

KSSU Group

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
CHAPTER 76 TAB			76-11-01			76-11-03		CONT.
ENGINE CONTROLS (CF6-80C SERIES ENGINES)			401	FEB 10/94	J02	205	FEB 10/92	J02
			402	FEB 10/89	J01	206	FEB 10/92	J02
			403	FEB 10/89	J01	207	FEB 10/92	J02
			404	FEB 10/94	J02	208	FEB 10/92	J02
			405	JUN 10/94	J02	209	FEB 10/92	J02
			406	OCT 10/94	J02	210	FEB 10/92	J02
76-CONTENTS			76-11-01			211	FEB 10/92	J02
1	OCT 15/98	JKSS	501	JUN 10/95	J02	212	FEB 10/92	J02
2	OCT 18/99	JKSS	502	FEB 10/89	J01	213	FEB 10/92	J02
3	OCT 18/99	JKSS	503	OCT 10/88	J01	214	JUN 10/92	J02
R 4	OCT 18/00	JKSS.1	504	JUN 10/93	J01	215	FEB 10/92	J02
5	OCT 10/97	JKSS	505	OCT 10/94	J02	216	FEB 10/92	J02
6	BLANK		506	OCT 10/94	J02	217	FEB 10/92	J02
76-FAULT CODE INDEX			507	OCT 10/94	J02	218	FEB 10/92	J02
1	FEB 10/92	J01	508	OCT 10/94	J02	219	JUN 10/97	J02
2	FEB 10/97	J01	509	OCT 10/94	J02	220	JUN 10/97	J02
3	FEB 10/97	J01	510	OCT 10/94	J02	221	JUN 10/97	J02
R 4	OCT 18/00	J01.101	511	OCT 10/94	J02	222	JUN 10/97	J02
R 5	OCT 18/00	J01.101	512	BLANK		223	JUN 10/97	J02
R 6	OCT 18/00	J01.101	76-11-02			224	JUN 10/97	J02
R 7	OCT 18/00	J01.101	401	FEB 10/94	J02	225	JUN 10/97	J02
8	BLANK		402	FEB 10/89	J01	226	JUN 10/97	J02
76-11-00			403	JUN 15/98	J01	227	JUN 10/97	J02
1	FEB 10/89	J02	404	FEB 10/97	J02	228	JUN 10/97	J02
2	FEB 10/89	J01	405	FEB 10/97	J02	229	JUN 10/97	J02
3	JUN 10/88	J01	406	BLANK		230	JUN 10/97	J02
4	JUN 10/88	J01	76-11-02			231	JUN 10/97	J02
5	OCT 10/89	J02	501	FEB 18/00	J02	232	JUN 10/97	J02
6	OCT 10/89	J02	R 502	OCT 18/00	J06.1	233	JUN 10/97	J02
7	FEB 10/89	J02	503	FEB 10/92	J02	234	JUN 10/97	J02
8	OCT 10/89	J03	504	FEB 10/92	J02	235	JUN 10/97	J02
9	FEB 10/89	J03	505	FEB 10/92	J03	236	JUN 10/97	J02
10	FEB 10/89	J03	506	FEB 10/92	J03	237	JUN 10/97	J02
11	FEB 10/89	J03	507	FEB 10/94	J02	238	JUN 10/97	J02
12	BLANK		508	JUN 10/95	J02	239	JUN 10/97	J02
76-11-00			509	JUN 10/96	J02	240	JUN 10/97	J02
101	OCT 10/89	J01	510	JUN 10/96	J02	241	JUN 10/97	J02
102	FEB 10/89	J01	511	FEB 10/94	J03	242	JUN 10/97	J02
103	FEB 10/89	J01	512	OCT 10/97	J03	243	JUN 10/97	J02
104	FEB 10/89	J01	R 513	OCT 18/00	J05.1	244	JUN 10/97	J02
105	OCT 10/96	J01	514	FEB 10/92	J02	245	JUN 10/97	J02
R 106	OCT 18/00	J01.1	515	JUN 10/93	J02	246	OCT 18/99	J02
R 107	OCT 18/00	J01.1	516	FEB 10/92	J02	247	OCT 18/99	J02
R 108	OCT 18/00	J01.1	517	OCT 10/97	J02	R 248	OCT 18/00	J02.1
R 109	OCT 18/00	J01.1	518	FEB 15/98	J03	249	OCT 18/99	J02
R 110	OCT 18/00	J01.1	519	FEB 15/98	J03	250	OCT 18/99	J02
R 111	OCT 18/00	J01.1	520	FEB 15/98	J03	251	OCT 18/99	J02
R 112	OCT 18/00	J01.1	521	FEB 15/98	J03	252	JUN 10/97	J02
R 113	OCT 18/00	J01.1	522	BLANK		253	JUN 10/97	J02
R 114	OCT 18/00	J01.1	76-11-03			254	JUN 10/97	J02
R 115	OCT 18/00	J01.1	201	JUN 10/97	J02	255	JUN 10/97	J02
116	OCT 15/98	J01	202	JUN 10/97	J02	256	JUN 10/97	J02
117	OCT 15/98	J01	203	FEB 10/94	J01	257	JUN 10/97	J02
118	OCT 15/98	J01	204	FEB 10/92	J01	258	JUN 10/97	J02
						259	JUN 10/97	J02
						260	BLANK	

R = REVISED, A = ADDED OR D = DELETED  
F = FOLDOUT PAGE  
98  
OCT 18/00

**D633U101-98**

CHAPTER 76  
EFFECTIVE PAGES  
J PAGE 1  
CONTINUED

KSSU Group

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
76-11-04			76-12-02		CONT.			
401	JUN 10/93	J02	R 507	OCT 18/00	J02.1			
402	FEB 10/89	J01	508	OCT 10/95	J02			
403	FEB 10/94	J02	509	OCT 10/94	J02			
404	FEB 10/92	J03	510	OCT 10/94	J02			
76-12-00			R 511	OCT 18/00	J02.1			
1	OCT 10/95	J02	R 512	OCT 18/00	J02.1			
2	FEB 10/89	J01	R 513	OCT 18/00	J05.1			
3	FEB 10/89	J01	514	OCT 10/97	J02			
4	FEB 10/89	J02	515	OCT 10/97	J02			
76-12-00			516	OCT 10/97	J02			
601	OCT 10/95	J02	517	OCT 10/97	J02			
602	FEB 10/95	J02	518	BLANK				
603	FEB 10/95	J02	76-21-00					
604	OCT 10/93	J02	1	FEB 10/89	J02			
605	FEB 10/95	J02	2	JUN 10/88	J01			
606	FEB 10/95	J02	3	FEB 10/89	J01			
607	FEB 10/95	J02	4	JUN 10/88	J01			
608	FEB 10/95	J02	5	JUN 10/88	J01			
609	FEB 10/95	J02	6	FEB 10/89	J02			
610	FEB 10/95	J02						
611	FEB 10/95	J02						
612	FEB 10/95	J02						
613	FEB 10/95	J02						
614	FEB 10/95	J02						
615	FEB 10/95	J02						
616	FEB 10/94	J02						
617	FEB 10/95	J02						
618	BLANK							
76-12-01								
401	FEB 10/92	J03						
402	FEB 10/89	J01						
403	FEB 10/92	J03						
404	FEB 10/92	J03						
405	FEB 10/92	J02						
406	BLANK							
76-12-02								
401	FEB 10/95	J02						
402	JUN 10/90	J02						
403	OCT 10/95	J03						
404	JUN 10/93	J03						
405	FEB 10/95	J02						
406	FEB 10/95	J02						
407	FEB 10/95	J03						
408	FEB 10/95	J03						
409	FEB 10/95	J03						
410	BLANK							
76-12-02								
501	OCT 10/94	J02						
502	OCT 10/94	J01						
503	OCT 10/95	J02						
504	OCT 10/94	J02						
505	OCT 10/94	J02						
R 506	OCT 18/00	J02.1						

R = REVISED, A = ADDED OR D = DELETED  
F = FOLDOUT PAGE  
98  
OCT 18/00

**D633U101-98**

CHAPTER 76  
EFFECTIVE PAGES  
J PAGE 2  
LAST PAGE

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
<u>FAULT CODE INDEX</u>	76-FAULT CODE INDEX	1	ALL
<u>POWER CONTROL</u>	76-10-00		
ENGINE CONTROL SYSTEM	76-11-00		
Description and Operation		1	ALL
General		1	
Autothrottle Servomotor and Brake Assembly		1	
Disengage Switches		9	
Engine Start Module		9	
Go-Around Switches		9	
Thrust Lever Position Resolver		9	
Thrust Levers		1	
Operation		10	
Component Location		101	ALL
Component Index			
Component Location			
Fault Isolation			
General		105	
Engine Fuel Control Problem. EICAS Message "ENG (1, 2, 3, or 4) FUEL VLV" Displayed (Fig. 103)		106	
Forward/Reverse Thrust Lever Problems (Fig. 104)		116	
Thrust Levers Misaligned (Fig. 105)		118	
BRAKE ASSEMBLY - AUTOTHROTTLE	76-11-04		
Removal/Installation		401	ALL

76-CONTENTS

JKSS

Page 1

Oct 15/98

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	Chapter Section <u>Subject</u>	<u>Page</u>	<u>Effectivity</u>
CONTROL STAND	76-11-03		
Maintenance Practices		201	ALL
Activate, Autothrottle		253	
Activate, Seat, CAPT and F/O		256	
Adjustment, Microswitch Pack		240	
Chock Wheels		202	
De-energize, Actuation		229	
Circuit, Speed Brake			
De-energize, Interlock		212	
Actuators, Reverse Thrust			
Lever			
De-energize, Resolvers,		210	
Thrust Lever Position			
De-energize, RVDT, Flap		230	
Lever			
De-energize, Switches, Fuel		212	
Control Toggle			
De-energize, Switches, STAB		213	
TRIM			
De-energize, Switches,		205	
Thrust Lever			
Deactivate, Autothrottle		209	
Deactivate, Seat, CAPT and		205	
F/O			
Energize, Actuation		255	
Circuits, Speed Brake Lever			
Energize, Interlock		253	
Actuator, Reverse Thrust			
Lever			
Energize, Resolvers, Thrust		251	
Lever Position			
Energize, RVDT, Flap Lever		254	
Energize, Switch, Fuel		252	
Control Toggle			
Energize, Switches, STAB		255	
TRIM			
Energize, Switches, Thrust		254	
Lever			
Installation, Cover, Flap		250	
Lever			
Installation, Cover, Speed		250	
Brake Lever			
Installation, Cover, Switch		234	

76-CONTENTS

JKSS

Page 2  
Oct 18/99

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
Installation, Cover, Thrust Lever		237	
Installation, Engine Start Module		234	
Installation, Microswitch Pack Assembly		238	
Installation, Microswitch Pack Cover		249	
Installation, Microswitches		237	
Installation, Side Panels, Control Stand		251	
Installation, STAB TRIM Indicator		249	
Installation, Thrust Lever Rail		236	
Removal, Cover, Flap Lever		232	
Removal, Cover, Speed Brake Lever		230	
Removal, Cover, Switch		206	
Removal, Cover, Thrust Lever Assembly		206	
Removal, Engine Start Module		214	
Removal, Microswitch Pack Assembly		219	
Removal, Microswitch Pack Cover		218	
Removal, Microswitches		226	
Removal, Side Panels, Control Stand		210	
Removal, STAB TRIM Indicator		227	
Removal, Thrust Lever Rail		214	
Replacement, Light, Fuel Control Switch		256	
LEVER ASSEMBLY, THRUST	76-11-01		
Removal/Installation		401	ALL
Adjustment/Test		501	ALL
Adjustment - Thrust Lever Assembly		501	
System Test - Engine Control		506	
RESOLVER - THRUST LEVER POSITION	76-11-02		
Removal/Installation		401	ALL

76-CONTENTS

JKSS

Page 3  
Oct 18/99

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
Adjustment/Test		501	ALL
General		501	
EICAS		512	
Procedure		502	
AUTOTHROTTLE SYSTEM	76-12-00		
Description and Operation		1	ALL
General		1	
Description		1	
Autothrottle Servomotor and		1	
Brake Assembly			
Disengage Switches		1	
Go-Around Switches		4	
Inspection/Check		601	ALL
Control Stand Components		601	
Inspection			
Visual Inspection of the		615	
Control Stand Components			
SERVOMOTOR GENERATOR AND GEARBOX	76-12-01		
- AUTOTHROTTLE			
Removal/Installation		401	ALL
SWITCH - AUTOTHROTTLE	76-12-02		
DISCONNECT/RESET AND GO-AROUND			
Removal/Installation		401	ALL
Adjustment/Test		501	ALL
Switch Adjustment -		501	
Autothrottle			
Disconnect/Reset			
Switch Adjustment -		511	
Go-Around (AIRPLANES WITH			
POST-SB 22-2216)			
Switch Adjustment -		506	
Go-Around (AIRPLANES WITH			
PRE-SB 22-2216)			
<u>EMERGENCY SHUTDOWN</u>	76-20-00		

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	Chapter Section <u>Subject</u>	<u>Page</u>	<u>Effectivity</u>
EMERGENCY SHUTDOWN, ENGINE FIRE	76-21-00		
Description and Operation		1	ALL
General		1	
Aural Warning Speakers		1	
Engine Fire Switch		1	
EICAS Main Display Screen		1	
Fuel Control Toggle Switch		1	
Master Warning Lights		1	
Operation		6	

## FAULT CODE INDEX

### 1. General

- A. The Fault Code Index includes fault isolation or corrective action for each fault code in the Fault Reporting Manual (FRM). The fault codes for each chapter are in numerical order.
  - (1) The first paragraph given with each fault code is the log book report from the FRM. The log book report is a short description of the fault.
  - (2) The numbered paragraphs after the log book report contain the fault isolation or the corrective action.
- B. The fault isolation for most EICAS messages, engine exceedances, or PFD flags includes a list of one or more possible correlated CMCS messages.
  - (1) For each CMCS message in the list, there is the message number and an ATA number. The ATA number is the prompt under which you can find the message in Existing Faults or Fault History on the CDU.
  - (2) The corrective action refers to the procedure in Figure 1 of this section. Figure 1 shows how to use the Present Leg Faults, Existing Faults, and Fault History functions of the CMC to isolate the fault to a specific CMCS message.
- C. For those EICAS status messages which latch into EIU memory when they occur, this index includes the letters NVM, NVM-A, or NVM-G to the right of the log book report.
  - (1) NVM indicates that the message latches if it occurs in the air or on the ground.
  - (2) NVM-A indicates that the message latches only if it occurs in the air.
  - (3) NVM-G indicates that the message latches only if it occurs on the ground.
  - (4) To remove the latched message from the EICAS after you correct the fault, you must use the ERASE function of the CMC.

**NOTE:** Do not erase a latched EICAS message until you are sure that you have corrected the fault.

EFFECTIVITY

ALL

## 76-FAULT CODE INDEX

J01

Page 1

Feb 10/92



- D. When the CDU shows a large number of Flight Deck Effects (FDEs) or CMCS messages, it is possible that there is a bus failure. Do these steps to isolate the cause of the bus failure:
- (1) Look at the CMCS messages to determine which system or LRU is related to all the messages.
  - (2) Look at the wiring diagram for each system and determine if the suspect LRUs are on a common bus.
  - (3) Do a check of the wiring between each of the suspect LRUs and the common bus.
  - (4) Repair any problems that you find.
  - (5) If the problem continues, remove each LRU individually to determine which LRU is the cause of the fault.
  - (6) Replace the LRU which caused the fault.

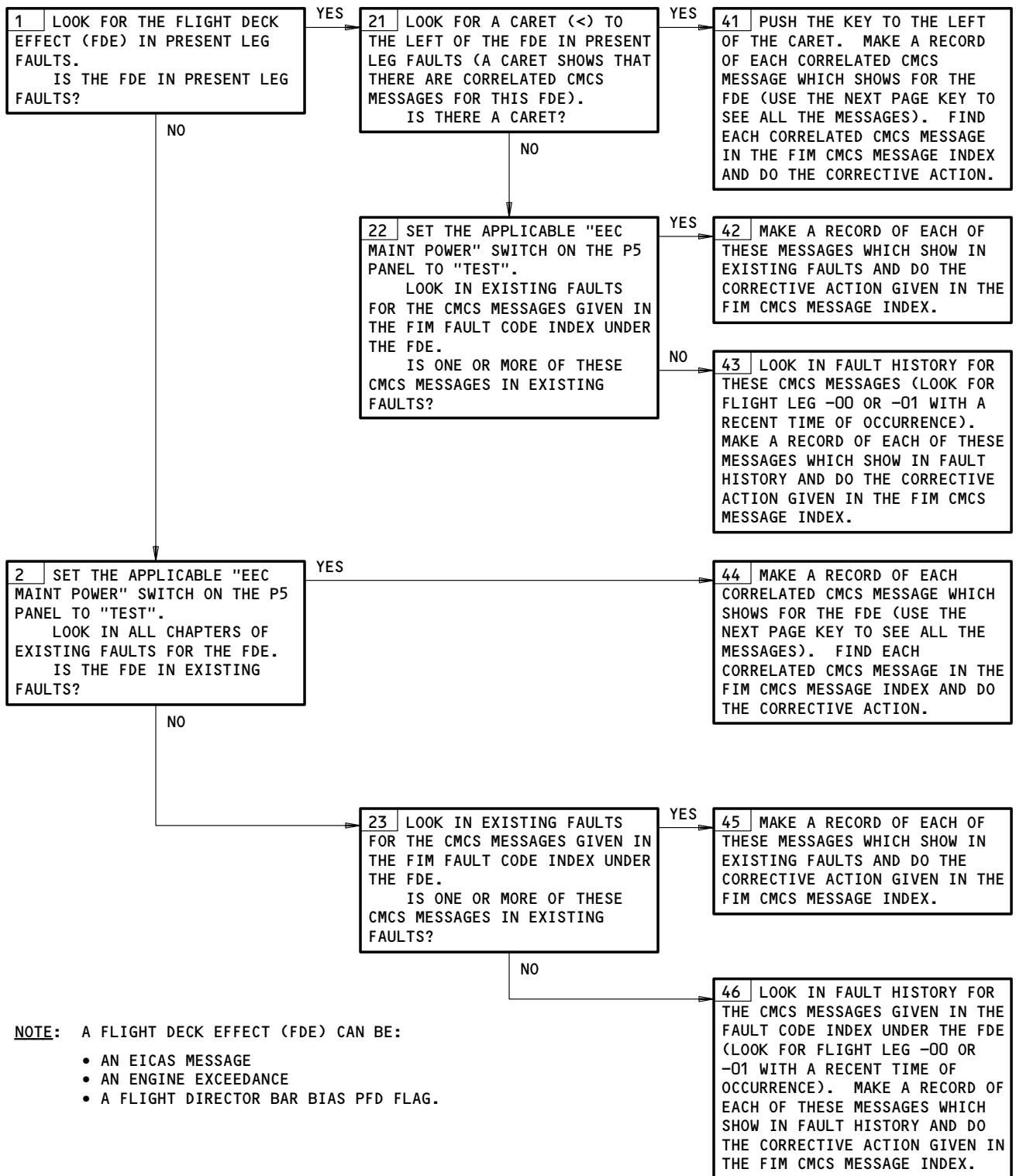
EFFECTIVITY

ALL

## 76-FAULT CODE INDEX

J01

Page 2  
Feb 10/97


 Fault Isolation Procedure with the CMCS  
 Figure 1

EFFECTIVITY

ALL

# 76-FAULT CODE INDEX

J01

 Page 3  
 Feb 10/97

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
00 17 69 01	ENG 1 FEEDBACK shows on the auto snapshot report of the performance maintenance page. 1. Look at the snapshot for this message.
00 17 69 02	ENG 2 FEEDBACK shows on the auto snapshot report of the performance maintenance page. 1. Look at the snapshot for this message.
00 17 69 03	ENG 3 FEEDBACK shows on the auto snapshot report of the performance maintenance page. 1. Look at the snapshot for this message.
00 17 69 04	ENG 4 FEEDBACK shows on the auto snapshot report of the performance maintenance page. 1. Look at the snapshot for this message.
76 03 01 ____	No. (01=1, 02=2, 03=3, 04=4) eng thrust levers misaligned ____ knob(s) during (T.O., climb, cruise). EEC(s) in NORM and autothrottle OFF. 1. 76-11-00, Fig. 105 Block 1.
76 03 02 00	The EICAS message ENG 1 FUEL VLV (ADVISORY) shows. 1. Look for one or more of these CMCS messages (Fig. 1):  24719 (24-60)    28631 (28-22)    71574 (71-00)  <u>NOTE:</u> The CMC message 71574 can also be set but its corrective action is the same as the step that follow:  2. If this CMCS message is not found, refer to 76-11-00, Fig. 103, Block 1.
76 03 03 00	The EICAS message ENG 2 FUEL VLV (ADVISORY) shows. 1. Look for one or more of these CMCS messages (Fig. 1):  24719 (24-60)    28632 (28-22)    72574 (71-00)  <u>NOTE:</u> The CMC message 72574 can also be set but its corrective action is the same as the step that follows:  2. If this CMCS message is not found, refer to 76-11-00, Fig. 103, Block 1.

EFFECTIVITY

ALL

## 76-FAULT CODE INDEX

J01.101

Page 4  
Oct 18/00

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
76 03 04 00	<p>The EICAS message ENG 3 FUEL VLV (ADVISORY) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="padding-left: 40px;">24719 (24-60)    28633 (28-22)    73574 (71-00)</p> <p><u>NOTE:</u> The CMC message 73574 can also be set but its corrective action is the same as the step that follows:</p> <p>2. If this CMCS message is not found, refer to 76-11-00, Fig. 103, Block 1.</p>
76 03 05 00	<p>The EICAS message ENG 4 FUEL VLV (ADVISORY) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="padding-left: 40px;">24719 (24-60)    28634 (28-22)    74574 (71-00)</p> <p><u>NOTE:</u> The CMC message 74574 can also be set but its corrective action is the same as the step that follows:</p> <p>2. If this CMCS message is not found, refer to 76-11-00, Fig. 103, Block 1.</p>
76 03 06 00	<p>The EICAS message ENG 1 FUEL VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="padding-left: 40px;">24719 (24-60)    71574 (71-00)</p> <p><u>NOTE:</u> The CMC message 71574 can also be set but its corrective action is the same as the steps that are given for this fault code.</p> <p>2. Refer to 76-11-00, Fig. 103, Block 1.</p>
76 03 07 00	<p>The EICAS message ENG 2 FUEL VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="padding-left: 40px;">24719 (24-60)    72574 (71-00)</p> <p><u>NOTE:</u> The CMC message 72574 can also be set but its corrective action is the same as the steps that are given for this fault code.</p> <p>2. Refer to 76-11-00, Fig. 103, Block 1.</p>

EFFECTIVITY
ALL

## 76-FAULT CODE INDEX

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
76 03 08 00	<p>The EICAS message ENG 3 FUEL VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">24719 (24-60)      73574 (71-00)</p> <p style="margin-left: 40px;"><u>NOTE:</u> The CMC message 73574 can also be set but its corrective action is the same as the steps that are given for this fault code.</p> <p>2. Refer to 76-11-00, Fig. 103, Block 1.</p>
76 03 09 00	<p>The EICAS message ENG 4 FUEL VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">24719 (24-60)      74574 (71-00)</p> <p style="margin-left: 40px;"><u>NOTE:</u> The CMC message 74574 can also be set but its corrective action is the same as the steps that are given for this fault code.</p> <p>2. Refer to 76-11-00, Fig. 103, Block 1.</p>
76 03 10 00	<p>ON AIRPLANES WITH IDS S/W -008, The EICAS message ENG 1 FAIL (CAUTION) shows.</p> <p>1. 71-00-00, Fig. 114, Block 1.</p>
76 03 10 00	<p>ON AIRPLANES WITH IDS S/W -009, The EICAS message ENG 1 FAIL (CAUTION) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">71956 (71-00)</p> <p>2. 71-00-00, Fig. 114, Block 1.</p>
76 03 11 00	<p>ON AIRPLANES WITH IDS S/W -008, The EICAS message ENG 2 FAIL (CAUTION) shows.</p> <p>1. 71-00-00, Fig. 114, Block 1.</p>
76 03 11 00	<p>ON AIRPLANES WITH IDS S/W -009, The EICAS message ENG 2 FAIL (CAUTION) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">72956 (71-00)</p> <p>2. 71-00-00, Fig. 114, Block 1.</p>

EFFECTIVITY

ALL

## 76-FAULT CODE INDEX

J01.101

Page 6  
Oct 18/00



FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
76 03 12 00	ON AIRPLANES WITH IDS S/W -008, The EICAS message ENG 3 FAIL (CAUTION) shows. 1. 71-00-00, Fig. 114, Block 1.
76 03 12 00	ON AIRPLANES WITH IDS S/W -009, The EICAS message ENG 3 FAIL (CAUTION) shows. 1. Look for one or more of these CMCS messages (Fig. 1):  73956 (71-00)  2. 71-00-00, Fig. 114, Block 1.
76 03 13 00	ON AIRPLANES WITH IDS S/W -008, The EICAS message ENG 4 FAIL (CAUTION) shows. 1. 71-00-00, Fig. 114, Block 1.
76 03 13 00	ON AIRPLANES WITH IDS S/W -009, The EICAS message ENG 4 FAIL (CAUTION) shows. 1. Look for one or more of these CMCS messages (Fig. 1):  74956 (71-00)  2. 71-00-00, Fig. 114, Block 1.

EFFECTIVITY
ALL

## 76-FAULT CODE INDEX

J01.101

Page 7  
Oct 18/00

ENGINE CONTROL SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. Thrust commands from flight crew or thrust management computer are transmitted to the engine by the engine control system. The engine control system consists of the thrust lever assembly, the brake assembly, the thrust lever position resolvers, the reverse thrust lever interlock actuator, the electronic control unit, and the main engine control (MEC).

2. Thrust Levers

- A. There are four thrust lever assemblies located in the control stand between the captain and the first officer.
- B. Each thrust lever assembly consists of a forward thrust select handle and a reverse thrust select handle.
  - (1) The reverse thrust lever is inhibited by the grounding latch on the reverse thrust lever from more than 8.5 degrees of lever travel when the forward thrust lever is advanced more than 2 degrees of lever travel.
- C. Each thrust lever assembly contains electrical control switches within the thrust lever housing.
- D. Each thrust lever assembly is connected directly to the brake assembly by a connector rod.
- E. Each thrust lever assembly is connected directly to a thrust lever position resolver through the brake assembly by a second connector rod.

3. Autothrottle Servomotor Generator, Gearbox, and Brake Assembly

- A. The autothrottle servomechanism/brake assembly is a single unit to position all thrust levers as commanded by the thrust management computer.
- B. The autothrottle servomechanism is connected indirectly to each thrust lever by a connecting rod and indirectly to each thrust lever position resolver by a second connecting rod, through the brake assembly.
- C. The brake mechanism provides a friction feel force for the thrust lever and rotates to make contact with the reverse thrust lever interlock when reverse thrust is selected, but the thrust reversers have not yet completed translation beyond the null thrust position which is 50% of the distance from stow to deploy.

EFFECTIVITY

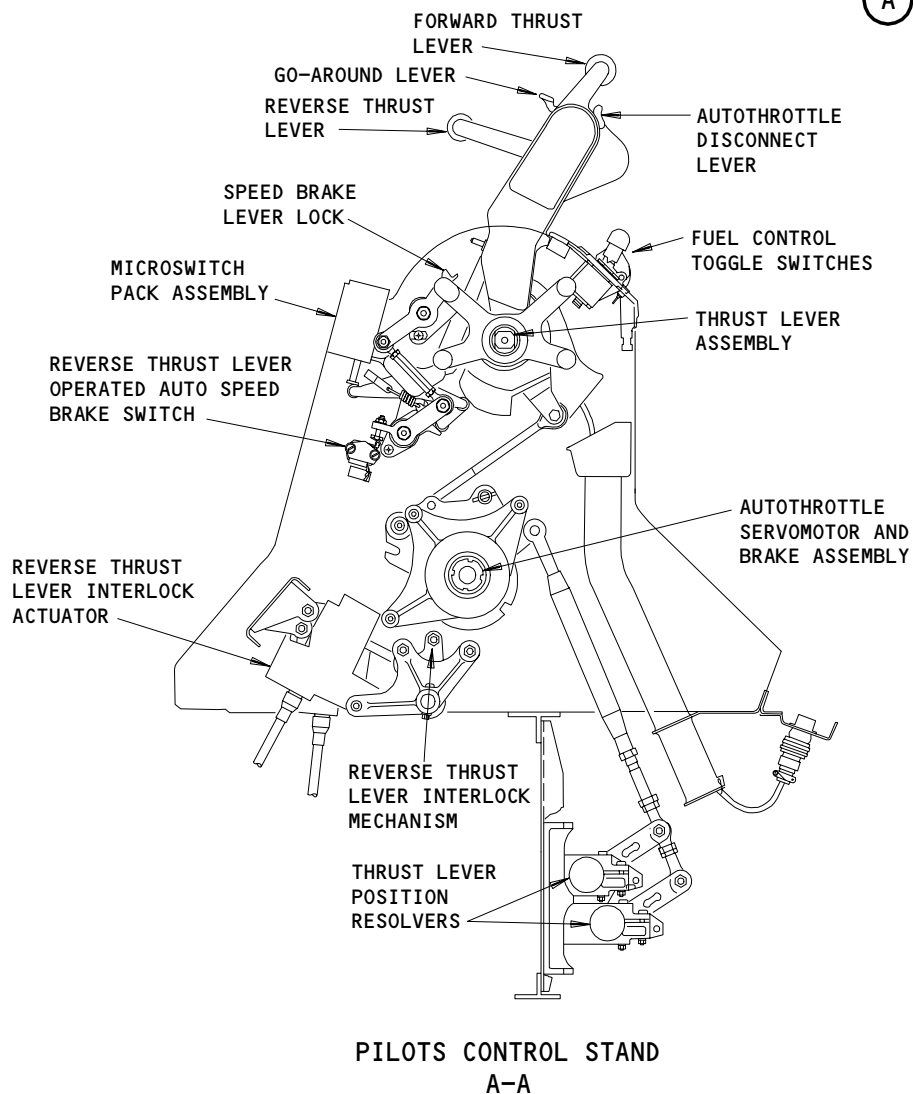
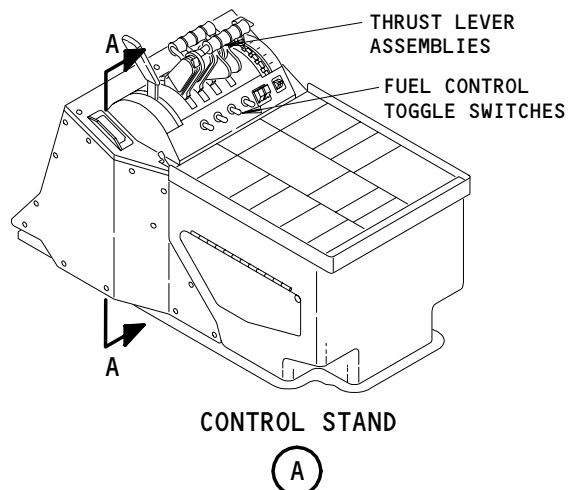
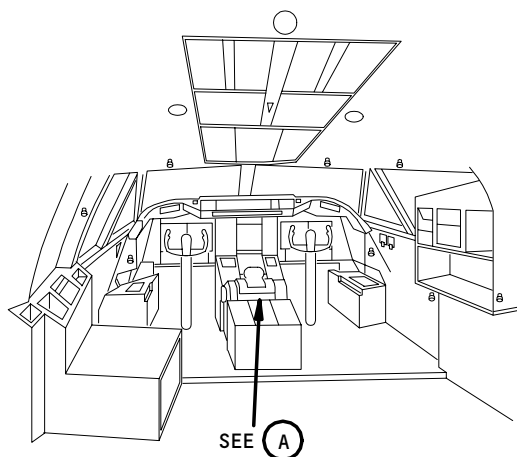
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76-11-00

J02

Page 1

Feb 10/89



Engine Control System - Component Location  
Figure 1 (Sheet 1)

EFFECTIVITY

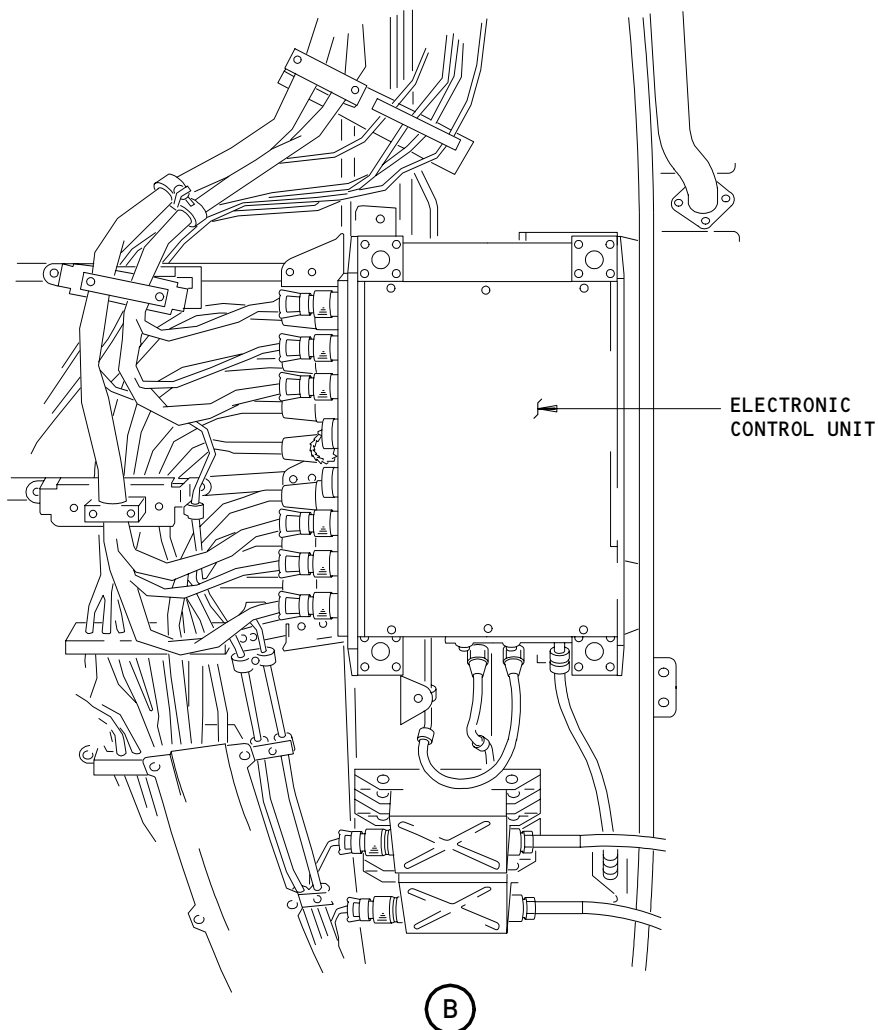
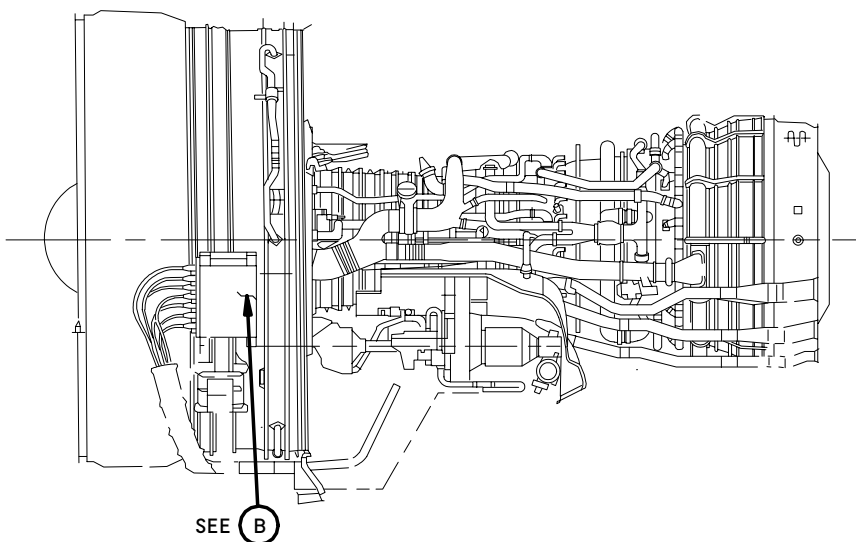
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76-11-00

J01

Page 2  
Feb 10/89





Engine Control System - Component Location  
Figure 1 (Sheet 2)

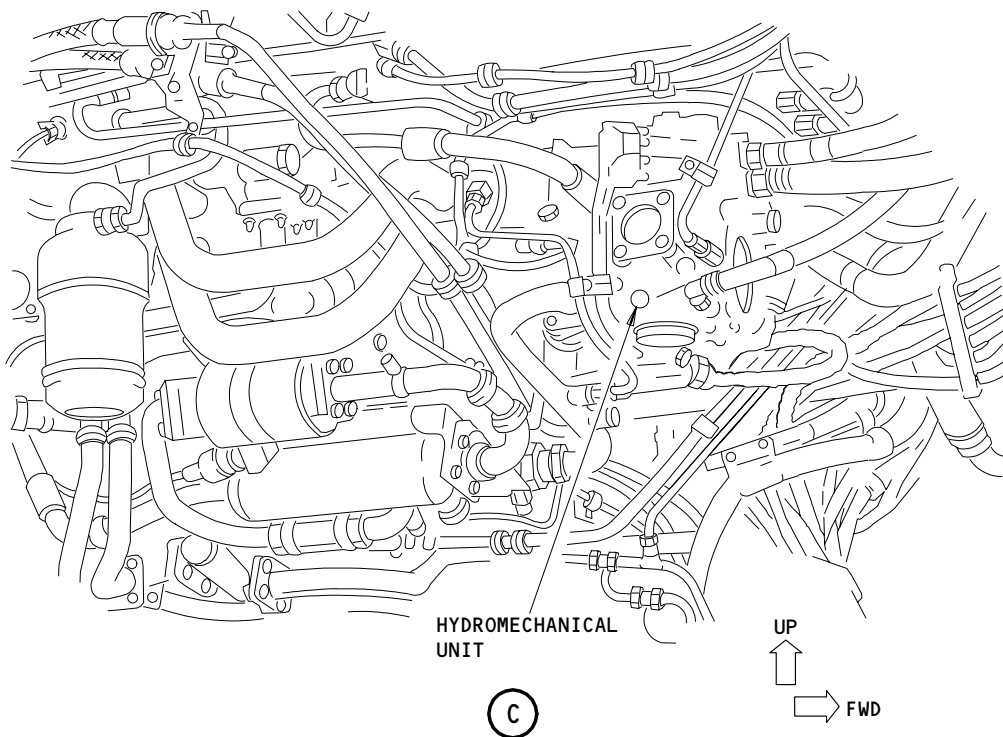
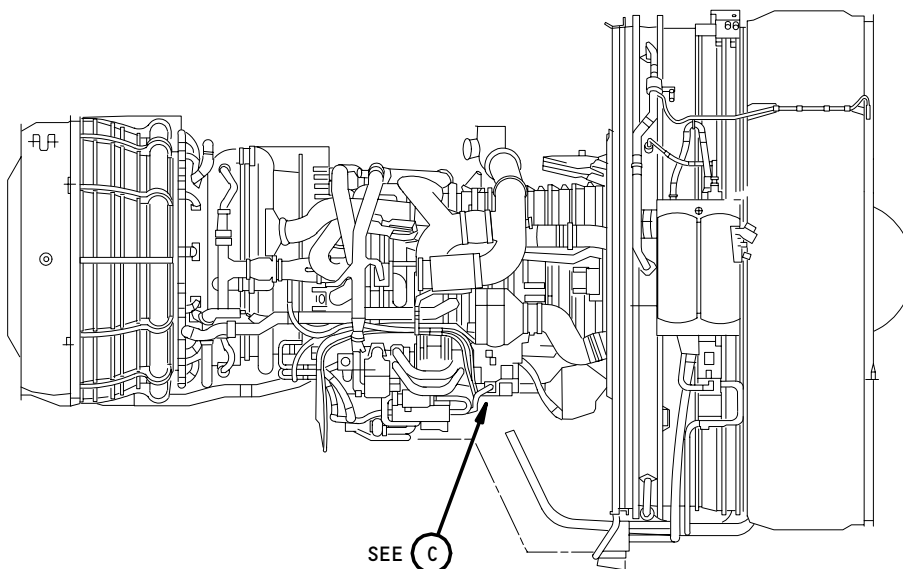
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76-11-00

J01

Page 3  
Jun 10/88



Engine Control System - Component Location  
Figure 1 (Sheet 3)

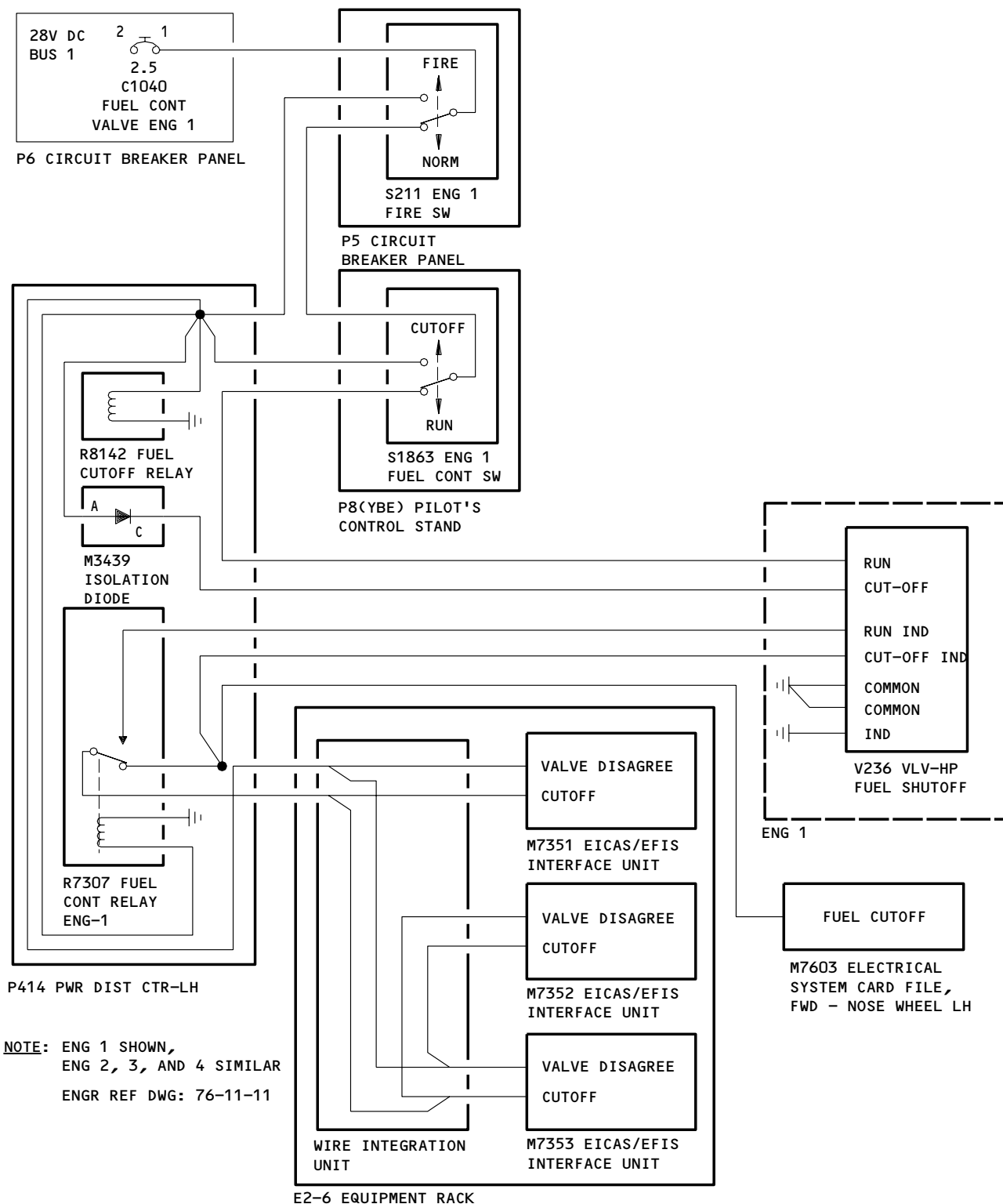
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76-11-00

J01

Page 4  
Jun 10/88



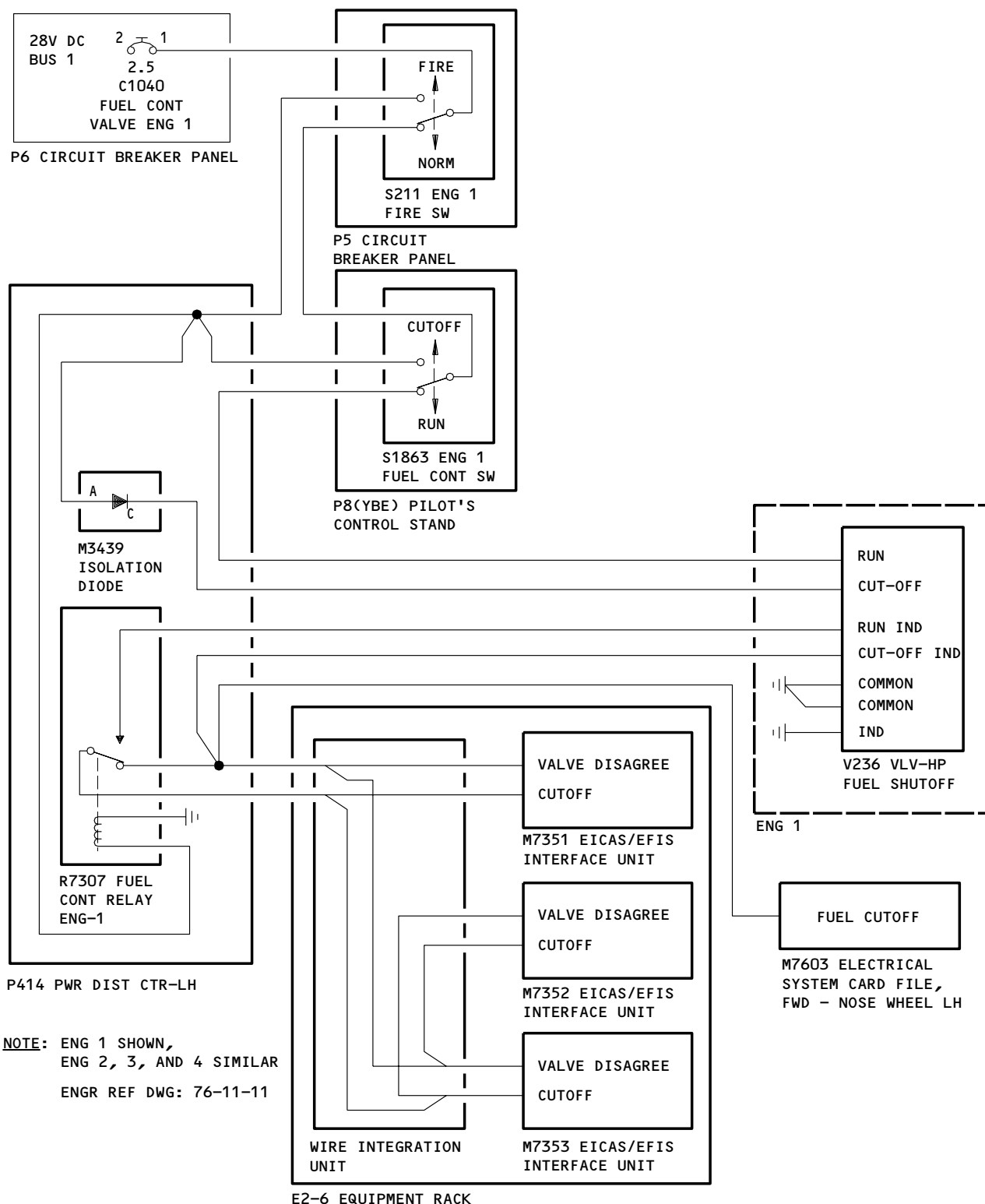
Engine Fuel Conditioning Control Schematic  
Figure 2 (Sheet 1)

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76-11-00

J02

Page 5  
Oct 10/89



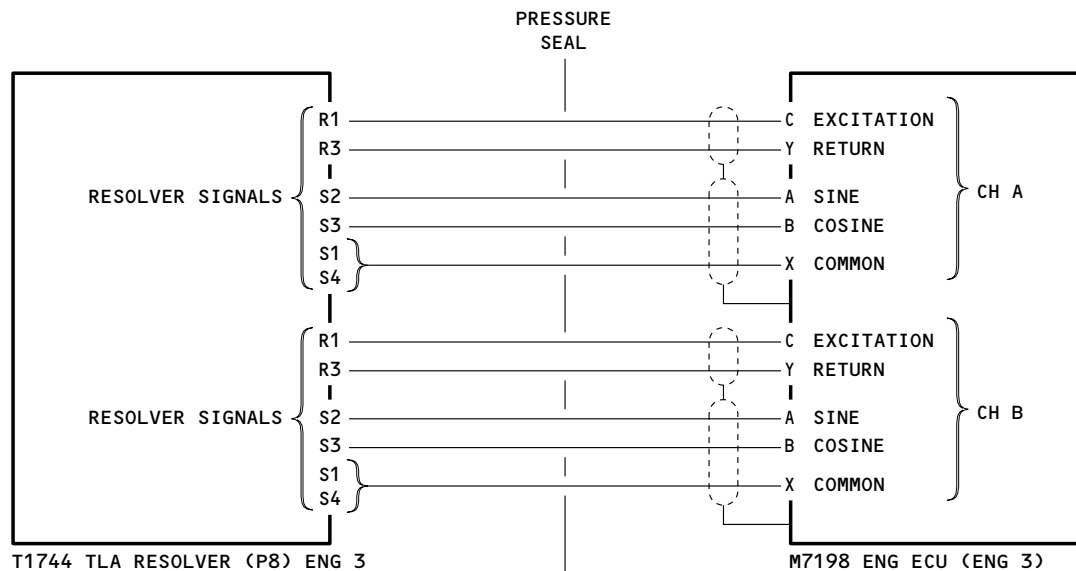
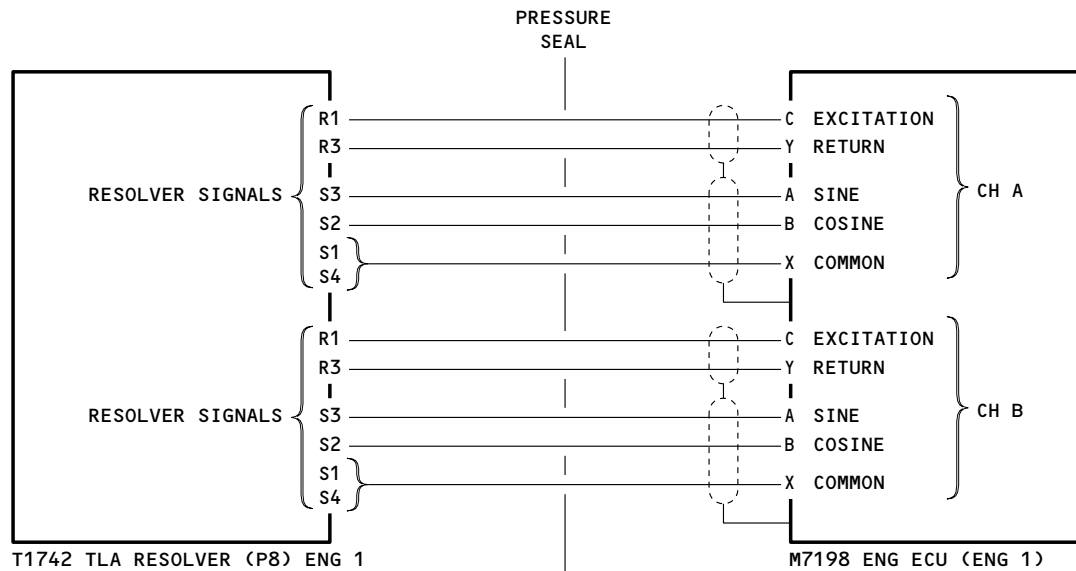
Engine Fuel Conditioning Control Schematic  
Figure 2 (Sheet 2)

EFFECTIVITY  
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76-11-00

J02

Page 6  
Oct 10/89



**NOTE:** ENG 1 AND ENG 2 SIMILAR  
ENG 3 AND ENG 4 SIMILAR

ENGR REF DWG: 73-21-02

### ECU THRUST LEVER POSITION RESOLVER

### Engine Fuel Conditioning Control Schematic Figure 2 (Sheet 3)

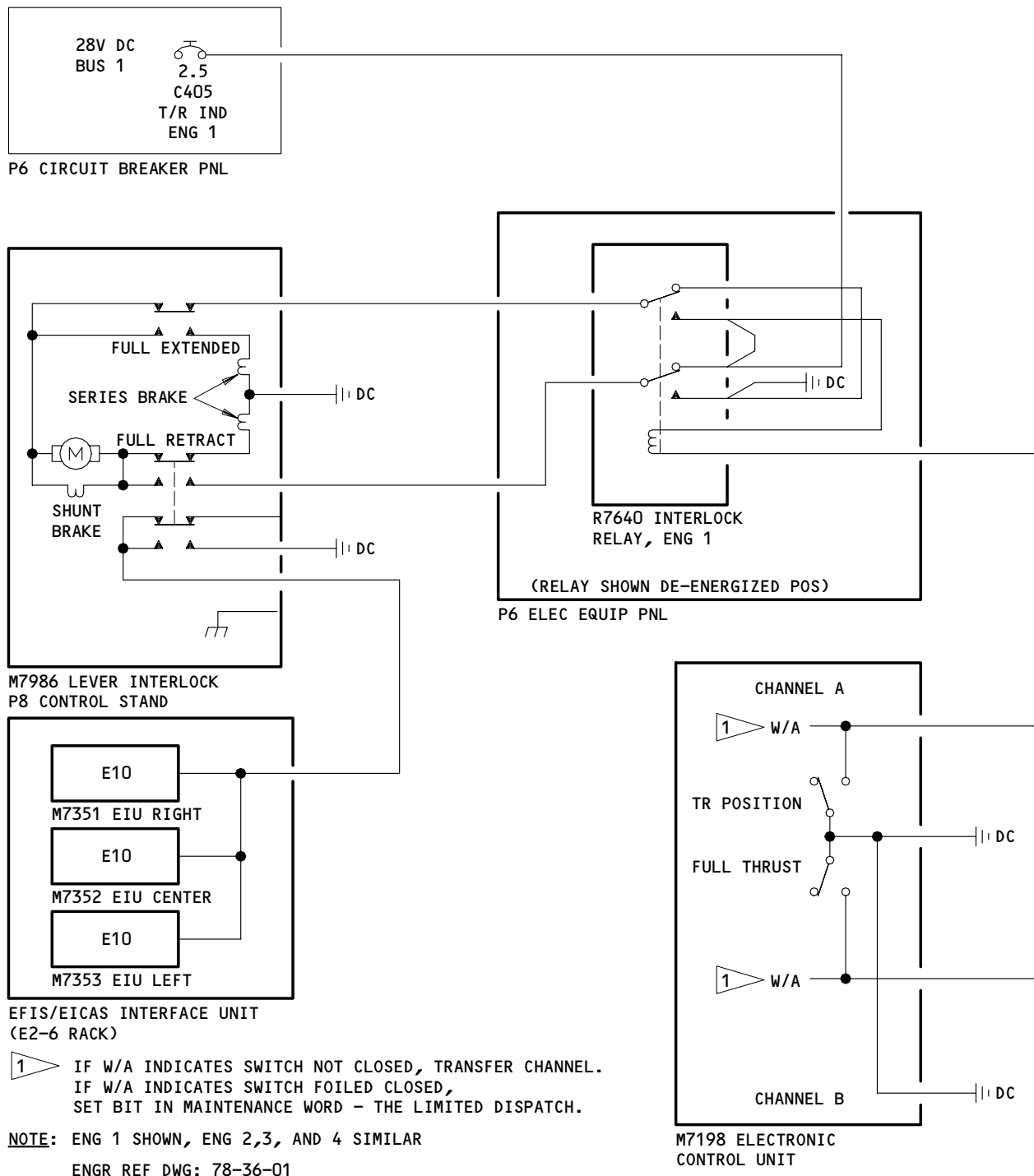
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**76-11-00**

J02

Page 7  
Feb 10/89



### ECU THRUST LEVER INTERLOCK

Engine Fuel Conditioning Control Schematic  
Figure 2 (Sheet 4)

EFFECTIVITY

ALL

76-11-00

J03

Page 8  
Oct 10/89

4. Thrust Lever Position Resolver

- A. There are four thrust lever position resolvers located beneath the floor under the aft end of the control stand in the flight compartment. Each thrust lever position resolver is connected to the brake assembly by a control rod.
- B. The thrust lever position resolver is a dual unit which provides electrically isolated thrust lever position signals to both electronic control unit channels (Ref 76-11-02/401).
- C. Thrust lever position resolver electrical power is supplied by the electronic control unit.

5. Disengage Switches

- A. Two disengage switches are located in thrust lever assembly 1, and two are located in thrust lever assembly 4.
- B. The disengage switches are used to manually disengage the autothrottle system.

6. Go-Around Switches

- A. Three go-around switches are located in thrust lever assembly 2, and three are located in thrust lever assembly 3.
- B. The go-around switches provide input to the FMC to signal go-around conditions selected. Go-Around flight control settings and thrust settings are preselected settings which are attained and controlled by the FMC when the go-around switches are closed.

7. Engine Start Module

- A. The engine start module consists of four fuel control toggle switches located on the aft deck of the control stand. Each switch may be placed either in the RUN position or the CUTOFF position. Each switch operates an airframe shutoff solenoid valve, indirectly controlling the pressurizing and shutoff valve.
- B. Each toggle will illuminate red as a warning of an engine fire. Flipping the fuel control toggle switch to the CUTOFF position during flight, as required by the Engine Fire Emergency Shutdown procedure (Ref 76-21-00/001), will cause the engine indication and crew alerting system (EICAS) status message SHUTDOWN to appear in the upper right corner of the EICAS main display screen in white letters.
- C. Also part of the engine start system are the ignition switches and the start switches located on the P5 overhead panel.

EFFECTIVITY

ALL

76-11-00

J03

Page 9

Feb 10/89

## 8. Operation

- A. The forward thrust lever controls the forward thrust power settings through the full range of motion of 50 degrees.
- (1) As the forward thrust lever is moved, it rotates the brake assembly which in turn rotates the thrust lever position resolvers.
  - (2) The thrust lever position resolvers receive power from the ECU and by altering electrical signals, indicate thrust lever position to the ECU.
  - (3) The ECU transmits an electrical signal to operate the torque motor controlling the fuel metering valve on the HMU to set fuel flow.
- B. The reverse thrust lever controls thrust reverser deployment and reverse thrust power.
- (1) The reverse thrust lever is inhibited by the grounding latch on the reverse thrust lever from more than 8.5 degrees of lever travel when the forward thrust lever is more than 2 degrees forward of idle. When the forward thrust lever is in idle the reverse thrust lever may be advanced.
  - (2) Between 2 degrees and 8 degrees of lever travel the reverse thrust lever actuates the thrust reverser control switch, located in the thrust lever assembly handles, causing the thrust reverser pressure regulating and shutoff valve in the strut to open and pressurize the thrust reverser system.
  - (3) Between 25 degrees and 35 degrees of lever travel the reverse thrust lever actuates the thrust reverser directional control switches, located in the microswitch pack assembly, causing the thrust reverser directional pilot valve located at 11 o'clock on the torque box of the the left thrust reverser half to move to the deploy position.
  - (4) When reverse thrust is selected the ECU transmits an electrical signal to the reverse thrust lever interlock actuator to motor from the normal or retract position into the extend position. In the extend position the reverse thrust lever interlock mechanism prevents movement of the reverse thrust lever beyond 55 degrees of lever travel.
  - (5) When the thrust reverser has reached the null thrust position, the ECU transmits an electrical signal to the reverse thrust lever interlock actuator causing the actuator to motor to the retract position.
    - (a) With the reverse thrust lever interlock actuator in the retract position the reverse thrust lever interlock mechanism allows the reverse thrust lever to be moved the remainder of the 89.25 degrees of reverse thrust lever travel.
      - 1) The reverse thrust lever rotates the brake assembly, which in turn rotates the thrust lever position resolvers.

EFFECTIVITY

ALL

76-11-00

J03

Page 10  
Feb 10/89



- 2) The thrust lever position resolvers, by altering electrical signals, indicate reverse thrust lever position to the ECU.
- 3) When the thrust reverser has reached the null thrust position, the ECU transmits an electrical signal to operate the torque motor controlling the fuel metering valve on the HMU to set fuel flow, based on reverse thrust lever position and thrust reverser position beyond the null thrust position.

EFFECTIVITY

ALL

76-11-00

J03

Page 11  
Feb 10/89

ENGINE CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ASSEMBLY - AUTOTHROTTLE BRAKE	2	1	FLT COMPT, CONTROL STAND	76-11-05
ASSEMBLY - MICROSWITCH PACK	1	1	FLT COMPT, CONTROL STAND	76-11-03
ASSEMBLY - THRUST LEVER PACK	2	1	FLT COMPT, CONTROL STAND	76-11-01
CARD - (REF 29-30-00, FIG. 101)				
HYDIM 1, ENG 1, YMLA020				
HYDIM 2, ENG 2, YMLA021				
HYDIM 3, ENG 3, YMLA022				
HYDIM 4, ENG 4, YMLA022				
CIRCUIT BREAKERS -	1		FLT COMPT, P7	
FMCS A/T SERVO EXC, C10333		1	7C25	*
FMCS A/T SERVO L, C8854		1	7C4	*
FMCS A/T SERVO R, C8855		1	7C26	*
CIRCUIT BREAKER -	1		FLT COMPT, P6	
FUEL CONT VALVE ENG 1, C1040		1	6L10	*
FUEL CONT VALVE ENG 2, C1041		1	6L11	*
FUEL CONT VALVE ENG 3, C1042		1	6L12	*
FUEL CONT VALVE ENG 4, C1043		1	6L13	*
DIODE - (REF 31-01-36, FIG. 101)				
ISOLATION, M3439				
ISOLATION, M3440				
ISOLATION, M3441				
ISOLATION, M3442				
MOTOR - A/T SERVO, M7444	3	1	FLT COMPT, CONTROL STAND	76-12-01
RELAY - (REF 31-01-36, FIG. 101)				
FUEL/IGN CONT, ENG 1, R7307				
FUEL/IGN CONT, ENG 2, R7308				
FUEL/IGN CONT, ENG 3, R7309				
FUEL/IGN CONT, ENG 4, R7310				

\* SEE WM EQUIPMENT LIST

 Engine Control System - Component Index  
 Figure 101 (Sheet 1)

EFFECTIVITY

ALL

76-11-00

J01

 Page 101  
 Oct 10/89

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
RESOLVER - THRUST LEVER POSITION (TLA) T1742,T1743,T1744,T1745	2	4	PASS COMPT, CEILING PANELS UNDER CONTROL STAND	76-11-02
SWITCH - A/T DISCONNECT, S7	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T DISCONNECT, S9	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T GO AROUND L, S1	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T GO AROUND L, S2	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T GO AROUND R, S5	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T GO AROUND R, S6	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T RESET, S8	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - A/T RESET, S10	3	1	FLT COMPT, CONTROL STAND	76-12-02
SWITCH - (REF 26-21-00, FIG. 101)				
FIRE, ENG 1, S211				
FIRE, ENG 2, S212				
FIRE, ENG 3, S213				
FIRE, ENG 4, S214				
SWITCH - FUEL CONT, ENG 1, S1863	2	1	FLT COMPT, CONTROL STAND	76-11-03
SWITCH - FUEL CONT, ENG 2, S1864	2	1	FLT COMPT, CONTROL STAND	76-11-03
SWITCH - FUEL CONT, ENG 3, S1865	2	1	FLT COMPT, CONTROL STAND	76-11-03
SWITCH - FUEL CONT, ENG 4, S1866	2	1	FLT COMPT, CONTROL STAND	76-11-03
UNIT - (REF 31-61-00, FIG. 101)				
C, EFIS/EICAS INTERFACE M7352				
L, EFIS/EICAS INTERFACE M7353				
R, EFIS/EICAS INTERFACE M7351				

Engine Control System - Component Index  
 Figure 101 (Sheet 2)

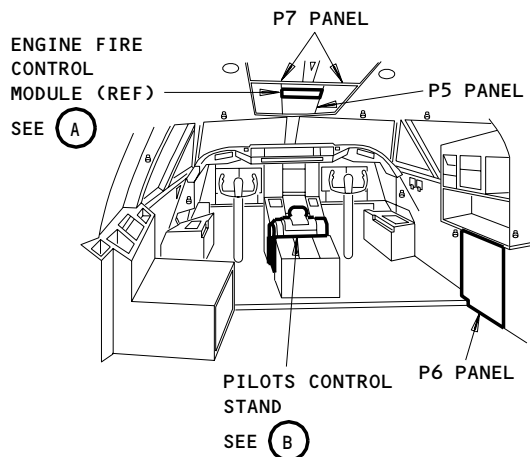
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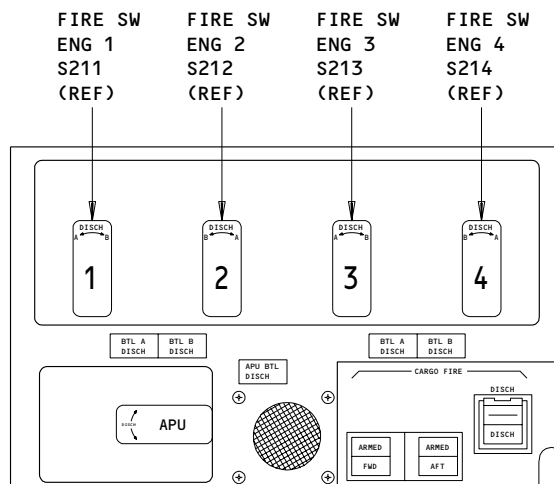
76-11-00

J01

Page 102  
 Feb 10/89

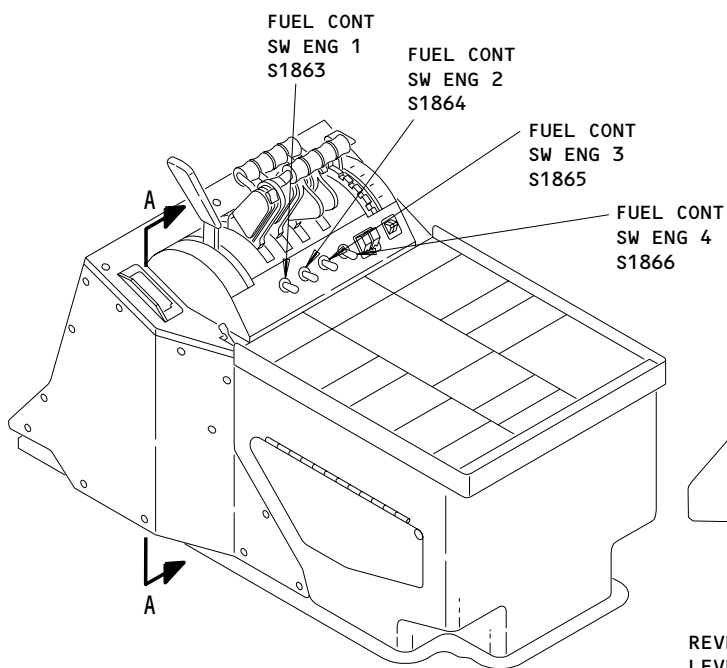


FLT COMPT



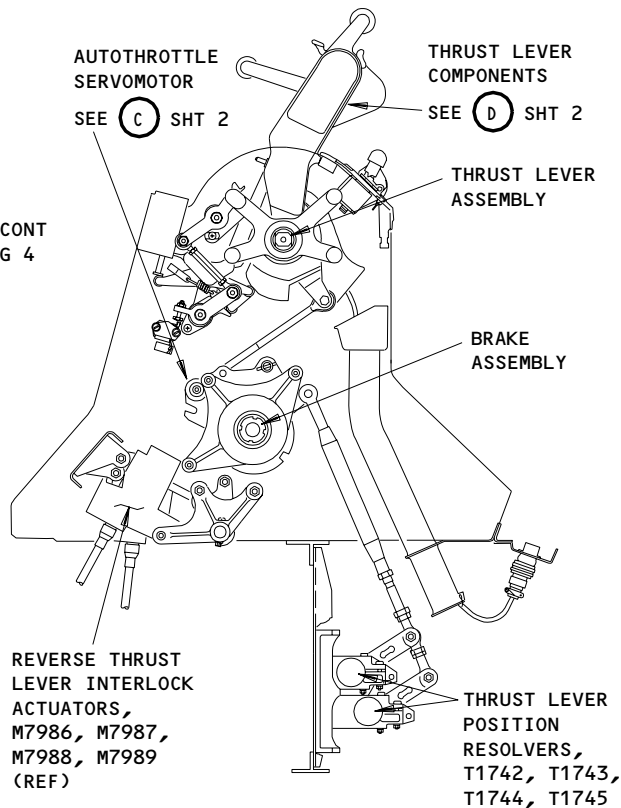
ENGINE FIRE CONTROL MODULE (REF)

(A)



PILOTS CONTROL STAND

(B)



PILOTS CONTROL STAND

A-A

Engine Control System - Component Location  
Figure 102 (Sheet 1)

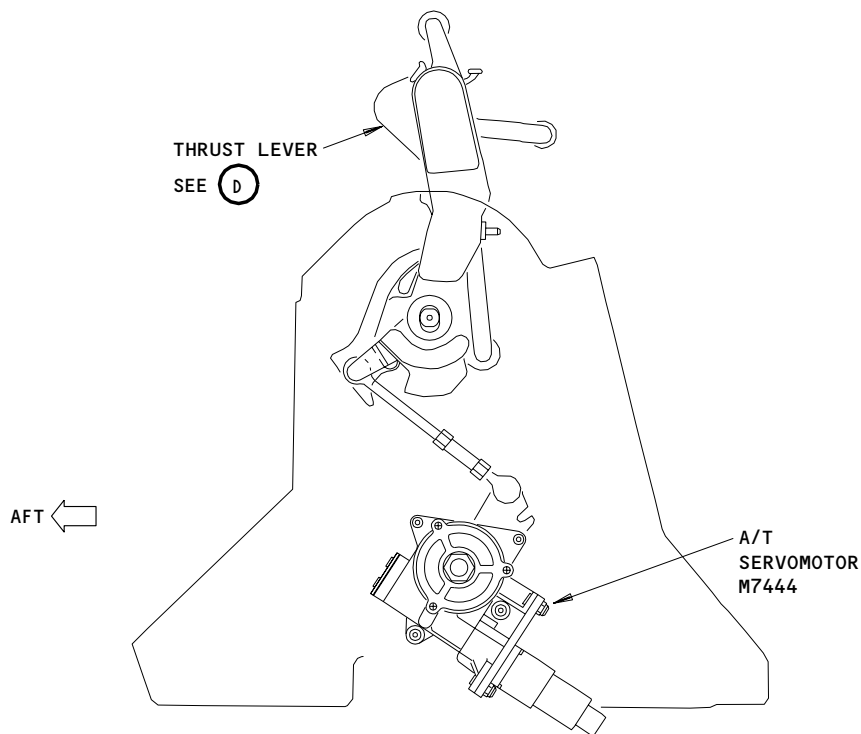
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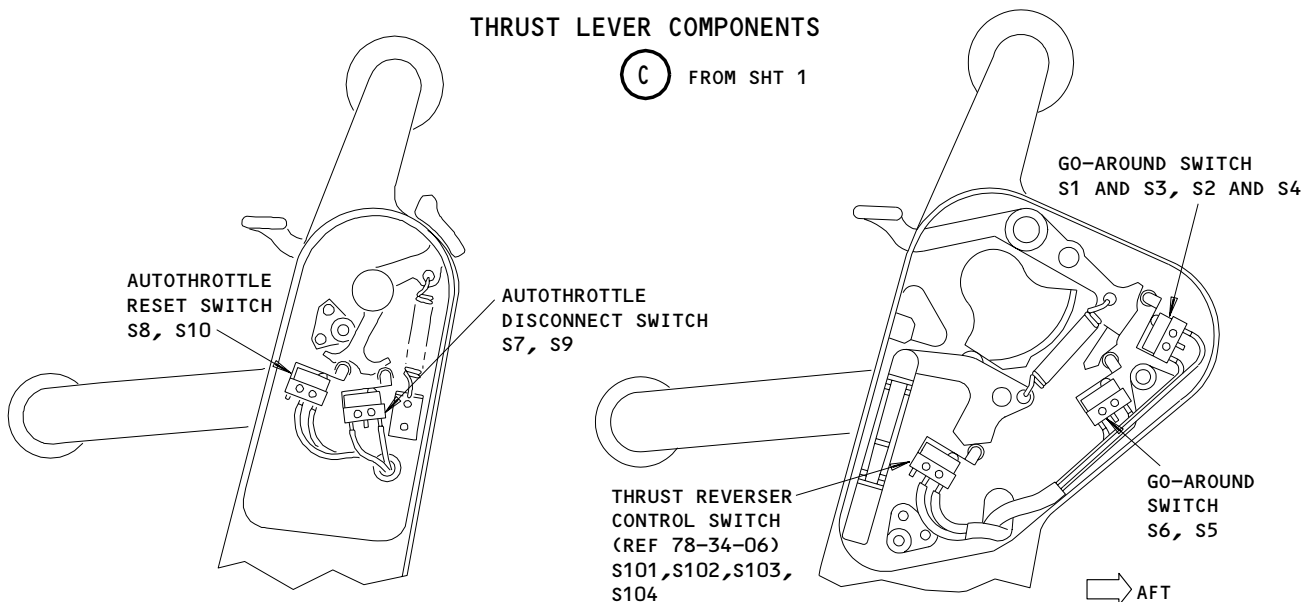
J01

Page 103  
Feb 10/89



THRUST LEVER COMPONENTS

(C) FROM SHT 1



THRUST LEVER NO. 1  
(NO. 4 SIMILAR)

THRUST LEVER NO. 3  
(NO. 2 SIMILAR)

(D)

Engine Controls - Component Location  
Figure 102 (Sheet 2)

EFFECTIVITY

ALL

76-11-00

J01

Page 104  
Feb 10/89

ENGINE CONTROL SYSTEM – FAULT ISOLATION

1. General
  - A. Fault isolation of the engine control system combines usage of EICAS messages, visual checks of component condition, and system operational checks and tests.
  - B. Fault isolation may require application of electrical power.
2. Fault Isolation Tips
  - A. After performing corrective action for faulty relays, diodes, and switches, repeat the step at which the failure was encountered.
3. Fault Isolation Procedures

Figure	Title
103	Engine Fuel Control Problem. EICAS Message "ENG (1, 2, 3, or 4) FUEL VLV" Displayed
104	Forward/Reverse Thrust Lever Problems
105	Thrust Levers Misaligned

EFFECTIVITY

ALL

76-11-00

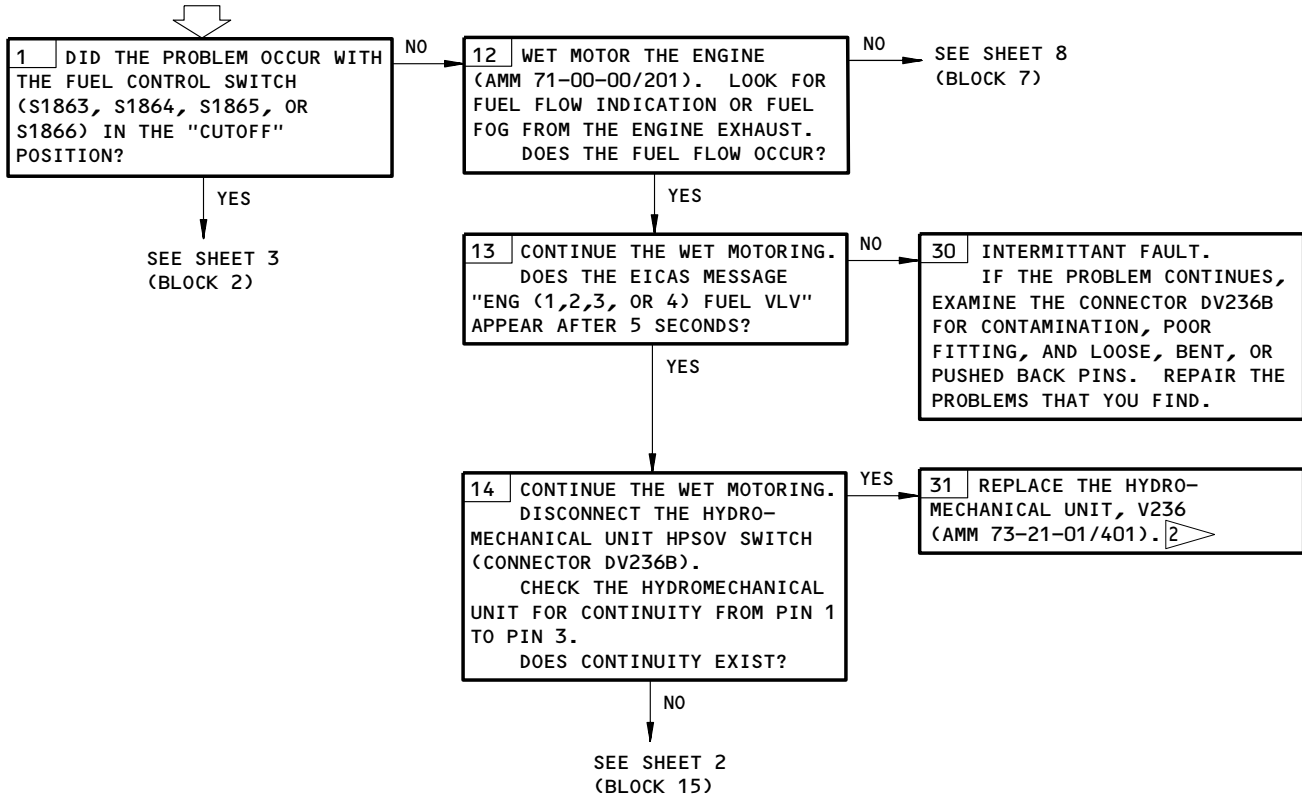
J01

Page 105  
Oct 10/96

ENGINE FUEL CONTROL  
PROBLEM. EICAS  
MESSAGE "ENG (1,2,  
3, OR 4) FUEL VLV"  
DISPLAYED.

**PREREQUISITES**

MAKE SURE THESE CIRCUIT BREAKERS ARE CLOSED:  
6L10, 6L11, 6L12, 6L13  
MAKE SURE THE AIRPLANE IS IN THIS CONFIGURATION:  
ELECTRICAL POWER IS ON (AMM 24-22-00/201)  
WET MOTORING (AMM 24-22-00/201)



- 1 CLOSE THE CIRCUIT BREAKERS OPENED IN THE PREVIOUS BLOCKS.
- 2 CONNECT THE CONNECTORS DISCONNECTED IN THE PREVIOUS BLOCKS.
- 3 DO NOT REMOVE THE JUMPER (IF INSTALLED), OR CLOSE THE CIRCUIT BREAKER.

Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 1)

EFFECTIVITY

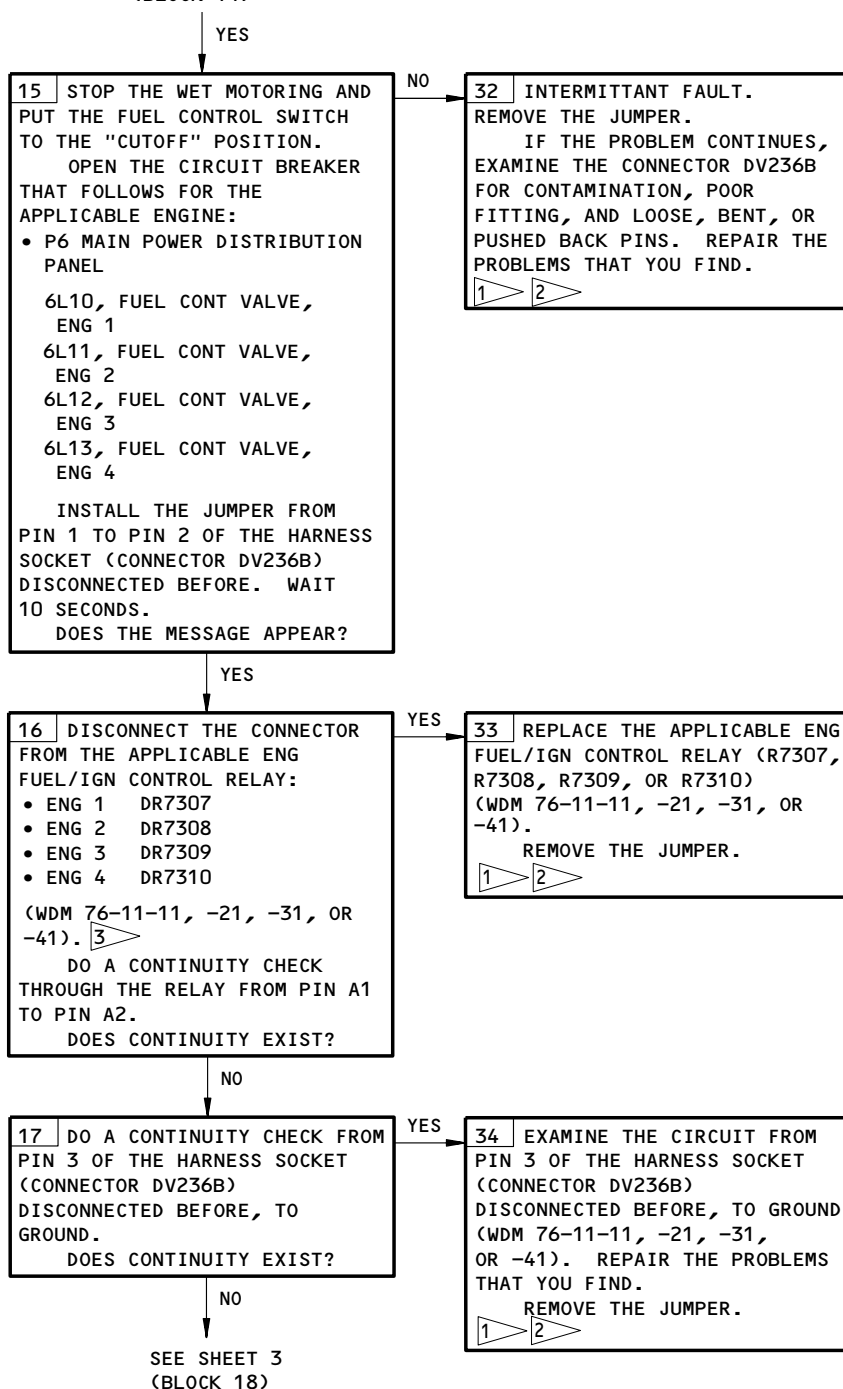
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76-11-00

J01.1

Page 106  
Oct 18/00

FROM SHEET 1  
(BLOCK 14)



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 2)

EFFECTIVITY

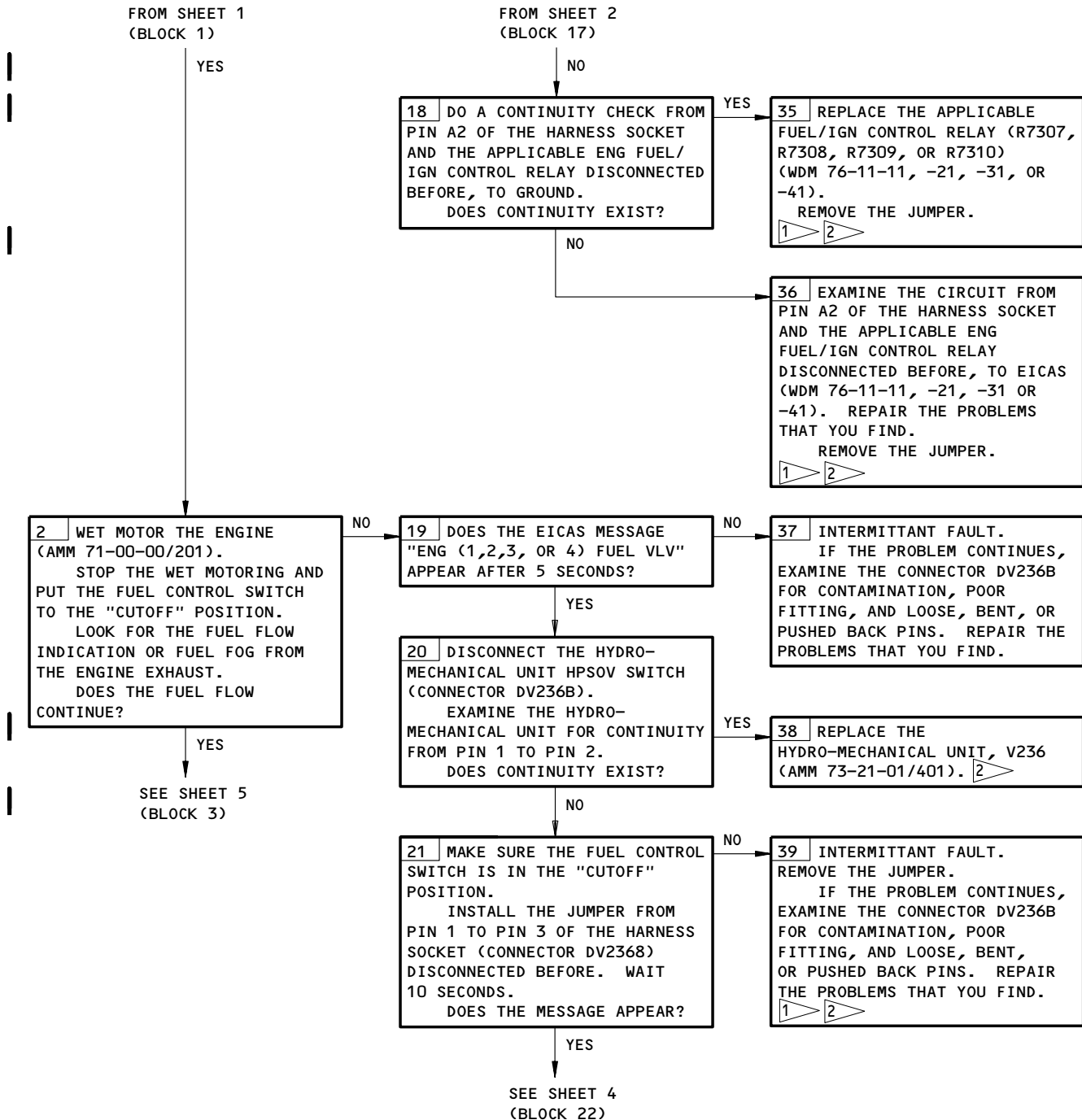
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76-11-00

J01.1

Page 107  
Oct 18/00





Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 3)

EFFECTIVITY

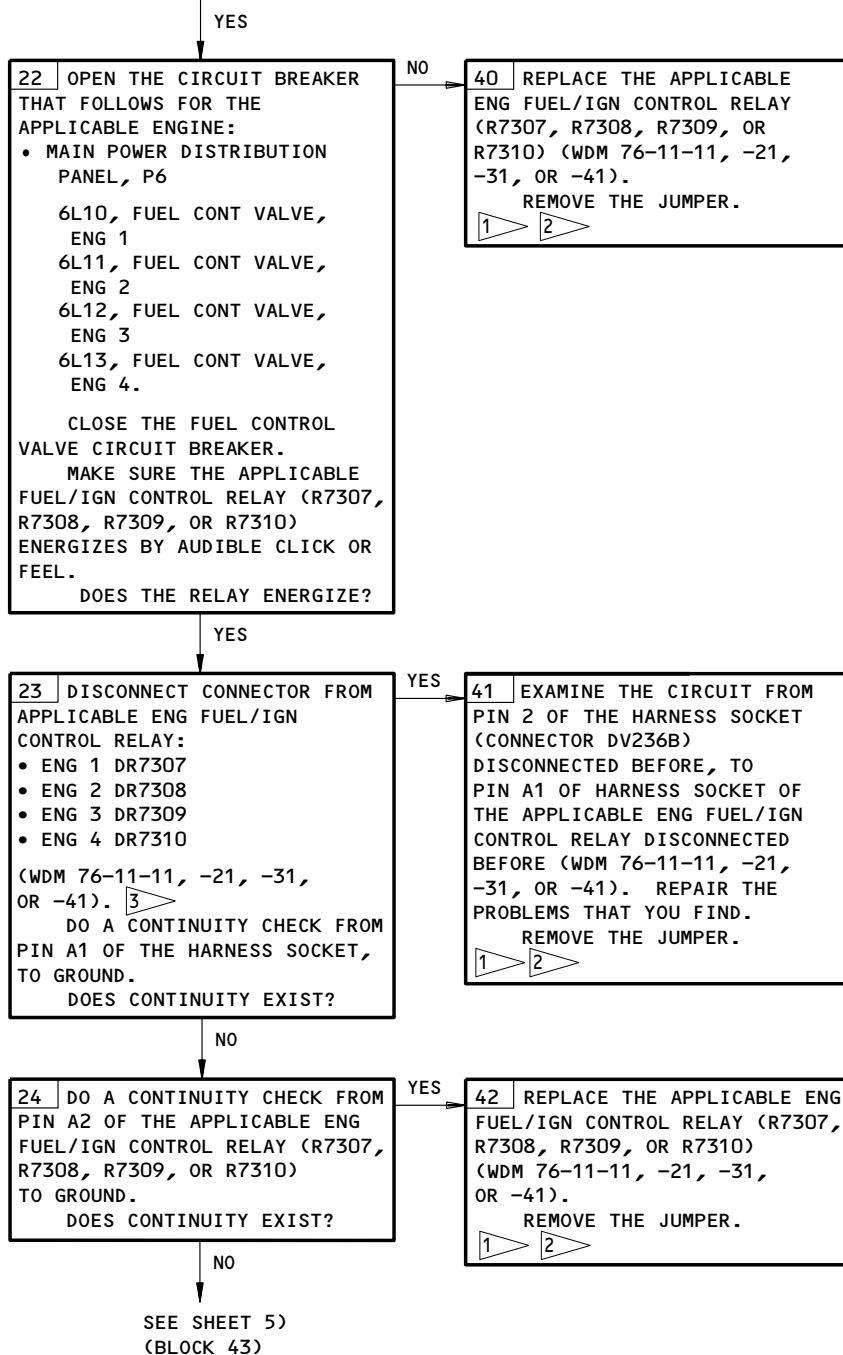
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76-11-00

J01.1

Page 108  
Oct 18/00

FROM SHEET 3  
(BLOCK 21)



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 4)

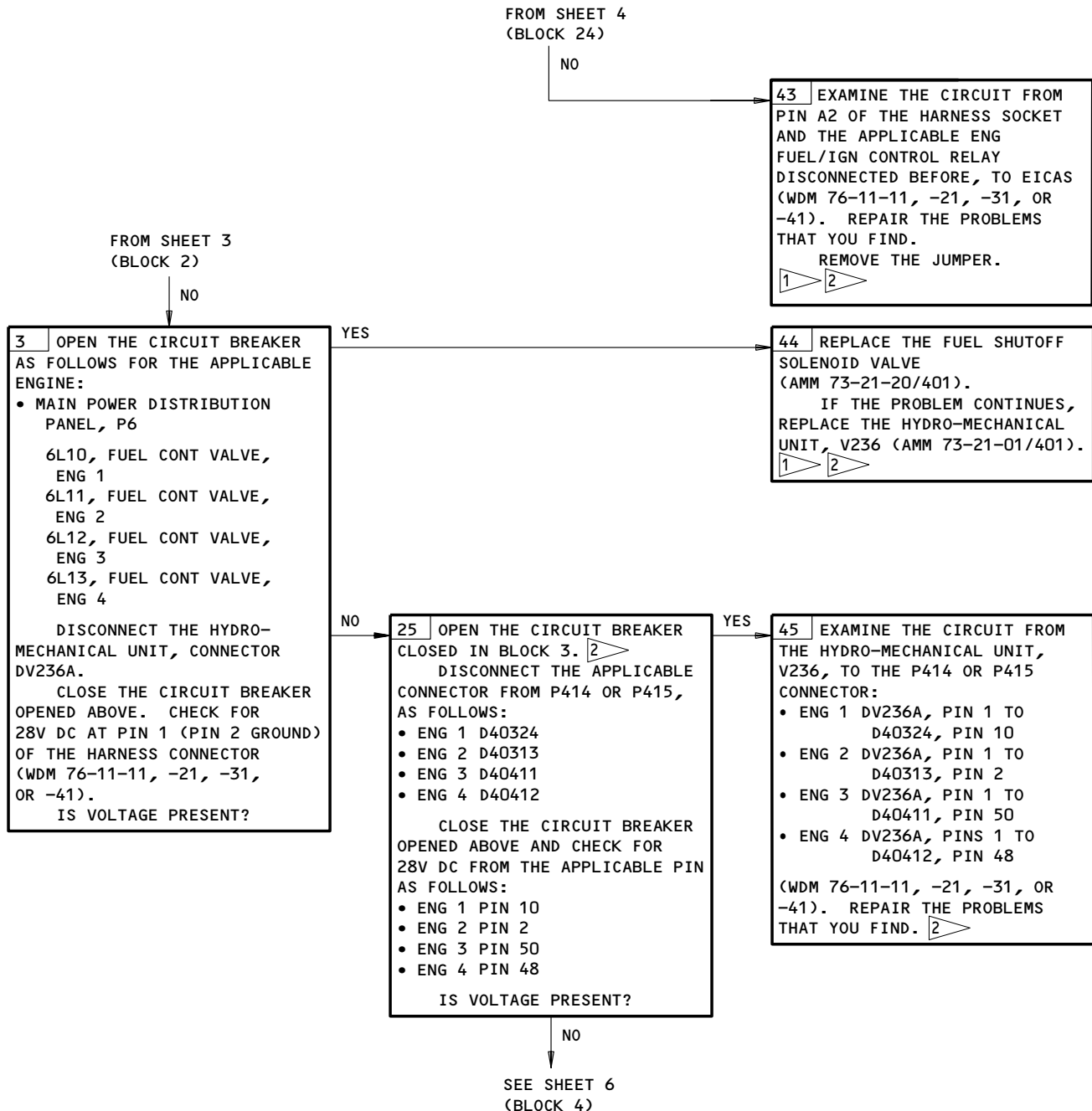
EFFECTIVITY

ALL

76-11-00

J01.1

Page 109  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 5)

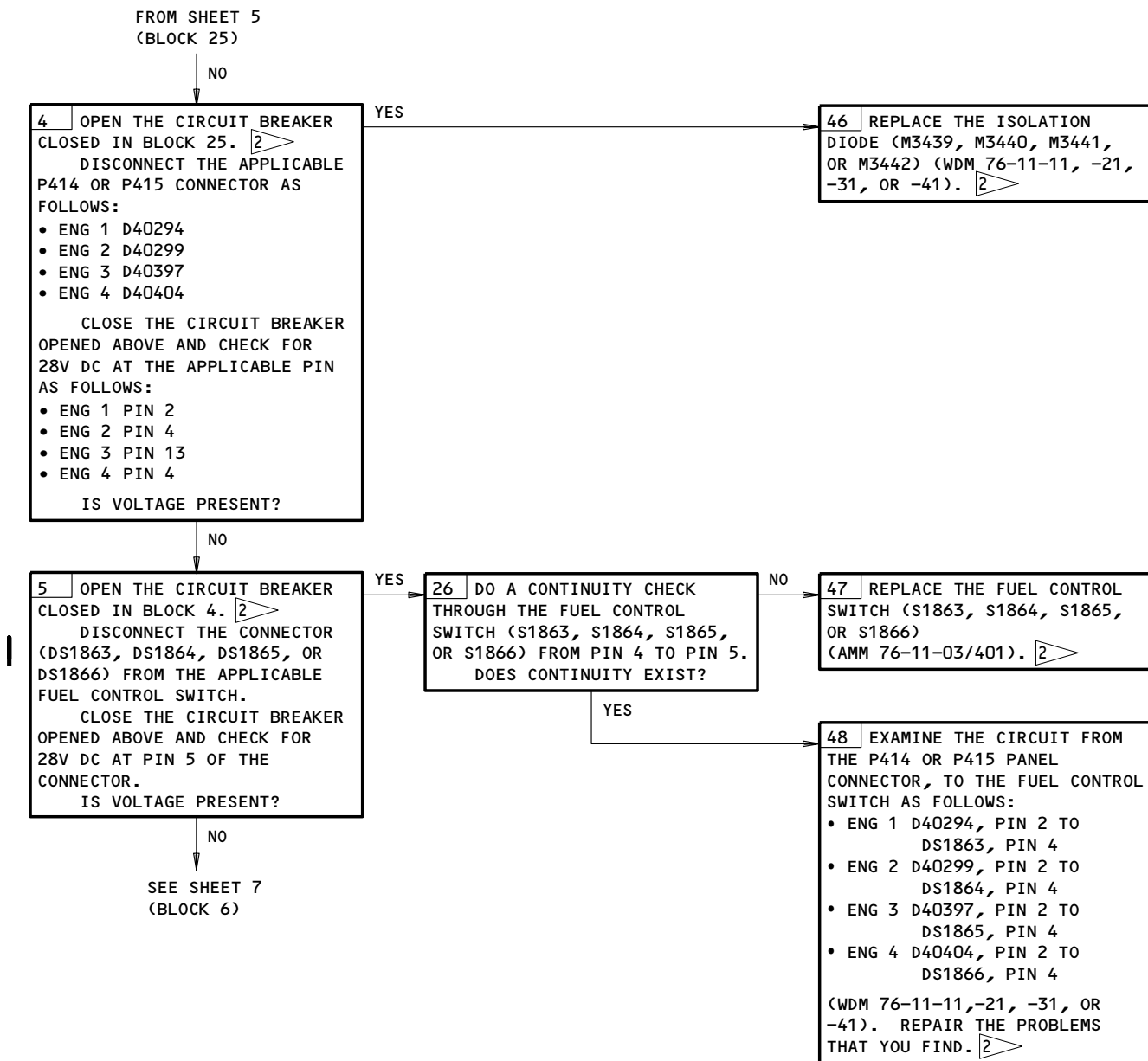
EFFECTIVITY

ALL

76-11-00

J01.1

Page 110  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 6)

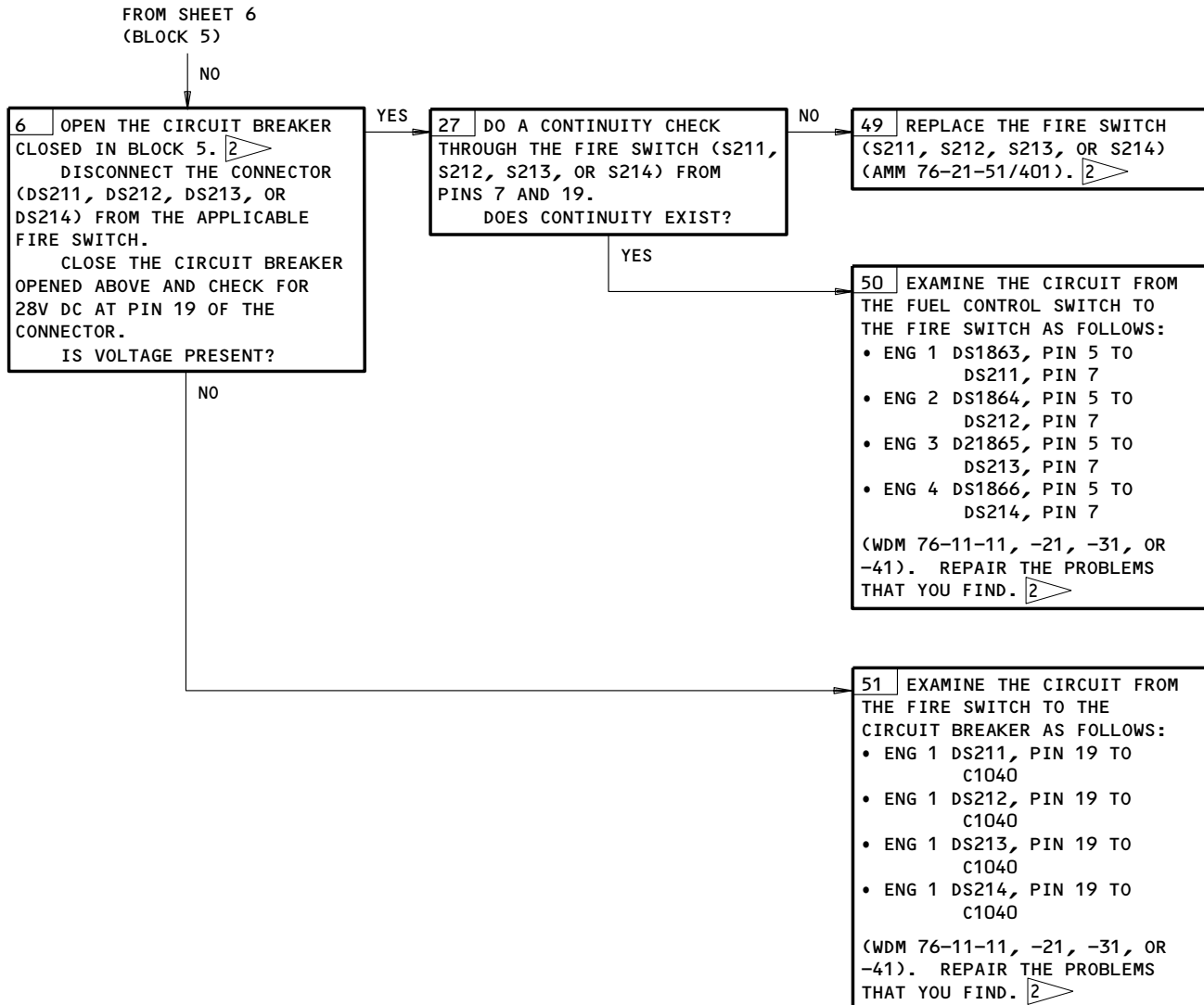
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ALL

76-11-00

J01.1

Page 111  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 7)

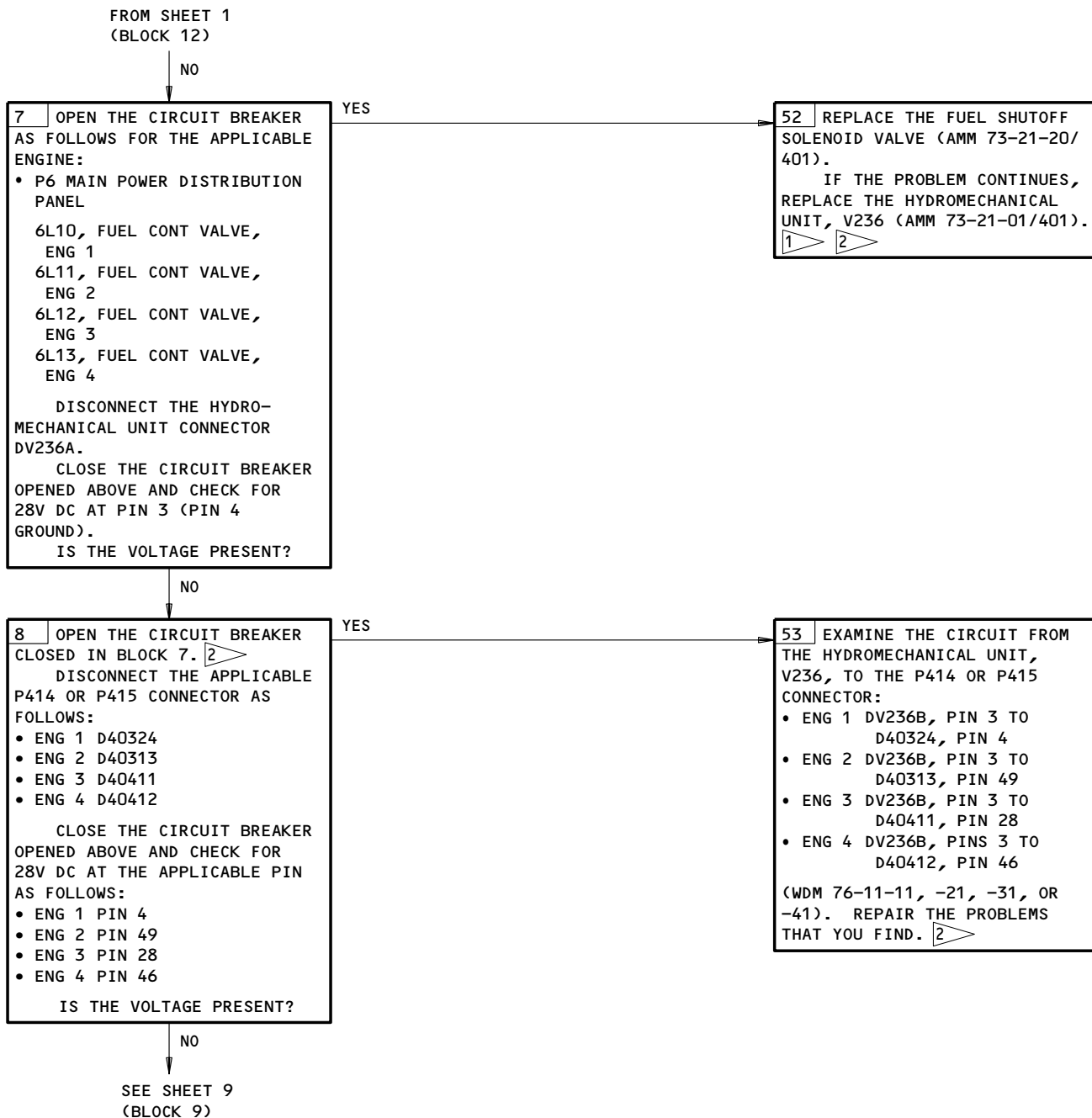
EFFECTIVITY

ALL

76-11-00

J01.1

Page 112  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 8)

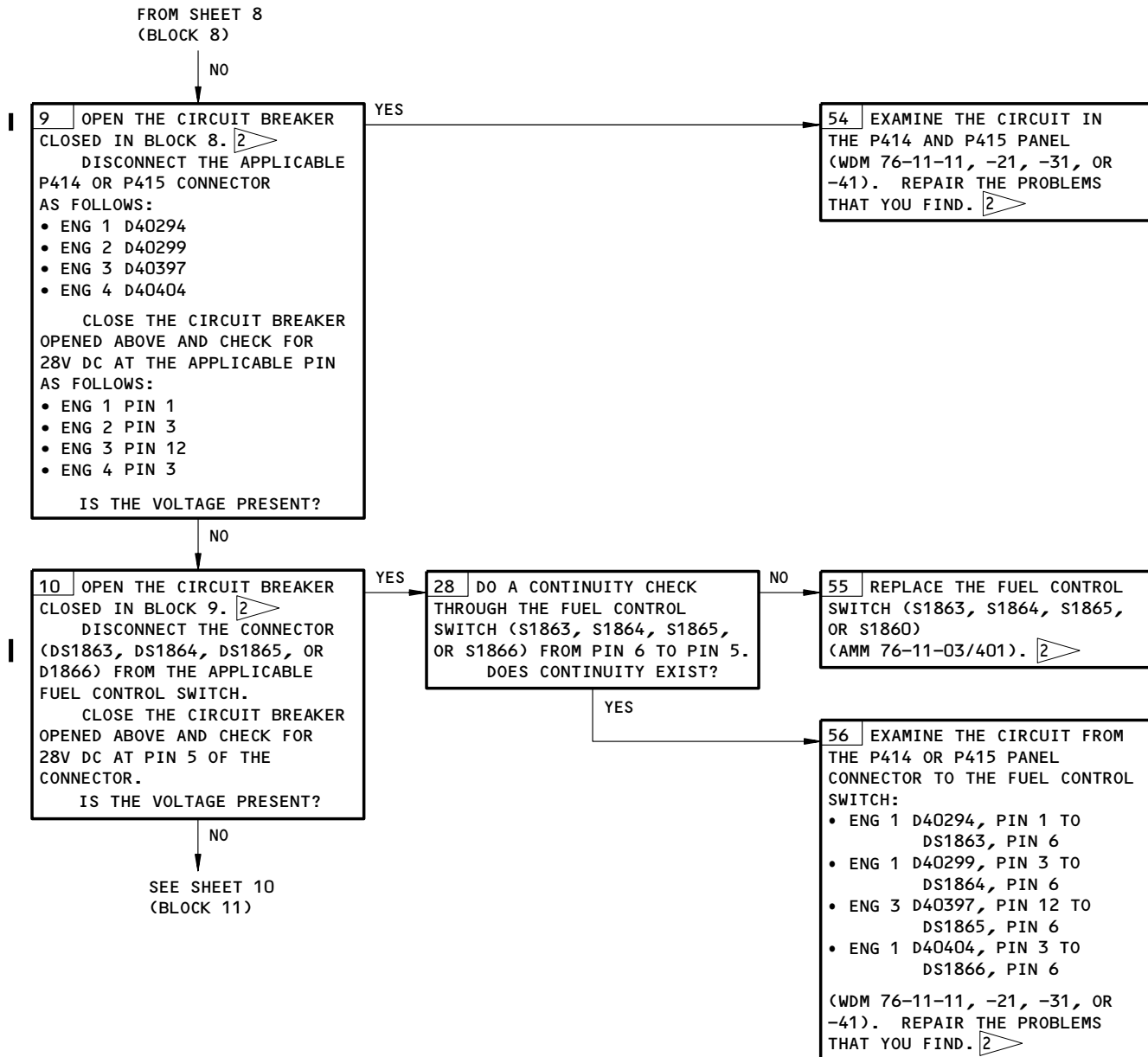
EFFECTIVITY

ALL

76-11-00

J01.1

Page 113  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, or 4) FUEL VLV Displayed.  
Figure 103 (Sheet 9)

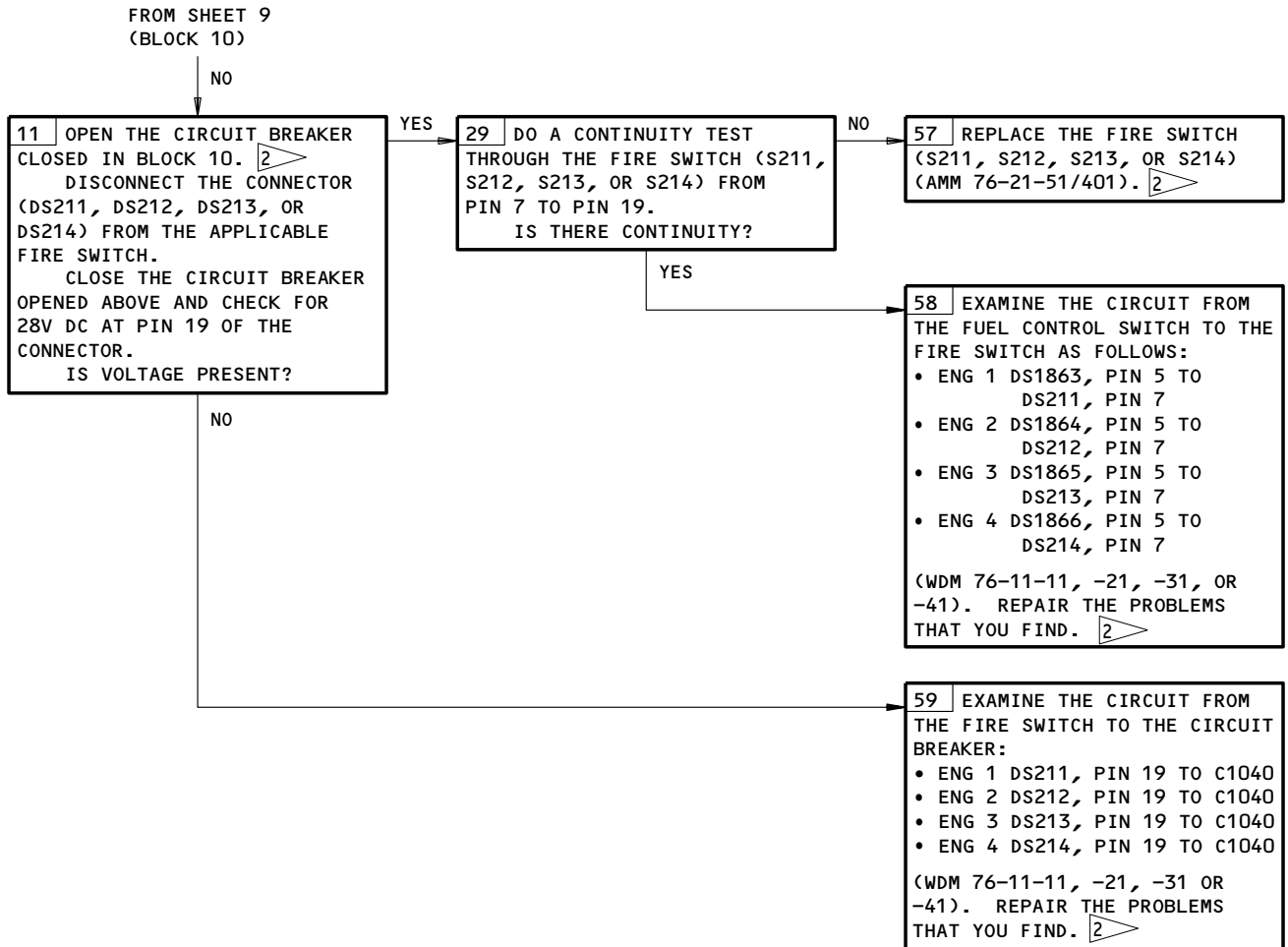
EFFECTIVITY

ALL

76-11-00

J01.1

Page 114  
Oct 18/00



Engine Fuel Control Problem.  
EICAS Message ENG (1,2,3, OR 4) FUEL VLV Displayed.  
Figure 103 (Sheet 10)

EFFECTIVITY

ALL

**76-11-00**

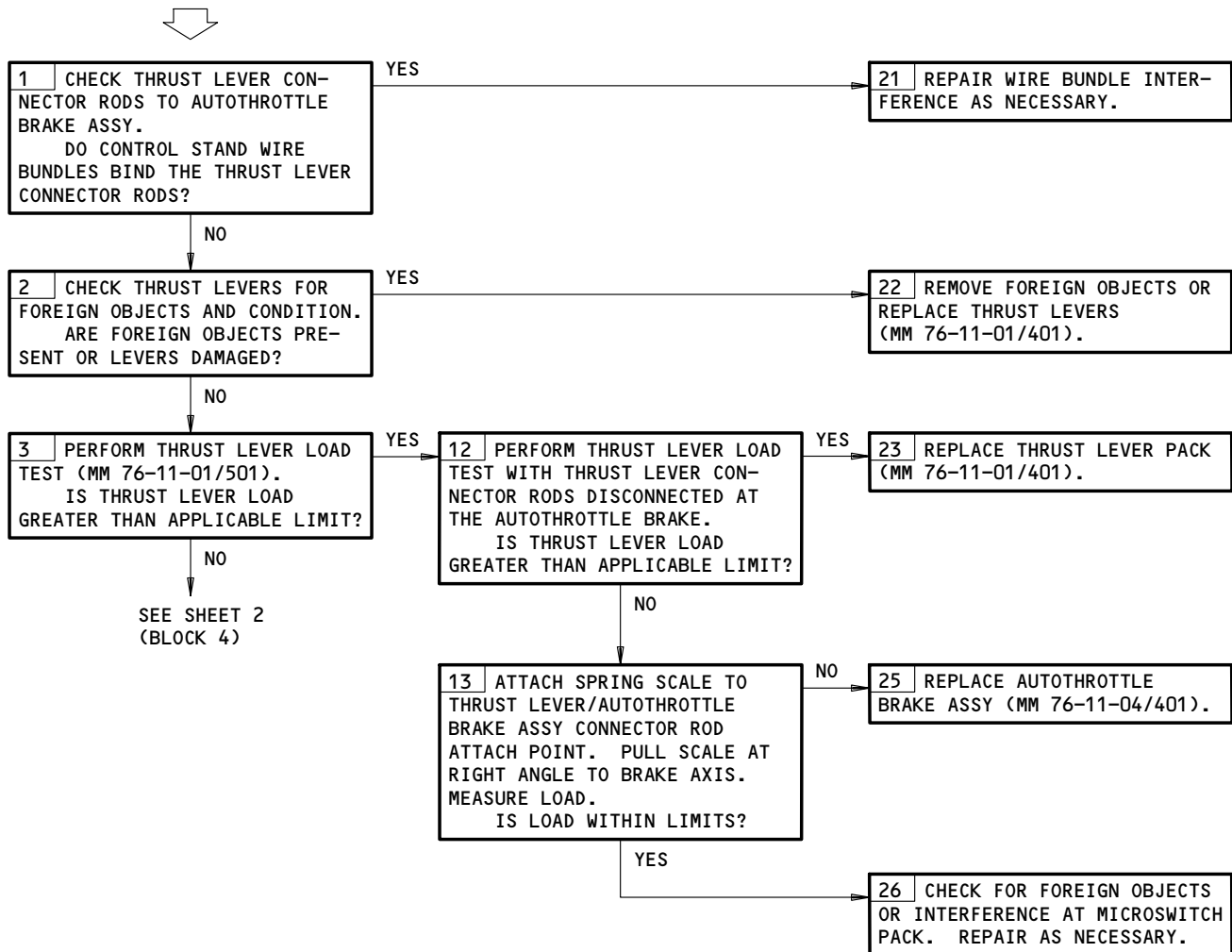
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Page 115  
Oct 18/00



# FORWARD/REVERSE THRUST LEVER PROBLEMS

**PREREQUISITES**  
NONE



Forward/Reverse Thrust Lever Problems  
Figure 104 (Sheet 1)

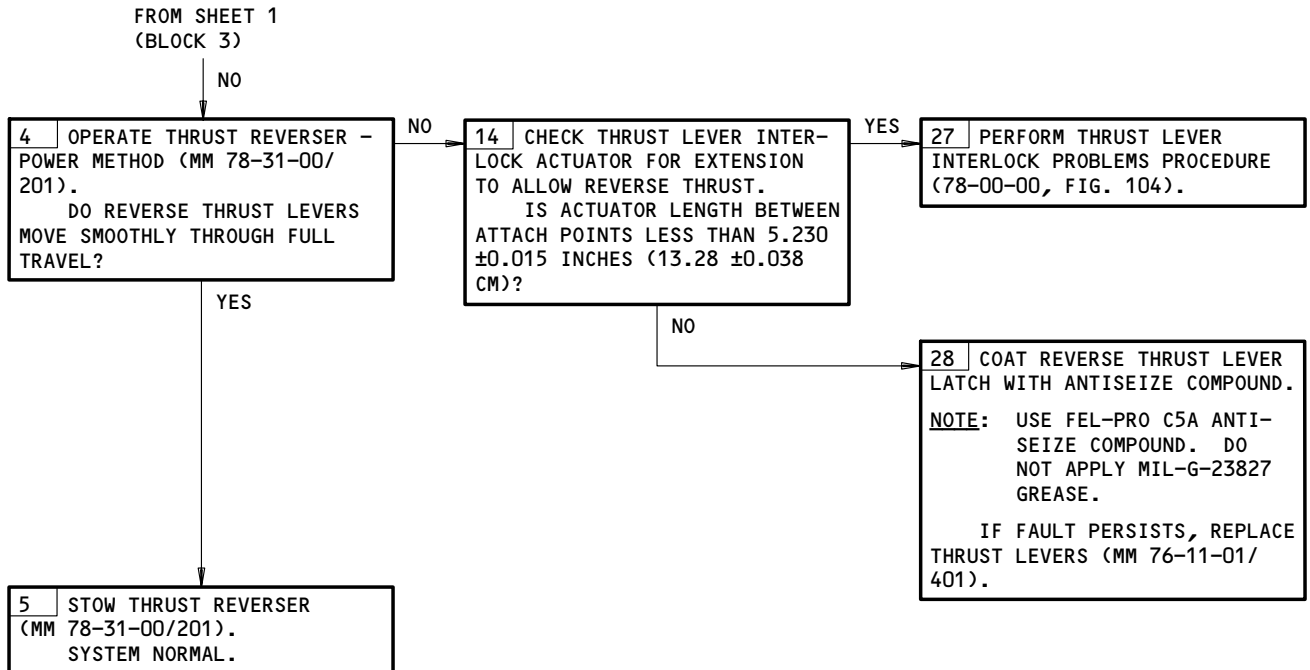
EFFECTIVITY

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## 76-11-00

J01

Page 116  
Oct 15/98


 Forward/Reverse Thrust Lever Problems  
 Figure 104 (Sheet 2)

EFFECTIVITY \_\_\_\_\_

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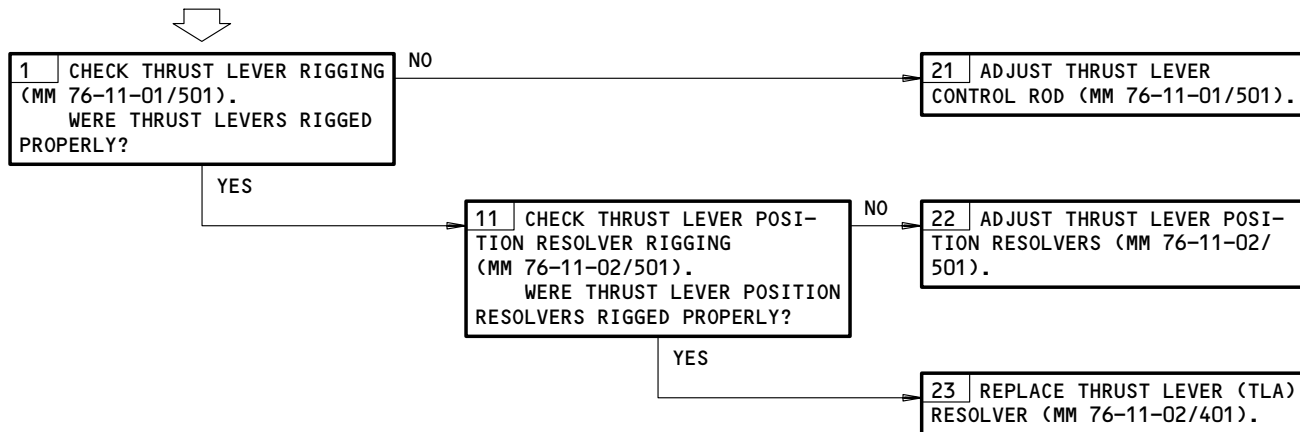
**76-11-00**

J01

Page 117  
Oct 15/98

**THRUST LEVERS  
MISALIGNED**

**PREREQUISITES**  
ELECTRICAL POWER (MM 24-22-00)



Thrust Levers Misaligned  
Figure 105

EFFECTIVITY

ALL

**76-11-00**

J01

Page 118  
Oct 15/98

THRUST LEVER ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the thrust lever assemblies. The second task is the installation of the thrust lever assemblies.
- B. This procedure is necessary for the repair or replacement of the worn or damaged thrust lever assemblies and the switch wire bundle of the thrust lever assembly. This procedure is also necessary to get access to other component parts of the control stand.
- C. You can get access to the mounting brackets of the thrust lever assembly by the removal of the applicable covers, seals, rails, and engine start module.
- D. Removal of the thrust lever assemblies has these steps:
  - (1) Remove the eight mounting bolts.
  - (2) Disconnect the eight electrical connectors.
  - (3) Disconnecting the four mechanical connector rods.
- E. You must adjust the thrust levers after you install the thrust lever assemblies.

TASK 76-11-01-004-001-J00

2. Thrust Lever Assembly Removal (Fig. 401)

A. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) AMM 76-11-03/201, Control Stand
- (3) IPC 76-11-01 Fig. 2

B. Access

(1) Location Zone

- |     |  |
|-----|--|
| 211 | Passenger Cabin - Nose to First Door, LH |
| 212 | Passenger Cabin - Nose to First Door, RH |
| 221 | Flight Compartment, LH                   |
| 222 | Flight Compartment, RH                   |

C. Procedure

S 864-002-J00

- (1) Do the deactivation procedure of the captain's and first officer's seats (AMM 76-11-03/201).

S 864-003-J00

- (2) Remove electrical power of the thrust lever switches, FUEL CONTROL (toggle) switches, and STAB TRIM switches (AMM 76-11-03/201).

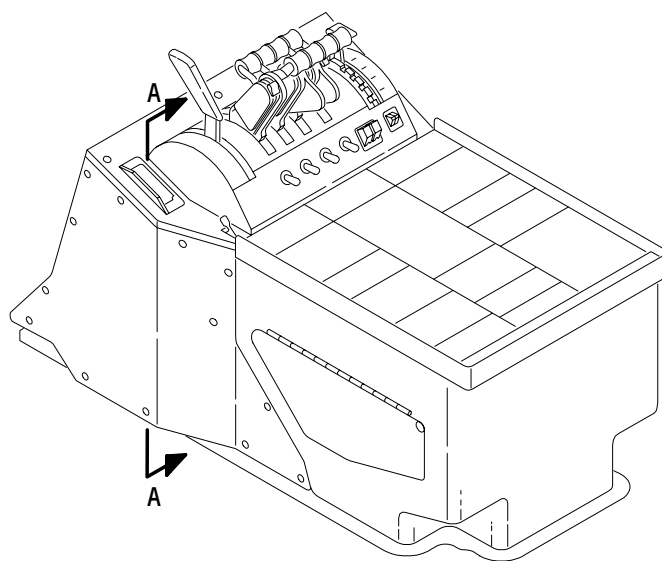
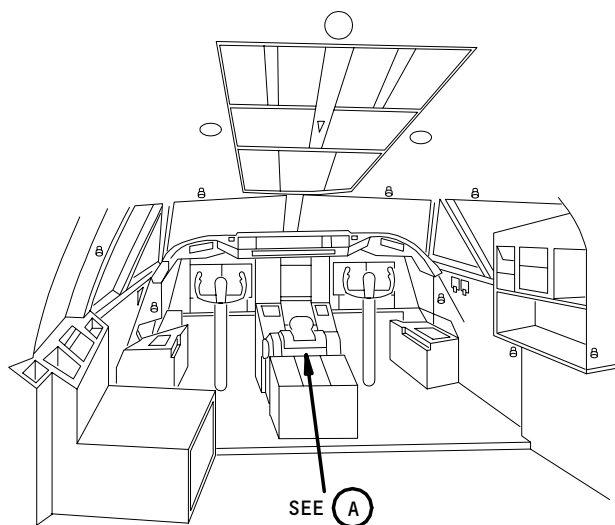
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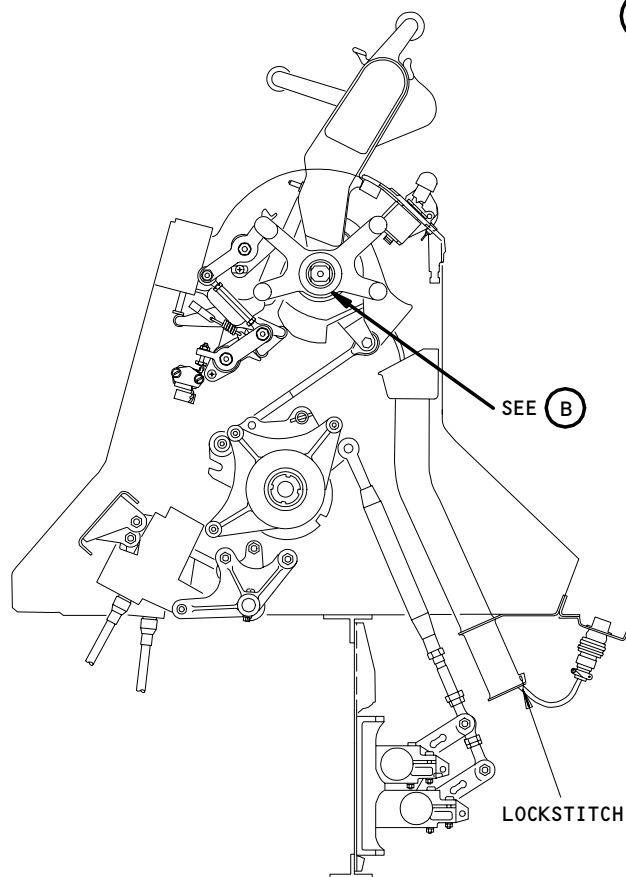
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Page 401  
Feb 10/94



CONTROL STAND

(A)



A-A

Thrust Lever Assembly  
Figure 401 (Sheet 1)

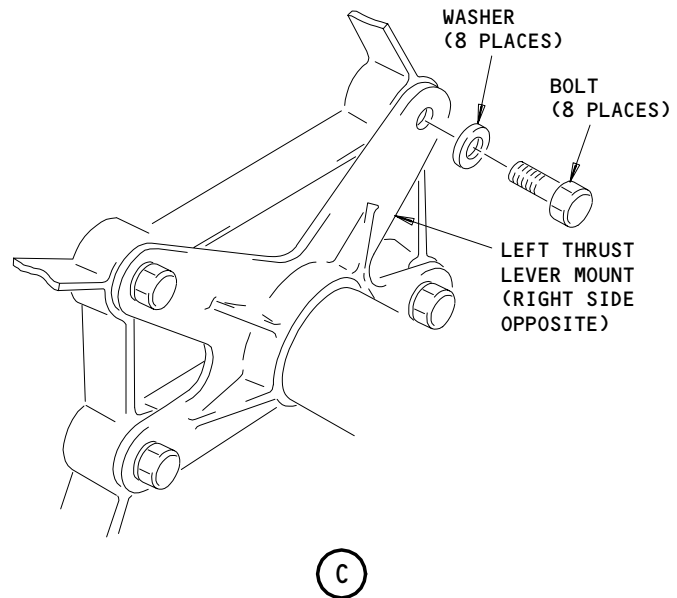
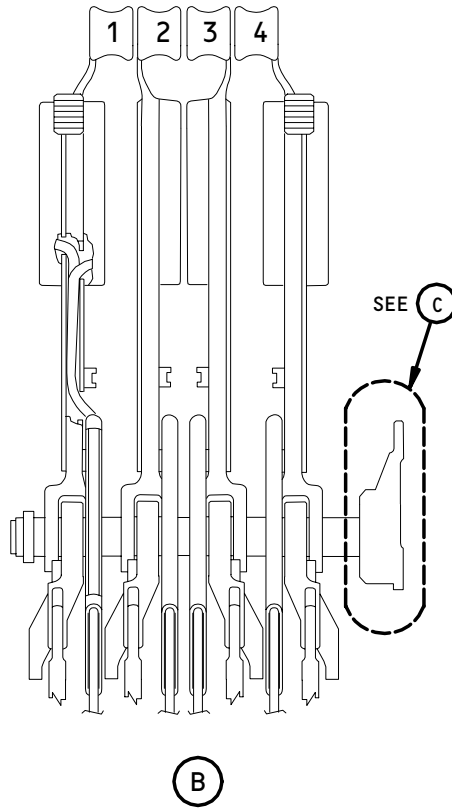
EFFECTIVITY

ALL

76-11-01

J01

Page 402  
Feb 10/89



Thrust Lever Assembly  
Figure 401 (Sheet 2)

EFFECTIVITY	
ALL	

76-11-01

J01

Page 403  
Feb 10/89

- S 864-026-J00
- (3) Do the deactivation procedure of the autothrottle servomotor (AMM 76-11-03/201).
- S 014-004-J00
- (4) Remove the thrust lever cover, side panels, thrust lever rails, and engine start module from the control stand (AMM 76-11-03/201).
- S 034-005-J00
- (5) Disconnect the control rods from the thrust levers.
- S 014-006-J00
- (6) Remove the passenger cabin ceiling panel to get access to the electrical plugs (AMM 25-22-01/401).
- S 034-007-J00
- (7) Disconnect these electrical connectors:
- (a) P12
  - (b) P13
  - (c) P14
  - (d) P15
  - (e) P19
  - (f) P20
  - (g) P21
  - (h) P22.
- S 434-019-J00
- (8) Install the end caps on the connectors and receptacles.
- S 014-008-J00
- (9) Remove the lockstitch from the wire bundle and the wire guide.
- S 014-009-J00
- (10) Carefully put the connectors through the wire guide until the bundles are free of the structure.
- S 034-010-J00
- (11) Remove the eight bolts that attach the thrust levers to the control stand structure.
- S 024-011-J00
- (12) Lift the thrust levers up and move them rearward to remove the thrust levers.

TASK 76-11-01-404-012-J00

3. Thrust Lever Assembly Installation (Fig. 401)

A. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) AMM 76-11-01/501, Thrust Lever Assembly
- (3) AMM 76-11-03/201, Control Stand

EFFECTIVITY

ALL

76-11-01

J02

Page 404  
Feb 10/94

- (4) AMM 78-31-00/501, Thrust Reverser System
- (5) IPC 76-11-01 Fig. 2

B. Access

(1) Location Zone

- 211 Passenger Cabin - Nose to First Door, LH
- 212 Passenger Cabin - Nose to First Door, RH
- 221 Flight Compartment, LH
- 222 Flight Compartment, RH

C. Procedure

S 424-013-J00

- (1) Carefully lower the thrust levers and move them forward to install thrust levers into the control stand.

S 434-014-J00

- (2) Attach the thrust levers to the control stand structure with the eight bolts and washers.

S 434-015-J00

- (3) Carefully put the connectors and wire bundles through the wire guide.

S 844-016-J00

- (4) Move the thrust levers fully forward.

S 034-017-J00

- (5) Remove the end caps from the connectors and mating receptacles.

S 434-018-J00

- (6) Connect the electrical connectors as follows:

- (a) P12
- (b) P13
- (c) P14
- (d) P15
- (e) P19
- (f) P20
- (g) P21
- (h) P22.

S 434-020-J00

- (7) Install the lockstitch from the wire bundles to the wire guides.

S 434-022-J00

- (8) Connect the control rods to the thrust levers with the bolt, bushings, washers and nut.

EFFECTIVITY

ALL

76-11-01

J02

Page 405  
Jun 10/94



- S 824-021-J00
- (9) Adjust the thrust levers (AMM 76-11-01/501).
- S 414-022-J00
- (10) Install the engine start module, thrust lever rails, thrust lever cover, and side panels on the control stand (AMM 76-11-03/201).
- S 414-019-J00
- (11) Install the passenger cabin ceiling panel (AMM 25-22-01/401).
- S 864-023-J00
- (12) Do the activation procedure of the autothrottle servomotor (AMM 76-11-03/201).
- S 864-021-J00
- (13) Energize the thrust lever switches, FUEL CONTROL (toggle) switches, and STAB TRIM switches (AMM 76-11-03/201).
- S 864-024-J00
- (14) Do the activation procedure of the captain's and first officer's seats (AMM 76-11-03/201).
- S 714-025-J00
- (15) Do the thrust reverser system operational test (AMM 78-31-00/501).

EFFECTIVITY

ALL

76-11-01

J02

Page 406  
Oct 10/94

THRUST LEVER ASSEMBLY - ADJUSTMENT/TEST

1. General

- A. This procedure has two tasks:
  - (1) The first task is the adjustment of the thrust lever assembly.
  - (2) The second task is the engine control system test.
- B. Adjust the thrust lever assemblies with ambient temperature between 60°F and 90°F.
- C. Operate all test equipment for more than 10 minutes before you use them. This will let the equipment temperature becomes stable.
- D. We recommend you to use the thrust lever protractor G76002-1 to find the thrust lever angle. If the thrust lever protractor is not available, you can find the thrust lever angle from the EICAS EPCS maintenance page.

TASK 76-11-01-825-001-J00

2. Thrust Lever Assembly Adjustment (Fig. 501 and 502)

- A. Special Tools and Equipment
  - (1) G12001-1 Rig Pin Set or
  - (2) G12001-47 Rig Pin Set (Alternate)
    - (a) TL 1, MS20392-4C or equivalent 0.309-0.311 inch (7.85-7.90 mm) diameter rod or bolt by 12.0 inches (305 mm) long
- B. References
  - (1) AMM 76-11-03/201, Control Stand
  - (2) AMM 78-34-03/501, Reverse Thrust Lever Interlock Actuator
- C. Access
  - (1) Location Zone
    - 221 Control Cabin, LH
    - 222 Control Cabin, RH

D. Procedure

S 045-002-J00

- (1) Do the deactivation procedure of the captain and first officer seats (AMM 76-11-03/201).

S 865-003-J00

- (2) Remove electrical power from the thrust lever switches, actuation circuits of the speed brake lever and the flap lever RVDT (AMM 76-11-03/201).

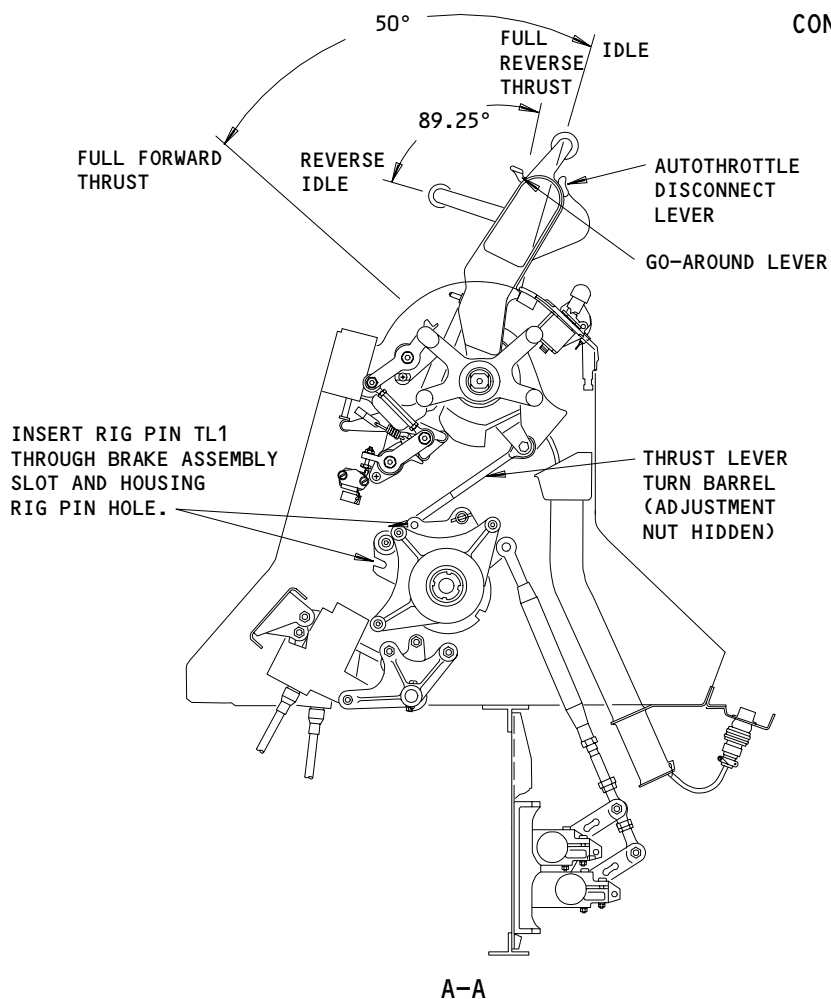
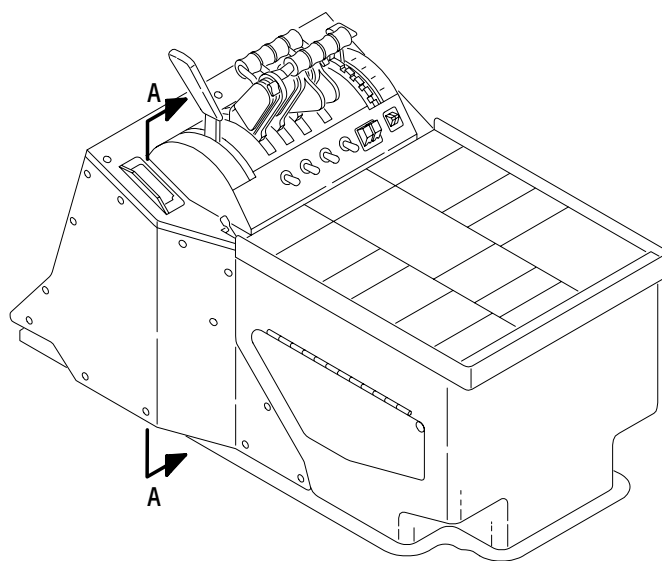
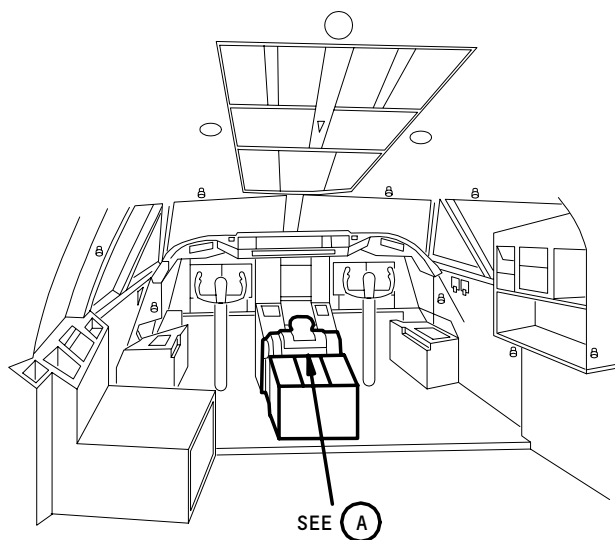
EFFECTIVITY

ALL

76-11-01

J02

Page 501  
Jun 10/95



Thrust Lever Assembly  
Figure 501

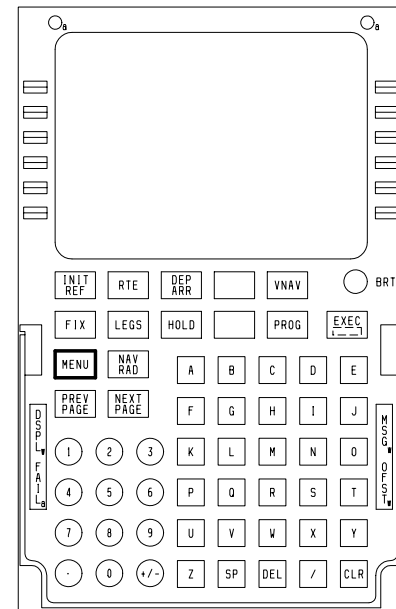
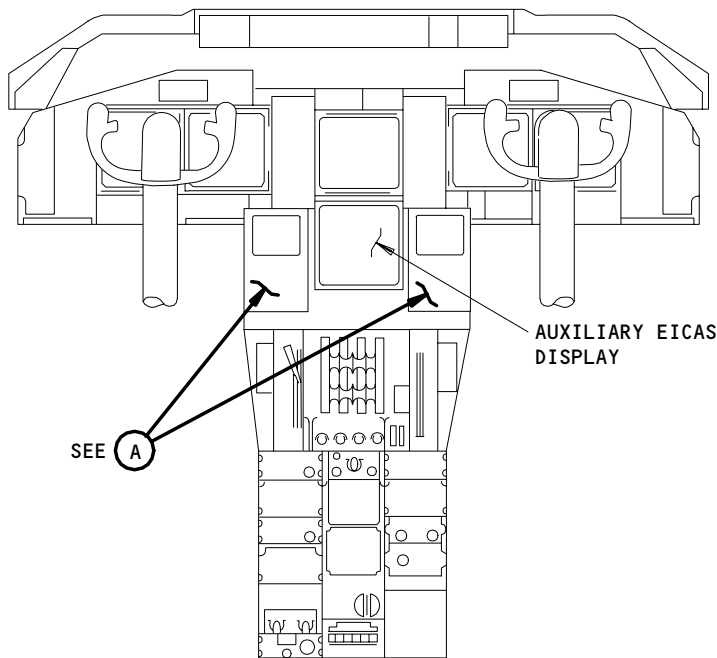
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ALL

76-11-01

J01

Page 502  
Feb 10/89



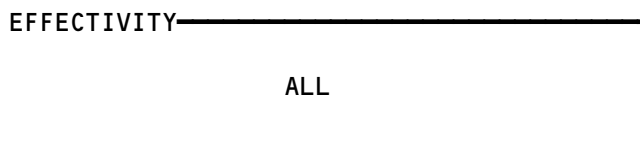
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A

#### Instructions to Access EICAS – EPCS Maintenance Page TRA Readout

1. Press MENU key on CDU. Ensure main menu page is displayed.
2. Press LSK 6L (<CMC). Ensure CMC MENU 1/2 page is displayed.
3. Press LSK 3L (<EICAS MAINT PAGES). Ensure EICAS MAINT PAGES SYSTEMS 1/3 page is displayed.
4. Press NEXT PAGE key. Display consecutive pages until (<73 EPCS) is displayed for selection.
5. Press LSK 4L (<73 EPCS). Ensure TRA readout is displayed on EICAS auxiliary display.

Thrust Lever Position/EICAS TRA Readout  
Figure 502 (Sheet 1)



76-11-01

J01

Page 503  
Oct 10/88

FORWARD THRUST LEVER ANGLE (TLA) IN DEGREES	EICAS EPCS MAINTENANCE PAGE THRUST RESOLVER ANGLE READOUT (TRA) IN DEGREES (±0.8 DEGREES)
0	35.0
2	37.1
4	39.1
6	41.2
8	43.2
10	45.2
12	47.2
14	49.2
16	51.1
18	53.1
20	55.0
22	56.9
24	58.9
26	60.8
28	62.7
30	64.6
32	66.5
34	68.4
36	70.4
38	72.4
40	74.4
42	76.4
44	78.5
46	80.7
48	82.8
50	85.2

FORWARD THRUST LEVER/EICAS TRA READOUT  
TABLE A

REVERSE THRUST LEVER ANGLE (TLA) IN DEGREES	EICAS EPCS MAINTENANCE PAGE THRUST RESOLVER ANGLE READOUT (TRA) IN DEGREES (±0.8 DEGREES)
0	35.0
2	35.1
4	35.2
6	35.2
8	35.1
10	35.0
12	34.8
14	34.6
16	34.3
18	34.0
20	33.7
22	33.2
24	32.8
26	32.3
28	31.7
30	31.1
32	30.5
34	29.9
36	29.2
38	28.4
40	27.7
42	26.9
44	26.0
46	25.3
48	24.4
50	23.5
52	22.6
54	21.7
55	21.2
56	20.8
58	19.8
60	18.9
62	17.9
64	16.9
66	15.9
68	15.0
70	14.0
72	13.1
74	12.1
76	11.2
78	10.2
80	9.3
82	8.4
84	7.5
86	6.6
88	5.7
89.25	5.2

REVERSE THRUST LEVER/EICAS TRA READOUT  
TABLE B

Thrust Lever Position/EICAS TRA Readout  
Figure 502 (Sheet 2)

EFFECTIVITY

ALL

76-11-01

J01

Page 504  
Jun 10/93

S 045-033-J00

- (3) Do the deactivation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 865-004-J00

- (4) Remove the switch covers of the thrust lever assembly, thrust lever cover and side panels of the control stand (AMM 76-11-03/201).

S 215-020-J00

- (5) Do a check on the thrust lever assembly:  
(a) Move the thrust levers approximately 42.0 degrees forward of idle.

NOTE: Thrust Lever Angle (TLA) is shown on the EPCS-MAN event screen as Thrust Resolver Angle (TRA) degrees of movement (Fig. 502)

- (b) Put a TL 1 rig pin through the mounting brackets of the autothrottle brake and rigging slots in the brake housing.  
(c) Make sure that all of the forward thrust lever knobs are aligned.  
1) If the forward thrust lever knobs are not aligned then adjust the thrust lever rods 1, 3 and 4:  
a) Remove the lockwire on the control rods.  
b) Loosen the locknuts.  
c) Adjust the turnbarrels until the aft face of each lever knob aligns less than 0.02 inches (0.5 mm) of the aft face of lever knob No. 2.  
d) Tighten the locknuts.  
e) Install lockwire on the control rods.  
f) Do a check of all rod ends of the control rods for correct thread engagement.

NOTE: The rod end threads must be seen through the inspection holes and should cover at least one half of the hole diameter.

- (d) Remove the TL 1 rig pin from the autothrottle brake assembly.  
(e) Move the forward thrust levers to the idle position.

EFFECTIVITY

ALL

76-11-01

J02

Page 505  
Oct 10/94

S 825-021-J00

- (6) Do the adjustment of the interlock actuator of the reverse thrust lever (AMM 78-34-03/501).

S 825-022-J00

- (7) Do the adjustment of the thrust lever position resolver (AMM 76-11-02/501).

S 435-024-J00

- (8) Install the side panels and thrust lever cover of the control stand, and the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 445-025-J00

- (9) Do the activation procedure for the autothrottle servomotor (AMM 76-11-03/201).

S 865-026-J00

- (10) Energize the flap lever RVDT, the actuation circuits of the speed brake lever and thrust lever switches (AMM 76-11-03/201).

S 865-027-J00

- (11) Do the activation procedure for the captain and first officer seats (AMM 76-11-03/201).

TASK 76-11-01-725-023-J00

3. Engine Control System Test (Fig. 501 and 502)

A. General

- (1) This system test has one task. The task is the test of the thrust lever load.

B. Special Tools and Equipment

- (1) G76002-7 Protractor - Thrust Levers (Recommended)  
(2) G76002-1 Protractor - Thrust Levers (Alternative)

C. Standard Tools and Equipment

- (1) Gage - Dial Push/Pull, DPP-25 (DPP-125N), 25 Pound (125N) Capacity

D. References

- (1) AMM 27-62-09/401, Auto Speed Brake Arming Switch  
(2) AMM 76-11-03/201, Control Stand

E. Access

- (1) Location Zone  
221 Control Cabin, LH  
222 Control Cabin, RH

F. Procedure

S 045-029-J00

- (1) Do the deactivation procedure of the captain and first officer seats (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-11-01

J02

Page 506  
Oct 10/94

- S 865-030-J00
- (2) Remove electrical power from the thrust lever switches, actuation circuits of the speed brake lever and the flap lever RVDT (AMM 76-11-03/201).
- S 045-031-J00
- (3) Do the deactivation procedure of the autothrottle servomotor (AMM 76-11-03/201).
- S 015-032-J00
- (4) Remove the switch covers of the thrust lever assembly, thrust lever cover and side panels of the control stand (AMM 76-11-03/201).
- S 845-009-J00
- (5) Move each reverse thrust lever 8.5 degrees forward of lever travel.  
(a) Make sure each forward thrust lever does not move when the reverse thrust lever moves 8.5 degrees or more from the reverse idle.
- S 845-011-J00
- (6) Move each reverse thrust lever back to the idle position.
- S 225-012-J00
- (7) Use a push-pull scale to find the knob load on the forward thrust lever:  
(a) Make sure that the load is not more than 3.4 pounds (15.1 Newtons) through full range of travel.
- S 715-013-J00
- (8) Make sure you can move the forward thrust lever smoothly through 50 degree of full range travel.
- S 845-014-J00
- (9) Move each forward thrust lever forward more than 2 degrees of lever travel.

EFFECTIVITY

ALL

76-11-01

J02

Page 507  
Oct 10/94



S 715-015-J00

- (10) Use a push-pull scale to apply 10 pounds (44.5 Newtons) of knob load to each reverse thrust lever:
- (a) Make sure that each lever does not move more than 8.5 degrees from reverse idle when the forward thrust lever is more than 5  $\pm 2$  degrees from idle.

S 845-016-J00

- (11) Move each forward thrust lever back to the idle position.

S 715-017-J00

- (12) Make sure that the reverse thrust lever will not move more than 55 degrees when the forward thrust lever is less than 2 degrees from idle and the reverse thrust interlock actuator is retracted.

S 865-028-J00

**WARNING:** MAKE SURE THAT YOU REMOVE THE ELECTRICAL POWER TO THE INTERLOCK ACTUATORS. INTERLOCK ACTUATORS OF THE REVERSE THRUST LEVER OPERATE LESS THAN 1 SECOND. IF YOU DO NOT REMOVE ELECTRICAL POWER FROM THE INTERLOCK ACTUATORS, IT CAN CAUSE THE REVERSE THRUST LEVER TO OPERATE ACCIDENTALLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (13) Do these steps to move the interlock actuator to the extended position:
- (a) Disconnect these electrical connectors from the connector bracket:
    - 1) DM7986 - Thrust Lever 1
    - 2) DM7987 - Thrust Lever 2
    - 3) DM7988 - Thrust Lever 3
    - 4) DM7989 - Thrust Lever 4
  - (b) Apply 28 volts DC to pin 8 and ground pin 6 and pin 10 of each actuator connector to extend the actuator.

EFFECTIVITY

ALL

76-11-01

J02

Page 508  
Oct 10/94

S 865-074-J00

- (14) Make sure that the speed brake lever is at the down position.

S 865-018-J00

- (15) Move the reverse thrust levers from the idle position to the full reverse position.  
(a) Use the push-pull scale to make sure that the knob load of the reverse thrust lever is not more than 6.5 pounds (29.0 Newtons).

NOTE: In general the maximum reverse thrust lever load is 4 pounds (17.8 Newtons) except at the detent. At the detent the maximum knob load is 5.5 pounds (24.5 Newtons) on handles 1 and 3 and 6.5 pounds (29.0 Newtons) on handles 2 and 4, respectively.

S 865-019-J00

- (16) Move the reverse thrust levers from the full reverse position to the idle position.  
(a) Use the push-pull scale to make sure that the knob load of the reverse thrust lever is not more than 6.5 pounds (29.0 Newtons).

NOTE: In general the maximum reverse thrust lever load is 4 pounds (17.8 Newtons) except at the detent. At the detent the maximum knob load is 6.5 pounds (29.0 Newtons).

S 825-003-J00

- (17) Lift the reverse thrust levers 6.0 degrees from the idle/stow position.  
(a) Make sure the reverse thrust levers move back to the idle/stow position when you release them.

S 715-022-J00

- (18) Make sure that you can move the reverse thrust lever smoothly through the full range of travel, 89.25 degrees.

S 865-060-J00

- (19) Do these steps to move the interlock actuator back to the retracted position:  
(a) Apply 28 volts DC to pin 6 and ground pin 8 and pin 10 to each of these actuator connectors to retract the actuator.  
1) DM7986 - Thrust Lever 1

EFFECTIVITY

ALL

76-11-01

J02

Page 509  
Oct 10/94

- 2) DM7987 - Thrust Lever 2
- 3) DM7988 - Thrust Lever 3
- 4) DM7989 - Thrust Lever 4
- (b) Connect these connectors to the connector bracket.

S 715-023-J00

- (20) Push the go-around triggers:
  - (a) Make sure the triggers and the switch rollers operate freely.
  - (b) Make sure the triggers go back to the initial position after you pushed them.

S 715-025-J00

- (21) Push the autothrottle disconnect triggers:
  - (a) Make sure that the triggers and the switch rollers operate freely.
  - (b) Make sure that the triggers go back to the initial position after you pushed them.

S 715-027-J00

- (22) Make sure that the reverse thrust lever No. 2 and No. 4 lift the speed brake lever out of detent smoothly.

S 715-029-J00

- (23) Make sure that the reverse thrust lever operates the auto speed brake arming switch (S861) correctly (AMM 27-62-09/401).

S 435-030-J00

- (24) Install the side panels and thrust lever cover of the control stand, and the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 445-057-J00

- (25) Do the activation procedure for the autothrottle servomotor (AMM 76-11-03/201).

S 865-031-J00

- (26) Energize the flap lever RVDT, the actuation circuits of the speed brake lever and thrust lever switches (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-11-01

J02

Page 510  
Oct 10/94

- S 445-032-J00
- (27) Do the activation procedure for the captain and first officer seats  
(AMM 76-11-03/201).

EFFECTIVITY	
	ALL

76-11-01

J02

Page 511  
Oct 10/94

THRUST LEVER POSITION RESOLVER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the thrust lever position resolvers (referred to as the resolvers). The second task is the installation of the resolvers.
- B. The resolvers are installed below the control stand assembly.

TASK 76-11-02-004-001-J00

2. Thrust Lever Position Resolver Removal (Fig. 401)

A. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) AMM 76-11-03/201, Control Stand
- (3) IPC 76-11-02 Fig. 1

B. Access

(1) Location Zone

- 211 Passenger Cabin - Nose to First Door, LH
- 212 Passenger Cabin - Nose to First Door, RH

C. Procedure

S 864-002-J00

- (1) Do the deactivation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 864-018-J00

- (2) Remove electrical power from the resolvers (AMM 76-11-03/201).

S 014-003-J00

- (3) Remove the passenger cabin ceiling panel to get access to the resolvers (AMM 25-22-01/401).

S 034-004-J00

- (4) Remove the electrical cable and the wire bundle clamps.

S 034-005-J00

- (5) Disconnect the applicable electrical connector:
  - (a) T1742 for the resolver No. 1
  - (b) T1743 for the resolver No. 2
  - (c) T1744 for the resolver No. 3
  - (d) T1745 for the resolver No. 4.

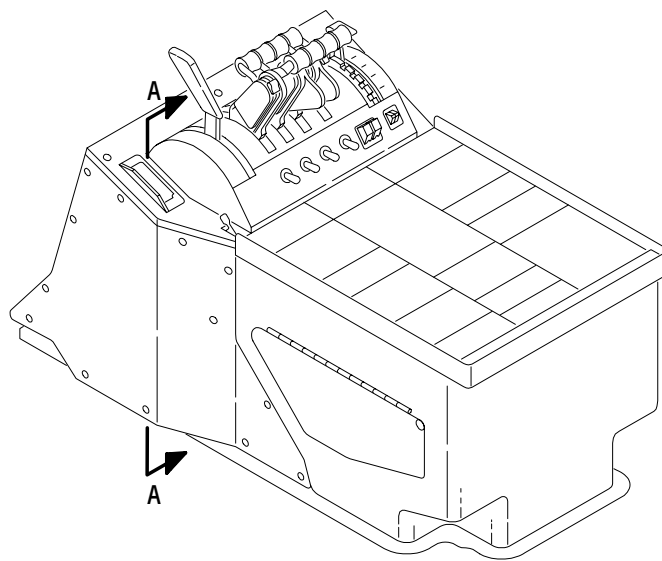
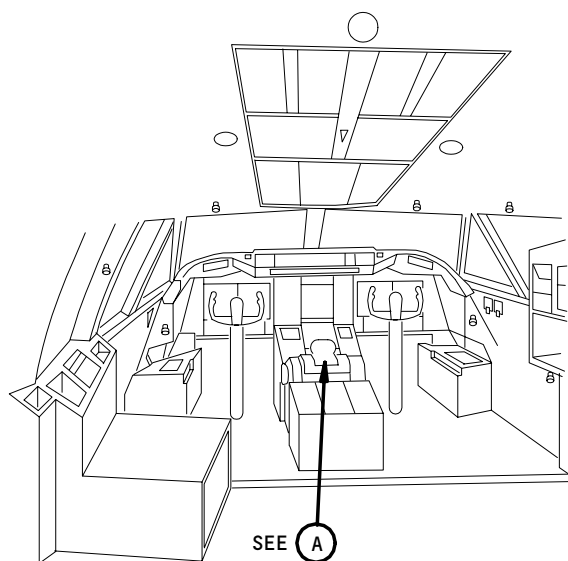
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ALL

76-11-02

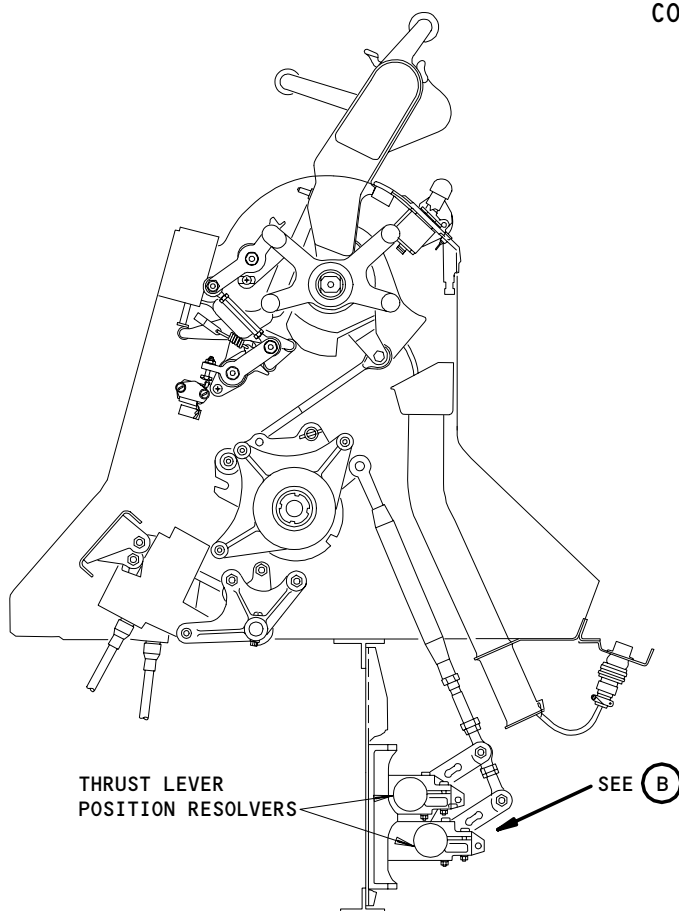
J02

Page 401  
Feb 10/94



CONTROL STAND

(A)



A-A

Thrust Lever Position Resolvers  
Figure 401 (Sheet 1)

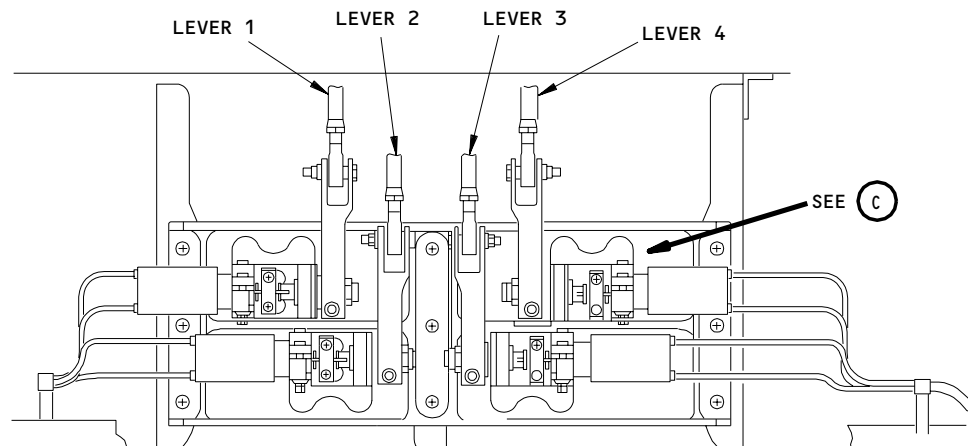
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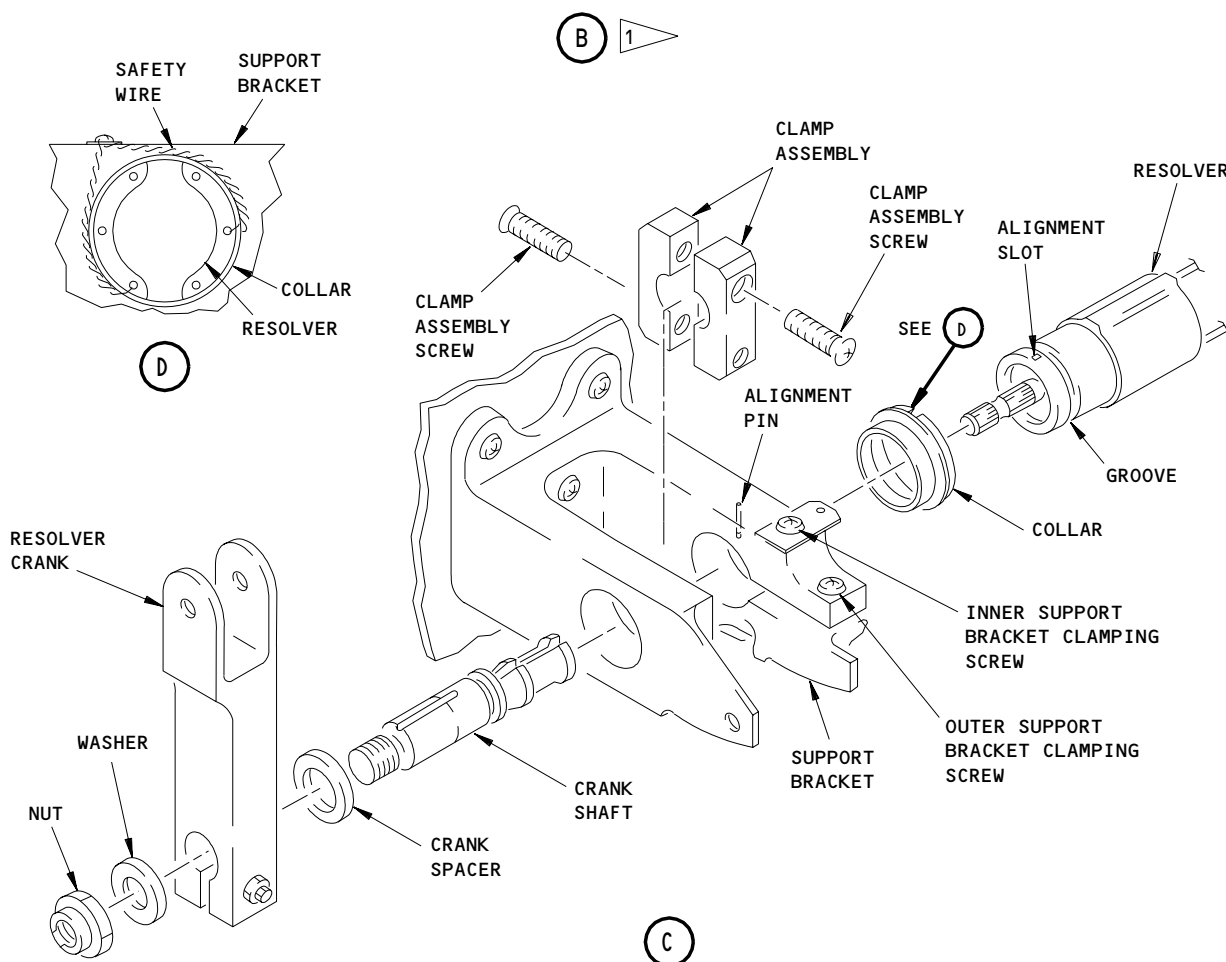
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J01

Page 402  
Feb 10/89



THRUST LEVER POSITION RESOLVERS



1 TLA RESOLVERS 1 AND 4 HAVE SLOTS. TLA RESOLVERS 2 AND 3 DO NOT HAVE SLOTS

Thrust Lever Position Resolvers  
Figure 401 (Sheet 2)

EFFECTIVITY

ALL

76-11-02

J01

Page 403  
Jun 15/98

- S 434-020-J00
- (6) Install caps on the connector and the receptacle.
- S 034-006-J00
- (7) Remove the clamp assembly securing the resolver in the shaft.
- (a) Remove the two bolts securing the clamp halves.
- (b) Remove the two clamp halves.
- S 344-028-J00
- (8) Remove the safety wire securing the resolver collar to the bracket.
- S 344-029-J00
- (9) Remove the inner support bracket clamping screw.
- S 034-007-J00
- (10) Loosen the outer clamp screw in support bracket.
- S 024-008-J00
- (11) Remove the resolver and collar.
- (a) Rotate the resolver to align the slot in the resolver body with the pin in the bracket and remove the resolver from the bracket.
- (b) Retain the collar for installation of the resolver.

TASK 76-11-02-404-009-J00

3. Thrust Lever Position Resolver Installation (Fig. 401)

A. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) AMM 76-11-02/501, Thrust Lever Position Resolver
- (3) AMM 76-11-03/201, Control Stand
- (4) IPC 76-11-02 Fig. 1

B. Access

- (1) Location Zone
- |     |  |
|-----|--|
| 211 | Passenger Cabin - Nose to First Door, LH |
| 212 | Passenger Cabin - Nose to First Door, RH |

C. Procedure

- S 434-030-J00
- (1) Install the collar on the resolver.
- S 424-010-J00
- (2) Install the resolver in the support bracket.
- (a) Align the slot in the resolver with the pin in the bracket.

EFFECTIVITY

ALL

76-11-02

J02

Page 404  
Feb 10/97



- (b) Align the serrated resolver shaft in the crank shaft.
- (c) Assure the resolver is installed so the pin in the bracket is in the groove of the resolver body to allow rotation of the resolver.

S 434-011-J00

- (3) Install the clamp assembly.
  - (a) Install the two clamp halves on the crank shaft aligning them with the slots in the shaft (plus or minus 10 degrees).
  - (b) Install the bolts to secure the clamp halves.
  - (c) Tighten the bolts.

S 434-032-J00

- (4) Install the inner support bracket clamping screw.

S 824-012-J00

- (5) Adjust the resolver (AMM 76-11-02/501).

S 434-013-J00

- (6) Tighten the two screws on the support bracket to hold the resolver tightly in place.

S 434-031-J00

- (7) Install the safety wire securing the resolver collar to the support bracket.

S 434-014-J00

- (8) Connect the applicable electrical connectors:
  - (a) T1742 for the resolver No. 1
  - (b) T1743 for the resolver No. 2
  - (c) T1744 for the resolver No. 3
  - (d) T1745 for the resolver No. 4

S 434-015-J00

- (9) Install the electrical cable and the wire bundle clamps.

S 414-016-J00

- (10) Install the passenger cabin ceiling panel (AMM 25-22-01/401).

S 864-017-J00

- (11) Do the activation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 864-019-J00

- (12) Supply electrical power to the resolvers if it is necessary (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-11-02

J02

Page 405  
Feb 10/97

THRUST LEVER POSITION RESOLVER - ADJUSTMENT/TEST

1. General

- A. This procedure has one task. The task is to adjust the thrust lever position resolver (referred to as the resolver). There are two procedures to do this task: The first procedure uses external equipment and the second procedure uses the airplane EICAS screen. It is recommended that you use the first procedure.
- B. The resolver is installed below the control stand assembly. The resolver is a mechanical-electrical transducer which changes the mechanical input from the thrust lever into an electrical output. This is done when an electrical signal received from the full authority fuel control (FAFC) (AMM 76-11-02/401) is changed in phase by a quantity related to the thrust lever and resolver position. This signal is then returned to the (FAFC) as input for the adjustment of the metering valve of the fuel metering unit.
- C. This procedure gives the accurate calibration of the resolver.
- D. You must turn on all electrical equipment a minimum of 10 minutes before you use them to let the temperature become stable.

TASK 76-11-02-825-091-J00

2. Thrust Lever Position Resolver Calibration (Fig. 501 and 502)

A. Equipment

- (1) G12001-47, Rig Pin Set
  - (a) TL1, MS20392-4C or equivalent 0.309-0.311 inch (7.85-7.90 mm) diameter rod or bolt by 12.0 inches (305 mm) long.
  - (b) TR1 and TR2, MS20392-3C or equivalent 0.246-0.248 inch (6.25-6.30 mm) diameter rod or bolt by 3.5 inches (89 mm) long.
- (2) Sinewave Generator - Output Range 0-10 ( $\pm 0.01$ ) volts RMS, Frequency Range 2.5-3.5 ( $\pm 0.01$ ) kHz
- (3) Digital Multimeter - Range 0-50 ( $\pm 0.01$ ) volts RMS
- (4) Universal Counter - Range 2.5-3.5 ( $\pm 0.01$ ) kHz
- (5) Angle Position Indicator (API) - 0.00 to 359.99 degrees ( $\pm 0.05$  degree), 360 Hz to 4.8 kHz, (North Atlantic 8810S3128 or equivalent)

- (6) Weight - 10 Pounds (44.5 N)
- (7) Shock Cord

B. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) AMM 76-11-01/501, Thrust Lever Assembly
- (3) AMM 76-11-03/201, Control Stand

C. Access

- (1) Location Zone
  - 211 Passenger Cabin - Nose to First Door, LH
  - 212 Passenger Cabin - Nose to First Door, RH
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

EFFECTIVITY

ALL

76-11-02

J02

Page 501  
Feb 18/00

D. Procedure

S 865-092-J00

- (1) Do the deactivation procedure of the CAPT and F/O seats (AMM 76-11-03/201).

S 035-093-J00

- (2) Remove the side panels of the control stand (AMM 76-11-03/201).

S 865-094-J00

- (3) Remove electrical power to the resolvers, the thrust lever switches and the interlock actuators of the reverse thrust lever (AMM 76-11-03/201).

S 015-095-J00

- (4) Remove the passenger cabin ceiling panel to get access to the resolvers (AMM 25-22-01/401).

S 495-096-J00

- (5) Hang a 10 pound (44.5 N) weight from the resolver crank.

NOTE: The load must be sufficient to remove the effects of the backlash but must not be more than 10 pounds (44.5 N).

S 495-097-J00

- (6) Move all four thrust levers forward until you can put the rig pin TL1 through all four brake assemblies and each inboard side frame of the control stand (Fig. 501).

S 495-098-J00

- (7) Adjust the thrust levers (AMM 76-11-01/501).

S 495-099-J00

- (8) Adjust the connecting rods (referred to as rods) to the No. 1 and 4 resolvers until you can put the rig pin TR1 through the two resolver arms and the resolver mounting brackets (Fig. 501).

S 495-100-J00

- (9) Adjust the rods to the No. 2 and 3 resolvers until you can put the rig pin TR2 through the two resolver arms and the resolver mounting brackets (Fig. 501).

S 435-101-J00

- (10) Tighten the jamnuts on the connecting rod.

S 435-102-J00

- (11) For engines No. 1, 3 and 4, install lockwire on the rod if the turn barrel on the rod is drilled for lockwire installation.

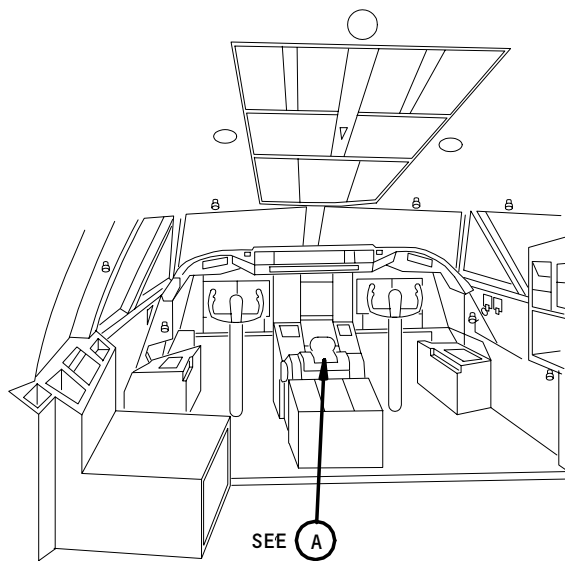
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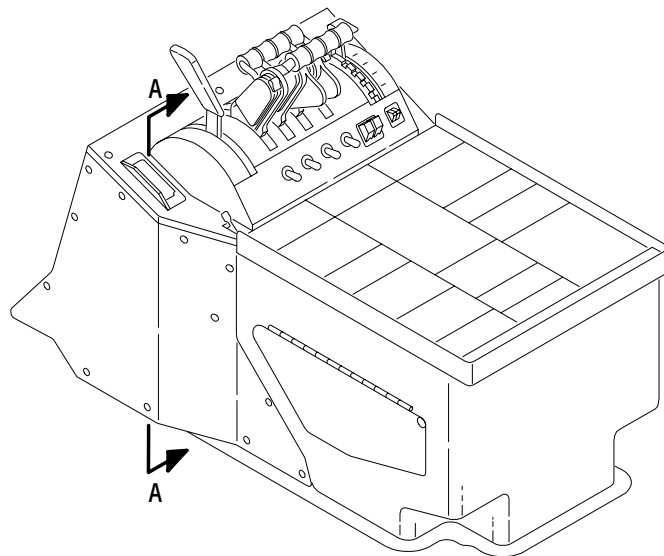
76-11-02

J06.1

Page 502  
Oct 18/00

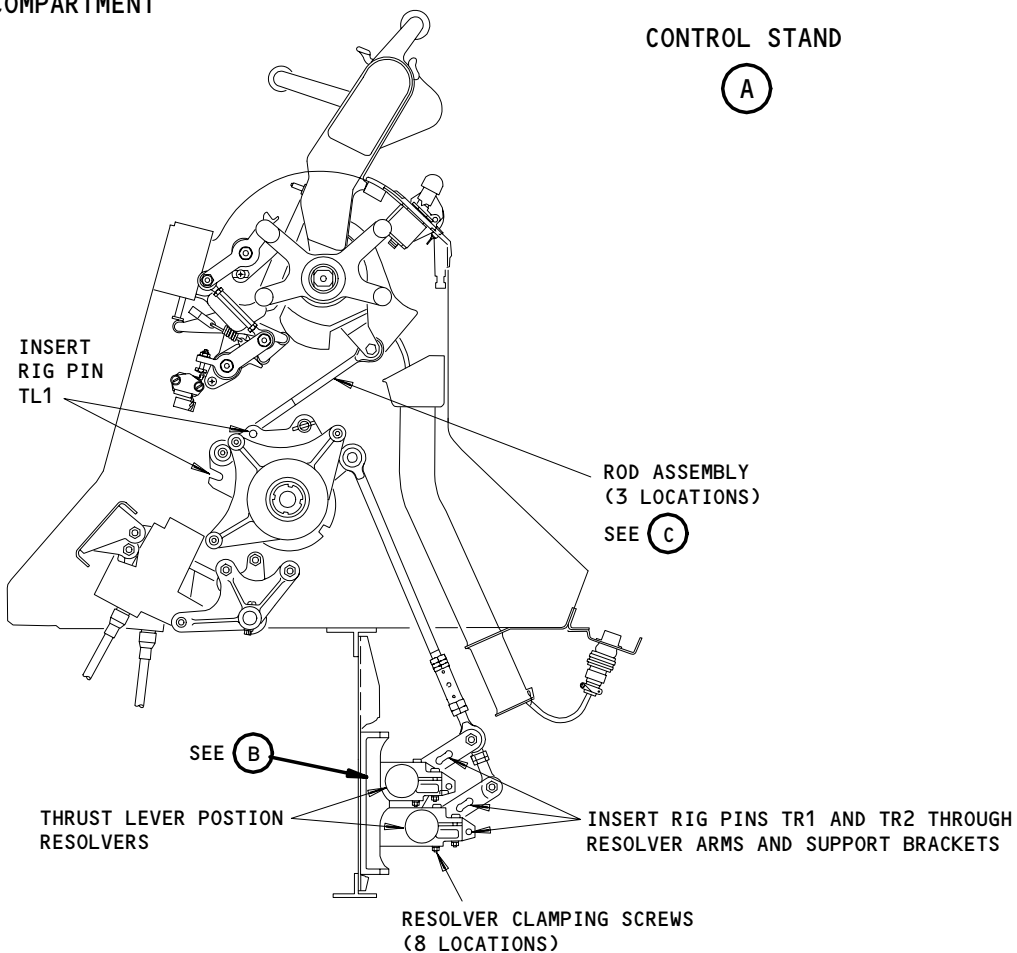


FLIGHT COMPARTMENT



CONTROL STAND

(A)



A-A

Thrust Lever Position Resolvers  
Figure 501 (Sheet 1)

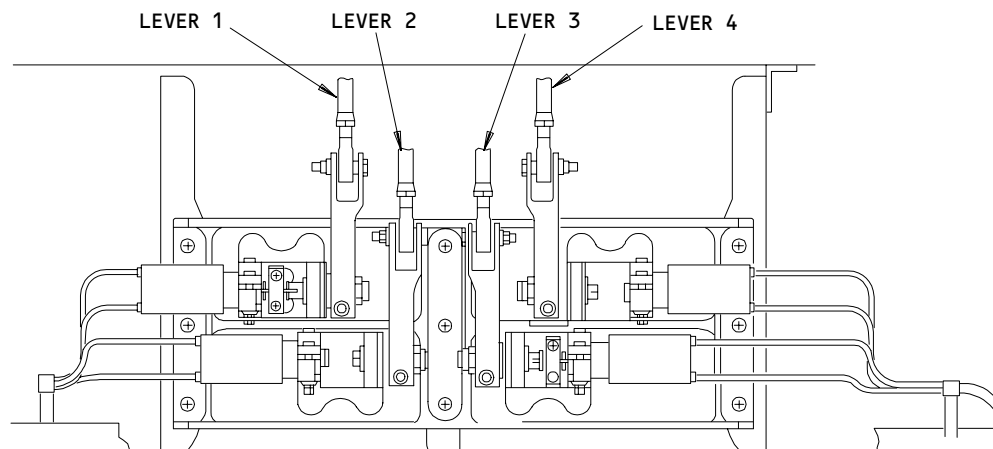
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ALL

76-11-02

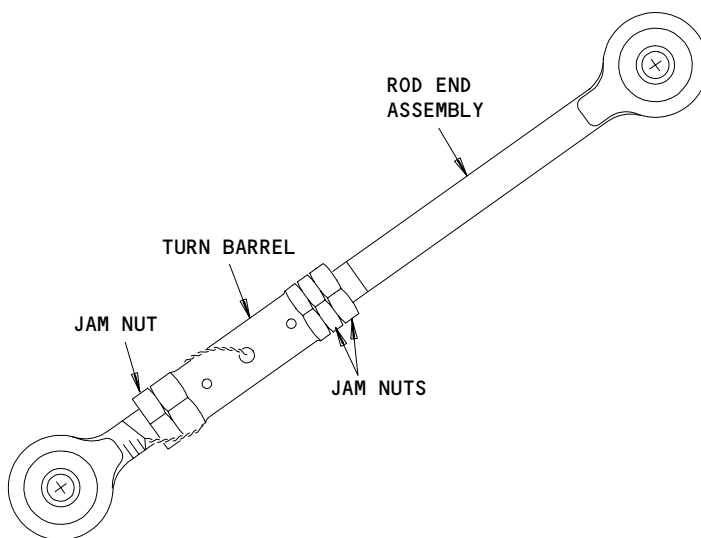
J02

Page 503  
Feb 10/92



THRUST LEVER POSITION RESOLVERS

(B)



ROD ASSEMBLY  
(EXAMPLE)

(C)

**NOTE:** ON AIRPLANES BEFORE SB 76-2076,  
ROD ASSEMBLIES DO NOT HAVE  
PROVISIONS FOR LOCKWIRE.

Thrust Lever Position Resolvers  
Figure 501 (Sheet 2)

EFFECTIVITY

ALL

76-11-02

J02

Page 504  
Feb 10/92

- (12) Install the inspection seal on the rods.

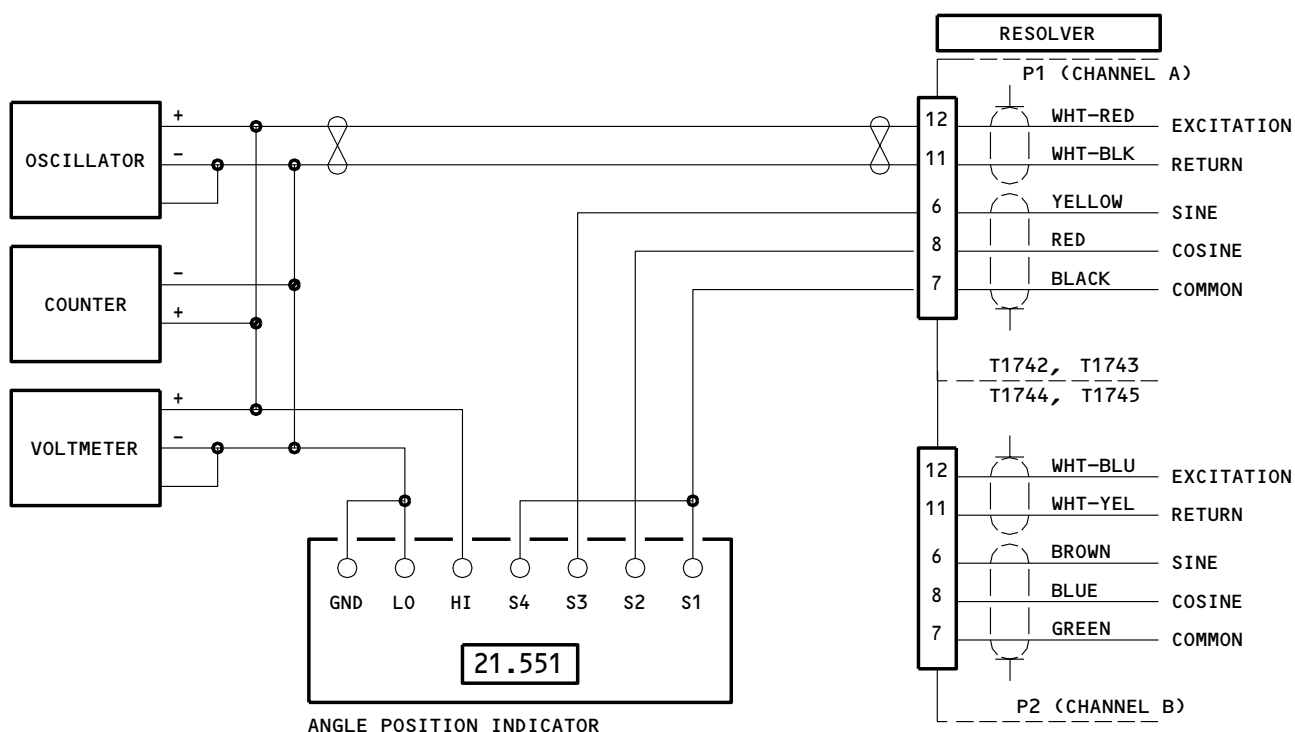
**NOTE:** No more adjustment of the rods is permitted after this step.

S 035-104-J00

- (13) Disconnect Channel A electrical connectors as follows:
- (a) P1 of T1742 for the No. 1 thrust lever resolver
  - (b) P1 of T1743 for the No. 2 thrust lever resolver
  - (c) P1 of T1744 for the No. 3 thrust lever resolver
  - (d) P1 of T1745 for the No. 4 thrust lever resolver.

S 485-105-J00

- (14) Connect the pulse generator, multimeter, counter, and angle position indicator (API) to the Channel A connector of each resolver (Fig. 502):
  - (a) For the No. 1 thrust lever resolver, the connection is at P1 of the connector T1742.
  - (b) For the No. 2 thrust lever resolver, the connection is at P1 of the connector T1743.
  - (c) For the No. 3 thrust lever resolver, the connection is at P1 of the connector T1744.
  - (d) For the No. 4 thrust lever resolver, the connection is at P1 of the connector T1745.



### Angle Position Indicator Equipment Installation Figure 502

### EFFECTIVITY:

ALL

76-11-02

J03

Page 505  
Feb 10/92

S 035-106-J00

- (15) Loosen resolver clamping screws on the support bracket (Fig. 501).

S 825-107-J00

- (16) Set the output voltage and frequency of the pulse generator as follows:
- (a) 7.07  $\pm$ 0.07 volts RMS
  - (b) 3.15  $\pm$ 0.03 kHz.

S 825-108-J00

- (17) For the resolvers No. 1 and No. 2, adjust the resolver:
- (a) Turn the resolver body with your fingers until the API display value is 77.24  $\pm$ 0.167 degrees.
  - (b) Write the API display value.
  - (c) Tighten the resolver clamping screws on the support bracket.

S 825-109-J00

- (18) For the resolvers No. 3 and No. 4, adjust the resolver:
- (a) Turn the resolver body with your fingers until the API display value is 12.76  $\pm$ 0.167 degrees.
  - (b) Subtract the API display value from 90 degrees and write the new value.
  - (c) Tighten the resolver clamping screws on the support bracket.

S 035-110-J00

- (19) Disconnect the pulse generator, multimeter, counter, and API.

S 435-111-J00

- (20) Connect the Channel A electrical connectors as follows:
- (a) P1 of T1742 for the No. 1 thrust lever resolver
  - (b) P1 of T1743 for the No. 2 thrust lever resolver
  - (c) P1 of T1744 for the No. 3 thrust lever resolver
  - (d) P1 of T1745 for the No. 4 thrust lever resolver.

S 035-112-J00

- (21) Disconnect the Channel B electrical connectors as follows:
- (a) P2 of T1742 for the No. 1 thrust lever resolver
  - (b) P2 of T1743 for the No. 2 thrust lever resolver
  - (c) P2 of T1744 for the No. 3 thrust lever resolver
  - (d) P2 of T1745 for the No. 4 thrust lever resolver.

S 485-113-J00

- (22) Connect the pulse generator, multimeter, counter, and angle position indicator (API) to the Channel B connector of each resolver (Fig. 502):
- (a) For the No. 1 thrust lever resolver, the connection is at P2 of connector T1742.
  - (b) For the No. 2 thrust lever resolver, the connection is at P2 of connector T1743.

EFFECTIVITY

ALL

76-11-02

J03

Page 506  
Feb 10/92

- (c) For the No. 3 thrust lever resolver, the connection is at P2 of connector T1744.
- (d) For the No. 4 thrust lever resolver, the connection is at P2 of connector T1745.

S 825-114-J00

- (23) Set the output voltage and frequency of the pulse generator as follows:
  - (a) 7.07  $\pm$ 0.07 volts RMS
  - (b) 3.15  $\pm$ 0.03 kHz.

S 825-115-J00

- (24) For the resolvers No. 1 and No. 2, write the API display value.

S 825-116-J00

- (25) For the resolvers No. 3 and No. 4:
  - (a) Subtract the API display value from 90 degrees and write the new value.

S 825-117-J00

- (26) With the API display values for Channel A and Channel B for all four resolvers, subtract the Channel B value from the Channel A value for each of the resolvers.

S 825-118-J00

- (27) Make sure that the difference between each Channel A value and each Channel B value is not more than 0.31 degrees.

S 035-119-J00

- (28) Disconnect the pulse generator, multimeter, counter, and API.

S 435-120-J00

- (29) Connect the Channel B electrical connectors as follows:
  - (a) P2 of T1742 for the No. 1 thrust lever resolver
  - (b) P2 of T1743 for the No. 2 thrust lever resolver
  - (c) P2 of T1744 for the No. 3 thrust lever resolver
  - (d) P2 of T1745 for the No. 4 thrust lever resolver.

S 095-121-J00

- (30) Remove rig pins TL1, TR1, and TR2.

S 095-122-J00

- (31) Remove the 10 pound (44.5 N) weight.

E. Check the Adjustment

S 035-123-J00

- (1) Disconnect the Channel A electrical connectors as follows:
  - (a) P1 of T1742 for thrust resolver No. 1
  - (b) P1 of T1743 for thrust resolver No. 2
  - (c) P1 of T1744 for thrust resolver No. 3
  - (d) P1 of T1745 for thrust resolver No. 4.

EFFECTIVITY

ALL

76-11-02

J02

Page 507  
Feb 10/94



S 485-124-J00

- (2) Connect the pulse generator, multimeter, counter, and API to the Channel A connector of each resolver (Fig. 502).
- (a) For the No. 1 thrust lever resolver, the connection is at P1 of connector T1742.
  - (b) For the No. 2 thrust lever resolver, the connection is at P1 of connector T1743.
  - (c) For the No. 3 thrust lever resolver, the connection is at P1 of connector T1744.
  - (d) For the No. 4 thrust lever resolver, the connection is at P1 of connector T1745.

S 865-125-J00

- (3) Move all four thrust levers to the full forward thrust position.

S 825-126-J00

- (4) Make sure that the API display values are in the limits as follows:
- (a)  $85.0 \pm 1.00$  degrees for the No. 1 and 2 resolvers.
  - (b)  $5.0 \pm 1.00$  degrees for the No. 3 and 4 resolvers.

S 865-127-J00

- (5) Retract all four forward thrust levers to the idle position.

S 825-128-J00

- (6) Make sure that the API display values are in the limits as follows:
- (a)  $34.82 \pm 0.75$  degrees for the No. 1 and No. 2 resolvers.
  - (b)  $55.18 \pm 0.75$  degrees for the No. 3 and No. 4 resolvers.

S 865-179-J00

- (7) Open the T/R IND Circuit Breakers (C/B's).
- (a) P6 Main Power Distribution Panel
    - 1) 6F12 ENG 1 T/R IND
    - 2) 6E12 ENG 2 T/R IND
    - 3) 6D12 ENG 3 T/R IND
    - 4) 6C12 ENG 4 T/R IND.

S 865-180-J00

- (8) Open the C/B's for each engine and install DO-NOT-CLOSE identifiers.
- (a) P180 DC Power Distribution Panel
    - 1) 180J5 ENG 1 EEC PWR CH A
    - 2) 180J6 ENG 1 EEC PWR CH B
    - 3) 180F5 ENG 2 EEC PWR CH A
    - 4) 180F6 ENG 2 EEC PWR CH B
    - 5) 180G20 ENG 3 EEC PWR CH A
    - 6) 180G21 ENG 3 EEC PWR CH B
    - 7) 180D20 ENG 4 EEC PWR CH A
    - 8) 180D21 ENG 4 EEC PWR CH B.

EFFECTIVITY

ALL

76-11-02

J02

Page 508  
Jun 10/95

S 035-181-J00

- (9) Disconnect electrical connectors DM7198E (J5) for channel A and DM7198F (J6) for channel B from each ECU and ground connector pin 7.

S 865-182-J00

**WARNING:** THE INTERLOCK ACTUATOR OF THE REVERSE THRUST LEVER OPERATES IN LESS THAN ONE SECOND. FAILURE TO KEEP PERSONS AND TOOLS CLEAR DURING THE OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (10) Motor each interlock actuator of the reverse thrust lever to the extend position:  
(a) Close the T/R IND C/B  
(b) Open the T/R IND C/B

S 865-183-J00

- (11) Move all four reverse thrust levers to the full reverse thrust position.

S 825-129-J00

- (12) Make sure that the API display values are in the limits as follows:  
(a)  $4.56 \pm 0.80$  degrees for the No. 1 and 2 resolvers.  
(b)  $85.44 \pm 0.80$  degrees for the No. 3 and 4 resolvers.

S 865-130-J00

- (13) Move all four reverse thrust levers to the stow position.

S 865-084-J00

**WARNING:** THE INTERLOCK ACTUATOR OF THE REVERSE THRUST LEVER OPERATES IN LESS THAN ONE SECOND. FAILURE TO KEEP PERSONS AND TOOLS CLEAR DURING THE OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (14) Motor each interlock actuator of the reverse thrust lever to the retracted position:  
(a) Disconnect ground from Pin 7  
(b) Close the T/R IND C/B  
(c) Open the T/R IND C/B

S 035-185-J00

- (15) Remove the ground from pin 7 and connect the electrical connectors DM7198E (J5) for channel A and DM7198F (J6) for channel B to each ECU.

S 035-186-J00

- (16) Remove the DO-NOT-CLOSE identifier and close the C/B's for each engine:  
(a) 180J5 ENG 1 EEC PWR CH A

EFFECTIVITY

ALL

76-11-02

J02

Page 509  
Jun 10/96

- (b) 180J6 ENG 1 EEC PWR CH B
- (c) 180F5 ENG 2 EEC PWR CH A
- (d) 180F6 ENG 2 EEC PWR CH B
- (e) 180G20 ENG 3 EEC PWR CH A
- (f) 180G21 ENG 3 EEC PWR CH B
- (g) 180D20 ENG 4 EEC PWR CH A
- (h) 180D21 ENG 4 EEC PWR CH B.

S 435-187-J00

- (17) Close all of the T/R IND C/B's.
  - (a) P6 Main Power Distribution Panel
    - 1) 6F12 ENG 1 T/R IND
    - 2) 6E12 ENG 2 T/R IND
    - 3) 6D12 ENG 3 T/R IND
    - 4) 6C12 ENG 4 T/R IND.

S 865-131-J00

- (18) Move the thrust lever No. 1 forward from the idle position until the API shows a value of 80.00 degrees.

NOTE: You can keep hysteresis at a minimum during thrust lever adjustment if you move the thrust levers forward smoothly from the idle position. If overshoot occurs, return the thrust levers to idle and do this step again.

- (a) Do not move thrust lever No. 1 after you got the final adjustment.

S 975-132-J00

- (19) Write the API display value of the angular travel of the resolver No. 1.

S 865-133-J00

- (20) Move the thrust levers No. 2, No. 3, and No. 4 forward from the idle position until the thrust lever knobs are aligned with the knob of the No. 1 thrust lever.

NOTE: You can keep hysteresis at a minimum during thrust lever adjustment if you move the thrust levers forward smoothly from the idle position. If overshoot occurs, return the thrust levers to idle and do this step again.

S 975-134-J00

- (21) Write the API display value of the angular travel of the resolver No. 2.

S 975-135-J00

- (22) Subtract the API display value of the angular travel of the resolvers No. 3 and No. 4 from 90 degrees and write the new values.

EFFECTIVITY

ALL

76-11-02

J02

Page 510  
Jun 10/96

- S 825-136-J00
- (23) Make sure that the difference between the API display values of the thrust lever resolvers is not larger than 1.5 degrees.
- S 825-137-J00
- (24) If the API display value at full forward thrust or full reverse thrust is not in the limit, or if the thrust lever knob alignment is not in the specified limit; then adjust the thrust lever assemblies (AMM 76-11-01/501) and the resolvers (AMM 76-11-02/501) again.
- S 085-138-J00
- (25) Disconnect the pulse generator, multimeter, counter, and API.
- S 865-139-J00
- (26) Make sure that all of the resolver body clamps are tight.
- S 865-140-J00
- (27) Make sure that all of the adjustment nuts of the connecting rod are tight.
- S 435-141-J00
- (28) Connect the electrical connectors of the Channel A as follows:
- (a) P1 of T1742 for the No. 1 thrust lever position resolver
  - (b) P1 of T1743 for the No. 2 thrust lever position resolver
  - (c) P1 of T1744 for the No. 3 thrust lever position resolver
  - (d) P1 of T1745 for the No. 4 thrust lever position resolver.
- S 415-142-J00
- (29) Install the passenger cabin ceiling panel (AMM 25-22-01/401).
- S 435-143-J00
- (30) Install the side panels of the control stand (AMM 76-11-03/201).
- S 865-144-J00
- (31) Energize the resolvers, thrust lever switches, and the interlock actuators of the reverse thrust lever (AMM 76-11-03/201).
- S 865-145-J00
- (32) Do the activation procedure of the CAPT and F/O seats (AMM 76-11-03/201).

EFFECTIVITY

ALL

**76-11-02**

J03

Page 511  
Feb 10/94

TASK 76-11-02-825-146-J00

3. Thrust Lever Position Resolver Calibration - EICAS

(Fig. 501 and 503)

A. General

- (1) You can use this procedure of the thrust lever position resolver (referred to as the resolver) adjustment if the sinewave generator, digital multimeter, universal counter, and angle position indicator are not available. It is recommended that you use the external equipment. There is less error when you use the external equipment than when you use the airplane EICAS screen.

B. Equipment

- (1) G12001-47, Rig Pin Set
  - (a) TL1, MS20392-4C or equivalent 0.309-0.311 inch (7.85-7.90 mm) diameter rod or bolt by 12.0 inches (305 mm) long.
  - (b) TR1 and TR2, MS20392-3C or equivalent 0.246-0.248 inch (6.25-6.30 mm) diameter rod or bolt by 3.5 inches (89 mm) long.
- (2) Weight - 10 Pounds (44.5 N)
- (3) Shock Cord

C. References

- (1) AMM 24-22-00/201, Manual Control (Electrical Power)
- (2) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (3) AMM 76-11-01/501, Thrust Lever Assembly
- (4) AMM 76-11-03/201, Control Stand

D. Access

- (1) Location Zone
  - 211 Passenger Cabin - Nose to First Door, LH
  - 212 Passenger Cabin - Nose to First Door, RH
  - 221 Control Cabin LH
  - 222 Control Cabin RH

E. Procedure

S 865-147-J00

- (1) Do the deactivation procedure of the CAPT and F/O seats (AMM 76-11-03/201).

S 015-148-J00

- (2) Remove the side panels of the control stand (AMM 76-11-03/201).

S 015-149-J00

- (3) Remove the ceiling panels to get access to the resolvers (AMM 25-22-01/401).

S 495-150-J00

- (4) Hang a 10 pound (44.5 N) weight from the resolver crank.

**NOTE:** The load must be sufficient to remove the effects of the backlash but must not be more than 10 pounds (44.5 N).

EFFECTIVITY

ALL

76-11-02

J03

Page 512  
Oct 10/97

- S 495-151-J00
- (5) Move all four thrust levers forward until you can put rig pin TL1 through all four brake assemblies and each inboard side frame of the control stand (Fig. 501).
- S 495-152-J00
- (6) Adjust the thrust levers (AMM 76-11-01/501).
- S 495-153-J00
- (7) Adjust the connecting rods (referred to as rods) to the No. 1 and No. 4 resolvers until you can put rig pin TR1 through the two resolver arms and the resolver mounting brackets (Fig. 501).
- S 495-154-J00
- (8) Adjust the rods to the No. 2 and No. 3 resolvers until you can put rig pin TR2 through the two resolver arms and the resolver mounting brackets (Fig. 501).
- S 435-155-J00
- (9) Tighten the rod jamnuts.
- S 435-156-J00
- (10) For engines 1, 3 and 4, install lockwire on the rod if the turn barrel on the rod is drilled for lockwire installation.
- S 425-157-J00
- (11) Install the inspection seal on the rods.
- NOTE: No more adjustment of the rod is permitted after this step.
- S 865-192-J00
- (12) Supply electrical power (AMM 24-22-00/201).
- S 865-191-J00
- (13) Set the EEC Maintenance Power switch, on the maintenance overhead panel P461, to the TEST position.
- S 865-158-J00
- (14) Get access to the EICAS-EPCS maintenance page which shows the the thrust resolver angle (TRA) (Fig. 503).
- S 035-159-J00
- (15) Loosen the resolver clamping screws on the support bracket (Fig. 501).
- S 825-160-J00
- (16) Turn the resolver body with your fingers until the EICAS reads 77.3  $\pm$ 0.2 TRA.

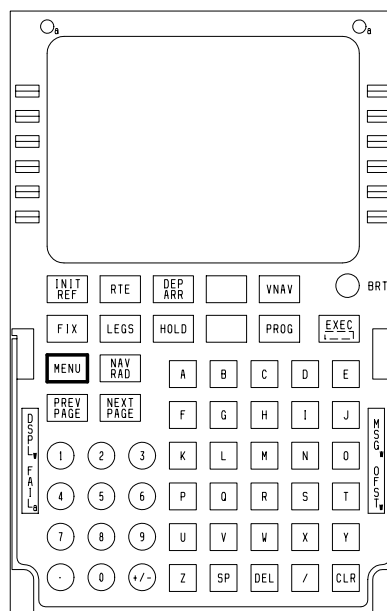
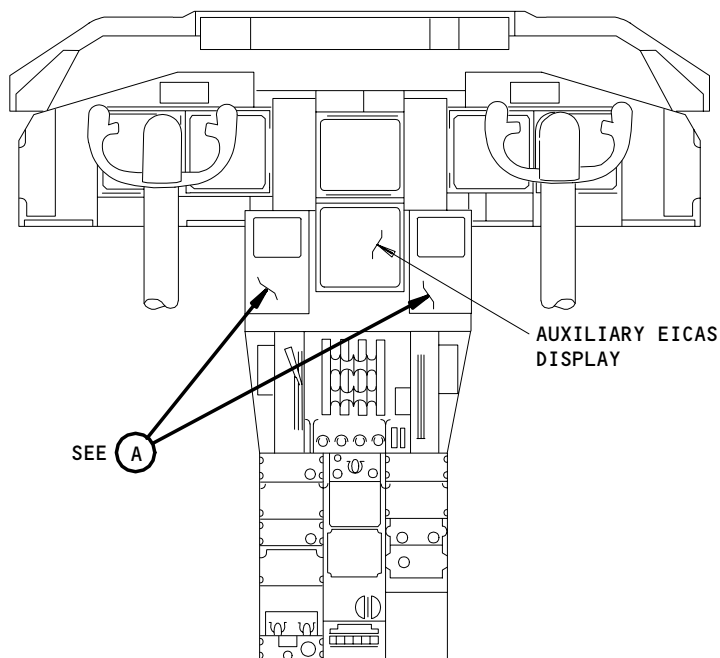
EFFECTIVITY

ALL

76-11-02

J05.1

Page 513  
Oct 18/00



CDU

(A)

#### Instructions to Access EICAS - EPCS Maintenance Page TRA Readout

1. Press MENU key on CDU. Ensure main menu page is displayed.
2. Press LSK 6L (<CMC). Ensure CMC MENU 1/2 page is displayed.
3. Press LSK 3L (<EICAS MAINT PAGES). Ensure EICAS MAINT PAGES SYSTEMS 1/3 page is displayed.
4. Press NEXT PAGE key. Display consecutive pages until (<73 EPCS) is displayed for selection.
5. Press LSK 4L (<73 EPCS). Ensure TRA readout is displayed on EICAS auxiliary display.

Thrust Lever Position/EICAS TRA Readout  
Figure 503 (Sheet 1)

EFFECTIVITY

ALL

76-11-02

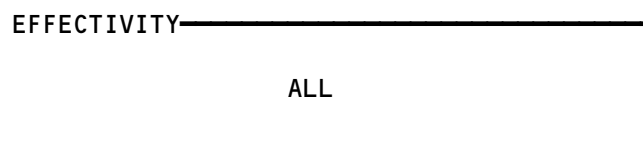
J02

Page 514  
Feb 10/92

FORWARD THRUST LEVER ANGLE (TLA) IN DEGREES	EICAS EPCS MAINTENANCE PAGE THRUST RESOLVER ANGLE READOUT (TRA) IN DEGREES (±0.8 DEGREES)
0	35.0
2	37.1
4	39.1
6	41.2
8	43.2
10	45.2
12	47.2
14	49.2
16	51.1
18	53.1
20	55.0
22	56.9
24	58.9
26	60.8
28	62.7
30	64.6
32	66.5
34	68.4
36	70.4
38	72.4
40	74.4
42	76.4
44	78.5
46	80.7
48	82.8
50	85.2

FORWARD THRUST LEVER/EICAS TRA READOUT  
TABLE A

Thrust Lever Position/EICAS TRA Readout  
Figure 503 (Sheet 2)



76-11-02

J02

Page 515  
Jun 10/93



REVERSE THRUST LEVER ANGLE (TLA) IN DEGREES	EICAS EPCS MAINTENANCE PAGE THRUST RESOLVER ANGLE READOUT (TRA) IN DEGREES (±0.8 DEGREES)
0	35.0
2	35.1
4	35.2
6	35.2
8	35.1
10	35.0
12	34.8
14	34.6
16	34.3
18	34.0
20	33.7
22	33.2
24	32.8
26	32.3
28	31.7
30	31.1
32	30.5
34	29.9
36	29.2
38	28.4
40	27.7
42	26.9
44	26.0
46	25.3
48	24.4
50	23.5
52	22.6
54	21.7
55	21.2
56	20.8
58	19.8
60	18.9
62	17.9
64	16.9
66	15.9
68	15.0
70	14.0
72	13.1
74	12.1
76	11.2
78	10.2
80	9.3
82	8.4
84	7.5
86	6.6
88	5.7
89.25	5.2

REVERSE THRUST LEVER/EICAS TRA READOUT  
TABLE B

Thrust Lever Position/EICAS TRA Readout  
Figure 503 (Sheet 3)

EFFECTIVITY

ALL
-----

76-11-02

J02

Page 516  
Feb 10/92

S 435-161-J00

- (17) Tighten the resolver clamping screws on the support bracket.

S 095-162-J00

- (18) Remove the rig pins.

S 095-163-J00

- (19) Remove the 10 pound (44.5 N) weight.

F. Check the Adjustment

S 865-164-J00

- (1) Move all four thrust levers at the same time to the full forward thrust position.

S 825-165-J00

- (2) Make sure that all four EICAS TRA values stay the same through the full range of motion.

S 825-166-J00

- (3) Make sure that all four EICAS TRA values are  $85.0 \pm 1.0$  at the full forward thrust position.

S 865-167-J00

- (4) Retract all four forward thrust levers to the idle position.

S 825-168-J00

- (5) Make sure that all four EICAS TRA values are  $35.0 \pm 0.8$  at the idle.

S 865-076-J00

**WARNING:** DO THE DEACTIVATION PROCEDURE OF THE THRUST REVERSER SYSTEM, WHICH MUST INCLUDE THE INSTALLATION OF LOCK BAR (OR BLOCKERS), TO PREVENT THE ACCIDENTAL OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do the deactivation procedure of the thrust reverser system for ground maintenance (AMM 78-31-00/201).

S 865-077-J00

- (7) Open the T/R IND Circuit Breakers (C/B's).

(a) P6 Main Power Distribution Panel

- 1) 6F12 ENG 1 T/R IND
- 2) 6E12 ENG 2 T/R IND
- 3) 6D12 ENG 3 T/R IND
- 4) 6C12 ENG 4 T/R IND.

EFFECTIVITY

ALL

76-11-02

J02

Page 517  
Oct 10/97

S 865-078-J00

- (8) Open the C/B's for each engine.
- (a) P180 DC Power Distribution Panel
- 1) 180J5 ENG 1 EEC PWR CH A
  - 2) 180J6 ENG 1 EEC PWR CH B
  - 3) 180F5 ENG 2 EEC PWR CH A
  - 4) 180F6 ENG 2 EEC PWR CH B
  - 5) 180G20 ENG 3 EEC PWR CH A
  - 6) 180G21 ENG 3 EEC PWR CH B
  - 7) 180D20 ENG 4 EEC PWR CH A
  - 8) 180D21 ENG 4 EEC PWR CH B.

S 035-091-J00

- (9) Disconnect electrical connectors DM7198E (J5) for channel A and DM7198F (J6) for channel B from each ECU (EEC) and ground connector pin 7.

S 865-085-J00

**WARNING:** BE CAREFUL. THE INTERLOCK ACTUATOR OF THE REVERSE THRUST LEVER OPERATES IN LESS THAN ONE SECOND. FAILURE TO KEEP PERSONS AND TOOLS CLEAR DURING THE OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (10) Motor each interlock actuator of the reverse thrust lever to the extend position:
- (a) Close the T/R IND C/B
- (b) Open the T/R IND C/B
- (c) Close the ENGX EEC PWR CHX

S 865-194-J00

- (11) Close these C/B's for each engine.
- (a) P180 DC Power Distribution Panel
- 1) 180J5 ENG 1 EEC PWR CH A
  - 2) 180J6 ENG 1 EEC PWR CH B
  - 3) 180F5 ENG 2 EEC PWR CH A
  - 4) 180F6 ENG 2 EEC PWR CH B
  - 5) 180G20 ENG 3 EEC PWR CH A
  - 6) 180G21 ENG 3 EEC PWR CH B
  - 7) 180D20 ENG 4 EEC PWR CH A
  - 8) 180D21 ENG 4 EEC PWR CH B.

S 865-189-J00

- (12) Make sure the EEC Maintenance Power switch on the maintenance overhead panel is in the TEST position.

S 865-170-J00

- (13) Move all four reverse thrust levers at the same time to the full reverse thrust position.

EFFECTIVITY

ALL

76-11-02

J03

Page 518  
Feb 15/98

S 825-171-J00

- (14) Make sure that all four EICAS TRA values stay the same through the full range of motion.

S 825-172-J00

- (15) Make sure that all four EICAS TRA values are  $5.0 \pm 0.8$  at the full reverse thrust position.

S 895-196-J00

- (16) Open the ENG EEC PWR CHX C/B

S 865-173-J00

- (17) Move all four reverse thrust levers to the stow position.

S 865-086-J00

**WARNING:** BE CAREFUL. THE INTERLOCK ACTUATOR OF THE REVERSE THRUST LEVER OPERATES IN LESS THAN ONE SECOND. FAILURE TO KEEP PERSONS AND TOOLS CLEAR DURING THE OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (18) Motor each interlock actuator of the reverse thrust lever to the retracted position.

- (a) Disconnect ground from Pin 7
- (b) Close the T/R IND C/B
- (c) Open the T/R IND C/B.

S 865-190-J00

- (19) Put the EEC Maintenance Power switch on the maintenance overhead panel to the NORM position.

S 865-195-J00

- (20) Open these C/B's for each engine.
- (a) P180 DC Power Distribution Panel
    - 1) 180J5 ENG 1 EEC PWR CH A
    - 2) 180J6 ENG 1 EEC PWR CH B
    - 3) 180F5 ENG 2 EEC PWR CH A
    - 4) 180F6 ENG 2 EEC PWR CH B
    - 5) 180G20 ENG 3 EEC PWR CH A
    - 6) 180G21 ENG 3 EEC PWR CH B
    - 7) 180D20 ENG 4 EEC PWR CH A
    - 8) 180D21 ENG 4 EEC PWR CH B.

S 035-081-J00

- (21) Connect the electrical connectors DM7198E (J5) for channel A and DM7198F (J6) for channel B to each ECU.

S 035-082-J00

- (22) Close these C/B's for each engine:
- (a) 180J5 ENG 1 EEC PWR CH A

EFFECTIVITY

ALL

76-11-02

J03

Page 519  
Feb 15/98

- (b) 180J6 ENG 1 EEC PWR CH B
- (c) 180F5 ENG 2 EEC PWR CH A
- (d) 180F6 ENG 2 EEC PWR CH B
- (e) 180G20 ENG 3 EEC PWR CH A
- (f) 180G21 ENG 3 EEC PWR CH B
- (g) 180D20 ENG 4 EEC PWR CH A
- (h) 180D21 ENG 4 EEC PWR CH B.

S 435-083-J00

- (23) Close all of the T/R IND C/B's.
  - (a) P6 Main Power Distribution Panel
    - 1) 6F12 ENG 1 T/R IND
    - 2) 6E12 ENG 2 T/R IND
    - 3) 6D12 ENG 3 T/R IND
    - 4) 6C12 ENG 4 T/R IND.

S 865-174-J00

- (24) If the API display value at full forward thrust or full reverse thrust is not in the limit, or if the thrust lever knob alignment is not in the specified limit; then adjust the thrust lever assemblies (AMM 76-11-01/501) and the resolvers (AMM 76-11-02/501) again.

S 865-089-J00

- (25) Make sure that all of the resolver body clamps are tight.

S 865-090-J00

- (26) Make sure that all of the adjustment nuts on the connecting rods are tight.

S 415-088-J00

- (27) Install the passenger cabin ceiling panel (AMM 25-22-01/401).

S 415-176-J00

- (28) Install the side panels of the control stand (AMM 76-11-03/201).

S 865-177-J00

- (29) Do the activation procedure of the CAPT and F/O seats (AMM 76-11-03/201).

S 445-178-J00

- (30) Do the activation procedure of the thrust reverser system (AMM 78-31-00/201).

EFFECTIVITY

ALL

76-11-02

J03

Page 520  
Feb 15/98

S 865-193-J00  
(31) Remove the electrical power (24-22-00/201).

EFFECTIVITY	
	ALL

76-11-02

J03

Page 521  
Feb 15/98

CONTROL STAND - MAINTENANCE PRACTICES

1. General

A. This procedure has many tasks which you can use individually or together. These tasks supply the electrical isolation of and access for the removal, installation, and adjustment of the control stand components that follow:

- (1) Thrust lever assemblies and switches
- (2) Autothrottle servomotor generator, gearbox, and brake assembly
- (3) Thrust lever position resolvers
- (4) Reverse thrust lever interlock actuators
- (5) Engine start module
- (6) STAB TRIM indicators
- (7) Microswitch pack assembly
- (8) Speed brake lever assembly and switches
- (9) Flap lever assembly and flap lever rotational variable displacement transformer (RVDT)
- (10) Replacement of the light for the fuel control switch.

B. These tasks included can possibly give the instructions for the deactivation of the flight control or engine control systems to which each of these components is connected. Thus, the warnings that follow are given to identify the related safety problems to complete the tasks.

- (1) The parking brake is released when you push the brake pedals to the stops. If the parking brake is accidentally released when there are no chocks on the wheels, injury to persons or damage to equipment can occur.
- (2) Do the deactivation of the flight compartment seats. If the deactivation procedure is not done, the accidental operation of the flight compartment seat can cause injury to persons or damage to equipment.
- (3) The thrust reverser is operated when you set the reverse thrust lever to the reverse thrust position. Do the deactivation procedure of the thrust reverser for ground maintenance (AMM 78-31-00/201) during the removal, installation, or adjustment of the components that follow:
  - Thrust lever assembly
  - Thrust lever switches
  - Autothrottle servomotor
  - Brake assembly
  - Microswitch pack assembly
  - Interlock actuators of the reverse thrust lever.If the deactivation procedure is not done, the accidental operation of the thrust reverser can cause injury to persons or damage to equipment.

EFFECTIVITY

ALL

76-11-03

J02

Page 201  
Jun 10/97

- (4) Make sure to open the circuit breakers for the applicable engine ignition before you open the circuit breakers, ENG FUEL CONT VALVE, or put the fuel control toggle switches to the RUN position. If you do not open the circuit breakers, it can cause the igniter plugs to automatically fire if or when the airplane is in one of the conditions that follow: flaps are out zero detent, nacelle anti-ice is ON, con ignition switch is set to ON, or engine start switch is pulled to ON. With fuel, which is not burned, in the combustion chamber, an internal engine or tailpipe fire can occur and cause injury to persons or damage to the engine.
- (5) Do the deactivation procedure of the autothrottle servomotor/brake assembly. The autothrottle servomotor/brake assembly can move the thrust levers from the forward idle position to the full forward thrust position in five seconds. If the deactivation procedure is not done, the accidental operation of the autothrottle servomotor/brake assembly can occur and cause injury to persons or damage to equipment.
- (6) Do the deactivation procedure for the interlock actuators of the reverse thrust lever. The interlock actuator operates in less than one second. If the deactivation procedure is not done, the accidental operation of the interlock actuator can occur and cause injury to persons or damage to equipment.
- (7) Do the deactivation procedure for the spoiler/speedbrake control system (AMM 27-62-00/201). If the deactivation procedure is not done, the accidental spoiler movement can cause injury to persons.
- (8) Do the deactivation procedure of the flaps for ground maintenance (AMM 27-51-00/201) and (AMM 27-81-00/201). If the deactivation procedure is not done, the accidental flap operation can cause injury to persons or damage to equipment.

TASK 76-11-03-982-144-J00

2. Install the Chocks to the Airplane Wheels

A. General

- (1) You must do this task before the removal, installation, or adjustment of a control stand component.

B. Procedure

S 862-145-J00

**WARNING:** MAKE SURE THE CHOCKS ARE INSTALLED ADJACENT TO THE AIRPLANE WHEELS. THE PARKING BRAKE IS RELEASED WHEN YOU PUSH THE BRAKE PEDALS TO THE STOPS WHICH CAN CAUSE THE AIRPLANE TO MOVE IF THE CHOCKS ARE NOT INSTALLED. IF THE CHOCKS ARE NOT INSTALLED, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Make sure the chocks are installed adjacent to the airplane wheels.

EFFECTIVITY

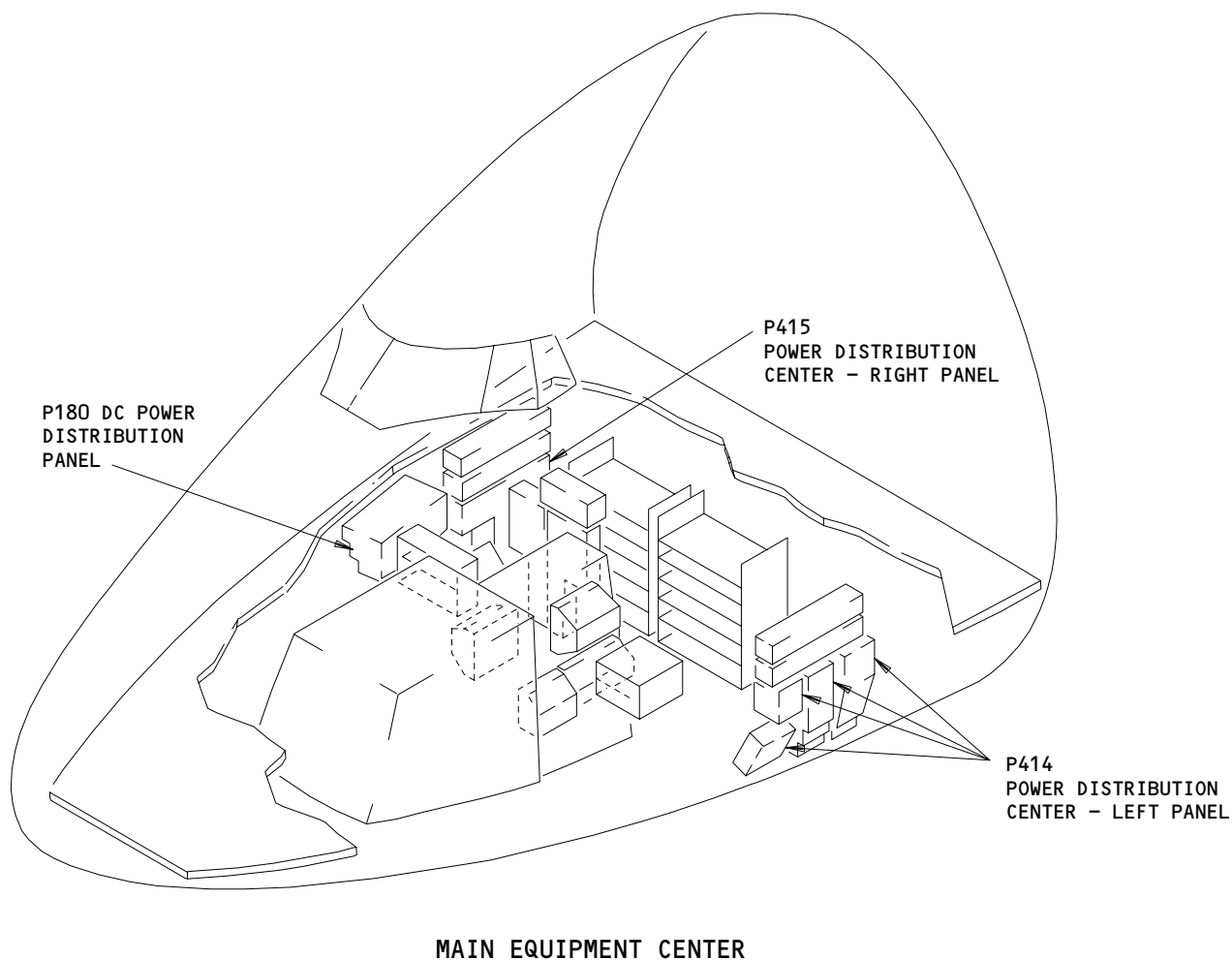
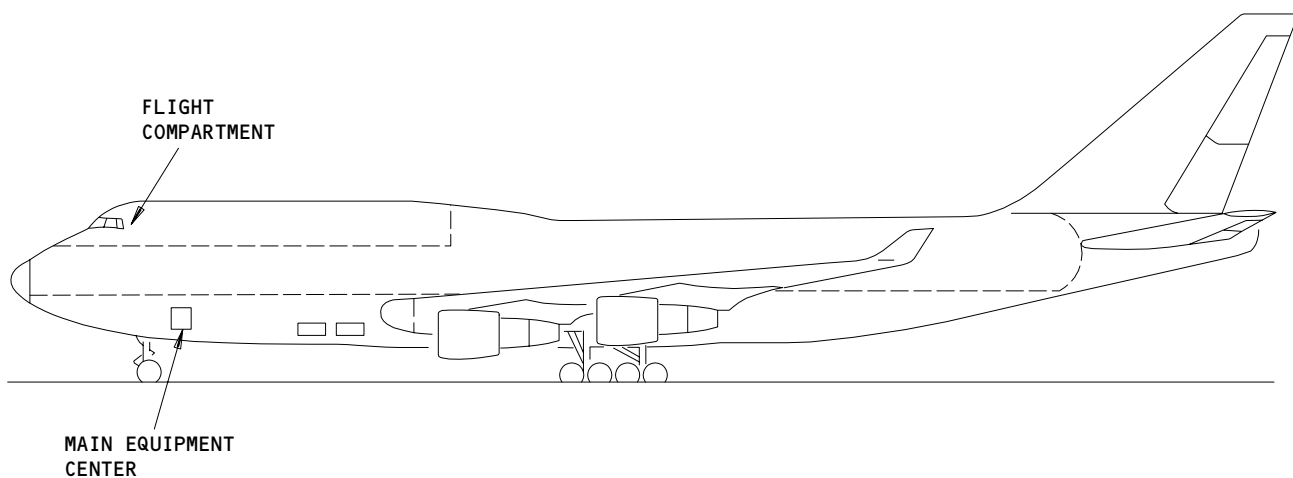
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76-11-03

J02

Page 202  
Jun 10/97





Panel Locations  
Figure 201 (Sheet 1)

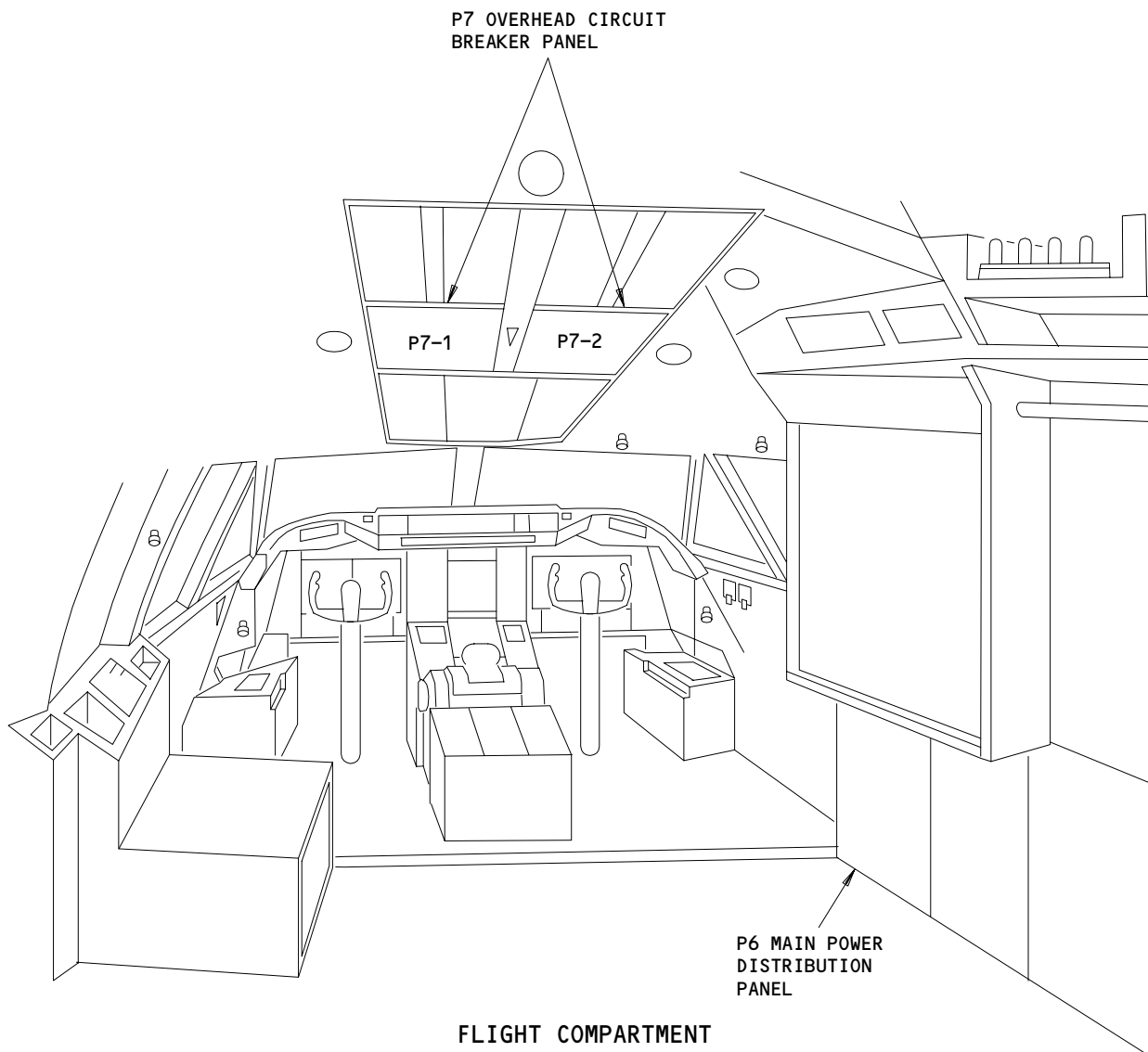
EFFECTIVITY

ALL
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76-11-03

J01

Page 203  
Feb 10/94



Panel Locations  
Figure 201 (Sheet 2)

EFFECTIVITY

ALL

76-11-03

J01

Page 204  
Feb 10/92

TASK 76-11-03-862-147-J00

3. Deactivation Procedure for the Captain and First Officer Seats (Fig. 201)

A. General

- (1) You must do this task before the removal, installation, or adjustment of a control stand component.

B. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

C. Procedure

S 862-148-J00

**WARNING:** DO THE DEACTIVATION PROCEDURE OF THE FLIGHT COMPARTMENT SEAT. IF YOU DO NOT DO THE DEACTIVATION PROCEDURE, THE ACCIDENTAL OPERATION OF THE FLIGHT COMPARTMENT SEAT CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Open these circuit breakers that follow and attach the DO-NOT-CLOSE tags:
  - (a) P414 Power Distribution Center - Left
    - 1) 414D8 CAPT PWR SEAT
  - (b) P415 Power Distribution Center - Right
    - 1) 415H32 F/O PWR SEAT

TASK 76-11-03-862-149-J00

4. Remove the Electrical Power from the Thrust Lever Switches (Fig. 201)

A. General

- (1) This task removes the electrical power from the control switches for the thrust reverser in the thrust lever assemblies.
- (2) You must do this task before the removal, installation, or adjustment of the thrust lever assemblies and the switches in the thrust lever assemblies.
- (3) You must do this task before you do the maintenance on the autothrottle servomotor and brake assembly, the speed brake lever assembly, and the flap lever assembly. This task will prevent injury or damage caused by the accidental operation of the reverse thrust lever.

B. References

- (1) AMM 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

D. Procedure

EFFECTIVITY

ALL

76-11-03

J02

Page 205  
Feb 10/92

S 042-150-J00

**WARNING:** DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Complete this task: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201)

S 862-151-J00

- (2) To remove the electrical power from the control switches, open these circuit breakers and attach the DO-NOT-CLOSE tags:
- (a) P6 Main Power Distribution Panel
- 1) 6F13 T/R CONT ENG 1
  - 2) 6E13 T/R CONT ENG 2
  - 3) 6D13 T/R CONT ENG 3
  - 4) 6C13 T/R CONT ENG 4

TASK 76-11-03-002-152-J00

5. Remove the Thrust Lever Assembly Switch Covers (Fig. 202)

A. General

- (1) This task gives access to the control switches for the thrust reverser and the autothrottle disconnect and go-around switches for the removal, installation, and adjustment.

B. References

- (1) IPC 76-11-01 Fig. 2

C. Access

- (1) Location Zone

221 Control Cabin, LH  
222 Control Cabin, RH

D. Procedure

S 032-153-J00

- (1) Remove the three screws from the switch cover for the thrust lever assembly.

S 022-154-J00

- (2) Remove the switch cover.

S 552-155-J00

- (3) Keep the switch cover.

TASK 76-11-03-002-156-J00

6. Remove the Control Stand Thrust Lever Cover (Fig. 203)

A. General

- (1) This task gives access to the thrust lever assemblies for the removal, installation, and adjustment.

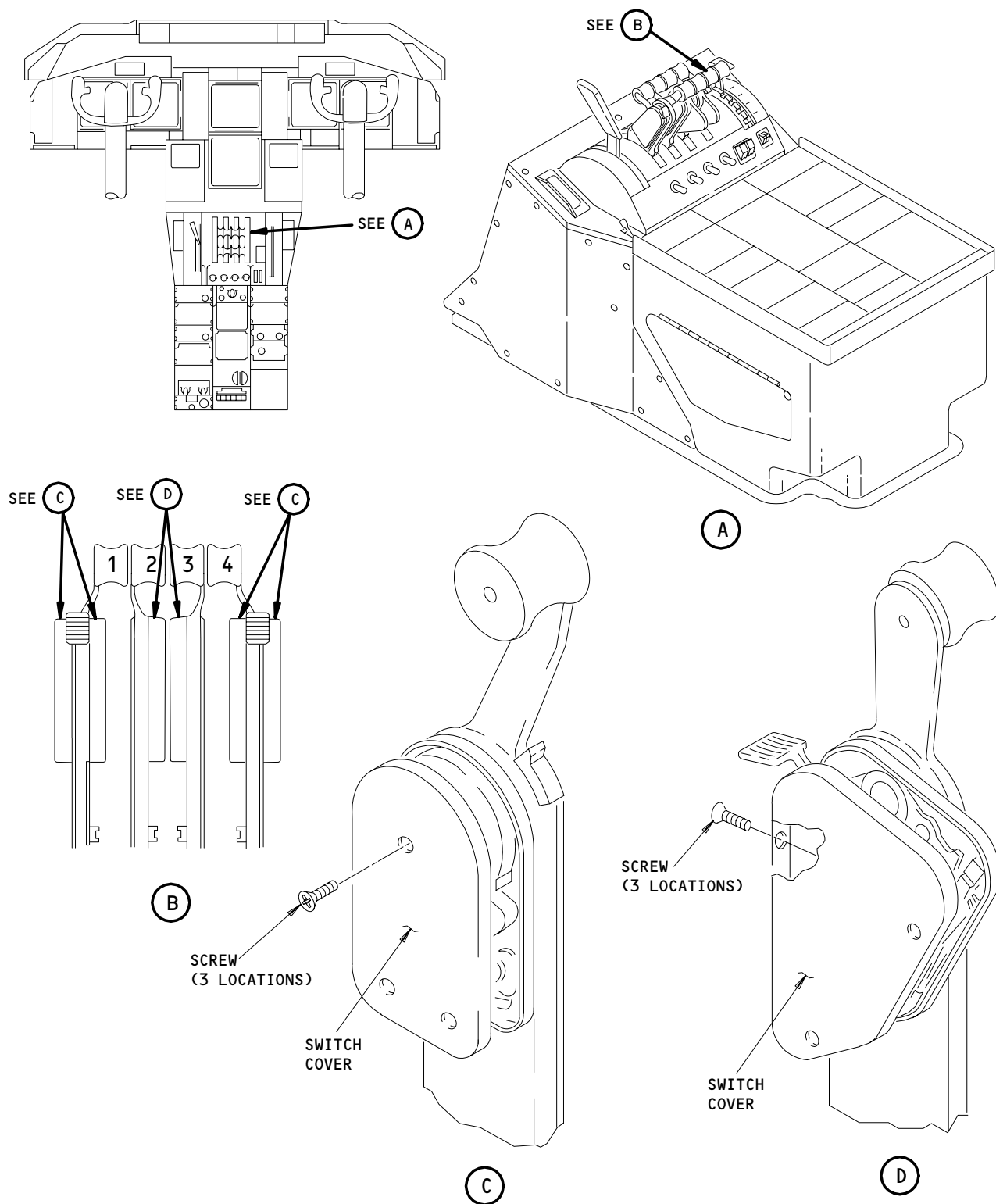
EFFECTIVITY

ALL

**76-11-03**

J02

Page 206  
Feb 10/92



Control Stand - Thrust Lever Assembly Switch Covers  
Figure 202

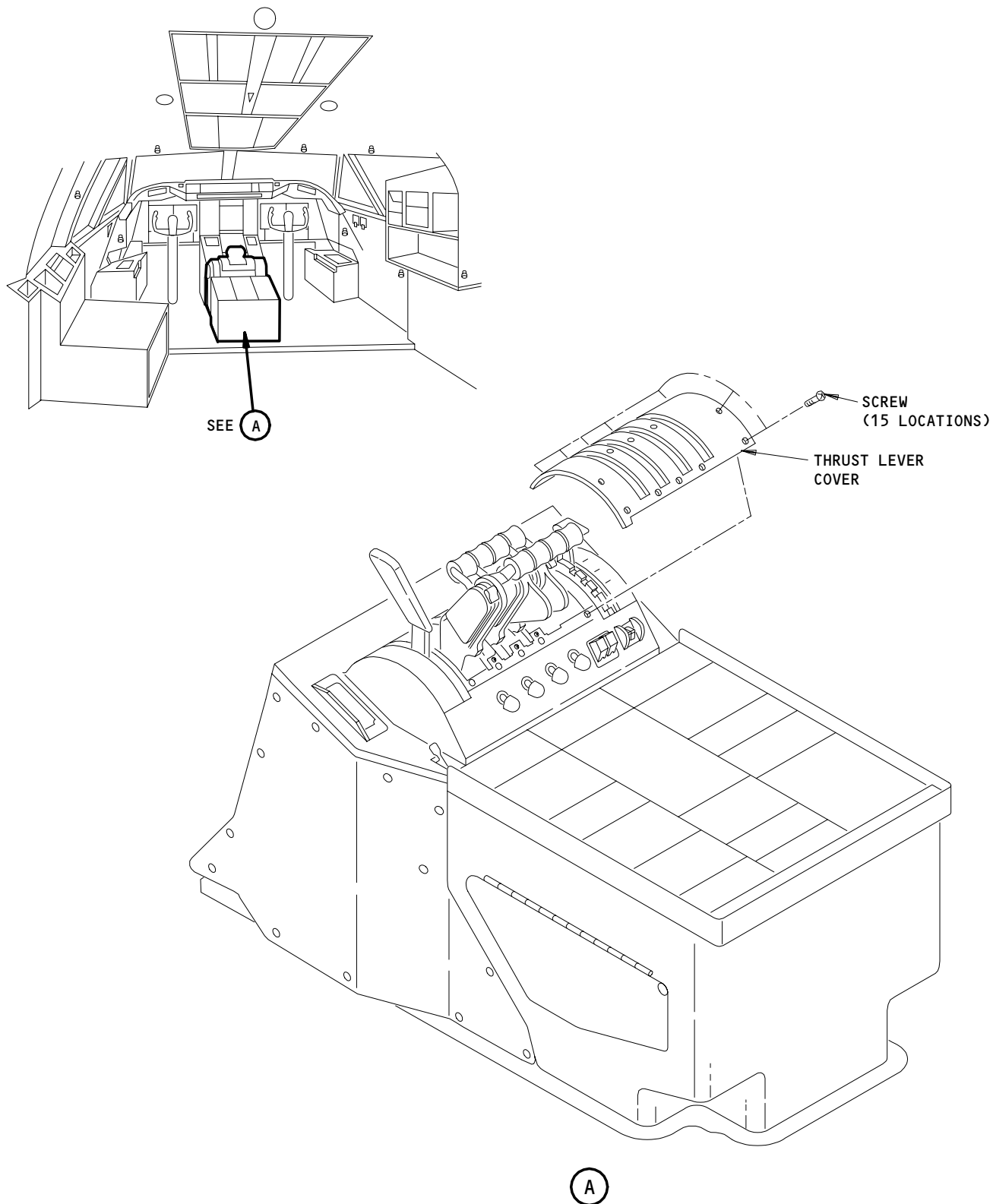
EFFECTIVITY

ALL

76-11-03

J02

Page 207  
Feb 10/92



Control Stand - Thrust Lever Cover Installation  
Figure 203

EFFECTIVITY

ALL

76-11-03

J02

Page 208  
Feb 10/92

B. References

- (1) IPC 76-11-03

C. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

D. Procedure

S 022-157-J00

- (1) Remove the thrust lever cover on the control stand.
  - (a) Remove 15 screws from the thrust lever cover.
  - (b) Put the thrust levers at the full forward thrust position.
  - (c) Remove the thrust lever cover.
  - (d) Keep the thrust lever cover.

TASK 76-11-03-042-158-J00

7. Deactivation Procedure for the Autothrottle Servomotor (Fig. 201)

A. General

- (1) This task removes the electrical power from the autothrottle servomotor.
- (2) You must do this task before the removal, installation, or adjustment of the components that follow: thrust lever assemblies, the autothrottle servomotor or brake assembly, the interlock actuators of the reverse thrust lever, and the microswitch pack assembly.

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

S 862-159-J00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY. THE AUTOTHROTTLE SERVOMETER/BRAKE ASSEMBLY CAN MOVE THE THRUST LEVERS FROM THE FORWARD IDLE POSITION TO THE FULL FORWARD THRUST POSITION IN FIVE SECONDS. IF YOU DO NOT DO THE DEACTIVATION PROCEDURE, THE ACCIDENTAL OPERATION OF THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN OCCUR AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
  - (a) P7 Overhead Circuit Breaker Panel
    - 1) 7C4 FMCS A/T SERVO L
    - 2) 7C25 FMCS A/T SERVO EXC
    - 3) 7C26 FMCS A/T SERVO R

EFFECTIVITY

ALL

76-11-03

J02

Page 209  
Feb 10/92

TASK 76-11-03-002-160-J00

8. Remove the Control Stand Side Panels (Fig. 204)

A. General

- (1) This task gives access to the autothrottle servomotor and brake assembly, the interlock actuators for the reverse thrust lever, the connecting rods for the thrust lever assembly-brake assembly, the reverse thrust lever switch, the flap lever RVDT, the locking mechanism for the speed brake, the speed brake assembly, the flap lever assembly, and the electrical cables for the control stand.

B. References

- (1) IPC 76-11-03

C. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

D. Procedure

S 032-161-J00

- (1) Disengage the 13 quick-release fasteners which hold each side panel to the control stand.

S 022-162-J00

- (2) Remove the side panel on the control stand.

S 552-163-J00

- (3) Keep the side panel.

TASK 76-11-03-862-164-J00

9. Remove the Electrical Power from the Thrust Command Resolvers (Fig. 201)

A. General

- (1) This task removes the electrical power from the electronic engine control and the thrust command resolvers.
- (2) You must do this task before to the removal, installation, or adjustment of the position resolvers for the thrust lever.

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

S 862-165-J00

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
  - (a) P180 DC Power Distribution Panel
    - 1) 180D20 ENG 4 EEC PWR CH A
    - 2) 180D21 ENG 4 EEC PWR CH B
    - 3) 180F5 ENG 2 EEC PWR CH A
    - 4) 180F6 ENG 2 EEC PWR CH B
    - 5) 180G20 ENG 3 EEC PWR CH A

EFFECTIVITY

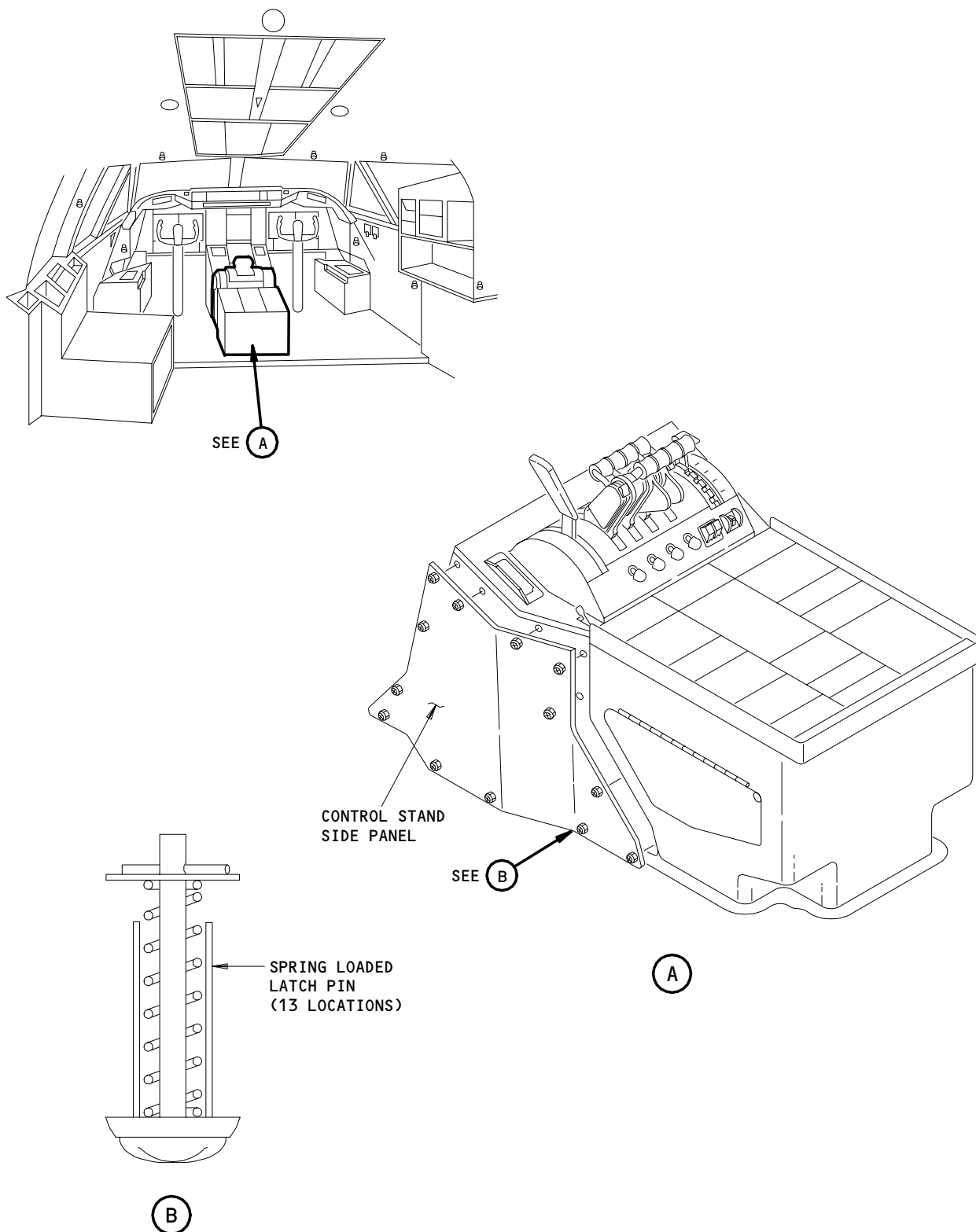
ALL

76-11-03

J02

Page 210  
Feb 10/92





Control Stand - Side Panel Installation  
Figure 204

EFFECTIVITY

ALL

76-11-03

J02

Page 211  
Feb 10/92

- 6) 180G21 ENG 3 EEC PWR CH B
- 7) 180J5 ENG 1 EEC PWR CH A
- 8) 180J6 ENG 1 EEC PWR CH B

TASK 76-11-03-862-166-J00

10. Remove the Electrical Power from the Reverse Thrust Lever Interlock Actuators  
(Fig. 201)

A. General

- (1) This task removes the electrical power from the interlock actuator for the reverse thrust lever.
- (2) You must do this task before the removal or installation of the interlock actuator for the reverse thrust lever.
- (3) You must do this task before you do the maintenance on the autothrottle servomotor and brake assembly, the speed brake lever assembly, and the flap lever assembly. Do this task to prevent the accidental operation of the reverse thrust lever which can cause injury to persons or damage to equipment.

B. Access

- (1) Location Zone
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

C. Procedure

S 862-167-J00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE INTERLOCK ACTUATORS OF THE REVERSE THRUST LEVER. THE INTERLOCK ACTUATORS OPERATE IN LESS THAN ONE SECOND. IF THE DEACTIVATION PROCEDURE IS NOT DONE, THE ACCIDENTAL OPERATION OF THE INTERLOCK ACTUATOR CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
  - (a) P6 Main Power Distribution Panel
    - 1) 6F12 T/R IND ENG 1
    - 2) 6E12 T/R IND ENG 2
    - 3) 6D12 T/R IND ENG 3
    - 4) 6C12 T/R IND ENG 4

TASK 76-11-03-862-168-J00

11. Remove the Electrical Power from the Fuel Control Toggle Switches (Fig. 201)

A. General

- (1) This task removes the electrical power from the fuel control toggle switches in the engine start module.
- (2) You must do this task before the removal or installation of the engine start module.

EFFECTIVITY

ALL

76-11-03

J02

Page 212  
Feb 10/92

B. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

C. Procedure

S 862-169-J00

**WARNING:** MAKE SURE YOU OPEN THE CIRCUIT BREAKERS FOR THE ENGINE IGNITION BEFORE YOU OPEN THE CIRCUIT BREAKERS FOR THE FUEL CONTROL VALVE. THE IGNITER PLUGS WILL AUTOMATICALLY FIRE IF YOU ARE OUT OF ZERO DETENT, NACELLE ANTI-ICE IS ON, CON IGNITION SWITCH IS SET TO "ON", OR ENGINE START SWITCH IS PULLED TO "ON". IF THE COMBUSTION CHAMBER HAS FUEL IN IT, AN INTERNAL ENGINE OR A TAILPIPE FIRE CAN OCCUR. THE FIRE CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE ENGINE.

(1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F1 IGN 1 ENG 1
- 2) 6F2 IGN 1 ENG 2
- 3) 6F3 IGN 1 ENG 3
- 4) 6F4 IGN 1 ENG 4
- 5) 6G1 FUEL SHUTOFF VALVE ENG 1
- 6) 6G2 FUEL SHUTOFF VALVE ENG 2
- 7) 6G3 FUEL SHUTOFF VALVE ENG 3
- 8) 6G4 FUEL SHUTOFF VALVE ENG 4
- 9) 6G19 STBY IGN ENG 1
- 10) 6G20 STBY IGN ENG 2
- 11) 6G21 STBY IGN ENG 3
- 12) 6G22 STBY IGN ENG 4
- 13) 6K19 IGN 2 ENG 1
- 14) 6K20 IGN 2 ENG 2
- 15) 6K21 IGN 2 ENG 3
- 16) 6K22 IGN 2 ENG 4
- 17) 6L10 FUEL CONT VALVE ENG 1
- 18) 6L11 FUEL CONT VALVE ENG 2
- 19) 6L12 FUEL CONT VALVE ENG 3
- 20) 6L13 FUEL CONT VALVE ENG 4

TASK 76-11-03-862-170-J00

12. Remove the Electrical Power from the STAB TRIM Switches and Indicators  
(Fig. 201)

A. General

- (1) This task removes the electrical power from the STAB TRIM control switches in the engine start module and the STAB TRIM indicators on the side panel brackets of the control stand.

EFFECTIVITY

ALL

**76-11-03**

J02

Page 213  
Feb 10/92

- (2) You must do this task before the removal or installation of the engine start module or the STAB TRIM indicators on the side panel bracket assemblies.

B. Access

(1) Location Zone

- 221 Control Cabin, LH  
222 Control Cabin, RH

C. Procedure

S 862-171-J00

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6K23 L STAB TRIM POS IND  
2) 6K24 R STAB TRIM POS IND

(b) P7 Overhead Circuit Breaker Panel

- 1) 7E7 STAB TRIM L S/O VALVE  
2) 7E20 STAB TRIM R S/O VALVE  
3) 7E23 ALT STAB TRIM CONT

TASK 76-11-03-002-172-J00

13. Remove the Control Stand Thrust Lever Rails (Fig. 205)

A. General

- (1) This task gives access to the thrust lever assemblies for the removal, installation, and adjustment.

B. References

- (1) IPC 76-11-03 Fig. 4

C. Access

(1) Location Zone

- 221 Control Cabin, LH  
222 Control Cabin, RH

D. Procedure

S 022-173-J00

- (1) Remove the thrust lever rails.  
(a) Remove the two screws from each thrust lever rail.  
(b) Remove the thrust lever rail.  
(c) Keep the thrust lever rail.

TASK 76-11-03-002-174-J00

14. Remove the Engine Start Module (Fig. 206 thru 207)

A. General

- (1) This task gives access to the fuel control toggle switches and the stabilizer trim switches in the engine start module.

B. References

- (1) IPC 76-11-03 Fig. 3

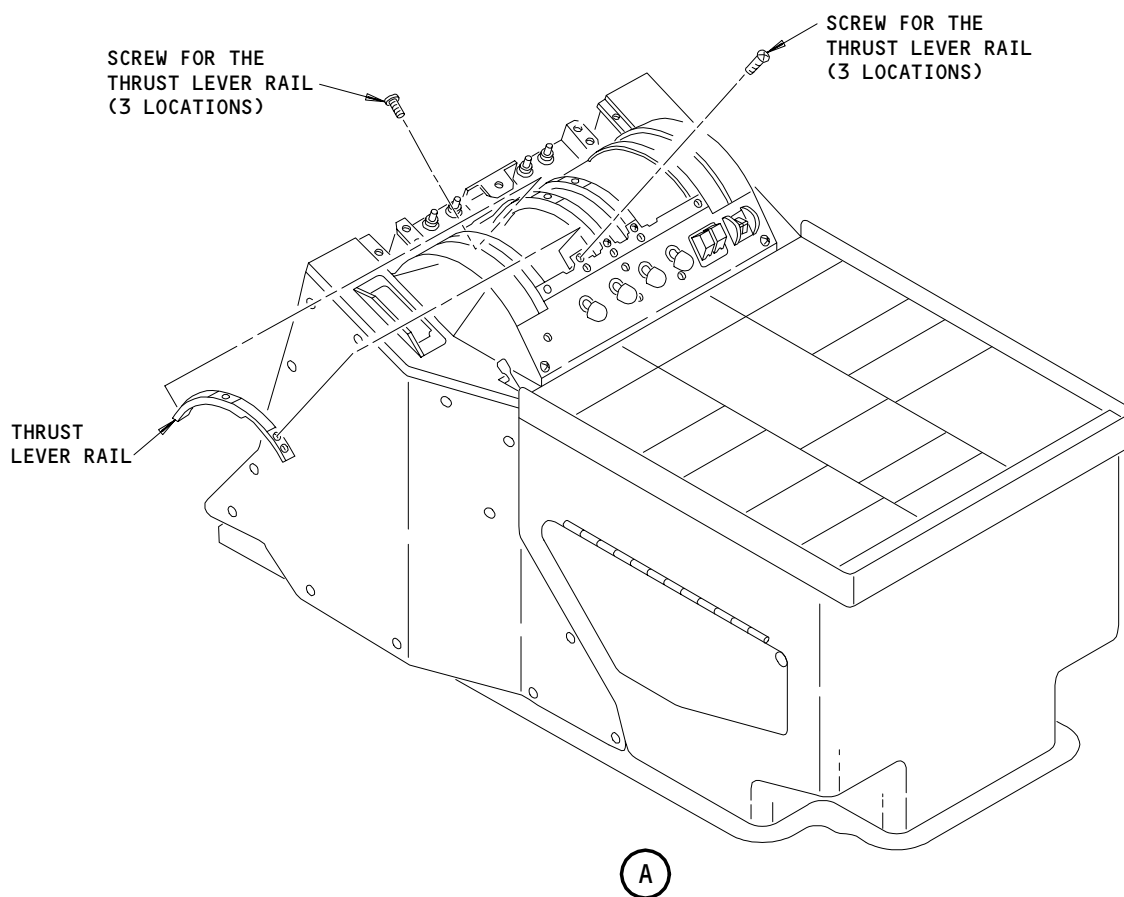
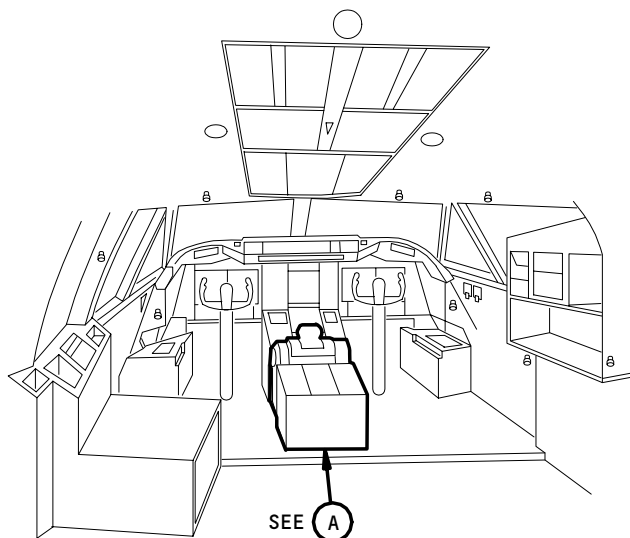
EFFECTIVITY

ALL

76-11-03

J02

Page 214  
Jun 10/92



Control Stand - Thrust Lever Rails Installation  
Figure 205

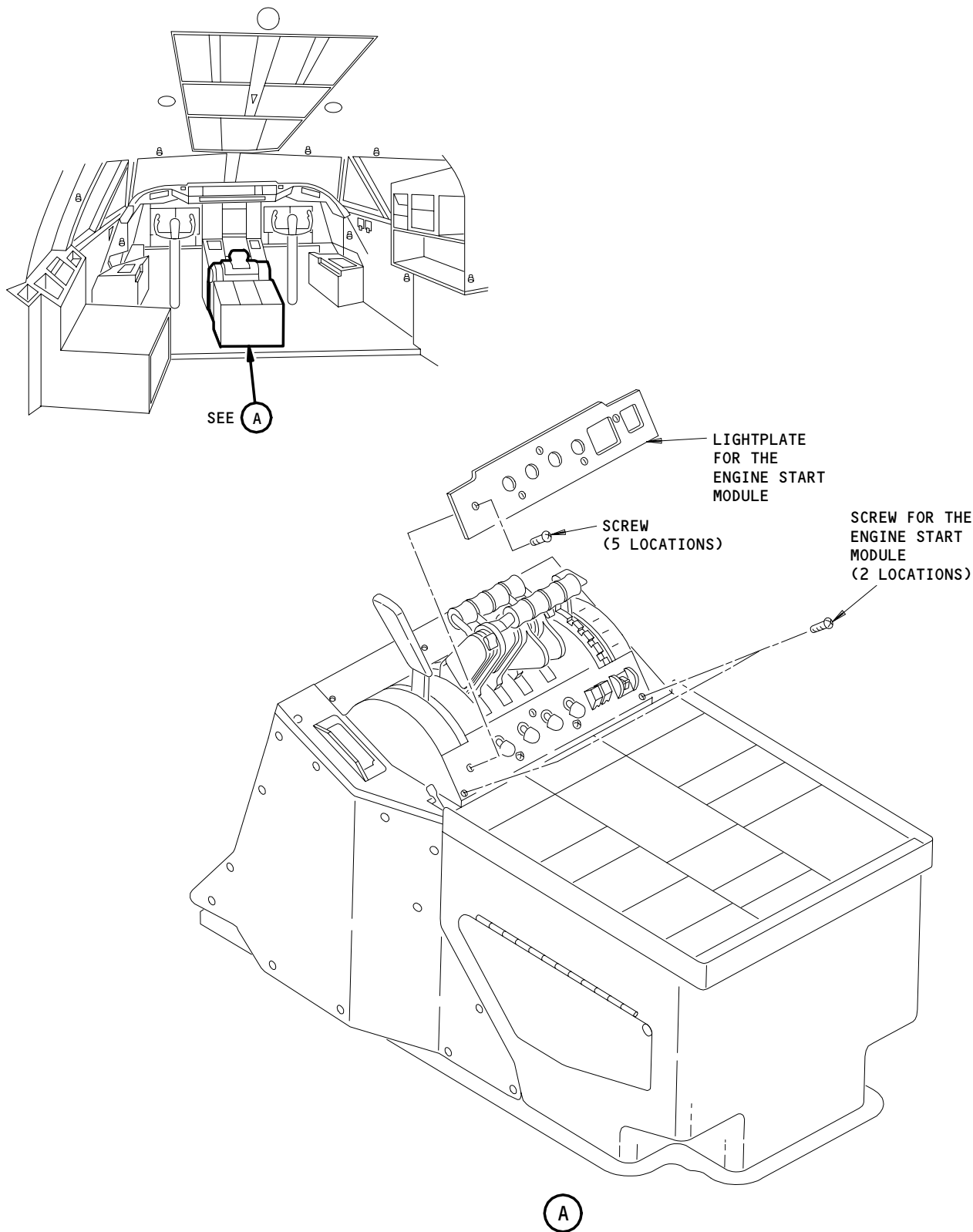
EFFECTIVITY

ALL

76-11-03

J02

Page 215  
Feb 10/92



(A)  
Control Stand - Engine Start Module Installation  
Figure 206

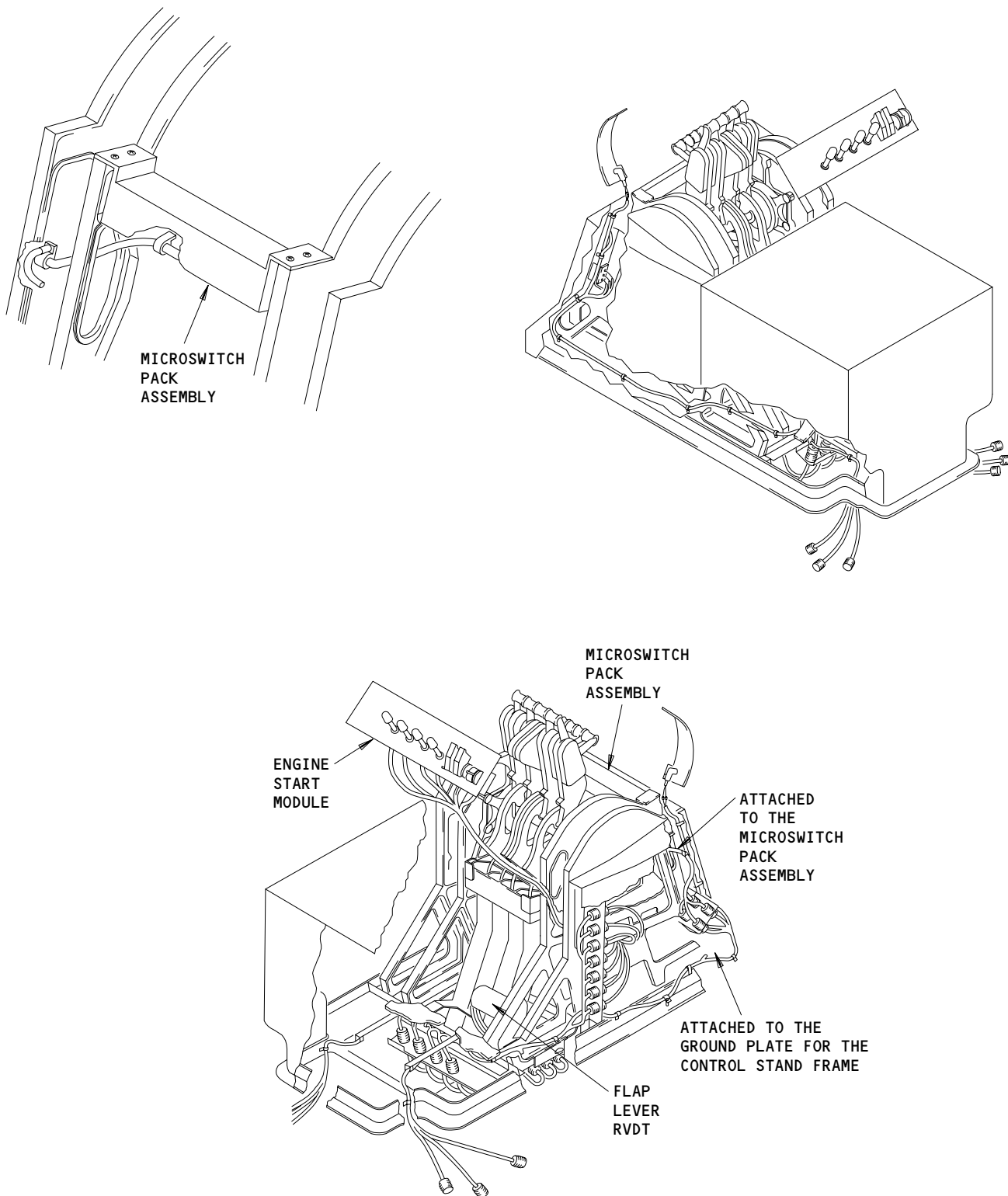
EFFECTIVITY

ALL

76-11-03

J02

Page 216  
Feb 10/92



Control Stand - Electrical Cable Installation  
Figure 207

EFFECTIVITY

ALL

76-11-03

J02

Page 217  
Feb 10/92

C. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

D. Procedure

S 862-278-J00

- (1) Do the procedure to remove the electrical power from the STAB TRIM switches and from the indicators.

S 012-175-J00

- (2) Remove the lightplate for the engine start module.
- (a) Remove the five screws from the lightplate.
  - (b) Remove the four fuel control switch knobs.
  - (c) Disconnect the lightplate wire from the engine start module.
  - (d) Remove the lightplate.
  - (e) Keep the lightplate.

S 022-176-J00

**CAUTION:** BE VERY CAREFUL DURING THE REMOVAL AND WHEN YOU HOLD THE ENGINE START MODULE. DAMAGE TO THE LIGHTPLATES, SWITCHES, NUTPLATES, WIRE CONNECTIONS OR FINISH CAN OCCUR.

- (3) Remove the engine start module.
- (a) Disconnect the electrical connectors and install the protection caps on the electrical connector and the mating receptacle as follows:
    - 1) P1
    - 2) P2
    - 3) P3
    - 4) P4
    - 5) P5
    - 6) P6
    - 7) P7
  - (b) Make a mark at the locations where the cable clamps are installed on the wires for the engine start module.
  - (c) Remove the cable clamps from the control stand frame.

**NOTE:** To move the engine start module, it is necessary to remove the cable clamps to loosen the wire.

- (d) Remove the two screws from the engine start module.
- (e) Remove the engine start module.
- (f) Keep the engine start module.

TASK 76-11-03-002-177-J00

15. Remove the Microswitch Pack Cover (Fig. 205)

A. General

- (1) This task gives access to the microswitch pack assembly.

EFFECTIVITY

ALL

**76-11-03**

J02

Page 218  
Feb 10/92



B. References

- (1) IPC 76-11-03

C. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

D. Procedure

S 032-178-J00

- (1) Remove the three screws from the microswitch pack cover.

S 022-179-J00

- (2) Remove the microswitch pack cover.

S 552-180-J00

- (3) Keep the microswitch pack cover.

TASK 76-11-03-002-181-J00

16. Remove the Microswitch Pack Assembly (Fig. 208)

A. General

- (1) This task gives access to the thrust reverser and autobrake/speed brake reduction switches installed in the microswitch pack assembly.
- (2) Before you do this task make sure that all the deactivation tasks for the applicable systems are done. Read the instructions at the beginning of this maintenance practices section.

B. References

- (1) PASSENGER AIRPLANES;  
AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (2) FREIGHTERS;  
AMM 25-59-01/401, Main Deck Cargo Compartment Lining Panels
- (3) IPC 76-11-03

C. Access

- (1) PASSENGER AIRPLANES;

Location Zone

211	Main Passenger Cabin - Nose to First Door, LH
212	Main Passenger Cabin - Nose to First Door, RH
221	Control Cabin LH
222	Control Cabin RH

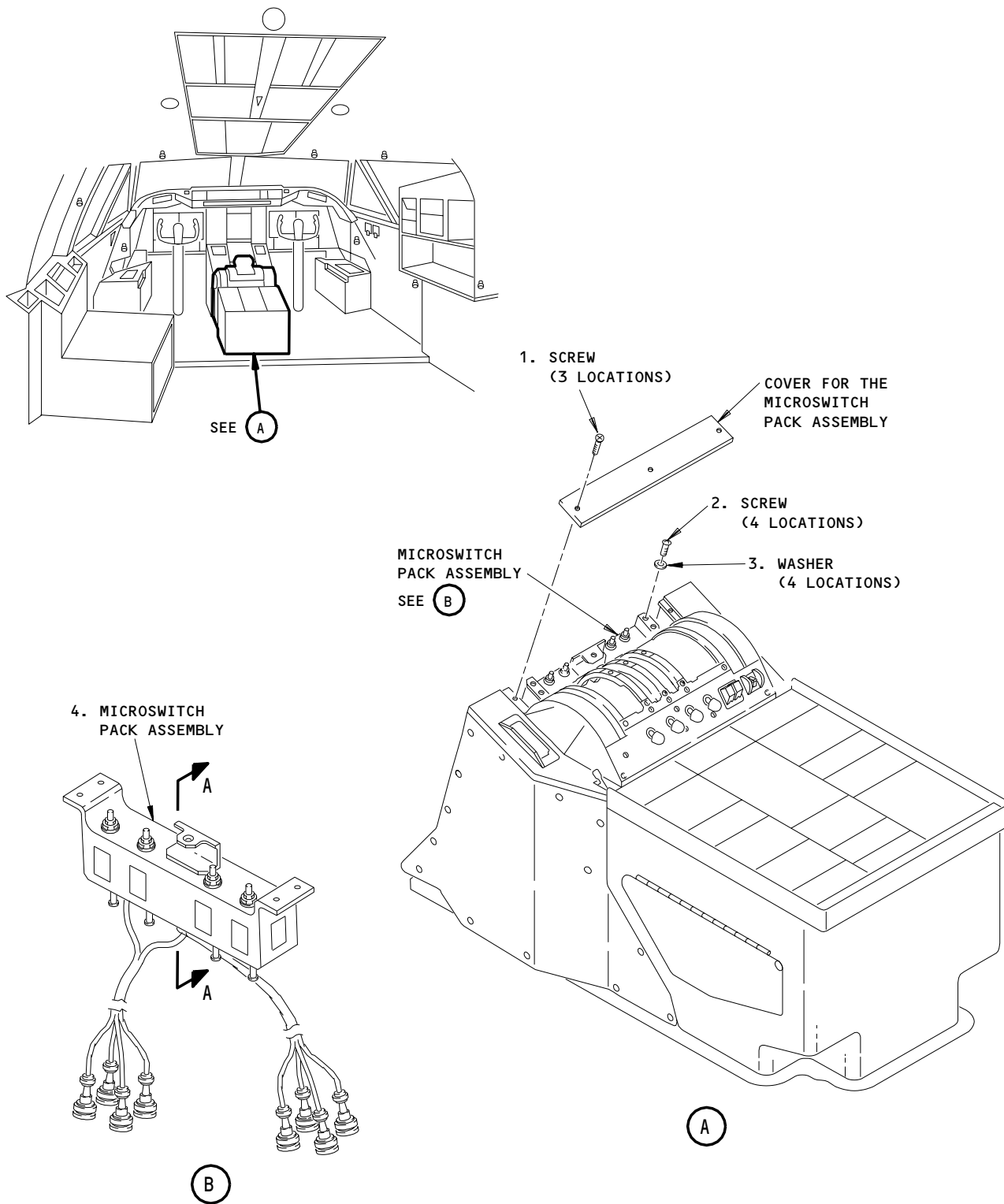
EFFECTIVITY

ALL

76-11-03

J02

Page 219  
Jun 10/97



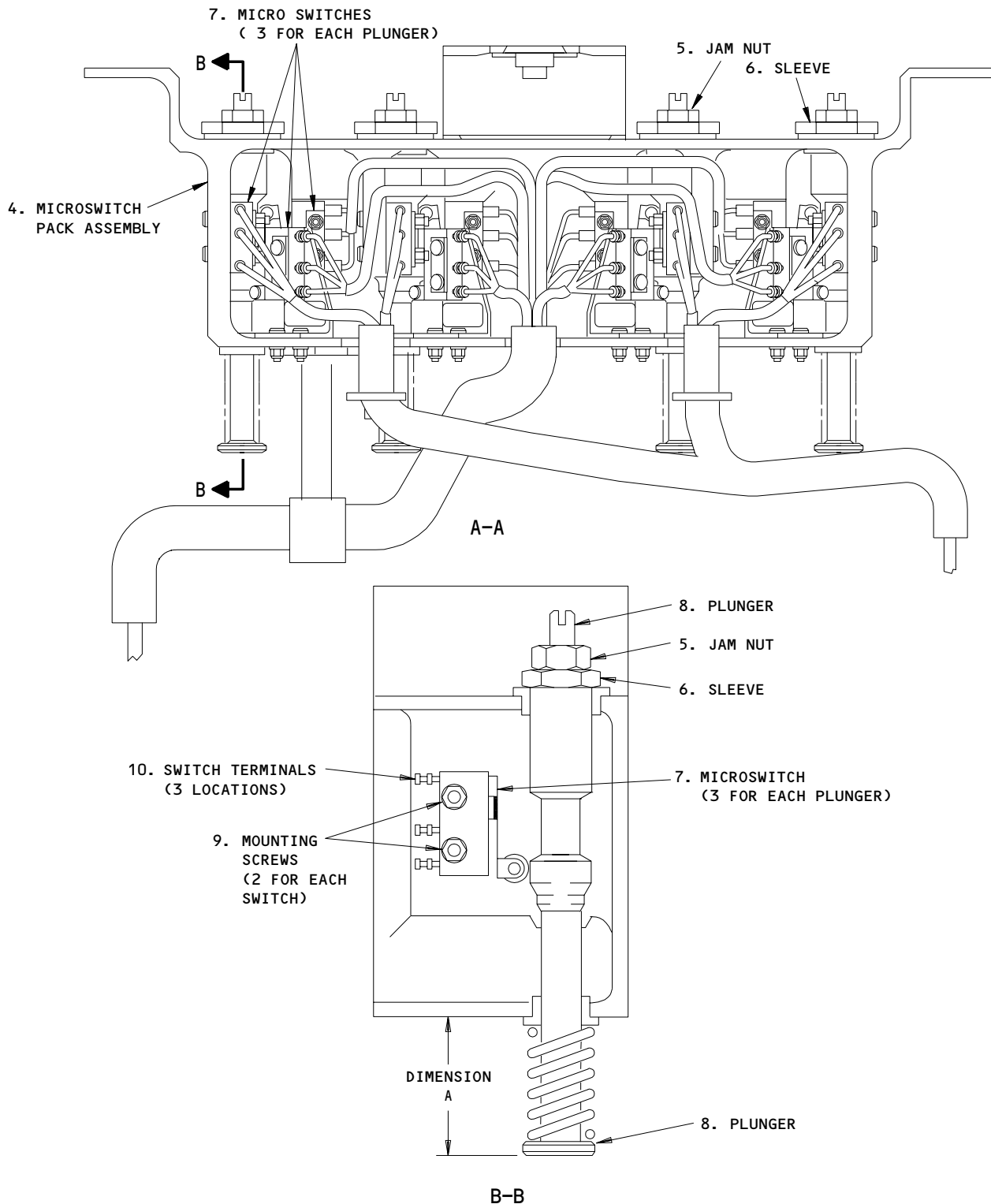
Control Stand - Microswitch Installation  
Figure 208 (Sheet 1)

EFFECTIVITY  
AIRPLANES WITH THRUST REVERSER  
SYNC LOCKS

76-11-03

J02

Page 220  
Jun 10/97



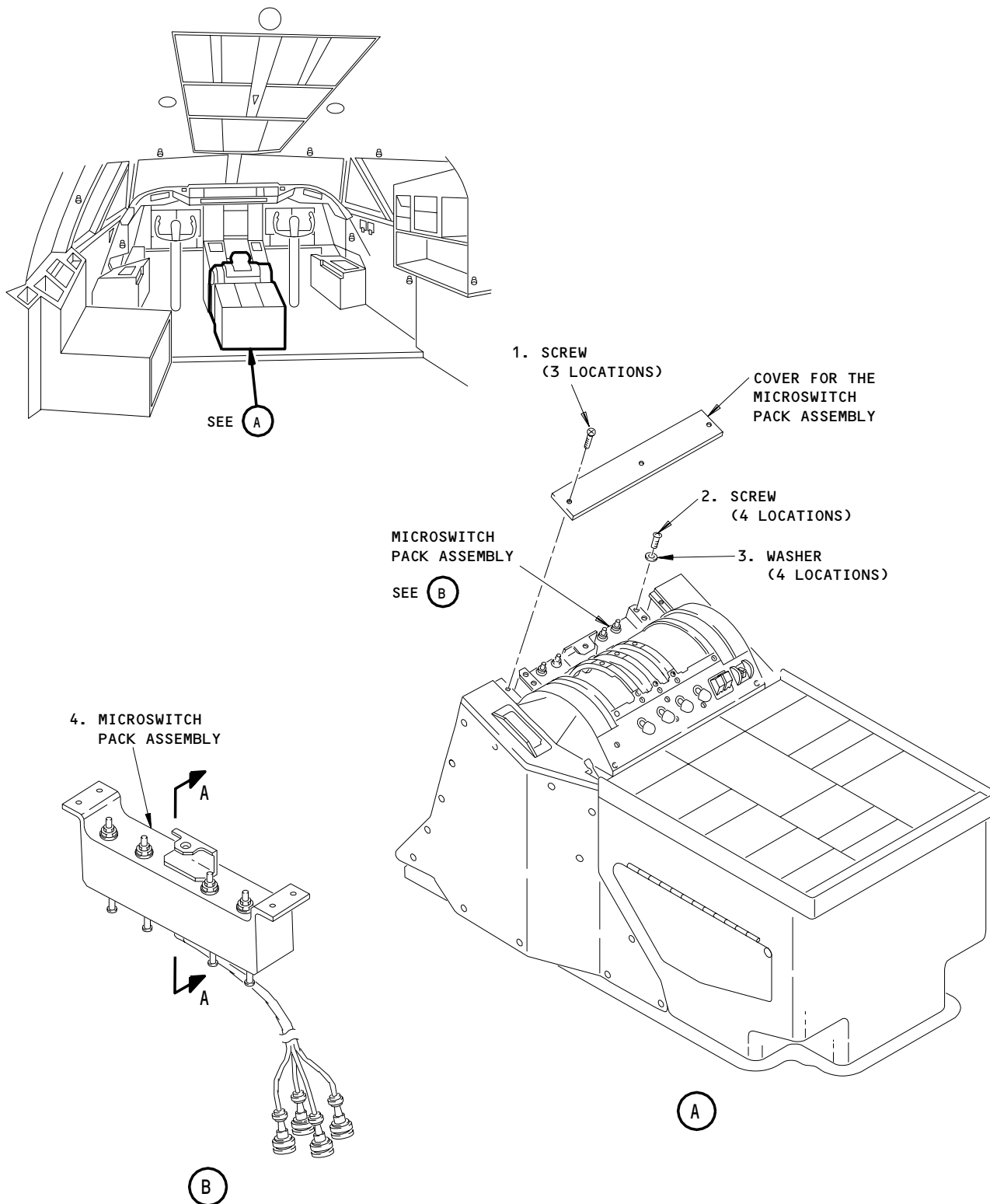
Control Stand - Microswitch Installation  
Figure 208 (Sheet 2)

EFFECTIVITY  
AIRPLANES WITH THRUST REVRESER  
SYNC LOCKS

76-11-03

J02

Page 221  
Jun 10/97



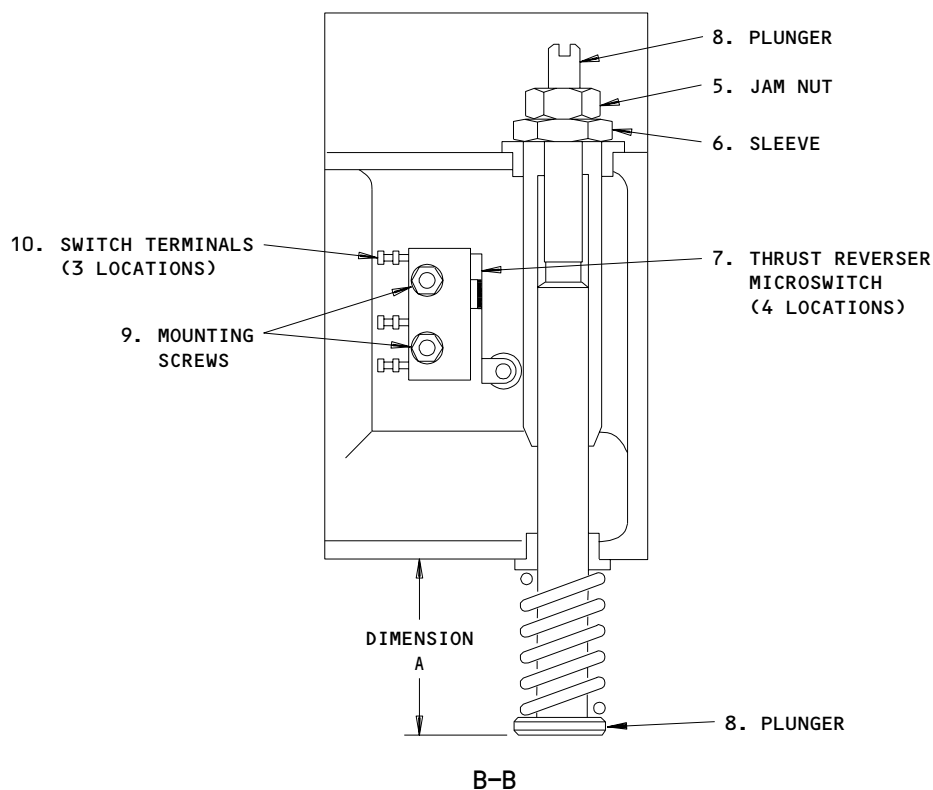
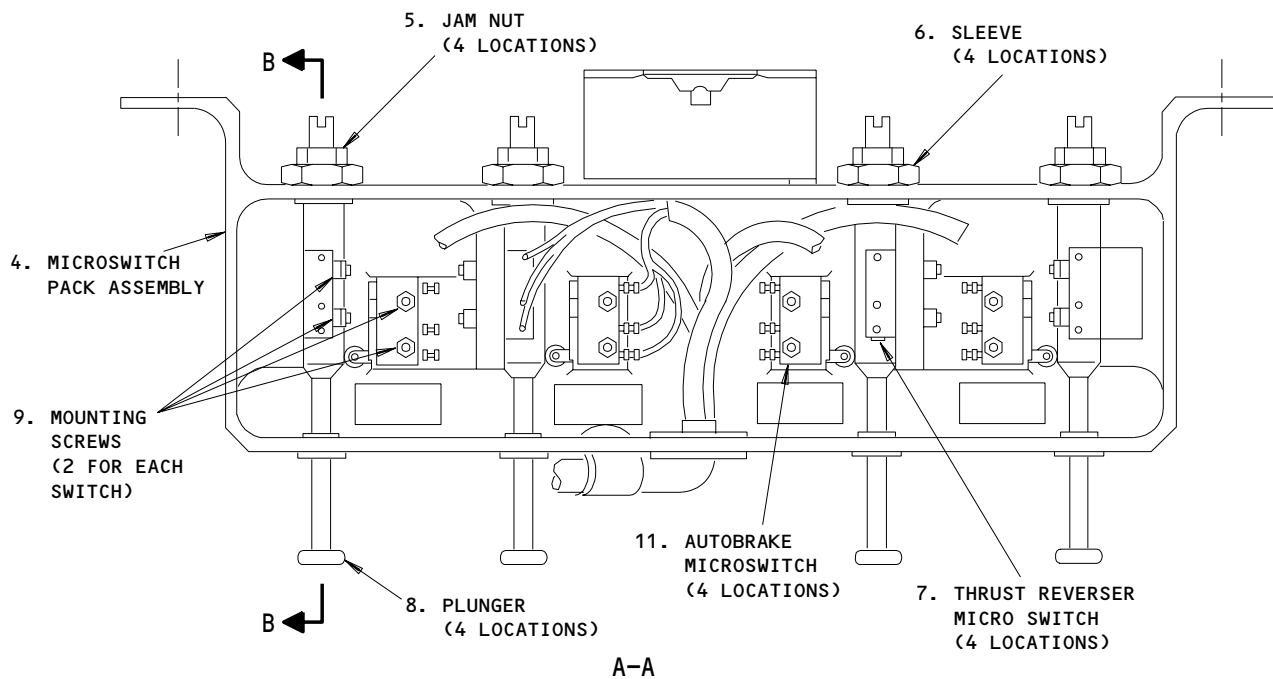
Control Stand - Microswitch Installation  
Figure 208 (Sheet 3)

EFFECTIVITY—  
AIRPLANES WITHOUT THRUST REVERSER  
SYNC LOCKS

76-11-03

J02

Page 222  
Jun 10/97



Control Stand - Microswitch Installation  
Figure 208 (Sheet 4)

EFFECTIVITY  
AIRPLANES WITHOUT THRUST REVERSER  
SYNC LOCKS

76-11-03

J02

Page 223  
Jun 10/97

	SWITCH NO.	SWITCH NAME
ENGINE NO. 1	S1B	SWITCH-AUTOBRAKE/AUTO SPEED BRAKE
	S181	SWITCH-THRUST REVERSER (DCV)
ENGINE NO. 2	S2B	SWITCH-AUTOBRAKE
	S182	SWITCH-THRUST REVERSER (DCV)
ENGINE NO. 3	S3B	SWITCH-AUTOBRAKE/AUTO SPEED BRAKE
	S183	SWITCH-THRUST REVERSER (DCV)
ENGINE NO.4	S4B	SWITCH-AUTOBRAKE
	S184	SWITCH-THRUST REVERSER (DCV)

TABLE 1  
SWITCH IDENTIFICATION FOR AIRPLANES  
WITHOUT THRUST REVERSER SYNC LOCK

	SWITCH NO.	SWITCH NAME
ENGINE NO. 1	S1B	SWITCH-AUTOBRAKE/AUTO SPEED BRAKE
	S181	SWITCH-THRUST REVERSER (DCV)
	S191	SWITCH-THRUST REVERSER SYNC LOCK
ENGINE NO. 2	S182	SWITCH-THRUST REVERSER (DCV)
	S2B	SWITCH-AUTOBRAKE
	S192	SWITCH-THRUST REVERSER SYNC LOCK
ENGINE NO. 3	S3B	SWITCH-AUTOBRAKE/AUTO SPEED BRAKE
	S183	SWITCH-THRUST REVERSER (DCV)
	S193	SWITCH-THRUST REVERSER SYNC LOCK
ENGINE NO. 4	S4B	SWITCH-AUTOBRAKE
	S184	SWITCH-THRUST REVERSER (DCV)
	S194	SWITCH-THRUST REVERSER SYNC LOCK

TABLE 2  
SWITCH IDENTIFICATION FOR AIRPLANES  
WITH THRUST REVERSER SYNC LOCK

Control Stand - Microswitch Installation  
Figure 208 (Sheet 5)

EFFECTIVITY	
ALL	

76-11-03

- (2) FREIGHTERS;  
Location Zone  
210 Main Deck Cargo Compartment  
221 Control Cabin LH  
222 Control Cabin RH

D. Procedure

S 022-282-J00

- (1) Do this task: Remove the Microswitch Pack Cover.

S 012-283-J00

- (2) PASSENGER AIRPLANES;  
Remove the ceiling panels in the main passenger cabin to get access to the connector plugs below the control stand (AMM 25-22-01/401).

S 012-284-J00

- (3) FREIGHTERS;  
Remove the lining panel below the control stand to get access to the connector plugs (AMM 25-59-01/401).

S 022-182-J00

CAUTION: BE VERY CAREFUL DURING THE REMOVAL AND WHEN YOU HOLD THE MICROSWITCH PACK ASSEMBLY. DAMAGE TO THE SWITCHES, NUTPLATES, OR WIRE CONNECTIONS CAN OCCUR.

- (4) Remove the microswitch pack assembly.  
(a) Disconnect the electrical connector and install the protection caps on the electrical connector and the mating receptacle as follows:  
1) P8  
2) P9  
3) P10  
4) P11  
5) AIRPLANES WITH SYNC LOCKS;  
D41194P  
6) AIRPLANES WITH SYNC LOCKS;  
D41195P  
7) AIRPLANES WITH SYNC LOCKS;  
D41294P  
8) AIRPLANES WITH SYNC LOCKS;  
D41295P

EFFECTIVITY

ALL

76-11-03

J02

Page 225  
Jun 10/97

- (b) Make a mark at the locations where the cable clamps are installed on the microswitch pack assembly wire.
- (c) Remove the cable clamps from the control stand frame.

**NOTE:** To move the microswitch pack assembly, it is necessary to remove the cable clamps to loosen the wire.

- (d) Remove the four screws (2) and washers (3) from the microswitch pack assembly (4).
- (e) Remove the microswitch pack assembly (4).
- (f) Keep the microswitch pack assembly (4).

**TASK 76-11-03-002-183-J00**

**17. Remove the Microswitches (Fig. 208)**

**A. General**

- (1) This task gives instructions to remove the Autobrake/Auto Speed Brake and Thrust Reverser switches from the microswitch pack assembly.
- (2) To get access to the microswitches, you must first do the task: Remove the microswitch pack assembly.

**B. Standard Tools and Equipment**

- (1) Soldering tool - Commercially available

**C. References**

- (1) AMM 20-11-25/201, Heat Guns and/or Soldering Irons
- (2) IPC 76-11-03 Fig. 1

**D. Access**

- (1) Location Zone
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

**E. Procedure**

**S 032-184-J00**

- (1) Remove the mounting screws (9) from the applicable microswitch (7).

**NOTE:** Fig. 208 (Sheet 5) gives a list of microswitch identification numbers.

EFFECTIVITY

ALL

**76-11-03**

J02

Page 226  
Jun 10/97



- S 022-185-J00  
(2) Remove the microswitch (7) from the microswitch pack assembly (4).

- S 032-186-J00  
(3) Remove the heat shrink tube from the wire switch terminals.

- S 932-187-J00  
(4) Put a tag on the wires for the correct identification during the installation.

- S 312-188-J00  
(5) Remove the solder wires from the switch terminals (AMM 20-11-25/201).

TASK 76-11-03-002-189-J00

18. Remove the STAB TRIM Indicators (Fig. 209)

A. General

- (1) This task removes the STAB TRIM indicators from the side panel bracket assemblies on the control stand.

B. References

- (1) IPC 27-48-02

C. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

D. Procedure

S 022-190-J00

**CAUTION:** BE CAREFUL DURING THE REMOVAL AND WHEN YOU HOLD THE STAB TRIM INDICATORS. DAMAGE TO THE WIRE CONNECTIONS OR FINISH CAN OCCUR.

- (1) Remove the STAB TRIM indicators.  
(a) Make a mark at the locations where the cable clamps are installed on the wire.

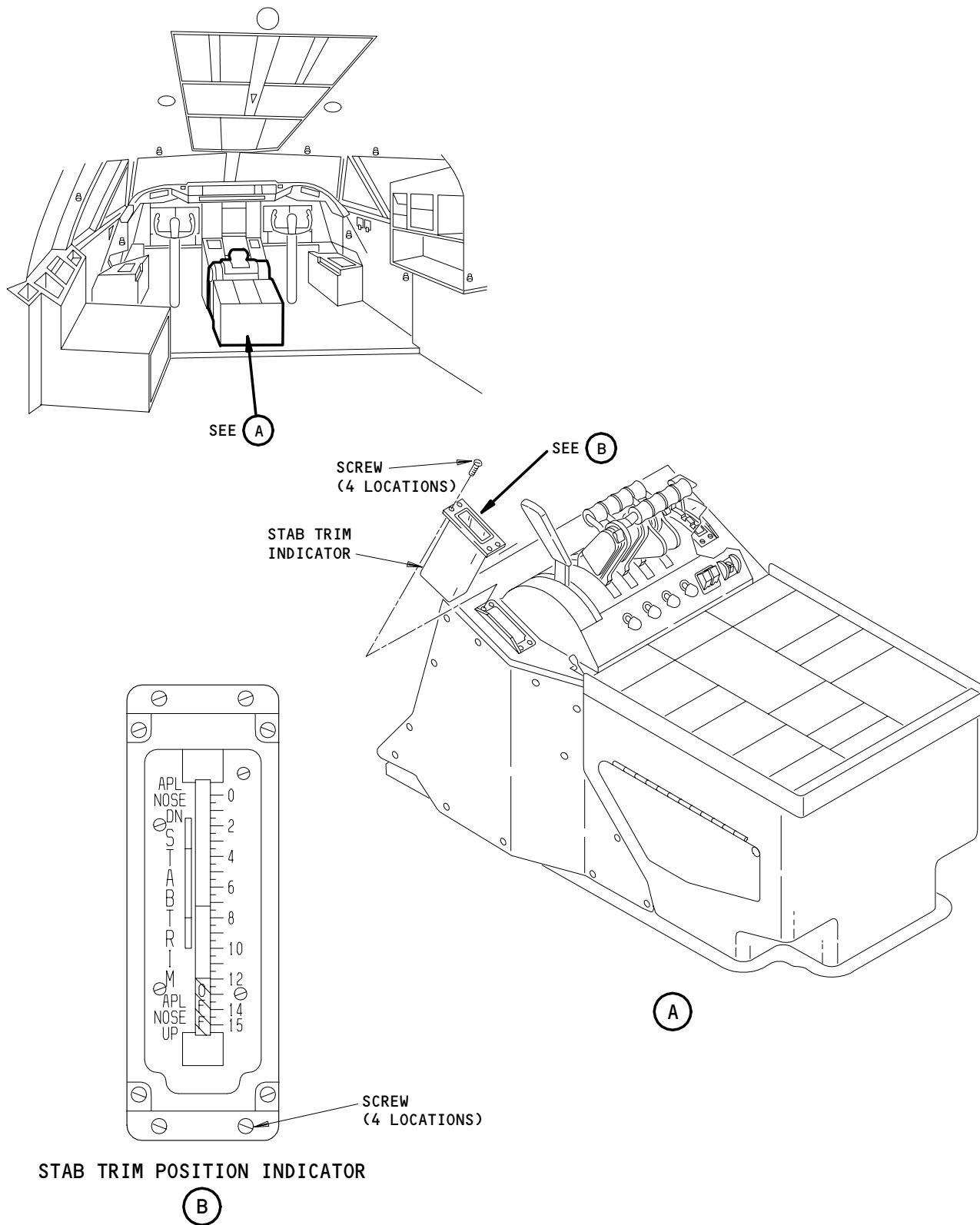
EFFECTIVITY

ALL

76-11-03

J02

Page 227  
Jun 10/97



Control Stand - STAB TRIM Indicator Installation  
Figure 209

EFFECTIVITY	
ALL	

76-11-03

(b) Remove the cable clamps from the control stand frame.

NOTE: To move the STAB TRIM indicators, it is necessary to remove the cable clamps to loosen the wire.

(c) Remove the four screws from each STAB TRIM indicator.

(d) Remove the STAB TRIM indicators.

(e) Keep the STAB TRIM indicators.

TASK 76-11-03-862-191-J00

19. Remove the Electrical Power from the Speed Brake Lever Actuation Circuits  
(Fig. 201)

A. General

(1) This task removes the electrical power from the reverse thrust lever operated autospeed brake switch and the speed brake operation circuits.

(2) You must do this task before you do the maintenance on the components that follow: the thrust lever assemblies, autothrottle servomotor and brake assembly, the speed brake lever assembly, the flap lever assembly, and the interlock actuators for the thrust lever. This will prevent the accidental operation of the speed brake operation circuits which can cause injury to persons or damage to equipment.

B. References

(1) AMM 27-62-00/501, Speed Brake Control System

C. Access

(1) Location Zone

221 Control Cabin, LH

222 Control Cabin, RH

D. Procedure

S 042-192-J00

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Complete the deactivation procedure for the spoiler/speedbrake control system for ground maintenance (AMM 27-62-00/501).

EFFECTIVITY

ALL

76-11-03

J02

Page 229  
Jun 10/97

S 862-193-J00

- (2) Open this circuit breaker, 7G6 SPEED BRAKE AUTO CONT, on the overhead circuit breaker panel, P7.
  - (a) Attach the DO-NOT-CLOSE tag.

TASK 76-11-03-002-194-J00

20. Remove the Speed Brake Lever Cover (Fig. 210)

A. General

- (1) This task gives access to the speed brake lever assembly.

B. References

- (1) IPC 76-11-03

C. Access

- (1) Location Zone

221 Control Cabin, LH

222 Control Cabin, RH

D. Procedure

S 032-195-J00

- (1) Remove the speed brake lightplate.
  - (a) Remove the three screws from the speed brake lightplate.
  - (b) Disconnect the connector for the speed brake lightplate.
  - (c) Remove the speed brake lightplate.
  - (d) Keep the speed brake lightplate.

S 022-196-J00

- (2) Remove the cover on the speed brake lever.
  - (a) Remove the five screws from the cover.
  - (b) Lift the cover.
  - (c) Disconnect the inline electrical connectors.
  - (d) Remove the cover.
  - (e) Keep the cover.

TASK 76-11-03-862-197-J00

21. Remove the Electrical Power from the Flap Lever RVDT (Fig. 201)

A. General

- (1) This task removes the electrical power from the flap lever RVDT.
- (2) You must do this task before you do the maintenance on the components that follow: the thrust lever assemblies, autothrottle servomotor and brake assembly, the speed brake lever assembly, and the flap lever assembly. This will prevent the accidental operation of the flap lever which can cause injury to persons or damage to equipment.

B. References

- (1) AMM 27-81-00/201, Leading Edge Flap System

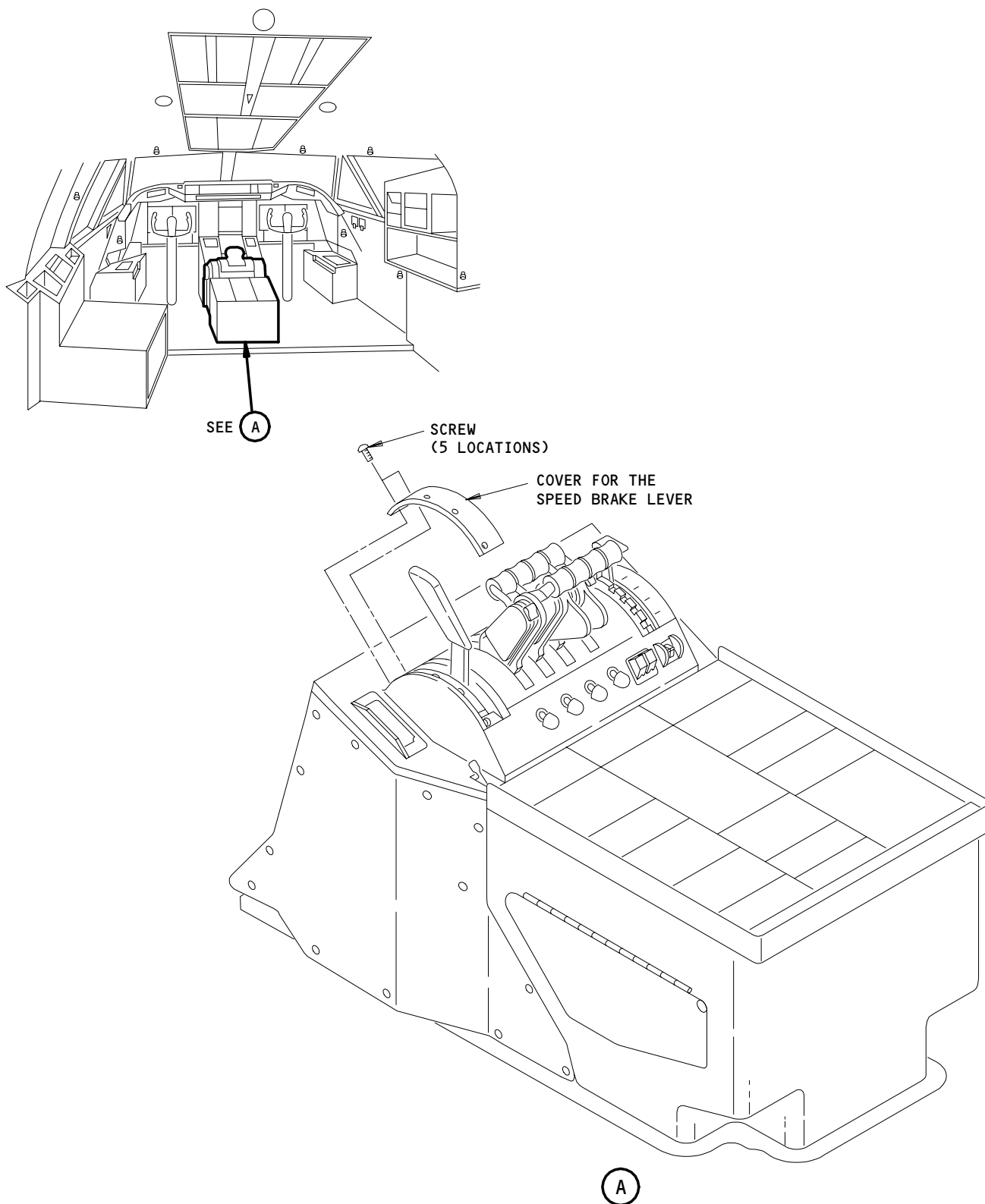
EFFECTIVITY

ALL

76-11-03

J02

Page 230  
Jun 10/97



Control Stand - Speed Brake Lever Cover Installation  
Figure 210

EFFECTIVITY

ALL

76-11-03

J02

Page 231  
Jun 10/97

C. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

D. Procedure

S 042-198-J00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE FLAPS. THE ACCIDENTAL OPERATION OF THE FLAPS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Complete the deactivation procedure for the drive circuit of the leading edge flap for ground maintenance (AMM 27-81-00/201).

S 862-199-J00

- (2) Open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P7 Overhead Circuit Breaker Panel

- 1) 7C12 FLT CONT ELEC 1L AC
- 2) 7C13 FLT CONT ELEC 1L DC
- 3) 7C14 FLT CONT ELEC 1R AC
- 4) 7C15 FLT CONT ELEC 1R DC
- 5) 7C10 FLT CONT ELEC 2L AC
- 6) 7C11 FLT CONT ELEC 2L DC
- 7) 7C16 FLT CONT ELEC 2R AC
- 8) 7C17 FLT CONT ELEC 2R DC

TASK 76-11-03-002-200-J00

22. Remove the Flap Lever Cover (Fig. 211)

A. General

- (1) This task gives access to the flap lever assembly.

B. References

- (1) IPC 76-11-03

C. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

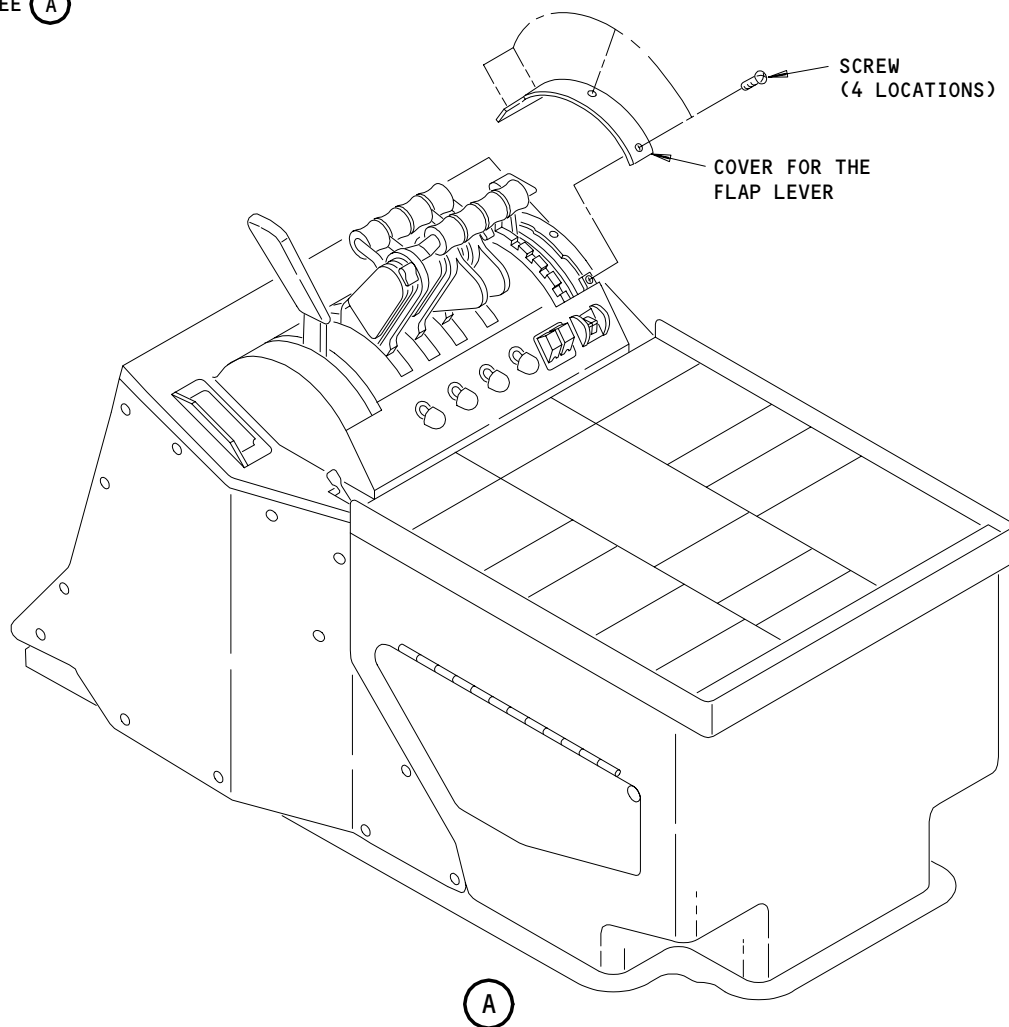
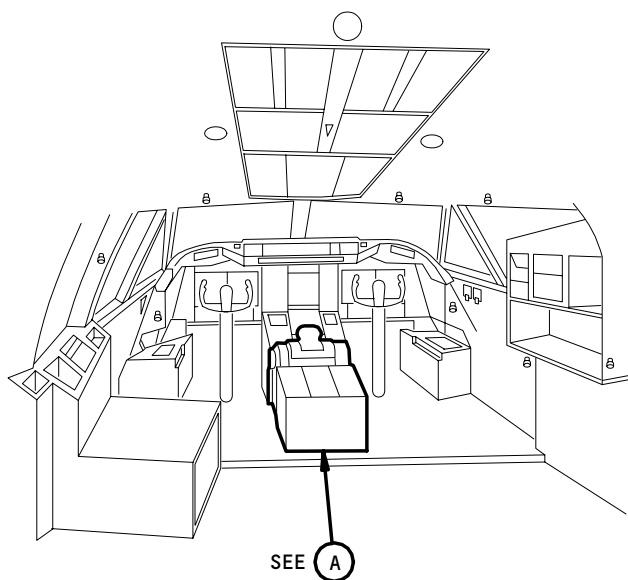
EFFECTIVITY

ALL

**76-11-03**

J02

Page 232  
Jun 10/97



Control Stand - Flap Lever Cover Installation  
Figure 211

EFFECTIVITY

ALL

76-11-03

J02

Page 233  
Jun 10/97

D. Procedure

S 032-201-J00

- (1) Remove the flap lever lightplate.
  - (a) Remove the two screws from the flap lever lightplate.
  - (b) Disconnect the connector for the flap lever lightplate.
  - (c) Remove the flap lever lightplate.
  - (d) Keep the flap lever lightplate.

S 022-202-J00

- (2) Remove the flap lever cover.
  - (a) Remove the four screws from the flap lever cover.
  - (b) Lift the flap lever cover.
  - (c) Remove the flap lever cover.
  - (d) Keep the flap lever cover.

TASK 76-11-03-402-203-J00

23. Install the Thrust Lever Assembly Switch Covers (Fig. 202)

A. References

- (1) IPC 76-11-01 Fig. 2

B. Access

- (1) Location Zone
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

C. Procedure

S 862-280-J00

- (1) Do the procedure to remove the electrical power from the STAB TRIM switches and indicators.

S 422-204-J00

- (2) Put the switch cover for the thrust lever assembly on the thrust lever assembly.

S 432-205-J00

- (3) Install the three screws in the switch cover.

S 432-206-J00

- (4) Tighten the three screws.

TASK 76-11-03-402-207-J00

24. Install the Engine Start Module (Fig. 205 thru 207)

A. General

- (1) You must install the engine start module before you install the thrust lever cover on the control stand.

B. References

- (1) IPC 76-11-03 Fig. 3

EFFECTIVITY

ALL

76-11-03

J02

Page 234  
Jun 10/97



C. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

D. Procedure

S 862-279-J00

- (1) Do the procedure to energize the STAB TRIM switches and the indicators.

S 422-208-J00

**CAUTION:** BE CAREFUL DURING THE INSTALLATION AND WHEN YOU HOLD THE ENGINE START MODULE. DAMAGE TO THE LIGHTPLATES, SWITCHES, NUTPLATES, WIRE CONNECTIONS OR FINISH CAN OCCUR.

TIGHTEN THE SCREWS FOR THE ENGINE START MODULE WITH YOUR HAND. THE LIGHTPLATES FOR THE ENGINE START MODULE ARE EASILY BROKEN IF YOU TIGHTEN THE FASTENERS WITH AN ELECTRICAL SCREWDRIVER.

- (2) Install the engine start module.
- (a) Put the engine start module in the control stand.
  - (b) Install the two screws in the engine start module.
  - (c) Tighten the two screws.

S 412-209-J00

- (3) Install the lightplate for the engine start module.
- (a) Put the lightplate on the control stand.
  - (b) Connect the electrical connector for the lightplate.
  - (c) Install the five screws in the lightplate.
  - (d) Tighten the five screws.

S 422-210-J00

- (4) Install the four fuel control switch knobs.

S 862-211-J00

**WARNING:** MAKE SURE YOU OPEN THE CIRCUIT BREAKERS FOR THE ENGINE IGNITION BEFORE YOU PUT THE FUEL CONTROL TOGGLE SWITCHES TO THE "RUN" POSITION. THE IGNITER PLUGS WILL AUTOMATICALLY FIRE IF YOU ARE OUT OF ZERO DETENT, NACELLE ANTI-ICE IS ON, CON IGNITION SWITCH IS SET TO "ON", OR ENGINE START SWITCH IS PULLED TO "ON". IF THE COMBUSTION CHAMBER HAS FUEL IN IT, AN INTERNAL ENGINE OR A TAILPIPE FIRE CAN OCCUR. THE FIRE CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE ENGINE.

- (5) Make sure the fuel control toggle switches do not have electrical power and are in the CUTOFF position.

EFFECTIVITY

ALL

76-11-03

J02

Page 235  
Jun 10/97

- S 032-212-J00
- (6) Remove the protection caps from the electrical connector and mating receptacle.

- S 432-213-J00
- (7) Connect the electrical connectors that follow:
- (a) P1
  - (b) P2
  - (c) P3
  - (d) P4
  - (e) P5
  - (f) P6
  - (g) P7

- S 432-214-J00
- (8) Attach the wire to the control stand with the cable clamps.

- S 862-213-J00
- (9) Do the procedure to energize the STAB TRIM switches and indicators.

- S 912-214-J00
- (10) Wet motor all four engines (AMM 71-00-00/201).

- S 212-215-J00
- (11) Make sure that the ENG X FUEL VALVE advisory and status messages (X=1,2,3 and 4) do not show.
- (a) If a message shows, examine the applicable electrical connector for damage and correct installation.

- S 722-216-J00
- (12) Do a functional test on the stabilizer trim cutout switches (AMM 27-41-00/501).

TASK 76-11-03-402-215-J00

25. Install the Control Stand Thrust Lever Rails (Fig. 206)

A. References

- (1) IPC 76-11-03 Fig. 4

B. Access

- (1) Location Zone
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

C. Procedure

- S 422-216-J00
- (1) Install the thrust lever rails.
- (a) Put the thrust lever rails in the control stand.
  - (b) Install the two screws into each thrust lever rail.
  - (c) Tighten the two screws.

EFFECTIVITY

ALL

76-11-03

J02

Page 236  
Jun 10/97

TASK 76-11-03-402-217-J00

26. Install the Control Stand Thrust Lever Cover (Fig. 203)

A. General

- (1) You must install the engine start module before you install the thrust lever cover on the control stand.

B. References

- (1) IPC 76-11-03

C. Access

- (1) Location Zone

221 Control Cabin, LH

222 Control Cabin, RH

D. Procedure

S 422-218-J00

- (1) Install the thrust lever cover.
  - (a) Put the thrust lever cover on the control stand.
  - (b) Install the 15 screws in the thrust lever cover.
  - (c) Tighten the 15 screws.

TASK 76-11-03-402-219-J00

27. Install the Microswitches (Fig. 208)

A. General

- (1) This task gives the instruction to install the autobrake/auto speed brake and thrust reverser microswitches, in the microswitch pack assembly.
- (2) You must remove the microswitch pack assembly to replace the applicable switch. Thus, you must do a check of all switches for the correct adjustment after the microswitch pack assembly is installed.

B. Standard Tools and Equipment

- (1) Soldering tool - Commercially available
- (2) Heat Gun - Commercially available

C. Consumable Materials

- (1) G02104 Heat Shrink Tube - RT876, Color Yellow, Raychem Corp., Menlo Park, CA

D. References

- (1) AMM 20-11-25/201, Heat Guns and/or Soldering Irons
- (2) IPC 76-11-03, Fig. 1

E. Access

- (1) Location Zone

221 Control Cabin, R

222 Control Cabin, L

F. Procedure

S 412-220-J00

- (1) Put the heat shrink tube on the wires (shrink tube after you solder the wires to the switch).

EFFECTIVITY

ALL

76-11-03

J02

Page 237  
Jun 10/97

S 312-221-J00

- (2) Solder the wires to their correct terminals (AMM 20-11-25/201).

S 332-222-J00

- (3) Use the heat gun to make the tube on the wire terminals smaller (AMM 20-11-25/201).

S 422-223-J00

- (4) Install the microswitch (7) with the mounting screws (9).

S 822-285-J00

- (5) AIRPLANES WITHOUT SYNC LOCKS;  
Pre-adjust the microswitch if necessary.

**NOTE:** Make sure the plunger rods come out from the bottom of the microswitch pack assembly so that dimension A is between 0.95-1.00 inch (24.1-25.4 mm) (Fig. 208).

S 822-286-J00

- (6) AIRPLANES WITH SYNC LOCKS;  
Pre-adjust the microswitch if necessary.

**NOTE:** Make sure the plunger rods come out from the bottom of the microswitch pack assembly so that dimension A is between 1.16-1.19 inch (29.4-30.1 mm) (Fig. 208).

S 822-225-J00

- (7) If the plunger (8) is not in the limit, do the steps that follow:  
(a) Loosen the jamnut (5).  
(b) Turn the plunger (8), while you hold the sleeve (6) with no movement, until you get the initial adjustment.  
(c) Tighten the jamnut (5).

TASK 76-11-03-402-226-J00

28. Install the Microswitch Pack Assembly (Fig. 208)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

EFFECTIVITY

ALL

76-11-03

J02

Page 238  
Jun 10/97

S 422-227-J00

**CAUTION:** BE CAREFUL DURING THE INSTALLATION AND WHEN YOU HOLD THE MICROSWITCH PACK ASSEMBLY. DAMAGE TO THE SWITCHES, NUTPLATES, OR WIRE CONNECTIONS CAN OCCUR.

- (1) Install the microswitch pack assembly.
  - (a) Put the forward thrust levers at approximately 25 degrees of the thrust lever movement forward of the idle position.
  - (b) Put the microswitch pack assembly (4) in the control stand.
  - (c) Install the four screws (2) and washers (3) into the microswitch pack assembly (4).
  - (d) Tighten the four screws (2).

S 432-228-J00

- (2) Remove the protection caps from the electrical connector and mating receptacle.

S 432-229-J00

- (3) Connect the electrical connectors that follow:
  - (a) P8
  - (b) P9
  - (c) P10
  - (d) P11
  - (e) AIRPLANES WITH SYNC LOCKS;  
D41194P
  - (f) AIRPLANES WITH SYNC LOCKS;  
D41195P
  - (g) AIRPLANES WITH SYNC LOCKS;  
D41294P
  - (h) AIRPLANES WITH SYNC LOCKS;  
D41295P

S 432-230-J00

- (4) Attach the wire to the control stand with the cable clamps.

EFFECTIVITY

ALL

76-11-03

J02

Page 239  
Jun 10/97

TASK 76-11-03-822-231-J00

29. Adjust the Microswitches (Fig. 208 and 212)

A. General

- (1) This task gives the instruction for the adjustment of the autobrake/auto speed brake and thrust reverser microswitches in the microswitch pack assembly.
- (2) AIRPLANES WITHOUT SYNC LOCKS;  
All the switches in the microswitch pack assembly are operated as a pair for each thrust lever by a beveled plunger assembly. You only have to adjust the plunger for one microswitch to get the correct adjustment for the pair of switches. But you must do a continuity check of each microswitch separately to make sure it works correctly.
- (3) AIRPLANES WITH SYNC LOCKS;  
All the switches in the microswitch pack assembly are operated in sets of three for each thrust lever by a beveled plunger assembly. You only have to adjust the plunger for one microswitch to get the correct adjustment for the set of microswitches. But you must do a continuity check of each microswitch separately to make sure works correctly.
- (4) You can read the thrust lever angle from the EICAS EPCS maintenance page when you do not have a digital thrust lever protractor. But, you are recommended to find the thrust lever angle with the thrust lever protractor G76002-1 or G76002-7.

B. Special Tools and Equipment

- (1) G76002-1 Protractor - Thrust Levers or
- (2) G76002-7 Protractor - Thrust Levers (Preferred)

C. Standard Tools and Equipment

- (1) Digital Multimeter - Range 0-50 ( $\pm 0.01$ ) volts RMS; Commercially available

D. Access

- (1) PASSENGER AIRPLANES;

Location Zone

- |     |   |
|-----|---|
| 211 | Main Passenger Cabin - Nose to First Door, LH |
| 212 | Main Passenger Cabin - Nose to First Door, RH |
| 221 | Control Cabin LH                              |
| 222 | Control Cabin RH                              |

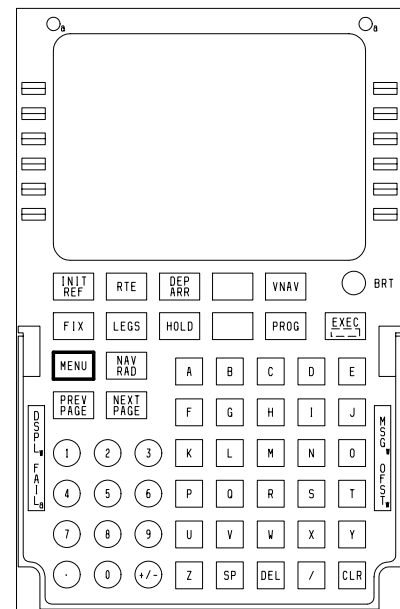
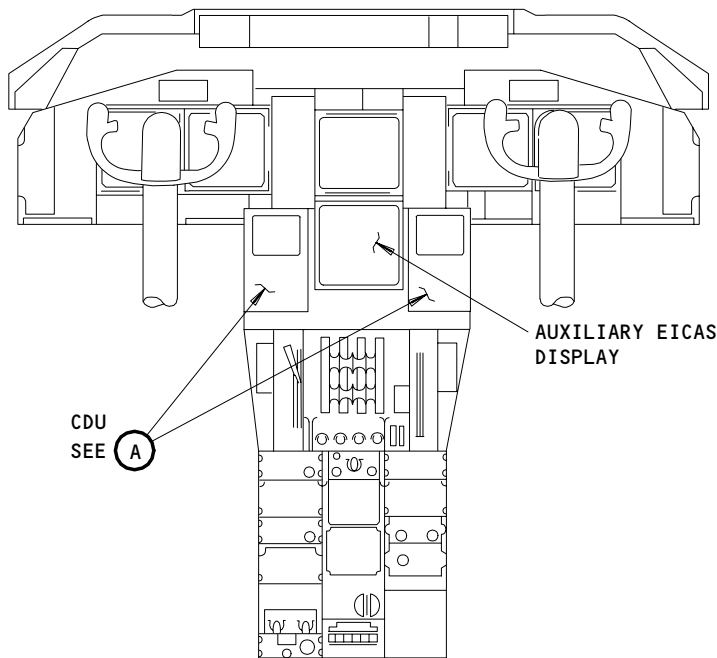
EFFECTIVITY

ALL

76-11-03

J02

Page 240  
Jun 10/97



CDU  
(A)

#### Instructions to get Access to the EICAS - EPCS Maintenance Page TRA Readout

1. Push the MENU key on CDU. Make sure the main menu page shows
2. Push the LSK 6L (<CMC). Make sure the CMC MENU 1/2 page shows.
3. Push the LSK 3L (<EICAS MAINT PAGES). Make sure the EICAS MAINT PAGES SYSTEMS 1/3 page shows.
4. Push the NEXT PAGE key until (<73 EPCS) shows.
5. Push the LSK 4L (<73 EPCS). Make sure the TRA readout shows on the EICAS auxiliary display.

Thrust Lever Position/EICAS TRA Readout  
Figure 212 (Sheet 1)

EFFECTIVITY	
ALL	

76-11-03

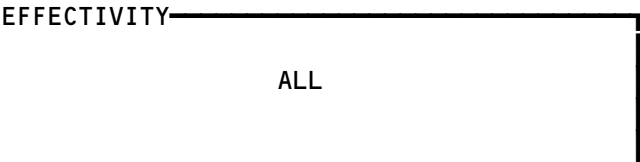
J02

Page 241  
Jun 10/97

FORWARD THRUST LEVER ANGLE (TLA) IN DEGREES	EPCS MAINTENANCE PAGE ON EICAS THRUST RESOLVER ANGLE (TRA) IN DEGREES
0	35.0
2	37.1
4	39.1
6	41.2
8	43.2
10	45.2
12	47.2
14	49.2
16	51.1
18	53.1
20	55.0
22	56.9
24	58.9
26	60.8
28	62.7
30	64.6
32	66.5
34	68.4
36	70.4
38	72.4
40	74.4
42	76.4
44	78.5
46	80.7
48	82.8
50	85.2

FORWARD THRUST LEVER/EICAS TRA READOUT  
TABLE A

Thrust Lever Position/EICAS TRA Readout  
Figure 212 (Sheet 2)



76-11-03



REVERSE THRUST LEVER ANGLE (TLA) IN DEGREES	EPCS MAINTENANCE PAGE ON EICAS THRUST RESOLVER ANGLE (TRA) IN DEGREES
0	35.0
2	35.1
4	35.2
6	35.2
8	35.1
10	35.0
12	34.8
14	34.6
16	34.3
18	34.0
20	33.7
22	33.2
24	32.8
26	32.3
28	31.7
30	31.1
32	30.5
34	29.9
36	29.2
38	28.4
40	27.7
42	26.9
44	26.0
46	25.3
48	24.4
50	23.5
52	22.6
54	21.7
55	21.2
56	20.8
58	19.8
60	18.9
62	17.9
64	16.9
66	15.9
68	15.0
70	14.0
72	13.1
74	12.1
76	11.2
78	10.2
80	9.3
82	8.4
84	7.5
86	6.6
88	5.7
89.25	5.7

REVERSE THRUST LEVER/EICAS TRA READOUT  
TABLE B

Thrust Lever Position/EICAS TRA Readout  
Figure 212 (Sheet 3)

EFFECTIVITY

ALL
-----

76-11-03

J02

Page 243  
Jun 10/97

- (2) FREIGHTERS;  
Location Zone  
210 Main Deck Cargo Compartment  
221 Control Cabin LH  
222 Control Cabin RH

E. Procedure

- S 032-232-J00
- (1) Disconnect the applicable electrical connector for the microswitch pack.
- (a) P8
  - (b) P9
  - (c) P10
  - (d) P11
- S 862-233-J00
- (2) Set all thrust levers to idle stop and all reverse thrust levers to the stow position.
- S 822-287-J00
- (3) Adjust the applicable microswitch.
- (a) AIRPLANES WITHOUT SYNC LOCKS;  
Set the forward thrust lever of the switch which must be adjusted to a position between 7.5 and 8.5 degrees from the idle stop.
  - (b) AIRPLANES WITH SYNC LOCKS;  
Set the forward thrust lever of the switch which must be adjusted to a position between 9.5 and 10.5 degrees from the idle stop.
    - 1) Keep the forward thrust lever in this position.
  - (c) Connect the ohmmeter between pins 4 and 6 on the applicable electrical connector.

NOTE: Refer to the table given for the resistance check to find the correct connector for the applicable microswitch.

EFFECTIVITY

ALL

76-11-03

J02

Page 244  
Jun 10/97

- (d) Loosen the jamnut (5) five full turns.
- (e) Turn the sleeve (6) counterclockwise several turns.
- (f) Turn the sleeve (6) clockwise, while you hold the plunger (8) with no movement, until the switch opens (infinite resistance).
- (g) Tighten the jamnut (5) while you hold the plunger (8) and sleeve(6) with no movement.

NOTE: Make sure the plunger and sleeve position do not move.

- (h) Move the thrust levers through the full forward and reverse movement.
  - 1) Make sure the switch pack mechanism operates smoothly and the springs keep the outer plungers against the mechanism of operation.
- (i) Put all thrust levers to the idle stop position and all reverse thrust levers to the stowed position.

S 762-243-J00

- (4) Do a check of the switch continuity with the steps that follow:
  - (a) Connect an ohmmeter to the connector plug and pins given in the table.
    - 1) Make sure you have the resistance shown.
    - 2) AIRPLANES WITHOUT SYNC LOCKS;  
Make sure you have the resistance shown.

NOTE: For the switch resistance at the Thrust Lever Position, the switches should not change state between the idle stop position and the 7 degree position. For the Reverse Thrust Lever Position, the switches should not change state between the stowed position and the 15 degree position.

- 3) AIRPLANES WITH SYNC LOCKS;  
Make sure you have the resistance shown.

NOTE: For the switch resistance at the Thrust Lever Position, the switches should not change state between the idle stop position and the 9 degree position. For the Reverse Thrust Lever Position, the switches should not change state between the stowed position and the 15 degree position.

EFFECTIVITY

ALL

76-11-03

J02

Page 245  
Jun 10/97

- 4) If the switch operation is not correct, carefully bend the switch arm to get the correct operation point.
- 5) Put each thrust lever to the idle stop position after each test is done.

AIRPLANES WITHOUT SYNC LOCKS; SWITCH ACTUATION RESISTANCE CHECK						
Thrust Lever	Switch		Connector		Switch Resistance at Thrust Lever Position	
No.	No.	Name	Plug	Pin	7 degrees	9 degrees
1	S1B S1B	Autobrake/ Auto Speed Brake	P8 P8	4 & 5 4 & 6	Infinite 0	0 Infinite
2	S2B S2B	Autobrake	P9 P9	4 & 5 4 & 6	Infinite 0	0 Infinite
3	S3B S3B	Autobrake/ Auto Speed Brake	P10 P10	4 & 5 4 & 6	Infinite 0	0 Infinite
4	S4B S4B	Autobrake	P11 P11	4 & 5 4 & 6	Infinite 0	0 Infinite

AIRPLANES WITHOUT SYNC LOCKS; SWITCH ACTUATION RESISTANCE CHECK						
Thrust Lever	Switch		Connector		Switch Resistance at Reverse Thrust Lever Position	
No.	No.	Name	Plug	Pin	15 degrees	30 degrees
1	S181 S181	Thrust Reverser (DCV)	P8 P8	1 & 2 1 & 3	Infinite 0	0 Infinite
2	S182 S182	Thrust Reverser (DCV)	P9 P9	1 & 2 1 & 3	Infinite 0	0 Infinite
3	S183 S183	Thrust Reverser (DCV)	P10 P10	1 & 2 1 & 3	Infinite 0	0 Infinite
4	S184 S184	Thrust Reverser (DCV)	P11 P11	1 & 2 1 & 3	Infinite 0	0 Infinite

EFFECTIVITY

ALL

**76-11-03**

J02

Page 246  
Oct 18/99

AIRPLANES WITH SYNC LOCKS; SWITCH ACTUATION RESISTANCE CHECK						
Thrust Lever	Switch		Connector		Switch Resistance at Thrust Lever Position	
No.	No.	Name	Plug	Pin	9 degrees	11 degrees
1	S1B S1B	Autobrake/ Auto Speed Brake	P8 P8	4 & 5 4 & 6	Infinite 0	0 Infinite
2	S2B S2B	Autobrake	P9 P9	4 & 5 4 & 6	Infinite 0	0 Infinite
3	S3B S3B	Autobrake/ Auto Speed Brake	P10 P10	4 & 5 4 & 6	Infinite 0	0 Infinite
4	S4B S4B	Autobrake	P11 P11	4 & 5 4 & 6	Infinite 0	0 Infinite

EFFECTIVITY

ALL

**76-11-03**

J02

Page 247  
Oct 18/99

AIRPLANES WITH SYNC LOCKS; SWITCH ACTUATION RESISTANCE CHECK						
Thrust Lever No.	Switch		Connector		Switch Resistance at Reverse Thrust Lever Position	
	No.	Name	Plug	Pin	15 degrees	30 degrees
1	S181 S181	Thrust Reverser (DCV)	P8 P8	9 & 2 9 & 3	Infinite 0	0 Infinite
2	S182 S182	Thrust Reverser (DCV)	P9 P9	9 & 2 9 & 3	Infinite 0	0 Infinite
3	S183 S183	Thrust Reverser (DCV)	P10 P10	9 & 2 9 & 3	Infinite 0	0 Infinite
4	S184 S184	Thrust Reverser (DCV)	P11 P11	9 & 2 9 & 3	Infinite 0	0 Infinite
1	S191 S191	Thrust Reverser (Sync Lock)	D41294P D41294P	5 & 8 5 & 13	Infinite 0	0 Infinite
2	S192 S192	Thrust Reverser (Sync Lock)	D41295P D41295P	5 & 8 5 & 13	Infinite 0	0 Infinite
3	S193 S193	Thrust Reverser (Sync Lock)	D41194P D41194P	5 & 8 5 & 13	Infinite 0	0 Infinite
4	S194 S194	Thrust Reverser (Sync Lock)	D41195P D41195P	5 & 8 5 & 13	Infinite 0	0 Infinite

(b) Disconnect the ohmmeter.

S 432-244-J00

- (5) Connect the applicable electrical connector for the microswitch pack.
- (a) P8
  - (b) P9
  - (c) P10
  - (d) P11
  - (e) AIRPLANES WITH SYNC LOCKS;  
D41194P
  - (f) AIRPLANES WITH SYNC LOCKS;  
D41195P
  - (g) AIRPLANES WITH SYNC LOCKS;  
D41294P
  - (h) AIRPLANES WITH SYNC LOCKS;  
D41295P

EFFECTIVITY

ALL

**76-11-03**

J02.1

Page 248  
Oct 18/00

- S 412-288-J00  
(6) Do this task: Install the Microswitch Pack Cover.

- S 412-289-J00  
(7) PASSENGER AIRPLANES;  
Install the ceiling panels in the main passenger cabin  
(AMM 25-22-01/401).

- S 412-290-J00  
(8) FREIGHTERS;  
Install the lining panel below the control stand (AMM 25-59-01/401).

TASK 76-11-03-402-245-J00

30. Install the Microswitch Pack Cover (Fig. 205)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

- S 422-246-J00  
(1) Put the microswitch pack cover on the control stand.

- S 432-247-J00  
(2) Install the three screws in the microswitch pack cover.

- S 432-248-J00  
(3) Tighten the three screws.

TASK 76-11-03-402-249-J00

31. Install the STAB TRIM Indicators (Fig. 209)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

EFFECTIVITY

ALL

76-11-03

J02

Page 249  
Oct 18/99

S 422-250-J00

**CAUTION:** BE CAREFUL DURING THE INSTALLATION AND WHEN YOU HOLD THE STAB TRIM INDICATORS. DAMAGE TO THE FINISH CAN OCCUR.

- (1) Install the STAB TRIM indicators.
  - (a) Put the STAB TRIM indicators on the side panel bracket assemblies.
  - (b) Install the four screws in each STAB TRIM indicator.
  - (c) Tighten the screws.

S 432-251-J00

- (2) Attach the wire to the control stand with the cable clamps.

TASK 76-11-03-402-252-J00

32. Install the Flap Lever Cover (Fig. 211)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

S 422-253-J00

- (1) Install the flap lever cover.
  - (a) Put the flap lever cover on the control stand.
  - (b) Install the four screws in the flap lever cover.
  - (c) Tighten the four screws.

S 432-254-J00

- (2) Install the flap lever lightplate.
  - (a) Put the flap lever lightplate on the flap lever cover.
  - (b) Connect the electrical connector for the flap lever lightplate.
  - (c) Install the two screws in the flap lever lightplate.
  - (d) Tighten the two screws.

TASK 76-11-03-402-255-J00

33. Install the Speed Brake Lever Cover (Fig. 210)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

EFFECTIVITY

ALL

76-11-03

J02

Page 250  
Oct 18/99



C. Procedure

S 422-256-J00

- (1) Install the cover for the speed brake lever.
  - (a) Put the cover on the control stand.
  - (b) Install the five screws in the cover.
  - (c) Tighten the five screws.

S 432-257-J00

- (2) Install the speed brake lightplate.
  - (a) Put the speed brake lightplate on the cover.
  - (b) Connect the electrical connector for the speed brake lightplate.
  - (c) Install the three screws in the speed brake lightplate.
  - (d) Tighten the three screws.

TASK 76-11-03-402-258-J00

34. Install the Control Stand Side Panels (Fig. 204)

A. References

- (1) IPC 76-11-03

B. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

C. Procedure

S 422-259-J00

- (1) Install the right and left side panels.
  - (a) Put the side panels on the control stand.
  - (b) Engage the 13 quick-release fasteners to hold each side panel to the control stand.

TASK 76-11-03-862-260-J00

35. Energize the Thrust Lever Position Resolvers (Fig. 201)

A. Access

- (1) Location Zone

221	Control Cabin, LH
222	Control Cabin, RH

B. Procedure

S 862-261-J00

- (1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:
  - (a) P180 DC Power Distribution Panel
    - 1) 180D20 ENG 4 EEC PWR CH A

EFFECTIVITY

ALL

76-11-03

J02

Page 251  
Oct 18/99

- 2) 180D21 ENG 4 EEC PWR CH B
- 3) 180F5 ENG 2 EEC PWR CH A
- 4) 180F6 ENG 2 EEC PWR CH B
- 5) 180G20 ENG 3 EEC PWR CH A
- 6) 180G21 ENG 3 EEC PWR CH B
- 7) 180J5 ENG 1 EEC PWR CH A
- 8) 180J6 ENG 1 EEC PWR CH B

TASK 76-11-03-862-262-J00

36. Energize the Fuel Control Toggle Switches (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-263-J00

**WARNING:** MAKE SURE YOU KEEP THE CIRCUIT BREAKERS FOR THE ENGINE IGNITION OPEN WHILE THE CIRCUIT BREAKERS FOR THE FUEL CONTROL VALVE ARE OPEN. THE IGNITER PLUGS WILL AUTOMATICALLY FIRE IF YOU ARE OUT OF ZERO DETENT, NACELLE ANTI-ICE IS ON, CON IGNITION SWITCH IS SET TO "ON", OR ENGINE START SWITCH IS PULLED TO "ON". IF THE COMBUSTION CHAMBER HAS FUEL IN IT, AN INTERNAL ENGINE OR A TAILPIPE FIRE CAN OCCUR. THE FIRE CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE ENGINE.

(1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F1 IGN 1 ENG 1
- 2) 6F2 IGN 1 ENG 2
- 3) 6F3 IGN 1 ENG 3
- 4) 6F4 IGN 1 ENG 4

EFFECTIVITY

ALL

76-11-03

J02

Page 252  
Jun 10/97

- 5) 6G1 FUEL SHUTOFF VALVE ENG 1
- 6) 6G2 FUEL SHUTOFF VALVE ENG 2
- 7) 6G3 FUEL SHUTOFF VALVE ENG 3
- 8) 6G4 FUEL SHUTOFF VALVE ENG 4
- 9) 6G19 IGN 1 ENG 1
- 10) 6G20 IGN 2 ENG 2
- 11) 6G21 IGN 2 ENG 3
- 12) 6G22 IGN 2 ENG 4
- 13) 6K19 STBY IGN ENG 1
- 14) 6K20 STBY IGN ENG 2
- 15) 6K21 STBY IGN ENG 3
- 16) 6K22 STBY IGN ENG 4
- 17) 6L10 FUEL CONT VALVE ENG 1
- 18) 6L11 FUEL CONT VALVE ENG 2
- 19) 6L12 FUEL CONT VALVE ENG 3
- 20) 6L13 FUEL CONT VALVE ENG 4

TASK 76-11-03-442-264-J00

37. Activation Procedure for the Autothrottle Servomotor (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-265-J00

(1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P7 Overhead Circuit Breaker Panel

- 1) 7C4 FMCS A/T SERVO L
- 2) 7C25 FMCS A/T SERVO EXC
- 3) 7C26 FMCS A/T SERVO R

TASK 76-11-03-862-266-J00

38. Energize the Reverse Thrust Lever Interlock Actuators (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

EFFECTIVITY

ALL

**76-11-03**

J02

Page 253  
Jun 10/97

B. Procedure

S 862-267-J00

- (1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F12 T/R IND ENG 1
- 2) 6E12 T/R IND ENG 2
- 3) 6D12 T/R IND ENG 3
- 4) 6C12 T/R IND ENG 4

TASK 76-11-03-862-268-J00

39. Energize the Thrust Lever Switches (Fig. 201)

A. Access

- (1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-269-J00

- (1) To energize the control switches for the thrust reverser, close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F13 T/R CONT ENG 1
- 2) 6E13 T/R CONT ENG 2
- 3) 6D13 T/R CONT ENG 3
- 4) 6C13 T/R CONT ENG 4

TASK 76-11-03-862-270-J00

40. Energize the Flap Lever RVDI (Fig. 201)

A. Access

- (1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

EFFECTIVITY

ALL

76-11-03

J02

Page 254  
Jun 10/97

B. Procedure

S 862-271-J00

- (1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P7 Overhead Circuit Breaker Panel

- 1) 7C12 FLT CONT ELEC 1L AC
- 2) 7C13 FLT CONT ELEC 1L DC
- 3) 7C14 FLT CONT ELEC 1R AC
- 4) 7C15 FLT CONT ELEC 1R DC
- 5) 7C10 FLT CONT ELEC 2L AC
- 6) 7C11 FLT CONT ELEC 2L DC
- 7) 7C16 FLT CONT ELEC 2R AC
- 8) 7C17 FLT CONT ELEC 2R DC

TASK 76-11-03-862-272-J00

41. Energize the Speed Brake Lever Actuation Circuits (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-273-J00

- (1) Close this circuit breaker, 7G6 SPEED BRAKE AUTO CONT, on the overhead circuit breaker panel, P7, and remove the DO-NOT-CLOSE tag:

TASK 76-11-03-862-274-J00

42. Energize the STAB TRIM Switches and Indicators (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-275-J00

- (1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6K23 L STAB TRIM POS IND
- 2) 6K24 R STAB TRIM POS IND

(b) P7 Overhead Circuit Breaker Panel

- 1) 7E7 STAB TRIM L S/O VALVE
- 2) 7E20 STAB TRIM R S/O VALVE
- 3) 7E23 ALT STAB TRIM CONT

EFFECTIVITY

ALL

76-11-03

J02

Page 255  
Jun 10/97

TASK 76-11-03-862-276-J00

43. Activation Procedure for the Captain and First Officer Seats (Fig. 201)

A. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

B. Procedure

S 862-277-J00

(1) Close these circuit breakers and remove the DO-NOT-CLOSE tags:

(a) P414 Power Distribution Center - Left

- 1) 414D8 CAPT PWR SEAT

(b) P415 Power Distribution Center - Right

- 1) 415H32 F/O PWR SEAT

TASK 76-11-03-962-217-J00

44. Fuel Control Switch Light Replacement

A. References

- (1) AMM 26-10-00/501, Fire/Overheat Detection Systems

B. Access

(1) Location Zone

- 221 Control Cabin, LH
- 222 Control Cabin, RH

C. Procedure

S 862-218-J00

**WARNING:** MAKE SURE YOU OPEN THE CIRCUIT BREAKERS FOR THE ENGINE IGNITION BEFORE YOU OPEN THE CIRCUIT BREAKERS FOR THE FUEL CONTROL VALVE. THE IGNITER PLUGS WILL AUTOMATICALLY FIRE IF YOU ARE OUT OF ZERO DETENT, NACELLE ANTI-ICE IS ON, CON IGNITION SWITCH IS SET TO "ON", OR ENGINE START SWITCH IS PULLED TO "ON". IF THE COMBUSTION CHAMBER HAS FUEL IN IT, AN INTERNAL ENGINE OR A TAILPIPE FIRE CAN OCCUR. THE FIRE CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE ENGINE.

(1) Open these circuit breakers and attach DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F1 IGN 1 ENG 1
- 2) 6F2 IGN 1 ENG 2
- 3) 6F3 IGN 1 ENG 3
- 4) 6F4 IGN 1 ENG 4

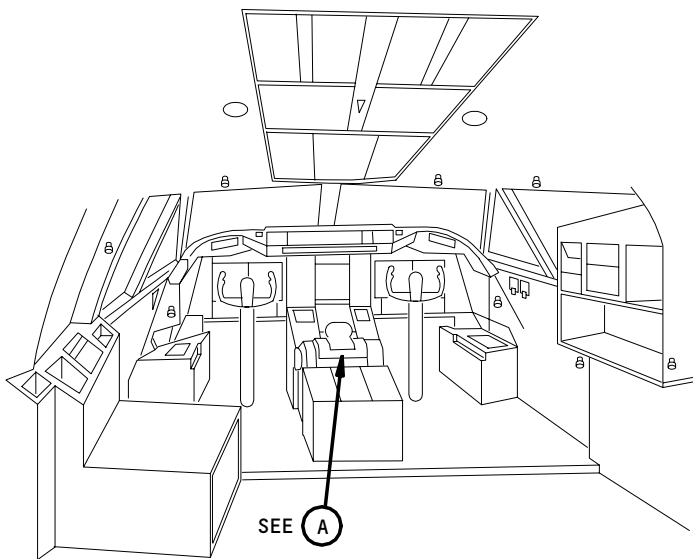
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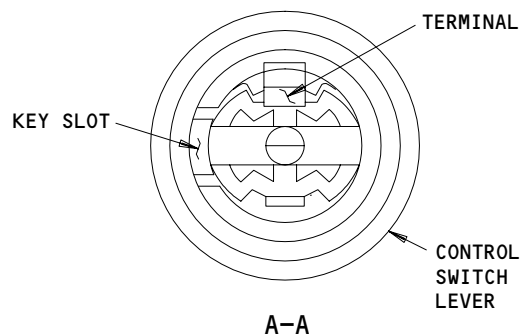
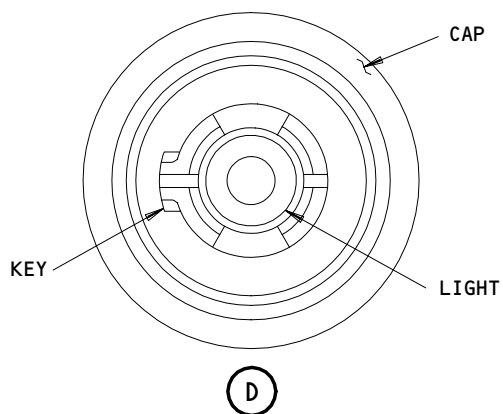
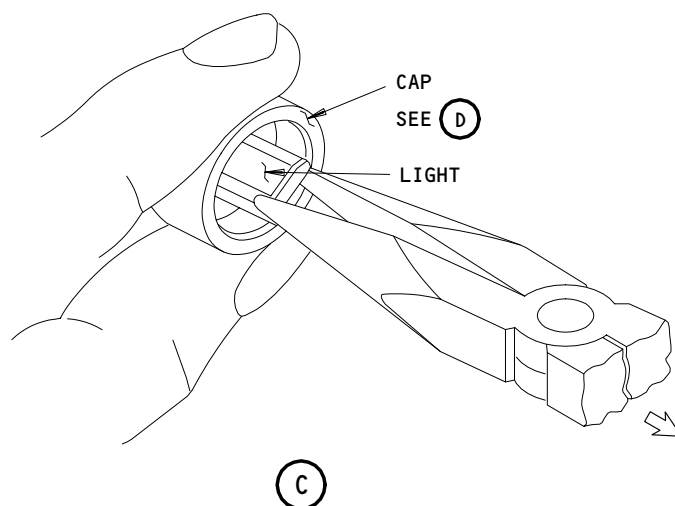
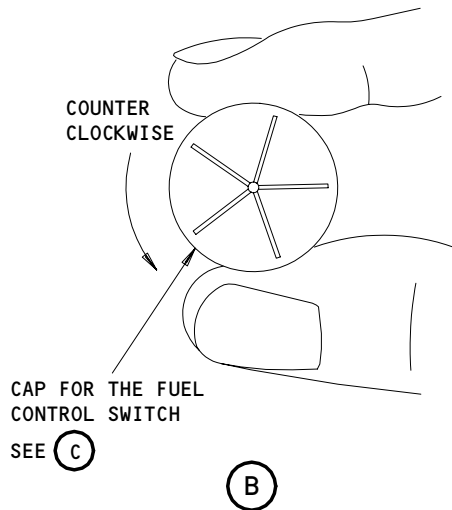
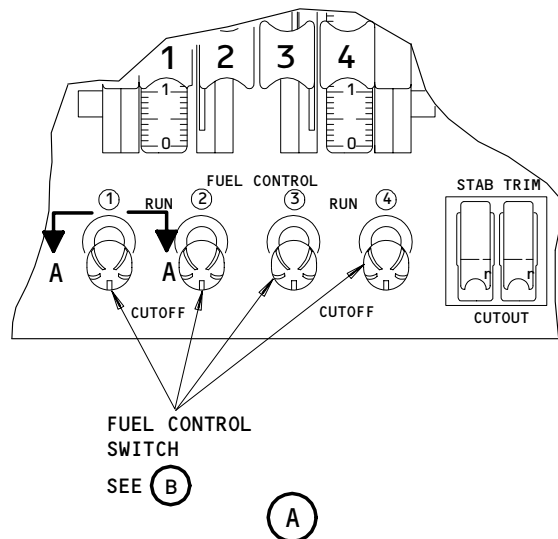
76-11-03

J02

Page 256  
Jun 10/97



FLIGHT COMPARTMENT



Fuel Control Switch Light Replacement  
Figure 213

EFFECTIVITY

ALL

76-11-03

J02

Page 257  
Jun 10/97

- 5) 6G1 FUEL SHUTOFF VALVE ENG 1
- 6) 6G2 FUEL SHUTOFF VALVE ENG 2
- 7) 6G3 FUEL SHUTOFF VALVE ENG 3
- 8) 6G4 FUEL SHUTOFF VALVE ENG 4
- 9) 6G19 STBY IGN ENG 1
- 10) 6G20 STBY IGN ENG 2
- 11) 6G21 STBY IGN ENG 3
- 12) 6G22 STBY IGN ENG 4
- 13) 6K19 IGN 2 ENG 1
- 14) 6K20 IGN 2 ENG 2
- 15) 6K21 IGN 2 ENG 3
- 16) 6K22 IGN 2 ENG 4
- 17) 6L10 FUEL CONT VALVE ENG 1
- 18) 6L11 FUEL CONT VALVE ENG 2
- 19) 6L12 FUEL CONT VALVE ENG 3
- 20) 6L13 FUEL CONT VALVE ENG 4

S 962-219-J00

(2) Replace the light (Fig. 213):

- (a) Turn the cap for the fuel control switch counterclockwise and remove the cap.

NOTE: Tools are not usually necessary to remove the cap.

- (b) Hold the cap in your hand.
- (c) Carefully hold the light terminal with needle nose pliers and pull the light from the cap.
- (d) Install a new light in the cap with light pressure from one finger.

NOTE: The light will make clicks when it is in the retainers.

- (e) Align the key in the cap with the key slot in the control switch lever.
- (f) Carefully push the cap down and turn it clockwise to put the cap on the control switch lever.

S 862-220-J00

(3) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

- (a) P6 Main Power Distribution Panel

- 1) 6F1 IGN 1 ENG 1
- 2) 6F2 IGN 1 ENG 2
- 3) 6F3 IGN 1 ENG 3
- 4) 6F4 IGN 1 ENG 4
- 5) 6G1 FUEL SHUTOFF VALVE ENG 1
- 6) 6G2 FUEL SHUTOFF VALVE ENG 2
- 7) 6G3 FUEL SHUTOFF VALVE ENG 3
- 8) 6G4 FUEL SHUTOFF VALVE ENG 4
- 9) 6G19 STBY IGN ENG 1
- 10) 6G20 STBY IGN ENG 2

EFFECTIVITY

ALL

76-11-03

J02

Page 258  
Jun 10/97



- 11) 6G21 STBY IGN ENG 3
- 12) 6G22 STBY IGN ENG 4
- 13) 6K19 IGN 2 ENG 1
- 14) 6K20 IGN 2 ENG 2
- 15) 6K21 IGN 2 ENG 3
- 16) 6K22 IGN 2 ENG 4
- 17) 6L10 FUEL CONT VALVE ENG 1
- 18) 6L11 FUEL CONT VALVE ENG 2
- 19) 6L12 FUEL CONT VALVE ENG 3
- 20) 6L13 FUEL CONT VALVE ENG 4

S 862-219-J00

- (4) Do this procedure: Operational Test for Fire/Overheat Detection Systems (AMM 26-10-00/501).

EFFECTIVITY

ALL

76-11-03

J02

Page 259  
Jun 10/97

AUTOTHROTTLE BRAKE ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the autothrottle brake assembly (referred to as the brake assembly) from the control stand. The second task is the installation of the brake assembly into the control stand.
- B. The brake assembly is removed and replaced as a unit through the left side of the control stand.
- C. To replace the brake assembly, you must do these steps:
  - (1) Do the deactivation procedure for the captain and first officer seats.
  - (2) Do the deactivation procedure for the autothrottle servomotor.
  - (3) Remove the autothrottle servomotor generator and gearbox.
  - (4) Replace the brake assembly.
  - (5) Adjust the thrust levers and thrust lever position resolvers.
  - (6) Install the servomotor generator and gearbox.
  - (7) Do the activation procedure for the captain and first officer seats.
  - (8) Do the activation procedure for the autothrottle servomotor.

TASK 76-11-04-004-001-J00

2. Autothrottle Brake Assembly Removal (Fig. 401)

- A. References
  - (1) 76-11-03/201, Control Stand
  - (2) 76-12-01/401, Autothrottle Servomotor Generator and Gearbox
  - (3) IPC 22-31-03 Fig. 1
- B. Access
  - (1) Location Zone
    - 221 Flight Compartment - LH
    - 222 Flight Compartment - RH
- C. Procedure
  - S 044-002-J00
    - (1) Do the deactivation procedure for the captain and first officer seats (Ref 76-11-03/201).
  - S 044-003-J00
    - (2) Do the deactivation procedure for the autothrottle servomotor (Ref 76-11-03/201).
  - S 034-004-J00
    - (3) Remove the side panels of the control stand (Ref 76-11-03/201).
  - S 014-004-J00
    - (4) Remove the servomotor generator and gearbox (Ref 76-12-01/401).
  - S 014-005-J00
    - (5) Remove the cross member from the left side of the control stand.

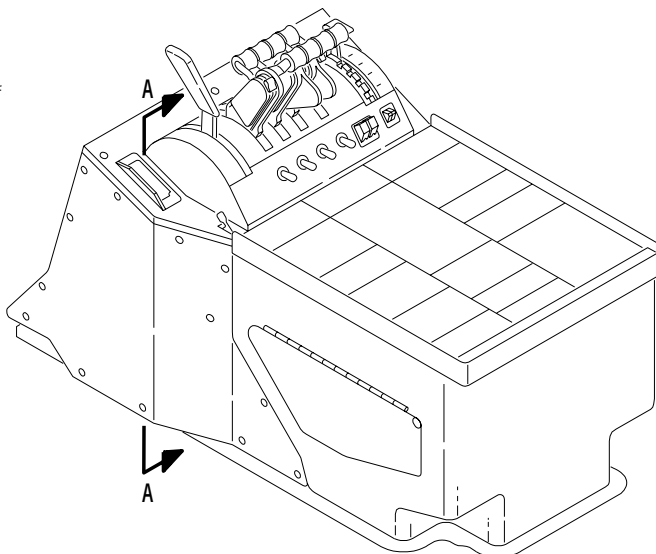
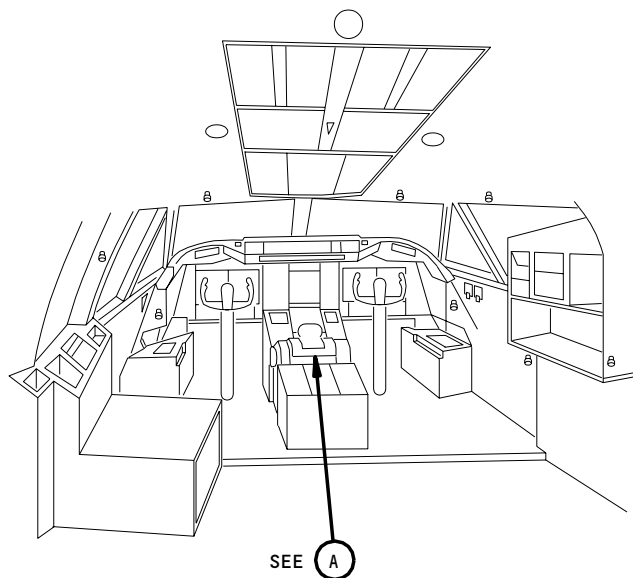
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**76-11-04**

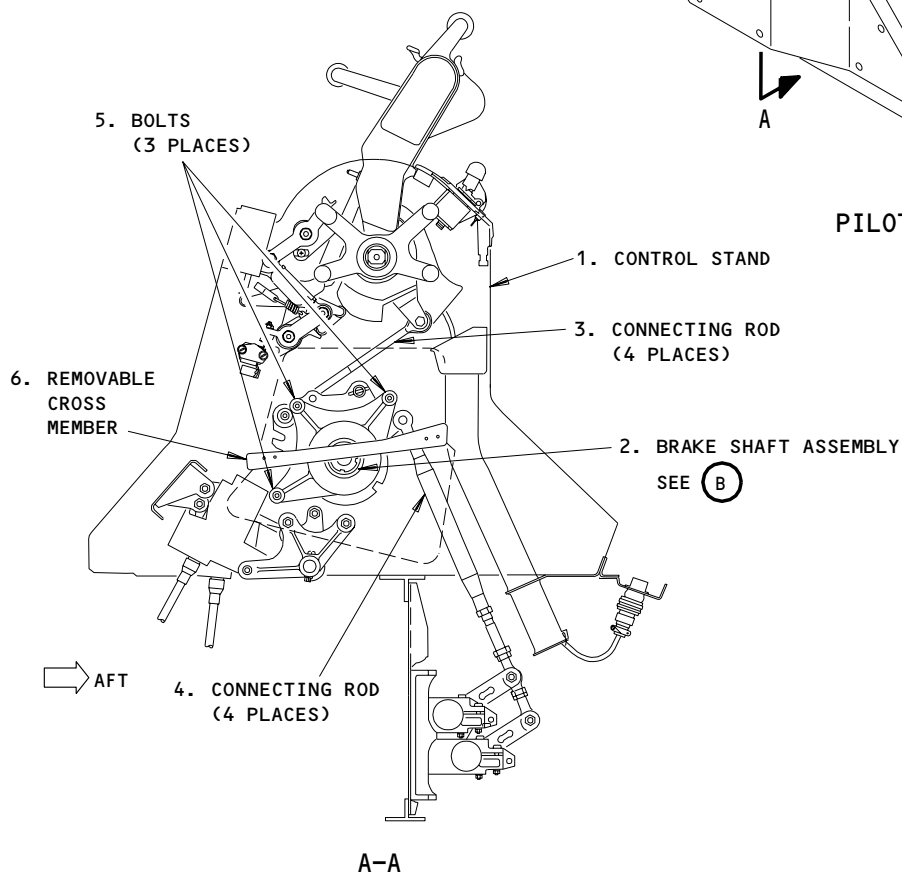
J02

Page 401  
Jun 10/93



PILOTS CONTROL STAND

(A)



Autothrottle Brake Shaft Assembly Installation  
Figure 401 (Sheet 1)

EFFECTIVITY

ALL

76-11-04

J01

Page 402  
Feb 10/89

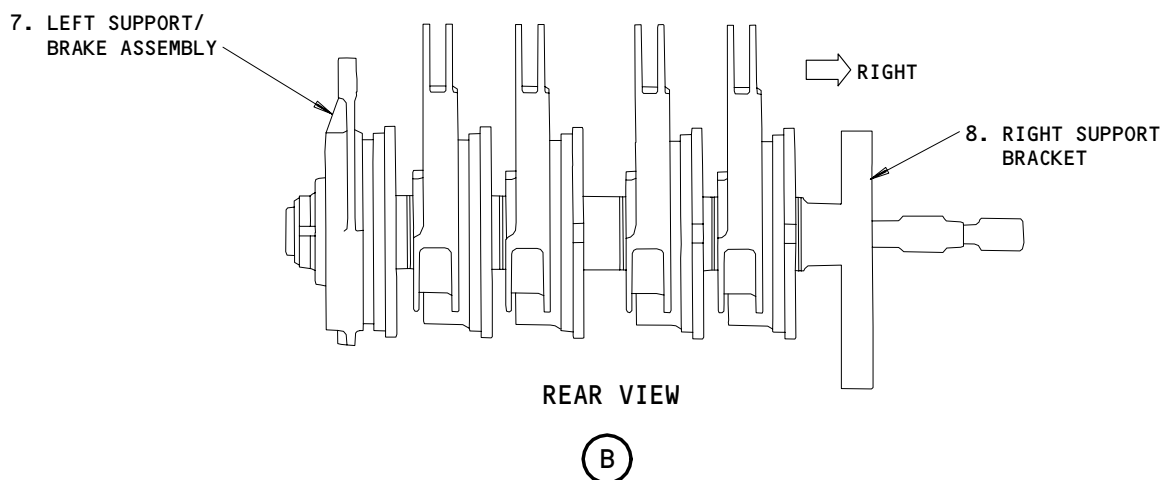
- S 034-006-J00
- (6) Disconnect eight connecting rods from the brake assembly.
- S 984-005-J00
- (7) Put the connecting rods to one side.
- S 034-007-J00
- (8) Hold the brake assembly while you do these steps:
- (a) Remove the three bolts from the left support/brake assembly.
  - (b) Remove the remaining bolt from the right support bracket.
- S 024-008-J00
- (9) Remove the brake assembly from the control stand through the opening on the left side of the control stand.

TASK 76-11-04-404-009-J00

3. Autothrottle Brake Assembly Installation

A. References

- (1) 76-11-01/501, Thrust Lever Assembly
- (2) 76-11-02/501, Thrust Lever Position Resolvers
- (3) 76-11-03/201, Control Stand
- (4) 76-12-01/401, Autothrottle Servomotor Generator and Gearbox
- (5) IPC 22-31-03-01 Fig. 1



Autothrottle Brake Shaft Assembly - Installation  
Figure 401 (Sheet 2)

EFFECTIVITY	
	ALL

76-11-04

J02

Page 403  
Feb 10/94

B. Access

(1) Location Zone

- 221 Flight Compartment - LH
- 222 Flight Compartment - RH

C. Procedure

S 424-010-J00

- (1) Install the brake assembly into the control stand through the opening of the support frame on the left side of the control stand.

S 434-011-J00

- (2) Install three bolts into the left support/brake assembly.

S 434-007-J00

- (3) Install one bolt into the right support bracket.

S 434-012-J00

- (4) Tighten the bolts.

S 434-013-J00

- (5) Connect four connecting rods between the thrust lever pack assembly and the brake assembly.

S 434-006-J00

- (6) Connect four connecting rods between the thrust lever position resolvers and the brake assembly.

S 834-014-J00

- (7) Adjust the thrust lever assemblies (Ref 76-11-01/501).

S 834-015-J00

- (8) Adjust the thrust lever position resolvers (Ref 76-11-02/501).

S 414-016-J00

- (9) Install the servomotor generator and gearbox (Ref 76-12-01/401).

S 434-017-J00

- (10) Install the side panels for the control stand (Ref 76-11-03/201).

S 864-018-J00

- (11) Do the activation procedure for the autothrottle servomotor (Ref 76-11-03/201).

S 864-019-J00

- (12) Do the activation procedure for the captain and first officer seats (Ref 76-11-03/201).

EFFECTIVITY

ALL

76-11-04

J03

Page 404  
Feb 10/92

AUTOTHROTTLE SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. The Autothrottle (A/T) System computation is performed by the Thrust Management Function (TMF) of the Flight Management Computer (FMC). A description of the autothrottle is therefore covered in the thrust management portion of the FMCS (Ref 34-61-00/001).
- B. The Central Maintenance Computer System (CMCS) (AMM 45-10-00/001) monitors the FMCS for autothrottle related faults or failures and is accessed through the Control Display Unit (CDU). The CDU acts as the focal control and display for initiating and interacting with BITE and for identifying faults in systems monitored by the CMCS.
- C. Faults or failures monitored by the CMCS appear as maintenance messages on the CDU. Autothrottle faults or failures will appear, therefore, on the CDU in maintenance messages identified by ATA Chapter 34-61, Flight Management (Ref 34-CMCS MESSAGE INDEX).
- D. A receptacle in the main equipment center (when installed) allows a remote CDU to interface with the CMC. The remote CDU permits access to autothrottle related BITE, faults, or failures from the main equipment center.
- E. Testing of the autothrottle system will be covered in the thrust management portion of the FMCS Adjustment/Test (Ref 34-61-00/501).

2. Autothrottle System Component Description

- A. Autothrottle Servomotor Generator, Gearbox, and Brake Assembly (Ref 76-11-04/401 and 76-12-01/401)
  - (1) The autothrottle servomechanism/brake assembly is a single unit to position all thrust levers as commanded by the thrust management computer.
  - (2) The autothrottle servomechanism is connected indirectly to each thrust lever by a connecting rod and indirectly to each thrust lever position resolver by a second connecting rod, through the brake assembly.
  - (3) The brake mechanism provides a friction feel force for the thrust lever and rotates to make contact with the reverse thrust lever interlock when reverse thrust is selected, but the thrust reversers have not yet completed translation beyond the null thrust position which is 50% of the distance from stow to deploy.
- B. Disengage Switches (Ref 76-12-02/401)
  - (1) Two disengage switches are located in thrust lever assembly 1, and two are located in thrust lever assembly 4.
  - (2) The disengage switches are used to manually disengage the autothrottle system.
  - (3) Two disengage switches are located in thrust lever assembly 1, and two are located in thrust lever assembly 4.

EFFECTIVITY

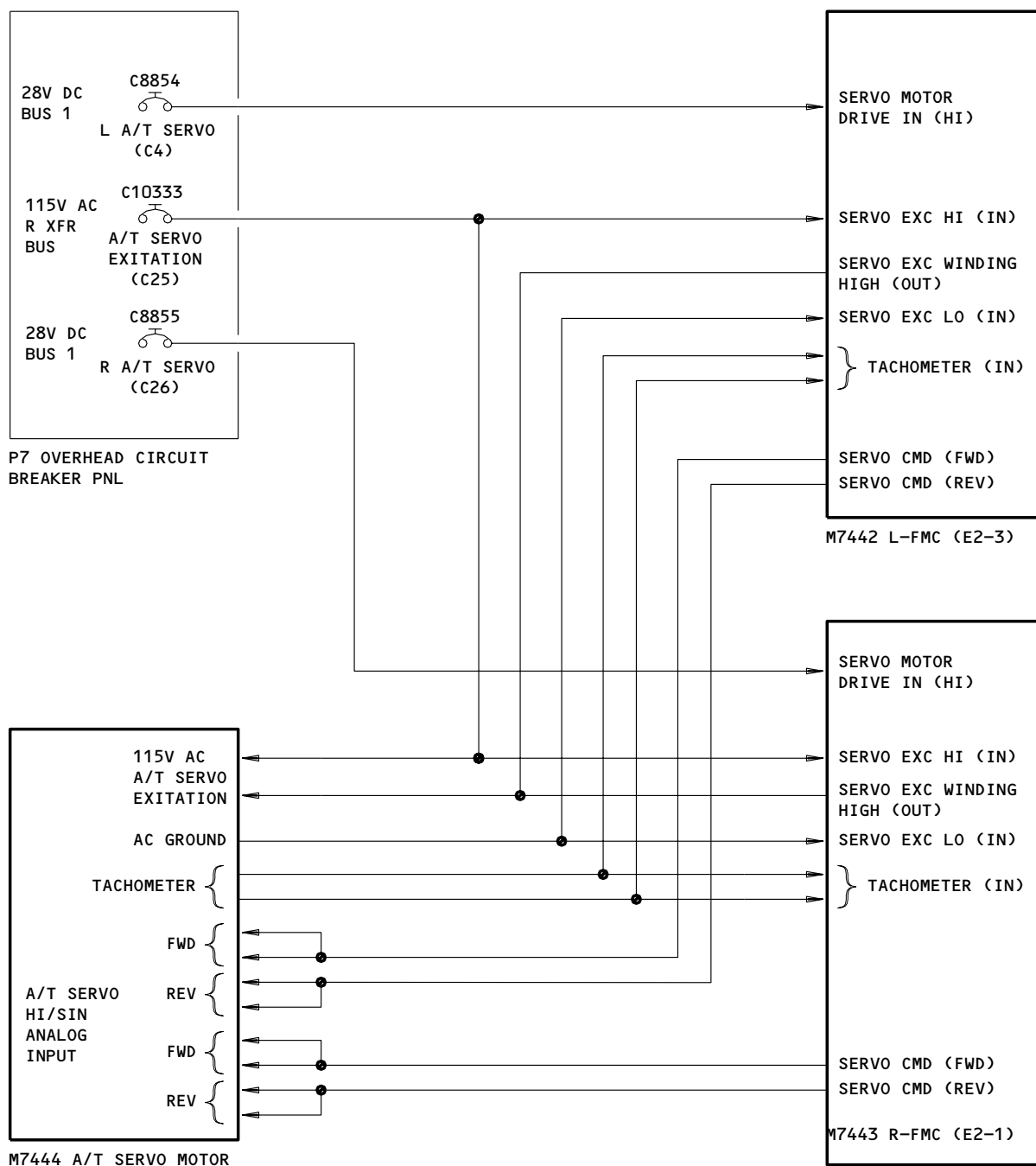
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76-12-00

J02

Page 1

Oct 10/95



FMC AUTOTHROTTLE SERVO MOTOR

Autothrottle Schematic  
Figure 1 (Sheet 1)

EFFECTIVITY

ALL

76-12-00

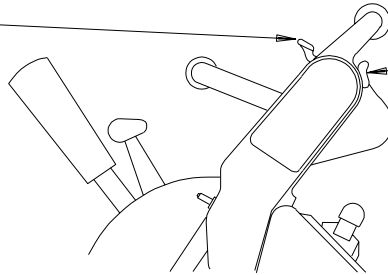
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Page 2  
Feb 10/89

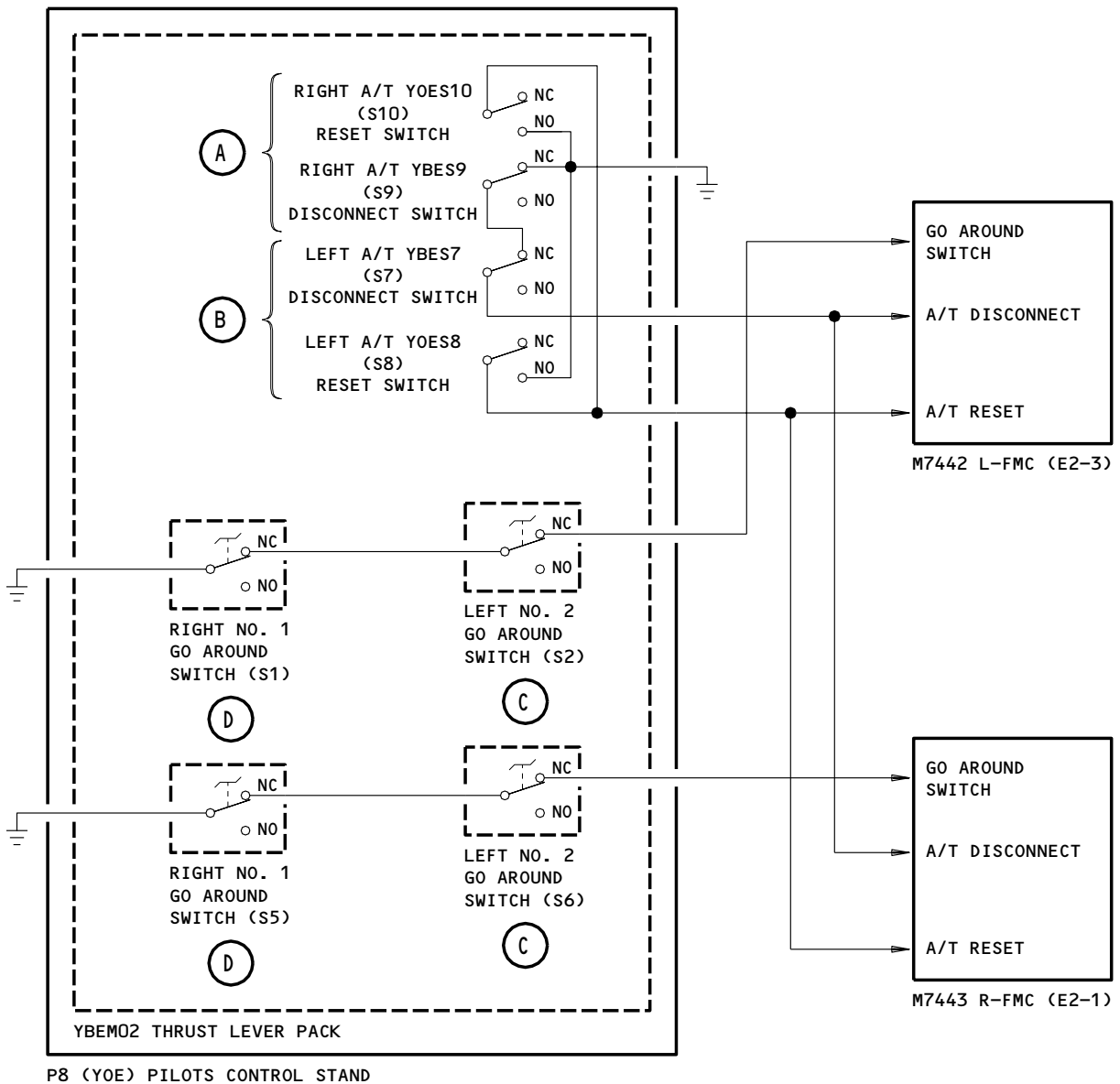
- GO AROUND SWITCH LEVERS
- LEFT LEVER FOR S2 AND S6  
SEE (C)
- RIGHT LEVER FOR S1 AND S5  
SEE (D)

FWD ←

- AUTOTHROTTLE DISCONNECT AND RESET SWITCH LEVERS
- LEFT LEVER FOR S7 AND S8  
SEE (B)
- RIGHT LEVER FOR S9 AND S10  
SEE (A)



THRUST LEVER ASSEMBLY



FMC THRUST LEVER SWITCHES

Autothrottle Schematic  
Figure 1 (Sheet 2)

EFFECTIVITY

ALL

76-12-00

J01

Page 3  
Feb 10/89



- C. Go-Around Switches (Ref 76-12-02/401)
- (1) Three go-around switches are located in thrust lever assembly 2, and three are located in thrust lever assembly 3.
  - (2) The go-around switches provide input to the FMC to signal go-around conditions selected. Go-Around flight control settings and thrust settings are preselected settings which are attained and controlled by the FMC when the go-around switches are closed.

EFFECTIVITY

ALL
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76-12-00

AUTOTHROTTLE SYSTEM - INSPECTION/CHECK

1. General

- A. This procedure has two tasks. The first task is to examine the control stand components for their design limits and wear limits. The second task is a visual inspection of the control stand components to make sure that the condition of the components is good and that they are correctly attached. You only need to do the first task if the results of the second task are unsatisfactory.

TASK 76-12-00-226-001-J00

2. Control Stand Components Inspection (Fig. 601)

A. General

- (1) This task is to examine these control stand components for the design limits and the wear limits:  
(a) Thrust lever assembly  
(b) Autothrottle brake assembly  
(c) Thrust lever position resolvers.

B. Consumable Materials

- (1) Grease, MIL-G-23827  
(2) Sealant, BMS 5-95

C. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels  
(2) AMM 76-11-03/201, Control Stand  
(3) AMM 78-31-00/201, Thrust Reverser System

D. Access

- (1) Location Zone  
221 Control Cabin, LH  
222 Control Cabin, RH

E. Procedure

S 866-002-J00

- (1) Remove the electrical power from the thrust lever switches (AMM 76-11-03/201)

S 866-003-J00

- (2) Do the deactivation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 866-004-J00

- (3) Remove the electrical power from the interlock actuators of the reverse thrust lever (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-12-00

J02

Page 601  
Oct 10/95

- S 866-005-J00
- (4) Remove the electrical power from the thrust lever position resolvers (AMM 76-11-03/201).
- S 866-006-J00
- (5) Remove the electrical power from the speed brake lever actuation circuits (AMM 76-11-03/201).
- S 866-007-J00
- (6) Remove the electrical power from the flap lever RVDT (AMM 76-11-03/201).
- S 016-008-J00
- (7) Remove the switch covers of the thrust lever assembly (AMM 76-11-03/201).
- S 016-009-J00
- (8) Remove the thrust lever cover of the control stand (AMM 76-11-03/201).
- S 016-010-J00
- (9) Remove the side panels of the control stand (AMM 76-11-03/201).
- S 016-011-J00
- (10) Remove the thrust lever rails of the control stand (AMM 76-11-03/201).
- S 226-012-J00
- (11) Do an inspection of the thrust lever assembly:

**NOTE:** The numbers in parenthesis after the component (example, bearings (1,3,4,6,7)) are the Index numbers from the table in Figure 601, Sheet 5-8). The Index numbers show a check for wear limit. There could be more than one Index number (check) for a component.

- (a) Remove the nut from the bearing/shaft assembly (4).

EFFECTIVITY

ALL

**76-12-00**

J02

Page 602  
Feb 10/95

- (b) Remove these components:
  - 1) The four bearing/shaft assembly (1)
  - 2) The four thrust lever/bolt (2)
  - 3) The four bearing/bolt (3)
  - 4) The five bearing/shaft assembly (4)
  - 5) The four crank assembly/bolt (5)
  - 6) The four bearing/bolt (6)
  - 7) The four bearing/lever (7)
  - 8) The four link/pivot rivet (8).
- (c) Do a check on the components that you removed for the correct limits as shown in the table.
  - 1) If the dimensions of the component exceed the given limits, do the applicable repair.
- (d) Install these components to assemble the thrust lever assembly:

NOTE: Apply a layer of MIL-G-23827 grease to the bearings.

- 1) The four link/pivot rivet (8)
  - 2) The four bearing/lever (7)
  - 3) The four bearing/bolt (6)
  - 4) The four crank assembly/bolt (5)
  - 5) The five bearing/shaft assembly (4)
  - 6) The four bearing/bolt (3)
  - 7) The four thrust lever/bolt (2)
  - 8) The four bearing/shaft assembly (1).
- (e) Install the nut to the bearing/shaft assembly (4).
  - 1) Tighten the nut to 150-180 in-lbs above the run on torque.

S 416-010-J00

- (12) Install the switch cover for the thrust lever assembly (AMM 76-11-03/201).

S 226-013-J00

- (13) Do an inspection of the autothrottle servomotor and brake assembly:
  - (a) Remove the autothrottle servomotor and brake assembly (AMM 76-11-04/401).
  - (b) Remove the locknut on the brake shaft assembly.

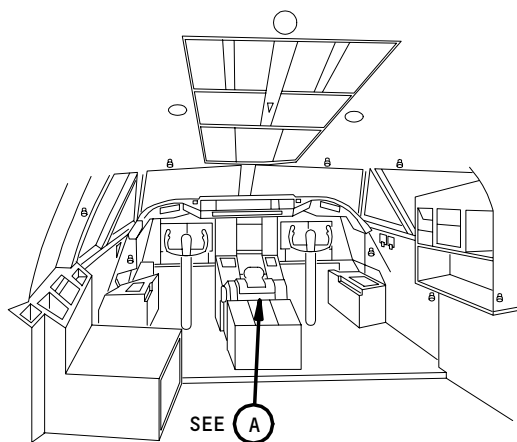
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ALL

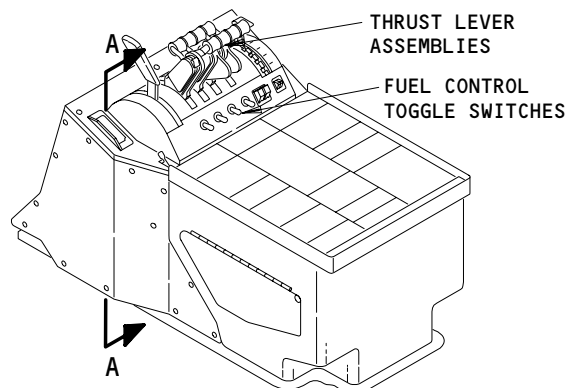
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J02

Page 603  
Feb 10/95

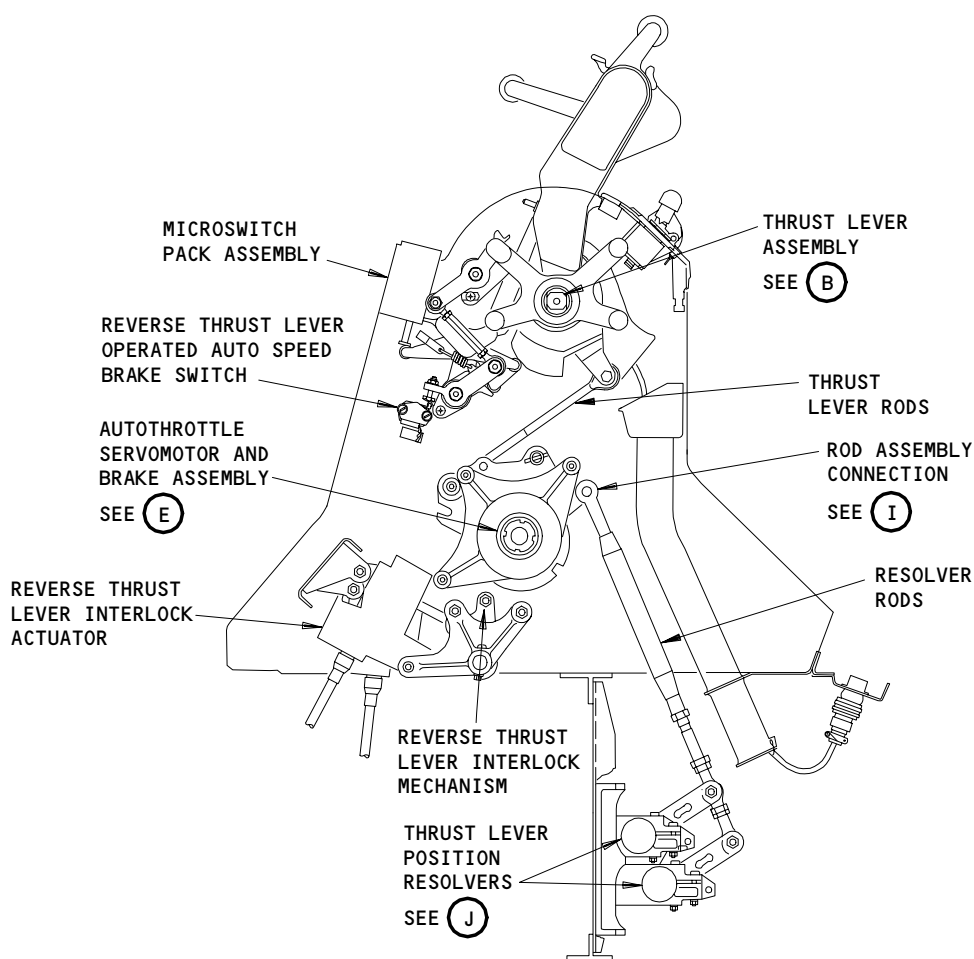


FLIGHT COMPARTMENT



CONTROL STAND

(A)



PILOTS' CONTROL STAND

A-A

Autothrottle System Inspection/Check  
Figure 601 (Sheet 1)

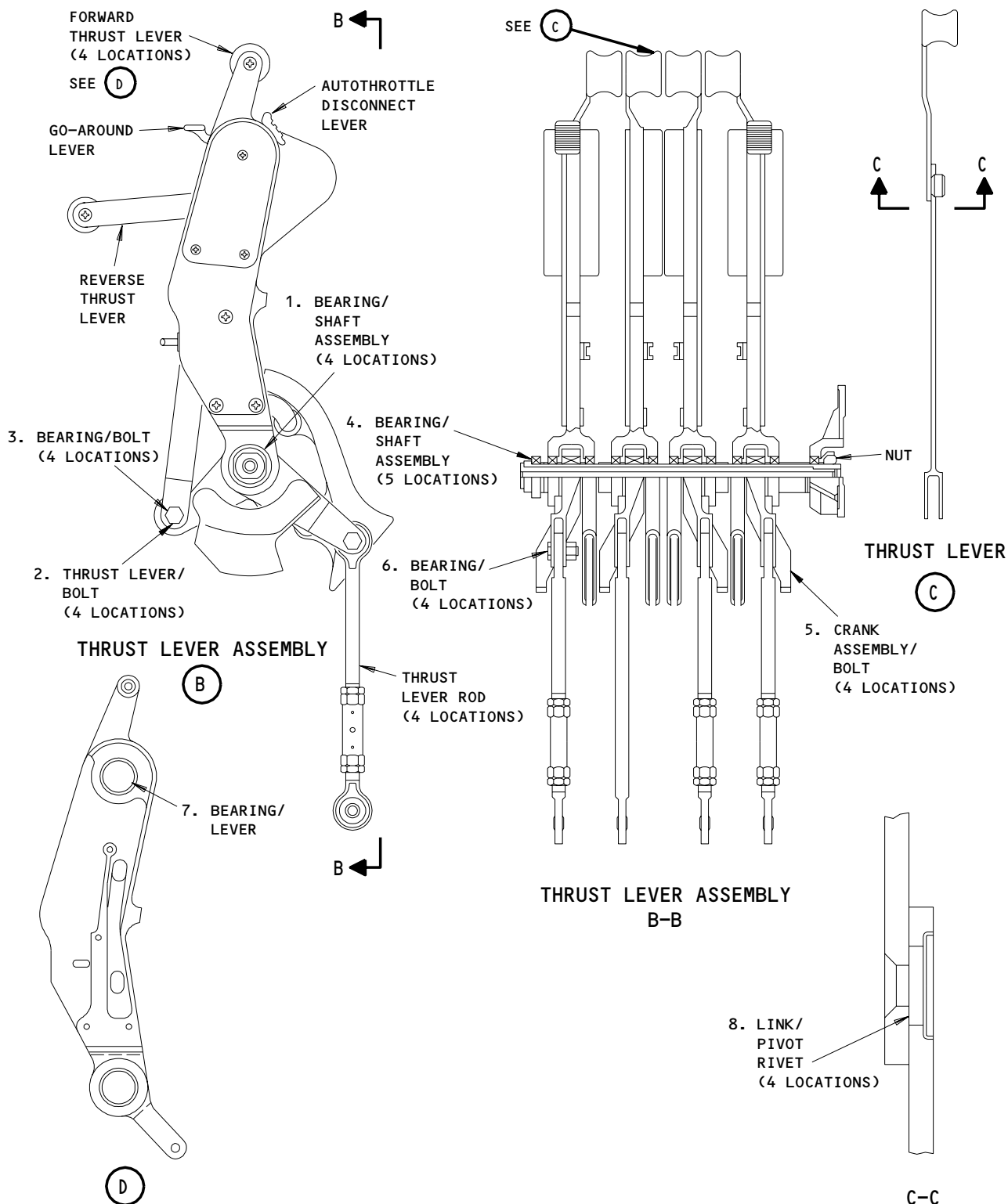
EFFECTIVITY

ALL

76-12-00

J02

Page 604  
Oct 10/93



Autothrottle System Inspection/Check  
Figure 601 (Sheet 2)

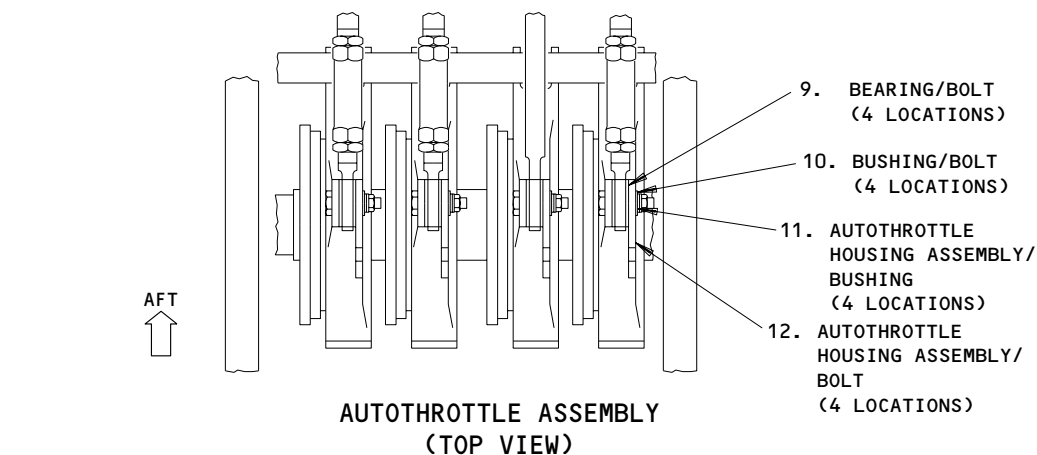
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ALL

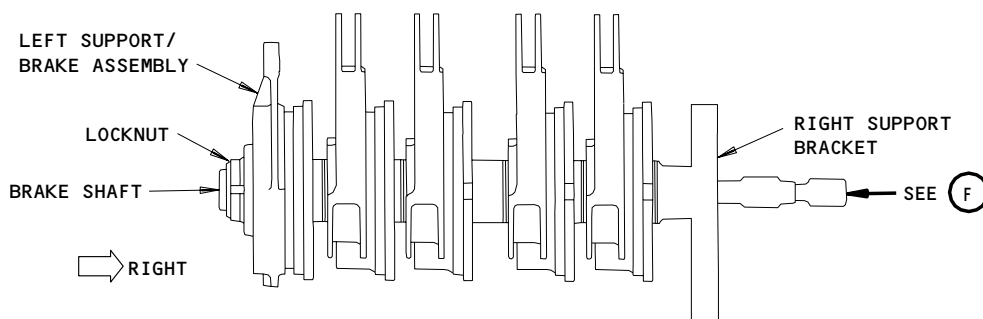
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J02

Page 605  
Feb 10/95

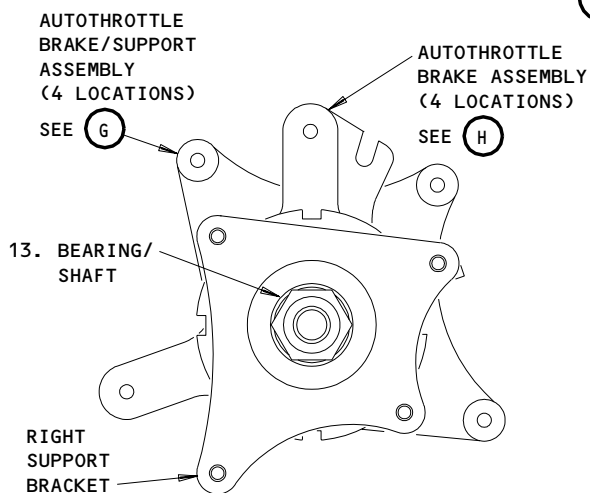


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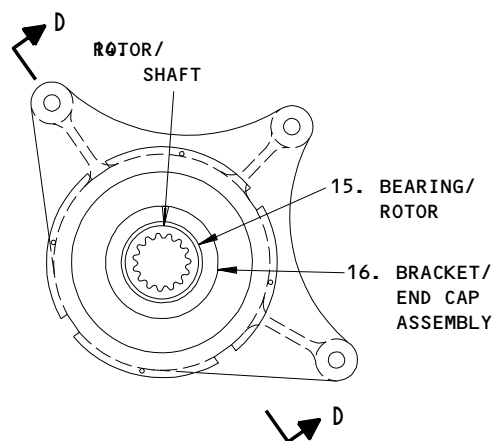


AUTOTHROTTLE SERVMOTOR AND BRAKE ASSEMBLY  
(REAR VIEW)

(E)



(F)



AUTOTHROTTLE BRAKE/SUPPORT ASSEMBLY

(G)

Autothrottle System Inspection/Check  
Figure 601 (Sheet 3)

EFFECTIVITY

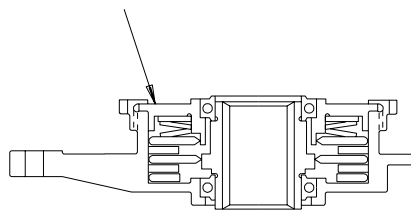
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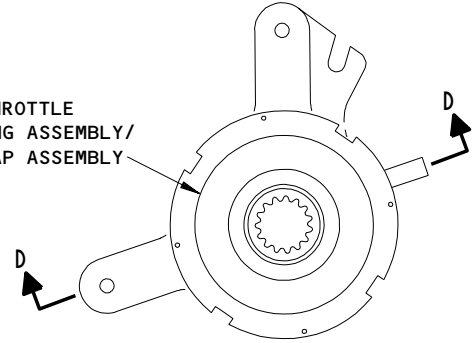
Page 606  
Feb 10/95

17. STATOR/ROTOR AND  
END CAP ASSEMBLY



D-D

18. AUTOTHROTTLE  
HOUSING ASSEMBLY/  
END CAP ASSEMBLY



AUTOTHROTTLE BRAKE ASSEMBLY

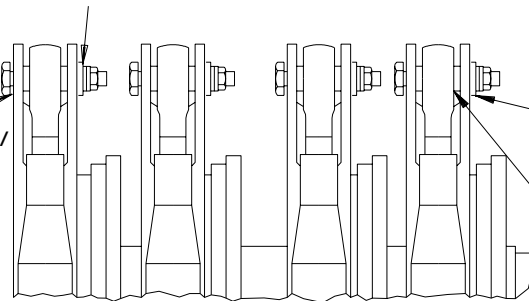
(H)

20. BUSHING/BOLT  
(4 LOCATIONS)

19. AUTOTHROTTLE  
HOUSING ASSEMBLY/  
BOLT  
(4 LOCATIONS)

21. AUTOTHROTTLE  
HOUSING ASSEMBLY/  
BUSHING  
(4 LOCATIONS)

ROD END BEARING  
(4 LOCATIONS)



ROD ASSEMBLY CONNECTION

(I)

24. RESOLVER CRANK/  
BOLT  
(4 LOCATIONS)

23. BUSHING/BOLT  
(4 LOCATIONS)

RESOLVER ROD 3

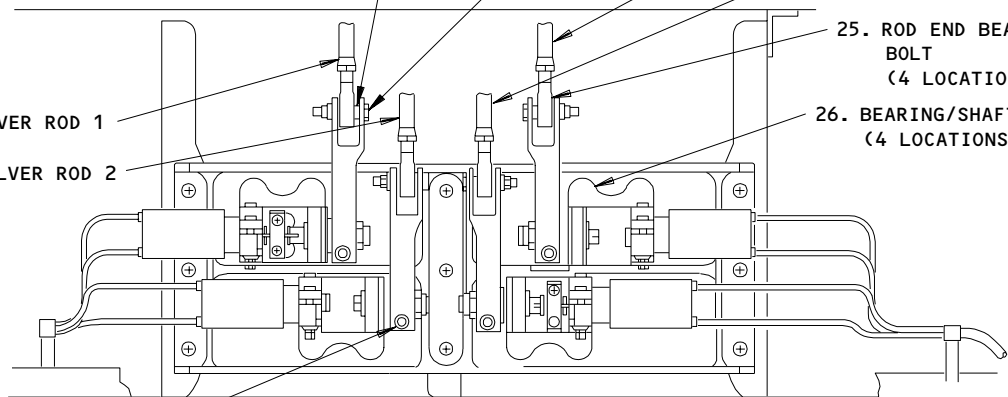
RESOLVER ROD 4

25. ROD END BEARING/  
BOLT  
(4 LOCATIONS)

26. BEARING/SHAFT  
(4 LOCATIONS)

RESOLVER ROD 1

RESOLVER ROD 2



22. RESOLVER CRANK/  
BUSHING  
(4 LOCATIONS)

THRUST LEVER POSITION RESOLVERS

(J)

Autothrottle System Inspection/Check  
Figure 601 (Sheet 4)

EFFECTIVITY

ALL

76-12-00

J02

Page 607  
Feb 10/95

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INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
1	BEARING B5539WZZFS428	ID	0.7495	0.7500	0.7508	0.002	X		
	SHAFT 253U5808-1	OD	0.7488	0.7493	0.7480			X	
2	THRUST LEVER 253U5809-1,-2	ID	0.2495	0.2505	0.2535	0.005	X		
	BOLT BACB30NF4-7	OD	0.2485	0.2495	0.2460		X		
3	BEARING MKSP4AFS428	ID	0.2497	0.2500	0.2525	0.004	X		
	BOLT BACB30NF4-7	OD	0.2485	0.2495	0.2460		X		
4	BEARING BACB10CF12PP	ID	0.7493	0.7507	0.7518	0.003	X		
	SHAFT 253U5808-1	OD	0.7488	0.7493	0.7480			X	
5	CRANK ASSY 253U5830	ID	0.2495	0.2505	0.2535	0.005	X		
	BOLT BACB30NF4-7	OD	0.2485	0.2495	0.2460		X		

Autothrottle System Inspection/Check  
Figure 601 (Sheet 5)

EFFECTIVITY

ALL

76-12-00

J02

Page 608  
Feb 10/95

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
8	LINK 253U5818-1	ID	0.375	0.376		0.006	X		
	PIVOT RIVET 253U5810-1	OD	0.372	0.373			X		
9	BEARING BACB10AC4A	ID	0.2495	0.2500	0.2525	0.004	X		
	BOLT BACB30NF4-11	OD	0.2485	0.2495	0.2460		X		
10	BUSHING BACB28AK04-21	ID	0.2500	0.2505	0.2530	0.0045	X		
	BOLT BACB30NF4-11	OD	0.2485	0.2495	0.2460		X		
11	AUTOTHROTTLE HOUS- ING ASSY 253U7202	ID	0.3705	0.3756	0.377	0.003		X	
	BUSHING BACB28AK04-21	OD	0.3740	0.3745	0.3726		X		
12	AUTOTHROTTLE HOUS- ING ASSY 253U7202	ID	0.2500	0.2505	0.2535	0.005	X		
	BOLT BACB30NF4-11	OD	0.2485	0.2495	0.2460		X		
13	BEARING BACB10AS17	ID	1.0620	1.0625	1.0640	0.0025	X		
	SHAFT 253U7208-1	OD	1.0615	1.0620	1.0600			X	
14	ROTOR 254N1165-3	ID	0.8750	0.8800	0.8820	0.008	X		
	SHAFT 253U7208-1	OD	0.8740	0.8745	0.8720		X		

Autothrottle System Inspection/Check  
Figure 601 (Sheet 6)

EFFECTIVITY

ALL



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

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Page 609  
Feb 10/95

**BOEING**  
747-400  
MAINTENANCE MANUAL

////////////////////  
/ CF6-80C SERIES /  
/ ENGINES /  
////////////////////

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
15	BEARING BACB10AS21	ID	1.3120	1.3125	1.340	0.0025	X		
	ROTOR 254N1165-2,-3	OD	1.3115	1.3120	1.310			X	
16	BRACKET 253U7210-1	ID	3.2515	3.2525	3.254	0.005	X		
	END CAP ASSY 254N1162-5	OD	3.2490	3.2495	3.248		X		
17	STATOR 254N1167-2		1.7495	1.7505	1.7515	0.0035	X		
	ROTOR 254N1165-2,-3 END CAP ASSY 254N1162-5		1.7480	1.7490	1.747		X		
18	AUTOTHROTTLE HOUS-ING ASSY 253U7202-1	ID	3.2515	3.2525	3.254	0.005	X		
	END CAP ASSY 254N1162-5	OD	3.2490	3.2495	3.248		X		
19	AUTOTHROTTLE HOUS-ING ASSY 253U7202	ID	0.2500	0.2505	0.2610	0.0045		X	
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
20	BUSHING BACB28AK04-21	ID	0.2500	0.2505	0.2530	0.0045	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
21	AUTOTHROTTLE HOUS-ING ASSY 253U7202	ID	0.3750	0.3756	0.3770	0.0030		X	
	BUSHING BACB28AK04-21	OD	0.3740	0.3745	0.3726		X		

 FEMALE SQUARE  
 MALE SQUARE

Autothrottle System Inspection/Check  
Figure 601 (Sheet 7)

EFFECTIVITY

ALL

76-12-00

J02

Page 610  
Feb 10/95

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
22	RESOLVER CRANK 253U5214-1	ID	0.3763	0.3768	0.3780	0.0025		X	
	BUSHING BACB28Y4C021	OD	0.3756	0.3761	0.3745		X		
23	BUSHING BACB28Y4C021	ID	0.2500	0.2515	0.2535	0.005	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
24	RESOLVER CRANK 253U5214-1	ID	0.2500	0.2610	0.2610	0.0125	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
25	ROD END BEARING BACB10AD12	ID	0.2497	0.2500	0.2525	0.004	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
26	BEARING B5538WZZFS428	ID	0.6245	0.6250	0.6255	0.0015	X		
	SHAFT 253U5219-1	OD	0.6240	0.6245	0.6235		X		

Autothrottle System Inspection/Check  
Figure 601 (Sheet 8)

EFFECTIVITY \_\_\_\_\_  
ALL

76-12-00

J02

Page 611  
Feb 10/95

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
21	AUTOTHROTTLE HOUS- ING ASSY 253U7202	ID	0.3750	0.3756	0.3770	0.0030		X	
	BUSHING BACB28AK04-21	OD	0.3740	0.3745	0.3726		X		
22	RESOLVER CRANK 253U5214-1	ID	0.3763	0.3768	0.3780	0.0025		X	
	BUSHING BACB28Y4C021	OD	0.3756	0.3761	0.3745		X		
23	BUSHING BACB28Y4C021	ID	0.2500	0.2515	0.2535	0.005	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
24	RESOLVER CRANK 253U5214-1	ID	0.2500	0.2610	0.2610	0.0125	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
25	ROD END BEARING BACB10AD12	ID	0.2497	0.2500	0.2525	0.004	X		
	BOLT BACB30NF4-16	OD	0.2485	0.2495	0.2460		X		
26	BEARING B5538WZZFS428	ID	0.6245	0.6250	0.6255	0.0015	X		
	SHAFT 253U5219-1	OD	0.6240	0.6245	0.6235		X		

Autothrottle System Inspection/Check  
Figure 601 (Sheet 9)

EFFECTIVITY

ALL

76-12-00

J02

Page 612  
Feb 10/95

- (c) Remove the brake shaft from the assembly.
- (d) Remove these components:
  - 1) The four bearing/bolt (9)
  - 2) The four bushing/bolt (10)
  - 3) The four autothrottle housing assembly/bushing (11)
  - 4) The four autothrottle housing assembly/bolt (12)
  - 5) The four bearing/shaft (13)
  - 6) The four rotor/shaft (14)
  - 7) The four bearing/rotor (15)
  - 8) The four bracket/end cap assembly (16)
  - 9) The four stator/rotor and end cap assembly (17)
  - 10) The four autothrottle housing assembly/end cap assembly (18)
  - 11) The four autothrottle housing assembly/bolt (19)
  - 12) The four bushing/bolt (20)
  - 13) The four autothrottle housing assembly/bushing (21).
- (e) Do a check on the components that you removed for the correct limits as shown in the table.
  - 1) If the dimensions of the component exceed the given limit, do the applicable repair.
- (f) Install these components to assemble the autothrottle brake assembly:

**NOTE:** Apply a layer of MIL-G-23827 grease to all of the mating surfaces.

- 1) The four autothrottle housing assembly/bushing (21)
  - 2) The four bushing/bolt (20)
  - 3) The four autothrottle housing assembly/bolt (19)
  - 4) The four autothrottle housing assembly/end cap assembly (18)
  - 5) The four stator/rotor and end cap assembly (17)
  - 6) The four bracket/end cap assembly (16)
  - 7) The four bearing/rotor (15)
  - 8) The four rotor/shaft (14)
  - 9) The four bearing/shaft (13)
  - 10) The four autothrottle housing assembly/bolt (12)
  - 11) The four autothrottle housing assembly/bushing (11)
  - 12) The four bushing/bolt (10)
  - 13) The four bearing/bolt (9).
- (g) Install the shaft.
  - (h) Install the locknut.
    - 1) Torque the nut to 100-150 in-lbs above the run on torque.
    - 2) The housing of the break/support assembly must have a minimum of 0.10 inch of axial travel when you install the locknut.
  - (i) Install the autothrottle servomotor and brake assembly (AMM 76-11-04/401).

EFFECTIVITY

ALL

76-12-00

J02

Page 613  
Feb 10/95

S 226-016-J00

- (14) Do an inspection of the thrust lever position resolvers:
- (a) Remove the passenger cabin ceiling panel to get access to the thrust lever position resolvers (referred to as the resolvers) (AMM 25-22-01/401).
  - (b) Remove the resolvers (AMM 76-11-02/401).
  - (c) Disconnect rod assemblies from resolver cranks.
  - (d) Remove these components:
    - 1) The four resolver crank/bushing (22)
    - 2) The four bushing/bolt (23)
    - 3) The four resolver crank/bolt (24)
    - 4) The four rod end bearing/bolt (25)
    - 5) The four bearing/shaft (26).
  - (e) Do a check on the components that you removed for the correct limits as shown in the table.
    - 1) If the dimensions of the components exceed the given limit, do the applicable repair.
  - (f) Install these components:

NOTE: Apply a layer of BMS5-95 wet sealant to the bushings.

- 1) The four bearing/shaft (26)
  - 2) The four rod end bearing/bolt (25)
  - 3) The four resolver crank/bolt (24)
  - 4) The four bushing/bolt (23)
  - 5) The four resolver crank/bushing (22).
- (g) Connect the rod assemblies to the resolver cranks.
  - (h) Install the resolvers (AMM 76-11-02/401).
  - (i) Install the passenger cabin ceiling panel (AMM 25-22-01/401).

S 416-018-J00

- (15) Install the thrust lever rails of the control stand (AMM 76-11-03/201).

S 416-019-J00

- (16) Install the side panels of the control stand (AMM 76-11-03/201).

S 416-020-J00

- (17) Install the thrust lever cover of the control stand (AMM 76-11-03/201).

S 416-021-J00

- (18) Install the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 866-022-J00

- (19) Supply electrical power to the thrust lever switches (AMM 76-11-03/201).

EFFECTIVITY

ALL

**76-12-00**

J02

Page 614  
Feb 10/95

- S 866-023-J00  
(20) Supply electrical power to the flap lever RVDT (AMM 76-11-03/201).
- S 866-024-J00  
(21) Supply electrical power to the speed brake lever actuation circuits (AMM 76-11-03/201).
- S 866-025-J00  
(22) Supply electrical power to the thrust lever position resolvers (AMM 76-11-03/201).
- S 866-026-J00  
(23) Supply electrical power to the interlock actuators of the reverse thrust lever (AMM 76-11-03/201).
- S 826-027-J00  
(24) Adjust the thrust lever assemblies (AMM 76-11-01/501).
- S 826-028-J00  
(25) Adjust the thrust lever position resolvers (AMM 76-11-02/501).
- S 866-029-J00  
(26) Do the activation procedure of the autothrottle servomotor (AMM 76-11-03/201).

TASK 76-12-00-216-032-J00

3. Visual Inspection of the Control Stand Components (Fig. 602)

A. General

- (1) This task is a visual inspection of these control stand components:  
(a) Thrust lever assembly  
(b) Autothrottle brake assembly  
(c) Thrust lever position resolvers.

B. References

- (1) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels  
(2) AMM 76-11-03/201, Control Stand

C. Access

- (1) Location Zone  
221 Control Cabin, LH  
222 Control Cabin, RH

D. Procedure

- S 866-038-J00  
(1) Remove the electrical power from the thrust lever switches (AMM 76-11-03/201).
- S 016-033-J00  
(2) Remove the side panels of the control stand (AMM 76-11-03/201).
- S 016-034-J00  
(3) Remove the passenger cabin ceiling panel (AMM 25-22-01/401).

EFFECTIVITY

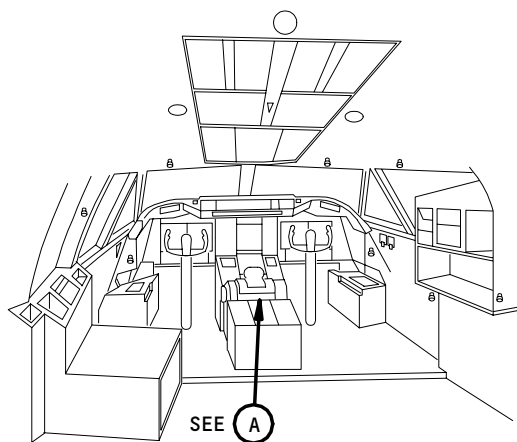
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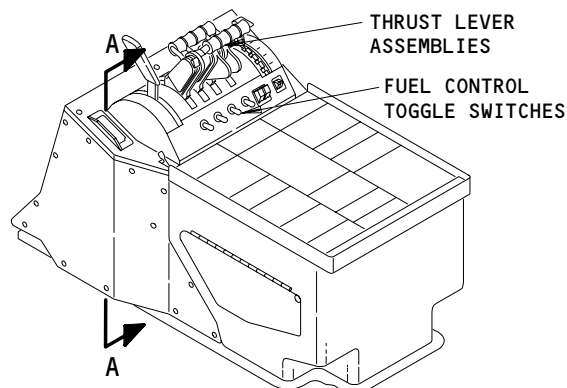
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Page 615  
Feb 10/95



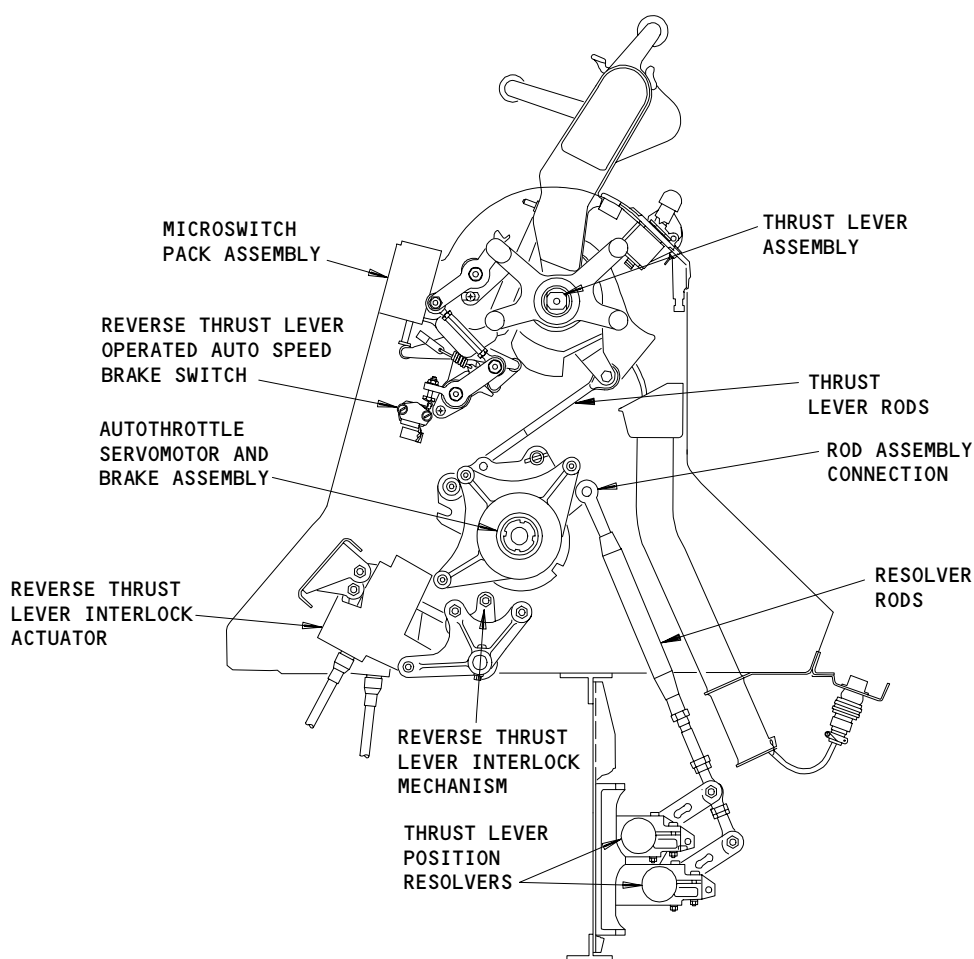


FLIGHT COMPARTMENT



CONTROL STAND

(A)



PILOTS' CONTROL STAND

A-A

Autothrottle System Inspection/Check  
Figure 602

EFFECTIVITY

ALL

76-12-00

J02

Page 616  
Feb 10/94

S 216-035-J00

- (4) Visually examine all of the components from the thrust lever to the resolver.
- (a) Look for cracks, corrosion or worn surfaces.
  - (b) Make sure that all fasteners are correctly attached.
  - (c) If the results of the visual inspection are unsatisfactory, you must refer to Control Stand Components Inspection for the wear limits.

S 866-036-J00

- (5) Move the forward and reverse thrust levers through their full range of travel.
- (a) Make sure that the thrust levers operate smoothly and do not bind.

S 416-002-J00

- (6) Install the side panels of the control stand (AMM 76-11-03/201).

S 416-003-J00

- (7) Install the passenger cabin ceiling panel (AMM 25-22-01/401).

S 866-011-J00

- (8) Supply electrical power to the thrust lever switches (AMM 76-11-03/201).

EFFECTIVITY

ALL

**76-12-00**

J02

Page 617  
Feb 10/95

AUTOTHROTTLE SERVOMOTOR GENERATOR AND GEARBOX - REMOVAL/INSTALLATION

1. General

- A. This procedure has three tasks. The first is the servomotor generator and gearbox removal. The other tasks are the installation procedures for the servomotor generator and the gearbox.
- B. The autothrottle servomotor generator is installed on the gearbox of the autothrottle drive assembly and is held in its position by three bolts. One multi-pin electrical connector is attached to the unit. The servomotor generator and gearbox can be removed and installed as a unit.
- C. To replace the servomotor generator and the gearbox, you must do these steps:
  - (1) Do the deactivation procedure for the autothrottle servomotor.
  - (2) Do the deactivation procedure for the pilots' seats.
  - (3) Remove the side panels from the control stand.
  - (4) Remove the servomotor generator from the gearbox if it is necessary.
  - (5) Remove the gearbox (with the servomotor generator if it is attached).
  - (6) Install the servomotor generator and the gearbox.
  - (7) Do the activation procedure for the pilots' seats.
  - (8) Do the activation procedure for the autothrottle servomotor.
  - (9) Install the side panels.
  - (10) Do the FMC operational test.

TASK 76-12-01-004-001-J00

2. Servomotor Generator and Gearbox Removal (Fig. 401)

A. References

- (1) 76-11-03/201, Control Stand
- (2) IPC 22-31-03 Fig. 1

B. Access

- (1) Location Zone  
222 Flight Compartment - Right

C. Procedure

S 034-002-J00

- (1) Remove the side panels of the control stand (Ref 76-11-03/201).

S 864-003-J00

- (2) Do the deactivation procedure for the captain and first officer seats (Ref 76-11-03/201).

S 864-004-J00

- (3) Do the deactivation procedure for the autothrottle servomotor (Ref 76-11-03/201).

S 864-005-J00

- (4) Attach the DO-NOT-OPERATE tags on all thrust levers.

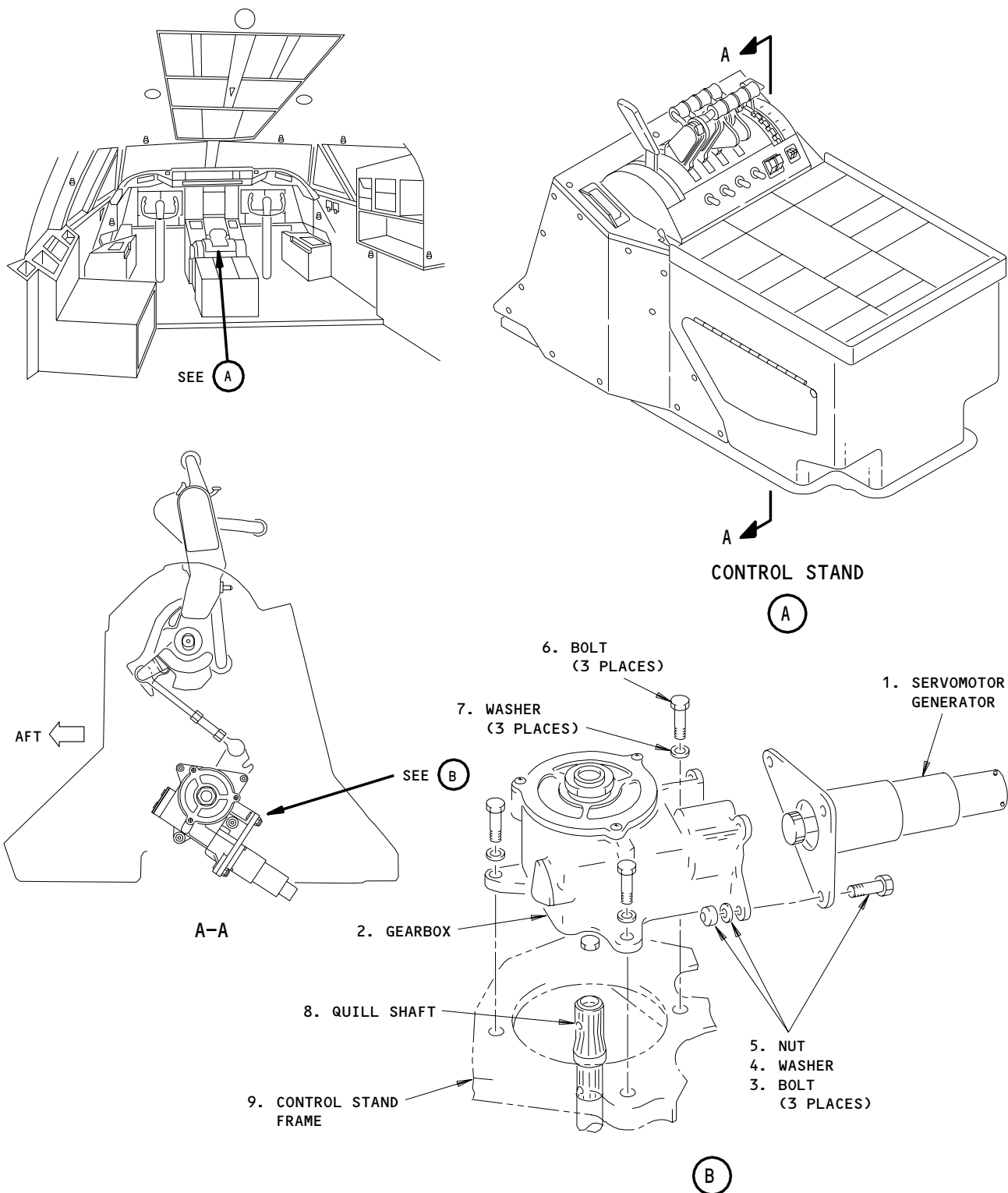
EFFECTIVITY

ALL

76-12-01

J03

Page 401  
Feb 10/92



Autothrottle Servomotor Generator Installation  
Figure 401

EFFECTIVITY

ALL

76-12-01

J01

Page 402  
Feb 10/89

S 034-006-J00

- (5) Remove the electrical connector DM7444 from the A/T servomotor generator M7444.

S 034-007-J00

- (6) To remove the servomotor generator from the gearbox, hold the servomotor generator while you do this step:  
(a) Remove the mounting bolts, washers and nuts that hold the servomotor generator to the gearbox.  
(b) Remove the servomotor generator.

S 034-008-J00

- (7) To remove the servomotor generator and the gearbox as an assembly, hold the assembly while you do this step:  
(a) Remove the mounting bolts and washers that attach the gearbox to the control stand.

S 024-009-J00

- (8) Remove the gearbox (or assembly).

TASK 76-12-01-404-010-J00

3. Servomotor Generator Gearbox Installation (Fig. 401)

A. References

- (1) 34-61-00/501, Flight Management Computer System  
(2) 76-11-03/201, Control Stand  
(3) IPC 22-31-03 Fig. 1

B. Access

- (1) Location Zone  
222 Flight Compartment - RH

C. Procedure

S 424-011-J00

- (1) Hold the gearbox assembly and engage the gearbox assembly splines with the quill shaft of the autothrottle brake assembly.

S 434-012-J00

- (2) Install the bolts and washers.

S 434-013-J00

- (3) Connect the electrical connector DM7444 to the autothrottle servomotor generator M7444.

S 864-014-J00

- (4) Do the activation procedure for the captain and first officer seats (Ref 76-11-03/201).

S 864-015-J00

- (5) Do the activation procedure for the autothrottle servomotor (Ref 76-11-03/201).

EFFECTIVITY

ALL

76-12-01

J03

Page 403  
Feb 10/92

S 034-016-J00

- (6) Install the side panels of the control stand (Ref 76-11-03/201).

S 714-017-J00

- (7) Do the FMCS Operational Test (Ref 34-61-00/501).

TASK 76-12-01-404-018-J00

4. Servomotor Generator Installation (Fig. 401)

A. Consumable Materials

- (1) D00013 Grease - MIL-G-23827

B. References

- (1) 34-61-00/501, Flight Management Computer System  
(2) 76-11-03/201, Control Stand  
(3) IPC 22-31-03 Fig. 1

C. Access

- (1) Location Zone  
222 Flight Compartment - Right

D. Procedure

S 644-019-J00

- (1) Apply lubricant on the drive gear of the servomotor generator.

NOTE: Apply a layer of MIL-G-23827 grease on all mating surfaces.

S 424-020-J00

CAUTION: CAREFULLY INSTALL THE SERVOMOTOR GENERATOR. THIS WILL PREVENT  
DAMAGE TO THE SPLINE ON THE GEARBOX.

- (2) Put the servomotor generator on the gearbox and install the mounting bolts, washers, and nuts.

S 434-021-J00

- (3) Connect the electrical connector DM7444 to the autothrottle servomotor generator M7444.

S 864-022-J00

- (4) Do the activation procedure for the captain and first officer seats (Ref 76-11-03/201).

S 864-023-J00

- (5) Do the activation procedure for the autothrottle servomotor (Ref 76-11-03/201).

S 034-024-J00

- (6) Install the side panels of the control stand (Ref 76-11-03/201).

EFFECTIVITY

ALL

76-12-01

J03

Page 404  
Feb 10/92

- S 714-025-J00  
(7) Do the FMCS Operational Test (Ref 34-61-00/501).

EFFECTIVITY

ALL
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76-12-01

J02

Page 405  
Feb 10/92

AUTOTHROTTLE DISCONNECT/RESET AND GO-AROUND SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the autothrottle disconnect/reset or the go-around switch. The second task is the installation of the autothrottle disconnect/reset or the go-around switch.
- B. The lever-operated autothrottle disconnect and the go-around switches are in the engine thrust levers. The autothrottle disconnect switches are installed in the No. 1 and 4 thrust levers. The go-around switches are installed in the No. 2 and 3 thrust levers.

NOTE: Three go-around switches are in each of the No. 2 and 3 thrust levers for the autothrottle and autopilot system. One autothrottle disconnect switch and one autothrottle reset switch is in each of No. 1 and 4 thrust levers.

- C. This table contains the equipment number and the thrust lever location for the components.

EFFECTIVITY

ALL

76-12-02

J02

Page 401  
Feb 10/95



EQUIPMENT NO.	COMPONENT	THRUST LEVER NO.
P12	CONNECTOR PLUG	1
P13	CONNECTOR PLUG	2
P14	CONNECTOR PLUG	3
P15	CONNECTOR PLUG	4
P19	CONNECTOR PLUG	2
P20	CONNECTOR PLUG	2
P21	CONNECTOR PLUG	3
P22	CONNECTOR PLUG	3
S1	L NO. 1 AFCS GO-AROUND SWITCH	2
S2	L NO. 2 AFCS GO-AROUND SWITCH	3
S3	C NO. 1 AFCS GO-AROUND SWITCH	2
S4	C NO. 2 AFCS GO-AROUND SWITCH	3
S5	R NO. 1 AFCS GO-AROUND SWITCH	2
S6	R NO. 2 AFCS GO-AROUND SWITCH	3
S7	AUTOTHROTTLE DISCONNECT SWITCH	1
S8	AUTOTHROTTLE RESET SWITCH	1
S9	AUTOTHROTTLE DISCONNECT SWITCH	4
S10	AUTOTHROTTLE RESET SWITCH	4

EQUIPMENT NUMBER AND LOCATION  
TABLE 401

EFFECTIVITY

ALL

**76-12-02**

J02

Page 402  
Jun 10/90

TASK 76-12-02-004-001-J00

2. Autothrottle Disconnect/Reset or Go-Around Switch Removal (Fig. 401 and 402)

A. General

- (1) It is not necessary to replace all of the switches if only one of them does not operate.
- (2) To remove the applicable switch, you must do these steps:
  - (a) Do the deactivation procedure for the autothrottle servomotor.
  - (b) Get access to the switch.
  - (c) Remove the switch.
  - (d) Unsolder the wires from the switch.

B. Equipment

- (1) Soldering tool

C. References

- (1) AMM 20-11-25/201, Heat guns and/or Soldering Irons
- (2) AMM 76-11-03/201, Control Stand
- (3) IPC 76-11-01 Fig. 2

D. Access

- (1) Location Zone
  - 221 Flight Compartment - L
  - 222 Flight Compartment - R

E. Procedure

S 864-020-J00

- (1) Do the deactivation procedure for the CAPT and F/O seats (AMM 76-11-03/201).

S 864-021-J00

**WARNING:** YOU MUST DO THE DEACTIVATION PROCEDURE FOR THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY. THE ACCIDENTAL OPERATION OF THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT. THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN MOVE THE THRUST LEVERS FROM THE FORWARD IDLE TO THE FULL FORWARD THRUST IN FIVE SECONDS.

- (2) Do the deactivation procedure for the autothrottle servomotor (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-12-02

J03

Page 403  
Oct 10/95

S 864-023-J00

- (3) To remove the autothrottle go-around switches for the applicable engine, open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P7 Overhead Circuit Breaker Panel

- 1) 7C1 FMCS FMC L
- 2) 7C23 FMCS FMC R
- 3) 7C4 FMCS A/T SERVO L
- 4) 7C25 FMCS A/T SERVO EXC
- 5) 7C26 FMCS A/T SERVO R
- 6) 7D8 FLT CONT CMPTR L PWR
- 7) 7D13 FLT CONT CMPTR C PWR
- 8) 7D15 FLT CONT CMPTR R PWR

S 864-019-J00

- (4) To remove the autothrottle disconnect/reset switches for the applicable engine, open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P6 Main Power Distribution Panel

- 1) 6F13 ENG 1 T/R CONT
- 2) 6E13 ENG 2 T/R CONT
- 3) 6D13 ENG 3 T/R CONT
- 4) 6C13 ENG 4 T/R CONT
- 5) 6F10 ENG 1 IDLE CONT/TMC DISCRETES
- 6) 6E10 ENG 2 IDLE CONT/TMC DISCRETES
- 7) 6D10 ENG 3 IDLE CONT/TMC DISCRETES
- 8) 6C10 ENG 4 IDLE CONT/TMC DISCRETES

S 864-003-J00

- (5) Make sure the engines are not in the operation.

S 034-004-J00

- (6) Remove the covers of the thrust lever switch (AMM 76-11-03/201).

S 024-018-J00

- (7) Remove the switch:

- (a) Remove the screws which attach the applicable switch and actuator assembly to the thrust lever.
- (b) Remove the switch and actuator from the thrust lever.
- (c) Remove the heat shrink tubing from the wire terminals.
- (d) Unsolder the wires from the switch (AMM 20-11-25/201).

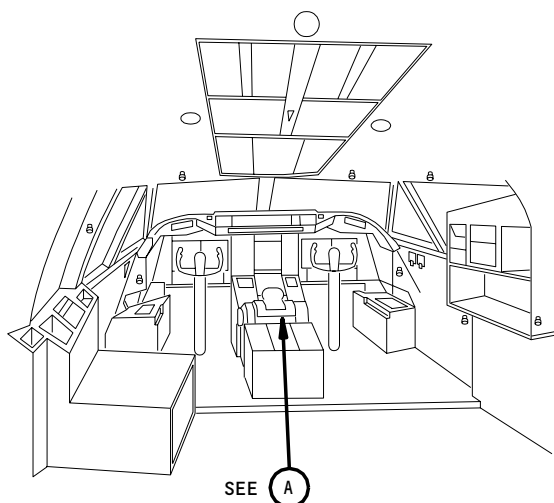
EFFECTIVITY

ALL

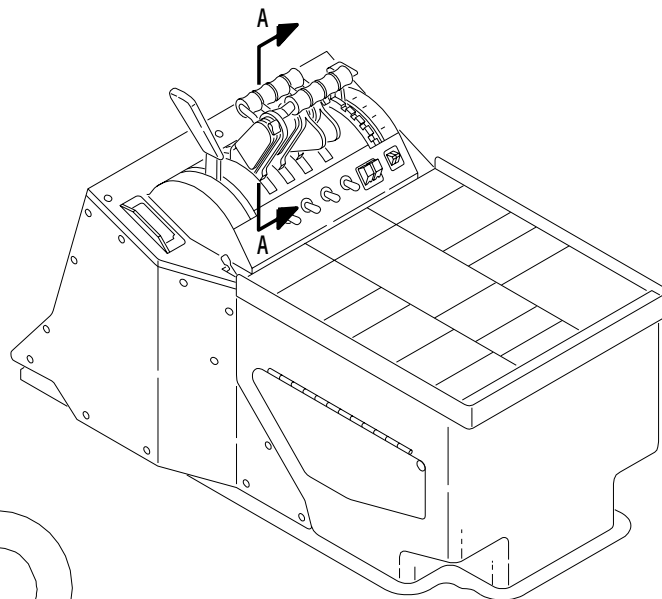
76-12-02

J03

Page 404  
Jun 10/93

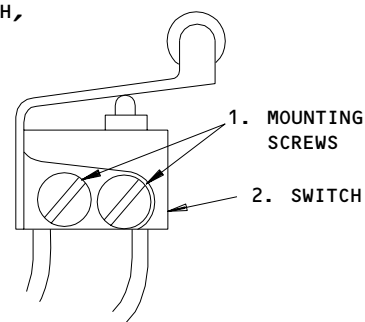
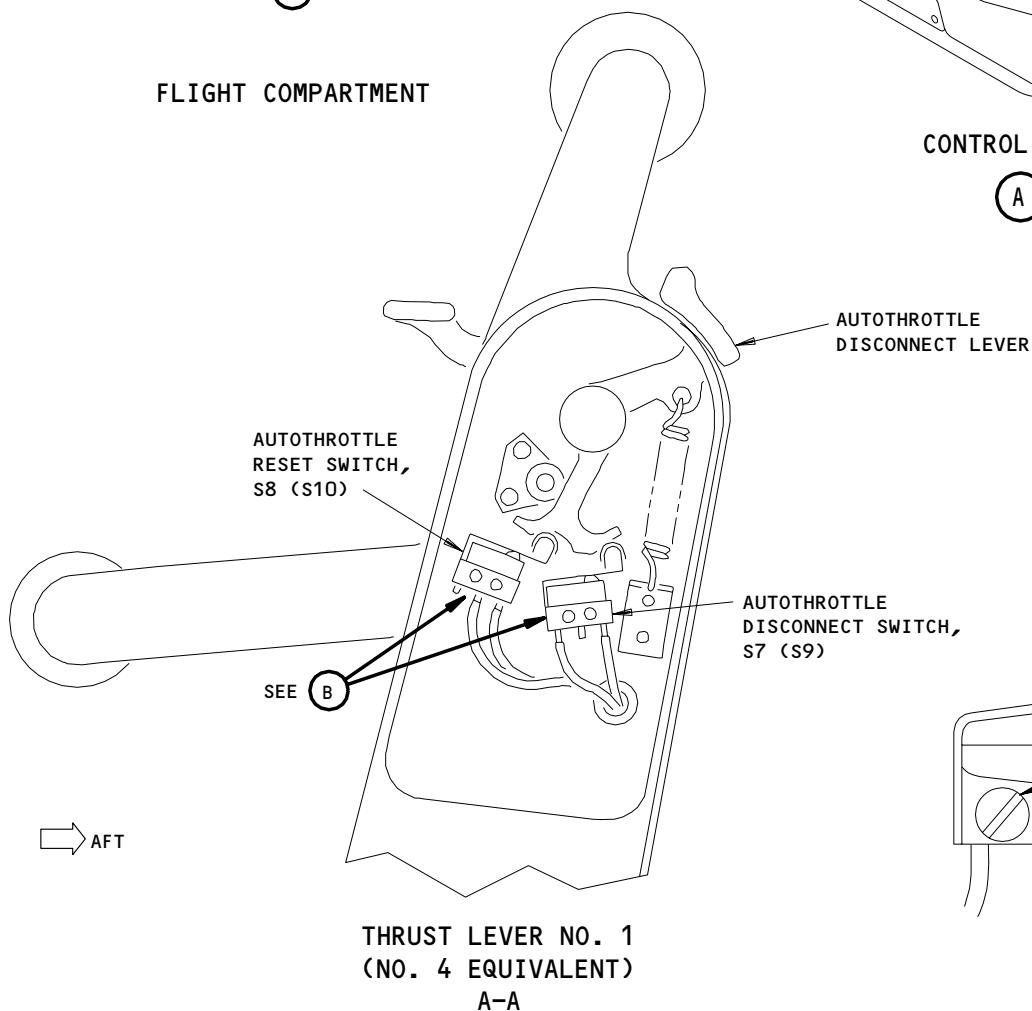


FLIGHT COMPARTMENT



CONTROL STAND

(A)



(B)

Autothrottle Disconnect Switch and Reset Switch Removal/Installation  
Figure 401

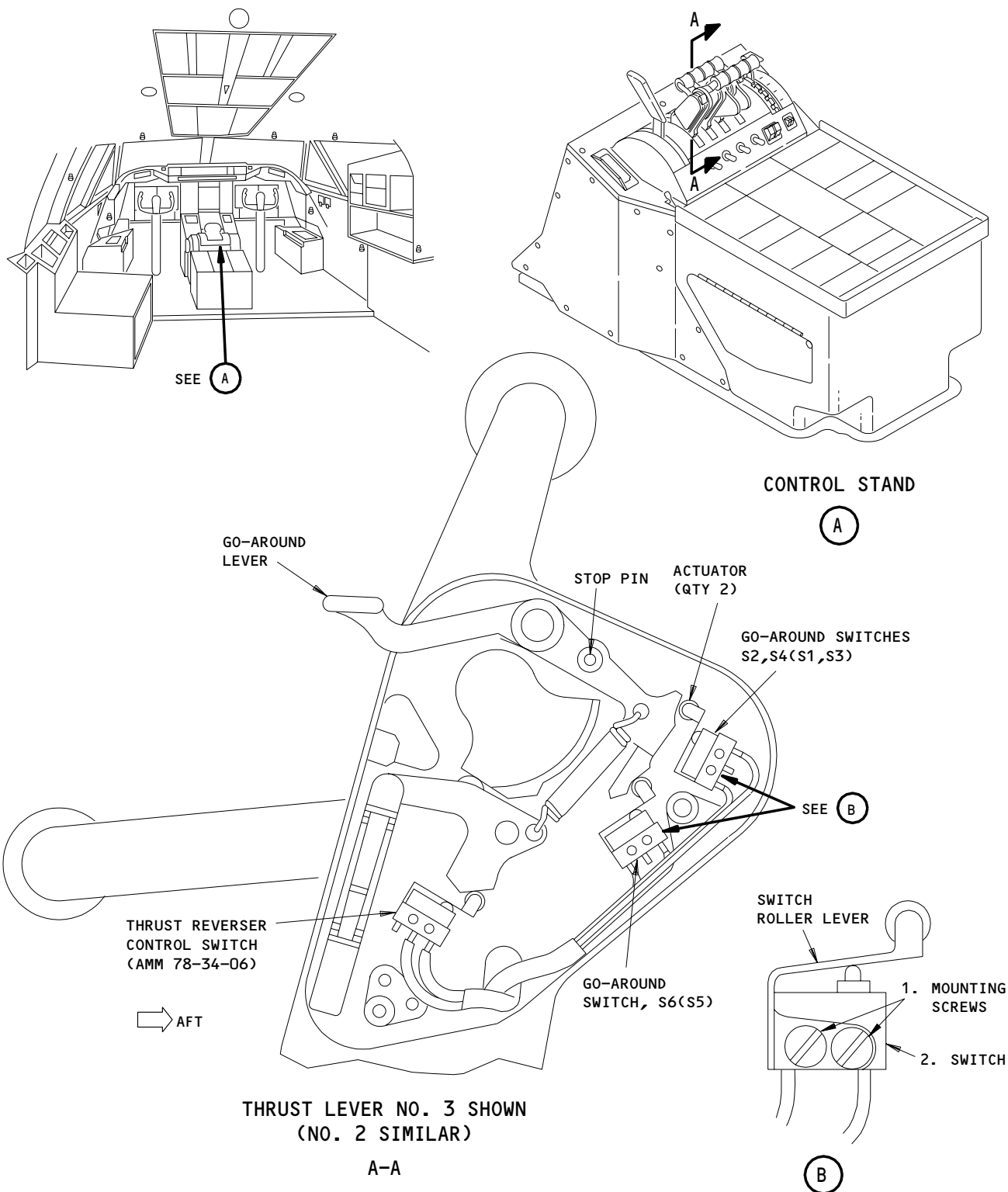
EFFECTIVITY

ALL

76-12-02

J02

Page 405  
Feb 10/95



Go-Around Switch Removal/Installation  
Figure 402

EFFECTIVITY

ALL

76-12-02

J02

Page 406  
Feb 10/95

TASK 76-12-02-404-017-J00

3. Autothrottle Disconnect/Reset or Go-Around Switch Installation

(Fig. 401 and 402)

A. General

- (1) It is not necessary to replace all of the switches if only one of them does not operate.

B. Equipment

- (1) Heat gun
- (2) Soldering tool

C. Consumable Materials

- (1) G02104 Heat Shrink Tubing - RT876, color yellow, Raychem Corp., Menlo Park, CA

D. References

- (1) AMM 20-11-25/201, Heat Guns and Soldering Guns
- (2) AMM 25-22-01/401, Main Passenger Cabin Ceiling Panels
- (3) AMM 76-12-02/501, Autothrottle Disconnect/Reset and Go-Around Switch
- (4) AMM 76-11-03/201, Control Stand
- (5) IPC 76-11-01 Fig. 2

E. Access

- (1) Location Zone
  - 221 Flight Compartment - L
  - 222 Flight Compartment - R

F. Procedure

S 424-018-J00

- (1) Install the switch:
  - (a) Put the heat shrink tubing on the wires.
  - (b) Solder the wires to the new switch (AMM 20-11-25/201).
  - (c) Heat shrink the tubing on the wire terminals (AMM 20-11-25/201).
  - (d) Put the switch and the actuator in its position on the thrust lever.

NOTE: Install the switch with the plunger in the aft direction.

- (e) Install the two screws.

EFFECTIVITY

ALL

76-12-02

J03

Page 407  
Feb 10/95

S 864-027-J00

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

(a) P6 Main Power Distribution Panel

- 1) 6F13 ENG 1 T/R CONT
- 2) 6E13 ENG 2 T/R CONT
- 3) 6D13 ENG 3 T/R CONT
- 4) 6C13 ENG 4 T/R CONT
- 5) 6F10 ENG 1 IDLE CONT/TMC DISCRETES
- 6) 6E10 ENG 2 IDLE CONT/TMC DISCRETES
- 7) 6D10 ENG 3 IDLE CONT/TMC DISCRETES
- 8) 6C10 ENG 4 IDLE CONT/TMC DISCRETES

S 864-031-J00

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

(a) P7 Overhead Circuit Breaker Panel

- 1) 7C1 FMCS FMC L
- 2) 7C23 FMCS FMC R
- 3) 7C4 FMCS A/T SERVO L
- 4) 7C25 FMCS A/T SERVO EXC
- 5) 7C26 FMCS A/T SERVO R
- 6) 7D8 FLT CONT CMPTR L PWR
- 7) 7D13 FLT CONT CMPTR C PWR
- 8) 7D15 FLT CONT CMPTR R PWR

S 824-020-J00

- (4) Do the procedure for the Autothrottle Disconnect/Reset and Go-Around Switch - Adjustment (AMM 76-12-02/501).

S 414-015-J00

- (5) Install the covers of the thrust lever switch (AMM 76-11-03/201).

S 864-016-J00

- (6) Do the activation procedure for the autothrottle servomotor (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-12-02

J03

Page 408  
Feb 10/95

- S 864-022-J00
- (7) Do the activation procedure for the CAPT and F/O seats  
(AMM 76-11-03/201).

EFFECTIVITY	
	ALL

76-12-02

J03

Page 409  
Feb 10/95



AUTOTHROTTLE DISCONNECT/RESET AND GO-AROUND SWITCH - ADJUSTMENT/TEST

1. General

- A. Do this procedure with an ambient temperature higher than 60°F but less than 90°F.
- B. You must operate all test equipment for a minimum of 10 minutes before you use them to let the operating temperature become stable.
- C. The disconnect/reset switch adjustment does a test of these autothrottle switches:
  - (1) S7 and S8 switches installed in the thrust lever No. 1 and S9 and S10 switches installed in the thrust lever No. 4.
- D. The go-around switch adjustment does a test of these autothrottle switches:
  - (1) S1, S3, and S5 switches installed in the thrust lever No. 2 and S2, S4, and S6 switches installed in the thrust lever No. 3.

TASK 76-12-02-705-033-J00

2. Autothrottle Disconnect/Reset Switch Adjustment (Fig. 501)

- A. Equipment
  - (1) Digital Multimeter - Range 0-50  $\pm 0.01$  volts RMS
- B. References
  - (1) AMM 76-11-03/201, Control Stand
  - (2) IPC 76-11-03
- C. Access
  - (1) Location Zone
    - 221 Control Cabin, LH
    - 222 Control Cabin, RH
- D. Procedure
  - S 865-001-J00
    - (1) Do the deactivation procedure for the captain and first officer seats (AMM 76-11-03/201).
  - S 865-035-J00
    - (2) Remove the electrical power from the thrust lever switches (AMM 76-11-03/201).

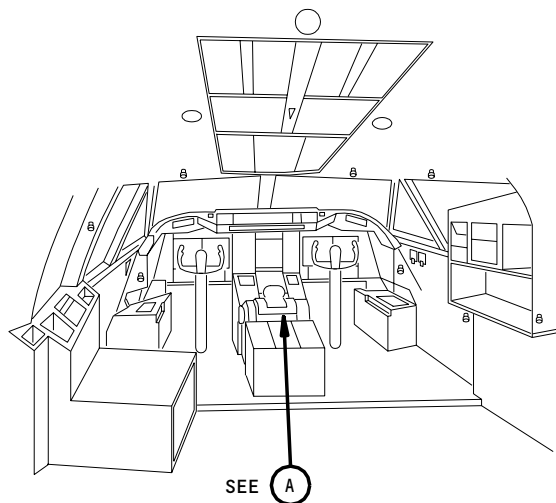
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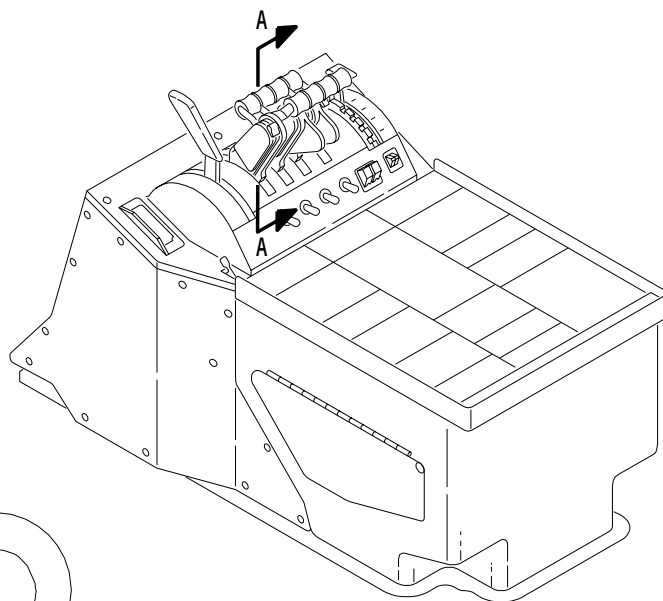
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J02

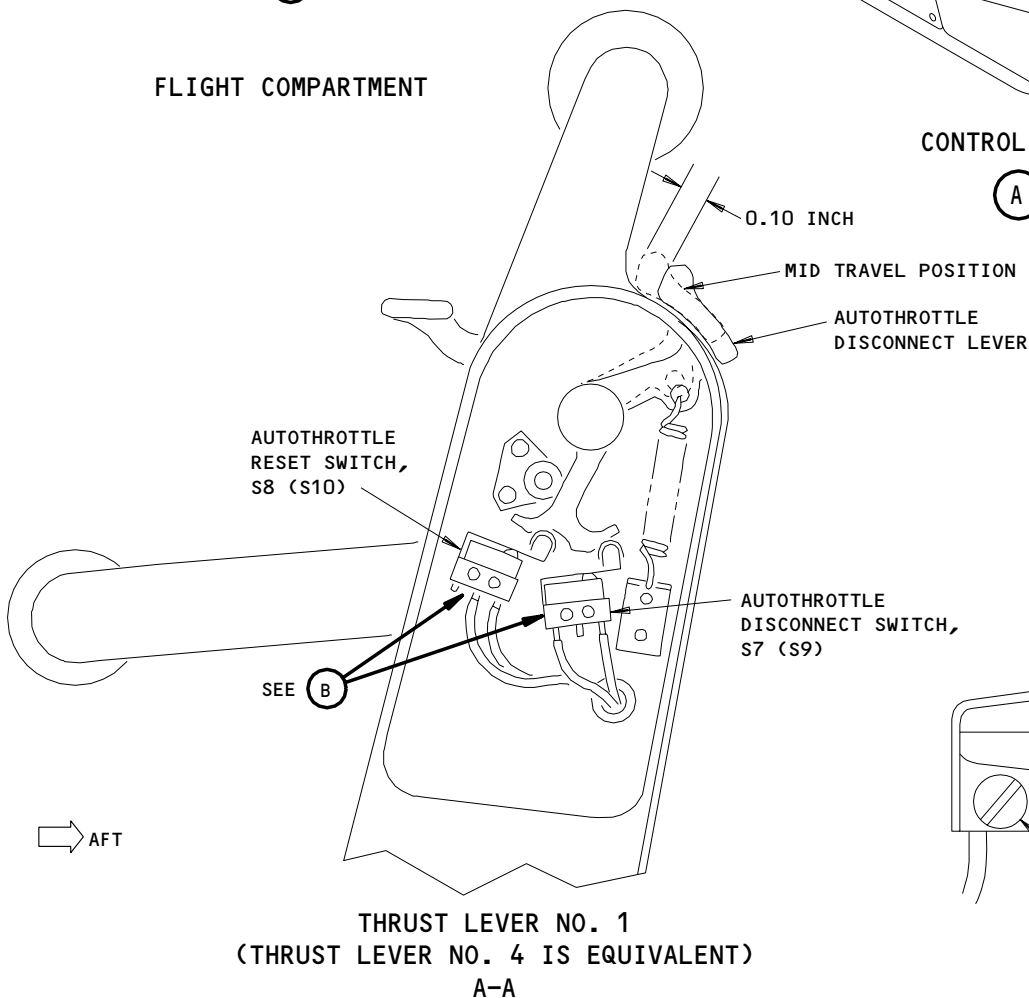
Page 501  
Oct 10/94



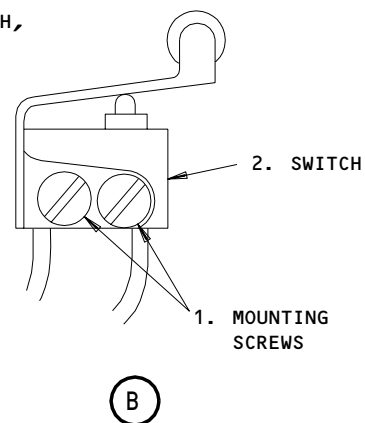
FLIGHT COMPARTMENT



CONTROL STAND



THRUST LEVER NO. 1  
(THRUST LEVER NO. 4 IS EQUIVALENT)  
A-A



Autothrottle Disconnect Switch and Reset Switch Adjustment  
Figure 501

EFFECTIVITY

ALL

76-12-02

J01

Page 502  
Oct 10/94

S 865-053-J00

**WARNING:** YOU MUST DO THE DEACTIVATION PROCEDURE FOR THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY. THE ACCIDENTAL OPERATION OF THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT. THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN MOVE THE THRUST LEVERS FROM THE FORWARD IDLE TO THE FULL FORWARD THRUST IN FIVE SECONDS.

- (3) Do the deactivation procedure for the autothrottle servomotor (AMM 76-11-03/201).

S 035-003-J00

- (4) Remove the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 865-040-J00

- (5) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
- (a) P6 Main Power Distribution Panel
    - 1) 6F13 ENG 1 T/R CONT
    - 2) 6E13 ENG 2 T/R CONT
    - 3) 6D13 ENG 3 T/R CONT
    - 4) 6C13 ENG 4 T/R CONT
    - 5) 6F10 ENG 1 IDLE CONT/TMC DISCRETES
    - 6) 6E10 ENG 2 IDLE CONT/TMC DISCRETES
    - 7) 6D10 ENG 3 IDLE CONT/TMC DISCRETES
    - 8) 6C10 ENG 4 IDLE CONT/TMC DISCRETES

S 865-036-J00

- (6) Adjust the applicable autothrottle disconnect (S7) or reset (S8) switch:
- (a) Push and hold the disconnect switch lever on the No. 1 thrust lever 0.10 inch (2.54 mm), to the mid-travel position.
  - (b) Make sure that the switch did not operate:

**NOTE:** You can hear a click or get a change of continuity between the pins of the plug when you operate the switch.

- 1) To do the continuity check, do these steps:
  - a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the plugs below the control stand (AMM 25-22-01/401).
  - b) Disconnect the plug P12.
  - c) For the disconnect switch S7, do a continuity check between pins 4 and 5 of plug P12.

**NOTE:** If there is no continuity, the switch has operated.

EFFECTIVITY

ALL

76-12-02

J02

Page 503  
Oct 10/95

- d) For the reset switch S8, do a continuity check between pins 6 and 7 of plug P12.

NOTE: If there is continuity the switch has operated.

- (c) If the switch operated, do one of these procedures:
- 1) Procedure 1:
    - a) Loosen the switch mounting screws and move the switch away from the actuating lever.
    - b) Tighten the mounting screws.
    - c) Do the procedure to adjust the autothrottle disconnect (S7) or reset (S8) switch.
  - 2) Procedure 2:
    - a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
    - b) Do the procedure to adjust the autothrottle disconnect (S7) or reset (S8) switch.

S 825-037-J00

- (7) Adjust the applicable autothrottle disconnect (S9) or the reset (S10) switch:
- (a) Push and hold the disconnect switch lever on the No. 4 throttle down 0.10 inch (2.54 mm), to the mid-travel position.
  - (b) Make sure that the switch did not operate:

NOTE: You can hear a click or get a change of continuity between the pins of the plug when you operate the switch.

- 1) To do the continuity check, do these steps:
  - a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the plugs below the control stand (AMM 25-22-01/401).
  - b) Disconnect the plug P15.
  - c) For the disconnect switch (S9), do a continuity check between pins 4 and 5 of plug P15.

NOTE: If there is no continuity, the switch has operated.

- d) For the reset switch S10, do a continuity check between pins 6 and 7 of plug P15.

NOTE: If there is continuity the switch has operated.

- (c) If the switch operated, do one of these procedures:
- 1) Procedure 1:
    - a) Loosen the switch mounting screws and move the switch away from the actuating lever.
    - b) Tighten the mounting screws.

EFFECTIVITY

ALL

76-12-02

J02

Page 504  
Oct 10/94

- c) Do the procedure to adjust the autothrottle disconnect (S9) or reset (S10) switch.
- 2) Procedure 2:
  - a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
  - b) Do the procedure to adjust the autothrottle disconnect (S9) or reset (S10) switch.
- (d) Push the disconnect switch lever on the No. 1 or No. 4 thrust lever through its full travel.
- (e) Make sure that the switch operates.

NOTE: You can hear a click or get no continuity between the pins of the plug when you operate the switch.

- 1) To do the continuity check, do these steps:
  - a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the plugs below the control stand (AMM 25-22-01/401).
  - b) For the autothrottle disconnect (S7) or reset (S8) switch, disconnect the plug P12.
  - c) For the autothrottle disconnect (S9) or reset (S10) switch, disconnect the plug P15.
  - d) For the disconnect switch S7, do a continuity check between pins 4 and 5 of plug P12.

NOTE: You must not find continuity between the pins.

- e) For the disconnect switch (S9), do a continuity check between pins 4 and 5 of plug P15.

NOTE: You must not find continuity between the pins.

- f) For the reset switch (S8), do a continuity check between pins 6 and 7 of plug P12.

NOTE: You must find continuity between the pins.

- g) For the reset switch S10, do a continuity check between pins 6 and 7 of plug P15.

NOTE: You must find continuity between the pins.

EFFECTIVITY

ALL

76-12-02

J02

Page 505  
Oct 10/94

S 865-041-J00

(8) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

(a) P6 Main Power Distribution Panel

- 1) 6F13 ENG 1 T/R CONT
- 2) 6E13 ENG 2 T/R CONT
- 3) 6D13 ENG 3 T/R CONT
- 4) 6C13 ENG 4 T/R CONT
- 5) 6F10 ENG 1 IDLE CONT/TMC DISCRETES
- 6) 6E10 ENG 2 IDLE CONT/TMC DISCRETES
- 7) 6D10 ENG 3 IDLE CONT/TMC DISCRETES
- 8) 6C10 ENG 4 IDLE CONT/TMC DISCRETES

E. Put the airplane back to its usual condition.

S 435-042-J00

(1) Install the switch covers of the thrust lever assembly  
(AMM 76-11-03/201).

S 865-043-J00

(2) Supply electrical power to the thrust lever switches  
(AMM 76-11-03/201).

S 865-044-J00

(3) Do the activation procedure of the autothrottle servomotor  
(AMM 76-11-03/201).

S 865-045-J00

(4) Do the activation procedure of the captain and first officer seats  
(AMM 76-11-03/201).

TASK 76-12-02-705-034-J00

3. AIRPLANES WITH PRE-SB 22-2216;

Go-Around Switch Adjustment (Fig. 502)

A. Equipment

- (1) Digital Multimeter - Range 0-50  $\pm 0.01$  volts RMS

B. References

- (1) AMM 76-11-03/201, Control Stand

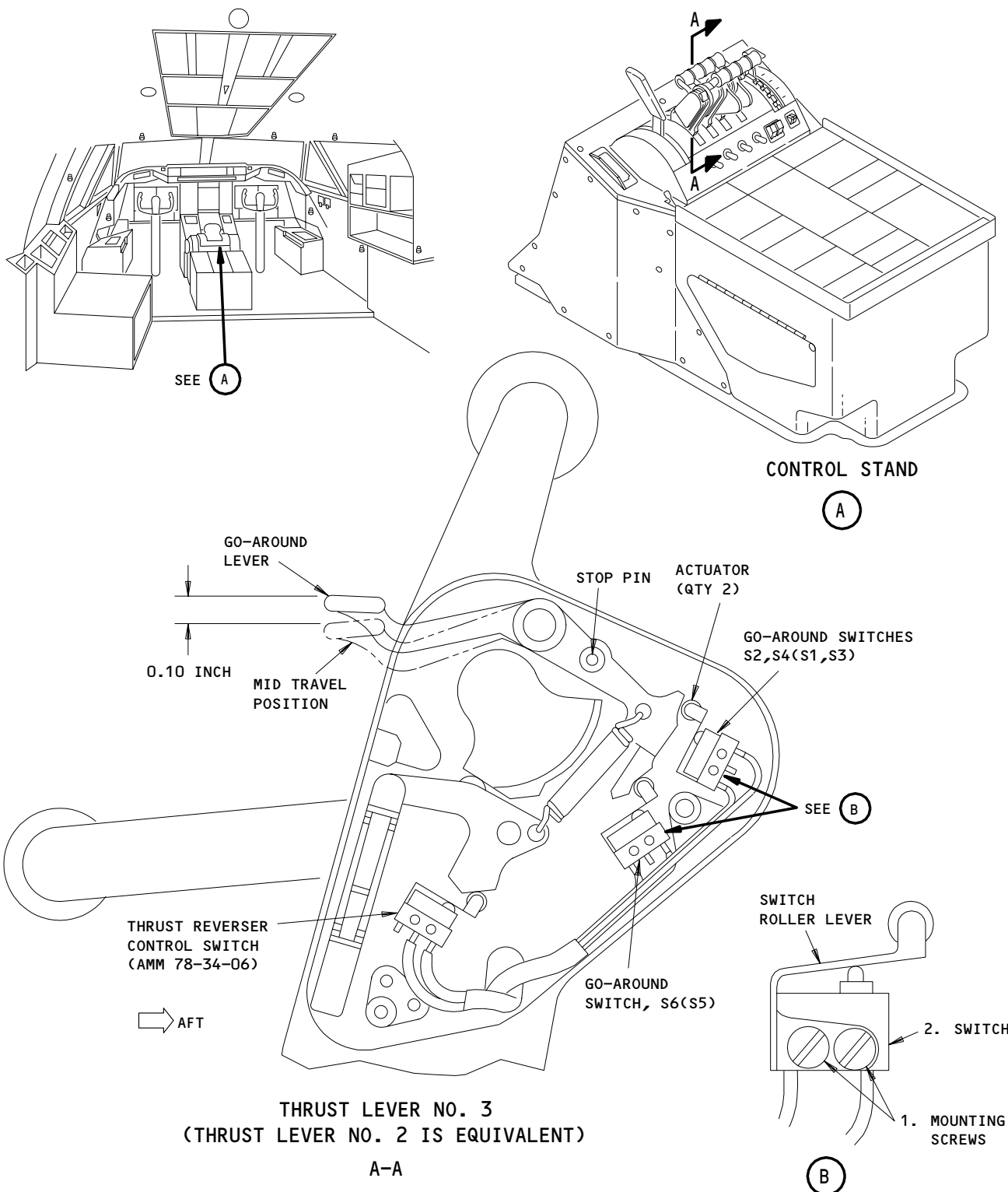
EFFECTIVITY

ALL

76-12-02

J02.1

Page 506  
Oct 18/00



Go-Around Switch Adjustment  
Figure 502

EFFECTIVITY  
AIRPLANES WITH PRE-SB 22-2216

76-12-02

J02.1

Page 507  
Oct 18/00

(2) IPC 76-11-03

C. Access

(1) Location Zone

221 Control Cabin, LH  
222 Control Cabin, RH

D. Procedure

S 865-046-J00

(1) Do the deactivation procedure for the captain and first officer seats (AMM 76-11-03/201).

S 865-047-J00

(2) Remove the electrical power from the thrust lever switches (AMM 76-11-03/201).

S 865-052-J00

**WARNING:** YOU MUST DO THE DEACTIVATION PROCEDURE FOR THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY. THE ACCIDENTAL OPERATION OF THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT. THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN MOVE THE THRUST LEVERS FROM THE FORWARD IDLE TO THE FULL FORWARD THRUST IN FIVE SECONDS.

(3) Do the deactivation procedure for the autothrottle servomotor (AMM 76-11-03/201).

S 035-049-J00

(4) Remove the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 865-039-J00

(5) Open these circuit breakers and attach the DO-NOT-CLOSE tags:

(a) P7 Overhead Circuit Breaker Panel  
1) 7C1 FMCS FMC L

EFFECTIVITY

ALL

**76-12-02**

J02

Page 508  
Oct 10/95



- 2) 7C23 FMCS FMC R
- 3) 7C4 FMCS A/T SERVO L
- 4) 7C25 FMCS A/T SERVO EXC
- 5) 7C26 FMCS A/T SERVO R
- 6) 7D8 FLT CONT CMPTR L PWR
- 7) 7D13 FLT CONT CMPTR C PWR
- 8) 7D15 FLT CONT CMPTR R PWR

S 825-038-J00

- (6) Adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4, or S6):

- (a) Push and hold the G/A switch lever on No. 2 or No. 3 thrust lever down 0.10 inch (2.5 mm), to the mid-travel position.
- (b) Make sure that the switch did not operate:

NOTE: You can hear a click or get no continuity between the pins of the plug when you operate the switch.

- 1) To do the continuity check, do these steps:
  - a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the plugs below the control stand (AMM 25-22-01/401).
  - b) For S1 or S2, disconnect the plug P13 or P14.
    - 1. Do a continuity check between pins 4 and 5 of the applicable plug P13 or P14.
  - c) For S3 or S4, disconnect the plug P19 or P21.
    - 1. Do a continuity check between pins 1 and 3 of the applicable plug P19 or P21.
  - d) For S5 or S6, disconnect the plug P20 or P22.
    - 1. Do a continuity check between pins 1 and 3 of the applicable plug P20 or P22.
- (c) If the switch operated (continuity is not found), do one of these procedure:
  - 1) Procedure 1:
    - a) Loosen the switch mounting screws and move the switch away from the actuating lever.

EFFECTIVITY

ALL

76-12-02

J02

Page 509  
Oct 10/94

- b) Tighten the mounting screws.
- c) Do the procedure to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- 2) Procedure 2:
  - a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
  - b) Do the procedure to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- (d) Push the G/A switch lever on No. 2 or No. 3 thrust lever to its full travel position.
- (e) Make sure that the switch operates:

NOTE: You can hear a click or get no continuity between the pins of the plug if you operated the switch.

- 1) To do the continuity check, do these steps:
  - a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the plugs below the control stand (AMM 25-22-01/401).
  - b) For S1 or S2, disconnect the plug P13 or P14.
    - 1. Do a continuity check between pins 4 and 5 of the applicable plug P13 or P14.
    - 2. Make sure there is no continuity.
  - c) For S3 or S4, disconnect the plug P19 or P21.
    - 1. Do a continuity check between pins 1 and 3 of the applicable plug P19 or P21.
    - 2. Make sure there is no continuity.
  - d) For S5 or S6, disconnect the plug P20 or P22.
    - 1. Do a continuity check between pins 1 and 3 of the applicable plug P20 or P22.
    - 2. Make sure there is no continuity.

S 865-050-J00

- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
  - (a) P7 Overhead Circuit Breaker Panel
    - 1) 7C1 FMCS FMC L

EFFECTIVITY

ALL

76-12-02

J02

Page 510  
Oct 10/94

- 2) 7C23 FMCS FMC R
- 3) 7C4 FMCS A/T SERVO L
- 4) 7C25 FMCS A/T SERVO EXC
- 5) 7C26 FMCS A/T SERVO R
- 6) 7D8 FLT CONT CMPTR L PWR
- 7) 7D13 FLT CONT CMPTR C PWR
- 8) 7D15 FLT CONT CMPTR R PWR

E. Put the airplane back to its usual condition.

S 435-030-J00

- (1) Install the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 865-031-J00

- (2) Supply electrical power to the thrust lever switches (AMM 76-11-03/201).

S 865-051-J00

- (3) Do the activation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 865-032-J00

- (4) Do the activation procedure of the captain and first officer seats (AMM 76-11-03/201).

4. TASK 76-12-02-705-067-J00  
AIRPLANES WITH POST-SB 22-2216;  
Go-Around Switch Adjustment (Fig. 503)

A. Equipment

- (1) Digital Multimeter - Range 0-50  $\pm 0.01$  volts RMS
- (2) Drill-bits - 1/32 and 1/64 inch

B. References

- (1) AMM 76-11-03/201, Control Stand
- (2) IPC 76-11-03

C. Access

- (1) Location Zone
  - 221 Control Cabin, LH
  - 222 Control Cabin, RH

D. Procedure

S 865-068-J00

- (1) Do the deactivation procedure for the captain and first officer seats (AMM 76-11-03/201).

S 865-069-J00

- (2) Remove the electrical power from the thrust lever switches (AMM 76-11-03/201).

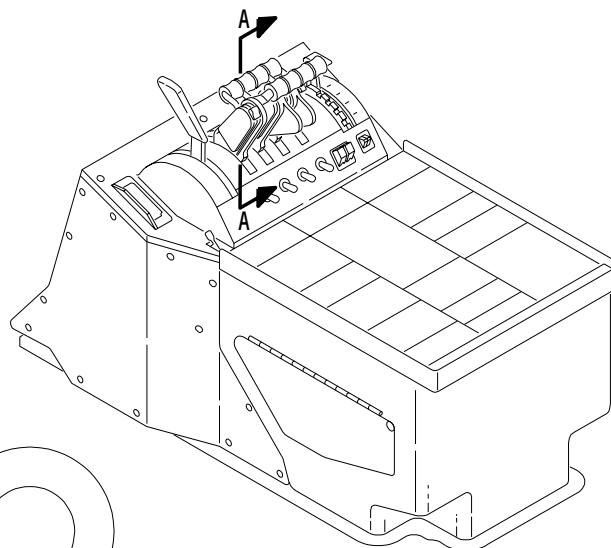
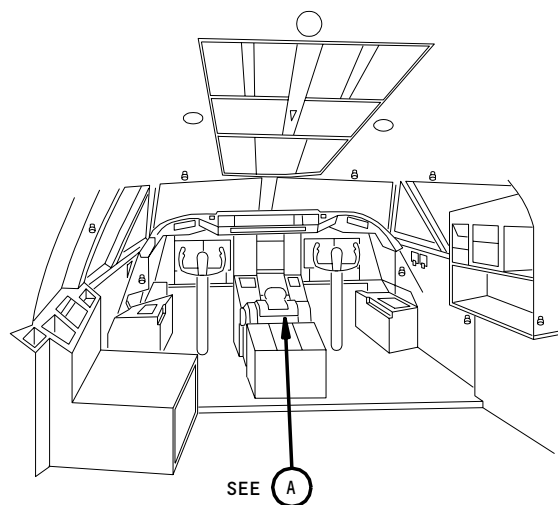
EFFECTIVITY

ALL

76-12-02

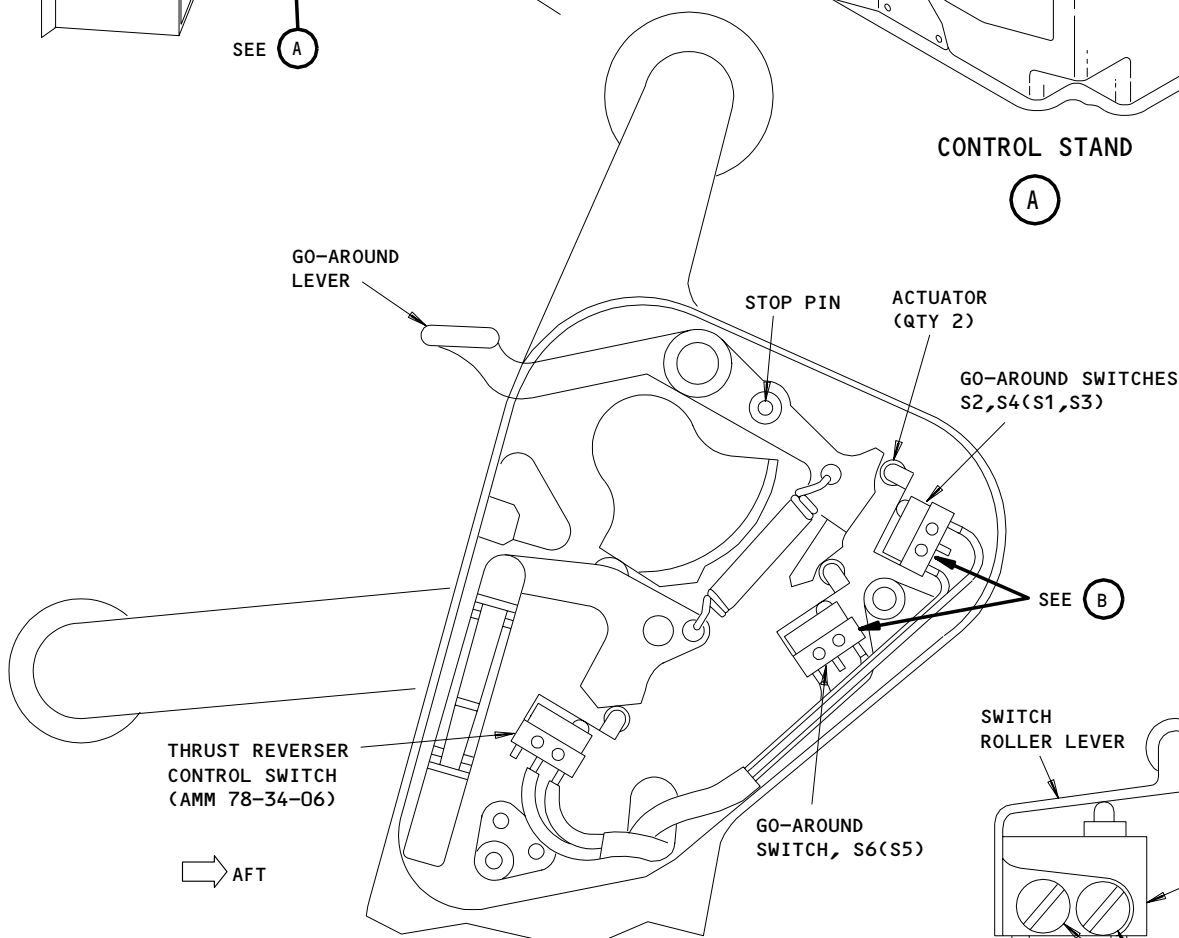
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Page 511  
Oct 18/00



CONTROL STAND

(A)



THRUST LEVER NO. 3  
(THRUST LEVER NO. 2 IS EQUIVALENT)

A-A

(B)

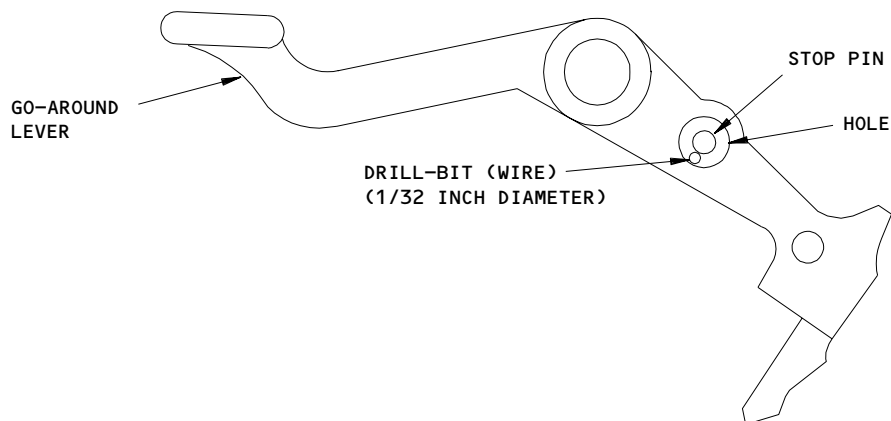
Go-Around Switch Adjustment  
Figure 503 (Sheet 1)

EFFECTIVITY  
| AIRPLANES WITH POST-SB 22-2216

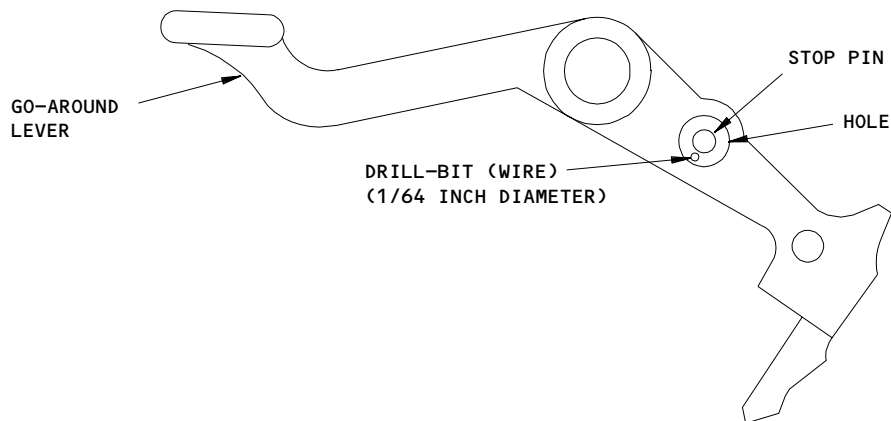
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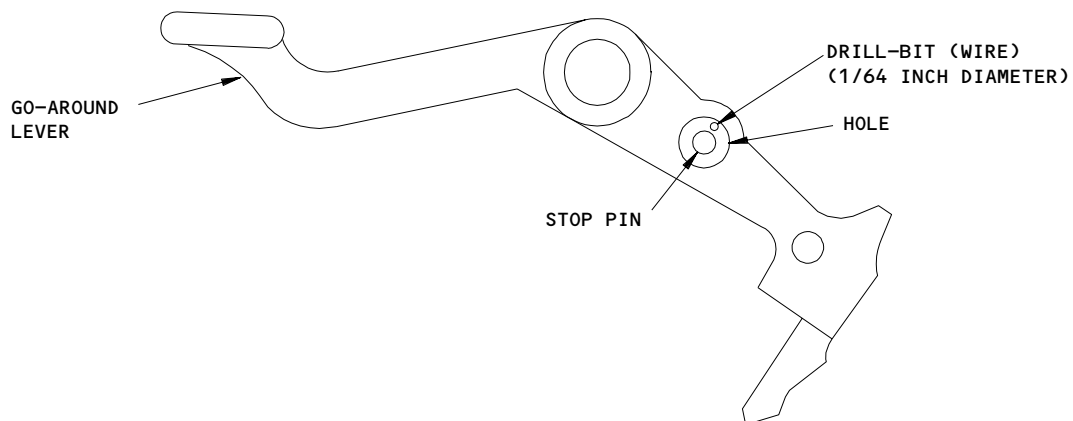
Page 512  
Oct 18/00



ADJUSTMENT POSITION 1



ADJUSTMENT POSITION 2



ADJUSTMENT POSITION 3

Go-Around Switch Adjustment  
Figure 503 (Sheet 2)

EFFECTIVITY  
| AIRPLANES WITH POST-SB 22-2216

76-12-02

J05.1

Page 513  
Oct 18/00

S 865-070-J00

**WARNING:** YOU MUST DO THE DEACTIVATION PROCEDURE FOR THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY. THE ACCIDENTAL OPERATION OF THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT. THE AUTOTHROTTLE SERVOMOTOR/BRAKE ASSEMBLY CAN MOVE THE THRUST LEVERS FROM THE FORWARD IDLE TO THE FULL FORWARD THRUST IN FIVE SECONDS.

- (3) Do the deactivation procedure for the autothrottle servomotor (AMM 76-11-03/201).

S 035-071-J00

- (4) Remove the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 865-072-J00

- (5) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
- (a) P7 Overhead Circuit Breaker Panel
    - 1) 7C1 FMCS FMC L
    - 2) 7C23 FMCS FMC R
    - 3) 7C4 FMCS A/T SERVO L
    - 4) 7C25 FMCS A/T SERVO EXC
    - 5) 7C26 FMCS A/T SERVO R
    - 6) 7D8 FLT CONT CMPTR L PWR
    - 7) 7D13 FLT CONT CMPTR C PWR
    - 8) 7D15 FLT CONT CMPTR R PWR

S 825-073-J00

- (6) Adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4, or S6), in adjustment position No. 1 (Fig. 503):

**NOTE:** In this procedure a 1/32 drill-bit is used to adjust the switches. You can use a wire with 0.032 inch (0.8 mm) diameter as an alternative to the drill-bit.

- (a) Open the center ceiling panel in the second row forward of the No. 1 doors to get access to the connectors below the control stand (AMM 25-22-01/401).
- (b) Insert a 1/32 drill-bit between the stop-pin and the hole of the go-around lever (Fig. 503, adjustment position No. 1).
- (c) Push the go-around lever to hold the drill-bit in position.
- (d) Disconnect the connectors of the applicable switches and do a continuity check between the pins given in Table 1.
  - 1) Make sure there is continuity between the pins.
- (e) If continuity is not found, do one of these procedures:
  - 1) Procedure 1:
    - a) Loosen the switch mounting screws and change the position of the switch until you get continuity.
    - b) Tighten the mounting screws.

EFFECTIVITY

ALL

76-12-02

J02

Page 514  
Oct 10/97

- c) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- 2) Procedure 2:

**CAUTION:** DO NOT MAKE A SHARP BEND. DO NOT BEND AND STRAIGHTEN THE SWITCH ROLLER LEVER.

- a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
- b) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- (f) If the switches are adjusted correctly, remove the drill-bit.

E N				
TABLE 1, CONNECTORS AND PIN NUMBERS				
F P S				
THRUST LEVER NO. 2 THRUST LEVER NO. 3				
F P S L P S				
SWITCHES CONNECTORS SWITCHES CONNECTORS PIN				
F L S L S L S L S				
S1 P13 S2 P14 4 and 5				
F L S L S L S L S				
S3 P19 S4 P21 1 and 3				
F L S L S L S L S				
S5 P20 S6 P22 1 and 3				
F G S G S G S G S G S				

S 825-079-J00

- (7) Adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4, or S6), in adjustment position No. 2 (Fig. 503).

**NOTE:** In this procedure a 1/64 drill-bit is used to adjust the switches. You can use a wire with 0.015 inch (0.4 mm) diameter, as an alternative to the drill-bit.

- (a) Insert a 1/64 drill-bit between the stop-pin and the hole as shown in Fig. 503, adjustment position No. 2.
- (b) Push the go-around lever to hold the 1/64 drill-bit in position.
- (c) Disconnect the connectors of the applicable switches and do a continuity check between the pins given in Table 1.
- 1) Make sure there is no continuity between the pins.
- (d) If continuity is found, do one of these procedure:
- 1) Procedure 1:
- a) Loosen the switch mounting screws and change the position of the applicable switch until you get continuity.
- b) Tighten the mounting screws.
- c) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).

EFFECTIVITY

ALL

76-12-02

J02

Page 515  
Oct 10/97

2) Procedure 2:

CAUTION: DO NOT MAKE A SHARP BEND. DO NOT BEND AND  
STRAIGHTEN THE SWITCH ROLLER LEVER.

- a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
- b) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- (e) If the switches are adjusted correctly, release the go-around lever and move the 1/64 drill-bit to the opposite side of the stop pin.

S 825-080-J00

- (8) Adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4, or S6), in adjustment position No. 3 (Fig. 503):

NOTE: In this procedure a 1/64 drill-bit is used to adjust the switches. You can use a wire with 0.016 inch (0.4 mm) diameter as an alternative to the drill-bit.

- (a) With the 1/64 drill-bit in adjustment position No. 3, push the go-around lever to the end of its travel and release it.
- (b) Disconnect the connectors of the applicable switches and do a continuity check between the pins given in Table 1.
  - 1) Make sure there is continuity between the pins.
- (c) If continuity is not found, do one of these procedure:
  - 1) Procedure 1:
    - a) Loosen the switch mounting screws and change the position of the switch until you get continuity.
    - b) Tighten the mounting screws.
    - c) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
  - 2) Procedure 2:

CAUTION: DO NOT MAKE A SHARP BEND. DO NOT BEND AND  
STRAIGHTEN THE SWITCH ROLLER LEVER.

- a) Bend the switch roller lever no more than 0.06 inch (1.5 mm).
- b) Do the procedure again to adjust the applicable AFCS Go-Around Switches (S1, S3, or S5) or (S2, S4 or S6).
- (d) If the switches are adjusted correctly, remove the drill-bit.

EFFECTIVITY

ALL

76-12-02

J02

Page 516  
Oct 10/97



- (e) Connect the connectors to the receptacles in the control stand.  
E. Put the airplane back to its usual condition.

S 415-081-J00

- (1) Close the center ceiling panel in the second row forward of the No. 1 doors (AMM 25-22-01/401).

S 435-075-J00

- (2) Install the switch covers of the thrust lever assembly (AMM 76-11-03/201).

S 865-074-J00

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

(a) P7 Overhead Circuit Breaker Panel

- |    |      |                      |
|----|------|----------------------|
| 1) | 7C1  | FMCS FMC L           |
| 2) | 7C23 | FMCS FMC R           |
| 3) | 7C4  | FMCS A/T SERVO L     |
| 4) | 7C25 | FMCS A/T SERVO EXC   |
| 5) | 7C26 | FMCS A/T SERVO R     |
| 6) | 7D8  | FLT CONT CMPTR L PWR |
| 7) | 7D13 | FLT CONT CMPTR C PWR |
| 8) | 7D15 | FLT CONT CMPTR R PWR |

S 865-076-J00

- (4) Supply electrical power to the thrust lever switches (AMM 76-11-03/201).

S 865-077-J00

- (5) Do the activation procedure of the autothrottle servomotor (AMM 76-11-03/201).

S 865-078-J00

- (6) Do the activation procedure of the captain and first officer seats (AMM 76-11-03/201).

EFFECTIVITY

ALL

76-12-02

J02

Page 517  
Oct 10/97

ENGINE FIRE EMERGENCY SHUTDOWN – DESCRIPTION AND OPERATION

1. General
  - A. Engine fire emergency shutdown provides component location and operational descriptions of the engine fire warning devices, the engine shutdown controls, and the fire extinguishing controls.
  - B. The engine fire emergency shutdown system is part of the airplane fire protection system. Refer to Engine Fire Detection (Ref 26-11-00/001) and Engine Fire Extinguishing (Ref 26-21-00/001) for detailed system descriptions.
  - C. The engine fire emergency shutdown procedure is part of the engine control system. Refer to Engine Control System (Ref 76-11-00/001) for detailed system description.
2. Master Warning Lights (Fig. 1)
  - A. The master warning lights are located on the forward panel glare shield. There is one to the port side of the cockpit and one to the starboard side of the cockpit.
  - B. The master warning lights will illuminate red to indicate an engine fire.
3. Engine Indication and Crew Alerting System (EICAS) Main Display (Fig. 2)
  - A. The EICAS main display screen is located in the center of the forward panel with the auxiliary display screen located just beneath it.
  - B. The EICAS display will indicate an engine fire with the EICAS warning FIRE following the appropriate location, i.e. ENG 3 FIRE.
  - C. The EICAS warning FIRE will be displayed in red letters in the upper right corner of the main display.
4. Fuel Control Toggle Switch (Fig. 3)
  - A. The fuel control toggle switches are located at the aft end of the control stand.
  - B. The fuel control toggle switch will indicate an engine fire by illuminating red, the toggle corresponding to the engine in which the fire is located.
5. Engine Fire Switch (Fig. 4)
  - A. The engine fire switches are located on the overhead panel.
  - B. The engine fire switch will indicate an engine fire by illuminating red, the knob corresponding to the engine in which the fire is located.
6. Aural Warning Devices (Fig. 4)
  - A. The aural warning devices are speakers mounted in the overhead panel, just forward of the engine fire switches.
  - B. The aural warning devices will indicate an engine fire by sounding a bell.

EFFECTIVITY

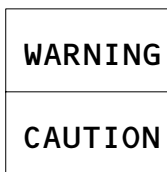
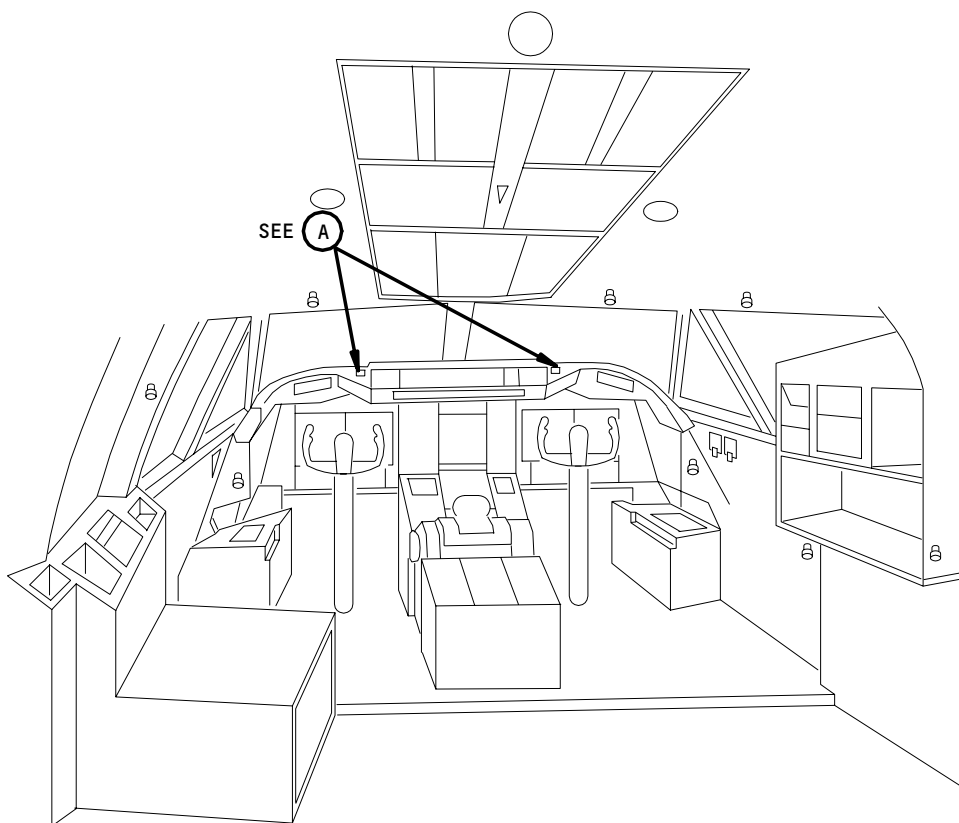
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76-21-00

J02

Page 1

Feb 10/89



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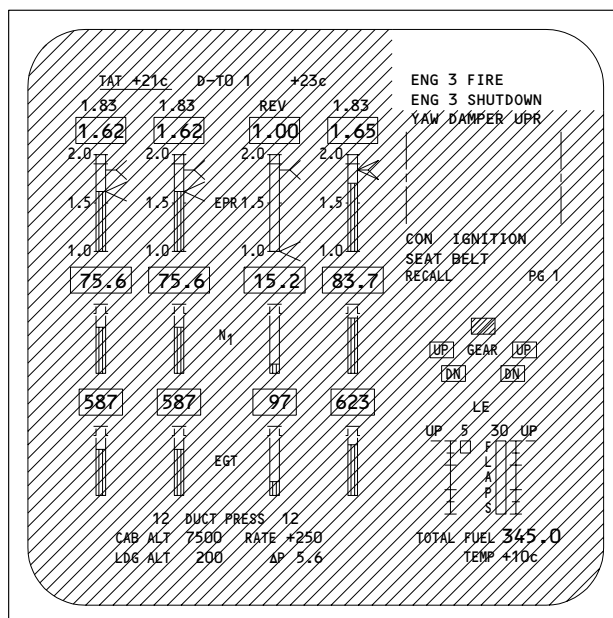
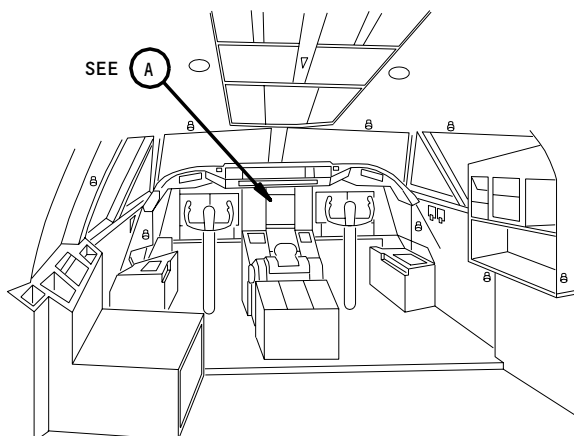
Master Warning Lights  
Figure 1

EFFECTIVITY	
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76-21-00

J01

Page 2  
Jun 10/88



A

EICAS Display Screen  
Figure 2

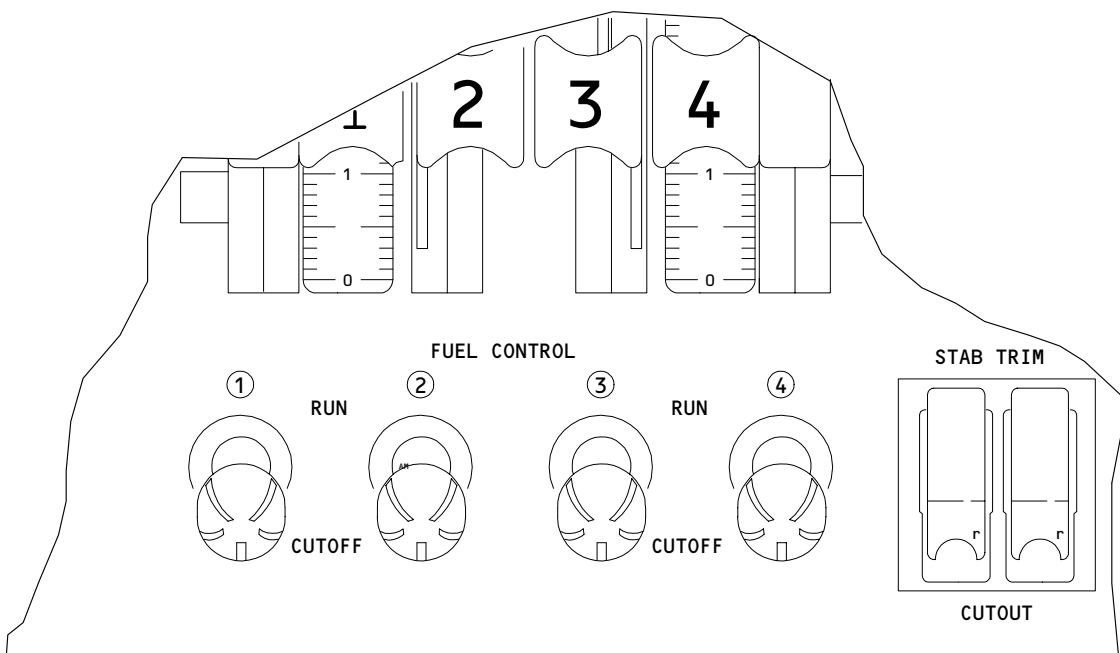
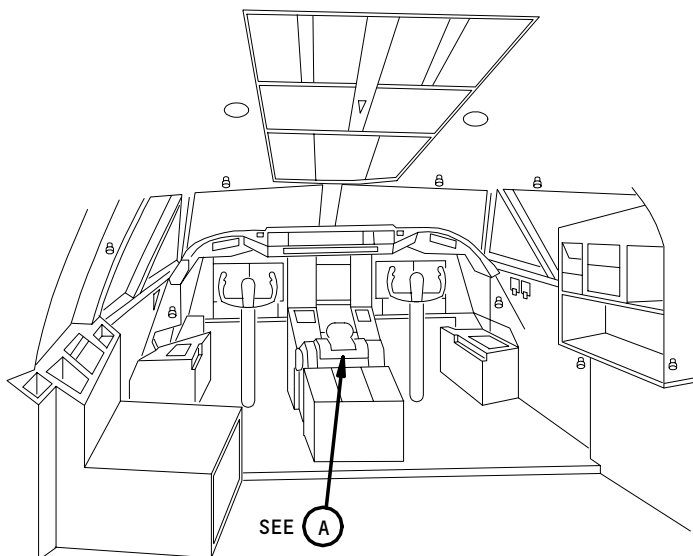
EFFECTIVITY

ALL

76-21-00

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Page 3  
Feb 10/89



(A)

Fuel Control Toggle Switches  
Figure 3

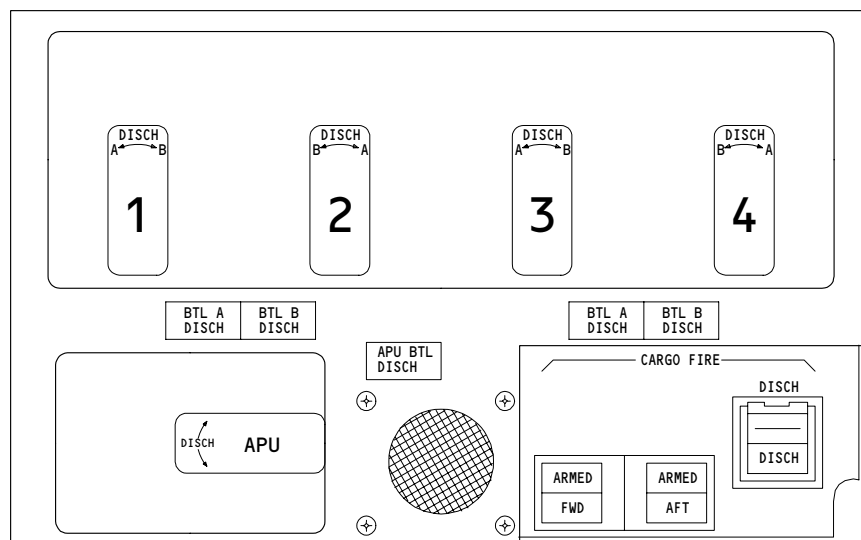
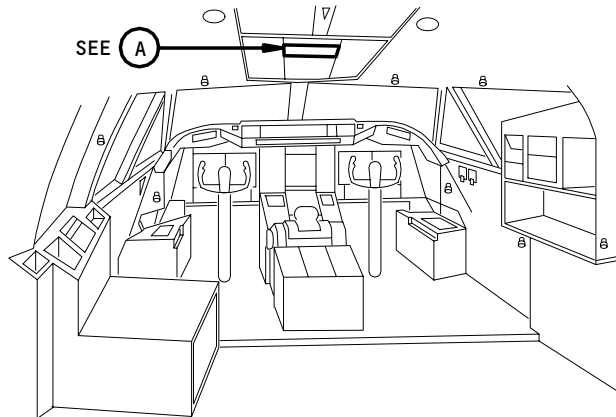
EFFECTIVITY

ALL

76-21-00

J01

Page 4  
Jun 10/88



(A)

Engine Fire Switches  
Figure 4

EFFECTIVITY

ALL

76-21-00

J01

Page 5  
Jun 10/88

7. Operation

- A. Engine fire emergency shutdown is controlled by the engine fire switch.
- (1) The engine fire switch opens the airframe shutoff solenoid valve and closes the fuel shutoff valve, ceases engine ignition, depressurizes the hydraulic system, isolates the engine, and arms the engine fire extinguisher when the switch knob is pulled out.
    - (a) Engine isolation de-energizes the generator control relay, closes the engine hydraulic and pneumatic isolation valves, and ensures the fuel shutoff valve is closed.
    - (b) Engine isolation will be indicated on the EICAS main display by the EICAS status message SHUTDOWN following the appropriate location, i.e. ENG 3 SHUTDOWN.
      - 1) The EICAS status message SHUTDOWN will be displayed in white letters in the upper right corner of the screen.
  - (2) Each engine fire switch is connected electrically to two extinguisher bottles.
    - (a) Engine one and engine two are connected to the same two extinguisher bottles while engine three and engine four are connected to another two extinguisher bottles.
- B. Rotating the armed engine fire switch to either the right or the left will discharge one of the two bottles.

EFFECTIVITY

ALL

76-21-00

J02

Page 6  
Feb 10/89