TO: ALL HOLDERS OF WHEEL BRAKE ACTUATOR ASSEMBLY COMPONENT MAINTENANCE MANUAL 32-41-25

REVISION NO. 7 DATED OCT 01/90

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
501	Changed the compression spring data for spring, P/N 274N1012-1.

WHEEL BRAKE ACTUATOR ASSEMBLY

PART NUMBER 274T4570-2

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

REVISION RECORD

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

REVISION NUMBER	REVISION DATE	DATE FILED	BY

REVISION NUMBER	REVISION DATE	DATE FILED	BY

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR B10823	JAN 10/83

PAGE	DATE	CODE
32-41-25		
TITLE PAGE		
1	JUL 10/83	01
2	BLANK	
REVISION RECORD		
1	JUL 10/83	01
2	BLANK	
TR & SB RECORD		
1	JUL 10/83	01
2	BLANK	
LIST OF EFFECTIVE PAGES		
*1	OCT 01/90	01
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CONTENTS		
1	JAN 10/85	01.1
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101	OCT 01/88	01.1
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301	JUL 10/83	01
302	BLANK	
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401	JUL 10/83	01
402	BLANK	
CHECK		
*501	OCT 01/90	01.1
502	BLANK	
REPAIR-GENERAL		
601	JUL 10/83	01
602	JUL 10/83	01
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602	BLANK	
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601	JUL 10/83	01
602	BLANK	
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701	JAN 10/85	01.1
702	BLANK	
FITS AND CLEARANCES		
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901	JAN 10/85	01.1
902	BLANK	
ILLUSTRATED PARTS LIST		
1001	JUL 10/83	01
1002	JUL 10/83	01.1
1003	BLANK	
1004	JUL 10/83	01.1
1005	JUL 10/83	01.1
1006	JUL 10/83	01.1

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

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 -- Sep 14/82
Disassembly -- Sep 14/82
Assembly -- Sep 14/82

WHEEL BRAKE ACTUATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. The wheel brake actuator assembly consists of a steel casing and a baseplate containing steel piston, spring retainer, compression springs, steel tube, plastic sleeve, plastic plunger, and spring seat. Hydraulic pressure overcomes spring force and moves the piston, extending the plunger against the brake metering valve slide to operate the brake. Removal of hydraulic pressure allows the spring to return the piston, releasing brake application.

2. Leading Particulars (approximate)

   Length -- 5 inches
   Diameter -- 3 inches
   Weight -- 1.3 pounds

TESTING AND TROUBLE SHOOTING

1. Test Equipment and Materials

NOTE: Equivalent substitutes may be used.

A. Hydraulic Test Stand -- Capability of supplying hydraulic fluid at variable pressure of 0-5000 psi at room temperature (70-90°F).

B. Scale -- Capable of measuring up to 50 pounds exerted force from plunger of the actuator assembly.

C. Test Fluid -- BMS 3-11

D. A32060-1 -- Test Fixture

2. Preparation for Test

A. Remove sealing ring (5, IPL Fig. 1)

B. Mount actuator in fixture A32060-1 in horizontal position, with drain holes vertical.

3. Test

WARNING: DO NOT OPERATE UNIT WHEN PROOF PRESSURE IS APPLIED.

CAUTION: DO NOT APPLY COMPRESSED AIR TO PORT AT ANY TIME.

A. Slowly apply hydraulic pressure of 4450-4550 psi to inlet port and hold for 3 minutes. Check that no leakage occurs at drain hole.

B. Repeat test at pressure of 3-8 psi. Check that no leakage occurs.

C. Apply pressure 1400-1600 psi to inlet port. From spring-held position, slowly extend plunger to 0.090-0.158 position. Then extend plunger 0.10 inch further and measure the force. From this last position, retract plunger 0.20 inch and again measure the force. Sum the two values and divide by 2. The resulting average force must be 35-47 pounds, and neither of the two individual force measurements may deviate from the average force by more than 10 pounds.

D. Reduce pressure to 450-550 psi. Check that plunger returns to the spring-held position.

E. Cycle unit for 25 complete stroke cycles at a rate of approximately 3 cycles per minute, alternately applying 2950-3050 psi and 0-50. Check that no external leakage occurs at drain hole.

F. Reinstall sealing ring (5) and lockwire bolts (15) to sealing ring (5).

TROUBLE	POSSIBLE CAUSE	CORRECTION
Leakage at drain hole	Defective cap ring (35) or packing (40).	Disassemble and replace defective parts per par. 4A, 4B.
Force exerted or travel below minimum	Defective inner spring (50).	Disassemble and replace defective parts per par. 4A, 4B.
Force exerted or travel above maximum	Defective outer spring (65).	Disassemble and replace defective parts per par. 4A, 4B.

Trouble Shooting Chart

Figure 101

4. Corrective Procedures

A. Disconnect hydraulic line and drain hydraulic fluid from unit.

B. Replacement of cap ring (35), packing (40) and springs (50, 65).

(1) Disassemble unit per DISASSEMBLY par. 2A thru 2C.

(2) Replace defective parts.

(3) Assemble unit per ASSEMBLY par. 2B thru 2F and retest unit per par. 3.

DISASSEMBLY

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

1. Parts Replacement

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

   A. Cap ring (35)

   B. Packing (40)

2. Disassembly (IPL Fig. 1)

   CAUTION: REMOVE NUTS (25) EVENLY AS SPRING FORCE ACTING ON BOTTOM OF BASEPLATE MAY BIND OR CAUSE DAMAGE TO PARTS.

   A. Remove lockwire and remove sealing ring (5), and evenly remove bolts (15), washers (20) and nuts (25) and separate baseplate (95) from casing (10).

   B. Remove piston (30), retainers (45, 60), springs (50, 65), tube (55), sleeve (70) and plunger (75) from casing (10).

   C. Remove cap ring (35) and packing (40) from piston (30).

   D. Remove scraper (90) from baseplate (95).

CLEANING

1. Clean all parts except plastic retainer (60), sleeve (70) and plunger (75), using standard industry practices per 20-30-03.

2. Wash plastic retainer (60), sleeve (70) and plunger (75) in mild solution of soap and water.

CHECK

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

2. Magnetic particle check per 20-20-01 -- casing (10), tube (55) and springs (50, 65).

3. Penetrant check per 20-20-02 -- Piston (30) and baseplate (95).

4. Check Springs (50, 65)

ITEM NO. FIG. 1	TEST LENGTH (INCHES)	ALLOWABLE LOAD LIMIT (POUNDS)
50	1.20	36 - 44
65	0.99 1.24	55.5 - 59.5 43.5 - 47.5

Compression Spring Data

REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
274T4572	CASING	1-1
274T4577	BASEPLATE	2-1
- - - -	MISC PARTS	3-1

2. Standard Practices

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

   20-30-02 Stripping of Protective Finishes
   20-30-03 General Cleaning Procedures
   20-41-01 Decoding Table for Boeing Finish Codes
   20-42-05 Bright Cadmium Plating
   20-43-01 Chromic Acid Anodizing

3. Materials

   NOTE: Equivalent substitutes may be used.

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

4. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in applicable repair procedures are shown in Fig. 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
∅	DIAMETER
BASIC (BSC) OR [DIM]	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE FROM WHICH PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE

EXAMPLES

— 0.002	STRAIGHT WITHIN 0.002
⊥ B 0.002	PERPENDICULAR TO B WITHIN 0.002
// A 0.002	PARALLEL TO A WITHIN 0.002
○ 0.002	ROUND WITHIN 0.002
⌭ 0.010	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
⌒ A 0.006	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART IN RELATION TO DATUM PLANE A
⌓ A 0.020	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ C ∅ 0.0005	CONCENTRIC TO C WITHIN 0.0005 DIAMETER (FULL INDICATOR MOVEMENT)
⌯ A 0.010	SYMMETRICAL WITH A WITHIN 0.010
∠ A 0.005	ANGULAR TOLERANCE 0.005 WITH A
⌖ B ∅ 0.002 Ⓢ	LOCATED AT TRUE POSITION WITHIN 0.002 DIA IN RELATION TO DATUM B, REGARDLESS OF FEATURE SIZE
⊥ A ∅ 0.010 Ⓜ 0.510 Ⓟ	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010-INCH DIAMETER, PERPENDICULAR TO, AND EXTENDING 0.510-INCH ABOVE, DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	EXACT DIMENSION IS 2.000

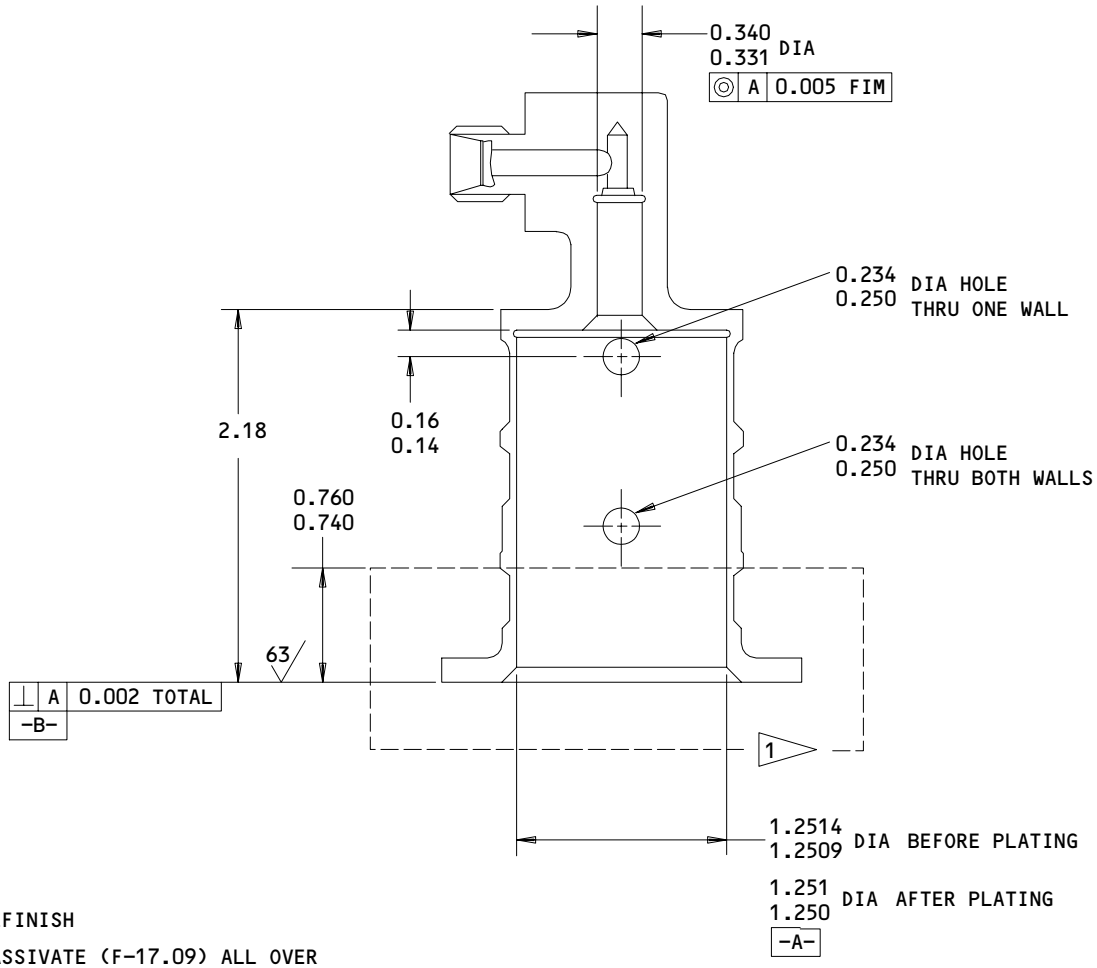
True Position Dimensioning Symbols
Figure 601

CASING - REPAIR 1-1

274T4572-1

1. Plating Repair

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



REFINISH

PASSIVATE (F-17.09) ALL OVER EXCEPT AS NOTED IN 1

1 CADMIUM PLATE (0.0002-0.0004 INCH) (F-15.02) THIS SURFACE

MATERIAL: 15-5PH STEEL (HT 150-179 KSI)

ALL DIMENSIONS ARE IN INCHES

Casing Repair
Figure 601

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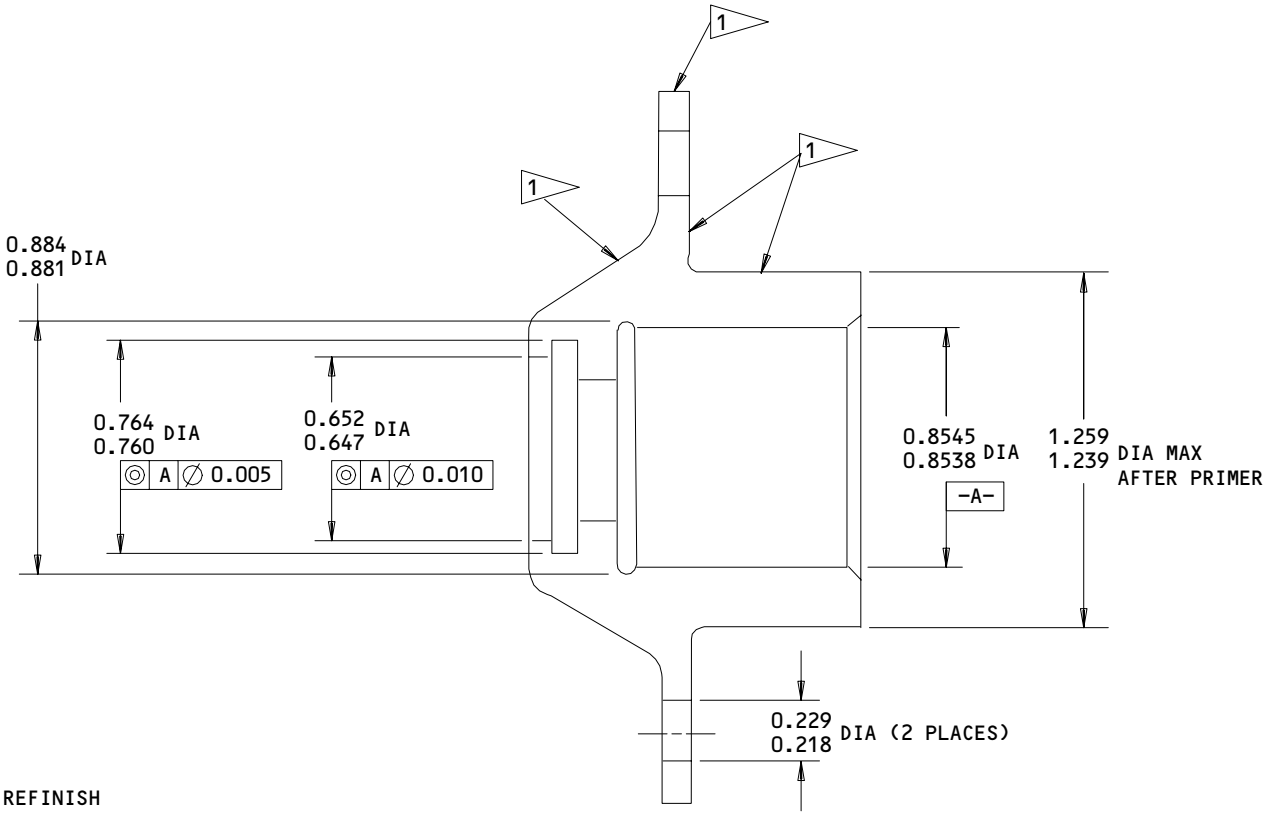
BASEPLATE - REPAIR 2-1

274T4577-1

1. Plating Repair

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



REFINISH

CHROME ACID ANODIZE (F-17.04) ALL OVER, EXCEPT AS NOTED IN 1

1 CHROMIC ACID ANODIZE AND APPLY ONE COAT PRIMER, BMS 10-11, TYPE 1 (F-18.13) THIS SURFACE ONLY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

274T4577

Baseplate Repair
Figure 601

19982

MISCELLANEOUS PARTS - REPAIR 3-1

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

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Piston (30)	302 CRES	Passivate (F-17.09)
Springs (50,65)	17-7PH CRES	Passivate (F-17.09)
Tube (55)	15-5PH CRES 150-170 ksi	Passivate (F-17.09)

Refinish Details
Figure 601

ASSEMBLY

1. Materials

   NOTE: Equivalent substitutes may be used.

   A. Assembly Lube -- MCS352 (Ref 20-60-03)

   B. Lockwire -- MS20995NC20

2. Assembly

   A. Install scraper (90, IPL Fig. 1) on baseplate (95).

   B. Lightly lubricate cap ring (35) and packing (40) with assembly lube and install ring (35) and packing (40) on piston (30).

   C. Install sleeve (70), spring (65) and retainer (60) on baseplate (95) and install tube (55), plunger (75), spring (50), retainer (45) and piston (30) on baseplate (95).

   D. Install casing (10) on baseplate (95) and secure with bolts (15), washers (20) and nuts (25).

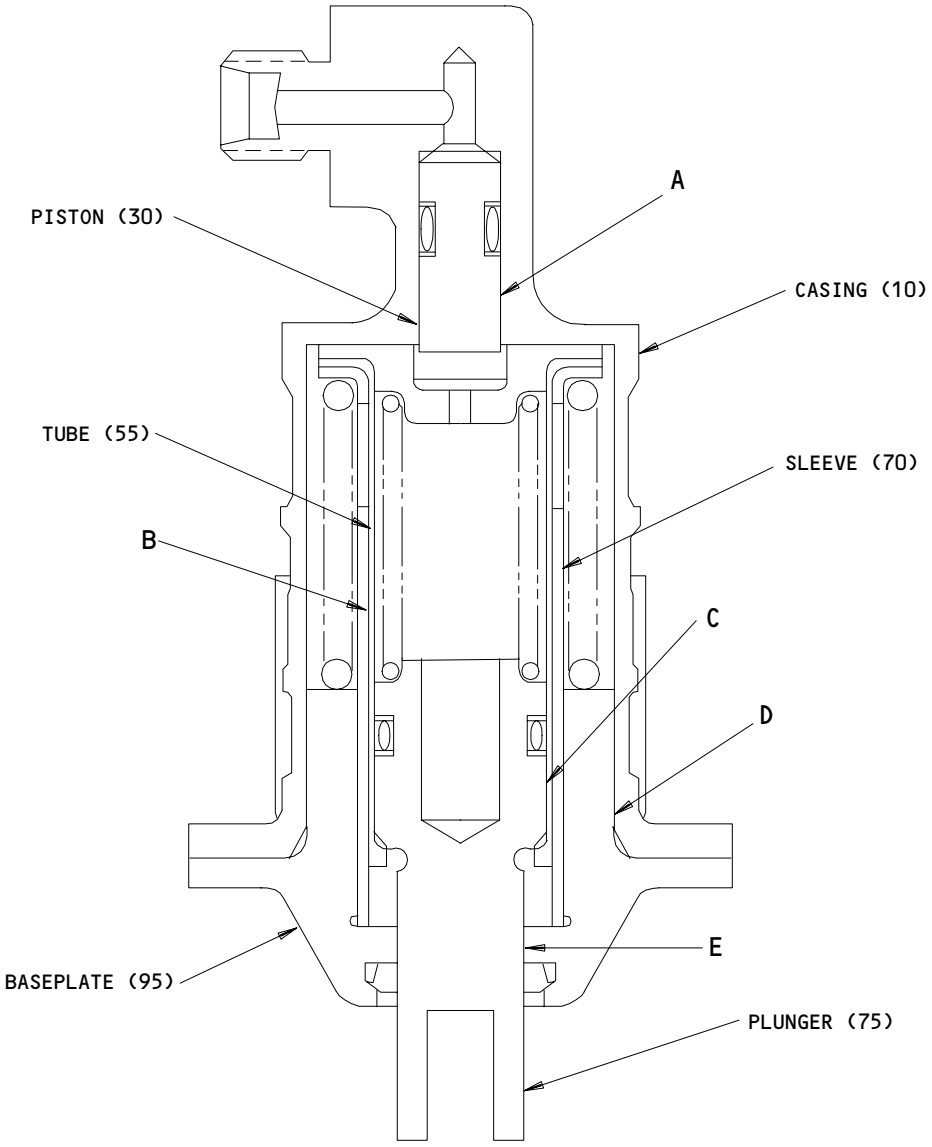
   E. Install sealing ring (5) on casing (10).

   F. Lockwire bolts (15) to sealing ring (5) per 20-50-02 using double twist method.

   G. Test unit per TESTING/TROUBLE SHOOTING.

3. Store this component using standard industry practices and information contained in 20-44-02.

FITS AND CLEARANCES



Fits and Clearances
Figure 801 (Sheet 1)

Ref Letter Fig.801	Mating Item No. IPL Fig.	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 10	0.329	0.330	0.003	0.005		0.332	0.007
	OD 30	0.325	0.326			0.324		
B	ID 70	0.750	0.752	0.005	0.009		0.753	0.010
	OD 55	0.743	0.745			0.742		
C	ID 55	0.689	0.691	0.005	0.009		0.692	0.010
	OD 75	0.682	0.684			0.681		
D	ID 10	1.250	1.251	0.003	0.005		1.252	
	OD 95	1.246	1.247					
E	ID 95	0.502	0.504	0.004	0.008		0.506	0.012
	OD 75	0.496	0.498			0.492		

ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801 (Sheet 2)

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SPECIAL TOOLS, FIXTURES AND EQUIPMENT

NOTE: Equivalent substitutes may be used.

1. A32060-1 -- Test Fixture

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

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

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

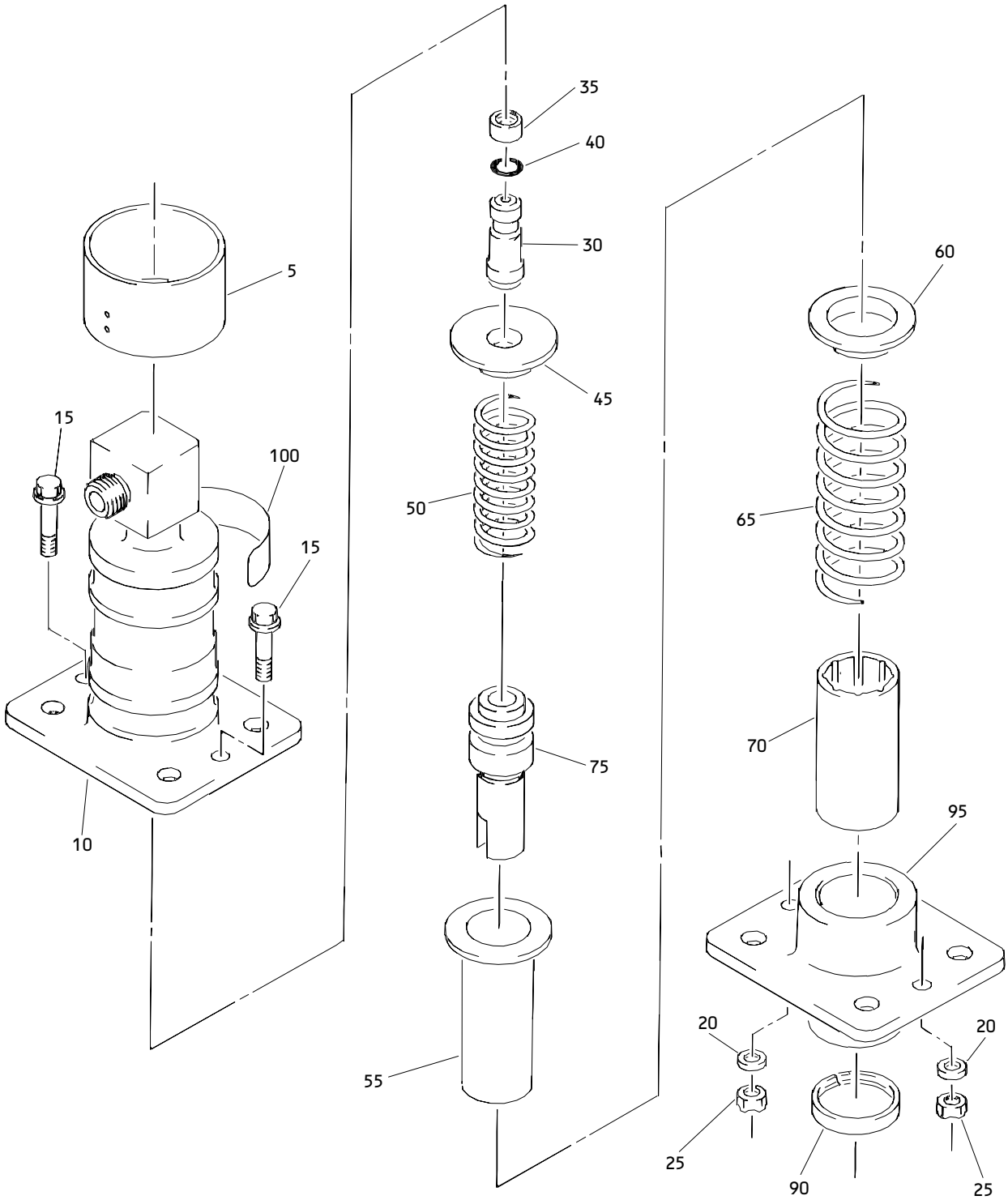
71087 BOOTS ACFT NUT DIV TOWNSEND CO SEE TEXTRON INC CHERRY
FASTENER TOWNSEND DIV V11815

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

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

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

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



Wheel Brake Actuator Assembly
Figure 1

T57275

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	274T4570-1		DELETED		
-1A	274T4570-2		ACTUATOR ASSY - WHL BRAKE		RF
5	69B80159-1		SEALING RING		1
10	274T4572-1		DELETED		
10A	274T4572-2		.CASING		1
			ATTACHING PARTS		
15	NAS6703H4		.BOLT		2
20	AN960PD10L		.WASHER		2
25	BRH10A3		.NUT-		2
			(V52828)		
			(SPEC BACN10JC3)		
			(OPT H10-3BAC		
			(V15653))		
			(OPT NS202101-02		
			(V80539))		
			(OPT RMLH9075-3W		
			(V72962))		
			(OPT T6S1032J		
			(V71087))		
			(OPT VN303A02		
			(V92215))		
			(OPT 96-02		
			(V80539))		
			-------*-------		
30	274T4576-1		.PISTON		1
35	69-54540-009		.RING-CAP		1
40	NAS1611-009		.PACKING		1
45	69B80162-1		.RETAINER-SPR		1
50	274N1012-1		.SPRING		1
55	274T4574-1		DELETED		
55A	274T4574-2		.TUBE		1
60	69B80165-1		.SEAT-SPR		1
65	69B80161-1		.SPRING		1
70	69B80163-1		.SLEEVE		1
75	274T4575-1		.PLUNGER		1

FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
90	CWR76-1A		.SCRAPER- (V26879) (SPEC BACS34A1) (OPT DW96801-25 (V02886)) (OPT S30388-1 (V97820)) (OPT TF005-25C (V07128)) (OPT 2140-25 (V26303))		1
95	274T4577-1		.BASEPLATE		1
100	BAC27THY0057		.NAMEPLATE		1