TO: ALL HOLDERS OF JT9D-7R4 FUEL CONTROL BOX ASSEMBLY COMPONENT MAINTENANCE MANUAL 76-11-11

REVISION NO. 20 DATED NOV 01/05

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
REPAIR-GEN	Added clarifications and updated callouts.
601	
REPAIR 1-1	
601	
REPAIR 2-1	
601	
REPAIR 3-1	
601	
701	
802	Changed item number callout for the pin in Location C.

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JT9D-7R4 FUEL CONTROL BOX ASSEMBLY

PART NUMBERS 315T3040-4,-6 THRU -14
015T0171-3,-4
015T1298-5 THRU -18
015T0376-5 THRU -8,-23,-24

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

T22110

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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

T22105

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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR B10184	JUL 10/81
		PRR VDC-T0068-1	APR 10/82
		PRR VDC-T0242	APR 10/83
		PRR B11283	APR 10/85
767-76-0009			OCT 10/85
767-76-0018		PRR B11485	JAN 01/92
767-76-0028		PRR B12020	JAN 01/91
767-76-0028R1		PRR B12020	NOV 01/99
767-76-0028R3		PRR B12020	JUN 01/96
767-76-0018R2		PRR B11485	JUN 01/96

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BOEING
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MAINTENANCE MANUAL

TABLE OF CONTENTS

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INTRODUCTION

The instructions that are specified in this manual give the data necessary to do the maintenance functions that range from simple maintenance checks and part replacement to complete shop-type repair procedures.

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.

Throughout the manual IPL item number references include alpha-variants, unless otherwise stated.

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.

Verification:

Disassembly	APR 1/82
Assembly	APR 1/82

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JT9D-7R4 FUEL CONTROL BOX ASSEMBLY

DESCRIPTION AND OPERATION

1. Description

   A. The fuel control box assembly has a housing that contains a bearing-mounted gear that engages with the gear rack and transducer.

   B. The fuel control box attaches to the top of the engine control unit and supports the engine control actuator.

   C. The fuel control unit drive extends through the control assembly housing and engages the engine control actuator.

2. Operation

   A. A lever on the fuel control box assembly gear engages with the fuel control unit power lever.

   B. The throttle push/pull cable moves the rack, thus turning the bearing-mounted gear that sets the fuel control power lever in the correct position for the specified throttle setting.

   C. The transducer then transmits the power lever angle to the autothrottle.

      NOTE: On some fuel control box assemblies, an additional switch is mounted on the housing signal's part power indicator, and is located in the cockpit.

3. Leading Particulars (Approximate)

   Height -- 6 inches
   Width -- 9 inches
   Thickness -- 4 inches
   Weight -- 4 pounds

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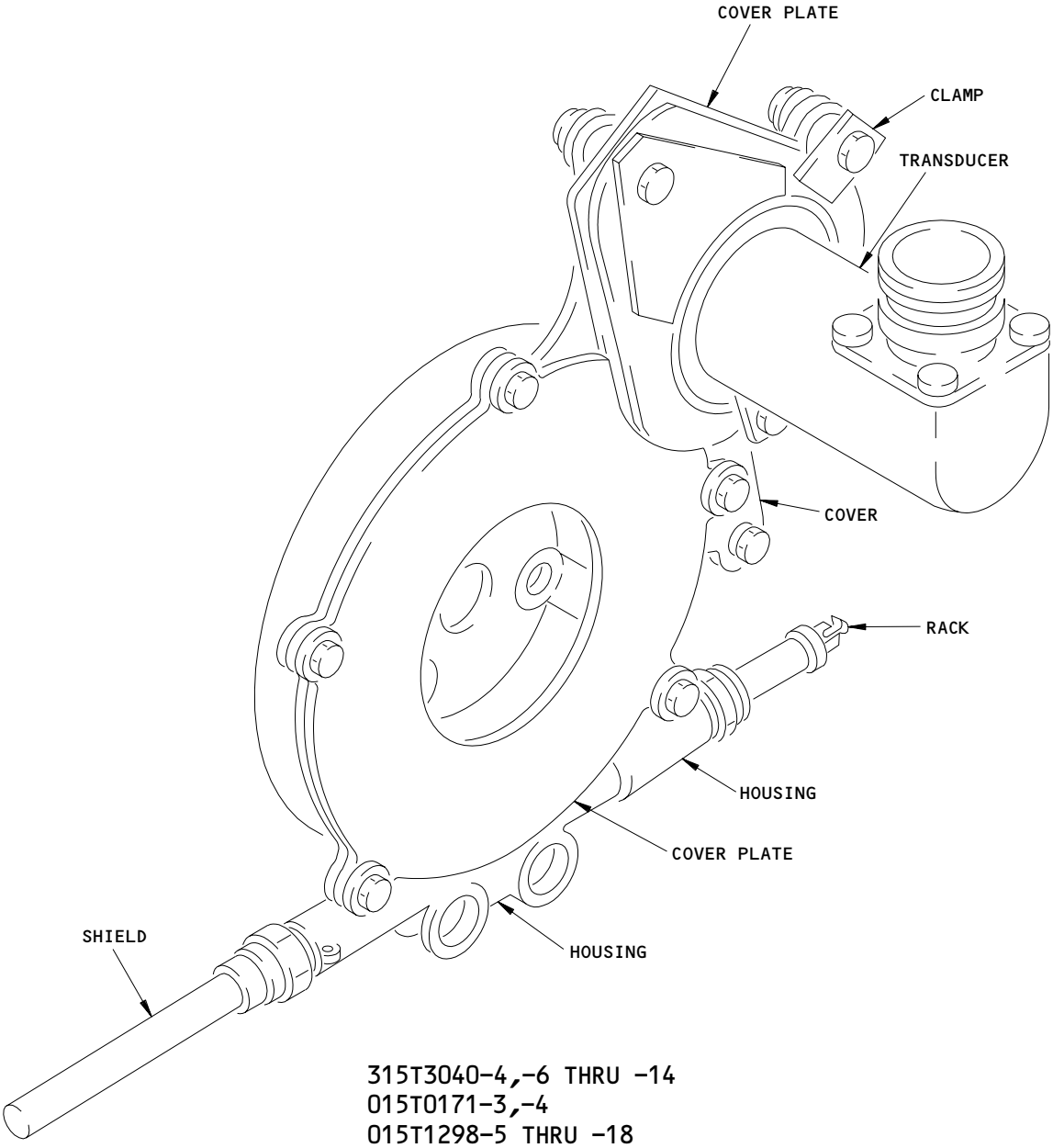

315T3040-4,-6 THRU -14
015T0171-3,-4
015T1298-5 THRU -18
015T0376-5 THRU -8,-23,-24

JT9D7R4 Fuel Control Box Assembly
Figure 1

W66294

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DISASSEMBLY

1. The disassembly procedure that follows contains the data necessary to disassemble the JT9D-7R4 Fuel Control Box Assembly.

2. The Boeing Company recommends that you disassemble the fuel control box assembly only when necessary to do the specified procedures that follow:

   A. To complete any type of fault isolation.

   B. To find out if the parts are in a serviceable condition.

   C. To make any necessary repairs to the assembly unit.

   D. To put the assembly unit back into a serviceable condition.

3. Where applicable, use standard industry practices to disassemble this assembly unit.

   A. On 315T3040-6, -8, -10, and -14 assemblies, remove parts (10 thru 21, IPL Fig. 1) and remove switch (5).

   B. On 315T3040-13 assembly, remove parts (10 thru 20, IPL Fig. 1) and remove cover (6).

   C. Remove parts (30 thru 61) and remove transducer (65) and attached parts from housing (175).

   D. Remove nut (70), spacer (75), gear (80) and spacer (85) from transducer (65).

   E. Remove lockwire and remove nut (90), sleeve (95) and shield (100). Loosen jamnut (110) and remove adapter (105), remove nut (110) from adapter.

   F. Remove parts (120, 125) and remove coverplate (115) from housing (175).

   G. On 315T3040-4 and -6 thru -10 assemblies, remove nuts (130), eccentric pins (135), shim washers (136), and bearings (140).

   H. On 315T3040-11, -13, -14 assemblies, remove nuts (130), eccentric pins (135), and slider (143).

   I. Remove adjusting screw (145).

   J. Remove gear assembly (155) from housing (175).

      NOTE: Do not remove bearing (160) from gear (165) or bearing (162) from gear (167) unless necessary for repair or replacement.

   K. Remove gear rack (170) from housing (175).

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L. Remove wiper ring (169) from housing (175).

4. If necessary, refer to IPL Figure 1 for the applicable item numbers.

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CLEANING

1. The cleaning procedures that follow contain the data necessary to clean the Fuel Control Box Assembly.

2. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects specified in this cleaning procedure.

3. Where applicable, use standard industry practices along with SOPM 20-30-03 to clean all of the parts, except the bearings (140B, 140C, 160 thru 160E, 162 thru 162L).

   A. Clean carbon graphite bearings (140B, 140C) only by dusting with clean dry cloth.

      NOTE: Do not expose bearings to solvent or lubricant.

   B. Send bearings (160, 160B, 160E, 162B thru 162L) to manufacturer (V40920) for cleaning and relubricating.

   C. Clean bearings (160C, 160D, 162, 162A) as given in SOPM 20-30-01, method 1 (Ultrasonic).

      NOTE: Bearings (160C, 160D, 162, 162A) have a split outer race which is held in alignment by two rings. Bearing may be disassembled for cleaning, inspection, and lubrication by removing rings and spreading outer race to allow balls to be removed.

4. Lubricate bearings (160C, 162) with Aeroshell 16 and bearings (160D, 162A) with MIL-G-81322.

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CHECK

1. The check procedure that follows contains the data necessary to do a complete inspection of the Fuel Control Box Assembly.

2. Where applicable, use standard industry practices to do an inspection of all of the parts for defects or damage.

   NOTE: Refer to the Fits and Clearance section for the specified design dimensions and wear limits.

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

   A. Examine the carbon graphite bearings (140) for external damage, excessive radial play, and evidence of cracking or breakdown of carbon graphite.

   B. Replace the bearings (140) if more than small surface damage is found.

   CAUTION: TO PREVENT DAMAGE RESULTING FROM MAGNETIZATION, REMOVE ANY MULTIPLE PART BEARINGS PRIOR TO SUBJECTING ITEMS TO MAGNETIC PARTICLE TYPE CHECKS.

   C. Do a magnetic particle inspection (SOPM 20-20-01) of the gears (165, 167), rack (170) and housing (175).

   D. Examine the teeth of the gears (80, 165, 167) and the rack (170) for excessive wear. Replace parts if excessive wear is found.

   E. Examine the bearings (160, 162) for track corrosion, jamming, roughness, high rotational torque, and axial rock.

4. Replace the bearings (160,162) if the axial rock is more than 0.004 inch as measured at gear pitch diameter.

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REPAIR - GENERAL

1. Content

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

P/N	NAME	REPAIR
315T3035	GEAR	1-1;1-2
315T3037	HOUSING	2-1
- - -	MISCELLANEOUS PARTS REFINISH	3-1

2. Standard Practices

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

SOPM 20-10-01 Machining of High Strength Steel
SOPM 20-10-03 Shot Peening
SOPM 20-10-04 Grinding of Chrome Plated Parts
SOPM 20-30-02 Stripping of Protective Finishes
SOPM 20-41-01 Finish Codes (F and SRF)
SOPM 20-42-03 Chrome Plating
SOPM 20-50-03 Bearing and Bushing Replacement
SOPM 20-50-08 Application of Dry Lubricant
SOPM 20-60-03 Lubricants
SOPM 20-60-04 Miscellaneous Materials

3. Materials

NOTE: If necessary, you can use equivalent substitutes.

A. Retaining Compound -- Locktite 40, Grade A (SOPM 20-60-04)

B. Lubricant -- Sermetel 20, Texram 520, BMS 3-8 (SOPM 20-60-03)

C. Sealant -- BMS 5-63 (SOPM 20-60-04)

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4. Dimension Symbols

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

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GEAR ASSEMBLY - REPAIR 1-1

315T3035-1, -5

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

1. Bearing Replacement (315T3035-1 only)

   A. Press out the old bearing (160, 160B thru 160E).

   B. If repair of the gear bore is necessary, refer to REPAIR 1-2 for repair instructions.

   C. Apply Loctite Retaining Compound on OD of new bearing.

   D. Install bearing and ball stake as given in SOPM 20-50-03 but make the ball stakes 0.010-0.015 inch deep.

2. Bearing Replacement (315T3035-5 only)

   A. Drill out rivets (157) and remove clamp ring (158).

   B. Press out bearings (162 thru 162K).

   C. If repair of the gear bore is necessary, refer to REPAIR 1-2 for repair instructions.

   D. Install a replacement bearing with wet sealant.

   E. Attach clamp ring (158) with rivets (157).

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GEAR - REPAIR 1-2

315T3035-2, -4

NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to the Refinish instructions given in Fig. 601.

1. Inside Diameter (ID) Repair (Fig. 601)

A. Method 1

(1) If necessary, machine the ID to the repair limits shown in Fig. 601 to remove defects or damage.

(2) Shot peen (SOPM 20-10-03) the repair surface.

(3) Chrome plate the repaired surface as given in SOPM 20-42-03, for class 3 plating.

(4) Grind to the design dimensions and finish as shown in SOPM 20-10-04.

B. Method 2

(1) Machine gear as shown in Fig. 601 observe 0.150 inch minimum lug thickness and diametric limits.

(2) Fabricate the repair bushing as shown in Fig. 602, from AISI 321 CRES.

(3) Install the repair bushing and the bearing.

(4) Roller swage the bushing as given in SOPM 20-50-03.

2. Split Tang Repair (Fig. 601)

A. Machine the external contacting surfaces, as necessary and use the repair limit (0.488 inch) to remove the defects.

NOTE: Make sure that wear surface is not less than 0.0035 inch when machining each repair area.

B. Shot peen (0.017-0.0033 inch shot size and 0.008-0.012 A2 intensity) as given in SOPM 20-10-03.

C. Chrome plate buildup repaired surface and grind to design dimensions (0.495 to 0.497 inch).

NOTE: Make sure that the surface finish is 63AA or better.

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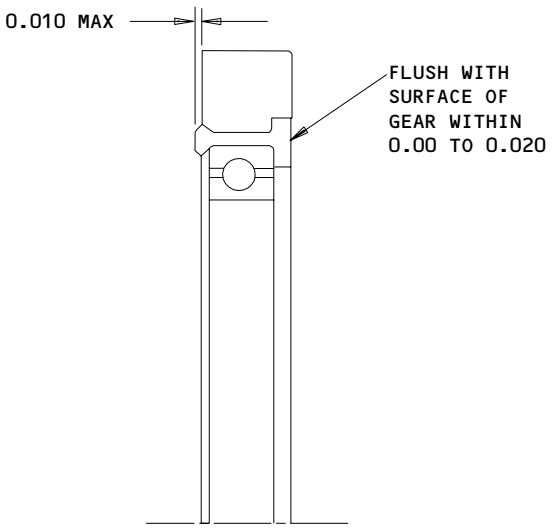
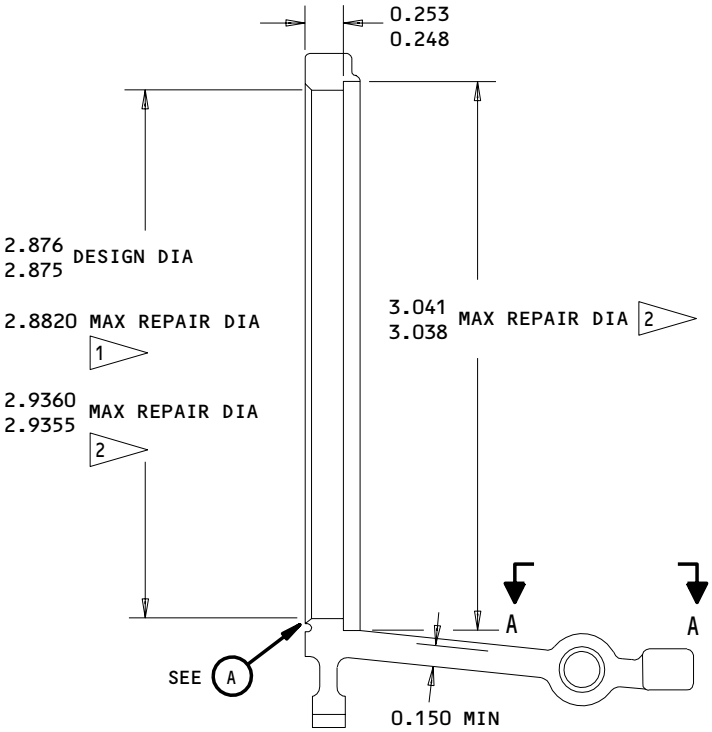


315T3035-1

BUSHING AND BEARING INSTALLATION



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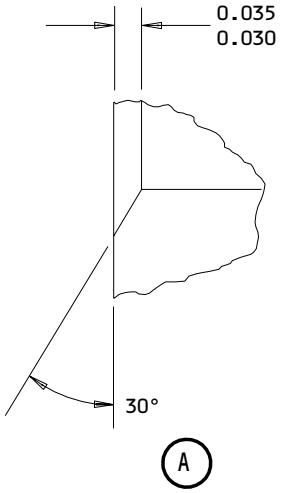

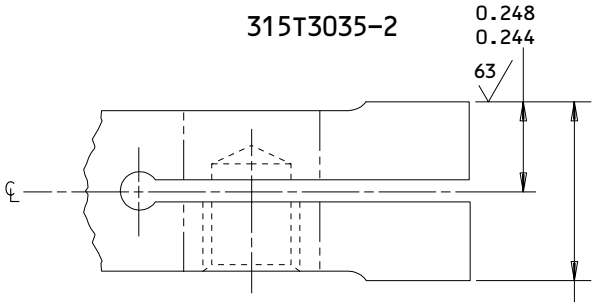

A-A
SPLIT TANG REPAIR

REFINISH

PASSIVATE (F-17.09) FOLLOWED BY SOLID DRY FILM LUBRICANT (SERMETEL TYPE 20, TEXRAM 520, OR OPTIONAL BMS 3-8)

1 REPAIR LIMIT FOR CHROME PLATE BUILDUP (REF 20-42-03). OBSERVE 0.03 PLATING RUN OUT

2 REPAIR LIMIT FOR BUSHING INSTALLATION

REPAIR

REF 1 2

SHOTPEEN: (REF 20-10-03)
0.017-0.033 SHOT SIZE
0.008-0.012 A2 INTENSITY

MATERIAL: 17-4PH CRES, 130 KSI MINIMUM. NITRIDE CASE HARDENED (MALCOMIZED) TO 0.004-0.008 INCH DEPTH ON GEAR TEETH.

BREAK ALL SHARP EDGES 0.008 R

63 ALL MACHINED SURFACES

ALL DIMENSIONS ARE IN INCHES

Gear Repair
Figure 601

T22106

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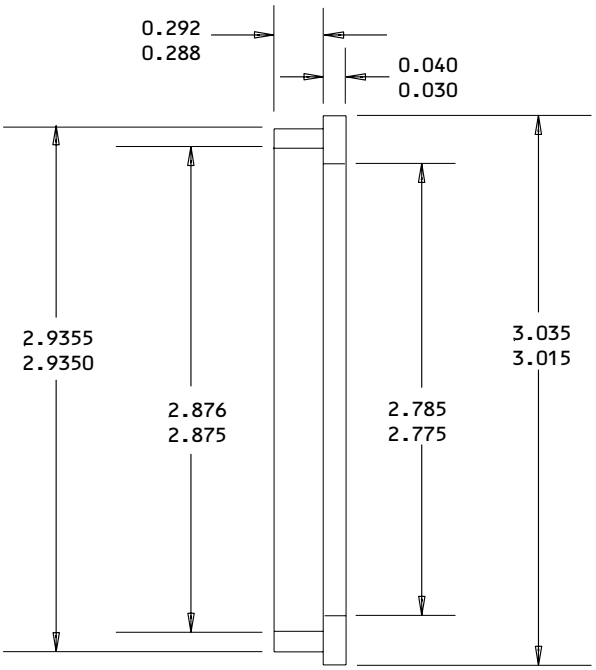

63 ALL MACHINED SURFACES

BREAK ALL SHARP EDGES 0.02-0.03

MATERIAL: 321 CRES

ALL DIMENSIONS ARE IN INCHES

Repair Bushing
Figure 602

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HOUSING - REPAIR 2-1

315T3037-1, -3

NOTE: Refer to REPAIR-GEN for list of applicable standard practices. For repair of surfaces which may only require restoration of original finish, refer to the Refinish instructions given in Fig. 601.

1. Outside Diameter (OD) Repair (Fig. 601)

   A. If necessary, machine the OD to the repair limits shown in Fig. 601 to remove defects and damage.

   B. Shot peen (SOPM 20-10-03) the repair surface.

   C. Build up with chrome plate (SOPM 20-42-03).

   D. Grind to design dimensions and finish.

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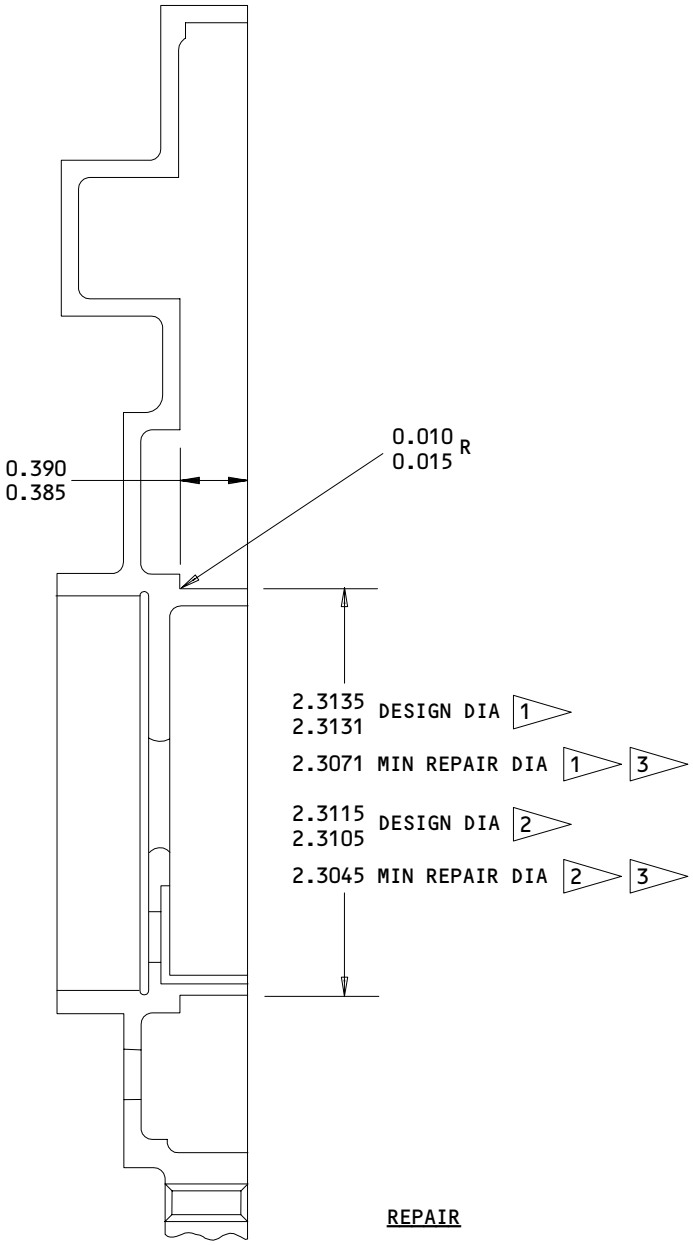

315T3037-1,-3

REFINISH

PASSIVATE (F-17.09) ALL OVER

1 315T3037-1

2 315T3037-3

3 CHROME PLATE BUILDUP (SOPM 20-42-03) AND GRIND TO DESIGN DIMENSION. OBSERVE 0.03 MAXIMUM PLATING RUNOUT

REPAIR

REF 3

63 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES 0.008

SHOT PEEN: (SOPM 20-10-03)
0.017-0.033 SHOT SIZE
0.008-0.012 A2 INTENSITY

MATERIAL: 17-4PH CRES PER AMS 5342, 130 KSI MINIMUM

ALL DIMENSIONS ARE IN INCHES

Housing Repair
Figure 601

T22109

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MISCELLANEOUS PARTS REFINISH - REPAIR 3-1

1. Repair of parts listed in Fig. 601 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		
Clamp (45), adapter (105)	15-5PH CRES 180-200 ksi	Passivate (F-17.25, which replaces F-17.09)
Spacer (75,85)	303 or 304 CRES	Passivate (F-17.25, which replaces F-17.09)
Coverplate (25), spacer (150), shield (100)	304 CRES	Passivate (F-17.25, which replaces F-17.09)
Pin (135)	302/303 CRES	Passivate (F-17.25, which replaces F-17.09)
Gear (80), rack (170)	17-4PH CRES (15-5PH CRES optional) 180-200 ksi	Passivate (F-17.25, which replaces F-17.09) all over followed by Armoloy chrome plate 0.00005-0.00020 inch plating thickness. Apply a dry film lubricant, Texram 520 or Sermetel 20 or BMS 3-8 on the gear teeth surfaces.
Coverplate (61), clamp ring (158)	301 CRES	Passivate (F-17.25, which replaces F-17.09).

Refinish Details
Figure 601

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ASSEMBLY

1. Materials

   NOTE: Equivalent substitutes can be used.

   A. Retaining Compound -- Locktite 40, Grade A (SOPM 20-60-04)

   B. Lockwire -- MS20995C32 (SOPM 20-60-04)

2. Standard Practices

   A. Refer to these Standard Overhaul Practices Manuals (SOPM) for the standard procedures specified in this assembly procedure.

      (1) SOPM 20-50-02 Installation of Safetying Devices

      (2) SOPM 20-60-04 Miscellaneous Materials

3. Assembly (IPL Fig. 1)

   A. The assembly procedure that follows contains the data necessary to assemble the Fuel Control Box Assembly.

   B. Where applicable, use standard industry practices to assemble this unit.

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

   D. Refer to IPL Figure 1 for the applicable item numbers.

   E. Install rack (170) in housing (175).

   F. Install wiper ring (169) in housing (175) with chamfered edge toward housing surface.

   G. Apply retaining compound to ID of bearing (160, 162) only.

      (1) Press gear assembly (155) onto housing (175) with index mark on tooth of gear (165, 167) between index teeth of rack (170) (Fig. 701).

      (2) Install spacer (150). Back of rack disconnect tip will be 3.835 inches from the gear/rack mesh point.

   H. On 315T3040-4 and -6 thru -10 assemblies, install bearing (140), shim washers (136), eccentric pins (135), nuts (130).

      (1) On 315T3040-11, -13 and -14 assemblies, install slider (143), eccentric pins (135) and nuts (130).

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(2) Install the setscrew (145).

I. Install coverplate (115) and secure with parts (120, 125).

J. Install overtravel shield (100), sleeve (95) on housing (175), and secure with nut (90).

K. Adjust rack (170) and gear assembly (155) positions.

(1) Loosen nuts (130) so that eccentric pins (135) are free to move.

(2) Rotate eccentric pins (135) clockwise to reduce backlash of rack (170) to gear (165, 167) to 0.003 inch maximum.

(3) Maintain a parallel condition between rack (170) and hole in housing to eliminate contact and to prevent interferences or binding when rack (170) is moved through its total range of travel.

(4) Move rack through full travel to check smoothness of operation, adjust as required.

(5) Secure eccentric pins (135) and tighten nuts (130) to 25-50 lb-in.

L. Position unit in a vertical position.

(1) Pull rack (170) up to approximately 5 degrees from its maximum extended travel and release. Check that rack moves down to maximum extended position with force not exceeding 0.40 lbs.

(2) Readjust eccentric pins (135) per Step G. if necessary.

M. With gear and housing held in a fixed position, do the steps that follow.

(1) Apply a 5 pound force to the rack in each direction of travel.

(2) Rack backlash must not exceed 0.003 inch Full Indicator Movement (F.I.M).

N. On completion of step I, check that nuts (130) are tightened to 25-50 pound-inches. Lockwire nuts using double twist method (Fig. 701).

O. Do the steps that follow to install the transducer (65).

(1) Install spacer (85), gear (80), spacer (75) on transducer (65) and secure with nut (70).

(2) Remove adapter (105) and jamnut (110) from housing (175).

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(3) Assemble transducer (65) with attached parts on housing (175). Ensure that index mark on gear (80) aligns with index mark on housing (175) with back of disconnect tip of rack (170) set at 3.49 to 3.51 inches from vertical centerline of housing (175) (Fig. 701).

(4) Install clamps (45), coverplate (61), coverplate (25) and secure with bolts (50, 30), washers (55, 35) and nuts (60, 40).

P. Install adapter (105) with jamnut (110) on housing (175).

(1) Adjust adapter so that distance between end of adapter and centerline of housing is 4.26 to 4.28 inches (Fig. 701).

(2) Tighten jamnut (110) to the housing (175).

Q. On 315T3040-6, -8, -10 and -14 assemblies, install switch (5), bracket (21), and secure with bolts (10), washers (15) (one on each side) and nuts (20).

R. On 315T3040-13 assembly, install cover (6) with bolts (10), washers (15) (one on each side) and nuts (20).

S. Use the double-twist method (SOPM 20-50-02) to install the lockwire nut (90) to the eye on the housing.

T. Use standard industry practices and information given in SOPM 20-44-02 for storage of this part.

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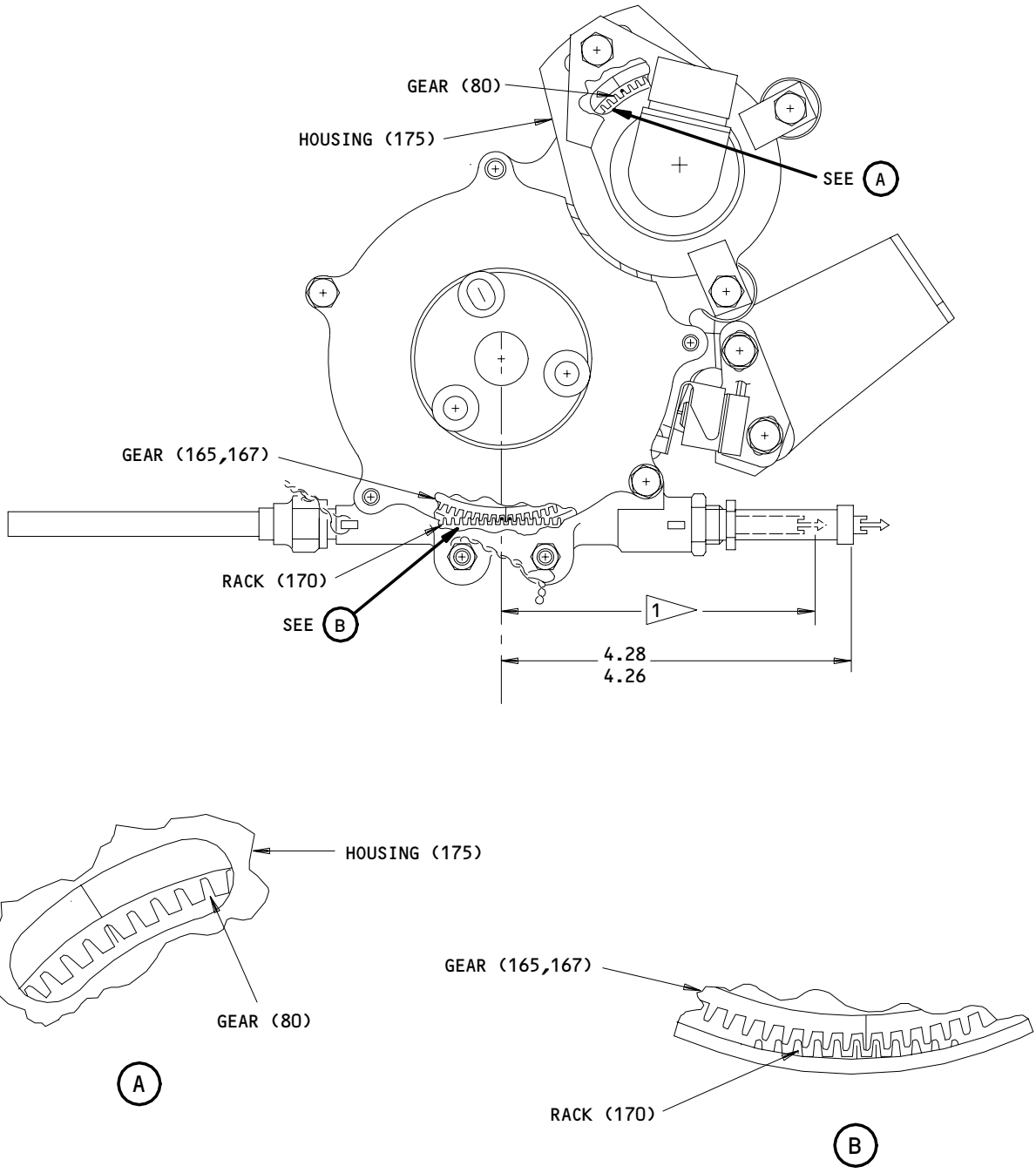

1 3.51
3.49 WITH TRANSDUCER PROPERLY MESHED

3.835 WITH GEAR AND RACK PROPERLY MESHED

ALL DIMENSIONS ARE IN INCHES

Assembly Details
Figure 701

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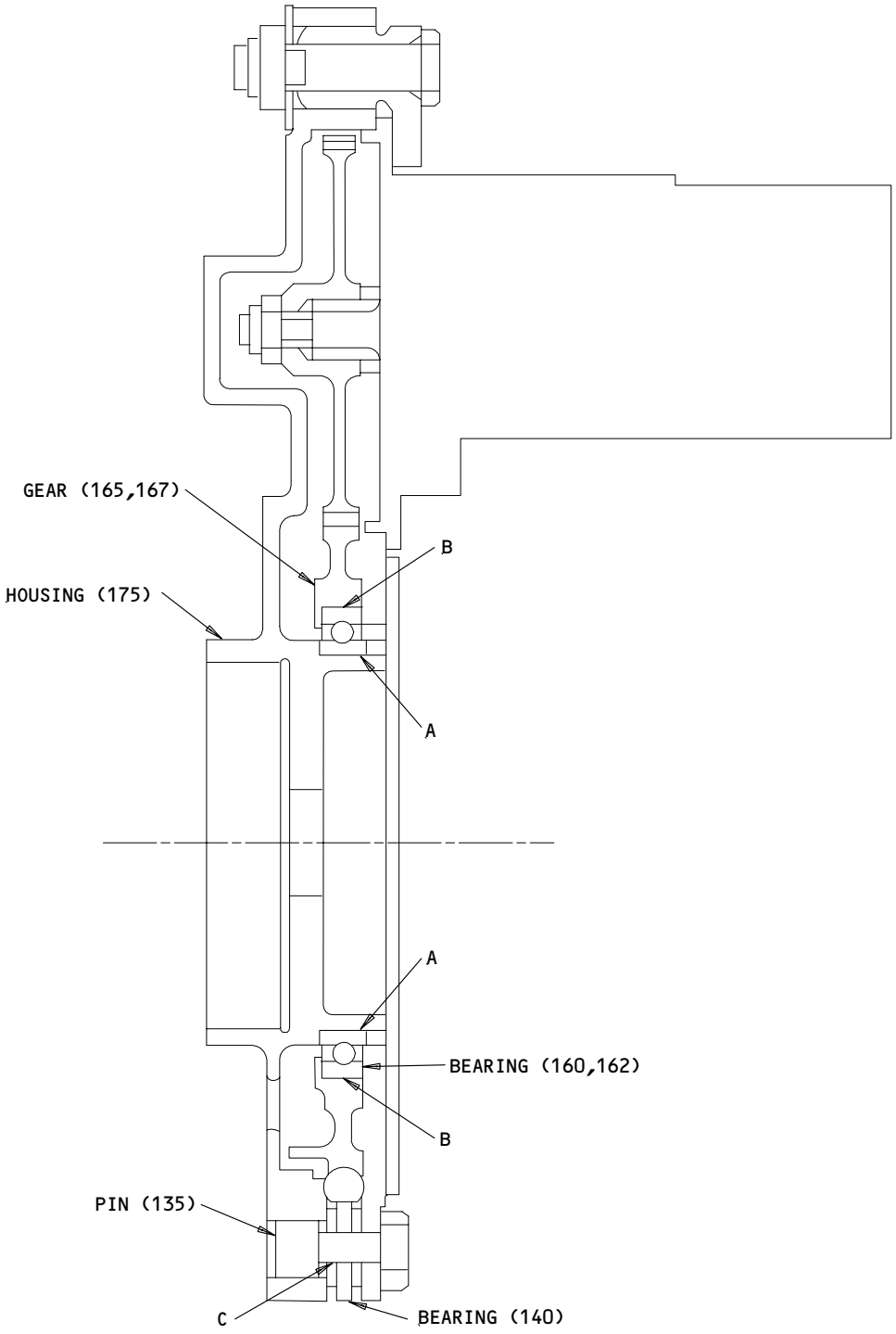
FITS AND CLEARANCES



Fits and Clearances
Figure 801 (Sheet 1)

T22115

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Ref Letter Fig.801	Mating Item No. IPL Fig.	Design Dimension				Service Wear Limit		
		Dimension		Assembly Clearance		Dimension		Maximum Clearance
		Min	Max	Min	Max	Min	Max	
A	ID 160,162 OD 175	2.3120 2.3131 [3] 2.3105 [4]	2.3130 2.3135 [3] 2.3115 [4]	−0.0015 [1] [3] 0.0005 [4]	−0.0001 [1] [3] 0.0025 [4]	 2.3131 [3] 2.3105 [4]	2.3130	−0.0001 [1] [3] 0.0025 [4]
B	ID 165 OD 160	2.8750 2.8742	2.8760 2.8750	0.0000	0.0018	 2.8742	2.8760	0.0018
C	ID 140 OD 135	0.2498 0.2490	0.2503 0.2495	0.0003	0.0013			0.0002
D	OD 165,170		0.003 [2]					

[1] NEGATIVE VALUES ARE AN INTERFERENCE FIT
[2] MAXIMUM BACKLASH
[3] 315T3037−1
[4] 315T3037−3

ALL DIMENSIONS ARE IN INCHES

Fits and Clearances
Figure 801 (Sheet 2)

14001

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Ref IPL		Name	Torque*	
Fig. No.	Item No.		Pound-Inches	Pound-Feet
1	130	Nut	25-50	

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

Torque Table
Figure 802

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ILLUSTRATED PARTS LIST

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

2. Indentures show parts relationships as follows:

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

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

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

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

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

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

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

6. Parts Interchangeability

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

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VENDORS

02758 NETWORKS ELECTRONIC CORP U S BEARING DIV
9750 DESOTO AVENUE
CHATSWORTH, CALIFORNIA 91311

08524 DEUTSCH FASTENER CORPORATION
PO BOX 92925 7001 WEST IMPERIAL HIGHWAY
LOS ANGELES, CALIFORNIA 90045

10630 ANILLO INDUSTRIES, INCORPORATED
2090 NORTH GLASSELL
ORANGE, CALIFORNIA 92667

11328 TELEDYNE LINAIR ENGINEERING
651 WEST KNOX STREET
GARDENA, CALIFORNIA 90248

11815 TOWNSEND DIV OF TEXTRON INC CHERRY FASTENER UNIT
BOX 2157 1224 EAST WARNER AVENUE
SANTA ANA, CALIFORNIA 92707

14397 FABER ENTERPRISES, INCORPORATED
6606 VARIEL AVE
CANOGA PARK, CALIFORNIA 91303

14798 DEUTSCH CO METAL COMPONENTS DIV
14800 SOUTH FIGUEROA STREET
GARDENA, CALIFORNIA 90061

15653 KAYNAR MFG COMPANY INC KAYLOCK DIV
PO BOX 3001 800 SOUTH STATE COLLEGE BLVD
FULLERTON, CALIFORNIA 92634

19710 MPC PRODUCTS CORP
7426 NORTH LINDER AVENUE
SKOKIE, ILLINOIS 60076

21335 FAFNIR BEARING DIVISION
TEXTRON INCORPORATED
37 BOOTH STREET
NEW BRITAIN, CONNECTICUT 06050

30974 AEROFIT PRODUCTS INCORPATED
8531 WHITAKER STREET
BUENA PARK, CALIFORNIA 90621

34336 L AND S MACHINE COMPANY, INC.
2019 S.W. BOULEVARD
WICHITA, KANSAS 67277

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VENDORS

40920 MINIATURE BEARING DIVISION MPB CORPORATION
OPTICAL AVENUE PRECISION PARK
KEENE, NEW HAMPSHIRE 03431

50632 KAMATICS CORP
1335 BLUE HILLS ROAD
BLOOMFIELD, CONNECTICUT 06002

50948 PARKER-HANNIFIN CORP HUNTSVILLE AIRCRAFT FACILITY
9400 SOUTH MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA 35802

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

55231 TRIBON BEARING COMPANY
5581 WEST 164TH STREET
CLEVELAND, OHIO 44142

56878 SPS TECHNOLOGIES INC
HIGHLAND AVENUE
JENKINTOWN, PENNSYLVANIA 19046

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

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

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

81205 BOEING CO THE
PO BOX 3707
SEATTLE, WASHINGTON 98124

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

97393 SHUR-LOK CORPORATION
2541 WHITE ROAD
IRVINE, CALIFORNIA 92713

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PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
AN960C10L		1	15	4
		1	125	2
AN960C416		1	35	1
BACN10DP5J		1	90	1
BACN10GW3AS		1	20	2
BACN10JC3C		1	70	1
BACN10JC4C		1	40	1
		1	60	2
BACW10P186C		1	55	2
BCREFA2378		1	162G	1
BCREFA2379		1	162F	1
BCREFA2380		1	162E	1
BCREFA2423		1	162H	1
BCREFA2424		1	162J	1
BCREFA2425		1	162K	1
BMN10GW3AS		1	20	2
BRH10C3		1	70	1
BRH10C4		1	40	1
		1	60	2
GM6425		1	65	
HSP4TL104		1	140B	2
H31-3BAC		1	70	1
H31-4BAC		1	40	1
H95-3		1	20	2
KJT115204B		1	143	1
KRP114804BT		1	140B	2
LA3628A		1	140	
LS5097		1	110C	1
		1	110F	
MB546DDA3257		1	162	1
		1	160C	1
MB546DDFS464		1	160D	1
		1	162A	1
MS18064-20		1	145	1
MS20427M2-6		1	157	10
MS20613-4C5		1	23G	
MS20613-4C8		1	23	
MS20615-4M5		1	23H	1
MS20615-4M8		1	23A	1
MS20819-5C		1	95	1
NAS1056C4-015		1	23P	1
NAS202101S02		1	70	1
NAS509-3C		1	130A	
NAS509-7C		1	110A	
NAS6603H1		1	120	2
NAS6703-4		1	10	2
NAS6704-12		1	50	2

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PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
NAS6704-5		1	30	1
NS202101S048		1	40	1
P56B		1	65A	1
P56C		1	65B	1
SL2997C7R		1	110	1
		1	110B	
SL2999C3		1	130	2
SL7021C332		1	20	2
S315N166-1		1	140A	
		1	140B	2
S315T400-1		1	5	
S315T400-2		1	5B	
S315T400-4		1	5C	
S37-46BIE3P515LY198		1	162E	1
S37-46BIE3P515LY304		1	162H	1
S37-46BIE5P515LY198		1	162F	1
S37-46BIE5P515LY304		1	162J	1
S37-46BIE7P515LY198		1	162G	1
S37-46BIE7P515LY304		1	162K	1
T6C1032J		1	70	1
T6C428J		1	40	1
VN303B02		1	70	1
VN303B048		1	40	1
VN497DM02		1	20	2
015T0171-3		1	1M	RF
015T0171-4		1	1N	RF
015T0376-23		1	1Z	RF
015T0376-24		1	1AA	RF
015T0376-5		1	1V	RF
015T0376-6		1	1W	RF
015T0376-7		1	1X	RF
015T0376-8		1	1Y	RF
015T1298-10		1	1U	RF
015T1298-11		1	1AB	RF
015T1298-12		1	1AC	RF
015T1298-13		1	1AD	RF
015T1298-14		1	1AE	RF
015T1298-15		1	1AF	RF
015T1298-16		1	1AG	RF
015T1298-17		1	1AH	RF
015T1298-18		1	1AJ	RF
015T1298-5		1	1P	RF
015T1298-6		1	1Q	RF
015T1298-7		1	1R	RF
015T1298-8		1	1S	RF
015T1298-9		1	1T	RF
101LH9075-3W		1	70	1

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PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
101LH9075-4W		1	40	1
10602-00		1	140B	2
109LH8574-3		1	20	2
3TWF3746PLY198		1	160	1
		1	162B	1
3TWF3746SLY198		1	160A	
3TWF3746SULY198		1	160E	1
		1	162C	1
3TWF3746ULY198		1	160B	1
		1	162D	1
315T1005-1		1	110D	1
		1	110E	
315T1017-1		1	80	1
315T1029-1		1	135	2
315T3012-1		1	6	1
315T3033-1		1	61	1
315T3034-1		1	21	1
315T3034-2		1	21A	1
315T3034-3		1	24G	1
315T3034-4		1	24	1
315T3035-1		1	155	1
315T3035-2		1	165	1
315T3035-4		1	167	1
315T3035-5		1	155G	1
315T3037-1		1	175	1
315T3037-3		1	175A	1
		1	175B	1
315T3040-10		1	1G	RF
315T3040-11		1	1H	RF
315T3040-12		1	1J	RF
315T3040-13		1	1K	RF
315T3040-14		1	1L	RF
315T3040-3		1	1	
315T3040-4		1	1A	RF
315T3040-5		1	1B	
315T3040-6		1	1C	RF
315T3040-7		1	1D	RF
315T3040-8		1	1E	RF
315T3040-9		1	1F	RF
315T3041-1		1	45	2
315T3042-1		1	115	1
315T3046-1		1	150	1
315T3370-1		1	136	4
315T3726-1		1	169	1

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PART NUMBER	AIRLINE PART NO.	FIG.	ITEM	TTL REQ
315T3726-2		1	158	1
315T4011-2		1	170	1
315T4012-1		1	105	1
60B90034-2		1	65A	1
60B90034-3		1	65B	1
60B96210-1		1	140C	2
65716		1	5A	
65716-4		1	5D	1
66B90023-1		1	25	1
66B90025-1		1	75	1
66B90025-2		1	85	1
66796B1032		1	20	2
69B96280-1		1	100	1
97-02		1	70	1
97-048		1	40	1

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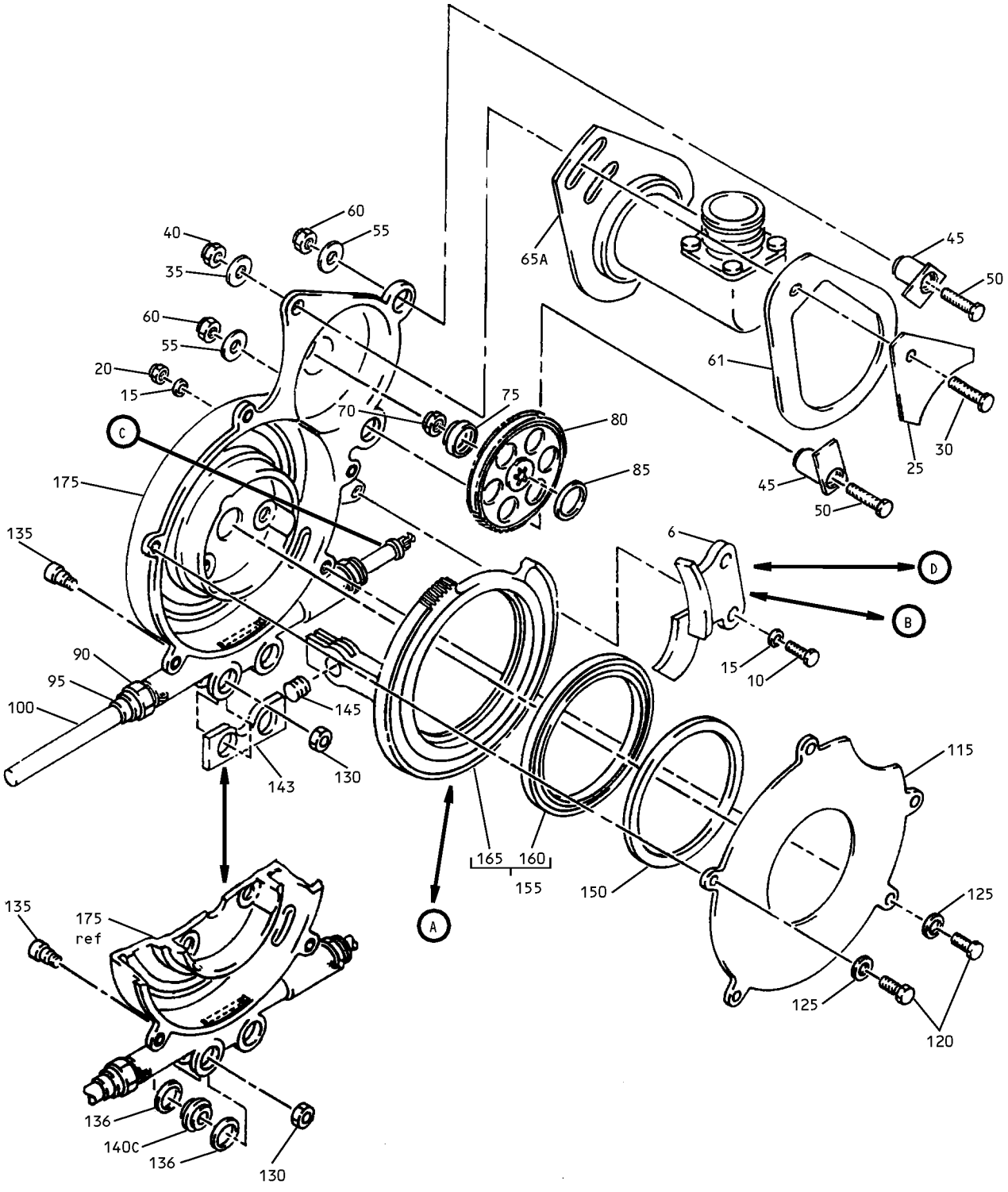

JT9D7R4 Fuel Control Box Assembly
Figure 1 (Sheet 1)

T55259

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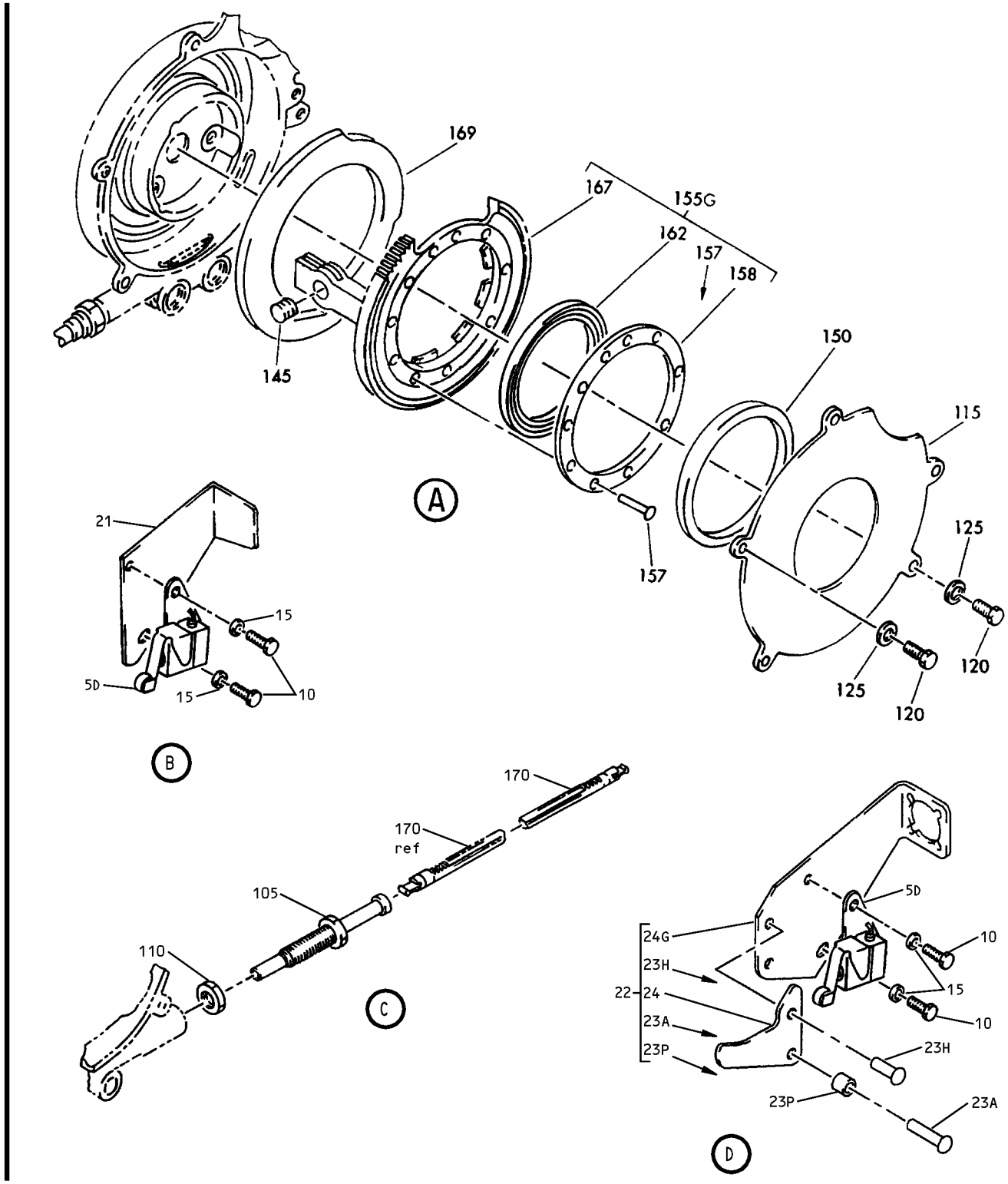

JT9D7R4 Fuel Control Box Assembly
Figure 1 (Sheet 2)

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1	315T3040-3		DELETED		
-1A	315T3040-4		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0009, 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3)	B	RF
-1B	315T3040-5		DELETED		
-1C	315T3040-6		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0009, 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3)	A	RF
-1D	315T3040-7		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0009, 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3)	C	RF
-1E	315T3040-8		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0009, 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3)	D	RF
-1F	315T3040-9		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3) (POST SB 767-76-0009)	E	RF
-1G	315T3040-10		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-60018, 767-76-0018R2, 767-76-0028, 767-76-0028R3) (POST SB 767-76-0009)	F	RF

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1H	315T3040-11		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0028, 767-76-0028R3) (POST SB 767-76-0018, 767-76-0018R2)	G	RF
-1J	315T3040-12		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0028R1, 767-76-0028R3) (POST SB 767-76-0018, 767-76-0018R2)	H	RF
-1K	315T3040-13		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028, 767-76-0028R3)	J	RF
-1L	315T3040-14		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R1, 767-76-0028R3)	K	RF
-1M	015T0171-3		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0009) (PRE SB 767-76-0028R3)	L	RF
-1N	015T0171-4		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0009) (PRE SB 767-76-0028R3)	M	RF
-1P	015T1298-5		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	N	RF
-1Q	015T1298-6		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	O	RF
-1R	015T1298-7		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	P	RF
-1S	015T1298-8		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	Q	RF

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1T	015T1298-9		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	R	RF
-1U	015T1298-10		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028)	S	RF
-1V	015T0376-5		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0018, 767-76-0018R2) (PRE SB 767-76-0028R3)	T	RF
-1W	015T0376-6		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0018, 767-76-0018R2) (PRE SB 767-76-0028R3)	U	RF
-1X	015T0376-7		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0018, 767-76-0018R2) (PRE SB 767-76-0028R3)	V	RF
-1Y	015T0376-8		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0018, 767-76-0018R2) (PRE SB 767-76-0028R3)	W	RF
-1Z	015T0376-23		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0028R3)	X	RF
-1AA	015T0376-24		BOX ASSY-JT9D7R4 FUEL CONTROL (PRE SB 767-76-0028R3)	Y	RF

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-1AB	015T1298-11		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R1, 767-76-0028R3)	Z	RF
-1AC	015T1298-12		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R1, 767-76-0028R3)	AA	RF
-1AD	015T1298-13		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R1, 767-76-0028R3)	AB	RF
-1AE	015T1298-14		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R1, 767-76-0028R3)	AC	RF
-1AF	015T1298-15		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R3)	AD	RF
-1AG	015T1298-16		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R3)	AE	RF
-1AH	015T1298-17		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R3)	AF	RF
-1AJ	015T1298-18		BOX ASSY-JT9D7R4 FUEL CONTROL (POST SB 767-76-0028R3)	AG	RF
5	S315T400-1		DELETED		
5A	65716		DELETED		
5B	S315T400-2		DELETED		
5C	S315T400-4		DELETED		
5D	65716-4		.SWITCH (V02005) (SPEC S315T400-4)	ADFKO QSUW	1
6	315T3012-1		.COVER	JNPR Z AB AD AF	1
10	NAS6703-4		.BOLT	ADFH J-SU WZ AB AD AF	2

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
15	AN960C10L		.WASHER	ADFH J-SU WZ AB AD AF	4
20	BACN10GW3AS		.NUT (OPT BMN10GW3AS (V08524)) (OPT H95-3 (V15653)) (OPT SL7021C332 (V11815)) (OPT VN497DM02 (V92215)) (OPT 109LH8574-3 (V72962)) (OPT 66796B1032 (V56878))	ADFH J-SU WZ AB AD AF	2
21	315T3034-1		.BRACKET	ADFHU W	1
21A	315T3034-2		.BRACKET ASSY	KOQS AA AC AE AG	1
23	MS20613-4C8		DELETED		
23A	MS20615-4M8		..RIVET	KOQS AA AC AE AG	1
23G	MS20613-4C5		DELETED		
23H	MS20615-4M5		..RIVET	KOQS AA AC AE AG	1
23P	NAS1056C4-015		..SPACER	KOQS AA AC AE AG	1
24	315T3034-4		..FLANGE	KOQS AA AC AE AG	1
24G	315T3034-3		..BRACKET	KOQS AA AC AE AG	1
25	66B90023-1		.PLATE-COVER		1
30	NAS6704-5		.BOLT		1
35	AN960C416		.WASHER		1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
40	BRH10C4		.NUT- (V52828) (SPEC BACN10JC4C) (OPT H31-4BAC (V15653)) (OPT NS202101S048 (V80539)) (OPT T6C428J (V71087)) (OPT VN303B048 (V92215)) (OPT 101LH9075-4W (V72962)) (OPT 97-048 (V80539))		1
45	315T3041-1		.CLAMP		2
50	NAS6704-12		.BOLT		2
55	BACW10P186C		.WASHER- (V10630) (SPEC BACW10P186C) (V81205)		2
60	BRH10C4		.NUT- (V52828) (SPEC BACN10JC4C) (SEE ITEM 40 FOR OPTIONAL PARTS)		2
61	315T3033-1		.PLATE-COVER		1
65	GM6425		DELETED		
65A	P56B		.TRANSDUCER (V19710) (SPEC 60B90034-2)	ABL-0 TUXYZ AA AD-AG	1
65B	P56C		.TRANSDUCER (V19710) (SPEC 60B90034-3)	C-K P-SVW AB AC	1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
70	BRH10C3		.NUT-		1
			(V52828)		
			(SPEC BACN10JC3C)		
			(OPT H31-3BAC		
			(V15653))		
			(OPT NAS202101S02		
			(V80539))		
			(OPT T6C1032J		
			(V71087))		
			(OPT VN303B02		
			(V92215))		
			(OPT 101LH9075-3W		
			(V72962))		
			(OPT 97-02		
			(V80539))		
75	66B90025-1		.SPACER		1
80	315T1017-1		.GEAR		1
85	66B90025-2		.SPACER		1
90	BACN10DP5J		.NUT		1
			(V11328)		
			(SPEC BACN10DP5J)		
			(V14397)		
			(V14798)		
			(V30974)		
			(V50948)		
95	MS20819-5C		.SLEEVE		1
100	69B96280-1		.SHIELD		1
105	315T4012-1		.ADAPTER		1
110	SL2997C7R		.NUT		1
			(V97393)		
			(OPT ITEMS 110C, 110D)		
-110A	NAS509-7C		DELETED		
-110B	SL2997C7R		DELETED		1
-110C	LS5097		.NUT		1
			(V34336)		
			(OPT ITEMS 110,110D)		
-110D	315T1005-1		.NUT		1
			(OPT ITEMS 110,110C)		
-110E	315T1005-1		DELETED		
-110F	LS5097		DELETED		1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
115	315T3042-1		.PLATE-COVER		1
120	NAS6603H1		.BOLT		2
125	AN960C10L		.WASHER		2
130	SL2999C3		.NUT		2
			(V97393)		
-130A	NAS509-3C		DELETED		
135	315T1029-1		.PIN		2
136	315T3370-1		.WASHER-SHIM	A-F	4
			(USED WITH ITEM 140C)	L-S	
-140	LA3628A		DELETED		
-140A	S315N166-1		DELETED		
-140B	10602-00		.BEARING	A-F	2
			(V55231)	L-S	
			(SPEC S315N166-1)		
			(OPT KRP114804BT (V50632))		
			(OPT HSP4TL104 (V02758))		
			(OPT ITEM 140C WHEN USED WITH ITEM 136)		
140C	60B96210-1		.BEARING ASSY (OPT ITEM 140B)(USED WITH ITEM 136)	A-F L-S	2
-143	KJT115204B		.SLIDER	G-K	1
			(V50632)	T-AC	
				AF AG	
145	MS18064-20		.SETSCREW		1
150	315T3046-1		.SPACER		1
-155	315T3035-1		.GEAR ASSY	A-D	1
				N-Q	
				T-W	
				Z-AC	
155G	315T3035-5		.GEAR ASSY	E-MRS	1
				AD-AG	
157	MS20427M2-6		..RIVET	E-MRS	10
				AD-AG	
158	315T3726-2		..RING-CLAMP	E-MRS	1
				AD-AG	
160	3TWF3746PLY198		..BEARING	A-D	1
			(V40920)	N-Q	
			(OPT ITEMS 160B,160C, 160D,160E)	T-W Z-AC	
-160A	3TWF3746SLY198		DELETED		

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-160B	3TWF3746ULY198		..BEARING (V40920) (OPT ITEMS 160,160C, 160D,160E)	A-D N-Q T-W Z-AC	1
-160C	MB546DDA3257		..BEARING (V21335) (OPT ITEMS 160,160B, 160D,160E)	A-D N-Q T-W Z-AC	1
-160D	MB546DDFS464		..BEARING (V21335) (OPT ITEMS 160,160B, 160C,160E)	A-D N-Q T-W Z-AC	1
-160E	3TWF3746SULY198		..BEARING (V40920) (OPT ITEMS 160,160B, 160D,160E)	A-D N-Q T-W Z-AC	1
162	MB546DDA3257		..BEARING (V21335) (OPT ITEMS 162A THRU 162H,162J,162K)	E-MRS AD-AG	1
-162A	MB546DDFS464		..BEARING (V21335) (OPT ITEMS 162,162B THRU 162H,162J,162K)	E-MRS AD-AG	1
-162B	3TWF3746PLY198		..BEARING (V40920) (OPT ITEMS 162,162A,162C THRU 162H,162J,162K)	E-MRS AD-AG	1
-162C	3TWF3746SULY198		..BEARING (V40920) (OPT ITEMS 162,162A, 162B,162D THRU 162H, 162J,162K)	E-MRS AD-AG	1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-162D	3TWF3746ULY198		..BEARING (V40920) (OPT ITEMS 162 THRU 162C,162E THRU 162H, 162J,162K) *[1]	E-MRS AD-AG	1
-162E	BCREFA2380		..BEARING (V40920) (S37-46BIE3P515LY198) (OPT ITEMS 162 THRU 162D,162F THRU 162H, 162J,162K) *[1]	E-GMRS AD-AG	1
-162F	BCREFA2379		..BEARING (V40920) (S37-46BIE5P515LY198) (OPT ITEMS 162 THRU 162E,162G,162H,162J, 162K) *[1]	E-MRS AD-AG	1
-162G	BCREFA2378		..BEARING (V40920) (S37-46BIE7P515LY198) (OPT ITEMS 162 THRU 162F,162H,162J,162K) *[1]	E-MRS AD-AG	1
-162H	BCREFA2423		..BEARING (V40920) (S37-46BIE3P515LY304) (OPT ITEMS 162 THRU 162G,162J,162K) *[1]	E-MRS AD-AG	1
-162J	BCREFA2424		..BEARING (V40920) (S37-46BIE5P515LY304) (OPT ITEMS 162 THRU 162H,162K) *[1]	E-MRS AD-AG	1

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FIG. & ITEM	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1234567	EFF CODE	QTY PER ASSY
01-					
-162K	BCREFA2425		..BEARING (V40920) (S37-46BIE7P515LY304) (OPT ITEMS 162 THRU 162H,162J) *[1]	E-MRS AD-AG	1
165	315T3035-2		..GEAR	A-D N-Q T-W Z-AC	1
167	315T3035-4		..GEAR	E-MRS AD-AG	1
169	315T3726-1		.RING-WIPER	E-MRS AD-AG	1
170	315T4011-2		.RACK		1
175	315T3037-1		.HOUSING	A-D N-Q T-W Z-AC	1
-175A	315T3037-3		.HOUSING	E-MRS AD-AG	1
-175B	315T3037-3		.HOUSING (POST SB 767-76-0009)	A-D	1

*[1] THIS BCREFAXXXX PART NUMBER IS A BOEING REFERENCE NUMBER USED TO TO ORDER SPECIFIC VENDOR PART NUMBERS.

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