TO: ALL HOLDERS OF OUTBOARD LEADING EDGE SLAT DRIVE POWER DRIVE UNIT GEARBOX ASSEMBLY COMPONENT MAINTENANCE MANUAL 27-81-72

REVISION NO. 3 DATED JUL 01/01

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
702,705	Changed formula to calculate shim thickness.
702	Deleted reference to engraved dimension on follow-up worm gear.

OUTBOARD LEADING EDGE SLAT DRIVE POWER DRIVE UNIT GEARBOX ASSY

PART NUMBER 256T2711-1

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

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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	Feb 12/82
Assembly	Feb 12/82

OUTBOARD LEADING EDGE SLAT DRIVE POWER DRIVE UNIT GEARBOX ASSEMBLY

DESCRIPTION AND OPERATION

1. The power drive unit gearbox is used in conjunction with a hydraulic motor, electric motor, and feedback follow-up mechanism to provide torque for actuating the aircraft leading edge slat system.

2. Main input power to the gearbox is supplied by a hydraulic motor with an electric motor acting as an alternate power source. A reduction gear train maintains output speed and torque for proper operation of the leading edge slats. A right angle drive takeoff, at the output shaft, provides feedback of actual slat extension to the slat drive control unit assembly.

3. Leading Particulars (approx)

   Length -- 12 inches
   Width -- 12 inches
   Height -- 17 inches
   Weight -- 23 lbs
   Overall gear ratio -- 2.3902 Hyd Motor to Output
   -- 2.2273 Elec Motor to Output
   -- 160.00 Follow-up Gear Train

TESTING AND TROUBLE SHOOTING

1. Test Equipment and Materials

   NOTE: Equivalent substitutes may be used.

   A. Check Fixture -- A27048-6

   B. Lock Assembly -- A27051-2

   C. Crank Assembly -- A27051-8

   D. Clamp Assembly -- A27051-7

2. Test (IPL Fig. 1)

   A. Install gearbox assembly on check fixture A27048-6. With no load applied to the output shaft (245), rotate both hydraulic and electric input shafts (180, 195) to provide a minimum of two revolutions of the output shaft in each direction. There shall be no significant roughness or binding.

   B. Clamp coupling (90) with lock assembly A27051-2 to keep output shaft (245) from turning.

   C. Install input crank assembly A27051-8 in the hydraulic motor input shaft (195) and install clamp assembly A27051-7 on crank.

   D. Apply a 5-10 lb-in. (6-12 kg-cm) torque to the motor input and measure backlash at the clamp assembly scribe line. Check that backlash is 0.016-0.080 in. (0.41-2.03 mm) FIM.

      NOTE: This measurement corresponds to a backlash of 0.002-0.010 in. (0.05-0.25 mm) at the pitch line of the input spline.

   E. Remove input crank assembly and clamp assembly from hydraulic motor input and re-install in electric motor input shaft (180). Repeat step D.

   F. Remove input crank assembly and clamp assembly. Remove gearbox assembly from check fixture.

   G. If backlash is within limits and bearings feel free and smooth running when turned by hand, relubricate gearbox, and assemble.

3. Corrective Procedures

   A. If backlash is within limits, but significant binding or roughness is experienced, disassemble gearbox and visually check gears for pitting or other obvious defects. Replace gears as required. Replace all bearings. Reassemble unit and retest per par. 2.

B. If backlash exceeds limit, completely disassemble gearbox assembly and visually check gears for obvious signs of wear. Check that gear bearing pattern is centered in area of pitch diameter. If gears appear satisfactory, replace bearings. Reassemble unit and retest per par. 2. If backlash is still out of range, disassemble unit and replace all gears.

DISASSEMBLY

NOTE: See Testing and Trouble Shooting 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. Equipment

   NOTE: Equivalent substitutes may be used.

   A. Wrench -- A27051-10

   B. Spanner Adapter -- A27051-4,-6

   C. Holding Fixture Assembly -- A27054-2

   D. Clamp -- A27054-10 (2 required)

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. Cotter pin (75)

   B. Lockwire

3. Disassemble Gearbox Assembly (IPL Fig. 1)

   A. Remove cap (25) by removing bolts (30), washers (35) and nuts (40).

   B. Use wrench A27051-10 on coupling (90) to lock gear train and remove nut (145) and washer (150) from gear shaft (240), using spanner adapter A27051-4.

   C. Remove cotter pins (75) and discard.

   D. Use wrench A27051-10 to remove nuts (80), washers (85) and couplings (90).

   E. Separate cover (95) from housing assembly (105) by removing bolts (47, 50, 55), washers (65), and nuts (70).

   F. Remove gear shaft (245) with bearings (135).

   G. Remove gear assemblies (180, 195) with bearings (140). Do not remove plugs (185, 200) from gears (190, 205) unless replacement is necessary. See REPAIR 4-1, 5-1.

H. Remove gear shaft (240) with gear (175) and bearing (165). If necessary, hold follow-up gear train (225, 230, 235) stationary, and rotate gear shaft (240) while pulling.

I. Remove bearing (170) from housing assembly (105).

J. Mount gear shaft (240) and attached parts in holding fixture assembly A27054-2. Using spanner adapter A27051-6, remove nut (155), washer (160) and bearing (165) and separate gear (175) from gear shaft (240).

K. Deleted.

L. Remove follow-up cover (100) from housing assembly (105) by removing bolts (45, 60), washers (65) and nuts (70).

M. Remove gear (235) with bearings (215, 220).

N. Remove gear shaft (230) with worm gear (225), bearings (215), nut (145), washer (150) and shims (210). Tag shim thickness and location to facilitate reassembly.

NOTE: Shim thickness will be re-calculated during assembly if any of the following parts related to end play are replaced.

(1) Follow-up Cover (100)

(2) Housing Assembly (105)

(3) Bearings (215)

(4) Follow-up Worm Gear (225)

(5) Follow-up Gear Shaft (230)

O. Hold worm gear (225) in a vise with clamps A27054-10. Use spanner adapter A27051-4 to remove nut (145) and washer (150), then separate worm gear from gear shaft (230).

P. Remove drain covers (10) from housing assembly (105) by removing bolts (15) and washers (20).

Q. Remove inspection cover (5) from housing assembly (105) by removing bolts (15) and washers (20).

R. Do not remove bearings (125, 130), inserts (110, 115, 120), or nameplate (250) from housing assembly (105) unless replacement is required.

CLEANING

1. Clean all parts except bearings (125, 130, 135, 140, 165, 170, 215, 220, IPL Fig. 1) using standard industry practices and information contained in 20-30-03.

2. Clean bearings (125, 130, IPL Fig. 1) per 20-30-01, method 1. Relubricate with MIL-G-21164 grease, 0.0001-0.0003 inch thick, to ball bore and ID of race.

3. Clean bearings (135, 140, 165, 170, 215, 220, IPL Fig. 1) per manufacturer's instructions.

CHECK

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

2. Penetrant check per 20-20-02 (IPL Fig. 1):

   A. Cap (25)

   B. Cover (95, 100)

   C. Housing (105)

   D. Gear (225, 235)

3. Magnetic particle check per 20-20-01 (IPL Fig. 1):

   A. Washer (160)

   B. Gear (175)

   C. Plug (185, 200)

   D. Gear (190, 205)

   E. Gear Shaft (230, 240, 245)

4. Check gear teeth and splines for uneven wear.

REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
256T2712	HOUSING	1-1
256T2714	COVER	2-1
256T2716	FOLLOW-UP COVER	3-1
256T2719	GEAR	4-1
256T2720	GEAR	5-1
256T2721	GEAR SHAFT	6-1
256T2724	GEAR SHAFT	7-1
256T2727	FOLLOW-UP GEAR SHAFT	8-1
256T2728	FOLLOW-UP GEAR	9-1
256T2635	NAMEPLATE	10-1
- - -	MISC PARTS REFINISH	11-1

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
20-41-02 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 Installation and Retention
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. Corrosion Preventive Compound -- MIL-C-11796, Class 1 (Ref 20-60-02)

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

C. Adhesive -- BMS 5-92 (Ref 20-60-04)

4. Dimensioning Symbols

A. Standard True Position 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
[⊥ | B | 0.002]	PERPENDICULAR TO B WITHIN 0.002
[// | A | 0.002]	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
[⌒ | A | 0.006]	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
[⌓ | A | 0.020]	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
[◎ | C | ∅ 0.0005]	CONCENTRIC TO C WITHIN 0.0005 DIAMETER
[⌯ | A | 0.010]	SYMMETRICAL WITH A WITHIN 0.010
[∠ | A | 0.005]	ANGULAR TOLERANCE 0.005 WITH A
[⌖ | B | ∅ 0.002 Ⓢ]	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
[⊥ | A | ∅ 0.010 Ⓜ] [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	EXACT DIMENSION IS 2.000

(NOTE THAT [⌓ | A | 0.020] MAY ALSO APPEAR AS [⌓ | 0.020 | A])

True Position Dimensioning Symbols
Figure 601

HOUSING ASSEMBLY - REPAIR 1-1

256T2712-1

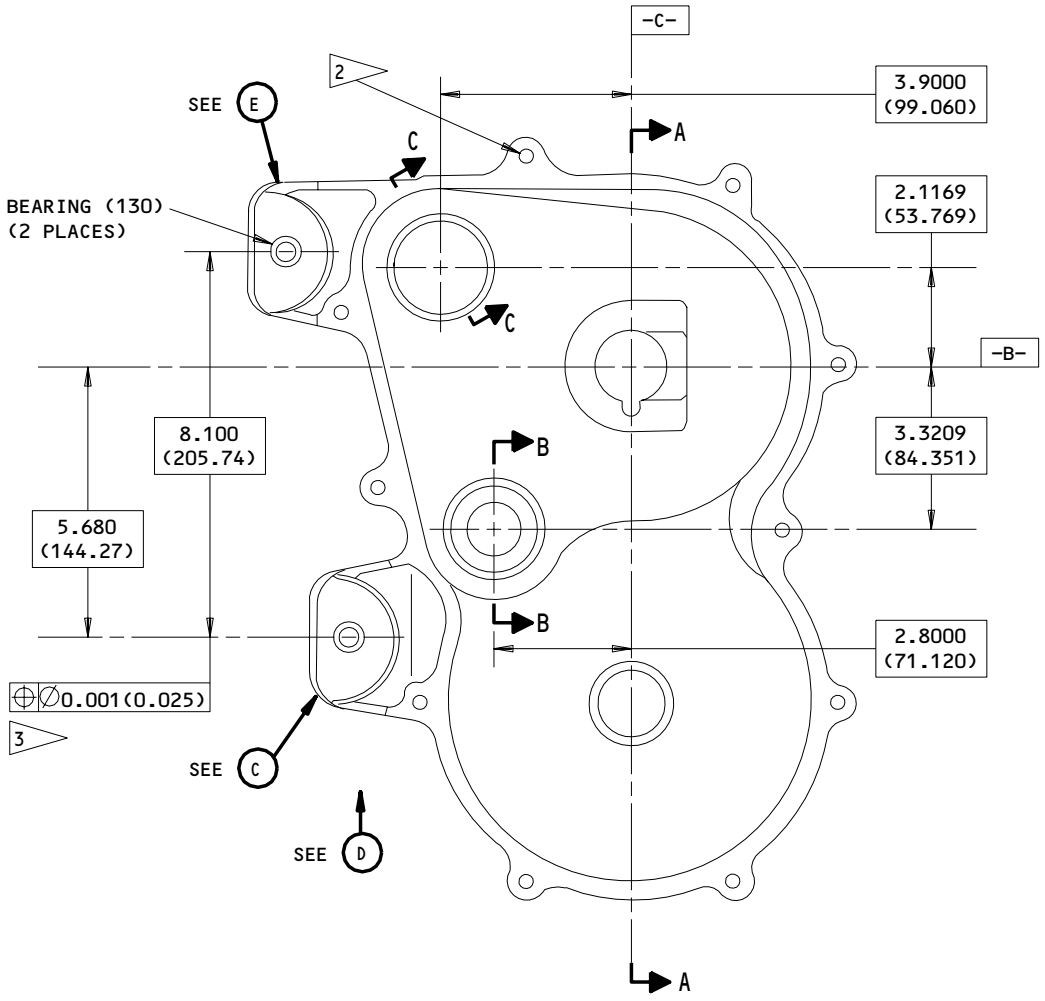
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions in Fig. 601.

1. Bearing Replacement (IPL, Fig. 1)

   A. Remove bearings (125, 130).

   B. Install bearings (125, 130) and swage using type 1 groove configuration per 20-50-03 (Fig. 601).

   C. Push out load for bearing (125) shall be 1048 lbs. Pushout load for bearing (130) shall be 1148 lbs.



REFINISH

ANODIZE (F-17.05) HOUSING (110) ALL OVER AFTER MACHINING AND BEFORE BEARING (125,130) INSTALLATION. APPLY ONE COAT BMS 10-11, TYPE 1, PRIMER (F-20.02) TO EXTERNAL SURFACES AND BOLT HOLES EXCEPT AS NOTED

1 NO PRIMER THIS SURFACE

2 NO PRIMER IN BOLT HOLE

3 HOLD DIMENSION DURING BEARING INSTALLATION

MATERIAL: AL ALLOY

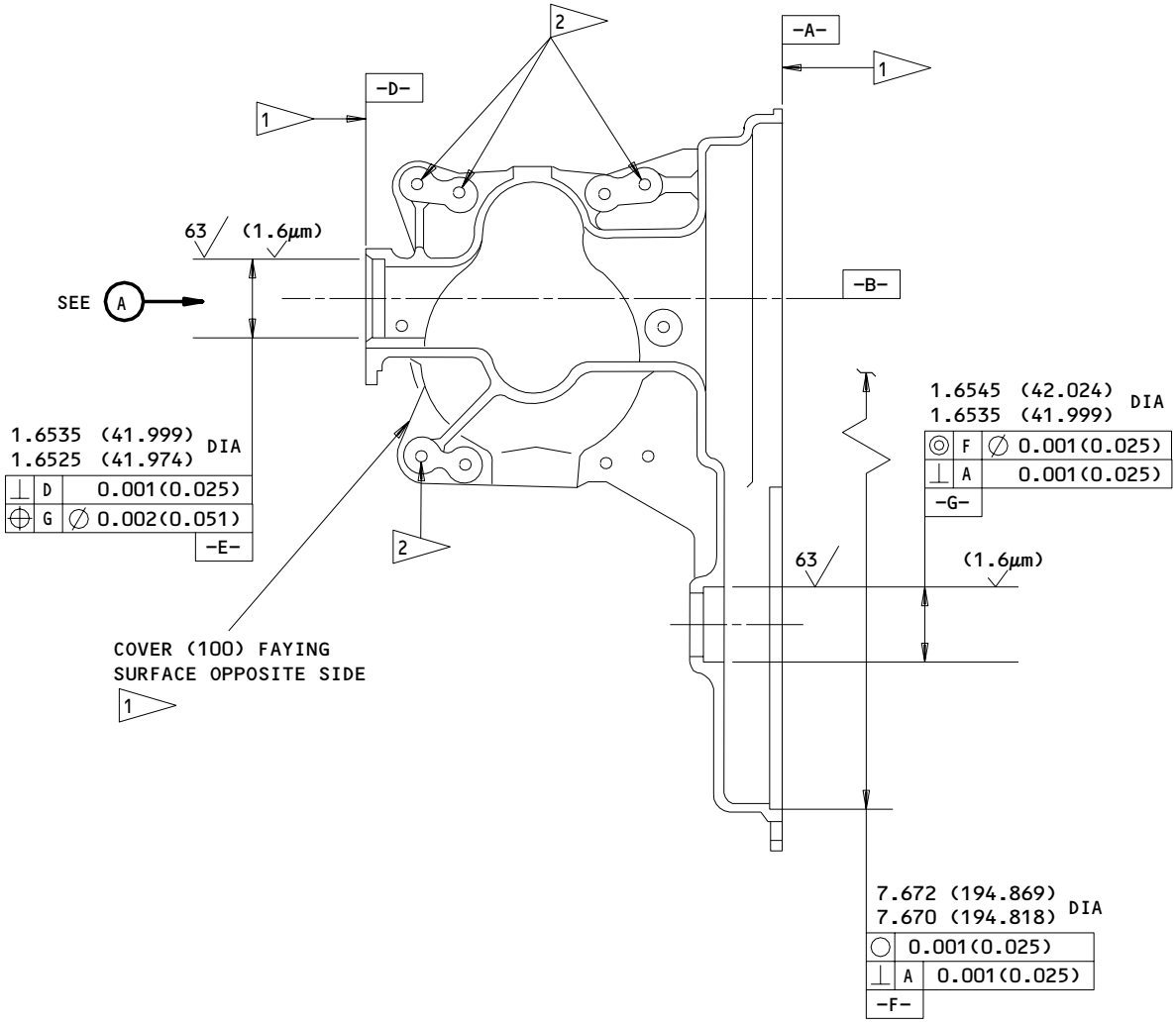
BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203)R

125 (3.2μm) EXCEPT AS NOTED

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

256T2712-1
Housing Assembly Repair
Figure 601 (Sheet 1)

14166



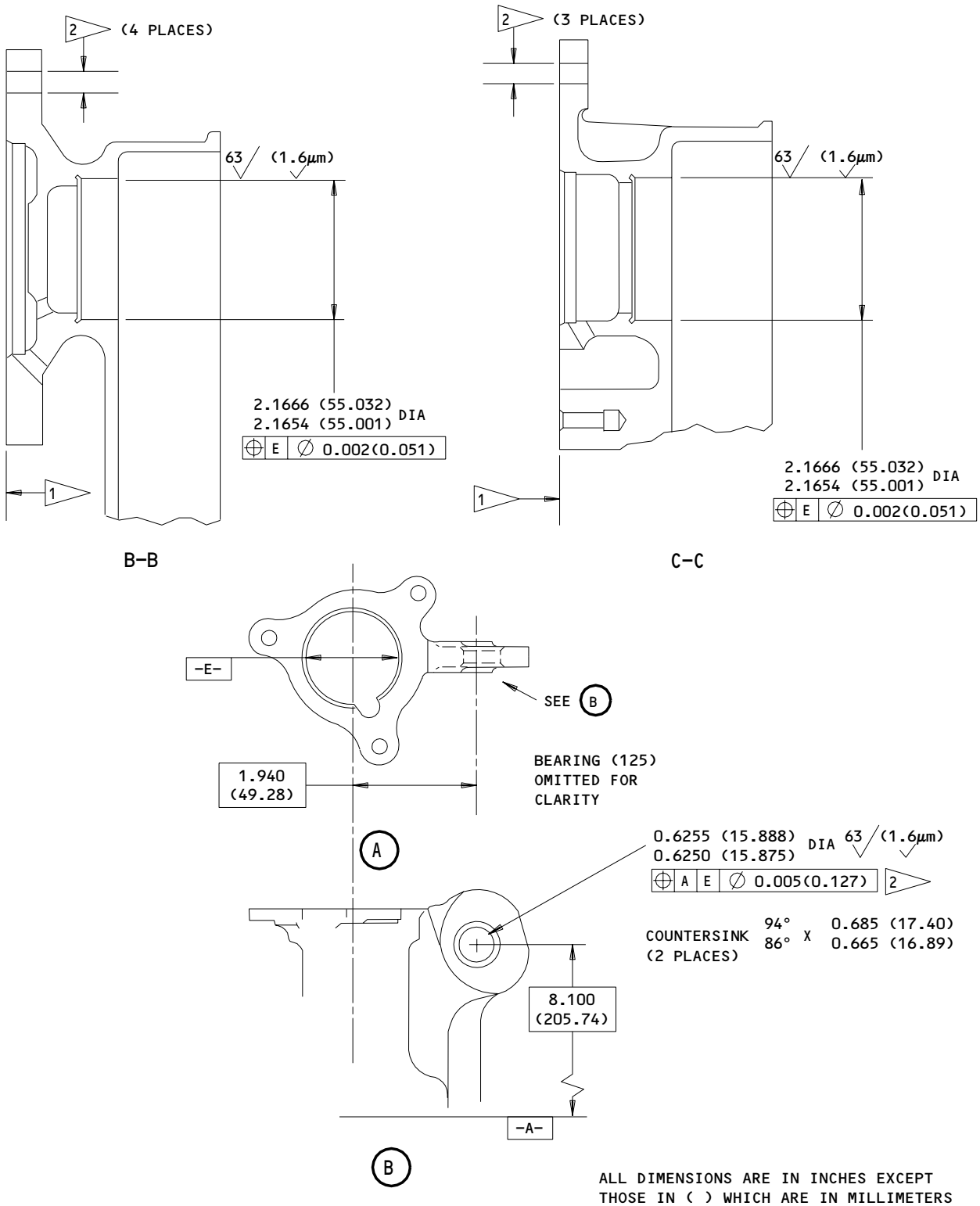
A-A

1 NO PRIMER THIS SURFACE

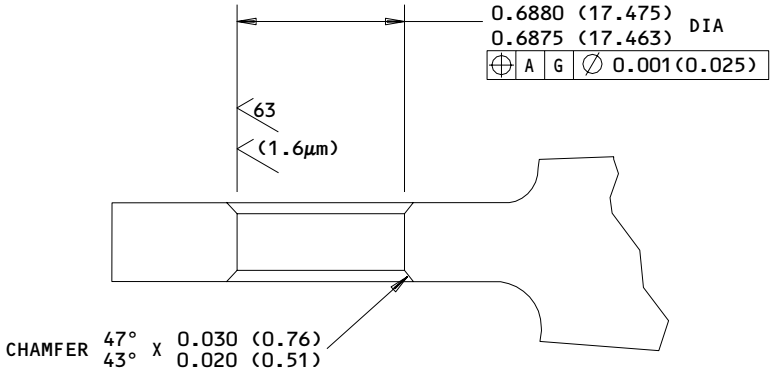
2 NO PRIMER IN BOLT HOLE

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

256T2712-1
Housing Assembly Repair
Figure 601 (Sheet 2)

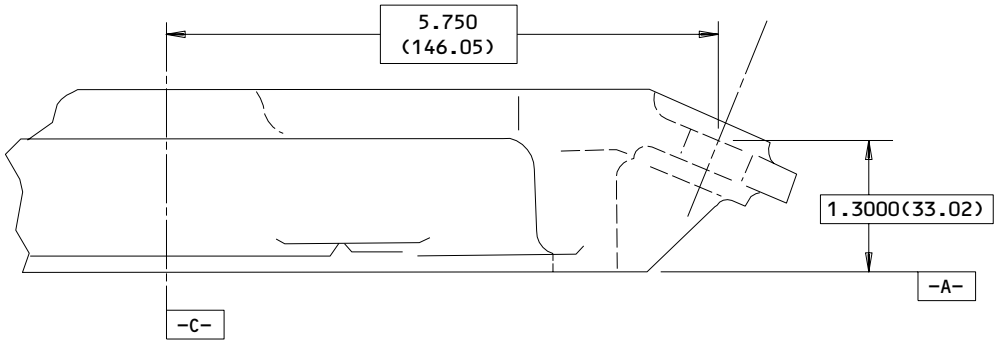


256T2712-1
Housing Assembly Repair
Figure 601 (Sheet 3)



BEARING (130) OMITTED FOR CLARITY

C



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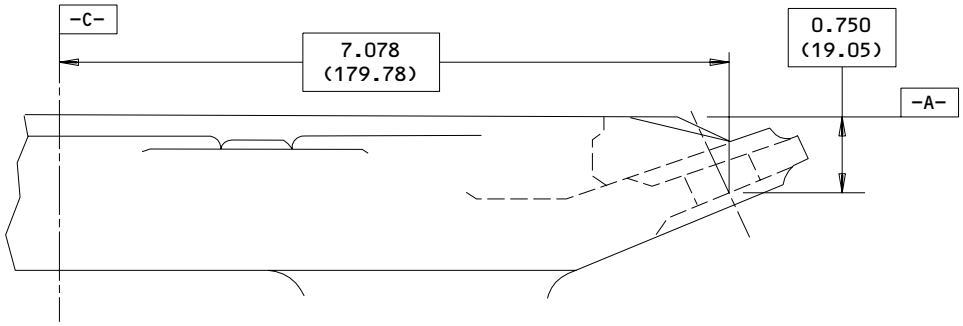


E

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

256T2712-1
Housing Assembly Repair
Figure 601 (Sheet 4)

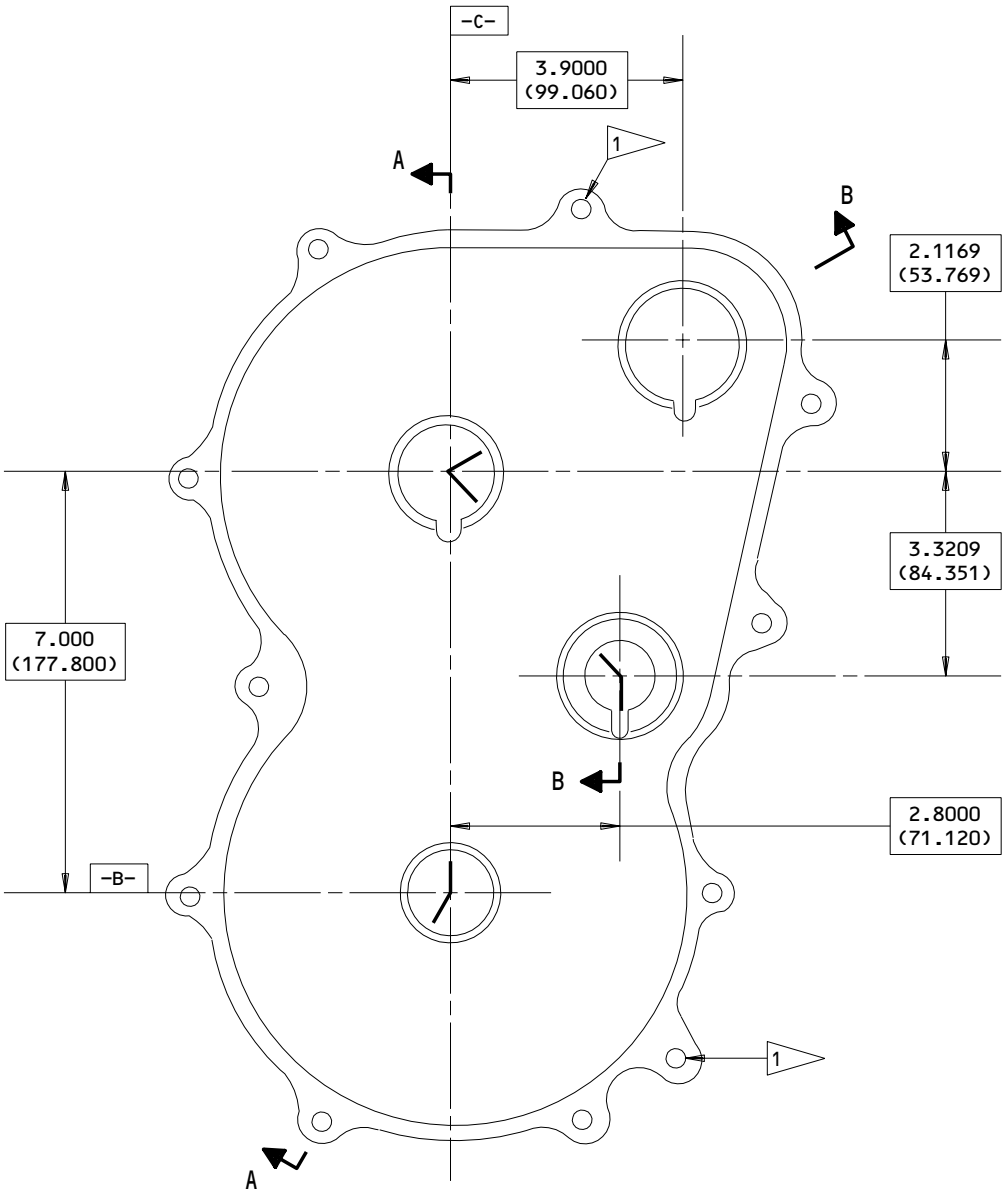
14262

COVER - REPAIR 2-1

256T2714-1

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

ANODIZE ALL OVER (F-17.05) AND APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER (F-20.02) TO EXTERNAL SURFACES AND BOLT HOLES EXCEPT AS NOTED

1 NO PRIMER THIS SURFACE

MATERIAL: AL ALLOY

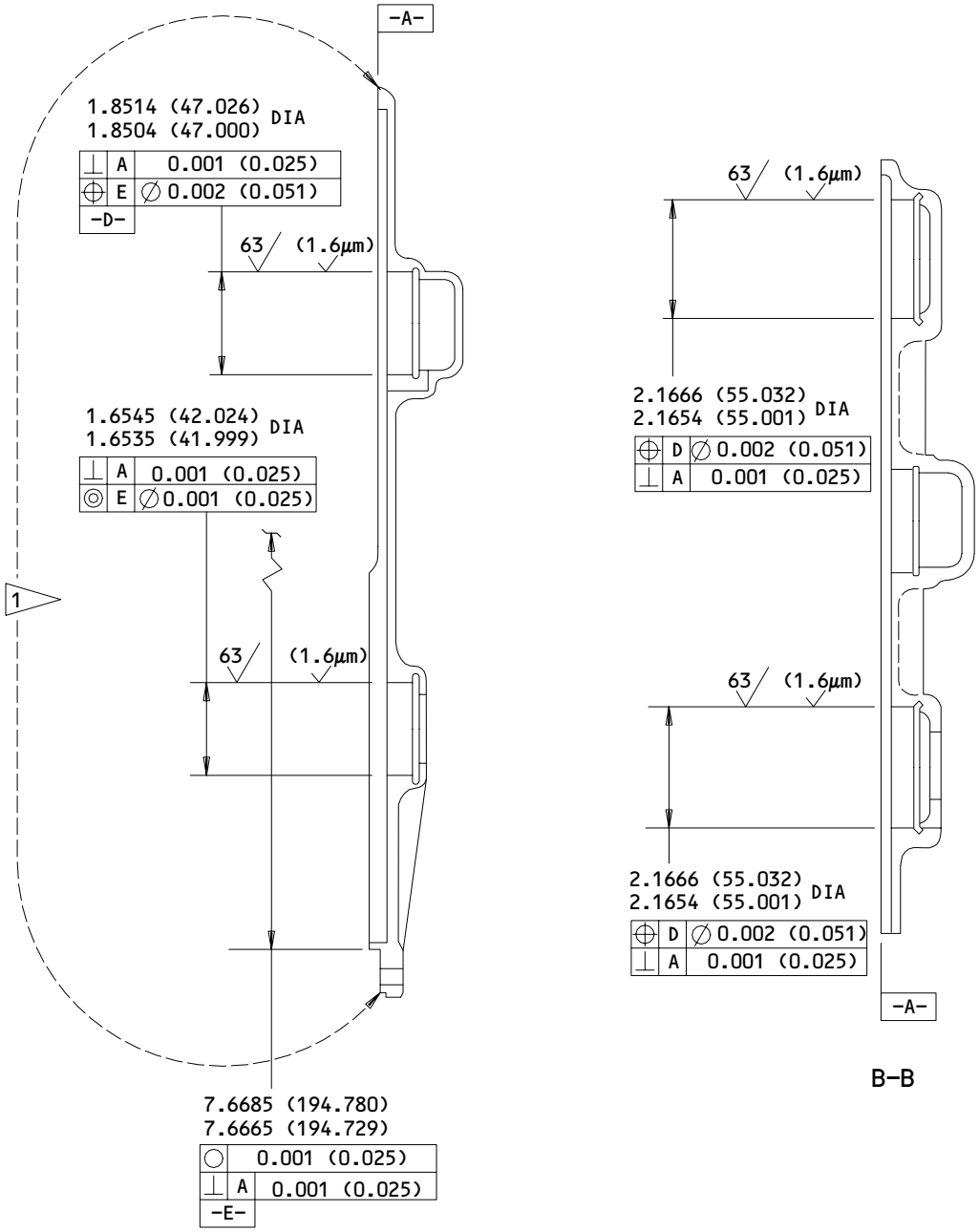
125 (3.2μm) EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203)R

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

256T2714-1
Cover Repair
Figure 601 (Sheet 1)

14263



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

256T2714-1
Cover Repair
Figure 601 (Sheet 2)

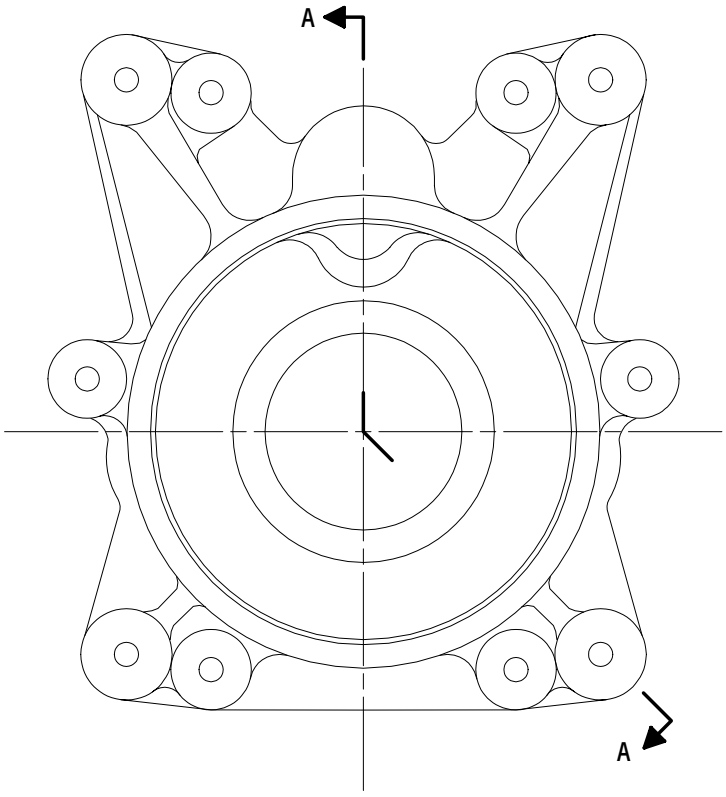
14267

FOLLOW-UP COVER - REPAIR 3-1

256T2716-1

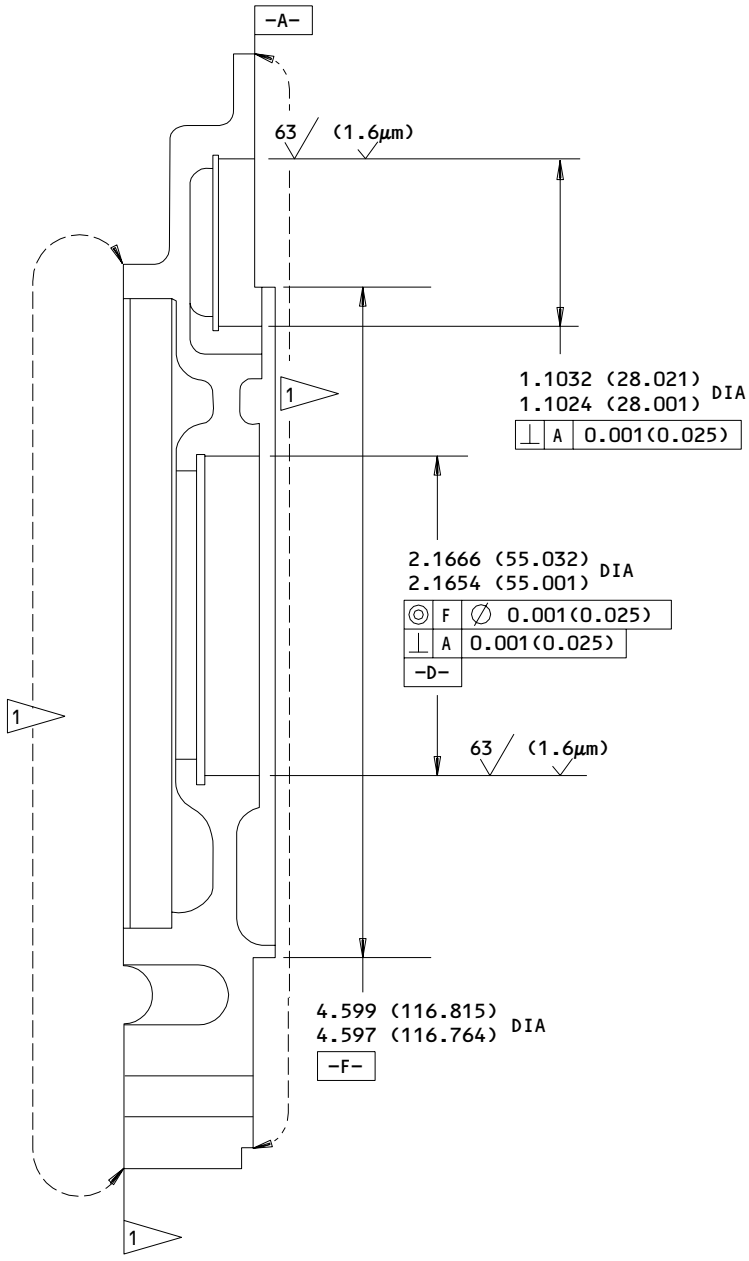
1. Plating Repair

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



Follow-Up Cover Repair
Figure 601 (Sheet 1)

14268



A-A

REFINISH

ANODIZE (F-17.05) ALL OVER AND APPLY ONE COAT BMS 10-11, TYPE 1, PRIMER TO EXTERNAL SURFACES EXCEPT AS NOTED

1 NO PRIMER THIS SURFACE

MATERIAL: AL ALLOY

BREAK ALL SHARP EDGES APPROXIMATELY 0.008 (0.203)R

125 (3.2µm) ALL MACHINED SURFACES EXCEPT AS NOTED

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

256T2716-1
Follow-Up Cover Repair
Figure 601 (Sheet 2)

14327

GEAR ASSEMBLY - REPAIR 4-1

256T2719-1

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 in Fig. 601.

1. Plug Replacement (IPL Fig. 1)

   A. Remove plug. See Repair 11-1 for plug refinish.

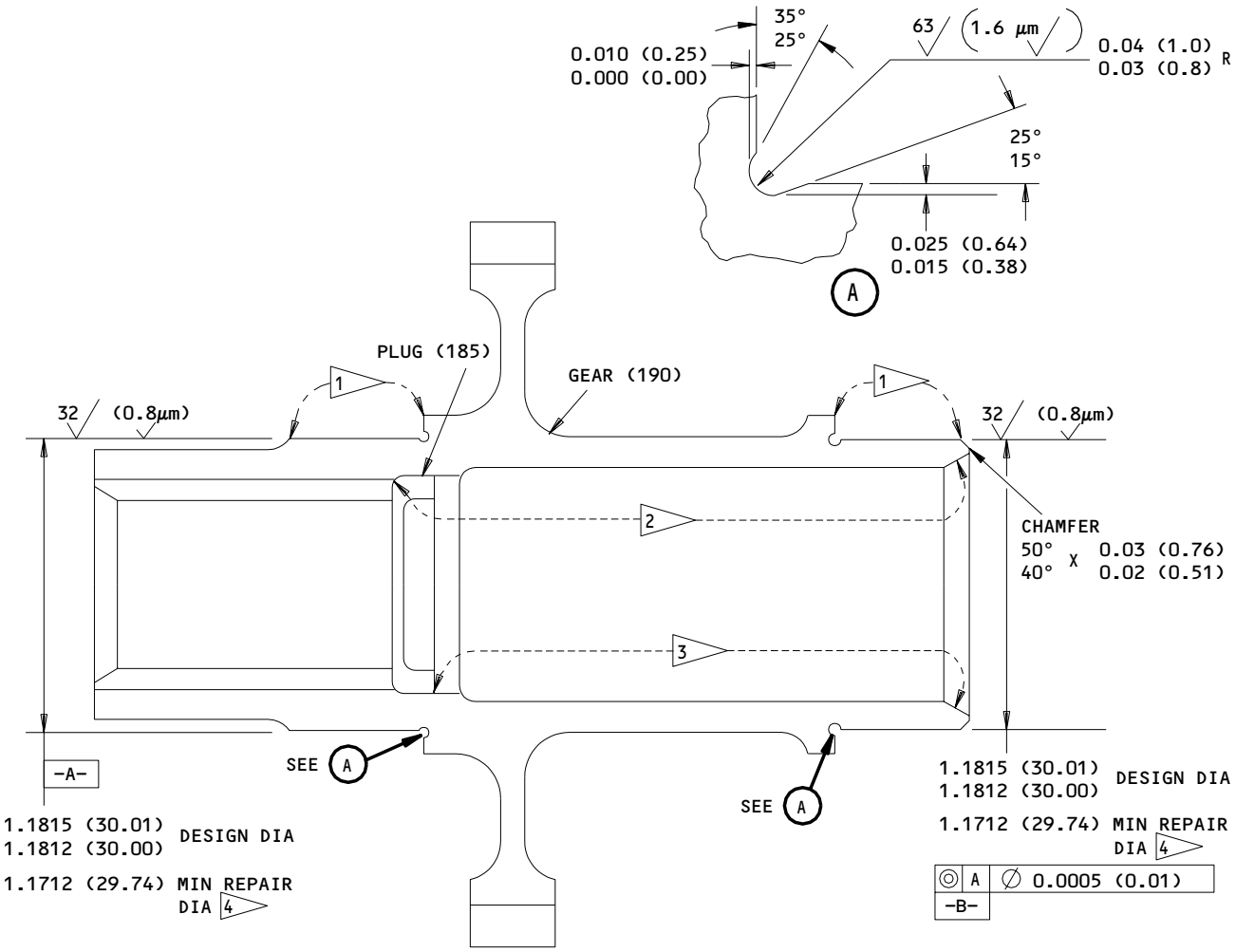
   B. Install plug using wet BMS 10-11, type 1 primer.

2. Bearing Seat Repair (Fig. 601)

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

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate and grind to design dimension and finish as indicated.



REFINISH

CADMIUM PLATE GEAR (190) (F-15.23) ALL OVER EXCEPT AS NOTED. PLATING THICKNESS 0.00015-0.0004 (0.004-0.010) ALLOWABLE ON GEAR TEETH.

1. NO PLATING THIS SURFACE
2. UNCONTROLLED PLATING THICKNESS ALLOWED
3. FOLLOWING PLUG INSTALLATION, PHOSPHATE COAT INTERNAL BORE (F-18.02) EXCEPT OMIT FOLLOW-UP OIL TREATMENT. APPLY TWO COATS BMS 10-11, TYPE 1, PRIMER (F-20.03) AND COAT WITH CORROSION PREVENTIVE COMPOUND (F-19.03)
4. BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT OF 0.00-0.08 (0.00-2.03) AT 0.00-0.02 (0.00-0.51) FROM SURFACE EDGE AND FILLET RADIUS. MAXIMUM PLATE THICKNESS IS 0.005 (0.13)

REPAIR

REF 4

63 (1.6µm) ON GEAR AND SPLINE TEETH

125 (3.2µm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203) R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.008A
COVERAGE 2.0

MATERIAL: 9310 STEEL (GEAR TEETH CARBURIZED 0.012-0.023 (0.30-0.58) DEEP)
150-190 KSI

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

256T2719-1
Gear Assembly Repair
Figure 601

14331

GEAR ASSEMBLY - REPAIR 5-1

256T2720-1

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 in Fig. 601.

1. Plug Replacement (IPL Fig. 1)

   A. Remove plug. See Repair 11-1 for plug refinish.

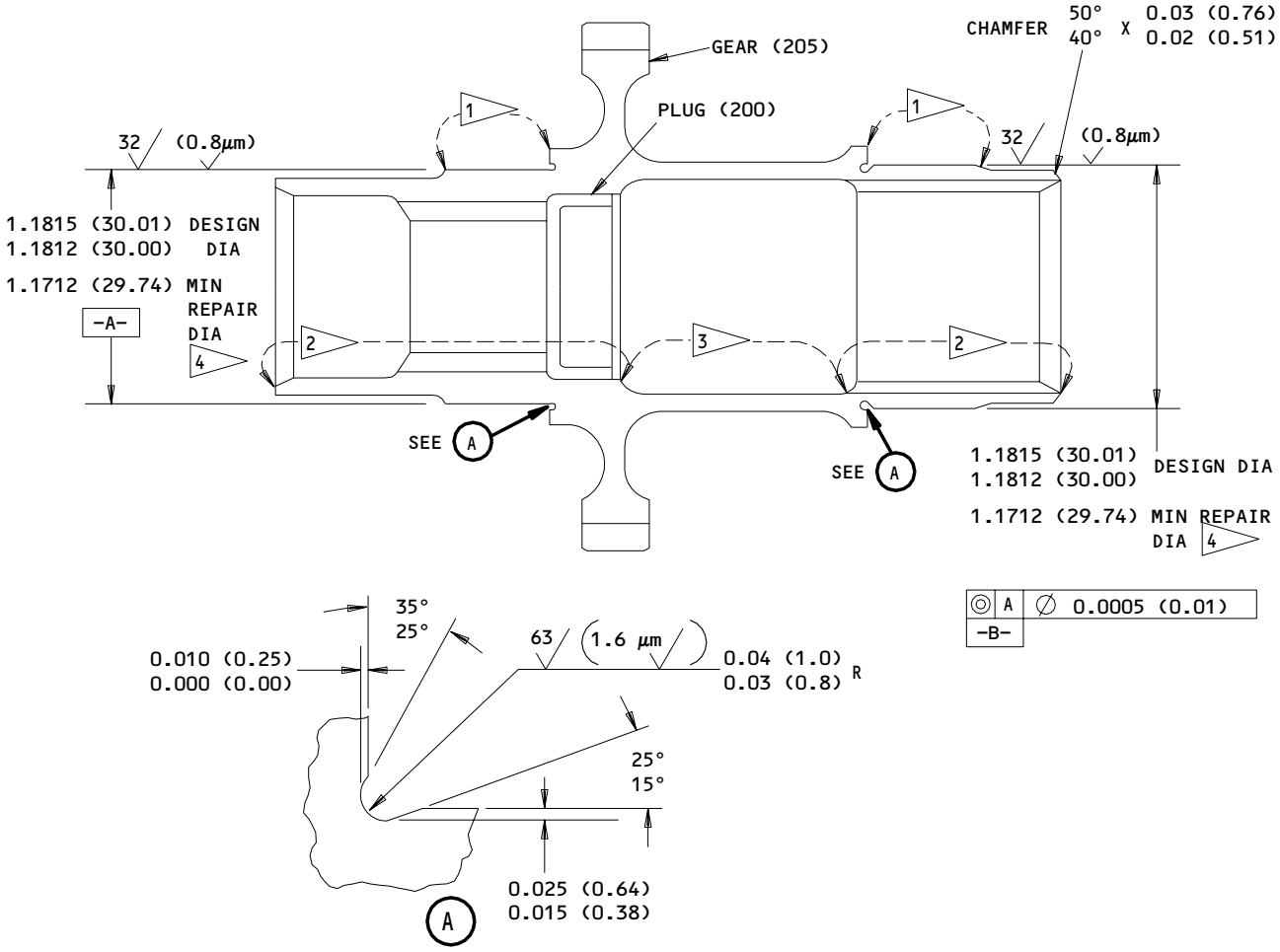
   B. Install plug using wet BMS 10-11, type 1 primer.

2. Bearing Seat Repair (Fig. 601)

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

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate and grind to design dimension and finish as indicated.



REFINISH

CADMIUM PLATE GEAR (205) (F-15.23) ALL OVER EXCEPT AS NOTED. PLATING THICKNESS 0.00015-0.0004 (0.004-0.010) ALLOWABLE ON GEAR TEETH

1 NO PLATING THIS SURFACE

2 UNCONTROLLED PLATING THICKNESS ALLOWED

3 FOLLOWING PLUG INSTALLATION, PHOSPHATE COAT INTERNAL BORE (F-18.02) EXCEPT OMIT FOLLOW-UP OIL TREATMENT. APPLY TWO COATS BMS 10-11, TYPE 1, PRIMER (F-20.03) AND COAT WITH CORROSION PREVENTIVE COMPOUND (F-19.03)

4 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT OF 0.00-0.08 (0.00-2.03) AT 0.00-0.02 (0.00-0.51) FROM SURFACE EDGE AND FILLET RADIUS. MAXIMUM PLATE THICKNESS IS 0.005 (0.13)

REPAIR

REF 4

63 (1.6μm) ON GEAR AND SPLINE TEETH

125 (3.2μm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.20)R

SHOT PEEN: SHOT NO: 170-460
INTENSITY 0.003-0.006A
COVERAGE 2.0

MATERIAL: 9310 STEEL (GEAR TEETH CARBURIZED 0.012-0.023 (0.30-0.58) DEEP) 150-190 KSI

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

256T2720-1
Gear Assembly Repair
Figure 601

14333

GEAR SHAFT - REPAIR 6-1

256T2721-1

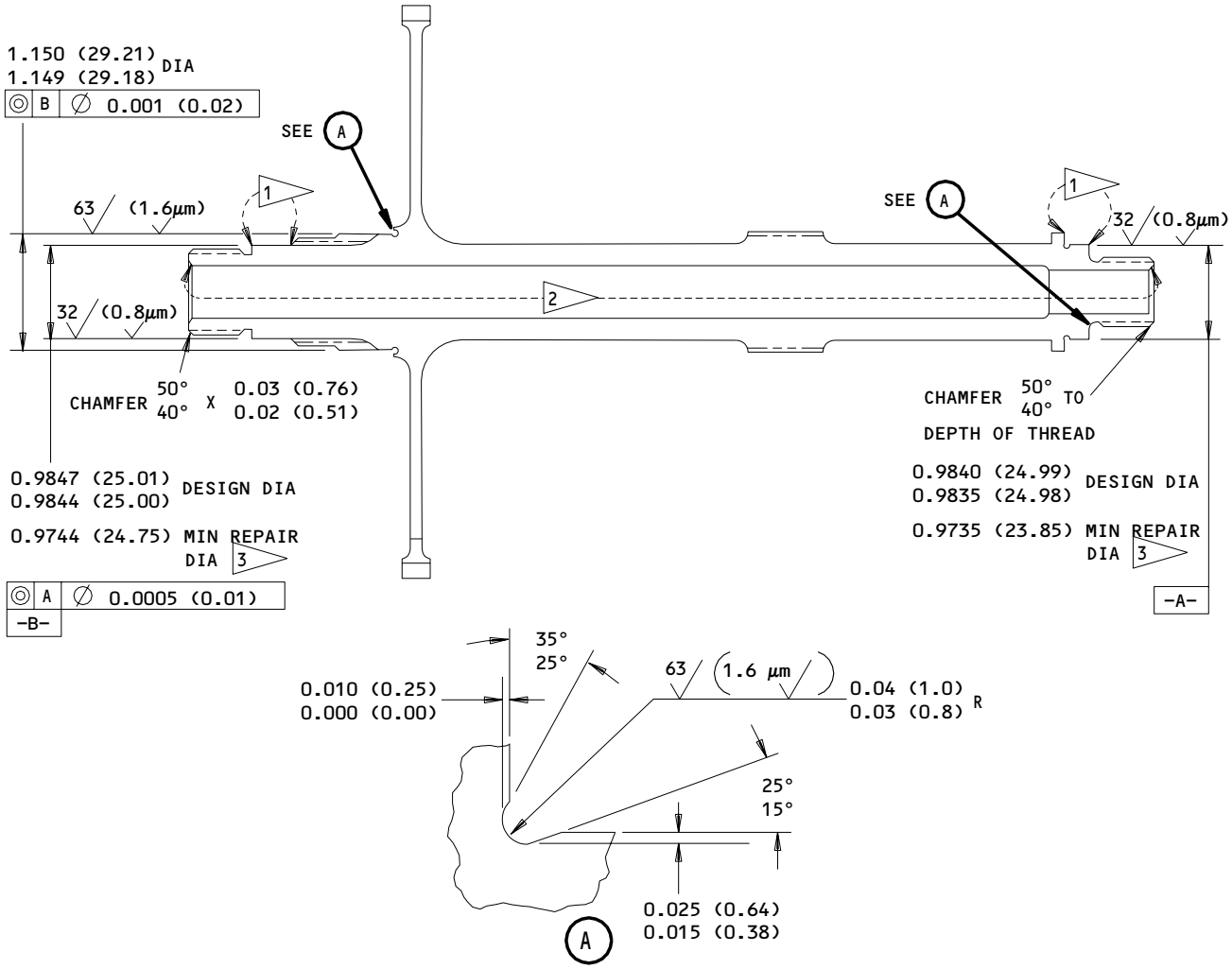
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions in Fig. 601.

1. Bearing Seat Repair (Fig. 601)

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

   B. Shot peen as indicated.

   C. Build up repaired area with chromic plate and grind to design dimension and finish as indicated.



REFINISH

CADMIUM PLATE (F-15.23) ALL OVER EXCEPT AS NOTED. PLATING THICKNESS 0.00015-0.0004 (0.004-0.010) ALLOWABLE ON GEAR AND WORM

1 NO FINISH THIS SURFACE

2 PHOSPHATE COAT (F-18.02) EXCEPT OMIT FOLLOW-UP OIL TREATMENT. APPLY TWO COATS OF BMS 10-11, TYPE 1, PRIMER (F-20.03) FOLLOWED BY CORROSION PREVENTIVE COMPOUND (F-19.03)

3 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT OF 0.00-0.08 (0.00-2.03) AT 0.00-0.02 (0.00-0.51) FROM SURFACE EDGE AND FILLET RADIUS. MAXIMUM PLATE THICKNESS IS 0.005 (0.13)

REPAIR

REF 3

32 (0.8μm) ON WORM

63 (1.6μm) ON GEAR AND SPLINE TEETH

125 (3.2μm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.20)R

SHOT PEEN: SHOT NO: 170-460
INTENSITY 0.14A
COVERAGE 2.0

MATERIAL: 9310 STEEL (GEAR TEETH CARBURIZED 0.012-0.023 (0.30-0.58) DEEP) 150-190 KSI

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

256T2721-1
Gear Shaft Repair
Figure 601

14335

GEAR SHAFT - REPAIR 7-1

256T2724-1

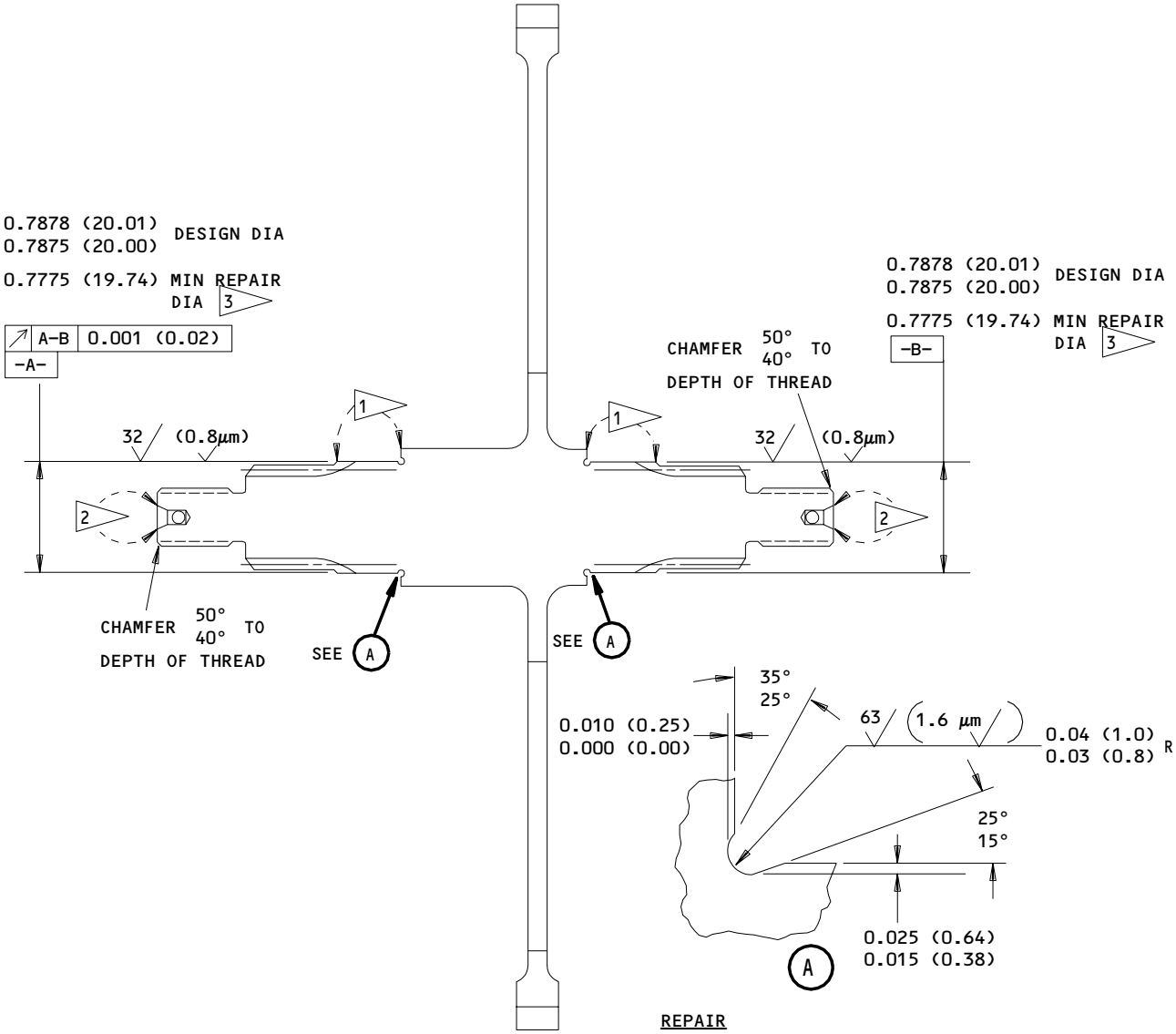
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions in Fig. 601.

1. Bearing Seat Repair (Fig. 601)

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

B. Shot peen as indicated.

C. Build up repaired area with chrome plate and grind to design dimension and finish as indicated.



REFINISH

CADMIUM PLATE (F-15.23) ALL OVER EXCEPT AS NOTED. PLATING THICKNESS 0.00015-0.0004 (0.004-0.010) ALLOWABLE ON GEAR TEETH

1 NO FINISH

2 UNCONTROLLED PLATING THICKNESS ACCEPTABLE

3 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT OF 0.00-0.08 (0.00-2.03) AT 0.00-0.02 (0.00-0.51) FROM SURFACE EDGE AND FILLET RADIUS. MAXIMUM PLATE THICKNESS IS 0.005 (0.13)

REPAIR

3

63 (1.6µm) ON GEAR AND SPLINE TEETH

125 (3.2µm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203)R

SHOT PEEN: SHOT NO. 170-460
INTENSITY 0.14A
COVERAGE 2.0

MATERIAL: 9310 STEEL (GEAR TEETH CARBURIZED 0.020-0.035 (0.51-0.89) DEEP)

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

256T2724-1
Gear Shaft Repair
Figure 601

14338

FOLLOW-UP GEAR SHAFT - REPAIR 8-1

256T2727-1

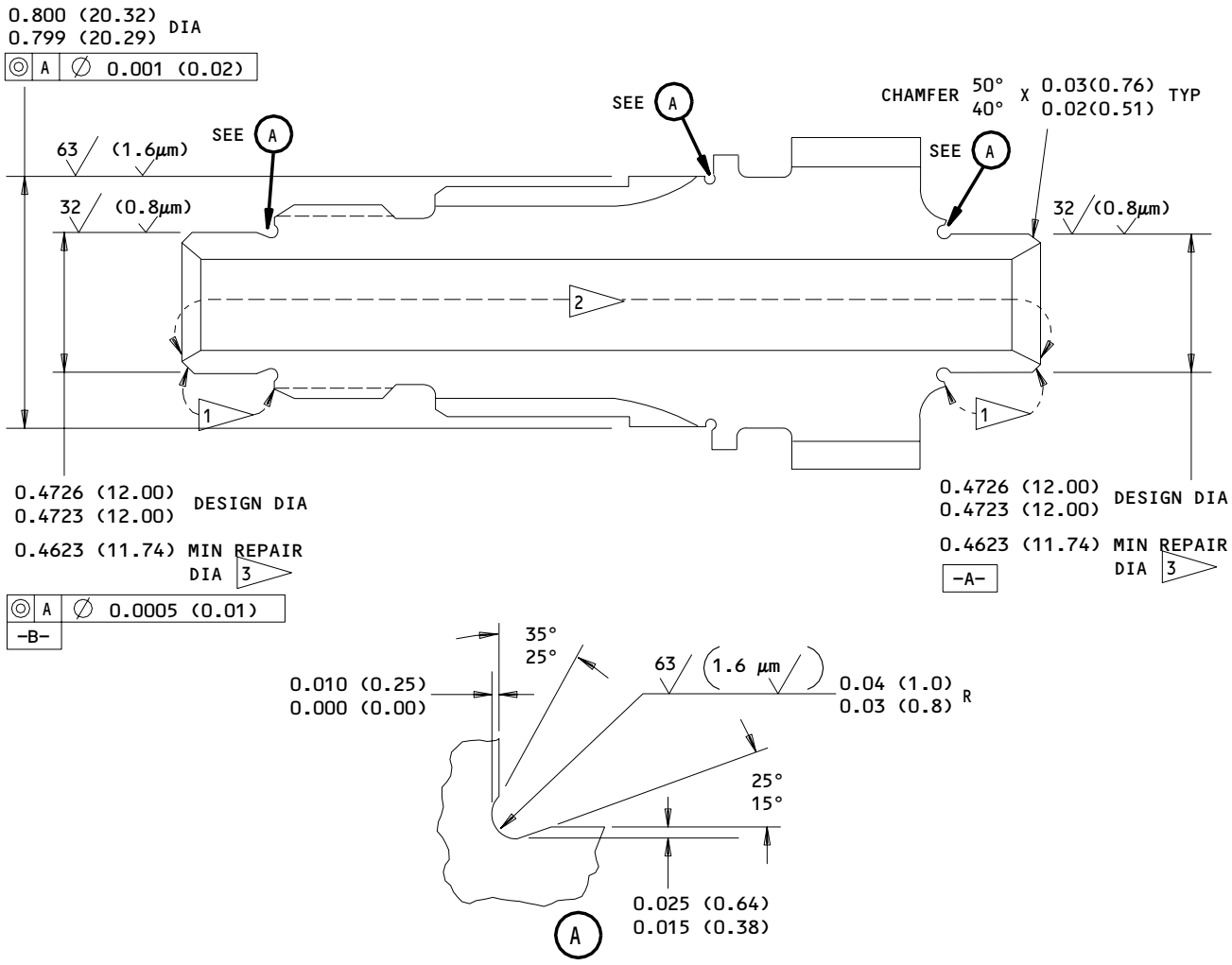
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions in Fig. 601.

1. Bearing Seat Repair (Fig. 601)

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

   B. Shot peen as indicated.

   C. Build up repaired area with chrome plate and grind to design dimension and finish as indicated.



REFINISH

CADMIUM PLATE (F-15.06) ALL OVER EXCEPT AS NOTED. PLATING THICKNESS 0.00015-0.0004 (0.004-0.010) ALLOWABLE ON GEAR TEETH

1 NO FINISH THIS SURFACE

2 PHOSPHATE COAT (F-18.02) EXCEPT OMIT FOLLOW-UP OIL TREATMENT. APPLY TWO COATS OF BMS 10-11, TYPE 1, PRIMER (F-20.03) FOLLOWED BY CORROSION PREVENTIVE COMPOUND (F-19.03)

3 BUILD UP WITH CHROME PLATE (F-15.03) AND GRIND TO DESIGN DIMENSIONS AND FINISH SHOWN. OBSERVE RUNOUT OF 0.00-0.08 (0.00-2.03) AT 0.00-0.02 (0.00-0.51) FROM SURFACE EDGE AND FILLET RADIUS. MAXIMUM PLATE THICKNESS IS 0.005 (0.13)

REPAIR

REF 3

63 (1.6µm) ON GEAR AND SPLINE

125 (3.2µm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203)R

SHOT PEEN: SHOT NO: 170-460
INTENSITY 0.003-0.006A
COVERAGE 2.0

MATERIAL: 4340 STEEL, 150-170 KSI

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

256T2727-1
Follow-Up Gear Shaft Repair
Figure 601

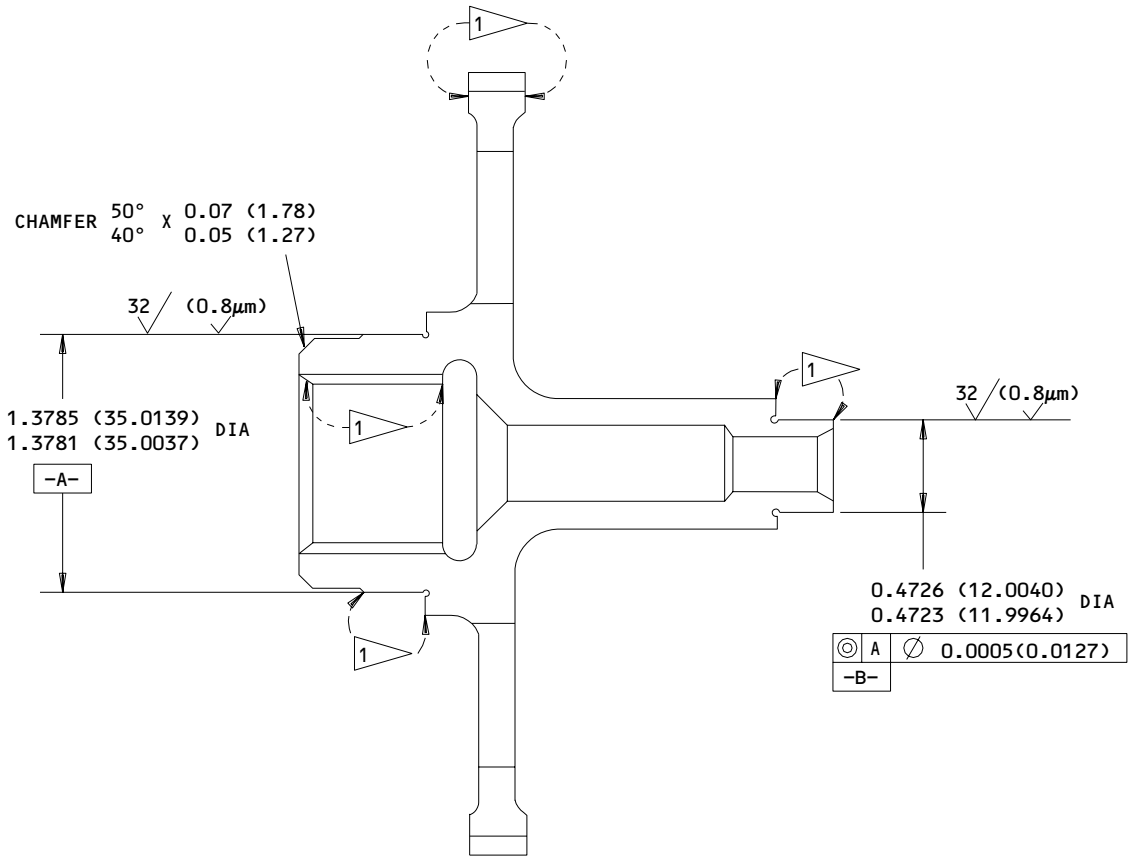
14341

FOLLOW-UP GEAR - REPAIR 9-1

256T2728-1

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-17.04) ALL OVER

APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER EXCEPT AS NOTED

1 NO FINISH THIS SURFACE

MATERIAL: AL ALLOY

63 (1.6µm) ON GEAR AND SPLINE TEETH

125 (3.2µm) ALL OVER EXCEPT AS NOTED

BREAK SHARP EDGES APPROXIMATELY 0.008 (0.203)R

ALL DIMENSIONS APPLY AFTER ANODIZONG

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

256T2728-1
Follow-Up Gear Repair
Figure 601

14344

NAMEPLATE REPLACEMENT - REPAIR 10-1

256T2635-2

1. Nameplate Replacement

   A. Remove nameplate if damaged.

   B. Steel stamp assembly part number and serial number per 20-50-10.

   C. Using adhesive, apply nameplate to same area where damaged nameplate was attached per 20-50-12.

MISCELLANEOUS PARTS REFINISH - REPAIR 11-1

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

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Cover (5)	Al alloy	Chromic and anodize (F-17.04) and apply one coat primer, BMS 10-11, type 1 (F-20.02). Primer optional in holes.
Cap (25)	Al alloy	Anodize all over (F-17.05) and apply one coat BMS 10-11, type 1 primer to all surfaces and bolt holes except faying surface (F-20.02).
Washer (160), Plug (185,200)	4130 Steel, 125-145 ksi	Cadmium plate all over (F-15.06).
Gear (175)	9310 steel	Cadmium plate all over (F-15.23) except plating thickness 0.00015-0.00040 inch (0.0038-0.0102) on gear teeth. Uncontrolled plating thickness acceptable in bore. Gear teeth carburized 0.020-0.035 inch (0.51-0.89) deep.*[1]
Gear (225)	Al-Ni Bronze Alloy	Cadmium plate all over (F-15.06) except plating thickness 0.00015-0.00040 inch (0.0038-0.0102) on gear teeth. Uncontrolled plating thickness acceptable in bore.*[1]

*[1] All dimensions are in inches except dimensions in ( ) which are in millimeters.

Refinish Details
Figure 601

ASSEMBLY

1. Equipment

   NOTE: Equivalent substitutes may be used.

   A. Spanner Adapter -- A27051-4,-6

   B. Wrench -- A27051-10

   C. Backlash Check Fixture -- A27048-6

   D. Lock Assembly -- A27051-2

   E. Input Crank Assembly -- A27051-8

   F. Clamp Assembly -- A27051-7

   G. Holding Fixture Assembly -- A27054-2

   H. Clamp -- A27054-10 (2 required)

2. Material

   NOTE: Equivalent substitutes may be used.

   A. Sealant -- BMS 5-26 (Ref 20-60-04)

   B. Lockwire -- MS20995NC32

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

   D. Grease -- MIL-G-23827 (Ref 20-50-03)

3. Assemble Gearbox Assembly (IPL Fig. 1)

   A. Install follow-up worm gear (225) on gear shaft (230). Observe proper orientation (Fig. 701). Mount worm gear in a vise, using clamps A27054-10, and install washer (150) and nut (145). Tighten nut to 300-350 lb-in. (346-403 kg-cm), using spanner adapter A27051-4.

   B. Press bearings (215) on gear shaft (230).

C. Select shims (210).

NOTE: If any of the following parts have been replaced, shim (210) thickness must be recalculated according to instructions in step D. Otherwise, use same thickness as was recorded during disassembly.

(1) Follow-up Cover (100)

(2) Housing Assembly (105)

(3) Bearings (215)

(4) Follow-up Worm Gear (225)

(5) Follow-up Gear Shaft (230)

D. Determine thickness of shims S1, S2 necessary to obtain end play X1, X2 of 0.002-0.006 (0.051-0.152) as follows (Fig. 701):

(1) Deleted.

(2) Measure dimension C; distance from center of bearing bore in housing assembly (105) to mating surface of cover (100).

(3) Measure bearing bore depths L and E from faying surface of cover (100) and housing assembly (105).

(4) Measure D; distance between bearing (215) outer races with an axial load of approximately 5 lbs (2.27 kg) applied between bearings.

(5) Measure B from follow-up worm gear (225) to outer race of bearing (215) with an axial load of approximately 5 lb (2.27 kg) applied to seat the bearing.

(6) Measure dimension A on follow-up worm gear (225).

NOTE: Design dimension is 0.547-0.551 (13.894-13.995).

(7) Calculate thickness of shims (210) S1 and S2:

S1 = L - C - (B - A) - 0.004 (0.101)
S2 = L + E - D - S1 - 0.008 (0.203)

(8) Select shims (210) S1 and S2 within ± 0.002 (0.051).

E. Install gear shaft (230) with shims (210).

F. Press bearings (215, 220) on gear (235) and install in housing. Fill gear teeth spaces of gears (230, 235) with grease.

G. Attach cover (100) with bolts (45, 60), washers (65), and nuts (70). Install bolts using wet primer and tighten fasteners to 58-80 lb-in. (67-92 kg-cm). Lockwire bolts using double-twist method and apply bead of sealant on seam between cover and housing.

H. Coat splines of gear shaft (240) with grease and install gear (175).

I. Using holding fixture assembly A27054-2, install bearing (165), washer (160), and nut (155) on gear shaft (240). Use spanner adapter A27051-6 to tighten nut to 1200-1300 lb-in. (1385-1500 kg-cm).

J. Press bearing (170) into housing assembly (105) and install gear shaft (240).

K. Press bearings (140) on gear assembly (195) and install in housing assembly (105). Fill gear teeth spaces of gear shaft (240) and gear assembly (195) with grease.

L. Press bearings (140) on gear assembly (180) and install in housing assembly (105). Fill gear teeth spaces of gear assembly (180) with grease.

M. Press bearings (135) on gear shaft (245) and install into housing assembly (105). Fill gear teeth spaces of gear shaft (245) and gear (175) with grease.

N. Fill space between bearing for gear assembly (195) and cover (95) with grease (Fig. 702). Install cover (95) on housing assembly (105) and secure with bolts (47, 50, 55), washers (65), and nuts (70). Install bolts with wet primer and tighten diagonally opposed fasteners to 58-80 lb-in. (58-92 kg-cm). Lockwire bolts using double-twist method.

O. Seal seam between cover (95) and housing assembly (105) with a bead of sealant.

P. Coat splines of gear shaft (245) with grease and install couplings (90). Fill space between coupling and bearing with grease. Install washers (85) and nuts (80). Hold coupling with wrench A27051-10 and tighten nuts to 160-240 lb-in. (185-275 kg-cm) (Fig. 702). Install cotter pins (75).

Q. Install washer (150) and nut (145) on gear shaft (240). Using wrench A27051-10 to restrain coupling (90) and tighten nut (145) to 600-700 lb-in. (691-807 kg-cm), using spanner adapter A27051-4.

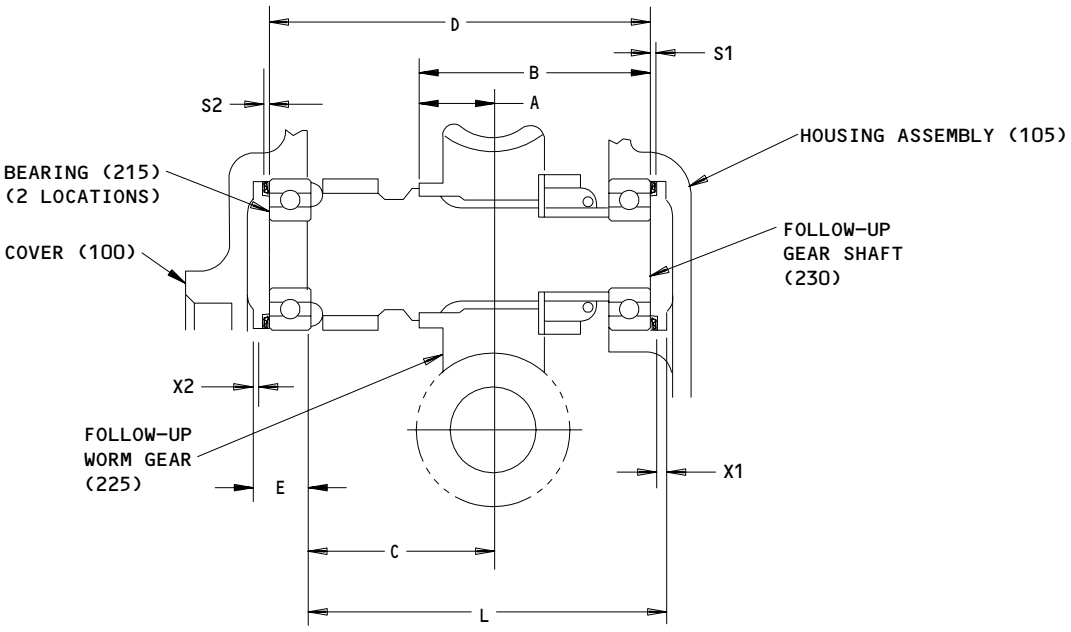
R. Install cap (25) with bolts (30) and washers (35). Install bolts with wet primer and tighten to 20-30 lb-in. (23-35 kg-cm). Seal seam between cap (25) and housing assembly (105) with sealant.

S. Install covers (5, 10) with bolts (15) and washers (20). Install bolts with wet primer and tighten to 20-30 lb-in. (23-35 kg-cm). Seal seam between cover (5, 10) and housing assembly (105) with sealant.

T. Check backlash per Testing and Trouble Shooting.

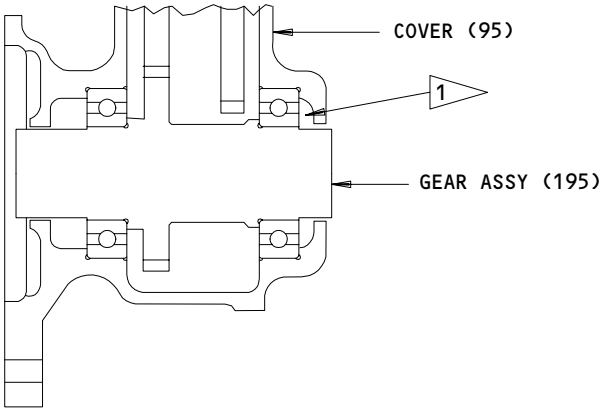
4. Storage

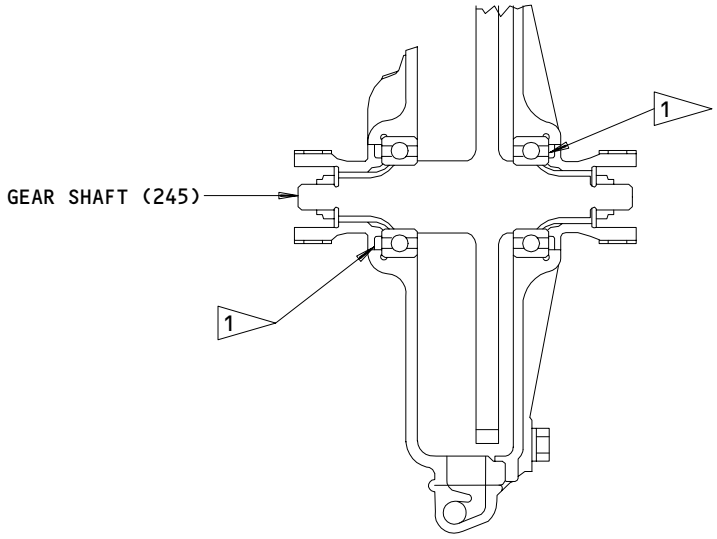
A. Use standard industry practices and information contained in 20-44-02 for storage of this component.



NOTE: DIMENSIONS C,E, AND L ARE MEASURED FROM FAYING SURFACE OF COVER (100) AND HOUSING ASSEMBLY (105).

Endplay Adjustment
Figure 701

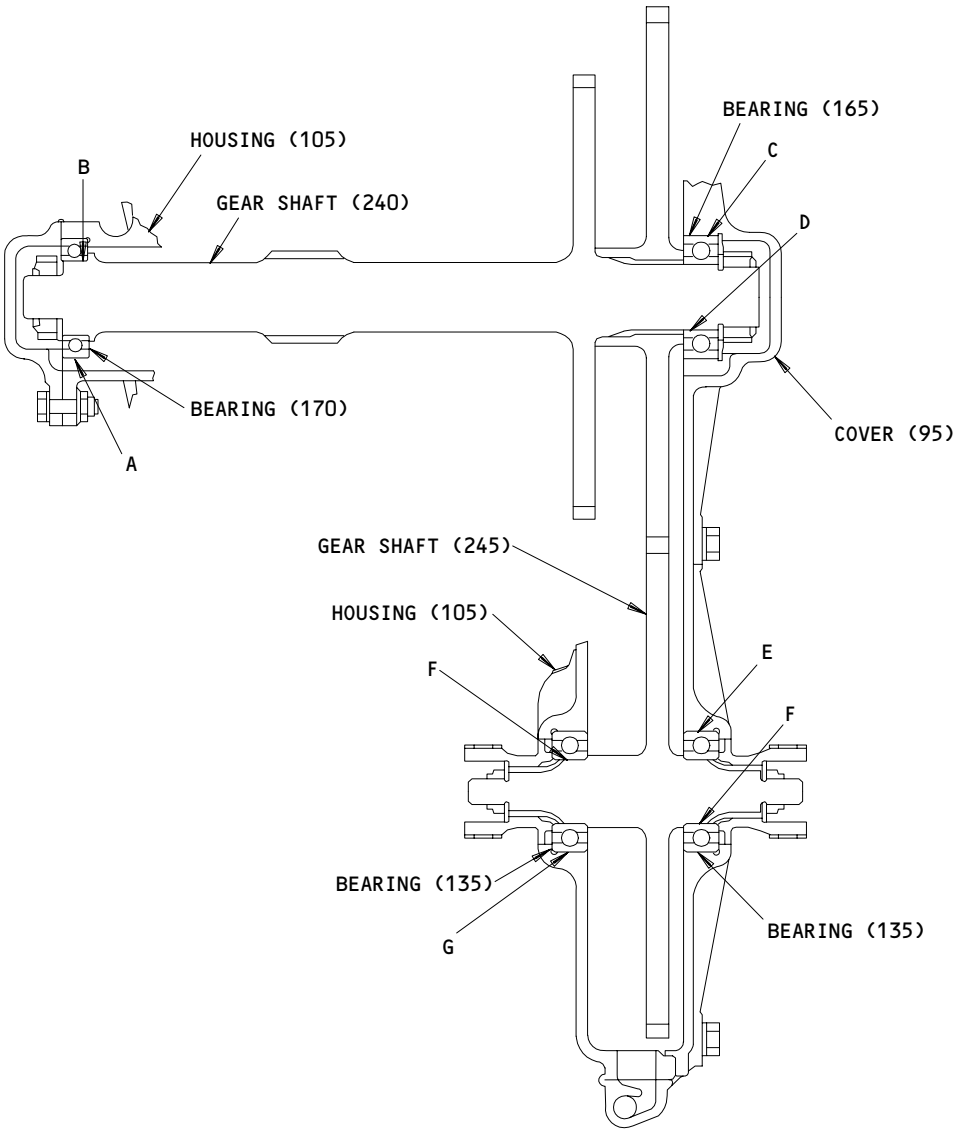




1 FILL POCKET WITH GREASE

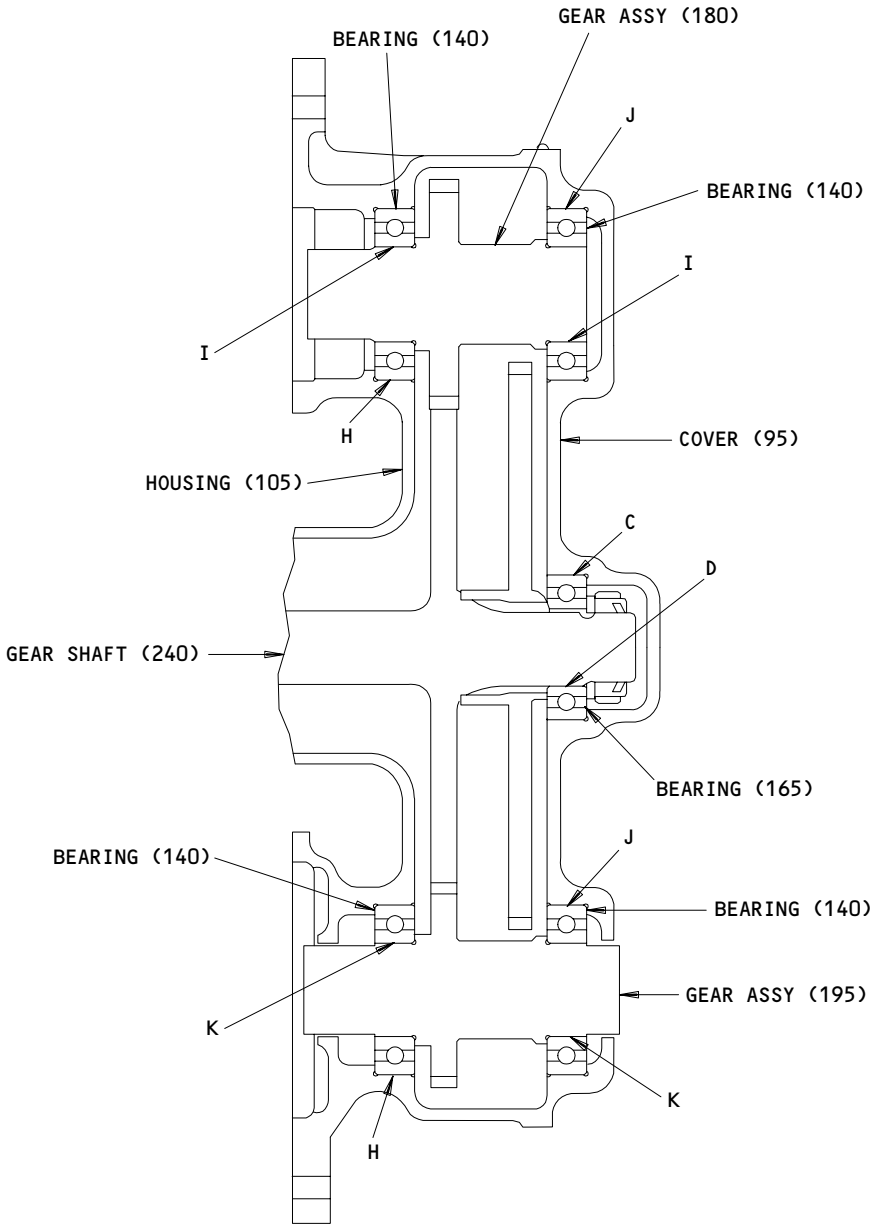
Assembly Details
Figure 702

FITS AND CLEARANCES



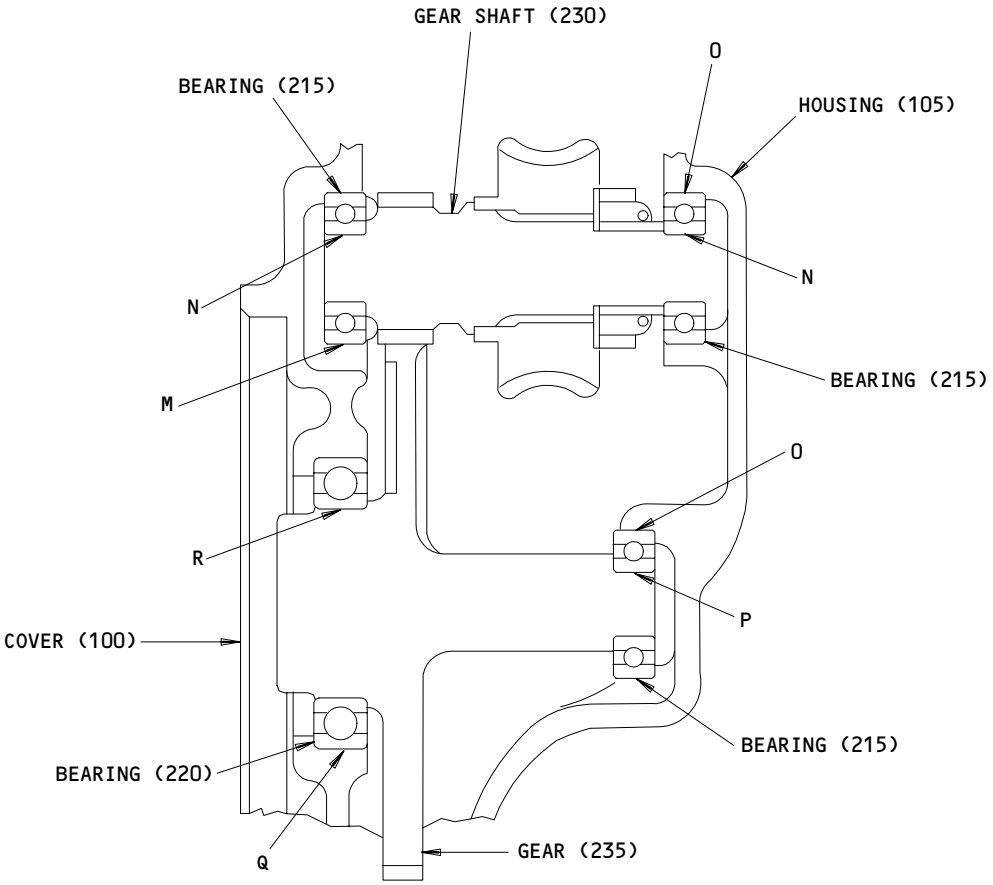
ITEM NUMBERS REFER TO IPL FIG. 1

Fits and Clearances
Figure 801 (Sheet 1)



ITEM NUMBERS REFER TO IPL FIG. 1

Fits and Clearances
Figure 801 (Sheet 2)



ITEM NUMBERS REFER TO IPL FIG. 1

Fits and Clearances
Figure 801 (Sheet 3)

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 105 OD 170	1.6525 (41.97) 1.6530 (41.99)	1.6535 (42.00) 1.6535 (42.00)	-0.0010 (-0.03)	0.0005 (0.01)	1.6515 (41.95)	1.6545 (42.02)	0.0010 (0.03)
B	ID 170 OD 240	0.9839 (24.99) 0.9835 (24.98)	0.9843 (25.00) 0.9840 (24.99)	-0.0001 (-0.00)	0.0008 (0.02)	0.9824 (24.95)	0.9855 (25.03)	0.0015 (0.04)
C	ID 95 OD 165	1.8504 (47.00) 1.8499 (46.99)	1.8514 (47.03) 1.8504 (47.00)	0.0000 (0.00)	0.0015 (0.04)	1.8474 (46.92)	1.8534 (47.08)	0.0030 (0.08)
D	ID 165 OD 240	0.9839 (24.99) 0.9844 (25.00)	0.9843 (25.00) 0.9847 (25.01)	-0.0008 (-0.02)	-0.0001 (-0.00)	0.9835 (24.98)	0.9851 (25.02)	0.0004 (0.01)
E	ID 95 OD 135	1.6535 (42.00) 1.6530 (41.99)	1.6545 (42.02) 1.6535 (42.00)	0.0000 (0.00)	0.0015 (0.04)	1.6505 (41.92)	1.6565 (42.08)	0.0030 (0.08)
F	ID 135 OD 245	0.7870 (19.99) 0.7875 (20.00)	0.7874 (20.00) 0.7878 (20.01)	-0.0008 (-0.02)	-0.0001 (-0.00)	0.7866 (19.98)	0.7882 (20.02)	0.0004 (0.01)
G	ID 105 OD 135	1.6535 (42.00) 1.6530 (41.99)	1.6545 (42.02) 1.6535 (42.00)	0.0000 (0.00)	0.0015 (0.04)	1.6505 (41.92)	1.6565 (42.08)	0.0030 (0.08)
H	ID 105 OD 140	2.1654 (55.00) 2.1649 (54.99)	2.1666 (55.03) 2.1654 (55.00)	0.0000 (0.00)	0.0017 (0.04)	2.1624 (54.92)	2.1684 (55.08)	0.0030 (0.08)
I	ID 140 OD 180	1.1807 (29.99) 1.1812 (30.00)	1.1811 (30.00) 1.1815 (30.01)	-0.0008 (-0.02)	-0.0001 (-0.00)	1.1803 (29.98)	1.1819 (30.02)	0.0004 (0.01)

1 NEGATIVE VALUES DENOTE INTERFERENCE FIT

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

Fits and Clearances
Figure 801 (Sheet 4)

14152

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 95 OD 140	2.1654 (55.00) 2.1649 (54.99)	2.1666 (55.03) 2.1654 (55.00)	0.0000 (0.00)	0.0017 (0.04)	2.1624 (54.93)	2.1684 (55.08)	0.0030 (0.08)
K	ID 140 OD 195	1.1807 (29.99) 1.1812 (30.00)	1.1811 (30.00) 1.1815 (30.01)	−0.0008 (−0.02)	−0.0001 (−0.00)	1.1803 (29.98)	1.1819 (30.02)	0.0004 (0.01)
M	ID 100 OD 215	1.1024 (28.00) 1.1020 (28.00)	1.1032 (28.02) 1.1024 (28.00)	0.0000 (0.00)	0.0012 (0.03)	1.1000 (27.94)	1.1048 (28.06)	0.0024 (0.06)
N	ID 215 OD 230	0.4721 (11.99) 0.4723 (12.00)	0.4724 (12.00) 0.4726 (12.00)	−0.0005 (−0.01)	0.0001 (0.00)	0.4717 (11.98)	0.4730 (12.01)	0.0004 (0.01)
O	ID 105 OD 215	1.1024 (28.00) 1.1020 (28.00)	1.1032 (28.02) 1.1024 (28.00)	0.0000 (0.00)	0.0012 (0.03)	1.1000 (27.94)	1.1048 (28.06)	0.0024 (0.06)
P	ID 215 OD 235	0.4721 (11.99) 0.4723 (12.00)	0.4724 (12.00) 0.4726 (12.00)	−0.0005 (−0.01)	0.0001 (0.00)	0.4717 (11.98)	0.4730 (12.01)	0.0004 (0.01)
Q	ID 100 OD 220	2.1654 (55.00) 2.1649 (54.99)	2.1666 (55.03) 2.1654 (55.00)	0.0000 (0.00)	0.0017 (0.04)	2.1624 (54.93)	2.1684 (55.08)	0.0030 (0.08)
R	ID 220 OD 235	1.3775 (34.99) 1.3781 (35.00)	1.3780 (35.00) 1.3785 (35.01)	−0.0010 (−0.03)	−0.0001 (−0.00)	1.3771 (34.98)	1.3789 (35.02)	0.0004 (0.01)

1 NEGATIVE VALUES DENOTE INTERFERENCE FIT

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

Fits and Clearances
Figure 801 (Sheet 5)

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES (kg-cm)	POUND-FEET (kg-m)
15, 30	BOLT	20-30 (23-35)	
45, 47A	BOLT	58-80 (67-92)	
70	NUT	58-80 (67-92)	
80	NUT	160-240 (185-275)	
145	NUT (USED ON ITEM 230)	300-350 (346-403)	
145	NUT (USED ON ITEM 240)	600-700 (691-807)	
155	NUT	1200-1300 (1385-1500)	

Torque Table
Figure 802

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

1. Backlash Check Fixture -- A27048-6
2. Lock Assembly -- A27051-2 *[1]
3. Spanner Adapter -- A27051-4,-6 *[1]
4. Clamp Assembly -- A27051-7 *[1]
5. Input Crank Assembly -- A27051-8 *[1]
6. Wrench -- A27051-10 *[1]
7. Holding Fixture Assembly -- A27054-2 *[2]
8. Clamp -- A27054-10 (2 required) *[2]
9. Dial Indicator

*[1] These tools are included in Tool Set A27051-31

*[2] These tools are included in Holding Fixture A27054-14

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

02758 U S BEARING DIV NETWORKS ELEC CORP
9750 DE SOTO AVENUE
CHATSWORTH, CALIFORNIA 91311

09455 LEAR SIEGLER INC TRANSPORT DYNAMICS DIV
PO BOX 1953 3131 WEST SEGERSTROM STREET
SANTA ANA, CALIFORNIA 92702

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

15860 NEW HAMPSHIRE BALL BEARINGS, INCORPORATED ASTRO DIVISION
155 LEXINGTON AVENUE
LACONIA, NEW HAMPSHIRE 03246

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

23589 NIPPON MINATURE BEARING CORP SEE NMB CORP V50294

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

71087 BOOTS ACFT NUT DIV TOWNSEND CO SEE TEXTRON INC CHERRY
FASTENER TOWNSEND DIV V11815

VENDORS

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

73134 INCOM INTERNATIONAL INC HEIM DIV
60 ROUND HILL ROAD
FAIRFIELD, CONNECTICUT 06430

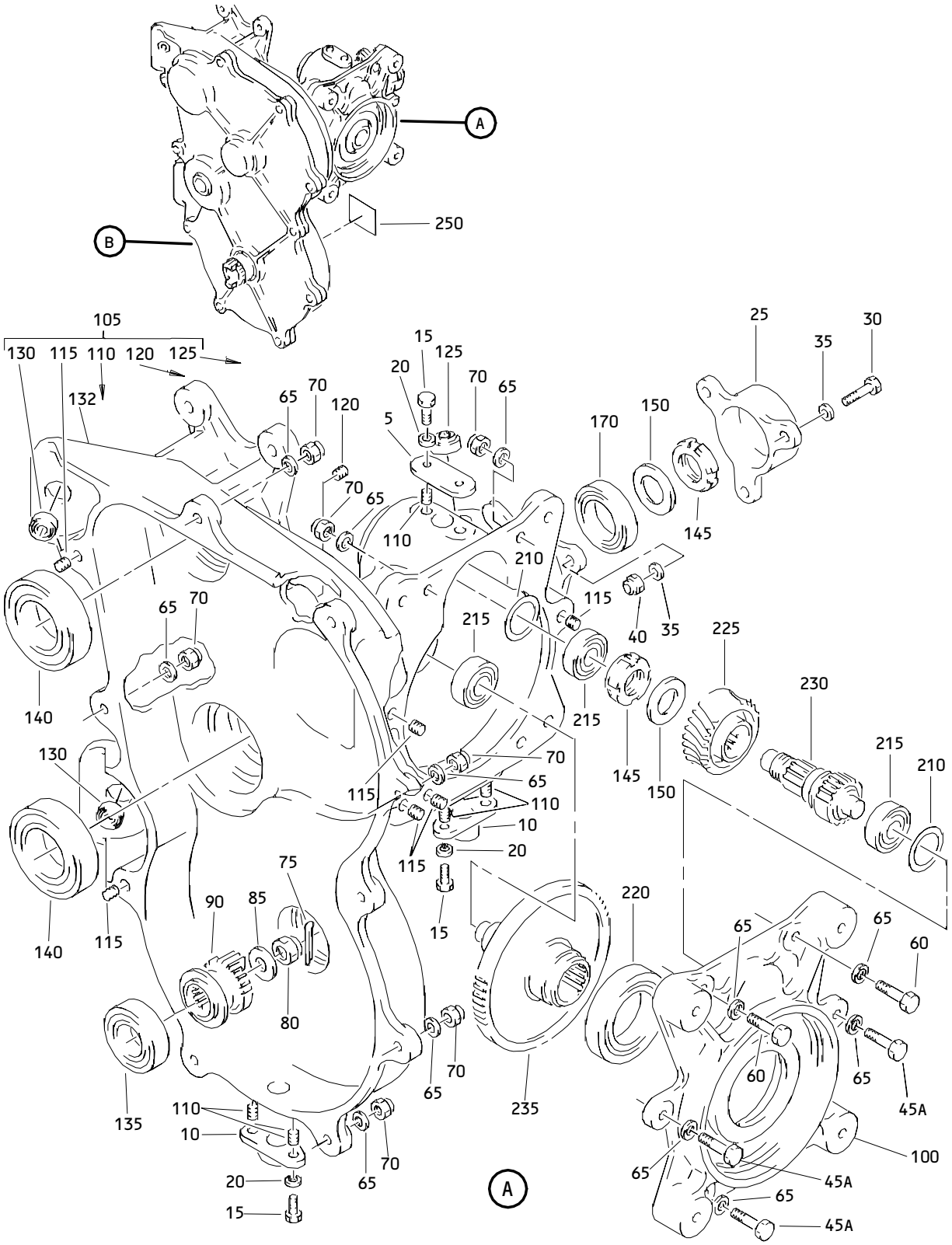
80539 SPS TECHNOLOGIES INC AEROSPACE PRODUCTS DIV
2701 SOUTH HARBOR BOULEVARD
SANTA ANA, CALIFORNIA 92702

81376 SOUTHWEST PRODUCTS COMPANY
PO BOX 1028
MONROVIA, CALIFORNIA 91016

92215 VOI-SHAN DIV OF VSI CORP
8463 HIGUERA STREET
CULVER CITY, CALIFORNIA 90230

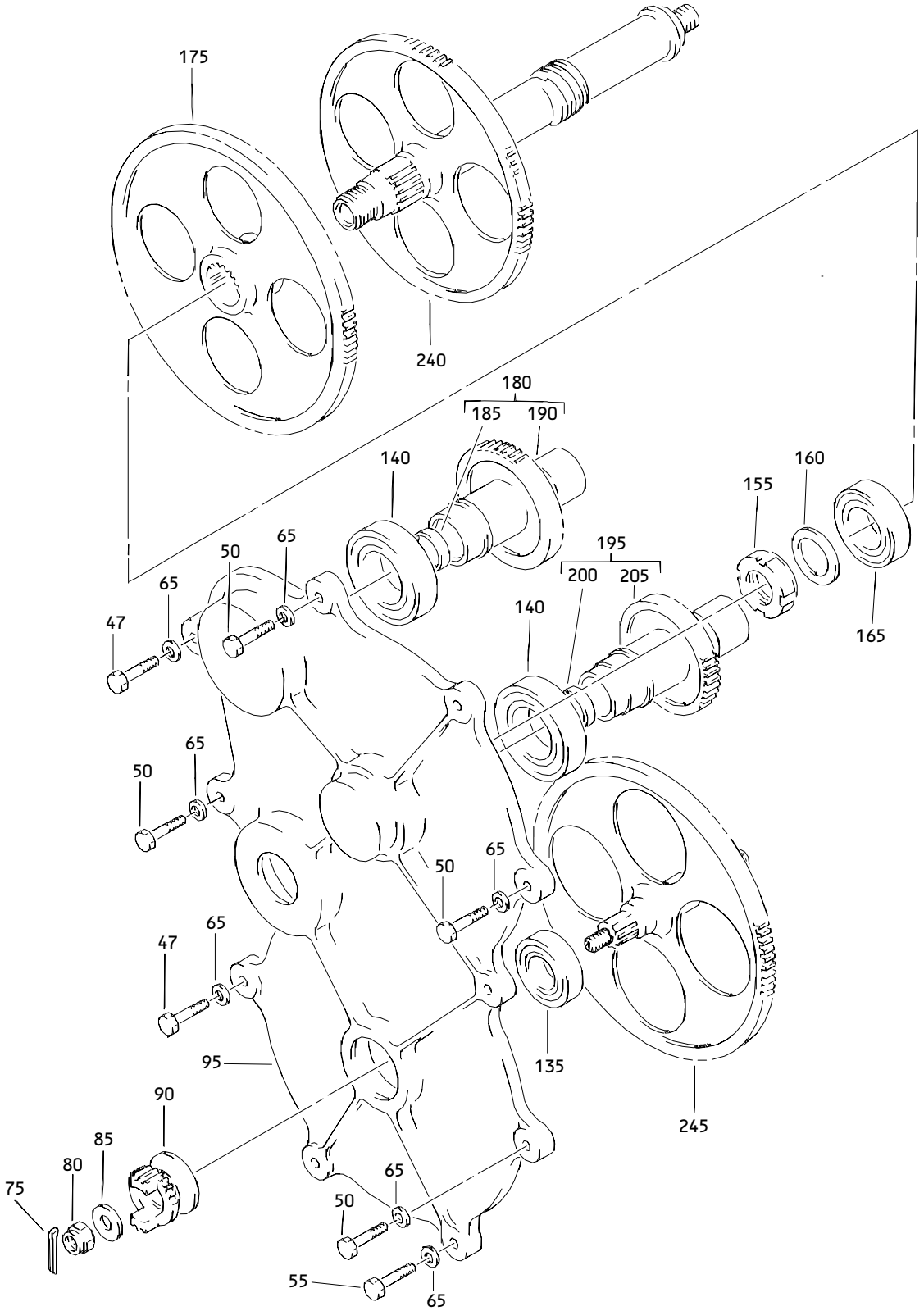
97393 SHUR-LOK CORPORATION
2541 WHITE ROAD
IRVINE, CALIFORNIA 92713

97613 SARGENT INDUSTRIES KAHR BEARING DIVISION
3010 NORTH SAN FERNANDO ROAD
BURBANK, CALIFORNIA 91503



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

T55247



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

T55248

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	256T2711-1		GEARBOX ASSY-OUTBD LE SLAT DRIVE PWR DRIVE UNIT		RF
5	256T2313-1		.COVER-INSPECTION HOLE		1
10	256T2633-1		.COVER-DRAIN		2
			ATTACHING PARTS		
15	NAS563-15		.BOLT		6
20	AN960PD10		.WASHER		6
			-------*-------		
25	256T2718-1		.CAP		1
			ATTACHING PARTS		
30	NAS6603-7		.BOLT		3
35	AN960PD10		.WASHER		6
40	BRH10A3		.NUT-		3
			(V52828)		
			(SPEC BACN10JC3)		
			(OPT H10-3BAC (V15653))		
			(OPT NS202101-02 (V80539))		
			(OPT RMLH9075-3W (V72962))		
			(OPT T6S1032J (V71087))		
			(OPT VN303A02 (V92215))		
			(OPT 96-02 (V80539))		
			-------*-------		
45	NAS564-25		DELETED		
45A	NAS564-27		.BOLT		3
47	NAS564-29		.BOLT		2
50	NAS6604-9		.BOLT		4
55	NAS6604-10		.BOLT		4
60	NAS6604-12		.BOLT		3
65	AN960PD416		.WASHER		27

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
70	BRH10A4		.NUT-		11
			(V52828)		
			(SPEC BACN10JC4)		
			(OPT H10-4BAC		
			(V15653))		
			(OPT NS202101-048		
			(V80539))		
			(OPT RMLH9075-4W		
			(V72962))		
			(OPT T6S428J		
			(V71087))		
			(OPT VN303A048		
			(V92215))		
			(OPT 96-048		
			(V80539))		
75	MS24665-283		.PIN-COTTER		2
80	BRH10A6		.NUT-		2
			(V52828)		
			(SPEC BACN10JC6)		
			(OPT H10-6BAC		
			(V15653))		
			(OPT RMLH9075-6		
			(V72962))		
			(OPT 96-064		
			(V80539))		
85	256T2311-1		.WASHER		2
90	256T2309-1		.COUPLING		2
95	256T2714-1		.COVER		1
100	256T2716-1		.COVER-FOLLOWUP		1
105	256T2712-1		.HOUSING ASSY		1
110	MS21209F1-15		..INSERT		6
115	MS21209F4-20		..INSERT		6
120	MS21209F5-20		..INSERT		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
125	HU4-134		..BEARING- (V02758) (SPEC BACB10AB4) (OPT ABW4V5 (V23589)) (OPT AW4VCRG (V15860)) (OPT BSSR4804 (V81376)) (OPT KWB4-20CRG (V97613)) (OPT WG4E (V73134)) (OPT 55282 (V09455))		1
130	HU5-134		..BEARING- (V02758) (SPEC BACB10AB5) (OPT ABW5V5 (V23589)) (OPT AW5VCRG (V15860)) (OPT BSSR5544 (V81376)) (OPT KWB5-20CRG (V97613)) (OPT WG5E (V73134)) (OPT 55283 (V09455))		2

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
132	256T2712-2		..HOUSING		1
135	LL104KS		.BEARING- (V38443) (SPEC BACB10BA20PP) (OPT 6004FTT (V43991)) (OPT 9104LLT1C1-01 (V21760)) (OPT 9104NPPFS428 (V21335)) (OPT 993L04 (V29337))		2
140	LL106KS		.BEARING- (V38443) (SPEC BACB10BA30PP) (OPT 6006TT (V43991)) (OPT 9106LLT1C1-01 (V21760)) (OPT 9106NPPFS428 (V21335)) (OPT 993L06 (V29337))		4
145	SL2822-10		.NUT- (V97393) (SPEC BACN10RF10) (OPT BR9080-10 (V72962))		2
150	AN960-1016		.WASHER		2
155	SL2822-14		.NUT- (V97393) (SPEC BACN10RF14) (OPT BR9080-14 (V72962))		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
160	256T2729-1		.WASHER		1
165	LL105KS		.BEARING- (V38443) (SPEC BACB10BA25PP) (OPT 6005TT (V43991)) (OPT 9105LLT1C1-01 (V21760)) (OPT 9105NPPFS428 (V21335)) (OPT 993L05 (V29337))		1
170	1905LLT1C1-01		.BEARING- (V21760) (SPEC BACB10BB25PP) (OPT 9305PPFS428 (V21335))		1
175	256T2722-1		.GEAR		1
180	256T2719-1		.GEAR ASSY		1
185	256T2629-2		..PLUG		1
190	256T2719-2		..GEAR		1
195	256T2720-1		.GEAR ASSY		1
200	256T2629-2		..PLUG		1
205	256T2720-2		..GEAR		1
210	256T2631-1		.SHIM		AR
-210A	256T2631-2		.SHIM		AR
-210B	256T2631-3		.SHIM		AR
-210C	256T2631-4		.SHIM		AR
-210D	256T2631-5		.SHIM		AR
-210E	256T2631-6		.SHIM		AR
215	LL101KS		.BEARING- (V38443) (SPEC BACB10BA12PP) (OPT 6001FTT (V43991)) (OPT 9101LLT1C1-01 (V21760)) (OPT 9101NPPFS428 (V21335)) (OPT 993L01 (V29337))		3

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
220	1907RRT1C1-01		.BEARING- (V2176O) (SPEC BACB1OBB35PP) (OPT 93O7PPPRBFS428 (V21335))		1
225	256T2726-1		.GEAR-FOLLOWUP WORM		1
230	256T2727-1		.SHAFT-FOLLOWUP GEAR		1
235	256T2728-1		.GEAR-FOLLOWUP		1
240	256T2721-1		.SHAFT-GEAR		1
245	256T2724-1		.SHAFT-GEAR		1
250	256T2635-2		.NAMEPLATE		1