TO: ALL HOLDERS OF COWL OPENING ACTUATOR ASSEMBLY COMPONENT MAINTENANCE MANUAL, 78-31-08

REVISION NO. 14 DATED JUL 01/04

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
TR & SB RECORD 1 1007,1009	Added R2 to Service Bulletin 747-78-2169 on TRSBR page and the IPL.
TR & SB RECORD 1 1004,1007	Added Service Bulletin 767-78-0043 on TRSBR page and the IPL.

BOEING

COMPONENT
MAINTENANCE MANUAL

COWL OPENING ACTUATOR ASSEMBLY

PART NUMBERS W315T3800-1 THRU -6

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

199608

REVISION RECORD

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

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

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR B11264	JAN 10/86
		PRR B11478	JAN 10/86
767-78-0083	78-6	PRR B12900-91	MAR 01/99
747-78-2169R2	78-8	PRR 85900-112	JUL 01/04
767-78-0083R1			MAR 01/03
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*[1] Special instructions not required. Use standard industry practices.

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:

Testing/TS: APR 15/91

COWL OPENING ACTUATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The actuator forms part of a manually operated system designed to independently open and close the thrust reverser cowl halves. Each of two actuators is used in conjunction with separate flexible and fixed hydraulic lines mounted on the thrust reverser torque box. Hydraulic pressure is provided by means of a ground support equipment hand pump.

2. Operation

   A. The actuator is designed to operate in either of two different modes. During normal operation the main piston and rod end is extended by pressure applied from a hydraulic handpump. The actuator may also be extended by applying a tension load to the rod end without use of an external pump. In this mode, representing a cowl being forcibly opened, oil is drawn from the integral reservoir into the main cylinder by the action of the piston. During the retract cycle, oil is either returned to the handpump or to the internal reservoir. In both situations, the flow of oil out of the main cylinder is restricted by a flow control valve, resulting in a controlled retract rate. An internal compression spring provides snubbing during approximately the last 0.5 inch of retraction.

3. Leading Particulars (Approximate)

   Length -- 11 inches (retracted)
   Length -- 20 inches (extended)

TESTING AND TROUBLE SHOOTING

1. Test Equipment and Materials

NOTE: Equivalent substitutes may be used.

A. Hydraulic Test Stand -- Requirements:
   a. Lubricating oil supply at 0-5300 psi
   b. Hydraulic fluid supply at 0-1500 psi
   c. Fluid temperature for tests 5A thru 5C, 60-120°F
   d. Ambient temperature for tests 5A thru 5C, 60-100°F
   e. Fluid and ambient temperature for test 5D, 60-80°F
   f. Filtration, 15 microns absolute
   g. Nitrogen supply at 0-600 psi

B. A78021-5 -- Holding Block Tool

C. A78021-2 -- Actuator Test Fixture

D. Position transducer -- Capable of measuring 8-inch stroke

E. Spring scale -- 0-10 lbs capacity

F. Oscilloscope

G. Oil, Lubricating -- MIL-L-7808 (Ref 20-60-03)

H. Oil, Hydraulic -- MIL-H-5606 or MIL-H-6083 (Ref 20-60-03)

2. Length Check

A. Ensure actuator piston is fully retracted.

B. Measure distance between center of rod end bearings and verify that length is 11.935-11.965 inches.

3. Reservoir Piston Friction Check

A. Remove end cap assembly (90, IPL Fig. 1)

B. With port open to atmosphere, retract reservoir piston (110A, IPL Fig. 1) with a spring scale.

C. Verify that force to move the piston does not exceed 5 pounds.

D. With actuator in holding block tool A78021-5, reinstall end cap and tighten to 1200-1300 pound-inches.

4. Preparation for Test

A. Install actuator in test fixture A78021-2 and fill with lubricating oil. Make connections as shown in Fig. 101.

B. Charge accumulator as follows (for 2 inch diameter load cylinder and 231 cubic inch accumulator):

(1) Open hydraulic side to atmosphere.

(2) Apply 208 psi nitrogen to pneumatic charging valve.

(3) Close valve to maintain pneumatic pressure.

(4) Connect hydraulic source to hydraulic side of accumulator and apply 800 psi hydraulic pressure. Close valve to maintain pressure.

5. Test

A. Bleed Test (Fig. 101)

(1) Extend test actuator by slowly increasing pressure to 3500 psi at actuator pressure port.

(2) Operate 4-way valve to return and let load actuator return the test actuator to the retract position.

(3) Repeat several times and check that retract cycle of the test actuator is smooth over the entire stroke.

B. Proof Pressure and Low Pressure Leakage Test (Fig. 101)

(1) Extend test actuator by slowly increasing pressure to 3500 psi at actuator pressure port.

(2) With test actuator at fully extended position, increase hydraulic pressure to 5200-5300 psi and maintain that pressure for 3 minutes.

(3) Verify that there is no failure, permanent distortion, or leakage.

(4) Decrease pressure to 5-10 psi and maintain for 3 minutes. Verify that there is no leakage.

C. Operation and Leakage Test (Fig. 101)

(1) Extend test actuator by slowly increasing pressure to 3500 psi.

(2) Operate 4-way valve to return and let load actuator return the test actuator to the retract position.

(3) Repeat extend-retract cycle 25 times.

(4) Verify that retract time is not less than 10 seconds or more than 25 seconds.

(5) Verify that there is no leakage.

D. Auxiliary Reservoir Test (Fig. 102)

(1) Retract the actuator and cap the pressure port with cap (5, IPL Fig. 1) without inducing air into the actuator.

(2) Make connections as shown in Fig. 102.

(3) Apply hydraulic pressure to the load actuator to extend the test actuator. Extend time should be 8-12 seconds.

(4) Maintain actuator in extended condition for 3 minutes.

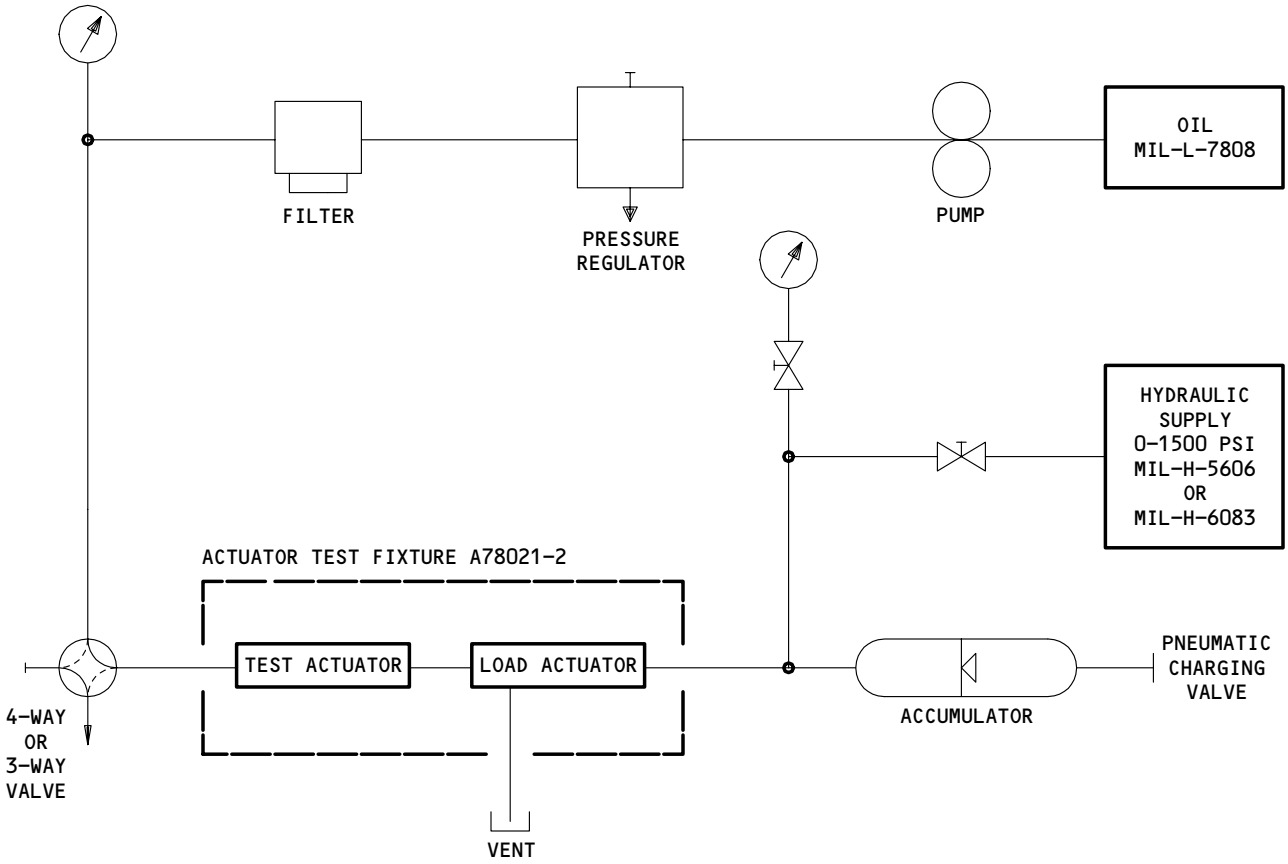
(5) Operate valve to allow load actuator to retract test actuator.

(6) The retract stroke shall be smooth with the exception that a drop of no more than 1.25 inches is permitted at the beginning of the retract stroke. Verify that the retract time is not less than 10 seconds or more than 25 seconds.

(7) Repeat extend/retract cycle 3 times.

E. Storage

(1) At completion of tests, actuator should be full of oil and all ports capped.



Operational Test
Figure 101

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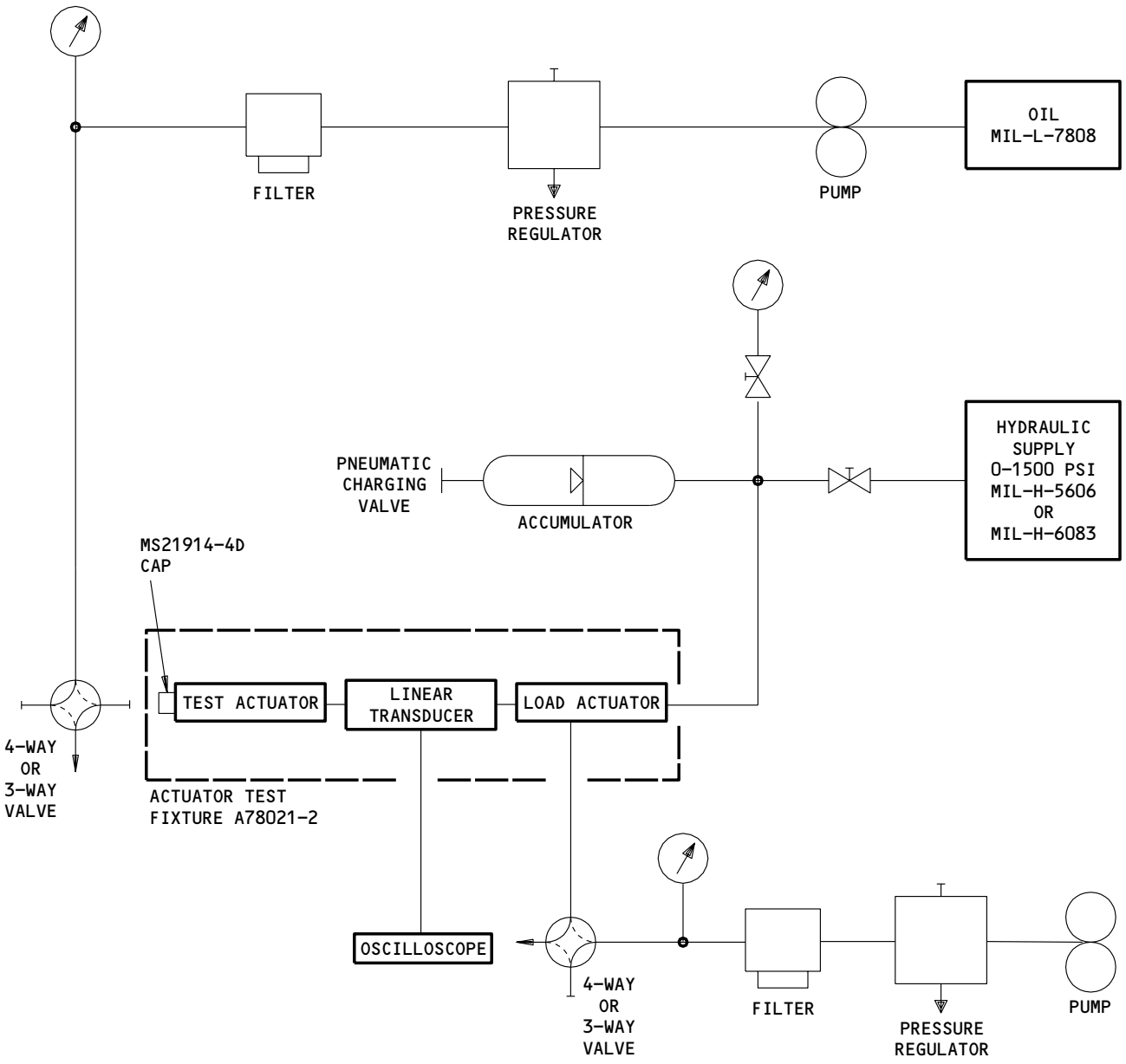


Actuator Auxiliary Reservoir Test
Figure 102

198670

DISASSEMBLY

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

1. Equipment

NOTE: Equivalent substitute may be used.

TOOL PART NO.	NOMENCLATURE
A78021-3	Spring Compressor
A78021-4	Cap Wrench
A78021-5	Holding Block
A78021-6	Rod Socket
A78021-7	Piston Retainer
A78021-33	Cap Wrench Assembly
A78021-38	Gland Wrench

2. Parts Replacement

NOTE: The following parts are recommended for replacement. Actual replacement may be based on in-service experience.

A. O-rings (10, 65, 65A, 70, 120, 120B)

B. Scraper (45)

C. Bearings (77A, 115)

D. Seals (70A, 72, 125A)

3. Disassembly (IPL Fig. 1)

A. Ensure piston (55) is fully retracted into body assembly (135).

B. Remove cap (5) and drain any oil from the actuator.

C. Remove fitting assembly (12A) and O-ring (10).

D. Remove the flow control valve as follows:

(1) For the cowl opening actuator assemblies, P/N W315T3800-1, -2, remove the stop (17) and the valve (18).

(2) For the cowl opening actuator assemblies, W315T3800-3, -4, -5, -6, remove the valve (19H).

E. Remove lockwire connecting gland (40) and end cap assembly (90).

F. Install body assembly (135) in body holding block tool A78021-5.

G. Use the gland wrench, A78021-38 to remove the gland (40) from the body assembly (135). Remove the gland (40) and the piston (55) with the attached rod end assembly (25) from the body assembly (135).

H. Remove the reservoir piston as follows:

(1) For the cowl opening actuator assemblies, P/N W315T3800-1, -2, remove the reservoir piston (110) from the body assembly (135 or 135A).

(2) For the cowl opening actuator assemblies, P/N W315T3800-3, -4, remove the reservoir piston (110A) from the body assembly (135B or 135C).

(3) For the cowl opening actuator assemblies, P/N W315T3800-5, -6, remove the reservoir piston assembly (111) from the body assembly (135B or 135C).

I. Remove the piston bearing and the seals from the reservoir piston as follows:

(1) For the cowl opening actuator assemblies, P/N W315T3800-1, -2, remove the piston bearing (115), O-ring (120), and two backup rings (125) from the reservoir piston (110).

(2) For the cowl opening actuator assemblies, P/N W315T3800-3, -4, remove the piston bearing (115), O-ring (120B), and seal (125A) from the reservoir piston (110A).

(3) For the cowl opening actuator assemblies, P/N W315T3800-5, -6, remove the piston bearing (115), O-ring (120B), and seal (125A) from the reservoir piston assembly (111).

J. Remove the end cap assembly (90) from the body assembly (135) using the cap wrench A78021-4 or the cap wrench assembly, A78021-33.

NOTE: Gland (40) must be removed first in order to remove end cap assembly (90) when using the cap wrench A78021-4.

NOTE: Do not remove spacer (95) or screen (100) from cap (105) unless replacement is necessary.

K. Install piston (55) in piston retainer A78021-7.

L. Bend back lockwasher (20).

M. Remove rod end assembly (25) from piston (55) using rod socket A78021-6.

N. Remove the gland (40) from the piston (55).

(1) Remove the scraper (45) and the bearing (77A) from the bore of the gland (40).

O. Remove the seals from the piston (55) as follows:

(1) For the cowl opening actuator assemblies, P/N W315T3800-1, -2, remove the o-ring (65) and two backup rings (70) from the piston (55).

(2) For the cowl opening actuator assemblies, P/N W315T3800-3, -4, remove the o-ring (65A) and the seal (70A) from the piston (55).

(3) For the cowl opening actuator assemblies, P/N W315T3800-5, -6, remove the seal (72) from the piston (55).

P. Compress spring (80) with spring compressor A78021-3 and remove retaining ring (60).

Q. Remove spacer (75), plunger (85), and spring (80) from piston (55).

CHECK

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

2. Refer to Fits and Clearances for design dimemsions and wear limits.

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

   A. Fitting (16)

   B. Ball (30)

   C. Gland (40)

   D. Plunger (85)

   E. Cap (105)

   F. Reservoir Piston (110A)

   G. Retainer (112H)

   H. Spring Guide (113)

   I. Piston Reservoir (114H)

   J. Body (150)

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

   A. Body (35)

   B. Piston (55)

   C. Spring (80)

   D. Spacer (75, 95)

5. Check spring (80) per Fig. 501.

ITEM NO. (IPL FIG. 1)	FREE LENGTH (INCHES)	TEST LENGTH (INCHES)	LOAD (POUNDS)
80	2.540	2.30 2.00	33.8-42.2 76.1-95.0

Spring Check
Figure 501

REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
W315T3801	BODY	1-1
W315T3802	BODY	2-1
W315T3803	PISTON	3-1
W315T3804	PISTON	4-1
W315T3805	GLAND	5-1
W315T3806	END CAP	6-1
W315T3808	PLUNGER	7-1
W315T3812	ROD END	8-1
W315T3800	ACTUATOR	9-1
- - -	MISCELLANEOUS PARTS REFINISH	10-1

2. Standard Practices

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

20-30-02 Stripping of Protecting 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
20-43-01 Chromic Acid Anodizing
20-50-03 Bearing Installation and Retention
20-50-08 Application of Dry Lubricant

3. Materials

NOTE: Equivalent substitutes may be used.

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

B. Enamel -- BMS 10-11, Type 2, Gloss white 702 (Ref 20-60-02)

C. Dry Film Lube -- Everlube 967 (Ref 20-60-03)

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

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
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
∅	DIAMETER
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)
Ⓢ	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 IN RELATION 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 IN RELATION 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

True Position Dimensioning Symbols
Figure 601

BODY ASSEMBLY - REPAIR 1-1

W315T3801-1 thru -4

1. Bearing Replacement (IPL Fig. 1)

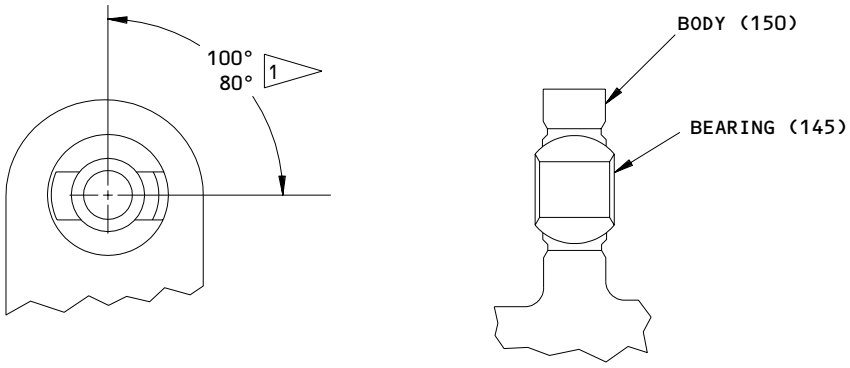
NOTE: Refer to REPAIR-GEN for list of applicable standard practices.

A. Remove bearing (145).

B. If corrosion or damage exists on lug face or hole surface refer to REPAIR 2-1 for instructions.

C. Coat new bearing OD and housing bore with BMS 10-11, Type 1 primer.

D. Roller swage bearing per 20-50-03, oriented as shown (Fig. 601).



1 BEARING ORIENTATION

W315T3801-1 Thru -4
Bearing Orientation
Figure 601

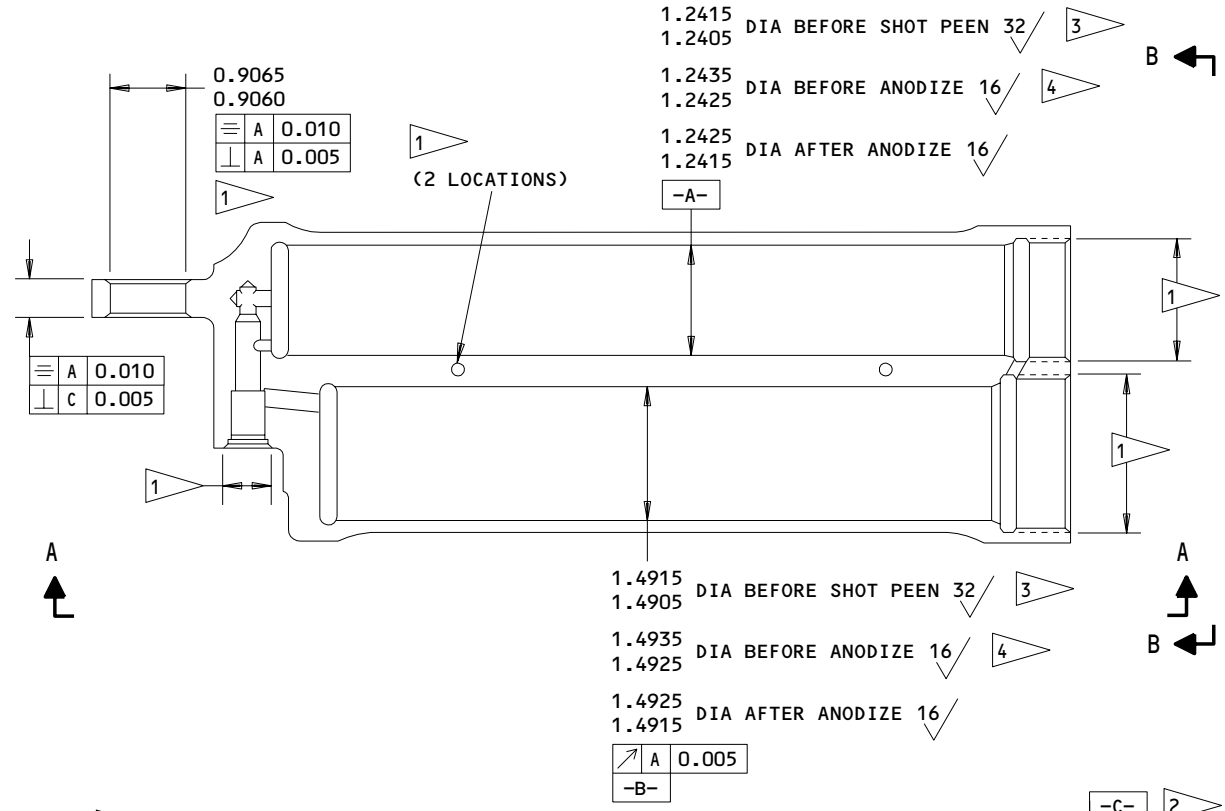
A17302

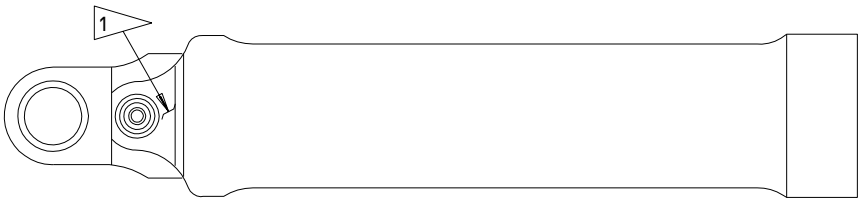
BODY - REPAIR 2-1

W315T3802-1, -2, -5, -6

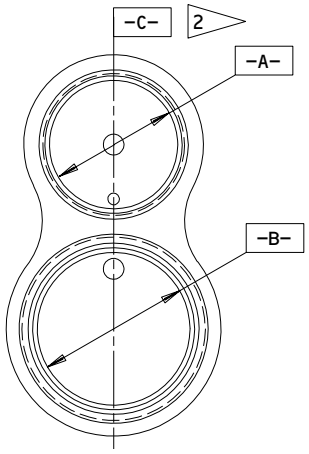
1. Plating Repair

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





A-A



B-B

REFINISH

CHROMIC ACID ANODIZE (F-17.02) AND APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER (F-20.02) EXCEPT AS NOTED

1. OMIT PRIMER FROM THIS BORE OR SURFACE
2. DATUM -C- IS ESTABLISHED BY THE CENTERS OF -A- AND -B-
3. GLASS BEAD INDICATED DIAMETERS ONLY. GLASS BEAD WITH PALLITINI A-G SPHERICAL BEADS OR NUMBER TWELVE GLASS BEADS PER MIL-G-9954. APPLY EVENLY WITH TRANSLATING/ROTATING 360 DEGREE NOZZE SPRAYING AT 45-90 DEGREES IMPACT ANGLE. INTENSITY RANGE 0.004-0.006 WITH ALMEN -A- STRIP.
4. HARD ANODIZE INDICATED DIAMETERS ONLY. HARD ANODIZE TO A TOTAL COATING THICKNESS OF 0.0020-0.0025 PER MIL-A-8625, TYPE III.

REPAIR

125 ALL MACHINED SURFACES

MATERIAL: 7075-01 OR 7075-T73
FOR W315T3802-5
7075-0 OR 7075-T73
FOR W315T3802-6

ALL DIMENSIONS ARE IN INCHES

W315T3802-5,-6
Body Repair
Figure 601

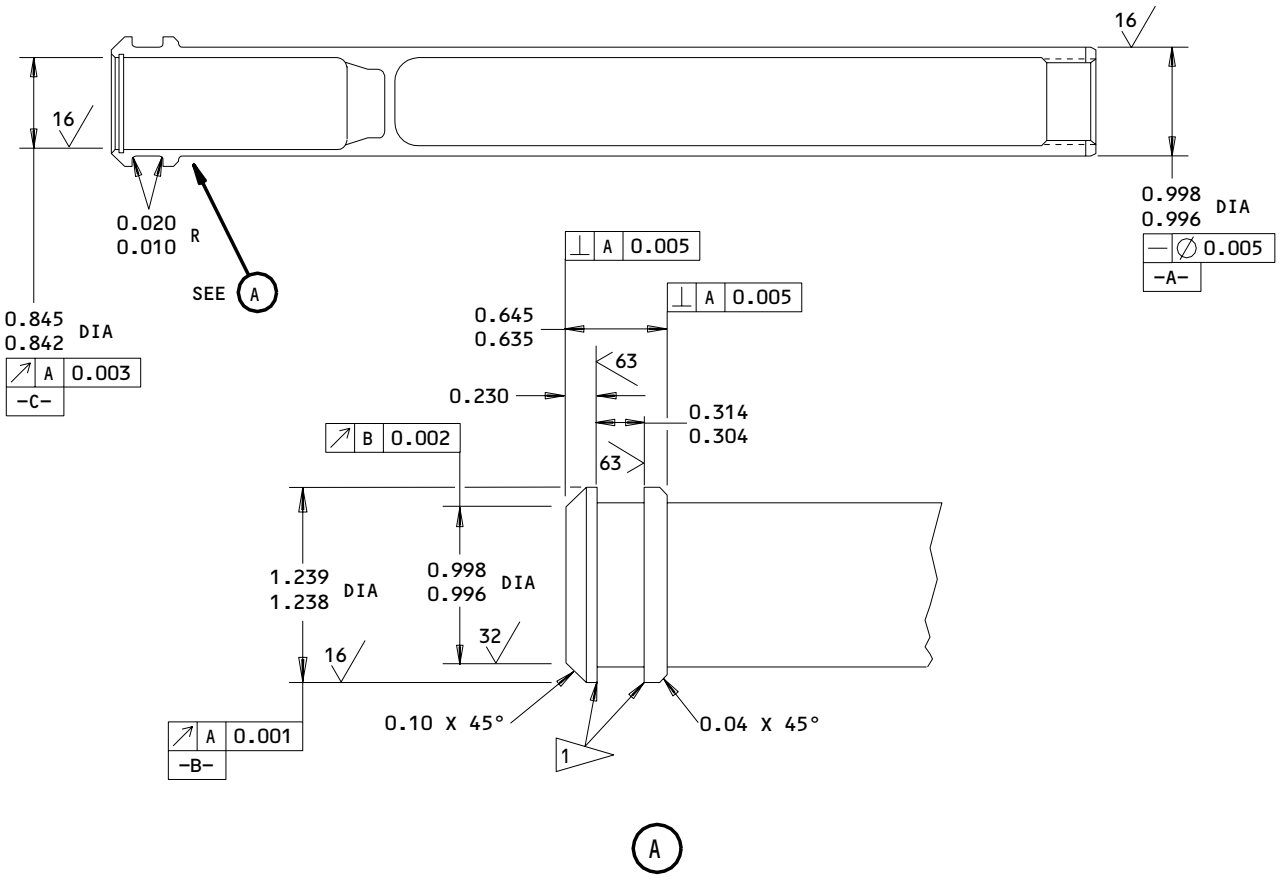
199612

PISTON - REPAIR 3-1

W315T3803-1

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

PASSIVATE (F-17.09)

1 BREAK SHARP EDGES INDICATED 0.005-0.010

REPAIR

125 ALL MACHINED SURFACES EXCEPT AS NOTED

MATERIAL: 15-5PH CRES
150-170 KSI

ALL DIMENSIONS ARE IN INCHES

W315T3803-1
Piston Repair
Figure 601

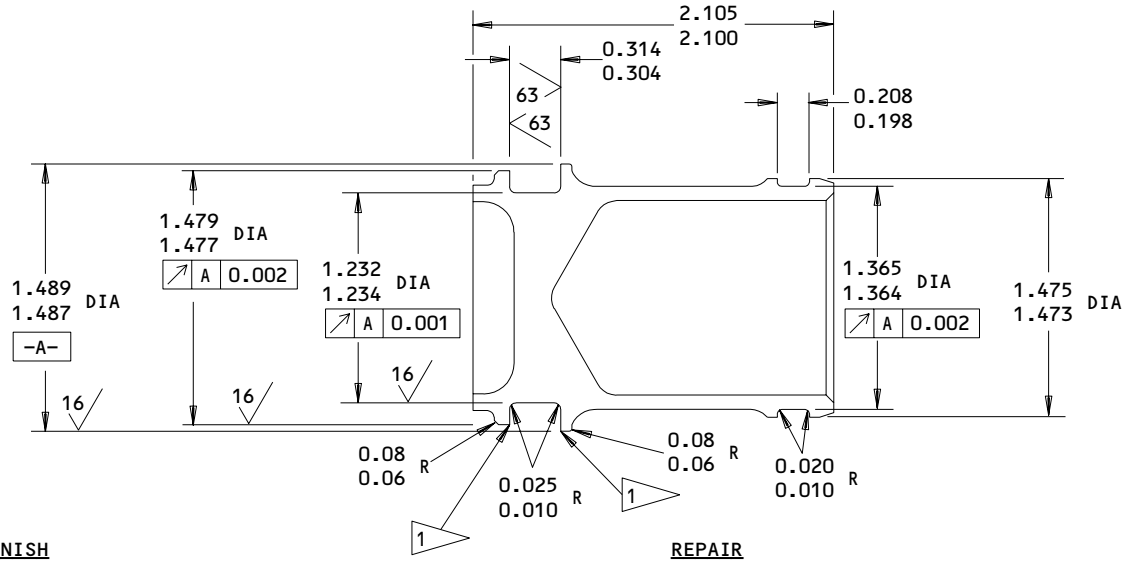
199613

RESERVOIR PISTON - REPAIR 4-1

W315T3804-1, -2

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.



W315T3804-1,-2
Reservoir Piston Repair
Figure 601

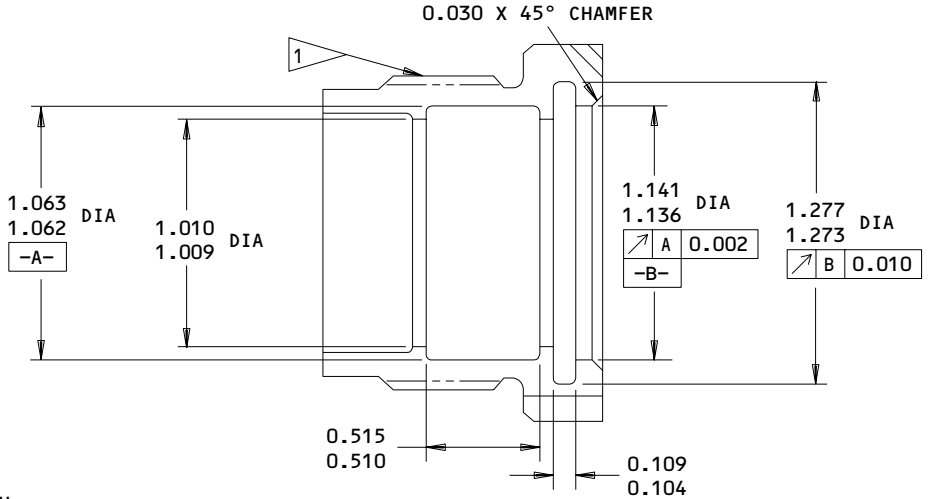
199614

GLAND-REPAIR 5-1

W315T3805-1

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-17.02) AND APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER (F-20.02) EXCEPT AS NOTED

1 OMIT PRIMER FROM THREADS

REPAIR

125 ALL MACHINED SURFACES

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

W315T3805-1

Gland Repair
Figure 601

199615

END CAP ASSEMBLY-REPAIR 6-1

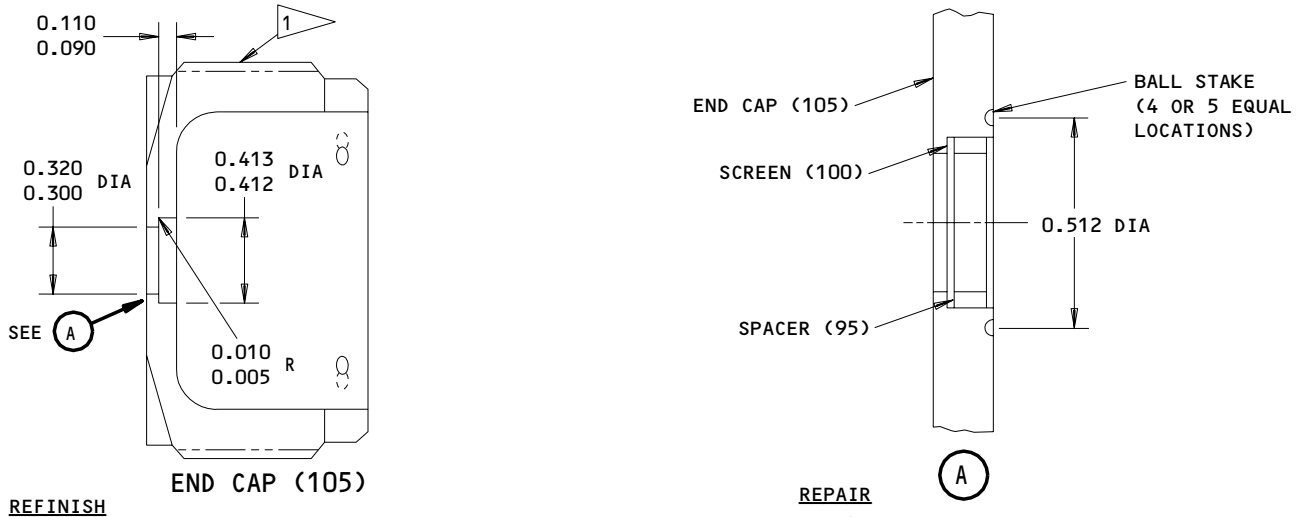
W315T3806-1

1. Screen Replacement (Fig. 601)

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

   A. Remove spacer (95) and screen (100) from end cap (105).

   B. Install new screen (100) and spacer (95) and ball stake end cap (105) four equal places per Fig. 601. Optional ball staking - five equal places.



REFINISH

END CAP (105) ONLY:
CHROMIC ACID ANODIZE (F-17.02) AND APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER EXCEPT AS NOTED

1 OMIT PRIMER FROM THREADS

REPAIR

125 ALL MACHINED SURFACES

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO IPL FIG. 1

W315T3806-1

End Cap Assembly Repair
Figure 601

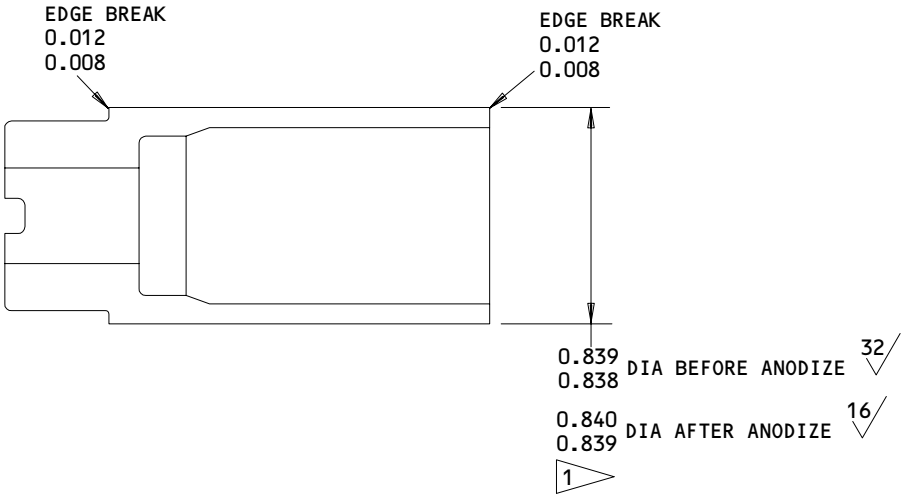
199616

PLUNGER - REPAIR 7-1

W315T3808-1

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

HARD ANODIZE AS NOTED

1 SULFURIC ACID HARD ANODIZE (F-17.06) 0.002-0.003 IN. THICK

2 FLASH HARD ANODIZE ALL OTHER SURFACES 0.0002-0.0004 IN. THICK

REPAIR

125 ALL MACHINED SURFACES EXCEPT AS NOTED

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

W315T3808-1
Plunger Repair
Figure 601

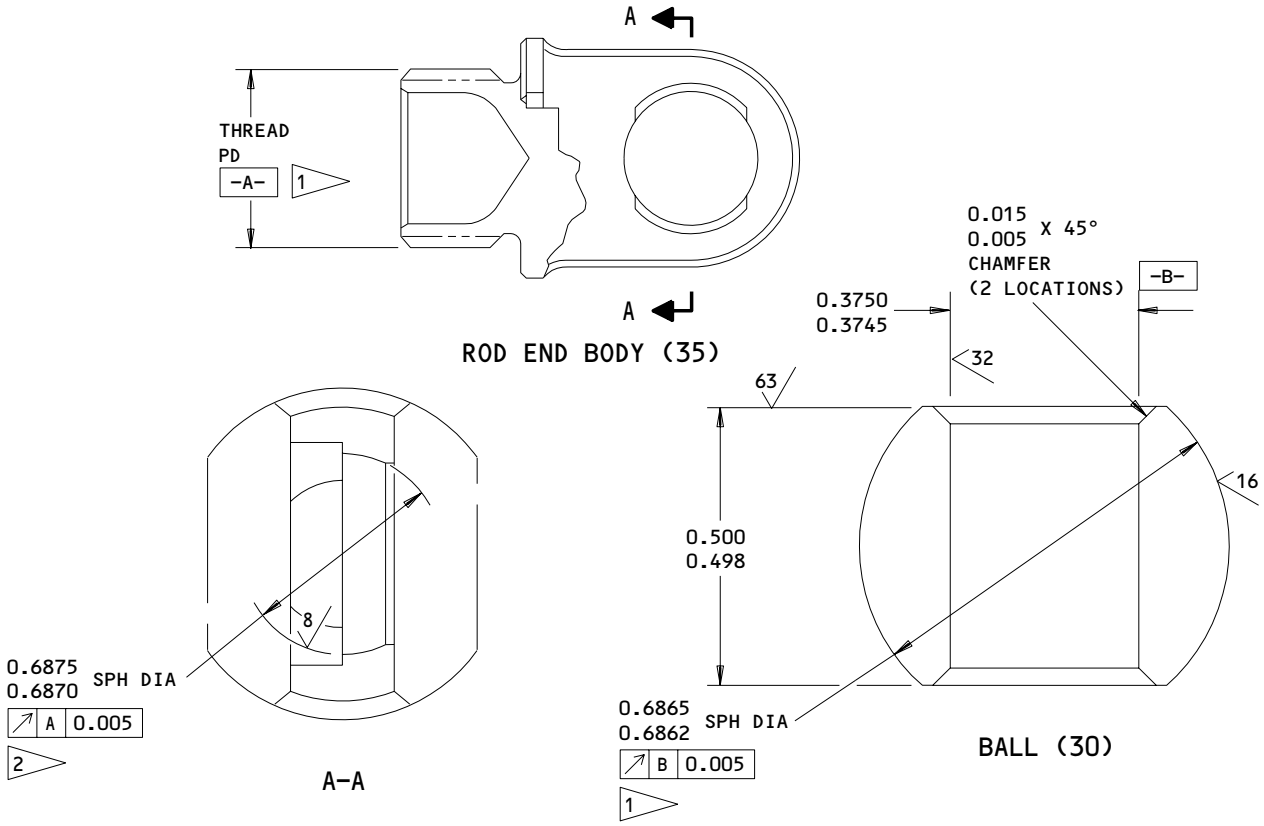
199617

ROD END ASSEMBLY - REPAIR 8-1

W315T3812-1

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

BALL (30): NO FINISH EXCEPT LUBRICATE AS NOTED

BODY (35): PASSIVATE (F-17.09) AND LUBRICATE AS NOTED

1 APPLY DRI-FILM LUBRICANT EVERLUBE 967, 0.0001-0.0003 INCH THICK ON SURFACE INDICATED

REPAIR

125 ON ALL MACHINED SURFACES EXCEPT AS NOTED

2 FINISH OBTAINED BY LAPPING

MATERIAL: BALL (30): STELLITE #6 PER AMS 5387

BODY (35): 15-5PH OR 17-4PH 145-170 KSI

ALL DIMENSIONS ARE IN INCHES

W315T3812-1
Rod End Repair
Figure 601

199618

ACTUATOR ASSEMBLY - REPAIR 9-1

W315T3800-1 thru -6

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

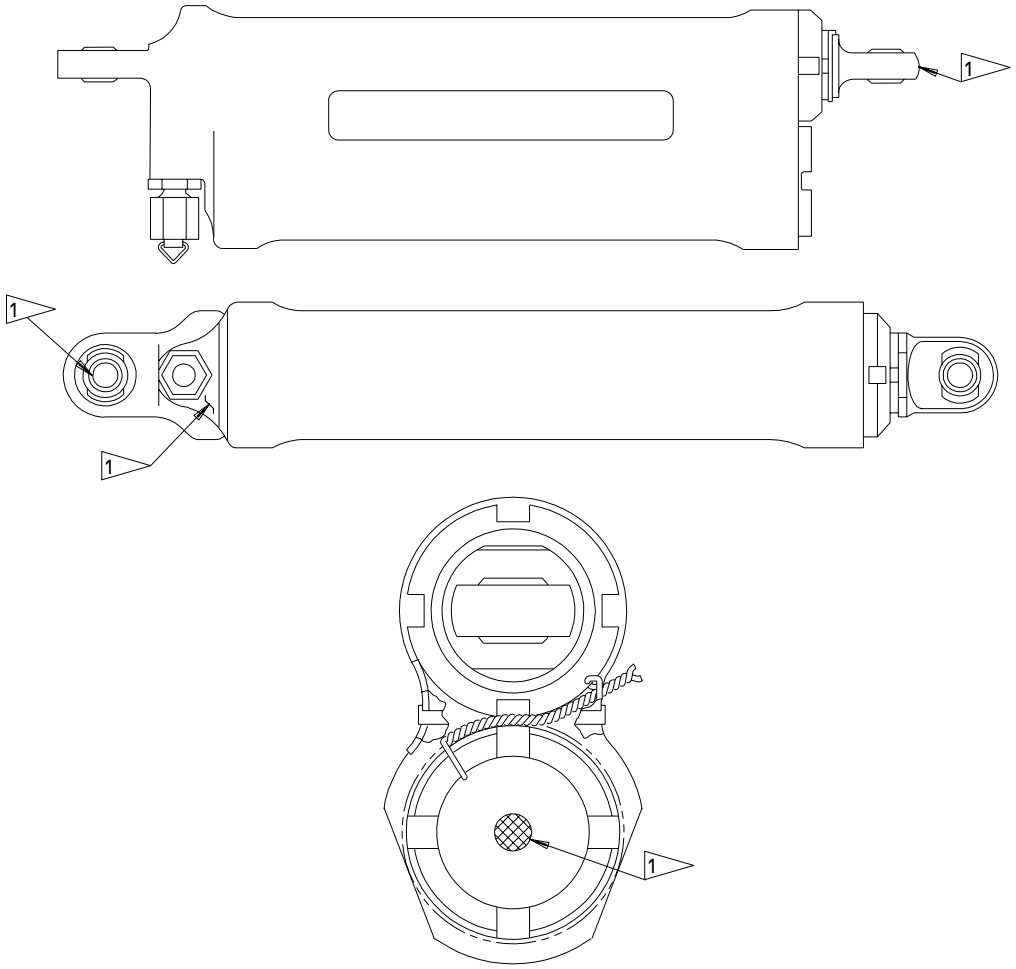
1. Refinish

   A. Actuator Assembly -- Apply one coat of BMS 10-11, type 1, primer and one coat of BMS 10-11, type 2, enamel as indicated in Fig. 601.

2. Nameplate Replacement (IPL Fig. 1)

   A. Form nameplate (155) to body of actuator and bond using type 38 adhesive per 20-50-12.

   B. Install rivets (130A). Driven head diameter to be 0.138-0.160 inch with thickness of 0.04-0.07 inch. Gap of 0.015 inch is acceptable between rivet head and nameplate.



REFINISH

APPLY ONE COAT OF BMS 10-11, TYPE 1, PRIMER (F-20.02) AND ONE COAT OF BMS 10-11, TYPE 2, WHITE ENAMEL EXCEPT AS NOTED

1 OMIT PRIMER AND ENAMEL FROM THIS SURFACE

W315T800-1 Thru -6
Actuator Assembly Repair
Figure 601

MISCELLANEOUS PARTS REFINISH - REPAIR 10-1

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

IPL FIG & ITEM	MATERIAL	FINISH
Fig. 1		
Fitting (16)		Passivate (F-17.09)
Washer (20)	301 or 302 CRES 1/4 Hard	Passivate (F-17.09)
Spring (80)	17-7 PH CRES	Passivate (F-17.09)
Spacer (75,95)	15-5PH CRES 150-170 KSI	Passivate (F-17.09)
Retainer (112H)	Al Alloy	Anodize (F-17.02)
Spring Guide (113)	Al Alloy	Anodize (F-17.02)
Piston Reservoir(114H)	Al Alloy	Anodize (F-17.02)

Refinish Details
Figure 601

ASSEMBLY

1. Materials

NOTE: Equivalent substitutes may be used.

A. Lubricating Oil -- MIL-L-7808 (Ref 20-60-03)

B. Lubricating Oil -- MIL-L-23699 (optional) (Ref 20-60-03)

C. Lubricating Oil -- PWA 521-B (optional) (Ref 20-60-03)

D. Sealant -- BMS 5-95

2. Equipment

NOTE: Equivalent substitutes may be used.

TOOL PART NO.	NOMENCLATURE
A78021-3	Spring Compressor
A78021-4	Cap Wrench
A78021-5	Holding Block Tool
A78021-6	Rod Socket
A78021-7	Piston Retainer
A78021-32	Piston Puller Assembly
A78021-33	Cap Wrench Assembly
A78021-34	Reservoir Sizing Tool
A78021-35	Sizing Tool
A78021-36	Seal Guide
A78021-37	Reservoir seal Slide
A78021-38	Gland Wrench

3. Lubrication

A. Lubricate all O-rings and internal parts at assembly with lubricating oil.

4. Assembly (IPL Fig. 1)

A. For cowl opening actuator assemblies, P/N W315T3800-1 thru -4, assemble as shown in Steps 4.A.(1) thru 4.AD.

(1) Install spacer (75) and spring (80) into plunger (85). Then install plunger (85) into piston (55).

B. Using spring compressor A78021-3, compress spring (80) and install retaining ring (60).

C. Install O-ring (65) and backup rings (70) on the piston (55) head per 20-50-06.

D. Install bearing (77A) and scraper (45) in the inside diameter of gland (40).

E. Slide gland (40) on the piston (55).

F. Install lockwasher (20) on rod end assembly (25).

NOTE: Make sure that the lock feature of the lockwasher (20) faces the end of the piston (55).

G. Thread rod end assembly (25) into end of piston (55).

NOTE: Make sure that the lock feature of the lockwasher (20) engages the notch at the end of the piston (55).

H. With piston (55) and rod end assembly (25) mounted in piston retainer A78021-7, tighten rod end assembly to 275-350 pound-inches using rod socket A78021-6.

I. Bend the lockwasher (20) over flats on rod end assembly (25).

J. Coat both bores in body assembly (135) with lubricating oil.

K. Install piston rod (55) into body assembly (135) and hand tighten gland (40).

L. Mount body assembly (135) in body holding block tool A78021-5 and tighten gland (40) to 700-800 pound-inches using gland wrench, A78021-38.

M. Install O-ring (120) and backup rings (125) on reservoir piston (110) per 20-50-06.

N. Install bearing (115) on reservoir piston (110).

O. Coat the inside of body assembly (135) with MIL-L-7808 fluid.

P. Install reservoir piston (110) in body assembly (135) and push piston until fully bottomed in bore.

Q. Use a 501-pound (Chatillon or equivalent) push-pull gage to measure the running force to move the reservoir piston (110).

R. Record the result on the Functional Test Data Sheet. The force shall be 5 pounds maximum.

S. Install the main piston assembly (55) in the bore and submerge the inlet port in MIL-L-7808 fluid.

T. Eliminate all air from the unit by extending and retracting the main piston (55) and the reservoir piston (110).

U. Ensure all air is bled from the spring cavity by forcing the unit upside down while bleeding.

V. Install the flow control valve to ensure that no air or contamination enters the unit as follows:

(1) For the cowl opening assemblies, P/N W315T3800-1, -2, install the poppet (18) into the body assembly (135 or 135A) as shown in the SOPM 20-50-04.

(a) Install the stop (17) into the body assembly (135 or 135A)

(2) For the cowl opening assemblies, P/N W315T3800-3, -4, install the valve (19H) into the body assembly (135B or 135C) as shown in the SOPM 20-50-04.

W. Install O-ring (10) on fitting assembly (12A) per 20-50-06.

X. Install fitting assembly (12A) in body assembly (135) and tighten to 133-147 pound-inches.

Y. Tighten cap (5) on fitting assembly (12A) finger tight.

Z. Clean out excess fluid in vented side of piston (55) and reservoir piston bores. Tighten gland (40) into body (135) to 700-800 pound-inches using cap wrench A78021-4. Hold body (135) with holding block tool A78021-5.

NOTE: End cap assembly (90) must be installed first in order to install gland (40) when using cap wrench A78021-4.

AA. Apply BMS 5-95 sealant to thread only and screw in end cap assembly (90) and tighten to 1200-1300 pound-inches using the cap wrench A78021-4 or the cap wrench assembly, A78021-33.

AB. Verify that the distance between the actuator rod end bearings is as indicated in Fig. 701.

AC. Do a functional test of the cowl opening actuator assembly as shown in the TESTING AND TROUBLESHOOTING section.

AD. Lockwire gland (40) and end cap assembly (90) using double twist method as shown in Fig. 702.

AE. For cowl opening actuator assemblies, P/N W315T3800-5 and -6, assemble as follows:

(1) Install the spacer (75), the spring (80), the plunger (85), and the retaining ring (60) into the piston (55) as follows:

(a) Install the spacer (75) and the spring (80) into the bore of the plunger (85).

(b) Install the plunger (85) with the spring (80) into the bore of the piston (55). Compress the spring (80) and the plunger (85) with the spring compressor, A78021-3 and install the retaining ring (60).

(c) Use the seal slide, A78021-36 to install the seal (72) in the groove on the piston (55).

(2) Install the gland (40), the lockwasher (20) and rod end assembly (25) as follows:

(a) Install the bearing (77A) and the scraper (45) in the bore of the gland (40).

(b) Slide the gland (40) onto the piston (55).

(c) Install a new lockwasher (20) on the rod end assembly (25).

NOTE: Make sure that the lock feature of the lockwasher (20) faces the end of the piston (55).

(d) With the piston (55) mounted in the piston retainer, A78021-7, tighten the rod end assembly (25) to 275-325 pound-inches with the torque wrench socket, A78021-6.

NOTE: Make sure that the lock feature of the lockwasher (20) engages the notch at the end of the piston (55).

(e) Bend the lockwasher (20) over the flats on the rod end assembly (25).

(3) Install the reservoir piston assembly (111), piston bearing (115), O-ring (120B), and seal (125A) as follows:

(a) Install the o-ring (120B) into the groove on the reservoir piston assembly (111) with the use of the reservoir seal slide, A78021-37 and as shown in the SOPM (20-60-04).

(b) Install the seal (125A) onto the O-ring (120B) as shown in the SOPM (20-60-04).

(c) Install the bearing (115) onto the reservoir piston assembly (111).

(d) Apply a MIL-L-7808 lubricant to the faying surface of the body assembly (135B or 135C) that the reservoir piston assembly (111) will engage.

(e) Install the reservoir piston assembly (111) into the bore of the body assembly (135B or 135C) with the use of the reservoir sizing tool, A78021-34.

(f) Use a 50 pound Chatillon (or equivalent) push-pull force gage to measure the running force required to move the reservoir piston assembly (111). The force shall be a maximum of 5 pounds.

NOTE: Piston puller assembly, A78021-32 can be used to pull out the the reservoir piston assembly (111). The piston puller assembly, A78021-32 threads into the reservoir piston (114H).

(g) Record the results on the Functional Test Data Sheet.

(4) Install the valve (19H) into the body assembly (135B or 135C) as shown in the SOPM 20-50-04.

(5) Install the o-ring (10) on the fitting assembly (12C) as shown in the SOPM 20-50-06.

(6) Install the fitting assembly (12C) in the body assembly (135B or 135C) and tighten to 133-147 pound-inches.

(7) Install the cap (5) finger tight.

(8) Fill the actuator with oil as follows:

(a) Loosen the cap (5) and use the A78021-32 piston puller to push the reservoir piston assembly (111) to the bottom of the body (135B or 135C).

(b) Fill the main cylinder of the body (135B or 135C) to within one inch from the top of the main cylinder.

(c) Install the piston (55) to a depth of one inch which is just to the top of the fluid. Use the sizing tool, A78021-35, to install the piston (55).

(d) Leave the piston (55) in the extended position and turn the unit so that the piston rod assembly (25) points down.

(e) Retract the piston (55) to remove any trapped air.

1) If the oil begins to leak from the fitting assembly (12C) during retraction, use the piston puller assembly, A78021-32 to ensure that the reservoir piston assembly (111) is still at the bottom of the body (135B or 135C), then tighten the cap (5).

2) Complete the retraction of the piston (55) with the cap (5) tightened.

(9) If necessary, tighten the cap (5).

(10) Apply BMS 5-95 sealant only on the threads and instll the gland (40) into the body assembly (135B or 135C). Tighten the gland (40) to a 700-800 pound-inches torque. Use the gland wrench, A78021-38 and the holding block tool, A78021-5.

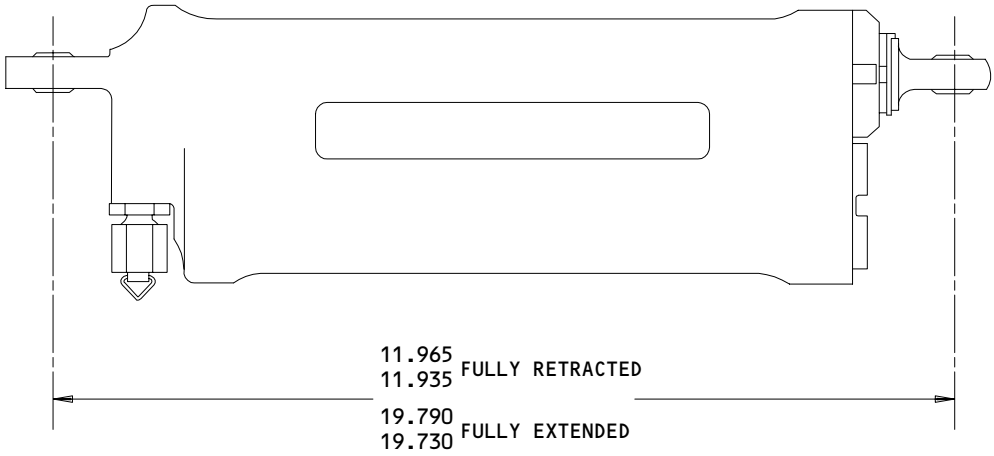
NOTE: The gland (40) must be installed first in order to install the end cap assembly (90) when using the cap wrench, A78021-4.

(11) Apply BMS 5-95 sealant only to the threads of the end cap assembly (90) and install into the body assembly (135B or 135C). Tighten the end cap assembly (90) to 1200-1300 pound-inches with the use of the cap wrench assembly, A78021-33. If necessary, use the holding block tool, A78021-5.

(12) Make sure that the distancee between the actuator rod end bearings are as shown in the Fig. 701.

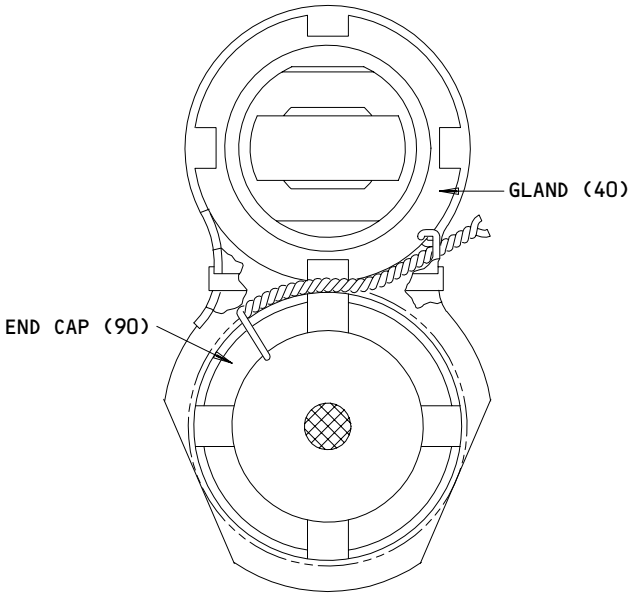
(13) Do a functional test of the cowl opening actuator assembly as shown in the TESTING AND TROUBLESHOOTING section.

(14) Use MS20995NC32 or MS20995N32 lockwire to lockwire the gland (40) and the end cap assembly (90) as shown in Fig. 702. Use the double twist method as shown in the SOPM 20-50-02.



Assembly Details
Figure 701

199703

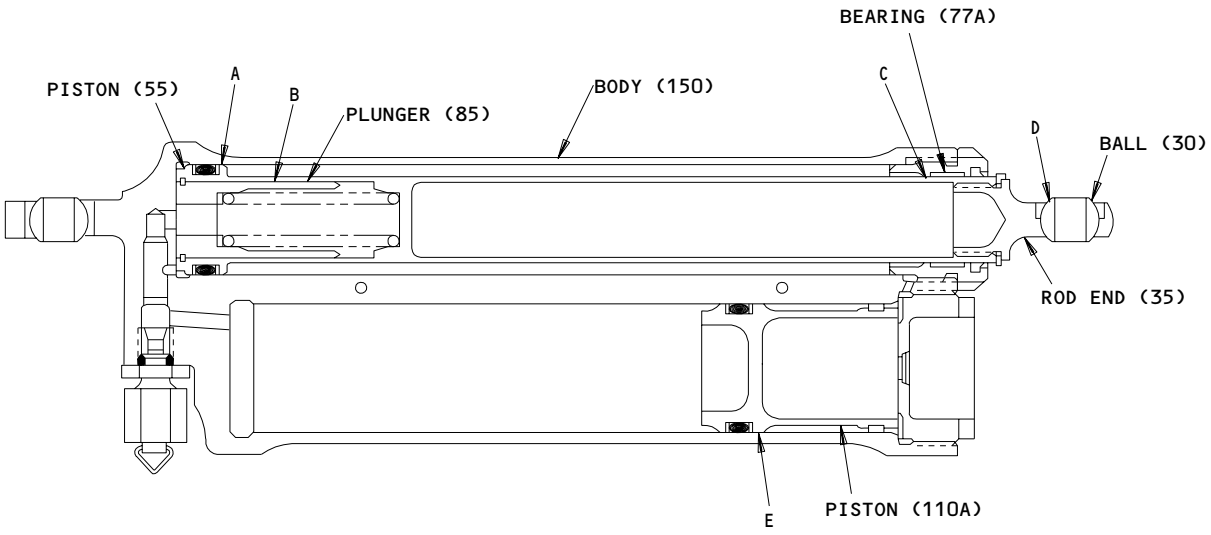


ITEM NUMBERS REFER TO IPL FIG. 1

Lockwire Details
Figure 702

199704

FITS AND CLEARANCES



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 150	1.241	1.243	0.002	0.005	1.241	1.244	0.007
	OD 55	1.238	1.239			1.237	1.239	
B	ID 55	0.842	0.845	0.002	0.006	0.842	0.846	0.008
	OD 85	0.839	0.840			0.837	0.840	
C	ID 77A	0.9995	1.0005	0.0015	0.0045	1	1	0.009
	OD 55	0.996	0.998			0.995	0.998	
D	ID 35	0.6870	0.6875	0.0005	0.0013	0.6870	0.6878	0.0018
	OD 30	0.6862	0.6865			0.6860	0.6868	
E	ID 150	1.491	1.493	0.002	0.006	1.491	1.494	0.008
	OD 110A	1.487	1.489			1.486	1.489	

* ALL DIMENSIONS ARE IN INCHES

1 NOMINAL THICKNESS = 0.03125
REPLACE IF NOMINAL THICKNESS IS
LESS THAN 0.0285 (WEAR LIMIT)

Fits and Clearances
Figure 801

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES	POUND-FEET
12A	FITTING	133-147	
25	ROD END ASSY	275-325	
40	GLAND	700-800	
90	END CAP ASSY	1200-1300	

Torque Table
Figure 802

199710

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

1. A78021-2 -- Actuator Test Fixture
2. A78021-3 -- Spring Compressor
3. A78021-4 -- Cap Wrench
4. A78021-5 -- Holding Block Tool
5. A78021-6 -- Rod Socket
6. A78021-7 -- Piston Retainer
7. A78021-32 -- Piston Puller Assembly
8. A78021-33 -- Cap Wrench Assembly
9. A78021-34 -- Reservoir Sizing Tool
10. A78021-35 -- Sizing Tool
11. A78021-36 -- Seal Slide
12. A78021-37 -- Reservoir Seal Slide
13. A78021-38 -- Gland Wrench

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

10989 MECTRON INDUSTRIES INCORPORATED SUB OF PALL CORP
330 TURNBULL CANYON ROAD PO BOX 3391
CITY OF INDUSTRY, CALIFORNIA 91745-0391

57606 PSI BEARINGS INC
2175 UNION PLACE
SIMI VALLEY, CALIFORNIA 93065

5P779 ALL SEALS INC
404 W ROWLAND AVE
SANTA ANA, CALIFORNIA 92707-3438

72902 GREENE TWEED AND CO. INC.
25 ENGERMAN AVE
DENTON, MARYLAND 21629

80756 SPIROLUX DIV. OF KAYDON CORP.
29 CASSENS STREET
ST. LOUIS, MISSOURI 63026-2542

80756 ASSOCIATED SPRING CORP.
15001 SOUTH BROADWAY PO BOX 231
GARDENA, CALIFORNIA 90248-1819

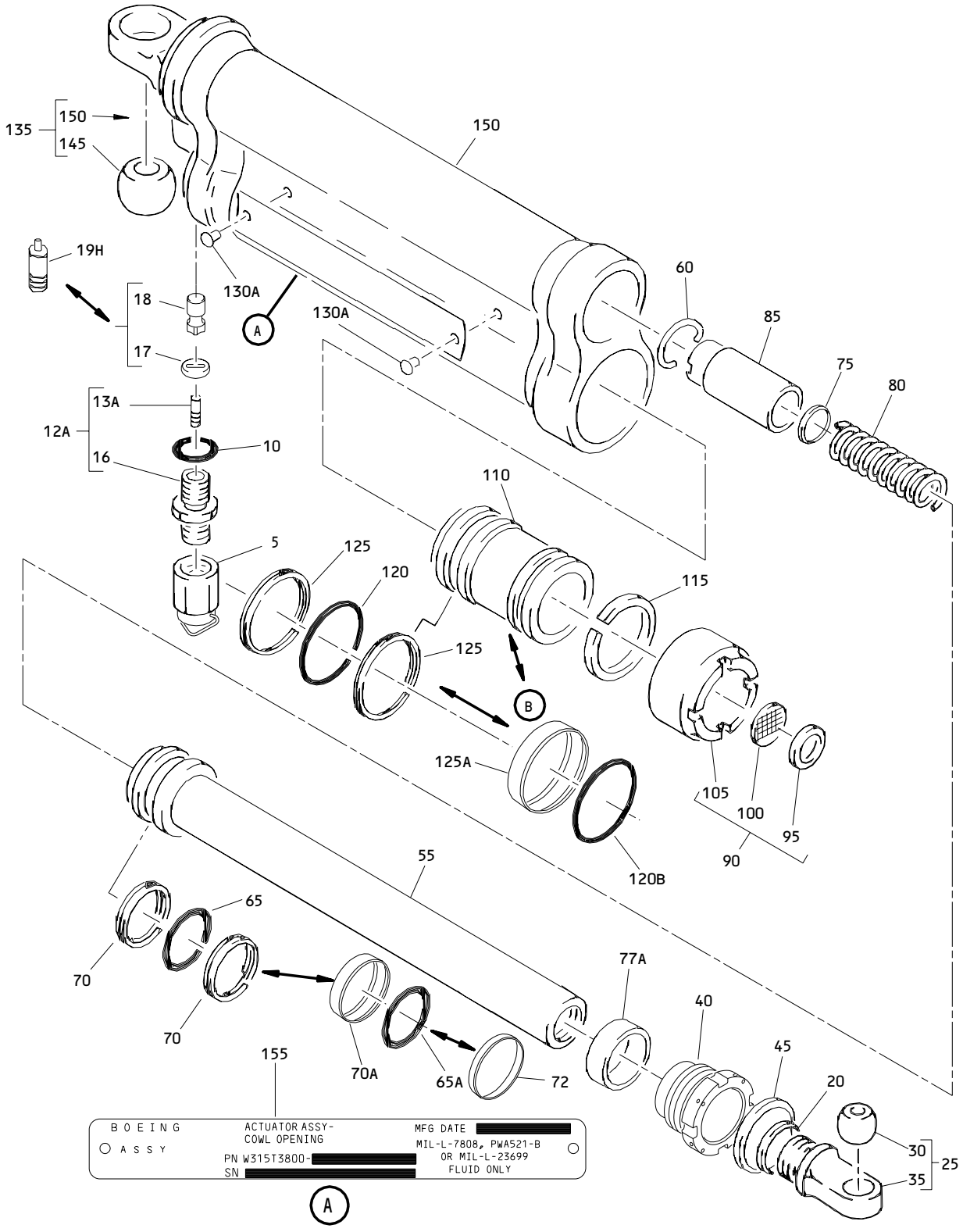
92555 LEE COMPANY
2 PETTIPAUG ROAD
WESTBROOK, CONNECTICUT 06498-1543

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

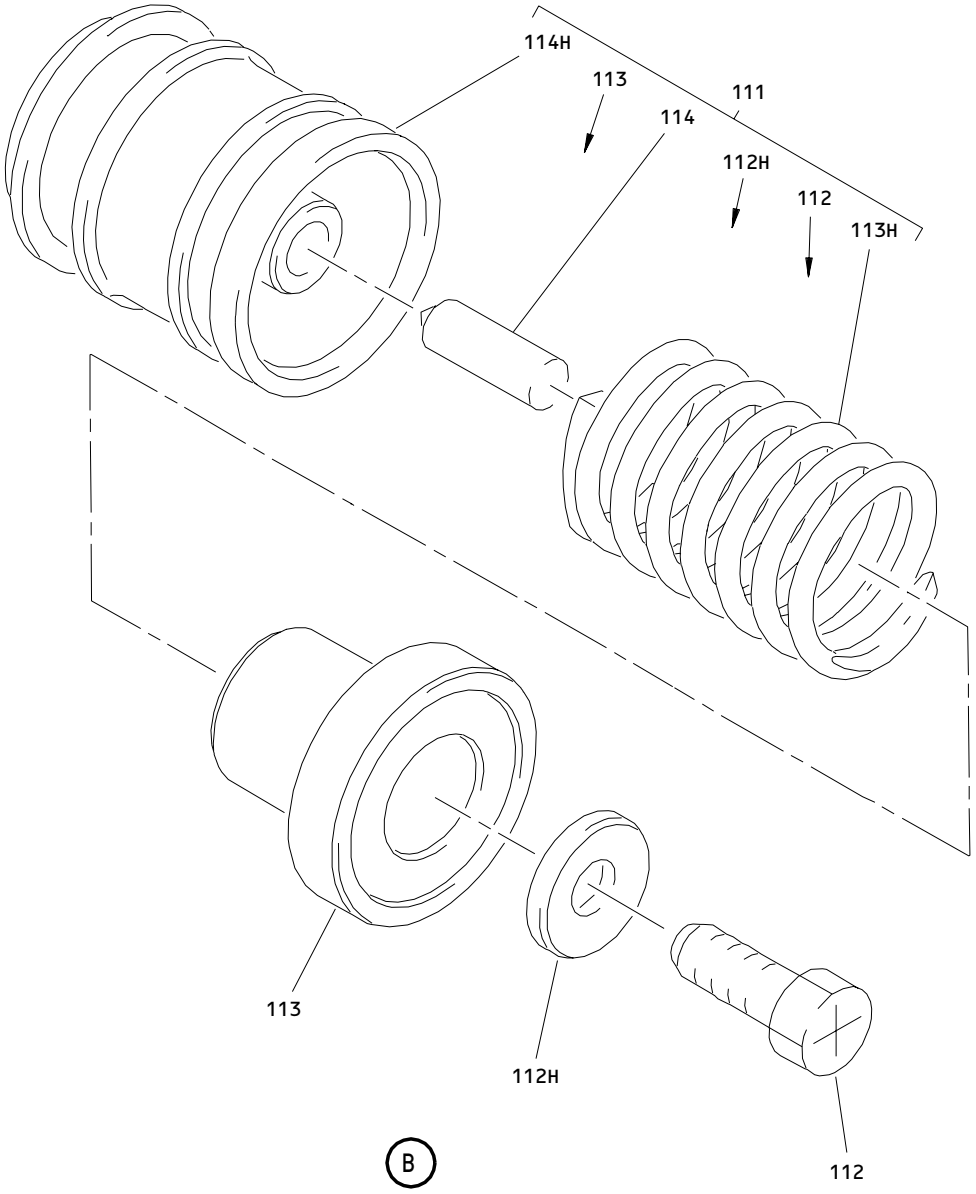
99240 CRISSAIR INC.
38905 10TH STREET EAST
PALMDALE, CALIFORNIA 93550-3415

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
BACS34A9A		1	45	1
BAC27TPP0279		1	155	1
BCREF15355		1	72	1
C1100-125-1750S		1	113H	1
FCFA2810500D		1	19H	1
FSCA1970040A		1	13A	1
FSCX0500750A		1	12B	1
		1	12D	1
MS20470DD4-22		1	130A	2
MS21209F-30P		1	114	1
MS21902J4		1	12E	
MS21914-4D		1	5	1
MS28782-19		1	70	2
MS28782-25		1	125	2
M25988-1-218		1	120B	1
M25988-4-214		1	65A	1
M83485-1-214		1	65	1
M83485-1-218		1	120	1
M83485-1-904		1	10	1
NAS1802-3-9		1	112A	1
NAS1802-3-9P		1	112	1
P23480		1	145	1
RR84		1	60	1
S30662-0214N5		1	70A	1
S30662-0218N99		1	125A	1
S34548-214-08-8		1	77A	1
W315T3800-1		1	1	RF
W315T3800-2		1	1A	RF
W315T3800-3		1	1B	RF
W315T3800-4		1	1C	RF
W315T3800-5		1	1D	RF
W315T3800-6		1	1E	RF
W315T3801-1		1	135	1
W315T3801-2		1	135A	2
W315T3801-3		1	135B	1
W315T3801-4		1	135C	1
W315T3802-1		1	150	1
W315T3802-2		1	150A	1
W315T3802-5		1	150B	1
W315T3802-6		1	150C	1
W315T3803-1		1	55	1
W315T3804-1		1	110	1
W315T3804-2		1	110A	1

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
W315T3805-1		1	40	1
W315T3806-1		1	90	1
W315T3806-2		1	105	1
W315T3807-1		1	80	1
W315T3808-1		1	85	1
W315T3809-1		1	75	1
W315T3809-2		1	95	1
W315T3810-1		1	115	1
W315T3812-1		1	25	1
W315T3812-2		1	35	1
W315T3812-3		1	30	1
W315T3815-1		1	20	1
W315T3816-1		1	18	1
W315T3817-1		1	17	1
W315T3818-2		1	12A	1
		1	12C	1
W315T3818-3		1	16	1
W315T3819-1		1	111	1
W315T3819-2		1	114H	1
W315T3819-3		1	113	1
W315T3819-4		1	112H	1
20001-400-200		1	100	1
296-21400-777-0420		1	72	1
1FA10019-5		1	1F	RF
6F3760		1	19J	1



Cowl Opening Actuator Assembly
Figure 1 (Sheet 1)



Cowl Opening Actuator Assembly
Figure 1 (Sheet 2)

H93784

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	W315T3800-1		ACTUATOR ASSY-COWL OPENING (PRE SB 767-78-0016)	A	RF
-1A	W315T3800-2		ACTUATOR ASSY-COWL OPENING (PRE SB 767-78-0016)	B	RF
-1B	W315T3800-3		ACTUATOR ASSY-COWL OPENING (POST SB 767-78-0016) (PRE SB 747-78-2169R2, SB 767-78-0083, SB 767-78-0043)	C	RF
-1C	W315T3800-4		ACTUATOR ASSY-COWL OPENING (POST SB 767-78-0016) (PRE SB 747-78-2169R2, SB 767-78-0083, SB 767-78-0043)	D	RF
-1D	W315T3800-5		ACTUATOR ASSY-COWL OPENING (POST SB 747-78-2169R2 SB 767-78-0083)	E	RF
-1E	W315T3800-6		ACTUATOR ASSY-COWL OPENING (POST SB 747-78-2169R2, SB 767-78-0083)	F	RF
-1F	1FA10019-5		ACTUATOR ASSY-COWL OPENING (V26437) (SPEC S315T363-5) (POST SB 767-78-0043)	G	RF
5	MS21914-4D		.CAP		1
10	M83485-1-904		.O-RING (V5P779)		1
12A	W315T3818-2		.FITTING ASSY (OPT TO ITEM 12E)	CD	1
-12B	FSCX0500750A		.FITTING ASSY (V92555) (OPT TO ITEM 12E)	CD	1
-12C	W315T3818-2		.FITTING ASSY	AB,FF	1
-12D	FSCX0500750A		.FITTING ASSY (OPT TO ITEM 12C)	AB,FF	1
-12E	MS21902J4		.UNION	CD	1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
13A	FSCA1970040A		..INSERT (V92555) (USED ON ITEMS 12A,12C)		1
15	MS21902J4		DELETED		
16	W315T3818-3		..FITTING (USED ON ITEMS 12A,12C)		1
17	W315T3817-1		.STOP	AB	1
18	W315T3816-1		.POPPET	AB	1
19	MS21902J4		DELETED		
19H	FCFA2810500D		.VALVE (V92555)	C-F	1
19J	6F3760		.VALVE (V99240) (OPT TO ITEM 19H)	C-F	1
20	W315T3815-1		.LOCKWASHER		1
25	W315T3812-1		.ROD END ASSY		1
30	W315T3812-3		..BALL		1
35	W315T3812-2		..BODY		1
40	W315T3805-1		.GLAND		1
45	BACS34A9A		.SCRAPER		1
55	W315T3803-1		.PISTON		1
60	RR84		.RING-RETAINING (V80756)		1
65	M83485-1-214		.O-RING	AB	1
-65A	M25988-4-214		.O-RING (V5P779)	CD	1
70	MS28782-19		..RING-BACK-UP	AB	2
70A	S30662-0214N5		..SEAL (V97820)	CD	1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
72	BCREF15355		.SEAL (V72902) (296-21400-777-0420)	EF	1
75	W315T3809-1		.SPACER		1
77A	S34548-214-08-8		.BEARING- (V97820)		1
80	W315T3807-1		.SPRING		1
85	W315T3808-1		.PLUNGER		1
90	W315T3806-1		.CAP ASSY-END		1
95	W315T3809-2		..SPACER		1
100	20001-400-200		..SCREEN- (V10989)		1
105	W315T3806-2		..CAP		1
110	W315T3804-1		.PISTON-RESERVOIR	AB	1
110A	W315T3804-2		.PISTON-RESERVOIR (PRE SB 747-78-2169R2, SB 767-78-0083R1)	CD	1
111	W315T3819-1		.PISTON ASSY-RESERVOIR (POST SB 747-78-2169R2, SB 767-78-0083R1)	EF	1
112	NAS1802-3-9P		..SCREW		1
-112A	NAS1802-3-9		..SCREW (OPT TO ITEM 112)		1
112H	W315T3819-4		..RETAINER		1
113	W315T3819-3		..GUIDE-SPRING		1
113H	C1100-125-1750S		..SPRING (V83553)		1
114	MS21209F-30P		..INSERT		1
114H	W315T3819-2		..PISTON-RESERVOIR		1
115	W315T3810-1		.BEARING-PISTON		1
120	M83485-1-218		.O-RING	AB	1
120A	M25989/1-218		DELETED		
-120B	M25988-1-218		.O-RING (V5P779)	C-F	1
125	MS28782-25		.RING-BACK-UP	AB	2
125A	S30662-0218N99		.SEAL (V97820)	C-F	1
130A	MS20470DD4-22		.RIVET		2
135	W315T3801-1		.BODY ASSY	A	1
-135A	W315T3801-2		.BODY ASSY	B	2
-135B	W315T3801-3		.BODY ASSY	CE	1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-135C	W315T3801-4		.BODY ASSY	DF	1
145	P23480		..BEARING- (V57606)		1
150	W315T3802-1		..BODY (USED ON W315T3801-1)		1
150A	W315T3802-2		..BODY (USED ON W315T3801-2)		1
-150B	W315T3802-5		..BODY (USED ON W315T3801-3)		1
-150C	W315T3802-6		..BODY (USED ON W315T3801-4)		1
155	BAC27TPP0279		.NAMEPLATE		1