TO: ALL HOLDERS OF MAIN LANDING GEAR RETRACT ACTUATOR ASSEMBLY COMPONENT MAINTENANCE MANUAL 32-32-00

REVISION NO. 25 DATED JUL 01/05

HIGHLIGHTS

All data that was in 767 CMM 32-32-01 is now included in this CMM 32-32-00.

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
501-502	Added clarifications and updated callouts.
REPAIR-GEN	
602	
REPAIR 3-1	
601	
REPAIR 7-1	
601	
701	
1010	Changed the position of the lube fittings on the rod end.

BOEING

COMPONENT
MAINTENANCE MANUAL

MAIN LANDING GEAR RETRACT ACTUATOR ASSEMBLY

PART NUMBER 273T1100-5,-6
273T1102-7,-8

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

T21880

BOEING
COMPONENT
MAINTENANCE MANUAL

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

T21870

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR B10267 PRR VDCT0163 PRR B10950	Oct 10/81 Oct 10/83 Oct 10/83

PAGE	DATE	CODE
32-32-00		
TITLE PAGE		
1	OCT 01/87	01
2	BLANK	
REVISION RECORD		
1	OCT 01/87	01
2	BLANK	
TR & SB RECORD		
1	OCT 01/87	01
2	BLANK	
LIST OF EFFECTIVE PAGES		
*1	JUL 01/05	01
THRU LAST PAGE		
CONTENTS		
1	NOV 01/04	01.1
2	BLANK	
INTRODUCTION		
1	OCT 01/87	01
2	BLANK	
DESCRIPTION & OPERATION		
1	OCT 01/87	01
2	BLANK	
TESTING & TROUBLE SHOOTING		
101	NOV 01/02	01.1
102	MAR 01/96	01.1
103	MAR 01/96	01.1
104	MAR 01/98	01.1
105	MAR 01/98	01.1
106	MAR 01/96	01.1
107	MAR 01/96	01.1
108	MAR 01/96	01.1

PAGE	DATE	CODE
DISASSEMBLY		
301	MAR 01/02	01.1
302	MAR 01/02	01.1
303	MAR 01/02	01.1
304	MAR 01/02	01.1
CHECK		
*501	JUL 01/05	01.1
*502	JUL 01/05	01.1
REPAIR-GENERAL		
601	NOV 01/02	01.101
*602	JUL 01/05	01.1
REPAIR 1-1		
601	SEP 01/95	01.1
602	MAR 01/02	01.1
REPAIR 2-1		
601	SEP 01/95	01.1
602	JUL 01/02	01.1
603	JUL 01/02	01.1
604	BLANK	
REPAIR 3-1		
*601	JUL 01/05	01.1
602	OCT 01/87	01
REPAIR 3-2		
601	NOV 01/02	01.1
602	JUL 01/98	01.101
603	NOV 01/02	01.1
604	JUL 01/98	01.101
REPAIR 4-1		
601	OCT 01/87	01
602	BLANK	
REPAIR 5-1		
601	OCT 01/87	01
602	OCT 01/87	01

* = REVISED, ADDED OR DELETED

PAGE	DATE	CODE
REPAIR 6-1		
601	OCT 01/87	01
602	BLANK	
REPAIR 7-1		
*601	JUL 01/05	01.1
602	BLANK	
REPAIR 8-1		
601	MAR 01/02	01.1
602	BLANK	
REPAIR 10-1		
601	OCT 01/87	01
602	BLANK	
REPAIR 11-1		
601	NOV 01/02	01.1
602	NOV 01/02	01.1
ASSEMBLY		
*701	JUL 01/05	01.1
702	MAR 01/03	01.1
703	JUL 01/01	01.1
704	MAR 01/03	01.1
705	MAR 01/03	01.1
706	NOV 01/03	01.1
707	MAR 01/03	01.1
708	MAR 01/03	01.1
709	MAR 01/03	01.1
710	MAR 01/03	01.1
711	MAR 01/03	01.1
712	NOV 01/03	01.1
713	MAR 01/03	01.1
714	BLANK	
FITS AND CLEARANCES		
801	MAR 01/03	01.1
802	MAR 01/03	01.1
803	MAR 01/03	01.1
804	BLANK	

PAGE	DATE	CODE
SPECIAL TOOLS		
901	MAR 01/02	01.1
902	BLANK	
ILLUSTRATED PARTS LIST		
1001	OCT 01/87	01
1002	OCT 01/87	01
1003	OCT 01/87	01
1004	NOV 01/04	01.1
1005	MAR 01/03	01.1
1006	NOV 01/03	01.1
1007	NOV 01/03	01.101
1008	BLANK	
1009	MAR 01/03	01.1
*1010	JUL 01/05	01.1
1011	MAR 01/03	01.1
1012	NOV 01/04	01.1
1013	NOV 01/03	01.1
1014	MAR 01/03	01.1
1015	NOV 01/03	01.101
1016	NOV 01/03	01.1
1017	MAR 01/03	01.1
1018	MAR 01/03	01.101
1019	MAR 01/03	01.101
1020	BLANK	

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

*[1] Special instructions are not necessary. Use standard industry practices and the instructions in SOPM 20-30-01 and 20-30-03.

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	Mar 12/82
Disassembly	Mar 12/82
Assembly	Mar 12/82

MAIN LANDING GEAR RETRACT ACTUATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The main landing gear retract actuator assembly consists of an internally honed microfinished barrel, piston, head end, and end cap. Internal snubbing limits piston speed during initial and final portions of piston travel. The actuator is double acting with more force during retraction than extension.

2. Operation

   A. The piston extends when pressure is applied to the DN (extend) port. Due to internal snubbing, the piston initially moves slowly, then increases speed when approximately one inch from the fully retracted position. The piston decreases speed when approximately one inch from full extension, where snubbing action occurs until stroke is completed.

   B. The piston starts to retract when pressure is applied to the UP (retract) port. As in extension, the piston moves in snubbed action during the final portion of retraction.

3. Leading Particulars (Approximate)

   Retracted -- 45.23 inches
   Extended -- 69.00 inches
   Stroke (nominal) -- 23.77 inches
   Weight (dry) -- 156 pounds
   (filled) -- 185 pounds
   Operating Fluid -- BMS 3-11, fire resistant hydraulic fluid

TESTING AND TROUBLE SHOOTING

1. Test Equipment and Materials

   NOTE: Equivalent substitutes can be used.

   A. Hydraulic test stand -- pressure controllable 0 - 5450 psi.

   B. A32087-1 -- Holding fixture equipment (includes A32087-2 fixture and A32087-3 pin).

   C. A32045-1 -- Torque Adapter

   D. Hydraulic fluid -- BMS 3-11, filtered to NAS1638 Class 8.

   E. Fittings for:

      (1) MS33649-6 port (0.5625-18 UNJF-3B)

      (2) MS33649-12 port (1.0625-12 UNJ-3B)

      (3) MS33649-16 port (1.3125-12 UNJ-3B)

   F. Assembly Lube -- MCS-352 (Ref 20-60-03)

2. Preparation for Test (Fig. 101)

   A. Do the test at room temperature, 70-90°F, and 13-17 psia atmospheric pressure.

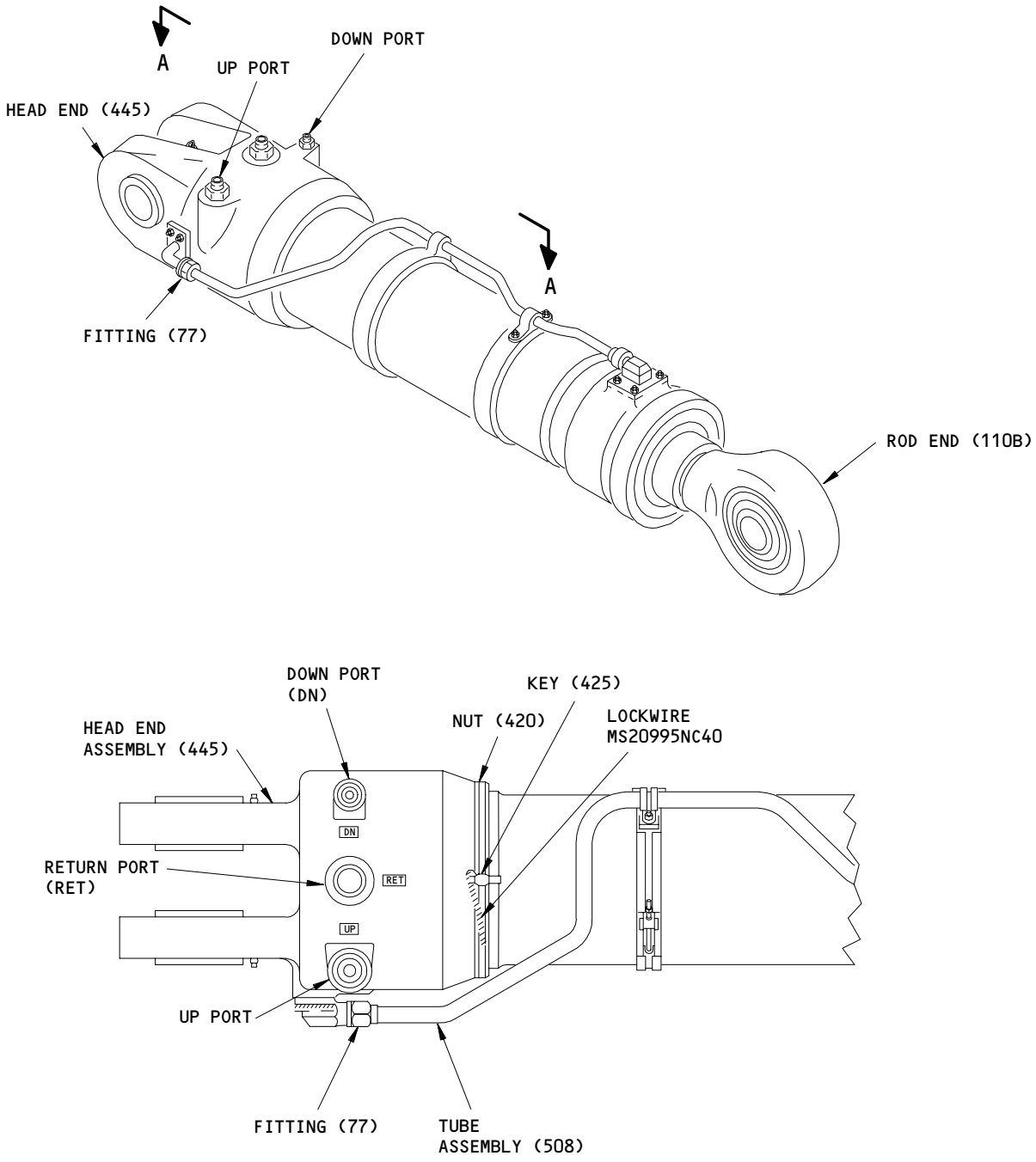
   B. Install actuator in holding fixture A32087-2 with hydraulic ports at the top and hold it with pin A32087-3.

   C. Fill the actuator with hydraulic fluid.

   D. Install test fittings in the hydraulic ports and connect the hydraulic stand to the actuator. Install a cap on the 3/8 inch fitting on fitting (77).

   E. Apply pressure of 900-1100 psi to the UP port and, with torque adapter A32045-1, tighten spanner nut (420) to 400-600 lb-in.

   F. Operate the actuator 10 full stroke cycles at 3000 psi to bleed entrapped air.



A-A

ITEM NUMBERS REFER TO IPL FIG. 1

Actuator Details
Figure 101

F55674

3. Test (Fig. 101)

WARNING: DO NOT APPLY AIR PRESSURE TO PORTS AT ANY TIME.

CAUTION: DO NOT CYCLE UNIT AT PROOF PRESSURE (5400 PSI).

A. External leakage test.

(1) Set test stand to provide 2950-3050 psi and 2 gpm maximum flow at the DN port and 3000 psi and 10 gpm maximum at the UP port. Pressure requirement at the return port is 0-100 psi. Test stand return pressure is 0-50 psi.

(2) Cycle unit 25 complete cycles and measure rod seal leakage. Check that leakage at rod seal (175) does not exceed 1 drop per 25 cycles and there is no external leakage.

NOTE: At static seals, a slight wetting insufficient to form a drop is acceptable.

B. Internal leakage test.

(1) Fully extend piston and attach hose to permit leakage from RET port to measuring device.

(2) Apply 3000 psi to DN port. Check that leakage at RET port does not exceed 12 cc per minute.

(3) Lower pressure at DN port to 50 psi. Check that leakage at RET port does not exceed 12 cc per minute.

(4) Fully retract actuator.

(5) Apply 3000 psi to UP port. Check that leakage at RET port does not exceed 400 cc per minute.

(6) Lower pressure at UP port to 50 psi. Check that leakage at RET port does not exceed 60 cc per minute.

(7) Remove hydraulic pressure and remove tube assembly (50B) from actuator. Cap fitting (77).

(8) Connect hydraulic test stand to fitting (75) at rod end.

(9) Apply 3000 psi to fitting (75) at rod end. Check that leakage at RET port does not exceed 12 cc per minute.

(10) Lower pressure at fitting (75) to 50 psi. Check that leakage at RET port does not exceed 12 cc per minute.

(11) Remove hydraulic pressure and disconnect hydraulic test stand from fitting (75). Install tube assembly (50B).

C. Proof pressure test.

CAUTION: DO NOT CYCLE UNIT AT PROOF PRESSURE.

(1) Slowly apply hydraulic pressure to ports as described in the following steps. Hold the specified pressure for 3 minutes. Check that there is no evidence of external leakage.

(2) Fully extend the actuator.

(a) Apply 5350-5450 psi hydraulic pressure to DN port and no pressure at UP and RET ports.

(b) Apply 3-7 psi hydraulic pressure to the DN port and no pressure at UP and RET ports.

(3) Remove hydraulic pressure and fully retract the actuator.

(a) Apply 5350-5450 psi hydraulic pressure to UP port and no pressure at DN and RET ports.

(b) Apply 3-7 psi hydraulic pressure to UP port and no pressure at DN and RET ports.

(4) Remove hydraulic pressure and fully extend actuator. Apply 3250-3350 psi hydraulic pressure to RET port and no pressure at UP and DN ports.

D. Snubbing test.

(1) Fully retract actuator.

(2) Apply 3000 psi to the DN port. Make sure the piston moves at a constant rate at approximately 1.3 inches from fully retracted position to 1.3 inches from fully extended position. Make sure that deceleration occurs at approximately 1.3 inches from extended position to end of stroke.

NOTE: At 2850-3150 psi pressure, actuator should extend from the fully retracted position to the fully extended position (stop to stop) in 50-70 seconds at 1 gpm.

(3) With the actuator fully extended, apply 3000 psi to the UP port. Make sure the piston moves at a constant rate from the fully extended position to 1.3 inches from the fully retracted position. Make sure that deceleration occurs at approximately 1.3 inches from the retracted position to the end of the stroke.

NOTE: At 2850-3150 psi pressure, actuator should retract from the fully extended position to the fully retracted position (stop to stop) in 28-42 seconds at 5 gpm.

4. Post Test Procedures

A. Disconnect hydraulic lines from actuator. Remove from test fixture.

B. Fill actuator with one pint of BMS 3-11 hydraulic fluid then cap or plug ports. Mark or tag each unit with test date.

C. Install clamps, lockwire, and sealant (refer to ASSEMBLY).

TROUBLE	PROBABLE CAUSE	CORRECTION
External leakage at head end assembly (445)	Spanner nut (420) not tightened properly	Pressurize actuator and tighten spanner nut per par. 3.A.
	Defective seal between head end assy (445) and barrel (440)	Disassemble and replace packing (430) and backup rings (435) per par. 5.C.
External leakage at rod end seal	Seal retainer nut (145) not tightened properly	Tighten seal retainer nut (145) per par 4.B.
	Defective seal (175) at rod end	Disassemble and replace seal (175) per par. 5.D.
External leakage at end cap assy (210)	Defective seal between end cap assy (210) and barrel (440)	Disassemble and replace packing (205) and backup rings (200) per par. 5.E.

Trouble Shooting Chart
Figure 102 (Sheet 1)

TROUBLE	PROBABLE CAUSE	CORRECTION
Too much internal leakage when DN port is pressurized	Defective seals around feed tube (370)	Disassemble and replace packings (320, 335, and 375) and backup rings (325, 340 and 380) per par. 5.F.
Too much internal leakage when UP port is pressurized	Leakage through retract snubber assy (390) or around retract snubber assy (390)	Disassemble and replace valve packing (405) and backup rings (410). Check sleeve (395) and slide (400) for defects and replace per par. 5.I.
	Defective piston seal (305)	Disassemble and replace piston seal (305) per par. 5.J.
Too much internal leakage when fitting (75) at rod end is pressurized	Defective piston seal (305)	Disassemble and replace piston seal (305) per par. 5.J.
Actuator extend time too long and actuator retract time too short	Pressure applied at wrong test port	Make sure correct test port (UP, DN) is used. Make sure ports have correct labels (Fig. 101).
Deceleration does not occur at 1.3 inches from extended position when DN port is pressurized	Defective extend snubber assy (290)	Disassemble and replace extend snubber assy (290) per par. 5.K.
Deceleration does not occur at 1.3 inches from retracted position when UP port is pressurized	Defective retract snubber assy (390)	Disassemble and replace retract snubber assy (390) per par. 5.I.

Trouble Shooting Chart
Figure 102 (Sheet 2)

5. Corrective Procedures

A. Drain hydraulic fluid from actuator before disassembling.

B. Seal retainer nut (145) -- With no hydraulic pressure applied, and with torque adapter A32045-2, tighten retainer nut (145) to 250-300 lb-in.

C. Replacement of packing (430) and backup rings (435).

(1) Disassemble unit per DISASSEMBLY par. 3.A. thru 3.H.(1).

(2) Lubricate parts with assembly lube or hydraulic fluid and install packing (430) and backup rings (435) on head end assembly (445).

(3) Assemble head end assembly per ASSEMBLY par. 3.M.

(4) Test unit per par. 3.

D. Replacement of seal (175).

(1) Disassemble unit per DISASSEMBLY par. 3.B. thru 3.O.(3).

(2) Lubricate packing (170) and seal (175) with assembly lube or hydraulic fluid and install parts.

(3) Assemble parts per ASSEMBLY par. 3.A.(4) thru 3.A.(8), 3.D., thru 3.G., 3.L., 3.M., and 3.N.

(4) Test unit per par. 3.

E. Replacement of packing (205) and backup rings (200).

(1) Disassemble per DISASSEMBLY, par. I. and J.

(2) Lubricate packing (205) and backup rings (200) with assembly lube or hydraulic fluid and slip parts over rod end assembly (110B) and through retainer (185). Install parts on end cap assembly (210).

(3) Install parts per ASSEMBLY par. 3.D., 3.F., 3.G.

(4) Test per par. 3.

F. Packings (320, 335, and 375) and backup rings (325, 340, and 380) replacement.

(1) Disassemble parts per DISASSEMBLY par. 3.A. thru 3.H.(9).

(2) Remove packing (320, 335) and backup rings (325, 340) from gland (330) and remove packing (375) and backup rings (380) from head end assembly (445).

(3) Lubricate packings (320, 335, and 375) and backup rings (325, 340, and 380) with assembly lube or hydraulic fluid.

(4) Install packing (375) and backup rings (380) in head end assembly (445).

(5) Install packings (320, 335) and backup rings (325, 340) in piston end gland (330) and assemble parts per ASSEMBLY par. 3.J. thru 3.M.

(6) Test unit per par. 3.

G. Replacement of packing (405), backup ring (410), and retract snubber assembly (390).

(1) Disassemble head end assembly (445) and remove retract snubber assembly (390) per DISASSEMBLY par. 3.A. thru 3.H.

(2) Check sleeve (395) and slide (400) for defects and replace if required.

(3) Install retract snubber assembly (390), packing (405), and backup ring (410) per ASSEMBLY par. 3.I.

(4) Assemble parts per ASSEMBLY par. 3.J.(3) thru (5), and 3.K. thru 3.M.

(5) Test unit per par. 3.

H. Replacement of seal (305).

(1) Disassemble unit per DISASSEMBLY par. 3.A. thru 3.I.

(2) Install piston seal (305) per ASSEMBLY par. 3.E.

(3) Assemble parts per ASSEMBLY par. 3.F., 3.G. and 3.K.

(4) Test unit per par. 3.

I. Replacement of extend snubber assembly (290).

(1) Completely disassemble unit per DISASSEMBLY.

(2) Replace extend snubber assembly (290) and assemble parts per ASSEMBLY.

(3) Test unit per par. 3.

DISASSEMBLY

NOTE: Refer to TESTING/TROUBLE SHOOTING to find the condition or probable cause of any malfunction and to find out how much disassembly and repair is necessary.

1. Equipment

NOTE: Equivalent substitutes can be used.

A. Torque Adapter -- A32070-1

B. Spanner Wrench -- A32045-1

C. Spanner Wrench -- A32045-2

D. Spanner Wrench -- A32045-3

E. Torque Fixture -- A32050-1

F. Crowfoot Wrench -- F70312-52 (supersedes F70312-42)

G. Rod End Wrench -- A32040-4

2. Parts Replacement (IPL Fig. 1)

NOTE: These parts are recommended for replacement. Actual replacement of other parts can be by in-service experience.

A. Lockwire and locknuts.

B. Packings, backup rings and seals.

C. Piston seal (305).

D. Cup lockwashers and staked screws.

E. Retainer (360).

F. Nameplate (20), strap (70), markers (5, 10, 15).

3. Disassembly (IPL Fig. 1)

A. Remove all lockwire.

B. Remove reducers (500, 510), union (490), packings (495, 505, 515) from actuator.

C. With spanner wrench A32045-1, loosen spanner nut (420). Remove key (425).

NOTE: Piston should be in retract position for removal of parts from feed tube in step H.(6).

D. Remove parts (25 thru 45), loosen coupling nuts on tube (50B), and remove tube from actuator.

E. Remove bolts (80) and fittings (75, 77).

F. Remove gasket (83), packings (85) and backup rings (90).

G. Remove clamps and pads (60, 65).

H. Disassemble head end (445).

CAUTION: BE CAREFUL WHEN THE HEAD END (445) HAS FEED TUBE (370) ATTACHED NOT TO DENT, NICK OR BEND THE FEED TUBE.

(1) Carefully unscrew head end (445) with attached feed tube (370) from barrel (440) sufficiently to gain access to lockwasher (315).

(2) Straighten lock tab on lockwasher (315) and, with crowfoot wrench F70312-52, unscrew gland (330) from piston (310B).

(3) Carefully remove head end (445) with attached feed tube (370) from barrel (440). Remove packings (430, 435).

(4) Remove spanner nut (420) from barrel (440) using spanner wrench A32045-1.

(5) Remove retainer (360) by removing staked screws (365) and remove feed tube (370) from head end (445).

(6) Drill out rivets (355A) and remove guide (350) from feed tube (370). Remove gland (330) and lockwasher (315) from feed tube.

(7) Remove rings (345) from guide (350), remove packings (320, 375), backup rings (325, 380) from gland (330) and remove packings (335, 430) and backup rings (340, 435) from head end (445).

(8) Disassemble retract snubber (390).

(a) Remove nut (385) from head end (445).

CAUTION: RETRACT SNUBBER ASSEMBLY (390) IS A MATCHED SET OF SLEEVE (395) AND SLIDE (400). KEEP THESE TWO PARTS TOGETHER, OR REPLACE THEM ONLY AS A SET, TO BE SURE OF CORRECT OPERATION AFTER ASSEMBLY.

(b) Carefully remove retract snubber (390) out of head end (445). Remove spring (412), spacer (413).

(9) Remove packings (405) and rings (410).

I. Remove piston (310), rod end (110), and end cap (210).

(1) Straighten tabs of lockwashers (100, 105).

(2) Loosen nut (95) and move lockwashers outward.

(3) Hold rod end (110) and loosen piston (310) with rod end wrench A32040-4 and fixture A32050-1.

(4) Unscrew rod end from piston and remove lockwashers (100, 105).

(5) Remove piston (310) from barrel (440).

(6) Remove screws (180) and move retainer (185) away from end cap (210).

(7) Push end cap out of barrel (440) and remove shear rings.

(8) Remove piston seal (305) from piston (310B).

J. Disassemble end cap (210).

(1) Remove packings (205) and backup rings (200).

(2) Remove retainer nut (145) with spanner wrench A32045-2.

(3) Remove scraper (150), retainer (165), seal (175) and bushing (195). Remove packing (160) and backup rings (155) from end cap (210).

(4) Remove check valve (240).

(a) Remove keepers (225) from end cap (210).

(b) Remove check valve (240) and remove packing (235) and backup rings (230) from check valve.

(5) Remove extend snubber (290).

(a) Remove retainer ring (250) and remove retainer (255).

(b) Remove spring (260, 275).

(c) Remove retainer (265).

(d) Remove keeper (245) and, with torque adapter A32070-1, remove nut (270).

CAUTION: EXTEND SNUBBER ASSEMBLY (290) IS A MATCHED SET OF SLEEVE (295) AND SLIDE (300). KEEP THESE TWO PARTS TOGETHER, OR REPLACE THEM ONLY AS A SET, TO BE SURE OF CORRECT OPERATION AFTER ASSEMBLY.

(e) Remove extend snubber (290) from end cap (210).

(f) Remove packings (285) and backup rings (280) from sleeve (295).

CHECK

1. Examine all parts for defects by standard industry practices.
2. Refer to FITS AND CLEARANCES for design dimensions and wear limits.
3. Magnetic particle check (SOPM 20-20-01):
   A. Nuts (95, 145, 385, 420)
   B. Rod end (110B)
   C. Retainers (255, 265)
   D. Sleeves (295, 395)
   E. Slides (300, 400)
   F. Feed tube (370)
   G. Piston (310B)
   H. Barrel (440)
   I. Fittings (75, 77)
   J. Key (425)
   K. Spacer (413)
   L. Spring (260)
   M. Keeper (245)
4. Penetrant check (SOPM 20-20-02):
   A. End cap (210)
   B. Seal retainer (165)
   C. Shear rings (190)
   D. Bushings (195)
   E. Piston end gland (330)

F. Feed tube retainer (360)

G. Head end (485)

H. Nut (270)

5. Spring (260).

A. Compress spring to length of 2.21 inches. The load to do this must be 10.9-13.3 pounds.

B. Compress spring to length of 0.93 inch. The load to do this must be 21.2-25.8 pounds.

6. Spring (275).

A. Compress spring to length of 2.80 inches. The load to do this must be 5.4-6.6 pounds.

REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
273T1103	BARREL	1-1
273T1104	PISTON	2-1
273T1105	HEAD END	3-1, 3-2
273T1109	RETAINER, SEAL	4-1
273T1110	TUBE, FEED	5-1
273T0070	FITTING	6-1
69B80058	FITTING	6-1
- -	MISCELLANEOUS PARTS REFINISH	7-1
BAC27THY0042	NAMEPLATE	8-1
273T1131	SPACER	10-1
273T1107	END CAP	11-1

2. Standard Practices

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

20-00-00 Introduction
20-10-01 Repair and Refinish of High Strength Steel Parts
20-10-02 Machining of Alloy Steel
20-10-04 Grinding of Chrome Plated Parts
20-10-05 Application and Finishing of Thermal Spray Coatings
20-20-02 Penetrant Methods of Examination
20-30-02 Stripping of Protective Finishes
20-41-01 Decoding Table for Boeing Finish Codes
20-42-02 Low Hydrogen Embrittlement Cadmium-Titanium Plating
20-42-03 Hard Chrome Plating
20-42-05 Bright Cadmium Plating
20-42-09 Electrodeposited Nickel Plating
20-43-01 Chromic Acid Anodizing
20-50-03 Bearing and Bushing Replacement
20-50-04 Installation of Permanent Pins and Plugs in Drill Passages
20-50-21 How to Install Nameplate Straps and Seals
20-60-01 Cleaning Materials
20-60-02 Finishing Materials
20-60-04 Miscellaneous Materials
32-00-05 Repair of High-Strength Steel Landing Gear Parts

3. Materials

NOTE: Equivalent substitutes can be used.

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

B. Enamel -- BMS 10-60, gray gloss color 707 (SOPM 20-60-02)

C. Sealant -- BMS 5-45 (Replaces BMS 5-26) (SOPM 20-60-04)

D. Solvent -- Aliphatic naphtha TT-N-95, Type 1 (SOPM 20-60-01)

4. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in applicable repair procedures are shown in SOPM 20-00-00.

BARREL - REPAIR 1-1

273T1103-1, -2

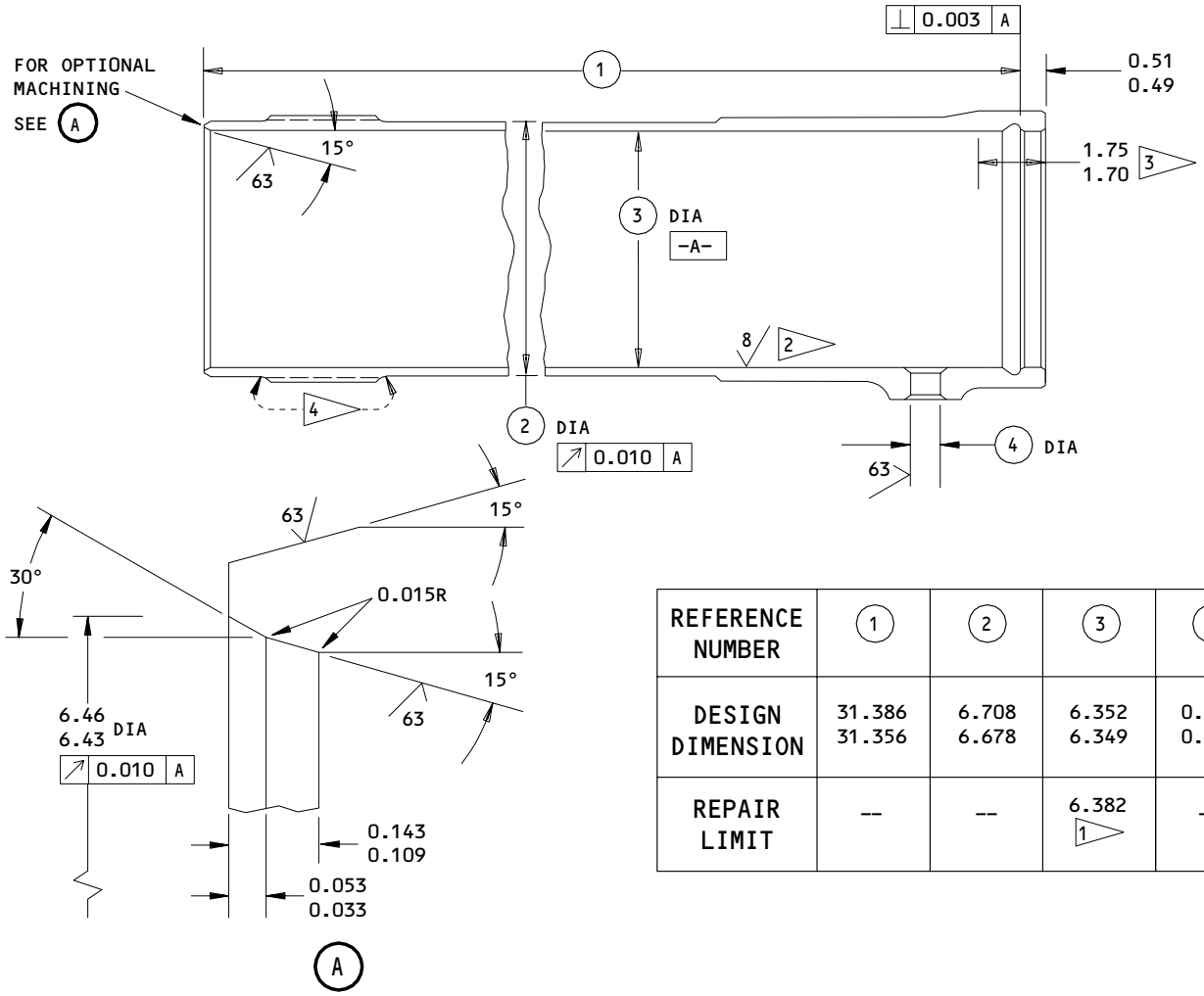
NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which is only replacement of the original finish, refer to Refinish instructions, Fig. 601.

1. Bore Repair (Fig. 601)

CAUTION: IF YOU DO THIS CHROME PLATE REPAIR, YOU MUST NICKEL PLATE THE MATING DIAMETER C ON THE PISTON (REPAIR 2-1).

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

B. Shot peen. Build up with chrome plate. Grind the chrome plate to design dimensions and finish.



REFERENCE NUMBER	1	2	3	4
DESIGN DIMENSION	31.386 31.356	6.708 6.678	6.352 6.349	0.803 0.801
REPAIR LIMIT	--	--	6.382 (1)	--

REFINISH

CADMIUM PLATE AREAS NOTED 3 4 . PASSIVATE (F-17.25, WHICH REPLACES F-17.09) ALL OTHER AREAS.

1 LIMIT FOR BUILDUP WITH CHROME PLATE (REF SOPM 20-42-03) AND GRINDING TO DESIGN DIM AND FINISH

2 8 AFTER SHOT PEENING; 63 OR SMOOTHER, BEFORE

3 CADMIUM PLATE (F-15.02) THIS AREA, 0.0002-0.0004 THICK, IF THE BORE DIAMETER -A- IS NOT CHROME PLATED. IF THE BORE IS CHROME PLATED, EXTEND THE CHROME PLATE ALL THE WAY TO THE GROOVE, AND CADMIUM PLATE FROM THE GROOVE OUT TO THE END.

4 CADMIUM PLATE (F-15.02), 0.0002-0.0004 THICK

REPAIR

REF 1

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES 0.01-0.03R

SHOT PEEN: 0.017-0.046 SHOT SIZE
0.010 A2 INTENSITY

MATERIAL: 15-5PH CRES, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

273T1103-1
Barrel Repair and Refinish
Figure 601

T21871

PISTON - REPAIR 2-1

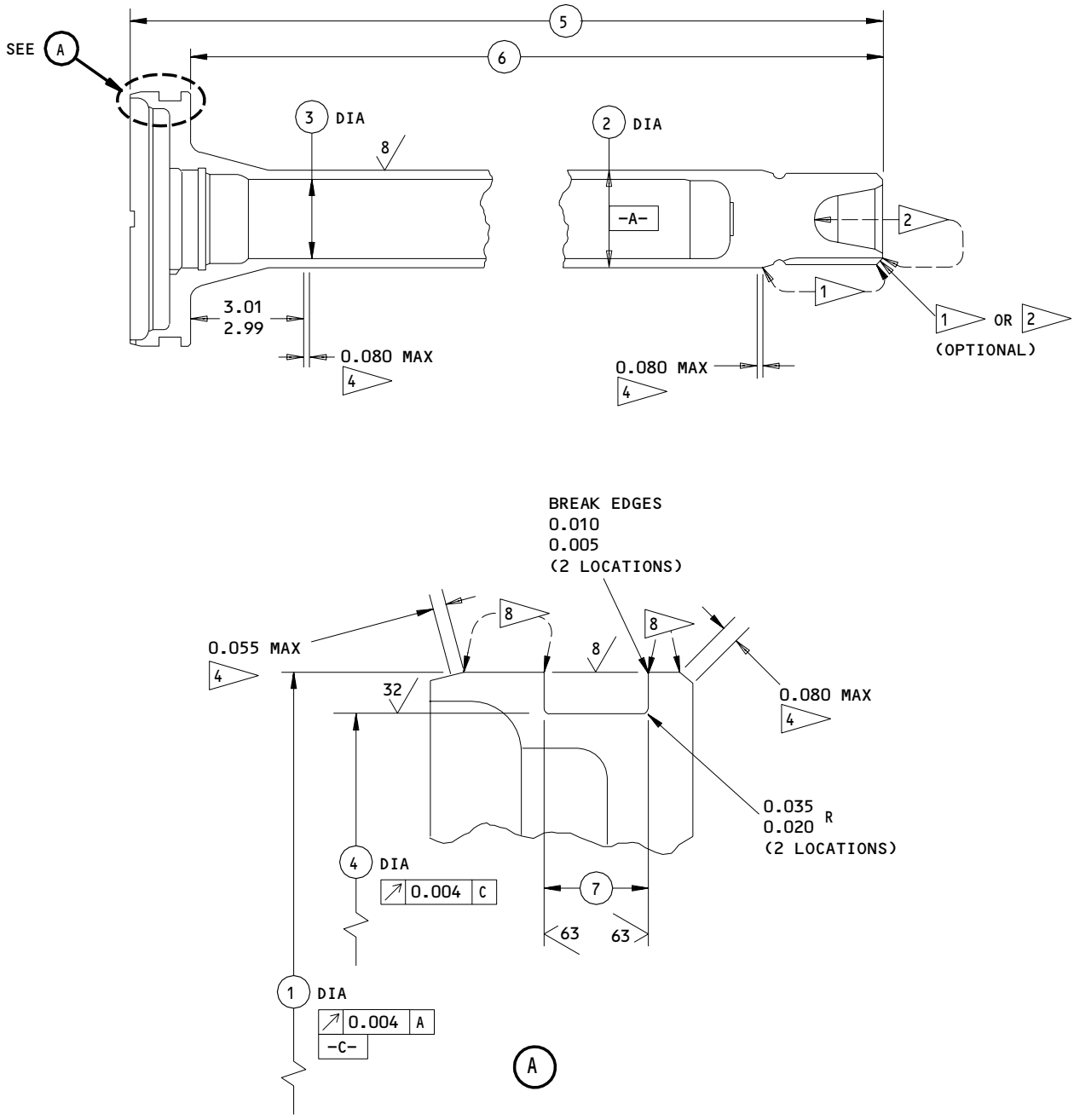
273T1104-3, -4, -5

NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which is only replacement of the original finish, refer to Refinish instructions, Fig. 601.

1. Diameters A, C (Fig. 601)

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

B. Shot peen. Build up with chrome or nickel plate. Grind chrome plate, or machine nickel plate, to design dimensions and finish.



273T1104-3,-4,-5
Piston Repair and Refinish
Figure 601 (Sheet 1)

T21873

REFERENCE NUMBER	(1)	(2)	(3)	(4)	(5)	(6)	(7)
DESIGN DIMENSION	6.345 6.343	2.498 2.496	2.245 2.243	5.872 5.869	34.704 34.674	33.254 33.224	0.589 0.579
REPAIR LIMIT	6.313 ▷6	2.466 ▷7	--	--	--	--	--

REFINISH

CADMIUM-TITANIUM PLATE AREAS AS NOTED ▷1 ▷2. CHROME PLATE (F-15.04) DIA -A- AND -C-, 0.0007 MIN THICK AFTER GRINDING, WITH PLATING RUNOUT AS NOTED ▷4. NO FINISH ON OTHER SURFACES.

▷1 CADMIUM-TITANIUM PLATE (F-15.01), 0.0003 TO 0.0005 THICK. WIPE THE PLATING WITH PRIMER (F-19.45)

▷2 CADMIUM-TITANIUM PLATE (F-15.01)

▷3 DELETED

▷4 PLATING RUNOUT

▷5 DELETED

▷6 LIMIT FOR NICKEL PLATE BUILDUP (REF SOPM 20-42-09) AND MACHINING TO DESIGN DIM AND FINISH

▷7 UNIT FOR CHROME PLATE BUILDUP (REF SOPM 20-42-03) AND GRINDING TO DESIGN DIM AND FINISH

▷8 GLASS BEAD PEEN THIS AREA

REPAIR

REF ▷6 ▷7

63√ ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES 0.01-0.03 R

SHOT PEEN: 0.017-0.046 SHOT SIZE
0.010 A2 INTENSITY

GLASS BEAD PEEN AREAS SHOWN BY ▷8:
0.0049-0.0059 GLASS BEAD SIZE
0.003A-0.006A2 INTENSITY

MATERIAL: 4330M STEEL, 220-240 KSI

ALL DIMENSIONS ARE IN INCHES

273T1104-3,-4,-5
Piston Repair and Refinish
Figure 601 (Sheet 2)

143528

HEAD END ASSEMBLY - REPAIR 3-1

273T1105-1

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

1. Bushing Replacement (Fig. 601)

   A. Remove bushings.

   B. If you find corrosion or damage on lug faces or hole surfaces refer to REPAIR 3-2 for repair instructions.

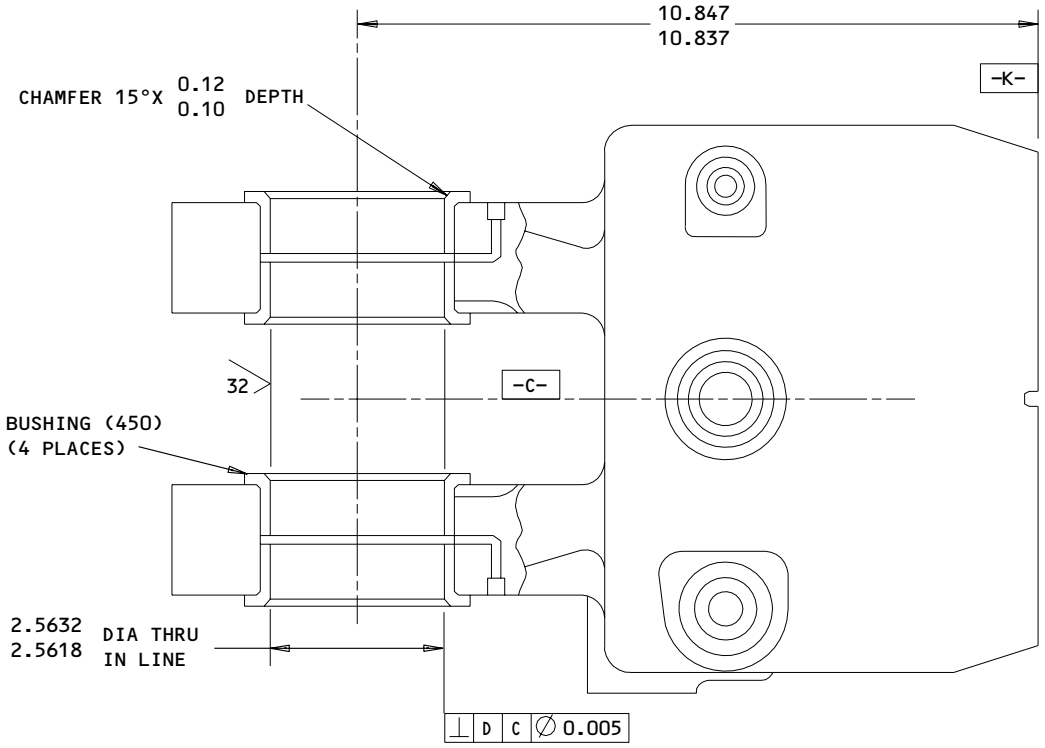
   C. Install replacement bushings by the shrink-fit method, with wet sealant.

   D. Machine the bushings to design dimension and finish.

   E. While the sealant is wet, remove all unwanted sealant from the gap between the bushings and apply grease to the lube fitting to be sure the lube passages are not blocked.

2. Pin and Plug Replacement

   A. Replace defective pins (455, 465) and plugs (460, 470) per SOPM 20-50-04.



ALL DIMENSIONS ARE IN INCHES

273T1105-1

Bushing Replacement
Figure 601

T21874

HEAD END - REPAIR 3-2

273T1105-2

NOTE: Refer to REPAIR - GENERAL for a list of applicable standard practices, and to IPL Fig. 1 for item numbers. For repair of surfaces which is only replacement of the original finish, refer to Refinish instructions, Fig. 601.

1. Lug Faces and Holes (Fig. 601)

   A. Installation of Oversize Bushings

      (1) Machine as necessary, within repair limits, to remove defects.

      (2) Shot peen.

      (3) Chemical treat. Apply primer, BMS 10-11 type 1.

      (4) Make bushings (Fig. 602), as required, to adjust for the amount of material removed in step (1).

      (5) Install bushings per REPAIR 3-1.

2. Seal Groove (Fig. 601)

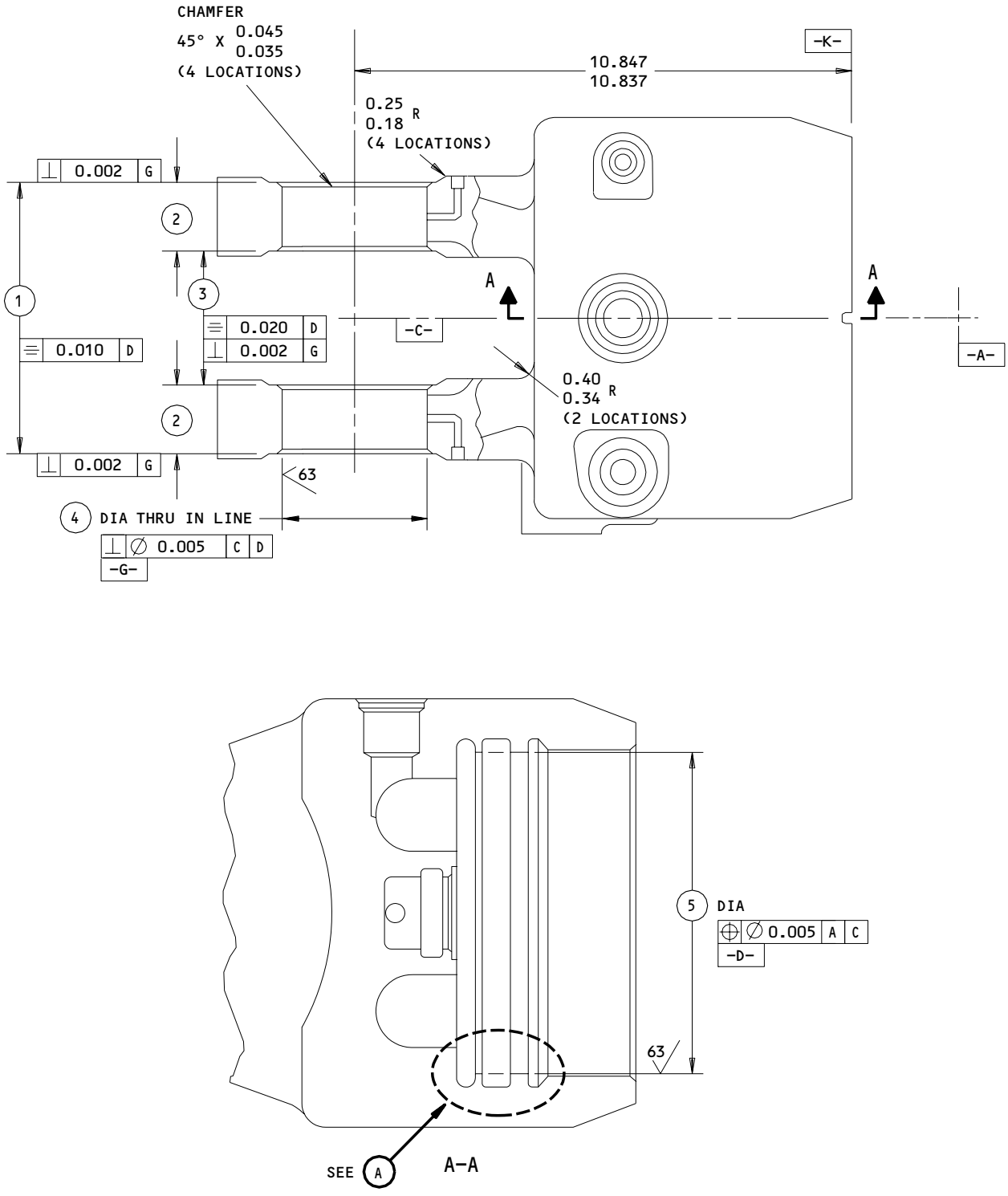
   CAUTION: THE PORES IN THE FLAME SPRAY COATING COULD PERMIT AN INCREASED AMOUNT OF HYDRAULIC FLUID LEAKS.

   A. Machine as necessary, within repair limits, to remove defects.

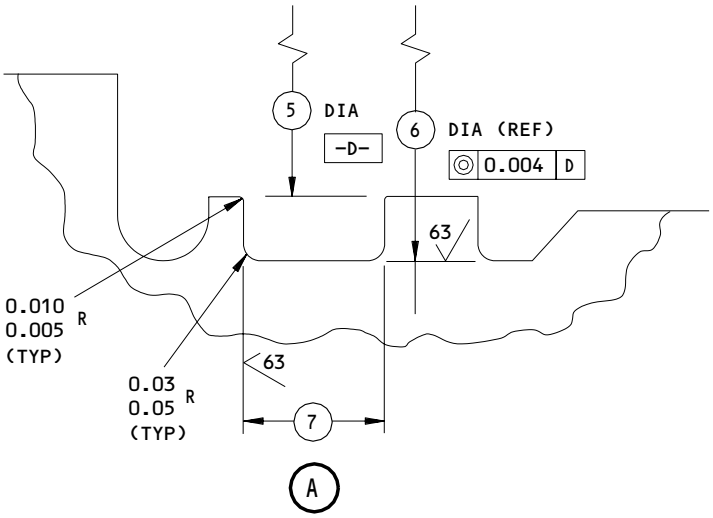
   B. Penetrant examine per SOPM 20-20-02.

   C. Build up with aluminum thermal spray (SOPM 20-10-05).

   D. Machine to design dimensions and finish.



273T1105-2
Head End Repair and Refinish
Figure 601 (Sheet 1)



	1	2	3	4 ▷2	4 ▷3	5	6	7
DESIGN DIM	6.245 6.240	1.740 1.735	2.770 2.765	2.9385 2.9375	2.9425 2.9415	6.754 6.751	7.227 7.224	0.589 0.579
REPAIR LIMIT	--	--	--	2.9425 2.9415 ▷1	2.9495 2.9485 ▷1	--	7.280 ▷4	--

REFINISH

CHROMIC ACID ANODIZE (F-17.04) ALL OVER. APPLY PRIMER, BMS 10-11, TYPE 1 (F-20.02) AND ENAMEL, BMS 10-60 (SRF-14.9813) EXCEPT OMIT PRIMER AND ENAMEL ON BORES AND THREADED AREAS. SEAL PLUGS WITH WET SEALANT BMS 5-26 OR MIL-S-8802

▷1 LIMIT FOR INSTL OF OVERSIZE BUSHING

▷2 FIRST REPAIR OF HOLE

▷3 SECOND REPAIR OF HOLE

▷4 LIMIT FOR BUILDUP WITH AL THERMAL SPRAY, BMS 10-67 TYPE 10, CLASS 2,3 OR 4 (SOPM 20-10-05)

REPAIR

REF ▷1 THRU ▷4

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK SHARP EDGES 0.02-0.03R

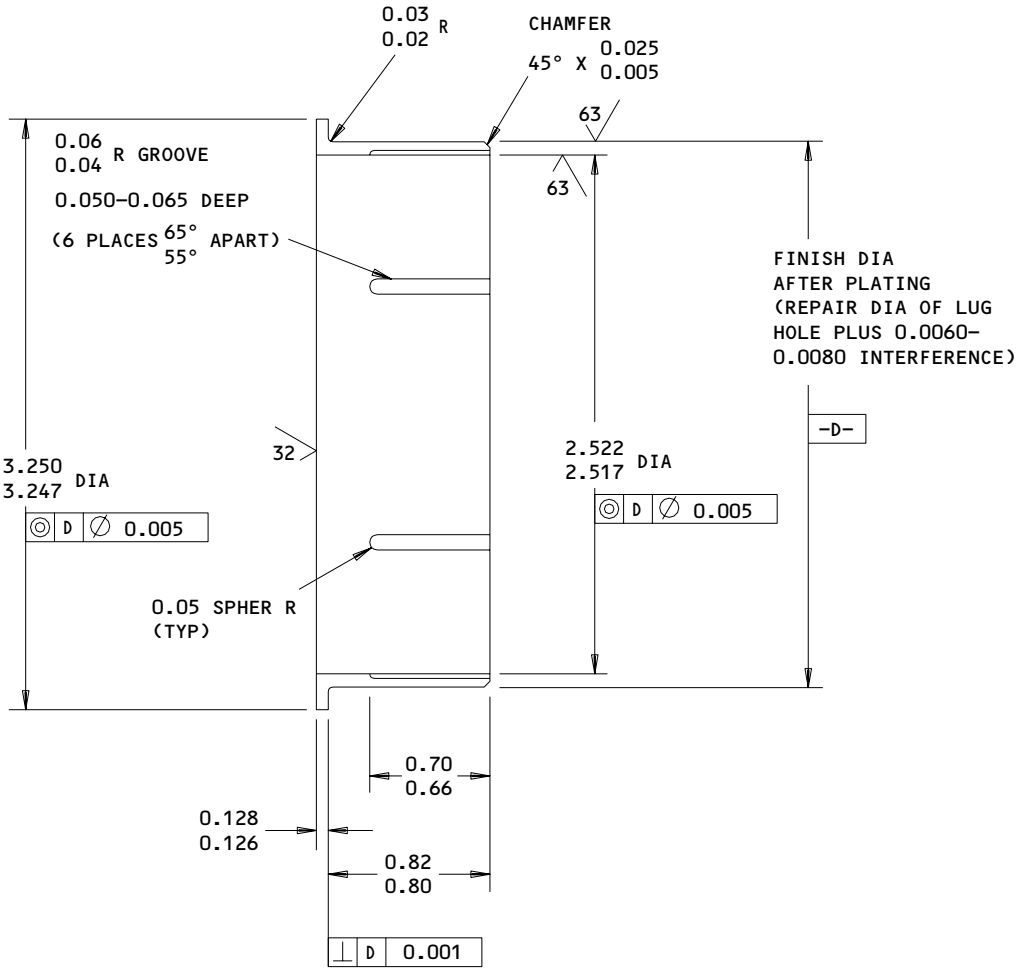
SHOT PEEN: 0.023-0.055 SHOT SIZE
0.010 A2 INTENSITY
DO NOT SHOT PEEN THREADED PORTS OR BORES FOR PLUGS AND INSERTS

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

273T1105-2
Head End Repair and Refinish
Figure 601 (Sheet 2)

143530



HOLE LOCATION (4) FIG. 601 – REPLACES BUSHING (450, IPL FIG. 1) 273T1127-1

125 MACHINED SURFACES EXCEPT AS NOTED

BREAK SHARP EDGES 0.01–0.02R

CADMIUM PLATE (0.0003–0.0005 THICK, F-15.06)
ALL OVER, EXCEPT ON FLANGE FACE AND BUSHING ID

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

ALL DIMENSIONS APPLY AFTER PLATING

ALL DIMENSIONS ARE IN INCHES

Oversize Bushing Details
Figure 602

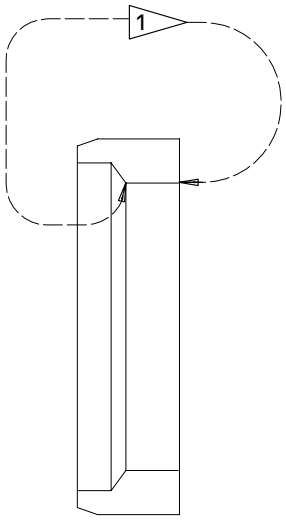
143531

RETAINER, SEAL - REPAIR 4-1

273T1109-1

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

CADMIUM PLATE (F-15.06)
AREA NOTED BY 1

NO FINISH ALL OTHER SURFACES

MATERIAL: AL-NI-BRZ PER AMS 4640

Seal Retainer Refinish
Figure 601

T21876

FEED TUBE - REPAIR 5-1

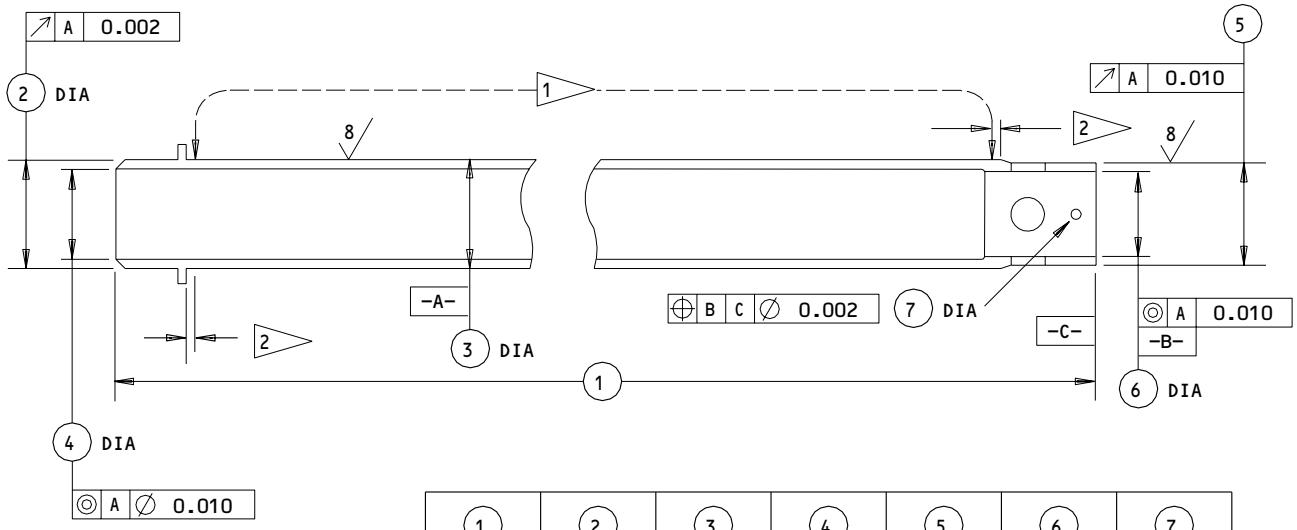
273T1110-1

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

1. Plating Repair (Fig. 601)

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

   B. Shot peen, plate, and grind surfaces noted to design dimensions and finish.



	1	2	3	4	5	6	7
DESIGN DIM	28.37 28.33	1.4980 1.4960	1.4980 1.4960	1.336 1.306	1.450 1.430	1.282 1.280	0.195 0.191
REPAIR LIMIT	———	———	1.4660 (3)	———	———	———	———

REFINISH

CHROME PLATE PER NOTED (1). OBSERVE PLATING RUNOUT AS NOTED

(1) CHROME PLATE (F-15.03), 0.0005-0.0007 THICK. OBSERVE PLATING RUNOUT AS SHOWN

(2) 0.08 MAX PLATING RUNOUT

(3) LIMIT FOR CHROME PLATE BUILDUP AND GRINDING TO DESIGN DIM AND FINISH

REPAIR

REF (3)

125 MACHINE FINISH EXCEPT AS NOTED

BREAK SHARP EDGES 0.02-0.03R

SHOT PEEN: 0.017-0.046 SHOT SIZE
0.010 A2 INTENSITY

MATERIAL: 4340 STEEL, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

273T1110-1

Feed Tube Repair and Refinish
Figure 601

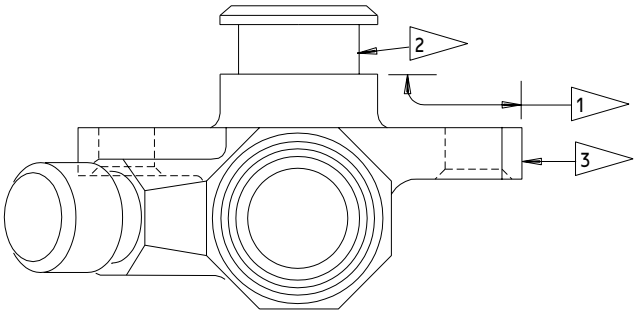
T21877

FITTING - REPAIR 6-1

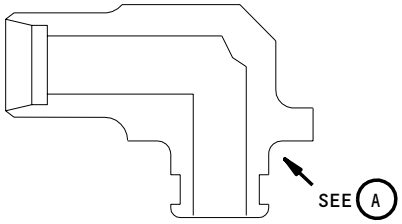
273T0070-1
69B80058-2

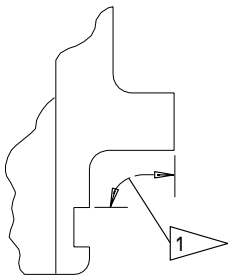
1. Plating Repair

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



273T0070-1





A

69B80058-2

REFINISH

PASSIVATE (F-17.09) ALL OVER AND PLATING AS NOTED

1 CADMIUM PLATE (F-15.02) THESE SURFACES ALL AROUND

2 NO PLATING ALLOWED IN GROOVE (273T0070-1 ONLY)

3 PLATING RUNOUT ALLOWED IN THESE SURFACES ALL AROUND (273T0070-1 ONLY)

MATERIAL: 15-5PH CRES, 180-200 KSI (273T0070-1)
17-4PH CRES, 180-200 KSI (69B80058-2)

Fitting Refinish
Figure 601

T21878

MISCELLANEOUS PARTS REFINISH - REPAIR 7-1

1. Repair of these parts is only replacement of the original finish. Refer to REPAIR - GENERAL for a list of applicable standard practices.

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Nuts (95,145,420)	4340 Steel, 180-200 ksi	Cadmium plate (F-15.02).
Rod End (115)	15-5PH CRES, 180-200 ksi	Cadmium plate (F-16.06) threads. Passivate (F-17.25) other surfaces.
Bearing (120)	Cu-Be	No finish.
Retainers (185, 300)	Al alloy	Chromic acid anodize (F-17.02).
Cap (220)	Al alloy	Chromic acid anodize (F-17.02).
Ring (190)	304 CRES	Cadmium plate (F-15.02).
Ring (250)	CRES wire	Passivate (F-17.25, which replaces F-17.09).
Guide (350)	Al alloy	Chromic acid anodize (F-17.02).
Key (425)	15-5PH CRES, 150-170 ksi	Cadmium plate (F-15.06). Optional: Cadmium-titanium plate (F-15.01)

Refinish Details
Figure 601

NAMEPLATE - REPAIR 8-1

BAC27THY0042

1. Nameplate Replacement (Fig. 601)

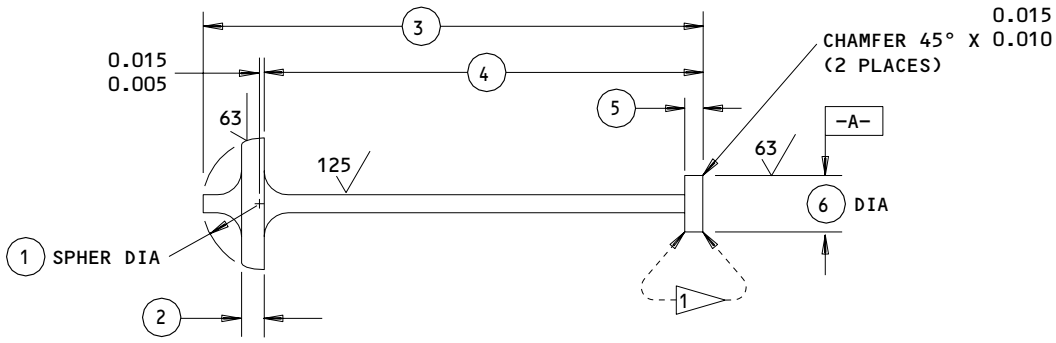
A. Install a replacement nameplate (20) with a new strap (70) per SOPM 20-50-21.

SPACER - REPAIR 10-1

273T1131-1

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.



	1	2	3	4	5	6
DESIGN DIM	1.054 1.049	0.215 0.205	4.210 4.200	3.675 3.655	0.14 0.12	0.448 0.446
REPAIR LIMIT	____	____	____	____	____	____

REFINISH

CHROME PLATE DIA -A- PER 1. NO FINISH ON OTHER SURFACES

1. CHROME PLATE (F-15.34 OR F-15.04), 0.0005-0.0010 THICK. NO GRINDING ALLOWED; HAND HONE WITH 280 GRIT OR FINER ABRASIVE PAPER TO REMOVE SHARP EDGES

REPAIR

(SAME AS REFINISH)

MATERIAL: 4330M STEEL, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

273T1131-1

Spacer Refinish
Figure 601

100710

END CAP ASSEMBLY - REPAIR 11-1

273T1107-1, -3

NOTE: Refer to REPAIR-GENERAL for a list of applicable standard practices , and to IPL Fig. 1 for item numbers. For repair of surfaces which is only replacement of the original finish, refer to Refinish instructions, Fig. 601.

1. Insert Replacement

   A. Remove defective inserts (215).

   B. Install replacement inserts with wet BMS 10-11, Type 1 primer, 3/4 to 1-1/2 turns below the surface of the cap. Remove the tangs.

2. Seal Groove (Fig. 601)

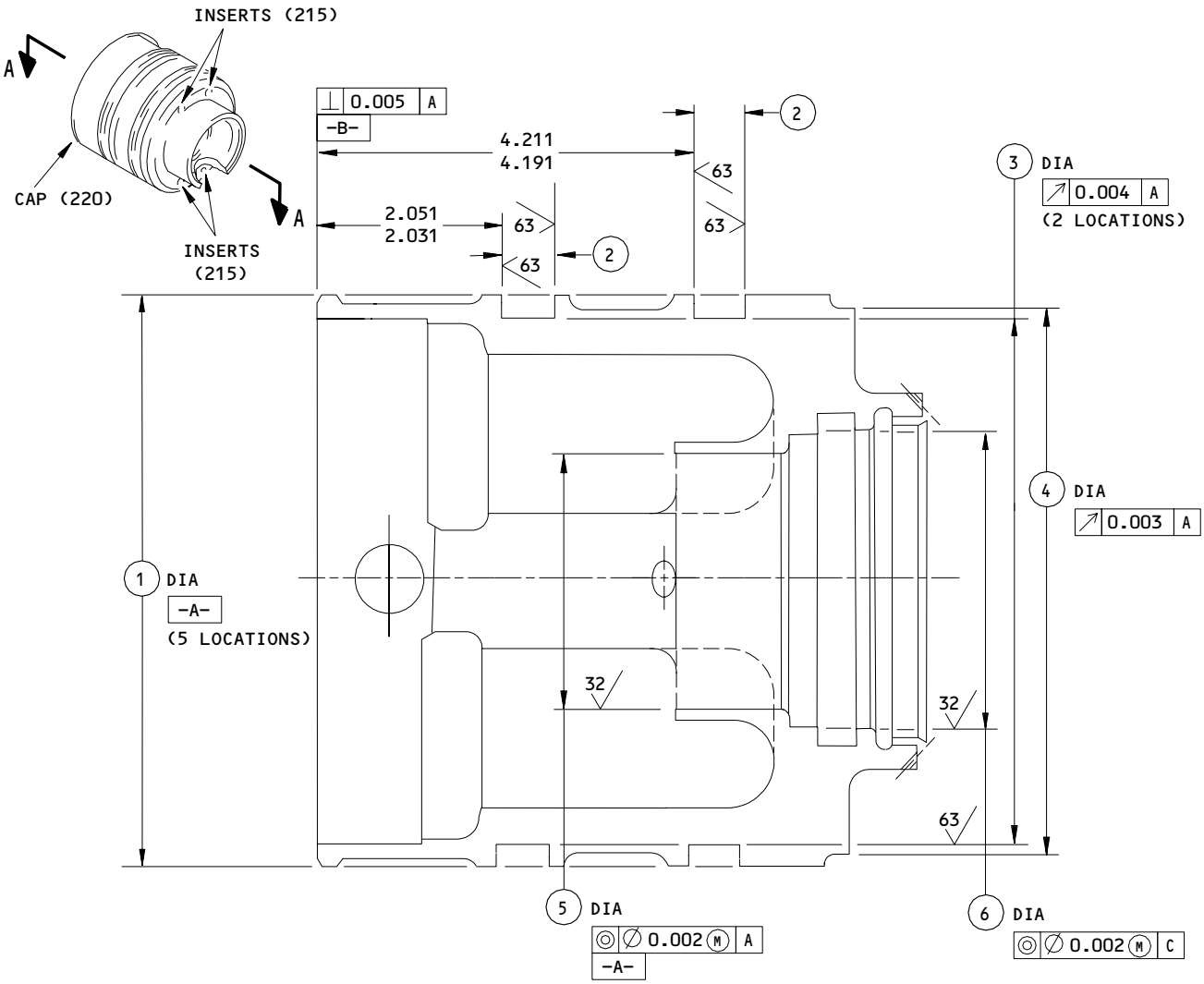
   CAUTION: THE PORES IN THE FLAME SPRAY COATING COULD PERMIT AN INCREASED AMOUNT OF HYDRAULIC FLUID LEAKS.

   A. Machine as necessary, within repair limits, to remove defects.

   B. Penetrant examine per SOPM 20-20-02.

   C. Build up with aluminum thermal spray (SOPM 20-10-05).

   D. Machine to design dimensions and finish.



	1	2	3	4	5	6
DESIGN DIM	6.345 6.343	0.589 0.579	5.872 5.869	6.026 6.023	2.8051 2.8036	3.252 3.250
REPAIR LIMIT	--	--	5.852 <1>	--	--	--

REFINISH

CAP (220): CHROMIC ACID ANODIZE (F-17.02).

<1> LIMIT FOR BUILDUP WITH AL THERMAL SPRAY, BMS 10-67 TYPE 10, CLASS 2,3 OR 4 (SOPM 20-10-05)

REPAIR

REF <1>

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: AL ALLOY

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

273T1107-1,-3
End Cap Repair and Refinish
Figure 601

G52321

ASSEMBLY

1. Materials

NOTE: Equivalent substitutes can be used.

A. Solvent -- TT-N-95 Aliphatic Naphtha (SOPM 20-60-01)

B. Sealant -- BMS 5-45 (Replaces BMS 5-26) (SOPM 20-60-04)

C. Corrosion Preventive Compound -- BMS 3-38 (SOPM 20-60-02).

D. Assembly Lube -- MCS-352 (SOPM 20-60-03)

E. Hydraulic Fluid -- BMS 3-11 (SOPM 20-60-03)

F. Enamel -- BMS 10-60 (SOPM 20-60-02)

G. Lockwire -- MS20995NC32 (MS20995N32 optional) (SOPM 20-60-04)

H. Lockwire -- MS20995NC40 (MS20995N40 optional) (SOPM 20-60-04)

2. Equipment

NOTE: Equivalent substitutes can be used.

A. Torque Adapter -- A32070-1

B. Spanner Wrench -- A32045-1

C. Spanner Wrench -- A32045-2

D. Spanner Wrench -- A32045-3

E. Rod End Wrench -- A32040-4

F. Crowfoot Wrench -- F70312-52 (supersedes F70312-42)

G. Torque Fixture -- A32050-1

3. Assembly (IPL Fig. 1.)

CAUTION: IN UNREPAIRED CONFIGURATIONS, THE CYLINDER ID IS NOT PLATED, AND THE MATING PISTON OD IS CHROME PLATED. IN SOME REPAIRED CONFIGURATIONS, THE CYLINDER ID IS CHROME PLATED AND THE MATING PISTON OD IS NICKEL PLATED OR IS NOT PLATED. A CHROME PLATED CYLINDER MUST NOT BE USED WITH A CHROME PLATED PISTON. FOR REPAIRED CONFIGURATIONS, A NICKEL PLATED PISTON CAN BE USED WITH A CHROME PLATED CYLINDER.

A. Assemble end cap (210) (Fig. 701):

(1) Install bushing (195).

(2) Lubricate packing (160) and backup rings (155) with assembly lube or hydraulic fluid and install parts in end cap (210).

(3) Lubricate seal (175) with assembly lube or hydraulic fluid and install in seal retainer (165).

(4) Install seal retainer (165) in end cap with seal (175) against bushing (195).

(5) Install scraper (150) in notch in seal retainer nut (145) with notched side against seal retainer nut.

(6) Install seal retainer nut (145) finger-tight. Apply sealant to threads at installation.

NOTE: Nut (145) will be tightened to final torque later.

(7) Lubricate packings (205) and backup rings (200) with assembly lube or hydraulic fluid and install these parts in the end cap.

B. Install check valve (240) (Fig. 701).

(1) Lubricate packings (235) and backup rings (230) with assembly lube or hydraulic fluid and install parts in check valve (240).

(2) Install check valve (240) in end cap with packing side in first and install keepers (225).

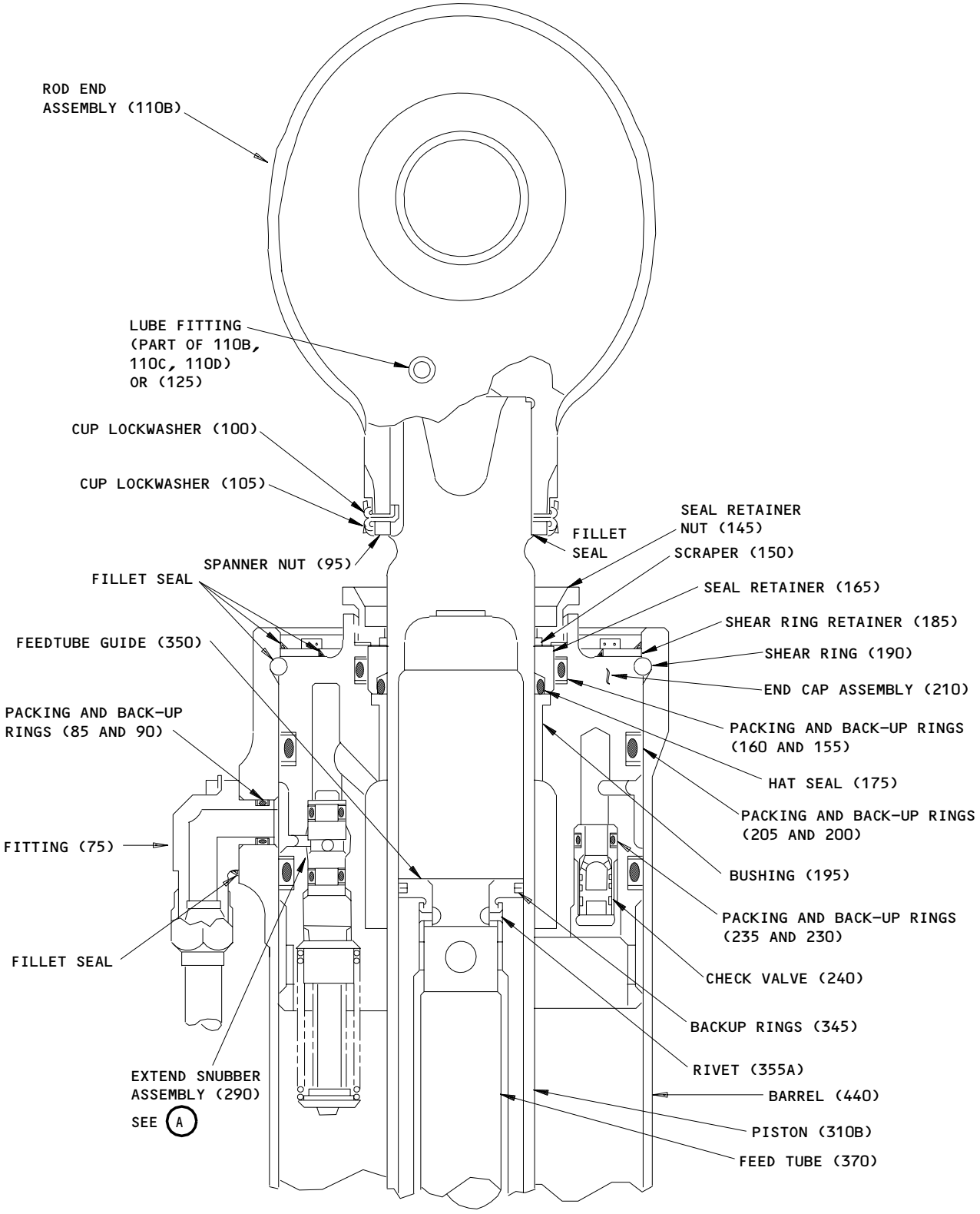
C. Install extend snubber (290) (Fig. 701).

CAUTION: SLEEVE (295) AND SLIDE (300) ARE MATCHED PARTS AND MUST BE KEPT TOGETHER.

(1) Lubricate parts with assembly lube or hydraulic fluid and install packings (285) and backup rings (280) in sleeve (295).

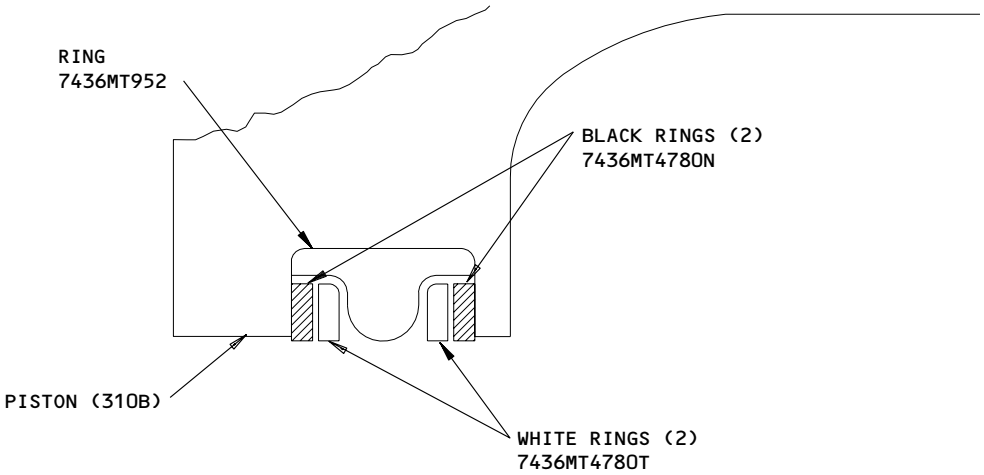
(2) Carefully install extend snubber (290) in end cap (210) with slide (300) in sleeve (295).

(3) Lubricate the internal threads of end cap (210) with assembly lube or hydraulic fluid.



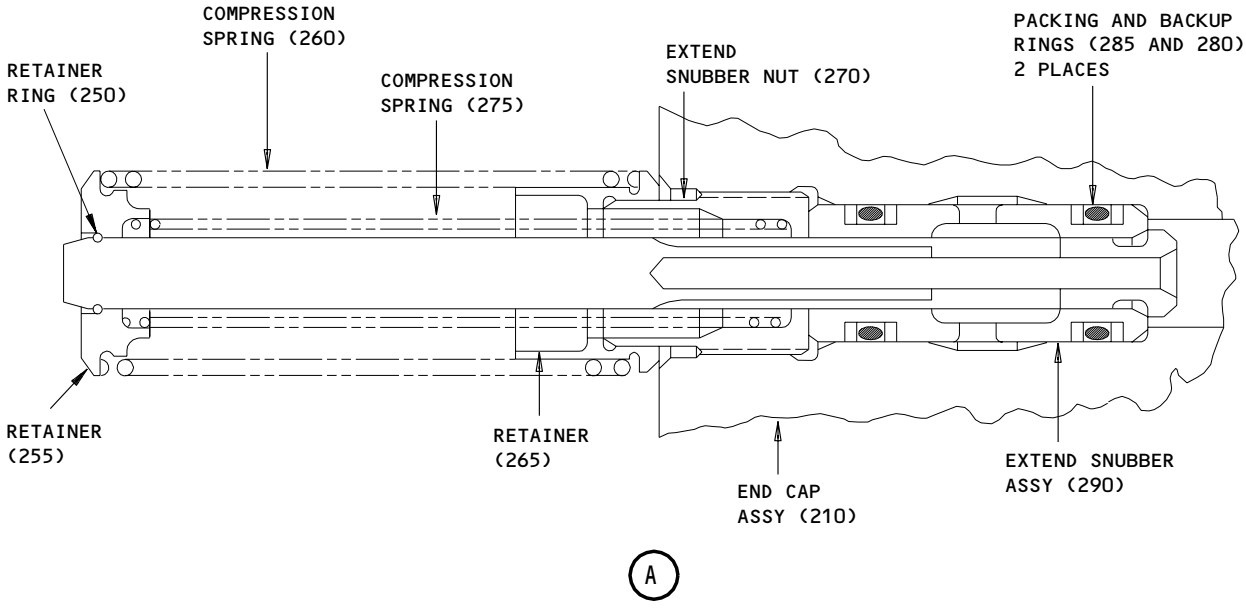
Assembly Details
Figure 701 (Sheet 1)

T21884



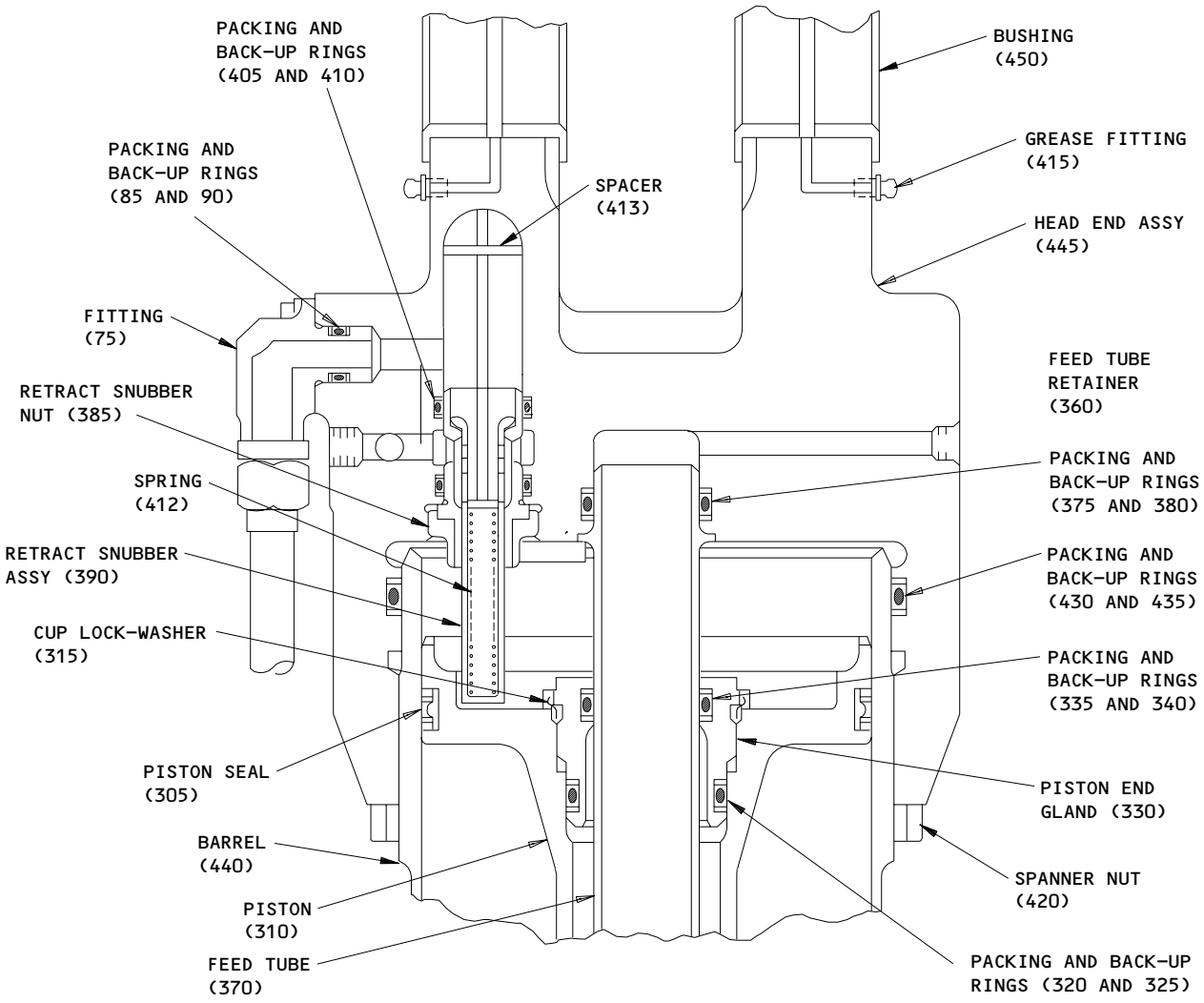
NOTE: PISTON SEAL RING (305) INCLUDES ONE 7436MT952 RING, TWO 7436MT478OT WHITE RINGS, AND TWO 7436MT478ON BLACK RINGS.

PISTON SEAL INSTALLATION



Assembly Details
Figure 701 (Sheet 2)

T21885



ITEM NUMBERS REFER TO IPL FIG. 1

Assembly Details
Figure 701 (Sheet 3)

T21886

(4) With the A32070-1 torque adapter, install nut (270). Tighten the nut to 20-30 lb-in.

(5) Install keeper (245).

(6) Install retainer (265).

(7) Install compression spring (260, 275).

(8) Install retainer (255).

(9) Compress springs (260, 275) and attach the retainer on slide (300) with retainer ring (250).

D. Install end cap (210) (Fig. 701).

(1) Lubricate the inner surfaces of end cap components mating with the rod of piston (310B) with assembly lube or hydraulic fluid.

(2) Clean the surfaces with solvent then apply sealant or corrosion preventive compound to three shear rings (190) and install the rings in the annular slot of barrel (440).

(3) Lubricate inner bore and seals (200, 205) of end cap (210) with assembly lube or hydraulic fluid.

(4) Insert end cap (210) into threaded side of barrel. Push the end cap into the barrel until shear rings (190) are at the bottom. Install shear ring retainer (185). Install four cap screws (180), but tighten the screws only finger-tight, because the parts will be removed before final assembly.

E. Install piston seal (305).

(1) Lubricate parts with assembly lube or hydraulic fluid and install seal (305) as shown in Fig. 701.

F. Install barrel (440) and piston (310B).

(1) Lubricate the bore of barrel (440) and the mating surfaces of piston (310B) with assembly lube or hydraulic fluid.

(2) Install the piston through barrel (440) and end cap (210).

(3) Remove four cap screws (180) and retainer (185).

(4) Lubricate internal threads in the end cap with wet sealant for the final installation of cap screws (180).

(5) Install shear ring retainer (185) and four cap screws (180). Tighten the cap screws to 30-50 lb-in.

G. Install rod end (110B).

(1) Install spanner nut (95) on rod end of piston (310B).

(2) Install lockwashers (100, 105) on rod end.

NOTE: Lockwashers will be permanently attached after the test.

(3) Clean the threads with solvent then apply sealant or corrosion preventive compound to the piston threads (310). If you use the corrosion preventive compound, apply it also to the conical cavity and slot in the piston, all interfaces and inside diameters of cup lockwashers and the jamnut. Then thread the rod end (110) onto the piston.

(4) With rod end wrench A32040-4 and fixture A32050-1, tighten rod end (110B) to 10,500-12,000 lb-in.

(5) With spanner wrench A32045-3, tighten spanner nut (95) to 800-1000 lb-in.

H. Assemble head end (445) (Fig. 701).

(1) Lubricate packings (375, 430) and backup rings (380, 435) with assembly lube or hydraulic fluid and install parts in the head end assembly.

I. Install retract snubber (390) (Fig. 701).

CAUTION: SLEEVE (395) AND SLIDE (400) ARE MATCHED PARTS AND MUST BE KEPT TOGETHER.

(1) Lubricate packings (405) and backup rings (410) with assembly lube or hydraulic fluid and install parts in head end (445).

(2) Carefully install retract snubber (390) in the head end with slide (400) in sleeve (395).

(3) Lubricate the internal threads in the head end with assembly lube or hydraulic fluid.

(4) Screw nut (385) in until it comes to the bottom. Then unscrew it one-fourth turn or less to let you install feed tube retainer (360).

J. Assemble feed tube (370) (Fig. 701).

(1) Lubricate packings (320, 335) and backup rings (325, 340) with assembly lube or hydraulic fluid and install parts in piston end gland (330).

(2) Lubricate feed tube (370) with assembly lube or hydraulic fluid and slide piston end gland onto feed tube with the cup lockwasher end on first.

(3) Install feed tube guide (350) on feed tube with two rivets (355A).

(4) Lubricate backup rings (345) with assembly lube or hydraulic fluid and install them on feed tube guide (350).

K. Install feed tube (370) (Fig. 702).

(1) Install feed tube (370) into head end (445).

(2) Make sure that retract snubber nut (385) is unscrewed one-fourth turn or less from the bottom position, then install feed tube retainer (360).

(3) Install three screws (365).

(4) With a punch that has a spherical end, stake the metal of the retainer (360) in two locations 180 degrees apart to lock the screws (365) in position.

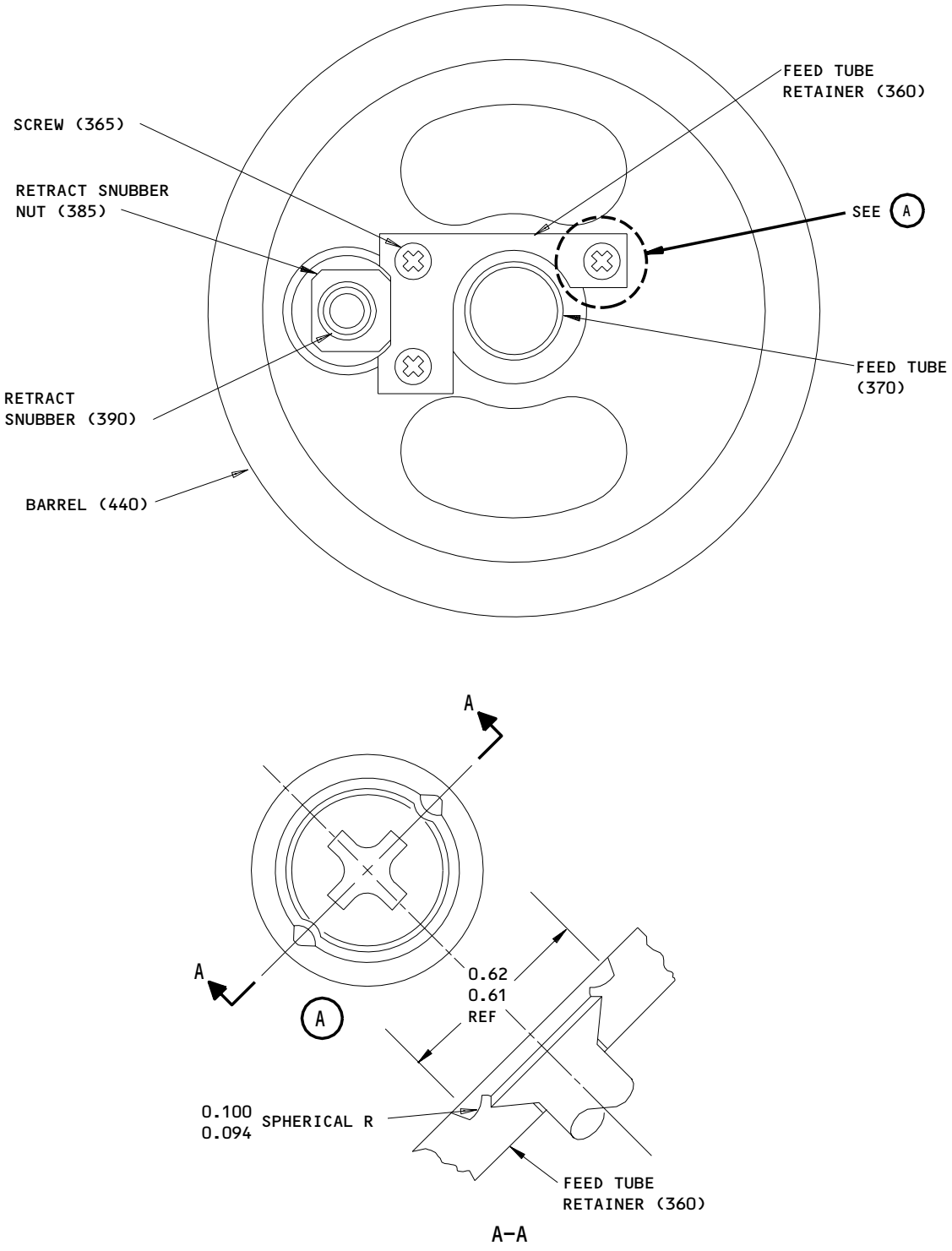
L. Assemble feed tube (370) to piston (310B) (Fig. 701).

(1) Apply sealant or corrosion preventive compund to mating threads, then thread spanner nut (420) onto barrel (440).

(2) Lubricate feed tube guide (350), piston end gland (330) and internal threads in piston (310B) with assembly lube or hydraulic fluid.

CAUTION: BE VERY CAREFUL, WHEN HEAD END (445) HAS FEED TUBE (370) ATTACHED, NOT TO BEND OR DISTORT FEED TUBE.

(3) Carefully install feed tube (370) into piston sufficiently to let you install piston end gland (330). Install lockwasher (315) on the gland. Give support for head end (445) to prevent stress on feed tube (370).



ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

Feed Tube Retainer Screw Staking Diagram
Figure 702

T21887

(4) With crowfoot wrench F70312-52, tighten piston end gland (330) to 50-100 lb-in.

(5) Break the flange of cup lockwasher (315) into the slots on gland (330) with a 0.24-inch square punch. Make sure the breaks are complete.

M. Install head end (445) (Fig. 701).

(1) Apply sealant or corrosion preventive compund to mating threads, then screw barrel (440) into head end (445) onto barrel (440) until it comes to the bottom. Unscrew one turn or less to let you install key (425).

(2) Install key (425). Do not install lockwire at this time. Key (425) will be lockwired to spanner nut (420) after the test.

(3) Hold head end (445) and tighten seal retainer nut (145) to 250-300 lb-in with spanner wrench A32045-2.

(4) Tighten spanner nut (420) finger-tight. Spanner nut (420) will be tightened to final torque during the test with actuator pressurized to 900-1100 psi.

N. Install fittings (75), clamps, and tube (50B) (Fig. 703).

(1) Lubricate packings (85) and backup rings (90) with assembly lube or hydraulic fluid and install them in fittings (75, 77).

(2) Lubricate internal threaded holes for bolts (80) with sealant or corrosion preventive compound.

(3) Fill cavity between fittings (75, 77) and actuator with assembly lube and install gasket (83), fittings (75, 77).

(4) Apply sealant under the bolt heads and install bolts (80) and tighten to 30-50 lb-in.

O. Install packings (495, 505, 515), reducers (500, 510), union (490) in actuator.

P. Do the test (Ref TESTING/TROUBLE SHOOTING).

Q. Install clamps and lockwire.

(1) Loosely install clamps (60) and pads (65). Cut off the edges of pads (65) as necessary to give clearance for clamps (60).

(2) Install block (40), clip (45), clamps (25), bolts (30C), nuts (35). Tighten nuts to 30-50 lb-in.

(3) Tighten the nuts on clamps (60) to 30-50 lb-in.

(4) Lockwire on nut (145) and bolts (80) by the double-twist method (SOPM 20-50-02).

(5) Lockwire key (425) to spanner nut (420) by the double-twist method (SOPM 20-50-02).

(6) Break the flanges of cup lockwashers (100, 105) into the slots in spanner nuts (95, 110B) with a 0.24 inch square punch. Make sure the breaks are complete.

R. Solvent clean the surfaces that will get sealant. Then apply a fillet of sealant at these locations (Fig. 701).

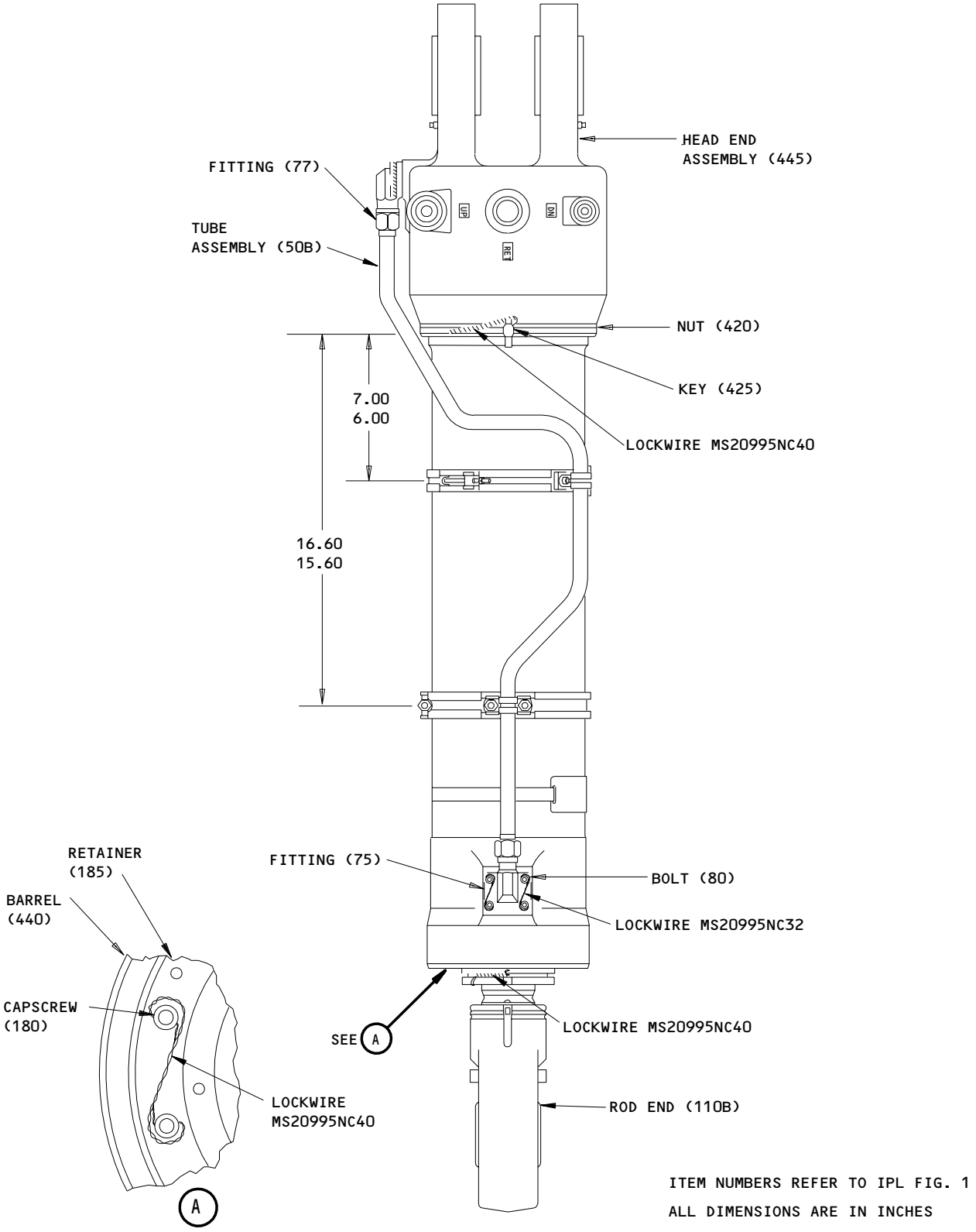
(1) Around nut (95) at rod end, over lockwashers (100, 105) and slots in rod end (110B).

(2) In recess and over shearing ring retainer (185) and screws (180).

(3) Around four sides of key (425).

(4) Both sides of spanner nut (420).

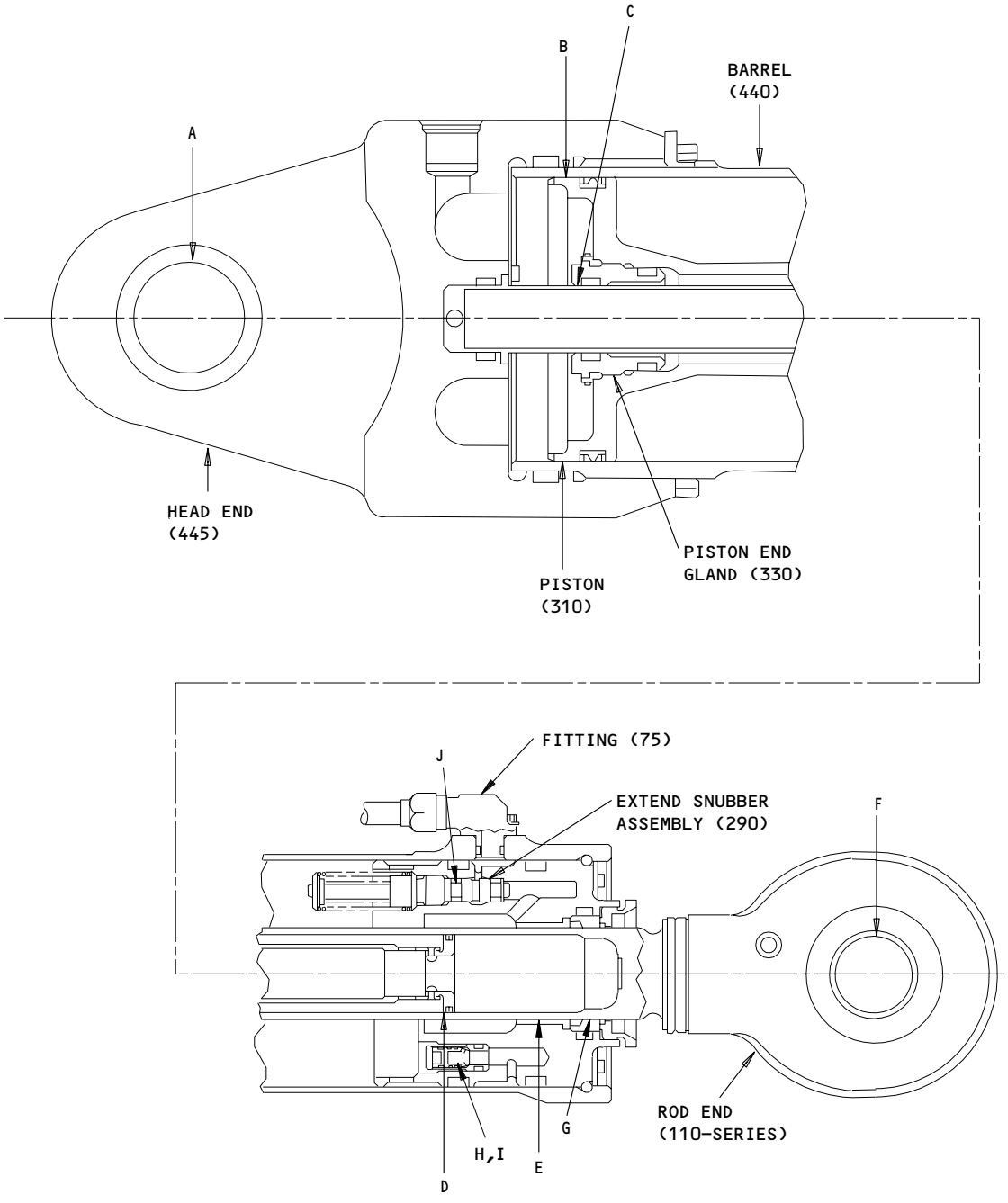
4. Give protection to the unit and put it away by standard industry practices and the instructions in SOPM 20-44-01.



Tube Assembly, Clamps and Lockwire Installation Details
Figure 703

T21888

FITS AND CLEARANCES



Fits and Clearances
Figure 801 (Sheet 1)

T21889

Ref Letter Fig.801	Mating Item No. IPL Fig.1	Design Dimensions				Service Wear Limits		
		Dimensions (inches)		Assembly Clearance (inch)		Dimensions Limits (inches)		Maximum Allowable Clearance (inch)
		Min	Max	Min	Max	Min	Max	
A	ID 450	2.5618	2.5632					
B	ID 440 OD 310	6.349 6.343	6.352 6.345	0.004	0.009	6.3415	6.3535	0.012
C	ID 330 OD 370	1.500 1.4960	1.502 1.4980	0.0020	0.0060	1.494	1.504	0.010
D	ID 310 OD 350	2.06 2.035	2.07 2.040	0.020	0.035	2.032	2.074	0.042
E	ID 195 OD 310	2.500 2.496	2.501 2.498	0.002	0.005	2.493	2.508	0.015
F	ID 110B, 110C, 110D	2.1245	2.1250					
F	ID 120	2.1270	2.1280					
G	ID 165 OD 310	2.501 2.496	2.503 2.498	0.003	0.007	2.487	2.512	0.025
H	ID 390 OD 413	0.450 0.446	0.455 0.448	0.002	0.009	0.442	0.457	0.015
I	ID 395 OD 400	0.6400 (1) 0.6400 (1)	0.6600 (1) 0.6600 (1)	0.0004 (2)	0.0008 (2)	0.6498	0.6509	0.0010
J	ID 295 OD 300	0.3500 (1) 0.3500 (1)	0.3505 (1) 0.3505 (1)	0.0004 (2)	0.0008 (2)	0.3499	0.3514	0.0011

ALL DIMENSIONS ARE IN INCHES

(1) DIMENSION BEFORE LAPPING
(2) DIMENSIONAL CLEARANCE AFTER LAPPING

Fits and Clearances
Figure 801 (Sheet 2)

19574

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO SOPM 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES	POUND-FEET
35	NUT	30-50	
80	BOLT	30-50	
60	CLAMP	30-50	
270	NUT	20-30	
420	NUT	400-600 *[1]	
110	ROD END	10,500-12,000	875-1000
145	NUT	250-300	
95	NUT	800-1,000	66.7-83.3
330	GLAND	50-100	

*[1] TIGHTEN WITH 900-1100 PSI HYDRAULIC PRESSURE APPLIED TO "UP" PORT OF ACTUATOR

Torque Table
Figure 802

T21891

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

NOTE: Equivalent substitutes can be used.

1. A32040-4 -- Rod End Wrench
2. A32045-1 -- Spanner Wrench
3. A32045-2 -- Spanner Wrench
4. A32045-3 -- Spanner Wrench
5. A32050-1 -- Torque Fixture
6. A32070-1 -- Torque Adapter - Retract Actuator Snubber Nut
7. A32087-1 -- Test fixture equipment (includes fixture A32087-2 and pin A32087-3).
8. F70312-52 -- Crowfoot Wrench (supersedes F70312-42)

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

02886 DODGE-WASMUND MFG CO INC
9603 BEVERLY ROAD
PICO RIVERA, CALIFORNIA 90660

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

11815 TOWNSEND DIV. OF TEXTRON, INC.
CHERRY FASTENER UNIT
BOX 2157, 1224 EAST WARNER AVENUE
SANTA ANA, CALIFORNIA 92707

14242 VOSS INDUSTRIES INC
2168 WEST 25TH STREET
CLEVELAND, OHIO 44113

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

26303 OHIO AIRCRAFT SUPPLIES INC
717 HINDRY AVENUE
INGLEWOOD, CALIFORNIA 90301

26879 CORONADO PLASTICS INCORPORATED
11069 PENROSE AVENUE
SUN VALLEY, CALIFORNIA 91352

34941 HARPER ENGINEERING COMPANY
200 SOUTH TOBIN STREET
RENTON, WASHINGTON 98055

52828 REPUBLIC FASTENER MFG CORP
1300 RANCHO CONEJO BLVD
NEWBURY PARK, CALIFORNIA 91320

72902 GREENE TWEED AND CO INC
320 ELM AVENUE
NORTH WALES, PENNSYLVANIA 19454

VENDORS

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

77896 REXNORD INC. BEARING DIVISION
2400 CURTIS STREET
DOWNERS GROVE, ILLINOIS 60515

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

83930 TRANSAMERICA DELAVAL INC ADEL FASTENERS DIV
1444 WASHINGTON AVENUE P.O. BOX 7727
HUNTINGTON, WEST VIRGINIA 25704

84971 TA MANUFACTURING CORP
375 WEST ARDEN AVENUE PO BOX 2500
GLENDALE, CALIFORNIA 91209

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

92555 LEE COMPANY
2 PETTIPAUG ROAD
WESTBROOK, CONNECTICUT 06498

94581 NATIONAL UTILITIES CORP DIV OF NUCO INDUSTRIES INC.
135 EAST RAILROAD AVENUE
MONROVIA, CALIFORNIA 91016

97820 W S SHAMBAN AND CO
711 MITCHELL ROAD
NEWBURY PARK, CALIFORNIA 91320

98625 AEROQUIP CORP AEROSPACE DIV MARMAN PLANT
11214 EXPOSITION BOULEVARD
LOS ANGELES, CALIFORNIA 90064

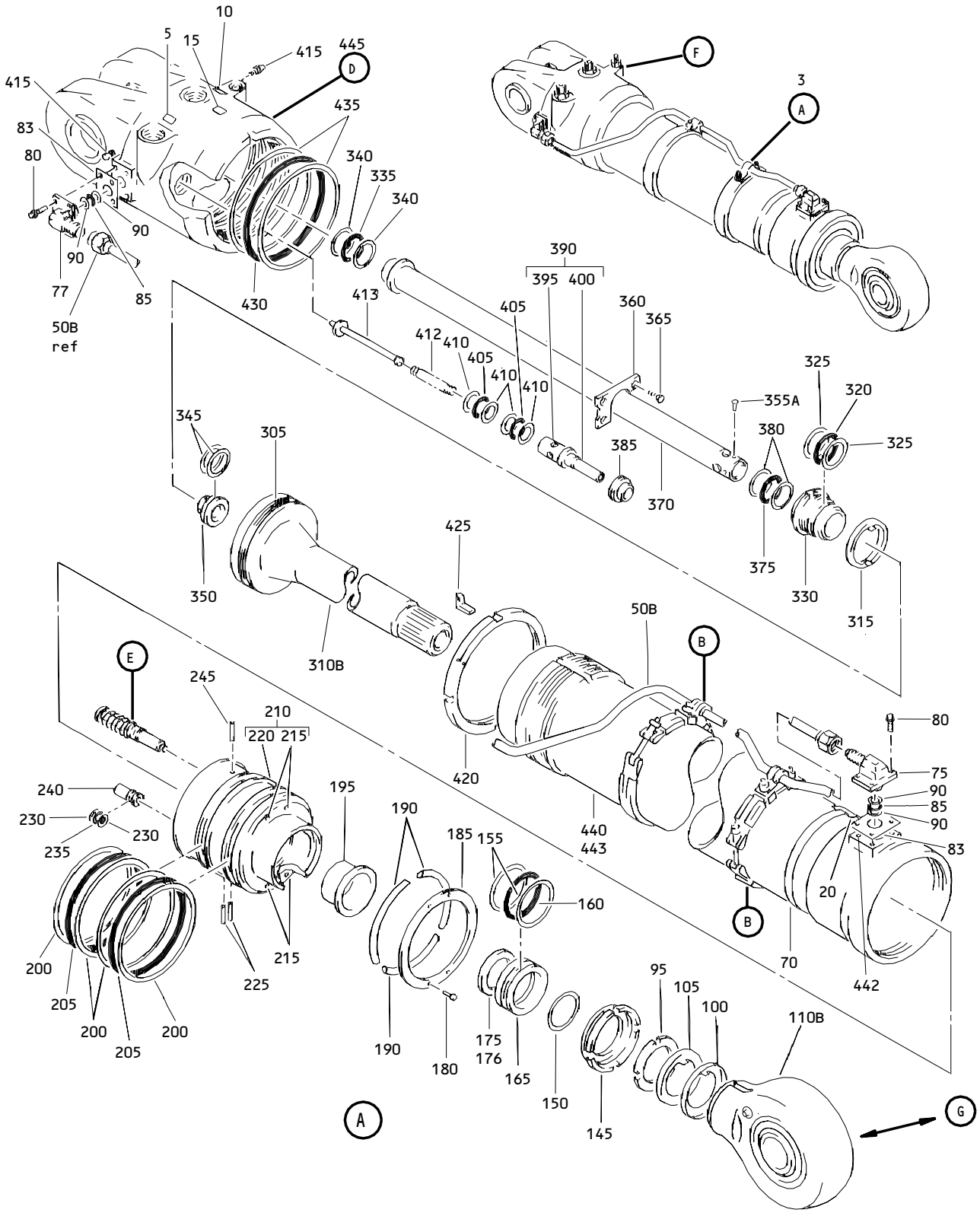
99240 CRISSAIR, INCORPORATED
122 ARENA STREET
EL SEGUNDO, CALIFORNIA 90246

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AFP230-06		1	490	1
AFP23216-10		1	500	1
AP1001-06		1	490	1
AP102716-10		1	500	1
BACB19F10S		1	40	4
BACB30LE4H2		1	80	8
BACB30NE3-2		1	30	
		1	30C	4
BACC10BN700L5ME		1	60	2
BACC10GF10C1H		1	25A	2
BACC10HB10C		1	25	2
BACC15AN10		1	45	4
BACN10JC3		1	35	4
BACP13B6-203		1	65	2
BACP20AX37D		1	460	1
BACP20AX37DP		1	455	1
BACP20AX43D		1	470	1
BACP20AX43DP		1	465	1
BACR15BA6AD10		1	355A	2
BACR15BA6D		1	355	
BACR17E16-10		1	500	1
BACS34A25		1	150	1
BACU24K6		1	490	1
BAC27THY0042		1	20	1
BAC27THY2		1	5	1
BAC27THY3		1	10	1
BAC27THY4		1	15	1
BC902T6		1	490	1
BC916T16-10		1	500	1
BRH10A3		1	35	4
CWR76-25A		1	150	1
DBOR17E16-10		1	500	1
DBOU24K6		1	490	1
DRX25A		1	110	
DRX25B		1	110B	1
DRX25C		1	110C	1
DRX25D		1	110D	1
DW96801-25		1	150	1
ER21902T6		1	490	1
ER21916T16-10		1	500	1
ER31916-16-10		1	500	1
FER22649T6		1	490	1
F10-6		1	490	1
F23-16-10		1	500	1
H10-3BAC		1	35	4
JM44SC17HB10R		1	25A	2

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
MS15001-1		1	125	2
		1	415	2
MS21209F4-15		1	475	3
MS21209F4-15P		1	215	4
		1	480	6
MS21209F4-20		1	442	4
MS27595-325		1	340	2
		1	380	2
MS27595-328		1	325	2
MS27595-440		1	435	2
MS28774-224		1	345	2
MS28782-10		1	280	4
MS28782-12		1	90	4
		1	230	2
MS28782-20		1	410	4
MS28782-42		1	155	2
MS28782-63		1	200	4
NAS1351C4H6P		1	180	4
NAS1611-112		1	285	2
NAS1611-114		1	85	2
		1	235	1
NAS1611-215		1	405	2
NAS1611-325		1	335	1
		1	375	1
NAS1611-328		1	320	1
NAS1611-333		1	176	1
NAS1611-339		1	160	1
NAS1611-436		1	205	2
NAS1611-440		1	430	1
NAS1612-6		1	495	1
NAS514P428-7		1	365	3
NAS6603-1		1	30A	
NAS6603-2		1	30B	
NS202101-02		1	35	4
PLGA4066010		1	455	1
PLGA4067010		1	460	1
PLGA4686010		1	465	1
PLGA4687010		1	470	1
RMLH9075-3W		1	35	4
S012T236-10		1	110A	
		1	110B	1
S012T236-11		1	110C	1
S012T236-12		1	110D	1
S13122-3026		1	155A	2
S30388-25		1	150	1
S33121-333-5		1	175A	1
S33555-333H99		1	175	1

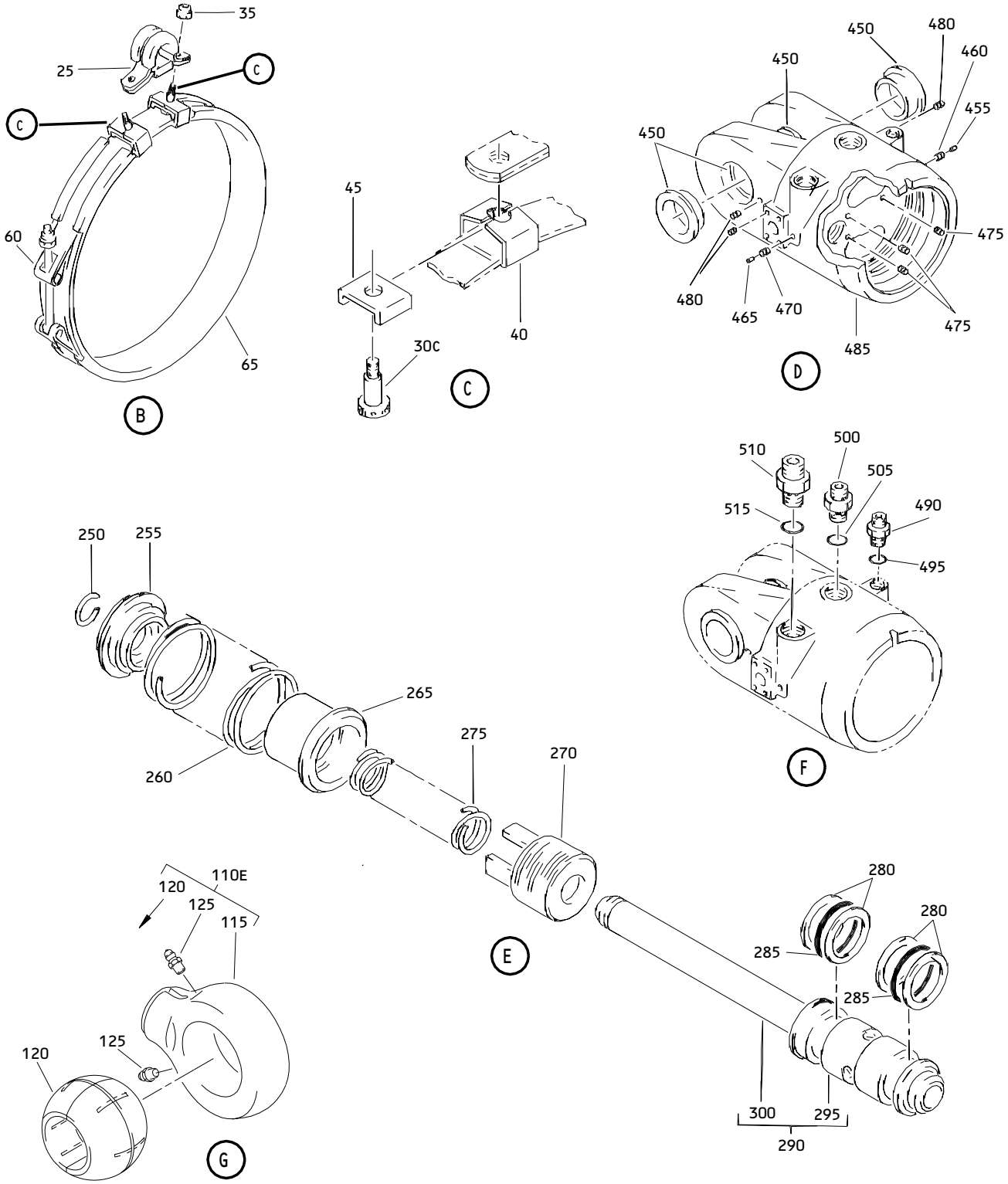
PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
S35600-3006		1	160A	1
S387SSH10		1	25A	2
TA0910004H110		1	25	2
TA12C34H10-1		1	25A	2
TF005-25C		1	150	1
T6S1032J		1	35	4
VN303A02		1	35	4
1C2428		1	240A	1
2-01075T16-10		1	500	1
2-01076T6		1	490	1
2C9066		1	240	1
2140-25		1	150	1
273T0050-2		1	70	1
273T0070-1		1	77	1
273T1100-5		1	1D	R
273T1100-6		1	1E	R
273T1102-1		1	1	
273T1102-12		1	110E	1
273T1102-14		1	110F	1
273T1102-2		1	50	
273T1102-3		1	50A	
273T1102-4		1	1A	
273T1102-5		1	50B	1
273T1102-6		1	50C	1
273T1102-7		1	3	1
273T1102-8		1	3A	1
273T1103-1		1	440	1
273T1103-2		1	443	1
273T1103-3		1	440A	1
273T1104-1		1	310	
273T1104-2		1	310A	
273T1104-3		1	310B	1
273T1104-4		1	310C	1
273T1104-5		1	310D	1
273T1104-6		1	310E	1
		1	310F	1
273T1105-1		1	445	1
273T1105-2		1	485	1
273T1106-1		1	295	1
273T1107-1		1	210	1
273T1107-2		1	220	1
273T1107-3		1	210A	1
273T1108-1		1	350	1
273T1109-1		1	165	1
273T1110-1		1	370	1
273T1111-1		1	195	1
273T1112-1		1	95	1

PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
273T1113-1		1	420	1
273T1114-1		1	390	1
273T1115-1		1	395	1
273T1116-1		1	400	1
273T1117-1		1	290	1
273T1117-2		1	290A	1
273T1118-1		1	300	1
273T1118-2		1	300A	1
273T1119-1		1	115	1
273T1119-2		1	115A	1
273T1120-1		1	330	1
273T1121-1		1	185	1
273T1122-1		1	100	1
273T1122-2		1	105	1
273T1124-1		1	360	1
273T1127-1		1	450	4
273T1129-1		1	145	1
273T1130-1		1	190	3
273T1131-1		1	413	1
273T1132-1		1	412	1
293W2521-19		1	120	1
31778-16-10		1	500	1
513SS10		1	25A	2
65B83752-2		1	83	2
66-12156-34		1	315	1
69B80034-2		1	425	1
69B80058-2		1	75	1
69B80085-1		1	250	1
69B80087-1		1	275	1
69B80088-1		1	270	1
69B80089-2		1	385	1
69B83368-1		1	265	1
69B83369-1		1	255	1
69B83370-1		1	260	1
69B83939-1		1	225	2
		1	245	1
7436MT952-4780		1	305	1
96-02		1	35	4



Main Landing Gear Retract Actuator Assembly
Figure 1 (Sheet 1)

T57408



Main Landing Gear Retract Actuator Assembly
Figure 1 (Sheet 2)

T21882

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	273T1102-1		DELETED		
-1A	273T1102-4		DELETED		
-1D	273T1100-5		ACTUATOR ASSY-MLG RETRACT	A	RF
-1E	273T1100-6		ACTUATOR ASSY-MLG RETRACT	B	RF
3	273T1102-7		.ACTUATOR ASSY	A	1
-3A	273T1102-8		.ACTUATOR ASSY	B	1
5	BAC27THY2		..MARKER-(UP)		1
10	BAC27THY3		..MARKER-(DN)		1
15	BAC27THY4		..MARKER-(RET)		1
20	BAC27THY0042		..NAMEPLATE		1
25	TA0910004H110		..CLAMP (V84971) (SPEC BACC10HB10C) (OPT ITEM 25A)		2
-25A	JM44SC17HB10R		..CLAMP (V22175) (SPEC BACC10GF10C1H) (OPT S387SSH10 (V18076)) (OPT TA12C34H10-1 (V84971)) (OPT 513SS10 (V83930)) (OPT ITEM 25)		2
30	BACB30NE3-2		DELETED		
30A	NAS6603-1		DELETED		
30B	NAS6603-2		DELETED		
30C	BACB30NE3-2		..BOLT		4
35	BRH10A3		..NUT (V52828) (SPEC BACN10JC3) (OPT H10-3BAC (V15653)) (OPT NS202101-02 (V80539)) (OPT RMLH9075-3W (V72962)) (OPT T6S1032J (V711815) (OPT VN303A02 (V92215)) (OPT 96-02 (V80539))		4

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
40	BACB19F10S		..BLOCK (V94581) (SPEC BACB19F10S) (V34941, V99326)		4
45	BACC15AN10		..CLIP (V94581) (SPEC BACC15AN10) (V34941)		4
50	273T1102-2		DELETED		
-50A	273T1102-3		DELETED		
50B	273T1102-5		..TUBE ASSY (OPT ITEM 50A)		1
-50C	273T1102-6		..TUBE ASSY (OPT ITEM 50)		1
60	BACC10BN700L5ME		..CLAMP-		2
65	BACP13B6-203		..PAD		2
70	273T0050-2		..STRAP-NAMEPLATE		1
75	69B80058-2		..FITTING		1
77	273T0070-1		..FITTING		1
80	BACB30LE4H2		..BOLT		8
83	65B83752-2		..GASKET		2
85	NAS1611-114		..PACKING		2
90	MS28782-12		..RING-BACKUP		4
95	273T1112-1		..NUT-ROD END SPANNER		1
100	273T1122-1		..CUP-LOCKWASHER		1
105	273T1122-2		..CUP-LOCKWASHER		1
110	DRX25A		DELETED		
110A	S012T236-10		DELETED		
110B	DRX25B		..ROD END ASSY (V77896) (SPEC S012T236-10) (OPT ITEM 110C) (USED ON ITEM 3)		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-110C	DRX25C		..ROD END ASSY- (V77896) (SPEC SO12T236-11) (OPT ITEM 110B) (USED ON ITEM 3)		1
-110D	DRX25D		..ROD END ASSY (V77896) (SPEC SO12T236-12)		1
-110E	273T1102-12		..ROD END ASSY		1
-110F	273T1102-14		..ROD END ASSY		1
115	273T1119-1		...ROD END (USED ON ITEM 110E)		1
115A	273T1119-2		...ROD END (USED ON ITEM 110F)		1
120	293W2521-19		...BEARING-SPHERICAL SPLIT BALL (USED ON ITEMS 110E, 110F)		1
125	MS15001-1		...FITTING-LUBE (USED ON ITEMS 110E, 110F)		2
145	273T1129-1		..NUT-SEAL RETAINER		1
150	CWR76-25A		..SCRAPER (V26879) (SPEC BACS34A25) (OPT DW96801-25 (V02886)) (OPT S30388-25 (V97820)) (OPT TF005-25C (V07128)) (OPT 2140-25 (V26303))		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
155	MS28782-42		..RING-BACKUP (USED WITH ITEM 210)		2
155A	S13122-3026		..RING-BACKUP (USED WITH ITEM 210A) (V97820)		2
160	NAS1611-339		..PACKING (USED WITH ITEM 210)		1
160A	S35600-3006		..O-RING (USED WITH ITEM 210A) (V97820)		1
165	273T1109-1		..RETAINER-SEAL		1
175	S33555-333H99		..HAT SEAL (V97820)		1
175A	S33121-333-5		..FOOT SEAL (V97820) (OPT TO ITEM 175 WHEN USED WITH ITEM 176)		1
176	NAS1611-333		..O-RING (OPT TO ITEM 175 WHEN USED WITH ITEM 175A)		1
180	NAS1351C4H6P		..SCREW-CAP		4
185	273T1121-1		..RETAINER-SHEAR RING		1
190	273T1130-1		..RING-SHEAR		3
195	273T1111-1		..BUSHING		1
200	MS28782-63		..RING-BACKUP		4
205	NAS1611-436		..PACKING		2
210	273T1107-1		..CAP ASSY-END (OPT ITEM 210A)		1
210A	273T1107-3		..CAP ASSY-END (REWORK FROM 273T1107-1) (OPT ITEM 210)		1
215	MS21209F4-15P		...INSERT		4
220	273T1107-2		...CAP		1
225	69B83939-1		..KEEPER		2
230	MS28782-12		..RING-BACKUP		2
235	NAS1611-114		..PACKING		1
240	2C9066		..VALVE-CHECK (V99240) (OPT)		1
240A	1C2428		..VALVE-CHECK (V99240) (OPT ITEM 240)		1
245	69B83939-1		..KEEPER		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
250	69B80085-1		..RING-RETAINER		1
255	69B83369-1		..RETAINER		1
260	69B83370-1		..SPRING-COMPRESSION		1
265	69B83368-1		..RETAINER		1
270	69B80088-1		..NUT-EXTEND SNUBBER		1
275	69B80087-1		..SPRING-COMPRESSION		1
280	MS28782-10		..RING-BACKUP		4
285	NAS1611-112		..PACKING		2
290	273T1117-1		..SNUBBER ASSY-EXTEND		1
-290A	273T1117-2		..SNUBBER ASSY-EXTEND (OPT) (USED ON ITEM 3A)		1
295	273T1106-1		...SLEEVE (MATCHED SET)		1
300	273T1118-1		...SLIDE (MATCHED SET) (USED ON ITEM 290)		1
-300A	273T1118-2		...SLIDE (MATCHED SET) (USED ON ITEM 290A)		1
305	7436MT952-4780		..SEAL-PISTON (CONSISTS OF 2 EACH 7436MTT AND 7436MTN RINGS AND 1 7436MT952 SEAL) (V72902)		1
310	273T1104-1		DELETED		
310A	273T1104-2		DELETED		
310B	273T1104-3		..PISTON (USED ON ITEM 3)		1
-310C	273T1104-4		..PISTON (OPT)		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-310D	273T1104-5		..PISTON (OPT)		1
-310E	273T1104-6		..PISTON (USED ON ITEM 3) (OPT)		1
-310F	273T1104-6		..PISTON (USED ON ITEM 3A)		1
315	66-12156-34		..CUP-LOCKWASHER		1
320	NAS1611-328		..PACKING		1
325	MS27595-328		..RING-BACKUP		2
330	273T1120-1		..GLAND-PISTON END		1
335	NAS1611-325		..PACKING		1
340	MS27595-325		..RING-BACKUP		2
345	MS28774-224		..RING-BACKUP		2
350	273T1108-1		..GUIDE-FEED TUBE ATTACHING PARTS		1
355	BACR15BA6D		DELETED		
355A	BACR15BA6AD10		..RIVET -------*-------		2
360	273T1124-1		..RETAINER-FEED TUBE		1
365	NAS514P428-7		..SCREW		3
370	273T1110-1		..TUBE-FEED		1
375	NAS1611-325		..PACKING		1
380	MS27595-325		..RING-BACKUP		2
385	69B80089-2		..NUT-RETRACT SNUBBER		1
390	273T1114-1		..SNUBBER ASSY-RETRACT		1
395	273T1115-1		...SLEEVE-(MATCHED SET)		1
400	273T1116-1		...SLIDE-(MATCHED SET)		1
405	NAS1611-215		..PACKING		2
410	MS28782-20		..RING-BACKUP		4

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
412	273T1132-1		..SPRING		1
413	273T1131-1		..SPACER		1
415	MS15001-1		..FITTING-LUBE		2
420	273T1113-1		..NUT-SPANNER		1
425	69B80034-2		..KEY		1
430	NAS1611-440		..PACKING		1
435	MS27595-440		..RING-BACKUP		2
440	273T1103-1		..BARREL		1
-440A	273T1103-3		..BARREL ASSY (USED ON ITEM 3A) (OPT)		1
-442	MS21209F4-20		...INSERT (USED ON ITEM 440A)		4
-443	273T1103-2		...BARREL (USED ON ITEM 440A)		1
445	273T1105-1		..HEAD END ASSY		1
450	273T1127-1		...BUSHING		4
455	PLGA4066010		...PIN- (V92555) (SPEC BACP20AX37DP)		1
460	PLGA4067010		...PLUG- (V92555) (SPEC BACP20AX37D)		1
465	PLGA4686010		...PIN- (V92555) (SPEC BACP20AX43DP)		1
470	PLGA4687010		...PLUG- (V92555) (SPEC BACP20AX43D)		1
475	MS21209F4-15		...INSERT		3
480	MS21209F4-15P		...INSERT		6

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
485	273T1105-2		...HEAD END		1
490	BC902T6		.UNION		1
			(V50948)		
			(SPEC BACU24K6)		
			(OPT DBOU24K6		
			(V14798))		
			(OPT ER21902T6		
			(V88334))		
			(OPT FER22649T6		
			(V14397))		
			(OPT F10-6		
			(V73197))		
			(OPT 2-01076T6		
			(V11328))		
			(OPT AFP230-06		
			(V30974))		
			(OPT AP1001-06		
			(V01673))		
495	NAS1612-6		.PACKING		1
500	AFP23216-10		.REDUCER		1
			(V30974)		
			(SPEC BACR17E16-10		
			(OPT AP102716-10		
			(V01673))		
			(OPT BC916T16-10		
			(V50948))		
			(OPT DBOR17E16-10		
			(V14798))		
			(OPT ER21916T16-10		
			(V88334))		
			(OPT ER31916-16-10		
			(V88334))		
			(OPT F23-16-10		
			(V73197))		
			(OPT 2-01075T16-10		
			(V11328))		
			(OPT 31778-16-10		
			(V14397))		

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
505	NAS1612-16		.PACKING		1
510	AFP23212-8		.REDUCER (V30974) (SPEC BACR17E12-8 (OPT AP102712-8 (V01673)) (OPT BC916T12-8 (V50948)) (OPT DBOR17E12-8 (V14798)) (OPT ER21916T12-8 (V88334)) (OPT ER31916-12-8 (V88334)) (OPT F23-12-8 (V73197)) (OPT 2-01075T12-8 (V11328)) (OPT 31778-12-8 (V14397))		1
515	NAS1612-12		.PACKING		1