TO: ALL HOLDERS OF SPEED BRAKE LEVER ASSEMBLY COMPONENT MAINTENANCE MANUAL 27-62-32

REVISION NO. 1 DATED MAR 01/99

HIGHLIGHTS

All data formerly in manual 27-62-31 is included in this manual 27-62-32.

CHAPTER/SECTION AND PAGE NO.	DESCRIPTION OF CHANGE
401	Changed instruction for cleaning teflon-lined parts.
501	Changed spring check procedure.
REPAIR-GEN 601	Added standard practices.
REPAIR-GEN 601 REPAIR 2-1 601 801 1007	Edited without technical change.
REPAIR-GEN 602-603	Updated True Position Dimensioning Symbols.
REPAIR 1-1 601-602	Added repair procedure for lever.
REPAIR 2-1 602 802	Changed dimensions on crank per latest engineering.

CHAPTER/SECTION AND PAGE NO.	DESCRIPTION OF CHANGE
REPAIR 2-1 602	Changed location of dimensional callout for slot in crank.
REPAIR 3-1 601	Changed finish code.
701	Changed refinish on bolts.
701	Added lockwire retention as option to ball stake method.
701	Added bearing installation procedure.
802	Updated Vendors List.
1003-1004	Added Numerical Parts List Index.
1006	Changed item number callout.
1008	Added optional bolt.
1009	Changed to rivet with smaller diameter for easier installation.

SPEED BRAKE LEVER ASSEMBLY

PART NUMBER 253T5623-1,-2

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

REVISION RECORD

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

REVISION NUMBER	REVISION DATE	DATE FILED	BY	REVISION NUMBER	REVISION DATE	DATE FILED	BY

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL

PAGE	DATE	CODE
27-62-32		
TITLE PAGE		
1	OCT 01/87	01
2	BLANK	
REVISION RECORD		
1	OCT 01/87	01
2	BLANK	
TR & SB RECORD		
1	OCT 01/87	01
2	BLANK	
LIST OF EFFECTIVE PAGES		
*1	MAR 01/99	01
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CONTENTS		
1	OCT 01/87	01
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DESCRIPTION & OPERATION		
1	OCT 01/87	01
2	BLANK	
DISASSEMBLY		
301	OCT 01/87	01
302	BLANK	
CLEANING		
*401	MAR 01/99	01.1
402	BLANK	
CHECK		
*501	MAR 01/99	01.1
502	BLANK	

PAGE	DATE	CODE
REPAIR-GENERAL		
*601	MAR 01/99	01.1
*602	MAR 01/99	01.1
*603	MAR 01/99	01.1
*604	BLANK	
REPAIR 1-1		
*601	MAR 01/99	01.1
*602	MAR 01/99	01.1
REPAIR 2-1		
*601	MAR 01/99	01.1
*602	MAR 01/99	01.1
REPAIR 3-1		
*601	MAR 01/99	01.1
602	BLANK	
ASSEMBLY		
*701	MAR 01/99	01.1
702	BLANK	
FITS AND CLEARANCES		
*801	MAR 01/99	01.1
*802	MAR 01/99	01.1
ILLUSTRATED PARTS LIST		
1001	OCT 01/87	01
*1002	MAR 01/99	01.1
*1003	MAR 01/99	01.1
*1004	MAR 01/99	01.1
*1005	BLANK	
*1006	MAR 01/99	01.1
*1007	MAR 01/99	01.1
*1008	MAR 01/99	01.1
*1009	MAR 01/99	01.1
*1010	BLANK	

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions ranging from simple checks and replacement to complete shop-type repair.

This manual is divided into separate sections:

1. Title Page
2. Record of Revisions
3. Temporary Revision & Service Bulletin Record
4. List of Effective Pages
5. Table of Contents
6. Introduction
7. Procedures & IPL Sections

Refer to the Table of Contents for the page location of applicable sections. An asterisked flagnote *[ ] in place of the page number indicates that no special instructions are provided since the function can be performed using standard industry practices.

The beginning of the REPAIR section includes a list of the separate repairs, a list of applicable standard Boeing practices, and an explanation of the True Position Dimensioning symbols used.

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

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

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

Verification:

Disassembly
Assembly

SPEED BRAKE LEVER ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The speed brake lever assembly consists of a knob, stop, built-up lever, compression spring and crank assembly. The crank assembly is composed of a crank and bearing.

2. Operation

   A. When pulling the knob (crank assembly held stationary) lever slides on stem of crank assembly against a compression spring. Releasing knob, lever is moved back to original position by the spring force.

3. Leading Particulars (Approximate)

   Length (overall) -- 14 inches
   Height (overall) -- 3 inches
   Width (overall) -- 1.5 inches
   Weight -- 4 pounds

DISASSEMBLY

1. Standard aircraft shop practices are sufficient for disassembly of this unit (IPL Fig. 1).

   NOTE: Do not remove rivets (90), bearings (50, 65) and spacer (55) unless repair or replacement is necessary. Do not remove spacer (45) unless it is loose and will slip off.

2. Parts Replacement

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

   A. Roll pin (5)

CLEANING

1. Clean all parts except bearings (50, 65, IPL Fig. 1) and crank (70) using standard industry practices per 20-30-03.

CAUTION: USE CARE WHEN CLEANING TEFLON-LINED PARTS. CERTAIN CLEANING SOLVENTS AND LUBRICANTS MAY CAUSE DETERIORATION OF TEFLON.

2. Clean teflon-lined bearings (50, 65) per manufacturer's instructions, and the crank (70) per special method in 20-30-01.

CHECK

1. Check all parts for obvious defects in accordance with standard industry practices (IPL Fig. 1).

2. Magnetic particle check per 20-20-01 -- Handle (95), lever (85), shaft (40), retainer (35), and crank (70).

3. Penetrant check per 20-20-02 -- Spacers (45, 55).

4. Check spring (10).

   A. Apply a 5.0 pound load to the spring.

   B. Make sure the spring compresses by 0.42-0.52 inch from its free length.

REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
65B82940	LEVER	1-1
253T5612	CRANK ASSEMBLY	2-1
- -	MISC PARTS REFINISH	3-1

2. Standard Practices

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

20-10-01 Repair and Refinish of High Strength Steel Parts
20-10-02 Machining of Alloy Steel
20-10-04 Grinding of Chrome Plated Parts
20-30-02 Stripping of Protective Finishes
20-30-03 General Cleaning Procedures
20-41-01 Decoding Table for Boeing Finish Codes
20-41-02 Application of Chemical and Solvent Resistant Finishes.
20-42-03 Hard Chrome Plating
20-42-05 Bright Cadmium Plating
20-43-01 Chromic Acid Anodizing
20-50-03 Bearing and Bushing Replacement
20-50-08 Application of Bonded Solid Film Lubricants
20-60-02 Finishing Materials
20-60-03 Lubricants
20-60-04 Miscellaneous Materials

3. Materials

   NOTE: Equivalent substitutes may be used.

   A. Coating -- Teflon-S, 954-10 (Ref 20-60-04)

   B. Lubricant -- Solid Film, BMS 3-8, Class A (Ref 20-60-03)

   C. Primer -- BMS 10-11, Type 1 (Ref 20-60-02)

4. Dimensioning Symbols

A. Standard True Positioning Dimensioning Symbols used in applicable repair procedures are shown in Fig. 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 WHICH PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓛ	LEAST MATERIAL CONDITION (LMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT

EXAMPLES

[— | 0.002]	STRAIGHT WITHIN 0.002
[⊥ | 0.002 | B]	PERPENDICULAR TO B WITHIN 0.002
[// | 0.002 | A]	PARALLEL TO A WITHIN 0.002
[○ | 0.002]	ROUND WITHIN 0.002
[⌭ | 0.010]	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
[⌒ | 0.006 | A]	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM PLANE A
[⌓ | 0.020 | A]	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE

[◎ | ∅ 0.0005 | C]	CONCENTRIC TO C WITHIN 0.0005 DIAMETER
[≡ | 0.010 | A]	SYMMETRICAL WITH A WITHIN 0.010
[∠ | 0.005 | A]	ANGULAR TOLERANCE 0.005 WITH A
[⌖ | ∅ 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, AND EXTENDING 0.510-INCH ABOVE, DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

NOTE: DATUM MAY APPEAR AT EITHER SIDE OF TOLERANCE FRAME [0.020 | A] [A | 0.020]

True Position Dimensioning Symbols
Figure 601

LEVER - REPAIR 1-1

65B82940-1

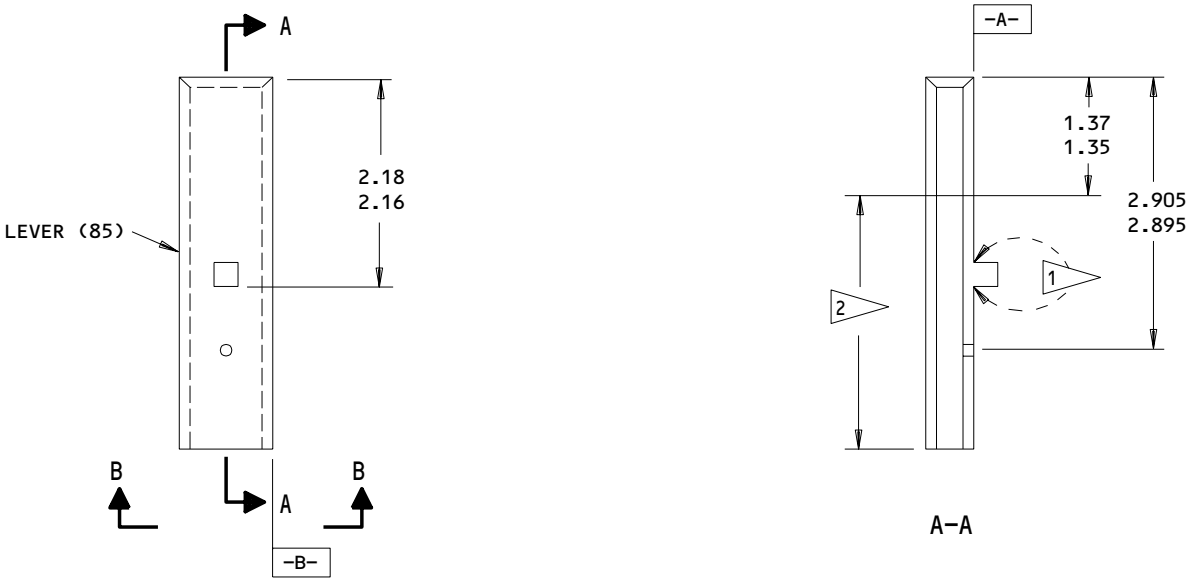
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions, Fig. 601.

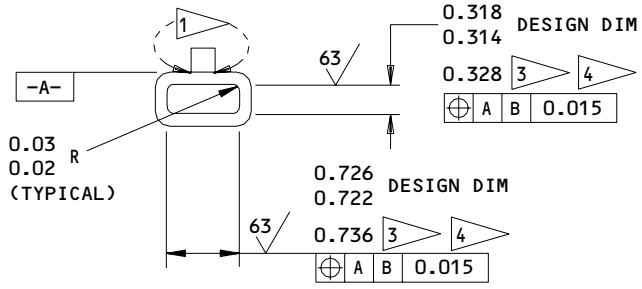
1. Lever Repair

2. Machine the inner surface as required, within the repair limits shown, to remove defects.

3. Build up the repaired surfaces with chrome plate (F-15.03), and grind to the design dimensions and finish shown.

4. Apply solid film lubricant BMS 3-8 to the inner surfaces.





REFINISH

CHROMIUM PLATE (F-14.111) EXCEPT AS NOTED BY 1

1 OMIT FINISH ON THESE SURFACES

2 APPLY SOLID FILM LUBRICANT BMS 3-8 CLASS A ON INNER SURFACES ONLY

3 BUILDUP WITH CHROME PLATE (F-15.03) AND GRIND TO DIMENSION AND FINISH SHOWN

4 MAXIMUM REPAIR LIMIT

REPAIR

REF 3

MATERIAL: 17-4PH CRES; 125-145 KSI

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

65B82940-1
Lever Repair
Figure 601

CRANK ASSEMBLY - REPAIR 2-1

253T5612-4, -6

NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions, Fig. 601.

1. Bearing Replacement (Fig. 601)

   A. Remove bearing (65).

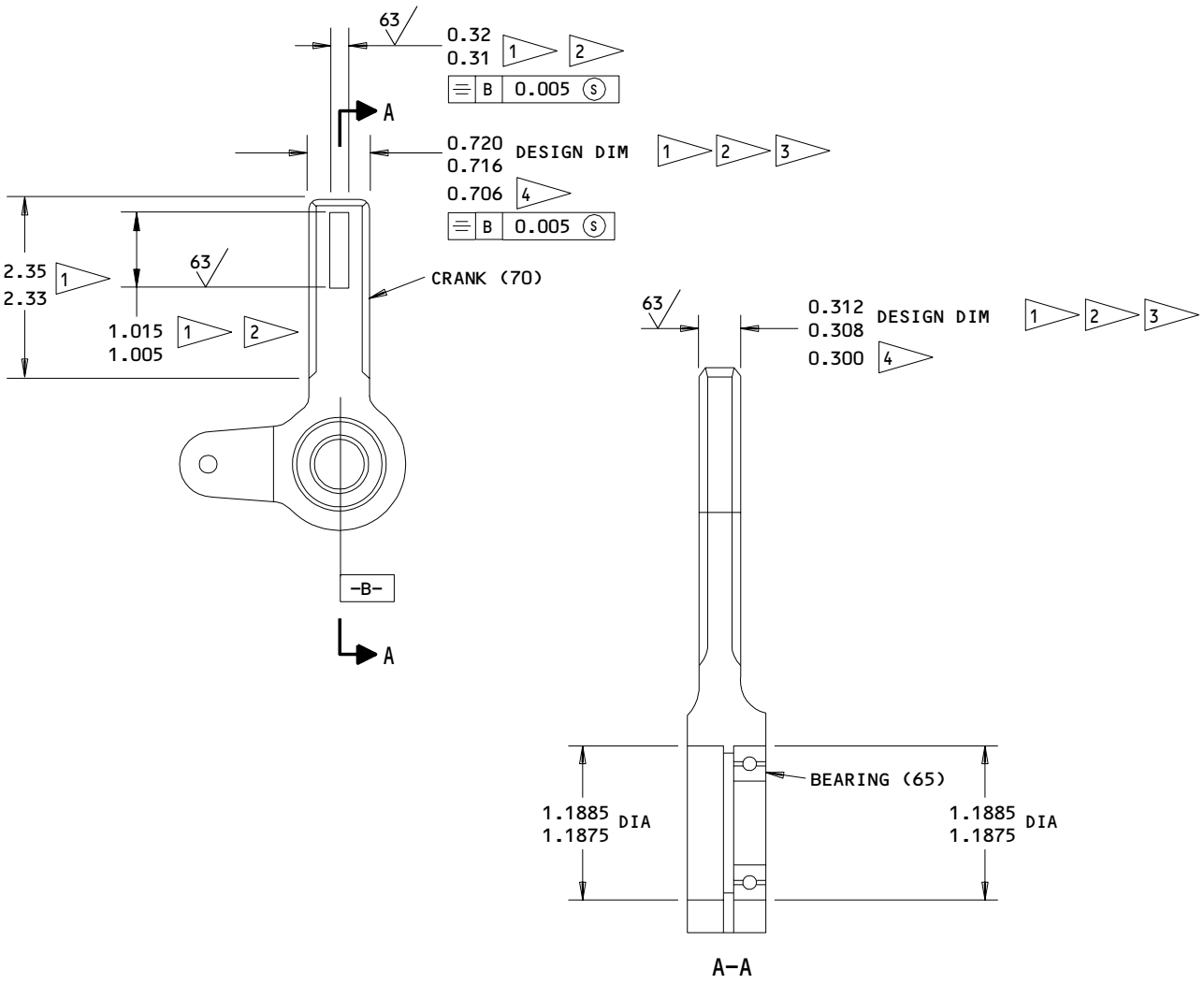
   B. Install new bearing using wet primer BMS 10-11, type 1 and roller swage per 20-50-03.

2. Repair (Fig. 601)

   A. Machine the crank (70) as required, within the repair limits shown, to remove defects.

   B. Build up the repaired surface with chrome plate (F-15.03), and grind to the design dimensions and finish shown.

   C. Apply teflon-S coating, 954-103, per manufacturer's instructions to the indicated surfaces.



REFINISH

CRANK (70) -- PASSIVATE (F-17.09)
CRANK (70A) -- NO FINISH

1 APPLY TEFLON-S COATING 954-103 TO SURFACES NOTED.

2 DIMENSIONS APPLY AFTER TEFLON COATING. HONING IS ALLOWED. MIN COATING THICKNESS IS 0.001.

3 CHROME PLATE BUILDUP AND GRIND TO DIMENSION AND FINISH SHOWN. CHROME PLATE RUNOUT 0.00-0.08. STOP CHROME PLATE RUNOUT 0.00-0.02 FROM FILLET RADIUS OR EDGE.

4 MINIMUM REPAIR DIMENSION

REPAIR

REF 3

MATERIAL: 17-4PH CRES, 180 KSI

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

253T5612-4,-6
Crank Assembly Repair
Figure 601

MISCELLANDOUS PARTS REFINISH - REPAIR 3-1

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

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Handle (95)	17-4PH CRES, 180 ksi	Chromium plate (F-14.111).
Stop (15)	8630 or 4130 Steel	Cadmium plate (F-15.02).
Shaft (40)	15-5PH CRES or 17-4PH CRES, 180-200 ksi	Passivate (F-17.09).
Retainer (35)	15-5PH CRES, 150-170 ksi	Passivate (F-17.09).
Spacer (45, 55)	Al alloy	Chromic acid anodize and apply one coat of primer BMS 10-11, type 1 (F-18.13).

Refinish Data
Figure 601

ASSEMBLY

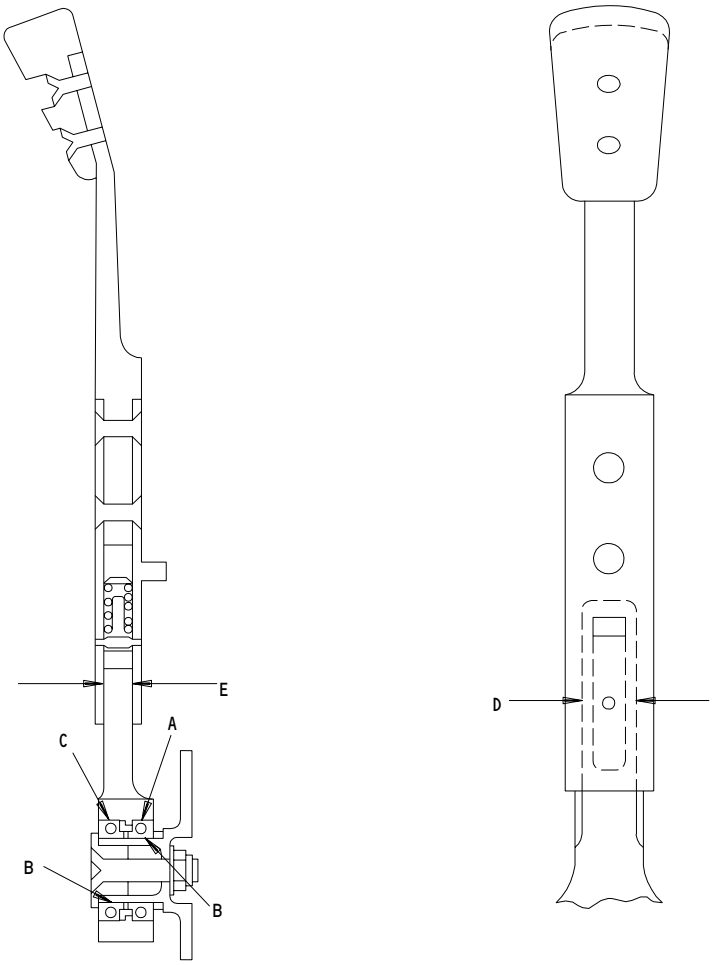
1. Standard aircraft shop practices are sufficient for assembly of this unit except as follows:

A. Ends of bolts (80, IPL Fig. 1) shall not protrude more than 0.005 inch. Machine ends of bolts if required. Stylus cadmium plate (Ref 20-42-10) the reworked area of the bolts, except touchup is not required on bolts (80A).

B. Rivet (90) must be flush to 0.005 inch below surface of lever (85).

C. Ball stake the lever (85) at one place each side of the hole for the roll pin (5). Distortion of the plated surface is permitted. Optional: Install lockwire MS20995NC20 through the hole in the roll pin and around the lever (Ref 20-50-02).

D. Install the bearing (50) in the crank assembly (60) per 20-50-03. Optional: Install the bearing with wet primer (F-20.06).



Fits and Clearances
Figure 801 (Sheet 1)

Ref Letter Fig.801	Mating Item No. IPL Fig.1	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 70 OD 65	1.1875 1.1870	1.1885 1.1875	0.0000	0.0015			
B	ID 50,65 OD 40	0.7495 0.7490	0.7500 0.7495	0.0000	0.0010			
C	ID 70 OD 50	1.1875 1.1870	1.1885 1.1875	0.0000	0.0015			
D	85 60, 60A	0.722 0.716	0.726 0.720	0.002	0.010	0.707	0.735	0.015
E	85 60, 60A	0.314 0.308	0.318 0.312	0.002	0.010	0.308	0.327	0.015

ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801 (Sheet 2)

130859

ILLUSTRATED PARTS LIST

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

2. Indentures show parts relationships as follows:

    Assembly
      Detail Parts for Assembly
      Subassembly
      Attaching Parts for Subassembly
        Detail Parts for Subassembly

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

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

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

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

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

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

6. Parts Interchangeability

Optional (OPT)	The parts are optional to and interchangeable with other parts having the same item number.
Supersedes, Superseded By (SUPSDS, SUPSD BY)	The part supersedes and is not interchangeable with the original part.
Replaces, Replaced By (REPLS, REPLD BY)	The part replaces and is interchangeable with, or is an alternate to, the original part.

VENDORS

K8455 RHP BEARINGS PLC RHP AEROSPACE
OLDENDS LANE
STONEHOUSE GL10 3RM UK

06144 INDUSTRIAL TECTONICS BEARING CORP
18301 SOUTH SANTA FE AVENUE
RANCO DOMINQUEZ, CALIFORNIA 90221

21335 TORRINGTON CO FAFNIR BEARING DIV
59 FIELD STREET
TORRINGTON, CONNECTICUT 06790-4942

38443 MRC BEARINGS
402 CHANDLER STREET
JAMESTOWN, NEW YORK 14701-3802

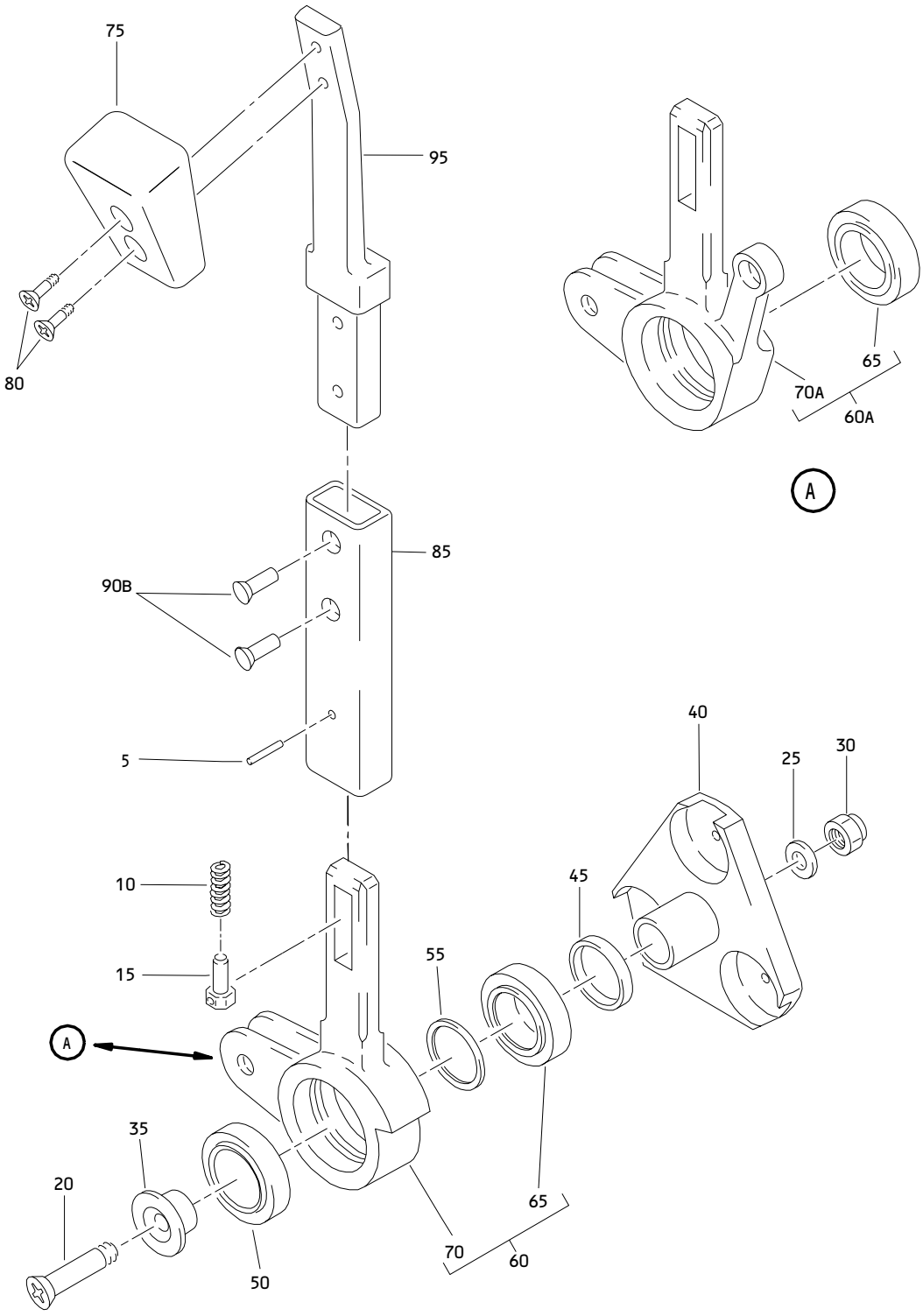
40920 MPB MINIATURE PRECISION BEARING DIV
PRECISION PARK PO BOX 547
KEENE, NEW HAMPSHIRE 03431

43991 FAG BEARING INCORPORATED
118 HAMILTON AVENUE
STAMFORD, CONNECTICUT 06904

83086 NEW HAMPSHIRE BALL BEARINGS, INCORPORATED
ROUTE 202
PETERBOROUGH, NEW HAMPSHIRE 03458

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AN960C416L		1	25	1
BACB10AS12		1	50	1
		1	65	1
BACB30LH3-2		1	80A	2
BACB30LU4-13		1	20	1
BACN10JC4		1	30	1
LLMB539		1	50	1
		1	65	1
MB539-2TS		1	50	1
		1	65	1
MB539DD		1	50	1
		1	65	1
MB539DDFS428		1	50	1
		1	65	1
MB539DDG20		1	50	1
		1	65	1
MB539DDLY196		1	50	1
		1	65	1
MB539DDSD610		1	50	1
		1	65	1
MB539TT		1	50	1
		1	65	1
MS16562-214		1	5	1
MS20427M5		1	90B	2
MS24585-1166		1	10	1
MT339E		1	50	1
		1	65	1
253T4006-2		1	55	1
253T4006-3		1	45	1
253T5422-2		1	40	1
253T5423-1		1	35	1
253T5612-4		1	60	1

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
253T5612-5		1	70	1
253T5612-6		1	63	1
253T5612-7		1	73	1
253T5614-1		1	95	1
253T5623-1		1	1	RF
253T5623-2		1	3	RF
65B82940-1		1	85	1
65C14183-43		1	75	1
66-14222-1		1	15	1



Speed Brake Lever Assembly
Figure 1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	253T5623-1		LEVER ASSY-SPEED BRAKE	A	RF
-3	253T5623-2		LEVER ASSY-SPEED BRAKE	B	RF
5	MS16562-214		.PIN-ROLL		1
10	MS24585-1166		.SPRING		1
15	66-14222-1		.STOP		1
20	BACB30LU4-13		.BOLT		1
25	AN960C416L		.WASHER		1
30	BACN10JC4		.NUT		1
35	253T5423-1		.RETAINER		1
40	253T5422-2		.SHAFT		1
45	253T4006-3		.SPACER		1
50	MB539DDSD610		.BEARING- (V83086) (SPEC BACB10AS12) (OPT LLMB539 (V38443)) (OPT MB539-2TS (V43991)) (OPT MB539DDFS428 (V21335)) (OPT MB539TT (V43991)) (OPT MB539DDG20 (V38443)) (OPT MT339E (VK8455)) (OPT MB539DDLY196 (V40920)) (OPT MB539DD (V06144))		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
55	253T4006-2		.SPACER		1
60	253T5612-4		.CRANK ASSY-	A	1
63	253T5612-6		.CRANK ASSY-	B	1
65	MB539DDSD610		..BEARING- (V83086) (SPEC BACB10AS12) (OPT LLMB539 (V38443)) (OPT MB539-2TS (V43991)) (OPT MB539DDFS428 (V21335)) (OPT MB539TT (V43991)) (OPT MB539DDG20 (V38443)) (OPT MT339E (VK8455)) (OPT MB539DDLY196 (V40920)) (OPT MB539DD (V06144))		1
70	253T5612-5		..CRANK	A	1
73	253T5612-7		..CRANK	B	1
75	65C14183-43		.KNOB ATTACHING PARTS		1
80	BACB30LU3-2		.BOLT- (OPT ITEM 80A)		2
-80A	BACB30LH3-2		.BOLT- (OPT ITEM 80) -------*-------		2
85	65B82940-1		.LEVER ATTACHING PARTS		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
90A	MS20427M6		DELETED		
90B	MS20427M5		.RIVET		2
			-------*-------		
95	253T5614-1		.HANDLE		1

- Item Not Illustrated