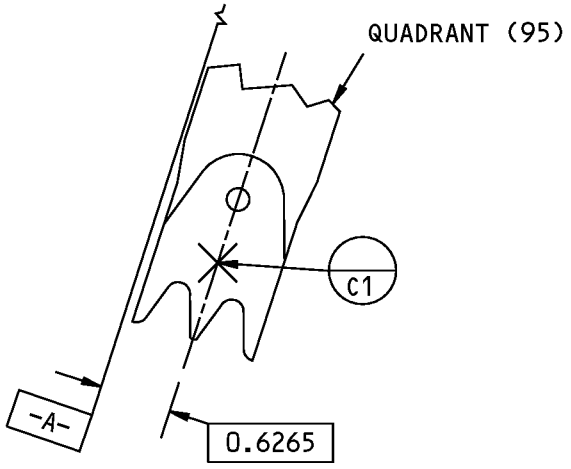


251A1111-3 SHOWN
251A1111-4 OPPOSITE

251A1111-3,-4 Quadrant Assembly Repair
Figure 601 (Sheet 1 of 2)



A–A



B–B

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

251A1111-3,-4 Quadrant Assembly Repair
Figure 601 (Sheet 2 of 2)

QUADRANT - REPAIR 2-2

251A1111–5, –6

1. General

A. This procedure has the data necessary to repair and refinish the quadrant (95, 100).

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. Quadrant Repair

A. References

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

B. Procedure

(1) Machine the bushing holes, as necessary, within the repair limits shown in REPAIR 2-2, Figure 601, to remove defects.

(2) Machine the bearing holes, as necessary, within the repair limits shown in REPAIR 2-2, Figure 601, to remove defects.

(3) Do a penetrant check of the quadrant (95, 100) (SOPM 20-20-02).

(4) Plate the bearing holes... specifics TBD by engineering.

3. Manufacturing of Oversized Bushings

A. Procedure

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

(1) Make the replacement for bushing (85).

NOTE: Dimensions to be met after finish. ____

(a) Machine the bushing (85) from 15-5PH per AMS 5659, or 17-4PH CRES per AMS 5643, as shown in REPAIR 2-2, Figure 602. Compensate for the amount of material removed in REPAIR 2-2, Paragraph 2.B.(1).

(b) Heat treat to 40-43 HRC (180-200 ksi).

(c) Cadmium plate (F-15.06) the bushing all over, or zinc-nickel plate as specified in BAC 5637 type 2, class 2 all over. Plating on the inner diameter is not necessary.

(2) Make the replacement for bushing (90).

NOTE: Dimensions to be met after finish. ____

(a) Machine the bushing (90) from Aluminum-Nickel-Bronze per AMS 4640, as shown in REPAIR 2-2, Figure 603. Compensate for the amount of material removed in REPAIR 2-2, Paragraph 2.B.(1).

(b) Anneal (TB00) the bushing (90).

(c) Cadmium plate (F-15.06) the bushing (90) all over, or zinc-nickel plate as specified in BAC 5637 type 2, class 2 all over. Plating on the inner diameter is not necessary.

4. Quadrant 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

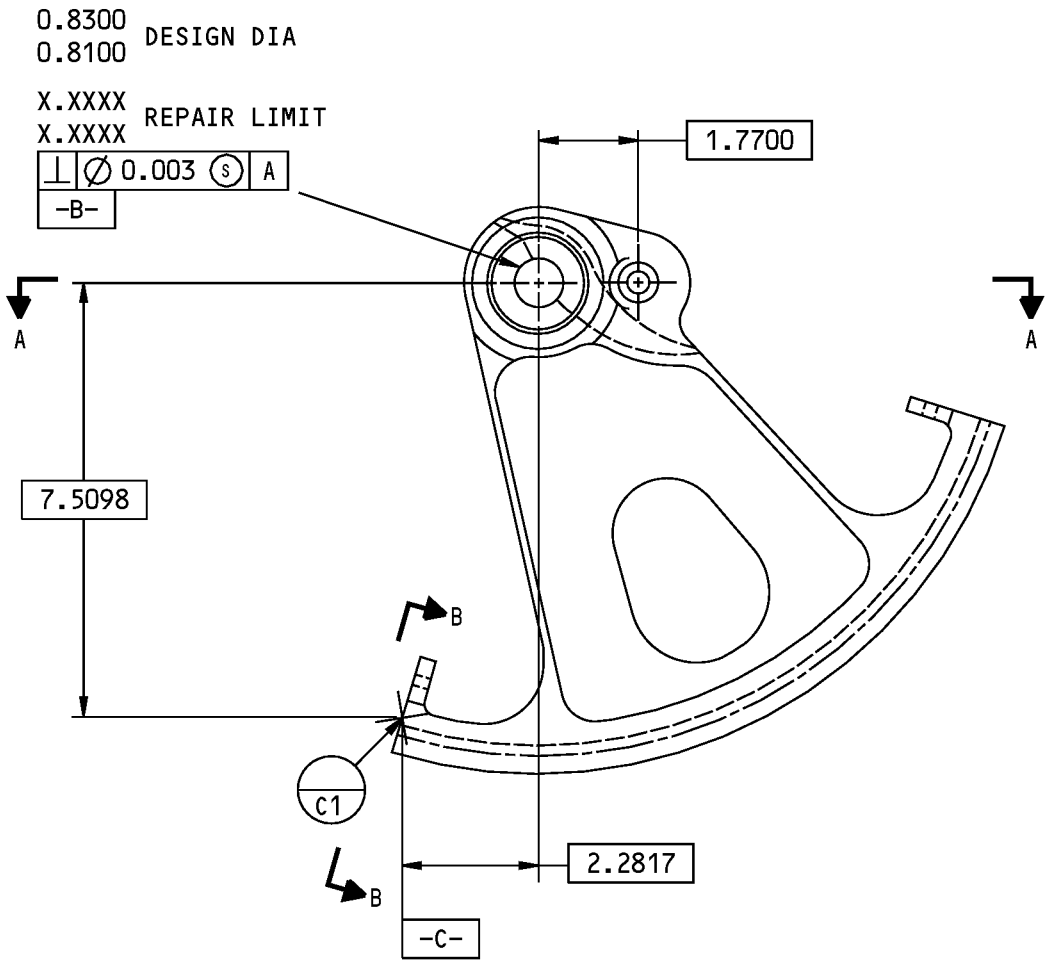
Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure

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

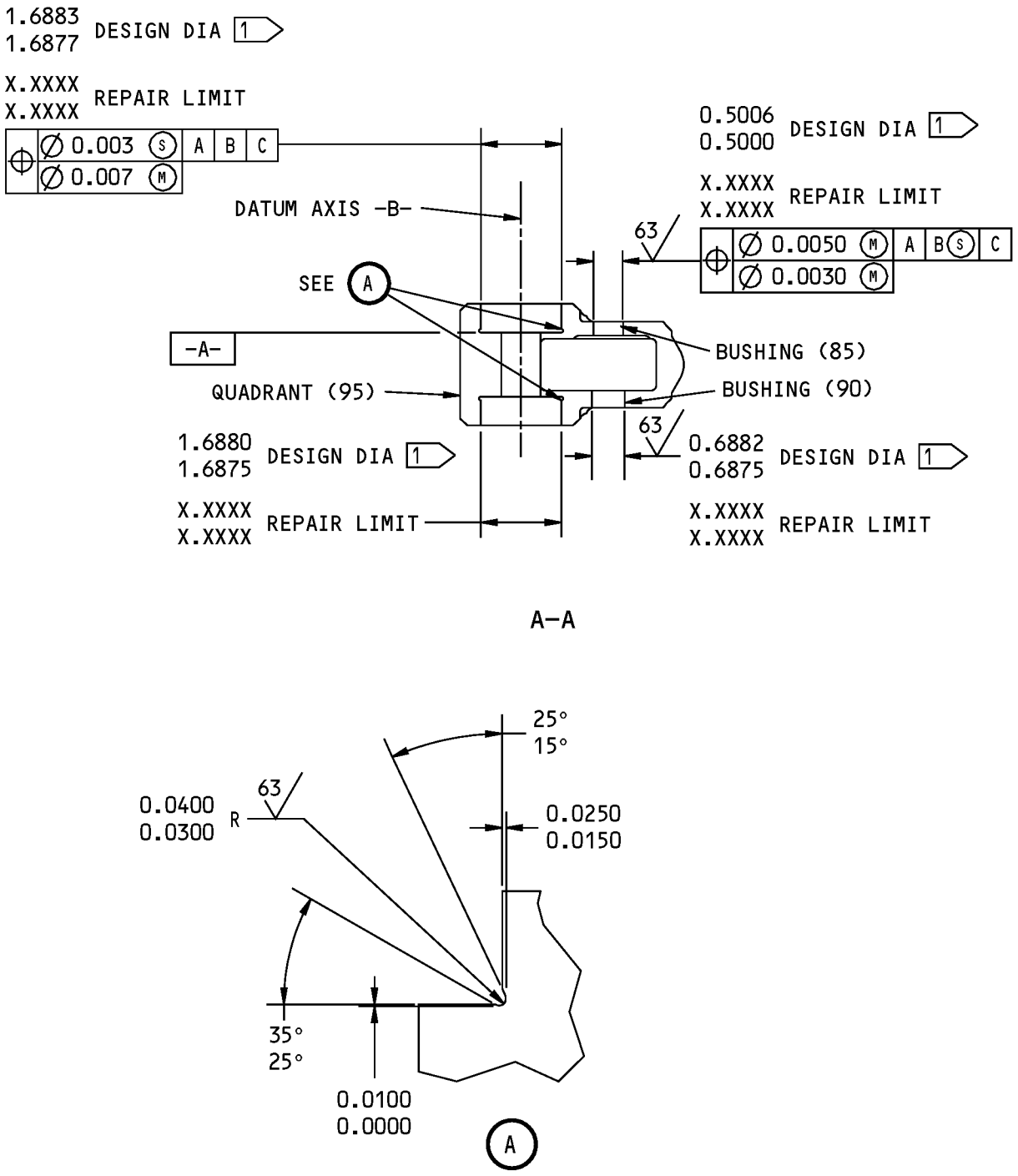
(1) Remove the old finish from the quadrant (95, 100).

(2) Anodize (F-17.31) and apply primer, C00259 to the quadrant (95, 100) all over, except do not apply primer, C00259 to the bearing holes or the bushing holes as shown in REPAIR 2-2, Figure 601.

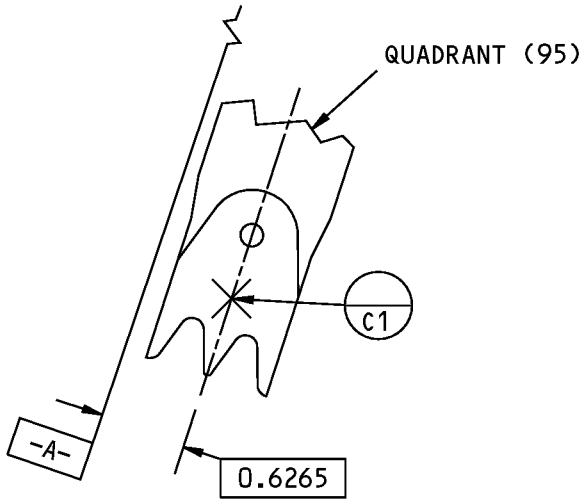


251A1111-5 SHOWN
251A1111-6 OPPOSITE

251A1111-5,-6 Quadrant Repair
Figure 601 (Sheet 1 of 3)



251A1111-5,-6 Quadrant Repair
Figure 601 (Sheet 2 of 3)



B–B

1 DO NOT APPLY BMS 10-11, TYPE 1, PRIMER TO THE HOLE

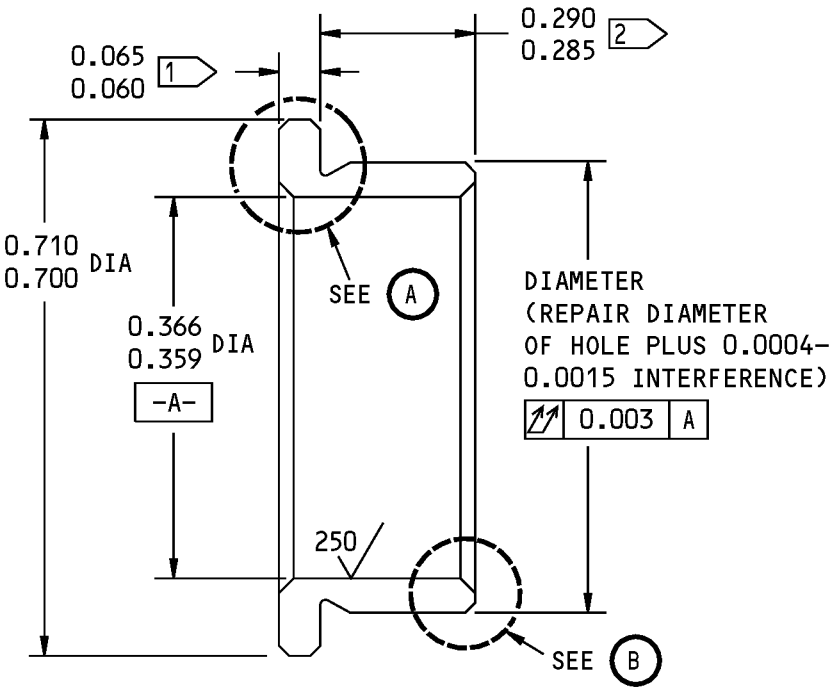
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

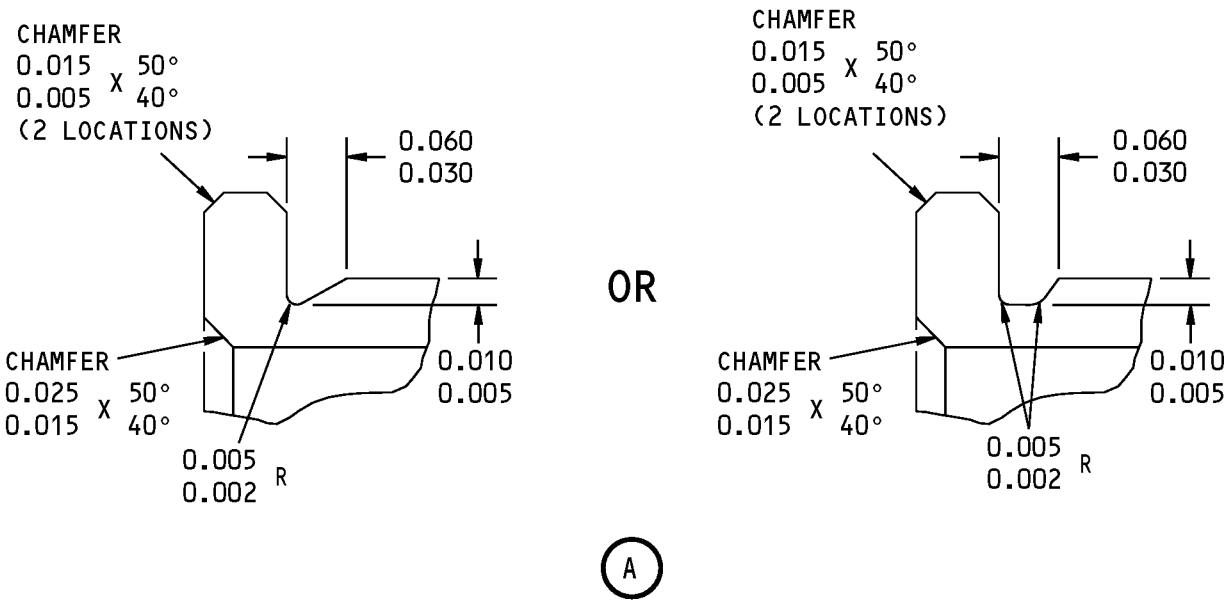
BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

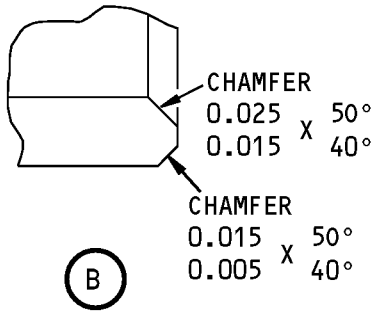
ALL DIMENSIONS ARE IN INCHES

251A1111-5,-6 Quadrant Repair
Figure 601 (Sheet 3 of 3)





Replacement for Bushing (85)
Figure 602 (Sheet 1 of 2)



1 PLUS THE AMOUNT REMOVED FROM THE LUG FACE.

2 MINUS THE AMOUNT REMOVED FROM THE LUG FACE.

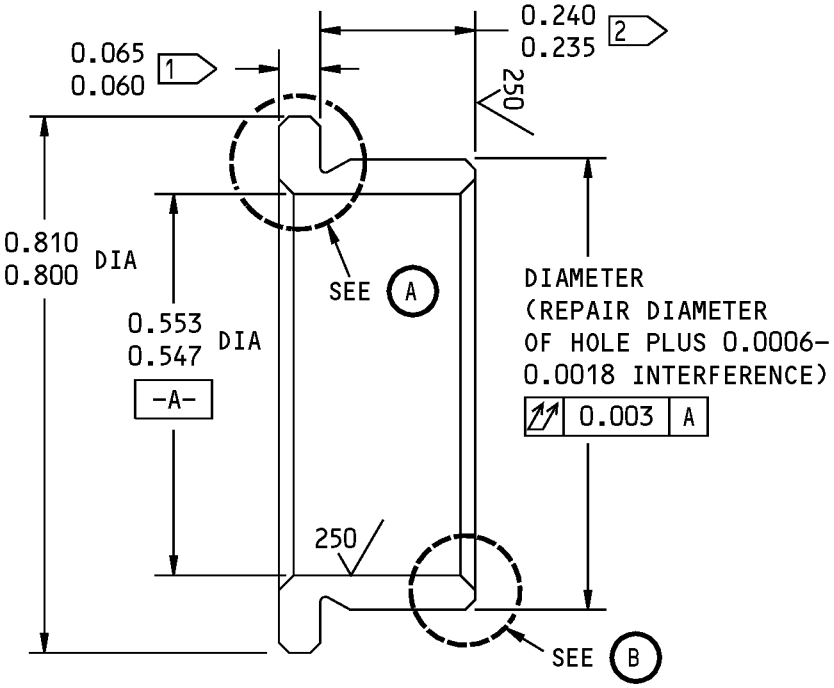
63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

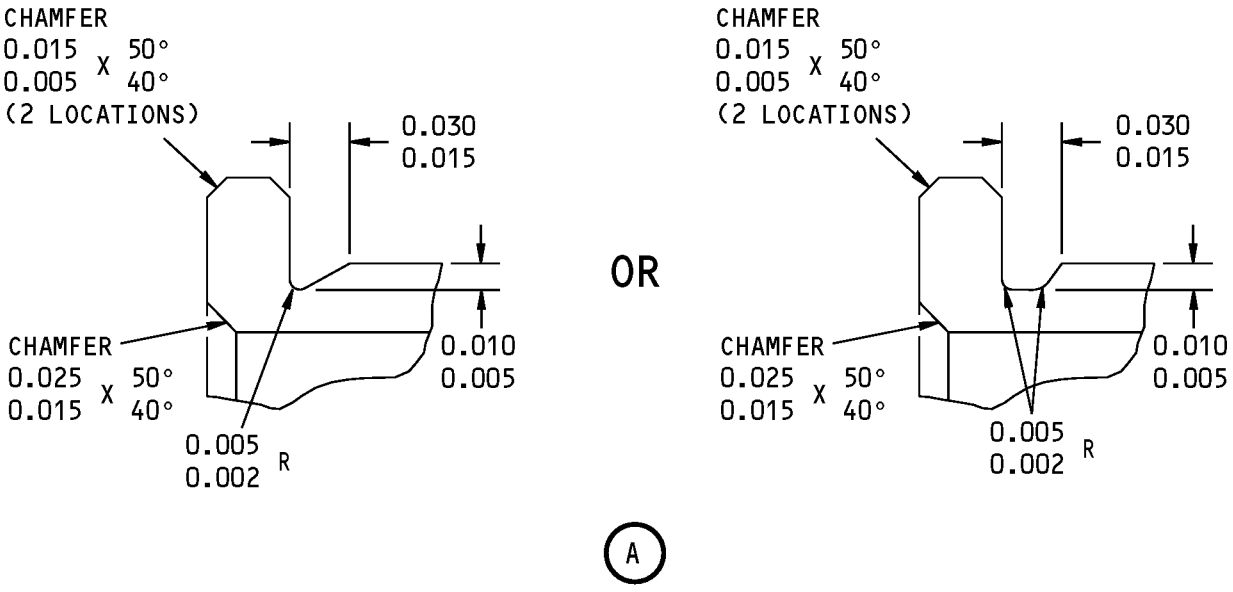
BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

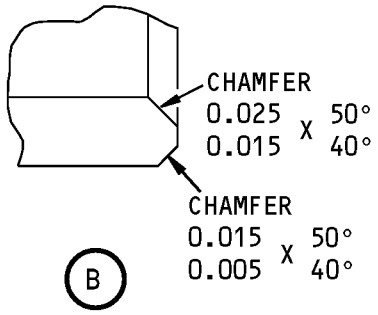
ALL DIMENSIONS ARE IN INCHES

Replacement for Bushing (85)
Figure 602 (Sheet 2 of 2)





Replacement for Bushing (90)
Figure 603 (Sheet 1 of 2)



1 PLUS THE AMOUNT REMOVED FROM THE LUG FACE.

2 MINUS THE AMOUNT REMOVED FROM THE LUG FACE.

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Replacement for Bushing (90)
Figure 603 (Sheet 2 of 2)

SUPPORT ASSEMBLY - REPAIR 3-1

251A1111–7

1. General

A. This procedure has the data necessary to replace the bushing (30) and the nutplate (25) on the support assembly (15).

B. Refer to the Standard Overhaul Practice Manual (SOPM) for details of 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. Bushing Replacement (REPAIR 3-1, Figure 601)

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

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

B. References

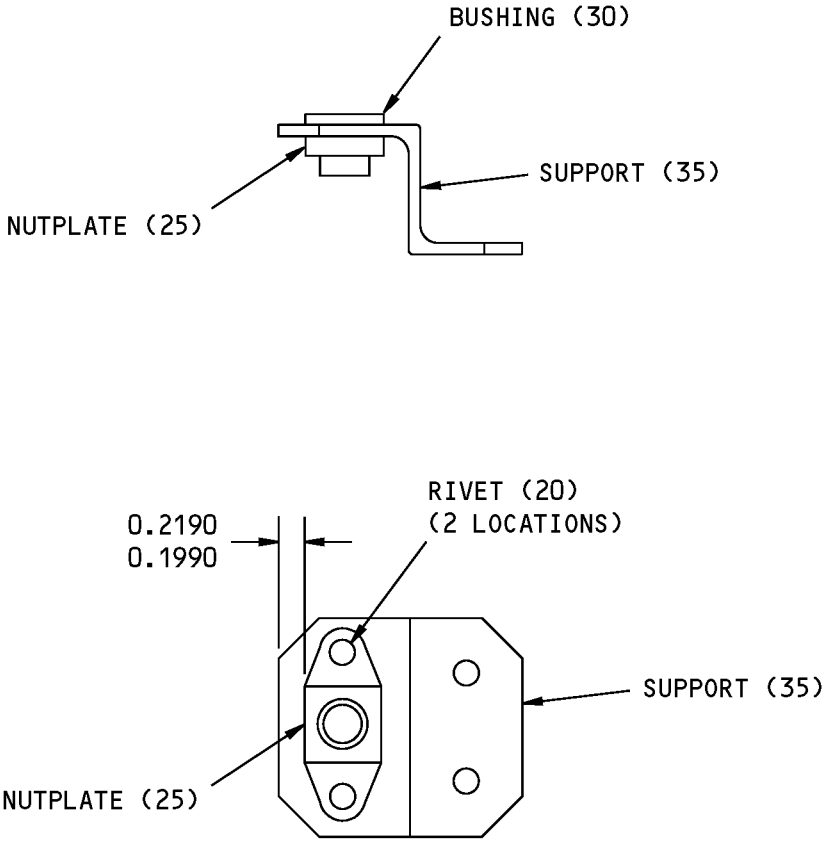
Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

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

(1) Remove the bushing (30) from the support (35).

(2) Install the new bushing (30) with sealant, A00247 using the shrink fit method as specified in SOPM 20-50-03.



ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

251A1111-7 Support Assembly Repair
Figure 601

SUPPORT - REPAIR 3-2

251A1111–8

1. General

A. This procedure has the data necessary to repair and refinish the support (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 1 for item numbers.

E. General repair details:

(1) Material: Aluminum alloy

2. Support Repair

A. Procedure

(1) Machine the bushing hole, as required, within the repair limits shown in REPAIR 3-2, Figure 601, to remove defects.

(2) Do a penetrant check of the support (35) (SOPM 20-20-02).

3. Manufacturing of Oversized Bushings

A. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Make the replacement for bushing (30).

(a) Machine the bushing (30) from 15-5PH CRES as specified in AMS 5643 and as shown in REPAIR 3-2, Figure 602. Compensate for the amount of material removed in REPAIR 3-2, Paragraph 2.A.(1).

(b) Heat treat to 40-43 HRC.

(c) Cadmium plate (F-15.06) the bushing all over. Plating on the inner diameter is not necessary.

4. Support 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

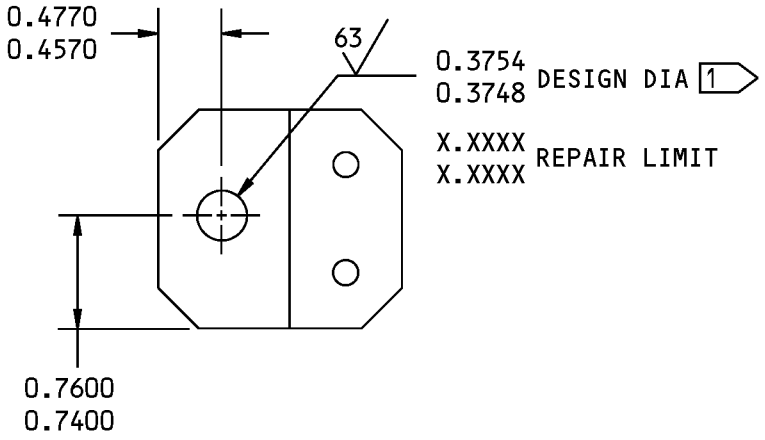
Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure

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

(1) Remove the old finish from the support (35).

(2) Anodize (F-17.31) and apply primer, C00259 to the support (35) all over, except do not apply primer, C00259 to the bushing hole.



1 DO NOT APPLY BMS 10-11, TYPE 1, PRIMER TO THE HOLE.

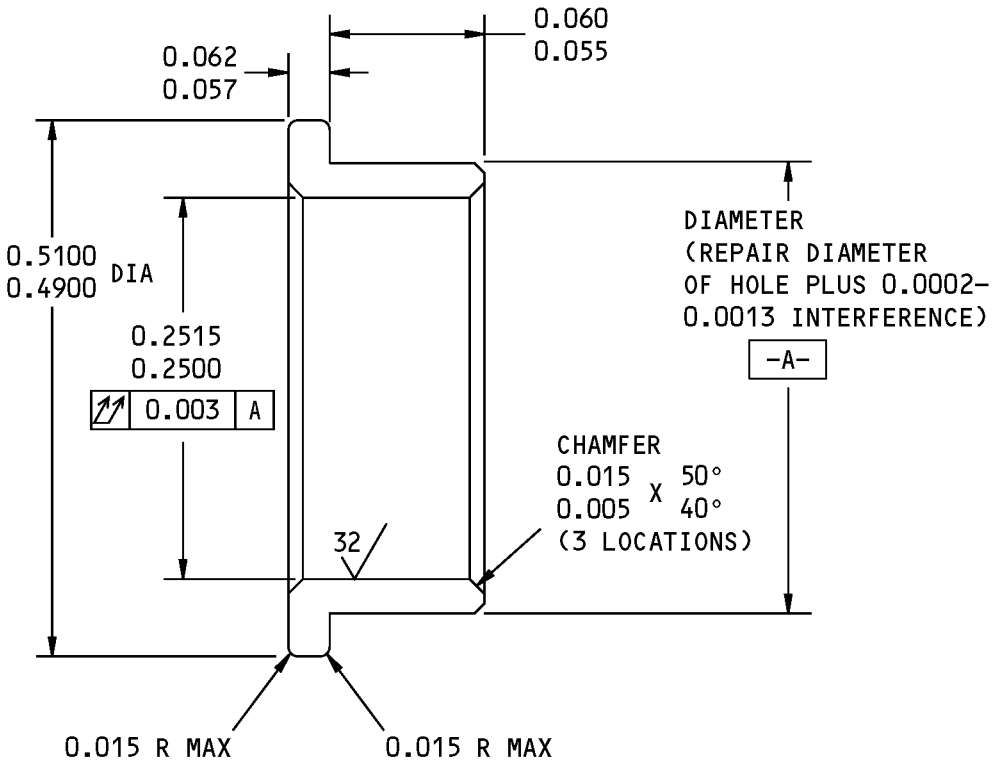
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

251A1111-8 Support Repair
Figure 601



63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Replacement for Bushing (30)
Figure 602

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the aileron control quadrant assembly (1A, 5).

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

C. Refer to IPL Figure 1 for item numbers.

2. Assembly

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
C50056	Compound - Nondrying Resin Mix Corrosion Inhibiting Material	BMS 3-27

B. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For bolt and nut installation, refer to, SOPM 20-50-01. For finishing materials, refer to SOPM 20-60-02. For micellaneous materials, refer to SOPM 20-60-04.

(1) Use standard industry procedures and the steps shown below to assemble this component.

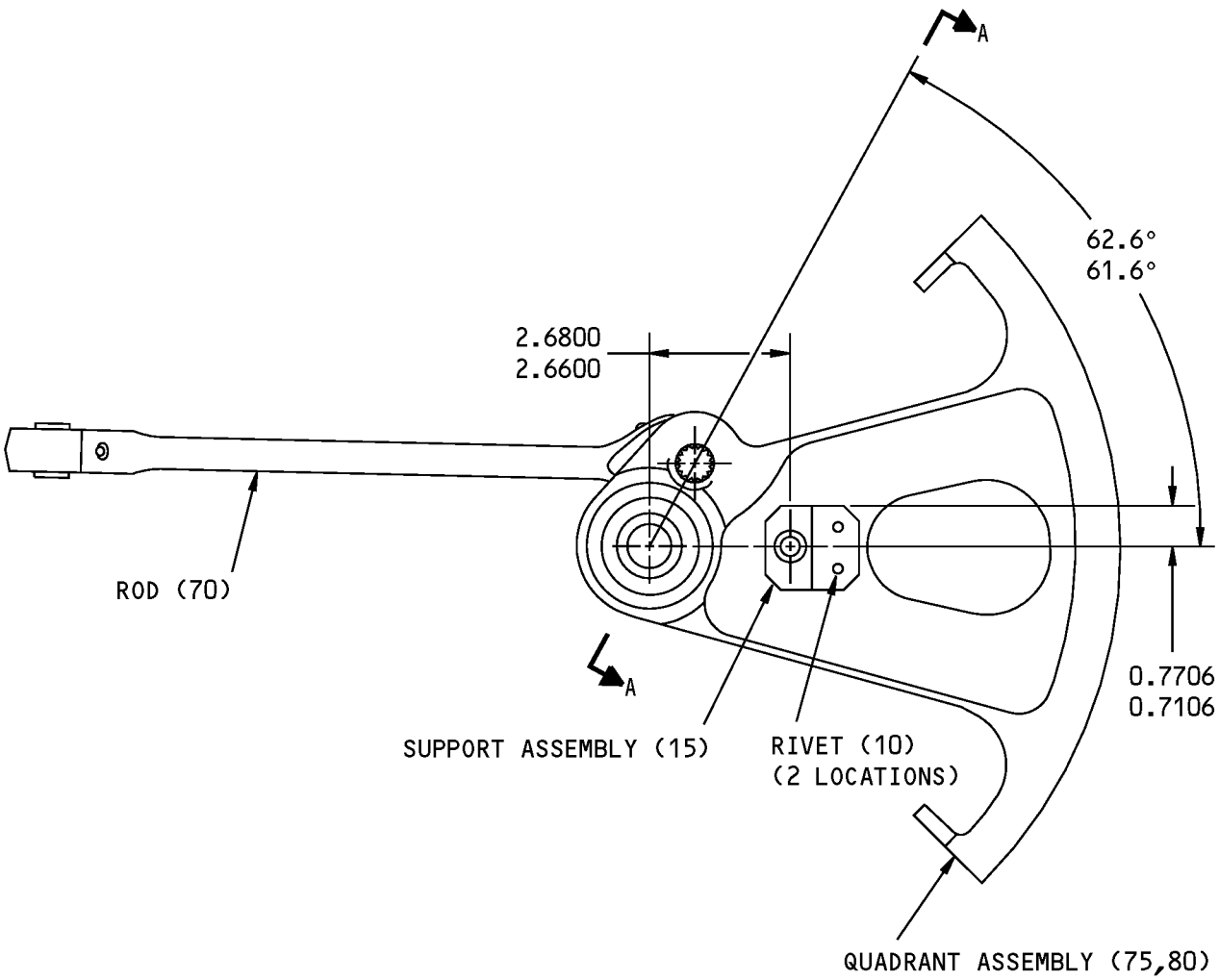
(2) Install one of the bearings (40) (SOPM 20-50-03) into the quadrant assembly (75, 80) using compound, C50056 as shown in ASSEMBLY, Figure 701. Do not swage this bearing.

(3) Install the bushing (45) (SOPM 20-50-03) into the quadrant assembly (75, 80), then install the other bearing (40) using sealant, A00247 as shown in ASSEMBLY, Figure 701. Swage the quadrant assembly (75, 80) over the bearing (SOPM 20-50-03).

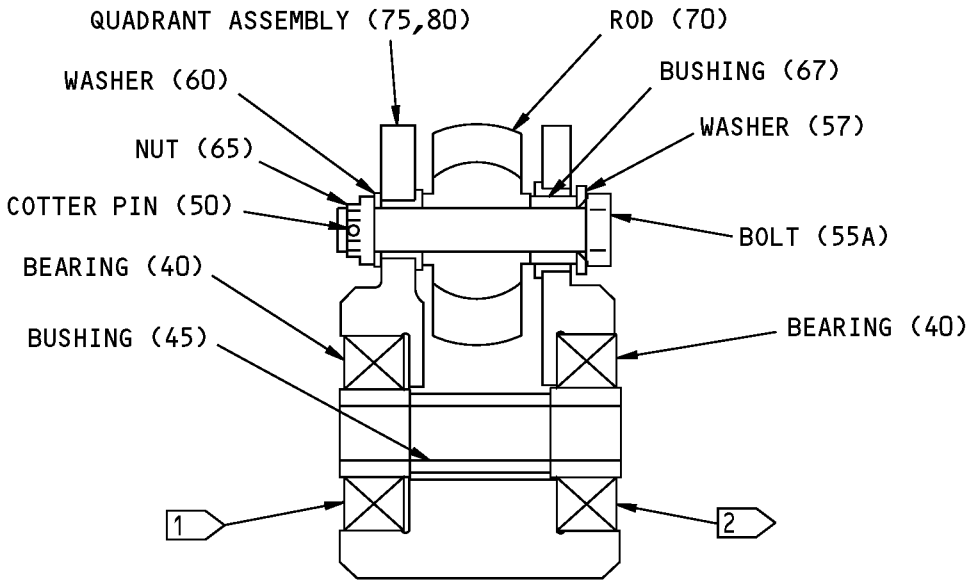
(4) Locate the support assembly (15) onto the quadrant assembly (75, 80) as shown in ASSEMBLY, Figure 701, then install the rivets (10).

(5) Install the rod (70) onto the quadrant assembly (75, 80) with the bolt (55A), washers (57, 60), bushing (67), and nut (65).

(6) Install the cotter pin (50) through the bolt (55A) and nut (65) (SOPM 20-50-02).



Assembly Details
Figure 701 (Sheet 1 of 2)



A-A

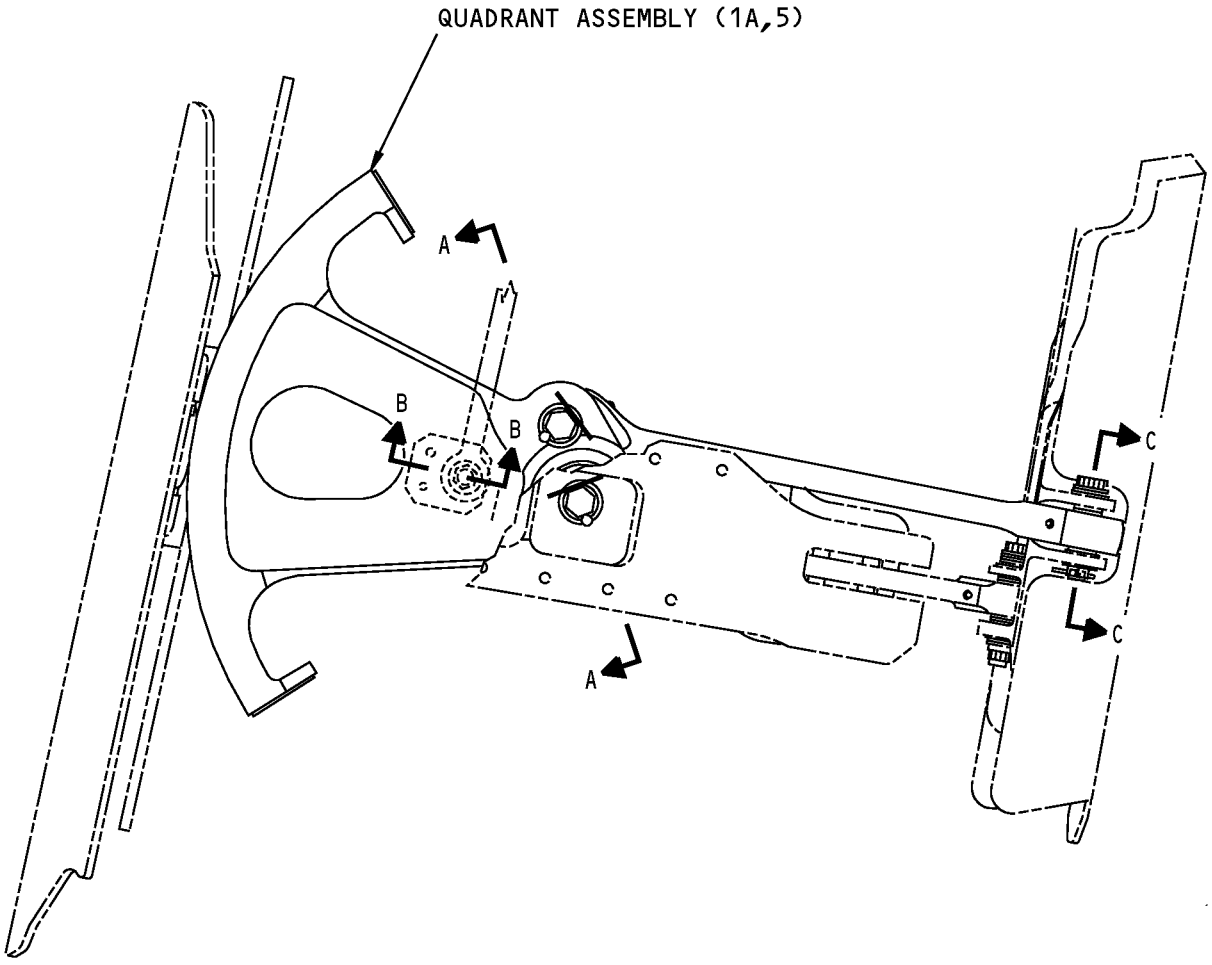
1 INSTALL THE BEARING (40) USING BMS 3-27. DO NOT SWAGE

2 INSTALL THE BEARING (40) USING BMS 5-95. ROLLER SWAGE THE QUADRANT ASSEMBLY (75,80) OVER THE BEARING (40)

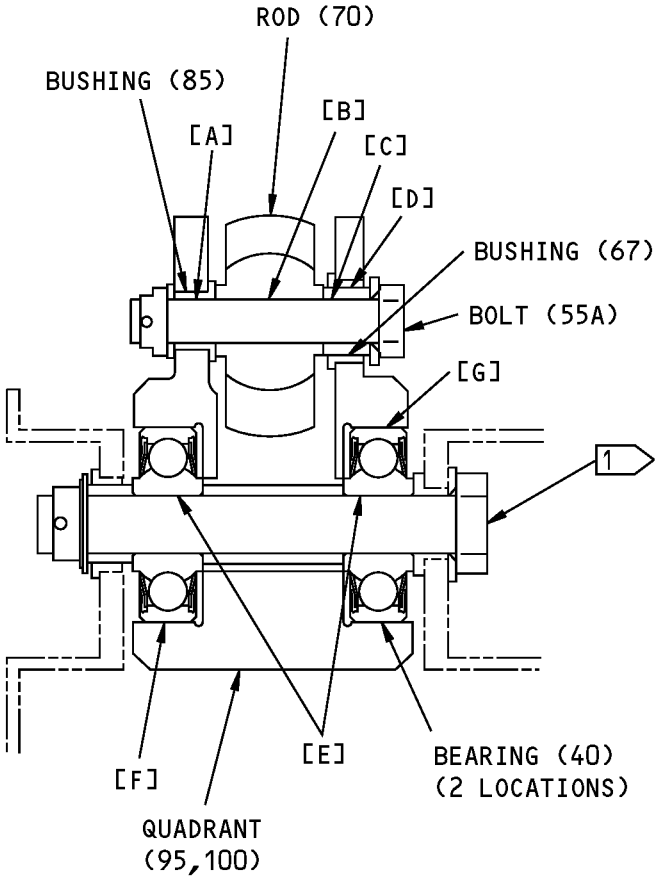
ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701 (Sheet 2 of 2)

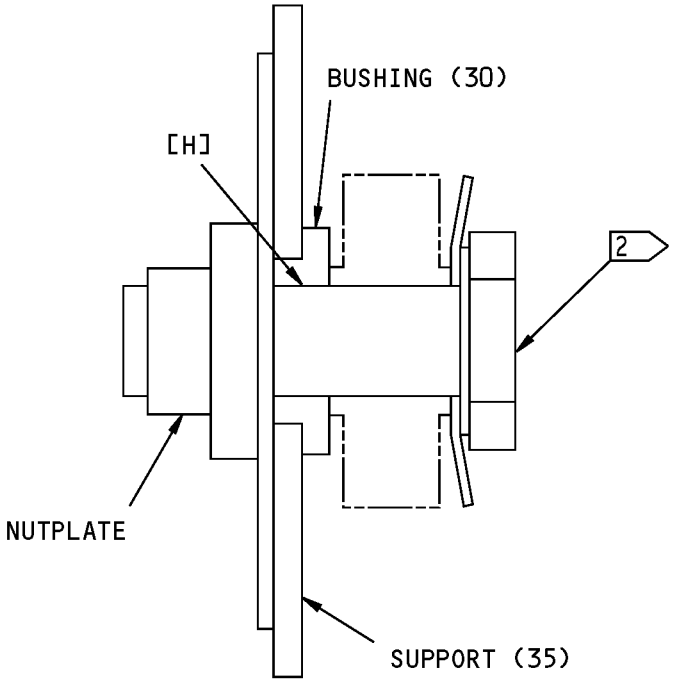


251A1111-1,-2 Fits and Clearances
Figure 801 (Sheet 1 of 4)

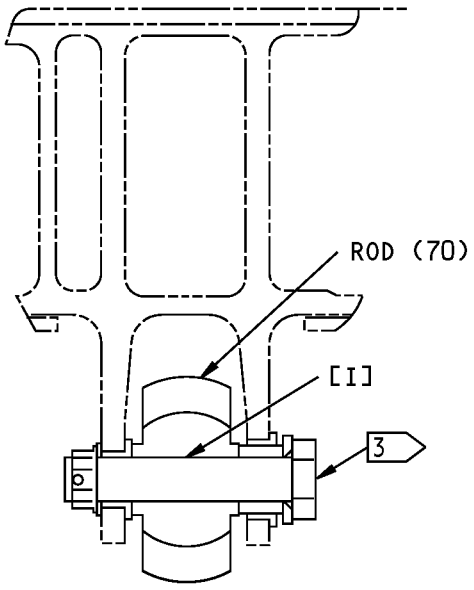


A–A

251A1111-1,-2 Fits and Clearances
Figure 801 (Sheet 2 of 4)



B–B



VIEW ROTATED 80° CLOCKWISE
C–C

ITEM NUMBERS REFER TO IPL FIG. 1

251A1111-1,-2 Fits and Clearances
Figure 801 (Sheet 3 of 4)

REF LETTER	REF IPL FIG. 1, MATING ITEM NO.	DESIGN DIMENSION*				SERVICE WEAR LIMIT*		
		DIMENSION		ASSEMBLY CLEARANCE		DIMENSION		MAXIMUM CLEARANCE
		MIN	MAX	MIN	MAX	MIN	MAX	
[A]	ID 85 OD 55A	0.3750 0.3735	0.3756 0.3745	0.0005	0.0021	– – X.XXXX	X.XXXX – –	X.XXXX
[B]	ID 70 OD 55A	X.XXXX 0.3735	X.XXXX 0.3745	X.XXXX	X.XXXX	– – X.XXXX	X.XXXX – –	X.XXXX
[C]	ID 67 OD 55A	0.3750 0.3735	0.3755 0.3745	0.0005	0.0020	– – X.XXXX	X.XXXX – –	X.XXXX
[D]	ID 90 OD 67	0.5620 0.5610	0.5627 0.5615	0.0005	0.0017	– – X.XXXX	X.XXXX – –	X.XXXX
[E]	ID 40 OD 1	0.4997 0.4985	0.5000 0.4995	0.0002	0.0015	– – X.XXXX	X.XXXX – –	X.XXXX
[F]	ID 95,100 OD 40	1.6877 1.6871	1.6883 1.6875	0.0002	0.0012	– – X.XXXX	X.XXXX – –	X.XXXX
[G]	ID 95,100 OD 40	1.6875 1.6871	1.6880 1.6875	0.0000	0.0009	– – X.XXXX	X.XXXX – –	X.XXXX
[H]	ID 30 OD 2	0.2500 0.2485	0.2515 0.2495	0.0005	0.0030	– – X.XXXX	X.XXXX – –	X.XXXX
[I]	ID 70 OD 3	X.XXXX 0.4985	X.XXXX 0.4995	X.XXXX	X.XXXX	– – X.XXXX	X.XXXX – –	X.XXXX

*ALL DIMENSIONS ARE IN INCHES

1 INSTALLATION BOLT BACB30UU6K49D

2 INSTALLATION BOLT BACB30NR4K6

3 INSTALLATION BOLT BACB30UU6K24D

251A1111-1,-2 Fits and Clearances
Figure 801 (Sheet 4 of 4)

(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.

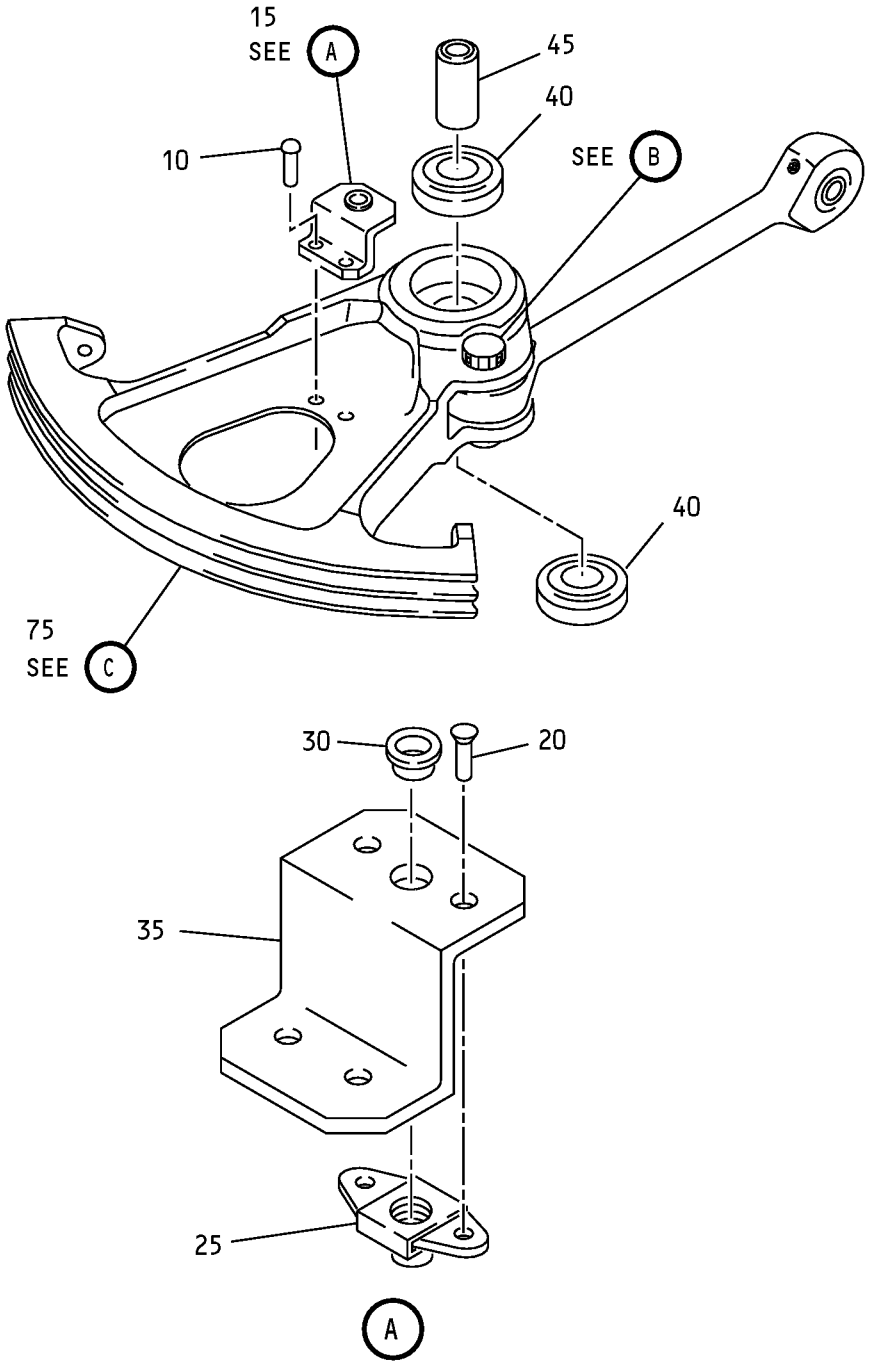
VENDOR CODES

Code	Name
11815	CHERRY AEROSPACE FASTENERS DIV OF TEXTRON 1224 EAST WARNER AVENUE PO BOX 2157 SANTA ANA, CALIFORNIA 92707-0157 FORMERLY IN LOS ANGELES, CALIF , FORMERLY CHERRY FASTENERS TOWNSEND DIV OF TEXTRON INC V71087
15653	ALCOA GLOBAL FASTENERS INC DIV KAYNAR PRODUCTS 800 S STATE COLLEGE BLVD FULLERTON, CALIFORNIA 92831-3001 FORMERLY VK6405 MICRODOT AEROSP LTD; FORMERLY KAYNAR TECH FORMERLY FAIRCHILD FASTENERS KAYNAR DIV
21335	TIMKEN US CORPORATION DIV FAFNIR 336 MECHANIC STREET LEBANON, NH 03766-0267 FORMERLY FAFNIR BRG AND TEXTRON INC FAFNIR DIV IN NEW BRITAIN, CONNECTICUT ; FORMERLY TORRINGTON CO THE SPECIAL PRODUCTS DIV SUB OF THE INGERSOLL-RAND CO V8D210 FORMERLY TORRINGTON CO FAFNIR BEARING DIV IN TORRINGTON, CT
40920	MPB MINIATURE PRECISION BEARING DIV PRECISION PARK PO BOX 547 KEENE, NEW HAMPSHIRE 03431 FORMERLY MPB CORP AND MINIATURE BRG DIV MPB CORP
52828	REPUBLIC FASTENER MFG CORP 1300 RANCHO CONEJO BLVD NEWBURY PARK, CALIFORNIA 91320-1405 FORMERLY IN SYLMAR, CALIFORNIA

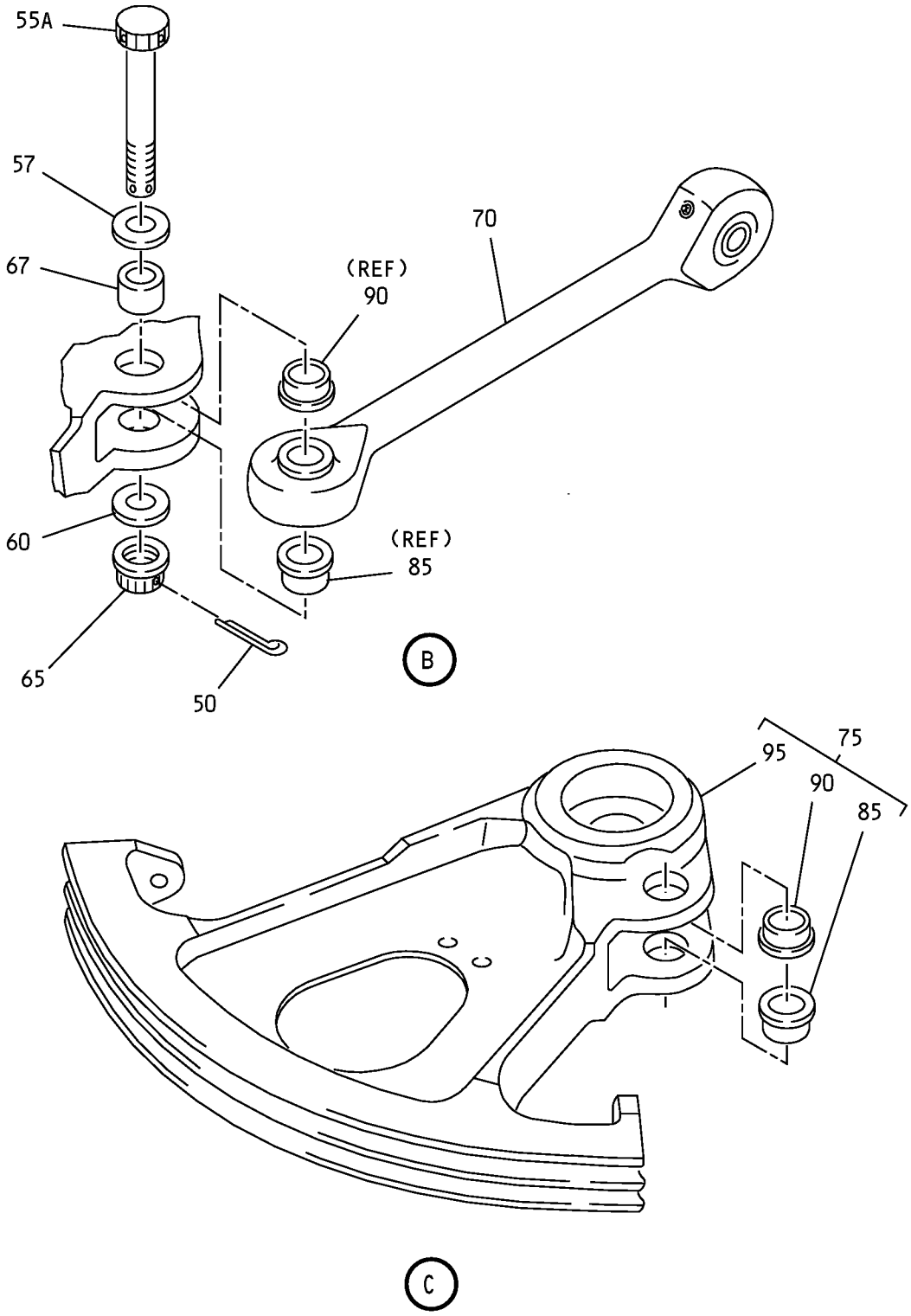
Code	Name
72962	HARVARD INDUSTRIES INC 3 WERNER WAY SUITE 210 LEBANON, NEW JERSEY 08833 FORMERLY ESNA V7A079 FORMERLY ELASTIC STOP NUT IN UNION, NJ
77896	REXNORD INC BEARING OPERATION 2400 CURTIS STREET DOWNERS GROVE, ILLINOIS 60515-4005 FORMERLY SHAEFER BEARING DIV REX CHAINBELT FORMERLY REX CHAINBELT INC BEARING DIV.
80539	SPS TECHNOLOGIES INC DIV AERPSOACE - SANTA ANA 2701 SOUTH HARBOR BOULEVARD SANTA ANA, CALIFORNIA 92704-5803 FORMERLY NUTT-SHEL DIV OF SPC WESTERN CO V80539 AND STANDARD PRESSED STEEL WESTERN DIV V17279
83086	NEW HAMPSHIRE BALL BEARING, INC HITECH DIVISION 172 JAFFREY ROAD PETERBOROUGH, NEW HAMPSHIRE 03458

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
102F9201-4		1	25	1
251A1111-1		1	1A	RF
251A1111-2		1	5	RF
251A1111-3		1	75	1
251A1111-4		1	80	1
251A1111-5		1	95	1
251A1111-6		1	100	1
251A1111-7		1	15	1
251A1111-8		1	35	1
ACMKP8P510LY198		1	40	2
BACB10FT8		1	40	2
BACB28AK06-41		1	67	1
BACB28AK08-122		1	45	1
BACB28AP06P029		1	85	1
BACB28AT09B024C		1	90	1
BACB28X4C006		1	30	1
BACB30UU6K27D		1	55A	1
BACN10JR4CFD		1	25	1
BACN11N106CD		1	65	1
BACP18BC03A10P		1	50	1
BACR15FT5D		1	10	2
BACR15GF3D		1	20	2
BACW10BN6AC		1	57	1
BRF200C4D		1	25	1
DDR6-184A1-501		1	70	1
K51602-4BAC		1	25	1
NAS1149D0663J		1	60	1
NS202476-048		1	25	1
PACMKP8A3908		1	40	2
SSMKP8P510LY86		1	40	2
SSMKP8SD705		1	40	2
T8092C428CD		1	25	1



Aileron Control Quadrant Assembly
IPL Figure 1 (Sheet 1 of 2)



Aileron Control Quadrant Assembly
IPL Figure 1 (Sheet 2 of 2)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1A	251A1111-1		QUADRANT ASSY-AIL. CONT	A	RF
–5	251A1111-2		QUADRANT ASSY-AIL. CONT	B	RF
10	BACR15FT5D		. RIVET (SIZE DETERMINED ON INST)		2
15	251A1111-7		. SUPPORT ASSY		1
20	BACR15GF3D		. . RIVET (SIZE DETERMINED ON INST)		2
25	BRF200C4D		. . NUTPLATE (V52828) (SPEC BACN10JR4CFD) (OPT K51602-4BAC (V15653)) (OPT NS202476-048 (V80539)) (OPT 102F9201-4 (V72962)) (OPT T8092C428CD (V11815))		1
30	BACB28X4C006		. . BUSHING		1
35	251A1111-8		. . SUPPORT		1
40	PACMKP8A3908		. BEARING (V21335) (SPEC BACB10FT8) (OPT SSMKP8P510LY86 (V83086)) (OPT ACMKP8P510LY198 (V40920)) (OPT SSMKP8SD705 (V83086))		2
45	BACB28AK08-122		. BUSHING		1
50	BACP18BC03A10P		. PIN-COTTER		1
55	BACB30UU6K26D		DELETED		
55A	BACB30UU6K27D		. BOLT		1
57	BACW10BN6AC		. WASHER		1
60	NAS1149D0663J		. WASHER		1
65	BACN11N106CD		. NUT		1
67	BACB28AK06-41		. BUSHING-PLAIN		1
70	DDR6-184A1-501		. ROD-BRG (V77896)		1
75	251A1111-3		. QUADRANT ASSY	A	1
–80	251A1111-4		. QUADRANT ASSY	B	1
85	BACB28AP06P029		. . BUSHING		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
90	BACB28AT09B024C		. . BUSHING		1
95	251A1111-5		. . QUADRANT	A	1
–100	251A1111-6		. . QUADRANT	B	1

–Item not Illustrated