

**B757 MANUAL SUPPLEMENT - ATP 3510  
SECTION 1 CHAPTER 76  
CONTROL PAGE - INITIAL ISSUE**

- A. File the attached Temporary Revision/Alerts in the Manual Supplement in ATA Chapter/Section/Subject/Page sequence
- B. File this Control Page in front of the Chapter TRs/Alerts.
- C. The following list shows active TRs/Alerts together with TRs/Alerts added by this control page.

Chapter Section Subject	Page	TR/Alert No.
76-00-00	601	* 76-520

- D. Remove and Destroy the following TRs/Alerts:

\* Indicates TRs/Alerts issued with this control page

**ATP  
TEMPORARY  
REVISION**

**AIRPLANE**

**NB322**

TR Page 1 of 3

25 February, 2000

**757 MAINTENANCE MANUAL**

**TEMPORARY REVISION No. 76-520**

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA).  
CAA DESIGN APPROVAL No. DAI/8566/78.

Manual Reference 76-00-00 Page 601

**REASON FOR REVISION**

To include the FAA control system inspection requirements (Ref AD99-27-06).

**ACTION**

**THRUST CONTROL CABLE INSPECTION PROCEDURE**

**1. General**

- A. Clean the cables, if necessary, for the inspection, in accordance with Boeing 757 Maintenance Manual 12-21-31.
- B. Use these procedures to verify the integrity of the thrust control cable system. The procedures must be performed along the entire cable run for each engine. To ensure verification of the portions of the cables which are in contact with pulleys and quadrants, the thrust control must be moved by operation of the thrust and/or the reverse thrust levers to expose those portions of the cables.
- C. The first task is an inspection of the control cable wire rope. The second task is an inspection of the control cable fittings. The third task is an inspection of the pulleys.

NOTE: These three tasks may be performed concurrently at one location of the cable system on the airplane, if desired, for convenience.

**2. Inspection of the Control Cable Wire Rope**

- A. Perform a detailed visual inspection to ensure that the cable does not contact parts other than pulleys, quadrants, cable seals, or grommets installed to control the cable routing. Look for evidence of contact with other parts. Correct the condition if evidence of contact is found.

NOTE: For the purposes of this procedure, a detailed visual inspection is defined as: "An intensive visual examination of a specific structural area, system, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at intensity deemed appropriate by the inspector. Inspection aids such as mirror, magnifying lenses, etc., may be used. Surface cleaning and elaborate access procedures may be required."

Originator: N. FREEMAN  
Reference: 4840  
Workbook: ENG-436

76-00-00  
Page 601

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## TEMPORARY REVISION No. 76-520 (Cont'd)

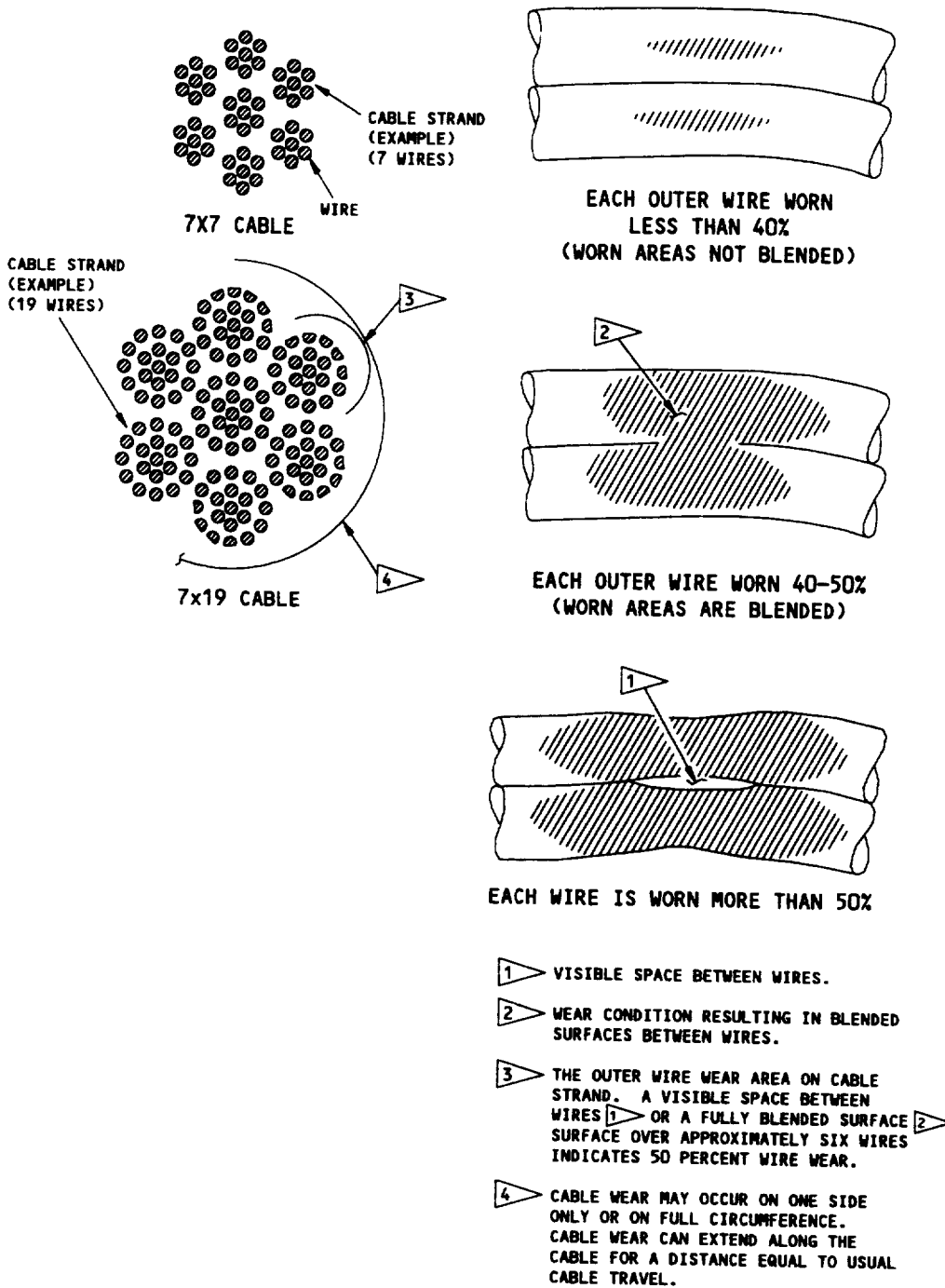
- B. Perform a detailed visual inspection of the cable runs to detect incorrect routing, kinks in the wire rope, or other damage. Replace the cable assembly if:
- (1) One cable strand had worn wires where one wire cross section is decreased by more than 40 percent (see Figure 1).
  - (2) A kink is found, or
  - (3) Corrosion is found.
- C. Perform a detailed visual inspection of the cable: To check for broken wires, rub a cloth along the length of the cable. The cloth catches on broken wires.
- (1) Replace the 7x7 cable assembly if there are two or more broken wires in 12 continuous inches of cable or there are three or more broken wires anywhere in the total cable assembly.
  - (2) Replace the 7x19 cable assembly if there are four or more broken wires in 12 continuous inches of cable or there are six or more broken wires anywhere in the total cable assembly.

**3. Inspection of the Control Cable Fittings**

- A. Perform a detailed visual inspection to ensure that the means of locking the joints are intact (wire locking, cotter pins, turnbuckle clips, etc.). Install any missing parts.
- B. Perform a detailed visual inspection of the swaged portions of swaged end fittings to detect surface cracks or corrosion. Replace the cable assembly if cracks or corrosion are found.
- C. Perform a detailed visual inspection of the unswaged portion of the end fitting. Replace the cable assembly if a crack is visible, if corrosion is present, or if the end fitting is bent more than 2 degrees.
- D. Perform a detailed visual inspection of the turnbuckle. Replace the turnbuckle if a crack is visible or if corrosion is present.

**4. Inspection of Pulleys**

- A. Perform a detailed visual inspection to ensure that pulleys are free to rotate. Replace pulleys which are not free to rotate.



**CABLE WEAR PATTERNS  
FIGURE 1**

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PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
CHAPTER 76 TAB			76-11-00			76-11-10		CONT.
ENGINE CONTROLS			601	JAN 28/02	R01	407	SEP 20/98	R01
EFFECTIVE PAGES			602	DEC 20/95	R01	408	JAN 28/05	R01
SEE LAST PAGE OF LIST FOR			603	MAR 20/93	R03	409	MAY 28/03	R01
NUMBER OF PAGES			604	BLANK		410	MAR 20/97	R01
76-CONTENTS			76-11-01			76-11-10		
1	JAN 28/06	RGUI	401	JAN 28/03	R01	601	MAR 20/94	R01
R 2	JAN 20/09	RGUI.1	402	MAR 20/94	R01	602	JUN 20/89	R01
76-11-00			403	MAR 20/94	R02	603	MAR 20/94	R01
1	JAN 28/02	R01	404	MAR 20/94	R02	604	MAR 20/94	R01
2	JAN 28/02	R01	405	SEP 28/02	R04	76-11-11		
3	JAN 28/02	R01	406	MAY 28/99	R06	401	MAY 28/99	R01
4	JAN 28/02	R01	407	MAY 28/99	R09	402	MAY 28/99	R01
5	MAY 28/99	R01	408	MAY 28/99	R10	403	JAN 28/02	R01
6	MAY 28/99	R01	409	MAY 28/99	R06	404	MAY 28/99	R01
7	MAY 28/99	R01	410	BLANK		405	MAY 28/99	R01
8	MAY 28/99	R01	76-11-02			406	JAN 28/02	R01
76-11-00			201	SEP 20/93	R01	407	SEP 20/91	R01
101	DEC 15/85	R03	202	MAR 20/97	R01	408	BLANK	
102	SEP 20/96	R02	203	MAR 20/94	R01	76-11-12		
103	DEC 15/85	R03	204	MAR 20/97	R01	401	JAN 28/07	R01
104	JAN 28/00	R02	205	SEP 28/04	R01	402	SEP 20/90	R01
105	JAN 28/00	R01	206	MAY 28/99	R03	403	JAN 28/07	R01
106	BLANK		207	DEC 20/91	R01	404	SEP 20/96	R01
76-11-00			208	JUN 20/93	R03	405	SEP 20/96	R01
501	JAN 28/03	R01	76-11-03			406	BLANK	
502	JAN 28/03	R04	201	SEP 28/02	R01	76-21-00		
503	SEP 20/93	R03	202	JAN 28/05	R01	1	SEP 15/82	R01
504	SEP 20/93	R02	203	JUN 20/91	R01	2	SEP 15/82	R01
505	SEP 20/94	R01	204	SEP 20/08	R01	76-22-00		
506	SEP 20/94	R01	205	SEP 28/02	R02	1	JAN 28/02	R01
507	DEC 20/95	R01	206	SEP 28/04	R04	2	JAN 28/02	R01
508	MAR 20/97	R01	207	MAY 20/98	R06	3	MAR 20/88	R02
509	MAR 20/97	R02	208	MAR 20/94	R06	4	MAR 20/88	R02
510	SEP 20/93	R01	209	MAR 20/94	R03	76-22-01		
511	DEC 20/93	R03	210	BLANK		401	CONFIG 1	
512	SEP 20/93	R01	76-11-04			402	SEP 28/00	R01
513	JUN 20/97	R02	401	MAY 28/99	R01	403	SEP 28/00	R01
514	SEP 20/93	R01	402	MAY 28/99	R01	404	SEP 28/00	R01
515	SEP 20/93	R01	403	MAY 28/99	R01	405	JAN 28/05	R01
516	JAN 28/03	R03	404	MAY 28/99	R01	406	JAN 28/05	R01
517	JAN 28/01	R05	405	MAY 28/99	R01	407	SEP 28/00	R01
518	JAN 28/01	R06	406	MAY 28/99	R01	408	BLANK	
519	SEP 20/98	R03	407	MAY 28/99	R01	76-22-01		
520	SEP 20/98	R03	408	MAY 28/99	R01	401	CONFIG 2	
521	SEP 20/98	R03	409	SEP 20/91	R01	402	JAN 28/01	R01
522	SEP 20/98	R04	410	BLANK		403	JAN 28/01	R01
523	SEP 20/93	R06	76-11-10			404	JAN 28/01	R01
524	JAN 28/01	R03	401	JAN 28/06	R01	405	JAN 28/05	R01
			402	MAY 28/99	R01	406	JAN 28/01	R01
			403	MAY 28/99	R01	407	JAN 28/01	R01
			404	MAY 28/99	R01	408	BLANK	
			405	JAN 28/07	R01			
			406	SEP 20/98	R01			

R = REVISED, A = ADDED OR D = DELETED  
F = FOLDOUT PAGE  
32  
JAN 20/09

**D633N132**

CHAPTER 76  
EFFECTIVE PAGES  
R PAGE 1  
CONTINUED

GPA Group plc

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
76-22-01								
601	SEP 28/00	R01						
602	JAN 20/99	R01						
603	MAY 28/01	R01						
604	MAY 28/01	R01						

R = REVISED, A = ADDED OR D = DELETED  
F = FOLDOUT PAGE  
32  
JAN 20/09

**D633N132**

CHAPTER 76  
EFFECTIVE PAGES  
R 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>ENGINE CONTROLS</u>	76-00-00		
<u>POWER CONTROL</u>	76-10-00		
ENGINE CONTROL SYSTEM	76-11-00		
Description and Operation		1	ALL
General		1	
Component Details		1	
Engine Components		5	
Engine Control Strut Drum		5	
Fuel Control Switches		6	
Thrust Control Cables		5	
Thrust Lever Assembly		1	
Operation		6	
Fuel Control Switches		8	
Functional Description		6	
Component Location		101	ALL
Component Index			
Component Location			
Adjustment/Test		501	ALL
Adjustment of the Control System for the Engine		513	
Installation			
Adjustment of the Control System on the Airplane		501	
Installation			
Inspection/Check		601	ALL
BOX - INTERMEDIATE POWER CONTROL	76-11-11		
Removal/Installation		401	ALL
BOX ASSEMBLY - LOWER CONTROL	76-11-10		
Removal/Installation		401	ALL
Inspection/Check		601	ALL
CABLES - THRUST CONTROL	76-11-03		
Maintenance Practices		201	ALL
Install the Thrust Control Cables		203	
Remove the Thrust Control Cables		201	
CONTROL STAND LEVER'S RAILS, COVERS AND SEALS	76-11-04		
Removal/Installation		401	ALL

# 76-CONTENTS

CHAPTER 76 - ENGINE CONTROLS

TABLE OF CONTENTS

<u>Subject</u>	Chapter Section <u>Subject</u>	<u>Page</u>	<u>Effectivity</u>
GEARBOX - UPPER CONTROL	76-11-12		
Removal/Installation		401	ALL
MODULE - ENGINE FUEL CONTROL	76-11-02		
Maintenance Practices		201	ALL
Fuel Control Switch Light		206	
Replacement			
Install the Fuel Control		202	
Module			
Remove the Fuel Control		201	
Module			
THRUST LEVER	76-11-01		
Removal/Installation		401	ALL
<u>EMERGENCY SHUTDOWN</u>	76-20-00		
ENGINE FIRE EMERGENCY SHUTDOWN	76-21-00		
Description and Operation		1	ALL
General		1	
Component Details		1	
Operation		2	
TURBINE OVERSPEED EMERGENCY	76-22-00		
SHUTDOWN SYSTEM			
Description and Operation		1	ALL
General		1	
Description		1	
Operation		3	
ASSEMBLY - EMERGENCY SHUTOFF	76-22-01		
VALVE AND CABLE			
Removal/Installation		401	CONFIG 1 [*]
[*] RB211-535E4 AND RB211-535E4-B ENGINES PRE RR SB 72-C230 (PHASE II COMBUSTOR)			
Removal/Installation		401	CONFIG 2 [*]
[*] RB211-535E4 AND E4-B ENGINES POST RR SB72-C230 (PHASE V COMBUSTOR) AND RB211-535E4-C ENGINES			
Inspection/Check		601	ALL

**76-CONTENTS**



ENGINE CONTROL SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. The engine control system provides the means for controlling fuel and ignition for starting, operating and shutting down the engines, and for controlling engine forward and reverse thrust.
- B. Controlling fuel and ignition for starting is accomplished by the fuel control switch. It provides power to the fuel flow governor (FFG) to open the fuel shutoff valve (AMM 73-21-00/001) for starting, operating, and shutting down the engine. It also allows ignition (AMM 74-31-00/001) to begin.
- C. Controlling engine forward and reverse thrust is accomplished by movement of the forward and reverse thrust levers at the flight station. This movement is transmitted through aircraft and engine mounted cables to the engine fuel flow governor (AMM 73-21-00/001).

2. Component Details

A. Thrust Lever Assembly

- (1) The thrust lever assembly is located in the control stand on the flight compartment. The assembly contains forward and reverse thrust levers, thrust reverser control switches, autothrottle disengage switches, and go-around switches.
- (2) The forward thrust levers control forward engine thrust. They are mechanically linked to the autothrottle clutch pack by control rods. The autothrottle clutch pack transfers the movement of the thrust levers to the thrust control cable drums and then to the thrust control cables. The levers have an angular travel of 56 degrees from stop to stop. They are mechanically locked in the idle position while the reverse thrust levers are used.
- (3) The reverse thrust lever provides the control to obtain reverse engine thrust. The reverse thrust levers are linked to the thrust control cables the same as the forward thrust levers are. They have an angular travel of 113 degrees from stop to stop. They are mechanically locked in the full forward position while the forward thrust lever are not in the idle position.
- (4) A thrust reverser control switch is installed in each forward thrust lever. Each switch is actuated through a link by the corresponding reverse thrust lever. When reverse thrust is selected, the switches causes a circuit to be completed which energizes a solenoid on each thrust reverser isolation valve. This also causes hydraulic fluid to be used for operation of the thrust reverser deployment.
- (5) The autothrottle disengage switches (AMM 22-32-00/001) disengage the autothrottle allowing the pilot full command of the thrust levers.
- (6) The go-around switches (AMM 22-11-00/001) place the thrust management system in a go-around mode which advances the thrust levers to supply the rated EPR for a 2000 foot/minute climb.

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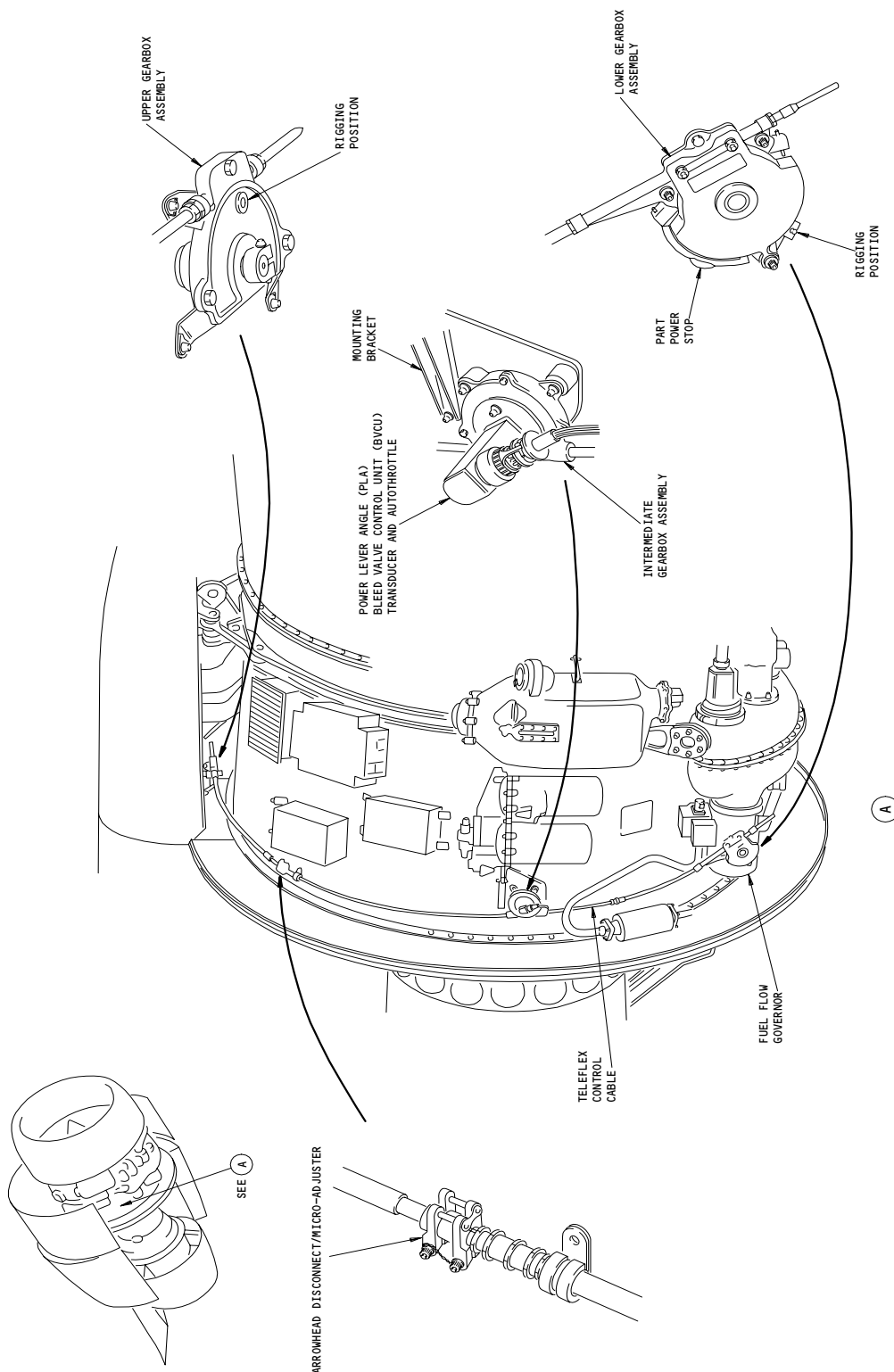
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76-11-00

R01

Page 1  
Jan 28/02

65474



Engine Power and Thrust Reverser Control Linkage  
Figure 1

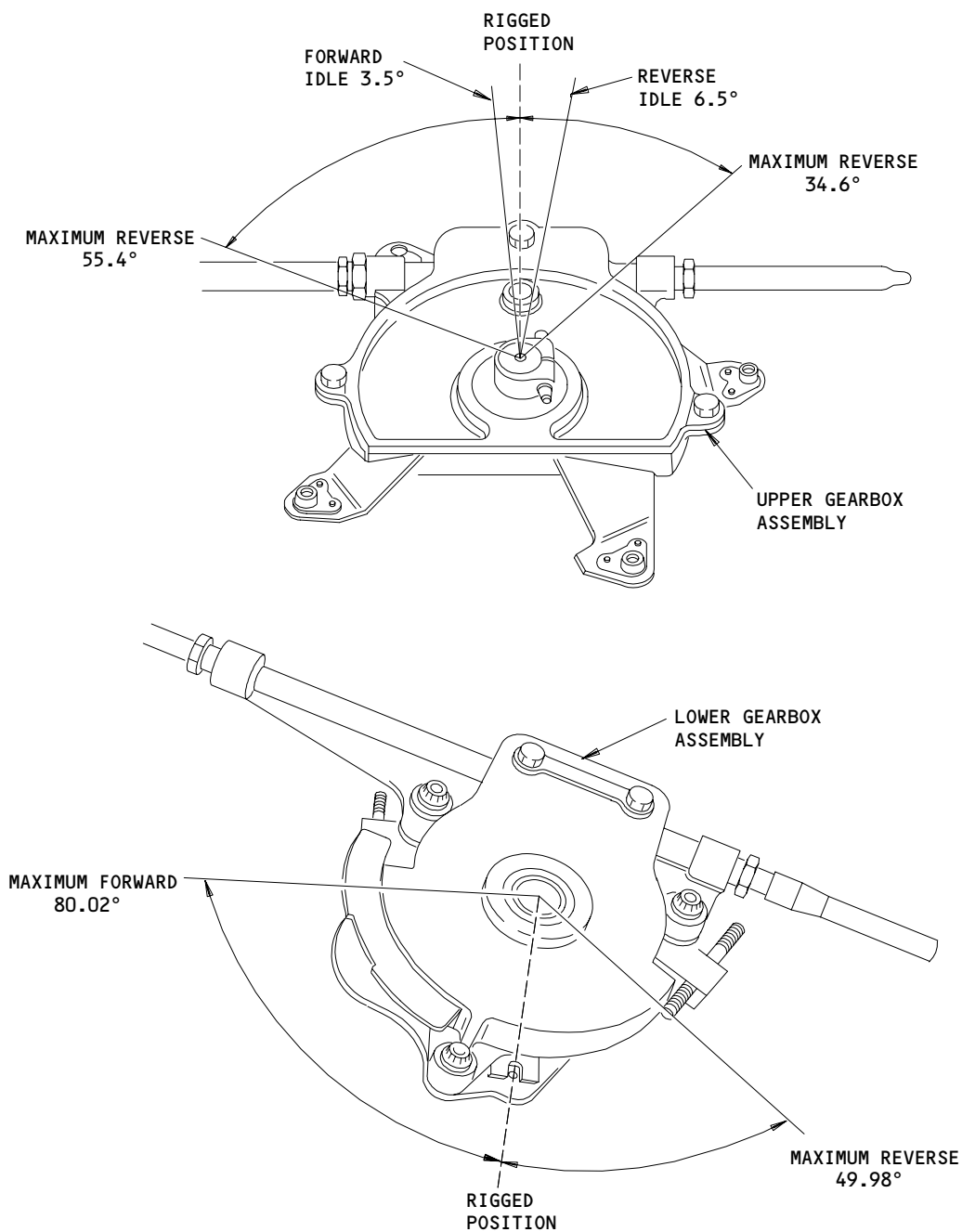
EFFECTIVITY

ALL

76-11-00

R01

Page 2  
Jan 28/02



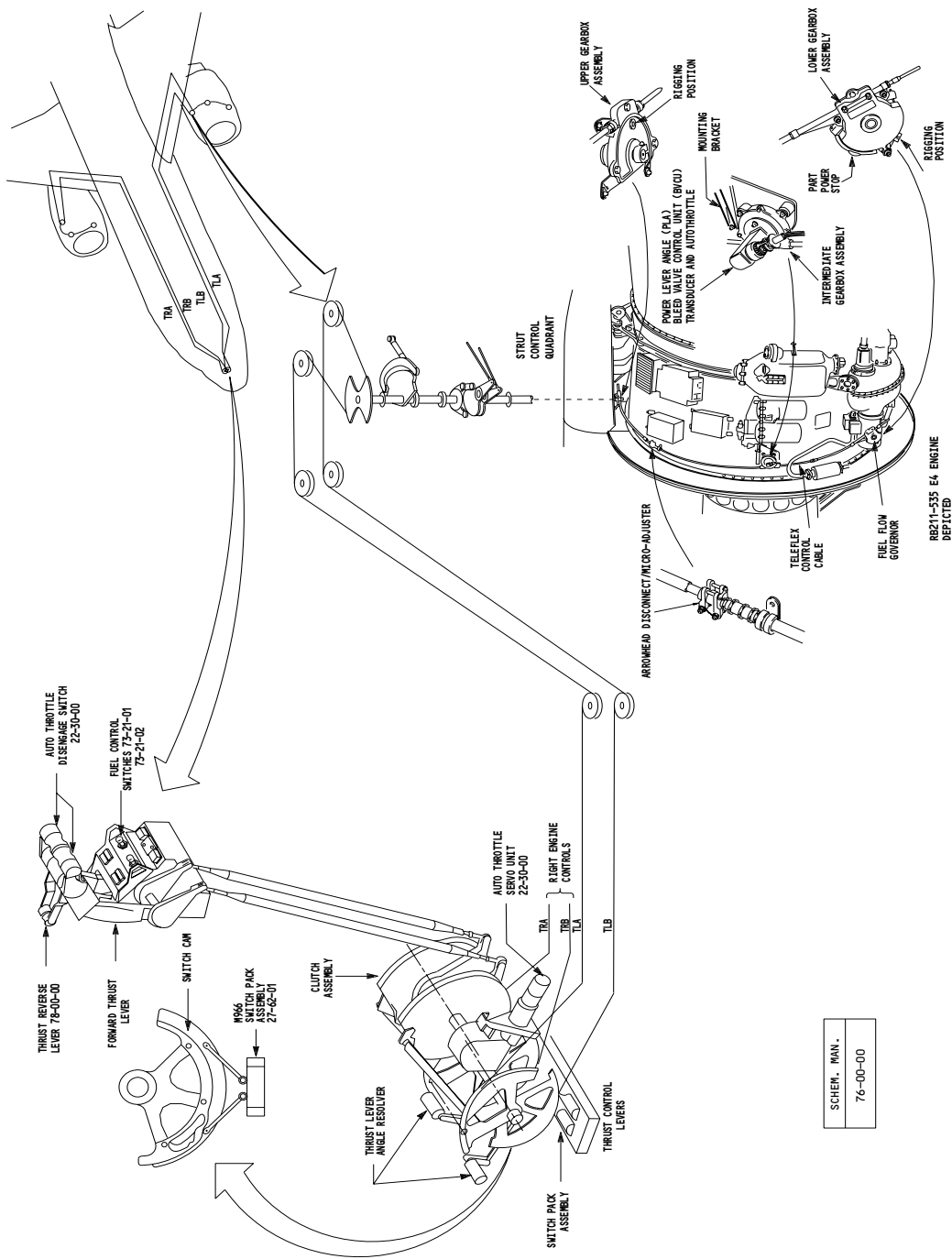
Engine Power and Thrust Reverser Control Linkage Operation  
Figure 2

EFFECTIVITY ————  
ALL

76-11-00

R01

Page 3  
Jan 28/02



Engine Controls  
Figure 3

SCHEM. MAN.
76-00-00

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EFFECTIVITY

ALL

76-11-00

R01

Page 4  
Jan 28/02

B. Thrust Control Cables (Fig. 3)

- (1) The thrust control cables are routed from the thrust control cable drum to the strut. The cable drum is attached to the autothrottle frame beneath the flight compartment floor. The cables run through the airplane under the cabin floor, through the wing leading edges to the engine control drum in the strut.
- (2) The cables are routed through large diameter pulleys with form fitting grooves which reduce friction and increase cable life. Turnbuckles are provided at various locations to assist cable rigging.
- (3) The cables consist of thrust control cable left A (TLA) and thrust control cable left B (TLB). There is an A and B cable for the right side also (TRA and TRB). Pulling the A cable provides forward thrust and pulling the B cable provides reverse thrust.

C. Engine Control Strut Drum (Fig. 3)

- (1) The engine control strut drum is located in the forward part of each strut. The strut drum transfers movement from thrust control cables to the upper gearbox, mounted on the strut firewall.
- (2) The strut drum consists of an input (upper) box, a connecting (center) shaft, and an output (lower) box.
  - (a) The input box consists of a control quadrant and a thrust reverser input cam mounted on a shaft. The thrust control cables end at the control quadrant which converts the linear movement of the cables into rotational movement of the input shaft. The thrust reverser input cam positions the thrust reverser directional control valve input arm to the deploy position when reverse thrust is selected.
  - (b) The connecting shaft connects the input shaft and output shaft and provides for angular and position tolerances between the shafts by means of flexible couplings on both ends.
  - (c) The output box consists of two thrust reverser feedback interlock cams and a connecting shaft. The feedback interlock cams prevent an increase in reverse thrust until the thrust reversers are approximately 55% deployed. At this point reverse thrust can be increased to maximum. The connecting shaft transmits rotation directly to the upper gearbox assembly.

D. Engine Components (Fig. 1 and 2)

- (1) The control system is mounted from the aircraft pylon, running around the right-hand side of the LP compressor case to the FFG and consists of three gearbox assemblies interconnected by a pushpull cable, which incorporates an 'arrowhead' disconnect and micro-adjustment assembly.
- (2) The upper gearbox assembly is mounted from the strut to which the airplane controls are attached. The assembly consists of a rack and pinion gear system which provides an angular movement of the gear sector over a range of 90 degrees from maximum forward to maximum reverse thrust.

EFFECTIVITY

ALL

76-11-00

R01

Page 5  
May 28/99

- (3) The intermediate gearbox assembly mounted through a bracket to the LP compressor case, provides location for and drives the power lever angle transducer (PLA), the transducer being part of the bleed valve control system (AMM 75-32-00). The assembly consists of a rack and pinion system which provides an angular movement of the gear sector over a range of 130 degrees from maximum forward to maximum reverse thrust.
  - (4) The lower gearbox assembly is mounted to the FFG and drives the fuel flow governor throttle control input shaft. The assembly consists of a rack and pinion gear system which provides an angular movement of the gear sector over a range of 130 degrees, from maximum forward to maximum reverse thrust. A part power stop provides for throttle angle setting check, when adjusting the power settings.
  - (5) An 'arrowhead' disconnect assembly within the pushpull cable between the upper and intermediate gearboxes provides for a suitable disconnect point between the engine and airframe, and also incorporates a micro-adjuster for fine adjustment when rigging the system.
  - (6) The airplane controls, throttle angle transducer and upper and lower gearbox assemblies incorporate facilities for rigging the system.
- E. Fuel Control Switches
- (1) The fuel control switches are located in control stand just aft of the thrust lever assembly. There is a switch for each engine with three positions: CUTOFF, RUN, and RICH.
  - (2) This switch controls fuel to the engines (AMM 73-21-00/001) for starting and operating and shutoffs the fuel for shutting down the engines. It also allows ignition (AMM 74-31-00/001) for starting.

3. Operation

A. Functional Description (Fig. 4)

- (1) Forward Thrust Control
  - (a) Movement of the forward thrust lever from idle to maximum power position rotates the gear sector within upper gearbox assembly in a counterclockwise direction through an arc of approximately 55.4 degrees. This movement is transmitted through the teleflex control cable, intermediate and lower gearbox assemblies to the FFG throttle cam, movement of which repositions the FFG range governor (AMM 73-21-00/001).

EFFECTIVITY

ALL

76-11-00

R01

Page 6  
May 28/99

- (b) Movement of the forward thrust lever back to idle position moves the controls in the opposite direction to reposition the FFG range governor.
  - (c) When the forward thrust levers are moved, sounds (i.e. squeaks) from the autothrottle clutch are caused by shoe chatter and are normal.
  - (d) Total angular movement of the upper gearbox assembly gear sector in forward thrust from the rigged position to maximum forward thrust, is 55.4 degrees, corresponding to 80.02 degrees movement of the lower gearbox assembly gear sector, input to the FFG.
- (2) Reverse Thrust Control
- (a) Movement of the reverse thrust lever from forward to reverse thrust mode, i.e. from idle to reverse idle position, rotates the upper gearbox assembly gear sector clockwise through 10 degrees. Further movement of the reverse thrust lever to maximum reverse thrust position moves the upper gearbox assembly gear sector to 34.6 degrees. This movement is transmitted to the lower gearbox assembly to rotate the FFG throttle cam in the opposite direction to forward thrust operation.
  - (b) When the reverse thrust levers are moved, sounds (i.e. squeaks) from the autothrottle clutch are caused by shoe chatter and are normal.
  - (c) The throttle cam is contoured to provide idle dwells for low and reverse idle and actuation of the range governor in either direction of rotation.
  - (d) Movement of the reverse thrust lever back to reverse idle position rotates the controls in the opposite direction to reposition the FFG range governor.
  - (e) Total angular movement of the upper gearbox assembly gear sector in reverse thrust, from the rigged position to maximum reverse thrust is 34.6 degrees corresponding to 49.98 degrees movement of the lower gearbox assembly gear sector input to the FFG.

EFFECTIVITY

ALL

76-11-00

R01

Page 7  
May 28/99

B. Fuel Control Switches

- (1) When the fuel control switch is placed in the RUN or RICH position, 28 volts dc is supplied from the fuel condition control circuit breaker, through a latched fire switch, to deenergize the solenoid which will open the fuel shutoff valve, and for RICH only energizes the cold day enrichment solenoid to allow more fuel to the spray nozzles. For further details on fuel control, refer to AMM 73-21-00/001.
- (2) When put in the cutoff position the solenoid on the fuel shutoff valve is energized to close the valve. It also deenergizes the cold day enrichment solenoid if the switch was at RICH which closes off the extra supply of fuel to the spray nozzles.

EFFECTIVITY

ALL

76-11-00

R01

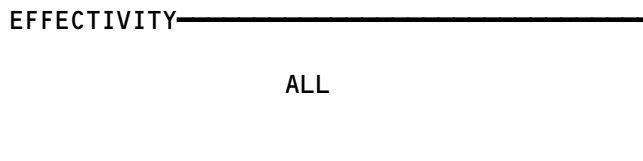
Page 8  
May 28/99



ENGINE CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CABLE - FUEL FLOW GOVERNOR THRUST CONTROL	1	1	414AR, R FAN COWL, L ENG	76-11-06
CABLE - L ENGINE, THRUST CONTROL	2	1	424AR, R FAN COWL, R ENG	76-11-06
		2	113AL, AUTOTHROTTLE CLUTCH PACK AND QUADRANT, LEFT SIDE, 821, FWD CARGO COMPARTMENT CEILING, 511BB,511CB,511DB,511EB,511FB, 511GB,511HB,511JB, FORWARD SPAR, 432AL, STRUT	76-11-03
CABLE - R ENGINE, THRUST CONTROL	2	2	113AL, AUTOTHROTTLE CLUTCH PACK AND QUADRANT, RIGHT SIDE, 821, FWD CARGO COMPARTMENT CEILING, 611BB,611CB,611DB,611EB,611FB, 611GB,611HB,611JB, FORWARD SPAR, 442AL, STRUT	76-11-03
LEVER - THRUST, M985	2	1	FLT COMPT, P10	76-11-01
GEARBOX, UPPER	1	1	414AR, R FAN COWL, L ENG	76-11-12
GEARBOX, INTERMEDIATE	1	1	424AR, R FAN COWL, R ENG	76-11-11
		1	414AR, R FAN COWL, L ENG	
BOX, LOWER POWER CONTROL LINKAGE	1	1	424AR, R FAN COWL, R ENG	76-11-10
		1	414AR, R FAN COWL, L ENG	
		1	424AR, R FAN COWL, R ENG	

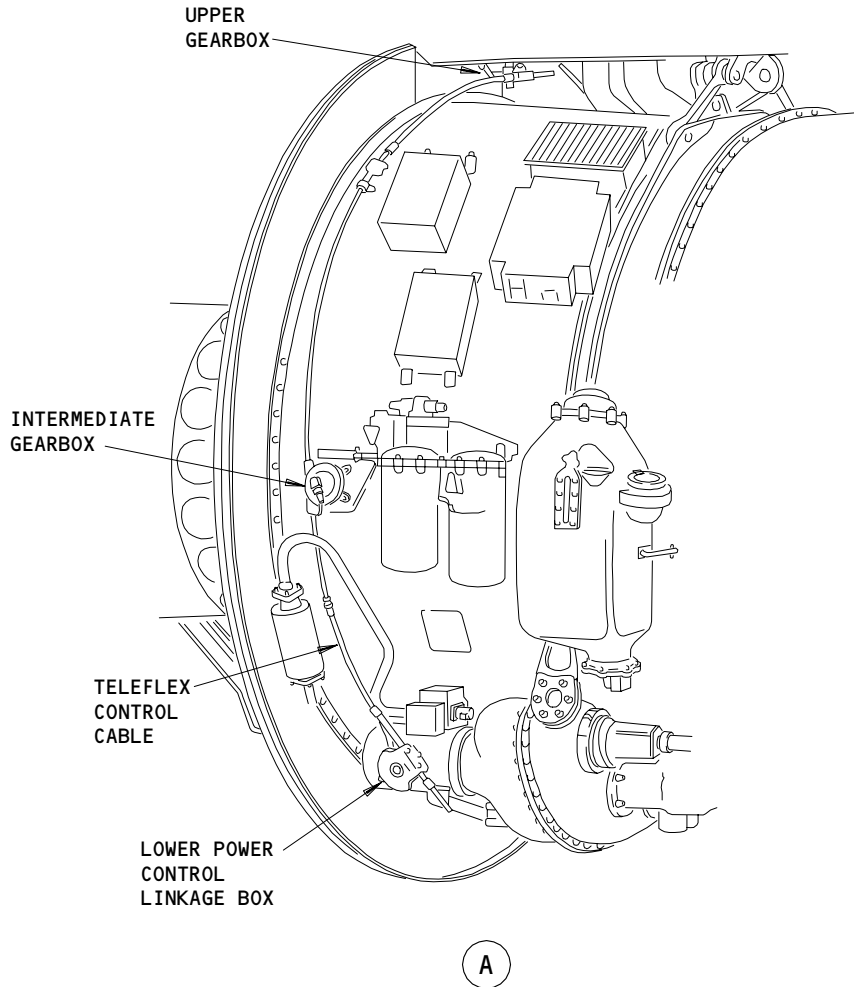
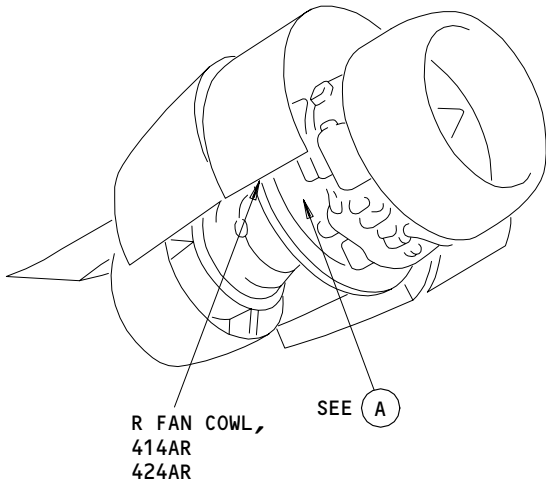
Component Index  
Figure 101



**76-11-00**

R03

Page 101  
Dec 15/85



Component Location  
 Figure 102 (Sheet 1)

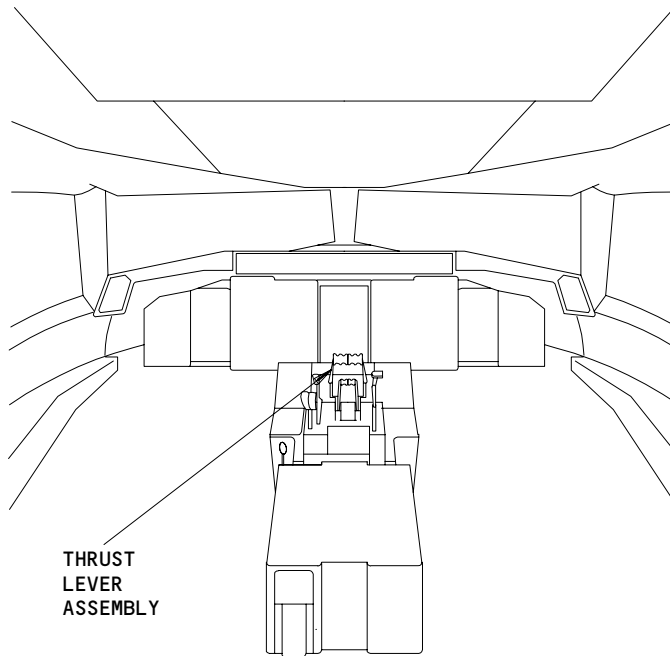
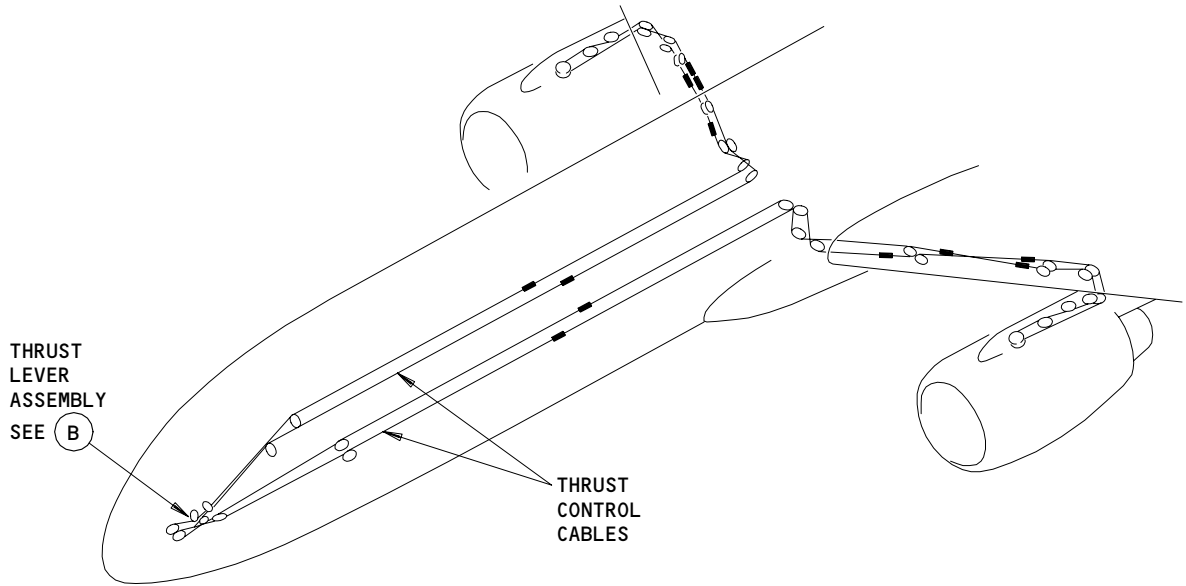
EFFECTIVITY	ALL
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76-11-00

R02

Page 102  
 Sep 20/96

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(B)

Component Location  
Figure 102 (Sheet 2)

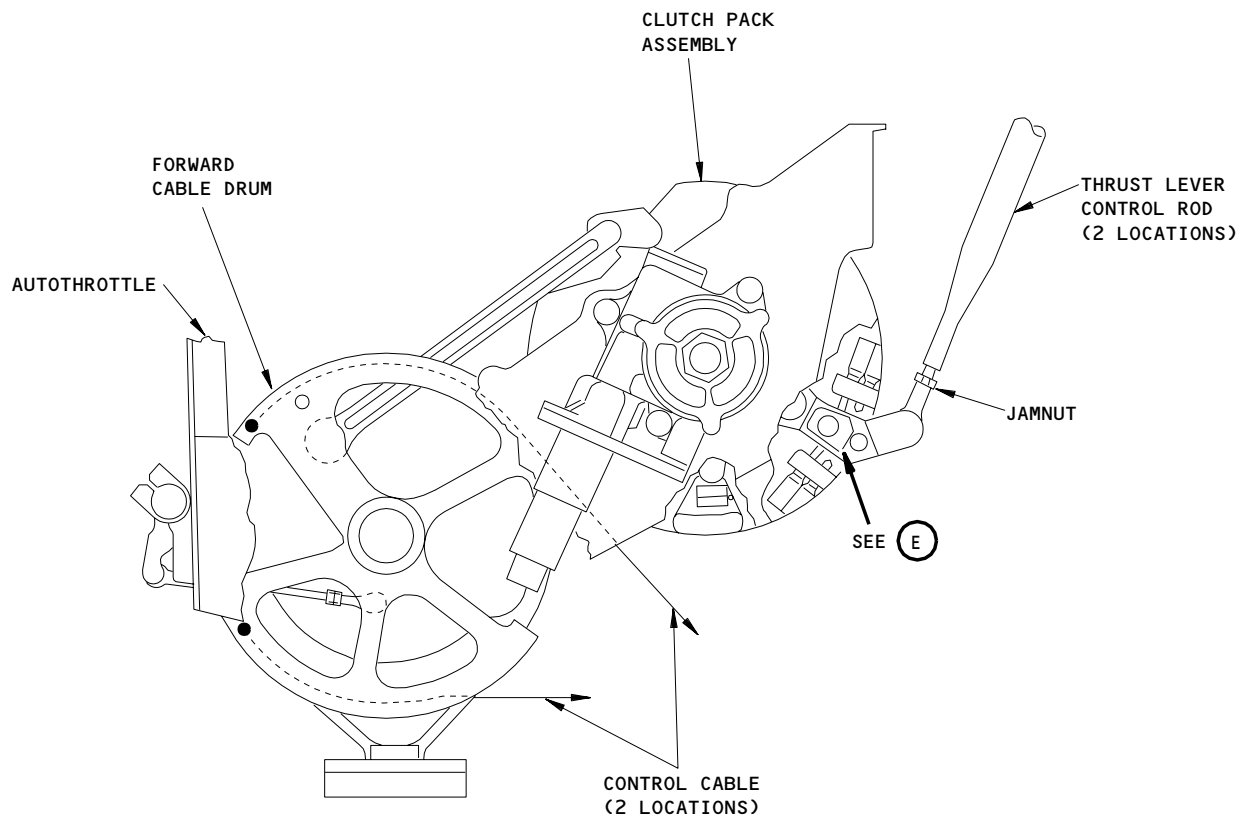
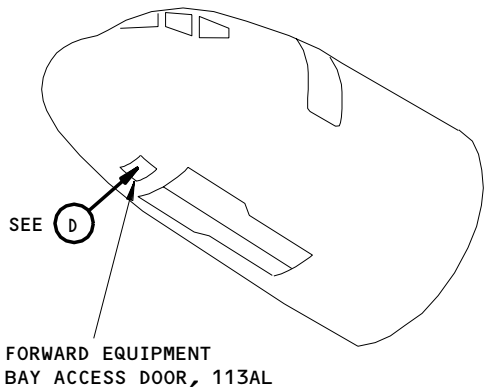
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76-11-00

R03

Page 103  
Dec 15/85



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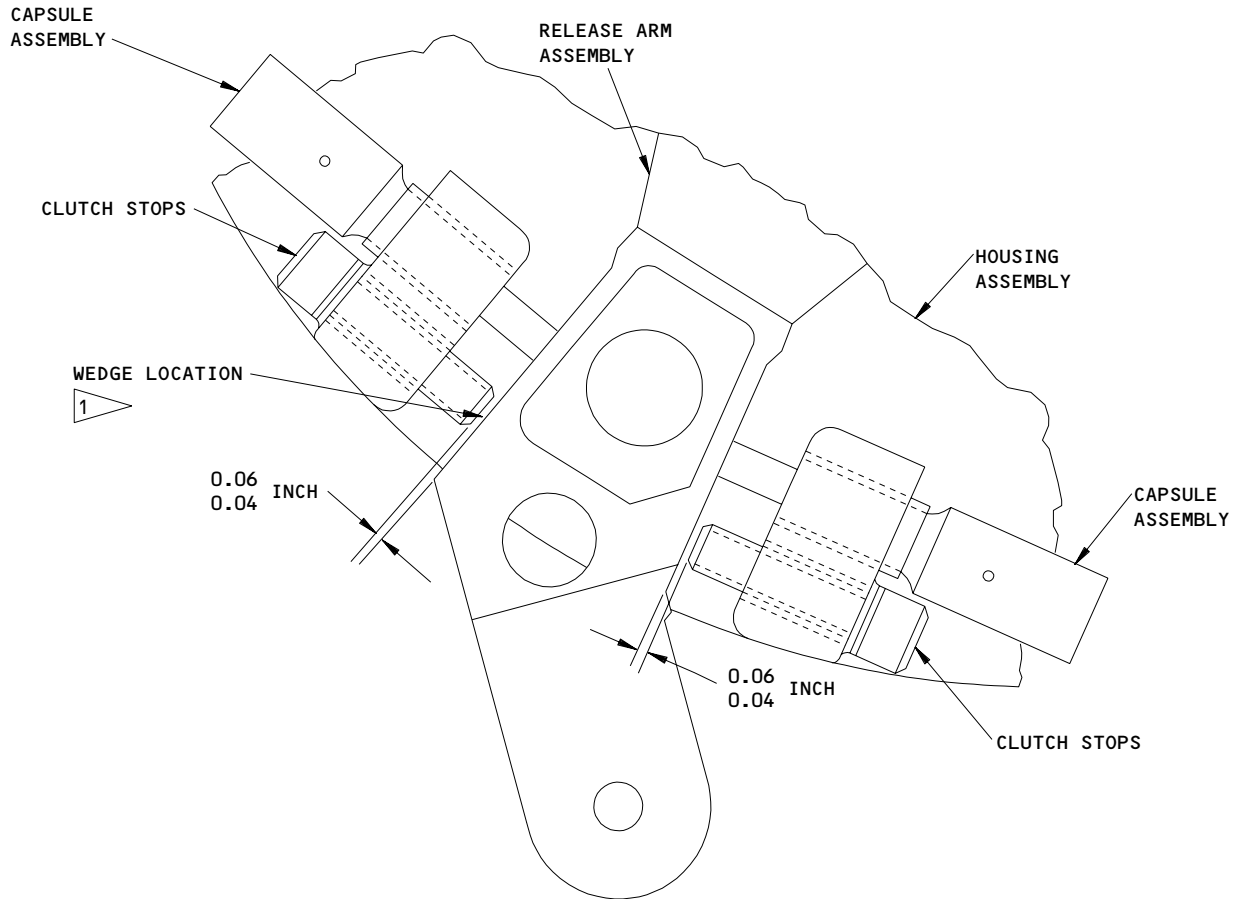
Engine Control System - Component Location  
Figure 102 (Sheet 3)

EFFECTIVITY	ALL
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76-11-00

R02

Page 104  
Jan 28/00



(E)

1 THE WEDGE IS USED TO HOLD THE RELEASE ARM ASSEMBLY AGAINST THE OPPOSITE CLUTCH STOP AND RELEASE THE CLUTCH. THE WEDGE CAN BE MADE OF ANY MATERIAL WHICH WILL NOT DAMAGE THE RELEASE ARM OF THE CLUTCH STOPS (PHENOLIC, BRASS, PLASTIC...ETC.)

Engine Control System - Component Location  
Figure 102 (Sheet 4)

EFFECTIVITY	ALL
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76-11-00

R01

Page 105  
Jan 28/00

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ENGINE CONTROL SYSTEM – ADJUSTMENT/TEST

1. General

- A. The adjustment of the engine control system has the two sections that follow:
  - (1) The adjustment of the components on the airplane.
  - (2) The adjustment of the components on the engine.
- B. The airplane adjustment section has these procedures:
  - (1) The adjustment of the control cable.
  - (2) The adjustment of the control rod of the thrust reverser.
- C. The engine adjustment section has these procedures:
  - (1) Adjustment of the engine controls after the engine installation.
  - (2) Adjustment of the engine controls after you replace the fuel flow governor (FFG).
  - (3) Adjustment of the engine controls after the you replace the lower control box, or the intermediate control box.
  - (4) Adjustment of the engine controls after you replace the upper control box.

TASK 76-11-00-825-003-R00

2. Adjustment of the Control System on the Airplane Installation

A. General

- (1) The ambient temperature must be stable before you start to adjust the airplane control system. The difference in the temperature must be less than  $\pm 5^{\circ}\text{F}$  between the internal and external components. Let the temperature become stable for one hour before you start the adjustment of the cable load. The temperature must stay in these limits during the adjustment of the control system.
- (2) Unless your instructions are different, you adjust the airplane cable while it is disconnected from the engine cable.
- (3) Also, adjust the engine cable when you disconnect it from the airplane cable.
- (4) Make these adjustments before you install the engine on the airplane.
- (5) All rig pins, when installed, must turn freely with light movement from your fingers.

B. Equipment

- (1) Rig Pin Set B20003-75 (AMM 20-10-24/201)

EFFECTIVITY

ALL

76-11-00

R01

Page 501  
Jan 28/03

- (2) Rig Pin Set B20003-XX (AMM 20-10-24/201)
  - (a) Rig Pin RR1 - P/N B20003-14
  - (b) Rig Pin RR2 - P/N B20003-29
  - (c) Rig Pin AT-1 - P/N B20003-67
- (3) Adapter, Torque Wrench - HU29369
- (4) Wrench, Torque - Standard 0.250 inch square drive

C. References

- (1) AMM 20-10-24/201, Rig Pins
- (2) AMM 22-32-04/201, Microswitch Pack - Maintenance Practices
- (3) AMM 54-52-01/401, Strut Fairings
- (4) AMM 54-53-01/401, Strut Access Doors
- (5) AMM 70-51-00/201, Torque Tightening Technique
- (6) AMM 70-50-02/201, Electrical Connectors
- (7) AMM 71-11-04/201, Fan Cowl Panels
- (8) AMM 73-21-09/501, Thrust Lever Angle (TLA) Transducer
- (9) AMM 75-32-14/401, Power Lever Angle Bleed Valve Control Unit and Autothrottle Transducer
- (10) AMM 76-11-03/201, Thrust Control Cables
- (11) AMM 76-11-10/401, Lower Power Control Box
- (12) AMM 78-31-00/201, Thrust Reverser
- (13) AMM 78-34-03/401, Thrust Reverser Feedback Cables

D. Access

- (1) Location Zones
  - 100 Lower Half of Fuselage
  - 410 No. 1 Power Plant
  - 420 No. 2 Power Plant
  - 430 No. 1 Nacelle Strut
  - 440 No. 2 Nacelle Strut

- (2) Access Panels

- 113AL Forward Equipment Bay
- 415AL Thrust Reverser (left)
- 416AR Thrust Reverser (right)
- 425AL Thrust Reverser (left)
- 426AR Thrust Reverser (right)
- 433GL Strut Access Door
- 443GL Strut Access Door

E. Prepare to adjust the components on the airplane:

S 045-001-R00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER 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) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

EFFECTIVITY

ALL

**76-11-00**

R04

Page 502  
Jan 28/03

- S 015-004-R00
- (2) Open the access hatch, 113AL of the forward equipment bay.
- S 015-006-R00
- (3) Remove the forward strut fairing (AMM 54-52-01/401).
- S 015-007-R00
- (4) Open the access door 433G of the strut (AMM 54-53-01/401).
- F. Adjustment of the thrust control cable:
- S 945-002-R00
- (1) Slowly move the thrust levers to the stop for the idle position and release them.
- S 865-087-R00
- (2) Attach the DO-NOT-OPERATE tag to the levers.
- S 425-005-R00
- (3) Install the rig pin at pin hole No. 1 (Fig. 501).
- (a) Make sure the rig pin moves freely into pin hole No. 1.
- NOTE: Pin hole No. 1 goes through the two forward cable drums and the autothrottle side frames.
- (b) If you can not install the pin freely then adjust the thrust lever rods until you can install the pin.
- 1) Examine the adjustable rod end to see if the threads engage correctly:
- a) The threads of the rod end must be seen through the inspection hole.
- b) Make sure that you can see threads on a minimum of one-half of the area.
- S 945-008-R00
- (4) Put the strut drum of the engine control in the idle adjustment position:
- NOTE: The rig pin in pin hole No. 1 must be kept in its position.
- (a) Install rig pin in pin hole No. 2 (Fig. 502).
- NOTE: Pin hole No. 2 is in the strut drum and it goes through the cam and the lower web of the bracket.
- 1) If it is necessary, with the cables installed, adjust the turnbuckles to put the rig pin in the hole freely.

EFFECTIVITY

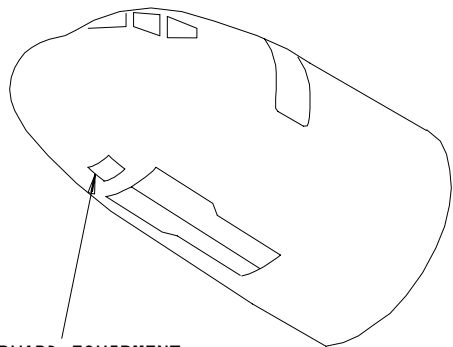
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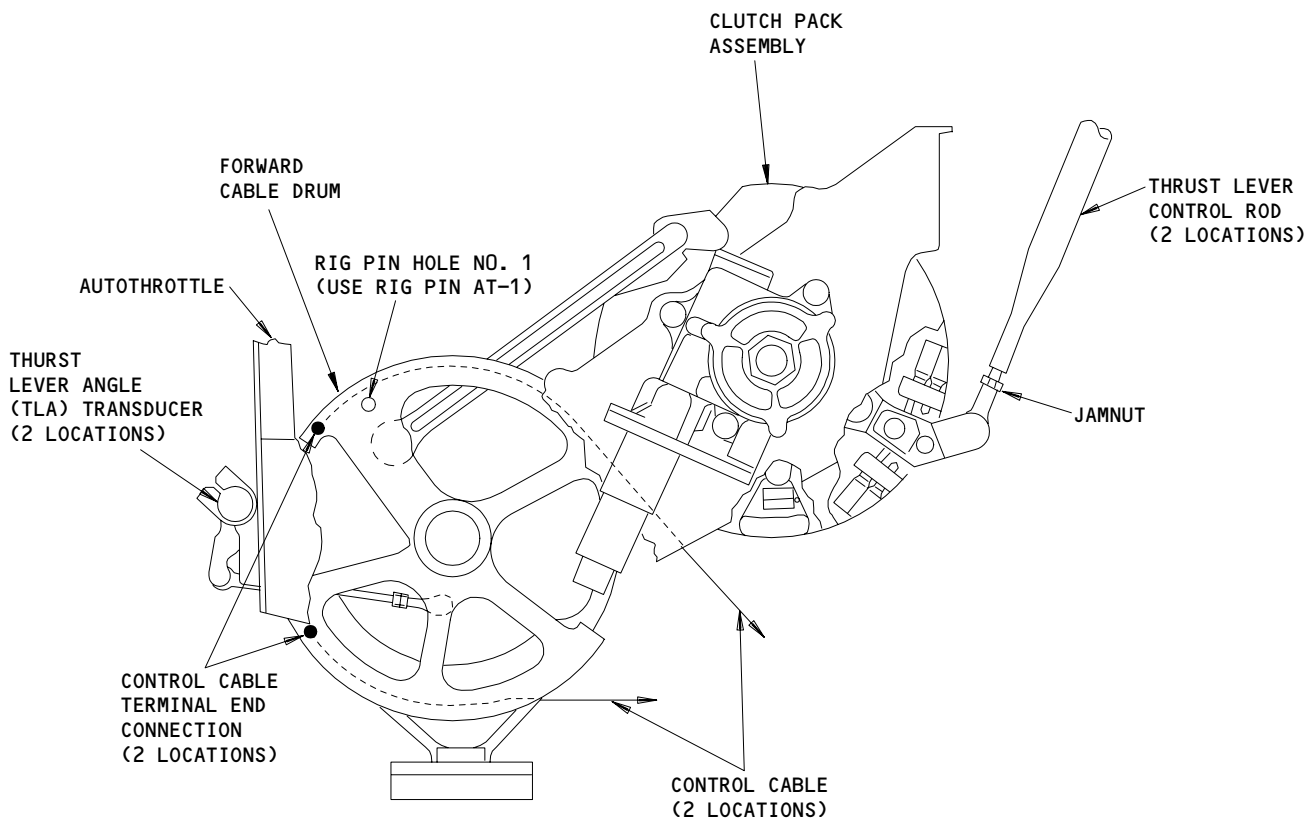
R03

Page 503  
Sep 20/93





FORWARD EQUIPMENT  
BAY ACCESS DOOR



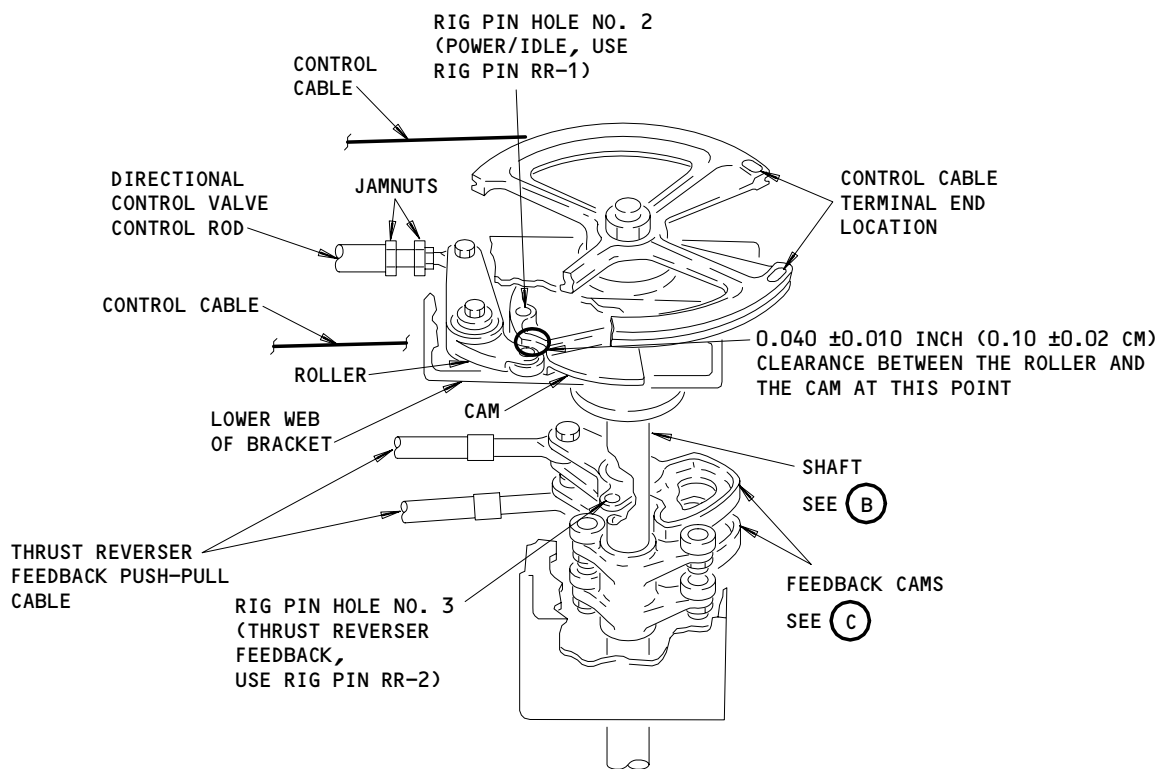
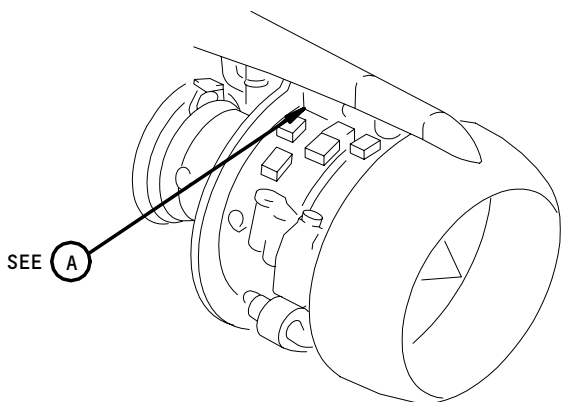
Control Cable Rigging - Airplane Installation  
Figure 501

EFFECTIVITY	ALL
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76-11-00

R02

Page 504  
Sep 20/93



ENGINE CONTROL STRUT DRUM

(A)

Control Cable Rigging - Strut Installation  
Figure 502 (Sheet 1)

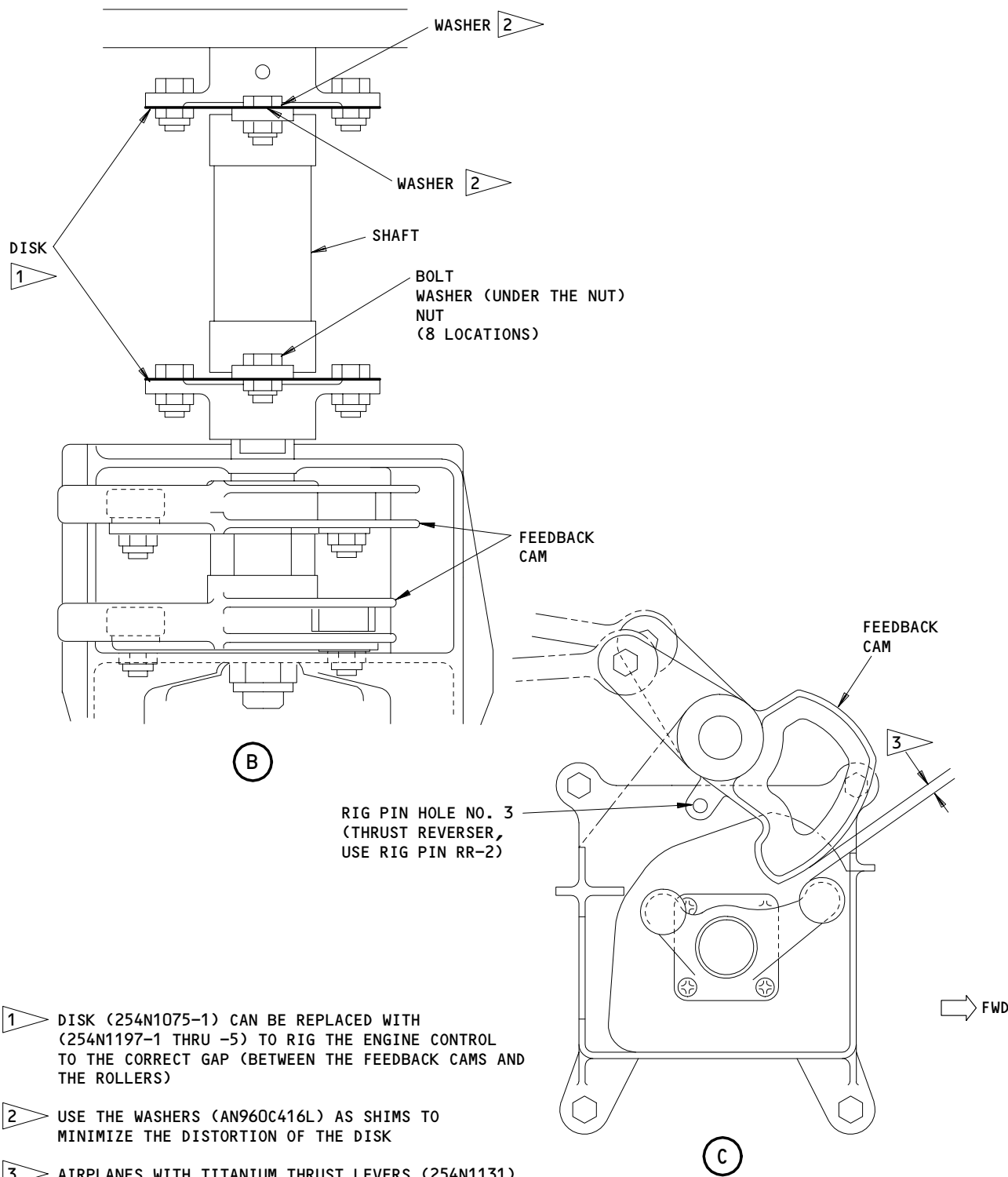
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76-11-00

R01

Page 505  
Sep 20/94

140620



- 1 DISK (254N1075-1) CAN BE REPLACED WITH (254N1197-1 THRU -5) TO RIG THE ENGINE CONTROL TO THE CORRECT GAP (BETWEEN THE FEEDBACK CAMS AND THE ROLLERS)
- 2 USE THE WASHERS (AN960C416L) AS SHIMS TO MINIMIZE THE DISTORTION OF THE DISK
- 3 AIRPLANES WITH TITANIUM THRUST LEVERS (254N1131)  
THE GAP IS 0.19-0.22 INCH (0.48-0.56cm)  
AIRPLANES WITH ALUMINUM THRUST LEVERS (254N1073)  
THE GAP IS 0.29-0.33 INCH (0.74-0.84cm)

Control Cable Rigging - Engine Installation  
Figure 502 (Sheet 2)

EFFECTIVITY	ALL
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76-11-00

115955

S 435-009-R00

- (5) If you replaced the control cables do these steps:  
 (a) Adjust the new cables to two times the final adjustment load, +/- 10 pounds (4.54 kilograms), that you find in the table that follows:

NOTE: Tension in the cables of the TLA, TLB, TRA, and TRB must be within 50 pounds (22.7 kilograms) during the adjustment.

TEMPERATURE *[1]	ADJUSTMENT LOAD *[2]	
	POUNDS	KILOGRAMS
DEGREES F		
130	69	31.3
110	64	29.1
90	60	27.2
70	55	25.0
50	50	22.7
30	46	20.9
10	41	18.6
-10	36	16.3
-30	31	14.1
-40	29	13.2

- \*[1] The temperature on the inner and outer side of the airplane must not be more than +5 or -5°F of the ambient temperature. The temperature must be stable for a minimum of one hour before the cable load is adjusted.
- \*[2] The cable loads must be adjusted to approximately +5 to -5 pounds of the table values.

EFFECTIVITY

ALL

76-11-00

R01

Page 507  
Dec 20/95

- (b) Do not install the turnbuckle locking clips at this time.
- (c) Remove the rig pin from hole No. 1 of the autothrottle assembly.
- (d) Remove the rig pin from hole No. 2 of the strut drum.
- (e) Remove the DO-NOT-OPERATE tag from the thrust levers.
- (f) Move the thrust levers from idle through the full range of forward travel for 25 times.

S 835-013-R00

- (6) Adjust the tension on the thrust control cables to the loads in the ADJUSTMENT LOAD table.

NOTE: Tension in the cables of the TLA, TLB, TRA, and TRB must be within 50 pounds (22.7 kilograms) during the adjustment.

S 945-014-R00

- (7) Slowly move the thrust levers to the idle stops.

NOTE: The rig pins must go into the rig pin holes freely. This must happen after you move the thrust levers to the idle stops and release them.

S 835-015-R00

- (8) Install the turnbuckle locking clips.

S 095-016-R00

- (9) If you installed the rig pins at pin hole No. 1 and pin hole No. 2 then remove them.

S 225-149-R00

- (10) If you have changed the adjustment of the thrust lever control rod, adjust the autothrottle microswitch pack (AMM 22-32-04/201).

S 415-017-R00

- (11) Close the access hatch of the forward equipment bay.

S 415-018-R00

- (12) Install the forward fairing (AMM 54-52-01/401).

S 415-019-R00

- (13) Close the access door of the strut (AMM 54-53-01/401).

EFFECTIVITY

ALL

76-11-00

R01

Page 508  
Mar 20/97

S 445-089-R00

- (14) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 835-119-R00

- (15) Adjust the two TLA transducers (AMM 73-21-09/501).

G. Adjustment of the feedback cables of the thrust reverser (Fig. 502):

S 045-082-R00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER 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) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 865-093-R00

- (2) Move the reverse thrust level to the retracted position.

S 865-094-R00

- (3) Move the forward thrust level to the idle position.

S 865-085-R00

- (4) Attach the DO-NOT-OPERATE tags to the levers.

S 015-076-R00

- (5) Open the access door, 433G, of the strut.  
(a) Remove the panel 433H (AMM 54-53-01/401).

S 425-090-R00

- (6) Install the rig pin at pin hole No. 3.  
(a) If you can not install the rig pin freely then do these steps to adjust the feedback cables of the thrust reverser:  
1) Disconnect the feedback cables (AMM 78-34-03/401).

EFFECTIVITY

ALL

76-11-00

R02

Page 509  
Mar 20/97

2) Install the rig pin at pin hole No. 2 (Fig. 502).

NOTE: Pin Hole No. 2 is in the cam and the lower web of the bracket.

- 3) Adjust the feedback cables (AMM 78-34-03/401).
- 4) Install the feedback cables (AMM 78-34-03/401).
- 5) Move the quadrant counterclockwise (viewed from above), to remove the backlash from the pin hole No. 2.
- 6) Examine the clearance between the rollers and the feedback cams (Fig. 502):
  - a) If you cannot get the clearance, replace the disk (254N1075) with a different disk (254N1197-1 thru -5).

NOTE: Disks 254N1197-1 thru -5 have an increment offset of one degree. A change of one degree adjusts the clearance by 0.031 inch (0.79 mm).

- b) Use a maximum of two washers as shims to decrease the disk distortion.
- 7) Remove the rig pin at pin hole No. 2.

S 025-091-R00

(7) Remove the rig pin at pin hole No. 3.

S 415-087-R00

- (8) Install the panel 433H (AMM 54-53-01/401).
  - (a) Close the access door 433G of the strut.

S 865-086-R00

(9) Remove the DO-NOT-OPERATE tag from the thrust levers.

S 445-095-R00

(10) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

H. Adjustment of the directional control valve of the control rod (Fig. 502):

EFFECTIVITY

ALL

76-11-00

R01

Page 510  
Sep 20/93

S 045-101-R00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER 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) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 865-145-R00

- (2) Move the reverse thrust level to the retracted position.

S 865-146-R00

- (3) Move the forward thrust level to the idle position.

S 865-098-R00

- (4) Attach the DO-NOT-OPERATE tags to the levers.

S 015-097-R00

- (5) Open the access door 433G of the strut.  
(a) Remove the panel 433H (AMM 54-53-01/401).

S 225-092-R00

- (6) Do a check to see if the clearance between the cam and the roller is 0.040 +/-0.010 inch (1.016 +/-0.254 mm).  
(a) If the clearance is not in the limits then do these steps:  
1) Install the rig pin at pin hole No. 2.  
2) Move the quadrant counterclockwise to remove the backlash from the pin hole No. 2.  
3) Make sure the input crank on the directional control valve of the thrust reverser is in the 0° stowage position (Fig. 503).

**NOTE:** The input crank is spring actuated against the stowed position stop.

EFFECTIVITY

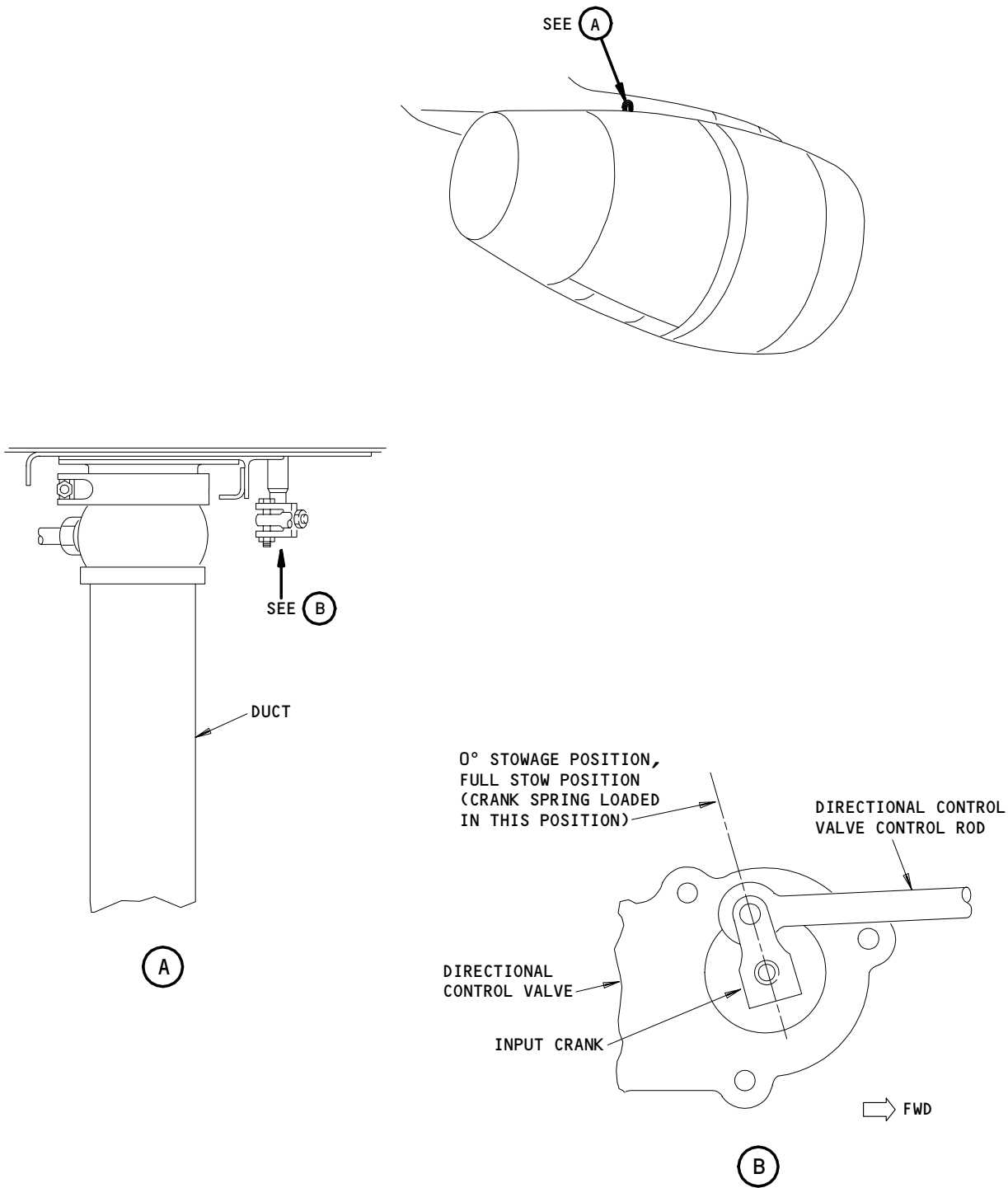
ALL

76-11-00

R03

Page 511  
Dec 20/93





Directional Control Valve Adjustments  
Figure 503

EFFECTIVITY	ALL
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76-11-00

R01

Page 512  
Sep 20/93

- 4) Loosen the two jamnuts on the control rod.
- 5) Adjust the control rod to give a 0.040 +/-0.010 inch (1.016 +/-0.254 mm) clearance between the cam and the roller.
- 6) Tighten the two jamnuts on the control rod.

CAUTION: MAKE SURE THAT THERE IS A MINIMUM CLEARANCE OF 0.75 INCH (19.05 mm) BETWEEN THE STRUT THERMAL ANTI-ICE DUCT ASSEMBLY AND THE INPUT CAM OF THE THRUST REVERSER VALVE.

- 7) Do a clearance check to make sure the 0.040 inch (0.101 mm) clearance does not change.
- 8) Look through the two inspection holes on the rod to make sure you engage the threads of the control rod correctly:
  - a) Make sure you only see the threads through the inspection holes.
  - b) Make sure that you can see threads on a minimum of one-half of the area.
- 9) Remove the rig pin at pin hole No. 2.

S 415-035-R00

- (7) Install the panel 433H (AMM 54-53-01/401).
  - (a) Close the access door 433G of the strut.

S 865-077-R00

- (8) Remove the DO-NOT-OPERATE tag from the thrust levers.

S 445-096-R00

- (9) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

TASK 76-11-00-825-046-R00

3. Adjustment of the Control System for the Engine Installation

A. General

- (1) This section gives the adjustment procedures for the areas of engine control that follow:
  - (a) Prepare to adjust the engine controls.

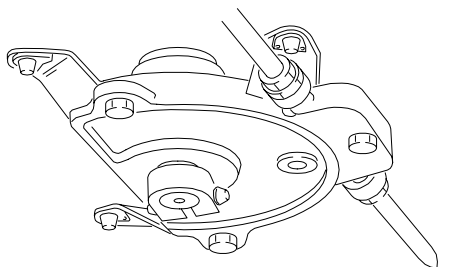
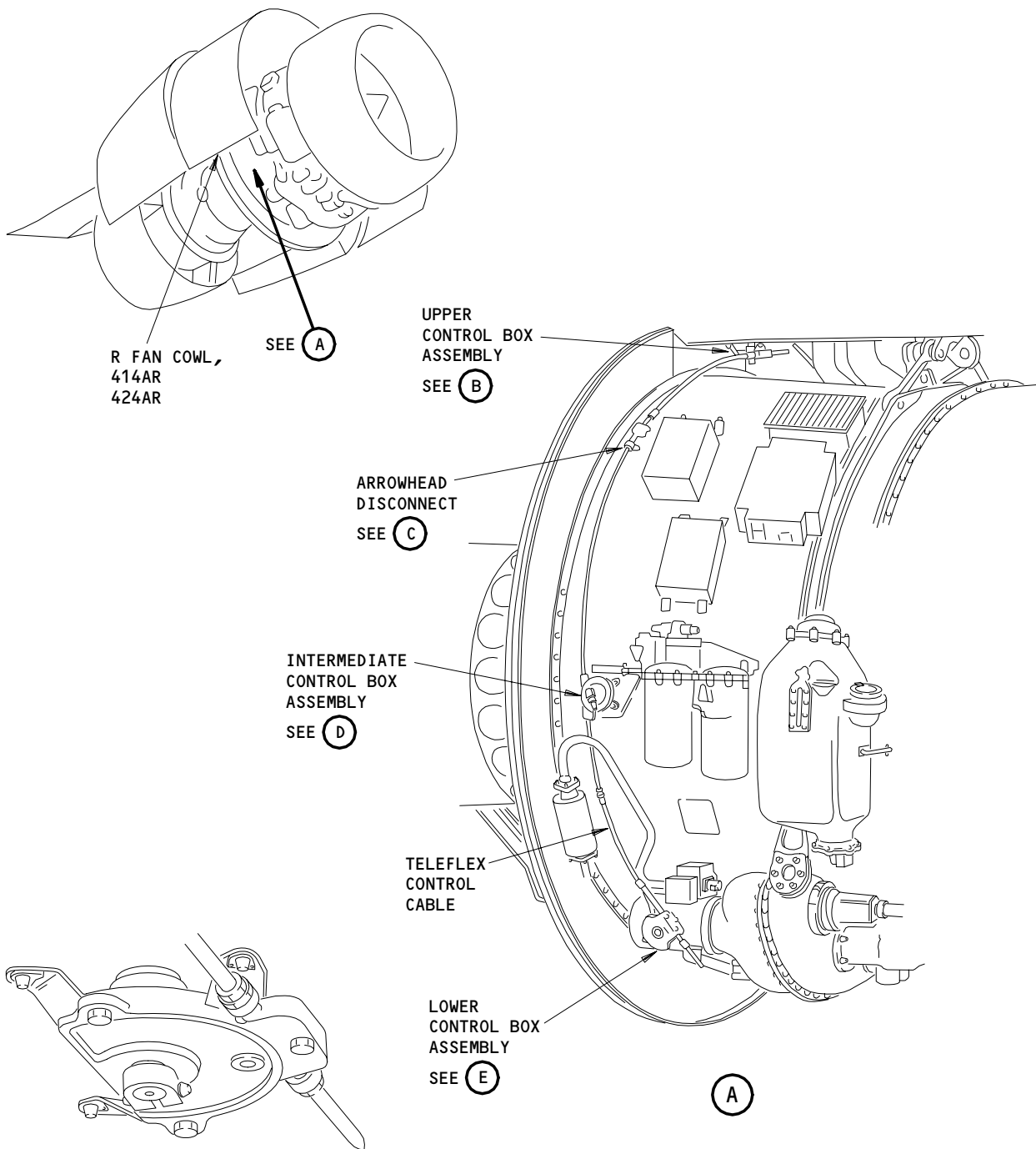
EFFECTIVITY

ALL

76-11-00

R02

Page 513  
Jun 20/97



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UPPER CONTROL BOX ASSEMBLY

(B)

Control System Rigging - Engine Installation  
Figure 504 (Sheet 1)

EFFECTIVITY

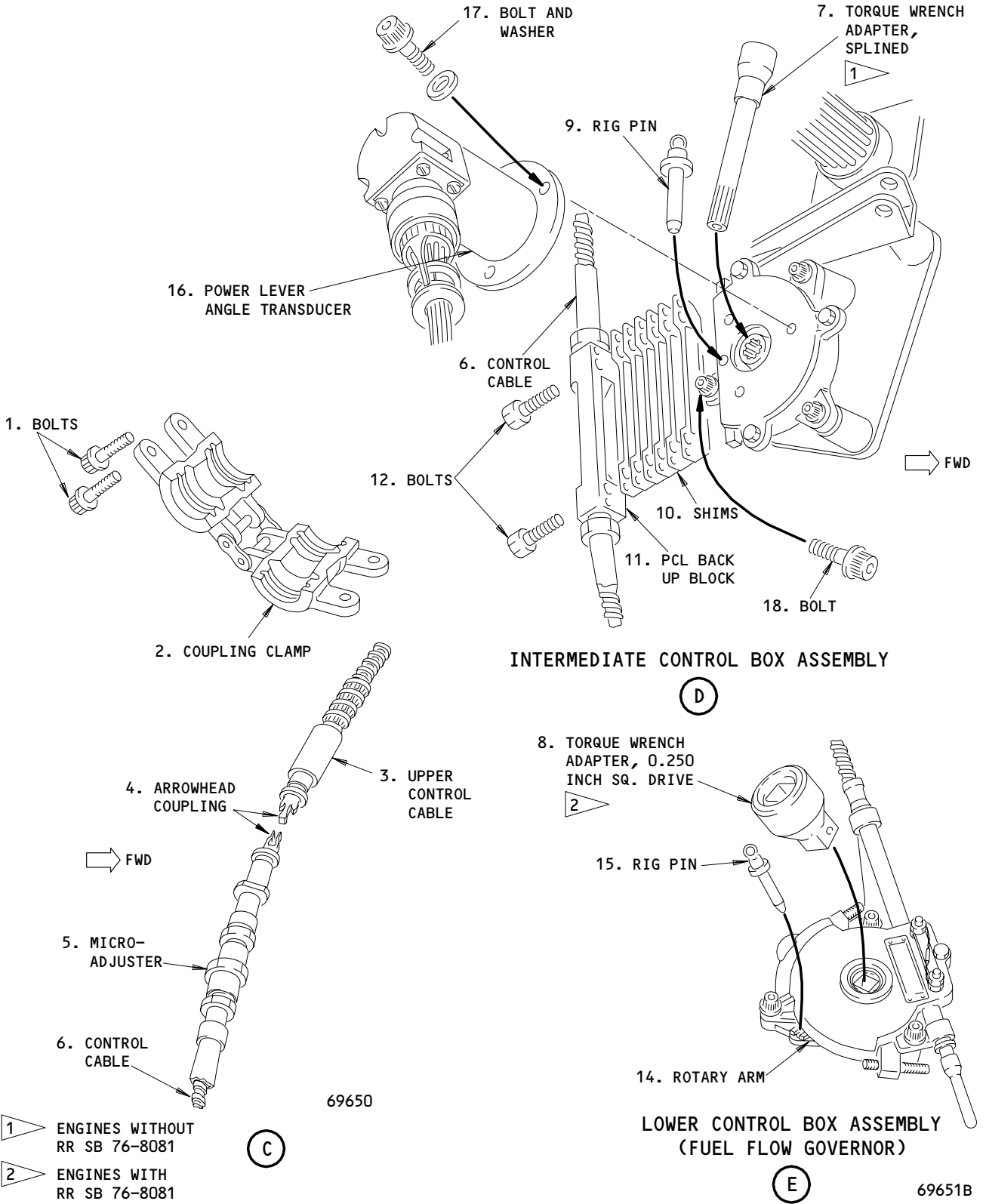
ALL

76-11-00

R01

Page 514  
Sep 20/93

208243



Control System Rigging - Engine Installation  
Figure 504 (Sheet 2)

EFFECTIVITY	
	ALL

76-11-00

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- (b) Adjustment of the corrected engine controls after the engine installation.
- (c) Adjust the engine controls after you replace the fuel flow governor (FFG).
- (d) Adjust the engine controls after the replacement of the lower control box, or the intermediate control box.
- (e) Adjustment of the engine controls after you replace the upper control box.
- (f) Make sure the engine controls move freely.

**B. Equipment**

- (1) Rig Pin - UT1150/2 (Rolls-Royce) or WT100719 (Woodward)
- (2) Rig Pin - UT1315/1, Rolls-Royce
- (3) Rig Pin Set B20003-75 (AMM 20-10-24/201)
- (4) Rig Pin Set B20003-XX (AMM 20-10-24/201)
  - (a) Rig Pin RR1 - P/N B20003-14
  - (b) Rig Pin RR2 - P/N B20003-29
  - (c) Rig Pin AT-1 - P/N B20003-67
- (5) Adapter, Torque Wrench - HU29369
- (6) Wrench, Torque - Standard 0.250 inch square drive

**C. References**

- (1) AMM 20-10-24/201, Rig Pins
- (2) AMM 22-32-04/201, Microswitch Pack - Maintenance Practices
- (3) AMM 54-52-01/401, Strut Fairings
- (4) AMM 54-53-01/401, Strut Access Doors
- (5) AMM 70-51-00/201, Torque Tightening Technique
- (6) AMM 70-50-02/201, Electrical Connectors
- (7) AMM 71-11-04/201, Fan Cowl Panels
- (8) AMM 73-21-09/501, Thrust Lever Angle (TLA) Transducer
- (9) AMM 75-32-14/401, Power Lever Angle Bleed Valve Control Unit and Autothrottle Transducer
- (10) AMM 76-11-03/201, Thrust Control Cables
- (11) AMM 76-11-10/401, Lower Power Control Box
- (12) AMM 78-31-00/201, Thrust Reverser
- (13) AMM 78-34-03/401, Thrust Reverser Feedback Cables
- (14) RR SB 76-8081 - Engine Controls - Power Control Linkage - Lower Control Box - Introduction of square drive for cycling.
- (15) RR SB 76-8082 - Engine Controls - Power Control Linkage - Lower Control Box - Introduction of intermediate box mounting spacer.
- (16) RR SB 76-8386 - Engine Controls - Lower Control Box - Introduction of revised gear sector and bearings.

**D. Access**

- (1) Location Zones
  - 410 No. 1 Power Plant
  - 420 No. 2 Power Plant

EFFECTIVITY

ALL

**76-11-00**

R03

Page 516  
Jan 28/03

- (2) Access Panels
  - 415AL Thrust Reverser (left)
  - 416AR Thrust Reverser (right)
  - 425AL Thrust Reverser (left)
  - 426AR Thrust Reverser (right)

E. Prepare to adjust the engine controls:

S 865-144-R00

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach a DO-NOT-CLOSE identifier:
  - (a) 6C1, FUEL COND CONT L
  - (b) 6C2, FUEL COND CONT R

S 865-143-R00

- (2) Slowly move the thrust levers rearward to the idle stop position.

S 865-101-R00

- (3) Attach the DO-NOT-OPERATE tag to the levers.

S 045-102-R00

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

- (4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 015-136-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (5) Open the fan cowl panel on the right side (AMM 71-11-04/201).

F. Do these steps to connect and to adjust the engine controls after an engine installation (Fig. 504):

S 865-104-R00

- (1) Make sure that the thrust levers are at the idle stop position.

S 425-105-R00

- (2) Install the rig pin at the pin hole No. 2 of the strut drum (Fig. 502).

S 435-106-R00

- (3) Connect the higher and the lower cable at the arrowhead coupling (4) (Fig. 504).

EFFECTIVITY

ALL

76-11-00

R05

Page 517  
Jan 28/01

- S 435-107-R00
- (4) Install the coupling clamp (2) to the arrowhead coupling (4):
- (a) Tighten the bolts (1) of the clamp to 25-30 pound-inches (2.82-3.62 newton meters).
- 1) Install lockwire on the bolts (1).
- S 425-108-R00
- (5) Install the rig pin UT1150/2 (15) into the rotary arm (14) of the lower control box assembly:
- (a) If you can not install the pin freely then adjust the micro-adjuster (5) to permit installation of the pin.
- (b) Install lockwire on the micro-adjuster (5).
- S 025-109-R00
- (6) Remove the rig pins from the rotary arm and the strut drum.
- S 865-139-R00
- (7) Make sure you can move the engine controls freely.
- S 835-124-R00
- (8) Adjust the PLA transducers (AMM 75-32-14/401).
- S 835-125-R00
- (9) Adjust the two TLA transducers (AMM 73-21-09/501).
- G. Do these steps to adjust the engine controls after you replaced a fuel flow governor (FFG) (Fig. 504):
- S 865-111-R00
- (1) Make sure that the thrust levers are at the idle stop position.
- S 425-112-R00
- (2) Install the rig pin at the pin hole No. 2 of the strut drum (Fig. 502).
- S 425-110-R00
- (3) Install the rig pin UT1150/2 (15) into the rotary arm (14) of the lower control box assembly:
- (a) If you can not install the pins freely then adjust the micro-adjuster (5) to permit installation of the pins.
- S 425-113-R00
- (4) Install the rig pin UT1315/1 (9) to the intermediate control box.
- (a) Make sure that you can turn the rig pin freely with light movement from your fingers.
- S 435-114-R00
- (5) Install lockwire on the micro-adjuster (5).

EFFECTIVITY

ALL

76-11-00

R06

Page 518  
Jan 28/01

- S 025-115-R00
  - (6) Remove all three rig pins.
  
  - S 865-140-R00
  - (7) Make sure you can move the engine controls freely.
  
  - S 835-128-R00
  - (8) Adjust the PLA transducers (AMM 75-32-14/401).
  
  - S 835-129-R00
  - (9) Adjust the two TLA transducers (AMM 73-21-09/501).
- H. Do these steps to adjust the engine controls after you replace the lower control box or the intermediate control box (Fig. 504):
- S 225-137-R00

**CAUTION:** ENGINES PRE RR SB 76-8081;  
MAKE SURE YOU DO NOT SUPPLY SIDE LOADS TO THE INTERMEDIATE CONTROL BOX WHEN YOU PUT ON OR REMOVE THE TORQUE WRENCH ADAPTERS. SIDE LOADS CAN DECREASE THE FIT OF THE TRANSDUCER OF THE POWER LEVER ANGLE. NO OTHER TOOL IS PERMITTED.

MAKE SURE THAT THE TORQUES SUPPLIED DURING THE ADJUSTMENT OF THE RUNNING RESISTANCE OF THE CONTROL CABLE ARE NOT TOO LARGE. IT IS IMPORTANT THAT THE TORQUE LOADS ARE NOT MORE THAN 21 POUND-INCHES (2.37 NEWTON-METERS). IF THE TORQUE IS TOO LARGE, DAMAGE TO THE COMPONENTS CAN OCCUR.

ENGINES PRE RR SB 76-8082;  
THE SHIM PACK OF THE LOWER BOX ASSEMBLY OF THE POWER CONTROL LINKAGE (10) HAS A MAXIMUM OF THE SIX SHIMS. THIS QUANTITY MUST NOT BE MORE SIX SHIMS BECAUSE IT WILL DECREASE THE SERVICEABLE CONDITION OF THE CONTROLS.

ENGINES POST RR SB 76-8082;  
DO NOT INSTALL THE SHIMS BECAUSE THIS WILL DECREASE THE SERVICEABLE CONDITION OF THE CONTROLS.

- (1) ENGINES POST RR SB 76-8081 AND RR SB 76-8082;  
Do these steps to examine the resistance of the control cable:
  - (a) Put the torque wrench with a square drive adapter of 0.25 inches (8) into the drive on the lower control box.

EFFECTIVITY

ALL

76-11-00

R03

Page 519  
Sep 20/98



- (b) Use the torque wrench to measure the running resistance of the control cable.
- (c) If you do not find a running resistance, replace the lower control box (AMM 76-11-10/401).
- (d) ENGINES PRE RR SB 76-8386;  
If the resistance is equal to or more than 18 pound-inches (2.03 newton meters), replace the lower control box (AMM 76-11-10/401).
- (e) ENGINES POST RR SB 76-8386;  
If the resistance is equal to or more than 21 pound-inches (2.87 newton meters), replace the lower control box (AMM 76-11-10/401).

S 225-117-R00

- (2) ENGINES PRE RR SB 76-8081 AND RR SB 76-8082;

Do these steps to examine the running resistance of the control cables:

- (a) Put the torque wrench adapter (7) into the socket with splines of the intermediate control box.
- (b) Use the torque wrench to measure the running resistance of the control cable.
- (c) If you find a running resistance, look for the quantity of shims (10) that are installed with the back-up block (11):
  - 1) If you installed 6 shims, replace the lower control box (AMM 76-11-10/401).
  - 2) If you have less than 6 shims installed, add one shim at a time until you have a maximum of seven.
  - 3) To install the shims, use the steps found in the procedure below (ENGINES PRE RR SB 76-8082) to set the running resistance of the control cable.
  - 4) Measure the running resistance of the cable again.
- (d) If you find no running resistance, remove one shim from the back-up block (11).
  - 1) Do the procedure below (ENGINES PRE RR SB 76-8082) to set the running resistance of the control cable.

EFFECTIVITY

ALL

76-11-00

R03

Page 520  
Sep 20/98

- S 825-118-R00
- (3) ENGINES PRE RR SB 76-8082;  
Do these steps to set the running resistance of the control cable:
- (a) Install the rig pin UT1315/1 (9) into the intermediate control box.
  - (b) Install the rig pin UT1150/2 (15) into the rotary arm (14) of the lower control box.
  - (c) Remove the bolt (18) that attaches the intermediate control box at the rear position.
  - (d) Remove the bolts (12) that attach the back-up block (11) of the control cable to the intermediate control box (9).
  - (e) Add or remove a shim of the shim pack (10) of the back-up block as it is necessary.

NOTE: The resistance will decrease when you add one shim.  
The resistance will increase when you remove one shim.

- (f) Install the back-up block (11) and the shim pack (10) on the intermediate control box:
  - 1) Install the bolts (12).
- (g) Tighten the bolts (12) to 25-32 pound-inches (2.82-3.62 newton meters).
- (h) Install the bolt (18) to the intermediate control box at the rear position.
- (i) Remove the rig pins from the rotary arm and the intermediate control box.

- S 865-138-R00
- (4) Make sure the engine controls move freely.

- S 835-132-R00
- (5) Adjust the PLA transducers (AMM 75-32-14/401).

- S 835-133-R00
- (6) Adjust the two TLA transducers (AMM 73-21-09/501).

EFFECTIVITY

ALL

76-11-00

R03

Page 521  
Sep 20/98

S 725-052-R00

- (7) Do a test for the thrust lever load (Fig. 505).
  - (a) Attach a spring scale to the thrust lever knob that is forward.
    - 1) Use the scale to pull the thrust lever through the full forward motion.
      - a) Make a record of the measured load.
    - 2) Make sure that the maximum load is not more than 4.5 pounds (2.04 kilograms).
    - 3) Put the thrust levers to the idle position after you remove the spring scale.

S 225-148-R00

- (8) Make a check of the autothrottle microswitch pack for correct adjustment and adjust if necessary (AMM 22-32-04/201).

S 865-122-R00

- (9) Remove the DO-NOT-OPERATE tags from the thrust levers.

S 865-123-R00

- (10) Remove the DO-NOT-CLOSE tags and close these applicable P6 circuit breakers:
  - (a) 6C1, FUEL COND CONT L
  - (b) 6C2, FUEL COND CONT R

S 445-072-R00

- (11) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 945-055-R00

- (12) Move the controls through their full travel at least two times.
  - (a) Make sure the FFG lever has full travel and that it touches the forward stop on the FFG.

S 415-081-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (13) Close the fan cowl panel (Ref 71-11-04) on the right side.

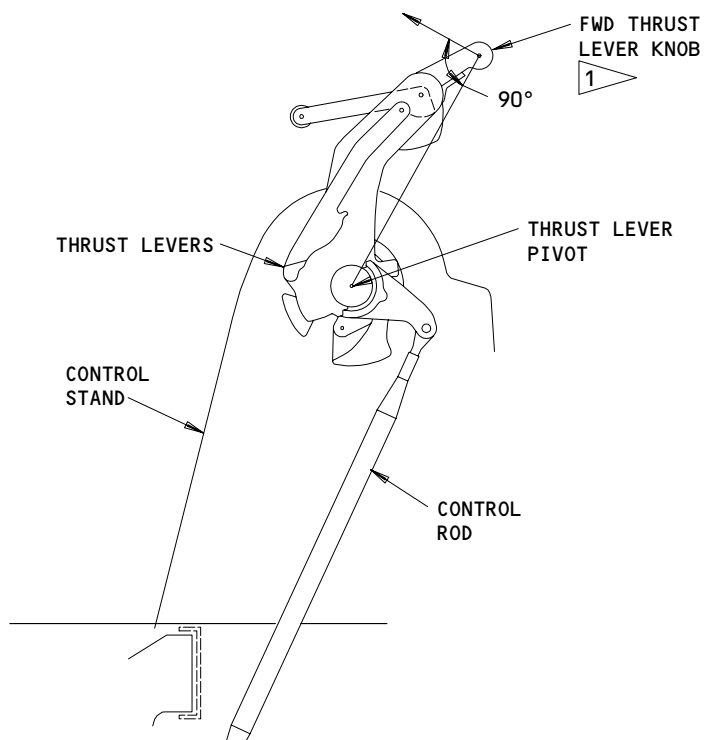
EFFECTIVITY

ALL

76-11-00

R04

Page 522  
Sep 20/98



1 MEASURE THE LEVER LOAD AT THE CENTERLINE OF THE KNOB. MEASURE THE LOAD PERPENDICULAR TO AN IMAGINARY LINE BETWEEN THE CENTER OF THE THRUST LEVER KNOB AND THE THRUST LEVER PIVOT.

Thrust Lever Load Measurement  
Figure 505

EFFECTIVITY	ALL
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76-11-00

R06

Page 523  
Sep 20/93

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I. Do these steps to adjust the engine controls after you replace the upper control box.

S 215-156-R00

- (1) Make sure the thrust levers are at the idle position.

S 425-157-R00

- (2) Install the rig pin at location No. 2 in the strut drum control (Fig. 502).

S 425-158-R00

- (3) Install rig pin UT1150/2 into the rotary arm of the lower control box assembly.
  - (a) If you can not install the pins freely, adjust the micro-adjuster to permit installation of the pins.

S 425-159-R00

- (4) Install rig pin UT1315/1 to the intermediate control box and make sure you can freely turn the rig pin with your fingers.

S 425-160-R00

- (5) Install lockwire on the micro-adjuster.

S 025-161-R00

- (6) Remove all three rig pins.

S 215-162-R00

- (7) Cycle the thrust levers full forward and aft several times and make sure the levers move freely. While cycling the thrust levers, also perform the following:
  - (a) With the thrust lever full forward, make sure the FFG is at the forward stop.
  - (b) Perform a check of the thrust lever load (Fig. 505).

S 825-163-R00

- (8) If the micro-adjuster was disturbed while performing this adjustment, also accomplish the following:
  - (a) Adjust the PLA transducer (AMM 75-32-14/401).
  - (b) Adjust the TLA transducer (AMM 73-21-09/501).

EFFECTIVITY

ALL

76-11-00

R03

Page 524  
Jan 28/01

ENGINE CONTROLS – INSPECTION/CHECK

1. General

- A. This procedure has one task. This task examines the components of the engine control system.

TASK 76-11-00-206-001-R00

2. Examine the Engine Control System

A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 54-52-01/401, Strut Fairings
- (3) AMM 54-53-01/401, Strut Access Doors
- (4) AMM 71-11-04/201, Fan Cowl Panels

B. Access

(1) Location Zones

- 113/114 Forward Equipment Center
- 410 No. 1 Power Plant (Left)
- 420 No. 2 Power Plant (Right)

(2) Access Panels

- 113AL Forward Equipment Center Access Door
- 414AR Fan Cowl Panel (Right)
- 424AR Fan Cowl Panel (Right)
- 433G Strut Access Panel

C. Prepare to Examine the Engine Control System.

S 016-002-R00

- (1) Open the door, 113AL, to get access to the forward equipment bay (AMM 06-41-00/201).

S 016-003-R00

- (2) Remove the forward strut fairing (AMM 54-52-01/401).

S 016-004-R00

- (3) Open the strut access door, 433G (AMM 54-53-01/401).

S 016-005-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAP WHEN YOU OPEN THE FAN COWL PANEL. DAMAGE TO THE KEVLAR WRAP CAN OCCUR WHEN YOU DO NOT FOLLOW THE PRECAUTIONS.

- (4) Open the right fan cowl panel (AMM 71-11-04/201).

D. Examine the Engine Control System.

S 216-006-R00

- (1) Make sure the thrust levers are not damaged and are correctly installed.

EFFECTIVITY

ALL

76-11-00

R01

Page 601  
Jan 28/02

- S 216-007-R00
- (2) Make sure the control rods between the thrust levers and the input levers on the autothrottle clutch are not damaged and are correctly installed.
- S 216-008-R00
- (3) Make sure the forward cable quadrants are not damaged and are correctly installed.
- S 216-009-R00
- (4) Make sure the connection of the thrust control cables to the forward cable quadrants are not damaged and are correctly installed.
- S 216-010-R00
- (5) Make sure the links between the autothrottle clutches and the forward cable quadrants are not damaged and are correctly installed.
- S 216-011-R00
- (6) Make sure the thrust control cables in the fuselage, struts and the wings are not damaged and are correctly installed.
- (a) Replace the segment of the thrust control cable if it is damaged (AMM 76-11-03/201).
- S 216-013-R00
- (7) Make sure the pulleys for the thrust control cables in the fuselage, the struts, and the wing are not damaged and are correctly installed.
- (a) Make sure the idler pulleys can turn freely.
- (b) Make sure the 90 degree turn-out pulleys can turn freely.
- (c) Replace the pulleys if it is necessary (AMM 20-10-07/401).
- S 216-012-R00
- (8) Make sure the strut control drum on the top of the strut is not damaged and is correctly installed.
- S 216-014-R00
- (9) Make sure the connection of the thrust control cables to the strut drums are not damaged and are correctly installed.
- S 216-015-R00
- (10) Make sure the thrust control cables are correctly adjusted.
- (a) Move the two forward thrust levers rearward and hold them against the idle stop.
- (b) Install the rig pin AT-1 through the two forward cable quadrants and the two side frames of the autothrottle structure.
- (c) Install the rig pin RR-2 through the bracket web and the cam in the strut control drum.

EFFECTIVITY

ALL

76-11-00

R01

Page 602  
Dec 20/95

- (d) Make sure the tension force on the thrust control cable is in the limits permitted for the ambient temperature (AMM 76-11-00/501).
- (e) Do the procedure to adjust the thrust control cable for these conditions (AMM 76-11-00/501):
  - 1) You cannot install the rig pin AT-1 or RR-2.
  - 2) The rig pin AT-1 or RR-2 cannot turn freely.
  - 3) The tension force on the thrust control cable is more than 5 pounds from the correct value.
- (f) Remove the rig pins AT-1 and RR-2.

S 216-016-R00

- (11) Make sure the strut drum, the shaft, the thrust reverser feedback cams and cable connections are not damaged and are correctly installed.

S 216-019-R00

- (12) Examine the engine controls on the engine fan case.
  - (a) Make sure the upper gearbox is not damaged and is correctly installed.
  - (b) Make sure the intermediate gearbox is not damaged and is correctly installed.
  - (c) Make sure the lower gearbox is not damaged and is correctly installed.
  - (d) Make sure the teleflex cable and the disconnect clamps are not damaged and are correctly installed.

E. Put the Airplane Back to the Usual Condition.

S 416-020-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAP WHEN YOU CLOSE THE FAN COWL PANEL. DAMAGE TO THE KEVLAR WRAP CAN OCCUR WHEN YOU DO NOT FOLLOW THE PRECAUTIONS.

- (1) Close the right fan cowl panel (AMM 71-11-04/201).

S 416-021-R00

- (2) Close the strut access door, 433G (AMM 54-53-01/401).

S 416-022-R00

- (3) Install the forward strut fairing (AMM 54-52-01/401).

S 416-023-R00

- (4) Close the door, 113AL (AMM 06-41-00/201).

EFFECTIVITY

ALL

**76-11-00**

R03

Page 603  
Mar 20/93



THRUST LEVER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks. The first task removes the thrust levers from the control stand. The second task installs the thrust levers into the control stand.

TASK 76-11-01-004-001-R00

2. Remove the Thrust Levers

A. Equipment

- (1) Rig Pin Set B20003-XX (AMM 20-10-24/201)
  - (a) Rig Pin AT1 - P/N B20003-67

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 20-10-24/201, Rig Pins
- (3) AMM 27-61-00/201, Spoiler/Speedbrake Control System
- (4) AMM 76-11-00/501, Engine Control System
- (5) AMM 76-11-02/201, Engine Fuel Control Module
- (6) AMM 76-11-04/401, Control Stand Lever's Rails, Covers and Seals
- (7) AMM 78-31-00/501, Thrust Reverser System

C. Access

- (1) Location Zones
  - 110 Lower Forward Fuselage
  - 210 Control Cabin
  
- (2) Access Panels
  - 113AL Forward Equipment Bay

D. Prepare to Remove the Thrust Levers

S 864-002-R00

**WARNING:** DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS AND SPEEDBRAKE. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURY OR DAMAGE.

- (1) Do the deactivation procedure for the spoilers/speedbrake (AMM 27-61-00/201).

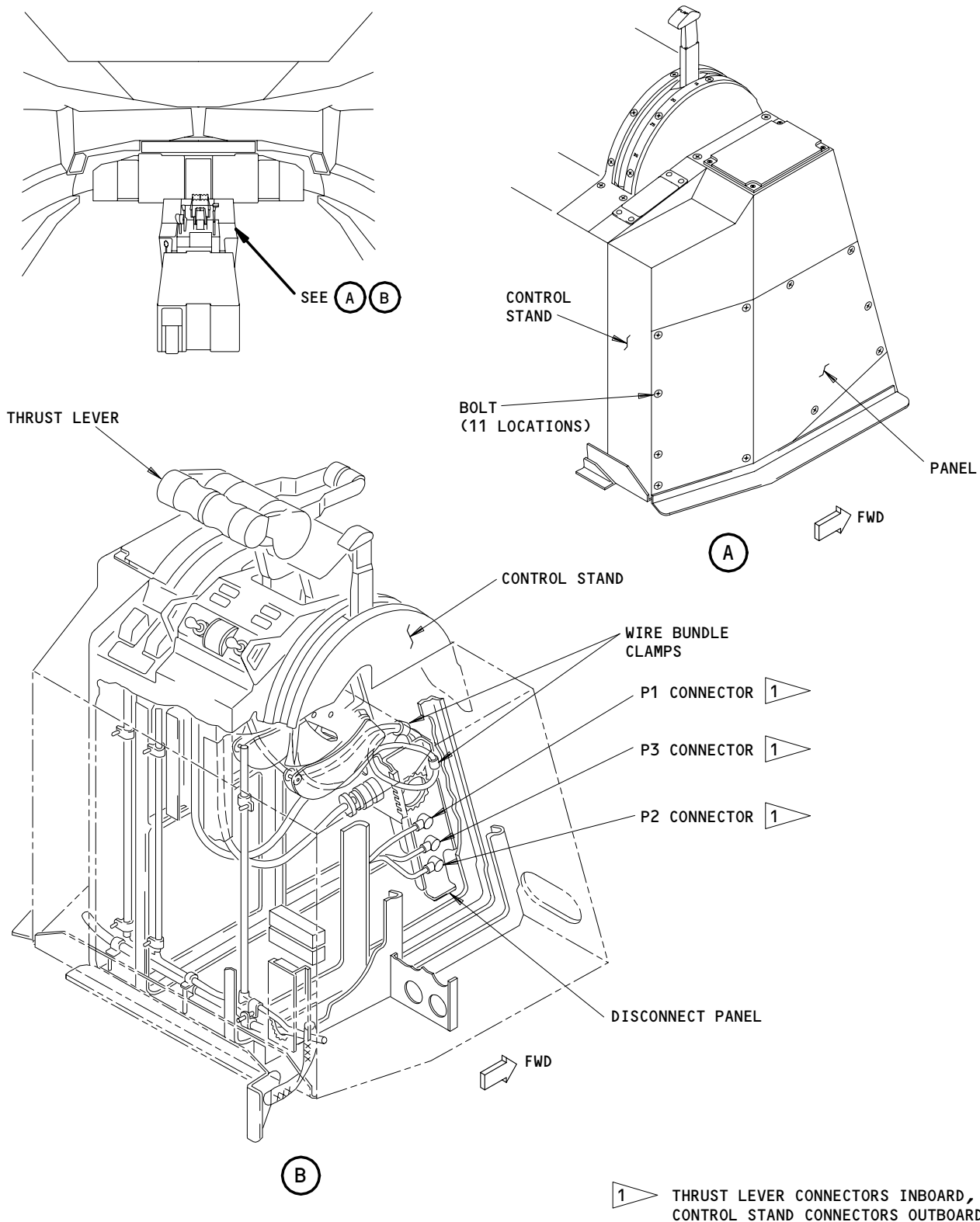
EFFECTIVITY

ALL

76-11-01

R01

Page 401  
Jan 28/03



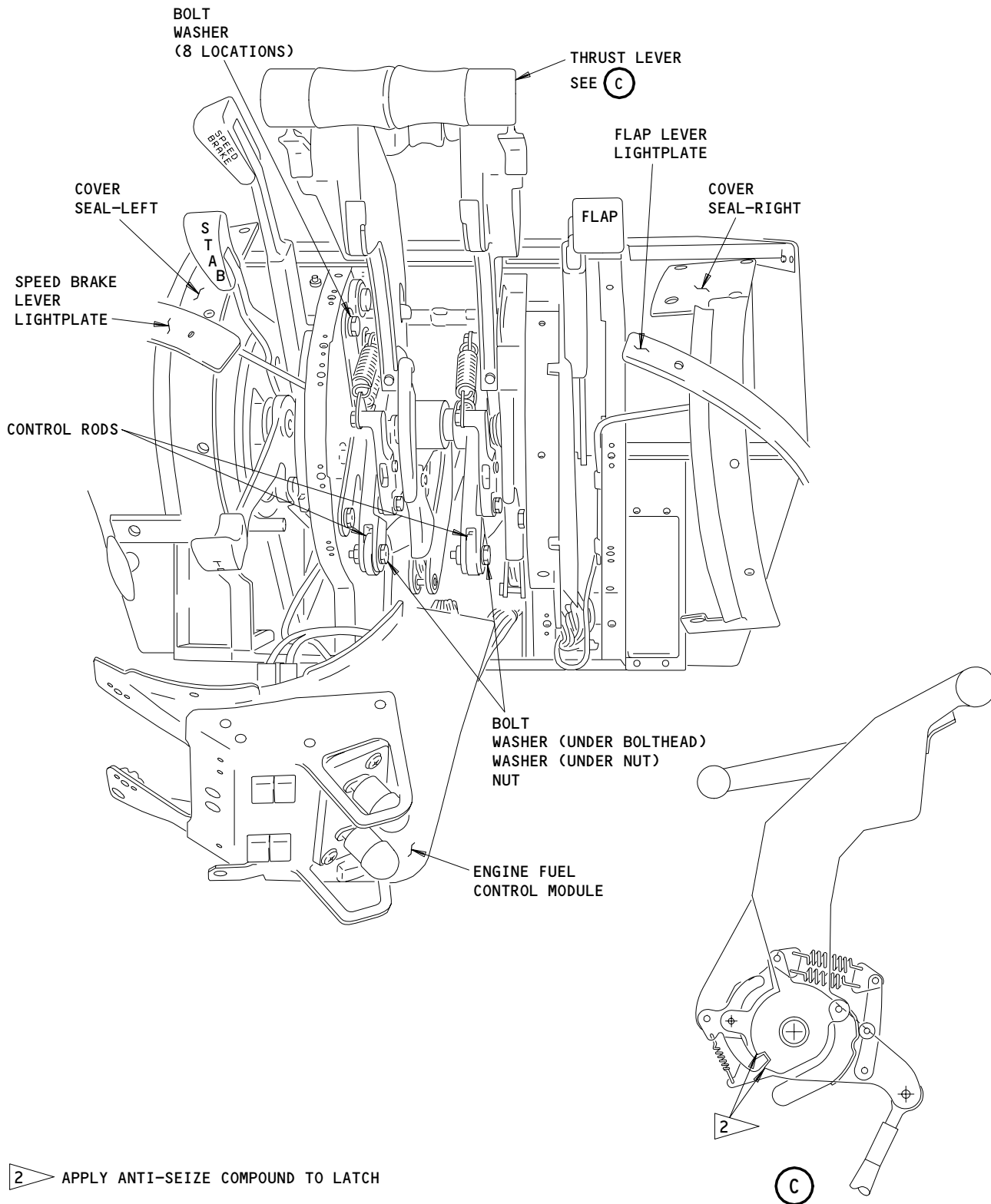
Thrust Lever/Control Stand Access  
Figure 401 (Sheet 1)

EFFECTIVITY	
	ALL

76-11-01

R01

Page 402  
Mar 20/94



2 APPLY ANTI-SEIZE COMPOUND TO LATCH

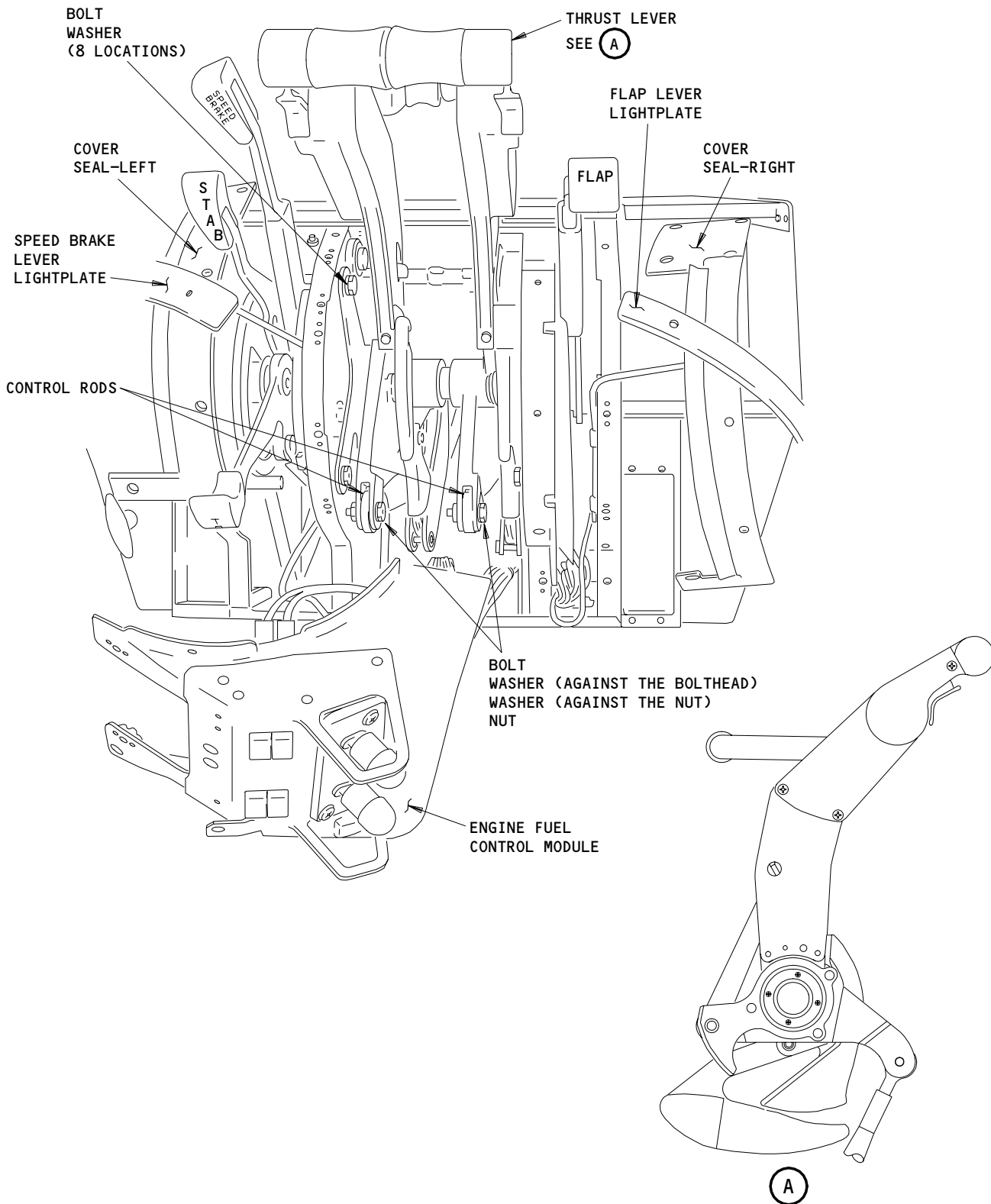
Thrust Lever Installation  
Figure 401 (Sheet 2)

EFFECTIVITY  
AIRPLANES WITH TITANIUM THRUST LEVERS

76-11-01

R02

Page 403  
Mar 20/94



Thrust Lever Installation  
Figure 401 (Sheet 3)

EFFECTIVITY  
AIRPLANES WITH ALUMINUM THRUST LEVERS

76-11-01

D01959

R02

Page 404  
Mar 20/94

- S 864-003-R00
- (2) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11E16, MODE CONT PNL LEFT
  - (b) 11E17, FLT CONT COMPUTER POWER LEFT
  - (c) 11E18, FLT CONT COMPUTER SERVO LEFT
  - (d) 11E20, FLIGHT CONT CMPTR PWR CENTER
  - (e) 11E21, FLIGHT CONT CMPTR SERVO CENTER
  - (f) 11E34, MODE CONT PNL RIGHT
  - (g) 11E35, FLT CONT CMPTR PWR RIGHT
  - (h) 11E36, FLT CONT CMPTR SERVO RIGHT
  - (i) 11F14, TMC AC
  - (j) 11F15, TMC DC
  - (k) 11F16, TMC SERVO
  - (l) 11G11, AUTO SPEED BRAKE

- S 864-116-R00
- (3) For the left engine, open these these circuit breakers and attach DO-NOT-CLOSE tags:
- (a) On the P11 panel:
    - 1) 11D12, ENG LEFT T/R CONT or  
11K6, T/R CONT L
  - (b) On the P6 panel:
    - 1) 6C12, L ENG SYNC LOCK (if installed)

- S 864-117-R00
- (4) For the right engine, open these circuit breakers and attach DO-NOT-CLOSE tags:
- (a) On the P11 panel:
    - 1) 11B30, ENG RIGHT T/R CONT-ALTN (if installed)
    - 2) 11K32, R ENG SYNC LOCK (if installed)
    - 3) 11K33, R ENG T/R CONT
  - (b) On the P6 panel:
    - 1) 6D12, R ENG SYNC LOCK-ALTN (if installed)

- S 864-042-R00
- (5) Open the access door, 113AL, to get access to the autothrottle in the forward equipment bay (AMM 06-41-00/201).

- S 494-043-R00
- (6) Install the rig pin AT-1 through the autothrottle frame and quadrants.

EFFECTIVITY

ALL

76-11-01

R04

Page 405  
Sep 28/02

S 034-044-R00

**CAUTION:** YOU MUST BE CAREFUL WHEN YOU REMOVE THE LIGHTPLATES, THE THRUST LEVERS, AND THE ENGINE FUEL CONTROL MODULE FROM THE CONTROL STAND. YOU MUST PREVENT DAMAGE TO THE SWITCHES, LIGHTS, LIGHTPLATES, NUTPLATES, WIRE BUNDLES AND THE PAINTED FINISH ON THE PARTS.

(7) Remove the rails, covers, and seals on the control stand (AMM 76-11-04/401).

E. Remove the Thrust Levers

S 024-045-R00

- (1) Do these steps to remove the thrust levers.
- (a) Detach the thrust lever control rods from the autothrottle brake by removing the bolts, washers, bushings, and nuts.
  - (b) Move the thrust levers forward and disconnect the control rods from the thrust levers.
    - 1) Remove the control rods from the control stand.

**CAUTION:** DO NOT PULL THE THRUST LEVERS AWAY FROM THE CONTROL STAND UNTIL ALL WIRE BUNDLE CLAMPS ARE REMOVED AND THE ELECTRICAL CONNECTORS ARE DISCONNECTED. DAMAGE TO THE WIRES CAN OCCUR.

- (c) Remove eight bolts that hold the thrust levers to the control stand structure.
- (d) Carefully lift the thrust levers up and forward to remove the thrust levers.
- (e) Put the thrust levers on the control stand.
- (f) Remove the screws that hold the wire bundle clamps of the thrust levers to the support structure.
- (g) Disconnect the electrical connectors (P1, P2 and P3) from disconnect panel.

**NOTE:** The connectors are on the forward side of the disconnect panel.

- (h) Remove the thrust levers.
- (i) Find the approximate position that the wire bundle clamps are installed on the wire bundles.
  - 1) Make a record of that position for the installation.

EFFECTIVITY

ALL

76-11-01

TASK 76-11-01-404-046-R00

3. Install the Thrust Levers

A. General

- (1) Titanium thrust lever assemblies, 254N1131, or aluminum thrust lever assemblies, 254N1073, can be installed. You must do the engine control rigging to change the gap between the feedback cams and rollers on the strut control shaft. The gap is different for aluminum thrust levers and titanium thrust levers.

B. Equipment

- (1) Rig Pin AT1 - P/N B20003-67, Part of Set B20003-65 (AMM 20-10-24)

C. Consumable Materials

- (1) Antiseize Compound, C5A Fel-Pro Inc. (AMM 20-30-04/201)

D. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 20-10-24/201, Rig Pins
- (3) AMM 76-11-00/501, Engine Control System
- (4) AMM 76-11-04/401, Control Stand Lever's Rails, Covers, and Seals
- (5) AMM 78-31-00/501, Thrust Reverser System

E. Access

- (1) Location Zones
  - 110 Lower Forward Fuselage
  - 210 Control Cabin
- (2) Access Panels
  - 113AL Forward Equipment Bay

F. Install the Thrust Levers (Fig. 401)

S 864-122-R00

- (1) Make sure you have the correct thrust lever assemblies before you install the thrust levers.

S 644-124-R00

- (2) AIRPLANES WITH TITANIUM THRUST LEVERS;  
Make sure the reverse thrust lever latches on the left and right thrust levers are lubricated with antiseize compound.

NOTE: Apply the compound only from the tube to prevent contamination of the compound.

S 424-048-R00

- (3) Do these steps to install the thrust levers.

EFFECTIVITY

ALL

76-11-01

R09

Page 407  
May 28/99

**CAUTION:** YOU MUST BE CAREFUL WHEN YOU INSTALL THE LIGHTPLATES, THE THRUST LEVERS, AND THE ENGINE FUEL CONTROL MODULE IN THE CONTROL STAND. DAMAGE CAN OCCUR TO THE PARTS AND THE PAINTED FINISH ON THE PARTS.

- (a) Pull the wire bundles tightly through the wire guide and counterbalance of the thrust levers.
- (b) Install the clamps at the approximate position on the wire bundle from the record that was made.
- (c) Carefully push the electrical connectors (P1, P2, and P3) and wire bundles through the hole in the structure.
- (d) Connect the electrical connectors to the disconnect panel.
- (e) Install the wire bundle clamps to the structure with screws.

**CAUTION:** YOU MUST INSTALL THE CONTROL RODS WITH THE ADJUSTMENT NUT AND THE JAM NUT AT THE LOWER END AT THE AUTO THROTTLE ASSEMBLY. DAMAGE CAN OCCUR IF THE EQUIPMENT IS NOT INSTALLED CORRECTLY.

- (f) Install the control rods into the control stand.
- (g) Carefully move the thrust levers down and forward to install the thrust levers in the control stand.
- (h) Attach the thrust levers to the structure of the control stand with eight bolts and washers.
- (i) Connect a control rod to each thrust lever with a bolt, washers and a nut.
- (j) Attach each control rod to the release arm on the autothrottle brake with a bolt, washer, bushing, and nut.

G. Put the Airplane Back to It's Usual Condition

S 414-049-R00

- (1) Install the rails, covers, and seals on the control stand (AMM 76-11-04/401).

S 094-051-R00

- (2) Remove the rig pin AT1.

S 414-052-R00

- (3) Close the access door 113AL.

S 714-053-R00

- (4) Make a check that the thrust levers move through full travel and that the thrust levers turn freely and independently.

S 864-054-R00

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel, P11:
  - (a) 11E16, MODE CONT PNL LEFT
  - (b) 11E17, FLT CONT COMPUTER POWER LEFT
  - (c) 11E18, FLT CONT COMPUTER SERVO LEFT

EFFECTIVITY

ALL

76-11-01

R10

Page 408  
May 28/99



- (d) 11E20, FLIGHT CONT CMPTR PWR CENTER
- (e) 11E21, FLIGHT CONT CMPTR SERVO CENTER
- (f) 11E34, MODE CONT PNL RIGHT
- (g) 11E35, FLT CONT CMPTR PWR RIGHT
- (h) 11E36, FLT CONT CMPTR SERVO RIGHT
- (i) 11F14, TMC AC
- (j) 11F15, TMC DC
- (k) 11F16, TMC SERVO
- (l) 11G11, AUTO SPEED BRAKE

S 864-118-R00

- (6) For the left engine, remove the DO-NOT-CLOSE tags and close these circuit breakers:
  - (a) On the P11 panel:
    - 1) 11D12, ENG LEFT T/R CONT or 11K6, T/R CONT L
  - (b) On the P6 panel:
    - 1) 6C12, L ENG SYNC LOCK (if installed)

S 864-119-R00

- (7) For the right engine, remove the DO-NOT-CLOSE tage and close these circuit breakers:
  - (a) On the P11 panel:
    - 1) 11B30, ENG RIGHT T/R CONT-ALTN (if installed)
    - 2) 11K32, R ENG SYNC LOCK (if installed)
    - 3) 11K33, R ENG T/R CONT
    - 4) 11B30, ENG R T/R CONT ALTN
  - (b) On the P6 panel:
    - 1) 6D12, R ENG SYNC LOCK-ALTN (if installed)

S 714-094-R00

- (8) Do the procedure to adjust and test the engine control system (AMM 76-11-00/501).

S 714-095-R00

- (9) Do the procedure to test the thrust reverser operation (AMM 78-31-00/501).

S 714-096-R00

- (10) Make a check that the reverse thrust levers move to the full reverse thrust position and do not bind.
  - (a) Make sure that the follower bearing rides smoothly on the detent cam.

S 444-097-R00

- (11) Do the activation procedure for the spoiler/speedbrake control system (AMM 27-61-00/201).

EFFECTIVITY

ALL

76-11-01

R06

Page 409  
May 28/99

ENGINE FUEL CONTROL MODULE - MAINTENANCE PRACTICES

TASK 76-11-02-002-001-R00

1. Remove the Fuel Control Module

A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 33-13-01/401, Lightplates
- (3) AMM 76-11-04/401, Control Stand Lever's Rails, Covers, and Seals

B. Access

- (1) Location Zone  
210 Control Cabin
  
- (2) Access Panels  
113AL Forward Equipment Bay

C. Prepare to Remove the Fuel Control Module

S 012-002-R00

- (1) Open the access door, 113AL (AMM 06-41-00/201).

S 862-003-R00

- (2) For the left engine, open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
  - (a) 6C1, FUEL COND CONT L
  - (b) 6E1, FUEL VALVES L SPAR

S 862-004-R00

- (3) For the right engine, open these circuit breakers on the main power distribution panel, P6 and attach DO-NOT-CLOSE tags:
  - (a) 6C2, FUEL COND CONT R
  - (b) 6E2, FUEL VALVES R SPAR

S 862-005-R00

- (4) For the left engine, open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
  - (a) 11C12, STAB TRIM SHUTOFF LEFT
  - (b) 11D19, ENGINE START CONT LEFT
  - (c) 11L4, LEFT ENGINE ELECTRONIC ENGINE CONTROL LIMITER
  - (d) 11L5, LEFT ENGINE ELECTRONIC ENGINE CONTROL SUPV
  - (e) 11L7, LEFT ENGINE IDLE CONTROL

S 862-006-R00

- (5) For the right engine, open these circuit breakers on the overhead panel, P11 and attach DO-NOT-CLOSE tags:
  - (a) 11C13, STAB TRIM SHUTOFF RIGHT

EFFECTIVITY

ALL

76-11-02

R01

Page 201  
Sep 20/93

- (b) 11D20, ENGINE START CONT RIGHT
- (c) 11L31, RIGHT ENGINE ELECTRONIC ENGINE CONTROL LIMITER
- (d) 11L32, RIGHT ENGINE ELECTRONIC ENGINE CONTROL SUPV
- (e) 11L33, RIGHT ENGINE IDLE CONTROL

S 032-007-R00

**CAUTION:** BE VERY CAREFUL WHEN YOU REMOVE THE LIGHTPLATES AND THE ENGINE FUEL CONTROL MODULE FROM THE CONTROL STAND. YOU MUST PREVENT DAMAGE TO THE SWITCHES, LIGHTPLATES, LIGHTS, NUTPLATES, WIRE BUNDLES AND THE FINISH ON ALL PANEL SURFACES.

- (6) Remove the lever's rails, covers, and seals from the control stand (AMM 76-11-04/401).

**NOTE:** The switch and lightplate wire bundles can be damaged if you do not lift the module carefully from the control stand.

**NOTE:** If the wire length is not sufficient to remove the lightplate you can remove two clamps that hold the wire bundles. The right-hand lower-side pedestal-cover is removed to give access to these clamps (AMM 76-11-04/401). If necessary remove the first officer seat to get a better access (AMM 25-11-01/201).

D. Remove the Fuel Control Module (Fig. 201)

S 022-008-R00

- (1) Do these steps to remove the fuel control module:
  - (a) Remove the fuel control lightplate, and the stabilizer trim lightplate from the fuel control module (AMM 33-13-01/401).
  - (b) Get access to the electrical connectors for the fuel control module below the control stand.

**NOTE:** Use the door, 113AL, to get the electrical connectors below the control stand. If necessary, remove the throttle push-pull tube to get a better access (AMM 76-11-01/401).

- (c) Disconnect electrical connectors P8 and P9.
- (d) Remove the seven bolts in the module.
- (e) Carefully pull the fuel control module up and aft.
- (f) Carefully put the electrical connectors and the wire bundles between the control rods of the thrust levers and through the separator conduit.

TASK 76-11-02-402-009-R00

2. Install the Fuel Control Module

A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels

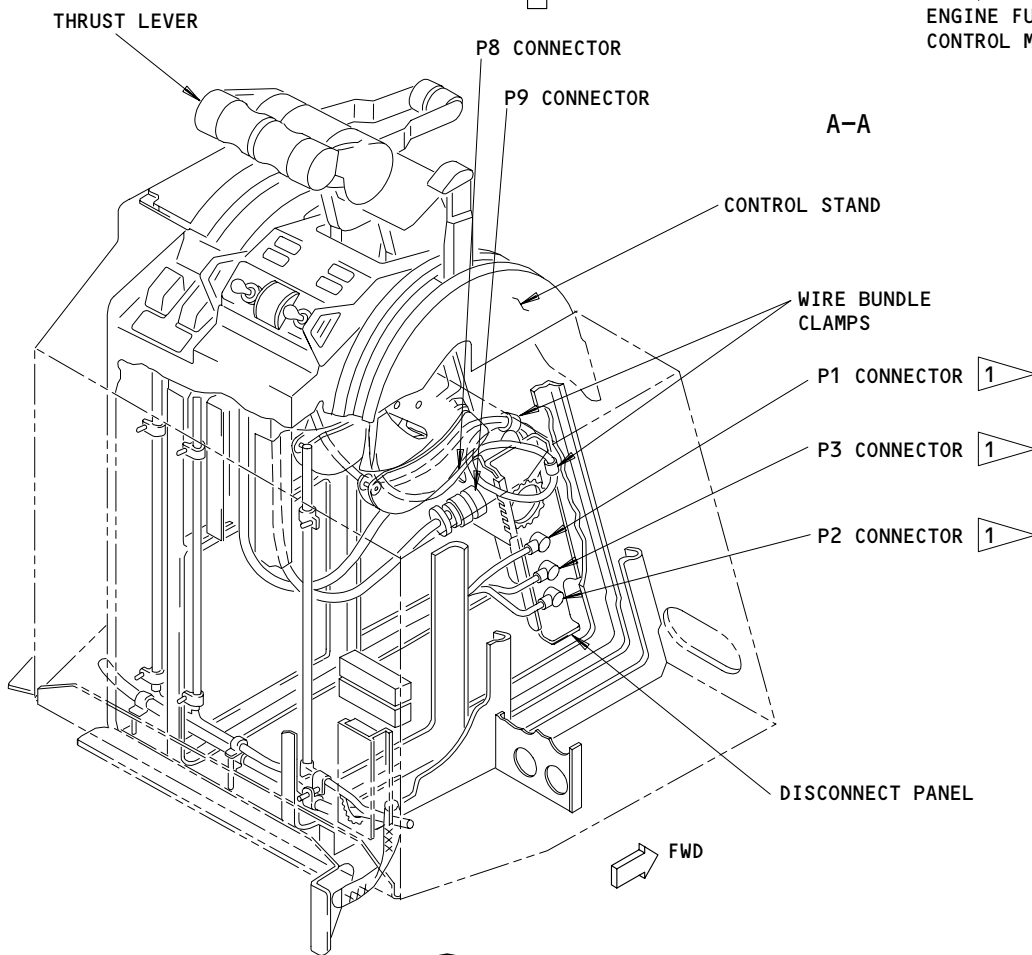
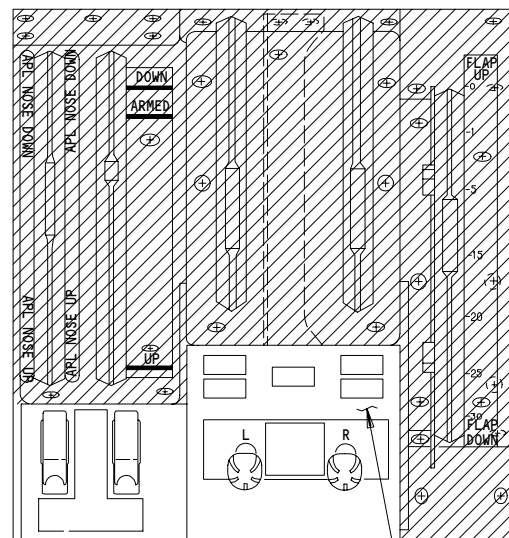
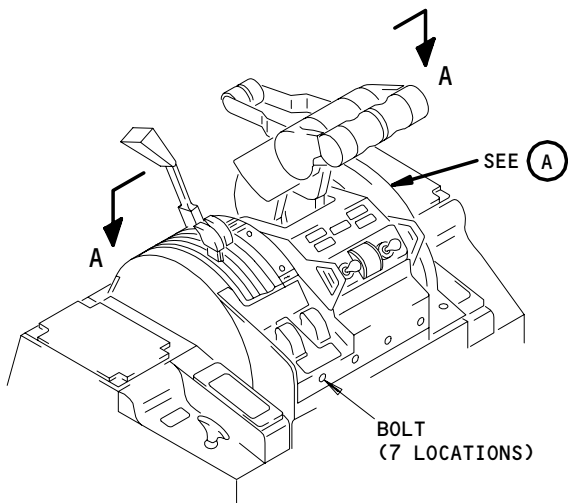
EFFECTIVITY

ALL

76-11-02

R01

Page 202  
Mar 20/97



1 THRUST LEVER CONNECTORS INBOARD,  
CONTROL STAND CONNECTORS OUTBOARD

Engine Fuel Control Module Installation  
Figure 201

EFFECTIVITY	ALL
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76-11-02

R01

Page 203  
Mar 20/94

- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 27-41-00/501, Horizontal Stabilizer Trim Control System
- (4) AMM 28-22-00/501, Engine Fuel Feed System
- (5) AMM 33-13-01/401, Lightplates
- (6) AMM 33-16-00/501, Master Dim and Test
- (7) AMM 76-11-00/501, Engine Control System
- (8) AMM 76-11-04/401, Control Stand Lever's Rails, Covers, and Seals

B. Access

- (1) Location Zone  
210 Control Cabin
- (2) Access Panels  
113AL Forward Equipment Bay

C. Install the Fuel Control Module

S 422-010-R00

**CAUTION:** BE VERY CAREFUL WHEN YOU INSTALL THE LIGHTPLATES AND THE ENGINE FUEL CONTROL MODULE FROM THE CONTROL STAND. YOU MUST PREVENT DAMAGE TO THE SWITCHES, LIGHTPLATES, LIGHTS, NUTPLATES, WIRE BUNDLES AND THE FINISH ON ALL PANEL SURFACES.

- (1) Do these steps to install the fuel control module:

**NOTE:** Install the throttle push-pull tube if removed (AMM 76-11-01/401).

- (a) Put the module above the control stand.
- (b) Put the electrical connectors and the wire bundles through the separator conduit.
- (c) Put the electrical connectors between the control rods of the thrust levers.
- (d) Move the module down and in the forward direction until it goes into the control stand.
- (e) Install the seven bolts through the flange on the module.
- (f) Connect the electrical connectors P8 and P9 to the electrical connector panel.

S 432-011-R00

- (2) Install the fuel control lightplate and the stabilizer trim lightplate on the fuel control module (AMM 33-13-01/401).

S 432-012-R00

- (3) Install the lever's, rails, covers, and seals to the control stand (AMM 76-11-04/401).

**NOTE:** Install the first officer seat if removed (AMM 25-11-01/201).

EFFECTIVITY

ALL

76-11-02

R01

Page 204  
Mar 20/97

- S 862-013-R00
- (4) For the left engine, remove the DO-NOT-CLOSE tag and close these P11 circuit breakers:
- (a) 11C12, STAB TRIM SHUTOFF LEFT
  - (b) 11D19, ENGINE START CONT LEFT
  - (c) 11L4, LEFT ENGINE ELECTRONIC ENGINE CONTROL LIMITER
  - (d) 11L5, LEFT ENGINE ELECTRONIC ENGINE CONTROL SUPV
  - (e) 11L7, LEFT ENGINE IDLE CONTROL
- S 862-014-R00
- (5) For the right engine, remove the DO-NOT-CLOSE tag and close these P11 circuit breakers:
- (a) 11C13, STAB TRIM SHUTOFF RIGHT
  - (b) 11D20, ENGINE START CONT RIGHT
  - (c) 11L31, RIGHT ENGINE ELECTRONIC ENGINE CONTROL LIMITER
  - (d) 11L32, RIGHT ENGINE ELECTRONIC ENGINE CONTROL SUPV
  - (e) 11L33, RIGHT ENGINE IDLE CONTROL
- D. Do a Test of the Fuel Control Module.
- S 862-015-R00
- (1) Supply the electrical power (AMM 24-22-00/201).
- S 712-016-R00
- (2) Do this test: Master Dim and Test - Operational Test (AMM 33-16-00/501).
- (a) Make sure all the P10 switch/lights and the annunciator lights are ON.
- S 712-017-R00
- (3) Do this test: Engine Fuel Shutoff Valve (Spar Valve) Test (AMM 28-22-00/501).
- S 712-018-R00
- (4) Do this test: Stab Trim Switch Test (AMM 27-41-00/501).
- S 862-028-R00
- (5) Close the access door, 113AL (AMM 06-41-00/201).
- S 712-019-R00
- (6) AIRPLANES WITH REV ISLVN LIGHT;  
Do a check of the thrust reverser indication lights:
- (a) For the left engine, open this circuit breaker on the overhead panel, P11:
    - 1) 11D11, L ENG T/R IND or  
11K5, T/R IND L
  - (b) Make sure the REV ISLV light comes on for the left thrust reverser.
  - (c) After three seconds, close the circuit breaker.

EFFECTIVITY

ALL

76-11-02

R01

Page 205  
Sep 28/04

- (d) For the right engine, open this circuit breaker on the overhead panel, P11:
  - 1) 11B29, R ENG T/R IND or  
11K32, T/R IND R
- (e) Make sure the REV ISLV light comes on for the right thrust reverser.
- (f) After three seconds, close the circuit breaker.

S 862-020-R00

- (7) For the left engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on panel, P6:
  - (a) 6C1, FUEL COND CONT L
  - (b) 6E1, FUEL VALVES L SPAR

S 862-021-R00

- (8) For the right engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on panel, P6:
  - (a) 6C2, FUEL COND CONT R
  - (b) 6E2, FUEL VALVES R SPAR

S 862-022-R00

- (9) Remove the electrical supply if it is not necessary (AMM 24-22-00/201).

TASK 76-11-02-962-023-R00

3. Fuel Control Switch Light Replacement (Fig. 202)

A. References

- (1) AMM 26-10-00/601, AFOLTS

B. Access

- (1) Location Zone  
210 Control Cabin

C. Procedure

S 862-024-R00

- (1) Open these circuit breakers and attach DO-NOT-CLOSE tags:
  - (a) P6 Panel
    - 1) 6C1, FUEL COND CONT L
    - 2) 6C2, FUEL COND CONT R
  - (b) P11 Panel
    - 1) 11A32, IND LTS 1
    - 2) 11A33, IND LTS 2

S 962-025-R00

- (2) Replace the light:
  - (a) Turn the cap for the fuel control switch counterclockwise and remove the cap.

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

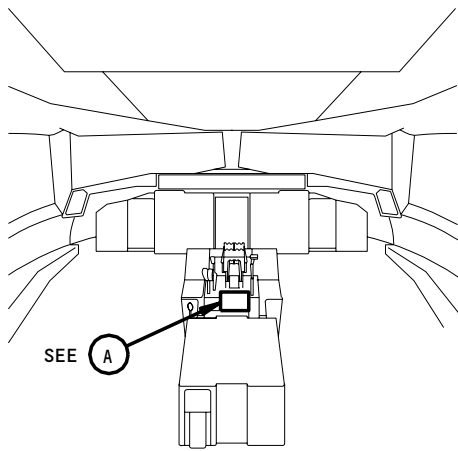
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76-11-02

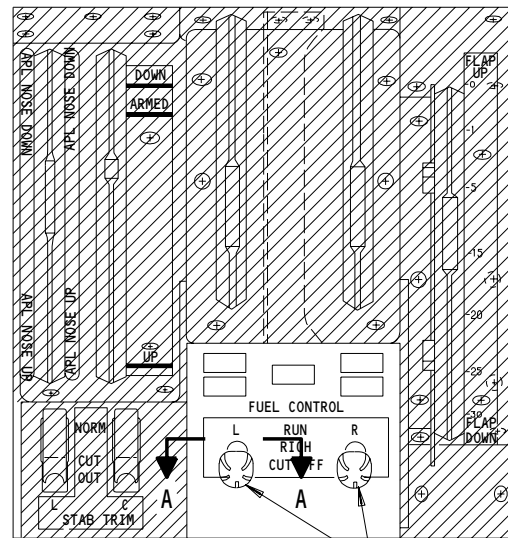
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Page 206  
May 28/99

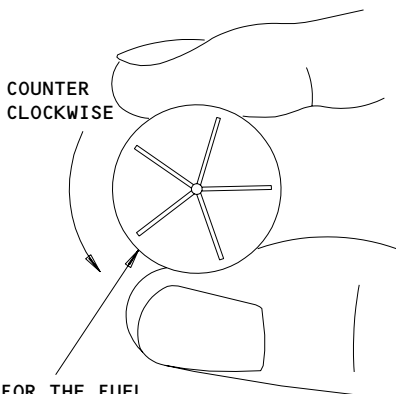


FLIGHT COMPARTMENT

FWD  
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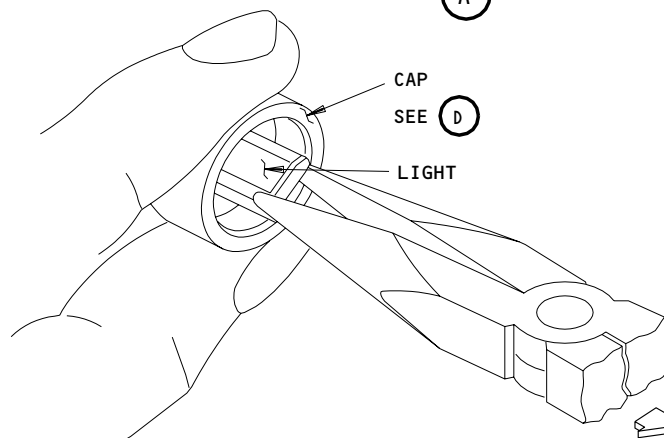


FUEL CONTROL SWITCH  
SEE B

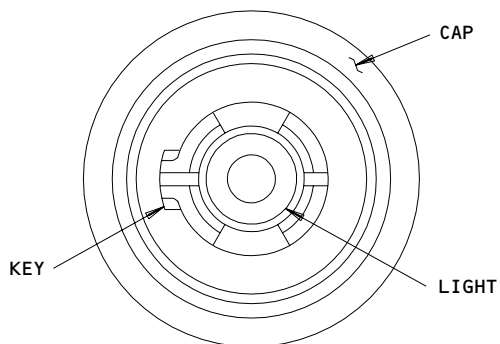


CAP FOR THE FUEL CONTROL SWITCH  
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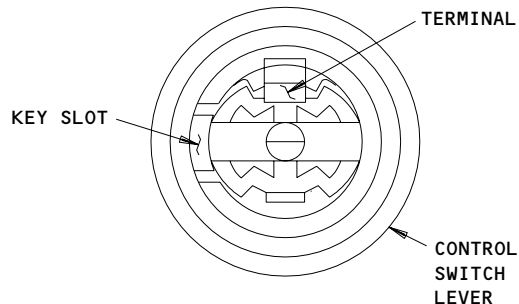
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C



D



A-A

Fuel Control Switch Light Replacement  
Figure 202

EFFECTIVITY

ALL

76-11-02

R01

Page 207  
Dec 20/91



- (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 in the control switch lever.

S 862-026-R00

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

- (a) P6 Panel
  - 1) 6C1, FUEL COND CONT L
  - 2) 6C2, FUEL COND CONT R
- (b) P11 Panel
  - 1) 11A32, IND LTS 1
  - 2) 11A33, IND LTS 2

EFFECTIVITY

ALL

76-11-02

R03

Page 208  
Jun 20/93

THRUST CONTROL CABLES - MAINTENANCE PRACTICES

1. General

- A. This procedure has one task. This procedure shows the length of the thrust control cables, the cable stops and the terminal fittings.
  - (1) All control cables are from terminal to terminal.
  - (2) The TLA and TRA control cables will increase the forward thrust.
  - (3) The TLB and TRB control cables will decrease the forward thrust.
- B. The thrust control cables follow this path through the airplane:
  - (1) The cables are connected to a forward cable drum on the autothrottle clutch pack below the flight compartment.
  - (2) The cables go below the flight compartment in the ceiling of the forward cargo compartment.
  - (3) The cables go through the fuselage airseals into the wing structure.
  - (4) The cables are aft of the leading edge, in front of the front spar.
  - (5) The cables go to the engine strut and are connected to the strut control quadrant on the top of the strut.

TASK 76-11-03-002-001-R00

2. Remove the Thrust Control Cables

A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
- (3) AMM 06-44-00/201, Wing Access Doors and Panels
- (4) AMM 06-46-00/201, Entry, Service, and Cargo Doors, Access Doors, and Panels
- (5) AMM 20-10-03/401, Control Cables
- (6) AMM 20-10-04/401, Control Cable Air Seals
- (7) AMM 20-10-05/401, Turnbuckle Locking Clips
- (8) AMM 20-10-06/401, Control Cable Grommets
- (9) AMM 20-10-08/401, Control Cable Quick Stops
- (10) AMM 20-20-02/601, Control Cables
- (11) AMM 25-50-01/401, Cargo Compartment Ceiling Lining
- (12) AMM 27-81-00/201, Leading Edge Slat System
- (13) AMM 76-11-00/501, Engine Control System

EFFECTIVITY

ALL

**76-11-03**

R01

Page 201  
Sep 28/02

(14) AMM 78-31-00/201, Thrust Reverser System  
B. Access

(1) Location Zones

121/122 Forward Cargo Compartment  
431/441 Forward Strut Fairing  
510/610 Wing Leading Edge

(2) Access Panels

113AL Forward Equipment Bay  
432AL Left Forward Strut Fairing, Upper Section  
442AL Right Forward Strut Fairing, Upper Section  
511DB Left Leading Edge - Inboard of Strut  
511FB Left Leading Edge - Inboard of Strut  
511HB Left Leading Edge - Inboard of Strut  
611DB Right Leading Edge - Inboard of Strut  
611FB Right Leading Edge - Inboard of Strut  
611HB Right Leading Edge - Inboard of Strut

C. Remove the Thrust Control Cables.

S 042-003-R00

**WARNING:** DO THE LE SLATS DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE LE SLATS. THE ACCIDENTAL OPERATION OF THE LE SLATS CAN CAUSE INJURY TO PERSONS.

- (1) Do the deactivation of the LE slats before you open the wing access panels (AMM 27-81-00/201).

S 042-004-R00

**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.

- (2) Do the deactivation of the thrust reverser before you remove the strut fairings (AMM 78-31-00/201).

S 012-005-R00

- (3) You can get access to the thrust control cables and components of the engine control system through access doors and panels in the fuselage, the wing and the strut.
- (a) Open the access door, 113AL, to get to the the autothrottle clutch pack in the forward equipment center (AMM 06-41-00/201).
- (b) Go into the forward cargo compartment to get access to the fuselage turnbuckles through the ceiling lining (AMM 25-50-01/401).

EFFECTIVITY

ALL

76-11-03

R01

Page 202  
Jan 28/05

- (c) For the left wing, open the access panels 511DB, 511FB, and 511HB that are aft of the wing leading edge to get to the cable, the wing turnbuckles and the cable stops (AMM 06-44-00/201).
- (d) For the right wing, open the access panels 611DB, 611FB, and 611HB that are aft of the wing leading edge to get to the cable, the wing turnbuckles and the cable stops (AMM 06-44-00/201).
- (e) Remove the top strut fairings, 432AL or 442AL, to get access to the strut control quadrant (AMM 06-43-00/201).

S 212-006-R00

- (4) If you must examine the cables and the cable pulleys, do this procedure:
  - (a) Refer to AMM 20-20-02/601 for the procedure to examine the control cable and the control cable pulleys.

S 912-002-R00

- (5) If you must replace the thrust control cables, do these procedures:
  - (a) Refer to AMM 20-10-03/401 for the procedure to remove the thrust control cables.
  - (b) Refer to AMM 20-10-04/401 for the procedure to remove the control cable air seals.
  - (c) Refer to AMM 20-10-05/401 for the procedure to remove the turnbuckle locking clips.
  - (d) Refer to AMM 20-10-06/401 for the procedure to remove the control cable grommets.
  - (e) Refer to AMM 20-10-08/401 for the procedure to remove the quick stops on the control cable.

TASK 76-11-03-402-007-R00

### 3. Install the Thrust Control Cables

#### A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels

EFFECTIVITY

ALL

**76-11-03**

R01

Page 203  
Jun 20/91

- (3) AMM 06-44-00/201, Wing Access Doors and Panels
- (4) AMM 06-46-00/201, Entry, Service, and Cargo Doors, Access Doors, and Panels
- (5) AMM 20-10-03/401, Control Cables
- (6) AMM 20-10-04/401, Control Cable Air Seals
- (7) AMM 20-10-05/401, Turnbuckle Locking Clips
- (8) AMM 20-10-06/401, Control Cable Grommets
- (9) AMM 20-10-08/401, Control Cable Quick Stops
- (10) AMM 20-20-02/601, Control Cables
- (11) AMM 25-50-01/401, Cargo Compartment Ceiling Lining
- (12) AMM 27-81-00/201, Leading Edge Slat System
- (13) AMM 76-11-00/501, Engine Control System
- (14) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

- 121/122 Forward Cargo Compartment
- 431/441 Forward Strut Fairing
- 510/610 Wing Leading Edge

(2) Access Panels

- 113AL Forward Equipment Bay
- 431AT Left Forward Strut Fairing, Fwd Section
- 441AT Right Forward Strut Fairing, Fwd Section
- 511CB Left Leading Edge - Inboard of Strut
- 511NB Left Leading Edge - Inboard of Strut
- 511RB Left Leading Edge - Inboard of Strut
- 611CB Right Leading Edge - Inboard of Strut
- 611NB Right Leading Edge - Inboard of Strut
- 611RB Right Leading Edge - Inboard of Strut

C. Install the Thrust Control Cables.

S 422-010-R00

- (1) Install new thrust control cables that have the correct length, the correct end fittings and construction.

**NOTE:** The zinc-only and tin-over-zinc coated cables are interchangeable, provided the opposite cables within a cable loop are of the same type. The use of mixed types of cables within a cable tool has unwanted effect on the system rigging.

- (a) Examine the cable specification table for the length, end fittings and construction.

S 912-008-R00

- (2) If you must replace the thrust control cables, do these procedures:
  - (a) Refer to AMM 20-10-03/401 for the procedure to install the thrust control cables.
  - (b) Refer to AMM 20-10-04/401 for the procedure to install the control cable air seals.

EFFECTIVITY

ALL

76-11-03

R01

Page 204  
Sep 20/08

- (c) Refer to AMM 20-10-05/401 for the procedure to install the turnbuckle locking clips.
- (d) Refer to AMM 20-10-06/401 for the procedure to install the control cable grommets.
- (e) Refer to AMM 20-10-08/401 for the procedure to install the quick stops on the control cable.

S 822-009-R00

- (3) After the thrust control cables are installed, do these steps:
  - (a) Make sure that all the pulleys turn freely without interference with all the cable guards.
  - (b) Make sure the control cables are not moved from the usual travel position by the fairleads, rubstrips or the grommets.
  - (c) Make sure the cables do not touch the pulley flanges or the quadrant flanges over the full cable travel.
  - (d) Make sure the cable stops do not touch the structure over the full cable travel.

S 832-011-R00

- (4) Adjust the thrust control system (AMM 76-11-00/501).

S 712-012-R00

- (5) Do the test for the engine control system (AMM 76-11-00/501).

S 412-013-R00

- (6) Close the access doors and panels.
  - (a) Close the access door, 113AL (AMM 06-41-00/201).
  - (b) Install the ceiling lining (AMM 25-50-01/401).
  - (c) For the left wing, close the access panels 511DB, 511FB, and 511HB (AMM 06-44-00/201).
  - (d) For the right wing, open the access panels 611DB, 611FB, and 611HB (AMM 06-44-00/201).
  - (e) Install the top strut fairings, 432AL or 442AL (AMM 06-43-00/201).

S 442-014-R00

- (7) Do the activation procedure for the LE slats (AMM 27-81-00/201).

S 442-015-R00

- (8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

EFFECTIVITY

ALL

**76-11-03**

R02

Page 205  
Sep 28/02

D. Thrust Control Cable Specifications (Fig. 201).

S 862-020-R00

- (1) The terminal fittings, the material, the composition, and the lengths of the cables shown in Fig. 201 are given in the table that follows.

CABLE SECTION	LENGTH (INCHES)	TERMINAL FITTINGS [2]	
		FORWARD OR INBOARD END	AFT OR OUTBOARD END
TLA-1 [1]	381.5	BACT14A3	MS21260L3 RH
TLB-1 [1]	400.5	BACT14A3	MS21260L3 LH
TRA-1 [1]	381.5	BACT14A3	MS21260L3 RH
TRB-1 [1]	401.2	BACT14A3	MS21260L3 LH
TLA-2 [1]	390.6	MS21260L3 LH	MS21260L3 LH
TLB-2 [1]	403.0	MS21260L3 RH	MS21260L3 RH
TRA-2 [1]	390.6	MS21260L3 LH	MS21260L3 LH
TRB-2 [1]	403.0	MS21260L3 RH	MS21260L3 RH
TLA-3 [3]	219.0	MS21260L3 RH	BACT14A3
TLB-3 [3]	196.9	MS21260L3 LH	BACT14A3
TRA-3 [3]	230.8	MS21260L3 RH	BACT14A3
TRB-3 [3]	202.0	MS21260L3 LH	BACT14A3

[1] Airplanes were delivered with either 3/32-inch diameter 7x19 non-jacketed carbon steel wire rope with zinc coating, or with 3/32-inch diameter 7x7 non-jacketed carbon steel wire rope with tin-over-zinc coating. It is recommended to use 7x7 carbon steel wire rope with tin-over-zinc coating. Use the same type of cable for the opposite cables with a given cable loop.

[2] Terminal Fittings are Corrosion Resistant Steel.

[3] Breakaway Cable with Cable Stop; all cables 3/32 inch dia 7x7 non-jacketed wire rope, corrosion resistant steel. Stop 251N6370-1 swaged onto cable so that length from end of terminal MS21260L to flat end of stop is 108.2 inch for TLA and TRA cables; 80.0 inch for TLB and TRB cables. After swaging, stop small diameter shall be 0.185-0.190 inch over the length of 0.80 inch.

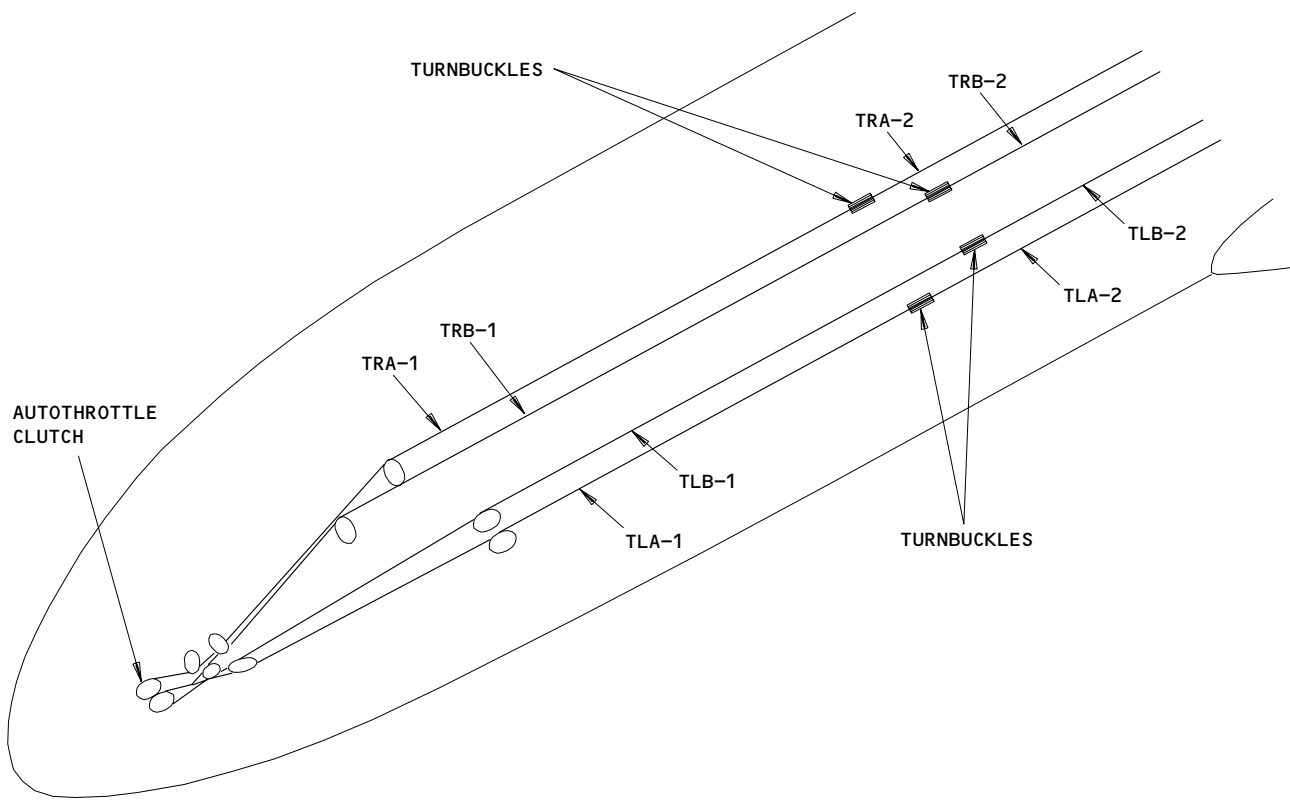
EFFECTIVITY

ALL

76-11-03

R04

Page 206  
Sep 28/04



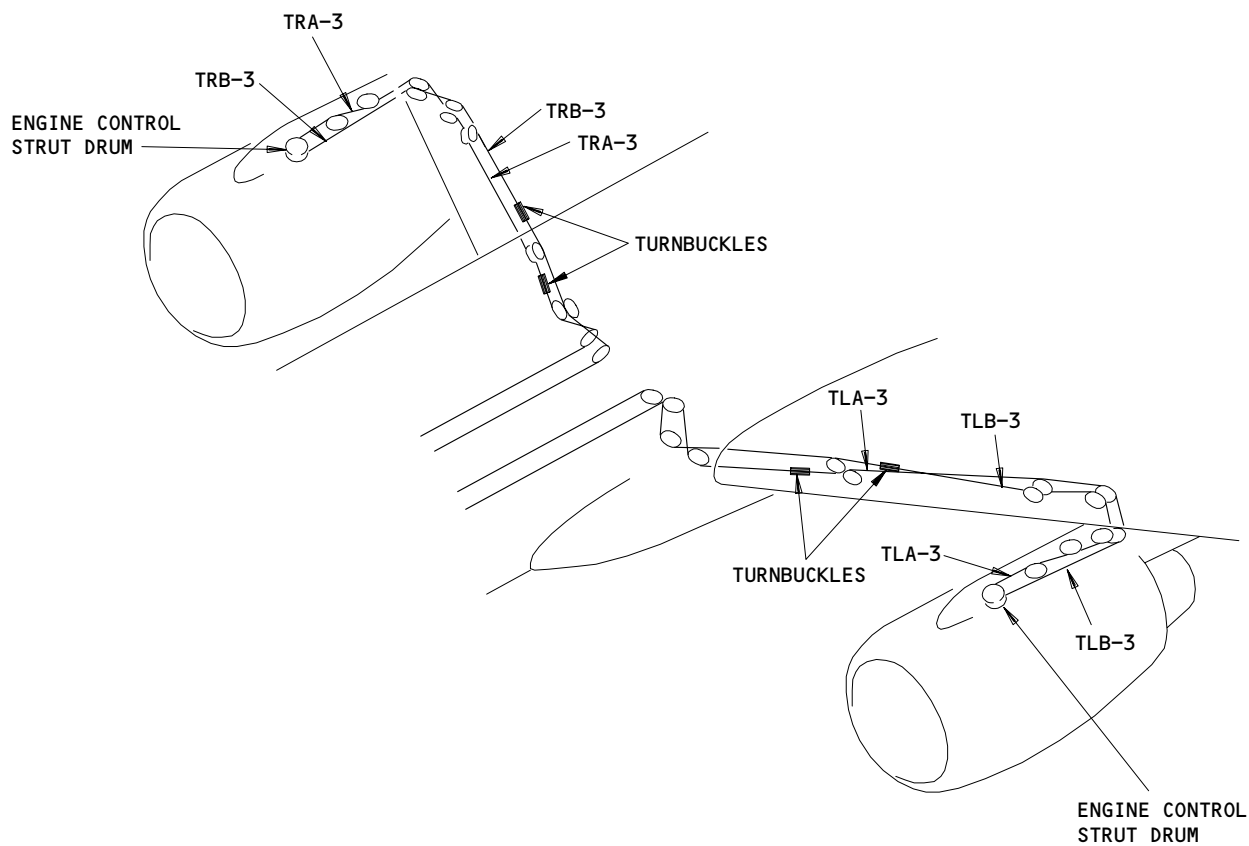
Thrust Control Cable Runs and Terminal Fittings  
Figure 201 (Sheet 1)

EFFECTIVITY	ALL
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**76-11-03**

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AIRPLANES WITH THRUST CONTROL CABLES TLA/TLB/TRA/TRB -1 TO -3

Thrust Control Cable Runs and Terminal Fittings  
Figure 201 (Sheet 2)

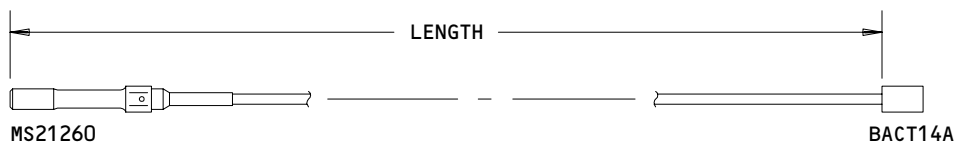
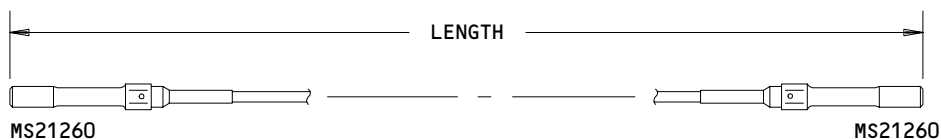
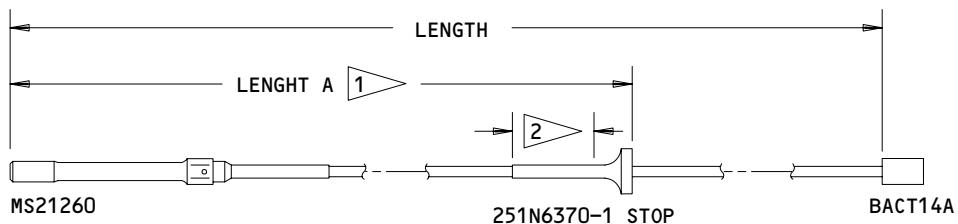
EFFECTIVITY	ALL
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76-11-03

R06

Page 208  
Mar 20/94

E10050



**CABLE EXAMPLES**

- 1 TLA/TRB CABLE LENGTH A IS 108.2 INCHES  
TLB/TRB CABLE LENGTH A IS 80.0 INCHES
- 2 OVER LENGTH OF 0.80 INCH, STOP DIAMETER IS 0.185-0.195 INCH

AIRPLANES WITH THRUST CONTROL CABLES TLA/TLB/TRB -1 TO -3

Cable Examples and Terminal Fittings  
Figure 202

EFFECTIVITY	ALL
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**76-11-03**

CONTROL STAND LEVER'S RAILS, COVER, AND SEALS - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task removes the rails, covers and seals on the control stand. The second task installs the rails, covers and seals on the control stand.
- B. This procedure gives access to these components in the control stand: the thrust levers, the engine fuel control module, the flap control lever, the speedbrake control lever, and the stabilizer trim levers.

TASK 76-11-04-004-001-R00

2. Remove the Rails, Covers, and Seals from the Control Stand Levers

A. References

- (1) AMM 27-41-02/401, Stabilizer Trim Lever
- (2) AMM 27-51-32/401, Flap Control Lever
- (3) AMM 27-61-00/201, Spoiler/Speedbrake Control System
- (4) AMM 27-62-01/401, Speedbrake Lever
- (5) AMM 78-31-00/201, Thrust Reverser System

B. Access

- (1) Location Zone  
210 Control Cabin

C. Prepare to Remove the Rails, Cover, and Seals.

S 044-002-R00

**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 INJURY TO PERSONS OR DAMAGE TO THE EQUIPMENT.

- (1) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the spoilers.

S 044-008-R00

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

- (2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Forward Thrust Position) (AMM 78-31-00/201).

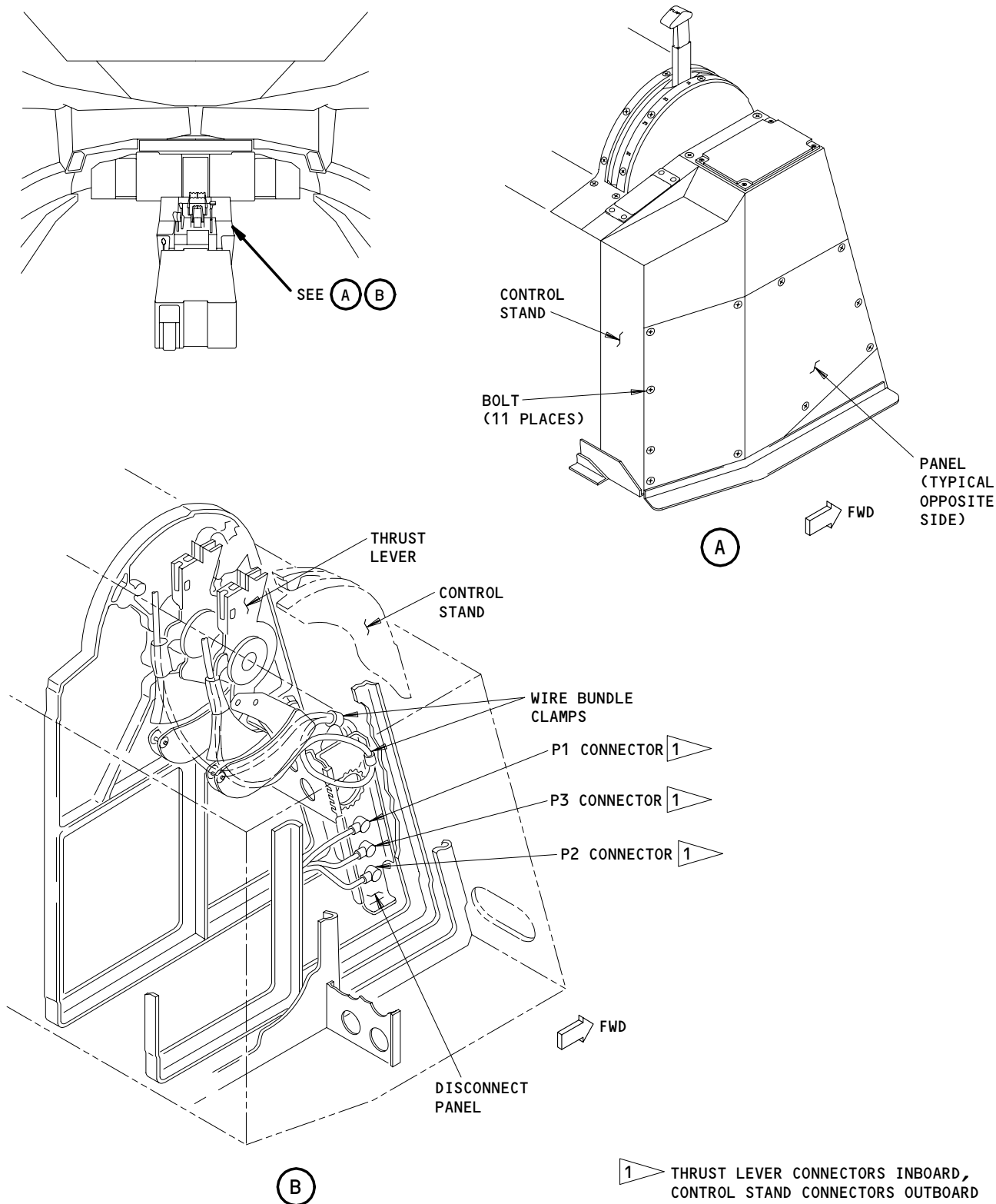
EFFECTIVITY

ALL

76-11-04

R01

Page 401  
May 28/99



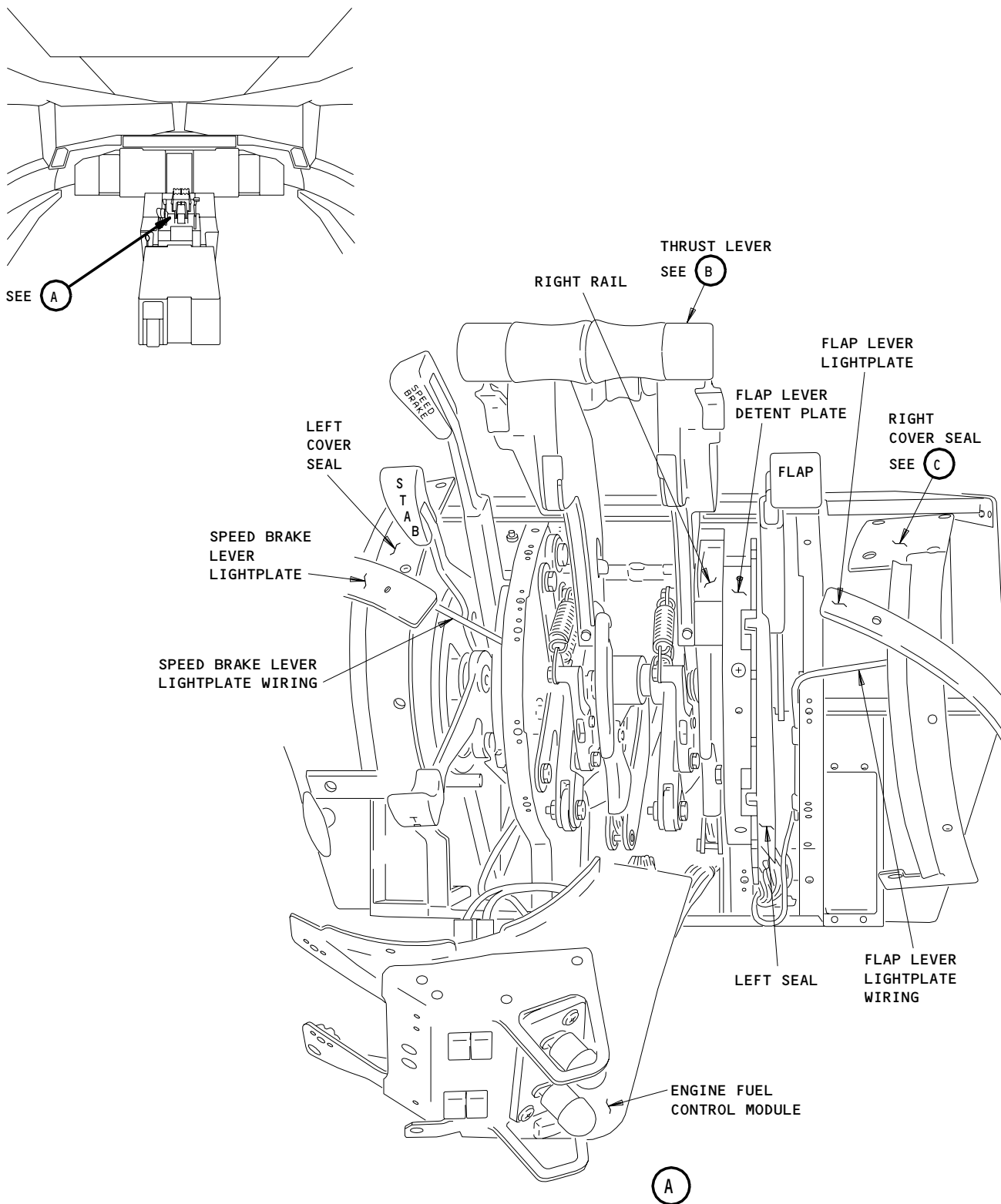
Control Stand/Lightplate Wiring  
Figure 401

EFFECTIVITY	
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76-11-04

R01

Page 402  
May 28/99



Control Stand Lightplate/Cover Seal Installation  
Figure 402 (Sheet 1)

EFFECTIVITY

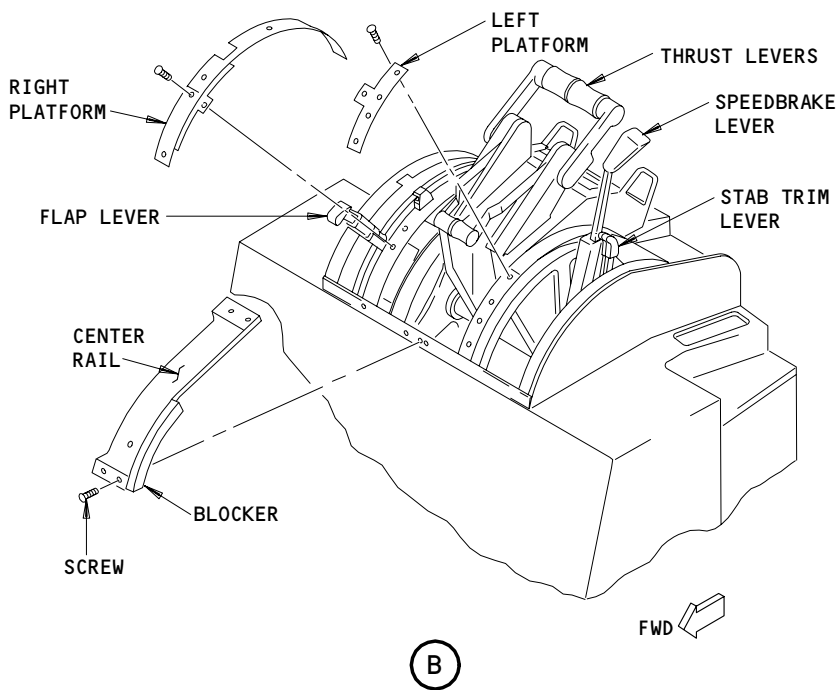
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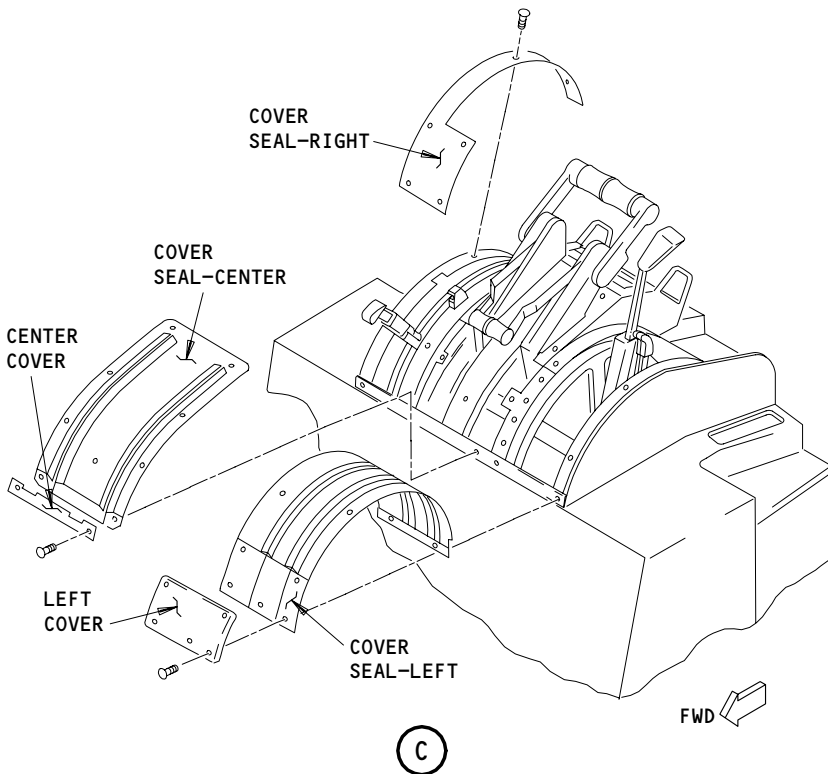
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Page 403  
May 28/99

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(B)



(C)

Control Stand Lightplate/Cover Seal Installation  
Figure 402 (Sheet 2)

EFFECTIVITY	
	ALL

76-11-04

R01

Page 404  
May 28/99

D. Remove the rails, covers, and seals.

S 024-003-R00

- (1) Remove the rails, covers, and seals (Fig. 401, 402):

**CAUTION:** BE VERY CAREFUL WHEN YOU REMOVE AND MOVE THE LIGHTPLATES AND THE CONTROL STAND COMPONENTS. DAMAGE TO THE LIGHTPLATES, SWITCHES, NUTPLATES, WIRE BUNDLES OR THE FINISH ON THE PARTS CAN OCCUR.

- (a) Remove the access panels on the lower left side and the lower right side of the control stand to get access to the lightplate wires.
- (b) Cut the wire ties that hold the loose wire for the lightplates of the flap, speedbrake, fuel control and stabilizer trim.

**NOTE:** It is necessary to have the loose wire to move the lightplates. The wire ties are near the burndy blocks are on the lower right side at the rear of the control stand.

- 1) When you remove the necessary wire ties, make a record of the locations for the subsequent installation.
- (c) Remove the two screws which are aft of the flap lever and which attach the aft cover.
- (d) Remove the aft cover.
- (e) Remove the flap lever lightplate:
- 1) Pull the loose wire for the flap lever lightplate to the lightplate.
- 2) Remove the two screws which attach the flap lever lightplate.
- 3) Put the flap lever lightplate to the side.
- (f) Move the loose wire for the speedbrake, the stabilizer trim, and fuel control lightplates to the bottom of the vertical conduits.
- (g) Remove the speedbrake lever lightplate:
- 1) Remove the two screws from the speedbrake lever lightplate.
- 2) Lift the lightplate as far as permitted by the loose wire and put the lightplate to the side.
- (h) Remove the two screws and the center cover.
- (i) Remove the five screws and the left cover.
- (j) Remove the eight screws which attach the right cover seal and put the cover seal to the side.
- (k) Remove the five screws which attach the left cover seal and put the cover seal to the side.
- (l) Remove the three screws and the center cover seal.
- (m) Remove the three screws and the right platform.
- (n) Remove the one screw and the left platform.

EFFECTIVITY

ALL

76-11-04

R01

Page 405  
May 28/99

(o) Remove the four bolts and the center rail.

NOTE: You have sufficient access to remove the engine fuel control module (AMM 76-11-02/201) if it is necessary.

(p) Remove the engine fuel control module (AMM 76-11-02/201).

NOTE: You have sufficient access to remove the stabilizer trim lever (AMM 27-41-02/401) and the speedbrake lever (AMM 27-62-01/401) if it is necessary.

(q) Remove the two screws, detent plate, and left seal below the detent plate for the flap lever.

NOTE: You have sufficient access to remove the flap control lever (AMM 27-51-32/401) if it is necessary.

(r) Remove the two bolts and the right rail.

NOTE: You have sufficient access to remove the thrust levers (AMM 76-11-01/401) if it is necessary.

TASK 76-11-04-404-004-R00

3. Install the Rails, Covers, and Seals on the Control Stand Levers

A. References

- (1) AMM 27-61-00/201, Spoiler/Speedbrake Control System
- (2) AMM 78-31-00/201, Thrust Reverser System

B. Access

- (1) Location Zone  
210 Control Cabin

C. Install the rails, covers and seals.

S 424-005-R00

CAUTION: BE VERY CAREFUL WHEN YOU TOUCH AND INSTALL THE LIGHTPLATES AND THE CONTROL STAND COMPONENTS. DAMAGE TO THE LIGHTPLATES, SWITCHES, NUTPLATES, WIRE BUNDLES OR THE FINISH ON THE PARTS CAN OCCUR.

- (1) Install these components if they were removed:
  - (a) Install the right rail with two bolts and washers.
    - 1) Make sure you have the correct clearance between the right thrust lever and the right rail (Fig. 403).

EFFECTIVITY

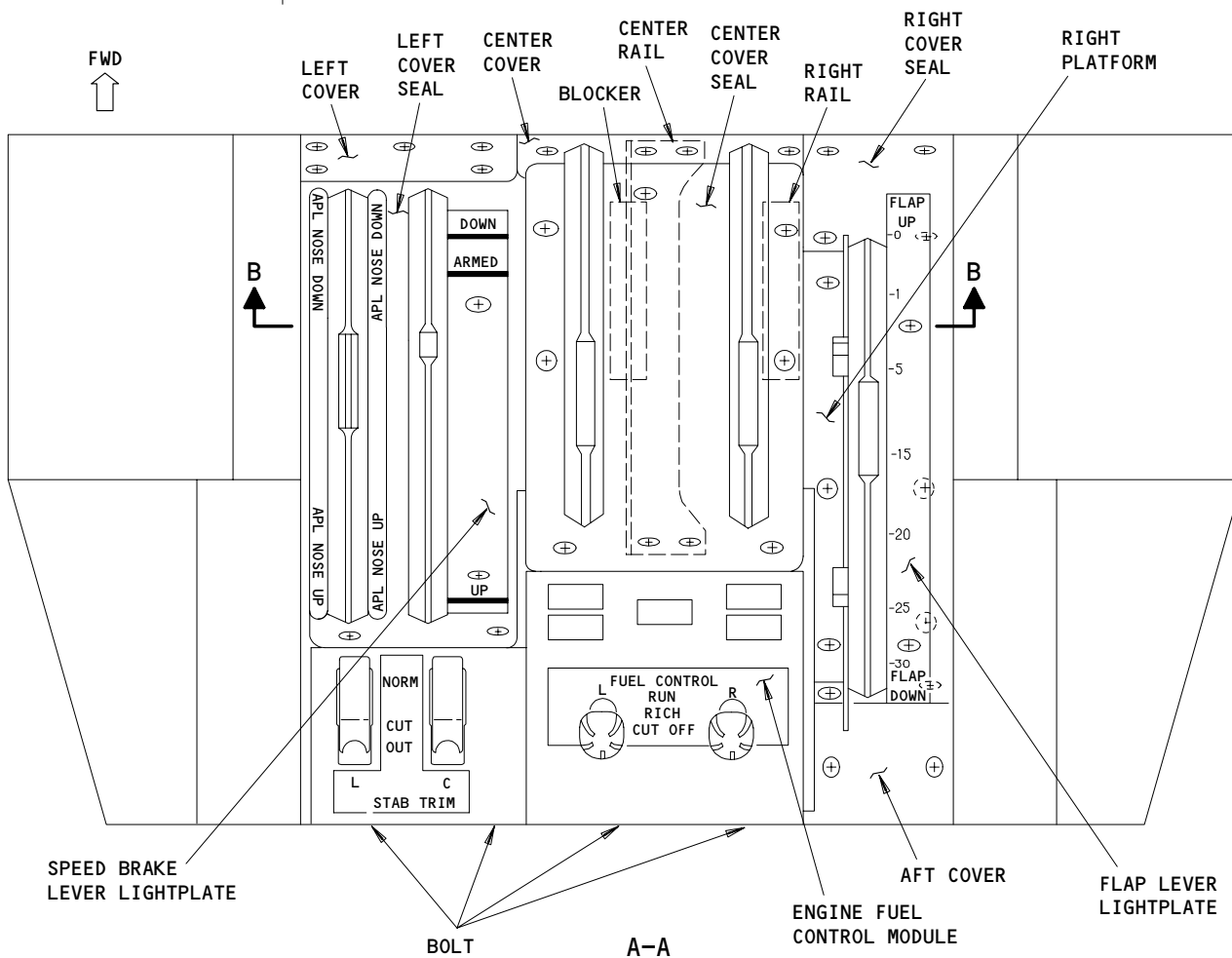
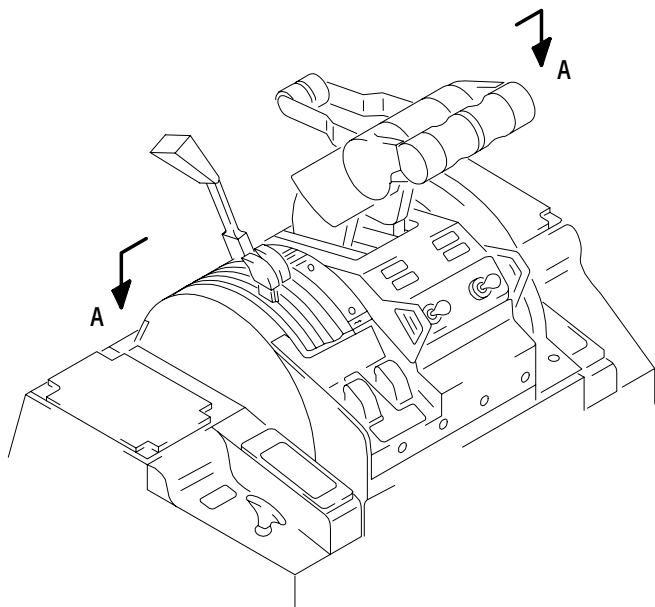
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76-11-04

R01

Page 406  
May 28/99





Control Stand Lightplate/Cover Seal Clearances  
Figure 403 (Sheet 1)

EFFECTIVITY	ALL
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76-11-04

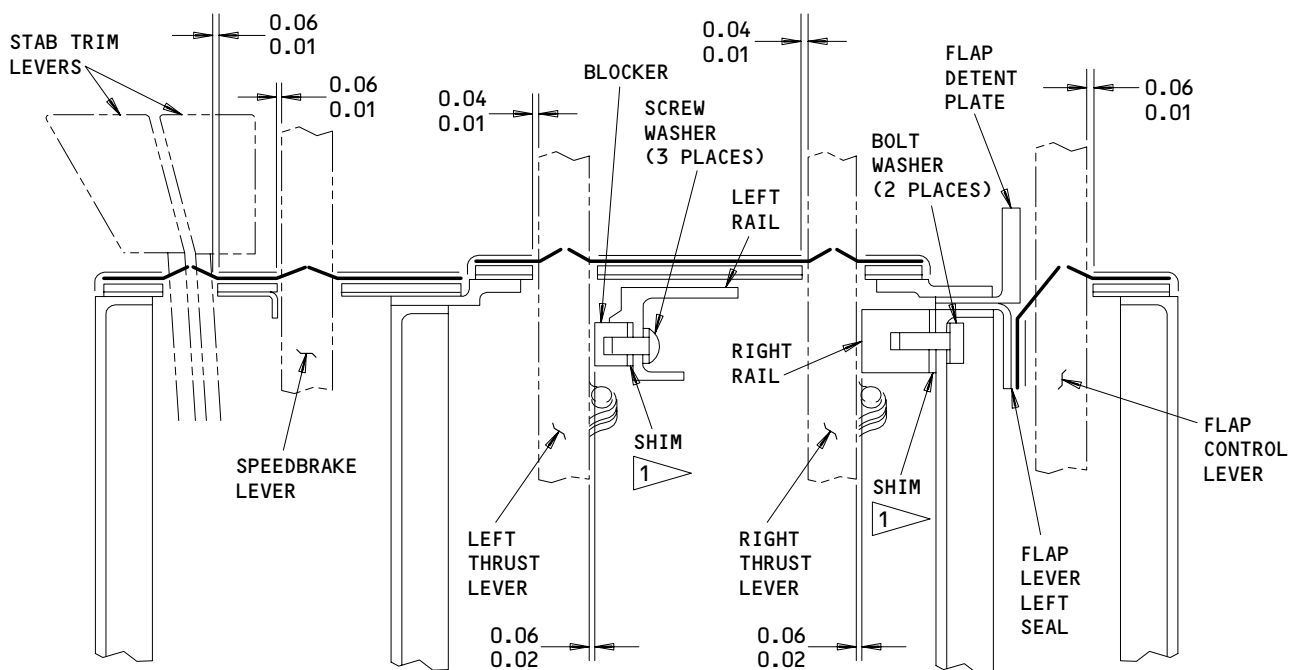
R01

Page 407  
May 28/99

- 2) Install shims on the rail if it is necessary.
- (b) Install the left seal and the detent plate for the flap lever with two screws.
- (c) Install the engine fuel control module (AMM 76-11-02/201).

S 424-009-R00

- (2) Do these steps to install the rails, covers, and seals (Fig. 401, 402):
  - (a) Install the center rail with four bolts.
    - 1) Use the shims on the blocker to keep the correct clearance between the left thrust lever and the center rail block (Fig. 403).
  - (b) Install the left platform with one screw.
  - (c) Install the right platform with three screws.
  - (d) Install the center cover seal with three screws.
  - (e) Install the left cover seal with five screws.
  - (f) Install the right cover seal with eight screws.
  - (g) Install the left cover with five screws.
  - (h) Install the center cover with two screws.



1 ONE COAT BMS 10-11 PRIMER, TYPE 1

B-B

ALL DIMENSIONS ARE IN INCHES

Control Stand Lightplate/Cover Seal Clearances  
Figure 403 (Sheet 2)

EFFECTIVITY

ALL

**76-11-04**

R01

Page 408  
May 28/99

251048

**CAUTION:** MANUALLY TIGHTEN THE SCREWS ON THE LIGHTPLATES. DAMAGE TO THE LIGHTPLATES CAN OCCUR IF YOU TIGHTEN THE SCREWS WITH POWER SCREWDRIVERS.

- (i) Carefully pull the loose wire for the speedbrake lightplate down through the left cover seal.
  - (j) Install the speedbrake lightplate with two screws.
  - (k) Carefully pull the loose wire for the flap lever lightplate down through the right cover seal.
  - (l) Install the flap lever lightplate with two screws.
  - (m) Install the aft cover with two screws.
  - (n) Make sure the stabilizer trim levers, the speedbrake levers, and the flap levers move freely in the cover seals.
  - (o) Move the loose wire from the stabilizer trim and the fuel control lightplates to the burndy block.
  - (p) Safety the loose wires with wire ties if it is necessary.
  - (q) Install the access panels on the lower left side and the lower right side of the control stand.
- D. Put the Airplane Back to Its Usual Condition.

S 444-006-R00

- (1) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 444-007-R00

- (2) Do the activation procedure for the spoilers (AMM 27-61-00/201).

EFFECTIVITY

ALL

76-11-04

R01

Page 409  
Sep 20/91

LOWER CONTROL BOX ASSEMBLY – REMOVAL/INSTALLATION

1. General

- A. This procedure gives the instructions to remove and install the lower control box for the push-pull cable.
- B. The lower control box is attached to the fuel flow governer (FFG). The lower control box gives a mechanical connection between the push-pull cable and the FFG.
- C. Use the procedures in AMM 70-51-00/201 to tighten the fastenser. Tighten the fasteners to the torque values in AMM 70-51-00/201 unless a torque value is specified in this procedure.

TASK 76-11-10-004-001-R00

2. Remove the Lower Control Box

A. Equipment

- (1) Rig Pin – UT1150/2 (Rolls-Royce) or WT100719 (Woodward)
- (2) Rig Pin – UT1315/1 (Rolls-Royce)
- (3) Rig Pin RR-2 – P/N B20003-29 from Rig Pin Set B20003-XX (Ref 20-10-24)

B. References

- (1) AMM 71-11-04/201, Fan Cowl Panels
- (2) AMM 75-32-14/401, Power Lever Angle – Bleed Valve Control Unit and Autothrottle Transducer
- (3) AMM 76-11-00/501, Engine Control System
- (4) AMM 78-31-00/201, Thrust Reverser

C. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 414AR Fan Cowl Panel (Right)
  - 424AR Fan Cowl Panel (Right)

D. Prepare to Remove the Lower Control Box Assembly

S 864-002-R00

- (1) For the left engine, open this circuit breaker on the distribution panel for the main power, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C1, FUEL COND CONT L

S 864-003-R00

- (2) For the right engine, open this circuit breaker on the distribution panel for the main power, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C2, FUEL COND CONT R

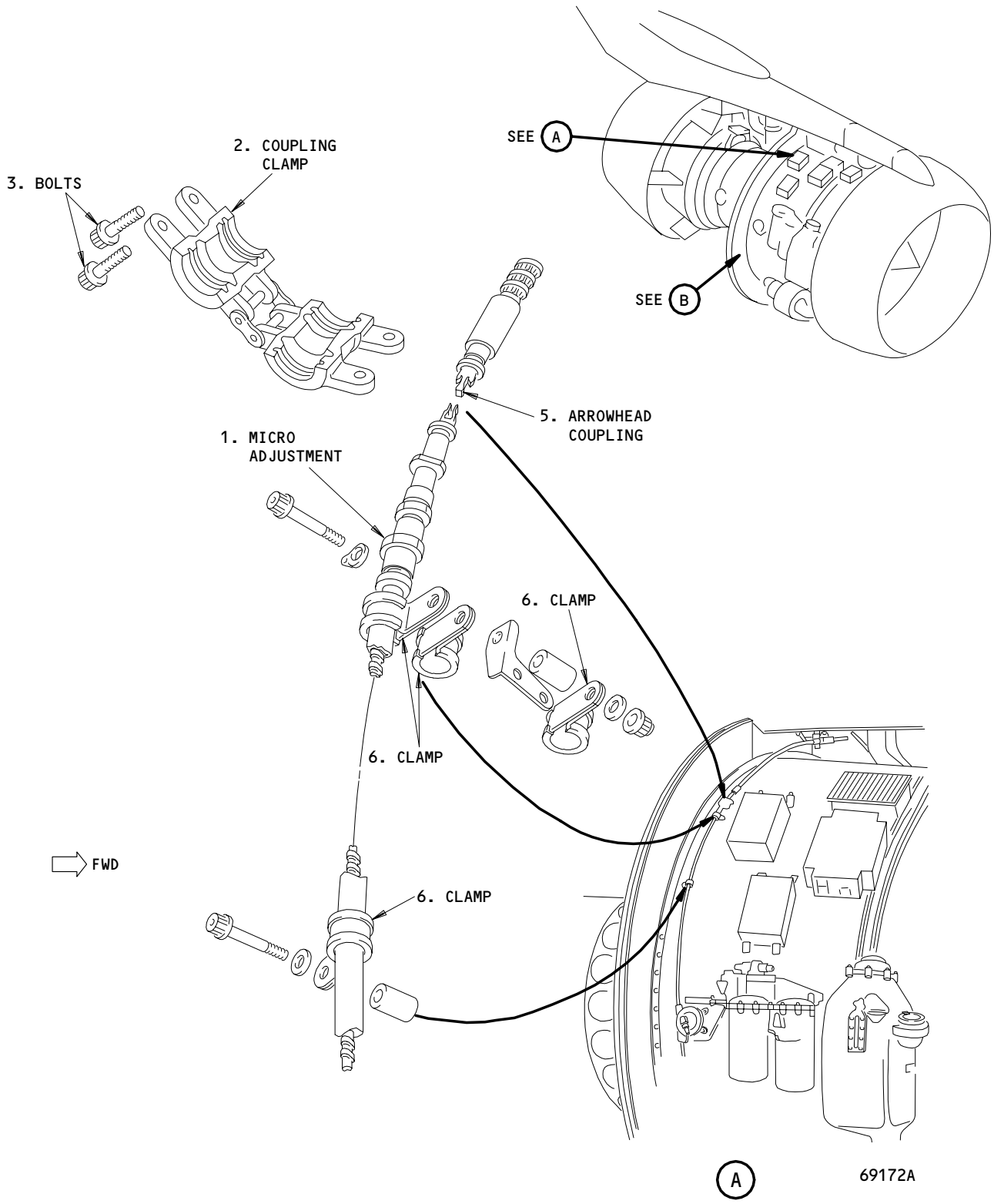
EFFECTIVITY

ALL

76-11-10

R01

Page 401  
Jan 28/06



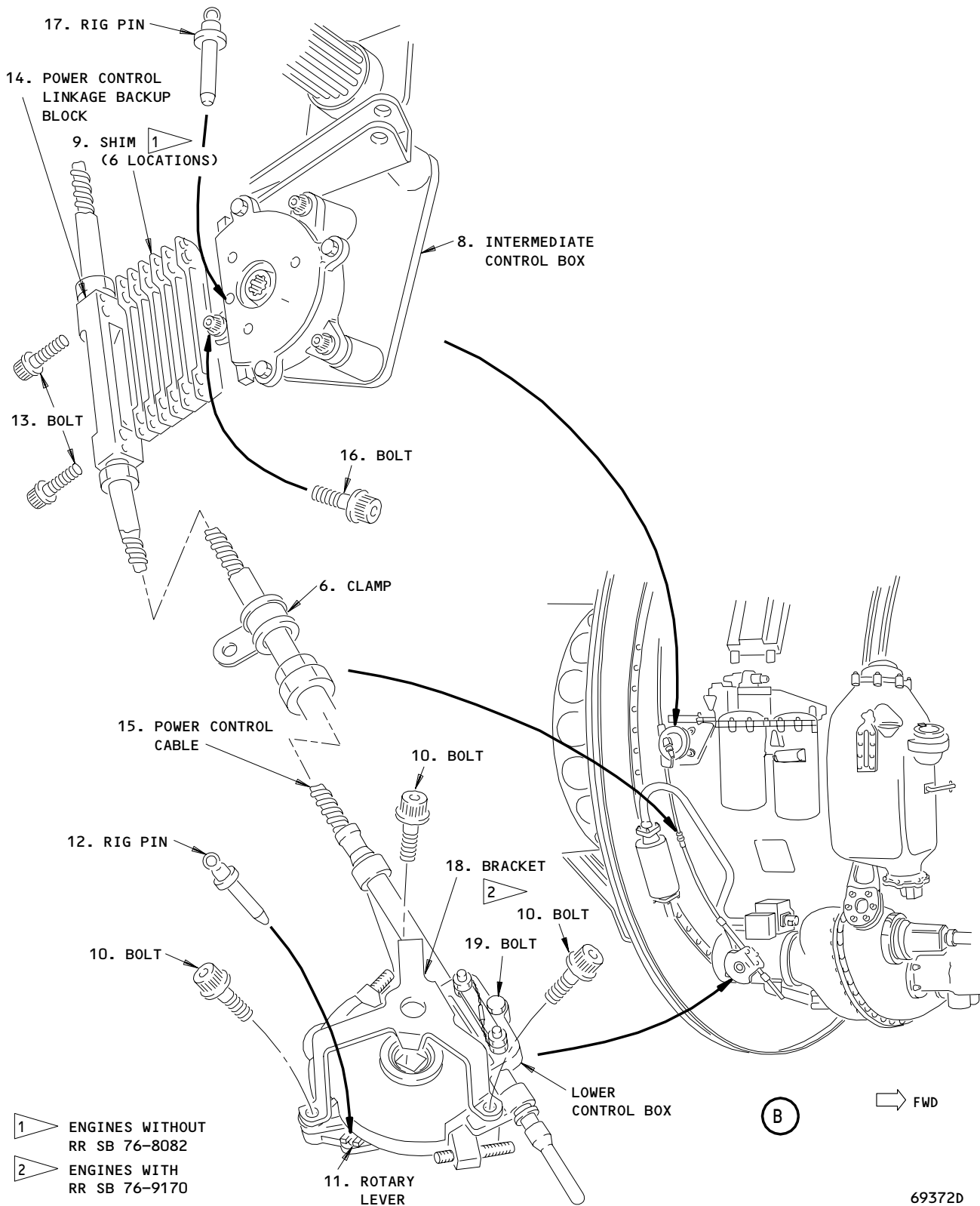
Lower Control Box Assembly - Installation  
Figure 401 (Sheet 1)

EFFECTIVITY	
ALL	

76-11-10

R01

Page 402  
May 28/99



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Lower Control Box Assembly - Installation  
Figure 401 (Sheet 2)

EFFECTIVITY

ALL

76-11-10

R01

Page 403  
May 28/99

141507

S 044-050-R00

**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 AND DAMAGE TO EQUIPMENT.

- (3) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 864-005-R00

- (4) Put the thrust levers in the idle position and attach a DO-NOT-OPERATE tag.

S 014-006-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (5) Open the right fan cowl panel (AMM 71-11-04/201).

S 094-007-R00

- (6) Install the rig pin (7) UT1315/1 in the intermediate control box.

E. Remove the Lower Control Box Assembly (Fig. 401)

S 034-008-R00

- (1) Remove the bolts (3) and clamp (2) which attach the lower cable to the top cable.

S 034-009-R00

- (2) Disconnect the lower cable from the top cable at the arrowhead connection (5).

S 034-010-R00

- (3) Remove the one bolt (16) which attaches the intermediate control box at the rear position.

S 034-011-R00

- (4) Remove the bolts (13) and remove the backup block for the power control linkage (PCL) (14) from the intermediate control box (8).

S 034-012-R00

- (5) ENGINES PRE RR SB 76-8082;  
Remove the shims (9).

S 024-053-R00

- (6) ENGINES PRE RR SB 76-9170;  
Remove the three bolts (10) which attach the lower control box.  
(a) Pull the control box from the dowel pins on the FFG interface.

EFFECTIVITY

ALL

76-11-10

R01

Page 404  
May 28/99

- S 024-054-R00
- (7) ENGINES POST RR SB 76-9170;  
Remove the three bolts (10) which attach the lower control box and bracket.  
(a) Pull the control box from the dowel pins on the FFG interface.

- S 024-014-R00
- (8) Remove the clamps (6) and remove the lower control box from the engine.  
(a) Make a record of the location of the clamps.

NOTE: This data is used when you install the lower control box.

TASK 76-11-10-404-015-R00

3. Install the Lower Control Box

A. Equipment

- (1) Rig Pin - UT1150/2 (Rolls-Royce) or WT100719 (Woodward)  
(2) Rig Pin - UT1315/1 (Rolls-Royce)  
(3) Rig Pin RR-2 - P/N B20003-29 from Rig Pin Set.

B. Consumable Materials

- (1) Lockwire  
British Spec/Ref - DTD.189A, 22SWG  
American Spec/Ref - 21 AWG

C. References

- (1) AMM 71-11-04/201, Fan Cowl Panels  
(2) AMM 75-32-14/401, Power Lever Angle - Bleed Valve Control Unit and Autothrottle Transducer  
(3) AMM 76-11-00/501, Engine Control System  
(4) AMM 78-31-00/201, Thrust Reverser

D. Access

- (1) Location Zones
- |         |                           |
|---------|---------------------------|
| 211/212 | Control Cabin             |
| 410     | No. 1 Power Plant (Left)  |
| 420     | No. 2 Power Plant (Right) |

EFFECTIVITY

ALL

76-11-10

R01

Page 405  
Jan 28/07



- (2) Access Panels
  - 414AR Fan Cowl Panel (Right)
  - 424AR Fan Cowl Panel (Right)

E. Prepare to Install the Lower Control Box

S 014-016-R00

- (1) Remove the transducer for the PLA (AMM 75-32-14/401).

S 824-017-R00

**CAUTION:** KEEP THE POWER CONTROL CABLE FREE OF KINKS OR OTHER DAMAGE. THE PERFORMANCE OF THE ENGINE COULD BE DECREASED IF THE CABLE IS DAMAGED.

- (2) Hold the control linkage when you install the lower control box.

F. Install the Lower Control Box (Fig. 401)

S 434-018-R00

- (1) Attach the back-up block (14) for the PCL to the intermediate control box (8).

**NOTE:** Use the bolts (13) to temporarily hold the control linkage when you install the lower control box.

S 824-019-R00

- (2) Align the rotary lever (11) on the FFG with the rig pin position.

S 494-020-R00

- (3) Install the rig pin (12) (UT1150/2).

S 424-021-R00

- (4) Do these steps to install the lower control box:
  - (a) Engage the rotary arm on the lower control box with the rotary lever (11).
  - (b) Align the dowel holes on the lower control box with the dowels on the FFG interface.
  - (c) Apply a light pressure to the control box to install the box fully.

EFFECTIVITY

ALL

76-11-10

R01

Page 406  
Sep 20/98

S 434-055-R00  
(5) ENGINES PRE RR SB 76-9170;  
Install the three bolts (10) and tighten (AMM 70-51-00/201).

S 434-056-R00  
(6) ENGINES POST RR SB 76-9170;  
Put the bracket (18) on the lower control box and install the three bolts (10) and tighten (AMM 70-51-00/201).

S 434-023-R00  
(7) Loosely attach the conduit clips (6).

S 434-024-R00

**CAUTION:** ON ENGINES WITH RR SB 76-8082,  
DO NOT INSTALL THE SHIMS TO THE ENGINE. THE INCORRECT  
OPERATION OF THE CONTROLS COULD RESULT IF YOU INSTALL THE SHIMS  
ON THESE ENGINES.

(8) Remove the bolts (13) which hold the PCL back-up block (14).

S 434-025-R00  
(9) ENGINES PRE RR SB 76-8082;  
Do these steps:  
(a) Install 3 shims (9) between the PCL back-up block and the  
intermediate control box.  
(b) Install the bolts (13) again.

S 434-026-R00  
(10) ENGINES POST RR SB 76-8082;  
Install the bolts (13).

S 434-027-R00  
(11) Tighten the bolts (13) to 25-32 pound-inches (2.83-3.62 newton  
meters).

S 434-028-R00  
(12) Install the bolt (16) to the rear location on the intermediate  
control box.

S 434-029-R00  
(13) Tighten the bolt (16) (AMM 70-51-00/201).

EFFECTIVITY

ALL

76-11-10

R01

Page 407  
Sep 20/98

S 434-060-R00

**CAUTION:** MAKE SURE THAT THE BEND IN THE CONTROL CABLE HAS AS BIG A RADIUS AS POSSIBLE. IF THE RADIUS IS TOO SMALL, DAMAGE CAN OCCUR IN THE CONTROL CABLE.

(14) Tighten the clips (6) (AMM 70-51-00/201).

S 094-031-R00

(15) Remove the rig pin (12) (UT1150/2) from the rotary lever (11) on the FFG.

S 094-032-R00

(16) Remove the rig pin (7) (UT1315/1) from the intermediate control box.

S 824-057-R00

(17) ENGINES POST RR SB 76-8386;

Align the lower control box as follows:

- (a) Loosen the bolt (19) on the back plate of the lower control box.
- (b) Loosen the three bolts (10) to let the lower control box move on the dowels.
- (c) Carefully turn the lower control box clockwise and counterclockwise until the position is found where the box operates at the lowest friction.
- (d) Do these steps to make sure the box is in the correct position.
  - 1) Turn the square drive to find the torque value.

**NOTE:** The maximum torque for a unit that is not pressurized is 19 inch-pounds (2.15 newton-meters).

- (e) If the torque is more than 19 inch-pounds (2.15 newton-meters), turn the lower control box and then turn the square drive until the torque is less than the maximum.
- (f) Align the rotary lever (11) on the FFG with the rig pin position.
- (g) Install the rig pin (12) (UT1150/2).
- (h) Hold the lower control box in position and tighten the three bolts (10) (AMM 70-51-00/201).
- (i) Tighten the bolts (19) on the back plate of the lower control box to 34-50 pound-inches (4.52-5.65 newton meters).
- (j) Remove the rig pin (12) (UT1150/2).

S 824-033-R00

(18) Adjust the power control cable (AMM 76-11-00/501).

S 434-034-R00

(19) Lockwire the bolts (13).

EFFECTIVITY

ALL

76-11-10

R01

Page 408  
Jan 28/05

- S 434-035-R00  
(20) Install the PLA transducer (AMM 75-32-14/401).
- G. Connect the Engine Controls After the Installation of the Lower Control Box (Fig. 401)
- S 864-036-R00  
(1) Make sure the thrust levers are at the idle position.
- S 094-037-R00  
(2) Install the rig pin RR-2 in the No. 2 hole of the strut drum.
- S 434-038-R00  
(3) Connect the top and lower cable at the arrowhead coupling (5).
- S 434-039-R00  
(4) Attach the arrowhead coupling with the coupling clamp (2).  
(a) Tighten the bolts (3) to 27-30 pound-inches (3.05-3.39 newton meters).
- S 434-040-R00  
(5) Attach a lockwire to the bolts (3).
- S 434-041-R00  
(6) Install the rig pin (12) (UT1150/2) into the rotary lever (11) and the rigging position of the lower control box.  
(a) Adjust the micro adjuster (1) to permit a free installation of the rig pin.
- S 094-042-R00  
(7) Remove the rig pins from the rotary lever and from the strut drum.
- S 434-043-R00  
(8) Attach a lockwire to the micro adjuster (1).
- S 864-044-R00  
(9) Remove the DO-NOT-OPERATE tags from the thrust levers.
- S 714-048-R00  
(10) Move the forward thrust lever through the full forward travel.  
(a) Make sure the power lever on the fuel flow governor (FFG) touches the forward FFG stop.
- S 714-058-R00  
(11) Do an adjustment of the control system for the lower control box (AMM 76-11-00/501).
- H. Put the Airplane Back to Its Usual Condition

EFFECTIVITY

ALL

76-11-10

R01

Page 409  
May 28/03

S 414-052-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(1) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-051-R00

(2) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-045-R00

(3) For the left engine, remove the DO-NOT-CLOSE tag and close this P6 circuit breaker:  
(a) 6C1, FUEL COND CONT L

S 864-046-R00

(4) For the right engine, remove the DO-NOT-CLOSE tag and close this P6 circuit breaker:  
(a) 6C2, FUEL COND CONT R

EFFECTIVITY

ALL

76-11-10

R01

Page 410  
Mar 20/97

LOWER CONTROL BOX ASSEMBLY - INSPECTION/CHECK

1. General

- A. This procedure has one task. This task gives the visual inspection procedure and the damage limits for the fretted or broken strands for the flexible casing of the lower control box.

TASK 76-11-10-206-001-R00

2. Examine the Lower Control Box

A. References

- (1) AMM 71-11-04/201, Fan Cowl Panels
- (2) AMM 78-31-00/201, Thrust Reverser System

B. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 414AR Fan Cowl Panel (Right)
  - 424AR Fan Cowl Panel (Right)

C. Examine the Lower Control Box (Fig. 601).

S 866-002-R00

- (1) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach a D0-NOT-CLOSE tag.
  - (a) 6C1, FUEL COND CONT L

S 866-003-R00

- (2) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach a D0-NOT-CLOSE tag.
  - (a) 6C2, FUEL COND CONT R

S 866-004-R00

- (3) Put the forward thrust levers in the idle power position and attach a D0-NOT-OPERATE tag.

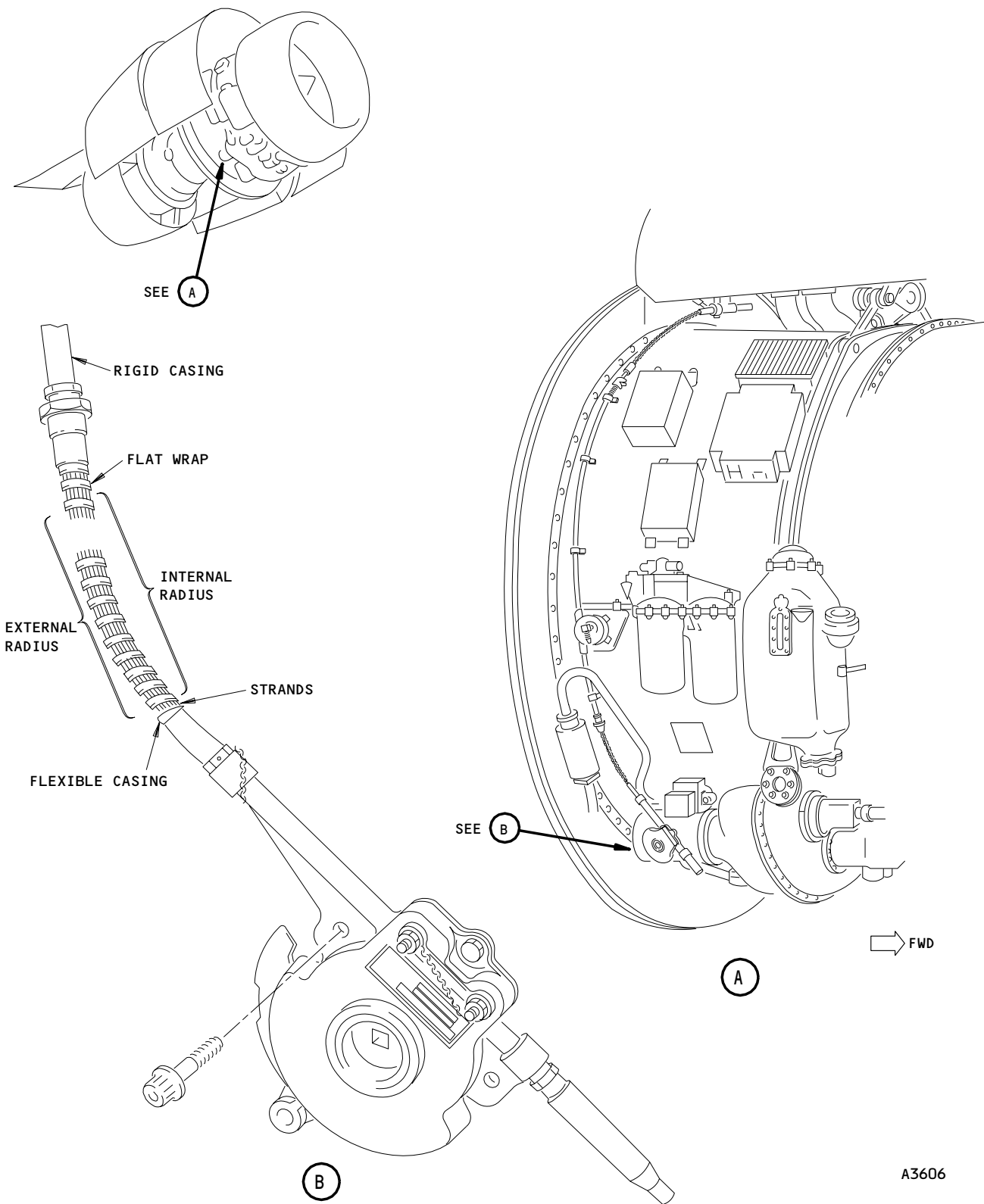
EFFECTIVITY

ALL

76-11-10

R01

Page 601  
Mar 20/94



Lower Control Box Flexible Casing Inspection  
Figure 601

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EFFECTIVITY	
	ALL

76-11-10

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S 046-005-R00

**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 THE EQUIPMENT.

- (4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 016-006-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (5) Open the right fan cowl panel (AMM 71-11-04/201).

S 226-007-R00

- (6) Examine the wire strands in the flexible casing for severe fretting or broken strands.
- (a) One group with not more than three severely fretted or broken strands on the external radius is permitted.
  - (b) Not more than seven severely fretted or broken strands on the external radius is permitted.
    - 1) Each strand must be separated by a minimum of two satisfactory strands.
  - (c) Fretted or broken strands on the external radius that are more than the limits are not permitted.
  - (d) A severely fretted or broken strand(s) on the internal radius is not permitted.

S 416-008-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF YOU DO NOT OBEY THE PRECAUTIONS, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (7) Close the right fan cowl panel (AMM 71-11-04/201).

S 446-009-R00

- (8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 866-010-R00

- (9) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on panel, P6.
- (a) 6C1, FUEL COND CONT L

EFFECTIVITY

ALL

76-11-10

R01

Page 603  
Mar 20/94



S 866-011-R00

- (10) For the right engine, remove the DO-NOT-CLOSE tags and close this circuit breaker on panel, P6.  
(a) 6C2, FUEL COND CONT R

S 866-012-R00

- (11) Remove the DO-NOT-OPERATE tags from the thrust levers.

EFFECTIVITY

ALL

76-11-10

R01

Page 604  
Mar 20/94

INTERMEDIATE POWER CONTROL BOX - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks. The first task removes the intermediate control box. The second task installs the intermediate control box.

TASK 76-11-11-004-001-R00

2. Remove the Intermediate Control Box

A. Equipment

- (1) Rig Pin - UT1150/2 (Rolls-Royce) or  
WT100719 (Woodward)
- (2) Rig Pin - UT1315/1 (Rolls-Royce)

B. References

- (1) AMM 71-11-04/201, Fan Cowl Panels
- (2) AMM 75-32-14/401, Power Lever Angle (PLA) Bleed Valve Control Unit (BVCU) and Autothrottle Transducer
- (3) AMM 78-31-00/201, Thrust Reverser System

C. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 414AR Fan Cowl Panel (Right)
  - 424AR Fan Cowl Panel (Right)

D. Remove the Intermediate Control Box

S 864-002-R00

- (1) For the left engine, open this circuit breaker on the overhead panel, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C1, FUEL COND CONT L

S 864-003-R00

- (2) For the right engine, open this circuit breaker on the overhead panel, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C2, FUEL COND CONT R

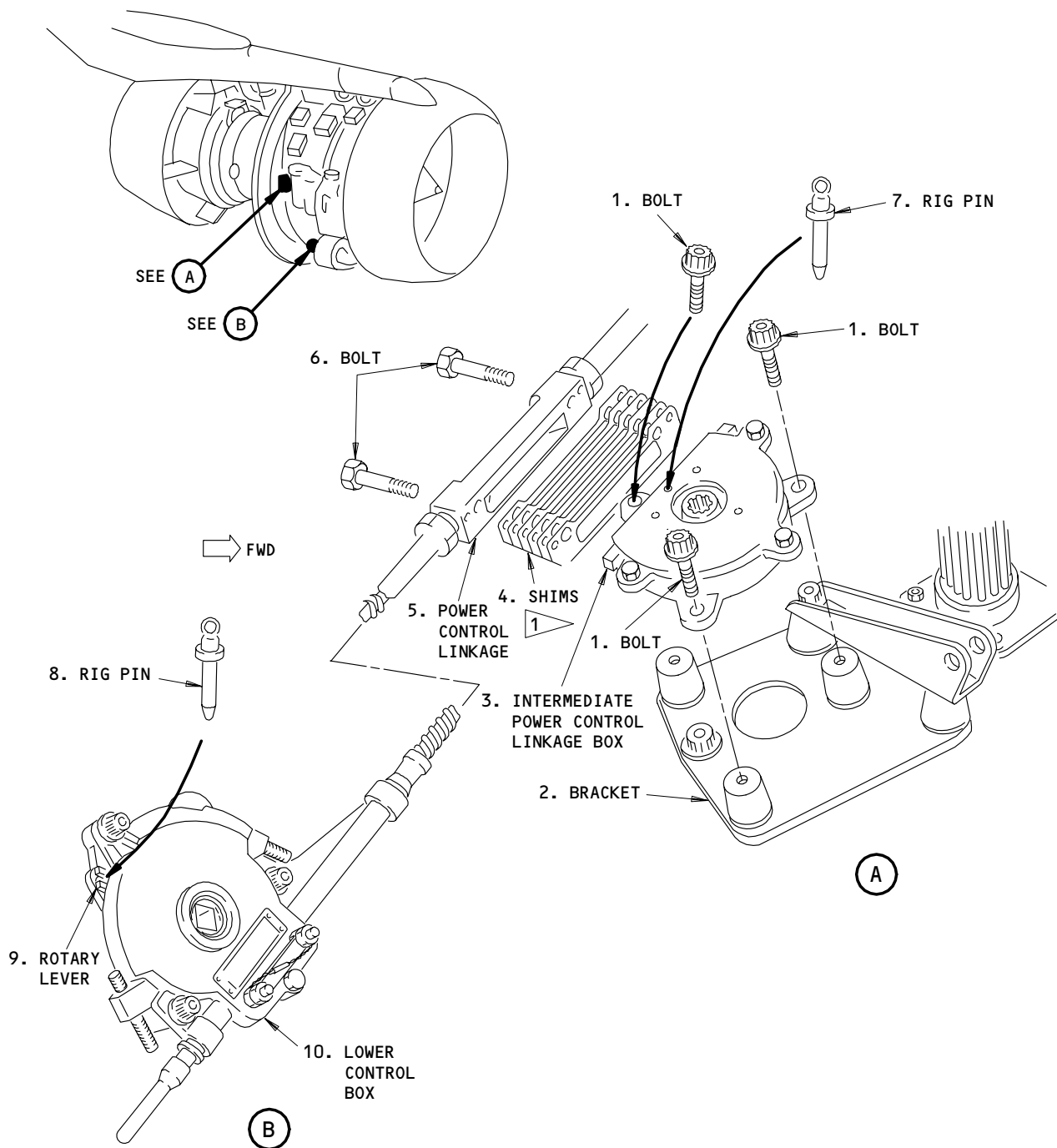
EFFECTIVITY

ALL

76-11-11

R01

Page 401  
May 28/99



1 ENGINES WITHOUT  
RR SB 76-8082

68770A

Intermediate Power Control Box - Installation  
Figure 401

EFFECTIVITY	
	ALL

76-11-11

141510

S 044-004-R00

**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 AND DAMAGE TO EQUIPMENT.

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

S 864-005-R00

- (4) Move the thrust levers rearward to the idle position and attach a DO-NOT-OPERATE tag.

S 014-006-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (5) Open the right fan cowl panel (AMM 71-11-04/201).

S 034-007-R00

- (6) Remove the power lever angle (PLA) Bleed Valve Control Unit (BVCU) and Autothrottle transducer (AMM 75-32-14/401).

S 864-008-R00

- (7) Install the rig pin UT1150/2 through the rotary arm into the lower control box to hold the control cable in the idle position.

S 024-009-R00

- (8) Remove the Intermediate Control Box (Fig. 401).
  - (a) Remove the bolt (1) that holds the intermediate control box (3) to the support bracket (2) at the rear position.
  - (b) Remove the bolts (6) to disconnect the back-up block (5) for the power control linkage (PCL) from the intermediate control box (3).
  - (c) ENGINES PRE-RR-SB 76-8082;  
Remove the shims (4).
  - (d) Remove the two bolts (1) to remove the intermediate control box (3) from the bracket (2).

TASK 76-11-11-404-010-R00

3. Install the Intermediate Control Box

A. Equipment

- (1) Rig Pin - UT1150/2 (Rolls-Royce) or WT100719 (Woodward)
- (2) Rig Pin - UT1315/1 (Rolls-Royce)

EFFECTIVITY

ALL

76-11-11

R01

Page 403  
Jan 28/02

B. Consumable Materials

- (1) Methyl-ethyl-ketone MEK Solvent  
British Spec/Ref - B.S. 1940: 1968  
OMat No. 135
- (2) Lint-free cloth
- (3) Jointing Compound  
British Spec/Ref - DTD. 900/4586, PL32L  
OMat No. 4/46
- (4) Lockwire  
British Spec/Ref - DTD. 189A, 22SWG  
American Spec/Ref - 21AWG  
OMat No. 238

C. References

- (1) AMM 70-51-00/201, Torque Tightening Techniques
- (2) AMM 70-42-12/201, Local Surface Protection
- (3) AMM 71-11-04/201, Fan Cowl Panels
- (4) AMM 75-32-14/401, Power Lever Angle (PLA) Bleed Valve Control Unit (BVCU) and Autothrottle Transducer
- (5) AMM 76-11-00/501, Engine Control System
- (6) AMM 78-31-00/201, Thrust Reverser System

D. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 414AR Fan Cowl Panel (Right)
  - 424AR Fan Cowl Panel (Right)

E. Install the Intermediate Control Box

EFFECTIVITY

ALL

76-11-11

R01

Page 404  
May 28/99

S 114-011-R00

**WARNING:** WHEN YOU USE DEGREASING FLUID OR CLEANING FLUID, MAKE SURE THE WORK AREA HAS A GOOD FLOW OF AIR. DO NOT LET THESE MATERIALS COME IN CONTACT WITH YOUR SKIN. DO NOT BREATHE THE GAS FROM THESE MATERIALS. THESE MATERIALS ARE FLAMMABLE; KEEP THEM AWAY FROM IGNITION SOURCES. THESE MATERIALS CAN INJURE YOU.

**CAUTION:** CLEANING FLUID OR DEGREASING FLUID CAN DAMAGE THE SURFACE PROTECTION. YOU MUST PROTECTED THESE DAMAGE AREAS AGAIN (AMM 70-42-12/201).

- (1) Remove all the jointing compound from the mounting surfaces of the bracket (2).
  - (a) Use a clean, dry, lint-free cloth that is moist with degreasing fluid to make the mounting surfaces of the bracket clean.

**NOTE:** Do not contaminate the degreasing fluid. Pour the fluid on the cloth, away from the container.

S 394-012-R00

**CAUTION:** WHEN YOU USE THE JOINTING COMPOUND, MAKE SURE THE COMPOUND DOES NOT GO INTO THE INTERMEDIATE CONTROL BOX. THE COMPOUND CAN MAKE THE BOX DIFFICULT TO OPERATE.

- (2) Apply the jointing compound on the bracket.
  - (a) Make sure the mating faces are clean and are not damaged.
  - (b) Put the jointing compound on the mating faces on the bracket (2) and the intermediate control box (3) with a brush.
    - 1) Wait for 10 minutes to air dry the jointing compound.

S 424-013-R00

- (3) Install the Intermediate Control Box (Fig. 401).
  - (a) Attach the intermediate control box (3) to the bracket (2) with two bolts (1) at the two forward locations.

**CAUTION:** MAKE SURE THE RIG PIN ENGAGES THE QUADRANT IN THE INTERMEDIATE CONTROL BOX. YOU MUST DO THIS TO CORRECTLY ADJUST THE ENGINE CONTROLS.

- (b) Install the rig pin UT1315/1 through the quadrant of the intermediate control box.

**NOTE:** Radial movement of the quadrant will show the rig pin is not correctly installed.

EFFECTIVITY

ALL

76-11-11

R01

Page 405  
May 28/99

**CAUTION:** DO NOT INSTALL THE SHIMS ON AN ENGINE WITH RR SB 76-8082.  
THE ENGINE CONTROL SYSTEM WILL NOT OPERATE CORRECTLY.

- (c) Attach the back-up block (5) to the control box (3) with the hexagon head bolts (6).
  - 1) Do not tighten the bolts at this time.
- (d) ENGINES PRE-RR-SB 76-8082;  
Install the shims (4).
- (e) Install the remaining bolt (1) in the rear position to hold the intermediate control box (3) to the bracket (2).
- (f) Tighten the bolts (6) to 25-32 pound-inches (2.83- 3.62 newton meters).

S 864-014-R00

- (4) Remove the rig pins UT1315/1 and UT1150/2.

S 824-015-R00

- (5) Adjust the power control cable (AMM 76-11-00/501).

S 424-016-R00

- (6) Install the lockwire on the bolts (6).

S 434-017-R00

- (7) Install the PLA (BVCU and autothrottle) transducer (AMM 75-32-14/401).

S 864-021-R00

- (8) Remove the DO-NOT-OPERATE tags from the thrust levers.

S 714-025-R00

- (9) Do a test of the engine control system (AMM 76-11-00/501).

S 214-022-R00

- (10) Move the forward thrust lever through the full forward travel.
  - (a) Make sure the power lever on the fuel flow governor (FFG) touches the FFG forward stop.

EFFECTIVITY

ALL

76-11-11

R01

Page 406  
Jan 28/02

S 414-024-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(11) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-020-R00

(12) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-018-R00

(13) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the panel, P6.  
(a) 6C1, FUEL COND CONT L

S 864-019-R00

(14) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the panel, P6.  
(a) 6C2, FUEL COND CONT R

EFFECTIVITY

ALL

76-11-11

R01

Page 407  
Sep 20/91



UPPER CONTROL GEARBOX – REMOVAL/INSTALLATION

1. General

A. The procedure has two tasks. The first task removes the gearbox. The second task installs and adjusts the upper control gearbox.

TASK 76-11-12-004-021-R00

2. Remove the Upper Control Gearbox

A. Equipment

(1) Rig Pin, RR-2 - P/N B20003-29 .

B. References

- (1) AMM 20-10-24/201, Rig Pins
- (2) AMM 54-53-01/401, Strut Access Doors
- (3) AMM 71-11-04/201, Fan Cowl Panels
- (4) AMM 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zones

211/212	Control Cabin
410	No. 1 Power Plant (Left)
420	No. 2 Power Plant (Right)

(2) Access Panels

414AR	Fan Cowl Panel (Right)
424AR	Fan Cowl Panel (Right)

D. Remove the upper control gearbox (Fig. 401).

S 864-001-R00

- (1) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C1, FUEL COND CONT L

S 864-002-R00

- (2) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:
  - (a) 6C2, FUEL COND CONT R

S 864-003-R00

- (3) Put the thrust levers at the aft stop in the control stand (idle position) and attach DO-NOT-OPERATE tags.

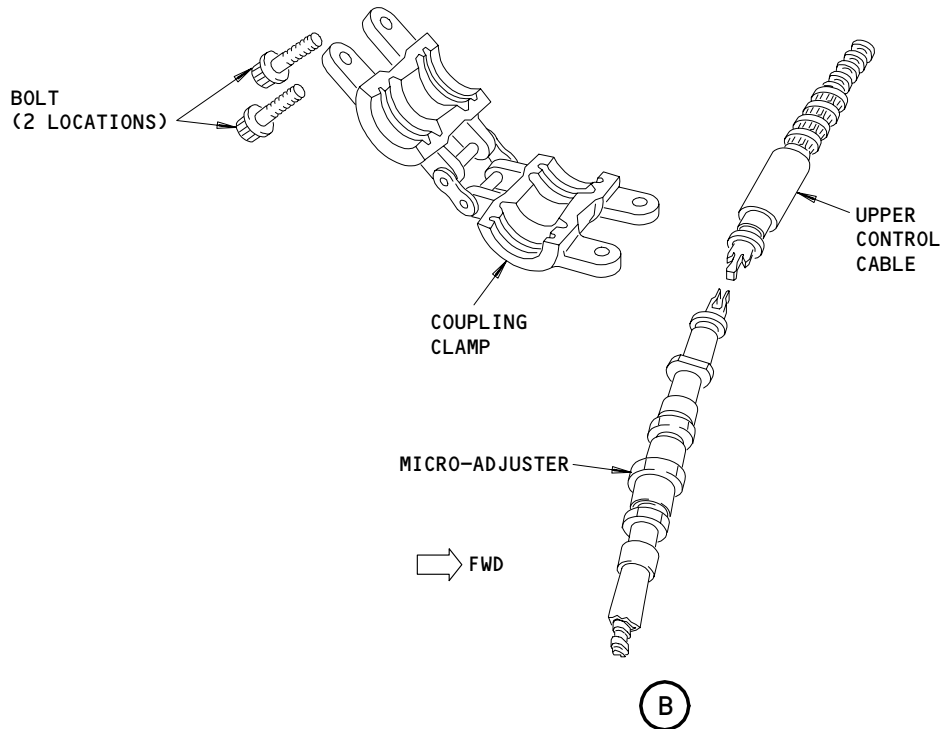
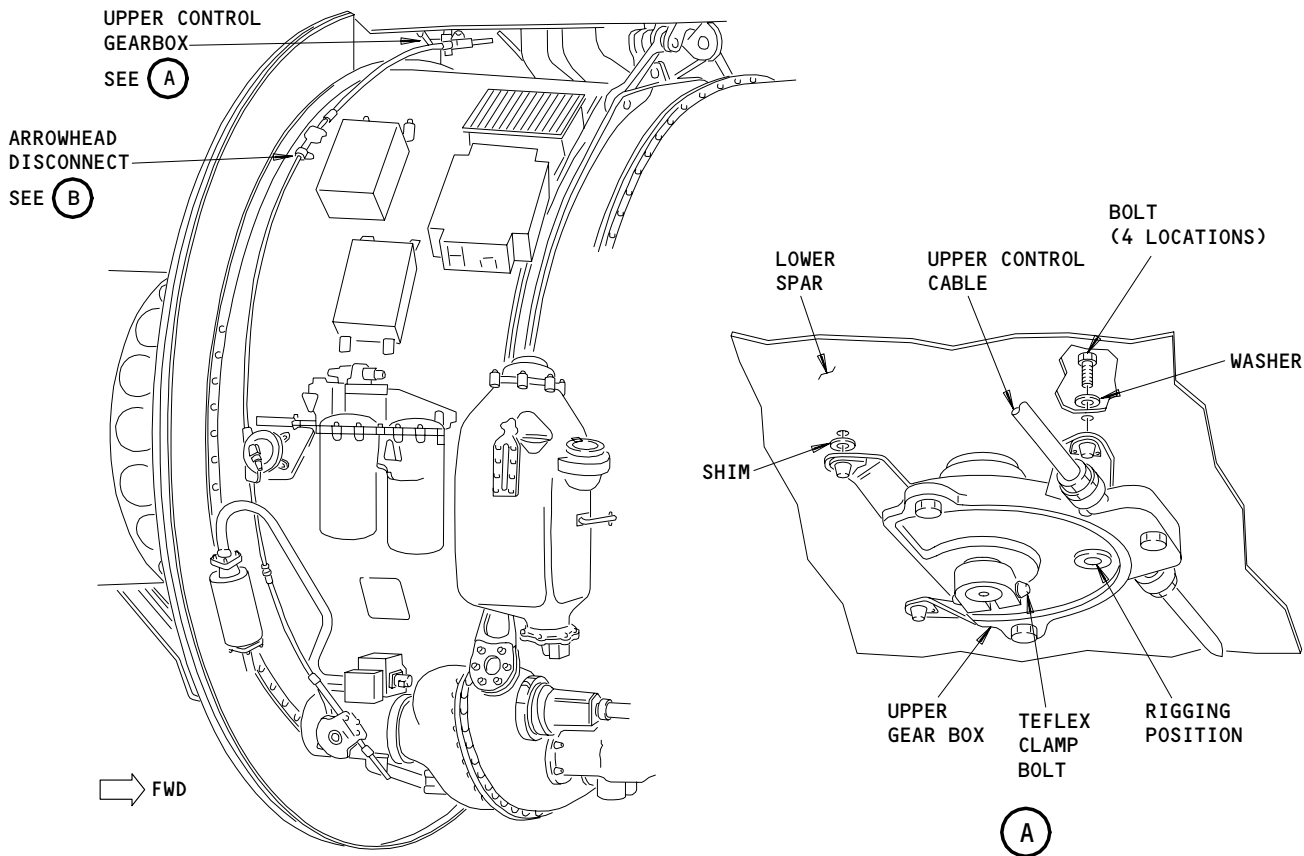
EFFECTIVITY

ALL

76-11-12

R01

Page 401  
Jan 28/07



Upper Control Gearbox - Installation  
Figure 401

EFFECTIVITY	
ALL	

76-11-12

R01

Page 402  
Sep 20/90

S 044-018-R00

**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 AND DAMAGE TO EQUIPMENT.

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

S 014-004-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (5) Open the right fan cowl panel (AMM 71-11-04/201).

S 014-005-R00

- (6) Open the strut access door (AMM 54-53-01/401).

S 864-006-R00

- (7) Install the rig pin RR-2 through the lower web of the bracket and the cam (rig pin hole No. 2) in the engine control strut drum.

S 024-007-R00

- (8) Remove the upper control gearbox.
  - (a) Disconnect the teleflex control cable at the arrowhead micro-adjuster.
  - (b) Loosen the clamp bolt on the upper control gearbox.
  - (c) Remove the bolts that hold the upper control gearbox to the strut.
  - (d) Slide the gearbox down from the splined shaft.

TASK 76-11-12-404-008-R00

3. Install the Upper Control Gearbox

A. Equipment

- (1) Rig Pin, RR-2 - P/N B20003-29.

B. References

- (1) AMM 20-10-24/201, Rig Pins
- (2) AMM 54-53-01/401, Strut Access Doors
- (3) AMM 71-00-00/501, Power Plant
- (4) AMM 71-11-04/201, Fan Cowl Panels

EFFECTIVITY

ALL

76-11-12

R01

Page 403  
Jan 28/07

- (5) AMM 73-21-09/501, Thrust Lever Angle Transducer
- (6) AMM 76-11-00/501, Engine Control System
- (7) AMM 78-31-00/201, Thrust Reverser

C. Access

(1) Location Zones

- 211/212 Control Cabin
- 410 No. 1 Power Plant (Left)
- 420 No. 2 Power Plant (Right)

(2) Access Panels

- 414AR Fan Cowl Panel (Right)
- 424AR Fan Cowl Panel (Right)

D. Install the Upper Control Gearbox (Fig. 401).

S 424-009-R00

- (1) Install the upper control gearbox (Fig. 401).
  - (a) Install the upper control gearbox on the splined drive shaft that comes through lower spar.
    - 1) Make sure the first gearbox flange touches the lower spar surface with zero clearance.
  - (b) Align the flange mounting holes with the correct bolt holes in the lower spar face.
  - (c) Lightly tighten (do not torque) the clamp bolt for the teleflex cable.
  - (d) Make sure the upper gearbox is perpendicular with the drive shaft.
  - (e) Measure the clearance between the remaining flanges and the lower spar surface.
  - (f) Find the necessary shim thickness for all the mounting flange clearances (thickness within  $\pm 0.003$  inch).
  - (g) Loosen the clamp bolt on the gearbox.
  - (h) Install the shims between the flanges and the lower spar surface.
  - (i) Install the bolts through the lower spar face into the upper control gearbox.
  - (j) Tighten the clamp bolt on the gearbox to 27-32 pound-inches (3.05-3.62 newton meters).
  - (k) Connect the teleflex cable to the arrowhead disconnect on the gearbox.
  - (l) Tighten the bolts on the coupling clamp to 25-30 pound-inches (2.83-3.39 newton meters).

S 864-010-R00

- (2) Remove the rig pin RR-2 from the engine control strut drum.

S 864-011-R00

- (3) Make sure the idle rig position at the lower control gearbox has not changed.

EFFECTIVITY

ALL

76-11-12

R01

Page 404  
Sep 20/96

- S 864-014-R00
- (4) Remove the DO-NOT-OPERATE tags from the thrust levers.
  
- S 714-019-R00
- (5) Do a test of the engine control system (AMM 76-11-00/501).
  
- S 414-012-R00
- (6) Close the strut access door (AMM 54-53-01/401).
  
- S 414-013-R00

**CAUTION:** OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (7) Close the right fan cowl panel (AMM 71-11-04/201).
  
- S 444-020-R00
- (8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).
  
- S 864-015-R00
- (9) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
  - (a) 6C1, FUEL COND CONT L
  
- S 864-016-R00
- (10) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
  - (a) 6C2, FUEL COND CONT R
  
- S 824-023-R00
- (11) Do the thrust lever angle (TLA) transducer adjustment (AMM 73-21-09/501).

EFFECTIVITY

ALL

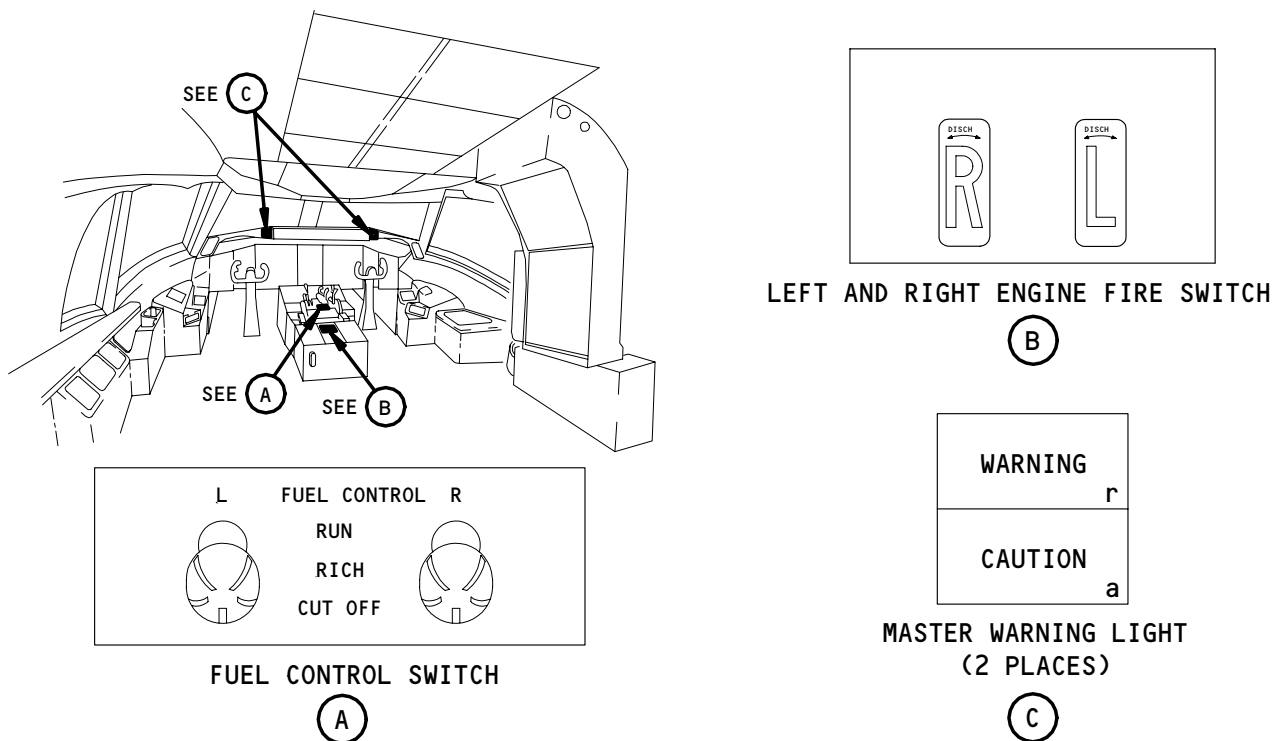
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Page 405  
Sep 20/96

ENGINE FIRE EMERGENCY SHUTDOWN – DESCRIPTION AND OPERATION

1. General (Fig. 1)
  - A. This section describes the engine fire emergency shutdown procedure. For further information on engine controls see Engine Control System (Ref 76-11-00) which describes the thrust control system and the start control system.
2. Component Details
  - A. Engine fire emergency shutdown is controlled by the thrust lever, fuel control switch and the engine fire switches. The engine fire switches, thrust lever, and fuel control switch are located on the control stand.
  - B. The engine fire emergency shutdown system is part of the airplane fire protection system. For information on fire protection systems affecting engine fire emergency shutdown refer to Engine Fire Detection (Ref 26-11-00) and Engine Fire Extinguishing (Ref 26-21-00).
  - C. An engine fire is indicated by a level A message on the Engine Indication and Crew Alerting System (EICAS) display, ringing of the the fire warning bell, and illumination of the applicable fire switch, fuel control switch, and master warning lights.



Engine Fire Emergency Shutdown  
Figure 1

EFFECTIVITY	ALL
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76-21-00

3. Operation

A. Engine emergency shutdown is done by moving the thrust lever to idle position, fuel control switch to CUTOFF position, and pulling the applicable fire switch. Moving the thrust lever to idle position decelerates the engine while moving the fuel control switch to CUTOFF stops engine operation. Pulling the fire switch arms the engine fire extinguisher, silences the bell, depressurizes the hydraulic system and isolates the engine. Engine isolation de-energizes the generator control relay and closes the fuel, hydraulic fluid, and pneumatic valves. After engine isolation is accomplished, the fire switch is turned to the left or right to discharge the left or right extinguisher bottles.

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76-21-00

TURBINE OVERSPEED EMERGENCY SHUTDOWN SYSTEM – DESCRIPTION AND OPERATION

1. General

- A. A failure of either the LP compressor or LP turbine shaft would result in a rapid acceleration of the LP turbine. This acceleration is utilized to operate a turbine overspeed emergency shutdown system.
- B. The turbine overspeed emergency shutdown system (Fig. 1) automatically cuts the fuel supply to the fuel spray nozzles through a valve activated by a spring loaded pawl mechanism and cables.
- C. The system consists of an oil feed/signal tube (signal tube), a spring loaded pawl mechanism, an operating cable and a fuel shutoff valve.

2. Description

- A. The signal tube is mounted within the LP turbine shaft. It is splined to the fan retention shaft at the front and supported within the pawl carrier sleeve at the rear. The signal tube therefore is not positively connected to the LP turbine shaft, and not subject to the rotational displacement experienced by the LP shaft system. The rear end of the signal tube is slotted to allow the pawls outward movement when the system actuates.
- B. The pawl mechanism is a hollow cylindrical sleeve (pawl carrier), flanged and attached at the front to the LP turbine stubshaft. Flanges at the rear provide for attachment of two spring loaded pawls located on opposite sides of the signal tube. Slots toward the rear of the pawl carrier provide for pawl retention when the system has operated.
- C. The mechanical operating cable is formed at one end into an elongated stirrup, housed within a guide assembly attached to the oil scavenge turbine bearing housing. A breakable bellows assembly is attached to the cable to provide an oil seal within the bearing housing. The cable passes through the lower section of the LP turbine bearing support and exhaust case, extends forward to a disconnect within a control box attached to the LP turbine case. The cable then attaches to and operates the fuel shutoff valve.
- D. The shutoff valve (AMM 73-11-00/001) is mounted in the HP fuel line at the inlet to the LH and RH fuel manifolds. The unit is a lever operated, rotary shutoff cock which, when activated prevents fuel from reaching the fuel spray nozzles.

EFFECTIVITY

ALL

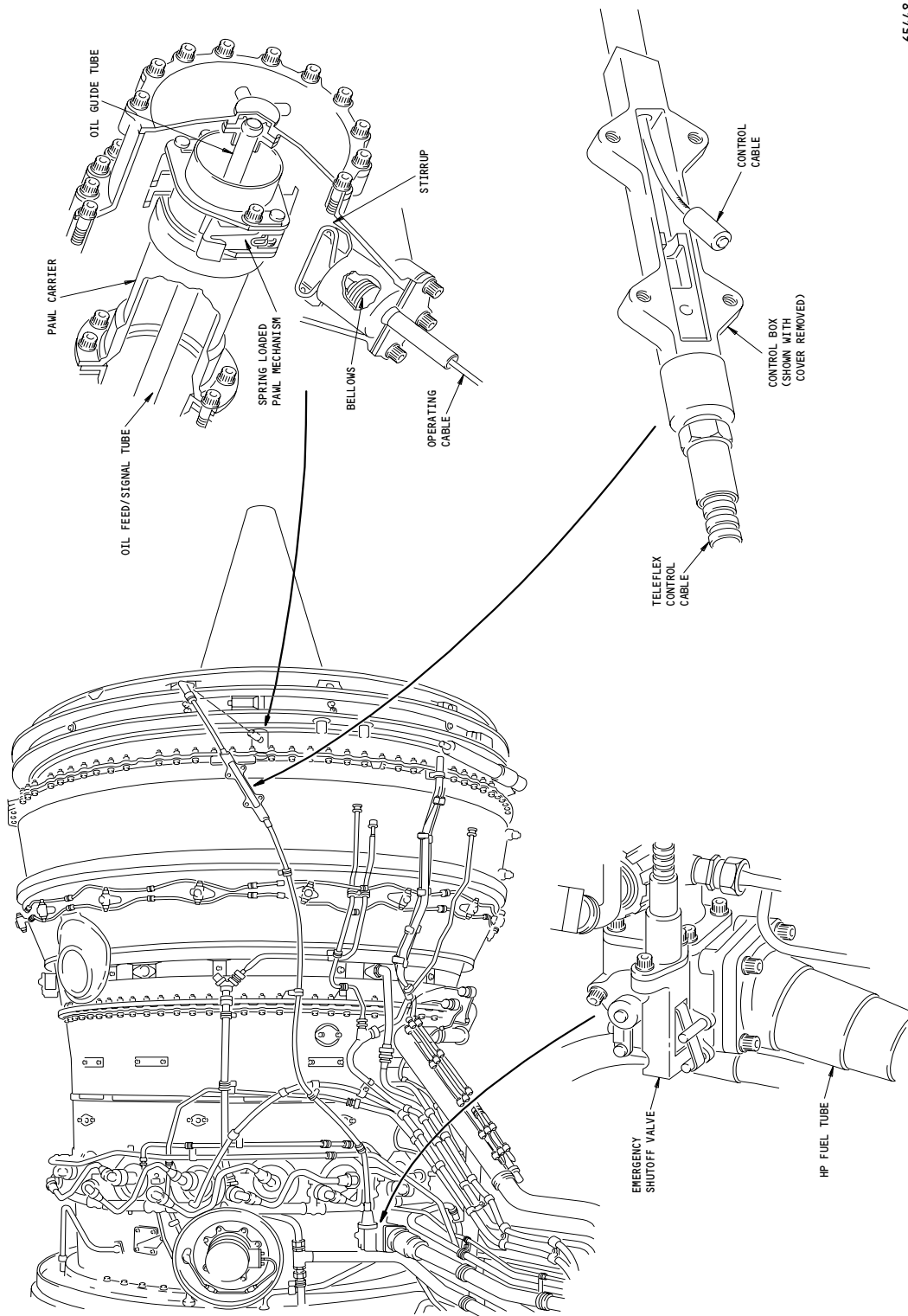
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R01

Page 1  
Jan 28/02



65448



Turbine Overspeed Emergency Shut-down System  
Figure 1

EFFECTIVITY

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76-22-00

R01

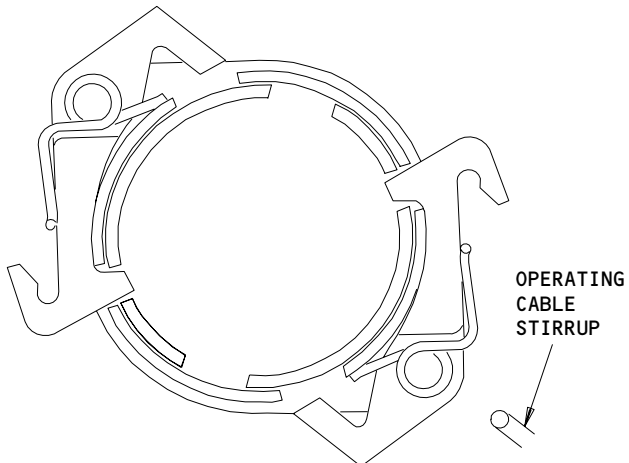
Page 2  
Jan 28/02

3. Operation

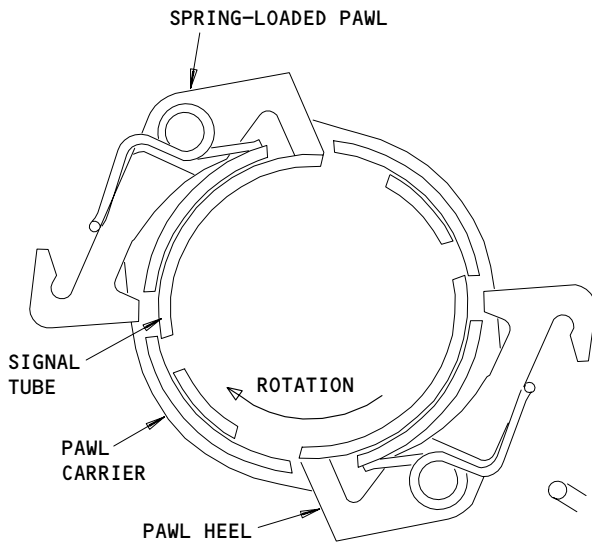
- A. During normal operating conditions (Fig. 2), the heel of the two pawls seat onto the signal tube through slots in the pawl carrier. Failure of the LP fan or LP turbine shafts would result in a rapid acceleration of the LP turbine, resulting in an angular displacement between the LP turbine and signal tube increasing from a normal, maximum takeoff condition of 15 degrees to an operational overspeed condition of 35 degrees. This results in an alignment of the slots in the signal tube and the pawl carrier, allowing the spring loaded pawls, acting under centripital force to engage in the slots. The centripital force on the pawls causes them to extend outward and catch the operating cable stirrup. Once one pawl is engaged with the operating cable, the cable is wound around the LP shaft, pulling the cable and activating the fuel shutoff valve stopping fuel supply to the fuel spray nozzles.
- B. Because the pawl carrier and signal tube are locked together by the heels of the pawls, the bellows assembly will be broken due to the initial pull of the cable.

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

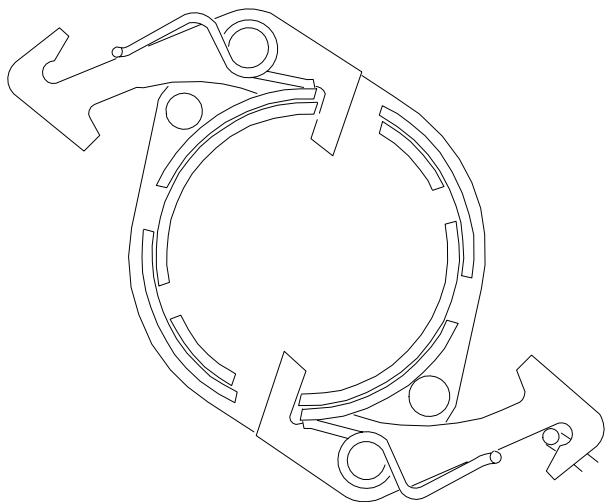
76-22-00



0° DISPLACEMENT  
STATIC CONDITION



15° DISPLACEMENT  
MAXIMUM TAKE-OFF CONDITION



35° DISPLACEMENT  
FAILED SHAFT CONDITION

65449

Sequence of Operation  
Figure 2

EFFECTIVITY	ALL
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76-22-00

R02

Page 4  
Mar 20/88

141512

EMERGENCY SHUTOFF VALVE AND CABLE ASSEMBLY – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task removes the shutoff valve and cable. The second task installs the shutoff valve and cable.

TASK 76-22-01-004-001-R01

2. Remove the Emergency Shutoff Valve (S.O.V.) and Cable

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control  
(2) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

- |         |                           |
|---------|---------------------------|
| 211/212 | Control Cabin             |
| 410     | No. 1 Power Plant (Left)  |
| 420     | No. 2 Power Plant (Right) |

(2) Access Panels

- |       |                        |
|-------|------------------------|
| 415AL | Thrust Reverser (Left) |
| 425AL | Thrust Reverser (Left) |

C. Remove the Emergency Shutoff Valve (S.O.V.) and Cable.

S 864-002-R01

- (1) Supply the electrical power (AMM 24-22-00/201).

S 044-003-R01

- (2) Do the deactivation procedure for the engine fuel system.
- (a) Make sure these circuit breakers on the P6 main power distribution panel are closed.
- 1) 6E1, L SPAR FUEL VALVE
  - 2) 6E2, R SPAR FUEL VALVE
- (b) Make sure the left and right FUEL CONTROL switch on the control stand is at the CUTOFF position and attach a DO-NOT-OPERATE tag.
- (c) Make sure the left and right ENG VALVE lights and the left and right FUEL SPAR lights are out on the control stand.
- (d) For the left engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
- 1) 6E1, L SPAR FUEL VALVE
- (e) For the right engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
- 1) 6E2, R SPAR FUEL VALVE

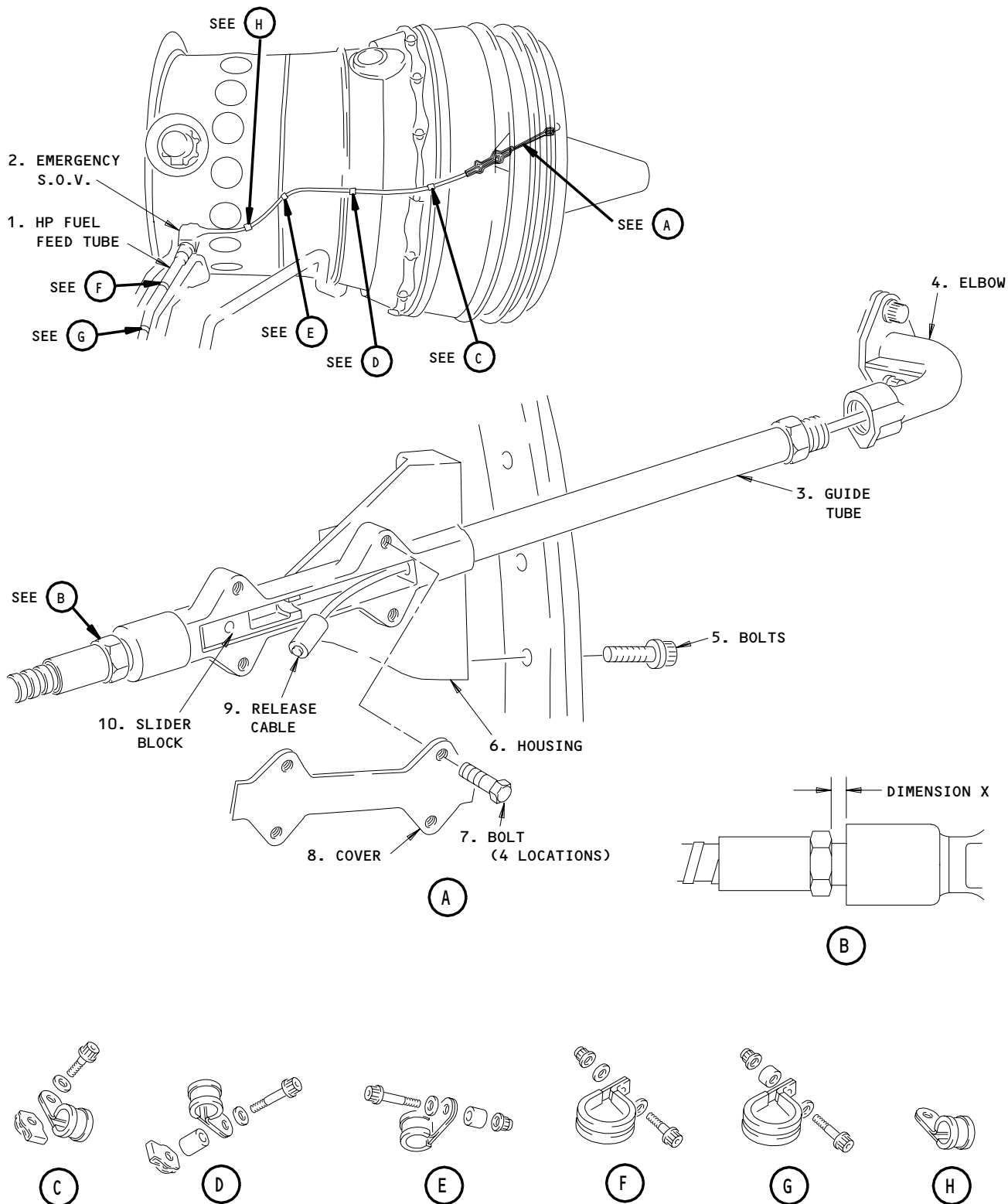
S 864-004-R01

- (3) Remove the electrical power (AMM 24-22-00/201).

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**  
CONFIG 1  
Page 401  
Sep 28/00

R01



78600A

Emergency Shutoff Cable Assembly Removal/Installation  
Figure 401

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**

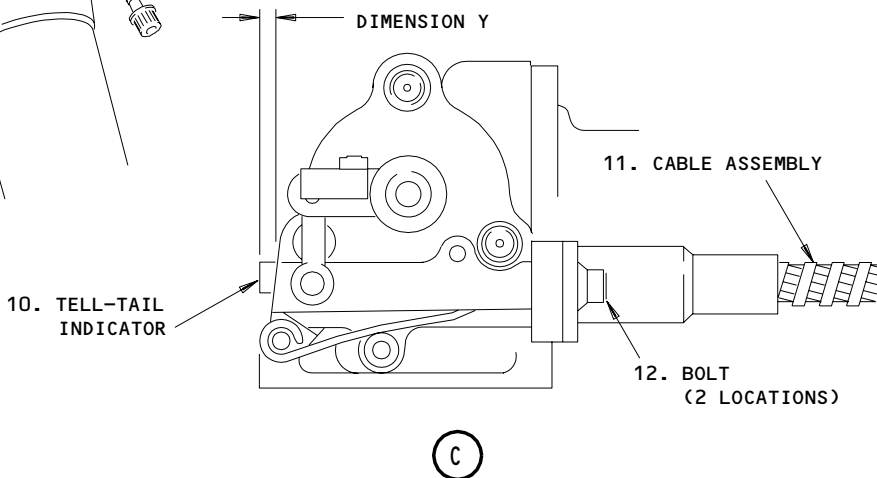
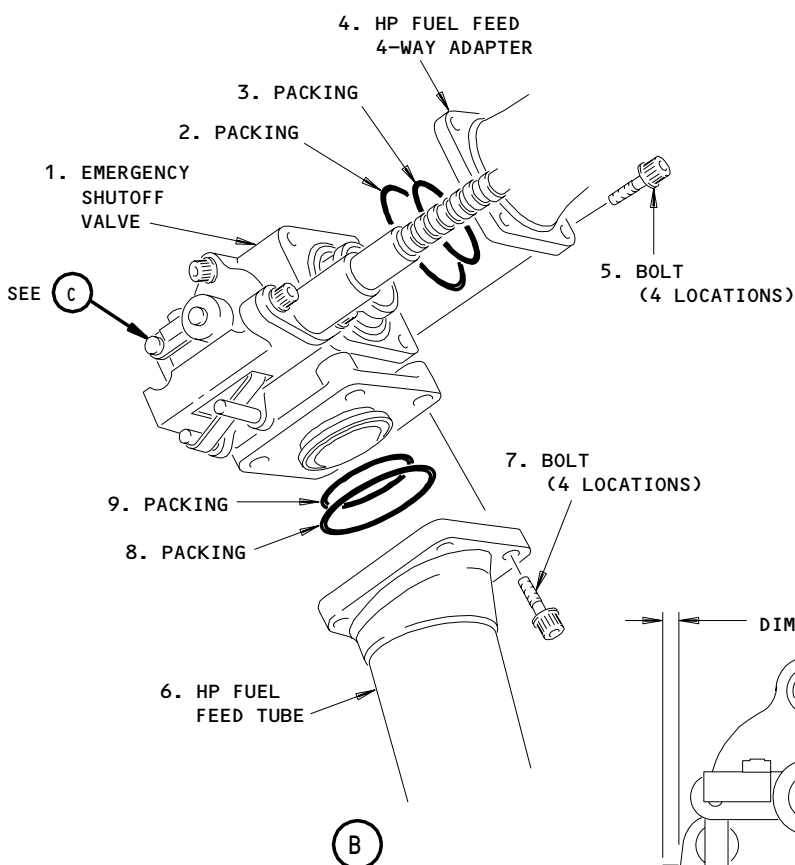
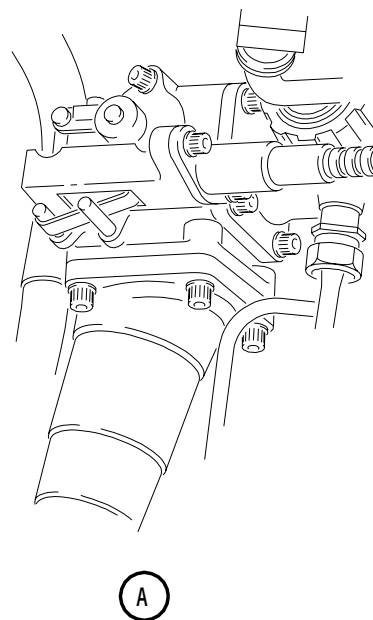
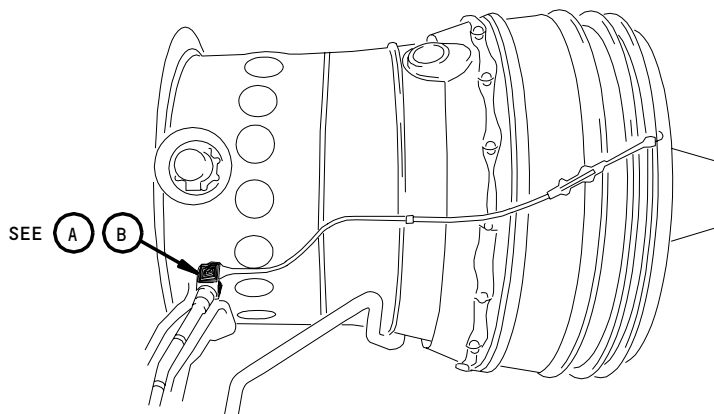
CONFIG 1

Page 402

Sep 28/00

R01

L00703



Emergency Shutoff Valve Removal/Installation  
Figure 402

78601A

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**

CONFIG 1

R01

Page 403

Sep 28/00

L00701

S 044-005-R01

**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.

- (4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-006-R01

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Open the left thrust reverser (AMM 78-31-00/201).

S 024-007-R01

- (6) Remove the valve and cable assembly (Fig. 401).
- (a) Remove the screws, the nuts, the washers, the spacers, and the clamps that hold the (HP fuel) feed tube (1) and the valve and cable assembly (2).
  - (b) Disconnect the cable guide tube (3) from the elbow (4).
  - (c) Remove the bolts (7) that hold the cover (8).
  - (d) Release the cable (9) from the slider block (10).
  - (e) Remove the bolts (5) that hold the disconnect housing (6) to the engine.
  - (f) Remove the disconnect housing (6) and the cable guide tube (3).
  - (g) Remove the bolts (5) that hold the valve to the (HP fuel feed) 4-way adapter (4) (Fig. 402).
  - (h) Remove the bolts (7) that hold the valve to the (HP fuel) feed tube (6).
  - (i) Remove the valve and cable assembly.
  - (j) Remove the packings (8) and (9) and discard them.

TASK 76-22-01-404-008-R01

3. Install the Emergency Shutoff Valve and Cable Assembly

A. General

- (1) Use the procedure in (AMM 70-02-01/201) to install the seal rings.

B. References

- (1) AMM 70-02-01/201, Identification, Lubrication and Fitting of Rubber Seal Rings
- (2) AMM 70-51-00/201, Torque Tightening Technique
- (3) AMM 71-00-00/501, Power Plant

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**  
CONFIG 1  
Page 404  
Jan 28/05

R01

- (4) AMM 78-31-00/201, Thrust Reverser System
- C. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 415AL Thrust Reverser (Left)
  - 425AL Thrust Reverser (Left)

D. Install the Emergency Shutoff Valve and Cable Assembly.

S 424-009-R01

- (1) Install the valve and cable assembly.
  - (a) Measure the length of the tell-tail indicator (10) (Fig. 402).
    - 1) Make sure the dimension 'Y' is between 0.187 inch (4.75 mm) and 0.106 inch (2.70 mm).
    - 2) If the dimension 'Y' is less than 0.106 inch (2.70 mm), replace the valve and cable assembly.
  - (b) Make sure the mounting faces are clean and do not have damage.
  - (c) Install the cable assembly clamps at the correct locations.
    - 1) Do not tighten the clamps.
  - (d) Lubricate (AMM 70-02-01/201) and install the new seal ring (8) to the (HP fuel) feed tube (6) (Fig. 402).
  - (e) Lubricate (AMM 70-02-01/201) and install the new seal rings (9) to the valve (1).
  - (f) Put the valve (1) on the (HP fuel) feed tube (6).
    - 1) Install and tighten the bolts (7) (AMM 70-51-00/201).
  - (g) Install the valve on the (HP fuel feed) 4-way adapter (4).
    - 1) Install and tighten the bolts (5) (AMM 70-51-00/201).

**CAUTION:** DO NOT ADJUST THE CABLE ASSEMBLY. THE DIMENSION 'X' IS SET WHEN THE CABLE IS ASSEMBLED (FIG. 401).

- (h) Push the cable through the cable guide tube (3) (Fig. 401).
- (i) Install the disconnect housing (6) on the forward side of the rear flange of the LP turbine casing.
  - 1) Install and tighten the bolts (5) (AMM 70-51-00/201).
- (j) Connect the cable (6) to the slider block (7).
  - 1) Push the cable into the guide tube.
- (k) Install the cover (9) on the disconnect housing.
  - 1) Install and tighten the bolts (8) (AMM 70-51-00/201).

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**  
CONFIG 1  
Page 405  
Jan 28/05

R01



**CAUTION:** IF THE LENGTH OF THE TELL-TAIL INDICATOR (DIMENSION 'Y') IS LESS THAN 0.106 INCH (2.70 mm), THE VALVE MAY NOT OPERATE. REPLACE THE VALVE AND CABLE ASSEMBLY.

- (l) Measure the length of the tell-tail indicator (10) (Fig. 402).
  - 1) Make sure the dimension 'Y' is between 0.187 inch (4.75 mm) and 0.106 inch (2.70 mm).
  - 2) If the dimension 'Y' is less than 0.106 inch (2.70 mm), replace the valve and cable assembly.
- (m) Connect the guide tube (3) (Fig. 401).
  - 1) Install lockwire.
- (n) Install the (HP fuel feed) tube support clamps and tighten (AMM 70-51-00/201).
- (o) Tighten the support clamps for the valve and cable assembly (AMM 70-51-00/201).

S 444-010-R01

- (2) Do the activation procedure for the fuel system.
  - (a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E1, L SPAR FUEL VALVE
  - (b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E2, R SPAR FUEL VALVE

S 864-011-R01

- (3) Remove the DO-NOT-OPERATE tag from the FUEL CONTROL switch on the control stand.

S 414-012-R01

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Close the left thrust reverser (AMM 78-31-00/201).

S 794-013-R01

- (5) Do the Test 2 (AMM 71-00-00/501).

S 014-014-R01

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Open the left thrust reverser (AMM 78-31-00/201).

S 794-015-R01

(7) Look for fuel leakage at the tube connections.

S 414-016-R01

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Close the left thrust reverser (AMM 78-31-00/201).

S 444-017-R01

(9) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

EFFECTIVITY  
RB211-535E4 AND RB211-535E4-B ENGINES  
PRE RR SB 72-C230 (PHASE II COMBUSTOR)

**76-22-01**  
CONFIG 1  
Page 407  
Sep 28/00

R01

EMERGENCY SHUT-OFF VALVE AND CABLE ASSEMBLY – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task removes the shutoff valve and cable. The second task installs the shutoff valve and cable.

TASK 76-22-01-004-001-R02

2. Remove the Emergency Shut-Off Valve (S.O.V.) and Cable

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control  
(2) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

- |         |                           |
|---------|---------------------------|
| 211/212 | Control Cabin             |
| 410     | No. 1 Power Plant (Left)  |
| 420     | No. 2 Power Plant (Right) |

(2) Access Panels

- |       |                        |
|-------|------------------------|
| 415AL | Thrust Reverser (Left) |
| 425AL | Thrust Reverser (Left) |

C. Remove the Emergency Shut-Off Valve (S.O.V.) and Cable.

S 864-002-R02

- (1) Supply the electrical power (AMM 24-22-00/201).

S 044-003-R02

- (2) Do the deactivation procedure for the engine fuel system.
- (a) Make sure these circuit breakers on the P6 main power distribution panel are closed.
- 1) 6E1, L SPAR FUEL VALVE
  - 2) 6E2, R SPAR FUEL VALVE
- (b) Make sure the left and right FUEL CONTROL switch on the control stand is at the CUTOFF position and attach a DO-NOT-OPERATE tag.
- (c) Make sure the left and right ENG VALVE lights and the left and right FUEL SPAR lights are out on the control stand.
- (d) For the left engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
- 1) 6E1, L SPAR FUEL VALVE
- (e) For the right engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
- 1) 6E2, R SPAR FUEL VALVE

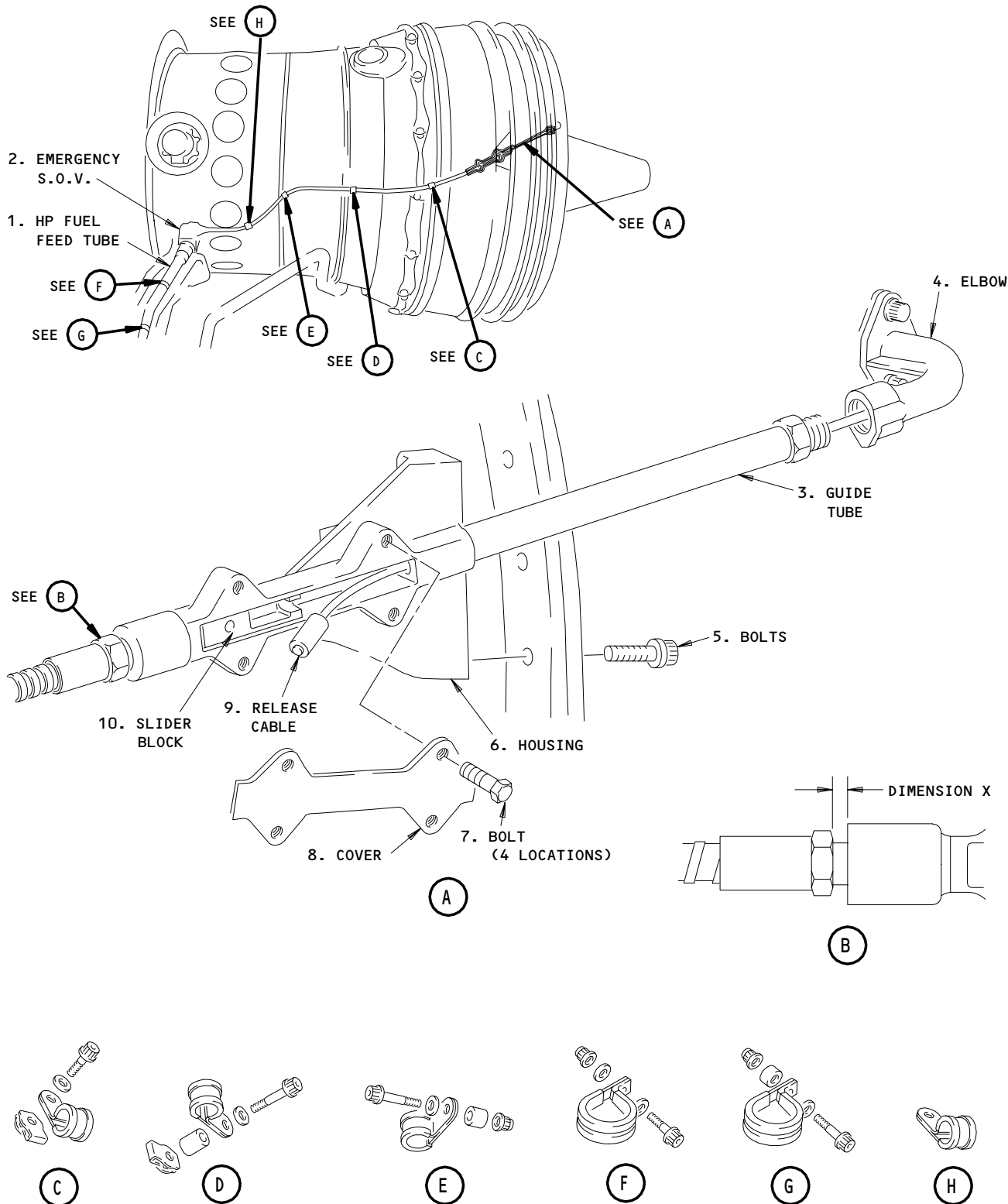
S 864-004-R02

- (3) Remove the electrical power (AMM 24-22-00/201).

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 401  
Jan 28/01

R01



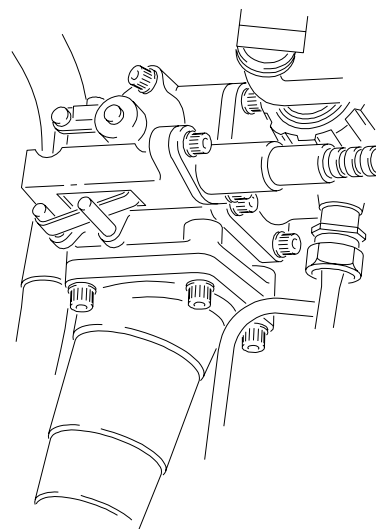
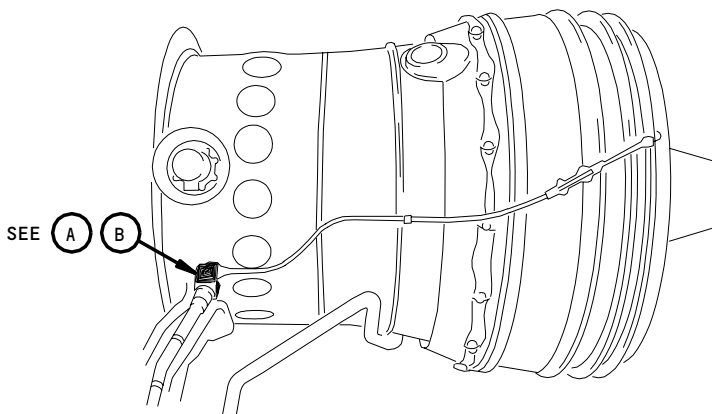
78600A

Emergency Shutoff Cable Assembly Removal/Installation  
Figure 401

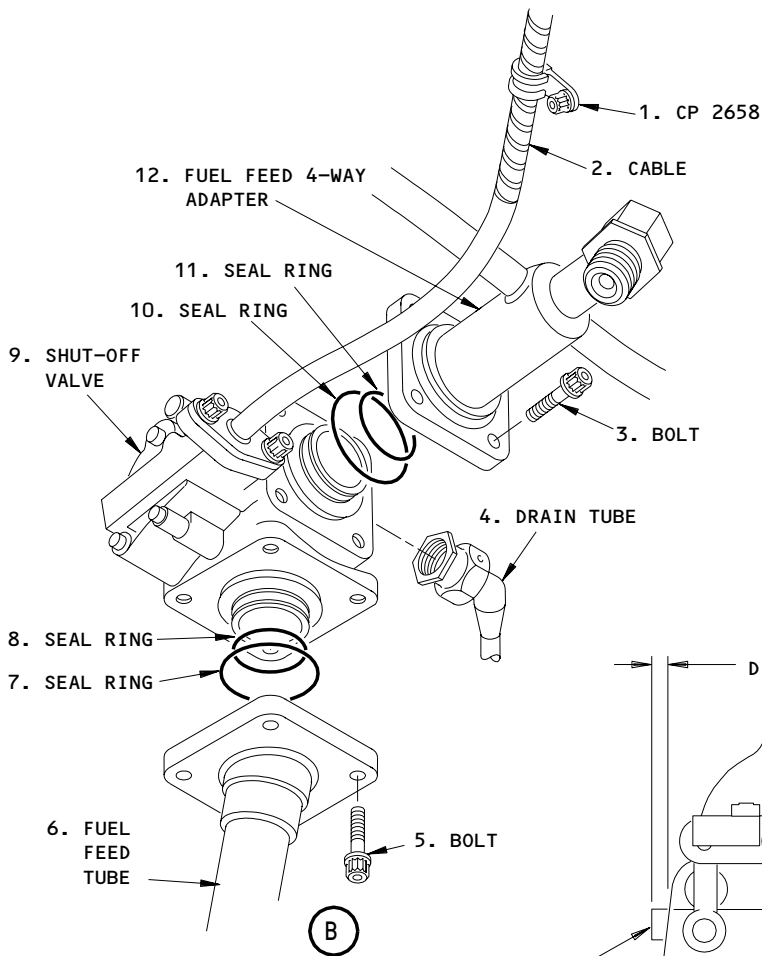
EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 402  
Jan 28/01

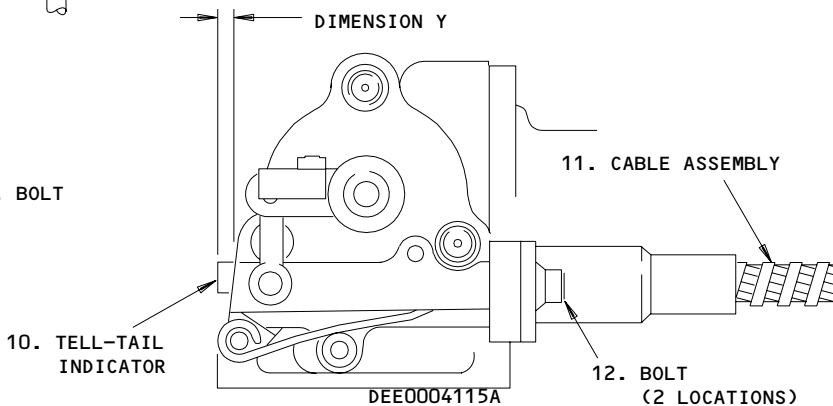
R01



A



B



C

Emergency Shutoff Valve Removal/Installation  
Figure 402

78601A

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 403  
Jan 28/01

R01

S 044-005-R02

**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.

- (4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-006-R02

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Open the left thrust reverser (AMM 78-31-00/201).

S 024-018-R02

- (6) Remove the two fuel tubes from the fuel manifold (AMM 73-11-11/401) to get access to the shut-off valve.

S 024-007-R02

- (7) Remove the valve and cable assembly.
- (a) Disconnect the drain tube (15).
  - (b) Remove the bolts (16) that attach the fuel feed tube (1).
  - (c) Remove the bolts (7) that hold the cover (8).
  - (d) Release the cable (9) from the slider block (10).
  - (e) Remove the cable assembly clamps.
  - (f) Remove the bolts (5) that hold the disconnect housing (6) to the engine.
  - (g) Remove the disconnect housing (6) and the cable guide tube (3).
  - (h) Remove the bolts (14) that hold the valve (2) to the (HP fuel feed) 4-way adapter (13).
  - (i) Remove the valve and cable assembly.
  - (j) Remove the seal rings (17), (18), (19) and (20) and discard them.
  - (k) Put caps on the open tube ends.

TASK 76-22-01-404-008-R02

3. Install the Emergency Shut-Off Valve and Cable Assembly

A. General

- (1) Use the procedures in (AMM 70-02-01/201) to install the seal rings.

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 404  
Jan 28/05

R01

B. Consumable Materials

- (1) Lockwire  
British Spec./Ref - DTD 189A 22 SWG  
American Spec./Ref - 21 SWG  
OMat No. 238

C. References

- (1) AMM 70-02-01/201, Identification, Lubrication and Fitting of Rubber Seal Rings
- (2) AMM 70-51-00/201, Torque Tightening Technique
- (3) AMM 71-00-00/501, Power Plant
- (4) AMM 78-31-00/201, Thrust Reverser System

D. Access

- (1) Location Zones
  - 211/212 Control Cabin
  - 410 No. 1 Power Plant (Left)
  - 420 No. 2 Power Plant (Right)
- (2) Access Panels
  - 415AL Thrust Reverser (Left)
  - 425AL Thrust Reverser (Left)

E. Install the Emergency Shut-Off Valve and Cable Assembly.

S 424-009-R02

- (1) Install the valve and cable assembly.
  - (a) Measure the length of the tell-tail indicator (21).
    - 1) Make sure the dimension 'Y' is between 0.187 inch (4.75 mm) and 0.106 inch (2.70 mm).
    - 2) If the dimension 'Y' is less than 0.106 inch (2.70 mm), replace the valve and cable assembly.
  - (b) Make sure the mounting faces are clean and do not have damage.
  - (c) Install the cable assembly clamps at the correct locations.
    - 1) Do not tighten the clamps.
  - (d) Lubricate and install the new seal rings (17) and (18) to the (HP fuel) feed tube (1) (Fig. 402).
  - (e) Lubricate (AMM 70-02-01/201) and install the new seal rings (19) and (20) to the valve (2).
  - (f) Put the valve (2) on the (HP fuel) feed tube (6).
    - 1) Install and tighten the bolts (16) (AMM 70-51-00/201).
  - (g) Install the valve on the (HP fuel feed) 4-way adapter (13).
    - 1) Install and tighten the bolts (14) (AMM 70-51-00/201).

**CAUTION:** DO NOT ADJUST THE CABLE ASSEMBLY. THE DIMENSION 'X' IS SET WHEN THE CABLE IS ASSEMBLED (FIG. 401).

- (h) Push the cable through the cable guide tube (3) (Fig. 401).

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 405  
Jan 28/05

R01

- (i) Install the disconnect housing (6) on the forward side of the rear flange of the LP turbine casing.
  - 1) Install and tighten the bolts (5) (AMM 70-51-00/201).
- (j) Connect the cable (9) to the slider block (10).
  - 1) Push the cable into the guide tube.
- (k) Install the cover (8) on the disconnect housing.
  - 1) Install and tighten the bolts (7) (AMM 70-51-00/201).

**CAUTION:** IF THE LENGTH OF THE TELL-TAIL INDICATOR (DIMENSION 'Y') IS LESS THAN 0.106 INCH (2.70 mm), THE VALVE MAY NOT OPERATE. REPLACE THE VALVE AND CABLE ASSEMBLY.

- (l) Measure the length of the tell-tail indicator (21) (Fig. 402).
  - 1) Make sure the dimension 'Y' is between 0.187 inch (4.75 mm) and 0.106 inch (2.70 mm).
  - 2) If the dimension 'Y' is less than 0.106 inch (2.70 mm), replace the valve and cable assembly.
- (m) Connect the guide tube (3) to the elbow (4).
  - 1) Install lockwire.
- (n) Install the (HP fuel feed) tube support clamps and tighten (AMM 70-51-00/201).
- (o) Tighten the support clamps for the valve and cable assembly (AMM 70-51-00/201).
- (p) Install the fuel tubes removed for access (AMM 73-11-11/401).

S 444-010-R02

- (2) Do the activation procedure for the fuel system.
  - (a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E1, L SPAR FUEL VALVE
  - (b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E2, R SPAR FUEL VALVE

S 864-011-R02

- (3) Remove the DO-NOT-OPERATE tag from the FUEL CONTROL switch on the control stand.

S 414-012-R02

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Close the left thrust reverser (AMM 78-31-00/201).

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 406  
Jan 28/01

R01



S 794-013-R02  
(5) Do the Test 2 (AMM 71-00-00/501).

S 014-014-R02

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Open the left thrust reverser (AMM 78-31-00/201).

S 794-015-R02

(7) Look for fuel leakage at the tube connections.

S 414-016-R02

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Close the left thrust reverser (AMM 78-31-00/201).

S 444-017-R02

(9) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

EFFECTIVITY  
RB211-535E4 AND E4-B ENGINES POST RR  
SB72-C230 (PHASE V COMBUSTOR)  
AND RB211-535E4-C ENGINES

**76-22-01**  
CONFIG 2  
Page 407  
Jan 28/01

R01

EMERGENCY SHUT-OFF VALVE AND CABLE ASSEMBLY - INSPECTION/CHECK

1. General

- A. This procedure gives inspection limits for the emergency shut-off valve and cable.

TASK 76-22-01-206-018-R00

2. Do an Inspection of the Emergency (S.O.V.) and Cable

A. References

- (1) 24-22-00/201, Electrical Power - Control
- (2) 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

- 211/212 Control Cabin
- 410 No. 1 Power Plant (Left)
- 420 No. 2 Power Plant (Right)

(2) Access Panels

- 415AL Thrust Reverser (Left)
- 425AL Thrust Reverser (Left)

C. Prepare to Examine the Shut-Off Valve (S.O.V.) and Cable.

S 866-002-R00

- (1) Supply the electrical power (AMM 24-22-00/201).

S 046-003-R00

- (2) Do the deactivation procedure for the engine fuel system.
- (a) Make sure these circuit breakers on the P6 main power distribution panel are closed.
    - 1) 6E1, L SPAR FUEL VALVE
    - 2) 6E2, R SPAR FUEL VALVE
  - (b) Make sure the left and right FUEL CONTROL switch on the control stand is at the CUTOFF position and attach a DO-NOT-OPERATE tag.
  - (c) Make sure the left and right ENG VALVE lights and the left and right FUEL SPAR lights are out on the control stand.
  - (d) For the left engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
    - 1) 6E1, L SPAR FUEL VALVE
  - (e) For the right engine, open this circuit breaker on the P6 main power distribution panel and attach a DO-NOT-CLOSE tag:
    - 1) 6E2, R SPAR FUEL VALVE

S 866-004-R00

- (3) Remove the electrical power (AMM 24-22-00/201).

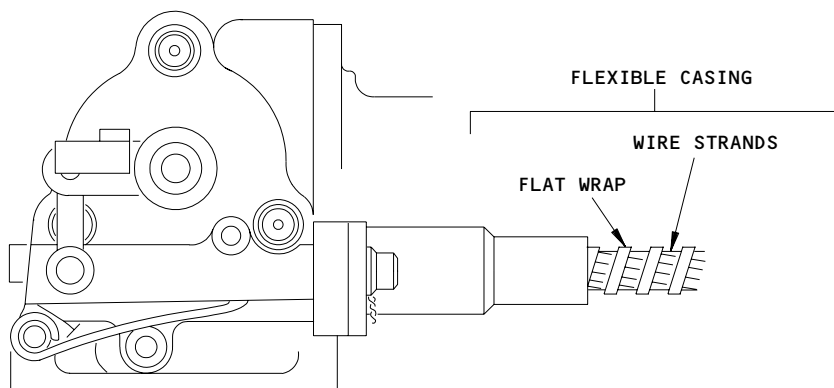
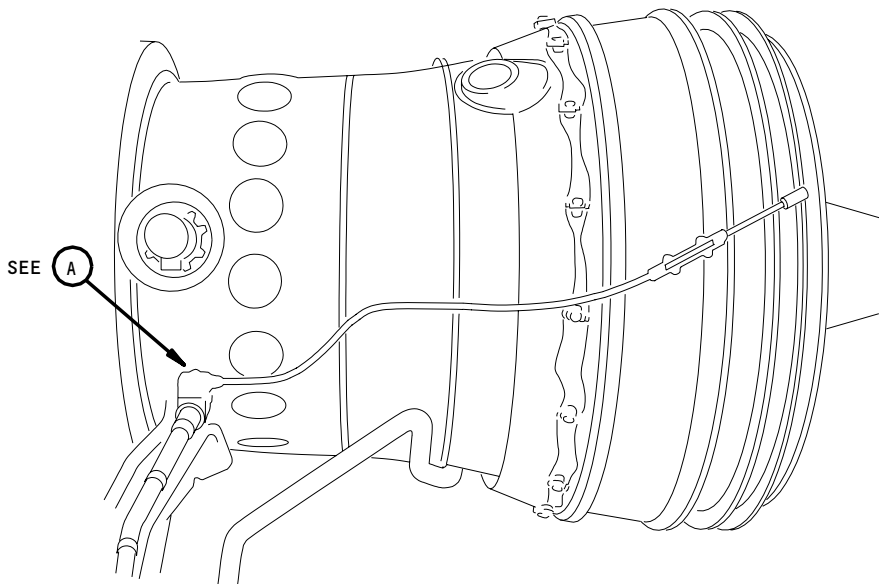
EFFECTIVITY

ALL

76-22-01

R01

Page 601  
Sep 28/00



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Emergency Shutoff Valve  
Figure 601

EFFECTIVITY	ALL
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76-22-01

R01

Page 602  
Jan 20/99

H91628

S 046-005-R00

**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.

- (4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 016-006-R00

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Open the left thrust reverser (AMM 78-31-00/201).
- D. Do an Inspection of the Emergency S.O.V. and Cable.

S 216-019-R00

- (1) Examine the flexible casing.
  - (a) Examine the flexible casing wire for signs of wear or broken strands.

S 216-020-R00

- (2) Acceptance Standards
  - (a) Flexible Casing
    - 1) One group of up to three worn or broken strands - Accept.
    - 2) A maximum of seven worn or broken strands is permitted. The worn or broken strands must have not less than two satisfactory strands between them - Accept.
    - 3) Any damage greater than the above limits - Reject.

- E. Return the Airplane to its Usual Condition

S 446-010-R00

- (1) Do the activation procedure for the fuel system.
  - (a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E1, L SPAR FUEL VALVE
  - (b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 main power distribution panel.
    - 1) 6E2, R SPAR FUEL VALVE

EFFECTIVITY

ALL

76-22-01

R01

Page 603  
May 28/01

S 866-011-R00

- (2) Remove the DO-NOT-OPERATE tag from the FUEL CONTROL switch on the control stand.

S 416-012-R00

**WARNING:** OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Close the left thrust reverser (AMM 78-31-00/201).

S 446-017-R00

- (4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

EFFECTIVITY

ALL

**76-22-01**

R01

Page 604  
May 28/01