COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

ELEVATOR BUS ASSEMBLY

PART NUMBER 251A2341–1, –2, –3

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COMPONENT MAINTENANCE MANUAL

Revision No. 8
Jul 01/2009

To: All holders of ELEVATOR BUS ASSEMBLY 27-37-20.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

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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	
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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.

ELEVATOR BUS ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The elevator bus assembly consists of a torque tube assembly and a crank assembly mounted at each end of the tube. The two crank assemblies are bolted at the center of the torque tube by eight bolts. The torque tube assembly is a dual load path.

2. Operation

A. The elevator bus assembly is part of the elevator controls system. Actuation of the control columns aft or forward will result in a torque transmitted from the power control unit to the torque tube, and subsequently to the elevator, moving it up or down.

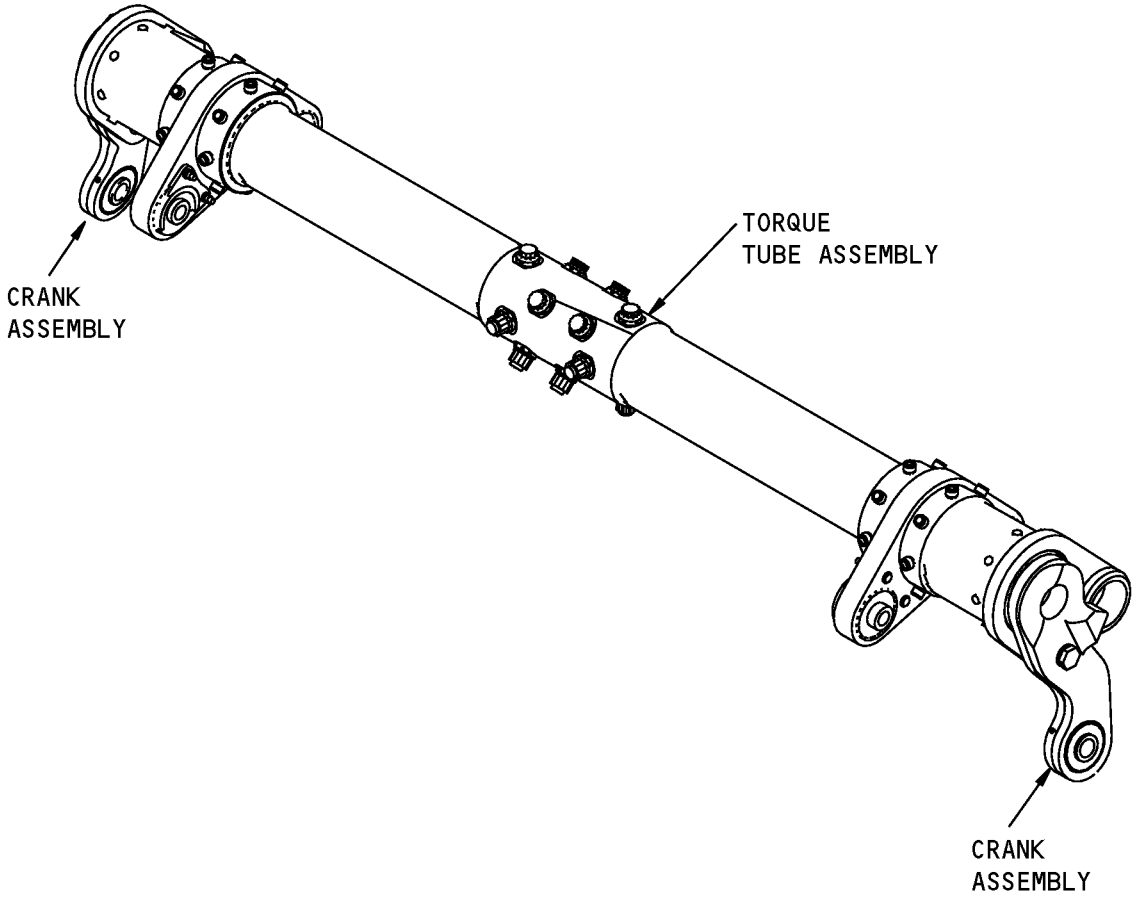
3. Leading Particulars (Approximate)

A. Length – 44 inches

B. Width – 6 inches

C. Height – 8 inches

D. Weight – 50 pounds



Elevator Bus Assembly
Figure 1

(NOT APPLICABLE)

DISASSEMBLY

1. General

A. This procedure has the data necessary to disassemble the elevator buss assembly.

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. Procedure

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

(2) Remove the nuts (20), washers (10, 15), and bolts (5).

(3) Remove the nut (40), washers (30, 35), bushing (45), and bolt (25).

(4) Remove the crank assemblies (50, 55).

(5) Remove the bushings (135).

(6) Remove the sleeves (85) and pins (120).

(7) Remove the cranks (100, 105, 110, 115).

(8) Separate the torque tubes (125, 130).

NOTE: Do not remove the bolt (185), collars (190), spacers (195), bushings (200), or end fittings (205, 210) unless repair or replacement is necessary.

(9) Remove the collars (145), bolts (140), and plates (150, 155).

(10) Remove the bearings (165, 170) and sleeves (160).

CLEANING

1. General

A. This procedure has the data necessary to clean the elevator buss assembly.

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 (60, 165, 170) as specified in SOPM 20-30-01.

(2) Use standard industry procedures and refer to SOPM 20-30-03 to clean all other parts.

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) 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 magnetic particle check (SOPM 20-20-01) of these parts:

(a) Sleeve (85)

(b) Crank (100, 105, 110, 115)

(c) Pin (120)

(d) Tube (125, 130)

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

(a) Plate (150, 155)

(b) End fitting (205, 210)

(c) Torque tube (225)

(d) Sleeve (220)

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
65-65309	CRANK ASSEMBLY	2-1
65-61751	TORQUE TUBE ASSEMBLY	3-1
65-61752	END FITTING	4-1
65-61750	TORQUE TUBE	5-1

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. 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 decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02.

(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
IPL Fig. 1		
Sleeve (85)	17-4PH CRES 180-200 KSI	Prepare surface and passivate (F-17.09).
Crank (100,105)	17-4PH CRES 180-200 KSI	Prepare surface and passivate (F-17.09).
Crank (110,115)	15-5PH CRES 180-200 KSI	Prepare surface and passivate (F-17.09).
Pin (120)	15-5PH CRES 180-200 KSI	Prepare surface and passivate (F-17.04).
Tube (125,130)	15-5PH CRES 180-200 KSI	Prepare surface and passivate (F-17.09).
Bushing (135)	Aluminum-Nickel-Bronze	Cadmium plate (F-15.06) all over, except plating in bushing bore is optional.

Table 601: Refinish Details (Continued)

IPL FIG. & ITEM	MATERIAL	FINISH
Plate (150, 155)	Al Alloy	Boric acid-sulfuric acid anodize or chromic acid anodize (F-17.31) and apply primer, C00259 (F-20.02), but no primer in bore. Apply colored chemical coating to holes for bolt (140).
Spacer (195)	Al Alloy	Colored film treat or chromic acid anodize and apply primer, C00259 (F-18.05) all over.
Sleeve (220)	Aluminum-Bronze-Alloy	Cadmium plate (F-4.201) on exterior surface only.

CRANK ASSEMBLY - REPAIR 2-1

65-65309–33, –34, –39, –40

1. General

A. This procedure has the data necessary to repair the crank assembly (50, 55).

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. Bearing/Sleeve Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. References

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

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

(1) Remove the bearing (60) from the sleeve (70A).

(2) Remove the sleeve (70A) from the cranks (100, 105, 110, 115).

(3) Machine housing to remove damage or corrosion. Passivate bearing bore (F-17.25) or abrasive clean (F-18.12) except protect lubrication bore during application.

(4) Roller swage the replacement sleeve (70A) in the cranks (100, 105, 110, 115) (SOPM 20-50-03). Install the replacement bearing (60) in the sleeve (70A) and roller swage (SOPM 20-50-03).

(5) Install sleeve (70B) and replacement bearing (60) with grease, D00633 and roller swage over both housing and bearing (SOPM 20-50-03).

(6) Make sure the maximum breakout torque for the bearing does not exceed 2.0 inch-lbs.

3. Lube Fitting Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. References

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

C. Procedure

(1) Remove the lube fitting (65A).

(2) Install new lube fitting (65A) (SOPM 20-50-03).

(3) After bearing installation, apply grease, D00633 to lube fitting until grease, D00633 appears at inner race of bearing.

4. Crank Replacement

A. Procedure

(1) Remove the cranks (100, 105, 110, 115) from the torque tube (130).

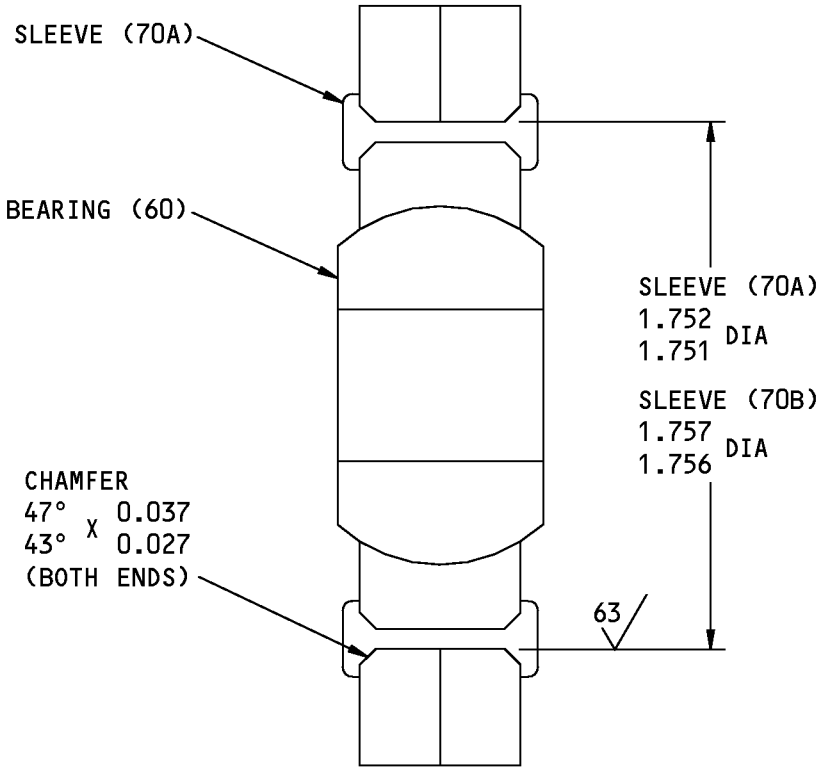
(2) Install new cranks and drill holes as shown in ASSEMBLY, Figure 701.

5. Tube Replacement

A. Procedure

(1) Remove the torque tubes (125, 130) from the torque tube assembly (90, 95).

(2) Install new tubes and drill holes as shown in ASSEMBLY, Figure 701.



CRANK ASSEMBLY (50,55)

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Crank Assembly
Figure 601

TORQUE TUBE ASSEMBLY - REPAIR 3-1

65-61751–6

1. General

A. This procedure has the data necessary to repair the torque tube assembly (175).

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. End Fitting Replacement

A. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION

B. Procedure

NOTE: For bolt and nut installation, refer to SOPM 20-50-01.

(1) Remove the rivets (180), bolts (185), and collars (190).

(2) Remove the end fittings (205, 210) from the torque tube assembly (215).

(3) Install new end fittings (205, 210) on torque tube assembly (215). Make sure to align bearing holes in end fittings within 0.005 inch.

(4) Drill holes in new end fitting (205, 210) as shown in ASSEMBLY, Figure 701.

(5) Install rivets (180), bolts (185), and collars (190).

3. Sleeve Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A01070	Adhesive - Polyamide	BAC5010, Type 38

B. References

Reference	Title
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

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

(1) Remove the sleeve (220) from the torque tube (225).

(2) Install the new sleeve (220) into the torque tube (225) with adhesive, A01070.

(3) Drill new holes as shown in ASSEMBLY, Figure 701.

END FITTING - REPAIR 4-1

65-61752–7, –8

1. General

A. This procedure has the data necessary to refinish the end fitting (205, 210).

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. End Fitting 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

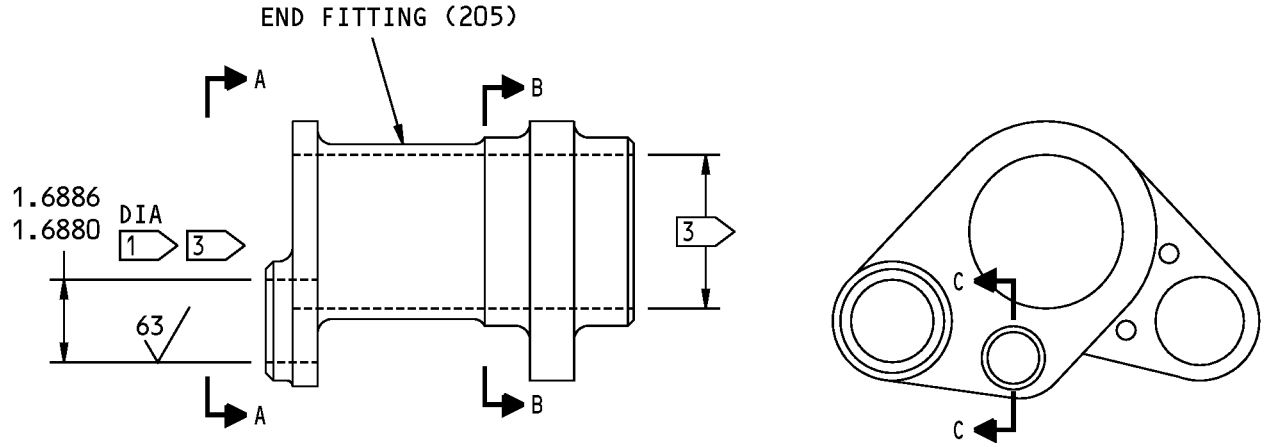
Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure

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

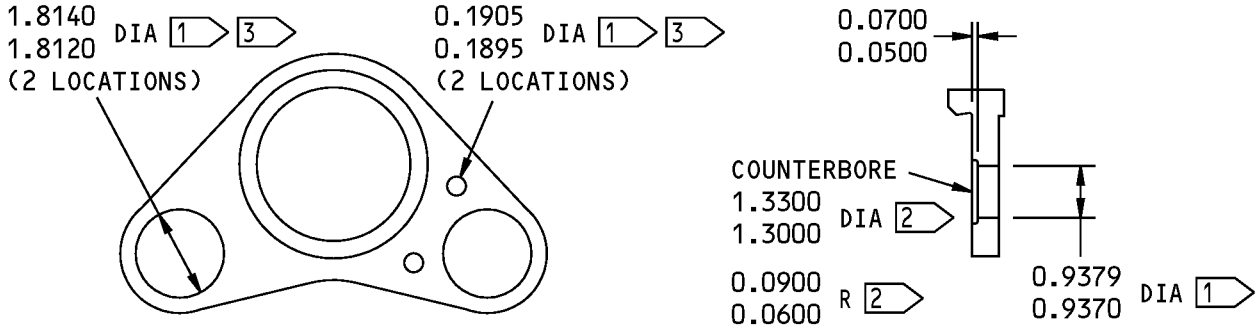
(1) Chromic acid anodize and apply primer, C00259 (F-18.13) except as noted in REPAIR 4-1, Figure 601.

(2) Apply colored chemical coating (F-17.10) or apply chemical treatment and apply primer, C00259 (F-18.01) as noted in REPAIR 4-1, Figure 601.



65-61752-7 SHOWN
65-61752-8 OPPOSITE

A-A



B-B

C-C

1 APPLY COLORED CHEMICAL COATING ON THIS SURFACE

2 APPLY FINISH (F-18.01) TO THIS SURFACE

3 NO PRIMER ON THIS SURFACE

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

65-61752-7,-8 End Fitting Refinish
Figure 601

TORQUE TUBE - REPAIR 5-1

65-61750–1

1. General

A. This procedure has the data necessary to refinish the torque tube (225).

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.

D. General repair details:

(1) Material: Aluminum alloy

2. Torque Tube Refinish

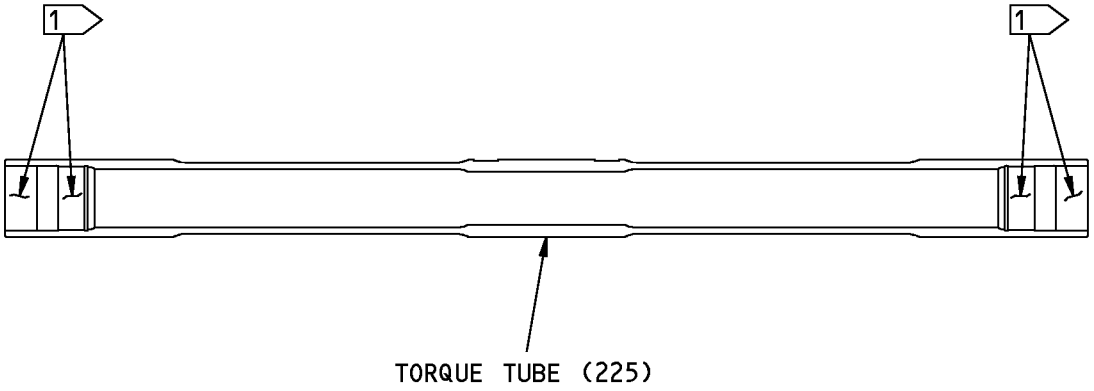
A. Consumable Materials

NOTE: Equivalent substitutes may be used.

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

B. Procedure

(1) Colored film chemical treat and apply primer, C00259 (F-18.07) except as noted in REPAIR 5-1, Figure 601.



1 NO PRIMER ON THIS SURFACE

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

65-61750-1 Torque Tube Refinish
Figure 601

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the elevator bus assembly.

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

B. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

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

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

(2) Install the sleeves (160) in the end fittings (205, 210).

(3) Install the bearings (165, 170) in the sleeves (160) and roller swage (SOPM 20-50-03). Make sure the maximum breakout torque for the bearing does not exceed 0.50 inch-pound.

(4) Install the plates (150, 155) on the end fittings (205, 210), with the bolts (140) and the collars (145) as shown in ASSEMBLY, Figure 701.

NOTE: If new end fittings (205, 210) are installed, drill new holes as shown in ASSEMBLY, Figure 701.

(5) Insert the torque tube (125) into torque tube (130).

(6) Install the cranks (100, 105, 110, 115) on the torque tube (130).

(7) Install the pins (120) in the cranks (100, 105, 110, 115) using the shrink fit procedure (SOPM 20-50-03). Make sure the pins do not extend past the cranks (100, 105) at either end.

NOTE: If new torque tubes (125, 130) or cranks (100, 105, 110, 115) are installed, drill new pin holes as shown in ASSEMBLY, Figure 701.

CAUTION: OUTSIDE DIAMETER OF SLEEVE (85) MUST BE WITHIN THE LIMITS SHOWN IN FIG. 701 OR DAMAGE TO BUSHING LINERS MAY RESULT.

(8) Install the sleeves (85) over the cranks (100, 105) (SOPM 20-50-03).

NOTE: If new sleeves (85) are installed, machine outside diameter as shown in ASSEMBLY, Figure 701.

(9) Install the bushings (135) in the end fittings (205, 210) with sealant, A00247 using the shrink-fit procedure (SOPM 20-50-03).

(10) Install the crank assemblies (50, 55) in the torque tube assembly (175).

(11) Apply finish to bolt (5) holes as noted in ASSEMBLY, Figure 701.

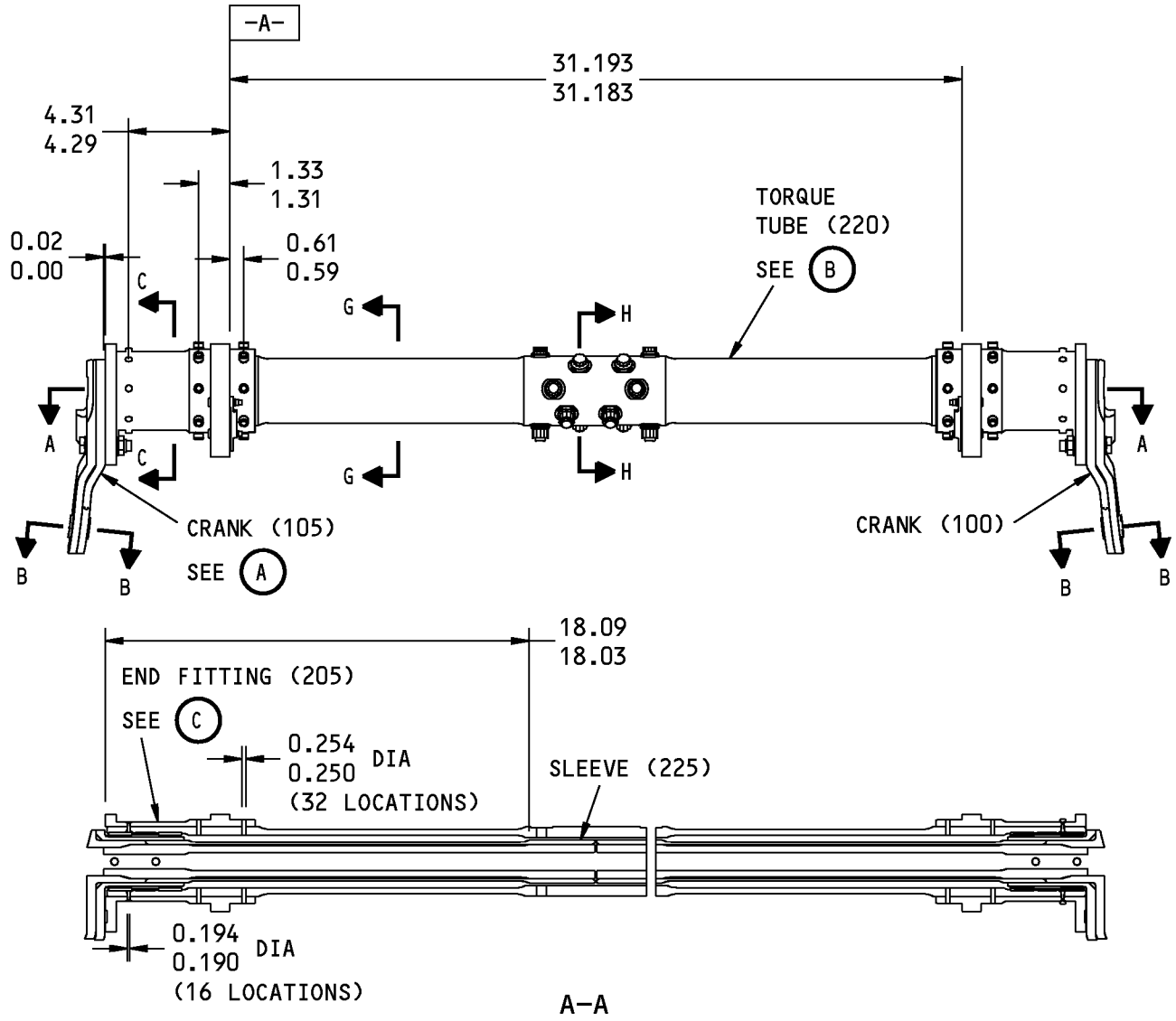
(12) Install the bolts (5), washers (10), and nuts (20). Tighten the nuts (20) to 100-130 inch-pounds.

NOTE: If new sleeve (220) or torque tube (225) is installed, drill new holes as shown in ASSEMBLY, Figure 701.

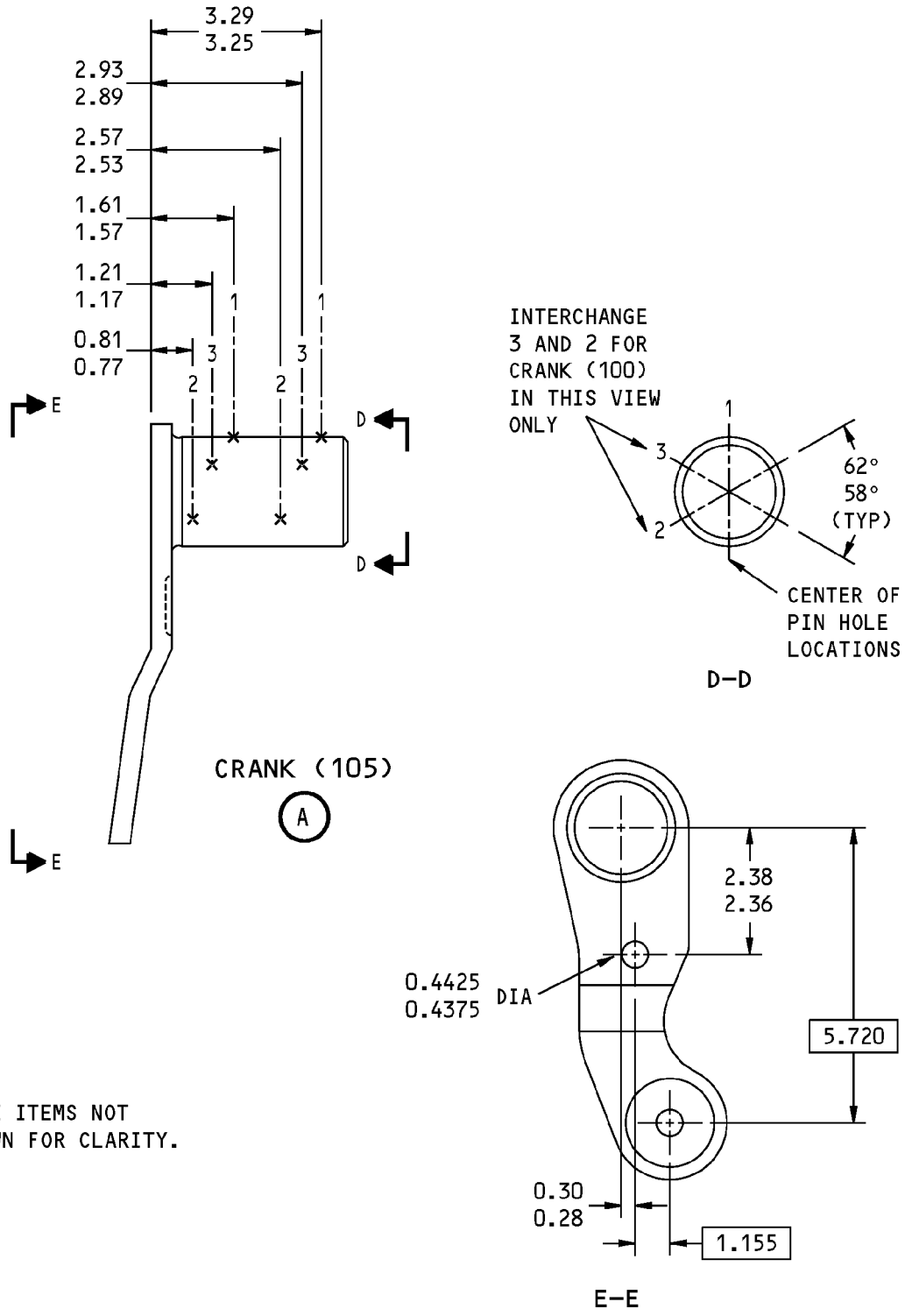
(13) Insert the bolts (25) through the cranks (100, 105, 110, 115) and end fittings (205, 210).

(14) Install the bushing (45) on the bolt (25) with sealant, A00247 using the shrink-fit procedure.

(15) Install the washer (35) and the nut (40) on the bolt (25).

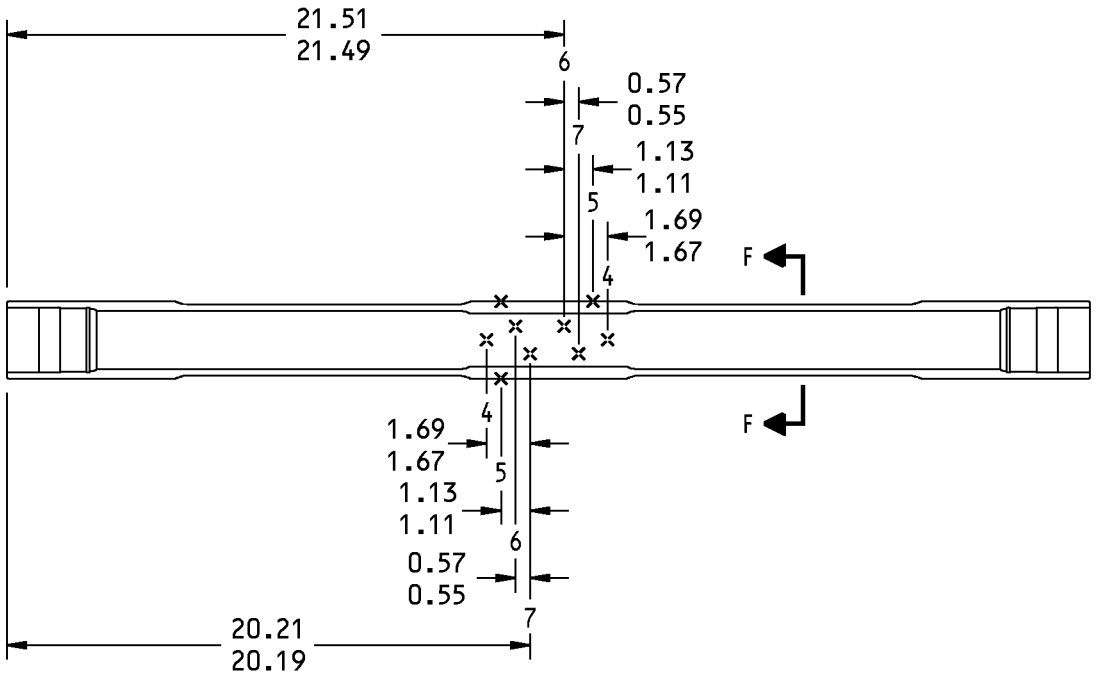


Assembly Details
Figure 701 (Sheet 1 of 5)



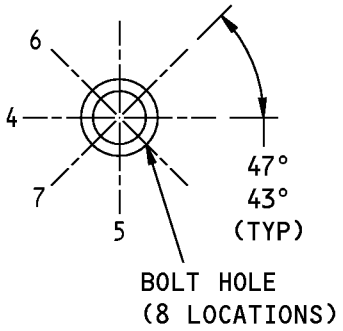
NOTE: SOME ITEMS NOT SHOWN FOR CLARITY.

Assembly Details
Figure 701 (Sheet 2 of 5)

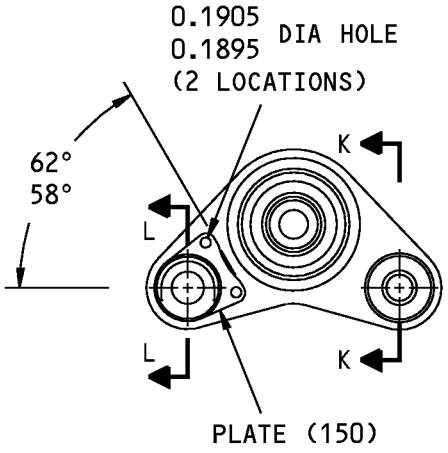


TORQUE TUBE (225)

B

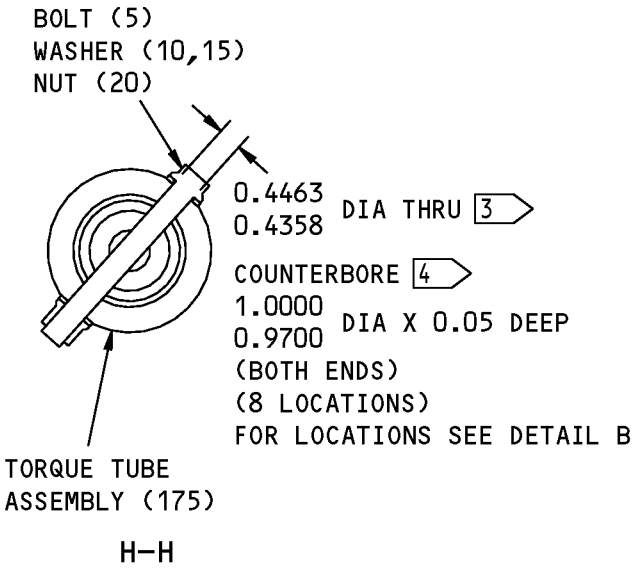


F–F

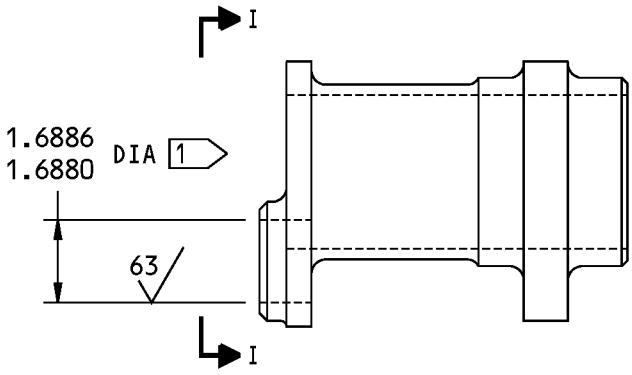


G–G

Assembly Details
Figure 701 (Sheet 3 of 5)

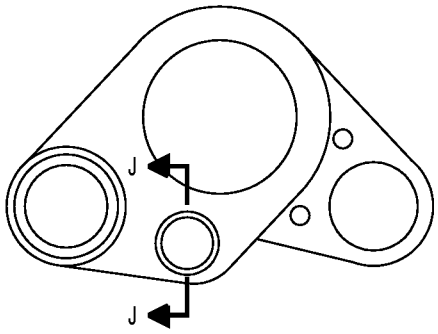


H-H

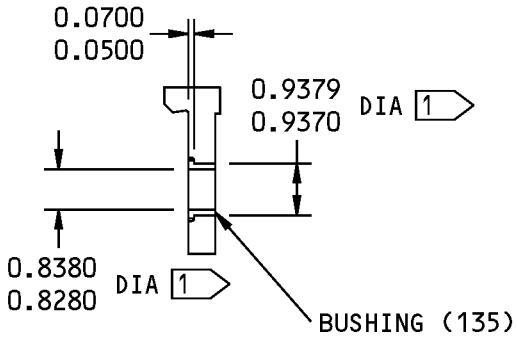


END FITTING (205)

C

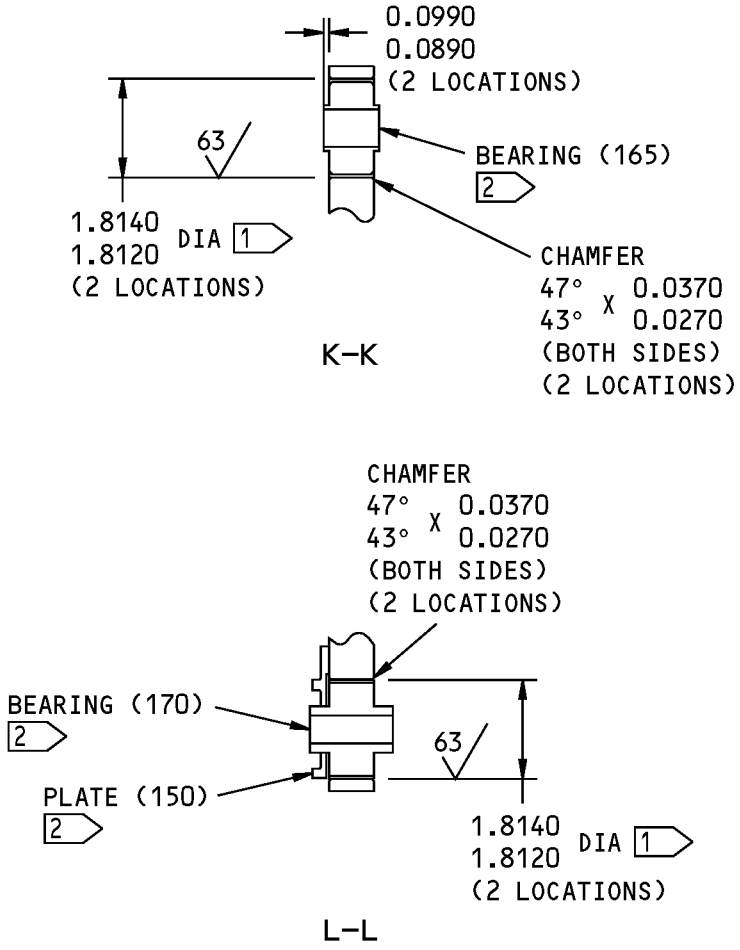


I-I



J-J

Assembly Details
Figure 701 (Sheet 4 of 5)



1 DIAMETERS CONCENTRIC WITHIN 0.005 FULL INDICATOR MOVEMENT

2 BORES CONCENTRIC WITHIN 0.010 DIAMETER

3 COLORED CHEMICAL COAT (F-17.10) THIS SURFACE

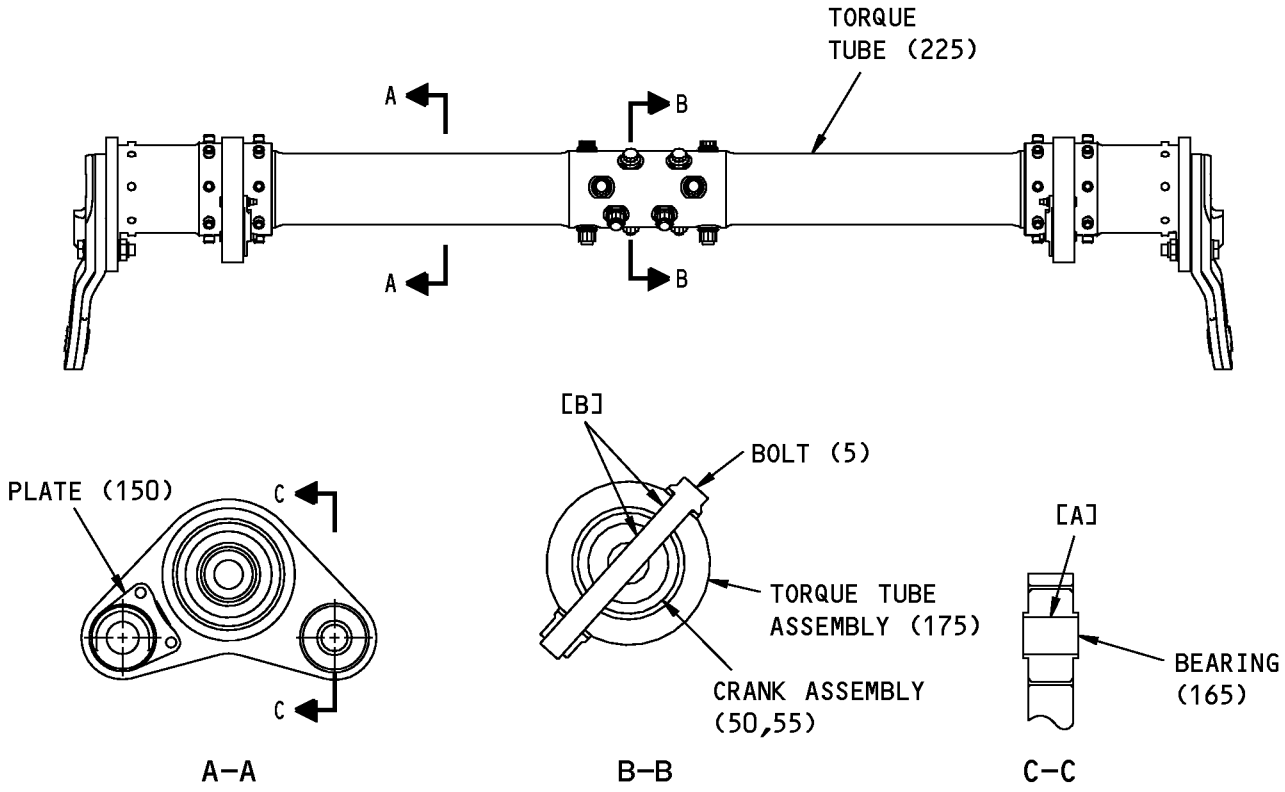
4 COLORED CHEMICAL COAT AND APPLY ONE COAT OF BMS 10-11, TYPE 1 PRIMER (F-18.01) THIS SURFACE

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701 (Sheet 5 of 5)

FITS AND CLEARANCES



REF LETTER	REF IPL FIG. 1, MATING ITEM NO.	DESIGN DIMENSION*				SERVICE WEAR LIMIT*		
		DIMENSION		ASSEMBLY CLEARANCE 1		DIMENSION		MAXIMUM CLEARANCE
		MIN	MAX	MIN	MAX	MIN	MAX	
[A]	ID 165	0.6245	0.6250	0.0005	0.0020			
	OD 2	0.6230	0.6240					
[B]	ID 50,55,175	0.4358	0.4363	-0.0012	-0.0002			
	OD 5	0.4365	0.4370					

* ALL DIMENSIONS ARE IN INCHES

1 NEGATIVE VALUES INDICATE INTERFERENCE FIT

2 INSTALLATION PART

Fits and Clearances
Figure 801

(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
06710	LAMSON AND SESSIONS CO THE VALLEY-TODECO 12975 BRADLEY AVENUE SYLMAR, CALIFORNIA 91342-3830 FORMERLY VALLEY BOLT CORP VB0097 IN NORTH HOLLYWOOD, CA
06725	AIR INDUSTRIES CORPORATION 12570 KNOTT STREET GARDEN GROVE, CALIFORNIA 92641-3932 FORMERLY AIR INDUSTRIES OF CALIF IN GARDENA, CALIF.
06950	SCREWCORP VSI AEROSPACE PRODUCTS DIV FAIRCHILD IND DIV 13001 EAST TEMPLE AVENUE PO BOX 730 CITY OF INDUSTRY, CALIFORNIA 91746-1417 FORMERLY VB0096 AND VSI CORP SCREWCORP DIV FORMERLY IN CULVER CITY, CALIFORNIA SCREW CORP SEE V.S.I. CORP SCREWCORP DIVISION
09455	RBC TRANSPORT DYNAMICS CORP 3131 W SEGERSTROM AVE SANTA ANA, CALIFORNIA 92704-5872 FORMERLY TRANSPORT DYNAMICS AEROSPACE DIV; FABROID DIV TRANSPORT DYNAMICS V17571 & LEAR SEIGLER INC TRANSPORT DIV V98076; FORMERLY BFM TRANSPORT DYNAMICS
0PTK6	SPS TECHNOLOGIES INC AEROSPACE PRODUCTS DIV 5195 W 4700 SALT LAKE CITY, UTAH 94118 SEE V56878 SPS TECHNOLOGIES INC

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
15860	NEW HAMPSHIRE BALL BEARINGS, INC ASTRO DIVISION 155 LEXINGTON AVENUE LACONIA, NEW HAMPSHIRE 03246-2937 FORMERLY ASTRO BEARING CORP, LOS ANGELES, CALIF.
17446	HUCK INTL INC AEROSPACE FASTENER DIV 900 WATSON CENTER ROAD CARSON, CALIFORNIA 90745-4201 FORMERLY V32134 REXNORD INC; FORMERLY V97928 HUCK INTL
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
27238	BRISTOL INDUSTRIES 630 EAST LAMBERT ROAD PO BOX 630 BREA, CALIFORNIA 92621-4119
56878	SPS TECHNOLOGIES INC AEROSPACE AND INDUSTRIAL PRODUCTS DIV 301 HIGHLAND AVE JENKINTOWN, PENNSYLVANIA 19046 FORMERLY STANDARD PRESSED STEEL FORMERLY IN SALT LAKE, UTAH

Code	Name
5M902	ALCOA GLOBAL FASTENERS INC, DIV OF VOI-SHAN PRODUCTS 3000 W LOMITA BLVD TORRANCE, CALIFORNIA 90505-5103 FORMERLY FAIRCHILD INC INC FAIRCHILD AEROSPACE FASTENERS DIV
60516	WEST COAST AEROSPACE INC 812 MIRAFLORES STREET SAN PEDRO, CALIFORNIA 90731-1439
62554	SIMMONDS MECAERO FASTENERS INC 1734 SEQUOIA AVENUE ORANGE, CALIFORNIA 92668
72962	HARVARD INDUSTRIES INC 3 WERNER WAY SUITE 210 LEBANON, NEW JERSEY 08833 FORMERLY ESNA V7A079 FORMERLY ELASTIC STOP NUT IN UNION, NJ
73134	ROLLER BEARING COMPANYOF AMER DBA HEIM BEARINGS DIV 60 ROUND HILL RD FAIRFIELD, CONNECTICUT 06430-0000 FORMERLY INCOM INTL HEIM DIV; HEIM UNIVERSAL CORP INCOM; FORMERLY HEIM DIV INCOM INTL; IMO IND HEIM BEARINGS DIV
73197	HI-SHEAR TECHNOLOGY CORP 2600 SKYPARK DRIVE TORRANCE, CALIFORNIA 90509
77896	REXNORD INC BEARING OPERATION 2400 CURTIS STREET DOWNERS GROVE, ILLINOIS 60515-4005 FORMERLY SHAEFER BEARING DIV REX CHAINBELT FORMERLY REX CHAINBELT INC BEARING DIV.
81376	SMITH ACQUISITION COMPANY 2240 BUENA VISTA BALDWIN PARK, CALIFORNIA 91706

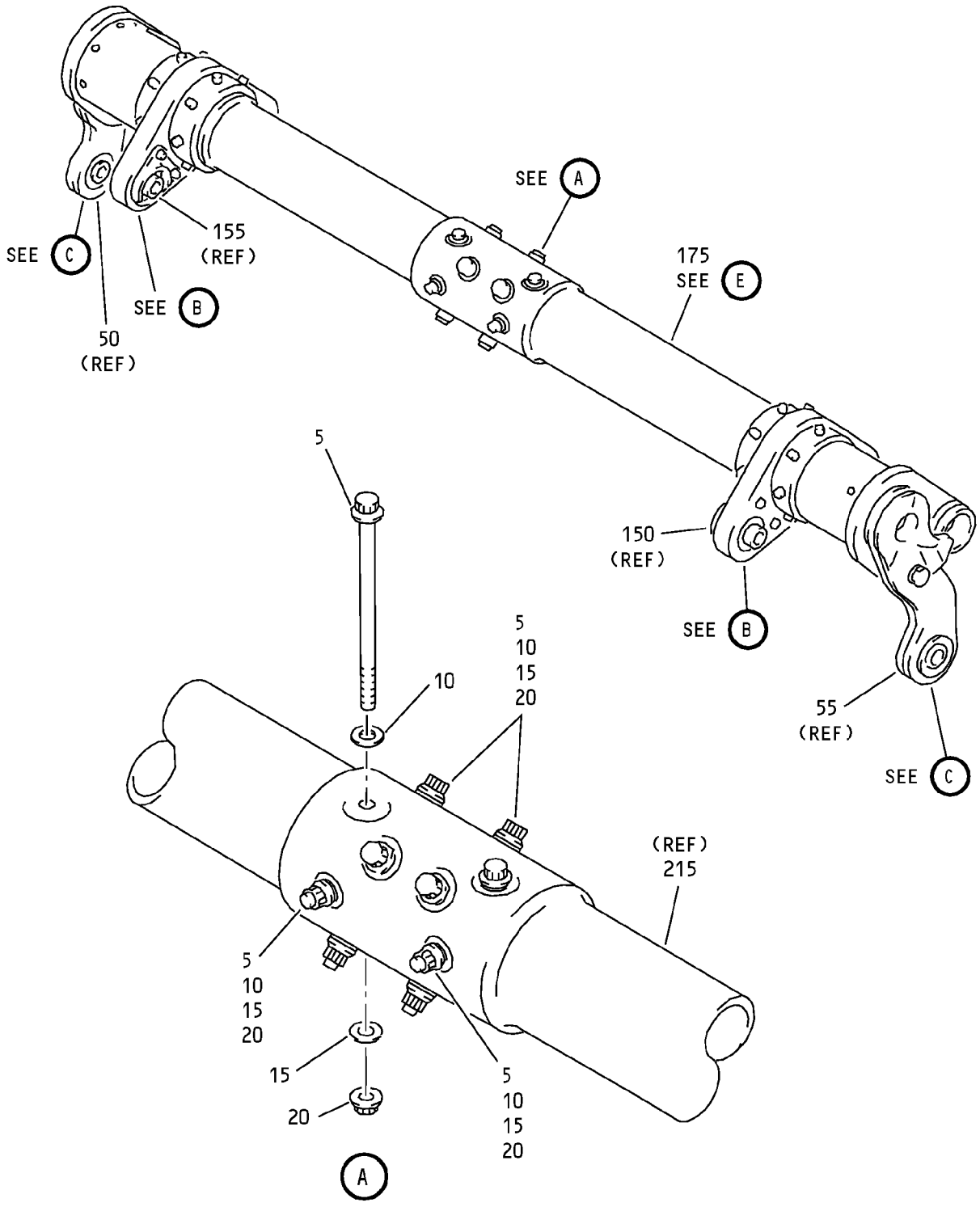
Code	Name
92215	FAIRCHILD IND INC FAIRCHILD AEROSPACE FASTENER DIV 3010 W LOMITA BLVD TORRANCE, CALIFORNIA 90505-5102 FORMERLY VOI-SHAN IN CULVER CITY, CALIF
97613	SARGENT CONTROLS & AEROSPACE/KAHR BEARING DIV 5675 W BURLINGAME RD TUCSON, ARIZONA 85743 FORMERLY AETNA STEEL PROD KAHR BEARING DIV V96579 FORMERLY SARGENT IND KAHR BEARING DIV, BURBANK, CALIFORNIA
97928	Replaced: [V97928] SEE V17446 HUCK INTL by Code: Name and Address below 17446: HUCK INTL INC AEROSPACE FASTENER DIV 900 WATSON CENTER ROAD CARSON, CALIFORNIA 90745-4201 FORMERLY V32134 REXNORD INC; FORMERLY V97928 HUCK INTL
9N513	VOI SHAN/CHATSWORTH DIV OF VSI CORP SUB OF FAIRCHILD IND CHATSWORTH, CALIFORNIA 91311-5013 COMPANY NO LONGER WISHES TO BE CONSIDERED FOR FED CONTRCTG
S0352	NIPPON MINIATURE BEARING CO LTD TOKYO, JAPAN

NUMERICAL INDEX

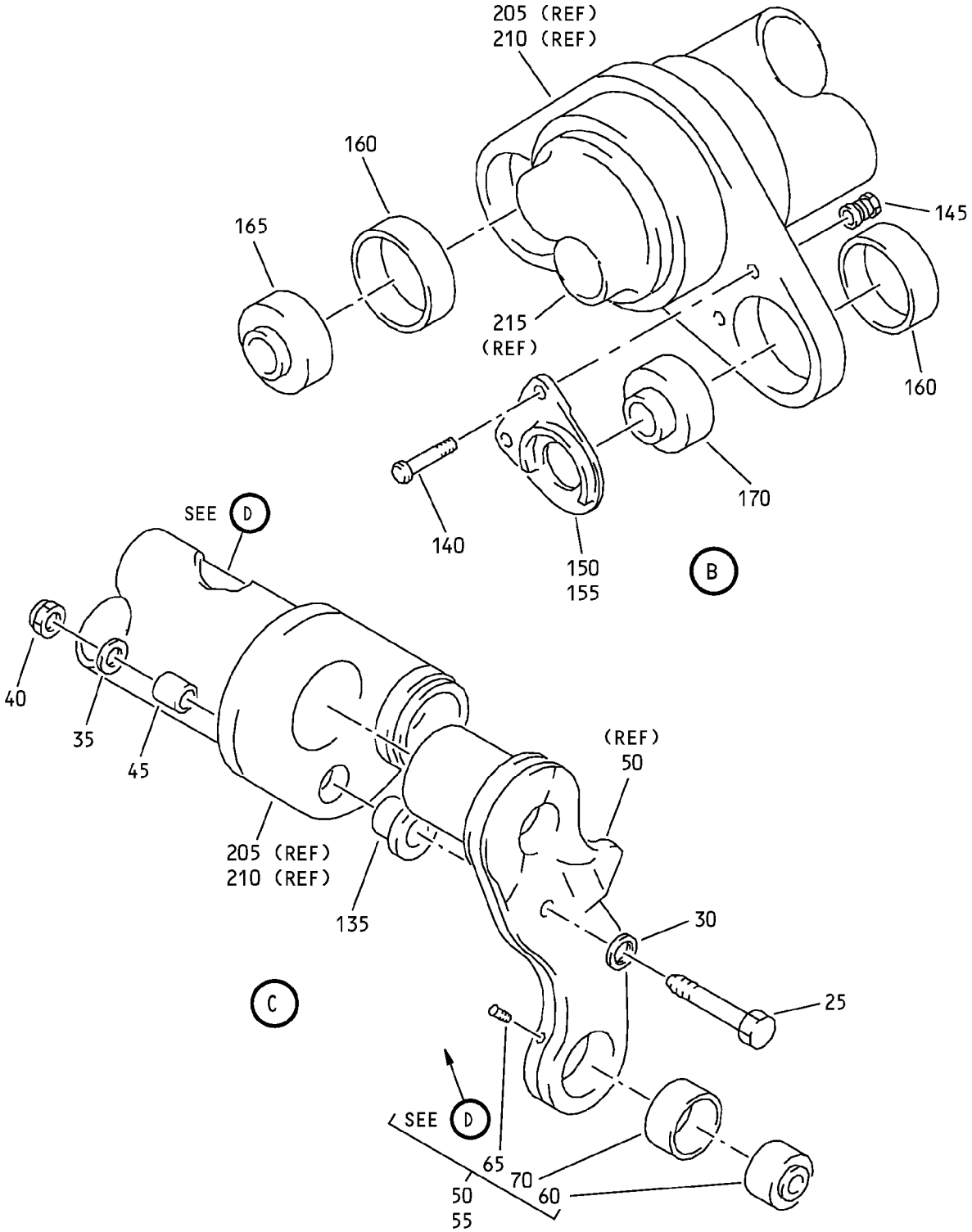
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
10-60516-53		1	200	4
10-60516-53A		1	200A	4
102LH9031-7		1	20	8
102LH90317		1	20	8
251A2341-1		1	1A	RF
251A2341-2		1	1B	RF
251A2341-3		1	1C	RF
251A2369-1		1	150	1
251A2369-2		1	155	1
2LPYDT08-11		1	185A	32
65-61750-1		1	225	1
65-61751-2		1	215	1
65-61751-6		1	175	1
65-61752-7		1	205	1
65-61752-8		1	210	1
65-61753-1		1	100	1
65-61753-2		1	105	1
65-65306-3		1	110	1
65-65306-4		1	115	1
65-65307-2		1	125	1
65-65308-2		1	130	1
65-65309-33		1	50	1
65-65309-34		1	55	1
65-65309-35		1	75	1
65-65309-36		1	80	1
65-65309-37		1	90	1
65-65309-38		1	95	1
65-65309-39		1	50A	1
65-65309-40		1	55A	1
67832CD7		1	20	8
67832CD720		1	20	8
69-38919-13		1	160	4
69-48962-1		1	220	1
69-50558-2		1	120	6

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-50559-1		1	85	1
69-50560-1		1	195	2
69-50563-1		1	45	2
69-63523-2		1	70A	1
69-63523-3		1	70B	1
69-78745-1		1	135	2
90238		1	200	4
AJ36A101		1	200	4
BACB30DX8-11		1	185A	32
BACB30DY6-8		1	180A	16
BACB30LE7U46		1	5	8
BACB30LJ7U23		1	25	2
BACB30NX6K16		1	140	4
BACC30BH6		1	145A	4
BACC30X6		1	145	4
BACN10HR7CD		1	20	8
BACN10JC7CM		1	40	2
BACN10YR7CM		1	40A	2
BACW10BP7CD		1	10	8
		1	30	2
BACW10BP7DP		1	15	8
BH00303CM7		1	20	8
BJC72TF78A32		1	200	4
BMN10HRCWD3-7		1	20	8
		1	20	8
BMN5024CWD37		1	20	8
CR60307		1	20	8
DAS10-26B1-502		1	60	1
DAS10-27A1-502		1	165	2
DAS8-27B1-502		1	170A	2
DAS8-27B7		1	170	2
DBA36-001		1	200	4
H51560-7		1	20	8
H52732-7CM		1	40A	2
HL1012AZ6-16		1	140	4

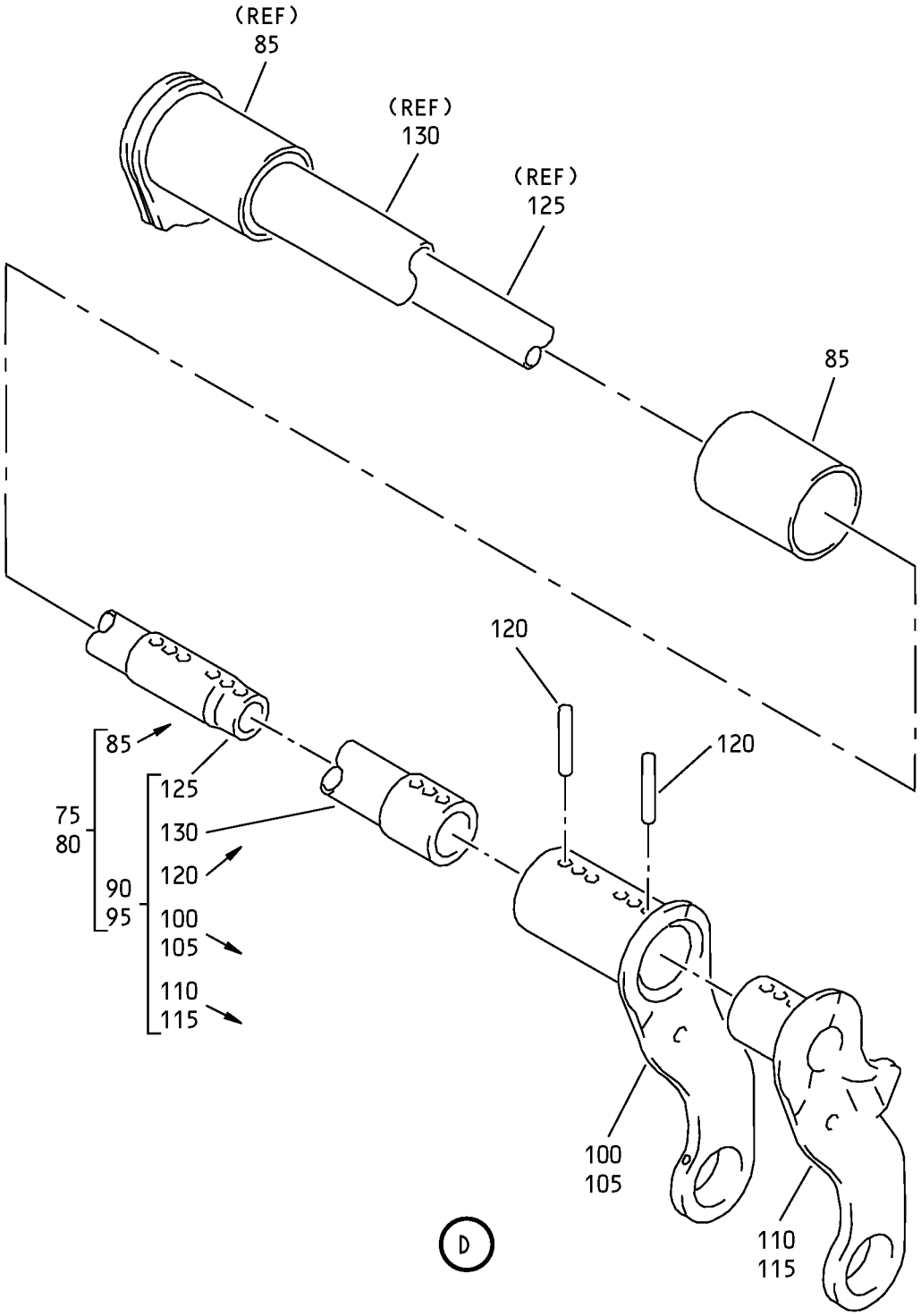
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		1	140	4
		1	140	4
		1	140	4
		1	140	4
		1	140	4
		1	140	4
		1	140	4
HL1087-6		1	145A	4
		1	145A	4
		1	145A	4
		1	145A	4
HL1187-6		1	145	4
		1	145	4
		1	145	4
		1	145	4
HL12VAZ6-16		1	140	4
		1	140	4
		1	140	4
HL87-6		1	145	4
		1	145	4
		1	145	4
KJN36-12		1	200	4
L802-6K16		1	140	4
NAS1080-06		1	187	16
NAS1080-08		1	190A	32
NAS1149C0716R		1	35	2
NAS516-1A		1	65A	1
NAS77A12-038P		1	135A	2
NH36-201A		1	200	4
PBE36A32NE		1	200A	4
PBR36A32NE		1	200	4
PLH57CM		1	40A	2
SL7108C7		1	20	8
VCU0005D7		1	20	8
YTS175A		1	200	4



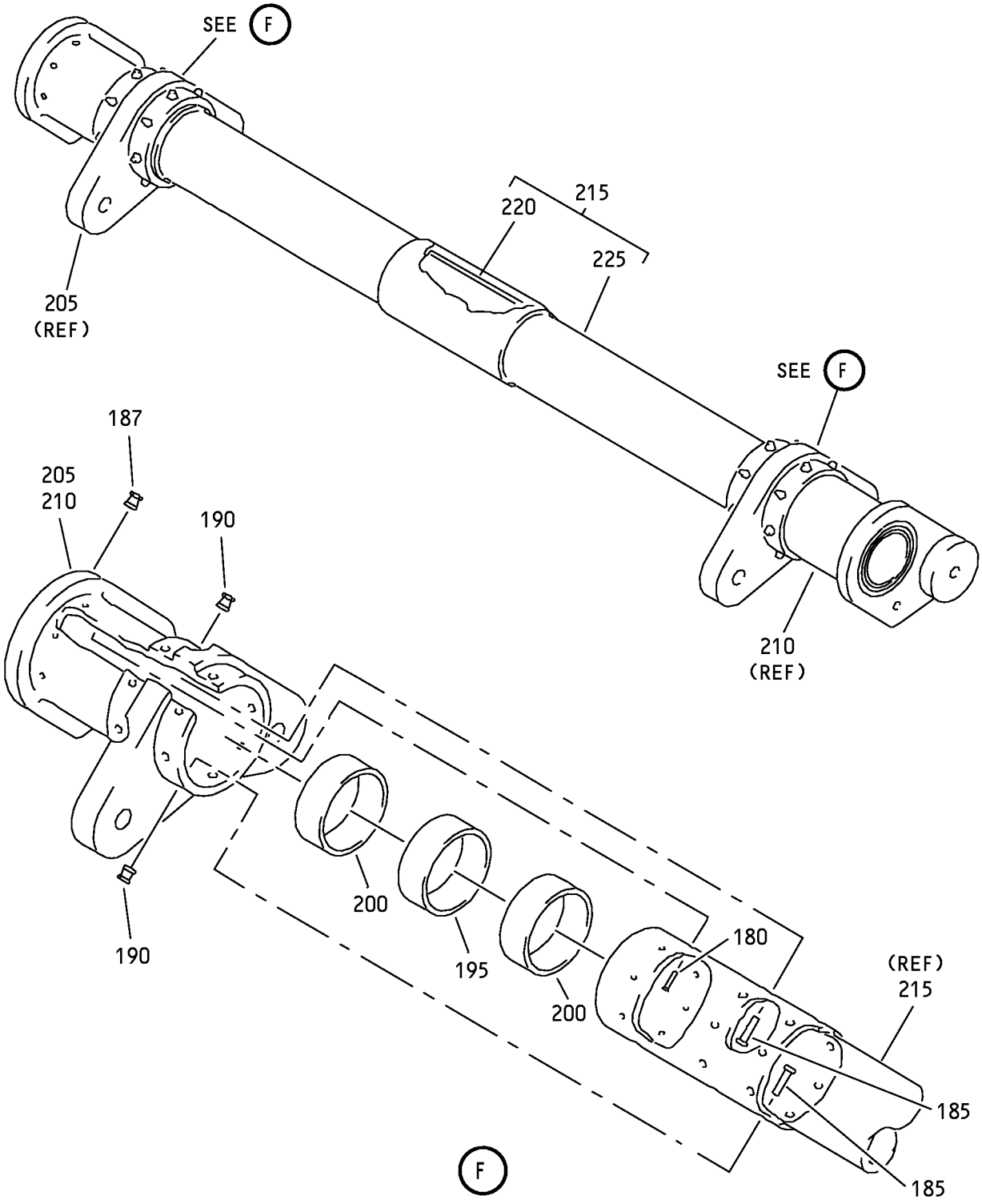
Elevator Buss Assembly
IPL Figure 1 (Sheet 1 of 4)



Elevator Buss Assembly
IPL Figure 1 (Sheet 2 of 4)



Elevator Buss Assembly
IPL Figure 1 (Sheet 3 of 4)



G50585 S0004992687_V2

Elevator Buss Assembly
IPL Figure 1 (Sheet 4 of 4)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1A	251A2341-1		ELEVATOR BUSS ASSY-ELEV CONT	A	RF
–1B	251A2341-2		ELEVATOR BUSS ASSY-ELEV CONT	B	RF
–1C	251A2341-3		ELEVATOR BUSS ASSY-ELEV CONT	C	RF
5	BACB30LE7U46		. BOLT		8
10	BACW10BP7CD		. WASHER		8
15	BACW10BP7DP		. WASHER		8
20	H51560-7		. NUT (V15653) (SPEC BACN10HR7CD) (OPT 67832CD720 (V56878)) (OPT 102LH9031-7 (V72962)) (OPT BH00303CM7 (V27238)) (OPT BMN5024CWD37 (V97928)) (OPT CR60307 (V62554)) (OPT SL7108C7 (V11815)) (OPT VCU0005D7 (V06710)) (OPT 102LH90317 (V72962)) (OPT 67832CD7 (V56878)) (OPT BMN10HRCWD3-7 (V97928)) (OPT BMN10HRCWD3-7 (V97928))		8
25	BACB30LJ7U23		. BOLT		2
30	BACW10BP7CD		. WASHER		2
35	NAS1149C0716R		. WASHER		2
40	BACN10JC7CM		. NUT (OPT ITEM 40A)		2
–40A	H52732-7CM		. NUT (V15653) (SPEC BACN10YR7CM) (OPT PLH57CM (V62554)) (OPT ITEM 40)		2
45	69-50563-1		. BUSHING		2
50	65-65309-33		. CRANK ASSY	A, B	1
–50A	65-65309-39		. CRANK ASSY	C	1
55	65-65309-34		. CRANK ASSY	A, B	1
–55A	65-65309-40		. CRANK ASSY	C	1
60	DAS10-26B1-502		. . BEARING (V77896)		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
65	NAS516-1		DELETED		
65A	NAS516-1A		. . FITTING		1
70	69-63532-2		DELETED		
70A	69-63523-2		. . SLEEVE	A, B	1
–70B	69-63523-3		. . SLEEVE	C	1
75	65-65309-35		. . SLEEVE ASSY (USED ON ITEMS 50, 50A)		1
80	65-65309-36		. . SLEEVE ASSY (USED ON ITEMS 55, 55A)		1
85	69-50559-1		. . . SLEEVE		1
90	65-65309-37		. . . TUBE ASSY (USED ON ITEM 75)		1
95	65-65309-38		. . . TUBE ASSY (USED ON ITEM 80)		1
100	65-61753-1		. . . . CRANK (USED ON ITEM 90)		1
105	65-61753-2		. . . . CRANK (USED ON ITEM 95)		1
110	65-65306-3		. . . . CRANK (USED ON ITEM 90)		1
115	65-65306-4		. . . . CRANK (USED ON ITEM 95)		1
120	69-50558-2		. . . . PIN		6
125	65-65307-2		. . . . TUBE		1
130	65-65308-2		. . . . TUBE		1
135	69-78745-1		. BUSHING (OPT ITEM 135A)		2
–135A	NAS77A12-038P		. BUSHING (OPT ITEM 135)		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	HL1012AZ6-16		. BOLT (V97928) (SPEC BACB30NX6K16) (OPT HL12VAZ6-16 (V73197)) (OPT HL12VAZ6-16 (V92215)) (OPT HL12VAZ6-16 (V97928)) (OPT L802-6K16 (V06725)) (OPT HL1012AZ6-16 (V0PTK6)) (OPT HL1012AZ6-16 (V06725)) (OPT HL1012AZ6-16 (V06950)) (OPT HL1012AZ6-16 (V17446)) (OPT HL1012AZ6-16 (V56878)) (OPT HL1012AZ6-16 (V60516)) (OPT HL1012AZ6-16 (V73197))		4
145	HL1187-6		. COLLAR (V5M902) (SPEC BACC30X6) (OPT HL87-6 (V73197)) (OPT HL87-6 (V92215)) (OPT HL1187-6 (V56878)) (OPT HL1187-6 (V92215)) (OPT HL87-6 (V56878)) (OPT HL1187-6 (V73197))	A, B	4
–145A	HL1087-6		. COLLAR (V73197) (SPEC BACC30BH6) (OPT HL1087-6 (V56878)) (OPT HL1087-6 (V92215)) (OPT HL1087-6 (V9N513))	C	4
150	251A2369-1		. PLATE-ANTI-ROTATION		1
155	251A2369-2		. PLATE-ANTI-ROTATION		1
160	69-38919-13		. SLEEVE		4
165	DAS10-27A1-502		. BEARING (V77896)		2
170	DAS8-27B7		. BEARING (V77896)	A	2
–170A	DAS8-27B1-502		. BEARING (V77896)	B, C	2
175	65-61751-6		. TUBE ASSY-TORQUE		1
180	BACR15FJ6P8		DELETED		
180A	BACB30DY6-8		. . BOLT		16

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
185	BACB30DX8-10		DELETED		
185A	2LPYDT08-11		. . BOLT (V11815) (SPEC BACB30DX8-11)		32
187	NAS1080-06		. . COLLAR		16
190	NAS1080		DELETED		
190A	NAS1080-08		. . COLLAR		32
195	69-50560-1		. . SPACER		2
200	AJ36A101		. . BUSHING (VS0352) (SPEC 10-60516-53) (OPT 90238 (V09455)) (OPT BJC72TF78A32 (V21335)) (OPT DBA36-001 (V81376)) (OPT KJN36-12 (V97613)) (OPT NH36-201A (V15860)) (OPT PBR36A32NE (V73134)) (OPT YTS175A (V77896)) (OPT ITEM 200A)		4
–200A	PBE36A32NE		. . BUSHING (V73134) (SPEC 10-60516-53A) (OPT ITEM 200)		4
205	65-61752-7		. . FITTING-END		1
210	65-61752-8		. . FITTING-END		1
215	65-61751-2		. . TUBE ASSY		1
220	69-48962-1		. . . SLEEVE		1
225	65-61750-1		. . . TUBE-TORQUE		1

–Item not Illustrated