

 **BOEING**  
COMPONENT  
MAINTENANCE MANUAL

TO: ALL HOLDERS OF MAIN LANDING GEAR DOOR ACTUATOR ASSEMBLY  
COMPONENT MAINTENANCE MANUAL 32-32-20

REVISION NO. 11 DATED MAR 01/03

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

104	Added clarification and updated callouts.
301-303	
REPAIR-GEN	
601	
REPAIR 1-1	
602	
702	
301-302	Added A32059-27 tools, which supersede A32059-14, -15
701-703	tools.
901	

**32-32-20**

HIGHLIGHTS

01.1

Page 1

Mar 01/03



# MAIN LANDING GEAR DOOR ACTUATOR ASSEMBLY

PART NUMBER 273T0073-1  
273T4520-9

COMPONENT MAINTENANCE MANUAL  
WITH  
ILLUSTRATED PARTS LIST

**32-32-20**

TITLE PAGE

Page 1

Jan 10/84

01

109304

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
32-7		PRR B10787 MC B1323-001K	JAN 10/85 APR 10/85

**32-32-20**

TR & SB RECORD

01.1

Page 1

Jan 01/90

PAGE	DATE	CODE	PAGE	DATE	CODE
32-32-20			DISASSEMBLY		
TITLE PAGE			304	BLANK	CONT.
1	JAN 10/84	01	CHECK		
2	BLANK		501	JAN 01/90	01.1
REVISION RECORD			502	BLANK	
1	JAN 01/90	01.1	REPAIR-GENERAL		
2	BLANK		*601	MAR 01/03	01.1
TR & SB RECORD			602	JUL 01/02	01.1
1	JAN 01/90	01.1	REPAIR 1-1		
2	BLANK		601	JAN 01/90	01.1
LIST OF EFFECTIVE PAGES			*602	MAR 01/03	01.1
*1	MAR 01/03	01	REPAIR 2-1		
THRU LAST PAGE			601	JAN 01/90	01.1
CONTENTS			602	DEC 01/94	01.1
1	JUL 01/02	01.1	603	DEC 01/94	01.1
2	BLANK		604	BLANK	
INTRODUCTION			REPAIR 3-1		
1	JAN 01/90	01.1	601	JAN 01/90	01.1
2	BLANK		602	JAN 01/90	01.1
DESCRIPTION & OPERATION			REPAIR 4-1		
1	DEC 01/95	01.1	601	JUL 01/02	01.1
2	BLANK		602	BLANK	
TESTING & TROUBLE SHOOTING			REPAIR 4-2		
101	MAR 01/01	01.1	601	JAN 01/90	01.1
102	MAR 01/01	01.1	602	JAN 01/90	01.1
103	JAN 01/90	01.1	603	JAN 01/90	01.1
*104	MAR 01/03	01.1	604	BLANK	
105	JAN 01/90	01.1	REPAIR 5-1		
106	JAN 01/90	01.1	601	JAN 01/90	01.1
DISASSEMBLY			602	BLANK	
*301	MAR 01/03	01.1	REPAIR 6-1		
*302	MAR 01/03	01.1	601	JUL 01/02	01.1
*303	MAR 01/03	01.1	602	BLANK	

\* = REVISED, ADDED OR DELETED

**32-32-20**

EFFECTIVE PAGES  
CONTINUED Page 1  
01 Mar 01/03

PAGE	DATE	CODE	PAGE	DATE	CODE
REPAIR 7-1					
601	JUL 01/02	01.1			
602	BLANK				
ASSEMBLY					
*701	MAR 01/03	01.1			
*702	MAR 01/03	01.1			
*703	MAR 01/03	01.1			
704	JAN 01/90	01.1			
705	JAN 01/90	01.1			
706	JUL 01/02	01.1			
FITS AND CLEARANCES					
801	JAN 01/90	01.1			
802	JAN 01/92	01.1			
803	JAN 01/90	01.1			
804	BLANK				
SPECIAL TOOLS					
*901	MAR 01/03	01.1			
902	BLANK				
ILLUSTRATED PARTS LIST					
1001	JAN 01/90	01.1			
1002	JUL 01/02	01.1			
1003	BLANK				
1004	BLANK				
1005	JAN 01/90	01.1			
1006	JAN 01/90	01.1			
1007	JUL 01/02	01.1			
1008	JUL 01/02	01.1			

\* = REVISED, ADDED OR DELETED

**32-32-20**

EFFECTIVE PAGES  
 LAST PAGE Page 2  
 01 Mar 01/03

TABLE OF CONTENTS

<u>Paragraph Title</u>	<u>Page</u>
Description and Operation . . . . .	1
Testing and Trouble Shooting . . . . .	101
Disassembly . . . . .	301
Cleaning. . . . .	*[1]
Check . . . . .	501
Repair. . . . .	601
Assembly . . . . .	701
Fits and Clearances . . . . .	801
Special Tools . . . . .	901
Illustrated Parts List. . . . .	1001

\*[1] Special instructions are not necessary. Use standard industry practices and the instructions in SOPM 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                                      | 4. List of Effective Pages   |
| 2. Record of Revisions                             | 5. Table of Contents         |
| 3. Temporary Revision &<br>Service Bulletin Record | 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/Trouble Shooting -- APR 22/86  
Disassembly -----APR 22/86  
Assembly -----APR 22/86



MAIN LANDING GEAR DOOR ACTUATOR ASSEMBLY

DESCRIPTION AND OPERATION

- | 1. The main landing gear door actuator assembly has a head end, cylinder, piston rod, and rod end, all made of corrosion resistant steel.
  
- | 2. Hydraulic pressure is applied to the extend or retract port of the actuator to open or shut main landing gear doors during gear extension or retraction. The actuator also has snubbing action as it comes to or goes away from the retracted position.
  
- | 3. Leading Particulars (Approximate)  
  
| Length -- 34 inches  
| Diameter -- 3 inches  
| Weight -- 27 pounds  
| Hydraulic Fluid -- BMS 3-11  
| Maximum Operating Pressure --3000 psi  
| Proof Pressure -- 5400 psi

**32-32-20**

DESCRIPTION & OPERATION

01.1

Page 1

Dec 01/95

TESTING AND TROUBLE SHOOTING

1. Equipment and Materials

NOTE: Equivalent substitutes can be used.

A. Hydraulic stand to supply BMS 3-11 hydraulic fluid at variable pressure of 0-5500 psi. Hydraulic fluid must be continuously filtered to 25 microns absolute. Temperature of fluid must be 80-120° F.

B. A32059-16 -- Fixture

C. Fittings for:

(1) MS33649-8 port

(2) MS33649-6 port

(3) Lockwire -- MS20995N32 or MS20995NC32 (SOPM 20-60-04)

2. Preparation for Test

A. Ambient Conditions

(1) Temperature -- 60-100°F

(2) Pressure -- 13-17 psia

B. Install the actuator in the test stand and install test fittings in the actuator port. Connect hydraulic lines to the actuator.

C. Apply pressure of 4500-4700 psi to EXTEND port, release the pressure and tighten bolts (130) to 67.5-82.5 lb-in.

D. Cycle the actuator 10 cycles or more to bleed trapped air.

**32-32-20**

### 3. Test (Fig. 102)

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

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

#### A. Proof Pressure

- (1) Put the unit at 1.47–1.53 inches from the fully extended position, and hold to prevent travel from this position, or fully retract the unit. Slowly apply a minimum pressure of 5400 psi to the RETRACT port with the EXTEND port open, and hold the pressure for 2 minutes. Make sure there is no external leakage or permanent set.
- (2) Do step A.(1) again but apply the pressure to the EXTEND port, and fully extend the unit. Make sure there is no external leakage or permanent set.
- (3) Do step A.(1) again, but with an applied pressure of 3–7 psi. Make sure there is no external leakage or permanent set.
- (4) Do step A.(2) again, but with an applied pressure of 3–7 psi. Make sure there is no external leakage or permanent set.

#### B. Internal Leakage

- (1) Put the unit at 1.47–1.53 inches from the fully extended position, and hold to prevent travel from this position, or fully extend the unit. Slowly apply 2900–3100 psi to the EXTEND port with the RETRACT port open. Measure the leakage from RETRACT port after 2 minutes. Make sure the leakage is not more than 2.0 cc per minute.

#### C. External Leakage/Operation

- (1) Operate the unit for 25 complete cycles at a rate of approximately 1 cycle in 6 seconds, or less, and apply 2900–3100 psi at each bottomed position. Make sure that leakage at dynamic seal (100) is not more than 1 drop per 25 cycles. Make sure there is no leakage at external static seals (70, 75, 65, 170). The unit must operate smoothly.

#### D. Snubbing Test

- (1) With the unit fully extended, apply 3000 psi to RETRACT port. Make sure piston decelerates smoothly to the fully retracted position.

### 4. Post Test Procedures

- #### A. Disconnect the unit from the test equipment.

**32-32-20**

- B. Lockwire and apply fillet seal per ASSEMBLY.
- C. Partially fill unit with BMS 3-11 hydraulic fluid and cap or plug ports. Mark or tag each unit with test data.

TROUBLE	PROBABLE CAUSE	CORRECTION
Leakage at retract port exceed 2.0 cc/mm	Defective seal ring (100)	Replace parts per par. 5.B.
Leakage at rod seal exceed 1 drop per 25 cycles	Defective packing (90), rings (85), seal (75) or optional packing (77) and foot seal (79)	Replace parts per par. 5.B.
Binding or irregular movement	Defective piston rod (95), gland (80), cylinder (175)	Replace parts per par. 5.C., 5.B., 5.D., 5.E.

Trouble Shooting Chart  
 Figure 101

5. Corrective Procedures

- A. Drain all hydraulic fluid.
- B. Replacement of packing (90), rings (85), seal ring (100), hat seal (75) and scraper (65).
  - (1) Disassemble unit and replace packing (90), rings (85), seal ring (100), hat seal (75) or optional packing (77) and foot seal (79), scraper (65) per DISASSEMBLY par. 3.D. thru 3.H.
  - (2) Install new parts per ASSEMBLY par. 3.E. thru 3.K., 3.O. thru 3.Q.
- C. Replacement of gland (80), gland follower (70)
  - (1) Disassemble unit and replace gland (80), gland follower (70) per DISASSEMBLY par. 3.D. thru 3.H.

**32-32-20**

(2) Install new parts per ASSEMBLY par. 3.F. thru 3.K., 3.O. thru 3.Q.

D. Replacement of piston rod (95).

(1) Disassemble piston rod (95) per DISASSEMBLY par. 3.D. thru 3.H.

(2) Check piston rod (95). Replace or repair as required.

(3) Install piston rod (95) per ASSEMBLY par. 3.E., 3.G. thru 3.K.,  
3.O. thru 3.Q.

E. Replacement of cylinder (175)

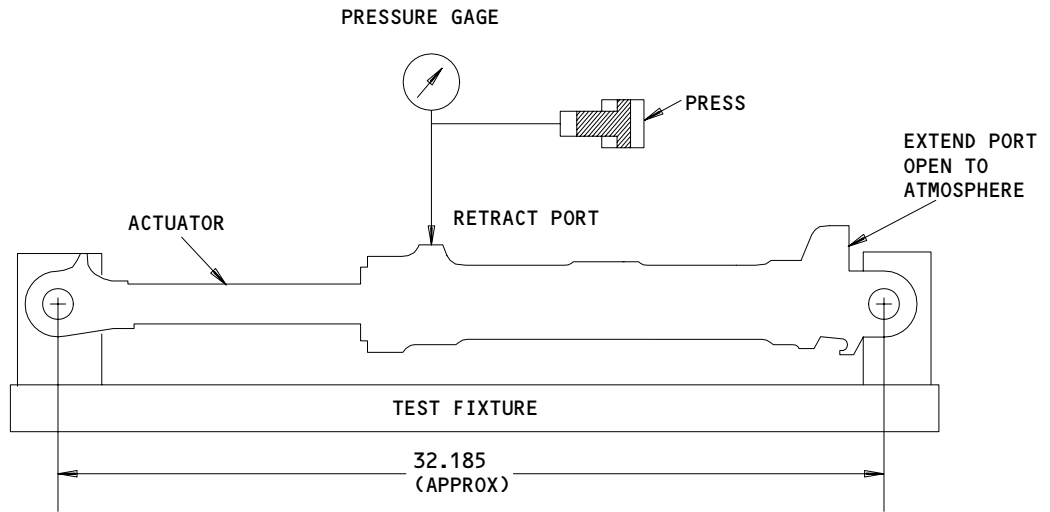
(1) Disassemble cylinder (175) per DISASSEMBLY par. 3.C., 3.D., 3.G.,  
3.I.

(2) Examine cylinder (175). Replace or repair as required.

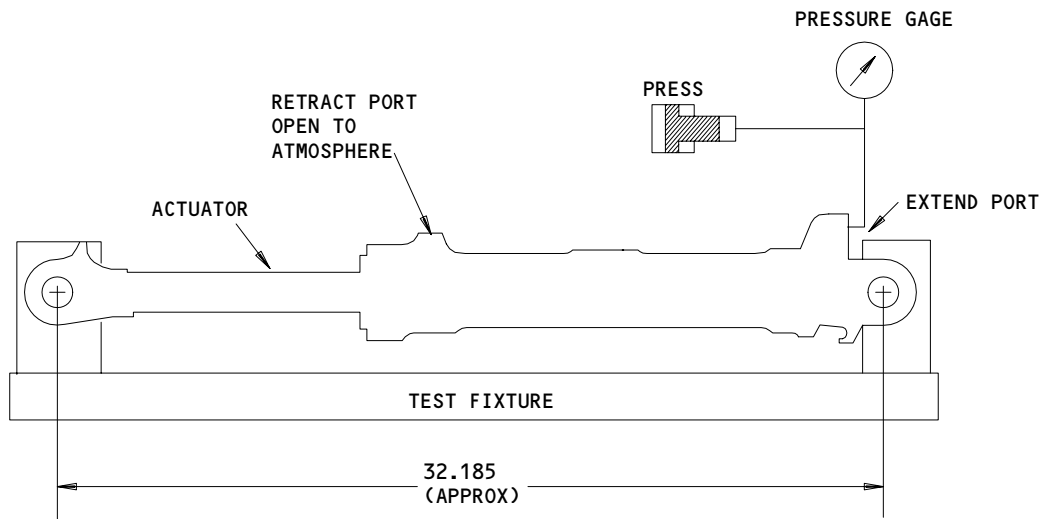
(3) Install cylinder (175) per ASSEMBLY par. 3.D., 3.H., 3.I.

**32-32-20**

TESTING & TROUBLE SHOOTING  
01.1 Page 104  
Mar 01/03



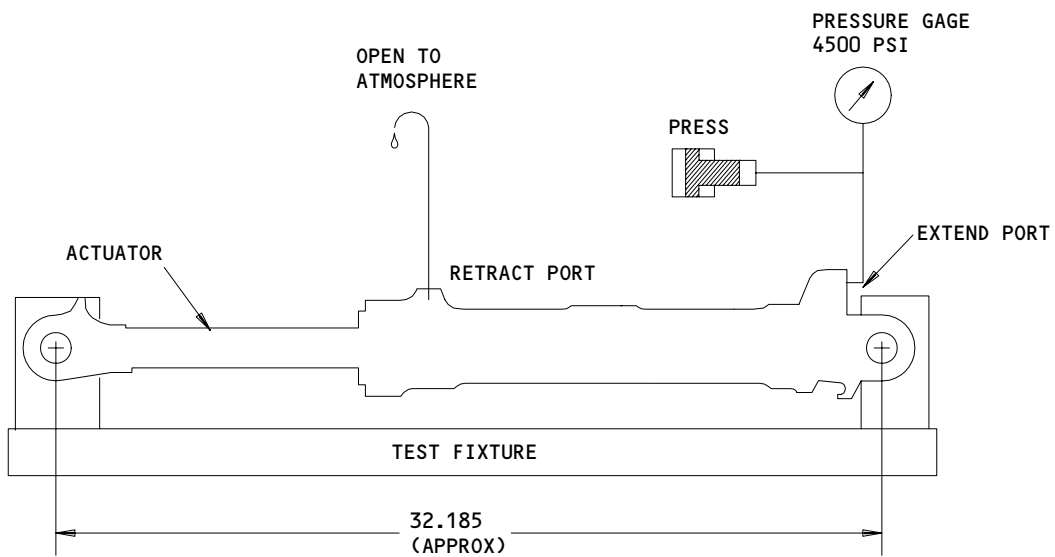
PROOF PRESSURE TEST  
(PRESSURE AT RETRACT PORT)



PROOF PRESSURE TEST  
(PRESSURE AT EXTEND PORT)

Test Schematic  
Figure 102 (Sheet 1)

**32-32-20**



INTERNAL LEAKAGE TEST

Test Schematic  
Figure 102 (Sheet 2)

**32-32-20**

DISASSEMBLY

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

1. Equipment

NOTE: Equivalent substitutes can be used.

A. A32059-16 -- Fixture

B. A32059-28 -- Wrench Adapter (supersedes A32059-17)

C. A32059-18 -- Wrench Adapter

2. Parts Replacement (IPL Fig. 1)

NOTE: The following parts are recommended for replacement. Unless otherwise specified, actual replacement may be based on in-service experience.

A. Lockwire

B. Packings (10, 25, 90, 170)

C. Retainers (85, 165)

D. Seal (75, 100)

E. Scraper (65)

F. Gland Follower (70)

3. Disassembly

A. Remove elbow (15), valve (5, 20), packing (10, 25) from actuator (30).



**CAUTION:** BEARINGS (35, 125) ARE A SET OF MATCHED HALVES. KEEP EACH SET TOGETHER FOR PROPER OPERATION AFTER ASSEMBLY. DO NOT MIX WITH HALVES OF OTHER BEARING SETS.

B. Remove bearings (35, 125) from rod end (45) and head end (140).

**NOTE:** Do not remove fittings (50, 145) from rod end (45) and head end (140) unless necessary for repair or replacement.

C. Remove lockwire from bolts (130).

**NOTE:** Make a note of the location and method of lockwiring to help during assembly.

D. Remove lockwire from nut. Hold cylinder (175) in a padded vise and use torque wrench A32059-18 to loosen nut (60).

**CAUTION:** BE CAREFUL WHEN YOU HOLD PISTON ROD (95) NOT TO DAMAGE MACHINED SURFACES.

E. Straighten the flange break on cup lockwasher (40). Hold piston rod (95) in fixture A32059-16 and, with torque adapter wrench A32059-28, remove rod end (55). Discard lockwasher (40).

F. Temporarily install rod end (55) on piston rod (95) and pull piston rod with attached parts from cylinder (175).

**CAUTION:** BE CAREFUL NOT TO DAMAGE PARTS WHEN YOU REMOVE THE PISTON ROD FROM CYLINDER (175).

G. Remove rod end (55) and slide gland follower (70), seal (75) or optional packing (77) and foot seal (79), and gland (80) from piston rod (95).

H. Remove packing (90), rings (85) from gland (80). Remove seal (100) from piston rod (95).

I. Remove bolts (130), washer (135) from head end (140) and separate head end from cylinder (175).

**NOTE:** Do not remove strap (180) or nameplate (185) from cylinder (175) unless necessary for repair or replacement.

J. Remove packing (170), back up ring (165) from head end (140).

**32-32-20**

DISASSEMBLY

01.1

Page 302

Mar 01/03

K. Remove staked retainer (110) material from the heads of screws (105) with a round-ended drift pin, or equivalent, then remove the screws.

NOTE: Head of each screw (105) is staked in position at two locations on retainer (110).

L. Remove retainer (110), ring (115), and holder (120) from head end (140). Discard retainer (110) if it has more than two stakes at each location for screws (105).

**32-32-20**

DISASSEMBLY

01.1

Page 303

Mar 01/03

CHECK

1. Check all parts for obvious defects in accordance with standard industry practices. Refer to FITS AND CLEARANCES for design dimensions and wear limits.
2. Magnetic particle check per 20-20-01 -- rod end (55), piston rod (95), cylinder (175), head end (160).

**32-32-20**

CHECK

01.1

Page 501

Jan 01/90

REPAIR-GENERAL

1. Content

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

<u>P/N</u>	<u>NAME</u>	<u>REPAIR</u>
273T0074	ROD END ASSY	1-1
273T0075	PISTON ROD	2-1
273T0076	CYLINDER	3-1
273T0077	HEAD END ASSY	4-1, 4-2
273T0080	NUT	5-1
BAC27THY0147	NAMEPLATE	6-1
- - - -	MISCELLANEOUS PARTS REFINISH	7-1

2. Standard Practices

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

- | 20-00-00 Introduction
- | 20-10-02 Machining of Alloy Steel
- | 20-10-03 Shot Peening
- | 20-10-04 Grinding of Chrome Plated Parts
- | 20-30-02 Stripping of Protective Finishes
- | 20-30-03 General Cleaning Procedures
- | 20-41-01 Decoding Table for Boeing Finish Codes
- | 20-42-03 Chrome Plating
- | 20-42-05 Cadmium Plating
- | 20-50-04 Installation of Permanent Pins and Plugs in Drill Passages
- | 20-50-08 Application of Bonded Solid Film Lubricant
- | 20-50-21 How to Install Nameplate Straps and Seals
- | 20-60-03 Lubricants

3. Materials

| NOTE: Equivalent substitutes can be used.

- A. Grease -- BMS 3-33 or MIL-G-23827 (SOPM 20-60-03).
- B. Solid Film Lubricant -- BMS 3-8 (SOPM 20-60-03).

| C. Solid Film Lubricant -- MIL-L-8937 (SOPM 20-60-03)

| 4. Dimensioning Symbols

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

**32-32-20**

REPAIR-GENERAL

01.1

Page 602

Jul 01/02

ROD END ASSY - REPAIR 1-1

273T0074-1

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.

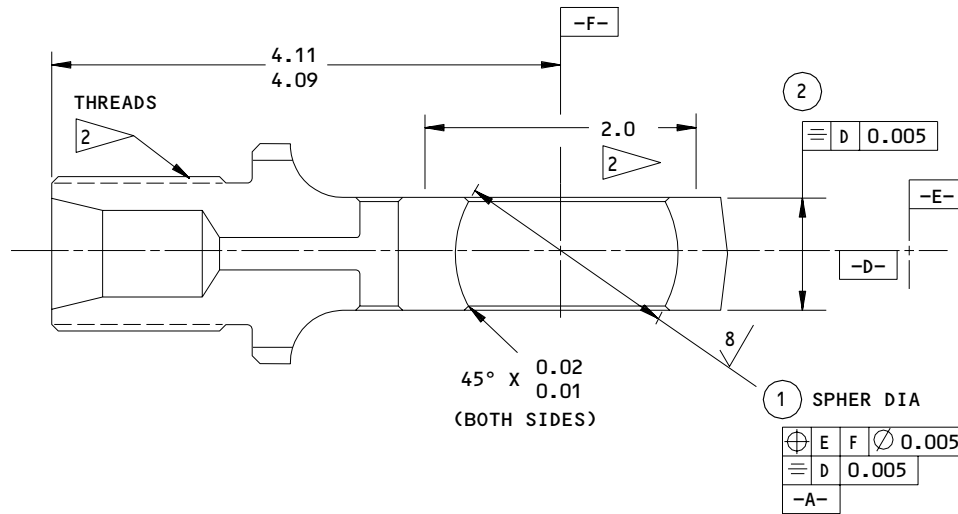
**32-32-20**

REPAIR 1-1

01.1

Page 601

Jan 01/90



	1	2
DESIGN DIM	1.8160 1.8145	0.990 0.890
REPAIR LIMIT	1.8190 3	—

**REFINISH**

CHROME PLATE (F-15.34) DIA -A-, 0.0005-0.0010 THICK. DO NOT GRIND. LIGHT LAPPING IS PERMITTED. PUT A PLATING RUNOUT PER 1. APPLY SOLID FILM LUBE PER 2 TO THREADS. PASSIVATE (F-17.25, WHICH REPLACES F-17.09) ALL OTHER SURFACES.

- 1 CHROME PLATE RUNOUT
- 2 APPLY BMS 3-8 SOLID FILM LUBE (F-19.10) OR MIL-L-46010 TYPE 1 SOLID FILM LUBE (F-19.81).
- 3 LIMIT FOR CHROME PLATE BUILDUP. DO NOT GRIND. LIGHT LAPPING IS PERMITTED. PUT A PLATING RUNOUT PER 2

**REPAIR**

REF 3  
 125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY  
 SHOT PEEN:  
 0.017-0.033 SHOT SIZE  
 0.010 A2 INTENSITY  
 MATERIAL: 15-5PH CRES, 180-200 KSI  
 ALL DIMENSIONS ARE IN INCHES

273T0074-2

Rod End  
 Figure 601

**32-32-20**

REPAIR 1-1

01.1

Page 602

Mar 01/03

PISTON ROD - REPAIR 2-1

273T0075-1, -3

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.

**32-32-20**

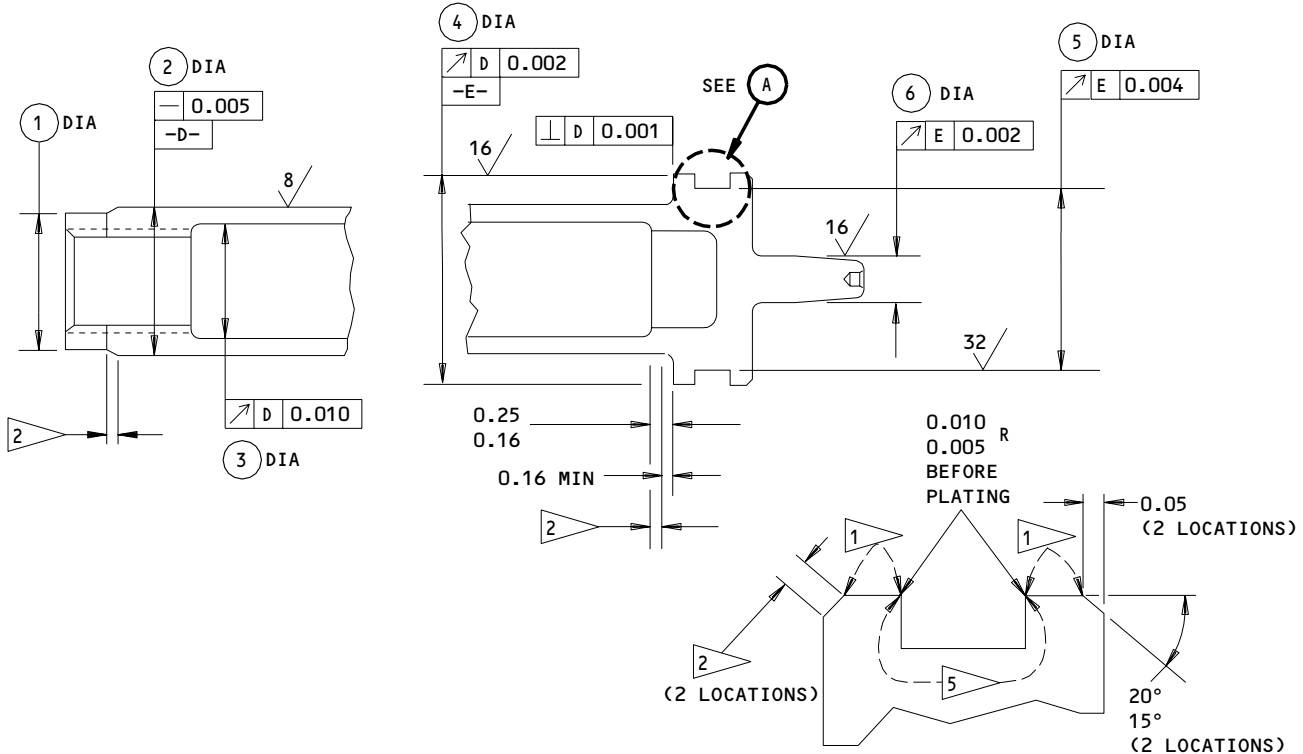
REPAIR 2-1

01.1

Page 601

Jan 01/90





	1	2	3	4	5	6
DESIGN DIM	1.680 1.675	1.748 1.746	1.365 1.355	2.490 2.488	2.121 2.119	0.5005 0.5000
REPAIR LIMIT	-----	1.736 3	-----	2.480 4	-----	-----

**REFINISH**

CHROME PLATE (F-15.34) DIA -D-, 0.003-0.005 THICK. NICKEL PLATE DIA -E- PER 1. OBSERVE PLATING RUNOUT PER 2. PASSIVATE (F-17.09) UNPLATED AREAS.

1 NICKEL PLATE (F-15.33), 0.0015 THICK AFTER MACHINING

NOTE: THIS CHANGES ORIGINAL FINISH OF DIA -E- FROM CHROME PLATE TO NICKEL. THE CHROME PLATED CONFIG IS NOT RECOMMENDED.

2 PLATING RUNOUT

3 LIMIT FOR CHROME PLATE BUILDUP AND GRINDING TO DESIGN DIM AND FINISH. OBSERVE PLATING RUNOUT PER 2

**REPAIR**

REF 3 4

125 MACHINE FINISH UNLESS SHOWN DIFFERENTLY

SHOT PEEN: 0.017-0.046 SHOT SIZE  
 0.012 A2 INTENSITY

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

ALL DIMENSIONS ARE IN INCHES

4 LIMIT FOR NICKEL PLATE BUILDUP AND MACHINING TO DESIGN DIM AND FINISH. OBSERVE PLATING RUNOUT PER 2

5 NO PLATING

273T0075-1

Piston Rod Repair and Refinish  
 Figure 601 (Sheet 1)

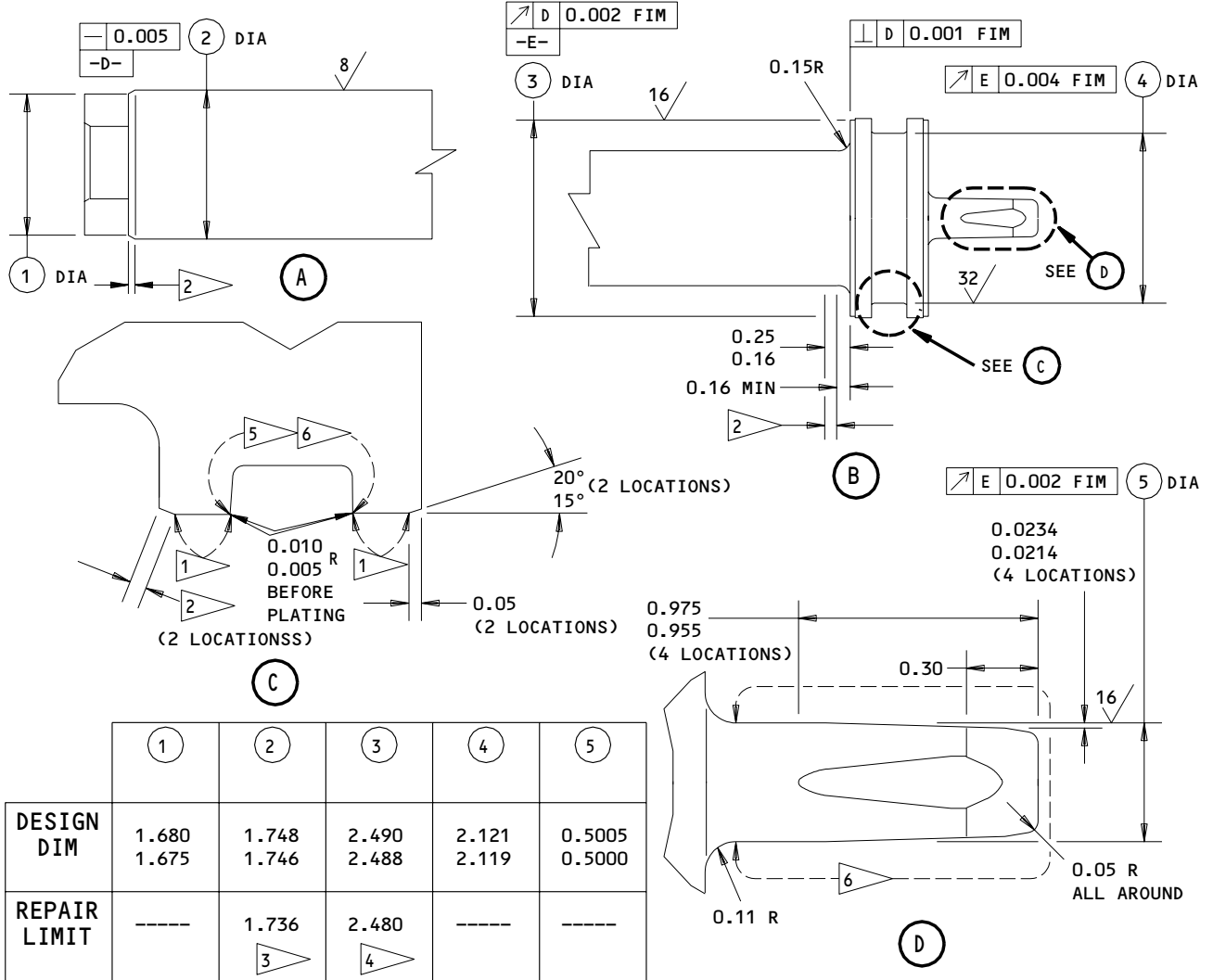
**32-32-20**

REPAIR 2-1

01.1

Page 602

Dec 01/94



**REFINISH**

CHROME PLATE (F-15.34) DIA -D-, 0.003-0.005 THICK. NICKEL PLATE DIA -E- PER 1. OBSERVE PLATING RUNOUT PER 2. PASSIVATE (F-17.09) UNPLATED AREAS.

1 NICKEL PLATE (F-15.33), 0.0015 THICK AFTER MACHINING  
**NOTE:** THIS CHANGES ORIGINAL FINISH OF DIA -E- FROM CHROME PLATE TO NICKEL. THE CHROME PLATED CONFIG IS NOT RECOMMENDED.

2 PLATING RUNOUT  
 3 LIMIT FOR CHROME PLATE BUILDUP AND GRINDING TO DESIGN DIM AND FINISH. OBSERVE PLATING RUNOUT PER 2

**REPAIR**

REF 3 4  
 125 MACHINE FINISH UNLESS SHOWN DIFFERENTLY  
 SHOT PEEN: 0.017-0.046 SHOT SIZE  
 0.012 A2 INTENSITY  
 MATERIAL: 15-5PH CRES, 180-200 KSI  
 ALL DIMENSIONS ARE IN INCHES  
 4 LIMIT FOR NICKEL PLATE BUILDUP AND MACHINING TO DESIGN DIM AND FINISH. OBSERVE PLATING RUNOUT PER 2  
 5 NO PLATING  
 6 DO NOT SHOT PEEN THIS AREA

273T0075-3

Piston Rod Repair and Refinish  
 Figure 601 (Sheet 2)

**32-32-20**

REPAIR 2-1  
 Page 603  
 Dec 01/94

01.1

CYLINDER - REPAIR 3-1

273T0076-1

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.

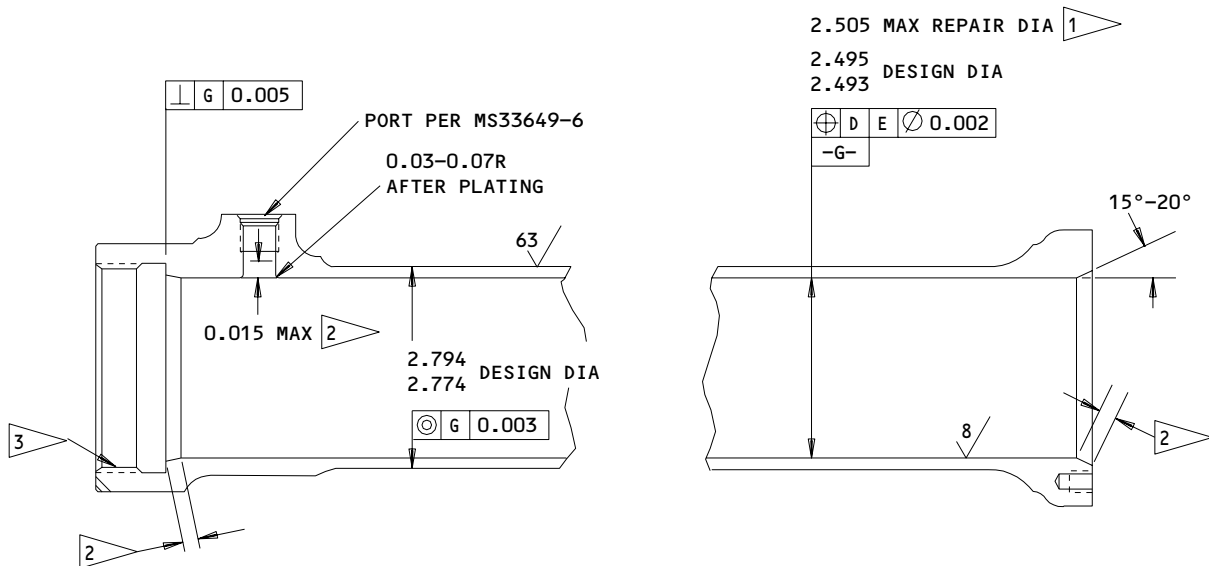
**32-32-20**

REPAIR 3-1

01.1

Page 601

Jan 01/90



**REFINISH**

PASSIVATE (F-17.09) ALL OVER

1 LIMIT FOR CHROME PLATE BUILDUP AND GRINDING TO DESIGN DIMENSION AND FINISH. OBSERVE PLATING RUNOUT PER 2

2 CHROME PLATE AND SHOT PEEN RUNOUT

3 DO NOT SHOT PEEN THREADS

**REPAIR**

REF 1 2

125 MACHINE FINISH EXCEPT AS NOTED

SHOT PEEN:  
 0.017-0.046 SHOT SIZE  
 0.12 A2 INTENSITY

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

ALL DIMENSIONS ARE IN INCHES

273T0076-1  
 Cylinder Repair and Refinish  
 Figure 601

**32-32-20**

REPAIR 3-1

Page 602

Jan 01/90

01.1

HEAD END ASSEMBLY - REPAIR 4-1

273T0077-1

**NOTE:** Refer to REPAIR-GEN for a list of applicable standard practices. If you find defects on head end surfaces, refer to REPAIR 4-2 for repair instructions.

1. Pin and Plug Replacement (Fig. 601)

A. Replace defective pin (155) and plug (150) per SOPM 20-50-04.

**32-32-20**

REPAIR 4-1

01.1

Page 601

Jul 01/02

HEAD END - REPAIR 4-2

273T0077-1

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, chrome or nickel plate, and grind or machine surfaces noted to design dimensions and finish. (Machine, do not grind, nickel plate.)

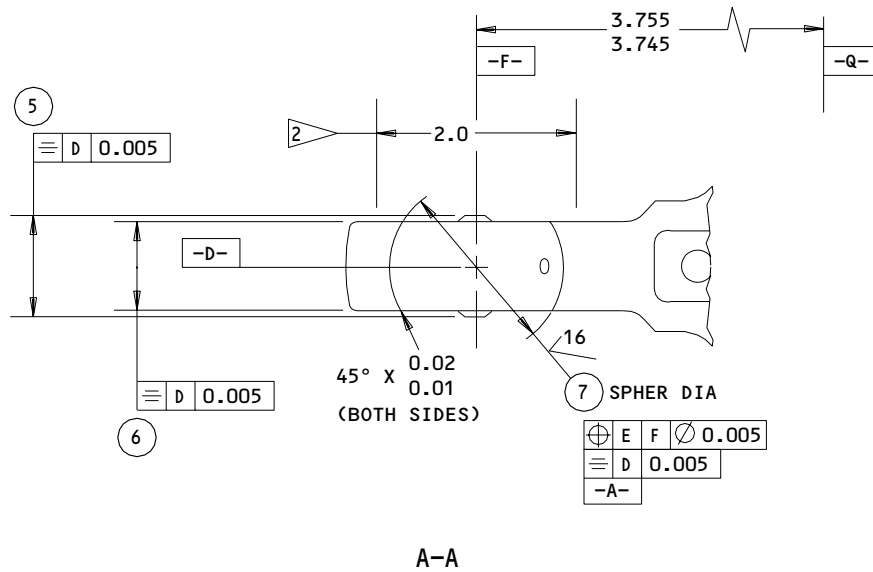
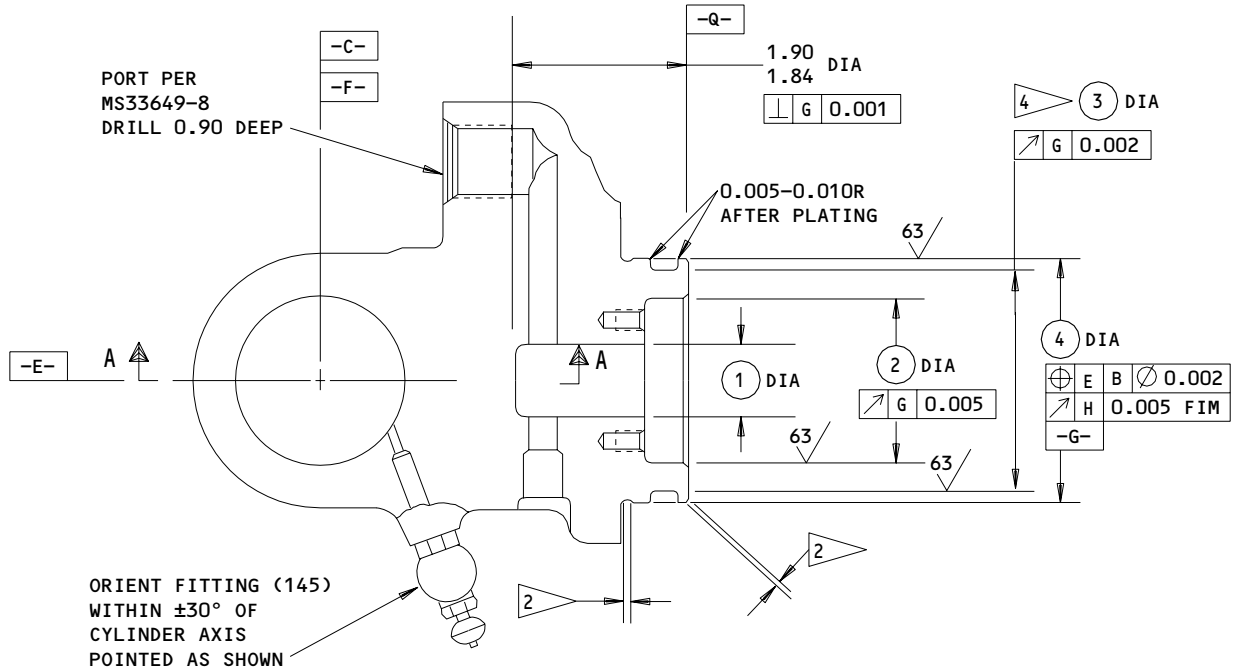
**32-32-20**

REPAIR 4-2

01.1

Page 601

Jan 01/90



273T0077-2  
 Head End Repair and Refinish  
 Figure 601 (Sheet 1)

**32-32-20**

REPAIR 4-2  
 Page 602  
 Jan 01/90

01.1

	①	②	③	④	⑤	⑥	⑦
<b>DESIGN DIM</b>	0.760 0.740	1.705 1.700	2.250 2.248	2.490 2.488	1.025 1.020	0.900 0.890	1.7535 1.7520
<b>REPAIR LIMIT</b>	-----	-----	-----	2.478 ③	-----	-----	1.7555 ⑤

**REFINISH**

CHROME PLATE DIA -A- PER ①. OBSERVE  
PLATING RUNOUT PER ②. PASSIVATE (F-17.09)  
OTHER SURFACES

- ① CHROME PLATE (F-15.34) 0.0005-0.0010 THICK. DO NOT GRIND. LIGHT LAPPING IS PERMISSIBLE
- ② CHROME PLATE RUNOUT
- ③ LIMIT FOR CHROME PLATE BUILDUP AND GRINDING TO DESIGN DIMENSION AND FINISH. OBSERVE PLATING RUNOUT PER ②
- ④ NO PLATING ON GROOVE SIDES AND BOTTOM
- ⑤ LIMIT FOR CHROME PLATE BUILDUP. DO NOT GRIND. LIGHT LAPPING PERMISSIBLE. OBSERVE PLATING RUNOUT PER ②

**REPAIR**

REF ③  
125 ✓ MACHINE FINISH EXCEPT AS NOTED  
SHOT PEEN: 0.017-0.033 SHOT SIZE  
0.010 A2 INTENSITY  
MATERIAL: 15-5PH CRES, 180-200 KSI  
ALL DIMENSIONS ARE IN INCHES

273T0077-2  
Head End Repair and Refinish  
Figure 601 (Sheet 2)

**32-32-20**  
REPAIR 4-2  
Page 603  
Jan 01/90

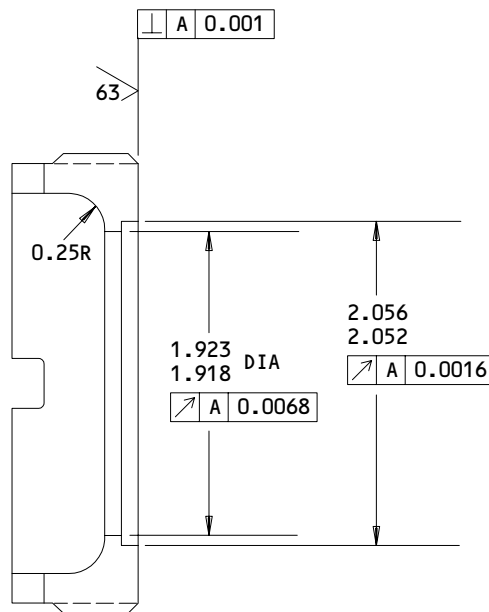


NUT - REPAIR 5-1

273T0080-1

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) ALL OVER. APPLY DRY FILM  
LUBRICANT BMS 3-8 TO THREADS

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

ALL DIMENSIONS ARE IN INCHES

Nut  
Figure 601

**32-32-20**

REPAIR 5-1

01.1

Page 601

Jan 01/90

NAMEPLATE – REPAIR 6-1

BAC27HY0147

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

1. Nameplate Replacement (Fig. 601)

- A. Install a replacement nameplate (185) with a new strap (180) per SOPM 20-50-21.

**32-32-20**

REPAIR 6-1

01.1

Page 601

Jul 01/02

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
<u>Fig. 1</u>		
Balls (35, 125)	Cu-Be	No Finish
Retainer (110)	303 Cres	Passivate (F-17.25, which replaces F-17.09).
Holder (120)	4130 Steel 125-145 ksi	Cadmium plate (F-15.06)

Refinish Details  
Figure 601

**32-32-20**

REPAIR 7-1

01.1

Page 601

Jul 01/02

ASSEMBLY

1. Materials

NOTE: Equivalent substitutes can be used.

- A. Assembly Lube -- MCS 352 (SOPM 20-60-03)
- B. Hydraulic Fluid -- BMS 3-11 (SOPM 20-60-03)
- C. Sealant -- BMS 5-26 or MIL-S-8802 (SOPM 20-60-04)
- D. Grease -- BMS 3-24 (SOPM 20-60-03)
- E. Grease -- BMS 3-33 (SOPM 20-60-03)
- F. Grease -- MIL-G-23827 (SOPM 20-60-03)
- G. Lockwire -- MS20995N32 or MS20995NC32 (SOPM 20-60-04)

2. Equipment

NOTE: Equivalent substitutes can be used.

- A. A32059-14 -- Holding Equipment, which includes:
  - (1) A32059-16 -- Fixture
  - (2) A32059-28 -- Wrench Adapter (supersedes A32059-17)
  - (3) A32059-18 -- Wrench Adapter

3. Assembly (IPL Fig. 1)

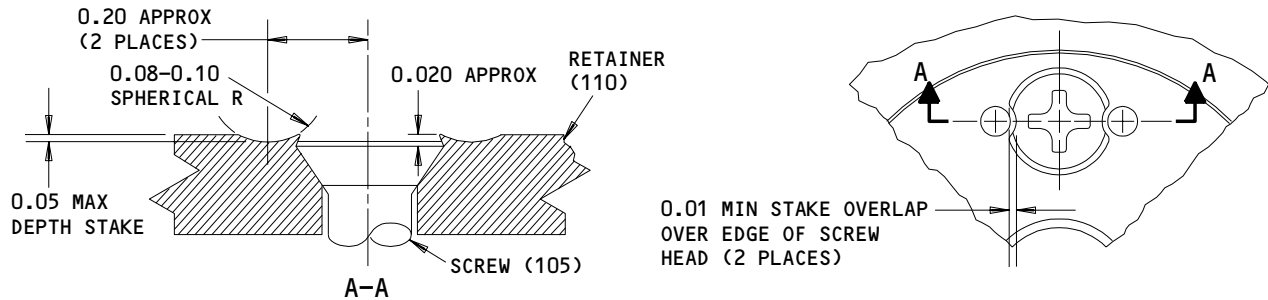
CAUTION: IN A LIMITED NUMBER OF CONFIGURATIONS, THE CYLINDER ID IS NOT PLATED, AND THE MATING PISTON OD IS CHROME PLATED. IN LATER CONFIGURATIONS, THE CYLINDER ID IS CHROME PLATED AND THE MATING PISTON OD IS NOT PLATED. A CHROME PLATED CYLINDER MUST NOT BE USED WITH A CHROME PLATED PISTON. FOR REPAIRED CONFIGURATIONS, A NICKEL PLATED PISTON CAN BE USED WITH A CHROME PLATED CYLINDER.

- A. Install ring (115) into holder (120), retainer (110) on holder, and install assembled parts in head end assy (140). Install screws (105) into retainer and tighten to 31.5-38.5 lb-in.
- B. Stake screw (105) heads as shown Fig. 701 with a spherical end punch, at 2 locations approximately 180° apart. If no space is available for new stakes, replace retainer (110).

**32-32-20**

ASSEMBLY  
Page 701  
Mar 01/03

01.1



Stake Overlap  
 Figure 701

109493

- C. Lubricate packing (170) and retainers (165) with assembly lube and install packing and retainers in head end assy (140).
- D. Install cylinder (175) in fixture A32059-16 and install head end (140). Apply a thin layer of grease to threads of bolts (130) and attach head end assy with bolts (130), washers (135) and tighten bolts to 67.5-82.5 lb-in.
- E. Lightly lubricate piston ring (100) with assembly lube and install piston ring into piston (95) groove, as shown in Fig. 702.
- F. Lightly lubricate packing (90), retainers (85), hatseal (75) or optional packing (77) and foot seal (79), and scraper (65). Install packing (90), retainers (85) into gland (80) groove.
- G. Slide gland (80), hat seal (75) or optional packing (77) and foot seal (79), gland follower (70), and scraper ring (65) along piston rod (95).

**CAUTION:** BE CAREFUL NOT TO DAMAGE PISTON ROD (95) WHEN YOU INSTALL THE ROD (95) IN CYLINDER (175).

- H. Slide piston rod (95) and attached parts into cylinder (175).
- I. Apply a thin layer of grease to thread of nut (60) and screw nut in cylinder (175). With rench adapter A32059-18, tighten nut to 600-800 lb-in.
- J. Insert cup lockwasher (40) on rod end (55). Apply a thin layer of grease to rod end threads. Screw rod end to piston rod (95) finger tight.

**32-32-20**

ASSEMBLY  
 Page 702  
 Mar 01/03

01.1

- | K. Hold piston rod (95), and with wrench adapter A32059-28, tighten rod end (55) to 2200-2500 lb-in. Make sure the locking tab of cup lockwasher (40) is in the slot of piston rod (95), and is not broken off or damaged. Replace the lockwasher if damaged.

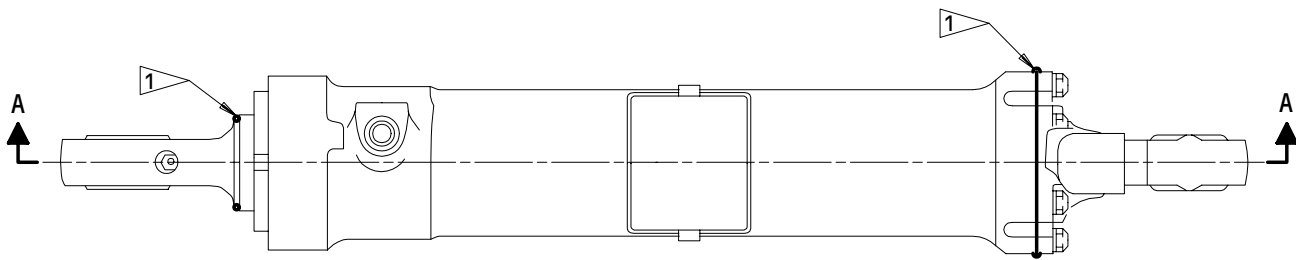
**CAUTION:** BEARINGS (35, 125) ARE A SET OF MATCHED HALVES. DO NOT MIX WITH BEARING HALVES FROM OTHER SETS. BEARING HALVES MUST BE INSTALLED WITH THE INDEX MARKS ALIGNED.

- L. Apply a thin layer of grease to bearings (35, 125) through the grease fittings. Install bearings (125) in head end (140) and rod end (45) respectively with index marks on bearing halves aligned.
- M. Install packings (10, 25) and valves (5, 20) on head end (140) and rod end (45). Install elbow (15) in valve (20).
- N. Do the test (TESTING/TROUBLE SHOOTING).
- O. After the test, use a 0.25 inch square punch, and break flange of cup lockwasher (40) into slot of rod end assy (45).
- P. Apply sealant to these contact areas (Fig. 702):
- (1) Head end (140) and cylinder (175).
  - (2) Piston rod (95) slots.
  - (3) Cup lockwashers (40) and rod end (45).

**32-32-20**

ASSEMBLY  
Page 703  
Mar 01/03

01.1



SEALANT APPLICATION

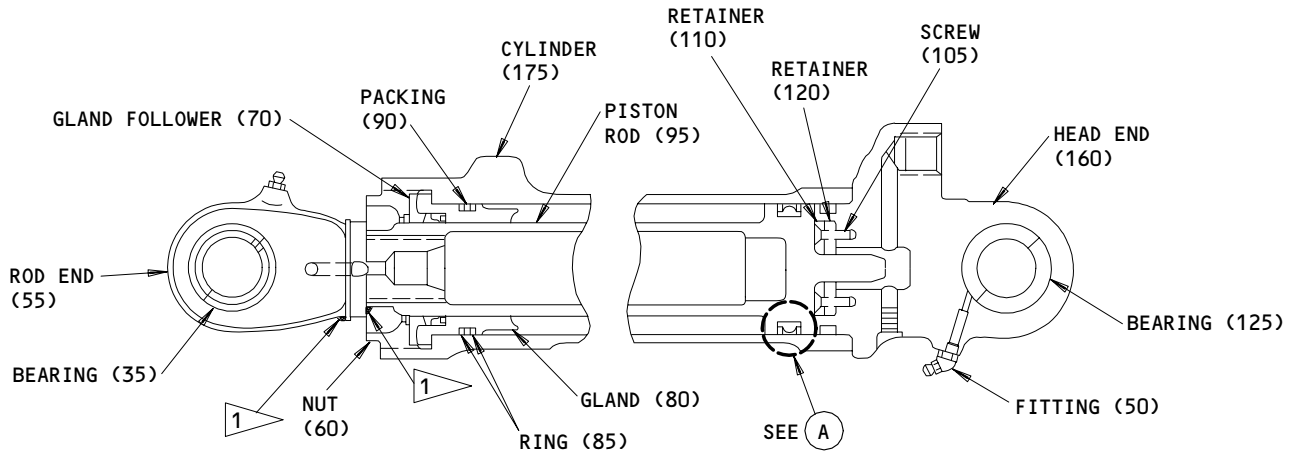
Assembly Details  
Figure 702 (Sheet 1)

109494

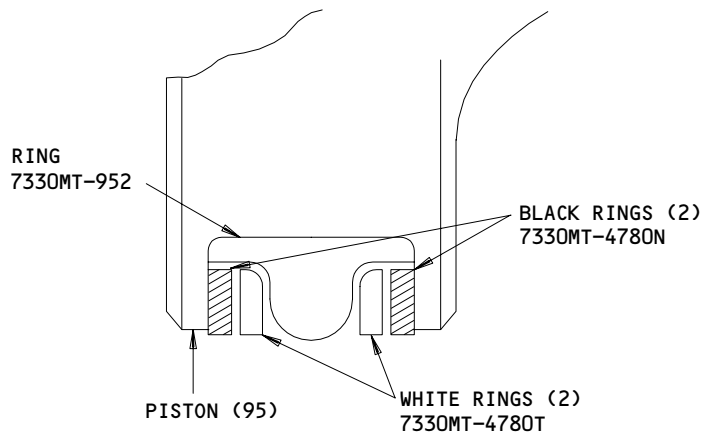
**32-32-20**

ASSEMBLY  
Page 704  
Jan 01/90

01.1



1 APPLY SEALANT, BMS 5-26 (MIL-S-8802 OPT)



PISTON SEAL DETAILS

A

**NOTE:** PISTON SEAL RING  
 7330MT-4780T (2), 7330MT-4780N (2)

Assembly Details  
 Figure 702 (Sheet 2)

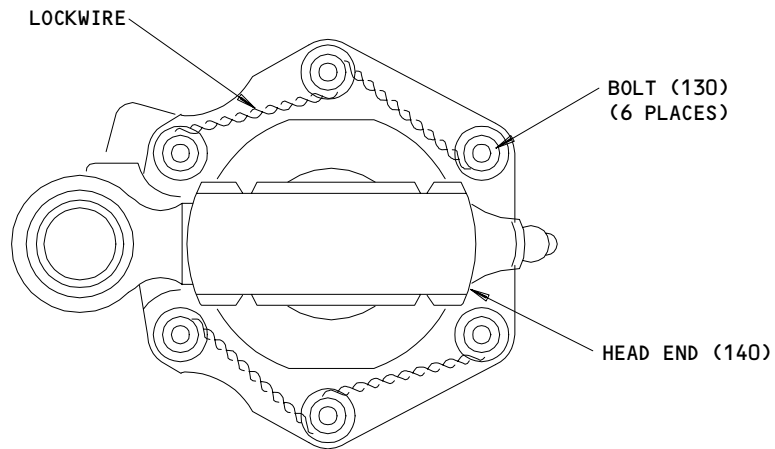
**32-32-20**

ASSEMBLY  
 Page 705  
 Jan 01/90

01.1



- Q. Using double twist method, lockwire nut (60) to cylinder (175); Lockwire bolts (130) to each other (Fig. 703).



Lockwire Installation  
Figure 703

109518

4. Storage

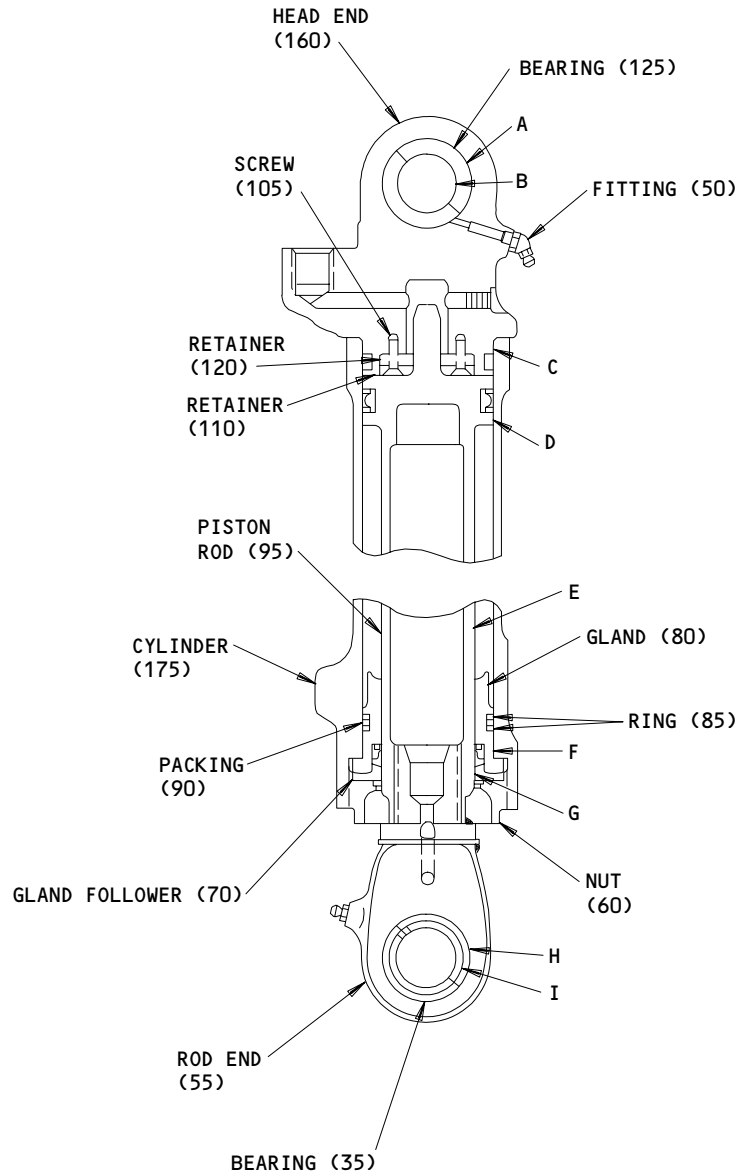
- A. Fill the unit with hydraulic fluid.
- B. Cap or plug ports with hydraulic fluid resistant caps or plugs.
- C. Give protection to the unit and put it away by standard industry practices and the instructions in SOPM 20-44-02 and SOPM 20-70-01.

**32-32-20**

ASSEMBLY  
Page 706  
Jul 01/02

01.1



FITS AND CLEARANCES





Fits and Clearances  
Figure 801 (Sheet 1)

**32-32-20**

FITS AND CLEARANCES  
01.1 Page 801  
Jan 01/90

Ref Letter Fig.801	Mating Item No. IPL Fig. 1	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 160	1.7520	1.7535	0.002	0.004			
	OD 125	1.7495	1.7500					
B	ID 125	1.1245	1.1250	0.0005	0.0025		1.1255	
	OD 	1.1225	1.1240					
C	ID 175	2.493	2.495	0.003	0.007		2.496	0.009
	OD 160	2.488	2.490					
D	ID 175	2.493	2.495	0.003	0.007		2.496	0.009
	OD 95	2.488	2.490					
E	ID 80	1.750	1.752	0.002	0.006		1.753	0.008
	OD 95	1.746	1.748					
F	ID 175	2.493	2.495	0.003	0.007		2.496	0.009
	OD 80	2.488	2.490					
G	ID 70	1.754	1.756	0.006	0.010		1.757	0.012
	OD 95	1.746	1.748					
H	ID 55	1.8145	1.8160	0.002	0.004			
	OD 35	1.8120	1.8125					
I	ID 35	1.1870	1.1875	0.0005	0.0025		1.1880	
	OD 	1.1850	1.1865					

 INSTALLATION BOLT 149T6985-4 OR -8

 INSTALLATION BOLT 149T6985-5

Fits and Clearances  
Figure 801 (Sheet 2)

**32-32-20**

FITS AND CLEARANCES  
01.1 Page 802  
Jan 01/92

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO 20-50-01			
ITEM NO. IPL FIG. 1	NAME	TORQUE	
		POUND-INCHES	POUND-FEET
55	ROD END	2200-2500	
60	NUT	600-800	
105	SCREW	31.5-38.5	
130	BOLT	67.5-82.5	

Torque Table  
 Figure 802

**32-32-20**

SPECIAL TOOLS, FIXTURES AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

- | 1. A32059-27 -- Holding Equipment (supersedes A32059-14) which includes:
  - A. A32059-16 -- Fixture
  - | B. A32059-28 -- Wrench Adapter (supersedes A32059-17)
  - C. A32059-18 -- Wrench Adapter

**32-32-20**

SPECIAL TOOLS

01.1

Page 901

Mar 01/03

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.

**32-32-20**

VENDORS

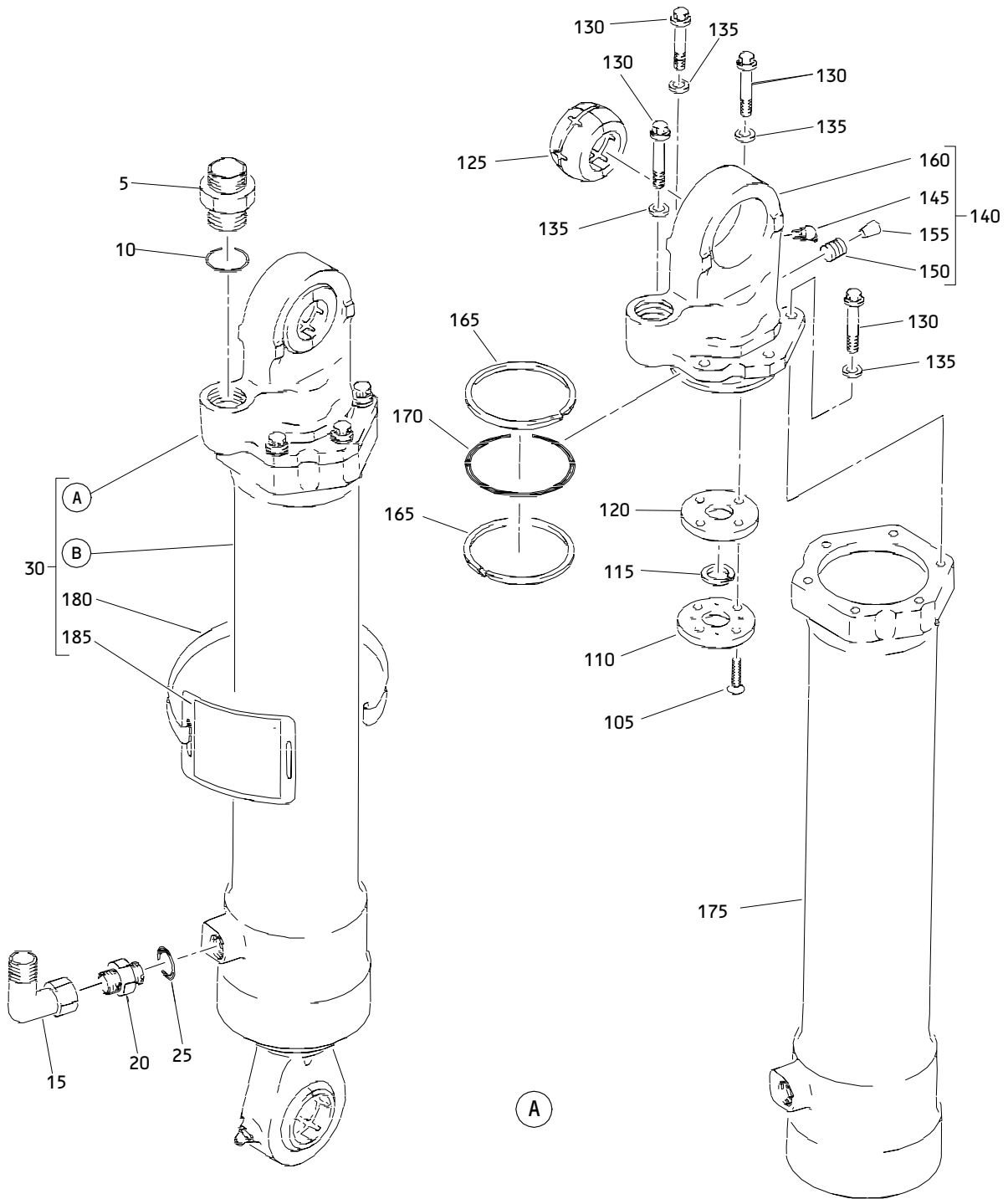
72902 GREENE TWEED AND CO INC  
320 ELM AVENUE  
NORTH WALES, PENNSYLVANIA 19454

97820 SHAMBAN W S AND CO  
711 MITCHELL ROAD, P.O. BOX 665  
NEWBURY PARK, CALIFORNIA 91320

99240 CRISSAIR, INCORPORATED  
38905 10TH STREET EAST  
PALMDALE, CALIFORNIA 93550

**32-32-20**

ILLUSTRATED PARTS LIST  
01.1 Page 1002  
Jul 01/02

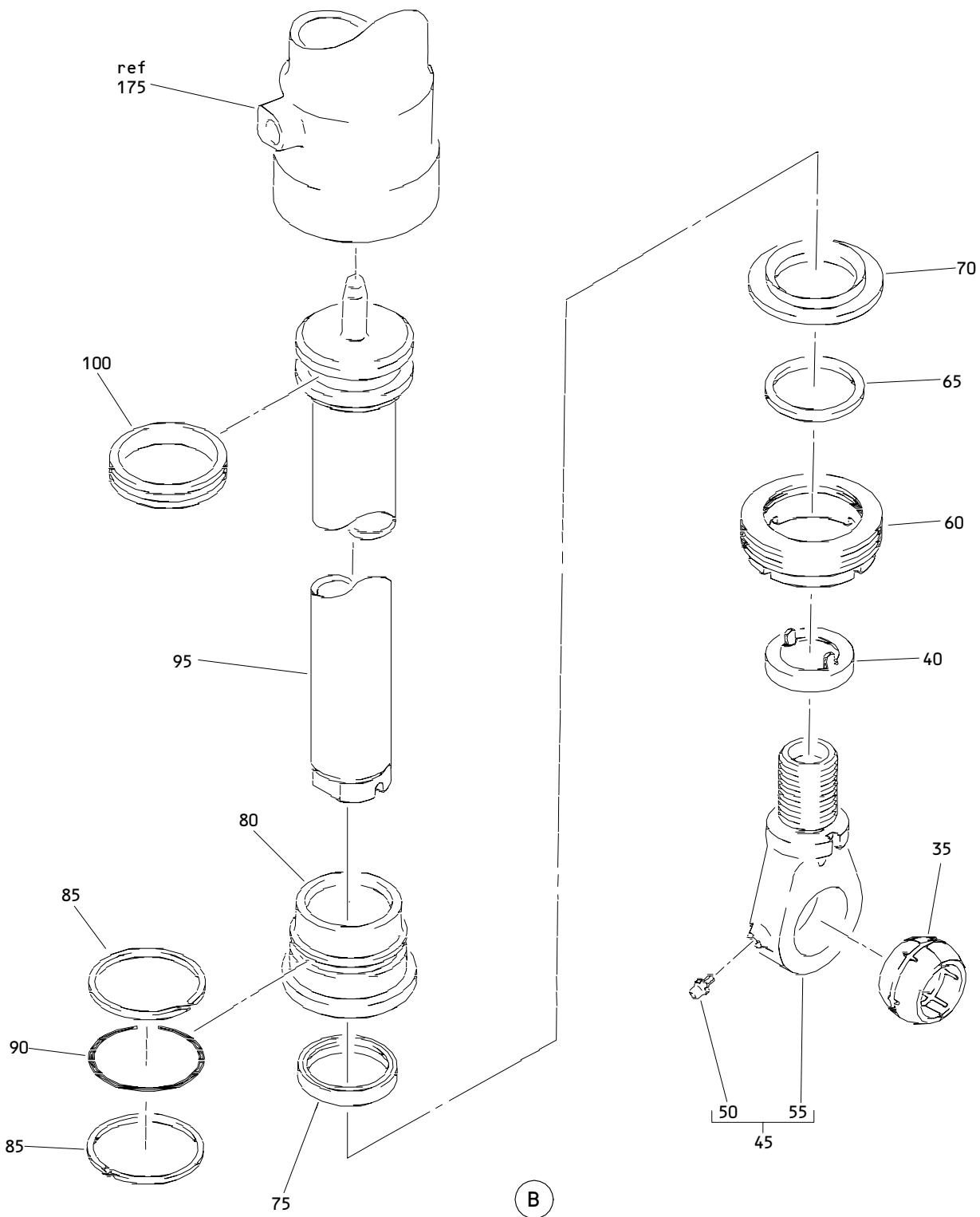


Main Landing Gear Door Actuator Assembly  
Figure 1 (Sheet 1)

**32-32-20**

ILLUSTRATED PARTS LIST  
01.1 Page 1005  
Jan 01/90





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

**32-32-20**

ILLUSTRATED PARTS LIST  
 01.1 Page 1006  
 Jan 01/90

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	273T4520-9		ACTUATOR ASSY-MLG DOOR *[1]		RF
5	9R3206-3		.VALVE-CHK RESTRICT (V99240)		1
10	NAS1612-8		.PACKING		1
15	NAS1762T0606		.ELBOW		1
20	9R3204		.VALVE-CHK RESTRICT (V99240)		1
25	NAS1612-6		.PACKING		1
30	273T0073-1		.ACTUATOR ASSY		1
35	270T0002-19		..BALL		1
40	66-12156-7		..CUP		1
45	273T0074-1		..ROD END ASSY- (OPT ITEM 45A)		1
-45A	273T0084-1		..ROD END ASSY- (OPT TO ITEM 45)		1
50	MS15004-1		...FITTING- (USED ON ITEM 45)		1
55	273T0074-2		...ROD END- (USED ON ITEM 45)		1
60	273T0080-1		..NUT		1
65	BACS34A19A		..SCRAPER		1
70	273T0082-1		..FOLLOWER-GLAND		1
75	S33555-327H99		..HATSEAL- (V97820)		1
-77	NAS1611-327		..PACKING (USED WITH ITEM 79) (OPT TO ITEM 75)		1
-79	S33121-327-5		..FOOT SEAL (USED WITH ITEM 77) (OPT TO ITEM 75)		1
80	273T0081-1		..GLAND		1
85	MS28774-228		..RETAINER		2
90	NAS1611-228		..PACKING		1
95	273T0075-1		..ROD-PISTON (OPT ITEM 95A)		1
-95A	273T0075-3		..ROD-PISTON (OPT ITEM 95)		1
100	7330MT952-4780		..SEAL-RING (V72902)		1
105	NAS514P1032-10		..SCREW		4
110	273T0079-1		..RETAINER		1
115	273T0044-1		..RING		1
120	273T0078-1		..HOLDER		1
125	270T0002-18		..BALL		1

**32-32-20**

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
130	BACB30LE4HU2		..BOLT-		6
135	AN960C416L		DELETED		
135A	BACW10BP4AC		..WASHER		6
135B	BACW10BP4C		..WASHER (OPT)		6
140	273T0077-1		..HEAD END ASSY-		1
			(OPT ITEM 140A)		
-140A	273T0086-1		DELETED		
145	MS15004-2		...FITTING-		1
			(USED ON ITEM 140)		
150	BACP20AX31		...PLUG-		1
155	BACP20AX319		...PIN-		1
160	273T0077-2		...HEAD END-		1
165	MS28774-228		..RETAINER		2
170	NAS1611-228		..PACKING		1
175	273T0076-1		..CYLINDER-		1
			(OPT ITEM 175A)		
-175A	273T0085-1		..CYLINDER-		1
			(OPT ITEM 175)		
180	273T0083-1		..STRAP		1
185	BAC27THY0147		..NAMEPLATE		1

\*[1] POST SB 32-7. REFER TO CMM 32-32-19 FOR PRE SB 32-7 CONFIG.

**32-32-20**

ILLUSTRATED PARTS LIST  
01.1 Page 1008  
Jul 01/02