TO: ALL HOLDERS OF TRAILING EDGE FLAP DRIVE OFFSET TEE GEARBOX ASSEMBLY
COMPONENT MAINTENANCE MANUAL 27-51-22

REVISION NO. 4 DATED MAR 01/00

HIGHLIGHTS

All data formerly in manual 27-51-21 is included in this manual 27-51-22.

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
TR & SB RECORD	Incorporated latest engineering changes that add
1	Substitute Kit Assemblies 256T3540-5 and -6.
102-105	
301-302	
REPAIR 2-1	
601	
REPAIR 7-1	
601-602	
REPAIR 8-1	
601-602	
REPAIR 9-1	
601-602	
REPAIR 10-1	
601-602	
701-704,706	
801-803	
1002,1004-1007, 1009-1016	
CONTENTS	Clarified text without technical change.
1	
101-105	
301	
401	

CHAPTER/SECTION AND PAGE NO.	DESCRIPTION OF CHANGE
501	HIGHLIGHT CONTINUED FROM PREVIOUS PAGE
REPAIR-GEN	
603	
REPAIR 13-1	
601	
REPAIR 14-1	
601	
701-705	

TRAILING EDGE FLAP DRIVE
OFFSET TEE GEARBOX ASSEMBLY

PART NUMBER 256T3540-3, -4

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
		PRR B10112 PRR B13106-7	OCT 10/81 MAR 01/00

PAGE	DATE	CODE
27-51-22		
TITLE PAGE		
1	OCT 01/87	01
2	BLANK	
REVISION RECORD		
1	OCT 01/87	01
2	BLANK	
TR & SB RECORD		
*1	MAR 01/00	01.1
2	BLANK	
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*1	MAR 01/00	01
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*1	MAR 01/00	01.1
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1	OCT 01/87	01
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1	OCT 01/90	01.101
2	BLANK	
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*101	MAR 01/00	01.1
*102	MAR 01/00	01.1
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*104	MAR 01/00	01.1
*105	MAR 01/00	01.1
*106	BLANK	
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*302	MAR 01/00	01.1
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*401	MAR 01/00	01.1
402	BLANK	
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*501	MAR 01/00	01.1
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602	OCT 01/87	01
*603	MAR 01/00	01.1
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601	OCT 01/87	01
602	BLANK	
REPAIR 6-1		
601	OCT 01/87	01
602	BLANK	
REPAIR 7-1		
*601	MAR 01/00	01.1
*602	MAR 01/00	01.1

* = REVISED, ADDED OR DELETED

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REPAIR 8-1		
*601	MAR 01/00	01.1
*602	MAR 01/00	01.1
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*601	MAR 01/00	01.1
*602	MAR 01/00	01.1
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*602	MAR 01/00	01.1
REPAIR 11-1		
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602	BLANK	
REPAIR 12-1		
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602	BLANK	
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*601	MAR 01/00	01.1
602	BLANK	
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*601	MAR 01/00	01.1
602	BLANK	
ASSEMBLY		
*701	MAR 01/00	01.1
*702	MAR 01/00	01.1
*703	MAR 01/00	01.1
*704	MAR 01/00	01.1
*705	MAR 01/00	01.1
*706	MAR 01/00	01.1
FITS AND CLEARANCES		
*801	MAR 01/00	01.1
*802	MAR 01/00	01.1
*803	MAR 01/00	01.1
804	OCT 01/87	01

PAGE	DATE	CODE
SPECIAL TOOLS		
901	OCT 01/87	01
902	BLANK	
ILLUSTRATED PARTS LIST		
1001	OCT 01/87	01
*1002	MAR 01/00	01.1
*1003	MAR 01/00	01.1
*1004	MAR 01/00	01.1
*1005	MAR 01/00	01.1
*1006	MAR 01/00	01.1
*1007	MAR 01/00	01.1
*1008	BLANK	
*1009	MAR 01/00	01.1
*1010	MAR 01/00	01.1
*1011	MAR 01/00	01.1
*1012	MAR 01/00	01.1
*1013	MAR 01/00	01.1
*1014	MAR 01/00	01.1
*1015	MAR 01/00	01.1
*1016	MAR 01/00	01.1

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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	Jan 29/82
Assembly	Jan 29/82

TRAILING EDGE FLAP DRIVE OFFSET TEE GEARBOX ASSEMBLY

DESCRIPTION AND OPERATION

1. The trailing edge flap drive offset tee gearbox assembly consists of a series of bearing-mounted bevel gears enclosed in an aluminum alloy housing. Internally-splined coupling sleeves are attached to the ends of the gear shafts.

2. Power from the trailing edge flap drive power drive unit (PDU) is delivered to rotary actuators operating each flap via flap drive torque tubes. The offset tee gearbox assembly splits the drive path, providing a direct line to one of the inboard flap actuators and an offset line to the outboard flap actuators.

3. Leading Particulars (approximate)

   A. Length -- 11 inches (28 centimeters)

   B. Width -- 7 inches (18 centimeters)

   C. Height -- 17 inches (43 centimeters)

   D. Weight -- 17 pounds (8 kilograms)

TESTING AND FAULT ISOLATION

1. Test Equipment and Materials

   NOTE: Equivalent substitutes may be used.

   A. Test Fixture -- A27046-99 (Consists of -100 fixture assembly plus -129 and -130 usage placards)

   B. Test Equipment -- A27046-8 (Includes -53 tower assembly, -54 crank assembly, -55 brackets, -56, -58, -113, and -118 clamp assemblies, -123 and -124 collars, -126 weight assembly

2. Visually check unit in accordance with standard industry practices.

3. Binding and Roughness Check

   A. With no load on the output shaft, operate the input shaft by hand through a minimum of 720 degrees in both directions. There shall be no significant binding or roughness.

4. No-Load Torque Check

   A. Prior to beginning no-load torque check, rotate the input shaft through 12 revolutions in both directions.

   B. With no load on the output shaft, measure the amount of torque applied at the input shaft when rotated through a minimum of 720 degrees in both directions. The no-load torque shall not exceed 2.5 pound-inches (0.28 Nm).

5. Corrective Procedures

   A. If no corrective action is required, proceed with backlash check (par. 6).

   B. If roughness or binding exists, or if no-load torque of 2.5 pound-inches (0.28 Nm) is exceeded, replace bearings (75, 80, IPL Fig. 1) as follows:

      (1) Completely disassemble unit per DISASSEMBLY and remove gears and bearings.

(2) Examine gears for pitting and other signs of uneven wear. Bearing pattern is to be centered in the area of pitch diameter.

6. Backlash Check (IPL Fig. 1)

NOTE: Units "in service" referred to in the following test are units removed from service for known or suspected malfunctioning characteristics and for which testing is desired to determine further disposition. Units that meet the "in service" limits may be returned to service without overhaul.

Test limits for units in service are the same as for overhauled unless otherwise noted.

A. Check backlash between gears (260, 265).

(1) Disassemble unit as shown in DISASSEMBLY steps 2.A. thru 2.E.

(2) Install gearbox assembly on test fixture assembly A27046-100 as shown in placard A27046-129 ("Usage A").

(3) Remove nut and washer from clamp assembly A27046-113, and install with collar A27046-123 in gearbox.

(4) Attach clamp assemblies A27046-56, -58, crank assembly A27046-54, and brackets A27046-55 to clamp assembly A27046-113 and shaft of bevel gear (260). Secure parts with washers (50) and nuts (45).

(5) Reinstall washer and nut previously removed from clamp assembly A27046-113 and tighten nut to lock clamp to idler bevel gear (265).

(6) Using weight assembly A27046-126, or equivalent, apply a 25-35 pound (111-156 N) outward axial load to idler bevel gear (155) and clamp in position. Apply an equal outward axial load to input bevel gear (260) to seat gear firmly against shim(s) and bearing cap.

(7) Using crank assembly apply a 5-10 pound-inch (0.56-1.13 Nm) torque to the shaft in each direction. Check that backlash at the scribe line on clamp assembly A27046-58 is 0.007-0.016 inches (0.179-0.406 mm) per mesh for units in service, or 0.007-0.013 inches (0.179-0.330 mm) per mesh for overhauled units, measured at three places approximately 120 degrees apart. Backlash is the total clearance measured from the torqued position in one direction to the torqued position in the other direction.

NOTE: Backlash specified is equivalent to 0.004-0.009 inches (0.102-0.229 mm) for units in service, or 0.004-0.007 inches (0.10 2-0.178 mm) for overhauled units, measured at the pitch line of the gears. Do not include internal spline backlash when measuring individual gear set backlash.

B. If backlash exceeds required limits, adjust shim thickness on bevel gear (260) as follows:

(1) Disassemble unit as shown in DISASSEMBLY steps 2.E. thru 2.G.

(2) Adjust thickness of shims (120) as required to increase or decrease backlash. Then assemble parts as shown in ASSEMBLY steps 4.E. thru 4.G.

NOTE: If backlash is below minimum, use next thinner shim or shim set as shown in table (Fig. 701). If backlash exceeds maximum, use next thicker shim or shim set.

(3) Repeat backlash check.

C. Remove gearbox from test fixture and remove clamp assembly A27046-113 from gearbox.

D. If backlash still exceeds required limits, replace bearing then gears as required and repeat backlash check.

E. After correct backlash has been obtained, rotate bevel gear (260) by hand with no load on bevel gear (265). Check that gears mesh smoothly with no significant binding or roughness through at least two revolutions in each direction.

F. Check backlash between gears (255, 270).

(1) Disassemble unit as shown in DISASSEMBLY steps 2.F. thru 2.H. and 2.J. Remove bevel gear (265), bearing (210) and shim (215) from housing (220).

(2) Reinstall housing assembly (165) and bevel gear (255) as shown in ASSEMBLY steps 4.L., 4.N., and 4.O.

(3) Install gearbox assembly on test fixture assembly A27046-100 as shown in placard A27046-130 (Usage B).

(4) Attach collar A27046-124 with fasteners (30, 35), then insert sleeve A27046-122 into gearbox over protruding rod assembly A27046-119.

(5) Attach clamp assemblies A27046-56, -58, crank assembly A27046-54, and brackets A27046-55 to clamp assembly A27046-118 and shaft of bevel gear (255). Secure parts with washers (50) and nuts (45).

(6) Reinstall washer and nut previously removed from clamp assembly A27046-118 and tighten nut to lock clamp to idler shaft bevel gear (370).

(7) Using weight assembly A27046-126, or equivalent, apply a 25-35 pound (111-156 N) outward axial load to idler shaft bevel gear (270) and clamp in position. Apply an equal outward axial load to output shaft (255) to seat gear firmly against shim(s) and cover.

(8) Using crank assembly, apply a 5-10 pound-inch (0.56-1.13 Nm) torque to the shaft in each direction. Check that backlash at the scribe line on clamp assembly A27046-58 is 0.007-0.016 inches (0.179-0.406 mm) for units in service, or 0.007-0.013 inches (0.179-0.330 mm) for overhauled units, measured at three places approximately 120 degrees apart. Backlash is the total clearance measured from the torqued position in one direction to the torqued position in the other direction.

NOTE: Backlash specified is equivalent to 0.004-0.009 inch (0.102-0.229 mm) for units in service, or 0.004-0.007 inch (0.102-0.178 mm) for overhauled units, measured at the pitch line of the gears.

G. If backlash exceeds required limits, adjust shim thickness on bevel gear (85) as follows:

(1) Disassemble unit as shown in DISASSEMBLY steps 2.A. thru 2.D.

(2) Adjust thickness of shims (80) as required to increase or decrease backlash. Then assemble parts as shown in ASSEMBLY steps 4.N. and 4.O.

NOTE: If backlash is below minimum, use next thinner shim or shim set as shown in table (Fig. 701). If backlash exceeds maximum, use next thicker shim or shim set.

(3) Repeat backlash check.

H. Remove gearbox from test fixture.

I. If backlash still exceeds required limits, replace bearing then gears as required and repeat backlash check.

J. After correct backlash has been obtained, rotate bevel gear (255) by hand with no load on bevel gear (270). Check that gears mesh smoothly with no significant binding or roughness through at least two revolutions in each direction.

K. Complete assembly as shown in ASSEMBLY steps 4.Q. and on.

DISASSEMBLY

NOTE: See TESTING AND FAULT ISOLATION to establish the condition of the component or most probable cause of its malfunction. This is to determine the extent of disassembly required without completely tearing down and rebuilding the component.

1. Parts Replacement (Ref IPL Fig. 1)

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

   A. Lockwire

   B. Molded sleeve (60)

2. Disassembly (Ref IPL Fig. 1)

   A. Remove lockwire and sealant.

   B. Remove nuts (45) and washers (50) then slide parts (40, 55, 60) off shafts of input and output bevel gears (255, 260).

   C. Remove bolts (70) and washers (75) then remove cover (65) and enclosed parts from housing assembly (165).

   D. Remove bevel gear (255), bearings (95, 100), shield (90), and shim(s) (80) from cover. Remove bearings and shield from bevel gear. Measure and record shim thickness to facilitate assembly.

   E. Remove parts (10 thru 20) from housing assemblies (165, 220). Remove bolts (175) and washers (180) and detach output housing assembly (165) from input housing assembly (220).

      NOTE: Do not remove inserts (185, 190, 195) or nameplate (160) from output housing unless necessary for repair or replacement.

   F. Remove bolts (110) and washers (115) and remove bearing cap (105), bevel gear (260), and associated parts (120, 130 thru 150) from housing.

   G. Separate bearing cap and bevel gear. Remove shield (130) and bearings (135, 140) from gear. Remove shim(s) (120) and measure and record thickness.

   H. Remove splined coupling (145) from bevel gear. Remove C-ring (150).

I. Separate bevel gears (265, 270) and remove from housing assembly along with bearings (210) and shims (215). Measure and record shim thicknesses and note locations to facilitate assembly. Remove bearings (210) from gears.

J. Remove parts (25 thru 35) from housing assembly (220).

NOTE: Do not remove inserts (230, 235) from housing assembly unless necessary for repair or replacement.

CLEANING

1. Clean all parts using standard industry practices and information contained in 20-30-03, except as noted in par. 2.

2. Clean sealed bearings (95, 100, 135, 140, 210, IPL Fig. 1) as shown in manufacturer's instructions.

CHECK

1. Check all parts for obvious defects in accordance with standard industry practices.

2. Refer to FITS AND CLEARANCES for design dimensions and wear limits.

3. Magnetic particle check the following parts (Ref IPL Fig. 1) as shown in 20-20-01.

   A. Coupling half (40) and coupling sleeve (55)

   B. Splined coupling (145)

   C. Bevel gears (255, 260, 265, 270)

   D. C-ring (150)

4. Penetrant check the following parts (Ref IPL Fig. 1) as shown in 20-20-02.

   A. Drain (10)

   B. Cap (25)

   C. Cover (65)

   D. Bearing cap (105)

   E. Housings (200, 240)

5. Check gear teeth and splines for uneven wear.

REPAIR - GENERAL

1. Contents

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

P/N	NAME	REPAIR
256T3316	SHIELD	1-1
256T3342	COVER	2-1
256T3541	HOUSING	3-1
256T3542	HOUSING	4-1
256T3543	BEARING CAP	5-1
256T3544	CAP	6-1
256T3545	BEVEL GEAR	7-1
256T3546	BEVEL GEAR	8-1
256T3547	BEVEL GEAR	9-1
256T3548	BEVEL GEAR	10-1
256T3549	SPLINED COUPLING	11-1
256T3749	COUPLING HALF	12-1
256T3320	NAMEPLATE	13-1
- - -	MISC PARTS REFINISH	14-1

2. Standard Practices

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

20-10-02 Machining of Alloy Steels
20-10-03 Shot Peening
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
20-42-03 Hard Chrome Plating
20-42-05 Bright Cadmium Plating
20-43-01 Chromic Acid Anodizing
20-50-10 Application of Stencils, Insignia, Silk Screen, Part Numbering and Identification Markings
20-50-12 Application of Adhesives

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, class 1 (Ref 20-60-02)

C. Adhesive -- Type 38 (Ref 20-50-12)

—	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

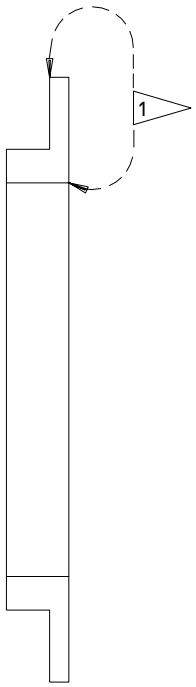
True Position Dimensioning Symbols
Figure 601

SHIELD - REPAIR 1-1

256T3316-1, -3

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CADMIUM PLATE (F-15.02) ALL OVER. APPLY ONE COAT PRIMER BMS 10-11, TYPE I (F-20.02) AS NOTED.

MATERIAL: 4340 STEEL (125-145 KSI)

1 APPLY PRIMER THESE SURFACES ONLY

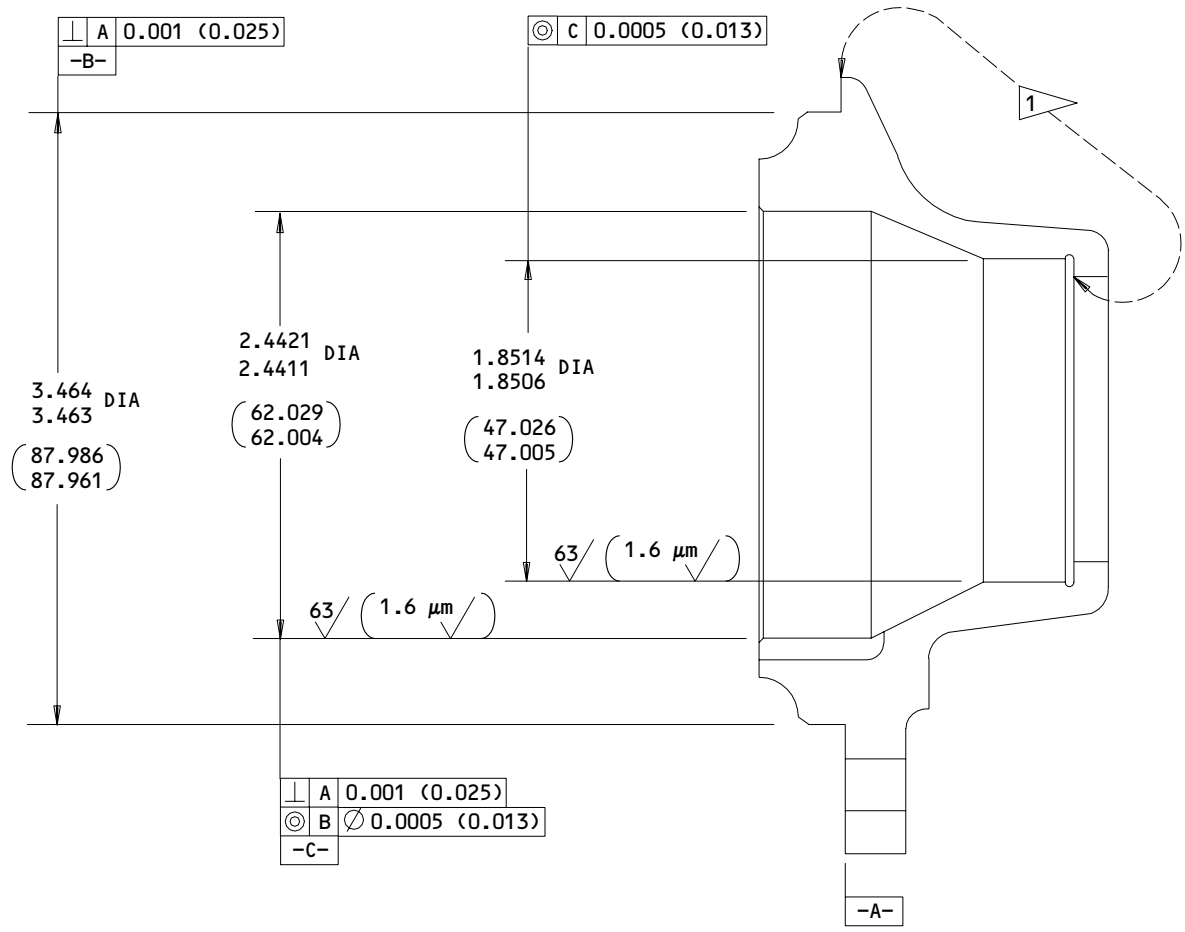
Shield Refinish
Figure 601

COVER - REPAIR 2-1

256T3342-1, -3

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) AS NOTED

1 APPLY PRIMER THIS AREA ONLY. OMIT PRIMER IN BOLT HOLES

MATERIAL: AL ALLOY

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

Cover Refinish
Figure 601

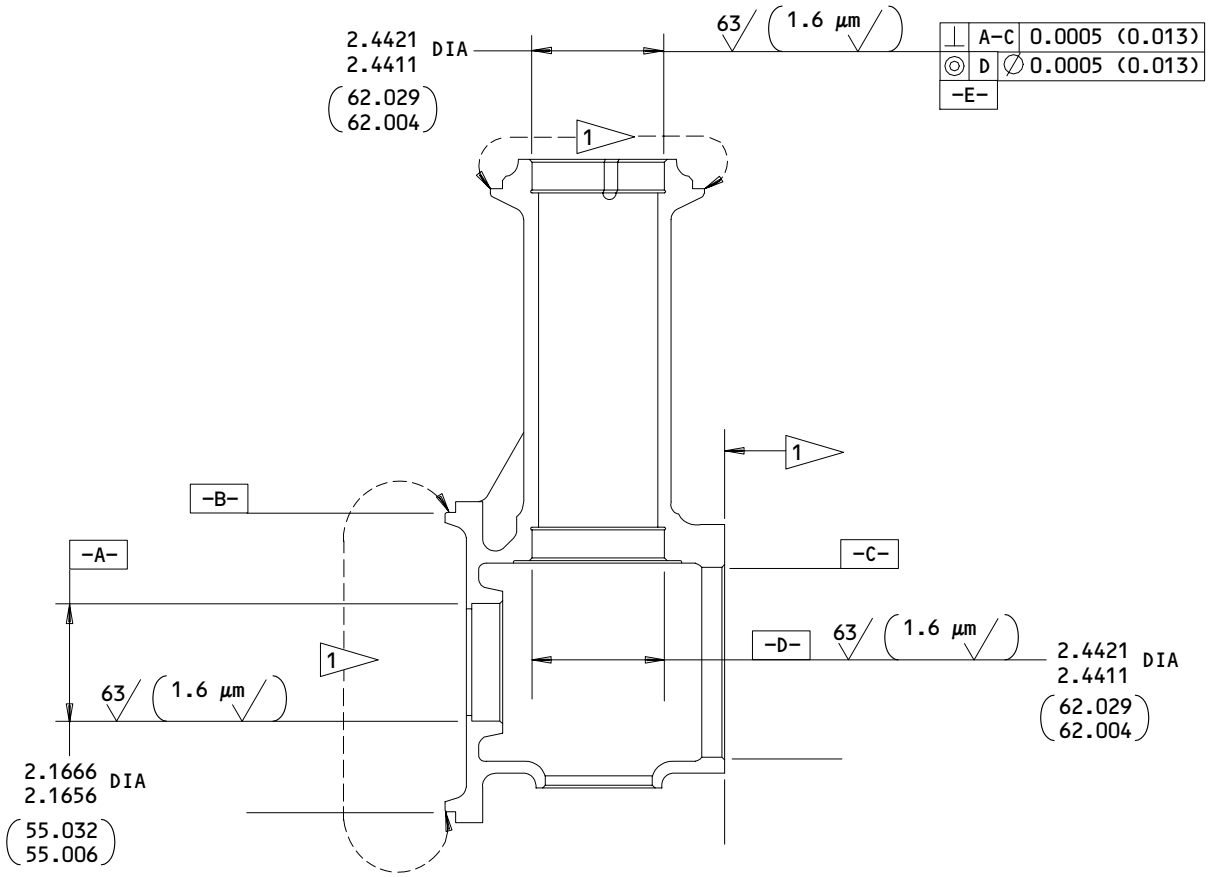
19248

HOUSING ASSEMBLY - REPAIR 3-1

256T3541-1, -2

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

HOUSING (240): CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) TO EXTERNAL SURFACES EXCEPT IN HOLES AND AS NOTED.

1 NO PRIMER THESE SURFACES

MATERIAL: AL ALLOY

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

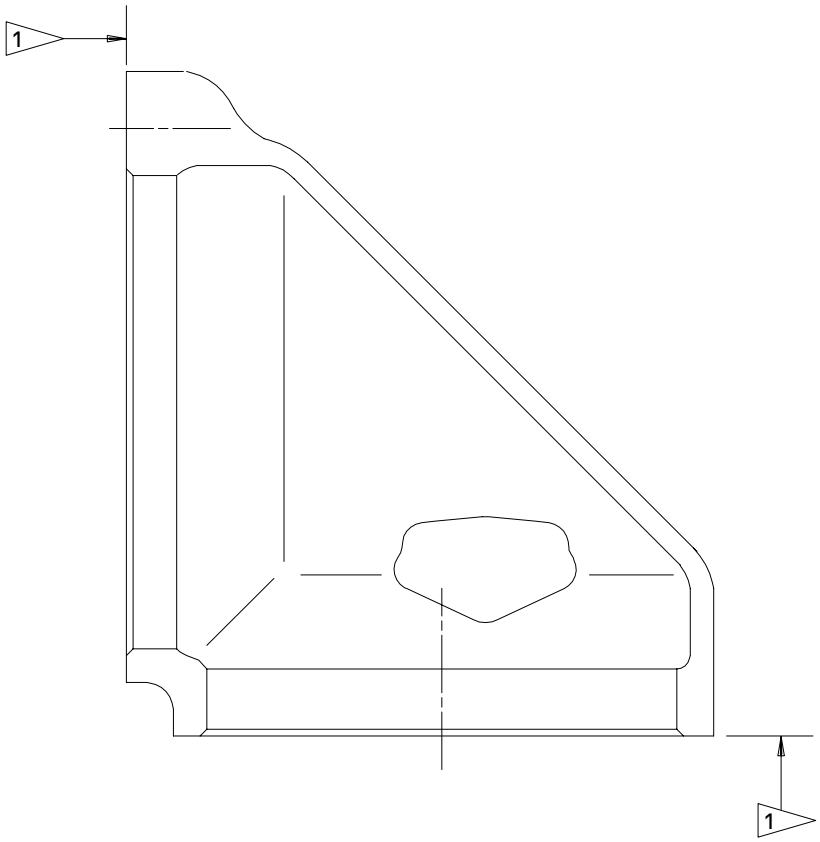
Housing Assembly Repair
Figure 601

HOUSING ASSEMBLY - REPAIR 4-1

256T3542-1, -2

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

MATERIAL: AL ALLOY

HOUSING (200): CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) TO EXTERNAL SURFACES EXCEPT AS NOTED.

1 NO PRIMER THESE SURFACES

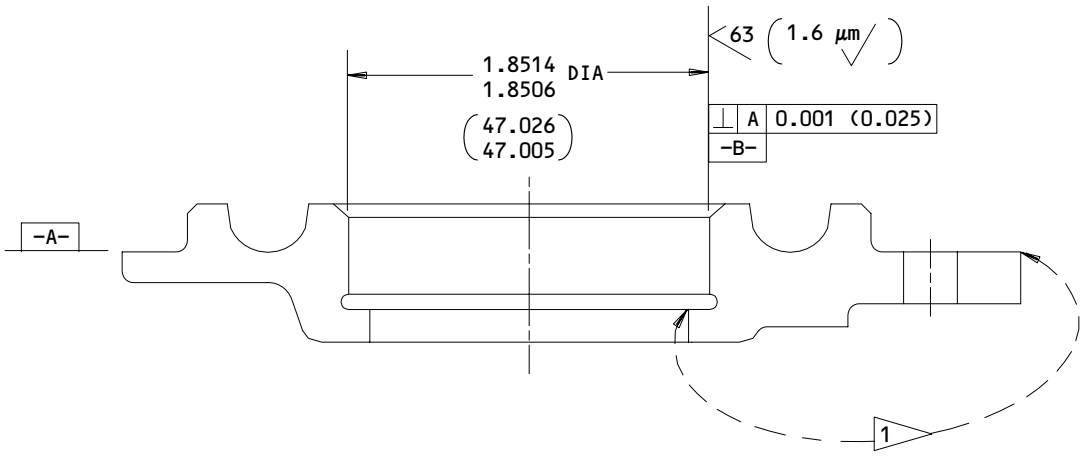
Housing Assembly Repair
Figure 601

BEARING CAP - REPAIR 5-1

256T3543-1

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) TO EXTERNAL SURFACES AS NOTED.

1 APPLY PRIMER THESE SURFACES ONLY. OMIT PRIMER IN BOLT HOLES

MATERIAL: AL ALLOY

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

Bearing Cap Refinish
Figure 601

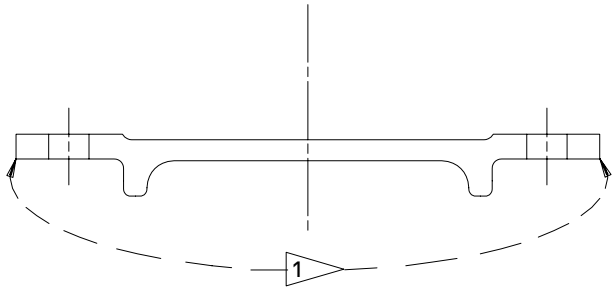
19251

CAP - REPAIR 6-1

256T3544-1

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

MATERIAL: AL ALLOY

CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05) ALL OVER. APPLY ONE COAT PRIMER, BMS 10-11, TYPE I (F-20.02) TO EXTERNAL SURFACES EXCEPT IN HOLES AND AS NOTED.

1 NO PRIMER THESE SURFACES

Cap Refinish
Figure 601

BEVEL GEAR - REPAIR 7-1

256T3545-1, -3

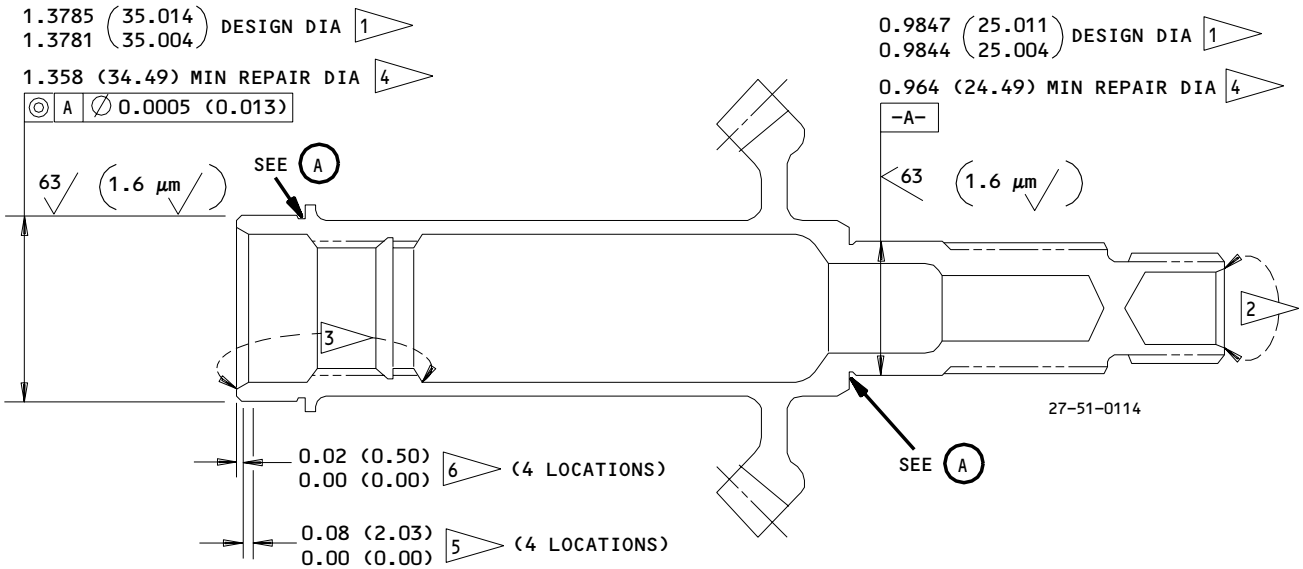
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair repair of surfaces which may only require stripping and restoration of original finish, refer to REFINISH INSTRUCTION, Fig. 601.

1. Bearing Seat Repair (Fig. 601)

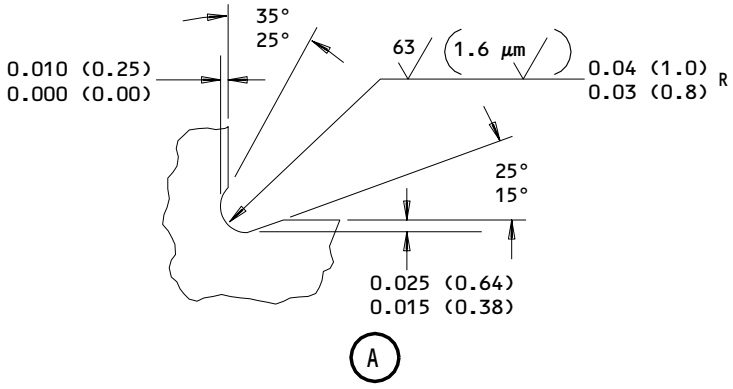
   A. Machine bearing seat as required, within repair limit shown, to remove defects.

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate, and grind to design dimensions and finish shown. Chrome plate must not exceed 0.010 inch (0.25 mm) after grinding.



256T3545-1 SHOWN
256T3545-3 SIMILAR



REFINISH

EXTERNAL SURFACES: CADMIUM PLATE (F-15.23) EXCEPT AS NOTED. PLATING THROW-IN ALLOWED AT MOUTHS OF BORES.

INTERNAL BORES: PHOSPHATE COAT (F-18.02) EXCEPT AS NOTED. DELETE FOLLOW-UP OIL TREATMENT. APPLY TWO COATS PRIMER, BMS 10-11, TYPE I (F-20.03) THEN APPLY CORROSION PREVENTIVE COMPOUND, MIL-C-11796, CLASS I (F-19.03)

1. NO CADMIUM PLATING THIS SURFACE
2. CADMIUM PLATE (F-15.23) EXCEPT UNCONTROLLED THICKNESS PERMITTED. NO PHOSPHATE COATING BEFORE APPLYING PRIMER AND COMPOUND
3. CADMIUM PLATE (F-15.23) ONLY ON THESE INTERNAL SURFACES
4. BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT AT EDGES AND RELIEF GROOVE AS INDICATED
5. PLATING RUNOUT
6. END OF PLATING

REPAIR

REF 4 5 6

125 (3.2 µm) ALL MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.01-0.02 (0.25-0.51) R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.006A
COVERAGE 2.0

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

DIMENSIONS ARE IN INCHES EXCEPT

DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T3545-1,-3
Bevel Gear Repair
Figure 601

19253

BEVEL GEAR - REPAIR 8-1

256T3546-1, -3

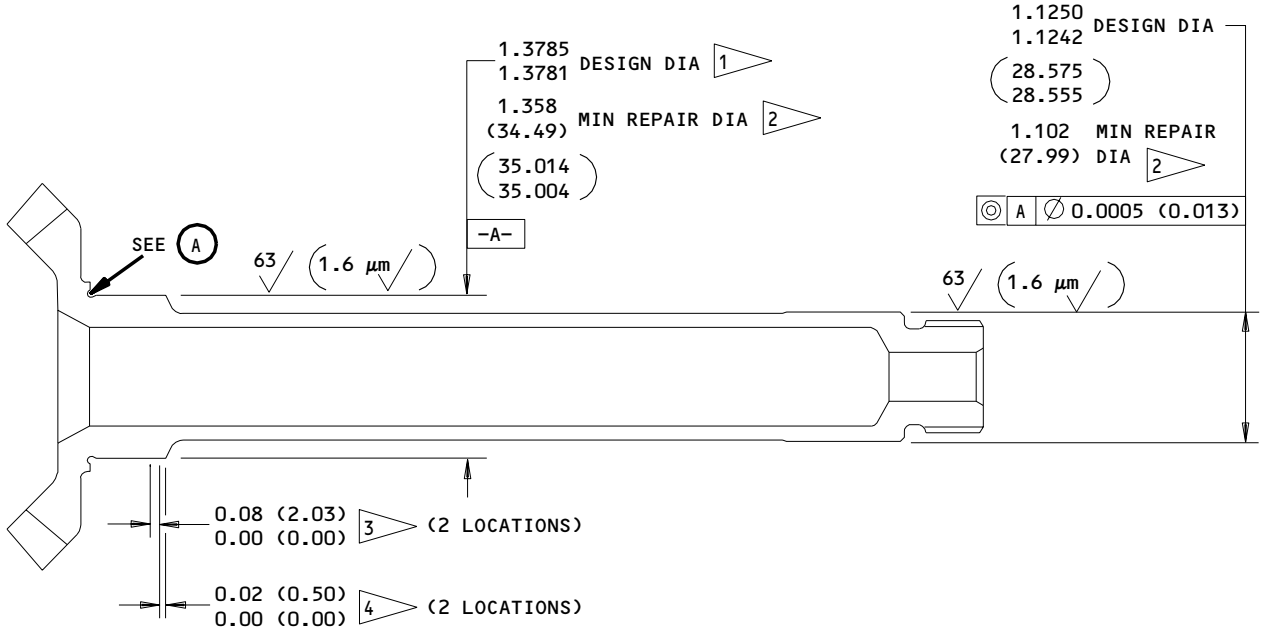
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require stripping and restoration of original finish, refer to REFINISH INSTRUCTION, Fig. 601.

1. Bearing Seat Repair (Fig. 601)

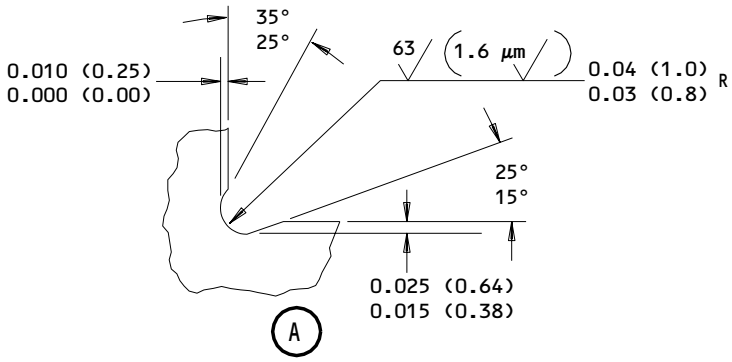
   A. Machine bearing seat as required, within repair limit shown, to remove defects.

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate, and grind to design dimensions and finish shown. Chrome plate must not exceed 0.010 inch (0.25 mm) after grinding.



256T3546-1 SHOWN
256T3546-3 SIMILAR



REFINISH

EXTERNAL SURFACES: CADMIUM PLATE (F-15.23) EXCEPT AS NOTED. PLATING THROW-IN ALLOWED AT MOUTHS OF BORES.

INTERNAL BORES: PHOSPHATE COAT (F-18.02) DELETING FOLLOW-UP OIL TREATMENT. APPLY TWO COATS PRIMER, BMS 10-11, TYPE I (F-20.03) THEN APPLY CORROSION PREVENTIVE COMPOUND, MIL-C-11796, CLASS I (F-19.03)

1 NO CADMIUM PLATING THIS SURFACE

2 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT AT EDGES AND RELIEF GROOVE AS INDICATED

3 PLATING RUNOUT

4 END OF PLATING

REPAIR

REF 2 3 4

125 (3.2 µm) ALL MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.01-0.02 (0.25-0.51) R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.006A
COVERAGE 2.0

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

DIMENSIONS ARE IN INCHES EXCEPT

DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T3546-1,-3
Bevel Gear Repair
Figure 601

19255

BEVEL GEAR - REPAIR 9-1

256T3547-1, -3

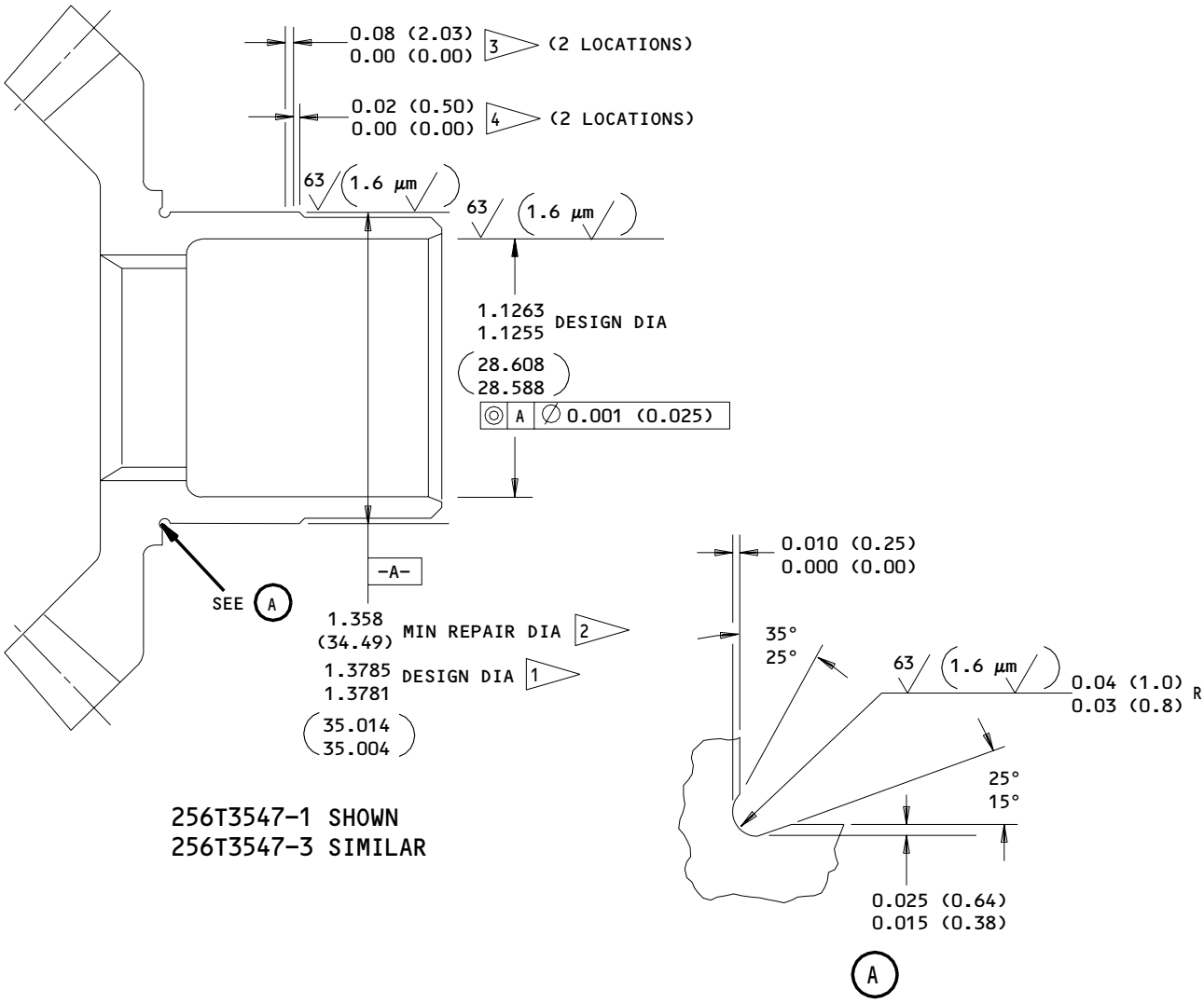
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require stripping and restoration of original finish, refer to REFINISH INSTRUCTION, Fig. 601.

1. Bearing Seat Repair (Fig. 601)

   A. Machine bearing seat as required, within repair limit shown, to remove defects.

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate, and grind to design dimensions and finish shown. Chrome plate must not exceed 0.010 inch (0.25 mm) after grinding.



256T3547-1 SHOWN
256T3547-3 SIMILAR

REFINISH

CADMIUM PLATE (F-15.23) EXCEPT AS NOTED

1 NO CADMIUM PLATING THIS SURFACE

2 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT AT EDGES AND RELIEF GROOVE AS INDICATED

3 PLATING RUNOUT

4 END OF PLATING

REPAIR

REF 2 3 4

125 (3.2 µm) ALL MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.01-0.02 (0.25-0.51) R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.006A
COVERAGE 2.0

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

DIMENSIONS ARE IN INCHES EXCEPT

DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T3547-1,-3
Bevel Gear Repair
Figure 601

BEVEL GEAR - REPAIR 10-1

256T3548-1, -3

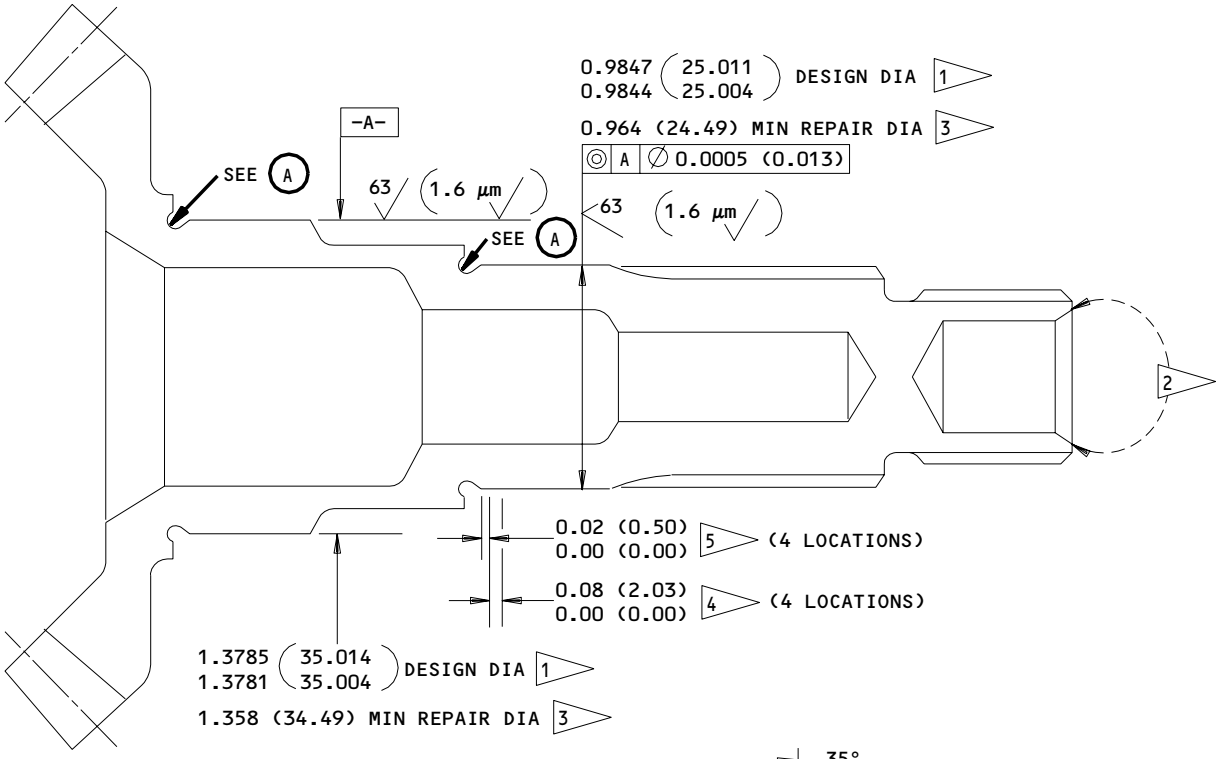
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require stripping and restoration of original finish, refer to REFINISH INSTRUCTION, Fig. 601.

1. Bearing Seat Repair (Fig. 601)

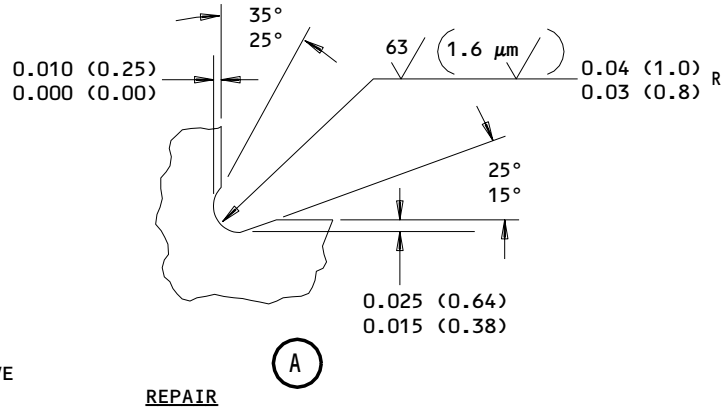
   A. Machine bearing seat as required, within repair limit shown, to remove defects.

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate, and grind to design dimensions and finish shown. Chrome plate must not exceed 0.010 inch (0.25 mm) after grinding.



256T3548-1 SHOWN
256T3548-3 SIMILAR



REFINISH

EXTERNAL SURFACES: CADMIUM PLATE (F-15.23) EXCEPT AS NOTED. PLATING THROW-IN ALLOWED AT MOUTHS OF BORES.

INTERNAL BORES: PHOSPHATE COAT (F-18.02) EXCEPT AS NOTED. DELETE FOLLOW-UP OIL TREATMENT. APPLY TWO COATS PRIMER, BMS 10-11, TYPE I (F-20.03) THEN APPLY CORROSION PREVENTIVE COMPOUND, MIL-C-11796, CLASS I (F-19.03)

1. NO CADMIUM PLATING THIS SURFACE
2. CADMIUM PLATE (F-15.23) EXCEPT UNCONTROLLED THICKNESS PERMITTED. NO PHOSPHATE COATING BEFORE APPLYING PRIMER AND COMPOUND.
3. BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT AT EDGES AND RELIEF GROOVE AS INDICATED
4. PLATING RUNOUT
5. END OF PLATING

REPAIR

REF 3 4 5

125 (3.2 µm) ALL MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.01-0.02 (0.25-0.51) R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.006A
COVERAGE 2.0

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

DIMENSIONS ARE IN INCHES EXCEPT

DIMENSIONS IN ( ) ARE IN MILLIMETERS

256T3548-1,-3
Bevel Gear Repair
Figure 601

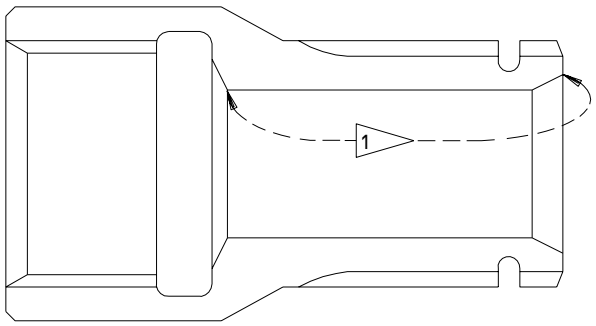
19257

SPLINED COUPLING - REPAIR 11-1

256T3549-1

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CADMIUM PLATE (F-15.02) ALL OVER. APPLY PRIMER AND CORROSION PREVENTIVE COMPOUND AS NOTED

MATERIAL: 4340 STEEL (180-200 KSI)

1 APPLY TWO COATS PRIMER, BMS 10-11, TYPE I (F-20.03), THEN APPLY CORROSION PREVENTIVE COMPOUND, MIL-C-11796, CLASS I (F-19.03)

Splined Coupling Refinish
Figure 601

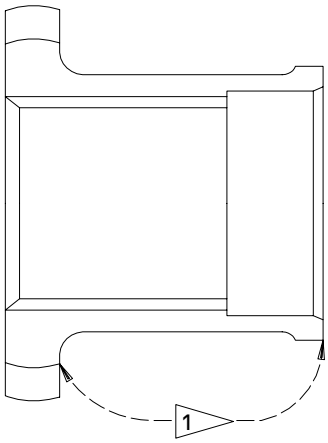
19258

COUPLING HALF - REPAIR 12-1

256T3749-1

1. Plating Repair

NOTE: Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in Fig. 601 and to REPAIR-GEN for list of applicable standard practices.



REFINISH

CADMIUM PLATE (F-15.02)
ALL OVER AND APPLY ONE COAT
PRIMER, BMS 10-11, TYPE 1
(F-20.02) AS INDICATED BY 1

MATERIAL: 4340 STEEL, 150-170 KSI

Coupling Half Refinish
Figure 601

19399

NAMEPLATE - REPAIR 13-1

256T3320-1

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

1. Nameplate Replacement

A. Steel stamp assembly part number and serial number on nameplate.

B. Bend to conform to housing contour at location shown in IPL Fig. 1. Bond nameplate in place as shown in 20-50-12, type 38.

MISCELLANEOUS PARTS REFINISH - REPAIR 14-1

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

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Drain (10)	Al alloy	Chromic acid or sulfuric acid anodize (F-17.05) all over. Apply a layer of primer, BMS 10-11, type 1 (F-20.02) to external surfaces except in holes.
Coupling sleeve (55)	4140 steel 150-170 ksi	Cadmium plate (F-15.02).
C-ring (150)	Music wire	Cadmium plate (F-15.02).

Refinish Details
Figure 601

ASSEMBLY

1. Materials

NOTE: Equivalent substitutes may be used.

A. Grease -- MIL-G-21164 (optional: MIL-G-23827) (Ref 20-60-03)

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

C. Sealant -- BMS 5-26 or MIL-S-8802 (Ref 20-60-04)

D. Lockwire -- MS20995C32

2. Equipment

NOTE: Equivalent substitutes may be used.

A. Bearing Width Checking Equipment -- A27040-1

3. Lubrication

CAUTION: APPLY GREASE TO GEAR TEETH, FAYING SURFACES, SPLINES, SHAFTS, VOIDS AND CREVICES ONLY. DO NOT FILL HOUSING WITH GREASE OR DRAINAGE OF GEARBOX MAY BECOME AFFECTED. KEEP ALL DRAIN HOLES AND SLOTS CLEAR OF GREASE AFTER ASSEMBLY OF THE GEARS AND PRIOR TO INSTALLATION OF THE DRAIN PORT COVERS.

A. Apply 1.5 lbs of grease as shown in MIL-G-21164 (optional: MIL-G-23827) to gearbox. Liberally coat all surfaces of each gear (255, 260, 265, 270) with approximately 0.13 lb of grease per gear. Apply remaining grease uniformly to all remaining surfaces of the gearbox including the faying surfaces, splines, shafts, voids, crevices, and bearings. Make sure that drain holes and slots are clear of grease after assembly of the gears and prior to installation of the drain port covers.

4. Assembly (Ref IPL Fig. 1)

A. Determine proper shim thickness for bevel gear (265).

NOTE: If housing assembly (220) or bearing (210) have not been replaced, shim(s) removed during disassembly may be reinstalled.

(1) Install bearing (210) on checking equipment A27040-1 and apply axial load of 25-35 lbs (111-156 N). Measure bearing width "A" across inner race at bearing seat to outer race at shim seat (Ref Fig. 701). Note direction of bearing with respect to applied load.

(2) Add 1.860 in. (47.244 mm) to "A", then subtract this sum from the corresponding engraved dimension on housing assembly (220).

(3) Select appropriate shim or shim set from table.

B. Install bearing (210) on bevel gear (265) paying attention to direction of bearing (Ref Fig. 701 and 20-50-03).

C. Place shim(s) (215) in bearing recess in housing assembly (220). Install bevel gear with bearing.

D. Determine proper shim thickness for bevel gear (260).

NOTE: If housing assembly (220), bearing (135), bevel gear (260), or bearing cap (105) have not been replaced, shim(s) removed during disassembly may be reinstalled.

(1) Install bearing (135) on checking equipment A27040-1 and apply axial load of 25-35 lbs (111-156 N). Measure bearing width "B" across inner race at bearing seat to outer race at shim seat (Ref Fig. 701). Note direction of bearing with respect to applied load.

(2) Add 2.090 in. (53.086 mm) to "B", then subtract this sum from the sum of the corresponding engraved dimensions on housing assembly (220) and bearing cap (105).

(3) Select appropriate shim or shim set from table (Fig. 701).

E. Install bearings (135, 140) on input bevel gear (260) paying attention to direction of bearing (135) (Ref Fig. 701 and 20-50-03).

F. Install splined coupling (145) with C-ring (150) in bevel gear (260). Check that C-ring has snapped into place and that parts are locked together.

G. Place shim(s) (120) in bearing recess in bearing cap (105). Install bevel gear with bearings and splined coupling in housing assembly (220), then install bearing cap with bolts (110) and washers (115).

H. Check backlash between gears (260, 265) as shown in TESTING AND FAULT ISOLATION, steps 6.A thru 6.D.

I. Determine proper shim thickness for bevel gear (270).

NOTE: If housing assemblies (165, 220) or bearing (210) have not been replaced, shim(s) removed during disassembly may be reinstalled.

(1) Install bearing (210) on checking equipment A27040-1 and apply axial load of 25-35 lbs (111-156 N). Measure bearing width "C" across inner race at bearing seat to outer race at shim seat (Ref Fig. 701). Note direction of bearing with respect to applied load.

(2) Add 1.860 in. (47.244 mm) to "C", then subtract this sum from the sum of the corresponding engraved dimensions on housing assemblies (165, 220).

(3) Select appropriate shim or shim set from table.

J. Install bearing (210) on bevel gear (270) paying attention to direction of bearing (Ref Fig. 701 and 20-50-03).

K. Place shim(s) (215) in bearing recess in housing assembly (220). Insert rod assembly A27046-119 in bevel gear (270), then install bevel gear with bearing.

L. Attach output housing assembly (165) to input housing assembly (220) with bolts (175) and washers (180). Install with wet primer applied to all areas of boltholes.

M. Determine proper shim thickness for bevel gear (255).

NOTE: If housing assembly (165), bearing (95), bevel gear (255), or cover (65) have not been replaced, shim(s) removed during disassembly may be reinstalled.

(1) Install bearing (95) on checking equipment A27040-1 and apply axial load of 25-35 lbs (111-156 N). Measure bearing width "D" across inner race at bearing seat to outer race at shim seat (Ref Fig. 701). Note direction of bearing with respect to applied load.

(2) Add 3.150 in. (80.010 mm) to "D", then subtract this sum from the sum of the corresponding engraved dimensions on housing assembly (165) and cover (65).

(3) Select appropriate shim or shim set from table (Fig. 701).

N. Install bearings (100, 95) on output bevel gear (255) paying attention to direction of bearing (95) (Ref Fig. 701 and 20-50-03).

O. Place shim(s) (80) in bearing recess in cover (65). Install bevel gear with bearings in cover, then attach cover to housing assembly with bolts (70) and washers (75).

P. Check backlash between gears (255, 270) as shown in TESTING AND FAULT ISOLATION, steps 6.F thru 6.I.

Q. Install bearing (210) on bevel gear (265) paying attention to direction of bearing (Ref Fig. 701 and 20-50-03).

R. Place shim(s) (215) in bearing access in housing assembly (220). Install bevel gear (265) with bearing (210) into housing.

S. Install bearings (135, 140) on input bevel gear (260) paying attention to direction of bearing (135) (Ref Fig. 701 and 20-50-03).

T. Install splined coupling (145) with C-ring (150) in bevel gear (260). Check that C-ring has snapped into place and that parts are locked together.

U. Place shim(s) (120) in bearing recess in bearing cap (105). Install bevel gear with bearings and splined coupling in housing assembly (220), then install bearing cap with bolts (110) and washers (115).

V. Perform binding and roughness check as shown in TESTING AND FAULT ISOLATION.

W. Perform no load torque check as shown in TESTING AND FAULT ISOLATION.

X. If binding or roughness exists, or if no-load torque of 2.5 pound-inches is exceeded, replace bearings (75, 80, IPL Fig. 1).

Y. Remove bolts (110, 70) and washers (115, 75), then remove bevel gears (125, 85) with bearing cap (105) and cover (65) from housing assemblies (220, 165), respectively. Remove excess grease sticking to inside of housings, especially in drain grooves and holes.

Z. Reinstall bevel gears, cover, and bearing cap with bolts (110, 70) and washers (115, 75), respectively, with wet primer applied to bolt holes.

AA. Fill pocket areas of shields (130, 90) with grease and slide shields onto shafts of bevel gears (255, 260), and seated against bearings (135, 95), respectively. Wipe off excess grease.

AB. Install parts (40 thru 60) onto each bevel gear. Then tighten nuts (45) to 400-450 pound-inch (45-51 Nm).

AC. Install drains (10) onto housing assemblies (165, 220) with bolts (15) and washers (20) with wet primer applied to bolt holes.

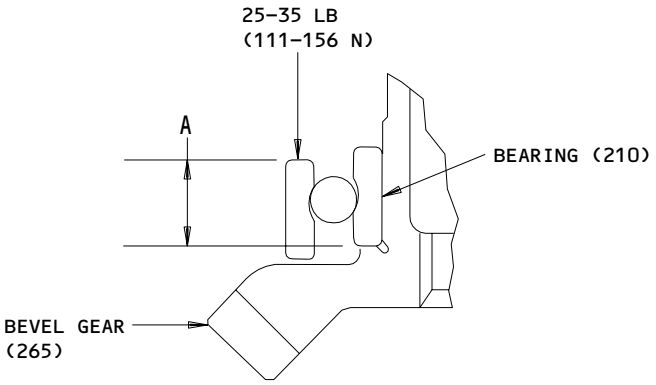
AD. Install cap (25) onto housing assembly (220) using bolts (30) and washers (35) with wet primer applied to bolt holes.

AE. Install lockwire on bolts (70, 110) by double-twist procedure. Install lockwire on bolts (175) by single wire procedure (Ref 20-50-02).

AF. Fillet seal all joint edges with sealant.

5. Storage

A. Use standard industry practices and information contained in 20-44-02 to store this component.



BEARING WIDTH MEASUREMENT

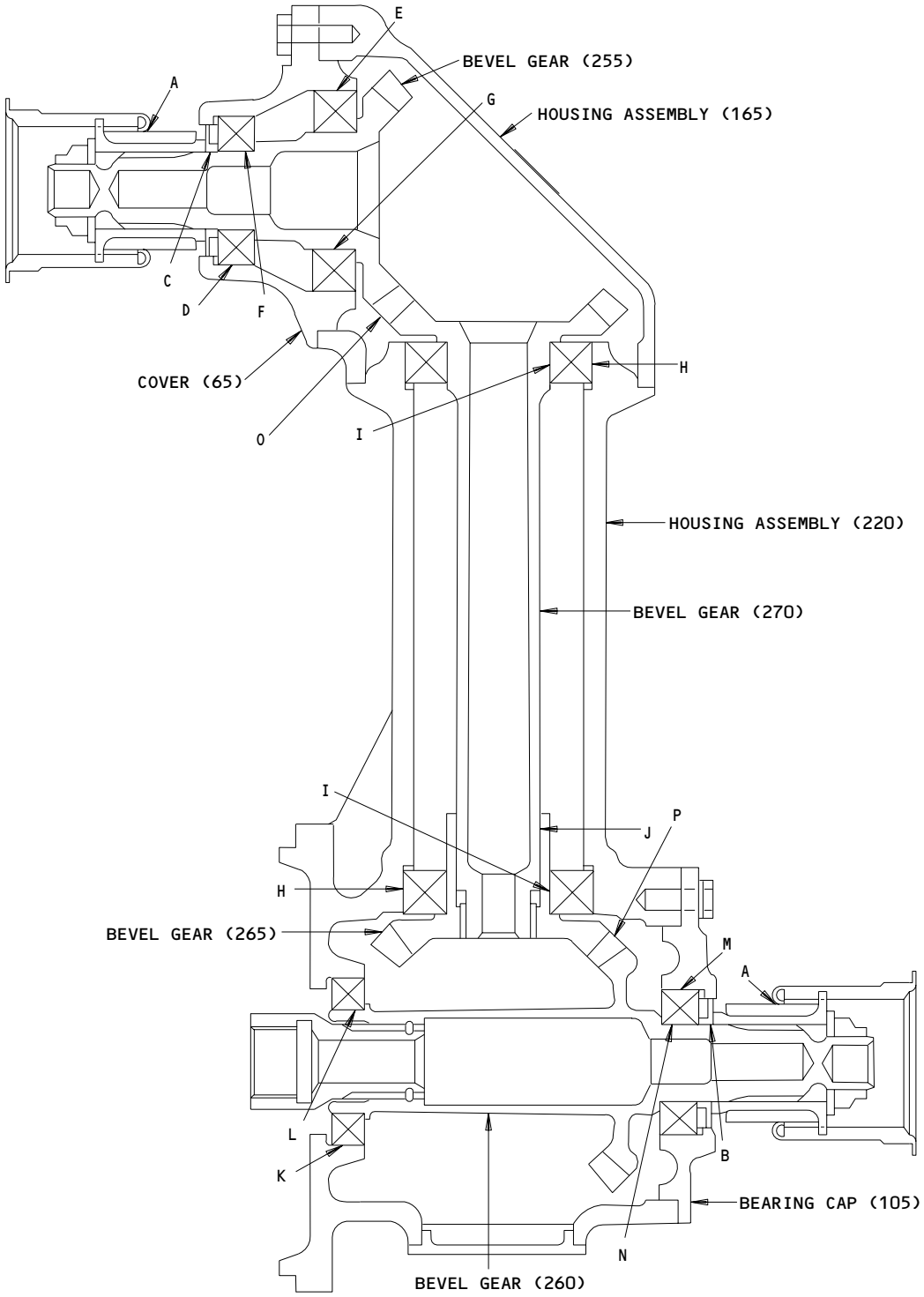
DIMENSION A SHOWN
DIMENSIONS B, C, D SIMILAR

SHIM OR SHIM SET		NOMINAL THICKNESS
USE WITH A AND C	USE WITH B AND D	
256T3551-1	256T3321-1	0.010 (0.254)
256T3551-2	256T3321-2	0.012 (0.305)
256T3551-3	256T3321-3	0.015 (0.381)
256T3551-4	256T3321-4	0.018 (0.457)
256T3551-5	256T3321-5	0.020 (0.508)
256T3551-1 AND -2	256T3321-1 AND -2	0.022 (0.559)
256T3551-1 AND -3	256T3321-1 AND -3	0.025 (0.635)
256T3551-2 AND -3	256T3321-2 AND -3	0.027 (0.686)
256T3551-1 AND -5	256T3321-1 AND -5	0.030 (0.762)
256T3551-2 AND -5	256T3321-2 AND -5	0.032 (0.813)
256T3551-3 AND -5	256T3321-3 AND -5	0.035 (0.889)
256T3551-4 AND -5	256T3321-4 AND -5	0.038 (0.965)
256T3551-5 AND -5	256T3321-5 AND -5	0.040 (1.016)

SHIM THICKNESS TABLE

Shim Selection
Figure 701

FITS AND CLEARANCES



Fits and Clearances
Figure 801 (Sheet 1)

19260

Ref Letter Fig.801	Mating Item No. IPL Fig. 1	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance [1]		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 55 OD 60	1.50 (38.10) 1.48 (37.59)	1.52 (38.61) 1.50 (38.10)	0.00 (0.00)	0.04 (1.02)			
B	ID 130 OD 260	0.986 (25.044) 0.9844 (25.004)	0.988 (25.095) 0.9847 (25.011)	0.0013 (0.033)	0.0036 (0.091)	0.9810 (24.917)	0.9917 (25.189)	0.0070 (0.178)
C	ID 90 OD 259	0.986 (25.044) 0.9844 (25.004)	0.988 (25.095) 0.9847 (25.011)	0.0013 (0.033)	0.0036 (0.091)	0.9810 (24.917)	0.9917 (25.189)	0.0070 (0.178)
D	ID 65 OD 95	1.8506 (47.005) 1.8499 (46.987)	1.8514 (47.026) 1.8504 (47.000)	0.0002 (0.005)	0.0015 (0.039)	1.8484 (46.949)	1.8534 (47.076)	0.0030 (0.076)
E	ID 65 OD 100	2.4411 (62.004) 2.4404 (61.986)	2.4421 (62.029) 2.4409 (61.999)	0.0002 (0.005)	0.0017 (0.043)	2.4391 (61.953)	2.4439 (62.075)	0.0030 (0.076)
F	ID 95 OD 255	0.9839 (24.991) 0.9844 (25.004)	0.9843 (25.001) 0.9847 (25.011)	-0.0008 (-0.020)	-0.0001 (-0.003)	0.9843 (25.001)	0.9844 (25.004)	0.0000 (0.000)
G	ID 100 OD 255	1.3775 (34.989) 1.3781 (35.004)	1.3780 (35.001) 1.3785 (35.014)	-0.0010 (-0.025)	-0.0001 (-0.003)	1.3780 (35.001)	1.3781 (35.004)	0.0000 (0.000)
H	ID 220 OD 210	2.4411 (62.004) 2.4404 (61.986)	2.4421 (62.029) 2.4409 (61.999)	0.0002 (0.005)	0.0017 (0.043)	2.4391 (61.953)	2.4439 (62.075)	0.0030 (0.076)
I	ID 210 OD 265,270	1.3775 (34.989) 1.3781 (35.004)	1.3780 (35.001) 1.3785 (35.014)	-0.0010 (-0.025)	-0.0001 (-0.003)	1.3780 (35.001)	1.3781 (35.004)	0.0000 (0.000)

Fits and Clearances
Figure 801 (Sheet 2)

8888

Ref Letter Fig.801	Mating Item No. IPL Fig. 1	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance [1]		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
J	ID 265 OD 270	1.1255 (28.588) 1.1242 (28.555)	1.1263 (28.608) 1.1250 (28.575)	0.0005 (0.013)	0.0021 (0.053)	1.1223 (28.506)	1.1290 (28.677)	0.0040 (0.102)
K	ID 220 OD 140	2.1656 (55.006) 2.1649 (54.988)	2.1666 (55.032) 2.1654 (55.001)	0.0002 (0.005)	0.0017 (0.044)	2.1636 (54.956)	2.1684 (55.077)	0.0030 (0.076)
L	ID 140 OD 260	1.3775 (34.989) 1.3781 (35.004)	1.3780 (35.001) 1.3785 (35.014)	−0.0010 (−0.025)	−0.0001 (−0.003)	1.3780 (35.001)	1.3781 (35.004)	0.0000 (0.000)
M	ID 105 OD 135	1.8506 (47.005) 1.8499 (46.987)	1.8514 (47.026) 1.8504 (47.000)	0.0002 (0.005)	0.0015 (0.039)	1.8484 (46.949)	1.8534 (47.076)	0.0030 (0.076)
N	ID 135 OD 260	0.9839 (24.991) 0.9844 (25.004)	0.9843 (25.001) 0.9847 (25.011)	−0.0008 (−0.020)	−0.0001 (−0.003)	0.9843 (25.001)	0.9844 (25.004)	0.0000 (0.000)
O	255,270 [2]			0.004 (0.102)	0.007 (0.178)		0.009 (0.229)	
P	260,265 [2]			0.004 (0.102)	0.007 (0.178)		0.009 (0.229)	

[1] NEGATIVE VALUES DENOTE INTERFERENCE FIT

[2] BACKLASH BETWEEN INSTALLED GEARS WITH BEVEL GEARS (265,270) FIXED AND MEASURED AT 3.1004 (78.75) PITCH DIAMETERS ON BEVEL GEARS (255,260,265,270).

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

Fits and Clearances
Figure 801 (Sheet 3)

8891

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES (NEWTON-METERS)	POUND-FEET
45	NUT	400 - 450 (45.2 - 50.8)	

Torque Table
Figure 802

15698

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

1. A27046-99 -- Test Fixture

2. A27046-8 -- Test Equipment

3. A27040-1 -- Bearing Width Checking Equipment

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

15653 KAYNAR TECHNOLOGY KAYNAR DIV
800 SOUTH STATE COLLEGE BLVD PO BOX 3001
FULLERTON, CALIFORNIA 92634-3001

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

21760 SCHATZ MANUFACTURING CO
FAIRVIEW AVENUE PO BOX 1191
POUGHKEEPSIE, NEW YORK 12601

29337 HOOVER GROUP INC BALL AND ROLLER DIV
2220 PENDLEY ROAD PO BOX 899
CUMMING, GEORGIA 30130-8671

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

56878 SPS TECHNOLOGIES INC AEROSPACE AND INDUSTRIAL PRODUCTS DIV
HIGHLAND AVENUE
JENKINTOWN, PENNSYLVANIA 19046

72962 HARVARD INDUSTRIES INC
3 WERNER WAY SUITE 210
LEBANON, NEW JERSEY 08833

VENDORS

78118 SPLIT BALL BEARING DIV OF MPB CORP
HIGHWAY 4
LEBANON, NEW HAMPSHIRE 03766-7301

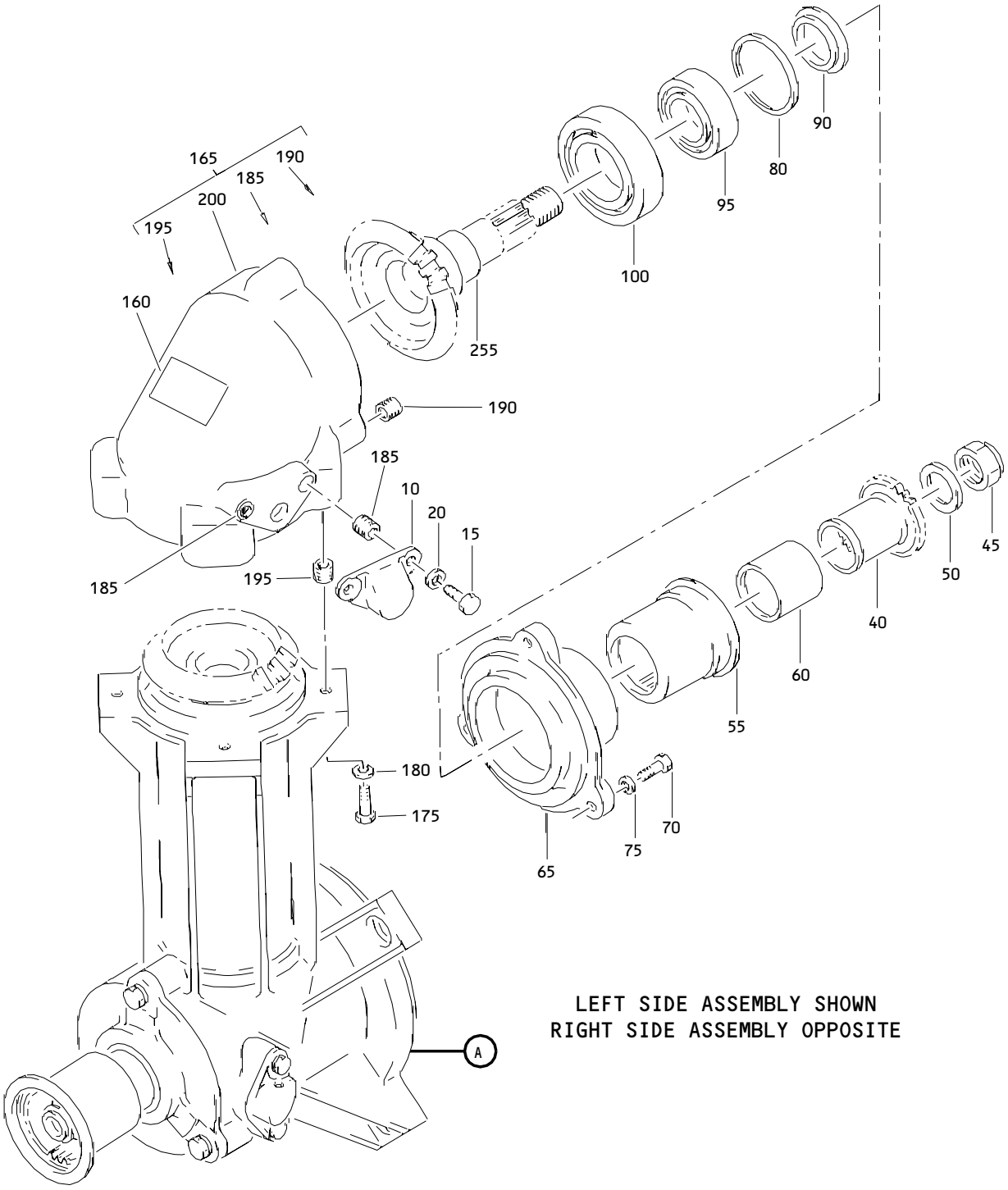
97928 DEUTSCH FASTENER CORP
3969 PARAMONT BOULEVARD
LAKEWOOD, CALIFORNIA 90712-4193

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AN960-1216		1	50	2
AN960PD10L		1	20	4
		1	35	2
AN960PD416L		1	75	3
		1	115	3
AN960PD516L		1	180	4
BACB10BA25PP		1	95	1
		1	135	1
BACB10BA35PP		1	100	1
		1	210	2
BACB10BB35PP		1	140	1
BACN10JC12		1	45	2
BMN4122AD3-12		1	45	2
C007RPP1P28LY19		1	140	1
C007RRP0ZZ		1	140	1
C105RRP0ZZ		1	95	1
		1	135	1
C105RRP1P28LY19		1	95	1
		1	135	1
C107RRPP1P28LY1		1	100	1
		1	210	2
C107RRP0ZZ		1	100	1
		1	210	2
H10-12BAC		1	45	2
LL105KS		1	95	1
		1	135	1
LL107KS		1	100	1
		1	210	2
LL107KSG20		1	100	1
		1	210	2
MS21209F1-15P		1	185	2
		1	230	4

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
MS21209F4-15P		1	190	3
		1	235	3
MS21209F5-15P		1	195	4
NAS6603-2		1	15	4
		1	30	2
NAS6604H4		1	110	3
NAS6604H6		1	70	3
NAS6605H5		1	175	4
PKTLL007P1		1	140	1
PKTLL105P1		1	95	1
		1	135	1
PKTLL107P1		1	100	1
		1	210	2
RMLH9074-12		1	45	2
1907RRT1C1-01		1	140	1
251T3316-3		1	90A	1
256T3316-1		1	90	1
		1	130	1
256T3316-3		1	130A	1
256T3320-1		1	160	1
256T3321-1		1	80	1
		1	120	1
256T3321-2		1	80A	1
		1	120A	1
256T3321-3		1	80B	1
		1	120B	1
256T3321-4		1	80C	1
		1	120C	1
256T3321-5		1	80D	1
		1	120D	1
256T3342-1		1	65	1
256T3343-1		1	10	2
256T3343-3		1	10A	2

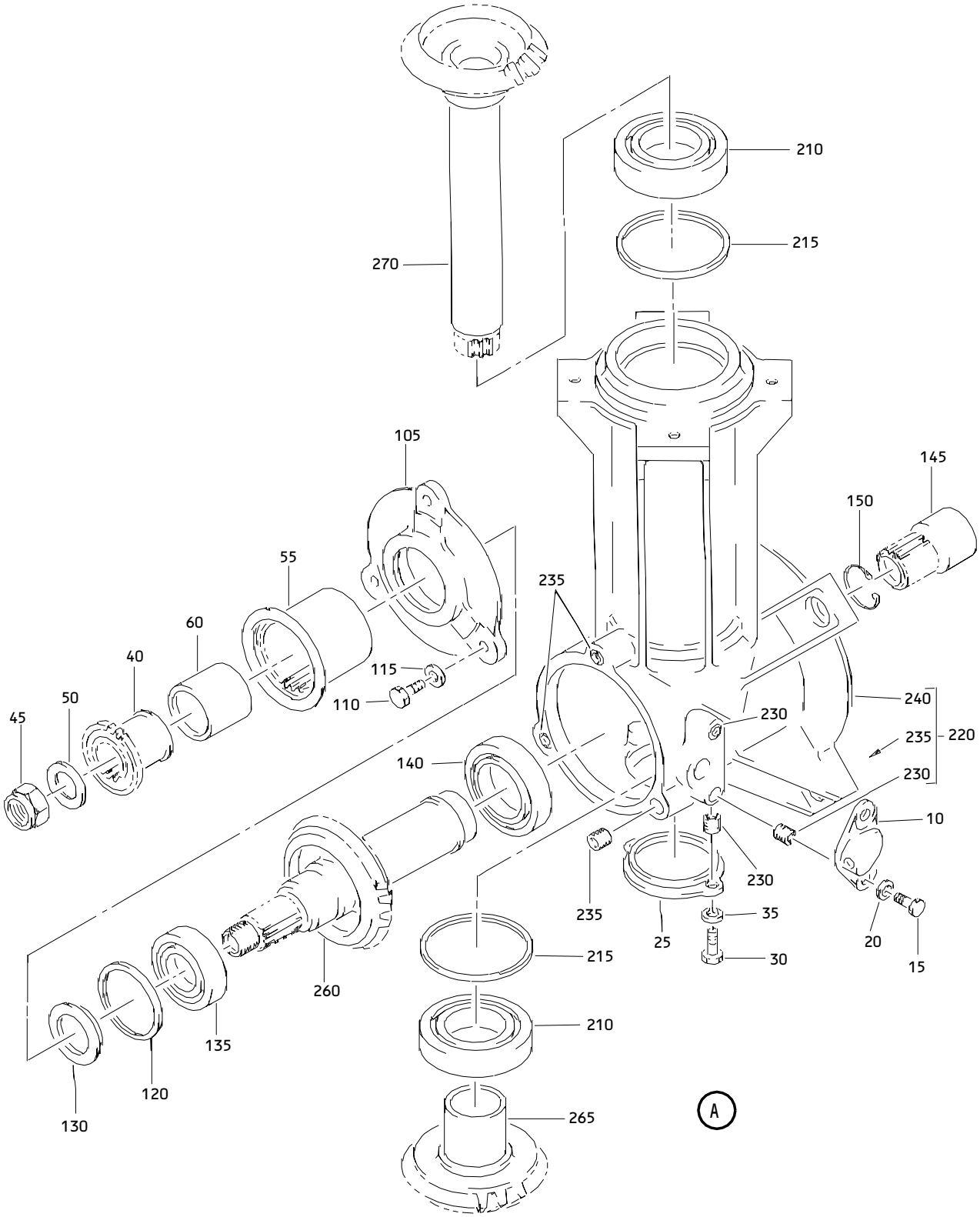
PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
256T3516-1		1	150	1
256T3540-3		1	1	RF
256T3540-4		1	5	RF
256T3540-5		1	250	1
256T3540-6		1	250A	1
256T3541-1		1	220	1
256T3541-2		1	225	1
256T3541-3		1	240	1
256T3541-4		1	245	1
256T3542-1		1	165	1
256T3542-2		1	170	1
256T3542-3		1	200	1
256T3542-4		1	202	1
256T3543-1		1	105	1
256T3544-1		1	25	1
256T3545-1		1	260	1
256T3545-3		1	260A	1
256T3546-1		1	270	1
256T3546-3		1	270A	1
256T3547-1		1	265	1
256T3547-3		1	265A	1
256T3548-1		1	255	1
256T3548-2		1	255A	1
256T3549-1		1	145	1
256T3551-1		1	215	2
256T3551-2		1	215A	2
256T3551-3		1	215B	2
256T3551-4		1	215C	2
256T3551-5		1	215D	2
256T3749-1		1	40	2
48FT1216		1	45	2
6005TT		1	95	1
		1	135	1
6007TT		1	100	1
		1	210	2

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
65B84033-18		1	60	2
65B84034-3		1	55	2
9105LLT1C1-01		1	95	1
		1	135	1
9105NPPFS428		1	95	1
		1	135	1
9107LLT1C1-01		1	100	1
		1	210	2
9107NPPFS4281		1	100	1
		1	210	2
9307PPPRBFS428		1	140	1
993L05		1	95	1
		1	135	1
993L07		1	100	1
		1	210	2



Trailing Edge Flap Drive Offset Tee Gearbox Assembly
Figure 1 (Sheet 1)

T57232



Trailing Edge Flap Drive Offset Tee Gearbox Assembly
Figure 1 (Sheet 2)

T57233

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	256T3540-3		GEARBOX ASSY-TE FLAP DRIVE OFFSET TEE LH	A	RF
-5	256T3540-4		GEARBOX ASSY-TE FLAP DRIVE OFFSET TEE RH	B	RF
10	256T3343-1		.DRAIN- (OPT ITEM 10A)		2
-10A	256T3343-3		.DRAIN- (OPT ITEM 10)		2
15	NAS6603-2		.BOLT		4
20	AN960PD10L		.WASHER		4
25	256T3544-1		.CAP		1
30	NAS6603-2		.BOLT		2
35	AN960PD10L		.WASHER		2
40	256T3749-1		.COUPLING HALF		2
45	H10-12BAC		.NUT- (V15653) (SPEC BACN10JC12) (OPT RMLH9074-12 (V72962)) (OPT 48FT1216 (V56878)) (OPT BMN4122AD3-12 (V97928))		2
50	AN960-1216		.WASHER		2
55	65B84034-3		.SLEEVE-CPLG		2
60	65B84033-18		.SLEEVE-MOLDED		2
65	256T3342-1		.COVER- (OPT ITEM 65A)		1
-65A	256T3342-3		.COVER- (OPT ITEM 65)		1
70	NAS6604H6		.BOLT		3
75	AN960PD416L		.WASHER		3
80	256T3321-1		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-80A	256T3321-2		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-80B	256T3321-3		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-80C	256T3321-4		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-80D	256T3321-5		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
85	256T3548-1		DELETED		
-85A	256T3548-2		DELETED		
90	256T3316-1		.SHIELD- (OPT ITEM 90A)		1
-90A	251T3316-3		.SHIELD- (OPT ITEM 90)		1
95	9105NPPFS428		.BEARING- (V21335) (SPEC BACB10BA25PP) (OPT LL105KS (V38443)) (OPT 6005TT (V43991)) (OPT 9105LLT1C1-01 (V21760)) (OPT 993L05 (V29337)) (OPT PKTLL105P1 (V78118)) (OPT C105RRP0ZZ (V40920)) (OPT C105RRP1P28LY196 (V40920))		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
100	LL107KSG20		.BEARING- (V38443) (SPEC BACB10BA35PP) (OPT LL107KS (V38443)) (OPT 6007TT (V43991)) (OPT 9107LLT1C1-01 (V21760)) (OPT 9107NPPFS4281 (V21335)) (OPT 993L07 (V29337)) (OPT PKTLL107P1 (V78118)) (OPT C107RRP0ZZ (V40920)) (OPT C107RRPP1P28LY196 (V40920))		1
105	256T3543-1		.CAP-BRG		1
110	NAS6604H4		.BOLT		3
115	AN960PD416L		.WASHER		3
120	256T3321-1		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-120A	256T3321-2		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-120B	256T3321-3		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-120C	256T3321-4		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-120D	256T3321-5		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
125	256T3545-1		DELETED		
-125A	256T3545-3		DELETED		
130	256T3316-1		.SHIELD- (OPT ITEM 130A)		1
-130A	256T3316-3		.SHIELD- (OPT ITEM 130)		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
135	9105NPPFS428		.BEARING-		1
			(V21335)		
			(SPEC BACB10BA25PP)		
			(OPT LL105KS		
			(V38443))		
			(OPT 6005TT		
			(V43991))		
			(OPT 9105LLT1C1-01		
			(V21760))		
			(OPT 993L05		
			(V29337))		
			(OPT PKTLL105P1		
			(V78118))		
			(OPT C105RRP0ZZ		
			(V40920))		
			(OPT C105RRP1P28LY196		
			(V40920))		
140	1907RRT1C1-01		.BEARING-		1
			(V21760)		
			(SPEC BACB10BB35PP)		
			(OPT 9307PPPRBFS428		
			(V21335))		
			(OPT PKTLL007P1		
			(V78118))		
			(OPT C007RRP0ZZ		
			(V40920))		
			(OPT C007RPP1P28LY196		
			(V40920))		
145	256T3549-1		.COUPLING-SPLINED		1
150	256T3516-1		.C-RING		1
155	256T3547-1		DELETED		
-155A	256T3547-3		DELETED		
160	256T3320-1		.NAMEPLATE		1
165	256T3542-1		.HOUSING ASSY	A	1
-170	256T3542-2		.HOUSING ASSY	B	1
			ATTACHING PARTS		
175	NAS6605H5		.BOLT		4
180	AN960PD516L		.WASHER		4
			-------*-------		
185	MS21209F1-15P		..INSERT		2
190	MS21209F4-15P		..INSERT		3
195	MS21209F5-15P		..INSERT		4
200	256T3542-3		..HOUSING	A	1
-202	256T3542-4		..HOUSING	B	1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
205	256T3546-1		DELETED		
-205A	256T3546-3		DELETED		
210	LL107KSG20		.BEARING- (V38443) (SPEC BACB10BA35PP) (OPT LL107KS (V38443)) (OPT 6007TT (V43991)) (OPT 9107LLT1C1-01 (V21760)) (OPT 9107NPPFS4281 (V21335)) (OPT 993L07 (V29337)) (OPT PKTLL107P1 (V78118)) (OPT C107RRP0ZZ (V40920)) (OPT C107RRPP1P28LY196 (V40920))		2
215	256T3551-1		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-215A	256T3551-2		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-215B	256T3551-3		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-215C	256T3551-4		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
-215D	256T3551-5		.SHIM-(THICKNESS TO BE DETERMINED UPON INSTALLATION)		AR
220	256T3541-1		.HOUSING ASSY	A	1
-225	256T3541-2		.HOUSING ASSY	B	1
230	MS21209F1-15P		..INSERT		4
235	MS21209F4-15P		..INSERT		3
240	256T3541-3		..HOUSING	A	1
-245	256T3541-4		..HOUSING	B	1
250	256T3540-5		.KIT ASSY-SUBSTITUTE (OPT ITEM 250A)		1
-250A	256T3540-6		.KIT ASSY-SUBSTITUTE (OPT ITEM 250)		1
255	256T3548-1		..GEAR-BEVEL (USED ON ITEM 250)		1
-255A	256T3548-2		..GEAR-BEVEL (USED ON ITEM 250A)		1
260	256T3545-1		..GEAR-BEVEL (USED ON ITEM 250)		1
-260A	256T3545-3		..GEAR-BEVEL (USED ON ITEM 250A)		1
265	256T3547-1		..GEAR-BEVEL (USED ON ITEM 250)		1
-265A	256T3547-3		..GEAR-BEVEL (USED ON ITEM 250)		1
270	256T3546-1		..GEAR-BEVEL (USED ON ITEM 250)		1
-270A	256T3546-3		..GEAR-BEVEL (USED ON ITEM 250A)		1

- Item Not Illustrated