

 **BOEING**  
COMPONENT  
MAINTENANCE MANUAL

TO: ALL HOLDERS OF OUTBOARD LEADING EDGE SLAT DRIVE ANGLE GEARBOX ASSEMBLY  
COMPONENT MAINTENANCE MANUAL 27-81-31

REVISION NO. 6 DATED OCT 10/85

HIGHLIGHTS

Pages which have been added or revised are outlined below together with the highlights of the revision. Remove and insert the affected pages as listed and enter Revision No. and date on the Record of Revision Sheet.

CHAPTER/SECTION

AND PAGE NO.

DESCRIPTION OF CHANGE

REPAIR 3-1 23  
601-603

Added shot peen and chrome plate details.

802

Added service wear limits.

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HIGHLIGHTS

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OUTBOARD LEADING EDGE SLAT DRIVE  
ANGLE GEARBOX ASSEMBLY

PART NUMBER 256T2320-1

COMPONENT MAINTENANCE MANUAL  
WITH  
ILLUSTRATED PARTS LIST

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TITLE PAGE

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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

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TR & SB RECORD

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1003	JUL 10/83	01.1			
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### 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                                      | 4. List of Effective Pages   |
| 2. Record of Revisions                             | 5. Table of Contents         |
| 3. Temporary Revision &<br>Service Bulletin Record | 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:

Testing/TS	Oct 13/81
Disassembly	Oct 13/81
Assembly	Oct 13/81

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OUTBOARD LEADING EDGE SLAT DRIVE ANGLE GEARBOX ASSEMBLY

DESCRIPTION AND OPERATION

1. The outboard leading edge slat drive angle gearbox assembly consists of two ball bearing mounted bevel gears enclosed in an aluminum housing. The external ends of the gear shafts are attached to splined couplings. Gear ratio is one to one. The gearbox transmits rotary motion from a power drive unit to a rotary actuator thru slat drive torque tubes.
2. Leading Particulars (Approximate)
  - A. Length -- 7 inches (18 centimeters)
  - B. Width -- 6 inches (15 centimeters)
  - C. Height -- 5 inches (13 centimeters)
  - D. Drive Angle -- 186° 36'
  - E. Weight -- 4 lbs (2 kg)

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DESCRIPTION & OPERATION

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TESTING/TROUBLE SHOOTING1. Equipment and Materials

NOTE: Equivalent substitutes may be used.

- A. Backlash Check Fixture -- A27049-1
- | B. Weight Assembly -- A27046-60 \*[1] (2 required)
- | C. Tower Assembly -- A27046-53 \*[1] (2 required)
- | D. Hand Knob -- 17501 \*[1] (4 required)
- | E. Dial indicator with 0.120 in. dia ball lever adapter
- | F. Sealant -- BMS 5-26 (Ref 20-60-04)
- | \*[1] Part of Test Equipment A27046-8

## 2. Visually check unit in accordance with standard industry practices. Rotate shafts in both directions and check for evidence of binding and roughness.

- A. If no corrective action is required, proceed with backlash check par. 3, otherwise replace parts per step B.
- B. If roughness or binding exists, replace bearings (35, 40, IPL Fig. 1) as follows:
  - (1) Completely disassemble unit per DISASSEMBLY and remove gears and bearings.
  - (2) Replace gears and bearings and assemble parts per ASSEMBLY steps 4.A. thru 4.I.

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3. Backlash Check

A. Mount unit in check fixture A27049-1. Apply 25-35 lb (11.3-15.9 kgf) axial force outward on one shaft using weight assembly A27046-60, or equivalent, then clamp that shaft in fixed position. Apply an equivalent outward axial load to the opposite shaft. Set 0.120 in. dia ball lever adapter of dial indicator on splines of coupling (50). Using socket adapter on nut (20), apply torque of 5-10 lb-in. (5.8-11.5 kgf-cm) to the shaft in both directions (clockwise and counterclockwise). Check that total travel (backlash) measured at spline is 0.002-0.005 inch (0.051-0.127 mm). Repeat check at three places approximately 120 degrees apart.

B. If no corrective procedures are required, check lubrication per par. 4. To correct backlash, adjust shim thickness as follows:

(1) Disassemble unit per DISASSEMBLY steps 3.A. thru 3.E.

(2) Adjust thickness of shims (45) as required to increase or decrease backlash and assemble parts per ASSEMBLY steps 4.B. thru 4.H.

NOTE: To decrease backlash, increase shim thickness. To increase backlash, reduce shim thickness.

(3) Repeat backlash check.

4. Check that splines and gear teeth are filled with grease. Lubricate as necessary.

CAUTION: DO NOT FILL HOUSING WITH GREASE OR OPERATION OF GEARBOX MAY BE ADVERSELY AFFECTED.

A. Fill gear teeth with grease.

B. Install cover (55) and secure with parts (60, 65). Tighten bolts (60) to 22-28 lb-in. (25-32 kgf-cm). Install bolts with wet primer.

5. Seal and install lockwire per ASSEMBLY steps 4.J. thru 4.L.

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TESTING & TROUBLE SHOOTING  
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DISASSEMBLY

NOTE: Refer to TESTING/TROUBLE SHOOTING to establish condition or probable cause of any malfunction and to determine extent of disassembly and repair.

1. Equipment

NOTE: Equivalent substitutes may be used.

A. Wrench -- A27051-10

2. Parts Replacement

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

A. Lockwire, cotter pins

3. Disassembly (IPL Fig. 1)

A. Remove lockwire and sealant using dull knife or equivalent.

B. Remove cotter pins (15). Use wrench A27051-10 to hold couplings (50), then remove nuts (20), washers (25) and couplings.

C. Remove bolts (5) and washers (10) and separate cover (70) from housing assembly (75).

D. Remove gears (30) with bearings (35, 40) and shims (45) from cover (70) and housing assembly (75).

NOTE: Note thickness and location of shim to facilitate assembly. Do not remove bearings (35, 40) from gears (30) unless necessary for repair or replacement.

E. Remove parts (60, 65) and remove cover (55).

NOTE: Do not remove nameplate (95) unless repair or replacement is necessary.

NOTE: Do not disassemble housing assembly (75) unless repair or replacement is necessary.

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DISASSEMBLY

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CLEANING

1. Clean all parts except bearings (35, 40, IPL Fig. 1) using standard industry practices and information contained in 20-30-03.
2. Clean teflon sealed bearings (35, 40) per manufacturer's instructions.

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CHECK

1. Check all parts for obvious defects in accordance with standard industry practices. Refer to FITS AND CLEARANCES for design dimensions and wear limits.
2. Magnetic particle check per 20-20-01 -- Washers (25, IPL Fig. 1), gear (30), coupling (50).
3. Penetrant check per 20-20-02 -- Housing (90), cover (70).
4. Check gear (30) teeth and splines for excessive or uneven wear.

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CHECK  
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REPAIR – GENERAL1. Content

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

<u>P/N</u>	<u>NAME</u>	<u>REPAIR</u>
256T2303	HOUSING	1-1
256T2305	COVER	2-1
256T2307	GEAR	3-1
65B81978	COVER	4-1
256T2314	NAMEPLATE	5-1
- - -	MISC PARTS REFINISH	6-1

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
20-10-03	Shot Peening
20-10-04	Grinding of Chrome Plated Parts
20-10-05	Application and Finishing of Plasma Flame Sprayed Coatings
20-30-02	Stripping of Protective Finishes
20-41-01	Decoding Table for Boeing Finish Codes
20-42-03	Hard Chrome Plating
20-42-05	Bright Cadmium Plating
20-43-01	Chromic Acid Anodizing
20-50-05	Application of Aluminum Foil and Other Markers
20-50-10	Application of Stencils, Insignia, Silk Screen, Part Numbering and Identification Markings

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3. Materials

NOTE: Equivalent substitutes may be used.

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

B. Corrosion Preventive Compound -- MIL-C-11796 (Ref 20-60-02)

C. Adhesive -- Type 70 (Ref 20-50-12)

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**4. Dimensioning Symbols**

A. Standard True Position Dimensioning Symbols used in applicable repair procedures are shown in Fig. 601.

—	STRAIGHTNESS	$\oplus$	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
$\square$	FLATNESS	$\varnothing$	DIAMETER
$\perp$	PERPENDICULARITY (OR SQUARENESS)	BASIC (BSC) OR	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.
//	PARALLELISM	<b>DIM</b>	
$\bigcirc$	ROUNDNESS	<b>-A-</b>	DATUM
$\bigcirc$	CYLINDRICITY	$\textcircled{M}$	MAXIMUM MATERIAL CONDITION (MMC)
$\frown$	PROFILE OF A LINE	$\textcircled{S}$	REGARDLESS OF FEATURE SIZE (RFS)
$\triangle$	PROFILE OF A SURFACE	$\textcircled{P}$	PROJECTED TOLERANCE ZONE
$\odot$	CONCENTRICITY		
$\equiv$	SYMMETRY		
$\sphericalangle$	ANGULARITY		
$\nearrow$	RUNOUT		

**EXAMPLES**

$\text{—} \quad 0.002$	STRAIGHT WITHIN 0.002	$\textcircled{\odot} \text{ C } \varnothing \quad 0.0005$	CONCENTRIC TO C WITHIN 0.0005 DIAMETER (FULL INDICATOR MOVEMENT)
$\perp \text{ B } \quad 0.002$	PERPENDICULAR TO B WITHIN 0.002	$\equiv \text{ A } \quad 0.010$	SYMMETRICAL WITH A WITHIN 0.010
// $\text{ A } \quad 0.002$	PARALLEL TO A WITHIN 0.002	$\sphericalangle \text{ A } \quad 0.005$	ANGULAR TOLERANCE 0.005 WITH A
$\bigcirc \quad 0.002$	ROUND WITHIN 0.002	$\oplus \text{ B } \varnothing \quad 0.002 \textcircled{S}$	LOCATED AT TRUE POSITION WITHIN 0.002 DIA IN RELATION TO DATUM B, REGARDLESS OF FEATURE SIZE
$\bigcirc \quad 0.010$	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER	$\perp \text{ A } \varnothing \quad 0.010 \textcircled{M}$ $0.510 \textcircled{P}$	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010-INCH DIAMETER, PERPENDICULAR TO, AND EXTENDING 0.510-INCH ABOVE, DATUM A, MAXIMUM MATERIAL CONDITION
$\frown \text{ A } \quad 0.006$	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART IN RELATION TO DATUM PLANE A	$2.000$	EXACT DIMENSION IS 2.000
$\triangle \text{ A } \quad 0.020$	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE	OR 2.000 BSC	

True Position Dimensioning Symbols  
Figure 601

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REPAIR-GENERAL

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HOUSING ASSEMBLY - REPAIR 1-1

256T2303-1

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

1. Bearing Bores (Fig. 601)

- A. Machine holes, as required, within repair limits shown to remove defects.
- B. Shot peen as indicated.
- C. Build up repaired surfaces with aluminum plasma flame spray coating, BMS 10-67, type 10 (Ref 20-10-05).
- D. Machine to finish and dimensions shown.
- E. Alodize repaired surfaces.

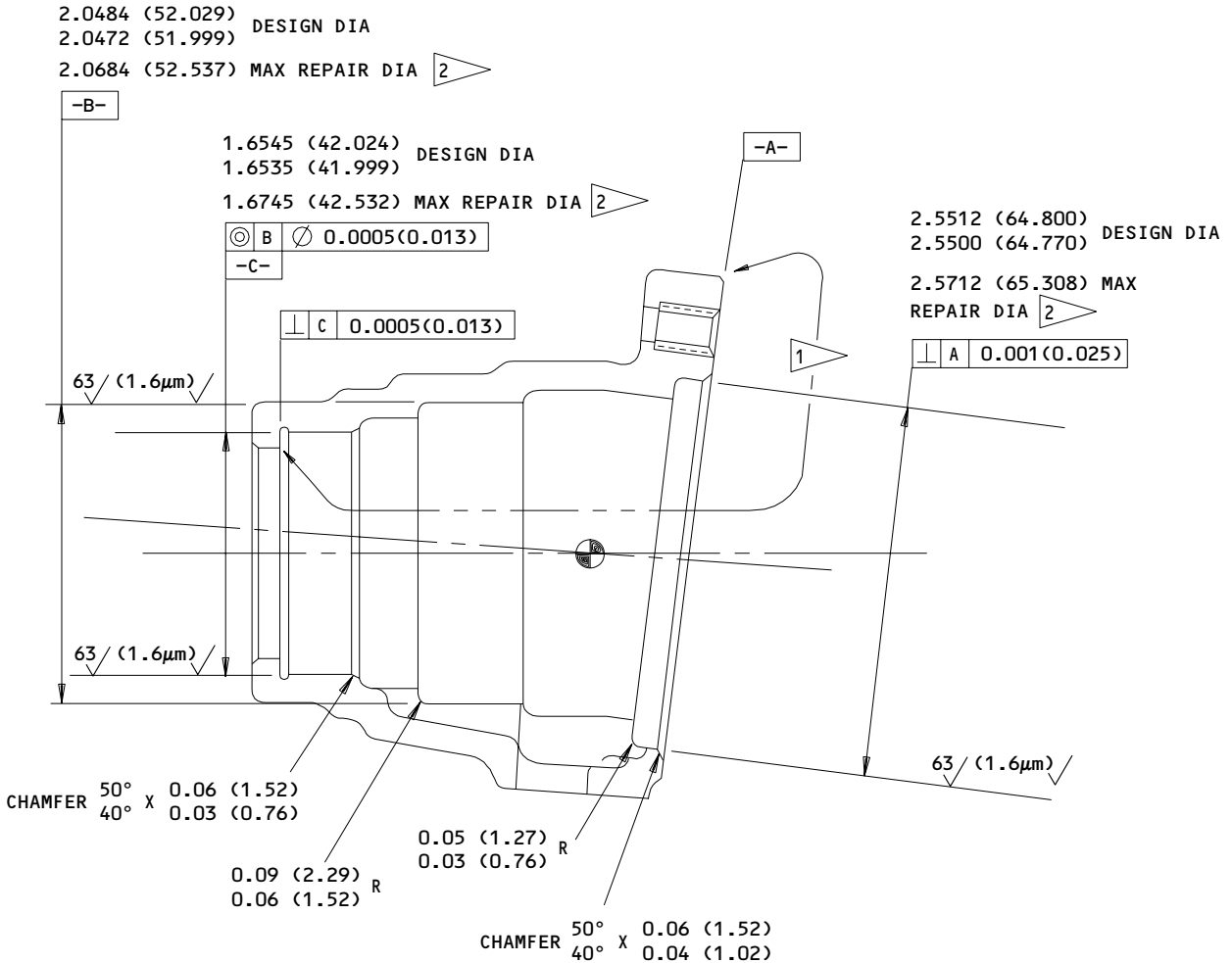
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REPAIR 1-1

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**REFINISH**

ANODIZE (F-17.05) ALL OVER AND APPLY 1 COAT OF BMS 10-11, TYPE 1 PRIMER (F-20.02) ON EXTERIOR SURFACES EXCEPT AS NOTED IN 1

1 NO PRIMER THIS SURFACE

2 BUILD UP WITH AL PLASMA FLAME SPRAY BMS 10-67, TYPE 10 AND MACHINE TO DIMENSIONS AND FINISH SHOWN

**REPAIR**

REF 2

SHOTPEEN (REF 20-10-03)

125 (3.2µm) ✓ MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.008 (0.20)R

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T2303-1  
 Housing Repair and Refinish  
 Figure 601

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REPAIR 1-1

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COVER - REPAIR 2-1

256T2305-1

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

1. Bearing Bores and External Surfaces (Fig. 601)

- A. Machine holes, as required, within repair limits shown to remove defects.
- B. Shot peen as indicated.
- C. Build up repaired surfaces with aluminum plasma flame spray coating, BMS 10-67, type 10 (Ref 20-10-05).
- D. Machine to finish and dimensions shown.
- E. Alodize repaired surfaces.

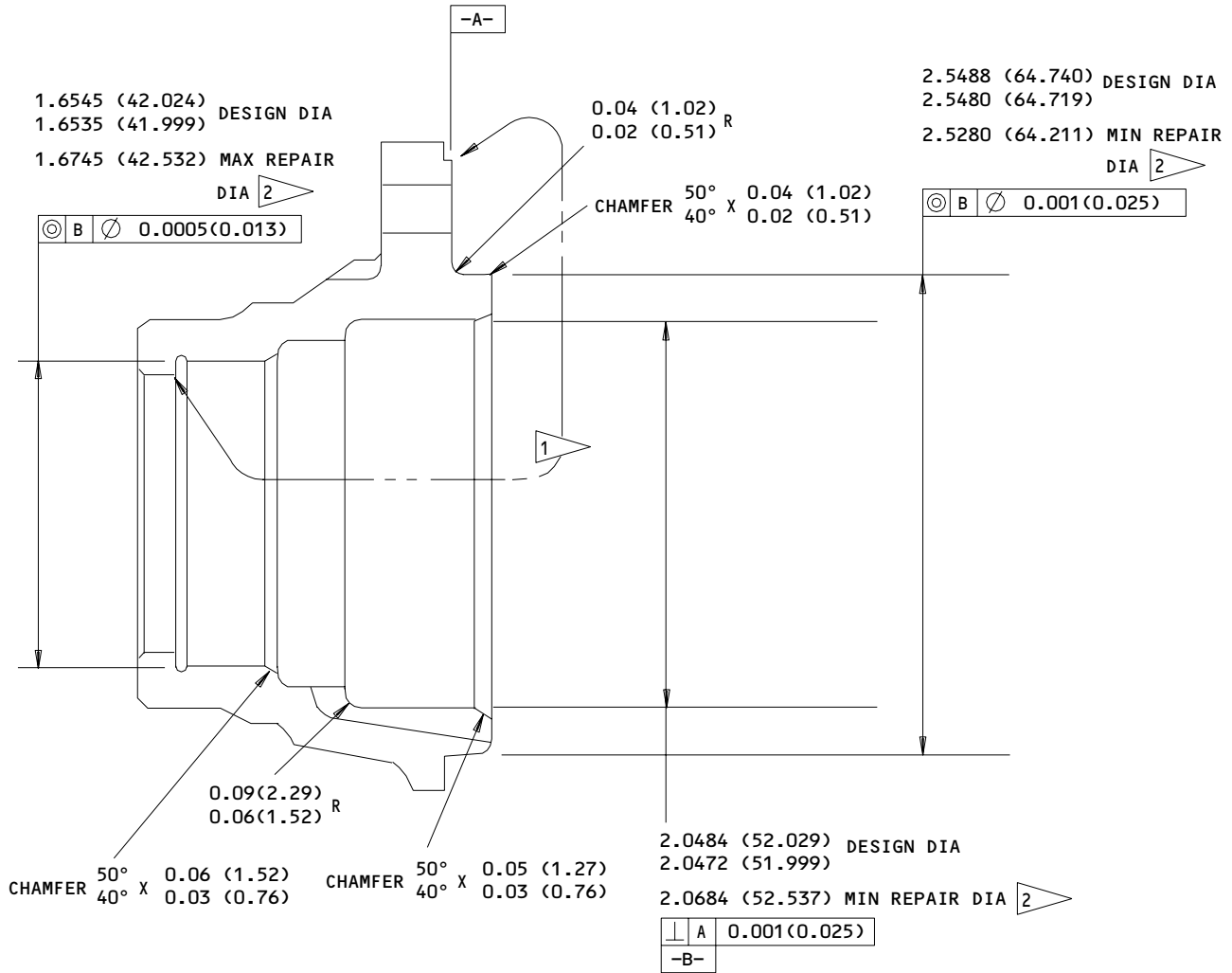
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REPAIR 2-1

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**REFINISH**

ANODIZE (F-17.05) ALL OVER AND APPLY  
 1 COAT OF BMS 10-11, TYPE 1 PRIMER  
 (F-20.02) EXCEPT AS NOTED

- 1 OMIT PRIMER THIS SURFACE
- 2 BUILD UP WITH AL PLASMA FLAME  
 SPRAY BMS 10-67 TYPE 10 AND  
 MACHINE TO DIMENSIONS AND  
 FINISH SHOWN

**REPAIR**

REF 2

SHOTPEEN (REF 20-10-03)

125/ (3.2μm)/ MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.008 (0.20)R

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS  
 IN ( ) ARE IN MILLIMETERS

256T2305-1  
 Cover Repair and Refinish  
 Figure 601

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REPAIR 2-1  
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GEAR, BEVEL - REPAIR 3-1

256T2307-1

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

**1. Shank Repair (Fig. 601)**

- A. Machine, as required, within repair limit shown to remove defects.
- B. Shot peen as indicated.
- C. Chrome plate build up repaired area and grind to design dimensions and finishes shown. Chrome plate not to exceed 0.015 inch (0.381 mm) after grinding.

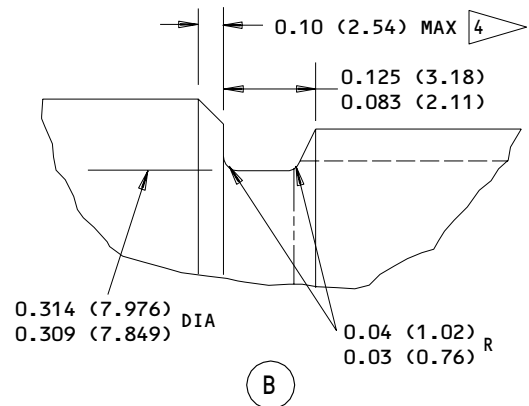
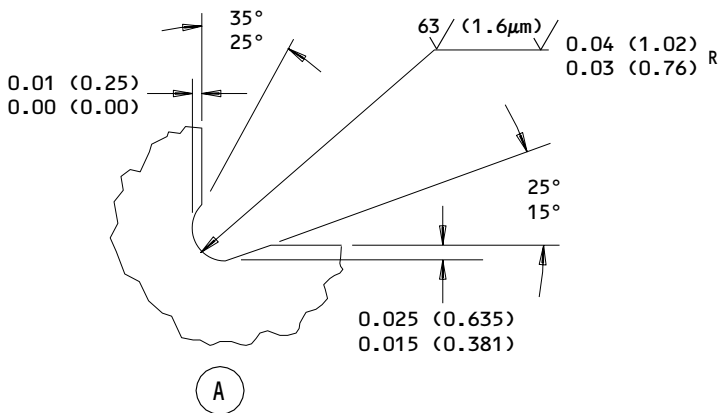
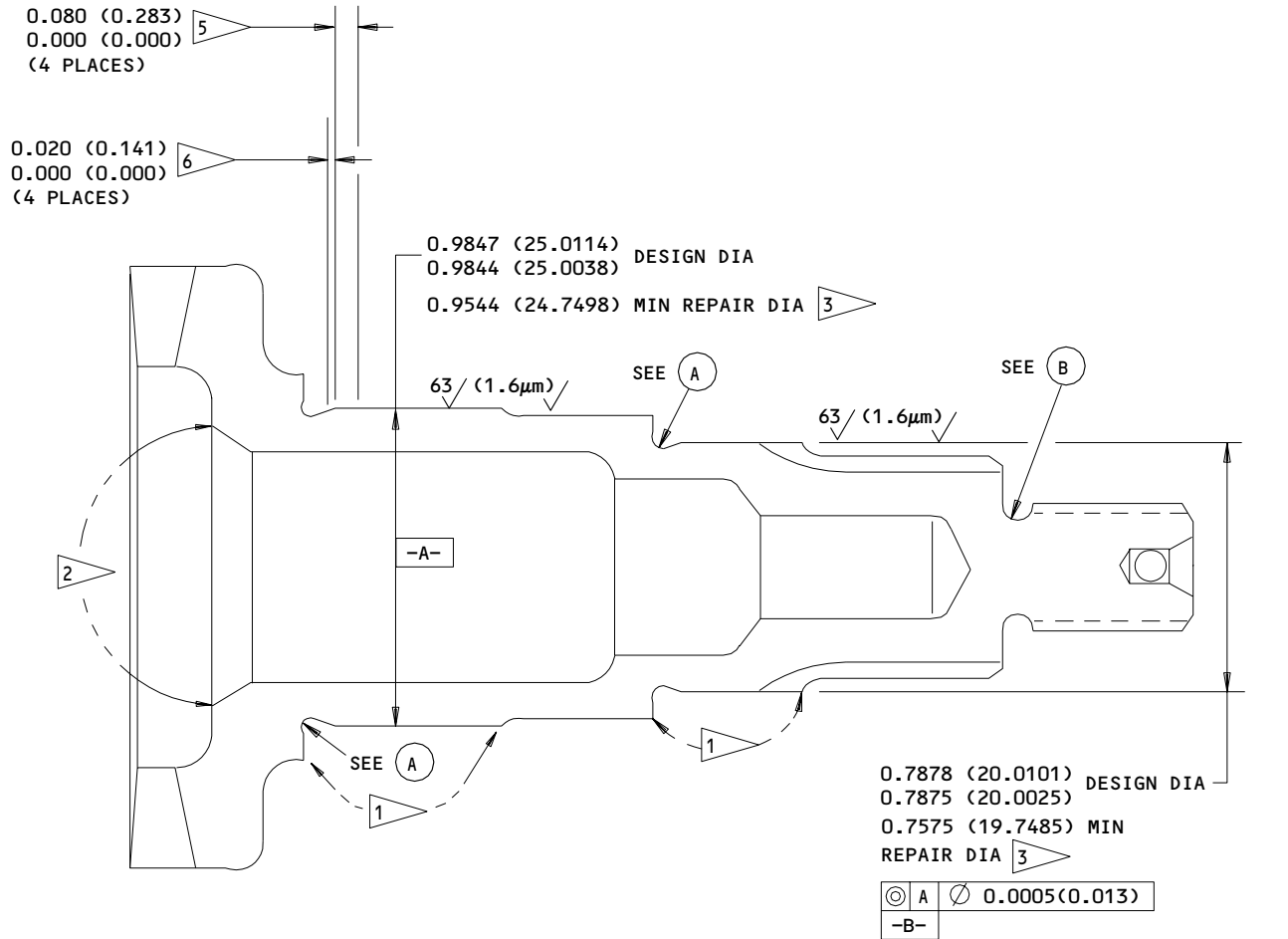
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Gear Repair and Refinish  
 Figure 601 (Sheet 1)

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


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





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REFINISH

CADMIUM PLATE (F-15.23) ALL OVER EXCEPT AS NOTED  
 IN  AND . FINISH INTERNAL BORE PER 

-  NO CADMIUM PLATE THIS SURFACE
-  APPLY PHOSPHATE COATING (F-18.02) EXCEPT DELETE FOLLOWUP OIL TREATMENT, FOLLOWED BY 2 COATS OF BMS 10-11, TYPE 1 PRIMER (F-20.03). COAT INTERIOR WITH CORROSION PREVENTIVE COMPOUND MIL-C-11796 CLASS 1 (F-19.03).
-  CHROME PLATE BUILDUP AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN.
-  RESTORATION TO DESIGN DIM NOT REQUIRED
-  PLATING RUNOUT
-  END OF PLATING

REPAIR

REF    

SHOTPEEN (REF 20-10-03)

125  $\sqrt{(3.2\mu\text{m})}$  MACHINED SURFACES EXCEPT  
 AS NOTED

SHOT PEEN: SHOT NO. 170-460  
 INTENSITY .0006A  
 COVERAGE 2.0

BREAK SHARP EDGES 0.008 (0.20)R

MATERIAL: 9310 STEEL (CARBURIZED-  
 150-190 KSI CORE STRENGTH)

ALL DIMENSIONS ARE IN INCHES EXCEPT  
 DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T2307-1

Gear Repair and Refinish  
 Figure 601 (Sheet 2)

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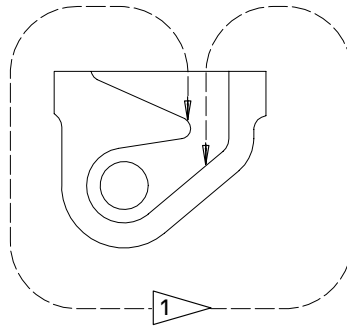


COVER, DRAIN - REPAIR 4-1


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1. Plating Repair

**NOTE:** Repair consists of restoration of original finish. Refer to Refinish instructions, Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CHROMIC ACID ANODIZE (F-17.02) ALL OVER  
AND APPLY 1 COAT OF BMS 10-11, TYPE 1 PRIMER  
(F-20.02) TO SURFACES INDICATED BY 

MATERIAL: AL ALLOY

Cover Repair  
Figure 601

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REPAIR 4-1

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NAMEPLATE - REPAIR 5-1

256T2314-1

1. Nameplate Replacement

NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

- A. Steel stamp part number and serial number on nameplate per 20-50-10.
- B. Install nameplate (95) on housing assembly (75) per 20-50-05 using adhesive indicated in 20-50-12, type 70.

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REPAIR 5-1

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MISCELLANEOUS PARTS REFINISH – REPAIR 6-1

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

IPL FIG. & ITEM	MATERIAL	FINISH
<u>Fig. 1</u>		
Washer (25)	4130 steel, 125-145 ksi	Cadmium plate (F-15.02) all over.
Coupling (50)	4340 steel, 150-170 ksi	Cadmium plate (F-15.02) and apply 1 coat of BMS 10-11, type 1 primer (F-20.02) all over except omit primer on splined surfaces.

Refinish Details  
Figure 601

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REPAIR 6-1

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ASSEMBLY1. Materials

NOTE: Equivalent substitutes may be used.

- A. Grease -- MIL-G-23827 (Ref 20-60-03)
- B. Sealant -- BMS 5-26 (Ref 20-60-04)
- C. Lockwire -- MS20995C32

2. Equipment

NOTE: Equivalent substitutes may be used.

- A. Wrench -- A27051-10

3. Lubrication

- A. Apply light coating of grease to splines, faying surfaces, and bearings at assembly.

CAUTION: APPLY GREASE TO GEAR TEETH ONLY. DO NOT FILL HOUSING WITH GREASE OR OPERATION OF GEARBOX MAY BE ADVERSELY AFFECTED.

- B. Fill gear teeth and pockets with grease (Ref Fig. 701).

4. Assembly (IPL Fig. 1)

- A. Install bearings (35, 40) on gear shafts (30).
- B. Determine shim (45) thickness as shown in Fig. 701.
- C. Deleted.
- D. Place shims (45) in bottom of bearing recess in cover (70) and housing assembly (75) and install gears (30) in housing and cover.

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SHIM THICKNESS CALCULATION

SHIM = A-[B+C]  
OR SHIM = A MINUS SUM OF B PLUS C  
WHERE A = DIMENSION ENGRAVED ON COVER AND HOUSING  
B = MEASURED BEARING WIDTH  
C = GIVEN DIMENSION FOR HOUSING  
C = 1.620 (41.148)  
FOR COVER  
C = 0.970 (24.638)

SHIM OR SHIM SET	NOMINAL THICKNESS	
256T2312-1	0.010	(0.254)
256T2312-2	0.012	(0.305)
256T2312-3	0.015	(0.381)
256T2312-4	0.018	(0.457)
256T2312-5	0.020	(0.508)
256T2312-6	0.025	(0.635)
256T2312-1 & -2	0.022	(0.559)
256T2312-2 & -2	0.024	(0.610)
256T2312-2 & -3	0.027	(0.686)
256T2312-1 & -4	0.028	(0.711)
256T2312-1 & -5	0.030	(0.762)
256T2312-2 & -5	0.032	(0.813)
256T2312-3 & -4	0.033	(0.838)
256T2312-3 & -5	0.035	(0.889)

EXAMPLE

HOUSING

A = 2.117 (53.772)  
B = 0.4720 (11.989)  
C = 1.620 (41.148)

SHIM = 2.117(53.772)-[0.4720(11.989)  
+1.620(41.148)]  
= 2.117(53.772)-2.0920(53.132)  
= 0.0250(0.635)

USE SHIM 256T2312-6

COVER

A = 1.4692(37.318)  
B = 0.4722(11.994)  
C = 0.970(24.638)

SHIM = 1.4692(37.318)-[0.4722  
(11.994)+0.970(24.638)]  
= 1.4692(37.318)-1.4422  
(36.632)  
= 0.0270(0.686)

USE SHIMS 256T2312-2 & -3

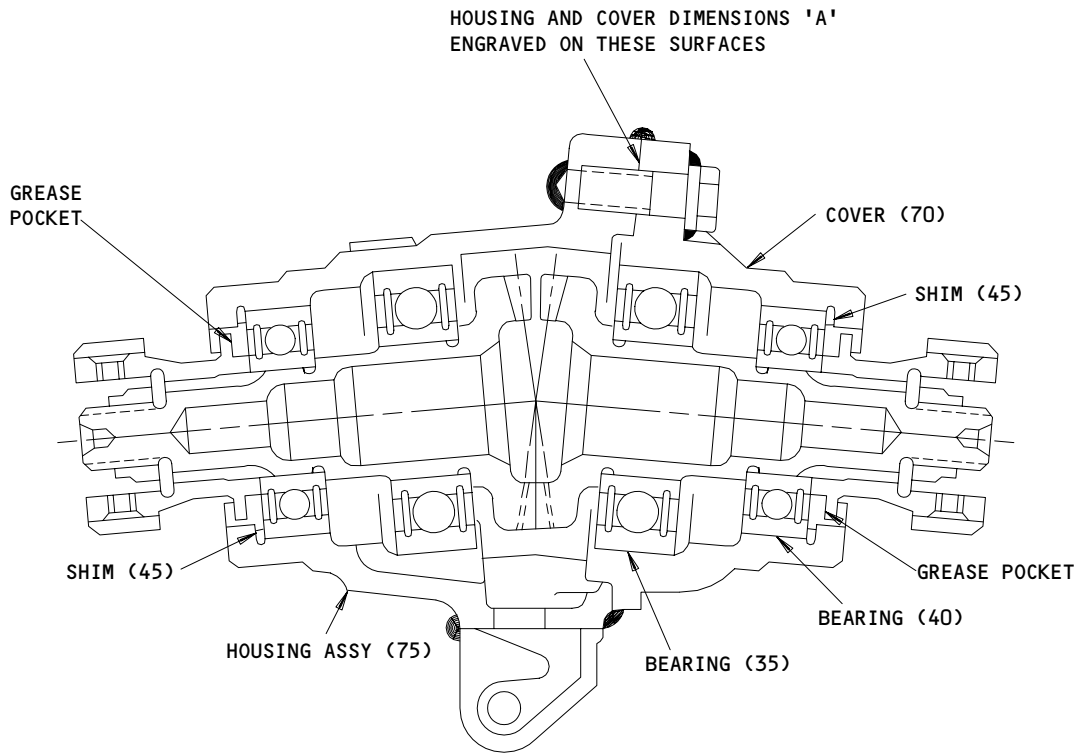
ALL DIMENSIONS ARE IN INCHES EXCEPT  
DIMENSIONS IN ( ) ARE IN MILLIMETERS

Assembly Details and Shim Adjustment  
Figure 701 (Sheet 1)

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Assembly Details and Shim Adjustment  
Figure 701 (Sheet 2)

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ASSEMBLY  
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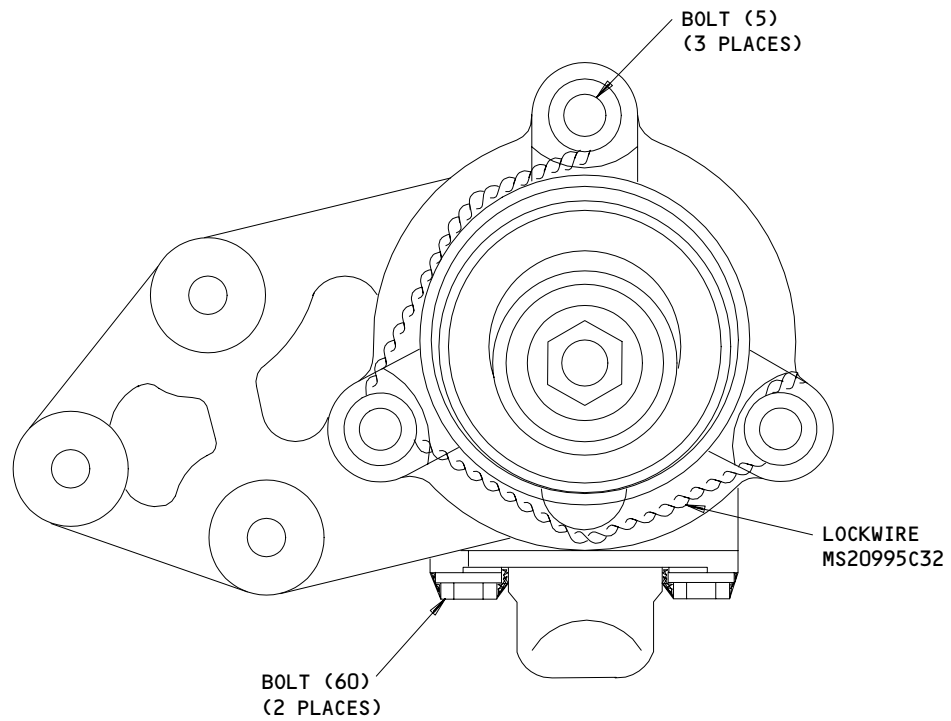
- E. Slide coupling (50) on gear (30) in housing assembly (75) and fill pocket area between coupling flange and bearing (40) with grease (Fig. 701). Install washer (25) and nut (20). Use wrench A27051-10 to hold coupling (50) and tighten nut to 160-240 lb-in. (185-275 kgf-cm). Install cotter pin (15).
- F. Mate cover (70) with housing (75) and install washers (10) and bolts (5). Install bolts (5) with wet primer. Tighten bolts to 65-80 lb-in. (75-92 kgf-cm).
- G. Slide coupling (50) on gear (30) in cover (70) and fill pocket area between coupling flange and bearing (40) with grease (Fig. 701). Install washer (25) and nut (20). Use wrench A27051-10 to hold coupling (50) and tighten nut to 160-240 lb-in. (185-275 kgf-cm). Install cotter pin (15).
- H. Install cover (55) and secure with washers (65) and bolts (60). Install bolts with wet primer. Tighten bolts to 22-28 lb-in. (25-32 kgf-cm).
- I. Test unit per TESTING/TROUBLE SHOOTING.
- J. Fillet seal heads of bolts (5, 60) and cover exposed ends of bolts (5) with sealant (Fig. 701, 702).
- K. Fillet seal contact areas between housing assembly (75) and covers (55, 70) with sealant (Fig. 701).
- L. Install lockwire using double-twist method per 20-50-02 as shown in Fig. 702.

## 5. Storage

- A. Store this assembly using standard industry practices.

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Lockwire Diagram  
Figure 702

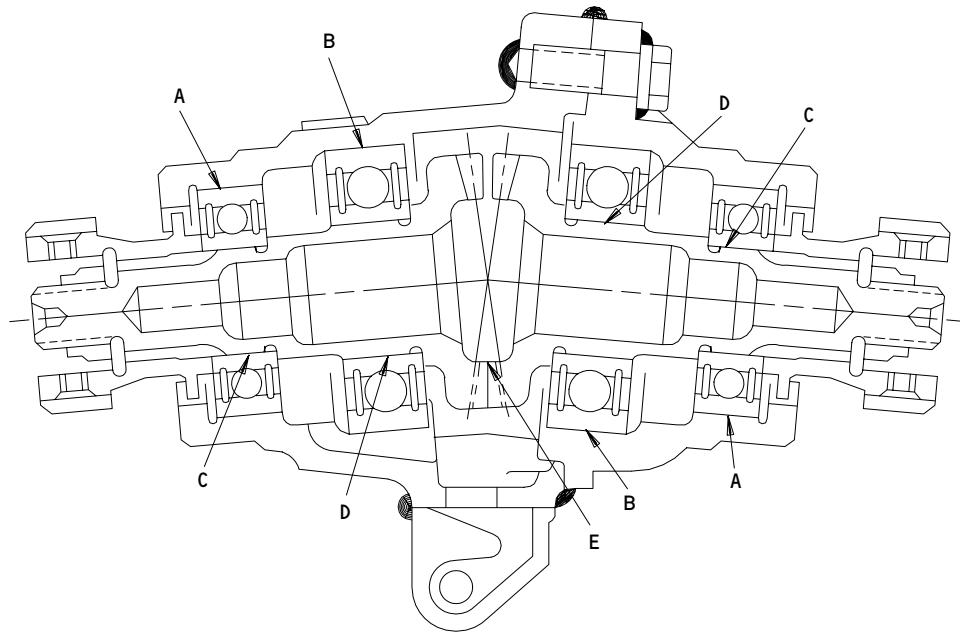
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FITS AND CLEARANCES



Fits and Clearances  
Figure 801 (Sheet 1)

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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 70,75 OD 40	1.6535 (41.999) 1.6530 (41.986)	1.6545 (42.024) 1.6535 (41.999)	0.0000 (0.000)	0.0015 (0.038)	1.6505 (41.923)	1.6575 (42.100)	0.0030 (0.008)
B	ID 70,75 OD 35	2.0472 (51.999) 2.0467 (51.986)	2.0484 (52.029) 2.0472 (51.999)	0.0000 (0.000)	0.0017 (0.043)	2.0437 (51.910)	2.0514 (52.106)	0.0030 (0.008)
C	ID 40 OD 30	0.7870 (19.99) 0.7875 (20.00)	0.7874 (20.00) 0.7878 (20.01)	-0.0008 (-0.0203) *[1]	-0.0001 (-0.0025) *[1]	0.7874 (20.00)	0.7877 (19.99)	0.0000 (0.000)
D	ID 35 OD 30	0.9839 (24.99) 0.9844 (25.00)	0.9843 (25.00) 0.9847 (25.01)	-0.0008 (-0.0203) *[1]	-0.0001 (-0.0025) *[1]	0.9843 (25.00)	0.9847 (24.99)	0.0000 (0.000)
E	ID 30 *[2]			0.003 (0.076)	0.007 (0.178)			0.007 (0.17)

\*[1] INTERFERENCE FIT

\*[2] BACKLASH BETWEEN INSTALLED GEARS

ALL DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS IN ( ) ARE IN MILLIMETERS.

Fits and Clearances  
 Figure 801 (Sheet 2)

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**BOEING**  
 COMPONENT  
 MAINTENANCE MANUAL

FOR TORQUE VALUE OF STANDARD FASTENERS, REFER TO 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES (kg-cm)	POUND-FeET (kg-m)
5	BOLT	65-80 (75-92)	
20	NUT	160-240 (185-275)	
60	BOLT	22-28 (25-32)	

Torque Table  
Figure 802

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FITS AND CLEARANCES  
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SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

- |1. A27049-1 -- Backlash Check Fixture
  - |2. A27051-10 -- Wrench
  - |3. A27046-53 -- Tower Assembly \*[1]
  - |4. A27046-60 -- Weight Assembly \*[1]
  - |5. 17501 -- Hand Knob \*[1]
- |\*[1] Part of Test Equipment A27046-8

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SPECIAL TOOLS

01.1

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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.

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ILLUSTRATED PARTS LIST

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VENDORS

15653 KAYNAR MFG COMPANY INC KAYLOCK DIV  
PO BOX 3001 800 SOUTH STATE COLLEGE BLVD  
FULLERTON, CALIFORNIA 92634

21335 TEXTRON INC FAFNIR BEARING DIVISION  
37 BOOTH STREET  
NEW BRITAIN, CONNECTICUT 06050

21760 SCHATZ FEDERAL BEARINGS CO INC  
FAIRVIEW AVENUE  
POUGHKEEPSIE, NEW YORK 12602

29337 HOOVER UNIVERSAL INC BALL AND ROLLER DIV  
ERWIN, TENNESSEE 37650

38443 TRW INC BEARING DIV  
402 CHANDLER STREET  
JAMESTOWN, NEW YORK 14701

43991 FAG BEARING INCORPORATED  
HAMILTON AVENUE  
STAMFORD, CONNECTICUT 06904

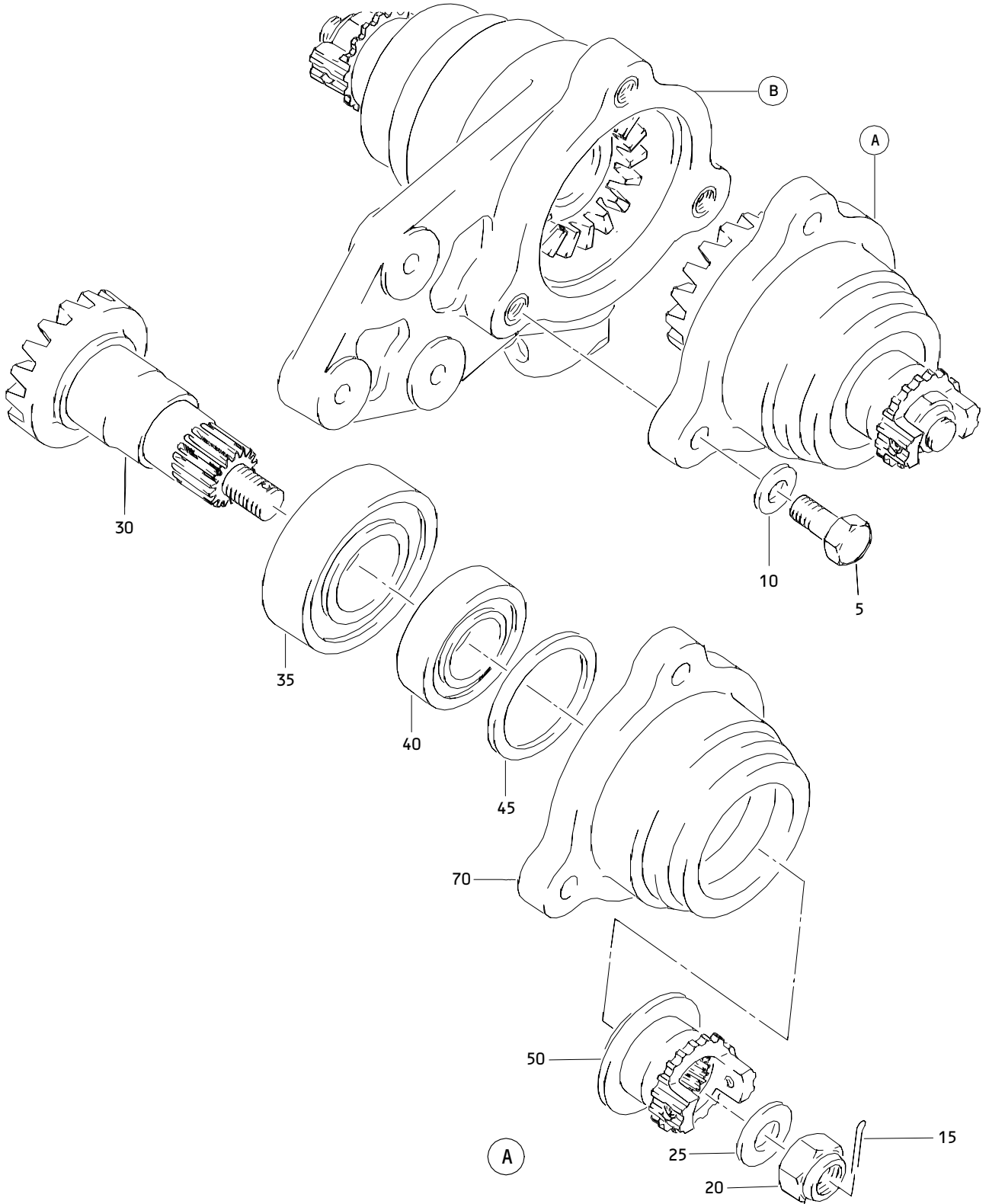
52828 REPUBLIC FASTENER MFG CORP  
1300 RANCHO CONEJO BLVD  
NEWBURY PARK, CALIFORNIA 91320

72962 ESNA DIV OF AMERACE CORP  
2330 VAUXHALL ROAD  
UNION, NEW JERSEY 07083

80539 SPS TECHNOLOGIES INC AEROSPACE PRODUCTS DIV  
2701 SOUTH HARBOR BOULEVARD  
SANTA ANA, CALIFORNIA 92702

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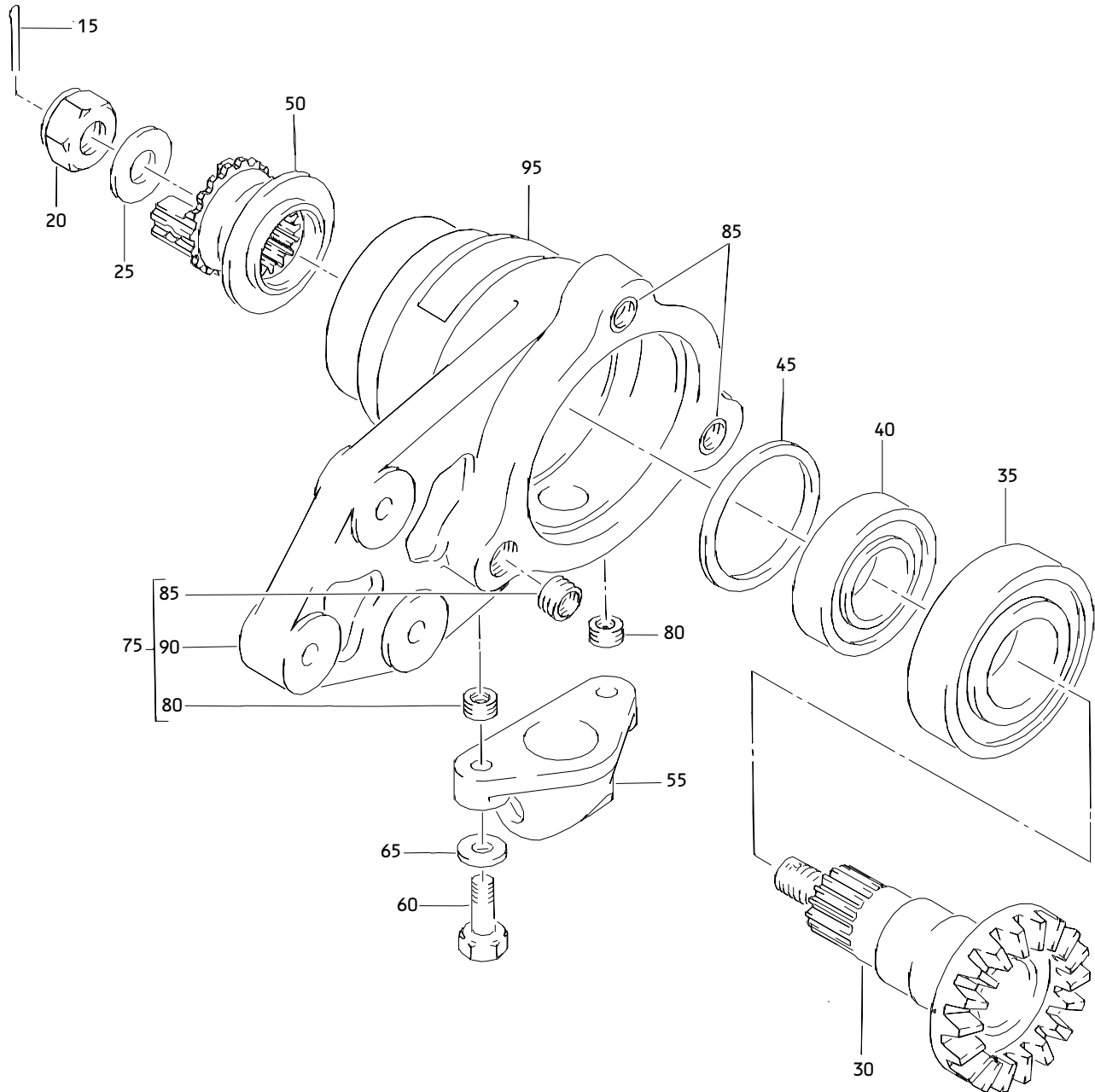
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Outboard Leading Edge Slat Drive Angle Gearbox Assembly  
Figure 1 (Sheet 1)

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(B)

Outboard Leading Edge Slat Drive Angle Gearbox Assembly  
Figure 1 (Sheet 2)

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**BOEING**  
 COMPONENT  
 MAINTENANCE MANUAL

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01- -1	256T2320-1		GEARBOX ASSY-OUTBD LE SLAT DRIVE ANGLE		RF
5	NAS6604H6		.BOLT		3
10	AN960PD416		.WASHER		3
15	MS24665-283		.PIN-COTTER		2
20	BRH10A6		.NUT- (V52828) (SPEC BACN10JC6) (OPT H10-6BAC (V15653)) (OPT RMLH9075-6 (V72962)) (OPT 96-064 (V80539))		2
25	256T2311-1		.WASHER		2
30	256T2307-1		.GEAR-BEVEL		2
35	1205LLT1C1-01		.BEARING- (V21760) (SPEC BACB10AZ25PP) (OPT 205NPPFS428 (V21335)) (OPT 205TT (V43991)) (OPT 99205 (V29337))		2
40	LL104KS		.BEARING- (V38443) (SPEC BACB10BA20PP) (OPT 6004FTT (V43991)) (OPT 9104LLT1C1-01 (V21760)) (OPT 9104NPPFS428 (V21335)) (OPT 993L04 (V29337))		2
45	256T2312-1		.SHIM		AR
-45A	256T2312-2		.SHIM		AR
-45B	256T2312-3		.SHIM		AR

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-45C	256T2312-4		.SHIM		AR
-45D	256T2312-5		.SHIM		AR
-45E	256T2312-6		.SHIM		AR
50	256T2309-1		.COUPLING		2
55	65B81978-3		.COVER-DRAIN ATTACHING PARTS		1
60	NAS6603-2		.BOLT		2
65	AN960PD10		.WASHER -----*-----		2
70	256T2305-1		.COVER		1
75	256T2303-1		.HOUSING ASSY		1
80	MS21209F1-15		..INSERT		2
85	MS21209F4-15		..INSERT		3
90	256T2303-2		..HOUSING		1
95	256T2314-1		.NAMEPLATE		1

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