TO: ALL HOLDERS OF CARGO DOOR LATCH ACTUATOR ASSEMBLY OVERHAUL MANUAL, 52-30-61

REVISION NO. 2, DATED NOV 1/00

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D&O	D/Assy	Cleaning	Insp/Chk	Repair	Assy	F/C	Test	T/Shooting	S/Tools	Storage	IPL	L/Overhaul
Added assembly 65-62238-2	X	X		X	X	X	X	X			X	X	

CARGO DOOR LATCH ACTUATOR ASSEMBLY

52-30-61

BOEING P/N 65-62238-1, -2

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT

LIST OF EFFECTIVE PAGES

* Indicates pages revised, added or deleted in latest revision

F Indicates foldout pages - print one side only

PAGE	DATE	PAGE	DATE	PAGE	DATE
52-30-61					
* T-1	Nov 1/00				
T-2	BLANK				
* LEP-1	Nov 1/00				
LEP-2	BLANK				
T/C-1	Nov 15/68				
T/C-2	BLANK				
* 1	Nov 1/00				
* 2	Nov 1/00				
* 3	Nov 1/00				
* 4	Nov 1/00				
* 4A	Nov 1/00				
* 4B	Nov 1/00				
* 5	Nov 1/00				
* 6	Nov 1/00				
* 7	Nov 1/00				
* 8	Nov 1/00				
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Special Tools, Fixtures, and Equipment	11
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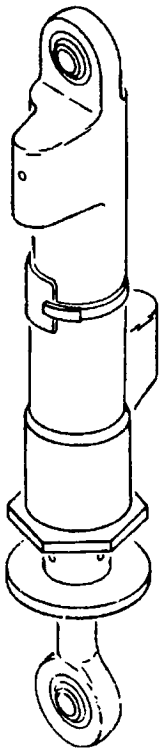
Numerical Parts List Index	None

CARGO DOOR LATCH ACTUATOR ASSEMBLY
Boeing Part Number 65-62238-1, -2



Cargo Door Latch Actuator Assembly
Figure 1

1. DESCRIPTION AND OPERATION

A. Description

(1) The cargo door latch actuator assembly is a hydraulically operated unit. It consists of piston, rod, bearing and cylinder assemblies and a combination of O-ring packings and backup rings to seal sliding surfaces of piston and cylinder.

B. Operation

(1) A cargo door latch actuator assembly is located above each door latch. When the cargo door is drawn to its fully closed position the latch actuator assembly engages a pin which mechanically locks the cargo door.

C. Leading Particulars

Operating Fluid -- Hydraulic fluid, BMS 3-11
Operating Pressure -- 3000 psi
Proof Pressure -- 4500 psi
Length (between bearing centerlines)
Extended -- 16.08 to 16.14 inches (65-62238-1, -2)
Retracted -- 11.38 to 11.42 inches (65-62238-1)
-- 11.36 to 11.44 inches (65-62238-2)
Stroke -- 4.7 1 inches

2. DISASSEMBLY (See Fig. 6.)

A. Remove all lockwiring and plugs from hydraulic ports. Drain hydraulic fluid from assembly.

B. Unscrew bearing assembly (1) and remove it together with piston rod assembly (12) from cylinder assembly (21).

NOTE: Do not remove bushing (2) unless replacement is necessary.

C. Remove parts (4 thru 6) and piston (7) from piston rod assembly (12). Remove packings (8, 11) and rings (9, 10) from piston (7).

D. Separate piston rod assembly (12) from bearing assembly (1).

NOTE: Do not remove bearing (13) from rod (14) unless replacement is necessary.

E. Remove packing (15, 17, 19) and rings (16, 18, 20) from bearing assembly (1).

NOTE: Do not remove parts (22 or 23) from cylinder (25). Do not remove bearing (24) from cylinder (25) unless replacement is necessary. Do not remove union (30) and packing (35) from cylinder (25) unless replacement is necessary.

F. Remove nameplate (27) and strap (26).

G. Remove straps (40) and fluid absorber (45).

3. CLEANING (See Fig. 6.)

A. General

(1) Wash all metal parts except bearings (13, 24) with cleaning solvent, Specification P-D-680 or equivalent.

(2) Use a stiff bristle brush to remove accumulations of foreign matter.

(3) Rinse and dry thoroughly with dry, moisture-free compressed air or with clean, lint-free cloth.

B. Bearings

(1) For specific instructions on cleaning teflon lined bearings (13, 24) refer to Subject SOPM 20-30-03, "Cleaning and Relubricating Antifriction Bearings."

4. INSPECTION/CHECK (See Fig. 6.)

A. Visual Check

(1) Visually examine all metal parts for cracks, burrs, pitting and corrosion using strong light and 10-power magnification.

(2) Visually examine all threads for cross threading and stripping.

(3) Examine all packing grooves for defects.

(4) Examine painted and plated surfaces for blistering, flaking and continuity of finish.

(5) Examine bearings (13, 24) for binding and for excessive radial and axial play.

(6) Examine nameplate (27) for legibility.

B. Special Check

(1) If visual examination discloses evidence of defects in any of listed parts, perform the following checks:

(a) Fluorescent dye penetrant check -- bearing (1, 69-53008-2; 3, 69-53008-1), piston (7, 69-53009-2) and cylinder (25, 65-62237-2 or 65-62275-2).

(b) Magnetic particle check, class B -- piston (7, 69-53009-1), piston rod (14) and cylinder (25, 65-62275-5).

5. REPAIR

A. Rework (Fig. 6)

(1) Use standard industry practices for repair of this component, and additional procedures in the steps that follow.

(2) If piston (7, 69-53009-1) or rod (14) OD is damaged or worn beyond limits given in Fig. 4, machine to clean up damage, maintaining 125-microinch finish (SOPM 20-10-02). Minimum diameter of reworked piston (7, 69-53309-1) is 1.104 inches, rod (14) is 0.613 inch (Fig. 2). If base material is removed during machining, stress relieve part at 950-1000°F. Shot peen the piston rod (14, 65-62278-4) (SOPM 20-10-03), intensity 0.016A, coverage 2.0, as shown in Fig. 2. Build up reworked surface with hard chrome plate (SOPM 20-42-03) and machine to design dimension (Fig. 2). Maintain 16-microinch finish on piston (7, 69-53009-1) and 8-microinch finish on rod (14). Material: Steel, 150-170 ksi.

B. Refinish (Fig. 6)

NOTE: Refer to SOPM 20-30-02 for stripping of protective finishes and to SOPM 20-41-01 for explanation of F and SRF finish codes.

(1) Hard chrome plate, class 2 (F-1.842) (SOPM 20-42-03) per Fig. 2. Apply cadmium plate (SOPM 20-42-05) to rod (14, 65-62278-2) surface shown in Fig. 2.

(a) Piston (7, 69-53009-1), piston rod (14, 65-62278-2)

(b) Piston (7, 69-53009-1) -- No finish (F-25.01)

(c) Piston rod (14, 65-62278-4) -- Apply chrome plate, Type 3, (SOPM 20-42-03) (F-15.34) to the surface shown in Fig. 2.

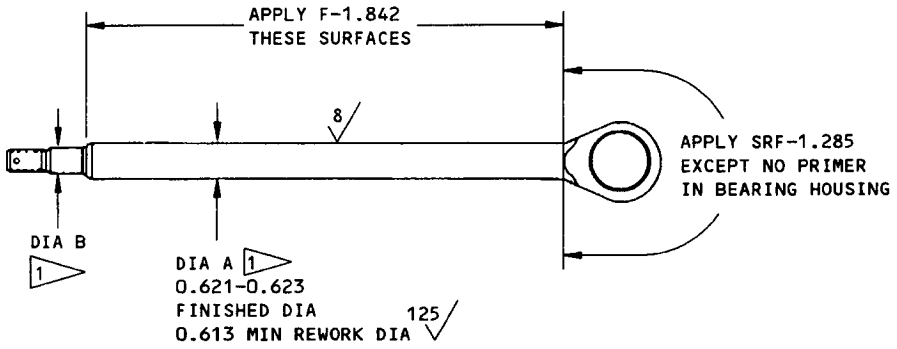
(2) Cylinder (25, 65-62237-2 or 65-62275-2)

(a) Interior surface -- Machine bore per Fig. 2. Hard anodize (F-2.204) per Fig. 2, coating thickness to be 0.0025-0.0030 inch. Following anodizing, machine bore to finish and dimension shown.

(b) Exterior surface -- Flash hard anodize, single coating thickness 0.0002 to 0.0005 inch and sodium dichromate seal followed by one coat of primer, BMS 10-11, Type 1 (SRF-12.205). No finish allowed in ports, holes or bearing housing.

(3) Cylinder (25, 65-62275-5)

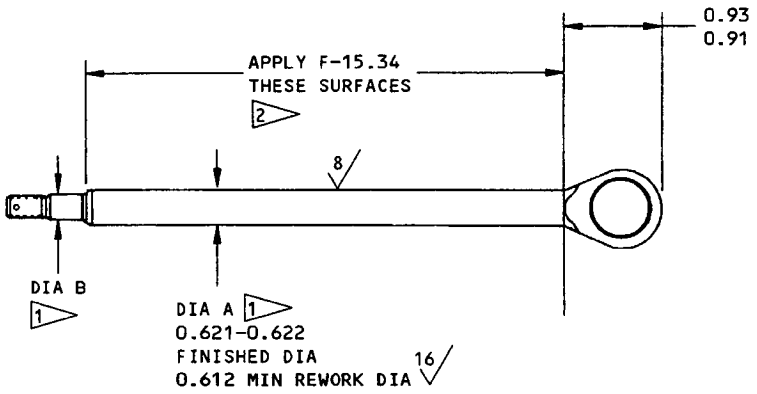
(a) 15-5 PH CRES, 150-170 ksi, no finish.



1 DIA 'A' AND DIA 'B' MUST BE CONCENTRIC WITHIN 0.002 INCH TIR AFTER PLATING

ALL DIMENSIONS ARE IN INCHES

PISTON ROD (14, 65-62278-2)



1 DIA 'A' AND DIA 'B' MUST BE CONCENTRIC WITHIN 0.002 INCH TIR AFTER PLATING

ALL DIMENSIONS ARE IN INCHES

2 SHOT PEEN THESE SURFACES

PISTON ROD (14, 65-62278-4)

Rework/Refinish Diagrams
Figure 2 (Sheet 1)

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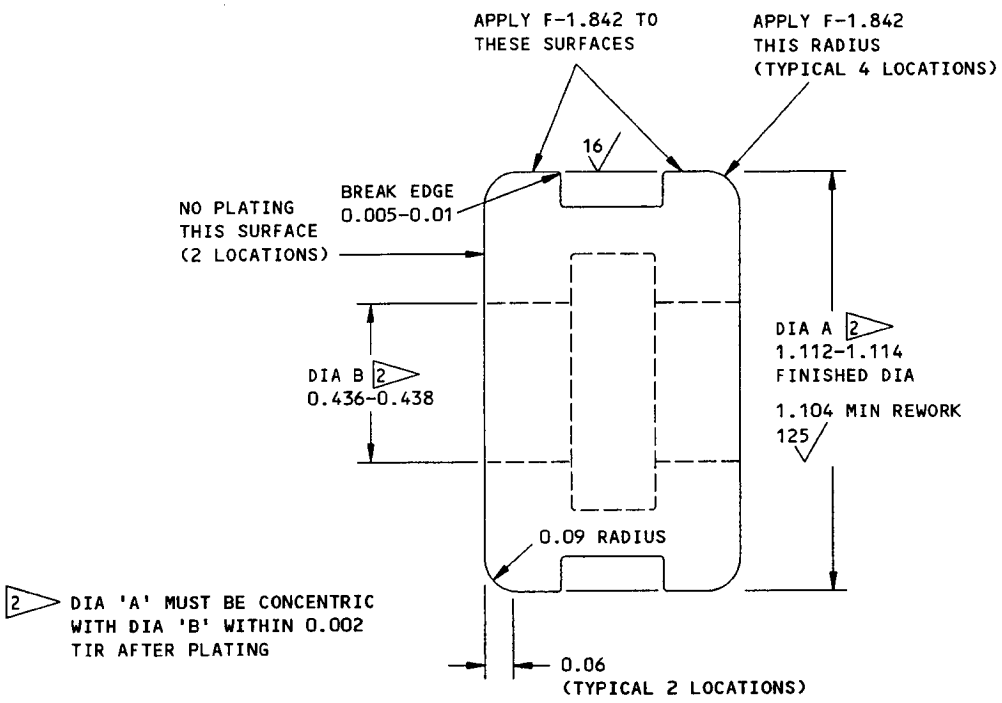
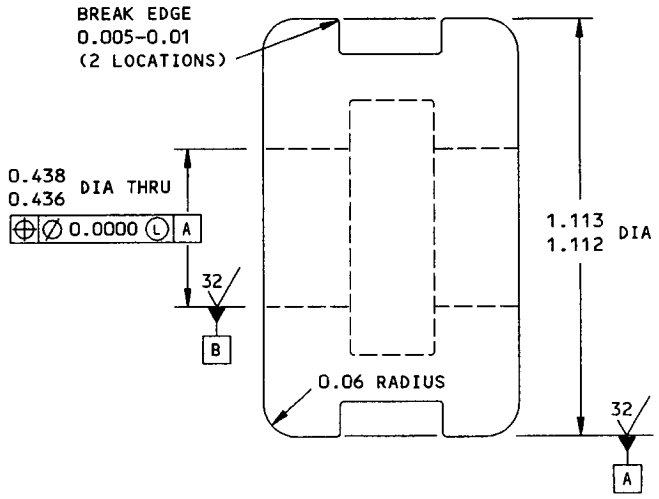
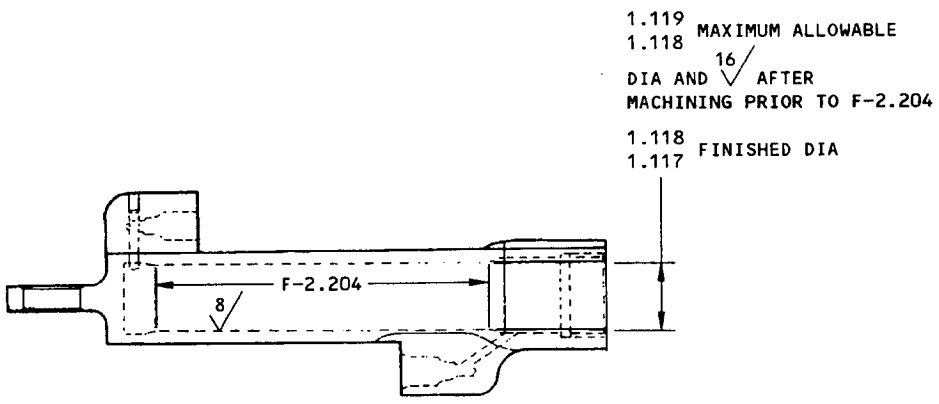


PISTON (7, 69-53009-1)



PISTON (7, 69-53009-2)

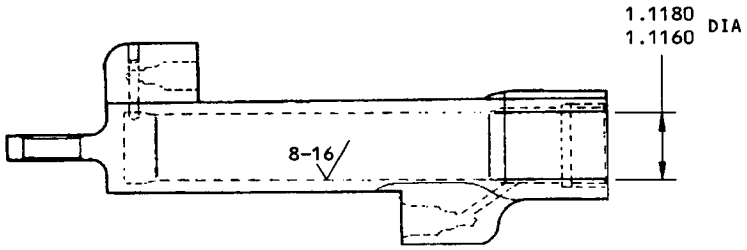
Rework/Refinish Diagrams
Figure 2 (Sheet 2)



EXCEPT AS NOTED, FLASH HARD ANODIZE 0.0002 TO 0.0005 THICK, SODIUM DICHROMATE SEAL PER MIL-A-8625 PLUS SRF-12.205. NO FINISH IN PORTS, HOLES AND BEARING HOUSING.

ALL DIMENSIONS ARE IN INCHES

CYLINDER (25, 65-62237-2 OR 65-62275-2)



ALL DIMENSIONS ARE IN INCHES

CYLINDER (25, 65-62275-5)

Rework/Refinish Diagrams
Figure 2 (Sheet 3)

C. Replacement (Fig. 6)

(1) Replace all unserviceable parts, observing following requirements:

(a) If nameplate is damaged or illegible, stamp the assembly dash number, serial number, date of manufacture and the name of the manufacturer on the new plate per SOPM 20-50-10, prior to installation. Apply a full layer of BMS 5-26 sealant to the back of the nameplate when you install it.

(b) When replacing teflon lined bearings (13, 24) apply a thin coat of BMS 5-95 sealant prior to installation to faying surfaces. Install new bearings per SOPM 20-50-03 and roller swage outer edge of bearing race.

1) Breakaway torque of bearing after installation in housing shall not exceed 20 pound-inches. Check as follows:

a) Rotate inner race at least 360 degrees.

b) Repeat step a) but note any positions where higher than average rotational torque is encountered.

c) Measure breakaway torque at all positions where higher than average rotational torque is encountered in step b) or at three intervals approximately 120 degrees apart if rotational torque is uniform.

(c) Install the union (30) and packing (35) as specified in SOPM 20-50-00.

6. ASSEMBLY (Fig. 6)

A. Assemble this component using standard industry practices, observing the following:

(1) Prior to assembly lubricate O-ring packings (8, 11, 15, 17, 19) and backup rings (9, 10, 16, 18, 20) with Skydrol Assembly Lube MCS352 or hydraulic fluid, BMS 3-11 and as specified in SOPM 20-50-00.

(2) For the 65-62238-2 actuator assembly, make sure the run-on torque for the nut (5, NAS1805-6P) is more than 30 pound-inches.

(3) Torque nut (5) to 160-190 pound-inches.

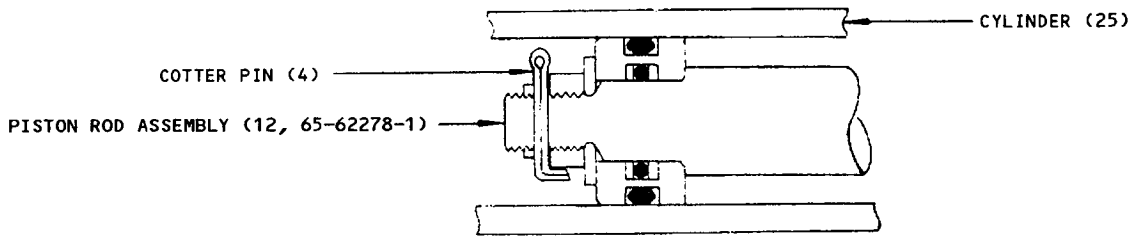
a) Install cotter pin (4) and bend pin ends as shown in Fig. 3.

(4) Put a light coat of grease, MIL-G-23827, on threads of bearing/bearing assembly (1) before installing in cylinder assembly (21). Tighten the bearing/bearing assembly (1) to 100-200 pound-inches.

(5) After assembly and tightening of bearing/bearing assembly (1) apply a bead of Dow Corning Sealant No. 30-121 or Q3-0121 around the periphery of cylinder (25) and bearing (1, 3) contact. (SOPM 20-50-19)

(6) After testing, lockwire bearing/bearing assembly (1) to cylinder assembly (21) using double-twist method and a tamper-proof seal (SOPM 20-50-02).

(7) After testing the 65-62238-2 actuator assembly, install fluid absorber (45) and straps (40). Make sure the outer diameter of the straps (40) is less than the outer diameter of the fluid absorber (45).

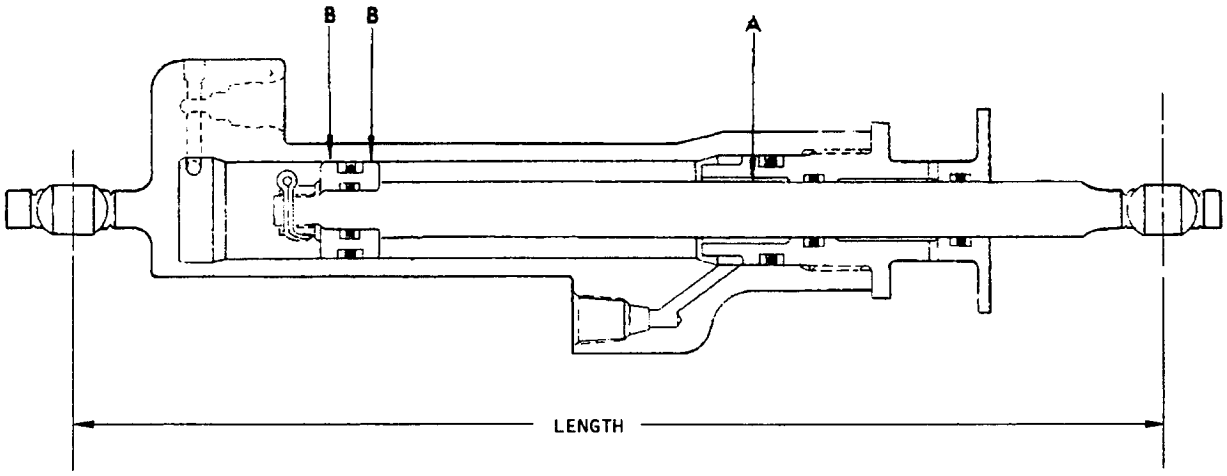


Assembly Diagram
Figure 3

7. FITS AND CLEARANCES

A. Figure 4 lists original design dimensions and service wear limits for certain close tolerance parts of the assembly. The original design dimensions are to be used as a guide for rework of parts which fail to meet the wear tolerance requirements. Unless otherwise specified in the rework procedure, a part should be returned to the design dimensions whenever rework is accomplished.

B. Clearances are given to aid assembly of the component. The value given in the "Maximum Allowable Clearance" column is the maximum permitted to ensure proper functioning until the next overhaul cycle of the component. If assembled parts fail to meet these requirements, one or more of the parts must be rejected. Parts that are rejected should be reworked if within the rework limits given in th e repair procedure; if not within rework limits, the parts should be scrapped. It is recommended that whenever newly reworked parts are assembled, the design clearances should be used as the guiding assembly criteria.



Fits and Clearances
Figure 4 (Sheet 1)

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Ref Letter Fig. 4	Mating Item No. Fig. 6	Original Design Dimensions				Service Wear Limits		
		Dimensions (inches)		Assembly Clearance (inches)		Dimension Limits (inches)		Maximum Allowable Clearance (inches)
		Min	Max	Min	Max	Min	Max	
A	ID 1 [5]	0.624	0.626	0.001	0.005		0.630	0.007
	OD 14 [7]	0.621	0.623			0.618		
A	ID 1 [6]	0.625	0.626	0.003	0.005			
	OD 14 [8]	0.621	0.622					
B	ID 21 [1]	1.117	1.118	0.003	0.006		1.119	0.008
	OD 7 [3]	1.112	1.114			1.110		
B	ID 21 [2]	1.116	1.118	0.003	0.006		1.119	0.008
	OD 7 [4]	1.112	1.113			1.110		

[1] Cylinder Assembly 65-62237-1 or 65-62275-1
[2] Cylinder Assembly 65-62275-2
[3] Piston 69-53009-1
[4] Piston 69-53009-2
[5] Bearing Assembly 69-53051-1
[6] Bearing 69-53008-2
[7] Rod 65-62278-2
[8] Rod 65-62278-4

Fits and Clearances
Figure 4 (Sheet 2)

8. TESTING (See Fig. 6.)

A. Test Equipment

(1) A hydraulic test stand capable of supplying hydraulic pressure controllable from 2 to 4500 psi.

(2) Hydraulic Fluid, BMS 3-11, Type 4 or Skydrol 7000 continuously filtered through a 15 micrometer absolute rated filter. Fluid temperature 60-120 degrees Fahrenheit.

(3) Ambient Conditions:

(a) Temperature 60-100°F.

(b) Atmospheric pressure 13-17 psi.

(c) Relative Humidity 10-90 percent.

B. Preparation for Test

(1) Tests are to be conducted at room temperature using hydraulic fluid, BMS 3-11 or Skydrol 7000.

(2) Fill unit to capacity with hydraulic fluid and bleed out all air by cycling unit manually. Add hydraulic fluid as required after bleeding.

(3) Record all test results.

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

CAUTION: DO NOT CYCLE THE ACTUATOR AT PROOF PRESSURE.

C. Functional Test Procedure

(1) Proof pressure test

(a) For the 65-62238-1 actuator assembly: apply a proof pressure of 4500 psi to both ports simultaneously for a period of 2 minutes. There shall be no leakage or permanent set.

(b) For the 65-62238-2 actuator assembly: With the actuator fully retracted and the extend port unpressurized (0 psi), apply 4400-4600 psi hydraulic pressure to the retract port for a minimum of one minute. With the actuator fully extended and the retract unpressurized (0 psi), apply 4400-4600 psi hydraulic pressure to the extend port for a minimum of one minute. No leakage, damage or permanent deformation can occur.

(c) With the actuator fully extended, apply pressure to both ports simultaneously using 2 psi for the 65-62238-1 actuator assembly or 2-10 psi for the 65-62238-2 actuator assembly for 2 minutes. No external leakage shall result.

(d) Extended and retract actuator 65-62238-1 at 0 psi, by hand. Extend and retract actuator 65-62238-2 slowly at 0-75 psi. There shall be no evidence of binding or sticking.

(e) Make sure the "Length" is within the dimensions given in Description and Operation, par. (1)(c).

(2) Rod seal leakage test

(a) Leakage past the primary piston rod seal (17) shall not exceed two drops per 25 cycles of actuation with 3000-3200 psi operating pressure applied to the actuator.

(b) There shall be no leakage past the secondary rod seal (19) or the static seal (15).

NOTE: Leakage check shall start after the first drop has formed and the piston rod wiped dry.

(3) Internal leakage test

(a) Retract the actuator fully.

(b) Leave the extend port open to the atmosphere.

(c) Apply 2900-3100 psi hydraulic pressure to the retract port for a minimum of one minute.

(d) Make sure the fluid does not leak more than 1.0 cc in a minute from the extend port.

(e) Extend the actuator fully.

(f) Leave the retract port open to the atmosphere.

(g) Apply 2900-3100 psi hydraulic pressure to the extend port for a minimum of one minute.

(h) Make sure the fluid does not leak more than 1.0 cc in a minute from the retract port.

(4) Post test procedures

(a) After testing, drain and partially fill actuator with hydraulic fluid, BMS 3-11, Type 4.

(b) Cap or plug ports with AN814 plugs and NAS1612 gaskets or other positive sealing method that is resistant to BMS 3-11, Type 4 hydraulic fluid.

Test Phase	Limits
4500 psi hydraulic pressure to both ports simultaneously for 2 minutes	No leakage or permanent set allowed
2 psi (65-62238-1) or 2-10 psi (65-62238-2) hydraulic pressure to both ports simultaneously for 2 minutes	No external leakage allowed
Cycling actuator 65-62238-1 manually at zero pressure or actuator 65-62238-2 slowly at 0-75 psi	No binding or sticking allowed
25 cycles of actuation with 3000 psi operating pressure applied to actuator	Leakage of 2 drops of hydraulic fluid permitted past primary piston rod seal (17). No leakage past secondary piston rod seal (19) permitted.

Test Limits
Figure 5

9. TROUBLE SHOOTING (See Fig. 6.)

A. Trouble during test after overhaul.

	Trouble	Possible Cause	Correction
(1)	Leakage around nut (5) or piston (7)	Improperly installed packings (8, 11), backup rings (9) or cap ring (10)	Replace defective parts and ensure careful installation of new parts
(2)	Leakage around bearing assembly (1) and rod assembly (12)	Improperly installed packings (17, 19) or backup rings (18, 20)	Replace defective parts and ensure careful installation of new parts
(3)	Leakage around bearing assembly (1) and cylinder assembly (21) periphery	Improperly installed and packing (15) or part backup rings (16)	Replace defective and ensure careful installation of new part
(4)	Movement of piston (7) is erratic	Foreign material between sliding surfaces	Disassemble, inspect and clean
		Sticking or binding due to improperly installed components	Disassemble, inspect and replace parts if defective

10. STORAGE INSTRUCTIONS

A. Partially fill the unit with hydraulic fluid, BMS 3-11, and cap or plug ports with AN814 plugs and NAS1612 gaskets.

B. Wrap the unit in vapor barrier paper. Mark or tag unit with identification and test date and store. File all test results by the serial number of the actuator.

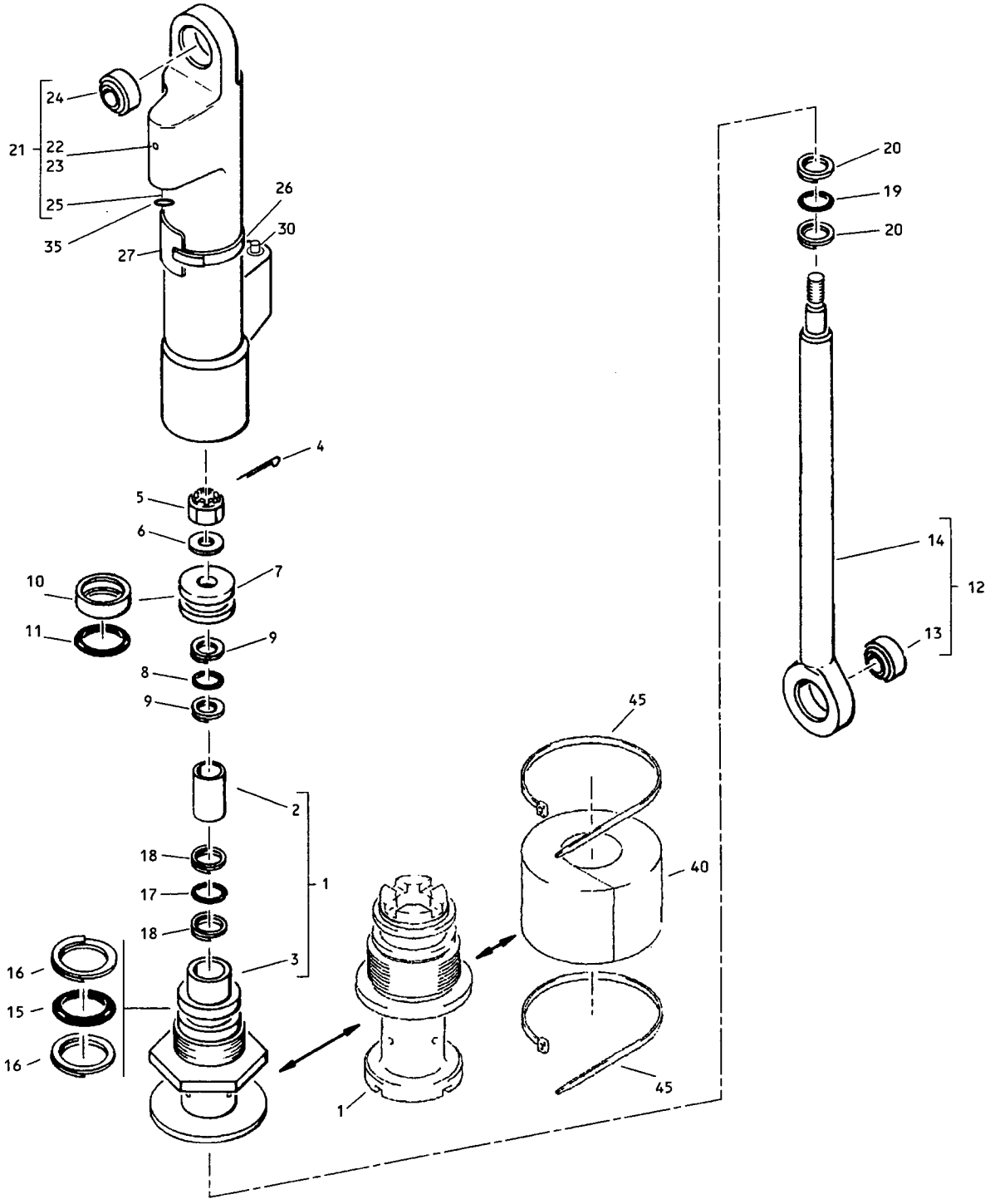
C. For further information, refer to Subject SOPM 20-44-02, "Temporary Protective Coatings."

11. SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

A. None

12. ILLUSTRATED PARTS LIST

A. Exploded View



Cargo Door Latch Actuator Assembly
Figure 6

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-	65-62238-1		CARGO DOOR LATCH ACTUATOR ASSY	A	
	65-62238-2		CARGO DOOR LATCH ACTUATOR ASSY	B	
1	69-53008-2		. BEARING	B	1
1	69-53051-1		. BEARING ASSY	A	1
2	69-53053-1		. . BUSHING	A	1
3	69-53008-1		. . BEARING	A	1
4	MS24665-283		. PIN, COTTER	A	1
5	AN310-6		. NUT	A	1
5	NAS1805-6P		. NUT	B	1
6	AN960-616		. WASHER	A	1
6	NAS1149E0663R		. WASHER	B	1
7	69-53009-1		. PISTON	A	1
7	69-53009-2		. PISTON	B	1
8	NAS1611-111		. PACKING, O-RING	A	1
8	NAS1611-111A		. PACKING (OPT NAS1611-111)	B	1
8	NAS1611-111		. PACKING (OPT NAS1611-111A)	B	1
9	MS28782-9		. RING, BACKUP	A	2
9	BACR12BM111		. RING	B	2
10	69-54540-212		. CAP RING	A	1
11	NAS1611-212		. PACKING, O-RING	A	1
11	PP220M212AT99 EH		. GLAND-SEAL	B	1
12	65-62278-1		. PISTON ROD ASSY	A	1
12	65-62278-3		. ROD ASSY	B	1
13	MS21230-7		. . BEARING	A	1
13	MS14103-7		. . BEARING	B	1
14	65-62278-2		. . ROD	A	1
14	65-62278-4		. . ROD	B	1
15	NAS1611-214		. PACKING, O-RING	A	1
15	NAS1611-214A		. PACKING (OPT NAS1611-214)	B	1
15	NAS1611-214		. PACKING (OPT NAS1611-214A)	B	1
16	MS28782-19		. RING, BACKUP	A	2
16	BACR12BM214		. RING	B	2
17	NAS1611-114		. PACKING, O-RING	A	1
17	NAS1611-114A		. PACKING (OPT NAS1611-114)	B	2
17	NAS1611-114		. PACKING (OPT NAS1611-114A)	B	2
18	MS28782-12		. RING, BACKUP	A	2
18	BACR12BM114		. RING	B	2
19	NAS1611-114		. PACKING, O-RING	A	1
19	NAS1611-114A		. PACKING (OPT NAS1611-114)	B	2
19	NAS1611-114		. PACKING (OPT NAS1611-114A)	B	2
20	MS28782-12		. RING, BACKUP	A	2
20	BACR12BM114		. RING	B	2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
6-					
21	65-62237-1		. CYLINDER ASSY (PREF)	A	1
21	65-62275-1		. CYLINDER ASSY (OPT TO 65-62237-1)	A	1
21	65-62275-4		. CYLINDER ASSY	B	1
22	BACP20AX12D		. . PLUG	A	1
22	BACP20AX12		. . PLUG	B	1
23	BACP20AX12DP		. . PIN	A	1
23	BACP20AX12P		. . PIN	B	1
24	MS21230-7		. . BEARING	A	1
24	MS14103-7		. . BEARING	B	1
25	65-62237-2		. . CYLINDER (USED ON 65-62237-1)	A	1
25	65-62275-2		. . CYLINDER (USED ON 65-62275-1)	A	1
25	65-62275-5		. . CYLINDER	B	1
26	69-35587-2		. STRAP	A	1
27	BAC27DHY84		. NAMEPLATE	A	1
27	273A2508-13		. NAMEPLATE	B	1
30	MS21902-4T		. UNION	B	2
35	NAS1612-4A		. PACKING (OPT NAS1612-4)	B	2
35	NAS1612-4		. PACKING (OPT NAS1612-4A)	B	2
40	BACS38K1		. STRAP	B	2
45	69-53022-2		. ABSORBER-FLUID	B	1