TO: ALL HOLDERS OF ALTERNATE EXTEND TORQUE SHAFT ASSEMBLY COMPONENT MAINTENANCE MANUAL 32-35-70

REVISION NO. 2 DATED NOV 01/02

HIGHLIGHTS

Pages which have been added or revised are outlined below together with the highlights of the revision. Remove and insert the affected pages as listed and enter Revision No. and date on the Record of Revision Sheet.

| CHAPTER/SECTION AND PAGE NO. | DESCRIPTION OF CHANGE |
|---|---|
| TITLE PAGE<br>1<br>REPAIR 2-1<br>601-602<br>REPAIR 4-1<br>601,603<br>1002-1004,1009-1012 | Added shaft assemblies 257T3501-3, -4, -5 with changed quadrant details. |
| TITLE PAGE<br>1<br>401<br>501<br>REPAIR-GEN<br>601-602<br>REPAIR 1-1<br>601<br>REPAIR 2-1<br>601-602<br>REPAIR 3-1<br>601-602<br>REPAIR 4-1<br>601-604<br>REPAIR 5-1<br>601-604<br>REPAIR 6-1<br>601-602 | Added clarifications and updated callouts. |

| CHAPTER/SECTION AND PAGE NO. | DESCRIPTION OF CHANGE |
|---|---|
| REPAIR 7-1 | HIGHLIGHT CONTINUED FROM PREVIOUS PAGE |
| 601 | |
| 701 | |
| 1001 | |

BOEING

COMPONENT
MAINTENANCE MANUAL

# ALTERNATE EXTEND TORQUE SHAFT ASSEMBLY

# PART NUMBERS 257T3501-1 THRU -5

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST



817799

REVISION RECORD

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

| REVISION NUMBER | REVISION DATE | DATE FILED | BY | REVISION NUMBER | REVISION DATE | DATE FILED | BY |
|---|---|---|---|---|---|---|---|
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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

| BOEING SERVICE BULLETIN | BOEING TEMPORARY REVISION | OTHER DIRECTIVE | DATE OF INCORPORATION INTO MANUAL |
|---|---|---|---|
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| PAGE | DATE | CODE |
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| REPAIR-GENERAL | | |
| *601 | NOV 01/02 | 01.1 |
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| 602 | JAN 01/91 | 01 |
| 603 | JAN 01/91 | 01 |
| 604 | JAN 01/91 | 01 |
| 605 | JAN 01/91 | 01 |
| 606 | JAN 01/91 | 01 |
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| *603 | NOV 01/02 | 01.1 |
| *604 | NOV 01/02 | 01.1 |
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| *602 | NOV 01/02 | 01.1 |
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| *604 | NOV 01/02 | 01.1 |
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| ASSEMBLY | | | | | |
| *701 | NOV 01/02 | 01.1 | | | |
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| *1001 | NOV 01/02 | 01.1 | | | |
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| *1004 | NOV 01/02 | 01.1 | | | |
| *1005 | NOV 01/02 | 01.1 | | | |
| *1006 | NOV 01/02 | 01.1 | | | |
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| *1012 | NOV 01/02 | 01.1 | | | |

* = REVISED, ADDED OR DELETED

TABLE OF CONTENTS

# INTRODUCTION

The instructions in this manual provide the information necessary to perform maintenance functions ranging from simple checks and replacement to complete shop-type repair.

This manual is divided into separate sections:

1. Title Page
2. Record of Revisions
3. Temporary Revision & Service Bulletin Record
4. List of Effective Pages
5. Table of Contents
6. Introduction
7. Procedures & IPL Sections

Refer to the Table of Contents for the page location of applicable sections. An asterisked flagnote *[ ] in place of the page number indicates that no special instructions are provided since the function can be performed using standard industry practices.

The beginning of the REPAIR section includes a list of the separate repairs, a list of applicable standard Boeing practices, and an explanation of the True Position Dimensioning symbols used.

An explanation of the use of the Illustrated Parts List is provided in the Introduction to that section.

All weights and measurements used in the manual are in English units, unless otherwise stated. When metric equivalents are given they will be in parentheses following the English units.

Design changes, optional parts, configuration differences and Service Bulletin modifications create alternate part numbers. These are identified in the Illustrated Parts List (IPL) by adding an alphabetical character to the basic item number. The resulting item number is called an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless otherwise indicated.

Verification:

Disassembly
Assembly

## ALTERNATE EXTEND TORQUE SHAFT ASSEMBLY

## DESCRIPTION AND OPERATION

1. The primary components of the alternate extend torque shaft assembly are two quandrant assemblies, a crank assembly and a common torque shaft.

2. During hydraulic system failure, an electric actuator can turn the torque shaft. This turns the quadrants and the crank assembly. Turning the quadrants moves two control cables that release the right and left main gear doors. This permits the main gear to free fall to the down and locked position. Turning the crank assembly releases the front gear doors, permitting the front gear to free fall to the down and locked position.

3. Leading Particulars (approximate)

   Length -- 17 inches
   Height -- 12 inches
   Width -- 13 inches

DISASSEMBLY

1. Disassembly (IPL Fig. 1)

A. Remove support assembly (60).

(1) Remove the nut (55) from the stub shaft (90).

(2) Slide the support assembly (60) from the stub shaft.

NOTE: Refer to the Repair sections for more disassemble procedures.

B. Disassemble the Support assembly (60).

(1) Remove the bolts (5), washers (10) and nuts (15) to remove the actuator (20), switch (25), and the switch plate (30).

CLEANING

1. Clean all parts by standard industry practices and the instructions in SOPM 20-30-03.

CHECK

1. Examine all parts for defects by standard industry practices.

2. Magnetic particle examine (SOPM 20-20-01) -- stub shaft (90).

3. Penetrant examine (SOPM 20-20-02) -- crank (195, 195A), flanged hub (125,185), quadrant (130,160,165), stop crank (85,85A) and support (75).

# REPAIR - GENERAL

1. Content

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

| P/N | NAME | REPAIR |
|---|---|---|
| 257T3519 | TORQUE SHAFT | 1-1 |
| 257T3511 | ACTUATOR SUPPORT ASSY | 2-1 |
| 257T3512 | STOP CRANK | 3-1 |
| 257T3513 | QUADRANT ASSY | 4-1 |
| 257T3514 | CRANK ASSY | 5-1 |
| 257T3520 | STUB SHAFT | 6-1 |
| - - - | MISCELLANEOUS PARTS | 7-1 |
| - - - | REFINISH | |

2. Standard Practices

A. Refer to the subsequent approved practices, as applicable, for details of the procedures in each repair.

20-00-00 Introduction
20-20-02 Penetrant Methods and Inspections
20-30-02 Stripping of Protective Finishes
20-41-01 Decoding Table for Boeing Finish Codes
20-41-02 Application of Chemical and Solvent Resistant Finishes
20-50-03 Bearing Installation and Retention

3. Materials

NOTE: Equivalent substitutes can be used.

A. Enamel -- BMS 10-11, Type 2, Color 702 (SOPM 20-60-02)

B. Sealant -- BMS 5-95 (SOPM 20-60-04)

C. Primer -- BMS 10-11, Type 1 (SOPM 20-60-02)

D. Grease -- BMS 3-33 or BMS 3-24 (SOPM 20-60-03)

4. Dimensioning Symbols

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

## TORQUE SHAFT - REPAIR 1-1

257T3519-1

1. Disassembly (Fig. 601 and IPL Fig. 1)

   A. Remove the rivets (80) from the stop crank (85) and the stub shaft (90).

   B. Remove the stop crank (85) and the stub shaft (90) from the torque shaft (220).

   C. Remove the rivets (105, 145) from the quadrant assembly (100, 135).

   D. Remove the quadrant (100, 135) from the torque shaft (220).

   E. Remove the rivets (200, 205) from the crank assembly (170, 200).

   F. Remove the crank assembly (170, 200) from the torque shaft (220).

   G. Remove the rivets (105, 145) from the quadrant assembly (100, 140).

   H. Remove the quadrant assembly (100, 140) from the torque shaft (220).

2. Torque Shaft Repair

   NOTE: Refer to REPAIR-GEN for a list of applicable standard practices. Instructions given in Fig. 602 are to repair the finishes of the items.

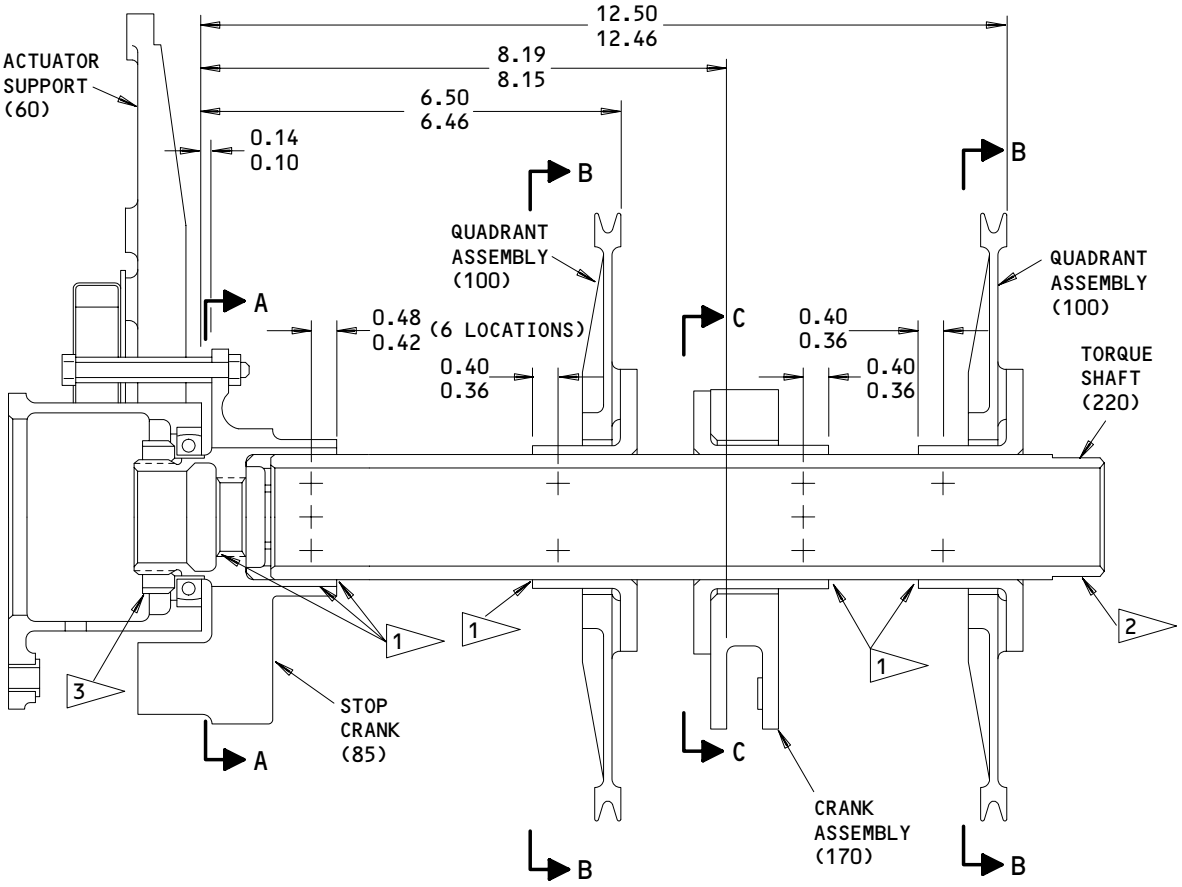
3. Assembly (Refer to Fig. 601 and IPL Fig. 1)

   A. Attach the quadrant assembly (100, 135) to the torque shaft (220) with new rivets (105, 145).

   B. Attach the crank assembly (170, 175) to the torque shaft (220) with new rivets (200, 205).

   C. Attach the other quadrant assembly (100, 140) to the torque shaft (220) with new rivets (105, 145).

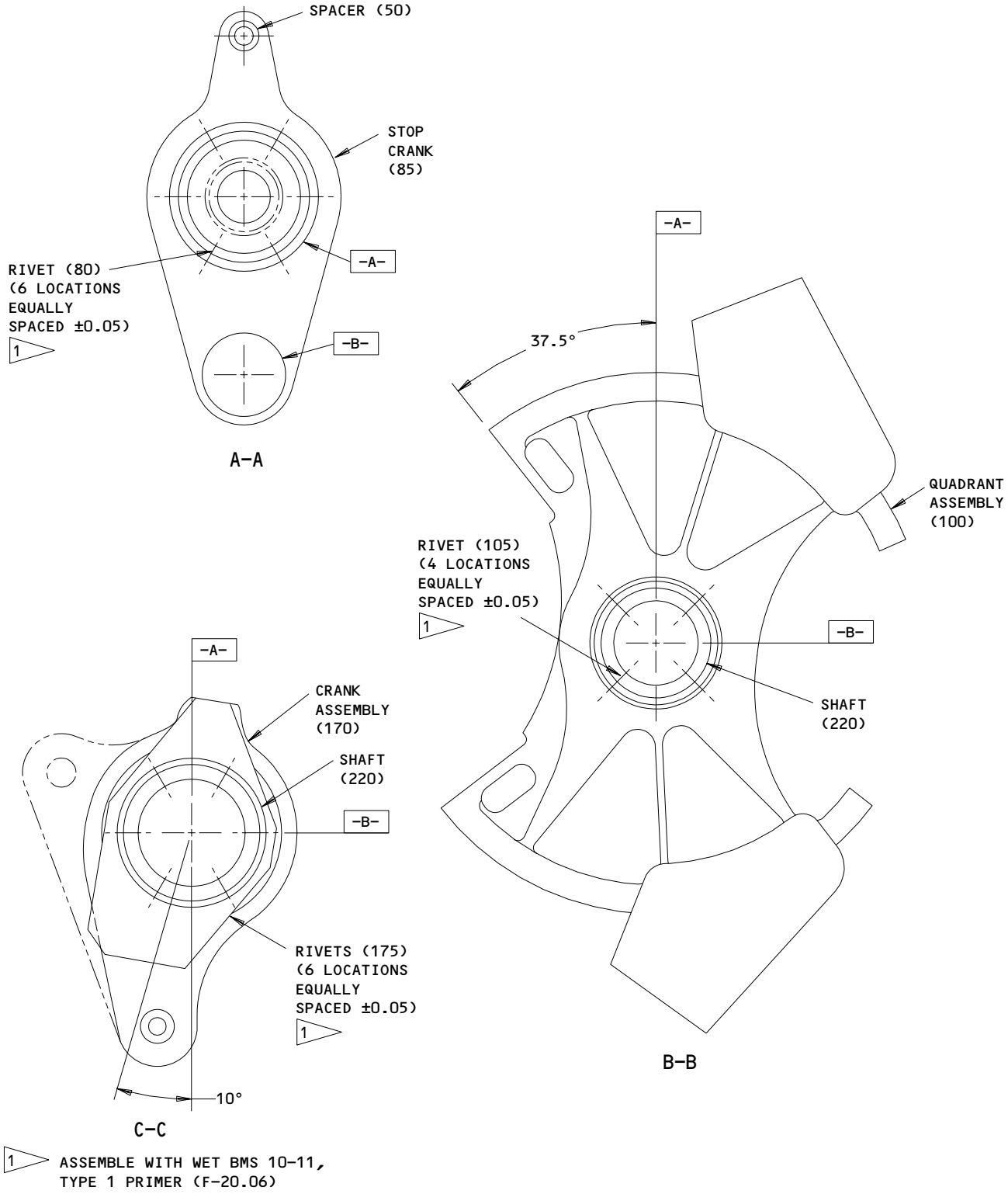
   D. Attach the stop crank (85) and the stub shaft (90) to the torque shaft (220) with new rivets (80).




(257T3501-1 ASSEMBLY)

1 ASSEMBLE WITH WET PRIMER, BMS 10-11, TYPE 1 (F-20.06).
2 DO NOT USE PRIMER ON THIS SURFACE.
3 LIMIT THE TORQUE TO 500-600 INCH-POUNDS.

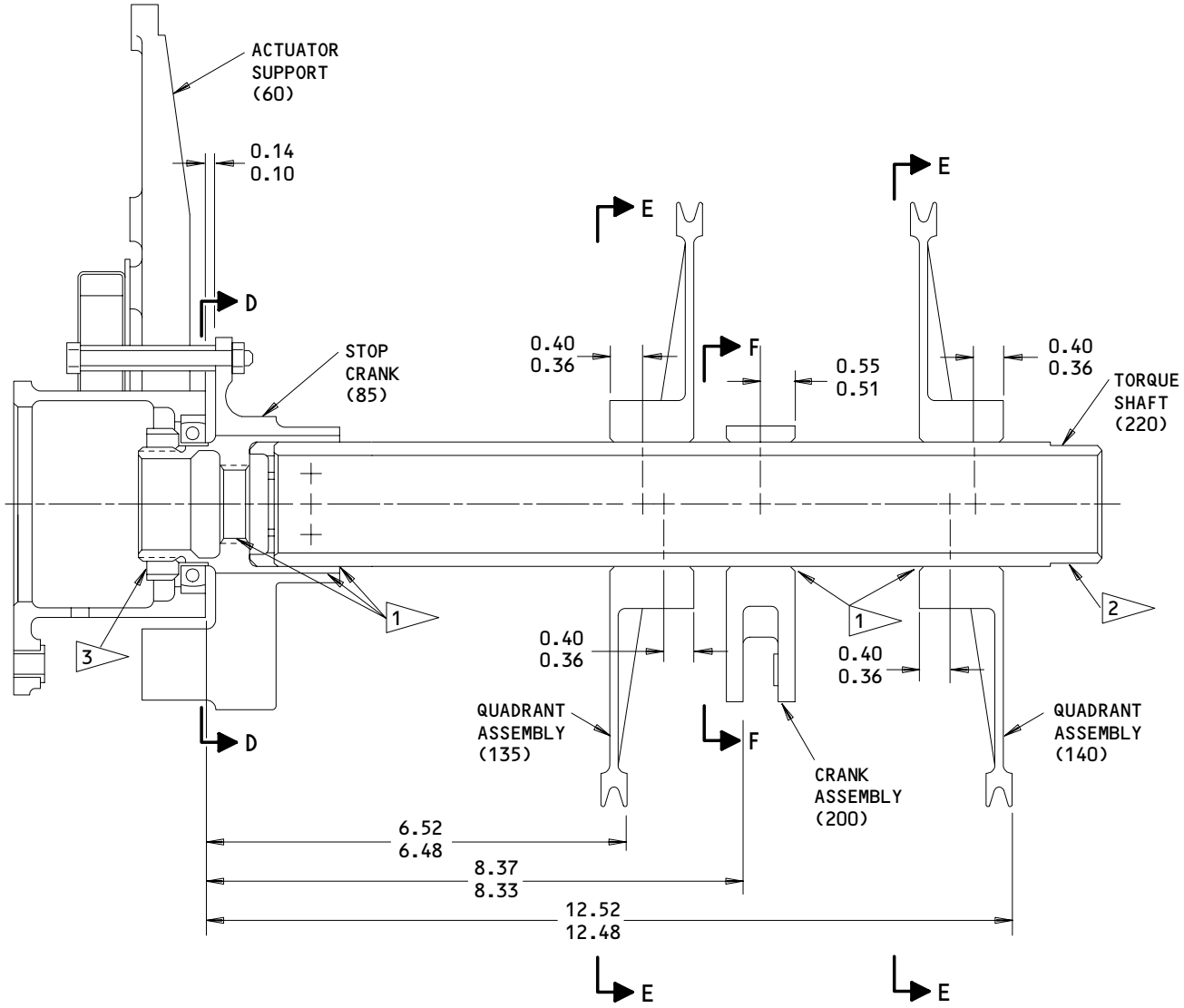
Torque Shaft Repair
Figure 601 (Sheet 1)




Torque Shaft Repair
Figure 601 (Sheet 2)



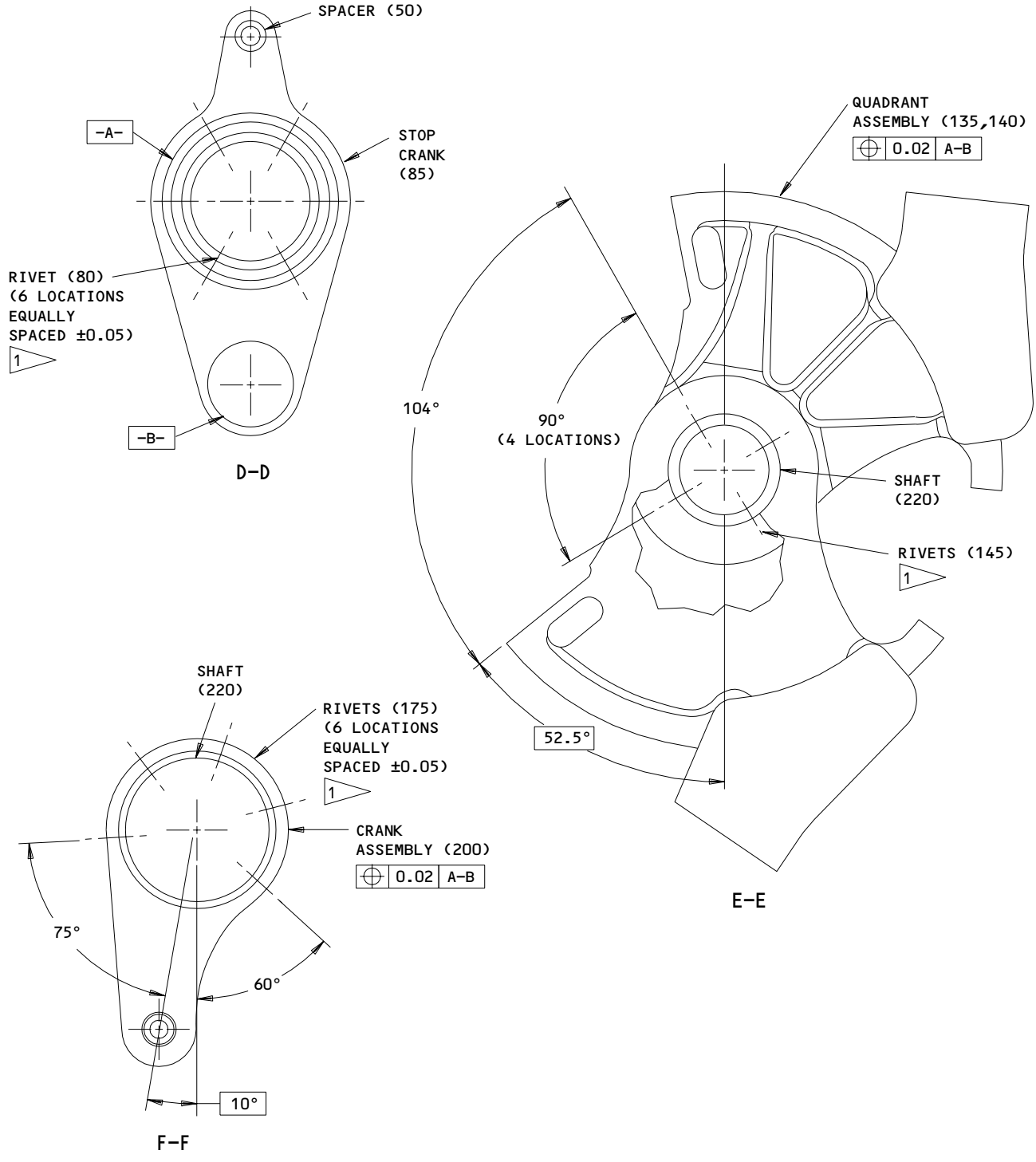
817829




(257T3501-2 ASSEMBLY)

1 ASSEMBLE WITH WET PRIMER, BMS 10-11, TYPE 1 (F-20.06).
2 DO NOT USE PRIMER ON THIS SURFACE.
3 LIMIT THE TORQUE TO 500-600 INCH-ROUNDS.

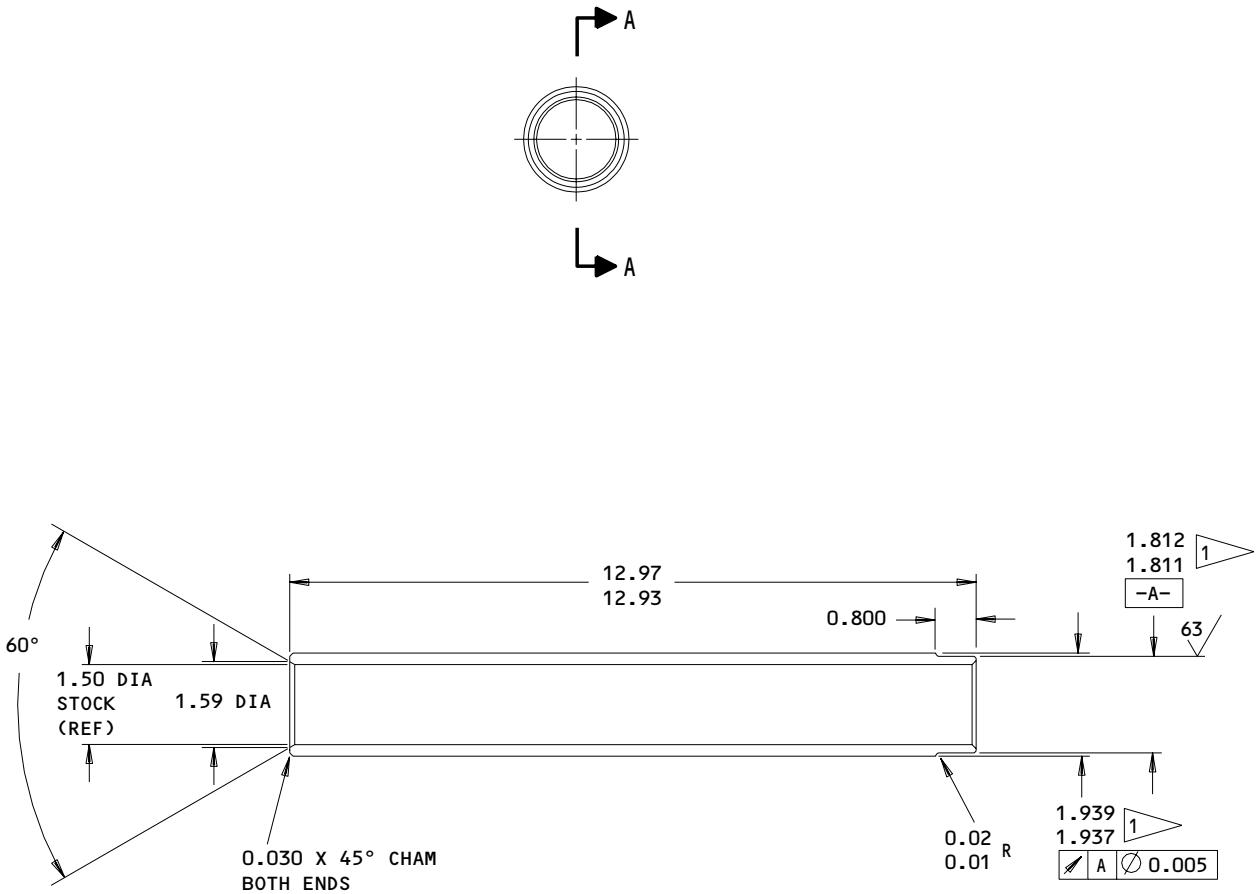
Torque Shaft Repair
Figure 601 (Sheet 3)




Torque Shaft Repair
Figure 601 (Sheet 4)



817860




A-A

REPAIR

CHROMIC ACID ANODIZE, TYPE 1, AND APPLY ONE COAT OF BMS 10-11, TYPE 1 PRIMER (F-18.13).

1 OMIT PRIMER ON THESE SURFACES

125 ON ALL MACHINED SURFACES, UNLESS SHOWN DIFFERENTLY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3519-1
Torque Shaft Repair
Figure 602



793817

ACTUATOR SUPPORT ASSEMBLY - REPAIR 2-1

257T3511-1, -4

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

1. Bearing Replacement (Fig. 601)

   A. Remove the old bearing (65) from the actuator support assembly (60).

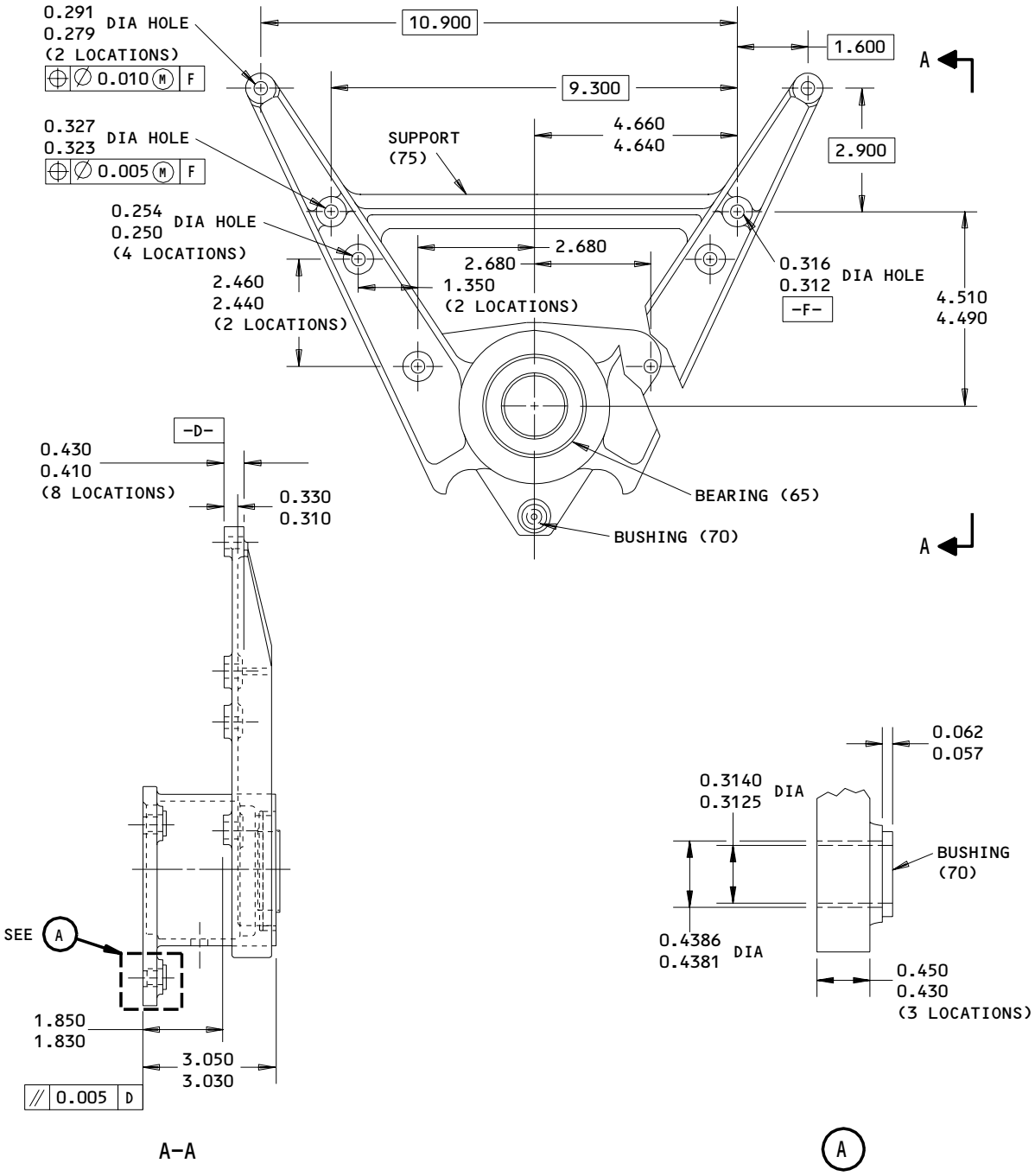
   B. Install a replacement bearing with BMS 5-95 wet sealant and roller swage the housing (SOPM 20-50-03).

2. Bushing Replacement (Fig. 601)

   A. Remove the old bushings from the actuator support assembly (60).

   B. Install replacement bushings by the press-fit method (SOPM 20-50-03).

   C. Make a check of the dimensions and machine them as necessary to the dimensions shown.




REFINISH

CHEMICAL TREAT AND APPLY BMS 10-11, TYPE 1 YELLOW PRIMER AND BMS 10-11, TYPE 2 WHITE GLOSS ENAMEL (F-21.12).

ITEM NUMBERS REFER TO IPL FIG. 1

ALL DIMENSIONS ARE IN INCHES

257T3511-1,-4
Actuator Support Repair
Figure 601



795264

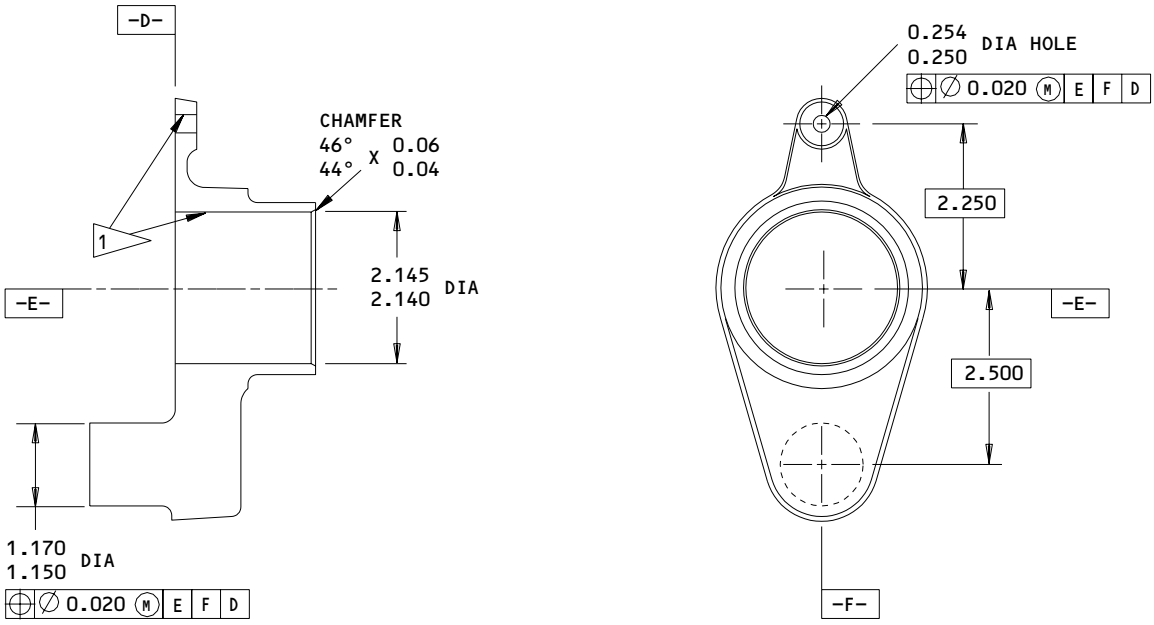
STOP CRANK - REPAIR 3-1

257T3512-1,-3

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

1. Coating Repair (Fig. 601)

A. Repair is only replacement of the original finish.




REFINISH

CHROMIC ACID ANODIZE AND APPLY BMS 10-11, TYPE 1 PRIMER (F-18.13). APPLY BMS 10-11, TYPE 2, COLOR 702 WHITE GLOSS ENAMEL (F-21.03).

1 NO PRIMER OR ENAMEL

REPAIR

(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3512-1,-3
Stop Crank Repair
Figure 601



817947

QUADRANT ASSY - REPAIR 4-1

257T3513-1, -5, -6, -11, -12

NOTE: Refer to REPAIR-GEN for a list of applicable standard practices. Refer to IPL Fig. 1 for item numbers.

1. Parts Replacement (Fig. 601)

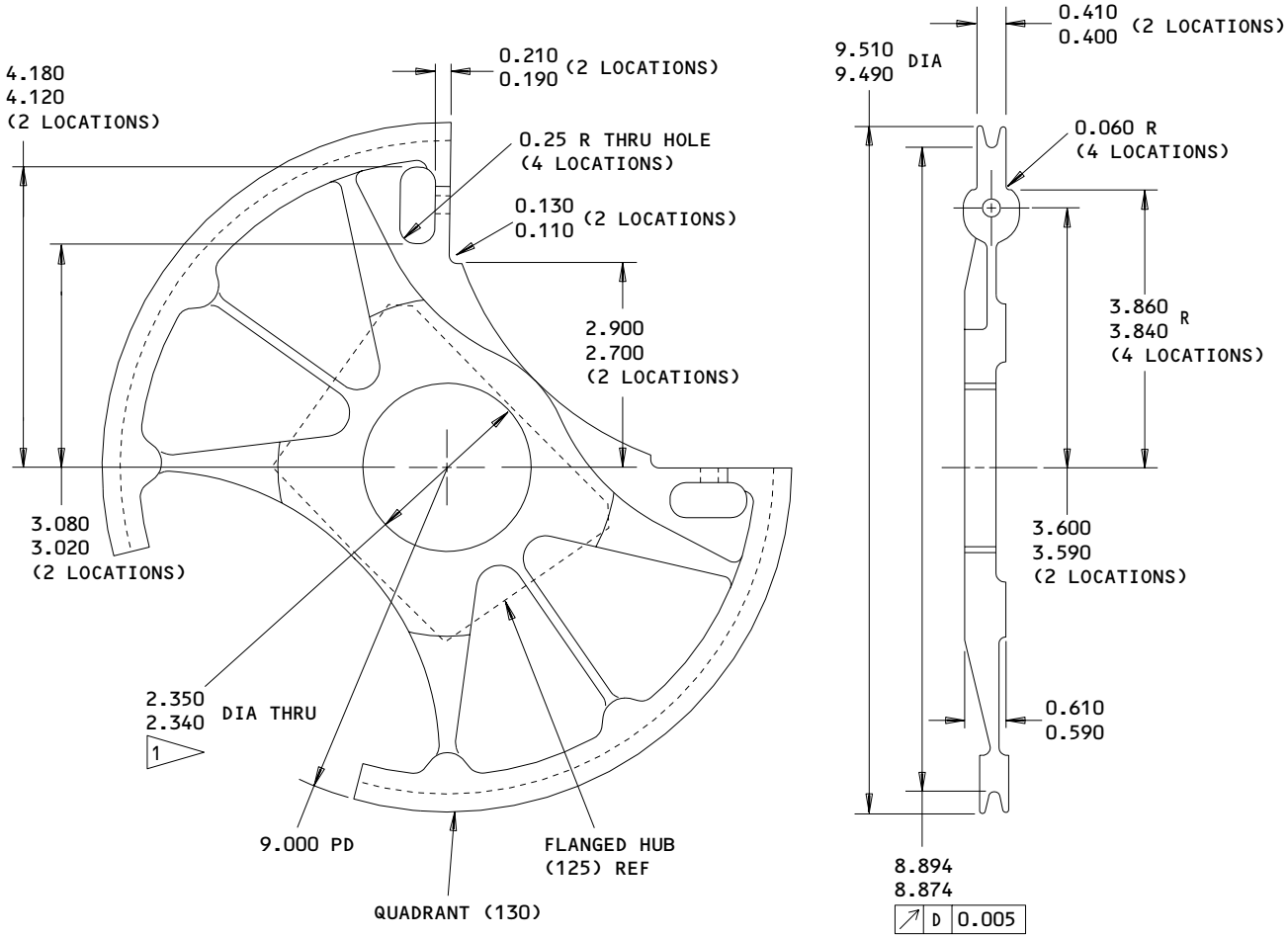
A. On quadrant assembly 257T3513-1, remove rivets (120) and flanged hub (125) from quadrant assembly (100).

B. Remove rivets (110) and cable guards (115).

C. Repair, refinish or replace parts as necessary.

D. On quadrant assembly 257T3513-1, attach flanged hub (125) to quadrant assembly (100) with new rivets (120).

E. Attach cable guards (115) to quadrant assembly (100, 135, 140) with new rivets (110).




REFINISH

CHROMIC ACID ANODIZE (F-17.04). APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02). APPLY BMS 10-11, TYPE 2, COLOR 702 WHITE GLOSS ENAMEL (F-21.03).

1 NO PRIMER OR ENAMEL

REPAIR

(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

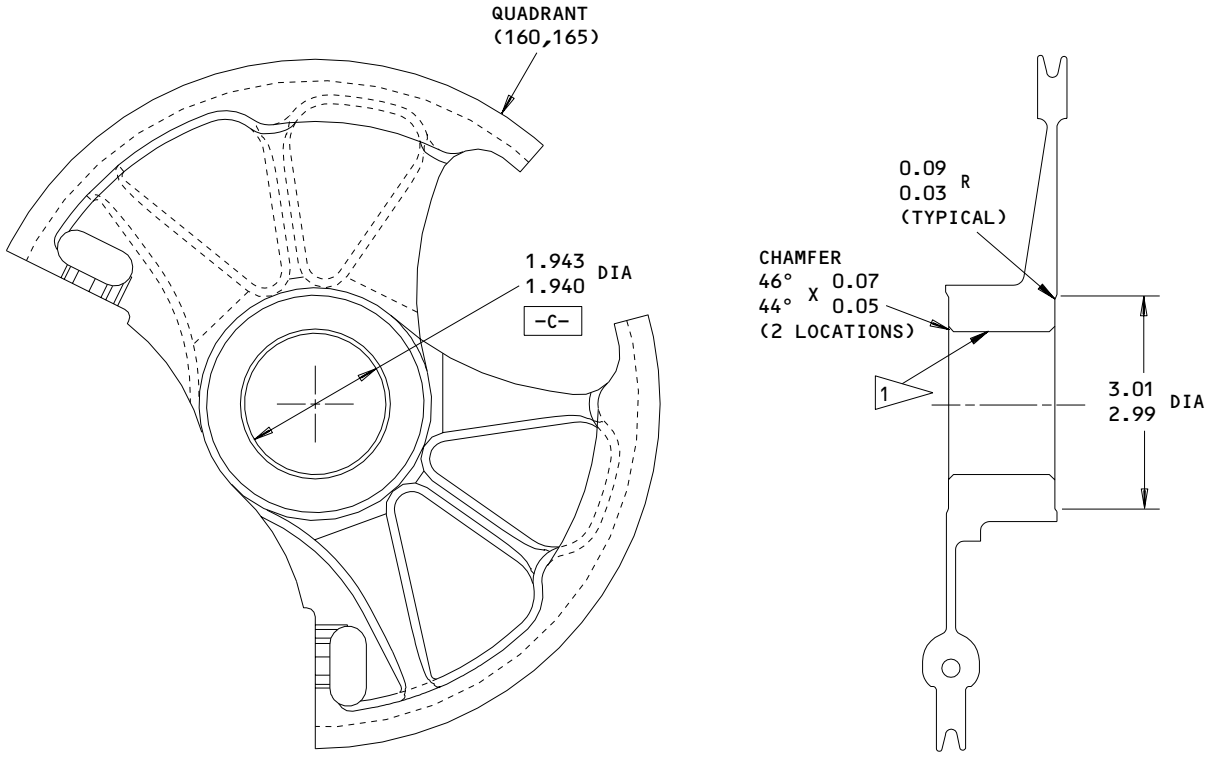
MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3513-1
Quadrant Assembly Repair
Figure 601 (Sheet 1)



818029




REFINISH

CHROMIC ACID OR SULFURIC ACID ANODIZE (F-17.05). APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02). APPLY BMS 10-11, TYPE 2, COLOR 702 WHITE GLOSS ENAMEL (F-21.15), 0.0005-0.0010 THICK.

1 NO PRIMER OR ENAMEL

REPAIR

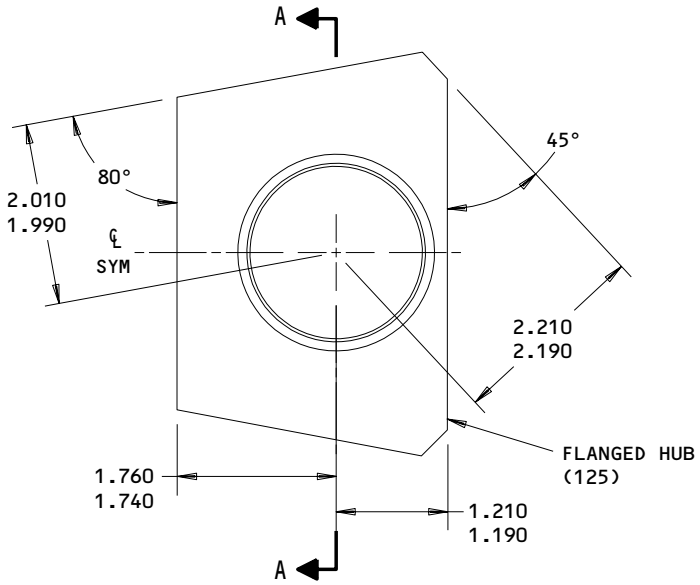
(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

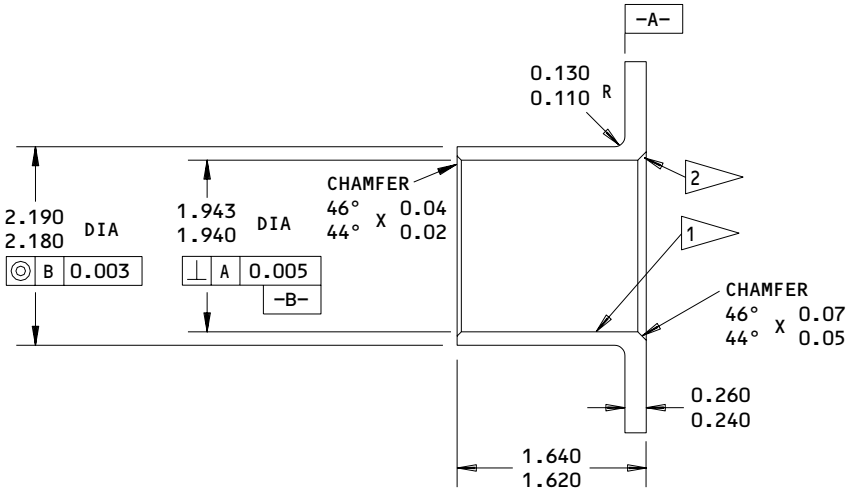
MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3513-5,-6
Quadrant Assembly Repair
Figure 601 (Sheet 2)




257T3525-1




A-A

REFINISH

CHROMIC ACID ANODIZE AND APPLY BMS 10-11, TYPE 1 PRIMER (F-18.13). APPLY BMS 10-11, TYPE 2, COLOR 702 WHITE GLOSS ENAMEL (F-21.03).

1 NO ENAMEL IN THE BORE

2 ENAMEL OPTIONAL ON CHAMFER

REPAIR

(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3525-1
Flanged Hub Repair
Figure 602



818047

## CRANK ASSEMBLY - REPAIR 5-1

257T3514-1, -5

NOTE: Refer to REPAIR-GEN for a list of applicable standard practices. Refer to IPL Fig. 1 for item numbers. For repair of surfaces which is only replacement of the original finish, refer to Refinish instructions.

1. Repair (Fig. 601)

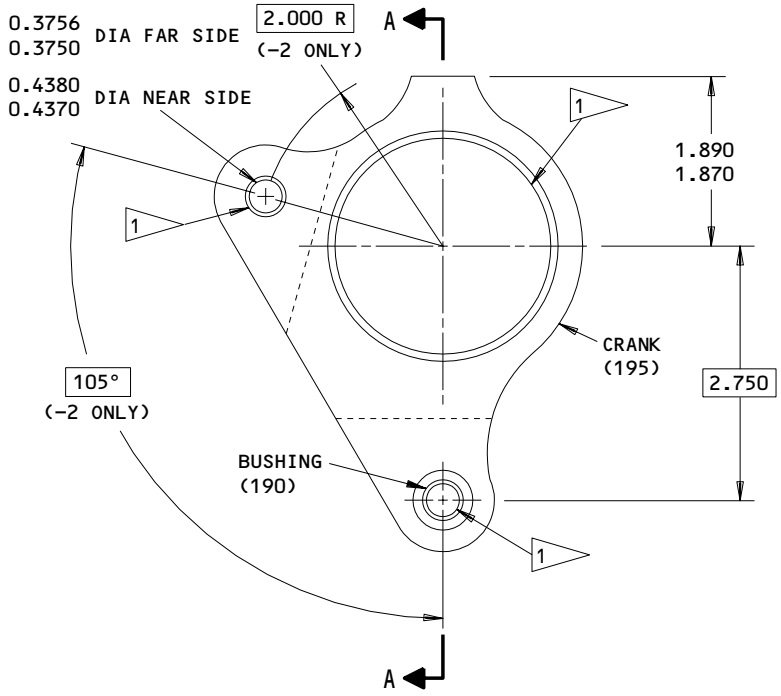
   A. On crank assembly 257T3514-1, remove rivets (180) and flanged hub (185).

   B. Replace parts as necessary.

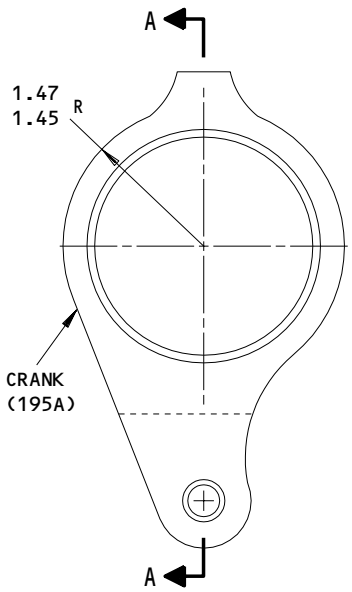
   CAUTION: USE BACR15BB8B26 RIVET ONLY. DO NOT USE SUBSTITUTES.

   C. On crank assembly 257T3514-1, attach flanged hub (185) to crank (195) with new rivets (180).

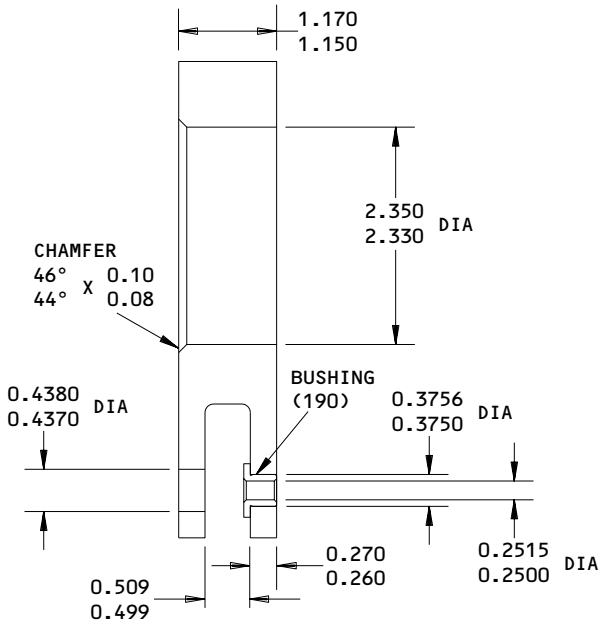
   D. Assemble with grease on the faying surfaces.




257T3514-1
SHOWN WITH 257T3514-2
FOR 257T3514-4 DIFFERENCES SEE (A)




257T3514-4
(A)

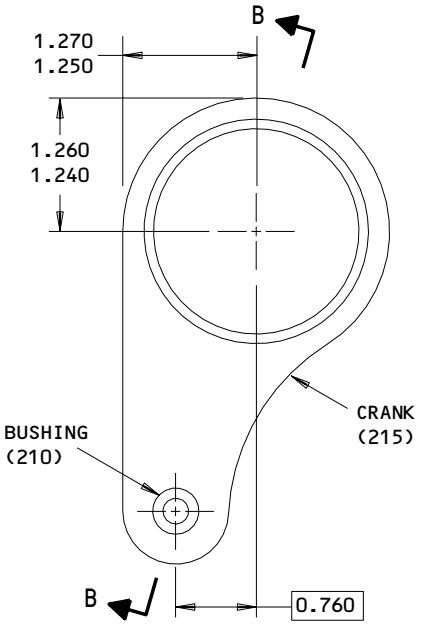



A-A

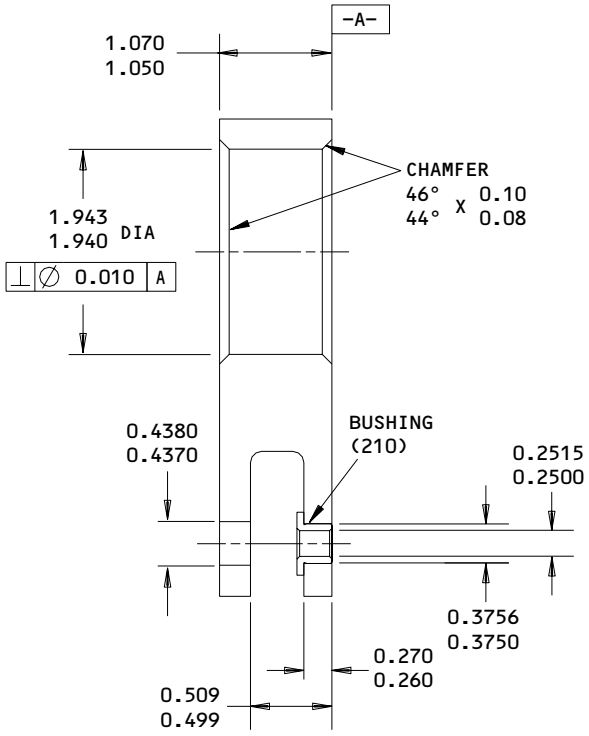
257T3514-1,-5
Crank Assembly Repair
Figure 601 (Sheet 1)



818664




257T3514-5




B-B

REFINISH

CHROMIC ACID ANODIZE AND APPLY BMS 10-11, TYPE 1 PRIMER (F-18.13). APPLY BMS 10-11, TYPE 2 ENAMEL, COLOR 702 WHITE GLOSS (F-21.03).

1 NO PRIMER OR ENAMEL

REPAIR

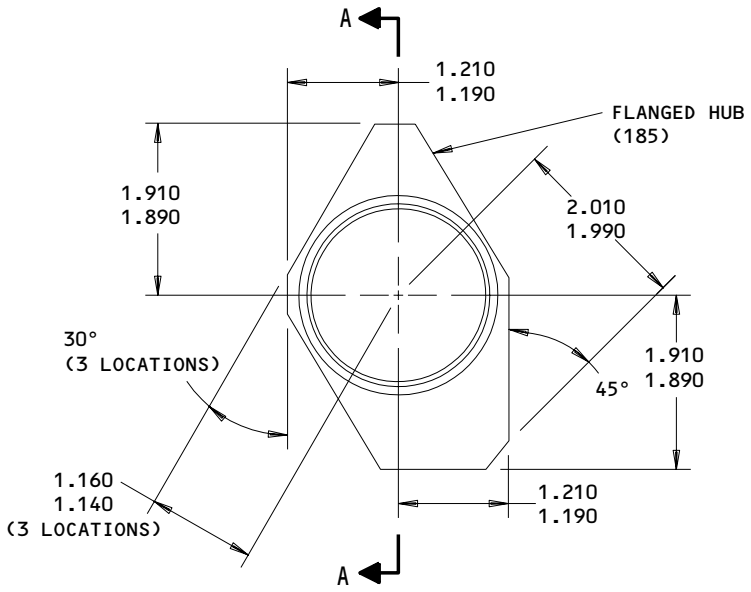
(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

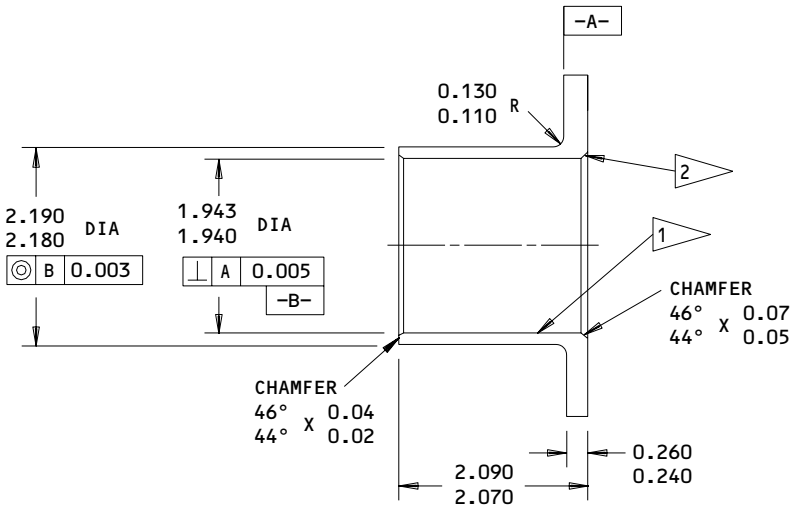
MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

257T3514-1,-5
Crank Assembly Repair
Figure 601 (Sheet 2)




257T3525-2




A-A

REFINISH

CHROMIC ACID ANODIZE AND APPLY BMS 10-11, TYPE 1 PRIMER (F-18.13). APPLY BMS 10-11, TYPE 2 ENAMEL, COLOR 702 WHITE GLOSS (F-21.03).

REPAIR

(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: AL ALLOY

ALL DIMENSIONS ARE IN INCHES

1 NO ENAMEL IN THE BORE.

2 ENAMEL OPTIONAL ON CHAMFER.

257T3525-2
Flanged Hub Repair
Figure 602



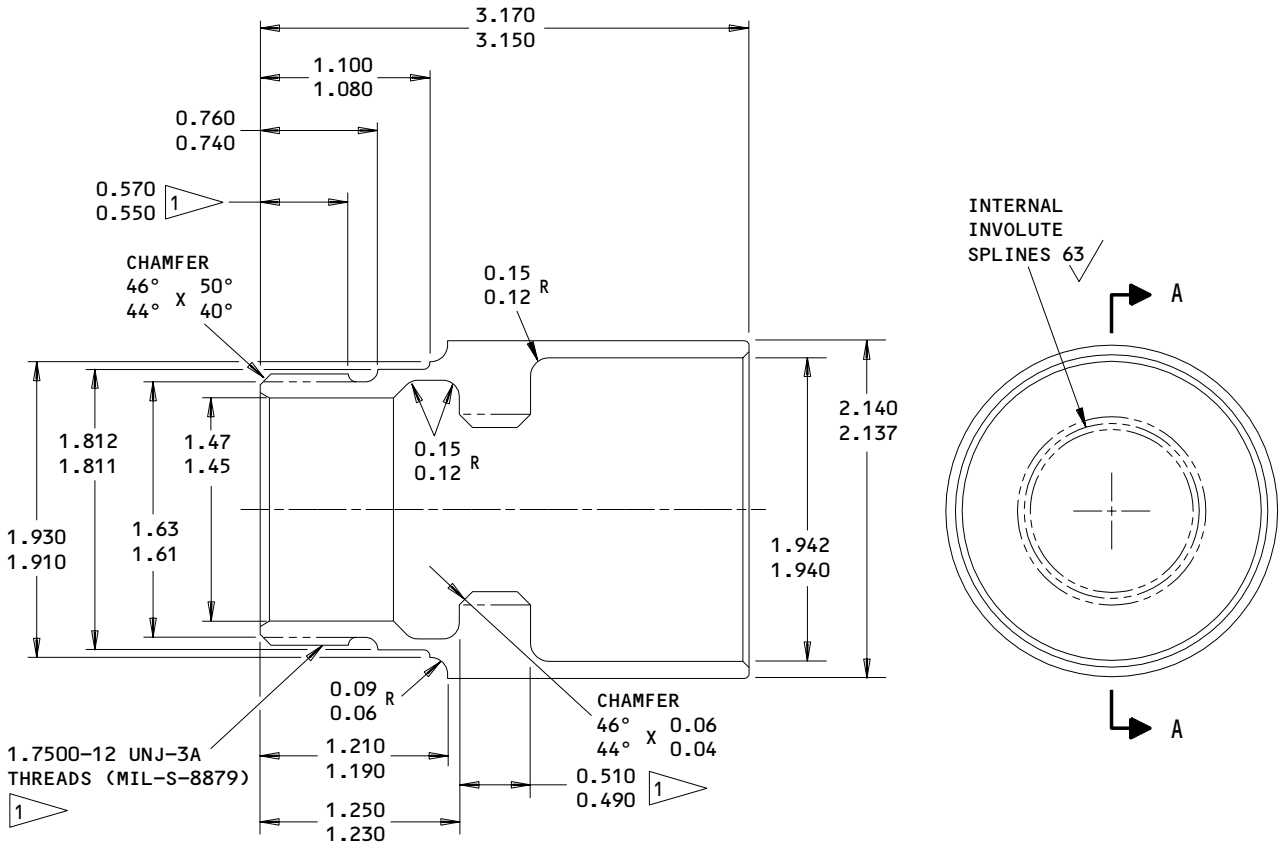
818095

STUB SHAFT - REPAIR 6-1

257T3520-1

1. Repair

A. Repair is only replacement of the original finish. Refer to Refinish instructions in Fig. 601. Refer to REPAIR-GENERAL for applicable standard practices.




A-A

REFINISH

CADMIUM PLATE (F-15.06) APPLY BMS 10-11, TYPE 1 PRIMER (F-20.02).

1 WIPE WITH PRIMER (F-19.45)

REPAIR

(SAME AS REFINISH)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

MATERIAL: 4340 STEEL, 180-200 KSI

ALL DIMENSIONS ARE IN INCHES

257T3520-1
Stub Shaft Repair
Figure 601



818286

MISCELLANEOUS PARTS REFINISH - REPAIR 7-1

1. Refinish of these parts is only replacement of the original finish. Refer to REPAIR-GENERAL for a list of applicable standard practices.

| IPL FIG. & ITEM | MATERIAL | FINISH |
|---|---|---|
| Fig. 1 | | |
| Switch plate (30)<br>Cable Guard (155) | Al alloy | Chemical treat and apply BMS 10-11, type 1 primer (F-18.06). Apply BMS 10-11 type 2 enamel (F-21.03). |
| Spacers (95) | Al alloy | Chromic acid anodize and apply BMS 10-11 type 1 primer (F-18.13) |

Refinish Details
Figure 601

ASSEMBLY

1. Assembly (IPL Fig. 1)

   A. Install the switch plate (30), switch (25) and the actuator (20) with bolts (5), washers (10) and nuts (15).

   B. Slide the support assembly (60) on the stub shaft (90).

   C. Install the nut (55) on the stub shaft (90) and tighten the nut to 500-600 in. lb.

2. Switch Adjustment (Fig. 701)

   A. Loosen the nuts (15) at each end of the switch plate (30).

   B. Put two 0.0875-0.0885 inch diameter pins, as shown, on each side of travel.

   C. Adjust the switches to touch the stop crank (85) when it is turned between its limits of travel.

   D. Tighten the nuts (15).

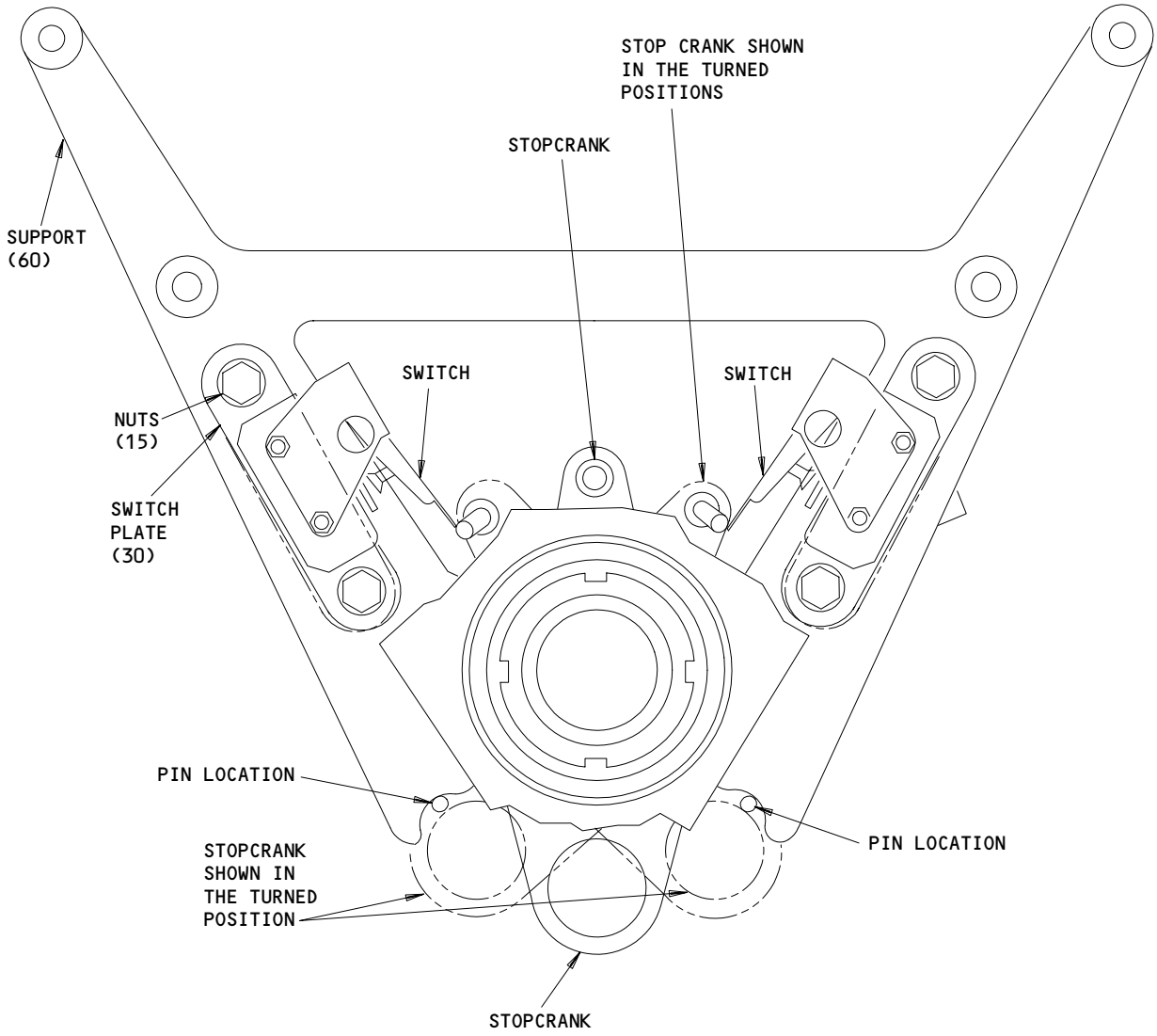
   E. Put two 0.0655-0.0665 inch diameter pins as shown.

   F. Turn the stop crank and make sure it touches and operates the switch before it touches the pins.

   G. Put two 0.1095-0.1105 inch diameter pins as shown.

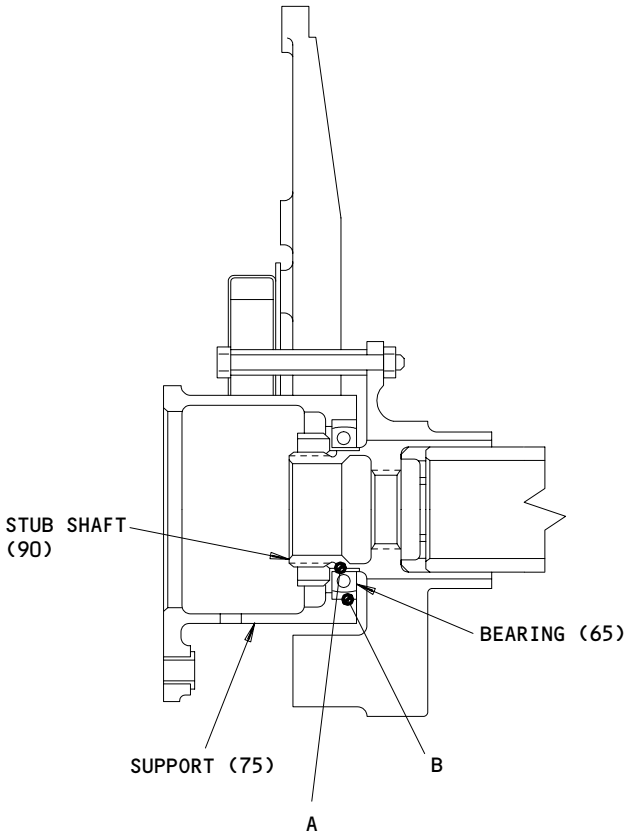
   H. Turn the stop crank and make sure it touches the pins before it touches the switches. Make sure the switches do not operate.

   NOTE: You can measure the electrical continuity through the common (C) and normally open (N.O.) terminals to see if the switches operate.




NOTE: THE QUADRANTS ARE NOT SHOWN.

Shaft Assembly Adjustment
Figure 701




| REF LETTER FIG. 801 | MATING ITEM NO. IPL FIG.1 | DESIGN DIMENSION | | | | SERVICE WEAR LIMIT | | |
|---|---|---|---|---|---|---|---|---|
| | | DIMENSION | | ASSEMBLY CLEARENCE | | DIMENSION | | MAXIMUM CLEARENCE |
| | | MIN | MAX | MIN | MAX | MIN | MAX | |
| A | ID 65<br>OD 90 | 1.8120<br>1.8110 | 1.8130<br>1.8120 | 0.0000 | 0.0020 | 1.8080 | 1.8160 | 0.0040 |
| B | ID 75<br>OD 65 | 2.7500<br>2.7490 | 2.7510<br>2.7500 | 0.0000 | 0.0020 | 2.7460 | 2.7540 | 0.0040 |

Fits and Clearances
Figure 801

818139

## ILLUSTRATED PARTS LIST

1. This section lists and illustrates replaceable or repairable component parts. The Illustrated Parts Catalog contains a complete explanation of the Boeing part numbering system.

2. Indentures show parts relationships as follows:

   Assembly
     Detail Parts for Assembly
     Subassembly
     Attaching Parts for Subassembly
       Detail Parts for Subassembly

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

3. One use code letter (A, B, C, etc.) is assigned in the EFF CODE column for each variation of top assembly. All listed parts are used on all top assemblies except when limitations are shown by use code letter opposite individual part entries.

4. Letter suffixes (alpha-variants) are added to item numbers for optional parts, Service Bulletin modification parts, configuration differences (except left- and right-hand parts), product improvement parts, and parts added between two sequential item numbers. The alpha-variant is not shown on illustrations when appearance and location of all variants of the part is the same.

5. Service Bulletin modifications are shown by the notations PRE SB XXXX and POST SB XXXX.

   A. When a new top assembly part number is assigned by SErvice Bulletin, the notations appear at the top assembly level only. The configuration differences at detail part level are then shown by use code letter.

   B. When the top assembly part number is not changed by the Service Bulletin, the notations appear at the detail part level.

6. Parts Interchangeability

| | |
|---|---|
| Optional (OPT) | The parts are optional to and interchangeable with other parts having the same item number. |
| Supersedes, Superseded By (SUBSDS, SUPSD BY) | The part supersedes and is not interchangeable with the original part. |
| Replaces, Replaced By (REPLS, REPLD BY) | The part replaces and is interchangeable with, or is an alternate to, the original part. |

VENDORS

06144 INDUSTRIAL TECTONICS BEARING CORP
18301 SOUTH SANTA FE AVENUE
RANCO DOMINQUEZ, CALIFORNIA 90221
FORMERLY IN COMPTON, CALIFORNIA

21335 TORRINGTON CO FAFNIR BEARING DIV
59 FIELD STREET
TORRINGTON, CONNECTICUT 06790-1008
FORMERLY FAFNIR BRG AND TEXTRON INC FAFNIR DIV IN
NEW BRITAIN, CONNECTICUT

38443 MRC BEARINGS
402 CHANDLER STREET
JAMESTOWN, NEW YORK 14701-3802
FORMERLY MARLIN-ROCKWELL CORP DIV TRW AND TRW INC

40920 MPB MINIATURE PRECISION BEARING DIV
PRECISION PARK PO BOX 547
KEENE, NEW HAMPSHIRE 03431
FORMERLY MPB CORP AND MINIATURE BRG DIV MPB CORP

56878 SPS TECHNOLOGIES INC AEROSPACE AND INDUSTRIAL PRODUCTS DIV
HIGHLAND AVENUE
JENKINTOWN, PENNSYLVANIA 19046
FORMERLY STANDARD PRESSED STEEL

72962 HARVARD INDUSTRIES INC
3 WERNER WAY SUITE 210
LEBANON, NEW JERSEY 08833
FORMERLY AMERACE CORP ESNA DIV
FORMERLY ELASTIC STOP NUT IN UNION, NJ

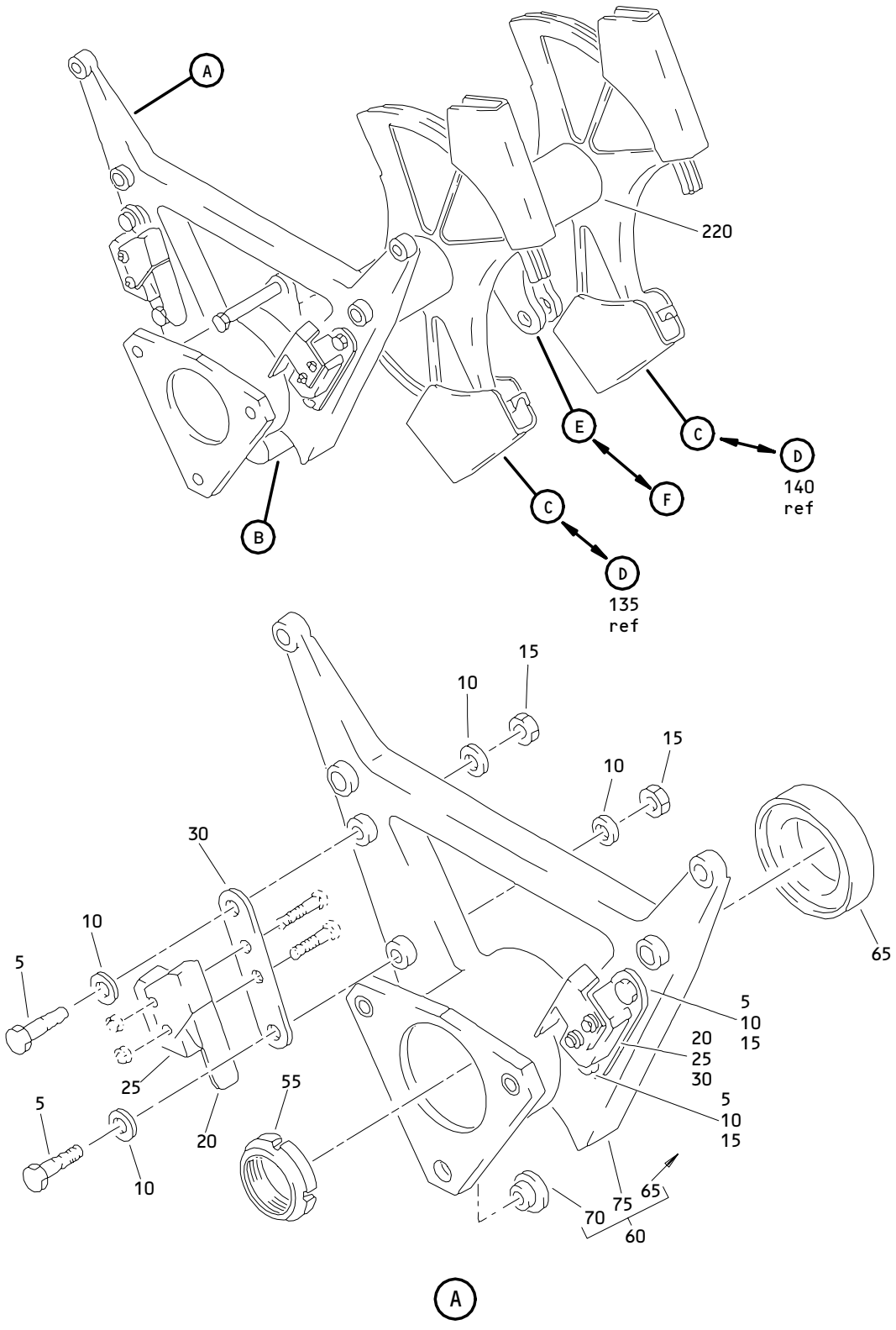
83086 NEW HAMPSHIRE BALL BEARINGS, INCORPORATED
ROUTE 202
PETERBOROUGH, NEW HAMPSHIRE 03458

91929 HONEYWELL INC MICRO SWITCH DIV
11 WEST SPRING STREET
FREEPORT, ILLINOIS 61032
FORMERLY MICRO SWITCH A DIV OF HONEYWELL
FORMERLY V74059 AND V40228

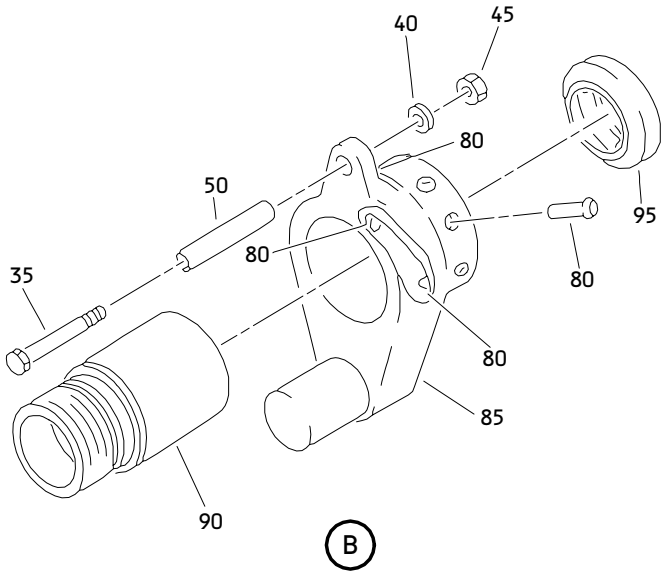
97393 SHUR-LOK CORPORATION
2541 WHITE ROAD PO BOX 19584
IRVINE, CALIFORNIA 92713
FORMERLY SHUR LOK CORP VB0060
FORMERLY IN SANTA ANA, CALIFORNIA 92714

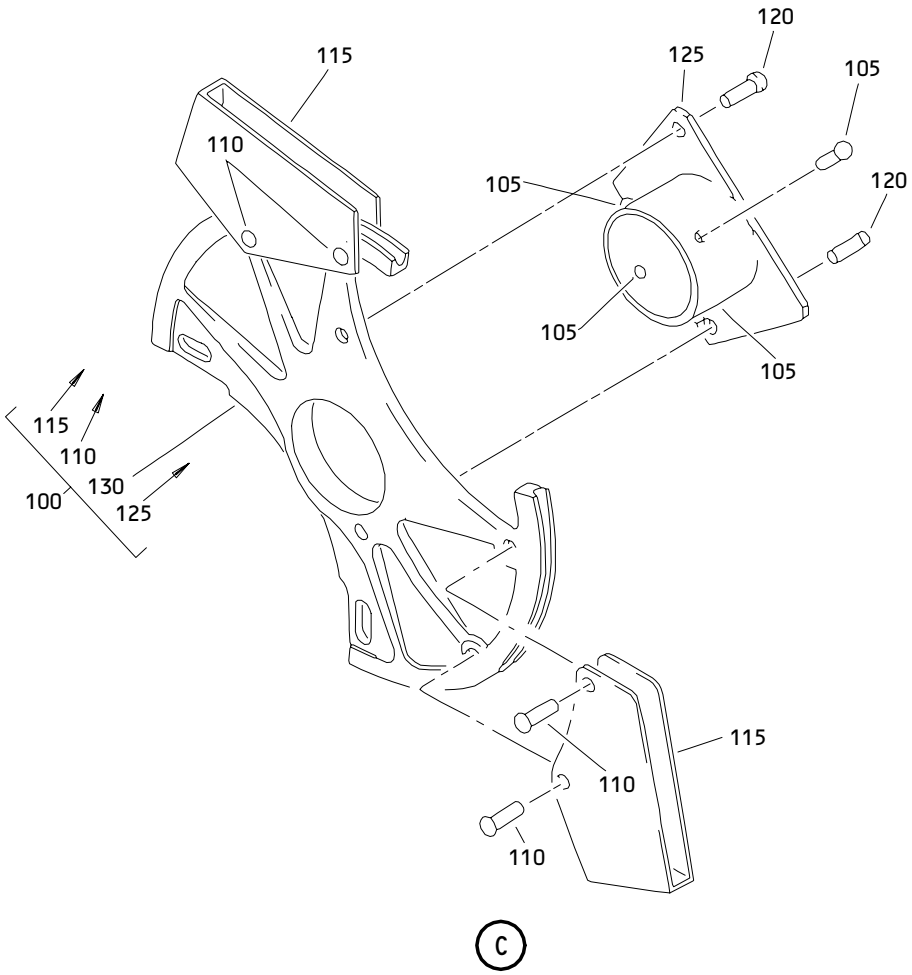
| PART NUMBER | AIRLINE PART NO. | FIG. | ITEM | TTL REQ |
|---|---|---|---|---|
| ADH3721R2 | | 1 | 20 | 2 |
| AN960JD416L | | 1 | 10A | 8 |
| | | 1 | 40A | 1 |
| AN960KD416L | | 1 | 10 | 8 |
| | | 1 | 40 | 1 |
| BACA12D2 | | 1 | 20 | 2 |
| BACB10EX29 | | 1 | 65 | 1 |
| BACN10JC4 | | 1 | 15 | 4 |
| | | 1 | 45 | 1 |
| BACN10RF28 | | 1 | 55 | 1 |
| BACR15BB5AD | | 1 | 110 | 8 |
| | | 1 | 150 | 8 |
| BACR15BB8B18 | | 1 | 120 | 4 |
| BACR15BB8B26 | | 1 | 180 | 3 |
| BR9080-2812 | | 1 | 55 | 1 |
| KP29BS | | 1 | 65 | 1 |
| KP29BSFS428 | | 1 | 65 | 1 |
| KP29BSLY196 | | 1 | 65 | 1 |
| KP29BSNJC | | 1 | 65 | 1 |
| KP29BSSD610 | | 1 | 65 | 1 |
| KP29BS2 | | 1 | 65 | 1 |
| MS21042L4 | | 1 | 15A | 4 |
| | | 1 | 45A | 1 |
| MS25011-2 | | 1 | 25 | 2 |
| MS27648-29 | | 1 | 65A | 1 |
| MS90354U0807 | | 1 | 80A | 6 |
| MS90354U0808 | | 1 | 205A | 5 |
| MS90354-0805 | | 1 | 105 | 8 |
| | | 1 | 175 | 6 |
| MS90354-0807 | | 1 | 80 | 6 |
| MS90354-0808 | | 1 | 205 | 5 |
| MS90354-0814 | | 1 | 145 | 8 |
| NAS43HT4-138 | | 1 | 50 | 1 |
| NAS6604-38 | | 1 | 35 | 1 |
| NAS6604-7 | | 1 | 5 | 4 |
| NAS77-4-24 | | 1 | 190 | 1 |
| | | 1 | 210 | 1 |
| NAS77-5-42 | | 1 | 70 | 3 |
| SL2822-28 | | 1 | 55 | 1 |
| 257T3501-1 | | 1 | 1 | RF |
| 257T3501-2 | | 1 | 1A | RF |
| 257T3501-3 | | 1 | 1B | RF |
| 257T3501-4 | | 1 | 1C | RF |
| 257T3501-5 | | 1 | 1D | RF |
| 257T3511-1 | | 1 | 60 | 1 |

| PART NUMBER | AIRLINE PART NO. | FIG. | ITEM | TTL REQ |
|---|---|---|---|---|
| 257T3511-2 | | 1 | 75 | 1 |
| 257T3511-4 | | 1 | 60A | 1 |
| 257T3511-5 | | 1 | 75A | 1 |
| 257T3512-1 | | 1 | 85 | 1 |
| 257T3512-3 | | 1 | 85A | 1 |
| 257T3513-1 | | 1 | 100 | 2 |
| 257T3513-11 | | 1 | 135A | 1 |
| 257T3513-12 | | 1 | 140B | 1 |
| 257T3513-2 | | 1 | 130 | 2 |
| 257T3513-5 | | 1 | 135 | 1 |
| 257T3513-6 | | 1 | 140 | 1 |
| 257T3513-7 | | 1 | 160 | 1 |
| 257T3513-8 | | 1 | 165 | 1 |
| 257T3514-1 | | 1 | 170 | 1 |
| 257T3514-2 | | 1 | 195 | 1 |
| 257T3514-4 | | 1 | 195A | 1 |
| 257T3514-5 | | 1 | 200 | 1 |
| 257T3514-6 | | 1 | 215 | 1 |
| 257T3516-1 | | 1 | 115 | 4 |
| | | 1 | 155 | 4 |
| 257T3516-2 | | 1 | 155A | 4 |
| 257T3517-1 | | 1 | 95 | 1 |
| 257T3519-1 | | 1 | 220 | 1 |
| 257T3520-1 | | 1 | 90 | 1 |
| 257T3525-1 | | 1 | 125 | 2 |
| 257T3525-2 | | 1 | 185 | 1 |
| 257T3526-1 | | 1 | 30 | 2 |
| 82631-2812 | | 1 | 55 | 1 |




Torque Shaft Assembly
Figure 1 (Sheet 1)

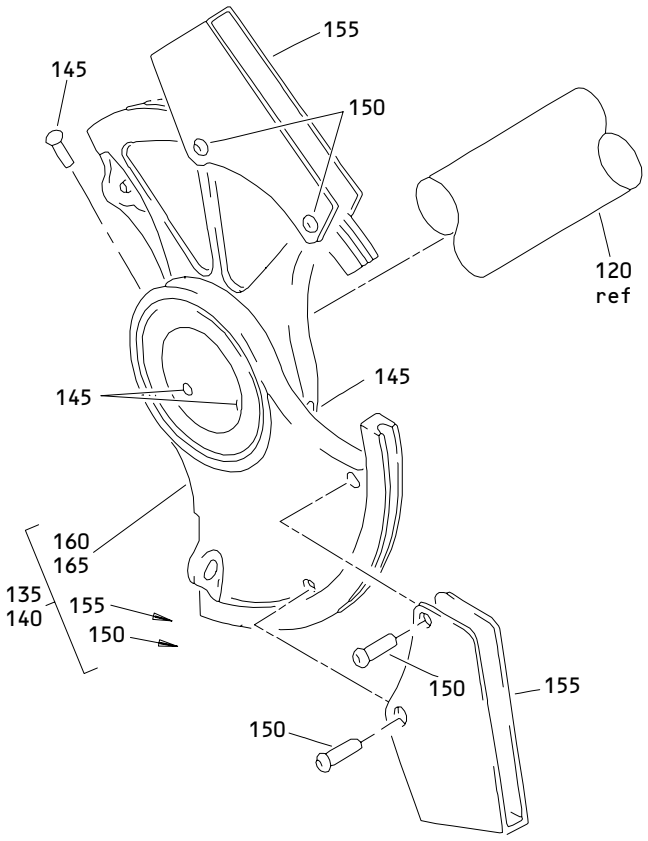


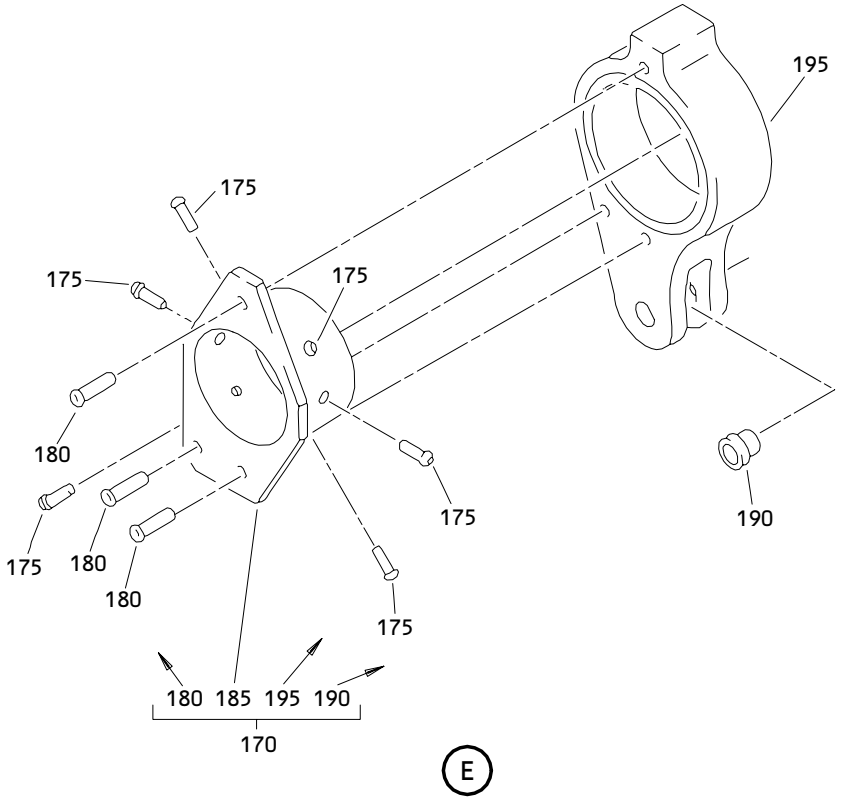

Torque Shaft Assembly
Figure 1 (Sheet 2)

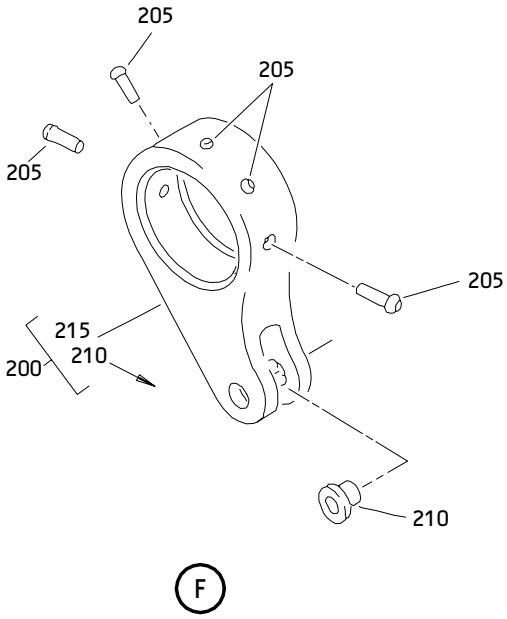


816905




Torque Shaft Assembly
Figure 1 (Sheet 3)




Torque Shaft Assembly
Figure 1 (Sheet 4)

| | FIG. & ITEM | PART NO. | AIRLINE PART NUMBER | NOMENCLATURE 1234567 | EFF CODE | QTY PER ASSY |
|---|---|---|---|---|---|---|
| | 01- | | | | | |
| | -1 | 257T3501-1 | | SHAFT ASSY-LG ALTERNATE EXTEND TORQUE | A | RF |
| | -1A | 257T3501-2 | | SHAFT ASSY-LG ALTERNATE EXTEND TORQUE | B | RF |
| R | -1B | 257T3501-3 | | SHAFT ASSY-LG ALTERNATE EXTEND TORQUE | C | RF |
| R | -1C | 257T3501-4 | | SHAFT ASSY-LG ALTERNATE EXTEND TORQUE | D | RF |
| R | -1D | 257T3501-5 | | SHAFT ASSY-LG ALTERNATE EXTEND TORQUE | E | RF |
| | 5 | NAS6604-7 | | .BOLT | | 4 |
| | 10 | AN960KD416L | | .WASHER | A | 8 |
| | -10A | AN960JD416L | | .WASHER | B-E | 8 |
| | 15 | BACN10JC4 | | .NUT | A | 4 |
| | -15A | MS21042L4 | | .NUT | B-E | 4 |
| | 20 | ADH3721R2 | | .ACTUATOR- (V91929) (SPEC BACA12D2) | | 2 |
| | 25 | MS25011-2 | | .SWITCH | | 2 |
| | 30 | 257T3526-1 | | .PLATE-SWITCH | | 2 |
| | 35 | NAS6604-38 | | .BOLT | | 1 |
| | 40 | AN960KD416L | | .WASHER | A | 1 |
| | -40A | AN960JD416L | | .WASHER | B-E | 1 |
| | 45 | BACN10JC4 | | .NUT | A | 1 |
| | -45A | MS21042L4 | | .NUT | B-E | 1 |
| | 50 | NAS43HT4-138 | | .SPACER | | 1 |
| | 55 | SL2822-28 | | .NUT- (V97393) (SPEC BACN10RF28) (OPT 82631-2812 (V56878)) (OPT BR9080-2812 (V72962)) | | 1 |
| | 60 | 257T3511-1 | | .SUPPORT ASSY-ACTR | A-C | 1 |
| R | -60A | 257T3511-4 | | .SUPPORT ASSY-ACTR | DE | 1 |

| | FIG. & ITEM | PART NO. | AIRLINE PART NUMBER | NOMENCLATURE 1234567 | EFF CODE | QTY PER ASSY |
|---|---|---|---|---|---|---|
| | 01-65 | KP29BSLY196 | | ..BEARING-<br>(V40920)<br>(SPEC BACB10EX29)<br>(OPT KP29BSSD610<br>(V83086))<br>(OPT KP29BS<br>(V06144))<br>(OPT KP29BSFS428<br>(V21335))<br>(OPT KP29BS2<br>(V38443))<br>(OPT KP29BSNJC<br>(V06144))<br>(OPT ITEM 65A) | | 1 |
| R | -65A | MS27648-29 | | ..BEARING-<br>(OPT ITEM 65) | | 1 |
| | 70 | NAS77-5-42 | | ..BUSHING | | 3 |
| | 75 | 257T3511-2 | | ..SUPPORT<br>(USED ON ITEM 60) | | 1 |
| R | -75A | 257T3511-5 | | ..SUPPORT<br>(USED ON ITEM 60A) | | 1 |
| | 80 | MS90354-0807 | | .RIVET | A-D | 6 |
| R | -80A | MS90354U0807 | | .RIVET | E | 6 |
| | 85 | 257T3512-1 | | .CRANK-STOP<br>(OPT ITEM 85A) | | 1 |
| | -85A | 257T3512-3 | | .CRANK-STOP<br>(OPT ITEM 85) | | 1 |
| | 90 | 257T3520-1 | | .SHAFT-STUB | | 1 |
| | 95 | 257T3517-1 | | .SPACER | | 1 |
| | 100 | 257T3513-1 | | .QUADRANT ASSY<br>ATTACHING PARTS | A | 2 |
| | 105 | MS90354-0805 | | .RIVET<br>-------*------- | A | 8 |
| | 110 | BACR15BB5AD | | ..RIVET-<br>(SIZE DETERMINE ON INST) | | 4 |
| | 115 | 257T3516-1 | | ..GUARD-CABLE | | 2 |
| | 120 | BACR15BB8B18 | | ..RIVET | | 2 |
| | 125 | 257T3525-1 | | ..HUB | | 1 |
| | 130 | 257T3513-2 | | ..QUADRANT | | 1 |
| | 135 | 257T3513-5 | | .QUADRANT ASSY | B | 1 |
| R | -135A | 257T3513-11 | | .QUADRANT ASSY | CDE | 1 |
| | 140 | 257T3513-6 | | .QUADRANT ASSY | B | 1 |
| R | -140A | 257T3513-6 | | .QUADRANT ASSY-<br>(LIMITED)<br>(OPT ITEM 140B) | CD | 1 |

| | FIG. & ITEM | PART NO. | AIRLINE PART NUMBER | NOMENCLATURE 1234567 | EFF CODE | QTY PER ASSY |
|---|---|---|---|---|---|---|
| | 01- | | | | | |
| R | -140B | 257T3513-12 | | .QUADRANT ASSY- (OPT ITEM 140A) | CD | 1 |
| R | -140C | 257T3513-12 | | .QUADRANT ASSY | E | 1 |
| | | | | ATTACHING PARTS | | |
| | 145 | MS90354-0814 | | .RIVET | B-E | 8 |
| | | | | -------*------- | | |
| | 150 | BACR15BB5AD | | ..RIVET- (SIZE DETERMINE ON INST) | | 4 |
| | 155 | 257T3516-1 | | ..GUARD-CABLE (USED ON ITEM 140A) | | 2 |
| R | -155A | 257T3516-2 | | ..GUARD-CABLE (USED ON ITEMS 135A, 140B) | | 2 |
| | 160 | 257T3513-7 | | ..QUADRANT- (USED ON ITEMS 135, 135A) | | 1 |
| | 165 | 257T3513-8 | | ..QUADRANT- (USED ON ITEMS 140, 140A,140B,140C) | | 1 |
| | 170 | 257T3514-1 | | .CRANK ASSY | A | 1 |
| | | | | ATTACHING PARTS | | |
| | 175 | MS90354-0805 | | .RIVET | A | 6 |
| | | | | -------*------- | | |
| | 180 | BACR15BB8B26 | | ..RIVET | | 3 |
| | 185 | 257T3525-2 | | ..HUB | | 1 |
| | 190 | NAS77-4-24 | | ..BUSHING | | 1 |
| | 195 | 257T3514-2 | | ..CRANK- (OPT ITEM 195A) | | 1 |
| | -195A | 257T3514-4 | | ..CRANK- (OPT ITEM 195) | | 1 |

| | FIG. & ITEM | PART NO. | AIRLINE PART NUMBER | NOMENCLATURE 1234567 | EFF CODE | QTY PER ASSY |
|---|---|---|---|---|---|---|
| | 01- | | | | | |
| | 200 | 257T3514-5 | | .CRANK ASSY | B-E | 1 |
| | | | | ATTACHING PARTS | | |
| | 205 | MS90354-0808 | | .RIVET | B-D | 5 |
| R | -205A | MS90354U0808 | | .RIVET | E | 5 |
| | | | | -------*------- | | |
| | 210 | NAS77-4-24 | | ..BUSHING | | 1 |
| | 215 | 257T3514-6 | | ..CRANK | | 1 |
| | 220 | 257T3519-1 | | .SHAFT | | 1 |

- Item Not Illustrated