COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

RAM AIR MODULATION SYSTEM EXHAUST DUCT TORQUE SHAFT AND UNIVERSAL JOINT ASSEMBLY

PART NUMBER 69-38753–2, –3, –4

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COMPONENT MAINTENANCE MANUAL

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To: All holders of RAM AIR MODULATION SYSTEM EXHAUST DUCT TORQUE SHAFT AND UNIVERSAL JOINT ASSEMBLY 21-26-06.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

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Location of Change	Description of Change
	NO HIGHLIGHTS

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

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COMPONENT MAINTENANCE MANUAL

TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
737-21-1123			MAR 01/01

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

Revision		Filed	
Number	Date	Date	Initials

Revision		Filed	
Number	Date	Date	Initials

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

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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.

RAM AIR MODULATION SYSTEM EXHAUST DUCT - TORQUE SHAFT AND UNIVERSAL JOINT ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The torque shaft and universal joint assembly consists of the parts that follow:

(1) A torque tube with an universal joint at one end.

(2) A stub shaft and an universal joint at the other end.

B. The universal joints have a male spline output.

2. Operation

A. The torque shaft and universal joint assembly transmits torque from the air conditioning system cable quadrant to the ram air modulation exhaust duct door.

3. Leading Particulars (Approximate)

A. Diameter – 1.5 inches

B. Length – 20 inches

C. Weight – 1 pound

(NOT APPLICABLE)

DISASSEMBLY

1. **Disassembly**

   A. General

      (1) This procedure has the data to disassemble the RAM air modulation system exhaust duct torque shaft and universal joint assembly.

      (2) Disassemble this component sufficiently to isolate the defects, do the necessary repairs, and put the component back to a serviceable condition.

      (3) Refer to IPL Figure 1 for the item numbers.

   B. Disassembly

      (1) Use standard industry practices to disassemble this assembly.

(NOT APPLICABLE)

CHECK

1. General

A. This procedure has the data to find defects in the specified parts.

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

C. Refer to IPL Figure 1 for the 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) Do a magnetic particle inspection of the following parts (IPL Figure 1) (SOPM 20-20-01).

(a) Shaft (60)

(b) Torque tube (65A)

(3) Do a penetrant inspection of the following parts (IPL Figure 1) (SOPM 20-20-02).

(a) Torque tube (65)

(4) Check universal joints (20, 40), as given in the manufacturer's instructions.

REPAIR

1. Content

A. Repair, refinish and replacement procedures are included in the section that follows:

Table 601:

P/N	NAME	REPAIR
—	MISC PARTS REFINISH	1-1

MISCELLANEOUS PARTS REFINISH - REPAIR 1-1

1. General

A. This procedure has the data to refinish shafts (60 and 60A) and torque tubes (65, 65A and 65B).

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

C. Refer to IPL Figure 1 for the item numbers.

2. Miscellaneous parts refinish

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I

B. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02.

(1) Repair of parts listed in REPAIR 1-1, Table 601 consists of restoration of the initial finish.

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
Shaft (60) Torque tube (65)	Al alloy	Alodize or chromic acid anodize and apply primer, C00259 (SRF-2.30).
Shaft (60A)	Al alloy	Chromate acid anodize and apply primer, C00259 (F-18.13).
Torque tube (65A,65B)	4130 Stl 125-145 ksi	Cadmium plate (F-15.02) exterior surfaces. Apply phosphate coating (F-1.303) interior surfaces. Apply primer, C00259 (F-20.02) all surfaces.

ASSEMBLY

1. General

A. This procedure has the data to assemble the RAM air modulation system exhaust duct torque shaft and universal joint assembly.

B. Refer to IPL Figure 1 for the item numbers.

2. Assembly

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I

B. References

Reference	Title
SOPM 20-60-02	FINISHING MATERIALS

C. Procedure

NOTE: If torque tube is worn or damaged beyond repair, replace entire assembly.

NOTE: For finishing materials, refer to SOPM 20-60-02.

(1) If shaft (60) needs replacement, then machine the fastener holes as follows:

(a) Install universal joint (40) on shaft (60) and check that end of shaft is visible thru the inspection hole in universal joint.

NOTE: Secure the universal joint and the shaft in a fixed position.

(b) Machine 0.1895-0.1905 inch diameter bolt holes thru universal joint (40) and shaft (60) using holes in universal joint for locations.

1) Remove the parts and deburr the holes.

2) Break edges to approximately 0.008 inch radius.

(c) Assemble universal joint (40) to shaft (60) with primer, C00259.

1) Secure universal joint to shaft with bolts (25), washers (30), and nuts (35).

2) Apply primer, C00259 to fastener holes, if necessary.

3) Install the fasteners with primer, C00259.

4) Tighten fasteners up to 10 lb-in. maximum for the 69-38753-2 assembly, or to 20-25 lb-in. for the 69-38753-3 and the 69-38753-4 assemblies.

(d) Assemble shaft (60) in torque tube (65).

1) Position to obtain 18.12-18.18 inch overall length (ASSEMBLY, Figure 701).

2) Check that the universal joints are aligned as shown in the figure.

3) Secure the torque tube to the shaft in a fixed position.

(e) Machine 0.1895-0.1905 inch diameter bolt holes in shaft (60).

1) Use holes in torque tube (65) for locations.

2) Remove the parts and deburr the holes.

3) Break edges to approximately 0.008 inch radius.

(f) Install shaft (60) in torque tube (65) with primer, C00259.

1) Secure shaft to torque tube with bolts (45), washers (50), and nuts (55).

2) Apply primer, C00259 to fastener holes, if necessary.

3) Install the fasteners with primer, C00259.

4) Tighten fasteners to 10 lb-in. maximum for the 69-38753-2 or to 20-25 lb-in. for the 69-38753-3 and the 69-38753-4.

(g) Install universal joint (20) to torque tube (65) with primer, C00259.

1) Secure the universal joint to the torque tube.

NOTE: Use bolts (5), washers (10), and nuts (15).

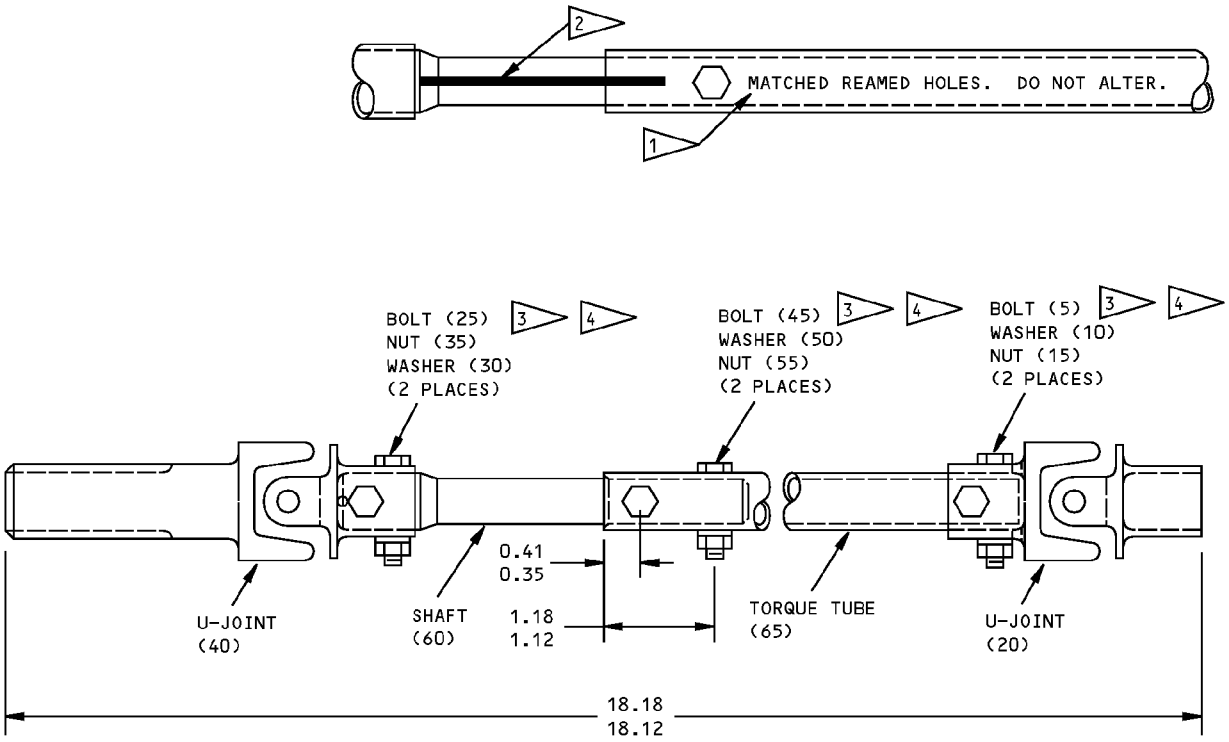
2) Apply primer, C00259to fastener holes as necessary.

3) Install the fasteners with primer, C00259.

4) Tighten fasteners to 10 lb-in. maximum for the 69-38753-2 assembly or to 20-25 lb-in. for the 69-38753-3 and the 69-38753-4 assemblies.

(2) If shaft (60) does not need replacement, then use steps ASSEMBLY, Paragraph 2.C.(1)(c), ASSEMBLY, Paragraph 2.C.(1)(f), and ASSEMBLY, Paragraph 2.C.(1)(g) above to assemble the shaft.

(3) Restore markings per ASSEMBLY, Figure 701, if necessary.



1. SKYDROL-RESISTANT STAMP 0.12 HIGH LETTERS (0.16 HIGH OPTIONAL) 3 PLACES EQUALLY SPACED AROUND TUBE.
2. PAINT INDEX MARK WITH BMS 10-60 BLACK GLOSS ENAMEL (SRF-14.9815-701) 0.03-0.08 WIDE AFTER ASSEMBLY. LENGTH APPROX. 4 INCHES.
3. APPLY ONE COAT OF PRIMER TO HOLES AND INSTALL FASTENER BEFORE OR AFTER PRIMER IS DRY. INSTALL FASTENERS WITH WET OR DRY PRIMER (F-12.415).
4. TIGHTEN TO A MAXIMUM OF 10 LB-IN. (69-38753-2) OR TO 20-25 LB-IN. (69-38573-3 AND 69-38573-4)

ALL DIMENSIONS ARE IN INCHES

Torque Shaft and Universal Joint Assembly
Figure 701

FOR TORQUE VALUES OF STANDARD FASTENERS, REFER TO 20-50-01				
ITEM NO. IPL FIG. 1	NAME	TORQUE		
		POUND-INCHES		POUND-FEET
		1	1A,1B	
15 35 55	NUT NUT NUT	10 MAX 10 MAX 10 MAX	20-25 20-25 20-25	

Torque Table
Figure 801

COMPONENT MAINTENANCE MANUAL

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

(NOT APPLICABLE)

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

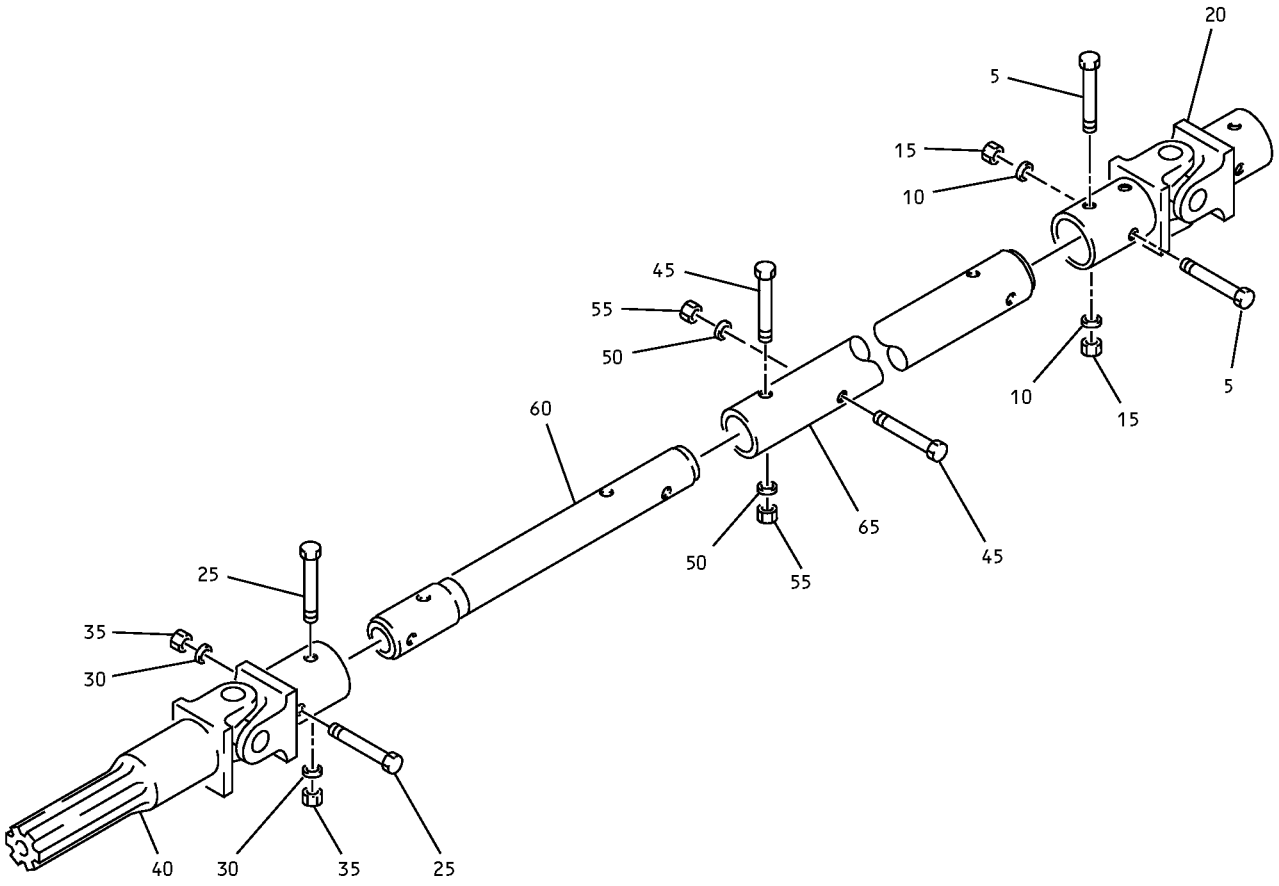
Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES,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

VENDOR CODES

Code	Name
03700	Replaced: [V03700] APEX MACHINE TOOL CO by Code: Name and Address below 03705: COOPER INDUSTRIES INC APEX DIV 762 WEST STEWART STREET PO BOX 952 DAYTON, OHIO 45401-0952 FORMERLY APEX MACHINE TOOL CO V03700
03705	APEX ENGINEERING PRODUCTS CORPORATION 11912 S SPAULDING SCHOOL P.O. BOX 439 PLAINFIELD, ILLINOIS 60544-9501
U1586	MOLLART UNIVERSAL JOINTS LTD WOKINGHAM RG41 2FW, UNITED KINGDOM OBSOLETE, UNKNOWN TO LOCAL POSTAL AUTHORITIES FORMERLY V0948B

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
12A100		1	20A	1
12A101		1	40A	1
16PF849		1	20C	1
16PF850		1	40C	1
69-38751-1		1	60	1
69-38751-2		1	60A	1
69-38752-1		1	65	1
69-38752-2		1	65A	1
69-38752-3		1	65B	1
69-38753-2		1	1	RF
69-38753-3		1	1A	RF
69-38753-4		1	1B	RF
A15936		1	20B	1
A15938		1	40B	1
AN960PD10		1	10	2
		1	30	2
		1	50	2
BACB10NE3-10		1	45	2
BACB10NE3-12		1	25	2
BACB30NE3-12		1	5	2
BACN10JC3		1	15	2
		1	35	2
		1	55	1
MS34312-12		1	20	1
MS34314-12		1	40	1



Torque Shaft and Universal Joint 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	69-38753-2		TORQUE SHAFT AND UNIVERSAL JOINT ASSY-RAM AIR MODULATION SYSTEM EXHAUST DUCT (PRE SB 737-21-1123)	A	RF
–1A	69-38753-3		TORQUE SHAFT AND UNIVERSAL JOINT ASSY-RAM AIR MODULATION SYSTEM EXHAUST DUCT (PRE SB 737-21-1123)	B	RF
–1B	69-38753-4		TORQUE SHAFT AND UNIVERSAL JOINT ASSY-RAM AIR MODULATION SYSTEM EXHAUST DUCT (PRE SB 737-21-1123)	C	RF
5	BACB30NE3-12		. BOLT		2
10	AN960PD10		. WASHER		2
15	BACN10JC3		. NUT		2
20	MS34312-12		. UNIVERSAL JOINT ASSY (OPT ITEM 20A,20B,20C)		1
–20A	12A100		. UNIVERSAL JOINT ASSY (V03705) (OPT ITEM 20,20B,20C)		1
–20B	A15936		. UNIVERSAL JOINT ASSY (VU1586) (PREFERED)		1
–20C	16PF849		. UNIVERSAL JOINT ASSY (OPT ITEM 20,20A,20B)		1
25	BACB10NE3-12		. BOLT		2
30	AN960PD10		. WASHER		2
35	BACN10JC3		. NUT		2
40	MS34314-12		. UNIVERSAL JOINT ASSY (OPT ITEM 40A,40B,40C)		1
–40A	12A101		. UNIVERSAL JOINT ASSY (V03700) (OPT ITEM 40,40B,40C)		1
–40B	A15938		. UNIVERSAL JOINT ASSY (VU1586) (PREFERED)		1
–40C	16PF850		. UNIVERSAL JOINT ASSY (OPT ITEM 40,40A,40B)		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–					
45	BACB10NE3-10		. BOLT		2
50	AN960PD10		. WASHER		2
55	BACN10JC3		. NUT		1
60	69-38751-1		. SHAFT	A, B	1
–60A	69-38751-2		. SHAFT	C	1
65	69-38752-1		. TORQUE TUBE	A	1
–65A	69-38752-2		. TORQUE TUBE	B	1
–65B	69-38752-3		. TORQUE TUBE	C	1

–Item not Illustrated