TO: ALL HOLDERS OF NOSE LANDING GEAR ALTERNATE UPLOCK RELEASE ACTUATOR COMPONENT MAINTENANCE MANUAL 32-35-86

REVISION NO. 2 DATED NOV 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 to the Record of Revision Sheet.

CHAPTER/SECTION AND PAGE NO.	DESCRIPTION OF CHANGE
CONTENTS 1	Added technical clarification to text paragraphs.
INTRODUCTION 1	
DESCRIPTION & OPERATION 1	
DESCRIPTION & OPERATION 2	Added technical clarification to figure.
101-102 301-302 701-703 901	Added new MGOS tooling to the testing and fault isolation section, the disassembly section and the assembly section.

BOEING

COMPONENT
MAINTENANCE MANUAL

NOSE LANDING GEAR ALTERNATE UPLOCK RELEASE ACTUATOR ASSEMBLY

PART NUMBER 293W5602-2

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

KD6878

REVISION RECORD

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

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

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

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

PAGE	DATE	CODE
32-35-86		
TITLE PAGE		
1	JUL 01/99	01
2	BLANK	
REVISION RECORD		
1	JUL 01/99	01
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TR & SB RECORD		
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LIST OF EFFECTIVE PAGES		
*1	NOV 01/01	01
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TESTING & FAULT ISOLATION		
*101	NOV 01/01	01.1
*102	NOV 01/01	01.1
103	JUL 01/99	01
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DISASSEMBLY		
*301	NOV 01/01	01.1
*302	NOV 01/01	01.1
CHECK		
501	JUL 01/99	01
502	JUL 01/99	01
REPAIR-GENERAL		
601	JUL 01/99	01
602	JUL 01/99	01
REPAIR 1-1		
601	JUL 01/99	01
602	BLANK	
REPAIR 2-1		
601	JUL 01/99	01
602	JUL 01/99	01
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603	JUL 01/99	01
604	JUL 01/99	01
REPAIR 4-1		
601	JUL 01/99	01
602	JUL 01/99	01
603	JUL 01/99	01
604	BLANK	
REPAIR 5-1		
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602	JUL 01/99	01
603	JUL 01/99	01
604	BLANK	

* = REVISED, ADDED OR DELETED

PAGE	DATE	CODE
ASSEMBLY		
*701	NOV 01/01	01.1
*702	NOV 01/01	01.1
*703	NOV 01/01	01.1
704	JUL 01/99	01
FITS AND CLEARANCES		
801	JUL 01/99	01
802	JUL 01/99	01
SPECIAL TOOLS		
*901	NOV 01/01	01.1
*902	BLANK	
ILLUSTRATED PARTS LIST		
1001	JUL 01/99	01
1002	JUL 01/99	01
1003	JUL 01/99	01
1004	JUL 01/99	01
1005	JUL 01/99	01
1006	BLANK	
1007	JUL 01/99	01
1008	JUL 01/99	01
1009	JUL 01/99	01
1010	JUL 01/99	01
1011	JUL 01/99	01
1012	BLANK	

PAGE	DATE	CODE

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

*[1] Special instructions are not necessary. Use standard industry procedures.

INTRODUCTION

The instructions that are specified in this manual give the data necessary to do the maintenance functions that range from simple maintenance checks and part replacement to complete shop—type repair procedures.

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.

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:

NOSE LANDING GEAR ALTERNATE UPLOCK RELEASE ACTUATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

A. The Nose Landing Gear Alternate Uplock Release Actuator Assembly controls the movement of the uplock assembly in the nose landing gear.

B. Each actuator assembly is made from the basic parts that follow:

(1) A piston assembly

(2) A spring

(3) A aluminum alloy barrel

2. Operation

A. During normal operation, hydraulic pressure from the alternate extend pump extends the actuator assembly which releases the uplock assembly in the nose landing gear.

B. The spring retracts the piston assembly when the hydraulic pressure is released.

3. Leading Particulars (Approximate)

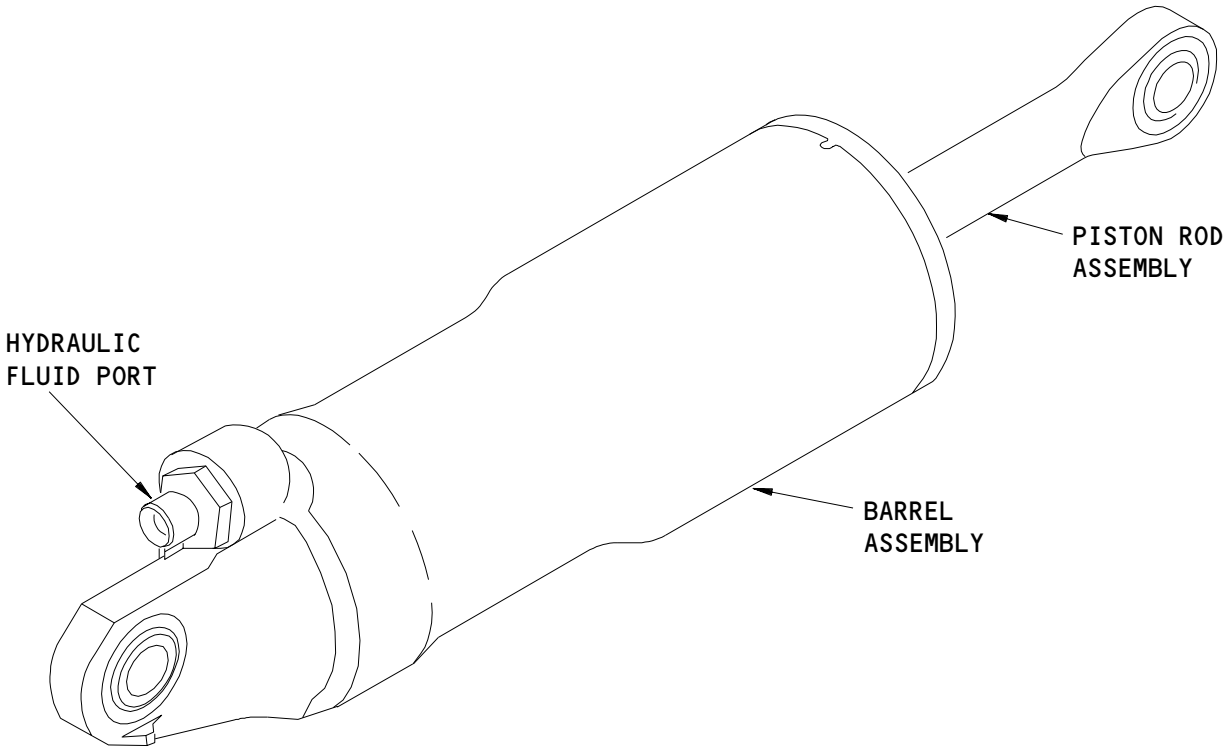
A. Length -- 14.4 inches (Fully extended)
-- 12.7 inches (Fully retracted)

B. Width -- 3 inches

C. Fluid (Operation) -- BMS 3-11 Hydraulic Fluid

D. Pressure (Operation) -- 2000-2250 psi

E. Proof Pressure -- 3400 psi



293W5602-2
Nose Landing Gear Alternate Uplock Release Actuator Assembly
Figure 1

KD6863

TESTING AND FAULT ISOLATION

1. General

   A. This procedure contains the data necessary to do a test of the actuator after an overhaul or for fault isolation.

      (1) Actuator Assembly Test:

         (a) External Leakage

         (b) Friction

         (c) Proof Pressure

      (2) Fault Isolation

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM chapters identified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Actuator Assembly Test

   A. Special Tools and Equipment

      NOTE: If necessary, you can use equivalent tools and equipment.

      (1) Fixture Equipment - Functional Test Landing Gear Actuator -- J32053-1

   B. Standard Tools and Equipment

      NOTE: Equivalent equipment can be used.

      (1) A hydraulic test stand with these requirements:

         (a) Can operate with BMS 3-11 hydraulic fluid.

         (b) Can operate in a range of 0-3500 psi

         (c) The fluid must be continuously filtered by a filter no larger than 15 micron absolute.

         (d) The fluid temperature to be 60-120°F.

C. Consumable Material

(1) D00183 Fluid, Hydraulic - BMS 3-11 (SOPM 20-60-03)

D. Reference

(1) SOPM 20-60-03, Lubricants

E. Prepare for Test

(1) Install the actuator in the holding fixture J32053-1 test fixture.

(2) Fill the actuator with hydraulic fluid.

NOTE: The actuator will be continuously full of BMS 3-11 hydraulic fluid for each Test.

(3) Attach the hydraulic test stand line to the port.

(4) Remove all of the air from the actuator.

F. Procedure

WARNING: DO NOT APPLY AIR PRESSURE TO THE PORTS. THIS CAN CAUSE DAMAGE TO THE UNIT OR INJURY TO YOU.

(1) Do an external leakage test:

(a) Clean around the dynamic rod seal to permit leak detection.

(b) Operate the actuator for a minimum of 50 full cycles at approximately 10-15 cycles per minute.

1) Fully retract the actuator.

2) Apply 2000-2250 psi hydraulic pressure to extend the piston.

a) Permit the piston to stop at the end of the piston travel.

3) Decrease the pressure to 40-60 psi to retract the piston.

a) Permit the piston to stop at the end of the piston travel.

4) Do step 1-3 for 25 full cycles.

5) After 25 cycles, do a visual check for leakage around the dynamic rod seal:

a) Recommended leakage is zero.

b) The leakage limit for the rod seal seat is 3 drops.

c) The leakage limit for the static seal is zero.

6) Operate the actuator again for a minimum of 25 full cycles as shown above.

7) After the 25 cycles, do a visual check for leakage around the dynamic road seal:

a) Recommended leakage is zero.

b) The leakage limit for the rod seal is 3 drops.

c) The leakage limit for for static seals is zero.

(c) Apply 2-5 psi hydraulic pressure to the actautor for a minimum of 2 minutes.

1) There must be no external leakage.

(2) Do a friction test:

(a) Retract the actuator rod fully.

(b) Apply the minimum hydraulic pressure to the extend port that is necessary to move the piston.

1) The rod must extend fully with a smooth, continuous movement.

(c) Remove the pressure applied to the actuator.

(3) Do a proof pressure test.

(a) Retract the actuator rod fully.

CAUTION: DO NOT EXTEND OR RETRACT THE PISTON AT PROOF PRESSURE (3400-3500 PSI).

(b) Slowly apply the hydraulic pressure to fully extend the actuator.

(c) Increase the pressure to 3400-3500 psi and hold for a minimum of 30 seconds.

(d) Make sure there is no sign of external leakage or permanent damage to the actuator.

(e) Remove the pressure from the actuator.

(4) Remove the actuator from the fixture.

(5) Fill the unit with hydraulic fluid and install the shipping caps.

3. Fault Isolation

TROUBLE	PROBABLE CAUSE	CORRECTION
External leakage	Defective packing seal between union (60) and barrel assembly (70)	Remove union (60) and replace packing (65).
	Gland (20) not fully torqued	Torque gland nut to 720 pound-inches.
	Defective packing seal (30)	Remove gland nut (20). Replace packing seal (35) and repalce the gland nut.
Leakage at rod end seal	Defective packing seal (50)	Remove gland nut (20). Replace packing seal (50) and replace the gland nut.
Extend/Retract motion not smooth	Defective spring, piston or gland nut	Disassemble and examine parts. Replace as necessary.
	Defective packing seal (50) or scraper (40)	Disassemble and replacee seals as necessary

Fault Isolation Chart
Table 101

DISASSEMBLY

1. General

   A. This procedure contains the data necessary to disassemble the actuator assembly.

   B. Disassemble the actuator assembly unit sufficiently to do the specified procedure that follow:

      (1) To complete any type of fault isolation.

      (2) To find out if the parts are in a serviceable condition.

      (3) To make any necessary repairs to the assembly unit.

      (4) To put the assembly unit back into a serviceable condition.

   C. Refer to IPL Fig. 1 for item numbers.

2. Actuator Disassembly

   A. Special Tools and Equipment

      NOTE: If necessary, you can use equivalent tools and equipment.

      (1) Fixture Equipment - Landing Gear Actuator Assemblies -- J32057-1 or J32057-94

          NOTE: The J32057-94 is the recommended fixture to use.

   B. Part Replacement

      NOTE: The parts which follow are recommended for replacement. Unless a procedure tells you to replace a part, replacement is optional.

      (1) Scraper(40)

      (2) Packings (35, 50)

      (3) Backup rings (30, 45)

   C. Procedure

      (1) Remove the union (60) and the packing (65).

      (2) Drain the hydraulic fluid from the actuator.

      (3) Bend the flange of the lockwasher (25) from the gland nut (20).

      (4) Remove the washer (25).

(5) Install the actuator in the J32057-1 or the J32057-94 holding fixture.

(6) Remove gland nut (20).

(7) Remove the packings (35, 50), the backup rings (30, 45), and the scraper (40) from the gland nut (20).

(8) Remove the piston rod assembly (5) and the spring (55) from the barrel assembly (70).

(9) Remove the barrel assembly from the J32067 holding fixture.

CHECK

1. General

   A. This procedure contains the data necessary to find defects in the material of the specified parts.

   B. Refer to FITS AND CLEARANCES for the design dimension and wear limits.

   C. Refer to the Standard Overhaul Practices Manual (SOPM) for details of the SOPM chapters identified in this procedure.

   D. Refer to IPL Fig. 1 for item numbers.

2. Check

   A. References

      (1) SOPM 20-20-01, Magnetic Particle Inspection

      (2) SOPM 20-20-02, Penetrant Methods of Inspection

   B. Procedure

      (1) Use standard industry procedures to do a visual check of all the parts for defects. Do the penetrant or magnetic particle check if the visual check shows possible damage or if you suspect possible damage on the parts listed below:

      (2) Do a class B magnetic particle check (SOPM 20-20-01) of this part:

         (a) Piston rod (15)

      (3) Do a penetrant check (SOPM 20-20-02) of this part:

         (a) Barrel (80)

      (4) Do a check of the spring (55):

         (a) Measure the load with the spring compressed to 3.37 inches.

            1) The load will be 124-146 pounds.

         (b) The maximum free length is 4.43 inches.

(c) Compress the spring to the solid height:

1) Maximum solid height is 1.75 inches.

2) The spring will compress to the solid height without permanent damage.

REPAIR - GENERAL

1. General

A. Instructions for repair, refinish, and replacement of the specified subassembly parts are included in each REPAIR when applicable:

PART NUMBER	NAME	REPAIR
- - -	REFINISH OF OTHER PARTS	1-1
293W5603	BARREL ASSEMBLY	2-1, 2-2
293W5604	PISTON ROD ASSEMBLY	2-1, 3-2
293W5606	GLAND NUT	4-1
BAC27WHY00010	NAMEPLATE INSTALLATION	5-1

—	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 THIS FEATURE 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 DATUM B WITHIN 0.002
// | 0.002 | A	PARALLEL TO DATUM 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 A
⌓ | 0.020 | A	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.020 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ | ∅ 0.0005 | C	CONCENTRIC TO DATUM C WITHIN 0.0005 DIAMETER
⌯ | 0.010 | A	SYMMETRICAL WITH DATUM A WITHIN 0.010
∠ | 0.005 | A	ANGULAR TOLERANCE 0.005 WITH DATUM 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 DATUM A, AND EXTENDING 0.510 INCH ABOVE DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

True Position Dimensioning Symbols
Figure 601

KD6877

REFINISH OF OTHER PARTS - REPAIR 1-1

1. General

   A. This repair gives the data that is necessary to refinish parts not given in the specified repairs.

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

   C. Refer to IPL Fig. 1 for item numbers.

2. Refinish of Other Parts

   A. General

      (1) Instructions for the repair of the parts listed in Table 601 are for repair of the initial finish.

   B. References

      (1) SOPM 20-30-02, Stripping of Protective Finishes

      (2) SOPM 20-30-03, General Cleaning Procedures

      (3) SOPM 20-41-01, Decoding of Boeing Finish Codes

   C. Procedure

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1 Washer,lock (25)	15-5PH CRES	Passivate (F-17.25).

Refinish Details
Table 601

BARREL ASSEMBLY - REPAIR 2-1

293W5603-1

1. General

   A. This repair gives the data that is necessary to replace the bearing on the barrel assembly (70).

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

   C. Refer to IPL Fig. 1 for item numbers.

2. Bearing Replacement

   A. Consumable Materials

      NOTE: Equivalent material can be used.

      (1) A00359 Sealant -- BMS 5-95 (SOPM 20-60-04)

   B. References

      (1) SOPM 20-50-03, Bearing Removal, Installation and Retention

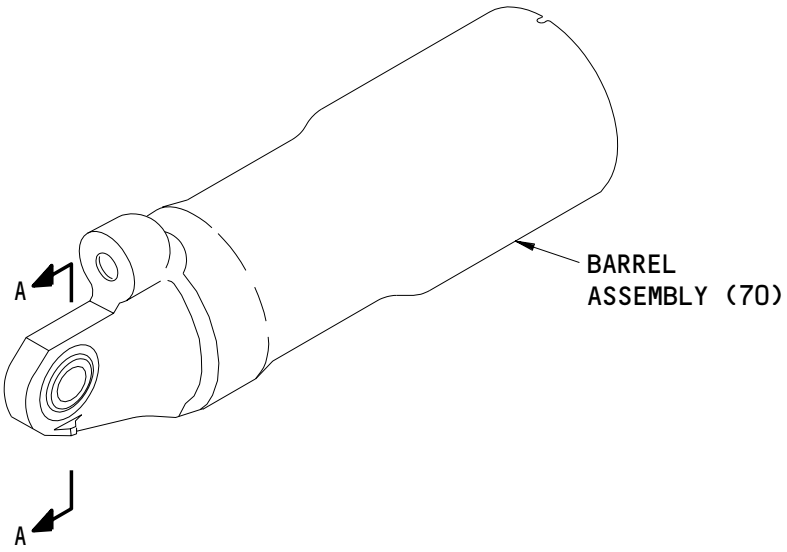
      (2) SOPM 20-60-04, Miscellaneous Materials

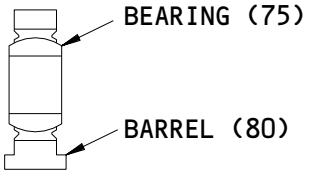
   C. Procedure

      (1) Remove the bearing (75) from the barrel (80).

      (2) Install the bearing (75) in the barrel (80) with BMS 5-95 sealant.

      (3) Roller swage (SOPM 20-50-03) the bearing (75) on the two sides.





A–A

ITEM NUMBERS REFER TO IPL FIG. 1

293W5603-1
Barrel Assembly Bearing Replacement
Figure 601

KD6875

BARREL - REPAIR 2-2

294W5603-2, -4

1. General

   A. This repair gives the data that is necessary to repair and refinish the barrel (80).

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

   C. Refer to the REPAIR - GENERAL (32-35-86/601, REPAIR - GENERAL) for the standard true position dimensioning symbols shown in the repair.

   D. Refer to IPL Fig. 1 for item numbers.

   E. General repair details:

      (1) Material: AL ALLOY

2. Barrel Refinish

   A. References

      (1) 32-35-86/601, REPAIR - GENERAL

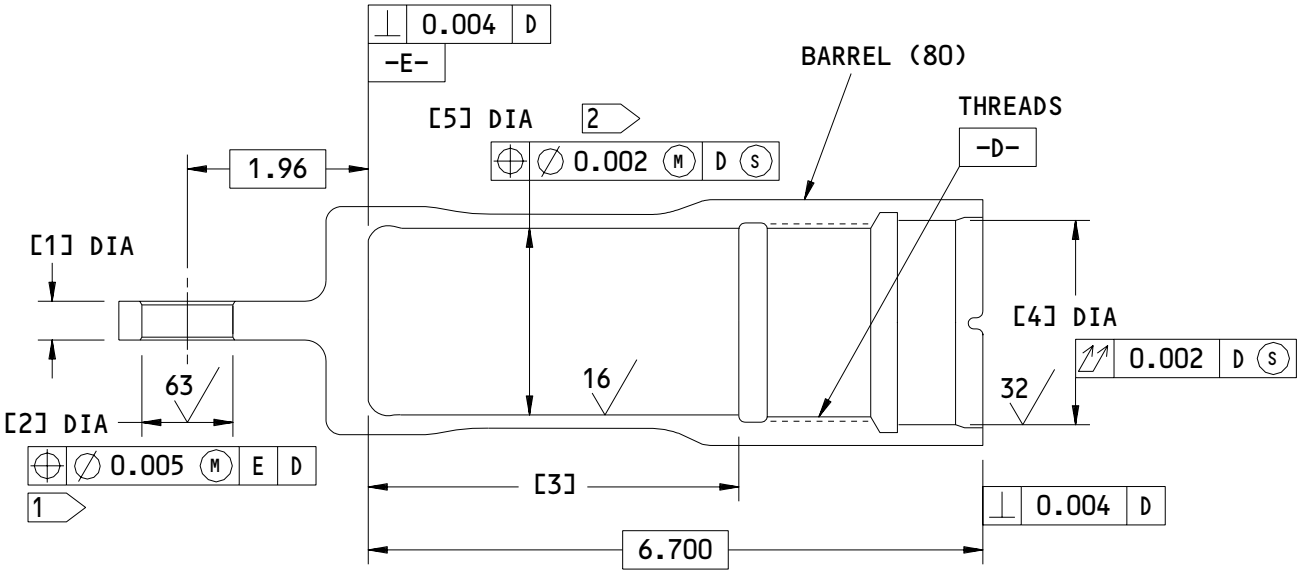
      (2) SOPM 20-30-02, Stripping of Protective Finishes

      (3) SOPM 20-30-03, General Cleaning Procedures

      (4) SOPM 20-41-01, Decoding of Boeing Finish codes

   B. Procedure (Fig. 601)

      (1) Apply no finish (F-25.01) on the barrel (80).



REFERENCE NUMBER	[1]	[2]	[3]	[4]	[5]
DESIGN DIMENSION	0.385 0.375	1.0005 1.0000	4.070 4.050	2.245 2.243	2.002 1.998
REPAIR LIMIT	--	--	--	--	2.011

1 APPLY FINISH (F-17.05) TO THIS AREA

2 APPLY FINISH (F-17.06) TO THIS AREA

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

293W5603-2,-4
Barrel Repair/Refinish
Figure 601

KD6887

PISTON ROD ASSEMBLY - REPAIR 3-1

294W5604-3

1. General

   A. This repair gives the data that is necessary to replace the bearing on the piston rod assembly (5).

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

   C. Refer to IPL Fig. 1 for item numbers.

2. Bearing Replacement

   A. Consumable Materials

      NOTE: Equivalent material can be used.

      (1) A00359 Sealant -- BMS 5-95 (SOPM 20-60-04)

   B. References

      (1) SOPM 20-50-03, Bearing Removal, Installtion and Retention

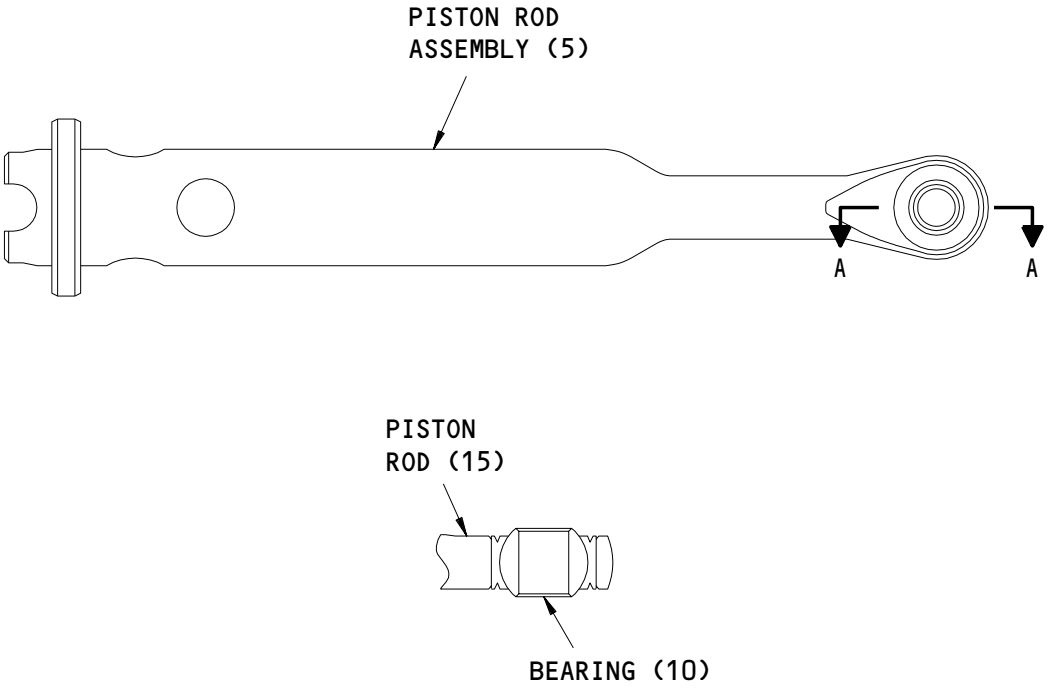
      (2) SOPM 20-50-04, Miscellaneous Materials

   C. Procedure

      (1) Remove the bearing (10) from the piston rod (15).

      (2) Install the new bearing (10) in the piston rod (15) with BMS 5-95 sealant.

      (3) Roller swage or anvil swage SOPM (20-50-03) the bearing (10) on the two sides.



A–A

ITEM NUMBERS REFER TO IPL FIG. 1

293W5604-3
Piston Rod Assembly Bearing Replacement
Figure 601

KD6888

PISTON ROD - REPAIR 3-2

294W5604-4

1. General

A. This repair gives the data that is necessary to repair and refinish the piston rod (15).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

C. Refer to the REPAIR - GENERAL (32-35-86/601, REPAIR - GENERAL) for the standard true position dimensioning symbols shown in the repair.

D. Refer to IPL Fig. 1 for item numbers.

E. General repair details:

(1) Shot Peen: 0.017-0.046 shot size
0.006-0.011 A2 intensity

(2) Material: 15-5PH CRES,AMS 5659,
180-200 KSI

2. Piston Rod Refinish

A. References

(1) 32-35-86/601, REPAIR - GENERAL

(2) SOPM 20-10-03, Shot Peening

(3) SOPM 20-30-02, Stripping of Protective Finishes

(4) SOPM 20-30-03, General Cleaning Procedures

(5) SOPM 20-41-01, Decoding Table for Boeing Finish Codes

(6) SOPM 20-42-03, Hard Chrome Plating

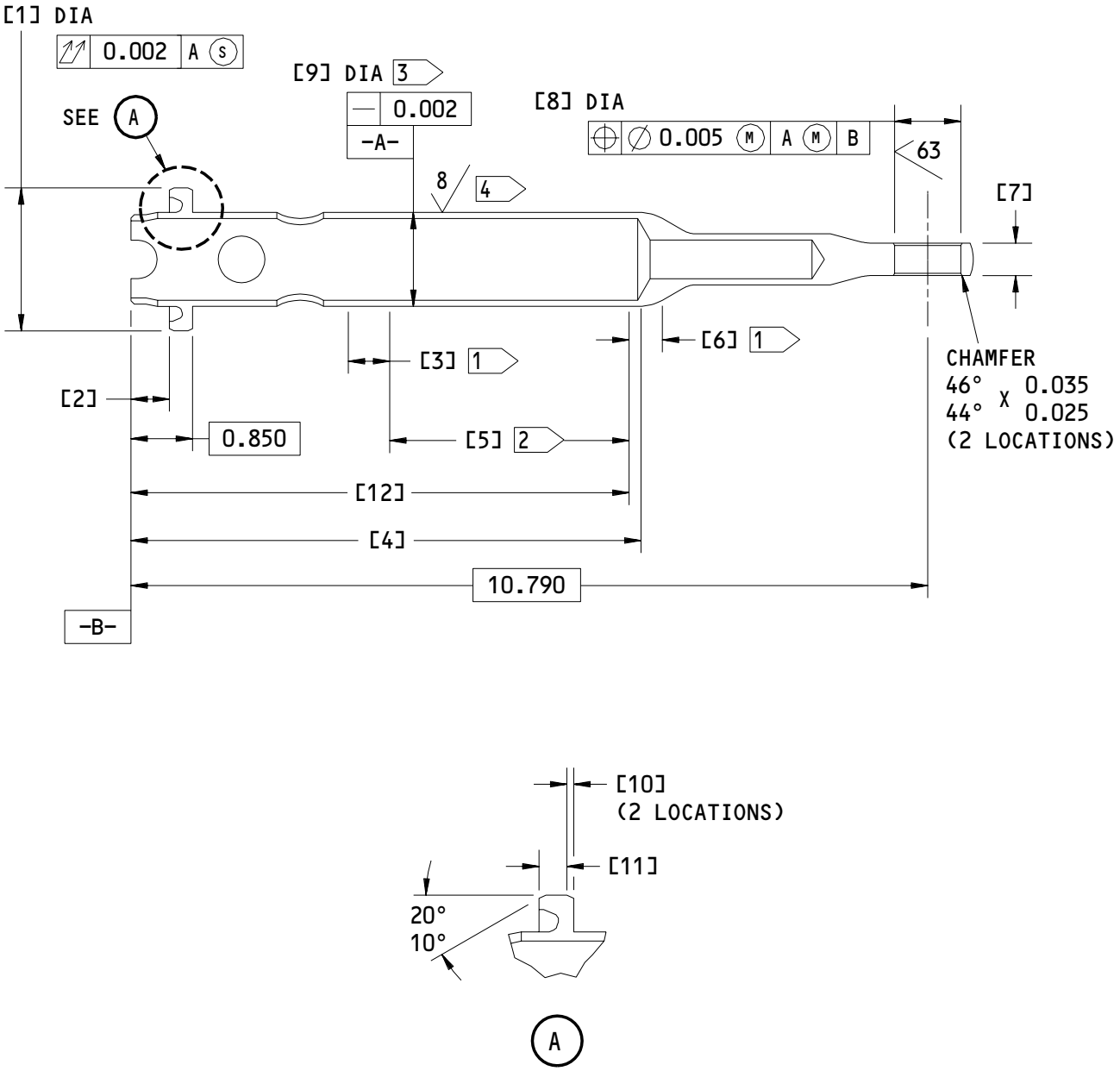
B. Procedure (Fig. 601)

(1) Put finish on the piston rod (15):

(a) Chrome plate (F-15.34) and grind as shown in Fig. 601.

1) Obey the flagnote 1 thru 4.

C. Passivate (F-17.25).



293W5604-4
Piston Rod Repair/Refinish
Figure 601 (Sheet 1)

REFERENCE NUMBER	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	
DESIGN DIMENSION	1.991 1.987	0.540 0.520	0.53 0.47	7.00 6.94	3.23 3.17	0.53 0.47	0.437 0.427	0.9067 0.9062	1.310 1.308	
REPAIR LIMIT	1.977	--	--	--	--	--	--	0.9367	1.278	

REFERENCE NUMBER	[10]	[11]	[12]
DESIGN DIMENSION	0.070 0.050	0.210 0.190	6.80 6.74
REPAIR LIMIT	--	--	--

1 CHROME PLATE RUN OUT AREA. THE MINIMUM LENGTH OF THE CHROME RUN OUT MUST BE 0.007 IN THIS AREA.

2 APPLY CHROME PLATE IN THIS AREA. THE MAXIMUM SURFACE FINISH BEFORE YOU CHROME PLATE MUST BE 63 MICROINCH.

3 AFTER CHROME PLATE AND GRIND

4 MAXIMUM SURFACE FINISH PERMITTED IS 16 MICROINCH

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

293W5604-4
Piston Rod Repair/Refinish
Figure 601 (Sheet 2)

KD7286

GLAND NUT - REPAIR 4-1

293W5606-2

1. General

A. This repair gives the data that is necessary to repair and refinish the gland nut (20).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

C. Refer to the REPAIR - GENERAL (32-35-86/601, REPAIR - GENERAL) for the standard true position dimensioning symbols shown in the repair.

D. Refer to IPL Fig. 1 for item numbers.

2. Gland Nut Refinish

A. General repair details:

(1) Material: AL-NI-BRZ

B. References

(1) 32-35-86/601, REPAIR - GENERAL

(2) SOPM 20-30-02, Stripping of Protective Finishes

(3) SOPM 20-30-03, General Cleaning Procedures

(4) SOPM 20-41-01, Decoding of Boeing Finish Codes

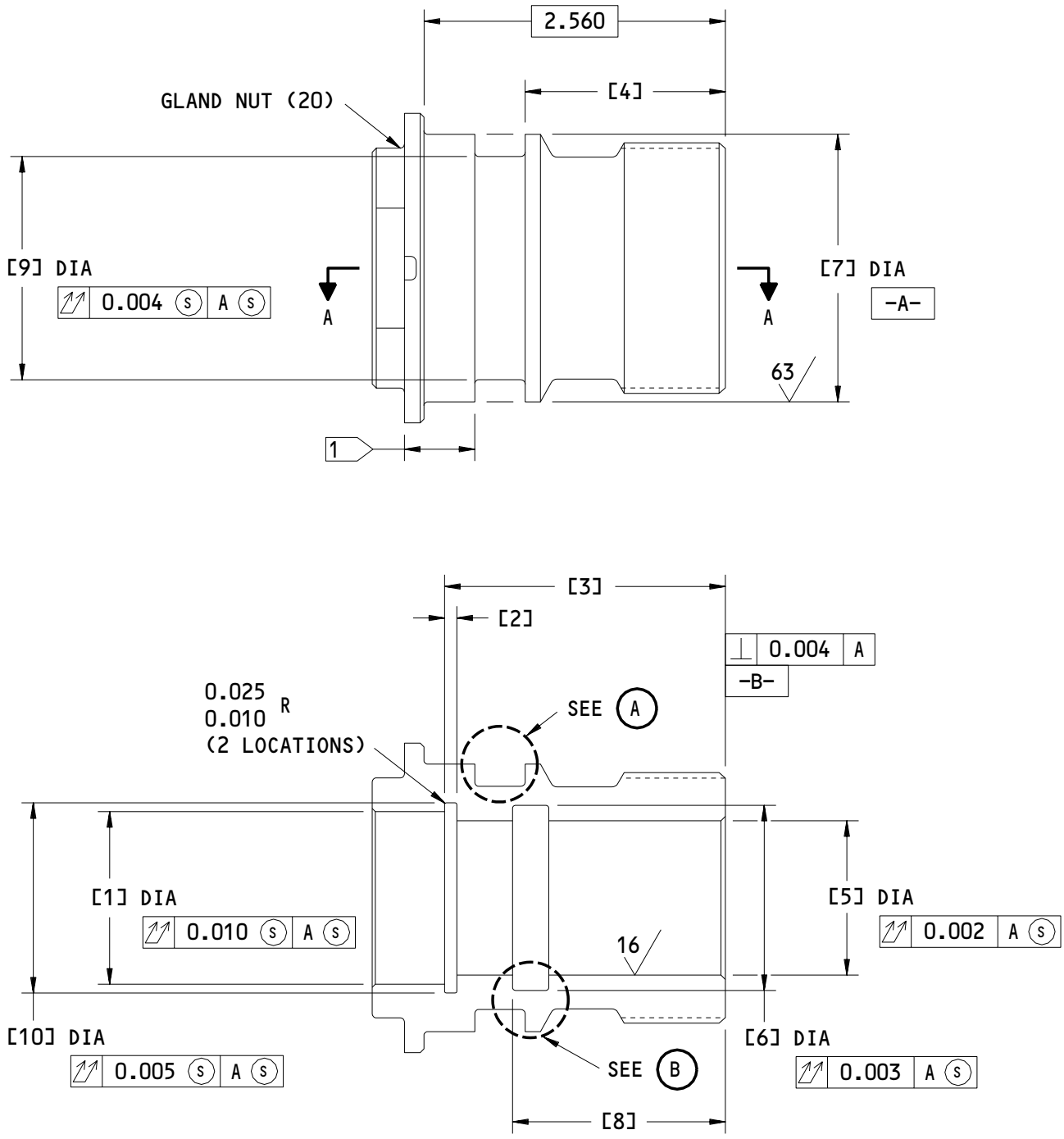
(5) SOPM 20-42-05, Brite Cadmium Plating

C. Procedure

(1) Put finish on gland nut (25):

(a) Cadmium palte (F-15.06) the area shown in Fig. 601.

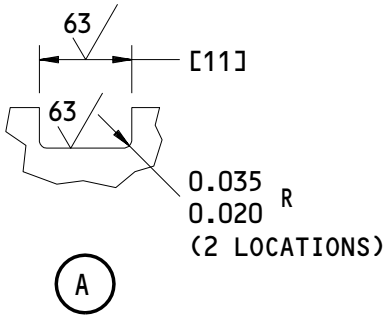
(b) Apply no finish (F-25.01) on all areas that do not have the cadmium plate.

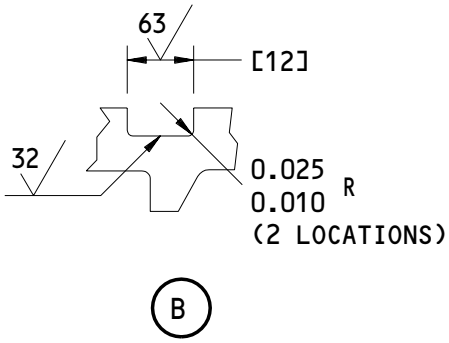


A-A

293W5606-2
Gland Nut Repair
Figure 601 (Sheet 1)

KD7290





REFERENCE NUMBER	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
DESIGN DIMENSION	1.485 1.480	0.109 0.104	2.40 2.34	1.710 1.690	1.313 1.312	1.555 1.553	2.240 2.239	1.83 1.77	1.871 1.869

REFERENCE NUMBER	[10]	[11]	[12]
DESIGN DIMENSION	1.618 1.614	0.434 0.424	0.314 0.304

1 > CADMIUM PLATE (F-15.06) THIS AREA

125 / ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

293W5606-2
Gland Nut Repair
Figure 601 (Sheet 2)

KD6913

NAMEPLATE INSTALLATION - REPAIR 5-1

BAC27WHY00010

1. General

   A. This repair has instructions for the replacement of the nameplate (90) and the strap (85).

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the standard practices shown in the repair.

   C. Refer to IPL Fig./1 for the item numbers.

2. Nameplate Replacement (Fig. 601)

   A. General

      (1) Use the strap only one time.

   B. Consumabale Materials

      (1) A00323 Adhesive -- Type 54 (SOPM 20-60-04)

   C. References

      (1) SOPM 20-60-04, Miscellaneous Materials

   D. Procedure

      (1) Prepare the nameplate:

         NOTE: Make sure the serial number and the part number are steel stamped on the nameplate.

         (a) Make the nameplate in a shape smaller than the barrel radius.

         (b) Make a small bend in the nameplate corners to the mounting surface.

      (2) Attach the nameplate to the barrel:

         (a) Install the strap through End 1 of the nameplate.

         (b) Bend the strap 0.25-0.30 around the end 1 of the nameplate.

(c) Bond the strap and the nameplate to the barrel assembly of the Type 54 adhesive:

1) Apply a layer of type 54 adhesive to the bottom of the strap and the nameplate.

2) Hold the nameplate on the barrel.

3) Install the strap through End 2 of the nameplate.

4) Pull the strap tight.

NOTE: Make sure the strap and the nameplate are tight against the barrel.

5) Bend the strap down around the End 2 of the nameplate.

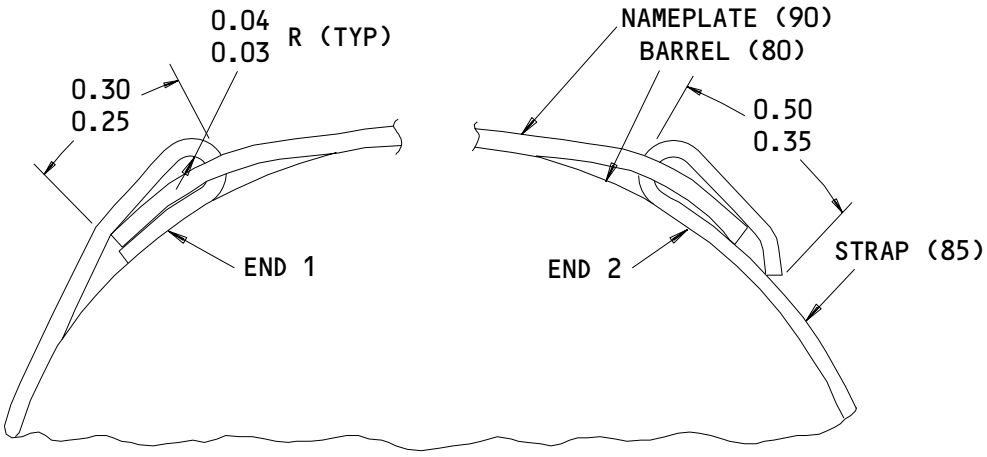
NOTE: Keep the strap tight.

6) Fill all of the areas between the strap and the barrel with the adhesive.

(d) Cut the strap 0.35-0.50 from the nameplate slot.

(e) Bend the strap end down with a slot nosed hammer.

(3) Seal the edges of the nameplate and strap with Type 54 adhesive.



ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Nameplate Installation
Figure 601

ASSEMBLY

1. General

   A. This procedure contains the data necessary to assemble the actuator assembly. There are two parts:

      (1) Actuator Assembly

      (2) Storage

   B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM chapters idntified in this procedure.

   C. Refer to IPL Fig. 1 for item numbers.

2. Actuator Assembly

   A. Special Tools and Equipment

      NOTE: If necessary, you can use equivalent tools and equipment.

      (1) Fixture Equipment - Landing Gear Actuator Assemblies -- J32057-1 or J32057-94

          NOTE: The J32057-94 is the recommended fixture to use.

   B. Consumable Materials

      NOTE: Equivalent equipment can be used.

      (1) D00183 Fluid, Hydraulic - BMS 3-11 (SOPM 20-60-03)

      (2) C00501 Protective Finish -- Type 41 (SOPM 20- 60-02)

      (3) A00589 Sealant -- BMS (SOPM 20-6--04)

   C. References

      (1) 32-35-86/101, Testing and Fault Isolation

      (2) SOPM 32-35-86/601, REPAIR 5-1, Nameplate Installation

      (3) SOPM 20-44-02, Temporary Protective Coating

      (4) SOPM 20-50-02, Installation Safety Devices

      (5) SOPM 20-60-02, Finish Materials

(6) SOPM 20-60-03, Lubricants

(7) SOPM 20-60-04, Miscellaneous materials

D. Procedure

(1) Install the barrel assembly (55) in the J32057-1 or the J32057-94 holding fixture.

(2) Install the piston rod assembly (5) and the spring (55) in barrel assembly (70).

(3) Install the backup rings (30, 45) and the packings (35, 50) gland nut (20).

(a) Lubricate the backup rings (30, 45) and the packings (35, 50) with with BMS 3-11, Type IV, hydraulic fluid.

(b) Install the backup rings and the packings on the gland nut.

(4) Install the scraper (40) in the gland nut (20).

(a) Lubricate the scraper (40) with BMS 3-11, Type IV, hydraulic fluid.

(b) Install scraper in the gland nut.

1) See the Fig. 701 for orientation of scraper.

(5) Install the gland nut (20) in the barrel assembly (70):

(a) Install the lockwasher (25) on the gland nut (20).

(b) Install the gland nut (20) and the lock washer in the barrel assembly (70).

(c) Torque the gland nut to 720 pound inches.

(d) Bend the flange of the lock washer fully into the slots of the gland nut.

(6) Install the union (60) in the barrel assembly (70):

(a) Lubricate the packing (65) with BMS 3-11, Type IV, hydraulic fluid.

(b) Install the packing on the union.

(c) Install the union in the hydraulic ports of the barrel assembly (70).

(7) Install the nameplate and the strap (32-35-86/601, REPAIR 5-1).

(8) Test the unit as shown in TESTING AND FAULT ISOLATION (32-35-86/101).

(9) Apply a bead of BMS 5-26 sealant to the joint between the gland nut (20) and the barrel assembly (70) as shown in Fig. 701.

(a) Obey flagnote 1 in Fig. 701.

(b) Make sure sealant dries fully.

(10) Apply a clear coat, type 41 on the dried sealant.

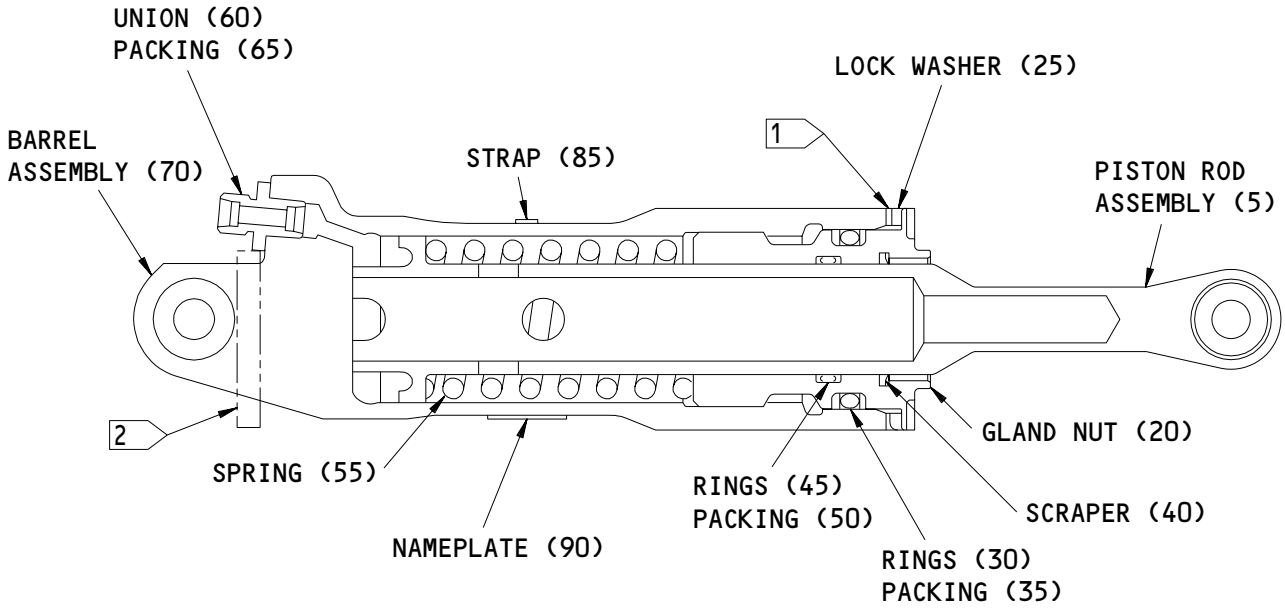
(11) Remove the barrel assembly (55) from the J32057 holding fixture.

E. Storage

(1) Partially fill the unit with hydraulic fluid.

(2) Seal ports with unit with BMS 3-11 resistant plugs or caps.

(3) Put the unit away with protection by standard industry practices and the data contained in SOPM 20-44-02.



1 APPLY A FILLET SEAL OF BMS 5-26 SEALANT TO THE JOINT BETWEEN THE GLAND NUT AND THE BARREL. APPLY A LAYER OF TOP COAT, TYPE 41 TO THE SEALANT AREA.

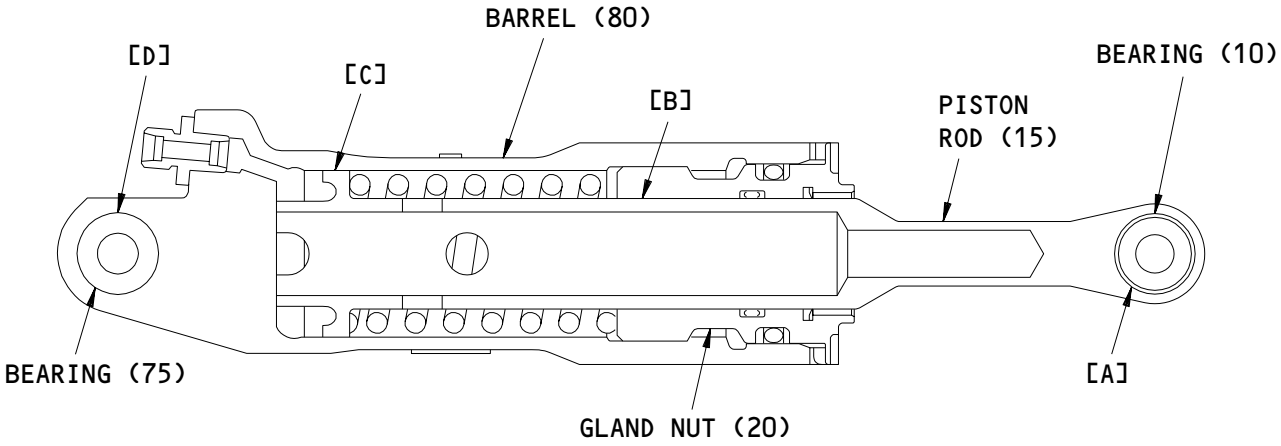
2 USE THIS AREA, ON THIS SIDE AND THE OTHER SIDE, TO HOLD THE BARREL WHEN YOU TORQUE THE GLAND NUT.

ITEM NUMBERS REFER TO IPL FIG. 1

Actuator Assembly Details
Figure 701

KD6920

FITS AND CLEARANCES



ITEM NUMBERS REFER TO IPL FIG. 1

REF LETTER	REF IPL FIG. 1, MATING ITEM NO.	DESIGN DIMENSION*				SERVICE WEAR LIMIT*		
		DIMENSION		ASSEMBLY CLEARANCE		DIMENSION		MAXIMUM CLEARANCE
		MIN	MAX	MIN	MAX	MIN	MAX	
[A]	ID 15	0.9062	0.9067	0.0000	0.0010		0.9072	0.0010
	OD 10	0.9057	0.9062			0.9052		
[B]	ID 20	1.312	1.313	0.002	0.005		1.316	0.006
	OD 15	1.308	1.310			1.306		
[C]	ID 80	1.998	2.002	0.007	0.015		2.011	0.020
	OD 15	1.987	1.991			1.978		
[D]	ID 80	1.0000	1.0005	0.0000	0.0010		1.0010	0.0010
	OD 75	0.9995	1.0000			0.9990		

* ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801

KD6922

REF IPL		NAME	TORQUE*	
FIG. NO.	ITEM NO.		POUND-INCHES	POUND-FEET
1	20	Gland Nut	720	

* REFER TO SOPM 20-50-01 FOR TORQUE VALUES OF STANDARD FASTENERS.

Torque Table
Figure 802

KD6923

SPECIAL TOOL, FIXTURES, AND EQUIPMENT

1. General

A. This is a list of the special tools, fixtures, and equipment that you can use in this manual.

B. If necessary, you can use equivalent alternatives.

(1) J32053-1 - Fixture Equipment - Functional Test Landing Gear Actuator

(2) J32057-1 or J32057-94 - Fixture Equipment - Landing Gear Actuator Assemblies

NOTE: The J32057-94 is the recommended fixture to use.

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

S0352 NIPPON MINIATURE BEARING CO LTD
TOKYO, JAPAN

02107 FLOUROCARBON CO OHIO DIV
DOVER, OHIO 44622
CANCELLED NO REPLACEMENT

02886 DODGE-WASMUND MFG CO INC
9607 BEVERLY ROAD
PICO RIVERA, CALIFORNIA 90660-2136

07128 TETRAFLUOR INC
2051 EAST MAPLE AVENUE
EL SEGUNDO, CALIFORNIA 90245-5009

09257 BUSAK AND SHAMBAN INC SEALS DIV
2531 BREMER DR PO BOX 176
FORT WAYNE, INDIANA 46801

15860 NEW HAMPSHIRE BALL BEARINGS, INCORPORATED ASTRO DIVISION
155 LEXINGTON AVENUE
LACONIA, NEW HAMPSHIRE 03246-2937

26303 GREENE TWEED IND INC ADVANTEC DIV
7101 PATTERSON DRIVE PO BOX 5037
GARDEN GROVE, CALIFORNIA 92645-5037

26879 CORONADO MFG INC
11069 PENROSE AVENUE
SUN VALLEY, CALIFORNIA 90352-2722

50632 KAMATICS CORP SUB OF KAMAN CORP
1335 BLUE HILLS ROAD
BLOOMFIELD, CONNECTICUT 06002-1304

73134 IMO INDUSTRIES INC HEIM BEARINGS DIV
60 ROUND HILL ROAD PO BOX 430
FAIRFIELD, CONNECTICUT 06430

81376 SOUTHWEST PRODUCTS COMPANY
2240 BUENA VISTA STREET
IRVINDALE, CALIFORNIA 91706

VENDORS

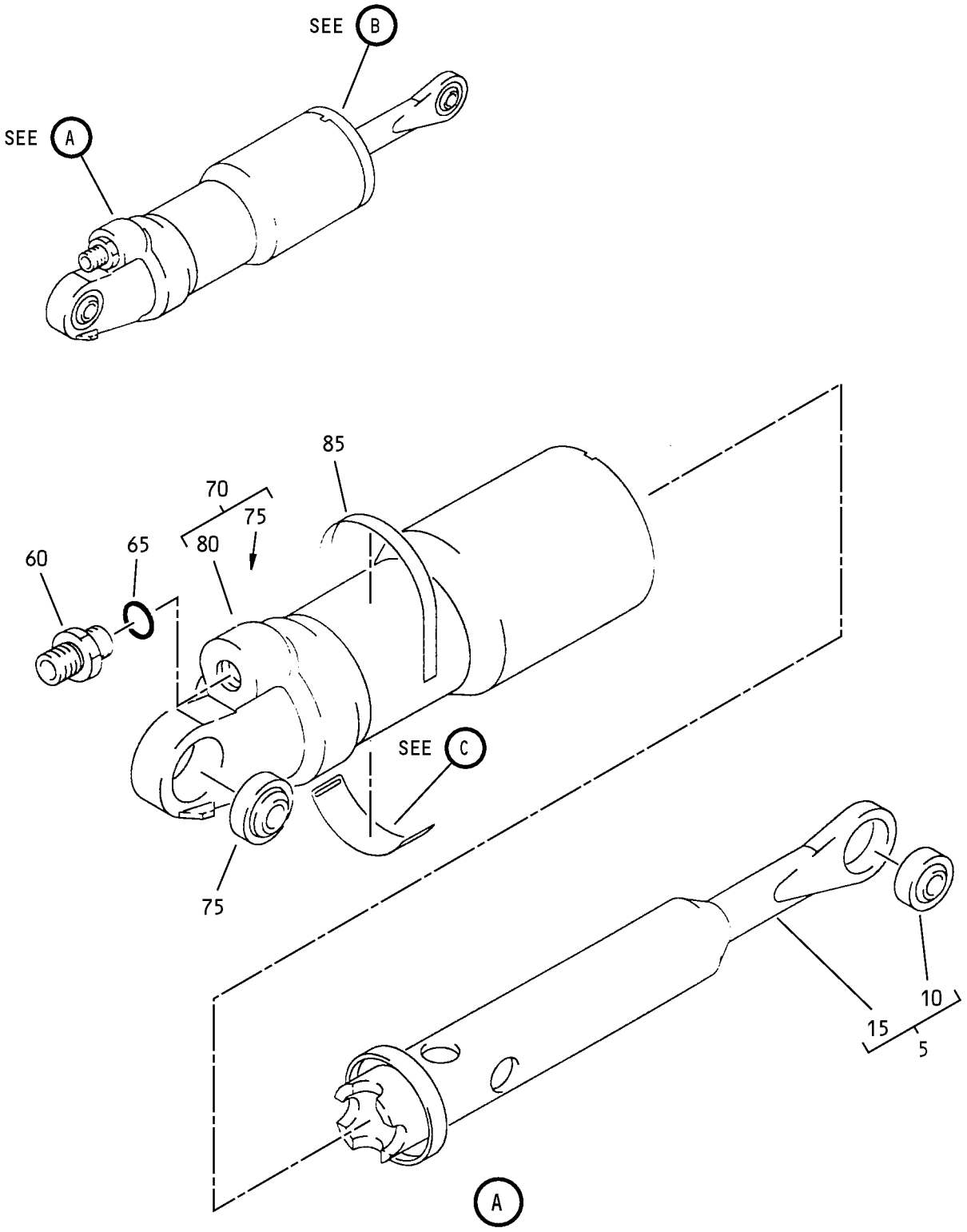
94878 RAYBESTOS-MANHATTAN INC PACIFIC COAST DIV
FULLERTON, CALIFORNIA 92631
BUSINESS DISCONTINUED

97613 SARGENT CONTROLS & AEROSPACE/KAHR BEARING DIV
5675 W BURLINGAME RD
TUCSON, ARIZONA 85743

97820 BUSAK AND SHAMBAN INC BEARING DIV
711 MITCHELL ROAD PO BOX 665
NEWBURY PARK, CALIFORNIA 91320-2214

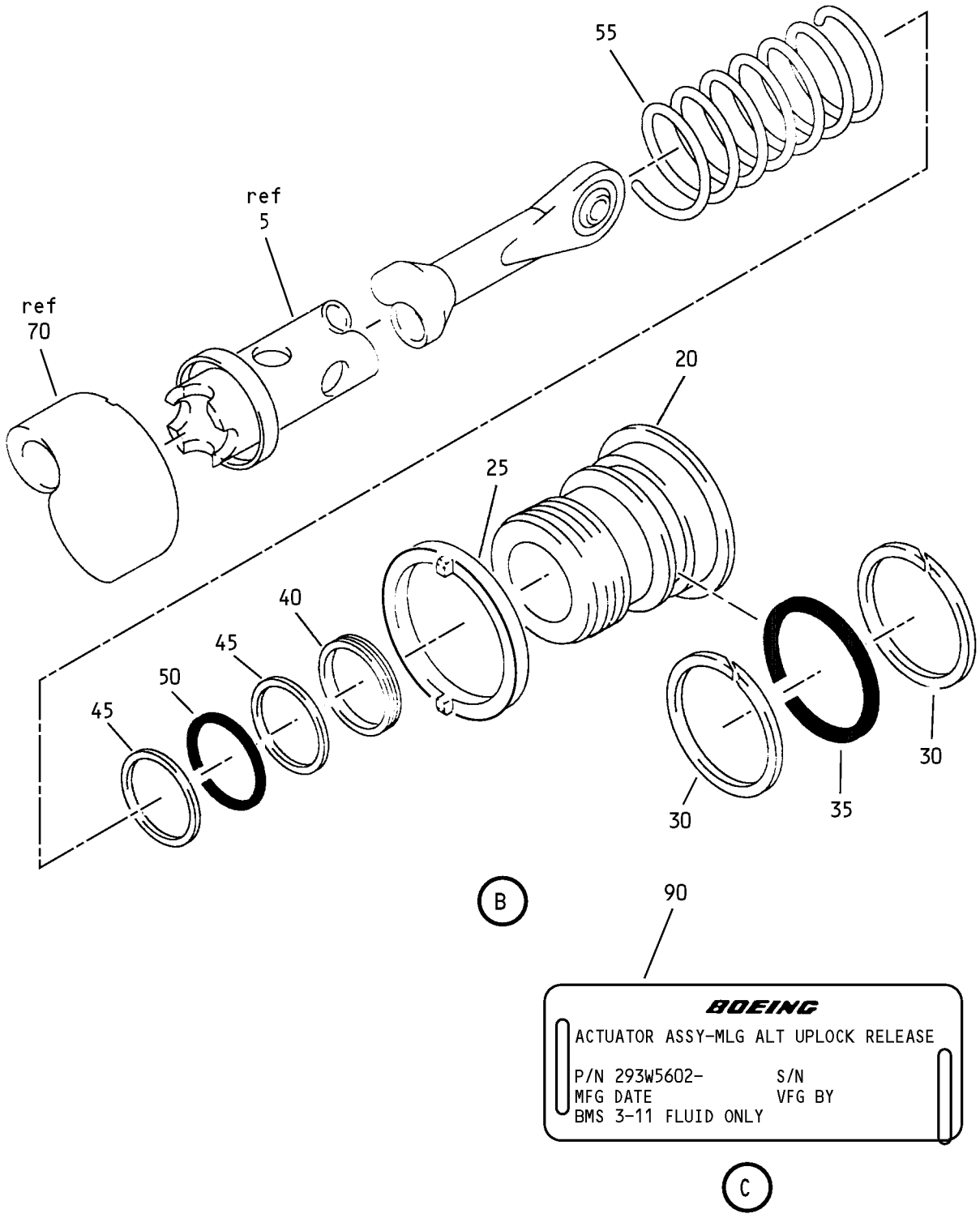
PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
ADB8VNC		1	75	1
ADW7V52N		1	10	1
BACB10FC08C		1	75	1
BACB10FE07		1	10	1
BACR12BM219		1	45	2
BACR12BM328		1	30	2
BACS34A14		1	40	1
BAC27WHY00010		1	90	1
CWR76-14A		1	40	1
C11236-219B		1	45	2
C11236-328B		1	30	2
DW96801-14		1	40	1
KNDB8-66		1	75	1
KR7ACWGBZ		1	10	1
KR8CNGBZC		1	75	1
KWDB7-38		1	10	1
MS219-02-4T		1	60	1
NAS1601-219		1	50	1
NAS1601-328		1	35	1
NAS1602-904		1	65	1
NES08B10GC		1	75	1
NRRS08B10GC		1	75	1
RMR12BM219		1	45	2
RMR12BM328		1	30	2
RMS34A14		1	40	1
STF800-219		1	45	2
STF800-328		1	30	2
SWKRS07-3405		1	10	1
S1106514		1	40	1
S30294-219-1		1	45	2
S30294-328-1		1	30	2
S3038814-1		1	40	1
S3038814-5		1	40	1
TF005-14		1	40	1
TF450-219A		1	45	2
TF450-328A		1	30	2
WES07AB10G		1	10	1
WHT07VSB		1	10	1
WRRS07AB10G		1	10	1
2100-219		1	45	2

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
2100-328		1	30	2
2140-14		1	40	1
293W2515-8		1	25	1
293W5602-2		1	1A	RF
293W5603-1		1	70	1
293W5603-2		1	80	1
293W5603-4		1	80A	1
293W5604-3		1	5	1
293W5604-4		1	15	1
293W5606-2		1	20	1
293W5610-2		1	55	1
69B80300-8		1	85	1



Nose Landing Gear Alternate Uplock Release Actuator Assembly
Figure 1 (Sheet 1)

K12308



Nose Landing Gear Alternate Uplock Release Actuator Assembly
Figure 1 (Sheet 2)

K12320

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1A	293W5602-2		ACTUATOR ASSY-ALTERNATE UPLOCK RELEASE, MLG		RF
5	293W5604-3		.ROD ASSY-PISTON		1
10	WES07AB10G		..BEARING- (V73134) (SPEC BACB10FE07) (OPT SWKRS07-3405 (V81376)) (OPT WHT07VSB (VS0352)) (OPT KR7ACWGBZ (V50632)) (OPT KWDB7-38 (V97613)) (OPT WRRS07AB10G (V73134)) (OPT ADW7V52N (V15860))		1
15	293W5604-4		..ROD		1
20	293W5606-2		.NUT-GLAND		1
25	293W2515-8		.WASHER-LOCK		1
30	C11236-328B		.RING- (V26879) (SPEC BACR12BM328) (OPT RMR12BM328 (V94878)) (OPT STF800-328 (V02107)) (OPT S30294-328-1 (V97820)) (OPT TF450-328A (V07128)) (OPT 2100-328 (V26303))		2
35	NAS1601-328		.PACKING		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
40	CWR76-14A		.SCRAPER- (V26879) (SPEC BACS34A14) (OPT DW96801-14 (V02886)) (OPT TF005-14 (V07128)) (OPT 2140-14 (V26303)) (OPT S3038814-1 (V09257)) (OPT S3038814-5 (V09257)) (OPT RMS34A14 (V94878)) (OPT S1106514 (V09257))		1
45	C11236-219B		.RING- (V26879) (SPEC BACR12BM219) (OPT RMR12BM219 (V94878)) (OPT STF800-219 (V02107)) (OPT S30294-219-1 (V97820)) (OPT TF450-219A (V07128)) (OPT 2100-219 (V26303))		2
50	NAS1601-219		.PACKING		1
55	293W5610-2		.SPRING-COMPRESSION		1
60	MS219-02-4T		.UNION		1
65	NAS1602-904		.PACKING		1
70	293W5603-1		.BARREL ASSY		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
75	ADB8VNC		..BEARING- (V1586O) (SPEC BACB1OFCO8C) (OPT KNDB8-66 (V97613)) (OPT KR8CNGBZC (V5O632)) (OPT NRRSO8B1OGC (V73134)) (OPT NESO8B1OGC (V73134))		1
80	293W5603-2		..BARREL- (OPT ITEM 80A)		1
-80A	293W5603-4		..BARREL-HOGOUT (OPT ITEM 80)		1
85	69B80300-8		.STRAP		1
90	BAC27WHY00010		.NAMEPLATE		1

- Item Not Illustrated