COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

TAILSKID ACTUATOR ASSEMBLY

PART NUMBER 273T4702–1, –2

PUBLISHED BY BOEING COMMERCIAL AIRPLANES GROUP, SEATTLE, WASHINGTON, USA
A DIVISION OF THE BOEING COMPANY
PAGE DATE: Jul 01/2009

BOEING®

COMPONENT MAINTENANCE MANUAL

Revision No. 7
Jul 01/2009

To: All holders of TAILSKID ACTUATOR ASSEMBLY 32-71-12.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

The COMPONENT MAINTENANCE MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

ATTENTION

IF YOU RECEIVE PRINTED REVISIONS, PLEASE VERIFY THAT YOU HAVE RECEIVED AND FILED THE PREVIOUS REVISION. BOEING MUST BE NOTIFIED WITHIN 30 DAYS IF YOU HAVE NOT RECEIVED THE PREVIOUS REVISION. REQUESTS FOR REVISIONS OTHER THAN THE PREVIOUS REVISION WILL REQUIRE A COMPLETE MANUAL REPRINT SUBJECT TO REPRINT CHARGES SHOWN IN THE DATA AND SERVICES CATALOG.

Location of Change	Description of Change
32-71-12	
TESTING AND FAULT ISOLATION	Changed the data in the Tools/Equipment list.
SPECIAL TOOLS FIXTURES AND EQUIPMENT	Changed the data in the Special Tools table. Changed the data in the Commercial Tools table. Changed the data in the Tool Supplier Information table. Added the Special Tools table. Added the Tool Supplier Information table.

COMPONENT MAINTENANCE MANUAL

A = Added, R = Revised, D = Deleted, O = Overflow

TABLE OF CONTENTS

BOEING

COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR 38610-3	MAR 01/06

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

BOEING®

COMPONENT MAINTENANCE MANUAL

All temporary revisions to this manual will be accompanied by a cover sheet bearing the temporary revision number. Enter the temporary revision number in numerical order, together with the temporary revision date, the date the temporary revision is inserted and the initials of the person filing.
When the temporary revision is incorporated or cancelled, and the pages are removed, enter the date the pages are removed and the initials of the person who removed the temporary revision.

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

Temporary Revision		Inserted		Removed	
Number	Date	Date	Initials	Date	Initials

Temporary Revision		Inserted		Removed	
Date	Initials	Number	Date	Date	Initials

INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Components that can be repaired have a different repair number for each specified repair. To find the repair number location of a component, look in the Repair-General procedure at the beginning of the REPAIR section. The Repair-General procedure also has an explanation of the True Position Dimension symbols used.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. The tool reference numbers found in the individual procedures and in the Special Tools, Fixtures, and Equipment section are used to identify if a tool is a standard tool (STD-XXXX), a commercial tool (COM-XXXX), or a Special Tool (SPL-XXXX). This reference number is also used to distinguish between tools with similar names in the same procedure. These reference numbers are for use in the documentation only. They are not to be used for ordering tools.

TAILSKID ACTUATOR ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The tailskid actuator assembly DESCRIPTION AND OPERATION, Figure 1 has a barrel assembly with a bearing installed in one end, a rod end assembly with a bearing, and a solenoid that controls the pressure port and return port.

2. Operation

A. The actuator assembly deploys the tailskid when hydraulic pressure is applied.

3. Leading Particulars (Approximate)

A. Length (between bearing centers)

(1) 273T4702-1

(a) 14.7250 ±0.0500 inches (retracted)

(b) 19.9650 ±0.0900 inches (extended)

(2) 273T4702-2

(a) 12.9950 ±0.0500 inches (retracted)

(b) 15.4140 ±0.0500 inches (extended)

B. Width – 5 inches

C. Weight – 9 pounds

D. Hydraulic Fluid – hydraulic fluid, D50122

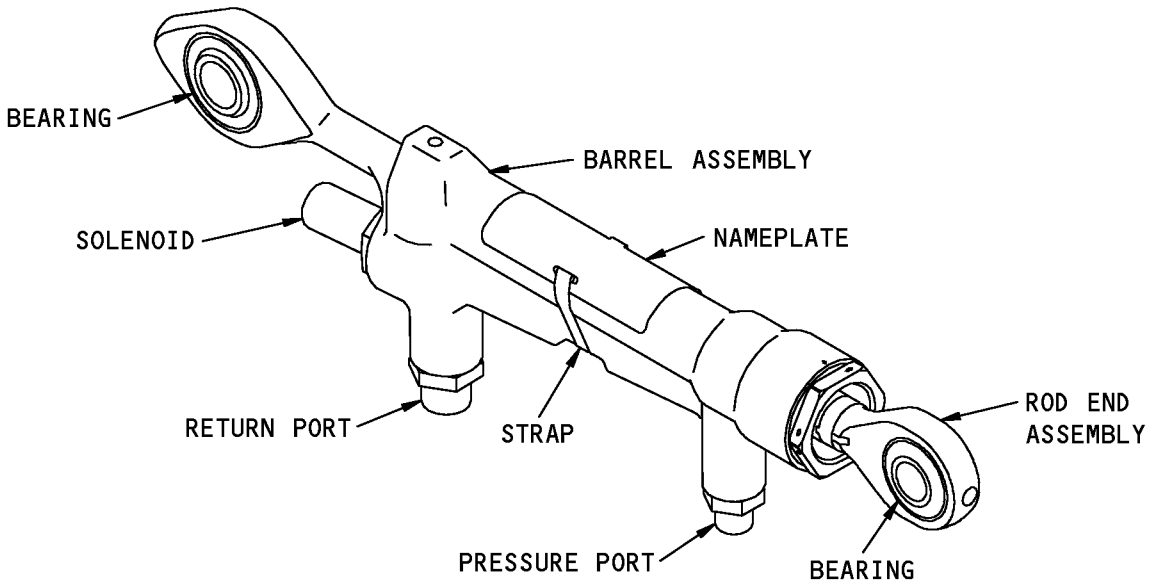
E. Operating Pressure – 3000 psi

F. Proof Pressure – 4500-4600 psi

G. Stroke

(1) 273T4702-1 – 5.24 inches

(2) 273T4702-2 – 2.419 inches



Tailskid Actuator Assembly
Figure 1

TESTING AND FAULT ISOLATION

1. General

A. This procedure tells how to do a test of the actuator assembly after an overhaul or for fault isolation. The test includes these items:

(1) Insulation Resistance (Pre Exposure)

(2) Dielectric Strength

(3) Insulation Resistance (Post Exposure)

(4) Bonding and Grounding

(5) Coil Resistance

(6) Suppression

(7) Drop out voltage

(8) Pull in voltage

(9) Proof Pressure

(10) External Leakage

(11) Internal Leakage

(12) Extended Stroke Rate

(13) Retracted Stroke rate

(14) Extend and retract length

(15) Friction

(16) Bearing Friction

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

C. Refer to IPL Figure 1 for item numbers.

2. Special Tools and Equipment

NOTE: Equivalent equipment can be used.

A. Actuator Assembly Fixture Equipment - LANDING GEAR ACTUATOR ASSY FIXTURE, SPL-9193.

B. Insulation and Dielectric Tester - dielectric strength tester, SPL-8671

(1) Parameters.

(a) AC: 0 to 5000V AC, 60 Hz, 0-2.5A, Accuracy: ± 5%

(b) DC: 0 to 500V DC, 0-250 Megohms, Accuracy: ± 5%

(2) Shown below are two examples that can be used. Equivalent models can be used.

(a) Example 1: Manufacturer: Kikusui, Model: 860A

(b) Example 2: Manufacturer: Hipotronics, Model: H300B Series

3. Actuator Assembly Test

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-8671	Tester - Dielectric Strength (Part #: 875B, Supplier: 61993)
SPL-9193	FIXTURE EQPT - LANDING GEAR ACTUATOR ASSYS (Part #: A32121-1, Supplier: 81205)
STD-5485	Hydraulic Test Stand - Capable of supplying BMS 3-11 fluid at maximum flow rate of 5 gpm at variable pressure of 0-5000 psi. Fluid shall be filtered continuously to 15 microns and be maintained 70-110?F.
STD-5502	Storage Oscilloscope - Sensitivity 500m V/cm Band Width 0-100 MHz Voltage Probe 100V, 10M ohm impedance
STD-7618	Ohmmeter - Standard

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D50122	Fluid - Hydraulic, Skydrol	BMS3-11, Type IV or Type V

C. References

Reference	Title
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-60-03	LUBRICANTS

D. Procedure

NOTE: For disassembly, refer to DISASSEMBLY. For Assembly, refer to ASSEMBLY. For Lubricants, refer to SOPM 20-60-03.

(1) Prepare for Test

(a) Test Conditions

1) Ambient Conditions

a) Temperature - 80°F ±20°F.

b) Pressure - 15 psi ±2 psi

c) Relative Humidity - 10 to 90 percent

(b) Install the actuator in Hydraulic Test Stand, STD-5485.

(c) Attach the hydraulic test stand lines to the ports.

(d) Fill the actuator with hydraulic fluid, D50122.

NOTE: The actuator will be continuously full of hydraulic fluid, D50122 for each test.

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

(2) Procedure

(a) Do an insulation resistance test (Pre Exposure).

1) With pins 1 and 3 tied together (TESTING AND FAULT ISOLATION, Figure 101), apply 500v dc for 1 minute between pin 1 and 2. Measure the insulation resistance with an insulation and dielectric tester. The insulation resistance must not be less than 40 megohms.

(b) Do a dielectric strength test using dielectric strength tester, SPL-8671.

1) With pins 1 and 3 tied together (TESTING AND FAULT ISOLATION, Figure 101), apply 1500Vrms, 60Hz for one minute between pin 1 and 2. Measure the leakage current with an dielectric strength tester, SPL-8671. The leakage current must not be more than 2.0 milliamps. There must be no arcing, flashover, sparkover or breakdown. The test voltage can be decreased to 1200Vrms, 60 Hz (80 percent of 1500Vrms) if the solenoid (95) had this test at 1500Vrms.

(c) Do an insulation resistance test (Post Exposure), using dielectric strength tester, SPL-8671.

1) With pins 1 and 3 tied together, see (TESTING AND FAULT ISOLATION, Figure 101), apply 500v dc for 1.0 minute between pins 1 and 2. Measure the insulation resistance. The insulation resistance must not be less than 40 megohms.

(d) Bonding and Grounding Test

1) Apply 1.0 amp between the electrical connector on the solenoid (95) valve and the mounting surface for the ground strap on the head end of the actuator barrel. Measure the voltage drop. Apply 1.0 amp between pin 2 and the mounting surface for the ground strap. Measure the voltage drop. In both cases, the voltage drop must not be more than 10 millivolts.

(e) Coil resistance test

1) With an standard ohmmeter, STD-7618, measure the coil resistance between pins 1 and 3, see TESTING AND FAULT ISOLATION, Figure 101. The coil resistance must be 85 - 115 ohms.

(f) Suppression Test

1) Apply 28v dc across pins 1 and 3, see (TESTING AND FAULT ISOLATION, Figure 101), with a 10msec minimum power interruption. With a Oscilloscope, STD-5502, measure the voltage during and after the power interruption. Voltage variations during and after the power interruption must be between -70 and +70v dc.

(g) Drop out voltage

1) With the solenoid valve energized, 50 psi applied to the return (RTN) port and 3000 psi applied to the pressure (press) port, De-energize the solenoid valve and measure the drop out voltage. The drop out voltage must be 3 VDC or more.

(h) Pull in voltage

1) With the solenoid valve De-energized 50 psi applied to the return (RTN) port and 3000 psi applied to the pressure (press) port, energize the solenoid valve, and measure the drop-in voltage. The drop in voltage must be 18 VDC or less.

(i) Proof Pressure Test

1) Fill the actuator assembly with hydraulic fluid, D50122.

2) With the actuator in the retracted position and the solenoid valve de-energized, slowly apply pressure to both ports to fully extend the actuator.

3) With the actuator fully extended, continue to increase the pressure to 4500 - 4600 psi. Hold this pressure for at least 30 seconds. There must not be any external leakage or permanent deformation.

(j) External Leakage Test

1) Fill the actuator assembly with hydraulic fluid, D50122.

2) Before you operate the unit, clean around the shaft of the piston rod (72) where the rod scraper (30) and rod seal (40) touch the piston rod. Then operate the actuator assembly for a minimum of 25 full no-load cycles at a rate of approximately 2-3 cycles per minute. Use 3000 to 3100 psi inlet pressure and 40 to 60 psi return pressure. Let the unit touch the stops at both ends of the stroke. Leakage at the rod seal (40) must not be more than one drop. There must be no leakage at the packings (55, 80, 90, 97).

3) Apply 2-5 psi to both ports and hold for two minutes. There must be no external leakage.

(k) Internal Leakage Test

1) Fill the actuator assembly with hydraulic fluid, D50122.

2) With the actuator assembly in the retracted position, apply 50 psi to the pressure (PRESS) port. Measure the internal leakage flow rate from the return (RTN) port. The flow rate leakage from the return (RTN) port must not be more than 2 cubic centimeters per minute.

3) With the actuator assembly in the retracted position, apply 3000 psi to the pressure (PRESS) port. Measure the internal leakage flow rate from the return (RTN) port. The flow rate leakage from the return (RTN) port must not be more than 2 cubic centimeters per minute.

4) With the actuator assembly in the extended position, apply 50 psi to the return (RTN) port. Measure the internal leakage flow rate from the pressure (PRESS) port. The flow rate leakage from the pressure (PRESS) port must not be more than 2 cubic centimeters per minute.

(l) Extended Stroke Rate

1) With the actuator assembly fully retracted, the piston rod (72) free to move, and the solenoid valve (95) energized, apply 50 psi to the return (RTN) port and 3000 psi to the pressure (PRESS) port.

2) De-energize the solenoid valve (95) and measure the time required for the actuator to fully extend. The time to fully extend the actuator must be:

a) 273T4702-1: 10-14 seconds

b) 273T4702-2: 3.2 - 3.7 seconds

(m) Retract Stroke Rate

1) With the actuator assembly fully extended, the piston rod (72) unrestrained, the solenoid valve (95) de-energize, apply 50 psi to the return (RTN) port and 3000 psi to the pressure (PRESS) port.

2) Energize the solenoid valve (95). Measure and record the time required for the actuator assembly to fully retract. The time required to fully retract must be:

a) 273T4702-1: 13 - 17 seconds

b) 273T4702-2: 3.9 - 4.7 seconds

(n) Extend and Retract Length

1) Measure the extended and retracted length of the actuator between the bearing centers. The length values must be as shown:

Table 101:

ACTUATOR PART NO.	EXTENDED LENGTH, INCHES	RETRACTED LENGTH, INCHES
273T4702-1	20.055 19.875	14.775 14.675
273T4702-2	15.514 15.324	13.045 12.945

(o) Friction Test

1) With the actuator assembly fully extended, the rod end assembly (5) free to move the solenoid valve (95) energized and the return (RTN) port open to atmospheric pressure, slowly apply 115 psi to the pressure (PRESS) port. The actuator assembly must retract smoothly and freely. When the actuator is fully retracted, de-energize the solenoid valve (95). The actuator assembly must extend smoothly and freely.

(p) Bearing Friction

1) Measure the breakout torque for the bearings (10, 115 or 145) in the rod end (15) and the barrel (120 or 150). The breakout torque must not be greater than 30 in-lb for either bearing (10, 115 or 145).

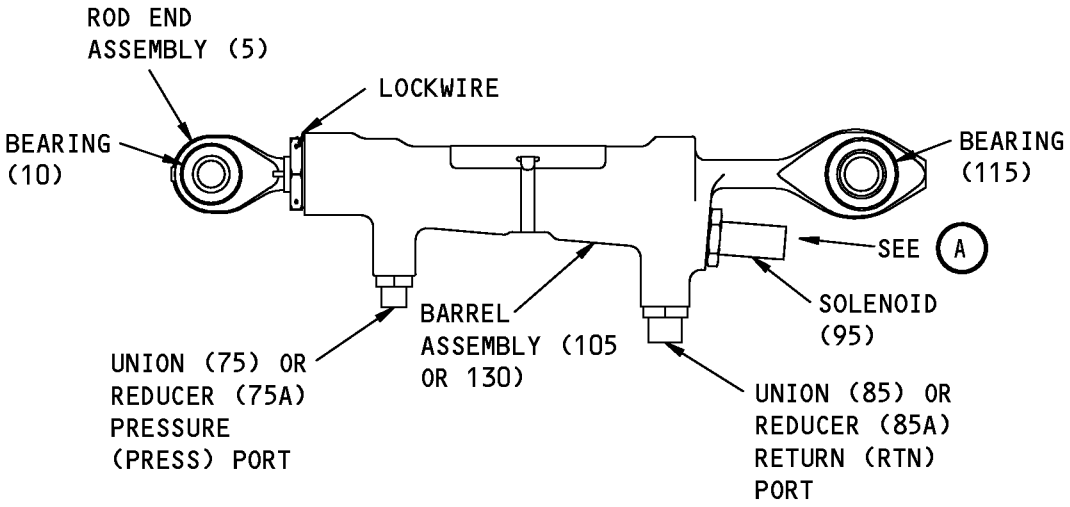
(q) After the tests, drain and refill the actuator assembly as follows:

1) With the actuator assembly in the retracted position, drain the hydraulic fluid from the actuator.

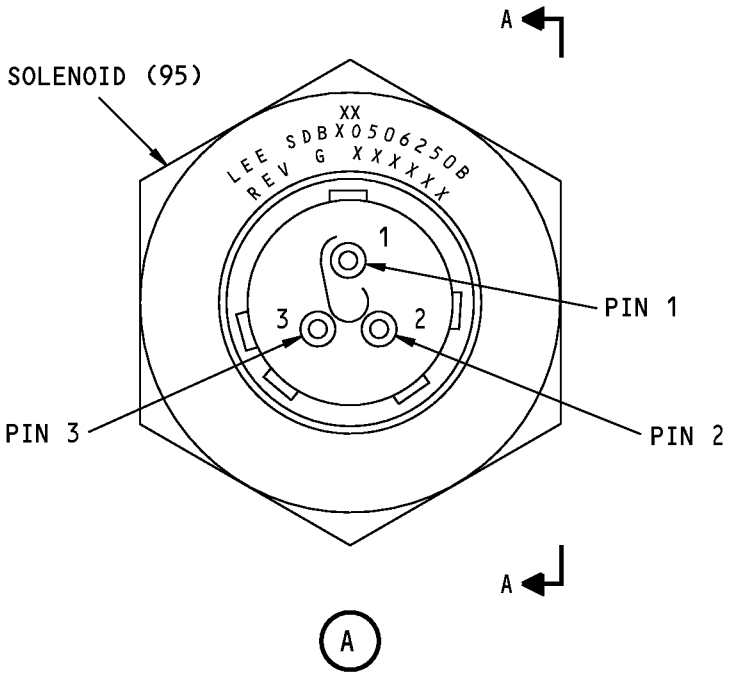
2) Add approximately 1 fluid ounce of new hydraulic fluid, D50122 through the pressure (PRESS) port. Seal off both the pressure (PRESS) port and return (RTN) port with hydraulic resistant shipping caps to prevent leakage during shipping. Remove the actuator from the LANDING GEAR ACTUATOR ASSY FIXTURE, SPL-9193 and Hydraulic Test Stand, STD-5485.

3) Identify the actuator assembly with the test date.

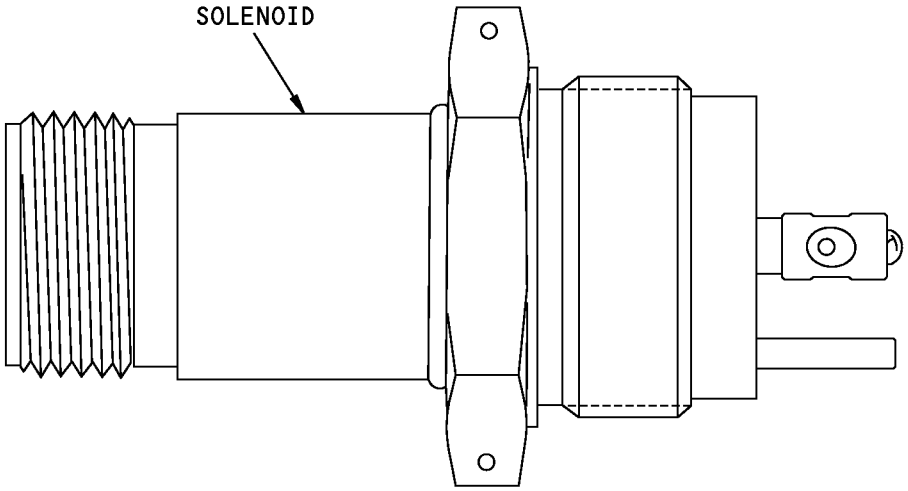
4) Install safety wire at the location shown in TESTING AND FAULT ISOLATION, Figure 101(SOPM 20-50-02).



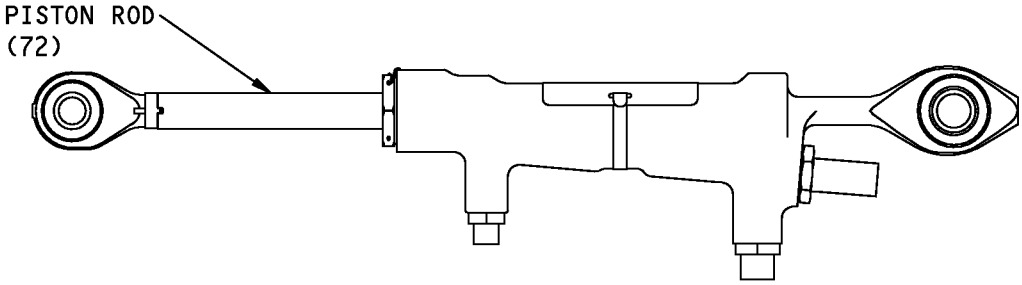
RETRACTED POSITION



Actuator Test
Figure 101 (Sheet 1 of 2)



A-A



EXTENDED POSITION

Actuator Test
Figure 101 (Sheet 2 of 2)

(NOT APPLICABLE)

(NOT APPLICABLE)

CHECK

1. General

A. This procedure tells how to find defects in the specified parts.

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

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

D. Refer to IPL Figure 1 for item numbers.

2. Check

A. References

Reference	Title
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Use standard industry procedures to do a visual check of all the parts for defects.

(2) Do a magnetic particle check (SOPM 20-20-01) of these parts:

(a) Rod End (15)

(b) Piston Rod (72)

(c) Barrel (120)

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

(a) Gland Nut (20)

REPAIR

1. General

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

Table 601:

P/N	NAME	REPAIR
273T4703	BARREL ASSEMBLY	2-1, 2-2
273T4704	PISTON ROD	3-1
273T4705	ROD END ASSEMBLY	4-1, 4-2
- - - -	NAMEPLATE INSTALLATION	5-1

2. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in REPAIR-GENERAL, Figure 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
⌵	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
Ø	DIAMETER
S Ø	SPHERICAL DIAMETER
R	RADIUS
SR	SPHERICAL RADIUS
()	REFERENCE
BASIC (BSC) OR [DIM]	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE FROM WHICH PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓛ	LEAST MATERIAL CONDITION (LMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT
TIR	TOTAL INDICATOR READING

EXAMPLES

[— | 0.002]	STRAIGHT WITHIN 0.002
[⊥ | 0.002 | B]	PERPENDICULAR TO B WITHIN 0.002
[// | 0.002 | A]	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
[⌒ | 0.006 | A]	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM PLANE A
[⌓ | 0.020 | A]	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.02 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
[◎ Ø 0.0005 | C]	CONCENTRIC TO C WITHIN 0.0005 DIAMETER
[⌯ | 0.010 | A]	SYMMETRICAL WITH A WITHIN 0.010
[∠ | 0.005 | A]	ANGULAR TOLERANCE 0.005 WITH A
[⌖ Ø 0.002 Ⓢ | B]	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
[⊥ Ø 0.010 Ⓜ | A] [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	THEORETICALLY EXACT DIMENSION IS 2.000

NOTE: DATUM MAY APPEAR AT EITHER SIDE OF TOLERANCE FRAME [0.020 | A] [A | 0.020]

True Position Dimensioning Symbols
Figure 601

BARREL ASSEMBLY - REPAIR 2-1

273T4703–1, –4

1. General

A. This procedure tells how to replace the bearing (115 or 145) in the barrel assembly (105 or 130).

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

C. Refer to IPL Figure 1 for item numbers.

2. Bearing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

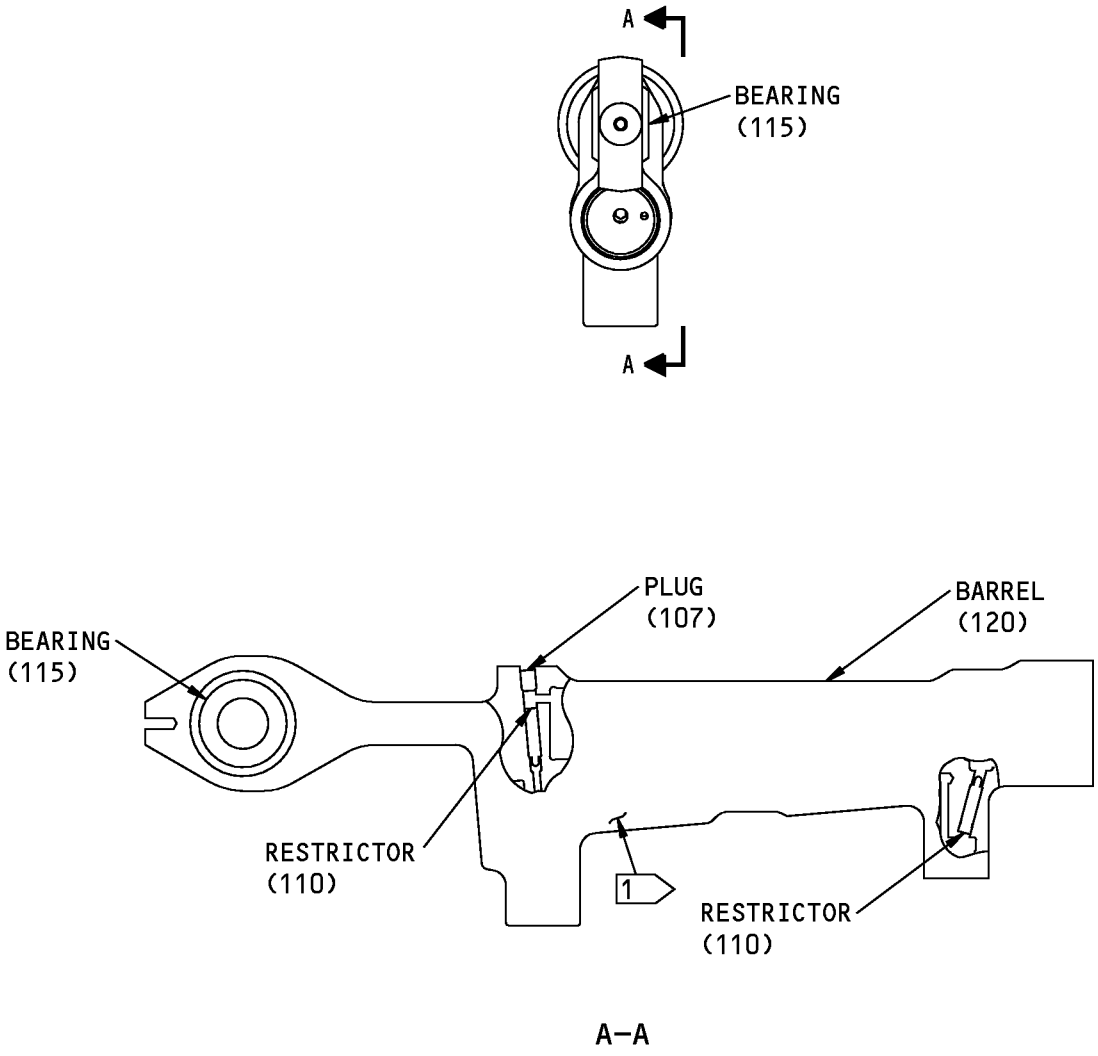
Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure (REPAIR 2-1, Figure 601 or REPAIR 2-1, Figure 602)

NOTE: For decoding table for boeing finish codes, refer to SOPM 20-41-01. For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the old bearing (115 or 145).

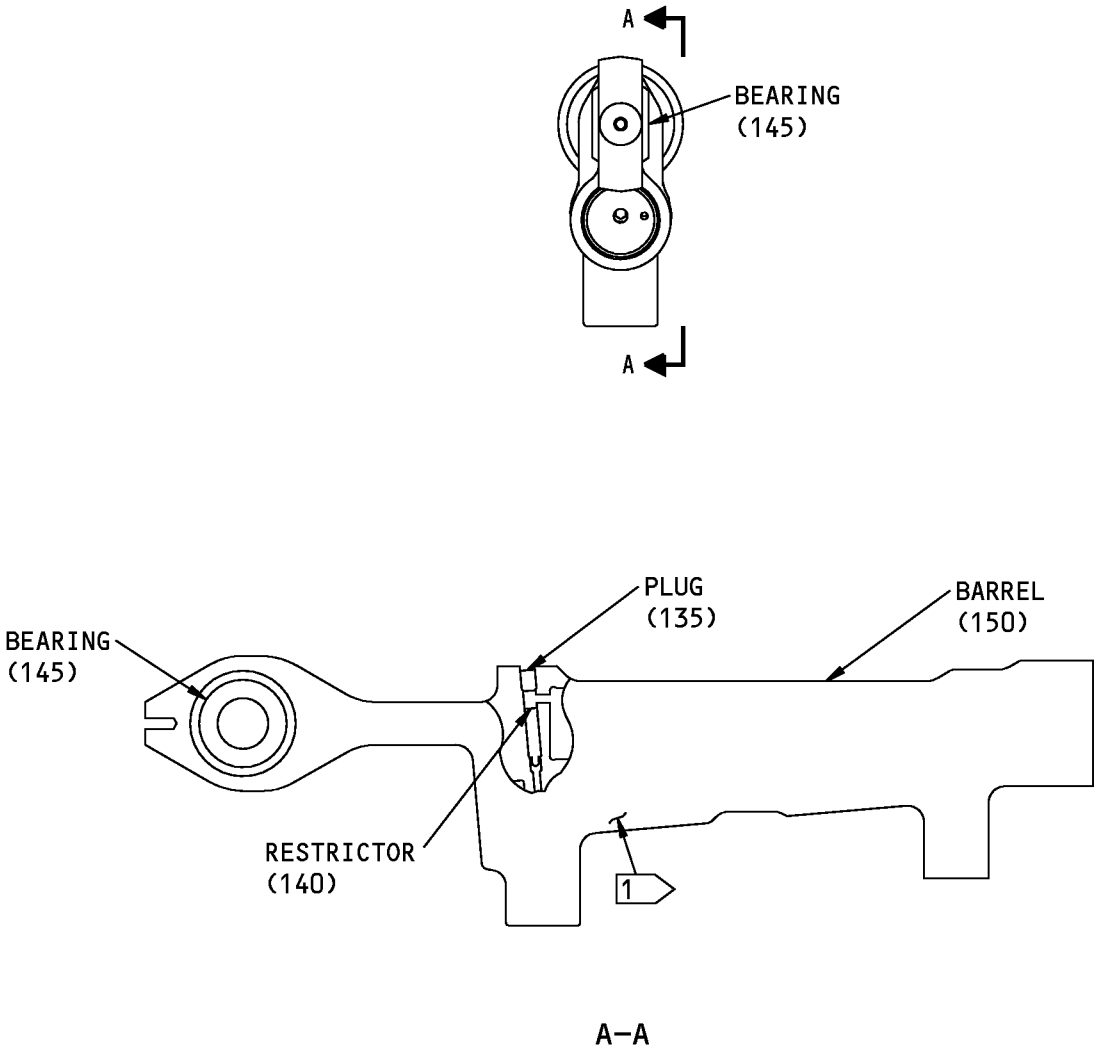
(2) Install a replacement bearing with sealant, A00247 and roller swage it (SOPM 20-50-03).



1 PART NUMBER AND SERIAL NUMBER

ITEM NUMBERS REFER TO IPL FIG. 1

273T4703-1 Barrel Assembly Bearing Replacement
Figure 601



1 PART NUMBER AND SERIAL NUMBER

ITEM NUMBERS REFER TO IPL FIG. 1

273T4703-4 Barrel Assembly Bearing Replacement
Figure 602

BARREL - REPAIR 2-2

273T4703–2, –5

1. General

A. This procedure tells how to repair the barrel (120 or 150).

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

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

D. Refer to REPAIR-GENERAL, Figure 601 for standard true position dimensioning symbols shown in the repair.

E. Refer to IPL Figure 1 for item numbers.

F. General repair details:

(1) Material:

(a) 15-5PH CRES, AMS 5659

(b) 180-200 Ksi

(2) Shot peen:

(a) Intensity 0.005-0.010A2 Coverage 2.0

2. Bearing Hole Repair (for barrel 273T4703-2 only)

A. References

Reference	Title
SOPM 20-10-02	MACHINING OF ALLOY STEEL
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-42-03	HARD CHROME PLATING
SOPM 20-42-09	ELECTRODEPOSITED NICKEL PLATING

B. Procedure (REPAIR 2-2, Figure 601)

NOTE: For machining of alloy steel, refer to SOPM 20-10-02. For decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Method 1: Bearing Hole Repair

(a) Machine the hole for the bearing (115) within repair limits, as necessary, to remove defects.

(b) Magnetic particle examine (SOPM 20-20-01).

(c) Shot peen the bearing hole (SOPM 20-10-03).

(d) If you machined within the chrome plate repair limit, build up with chrome plate (SOPM 20-42-03) and grind to design dimensions and finish. Chrome plate thickness after grinding must be 0.003-0.010 inch.

(e) If you machined for the nickel plate repair limit, build up with nickel plate (SOPM 20-42-09). Then chrome plate (SOPM 20-42-03). Be sure that the chrome plating thickness on top of the nickel plating is 0.003-0.005 inch.

(f) Install a replacement bearing (115) as shown in REPAIR 2-1.

(2) Method 2: Installation of Oversize Bearings

(a) For a 0.015 inch diameter oversize hole:

1) Machine the hole to the repair range for installation of a 0.015 inch oversize bearing.

2) Be sure that the hole surfaces have no defects.

3) Magnetic particle examine (SOPM 20-20-01).

4) Shot peen the hole (SOPM 20-10-03).

5) Get an oversize bearing KSC145700BZ12G015 or KSC312312BZG015 from Kamatics Corp. (V50632) and install it as shown in REPAIR 2-1.

(b) For a 0.030 inch diameter oversize hole:

1) Machine the hole to the repair range for installation of a hole for bearing (115) to 0.030 inch oversize bearing.

2) Be sure that the hole surfaces have no defects.

3) Magnetic particle examine (SOPM 20-20-01).

4) Shot peen the hole (SOPM 20-10-03).

5) Get an oversize bearing KSC145700BZ12G030 or KSC312312BZG030 from Kamatics Corp. (V50632) and install it as shown in REPAIR 2-1.

3. Barrel Bore Repair

A. References

Reference	Title
SOPM 20-10-01	REPAIR AND REFINISH OF HIGH STRENGTH STEEL PARTS
SOPM 20-10-02	MACHINING OF ALLOY STEEL
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-04	GRINDING OF CHROME PLATED PARTS
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-42-03	HARD CHROME PLATING
SOPM 20-42-09	ELECTRODEPOSITED NICKEL PLATING

B. Procedure (REPAIR 2-2, Figure 601 and REPAIR 2-2, Figure 602)

NOTE: For repair and refinish of high strength steel parts, refer to SOPM 20-10-01. For machining of alloy steels, refer to SOPM 20-10-02. For shot peening, refer to SOPM 20-10-03. For grinding of chrome plated parts, refer to SOPM 20-10-04. For electrodeposited nickel plating, refer to SOPM 20-42-09.

(1) Procedure

CAUTION: BEFORE YOU MACHINE THE BARREL, BE SURE TO REMOVE RESTRICTORS (110) TO PREVENT DAMAGE.

(a) Remove the restrictors (110). Refer to Lee Company process specification 187 to remove the restrictors.

(b) Machine the barrel bore as necessary, within repair limits, to remove defects.

(c) Magnetic particle examine (SOPM 20-20-01).

(d) Shot peen.

(e) If you machined for the nickel plate repair limit, build up with nickel plate (SOPM 20-42-09). Then chrome plate (SOPM 20-42-03). Be sure that the chrome plating thickness on top of the nickel plating is 0.003-0.005 inch.

(f) If you machined within the chrome plate repair limit, build up with chrome plate (SOPM 20-42-03) and grind to design dimensions and finish.

4. Barrel Refinish

A. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

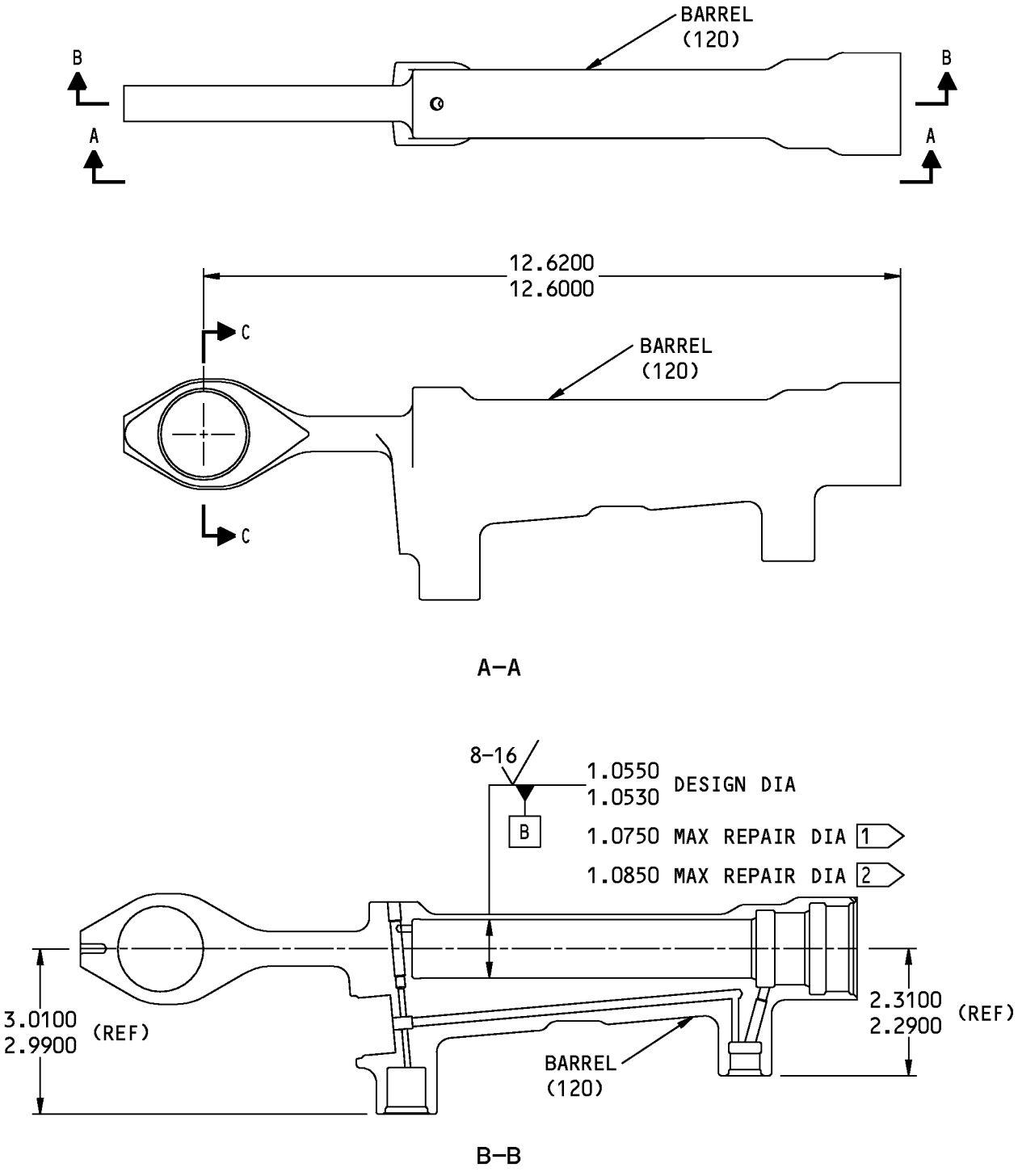
B. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedures, refer to SOPM 20-30-03. For decoding table for Boeing finish codes, refer to SOPM 20-41-01.

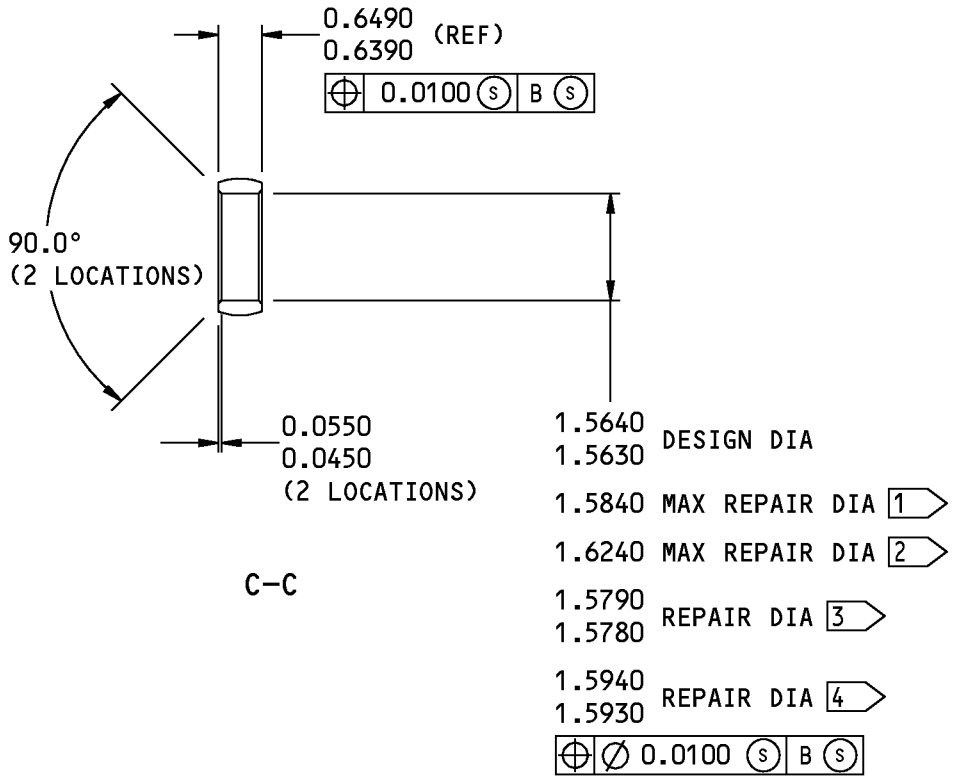
(1) Passivate (F-17.25) all over.

5. Install Replacement Restrictors

A. Install replacement restrictors (110 or 140) by Lee Company Process Specification 187.



273T4703-2 Barrel Repair
Figure 601 (Sheet 1 of 2)



1 LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03) AND GRIND TO DESIGN DIMENSIONS AND FINISH

2 LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09) AND THEN GRIND TO DESIGN DIMENSIONS AND FINISH

3 RANGE FOR INSTALLATION OF 0.015 OVERSIZE BEARING

4 RANGE FOR INSTALLATION OF 0.030 OVERSIZE BEARING

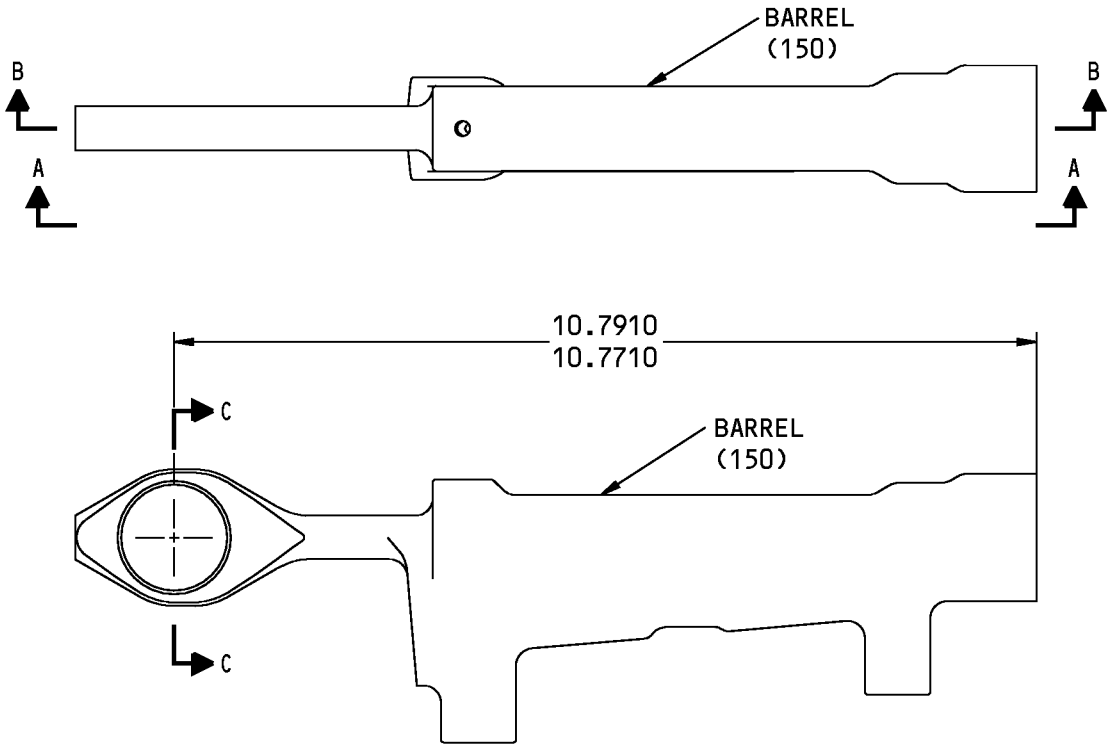
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

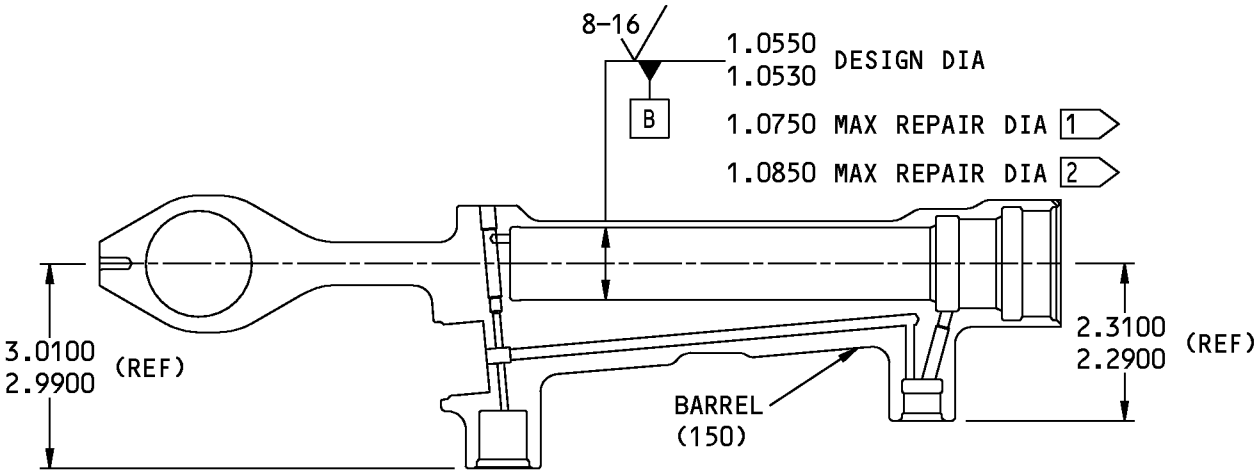
ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

273T4703-2 Barrel Repair
Figure 601 (Sheet 2 of 2)

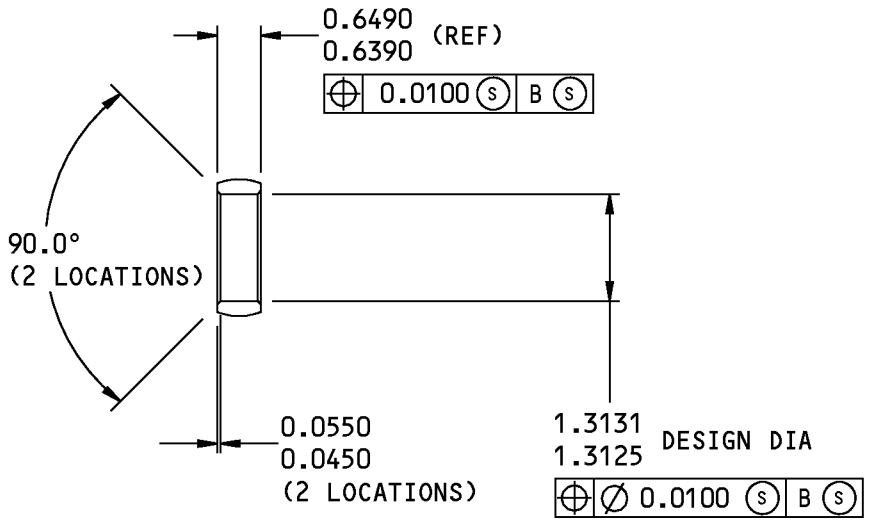


A–A



B–B

273T4703-5 Barrel Repair
Figure 602 (Sheet 1 of 2)



C–C

1 LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03) AND GRIND TO DESIGN DIMENSIONS AND FINISH

2 LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09) AND THEN GRIND TO DESIGN DIMENSIONS AND FINISH

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

273T4703-5 Barrel Repair
Figure 602 (Sheet 2 of 2)

PISTON ROD - REPAIR 3-1

273T4704–1, –2

1. General

A. This procedure tells how to repair and refinish the piston rod (72).

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

C. Refer to IPL Figure 1 for item numbers.

D. Refer to REPAIR-GENERAL, Figure 601 for standard true position dimensioning symbols shown in the repair.

E. General repair details:

(1) Material:

(a) 15-5PH CRES, AMS 5659

(b) 180-200 KSI

(2) Shot Peen:

(a) Intensity 0.005-0.010A2 Coverage 2.0

2. Piston Rod Repair

A. References

Reference	Title
SOPM 20-10-01	REPAIR AND REFINISH OF HIGH STRENGTH STEEL PARTS
SOPM 20-10-02	MACHINING OF ALLOY STEEL
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-04	GRINDING OF CHROME PLATED PARTS
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-42-03	HARD CHROME PLATING
SOPM 20-42-09	ELECTRODEPOSITED NICKEL PLATING

B. Procedure (REPAIR 3-1, Figure 601)

NOTE: For repair and refinish of high strength steel parts, refer to SOPM 20-10-01. For machining of alloy steels, refer to SOPM 20-10-02. For grinding of chrome plated parts, refer to SOPM 20-10-04.

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

(2) Magnetic particle examine (SOPM 20-20-01).

(3) Shot peen (SOPM 20-10-03).

(4) If you machined within the chrome plate repair limit, build up with chrome plate (SOPM 20-42-03) and grind to dimensions and finish. Chrome plate thickness after grinding must be 0.003-0.010 inch.

(5) If you machined for the nickel plate repair limit, build up with nickel plate (SOPM 20-42-09). Then chrome plate (SOPM 20-42-03). Be sure that the chrome plating thickness on top of the nickel plating is 0.003-0.005 inch.

3. Piston Refinish

A. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-42-03	HARD CHROME PLATING

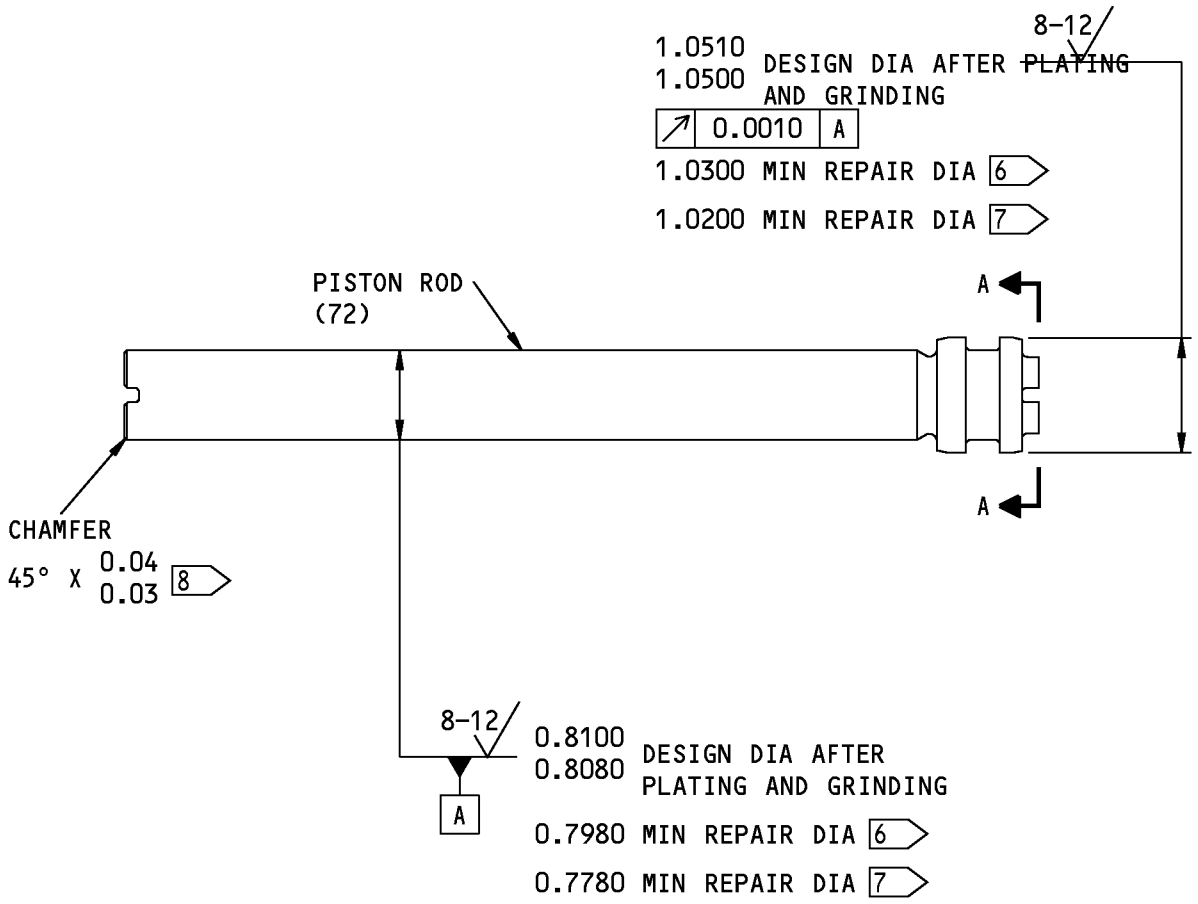
B. Procedure (REPAIR 3-1, Figure 601)

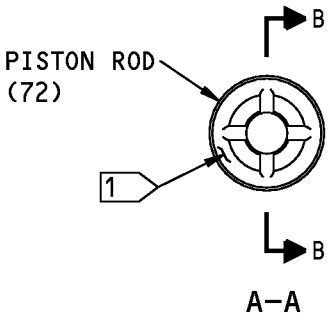
NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedures, refer to SOPM 20-30-03. For decoding table for Boeing finish codes, refer to SOPM 20-41-01. For hard chrome plating, refer to SOPM 20-42-03.

(1) Chrome plate (F-15.34) as shown.

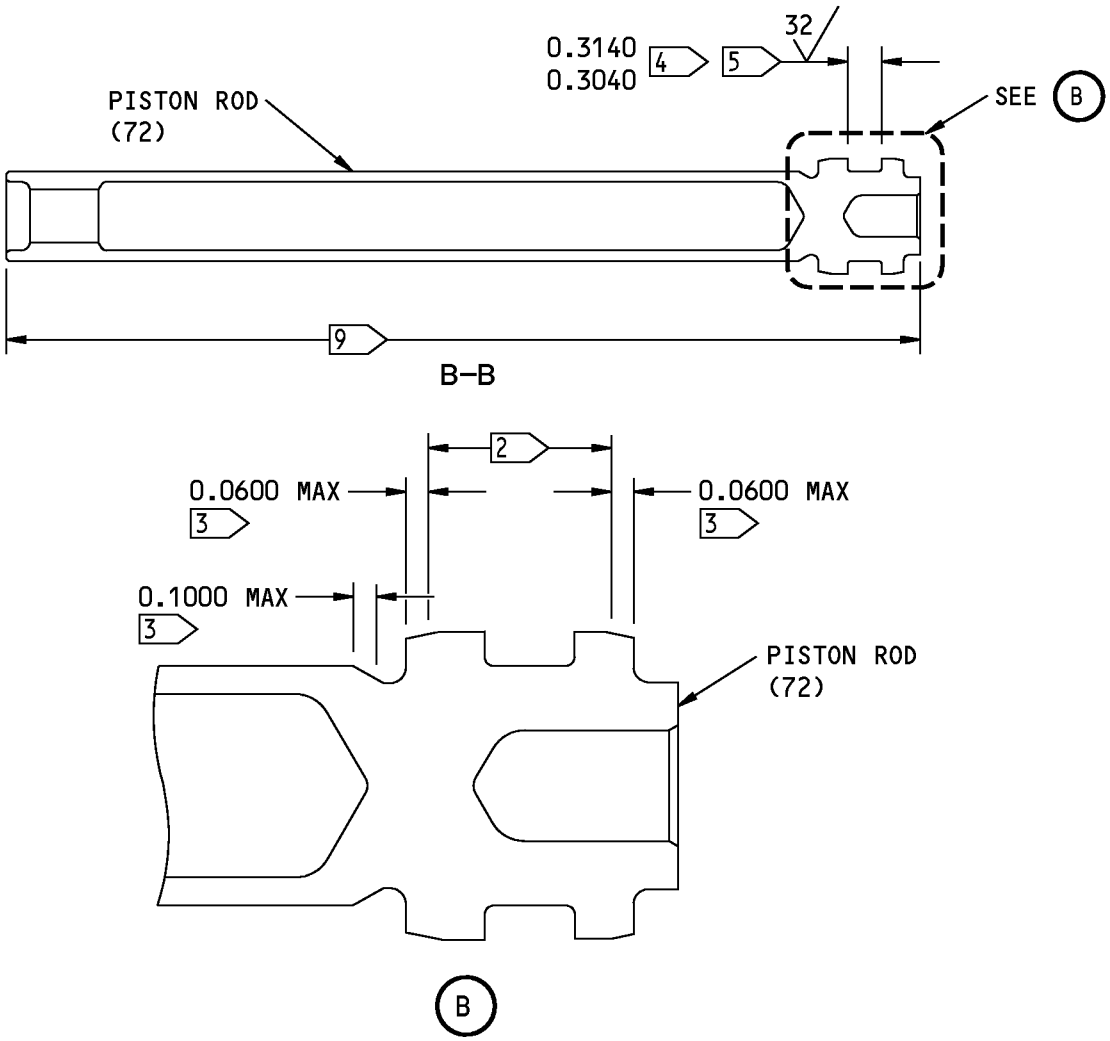
(2) Grind the chrome plate to design dimensions and finish. The final chrome plate thickness must be 0.003-0.005 inches if the chrome plated area is on top of nickel plate, otherwise the chrome plate thickness must be 0.003-0.010 inches.

(3) Passivate (F-17.25) other surfaces.





273T4704-1,-2 Piston Rod Repair
Figure 601 (Sheet 1 of 2)



1 > PART NUMBER AND SERIAL NUMBERS

2 > CHROME PLATE (F-15.34)

3 > CHROME PLATE RUNOUT AREA

4 > NO CHROME PLATE

5 > NO SHOT PEEN

6 > LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03) AND GRIND TO DESIGN DIMENSIONS AND FINISH

7 > LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09) AND THEN CHROME PLATE TO DESIGN DIMENSIONS AND FINISH

8 > KEEP THIS CHAMFER AFTER PLATING AND GRINDING

9 > SHOT PEEN THIS AREA, UNLESS SHOWN BY 5 >, BEFORE CHROME PLATING

125 √ ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

273T4704-1,-2 Piston Rod Repair
Figure 601 (Sheet 2 of 2)

ROD END ASSEMBLY - REPAIR 4-1

273T4705–1

1. General

A. This procedure tells how to replace the bearing (10) in the rod end assembly (15).

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

C. Refer to IPL Figure 1 for item numbers.

2. Bearing Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95

B. References

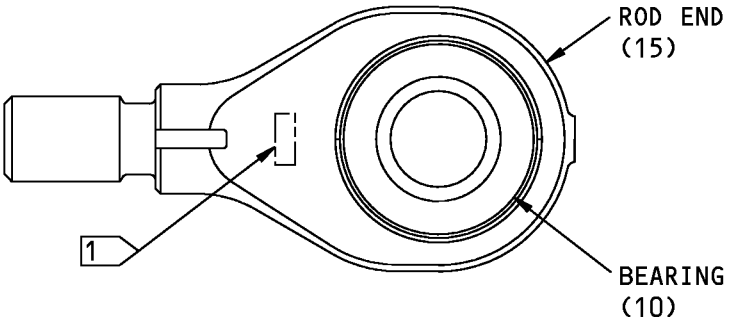
Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For decoding table for Boeing finish codes, refer to SOPM 20-41-01. For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the old bearing (10).

(2) Install a replacement bearing with sealant, A00247 and roller swage it (SOPM 20-50-03).



1 PART NUMBER AND SERIAL NUMBER LOCATED HERE

ITEM NUMBERS REFER TO IPL FIG. 1

273T4705-1 Rod End Assembly
Figure 601

ROD END - REPAIR 4-2

273T4705–2

1. General

A. This procedure tells how to repair the rod end (15).

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

C. Refer to REPAIR-GENERAL, Figure 601 for standard true position dimensioning symbols shown in the repair.

D. Refer to IPL Figure 1 for item numbers.

E. General repair details:

(1) Material:

(a) 15-5PH CRES, AMS 5659,

(b) 180-200 KSI

2. Bearing Hole Repair (REPAIR 4-2, Figure 601)

A. References

Reference	Title
SOPM 20-10-02	MACHINING OF ALLOY STEEL
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-42-03	HARD CHROME PLATING
SOPM 20-42-09	ELECTRODEPOSITED NICKEL PLATING

B. Procedure

NOTE: For machining of alloy steel, refer to SOPM 20-10-02. For decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Method 1: Bearing Hole Repair

(a) Machine the hole for the bearing (10) as necessary, within repair limits, to remove defects.

(b) Magnetic particle examine (SOPM 20-20-01).

(c) Shot peen the bearing hole (SOPM 20-10-03).

(d) If you machined within the chrome plate repair limit, build up with chrome plate (SOPM 20-42-03) and grind to design dimensions and finish. Chrome plate thickness after grinding must be 0.003-0.010 inch.

(e) If you machined for the nickel plate repair limit, build up with nickel plate (SOPM 20-42-09). Be sure that the chrome plating thickness on top of the nickel plating is 0.003-0.005 inch.

(f) Install a replacement bearing (10) as shown in REPAIR 4-1.

(2) Method 2: Installation of Oversize Bearings

(a) For a 0.015 inch diameter oversize hole:

1) Machine the hole to the repair range for installation of a 0.015 inch oversize bearing.
2) Be sure that the hole surfaces have no defects.
3) Magnetic particle examine (SOPM 20-20-01).
4) Shot peen the hole (SOPM 20-10-03).
5) Get an oversize bearing KSC145700BZ10G015 or KSC312210BZG015 from Kamatics Corp. (V50632) and install it as shown in REPAIR 4-1.

(b) For a 0.030 inch diameter oversize hole:

1) Machine the hole to the repair range for installation of a 0.030 inch oversize bearing.
2) Be sure that the hole surfaces have no defects.
3) Magnetic particle examine (SOPM 20-20-01).
4) Shot peen the hole (SOPM 20-10-03).
5) Get an oversize bearing KSC145700BZ10G030 or KSC312210BZG030 from Kamatics Corp. (V50632) and install it as shown in REPAIR 4-1.

3. Rod End Refinish

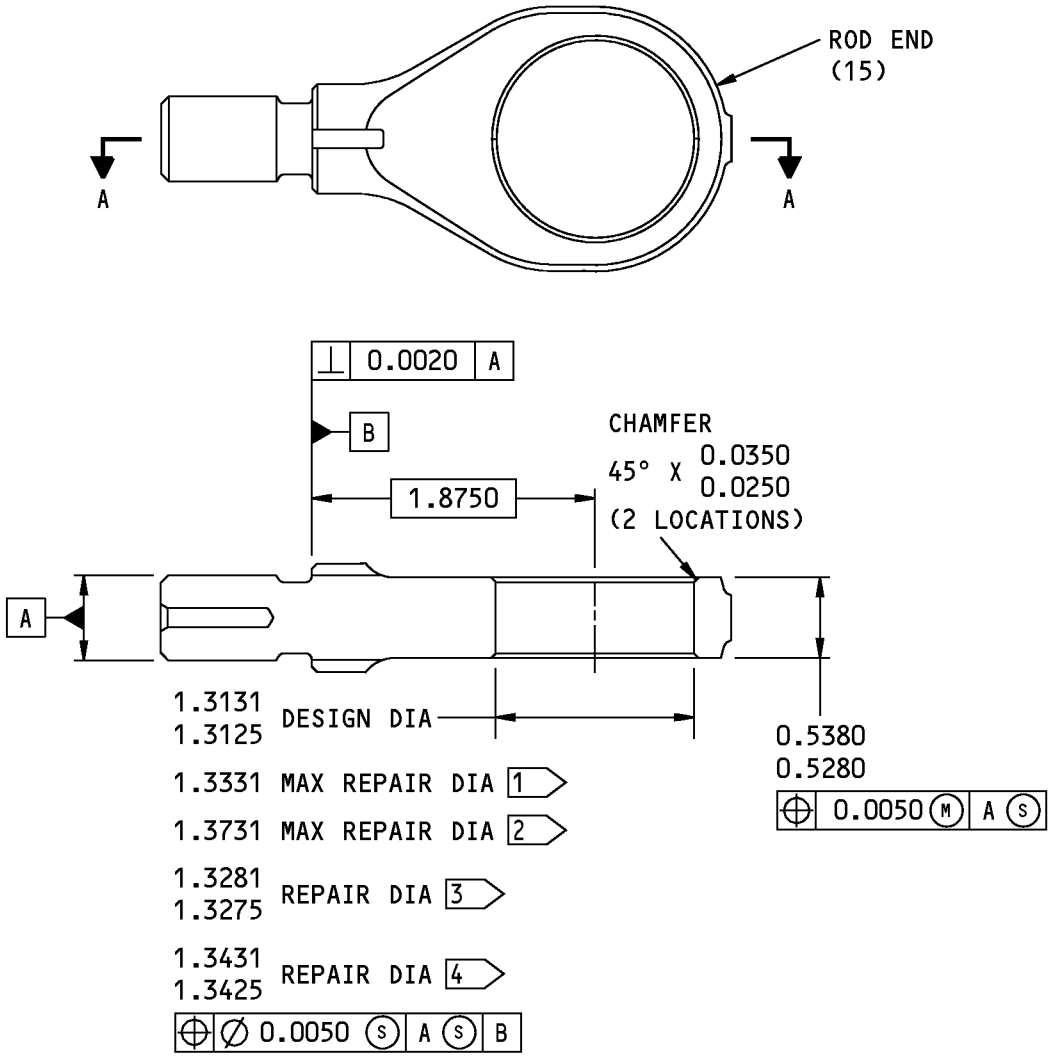
A. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For general cleaning procedures, refer to SOPM 20-30-03. For decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Passivate (F-17.25) all over.



1 LIMIT FOR CHROME PLATE BUILDUP (SOPM 20-42-03) AND GRIND TO DESIGN DIMENSIONS AND FINISH

2 LIMIT FOR NICKEL PLATE BUILDUP (SOPM 20-42-09) AND THEN CHROME PLATE TO DESIGN DIMENSIONS AND FINISH

3 RANGE FOR INSTALLATION OF 0.015 OVERSIZE BEARING

4 RANGE FOR INSTALLATION OF 0.030 OVERSIZE BEARING

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

273T4705-2 Rod End Repair
Figure 601

NAMEPLATE INSTALLATION - REPAIR 5-1

1. General

A. This procedure tells how to replace the nameplate (125) and the strap (100).

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

C. Refer to IPL Figure 1 for item numbers.

2. Nameplate Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A50061	Adhesive - Epoxy	BAC5010 Type 54

B. References

Reference	Title
SOPM 20-50-12	APPLICATION OF ADHESIVES
SOPM 20-50-21	HOW TO INSTALL NAMEPLATE STRAPS AND SEALS

C. Procedure

(1) Install a replacement nameplate with a new strap by the instructions in (SOPM 20-50-21), and with adhesive, A50061, (SOPM 20-50-12).

(2) Seal the edges of the nameplate and strap with adhesive, A50061, (SOPM 20-50-12).

ASSEMBLY

1. General

A. This procedure tells how to assemble the tailskid actuator assembly.

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

C. Refer to IPL Figure 1 for item numbers.

2. Assembly

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
C00032	Coating - Exterior Protective Enamel, General Use	BMS10-60, Type I
D50122	Fluid - Hydraulic, Skydrol	BMS3-11, Type IV or Type V
G50347	Lockwire - Nickel-copper, 0.032 inch diameter	NASM20995N˜ C32

B. References

Reference	Title
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-03	LUBRICANTS
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Actuator Assembly

NOTE: For finishing materials, refer to SOPM 20-60-02. For lubricants, refer to SOPM 20-60-03. For miscellaneous materials, refer to SOPM 20-60-04.

(1) Procedure (ASSEMBLY, Figure 701)

(a) Install the piston seal (65) and backup rings (70) onto the piston rod (72).

1) Lubricate the piston seal (65) and the backup rings (70) with hydraulic fluid, D50122.

2) Install the piston seal (65) and the backup rings (70).

(b) Install the rod seal-gland (60) on the piston rod (72).

1) Lightly lubricate the rod seal (40), the packing (45), the backup rings (50) and the packing (55) with hydraulic fluid, D50122.

2) Install the backup rings (50) and the packing (55) on the gland rod seal-gland (60).

3) Lightly lubricate the shaft of the piston rod (72) with hydraulic fluid, D50122 before you install the rod seal-gland (60) on the piston rod.

4) Install the rod seal-gland (60), rod seal (40), and packing (45) on the piston rod (72). Move the rod seal-gland (60) with rod-seal (40), and packing (45) along the shaft of the piston rod to let you install the gland nut (20) on the piston rod.

(c) Install the gland nut (20) on the piston rod (72).

1) Lightly lubricate the rod scraper (30) and the packing (35) with hydraulic fluid, D50122.

2) Install the rod scraper (30) and the packing (35) into the gland nut (20).

3) Lightly lubricate the shaft of the piston rod (72) with hydraulic fluid, D50122.

4) Install the gland nut (20) on the piston rod (72). Make sure that the rod scraper (30) and the packing (35) stay in position on the gland nut. Move the gland nut along the shaft of the piston rod to let you install the rod end assembly (5) on the piston rod.

(d) Installation of rod end assembly (5) onto the piston rod (72).

1) Install the lockwasher (25) onto the rod end assembly (5).

2) Install the rod end assembly (5) onto the piston rod (72).

a) Tighten the rod end to 150-180 pound-inches. Use the slots in the end of the piston to hold the piston in position while you tighten the rod end.

b) After you tighten the rod end, use a punch or equivalent tool to locally break the flange of cuplock washer (25) into the slots on the rod end. Make sure that the breaks are complete (ASSEMBLY, Figure 702).

(e) Install the piston rod (72), rod seal-gland (60), gland nut (20) and rod end assembly (5) assembly into the barrel assembly (105 or 130).

1) Lubricate the piston seal (65) and the backup rings (70) with hydraulic fluid, D50122 before installing the above assembly into the barrel (105 or 130).

CAUTION: BE CAREFUL NOT TO DAMAGE THE PISTON SEAL (65) AND THE BACKUP RINGS (70).

2) Install the above assembly approximately half way into the barrel assembly (105 or 130). Then move the rod seal-gland (60) along the shaft of the piston rod (72) until it seats into the barrel as shown.

3) Lightly lubricate the threads of the gland nut (20) with hydraulic fluid, D50122.

(f) Move the gland nut (20) along the shaft of the piston rod (72) until it engages the threads on the barrel (120). Hold the barrel just forward of bearing and tighten the gland nut (20) to 400-500 pound-inches.

1) Secure with lockwire, G50347 the gland nut (20) to the barrel (120) by the double-twist method and as shown in ASSEMBLY, Figure 701, (SOPM 20-50-02).

(g) Install the unions or reducers (75, 85), and packings (80, 90) on the barrel assembly (105 or 130).

(h) Install the solenoid (95), and packing (97) on the barrel assembly (105 or 130).

1) Tighten the solenoid (95) to 25-30 pound-feet.

2) Fillet seal at locations shown in ASSEMBLY, Figure 701, with sealant, A00767.

3) Apply a top coat of enamel coating, C00032 to the fillet seal.

(i) For the installation of nameplate (155) and strap (100), refer to REPAIR 5-1.

3. Actuator Storage

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D50122	Fluid - Hydraulic, Skydrol	BMS3-11, Type IV or Type V

B. References

Reference	Title
SOPM 20-44-02	TEMPORARY PROTECTIVE COATINGS
SOPM 20-60-03	LUBRICANTS
SOPM 20-70-01	PROTECTION, STORAGE AND HANDLING OF AIRPLANE COMPONENTS

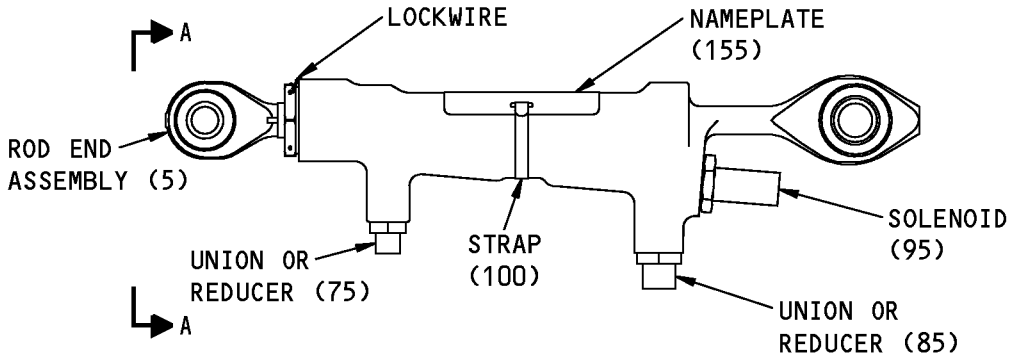
C. Procedure

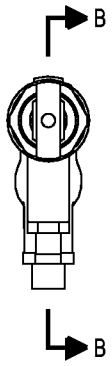
NOTE: For lubricants, refer to SOPM 20-60-03.

(1) Add approximately 1 fluid ounce of hydraulic fluid, D50122 through the pressure (PRESS) port.

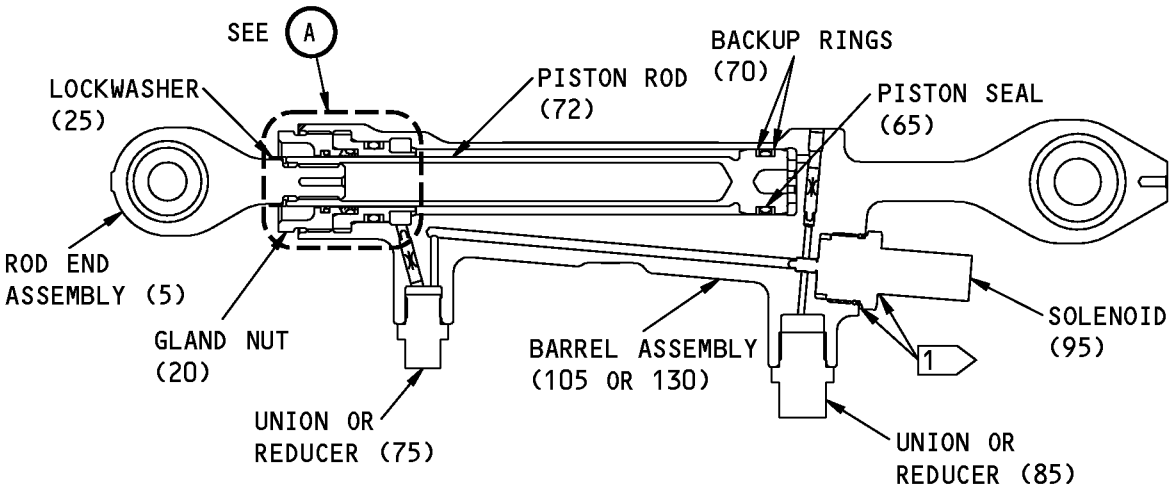
(2) Seal the parts with hydraulic fluid resistant shipping caps.

(3) Give protection to the actuator assembly and put it away by standard industry practices and the instructions in SOPM 20-44-02 and SOPM 20-70-01.



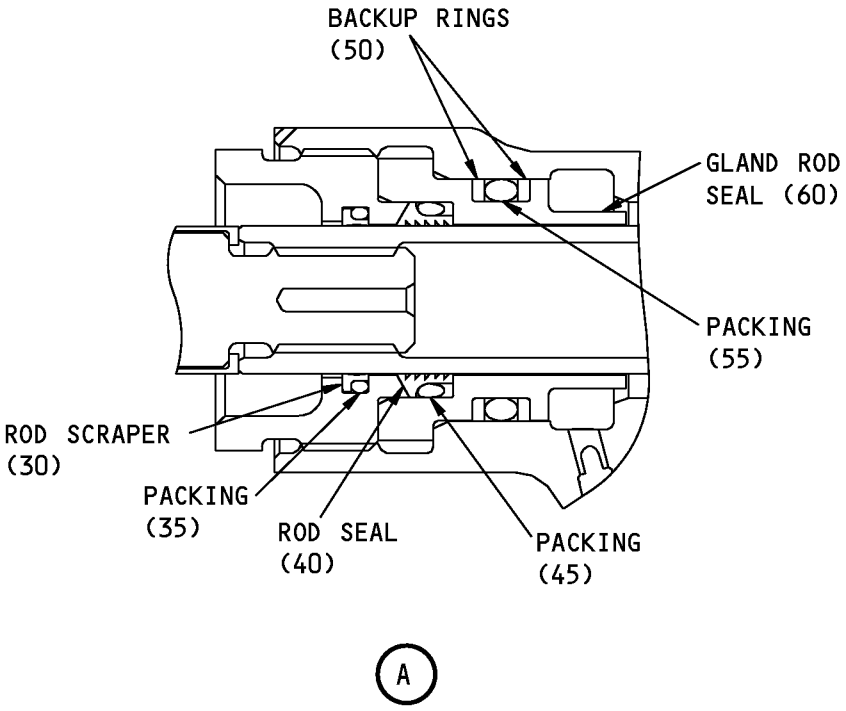


A–A



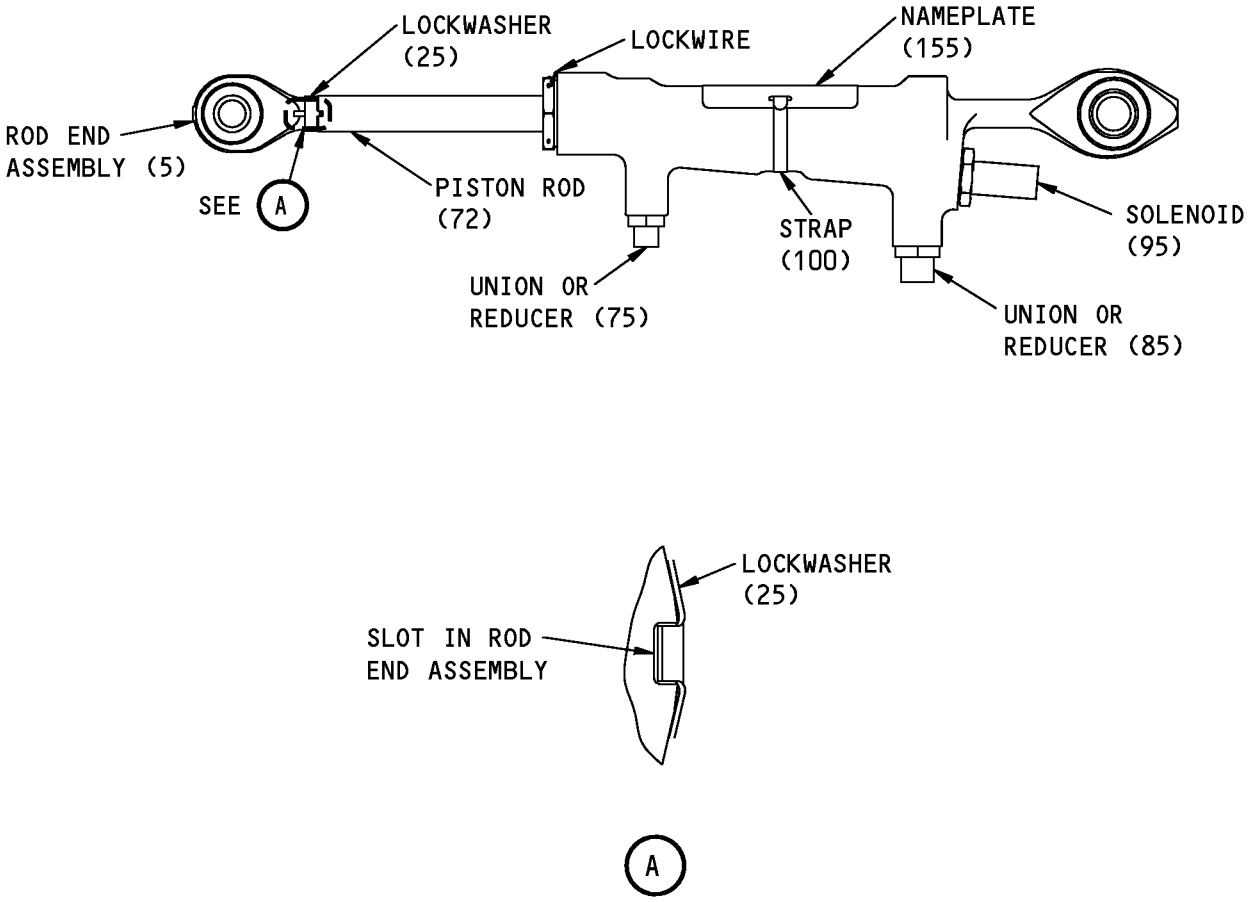
B–B

Tailskid Actuator Assembly
Figure 701 (Sheet 1 of 2)



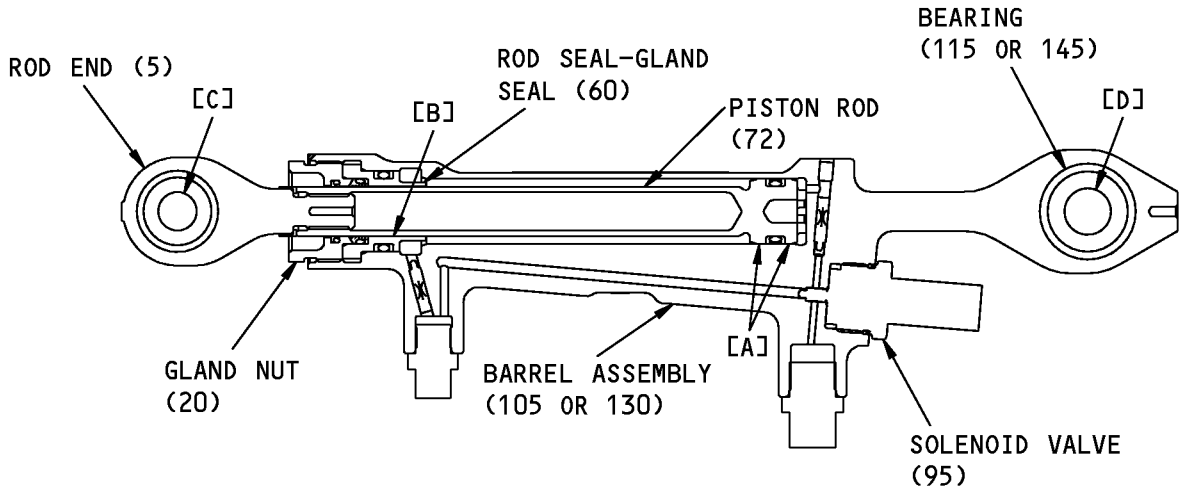
1 FILLET SEAL WITH BMS 5-45 SEALANT

Tailskid Actuator Assembly
Figure 701 (Sheet 2 of 2)



Tailskid Actuator Assembly
Figure 702

FITS AND CLEARANCES



REF LETTER	REF IPL FIG. 1, MATING ITEM NO.		DESIGN DIMENSION*				SERVICE WEAR LIMIT*		
			DIMENSION		ASSEMBLY CLEARANCE		DIMENSION		MAXIMUM CLEARANCE
			MIN	MAX	MIN	MAX	MIN	MAX	
[A]	ID	105 OR 130	1.0530	1.0550	0.0020	0.0050		1.0580	0.0060
	OD	72	1.0500	1.0510			1.0490		
[B]	ID	60	0.8120	0.8130	0.0020	0.0050		0.8160	0.0060
	OD	72	0.8080	0.8100			0.8070		
[C]	ID	10	0.6250	0.6255				0.6260	
[D]	ID	115 OR 145	0.7500	0.7505				0.7510	

* ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801

REF IPL		NAME	TORQUE*	
FIG. NO.	ITEM NO.		POUND-INCHES	POUND-FEET
1	5	ROD END	150-180	
1	20	Gland Nut	400-500	
1	95	Solenoid		25-30

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

Torque Table
Figure 802

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. General

A. This section lists the special tools, fixtures, and equipment necessary for maintenance.

NOTE: Equivalent substitutes may be used.

Special Tools

Reference	Description	Part Number	Supplier
SPL-8671	Tester - Dielectric Strength	875B	61993
SPL-9193	FIXTURE EQPT - LANDING GEAR ACTUATOR ASSYS	A32121-1	81205

Tool Supplier Information

CAGE Code	Supplier Name	Supplier Address
61993	KIKUSUI INTERNATIONAL CORP.	1980 ORIZABA AVENUE SIGNAL HILL, CA 90804 Telephone: 800-545-8784
81205	THE BOEING COMPANY	17930 INTERNATIONAL BLVD. SOUTH SEATAC, WA 98188-4321 Telephone: 206-662-6650 Facsimile: 206-662-7145

ILLUSTRATED PARTS LIST

1. Introduction

A. The Illustrated Parts List (IPL) contains an illustration and a list of component parts you can repair or replace. The Illustrated Parts Catalog (IPC) shows how to use the Boeing part number system.

B. This shows how parts are related: The relation of each item to its next higher assembly (NHA) is shown in the NOMENCLATURE column. Use the indenture system that follows:

1 2 3 4 5 6 7

. Assembly

. Attaching parts for assembly

. . Detail parts for assembly

. . Subassembly

. . Attaching parts for subassembly

. . . Detail parts for subassembly

. . . Sub-subassembly

. . . Attaching parts for subassembly

. . . . . Details parts for sub-subassembly

Detail Installation Parts (Included only if installation parts may be sent to the shop as part of assembly)

C. Each top assembly is given one use code letter (A, B, C, etc.) in the USAGE CODE column. All subsequent component parts in the list can have one or more of the use code letters to show effectivity to top assemblies. A component part without a use code applies to all top assemblies.

D. An alphabetical letter is added after the item number for optional parts, parts changed by a Service Bulletin, configuration differences (except left-handed and right-handed parts), last engineering releases, and parts added between item numbers in a sequence. The alphabetical letter will not be shown on the illustration for equivalent parts of the same part number.

E. Color-coded parts are identified with a single digit alpha following the dash number or with ''SP'' suffix. If the ''SP'' suffix is used, it represents consolidation of all color codes applicable for a given usage which are not separately listed. Orders for color-coded parts should include the registry number of the airplane for which the parts are ordered.

F. If a part number is 15 characters long but will not fit in the part number column, the part number will be displayed with a ''~'' at the end of the line and will be continued on the next line. The ''~'' denotes that the part number continues on the next line.

G. Parts changed by a Service Bulletin are shown by PRE SB XXXX and POST SB XXXX added to the NOMENCLATURE column.

(1) When a new top assembly is added by a Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the top assembly level only. The configuration differences at the detail part level are shown by use code letters.

(2) When the top assembly part number is not changed by the Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the detail level.

H. Interchangeable Parts

Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES, REPLACED BY)	The part replaces and is interchangeable with, or is an alternative to, the initial part.

VENDOR CODES

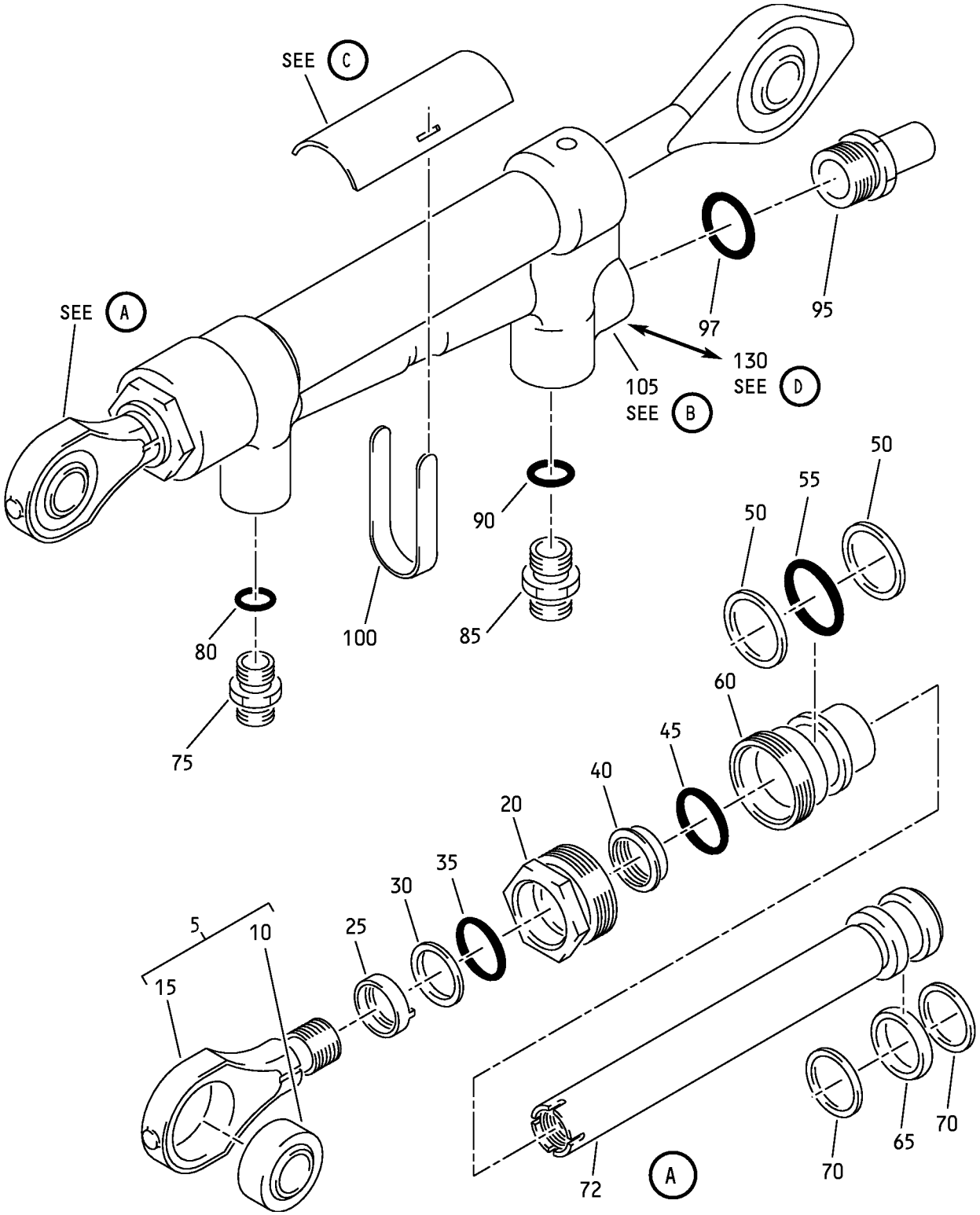
Code	Name
02107	FLOUROCARBON CO OHIO DIV DOVER, OHIO 44622 CANCELLED NO REPLACEMENT FORMERLY SPARTA MANUFACTURING CO
07128	TETRAFLUOR INC 2051 EAST MAPLE AVENUE EL SEGUNDO, CALIFORNIA 90245-5009 FORMERLY ROYAL IND TETRAFLUOR DIV V0667B ENGLEWOOD CALIF
26303	GREENE TWEED IND INC ADVANTEC DIV 7101 PATTERSON DRIVE PO BOX 5037 GARDEN GROVE, CALIFORNIA 92645-5037 FORMERLY OHIO AIRCRAFT SUPPLIES INC IN INGLEWOOD, CALIFORNIA FORMERLY ADVANTEC DIV OF IFP INC, LOS ANGELES, CA V5P801
26879	CORONADO MFG INC 11069 PENROSE AVENUE SUN VALLEY, CALIFORNIA 90352-2722 FORMERLY CORONADO PLASTICS INC IN BURBANK, CALIFORNIA
50632	KAMATICS CORP SUB OF KAMAN CORP 1335 BLUE HILLS ROAD BLOOMFIELD, CONNECTICUT 06002-1304
92555	LEE COMPANY 2 PETTIPAUG ROAD PO BOX 424 WESTBROOK, CONNECTICUT 06498-1543

Code	Name
94878	RAYBESTOS-MANHATTAN INC PACIFIC COAST DIV FULLERTON, CALIFORNIA 92631 BUSINESS DISCONTINUED
97820	BUSAK AND SHAMBAN INC BEARING DIV 711 MITCHELL ROAD PO BOX 665 NEWBURY PARK, CALIFORNIA 91320-2214 FORMERLY IN CULVER CITY, CALIF; FORMERLY SHAMBAN W S & CO

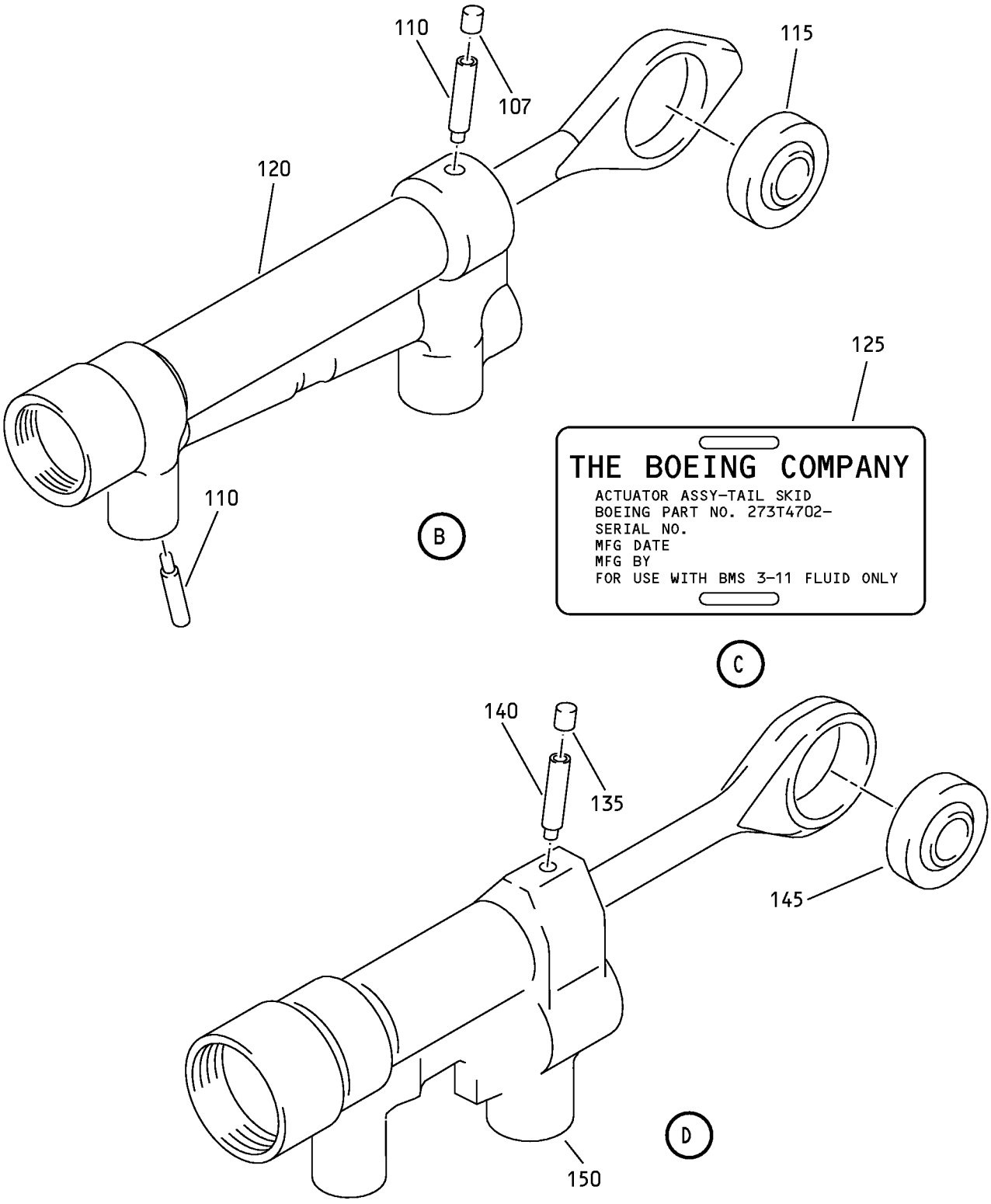
NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
2100-215		1	50	2
273T0050-14		1	100A	1
273T0050-4		1	100	1
273T4702-1		1	1A	RF
273T4702-2		1	1B	RF
273T4703-1		1	105	1
273T4703-2		1	120	1
273T4703-4		1	130	1
273T4703-5		1	150	1
273T4704-1		1	72	1
273T4704-2		1	72A	1
273T4705-1		1	5	1
273T4705-2		1	15	1
273T4706-1		1	60	1
273T4707-1		1	20	1
273T4708-1		1	25	1
BAC27TLG23		1	155	1
BAC27TLG44		1	155A	1
BACB10FB10G		1	10B	1
		1	145	1
BACB10FB12G		1	115B	1
BACP20AX18		1	107	1
		1	135	1
BACR12BM215		1	50	2
BUS70M211AT99		1	70	2
C11236-215B		1	50	2
JEVA1840808D		1	110	2
JEVA1845808D		1	110A	2
JEVA1855521D		1	140	1
KSC145700BZ10G		1	10	1
		1	145A	1
KSC145700BZ12G		1	115C	1
KSC312210BZG		1	10A	1
KSC312312BZG		1	115A	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
MS21902-6T		1	75	1
MS21902-8T		1	85	1
MS21916-6-4T		1	75A	1
MS21916-8-6T		1	85A	1
NAS1611-020A		1	35	1
NAS1611-022A		1	97	1
NAS1611-211A		1	45	1
NAS1611-215A		1	55	1
NAS1612-6A		1	80	1
NAS1612-8A		1	90	1
PLGA2187020		1	107	1
PP50WM211AT99EH		1	65	1
PP50WM211AT99EP		1	65B	1
RF210B211AT99		1	40	1
RMR12BM215		1	50	2
S30294-215-1		1	50	2
S32925-506-99		1	30B	1
S33121-211-99		1	40A	1
S33157-211-99		1	70A	2
S34750-211H99		1	65A	1
SDBX0506250B		1	95	1
STF800-215		1	50	2
TF450-215A		1	50	2
WE250B506AT99		1	30	1
		1	30A	1



Tailskid Actuator Assembly
IPL Figure 1 (Sheet 1 of 2)



Tailskid Actuator Assembly
IPL Figure 1 (Sheet 2 of 2)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1A	273T4702-1		ACTUATOR ASSY-TAILSKID	A	RF
–1B	273T4702-2		ACTUATOR ASSY-TAILSKID	B	RF
5	273T4705-1		. ROD END ASSY		1
10	KSC145700BZ10G		. . BEARING-SPHERICAL (V50632) (OPT ITEM 10A, 10B)		1
–10A	KSC312210BZG		. . BEARING-SPHERICAL (V50632) (OPT ITEM 10, 10B)		1
–10B	BACB10FB10G		. . BEARING (OPT ITEM 10, 10A)		1
15	273T4705-2		. . ROD END		1
20	273T4707-1		. NUT-GLAND		1
25	273T4708-1		. WASHER-LOCK		1
30	WE250B506AT99		. SCRAPER-ROD (V97820)	A	1
–30A	WE250B506AT99		. SCRAPER-ROD (V97820) (OPT ITEM 30B)	B	1
–30B	S32925-506-99		. SCRAPER-ROD (V97820) (OPT ITEM 30A)	B	1
35	NAS1611-020A		. PACKING		1
40	RF210B211AT99		. SEAL-ROD (V97820) (OPT ITEM 40A)		1
–40A	S33121-211-99		. SEAL-ROD (V97820) (OPT ITEM 40)		1
45	NAS1611-211A		. PACKING		1
50	C11236-215B		. RING-BACK-UP (V26879) (SPEC BACR12BM215) (OPT RMR12BM215 (V94878)) (OPT STF800-215 (V02107)) (OPT S30294-215-1 (V97820)) (OPT TF450-215A (V07128)) (OPT 2100-215 (V26303))		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
55	NAS1611-215A		. PACKING		1
60	273T4706-1		. ROD SEAL-GLAND		1
65	PP50WM211A~ T99EH		. SEAL-PISTON (V97820) (OPT ITEM 65A, 65B)		1
–65A	S34750-211H99		. SEAL-PISTON (V97820) (OPT ITEM 65, 65B)		1
–65B	PP50WM211AT99EP		. SEAL-PISTON (V97820) (OPT ITEM 65, 65A)		1
70	BUS70M211AT99		. RING-BACK-UP (V97820) (OPT ITEM 70A)		2
–70A	S33157-211-99		. RING-BACK-UP (V97820) (OPT ITEM 70)		2
72	273T4704-1		. ROD-PISTON	A	1
–72A	273T4704-2		. ROD-PISTON	B	1
75	MS21902-6T		. UNION	A	1
–75A	MS21916-6-4T		. REDUCER	B	1
80	NAS1612-6A		. PACKING		1
85	MS21902-8T		. UNION	A	1
–85A	MS21916-8-6T		. REDUCER	B	1
90	NAS1612-8A		. PACKING		1
95	SDBX0506250B		. VALUE-SOLENOID		1
97	NAS1611-022A		. PACKING		1
100	273T0050-4		. STRAP-NAMEPLATE	A	1
–100A	273T0050-14		. STRAP-NAMEPLATE	B	1
105	273T4703-1		. BARREL ASSY	A	1
107	PLGA2187020		. . PLUG (V92555) (SPEC BACP20AX18)	A	1
110	JEVA1840808D		. . RESTRICTOR (V92555) (OPT ITEM 110A)	A	2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–110A	JEVA1845808D		. . RESTRICTOR (V92555) (OPT ITEM 110)	A	2
115	KSC147500BZ12G		DELETED		
–115A	KSC312312BZG		. . BEARING-SPHERICAL (V50632) (OPT ITEM 115B, 115C)	A	1
–115B	BACB10FB12G		. . BEARING (OPT ITEM 115A, 115C)	A	1
–115C	KSC145700BZ12G		. . BEARING-SPHERICAL (V50632) (OPT ITEM 115A, 115B)	A	1
120	273T4703-2		. . BARREL	A	1
125	BAC27TLG23		DELETED		
130	273T4703-4		. BARREL ASSY	B	1
135	BACP20AX18		. . PLUG	B	1
140	JEVA1855521D		. . RESTRICTOR (V92555)	B	1
145	BACB10FB10G		. . BEARING (OPT ITEM 145A)	B	1
–145A	KSC145700BZ10G		. . BEARING-SPHERICAL (V50632) (OPT ITEM 145)	B	1
150	273T4703-5		. . BARREL	B	1
155	BAC27TLG23		. NAMEPLATE	A	1
155A	BAC27TLG44		. NAMEPLATE	B	1

–Item not Illustrated