COMPONENT MAINTENANCE MANUAL

LANDING GEAR PARTS LUBRICATION FITTING REPLACEMENT

PART NUMBER NONE

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COMPONENT MAINTENANCE MANUAL

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To: All holders of LANDING GEAR PARTS LUBRICATION FITTING REPLACEMENT 32-00-03.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

The COMPONENT MAINTENANCE MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

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Location of Change	Description of Change
	NO HIGHLIGHTS

COMPONENT MAINTENANCE MANUAL

A = Added, R = Revised, D = Deleted, O = Overflow

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COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		SL 20-4 (757)	OCT 01/87
		SL 20-11 (737)	OCT 01/87

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
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COMPONENT MAINTENANCE MANUAL

All temporary revisions to this manual will be accompanied by a cover sheet bearing the temporary revision number. Enter the temporary revision number in numerical order, together with the temporary revision date, the date the temporary revision is inserted and the initials of the person filing.
When the temporary revision is incorporated or cancelled, and the pages are removed, enter the date the pages are removed and the initials of the person who removed the temporary revision.

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Components that can be repaired have a different repair number for each specified repair. To find the repair number location of a component, look in the Repair-General procedure at the beginning of the REPAIR section. The Repair-General procedure also has an explanation of the True Position Dimension symbols used.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. The tool reference numbers found in the individual procedures and in the Special Tools, Fixtures, and Equipment section are used to identify if a tool is a standard tool (STD-XXXX), a commercial tool (COM-XXXX), or a Special Tool (SPL-XXXX). This reference number is also used to distinguish between tools with similar names in the same procedure. These reference numbers are for use in the documentation only. They are not to be used for ordering tools.

DESCRIPTION AND OPERATION

1. **Description**

   A. This manual tells how to replace press-fit lubrication fittings, in parts from which such fittings were removed. It also gives repair procedures for the mating lube hole in the parts.

2. **Operation**

   A. The procedures are typical for all landing gear parts. The overhaul or repair instructions in the applicable manuals for the landing gear components will tell you when to use this procedure.

(NOT APPLICABLE)

(NOT APPLICABLE)

(NOT APPLICABLE)

(NOT APPLICABLE)

REPAIR

1. Content

A. Repair, refinish and replacement procedures are included in separate repair sections as follows (REPAIR-GENERAL, Table 601):

Table 601: Repair, Refinish and Replacement Procedures

P/N	NAME	REPAIR
- - - -	LUBE FITTING REPLACEMENT	1-1
- - - -	LUBE HOLE REPAIR FOR PRESS-FIT LUBE FITTINGS	2-1
- - - -	LUBE HOLE REPAIR FOR THREADED LUBE FITTINGS	3-1

2. Standard Practices

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

(1) SOPM 20-00-00 Introduction

(2) SOPM 20-10-01 Repair and Refinish of High Strength Steel Parts

(3) SOPM 20-10-02 Machining of Alloy Steel

(4) SOPM 20-20-01 Magnetic Particle Inspection

(5) SOPM 20-30-03 General Cleaning Procedures

(6) SOPM 20-30-90 Solvents for Final Cleaning of Solvent Resistant Organic Coatings Before Non-Structural Bonding (Series 90 solvent, B01010)

(7) SOPM 20-30-92 Solvents for Final Cleaning Before General Sealing (Series 92 solvent, B01012)

(8) SOPM 20-50-03 Bearing and Bushing Replacement

(9) SOPM 20-50-12 Application of Adhesives

(10) SOPM 20-60-01 Cleaning Materials

(11) SOPM 20-60-04 Miscellaneous Materials

(12) CMM 32-00-05 Repair of High Strength Steel Landing Gear Parts

3. Materials

NOTE: Equivalent substitutes can be used.

A. Cotton swabs, G01659 (SOPM 20-60-04)

B. Primer, Loctite – Locquic grade T adhesive, A50100 (SOPM 20-60-04)

C. Adhesive (Retaining Compound) (SOPM 20-60-04):

(1) Loctite 675 Compound, A50201 (replaces Loctite 75) (preferred)

(2) Loctite 290 Compound, A50138 (optional)

(3) Loctite 680 compound, A50174 (optional)

D. Liquid nitrogen, G00262 (SOPM 20-60-04)

E. BMS 5-95 sealant, A00247 (SOPM 20-60-04)

F. Solvents:

(1) Series 90 solvent, B01010 (SOPM 20-30-90)

(2) Series 92 solvent, B01012 (SOPM 20-30-92)

4. Special Tools

NOTE: Equivalent substitutes can be used. The vendor for these tools is Alemite (V95879).

A. 5253-1 – 1743B lube fitting drive tool, SPL-4467

B. 5253-3 – 1728B lube fitting drive tool, SPL-4466

C. 5254-1 – Drive tool, SPL-4465 for angled lube fittings 1646B, 1744B, 1992B, 3024B

5. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in REPAIR-GENERAL, Figure 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
⌵	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
Ø	DIAMETER
S Ø	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
TIR	TOTAL INDICATOR READING

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
[◎ | Ø 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
[⌖ | Ø 0.002 Ⓢ | B]	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
[⊥ | Ø 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

LUBE FITTING REPLACEMENT - REPAIR 1-1

1. General

A. This procedure gives the data that is necessary to repair and refinish the lube fitting.

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the Material codes identified in this procedure.

D. Refer to REPAIR-GENERAL, Figure 601 for the standard true position dimensioning symbols shown in the repair.

2. Procedure

A. Lube Fitting Selection (REPAIR 1-1, Figure 601):

(1) Make a check of the diameter of the lube hole in the part.

(2) As applicable for the hole diameter, get the specified standard lube fitting, or modify a lube fitting as shown.

B. Cleaning (REPAIR 1-1, Figure 602):

(1) With cotton swabs, G01659, remove as much grease as possible from entire depth of the lube fitting hole.

(2) With Series 90 solvent, B01010 on a clean cotton swab, G01659, clean the hole to the depth shown. Clean again until no more visible grease, or dirt can be removed.

(3) Clean the replacement lube fitting (standard or modified per REPAIR 1-1, Figure 601) with Series 90 solvent, B01010.

C. Hole Preparation (REPAIR 1-1, Figure 602):

(1) With cotton swab, G01659, apply a thin layer of adhesive, A50100 to the bore of the hole, to the depth shown.

(2) Let adhesive, A50100 air dry at room temperature for a minimum of 5 minutes.

(3) Immediately before you install the lube fitting, apply a thin layer of adhesive with cotton swab, G01659, to the bore of the hole, to the depth shown.

D. Lube Fitting Installation:

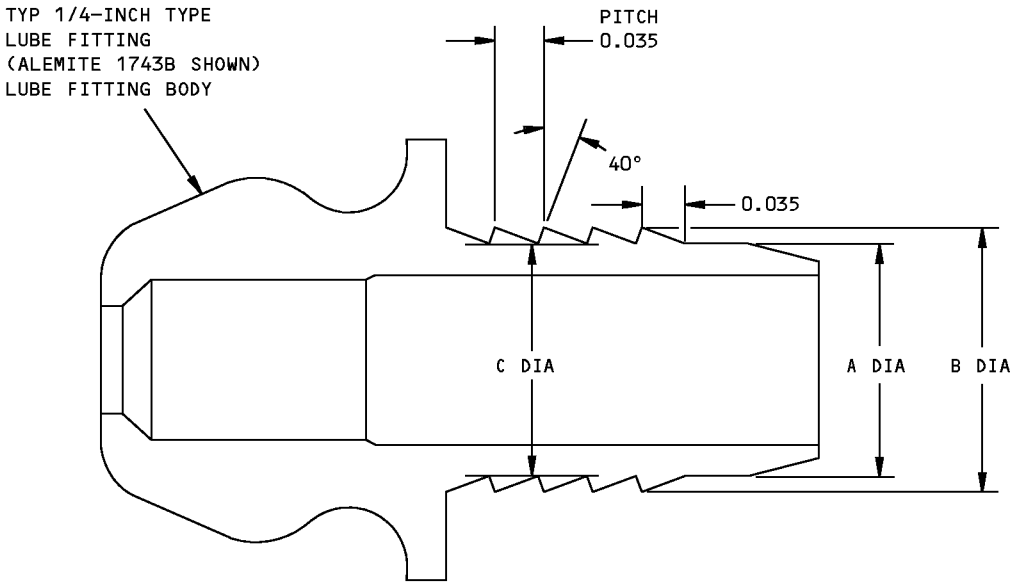
(1) Soak the lube fitting in liquid nitrogen, G00262 (SOPM 20-60-04) for a minimum of 1 minute to make sure it is completely cold.

(2) Install the lube fitting in the prepared hole, with the applicable drive tool.

(3) Cure for 12 hours at room temperature.

NOTE: Do not apply grease to the fitting during this cure.

E. After the cure, you can use a proof pressure of 2500-3000 psi, to be sure the lube fitting installation is serviceable.



1/4-INCH MODIFIED LUBE FITTING DETAILS

(A)

LUBE HOLE DIA	LUBE FITTING DIA	REPLACEMENT LUBE FITTING 1	
		STRAIGHT	ANGLED
0.194 MAX	3/16 2	1728B	1646B (65°),1992B (45°)
0.195-0.247	1/4 MODIFIED 2	SEE (A)	SEE (A)
0.248-0.249	1/4 3	1743B	1744B (65°),3024B (45°)
0.250-0.254	1/4 2	1743B	1744B (65°),3024B (45°)
0.255-UP	IF THERE ARE NO SPECIAL REPAIR INSTRUCTIONS IN THE COMPONENT OVERHAUL INSTRUCTIONS, CONTACT BOEING FOR REPAIR INSTRUCTIONS.		

FINISH:

BRUSH CADMIUM PLATE MACHINED SURFACES PER SOPM 20-42-05.

1 ALEMITE (V95879) PART NUMBERS

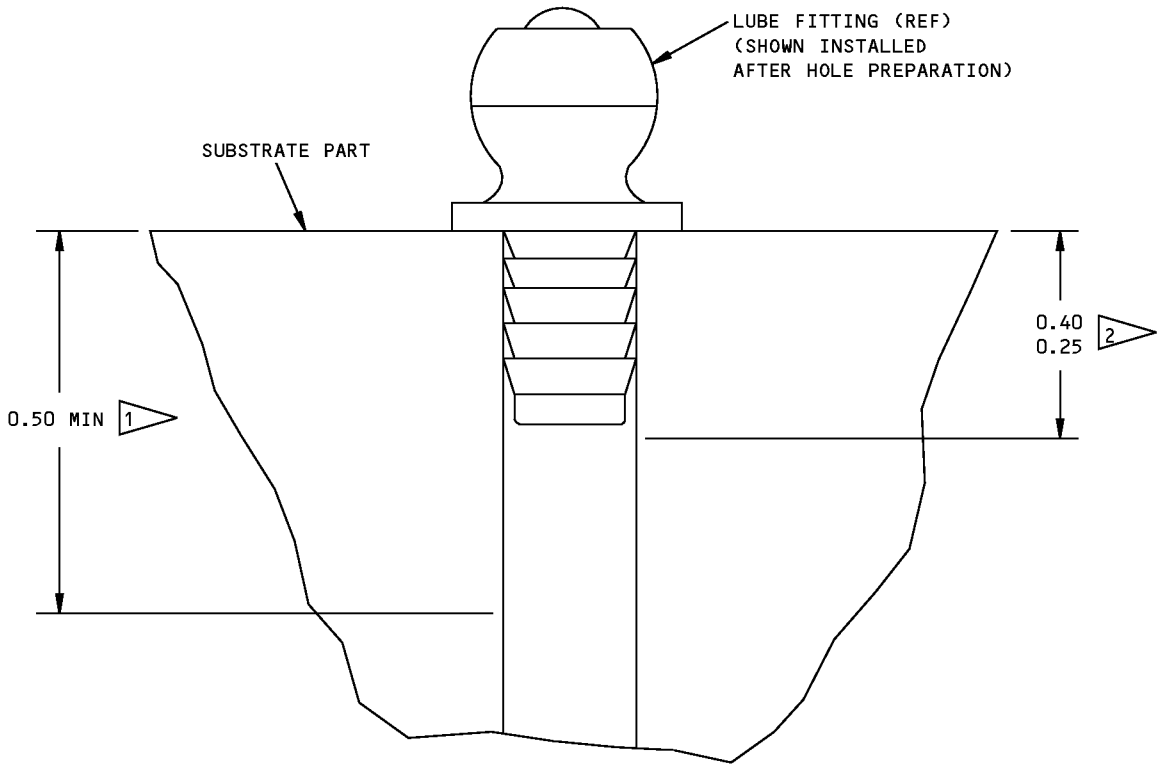
2 INSTALL WITH ADHESIVE.

3 INSTALLATION WITH ADHESIVE OPTIONAL.

X = LUBE HOLE DIA IN MATING COMPONENT
A = SHANK DIA (X MINUS 0.007-0.012)
B = SERRATION OD (X PLUS 0.005-0.010)
C = SERRATION ROOT OD (X MINUS 0.003-0.010)

ALL DIMENSIONS ARE IN INCHES

Lubrication Fitting Selection and Modification Details
Figure 601



Hole Preparation and Fitting Installation
Figure 602

LUBE HOLE REPAIR FOR PRESS-FIT LUBE FITTINGS - REPAIR 2-1

1. General

A. This procedure gives the data that is necessary for lube hole repair for press-fit lube fittings.

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the Material codes identified in this procedure.

D. Refer to REPAIR-GENERAL, Figure 601 for the standard true position dimensioning symbols shown in the repair.

2. Installation of Repair Bushing (REPAIR 2-1, Figure 601)

A. Make sure the area around the damaged lube hole has a flat area, sufficiently large to fit the 0.380-0.400 inch flange diameter of the repair bushing.

B. With the lube hole or passage as a guide, machine the top end of the hole larger, as shown, within the repair limit given in the component overhaul instructions. If the part is steel, machine per SOPM 20-10-02 and CMM 32-00-05.

C. If the part is steel, local nital etch examine the machined area (SOPM 20-10-02). Then wash the area with a good flow of water, G50256 to remove all signs of the etch solution.

D. If the part is steel, magnetic particle examine it (SOPM 20-20-01, Class A critical). If the part is not steel, penetrant examine it (SOPM 20-20-02).

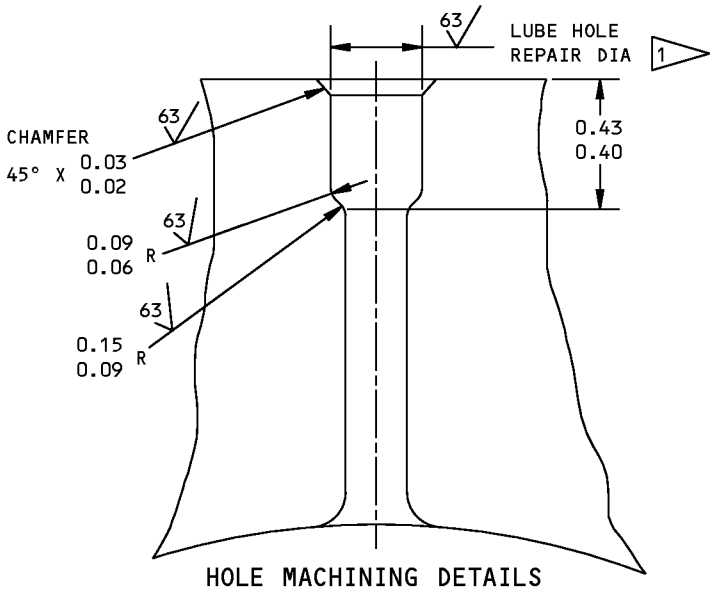
E. Make a repair bushing (REPAIR 2-1, Figure 602) as required, to adjust for the amount of material removed in REPAIR 2-1, Paragraph 2.B.

F. Apply sealant, A00247 (SOPM 20-60-04) to the machined hole as shown. If sealant, A00247 (SOPM 20-60-04) gets in deeper, clean out unwanted sealant, A00247 (SOPM 20-60-04) with Series 92 solvent, B01012 (SOPM 20-30-92) on cotton swab, G01659 (SOPM 20-60-04).

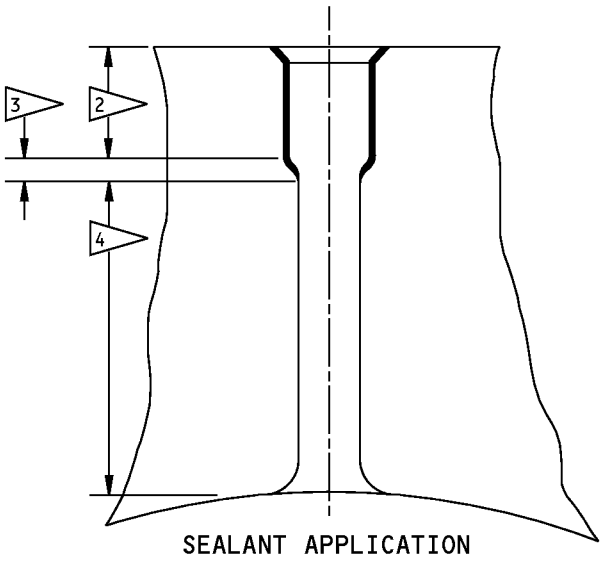
G. Install the repair bushing by the shrink-fit method (SOPM 20-50-03).

H. Machine the bushing bore to the design dimensions, and finish given in the component overhaul instructions.

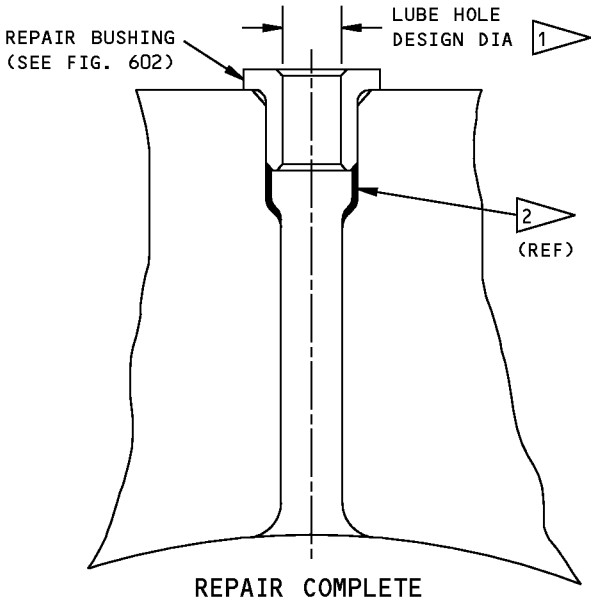
I. Install a replacement lube fitting per REPAIR 1-1.



HOLE MACHINING DETAILS



SEALANT APPLICATION



REPAIR COMPLETE

NOTE: STRAIGHT LUBE PASSAGE IS SHOWN. THIS REPAIR ALSO IS APPLICABLE TO ANGLED OR SPECIAL CONFIGURATIONS IF PERMITTED BY COMPONENT OVERHAUL INSTRUCTIONS.

1 REFER TO COMPONENT OVERHAUL INSTRUCTIONS FOR DESIGN DIMENSIONS AND REPAIR LIMITS

2 BMS 5-95 SEALANT

3 SEALANT RUNOUT AREA

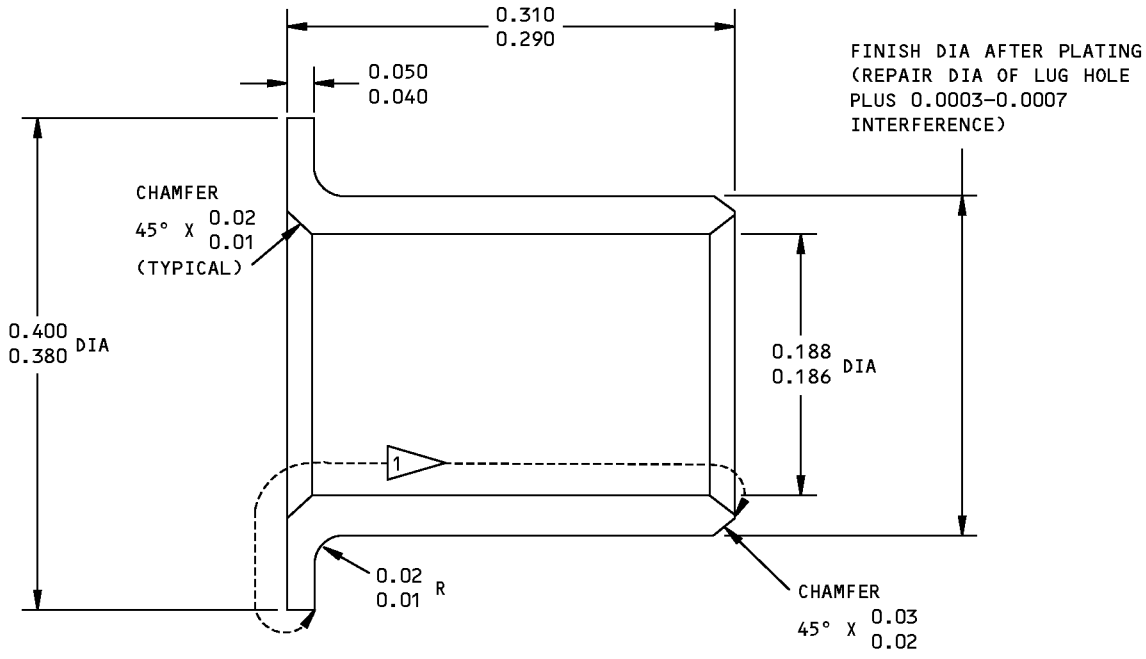
4 NO SEALANT PERMITTED

REPAIR

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ALL DIMENSIONS ARE IN INCHES

Lubrication Hole Repair
Figure 601



1 PLATING OPTIONAL

REPAIR

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK CORNERS 0.01-0.02 X 45°

CADMIUM PLATE EXCEPT AS NOTED 0.0003-0.0005 THICK PER SOPM 20-42-10 UNLESS SHOWN BY 1

MATERIAL: AL-NI-BRONZE PER AMS 4880 OR AMS 4640

ALL DIMENSIONS ARE IN INCHES

Repair Bushing Details
Figure 602

LUBE HOLE REPAIR FOR THREADED LUBE FITTINGS - REPAIR 3-1

1. General

A. This procedure gives the data that is necessary for lube hole repair for threaded lube fittings.

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the Material codes identified in this procedure.

D. Refer to REPAIR-GENERAL, Figure 601 for the standard true position dimensioning symbols shown in the repair.

2. Installation of Oversize Threaded Insert (REPAIR 3-1, Figure 601)

A. Make sure the area around the damaged lube hole has a flat area, sufficiently large to fit the repair diameter of the lube hole. If necessary, machine a spotface on the surface.

B. With the lube hole or passage as a guide, machine the top end of the hole larger, as shown, within the repair limit. If the part is steel, machine per SOPM 20-10-02 and CMM 32-00-05.

C. If the part is steel, local nital etch examine the machined area (SOPM 20-10-02). Then wash the area with a good flow of water, G50256 to remove all signs of the etch solution.

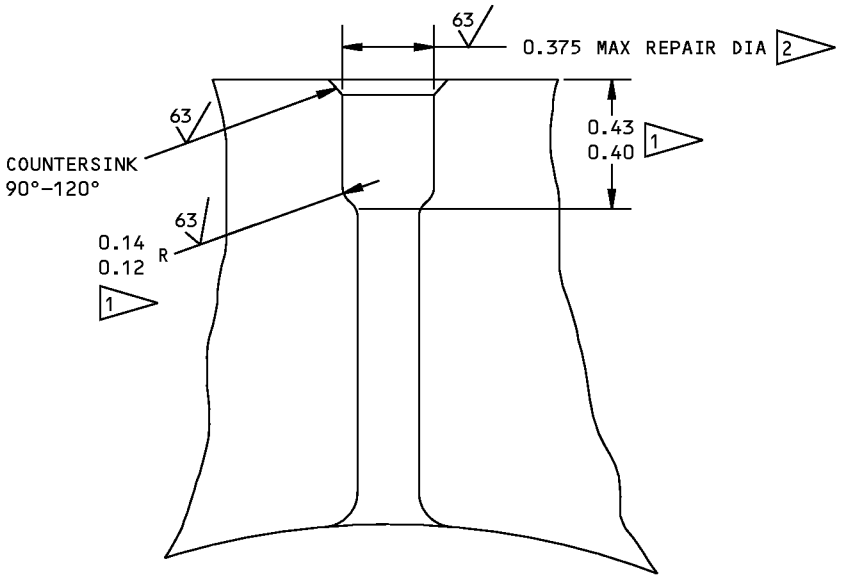
D. If the part is steel, magnetic particle examine it (SOPM 20-20-01, Class A critical). If the part is not steel, penetrant examine it (SOPM 20-20-02).

E. Refinish the lube hole by the component overhaul instructions.

F. Make an oversize threaded insert (REPAIR 3-1, Figure 602) as required, to adjust for the amount of material removed in REPAIR 3-1, Paragraph 2.B.

G. Install the threaded insert by the shrink-fit method (SOPM 20-50-03). Use the installation finish specified in the component overhaul instructions.

H. Install a replacement lube fitting, and tighten it to the specified torque or standard torque.



TYPICAL HOLE MACHINING DETAILS

NOTE: STRAIGHT LUBE PASSAGE IS SHOWN. THIS REPAIR ALSO IS APPLICABLE TO ANGLED OR SPECIAL CONFIGURATIONS IF PERMITTED BY COMPONENT OVERHAUL INSTRUCTIONS.

1 UNLESS THE COMPONENT OVERHAUL INSTRUCTIONS SHOW DIFFERENT DESIGN DIMENSIONS

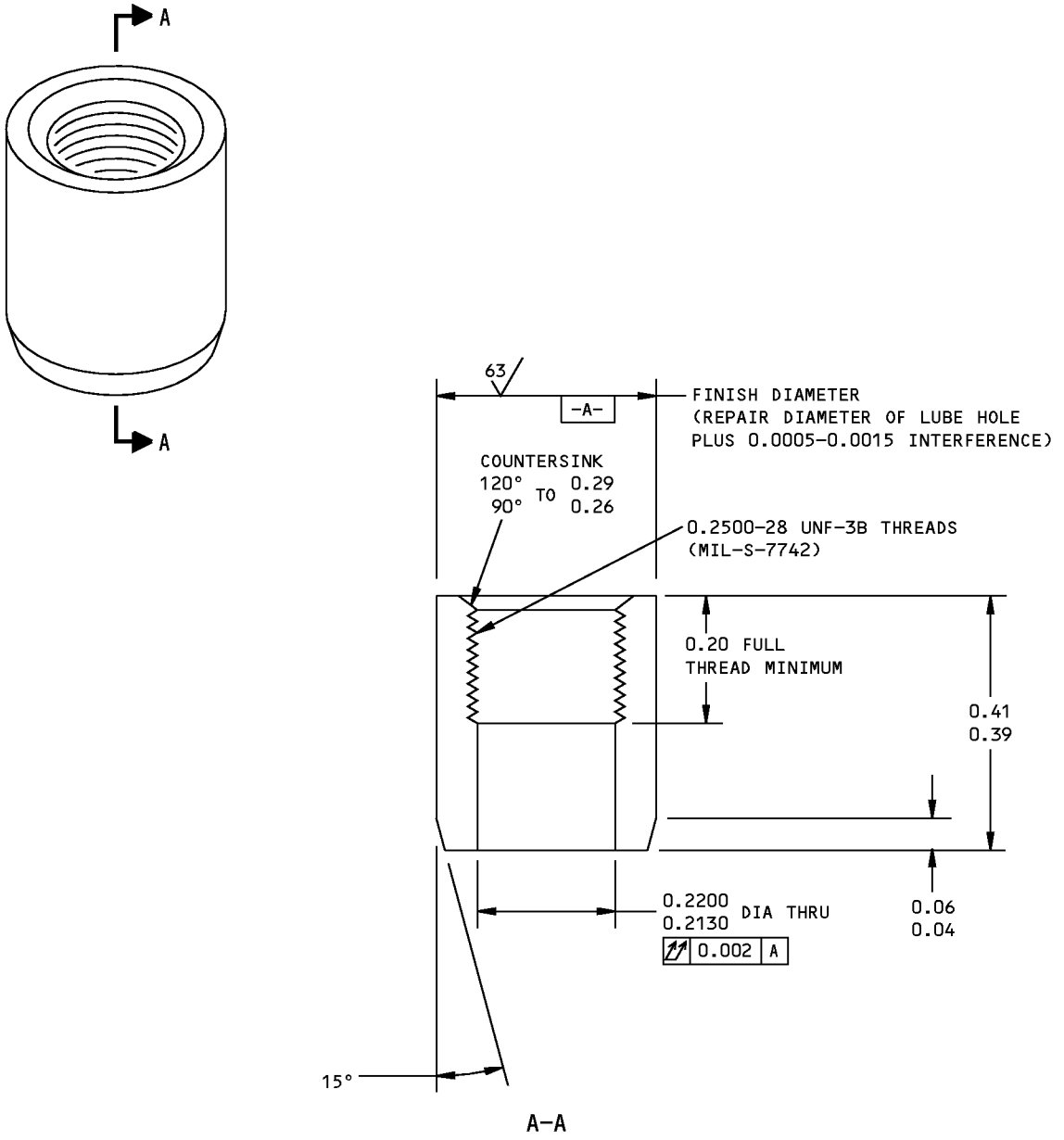
2 UNLESS SHOWN DIFFERENTLY IN COMPONENT OVERHAUL INSTRUCTIONS

REPAIR

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ALL DIMENSIONS ARE IN INCHES

Lubrication Hole Repair
Figure 601



125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK EDGES 0.01-0.02 R

MATERIAL: AL-NI-BRONZE
(AMS 4640 OR AMS 4880)

FINISH: NO FINISH

ALL DIMENSIONS ARE IN INCHES

Replaces 161W7010-1: Oversize Threaded Insert Details
Figure 602

(NOT APPLICABLE)

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COMPONENT MAINTENANCE MANUAL

FITS AND CLEARANCES

(NOT APPLICABLE)

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. General

A. This section lists the special tools, fixtures, and equipment necessary for maintenance.

NOTE: Equivalent substitutes may be used.

Special Tools

Reference	Description	Part Number	Supplier
SPL-4465	Drive tool for angled lube fittings 1646B, 1744B, 1992B, 3024B	5254-1	95879
SPL-4466	Drive Tool for Lube Fitting 1728B	5253-3	95879
SPL-4467	Drive Tool for Lube Fitting 1743B	5253-1	95879

Tool Supplier Information

CAGE Code	Supplier Name	Supplier Address
95879	ALEMITE CORP.	7725 LITTLE AVENUE CHARLOTTE, NC 28226 Telephone: 704-542-6900 Facsimile: 704-542-6591

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ILLUSTRATED PARTS LIST

(NOT APPLICABLE)