COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

FEEL AND CENTERING ELEVATOR CONTROL UNIT ASSEMBLY

PART NUMBER 65C25465–10, –11, –12, –15, –16, –17, –18, –19, –2, –20, –21, –22, –23, –4, –8

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. 28
Jul 01/2009

To: All holders of FEEL AND CENTERING ELEVATOR CONTROL UNIT ASSEMBLY 27-31-95.

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
	NO HIGHLIGHTS

BOEING®

COMPONENT MAINTENANCE MANUAL

Subject/Page	Date
TITLE PAGE	
O 1	Jul 01/2009
2	BLANK
27-31-95 TRANSMITTAL LETTER	
O 1	Jul 01/2009
2	BLANK
27-31-95 HIGHLIGHTS	
O 1	Jul 01/2009
2	BLANK
27-31-95 EFFECTIVE PAGES	
1 thru 2	Jul 01/2009
27-31-95 CONTENTS	
1	Mar 01/2006
2	BLANK
27-31-95 TR AND SB RECORD	
1	Mar 01/2006
2	BLANK
27-31-95 REVISION RECORD	
1	Mar 01/2006
2	Mar 01/2006
27-31-95 RECORD OF TEMPORARY REVISIONS	
1	Mar 01/2006
2	Mar 01/2006
27-31-95 INTRODUCTION	
1	Mar 01/2009
2	BLANK
27-31-95 DESCRIPTION AND OPERATION	
1	Mar 01/2006
2	BLANK
27-31-95 TESTING AND FAULT ISOLATION	
101	Nov 01/2008
102	Nov 01/2007
103	Mar 01/2006
104	Mar 01/2006
105	Mar 01/2006
106	Mar 01/2006
107	Mar 01/2006
27-31-95 TESTING AND FAULT ISOLATION (cont)	
108	Mar 01/2006
109	Mar 01/2006
110	Mar 01/2006
111	Mar 01/2006
112	Mar 01/2006
113	Mar 01/2006
114	Mar 01/2006
115	Jul 01/2006
116	BLANK
27-31-95 DISASSEMBLY	
301	Mar 01/2006
302	Mar 01/2006
27-31-95 CLEANING	
401	Mar 01/2006
402	BLANK
27-31-95 CHECK	
501	Mar 01/2006
502	Mar 01/2006
27-31-95 REPAIR - GENERAL	
601	Mar 01/2006
602	Mar 01/2006
603	Mar 01/2006
604	BLANK
27-31-95 REPAIR 1-1	
601	Mar 01/2006
602	Mar 01/2006
603	Mar 01/2006
604	BLANK
27-31-95 REPAIR 2-1	
601	Mar 01/2006
602	Mar 01/2006
27-31-95 REPAIR 3-1	
601	Mar 01/2006
602	Mar 01/2006
27-31-95 REPAIR 4-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 5-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 6-1	
601	Mar 01/2006
602	BLANK
27-31-95 REPAIR 7-1	
601	Mar 01/2006
602	BLANK
27-31-95 REPAIR 8-1	
601	Mar 01/2006
602	BLANK
27-31-95 REPAIR 9-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 10-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 11-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 12-1	
601	Nov 01/2006
602	BLANK
27-31-95 REPAIR 13-1	
601	Mar 01/2006
602	BLANK
27-31-95 REPAIR 14-1	
601	Mar 01/2006
602	BLANK
27-31-95 ASSEMBLY	
701	Nov 01/2008
702	Jul 01/2008
703	Jul 01/2008
704	Jul 01/2008
705	Mar 01/2006
706	Mar 01/2006
707	Mar 01/2006
708	Mar 01/2006
709	Mar 01/2006

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

Subject/Page	Date
27-31-95 ASSEMBLY (cont)	
710	Mar 01/2006
711	Mar 01/2006
712	Nov 01/2007
27-31-95 FITS AND CLEARANCES	
801	Jul 01/2006
802	BLANK
27-31-95 SPECIAL TOOLS, FIXTURES, AND EQUIPMENT	
901	Mar 01/2009
902	BLANK
27-31-95 ILLUSTRATED PARTS LIST	
1001	Nov 01/2008
1002	Jul 01/2006
1003	Mar 01/2006
1004	Mar 01/2006
1005	Mar 01/2006
1006	Mar 01/2006
1007	Mar 01/2006
1008	Mar 01/2006
1009	Mar 01/2006
1010	Mar 01/2006
1011	Mar 01/2006
1012	Mar 01/2006
1013	Mar 01/2006
1014	Mar 01/2006
1015	Mar 01/2006
1016	Mar 01/2006
1017	Mar 01/2006
1018	Mar 01/2006
1019	Mar 01/2006
1020	Mar 01/2006
1021	Mar 01/2006
1022	Mar 01/2006
1023	Mar 01/2006
1024	Mar 01/2006
1025	Mar 01/2006
1026	Mar 01/2006
1027	Mar 01/2006
1028	Mar 01/2006
27-31-95 ILLUSTRATED PARTS LIST (cont)	
1029	Mar 01/2006
1030	Mar 01/2006
1031	Mar 01/2006
1032	Mar 01/2006
1033	Mar 01/2006
1034	Mar 01/2006
1035	Mar 01/2006
1036	Mar 01/2006
1037	Mar 01/2006
1038	Mar 01/2006
1039	Mar 01/2006
1040	Mar 01/2006
1041	Mar 01/2006
1042	Mar 01/2006

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

TABLE OF CONTENTS

Paragraph Title	Page
ELEVATOR CONTROL FEEL AND CENTERING UNIT ASSEMBLY - DESCRIPTION AND OPERATION	1
TESTING AND FAULT ISOLATION	101
DISASSEMBLY	301
CLEANING	401
CHECK	501
REPAIR	601
ASSEMBLY	701
FITS AND CLEARANCES	801
SPECIAL TOOLS, FIXTURES, AND EQUIPMENT	901
ILLUSTRATED PARTS LIST	1001

BOEING®

COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR 33180-27	DEC 05/83
		PRR 33561-2	DEC 05/84
		PRR 34103-1	SEP 05/87
		PRR 35335	NOV 01/99
		PRR 38060-3	NOV 01/99
SB27A1194			NOV 01/99
SB 27-1197			NOV 01/99

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		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
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.

ELEVATOR CONTROL FEEL AND CENTERING UNIT ASSEMBLY - DESCRIPTION AND OPERATION

1. **Description**

   A. The elevator control feel and centering unit assembly consists of a mechanical centering unit assembly and a hydraulically-operated feel actuator.

   B. The centering unit assembly consists of a spring loaded cam follower assembly riding on a cam shaft assembly. The camshaft assembly also connects to the lever assembly thru tie assemblies and a link assembly. All these parts are mounted inside a housing assembly. The input crank assembly attaches to the camshaft assembly and activates the centering unit assembly.

2. **Operation**

   A. The elevator control feel and centering unit assembly provides mechanical centering of the elevator control thru the spring loaded centering cam mechanism. The unit also provides artificial feel thru a mechanical linkage actuated by a hydraulic feel actuator.

3. **Leading Particulars (Approximate)**

   A. Length – 13 inches

   B. Width – 5 inches

   C. Height – 10 inches

   D. Weight – 10 pounds

TESTING AND FAULT ISOLATION

1. General

A. This procedure has the data necessary to do a test of the elevator control feel and centering unit assembly (1A) after an overhaul or for fault isolation.

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

C. Refer to IPL Figure 1 and IPL Figure 2 for item numbers.

2. Testing

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5349	X-Y Recorder/Plotter (Part #: 925E, Supplier: 60795)
SPL-5351	Test Equipment - Elevator Feel and Centering Unit (Part #: A27041-175, Supplier: 81205)
SPL-5352	Readout and Control Equipment - Functional Test Stand (Part #: A27081-1, Supplier: 81205)
SPL-5446	X-Y recorder (Part #: RW20IT, Supplier: 31991) (Opt Part #: 7046A, Supplier: 28480) (Opt Part #: 7090A, Supplier: 28480)

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

C. Materials and Equipment

NOTE: Equivalent substitutes may be used.

(1) X-Y Plotter (Hewlett Packard Co.; Model HP7045B, X-Y recorder, SPL-5446, or Allen Datagraph; Model 925E, X-Y recorder/plotter, SPL-5349, or equivalent) with provisions for recording:

(a) Angular displacement up to 30 degrees in both directions from a zero.

(b) Torque up to 1900 pound-inches in both directions from a zero.

(2) Hydraulic test stand capable of supplying BMS 3-11 hydraulic fluid, D00153 at a constant pressure up to 2100 psig. Fluid shall be filtered per TESTING AND FAULT ISOLATION, Table 101.

Table 101: Hydraulic Fluid Filtering Chart

PARTICLE SIZE (MICRONS)	QUANTITY (MAX) 100 ML
10-25	6,000
26-50	1,400
51-100	400
101-150	20
over 150	0

D. Preparation for Test

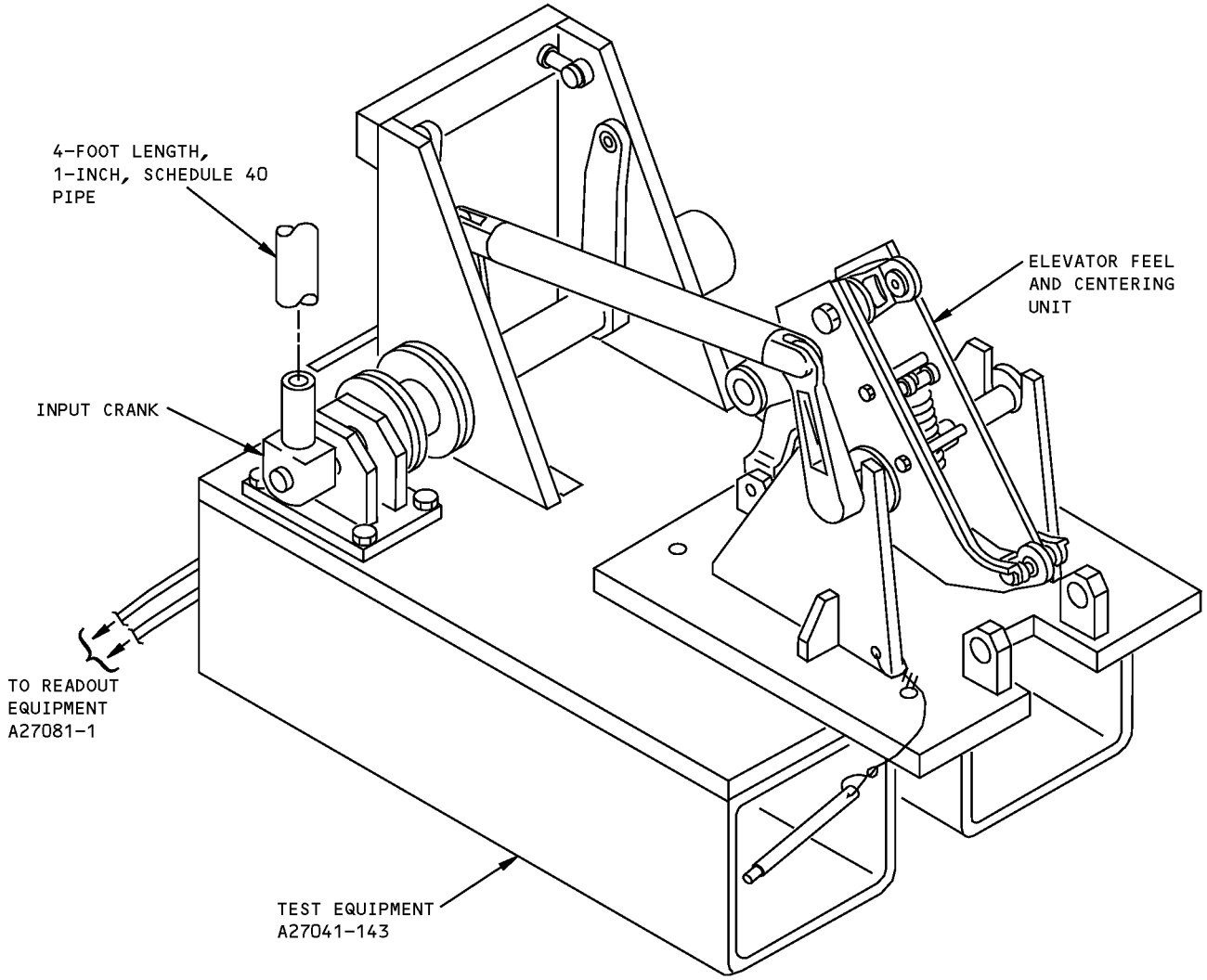
(1) Mount unit in A27041-161 Test Equipment - Elevator Feel and Centering Unit, SPL-5351 per TESTING AND FAULT ISOLATION, Figure 101 and attach the A27081-1 Readout Equipment, SPL-5352 per equipment instructions.

(2) Connect instruments, X-Y plotter and check calibration.

NOTE: The X-Y plotter (Hewlett Packard Co., X-Y recorder, SPL-5446; Allen Datagraph, X-Y recorder/plotter, SPL-5349, or equivalent) shall have provisions for recording:

Angular displacement up to 30 degrees in both directions from zero.

Torque up to 1900 pound-inches in both directions from a zero.



Functional Test Setup
Figure 101

E. Test 65C25465-2, -12, -15, -18 thru -23 Assemblies

(1) Test unit at 0 psi hydraulic pressure.

(a) With actuator assembly (60, IPL Figure 1) ports open, cycle unit a minimum of five times, then rotate input crank clockwise and counterclockwise and check the breakout torque.

(b) Check that breakout torque is Clockwise Rotation 58-73 pound-inches Counterclockwise Rotation 49-64 pound-inches

(c) If the torque values exceed these limits, loosen retainer (210, IPL Figure 2) and rotate post assembly (410) as required.

(d) Repeat check in TESTING AND FAULT ISOLATION, Paragraph 2.E.(1)(a) and TESTING AND FAULT ISOLATION, Paragraph 2.E.(1)(b).

(e) Rotate input crank counterclockwise and clockwise through full travel and plot input torque vs. input crank rotation. The resulting curve shall be continuous and smooth and fall entirely within the boundaries shown in TESTING AND FAULT ISOLATION, Figure 102.

(2) Check input crank rotation.

(a) Connect hydraulic pressure supply to actuator assembly pressure ports A and B. Leave return ports open.

(b) Apply hydraulic pressure simultaneously to pressure ports A and B and slowly increase pressure from 0 to 190-210 psig. Check that input crank rotation does not exceed 0.05 degree.

(c) Remove hydraulic pressure.

(d) Apply hydraulic pressure simultaneously to pressure ports A and B and slowly increase pressure from 0 to 2050-2150 psig. Check that input shaft rotation does not exceed 0.10 degree.

(e) Remove hydraulic pressure.

(3) Test unit at 190-210 psig hydraulic pressure.

(a) Apply 190-210 psig hydraulic pressure simultaneously to pressure ports A and B.

(b) Rotate input crank clockwise and counterclockwise and check that total clockwise plus counterclockwise breakout torque is 150 pound-inches maximum.

(c) With 190-210 psig hydraulic pressure applied simultaneously to pressure ports A and B, rotate input crank through a complete cycle, starting from zero in a clockwise direction. The rate of rotation shall be approximately 5-20 degrees/second.

(d) Plot input torque versus input crank rotation. Check that the resultant curve is continuous, smooth and falls entirely within the boundaries specified in TESTING AND FAULT ISOLATION, Figure 103.

(e) Repeat test in TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(c) and TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(d) except apply 190-210 psig hydraulic pressure to pressure port A only.

(f) Repeat test in TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(c) and TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(d) except apply 190-210 psig hydraulic pressure to pressure port B only.

(4) Test unit at 2050-2150 psig hydraulic pressure.

(a) Apply 2050-2150 psig hydraulic pressure simultaneously to pressure ports A and B.

(b) Rotate input crank through a complete cycle, starting from a zero in the clockwise direction. The rate of rotation shall be 5-20 degrees/second.

(c) Plot input torque versus input crank rotation. Check that the resultant curve is continuous, smooth and falls entirely within the boundaries specified in TESTING AND FAULT ISOLATION, Figure 104.

(d) Repeat test in TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(b) and TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(c) except apply 2050-2150 psig hydraulic pressure to pressure port A only.

(e) Repeat test in TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(b) and TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(c) except apply 2050-2150 psig hydraulic pressure to pressure port B only.

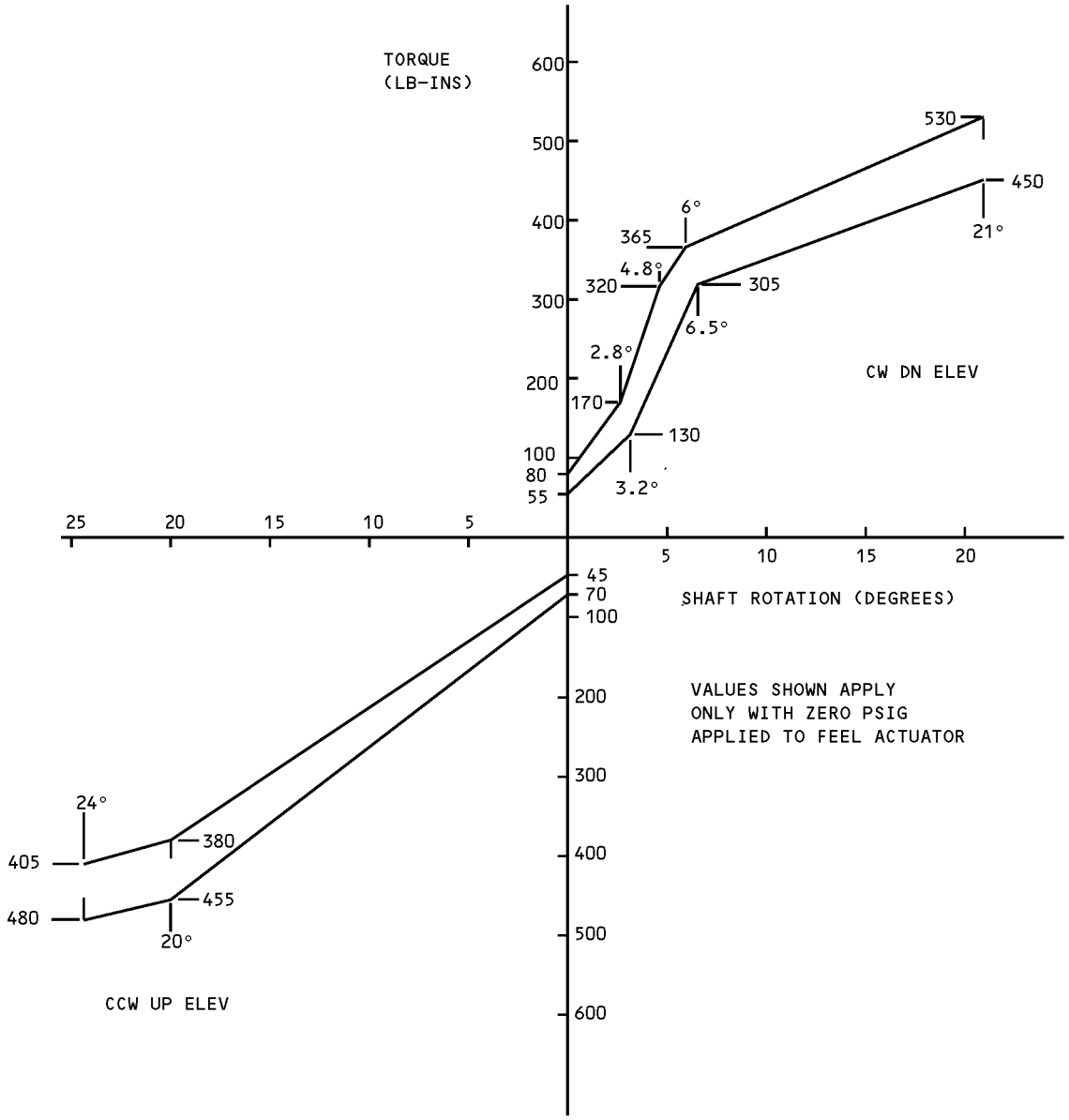
(5) Reduce hydraulic pressure to 200 psig.

CAUTION: TORQUE VALUE AT INTERNAL STOPS MUST NOT EXCEED 1400 POUND-INCHES OR DAMAGE TO PART MAY RESULT.

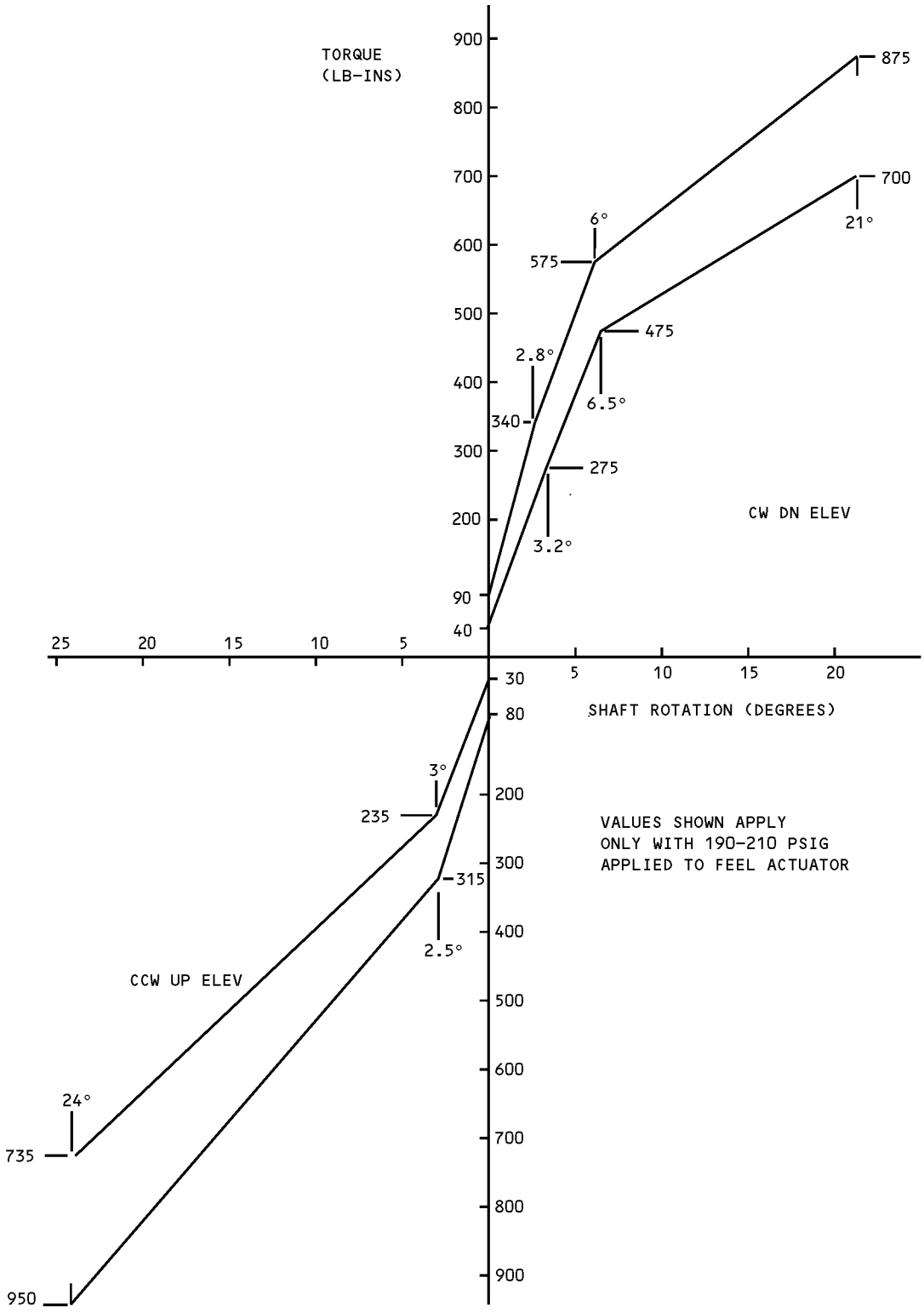
(a) Rotate input crank clockwise until internal stop is contacted and check that minimum travel is 21 degrees.

(b) Rotate input crank counterclockwise until internal stop is contacted and check that minimum travel is 24.5 degrees.

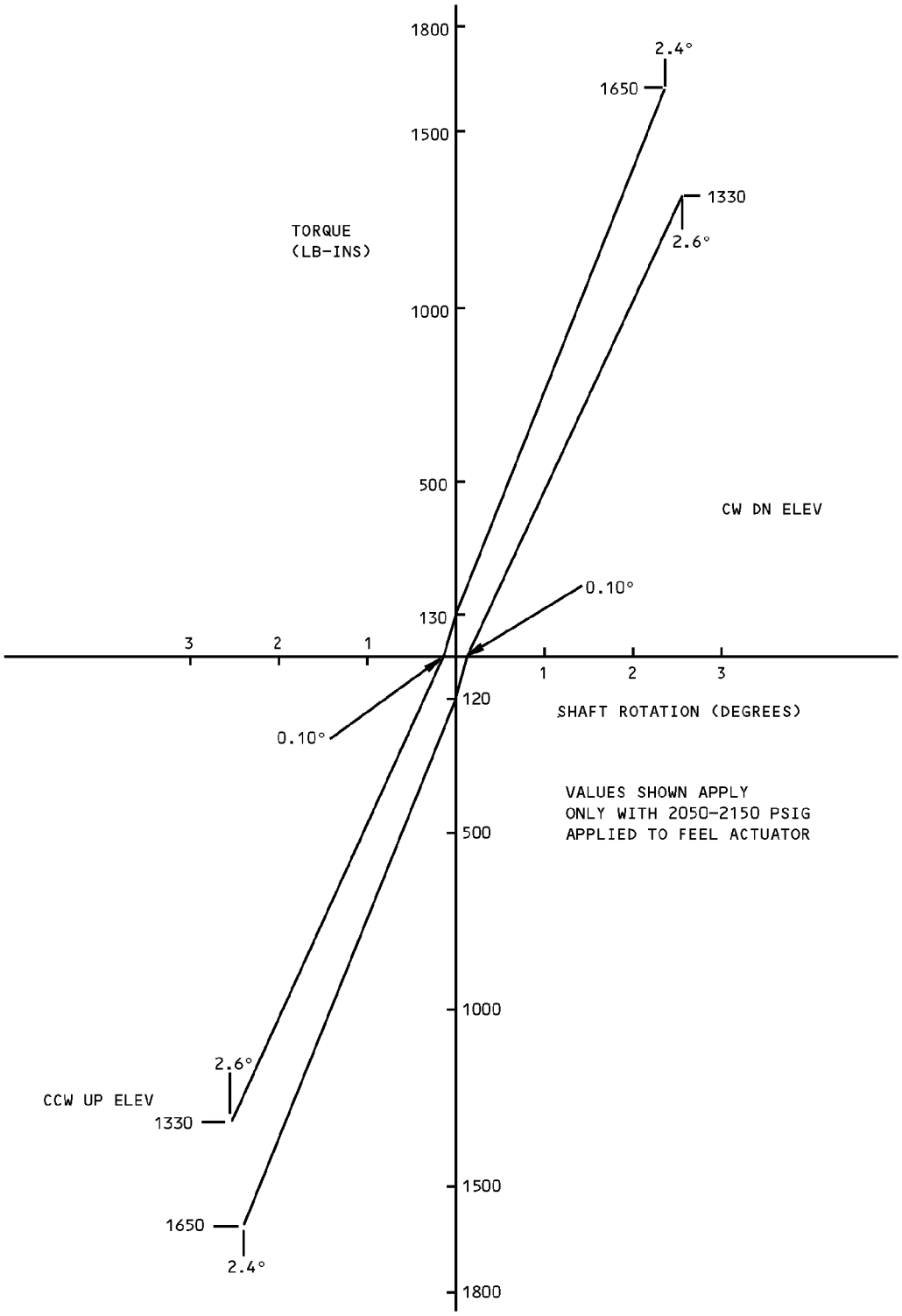
(6) After completing the test, prepare actuator assembly for shipping and storage per OHM 27-09-09.



65C25465-2,-12,-15,-18 thru -23 Assemblies Only Input Torque vs Crank Rotation - Zero Psig
Figure 102



65C25465-2,-12,-15,-18 thru -23 Assemblies Only Input Torque vs Crank Rotation - 190 to 210 Psig
Figure 103



65C25465-2,-12,-15,-18 thru -23 Assemblies Only Input Torque vs Crank Rotation - 2050 to 2150 Psig
Figure 104

F. Test 65C25465-4, -8, -10, -11, -16, -17 Assemblies

(1) Test unit without hydraulic pressure.

(a) With actuator assembly (60, IPL Figure 1) ports open, cycle unit a minimum of 5 times, then rotate input crank clockwise and counterclockwise and check the breakout torque.

(b) Check that breakout torque is Clockwise Rotation 60-75 pound-inches Counterclockwise Rotation 50-65 pound-inches

(c) If the torque values exceed these limits, loosen retainer (210, IPL Figure 2) and rotate post assembly (410) as required.

(d) Repeat check per TESTING AND FAULT ISOLATION, Paragraph 2.F.(1)(a) and TESTING AND FAULT ISOLATION, Paragraph 2.F.(1)(b).

(e) Rotate input crank counterclockwise and clockwise through full travel and plot input torque vs. input crank rotation. The resultant curve shall be continuous and smooth and fall entirely within the boundaries shown in TESTING AND FAULT ISOLATION, Figure 105.

(2) Check input crank rotation.

(a) Connect hydraulic pressure supply to feel actuator pressure ports A and B. Leave return ports open.

(b) Apply hydraulic pressure simultaneously to pressure ports A and B and slowly increase pressure from 0 to 190-210 psig. Check that input crank does not rotate more than 0.05 degree.

(c) Remove hydraulic pressure.

(d) Apply hydraulic pressure simultaneously to pressure ports A and B and slowly increase pressure from 0 to 2050-2150 psig. Check that input crank does not rotate more than 0.10 degree.

(3) Test unit at 245-265 psig hydraulic pressure.

(a) Apply 245-265 psig hydraulic pressure simultaneous to pressure ports A and B.

(b) Rotate input crank clockwise and counterclockwise and check that total clockwise plus counterclockwise breakout torque is 150 pound-inches maximum.

(c) With 245-265 psig hydraulic pressure applied simultaneously to pressure ports A and B, rotate input crank through a complete cycle, starting from zero in a clockwise direction. The rate of rotation shall be approximately 5-20 degrees/second.

(d) Plot input torque versus input crank rotation. Check that the resultant curve is continuous, smooth and falls entirely within the boundaries specified in TESTING AND FAULT ISOLATION, Figure 106.

(e) Repeat test per TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(c) and TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(d) except apply 245-255 psig to pressure port A only.

(f) Repeat test per TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(c) and TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(d) except apply 245-255 psig to pressure port B only.

(4) Test unit at 2050-2150 psig hydraulic pressure.

(a) Apply 2050-2150 psig hydraulic pressure simultaneously to pressure ports A and B.

(b) Rotate input crank through a complete cycle, starting from a zero in a clockwise direction. The rate of rotation shall be 5-20 degrees/second.

(c) Plot input torque versus input crank rotation. Check that the resultant curve is smooth and continuous and falls entirely within the boundaries specified in TESTING AND FAULT ISOLATION, Figure 107.

(d) Repeat test per TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(b) and TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(c) except apply 2050-2150 psig hydraulic pressure to pressure port A only.

(e) Repeat test TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(b) and TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(c) except apply 2050-2150 psig hydraulic pressure to pressure port B only.

(5) Reduce hydraulic pressure to 200 psig.

CAUTION: TORQUE VALUE AT INTERNAL STOPS MUST NOT EXCEED 1400 POUND-INCHES OR DAMAGE TO PART MAY RESULT.

(a) Rotate input crank clockwise until internal stop is contacted and check that minimum travel is 21 degrees.

(b) Rotate input crank counterclockwise until internal stop is contacted and check that minimum travel is 24.5 degrees.

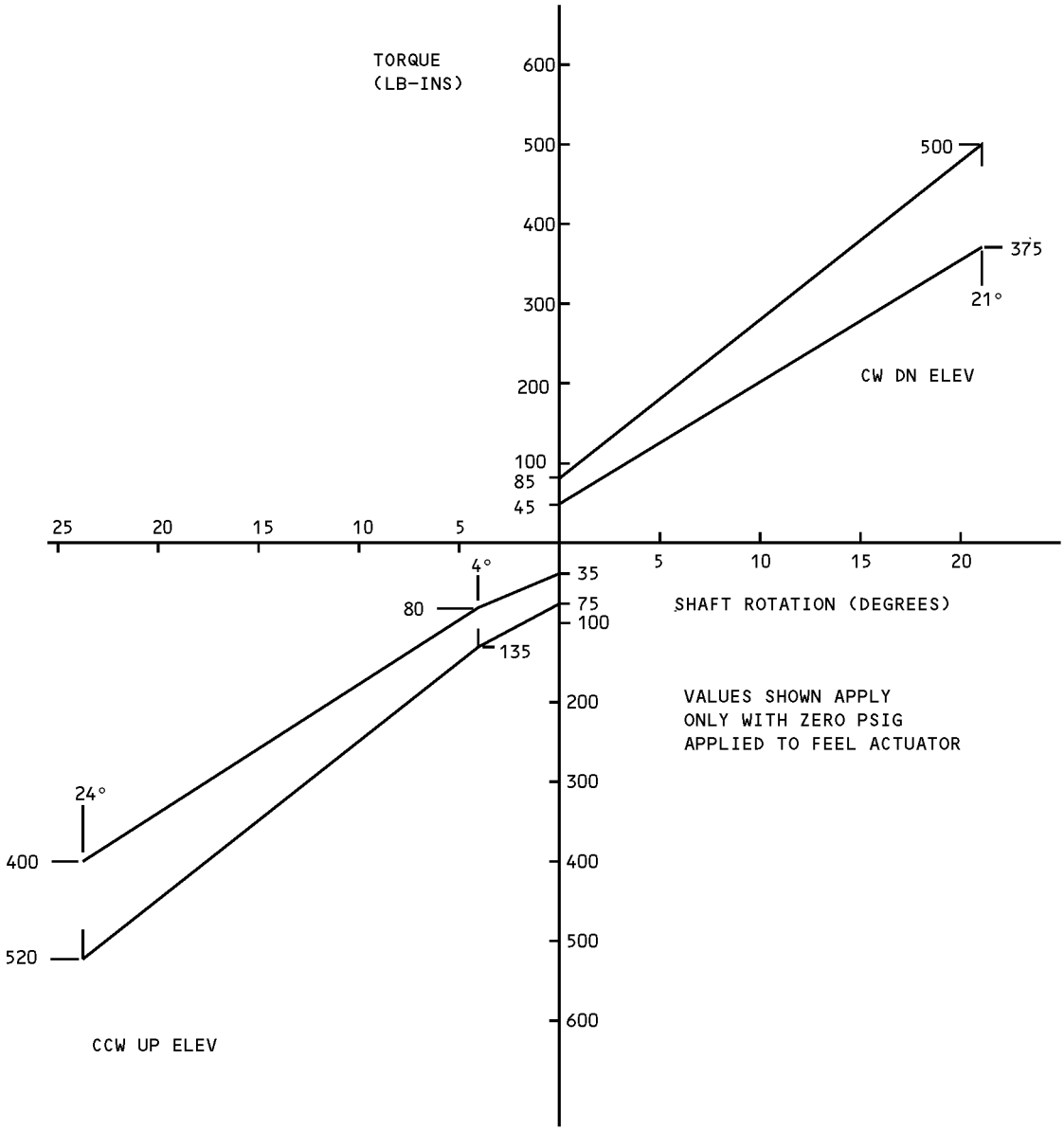
(6) After completing the test, prepare actuator assembly for shipping and storage per OHM 27-09-09.

Table 102: Trouble Shooting Chart

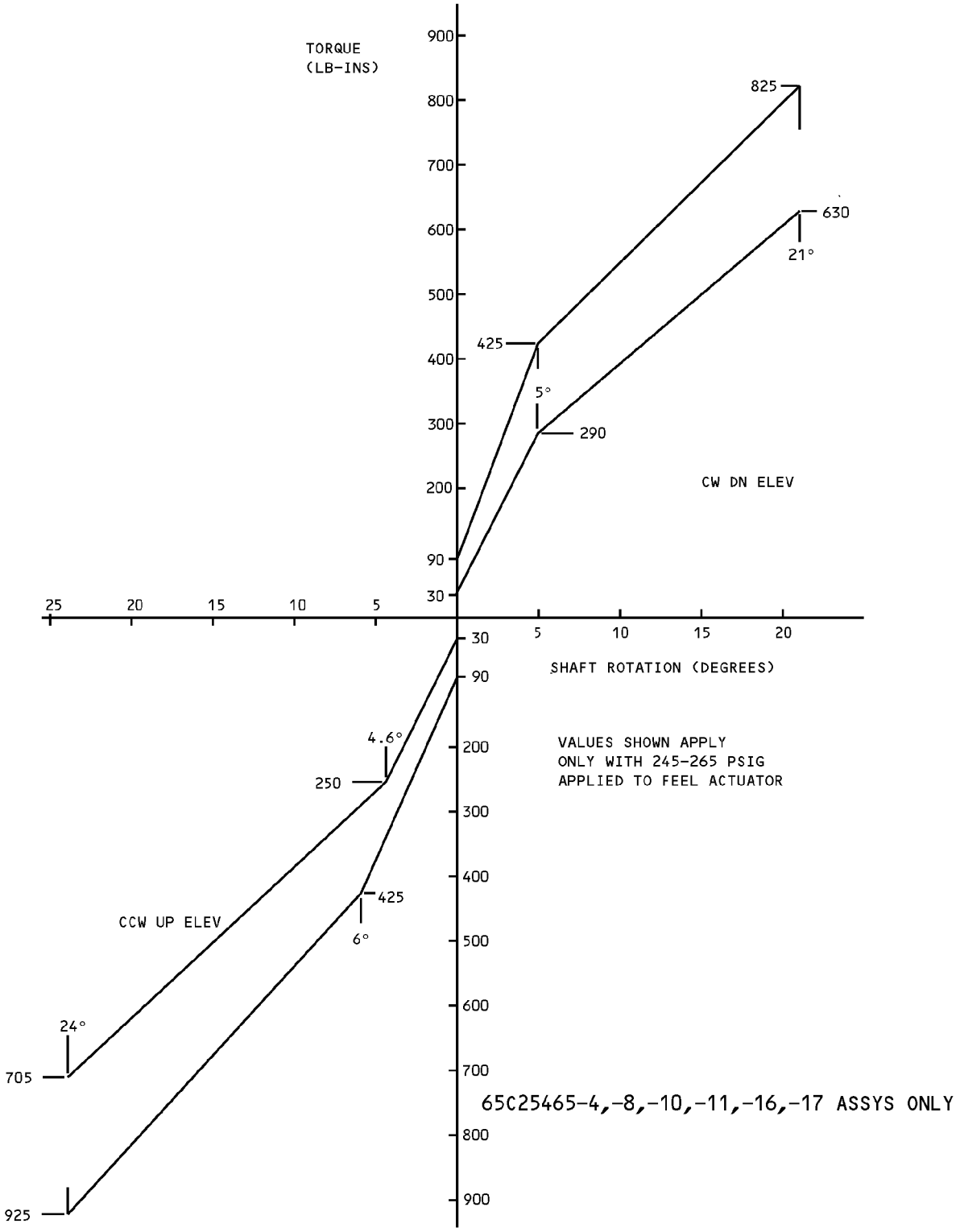
TROUBLE	PROBABLE CAUSE	CORRECTION
Steps per TESTING AND FAULT ISOLATION, Paragraph 2.E.(1)(e), TESTING AND FAULT ISOLATION, Paragraph 2.F.(1)(e).	Defective camshaft assembly	Replace camshaft assembly per TESTING AND FAULT ISOLATION, Paragraph 2.G.(1).
Steps per TESTING AND FAULT ISOLATION, Paragraph 2.E.(2), TESTING AND FAULT ISOLATION, Paragraph 2.F.(2).	Incorrect cam indexing	Replace camshaft assembly per TESTING AND FAULT ISOLATION, Paragraph 2.G.(1).
Steps per TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(c), TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(d); TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(b),TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(c); TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(c), TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(d); TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(b), TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(c).	Defective centering unit assembly	Disassemble and replace part per TESTING AND FAULT ISOLATION, Paragraph 2.G.(2).

Table 102: Trouble Shooting Chart (Continued)

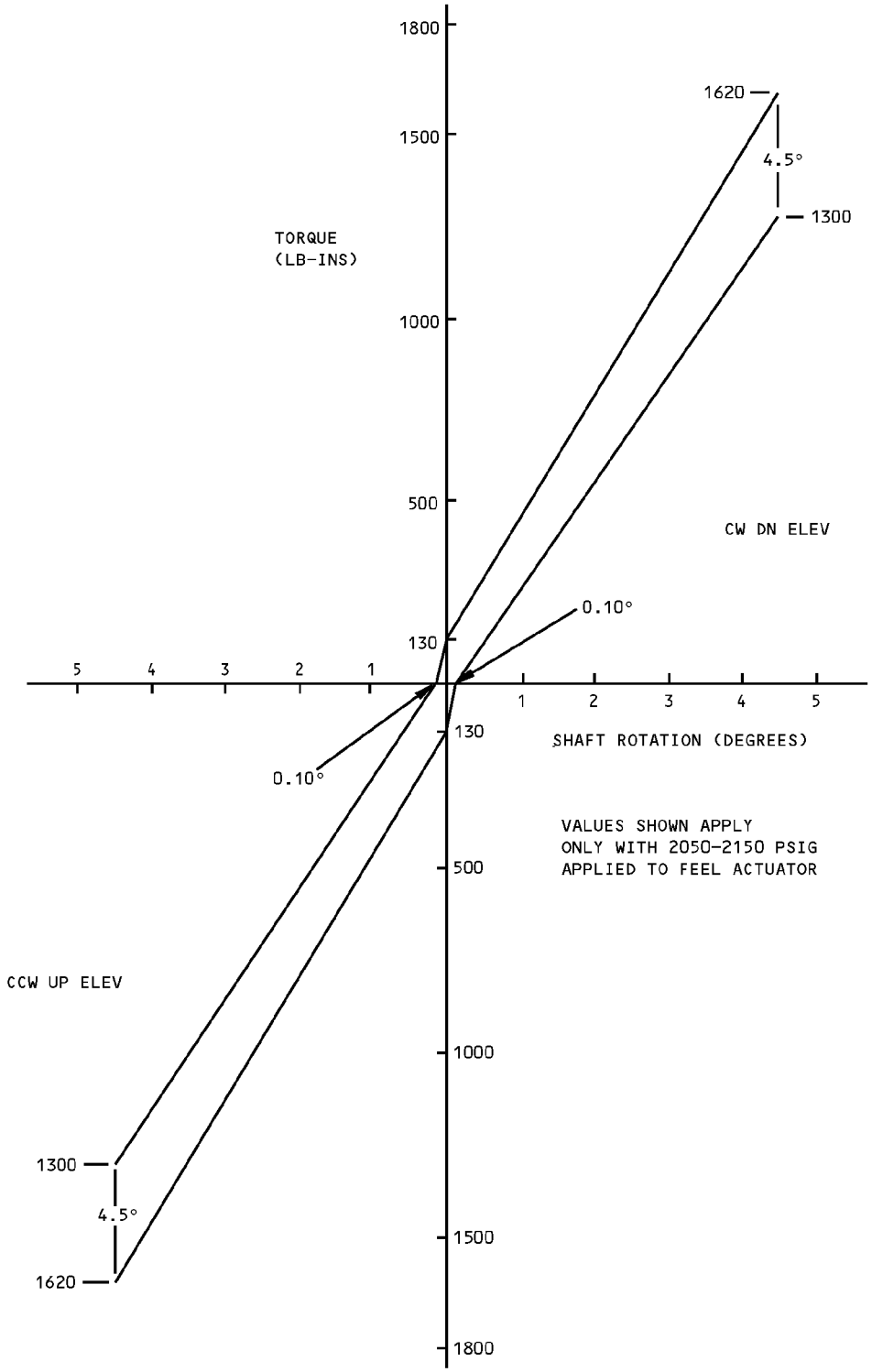
TROUBLE	PROBABLE CAUSE	CORRECTION
Steps per TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(e), TESTING AND FAULT ISOLATION, Paragraph 2.E.(3)(f); TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(d), TESTING AND FAULT ISOLATION, Paragraph 2.E.(4)(e); TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(e), TESTING AND FAULT ISOLATION, Paragraph 2.F.(3)(f); TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(d), TESTING AND FAULT ISOLATION, Paragraph 2.F.(4)(e).	Defective feel actuator assembly	Disassemble and replace part per TESTING AND FAULT ISOLATION, Paragraph 2.G.(2).
Steps per TESTING AND FAULT ISOLATION, Paragraph 2.E.(5), TESTING AND FAULT ISOLATION, Paragraph 2.F.(5).	Binding or defective centering unit assembly	Disassemble and replace part per TESTING AND FAULT ISOLATION, Paragraph 2.G.(2).
NOTE: Trouble shooting is keyed to the test steps.		



65C25465-4,-8,-10,-11,-16,-17 Assemblies Only Input Torque vs Crank Rotation - Zero Psig
Figure 105



Input Torque vs Crank Rotation - 245 to 265 Psig
Figure 106



65C25465-4,-8,-10,-11,-16,-17 Assemblies Only Input Torque vs Crank Rotation - 2050 to 2150 Psig
Figure 107

G. Corrective Procedures

(1) Replace camshaft assembly (665A, IPL Figure 2).

(a) Completely disassemble unit per DISASSEMBLY and replace camshaft assembly.

(b) Assemble parts per ASSEMBLY ASSEMBLY, Paragraph 2.D.(1) thru ASSEMBLY, Paragraph 2.D.(4), ASSEMBLY, Paragraph 2.D.(7) thru ASSEMBLY, Paragraph 2.D.(9), ASSEMBLY, Paragraph 2.E.(1) thru ASSEMBLY, Paragraph 2.E.(6).

(c) Retest unit.

(2) Disassemble feel and centering unit assembly.

(a) Disassemble unit per DISASSEMBLY DISASSEMBLY, Paragraph 3.A., DISASSEMBLY, Paragraph 3.B., DISASSEMBLY, Paragraph 3.C..

(b) Refer to OHM 27-09-09 for testing and repair procedures of cylinder assembly (90, IPL Figure 1).

(c) Disassemble centering unit assembly per DISASSEMBLY DISASSEMBLY, Paragraph 4. as required.

(d) Reassemble cylinder assembly and centering unit assembly per ASSEMBLY ASSEMBLY, Paragraph 2.E.(1) thru ASSEMBLY, Paragraph 2.E.(5).

(e) Retest unit.

DISASSEMBLY

1. **General**

   A. Refer to TESTING AND FAULT ISOLATION to establish the condition of the component or most probable cause of its malfunction. This is to determine the extent of disassembly required without completely tearing down and rebuilding the component.

2. **Parts Replacement**

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

   A. Nuts (5, 15, 95 IPL Figure 1; 50, 90, 180, 215, 530, 580, 630, IPL Figure 2)

   B. Packings (70, 85, IPL Figure 1)

   C. Lock bolts (525A, 575A, 625A, IPL Figure 2) and collars (520A, 570A, 620A)

3. **Disassemble Feel and Centering Unit Assemblies (IPL Figure 1)**

   A. Remove nuts (5, 15), washers (10, 20), bolt assemblies (25, 40), bushing (55A), and separate actuator assembly (60) from centering unit assembly (120A).

   B. Remove nut (95), washer (100), bushing (105), slide block (110) and fitting (115) from actuator assembly (60).

   C. Remove unions (65, 75), reducer (80) from cylinder assembly (90). Remove packings (70) from unions (65) and packings (85) from union (75) and reducer (80).

   D. Refer to OHM 27-09-09 for disassembly procedures of cylinder assembly (90).

4. **Disassembly of Centering Unit Assembly (IPL Figure 2)**

   CAUTION: DO NOT DISASSEMBLE BONDED ASSEMBLY OR DAMAGE TO PARTS MAY RESULT.

   A. Remove rivet (5) or bolt (5A) and collar (6), retainer (10) and bearing housing assembly (15) from camshaft assembly (665A).

   B. Remove nuts (50), washers (55), bolts (60), input crank assembly (45), and spacer (80) from camshaft assembly (665A).

   C. On 65C25505-6, -9 assemblies, remove nuts (90), washers (95), bolts (100) and crank assembly (85) from camshaft assembly (665D).

   D. Remove rivets (115) or bolt (115A) and collar (116), retainer (120), bearing housing assembly (125) and crank assembly (155) from camshaft assembly (665A).

   E. Remove screws (170) and cover plate (175).

   CAUTION: HOUSING ASSEMBLY (250A) COMPRISES MATCHING BOND ASSEMBLIES AND MUST BE KEPT TOGETHER TO ENSURE PROPER OPERATION AFTER ASSEMBLY.

   F. Remove housing assembly (250A).

      (1) On top assemblies 65C25505-11, -12, -14, remove stop support assembly (192), bushings (187, 188, 189), bolts (152, 153, 157), washers (167, 168, 177) and nuts (182, 183, 184).

      (2) Remove nut (180), washer (185) and inner shaft (190) from housing assembly (250A).

      (3) Remove rivets (195A) or lockbolts (195B), washers (197) and collars (196), and push inner shaft (200) out of outer shaft (430).

WARNING: SPRING POST ASSEMBLY (410) IS PRELOADED BY SPRINGS (400, 405). USE CARE WHILE REMOVING RETAINER (210) TO AVOID PERSONNEL INJURY.

(4) Restrain spring post assembly (410) and remove screws (205) and retainer (210). Carefully rotate spring post assembly (410) until minimum spring force is felt.

(5) Remove nuts (215), washers (220), bolts (225, 226, 230, 235), bushings (240) and retainers (245). On top assemblies 65C25505-13, 15, -16, remove nut (181), washer (172), bolt (151) and bushing (186).

(6) Slide housing bond assembly (325A) off from shafts (430, 515) and camshaft assembly (665A).

(7) Restrain cam follower assembly (435) and remove springs (400, 405) from spring post assembly (410). Remove spring post assembly from housing bond assembly (305A).

(8) Remove actuator fitting assembly (375) from housing bond assembly (305A).

(9) Remove outer shaft (430) from housing bond assembly (305A) and remove cam follower assembly (435).

(10) Remove housing bond assembly (305A) from shaft (515) and cam shaft assembly (665A). Tag and keep housing bond assemblies (305A, 325A) together as a matched set.

G. On 65C25505-4, -6, -8, -9 assemblies, remove rivets (352) and bracket assembly (345) if required.

H. Remove bearings (500) and bushing (505) from cam follower assembly (435).

I. Remove bearings (510) and outer shaft (515) from lever assembly (545).

J. Remove parts (520A thru 540) and separate link assembly (600) and lever assembly (545).

K. Remove parts (570A thru 595) and remove link assembly (600).

L. Remove parts (620A thru 645) and remove tie assemblies (650) from camshaft assembly (665).

NOTE: Note numbers of washers (627, 637) to facilitate assembly.

M. Do not separate cam assembly (690A) from feel lever assembly (695).

CLEANING

1. General

A. This procedure contains the data necessary to clean special parts.

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

C. Refer to IPL Figure 1 and IPL Figure 2 for item numbers.

2. Cleaning

A. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES

B. Procedure

(1) Clean all parts except sealed bearings using standard industry practices and information contained in SOPM 20-30-03.

(2) Clean sealed bearings according to the manufacturer's instructions.

CHECK

1. General

A. This procedure contains the data necessary to find defects in the material of 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 tolPL Figure 1 and IPL Figure 2 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) Check all parts for obvious defects in accordance with standard industry practices.

(2) Magnetic particle check per SOPM 20-20-01 the following parts:

(a) Bolts (30, 45, IPL Figure 1)

(b) Fitting (115, IPL Figure 1)

(c) Shafts (190, 515, IPL Figure 2)

(d) Springs (400, P/N 69-73361-1; 405, P/N 69-73360-1, IPL Figure 2)

(e) Bolts (535, 585, 635, IPL Figure 2)

(f) Tie assemblies (650, IPL Figure 2)

(g) Cam assembly (690A, IPL Figure 2)

(3) Penetrant check per SOPM 20-20-02 the following parts:

(a) Retainers (10, 30, 120, 120A, 140, 210, 245, 260, IPL Figure 2)

(b) Housing assembly (40, 150, IPL Figure 2)

(c) Bonded assembly (75, IPL Figure 2)

(d) Spacer (80, IPL Figure 2)

(e) Crank (110, 165, IPL Figure 2)

(f) Cover plate (175, IPL Figure 2)

(g) Shaft (200, IPL Figure 2)

(h) Bond assembly (305A, 325A, IPL Figure 2)

(i) Bonded assembly (395, IPL Figure 2)

(j) Springs (400A, 400B, P/N 251A2184-2, -3; 405A, P/N 251A2190-2, IPL Figure 2)

(k) Post (425, IPL Figure 2)

(l) Retainer (480, IPL Figure 2)

(m) Follower assemblies (490, 495, IPL Figure 2)

(n) Lever assemblies (565, IPL Figure 2)

(o) Bond assembly (615, IPL Figure 2)

(4) Check spring (400, P/N 69-73361-1, IPL Figure 2).

(a) Extend spring to 6.35 inches and check that load is 18.5-20.5 pounds.

(b) Extend spring to 7.35 inches and check that load is 76.1-92.9 pounds.

(5) Check spring (400A, P/N 251A2190-2, IPL Figure 2)

(a) Extend spring to 6.35 inches and check that load is 17.60-21.40 pounds.

(b) Extend spring to 7.90 inches and check that load is 108.25-132.25 pounds.

(6) Check spring (405, P/N 69-73360-1, IPL Figure 2).

(a) Extend spring to 6.26 inches and check that load is 10-11 pounds.

(b) Extend spring to 7.26 inches and check that load is 41-50 pounds.

(7) Check spring (405A, 405B, P/N 251A2184-2, -3, IPL Figure 2).

(a) Extend spring to 5.98 inches and check that load is 9.50-11.50 pounds.

(b) Extend spring to 7.53 inches and check that load is 58.25-71.25 pounds.

REPAIR

1. **Content**

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

Table 601:

P/N	NAME	REPAIR
65C25439	HOUSING	1-1
65C25485	LEVER	2-1
65C25487	FITTING - ACTUATOR	3-1
65C25504	CRANK	4-1
65C25510	LEVER - FEEL	5-1
65C25511	LEVER - FEEL	5-1
65C25512	FOLLOWER - CAM	6-1
69-73340	RETAINER - SPRING	7-1
69-73349	HOUSING - BEARING	8-1
69-73351-1	SHAFT - OUTER	9-1
69-73352	SHAFT - INNER	10-1
69-73353	SHAFT - OUTER	11-1
69-73435	LINK	12-1
- -	MISC. PARTS REFINISH	13-1
BAC27DCT0346	MARKER	14-1

2. **Standard Practices**

   A. Refer to the following standard practices as applicable, for details of procedures in individual repairs.
   - 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 20-41-02 Application of Chemical and Solvent Resistant Finishes
   - SOPM 20-43-01 Chromic Acid Anodizing
   - SOPM 20-50-05 Application of Aluminum Foil and Other Markers
   - SOPM 20-50-03 Bearing Installation and Retention
   - SOPM 20-60-03 Lubricants

3. **Materials**

   NOTE: Equivalent substitutes may be used.

   A. Primer – BMS 10-11, Type 1 primer, C00259

   B. Sealant – BMS 5-95 sealant, A00247

   C. Grease – BMS 3-33 grease, D00633

4. 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

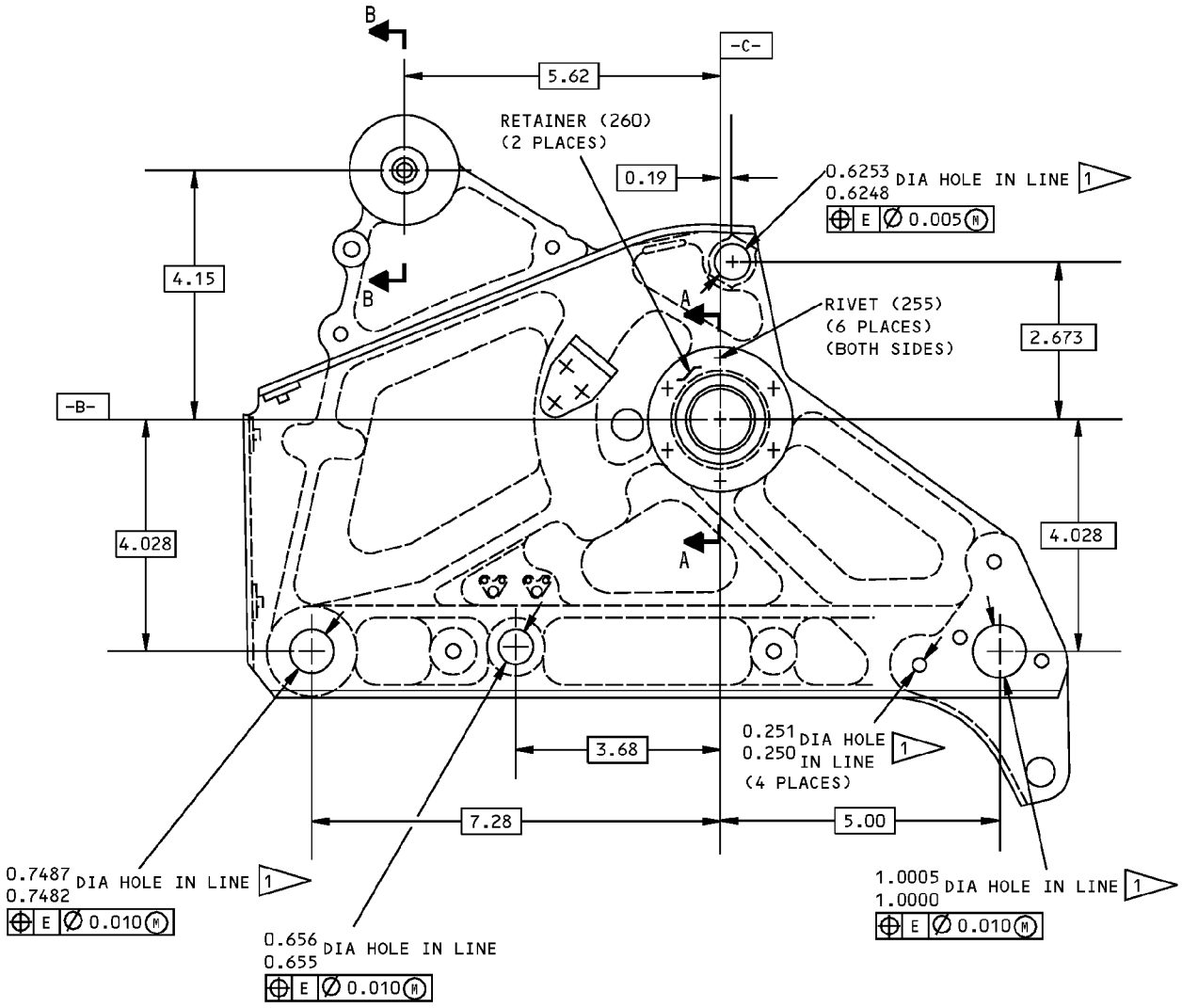
NOTE: DATUM MAY APPEAR AT EITHER SIDE OF TOLERANCE FRAME [0.020 | A] [A | 0.020]

True Position Dimensioning Symbols
Figure 601

HOUSING ASSEMBLY - REPAIR 1-1

65C25439–2, –17

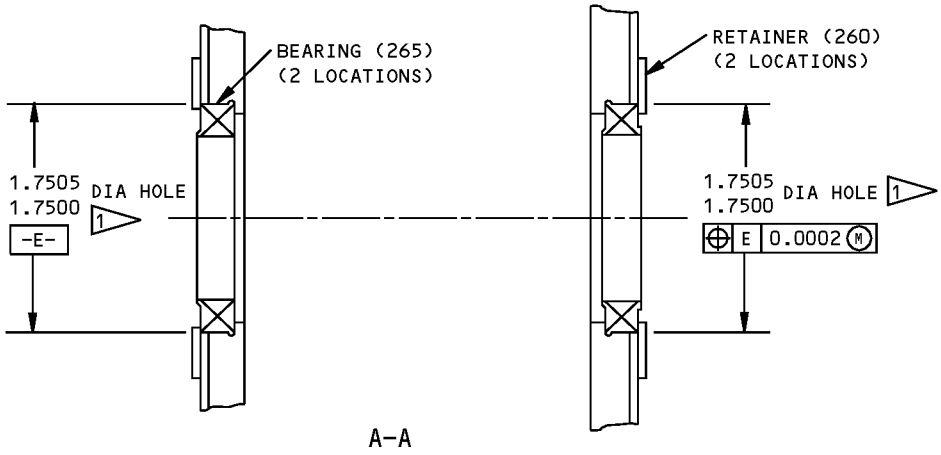
1. **General**
   A. The procedure has the data necessary to repair and refinish the housing assembly (250A, IPL Figure 2).
   B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practice Manual (SOPM) subjects identified in this procedure.
   C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.
   D. Refer to IPL Figure 2 for item numbers.
2. **Bearing (265) Replacement (REPAIR 1-1, Figure 601)**
   A. Remove rivets (255) and retainers (260).
   B. Remove defective bearings (265).
   C. Install replacement bearings (265) per SOPM 20-50-03 except use wet sealant, A00247.
   D. Install retainers (260) and rivets (255).
3. **Bearing (270) Replacement (REPAIR 1-1, Figure 601)**
   A. Remove bearing (270) and sleeve (275).
   B. Install replacement bearing and sleeve per SOPM 20-50-03 except use wet sealant, A00247. Orient gap in sleeve as shown.
   C. Roller swage sleeve per SOPM 20-50-03.
4. **Bearing (800) Replacement (REPAIR 1-1, Figure 601)**
   NOTE: Bearing (800) is an installation part that may remain attached when this assembly is removed. During installation the bearing will be free floating in the housing.
   A. Remove bearings (800), if attached.
   B. Install replacement bearings (800).



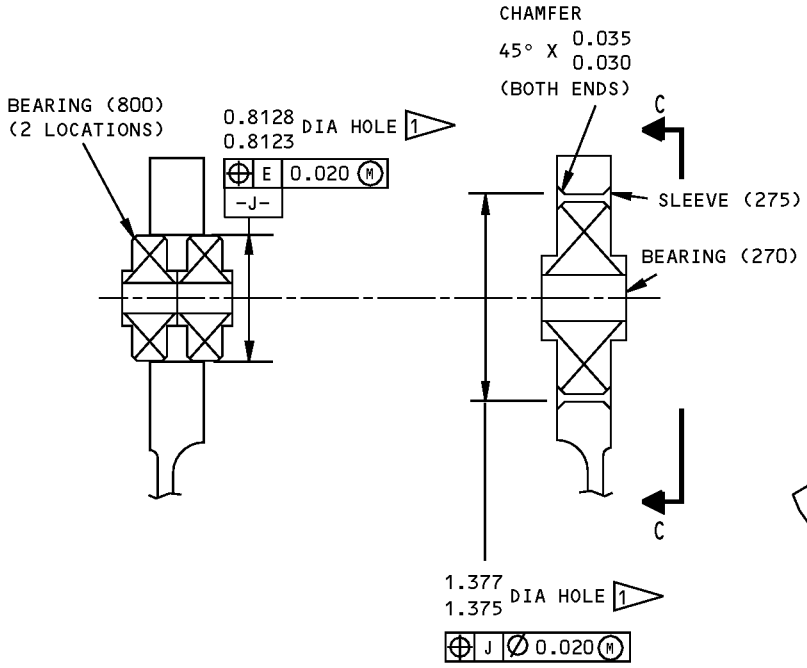
ITEM NUMBERS REFER TO IPL FIG. 2
ALL DIMENSIONS ARE IN INCHES

65C25439-2,-17

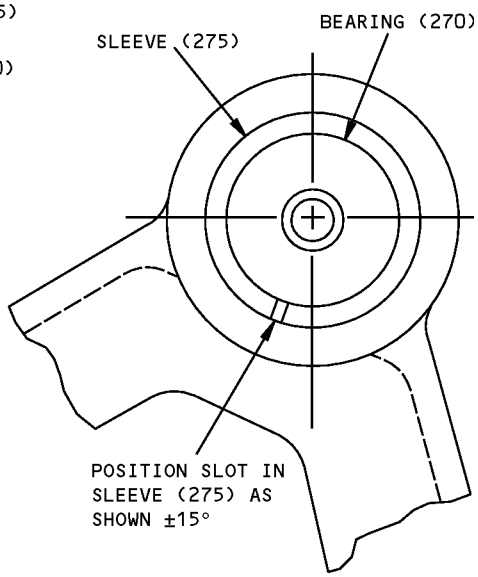
Housing Assembly Repair and Refinish
Figure 601 (Sheet 1 of 2)



A-A



B-B



C-C

REFINISH

MATCHED SET ASSY (300) -- CHEMICAL TREAT
(F-17.10) AND APPLY 1 COAT OF PRIMER (F-20.02)
ON ALL MACHINED SURFACES EXCEPT AS NOTED BY 1

MATERIAL: AL ALLOY

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

1 OMIT PRIMER THIS SURFACE

65C25439-2,-17

Housing Assembly Repair and Refinish
Figure 601 (Sheet 2 of 2)

LEVER ASSEMBLY - REPAIR 2-1

65C25485–1, –3, –5

1. General

A. The procedure has the data necessary to repair and refinish the lever assembly (545, IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Bushing Replacement (REPAIR 2-1, Figure 601)

A. Remove bushing.

B. Install replacement bushing per SOPM 20-50-03.

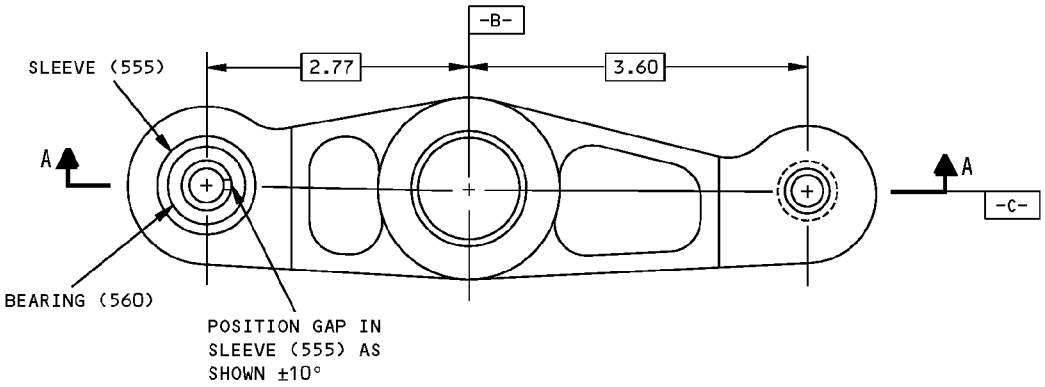
3. Bearing Replacement

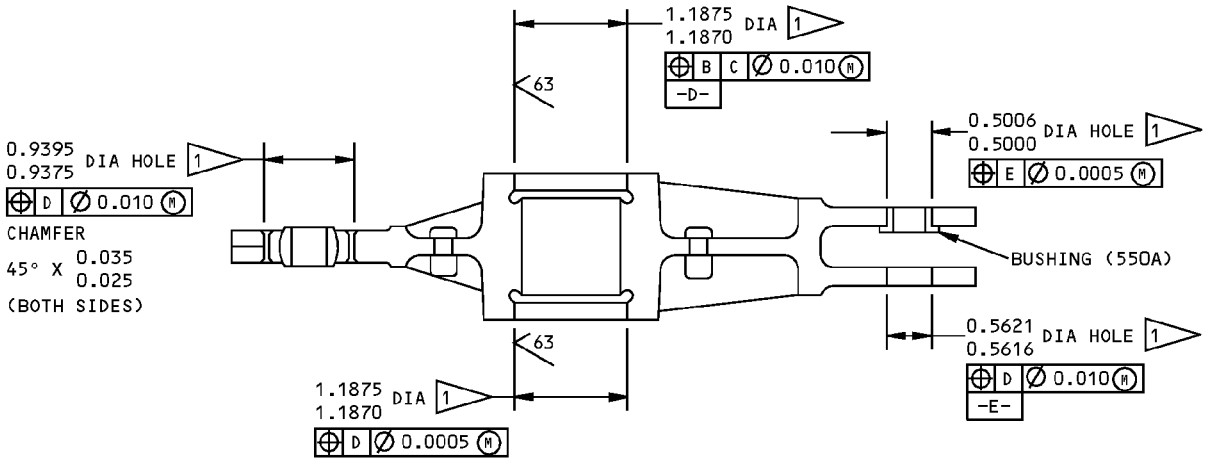
A. Remove bearing and sleeve.

B. Install replacement bearing and sleeve per SOPM 20-50-03.

C. Roller swage sleeve per SOPM 20-50-03.

D. Maximum breakout torque after bearing installation must not exceed 3 pound-inches.





A-A

REFINISH

LEVER ASSEMBLY (565) -- CHEMICAL TREAT (F-17.10) AND APPLY 1 COAT OF PRIMER (F-20-02) ON ALL MACHINED SURFACES EXCEPT OMIT PRIMER AS NOTED IN 1

1 OMIT PRIMER THIS SURFACE

MATERIAL: AL ALLOY

ITEM NUMBERS REFER TO IPL FIG. 2

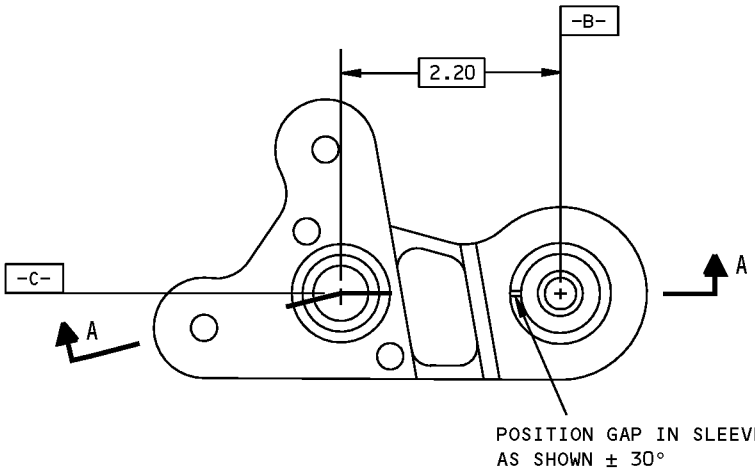
ALL DIMENSIONS ARE IN INCHES

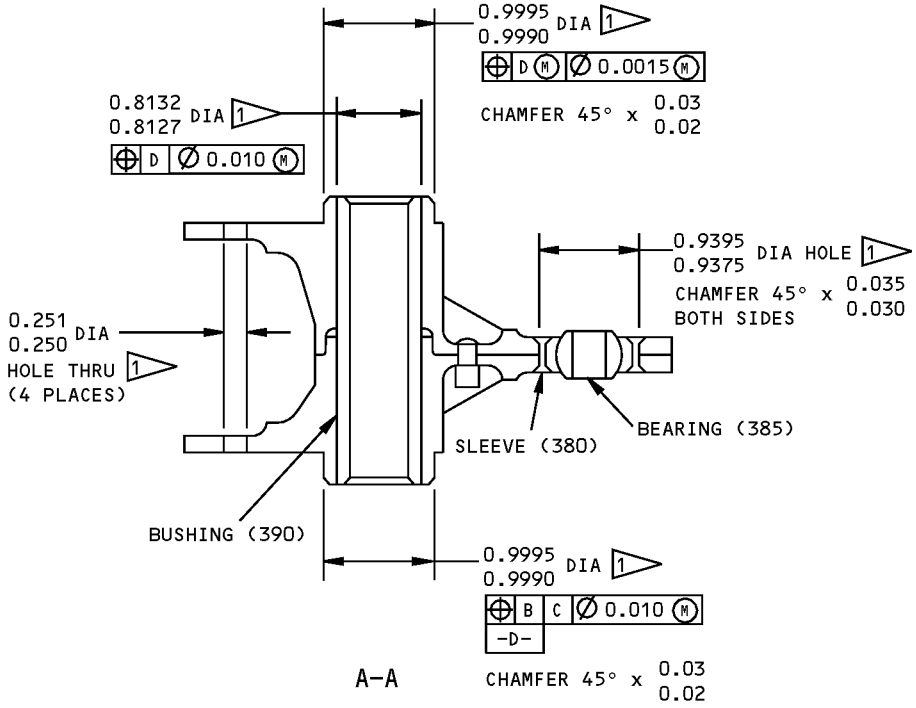
65C25485-1,-3,-5 Lever Assembly Repair and Refinish
Figure 601

ACTUATOR FITTING ASSEMBLY - REPAIR 3-1

65C25487–1, –3

1. **General**
   A. The procedure has the data necessary to repair and refinish the fitting assembly (375, IPL Figure 2).
   B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.
   C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumables codes identified in this procedure.
   D. Refer to IPL Figure 2 for item numbers.
2. **Bushing Replacement (REPAIR 3-1, Figure 601)**
   A. Remove bushing.
   B. Install replacement bushing using shrink fit method per SOPM 20-50-03.
3. **Bearing Replacement (REPAIR 3-1, Figure 601)**
   A. Remove bearing and sleeve.
   B. Install replacement bearing and sleeve per SOPM 20-50-03 except use wet sealant, A00247.
   C. Roller swage sleeve per SOPM 20-50-03.





REFINISH

BONDED ASSY (395) -- CHEMICAL TREAT (F-17.10) AND APPLY 1 COAT OF PRIMER (F-20.02) ON ALL MACHINED SURFACES EXCEPT AS NOTED BY 1

1 OMIT PRIMER THIS SURFACE

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO IPL FIG. 2

65C25487-1,-3 Fitting Assembly Repair and Refinish
Figure 601

INPUT CRANK ASSEMBLY - REPAIR 4-1

65C25504–1, –2

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (45, IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Bearing Replacement (REPAIR 4-1, Figure 601)

A. Remove bearing and sleeve.

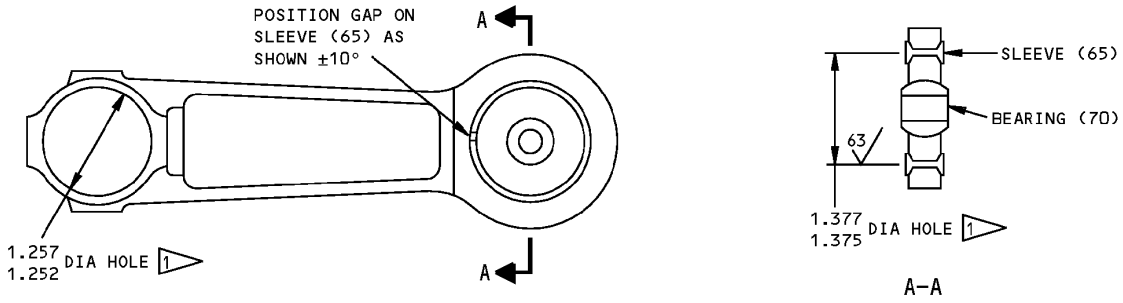
B. Install replacement bearing and sleeve per SOPM 20-50-03 except use wet sealant, A00247.

C. Roller swage sleeve per SOPM 20-50-03.

D. Maximum breakout torque after bearing installation must not exceed 0.075 pound-inch.

3. Refinish

A. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions, REPAIR 4-1, Figure 601.



REFINISH

BONDED ASSY (75) -- CHEMICAL TREAT (F-17.10) AND APPLY 1 COAT OF PRIMER (F-20.02) ON ALL MACHINED SURFACES EXCEPT AS NOTED BY 1

1 OMIT PRIMER THIS SURFACE

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO IPL FIG. 2

Crank Assembly Repair and Refinish
Figure 601

FEEL LEVER ASSEMBLY - REPAIR 5-1

65C25510–1, –3, 65C25511–1, –3

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (694, IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

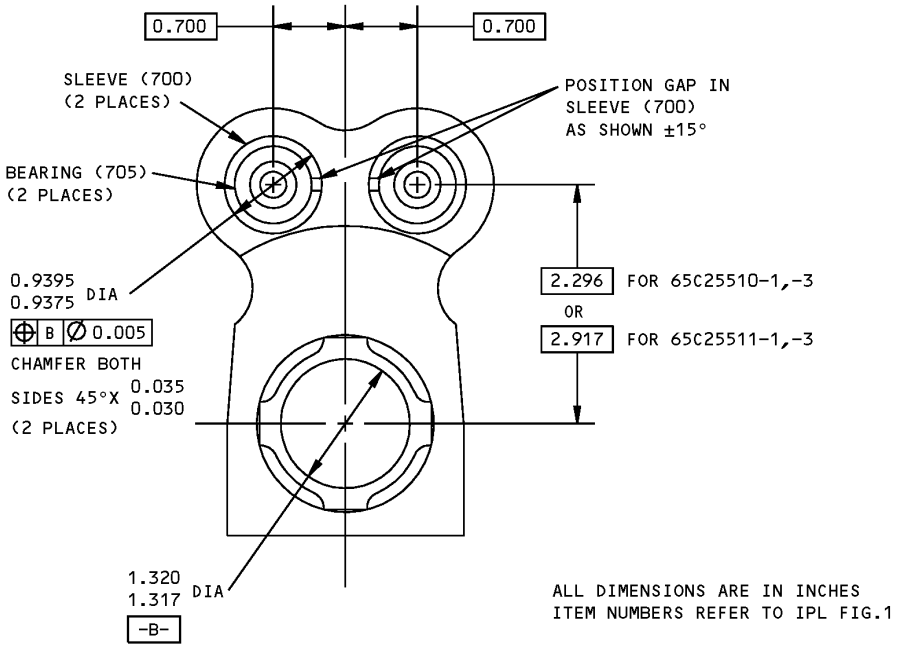
2. Bearing Replacement (REPAIR 5-1, Figure 601)

A. Remove bearing and sleeve.

B. Install replacement bearing and sleeve per SOPM 20-50-03 except use wet sealant, A00247. Orient gap in sleeve as indicated.

C. Roller swage sleeve per SOPM 20-50-03.

D. Maximum breakout torque after bearing installation must not exceed 3 pound-inches.



Bearing Replacement
Figure 601

CAM FOLLOWER ASSEMBLY - REPAIR 6-1

65C25512–1, –2

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (435,IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Parts Replacement

A. Remove rivets (440) or lockbolts (440A), washers (442) and collars (441).

B. Remove collars (445), washers (450) and lockbolts (455).

C. Separate follower assemblies (490, 495) and remove pins (460), bearing (465) and retainer assembly (470).

D. Replace defective parts.

E. Apply grease, D00633 to the outer diameter of pin (460) that will be installed into retainer assembly (470).

F. Reassemble parts and secure rivets (440) or lockbolts (440A), washers (442) and collars (441).

G. Install lockbolts (455), washers (450) and collars (445).

H. Verify that retainer assembly (470) is free to rotate on pin (460).

3. Refinish

A. Cam follower assembly (485) – Chemical treat (F-17.10) and apply primer, C00259 (F-20.02) all over. Material: Al alloy.

SPRING RETAINER ASSEMBLY - REPAIR 7-1

69-73340–1

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (470,IPL Figure 1).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 1 for item numbers.

2. Bushing Replacement

A. Remove bushing.

B. Install replacement bushing per SOPM 20-50-03 except use wet sealant, A00247.

C. Fillet seal bushing flange with sealant, A00247.

3. Refinish

A. Retainer (480, IPL Figure 2) – Chromic acid anodize and apply primer, C00259(F-18.13) all over except omit primer in bore for bushing. Material: Al alloy.

BEARING HOUSING ASSEMBLY - REPAIR 8-1

69-73349–1, –2

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (15,IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Bearing Replacement

A. Remove rivets (20, 25 or 130, 135) and retainer (30 or 140).

B. Remove defective bearing (35 or 145).

C. Install replacement bearing per SOPM 20-50-03 except use wet sealant, A00247.

D. Reinstall retainer and rivets.

3. Refinish

A. Housing assembly (15 or 150) – Chemical treat (F-17.10) and apply primer, C00259 (F-20.02) on all machined surfaces except omit primer in bore for bearing. Material: Al alloy.

B. Retainer (30 or 140) – Chemical treat and apply primer, C00259 (F-18.06) all over. Material: Al alloy.

OUTER SHAFT - REPAIR 9-1

69-73351–1

1. General

A. The procedure has the data necessary to repair and refinish the outer shaft (430, IPL Figure 2).

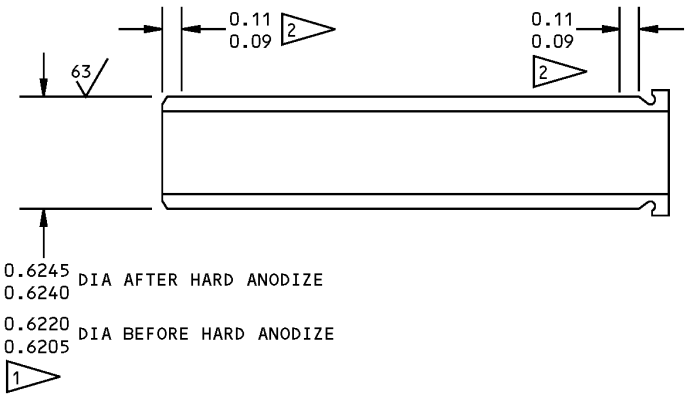
B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Plating Repair

A. Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in REPAIR 9-1, Figure 601.



REFINISH

CHROMIC ACID ANODIZE AND APPLY 1 COAT OF PRIMER (F-20.02) ALL OVER EXCEPT AS NOTED BY 1

1 OMIT PRIMER AND APPLY HARD ANODIZE PER BAC5821 CLASS II THIS SURFACE

2 HARD ANODIZE RUNOUT

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

Shaft Refinish
Figure 601

INNER SHAFT - REPAIR 10-1

69-73352–1

1. General

A. The procedure has the data necessary to repair and refinish the inner shaft (190, IPL Figure 2).

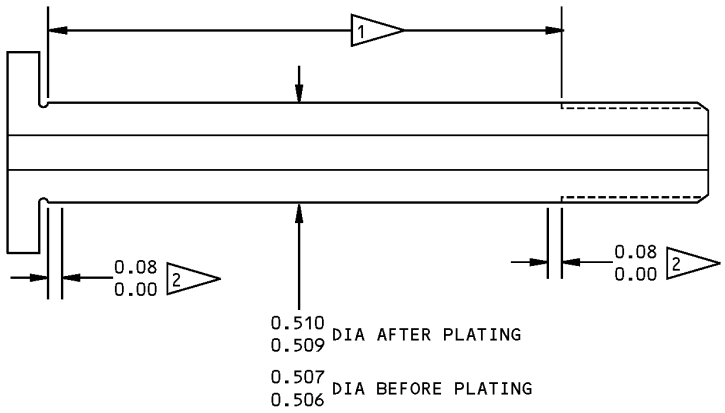
B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Plating Repair

A. Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in REPAIR 10-1, Figure 601.



REFINISH

PASSIVATE (F-17.09) EXCEPT AS NOTED BY 1

1 CHROME PLATE (F-15.03) 0.001-0.002 THICKNESS INDICATED AREA

2 CHROME PLATE RUNOUT

MATERIAL: 15-5PH, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

Shaft Refinish
Figure 601

OUTER SHAFT - REPAIR 11-1

69-73353–1

1. General

A. The procedure has the data necessary to repair and refinish the outer shaft (515, IPL Figure 2).

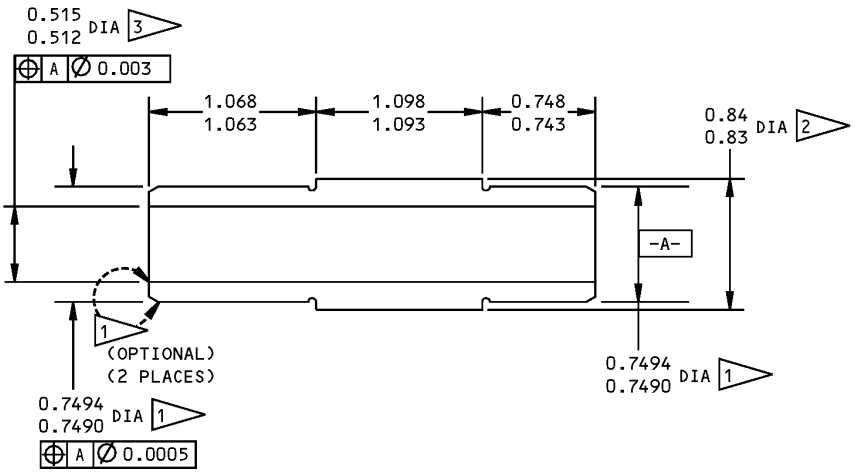
B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Plating Repair

A. Repair consists of stripping and restoration of original finish. Refer to Refinish instruction in REPAIR 11-1, Figure 601.



REFINISH

PASSIVATE (F-17.09) EXCEPT AS NOTED BY 1 2

1 CADMIUM PLATE (F-15.06) THIS SURFACE DIMENSIONS APPLY AFTER PLATING

2 CADMIUM PLATE AND APPLY 1 COAT OF PRIMER (F-16.01) THIS SURFACE

3 PLATING FLASH IN BORE ALLOWABLE

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

ALL DIMENSIONS ARE IN INCHES

Shaft Refinish
Figure 601

LINK ASSEMBLY - REPAIR 12-1

69-73435–1, –2

1. General

A. The procedure has the data necessary to repair and refinish the crank assembly (600,IPL Figure 2).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 2 for item numbers.

2. Bearing Replacement (REPAIR 12-1, Figure 601)

A. Remove bearing and sleeve.

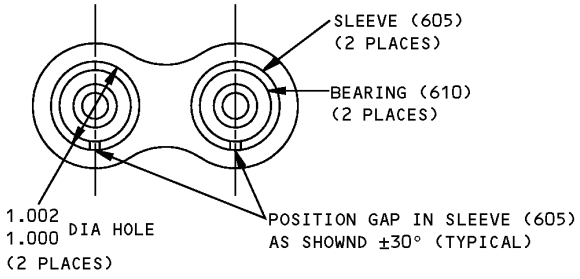
B. Install replacement bearing and sleeve per SOPM 20-50-03 except use wet sealant, A00247. Orient gap in sleeve as shown.

C. Roller swage sleeve per SOPM 20-50-03.

D. Maximum breakout torque after bearing installation must not exceed 0.075 pound-inch.

3. Refinish

A. For repair of surfaces which may only require restoration of original finish, refer to Refinish instructions, REPAIR 12-1, Figure 601.



REFINISH

BOND ASSY (615) -- CHROMIC ACID ANODIZE AND APPLY 1 COAT OF PRIMER (F-18.13) ALL OVER EXCEPT IN BORES FOR BEARINGS. CHEMICAL TREAT (F-17.10) IN BORES FOR BEARINGS

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO IPL FIG. 2

Link Assembly Repair and Refinish
Figure 601

MISCELLANEOUS PARTS REFINISH - REPAIR 13-1

1. General

A. This repair gives the data that is necessary to refinish parts not given in the specified repairs.

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 1 and IPL Figure 2 for item numbers.

2. Procedure

A. Repair of parts listed in REPAIR 13-1, Table 601 consists of restoration of the original finish.

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
Fig. 1		
Fitting (115)	15-5PH CRES, 180-200 ksi	Passivate (F-17.09) all over.
Fig. 2		
Retainers (10, 120)	Al alloy	Chromic acid anodize (F-17.04) and apply primer, C00259 (F-20.03) all over.
Crank (110)	Al alloy	Chromic acid anodize and apply primer, C00259 (F-18.13) all over except omit primer in 0.988-0.990 in. dia. hole.
Crank (165)	Al alloy	Chromic acid anodize (F-17.04) all over and apply primer, C00259 (F-20.02) all over except omit primer in 1.085-1.087 in. dia. hole.
Cover plate (175)	Al alloy	Chemical treat and apply primer, C00259 (F-18.06) all over.
Inner shaft (200)	Al alloy	Chromic acid anodize and apply primer, C00259 (F-18.13) all over.
Retainer (210)	Al alloy	Chromic acid anodize and apply primer, C00259 (F-18.13) all over except omit primer on splines.
Springs (400, P/N 69-73361-1; 405, P/N 69-73360-1)	17-7PH CRES wire	Passivate (F-17.09) all over.
Springs (400A P/N 251A2190-2; 405A,405B P/N 251A2184-2,-3)	Ti alloy	Apply no finish (F-25.01).
Post (425)	Al alloy	Chromic acid anodize and apply primer, C00259 (F-18.13) all over except omit primer on splines and in 0.190- 0.194 in. dia. hole.
Tie assembly (650)	17-7PH CRES, 150-170 ksi	Passivate (F-17.09) all over.

MARKER - REPAIR 14-1

BAC27DCT0346

1. General

A. The procedure has the data necessary to replace the marker (125, IPL Figure 1).

B. Refer to REPAIR-GENERAL, Paragraph 2. for the Standard Overhaul Practices Manual (SOPM) subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Paragraph 3. for the description of the consumable codes identified in this procedure.

D. Refer to IPL Figure 1 for item numbers.

2. Marker Replacement

A. Remove damaged marker.

B. Install new marker on centering unit assembly per SOPM 20-50-05.

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the elevator conrol feel and centering unit assembly.

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

C. Refer to IPL Figure 1 and IPL Figure 2 for item numbers.

2. Procedure

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5371	Elevator Feel and Centering Unit Assembly Equipment (Part #: C27005-19, Supplier: 81205)

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00028	Adhesive - Modified Epoxy For Rigid PVC, Foam Cored Sandwiches	BAC5010, Type 70 (BMS5-92, Type 1)
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS 3-27
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

C. References

Reference	Title
SOPM 20-50-12	APPLICATION OF ADHESIVES

D. Assemble Centering Unit Assembly (IPL Figure 2)

CAUTION: POSITION WASHERS (640) AND BUSHINGS (645) AS SHOWN IN IPL FIG. 2 OR BINDING OF TIE ASSEMBLIES (650) WILL RESULT.

(1) Position washers (640), bushings (645), tie assemblies (650) on camshaft assembly (665A) as shown in IPL Figure 2 and install washers (627, 637 and/or 637A), hollow bolts (635A) and lock bolts (625A). Use the same amount of washers (627, 637 and/or 637A) as noted during disassembly. Install nuts (630) and tighten to 85-100 pound-inches then install collars (620A). Check that tie assemblies move without any interference or binding.

(2) Position washers (590), bushings (595) and link assembly (600) between tie assemblies (650) and install hollow bolt (585A) and lock bolt (575A). Install nut (580A) and tighten to 80-100 pound-inches then install collar (570A).

(3) Coat bearings (510) I.D. with grease, D00015 and install bearing and outer shaft (515) on lever assembly (545).

(4) Install bushing (540) in lever assembly (545). Position link assembly (600) on lever assembly and install hollow bolt (535A) and lock bolt (525A). Install nut (530) and tighten to 80-100 pound-inches then install collar (520A).

(5) Refer to ASSEMBLY, Paragraph 2.D.(6) for assembly procedures for unit using an existing camshaft assembly (665A) or to ASSEMBLY, Paragraph 2.D.(7) for assembly procedures for unit using a replacement camshaft assembly (665A).

(6) Assemble unit with existing camshaft assembly (665A).

(a) Apply light coating of grease, D00015 to bores of housing bond assemblies (305A, 325A) which mate with shafts (430, 515).

(b) Install camshaft assembly (665A) with attached parts on housing bond assembly (305A) with outer shaft (515) mating with housing bond assembly.

(c) Position fitting assembly (375) on housing bond assembly (305A) and install bolts (235), washers (220) and nuts (215). Tighten nuts finger-tight.

(d) Install shaft (430) in housing bond assembly (305A).

(e) Install bushing (505) and bearings (500) in cam follower assembly (435) and install cam follower assembly on shaft (430) with bearing (465) resting on camshaft assembly (665A).

(f) Assemble springs (400, 405). Attach spring ends to cam follower assembly (435) and spring post assembly (410).

(g) Install spring post assembly in housing bond assembly (305A).

(h) Install housing bond assembly (325A).

(i) Install bolts (225 thru 235), washers (220), bushings (240), retainers (245), and nuts (215). On top assemblies 65C25505-13, 15, -16, install bolt (151), washer (172), bushing (186) and nut (181). Tighten nuts including ones installed in step (3) per 20-50-01.

(j) Check that bolts (625A, 635A) are centered in housing assembly (250). Remove all parts and add or subtract washers (627, 637 or 637A) as required and reassemble parts.

(k) Install inner shaft (200) through outer shaft (430). Align rivet holes in shafts (200, 430) and housing bond assemblies (305A, 325A) and install rivets (195A) or lockbolts (195B), washers (197) and collars (196). If housing assembly (250A) and/or shafts (200, 430) are new parts, drill 0.190-0.191 inch dia. rivet holes through using pilot hole locations in housing bond assemblies (305A, 325A).

(l) Install shaft (190) through shaft (515) and secure with washer (185) and nut (180). Tighten nut to 150-200 pound-inches.

(m) On top assemblies 65C25505-11, -12, -14, apply compound, C00913 to the threads and shank to bolts (152, 153, 157). Install stop support assembly (192), bushings (187, 188, 189), bolts (152, 153, 157), washers (167, 168, 177) and nuts (182, 183, 184). Remove excess compound, C00913 after installation of parts.

(n) Rotate spring post assembly (410) until pointer of spring post assembly aligns with index hole in housing bond assembly (325A) and hold in that position. Install spring post retainer (210) and secure with screws (205).

(o) Install spacer (80) and crank assembly (45) on camshaft assembly (665A) and secure with bolts (60), washers (55) and nuts (50). If crank assembly is replaced, drill 0.2485-0.2495 inch diameter boltholes thru crank assembly at pilot hole locations. Break sharp edges 0.008R. Apply alodine to holes per F-17.10. Check that axial play of spacer (80) does not exceed 0.005 inch.

(p) Install bearing housing assembly (15) on camshaft assembly (665A). Apply a light coat of grease, D00015 to retainer (10) and install retainer in camshaft assembly. Secure retainer with rivet (5), or bolt (5A) with primer, C00259 per F-20.06 and collar (6). If retainer is a replacement part, first drill 0.190-0.191 inch diameter hole thru retainer using existing hole in camshaft assembly to locate hole.

(q) Install crank assembly (155), bearing housing assembly (125) on cam shaft assembly (665A). Apply a light coat of grease, D00015 to retainer (120) and install retainer in camshaft assembly (665A). Install rivets (115), or bolts (115A) with primer, C00259 per F-20.06 and collars (116), through crank assembly (155) to secure. If crank assembly (155) is a replacement part, first drill 0.190-0.191 inch diameter holes through at pilot hole locations on crank assembly. If retainer (120) is a replacement part, first drill 0.190-0.191 inch diameter holes through using existing holes in camshaft assembly (665) as guides.

(r) On 65C25505-6, -9 assemblies, install crank assembly (85) and secure with bolts (100), washers (95) and nuts (90). If crank assembly (85) is a replacement part, first drill 0.2485-0.2495 inch diameter boltholes through crank assembly at pilot holes locations. If retainer (120A) is a replacement part, drill 0.2485-0.2495 inch diameter holes through at existing hole locations on camshaft assembly (665D). Apply a light coat of grease, D00015 to retainer (120A) and install onto camshaft assembly (665D).

(s) Attach pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371) to unit and apply 700-860 lbs force to lever assembly (545) as indicated in ASSEMBLY, Figure 701 to seat cam follower assembly (435) on camshaft assembly (665A). Check that crank assemblies (45, 85, 155) are in positions indicated in ASSEMBLY, Figure 701 using strap assemblies C27005-4, -5, -6 (components of C27005-19 Assembly Equipment, SPL-5371) as applicable. If crank assemblies (45, 85, 155) are not in positions indicated, replace camshaft assembly (665A).

(7) Assemble unit with a new camshaft assembly (665A).

(a) Apply a light coating of grease, D00015 to bores of housing bond assemblies (305A, 325A) which mate with shafts (430, 515).

(b) Install camshaft assembly with attached parts on housing bond assembly (305A) with outer shaft (515) mating with housing bond assembly.

(c) Install shaft (430) in housing bond assembly (305A).

(d) Install bushing (505) and bearings (510) in cam follower assembly (435) and install cam follower assembly in shaft (430) with bearing (465) resting on camshaft assembly (665A).

(e) Assemble springs (400, 405). Attach spring ends to cam follower assembly (435) and spring post assembly (410).

(f) Install spring post assembly (410) in housing bond assembly (305A).

(g) Install housing bond assembly (325A).

(h) Position actuator fitting assembly (375) between housing bond assemblies (305A, 325A) and secure with bolt (230, 235), washers (220), nuts (215) and retainer (245). Secure housing bond assemblies together with bolts (225, 226), washers (220), bushings (240) and nuts (215). On top assemblies 65C25505-13, -15, -16, install bolt (151), washer (172), bushing (186) and nut (181).

(i) Check that bolts (625A, 635A) are centered in housing assembly (250A). Remove parts and add or subtract washers (627, 637, or 637A) as required and reassemble.

(j) Rotate spring post assembly (410) until pointer aligns with index hole in housing bond assembly (325A) and hold in place. Install retainer (210) and secure with screws (205).

(k) Attach pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371) to unit and apply 700-860 pounds force to lever assembly (545) in the direction indicated to engage bearing (465) in camshaft assembly (665A) detent.

(l) With bearing (465) positively engaged in cam assembly (690A) detent, drill 0.155-0.161 inch diameter rivet hole for rivet (660) through cam assembly (690A) and lever assembly (695) at pilot hole location on cam assembly.

NOTE: A 0.60 inch diameter access hole is provided on the housing assembly (250A) to facilitate drilling.

(m) Release force and remove pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371).

(n) Remove camshaft assembly (665A) for final drilling and riveting as follows:

1) Restrain spring post assembly (410) and remove screws (205) and retainer (210). Slowly rotate spring post assembly in the direction that relieves the spring force on the spring post assembly.
2) Remove nuts (215), washers (220), bolts (225 thru 235), bushing (220), retainers (245) and actuator fitting assembly (375).
3) Remove housing bond assembly (325A).
4) Unhook springs (400, 405) from spring post assembly (410).
5) Rotate cam follower assembly (435) and remove camshaft assembly (665A).

(o) Align rivet (660) hole in cam assembly (690A) and feel lever assembly (695) and clamp cam assembly to feel lever assembly.

(p) Drill four 0.124-0.129 inch diameter holes for rivets (655) through cam assembly (690A) and feel lever assembly (695) at pilot hole locations on cam assembly.

(q) Select rivets (655, 660) which yield 0.002 inch maximum diametrical clearance with the rivet holes. Bond cam assembly (690A) to feel lever assembly (695) using adhesive, A00028 per SOPM 20-50-12. Align all rivet holes in cam assembly and feel lever assembly and secure parts together with rivets (655, 660). Install rivets with adhesive, A00028.

(r) Reassemble camshaft assembly (665A) and housing assembly (250A) per ASSEMBLY, Paragraph 2.D.(7)(a) thru ASSEMBLY, Paragraph 2.D.(7)(h), ASSEMBLY, Paragraph 2.D.(7)(j).

(s) On top assemblies 65C25505-11, -12, -14, apply compound, C00913 to the threads and shank to bolts (152, 153, 157). Install stop support assembly (192), bushings (187, 188, 189), bolts (152, 153, 157), washers (167, 168, 177) and nuts (182, 183, 184). Remove excess compound, C00913 after installation of parts.

(t) Install inner shaft (190) through outer shaft (515) and secure with washer (185) and nut (180). Tighten nut to 150-200 pound-inches.

(u) Install inner shaft (200) through outer shaft (430) and secure inner and outer shaft to housing assembly (250A) with rivets (195A) or lockbolts (195B), washers (197) and collars (196). If housing assembly (250A), or shafts (200, 430) are new parts, first drill 0.190-0.191 inch diameter holes through housing assembly and shafts at pilot hole locations on housing bond assemblies (305A, 325A).

(v) On 65C25505-2, -4, -8, -10 thru -16 assemblies, assemble input crank assembly (45) and crank assembly (155) as follows:

1) Install spacer (80), input crank assembly (45), crank assembly (155) and retainer (120) on camshaft assembly (665A).

2) Attach pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371) to unit and apply 700-860 pounds force to lever assembly (545) in the direction indicated to positively engage cam follower assembly (435) to camshaft assembly (665A) detent.

3) Locate input crank assembly (45) and crank assembly (155) at positions indicated by attaching strap assemblies C27005-5 and C27005-6 (components of C27005-19 Assembly Equipment, SPL-5371).

4) Drill 0.2485-0.2495 inch dia. holes through input crank assembly (45) and camshaft assembly (665A) at pilot hole locations on input crank assembly.

5) Drill 0.190-0.191 inch diameter holes through crank assembly (155), camshaft assembly (665A) and retainer (120) at pilot hole locations on crank assembly.

6) Remove force and pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371).

7) Install bearing housing assembly (15) and retainer (10) on camshaft assembly (665A) and drill 0.190-0.191 inch dia. rivet hole through camshaft assembly and retainer at location shown.

8) Remove retainers (10, 120), bearing housing assembly (15), spacer (80), crank assemblies (45, 155) from camshaft assembly (665A).

9) Break sharp edges 0.008 radius on drilled holes and manually apply alodine per F-17.10 on 0.2485-0.2495 inch diameter holes.

10) Install spacer (80) and input crank assembly (45) on camshaft assembly (665A) and secure input crank assembly with bolts (60), washers (65) and nuts (70). Check that axial play of spacer (80) does not exceed 0.005 inch.

11) Apply a light coat of grease, D00015 to retainers (10, 120). Install bearing housing assemblies (15, 125), crank assembly (155) and retainer (120) on camshaft assembly (665A) and install rivets (5, 115), or bolts (5A, 115A) with primer, C00259 per F-20.06 and collars (6, 116).

(w) On 65C25505-6, -9 assemblies, assemble crank assemblies (45, 85, 155) as follows:

1) Install spacer (80), input crank assembly (45), crank assemblies (85, 155) and retainer (120A) on camshaft assembly (665D). Install crank assembly (85) and retainer flush with cam shaft assembly.

2) Attach pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371) to unit and apply 700-860 lbs force to lever assembly (545) to positively engage cam follower assembly (435) to camshaft assembly (665D) detent.

3) Locate crank assemblies (45, 85, 155) at positions indicated with strap assemblies C27005-4, C27005-5 and C27005-6 (components of C27005-19 Assembly Equipment, SPL-5371), and secure in place.

4) Drill 0.2485-0.2495 inch dia. holes through input crank assembly (45) and camshaft assembly (665D) at pilot hole locations on input crank assembly.

5) Drill 0.190-0.191 inch diameter holes through crank assembly (155), camshaft assembly (665D) and retainer (120A) at pilot hole locations on crank assembly.

6) Drill 0.2485-0.2495 inch diameter holes through crank assembly (85), camshaft assembly (665D) and retainer (120A) at pilot hole locations on crank assembly (85).

7) Remove force and pull actuator assembly C27005-3 (component of C27005-19 Assembly Equipment, SPL-5371).

8) Install bearing housing assembly (15A) and retainer (10) on camshaft assembly (665D) and drill 0.190-0.191 inch diameter hole at location indicated.

9) Remove retainers (10, 120A), bearing housing assembly (15A, 125A), crank assemblies (45, 85, 155), spacer (80) from camshaft assembly (665D).

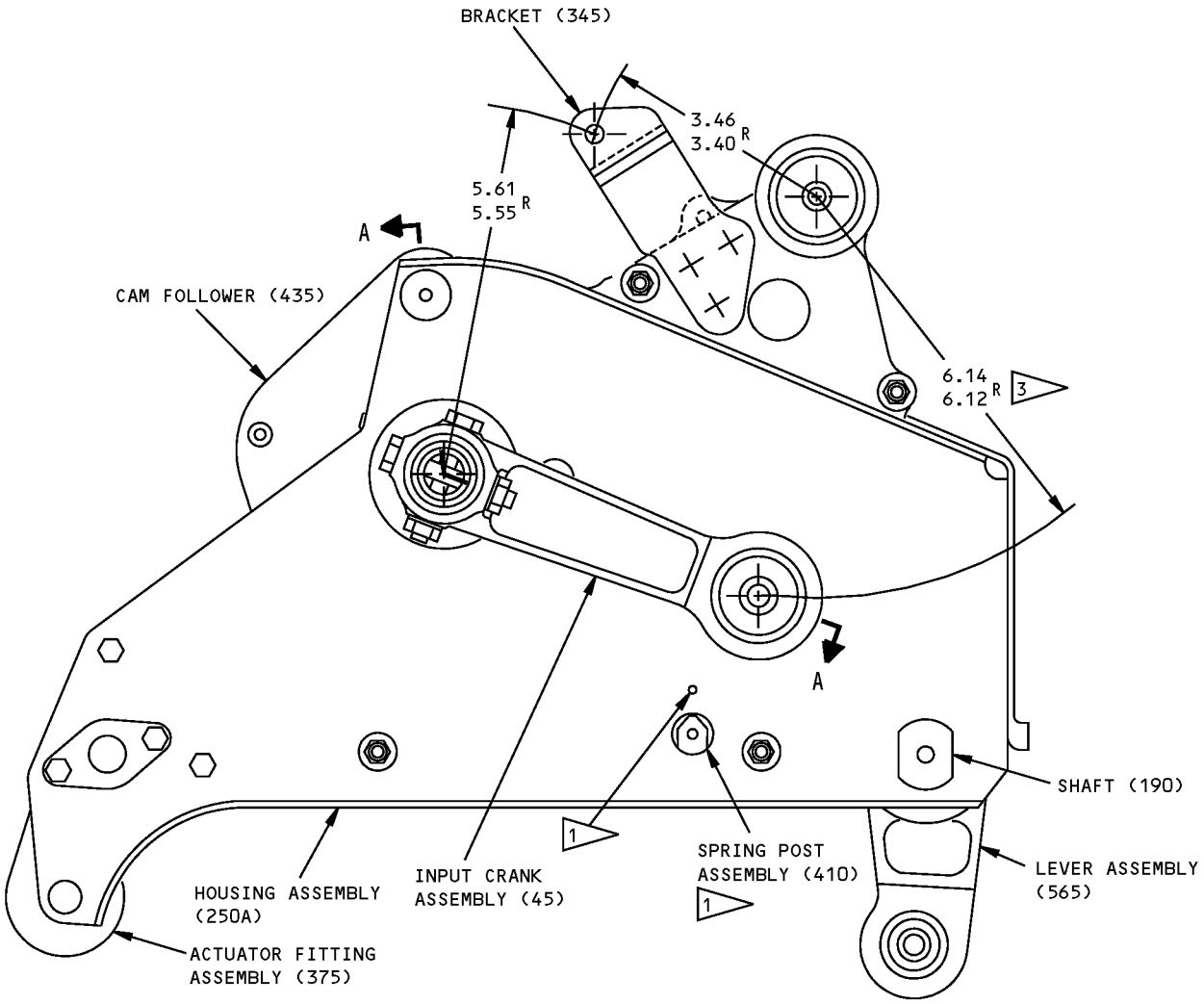
10) Break sharp edges 0.008R and manually apply alodine per F-17.10 to 0.2485-0.2495 inch diameter holes.

11) Install spacer (80) and input crank assembly (45) on camshaft assembly (665D) and secure input crank assembly with bolts (60), washers (55) and nuts (50). Apply a light coat of grease, D00015 to retainer (10) and install bearing housing assembly (15A) and retainer (10). Secure retainer with rivet (5), or bolt (5A) with primer, C00259 per F-20.06 and collar (6). Check that axial play of spacer (80) does not exceed 0.005 inch.

12) Install crank assemblies (85, 155) and bearing housing assembly (125A) on camshaft assembly (665D). Apply a light coat of grease, D00015 to retainer (120A) and install onto camshaft assembly (665D). Secure crank assembly (155) with rivets (115), or bolts (115A) with primer, C00259 per F-20.06 and collar (116), and secure crank assembly (85) with bolts (100), washers (95) and nuts (90).

(8) On 65C25505-4, -6, -8, -9 assemblies, install bracket assembly (345) on housing bond assembly (325) at location shown and secure with rivets (352).

(9) Install coverplate (175) and secure with screws (170).

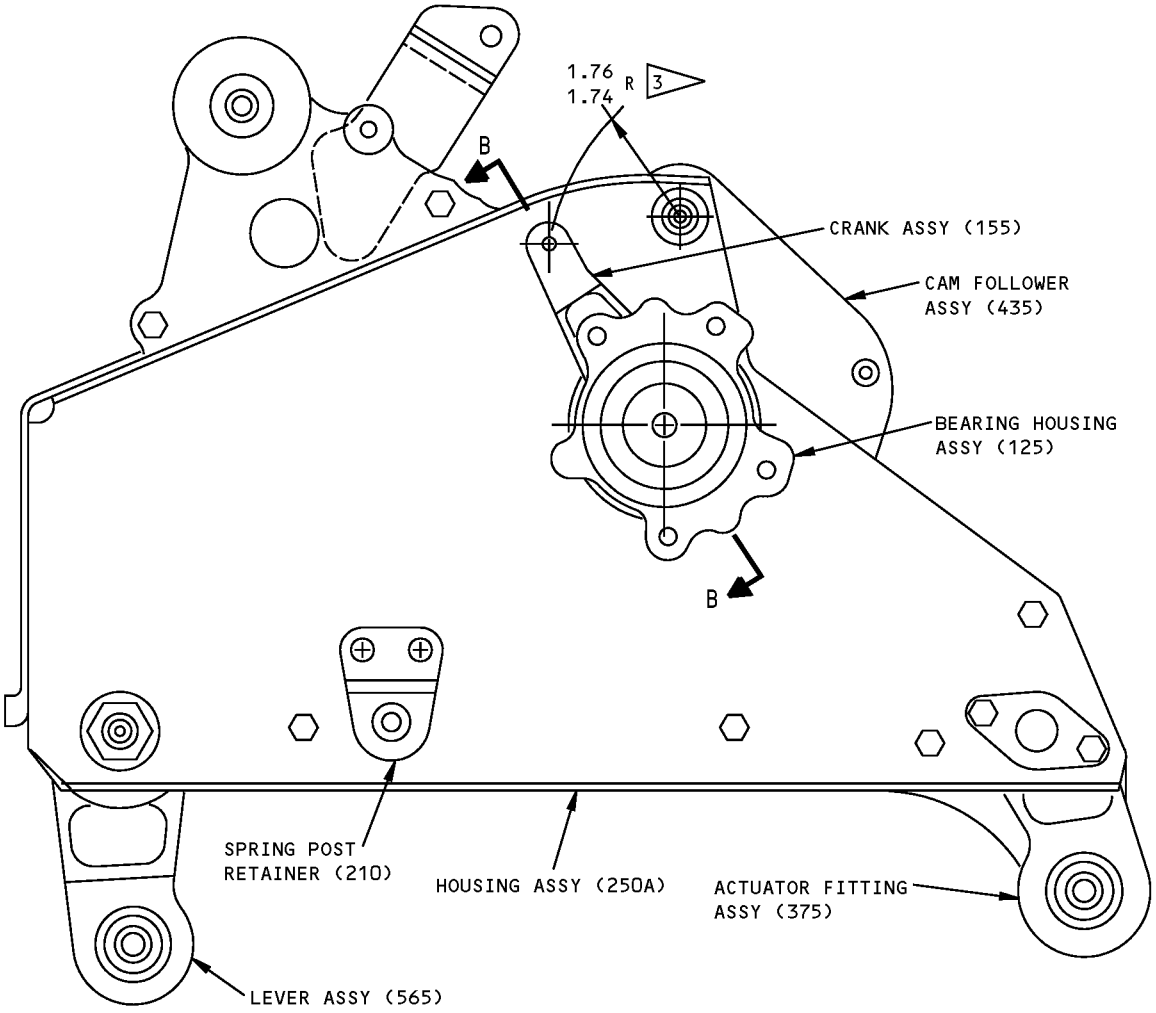


FRONT VIEW
(BEARING HOUSING ASSEMBLY (15) OMITTED FOR CLARITY)
65C25505-4,-8 ASSEMBLIES SHOWN
65C25505-2,-10 ASSEMBLIES SIMILAR
65C25505-6,-9 ASSEMBLIES SIMILAR UNLESS SHOWN DIFFERENTLY

ITEM NUMBERS REFER IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

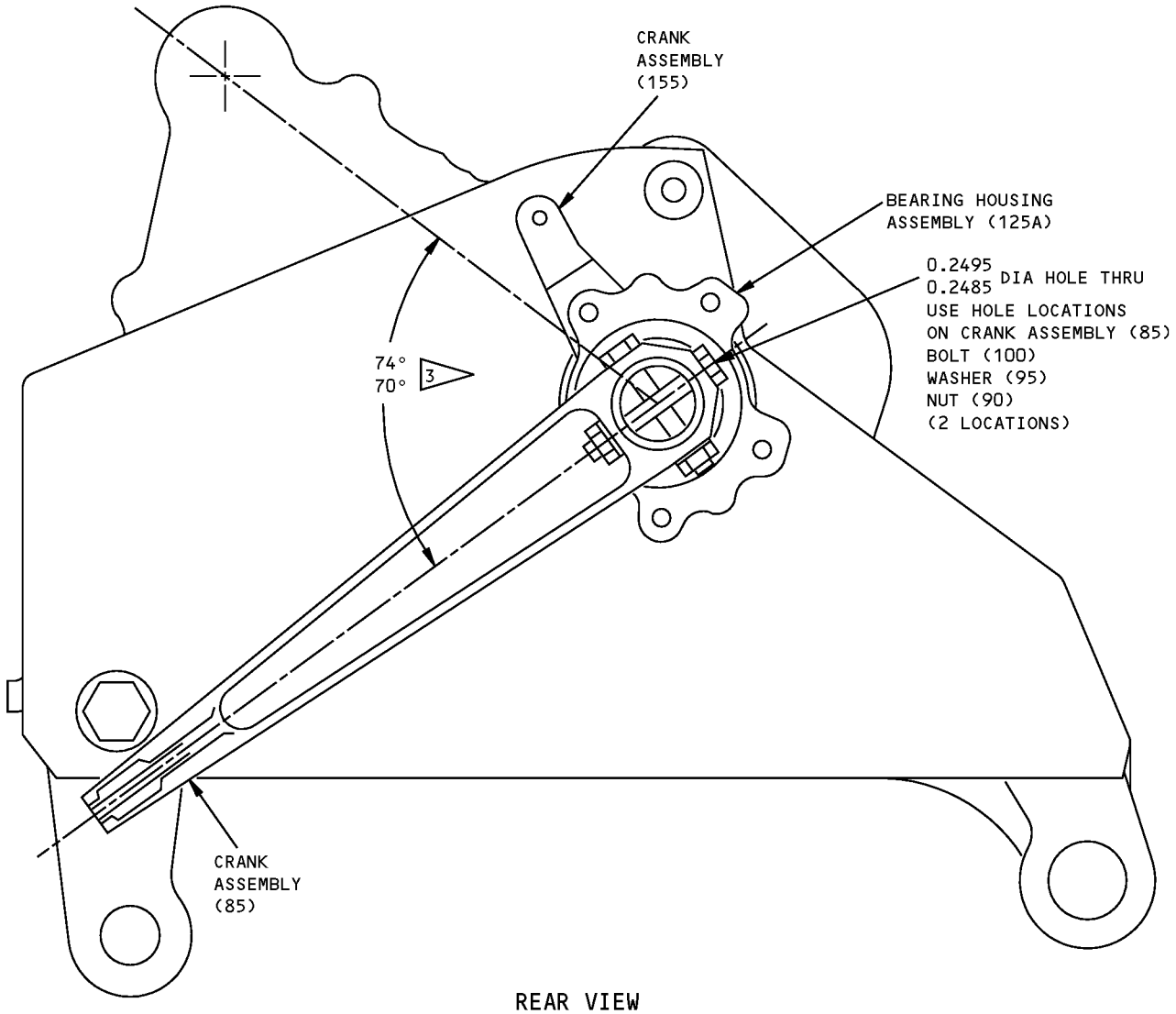
Assembly Details
Figure 701 (Sheet 1 of 5)



REAR VIEW

ITEM NUMBERS REFER TO IPL FIG. 2
ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701 (Sheet 2 of 5)

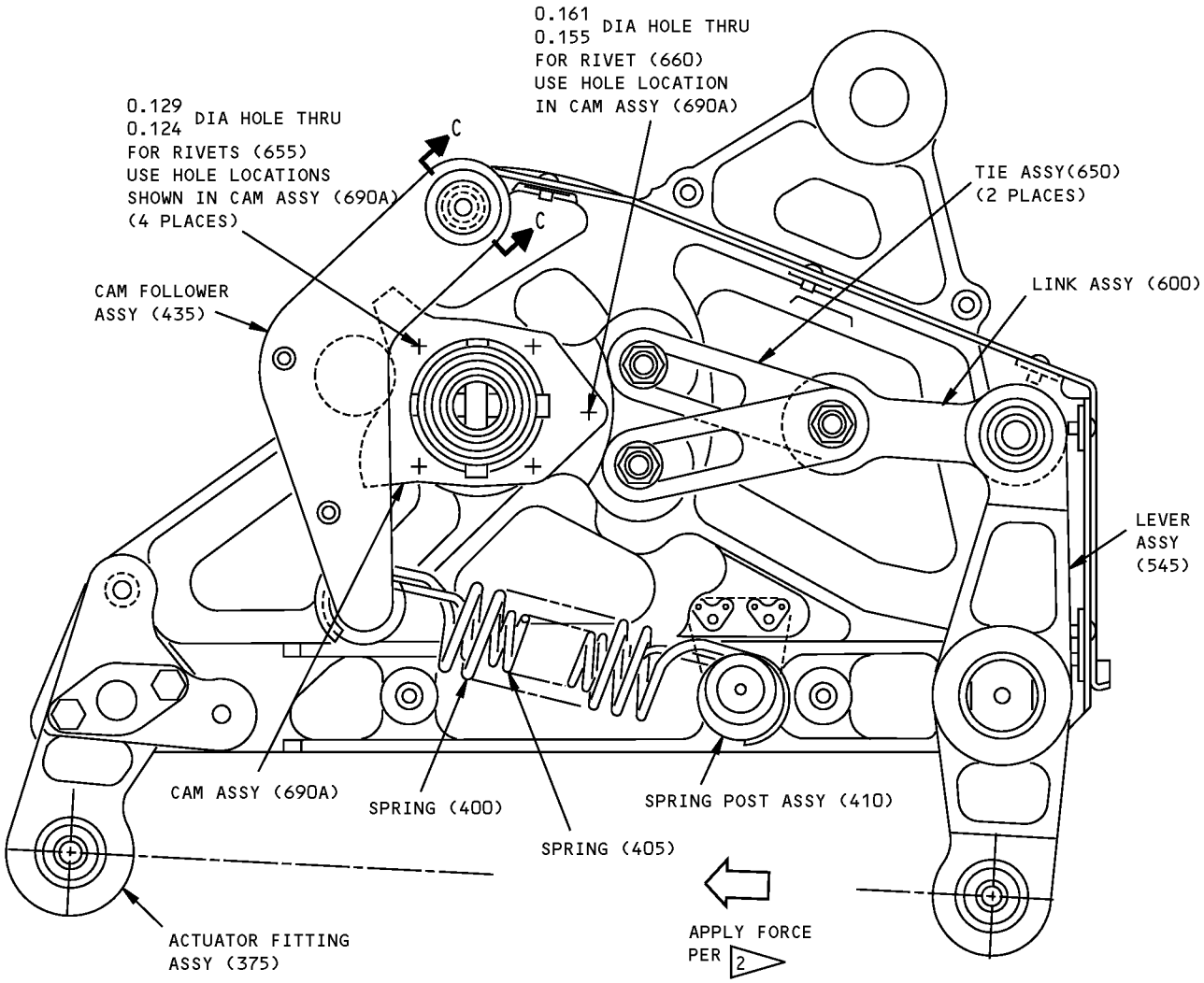


REAR VIEW
65C25505-6,-9 ASSEMBLIES ONLY

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

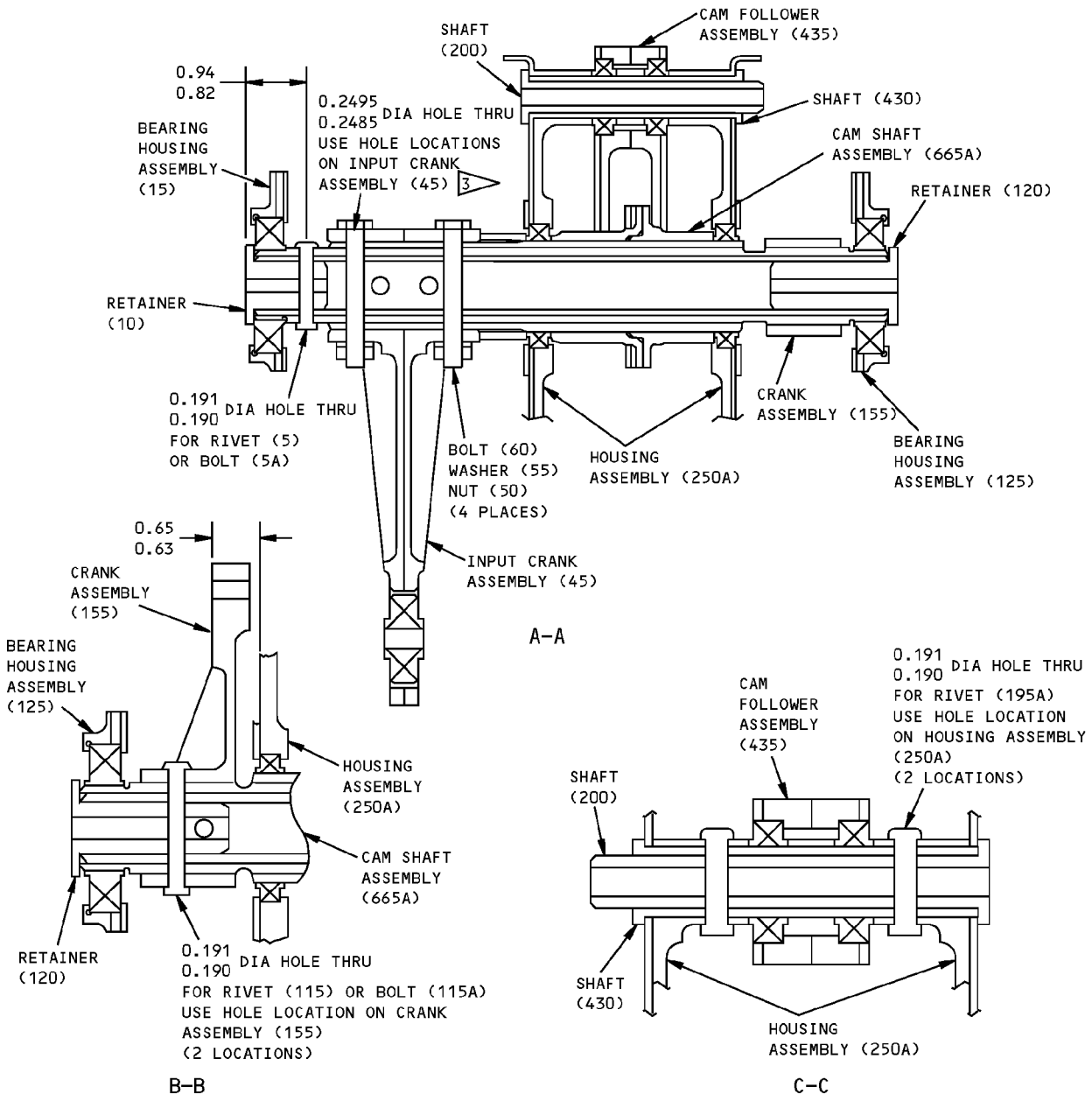
Assembly Details
Figure 701 (Sheet 3 of 5)



FRONT VIEW
(HOUSING BOND ASSY (325A), CRANK ASSY (45) AND BEARING
HOUSING ASSY (15) OMITTED FOR CLARITY)

ITEM NUMBERS REFER TO IPL FIG. 2
ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701 (Sheet 4 of 5)



1 ALIGN SPRING POST ASSEMBLY (410) WITH INDEX HOLE APPROXIMATELY AS SHOWN

2 APPLY 700-860 LBS FORCE TO LEVER ASSEMBLY (545) IN THE DIRECTION INDICATED TO SEAT CAM FOLLOWER ASSEMBLY (435) IN CAM ASSEMBLY (690A) DETENT

3 LOCATE CRANK ASSEMBLYS (45,85,155) ON CAM SHAFT ASSEMBLY (665A) WITH CAM FOLLOWER ASSEMBLY (435) SEATS IN CAM ASSEMBLY (690A) DETENT

ALL DIMENSIONS ARE IN INCHES

ITEM NUMBERS REFER TO IPL FIG. 2

Assembly Details
Figure 701 (Sheet 5 of 5)

E. Assemble Feel and Centering Unit Assembly (IPL Figure 1)

(1) Lightly lubricate packings (70, 85) with hydrualic fluid, D00153 or MCS 352B fluid, D00054 and install packings (70) on unions (65) and packings (85) on union (75) and reducer (80).

(2) Install unions (65, 75) and reducer (80) on cylinder assembly (90).

(3) Install fitting (115), sliding block (110), bushing (105), washer (100) and nut (95) on actuator assembly (60). Tighten nut (95) finger-tight.

CAUTION: DO NOT RETIGHTEN NUT (15).

(4) Position actuator assembly (60) on centering unit assembly (120A) and install bolt assembly (25). Install washer (20) and nut (15) and tighten nut to 85-100 pound-inches. Install washer (10) and nut (5) and tighten nut to 30-35 pound-inches. Do not retighten nut (15).

CAUTION: DO NOT RETIGHTEN NUT (15).

(5) Position the other end of actuator assembly (60) on centering unit assembly (120A) and install bushing (55A) and bolt assembly (40). Install washer (20) and nut (15) and tighten nut to 85-100 pound-inches. Install washer (10) and nut (5) and tighten nut to 30-35 pound-inches. Do not retighten nut (15). Tighten nut (95) to 100-125 pound-inches.

(6) Test unit per TESTING AND FAULT ISOLATION.

3. Storage

A. References

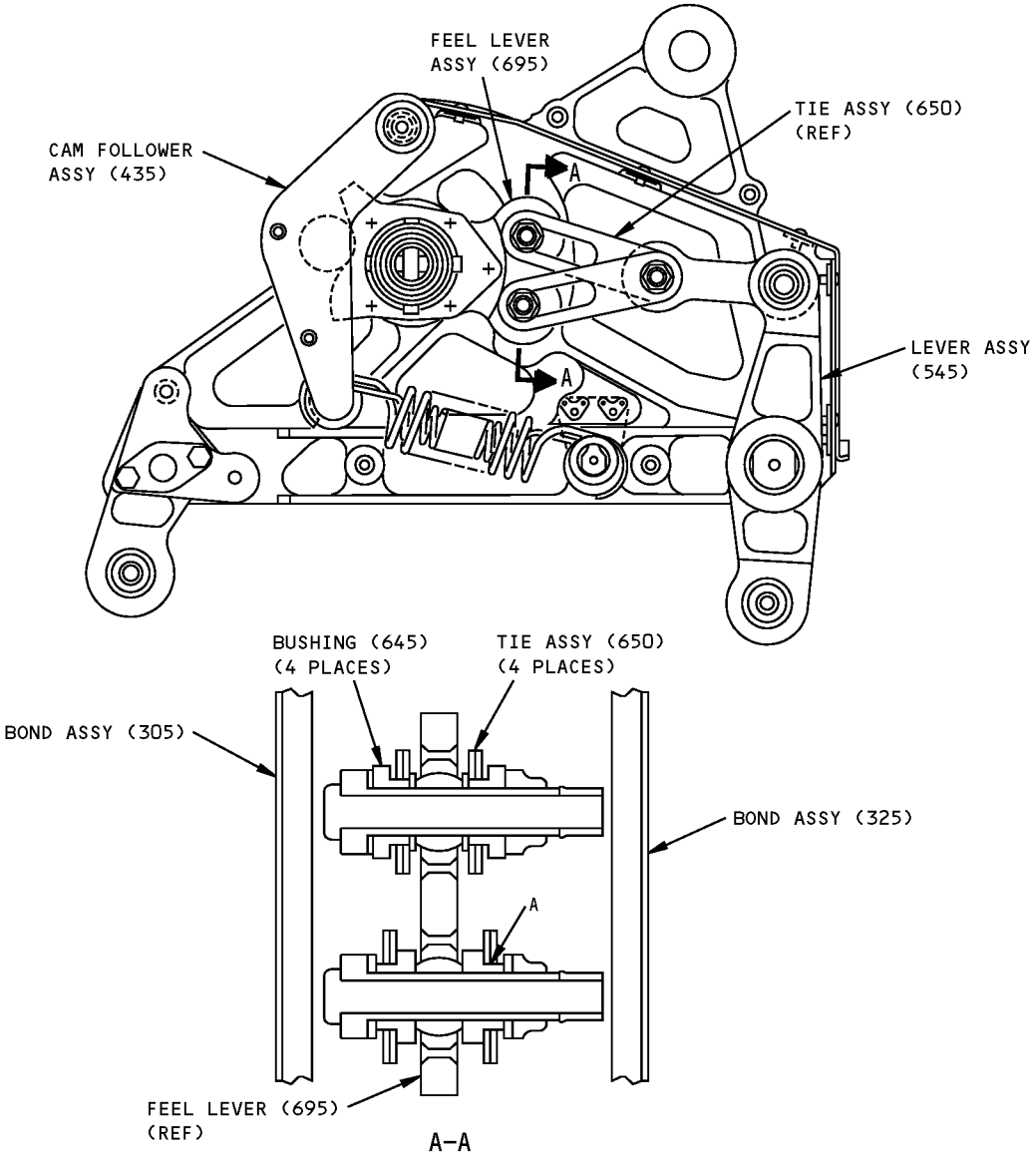
Reference	Title
SOPM 20-44-02	TEMPORARY PROTECTIVE COATINGS

B. Procedure

(1) Prepare actuator assembly for storage per OHM 27-09-09.

(2) Use standard industry practices and information contained in SOPM 20-44-02 to store this component.

FITS AND CLEARANCES



Ref Letter	Mating Item No. IPL Fig.2	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 650 OD 645	0.520 0.498	0.530 0.500	0.020	0.032	0.496	0.540	0.044

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801

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-5349	X-Y Recorder/Plotter	925E	60795
SPL-5351	Test Equipment - Elevator Feel and Centering Unit	A27041-175	81205
SPL-5352	Readout and Control Equipment - Functional Test Stand	A27081-1	81205
SPL-5371	Elevator Feel and Centering Unit Assembly Equipment	C27005-19	81205
SPL-5446	X-Y recorder	RW20IT Opt: 7046A Opt: 7090A	31991 28480 28480

Tool Supplier Information

CAGE Code	Supplier Name	Supplier Address
28480	HEWLETT-PACKARD COMPANY	1421 S. MANHATTAN AVE. FULLERTON, CA 92831 Telephone: 714-758-5805 Facsimile: 714-758-7537
31991	SOLTEC CORP	12977 ARROYO ST SAN FERNANDO, CA 91340-1597 Telephone: (818) 365-0800 Facsimile: (818) 365-7839
60795	ALLEN DATAGRAPH INC.	2 INDUSTRIAL WAY SALEM, NH 03079-2837 Telephone: (603) 893-1983 Facsimile: (603) 893-9042
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
60380	TORRINGTON CO BEARINGS DIV SUBSIDIARY OF INGERSOLL-RAND CORP 59 FIELD STREET PO BOX 1008 TORRINGTON, CONNECTICUT 06790-1008 FORMERLY TORRINGTON BEARING COMPANY
92563	MCGILL MFG CO INC BEARINGS DIV 909 LAFAYETTE STREET VALPARAISO, INDIANA 46383-4210

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
251A2184-2		2	405A	1
251A2184-3		2	405B	1
251A2190-2		2	400A	1
251T2125-1		2	645	4
251T2125-2		2	595	2
251T2125-3		2	590	2
251T2125-5		2	637D	AR
		2	637F	AR
		2	640B	4
60B00178-681		2	465A	1
65-38904-2		1	110	1
65-44503-10		1	90A	1
65-44503-8		1	90	1
65C25439-11		2	320A	1
65C25439-12		2	340A	1
65C25439-17		2	250B	1
65C25439-18		2	300B	1
65C25439-19		2	305B	1
65C25439-2		2	250A	1
65C25439-20		2	325B	1
65C25439-21		2	320B	1
65C25439-22		2	340B	1
65C25439-25		2	250C	1
65C25439-26		2	300C	1
65C25439-27		2	305C	1
65C25439-28		2	325C	1
		2	340C	1
65C25439-29		2	320C	1
65C25439-4		2	300A	1
65C25439-7		2	305A	1
65C25439-8		2	325A	1
65C25465-10		1	1G	RF
65C25465-11		1	1H	RF
65C25465-12		1	1J	RF

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
65C25465-14		1	60A	1
65C25465-15		1	1K	RF
65C25465-16		1	1L	RF
65C25465-17		1	1M	RF
65C25465-18		1	1N	RF
65C25465-19		1	1P	RF
65C25465-2		1	1A	RF
65C25465-20		1	1Q	RF
65C25465-21		1	1R	RF
65C25465-22		1	1S	RF
65C25465-23		1	1T	RF
65C25465-4		1	1C	RF
65C25465-5		1	60	1
65C25465-8		1	1E	RF
65C25485-1		2	545	1
65C25485-2		2	565	1
65C25485-3		2	545A	1
65C25485-4		2	565A	1
65C25485-5		2	545B	1
65C25487-1		2	375	1
65C25487-2		2	395	1
65C25487-3		2	375A	1
65C25487-4		2	395A	1
65C25504-1		2	45	1
65C25504-2		2	45A	1
65C25504-3		2	75	1
65C25504-4		2	75A	1
65C25505-10		1	120J	1
		2	1J	RF
65C25505-11		1	120K	1
		1	120L	1
		2	1K	1
65C25505-12		1	120M	1
		1	120N	1
		2	1L	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
65C25505-13		1	120P	1
		1	120Q	1
		2	1M	1
65C25505-14		1	120R	1
		1	120S	1
		1	120T	1
		2	1N	1
65C25505-15		1	120U	1
		2	1P	1
65C25505-16		1	120V	1
		2	1Q	1
65C25505-2		1	120A	1
		2	1A	RF
65C25505-4		1	120C	1
		2	1C	RF
65C25505-6		1	120E	1
		2	1E	RF
65C25505-8		1	120G	1
		2	1G	RF
65C25505-9		1	120H	1
		2	1H	RF
65C25510-1		2	695B	1
65C25510-2		2	710B	1
65C25510-3		2	695C	1
65C25510-4		2	710C	1
65C25511-1		2	695	1
65C25511-2		2	710	1
65C25511-3		2	695A	1
65C25511-4		2	710A	1
65C25512-1		2	435	1
65C25512-10		2	435C	1
65C25512-2		2	435A	1
65C25512-3		2	485	1
65C25512-4		2	485A	1
65C25512-5		2	490	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
65C25512-6		2	495	1
65C25512-7		2	490A	1
65C25512-8		2	495A	1
65C25512-9		2	435B	1
65C25513-1		2	410	1
65C25513-2		2	425	1
65C25513-3		2	410A	1
65C25513-4		2	425A	1
65C25517-10		2	665M	1
65C25517-2		2	665A	1
65C25517-3		2	665B	1
65C25517-4		2	665C	1
65C25517-5		2	665D	1
65C25517-6		2	665E	1
65C25517-7		2	665F	1
		2	665G	1
65C25517-8		2	665K	1
65C25517-9		2	665H	1
		2	665J	1
		2	665L	1
65C25518-2		2	690A	1
65C25518-7		2	690B	1
65C25518-8		2	690C	1
65C25518-9		2	690D	1
65C25522-1		2	155	1
65C25522-2		2	165	1
65C25533-1		2	85	1
65C25533-2		2	110	1
66-21297-2		1	105	1
69-27158-10		1	40	1
69-27158-4		1	25	1
69-27163-13		1	45	1
69-27163-14		2	585A	1
		2	635A	2
69-27163-15		2	535A	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-27163-5		1	30	1
69-38919-1		2	65	1
69-38919-2		2	380	1
		2	555	1
		2	700	2
69-38919-32		2	275	1
69-38919-33		2	605	2
69-70464-7		2	80	1
69-73340-1		2	470	1
69-73340-2		2	480	1
69-73340-3		2	470A	1
69-73340-4		2	480A	1
69-73342-1		2	40	1
		2	150	1
69-73343-1		2	725	1
69-73343-2		2	725A	1
69-73344-1		2	720	1
69-73344-2		2	720A	1
69-73344-3		2	720B	1
69-73345-1		2	715	1
69-73345-2		2	715A	1
69-73346-2		2	245	2
69-73346-4		2	260	2
69-73348-1		2	460	2
69-73349-1		2	15	1
		2	125	1
69-73349-2		2	15A	1
		2	125A	1
69-73349-3		2	15B	1
		2	125B	1
69-73350-1		2	175	1
69-73350-2		2	175A	1
69-73351-1		2	430	1
69-73351-2		2	200	1
69-73352-1		2	190	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-73353-1		2	515	1
69-73355-1		2	120	1
69-73355-2		2	10	1
69-73355-3		2	120A	1
69-73356-1		2	210	1
69-73358-1		1	115	1
69-73360-1		2	405	1
69-73361-1		2	400	1
69-73378-1		2	345	1
69-73378-2		2	370	1
69-73378-3		2	365	1
69-73434-1		2	650A	4
69-73434-3		2	650	4
69-73434-5		2	650B	4
		2	650C	4
69-73435-1		2	600A	1
69-73435-2		2	600	1
69-73435-3		2	615A	1
69-73435-4		2	615	1
69-73459-3		2	30	1
		2	140	1
69-74649-1		2	298	1
69-87835-1		2	192	2
69-87836-1		2	153B	1
AC69001		2	465A	1
AN960-10L		2	675	6
AN960-416L		1	100	1
AN960B616		2	637	AR
		2	640	4
AN960KD10L		2	450	4
AN960KD616L		2	537	1
		2	637A	AR
AN960PD416		1	10	2
		2	55	4
		2	95	2

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		2	220	10
		2	220B	9
AN960PD616		1	20	2
AN960PD816		2	185	1
AN960XC416L		2	627	AR
BAC27DCT0346		1	125	1
BACB10AP5		2	800	2
BACB10AR5		2	70	1
		2	270	1
BACB10AS10		2	500	2
BACB10AS12		2	510	2
BACB10AS21		2	265	2
BACB10AW16		2	35	1
		2	145	1
BACB10BX6		2	610	2
BACB10ET06		2	465	1
BACB10FV16		2	35A	1
		2	145A	1
BACB28AK04-034		2	189A	1
BACB28AK04-046		2	187A	2
BACB28AK05-014		2	188D	1
BACB28AK05-368		2	188C	1
BACB28AK05-382		2	188	1
BACB28AK06-032		2	540	1
BACB28BA0507382		2	188A	1
BACB28X6-C018		2	550A	1
BACB28Y10D047		2	505	1
BACB28Y10D287		2	390	1
BACB28Y4D034		2	189B	1
BACB28Y4D046		2	187B	2
BACB28Y4D230		2	240	4
BACB28Y5D286		2	186	1
BACB28Z4-034		2	189	1
BACB28Z4-046		2	187	2
BACB30DX6-27		2	680	3

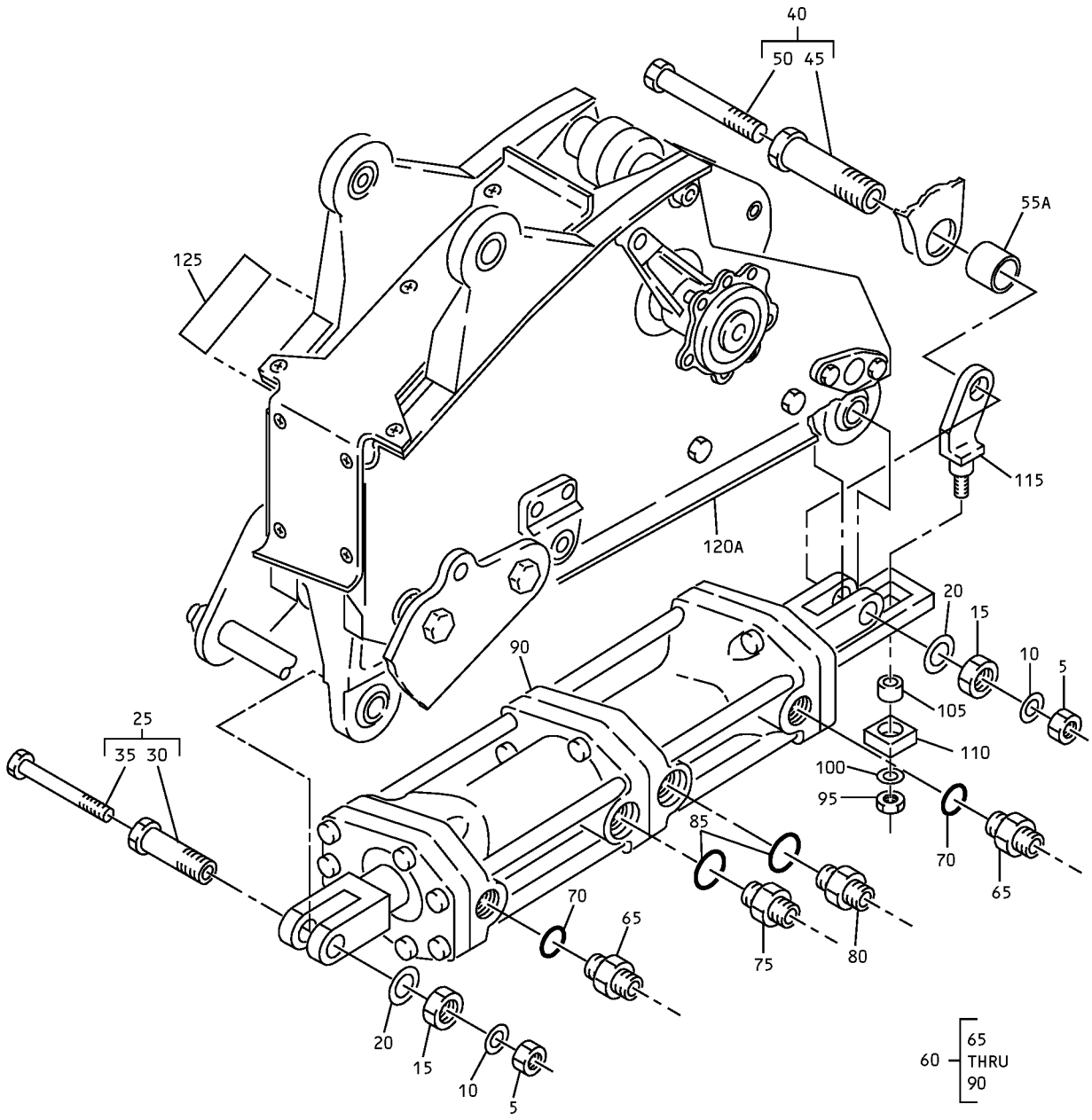
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
BACB30DX6-56		2	415	1
BACB30FM8-24		2	525B	1
BACB30FM8-28		2	575B	1
		2	625B	2
BACB30GP6-18		2	455	2
BACB30GW8-24		2	525A	1
BACB30GW8-28		2	575A	1
		2	625A	2
BACB30MB6A56		2	415A	1
BACB30MY6K13		2	195B	2
BACB30MY6K13X		2	195C	2
BACB30MY6K13Y		2	195D	2
BACB30MY6K18		2	5B	1
		2	5D	1
		2	440A	3
		2	455A	2
BACB30MY6K21		2	115B	2
		2	115D	2
BACB30MY6R18		2	5A	1
BACB30MY6R21		2	115A	2
BACB30NF4-43		1	50	1
BACB30NF5-65		2	153A	1
BACB30NM4HK48		2	230B	2
BACB30NM4K46		2	225B	2
BACB30NM4K67		2	226B	2
BACB30NM4K8		2	235A	4
BACB30NR4K64		2	152A	1
		2	157A	1
BACB30NR4K65		2	152	1
		2	157	1
BACB30NR5K47		2	151	1
BACB30NR5K65		2	153	1
BACB30VT6K18		2	5C	1
		2	5E	1
BACB30VT6K21		2	115C	2

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		2	115E	2
BACC30BH6		2	420A	1
BACC30K8		2	520A	1
		2	570A	1
		2	620A	2
BACC30M6		2	6	1
		2	116	2
		2	196	2
		2	441	3
		2	445A	2
BACC30M8		2	520B	1
		2	570B	1
		2	620B	2
BACN10HR4CD		1	95	1
BACN10JC8CM		2	180	1
BACN10JP08A		2	295	4
		2	315	3
		2	335	3
BACN10JP3C		2	285	2
BACN10YR3CD		2	6A	1
		2	116A	2
BACN10YR4CD		1	5A	2
		2	50A	4
		2	182	1
		2	184	1
		2	215B	10
BACN10YR5CD		2	181	1
		2	183	1
BACN10YR6CD		1	15A	2
		2	530A	1
		2	580A	1
		2	630A	2
BACR15BA3D		2	280	4
		2	290	8
		2	310	6

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		2	330	6
BACR15BA5D		2	20	2
		2	130	2
		2	255A	12
		2	297	3
BACR15BB5D		2	25	1
		2	135	1
		2	352	3
		2	360	3
BACR15BB6D		2	195A	2
BACR15BB6D20		2	440	3
BACR15CE5M13		2	660A	1
MS14104-6		2	385	1
		2	560	1
		2	705	2
MS14104-6K		2	560A	1
		2	705A	2
MS20615-4MP13		2	655	4
MS20615-5MP13		2	660	1
MS20615-6M26		2	5	1
		2	115	2
MS21042L4		1	5	2
		2	50	4
		2	90	2
		2	215	10
		2	215A	9
MS21042L6		1	15	2
		2	530	1
		2	580	1
		2	630	2
MS21209F1-15		2	160	1
MS21902-4		1	65	2
MS21902D6		1	75	1
MS21916D6-5		1	80	1
NAS1057W5-382		2	188B	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
NAS1080-06		2	420	1
		2	670	3
NAS1080D06		2	445	2
NAS1104-25		1	35	1
NAS11490616J		2	637E	AR
NAS1149B0463H		2	637B	AR
		2	640A	4
NAS1149B0616K		2	637C	AR
NAS1149C0432B		2	627A	AR
NAS1149D0332J		2	197	2
		2	442	3
		2	450A	4
NAS1149D0416J		2	627B	AR
NAS1149D0432J		2	167A	1
		2	177A	1
NAS1149D0463J		1	10A	2
		1	10B	2
		2	55A	4
		2	55B	4
		2	167	1
		2	177	1
		2	220A	10
		2	220C	9
		2	220D	10
NAS1149D0563J		2	168	1
		2	172	1
NAS1149D0616J		2	537B	1
NAS1149D0616K		2	537A	1
NAS1149D0663J		1	20A	2
		1	20B	2
NAS1149D0863J		2	185A	1
		2	185B	1
NAS1149F0332P		2	675A	6
NAS1149F0432P		1	100A	1
		1	100B	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
NAS1368N8D		2	105	1
NAS1612-4		1	70	2
NAS1612-6		1	85	2
NAS43DD6-68		1	55A	1
NAS602-6P		2	170	10
NAS623-3-5		2	205	2
NAS6604-24		2	100	2
NAS6604-46		2	225	2
		2	225A	1
NAS6604-67		2	226	2
		2	226A	2
NAS6604-8		2	235	4
NAS6604H48		2	230	2
		2	230A	2
NAS6704-26		2	60	4
NAS75-3-121		2	685	3
NAS77A6-42P		2	475	1
NAS8202A6		2	170A	10
YR1315		2	465A	1



Elevator Control Feel and Centering Unit Assembly
IPL Figure 1

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1	65C25465-1		DELETED		
–1A	65C25465-2		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	A	RF
–1B	65C25465-3		DELETED		
–1C	65C25465-4		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	B	RF
–1D	65C25465-7		DELETED		
–1E	65C25465-8		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	C	RF
–1F	65C25465-9		DELETED		
–1G	65C25465-10		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	D	RF
–1H	65C25465-11		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	E	RF
–1J	65C25465-12		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	F	RF
–1K	65C25465-15		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING (PRE ALERT SB 737-27A1194)	G	RF
–1L	65C25465-16		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	H	RF
–1M	65C25465-17		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	I	RF
–1N	65C25465-18		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING (POST ALERT SB 737-27A1194) (PRE SB 737-27-1197)	J	RF
–1P	65C25465-19		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	K	RF
–1Q	65C25465-20		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	L	RF
–1R	65C25465-21		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING (POST SB 737-27-1197)	M	RF
–1S	65C25465-22		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	N	RF

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1T	65C25465-23		UNIT ASSY-ELEVATOR CONTROL FEEL AND CENTERING	P	RF
5	MS21042L4		. NUT	A-K, M	2
5A	BACN10YR4CD		. NUT	L, N, P	2
10	AN960PD416		. WASHER	A-K, M	2
10A	NAS1149D0463J		. WASHER (OPT ITEM 10)	A-K, M	2
10B	NAS1149D0463J		. WASHER	L, N, P	2
15	MS21042L6		. NUT	A-K, M	2
15A	BACN10YR6CD		. NUT	L, N, P	2
20	AN960PD616		. WASHER	A-K, M	2
20A	NAS1149D0663J		. WASHER (OPT ITEM 20)	A-K, M	2
20B	NAS1149D0663J		. WASHER	L, N, P	2
25	69-27158-4		. BOLT ASSY		1
30	69-27163-5		. . BOLT-HOLLOW		1
35	NAS1104-25		. . BOLT		1
40	69-27158-10		. BOLT ASSY		1
45	69-27163-13		. . BOLT-HOLLOW		1
50	BACB30NF4-43		. . BOLT		1
55	NAS43DD6-44		DELETED		
55A	NAS43DD6-68		. BUSHING		1
60	65C25465-5		. ACTUATOR ASSY	A-F	1
–60A	65C25465-14		. ACTUATOR ASSY	G-N, P	1
65	MS21902-4		. . UNION		2
70	NAS1612-4		. . PACKING		2
75	MS21902D6		. . UNION		1
80	MS21916D6-5		. . REDUCER		1
85	NAS1612-6		. . PACKING		2
90	65-44503-8		. . CYLINDER ASSY (REFER TO OHM 27-09-09)	A-F	1
–90A	65-44503-10		. . CYLINDER ASSY (REFER TO OHM 27-09-09)	G-N, P	1

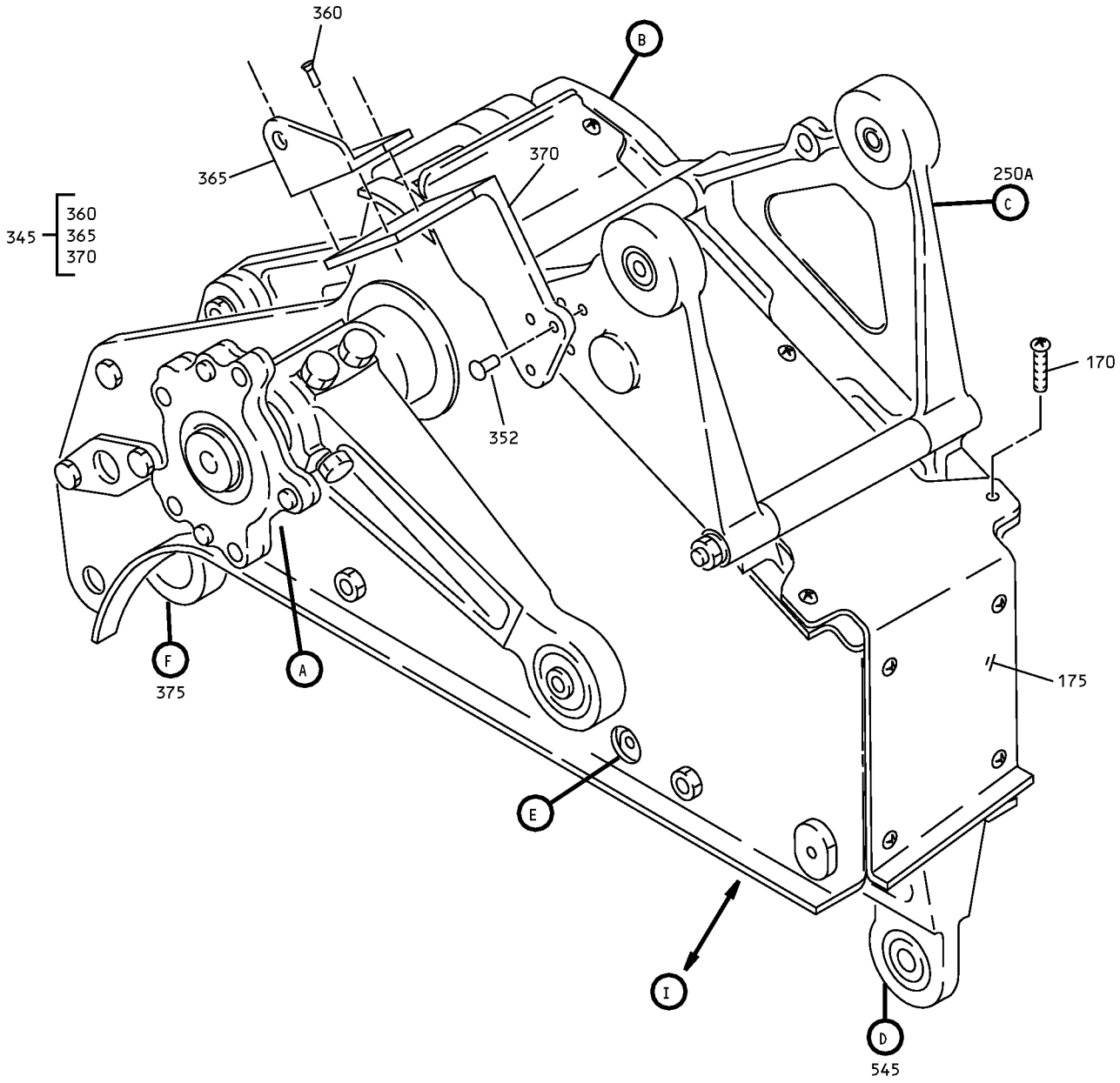
–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
95	BACN10HR4CD		. NUT		1
100	AN960-416L		. WASHER	A-K, M	1
100A	NAS1149F0432P		. WASHER (OPT ITEM 100)	A-K, M	1
100B	NAS1149F0432P		. WASHER	L, N, P	1
105	66-21297-2		. BUSHING		1
110	65-38904-2		. BLOCK-SLIDE		1
115	69-73358-1		. FITTING		1
120	65C25505-1		DELETED		
120A	65C25505-2		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (PRE ALERT SB 737-27A1194)	A	1
–120B	65C25505-3		DELETED		
–120C	65C25505-4		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	B	1
–120D	65C25505-5		DELETED		
–120E	65C25505-6		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	C	1
–120F	65C25505-7		DELETED		
–120G	65C25505-8		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	D, H	1
–120H	65C25505-9		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	E, I	1
–120J	65C25505-10		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (PRE ALERT SB 737-27A1194) (REPLACED BY ITEMS 120N, 120Q, 120T)	F, G	1
–120K	65C25505-11		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	J	1
–120L	65C25505-11		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (POST ALERT SB 737-27A1194) (PRE SB 737-27-1197)	A, F	1
–120M	65C25505-12		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	K	1

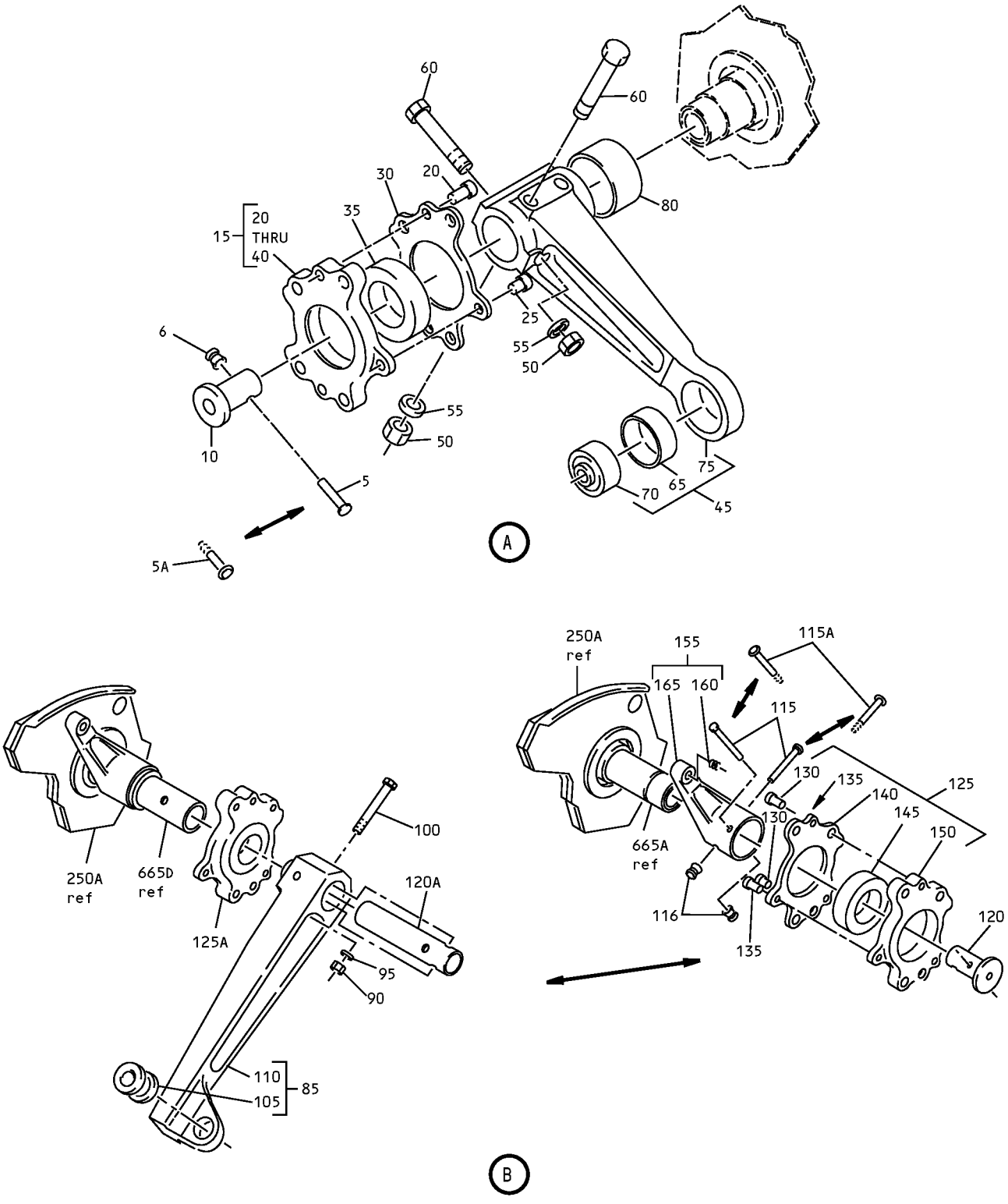
–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–120N	65C25505-12		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (REPLACES ITEM 120J)	F, G	1
–120P	65C25505-13		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	L	1
–120Q	65C25505-13		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (REPLACES ITEM 120J)	F, G	1
–120R	65C25505-14		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	M	1
–120S	65C25505-14		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (POST SB 737-27-1197)	A, F	1
–120T	65C25505-14		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2) (REPLACES ITEM 120J)	F, G	1
–120U	65C25505-15		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	N	1
–120V	65C25505-16		. UNIT ASSY-CENTERING (FOR DETAILS SEE FIG. 2)	P	1
125	BAC27DCT0346		. MARKER		1

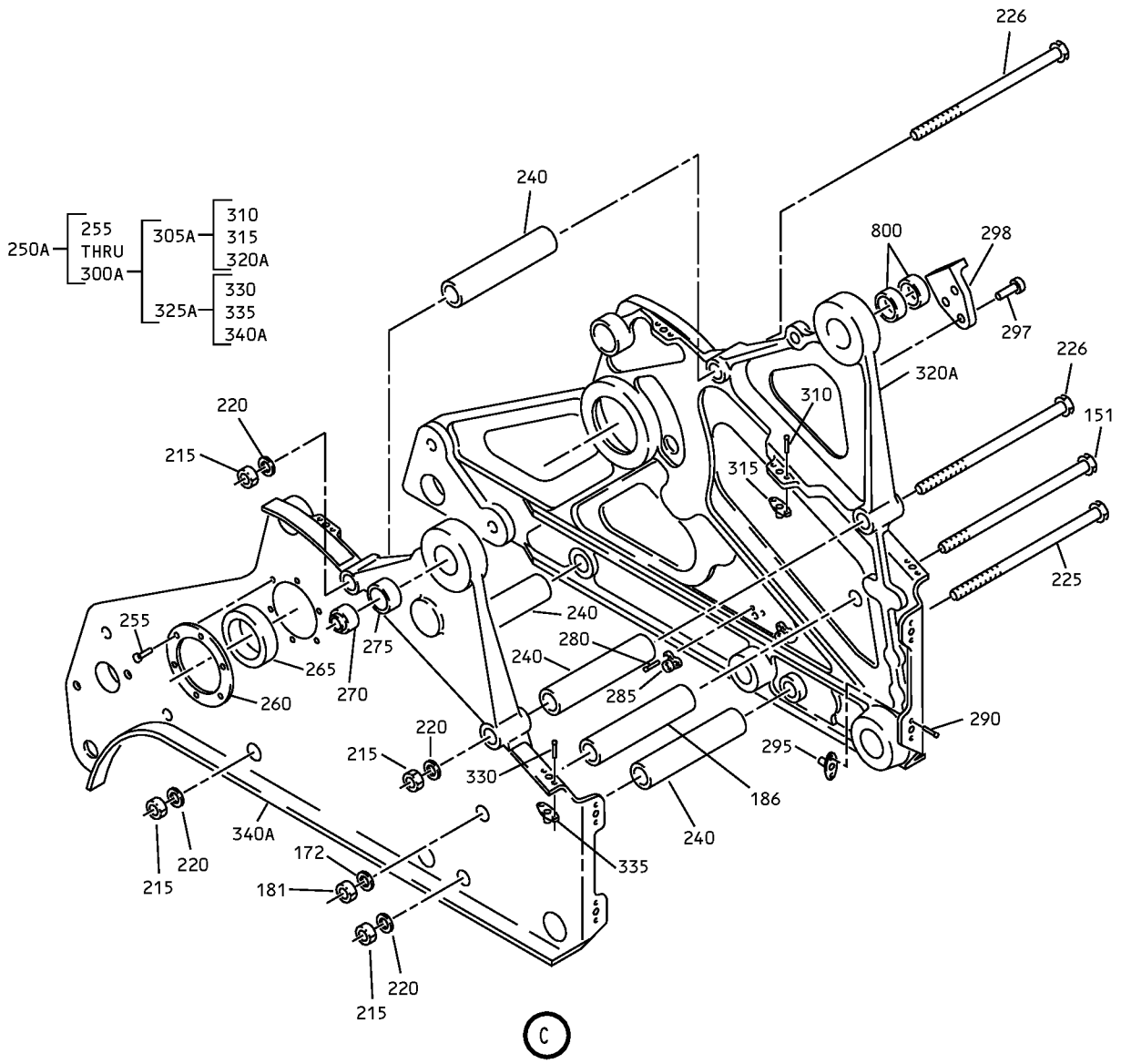
–Item not Illustrated



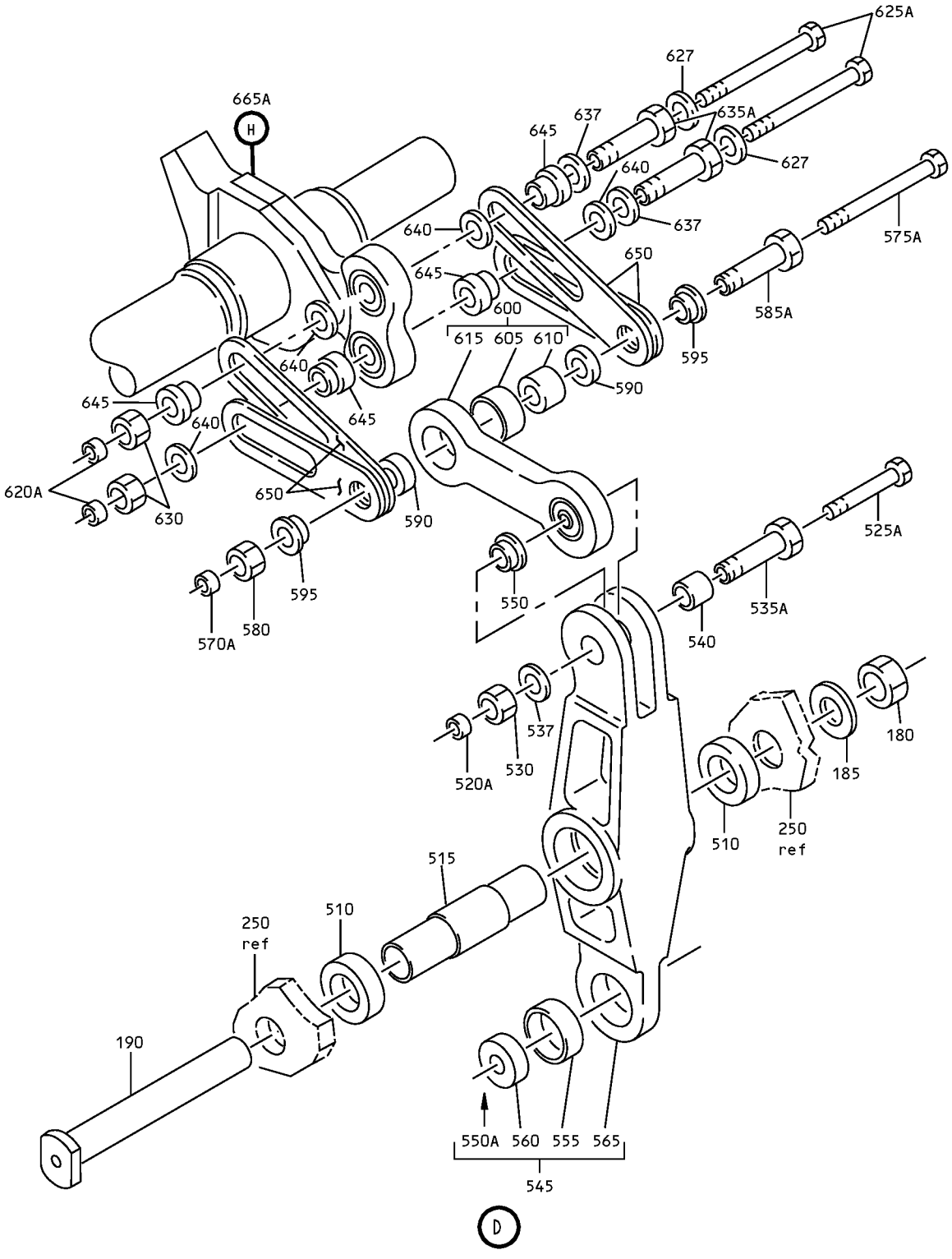
Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 1 of 7)



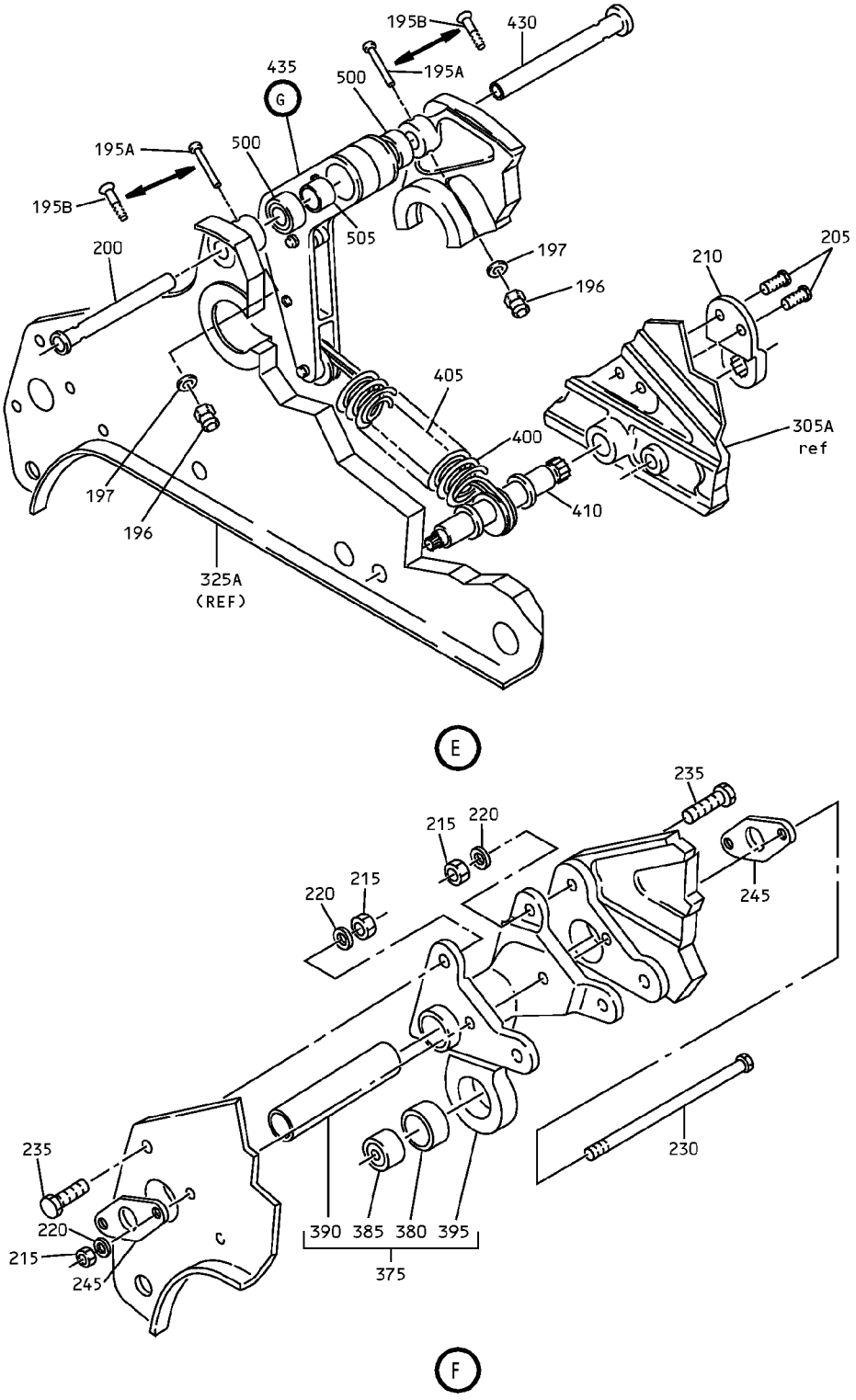
Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 2 of 7)



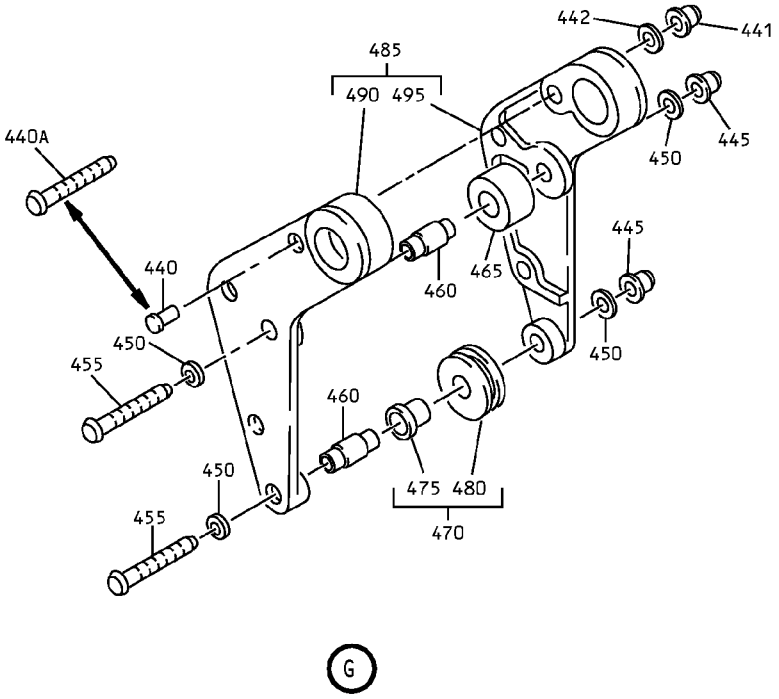
Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 3 of 7)

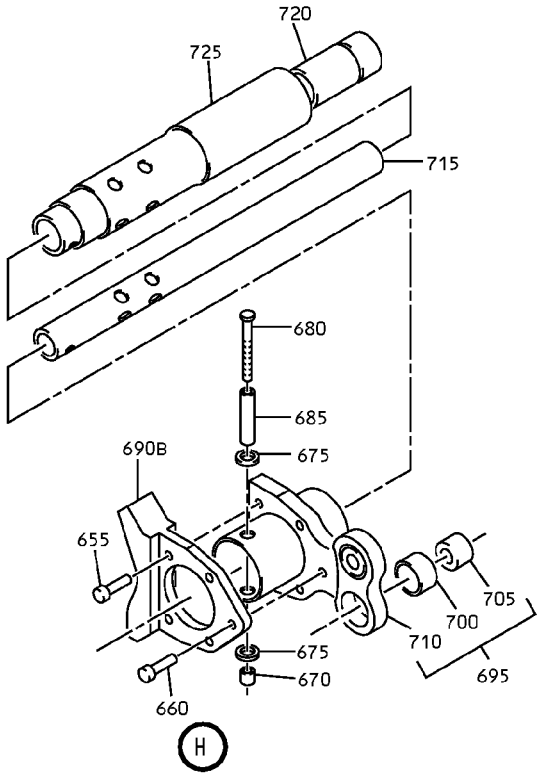


Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 4 of 7)

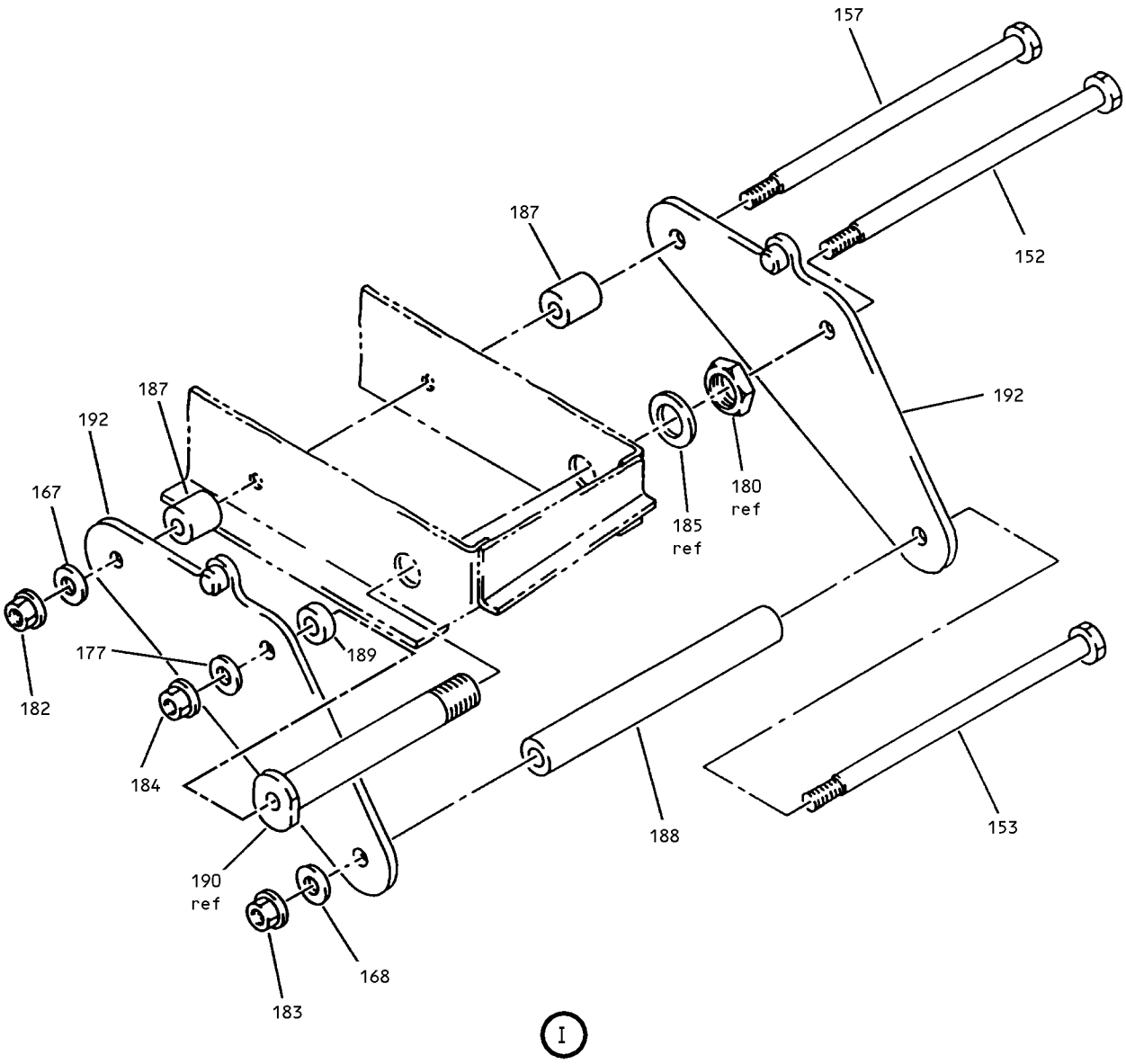


Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 5 of 7)





Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 6 of 7)



Elevator Control Centering Unit Assembly
IPL Figure 2 (Sheet 7 of 7)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–1	65C25505-1		DELETED		
–1A	65C25505-2		UNIT ASSY-ELEVATOR CONTROL CENTERING (PRE ALERT SB 737-27A1194)	A	RF
–1B	65C25505-3		DELETED		
–1C	65C25505-4		UNIT ASSY-ELEVATOR CONTROL CENTERING	B	RF
–1D	65C25505-5		DELETED		
–1E	65C25505-6		UNIT ASSY-ELEVATOR CONTROL CENTERING	C	RF
–1F	65C25505-7		DELETED		
–1G	65C25505-8		UNIT ASSY-ELEVATOR CONTROL CENTERING	D	RF
–1H	65C25505-9		UNIT ASSY-ELEVATOR CONTROL CENTERING	E	RF
–1J	65C25505-10		UNIT ASSY-ELEVATOR CONTROL CENTERING (PRE ALERT SB 737-27A1194)	F	RF
–1K	65C25505-11		. UNIT ASSY-ELEVATOR CONTROL CENTERING (POST ALERT SB 737-27A1194) (PRE SB 737-27-1197)	G	1
–1L	65C25505-12		. UNIT ASSY-ELEVATOR CONTROL CENTERING	H	1
–1M	65C25505-13		. UNIT ASSY-ELEVATOR CONTROL CENTERING	I	1
–1N	65C25505-14		. UNIT ASSY-ELEVATOR CONTROL CENTERING (POST SB 737-27-1197)	J	1
–1P	65C25505-15		. UNIT ASSY-ELEVATOR CONTROL CENTERING	K	1
–1Q	65C25505-16		. UNIT ASSY-ELEVATOR CONTROL CENTERING	L	1
5	MS20615-6M26		. RIVET	A-H, J	1
5A	BACB30MY6R18		. BOLT (OPT ITEM 5)	A-H, J	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–5B	BACB30MY6K18		. BOLT (OPT ITEM 5)	A-H, J	1
–5C	BACB30VT6K18		. BOLT (OPT ITEM 5)	A-H, J	1
–5D	BACB30MY6K18		. BOLT (OPT ITEM 5E)	I, K, L	1
–5E	BACB30VT6K18		. BOLT (OPT ITEM 5D)	I, K, L	1
6	BACC30M6		. COLLAR (USED WITH ITEM 5A, 5B, 5D)		1
–6A	BACN10YR3CD		. NUT (USED WITH ITEM 5C, 5E)		1
10	69-73355-2		. RETAINER		1
15	69-73349-1		. HOUSING ASSY-BEARING	A, F, G, H, I, J, K	1
–15A	69-73349-2		. HOUSING ASSY-BEARING	B-E	1
–15B	69-73349-3		. HOUSING ASSY-BEARING	L	1
20	BACR15BA5D		. . RIVET		2
25	BACR15BB5D		. . RIVET		1
30	69-73459-3		. . RETAINER		1
35	BACB10AW16		. . BEARING	A-K	1
–35A	BACB10FV16		. . BEARING	L	1
40	69-73342-1		. . HOUSING ASSY		1
45	65C25504-1		. CRANK ASSY-INPUT		1
–45A	65C25504-2		. CRANK ASSY-INPUT (OPT ITEM 45)	A, B, C	1
			ATTACHING PARTS		
50	MS21042L4		. NUT	A-H, J	4
–50A	BACN10YR4CD		. NUT	I, K, L	4
55	AN960PD416		. WASHER	A-H, J	4
–55A	NAS1149D0463J		. WASHER (OPT ITEM 55)	A-H, J	4
–55B	NAS1149D0463J		. WASHER	I, K, L	4

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
60	NAS6704-26		. BOLT		4
			- - - - - - - * - - - - - - -		
65	69-38919-1		. . SLEEVE		1
70	BACB10AR5		. . BEARING		1
75	65C25504-3		. . BONDED ASSY (USED ON ITEM 45)		1
–75A	65C25504-4		. . BONDED ASSY (USED ON ITEM 45A)		1
80	69-70464-7		. SPACER		1
85	65C25533-1		. CRANK ASSY	C, E	1
			ATTACHING PARTS		
90	MS21042L4		. NUT	C, E	2
95	AN960PD416		. WASHER	C, E	2
100	NAS6604-24		. BOLT	C, E	2
			- - - - - - - * - - - - - - -		
105	NAS1368N8D		. . GROMMET	C, E	1
110	65C25533-2		. . CRANK	C, E	1
115	MS20615-6M26		. RIVET	A-H, J	2
115A	BACB30MY6R21		. BOLT (OPT ITEM 115)	A-H, J	2
–115B	BACB30MY6K21		. BOLT (OPT ITEM 115)	A-H, J	2
–115C	BACB30VT6K21		. BOLT (OPT ITEM 115B)	A-H, J	2
–115D	BACB30MY6K21		. BOLT (OPT ITEM 115E)	I, K, L	2
–115E	BACB30VT6K21		. BOLT (OPT ITEM 115D)	I, K, L	2
116	BACC30M6		. COLLAR (USED WITH ITEM 115A, 115B,115D)		2
–116A	BACN10YR3CD		. NUT (USED WITH ITEM 115C, 115E)		2
120	69-73355-1		. RETAINER	A, B, D, F, G, H, I, J, K, L	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–120A	69-73355-3		. RETAINER	C, E	1
125	69-73349-1		. HOUSING ASSY-BEARING	A, F, G, H, I, J, K	1
–125A	69-73349-2		. HOUSING ASSY-BEARING	B-E	1
–125B	69-73349-3		. HOUSING ASSY-BEARING	L	1
130	BACR15BA5D		. . RIVET		2
135	BACR15BB5D		. . RIVET		1
140	69-73459-3		. . RETAINER		1
145	BACB10AW16		. . BEARING	A-K	1
–145A	BACB10FV16		. . BEARING	L	1
150	69-73342-1		. . HOUSING ASSY		1
151	BACB30NR5K47		. BOLT	I, K, L	1
152	BACB30NR4K65		. BOLT (OPT ITEM 152A)	G, H, J	1
–152A	BACB30NR4K64		. BOLT (OPT ITEM 152)	G, H, J	1
153	BACB30NR5K65		. BOLT (OPT ITEM 153A, 153B)	G, H, J	1
–153A	BACB30NF5-65		. BOLT (OPT ITEM 153, 153B)	G, H, J	1
–153B	69-87836-1		. BOLT (OPT ITEM 153, 153A)	G, H, J	1
155	65C25522-1		. CRANK ASSY		1
157	BACB30NR4K65		. BOLT (OPT ITEM 157A)	G, H, J	1
–157A	BACB30NR4K64		. BOLT (OPT ITEM 157)	G, H, J	1
160	MS21209F1-15		. . INSERT		1
165	65C25522-2		. . CRANK		1
167	NAS1149D0463J		. WASHER (USED WITH ITEM 157)	G, H, J	1
–167A	NAS1149D0432J		. WASHER (USED WITH ITEM 157A)	G, H, J	1
168	NAS1149D0563J		. WASHER	G, H, J	1
170	NAS602-6P		. SCREW	A-H, J	10

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–170A	NAS8202A6		. SCREW	I, K, L	10
172	NAS1149D0563J		. WASHER	I, K, L	1
175	69-73350-1		. PLATE-COVER	A-I, K, L	1
175A	69-73350-2		. PLATE-COVER	J	1
177	NAS1149D0463J		. WASHER (USED WITH ITEM 152)	G, H, J	1
–177A	NAS1149D0432J		. WASHER (USED WITH ITEM 152A)	G, H, J	1
180	BACN10JC8CM		. NUT		1
181	BACN10YR5CD		. NUT	I, K, L	1
182	BACN10YR4CD		. NUT	G, H, J	1
183	BACN10YR5CD		. NUT	G, H, J	1
184	BACN10YR4CD		. NUT	G, H, J	1
185	AN960PD816		. WASHER	A-H, J	1
–185A	NAS1149D0863J		. WASHER (OPT ITEM 185)	A-H, J	1
–185B	NAS1149D0863J		. WASHER	I, K, L	1
186	BACB28Y5D286		. BUSHING	I, K, L	1
187	BACB28Z4-046		. BUSHING (OPT ITEM 187A, 187B)	G, H, J	2
–187A	BACB28AK04-046		. BUSHING (OPT ITEM 187, 187B)	G, H, J	2
–187B	BACB28Y4D046		. BUSHING (OPT ITEM 187, 187A)	G, H, J	2
188	BACB28AK05-382		. BUSHING (OPT ITEM 188A, 188B, 188C)	G, H, J	1
–188A	BACB28BA0507382		. BUSHING (OPT ITEM 188, 188B, 188C)	G, H, J	1
–188B	NAS1057W5-382		. BUSHING (OPT ITEM 188, 188A, 188C)	G, H, J	1
–188C	BACB28AK05-368		. BUSHING (OPT ITEM 188, 188A, 188B) (USED WITH ITEM 188D)	G, H, J	1
–188D	BACB28AK05-014		. BUSHING (USED WITH ITEM 188C)	G, H, J	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
189	BACB28Z4-034		. BUSHING (OPT ITEM 189A, 189B)	G, H, J	1
189A	BACB28AK04-034		. BUSHING (OPT ITEM 189, 189B)	G, H, J	1
189B	BACB28Y4D034		. BUSHING (OPT ITEM 189, 189A)	G, H, J	1
190	69-73352-1		. SHAFT-INNER		1
192	69-87835-1		. STOP SUPPORT ASSY	G, H, J	2
195	MS20615-6M		DELETED		
195A	BACR15BB6D		. RIVET (OPT ITEM 195B, 195C, 195D)		2
195B	BACB30MY6K13		. LOCKBOLT (OPT ITEM 195A, 195C, 195D)		2
–195C	BACB30MY6K13X		. LOCKBOLT-OVERSIZE (OPT ITEM 195A, 195B, 195D)		2
–195D	BACB30MY6K13Y		. LOCKBOLT-OVERSIZE (OPT ITEM 195A, 195B, 195C)		2
196	BACC30M6		. COLLAR (USED ON ITEMS 195B, 195C,195D)		2
197	NAS1149D0332J		. WASHER (USED ON ITEMS 195B, 195C,195D)		2
200	69-73351-2		. SHAFT-INNER		1
205	NAS623-3-5		. SCREW		2
210	69-73356-1		. RETAINER-SPRING POST		1
215	MS21042L4		. NUT	A-F	10
–215A	MS21042L4		. NUT	G, H, J	9
–215B	BACN10YR4CD		. NUT	I, K, L	10
220	AN960PD416		. WASHER	A-F	10
–220A	NAS1149D0463J		. WASHER (OPT ITEM 220)	A-F	10
–220B	AN960PD416		. WASHER	G, H, J	9
–220C	NAS1149D0463J		. WASHER (OPT ITEM 220B)	G, H, J	9
–220D	NAS1149D0463J		. WASHER	I, K, L	10
225	NAS6604-46		. BOLT	A-F	2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–225A	NAS6604-46		. BOLT	G, H, J	1
–225B	BACB30NM4K46		. BOLT	I, K, L	2
226	NAS6604-67		. BOLT	A-H, J	2
–226A	NAS6604-67		. BOLT	I, K, L	2
–226B	BACB30NM4K67		. BOLT (OPT ITEM 226A)	I, K, L	2
230	NAS6604H48		. BOLT	A-H, J	2
–230A	NAS6604H48		. BOLT	I, K, L	2
–230B	BACB30NM4HK48		. BOLT (OPT ITEM 230A)	I, K, L	2
235	NAS6604-8		. BOLT	A-H, J	4
–235A	BACB30NM4K8		. BOLT	I, K, L	4
240	BACB28Y4D230		. BUSHING		4
245	69-73346-2		. RETAINER		2
250	65C25439-1		DELETED		
250A	65C25439-2		. HOUSING ASSY (OPT ITEM 250B)	A, B, C	1
–250B	65C25439-17		. HOUSING ASSY	A-H, J	1
–250C	65C25439-25		. HOUSING ASSY	I, K, L	1
255	BACR15BB5D		DELETED		
255A	BACR15BA5D		. . RIVET		12
260	69-73346-4		. . RETAINER		2
265	BACB10AS21		. . BEARING		2
270	BACB10AR5		. . BEARING		1
275	69-38919-32		. . SLEEVE		1
280	BACR15BA3D		. . RIVET		4
285	BACN10JP3C		. . NUTPLATE		2
290	BACR15BA3D		. . RIVET		8
295	BACN10JP08A		. . NUTPLATE		4
297	BACR15BA5D		. . RIVET		3
298	69-74649-1		. . STOP-ANGLE		1
300	65C25439-3		DELETED		

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
300A	65C25439-4		. . MATCHED SET ASSY (USED ON ITEM 250A)		1
–300B	65C25439-18		. . MATCHED SET ASSY (USED ON ITEM 250B)		1
–300C	65C25439-26		. . MATCHED SET ASSY (USED ON ITEM 250C)		1
305	65C25439-5		DELETED		
305A	65C25439-7		. . . BOND ASSY (USED ON ITEM 300A) (MATCHED WITH ITEM 325A)		1
–305B	65C25439-19		. . . BOND ASSY (USED ON ITEM 300B) (MATCHED WITH ITEM 325B)		1
–305C	65C25439-27		. . . BOND ASSY (USED ON ITEM 300C) (MATCHED WITH ITEM 325C)		1
310	BACR15BA3D		. . . . RIVET		6
315	BACN10JP08A		. . . . NUTPLATE		3
320	65C25439-9		DELETED		
320A	65C25439-11		. . . . BOND ASSY (USED ON ITEM 305A)		1
–320B	65C25439-21		. . . . BOND ASSY (USED ON ITEM 305B)		1
–320C	65C25439-29		. . . . BOND ASSY (USED ON ITEM 305C)		1
325	65C25439-6		DELETED		
325A	65C25439-8		. . . BOND ASSY (USED ON ITEM 300A) (MATCHED WITH ITEM 305A)		1
–325B	65C25439-20		. . . BOND ASSY (USED ON ITEM 300B) (MATCHED WITH ITEM 305B)		1
–325C	65C25439-28		. . . BOND ASSY (USED ON ITEM 300C) (MATCHED WITH ITEM 305C)		1
330	BACR15BA3D		. . . . RIVET		6
335	BACN10JP08A		. . . . NUTPLATE		3
340	65C25439-10		DELETED		

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
340A	65C25439-12		. . . . BOND ASSY (USED ON ITEM 325A)		1
–340B	65C25439-22		. . . . BOND ASSY (USED ON ITEM 325B)		1
–340C	65C25439-28		. . . . BOND ASSY (USED ON ITEM 325C)		1
345	69-73378-1		. BRACKET ASSY	B-E	1
			ATTACHING PARTS		
350	BACB30DX6-5		DELETED		
352	BACR15BB5D		. RIVET	B-E	3
355	NAS1080-06		DELETED		
			- - - - - - - * - - - - - - -		
360	BACR15BB5D		. . RIVET		3
365	69-73378-3		. . BRACKET		1
370	69-73378-2		. . ANGLE		1
375	65C25487-1		. FITTING ASSY-ACTUATOR		1
–375A	65C25487-3		. FITTING ASSY-ACTUATOR (OPT ITEM 375)	A, B, C	1
380	69-38919-2		. . SLEEVE		1
385	MS14104-6		. . BEARING		1
390	BACB28Y10D287		. . BUSHING		1
395	65C25487-2		. . BONDED ASSY-FITTING (USED ON ITEM 375)		1
–395A	65C25487-4		. . BONDED ASSY-FITTING (USED ON ITEM 375A)		1
400	69-73361-1		. SPRING-OUTER	A-J	1
400A	251A2190-2		. SPRING-OUTER	K, L	1
405	69-73360-1		. SPRING-INNER	A-J	1
405A	251A2184-2		. SPRING-INNER (OPT ITEM 405B)	K, L	1
405B	251A2184-3		. SPRING-INNER (OPT ITEM 405A)	K, L	1
410	65C25513-1		. POST ASSY-SPRING GROUND	A-J	1
–410A	65C25513-3		. POST ASSY-SPRING GROUND	K, L	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
415	BACB30DX6-56		. . LOCKBOLT		1
–415A	BACB30MB6A56		. . LOCKBOLT (OPT ITEM 415)		1
420	NAS1080-06		. . COLLAR (USED ON ITEM 415)		1
–420A	BACC30BH6		. . COLLAR (USED ON ITEM 415A)		1
425	65C25513-2		. . POST	A-J	1
–425A	65C25513-4		. . POST	K, L	1
430	69-73351-1		. SHAFT-OUTER		1
435	65C25512-1		. FOLLOWER ASSY-CAM	A-J	1
–435A	65C25512-2		. FOLLOWER ASSY-CAM (OPT ITEM 435)	A, B, C	1
–435B	65C25512-9		. FOLLOWER ASSY-CAM	K	1
–435C	65C25512-10		. FOLLOWER ASSY-CAM	L	1
440	BACR15BB6D20		. . RIVET (OPT ITEM 440A)		3
440A	BACB30MY6K18		. . LOCKBOLT (OPT ITEM 440)		3
441	BACC30M6		. . COLLAR (USED ON ITEM 440A)		3
442	NAS1149D0332J		. . WASHER (USED ON ITEM 440A)		3
445	NAS1080D06		. . COLLAR (USED ON ITEM 455)		2
–445A	BACC30M6		. . COLLAR (USED ON ITEM 455A)		2
450	AN960KD10L		. . WASHER (USED ON ITEM 455)		4
–450A	NAS1149D0332J		. . WASHER (USED ON ITEM 455A)		4
455	BACB30GP6-18		. . LOCKBOLT (OPT ITEM 455A)		2
–455A	BACB30MY6K18		. . LOCKBOLT (OPT ITEM 455)		2
460	69-73348-1		. . PIN		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
465	BACB10ET06		. . BEARING	A-K	1
–465A	AC69001		. . BEARING (V60380) (SPEC 60B00178-681) (OPT YR1315 (V92563))	L	1
470	69-73340-1		. . RETAINER ASSY-SPRING	A-J	1
–470A	69-73340-3		. . RETAINER ASSY-SPRING	K, L	1
475	NAS77A6-42P		. . . BUSHING		1
480	69-73340-2		. . . RETAINER	A-J	1
–480A	69-73340-4		. . . RETAINER	K, L	1
485	65C25512-3		. . FOLLOWER ASSY-CAM (USED ON ITEM 435,435B,435C)		1
–485A	65C25512-4		. . FOLLOWER ASSY-CAM (USED ON ITEM 435A)		1
490	65C25512-5		. . . FOLLOWER ASSY-HALF (USED ON ITEM 485)		1
–490A	65C25512-7		. . . FOLLOWER ASSY-HALF (USED ON ITEM 485A)		1
495	65C25512-6		. . . FOLLOWER ASSY-HALF (USED ON ITEM 485)		1
–495A	65C25512-8		. . . FOLLOWER ASSY-HALF (USED ON ITEM 485A)		1
500	BACB10AS10		. BEARING		2
505	BACB28Y10D047		. BUSHING		1
510	BACB10AS12		. BEARING		2
515	69-73353-1		. SHAFT-OUTER		1
520	BACC30K6		DELETED		
520A	BACC30K8		. COLLAR (USED ON ITEM 525A)		1
–520B	BACC30M8		. COLLAR (USED ON ITEM 525B)		1
525	BACB30GW6-24		DELETED		
525A	BACB30GW8-24		. LOCKBOLT (OPT ITEM 525B)		1
–525B	BACB30FM8-24		. LOCKBOLT (OPT ITEM 525A)		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
530	MS21042L6		. NUT	A-H, J	1
–530A	BACN10YR6CD		. NUT	I, K, L	1
535	69-27163-11		DELETED		
535A	69-27163-15		. BOLT-HOLLOW		1
537	AN960KD616L		. WASHER	A-H, J	1
–537A	NAS1149D0616K		. WASHER (OPT ITEM 537)	A-H, J	1
–537B	NAS1149D0616J		. WASHER	I, K, L	1
540	BACB28AK06-032		. BUSHING		1
545	65C25485-1		. LEVER ASSY	A-H, J	1
–545A	65C25485-3		. LEVER ASSY (OPT ITEM 545)	A, B, C	1
–545B	65C25485-5		. LEVER ASSY	I, K, L	1
550	BACB28X6-018		DELETED		
550A	BACB28X6-C018		. . BUSHING		1
555	69-38919-2		. . SLEEVE		1
560	MS14104-6		. . BEARING (REPLACED BY ITEM 560A)		1
–560A	MS14104-6K		. . BEARING (REPLACES ITEM 560)		1
565	65C25485-2		. . LEVER ASSY-BONDED (USED ON ITEMS 545,545B)		1
–565A	65C25485-4		. . LEVER ASSY-BONDED (USED ON ITEM 545A)		1
570	BACC30K6		DELETED		
570A	BACC30K8		. COLLAR (USED ON ITEM 575A)		1
–570B	BACC30M8		. COLLAR (USED ON ITEM 575B)		1
575	BACB30GW6-24		DELETED		
575A	BACB30GW8-28		. LOCKBOLT (OPT ITEM 575B)		1
–575B	BACB30FM8-28		. LOCKBOLT (OPT ITEM 575A)		1
580	MS21042L6		. NUT	A-H, J	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–580A	BACN10YR6CD		. NUT	I, K, L	1
585	69-27163-12		DELETED		
585A	69-27163-14		. BOLT-HOLLOW		1
590	251T2125-3		. WASHER		2
595	251T2125-2		. BUSHING		2
600	69-73435-2		. LINK ASSY	A, F-L	1
–600A	69-73435-1		. LINK ASSY	B-E	1
605	69-38919-33		. . SLEEVE		2
610	BACB10BX6		. . BEARING		2
615	69-73435-4		. . BOND ASSY	A, F-L	1
–615A	69-73435-3		. . BOND ASSY	B-E	1
620	BACC30K6		DELETED		
620A	BACC30K8		. COLLAR (USED ON ITEM 625A)		2
–620B	BACC30M8		. COLLAR (USED ON ITEM 625B)		2
625	BACB30GW6-27		DELETED		
625A	BACB30GW8-28		. LOCKBOLT (OPT ITEM 625B)		2
–625B	BACB30FM8-28		. LOCKBOLT (OPT ITEM 625A)		2
627	AN960XC416L		. WASHER	A-H, J	AR
–627A	NAS1149C0432B		. WASHER (OPT ITEM 627)	A-H, J	AR
–627B	NAS1149D0416J		. WASHER	I, K, L	AR
630	MS21042L6		. NUT	A-H, J	2
–630A	BACN10YR6CD		. NUT	I, K, L	2
635	69-27163-12		DELETED		
635A	69-27163-14		. BOLT-HOLLOW		2
637	AN960B616		. WASHER (OPT ITEM 637B)	A-G, J	AR
–637A	AN960KD616L		. WASHER (OPT ITEM 637C)	A-G, J	AR

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–637B	NAS1149B0463H		. WASHER (OPT ITEM 637)	A-G, J	AR
–637C	NAS1149B0616K		. WASHER (OPT ITEM 637A)	A-G, J	AR
–637D	251T2125-5		. WASHER	H	AR
–637E	NAS11490616J		. WASHER (OPT ITEM 637F)	I, K, L	AR
–637F	251T2125-5		. WASHER (OPT ITEM 637E)	I, K, L	AR
640	AN960B616		. WASHER	A-G, J	4
–640A	NAS1149B0463H		. WASHER (OPT ITEM 640)	A-G, J	4
–640B	251T2125-5		. WASHER	H, I, K, L	4
645	251T2125-1		. BUSHING		4
650	69-73434-3		. TIE ASSY (OPT ITEM 650B)	A, F, G, H, J	4
–650A	69-73434-1		. TIE ASSY	B-E	4
–650B	69-73434-5		. TIE ASSY (OPT ITEM 650)	A, F, G, H, J	4
–650C	69-73434-5		. TIE ASSY	IKL	4
655	MS20615-4MP13		. RIVET		4
660	MS20615-5MP13		. RIVET	A-G, J	1
–660A	BACR15CE5M13		. RIVET	H	1
665	65C25517-1		DELETED		
665A	65C25517-2		. CAMSHAFT ASSY (OPT ITEM 665G, 665H)	A	1
–665B	65C25517-3		. CAMSHAFT ASSY	B, D	1
–665C	65C25517-4		. CAMSHAFT ASSY (OPT ITEM 665B)	B	1
–665D	65C25517-5		. CAMSHAFT ASSY	C, E	1
–665E	65C25517-6		. CAMSHAFT ASSY (OPT ITEM 665D)	C	1
–665F	65C25517-7		. CAMSHAFT ASSY (OPT ITEM 665J)	F, G, J	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–665G	65C25517-7		. CAMSHAFT ASSY (OPT ITEM 665A, 665H)	A	1
–665H	65C25517-9		. CAMSHAFT ASSY (OPT ITEM 665A, 665G)	A	1
–665J	65C25517-9		. CAMSHAFT ASSY (OPT ITEM 665F)	F, G, J	1
–665K	65C25517-8		. CAMSHAFT ASSY	H	1
–665L	65C25517-9		. CAMSHAFT ASSY	I, K	1
–665M	65C25517-10		. CAMSHAFT ASSY	L	1
670	NAS1080-06		. . COLLAR		3
675	AN960-10L		. . WASHER		6
–675A	NAS1149F0332P		. . WASHER (OPT ITEM 675)		6
680	BACB30DX6-27		. . LOCKBOLT		3
685	NAS75-3-121		. . BUSHING		3
690	65C25518-1		DELETED		
–690A	65C25518-2		. . CAM ASSY (USED ON ITEM 665B THRU 665E)		1
–690B	65C25518-7		. . CAM ASSY (USED ON ITEM 665A, 665F, 665G)		1
–690C	65C25518-8		. . CAM ASSY (USED ON ITEM 665K)		1
–690D	65C25518-9		. . CAM ASSY (USED ON ITEM 665L, 665M)		1
695	65C25511-1		. . LEVER ASSY-FEEL (USED ON ITEM 665F THRU 665M)		1
–695A	65C25511-3		. . LEVER ASSY-FEEL (USED ON ITEM 665A)		1
–695B	65C25510-1		. . LEVER ASSY-FEEL (USED ON ITEM 665B, 665D)		1
–695C	65C25510-3		. . LEVER ASSY-FEEL (USED ON ITEM 665C, 665E)		1
700	69-38919-2		. . . SLEEVE		2
705	MS14104-6		. . . BEARING (REPLACED BY ITEM 705A)		2

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–705A	MS14104-6K		. . . BEARING (REPLACES ITEM 705)		2
710	65C25511-2		. . . BOND ASSY (USED ON ITEM 695)		1
–710A	65C25511-4		. . . BOND ASSY (USED ON ITEM 695A)		1
–710B	65C25510-2		. . . BOND ASSY (USED ON ITEM 695B)		1
–710C	65C25510-4		. . . BOND ASSY (USED ON ITEM 695C)		1
715	69-73345-1		. . SHAFT-INNER (USED ON ITEM 665A THRU 665C, 665F THRU 665M)		1
–715A	69-73345-2		. . SHAFT-INNER (USED ON ITEM 665D, 665E)		1
720	69-73344-1		. . SHAFT-INTERMEDIATE (USED ON ITEM 665A THRU 665C, 665F THRU 665L)		1
–720A	69-73344-2		. . SHAFT-INTERMEDIATE (USED ON ITEM 665D, 665E)		1
–720B	69-73344-3		. . SHAFT-INTERMEDIATE (USED ON ITEM 665M)		1
725	69-73343-1		. . SHAFT-OUTER (USED ON ITEM 665A THRU 665L)		1
–725A	69-73343-2		. . SHAFT-OUTER (USED ON ITEM 665M)		1
			INSTALLATION PARTS		
800	BACB10AP5		BEARING		2

–Item not Illustrated