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8	JUN 20/97	GUI	104	MAR 20/95	01	101	MAY 28/99	01
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102	JUN 20/93	01	506	JUN 20/97	01	506	MAR 20/91	01
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601	JAN 28/01	01	508	JAN 20/08	01	508	MAY 28/99	01
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407	SEP 20/91	01	410	MAY 28/01	17	26-13-00		
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6	JAN 28/02	02	506	MAY 28/02	06	206	DEC 20/95	05
7	MAY 20/08	02	507	MAY 28/02	20	207	DEC 20/95	07
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402	MAY 28/99	01	4	MAY 28/05	01	26-21-03		
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415	SEP 28/07	01	502	MAY 28/01	11	622	MAY 28/07	17
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606	SEP 20/96	01	510	MAY 28/01	02	405	SEP 28/06	01
607	SEP 20/96	01	511	MAY 28/01	02	406	SEP 28/07	03
608	SEP 28/00	01	512	MAY 28/01	02	407	SEP 28/07	02
609	SEP 20/98	01	513	MAY 28/01	02	408	SEP 28/07	15
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612	SEP 20/98	01	516	MAY 28/01	02	411	MAY 28/05	18
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26-23-05								
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Component Location			
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Detectors			
DETECTOR – LAVATORY SMOKE	26-14-01		
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Detector			
Install the Lavatory Smoke		204	
Detector			
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Detector			

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Fire and Overheat Detection Cards		4	
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Fire/Overheat Test Panel		4	
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Operation		4	
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Component Location		101	ALL
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Component Location			
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System Test – APU Fire Detection System		508	
ELEMENT – APU FIRE DETECTOR	26-15-02		
Removal/Installation		401	ALL
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Description and Operation		1	ALL
Component Details		1	
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Fire/Overheat Logic/Test Card		4	
Fire/Overheat Test Panel		4	
Smoke Detector Blowers		4	
Smoke Detector Plenum Pressure Switch		4	
Lower Cargo Compartment		1	
Operation		4	
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Smoke Detection Vacuum System		510	
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DETECTORS - CARGO SMOKE	26-16-01		
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Detector Installation			
Install the Cargo Smoke		206	
Detector			
Install the Smoke Detector		210	
Lamp			
Remove the Cargo Smoke		201	
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Lamp			
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PRESSURE			
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ISOLATION FLAPPER			
Maintenance Practices		201	ALL
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Flapper Valve Check		204	
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Component Index			
Component Location			
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Fire Detection			
System Test - Wheel Well Fire		503	
Detection			
DETECTOR - WHEEL WELL FIRE	26-17-01		
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Detector			
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Detector			
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General		1	
Component Details		1	
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Duct Leak Detectors		1	
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Removal/Installation		401	ALL
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Removal/Installation		401	ALL
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Cargo Compartment Fire		1	
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[*] AIRPLANES WITH METERED CARGO FIRE EXTINGUISHING SYSTEM			
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LAVATORY FIRE EXTINGUISHING	26-24-00		
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Temperature Indicator		2	
Lavatory Waste Compartment		1	
Automatic Fire Extinguishing			
Operation		2	
Functional Description		2	
EXTINGUISHER - FIRE	26-24-01		
Maintenance Practices		201	ALL
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- Removal/Installation			
Automatic Fire Extinguisher		201	
- Temperature Indicator			
Inspection/Check			
Automatic Fire Extinguisher		202	
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PORTABLE FIRE EXTINGUISHING	26-26-00		
Description and Operation		1	ALL
General		1	
Component Details		1	
Halon Extinguishers		1	
Pressurized Water		1	
Extinguishers			
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DETECTION - DESCRIPTION AND OPERATION

1. General

- A. Fire, overheat, and smoke detection systems are installed in the airplane. The systems provide aural and visual alerts when an alarm condition is detected.
- B. Engine fire detection (26-11-00)
 - (1) Dual-loop fire and overheat detection systems are installed in each engine area. Both loops of a system must sense a fire/overheat condition in order for an alarm to be given. If one loop is inoperative, then the system operates on the remaining loop.
- C. Strut overheat detection (26-12-00)
 - (1) A dual-loop overheat detection system is installed on each engine strut. Both loops must sense an overheat condition in order for an alarm to be given. If one loop is inoperative, then the system operates on the remaining loop.
- D. Engine turbine cooling overheat detection (26-13-00)
 - (1) A dual-loop overheat detection system is installed on each engine's turbine casing. Both loops must sense an overheat condition in order for an alarm to be given. If one loop is inoperative, then the system operates on the remaining loop.
- E. APU fire detection (26-15-00)
 - (1) A dual-loop fire detection system is installed in the APU compartment. Both loops must sense a fire condition in order for an alarm to be given. If one loop is inoperative, then the system operates on the remaining loop. When a fire is detected, the APU is automatically shutdown by the detection system.
 - (2) Dual smoke detection systems are installed in the forward and aft cargo compartments. Both detectors in either cargo compartment must sense smoke in order for a fire alarm to be given. If one detector is inoperative, then the system operates on the remaining detector.
- F. Wheel well fire detection (26-17-00)
 - (1) A single-loop fire detection system is installed, and is continuous through both main landing gear wheel wells.
- G. Duct leak detection (26-18-00)
 - (1) Two dual-loop duct leak detection systems are installed near all pneumatic ducting from the wing leading edges, through the air conditioning bays, the wheel well, the aft cargo compartment, and the aft pressure bulkhead back to the APU. Both loops of a system must sense a duct leak condition in order for an alarm to be given. If one loop is inoperative, then the system operates on the remaining detector.

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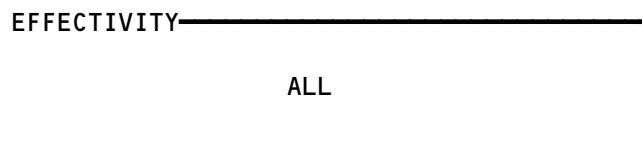
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DETECTION

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CARD 1 - FIRE/OVHT LOGIC/TEST, M10224		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 2 - FIRE/OVHT LOGIC/TEST, M10274		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 3 - FIRE/OVHT LOGIC/TEST, M10400		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 4 - FIRE/OVHT LOGIC/TEST, M10425		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 5 - FIRE/OVHT LOGIC/TEST, M10426		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 6 - FIRE/OVHT LOGIC/TEST, M10427		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 APU FIRE DET, M685		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 APU FIRE DET, M686		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 LEFT ENG FIRE DET, M681		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 LEFT ENG FIRE DET, M682		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 RIGHT ENG FIRE DET, M683		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 RIGHT ENG FIRE DET, M684		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - DUCT LEAK & WHEEL WELL FIRE, M691		1	119BL, MAIN EQUIP CTR, P50	26-10-01
CARD - LOOP 1 LEFT NACELLE OVHT DET, M10229		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 LEFT NACELLE OVHT DET, M10276		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 RIGHT NACELLE OVHT DET, M10230		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 RIGHT NACELLE OVHT DET, M10275		1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - DUCT LEAK & WHEEL WELL PWR SUPPLY, M10428		1	119BL, MAIN EQUIP CTR, P50	26-10-01

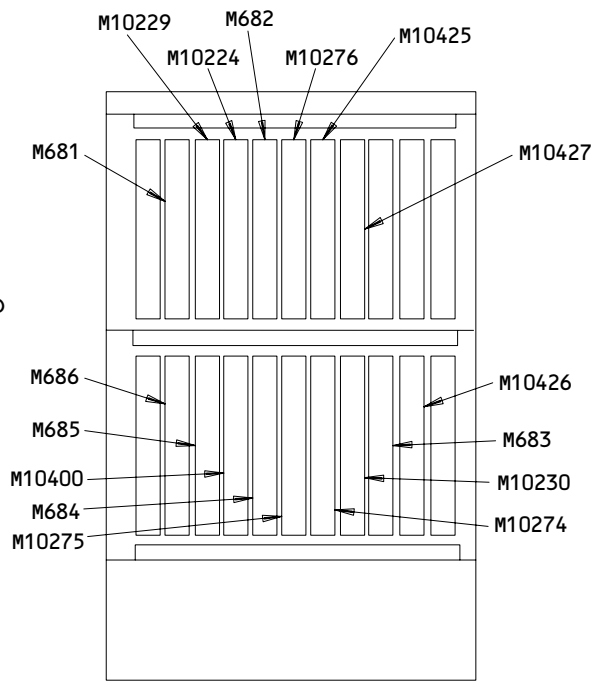
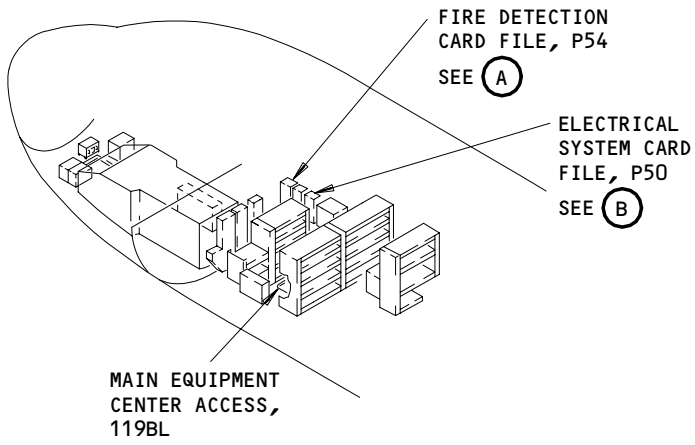
Detection - Component Index
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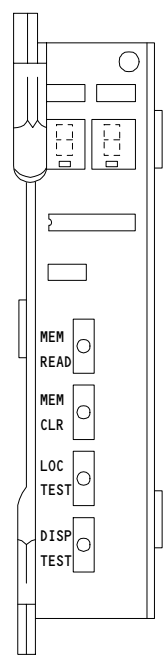
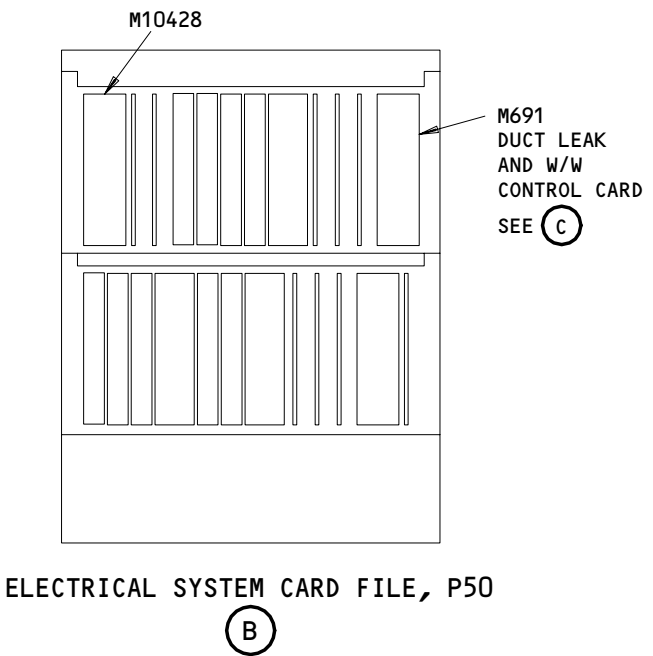
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FIRE DETECTION CARD FILE, P54
(A)



DUCT LEAK AND W/W
FIRE CONTROL CARD, M691
(C)

Detection - Component Location
Figure 102

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DETECTION - INSPECTION/CHECK

1. General

- A. This procedure is an operational check of AFOLTS (Automatic Fire/Overheat Logic/Test System).

TASK 26-10-00-736-064

2. Do a Test for AFOLTS System Check

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System

B. Access

(1) Location Zones

- 100 Lower Half of Fuselage
- 120 BS 396.5 to BS 900.0
- 200 Upper Half of Fuselage

(2) Access

- 119/120 Main Equipment Center
- 211/212 Flight Compartment Center

C. Prepare for the Check

S 866-001

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

D. Do a Test for AFOLTS System Check

S 756-002

- (1) Make sure these circuit breakers on the pilots' overhead panel, P11, are closed:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2

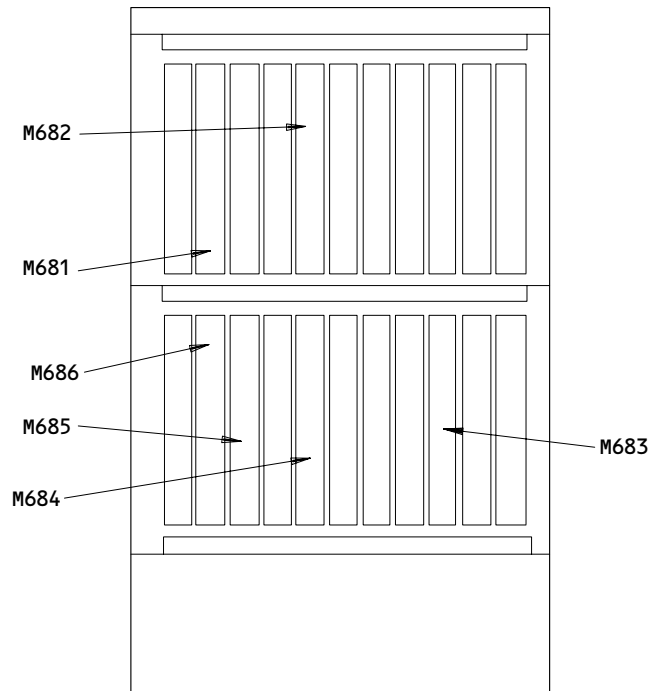
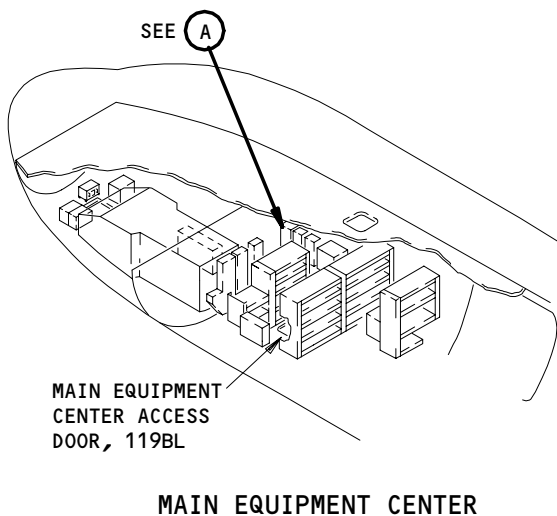
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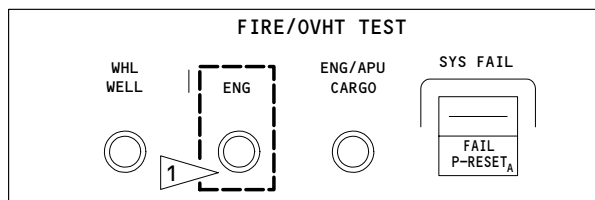
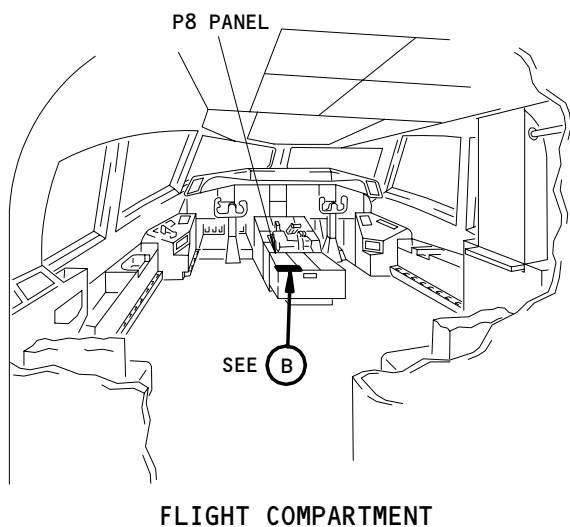
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FIRE DETECTION CARD FILE, P54

A



FIRE/OVERHEAT TEST PANEL, M10445

B

1 AIRPLANES WITH RB.211 ENGINES

Detection - Inspection/Check
Figure 601

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- (e) 11B24, FIRE DETECTION APU 1
- (f) 11B25, FIRE DETECTION APU 2
- (g) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
- (h) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- (i) 11J24, FIRE DET ALTN PWR CARGO

S 866-007

- (2) Push and hold the ENG/APU/CARGO switch, on the aft pilots' control stand, P8.

S 756-006

- (3) Make sure these indications occur:
 - (a) The fire bell is heard.
 - (b) The red master WARNING lights on the glare shield panels, P7, come on.
 - (c) The red FIRE warning light, on the captain's instrument panel P1-3, comes on.
 - (d) The lights on the LEFT, RIGHT, and APU fire switches (P8) come on.
 - (e) The FWD and AFT switch-lights on the CARGO FIRE panel (P8) come on.
 - (f) The L and R fuel control switch-lights, on the quadrant control stand, P10, come on.
 - (g) The yellow L ENG OVHT and R ENG OVHT lights (P8) come on.
 - (h) These EICAS messages show on the top display:
 - 1) L ENGINE FIRE
 - 2) R ENGINE FIRE
 - 3) APU FIRE
 - 4) FWD CARGO FIRE
 - 5) AFT CARGO FIRE
 - (i) This EICAS caution messages show on the top display.
 - 1) L ENG OVHT and R ENG OVHT

S 866-008

- (4) Release the test switch.
 - (a) Make sure all of the indications do not occur.

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S 866-072

- (5) Remove electrical power if it is not necessary.

TASK 26-10-00-726-090

3. Fire Detection Fail Light Check (Fig. 601)

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

- 100 Lower Half of Fuselage
120 BS 396.5 to BS 900.0
200 Upper Half of Fuselage

(2) Access

- 119/120 Main Equipment Center
211/212 Flight Compartment Center
121/122 Forward Cargo Compartment
153/154 Aft Cargo Compartment

C. Prepare for the Check

S 866-073

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

D. Do the Left Engine Check

S 866-074

- (1) Open the circuit breakers on the overhead circuit breaker panel, P11, in Table 601 for the left engine fire detection system. Attach DO-NOT-CLOSE tags:

Table 601		
SYSTEM	PRINTED CIRCUIT CARD	CIRCUIT BREAKERS
L ENGINE FIRE, L NACELLE OVHT	M681 - L ENG FIRE LOOP 1 M682 - L ENG FIRE LOOP 2	11A32, INDICATOR LIGHTS 1 11A33, INDICATOR LIGHTS 2 11B18, WARN ELEX B 11B20, FIRE DETECTION L ENGINE 1 11B21, FIRE DETECTION L ENGINE 2 11J26, FIRE DET ALTN PWR ENGINE LEFT 11J33, WARN ELEX A 11P29, R IND LTS 2

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03

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- S 026-010
- (2) Remove the, printed circuit cards, M681 and M682, from the fire detection card file, P54. P54 is in the E/E bay adjacent to the right side of the nose gear wheel well.
- S 866-075
- (3) Remove all of the DO-NOT-CLOSE tags and close the circuit breakers which were opened in Table 601.
- S 756-011
- (4) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switch-light (P8) is on.
 - (b) The EICAS message, FIRE/OVHT SYS, shows on the top display.
- S 866-012
- (5) Push the FAIL P-RESET switch-light.
- S 756-014
- (6) Make sure these indications occur:
- (a) The switch-light goes off.
 - (b) The EICAS message, FIRE/OVHT SYS, does not show.
- S 866-015
- (7) Open the circuit breakers in Table 601 and attach DO-NOT-CLOSE tags.
- S 426-016
- (8) Install the printed-circuit cards, M681 and M682.
- S 866-017
- (9) Remove all of the DO-NOT-CLOSE tags and close the circuit breakers in Table 601.
- E. Do the Right Engine Check
- S 866-018
- (1) Open the circuit breakers on the P11 panel in Table 602 for the fire detection system for the right engine and attach DO-NOT-CLOSE tags:

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Table 602		
SYSTEM	PRINTED CIRCUIT CARD	CIRCUIT BREAKERS
R ENGINE FIRE, R NACELLE OVHT	M683 - R ENG FIRE LOOP 1 M684 - R ENG FIRE LOOP 2	11A32, INDICATOR LIGHTS 1 11A33, INDICATOR LIGHTS 2 11B18, WARN ELEX B 11B22, FIRE DETECTION R ENGINE 1 11B23, FIRE DETECTION R ENGINE 2 11J27, FIRE DET ALTN PWR ENGINE RIGHT 11J33, WARN ELEX A 11P29, R IND LTS 2

- S 026-019
- (2) Remove printed-circuit cards, M683 and M684, from the fire detection card file, P54. P54 is in the E/E bay adjacent to to the right side of the nose gear wheel well.
- S 866-020
- (3) Remove all of the DO-NOT-CLOSE tags and close the circuit breakers in Table 602.
- S 756-021
- (4) Make sure the indications occur:
- (a) The yellow FAIL P-RESET light (P8) is on.
 - (b) The EICAS message, FIRE/OVHT SYS, shows on the top display.
- S 866-022
- (5) Push the FAIL P-RESET switch-light.
- S 216-076
- (6) Make sure these indication occur:
- (a) The switch-light goes off.
 - (b) The EICAS message, FIRE/OVHT SYS, does not show.
- S 866-023
- (7) Open the circuit breakers in Table 602 and attach DO-NOT-CLOSE tags:
- S 426-024
- (8) Install the printed-circuit cards, M683 and M684.
- S 866-025
- (9) Remove all of the DO-NOT-CLOSE tags and close the circuit breakers in Table 602.

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F. Do the APU Check

S 866-026

- (1) Open all of the circuit breakers on the P11 panel in Table 603 for the APU fire detection system and attach D0-NOT-CLOSE tags.

Table 603	
SYSTEM	CIRCUIT BREAKERS
APU FIRE	11A32, INDICATOR LIGHTS 1 11A35, INDICATOR LIGHTS 4 11B18, WARN ELEX B 11B24, FIRE DETECTION APU 1 11B25, FIRE DETECTION APU 2 11J25, FIRE DET ALTN PWR APU 11J33, WARN ELEX A 11P29, R IND LTS 2

S 026-027

- (2) Remove the printed-circuit cards, M685 and M686, from the fire detection card file, P54. P54 is in the E/E bay adjacent to the right side of the nose gear wheel well.

S 866-028

- (3) Remove all of the D0-NOT-CLOSE tags and close the circuit breakers in Table 603.

S 756-029

- (4) Make sure these indications occur:
 (a) The yellow FAIL P-RESET light (P8) is on.
 (b) The EICAS message, FIRE/OVHT SYS, shows on the top display.

S 866-030

- (5) Push the FAIL P-RESET switch-light.

S 216-077

- (6) Make sure these indications occur:
 (a) The switch-light goes off.
 (b) The EICAS message, FIRE/OVHT SYS, does not show.

S 866-031

- (7) Open the circuit breakers in Table 603 and attach D0-NOT-CLOSE tags.

S 426-032

- (8) Install the printed-circuit cards, M685 and M686.

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S 866-033

- (9) Remove all of the DO-NOT-CLOSE tags and close the circuit breakers in Table 603.

G. Do the Cargo Check

S 016-099

- (1) Open forward and aft cargo doors (AMM 52-34-00/201).

S 866-034

- (2) Turn the computer switch on the EICAS DISPLAY SELECT PANEL, P9, to the AUTO position.

S 866-035

- (3) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - (c) 11J24, FIRE DET ALTN PWR CARGO

S 036-036

- (4) Disconnect the electrical connectors, D4402 and D4404, from the smoke detectors in the forward cargo compartment, M10458 and M10459. The smoke detector assembly in the forward cargo compartment (detectors, blowers, and plenum pressure switch) is installed in the cargo compartment ceiling, just aft of No. 1 cargo door.

S 866-038

- (5) Remove all of the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 756-039

- (6) Make sure these indications occur:
 - (a) The yellow FAIL P-RESET switch-light, on the pilots control stand, P8, comes on.
 - (b) The EICAS message, FIRE/OVHT SYS, shows.
 - (c) These EICAS messages show.
 - 1) FWD CARGO DET 1
 - 2) FWD CARGO DET 2

S 866-040

- (7) Push the FAIL P-RESET switch-light, on P8.

S 756-041

- (8) Make sure these indication occur:
 - (a) The yellow FAIL P-RESET switch-light goes off.
 - (b) The EICAS message, FIRE/OVHT SYS, does not show.

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- S 866-042
- (9) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1
 - (b) 11B27, FIRE DETECTION CARGO 2
- S 426-043
- (10) Connect the electrical connector, D4402, to the detector, M10458, and connect the electrical connector, D4404, to the detector, M10459.
- S 036-044
- (11) Disconnect the electrical connectors, D4406 and D4408, from the smoke detectors in the aft cargo compartment, M10460 and M10461. The smoke detector assembly in the aft cargo compartment is installed in the cargo compartment sidewall just forward of No. 2 cargo door.
- S 866-045
- (12) Remove all of the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel.
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE 2
- S 756-046
- (13) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switch-light, on P8, comes on.
 - (b) The EICAS message, FIRE/OVHT SYS, shows on the top display.
 - (c) These EICAS messages show on the bottom display.
 - 1) AFT CARGO DET 1
 - 2) AFT CARGO DET 2
 - (d) These EICAS messages do not show on the bottom display.
 - 1) FWD CARGO DET 1
 - 2) FWD CARGO DET 2
- S 866-047
- (14) Push the FAIL P-RESET switch-light.
- S 756-048
- (15) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switch-light goes off.
 - (b) The EICAS message, FIRE/OVHT SYS, does not show.

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- S 866-049
- (16) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 436-050
- (17) Connect the electrical connector, D4406, to the detector, M10460.
- S 436-063
- (18) Connect the electrical connector, D4408, to the detector, M10461.
- S 866-051
- (19) Remove all of the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel.
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - (c) 11J24, FIRE DET ALTN PWR CARGO
- S 756-052
- (20) Make sure these EICAS messages do not show on the bottom display:
- (a) AFT CARGO DET 1
 - (b) AFT CARGO DET 2
- S 026-100
- (21) Close forward and aft cargo doors (AMM 52-34-00/201).
- S 866-062
- (22) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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FIRE DETECTION PRINTED-CIRCUIT CARDS - REMOVAL/INSTALLATION

1. General

- A. The fire detection card file, P54, contains printed circuit cards which have logic functions for the e fire/overheat detection systems: engine, APU, cargo, wheel well, and duct leak. The P54 card file is in the electrical/electronic equipment compartment adjacent to the removal/installation procedure is the same for all cards.

TASK 26-10-01-024-001

2. Remove the Printed-Circuit Card (Fig. 401)

A. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
(2) AMM 24-22-00/201, Electrical Power - Control

B. Remove the Printed-Circuit Card

S 864-031

- (1) Open the circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags. See Table 401 for the printed-circuit card to be removed and the applicable circuit breakers to be opened.

NOTE: All of the circuit breakers in each block must be opened.

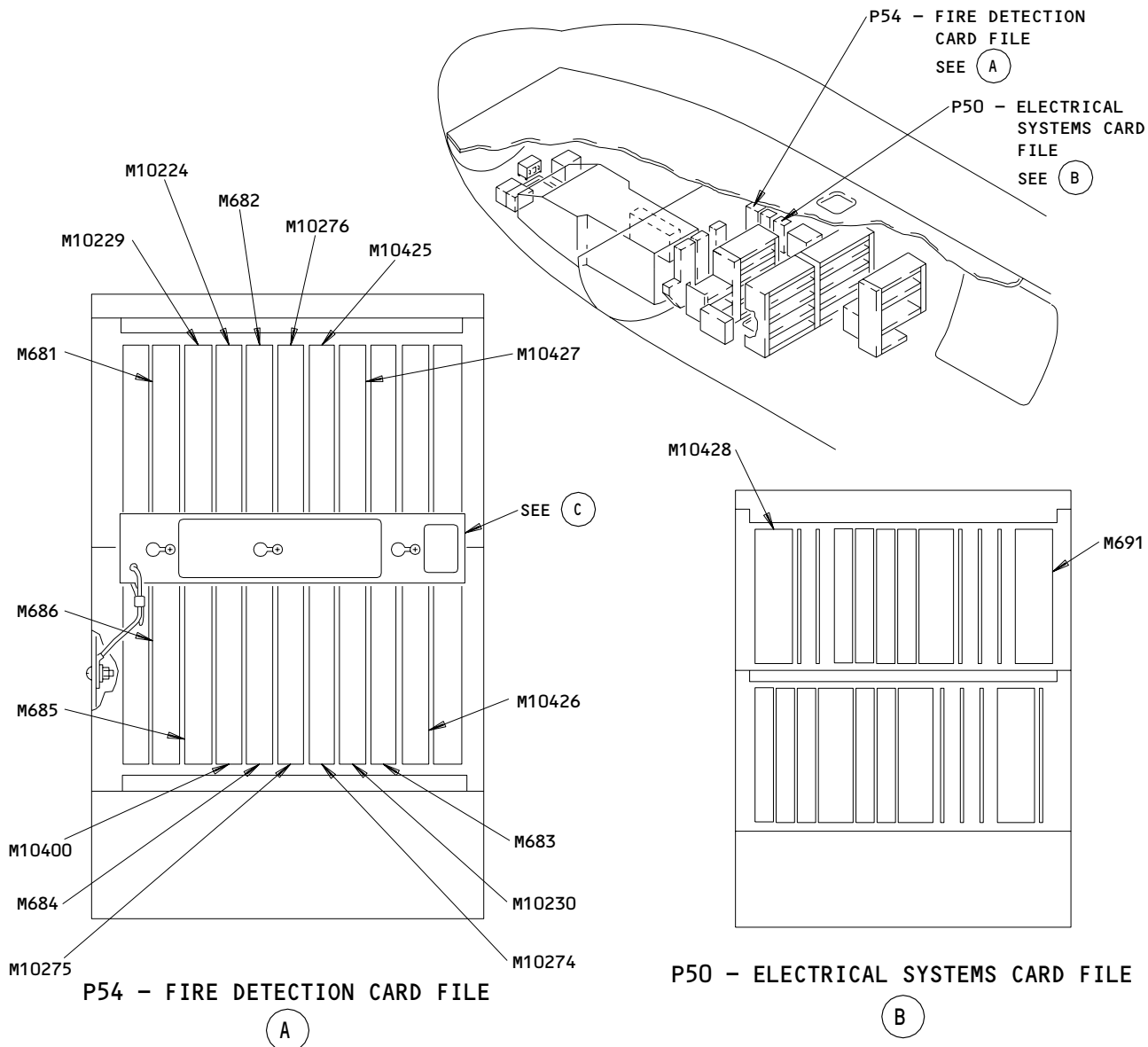
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Fire Detection Printed Circuit Card Installation
Figure 401

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Table 401

SYSTEM	PRINTED-CIRCUIT CARD	CIRCUIT BREAKERS
L ENGINE FIRE, L NACELLE OVHT, L TURBINE OVHT, L STRUT OVHT	M681 - L ENG FIRE LOOP 1 M682 - L ENG FIRE LOOP 2 M10229 - L NAC OVHT LOOP 1 M10276 - L NAC OVHT LOOP 2 M10224 - AFOLTS 1 *[1] M10425 - AFOLTS 4 *[1]	11A32, INDICATOR LIGHTS 1 11A33, INDICATOR LIGHTS 2 11B18, WARN ELEX B 11B20, FIRE DETECTION L ENGINE 1 11B21, FIRE DETECTION L ENGINE 2 11J26, FIRE DET ALTN PWR ENGINE LEFT 11J33, WARN ELEX A 11P29, R IND LTS 2
R ENGINE FIRE, R NACELLE OVHT, R TURBINE OVHT, R STRUT OVHT	M683 - R ENG FIRE LOOP 1 M684 - R ENG FIRE LOOP 2 M10230 - R NAC OVHT LOOP 1 M10275 - R NAC OVHT LOOP 2 M10274 - AFOLTS 2 *[1] M10426 - AFOLTS 5 *[1]	11A32, INDICATOR LIGHTS 1 11A33, INDICATOR LIGHTS 2 11B18, WARN ELEX B 11B22, FIRE DETECTION R ENGINE 1 11B23, FIRE DETECTION R ENGINE 2 11J27, FIRE DET ALTN PWR ENGINE RIGHT 11J33, WARN ELEX A 11P29, R IND LTS 2
APU FIRE	M685 - APU LOOP 1 M686 - APU LOOP 2 M10400 - AFOLTS 3 *[1]	11A32, INDICATOR LIGHTS 1 11A35, INDICATOR LIGHTS 4 11B18, WARN ELEX B 11B24, FIRE DETECTION APU 1 11B25, FIRE DETECTION APU 2 11J25, FIRE DET ALTN PWR APU 11J33, WARN ELEX A 11P29, R IND LTS 2
FWD CARGO SMOKE DETECTION, AFT CARGO SMOKE DETECTION	M10427 - AFOLTS 6 *[1]	11A34, INDICATOR LIGHTS 3 11A35, INDICATOR LIGHTS 4 11B18, WARN ELEX B 11B26, CARGO SMOKE DET 1 11B27, CARGO SMOKE DET 2 11J24, FIRE DET ALTN PWR CARGO 11J33, WARN ELEX A

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Table 401		
SYSTEM	PRINTED-CIRCUIT CARD	CIRCUIT BREAKERS
DUCT LEAK, WHEEL WELL FIRE	M691 - DUCT LEAK, W/W FIRE *[1] M10428 - DUCT LEAK, W/W PWR SUPPLY *[1]	11A32, INDICATOR LIGHTS 1 11B10, WW FIRE DETECTION 11B18, WARN ELEX B 11B35, WW FIRE TEST 11J33, WARN ELEX A 11P1, L IND LTS 1 11P28, R IND LTS 1 11Q17, DUCT LEAK DET LEFT 11Q25, DUCT LEAK DET RIGHT 11Q26, DUCT LEAK CONT

*[1] ESDS device. card has STATIC SENSITIVE placard on the extractors.

S 014-002

CAUTION: DO NOT REMOVE THE PRINTED-CIRCUIT CARD BEFORE YOU READ THE PROCEDURE FOR THE REMOVAL/INSTALLATION OF ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (20-41-01). ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CARD.

- (2) Open the applicable card file door. The fire detection cards, M691 and M10428, are in P50, and all of the other cards are in P54.

S 034-003

- (3) Loosen but do not remove the three screws of the safety bar which holds the printed-circuit card.

S 034-004

- (4) Move the safety bar away along the tracks in the bar, and then lift the bar from the screws.

S 024-005

- (5) To remove the printed-circuit card, hold the card ejectors and pull.

NOTE: The card location diagram is on the inner side of the panel door.

TASK 26-10-01-424-006

3. Install the Printed-Circuit Card (Fig. 401)

A. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices

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- (2) AMM 24-22-00/201, Electrical Power - Control
 - (3) AMM 26-16-00/501, Cargo Compartment Smoke Detection
- B. Install the Printed-Circuit Card

S 424-007

CAUTION: DO NOT INSTALL THE PRINTED-CIRCUIT CARD BEFORE YOU READ THE PROCEDURE FOR THE REMOVAL/INSTALLATION OF ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (20-41-01). ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CARD.

- (1) Install the printed-circuit card in the card tracks and push in until connected correctly with the connector.

S 434-008

- (2) Put the safety bar for the circuit-card along the screws and move the bar back to its initial position.

S 434-005

- (3) Tighten the screws which hold the bar in its position.

S 414-006

- (4) Close the card file door.

S 864-007

- (5) Remove the DO-NOT-CLOSE tags and close the circuit breakers on the overhead circuit breaker panel, P11. The applicable card to be installed is in TABLE 401.

- C. Do a Test of the Printed-Circuit Card Installation

S 864-008

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

S 754-009

- (2) Make sure the circuit breakers on the P11 panel are closed.

- D. Do a Test of the AFOLTS Card Installation for the Engine, APU, and Cargo Fire Detection Systems.

S 864-010

- (1) Push and hold the ENG/APU/CARGO test switch on the FIRE/OVHT TEST panel.

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S 754-011

- (2) Make sure the applicable EICAS message shows on the top display for the card that is replaced.

AFOLTS CARD

EICAS MESSAGE

Card 1 M10224	L ENGINE FIRE
Card 2 M10274	R ENGINE FIRE
Card 3 M10400	APU FIRE
Card 6 M10427	FWD CARGO FIRE

S 864-012

- (3) Release the ENG/APU/CARGO test switch.

S 714-028

- (4) Do the "Test of the Cargo Smoke Detection System" in the Operational Test - Lower Cargo Compartment Smoke Detection System (AMM 26-16-00/501).

E. Do a Test of the Engine Turbine/Strut Overheat Detection AFOLTS Cards Installation

S 864-013

- (1) Push and hold the ENG test switch on FIRE/OVHT TEST panel.

S 754-014

- (2) Make sure the applicable EICAS message shows on the top display for the card which is replaced.

AFOLTS CARD

EICAS MESSAGE

Card 4 M10425	L ENGINE FIRE
Card 5 M10426	R ENGINE FIRE

S 864-015

- (3) Release the ENG test switch.

F. Do a Test of the Cards Installation for the Engine and APU Fire/Ovht Detection Systems

S 864-016

- (1) Push and hold the ENG/APU/CARGO test switch.

S 864-017

- (2) Release the ENG/APU/CARGO test switch.

S 864-018

- (3) Push and release the ECS MSG switch on the EICAS maintenance panel.

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S 754-019

- (4) Make sure the applicable EICAS message does not show on the top display for the card that is replaced.

<u>FIRE/OVHT DETECTION LOOP CARD</u>	<u>EICAS MESSAGE</u>
M681	L ENG FIRE LP 1
M682	L ENG FIRE LP 2
M683	R ENG FIRE LP 1
M684	R ENG FIRE LP 2
M685	APU FIRE LP 1
M686	APU FIRE LP 2
M10229	L ENG OH LP 1
M10230	R ENG OH LP 1
M10275	R ENG OH LP 2
M10276	L ENG OH LP 2

- G. Do a Test of the Installation for the Duct Leak and Wheel Well Fire Card, M691

S 864-020

- (1) Push and hold the WHL WELL test switch on the FIRE/OVHT TEST panel.

S 754-021

- (2) Make sure the EICAS message, WHEEL WELL FIRE, shows on the top display.

S 864-022

- (3) Release the WHL WELL test switch.

- H. Do a Test of the Installation for the Duct Leak and Wheel Well Power Supply Card, M10428

S 864-023

- (1) Push and hold the WHL WELL test switch, on the FIRE OVHT TEST panel, for a minimum of eight seconds.

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- S 864-024
- (2) Release the WHL WELL test switch.
- S 864-025
- (3) Push and release the ECS MSG switch on the EICAS maintenance panel.
- S 754-026
- (4) Make sure the EICAS message DUCT LEAK BITE does not show on the top display .
- S 864-027
- (5) Remove electrical power if it is not necessary (AMM 24-22-00).

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ENGINE FIRE DETECTION – DESCRIPTION AND OPERATION

1. General

- A. Dual-loop fire and overheat detection systems are installed in each engine area. These systems monitor engine and nacelle temperatures, and provide alerts for both fire and overheat conditions.
- B. The four systems (left and right engine fire and nacelle overheat detection) use power from the 28-volt dc battery bus, with alternate power from the right main dc bus. The circuit breakers for each system are on overhead circuit breaker panel P11. The systems contain no on/off switches.
- C. The fire detection systems are each composed of four dual-loop detectors. Thus, each loop of a fire detection system has four detector elements, one from each detector. The nacelle overheat detection systems are each composed of one dual-loop detector.
- D. Each detection loop has a control card, and each engine has a fire/overheat logic/test card. All four systems have one fire/overheat test panel.
- E. All four systems operate in AND logic. Thus, both loops of a system must sense a fire/overheat or fault condition in order for an alarm to be given.

2. Component Details (Fig. 1)

A. Engine Fire and Overheat Detectors

(1) AIRPLANES WITH SYSTRON DONNER DETECTORS;

Refer to the data that follows:

- (a) A detector consists of two sensing elements which are attached to a support tube by quick-release mounting clamps. Each sensing element contains an inert gas, a gas-emitting core material, and has a responder on one end. The responder contains two pressure switches, and provides the electrical interface with the airplane wiring.
- (b) The inert gas in a sensing element expands as a function of average gas temperature. The gas-emitting core material expells gas due to high localized temperatures. Both actions cause an increase in pressure in the element, which causes an alarm pressure switch (in the responder) to activate. Both actions are completely reversible – as the temperature decreases, the pressure decreases, and the alarm switch deactivates. When a sensing element is damaged allowing the inert gas to leak out, an integrity pressure switch deactivates. The pressure switches provide alarm and integrity signals to the appropriate detector control card.

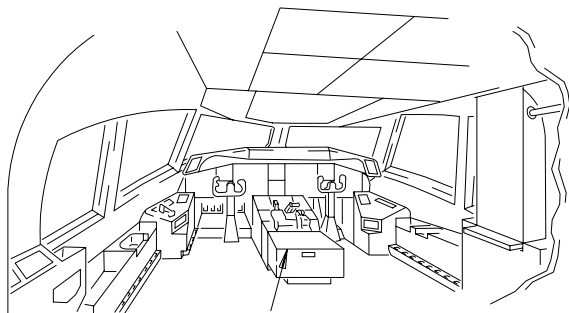
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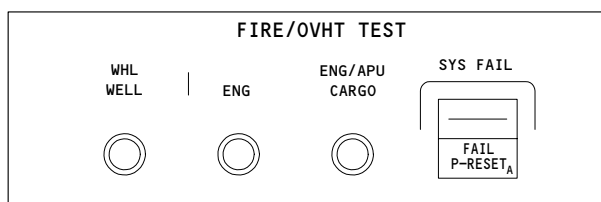
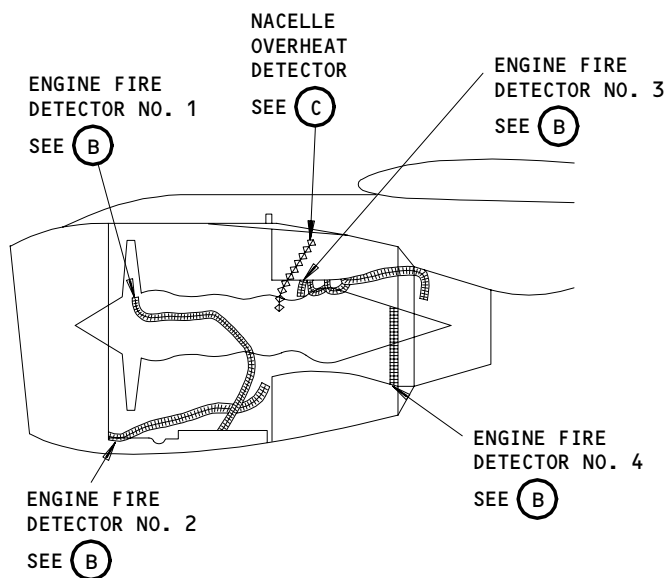
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FIRE/OVHT
TEST PANEL

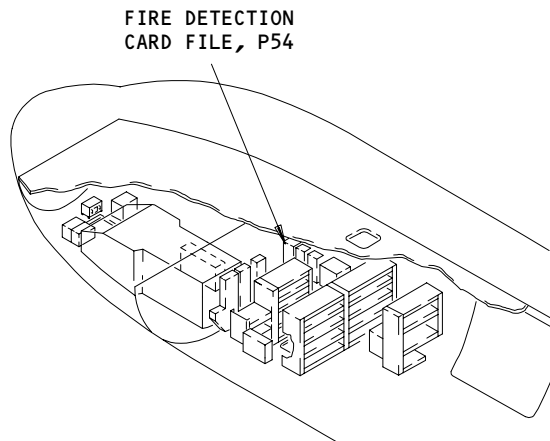
SEE (A)

FLIGHT COMPARTMENT



FIRE/OVHT TEST PANEL

(A)



MAIN EQUIPMENT CENTER

Engine Fire Detection Component Location
Figure 1 (Sheet 1)

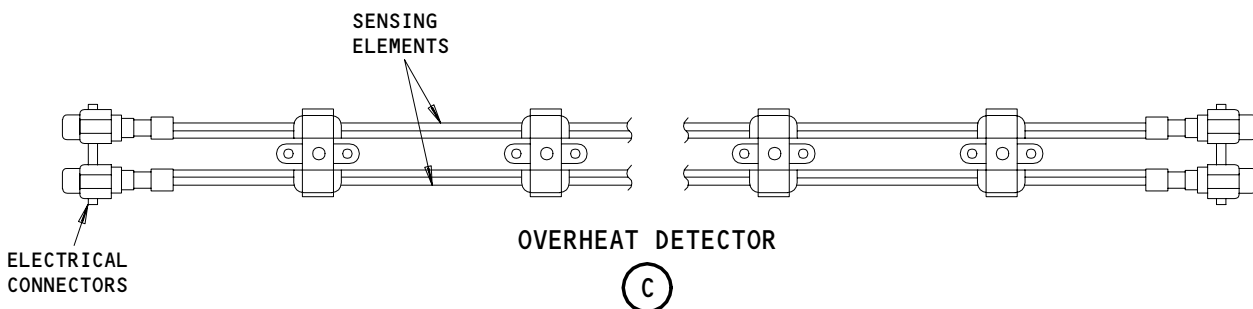
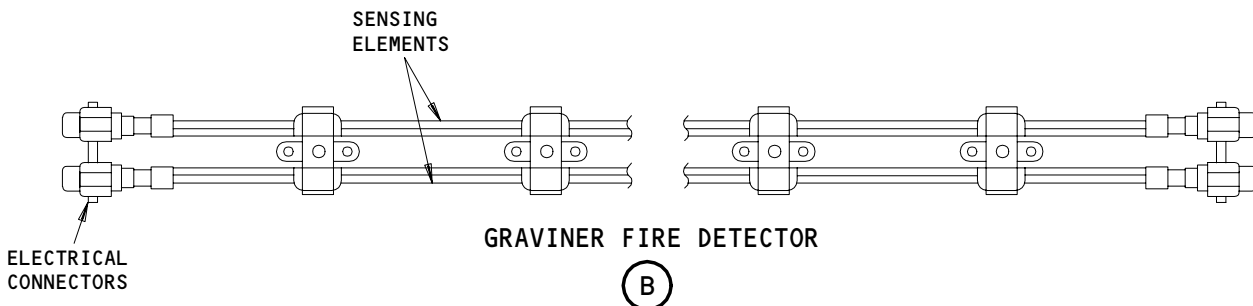
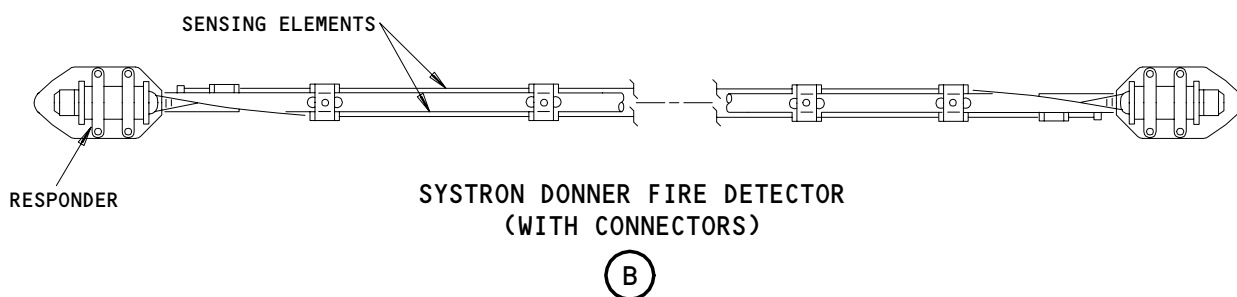
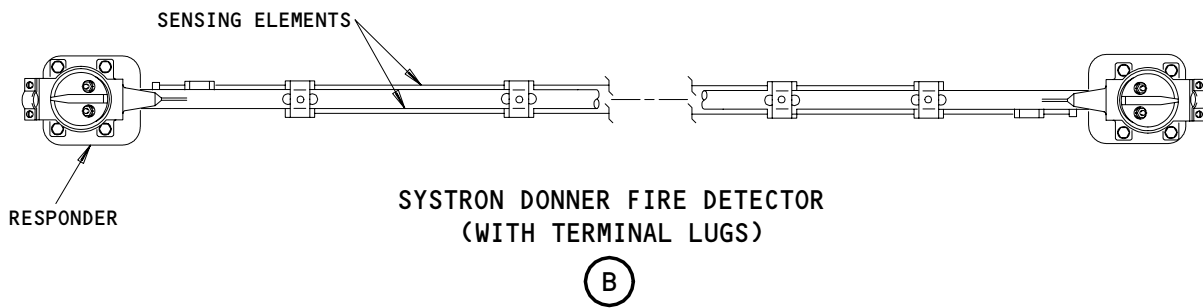
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Engine Fire Detection Component Location
Figure 1 (Sheet 2)

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- (c) The fire and overheat detectors are all identical except for the normal resistance value (at the electrical interface), the length, and a factory-set alarm point (temperature) for the alarm switch to activate.
- (2) AIRPLANES WITH GRAVINER DETECTORS;
Refer to the data that follows:
 - (a) A fire detector consists of two sensing elements which are attached to a support tube by quick-release mounting clamps. Each sensing element is a resistor-capacitor network, with resistance varying as a function of temperature.
 - (b) At low temperatures, the impedance of the sensing element is mainly resistive. As temperature increases, the resistance drops, thus the impedance becomes more reactive. The detector card senses the change as a fire signal. A pure resistance will not be sensed by the detector card as a fire, but as a fault.
 - (c) An overheat detector consists of two sensing elements which are attached to a support tube by quick-release mounting clamps. Each sensing element contains an inert gas, a gas-emitting core material, and has a responder on one end. The responder contains two pressure switches, and provides the electrical interface with the airplane wiring.
 - (d) The inert gas in a sensing element expands as a function of average gas temperature. The gas-emitting core material expells gas due to high localized temperatures. Both actions cause an increase in pressure in the element, which causes an alarm pressure switch (in the responder) to activate. Both actions are completely reversible - as the temperature decreases, the pressure decreases, and the alarm switch deactivates. When a sensing element is damaged allowing the inert gas to leak out, an integrity pressure switch deactivates. The pressure switches provide alarm and integrity signals to the appropriate detector control card.
- (3) Detector locations.
 - (a) The engine fire detectors are installed:
 - 1) on the right and left sides of the low-pressure compressor case lower sector (zone 1)

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- 2) on the underside of the engine strut, above the combustion case (zone 3)
 - 3) around the turbine case lower sector (zone 3).
 - (b) The nacelle overheat detectors are installed behind the precooler air inlets, in the pneumatic ducting area.
- B. Fire and Overheat Detection Cards
- (1) Each detection loop has a corresponding detection control card. These cards constantly monitor and process signals produced by each loop. The cards output alarm or fault signals to the fire/overheat logic/test card for the appropriate system.
 - (2) The detection control cards are in the P54 fire detection card file. The card file is in the electrical/electronic equipment compartment, along the right side of the nose gear wheel well.
- C. Fire/Overheat Logic/Test Cards
- (1) Two AFOLTS (Automatic Fire/Overheat Logic/Test System) cards interpret detection control card signals, provide system functional tests, and output fire/overheat warning and fault indication signals. Each card handles the fire and overheat detection systems for one engine.
 - (2) The AFOLTS cards are located in the P54 card file.
- D. Fire/Overheat Test Panel
- (1) The fire/overheat test panel contains a momentary pushbutton switch – ENG/APU/CARGO. This switch initiates a test of the fire, overheat, and smoke detection systems for the engines, APU, and cargo compartments. The test results in cockpit fire and overheat indications.
 - (2) The test panel also has an amber SYS FAIL – FAIL P–RESET switchlight. This switchlight indicates a fire, overheat, or smoke detection system failure. The switchlight is pressed to reset.
 - (3) The fire/overheat test panel is on aft pilots' control stand P8.
3. Operation (Fig. 2 and 3)
- A. Functional Description

NOTE: The Engine Turbine Cooling Overheat Detection System works in a similar way as the Engine Fire/Overheat System. Some indications displayed may be the same with either system. Refer to AMM 26-13-00/001 for the description and applicable indications of the Engine Turbine Cooling Overheat Detection System.

- (1) AIRPLANES WITH SYSTRON DONNER FIRE DETECTORS;
Refer to the data that follows:
 - (a) With 28-volt dc power applied to the systems, current is sent from each control card to the detectors in the corresponding loop. Each detector element has a resistance value, and is in parallel with the other elements in its loop. Thus, each loop has an equivalent resistance value, and the control card senses a loop voltage potential.

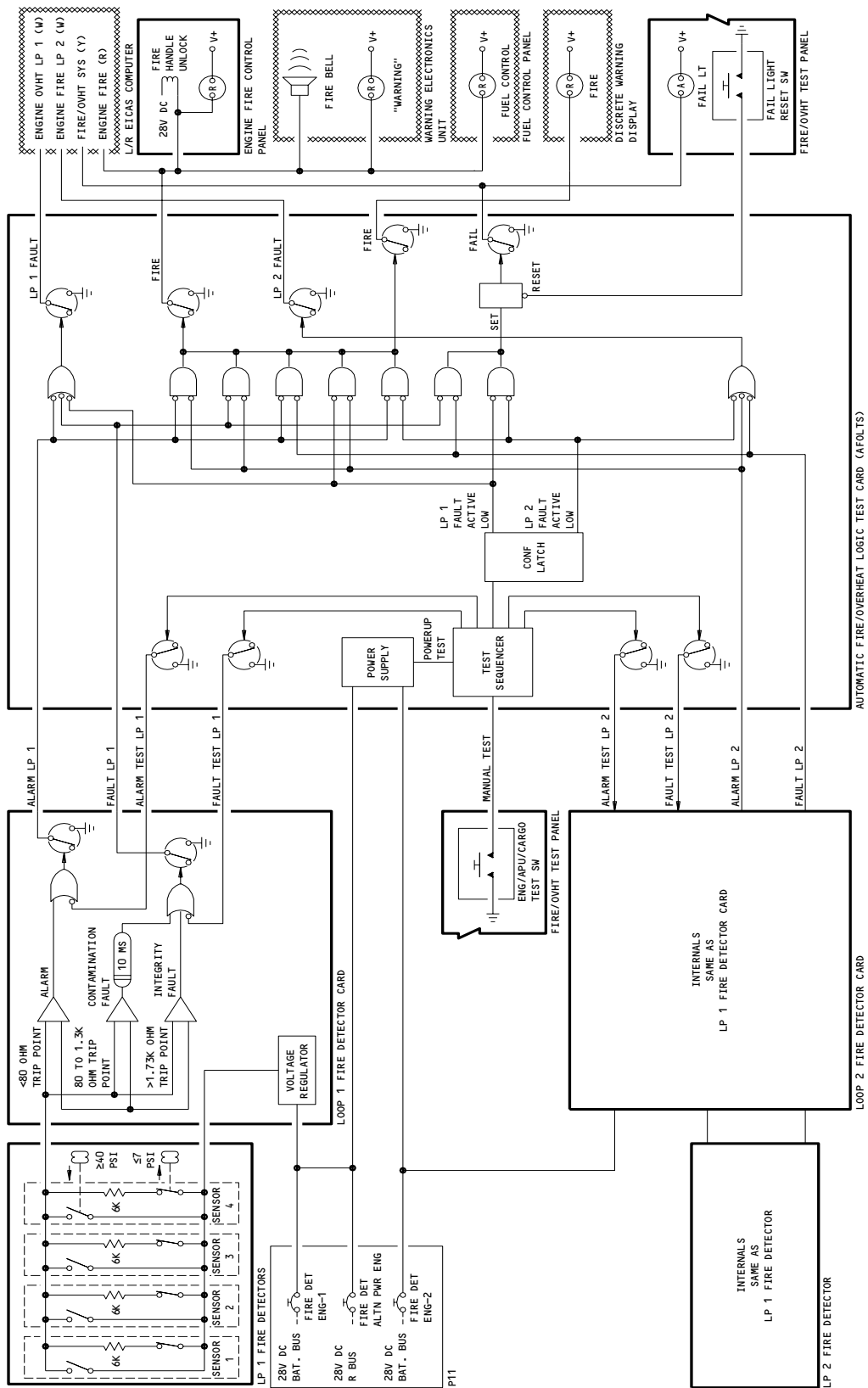
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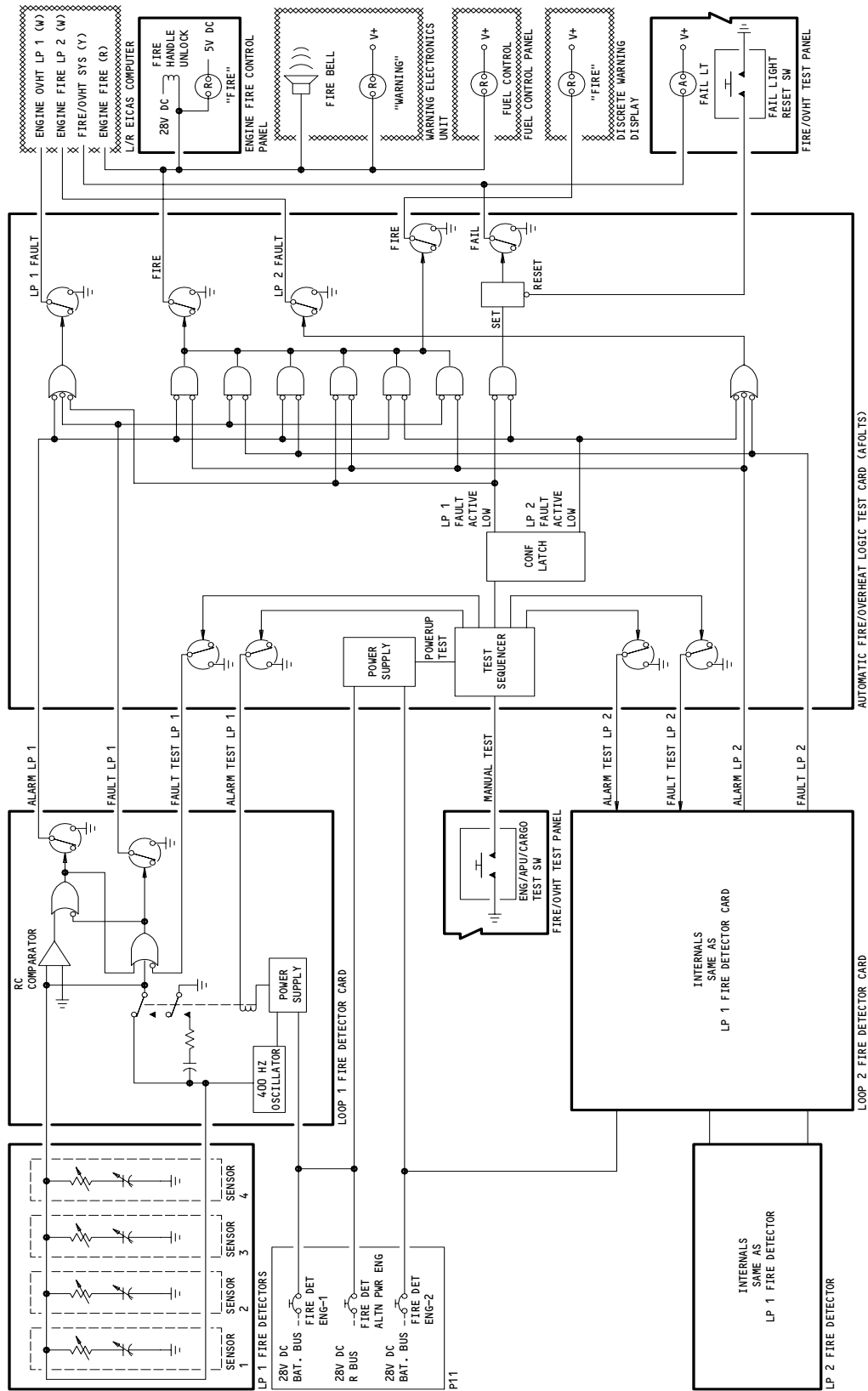
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Engine Fire Detection Schematic (Example)
Figure 2

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AIRPLANES WITH SYSTRON-DONNER DETECTORS

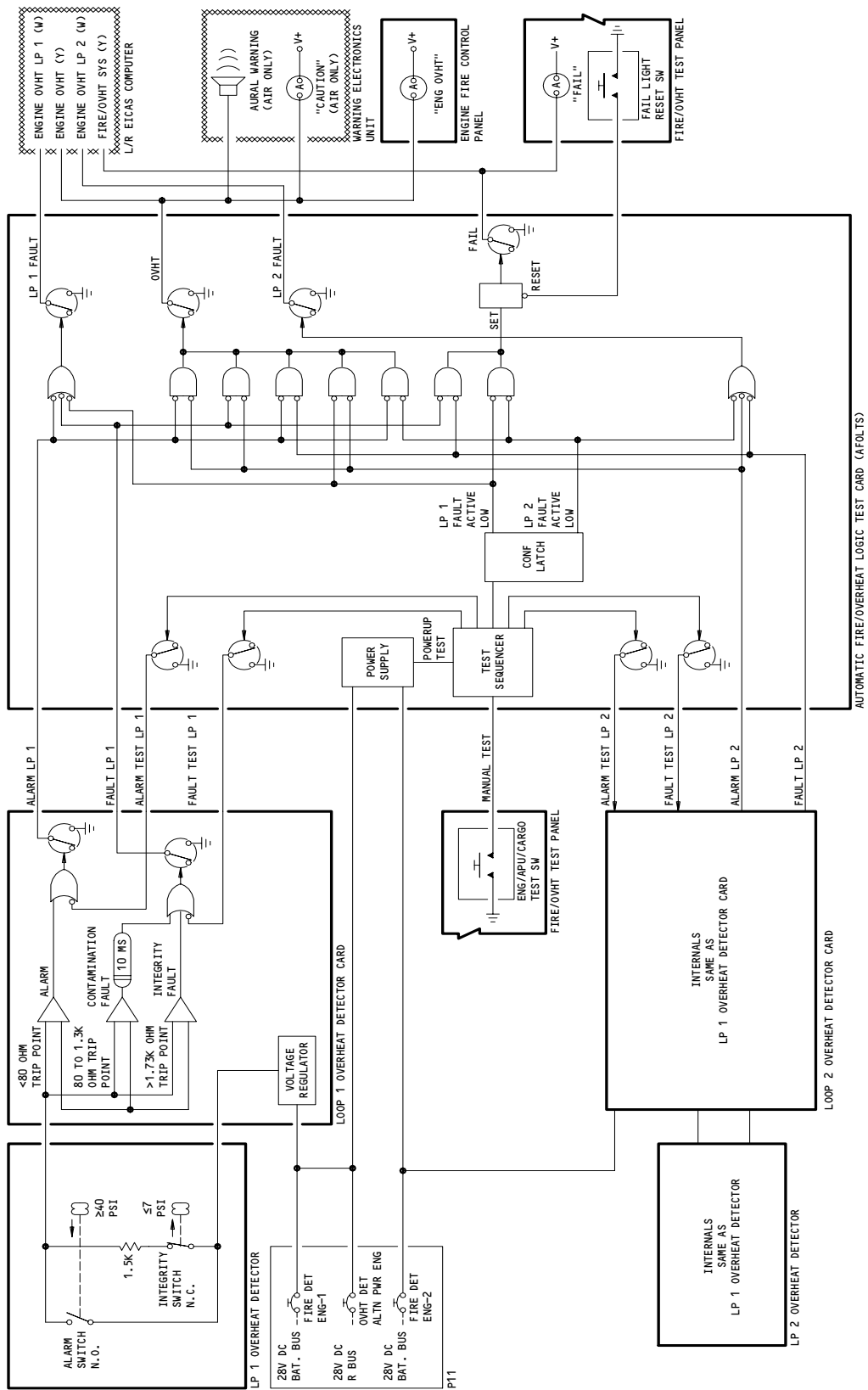
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Engine Fire Detection Schematic (Example)
Figure 2A

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AIRPLANES WITH GRAVINER FIRE DETECTORS

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Nacelle Overheat Detection Schematic (Example)
Figure 3

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- (b) When a detector element pressure switch opens (integrity switch) or closes (alarm switch), the equivalent loop resistance is changed, and the voltage sensed by the control card changes. The card determines which signal is sensed, and sends an appropriate (alarm or fault) signal to the AFOLTS card.
- (2) AIRPLANES WITH GRAVINER FIRE DETECTORS;
Refer to the data that follows:
 - (a) When temperature increases, the resistance of the fire detector element drops, and the detector card senses the voltage across the capacitance, triggering a fire indication. If the detector is shorted, contaminated or has opened up, only the voltage across the detector resistance changes. The detector card interprets this as a fault, and provides a fault indication.
 - (b) When an overheat detector element pressure switch opens (integrity switch) or closes (alarm switch), the loop resistance is changed, and the voltage sensed by the control card changes. The card determines which signal is sensed, and sends an appropriate (alarm or fault) signal to the AFOLTS card.
- (3) The AFOLTS card configures the signals from each system in AND logic, and determines the appropriate output to the flight crew as shown in table 1. Table 1 illustrates the normal operating mode.

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Logic System Operation Engine Fire/Ovht Detection Loops Logic AND Configuration Table 1			
INPUTS TO AFOLTS		AFOLTS OUTPUTS	
LOOP 1	LOOP 2	FIRE DETECTION SYSTEMS	OVERHEAT DETECTION SYSTEMS
ALARM	ALARM	FIRE	OVHT
ALARM	- - -	EICAS LOOP 1	EICAS LOOP 1
ALARM	FAULT	FIRE	OVHT
- - -	ALARM	EICAS LOOP 2	EICAS LOOP 2
FAULT	ALARM	FIRE	OVHT
FAULT	- - -	EICAS LOOP 1	EICAS LOOP 1
FAULT	FAULT	FIRE	FAIL
- - -	FAULT	EICAS LOOP 2	EICAS LOOP 2

- (4) Dual Loop Faults.
- (a) Dual loop engine fire detection system faults, which render the system inoperable, will produce FAIL outputs from AFOLTS on completion of a system test. Table 2 illustrates the test mode.
- (5) An engine fire indication is given by the following:
- (a) The appropriate red (LEFT or RIGHT) fire switch handle, on the P8 control stand, lights up and unlocks.
- (b) The appropriate red (L or R) FUEL CONTROL switch, on quadrant stand P10, lights up.
- (c) The red FIRE light, on captain's instrument panel P1-3, comes on.
- (d) The appropriate fire warning message - L or R ENGINE FIRE, is displayed on EICAS (Engine Indication and Crew Alerting System - P2 panel).
- (e) The red master WARNING lights, on glareshield panels P7, come on.
- (f) The fire bell sounds, on the flight deck aural warning speakers.
- (6) A nacelle overheat indication is given by the following:
- (a) The appropriate amber engine overheat light - L or R ENG OVHT, on the P8 control stand, comes on.
- (b) The appropriate overheat caution message - L or R ENG OVHT, is displayed on EICAS (P2).

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- (c) The amber master CAUTION lights, on glareshield panels P7, come on (inhibited when both fuel control switches are in cutoff).
 - (d) The caution annunciation owl tone sounds, on the flight deck aural warning speakers (inhibited when both fuel control switches are in cutoff).
 - (7) A dual-loop fault indication is given by the following:
 - (a) The amber FAIL P-RESET switchlight, on the P8 control stand, comes on.
 - (b) The advisory message, FIRE/OVHT SYS, is displayed on EICAS (P2).
 - (c) The appropriate system status/maintenance messages are displayed on EICAS:
 - 1) L ENG OH LP 1 and 2.
 - 2) R ENG OH LP 1 and 2.
 - 3) L ENG FIRE LP 1 and 2.
 - 4) R ENG FIRE LP 1 and 2.
 - (8) The FAIL P-RESET switchlight is pressed to reset the fault monitoring circuitry of the failed system. This also turns off the FAIL P-RESET switchlight, and clears the EICAS advisory message - FIRE/OVHT SYS.
 - (9) A single-loop fault or alarm signal indication is given by EICAS displaying the appropriate status/maintenance message:
 - (a) L ENG OH LP 1 or 2.
 - (b) R ENG OH LP 1 or 2.
 - (c) L ENG FIRE LP 1 or 2.
 - (d) R ENG FIRE LP 1 or 2.
 - (10) Detector, card, or associated wiring failures may not provide a valid fault output at the moment of failure. These inoperative loops can only be detected during a system test.
- B. Test (TABLE 2)

Engine Fire/Overheat Detection Test Logic Table 2			
INPUTS TO AFOLTS DURING SYSTEM TEST		AFOLTS CONFIGURATION AFTER TEST	EICAS MESSAGE AFTER TEST
LOOP 1	LOOP 2		
- - -	- - -	DUAL LOOP	NONE
- - -	FAULT	LOOP 1	EICAS LOOP 2
FAULT	- - -	LOOP 2	EICAS LOOP 1
FAULT	FAULT	FAIL	FIRE/OVHT SYS EICAS LOOP 1 EICAS LOOP 2

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- (1) AIRPLANES WITH SYSTRON DONNER DETECTORS;
Refer to the data that follows:
 - (a) When a test occurs, the AFOLTS cards send out signals to each loop of the detection systems. Returned signals indicate operating loops. If any loop is found faulty, AFOLTS reconfigures that system to operate on the remaining loop. If the remaining loop sustains an alarm, then a fire/overheat warning indication results. If the remaining loop sustains a fault, then a fail indication results.
- (2) AIRPLANES WITH GRAVINER DETECTORS;
Refer to the data that follows:
 - (a) When a test occurs, the AFOLTS cards send out signals to each loop of the detection systems. Returned signals indicate operating loops. If any loop is found faulty, AFOLTS reconfigures that system to operate on the remaining loop.
 - (b) For engine fire detection loops, if the remaining loop sustains an alarm or fault, fire indications result. For nacelle overheat detection loops, if the remaining loop sustains an alarm, overheat indications result. If the remaining overheat loop sustains a fault, fail indications result.
- (3) Power-up mode:
 - (a) Whenever power is first applied, an automatic system self-test occurs. All single-loop status/maintenance messages are momentarily displayed on EICAS (P2). If any loop is found faulty, then the appropriate loop message remains on EICAS display, and the system is reconfigured to the other loop. If both loops of a system are found faulty, then the FAIL P-RESET switchlight (on P8) comes on, and EICAS displays the advisory message - FIRE/OVHT SYS. Cockpit fire/overheat warnings will not be initiated by a power-up test.
- (4) Manual system test:
 - (a) When the ENG/APU/CARGO switch on the fire/overheat test panel (on P8) is pressed and held, the engine, APU, and cargo detection systems go through a self-test. All loop messages are displayed on EICAS. The ECS/MSG switch is used to advance to the next EICAS page in order to display all EICAS messages. After a two to four-second delay, a successful test terminates with all fire and overheat indications displayed. The engine indications are:
 - 1) The red LEFT and RIGHT fire switch handles light up, and unlock (on P8).

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- 2) The red L and R FUEL CONTROL switches light up (on P10).
 - 3) The red FIRE light comes on (on P1-3).
 - 4) The amber L and R ENG OVHT lights come on (on P8).
 - 5) EICAS displays L and R ENGINE FIRE (warnings), and L and R ENG OVHT (cautions).
 - 6) The red master WARNING lights come on (on P7).
 - 7) The fire bell sounds on the aural warning speakers.
- (b) When the ENG/APU/CARGO switch is released, all messages and indications should clear – except for any faulty-loop messages which will remain on EICAS. The FAIL P-RESET switchlight, and EICAS advisory message – FIRE/OVHT SYS, will also remain on if there is a dual-loop fault.
- (5) The manual system test and power-up mode will not invalidate an alarm in progress.

C. Control

- (1) Turn-on procedure:
- (a) Provide electrical power (Ref 24-22-00).
 - (b) Check that the following circuit breakers on overhead circuit breaker panel P11 are closed:
 - 1) FIRE DETECTION L ENGINE 1 and 2
 - 2) FIRE DETECTION R ENGINE 1 and 2
 - 3) FIRE DET ALTN PWR ENGINE LEFT and RIGHT

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ENGINE FIRE DETECTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CARD 1 - FIRE/OVHT LOGIC/TEST, M10224	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD 2 - FIRE/OVHT LOGIC/TEST, M10274	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 L ENG FIRE DET, M681	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 L ENG FIRE DET, M682	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 R ENG FIRE DET, M683	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 R ENG FIRE DET, M684	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 L NACELLE OVHT DET, M10229	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 L NACELLE OVHT DET, M10276	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 R NACELLE OVHT DET, M10230	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 R NACELLE OVHT DET, M10275	1	1	119BL MAIN EQUIP CTR, P54	26-10-01
CIRCUIT BREAKERS -	1		FLT COMPT, P11	
FIRE DET ALIN PWR ENG L, C763		1	11J26	*
FIRE DET ALTN PWR ENG R, C764		1	11J27	*
FIRE DETECTION L ENG 1, C774		1	11B20	*
FIRE DETECTION L ENG 2, C783		1	11B21	*
FIRE DETECTION R ENG 1, C775		1	11B22	*
FIRE DETECTION R ENG 2, C784		1	11B23	*
COMPUTER - (REF 31-41-00, FIG. 101)				
EICAS L, M10181				
EICAS R, M10182				
DIODE - BUS ISOLATION, R193,R194,R197,R198	1	4	FLT COMPT, BEHIND P5	*
ELEMENT - ENGINE FIRE DETECTOR, TS5148,TS5146,TS5144,TS5142, TS5147,TS5145,TS5143,TS5141	3	8	413AL,423AL,414AR,424AR, 415AL,425AL,417AL,427AL, EACH ENGINE	26-11-01
ELEMENT - ENGINE OVHT DETECTOR, TS5064,TS5065,TS5073,TS5074	2	4	415AL,425AL,416AR,426AR, EACH ENGINE	26-11-01
LIGHT - L ENG OVHT, YQNLO01	1	1	FLT COMPT, P8, FIRE CONT PANEL, M10443	*
LIGHT - R ENG OVHT, YQNLO03	1	1	FLT COMPT, P8, FIRE CONT PANEL, M10443	*
LIGHT - L ENG VALVE, YQSL002	1	1	FLT COMPT, P8, FUEL CONT, M73	*
LIGHT - R ENG VALVE, YQSL004	1	1	FLT COMPT, P8, FUEL CONT, M73	*
PANEL - FIRE/OVHT TEST, M10445	1	1	FLT COMPT, P8	26-11-02
PANEL - (REF 26-21-00, FIG. 101) ENG FIRE CONTROL, M10443				

* SEE THE WDM EQUIPMENT LIST

Engine Fire Detection System - Component Index
Figure 101 (Sheet 1)

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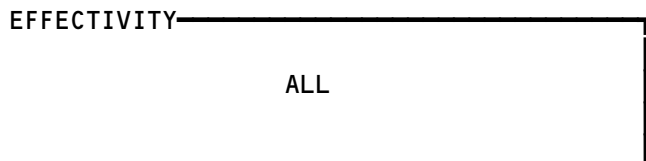
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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
PANEL - (AMM 28-22-00, FIG. 101) FUEL CONTROL, M73				
SWITCH - TEST, ENG/APU/CARGO, YQQS001	1	1	FLT COMPT, P8, FIRE TEST, M10445	*
SWITCH - FAIL LIGHT RESET, YQQS003	1	1	FLT COMPT, P8, FIRE TEST, M10445	*
SWITCH - (AMM 26-21-00, FIG. 101) L ENGINE FIRE, S37 R ENGINE FIRE, S38				

* SEE THE WDM EQUIPMENT LIST

Engine Fire Detection System - Component Index
 Figure 101 (Sheet 2)

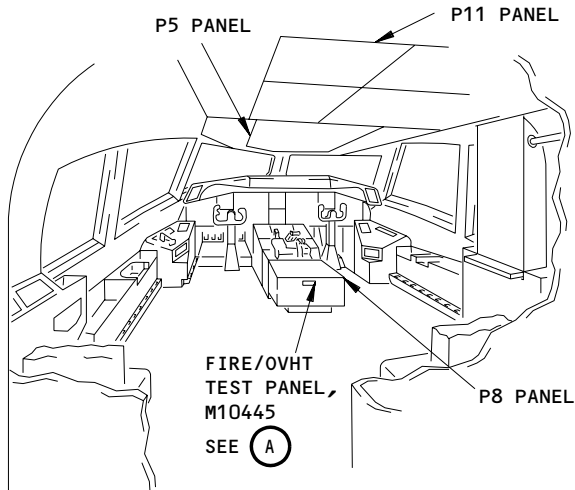


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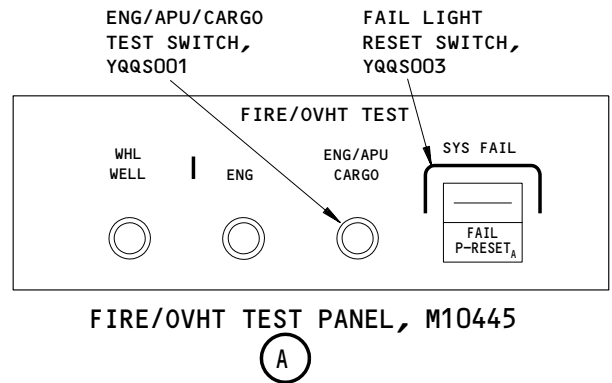
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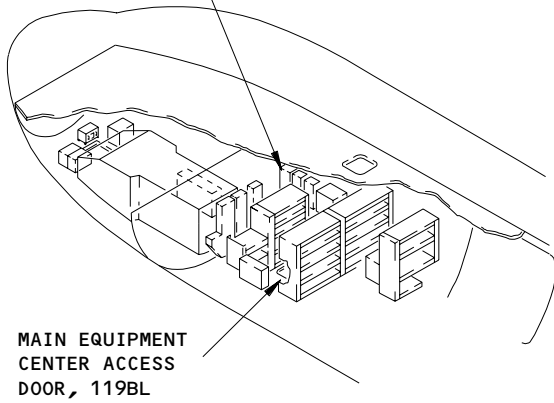
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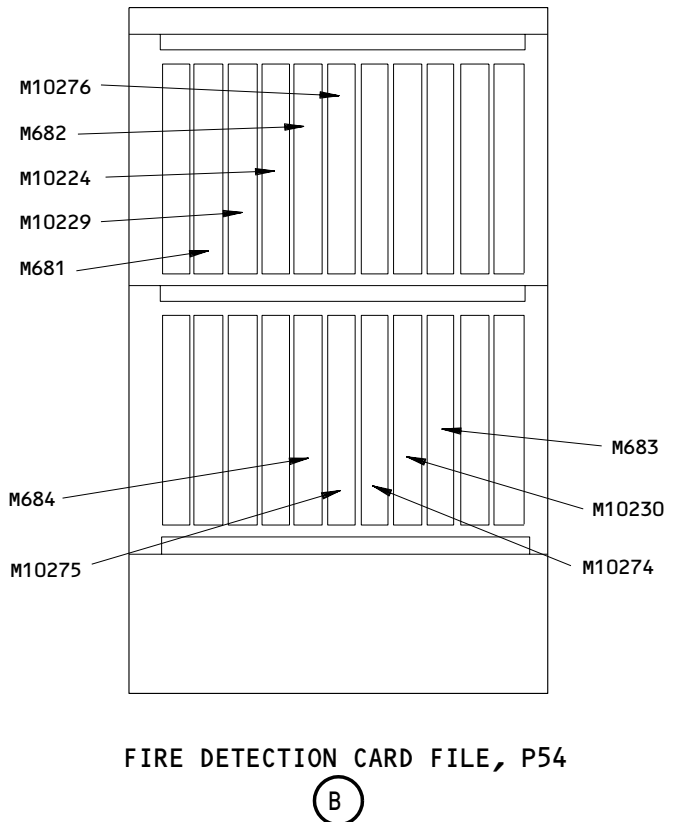
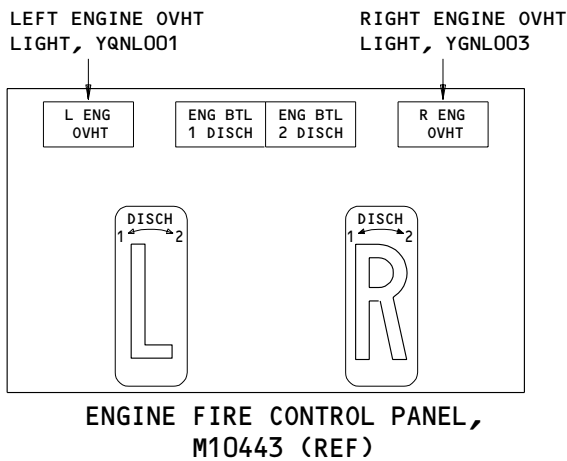
FLIGHT COMPARTMENT



FIRE DETECTION CARD FILE, P54
SEE (B)



MAIN EQUIPMENT CENTER



**Engine Fire Detection System - Component Location
Figure 102 (Sheet 1)**

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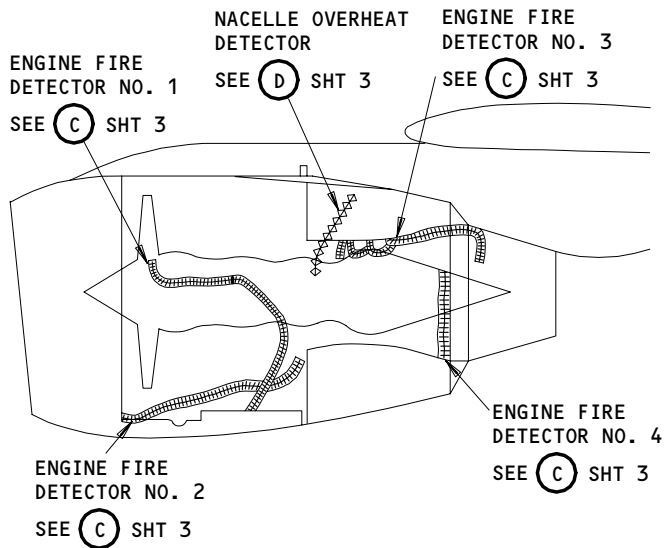
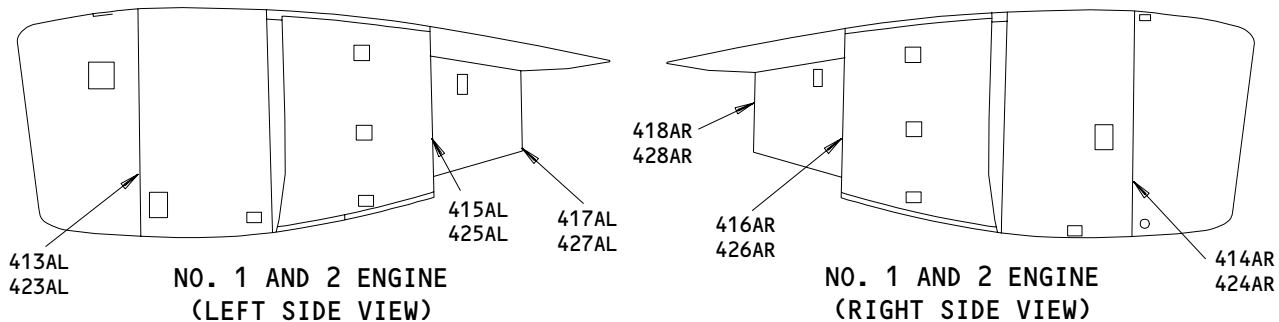
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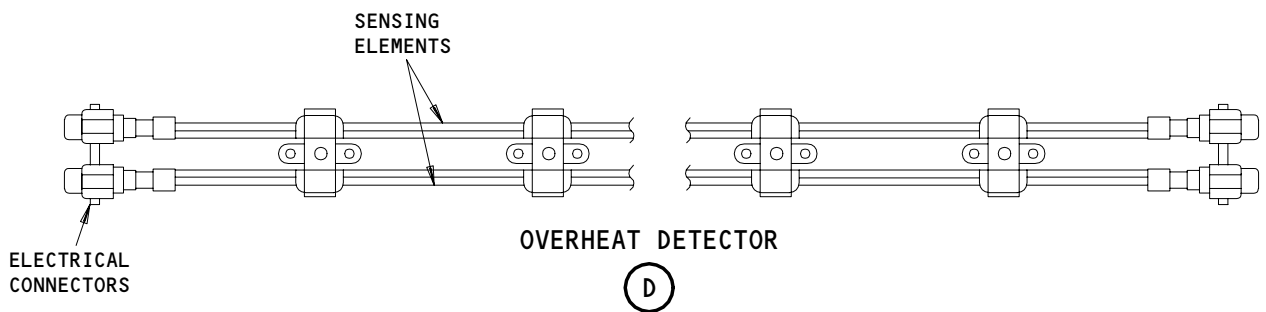
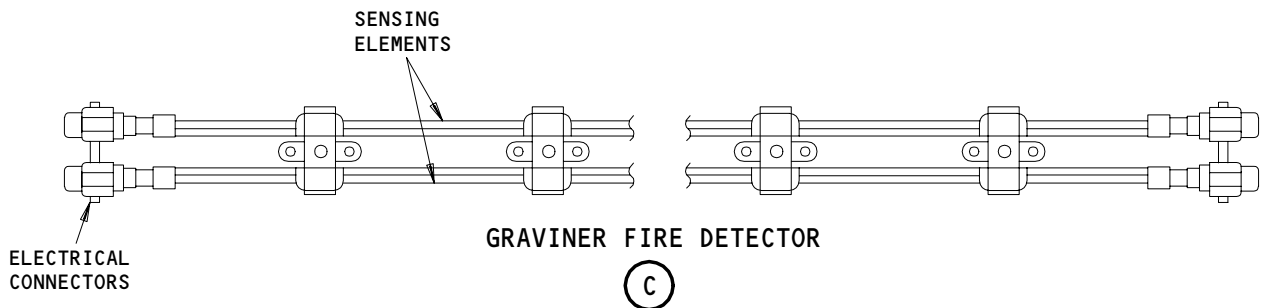
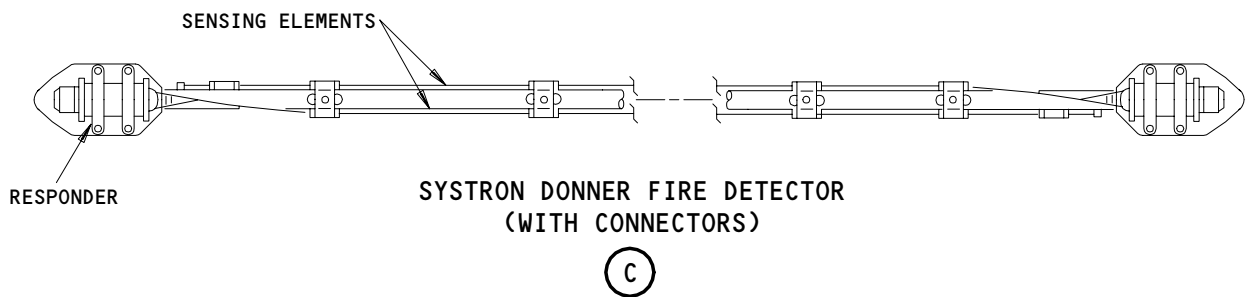
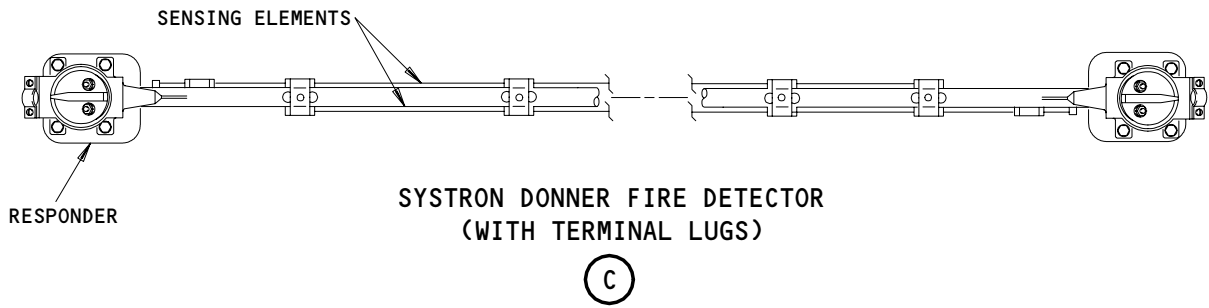

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Engine Fire Detection System - Component Location
 Figure 102 (Sheet 2)

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**Engine Fire Detection Component Location
 Figure 102 (Sheet 3)**

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ENGINE FIRE AND OVERHEAT DETECTION SYSTEM – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to do an operational test and a system test of the engine fire and overheat detection system.
- (1) The operational test will make sure the system operates correctly in a minimum of time. Only equipment installed in the plane will be used.
 - (2) The system test increases the function of the operational test. The system test will make sure that all of the necessary operations of the system occur correctly.

TASK 26-11-00-715-001

2. Operational Test – Engine Fire Detection System

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test

B. Access

- (1) 119/120 Main Equipment Center
- (2) 211/212 Flight Compartment

C. Prepare for the Test

S 865-002

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

S 755-003

- (2) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00/501).
 - (b) Warning System (AMM 31-51-00/501).
 - (c) Master Dim and Test System (AMM 33-16-00/501).

S 865-004

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6C1, FUEL COND CONT L
 - (b) 6C2, FUEL COND CONT R
 - (c) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (d) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (e) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (f) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 865-005

- (4) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11B24, FIRE DETECTION APU 1

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- (f) 11B25, FIRE DETECTION APU 2
- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11J24, FIRE DET ALTN PWR CARGO
- (j) 11J25, FIRE DET ALTN PWR APU
- (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
- (m) 11D7, ENGINES STBY IGN LEFT 1
- (n) 11D8, ENGINES STBY IGN LEFT 2
- (o) 11D9, ENGINES STBY IGN RIGHT 1
- (p) 11D10, ENGINES STBY IGN RIGHT 2
- (q) 11D19, ENGINES START CONT LEFT
- (r) 11D20, ENGINES START CONT RIGHT
- (s) 11L1, LEFT ENGINES STBY IGN 1
- (t) 11L28, RIGHT ENGINES STBY IGN 1

D. Do a Test of the Left Engine Fire Detection System

S 865-217

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the two circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2

S 755-007

- (2) Make sure the LEFT engine fire switch handle, on the aft pilots control stand, P8, is locked in position.

S 865-008

- (3) Push the ECS MSG switch on the EICAS maintenance panel (on P61).

S 865-009

- (4) Push and hold the ENG/APU/CARGO switch, on the FIRE/OVHT TEST panel, (on P8).

S 865-010

- (5) After 2-4 seconds, make sure these indications occur:
 - (a) The fire bell is heard.
 - (b) The red LEFT engine fire switch handle light, on P8, comes on.

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- (c) The red L FUEL CONTROL switch light, on the quadrant stand, P10, comes on.
- (d) The red FIRE light, on the captains instrument panel, P1-3, comes on.
- (e) The yellow L ENG OVHT light, on the P8 panel, comes on.
- (f) The EICAS message L ENGINE FIRE shows on the top display.
- (g) The EICAS message L ENG OVHT shows on the top display.
- (h) The red master WARNING lights, on the glareshield panel, P7, comes on.
- (i) The yellow CAUTION lights, on the glareshield panel, P7, comes on.

S 865-011

- (6) Push the ECS MSG switch as necessary to see subsequent EICAS pages.

S 755-124

- (7) Make sure these EICAS messages show on the bottom display:
 - (a) L ENG OH LP 1 and 2.
 - (b) L ENG FIRE LP 1 and 2.

S 865-012

- (8) Pull out the LEFT engine fire switch handle (on P8). Do not turn the handle.
 - (a) Make sure the fire bell stops.

S 865-014

- (9) Push back in the LEFT engine fire switch handle.

S 865-071

- (10) Open this circuit breaker on the P11 panel and attach DO-NOT-CLOSE tag:
 - (a) 11B20, FIRE DETECTION L ENGINE 1

S 865-216

- (11) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
 - (a) 11J26, FIRE DET ALTN PWR ENGINE LEFT

S 755-073

- (12) Make sure the indications in step (5) and (7) occur.

S 865-015

- (13) Release the ENG/APU/CARGO switch.

S 755-016

- (14) Make sure all of the indications stop.

S 865-017

- (15) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - (a) 11J26, FIRE DET ALTN PWR ENGINE LEFT

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- (b) 11B21, FIRE DETECTION L ENGINE 2
E. Do a Test of the Right Engine Fire Detection System

S 865-218

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the two circuit breakers at the same time.

- (a) 11B22, FIRE DETECTION R ENGINE 1
(b) 11B23, FIRE DETECTION R ENGINE 2

S 755-219

- (2) Make sure the RIGHT engine fire switch handle, on the aft pilots control stand, P8, is locked in position.

S 865-220

- (3) Push the ECS MSG switch on the EICAS maintenance panel (on P61).

S 865-221

- (4) Push and hold the ENG/APU/CARGO switch, on the FIRE/OVHT TEST panel, (on P8).

S 865-222

- (5) After 2-4 seconds, make sure these indications occur:
- (a) The fire bell is heard.
 - (b) The red RIGHT engine fire switch handle light, on P8, comes on.
 - (c) The red R FUEL CONTROL switch light, on the quadrant stand, P10, comes on.
 - (d) The red FIRE light, on the captains instrument panel, P1-3, comes on.
 - (e) The yellow R ENG OVHT light, on the P8 panel, comes on.
 - (f) The EICAS message R ENGINE FIRE shows on the top display.
 - (g) The EICAS message R ENG OVHT shows on the top display.
 - (h) The red master WARNING lights, on the glareshield panel, P7, comes on.
 - (i) The yellow CAUTION lights, on the glareshield panel, P7, comes on.

S 865-223

- (6) Push the ECS MSG switch as necessary to see subsequent EICAS pages.

S 755-224

- (7) Make sure these EICAS messages show on the bottom display:
- (a) R ENG OH LP 1 and 2.
 - (b) R ENG FIRE LP 1 and 2.

S 865-225

- (8) Pull out the RIGHT engine fire switch handle (on P8). Do not turn the handle.
- (a) Make sure the fire bell stops.

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- S 865-226
(9) Push back in the RIGHT engine fire switch handle.
- S 865-227
(10) Open this circuit breaker on the P11 panel and attach DO-NOT-CLOSE tag:
(a) 11B22, FIRE DETECTION R ENGINE 1
- S 865-228
(11) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
- S 755-229
(12) Make sure the indications in steps (5) and (7) occur.
- S 865-230
(13) Release the ENG/APU/CARGO switch.
- S 755-231
(14) Make sure all of the indications stop.
- S 865-232
(15) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
(b) 11B23, FIRE DETECTION R ENGINE 2
- F. Do a Test of the Fire Detection Fail Light
- S 865-070
(1) Open all of circuit breakers on the P11 panel which are in TABLE 1 for the left engine fire detection system. Attach DO-NOT-CLOSE tags.

TABLE 1		
SYSTEM	PRINTED CIRCUIT CARD	CIRCUIT BREAKERS
L ENGINE FIRE	M681 - L ENG FIRE LOOP 1 M682 - L ENG FIRE LOOP 2	11B20, FIRE DETECTION L ENGINE 1 11B21, FIRE DETECTION L ENGINE 2
R ENGINE FIRE	M683 - R ENG FIRE LOOP 1 M684 - R ENG FIRE LOOP 2	11B22, FIRE DETECTION R ENGINE 1 11B23, FIRE DETECTION R ENGINE 2

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S 755-020

- (2) Make sure these circuit breakers on the P11 panel are open:
(a) 11J26, FIRE DET ALTN PWR ENGINE LEFT
(b) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 755-021

- (3) Make sure these circuit breakers on the P11 panel are closed:
(a) 11A32, INDICATOR LIGHTS 1
(b) 11A33, INDICATOR LIGHTS 2
(c) 11B18, WARN ELEX B
(d) 11J33, WARN ELEX A

S 025-083

- (4) Remove the printed circuit cards, M681 and M682, from the fire detection card file, P54. P54 is in the E/E bay, along the right side of the nose gear wheel well.

S 865-084

- (5) Remove the DO-NOT-CLOSE tags and close the fire detection left engine circuit breakers which were opened in Table 1.

NOTE: The two circuit breakers must be closed at the same time.

S 755-022

- (6) Make sure the yellow FAIL P-RESET light (P8) is on.

S 755-023

- (7) Make sure the EICAS message FIRE/OVHT SYS shows on the top display.

S 755-074

- (8) Make sure the EICAS messages L ENG FIRE LP 1 and 2 show on the bottom display.

S 865-024

- (9) Push the FAIL P-RESET switch-light.

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S 755-025

- (10) Make sure the yellow FAIL P-RESET light (P8) goes off.

S 755-026

- (11) Make sure the EICAS message FIRE/OVHT SYS does not show on the top display.

S 755-075

- (12) Make sure the EICAS messages L ENG FIRE LP 1 and 2 show on the bottom display.

S 865-027

- (13) Open the circuit breakers on the P11 panel which were closed, in Table 1, and attach DO-NOT-CLOSE identifications.

S 435-028

- (14) Install the printed circuit cards, M681 and M682.

S 865-029

- (15) Remove the DO-NOT-CLOSE tags, and close the circuit breakers on the P11 panel which were opened, in Table 1.

NOTE: The two circuit breakers must be closed at the same time.

S 715-030

- (16) Do the test again for the Right Fire Detection System. Use the circuit breakers and the printed circuit cards for the right engine fire detection system as listed in Table 1.

S 865-031

- (17) Put the airplane back to its usual condition.

TASK 26-11-00-735-032

3. System Test - Engine Fire Detection System

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control

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

B. Access

(1) Location Zones

119/120	Main Equipment Center
211/212	Flight Compartment
410	No. 1 Power Plant (L)
420	No. 2 Power Plant (R)

(2) Access Panels

413/423	L, R Fan Cowl Panel (Left)
414/424	L, R Fan Cowl Panel (Right)
415/425	L, R Fan Reverser (Left)
416/426	L, R Fan Reverser (Right)

C. Prepare for Test

S 865-034

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (b) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 865-256

- (2) Open these circuit breakers on the lower sidewall panel, P6 and attach DO-NOT-CLOSE tags:
 - (a) 6C1, L FUEL COND CONT
 - (b) 6C2, R FUEL COND CONT

S 015-241

WARNING: 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.

- (3) Open the fan cowl panels (AMM 71-11-04).

S 015-036

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

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

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S 015-085

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

- (5) Open the thrust reversers (AMM 78-31-00/201).
D. Do a Test of the Nacelle Overheat System:

S 865-038

- (1) Open these P11 panel circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2

S 035-125

- (2) Prepare the detectors.
(a) Disconnect the electrical connectors, D2122 and D2402, from the nacelle overheat detectors, TS5064 and TS5065.
(b) Connect a jumper wire between pins A and D on connectors D2122 and D2402.

S 865-043

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Both of the circuit breakers must be closed at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2

S 755-044

- (4) Make sure these indications occur:
(a) The caution annunciation is heard.
(b) The yellow L ENG OVHT light, on P8, comes on.
(c) The EICAS message L ENG OVHT shows on the top display.
1) The EICAS messages L ENG OH LP 1 and L ENG OH LP 2 show on the bottom display.
(d) The yellow master CAUTION lights, on P7, come on.

S 865-045

- (5) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2

S 425-126

- (6) Return the detectors to normal.
(a) Remove the jumper wires from connector D2122 and D2402.

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- (b) Connect the electrical connector, D2122, to TS5064 and the electrical connector, D2402, to TS5065.
- E. Do a Test of the Fire Detector.

S 845-234

- (1) AIRPLANES WITH SYSTRON DONNER FIRE DETECTORS WITH CONNECTORS;
Prepare the detectors.
- (a) Disconnect electrical connectors, D1406 and D1408, from the engine fire detectors, TS5037 and TS5036.
- (b) Connect a jumper wire between pins A and D on electrical connectors D1406 and D1408.

S 845-235

- (2) AIRPLANES WITH SYSTRON-DONNER FIRE DETECTORS WITH TERMINAL LUGS;
Prepare the detectors.
- (a) Connect a jumper wire between the terminal studs of the fire detector, TS5036.
- (b) Connect a jumper wire between the terminal studs of the fire detector, TS5037.

S 845-236

- (3) AIRPLANES WITH GRAVINER FIRE DETECTORS;
Prepare the detectors.
- (a) Disconnect electrical connectors, D1450 and D1452, from the engine fire detectors, TS5148 and TS5147.
- (b) Connect a jumper wire between the center conductor of fire detector TS5148 and ground.
- (c) Connect a jumper wire between the center conductor of the fire detector, TS5147, and ground.

S 865-055

- (4) Remove the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:

NOTE: Close the two circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2

S 755-056

- (5) Make sure these indications occur:
- (a) The red LEFT engine fire handle light, on P8, comes on.

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- (b) The red L FUEL CONTROL switch light, on the quadrant control stand, P10, comes on.
- (c) The red FIRE light, on the captains instrument panel, P1-3, comes on.
- (d) The EICAS message L ENGINE FIRE shows on the top display.
- (e) The EICAS messages L ENG FIRE LP 1 and L ENG FIRE LP 2 show on the bottom display.
- (f) The red master WARNING lights, on the glareshield panel, P7, comes on.
- (g) The fire bell is heard.

S 865-057

- (6) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2

S 845-237

- (7) AIRPLANES WITH SYSTRON-DONNER FIRE DETECTORS WITH CONNECTORS;
Return the detectors to the normal configuration.
 - (a) Remove the jumper wire from pins A and D on electrical connectors D1406 and D1408.
 - (b) Connect electrical connectors, D1406 and D1408, to the engine fire detectors, TS5037 and TS5036.

S 845-238

- (8) AIRPLANES WITH SYSTRON-DONNER FIRE DETECTORS WITH TERMINAL LUGS;
Return the detectors to the normal configuration.
 - (a) Remove the jumper wire from the terminal studs of the fire detector, TS5036.

S 845-239

- (9) AIRPLANES WITH GRAVINER FIRE DETECTORS;
Return the detectors to the normal configuration.
 - (a) Remove the jumper wire from the center conductor of fire detector TS5148 and ground.
 - (b) Remove the jumper wire from the center conductor of the fire detector, TS5147, and ground.
 - (c) Connect electrical connectors, D1450 and D1452, to the engine fire detectors, TS5148 and TS5147.

S 415-108

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

- (10) Close the thrust reversers (AMM 78-31-00/201).

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S 415-248

WARNING: 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 fan cowl panels (AMM 71-11-04/201).

S 865-065

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

S 915-129

(13) Do the Left Engine Fire Detection System Test again for the Right Engine Fire Detection System. Use the RIGHT system detectors and circuit breakers in Table 2 and make sure the RIGHT system indications occur.

(a) ROLLS ROYCE ENGINES WITH SYSTRON DONNER DETECTORS;
Refer to the table that follows:

TABLE 2		
SYSTEM	DETECTOR (CONNECTOR)	CIRCUIT BREAKERS
R NACELLE OVHT	LOOP 1 - TS5073 (D2800) LOOP 2 - TS5074 (D2804)	11B22, FIRE DETECTION R ENGINE 1 11B23, FIRE DETECTION R ENGINE 2
R FIRE DETECT	LOOP 1 - TS5037 (D1406) LOOP 2 - TS5036 (D1408)	

(b) ROLLS ROYCE ENGINES WITH GRAVINER DETECTORS;
Refer to the table that follows:

TABLE 2		
SYSTEM	DETECTOR (CONNECTOR)	CIRCUIT BREAKERS
R NACELLE OVHT	LOOP 1 - TS5073 (D2800) LOOP 2 - TS5074 (D2804)	11B22, FIRE DETECTION R ENGINE 1 11B23, FIRE DETECTION R ENGINE 2
R FIRE DETECT	LOOP 1 - TS5148 (D1450) LOOP 2 - TS5147 (D1452)	

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F. Put the Airplane back to its Usual Condition.

S 865-067

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6C1, FUEL COND CONT L
 - (b) 6C2, FUEL COND CONT R
 - (c) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (d) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (e) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (f) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 865-068

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the system 1 and 2 circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B23, FIRE DETECTION R ENGINE 2
- (e) 11B24, FIRE DETECTION APU 1
- (f) 11B25, FIRE DETECTION APU 2
- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11D7, ENGINES STBY IGN LEFT 1
- (j) 11D8, ENGINES STBY IGN LEFT 2
- (k) 11D9, ENGINES STBY IGN RIGHT 1
- (l) 11D10, ENGINES STBY IGN RIGHT 2
- (m) 11D19, ENGINES START CONT LEFT
- (n) 11D20, ENGINES START CONT RIGHT
- (o) 11L1, LEFT ENGINES STBY IGN 1
- (p) 11L28, RIGHT ENGINES STBY IGN 1
- (q) 11J24, FIRE DET ALTN PWR CARGO
- (r) 11J25, FIRE DET ALTN PWR APU
- (s) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (t) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 865-069

- (3) Remove electrical power if it is not necessary (Ref 24-22-00).

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ENGINE FIRE AND OVERHEAT DETECTOR ELEMENT – REMOVAL/INSTALLATION

1. General

- A. Four dual-element fire detectors, and one dual-element overheat detector are located in each engine area. The removal/installation procedure is the same for each detector element.

TASK 26-11-01-024-001

2. Remove the Detector Element (Fig. 401)

A. References

- (1) 24-22-00/201, Electrical Power – Control
- (2) 71-11-04/201, Fan Cowl Panels
- (3) 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

- 410 No. 1 Power Plant (L)
- 420 No. 2 Power Plant (R)

(2) Access Panels

- 413, 423 L, R, Fan Cowl Panel (Left)
- 414, 424 L, R, Fan Cowl Panel (Right)
- 415, 425 L, R, Fan Reverser (Left)
- 416, 426 L, R, Fan Reverser (Right)

C. Remove the Detector Element

S 864-002

- (1) To remove the electrical power from the left engine detector elements, open these circuit breakers on the overhead circuit breaker panel, P11, attach DO-NOT-CLOSE tags:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11J26, FIRE DET ALTN PWR ENGINE LEFT

S 864-003

- (2) To remove the electrical power from the right engine detector elements, open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B22, FIRE DETECTION R ENGINE 1

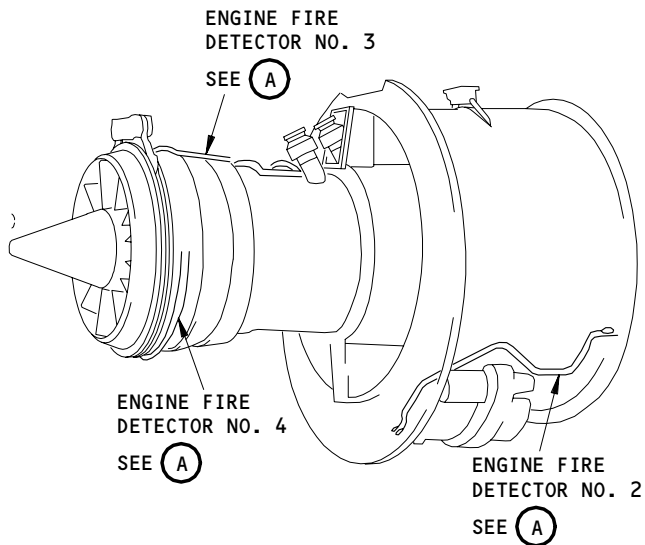
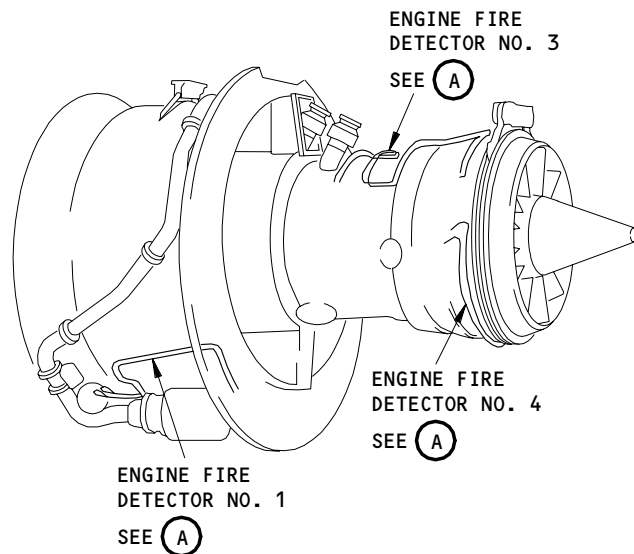
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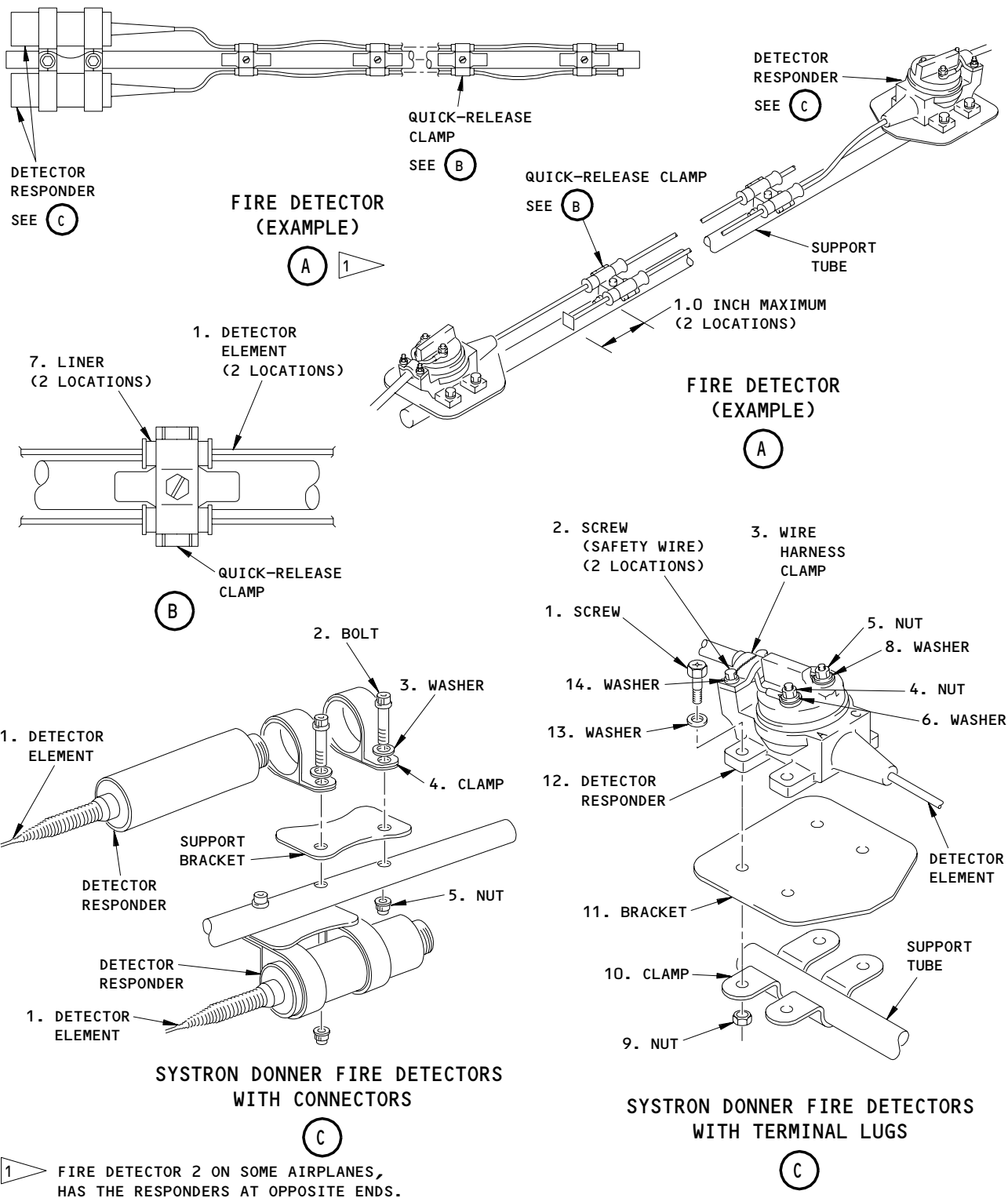
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Engine Fire Detector Element Installation
Figure 401 (Sheet 1)

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Engine Fire Detector Element Installation
Figure 401 (Sheet 2)

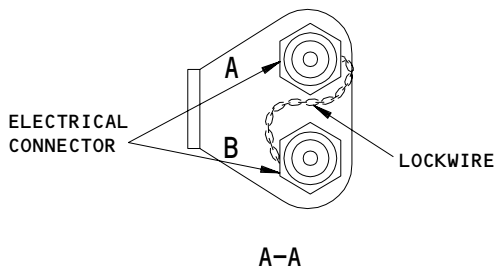
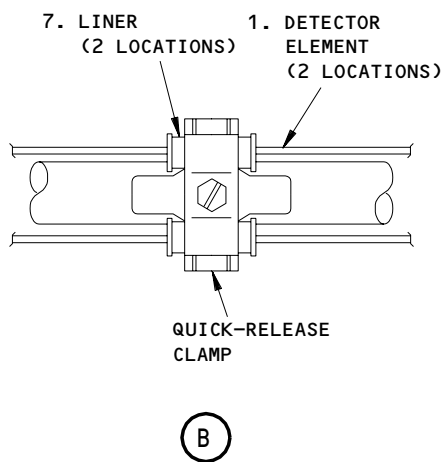
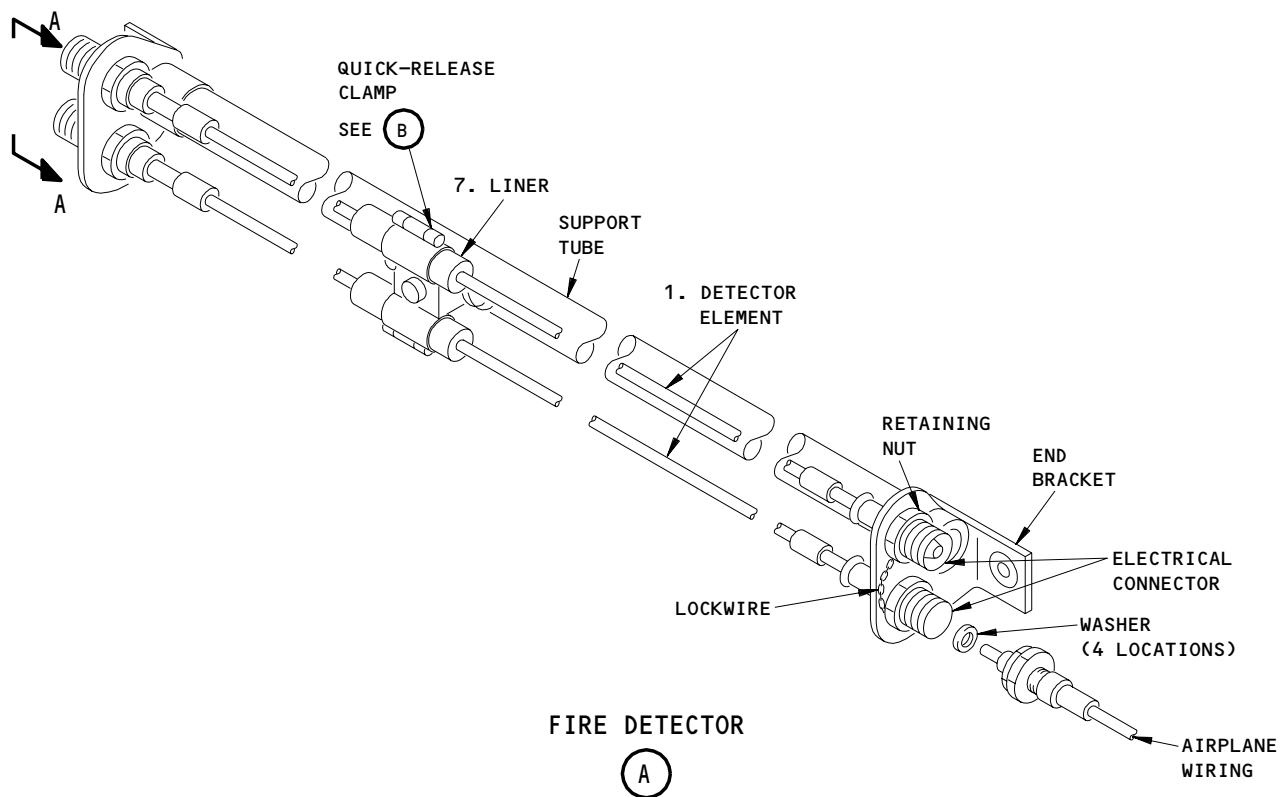
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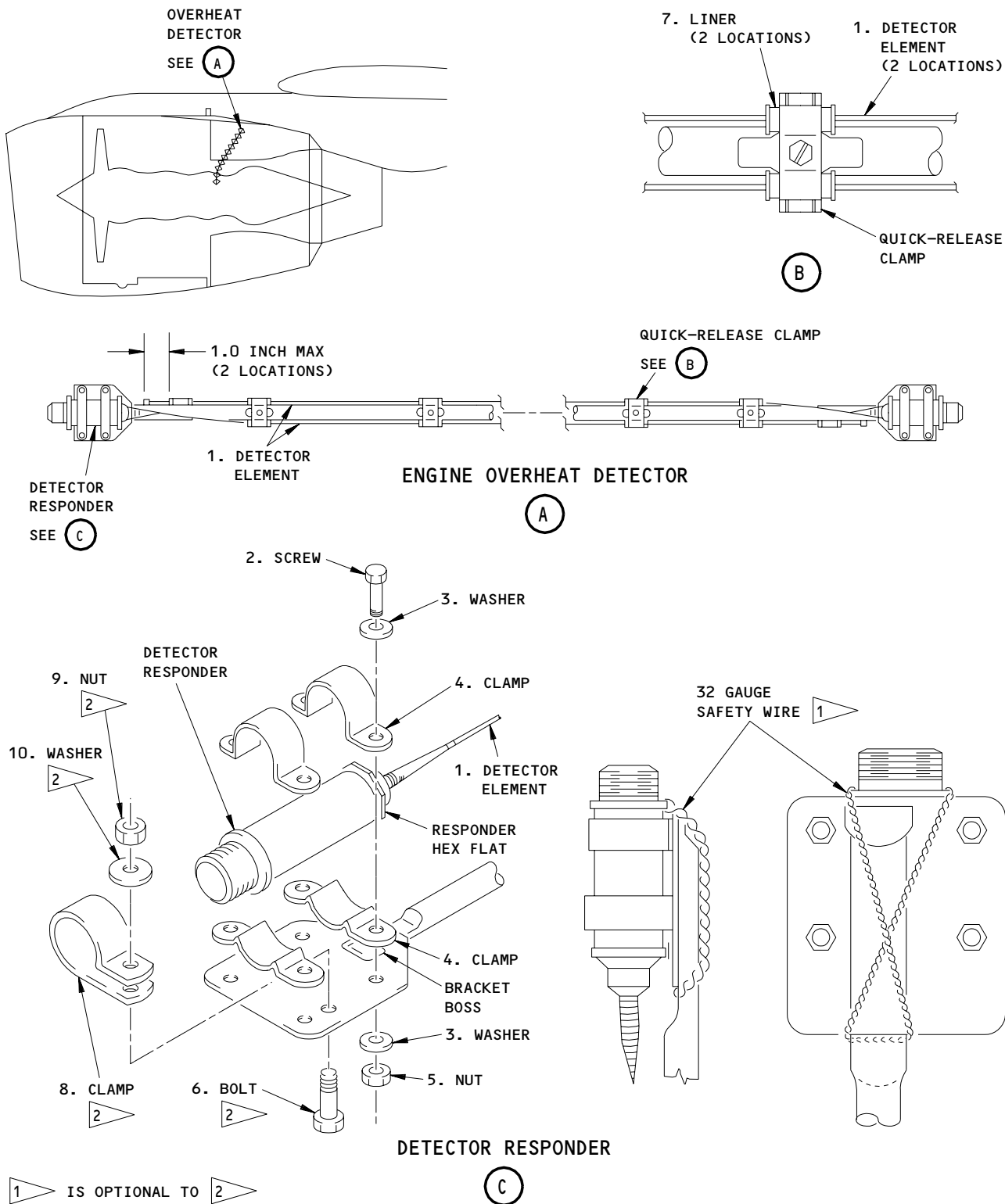
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Engine Fire Detector Element Installation
Figure 401 (Sheet 3)

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Engine Overheat Detector Element Installation
Figure 402

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- (b) 11B23, FIRE DETECTION R ENGINE 2
- (c) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 044-004

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

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

S 014-134

- (4) To access the detectors, do these steps.
 - (a) To access the forward fire detectors, open the fan cowl panels (AMM 71-11-04/201).

WARNING: FAILURE TO FOLLOW AMM 78-31-00/201 CAN CAUSE INJURY TO AND/OR DAMAGE TO THE FAN COWL AND FAN C-DUCT AND THRUST REVERSER.

- (b) To access the aft detectors, open the fan C-duct and thrust reversers (AMM 78-31-00/201).

D. SYSTRON DONNER FIRE DETECTORS WITH CONNECTORS;
Remove the fire detector elements

S 034-024

- (1) Remove the safety wire from the responder.

S 034-022

- (2) Disconnect the electrical connection and install a protective cap.

S 034-021

- (3) Remove the two bolts to remove the two clips on the detector responder.

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S 024-026

- (4) Open the quick-release clamps and remove the detector element.

E. ENGINES WITH GRAVINER DETECTORS;
Remove the Fire Detector Elements

S 014-080

- (1) Open the quick-release clamps.

S 024-081

- (2) Remove the detector elements.

S 014-082

- (3) Disconnect the electrical connectors at each end of the detector element to be removed.

S 434-083

- (4) Put caps on the electrical connectors for protection.

S 024-084

- (5) Discard the copper crush washers.

S 024-085

- (6) Remove the nut which holds the detector element to the end bracket of the support tube, at the two ends.

S 024-086

- (7) Remove the connectors from the end brackets.

F. SYSTRON DONNER FIRE DETECTORS WITH TERMINAL LUGS;
Remove the Fire Detector Elements

S 024-156

- (1) Remove the safety wire and the two screws (2) to remove the wiring clamp (3).

S 024-087

- (2) Remove the silcoset sealing compound to allow access to the nuts (4 and 5).

S 024-088

- (3) Remove the two nuts (4 and 5) and the engine wire lugs from the responder lugs.

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S 024-089

- (4) Remove the four screws (1) which attach the responder to its mounting bracket.

S 014-090

- (5) Open the quick release clamps.

S 024-091

- (6) Remove the detector element.

G. Remove the Overheat Detector Elements

S 034-027

- (1) Disconnect the electrical connection and install a protective cap.

S 034-028

- (2) Remove the four screws (2) to remove the two clamps (4) on the detector responder.

S 034-030

- (3) Remove the safety wire if attached.

S 034-031

- (4) For the overheat detectors with a third clamp, remove the one nut (9), washer (10), and bolt (6) to remove clamp (8).

S 034-034

- (5) Open the quick-release clamps to remove the detector element.

TASK 26-11-01-424-036

3. Install the Detector Element (Fig. 401)

A. Equipment

- (1) AIRPLANES WITH GRAVINER SYSTEMS;
Bonding Meter - AVTRON, T477W
- (2) Torque Wrench - commercially available

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B. Parts

(1) Refer to the IPC for part numbers and effectivities of the items in this table for engine fire detection.

(a) AIRPLANES WITH ROLLS ROYCE ENGINES AND SYSTRON DONNER FIRE DETECTOR SYSTEMS WITH CONNECTORS;
Use this table:

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Detector - Engine Fire	26-11-01	07 or 14	
	2	Bolt			
	3	Washer			
	4	Clamp			
	5	Nut			
	6	Liner			
	7				

(b) AIRPLANES WITH ROLLS ROYCE ENGINES AND SYSTRON DONNER FIRE DETECTORS WITH TERMINAL LUGS;
Use this table:

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401		Detector - Engine Fire	26-11-01	07 or 14	
	1	Screw			
	2	Screw			
	3	Wire Harness			
	4	Nut Clamp			
	5	Nut			
	6	Washer			
	7	Liner			
	8	Washer			
	9	Nut			
	10	Saddle Clamp			
	11	Bracket			
	12	Detector Responder			
	13	Washer			
14	Washer				

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(c) AIRPLANES WITH ROLLS ROYCE ENGINES AND GRAVINER FIRE DETECTION SYSTEMS;
Use this table:

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Detector - Engine Fire	26-11-01	07 or 14	
	2	Nut			
	7	Liner			

(2) Refer to the IPC for part numbers and effectivities of the items in this table for engine overheat detection.

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
402	1	Detector-Engine Overheat	26-11-01	05	
	2	Screw			
	3	Washer			
	4	Clamp			
	5	Nut			
	7	Liner			
	-	Shim (AR)			

C. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/201, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/601, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test System
- (5) AMM 70-12-04/201, Locking Techniques for Threaded Parts (Rolls-Royce Engines)
- (6) AMM 71-11-04/201, Fan Cowl Panels
- (7) AMM 78-31-00/201, Thrust Reverser System

D. Access

- (1) Location Zones

410	No. 1 Power Plant (L)
420	No. 2 Power Plant (R)

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- (2) Access Panels
 - 413, 423 L, R, Fan Cowl Panel (Left)
 - 414, 424 L, R, Fan Cowl Panel (Right)
 - 415, 425 L, R, Fan Reverser (Left)
 - 416, 426 L, R, Fan Reverser (Right)

E. SYSTRON DONNER FIRE DETECTORS WITH CONNECTORS;
Install the Fire Detector Elements

S 434-044

- (1) Install the responder with the two clamps (4), two bolts (2), washers (3), and nuts (5).

NOTE: Make sure the responder hex flat is parallel to the bracket boss.

S 434-048

CAUTION: DO NOT BEND THE DETECTOR ELEMENT. THIS CAN CAUSE DAMAGE TO THE ELEMENT.

- (2) Install the liners (7) on the detector element and install the element into the clamps in the correct position.

NOTE: Adjust the element for a maximum of 1 inch of overhang at the opposite end of the responder (Fig. 401).

S 414-051

- (3) Close the clamps and lock.

S 424-052

- (4) Remove the protective cap and install the electrical connection.

S 424-142

- (5) Wirelock the connection (AMM 70-12-04/201).

S 424-129

- (6) Use lockwire to lock the connector nuts in position.

F. ENGINES WITH GRAVINER;
Install the Fire Detector Elements

S 434-053

- (1) Install the one electrical connector, of the detector element, through the hole in the support tube end bracket, and tighten with the nut.

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S 434-054

CAUTION: DO NOT TWIST OR BEND THE DETECTOR ELEMENT. THIS CAN CAUSE DAMAGE TO THE ELEMENT.

(2) Install the detector element adjacent to the support tube.

S 984-128

(3) Make sure that any two clamps, which are attached, are not loose.

S 434-055

(4) Install the bushings (3) on the detector element at the location of the clamps.

S 434-056

(5) Put the element, with bushings, in the clamps and tighten.

S 434-057

(6) Install the remaining electrical connector through the hole in the end bracket of the support tube, and tighten with the nut.

S 754-058

(7) Make sure the resistance between the detector connector shell and the primary structure of the airplane is not more than 0.010 ohm.

S 434-059

(8) Lock with wire the connector nuts.

S 434-060

(9) Remove the protective caps from the airplane wiring connectors and mate with the detector element connectors. Use new copper crush washers. Tighten the fasteners as follows:

(a) Connectors: 80-100 pound-inches

(b) Retaining nut: 106-124 pound-inches

S 434-061

(10) Lock with wire the airplane wiring connectors to the element connectors.

G. AIRPLANES WITH SYSTRON DONNER FIRE DETECTORS WITH TERMINAL LUGS;
Install the fire detector elements

S 424-155

(1) Install the fire detector responder (12) to the bracket and raceway. Use the 4 bolts (1), 4 washers (13), and 4 nuts (9) and tighten.

S 424-095

(2) Install the electrical harness lugs to the terminal studs of the fire detector. Use 2 washers (6 and 8) and nuts (4 and 5) and tighten the nuts as follows:

(a) Nut (4): 25-30 pound-inches (2.8 - 3.3Nm)

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(b) Nut (5): 20-25 pound-inches (2.2 - 2.8Nm)

NOTE: The terminal studs and electrical harness lugs are of a different diameter to prevent cross wiring.

S 424-096

(3) Install the electrical harness clamp (3). Use the 2 screws (2) and lockwire.

S 114-130

WARNING: MAKE SURE THERE IS A GOOD FLOW OF AIR WHEN YOU USE FLUID TO REMOVE GREASE. YOU MUST WEAR GLOVES TO PREVENT SKIN CONTACT. YOU MUST NOT BREATHE TOO MUCH OF THE VAPOR NEAR THE FLUID. DO NOT SMOKE. THIS CAN CAUSE THE VAPOR TO DECOMPOSE AND BECOME VERY POISONOUS.

(4) Use a moist clean cloth which is free of lint. Make sure you put the fluid only on the cloth and away from the container. This will prevent contamination of the remaining fluid.

S 114-098

(5) Apply the moist cloth to these parts:
(a) The terminal studs and pieces which are attached
(b) The top of the fire detector body

S 434-099

(6) Apply silcoset sealing compound to the two terminal studs and the pieces which are attached. Apply to a minimum thickness of 0.039 inch (1.0mm).

S 434-100

CAUTION: DO NOT USE HEAT TO CURE THE SEALANT COMPOUND. THIS CAN CAUSE DAMAGE TO THE SEALANT COMPOUND.

(7) Use water to make a tissue moist and spread the tissue on the sealant compound to make it cure faster.

S 024-101

(8) Remove the tissue after 2 hours. The sealant compound will cure satisfactorily and be approved for flight.

NOTE: The sealant compound will cure fully after 48 hours at a minimum room temperature of 16 degrees celsius.

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S 424-102

CAUTION: DO NOT TWIST OR BEND THE DETECTOR ELEMENT. THIS CAN CAUSE DAMAGE TO THE ELEMENT.

- (9) Install the liners on the detector element, and install the element in the clamps in the correct position.

NOTE: Adjust the element for a maximum of 1 inch of overhang at the opposite end of the responder (Fig. 401).

At the clamp locations where only a single layer sensor is installed, a liner must be installed in the opposite side of the clamp. This will keep a constant load on the clamp spring.

S 414-103

- (10) Close the clamps and lock.

H. Install the Overheat Detector Elements

S 424-116

- (1) Install the responder with the two clamps (4), four screws (2), washers (3), and nuts (5).

NOTE: Make sure the responder hex flat is parallel to the bracket boss.

S 424-119

- (2) For the overheat detectors with two clamps, install lockwire (32 gage) on the responder (Fig. 401).

S 434-062

- (3) For the overheat detectors with a third (center) clamp, attach the center clamp (8) to the support bracket. Use a bolt (6), washer (10) and nut (9).

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S 434-065

- (4) Tighten the fasteners as follows:
(a) Screw: 20-40 pound-inches
(b) Bolt: 20-40 pound-inches

S 434-066

CAUTION: DO NOT BEND THE DETECTOR ELEMENT. THIS CAN CAUSE DAMAGE TO THE ELEMENT.

- (5) Install the liners (7) on the detector element, and install the element in the clamps in the correct position.

NOTE: Adjust the element for a maximum of 1 inch of overhang at the opposite end of the responder (Fig. 401).

S 414-069

- (6) Close the clamps and lock.

S 424-070

- (7) Remove the protective cap and install the electrical connection.

I. Return the airplane to the usual condition.

S 414-071

WARNING: FAILURE TO FOLLOW AMM 78-31-00/201 CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO THE FAN COWL AND FAN C-DUCT AND THRUST REVERSER.

- (1) Close the applicable fan cowl panels (AMM 71-11-04/201) and thrust reversers (AMM 78-31-00/201).

S 444-139

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

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J. Do a Test of the Detector Element Installation

S 864-074

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

S 754-075

- (2) Make sure these systems operate:
- (a) EICAS (AMM 31-41-00/201).
 - (b) Warning System (Ref 31-51-00/601).
 - (c) Master Dim and Test System (AMM 33-16-00/501).

S 864-076

- (3) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11B24, FIRE DETECTION APU 1
 - (f) 11B25, FIRE DETECTION APU 2
 - (g) 11B26, FIRE DETECTION CARGO 1
 - (h) 11B27, FIRE DETECTION CARGO 2
 - (i) 11J24, FIRE DET ALTN PWR CARGO
 - (j) 11J25, FIRE DET ALTN PWR APU
 - (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
- (m) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- 1) 6C1, FUEL COND CONT L
 - 2) 6C2, FUEL COND CONT R

S 864-077

- (4) Do the procedure for the left engine detectors.
- (a) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the two circuit breakers at the same time.

- 1) 11B20, FIRE DETECTION L ENGINE 1

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- 2) 11B21, FIRE DETECTION L ENGINE 2
 - (b) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel, P61.
 - (c) Push and hold the ENG/APU/CARGO switch on the FIRE/OVHT TEST panel, on the pilots aft control stand, P8.
 - (d) After 2-4 seconds, make sure these indications occur:
 - 1) The fire bell and caution annunciation are heard.
 - 2) The red LEFT engine fire handle light, on the pilots aft controls stand, P8, comes on.
 - 3) The red L FUEL CONTROL switch light, on the quadrant control stand, P10, comes on.
 - 4) The red FIRE light, on the captains instrument panel, P1-3, comes on.
 - 5) The yellow L ENG OVHT light, on the pilots aft control stand, P8, comes on.
 - 6) The EICAS messages L ENGINE FIRE and L ENG OVHT show on the top display.
 - 7) The red master WARNING and yellow CAUTION lights, on the glareshield panel, P7, come on.
 - (e) Push the ECS MSG switch, as necessary, to forward the EICAS pages. Make sure these EICAS messages show on the bottom display.
 - 1) L ENG OH LP 1 and 2
 - 2) L ENG FIRE LP 1 and 2
 - (f) Release the ENG/APU/CARGO switch.
 - (g) Make sure the indications stop.
 - (h) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - 1) 11B20, FIRE DETECTION L ENGINE 1
 - 2) 11B21, FIRE DETECTION L ENGINE 2
- S 864-078
- (5) Do the procedure again for the right engine detectors.
 - (a) Do the procedure again for thr right engine detection system. Use the right engine indications, and the circuit breakers listed below:
 - 1) 11B22, FIRE DETECTION R ENGINE 1

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2) 11B23, FIRE DETECTION R ENGINE 2

K. Put the airplane back to its usual condition.

S 864-123

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the system 1 and 2 circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B23, FIRE DETECTION R ENGINE 2
- (e) 11B24, FIRE DETECTION APU 1
- (f) 11B25, FIRE DETECTION APU 2
- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11J24, FIRE DET ALTN PWR CARGO
- (j) 11J25, FIRE DET ALTN PWR APU
- (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 864-124

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

- (a) 6C1, FUEL COND CONT L
- (b) 6C2, FUEL COND CONT R

S 864-079

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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FIRE/OVERHEAT TEST PANEL – REMOVAL/INSTALLATION

1. General

A. The FIRE/OVHT TEST panel, M10445, is on the pilots aft control stand, P8.

TASK 26-11-02-024-001

2. Remove the Panel

A. Remove the panel.

S 864-002

- (1) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
 - (a) 11A32, INDICATOR LIGHTS 1

S 024-003

- (2) Remove the FIRE/OVHT TEST panel.

TASK 26-11-02-424-004

3. Install the Panel

A. References

- (1) 24-22-00/201, Electrical Power – Control
- (2) 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) 31-51-00/501, Warning System
- (4) 33-16-00/501, Master Dim and Test

B. Install the FIRE/OVHT TEST Panel.

S 864-005

- (1) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the overhead circuit breaker panel, P11:
 - (a) 11A32, INDICATOR LIGHTS 1

C. Do a test of the Panel Installation:

S 864-006

- (1) Supply electrical power (Ref 24-22-00).

S 754-007

- (2) Make sure these systems operate:
 - (a) EICAS (Ref 31-41-00).
 - (b) Warning System (Ref 31-51-00).
 - (c) Master Dim and Test System (Ref 33-16-00).

S 754-008

- (3) Make sure these circuit breakers on the P11 panel are closed:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11B24, FIRE DETECTION APU 1
 - (f) 11B25, FIRE DETECTION APU 2

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- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11J24, FIRE DET ALTN PWR CARGO
- (j) 11J25, FIRE DET ALTN PWR APU
- (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (l) 11J27, FIRE DET ALTN PWR RIGHT ENGINE

S 864-009

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

S 864-010

- (5) Push the ECS MSG switch on the EICAS maintenance panel on the right side panel, P61.

S 864-011

- (6) Push and hold the ENG/APU/CARGO switch on the FIRE/OVHT TEST panel (on P8).

S 754-012

- (7) After 2-4 seconds, make sure these indications occur:
 - (a) The red LEFT and RIGHT engine fire handle lights, on P8, come on.
 - (b) The red L and R FUEL CONTROL switch lights, on the quadrant control stand, P10, come on.
 - (c) The red FIRE light, on the captains instrument panel, P1-3, comes on.
 - (d) The yellow L and R ENG OVHT lights, on P8, come on.
 - (e) The EICAS messages L and R ENGINE FIRE show on the top display.
 - (f) The EICAS messages L and R ENG OVHT shown on the top display.
 - (g) The red master WARNING lights, on P7, come on.
 - (h) The yellow master CAUTION lights, on the glareshield panel, P7, come on.
 - (i) The fire bell is heard.
 - (j) The caution annunciation is heard.
 - (k) The red FWD and AFT CARGO FIRE switch-lights, on the APU/CARGO fire control panel (on P8), come on.
 - (l) The EICAS messages FWD and AFT CARGO FIRE show on the top display.
 - (m) The EICAS message APU FIRE shows on the top display.
 - (n) The red APU fire switch handle light, on P8, comes on.

S 754-013

- (8) Push the ECS MSG switch as necessary to see subsequent EICAS pages and make sure these EICAS messages show on the bottom display:
 - (a) L ENG OH LP 1 and 2
 - (b) R ENG OH LP 1 and 2
 - (c) L ENG FIRE LP 1 and 2
 - (d) R ENG FIRE LP 1 and 2

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- (e) FWD CARGO DET 1 and 2
- (f) AFT CARGO DET 1 and 2
- (g) APU FIRE LP 1 and 2

S 864-014

- (9) Release the ENG/APU/CARGO switch.

S 754-015

- (10) Make sure all of the indications go off.

S 864-016

- (11) Push the ECS MSG switch on the EICAS maintenance panel (on P61).

S 864-017

- (12) Push and hold the ENG switch, on the FIRE/OVHT TEST panel (on P8).

S 754-018

- (13) Make sure these occur:
 - (a) The red LEFT and RIGHT engine fire handle lights, on P8, come on.
 - (b) The red L and R FUEL CONTROL switch lights, on the quadrant control stand, P10, come on.
 - (c) The red FIRE light, on P1-3, comes on.
 - (d) The yellow L and R ENG OVHT lights, on P8, come on.
 - (e) The EICAS messages L and R ENGINE FIRE show on the top display.
 - (f) The EICAS messages L and R ENG OVHT show on the top display.
 - (g) The red master WARNING lights, on P7, come on.
 - (h) The yellow master CAUTION lights, on P7, come on.
 - (i) The fire bell is heard.
 - (j) The caution annunciation is heard.

S 754-019

- (14) Push the ECS MSG switch as necessary to see subsequent EICAS pages and make sure these EICAS messages show on the bottom display:
 - (a) L TURB OH DET 1 and 2
 - (b) R TURB OH DET 1 and 2
 - (c) L STRUT OH DET 1 and 2
 - (d) R STRUT OH DET 1 and 2

S 754-020

- (15) Release the switch.

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- S 754-021
(16) Make sure the indications go off.
- S 754-022
(17) Make sure these circuit breakers on the P11 panel are closed:
(a) 11B10, W/W FIRE DET
(b) 11B35, W/W FIRE TEST
- S 864-041
(18) Push and hold the WHL WELL switch on the FIRE/OVHT TEST panel, M10445, on the P8.
- S 754-023
(19) Make sure these indications occur:
(a) The red WHEEL WELL light on the P3 panel comes on.
(b) The EICAS message WHEEL WELL FIRE shows on the top display.
(c) The red master WARNING lights, on P7, come on.
(d) The fire bell is heard.
- S 754-024
(20) Release the switch.
- S 754-025
(21) Make sure the indications go off.
- S 864-026
(22) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2
(c) 11B22, FIRE DETECTION R ENGINE 1
(d) 11B23, FIRE DETECTION R ENGINE 2
(e) 11B24, FIRE DETECTION APU 1
(f) 11B25, FIRE DETECTION APU 2

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- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11J24, FIRE DET ALTN PWR CARGO
- (j) 11J25, FIRE DET ALTN PWR APU
- (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 034-027

- (23) Remove the printed circuit cards, M681 and M682, from the fire detection card file, P54. P54 is in the E/E bay, along the right side of the nose gear wheel well.

S 864-028

- (24) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the two circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2

S 754-029

- (25) Make sure the yellow FAIL P-RESET light (P8) comes on.

S 754-030

- (26) Make sure the EICAS messages L ENG FIRE LP 1 and 2 show on the bottom display:

S 754-031

- (27) Make sure the EICAS message FIRE/OVHT SYS shows on the top display:

S 864-032

- (28) Push the FAIL P-RESET switch-light.

S 754-033

- (29) Make sure the yellow FAIL P-RESET light (P8) goes off.

S 754-034

- (30) Make sure the EICAS message FIRE/OVHT SYS does not show.

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S 754-040

- (31) Make sure the EICAS messages L ENG FIRE LP 1 and 2 show on the bottom display.

S 864-035

- (32) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2

S 434-036

- (33) Install the printed circuit cards, M681 and M682.
D. Put the airplane back to its usual condition.

S 864-037

- (1) Remove DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Close the system 1 and 2 circuit breakers at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B23, FIRE DETECTION R ENGINE 2
- (e) 11B24, FIRE DETECTION APU 1
- (f) 11B25, FIRE DETECTION APU 2
- (g) 11B26, FIRE DETECTION CARGO 1
- (h) 11B27, FIRE DETECTION CARGO 2
- (i) 11J24, FIRE DET ALTN PWR CARGO
- (j) 11J25, FIRE DET ALTN PWR APU
- (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 864-038

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

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S 864-039

- (3) Remove electrical power if it is not necessary (Ref 24-22-00).

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STRUT OVERHEAT DETECTION – DESCRIPTION AND OPERATION

1. General

- A. Dual-loop overheating detection systems are installed in each engine area. These systems monitor strut temperatures, and provide alerts for overheating conditions.
- B. Both systems (left and right strut overheating detection) use power from the 28-volt DC battery bus, with alternate power from the right main DC bus. The circuit breakers for each system are on overhead circuit breaker panel P11. The system contains no on/off switches.
- C. The overheating detection systems are each composed of a dual-loop detector. Thus, each loop of an overheating detection system has three detector switches. These switches are electrically connected in parallel, so that one switch can trigger an alarm signal for that loop.
- D. Each engine has a fire/overheat logic/test card, and both systems have one fire/overheat test panel.
- E. Both systems operate in AND logic. Thus, both loops of a system must sense an overheating condition in order for an alarm to be given.

2. Component Details (Fig. 1)

A. Strut Overheat Detectors

- (1) An overheating detector is a bi-metallic switch. When temperature exceeds the detectors trip temperature, the switch closes a path to ground. Each detector switch is identical except for trip temperature.
- (2) Six detector switches are located in each engine strut. Four switches are mounted through the firewall, two forward and two aft of the precooler area. The remaining two switches are located in the precooler area.

B. Fire/Overheat Logic/Test Cards

- (1) Two AFOLTS (Automatic Fire/Overheat Logic/Test System) cards interpret detector switch signals, provide system functional tests, and output overheating warning and fault indication signals. Each card handles the overheating detection system for one engine.
- (2) The AFOLTS cards are located in the P54 card file.

C. Fire/Overheat Test Panel

- (1) The fire/overheat test panel contains a momentary pushbutton switch – ENG. This switch initiates a test of the strut overheating and engine turbine cooling overheating detection systems. The test results in cockpit fire and overheating indications.
- (2) The test panel also has an amber SYS FAIL – FAIL P–RESET switchlight. This switchlight indicates a fire, overheating, or smoke detection system failure. The switchlight is pressed to reset.
- (3) The fire/overheat test panel is on aft pilots' control stand P8.

3. Operation (Fig. 2)

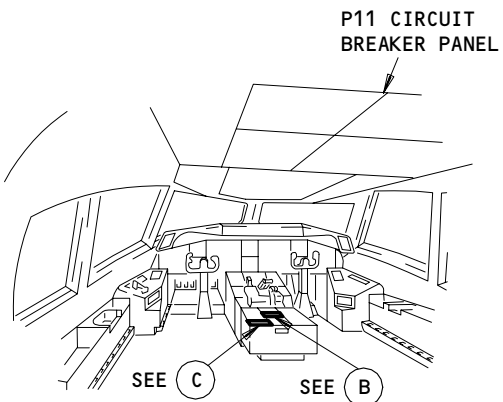
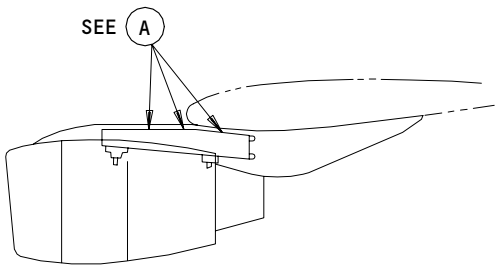
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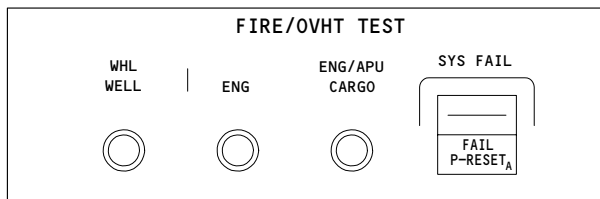
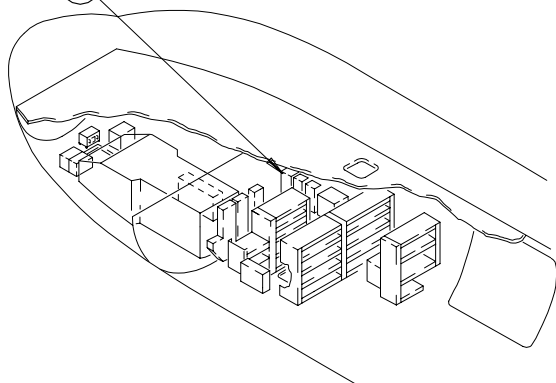
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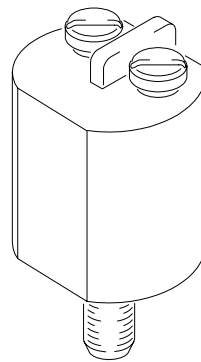


P54 - FIRE DETECTION
CARD FILE
SEE (D)



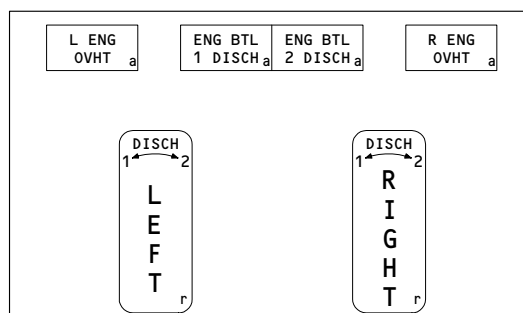
M10445-FIRE/OVHT TEST PANEL

(C)



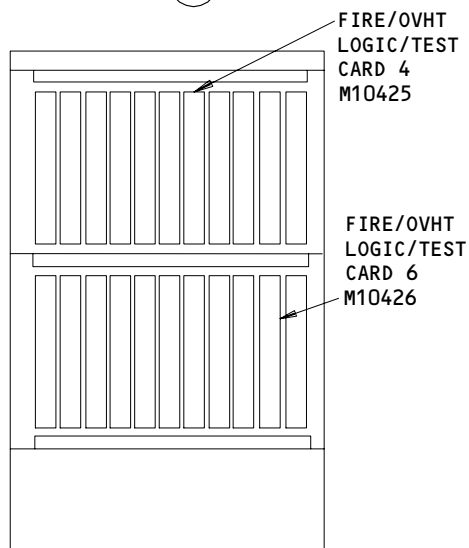
STRUT OVERHEAT SWITCH (6 PLACES)

(A)



M10443-ENGINE FIRE CONTROL PANEL

(B)



P54 - FIRE DETECTION CARD FILE

(D)

Strut Overheat Detection Component Location
Figure 1

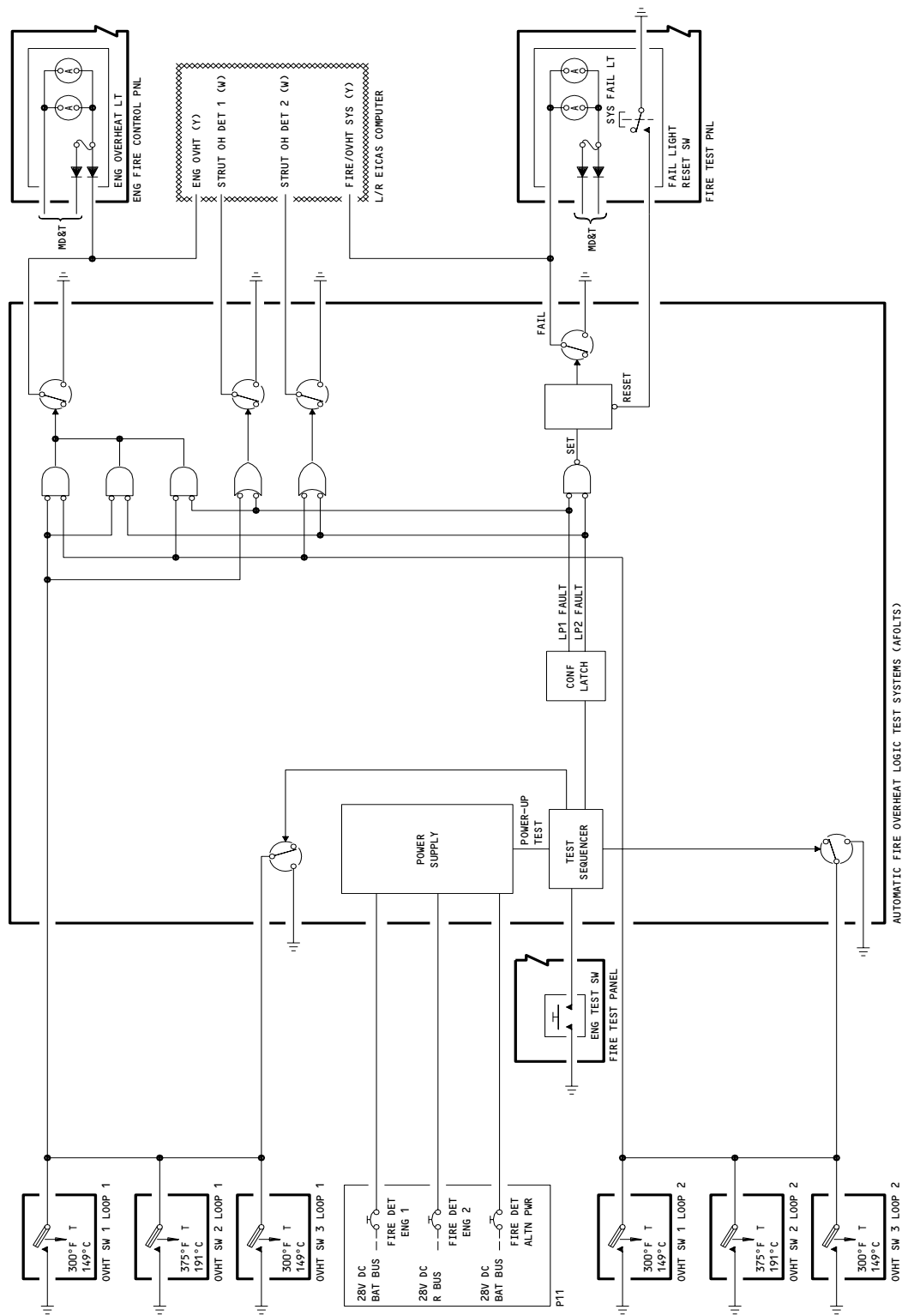
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Strut Overheat Detection Schematic (Example)
Figure 2

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A. Functional Description

- (1) The AFOLTS cards directly sense whether a switch is open or closed. Since a switch is either open or closed, detection control cards (used in engine and APU fire detection systems) are unnecessary.
- (2) When a detector switches trip temperature is exceeded, it closes, sending a ground signal to the AFOLTS card.
- (3) The AFOLTS card senses the signals from each loop and determines the appropriate output to the flight crew as shown on Table 1. Table 1 applies to the normal operating mode and the system test mode.

INPUTS TO AFOLTS		AFOLTS OUTPUTS
LOOP 1	LOOP 2	STRUT OVERHEAT DETECTION SYSTEMS
ALARM	ALARM	OVHT
ALARM	- - -	EICAS LOOP 1
- - -	ALARM	EICAS LOOP 2

TABLE 1

Logic System Operation
Strut Overheat Detection Loops
Logic AND Configuration

- (4) A strut overheat indication is given by the following:
 - (a) The appropriate amber engine overheat light - L or R ENG OVHT, on the P8 control stand, comes on.
 - (b) The appropriate overheat caution message - L or R ENG OVHT, is displayed on EICAS (P2).
 - (c) The amber master caution lights, on glareshield panels P7, come on.
 - (d) The caution annunciation tone sounds, on the flight deck aural warning speakers.
- (5) A dual-loop failure indication is given by the following:
 - (a) The amber FAIL P-RESET switchlight, on the P8 control stand, comes on.
 - (b) The advisory message, FIRE/OVHT SYS, is displayed on EICAS (P2).
 - (c) The appropriate system status/maintenance messages are displayed on EICAS:
 - 1) L STRUT OH DET 1 and 2
 - 2) R STRUT OH DET 1 and 2
- (6) The FAIL P-RESET switchlight is pressed to reset the fail light circuitry of the failed system. This also turns off the FAIL P-RESET switchlight, and clears the EICAS advisory message - FIRE/OVHT SYS.

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- (7) A single-loop failure indication is given by the following:
 - (a) The appropriate status/maintenance message is displayed on EICAS (P2):
 - 1) L STRUT OH DET 1 and 2
 - 2) R STRUT OH DET 1 and 2
- (8) A single loop alarm signal indication is given by the following:
 - (a) The appropriate amber engine overheat light - L or R ENG OVHT, on the P8 control stand, comes on.
 - (b) The appropriate overheat caution message - L or R ENG OVHT, is displayed on EICAS (P2).
 - (c) The amber master caution lights, on glareshield panels P7, come on.
 - (d) The owl caution annunciation tone sounds, on the flight deck aural warning speakers.
- (9) Detector, card, or associated wiring failures may not provide a failure indication at the moment of failure. These inoperative loops can only be detected during a system test.

B. Test

- (1) When a test occurs, the AFOLTS cards send out signals to each loop of the detection systems. Returned signals indicate operating loops. If any loop is found faulty, AFOLTS reconfigures that system to operate on the remaining loop. If the remaining loop sustains an alarm condition, then an overheat warning indication results.
- (2) Power-up mode:
 - (a) Whenever power is first applied, an automatic system self-test occurs. All loop status/maintenance messages are momentarily displayed on EICAS (P2). If any loop is found failed, then the appropriate loop message remains on EICAS display, and the system is reconfigured to the other loop. If both loops of a system are found failed, then the FAIL P-RESET switchlight (on P8) comes on, and EICAS displays the advisory message - FIRE/OVHT SYS. Cockpit overheat warnings will not be initiated by a power-up test.
- (3) Manual system test:
 - (a) When the ENG switch on the fire/overheat test panel (on P8) is pressed and held, the strut overheat and engine turbine cooling overheat detection systems go through a self-test. All loop messages are displayed on EICAS. Loop messages will disappear from the status page during fire/overheat output, but will remain on maintenance page. After a two to four second delay, a successful test terminates with all fire and overheat indications. The engine indications are:
 - 1) The red L and R fire switch handles light up, and unlock (on P8).
 - 2) The red L and R fuel control switches light up (on P10).
 - 3) The red FIRE light comes on (on P1-3).
 - 4) The amber L and R ENG OVHT lights come on (on P8).
 - 5) EICAS displays L and R ENGINE FIRE (warnings), and L and R ENG OVHT (cautions).

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- 6) The red master WARNING lights, on glareshield panel P7, come on.
 - 7) The fire bell sounds, on the flight compartment aural warning speakers.
 - 8) The amber master CAUTION lights, on glareshield panel P7, come on (inhibited when both fuel control switches are in cutoff).
 - 9) The caution annunciation owl tone sounds, on the flight compartment aural warning speakers (inhibited when both fuel control switches are in cutoff).
- (b) When the ENG switch is released, all messages and indications should clear - except for any faulty-loop messages which will remain on EICAS. The FAIL P-RESET switchlight, and EICAS advisory message - FIRE/OVHT SYS, will also remain on if there is a dual-loop failure.
- (4) The manual system test and power-up/power-interrupt mode will not invalidate an alarm in progress.

C. Control

- (1) Turn-on procedure:
- (a) Provide electrical power (Ref 24-22-00).
 - (b) Check that the following overhead panel P11 circuit breakers are closed:
 - 1) 11B20, FIRE DETECTION L ENGINE 1
 - 2) 11B21, FIRE DETECTION L ENGINE 2
 - 3) 11B22, FIRE DETECTION R ENGINE 1
 - 4) 11B23, FIRE DETECTION R ENGINE 2
 - 5) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - 6) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

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STRUT OVERHEAT DETECTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD 4 - (FIM 26-10-00/101) FIRE/OVHT LOGIC/TEST, M10425				
CARD 5 - (FIM 26-10-00/101) FIRE/OVHT LOGIC/TEST, M10426				
CIRCUIT BREAKERS	--		FLT COMPT, P11	
FIRE DET ALTN PWR ENGINE LEFT, C763		1	11J26	*
FIRE DET ALTN PWR ENGINE RIGHT, C764		1	11J27	*
FIRE DETECTION L ENGINE 1, C774		1	11B20	*
FIRE DETECTION L ENGINE 2, C783		1	11B21	*
FIRE DETECTION R ENGINE 1, C775		1	11B22	*
FIRE DETECTION R ENGINE 2, C784		1	11B23	*
COMPUTER - (FIM 31-41-00/101) EICAS L, M10181 EICAS R, M10182				
LIGHT - L ENG OVHT, YQNLO01	--	1	FLT COMPT, P8, ENG FIRE CONT PNL, M10443	*
LIGHT - R ENG OVHT, YQNLO03	--	1	FLT COMPT, P8, ENG FIRE CONT PNL, M10443	*
PANEL - (FIM 26-21-00/101) ENGINE FIRE CONTROL, M10443				
PANEL - (FIM 26-11-00/101) FIRE/OVHT TEST, M10445				
SWITCH - ENG TEST YQQS002	--	1	FLT COMPT, P8, FIRE/OVHT TEST PNL, M10445	*
SWITCH - LEFT STRUT OVHT/SW	--	6	430, LEFT ENG STRUT	26-12-01
NO. 1, LOOP 1, S10194			432AL	
NO. 2, LOOP 1, S10195			432AL	
NO. 3, LOOP 1, S10196			432AL	
NO. 2, LOOP 2, S10197			432AL	
NO. 1, LOOP 2, S10198			433LR	
NO. 3, LOOP 2, S10199			433LR	
SWITCH - RIGHT STRUT OVHT SW	--	6	440, RIGHT ENG STRUT	26-12-01
NO. 2, LOOP 1, S10200			442AL	
NO. 1, LOOP 1, S10201			442AL	
NO. 3, LOOP 1, S10202			442AL	
NO. 2, LOOP 2, S10203			442AL	
NO. 1, LOOP 2, S10204			443AL	
NO. 3, LOOP 2, S10205			443AL	

* SEE THE WDM EQUIPMENT LIST

Strut Overheat Detection System - Component Index
 Figure 101

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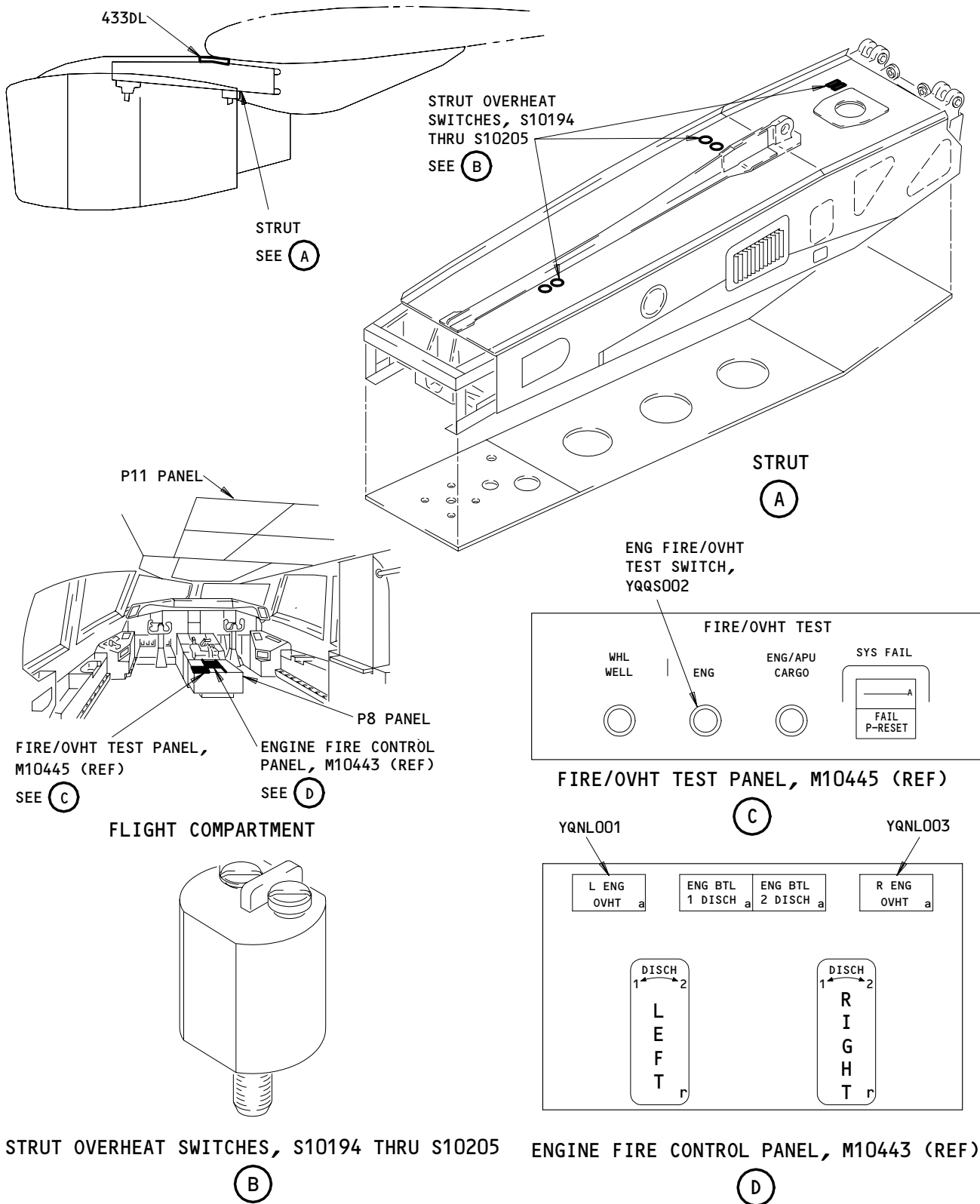
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Strut Overheat Detection System - Component Location
Figure 102

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STRUT OVERHEAT DETECTION SYSTEM – ADJUSTMENT/TEST

1. General

- A. This subject has two tasks. The first task is an operational test of the overheat detection system of the strut.
- B. The second task is a system test of the overheat detection system of the strut.
 - (1) The system test increases the function of the operational test. The system test will make sure that all of the necessary operations of the system occur correctly.

TASK 26-12-00-715-001

2. Operational Test – Strut Overheat Detection System

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuselage
211/212	Flight Compartment

(2) Access Panels

413, 423	L, R Fan Cowl Panel (Left)
414, 424	L, R Fan Cowl Panel (Right)
415, 425	L, R Fan Reverser (Left)
416, 426	L, R Fan Reverser (Right)

C. Prepare for Test

S 865-002

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

S 755-003

- (2) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00/501).
 - (b) Warning system (AMM 31-51-00/501).
 - (c) Master dim and test system (AMM 33-16-00/501).

S 755-004

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2

S 865-005

- (4) Close the EICAS circuit breakers on the P11 panel.

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- S 865-059
- (5) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6C1, FUEL COND CONT L
 - (b) 6C2, FUEL COND CONT R
- D. Do a Test of the Strut Overheat Detection System
- S 865-006
- (1) Push the ECS MSG switch on the EICAS maintenance panel, P61.
- S 865-007
- (2) Push and hold the ENG test switch on the pilots aft control stand, P8.
- S 755-008
- (3) Make sure these indications occur:
- (a) The L and R ENG OVHT light, on P8, comes on.
 - (b) The messages L and R ENG OVHT EICAS show on the top display.
 - (c) The EICAS messages L and R STRUT OH DET 1 and 2 show on the bottom.
- NOTE: Ignore EICAS messages that show up on the display, but are not called out in the procedure.
- (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.
- S 755-009
- (4) Release the ENG test switch and make sure the indications stop.
- S 865-060
- (5) Close these circuit breakers on the P6 panel and remove the DO-NOT-CLOSE tags:
- (a) 6C1, FUEL COND CONT L
 - (b) 6C2, FUEL COND CONT R
- S 865-010
- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-12-00-735-011

3. System Test - Strut Overheat Detection System

A. References

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

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- (2) AMM 24-22-00/201, Electrical Power Control
- (3) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (4) AMM 31-51-00/501, Warning System
- (5) AMM 33-16-00/501, Master Dim and Test

B. Access

(1) Location Zones

- 119/120 Main Equipment Center
- 200 Upper Half of Fuselage
- 211/212 Flight Compartment
- 430/440 Engine No. 1/No. 2 Nacelle strut

(2) Access Panels

- 413, 423 L, R Fan Cowl Panel (Left)
- 414, 424 L, R Fan Cowl Panel (Right)
- 415, 425 L, R Fan Reverser (Left)
- 416, 426 L, R Fan Reverser (Right)
- 432AL/433JR/433LR Left Strut - No. 1 Engine
- 442AL/443HL/443LL Right Strut - No. 2 Engine

C. Prepare for Test

S 865-012

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

S 035-014

- (2) Remove the strut access panels (AMM 06-43-00/201).

S 755-013

- (3) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00/501).
 - (b) Warning system (AMM 31-51-00/501).
 - (c) Master dim and test system (AMM 33-16-00/501).

S 865-063

- (4) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (b) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 865-064

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

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- (b) 6C2, FUEL COND CONT R
D. Do a Test of the Strut Overheat Detection System

S 865-015

- (1) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2

S 755-016

- (2) Make sure these indications occur:
- (a) The SYS FAIL light is not on (on P8).
 - (b) The L and R ENG OVHT lights are not on (on P8).
 - (c) The EICAS messages L and R ENG OVHT do not show on the top display.

S 865-017

- (3) Push the ECS MSG switch on the EICAS maintenance panel, P61.

S 755-018

- (4) Make sure the EICAS message STRUT OH DET or ENG OH LP do not show on the bottom display.

S 865-019

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel at the same time:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2

S 865-020

- (6) Connect a jumper wire between the two terminals on each of these switches which are installed on the No. 1 strut upper spar.
- (a) S10194
 - (b) S10198

S 865-021

- (7) Push the ECS MSG switch on the EICAS maintenance panel.

S 755-022

- (8) Make sure these indications occur:
- (a) The L ENG OVHT light on the pilots aft control stand, P8, comes on.
 - (b) The EICAS message L ENG OVHT shows on the top display.
 - (c) The EICAS messages L STRUT OH DET 1 and L STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

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- S 035-023
- (9) Remove the jumpers from the terminals.
- S 755-024
- (10) Make sure the indications stop.
- S 435-025
- (11) Connect a jumper wire between the two terminals on each of these switches installed on the No. 1 strut upper spar.
- (a) S10195
- (b) S10197
- S 755-026
- (12) Make sure these indications occur:
- (a) The L ENG OVHT light, on P8, comes on.
- (b) The EICAS message, L ENG OVHT, shows on the top display.
- (c) The EICAS messages L STRUT OH DET 1 and L STRUT OH DET 2 show on the bottom display.
- (d) The caution annunciation is heard.
- (e) The master CAUTION lights, on P7, come on.
- S 035-027
- (13) Remove the jumpers from the terminals.
- S 755-028
- (14) Make sure the indications stop.
- S 435-030
- (15) Connect a jumper between the two terminals on each of these switches installed on the engine rear mount bulkhead of No. 1 strut.
- (a) S10196
- (b) S10199
- S 755-031
- (16) Make sure these indications occur:
- (a) The L ENG OVHT light, on P8, comes on.
- (b) The EICAS message L ENG OVHT shows on the top display.
- (c) The EICAS messages L STRUT OH DET 1 and L STRUT OH DET 2 show on the bottom display.
- (d) The caution annunciation is heard.
- S 035-032
- (17) Remove the jumpers from the terminals.
- S 755-033
- (18) Make sure these indications stop:
- S 865-034
- (19) Push and hold the ENG test switch on the pilots aft control stand, P8.

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S 865-065

- (20) Make sure these indications occur:
- (a) The L ENG OVHT light comes on (on P8).
 - (b) The EICAS message L ENG OVHT shows on the top display.
 - (c) The EICAS messages L STRUT OH DET 1 and L STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

S 755-035

- (21) Release the ENG test switch and make sure the indications stop.

S 865-036

- (22) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2

S 865-062

- (23) Close these two circuit breakers, on the P11 panel, at the same time:
- (a) 11B22, FIRE DETECTION R ENGINE 1
 - (b) 11B23, FIRE DETECTION R ENGINE 2

S 435-037

- (24) Connect a jumper wire between the two terminals on each of these switches installed on the No. 2 strut upper spar.
- (a) S10200
 - (b) S10203

S 755-038

- (25) Make sure these indications occur:
- (a) The R ENG OVHT light comes on (on P8).
 - (b) The EICAS message R ENG OVHT shows on the top display.
 - (c) The EICAS messages R STRUT OH DET 1 and R STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

NOTE: The R ENGINE fire indications do show on the EICAS displays but can be ignored.

S 035-039

- (26) Remove the wire jumpers from the terminals.

S 755-040

- (27) Make sure the indications stop.

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S 435-041

- (28) Connect a wire jumper between the two terminals on each of these switches installed on the No. 2 strut upper spar.
- (a) S10201
 - (b) S10204

S 865-066

- (29) Make sure these indications occur:
- (a) The R ENG OVHT light comes on (on P8).
 - (b) The EICAS message R ENG OVHT shows on the top display.
 - (c) The EICAS messages R STRUT OH DET 1 and R STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

NOTE: The R ENGINE fire indications do show on the EICAS displays but can be ignored.

S 035-044

- (30) Remove the wire jumpers from the terminals.

S 755-045

- (31) Make sure the indications stop.

S 435-047

- (32) Connect a jumper wire between the two terminals on each of these switches installed on the engine rear mount bulkhead of the No. 2 strut.
- (a) S10202
 - (b) S10205

S 865-067

- (33) Make sure these indications occur:
- (a) The R ENG OVHT light comes on (on P8).
 - (b) The EICAS message R ENG OVHT shows on the top display.
 - (c) The EICAS messages R STRUT OH DET 1 and R STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

NOTE: The R ENGINE fire indications do show on the EICAS displays but can be ignored.

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S 035-050

- (34) Remove the wire jumpers from the terminals.

S 755-051

- (35) Make sure the indications stop.

S 865-053

- (36) Push and hold the ENG test switch on the pilots aft control stand, P8.

S 755-054

- (37) Make sure these indications occur:
- (a) The R ENG OVHT light comes on (on P8).
 - (b) The EICAS message R ENG OVHT EICAS shows on the top display.
 - (c) The EICAS messages R STRUT OH DET 1 and R STRUT OH DET 2 show on the bottom display.
 - (d) The caution annunciation is heard.
 - (e) The master CAUTION lights, on P7, come on.

S 755-055

- (38) Release the ENG test switch and make sure the indications stop.
E. Put the Airplane Back to Its Usual Condition

S 415-056

- (1) Install the strut access panels (AMM 06-43-00/201).

S 865-057

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (d) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
 - (e) 6C1, FUEL COND CONT L

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(f) 6C2, FUEL COND CONT R

S 865-058

(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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STRUT OVERHEAT SWITCH – REMOVAL/INSTALLATION

1. General

- A. Six disc thermal switches are installed on the strut upper spar and rear engine mount bulkhead. These switches sense if there is too much heat around the strut structure which is caused by leakages in the engine bleed air duct. Get access to the switches through the upper strut fairing.

TASK 26-12-01-034-016

2. Remove the strut Overheat Switch (Fig. 401)

A. References

- (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power Control
- (3) AMM 78-31-00/201, Thrust Reverser System

B. Equipment

- (1) Torque Wrench – commercially available

C. Consumable Materials

- (1) AMM 20-30-01/201, Sealant DC93-006 Dow Corning

D. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuselage
211/212	Flight Compartment
430/440	No. 1/No. 2 Nacelle Strut

(2) Access Panels

- (a) 413, 423 L,R Fan Cowl Panel (Left)
- (b) 414, 424 L, R Fan Cowl Panel (Right)
- (c) 415, 425 L, R Fan Reverser (Left)
- (d) 416, 426 L, R Fan Reverser (Right)
- (e) 432AL, 433JR, 433LR Nacelle Strut – Left engine No. 1
- (f) 442AL, 443HL, 443LL Nacelle Strut – Right Engine No. 2

E. Remove the Strut Overheat Switch

S 864-001

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE identifiers:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 014-002

- (2) Remove the strut access panels as necessary (AMM 06-43-00/201).

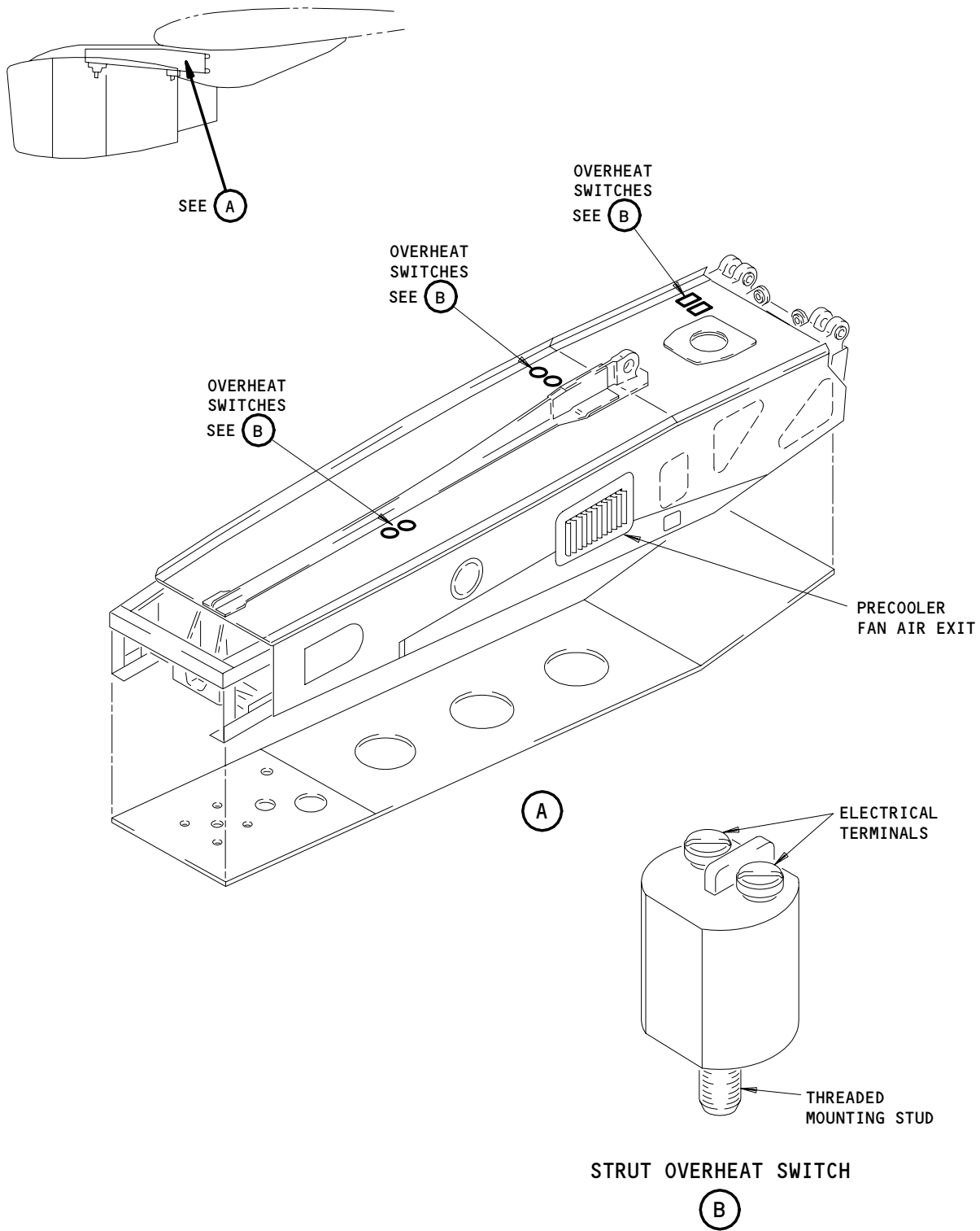
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Strut Overheat Switch Installation
Figure 401

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- S 024-026
- (3) Access to the aft strut overheat switches S10196, S10199, S10202, and S10205 may require disconnection of the strut pneumatic duct. If this is required, do this procedure:
Pneumatic Duct - Removal/Installation (AMM 36-11-01/401).
- S 034-003
- (4) Disconnect the wires from the terminals on the strut overheat switch.
- S 034-021
- (5) Remove the sealant around the switch on the top or the bottom where applicable.
- S 034-022
- (6) Remove the washer and lock nut if applicable.
- S 034-004
- (7) Loosen the switch and remove.

TASK 26-12-01-424-005

3. Install the Strut Overheat Switch (Fig. 401)

A. References

- (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power Control
- (3) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuselage
211/212	Flight Compartment
430/440	No. 1/No. 2 Nacelle Strut

(2) Access Panels

- (a) 413, 423 L, R Fan Cowl Panel (Left)
- (b) 414, 424 L, R Fan Cowl Panel (Right)
- (c) 415, 425 L, R Fan Reverser (Left)
- (d) 416, 426 L, R Fan Reverser (Right)
- (e) 432AL, 433JR, 433LR Nacelle Strut - Left engine No. 1
- (f) 442AL, 443HL, 443LL Nacelle Strut - Right Engine No. 2

C. Procedure

S 754-006

- (1) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are open and attach DO-NOT-CLOSE tags:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT

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(f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 754-007

- (2) Make sure the surfaces where the switches are to be installed are clean and free of damage.

S 434-008

- (3) Install the strut overheating switches using existing fasteners on the bottom of the upper spar or lock nuts, or washers if applicable.

NOTE: Switches in the precooler area are installed on the washers and are sealed with sealant DC 93-006. Switches which are forward and aft of the precooler do not require washers, but are sealed with sealant DC 93-006.

S 434-023

- (4) Tighten to a maximum of 22 pound-inches (2.48 Newton.Meters) for the forward and aft strut overheating switches S10194, S10198, S10201, S10204, S10196, S10199, S10202, and S10205. Tighten to a maximum of 40 pound-inches (4.5 Newton. Meters) for the precooler area strut overheating switches S10195, S10197, S10200, and S10203.

S 434-009

- (5) Connect the wires to the terminals on the switch.
D. Do a test of the Strut Overheat Switch Installation

S 864-010

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

S 034-011

- (2) Remove the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENG LEFT
 - (f) 11J27, FIRE DET ALTN PWR ENG RIGHT

S 864-017

- (3) Close the EICAS circuit breakers on the P11 panel six locations.

S 864-018

- (4) Push the ECS MSG switch on the EICAS maintenance panel, P61.

S 864-012

- (5) Push and hold the ENG test switch on the pilots aft control stand, P8. Make sure these indications occur.
- (a) The L and R ENG OVHT light comes on (on P8).
 - (b) The EICAS messages L and R ENG OVHT show on the top display.

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(c) These EICAS messages show on the bottom display:

- 1) L STRUT ON DET 1
- 2) R STRUT OH DET 1
- 3) L STRUT OH DET 2
- 4) R STRUT OH DET 2

S 754-013

(6) Release the ENG test switch and make sure the alert indications stop.

E. Put the Airplane Back to Its Usual Condition

S 434-024

(1) Install the strut pneumatic duct if disconnected (AMM 36-11-01/401).

S 414-014

(2) Install the strut access panels (AMM 06-43-00/201).

S 444-025

(3) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

S 864-015

(4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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ENGINE TURBINE COOLING OVERHEAT DETECTION – DESCRIPTION AND OPERATION

1. General

- A. Dual-loop overheating detection systems are installed in each engine turbine area. These systems monitor engine turbine cooling air temperatures, and provide alerts for overheating conditions.
- B. The systems use power from the 28-volt DC battery bus, with alternate power from the right main dc bus. The circuit breakers for each system are on overhead circuit breaker panel P11 (Fig. 2). The system contains no on/off switches.
- C. The overheating detection systems are each composed of a dual-loop detector. Thus, each loop of a fire detection system has one detector switch.
- D. Each engine has a fire/overheat logic/test card, and both systems have one fire/overheat test panel.
- E. Both systems operate in AND logic. Thus, both loops of a system must sense overheating condition in order for an alarm to be given.

2. Component Details (Fig. 1)

A. Overheat Detectors

- (1) The overheating detectors are temperature-sensitive, normally-closed switches. The switches are of bi-metallic construction, and function on the differential expansion properties of the two metals.
- (2) Both switches are mounted on a mixer block, located at the nine o'clock position on the turbine case. The mixer block is fed with turbine cooling air by an air sampling tube. When turbine cooling air temperature exceeds the trip point of the switch, the switch opens to provide an overheating signal.

B. Fire/Overheat Logic/Test Cards

- (1) Two AFOLTS (Automatic Fire/Overheat Logic/Test System) cards interpret detection switch signals, provide system functional tests, and output fire warning and fault indication signals. Each card handles the overheating detection systems for one engine.
- (2) The AFOLTS cards are located in the P54 card file.

C. Fire/Overheat Test Panel

- (1) The fire/overheat test panel contains a momentary pushbutton switch – ENG. This switch initiates a test of the engine turbine cooling overheating and strut overheating detection systems. The test results in cockpit fire and overheating indications.
- (2) The test panel also has an amber SYS FAIL – FAIL P–RESET switchlight. This switchlight indicates a fire, overheating, or smoke detection system failure. The switchlight is pressed to reset.
- (3) The fire/overheat test panel is on aft pilots' control stand P8.

3. Operation (Fig. 2)

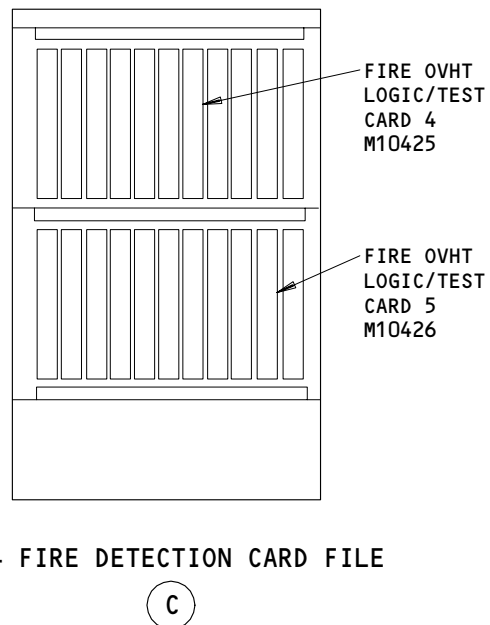
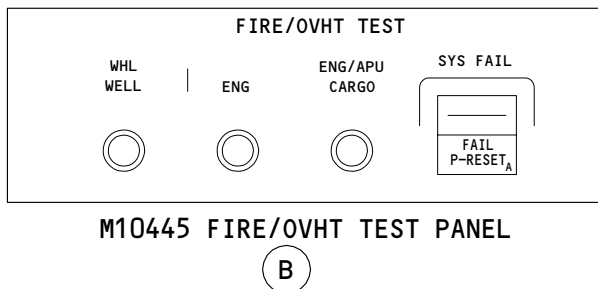
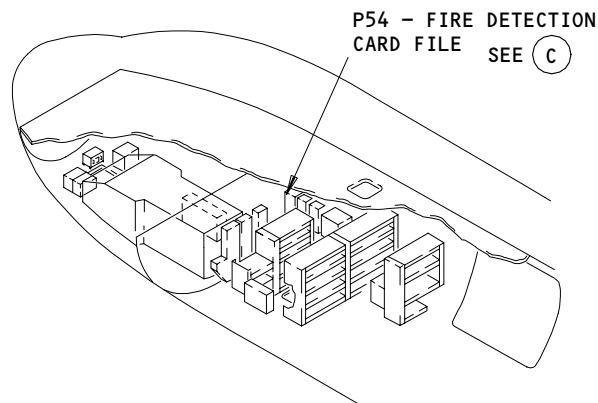
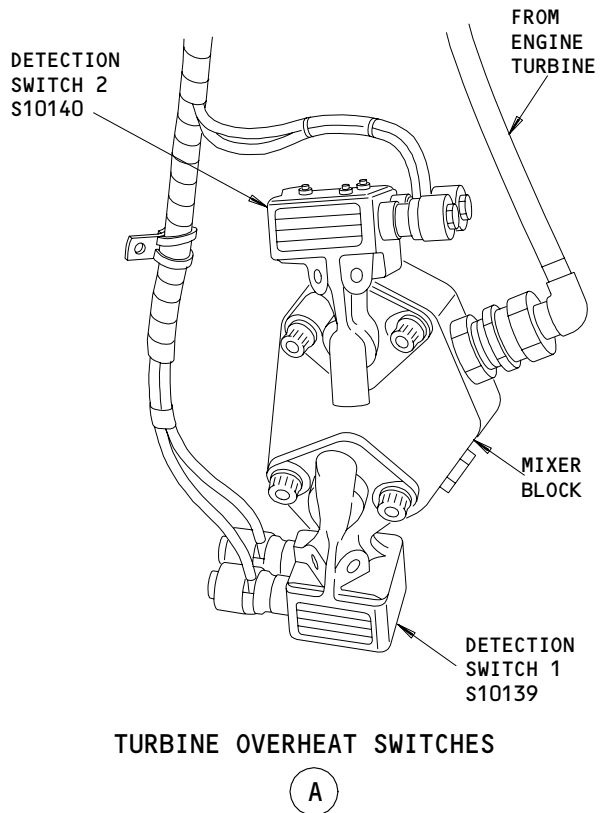
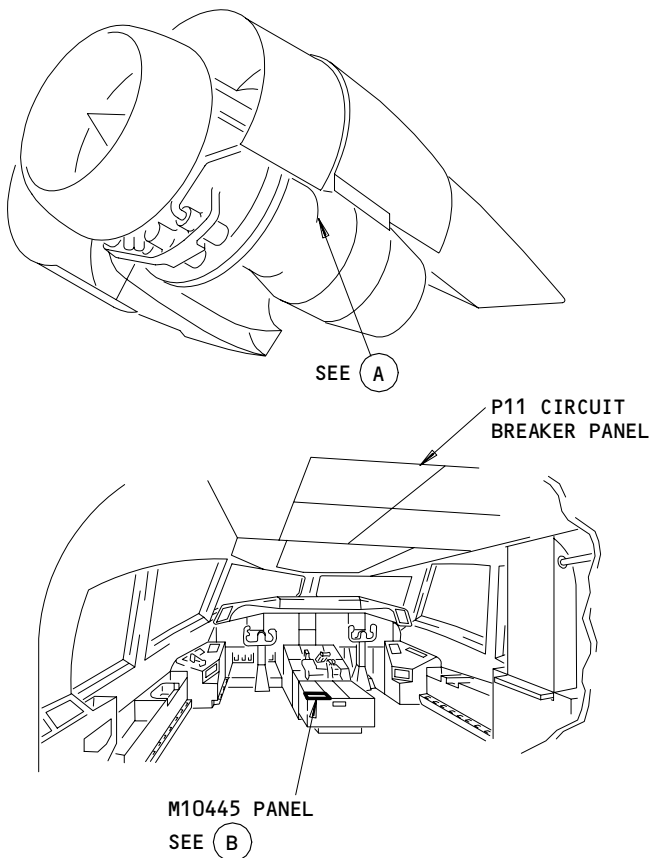
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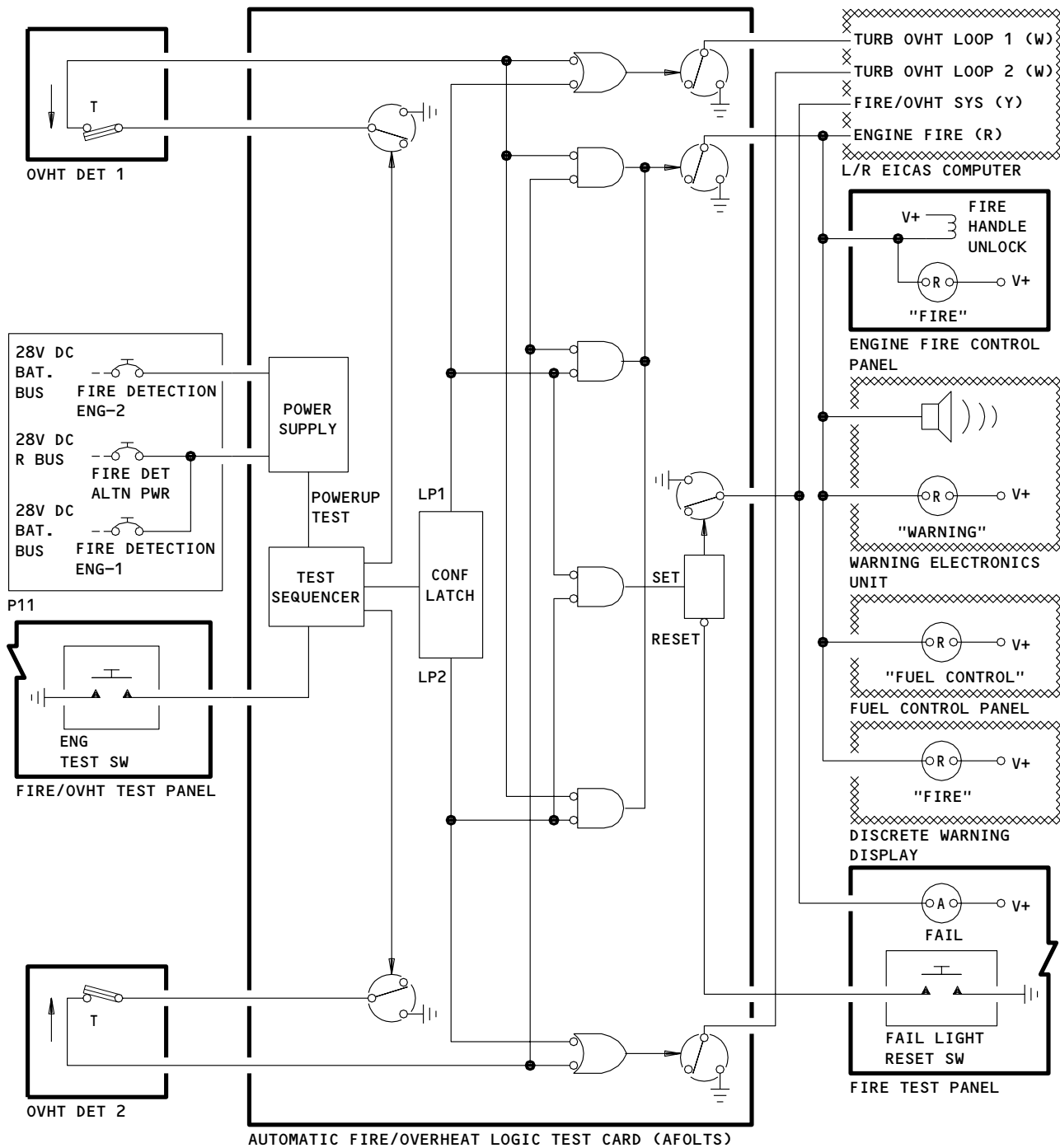
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Engine Turbine Cooling Overheat Detection Component Location
Figure 1

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Engine Turbine Cooling Overheat Detection Schematic (Example)
Figure 2

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A. Functional Description

NOTE: The Engine Fire/Overheat Detection System works in a similar way as the Engine Turbine Cooling Overheat Detection System. Some indications displayed may be the same for either system. Refer to AMM 26-11-00/001 for the description and applicable indications on the Engine Fire/Overheat Detection System.

- (1) The AFOLTS directly monitor the status of the detection switches (open or closed). Since the switch is either open or closed, detection control cards (used in engine and APU fire detection systems) are not used.
- (2) When turbine cooling air reaches the trip point of the switch, the switch opens, providing an alarm signal to the AFOLTS card. The AFOLTS card configures the signals from each system in AND logic, and determines the appropriate output to the flight crew as shown on Table 1. Table 1 illustrates the normal operating mode and is the same for the system test mode except a dual loop fault in the overheat will produce a FAIL output from AFOLTS.

INPUTS TO AFOLTS		AFOLTS OUTPUTS
LOOP 1	LOOP 2	TURBINE OVERHEAT SYSTEM
ALARM	ALARM	FIRE
ALARM	- - -	EICAS LOOP 1
- - -	ALARM	EICAS LOOP 2
- - -	- - -	

TABLE 1

Logic System Operation
 Engine Turbine Cooling Overheat Detection Loops
 Logic AND Configuration

- (3) An engine turbine cooling overheat indication is given by the following:
 - (a) The appropriate red (L or R) fire switch handle, on the P8 control stand, lights up and unlocks.
 - (b) The appropriate red (L or R) fuel control switch, on quadrant stand P10, lights up.
 - (c) The red FIRE light, on captain's instrument panel P1-3, comes on.
 - (d) The appropriate fire warning message - L or R ENGINE FIRE, is displayed on EICAS (Engine Indication and Crew Alerting System - P2 panel).
 - (e) The red master warning lights, on glareshield panels P7, come on.

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- (f) The fire bell sounds, on the flight deck aural warning speakers.
 - (4) A dual-loop inoperative indication is given by the following:
 - (a) The amber FAIL P-RESET switchlight, on the P8 control stand, comes on.
 - (5) A single-loop inoperative or alarm signal indication is given by the following:
 - (a) The appropriate status/maintenance message is displayed on EICAS (P2):
 - 1) L TURB OH DET 1 or 2.
 - 2) R TURB OH DET 1 or 2.
 - (6) Test circuit failures may not provide an inoperative signal at the moment of failure. These inoperative loops can only be detected during a system test.
- B. Test
- (1) When a test occurs, the AFOLTS cards send out signals to each loop of the detection systems. Returned signals indicate operating loops. If any loop is found inoperative, AFOLTS reconfigures that system to operate on the remaining loop. If the remaining loop sustains an alarm or inoperative condition, then a fire warning or fail indication results.
 - (2) Power-up mode:
 - (a) Whenever power is first applied, an automatic system self-test occurs. All single-loop status/maintenance messages are momentarily displayed on EICAS (P2). If any loop is found inoperative, then the appropriate loop message remains on EICAS display, and the system is reconfigured to the other loop. If both loops of a system are found inoperative, then the FAIL P-RESET switchlight (on P8) comes on, and EICAS displays the advisory message - FIRE/OVHT SYS. Cockpit fire warnings will not be initiated by a power-up test.
 - (3) Manual system test:
 - (a) When the ENG switch on the fire/overheat test panel (on P8) is pressed and held, the engine turbine cooling overheat and strut overheat detection systems go through a self-test. All loop messages are displayed on EICAS, and after a two-second delay, a successful test terminates with all fire and overheat indications. The indications for the turbine overheat test are:
 - 1) The red L and R fire switch handles light up, and unlock (on P8).
 - 2) The red L and R fuel control switches light up (on P10).
 - 3) The red FIRE light comes on (on P1-3).

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- 4) EICAS displays L and R ENGINE FIRE (warnings).
 - 5) EICAS displays L TURB OH DET 1 and 2 (maintenance)
 - 6) EICAS displays R TURB OH DET 1 and 2 (maintenance)
 - 7) The red master warning lights.
 - 8) The fire bell sounds on the aural warning speakers.
- (b) When the ENG switch is released, all messages and indications should clear - except for any inoperative loop messages which will remain on EICAS. The FAIL P-RESET switchlight, and EICAS advisory message - FIRE/OVHT SYS, will also remain on if there is a dual-loop inoperative.
- (4) The manual system test will not invalidate an alarm in progress.
- C. Control
- (1) Turn-on procedure:
- (a) Provide electrical power (Ref 24-22-00).
 - (b) Check that the following overhead panel P11 circuit breakers are closed:
 - 1) 11B20, FIRE DETECTION L ENGINE 1
 - 2) 11B21, FIRE DETECTION L ENGINE 2
 - 3) 11B22, FIRE DETECTION R ENGINE 1
 - 4) 11B23, FIRE DETECTION R ENGINE 2
 - 5) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - 6) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

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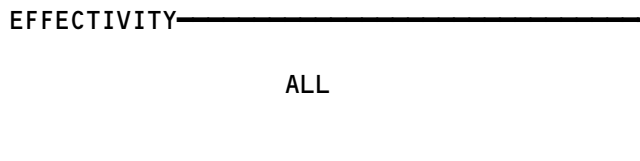

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 FAULT ISOLATION/MAINT MANUAL

ENGINE TURBINE COOLING OVERHEAT DETECTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD 4 - FIRE/OVHT LOGIC TEST, M10425	2	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD 5 - FIRE/OVHT LOGIC TEST, M10426	2	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CIRCUIT BREAKER -			FLT COMPT, P11	
FIRE DET ALTN PWR ENGINE LEFT, C763		1	11J26	*
FIRE DET ALTN PWR ENGINE RIGHT, C764		1	11J27	*
FIRE DETECTION L ENGINE 1, C774		1	11B20	*
FIRE DETECTION L ENGINE 2, C783		1	11B21	*
FIRE DETECTION R ENGINE 1, C775		1	11B22	*
FIRE DETECTION R ENGINE 2, C784		1	11B23	*
PANEL (FIM 26-12-00/101)				
FIRE TEST, M10445				
SWITCH - ENG TEST, YQGS002	1	1	FLT COMPT, P8, FIRE TEST, M10445	*
SWITCH - FAIL LIGHT RESET, YQGS003	1	1	FLT COMPT, P8, FIRE TEST, M10445	*
SWITCH - TURBINE OVERHEAT DETECTION, S10139	2	2	EACH ENGINE	26-13-01
SWITCH - TURBINE OVERHEAT DETECTION, S10140	2	2	EACH ENGINE	26-13-01

* SEE THE WDM EQUIPMENT LIST

Engine Turbine Cooling Overheat Detection System - Component Index
Figure 101

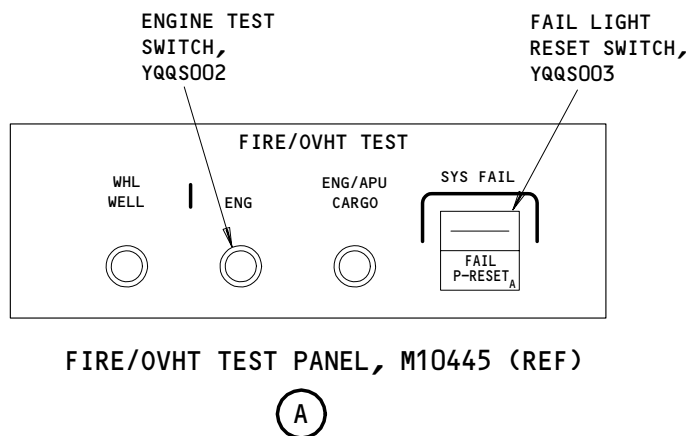
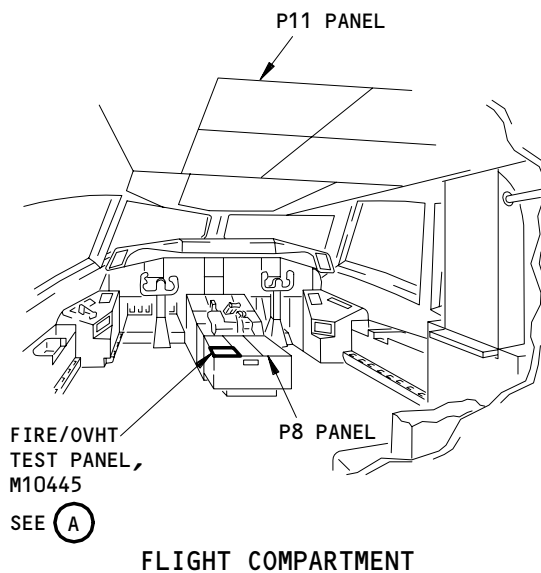


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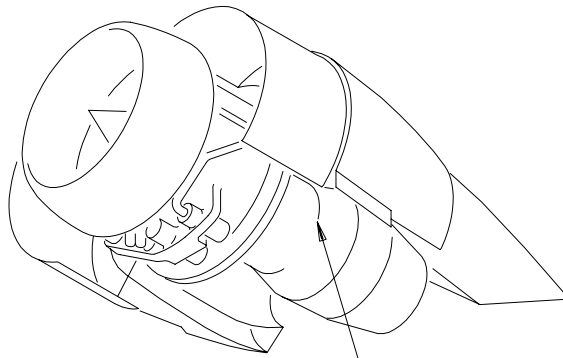
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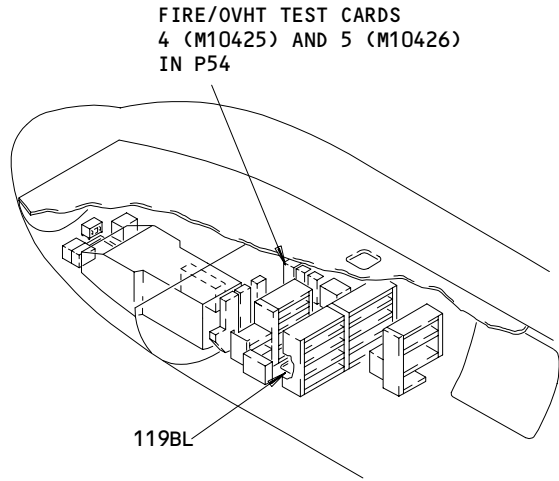
Engine Turbine Cooling Overheat Detection System - Component Location
Figure 102 (Sheet 1)

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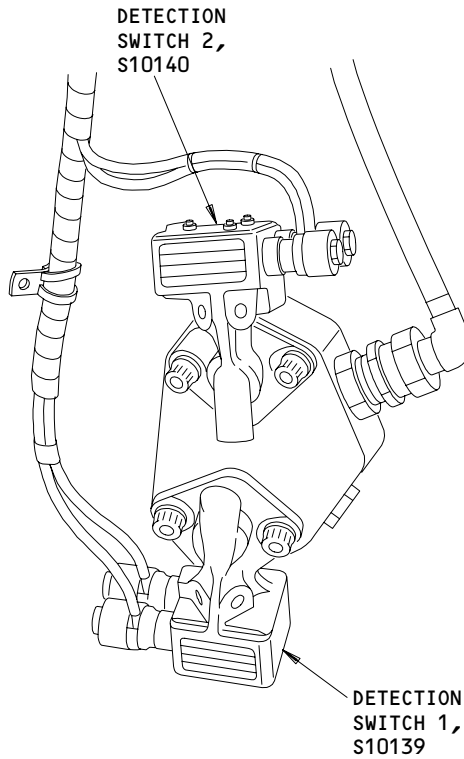


TURBINE OVERHEAT
DETECTION SWITCHES
SEE (B)



FIRE/OVHT TEST CARDS
4 (M10425) AND 5 (M10426)
IN P54

119BL



DETECTION
SWITCH 2,
S10140

DETECTION
SWITCH 1,
S10139

TURBINE OVERHEAT DETECTION SWITCHES

(B)

Component Location
Figure 102 (Sheet 2)

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ENGINE TURBINE COOLING OVERHEAT DETECTION SYSTEM – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to do an operational test and a system test of the engine turbine cooling overheat detection system.
- (1) The operational test makes sure the system operates correctly in a minimum of time. Use only equipment installed in the plane.
 - (2) The system test increases the functions of the operational test. Equipment installed in the airplane and external test equipment will be used.

TASK 26-13-00-715-007

2. Operational Test – Engine Turbine Cooling Overheat Detection System

A. References

- (1) 24-22-00/201, Electrical Power – Control
- (2) 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) 31-51-00/501, Warning System
- (4) 33-16-00/501, Master Dim and Test

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuelage
211/212	Flight Compartment

(2) Access

413, 423	L, R Fan Cowl Panel (Left)
414, 424	L, R Fan Cowl Panel (Right)
415, 425	L, R Fan Reverser (Left)
416, 426	L, R Fan Reverser (Right)

C. Prepare for the Test

S 865-008

- (1) Supply electrical power (Ref 24-22-00).

S 755-009

- (2) Make sure these systems operate:
 - (a) EICAS (Ref 31-41-00).
 - (b) Warning system (Ref 31-51-00).
 - (c) Master dim and test system (Ref 33-16-00).

S 865-010

- (3) Close these circuit breakers on the overhead circuit breaker panel, P11:
 - (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2

S 865-011

- (4) Close the EICAS circuit breakers (six places) on the P11 panel.

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D. Do a Test of the Engine Turbine Cooling Overheat Detection System.

S 865-012

- (1) Push the ECS MSG button on the EICAS maintenance panel (P61).

S 865-013

- (2) Push and hold the ENG test switch, on the pilots aft control stand, P8.
- (a) Make sure these indications occur:
- 1) The L and R engine fire warning lights, on the engine fire switches, come on.
 - 2) The red FIRE fire light, on the captains instrument panel, P1-3, comes on.
 - 3) The master WARNING lights, on the P7 panel, come on.
 - 4) The L and R switch-lights for the engine fuel controls, on the quadrant control stand, P10, come on.
 - 5) The fire bell is heard.

S 755-014

- (3) Make sure these EICAS messages show on the top display:
- (a) L ENGINE FIRE
 - (b) R ENGINE FIRE

S 755-051

- (4) Make sure these EICAS messages show on the bottom display:

NOTE: Ignore EICAS messages that show up on the display, but are not called out in the procedure.

- (a) L TURB OH DET 1
- (b) L TURB OH DET 2
- (c) R TURB OH DET 1
- (d) R TURB OH DET 2

S 865-015

- (5) Release the ENG test switch, on the P8 panel.
- (a) Make sure these indication occur:
- 1) The L and R engine fire warning lights, on the engine fire switches, go off.
 - 2) The red master FIRE light goes off.
 - 3) The red master WARNING lights, on the P7 panel, go off.
 - 4) The L and R switch-lights for the engine fuel controls, on the P10 panel, go off.
 - 5) The fire bell stops.

S 755-016

- (6) Make sure these EICAS messages do not show on the top display:
- (a) L ENGINE FIRE

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(b) R ENGINE FIRE

S 755-052

- (7) Make sure these EICAS messages do not show on the bottom display:
- (a) L TURB OH DET 1
 - (b) L TURB OH DET 2
 - (c) R TURB OH DET 1
 - (d) R TURB OH DET 2

S 865-017

- (8) Remove the electrical power, if it is not necessary (Ref 24-22-00).

TASK 26-13-00-735-018

3. System Test – Engine Turbine Cooling Overheat Detection System

A. References

- (1) 24-22-00/201, Electrical Power – Control
- (2) 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) 31-51-00/501, Warning System
- (4) 33-16-00/501, Master Dim and Test
- (5) 54-52-01/401 Strut Fairings

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuelage
211/212	Flight Compartment

(2) Access

413, 423	L, R Fan Cowl Panel (Left)
414, 424	L, R Fan Cowl Panel (Right)
415, 425	L, R Fan Reverser (Left)
416, 426	L, R Fan Reverser (Right)

C. Prepare for the Test

S 865-019

- (1) Supply electrical power (Ref 24-22-00).

S 755-020

- (2) Make sure these systems operate:
- (a) EICAS (Ref 31-41-00).
 - (b) Warning System (Ref 31-41-00).
 - (c) Master dim and test system (Ref 33-16-00).

S 015-021

- (3) Remove the aft forward strut fairing (Ref 54-52-01).

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S 865-022

WARNING: DO NOT CLOSE THE CIRCUIT BREAKERS APPLICABLE TO THE FIRE EXTINGUISHERS. THE ACCIDENTAL RELEASE OF THE CONTENTS OF THE FIRE EXTINGUISHER BOTTLES CAN CAUSE INJURY TO PERSONS.

CAUTION: REMOVE THE ELECTRICAL POWER BEFORE YOU REMOVE THE ELECTRICAL CONNECTORS OR CIRCUIT CARDS. INDUCTIVE SURGES OR ARCING CAN CAUSE DAMAGE TO THE EQUIPMENT.

(4) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B23, FIRE DETECTION R ENGINE 2
- (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

D. Do a Test of the Left Engine

S 035-001

(1) Disconnect one wire from each of the switches, S10140 and S10139, for the turbine overheat detection on the left engine.

S 865-002

(2) Close these two circuit breakers on the P11 panel:

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2

S 755-003

(3) Make sure these indications occur in less than 2 to 6 seconds:

- (a) The L engine fire warning light, on the engine fire switch, comes on (P8).
- (b) The red master FIRE light (P1-3) comes on.
- (c) The red master WARNING lights (2), on the glare-shield panel, P7, comes on.
- (d) The L switch-light for the engine fuel control (P10) comes on.
- (e) The fire bell is heard.

S 755-004

(4) Make sure this EICAS message shows on the top display:

- (a) L ENGINE FIRE

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- S 755-030
- (5) Make sure these EICAS messages show on the bottom display:
- (a) L TURB OH DET 1
 - (b) L TURB OH DET 2
- S 755-005
- (6) Open these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
- S 435-006
- (7) Connect the wires which were disconnected on each of the switches, S10140 and S10139, for the turbine overheat detection on the left engine.
- S 865-027
- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
- S 865-024
- (9) Push the ECS MSG switch on the EICAS maintenance panel (P61).
- S 865-025
- (10) Push and hold the ENG test switch on the FIRE/OVHT TEST panel (P8).
- (a) Make sure these indication occur:
 - 1) The L engine fire warning light, on the engine fire switch (P8), comes on.
 - 2) The red master FIRE light (P1-3) comes on.
 - 3) The master WARNING lights (P-7) comes on.
 - (b) The left switch-light for the engine fuel control (P10) comes on.
 - (c) The fire bell is heard.
- S 755-050
- (11) Make sure these EICAS messages show on the bottom display:
- (a) L ENGINE FIRE

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- (b) L TURB OH DET 1
- (c) L TURB OH DET 2

S 865-028

- (12) Release the ENG test switch on the FIRE/OVHT TEST panel (P8).
 - (a) Make sure these indications occur:
 - 1) The red L engine fire warning light goes out.
 - 2) The red master FIRE light goes out.
 - 3) The red master WARNING lights goes out.
 - 4) The switch-light for the L engine fuel control goes out.
 - 5) The fire bell stops.

S 755-029

- (13) Make sure these EICAS message do not show:
 - (a) L ENGINE FIRE
 - (b) L TURB OH DET 1
 - (c) L TURB OH DET 2

E. Do a Test of the Right Engine

S 035-048

- (1) Disconnect one wire from each of the switches, S10140 and S10139, for the turbine overheat detection on the right engine.

S 865-049

- (2) Close these two circuit breakers on the P11 panel:
 - (a) 11B22, FIRE DETECTION R ENGINE 1
 - (b) 11B23, FIRE DETECTION R ENGINE 2

S 755-032

- (3) Make sure these indications occur in less than 2 to 6 seconds:
 - (a) The R engine fire warning light, on the engine fire switch, comes on.
 - (b) The red master FIRE light (P1-3) comes on.
 - (c) The red master WARNING lights (2), on the glare-shield panel, P7, come on.

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- (d) The R switch-light for the engine fuel control (P10) comes on.
- (e) The fire bell is heard.

S 755-033

- (4) Make sure this EICAS message shows on the top display:
 - (a) R ENGINE FIRE

S 755-034

- (5) Make sure these EICAS messages show on the bottom display:
 - (a) R TURB OH DET 1
 - (b) R TURB OH DET 2

S 865-047

- (6) Open these circuit breakers on the P11 panel:
 - (a) 11B22, FIRE DETECTION R ENGINE 1
 - (b) 11B23, FIRE DETECTION R ENGINE 2

S 435-035

- (7) Connect the wires which were disconnected on each of the switches, S10140 and S10139, for the turbine overheat detection on the right engine.

S 865-036

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B22, FIRE DETECTION R ENGINE 1
 - (b) 11B23, FIRE DETECTION R ENGINE 2

S 865-037

- (9) Push the ECS MSG switch on the EICAS maintenance panel (P61).

S 865-038

- (10) Push and hold the ENG test switch on the FIRE/OVHT TEST panel (P8).
 - (a) Make sure these indications occur:
 - 1) The R engine fire warning light, on the engine fire switch, comes on.
 - 2) The red master FIRE light (P1-3) comes on.
 - 3) The red Master warning lights (P7) come on.
 - 4) The R switch-light, on the engine fuel control, comes on.
 - 5) The fire bell is heard.

S 755-039

- (11) Make sure this EICAS message shows on the top display:
 - (a) R ENGINE FIRE

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S 755-040

- (12) Make sure these EICAS messages show on the bottom display:
- (a) R TURB OH DET 1
 - (b) R TURB OH DET 2

S 865-041

- (13) Release the ENG test switch on the FIRE/OVHT TEST panel (P8).
- (a) Make sure these indications occur:
 - (b) The R engine fire warning light, on the engine fire switch, goes off.
 - (c) The red master FIRE light goes off.
 - (d) The red master WARNING lights (P7) go off.
 - (e) The R switch-light for the engine fuel control goes out.
 - (f) The fire bell stops.

S 755-043

- (14) Make sure these EICAS messages do not show:
- (a) R ENGINE FIRE
 - (b) R TURB OH DET 1
 - (c) R TURB OH DET 2

F. Put the Airplane back to its Usual Condition

S 415-044

- (1) Install the aft forward strut fairing.

S 865-045

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

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- S 865-046
(3) Remove electrical power if it is not necessary (Ref 24-22-00).

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ENGINE TURBINE COOLING OVERHEAT SWITCH – REMOVAL/INSTALLATION

1. General

- A. Two differential expansion switches, which are temperature sensitive, are used to detect overheat of the turbine cooling air. These detection switches are installed externally to the IP turbine. They are above the centerline on the left side when seen from the rear of the engine. Get access to the switches through the left thrust reverser cowl duct.

TASK 26-13-01-024-001

2. Remove the Overheat Detection Switch (Fig. 401)

A. References

- (1) AMM 78-31-00/201, Thrust Reverser System, Fan C-Duct and Thrust Reverser Opening and Closing.

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuselage
211/212	Flight Compartment

(2) Access Panels

413, 423	L, R Fan Cowl Panel (Left)
414, 424	L, R Fan Cowl Panel (Right)
415, 425	L, R Fan Reverser (Left)
416, 426	L, R Fan Reverser (Right)

C. Remove the Overheat Detection Switch

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, DO-NOT-CLOSE tags:
- (a) 11B19 or 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B20 or 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B21 or 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B22 or 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 014-003

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

- (2) Open the fan C-duct and the thrust reverser left half (AMM 78-31-00/201).

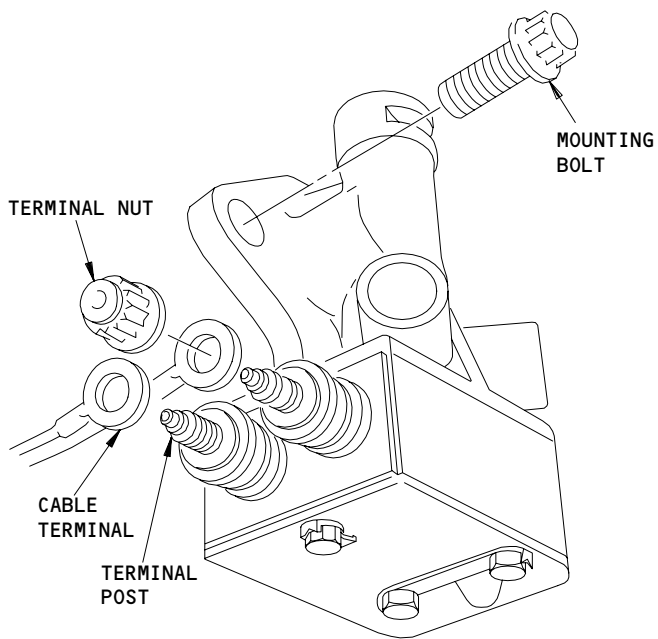
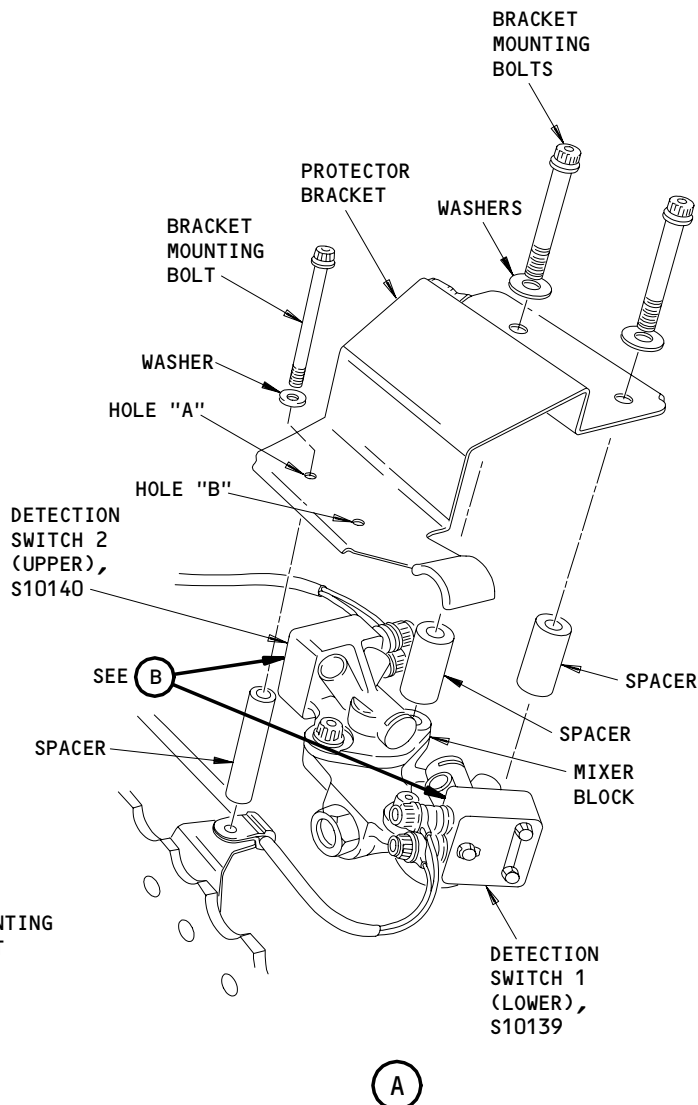
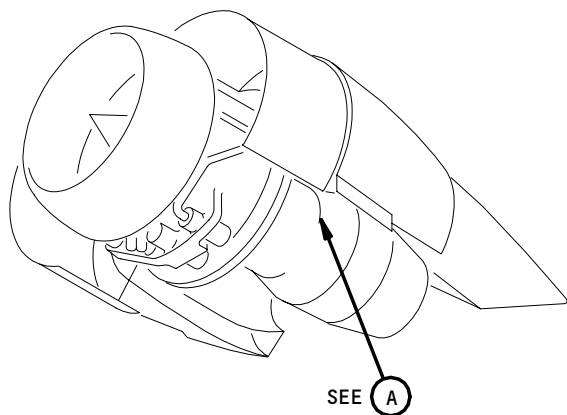
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ENGINE TURBINE COOLING OVERHEAT DETECTION SWITCH

(B)

93403

Engine Turbine Cooling Overheat Detection Switch Installation
Figure 401

EFFECTIVITY	ALL
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- S 034-005
(3) Remove the bracket bolts, washers and spacers, and the bracket.

- S 024-007
(4) Remove the bolt and the overheat detection switches from the mixer block.

- S 434-008
(5) Install approved plugs into all of the openings.

TASK 26-13-01-424-009

3. Install the Overheat Detection Switch (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power Control
- (2) AMM 70-51-00/201, Torque Tightening Technique
- (3) AMM 78-31-00/201, Thrust Reverser System, Fan C-Duct and Thrust Reverser Opening and Closing.

B. Access

(1) Location Zones

119/120	Main Equipment Center
200	Upper Half of Fuselage
211/212	Flight Compartment

(2) Access Panels

413, 423	L, R Fan Cowl Panel (Left)
414, 424	L, R Fan Cowl Panel (Right)
415, 425	L, R Fan Reverser (Left)
416, 426	L, R Fan Reverser (Right)

C. Prepare to install the Overheat Detection Switch

S 754-010

- (1) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are open and attach DO-NOT-CLOSE tags:
 - (a) 11B19 or 11B20, FIRE DETECTION L ENGINE 1

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- (b) 11B20 or 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B21 or 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B22 or 11B23, FIRE DETECTION R ENGINE 2
- (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 034-011

- (2) Remove the plugs from the openings.

S 754-012

- (3) Make sure the surfaces that touch are clean and free from damage.

D. Install the Overheat Detection Switch 1

S 424-015

- (1) Install the detection switch and tighten with the bolt (AMM 70-51-00/201).

S 434-016

CAUTION: INSTALL THE HEAT SHRINK SLEEVES ALONG THE WIRES AND THE TERMINALS ON THE SWITCH TO PREVENT MOISTURE CONTAMINATION. CONTAMINATION OF THE TERMINAL CAN CAUSE THE SYSTEM TO OPERATE INCORRECTLY.

- (2) Install the cable terminal lugs on the terminal posts with the terminal nuts and tighten to 25 lb-in (2.82 Nm).

NOTE: Do not adjust the position of the cable terminals after the terminal nuts have been tightened.

NOTE: Do not apply a side load when you tighten the terminal nuts.

S 424-018

- (3) Install the bracket and tighten with the bracket bolts, washers and spacers (AMM 70-51-00/201).

NOTE: The bolt and washer install correctly into hole B. Hole A is not used.

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E. Install the Overheat Detection Switch 2

S 424-030

- (1) Install the cable terminal lugs on the terminal posts with the terminal nuts and tighten to 25 lb-in (2.82Nm).

NOTE: Do not adjust the position of the cable terminals after the terminal nuts have been tightened.

NOTE: Do not apply a side load when you tighten the terminal nuts.

S 424-028

- (2) Install the overheat detection switch and tighten with the bolts in the forward hole (AMM 70-51-00/201).

S 424-034

- (3) Install the protector bracket and tighten with the bracket bolts, washers, and spacers (AMM 70-51-00/201).

S 424-029

- (4) Install the bracket and tighten with the bracket bolts, washers and spacers (AMM 70-51-00/201).

NOTE: The bolt and washer install correctly into hole B. Hole A is not used.

F. Do a Test of the Strut Overheat Switch Installation

S 864-027

- (1) Supply electrical power (AMM 24-22-00/210).

S 864-035

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B19 or 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B20 or 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B21 or 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B22 or 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (f) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 864-019

- (3) Close the EICAS circuit breakers (6 locations) on the P11 panel.

S 864-020

- (4) Push the ECS MSG button on the EICAS maintenance panel, P61.

S 864-021

- (5) Push and hold the ENG test switch on the FIRE/OVHT TEST panel (P8).

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S 754-022

- (6) Make sure these indications occur:
- (a) The LEFT (RIGHT) engine lights, on the engine fire switch, come on.
 - (b) The red master fire light, on the captains instrument panel, P1-3, comes on.
 - (c) The red master WARNING lights, on the glareshield panel, P7, come on.
 - (d) The engine FUEL CONTROL switch-light, on the quadrant control stand, P10, comes on.
 - (e) The fire bell is heard.

S 754-023

- (7) Make sure these indications occur:
- (a) The EICAS message L (R) ENGINE FIRE shows on the top display.
 - (b) The EICAS message L (R) TURB OH DET 1 shows on the bottom display.
 - (c) The EICAS message L (R) TURB OH DET 2 shows on the bottom display.

S 754-024

- (8) Release the ENG test switch and make sure these indications occur:
- (a) The LEFT (RIGHT) lights, on the engine fire switch, goes off.
 - (b) The master fire light, on P1-3, goes off.
 - (c) The master warning lights, on P7, go off.
 - (d) The L (R) control switch for the engine fuel control, on P10, goes off.
 - (e) The fire bell stops.
 - (f) These EICAS messages do not show.
 - 1) L(R) ENGINE FIRE
 - 2) L(R) TURB DET 1
 - 3) L(R) TURB DET 2

S 414-025

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

- (9) Close the fan C-duct and thrust reverser left half (AMM 78-31-00/201).

S 864-026

- (10) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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LAVATORY SMOKE DETECTION – DESCRIPTION AND OPERATION

1. General

- A. A smoke detector is installed in each lavatory to alert cabin attendants and flight crew members in the event of a lavatory fire (Fig. 1).
- B. Each smoke detector has the following features:
 - (1) Alarm horn which produces a continuous tone when smoke is detected.
 - (2) Alarm indicator lamp (red) that illuminates when smoke is detected.
 - (3) Power indicator lamp (green) which is illuminated when power is present.
 - (4) Power/reset switch used to interrupt alarm indications and reset smoke sensing circuit after smoke has been cleared from lavatory.

2. Operation (Fig. 2)

A. Functional Description

- (1) Lavatory smoke detectors use an ionization sensor to detect smoke. A very small amount of radioactive material ionizes the air between two electrodes allowing current to flow through the air between the electrodes. Any smoke particles present interfere with this current flow. The change in current flow is sensed by a current amplifier which outputs a signal to turn on the alarm horn and red alarm light.

NOTE: THE LAVATORY SMOKE DETECTOR MAY NOT BE TRIGGERED BY CIGARETTE SMOKE.

- (2) The presence of smoke is indicated by the following:
 - (a) Alarm lamp (red) on smoke detector face panel illuminates.
 - (b) Smoke detector alarm horn sounds.
 - (c) Alarm indications are interrupted by pressing the power/reset switch with a small screwdriver or other suitable tool.

B. Control

- (1) The following lavatory smoke detectors are powered by the left and right 28v dc bus located on overhead circuit breaker panel P11:
 - (a) 11N8, PASS CALL/LAV SMOKE LEFT
 - (b) 11N9, PASS CALL/LAV SMOKE RIGHT

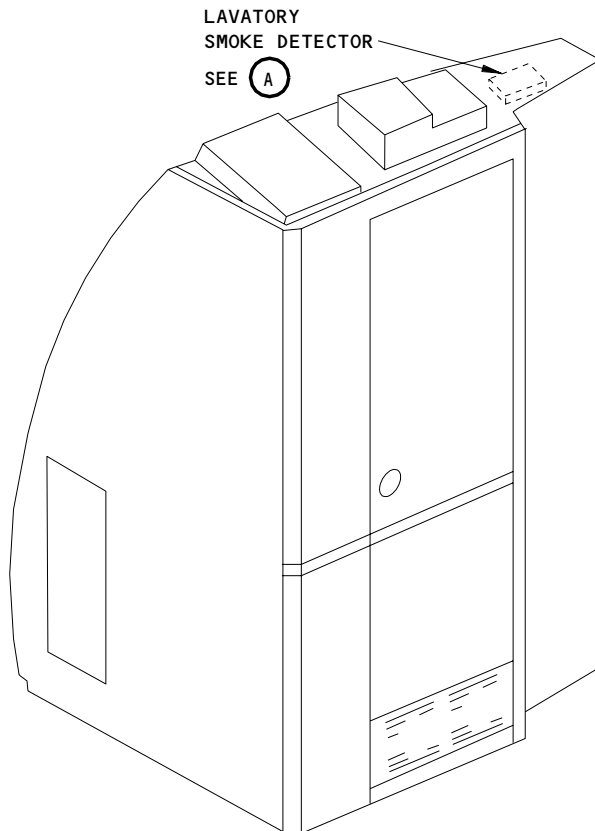
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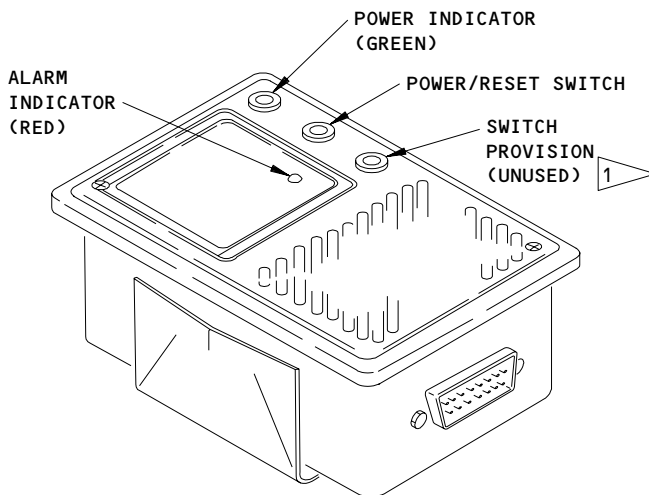
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LAVATORY
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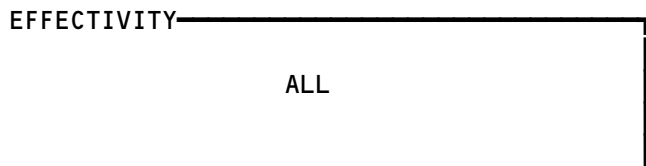


LAVATORY SMOKE DETECTOR

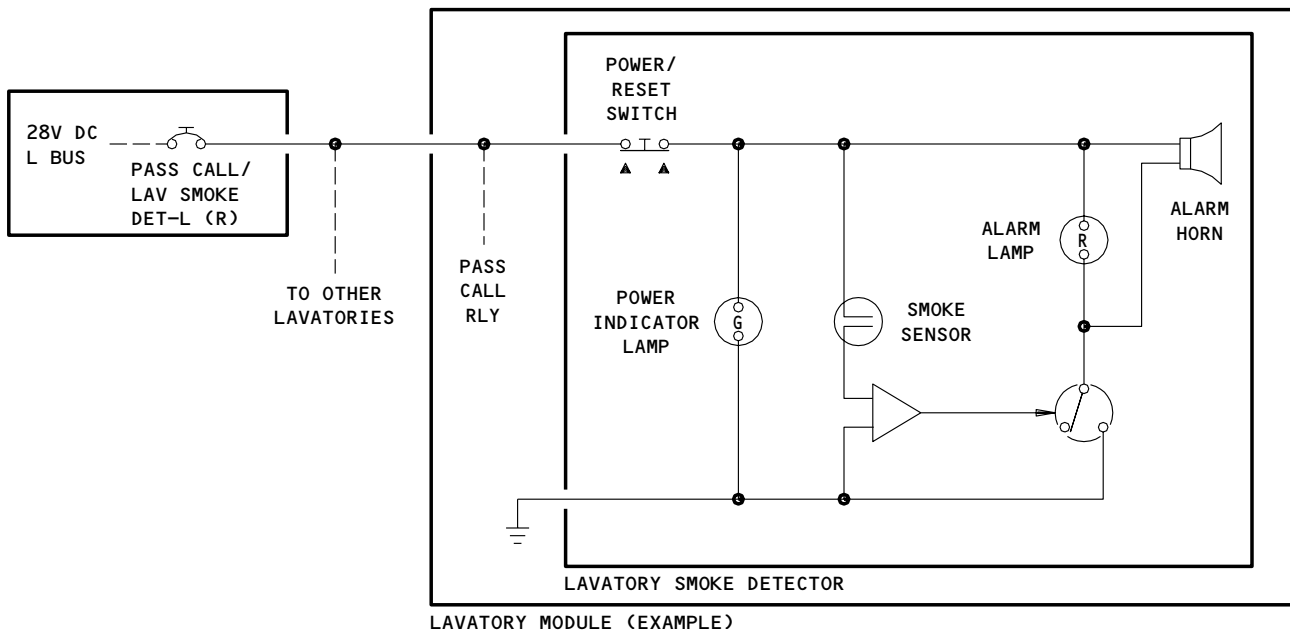
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1 NOT ON ALL
SMOKE DETECTORS

Lavatory Smoke Detector
Figure 1



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Lavatory Smoke Detection Schematic (Example)
Figure 2

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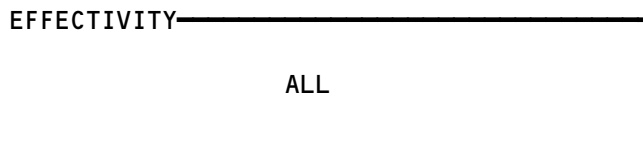

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LAVATORY SMOKE DETECTION

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER -	--		FLT COMPT, P11	
PASS CALL LAV SMOKE DET LEFT, C4376		1	11N8	*
PASS CALL LAV SMOKE DET RIGHT, C4375		1	11N9	*
LAVATORY SMOKE DETECTOR, M4	--	1	EACH LAVATORY	*

* SEE THE WDM EQUIPMENT LIST

Lavatory Smoke Detection - Component Index
Figure 101

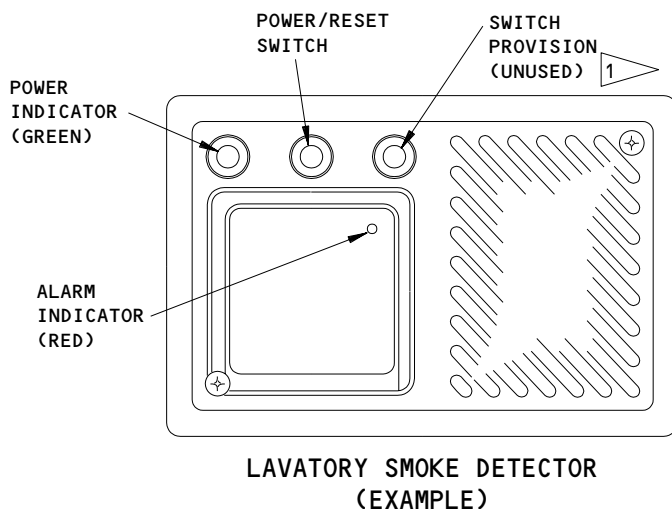
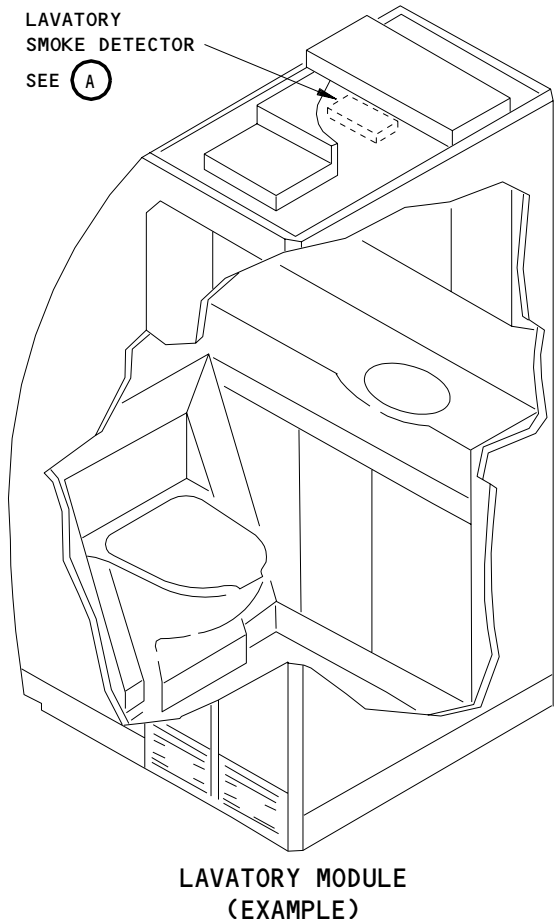


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1 NOT ON ALL SMOKE DETECTORS

(A)

Lavatory Smoke Detection - Component Location
Figure 102

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LAVATORY SMOKE DETECTION – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to perform a system test of the lavatory smoke detection system. This test will make sure the lavatory smoke detector sensing, annunciation and interrupt functions operate correctly.

TASK 26-14-00-735-001

2. System Test – Lavatory Smoke Detectors

A. Equipment

(1) Smoke Source

- (a) Smoke Detector Tester Spray p/n 25S or equivalent
Home Safeguard Industries
883 Broadway
Albany, NY 12207
Phone: 800-325-6045
- (b) Ventilation Smoke Tube P/N 458481 or equivalent
Mine Safety Appliance Co.
P.O. Box 426
Pittsburgh, PA 15230
Phone: 412-967-3000
FAX: 412-967-3161

B. References

- (1) AMM 24-22-00/201, Electrical Power – Control

C. Access

(1) Location Zones

- | | |
|---------|------------------------|
| 200 | Upper Half of Fuselage |
| 211/212 | Flight Compartment |
| 119/120 | Main Equipment Center |

D. Prepare for Test

S 865-002

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

S 755-003

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
- (a) 11N8, PASS CALL/LAV SMOKE LEFT
- (b) 11N9, PASS CALL/LAV SMOKE RIGHT

E. Do a Test of the Lavatory Smoke Detection System.

S 755-004

- (1) Make sure the green power indicator lamp, on the smoke detector face, comes on.

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S 865-032

WARNING: AN APPLICABLE CONTAINER MUST BE USED TO BURN MATERIAL. USE OF AN INCORRECT CONTAINER CAN LET SPARKS OR FLAMES CAUSE INJURY TO PERSONNEL AND DAMAGE EQUIPMENT.

- (2) Use an approved smoke source to make smoke adjacent to the lavatory smoke detector.

S 755-006

- (3) Make sure the red alarm lamp on the smoke detector face comes on.

S 755-007

- (4) Make sure the smoke detector alarm horn is heard.

S 865-008

- (5) Push and hold the POWER/RESET switch with a small screwdriver or other applicable tool.

S 755-009

- (6) Make sure the alarm indications stop.

S 865-010

- (7) Release the POWER/RESET switch.

S 865-012

- (8) Remove the smoke from the lavatory.

S 865-013

- (9) Push and release the POWER/RESET switch to stop the alarm and set the smoke sensing circuit.

S 755-014

- (10) Make sure the red alarm lamp goes off and the alarm horn is not heard.

S 865-015

- (11) Remove electrical power if it is not necessary (AMM 24-22-00).

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LAVATORY SMOKE DETECTOR – MAINTENANCE PRACTICES

1. General

- A. This procedure has three tasks. The first task removes the lavatory smoke detector. The second task installs the smoke detector. The third task cleans the smoke detector.
- B. A smoke detector is installed in the ceiling of each lavatory. The removal/installation procedure and the cleaning procedure are the same for each smoke detector.

TASK 26-14-01-002-001

2. Remove the Lavatory Smoke Detector

- A. Equipment
 - (1) Standard screwdriver
- B. References
 - (1) AMM 24-22-00/201, Electrical Power – Control
- C. Access
 - (1) Location Zones
 - 200 Upper Half of Fuselage
 - 211/212 Flight Compartment
 - 119/120 Main Equipment Center

D. Remove the Lavatory Smoke Detector (Fig. 201)

S 862-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11N8, PASS CALL/LAV SMOKE LEFT
 - (b) 11N9, PASS CALL/LAV SMOKE RIGHT

S 032-003

- (2) Loosen the two screws on the smoke detector faceplate.

S 032-004

- (3) Remove the faceplate from the smoke detector case.

S 032-005

- (4) Remove the two screws that hold the smoke detector to the ceiling bracket.

S 032-006

- (5) Disconnect the electrical connector from the smoke detector.

S 022-007

- (6) Remove the smoke detector and the ceiling bracket from the ceiling.

S 032-008

- (7) Disconnect the lanyard from the smoke detector.

S 162-009

- (8) Do the task "Clean the Smoke Detector" if it is necessary.

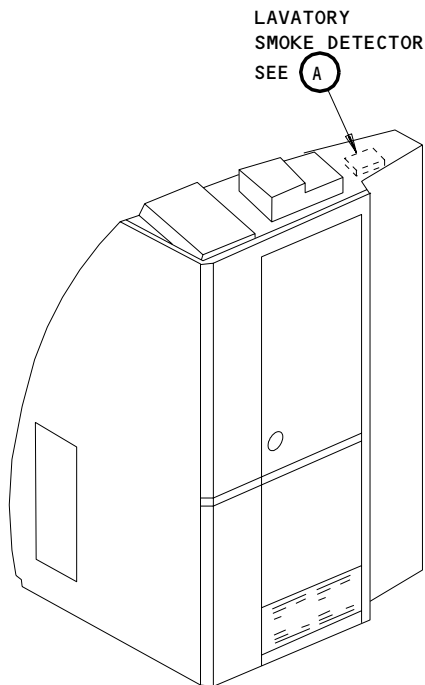
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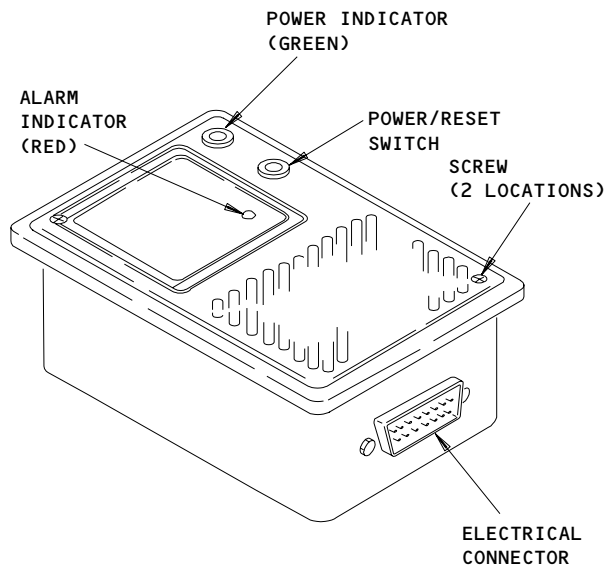
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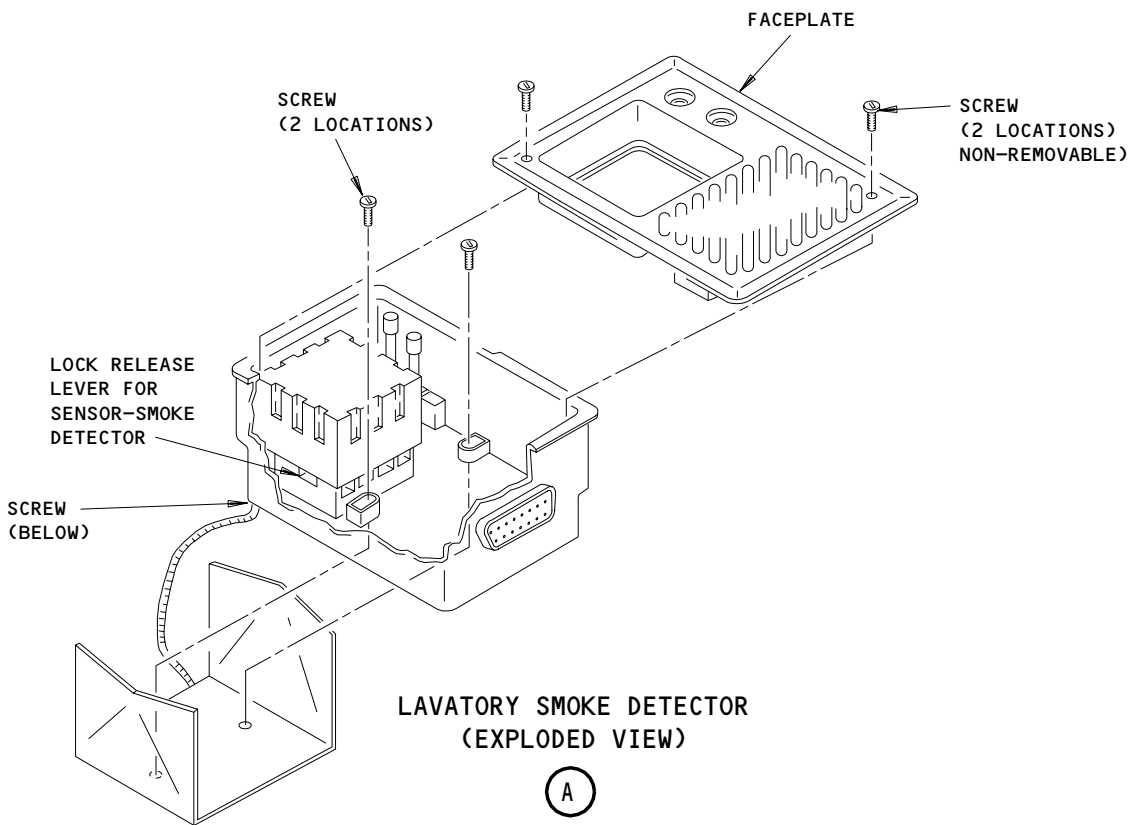


LAVATORY (EXAMPLE)



LAVATORY SMOKE DETECTOR

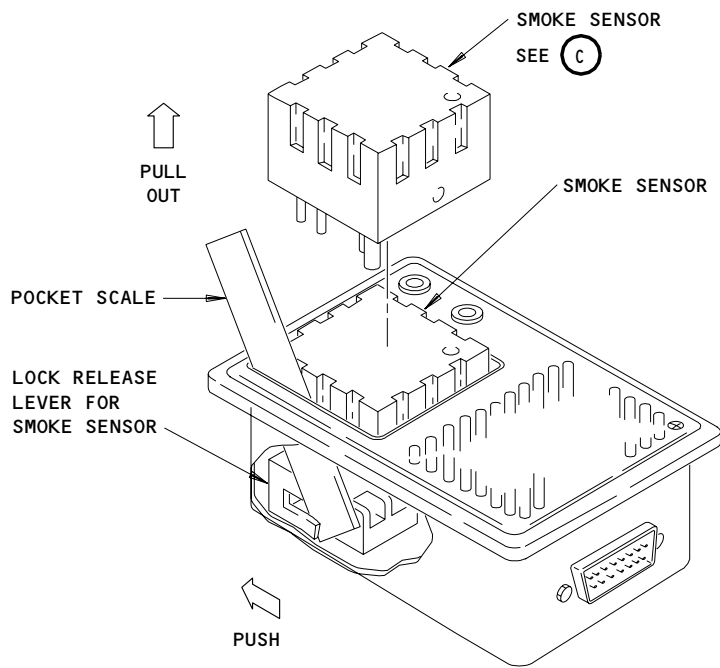
(A)



Lavatory Smoke Detector Installation
Figure 201

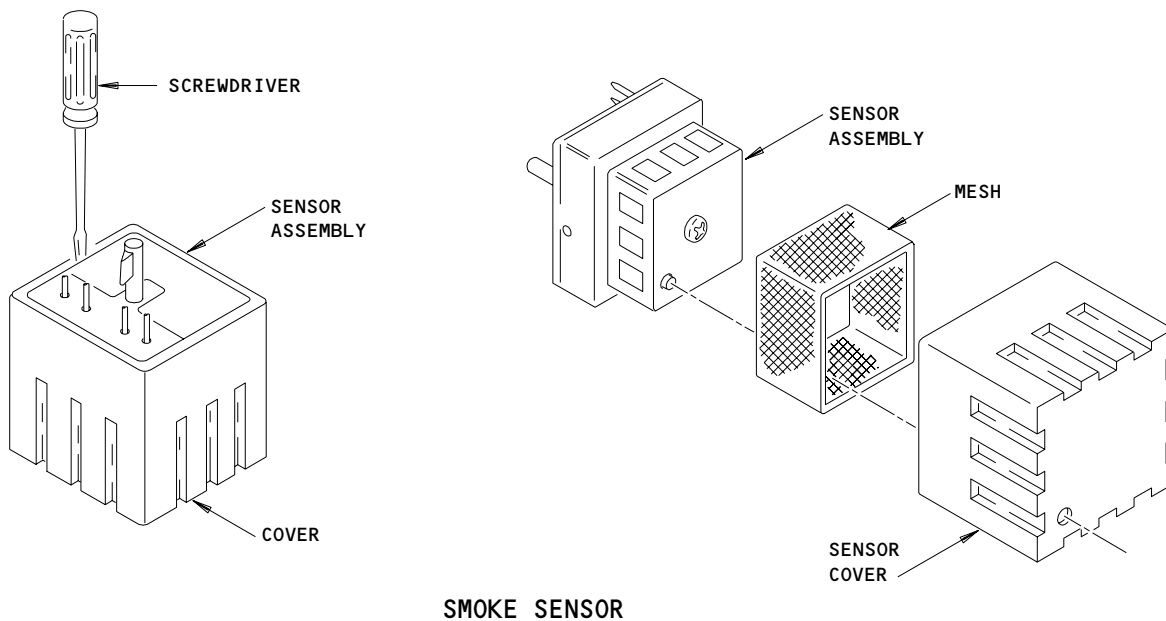
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LAVATORY SMOKE DETECTOR

(B)



SMOKE SENSOR

(C)

Lavatory Smoke Detector Cleaning
Figure 202

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TASK 26-14-01-402-010

3. Install the Lavatory Smoke Detector

A. Equipment

- (1) Standard screwdriver

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zones

200	Upper Half of Fuselage
211/212	Flight Compartment
119/120	Main Equipment Center

D. Install the Smoke Detector (Fig. 201)

S 432-011

- (1) Attach the ceiling bracket loosely to the smoke detector with two screws.

S 432-012

- (2) Attach the lanyard from the ceiling bracket to the smoke detector case.

S 432-013

- (3) Attach the airplane wiring connector to the smoke detector electrical connector.

S 422-014

- (4) Insert the smoke detector into the ceiling and push on the screws until the ceiling bracket snaps into the correct position.

S 432-015

- (5) Tighten the screws that hold the ceiling bracket in position.

S 432-016

- (6) Attach the faceplate to the smoke detector case with two screws.

S 862-017

- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11N8, PASS CALL/LAV SMOKE LEFT
 - (b) 11N9, PASS CALL/LAV SMOKE RIGHT

E. Lavatory Smoke Detector Test

S 862-020

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

S 752-019

- (2) Make sure that the green power indicator lamp on the smoke detector is on.

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S 862-018

- (3) Remove electrical power if it is not necessary.

TASK 26-14-01-102-035

4. Clean the Lavatory Smoke Detector

A. Equipment

- (1) Standard screwdriver
- (2) Pocket scale/ruler

B. Consumable Materials

- (1) Ethyl alcohol, spec 0-E-760 or 0-A-396 or Isopropyl alcohol, spec TI-I-735 (Ref 20-30-02)
- (2) Synthetic detergent
- (3) Warm water
- (4) Dry compressed air
- (5) Rubber gloves

C. References

- (1) AMM 26-14-00/501, Lavatory Smoke Detection

D. Access

- (1) Location Zones

200	Upper Half of Fuselage
211/212	Flight Compartment
119/120	Main Equipment Center

E. Clean the Smoke Detector (Fig. 202)

S 162-036

WARNING: YOU MUST CLEAN THE DETECTOR IN A WELL VENTILATED AREA WITHOUT HOT SURFACES, FLAME OR SPARKS. WEAR RUBBER GLOVES DURING THE PROCEDURE OR INJURY TO PERSONNEL CAN OCCUR.

- (1) Remove the dirt from the exterior of the smoke detector with a clean, lint-free cloth saturated with ethyl or isopropyl alcohol.

S 032-023

- (2) Do these steps to remove the Smoke Sensor from the Smoke Detector:
 - (a) Insert the pocket scale between the smoke sensor and the faceplate.
 - (b) Push the lock release lever with the pocket scale and then pull out the smoke sensor.

S 032-024

- (3) Slide the standard screwdriver between the smoke sensor and the sensor cover and twist it to release the lock on the cover.

S 032-025

- (4) Remove the cover from smoke sensor assembly.

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S 032-026

CAUTION: DO NOT TOUCH THE ELECTRODE INSIDE OF THE SMOKE SENSOR ASSEMBLY OR DAMAGE TO THE SENSOR CAN OCCUR.

(5) Pull out the mesh from the sensor assembly.

S 212-027

(6) Examine the mesh for dirt or other contamination.

S 142-028

(7) If the mesh is dirty, wash the mesh with a synthetic detergent and luke warm water.

S 422-029

(8) If the mesh is excessively dirty, replace it with a new mesh.

S 162-030

(9) Dry the mesh completely with dry compressed air.

S 162-031

CAUTION: DO NOT BLOW VIOLENTLY INTO THE SENSOR ASSEMBLY. THIS CAN CAUSE STATIC CHARGE ON THE ELECTRODES WHICH CAN CAUSE DAMAGE TO THE SENSOR.

(10) Blow out any dirt or particles in the sensor assembly.

S 432-032

(11) Install the mesh on the sensor assembly.

S 432-033

(12) Align the cover with the applicable hole in the sensor assembly and install the cover.

S 422-034

(13) Install the smoke sensor in the detector assembly.

S 712-021

(14) Do the Lavatory Smoke Detector Operational Test (AMM 26-14-00).

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APU FIRE DETECTION - DESCRIPTION AND OPERATION

1. General

- A. A dual-loop fire detection system is installed in the APU compartment. This system monitors temperatures in the compartment, and provides alerts for a fire condition.
- B. The APU fire detection system uses power from the 28-volt DC battery bus, with alternate power from the right main DC bus. The system circuit breakers are on overhead circuit breaker panel P11. The system contains no on/off switches.
- C. The system is composed of two dual-loop detectors. Thus, each loop of the system has two detector elements, one from each detector.
- D. Each detection loop has a control card. The system has one fire/overheat logic/test card, and a fire/overheat test panel.
- E. When the airplane is on the ground, an APU fire indication is given at the nose landing gear - on the LTS/APU/INTERPHONE panel, as well as in the cockpit.
- F. GUI ALL EXCEPT 115;
The detection system operates in AND logic on the ground and in the air. Thus, both loops of the system must sense a fire or fault condition in order for an alarm to be given.
- G. GUI 115;
Refer to the data that follows:
 - (1) In the air, the detection system operates in AND logic. Thus, both loops of the system must sense a fire or fault condition in order for an alarm to be given.
 - (2) On the ground, the detection system operates in OR logic. If either loop senses a fire an alarm will be given.

2. Component Details (Fig. 1)

A. APU Fire Detectors

- (1) A fire detector consists of two sensing elements which are attached to a support tube by quick-release mounting clamps. Each sensing element is a resistor-capacitor network, with resistance varying as a function of temperature.
- (2) At low temperatures, the impedance of the sensing element is mainly resistive. As temperature increases, the resistance drops, thus the impedance becomes more reactive. The detector card senses the change as a fire signal. A pure resistance will not be sensed by the detector card as a fire, but as a fault.

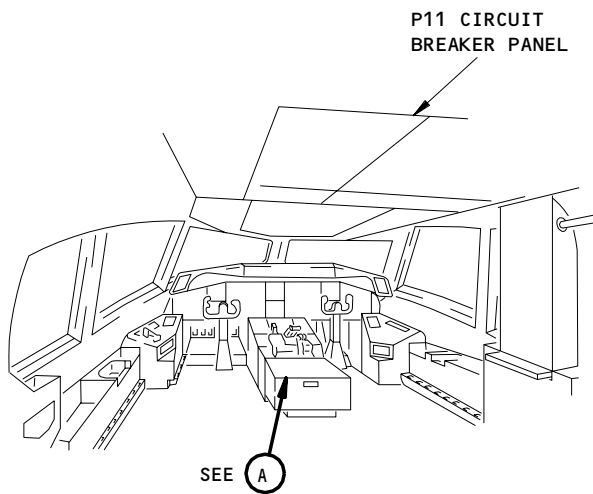
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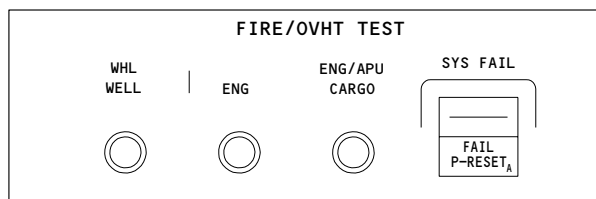
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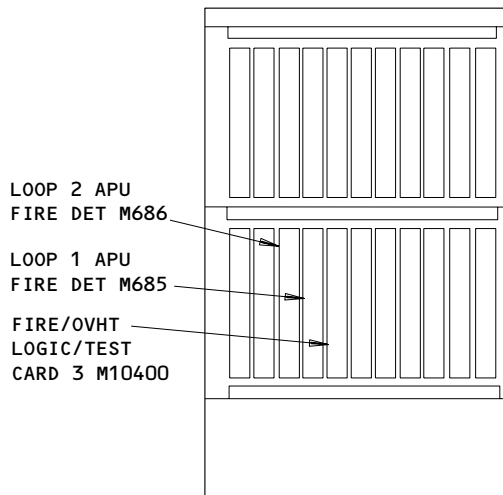
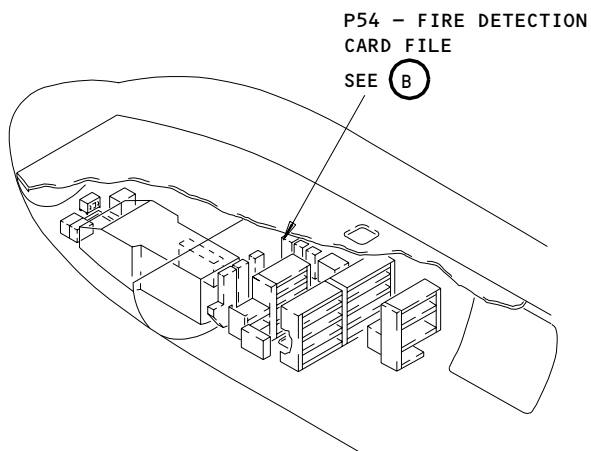


FLIGHT COMPARTMENT



FIRE/OVHT TEST PANEL

(A)



FIRE DETECTION CARD FILE P54

(B)

APU Fire Detection Component Location
Figure 1 (Sheet 1)

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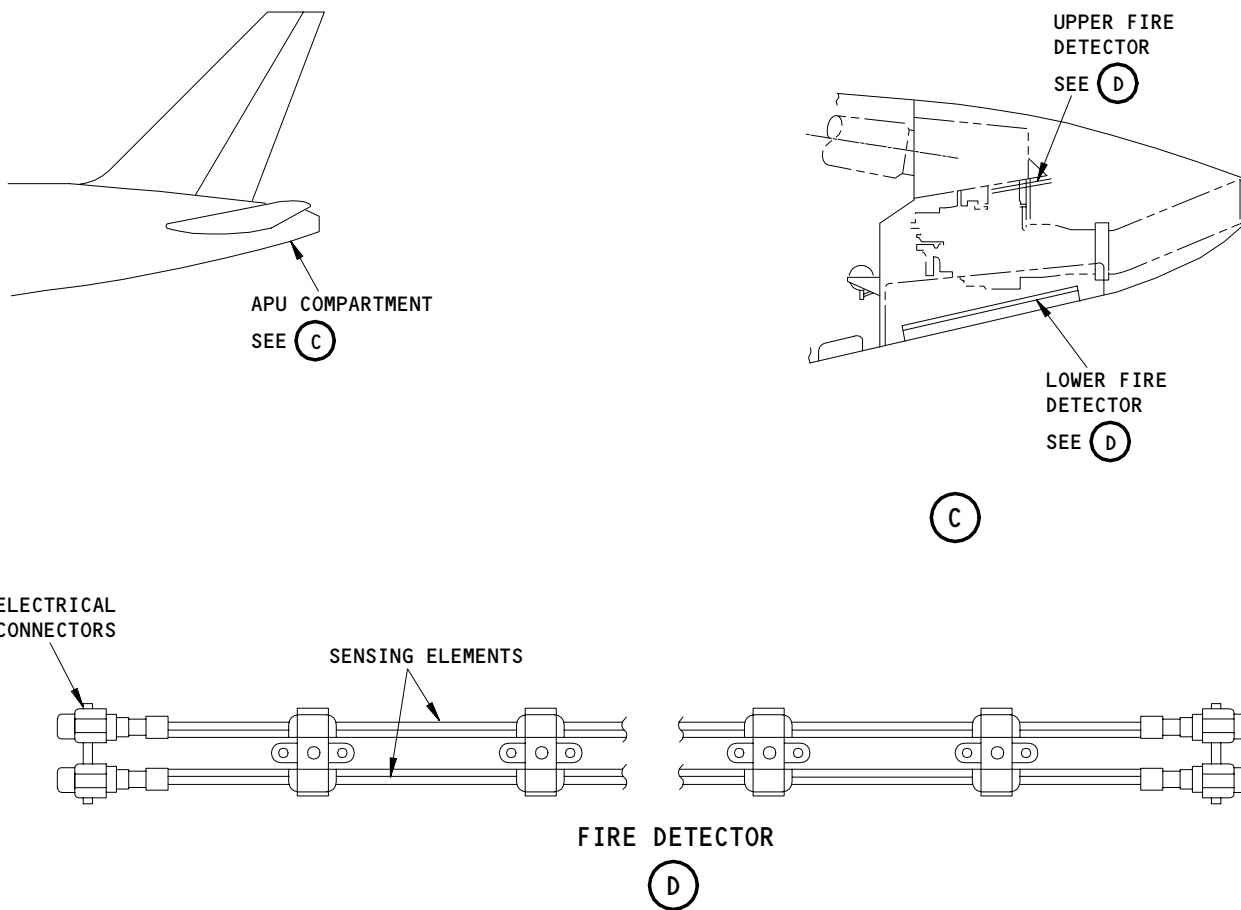
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APU Fire Detection Component Location
Figure 1 (Sheet 2)

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- (3) The fire detectors are installed above and below the APU. One detector forms a 180 degree arc around the air inlet above the APU and the other detector is below the APU, on an access door.
- B. Fire and Overheat Detection Cards
- (1) Each detection loop has a corresponding detection control card. These cards constantly monitor and process signals produced by each loop. The cards output alarm or fault signals to the fire/overheat logic/test card.
 - (2) The detection control cards are in the P54 fire detection card file. The card file is in the electrical/electronic equipment compartment, along the right side of the fuselage.
- C. Fire/Overheat Logic/Test Card
- (1) The AFOLTS (Automatic Fire/Overheat Logic/Test System) card interprets detection control card signals, provides a system functional test, and outputs fire warning and fault indication signals.
 - (2) The AFOLTS card is located in the P54 card file.
- D. Fire/Overheat Test Panel
- (1) The fire/overheat test panel contains a momentary pushbutton switch – ENG/APU/CARGO. This switch initiates a test of the fire, overheat, and smoke detection systems for the engines, APU, and cargo compartments. The test results in cockpit fire and overheat indications.
 - (2) The test panel also has an amber SYS FAIL – FAIL P–RESET switchlight. This switchlight indicates a fire, overheat, or smoke detection system failure. The switchlight is pressed to reset.
 - (3) The fire/overheat test panel is on aft pilots' control stand P8.
- E. LTS/APU/INTERPHONE Panel
- (1) LTS/APU/INTERPHONE panel P62 contains the APU FIRE light, and the APU fire warning horn. In addition, the panel contains switches that allow the APU to be shutdown (when a fire indication occurs), and the APU fire extinguisher to be discharged from the nose Landing gear area.
 - (2) P62 is located on the right side of the nose landing gear.
3. Operation (Fig. 2)
- A. Functional Description
- (1) When temperature increases, the resistance of the detector element drops, and the detector card senses the voltage across the capacitance, triggering a fire indication. If the detector is shorted, contaminated, or has opened up, only the voltage across the detector resistance changes. The detector card interprets this as a fault, and provides a fault indication.

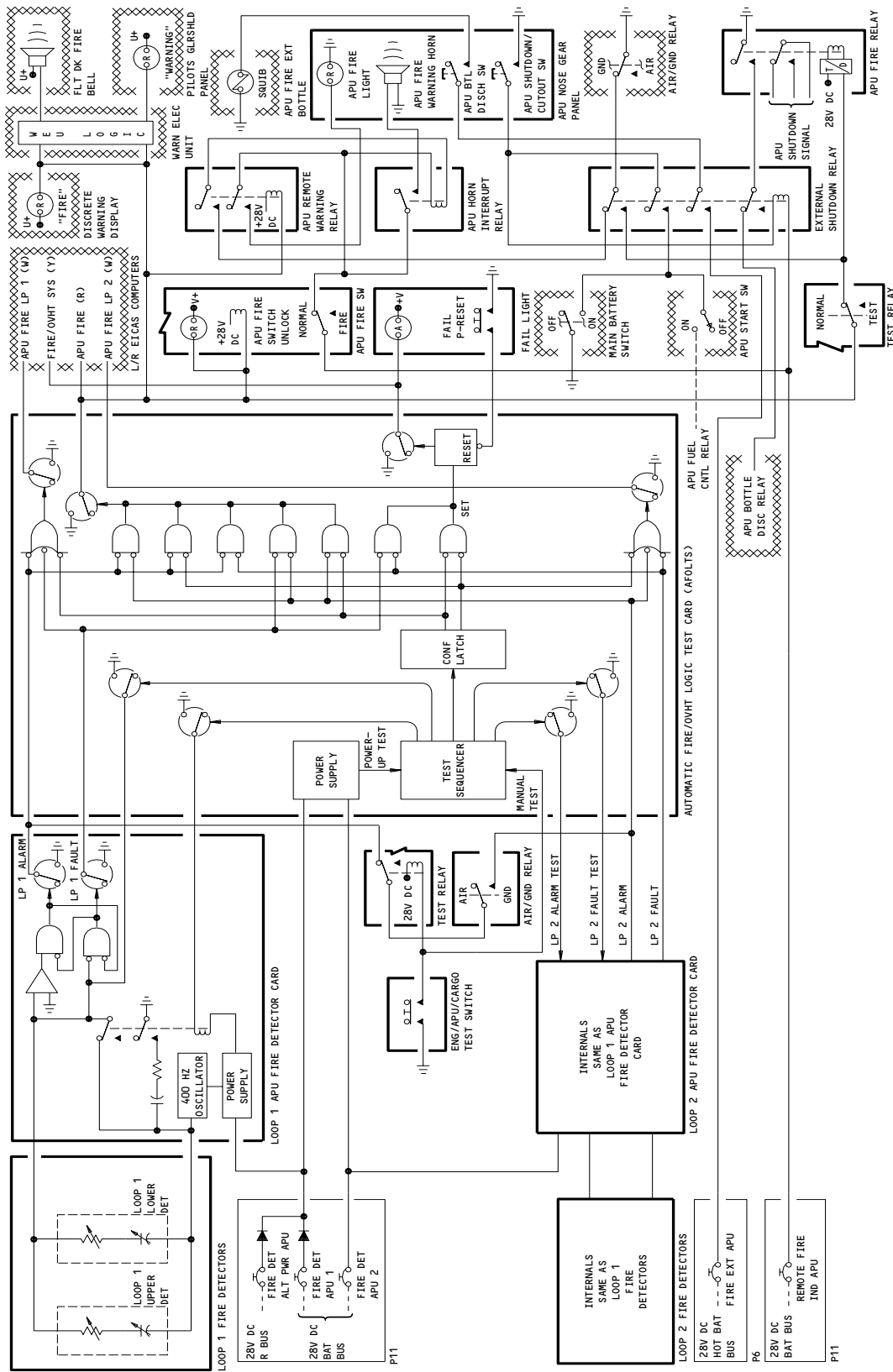
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APU Fire Detection Schematic
Figure 2

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- (2) The AFOLTS card configures the control card signals in AND logic, and determines the appropriate output to flight and ground crews. The APU Fire Detection Logic table shows the normal operating mode.

NOTE: APU FIRE LP 1 and APU FIRE LP 2 are EICAS maintenance messages visible only when "ECS/MSG" switch is pushed.

APU Fire Detection Logic Table 1			
INPUTS TO AFOLTS FROM APU FIRE DETECTION CARDS		EICAS MESSAGE	
LOOP 1	LOOP 2	GROUND	AIR
FIRE	FIRE	APU FIRE	APU FIRE
FIRE	----	APU FIRE	APU FIRE LP 1
----	FIRE	APU FIRE	APU FIRE LP 2
FIRE	FAULT	APU FIRE	APU FIRE
FAULT	FIRE	APU FIRE	APU FIRE
FAULT	FAULT	APU FIRE	APU FIRE
FAULT	----	APU FIRE LP 1	APU FIRE LP 1
----	FAULT	APU FIRE LP 2	APU FIRE LP 2

- (3) A cockpit APU fire indication is given by the following:
- The red APU fire switch handle, on the P8 control stand, lights up and unlocks.
 - The red FIRE light, on captain's instrument panel P1-3, comes on.
 - The fire warning message - APU FIRE, is displayed on EICAS (Engine Indication and Crew Alerting System - P2 panel).
 - The red master WARNING lights, on glareshield panels P7, come on.
 - The fire bell sounds, on the flight deck aural warning speakers.
 - The status/maintenance messages APU FIRE LP 1 and LP 2 are displayed on EICAS.
- (4) An APU remote fire indication is given on P62 by the following:
- The red APU FIRE light comes on.

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- (b) The APU fire warning horn sounds.
 - (5) When a fire is detected, the fire alarm signal is also provided to the APU, signaling the APU to shut down. The APU fire warning horn (on P62) sounds until one of the following occurs:
 - (a) The APU fire switch handle (on P8) is pulled out.
 - (b) The APU FIRE SHUTDOWN switch (on P62) is pushed.
 - (c) The fire signal ceases.
 - (6) A single-loop fault or alarm signal indication is given by EICAS displaying the status/maintenance message APU FIRE LP 1 or 2.
 - (7) Detector, card, or associated wiring failures may not provide a valid fault output at the moment of failure. These inoperative loops can only be detected during a system test.
- B. Test
- (1) When a test occurs, the AFOLTS card sends out signals to both loops of the system. Returned signals indicate operating loops. If either loop is found faulty, AFOLTS reconfigures the system to operate on the remaining loop.
 - (2) If the remaining loop sustains an alarm or fault condition, then a fire warning results.
 - (3) If both loops are found faulty, then a dual-loop fault indication is given by the following:
 - (a) The amber FAIL P-RESET switchlight, on the P8 control stand, comes on.
 - (b) The advisory message, FIRE/OVHT SYS, is displayed on EICAS (P2).
 - (c) The status/maintenance messages, APU FIRE LP 1 and 2, are displayed on EICAS.
 - (d) The FAIL P-RESET switchlight is pressed to reset the fault monitoring circuitry. This also turns off the FAIL P-RESET switchlight, and clears the EICAS advisory message, FIRE/OVHT SYS.
 - (4) Power-up mode (TABLE 2):

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APU Fire Detection TEST LOGIC Table 2			
INPUTS TO AFOLTS DURING SYSTEM TEST		AFOLTS CONFIGURATION AFTER TEST	EICAS MESSAGE AFTER TEST
LOOP 1	LOOP 2		
----	----	DUAL LOOP	NONE
----	FAULT	LOOP 1	APU FIRE LP 2
FAULT	----	LOOP 2	APU FIRE LP 1
FAULT	FAULT	FAIL	FIRE/OVHT SYS APU FIRE LP 1 APU FIRE LP 2

- (a) Whenever power is first applied, an automatic self-test occurs. Both single-loop APU status/maintenance messages are momentarily displayed on EICAS (P2). If either loop is found faulty, then the appropriate loop message remains on EICAS display, and the system is reconfigured to the other loop. If both loops are found faulty, then the FAIL P-RESET switchlight (on P8) comes on, EICAS displays APU FIRE LP 1 and LP 2 maintenance messages and the advisory message - FIRE/OVHT SYS. A fire warning will not be initiated by a power-up test.
- (5) Manual system test (TABLE 2):
- (a) When the ENG/APU/CARGO switch on the fire/overheat test panel (on P8) is pressed and held - the engine, APU, and cargo detection systems go through a self-test. Both APU loop messages are displayed on EICAS, and after a two to four-second delay, a successful test terminates with all APU fire indications.
- (b) When the ENG/APU/CARGO switch is released, all messages and indications should clear, except for any faulty-loop messages which will remain on EICAS. The FAIL P-RESET switchlight, and EICAS advisory message - FIRE/OVHT SYS, will also remain on if there is a dual-loop fault.
- (6) The manual system test and the power-up mode will not invalidate an alarm in progress. Neither test will cause the APU to shutdown.
- C. Control
- (1) Turn-on procedure:
- (a) Provide electrical power (AMM 24-22-00).

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- (b) Check that the following circuit breakers on overhead circuit breaker panel P11 are closed:
- 1) FIRE DET ALTN PWR APU
 - 2) FIRE DETECTION APU 1 and 2
 - 3) APU REMOTE FIRE IND

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FAULT ISOLATION/MAINT MANUAL

APU FIRE DETECTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD 3 - FIRE/OVHT LOGIC/TEST, M10400	2	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 1 APU FIRE DET, M685	2	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - LOOP 2 APU FIRE DET, M686	2	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CARD - L ENG SPEED, M10298	2	1	119BL, MAIN EQUIP CTR, P50	*
CARD - R ENG SPEED, M10311	2	1	119BL, MAIN EQUIP CTR, P50	*
CIRCUIT BREAKER -	1		FLT COMPT, P11	
APU REMOTE FIRE IND, C796		1	11B33	*
FIRE DET ALTN PWR APU, C765		1	11J25	*
FIRE DETECTION APU 1, C776		1	11B24	*
FIRE DETECTION APU 2, C785		1	11B25	*
COMPUTER - (FIM 31-41-00/101)				
EICAS L, M10181				
EICAS R, M10182				
DETECTOR - APU FIRE, TS5066,TS5067,TS5062, TS5063	2	2	315AL,316AR, APU COMPT	26-15-02
DIODE - BUS ISOLATION, R201,R202	1	2	FLT COMPT, BEHIND P5	*
DIODE - ISOLATION 1, R10088		1	FLT COMPT, BEHIND P36	
HORN - APU FIRE WARNING, B122		1	NOSE LANDING GEAR, P62	*
LIGHT - APU FIRE, L401		1	NOSE LANDING GEAR, P62	*
MODULE - DISCRETE WARNING DISPLAY, M779	1	1	FLT COMPT, P1-3	*
PANEL - (FIM 26-11-00/101)				
FIRE/OVHT TEST, M10445				
PANEL - (FIM 26-22-00/101)				
APU/CARGO FIRE CONT, M10444				
PANEL - (FIM 49-61-00/101)				
APU START, M10324 OR APU CONTROL, M1				
RELAY - (FIM 31-01-33/101)				
APU HORN INTERRUPTER, K420				
EXTERNAL SHUTDOWN, K421				
RELAY - (FIM 31-01-36/101)				
AIR GND, K145				
APU FIRE, K10334				
APU GND, K10373				
APU REMOTE WARNING, K10374				
TEST, K10325				
RELAY - (FIM 31-01-37/101)				
AIR GND SYS 2, K219				
SWITCH - APU BOTTLE DISCH, S485	1	1	NOSE LANDING GEAR, P62	*
SWITCH - APU FIRE, S39	1	1	FLT COMPT, P8, APU/CARGO FIRE CONTROL PANEL, M10444	*
SWITCH - APU FIRE SHUTDOWN, S484	1	1	NOSE LANDING GEAR, P62	*
SWITCH - ENG/APU/CARGO, YQSS001	1	1	FLT COMPT, P8, FIRE/OVHT TEST PANEL, M10445	*
SWITCH - FAIL LIGHT RESET, YQSS002	1	1	FLT COMPT, P8, FIRE/OVHT TEST PANEL, M10445	*

* SEE THE WDM EQUIPMENT LIST

APU Fire Detection System - Component Index
Figure 101

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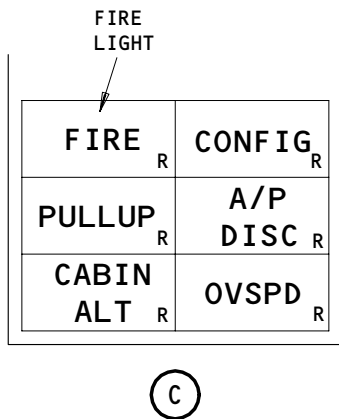
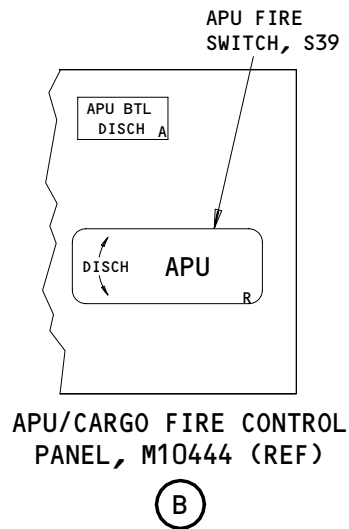
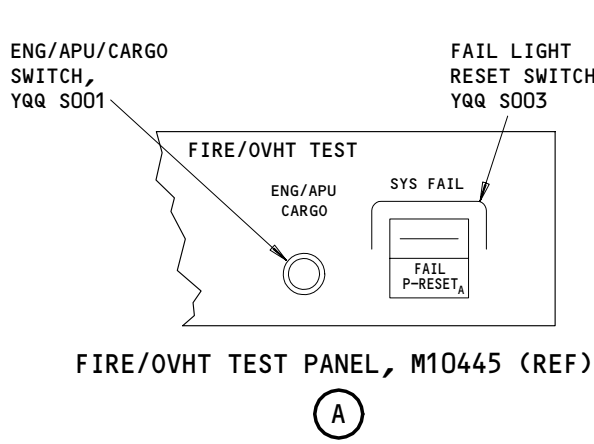
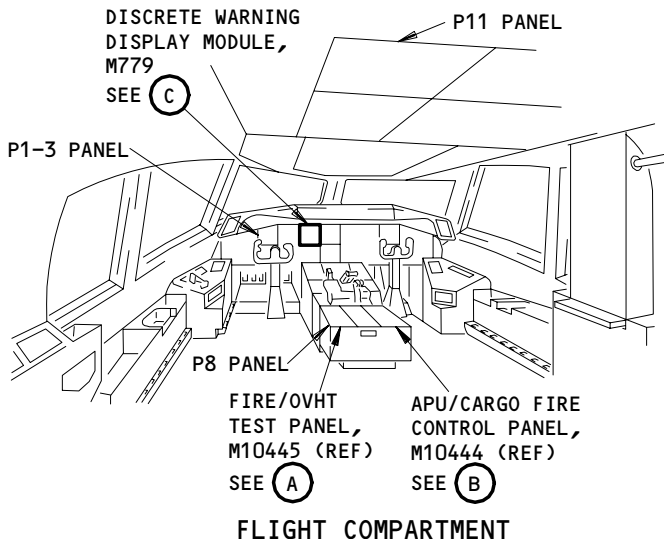
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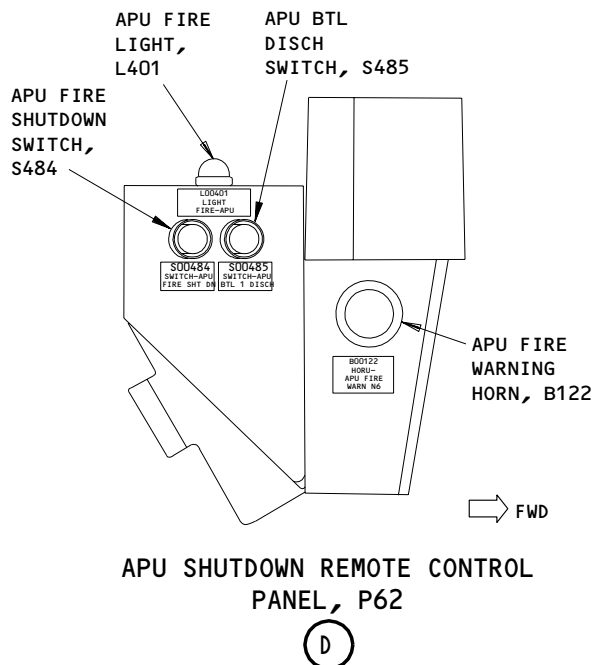
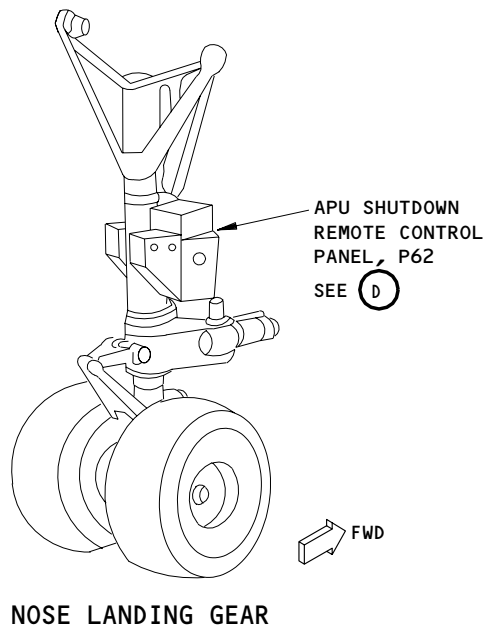
FAULT ISOLATION/MAINT MANUAL



APU Fire Detection System - Component Location
Figure 102 (Sheet 1)

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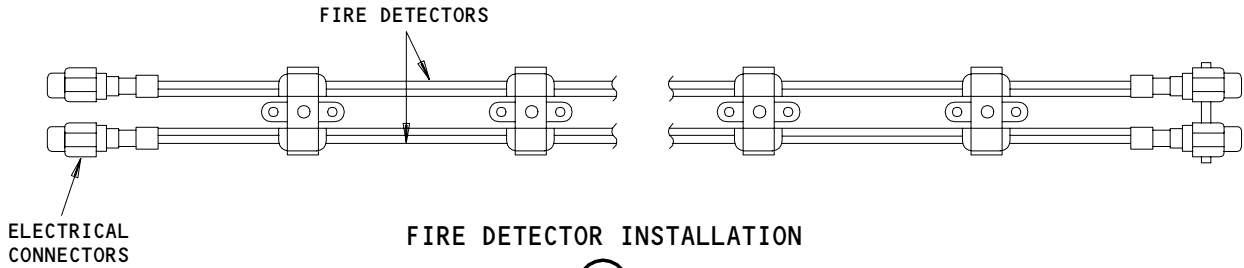
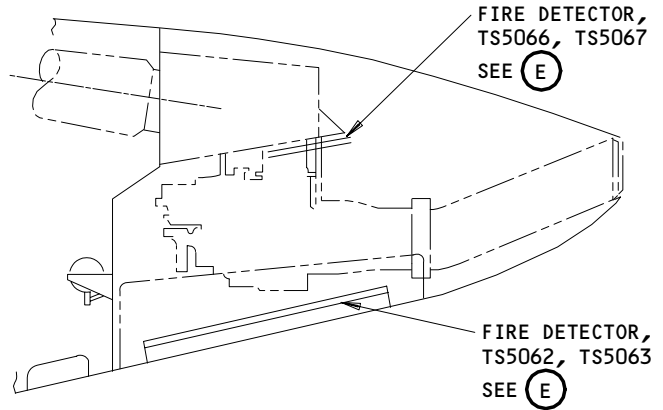
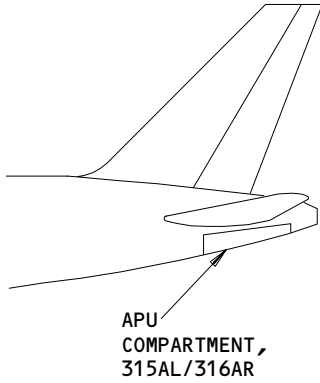
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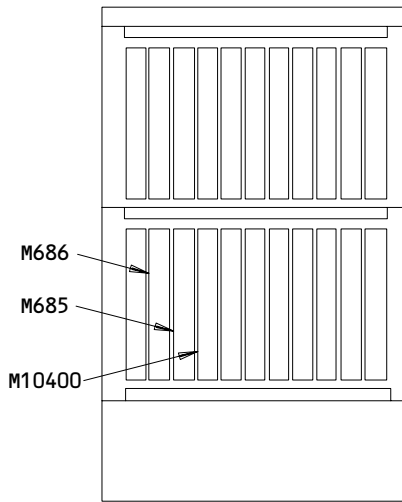
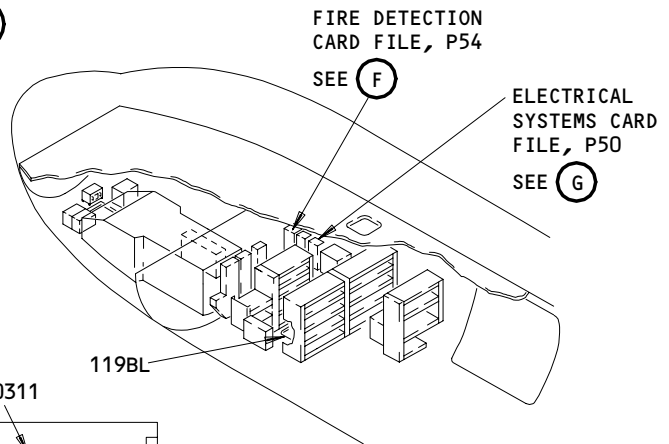
APU Fire Detection System - Component Location
Figure 102 (Sheet 2)

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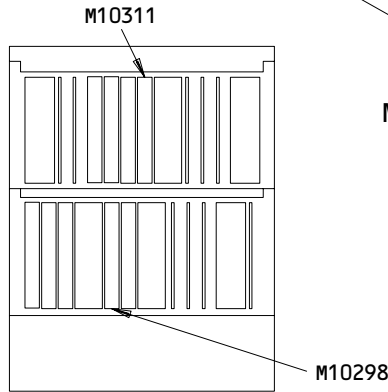


(E)



FIRE DETECTION CARD FILE, P54

(F)



ELECTRICAL SYSTEMS CARD FILE, P50

(G)

APU Fire Detection System - Component Location
Figure 102 (Sheet 3)

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APU FIRE DETECTION SYSTEM – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to do an operational test and a system test of the APU fire detection system.
- (1) The operational test will make sure the system operates correctly in a minimum of time. Only equipment installed in the plane will be used.
 - (2) The system test increases the functions of the operational test. Equipment installed in the airplane and external test equipment will be used.

TASK 26-15-00-715-001

2. Operational Test – APU Fire Detection System

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test
- (5) AMM 49-11-00/201, Auxiliary Power Unit
- (6) AMM 49-61-05/201, APU Control Unit (ACU)

B. Access

(1) Location Zones

119/120	Main Equipment Center
211/212	Flight Compartment
310	Fuselage

(2) Access Panels

311/312	Area Aft of Pressure Bulkhead to BS 1725 (L, R)
313/314	Stabilizer Torsion Box Compartment (L, R)
315/316	APU Compartment

C. Prepare for the Test

S 865-002

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

S 755-003

- (2) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00).
 - (b) Warning system (AMM 31-51-00).
 - (c) Master dim and test system (AMM 33-16-00).

S 755-004

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed.
 - (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11B33, APU REMOTE FIRE IND

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(d) 11J25, FIRE DET ALTN PWR APU

S 865-005

- (4) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
(a) 6G1, FIRE EXT APU

S 865-007

- (5) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B20, FIRE DETECTION L ENGINE 1
(b) 11B21, FIRE DETECTION L ENGINE 2
(c) 11B22, FIRE DETECTION R ENGINE 1
(d) 11B23, FIRE DETECTION R ENGINE 2
(e) 11B26, CARGO SMOKE DET 1
(f) 11B27, CARGO SMOKE DET 2
(g) 11J24, FIRE DET ALTN PWR CARGO
(h) 11J26, FIRE DET ALTN PWR ENG LEFT
(i) 11J27, FIRE DET ALTN PWR ENG RIGHT

D. Do a Test of the APU Fire Detection Loops

S 865-008

- (1) Try to pull out the APU fire switch, on the aft pilots control stand, P8, and make sure it is locked in position.

S 865-009

- (2) Push the ECS MSG switch on the EICAS maintenance panel on the side panel, P61.

S 865-010

- (3) Push and hold the ENG/APU/CARGO switch, on the FIRE/OVHT TEST panel, M10445 (on P8).

NOTE: Use the ECS MSG switch when it is necessary to see subsequent EICAS pages until all of the EICAS messages have been on the displays.

S 755-011

- (4) Make sure these EICAS messages show on the bottom display:
(a) APU FIRE LP 1

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(b) APU FIRE LP 2

S 755-012

- (5) After 2-4 seconds, make sure these indications occur:
- (a) The red APU light on the APU fire switch (on P8) comes on.
 - (b) The red FIRE light, on the captains instrument panel, P1-3, comes on.
 - (c) The EICAS message, APU FIRE, shows on the top display.
 - (d) The red master WARNING lights, on the glare shield panel, P7, come on.
 - (e) The fire bell is heard.
 - (f) The red APU FIRE light, on the nose landing gear control housing, P62, comes on. P62 is installed on the right side of the nose landing gear.
 - (g) With the plane on the ground, the fire warning horn for the APU, on P62, is heard.

S 865-013

- (6) Pull out the APU fire switch (on P8). Do not turn the handle.

S 755-014

- (7) Make sure these indications occur:
- (a) The red APU fire switch stays on.
 - (b) The fire bell stops.
 - (c) The red APU FIRE light (on P62) goes off.
 - (d) The APU fire warning horn stops.

S 865-015

- (8) Push in the APU fire switch handle.

S 865-016

- (9) Release the ENG/APU/CARGO switch.

S 755-017

- (10) Make sure all of the indications stop.

E. Do a Test of the Fire Detection System Fail Light

S 865-018

- (1) Open these circuit breakers, on the P11 panel, in Table 501 for the APU fire detection system and attach DO-NOT-CLOSE tags:

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Table 501	
SYSTEM	CIRCUIT BREAKERS
APU FIRE	11A32, INDICATOR LIGHTS 1 11A35, INDICATOR LIGHTS 4 11B18, WARN ELEX B 11B24, FIRE DETECTION APU 1 11B25, FIRE DETECTION APU 2 11B33, APU REMOTE FIRE IND 11J25, FIRE DET ALTN PWR APU 11J33, WARN ELEX A 11P29, R IND LTS 2

- S 035-019
- (2) Remove the printed-circuit cards, M685 and M686, from the fire detection card file, P54. P54 is in the E/E bay, along the right side of the nose gear wheel well.
- S 865-020
- (3) Remove the DO-NOT-CLOSE tags and close the circuit breakers in Table 501 which were opened.
- S 755-021
- (4) Make sure the yellow FAIL P-RESET light (P8) is on.
- S 755-020
- (5) Make sure the EICAS message, FIRE/OVHT SYS, shows on the top display.
- S 865-021
- (6) Push the FAIL P-REST switch-light.
(a) Make sure the switch-light goes off.
- S 755-022
- (7) Make sure the EICAS message, FIRE/OVHT SYS, goes off.
- S 865-022
- (8) Open the circuit breakers in Table 501 and attach DO-NOT-CLOSE tags.
- S 425-089
- (9) Install the printed-circuit cards, M685 and M686.
- S 865-024
- (10) Remove the DO-NOT-CLOSE tags and close the circuit breakers in Table 501 which were opened.

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F. Do a Test of the Remote APU Fire Warning Horn Interrupt

S 865-025

- (1) Push and hold the ENG/APU/CARGO switch (on P8).

S 865-026

- (2) Make sure the red APU FIRE light, on P62, comes on.

S 865-027

- (3) Make sure the APU fire warning horn is heard.

S 865-028

CAUTION: DO NOT USE THE APU SHUTDOWN SWITCH ON THE NOSE GEAR PANEL TO STOP THE OPERATION OF THE APU. THIS ARMS THE FIRE BOTTLE AND THE APU WILL NOT GO THROUGH A COOLING CYCLE WHICH CAN CAUSE DAMAGE TO THE APU.

- (4) Push the APU FIRE SHUTDOWN switch, on P62, and make sure these indications occur:
(a) The APU fire warning horn stops.
(b) The red APU FIRE light stays on.

S 865-029

- (5) Open and then close the APU REMOTE FIRE IND circuit breaker on the P11 panel.

S 755-030

- (6) Make sure the APU fire warning horn is heard.

S 865-031

- (7) Release the ENG/APU/CARGO switch and make sure these indications occur:
(a) The APU FIRE light goes off.
(b) The APU fire warning horn stops.

G. Do a Test of the APU Automatic Fire Shutdown

S 715-032

- (1) With the airplane on the ground and the two engines off, an APU fire will cause an automatic shutdown of the APU. The contents of the APU fire bottle will then be released. This is a test of the automatic shutdown function.

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S 865-034

WARNING: FAILURE TO OPEN THE CIRCUIT BREAKER ON THE P6 PANEL WILL CAUSE THE CONTENTS OF THE APU FIRE BOTTLE TO BE RELEASED. THIS CAN CAUSE INJURY TO PERSONS.

- (2) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
- (a) 6G1, FIRE EXT APU

S 865-035

- (3) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11J25, FIRE DET ALTN PWR APU

S 035-036

- (4) At the left miscellaneous electrical equipment panel, P36, in the main equipment center, do these steps:
- (a) Remove the test relay, K10335, from P36, section D.
 - (b) Connect a jumper wire from pins 2 to 4 on the electrical connector, D4398.

S 865-037

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11J25, FIRE DET ALTN PWR APU

S 865-038

- (6) Start the APU. Do not put on electrical or a pneumatic load on the APU (AMM 49-11-00).

S 865-039

- (7) Push and hold the ENG/APU/CARGO switch on the FIRE/OVHT test panel, P8.

S 755-040

- (8) Make sure the APU stops.

S 865-041

- (9) Release the ENG/APU/CARGO switch on the FIRE/OVHT test panel, P8.

S 865-042

- (10) Turn the APU start switch on the overhead panel, P5, to the off position.

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S 865-043

- (11) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11J25, FIRE DET ALTN PWR APU

S 035-044

- (12) At the P35 panel in the main equipment center, do these steps:
- (a) Remove the jumper wire from pins 2 to 4 on the electrical connector, D4398.
 - (b) Replace the test relay, K10335.

S 865-045

- (13) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11J25, FIRE DET ALTN PWR APU

S 715-046

- (14) Do the BITE erase procedure for the APU control unit to erase the APU message. This will prevent the message from the APU control unit nonvolatile memory. This can cause the APU to turn off.
- H. Put the Airplane Back to Its Usual Condition

S 865-047

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6G1, FIRE EXT APU

S 865-049

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11B26, CARGO SMOKE DET 1
 - (f) 11B27, CARGO SMOKE DET 2
 - (g) 11J24, FIRE DET ALTN PWR CARGO
 - (h) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (i) 11J27, FIRE DET ALTN PWR ENG RIGHT

S 865-050

- (3) Remove electrical power if it is not necessary.

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TASK 26-15-00-735-051

3. System Test - APU Fire Detection System

A. Equipment

- (1) Test Box - APU and Engine Fire Detection System
- Part Number B26001-1

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 26-22-00/501, APU Fire Extinguishing
- (3) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (4) AMM 31-51-00/501, Warning System
- (5) AMM 32-09-02/201, Air/Ground Relays
- (6) AMM 33-16-00/501, Master Dim and Test

C. Access

(1) Location Zones

119/120	Main Equipment Center
200	Flight Compartment
310	Fuselage

(2) Access Panels

311/312	Area Aft of Pressure Bulkhead to BS 1725 (L, R)
313/314	Stabilizer Torsion Box Compartment (L, R)
315/316	APU Compartment

D. Prepare for the Test

S 865-052

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

S 755-053

- (2) Make sure these systems operate:
 - (a) APU fire extinguishing system (AMM 26-22-00).
 - (b) EICAS (AMM 31-41-00).
 - (c) Warning System (AMM 31-51-00).
 - (d) System No. 2 Air/Ground Relay (AMM 32-09-02).
 - (e) Master Dim and Test System (AMM 33-16-00).

S 755-054

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B24, FIRE DETECTION APU 1

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- (b) 11B25, FIRE DETECTION APU 2
- (c) 11B33, APU REMOTE FIRE IND

S 865-055

- (4) Open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:

- (a) 11J25, FIRE DET ALTN PWR APU

S 865-056

WARNING: FAILURE TO OPEN THE CIRCUIT BREAKER ON THE P6 PANEL WILL CAUSE THE CONTENTS OF THE APU FIRE BOTTLE TO BE RELEASED. THIS CAN CAUSE INJURY TO PERSONS.

- (5) Open this circuit breakers on the P6 panel and attach a DO-NOT-CLOSE tag:

- (a) 6G1, FIRE EXT APU

E. Do a Test of the APU Fire Detection System

S 715-057

- (1) Do the operational test.

F. Do a Test of the APU Detector Elements

S 015-058

- (1) Open the APU access doors and install the rods to hold the doors open.

S 865-059

- (2) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:

- (a) 11B24, FIRE DETECTION APU 1
- (b) 11B25, FIRE DETECTION APU 2

S 035-060

- (3) Disconnect the electrical connectors, D1908 and D1914 (loop 1 and 2 lower detector elements), which are installed on the APU access door.

S 435-061

- (4) Connect the test box to the electrical connector, D1908.

S 865-062

- (5) Remove the DO-NOT-CLOSE tags and close these panel circuit breakers on the P11 panel:

- (a) 11B24, FIRE DETECTION APU 1
- (b) 11B25, FIRE DETECTION APU 2

S 865-063

- (6) Put the FIRE switch on the test box to the ON position and make sure these indications occur:

- (a) The red APU light on the APU fire switch (on P8) comes on.

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- (b) The red FIRE light, on P1-3, comes on.
- (c) The EICAS message, APU FIRE, shows on the top display.
- (d) The red master WARNING lights, on P7, come on.
- (e) The fire bell is heard.
- (f) The red APU FIRE light, on P62, comes on.

S 865-064

- (7) Release the FIRE switch on the test box and make sure the indications stop.

S 735-065

- (8) Do the Test again for the Fire Detector Element.

S 425-090

- (9) Connect the test box to the electrical connector, D1914.

S 865-066

- (10) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2

S 035-067

- (11) Remove the electrical connectors from the test box.

S 435-025

- (12) Connect the electrical connectors to the detector elements (D1908 to TS5066, D1914 to TS5062).

S 035-068

- (13) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2

S 415-069

- (14) Close the APU access doors.

G. Put the Airplane Back to Its Usual Condition

S 865-070

- (1) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
 - (a) 11J25, FIRE DET ALTN PWR APU

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- S 865-071
- (2) Remove the DO-NOT-CLOSE tag and close circuit breaker on the P6 panel:
(a) 6G1, FIRE EXT APU
- S 865-072
- (3) Remove electrical power if it is not necessary.

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APU FIRE DETECTOR ELEMENT – REMOVAL/INSTALLATION

1. General

- A. Two dual-element APU fire detectors are located in the APU compartment, above and below the APU. The removal/installation procedure is the same for each detector element.

TASK 26-15-02-024-030

2. Remove the APU Fire Detector Element (Fig. 401)

A. Equipment

- (1) Bonding Meter – AVTRON, T477W
(2) Torque Wrench – commercially available (For torque ranges, Ref Fig. 401)

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Detector Element	26-15-02	01	195,200
	2	Washer – Tab			165,170
	3	Washer – Sealing Copper			160
	4	Bushing			175,180
	5	Clip – P			185,190

C. Access

(1) Location Zones

- 119/120 Main Equipment Center
211/212 Flight Compartment
310 Fuselage

(2) Access Panels

- 311/312 Area Aft of Pressure Bulkhead to BS 1725 (L, R)
313/314 Stabilizer Torsion Box Compartment (L, R)
315/316 APU Compartment

D. Remove the APU Fire Detector Element

S 864-035

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
(a) 6G1, FIRE EXT APU or FIRE EXT APU 1

S 864-001

- (2) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11B24, FIRE DETECTION APU 1

S 014-002

- (3) Open the APU access doors and install rods to hold the doors open.

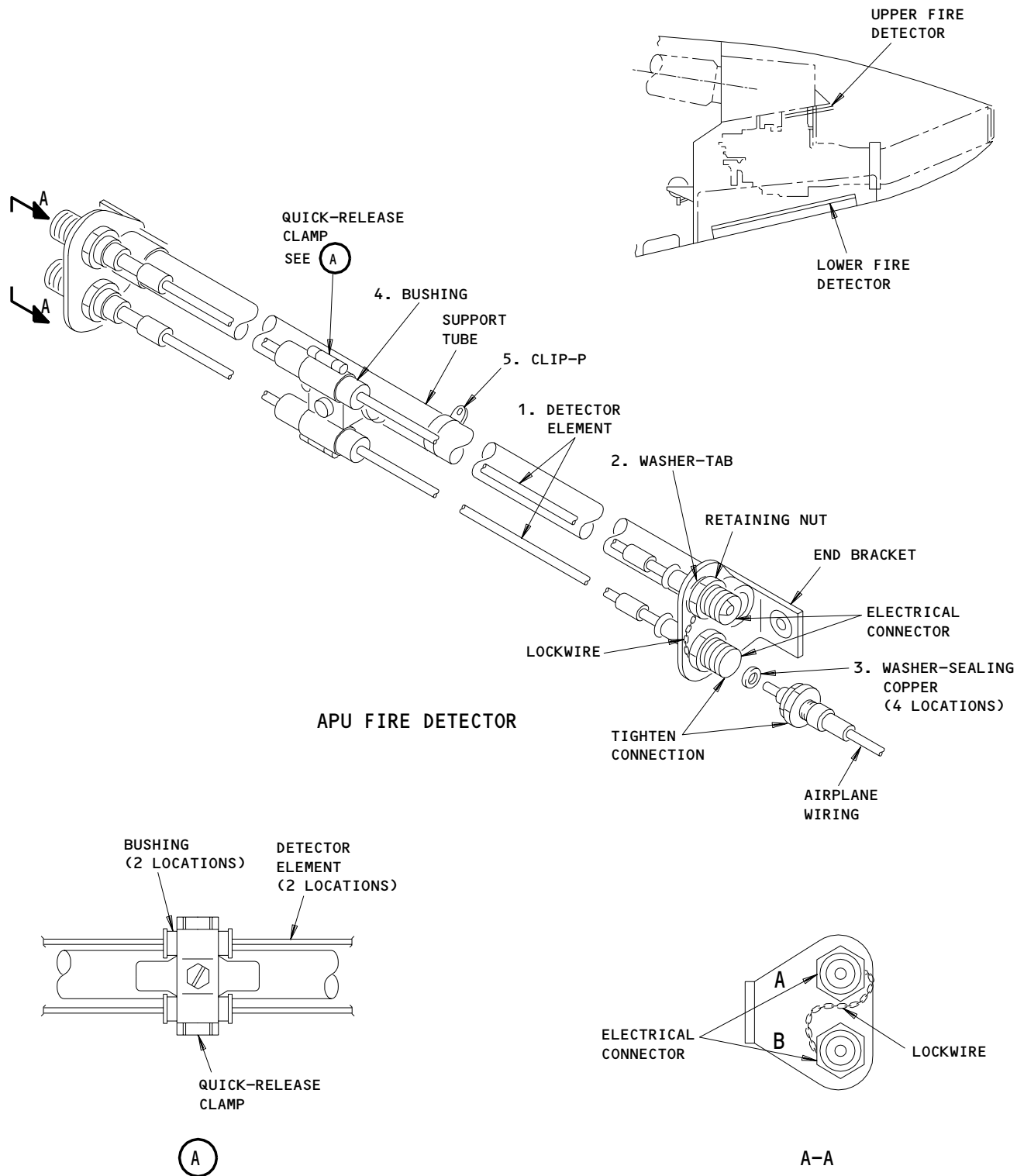
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APU Fire Detector Element Installation
Figure 401

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E. Remove the detector element

S 034-006

- (1) Disconnect the electrical connectors at each end of the detector element to be removed and install protective caps. Discard copper crush washers.

S 034-007

- (2) Remove the retaining nut which holds the detector element connector to the end bracket of the support tube at each end of the detector.

S 034-008

- (3) Remove the connector from the end brackets.

S 024-009

- (4) Open the quick-release clamps and remove the detector element.

TASK 26-15-02-424-010

3. Install the APU Fire Detector Element (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control

B. Equipment

- (1) Torque Wrench - commercially available

C. Access

(1) Location Zones

119/120	Main Equipment Center
211/212	Flight Compartment
310	Fuselage

(2) Access Panels

311/312	Area Aft of Pressure Bulkhead to BS 1725 (L, R)
313/314	Stabilizer Torsion Box Compartment (L, R)
315/316	APU Compartment

D. Install the detector element

S 424-031

- (1) Put one electrical connector of the detector element through the hole in the end bracket of the support tube. Tighten with a retaining nut.

S 434-016

CAUTION: DO NOT TWIST OR CAUSE A SHARP BEND TO THE DETECTOR ELEMENT. THIS CAN CAUSE DAMAGE TO ELEMENT.

- (2) Install the detector element along the support tube. Make sure it is not too loose between the two clamps.

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- S 434-017
- (3) Install the liners on the detector element at the location of the mounting clamps.
- S 434-018
- (4) Install the element with the liners in the clamps and tighten.
- S 434-019
- (5) Install the remaining electrical connector through the hole in the end bracket of the support tube. Tighten with a retaining nut.
- S 754-020
- (6) Make sure the resistance between the detector connector shell and the primary structure of the airplane is not more than 0.010 ohm.
- S 434-021
- (7) Use lockwire to lock the retaining nuts on the connector.
- S 034-022
- (8) Remove the protective caps from the airplane wire connectors and attach the connectors to the detector element connectors. Use new copper crush washers. Tighten the connectors to between 20 to 40 pound-inches.
- S 434-023
- (9) Use lockwire to lock the airplane wire connectors to the element connectors.
- S 414-024
- (10) Close the APU access doors.
- E. Do a Test of the Detector Element Installation:
- S 864-025
- (1) Supply electrical power (AMM 24-22-00).
- S 864-026
- (2) On the pilot forward control stand, P9, do these steps:
- (a) Set the EICAS COMPUTER select switch to the AUTO position.
- (b) Set the EICAS display to STATUS.

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- S 864-036
- (3) Close these circuit breakers on the main power distribution panel, P6, and remove DO-NOT-CLOSE tags:
(a) 6G1, FIRE EXT APU or FIRE EXT APU 1
- S 864-027
- (4) Close the circuit breakers (6 places) on the P11 panel.
- S 034-028
- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11B24, FIRE DETECTION APU 1
(b) 11B25, FIRE DETECTION APU 2
(c) 11J25, FIRE DET ALTN PWR APU
- S 754-029
- (6) Make sure these EICAS messages still show on the bottom display after momentary power-up:
(a) APU FIRE LP 1
(b) APU FIRE LP 2
- S 864-032
- (7) Remove the electrical power if it is not necessary.

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LOWER CARGO COMPARTMENT SMOKE DETECTION -
DESCRIPTION AND OPERATION

1. General

- A. Each of the forward and aft cargo compartments smoke detection systems are dual systems. The smoke detector systems monitor the air in the cargo compartments and provide alerts for smoke conditions.
- B. The dual smoke detection systems consist of a forward and aft component which are powered by the 28v dc battery bus and 115v ac ground service bus respectively. The system circuit breakers are on the overhead panel P11 (Fig. 2). There are no smoke detection system on/off switches.
- C. The main components of each smoke detection system are: a pair of smoke detectors, a pair of air-flow blowers, a plenum pressure switch, a fire/overheat logic/test card, and a fire/overheat test panel.
- D. The operation of both forward and aft systems is the same. Both systems operate in AND logic. Thus, both detectors of a system must sense smoke in order for a fire alarm to be given.

2. Component Details (Fig. 1)

- A. The forward cargo compartment smoke detector assembly (detectors, blowers, and plenum pressure switch) is located in the forward cargo compartment ceiling just aft of No. 1 cargo door. The aft cargo compartment smoke detector assembly is mounted behind the aft cargo compartment sidewall just forward of No. 2 cargo door.
- B. Cargo Smoke Detectors
 - (1) The smoke detectors operate on an optical principle. The detector consists of a photocell and pilot light in a light-proof chamber plus associated amplifier, output, and test circuits on a printed circuit board. The detector has inlet and outlet tubes to provide access to air and smoke.
 - (2) SMOKE DETECTORS WITH LAMP PLACARDS;
Smoke entering the light-proof chamber reflects the light from the pilot lamp onto a photocell. The photocell provides a signal to an amplifier where the signal is processed and routed to a relay. The relay provides an alarm output signal to the fire/overheat logic/test card.
 - (a) Because the smoke detector is very sensitive to the amount of light in the detector, the correct lamp must be used in the detector. If the incorrect lamp is used, then the detector will not be able to sense a smoke condition.

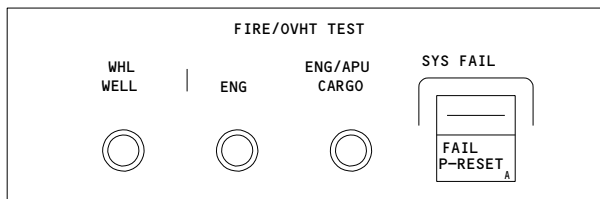
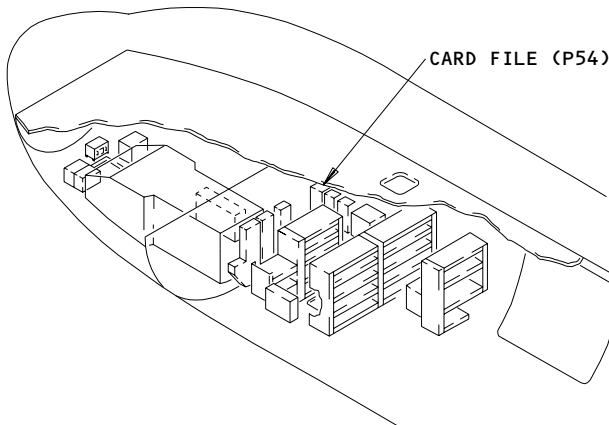
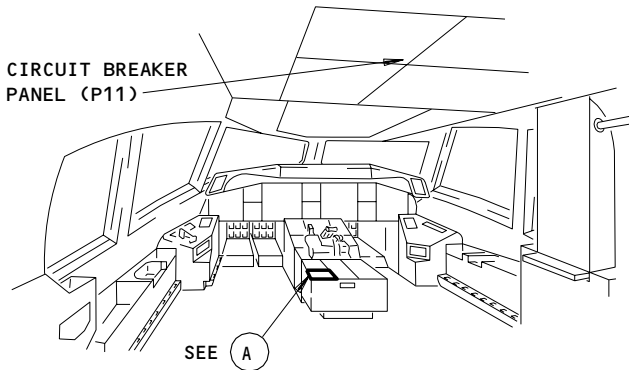
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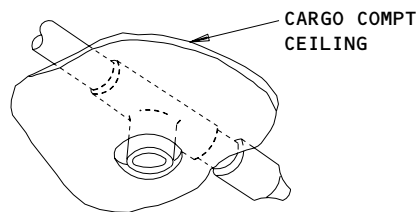
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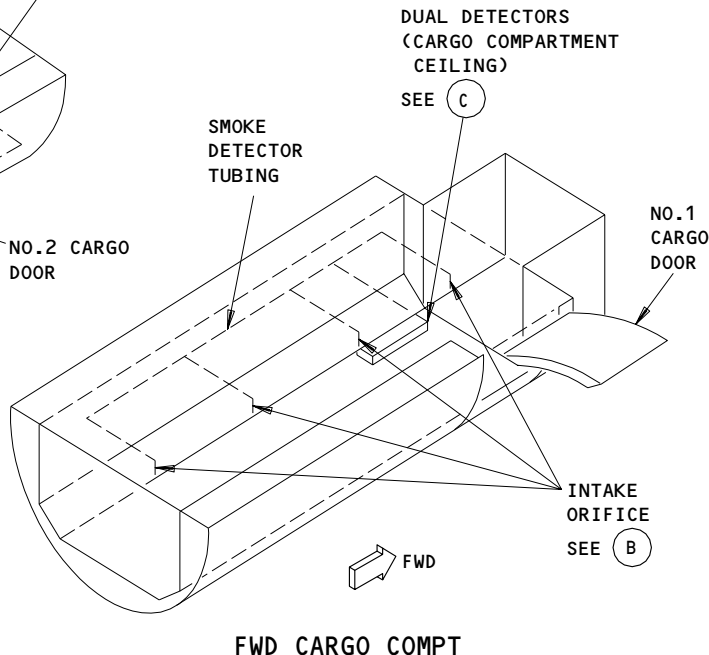
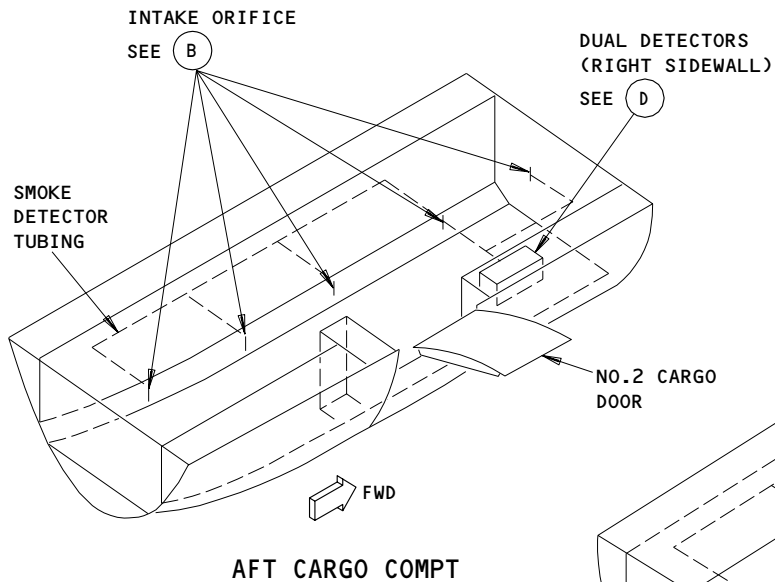
FIRE/OVERHEAT TEST PANEL

(A)



INTAKE ORIFICE

(B)



Cargo Compartment Smoke Detection System Component Location
Figure 1 (Sheet 1)

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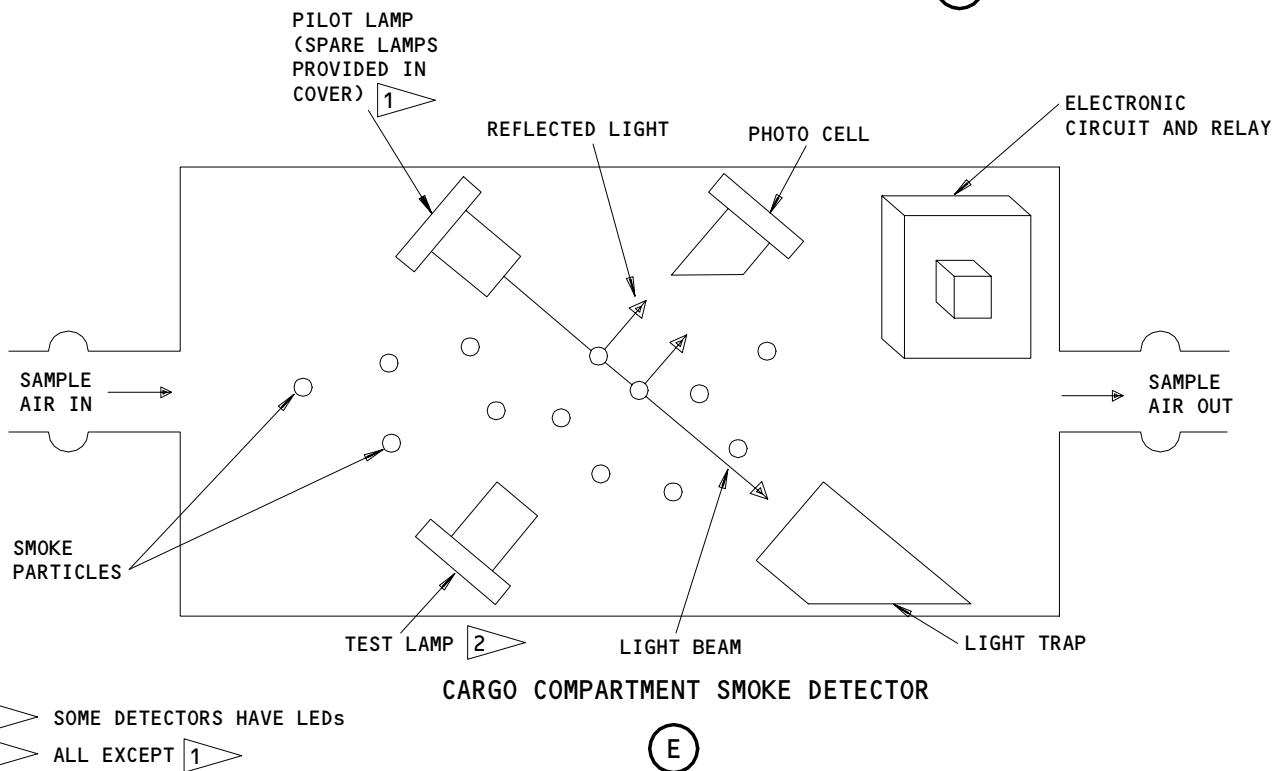
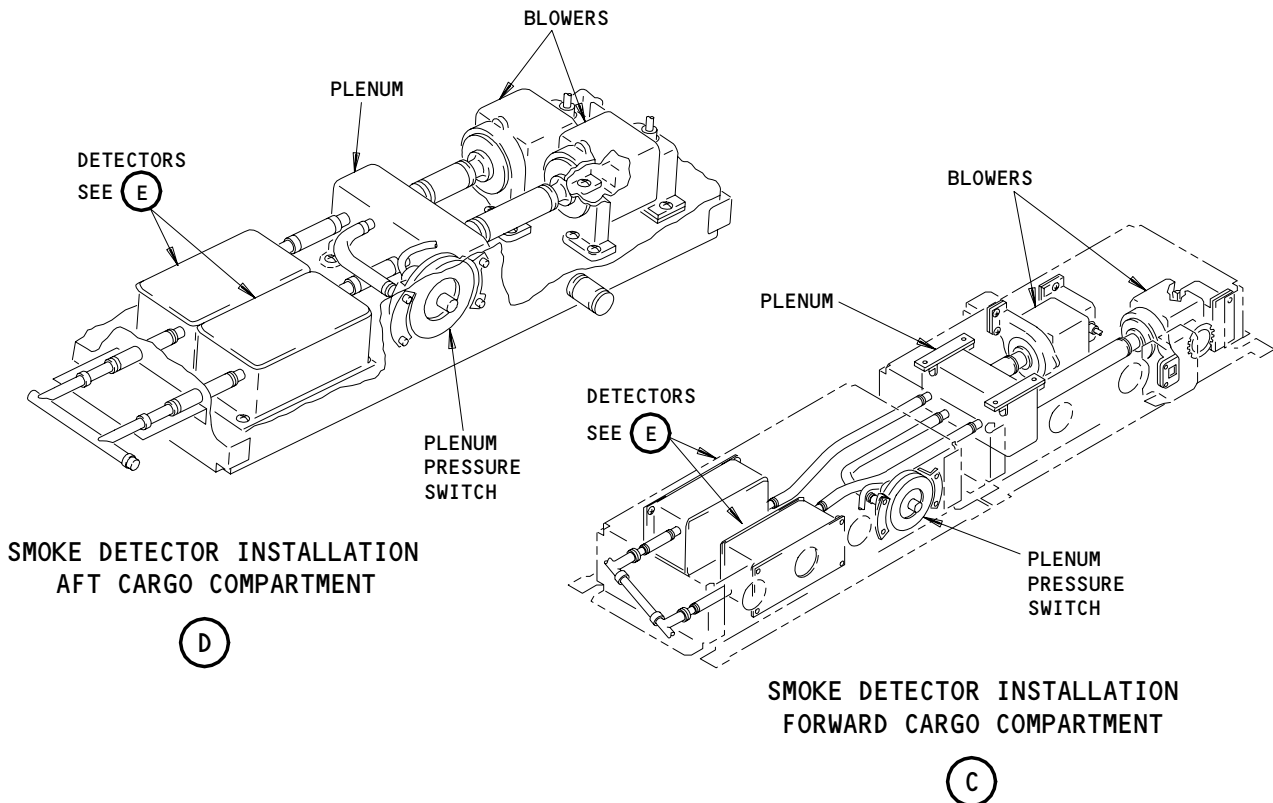
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Cargo Compartment Smoke Detection System - Component Location
Figure 1 (Sheet 2)

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- (3) SMOKE DETECTORS WITHOUT LAMP PLACARDS;
Smoke entering the light-proof chamber reflects the light from the LED onto a photo diode. There are two photo diodes in the chamber. One controls the intensity of the LED. The other photo diode measures the reflected light from the smoke particles. The reflected light increases the voltage output across the second photo diode. When the smoke concentration gets above 10%, the voltage will increase to above the reference voltage monitored by a comparator and relay driver. The relay provides an alarm output signal to the fire/overheat logic/test card.
- (a) These detectors use Light Emitting Diodes (LEDs). The LEDs are not replaceable parts.

C. Smoke Detector Blowers

- (1) One smoke detector blower is used to pull air into sampling tubes distributed throughout the cargo compartment, and then through the two detectors. A second blower serves as a back-up in case the operating blower fails.

D. Smoke Detector Plenum Pressure Switch

- (1) An air-flow pressure switch is installed in the plenum of each cargo compartment smoke detection system. The switch detects a failed blower, and turns on the standby blower and respective FWD or AFT DET FAN EICAS maintenance message. If the standby blower has also failed, EICAS status message CARGO DET AIR will be displayed.

E. Fire/Overheat Logic/Test Card

- (1) The AFOLTS (Automatic Fire/Overheat Logic/Test System) card interprets smoke detector signals, provides system functional tests, and outputs fire or fail indication signals for both systems.
- (2) The AFOLTS card has a function to reconfigure the alarm logic from the normally "AND" (dual loop operation) logic to the "OR" (single loop operation) logic when a detector fails during a power-up or manual test.
- (3) AIRPLANES WITH -136 AFOLTS CARDS (PRR 54790);
The AFOLTS card has a function to reconfigure the alarm logic when the detector fails a routine test. It initiates a test when one detector in a zone is in alarm and the other is not for more than 5 seconds, and periodically tests the second detector once every hour during flights dispatched with one detector inoperative.
- (4) The AFOLTS card is in the P54 fire detection card file. The card file is in the electrical/electronic equipment compartment.

F. Fire/Overheat Test Panel

- (1) The fire/overheat test panel contains a momentary push button switch - ENG/APU/CARGO. This switch initiates a test of the fire, overheat, and smoke detection systems for the engines, APU, and cargo compartments. The test results in cockpit fire and overheat indications.
- (2) The test panel also has an amber SYS FAIL - FAIL P-RESET switchlight. This switchlight indicates a fire, overheat, or smoke detection system failure. The switchlight is pressed to reset.
- (3) The fire/overheat test panel is on aft pilots' electrical control panel P8.

3. Operation (Fig. 2)

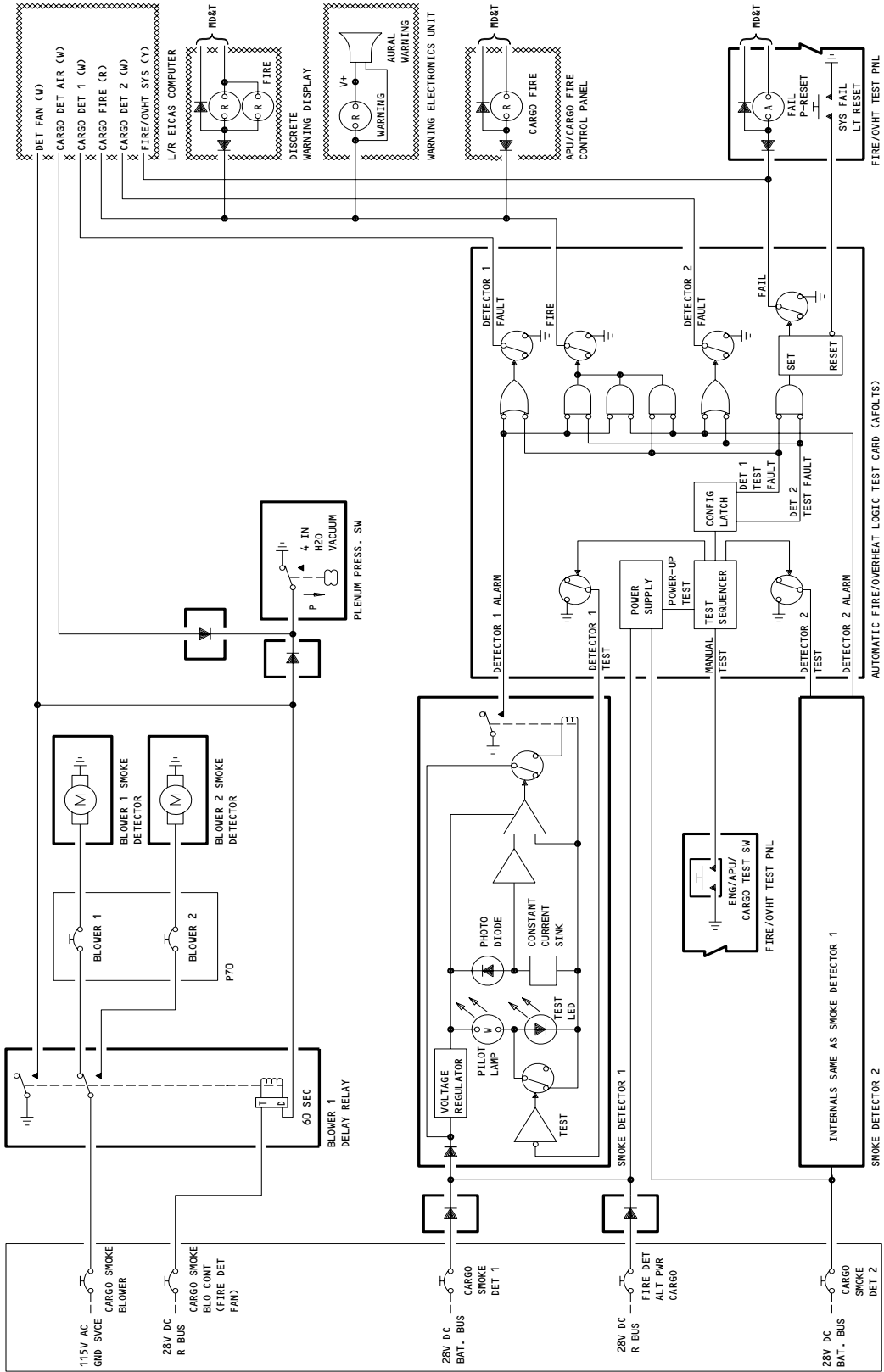
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Cargo Compartment
Smoke Detection Schematic (Example)
Figure 2

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A. Functional Description

(1) Smoke detector blowers

- (a) When electrical power is applied to the equipment, blower 1 starts to draw air through the system. The blower 1 delay relay prevents blower 2 from receiving electrical power for 60 seconds. Before the 60 seconds has elapsed, blower 1 creates a vacuum in the plenum, causing the plenum pressure switch to activate. The activated pressure switch deactivates the blower 1 delay relay, making blower 2 a back-up blower.
- (b) If blower 1 now fails, the plenum pressure switch deactivates. The blower 1 delay relay energizes after 60 seconds. The relay activates a latching circuit to hold the relay, and switches electrical power to blower 2. It also sends a signal to EICAS (Engine Indicating and Crew Alerting System) to display the appropriate maintenance message - FWD or AFT DET FAN, after 10 seconds (EICAS delay).
- (c) Blower 2 now draws air through the system causing the plenum pressure switch to activate. This causes the EICAS message - CARGO DET AIR, to go off. If blower 2 now fails, the EICAS message - CARGO DET AIR will come on after 20 seconds (EICAS delay).

(2) Smoke Detection

- (a) With all system power on, the blowers force air through the detectors. When either detector senses smoke, a signal is sent to the AFOLTS card.
- (b) The AFOLTS card senses the signals from each loop and determines the appropriate output to the flight crew. See Table 1.

INPUTS TO AFOLTS		AFOLTS
DETECTOR 1	DETECTOR 2	OUTPUTS
ALARM	ALARM	FIRE
ALARM	-----	EICAS DET 1
-----	ALARM	EICAS DET 2

TABLE 1
Logic System Operation
Cargo Compartment Smoke Detection
AND Configuration

- (c) A cargo compartment fire indication is given by the following:
 - 1) The appropriate red FWD or AFT CARGO FIRE switchlight, on the APU/cargo fire control panel (on the P8 control stand), comes on.
 - 2) The red FIRE light, on captain's instrument panel P1-3, comes on.
 - 3) The appropriate fire warning message - FWD or AFT CARGO FIRE, is displayed on EICAS (P2).
 - 4) The red master warning lights, on glareshield panels P7, come on.
 - 5) The fire bell sounds, on the flight deck aural warning speakers.

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- (d) A dual-detector fail indication is given by the following:
 - 1) The amber FAIL P-RESET switchlight, on the P8 control stand, comes on.
 - 2) The advisory message - FIRE/OVHT SYS, is displayed on EICAS.
 - 3) The appropriate system maintenance messages are displayed on EICAS:
 - a) FWD CARGO DET 1 and 2.
 - b) AFT CARGO DET 1 and 2.
- (e) The FAIL P-RESET switchlight is pressed to reset the fail light circuitry. This also turns off the FAIL P-RESET switchlight, and clears the EICAS advisory message - FIRE/OVHT SYS.
- (f) A single detector fault or alarm signal indication is given by the following:
 - 1) The appropriate maintenance message is displayed on EICAS:
 - a) FWD CARGO DET 1 or 2.
 - b) AFT CARGO DET 1 or 2.

B. Test

- (1) When a test occurs, the AFOLTS card sends a signal to both detectors of each system. The signal turns on a testlamp in each detector. The test lamp shines directly onto the detector photocell, which triggers an alarm. The pilot lamp and the test lamp are wired in series, thus a successful test guarantees that the pilot lamp is operating properly.
- (2) If either detector in a system is found faulty, AFOLTS reconfigures that system to operate on the remaining detector. If the remaining detector sustains an alarm condition, then a fire warning indication results.
- (3) Power-up mode:
 - (a) Whenever power is first applied to the battery bus, the engine, APU, and cargo compartment detection systems go through an automatic self-test. All single-detector maintenance messages are momentarily displayed on EICAs (P2). If any detector is found faulty, then the appropriate detector message remains on EICAS display, and the system is reconfigured to the other detector. If both detectors of a system are found faulty, then the FAIL P-RESET switchlight (on P8) comes on, and EICAS displays the advisory message - FIRE/OVHT SYS. A fire warning will not be initiated by a power-up test.
- (4) Manual system test:
 - (a) When the ENG/APU/CARGO switch on the fire/overheat test panel (on P8) is pressed and held - the engine, APU, and cargo detection systems go through a self-test. All detector maintenance messages are displayed on EICAS, and after a two to four-second delay, a successful test terminates with all cargo fire indications.
 - (b) The cargo fire indications are:
 - 1) The red FWD and AFT CARGO FIRE switchlights (on P8) come on.
 - 2) The red FIRE light (on P1-3) comes on.

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- 3) EICAS displays FWD and AFT CARGO FIRE warning messages (on P2).
 - 4) The red master warning lights (on P7) comes on.
 - 5) The fire bell sounds on the flight deck aural warning speakers.
- (c) When the ENG/APU/CARGO switch is released, all messages and indications should clear - except for any faulty-detector messages which will remain on EICAS. The FAIL P-RESET switchlight, and EICAS advisory message - FIRE/OVHT SYS, will also remain on if there is a dual-detector failure.
- (5) The manual system test and the power-up mode will not invalidate a fire alarm in progress.

C. Control

- (1) Turn-on procedure:
- (a) Provide electrical power (Ref 24-22-00).
 - (b) Check that the following circuit breakers on overhead circuit breaker panel P11 are closed:
 - 1) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - 2) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - 3) 11J24, FIRE DET ALTN PWR CARGO
 - 4) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
 - 5) 11S36, FIRE DET FAN PWR or CAR SMK BLO
 - (c) Check that the following Miscellaneous Electrical Equipment Panel P70 circuit breakers are closed.
 - 1) 70B10, SMOKE DET BLOWER 1
 - 2) 70B11, SMOKE DET BLOWER 2
 - 3) 70B12, SMOKE DET BLOWER 3
 - 4) 70B13, SMOKE DET BLOWER 4

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FAULT ISOLATION/MAINT MANUAL

LOWER CARGO COMPARTMENT SMOKE DETECTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
BLOWER 1 - FWD SMOKE DETECTOR, M10462	2	1	821, FORWARD CARGO COMPT	26-16-02
BLOWER 2 - FWD SMOKE DETECTOR, M10463	2	1	821, FORWARD CARGO COMPT	26-16-02
BLOWER 3 - AFT SMOKE DETECTOR, M10464	2	1	822, AFT CARGO COMPT	26-16-02
BLOWER 4 - AFT SMOKE DETECTOR, M10465	2	1	822, AFT CARGO COMPT	26-16-02
CARD 6 - FIRE/OVHT TEST/LOGIC, M10427	1	1	119BL, MAIN EQUIP CTR, P54	26-10-01
CIRCUIT BREAKER -	1		FLT COMPT, P11	*
CARGO SMOKE DET 1 OR FIRE DETECTION		1	11B26	*
CARGO 1, C772				
CARGO SMOKE DET 2 OR FIRE DETECTION		1	11B27	*
CARGO 2, C788				
CARGO SMOKE BLO, C794		1	11S36	*
CARGO SMOKE BLOWER CONT OR FIRE DET CARGO		1	11S35	*
FAN CONT, C795				
FIRE DET ALTN PWR CARGO, C766		1	11J24	*
CIRCUIT BREAKER -	1		119BL, MAIN EQUIP CTR, P70	
SMOKE DET BLOWER 1, C60		1	70B10	
SMOKE DET BLOWER 2, C61		1	70B11	26-16-01
SMOKE DET BLOWER 3, C62		1	70B12	26-16-01
SMOKE DET BLOWER 4, C63		1	70B13	*
COMPUTER - (FIM 31-41-00/101)				*
EICAS L, M10181				*
EICAS R, M10182				*
DETECTOR - AFT CARGO SMOKE 1, M10460	2	1	822, AFT CARGO COMPT	26-16-01
DETECTOR - AFT CARGO SMOKE 2, M10461	2	1	822, AFT CARGO COMPT	26-16-01
DETECTOR - FWD CARGO SMOKE 1, M10458	2	1	821, FWD CARGO COMPT	26-16-01
DETECTOR - FWD CARGO SMOKE 2, M10459	2	1	821, FWD CARGO COMPT	26-16-01
DIODE - BUS ISOLATION, R203,R204	1	2	FLT COMPT, BEHIND P5	
PANEL - (FIM 26-11-00/101)				
FIRE/OVHT TEST, M10445				
DISCRETE WARNING DISPLAY, M779				
PANEL - (FIM 26-22-00/101)				
APU/CARGO FIRE CONT, M10444				
RELAY - (FIM 31-01-36/101)				
BLOWER 1 DELAY, K10378				
BLOWER 3 DELAY, K10379				
SWITCH - ENG/APU/CARGO, YQQS001	1	1	FLT COMPT,P8,FIRE TEST PNL, M10445	*
SWITCH - FAIL LIGHT RESET, YQQS003	1		FLT COMPT,P8,FIRE TEST PNL, M10445	*
SWITCH/LIGHT - (FIM 26-23-00/101)		1		
FWD CARGO FIRE, S1				
AFT CARGO FIRE, S2				
SWITCH - AFT PLENUM PRESSURE, S10332	1	1	821, FWD CARGO COMPT	26-16-03
SWITCH - FWD PLENUM PRESSURE, S10333	2	1	822, AFT CARGO COMPT	26-16-03

* SEE THE WDM EQUIPMENT LIST

Lower Cargo Compartment Smoke Detection System - Component Index
Figure 101

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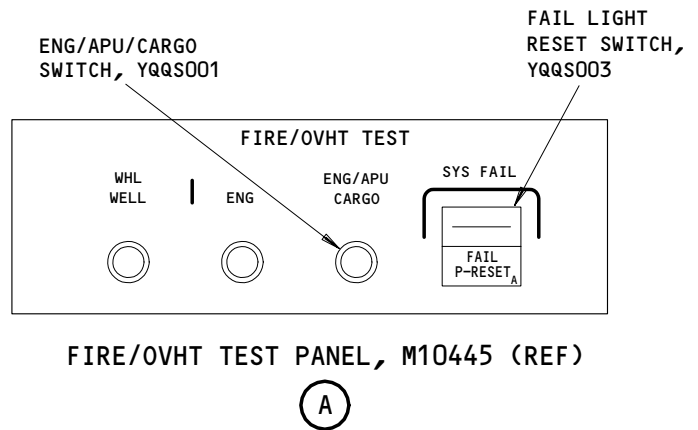
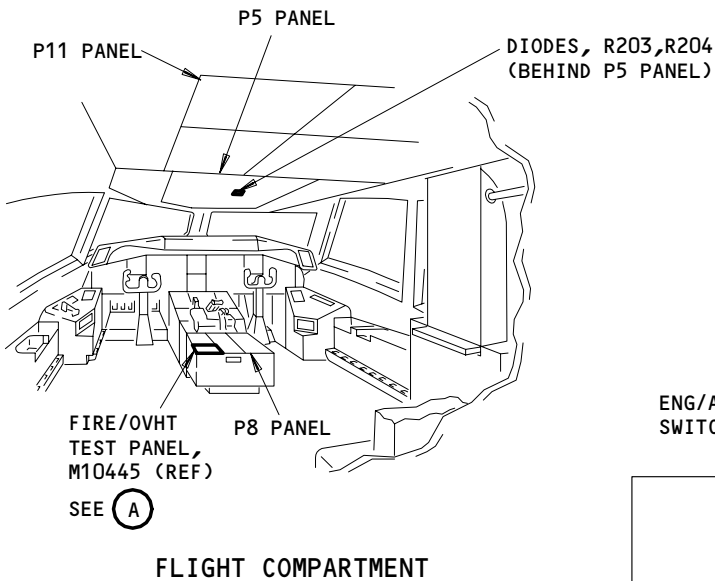
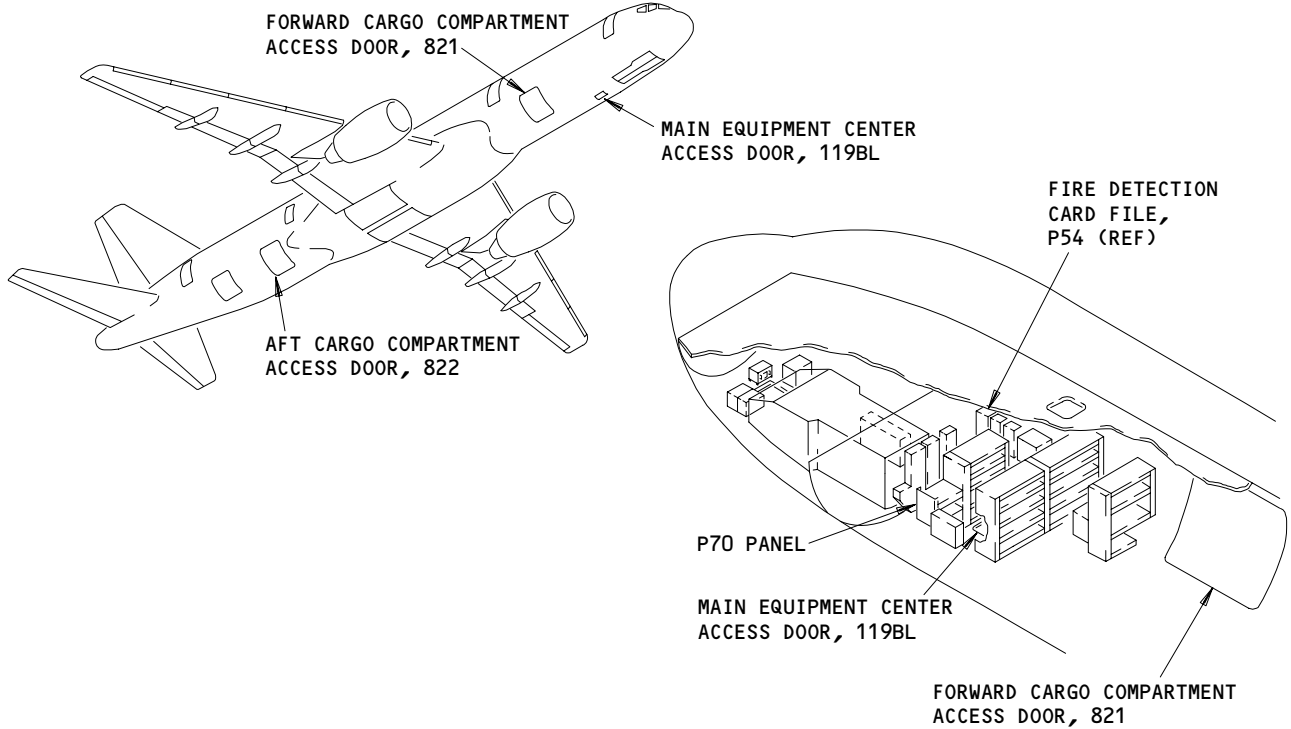
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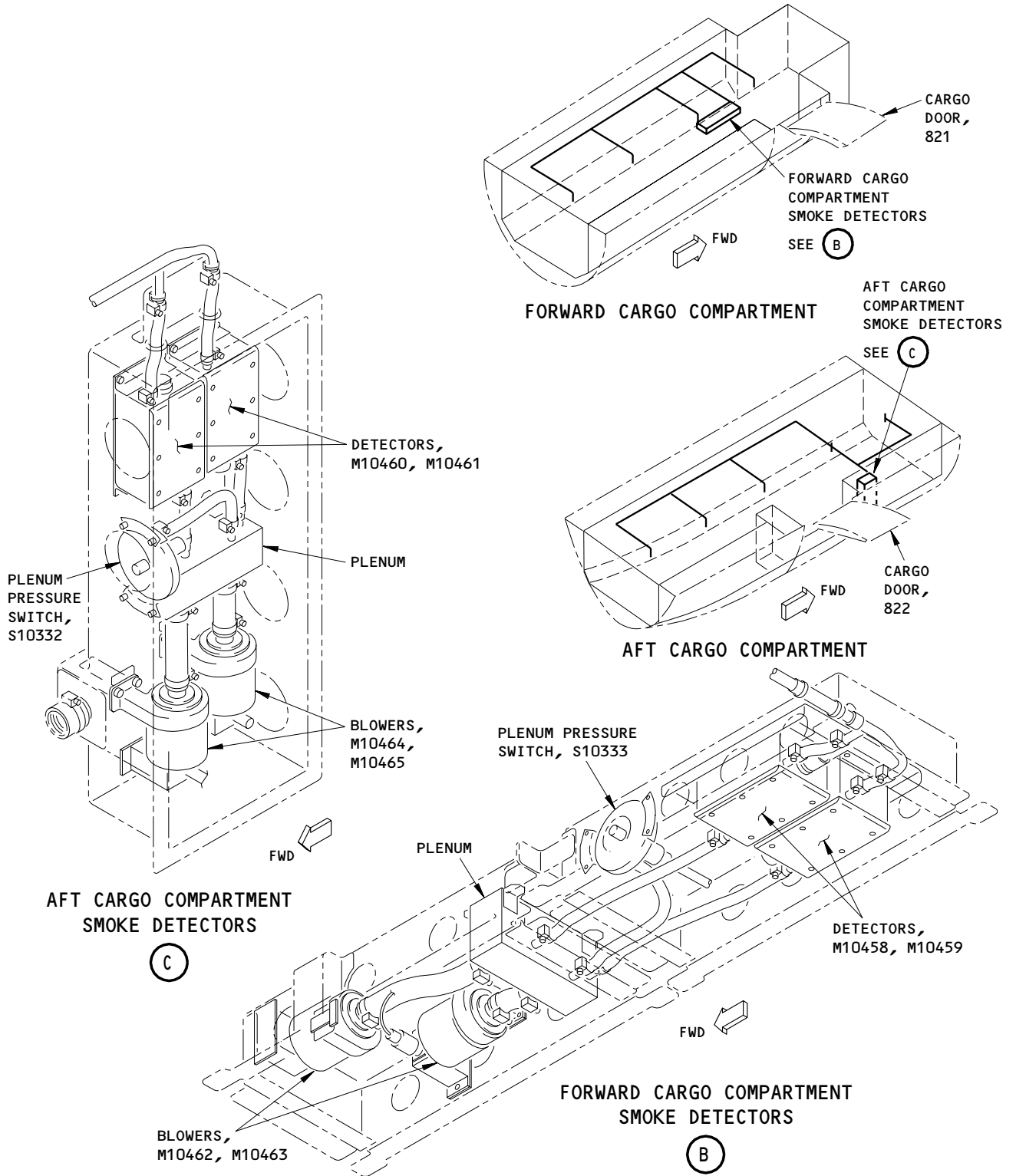
FAULT ISOLATION/MAINT MANUAL



Lower Cargo Compartment Smoke Detection System - Component Location
Figure 102 (Sheet 1)

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Lower Cargo Compartment Smoke Detection System - Component Location
Figure 102 (Sheet 2)

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LOWER CARGO COMPARTMENT SMOKE DETECTION SYSTEM – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to perform an operational test and a system test of the lower cargo compartment smoke detection system.
- (1) The operational test will make sure correct operation of the system will occur in a minimum of time. Use only equipment installed in the plane.
 - (2) The system test will make sure correct operation of the system will occur in a minimum of time. Equipment installed in the airplane and external test equipment will be used.

TASK 26-16-00-715-001

2. Operational Test – Lower Cargo Compartment Smoke Detection System

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test System
- (5) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

C. Prepare for Test

S 865-100

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

S 755-101

- (2) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00/501).
 - (b) Warning System (AMM 31-51-00/501).
 - (c) Master Dim and Test System (AMM 33-16-00/501).

S 755-002

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:

NOTE: Close the system 1 and 2 circuit breakers at the same time.

- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

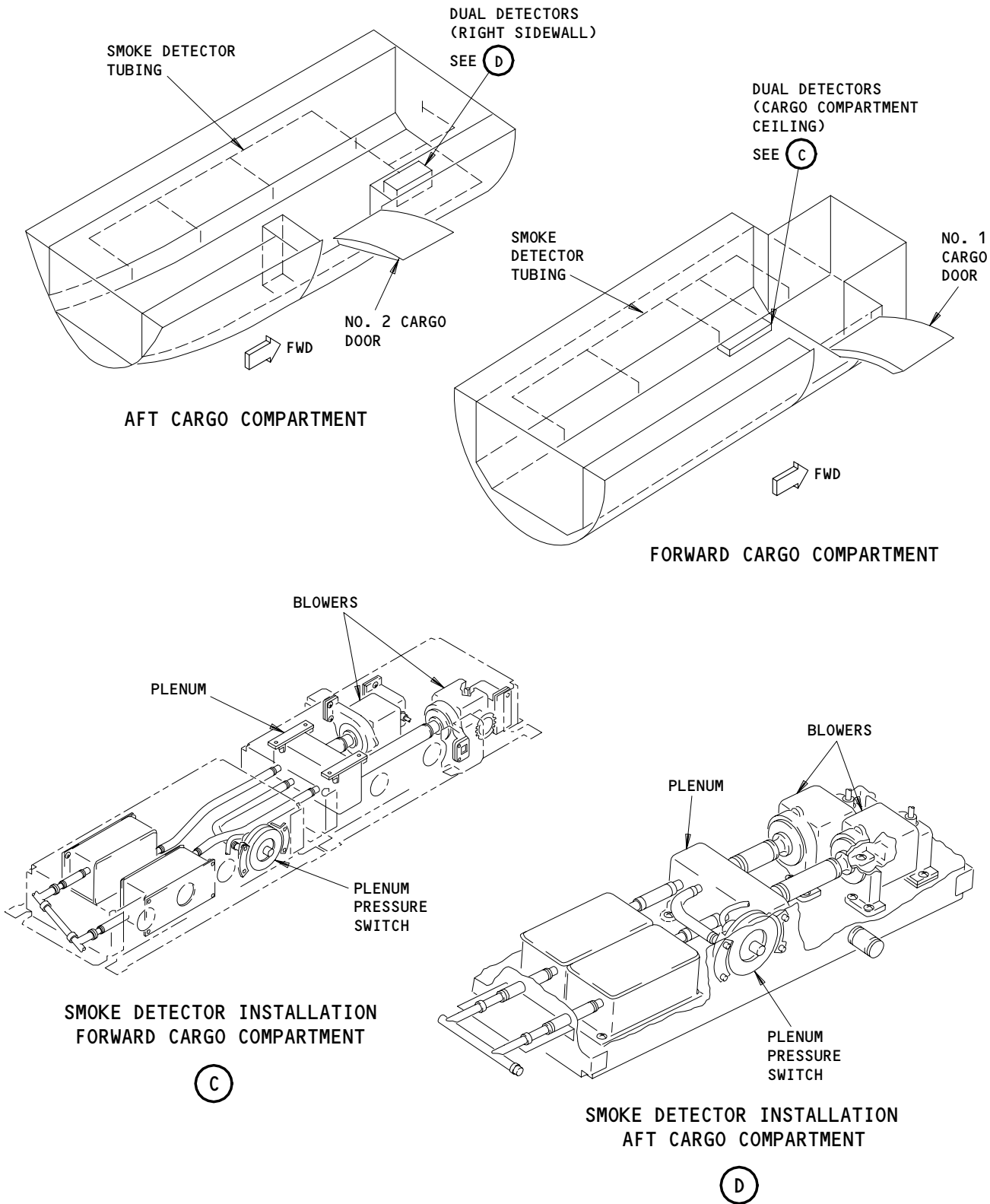
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Cargo Compartment Smoke Detection System Component Location
Figure 501

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- (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- (c) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
- (d) 11S36, FIRE DET FAN PWR or CARGO SMK BLO

S 755-003

- (4) Make sure these circuit breakers on the miscellaneous electrical equipment panel, P70, are closed:
 - (a) 70B10, SMOKE DET BLOWER 1
 - (b) 70B11, SMOKE DET BLOWER 2
 - (c) 70B12, SMOKE DET BLOWER 3
 - (d) 70B13, SMOKE DET BLOWER 4
- D. Do a Test of the Cargo Smoke Detection System

S 865-192

- (1) Push the STATUS switch on the EICAS DISPLAY select panel on the forward electronics panel, P9.

S 865-004

- (2) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel, P61.

S 755-005

- (3) Push and hold the ENG/APU/CARGO switch on the FIRE/OVHT TEST panel, M10445, on the aft pilots control stand, P8.

S 755-006

- (4) Make sure these EICAS messages show on the bottom display:
 - (a) FWD CARGO DET 1 and FWD CARGO DET 2
 - (b) AFT CARGO DET 1 and AFT CARGO DET 2

S 755-007

- (5) After 2-4 seconds, make sure these indications occur:
 - (a) The red FWD and AFT cargo firelights come on.
 - (b) The red FIRE light, on the captains instrument panel, P1-3, comes on.
 - (c) The EICAS messages FWD and AFT CARGO FIRE show on the top display.
 - (d) The red master WARNING lights, on the glareshield panel, P7, come on.
 - (e) The fire bell is heard.

S 865-008

- (6) Release the ENG/APU/CARGO switch.

S 755-009

- (7) Make sure the indications go off.

S 865-010

- (8) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

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- S 865-011
- (9) Close this circuit breaker on the P11 panel:
(a) 11J24, FIRE DET ALTN PWR CARGO
- S 755-012
- (10) Push and hold the ENG/APU/CARGO switch on the FIRE/OVHT TEST panel, M10445, on the pilots aft control stand, P8.
- S 755-013
- (11) Make sure these EICAS messages show on the bottom display:
(a) FWD CARGO DET 1 and FWD CARGO DET 2.
(b) AFT CARGO DET 1 and AFT CARGO DET 2.
- S 755-014
- (12) After 2-4 seconds, make sure these indications occur:
(a) The red FWD and AFT cargo fire light come on.
(b) The EICAS messages FWD and AFT CARGO FIRE show on the top display.
(c) The red master WARNING lights, on the glareshield panel, P7, come on.
(d) The fire bell is heard.
- S 865-015
- (13) Release the ENG/APU/CARGO switch.
- S 755-016
- (14) Make sure the indications stop.
- S 865-017
- (15) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
- E. GUI 115 WITH SB 26-22 AND GUI 001-114, 116-999;
Do a Test of the Fire Detection System Fail Light
- S 865-158
- (1) Put the EICAS COMPUTER select switch (on P9) to the AUTO position.
- S 865-159
- (2) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
(b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
(c) 11J24, FIRE DET ALTN PWR CARGO
- S 015-212
- (3) Open applicable cargo door (AMM 52-34-00/201).

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- S 035-020
- (4) Disconnect the electrical connectors, D4402 and D4404, from the forward cargo smoke detectors, M10458 and M10459. The forward cargo compartment smoke detector assembly (detectors, blowers, and plenum pressure switch) is located in the cargo compartment ceiling, just aft of the No. 1 cargo door. (See Figure 501)
- S 865-021
- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 755-022
- (6) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight, on the control stand, P8, comes on.
 - (b) The EICAS message FIRE/OVHT SYS shows on the top display.
 - (c) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 show on the bottom display.
- S 865-024
- (7) Push the FAIL P-RESET switchlight on the FIRE/OVHT TEST panel, M10445, on the pilots aft control, P8.
- S 755-025
- (8) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight goes off.
 - (b) The EICAS message FIRE/OVHT SYS does not show on the top display.
 - (c) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 show on the bottom display.
- S 865-026
- (9) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 435-027
- (10) Connect the electrical connector, D4402, to the detector, M10458.
- S 435-028
- (11) Connect the electrical connector, D4404, to the detector, M10459.
- S 035-029
- (12) Disconnect the electrical connectors D4406 and D4408 from the aft cargo smoke detectors M10460 and M10461. The aft cargo smoke detector assembly is located in the cargo compartment sidewall, forward of the No. 2 cargo door.

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S 865-030

- (13) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 755-031

- (14) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight, on P8, comes on.
 - (b) The EICAS message FIRE/OVHT SYS shows on the top display.
 - (c) The EICAS messages AFT CARGO DET 1 and AFT CARGO DET 2 show on the bottom display.
 - (d) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 do not show on the bottom display.

S 865-032

- (15) Push the FAIL P-RESET switchlight.

S 755-033

- (16) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight goes off.
 - (b) The EICAS message FIRE/OVHT SYS does not show on the top display.
 - (c) The EICAS messages AFT CARGO DET 1 and AFT CARGO DET 2 show on the bottom display.

S 865-034

- (17) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 035-035

- (18) Connect the electrical connector, D4406, to the detector, M10460.

S 035-036

- (19) Connect the electrical connector, D4408, to the detector, M10461.

S 865-037

- (20) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the panel P11, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11J24, FIRE DET ALTN PWR CARGO
 - (c) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 755-038

- (21) Make sure the EICAS messages AFT CARGO DET 1 and AFT CARGO DET 2 do not show on the bottom display.

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- S 025-213
(22) Close cargo door (AMM 52-34-00/201).
- S 865-181
(23) Remove electrical power if is not necessary (AMM 24-22-00/201).
- F. GUI 115 WITHOUT SB 26-22;
Do a test of the Fire Detection System Fail Light and make sure detectors are correctly connected.
- S 865-161
(1) Put the EICAS COMPUTER select switch (on P9) to the AUTO position.
- S 865-162
(2) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
(b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
(c) 11J24, FIRE DET ALTN PWR CARGO
- S 035-163
(3) Disconnect the electrical connectors, D4402, from the forward cargo smoke detectors 1, M10458. The forward cargo compartment smoke detector assembly (detector, blower, and plenum pressure switch) is located in the cargo compartment ceiling, just aft of the No. 1 cargo door. (See Figure 501)
- S 865-164
(4) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
(b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 755-165
(5) Make sure these indications occur:
(a) The EICAS messages FWD CARGO DET 1 shows on the bottom display.
- S 865-186
(6) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

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- (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 035-185
- (7) Disconnect the electrical connectors, D4404, from the forward cargo smoke detectors 2, M10459.
- S 865-184
- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
- (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 755-183
- (9) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight, on the control stand, P8, comes on.
- (b) The EICAS message FIRE/OVHT SYS shows on the top display.
- (c) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 show on the bottom display.
- S 865-166
- (10) Push the FAIL P-RESET switchlight on the FIRE/OVHT TEST panel, M10445, on the pilots aft control, P8.
- S 755-167
- (11) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight goes off.
- (b) The EICAS message FIRE/OVHT SYS does not show on the top display.
- (c) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 show on the bottom display.
- S 865-168
- (12) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
- (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- S 435-169
- (13) Connect the electrical connector, D4402, to the detector, M10458.
- S 435-170
- (14) Connect the electrical connector, D4404, to the detector, M10459.
- S 035-171
- (15) Disconnect the electrical connectors D4406 from the aft cargo smoke detectors M10460. The aft cargo smoke detector assembly is located in the cargo compartment sidewall, forward of the No. 2 cargo door.

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S 865-172

- (16) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 755-173

- (17) Make sure these indications occur:

S 865-190

- (18) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 035-189

- (19) Disconnect the electrical connectors D4408 from the aft cargo smoke detector 2, M10461.

S 865-188

- (20) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the P11 panel, at the same time:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 755-187

- (21) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight, on P8, comes on.
 - (b) The EICAS message FIRE/OVHT SYS shows on the top display.
 - (c) The EICAS messages AFT CARGO DET 1 and AFT CARGO DET 2 show on the bottom display.
 - (d) The EICAS messages FWD CARGO DET 1 and FWD CARGO DET 2 do not show on the bottom display.

S 865-174

- (22) Push the FAIL P-RESET switchlight.

S 755-175

- (23) Make sure these indications occur:
- (a) The yellow FAIL P-RESET switchlight goes off.
 - (b) The EICAS message FIRE/OVHT SYS does not show on the top display.
 - (c) The EICAS messages AFT CARGO DET 1 and AFT CARGO DET 2 show on the bottom display.

S 865-176

- (24) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

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(b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

S 035-177

(25) Connect the electrical connector, D4406, to the detector, M10460.

S 035-178

(26) Connect the electrical connector, D4408, to the detector, M10461.

S 865-179

(27) Remove the DO-NOT-CLOSE tags and close these circuit breakers, on the panel P11, at the same time:

(a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

(b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2

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3. System Test - Smoke Detection Vacuum Test

A. Equipment

(1) Gage, Vacuum - Hand-held, 0-10 inches of water.
Dwyer Instruments Inc., Michigan City, Indiana,
or equivalent.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test System
- (5) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

C. Access

- (1) Location Zones
 - 121/122 Forward Cargo Compartment
 - 153/154 Aft Cargo Compartment
 - 211/212 Flight Compartment

D. Prepare for Test

S 865-089

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

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- S 015-214
- (2) Open applicable cargo door (AMM 52-34-00/201).
- S 755-090
- (3) Make sure these systems operate:
- (a) EICAS (AMM 31-41-00/501).
 - (b) Warning System (AMM 31-51-00/501).
 - (c) Master Dim and Test System (AMM 33-16-00/501).
- S 755-091
- (4) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
- (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - (c) 11S35, CARGO SMOKE BLOWER CONT or FIRE DET CARGO CONT
 - (d) 11S36, FIRE DET FAN PWR or CARGO SMK BLO
- S 755-092
- (5) Make sure these circuit breakers on the miscellaneous relay panel, P70, are closed:
- (a) 70B10, SMOKE DET BLOWER 1
 - (b) 70B11, SMOKE DET BLOWER 2
 - (c) 70B12, SMOKE DET BLOWER 3
 - (d) 70B13, SMOKE DET BLOWER 4
- S 015-215
- (6) Open forward and aft cargo doors (AMM 52-34-00/201).
- E. Smoke Detection Vacuum Test

- S 865-094
- (1) Put the EICAS COMPUTER select switch (on P9) to the AUTO position.
- S 215-095
- (2) Do a vacuum measurement:
- (a) Examine the tubes from the smoke detection assemblies to the orifices in the cargo compartment ceilings. Inspect for sources of leakage.
 - (b) Measure the vacuum at each orifice in each cargo compartment. Inspect for a minimum measure of 0.5 inches of water (vacuum) at each orifice.
 - (c) Open these circuit breakers on the P70 panel, and attach DO-NOT-CLOSE tags:
 - 1) 70B10, SMOKE DET BLOWER 1
 - 2) 70B12, SMOKE DET BLOWER 3
 - (d) After 60 to 90 seconds, measure the vacuum at each orifice in each cargo compartment. Inspect for a minimum measure of 0.5 inches of water (vacuum) at each orifice.
 - (e) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P70 panel:
 - 1) 70B10, SMOKE DET BLOWER 1

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2) 70B12, SMOKE DET BLOWER 3

S 865-096

- (3) Open for one second, and then close this circuit breakers on the P11 panel, to set the system:
(a) 11S35, CARGO SMOKE BLOWER CONT or FIRE DET CARGO CONT

S 755-097

- (4) Make sure that within 90 seconds, these EICAS messages do not show on the bottom display.
(a) FWD CARGO DET 1 or FWD CARGO DET 2.
(b) AFT CARGO DET 1 or AFT CARGO DET 2.
(c) CARGO DET AIR.
(d) FWD DET FAN or AFT DET FAN.

S 025-216

- (5) Close cargo door (AMM 52-34-00/201).

S 865-153

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-16-00-735-147

4. System Test - Cargo Compartment Smoke Detection

A. Equipment

(1) Smoke Source

- (a) Corona Colt 8.5 (This is the preferred smoke source) or Colt 4 Basic or Colt 4 Turbo Smoke Generator
Corona Integrated Technologies, Inc.
6215 Oerstone Drive
West Vancouver, B.C., Canada
V7W 1X7
Phone: 1-888-878-9433
FAX: 604-738-9918
E-mail: info@smokemachines.com

NOTE: These Corona smoke generators require the supply kit and smoke fluid identified below. These items must be ordered separately from Corona.

- 1) Refill Kit - COLT SUPPLY KIT - Corona Integrated Technologies, Inc.

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- 2) Smoke fluid - CFC100AUSP - Corona Integrated Technologies, Inc.
- (b) (Alternative) Rosco Fog/Smoke Machine - Model 1500 or 1600
Rosco Laboratories Inc.
52 Harbor View
Stamford, CT 06902
Phone Number: (800) 767-2669 or (203) 708-8900
FAX Number: (203) 708-8919
- (c) Ventilation Smoke Tube (Part #458481)
(For use with Rosco Fog/Smoke Machine)
Mine Safety Appliance Co.
P.O. Box 426
Pittsburgh, PA 15230
Phone Number: (412) 967-3000
FAX Number: (412) 967-3161

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test System
- (5) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

C. Access

- (1) Location Zones
 - 121/122 Forward Cargo Compartment
 - 153/154 Aft Cargo Compartment
 - 211/212 Flight Compartment

D. Prepare for Test

S 865-148

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

S 755-149

- (2) Make sure these systems operate:
 - (a) EICAS (AMM 31-41-00/501).
 - (b) Warning System (AMM 31-51-00/501).
 - (c) Master Dim and Test System (AMM 33-16-00/501).

S 755-150

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - (c) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
 - (d) 11S36, FIRE DET FAN PWR or CARGO SMK BLO

S 755-151

- (4) Make sure these circuit breakers on the miscellaneous relay panel, P70, are closed:
 - (a) 70B10, SMOKE DET BLOWER 1
 - (b) 70B11, SMOKE DET BLOWER 2

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- (c) 70B12, SMOKE DET BLOWER 3
- (d) 70B13, SMOKE DET BLOWER 4

S 865-194

- (5) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel, P61.

E. Do a Test of the Forward Blowers, Control Relay, and Plenum Pressure Switch

S 755-103

- (1) Make sure the EICAS maintenance message FWD DET FAN does not show on the bottom display.

S 865-104

- (2) Open this circuit breaker on the P70 panel to stop the operation of blower (M10462):
 - (a) 70B10, SMOKE DET BLOWER 1

S 865-119

- (3) After approximately 20 seconds, make sure these indications occur:
 - (a) The EICAS message FWD DET FAN shows on the bottom display. This indicates that the plenum pressure switch and control relay have operated.

NOTE: The EICAS status message, CARGO DET AIR, may appear momentarily.

- (b) Push the STATUS switch on the EICAS DISPLAY select panel on the forward electronics panel, P9.
- (c) The EICAS message CARGO DET AIR does not show on the bottom display. This indicates that the forward blower 2 (M10463) operates.

S 865-120

- (4) Open this circuit breaker on the P70 panel to stop the operation of blower 2 (M10463).
 - (a) 70B11, SMOKE DET BLOWER 2

S 755-121

- (5) Make sure the EICAS messages CARGO DET AIR and FWD DET FAN show on the bottom display.

S 865-122

- (6) Close these circuit breakers on the P70 panel:
 - (a) 70B10, SMOKE DET BLOWER 1
 - (b) 70B11, SMOKE DET BLOWER 2

S 865-123

- (7) Open for 1 second, and then close these circuit breakers on the P11 panel to set system:
 - (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT

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S 755-124

- (8) Make sure that within 90 seconds, the EICAS message FWD DET FAN or CARGO DET AIR does not show on the bottom display. This indicates that the forward blower 1 (M10462) operates.

F. Do a Test of the Aft Blowers, Control Relay, and Plenum Pressure Switch

S 755-125

- (1) Make sure the EICAS maintenance message AFT DET FAN does not show on the bottom display.

S 865-126

- (2) Open this circuit breaker on the P70 panel to stop the operation of blower 3 (M10464).
 - (a) 70B12, SMOKE DET BLOWER 3

S 755-141

- (3) After approximately 20 seconds, make sure these indications occur:
 - (a) The EICAS maintenance message AFT DET FAN shows on the bottom display. This is an indication that the plenum pressure switch and control relay have operated.
 - (b) The EICAS status message CARGO DET AIR does not show on the bottom display. This is an indication that the aft blower 4 (M10465) operates.

S 865-142

- (4) Open this circuit breaker on the P70 panel to stop the operation of blower 4 (M10465):
 - (a) 70B13, SMOKE DET BLOWER 4

S 755-143

- (5) Make sure the EICAS messages CARGO DET AIR and AFT DET FAN show on the bottom display.

S 865-160

- (6) Close these circuit breakers on the P70 panel:
 - (a) 70B12, SMOKE DET BLOWER 3

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(b) 70B13, SMOKE DET BLOWER 4

S 865-144

(7) Open for 1 second, and then close these circuit breakers on the P11 panel, to set the system:

(a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT

S 755-146

(8) Make sure that within 90 seconds, the EICAS message AFT DET FAN or CARGO DET AIR does not show on the bottom display. This is an indication that aft blower 3 (M10464) operates.

G. Smoke Test

S 015-217

(1) Open forward and aft cargo doors (AMM 52-34-00/201).

S 725-152

WARNING: DO NOT BREATHE THE SMOKE. USE EYE PROTECTION. IF YOU USE THE VENTILATION SMOKE TUBE, DO NOT LET THE SMOKE TOUCH YOUR SKIN. TOO MUCH SMOKE FROM THE SMOKE TUBE CAN CAUSE CORROSION TO THE MATERIALS IN THE SMOKE DETECTION SYSTEM. IF THERE IS NOT SUFFICIENT AIR MOVEMENT IN THE AREA OR YOU GET RESPIRATORY PROBLEMS, USE AN APPLICABLE RESPIRATOR. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do the Smoke test as follows:

(a) Make smoke adjacent to each of the four orifices in the forward cargo compartment, one at time.

(b) For each orifice, make sure a fire indication occurs:

1) The red FWD CARGO FIRE switchlight, on the APU/CARGO fire control panel, (on P8), comes on.

2) The red FIRE light, on the captains instrument panel, P1-3, comes on.

3) The EICAS message FWD CARGO FIRE shows on the top display.

4) The red master warning lights, on the glareshield panel, P7, come on.

5) The fire bell is heard.

(c) Remove the smoke source.

(d) Make sure that the above fire indications go off when there is no smoke.

(e) Do the smoke test again for the 5 orifices in the aft cargo compartment. The AFT light in the AFT CARGO FIRE switchlight will come on and the EICAS message AFT CARGO FIRE shows on the top display.

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- S 025-218
- (3) Close forward and aft cargo doors (AMM 52-34-00/201).
- S 865-099
- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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LOWER CARGO COMPARTMENT SMOKE DETECTION SYSTEM - CLEANING/PAINTING

1. General

A. This section contains these procedures to clean the smoke detection system in the cargo compartment:

- (1) Cargo Smoke Detector
- (2) Cargo Compartment Smoke Detector Tubes

TASK 26-16-00-107-001

2. Clean the Cargo Smoke Detector (Fig. 701)

A. References

- (1) AMM 26-16-01/201, Cargo Smoke Detectors - Maintenance Practices
- (2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors
- (3) AIPC 26-16-58 Fig. 1
- (4) AIPC 26-16-59 Fig. 1, AIPC 26-16-59 Fig. 2, AIPC 26-16-59 Fig. 3, AIPC 26-16-59 Fig. 4

B. Equipment

- (1) A pneumatic air source which can supply dry, filtered compressed air (Maximum pressure of 30 PSI).
- (2) A vacuum capable of supplying a vacuum of 15 inches of water maximum.

C. Consumable Materials

- (1) Cleaning Solvent - Isopropyl Alcohol
- (2) Soft bristle brush
- (3) Tube brush
- (4) Soap and water
- (5) Paint - nonreflective, flat, black, antifungal
Use this paint or equivalent for touch-up:
2600-08 - Cardinal Industrial Finishes
1329 Potrero Avenue
South El Monte, CA 91733
P (626) 444-9274

D. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access Panels

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

E. Clean the Smoke Detectors

S 017-061

- (1) Open applicable cargo doors (AMM 52-34-00/201).

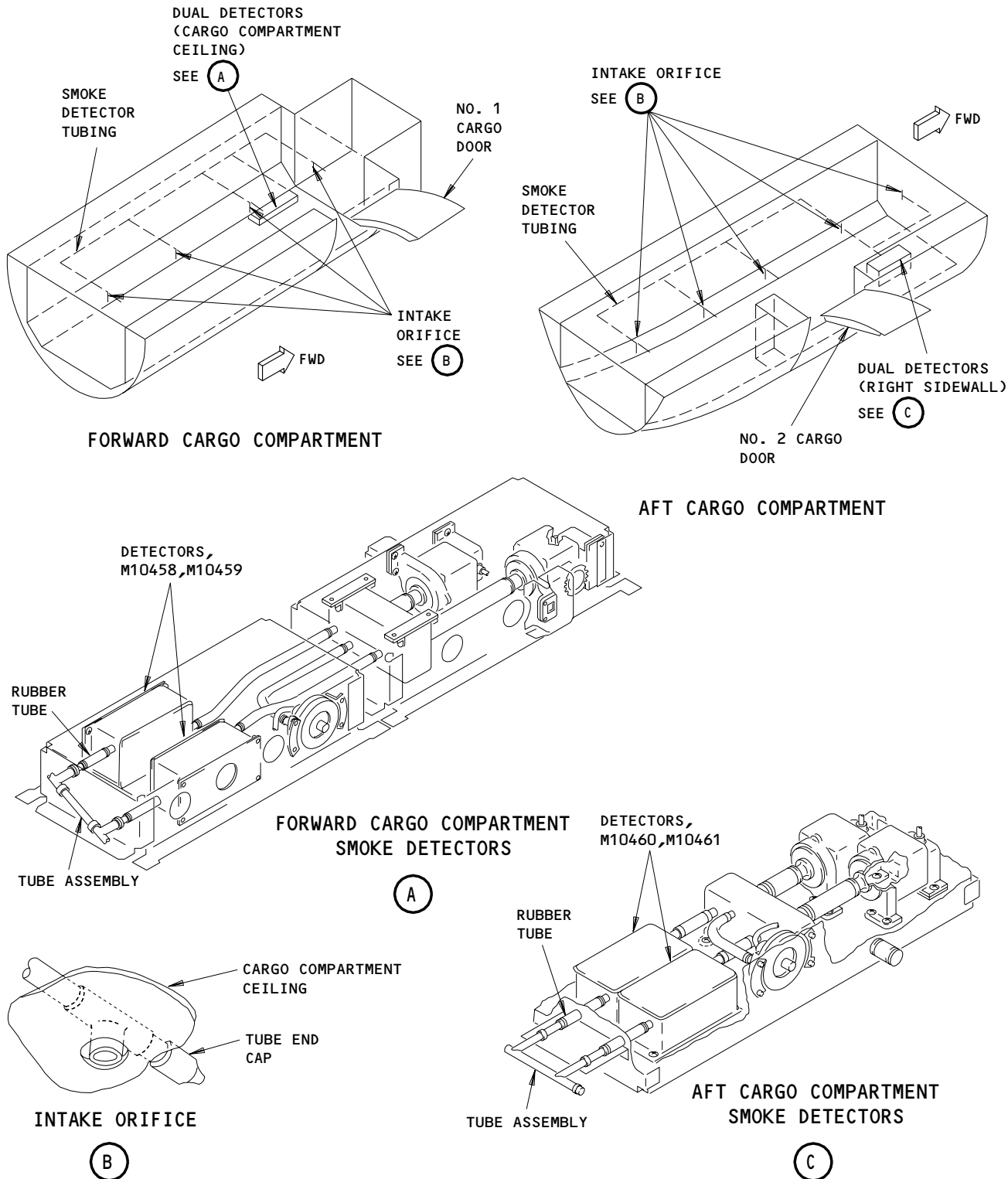
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Forward/Aft Cargo Compartment Smoke Detection Component Location
Figure 701

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- S 017-034
- (2) Get access to the smoke detectors in the cargo compartment.
- S 017-033
- (3) The smoke detectors in the forward cargo compartment are M10458 and M10459. They are installed in the ceiling of the forward cargo compartment just aft of the No. 1 cargo door. Get access to the detectors through the ceiling panels.
- S 017-032
- (4) The smoke detectors in the aft cargo compartment are M10460 and M10461. They are installed in the sidewall of the aft cargo compartment just forward of the No. 2 cargo door. Get access to the detectors through the sidewall panel.
- S 037-002
- (5) Remove the smoke detector (AMM 26-16-01/201).
- S 107-003
- (6) Blow away all remaining material inside the detector chamber. Use dry compressed air which will not exceed 15 psi.
- S 107-004
- (7) Remove all material which bonds to the detector chamber walls with a soft bristle brush and Isopropyl alcohol.
- S 757-005
- (8) Make sure there are no scratches or shiny areas inside the chamber.
- S 107-006
- (9) Clean and paint all scratches or shiny areas with nonreflective paint.
- S 757-007
- (10) Make sure there are no signs of wear, damage, burns, loose components, corrosion, or dirt build-up inside the chamber.
- S 757-008
- (11) Examine the pick-up tubes and orifice caps that come out of the ceiling of the compartment for blockage and dirt deposits. Clean the equipment if it is necessary.
- S 437-009
- (12) Assemble the smoke detector.
- S 437-010
- (13) Install the smoke detector (AMM 26-16-01/201) if you do not do the procedure to clean the tubes.

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S 717-011

(14) Do a Test of the Smoke Detector Installation (AMM 26-16-01/201).

S 027-062

(15) Close cargo doors (AMM 52-34-00/201).

TASK 26-16-00-107-012

3. Clean the Smoke Detector Tubes in the Cargo Compartment (Fig. 701)

A. General

- (1) This section includes two procedures, Methods 1 and 2, which can be used to clean the air sampling tubes for the smoke detector.
- (2) Method 1 provides a more thorough cleaning procedure than Method 2 and is suggested for smoke detection systems having a greater degree of contamination.

B. References

- (1) AMM 26-16-01/201, Cargo Smoke Detector - Maintenance Practices
- (2) AMM 26-16-00/501, Cargo Smoke Detection System - Adjustment Test
- (3) AMM 25-50-03/401, Bulkhead Lining - Removal/Installation
- (4) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

C. Equipment

- (1) A pneumatic air source which can supply dry, filtered compressed air (Maximum pressure of 30 PSI).
- (2) A vacuum source which can supply a maximum vacuum of 15 inches of water.

D. Consumable Materials

- (1) Soft bristle brush
- (2) Tube brush
- (3) Soap and water

E. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access Panels

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

F. Clean the Smoke Detector Tubing - Method 1

S 017-063

(1) Open applicable cargo doors (AMM 52-34-00/201).

S 037-014

(2) Remove all the smoke detectors (AMM 26-16-01/201).

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S 167-015

- (3) Remove the applicable cargo lining panels (AMM 25-50-03/401) to get access to the tube assembly at the smoke detectors, air sampling tube end caps, and orifices.

NOTE: Not all air sampling tubes have end caps.

S 177-016

- (4) For the tube assembly at the smoke detectors, do the steps that follow:
- (a) Remove the clamps and straps, and disconnect the tube assembly from the tubing system.
 - (b) Use a tube brush, soap and water to remove all of the contamination and debris from the tube assembly.
 - (c) Rinse fully and air dry the tube assembly. Use a wet vacuum to catch any excess water.
 - (d) Make sure the rubber tubes, straps and clamps are not damaged. Replace them if necessary.

S 037-017

- (5) Remove all of the caps from the ends of the air sampling tube.

S 167-052

CAUTION: AIR SAMPLING ORIFICE DIAMETERS HAVE CRITICAL DIMENSIONS. DO NOT INSERT ANY CLEANING DEVICES WHICH MAY ALTER THE DIMENSIONS OF THE ORIFICE.

- (6) Remove all remaining contamination and debris from the ends of the air sampling tube and adjacent orifices.

S 147-038

- (7) For tubes with end caps, remove all remaining material from the inner wall of the sampling tube directly across from the orifice. Use a mechanical probe if necessary.

S 167-020

CAUTION: REMOVE ALL OF THE SMOKE DETECTOR ASSEMBLIES AND THE END CAPS BEFORE YOU BLOW THE SYSTEM. IF NOT, THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (8) To clean the tubing system, do the steps that follow:
- (a) Use filtered compressed air to clean the tubing system. Use a maximum pressure of 30 psi.

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- (b) Make sure all the end caps are removed.
- (c) Start purging air from the open end tube assembly near the smoke detectors location.

NOTE: It is also acceptable to blow air from either or both open ends of the tubing system, the end caps, or tee tubing connections.

S 757-022

- (9) Do the procedure again if it is necessary to make sure the tubing is clean.

S 757-023

- (10) Make sure the air sampling tubes, tee tubing splices, orifices, end caps, straps, and clamps are not damaged. Replace them if it is necessary.

G. Smoke Detector Tubes Cleaning - Method 2

S 037-025

- (1) Remove the rubber tubes which attach the tube assemblies to the smoke detectors.

S 757-026

- (2) Examine the air sampling orifices and rubber sleeves at orifices for contamination and debris.

S 107-053

CAUTION: AIR SAMPLING ORIFICE DIAMETERS HAVE CRITICAL DIMENSIONS. DO NOT INSERT ANY CLEANING DEVICES WHICH MAY ALTER THE DIMENSIONS OF THE ORIFICE.

- (3) Remove the contamination and debris from the rubber sleeves and orifices if it is necessary.

S 167-028

CAUTION: USE A VACUUM OF NO LESS THAN 15 INCHES OF WATER. IF NOT, THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (4) Apply a vacuum of no less than 15 inches of water (0.5 psi) or greater than 140 inches of water (5 psi) to the end of the tubes which connects to the detector assemblies.

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H. Put the Airplane Back to Its Usual Condition.

- S 437-058
- (1) Assemble the smoke detector tubing.

- S 437-057
- (2) Install the smoke detector assembly (AMM 26-16-01/201).

- S 437-064
- (3) Make sure that the minimum protrusion length of the smoke detection air sampling ports are 0.20 inch (5.08 mm) from the compartment ceiling liner.
 - (a) If the protrusion length is less than 0.20 inch (5.08 mm) then do the procedure: Bulkhead Lining - Removal/Installation (AMM 25-50-03/401).

- S 437-059
- (4) Install the applicable cargo lining panels (AMM 25-50-03/401).

- S 717-056
- (5) Do a Test of the Smoke Detector Installation (AMM 26-16-01/201).

- S 027-060
- (6) Close main cargo doors (AMM 52-34-00/201).

- S 717-055
- (7) Do the Operational Test and the Vacuum Test for the applicable Cargo Smoke Detection System (AMM 26-16-00/501).

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CARGO SMOKE DETECTORS – MAINTENANCE PRACTICES

1. General

- A. This section contains these procedures for the cargo smoke detectors:
 - (1) Remove the Smoke Detector
 - (2) Install the Smoke Detector
 - (3) SMOKE DETECTORS WITH LAMP PLACARDS;
Remove the Detector Lamp
 - (4) SMOKE DETECTORS WITH LAMP PLACARDS;
Install the Detector Lamp
- B. SMOKE DETECTORS WITH LAMP PLACARDS;
The lamps removal/installation procedures apply only to smoke detectors that have lamps. These smoke detectors have an attached lamp placard. The newer type of detectors do not have lamps, and do not have lamp replacement placards attached. These detectors have LEDs. These LEDs are not replaceable parts.
- C. The smoke detectors in the forward cargo compartment are M10458 and M10459. They are installed in the ceiling of the forward cargo compartment just aft of the No. 1 cargo door. Get access to the forward detectors through the ceiling panel. The smoke detectors in the aft cargo compartment are M10460 and M10461. They are installed in the aft cargo compartment sidewall just forward of No. 2 cargo door. Get access to the aft detectors through the sidewall panel.

TASK 26-16-01-022-001

2. Remove the Cargo Smoke Detector (Fig. 201)

- A. References
 - (1) AMM 24-22-00/201, Electrical Power – Control
 - (2) AMM 31-41-00/501, EICAS
 - (3) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors
- B. Access
 - (1) Location Zones
 - 121/122 Forward Cargo Compartment
 - 153/154 Aft Cargo Compartment
 - 211/212 Flight Compartment
 - 820 Lower Half of Fuselage (RH Side)
 - (2) Access Panels
 - 821 Forward Cargo Compartment Door
 - 822 Aft Cargo Compartment Door
 - 823 Bulk Cargo Compartment Door
- C. Remove the Cargo Smoke Detector
 - S 862-002
 - (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1

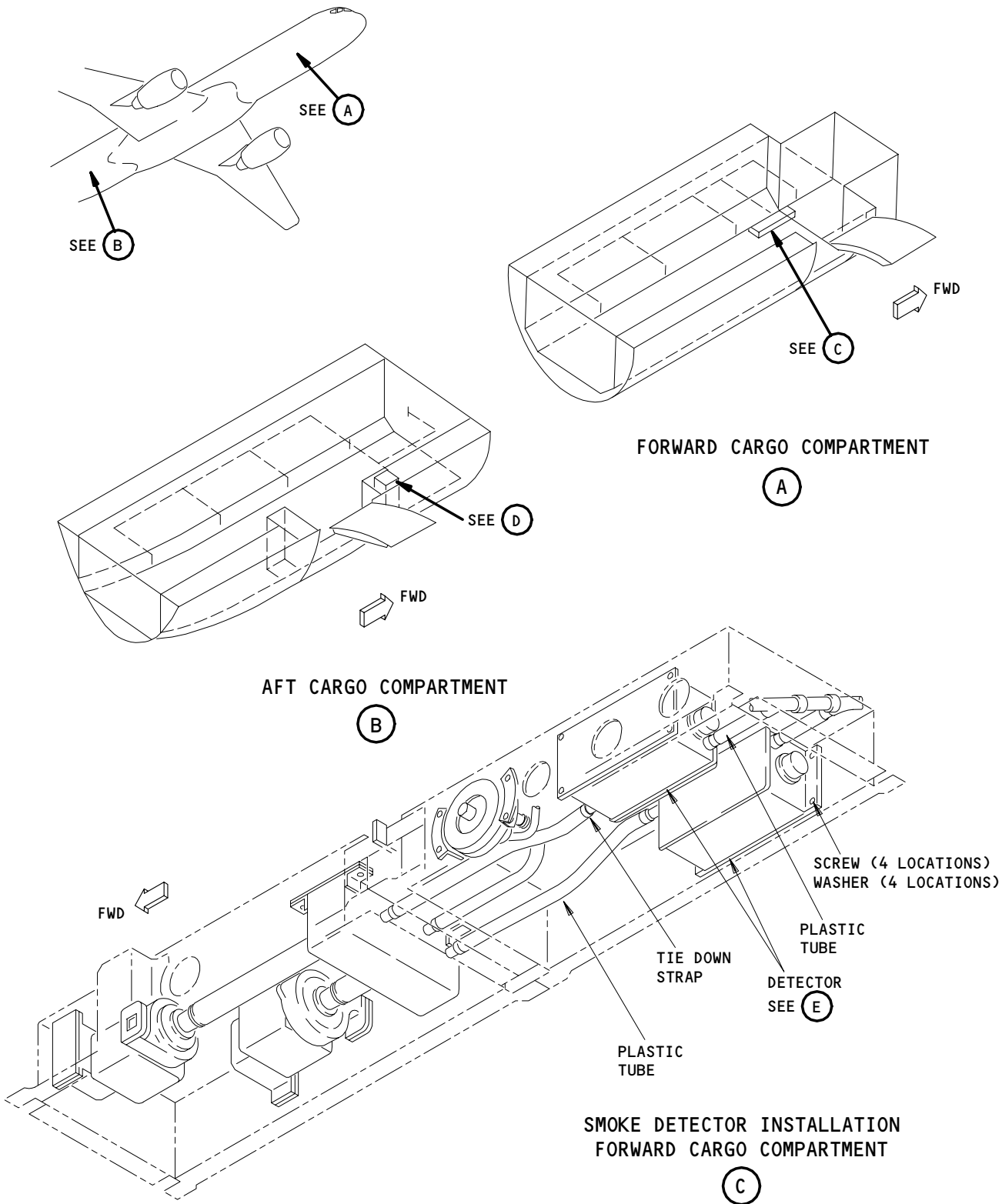
EFFECTIVITY

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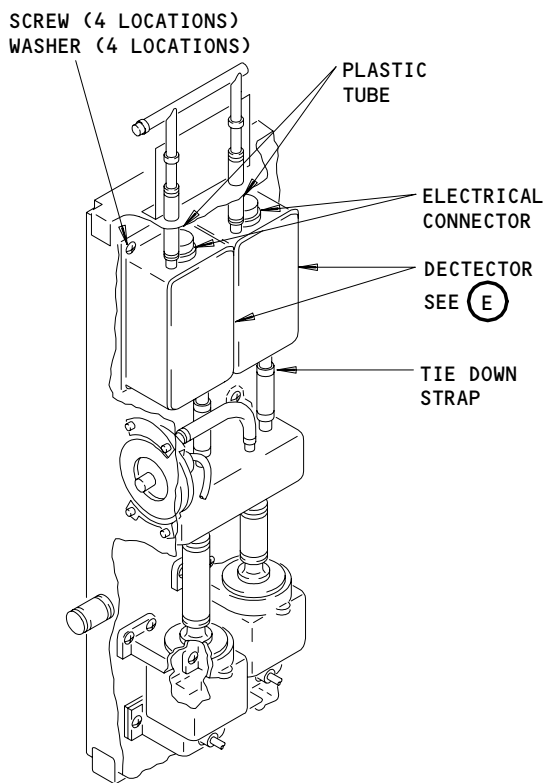
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Cargo Smoke Detector Installation
Figure 201 (Sheet 1)

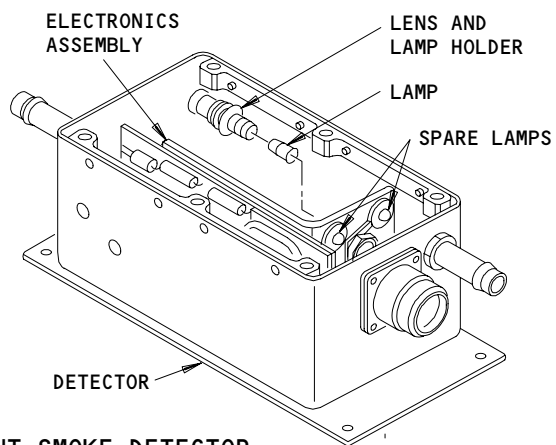
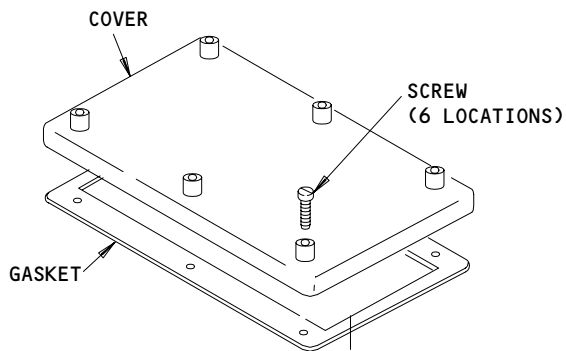
EFFECTIVITY
GUI 115 WITHOUT SB 26-22

26-16-01



**SMOKE DETECTOR INSTALLATION
AFT CARGO COMPARTMENT**

(D)



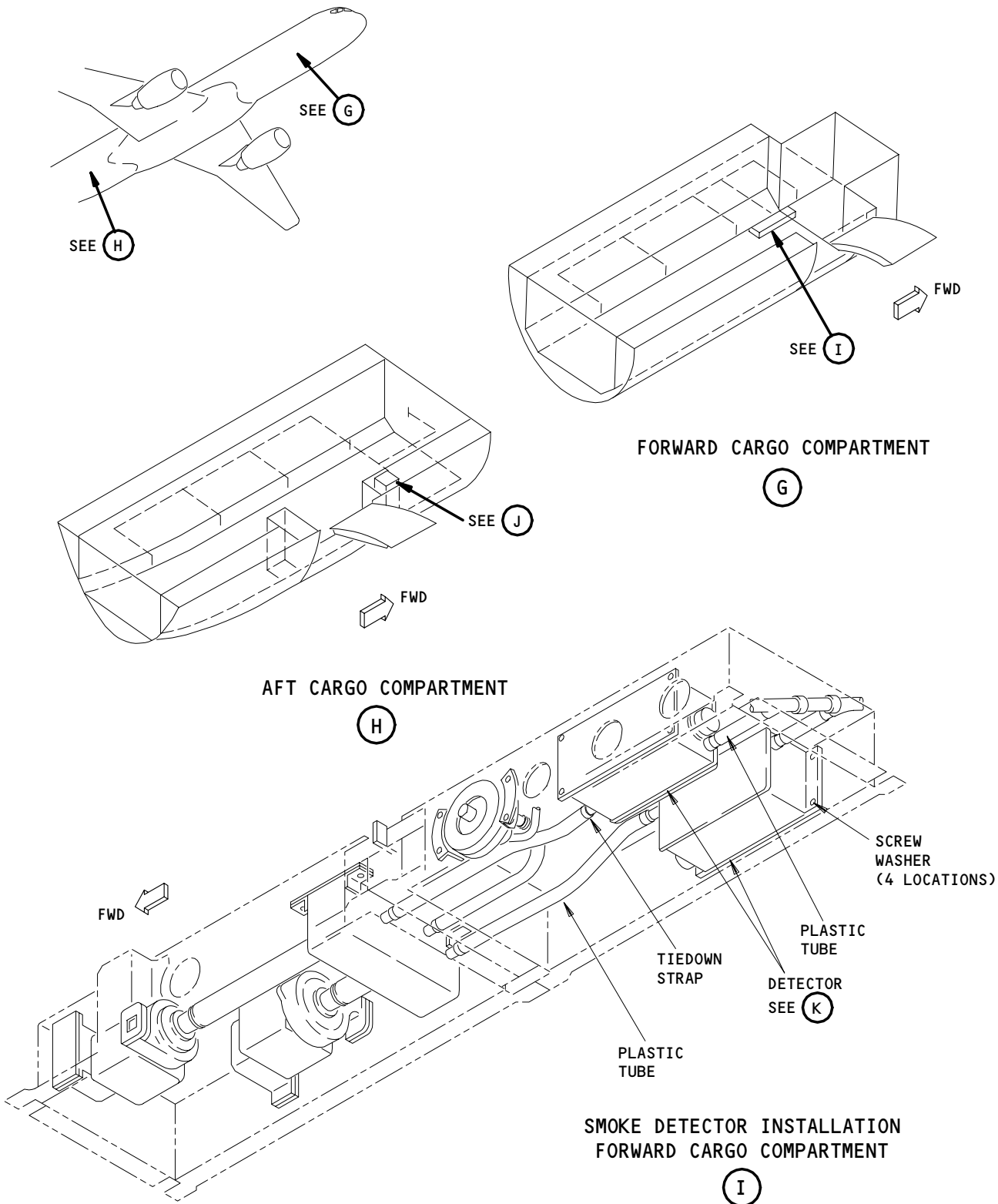
CARGO COMPARTMENT SMOKE DETECTOR

(E)

**Cargo Smoke Detector Installation
Figure 201 (Sheet 2)**

EFFECTIVITY
GUI 115 WITHOUT SB 26-22

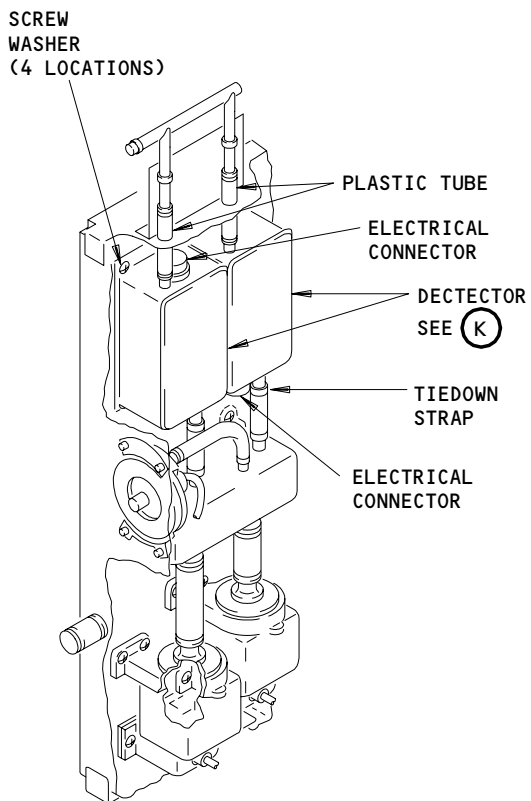
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Cargo Smoke Detector Installation
Figure 201 (Sheet 3)

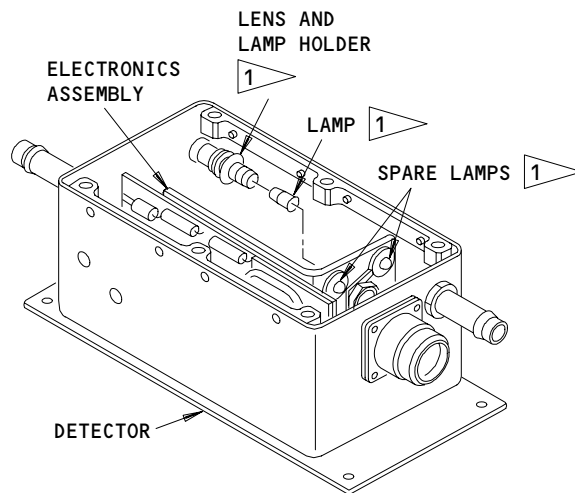
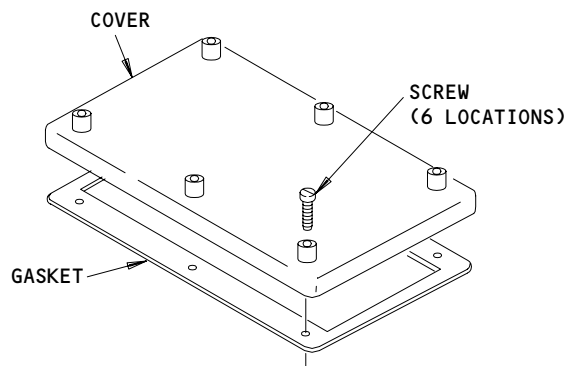
EFFECTIVITY
GUI 001-114, 116-999
AND GUI 115 WITH SB 26-22

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**SMOKE DETECTOR INSTALLATION
AFT CARGO COMPARTMENT**

(J)



CARGO COMPARTMENT SMOKE DETECTOR

(K)

1 NOT INSTALLED ON AUTRONICS
2156-604 DETECTORS

**Cargo Smoke Detector Installation
Figure 201 (Sheet 4)**

EFFECTIVITY
GUI 001-114, 116-999
AND GUI 115 WITH SB 26-22

26-16-01

- (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
- (c) 11J24, FIRE DET ALTN PWR CARGO
- (d) 11S35, FIRE DET CARGO FAN CONT or CARGO SMOKE BLOWER CONT
- (e) 11S36, FIRE DET CARGO FAN PWR or CARGO SMOKE BLOWER CONT

S 012-060

- (2) Open applicable cargo doors (AMM 52-34-00/201).

S 012-003

- (3) Get access to the smoke detector.

S 032-004

- (4) Remove the electrical connector.

S 032-005

- (5) Remove the two tiedown straps which hold the plastic tubes to the detector air ports.

S 032-006

- (6) Remove the two plastic tubes from the air ports.

S 032-007

- (7) Remove the four screws and washers.

S 022-008

- (8) Remove the smoke detector.

TASK 26-16-01-422-032

3. Install the Cargo Smoke Detector (Fig. 201)

A. Reference

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage (RH Side)

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- (2) Access Panels
 - 821 Forward Cargo Compartment Door
 - 822 Aft Cargo Compartment Door
 - 823 Bulk Cargo Compartment Door

C. Install Cargo Smoke Detector

S 422-009

- (1) Install the detector with the four screws and washers.

S 432-010

- (2) Install the plastic tubes to the detector air ports.

NOTE: The tube should move along the air port approximately 0.7 inch (1.8 cm).

S 432-011

- (3) Tighten the two plastic tubes to the air ports. Use the tiedown straps.

S 432-012

- (4) Install the electrical connector.

S 412-013

- (5) Close the access to the smoke detector.

S 022-061

- (6) Close cargo doors (AMM 52-34-00/201).

TASK 26-16-01-712-033

4. Do a Test of the Smoke Detector Installation

A. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage (RH Side)

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- (2) Access Panels
 - 821 Forward Cargo Compartment Door
 - 822 Aft Cargo Compartment Door
 - 823 Bulk Cargo Compartment door

B. Do a Test of the Smoke Detector Installation

S 862-014

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

S 752-015

- (2) Make sure EICAS operates (AMM 31-41-00/501).

S 862-016

- (3) On the pilot forward control stand, P9, set the EICAS COMPUTER select switch to L or R.

S 862-017

- (4) Set the EICAS display to STATUS.

S 862-018

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B26, FIRE DETECTION CARGO 1 or CARGO SMOKE DET 1
 - (b) 11B27, FIRE DETECTION CARGO 2 or CARGO SMOKE DET 2
 - (c) 11J24, FIRE DET ALTN PWR CARGO
 - (d) 11S35, FIRE DET CARGO FAN CONT or CARGO SMOKE BLOWER CONT
 - (e) 11S36, FIRE DET CARGO FAN PWR or CARGO SMOKE BLOWER CONT

S 752-019

- (6) Make sure these EICAS messages do not show on the bottom display:
 - (a) FWD CARGO DET 1
 - (b) FWD CARGO DET 2
 - (c) AFT CARGO DET 1
 - (d) AFT CARGO DET 2

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- S 022-062
(7) Close forward and aft cargo doors (AMM 52-34-00/201).

- S 862-020
(8) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-16-01-002-037

5. SMOKE DETECTORS WITH LAMP PLACARDS;
Remove the Smoke Detector Lamp (Fig. 201)

NOTE: The lamps removal/installation procedures apply only to smoke detectors that have lamps. These smoke detectors have an attached lamp placard. The newer type of detectors do not have lamps, and do not have lamp replacement placards attached. These detectors have LEDs. These LEDs are not replaceable parts.

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

- (1) Location Zones
- | | |
|---------|----------------------------------|
| 121/122 | Forward Cargo Compartment |
| 153/154 | Aft Cargo Compartment |
| 211/212 | Flight Compartment |
| 820 | Lower Half of Fuselage (RH Side) |

(2) Access Panels

- | | |
|-----|--------------------------------|
| 821 | Forward Cargo Compartment Door |
| 822 | Aft Cargo Compartment Door |
| 823 | Bulk Cargo Compartment Door |

C. Procedure - Remove the Lamp

NOTE: The forward cargo smoke detector must be removed to replace a lamp. Do not try to twist the detector to get access to the lamp.

- S 012-063
(1) Open forward and aft cargo doors (AMM 52-34-00/201).

- S 032-022
(2) Remove the six screws from the detector cover.

- S 032-023
(3) Remove the detector cover.

- S 032-024
(4) Loosen the lamp and lens holder from the electronics assembly.

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S 022-025

- (5) Remove the lamp from the lamp and lens holder.

TASK 26-16-01-402-038

6. SMOKE DETECTORS WITH LAMP PLACARDS;
Install the Smoke Detector Lamp (Fig. 201)

NOTE: The lamps removal/installation procedures apply only to smoke detectors that have lamps. These smoke detectors have an attached lamp placard. The newer type of detectors do not have lamps, and do not have lamp replacement placards attached. These detectors have LEDs. These LEDs are not replaceable parts.

A. References

- (1) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

- (1) Access Panels
 - 821 Forward Cargo Compartment Door
 - 822 Aft Cargo Compartment Door
 - 823 Bulk Cargo Compartment Door

C. Procedure - Install the Lamp

S 422-027

CAUTION: USE THESE LAMPS ONLY: CM382AS10, CM382AS15, GI382AS10 OR GI382AS15 14V. FAILURE OF THE SMOKE DETECTORS TO DETECT CARGO COMPARTMENT FIRES WILL OCCUR IF AN INCORRECT LAMP IS USED.

- (1) Put the lamp in the lamp and lens holder and tighten the lamp fixture.

S 432-030

- (2) Put the gasket and cover on the detector.

S 432-029

- (3) Install the screws and tighten to seal the detector.

NOTE: The detector cover must be air tight.

S 712-031

- (4) Do a Test of the Smoke Detector Installation.

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- S 022-064
(5) Close forward and aft cargo doors (AMM 52-34-00/201).

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SMOKE DETECTOR BLOWERS – REMOVAL/INSTALLATION

1. General

- A. The smoke detector blowers in the forward cargo compartment are M10462 and M10463. They are installed in the ceiling in the forward cargo compartment just aft of the No. 1 cargo door. Get access to the blowers through the cargo ceiling panel. The smoke detector blowers in the aft cargo component are M10464 and M10465. They are installed in the sidewall of the aft cargo compartment just forward of the No. 2 cargo door. Get access to the blowers through the sidewall panel.

TASK 26-16-02-024-001

2. Remove the Smoke Detector Blower (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

C. Do the Procedure to Remove the Smoke Detector Blowers.

S 864-003

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
(b) 11S36, FIRE DET FAN PWR or CAR SMK BLO

S 014-051

- (2) Open forward and aft cargo doors (AMM 52-34-00/201).

S 014-004

- (3) Get access to the blower.

S 034-006

- (4) Remove the electrical connector.

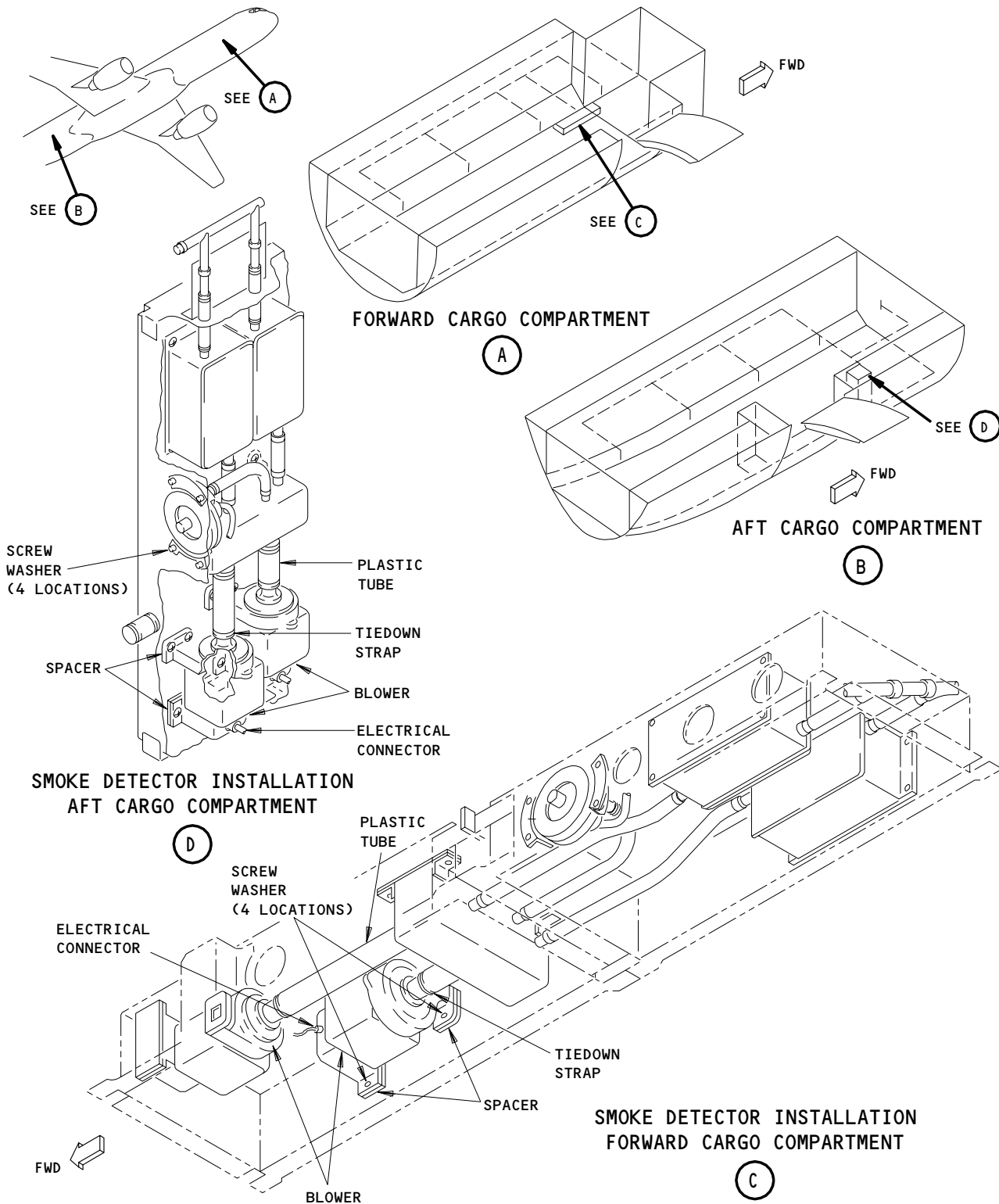
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Cargo Smoke Detector Blower Installation
Figure 401

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- S 034-008
- (5) Remove the tiedown strap which holds the plastic tube to the blower air port.
- S 034-007
- (6) Remove the plastic tube from the air port.
- S 034-009
- (7) Remove the four screws and washers.
- S 024-014
- (8) Remove the blower and spacers below the blower mounting pads.

TASK 26-16-02-424-011

3. Install the Smoke Detector Blower (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

C. Install the Smoke Detector Blower

- S 434-012
- (1) Put the spacers below the blower mounting pads.
- S 424-013
- (2) Install the blower with the four screws and washers.
- S 434-015
- (3) Install the plastic tube on the blower air port.

NOTE: The tube must move over the air port for approximately 0.7 inch (1.8 cm).

- S 434-016
- (4) Tighten the plastic tube to the air port. Use the tiedown strap.

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- S 434-017
 - (5) Install the electrical connector.

 - S 414-018
 - (6) Close the cargo access panel.

 - S 024-052
 - (7) Close forward and aft cargo doors (AMM 52-34-00/201).

 - S 864-019
 - (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
 - (b) 11S36, FIRE DET FAN PWR or CAR SMK BLO
- D. Do a Test of the Smoke Detector Blower Installation:
- S 864-020
 - (1) Supply electrical power (AMM 24-22-00/201).

 - S 754-021
 - (2) Make sure these EICAS messages do not show on the bottom display. This shows that the smoke detector blower 1 (fwd) or 3 (aft) operates:
 - (a) FWD DET FAN
 - (b) AFT DET FAN
 - (c) CARGO DET AIR

 - S 864-022
 - (3) Open these circuit breakers on the access panel to the forward cargo compartment, P70, which corresponds to the compartment (FWD or AFT) in which the blower was replaced.
 - (a) 70B10, SMOKE DET BLOWER 1 (FWD compartment)
 - (b) 70B12, SMOKE DET BLOWER 3 (AFT compartment)

 - S 754-027
 - (4) After 60 to 90 seconds, make sure the applicable EICAS message shows on the bottom display. This shows that the smoke detector blower 1 (fwd) or 3 (aft) does not operate:
 - (a) AFT DET FAN
 - (b) FWD DET FAN

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- S 754-048
- (5) Make sure this EICAS message does not show on the bottom display. This shows that the smoke detector blower 2 (fwd) or 4 (aft) operates:
- (a) CARGO DET AIR
- S 864-028
- (6) Close the circuit breaker on the P70 panel which was opened.
- S 864-030
- (7) Open and then close these circuit breakers on the P11 panel to set the blower system for the smoke detectors:
- (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
- S 754-031
- (8) Make sure these EICAS messages do not show on the bottom display. This shows that smoke detector blower 2 (4) stops and blower 1 (3) operates:
- (a) FWD DET FAN
(b) AFT DET FAN
(c) CARGO DET AIR
- E. Put the Airplane back to its Usual Condition.
- S 864-029
- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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SMOKE DETECTOR PLENUM PRESSURE SWITCH – REMOVAL/INSTALLATION

1. General

- A. The pressure switch, S10333, for the smoke detector in the forward cargo compartment is installed in the ceiling just aft of the No. 1 cargo door. Access the switch through the cargo ceiling panel. The pressure switch, S10332, for the smoke detector in the aft cargo compartment is installed in the sidewall just forward of the No. 2 cargo door. Get access to the switch through the sidewall panel.

TASK 26-16-03-024-001

2. Remove the Pressure Switch (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

C. Procedure

S 864-002

- (1) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
(a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
(b) 11S36, FIRE DET FAN PWR or CAR SMK BLO

S 014-050

- (2) Open cargo door (AMM 52-34-00/201).

S 014-003

- (3) Get access to the pressure switch.

S 034-004

- (4) Remove the electrical connector.

S 034-005

- (5) Remove the tiedown strap which holds the plastic tube to the air port of the pressure switch.

S 034-006

- (6) Remove the plastic tube from the air port.

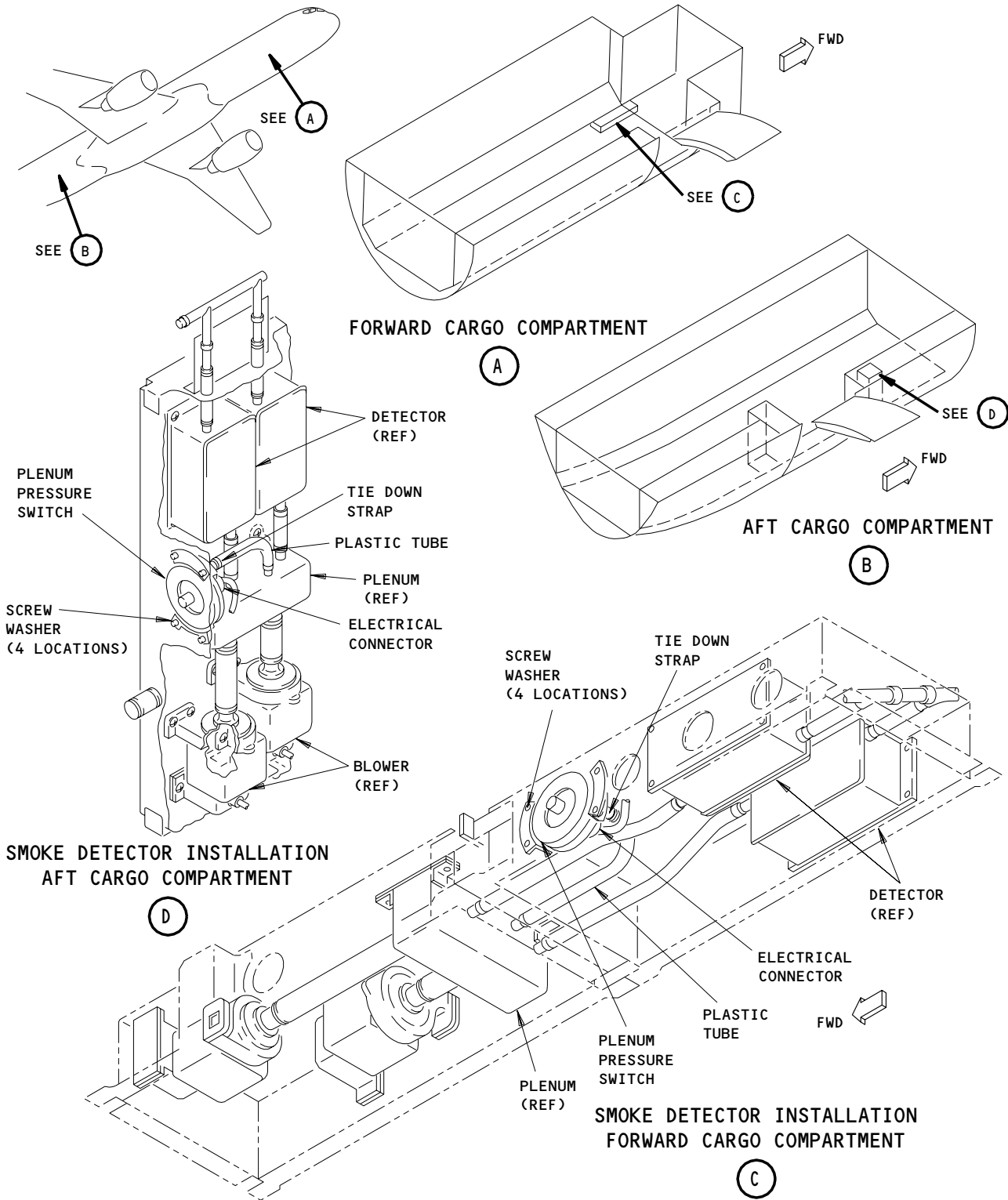
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Cargo Smoke Detector Plenum Pressure Switch Installation
Figure 401

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- S 034-007
(7) Remove the four screws and washers.

- S 034-043
(8) Remove the pressure switch.

TASK 26-16-03-424-008

3. Install the Pressure Switch (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lower Half of Fuselage

(2) Access

821	No. 1 Cargo Compartment Door
822	No. 2 Cargo Compartment Door

C. Install the Pressure Switch

- S 424-009
(1) Install the pressure switch with the four screws and washers.

- S 424-041
(2) Install the plastic tube on the air port of the pressure switch.

NOTE: The tube must move along the air port for approximately 0.7 inch (1.8 cm).

- S 434-010
(3) Tighten the plastic tube to the air port. Use the tiedown strap.

- S 434-011
(4) Install the electrical connector.

- S 414-012
(5) Close the access.

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- S 024-051
- (6) Close main cargo door (AMM 52-34-00/201).
- S 864-013
- (7) Remove D0-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
 - (b) 11S36, FIRE DET FAN PWR or CAR SMK BLO
- D. Do a Test of the Pressure Switch Installation:
- S 864-014
- (1) Supply electrical power (AMM 24-22-00/201).
- S 754-015
- (2) Make sure the SMOKE DET BLOWER 1 (FWD) or SMOKE DET BLOWER 3 (AFT) which is applicable to where the switch was installed does operate.
- S 864-016
- (3) Open these circuit breaker on the access panel to the forward cargo compartment (P70) which is applicable to the cargo compartment (FWD or AFT) where the switch was replaced:
- (a) 70B10, SMOKE DET BLOWER 1 (FWD compartment)
 - (b) 70B12, SMOKE DET BLOWER 3 (AFT compartment)
- S 754-042
- (4) After 60 to 90 seconds, make sure these EICAS messages do not show on the bottom display. This will make sure SMOKE DET BLOWER 2 (FWD) or SMOKE DET BLOWER 4 (AFT) operates:
- (a) FWD DET FAN
 - (b) AFT DET FAN
 - (c) CARGO DET AIR
- S 864-035
- (5) Close circuit breakers (P70) which were opened.
- S 864-036
- (6) Open and then close these circuit breakers to set the system:
- (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
- S 754-037
- (7) Make sure SMOKE DET BLOWER 2 (4) stops and SMOKE DET BLOWER 1 (3) operates.
- E. Put the Airplane back to its Usual Condition.
- S 864-038
- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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SMOKE DETECTOR FAN ISOLATION FLAPPER VALVE – MAINTENANCE PRACTICES

1. General

- A. This procedure is used for these maintenance practices:
 - (1) Flapper Valve Integrity Check using a vacuum gage.
 - (2) Comprehensive Flapper Valve Inspection/Check
 - (3) Flapper Valve Replacement
- B. This procedure is an operational check. It includes operation serviceable instructions for the cargo smoke detector fan isolation flapper valve.

TASK 26-16-05-702-001

2. Flapper Valve Integrity Check

A. Equipment

- (1) Vacuum Gauge – Hand-held, 0-10 inches of water – Model 104-10, DWYER INSTRUMENTS INC., MICHIGAN CITY, INDIANA, or equivalent.

B. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 26-16-02/401, Smoke Blowers
- (3) AMM 26-16-05/201, Smoke Detector Fan Isolation Valve
- (4) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

C. Access

(1) Location Zones

- 121/122 Forward Cargo Compartment
- 153/154 Aft Cargo Compartment
- 211/212 Flight Compartment
- 820 Lower Half of Fuselage (RH side)

(2) Access

- 821 Forward Cargo Compartment Door
- 822 Aft Cargo Compartment Door
- 823 Bulk Cargo Compartment Door

D. Procedure

S 862-086

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

S 862-002

- (2) Open these circuit breakers on the overhead circuit breaker panel, P11 and attach DO-NOT-CLOSE tags:
 - (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT

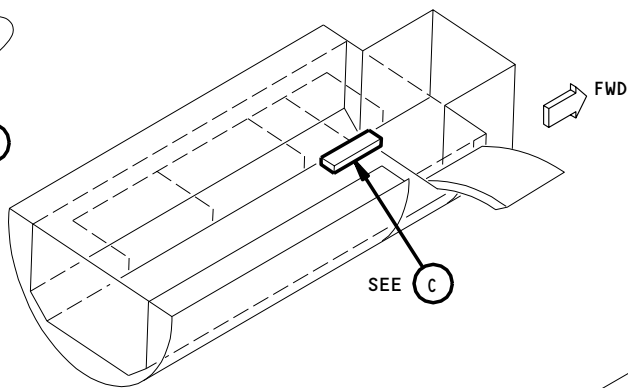
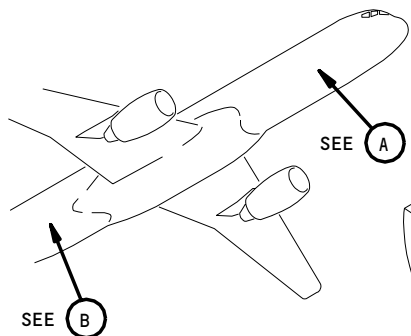
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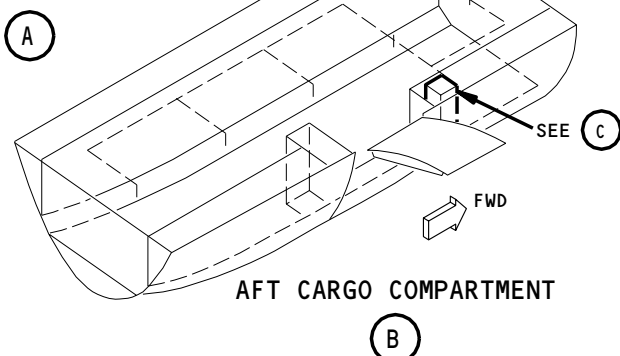
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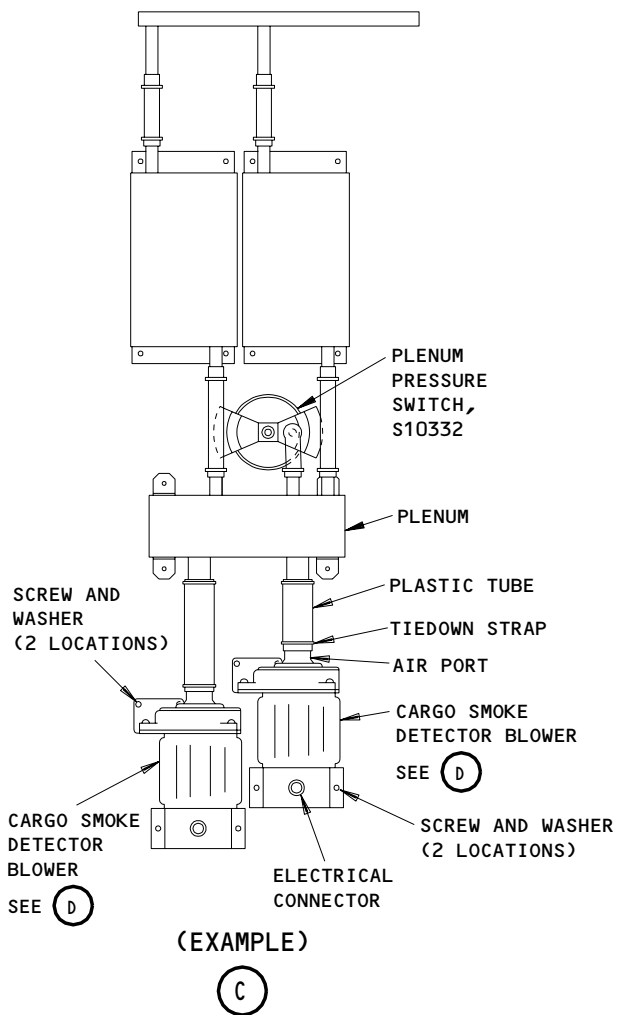
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FORWARD CARGO COMPARTMENT

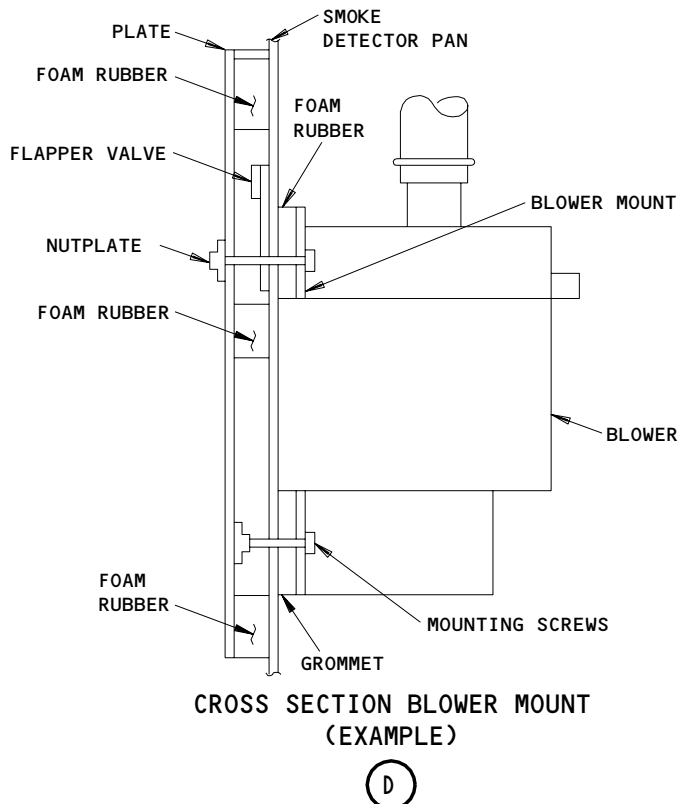


AFT CARGO COMPARTMENT



(EXAMPLE)

(C)



CROSS SECTION BLOWER MOUNT (EXAMPLE)

(D)

Smoke Detector Blower Fan Isolation Flapper Valve
Figure 201

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- (b) 11S36, FIRE DET FAN PWR or CAR SMK BLO
- S 012-089
- (3) Open cargo door (AMM 52-34-00/201).
- S 032-003
- (4) Disconnect the hose from the plenum pressure switch on the forward smoke detector.
- S 432-004
- (5) Connect the hose to the vacuum gage which is calibrated in inches of water.
- S 862-006
- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11S36, FIRE DET FAN PWR or CAR SMK BLO
- S 782-007
- (7) Make sure the vacuum gage shows a minimum of 8.0 inches of water.
- S 862-008
- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
- S 752-017
- (9) After 60 to 90 seconds, make sure the SMOKE DETECTOR BLOWER 1 stops and SMOKE DETECTOR BLOWER 2 starts to operate.
- S 782-027
- (10) Make sure the vacuum gage shows a minimum of 8.0 inches of water.
- S 702-028
- (11) If the vacuum gage does not show 8.0 inches of water, do the Check Flapper Valve procedure.
- S 032-029
- (12) Disconnect the vacuum gage.
- S 432-030
- (13) Connect the hose to the plenum pressure switch of the forward smoke detector.

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S 862-031

- (14) Open and then close these circuit breakers on the P11 panel to set the smoke detector blower system:
(a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT

S 702-032

- (15) Do the test again repeat test for the Aft cargo smoke detection system for blowers 3 and 4.

S 022-090

- (16) Close cargo door (AMM 52-34-00/201).

S 862-033

- (17) Remove electrical power (AMM 24-22-00/201) if it is not necessary.

TASK 26-16-05-702-034

3. Flapper Valve Check (Fig. 201)

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 26-16-02/401, Smoke Detector Blowers
(3) AMM 52-34-00/201, No. 1 and No. 2 Cargo Doors

B. Access

(1) Location Zones

119/120	Main Equipment Center
121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment
211/212	Flight Compartment
820	Lowr Half of Fuselage (RH side)

(2) Access

821	Forward Cargo Compartment Door
822	Aft Cargo Compartment Door
823	Bulk Cargo Compartment Door

C. Prepare to Do the Check

S 862-035

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

S 752-036

- (2) Make sure these circuit breakers on the Miscellaneous Electrical Equipment panel, P70, are closed:
(a) 70B10, SMOKE DET BLOWER 1
(b) 70B11, SMOKE DET BLOWER 2
(c) 70B12, SMOKE DET BLOWER 3

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(d) 70B13, SMOKE DET BLOWER 4

S 012-091

(3) Open cargo door (AMM 52-34-00/201).

D. Do the procedure for the Forward Cargo Compartment

S 752-037

(1) Make sure that Smoke Detector Blower 1 (M10462) operates.

S 032-038

(2) Remove the screws which hold Smoke Detector Blower 2 (M10463).

S 012-039

(3) To get access to the flapper valve remove Smoke Detector Blower 2. Be careful not to disconnect or cause kinks in the hoses.

S 752-040

(4) Make sure the open end around the flapper valve is free of dirt which would prevent a correct position of the valve.

S 752-041

(5) Make sure there is no deterioration of the valve.

S 862-042

(6) Move the valve from side to side to the direction of the open end. Make sure the valve is in the correct position and that it can move freely.

S 422-043

(7) Install smoke detector blower 2 and use the screws which were removed.

S 862-044

(8) Open this circuit breaker on the P70 panel:

(a) 70B10, SMOKE DET BLOWER 1

S 752-045

(9) Make sure Smoke Detector Blower 2 (M10463) operates.

S 032-046

(10) Remove the screws which hold Smoke Detector Blower 1 (M10462).

S 012-047

(11) To get access to the flapper valve remove Smoke Detector Blower. Be careful not to disconnect or cause kinks in the hoses.

S 752-048

(12) Make sure the open end around the flapper valve is free of dirt which will prevent a correct position of the valve.

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- S 862-049
- (13) Move the valve from side to side to the direction of the open end. Make sure the valve is in the correct position and that it can move freely.
- S 422-050
- (14) Install Smoke Detector Blower 1 and use the screws which were removed.
- S 862-051
- (15) Close these circuit breakers on the P70 panel:
- (a) 70B10, SMOKE DET BLOWER 1
- S 862-052
- (16) Open and then close these circuit breakers on the P70 panel to set the smoke detector blower system:
- (a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT
- S 752-053
- (17) Make sure Smoke Detector Blower 2 (M10463) stops and Smoke Detector Blower 1 starts to operate.
- E. Do the procedure for the Aft Cargo Compartment
- S 752-054
- (1) Make sure Smoke Detector Blower 3 (M10464) operates.
- S 032-055
- (2) Remove the screws which hold Smoke Detector Blower 4 (M10465).
- S 012-056
- (3) To get access to the flapper valve remove Smoke Detector Blower 4. Be careful not to disconnect or cause kinks in the hoses.
- S 752-057
- (4) Make sure the open end around the flapper valve is free of dirt which will prevent a correct position of the valve.
- S 862-058
- (5) Move the valve from side to side to the direction of the open end. Make sure the valve is in the correct position and does not stick because of remaining material
- S 422-059
- (6) Install Smoke Detector Blower 4 and use the screws which were removed.

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- S 862-060
- (7) Open this circuit breaker on the P70 panel:
(a) 70B12, SMOKE DET BLOWER 3
- S 752-061
- (8) Make sure Smoke Detector Blower 4 (M10465) operates.
- S 032-062
- (9) Remove the screws which hold Smoke Detector Blower 3 (M10464).
- S 012-063
- (10) To get access to the flapper valve remove Smoke Detector Blower 3. Be careful not to disconnect or cause kinks in the hoses.
- S 752-064
- (11) Make sure the open end around the flapper valve is free of dirt which will prevent a correct position of the valve.
- S 862-065
- (12) Move the valve from side to side to the direction of the open end. Make sure the valve is in the correct position and that it can move freely.
- S 422-066
- (13) Install Smoke Detector Blower 3 and use the screws which were removed.
- S 862-067
- (14) Close this circuit breaker on the P70 panel:
(a) 70B12, SMOKE DET BLOWER 3
- S 862-068
- (15) Open and then close these circuit breakers on the P11 panel to set the smoke detector blower system:
(a) 11S35, FIRE DET CARGO CONT or CARGO SMOKE BLOWER CONT

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S 752-069

- (16) Make sure Smoke Detector Blower 4 (M10465) stops and Smoke Detector Blower 3 (M10464) starts to operate.

S 022-092

- (17) Close the cargo doors (AMM 52-34-00/201).

S 862-070

- (18) Remove electrical power (AMM 24-22-00/201) if it is not necessary.

TASK 26-16-05-302-071

4. Flapper Valve Removal/Installation (Fig. 201)

A. Reference

- (1) AMM 26-16-02/401, Smoke Detector Blowers
- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 52-34-00/201, No. 1 and No. 2 Cargo Door

B. Access

(1) Location Zones

- | | |
|---------|----------------------------------|
| 121/122 | Forward Cargo Compartment |
| 153/154 | Aft Cargo Compartment |
| 820 | Lower Half of Fuselage (RH side) |

(2) Access

- | | |
|-----|--------------------------------|
| 821 | Forward Cargo Compartment Door |
| 822 | Aft Cargo Compartment Door |
| 823 | Bulk Cargo Compartment Door |

C. Do the Procedure

S 012-093

- (1) Open main cargo door (AMM 52-34-00/201).

S 012-087

- (2) Remove the applicable smoke detector blower (AMM 26-16-02/401).

S 322-072

- (3) Drill out the rivets to remove the flapper valve (three per valve). Keep the backup plate.

S 322-073

- (4) Drill the backup plate and panel for the installation of the blind rivets.

S 422-074

- (5) Install the new flapper and salvaged backup plate. Use the blind rivets.

S 422-075

- (6) Install the smoke detector blower (AMM 26-16-02/401).

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- S 702-082
(7) Do a Check of the Flapper Valve Integrity.

- S 022-094
(8) Close cargo door (AMM 52-34-00/201).

TASK 26-16-05-102-076

5. Clean the Flapper Valve

A. Reference

- (1) AMM 26-16-02/401, Smoke Detector Blowers
(2) AMM 52-34-00/201, No. 1 and No. 2 Cargo Door

B. Do the Procedure

- S 012-095
(1) Open main cargo door (AMM 52-34-00/201).

- S 022-077
(2) Remove the applicable smoke detector blower (AMM 26-16-02/401).

- S 122-078
(3) Remove the remaining material on the flapper valve or around the open end of the flapper valve. Use a soft bristle brush and soap and water.

- S 162-079
(4) Let the flapper valve dry.

- S 422-080
(5) Install the smoke detector blower (AMM 26-16-02/401).

- S 702-083
(6) Do a Check of the Flapper Valve Integrity.

- S 022-096
(7) Close cargo door (AMM 52-34-00/201).

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WHEEL WELL FIRE DETECTION – DESCRIPTION AND OPERATION

1. General

- A. A continuous single loop sensor system is installed in the left and right main wheel wells for detecting overheat conditions in those areas. When an overheat temperature is reached, the resistance of the sensor decreases such that a warning alert is provided to the flight crew.
- B. An overheat condition causes the master warning lights (red) on the glareshield (P7) to come on, the fire bell to sound, the WHEEL WELL FIRE (red) light to come on, and the EICAS indicator (P2) to display WHEEL WELL FIRE. The fire bell and master warning lights are reset by pressing one of the lights. The WHEEL WELL FIRE light and the EICAS display will remain on as long as the overheat condition exists (AMM 31-41-00/001).
- C. A test switch is provided on the fire/overheat test module at the rear of the pilots' control stand (P8). When operated, the test switch simulates a ground on the continuous loop sensor. The duct leak and wheel well overheat control card detects the ground as being an overheat condition and causes a wheel well fire warning.
- D. The wheel well fire detection system consists of four sensor elements, two circuit cards, a warning light and test switch. The system utilizes 115 Vac electrical power from the standby bus, and 28 Vdc from the battery bus.

2. Component Details (Fig. 1)

A. Wheel Well Overheat Detectors

- (1) The continuous loop sensor is composed of four elements, two in each wheel well. The sensor loop in each wheel well is mounted around the overhead by silicone bushings. The two elements begin on the inboard bulkhead, and are connected together at the outboard side via the forward and aft bulkheads. The elements are connected via wiring to the other wheel well elements and to the control card (P50).
- (2) The overheat sensors contain a thermistor material. The resistance of this material decreases as the temperature of the material increases. At a temperature greater than $400^{\circ}\text{F} \pm 20^{\circ}\text{F}$, the sensor provides an alarm signal (ground) to the control card in the P50 card file. When the temperature of material cools sufficiently, the alarm signal is automatically cancelled.

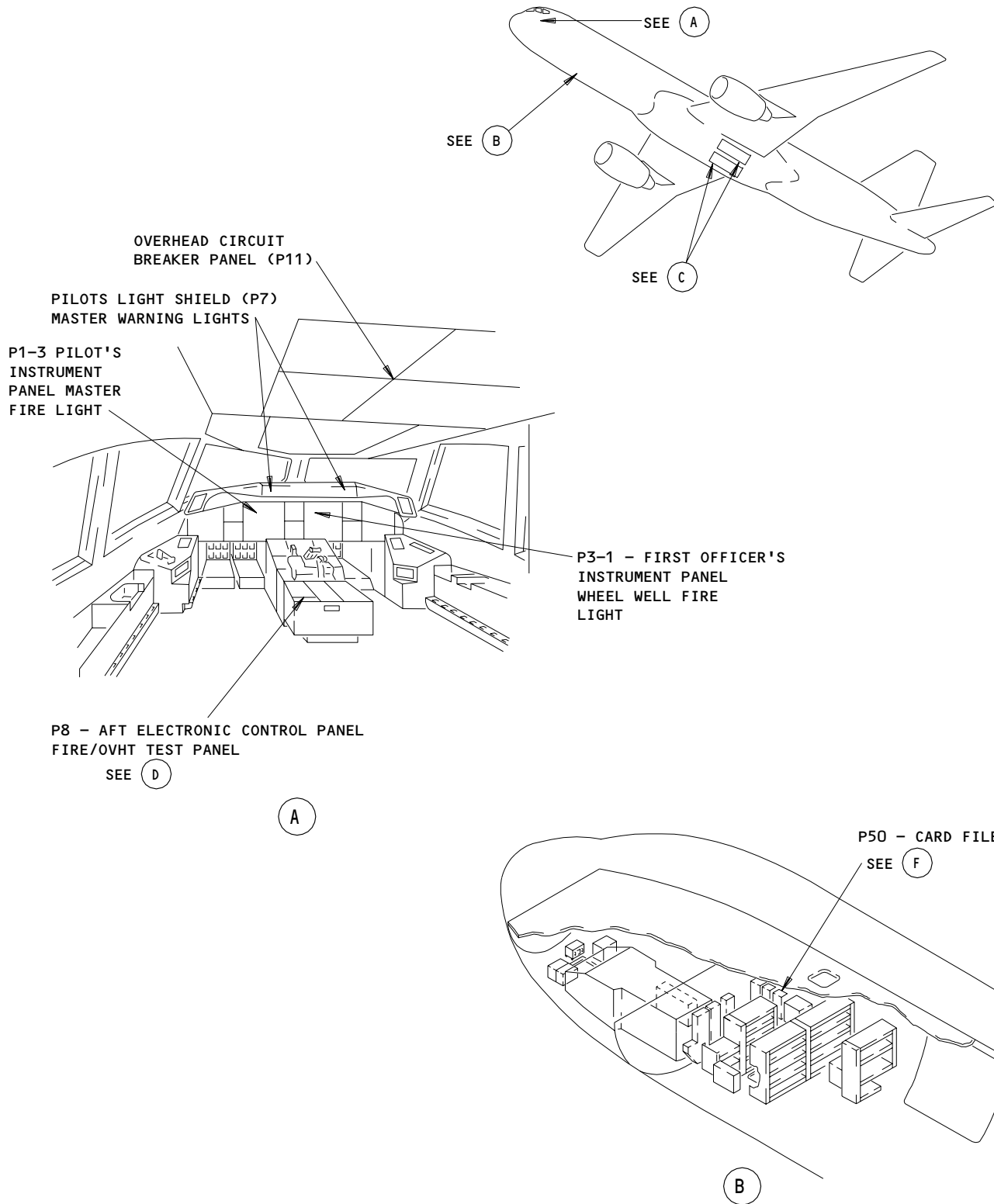
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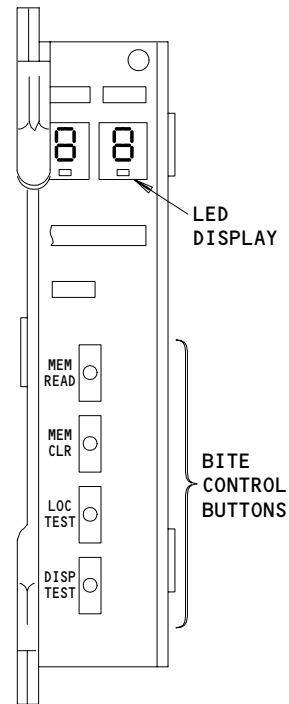
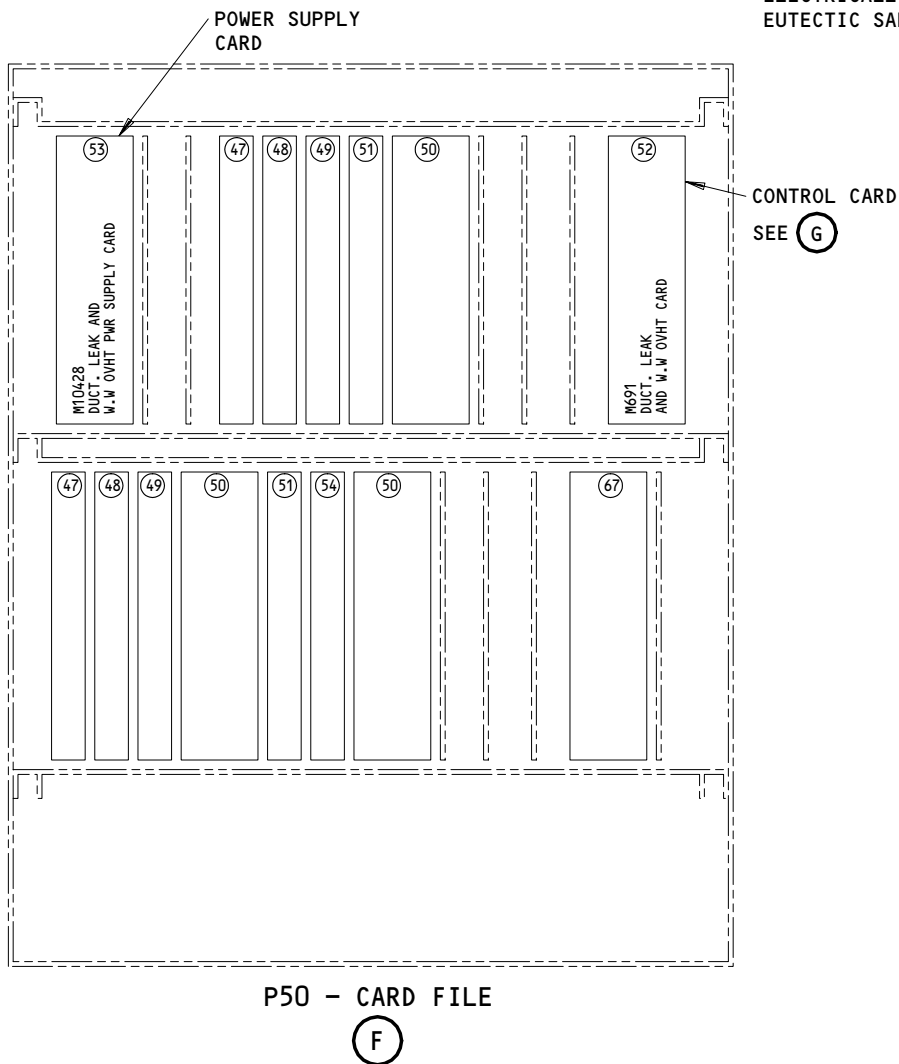
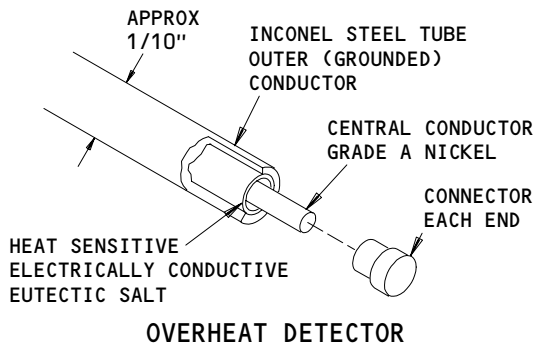
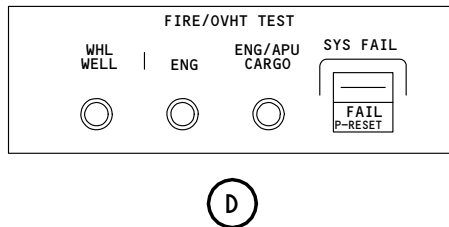
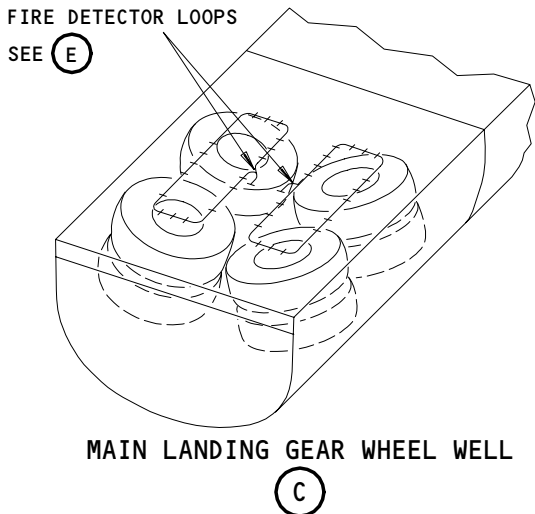
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Wheel Well Fire Detection Component Location
Figure 1 (Sheet 1)

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Wheel Well Fire Detection Component Location
Figure 1 (Sheet 2)

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B. Duct Leak and Wheel Well Fire Circuit Cards

- (1) A power supply card, and control card located in P50 serve the functions of the wheel well fire detection system. These same cards, also serve the functions of the duct leak detection system (AMM 26-18-00/001).
 - (a) The power supply card receives 28 Vdc from the battery bus, and provides regulated 5 Vdc, 19 Vdc, and 20 Vdc to the control card.
 - (b) The control card contains a microprocessor and memory which performs fault detection and BITE functions. If a fault is detected, a record is made in memory, for recall as required. A cover plate is installed on the card. The cover plate contains a LED display and four BITE pushbutton controls, identified as DISP TEST, LOC TEST, MEM CLR and MEM READ.

C. Fire/Overheat Test Panel

- (1) The fire/overheat test panel is on the pilots' control stand P8. The test panel contains the wheel well test switch and switches and relays associated with other fire and overheat detection systems.

D. Wheel Well Fire Light

- (1) The WHEEL WELL FIRE light is on the first officer's instrument panel P3. The light provides a red annunciation when on.

3. Operation

A. Functional Description (Fig. 2)

- (1) The system receives 115-volt standby ac power from overhead panel P11 circuit breaker WW FIRE DETECTION. The WW FIRE TEST circuit breaker on P11 provides battery bus 28 Vdc power to turn on the FIRE warning lights.
- (2) When a segment of the overheat sensor reaches a temperature of 400 degrees F, an alarm condition (low resistance) is sensed. Whenever an alarm condition is sensed, the microprocessor on the control card, rechecks the alarm at 20 millisecond intervals. If the alarm exists for 12 out of 15 cycles, then it is considered a valid alarm. The control card then provides an alarm signal to turn on the WHEEL WELL FIRE light on P3, the MASTER WARNING lights on P7, and the warning electronics unit (WEU) (AMM 31-51-00/001) to sound the fire bell in the flight compartment. The bell sounds until either one of the landing gear is lowered inflight. The fire alarm signals are cancelled when the fire detector cools to approximately 360 degrees F.
- (3) An EICAS alarm output signal is also routed to the left and right EICAS computers (AMM 31-41-00/001) which provide warning alerts in the flight compartment.
- (4) Both ends of the continuous fire detection loop are connected to a detection circuit on the duct leak overheat and wheel well fire card. If a fire detector breaks (open circuit), all detectors will remain connected to the fire detection circuit and will provide the normal fire annunciation.

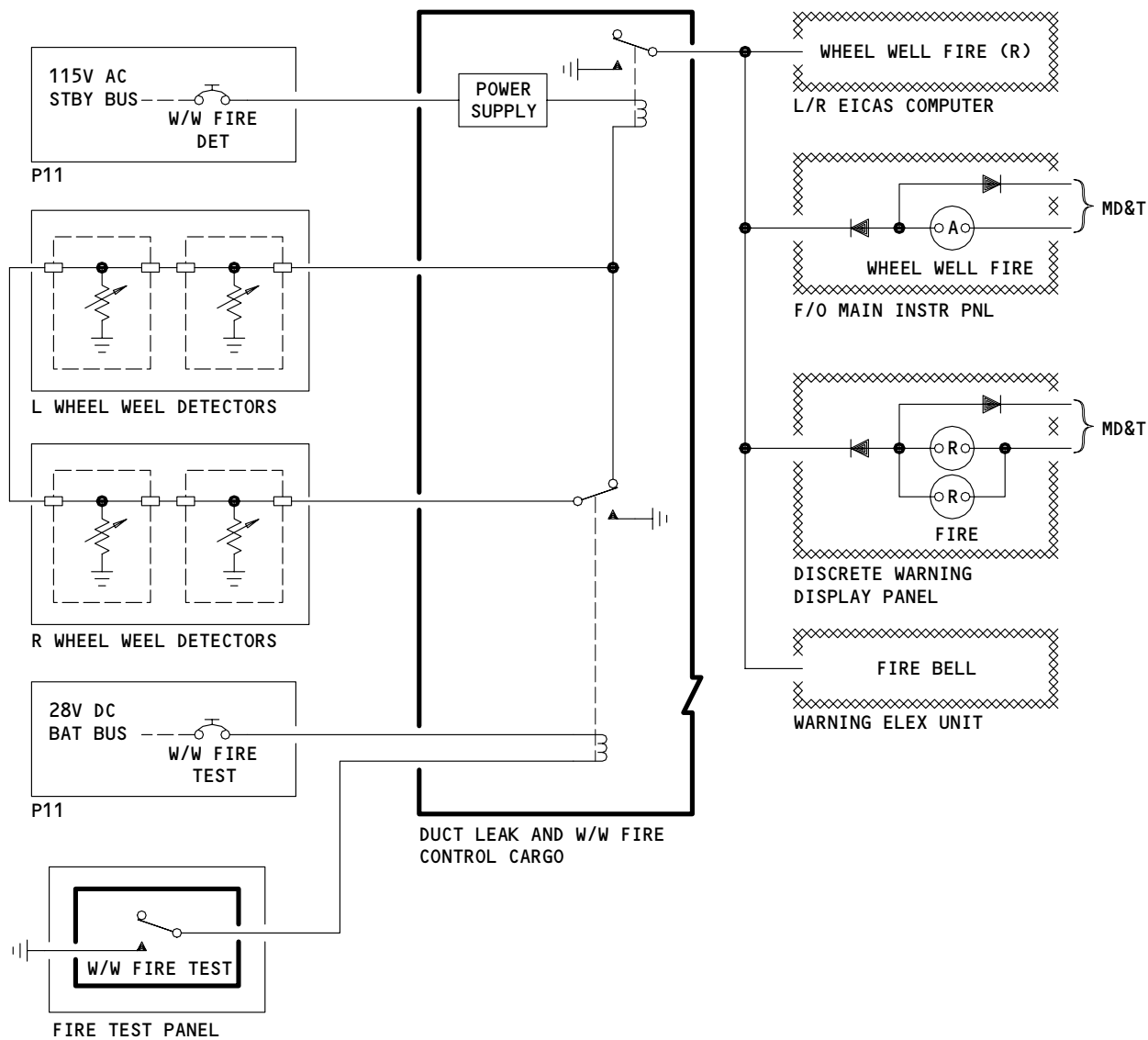
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Wheel Well Fire Detection Schematic
Figure 2

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B. Test

(1) Pressing the WHEEL WELL test switch on the M10445 fire overheat test panel disconnects and applies a ground to one end of the continuous detection loop. If there are no broken (open circuit) overheat detectors, an alarm signal is provided by the detection circuit on the duct leak overheat and wheel well fire card. The detection circuit provides an alarm signal to turn on the WHEEL WELL FIRE light on P3 and the FIRE master warning lights on P7, to initiate a warning alert from the EICAS and the WEU to generate the fire bell sound.

C. Control

(1) The system is active whenever it receives electrical power from the WW FIRE DETECTION circuit breaker.

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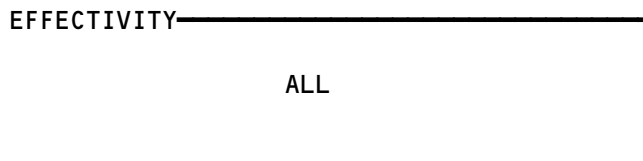
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WHEEL WELL FIRE DETECTION

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD - DUCT LEAK AND WHEEL WELL OVHT CONTROL, M691	2	1	119BL, MAIN EQUIP CTR, P50	26-10-01
CARD - DUCT LEAK AND WHEEL WELL POWER SUPPLY, M10428	2	1	119BL, MAIN EQUIP CTR, P50	26-10-01
CIRCUIT BREAKER - W/W FIRE TEST, C4290	1	1	FLT COMPT, P11 11B35	*
W/W FIRE DET, C770		1	11B10	*
COMPUTER - (FIM 31-41-00/101) EICAS L, M10181 EICAS R, M10182				
DETECTOR - WHEEL WELL OVERHEAT, TS202,TS203, TS204,TS205	2	4	MAIN WHEEL WELLS	26-17-01
LIGHT - WHEEL WELL FIRE, L445	1	1	FLT COMPT, P3-1, WARNING DISPLAY	*
MODULE - DISCRETE WARNING DISPLAY, M779	2	1	FLT COMPT, P1-3, MODULE M779	*
PANEL - (FIM 26-11-00/101) FIRE/OVHT TEST, M10445				
SWITCH - WHEEL WELL FIRE TEST, YQXS003 OR YQXS004	2	1	FLT COMPT, P8, FIRE/OVHT TEST PANEL, M10445	*

* SEE THE WDM EQUIPMENT LIST

Wheel Well Fire Detection - Component Index
Figure 101



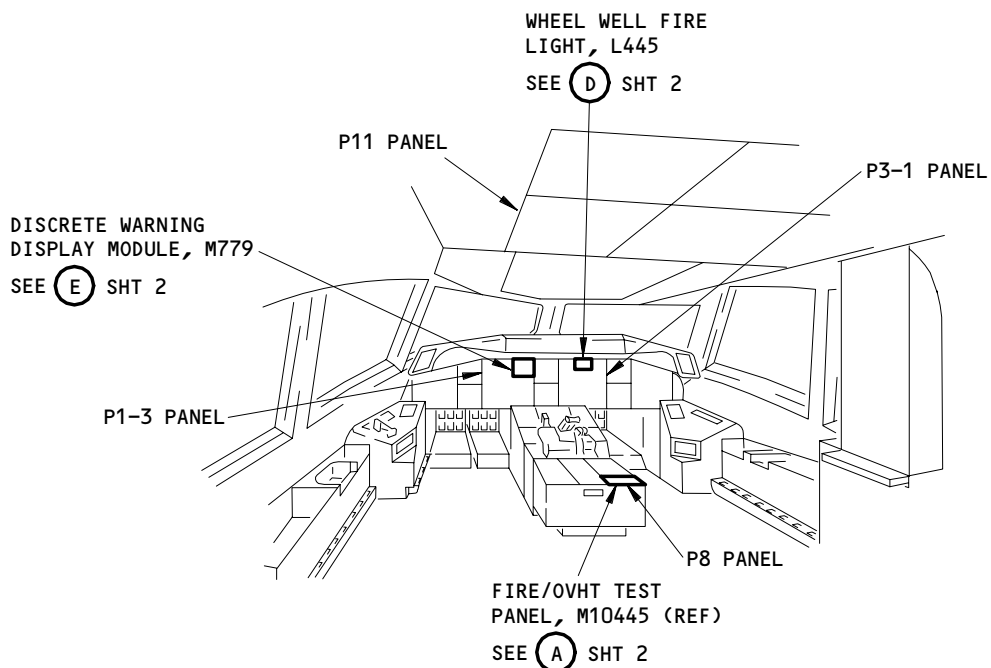
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FLIGHT COMPARTMENT

Wheel Well Fire Detection - Component Location
Figure 102 (Sheet 1)

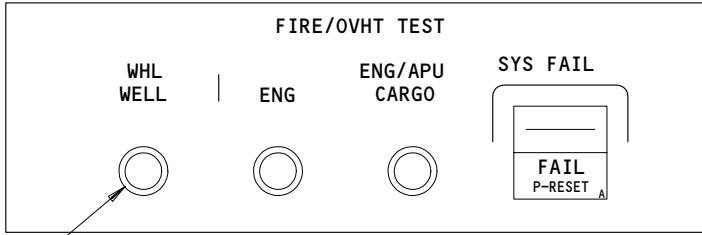
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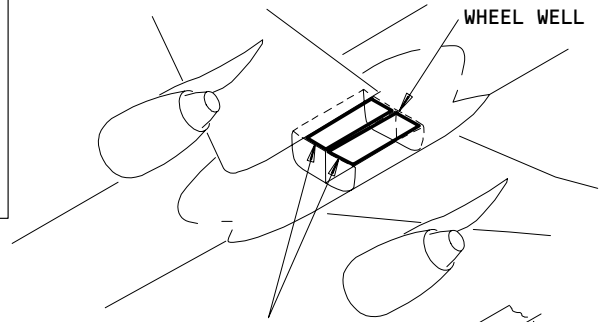
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WHEEL WELL
TEST SWITCH, YQQS004

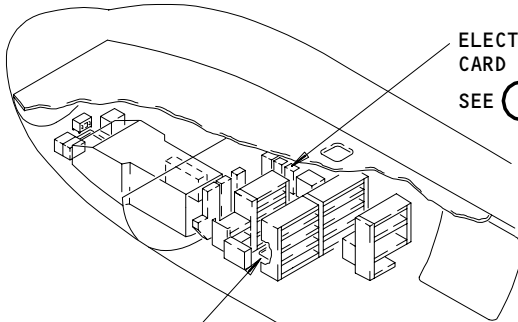
FIRE/OVHT TEST PANEL, M10445 (REF)

(A) FROM SHT 1



WHEEL WELL OVERHEAT
DETECTOR, TS204, TS205
TS202, TS203

SEE (B)



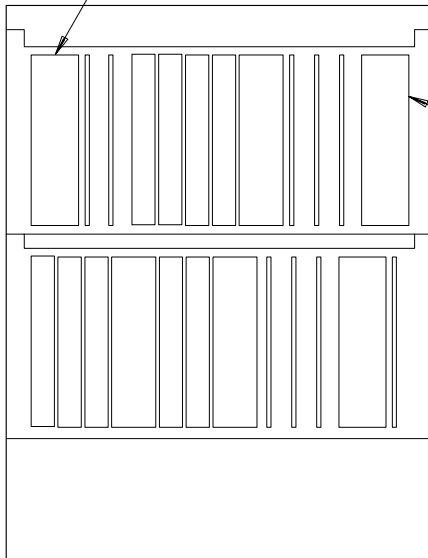
ELECTRICAL SYSTEM
CARD FILE, P50
SEE (C)

MAIN EQUIPMENT
CENTER ACCESS
DOOR, 119BL

EXAMPLE OF A WHEEL WELL OVERHEAT DETECTOR,
TS204, TS205, TS202, TS203

(B)

DUCT LEAK AND WHEEL WELL FIRE
POWER SUPPLY CARD, M10428
(REF)

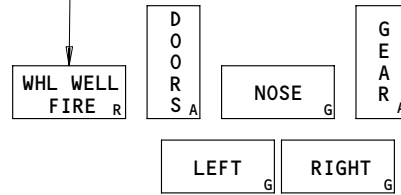


DUCT LEAK AND
WHEEL WELL FIRE
CONTROL CARD,
M691 (REF)

ELECTRICAL SYSTEM CARD FILE, P50

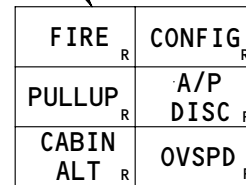
(C)

WHEEL WELL
FIRE LIGHT, L445



(D) FROM SHT 1

FIRE LIGHT



DISCRETE WARNING DISPLAY MODULE, M779

(E) FROM SHT 1

Wheel Well Fire Detection - Component Location
Figure 102 (Sheet 2)

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WHEEL WELL FIRE DETECTION – ADJUSTMENT/TEST

1. General

- A. This section contains procedures to perform an operational test and a system test of the wheel well fire detection system.
- (1) The operational test will make sure that the system operates correctly, in a minimum of time. Only equipment installed in the airplane will be used.
 - (2) The system test (par. 3) increases the function of the operational test to supply the necessary performance of the system.

TASK 26-17-00-715-001

2. Operational Test – Wheel Well Fire Detection (Fig. 501)

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 33-16-00/501, Master Dim and Test

B. Access

- (1) Location Zones
211/212 Flight Compartment

C. Do a Test of the Wheel Well Fire Detection system

S 865-003

- (1) Supply electrical power to the standby AC bus and DC BAT bus (AMM 24-22-00/201).

S 755-002

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B10, WW FIRE DETECTION
 - (b) 11B35, WW FIRE TEST
 - (c) 11J33, 'A' WARN ELEX MODULE
 - (d) 11B18, 'B' WARN ELEX MODULE

S 755-005

- (3) Push and hold the WHL WELL switch on the FIRE/OVHT TEST panel, M10445, on the aft pilots control stand, P8.
 - (a) Make sure these indications occur:
 - 1) The discrete FIRE warning light, on the P1-3 panel, comes on.
 - 2) The WHEEL WELL FIRE light on the P3 panel comes on.
 - 3) The EICAS message, WHEEL WELL FIRE, shows on the top display.
 - 4) The red MASTER WARNING lights, on the P7 panel, come on.
 - 5) The fire bell is heard.

S 755-006

- (4) Release the WHL WELL switch.
 - (a) Make sure the indications stop.

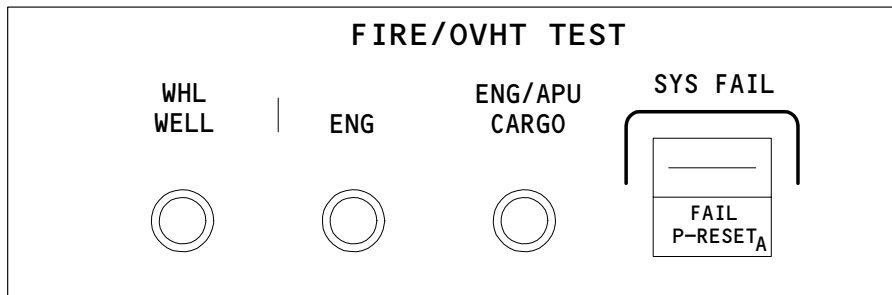
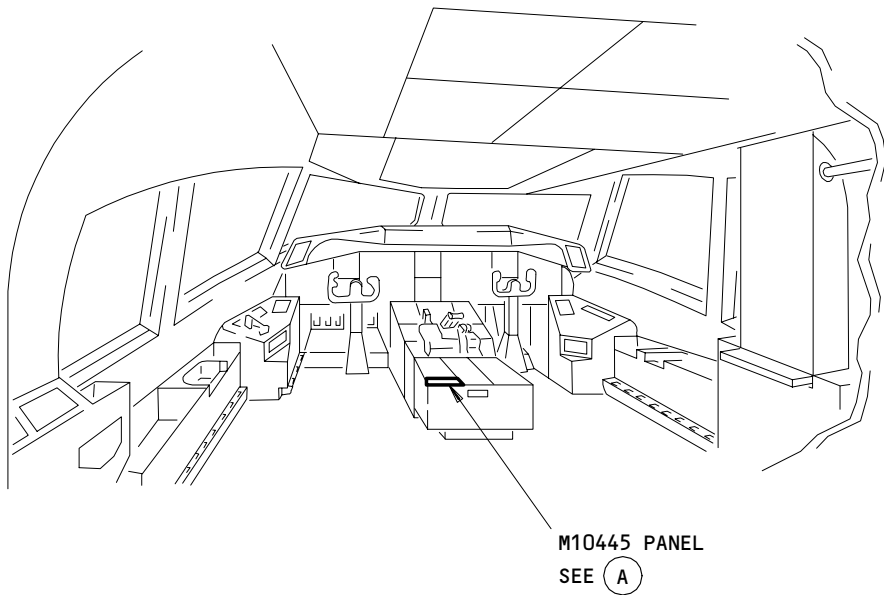
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M10445 - FIRE/OVHT TEST PANEL

(A)

Wheel Well Fire Detection Component Location
Figure 501

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S 865-007

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-17-00-735-008

3. System Test - Wheel Well Fire Detection

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 33-16-00/501, Master Dim and Test

B. Access

- (1) Location Zones
 - 119/120 Main equipment center
 - 211/212 Flight Compartment

C. Prepare for Test

S 865-009

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

S 755-010

- (2) Make sure these systems do operate:
 - (a) EICAS (AMM 31-41-00/501)
 - (b) Warning system (AMM 31-51-00/501)
 - (c) Master dim and test system (AMM 33-16-00/501)

S 755-017

- (3) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B10, WW FIRE DETECTION
 - (b) 11B35, WW FIRE TEST
 - (c) 11J33, 'A' WARN ELEX MODULE
 - (d) 11B18, 'B' WARN ELEX MODULE

D. Do a Test of the Wheel Well Fire Detection System

S 755-011

- (1) Push and hold the WHL WELL switch on the FIRE/OVHT TEST panel, M10445, on the P8 panel, and make sure these indications occur:
 - (a) The discrete FIRE warning light, on the P1-3 panel, comes on.
 - (b) The WHEEL WELL light, on the P3 panel, comes on.
 - (c) The WHEEL WELL FIRE warning message shows on the EICAS top display.
 - (d) The red MASTER WARNING lights, on the P7 panel, come on.
 - (e) The fire bell is heard.

S 755-012

- (2) Release the switch and make sure the indications stop.

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- S 865-013
- (3) At the electrical systems card file, P50, momentarily push the LOC TEST switch on the DUCT LEAK and WW FIRE CONTROL CARD.
- S 755-014
- (4) Make sure codes 91, then 99 show on the LED display, and code 84 does not show.
- E. Put the airplane back to its usual condition.
- S 945-015
- (1) Close the cover on the electrical system card file, P50.
- S 865-016
- (2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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WHEEL WELL FIRE DETECTOR – REMOVAL/INSTALLATION

1. General

- A. Wheel well fire detectors are installed in the left and right main wheel wells. The removal and installation procedure are the same for the two units.

TASK 26-17-01-014-018

2. Remove Wheel Well Fire Detector (Fig. 401)

A. Equipment

- (1) Main Gear Door Locks (AMM 32-00-15/201)
- (2) Caps to fit 35303-64 connectors
- (3) Bonding Meter, AVTRON T477W

B. References

- (1) AMM 24-22-00/201 Electrical Power – Control
- (2) AMM 32-00-15/201 Landing Gear Door Locks
- (3) AMM 32-00-20/201 Landing Gear Down Locks

C. Access

- (1) Location Zones
143/144 Main Landing Gear Wheel Well (left and right)

D. Procedure

S 014-017

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 864-001

- (2) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B10, WW FIRE DETECTION
 - (b) 11B35, WW FIRE TEST

S 014-019

CAUTION: ALWAYS OPEN THE FIRST THREE CLAMPS FROM THE DETECTOR BEFORE YOU LOOSEN THE HEXNUT AND DISCONNECT THE CONNECTOR. THIS MUST BE DONE TO MAKE SURE YOU CAN MOVE THE DETECTOR WITHOUT APPLYING FORCE TO THE CONNECTOR PINS.

- (3) Open the first three clamps near the detector end.

S 034-002

- (4) Remove the lockwire and disconnect the connectors at the two ends of the detector.

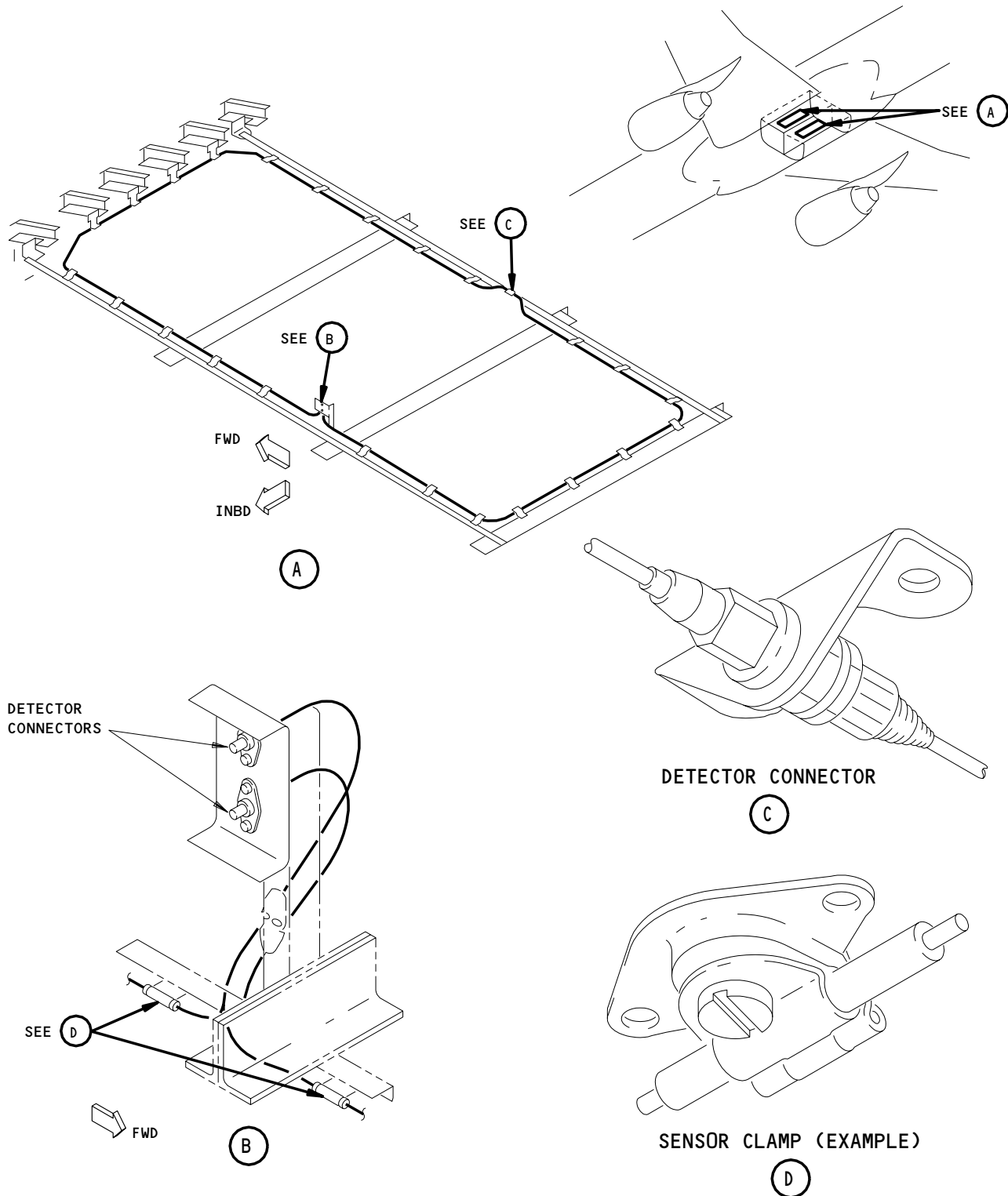
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Wheel Well Fire Detector Installation
Figure 401

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S 434-003

- (5) Install protective caps on the aircraft electrical connectors.

S 014-004

- (6) Open the remaining clamps and remove the detector.

TASK 26-17-01-414-005

3. Install Wheel Well Fire Detector (Fig. 401)

A. Equipment

- (1) Main Gear Door Locks (AMM 32-00-15/201)
- (2) Caps to fit 35303-64 connectors
- (3) Bonding Meter, AVTRON T477W

B. References

- (1) AMM 24-22-00/201 Electrical Power - Control
- (2) AMM 32-00-15/201 Landing Gear Door Locks
- (3) AMM 32-00-20/201 Landing Gear Down Locks

C. Access

- (1) Location Zones
 - 143/144 Main Landing Gear Wheel Well (left and right)

D. Procedure

S 014-020

CAUTION: SHAPE THE DETECTOR ELEMENT SO THAT IT WILL BE CLEAR OF ADJACENT PARTS AND STRUCTURE BY AT LEAST 0.5 INCH (1.27 CM). THE MINIMUM RADIUS FOR A BEND IS 1 INCH (2.54 CM). DO NOT MAKE BENDS LESS THAN 1 INCH FROM CLAMPS OR FLANGE ASSEMBLIES. THESE PRECAUTIONS WILL PREVENT DAMAGE TO THE DETECTOR ELEMENT.

- (1) Remove the protective caps and connect the two ends of new detector to the airplane connectors.
 - (a) Tighten the connectors to 50-60 pound-inches.

S 414-006

- (2) Install new grommets over the detector and place the detector into the clamps nearest to the connectors.

S 284-007

- (3) Make sure the grommets are centered in the clamps and secure the clamps.

S 724-008

- (4) Do steps 3 and 4 for the remaining clamps. Work towards the center of the detector.

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S 284-009

- (5) Make sure that the resistance between the connector shell of the detector and the primary airplane structure is not more than 0.004 ohm. If the resistance is more than 0.004 ohm, clean the bonding surfaces and do the check again.

S 434-010

- (6) Put lockwire on the connectors.

S 864-011

- (7) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
 - (a) 11B10, WW FIRE DETECTION
 - (b) 11B35, WW FIRE TEST

E. Test the Wheel Well Fire Detector Installation

S 864-012

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

S 984-013

- (2) Push and hold the WHL WELL test switch on the FIRE/OVHT TEST panel, M10445.

S 284-014

- (3) Make sure that the red WHEEL WELL fire light, on the P3-1 panel, is on.

S 984-015

- (4) Release the WHL WELL test switch and make sure that the WHEEL WELL fire light goes off.

S 014-021

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 864-016

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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WING AND BODY DUCT LEAK DETECTION – DESCRIPTION AND OPERATION

1. General

- A. The wing and body duct leak detection system monitors the temperature along the left and right wing bleed air duct zones, the air conditioning bays and the APU duct zone. When an overheat condition is detected in any of these zones, a caution alert is provided in the flight compartment.
- B. The system is divided into left and right zones, each containing dual detection elements set to trigger an alarm at 255°F. The left zone has five elements wired in series and extend, along the left wing leading edge, the left air conditioning bay, the wheel well, the aft cargo compartment, and the pressure bulkhead aft to the APU. The right zone has two elements wired in series and extend along the right wing leading edge, and the right air conditioning bay.
- C. The two zones are wired to the duct leak and wheel well fire control card in P50 electrical systems card file. If an overheat is sensed, the appropriate duct leak caution light on pneumatic control panel (P5) lights, and a level B caution appears on EICAS. A system test switch is provided on the miscellaneous test panel on P61 sidewall panel. The switch is labeled "DUCT LEAK". A successful test, lights the two duct leak lights on pneumatic control panel (P5). BITE is provided on the control card at P50 to assist with trouble shooting, and a DUCT LEAK BITE message displays on the EICAS maintenance page if a fault exists.
- D. The wing and body duct leak overheat detection system uses 115 Vac, and 28 Vdc power.

2. Component Details (Fig. 1)

A. Duct Leak Detectors

- (1) Detector elements consist of a fine nickel wire surrounded by a heat sensitive insulation, enclosed in a steel tube. Electrical connectors are attached to each end. The resistance of the heat sensitive insulation decreases as the temperature of the material increases. At a preselected temperature (resistance value), the detector provides an alarm signal (ground) to the detector card in the P50 card file. When the temperature of material cools sufficiently, the alarm signal is automatically cancelled.

B. Duct Leak and Wheel Well Fire Circuit Cards

- (1) A power supply card, and control card located in P50 serve the functions of the duct leak detection system. These same cards, also serve the functions of the wheel well fire detection system (Ref 26-17-00).
 - (a) The power supply card receives 28 Vdc from the R bus and provides regulated 5 Vdc, 19 Vdc, and 20 Vdc to the control card.
 - (b) The control card consists of a microprocessor board, relay board, and display board. It performs monitor and control functions of the system.
 - 1) The microprocessor board contains a microprocessor and memory.
 - 2) The relay board contains the sensor loop configuration relays.

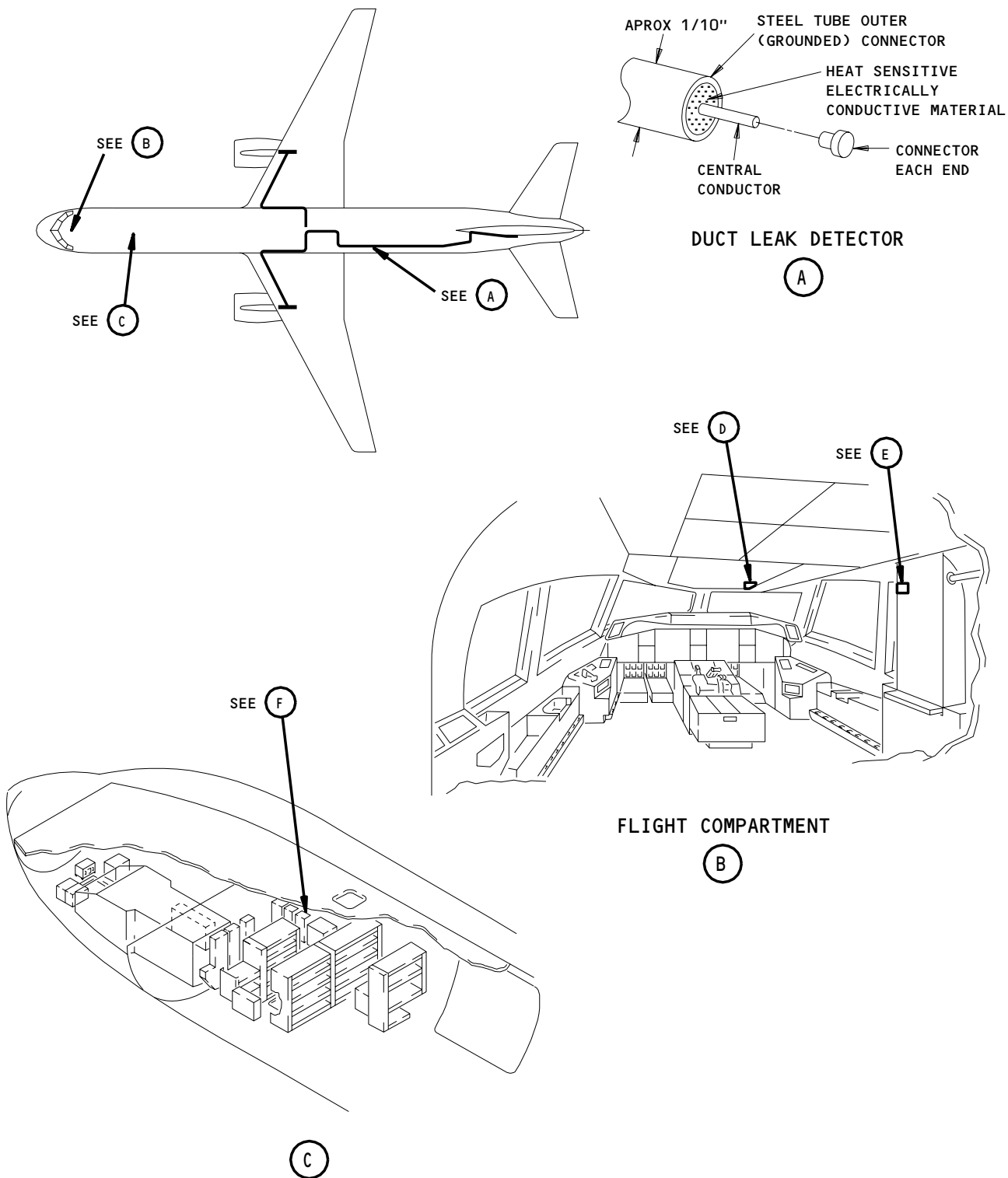
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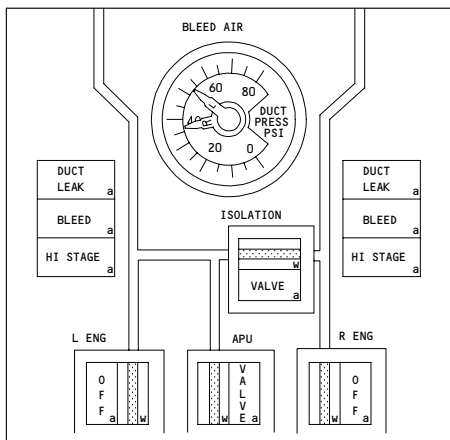
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Duct Leak Detection - Component Location
Figure 1 (Sheet 1)

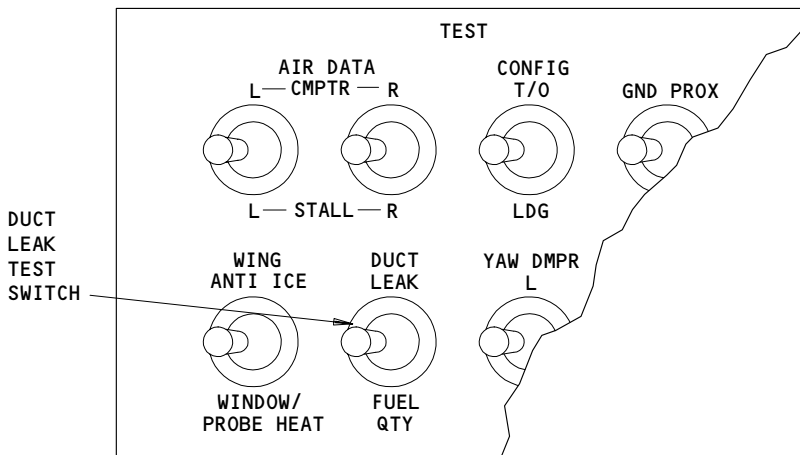
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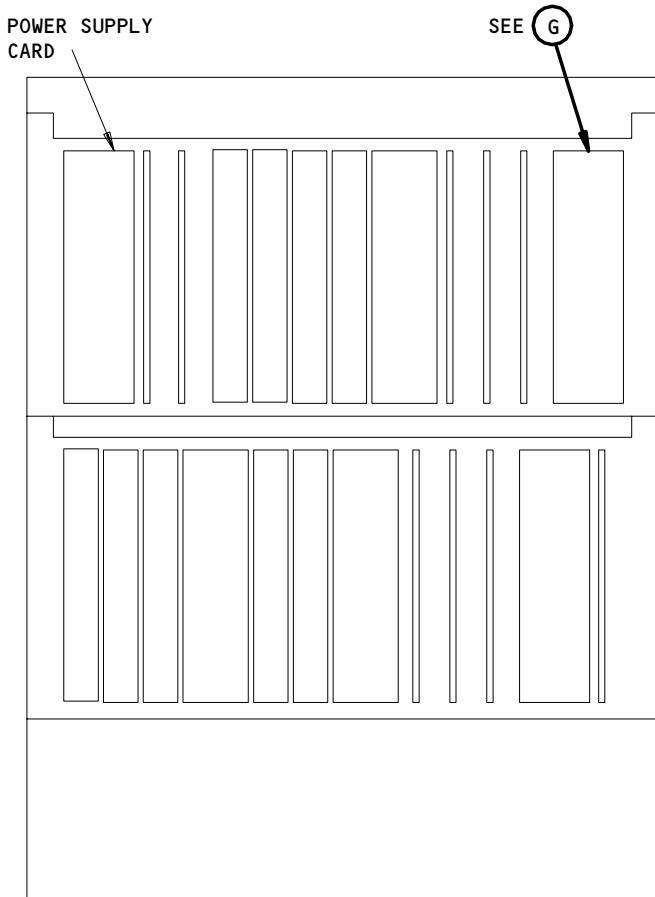
BLEED AIR SUPPLY PANEL

(D)



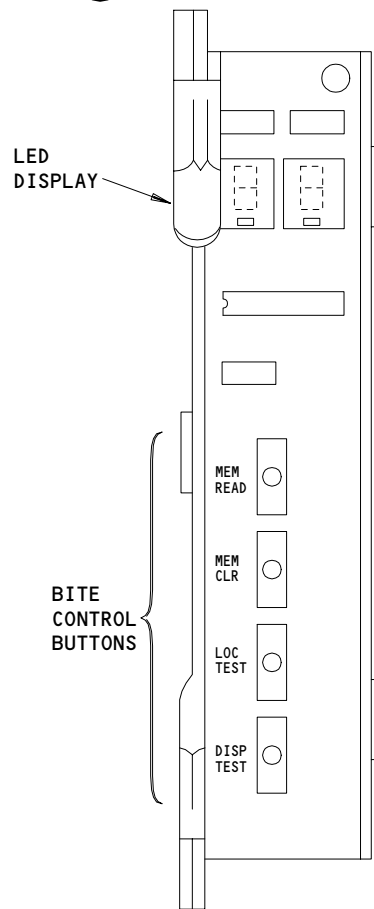
MISCELLANEOUS TEST PANEL

(E)



P50 CARD FILE

(F)



**DUCT LEAK AND WHEELWELL
FIRE CONTROL CARD (P50)**

(G)

**Duct Leak Detection Component Location
Figure 1 (Sheet 2)**

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- 3) The display board acts like a cover plate, and contains a LED display and four BITE pushbutton controls. The pushbuttons are identified, DISP TEST, LOC TEST, MEM CLR, and MEM READ.

C. Bleed Air Control Panel

- (1) The M10259 bleed air control panel is on the overhead panel P5. The panel contains the L WING DUCT LEAK and R WING DUCT LEAK lights. The lights provide an amber annunciation when on. The panel also contains the controls for the pneumatic system.

D. Miscellaneous Test Panel

- (1) The M10398 miscellaneous test panel is located on the right side panel P61. This panel contains a large number of test switches for various systems. The DUCT LEAK system test switch is on this panel.

3. Operation

A. Functional Description (Fig. 2)

- (1) The system receives the required power when the following overhead panel P11 circuit breakers are closed.

DUCT LEAK DET LEFT	115 Vac
DUCT LEAK DET RIGHT	115 Vac
DUCT LEAK CONT	28 Vdc
- (2) The 115 Vac is fed directly to the control card in P50, where it is transformed to 18 volt peak to peak, and applied to the detector elements. The 28 Vdc goes to the power supply card in P50, where it is converted to regulated 5 Vdc, 19 Vdc, and 20 Vdc. These voltages go to the control card for the microprocessor control and monitor circuits.
- (3) When a bleed air duct leak occurs, the sensors monitoring the duct, sense the change in temperature. When a temperature of 255°F is sensed by the dual loop detector, the appropriate amber duct leak light on P5 lights. An EICAS message L or R BLD DUCT LEAK is also displayed. As soon as the alarm is sensed, an auto test procedure (controlled by the microprocessor on the control card) begins. The system is checked at 20 millisecond intervals. If the alarm exists 12 out of 15 of these cycles, the alarm is considered valid.
- (4) If the auto test procedure identifies an open or short circuited sensor element, it reconfigures the system to an operable state. The configuration of the sensor loops is controlled by the microprocessor and configuration relays. The alarm is cancelled, but the defective sensor fault code is stored in nonvolatile memory, and DUCT LEAK BITE message is recorded on the maintenance page of EICAS.

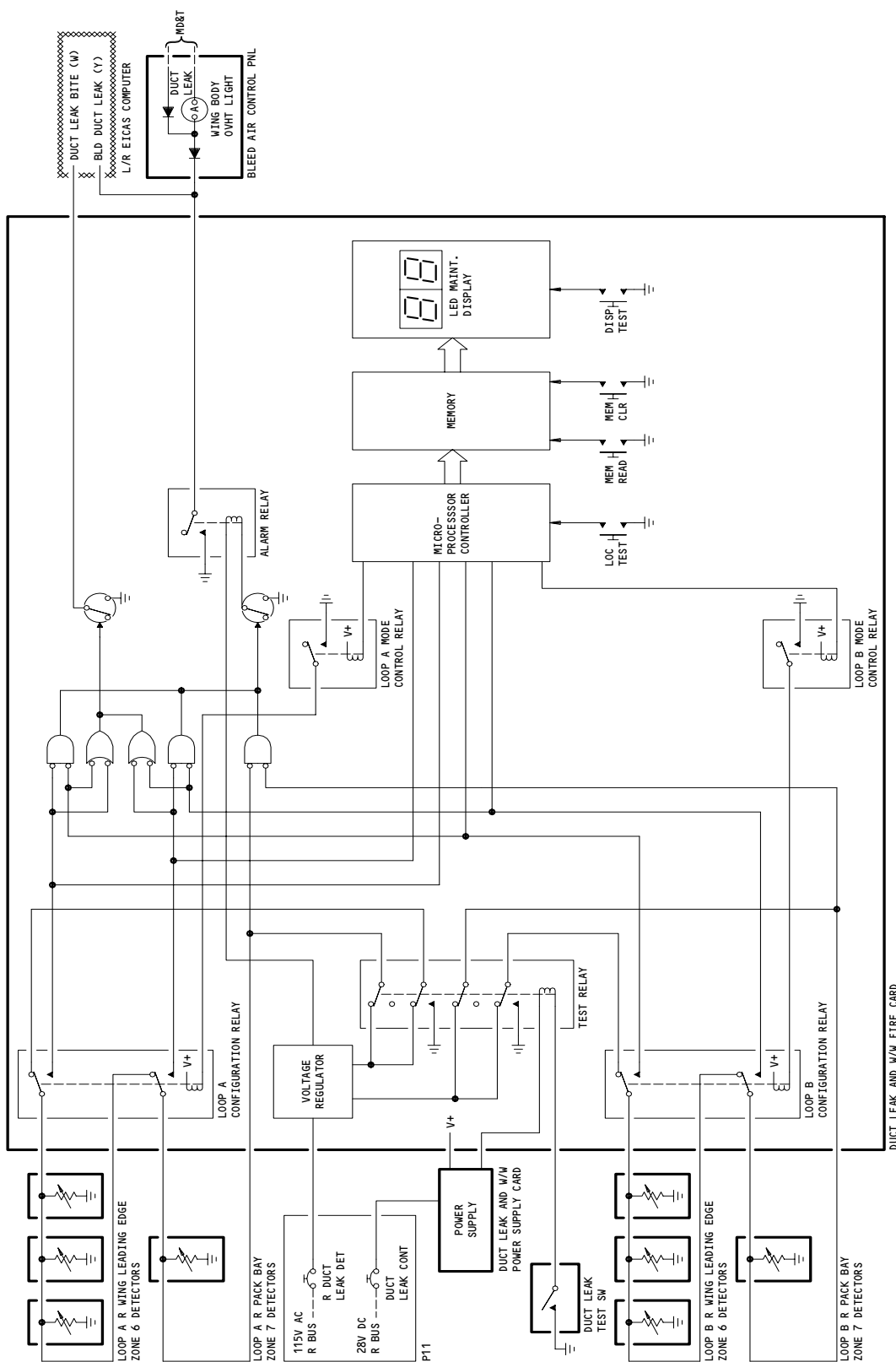
EFFECTIVITY

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Duct Leak Detection Schematic (Typical)
Figure 2

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- (5) If the auto test procedure identifies multiple faults, no operable state exists. The appropriate amber duct leak light on P5 will remain on, and L or R BLD DUCT LEAK message will display on EICAS. The fault codes for the multiple faults will be stored in nonvolatile memory, and DUCT LEAK BITE message will be recorded on the maintenance page of EICAS.
- (6) Should the system lose all DC power or if the control circuitry fails then the system reverts to a "fail-safe" mode of operation. In this mode, all relays are relaxed and all chips are reset. Any overheats or fires will light the warning lights. The system must still have the three AC voltage sources applied.

B. BITE

- (1) The system has both hardware and software built in test features. A description of BITE follows, and a placard with BITE operating instructions is posted in the cover of P50.
 - (a) Pressing the DUCT LEAK test switch on the misc test panel (P61), tests all detectors for continuity and faults. All flight compartment displays of duct leak will display if at least one loop in each zone is operating correctly. Any faults detected during the test will be stored in nonvolatile memory for recall as required. The DUCT LEAK BITE message will also be recorded on the maintenance page of EICAS.
 - (b) If DUCT LEAK BITE is recorded on EICAS maintenance page, further testing is required at the control card (P50).
 - (c) At the control card (P50), pressing DISP TEST switch tests the display and associated circuits. 88 is displayed as long as the switch is pressed if there is no failed DC power source.
 - (d) Momentarily pressing the LOC TEST switch initiates a self-test sequence. While the local test sequence is performed, the display indicates a 90 if only one loop is being tested or 91 if both loops are being tested. If a fault condition is detected during the test sequence, the code for that fault condition is indicated by the display for two minutes. Another momentary pressing of the LOC TEST switch during the two-minute display interval causes the test sequence to continue. If not continued, the test sequence terminates after the two minutes. When the entire test sequence has been performed, a 99 is displayed for one minute and then the test sequence terminates. The test sequence initiated by momentarily pressing the LOC TEST switch can be terminated at any time by momentarily operating the display test switch.

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- (e) Momentarily pressing the MEM READ switch displays the last fault code stored in memory. This operation can be repeated until all fault codes in memory have been displayed. Code 97, the memory read complete code, will then be displayed.
- (f) To obtain the alarm history, press DISP TEST and then MEM READ. Release DISP TEST and then MEM READ. The last alarm code stored in memory will be displayed. Momentarily pressing MEM READ will continue displaying the alarm codes on a last in first out basis. Code 97, the memory read complete code, will then be displayed.
- (g) The data stored in the alarm and maintenance memory can be erased or transferred to the alarm history memory if required. This is done by completing the local test sequence, and momentarily pressing MEM READ until data to be erased/transferred is displayed and then pressing MEM CLR.

C. Control

- (1) The system is active whenever it receives electrical power from P11 panel circuit breakers DUCT LEAK DET LEFT, DUCT LEAK DET RIGHT and DUCT LEAK CONT.

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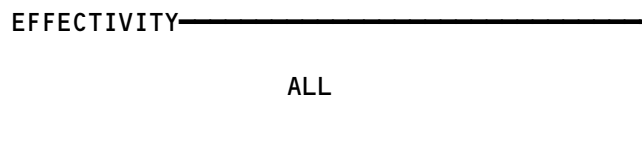
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 FAULT ISOLATION/MAINT MANUAL

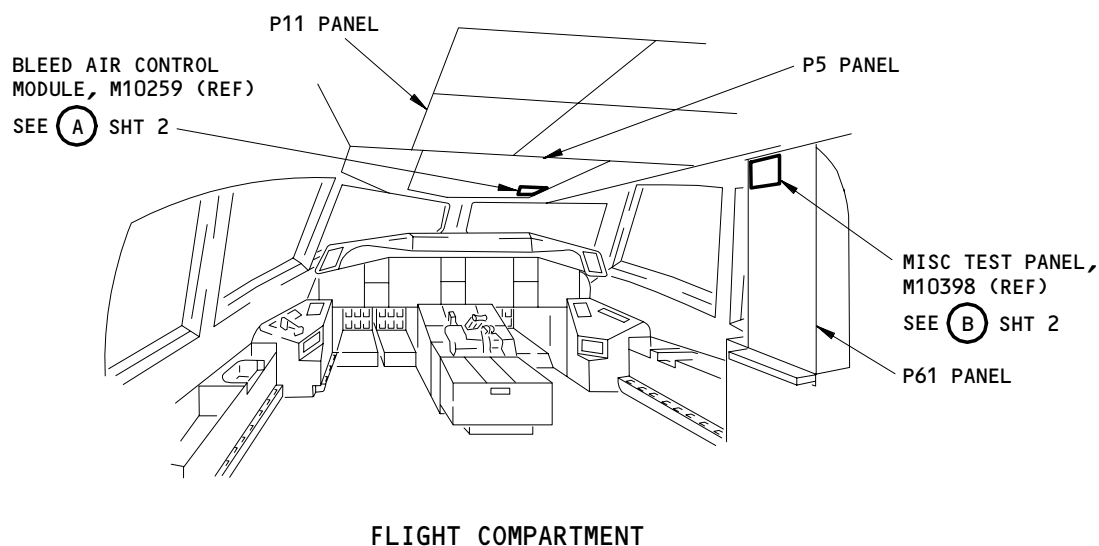
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD - DUCT LEAK AND WHEEL WELL FIRE CONTROL, M691	3	1	119BL, MAIN EQUIP CTR, P50	26-10-01
CARD - DUCT LEAK AND WHEEL WELL FIRE PWR SUPPLY, M10428	3	1	119BL, MAIN EQUIP CTR, P50	26-10-01
CIRCUIT BREAKER - DUCT LEAK CONT, C4261	1	1	FLT COMPT, P11 11Q26	*
DUCT LEAK DET LEFT, C4207		1	11Q17	*
DUCT LEAK DET RIGHT, C4208		1	11Q25	*
COMPUTER - (FIM 31-41-00/101) EICAS L, M10181 EICAS R, M10182				
DETECTOR - DUCT LEAK, TS5157,TS5158,TS5260, TS5159,TS5160,TS5161,TS5162,TS5259	2	8	L WING LOOP, ZONE 1	26-18-01
DETECTOR - DUCT LEAK, TS5167,TS5168,TS5163, TS5164,TS5166,TS5165	2	6	L PACK BAY, ZONE 2	26-18-01
DETECTOR - DUCT LEAK, TS5169,TS5170	2	2	MAIN WHEEL WELL, ZONE 3	26-18-01
DETECTOR - DUCT LEAK, TS5171,TS5172,TS5173, TS5174,TS5179,TS5180,TS5175,TS5176,TS5177, TS5178	2	10	BODY LOOP, ZONE 4, SEC 46	26-18-01
DETECTOR - DUCT LEAK, TS5181,TS5182,TS5183, TS5184	2	4	BODY LOOP, ZONE 5, SEC 48	26-18-01
DETECTOR - DUCT LEAK, TS5185,TS5186,TS5187, TS5188,TS5189,TS5190	2	6	R WING LOOP, ZONE 6	26-18-01
DETECTOR - DUCT LEAK, TS5191,TS5192	2	2	R PACK BAY, ZONE 7	26-18-01
LIGHT - L WING BODY OVHT, YNNL001	2	1	FLT COMPT, P5, BLEED AIR CONT, M10259	*
LIGHT - R WING BODY OVHT, YNNL002	2	1	FLT COMPT, P5, BLEED AIR CONT, M10259	*
PANEL - (FIM 30-32-00/101) MISC TEST, M10398				
PANEL - (FIM 36-10-00/101) BLEED AIR CONT, M10259				
SWITCH - DUCT LEAK/FUEL QTY, YPHS006	2	1	FLT COMPT, P61, MISC TEST PNL, M10398	*

* SEE THE WDM EQUIPMENT LIST

Duct Leak Detection - Component Index
Figure 101



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Duct Leak Detection - Component Location
 Figure 102 (Sheet 1)

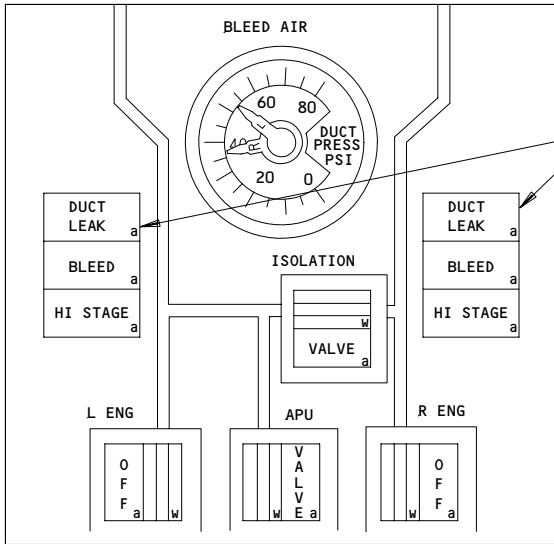
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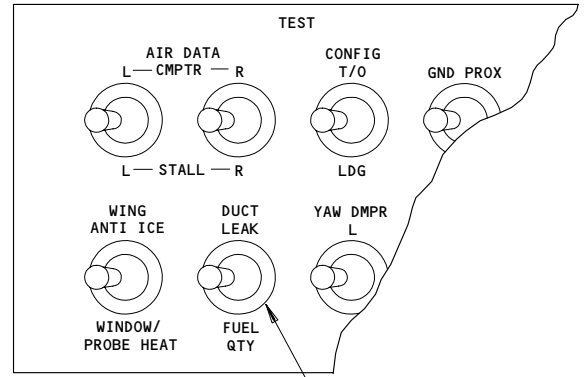
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BLEED AIR CONTROL MODULE, M10259 (REF)

(A) FROM SHT 1



MISCELLANEOUS TEST PANEL, M10398 (REF)

(B) FROM SHT 1

DUCT LEAK DETECTOR,
TS5157, TS5158, TS5159, TS5160,
TS5161, TS5162, TS5259, TS5260,
TS5185, TS5186, TS5187, TS5188,
TS5189, TS5190

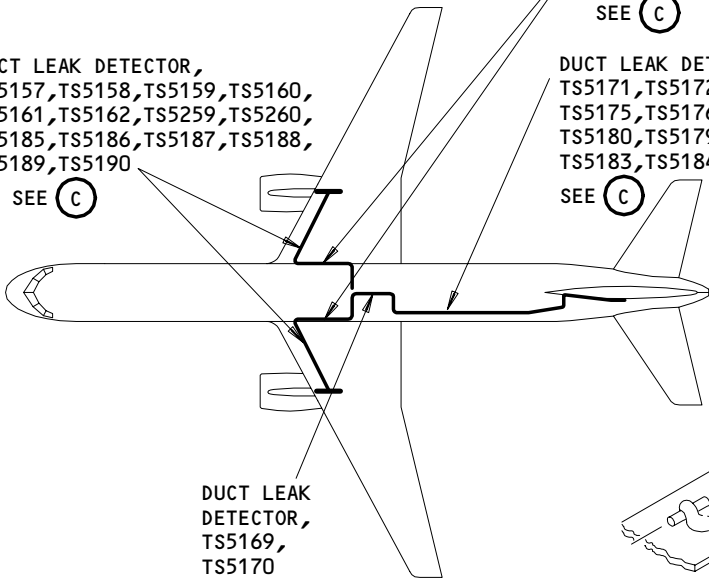
SEE (C)

DUCT LEAK DETECTOR,
TS5167, TS5168, TS5163, TS5164,
TS5166, TS5165, TS5191, TS5192

SEE (C)

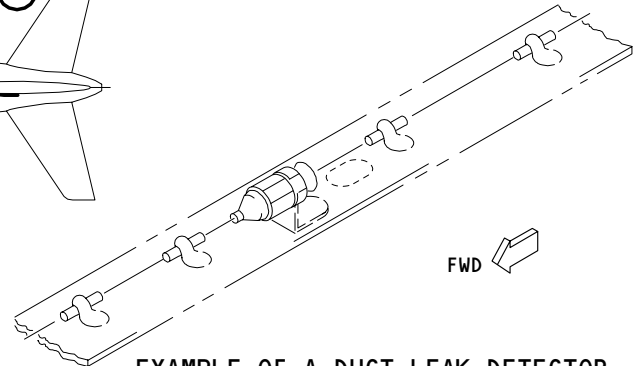
DUCT LEAK DETECTOR,
TS5171, TS5172, TS5173, TS5174,
TS5175, TS5176, TS5177, TS5178,
TS5180, TS5179, TS5181, TS5182,
TS5183, TS5184

SEE (C)



DUCT LEAK
DETECTOR,
TS5169,
TS5170

SEE (C)



EXAMPLE OF A DUCT LEAK DETECTOR,
TS5169, TS5170, TS5157, TS5158, TS5159,
TS5160, TS5161, TS5162, TS5259, TS5260,
TS5185, TS5186, TS5187, TS5188, TS5189,
TS5190, TS5171, TS5172, TS5173, TS5174,
TS5175, TS5176, TS5177, TS5178, TS5180,
TS5179, TS5167, TS5168, TS5163, TS5164,
TS5166, TS5165, TS5191, TS5192, TS5181,
TS5182, TS5183, TS5184

(C)

Duct Leak Detection - Component Location
Figure 102 (Sheet 2)

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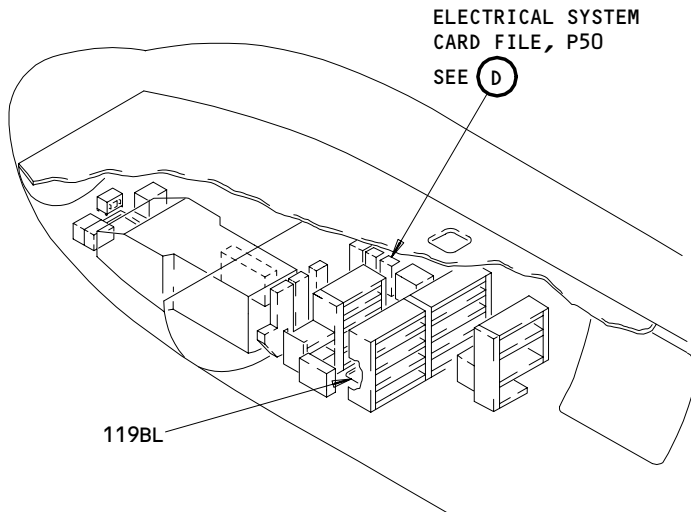
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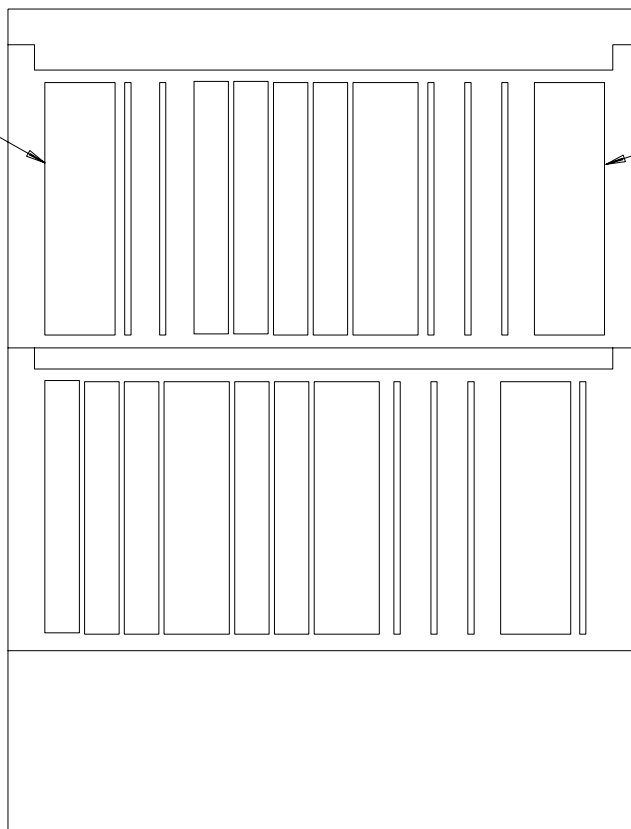
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MAIN EQUIPMENT CENTER

DUCT LEAK AND WHEEL WELL
FIRE POWER SUPPLY CARD,
M10428 (REF)

DUCT LEAK AND
WHEEL WELL
FIRE CONTROL CARD,
M691 (REF)



ELECTRICAL SYSTEM CARD FILE, P50

(D)

Duct Leak Detection - Component Location
Figure 102 (Sheet 3)

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WING AND BODY DUCT LEAK DETECTION – ADJUSTMENT/TEST

1. General

- A. This section contains procedures for the operational test and the system test of the wing and body duct leak detection system.
- (1) The operational test makes sure the system operates properly. Only equipment installed in the plane is used for the test.
 - (2) The system test makes sure the performance requirements of the system are met.

TASK 26-18-00-715-001

2. Operational Test – Wing and Body Duct Leak Detection

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-00/501, EICAS

B. Access

(1) Location Zones

100	Lower Half of Fuselage
120	Main Equipment Center (Right)
212	Control Cabin (Right)
530/630	Wing Area (Right & Left)

(2) Access Panel

119BL	Main Equipment Center
-------	-----------------------

C. Test Wing and Body Duct Leak Detection System

S 865-002

- (1) Supply electrical power to BUS R and BUS L AC bus and BUS R 28V DC (AMM 24-22-00/201).

S 285-003

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed.
 - (a) 11Q26, DUCT LEAK CONT
 - (b) 11Q17, DUCT LEAK LEFT
 - (c) 11Q25, DUCT LEAK RIGHT

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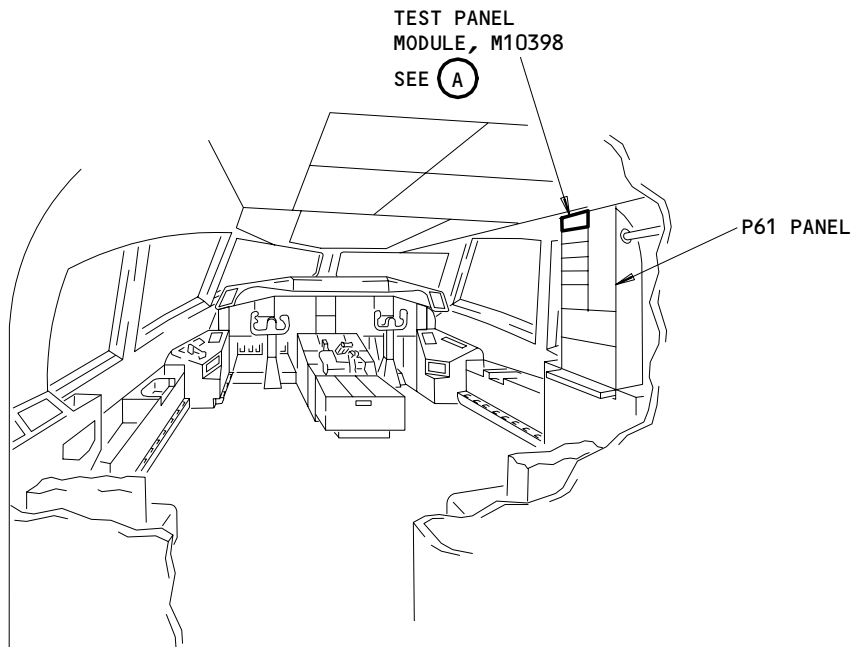
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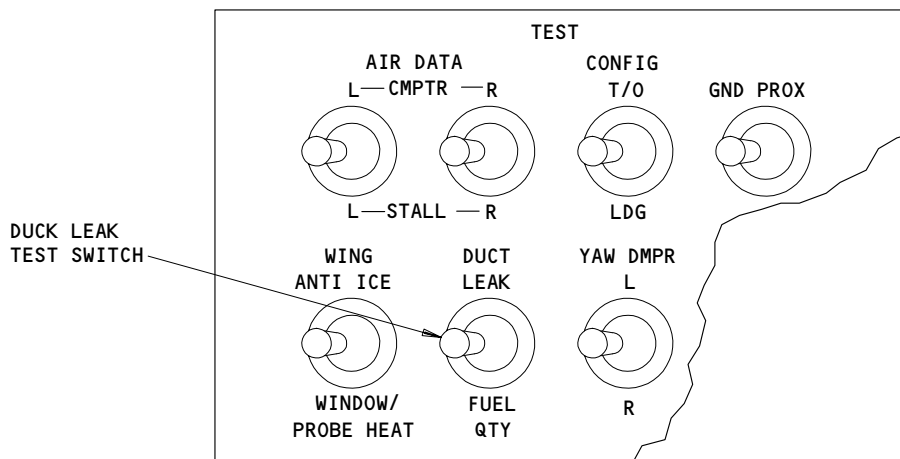
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FLIGHT COMPARTMENT



TEST PANEL MODULE, M10398

(A)

Duct Leak Detection - Component Location
Figure 501

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- S 985-041
- (3) Do the engine shutdown input removal procedure (AMM 31-41-00/201).

NOTE: Master CAUTION, owl aural, and a number of engine messages are inhibited when engines do not operate.

- S 985-005
- (4) Hold the DUCT LEAK/FUEL QTY switch on the miscellaneous test panel on the P61 panel in the DUCT LEAK position.

- S 285-051
- (5) Make sure these warnings occur:
- (a) The yellow DUCT LEAK lights on the bleed air supply panel on the P5 panel come on (2 places).
 - (b) The yellow L and R BLD DUCT LEAK messages are shown on the EICAS displays.
 - (c) The yellow master CAUTION lights on the P7 panel come on.
 - (d) The owl aural warning is heard.

- S 985-007
- (6) Release the switch and make sure the warnings go off.

- S 865-006
- (7) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-18-00-725-008

3. System Test - Wing and Body Duct Leak Detection

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/201, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (4) AMM 33-16-00/501, Master Dim and Test

B. Access

- (1) Location Zones

100	Lower Half of Fuselage
120	Main Equipment Center (Right)
212	Control Cabin (Right)
530/630	Wing Area (Right & Left)
- (2) Access Panel

119BL	Main Equipment Center
-------	-----------------------

C. Prepare for Test

- S 865-009
- (1) Supply electrical power (AMM 24-22-00/201).

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S 285-010

- (2) Make sure these systems operate:
- (a) EICAS (AMM 31-41-00/501)
 - (b) Master Dim and Test System (AMM 33-16-00/501)

S 985-052

- (3) Do the level B message preparation procedure (AMM 31-41-00/501).

NOTE: Level B EICAS messages are inhibited when engines are not running.

D. Test the Wing and Body Duct Leak Detection System

S 865-012

- (1) Open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags.
- (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT

S 035-013

- (2) Disconnect the D1956 connector from the detector element TS5167 at the left A/C pack bay (STA 915, WL 160 and LBL 40).

S 425-014

- (3) Connect a jumper between the center pin of D1956 and the center conductor of detector element TS5167.

S 425-015

- (4) Connect a jumper between the center conductor of detector element TS5167 and the inconel tubing of detector element TS5167.

S 035-016

- (5) Disconnect the connector D1996 from the detector element TS5191 at right of the A/C pack bay (STA 1101, WL 160 and RBL 62).

S 425-017

- (6) Connect a jumper between the center pin of D1996 and the center conductor of detector element TS5191.

S 425-016

- (7) Connect a jumper between the center conductor of detector element TS5191 and the inconel tubing of detector element TS5191.

S 985-017

- (8) Press the ECS/MSG button on the EICAS (P61) maintenance panel.

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- S 865-014
- (9) Remove the DO-NOT-CLOSE tags and close these breakers on the P11 overhead panel.
- (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT
- S 715-019
- (10) Wait a minimum of 30 seconds.
- S 985-020
- (11) Press the AUTO/READ button on the EICAS (P61) maintenance panel.
- S 985-021
- (12) Press the ERASE button on the EICAS (P61) maintenance panel for each page of messages.
- S 985-022
- (13) Press the AUTO/READ button on the EICAS maintenance panel (P61).
- S 285-023
- (14) Verify the following:
- (a) The left DUCT LEAK and the right DUCT LEAK lights shall not illuminate on the Bleed Air Supply Panel (P5).
 - (b) Both CAUTION lights shall not illuminate on the P7 panel.
 - (c) The L BLD DUCT LEAK and R BLD DUCT LEAK message shall not appear on the EICAS Caution page.
 - (d) The DUCT LEAK BITE message shall not appear on the EICAS maintenance page.
 - (e) The aural warning owl tone shall not sound from the aural warning speakers.
- S 985-029
- (15) Toggle and hold the DUCT LEAK test switch on M10398 in the P61 panel to the DUCT LEAK position and wait 5 seconds.
- S 285-030
- (16) Verify the following:
- (a) The left DUCT LEAK and the right DUCT LEAK lights shall illuminate on the Bleed Air Supply Panel (P5).
 - (b) Both CAUTION lights shall illuminate on the P7 panel.

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- (c) The L BLD DUCT LEAK and R BLD DUCT LEAK messages shall appear on the EICAS Caution page.
- (d) The DUCT LEAK BITE message shall not appear on the EICAS maintenance page.
- (e) The aural warning owl tone shall sound from the aural warning speakers.

S 985-031

- (17) Release the DUCT LEAK test switch on M10398 in P61.

S 285-032

- (18) Verify the following:
 - (a) The left DUCT LEAK and the right DUCT LEAK lights shall not illuminate on the Bleed Air Supply Panel (P5).
 - (b) Both CAUTION lights shall not illuminate on the P7 panel.
 - (c) The L BLD DUCT LEAK and R BLD DUCT LEAK message shall disappear from the EICAS Caution page.
 - (d) The aural warning owl tone shall silence from the aural warning speakers.

S 755-013

- (19) Wait for a minimum of 5 seconds.

S 285-014

- (20) Verify the DUCT LEAK BITE message shall appear on the EICAS maintenance page.

S 865-030

- (21) Open the following circuit breakers on the overhead panel P11 and attach DO-NOT CLOSE tags .
 - (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT

S 035-034

- (22) Disconnect the connector D1960 from the detector element TS5168 at the left A/C pack bay (STA 915, WL 160 and RBL 25).

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- S 435-035
- (23) Connect a jumper between the center pin of D1960 and the center conductor of detector element TS5168.
- S 435-040
- (24) Connect a jumper between the center pin of connector D1960 and the inconel tubing of detector element TS5168.
- S 035-036
- (25) Disconnect the D2026 connector from the detector element TS5192 at the right A/C pack bay (STA 923, WL 160 and RBL 47).
- S 435-037
- (26) Connect a jumper between the center pin of connector D2026 and the center conductor of detector element TS5192.
- S 435-038
- (27) Connect a jumper between the center pin of connector D2026 and the inconel tubing of detector element TS5192.
- S 865-039
- (28) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 overhead panel.
- (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT
- S 285-040
- (29) Verify the following indications within 5 seconds:
- (a) The left DUCT LEAK and the right DUCT LEAK lights shall illuminate on the Bleed Air Supply Panel (P5).
 - (b) Both CAUTION lights shall illuminate on the P7 panel.
 - (c) The L BLD DUCT LEAK and R BLD DUCT LEAK message shall appear on the EICAS Caution page.
 - (d) The DUCT LEAK BITE message shall appear on the EICAS maintenance page.
 - (e) The aural warning owl tone shall sound from the aural warning speakers.

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- S 865-041
- (30) Attach D0-NOT-CLOSE tags and open these breakers on the P11 overhead panel.
- (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT
- S 035-042
- (31) Remove the jumper between the center conductor of detector element TS5167 and the inonel tubing of detector element TS5167.
- S 035-043
- (32) Remove the jumper between the center pin of D1956 and the center conductor of detector element TS5167.
- S 435-044
- (33) Reconnect the connector D1956 to the detector element TS5167.
- S 035-045
- (34) Remove the jumper between the center conductor of detector element TS5191 and the inonel tubing of detector element TS5191.
- S 035-046
- (35) Remove the jumper between the center pin of conductor D1996 and the center conductor of detector element TS5191.
- S 435-047
- (36) Reconnect the connector D1996 to detector element TS5191.
- S 035-048
- (37) Remove the jumper between the center pin of connector D1960 and the inonel tubing of detector element TS5168.
- S 035-049
- (38) Remove the jumper between the center pin of connector D1960 and the center conductor of detector element TS5168.
- S 435-050
- (39) Reconnect the connector D1960 to detector element TS5168.
- S 035-051
- (40) Remove the jumper between the center pin of D2026 and the inonel tubing of detector element TS5192.
- S 035-052
- (41) Remove the jumper between the center pin of connector D2026 and the center conductor of detector element TS5192.
- S 435-053
- (42) Reconnect the connector D2026 to detector element TS5192.

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S 865-054

- (43) Remove the DO-NOT-CLOSE tags and close these breakers on the P11 overhead panel.
- (a) 11Q17, DUCT LEAK DET LEFT
 - (b) 11Q25, DUCT LEAK DET RIGHT
 - (c) 11Q26, DUCT LEAK CONT

S 285-055

- (44) Make sure these indications occur:
- (a) The left DUCT LEAK and the right DUCT LEAK lights shall not illuminate on the Bleed Air Supply Panel (P5).
 - (b) Both CAUTION lights shall not illuminate on the P7 panel.
 - (c) The L BLD DUCT LEAK and R BLD DUCT LEAK message shall disappear from the EICAS Caution page.
 - (d) The DUCT LEAK BITE message shall remain on the EICAS maintenance page.
 - (e) The aural warning owl tone shall silence from the aural warning speakers.

S 985-056

- (45) Push and release the LOC TEST button on the Wheel Well Fire and ECS Duct Leak Detection System control card M691 on the P50 Electrical Systems card file.

S 285-057

- (46) Make sure codes 91 and then 99 are shown on the M691 display.

S 985-058

- (47) Push and release the MEM READ button on the M691 display.

S 285-059

- (48) Make sure codes 24 or 74 are shown.

S 985-060

- (49) Push and release the MEM CLR button.

S 285-061

- (50) Make sure the display is blank.

S 985-062

- (51) Push and release the MEM READ button.

S 285-063

- (52) Make sure code 24 or 74 is shown.

S 985-064

- (53) Push and release the MEM CLR button.

S 285-065

- (54) Make sure the display is blank.

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- S 985-066
(55) Push and release the MEM READ button.
- S 285-067
(56) Make sure code 97 is shown.
- S 985-068
(57) Push and release the MEM CLR button.
- S 285-069
(58) Make sure the display is blank.
- S 985-070
(59) Press the ECS/MSG button on the EICAS (P61) maintenance panel.
- S 985-071
(60) Press the AUTO/READ button on the EICAS (P61) maintenance panel.
- S 985-072
(61) Press the ERASE button on the EICAS (P61) maintenance panel for each page of messages.
- S 985-073
(62) Press the AUTO/READ button on the EICAS maintenance panel (P61).
- S 285-074
(63) Verify the Left DUCT LEAK BITE disappears from the EICAS maintenance page.
- S 985-075
(64) Push and release the LOC TEST button on M691.
- S 285-076
(65) Make sure codes 91 and 99 are shown.
- S 985-077
(66) Push and release the MEM READ button.
- S 285-078
(67) Make sure code 97 is shown.
- NOTE:** Code 97 displays for 1 minute.
- S 985-079
(68) Push and hold the LOC TEST button
- S 985-080
(69) Push and hold the MEM READ button.

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S 985-081

(70) Release the LOC TEST button.

S 985-082

(71) Release the MEM READ button.

S 285-083

(72) Make sure code 97 is shown.

NOTE: Code 97 displays for 1 minute.

S 985-038

(73) Push and release the MEM CLR button while code 96 is shown.

NOTE: If step 3.C.(71) is missed do the procedure again from 3.C.(63) to 3.C.(70).

S 285-039

(74) Make sure code 25 or 75 is shown.

S 985-040

(75) Push and release the MEM CLR button.

S 285-041

(76) Make sure the display is blank.

S 985-042

(77) Push and release the MEM READ button.

S 285-043

(78) Make sure code 25 or 75 is shown.

S 985-044

(79) Push and release the MEM CLR button.

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- S 285-045
(80) Make sure the display is blank.
- S 985-046
(81) Push and release the MEM READ button.
- S 285-047
(82) Make sure code 97 is shown.
- S 985-048
(83) Push and release the MEM READ button.
- S 285-049
(84) Make sure the display is blank.
- S 865-040
(85) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel.
(a) 6C1 L FUEL COND CONT
(b) 6C2 R FUEL COND CONT
- E. Put the airplane back to its initial condition.
- S 865-050
(1) Close the cover on the electrical system card file, P50.
- S 865-015
(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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DUCT LEAK DETECTOR – REMOVAL/INSTALLATION

1. General (Fig. 401)

- A. Duct leak detectors are installed next to the pneumatic air ducts in the wings and in the fuselage.
- B. The removal/installation procedure is the same for all units except for access to the units.

TASK 26-18-01-024-031

2. Remove Duct Leak Detector

A. Equipment

- (1) Main Gear Door Locks (AMM 32-00-15/201)
- (2) Caps to fit 35303-64 connectors
- (3) Bonding Meter, AVTRON T477W

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 06-42-00/201, Empennage Access Doors and Panels
- (3) AMM 06-44-00/201, Wing Access Doors and Panels
- (4) AMM 25-50-02/401, Cargo Compartment Sidewall Panels
- (5) AMM 32-00-15/201, Landing Gear Door Locks
- (6) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

(1) Location Zones

133/134	Wing Center Section (Left and Right)
310	Fuselage Body Section 48
500/600	Wing (Left and Right)
730/740	Main Landing Gear Wheel Well

D. Prepare for Removal of the Wing Detectors (Fig. 402)

S 864-001

- (1) The wing detectors are mounted on the front spar above the pneumatic duct.

E. Prepare for Removal of the Under Wing Center Section

S 864-002

- (1) The under wing center section detectors are mounted near the pneumatic ducts in the ECS bay.

S 864-003

- (2) Open the ECS access doors to gain access to the detectors (AMM 06-41-00/201).

F. Prepare for Removal of the Wheel Well Detectors (Fig. 404)

S 284-004

- (1) Make sure the landing gear downlocks are installed (AMM 32-00-20/201).

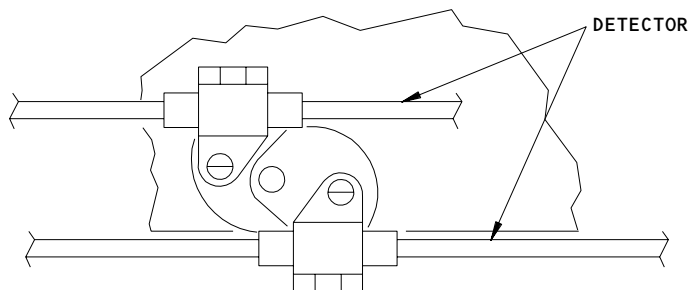
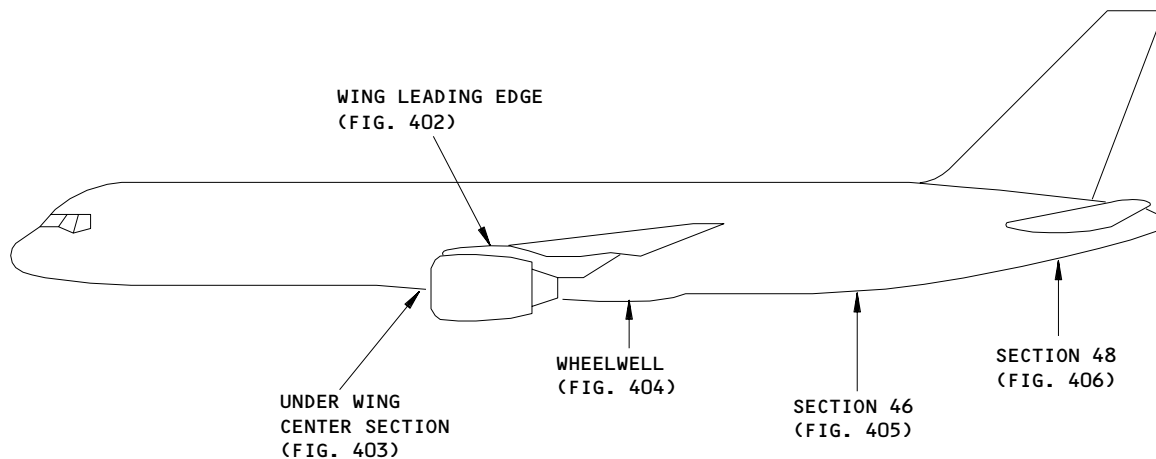
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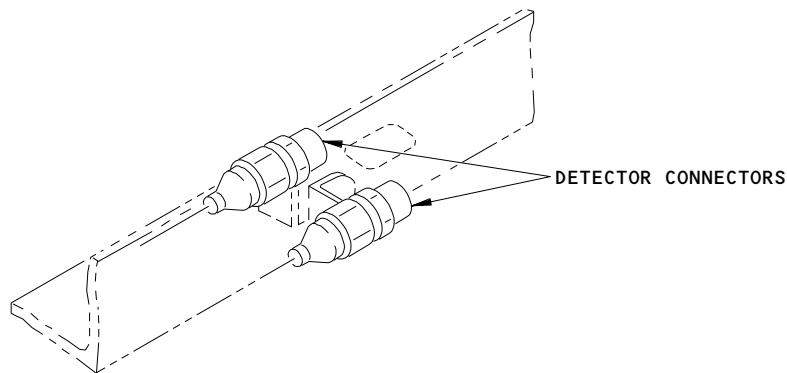
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LOOP DUCT LEAK DETECTOR
MOUNTING CLAMP (EXAMPLE)



LOOP DUCT LEAK DETECTOR
END INSTALLATION (EXAMPLE)

Duct Leak Detector Installation
Figure 401

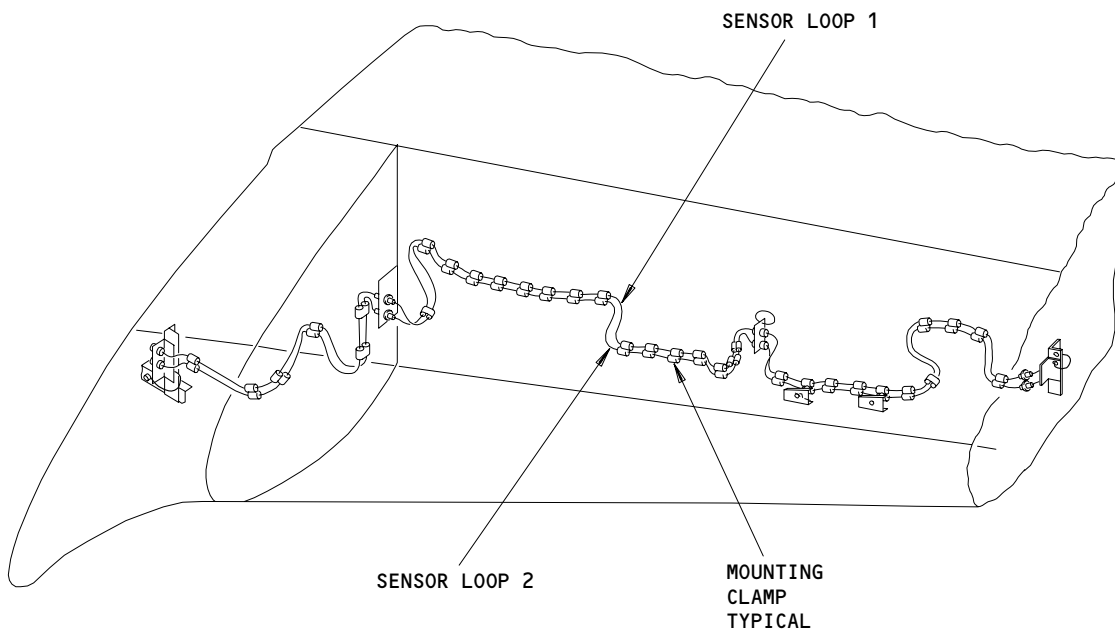
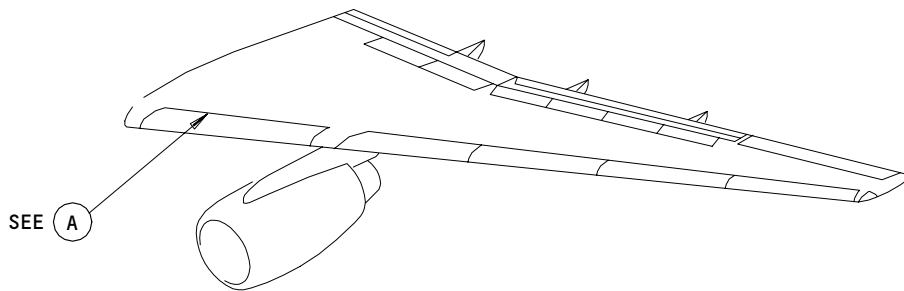
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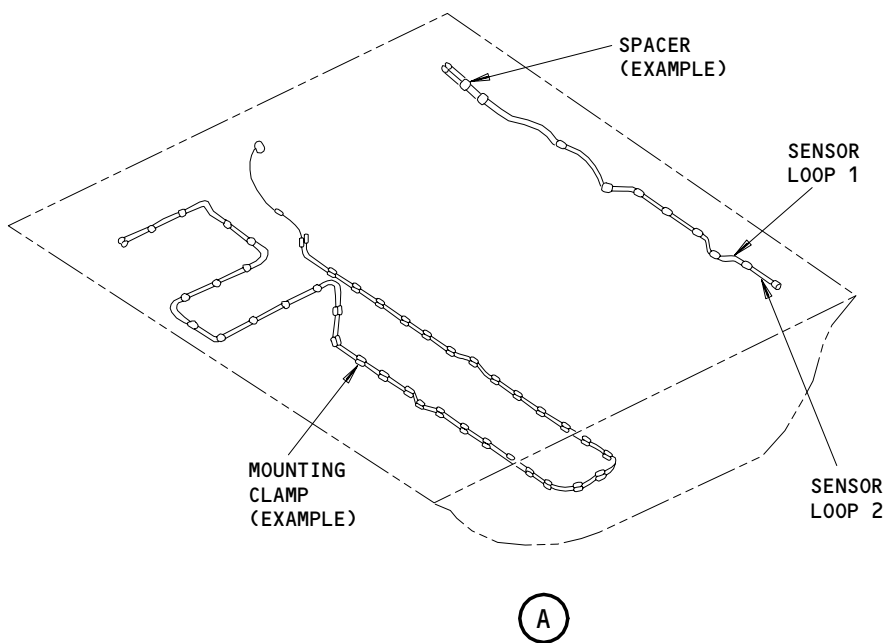
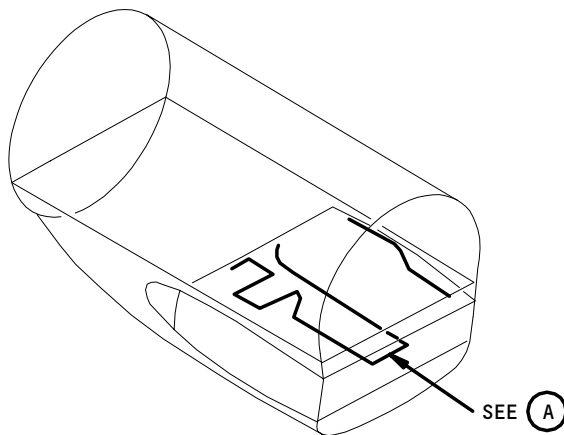
Wing Leading Edge Duct Leak Detector Installation
Figure 402

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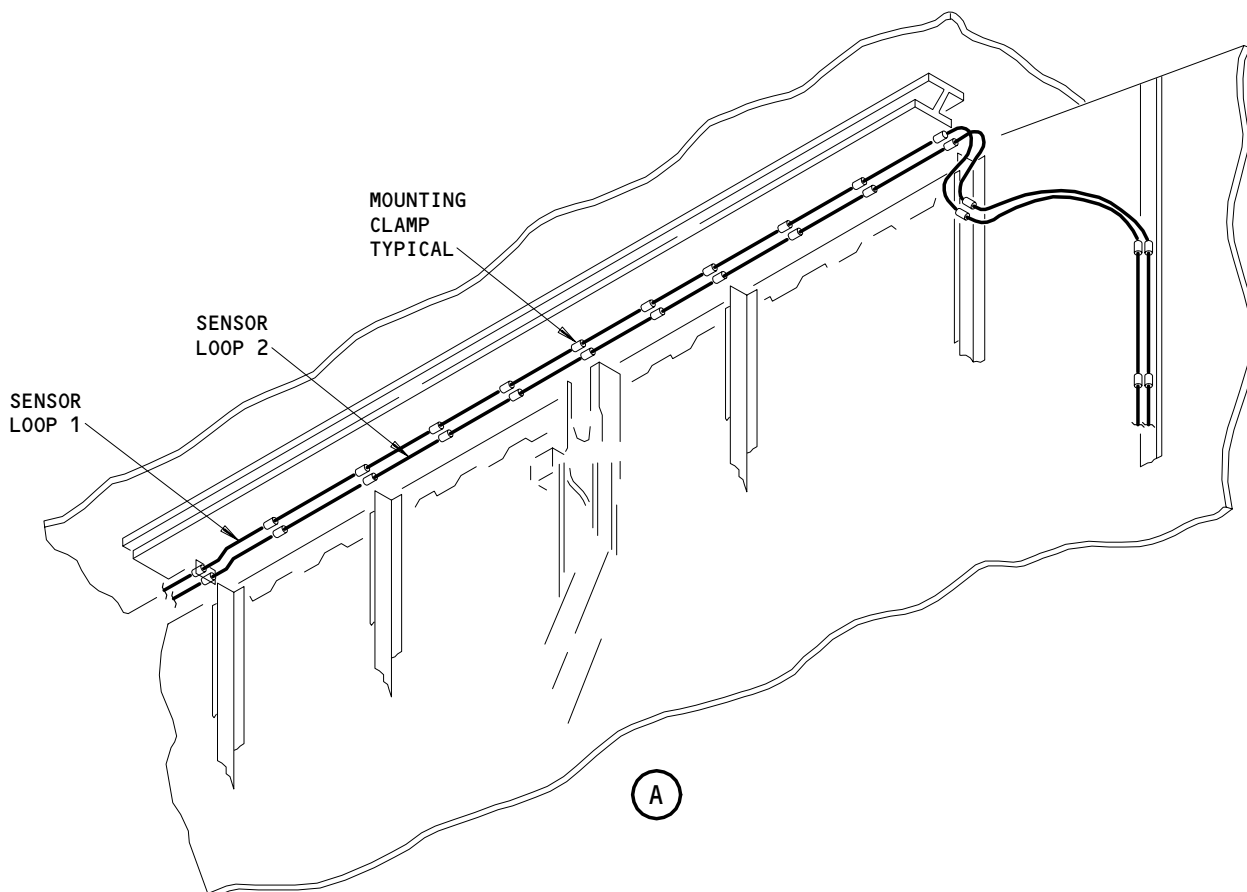
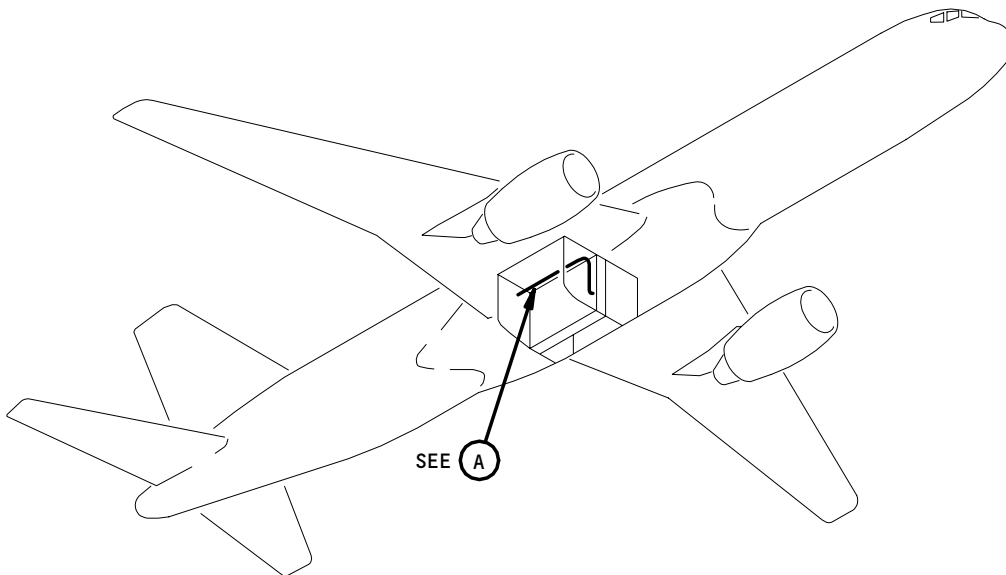
Under Wing Center Section Duct Leak Detector Installation
Figure 403

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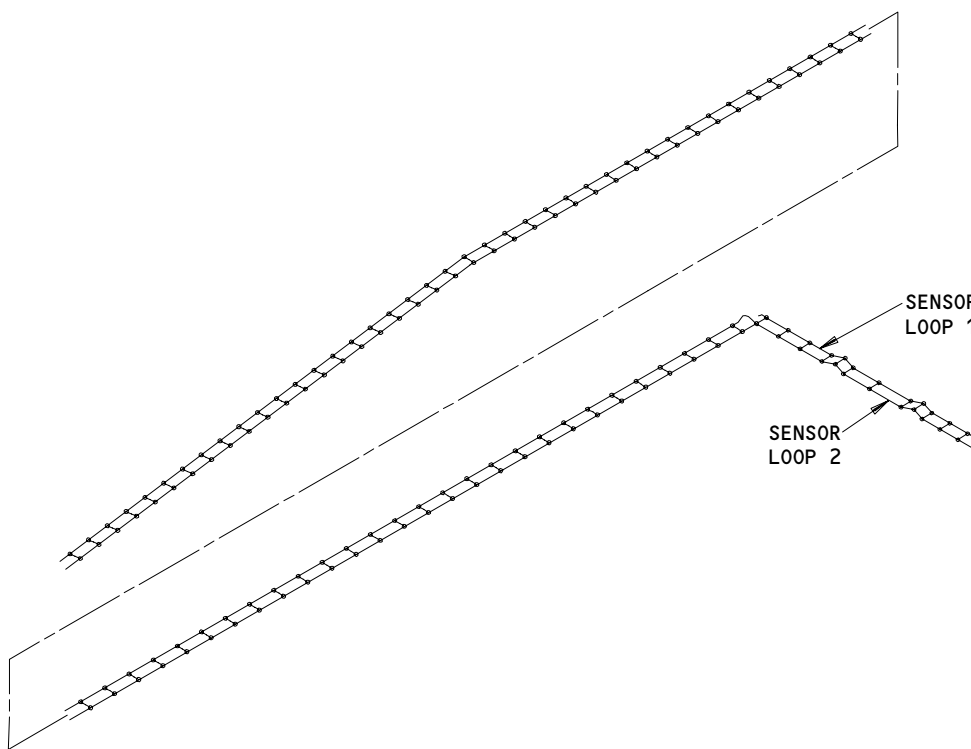
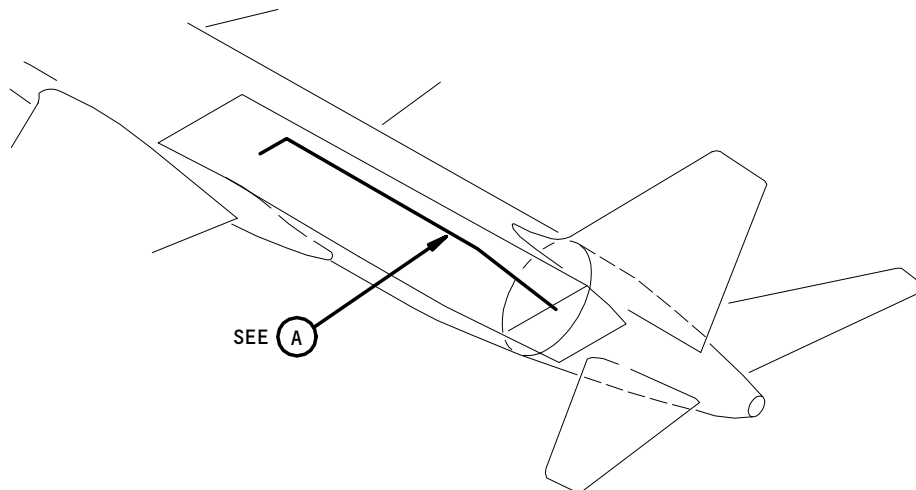
Wheel Well Duct Leak Detector Installation
Figure 404

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(A)

Section 46 Duct Leak Detector Installation
Figure 405

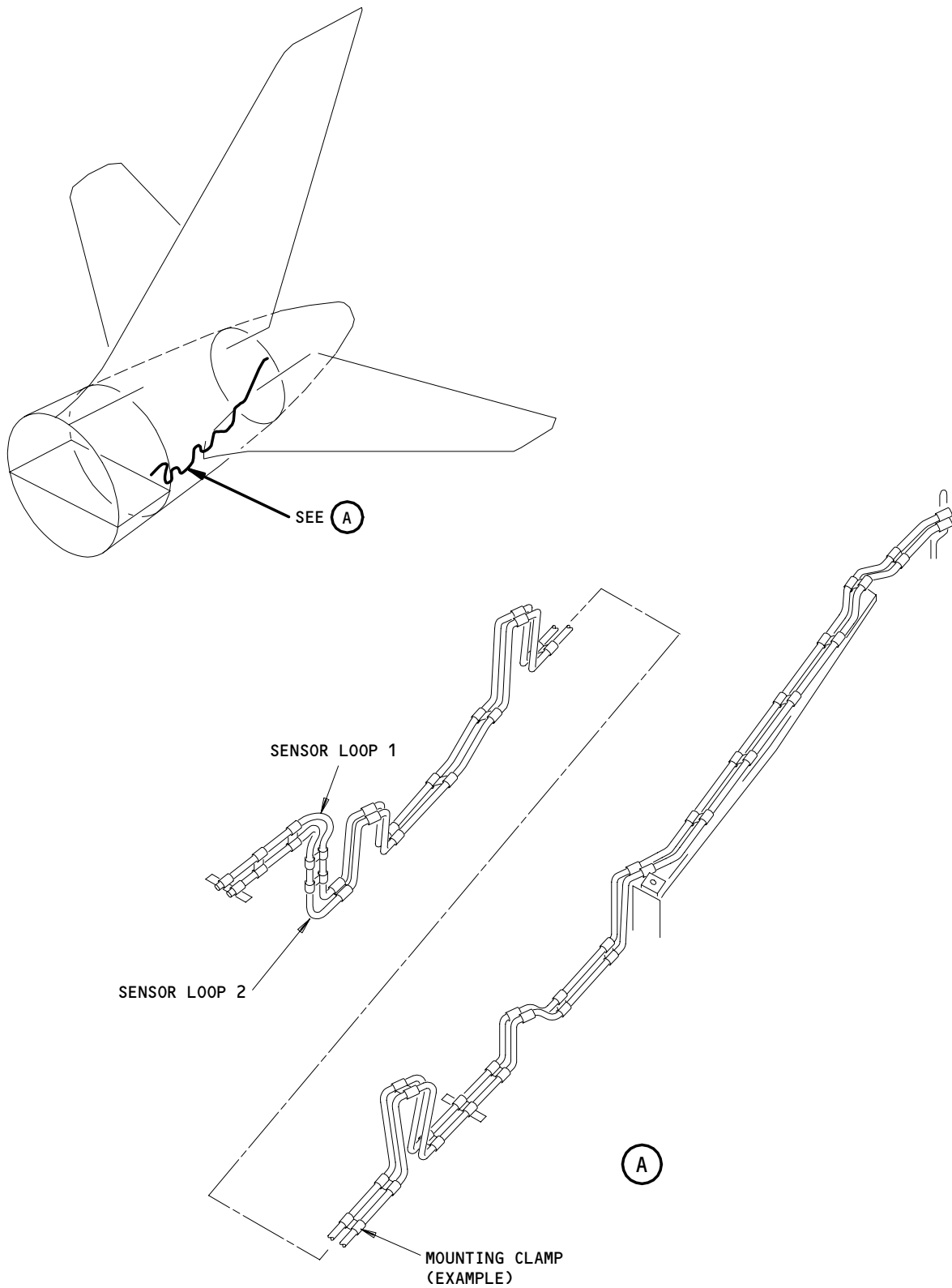
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Section 48 Duct Leak Detector Installation
Figure 406

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S 014-005

WARNING: USE THE PROCEDURE IN AMM 32-00-05/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Open the doors for the main landing gear and install the door locks (AMM 32-00-15/201).

S 864-006

- (3) The wheel well detector is on the left wall that separates the landing gear bays.

G. Prepare for Removal of the Section 46 Detectors (Fig. 405)

S 864-007

- (1) The detectors in section 46 are behind the wall panels in the aft cargo compartment. Detectors are installed near the pneumatic duct, under the the cargo compartment ceiling.

S 014-008

- (2) Remove the cargo deck wall panels as necessary to get access to the detectors (AMM 25-50-02/401).

H. Prepare for Removal of the Section 48 Detectors (Fig. 406)

S 864-009

- (1) The section 48 detectors are installed near the pneumatic duct near the center of section 48.

S 014-010

- (2) Open the Controls and Service Access Doors (AMM 06-42-00/201) to get access to the detectors.

I. Remove Detector

S 864-011

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11Q25, DUCT LEAK DET RIGHT
 - (b) 11Q17, DUCT LEAK DET LEFT

S 014-012

CAUTION: ALWAYS OPEN THE FIRST THREE CLAMPS FROM THE DETECTOR AND BEFORE YOU LOOSEN THE HEX NUT AND DISCONNECT THE CONNECTOR. THIS MUST BE DONE TO MAKE SURE YOU CAN MOVE THE DETECTOR WITHOUT APPLIED FORCE TO THE CONNECTOR PINS.

- (2) Open the first three clamps near the end of the connectors.

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- S 034-013
- (3) Remove the lockwire and disconnect the connectors at the two ends of the detector.
- S 434-014
- (4) Install protective caps on the airplane electrical connectors.
- S 014-015
- (5) Open the remaining clamps and remove the detector.

TASK 26-18-01-424-032

3. Install Duct Leak Detector (Fig. 401, 402, 403, 404, 405, 406)

A. Equipment

- (1) Main Gear Door Locks (AMM 32-00-15/201)
- (2) Caps to fit 35303-64 connectors
- (3) Bonding Meter, AVTRON T477W

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 06-42-00/201, Empennage Access Doors and Panels
- (3) AMM 06-44-00/201, Wing Access Doors and Panels
- (4) AMM 24-22-00/201, Electrical Power - Control
- (5) AMM 25-50-02/401, Cargo Compartment Sidewall Panels
- (6) AMM 32-00-15/201, Landing Gear Door Locks

C. Access

- (1) Location Zones
 - 133/134 Wing Center Section (Left and Right)
 - 310 Fuselage Body Section 48
 - 500/600 Wing (Left and Right)
 - 730/740 Main Landing Gear Wheel Well

D. Install the Detector

S 014-016

CAUTION: SHAPE THE DETECTOR ELEMENT SO THAT IT WILL BE CLEAR OF ADJACENT PARTS AND STRUCTURE BY AT LEAST 0.5 INCH (1.27 CM). THE MINIMUM RADIUS FOR A BEND IS 1 INCH (2.54 CM). DO NOT MAKE BENDS LESS THAN 1 INCH FROM CLAMPS OR FLANGE ASSEMBLIES. THESE PRECAUTIONS WILL PREVENT DAMAGE TO THE DETECTOR ELEMENT.

- (1) Remove the protective caps from the two ends of the detector and connect the two ends of the new detector to the airplane detectors.
 - (a) Tighten the connectors to 50-60 pound-inches.

S 414-017

- (2) Install the new grommets over the detector and put the detector in the clamps nearest the connectors.

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- S 284-018
- (3) Make sure the grommets are centered in the clamps and tighten the clamps.
- S 724-019
- (4) Do the two steps before for the remaining clamps. Work towards the center of detector.
- S 284-020
- (5) Make sure the resistance between the detector connector shell and the primary airplane structure is not more than 0.004 ohm.
- S 434-021
- (6) Put lockwire on the connectors.
- S 864-022
- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11Q25, DUCT LEAK DET RIGHT
 - (b) 11Q17, DUCT LEAK DET LEFT

E. Test Detector Installation

- S 864-023
- (1) Supply electrical power (AMM 24-22-00/201).
- S 984-024
- (2) Hold the DUCT LEAK test switch on the miscellaneous test panel in the DUCT LEAK position.
- S 284-025
- (3) Make sure the two yellow DUCT LEAK lights on the bleed air control panel on the P5 panel are on.
- S 984-026
- (4) Release the DUCT LEAK test switch and make sure the lights go off.
- S 284-027
- (5) Stop for 5 seconds and then make sure the message DUCT LEAK BITE is not shown on the EICAS display.
- S 414-028
- (6) Close the access panels as necessary (AMM 06-41-00/201, AMM 06-42-00/201).
- S 424-029
- (7) Install the wall panels, which were removed, on the cargo door (AMM 25-50-02/401).

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S 014-030

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Remove the door locks from the main landing gear doors and close the doors (AMM 32-00-15/201).

S 864-033

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

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EXTINGUISHING - DESCRIPTION AND OPERATION

1. General

- A. The airplane fire extinguishing consists of five systems:
 - (1) Engine fire extinguishing
 - (2) APU fire extinguishing
 - (3) Lavatory waste compartment automatic fire extinguishing
 - (4) Cargo compartment fire extinguishing
 - (5) Portable fire extinguishing
- B. Engine Fire Extinguishing (AMM 26-21-00/001)
 - (1) Two fire extinguishing bottles distribute extinguishing agent to either engine. Both bottles are installed forward of the aft cargo compartment.
- C. APU Fire Extinguishing (AMM 26-22-00/001)
 - (1) One fire extinguishing bottle distributes extinguishing agent to the APU. The bottle is forward of the APU firewall on the lower right side.
- D. Cargo Compartment Fire Extinguishing (AMM 26-23-00/001)
 - (1) Two fire extinguishing bottles distribute extinguishing agent to either compartment. Both bottles are installed forward of the aft cargo compartment.
- E. Lavatory Waste Compartment Automatic Fire Extinguishing
 - (1) The automatic fire extinguishing system floods the lavatory waste compartment with an inert gas to extinguish a fire. The system includes a heat activated extinguisher bottle and a temperature indicator.
- F. Portable Fire Extinguishing (AMM 26-26-00/001)
 - (1) Portable fire extinguishers can be of the following types: carbon dioxide, Halon, and pressurized water. These are located throughout the flight and passenger compartment areas.

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ENGINE FIRE EXTINGUISHING – DESCRIPTION AND OPERATION

1. General

- A. The engine fire extinguishing system has controls that release one or two applications of fire extinguishing agent to a fire in either engine compartment. The system has test capability.
- B. The engine fire extinguishing system includes the following: two engine fire extinguisher bottles, engine fire control panel, and the squib test control panel.
- C. The engine fire extinguishing system receives power from the 28 vdc hot battery bus, through the following circuit breakers on main power distribution panel P6.
 - (1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (2) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (3) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (4) 6H4, FIRE EXTINGUISHING ENG R BTL 2

2. Component Details (Fig. 1)

A. Engine Fire Extinguisher Bottle

- (1) Engine fire extinguisher bottles are located forward of the aft cargo compartment. The extinguisher bottle includes two squib cartridges, a pressure switch, and the combined safety relief and filler port.
- (2) Two squib cartridges are on the discharge valves of each extinguisher bottle. When detonated the cartridge ruptures a retaining disc in the valve releasing the extinguishing agent.
- (3) The pressure switch detects a decrease in bottle pressure and activates the bottle discharge lights. The pressure switch can be manually tested.
- (4) The safety relief valve is a thermal expansion overpressure rupture disc. If bottle pressure is too high, the safety relief ruptures, allowing the bottle to discharge. The filler port is for introducing the extinguishing agent and pressurizing gas into the bottle.
- (5) The extinguishing agent is bromotrifluoromethane (halon), and the pressurizing gas dry nitrogen. The agent leaves no residue when discharged.

B. Engine Fire Switch

- (1) The left and right (L/R) engine fire switch handles are located on the engine fire control panel at pilots' aft control stand P8. When a engine fire is detected, the engine fire switch handle red warning light comes on. A solenoid energizes releasing a mechanical interlock on the fire switch handle shaft. When the mechanical interlock is released, the fire switch handle can be operated by pulling the handle out and rotating it. Rotating the handle releases the extinguishing agent. After rotation, the fire handle automatically returns to an off-center position. To push the handle back in it must be in the center horizontal position. The fire switch handle can be manually unlocked by pressing the button behind the handle.

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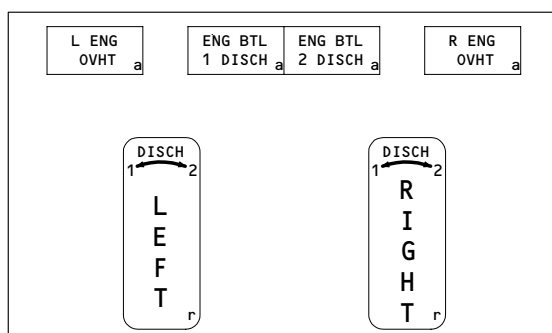
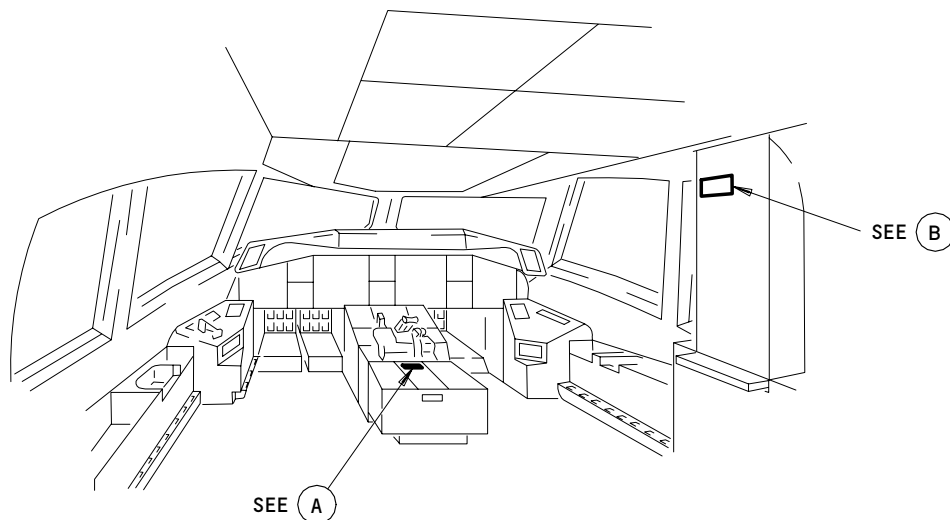
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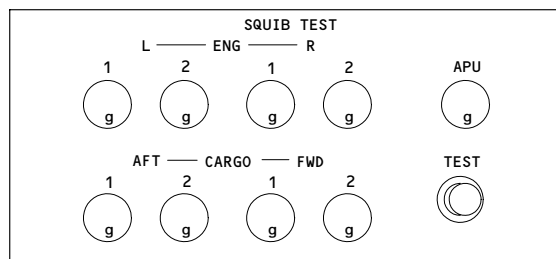
BOEING

757 MAINTENANCE MANUAL



ENGINE FIRE CONTROL PANEL

A



SQUIB TEST PANEL

B

**Engine Fire Extinguishing System Component Location
Figure 1 (Sheet 1)**

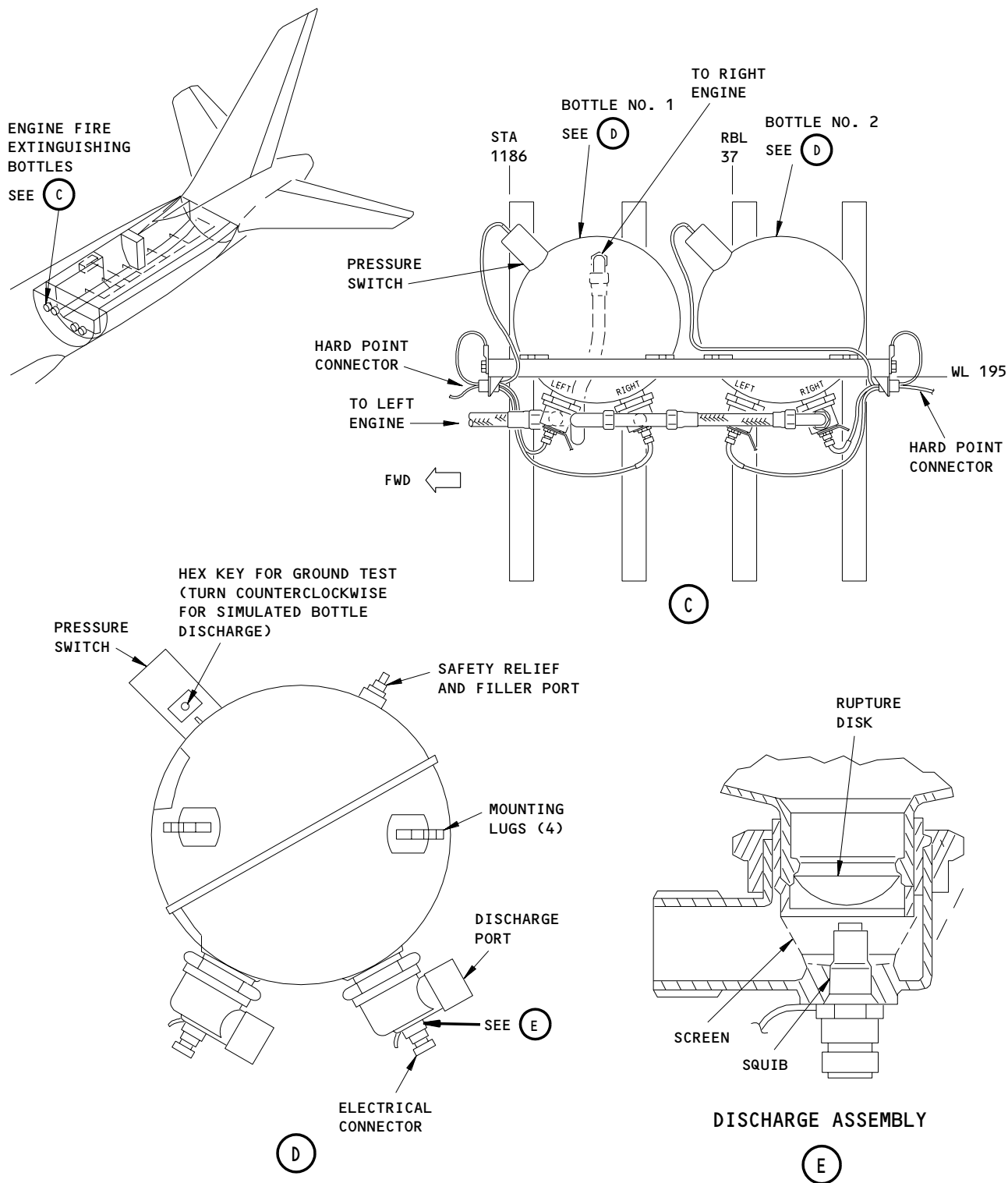
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Engine Fire Extinguishing System Component Location
Figure 1 (Sheet 2)

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C. Squib Test Panel

- (1) The squib test panel is located on the P61 right side panel. The switches on the panel are used to check extinguisher bottle squib cartridges. When pressed, the test switch on the panel checks circuit continuity through the squib cartridges. A green test light comes on for a successful test.

3. Operation (Fig. 2)

A. Functional Description

- (1) When a fire is detected in an engine, the appropriate fire switch handle red warning light comes on. A solenoid energizes releasing a mechanical interlock on the handle shaft. The handle is then operable. The mechanical interlock is manually released by pressing the button located behind the handle. When an engine fire switch handle is pulled out, the extinguishing bottles are armed for that engine. The following also happens: the engine generator field relay and generator circuit breaker are tripped, the engine fuel shut-off valve (spar valve) closes, the fire bell is reset, the engine drive hydraulic pump is depressurized, the engine hydraulic pump supply shut-off valve closes, the air supply pressure regulating and shut-off valve closes, and the electrical power to the T/R control system is removed. The APU shut-off valve closes only when the LEFT engine fire handle is pulled. When the LEFT engine fire handle is pulled, only the pneumatic supply from the APU is shut off, not the APU.
- (2) After pulling a fire switch handle out, rotating it discharges the extinguishing agent into the appropriate engine compartment. Rotating the handle counterclockwise discharges bottle number 1. Rotating it clockwise discharges bottle number 2. Decreasing bottle pressure, by discharge or leakage, activates the pressure switch. The switch sends a signal which turns on the appropriate amber ENG BTL DISCH light. The ENG BTL 1 and 2 DISCH lights are on the engine fire control panel P8. After a decrease in bottle pressure is recognized, an ENG BTL 1 or 2 DISCH message appears on the EICAS display.
- (3) Engine fire extinguishing agent can be discharged to either engine compartment from either bottle. Tubing runs from the bottles through the forward wing spars to each engine compartment. Extinguishing agent discharges from outlet nozzles in the forward and aft section of the engine compartment.

B. Engine Fire Extinguishing System Test

(1) Squib Test

- (a) The squib test control panel checks the integrity of extinguisher bottle squibs. Pressing the TEST switch applies current limited power to the extinguisher bottle squib discharge cartridge. If the squibs are good, the green ENG L/R (1 and 2) lights on the panel will come on.

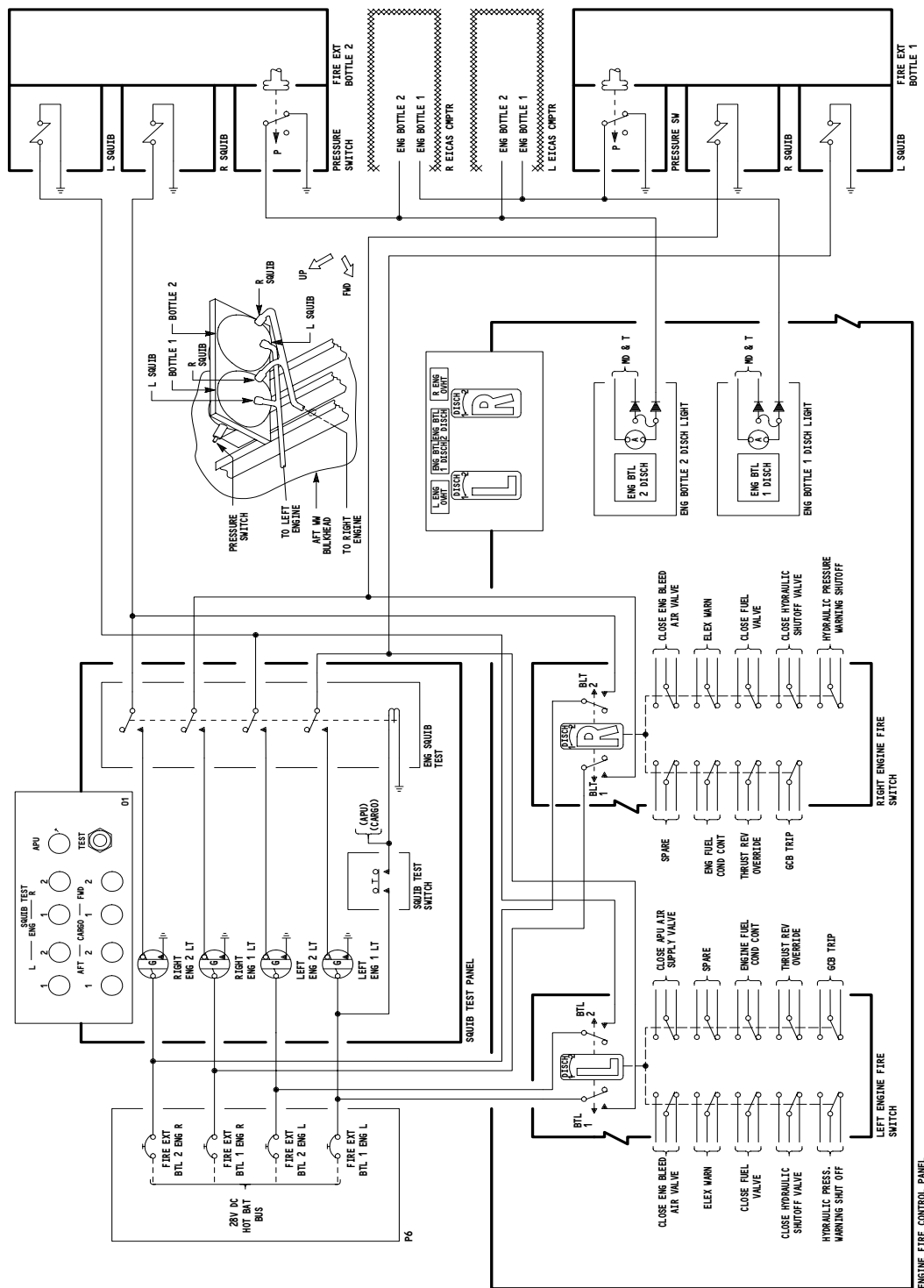
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Engine Fire Extinguishing Schematic
Figure 2

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- (2) Pressure Switch Test
 - (a) Manually activating the bottle pressure switch tests discharge light circuit continuity. When the hex-key assembly is turned clockwise, the amber ENG BTL 1 or 2 DISCH light comes on and an ENG BTL 1 or 2 DISCH message appears on the EICAS display indicating a successful test.

C. Control

- (1) Provide electrical power (AMM 24-22-00/201)
- (2) To place the system in operation, check that the following circuit breakers on main power distribution panel P6 are closed:
 - (a) FIRE EXTINGUISHING ENG L BTL 1
 - (b) FIRE EXTINGUISHING ENG L BTL 2
 - (c) FIRE EXTINGUISHING ENG R BTL 1
 - (d) FIRE EXTINGUISHING ENG R BTL 2

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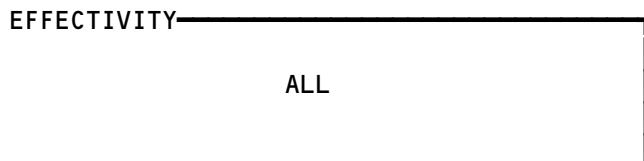
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 FAULT ISOLATION/MAINT MANUAL

ENGINE FIRE EXTINGUISHING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
BOTTLE - DISCH/CARTRIDGE ENG FIRE EXTINGUISH- ING, B17,B18	--	2	821, FWD CARGO COMPT	26-21-01
CIRCUIT BREAKER -			FLT COMPT, P6	
FIRE EXTINGUISHING ENG L BTL 1, C778		1	6H1	*
FIRE EXTINGUISHING ENG L BTL 2, C786		1	6H2	*
FIRE EXTINGUISHING ENG R BTL 1, C779		1	6H3	*
FIRE EXTINGUISHING ENG R BTL 2, C787		1	6H4	*
COMPUTER - (FIM 31-41-00/101)				
EICAS L, M10181				
EICAS R, M10182				
LIGHT - ENG BTL 1 DISCH, YQNL2	--	1	FLT COMPT, ENGINE FIRE CONTROL PANEL, M10443	*
LIGHT - ENG BTL 2 DISCH, YQNL4	--	1	FLT COMPT, ENGINE FIRE CONTROL PANEL, M10443	*
LIGHT - L ENG 1, YQML1	--	1	FLT COMPT, SQUIB TEST CONTROL PANEL, M10401	*
LIGHT - L ENG 2, YQML2	--	1	FLT COMPT, SQUIB TEST CONTROL PANEL, M10401	*
LIGHT - R ENG 1, YQML3	--	1	FLT COMPT, SQUIB TEST CONTROL PANEL, M10401	*
LIGHT - R ENG 2, YQML4	--	1	FLT COMPT, SQUIB TEST CONTROL PANEL, M10401	*
PANEL - (FIM 26-11-00/101)				
ENGINE FIRE CONTROL, M10443	--			
PANEL - SQUIB TEST CONTROL, M10401	--	1	FLT COMPT, P61	26-21-04
SWITCH - LEFT ENGINE FIRE, YQNS37	--	1	FLT COMPT, ENGINE FIRE CONTROL PANEL, M10443	26-21-02
SWITCH - RIGHT ENGINE FIRE, YQNS38	--	1	FLT COMPT, ENGINE FIRE CONTROL PANEL, M10443	26-21-02
SWITCH - TEST 1, YQMS1	--	1	FLT COMPT, SQUIB TEST CONTROL M10401	*

* SEE WM EQUIPMENT LIST

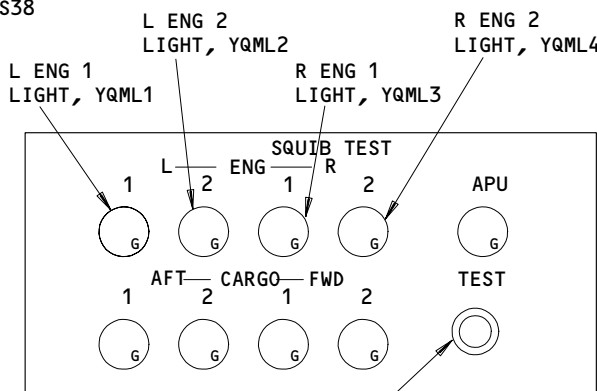
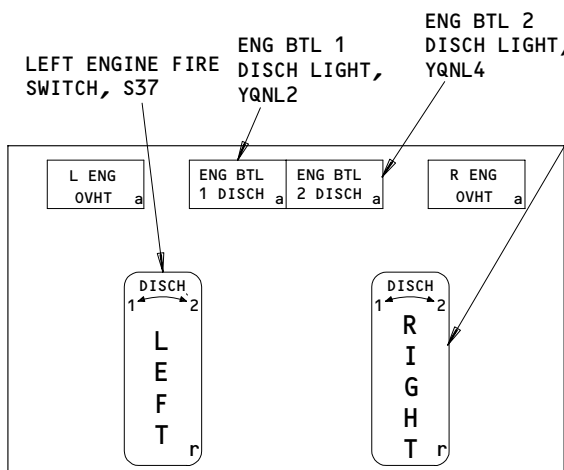
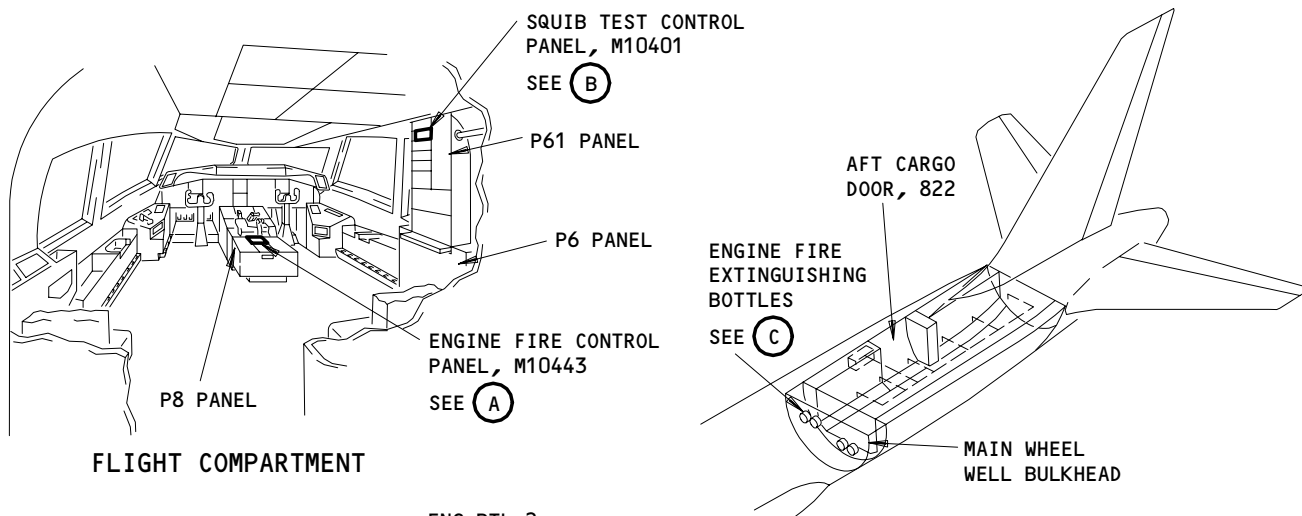
Engine Fire Extinguishing System - Component Index
 Figure 101



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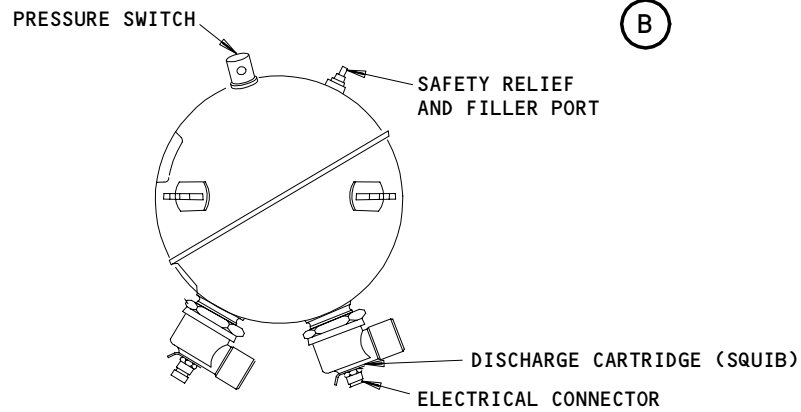
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(A)

(B)



(C)

Engine Fire Extinguishing System - Component Location
Figure 102

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ENGINE FIRE EXTINGUISHING SYSTEM – ADJUSTMENT TEST

1. General

- A. This section contains procedures to perform the tests that follow:
- (1) The operational test makes sure the system operates correctly. It can be done in a minimum of time and uses only the equipment installed in the airplane.
 - (2) The system test has different tests for each part of the system. When all the tests are done, the engine fire extinguishing system is ready to operate correctly.
 - (3) The discharge line test makes sure the connections are correct from the fire extinguisher bottles to the discharge nozzles.

TASK 26-21-00-715-199

2. Operational Test

A. General

- (1) The engine fire extinguishing system has two identical fire bottles located in the forward of the aft cargo compartment, an engine fire control panel, and a squib test panel. The extinguishing plumbing is connected to the left and right engine, which lets each engine receive extinguishing agent from either bottle. Each engine has an independently operated fire extinguishing system.

B. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power Control

C. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

D. Prepare for Test

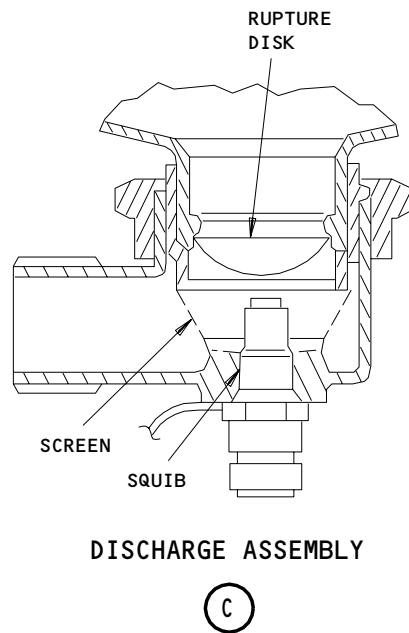
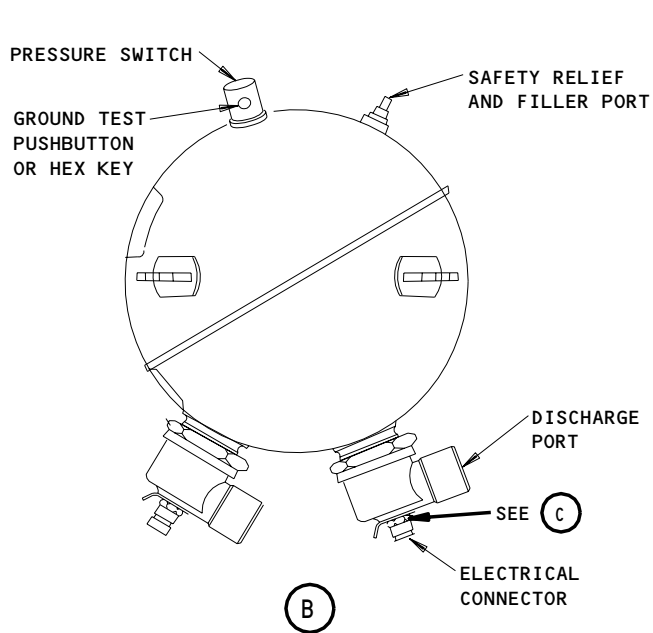
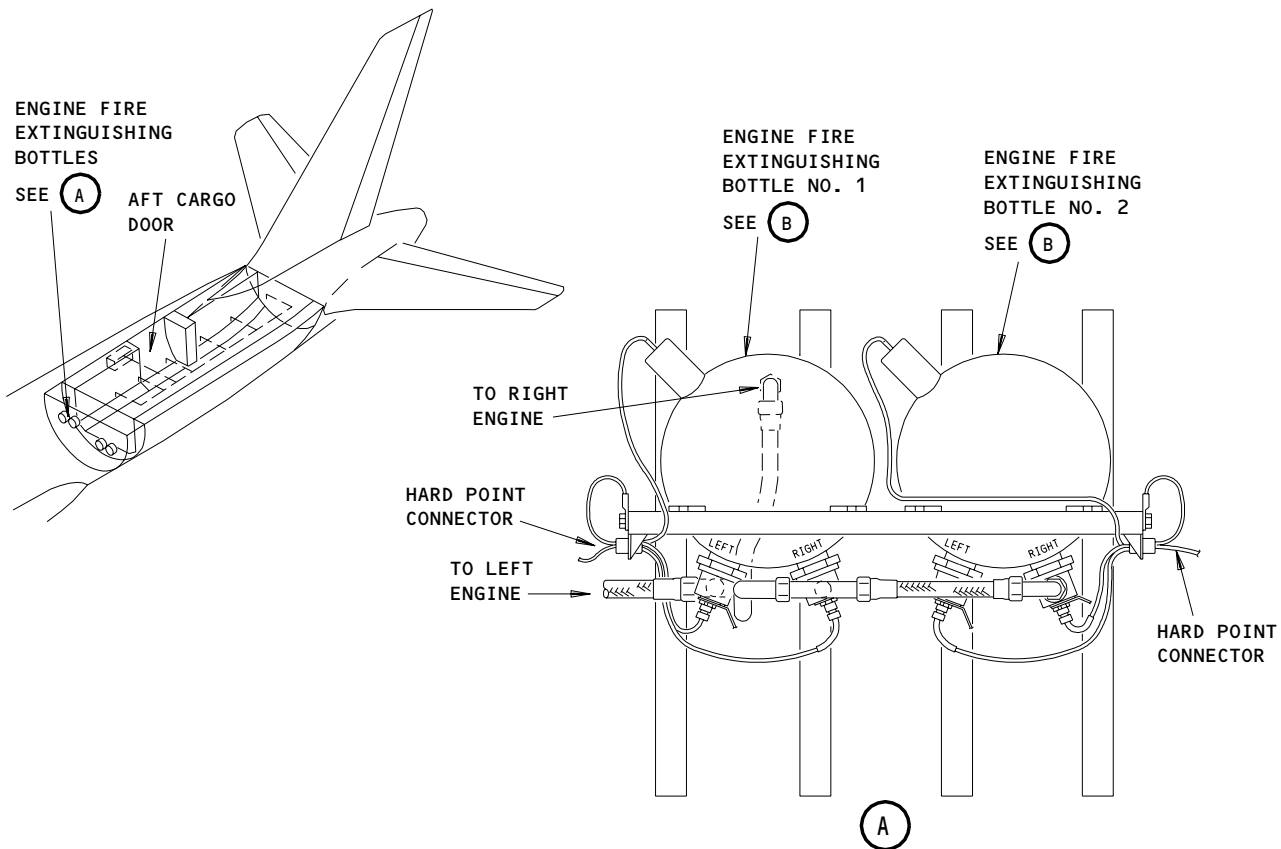
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Engine Fire Extinguishing System Component Location
Figure 501

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S 765-283

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 865-001

- (2) Supply electrical power (AMM 24-22-00/201).
- E. Do a test of the Extinguisher Bottle Pressure Switch

S 825-256

CAUTION: IF THE HEX KEY IS ROTATED MORE THAN 1/4 TURN, DAMAGE TO THE SWITCH MAY OCCUR.

- (1) On engine fire extinguisher bottle number 1, turn and hold the ground test hex key 1/4 turn clockwise.

S 825-257

CAUTION: IF THE HEX KEY IS ROTATED MORE THAN 1/4 TURN, DAMAGE TO THE SWITCH MAY OCCUR.

- (2) On engine fire extinguisher bottle number 1, push and hold the ground test pushbutton or turn and hold the ground test hex key 1/4 turn clockwise.
 - (a) Make sure the yellow ENG BTL 1 DISCH light on the ENGINE FIRE Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, ENG BTL 1, shows on the top display.

S 865-211

- (3) Release the ground test pushbutton or hex key.
 - (a) Make sure the yellow ENG BTL 1 DISCH light goes off.
 - (b) Make sure the EICAS message, ENG BTL 1, does not show on the top display.

S 985-212

- (4) On engine fire extinguisher bottle number 2, push and hold the ground test pushbutton or turn and hold the ground test hex key clockwise.
 - (a) Make sure the yellow ENG BTL 2 DISCH light on the ENGINE FIRE Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, ENG BTL 2, shows on the top display.

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S 985-213

- (5) Release the ground test pushbutton or hex key.
 - (a) Make sure the yellow ENG BTL 2 DISCH light goes off.
 - (b) Make sure the EICAS message, ENG BTL 2, does not show on the top display.

F. Do a test of the Extinguisher Bottle Squib Test Circuit

S 715-012

- (1) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green ENG L (1 and 2) and ENG R (1 and 2) squib test lights come on.

S 865-094

- (2) Release the TEST switch.
 - (a) Make sure the green ENG L (1 and 2) and ENG R (1 and 2) squib test lights go off.

S 865-017

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-21-00-735-201

3. System Test

A. General

- (1) The engine fire extinguishing system has two identical fire bottles located in the forward of the aft cargo compartment, an engine fire control panel, and a squib test panel. The extinguishing plumbing is connected to the left and right engine, which lets each engine receive extinguishing agent from either bottle. Each engine has an independently operated fire extinguishing system.

B. Equipment

- (1) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-187 (Recommended)
- (2) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-165 (Alternative)

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- (3) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-174 (Alternative)

NOTE: The A26001 test boxes do not include the test adapters. Refer to the A26001 drawing for the required test adapter cables.

- (4) Squib protective caps
(a) M83723/60-112-AN or AC
(b) M83723/60-110-AN or AC
(c) M83723/60-210-AN or AC
(d) M83723/60-108-AN or AC
- (5) Voltmeter - 28 vdc
(6) Resistor - 10 kohms or greater
(7) MULTIMETER-0-1000 VDC +/- 1%, 0-750 AC, 0-2 AMPS, 0-2 MEGOHMS - (commercially available)
- C. References
(1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
(2) AMM 24-22-00/201, Electrical Power Control
- D. Access
(1) Location Zones
153 Aft Cargo Compartment (Left)
154 Aft Cargo Compartment (Right)
- (2) Access Panels
822 Aft Cargo Compartment Door
- E. Prepare For Test

S 765-284

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 865-018

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

S 865-019

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

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- (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 025-020

- (4) At engine fire extinguisher bottles 1 and 2, disconnect these electrical connectors from the discharge squibs per Table 501:

TABLE 501 Engine Fire Bottle Connections	
Connector	Bottle Connected To:
D2188	B17, BTL1 - Left Engine Discharge Squib
D2190	B17, BTL1 - Right Engine Discharge Squib
D2266	B18, BTL2 - Right Engine Discharge Squib
D2268	B18, BTL2 - Left Engine Discharge Squib

S 435-197

WARNING: PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLES CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (5) Put the protective caps on all the fire bottle squibs.

S 865-022

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 735-023

- (7) On the SQUIB TEST Control Panel, P61, push the L ENG (1 and 2) and R ENG (1 and 2) squib test lights.
 - (a) Make sure the green squib test lights come on.

S 745-101

- (8) Make sure the six EICAS circuit breakers on the P11 panel are closed.

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F. Do a test of the Extinguisher Bottle Squib Discharge Circuit

S 865-105

- (1) On the control stand panel, P10, set the L and R FUEL CONTROL switches to the RUN position.

S 865-104

- (2) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 495-150

- (3) Attach the adapter cable to the connector on the squib circuit test box.

NOTE: Adapter cables are included with the squib circuit test box. The appropriate adapter cable must be attached to match the electrical connectors from the squibs.

S 425-204

WARNING: DO NOT INSTALL THE ELECTRICAL CONNECTORS TO THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY CAN OCCUR.

- (4) Connect the bottle 1 left engine squib connector, D2188, to the squib circuit test box adapter cable.

S 485-106

- (5) Connect the multimeter to the squib test box.

S 865-107

- (6) Set the LOAD CHECK switch on the squib circuit test box to the ON position.

S 865-108

- (7) On the ENGINE FIRE Control Panel, P8, pull the LEFT engine fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle. When you turn the fire handles, it is necessary to hold the handles against the stops while the voltage is measured.

- (a) Make sure the EICAS message, L ENG SHUTDOWN, shows on the top display.
- (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- (c) Make sure the multimeter on the squib circuit test box shows 0 \pm 2 volts.

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S 865-114

- (8) Turn and hold the LEFT engine fire handle fully counterclockwise to the DISCH 1 position.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
 - (b) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-111

- (9) Open this circuit breaker on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 765-110

- (10) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 765-109

- (11) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts.

S 865-127

- (12) Close this circuit breaker on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (c) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 215-153

- (13) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 215-154

- (14) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 745-126

- (15) Release the LEFT engine fire handle.
- (a) Make sure the fire handle moves quickly toward center about 10 degrees.
 - (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

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(c) Make sure the multimeter on the squib circuit test box shows 0 \pm 2 volts.

S 865-125

(16) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 025-124

(17) Disconnect the bottle 1 left engine squib connector, D2188, from the squib test box adapter cable.

S 425-123

(18) Connect the bottle 2 left engine squib connector, D2268, to the squib test box adapter cable.

S 865-122

(19) Set the LOAD CHECK switch on the squib circuit test box to the ON position.

S 865-121

(20) Turn and hold the LEFT engine fire handle fully clockwise to the DISCH 2 position.

(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

(b) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-118

(21) Open this circuit breaker on the P6 panel:

(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

(b) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 765-138

(22) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 765-137

(23) Make sure the multimeter on the squib circuit test box shows 0 \pm 2 volts.

S 865-136

(24) Close this circuit breaker on the P6 panel:

(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

(b) 6H2, FIRE EXTINGUISHING ENG L BTL 2

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S 215-157

- (25) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 215-158

- (26) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 745-135

- (27) Release the LEFT engine fire handle.
- (a) Make sure the fire handle moves quickly toward center about 10 degrees.
 - (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
 - (c) Make sure the multimeter on the squib circuit test box shows 0 \pm 2 volts.

S 865-134

- (28) Put the LEFT engine fire handle to the usual (vertical) position.
- (a) Make sure the EICAS message, L ENG SHUTDOWN, does not show on the top display.

S 865-132

- (29) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 025-131

- (30) Disconnect the bottle 2 left engine squib connector, D2268, from the squib circuit test box adapter cable.

S 425-130

- (31) Connect the bottle 1 right engine squib connector, D2190, to the squib circuit test box adapter cable.

S 865-129

- (32) Set the LOAD CHECK switch on the squib circuit test box to the ON position.

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S 865-128

- (33) On the ENGINE FIRE Control Panel, P8, pull the RIGHT engine fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle. When you turn the fire handles, it is necessary to hold the handles against the stops during the voltage measure.

- (a) Make sure the EICAS message, R ENG SHUTDOWN, shows on the top display.
- (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- (c) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts.

S 865-144

- (34) Turn and hold the RIGHT engine fire handle fully counterclockwise to the DISCH 1 position.

- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
- (b) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-222

- (35) Open this circuit breaker on the P6 panel:

- (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (b) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 765-141

- (36) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 865-140

- (37) Make sure the multimeter on squib circuit test box shows 0 ± 2 volts.

S 865-139

- (38) Close this circuit breaker on the P6 panel:

- (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (b) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 215-139

- (39) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

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S 215-140

- (40) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-207

- (41) Release the RIGHT engine fire handle.
- (a) Make sure the fire handle moves quickly toward center about 10 degrees.
 - (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
 - (c) Make sure the multimeter on squib test circuit box shows 0 ± 2 volts.

S 865-208

- (42) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 025-150

- (43) Disconnect the bottle 1 right engine squib connector, D2190, from the squib circuit test box adapter cable.

S 425-149

- (44) Connect the bottle 2 right engine squib connector, D2266, to the squib circuit test box adapter cable.

S 865-149

- (45) Set the LOAD CHECK switch on the squib circuit test box to the ON position.

S 865-205

- (46) Turn and hold the RIGHT engine fire handle fully clockwise to the DISCH 2 position.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
 - (b) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-223

- (47) Open these circuit breakers on the P6 panel:
- (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (b) 6H4, FIRE EXTINGUISHING ENG R BTL 2

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S 215-159

- (48) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 215-160

- (49) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts.

S 865-210

- (50) Close these circuit breakers on the P6 panel:
(a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
(b) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 215-145

- (51) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 215-146

- (52) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-157

- (53) Release the RIGHT engine fire handle.
(a) Make sure the fire handle moves quickly toward center about 10 degrees.
(b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
(c) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts.

S 865-209

- (54) Put the RIGHT engine fire handle to the usual (vertical) position.
(a) Make sure the EICAS message, R ENG SHUTDOWN, does not show on the top display.

S 865-154

- (55) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 025-153

- (56) Disconnect the bottle 2 right engine squib connector, D2266, from the squib circuit test box adapter cable.

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S 025-282

- (57) On the control stand panel, P10, set the L and R FUEL CONTROL switches to the CUTOFF position.

G. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 435-198

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

(a) Remove the protective cover from the fire bottle squib.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

(b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10k ohm resistor across the meter to remove any stray voltage from the electrical connector.

(c) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

4) Connect the electrical connector to the fire bottle squib.

H. Connect the Squib Connectors

S 865-025

- (1) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:

(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

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- (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 865-026

- (2) Make sure these circuit breakers on the P11 panel are closed:
 - (a) 11A32, IND LTS CKT 1
 - (b) 11A33, IND LTS CKT 2

S 425-027

- (3) Do the Squib Electrical Connection procedure to connect the electrical connector, D2188, to the left squib of bottle 1.

S 865-029

- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

S 865-030

- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green L ENG 1 squib test light on the SQUIB TEST Control Panel, P61, comes on.
 - (b) Make sure the R ENG 1, L ENG 2, and R ENG 2 squib test lights stay off.

S 865-034

- (6) Release the TEST switch.
 - (a) Make sure the L ENG 1 squib test light goes off.

S 865-036

- (7) Make sure this circuit breaker on the P6 panel is open:
 - (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

S 425-037

- (8) Do the Squib Electrical Connection procedure to connect the electrical connector, D2190, to the right squib of bottle 1.

S 865-038

- (9) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

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- S 865-039
- (10) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green L ENG 1 and R ENG 1 squib test lights on the SQUIB TEST Control Panel, P61, come on.
 - (b) Make sure the L ENG 2 and R ENG 2 squib test lights stay off.
- S 865-045
- (11) Release the TEST switch.
- (a) Make sure the L ENG 1 and R ENG 1 squib test lights go off.
- S 865-047
- (12) Make sure this circuit breaker on the P6 panel is open:
- (a) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- S 425-048
- (13) Do the Squib Electrical Connection procedure to connect the electrical connector, D2268, to the left squib of bottle 2.
- S 865-049
- (14) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- S 865-050
- (15) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green L ENG 1, R ENG 1, and L ENG 2 squib test lights on the SQUIB TEST Control Panel, P61, come on.
 - (b) Make sure the R ENG 2 squib test light stays off.
- S 865-054
- (16) Release the TEST switch.
- (a) Make sure the L ENG 1, R ENG 1, and L ENG 2 squib test lights go off.
- S 865-060
- (17) Make sure this circuit breaker on the P6 panel is open:
- (a) 6H4, FIRE EXTINGUISHING ENG R BTL 2
- S 425-061
- (18) Do the Squib Electrical Connection procedure to connect the electrical connector, D2266, to the right squib of bottle 2.
- S 865-062
- (19) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H4, FIRE EXTINGUISHING ENG R BTL 2

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S 865-063

- (20) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
(a) Make sure the green L ENG (1 and 2) and R ENG (1 and 2) squib test lights on the SQUIB TEST Control Panel, P61, come on.

S 865-067

- (21) Release the TEST switch.
(a) Make sure that all the squib test lights go off.

S 715-221

- (22) Do the Operational Test.
I. Put the airplane back to its usual condition.

S 865-138

- (1) Remove electrical power if it is not necessary (Ref 24-22-00).

TASK 26-21-00-725-202

4. Fire Extinguisher Discharge Lines System Test

A. General

- (1) The engine fire extinguishing system has two identical fire bottles located in the forward of the aft cargo compartment, an engine fire control panel, and a squib test panel. The extinguishing plumbing is connected to the left and right engine, which lets each engine receive extinguishing agent from either bottle. Each engine has an independently operated fire extinguishing system.

B. Equipment

- (1) Pneumatic Air Source (capable of supplying 40 psig minimum dry air)
(2) Test Equipment - Engine Fire Extinguisher System - B26003-3
(3) Gage 0-200 psig (certified) with minimum 1 psig increments and .25% accuracy (commercially available)

C. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices

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D. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

E. Prepare for Test

S 765-285

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 865-161

- (2) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

F. Test Fire Extinguisher Discharge Lines (Figure 502)

S 435-071

- (1) On the left and right engine struts, cap the nozzles (2) with the clamp or plug from the test equipment (figure 502).

S 025-072

- (2) Disconnect the left engine discharge line at bottle 1.

S 485-073

- (3) Install the regulator from the test equipment, and pressure gage to the discharge line.

S 025-074

- (4) Disconnect the left engine discharge line at bottle 2.

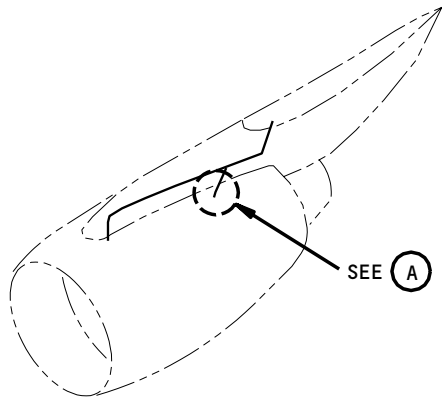
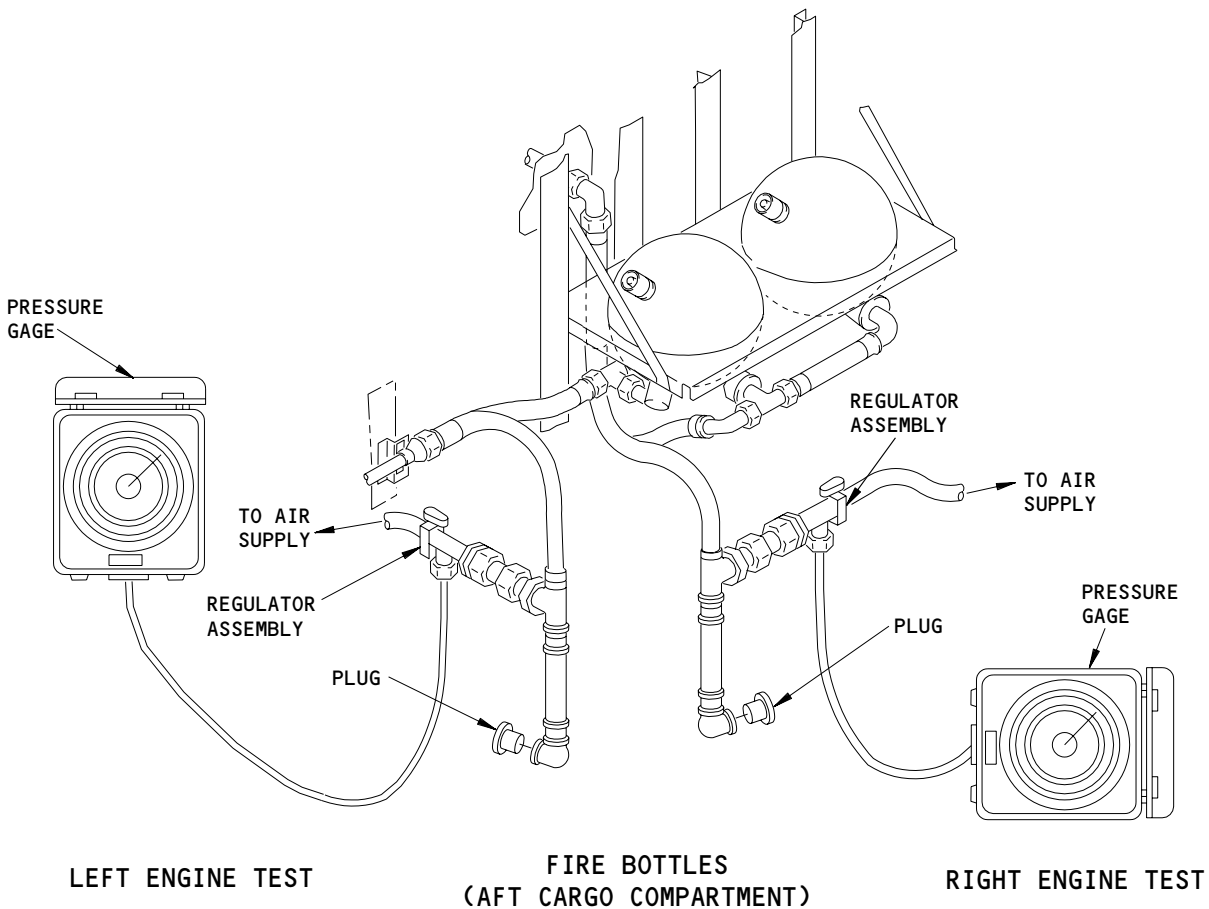
S 025-225

- (5) Install the plug in the bottle 2 discharge line.

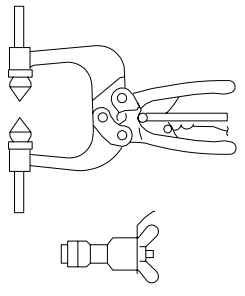
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ENGINE AND STRUT
(LEFT OR RIGHT)



CLAMP AND
PLUG ASSEMBLY
(A)

Pressure Test Setup
Figure 502

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S 485-075

- (6) Connect the dry air source to the regulator.

S 785-206

CAUTION: APPLY PRESSURE ONLY TO TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO DISCHARGE PORTS CAN OCCUR.

- (7) Apply 50 ±5 psig pressure to the left engine discharge line until the air pressure becomes stable.

S 785-077

- (8) Isolate the air pressure supply from the left engine discharge line.

S 785-078

- (9) After 2 minutes, make sure that the left engine discharge line pressure does not decrease more than 1 psig.

S 785-079

- (10) Release the air pressure from the regulator.

S 785-289

- (11) Remove the clamp or plug from the distribution nozzles.

S 785-287

- (12) Apply 50 ±5 psig pressure to the left engine discharge line until the air pressure becomes stable.

S 785-288

- (13) At the underside of the strut, make sure that air flows freely from the aft and fwd left discharge nozzles.

S 865-162

- (14) Remove the regulator and plug, and connect the left engine discharge lines to fire bottles 1 and 2.

S 785-080

- (15) Do the above steps again for the right engine discharge line.

S 435-086

- (16) Connect the right engine discharge lines to fire bottles 1 and 2.

G. Put the Airplane Back to Its Usual Condition.

S 865-082

- (1) Make sure these circuit breakers on the P6 panel are closed:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

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ENGINE FIRE EXTINGUISHER BOTTLE/DISCHARGE CARTRIDGE – REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Remove the Engine Fire Extinguisher Bottle Discharge Cartridge
- (2) Install the Applicable Discharge Cartridge (Squib)
- (3) Remove the Engine Fire Extinguisher Bottle 1 or 2 (as applicable)
- (4) Install the Engine Fire Extinguisher Bottle 1 or 2 (as applicable)

TASK 26-21-01-004-001

2. Remove the Engine Fire Extinguisher Bottle Discharge Cartridge

A. General

- (1) The two engine fire extinguisher bottles are in the front of the aft cargo compartment. Each fire extinguisher bottle has two discharge cartridges (squibs). The removal/installation procedure is the same for both bottles and squibs.

B. Equipment

- (1) Squib Protective Cap
 - M83723/60-210-AN or AC (Engine or APU)
 - M83723/60-112-AN or AC (Engine or APU)
 - M83723/60-18-AN or AC (Engine or APU)
 - M83723/60-110-AN or AC (Engine or APU)

C. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices

D. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

E. Remove the Applicable Discharge Cartridge (Squib) (Fig. 401)

S 764-193

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-10-33/401).

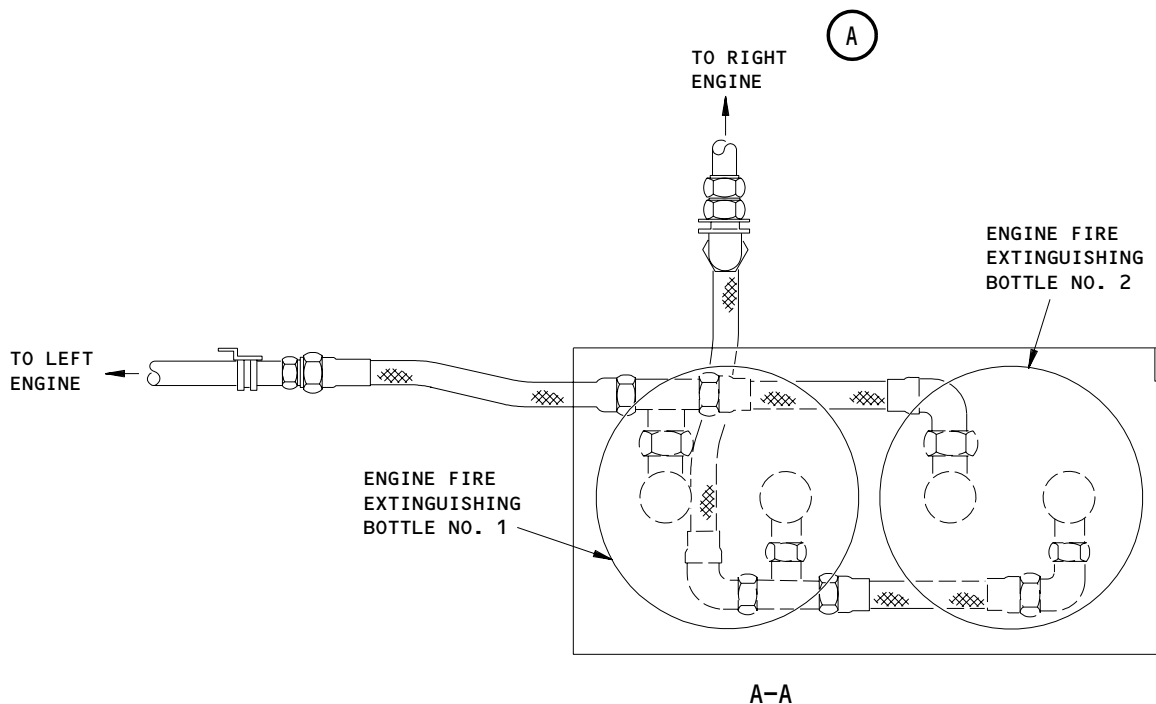
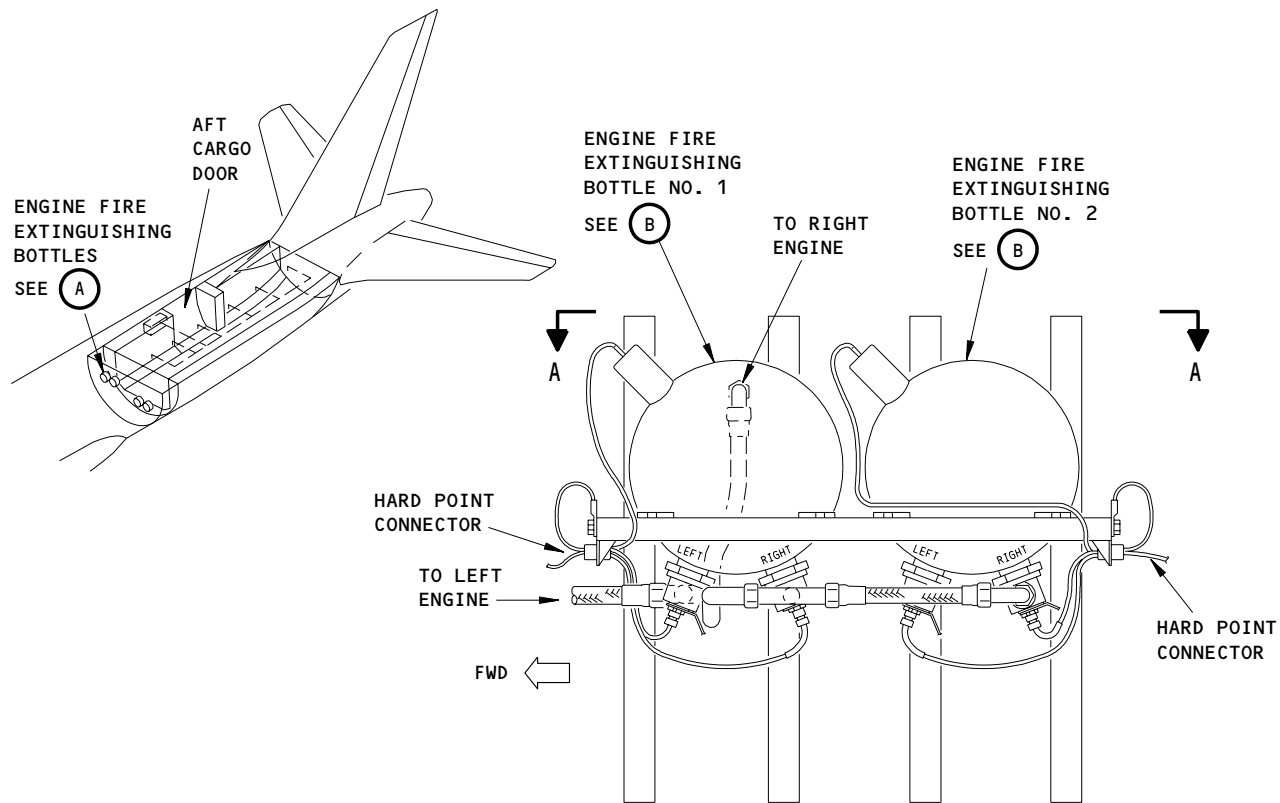
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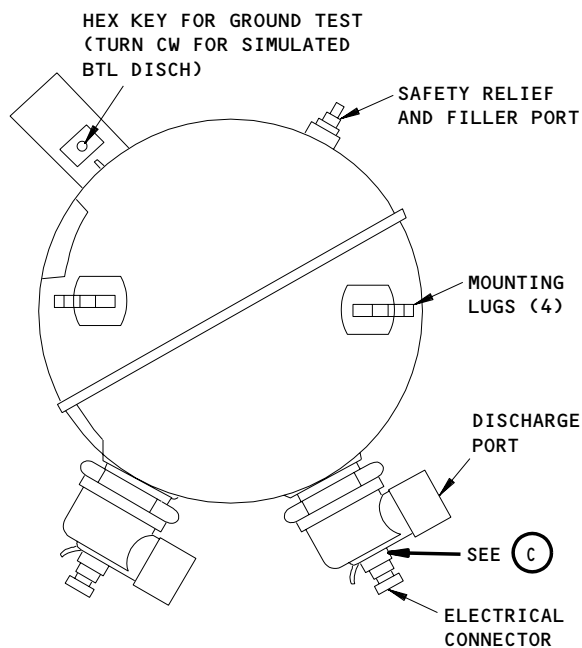
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Engine Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 401 (Sheet 1)

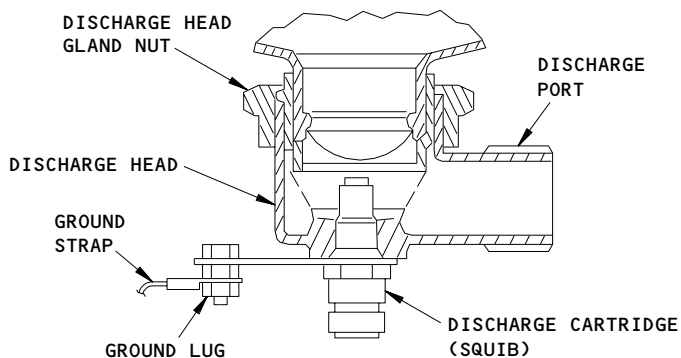
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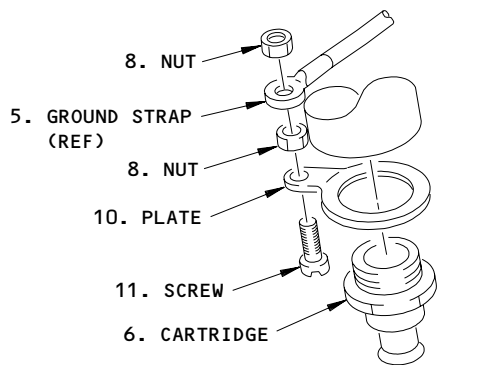


ENGINE FIRE BOTTLE (EXAMPLE)

(B)



(C)



GROUND LUG ASSEMBLY

(D)

Engine Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 401 (Sheet 2)

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S 864-002

- (2) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 034-003

- (3) Disconnect the electrical connector from the applicable squib (Ref Table 401).

S 434-116

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (4) Put a protective cap on the fire bottle squib.

S 014-005

- (5) Turn and remove the squib.

TASK 26-21-01-404-006

3. Install the Applicable Discharge Cartridge (Squib) (Fig. 401)

A. General

- (1) The two engine fire extinguisher bottles are in the front of the aft cargo compartment. Each fire extinguisher bottle has two discharge cartridges (squibs). The removal/installation procedure is the same for both bottles and squibs.

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- B. Equipment
 - (1) Voltmeter – with a 10k ohm or greater resistance
 - (2) Resistor – 10 kohms or greater
- C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Fire Extinguisher Bottle	26-21-01	50	1
	6	Cartridge			30
	8	Nut (2)			15
	10	Washer – GND			10
	11	Screw			5

- D. Reference
 - (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
 - (2) AMM 24-22-00/201, Electrical Power – Control

- E. Access
 - (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
 - (2) Access Panels
 - 822 Aft Cargo Compartment Door

F. Install the component.

S 764-194

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 434-007

- (2) Install the squib.

S 434-008

- (3) Tighten the squib to 90-100 pound-inches.

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S 434-117

- (4) Do the steps that follow to connect an electrical connector to a fire bottle squib.
- (a) If a protective cap is installed, remove the protective cap.

CAUTION: IF A SHUNT PLUG IS INSTALLED, PULL THE SHUNT PLUG STRAIGHT OFF THE FIRE BOTTLE SQUIB. IF YOU TWIST OR WIGGLE THE SHUNT PLUG, YOU CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (b) If a shunt plug is installed, pull the shunt plug straight off the squib and discard the shunt plug.

NOTE: Shunt plugs should not be used to cover the fire bottle squibs because they can cause damage to the squib pins.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (d) Make sure the squib pins are not bent or damaged.
(e) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (f) Connect the electrical connector to the applicable squib. Refer to Table 401.

- (g) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.

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3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

4) Connect the electrical connector to the fire bottle squib.

G. Test the installation of the squib.

S 864-013

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

S 864-014

(2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
- (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 984-016

(3) Push the TEST switch on the SQUIB TEST Control Panel on the right side panel, P61.

(a) Make sure the green L ENG 1 and 2 and R ENG 1 and 2 squib test lights come on.

S 984-132

(4) Release the TEST switch.

(a) Make sure the squib test lights go off.

S 864-025

(5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-21-01-004-026

4. Remove the Engine Fire Extinguisher Bottle 1 or 2 (as applicable) (Fig. 401)

A. General

(1) The two engine fire extinguisher bottles are in the front of the aft cargo compartment. Each fire extinguisher bottle has two discharge cartridges (squibs). The removal/installation procedure is the same for both bottles and squibs.

B. Equipment

(1) Discharge Port Cap - (Supplied with fire extinguisher bottles)

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- (2) Squib Protective Cap
 - M83723/60-210-AN or AC (Engine or APU)
 - M83723/60-112-AN or AC (Engine or APU)
 - M83723/60-18-AN or AC (Engine or APU)
 - M83723/60-110-AN or AC (Engine or APU)

C. Reference

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power - Control

D. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)

- (2) Access Panels

- 822 Aft Cargo Compartment Door

E. Remove the component.

S 764-195

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 864-027

- (2) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) For bottle 1:
 - 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 2) 6H3, FIRE EXTINGUISHING ENG R BTL 1

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- (b) For bottle 2:
- 1) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - 2) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 034-028

- (3) Disconnect the electrical connectors from the applicable bottle squibs and pressure switch. Refer to Table 401.

Table 401
Engine Fire Bottle Connections

CONNECTOR	IS CONNECTED TO BOTTLE
D2186 D2188 D2190	B17, Bottle 1 - Pressure Switch B17, Bottle 1 - Left Engine Discharge Squib B17, Bottle 1 - Right Engine Discharge Squib
D2270 D2268 D2266	B18, Bottle 2 - Pressure Switch B18, Bottle 2 - Left Engine Discharge Squib B18, Bottle 2 - Right Engine Discharge Squib

S 434-118

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (4) Put a protective cap on the fire bottle squibs.

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S 034-031

- (5) Remove the ground strap from the bottle ground lug, if it is installed.

NOTE: Ground straps are not installed on all airplanes. Some fire extinguishing bottles are grounded through the bottle mounting flange.

S 034-032

- (6) Disconnect the discharge hoses.

S 434-033

- (7) Install the discharge port caps on the bottle discharge ports.

S 034-034

- (8) Remove the nuts and bolts (four places) from the mounting lugs.

S 024-035

- (9) Remove the extinguisher bottle.

TASK 26-21-01-404-036

5. Install the Engine Fire Extinguisher Bottle 1 or 2 (as applicable) (Fig. 401)

A. General

- (1) The two engine fire extinguisher bottles are in the front of the aft cargo compartment. Each fire extinguisher bottle has two discharge cartridges (squibs). The removal/installation procedure is the same for both bottles and squibs.

B. Equipment

- (1) Voltmeter - with a 10k ohm or greater resistance

C. Consumable Materials

- (1) Use one of these corrosion inhibiting compounds:
(a) D50004 - Compound - Antiseize, BMS 3-28 (preferred)
(b) C00913 - Compound - Nondrying Resin Mix Corrosion Inhibiting, BMS 3-27 (alternative)

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(c) G50136 - Paste - Corrosion Inhibiting, Non-drying, BMS 3-38 (alternative)

D. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Fire Extinguisher Bottle	26-21-03	01	96
	6	Cartridge			103C
	8	Nut (2)			102
	10	Washer - GND			103F
	11	Screw			102E

E. Reference

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power - Control

F. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

G. Install the component.

S 764-196

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

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S 214-037

WARNING: DO NOT TOUCH THE BOTTLE WHEN THE DISCHARGE PORTS ARE EXPOSED. KEEP CAPS ON THE PORTS. DO NOT LET THE BOTTLE HIT THE AIRPLANE. BE CAREFUL NOT TO DAMAGE THE BOTTLE. IF THE BOTTLE IS ACCIDENTALLY DISCHARGED, IT CAN CAUSE INJURY TO PERSONS.

- (2) Before you install the bottle, make sure that its weight is $+0/-0.1$ pounds from the weight shown on the bottle. (If you install a bottle from storage, and do not do this check, obey the conditions in the next step).

NOTE: The measured weight of the bottle includes the charged bottle, the inspection tag on the bottle and the swivel assemblies. If the squib cartridge is not installed on the fire extinguisher bottle, do not install it. Weigh the squib cartridges as loose parts. Include the weight of the squib cartridges in the measured weight. If the squib cartridges are installed, weigh the bottle with the cartridges installed. Remove all protective caps when the parts are weighed.

S 214-160

- (3) If you install a fire bottle from storage, obey these conditions if you do not do the bottle-weight check:
- (a) Make sure that the bottle weight was measured, was in limits, and that the weight was recorded before it was put in storage.
 - (b) Make sure that the bottle was in storage for less than five years.
 - (c) Make sure that the bottle assembly has no dents, scratches, or other damage.

S 434-124

- (4) If the discharge cartridge is not installed on the fire extinguisher bottle, do the procedure to install the discharge cartridge (squib).

S 434-038

- (5) Set the bottle mounting lugs on the support bracket.

S 434-039

- (6) Install the mounting nuts and bolts (four places).

S 824-040

- (7) Loosen the discharge head gland nut and move the discharge heads to give the best access to the hose connections.

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S 624-192

- (8) Apply a layer of BMS 3-28 (preferred) to the outlet threads, outlet end, and outlet inner diameter where the tube assembly attaches to the discharge head.

(a) BMS 3-27 or BMS 3-38 are also acceptable alternatives as anti-corrosion compounds to use in this location.

S 434-041

- (9) Remove the discharge port caps and connect the discharge hoses to the ports. Refer to the outlet identification decal above each discharge outlet.

S 434-042

- (10) Tighten the gland nuts to 45-55 pound-feet.

S 434-043

- (11) Attach a lockwire to the gland nut on the discharge head.

S 434-044

- (12) Install the ground strap to the ground lugs, if it was removed.

NOTE: Ground straps are not installed on all airplanes. Some fire extinguishing bottles are grounded through the bottle mounting flange.

S 434-047

- (13) Install the electrical connector to the applicable bottle pressure switch. Refer to Table 401.

H. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 434-119

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

(a) If a protective cap is installed, remove the protective cap.

CAUTION: IF A SHUNT PLUG IS INSTALLED, PULL THE SHUNT PLUG STRAIGHT OFF THE FIRE BOTTLE SQUIB. IF YOU TWIST OR WIGGLE THE SHUNT PLUG, YOU CAN CAUSE DAMAGE TO THE SQUIB PINS.

(b) If a shunt plug is installed, pull the shunt plug straight off the squib and discard the shunt plug.

NOTE: Shunt plugs should not be used to cover the fire bottle squibs because they can cause damage to the squib pins.

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WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (d) Make sure the squib pins are not bent or damaged.
(e) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (f) Connect the electrical connector to the fire bottle squib.
(g) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- 4) Connect the electrical connector to the fire bottle squib.

I. Connect the squib electrical connectors to fire extinguisher bottle 1, if applicable.

S 864-048

- (1) Make sure these circuit breakers on the P6 panel are open:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 434-120

- (2) Do the Squib Electrical Connection procedure to connect the electrical connector, D2188, to the left squib of bottle 1.

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- S 864-050
- (3) Supply electrical power (AMM 24-22-00/201).
- S 864-051
- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
- S 984-052
- (5) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.
- (a) Make sure the green L ENG 1 squib test light on the SQUIB TEST Control Panel comes on.
- (b) Make sure the R ENG 1, L ENG 2, and R ENG 2 squib test lights stay off.
- S 214-056
- (6) Release the TEST switch.
- (a) Make sure the L ENG 1 squib test light goes off.
- S 864-179
- (7) Make sure this circuit breaker on the P6 panel is open:
- (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- S 434-060
- (8) Do the Squib Electrical Connection procedure to connect the electrical connector, D2190, to the right squib of bottle 1.
- S 864-061
- (9) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- S 984-063
- (10) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.
- (a) Make sure the green L ENG 1 and R ENG 1 squib test lights on the SQUIB TEST Control Panel come on.

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(b) Make sure the L ENG 2 and R ENG 2 squib test lights stay off.

S 214-066

(11) Release the TEST switch.

(a) Make sure the L ENG 1 and R ENG 1 squib test lights go off.

S 864-182

(12) Make sure this circuit breaker on the P6 panel is open:

(a) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 424-183

(13) Do the Squib Electrical Connection procedure to connect the electrical connector, D2268, to the left squib of bottle 2.

S 864-184

(14) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:

(a) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 864-185

(15) On the SQUIB TEST Control Panel, P61, push and hold the test switch.

(a) Make sure the L ENG 1, R ENG 1, and L ENG 2 squib test lights on the SQUIB TEST Control Panel, P61, come on.

(b) Make sure the R ENG 2 squib test light stays off.

S 864-186

(16) Release the TEST switch.

(a) Make sure the L ENG 1, R ENG 1, and L ENG 2 squib test lights go off.

S 864-187

(17) Make sure this circuit breaker on the P6 Panel is open:

(a) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 424-188

(18) Do the Squib Electrical Connection procedure to connect the electrical connector, D2266, to the right squib of bottle 2.

S 864-189

(19) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:

(a) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 984-074

(20) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.

(a) Make sure the L ENG 1, L ENG 2, R ENG 1, and R ENG 2 squib test lights on the SQUIB Test Control Panel, P61, come on.

S 214-078

(21) Release the TEST switch.

(a) Make sure that all the squib test lights go off.

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J. Do a test of the fire extinguisher bottle installation:

S 864-089

- (1) Make sure these circuit breakers on the P6 panel are closed:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 984-090

- (2) Push the TEST switch on the SQUIB TEST Control Panel, P61.
 - (a) Make sure the green L ENG 1 and 2 and R ENG 1 and 2 squib test lights come on.
 - (b) Release the TEST switch.
 - (c) Make sure the squib test lights go off.

S 214-097

- (3) Insert a hex key in the key receptacle on the bottle and turn it clockwise.
 - (a) Make sure the yellow ENG BTL 1 or 2 (as applicable) DISCH light on the ENGINE FIRE Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, ENG BTL 1 or 2 (as applicable), shows on the top display.

S 214-099

- (4) Release the hex key.
 - (a) Make sure the ENG BTL 1 or 2 DISCH light goes off.
 - (b) Make sure the ENG BTL 1 or 2 (as applicable) EICAS message does not show.

S 864-101

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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ENGINE FIRE CONTROL PANEL – REMOVAL/INSTALLATION

1. General

- A. The ENGINE FIRE Control Panel, M10443, is located on the aft pilots' control stand, P8.

TASK 26-21-02-004-071

2. Remove the ENGINE FIRE Control Panel (Fig. 401)

- A. Remove the component.

S 864-077

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6B3, GEN CONT UNIT APU
 - (b) 6C1, FUEL COND CONT L
 - (c) 6C2, FUEL COND CONT R
 - (d) 6E1, FUEL VALVE L SPAR
 - (e) 6E2, FUEL VALVE R SPAR
 - (f) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (g) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (h) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (i) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 864-078

- (2) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11A32, INDICATOR LIGHTS 1
 - (b) 11A33, INDICATOR LIGHTS 2
 - (c) 11B2, ISOL VALVE CONT
 - (d) 11B3, ISOL VALVE PWR
 - (e) 11B18, WARN ELEX B
 - (f) 11B19 or 11B20, FIRE DETECTION L ENGINE 1
 - (g) 11B20 or 11B21, FIRE DETECTION L ENGINE 2
 - (h) 11B21 or 11B22, FIRE DETECTION R ENGINE 1
 - (i) 11B22 or 11B23, FIRE DETECTION R ENGINE 2

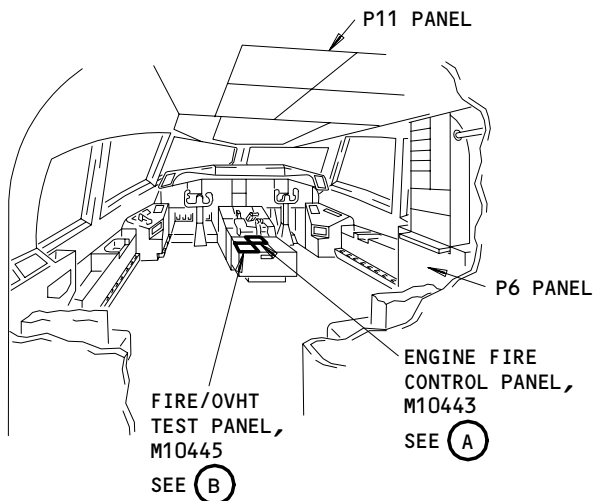
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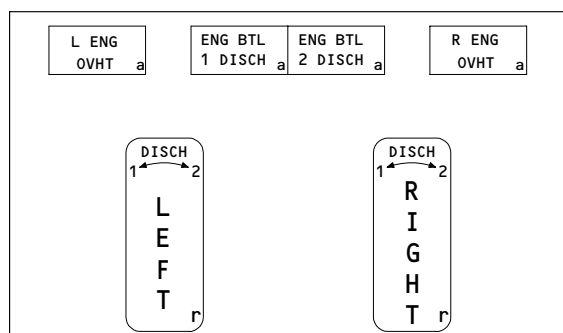
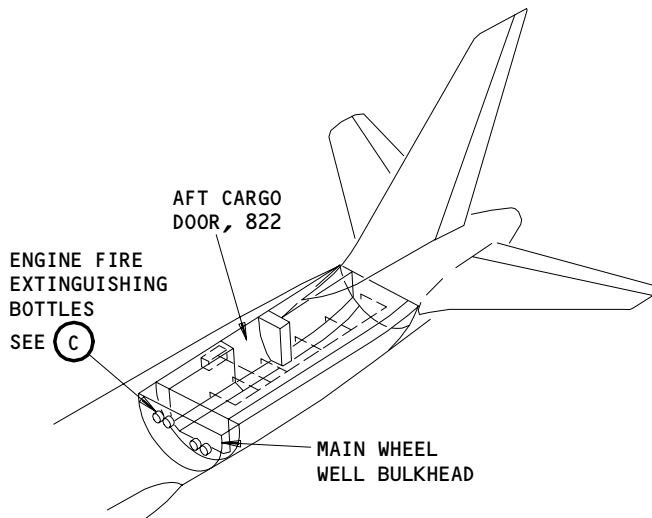
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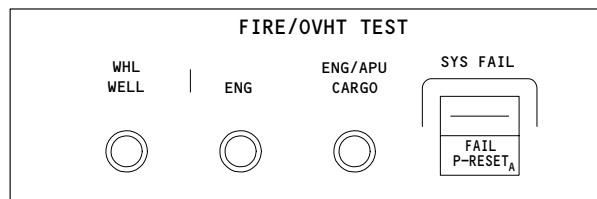


FLIGHT COMPARTMENT



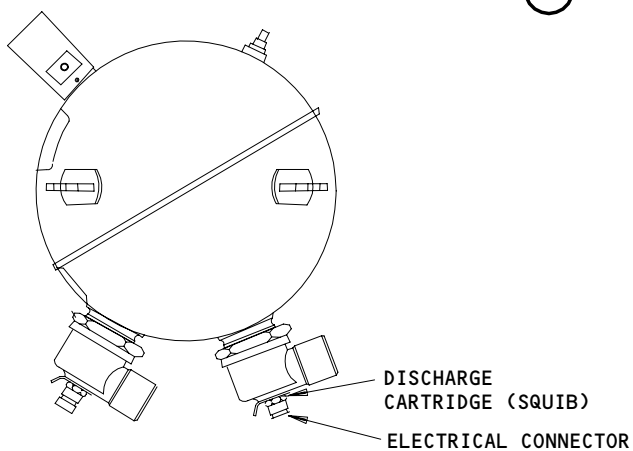
ENGINE FIRE CONTROL PANEL, M10443

(A)



FIRE/OVHT TEST PANEL, M10445

(B)



ENGINE FIRE EXT/DISCH CARTRIDGE BOTTLE

(C)

Engine Fire Control Panel Installation
Figure 401

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- (j) 11B23 or 11B24, FIRE DETECTION APU 1
- (k) 11B24 or 11B25, FIRE DETECTION APU 2
- (l) 11B25 or 11B26, FIRE DETECTION CARGO 1
- (m) 11B26 or 11B27, FIRE DETECTION CARGO 2
- (n) 11D28, HYDRAULICS ENG PUMP SUPPLY L or
HYDRAULICS ENG PUMP SOV L
- (o) 11D29, HYDRAULICS ENG PUMP SUPPLY R or
HYDRAULICS ENG PUMP SOV R
- (p) 11J24, FIRE DET ALTN PWR CARGO
- (q) 11J25, FIRE DET ALTN PWR APU
- (r) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (s) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
- (t) 11J33, WARN ELEX A
- (u) 11K6 or 11D11, L ENGINE T/R CONT
- (v) 11K14, L ENG PUMP VLV DEPRESS
- (w) 11K23, R ENG PUMP VLV DEPRESS
- (x) 11K33 or 11B30, R ENGINE T/R CONT
- (y) 11Q10, ENG BLEED L
- (z) 11Q19, ENG BLEED R

S 024-079

- (3) Remove the ENGINE FIRE Control Panel, M10443 (P8).

TASK 26-21-02-404-072

3. Install the ENGINE FIRE Control Panel

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 26-21-03/601, Engine Fire Switch

B. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

C. Install the component.

S 424-080

- (1) Install the ENGINE FIRE Control Panel, M10443 (P8).

S 864-081

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6B3, GEN CONT UNIT APU
 - (b) 6C1, FUEL COND CONT L
 - (c) 6C2, FUEL COND CONT R
 - (d) 6E1, FUEL VALVE L SPAR
 - (e) 6E2, FUEL VALVE R SPAR
 - (f) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (g) 6H2, FIRE EXTINGUISHING ENG L BTL 2

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- (h) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (i) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 864-082

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

- (a) 11A32, INDICATOR LIGHTS 1
- (b) 11A33, INDICATOR LIGHTS 2
- (c) 11B2, ISOL VALVE CONT
- (d) 11B3, ISOL VALVE PWR
- (e) 11B18, WARN ELEX B
- (f) 11B19 or 11B20, FIRE DETECTION L ENGINE 1
- (g) 11B20 or 11B21, FIRE DETECTION L ENGINE 2
- (h) 11B21 or 11B22, FIRE DETECTION R ENGINE 1
- (i) 11B22 or 11B23, FIRE DETECTION R ENGINE 2
- (j) 11B23 or 11B24, FIRE DETECTION APU 1
- (k) 11B24 or 11B25, FIRE DETECTION APU 2
- (l) 11B25 or 11B26, FIRE DETECTION CARGO 1
- (m) 11B26 or 11B27, FIRE DETECTION CARGO 2
- (n) 11D28, HYDRAULICS ENG PUMP SUPPLY L or
HYDRAULICS ENG PUMP SOV L
- (o) 11D29, HYDRAULICS ENG PUMP SUPPLY R or
HYDRAULICS ENG PUMP SOV R
- (p) 11J24, FIRE DET ALTN PWR CARGO
- (q) 11J25, FIRE DET ALTN PWR APU
- (r) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (s) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
- (t) 11J33, WARN ELEX A
- (u) 11K6 or 11D11, L ENGINE T/R CONT
- (v) 11K14, L ENG PUMP VLV DEPRESS
- (w) 11K23, R ENG PUMP VLV DEPRESS
- (x) 11K33 or 11B30, R ENGINE T/R CONT
- (y) 11Q10, ENG BLEED L
- (z) 11Q19, ENG BLEED R

- D. Use the ground test hex key to do a test of the ENGINE FIRE Control Panel installation.

S 864-083

- (1) Make sure these circuit breakers on the P6 panel are closed:

- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
- (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 864-084

- (2) Make sure this circuit breaker on the P11 panel is closed:

- (a) 11A33, INDICATOR LIGHTS 2

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- S 864-085
- (3) Open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
- (a) 11A32, INDICATOR LIGHTS 1
- S 984-086
- (4) Insert the hex key in the key receptacle on the pressure switch of the engine fire bottle 1 (B17).
- S 984-097
- (5) Turn the key clockwise and hold it.
- (a) Make sure the ENG BTL 1 DISCH light on the ENGINE FIRE Control Panel M10443 (P8) comes on.
- (b) Make sure the EICAS message, ENG BOTTLE 1, shows on the top display.
- S 984-088
- (6) Release the ground test hex key.
- (a) Make sure the ENG BTL 1 DISCH light goes off.
- (b) Make sure the EICAS message, ENG BOTTLE 1, is not shown on the top display.
- S 864-090
- (7) Open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
- (a) 11A33, INDICATOR LIGHTS 2
- S 864-091
- (8) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
- (a) 11A32, INDICATOR LIGHTS 1
- S 984-092
- (9) Insert the hex key in the key receptacle on the pressure switch on the engine fire bottle 2 (B18).
- S 984-098
- (10) Turn the key clockwise and hold it.
- (a) Make sure the ENG BTL 2 DISCH light on the ENGINE FIRE Control Panel M10443 (P8) comes on.
- (b) Make sure the EICAS message, ENG BOTTLE 2, shows on the top display.
- S 984-094
- (11) Release the ground test hex key.
- (a) Make sure the ENG BTL 2 DISCH light goes off.
- (b) Make sure the EICAS message, ENG BOTTLE 2, is not shown on the top display.

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S 864-096

- (12) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11A33, INDICATOR LIGHTS 2

S 914-099

- (13) Do the Engine Fire Switch Inspection Check (AMM 26-21-03/601).

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ENGINE FIRE SWITCH – INSPECTION CHECK

1. General

- A. This procedure does the operational checks of the engine fire switch to make sure the firing circuit is correct and the engine is isolated.
- B. This procedure contains a task. The task gives the operational checks of the engine fire switch functions.

TASK 26-21-03-206-001

2. Engine Fire Switch Operation Check (Fig. 601)

A. General

B. Equipment

- (1) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-187 (Recommended)
- (2) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-174 (Alternative)
- (3) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-165 (Alternative)

NOTE: The A26001 test boxes do not include the test adapter cables. The test adapter cables must be ordered separately. Refer to the A26001 drawing for the required cables.

- (4) Squib Protective Caps
 - M83723/60-112-AN or AC
 - M83723/60-110-AN or AC
 - M83723/60-210-AN or AC
 - M83723/60-18-AN or AC
- (5) Voltmeter – 28 vdc
- (6) Resistor – 10K ohm or greater
- (7) Multimeter 0-1000 VDC $\pm 1\%$, 0-750 VAC, 0-2 AMPS, 0-2 MEG OHMS (commercially available)

C. References

- (1) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power – Control (Apply Power)
- (3) AMM 29-11-00/201, Main Hydraulic Systems
- (4) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
- (5) AMM 71-00-00/201, Power Plant (Operating Procedures)
- (6) AMM 71-11-04/401, Fan Cowl Panels
- (7) AMM 77-12-03/201 Engine Speed Card (Simulated Engine Running)

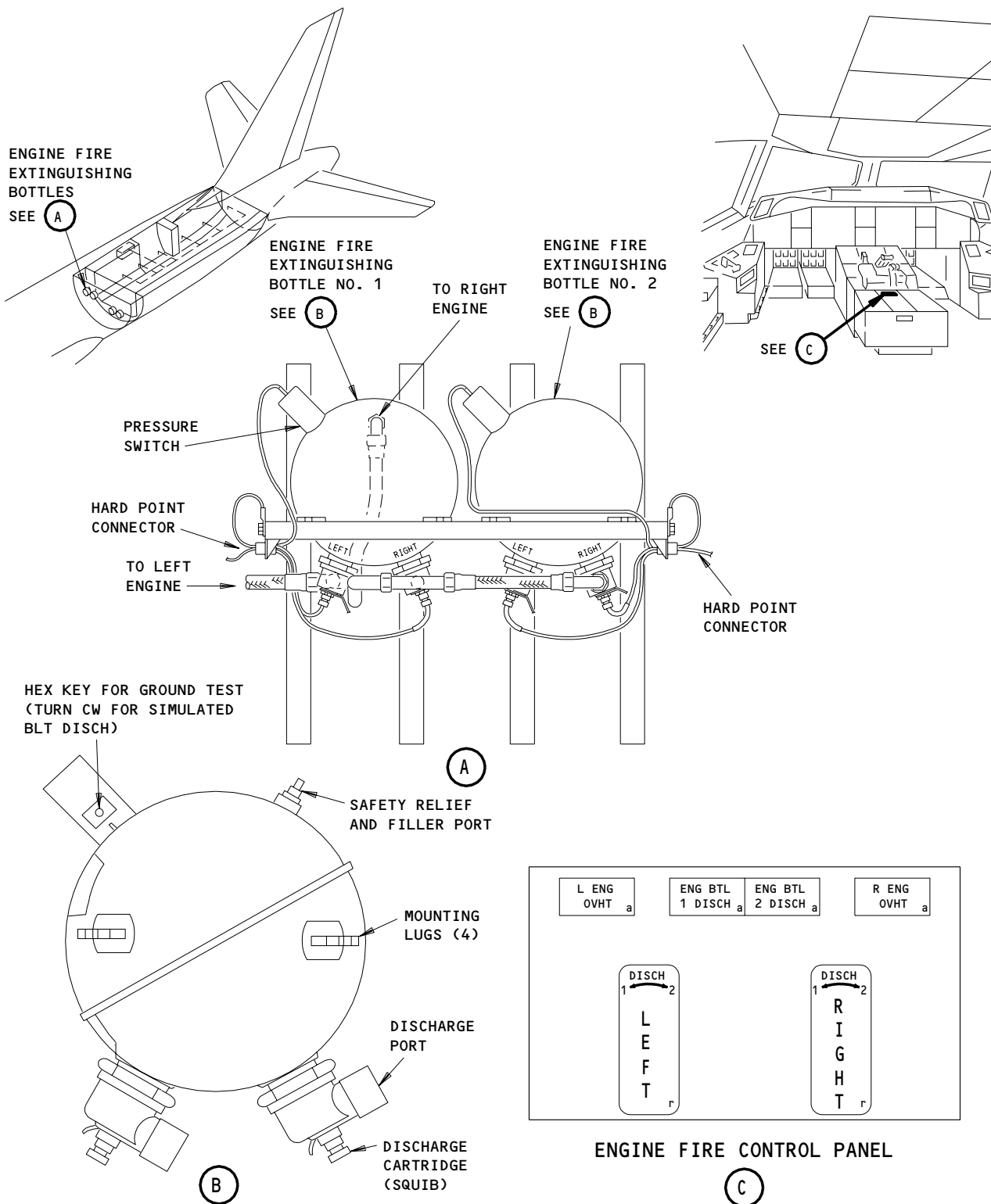
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Engine Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 601

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- (8) AMM 78-31-00/201, Thrust Reverser System
- D. Access
- (1) Location Zones
- 153/154 Aft Cargo Compartment
 - 400 Power Plants and Nacelle Struts
- (2) Access Panels
- 821 Forward Cargo Compartment Door
 - 822 Aft Cargo Compartment Door
 - 433HR Left Engine High Pressure Duct Door
 - 434AL Left Engine Hydraulics
 - 443BR Right Engine High Pressure Duct Door
 - 444AL Right Engine Hydraulics
- E. Prepare for Test

S 766-222

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 866-002

- (2) Supply Electrical Power (AMM 24-22-00/201).

S 866-003

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 036-004

- (4) At the engine fire extinguisher bottles, disconnect the connectors shown in the table that follows:

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Engine Fire Bottle Connections Table 601:

Connector	Bottle Connected to:
D2188	Bottle 1, B17, Left engine discharge squib
D2190	Bottle 1, B17, Right engine discharge squib
D2266	Bottle 2, B18, Right engine discharge squib
D2268	Bottle 2, B18, Left engine discharge squib

S 436-052

WARNING: PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLES CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

(5) Put the protective caps on all the fire bottle squibs.

F. Fire Switch Discharge Circuit Test

S 716-055

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

(1) Do the operational test that follows:

(a) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

- 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
- 2) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- 3) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- 4) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 986-085

(2) On the control stand panel, P10, set the L and R FUEL CONTROL switches to the RUN position.

S 866-086

(3) Set the LOAD CHECK switch on the squib test box to the OFF position.

S 486-027

(4) Attach the adapter cable to the connector on the squib test box.

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S 426-056

WARNING: DO NOT INSTALL THE ELECTRICAL CONNECTORS TO THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY CAN OCCUR.

- (5) Connect the bottle 1 left engine squib connector, D2188, to the squib test box adapter cable.

S 486-087

- (6) Connect the multimeter to the squib test box.

S 866-088

- (7) Set the LOAD CHECK switch on the squib test box to the ON position.

S 866-089

- (8) On the ENGINE FIRE Control Panel, P8, pull the LEFT engine fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle. When you turn the fire handles, it is necessary to hold the handles against the stops while the voltage is measured.

- (a) Make sure the EICAS message, L ENG SHUTDOWN, shows on the top display.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box stays off.
(c) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 866-090

- (9) Turn and hold the LEFT engine fire handle fully counterclockwise to the DISCH 1 position.

- (a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.
(b) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 866-091

- (10) Open this circuit breaker on the P6 panel:
(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

S 216-092

- (11) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

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S 216-093

- (12) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 866-094

- (13) Close this circuit breaker on the P6 panel:
(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

S 216-030

- (14) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

S 216-031

- (15) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 866-032

- (16) Release the LEFT engine fire handle.
(a) Make sure the fire handle moves quickly toward center about 10 degrees.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
(c) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 986-095

- (17) Set the LOAD CHECK switch on the squib test box to the OFF position.

S 026-096

- (18) Disconnect the bottle 1 left engine squib connector, D2188, from the squib test box adapter cable.

S 426-097

- (19) Connect the bottle 2 left engine squib connector, D2268, to the squib test box adapter cable.

S 866-098

- (20) Set the LOAD CHECK switch on the squib test box to the ON position.

S 866-099

- (21) Turn and hold the LEFT engine fire handle fully clockwise to the DISCH 2 position.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

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- (b) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 866-100

- (22) Open this circuit breaker on the P6 panel:
(a) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 766-101

- (23) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

S 216-102

- (24) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 866-103

- (25) Close this circuit breaker on the P6 panel:
(a) 6H2, FIRE EXTINGUISHING ENG L BTL 2

S 216-035

- (26) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

S 216-036

- (27) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 986-104

- (28) Release the LEFT engine fire handle.
(a) Make sure the fire handle moves quickly toward center about 10 degrees.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
(c) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 986-105

- (29) Put the LEFT engine fire handle to the usual (vertical) position.
(a) Make sure the EICAS message, L ENG SHUTDOWN, does not show on the top display.

S 986-106

- (30) Set the LOAD CHECK switch on the squib test box to the OFF position.

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S 026-107

- (31) Disconnect the bottle 2 left engine squib connector, D2268, from the squib test box adapter cable.

S 426-108

- (32) Connect the bottle 1 right engine squib connector, D2190, to the squib test box adapter cable.

S 986-109

- (33) Set the LOAD CHECK switch on the squib test box to the ON position.

S 866-110

- (34) On the ENGINE FIRE Control Panel, P8, pull the RIGHT engine fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle. When you turn the fire handles, it is necessary to hold the handles against the stops during the voltage measure.

- (a) Make sure the EICAS message, R ENG SHUTDOWN, shows on the top display.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box stays off.
(c) Make sure the multimeter on the squib test box shows 0 ± 2 volts.

S 866-111

- (35) Turn and hold the RIGHT engine fire handle fully counterclockwise to the DISCH 1 position.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.
(b) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 866-112

- (36) Open this circuit breaker on the P6 panel:
(a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

S 216-113

- (37) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

S 216-114

- (38) Make sure the multimeter on squib test box shows 0 ± 2 volts.

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S 866-115

- (39) Close this circuit breaker on the P6 panel:
(a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

S 216-039

- (40) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

S 216-040

- (41) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 986-116

- (42) Release the RIGHT engine fire handle.
(a) Make sure the fire handle moves quickly toward center about 10 degrees.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
(c) Make sure the multimeter on squib test box shows 0 ± 2 volts.

S 986-117

- (43) Set the LOAD CHECK switch on the squib test box to the OFF position.

S 026-118

- (44) Disconnect the bottle 1 right engine squib connector, D2190, from the squib test box adapter cable.

S 426-119

- (45) Connect the bottle 2 right engine squib connector, D2266, to the squib test box adapter cable.

S 986-120

- (46) Set the LOAD CHECK switch on the squib test box to the ON position.

S 866-079

- (47) Turn and hold the RIGHT engine fire handle fully clockwise to the DISCH 2 position.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.
(b) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

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- S 866-121
- (48) Open this circuit breaker on the P6 panel:
(a) 6H4, FIRE EXTINGUISHING ENG R BTL 2
- S 216-122
- (49) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
- S 766-123
- (50) Make sure the multimeter on the squib test box shows 0 ± 2 volts.
- S 866-124
- (51) Close this circuit breaker on the P6 panel:
(a) 6H4, FIRE EXTINGUISHING ENG R BTL 2
- S 216-043
- (52) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.
- S 216-044
- (53) Make sure the multimeter on the squib test box shows 16 volts minimum.
- NOTE:** If voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.
- S 986-125
- (54) Release the RIGHT engine fire handle.
(a) Make sure the fire handle moves quickly toward center about 10 degrees.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
(c) Make sure the multimeter on the squib test box shows 0 ± 2 volts.
- S 866-126
- (55) Put the RIGHT engine fire handle to the usual (vertical) position.
(a) Make sure the EICAS message, R ENG SHUTDOWN, does not show on the top display.
- S 866-127
- (56) Set the LOAD CHECK switch on the squib test box to the OFF position.
- S 026-128
- (57) Disconnect the bottle 2 right engine squib connector, D2266, from the squib test box adapter cable.

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S 866-221

(58) Set the fuel control switches to CUTOFF position.

G. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 436-054

(1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

(a) Remove the protective cap from the fire bottle squib.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

(b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10k ohm resistor across the meter to remove any stray voltage from the electrical connector.

(c) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

1) Disconnect the electrical connector from the fire bottle squib.

2) Make sure the squib pins are not bent or damaged.

3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

4) Connect the electrical connector to the fire bottle squib.

H. Connect the Squib Connectors

S 866-129

(1) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:

(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

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- (b) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- (c) 6H3, FIRE EXTINGUISHING ENG R BTL 1
- (d) 6H4, FIRE EXTINGUISHING ENG R BTL 2

S 866-130

- (2) Make sure these circuit breakers on the P11 panel are closed:
 - (a) 11A32, IND LTS CKT 1
 - (b) 11A33, IND LTS CKT 2

S 436-053

- (3) Do the Squib Electrical Connection procedure to connect the squib electrical connector, D2188, to the left squib of bottle 1.

S 866-131

- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

S 986-132

- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green L ENG 1 squib test light on the SQUIB TEST Control Panel, P61, comes on.
 - (b) Make sure the R ENG 1, L ENG 2, and R ENG 2 squib test lights stay off.

S 986-134

- (6) Release the TEST switch.
 - (a) Make sure the L ENG 1 squib test light goes off.

S 866-136

- (7) Make sure this circuit breaker on the P6 panel is open:
 - (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

S 916-137

- (8) Do the Squib Electrical Connection procedure to connect the squib electrical connector, D2190, to the right squib of bottle 1.

S 866-138

- (9) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6H3, FIRE EXTINGUISHING ENG R BTL 1

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- S 986-139
- (10) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green L ENG 1 and R ENG 1 squib test lights on the SQUIB TEST Control Panel, P61, come on.
 - (b) Make sure the L ENG 2 and R ENG 2 squib test lights stay off.
- S 986-141
- (11) Release the TEST switch.
- (a) Make sure the L ENG 1 and R ENG 1 squib test lights go off.
- S 866-143
- (12) Make sure this circuit breaker on the P6 panel is open:
- (a) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- S 916-144
- (13) Do the Squib Electrical Connection procedure to connect the squib electrical connector, D2268, to the left squib of bottle 2.
- S 866-145
- (14) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H2, FIRE EXTINGUISHING ENG L BTL 2
- S 986-146
- (15) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green L ENG 1, R ENG 1, and L ENG 2 squib test lights on the SQUIB TEST Control Panel, P61, come on.
 - (b) Make sure the R ENG 2 squib test light stays off.
- S 986-148
- (16) Release the TEST switch.
- (a) Make sure the L ENG 1, R ENG 1, and L ENG 2 squib test lights go off.
- S 866-150
- (17) Make sure this circuit breaker on the P6 panel is open:
- (a) 6H4, FIRE EXTINGUISHING ENG R BTL 2
- S 916-151
- (18) Do the Squib Electrical Connection procedure to connect the squib electrical connector, D2266, to the right squib of bottle 2.
- S 866-152
- (19) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H4, FIRE EXTINGUISHING ENG R BTL 2

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S 986-153

- (20) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
(a) Make sure the green L ENG (1 and 2) and R ENG (1 and 2) squib test lights on the SQUIB TEST Control Panel, P61, come on.

S 986-155

- (21) Release the TEST switch.
(a) Make sure that all the squib test lights go off.

I. Left and Right Generator Field Control Relay Operation During Switch Operation

S 716-162

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (1) AIRPLANES WITH FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;
do the operational check for the L ENG Fire Switch:
(a) Set the L GEN CONT switch on the pilots' Overhead panel P5 to the OFF (out) position.
1) Make sure the yellow OFF switch-light is on.
2) Make sure the white FIELD OFF light in the L GEN FIELD MANUAL RESET switch on the P61 panel is on.
(b) Push the L GEN FIELD MANUAL RESET switch (P61).
1) Make sure the FIELD OFF light goes off.
(c) Pull the L engine fire switch on the P8 panel.
1) Make sure the white FIELD OFF light comes on 5 seconds after the L fire switch is pulled.
(d) Push the L engine fire switch back to its usual position.
(e) Set the L GEN CONT switch on the pilot's Overhead panel P5 to the ON (in) position.
1) Make sure the white ON light on the L GEN CONT switch comes on.

S 716-163

- (2) AIRPLANES WITHOUT FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;
do the operational check for the L ENG Fire Switch:
(a) Open the fan cowl panels for the left engine (AMM 71-11-04/201).
(b) Disconnect the electrical connector D1396 from the Left Engine Integrated Drive Unit.
(c) Set the BAT Switch to OFF then ON.
(d) Set the STBY POWER Switch to AUTO.
1) Set the GEN CONT switch OFF (OUT), then ON (IN).
2) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 kohm.
(e) Pull the L ENG Fire Switch, on the P8 panel.
1) Make sure the resistance between pins 9 and 10 of the electrical connector is less than 250 ohms after 5 seconds.

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- (f) Push the L ENG Fire Switch to its normal position.
- (g) Set the GEN CONT switch OFF (OUT), then ON (IN).
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 kohm.
- (h) Connect the electrical connector D1396 to the Left Engine Integrated Drive Unit.
- (i) Close the fan cowl panels for the left engine (AMM 71-11-04/201).

S 716-165

- (3) AIRPLANES WITH FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;
do the operational check for the R ENG Fire Switch:
 - (a) Set the R GEN CONT switch on the pilots' Overhead panel P5 to the OFF (out) position.
 - 1) Make sure the yellow OFF switch-light is on.
 - 2) Make sure the white FIELD OFF light in the R GEN FIELD MANUAL RESET switch on the P61 panel is on.
 - (b) Push the R GEN FIELD MANUAL RESET switch (P61).
 - 1) Make sure the FIELD OFF light goes off.
 - (c) Pull the R engine fire switch on the P8 panel.
 - 1) Make sure the white FIELD OFF light comes on 5 seconds after the R fire switch is pulled.
 - (d) Push the R engine fire switch back to its usual position.
 - (e) Set the R GEN CONT switch on the pilot's Overhead panel P5 to the ON (in) position.
 - 1) Make sure the white ON light on the R GEN CONT switch comes on.

S 716-164

- (4) AIRPLANES WITHOUT FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;
do the operation check for the R ENG Fire Switch:
 - (a) Open the fan cowl panels for the right engine (AMM 71-11-04/201).
 - (b) Disconnect the electrical connector D1396 from the Right Engine Integrated Drive Unit.
 - (c) Set the BAT Switch to OFF then ON.
 - (d) Set the GEN CONT switch to OFF (OUT), then ON (IN).
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 kohm.
 - (e) Pull the R ENG Fire Switch, on the P8 panel.
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is less than 250 ohms.
 - (f) Push the R ENG Fire Switch to its normal position.
 - (g) Set the GEN CONT switch OFF (OUT), then ON (IN).
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 kohm.
 - (h) Connect the electrical connector D1396 to the Right Engine Integrated Drive Unit.
 - (i) Close the fan cowl panels for the right engine (AMM 71-11-04/201).

J. Hydraulic Supply Shutoff during the operation of the Fire Switch

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S 716-061

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

(1) Do the operational checks that follow:

- (a) Pull the LEFT fire handle on P8 panel, out to the emergency fire position.

NOTE: To pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

- (b) Open the aft strut hydraulic bay access door, 434AL left engine.
- (c) Make sure the EDP supply shutoff valve indicator (installed in the strut) moves to the CLOSE position.
- (d) Put back the LEFT fire handle to the usual position.
- (e) Make sure the EDP supply shutoff valve moves to the OPEN position.
- (f) Pull the RIGHT fire handle on the P8 panel, out to the emergency fire position.

NOTE: To pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

- (g) Open the aft strut hydraulic bay access door, 444AL right engine.
- (h) Make sure the EDP supply shutoff valve indicator (installed in the strut) moves to the CLOSE position.
- (i) Put back the RIGHT fire handle to the usual position.
- (j) Make sure the EDP supply shutoff valve moves to the OPEN position.

K. Engine Fuel Supply Shutoff during the Operation of the Fire Switch.

S 716-060

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

(1) Do the operational checks that follow:

- (a) Open these these circuit breakers on the P6 panel and attach a DO-NOT-CLOSE tag:
- 1) 6C1, FUEL COND CONT
 - 2) 6C2, FUEL COND CONT
- (b) Set the fuel control switch to RICH.

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- (c) Make sure the SPAR VALVE disagreement light on the P10 comes on and then goes off which shows the valve is open.
- (d) Pull the LEFT (RIGHT) fire handle on P8 out to the emergency fire position.

NOTE: To pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

- (e) Make sure the SPAR VALVE disagreement light on the P10 comes on and goes out which shows the valve is closed.
- (f) Put the FUEL CONTROL switch to the Cutoff position.
- (g) Put back the LEFT (RIGHT) fire handle to the usual position.
- (h) Remove the DO-NOT-CLOSE tags and close these circuit breaker on the P6 panel:
 - 1) 6C1, FUEL COND CONT
 - 2) 6C2, FUEL COND CONT

- L. Left Engine (Right Engine) Air Supply Shutoff during the operation of the Fire Switch.

S 866-063

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (1) Push the L (R) ENG BLEED AIR switch to the OFF position.

S 866-014

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

- (2) Deactivate the thrust reversers for the ground maintenance (AMM 78-31-00/201).

S 866-194

- (3) Simulate engines running (AMM 77-12-03/201).

S 016-012

- (4) Open the core cowl 417AL and 427AL.

S 416-080

- (5) Install a jumper wire between pins 1 and 2 of the Reverse Flow Check Controller connector D5272 (D5274).

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S 216-013

- (6) Do the operational checks that follow:
- (a) Push the L ENG BLEED AIR (R ENG BLEED AIR) switch to the on position (flow bar displayed).
 - 1) Make sure the PRSOV PILOT solenoid opens.
 - a) Listen for the solenoid to click and/or feel to see if the solenoid pin moves out.
 - (b) Pull the LEFT (RIGHT) fire handle on the P8 panel out to the emergency fire position.

NOTE: To pull fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

 - 1) Make sure the PRSOV PILOT solenoid closes.
 - a) Listen for the solenoid to click and/or feel to see if the solenoid pin moves in.
 - (c) Put back the LEFT (RIGHT) fire handle to the usual position.
 - (d) Stop simulated engines running (AMM 77-12-03/201).
 - (e) Remove the jumper wire between pins 1 and 2 of the Reverse Flow Check Controller connector D5272.
 - (f) Close strut access and pressure relief doors (AMM 06-43-00/201).

M. Engine Fuel Control Shutoff during the operation of the Fire Switch.

S 716-076

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (1) Do the operational checks that follow:
- (a) Do the wet motor engine procedure to the step in the procedure that sets the FUEL CONTROL switch to RUN and the ENG VALVE disagreement light comes on momentarily (AMM 71-00-00/201), then do the steps that follow:
 - 1) Pull the LEFT (RIGHT) fire handle on P8 out to the emergency fire position.

NOTE: To pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.
 - 2) Make sure the ENG VALVE disagreement light on P10 comes on and goes off which shows the valve is closed.
 - 3) Put back the fire handle to the usual position.

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- (b) Continue the wet motor engine procedure after the FUEL CONTROL switch is put back to the CUTOFF position to remove the remaining fuel.

N. Thrust Reverser (T/R) Power Shutoff during the operation of the Fire Switch.

NOTE: On airplanes with low oil pressure switch input to the thrust reverser isolation valve circuit, the thrust reverser override switch must be pushed and held for the duration of the check. The override switch is installed on the engine behind the Starter Control Valve access panel.

S 716-077

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (1) Supply hydraulic power (AMM 29-11-00/201).

S 716-084

- (2) Do the operational checks that follow:
 - (a) Put the L (R) thrust reverse lever in the DEPLOY position.
 - (b) Make sure the thrust reverser opens.
 - (c) Pull the LEFT (RIGHT) fire handle on the P8 panel out to the emergency fire position.

NOTE: To pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

- (d) Put the L (R) thrust reverse lever in the STOW position.
- (e) Make sure the thrust reverser does not close.

S 986-082

- (3) Put back the fire handle to the usual position.
 - (a) Make sure the thrust reverser closes.

S 866-158

- (4) Remove hydraulic power if it is not necessary (AMM 29-11-00/201).
- O. Flight Deck indications.

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S 866-078

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B20, FIRE DETECTION L ENGINE 1
 - (b) 11B21, FIRE DETECTION L ENGINE 2
 - (c) 11B22, FIRE DETECTION R ENGINE 1
 - (d) 11B23, FIRE DETECTION R ENGINE 2
 - (e) 11B24, FIRE DETECTION APU 1
 - (f) 11B25, FIRE DETECTION APU 2
 - (g) 11B26, CARGO SMOKE FIRE DET 1
 - (h) 11B27, CARGO SMOKE FIRE DET 2
 - (i) 11J24, FIRE DET ALTN PWR CARGO
 - (j) 11J25, FIRE DET ALTN PWR APU
 - (k) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (l) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

S 866-022

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Both circuit breakers must be closed at the same time.

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2

S 216-020

- (3) Do the operational checks that follow:
- (a) Try to pull the LEFT (RIGHT) engine fire handle (switch) on the ENGINE FIRE CONTROL panel (P8) out.
 - (b) Make sure the LEFT (RIGHT) handle is locked in position.
 - (c) Push the ECS/MSG switch on the EICAS maintenance panel (P61).

NOTE: To advance the EICAS pages, push the switch as necessary to make sure the messages are shown on EICAS panel (P2).

- (d) Push and hold the ENG/APU/CARGO test switch on the FIRE/OVHT TEST panel (P8).
- (e) Make sure these indications occur:
 - 1) The red FIRE light on the captain's instrument panel (P1-3) comes on.
 - 2) The red master WARNING lights on the glare shield panels (P7) come on.
 - 3) The LEFT engine fire handle and L ENG OVHT light on the ENGINE FIRE Control Panel (P8) come on.

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- 4) The red L FUEL CONTROL switch-light on the FUEL CONTROL panel (P10) comes on.
 - 5) The fire bell is heard through the flight deck aural warning speakers.
 - 6) The L ENGINE FIRE warning message and L ENG OVHT caution message are shown on the top EICAS display.
 - 7) Make sure these EICAS maintenance messages are shown on the bottom display:
 - a) L ENG FIRE LP 1
 - b) L ENG FIRE LP 2
 - c) L ENG OH LP 1
 - d) L ENG OH LP 2
- (f) Push the Master Caution Warning Switch.
 - 1) Make sure the fire bell on the flight deck aural warning speakers is not heard.
- (g) Pull but do not turn the LEFT engine fire handle on the ENGINE FIRE CONTROL panel (P8) out to the emergency fire position.
- (h) Push the LEFT engine fire handle on the ENGINE FIRE CONTROL panel back to the usual position.
- (i) Release the test switch on the FIRE/OVHT TEST panel (P8).
 - 1) Make sure the above indications stop.
- (j) Open these circuit breakers on the P11 panel, and attach DO-NOT-CLOSE tags:
 - 1) 11B20, FIRE DETECTION L ENGINE 1
 - 2) 11B21, FIRE DETECTION L ENGINE 2
- (k) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

NOTE: Both circuit breakers must be closed at the same time.

- 1) 11B22, FIRE DETECTION R ENGINE 1
 - 2) 11B23, FIRE DETECTION R ENGINE 2
- (l) Push and hold the ENG/APU/CARGO test switch on the FIRE/OVHT TEST panel (P8).
- (m) Make sure these indications occur:
 - 1) The red FIRE light on the captain's instrument panel (P1-3) comes on.
 - 2) The red master WARNING lights on the glare shield panels (P7) come on.
 - 3) The RIGHT engine fire handle and the R ENG OVHT light on the ENGINE FIRE CONTROL panel (P8) come on.
 - 4) The red R FUEL CONTROL switch-light on the FUEL CONTROL panel (P10) comes on.
 - 5) The fire bell is heard through the flight deck aural warning speakers.
 - 6) The R ENGINE FIRE warning message and R ENG OVHT caution message are shown on the top EICAS display (P2).
 - 7) Make sure these EICAS maintenance messages are shown on the bottom display.
 - a) R ENG FIRE LP 1

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- b) R ENG FIRE LP 2
- c) R ENG OH LP 1
- d) R ENG OH LP 2
- (n) Push the Master Caution Warning Switch.
 - 1) Make sure the fire bell on the flight deck aural warning speakers is not heard.
- (o) Pull but do not turn the RIGHT engine fire handle on the ENGINE FIRE Control Panel (P8) out to the emergency fire position.
- (p) Put the RIGHT engine fire handle on the ENGINE FIRE Control Panel back to the usual position.
- (q) Release the test switch on the FIRE/OVHT TEST Panel (P8).
 - 1) Make sure the above indications stop.
- (r) Remove DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - 1) 11B20, FIRE DETECTION L ENGINE 1
 - 2) 11B21, FIRE DETECTION L ENGINE 2
 - 3) 11B24, FIRE DETECTION APU 1
 - 4) 11B25, FIRE DETECTION APU 2
 - 5) 11B26, CARGO SMOKE FIRE DET 1
 - 6) 11B27, CARGO SMOKE FIRE DET 2
 - 7) 11J24, FIRE DET ALTN PWR CARGO
 - 8) 11J25, FIRE DET ALTN PWR APU
 - 9) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - 10) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

P. Restore Airplane To Normal

S 866-169

- (1) AIRPLANES WITH GENERATOR FIELD LIGHTS;
do this step.
 - (a) Push the L and R generator field reset switches on P61.
 - 1) Make sure the FIELD OFF switch-lights go off.

S 866-024

- (2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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SQUIB TEST CONTROL PANEL – REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks. The first task removes the SQUIB TEST Control Panel and the second task installs the panel and tests it.

TASK 26-21-04-024-015

2. Remove the SQUIB TEST Control Panel

A. General

- (1) The SQUIB TEST Control Panel, M10401, is on the right side panel, P61.

B. Reference

- (1) 24-22-00/201, Electrical Power – Control

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Remove the SQUIB TEST Control Panel

S 864-003

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6G1, FIRE EXT APU or FIRE EXT APU 1
 - (b) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (c) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (d) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (e) 6H4, FIRE EXTINGUISHING ENG R BTL 2
 - (f) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (g) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 024-004

- (2) Remove the SQUIB TEST Control Panel.

TASK 26-21-04-424-016

3. Install the Squib Test Control Panel

A. Reference

- (1) 24-22-00/201, Electrical Power – Control

B. Access

- (1) Location Zones
211/212 Flight Compartment

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C. Procedure

S 424-005

- (1) Install the SQUIB TEST Control Panel.

D. Test the SQUIB TEST Control Panel Installation

S 864-007

- (1) Supply electrical power (Ref 24-22-00).

S 864-012

- (2) Do the steps that follow:
 - (a) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.
 - 1) Make sure the green L ENG 1 squib test light on the SQUIB TEST Control Panel comes on.
 - 2) Make sure the R ENG 1, L ENG 2, and R ENG 2 squib test lights stay off.
 - (c) Release the TEST switch.
 - 1) Make sure the L ENG 1 squib test light goes off.
 - (d) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - 1) 6H4, FIRE EXTINGUISHING ENG R BTL 2
 - (e) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.
 - 1) Make sure the green L ENG 1 and R ENG 2 squib test lights on the SQUIB TEST Control Panel come on.
 - 2) Make sure the L ENG 2 and R ENG 1 squib test lights stay off.
 - (f) Release the TEST switch.
 - 1) Make sure the L ENG 1 and R ENG 2 squib test lights go off.
 - (g) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - 1) 6G1, FIRE EXT APU or FIRE EXT APU 1
 - 2) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - 3) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - 4) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - 5) 6H6, FIRE EXTINGUISHING CARGO BTL 2
 - (h) Push and hold the TEST switch on the SQUIB TEST Control Panel, P61.
 - 1) Make sure that all the green squib test lights come on.

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MAINTENANCE MANUAL

- (i) Release the TEST switch.
 - 1) Make sure that all the squib test lights go off.
- E. Put the Airplane back to its usual condition.

S 864-011

- (1) Remove electrical power if it is not necessary (Ref 24-22-00).

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SQUIB TEST CONTROL PANEL – INSPECTION/CHECK

1. General

- A. The SQUIB TEST Control Panel is installed on the P61 right side panel. The panel has one or two test switches to do a test of the fire extinguisher bottle squib cartridges.
- B. This procedure does a check of the lights and the squib for the engines, APU, and cargo fire extinguisher switches.

TASK 26-21-04-206-016

2. SQUIB TEST Control Panel Test (Fig. 601)

- A. Reference
 - (1) AMM 24-22-00/201, Electrical Power

- B. Access
 - (1) Location Zones
 - 211 Control Cabin (LH side)
 - 212 Control Cabin (RH side)

C. Prepare for Test

S 866-002

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

D. Do a Test of the SQUIB TEST Control Panel

S 866-027

- (1) Make sure these circuit breakers on the P6 panel are closed:
 - (a) 6G1, FIRE EXT APU or FIRE EXT APU 1
 - (b) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (c) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - (d) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - (e) 6H4, FIRE EXTINGUISHING ENG R BTL 2
 - (f) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (g) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 866-021

- (2) Push each squib test light on the SQUIB TEST Control Panel, P61, one at a time.
 - (a) Make sure that each squib test light comes on when pushed.

S 866-022

- (3) Push the TEST switch on the SQUIB TEST Control Panel.
 - (a) Make sure all the green squib test lights on the SQUIB TEST Control Panel come on.

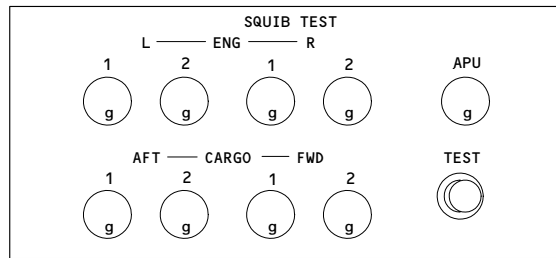
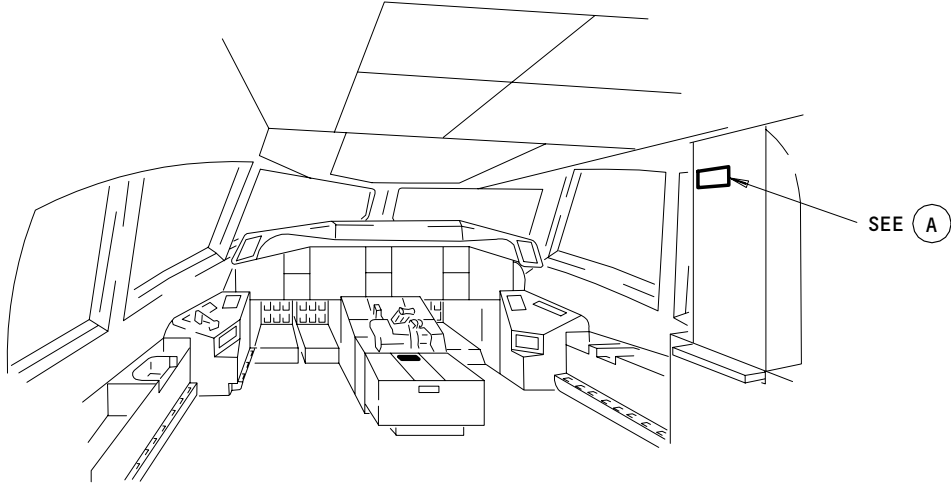
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SQUIB TEST PANEL

(A)

Squib Test Component Location
Figure 601

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- S 866-023
- (4) Release the TEST switch.
 - (a) Make sure all the squib test lights go off.
- E. Put the airplane back to its usual condition.
- S 866-019
- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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APU FIRE EXTINGUISHING SYSTEM – DESCRIPTION AND OPERATION

1. General

- A. The APU fire extinguishing system has controls in two locations that release one application of fire extinguishing agent to a fire in the APU compartment. The system has test capability.
- B. The APU fire extinguishing system includes the APU fire extinguisher bottle located forward of the APU firewall, the APU/CARGO fire control panel on pilots' aft control stand P8, the P62 APU shutdown remote control panel on the nosegear, and the squib test panel located on the P61 right side panel.
- C. The APU fire extinguishing system receives power from the 28 vdc hot battery bus, through a circuit breaker on main power distribution panel P6.
 - (1) The APU shutdown remote control panel P62 is located on the nose landing gear. P62 contains a red APU FIRE LIGHT, APU SHT DN/C.O. SWITCH, and APU BTL DISCH SWITCH. When a fire is detected in the APU compartment, the APU FIRE LIGHT comes on, and a warning horn sounds. Pressing APU SHT DN/CO shuts down the APU and arms the remote APU bottle discharge. Pressing APU BTL DISCH SWITCH discharges the APU fire bottle. If APU SHT DN/C.O. SWITCH is pressed, the APU remote fire indication power must be recycled OFF and ON to reset the system, otherwise fire horn is disabled.

2. Component Details (Fig. 1)

- A. APU Fire Extinguisher Bottle
 - (1) One APU fire extinguisher bottle is found forward of the APU fire wall on the lower right side. The extinguisher bottle includes a squib cartridge, pressure switch, and the combined safety relief and filler port.
 - (2) The squib cartridge located on the discharge valve, when detonated, ruptures a retaining disc in the valve releasing the extinguishing agent.
 - (3) The pressure switch detects a decrease in bottle pressure and activates the bottle discharge lights. The pressure switch can be tested using the manual override test hex key or the ground test pushbutton.
 - (4) The safety relief is a thermal expansion overpressure rupture disc. If bottle pressure is too high, the safety relief ruptures, allowing the bottle to discharge. The filler port is for introducing the extinguishing agent and pressurizing gas into the bottle.
 - (5) The extinguishing agent is bromotrifluoromethane (halon), and the pressurizing gas dry nitrogen. The agent leaves no residue when discharged.

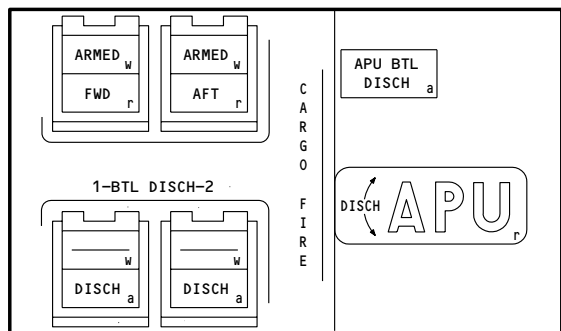
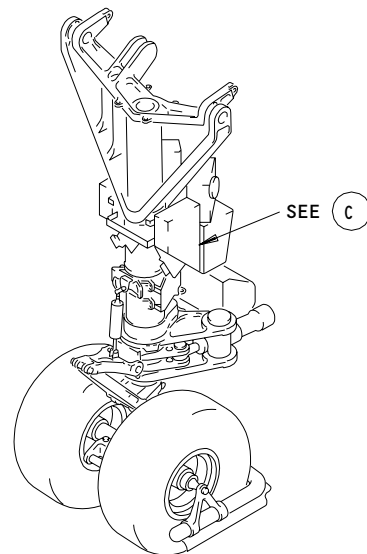
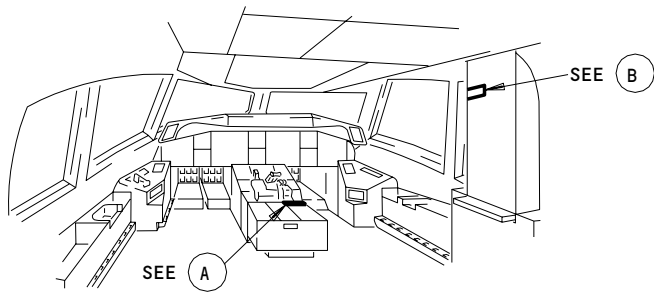
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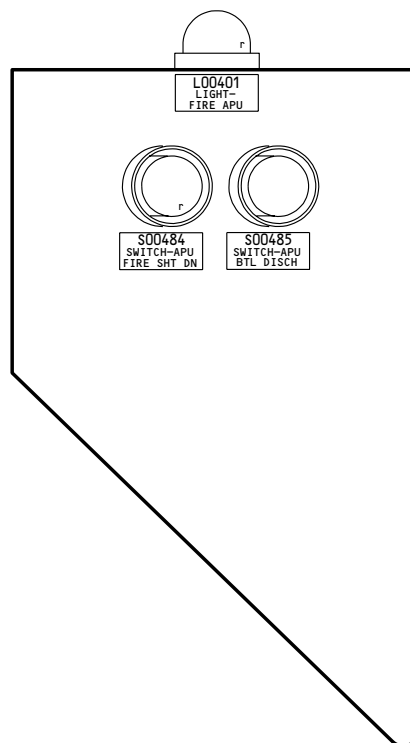
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APU AND CARGO FIRE CONTROL PANEL

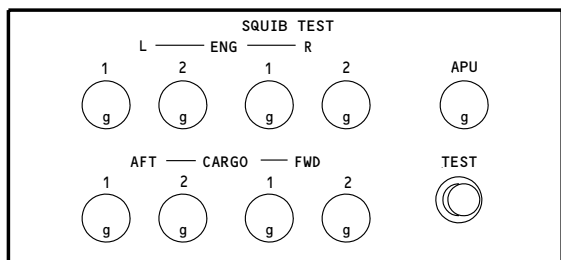
(A)

APU SHUTDOWN REMOTE CONTROL
PANEL P62 LOCATION



APU SHUTDOWN REMOTE CONTROL PANEL (P62)

(C)



SQUIB TEST CONTROL PANEL

(B)

APU Fire Extinguishing System Component Location
Figure 1 (Sheet 1)

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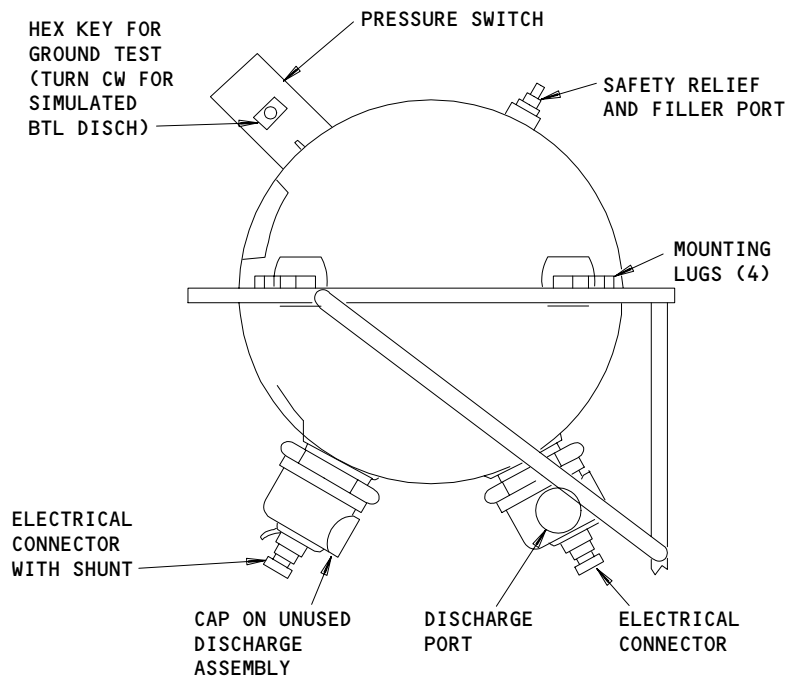
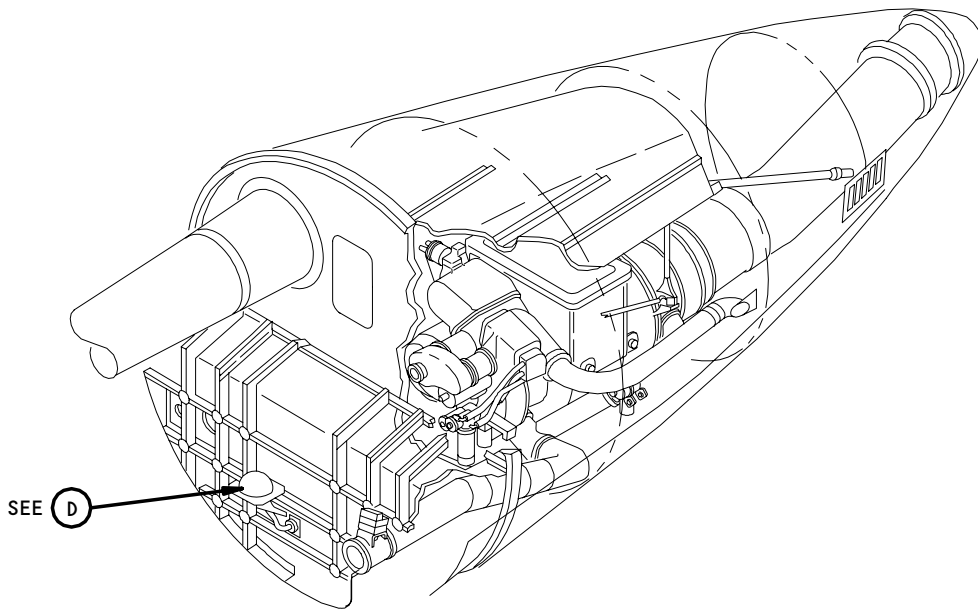
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APU FIRE EXTINGUISHER BOTTLE

(D)

APU Fire Extinguisher System Component Location
Figure 1 (Sheet 2)

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B. APU Fire Switch

- (1) The APU fire switch is located on the APU fire control panel at pilot's aft control stand P8. When a fire is detected in the APU compartment, the APU fire switch handle red warning light comes on. A solenoid energizes releasing a mechanical interlock on the fire switch handle shaft. When the mechanical interlock is released, the fire switch handle can be operated by pulling the handle out and rotating it. Rotating the handle releases the extinguishing agent. After rotation, the fire handle automatically returns to an off-center position. To push the handle back in it must be in the center horizontal position. The fire switch handle can be manually unlocked by pressing the button behind the handle.

C. APU Shutdown Remote Control Panel

- (1) The APU shutdown remote control panel P62 is located on the nose landing gear. P62 contains a red APU FIRE LIGHT, APU SHT DN/C. O. SWITCH, and APU BTL DISCH SWITCH. When a fire is detected in the APU compartment, the APU FIRE LIGHT comes on, and a warning horn sounds. Pressing APU SHT DN/CO switch shuts down the APU and arms the remote APU bottle discharge. Pressing APU BTL DISCH SWITCH, discharges the APU fire bottle. If APU SHT DN/C. O. SWITCH is pressed, the APU remote fire indication power must be recycled OFF and ON to reset the system, otherwise fire horn is disabled.

D. Squib Test Panel

- (1) The squib test panel is located on the P61 right side panel. The switches on the panel are used to check extinguisher bottle squib cartridges. When pressed, the TEST switch on the panel checks continuity of the squib cartridges. A green test light comes on for a successful test.

3. Operation (Fig. 2)

A. Functional Description

- (1) When a fire is detected in the APU compartment, the APU fire switch handle red warning light comes on and the fire warning bell sounds through the aural warning speakers. The red APU FIRE light on the P62 APU shutdown remote control panel also comes on.
- (2) After a fire is detected in the APU compartment, a solenoid energizes releasing a mechanical interlock on the fire switch handle shaft. The handle is then operable. The mechanical interlock is manually released by pressing the button located behind the fire handle.

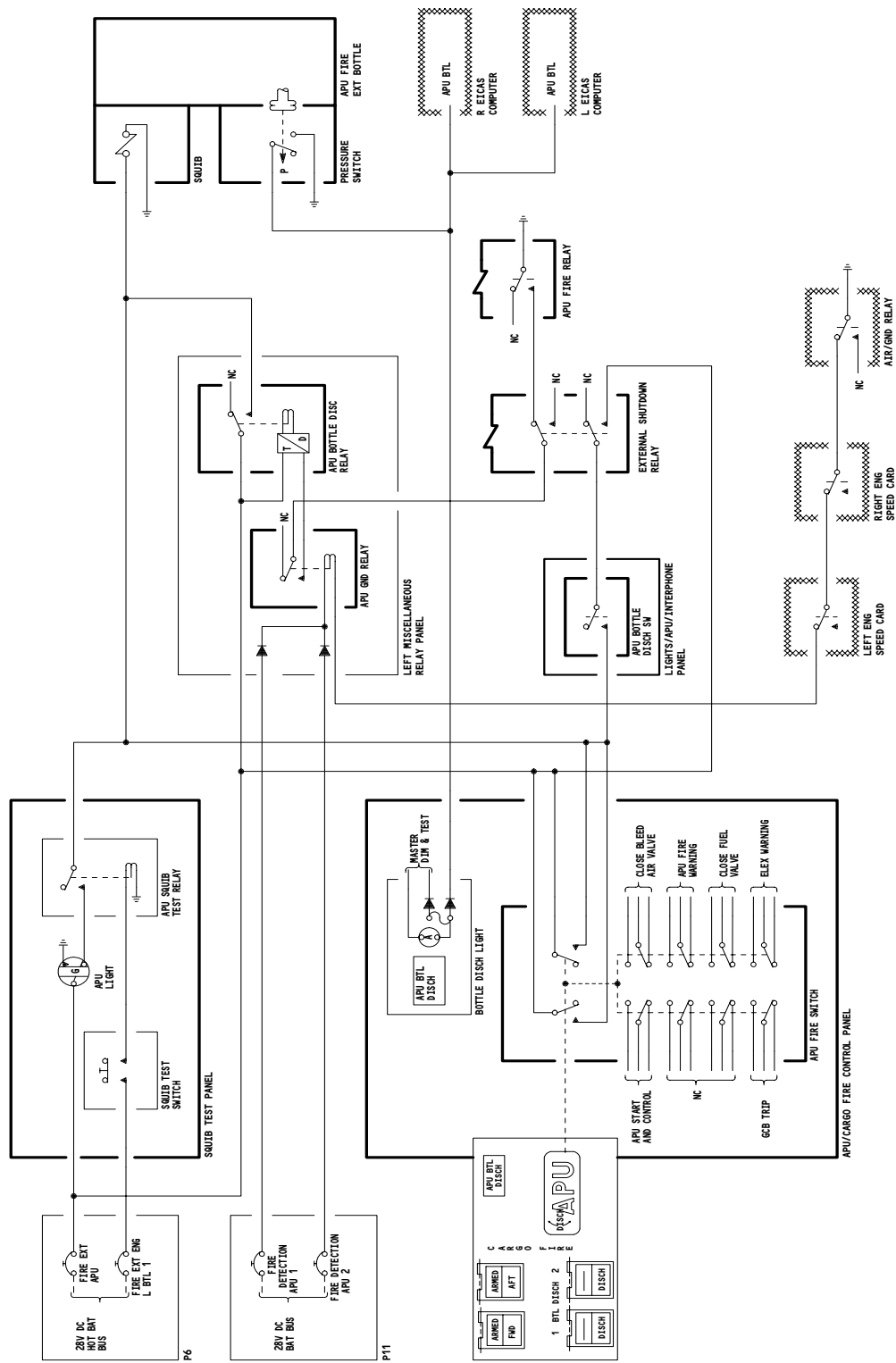
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APU Fire Extinguishing Schematic
Figure 2

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- (3) When the airplane is on the ground and a fire is detected, the APU will shut down and the fire extinguisher bottle will discharge automatically. When the airplane is in flight and a fire is detected, the APU will shut down automatically but the extinguisher bottle must be discharged manually.
 - (4) When the APU fire switch handle is pulled out, the APU automatically shuts down and the extinguishing bottle is armed. The following also happens: the APU generator field relay and generator circuit breaker are tripped; the APU fuel shut-off valve closes; the APU air supply valve closes; the fire bell shuts off; the external fire warning horn and APU fire light on P62 shut off.
 - (5) Extinguishing occurs when the APU fire handle is pulled out and rotated in either direction. After rotation of the handle, an electrical signal is applied to the squib cartridge of the extinguisher bottle. The electrical signal detonates the bottle squib producing a rupture in the retaining disc allowing the extinguishing agent to be released. The extinguishing agent runs to an outlet nozzle at the bottom of the APU fire wall and is discharged into the APU compartment.
 - (6) Decreasing bottle pressure, by discharge or leakage, activates the bottle pressure switch. The following occurs when a decrease in pressure is detected: the APU BTL DISCH light on APU/CARGO fire control panel P8 comes on, and a APU BTL DISCH message appears on the EICAS display.
- B. APU Extinguishing System Test
- (1) Squib Test
 - (a) The squib test control panel checks the integrity of extinguisher bottle squibs. Pressing the TEST switch sends a signal to the squib discharge cartridge. If the squib and circuit continuity are good, the green APU light on the panel will come on.
 - (2) Pressure Switch Test
 - (a) Manually activating the bottle pressure switch tests discharge light circuit continuity. When the manual override test hex key is turned 1/4 turn clockwise or the ground test pushbutton is pressed and held, the amber APU BTL DISCH light comes on and a APU BTL DISCH message appears on the EICAS display indicating a successful test.
- C. Control
- (1) To place the system in operation; provide electrical power (AMM 24-22-00/201, Electrical Power Control)
 - (2) Check that the following P6 panel circuit breakers are closed:
 - (a) 6G1, FIRE EXT APU
 - (b) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (3) Check that the following P11 panel circuit breakers are closed:
 - (a) 11B24, FIRE DETECTION APU 1
 - (b) 11B25, FIRE DETECTION APU 2
 - (c) 11B33, APU REMOTE FIRE IND

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APU FIRE EXTINGUISHING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
BOTTLE DISCH/CARTRIDGE - APU FIRE EXT	2	1	313AL, B25	26-22-01
CIRCUIT BREAKER	1		FLT COMPT, P6	
FIRE EXT APU, C780		1	6G1	*
FIRE EXTINGUISHING ENG L BTL 1, C778		1	6H1	
CIRCUIT BREAKER			FLT COMPT, P11	
FIRE DETECTION APU 1, C776		1	11B24	
FIRE DETECTION APU 2, C785		1	11B25	*
COMPUTER - (REF 31-41-00, FIG. 101)				*
EICAS L, M10181				
EICAS R, M10182				
LIGHT - APU, YQML5	2	1	FLT COMPT, M10401	*
LIGHT - APU BTL DISCH, YQPL1	1	1	FLT COMPT, M10444	*
PANEL - APU CARGO FIRE CONTROL, M10444	1	1	FLT COMPT, P8	*
PANEL - (REF 26-21-00, FIG. 101)				
SQUIB TEST CONTROL, M10401				
RELAY - (REF 31-01-36, FIG. 101)				
AIR/GND, K145				
APU BOTTLE DISC, K10336				
APU FIRE, K10334				
APU GND RELAY, K10373				
APU SQUIB TEST, K3				
RELAY - (REF 31-01-33, FIG. 101)				
EXTERNAL SHUTDOWN, K421				
SPEED CARD - (REF 77-12-00, FIG. 101)				
LEFT ENG, M10298				
RIGHT ENG, M10311				
SWITCH - APU BOTTLE DISCH, S485	2	1	NOSE LANDING GEAR, P62	*
SWITCH - APU FIRE, S39	1	1	FLT COMPT, M10444	26-22-03
SWITCH - SQUIB TEST, YQMS1	2	1	FLT COMPT, M10401	*

* SEE WM EQUIPMENT LIST

Component Index
Figure 101

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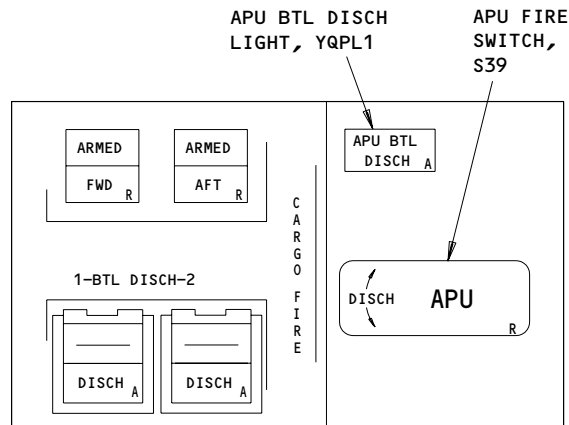
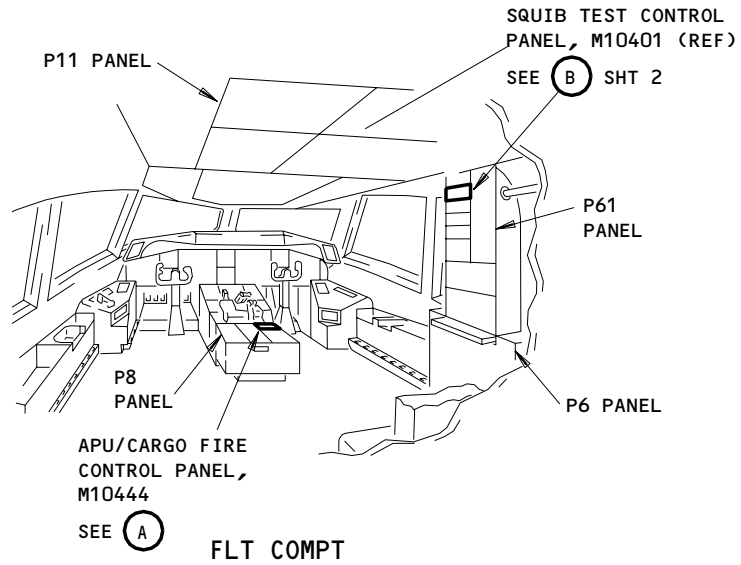
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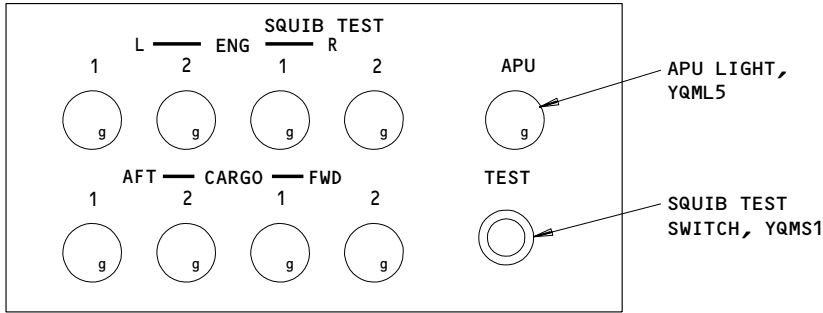
APU/CARGO FIRE CONTROL PANEL, M10444

(A)

Component Location
Figure 102 (Sheet 1)

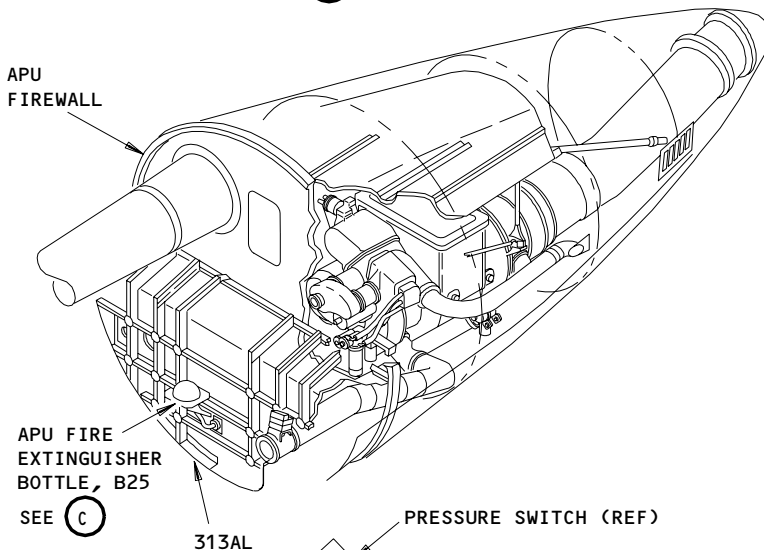
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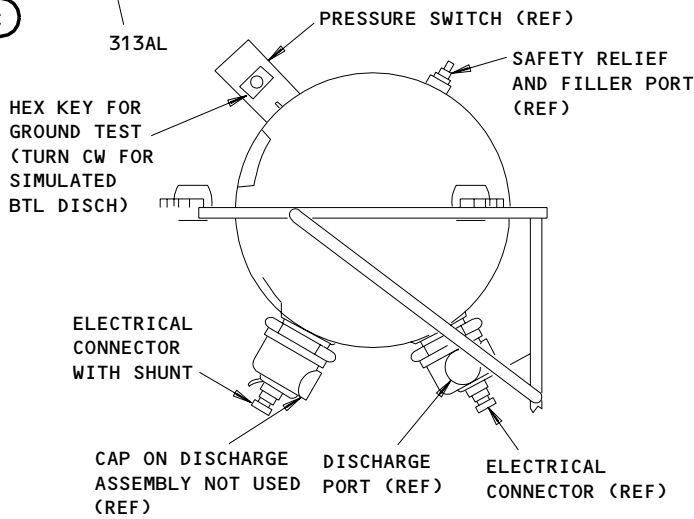


SQUIB TEST CONTROL PANEL, M10401 (REF)

(A) FROM SHT 1

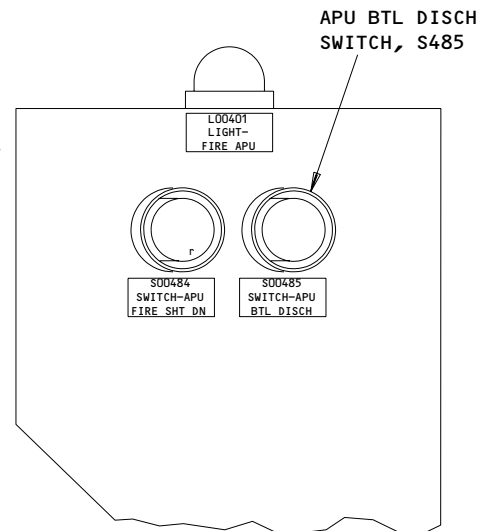
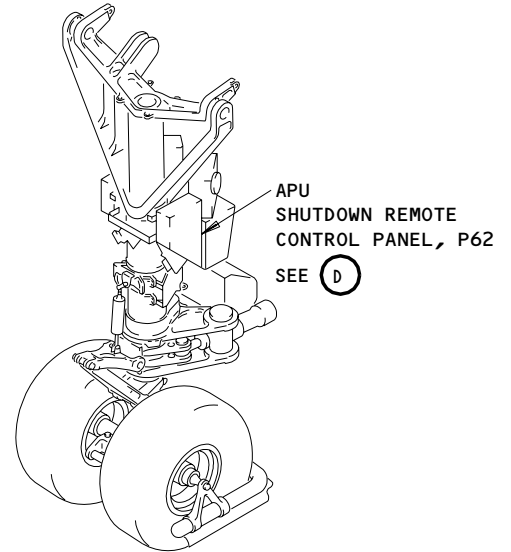


SEE (C)



APU FIRE EXTINGUISHER BOTTLE, B25

(C)



APU SHUTDOWN REMOTE CONTROL PANEL, P62

(D)

Component Location
Figure 102 (Sheet 2)

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26-22-00

APU FIRE EXTINGUISHING SYSTEM – ADJUSTMENT TEST

1. General

- A. The APU fire extinguishing system has one fire bottle installed on the forward side of the APU firewall.
- (1) The system test has different tests for each part of the system. When all the tests are done, the APU fire extinguishing system is ready to operate correctly.

TASK 26-22-00-715-156

2. Operational Test – APU Bottle Pressure Switch

A. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power – Control
(3) AMM 31-41-00/501, EICAS
(4) AMM 33-16-00/501, MASTER DIM AND TEST

B. Access

(1) Location Zones

- 211 Flight Compartment (Left)
212 Flight Compartment (Right)
315 APU Compartment (Left)
316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
315AL APU Access Door
316AR APU Access Door

C. Prepare for Test

S 865-001

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

S 715-002

- (2) Make sure these systems operate:
(a) EICAS (AMM 31-41-00).
(b) Master dim and test system (AMM 33-16-00).

S 865-003

- (3) Make sure that the following circuit breakers on the overhead circuit breaker panel, P11, are closed:
(a) 11B24, FIRE DETECTION APU 1
(b) 11B25, FIRE DETECTION APU 2

S 865-004

- (4) Make sure that the following circuit breakers on the main power distribution panel, P6, are closed:
(a) 6G1, FIRE EXT APU
(b) 6H1, FIRE EXTINGUISHING ENG L BTL 1

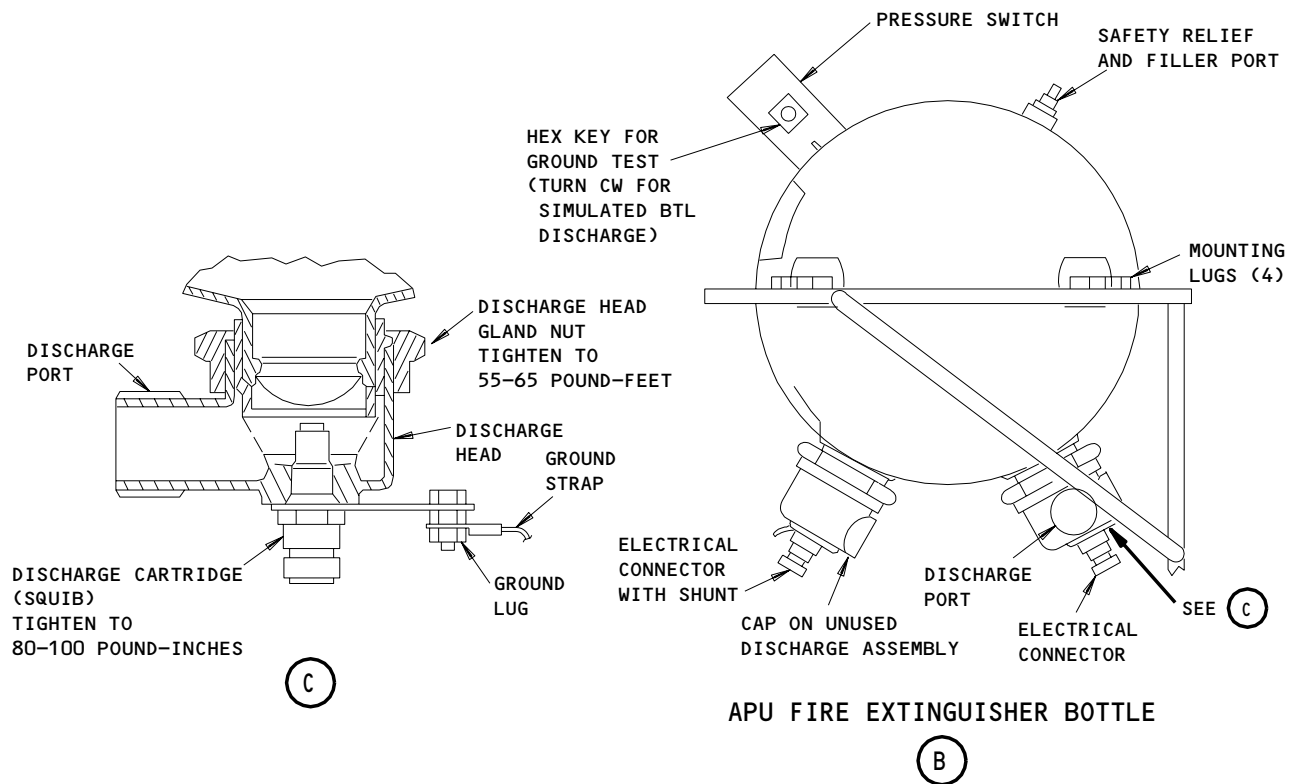
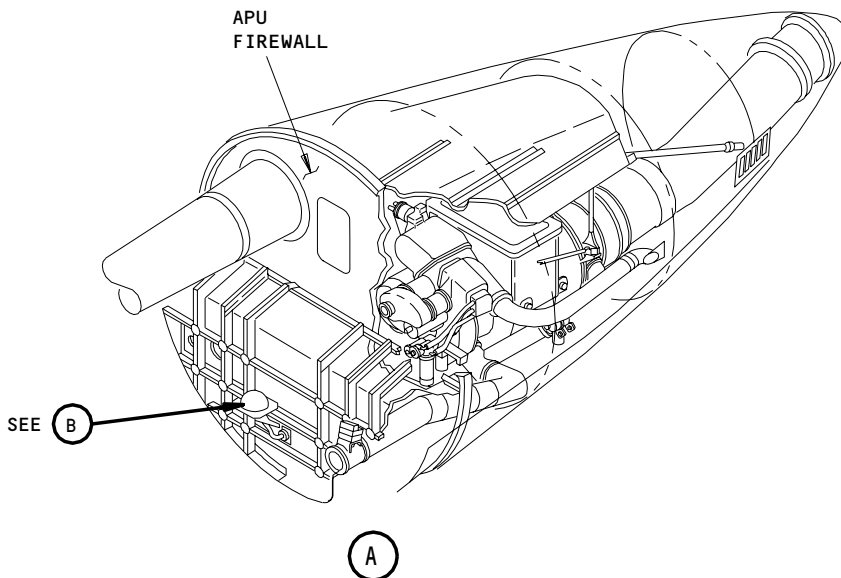
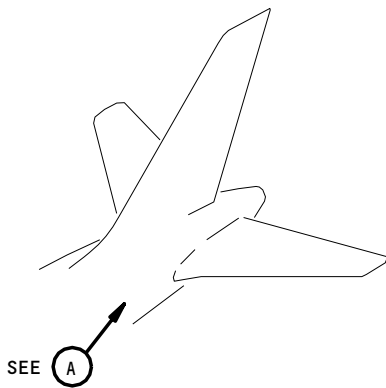
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APU Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 501

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D. Test Fire Extinguisher Bottle Pressure Switch

S 015-157

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL, AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (1) Open the controls bay access door, 313AL (AMM 06-42-00).

S 865-177

CAUTION: DO NOT TURN THE HEX KEY MORE THAN 1/4 OF A TURN. IF YOU TURN THE HEX KEY MORE THAN 1/4 OF A TURN, DAMAGE TO THE SWITCH MAY OCCUR.

- (2) At the APU fire extinguisher bottle, push and hold the ground test pushbutton or turn and hold the ground test hex key 1/4 turn clockwise.

S 725-010

- (3) Make sure the yellow APU BTL DISCH light on the P8 panel comes on.

S 735-018

- (4) Make sure the EICAS message, APU BTL, shows on the top display.

S 865-152

- (5) Release the ground test pushbutton or the ground test hex key.

S 745-021

- (6) Make sure the APU BTL DISCH light on the P8 panel goes off.

S 735-024

- (7) Make sure the EICAS message, APU BTL, does not show on the top display.

E. Put the Airplane Back to its Usual Condition

S 865-158

- (1) Remove the electrical power if it is not necessary (AMM 24-22-00).

S 415-160

- (2) Close the access door, 313AL (AMM 06-42-00).

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TASK 26-22-00-715-140

3. Operational Test - APU Squib Test Circuit

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control

B. Access

- (1) Location Zones
 - 211 Flight Compartment (Left)
 - 212 Flight Compartment (Right)

C. Prepare for Test

S 865-161

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

D. APU Squib Test Circuit Test

S 865-190

- (1) Make sure that the following circuit breaker on the Pilot's Right Sidewall Panel (P61) is closed:
 - (a) 6H1, BTL 1 ENG L FIRE EXTINGUISHING

S 715-028

- (2) At the Squib Test control panel, P61, push and hold the TEST switch.

S 745-172

- (3) Make sure the green APU squib test light on the Squib Test control panel comes on.

S 865-031

- (4) Release the TEST switch.

S 745-033

- (5) Make sure the APU squib test light goes off.

S 865-042

- (6) Remove electrical power if it is not necessary (AMM 24-22-00).

TASK 26-22-00-735-162

4. System Test

A. Equipment

- (1) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-187 (Recommended)
- (2) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-165 (Alternative)

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- (3) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-174 (Alternative)

NOTE: The A26001 test boxes do not include the test adapter cables. The test adapter cables must be ordered separately. Refer to the A26001 drawing for the required cables.

- (4) Squib Protective Caps
 - M83723/60-18AN or AC
 - M83723/60-110-AN or AC
- (5) Voltmeter - 28 vdc
- (6) Resistor - 10 Kohm
- (7) MULTIMETER-0-1000VDC +/- 1%, 0-750 AC, 0-2 AMPS, 0-2 MEG OHMS

B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (3) AMM 24-22-00/201 Electrical Power - Control

C. Access

- (1) Location Zones
 - 211 Flight Compartment (Left)
 - 212 Flight Compartment (Right)
 - 315 APU Compartment (Left)
 - 316 APU Compartment (Right)

- (2) Access Panels

- 313AL Control Bay Access Door
- 315AL APU Access Door
- 316AR APU Access Door

D. Prepare For Test

S 865-043

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

S 865-237

- (2) Make sure that the following circuit breakers on the main power distribution panel, P6 are closed:
 - (a) 6G1, FIRE EXT APU

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(b) 6H1, FIRE EXTINGUISHING ENG BTL 1

S 735-044

(3) At the Squib Test control panel, P61, push the APU squib test light.

S 745-045

(4) Make sure the green APU squib test light comes on.

S 865-047

(5) Open this circuit breaker on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:

(a) 6G1, FIRE EXT APU

S 015-163

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL, AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

(6) Open the controls bay access door, 313AL (Ref 06-42-00).

S 865-192

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 025-049

(8) At the APU fire extinguisher bottle, disconnect the electrical connector from the bottle squib (Ref Table 501).

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APU FIRE BOTTLE CONNECTIONS TABLE 501

Connector	Bottle Connected To:
D2262	Bottle 1 - APU Discharge Squib

S 435-154

WARNING: PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLES CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (9) Put the protective caps on the fire bottle squibs.

S 745-164

WARNING: DO NOT INSTALL THE ELECTRICAL CONNECTOR TO THE BOTTLE SQUIB WHEN YOU DO A TEST. IF THE BOTTLE SQUIBS ARE ACCIDENTALLY FIRED, IT CAN CAUSE INJURY TO PERSONS.

- (10) Make sure that the six EICAS circuit breakers on the overhead circuit breaker panel, P11, are closed.

E. Test Extinguisher Bottle Squib Discharge Circuit

S 485-165

- (1) Attach the adapter cable to the connector on the squib circuit test box.

S 865-057

- (2) Set the LOAD CHECK switch on the squib circuit test box to OFF.

S 425-058

- (3) Connect the APU squib connector, D2262, to the squib circuit test box adapter cable.

NOTE: Adapter cables are included with the squib circuit tester and must have the correct connectors.

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- S 865-060
- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6G1, FIRE EXT APU

- S 985-061
- (5) Connect the multimeter to the voltmeter jacks on the squib circuit test box.

- S 865-062
- (6) Set the LOAD CHECK switch on the squib circuit test box to ON.

- S 765-153
- (7) On the P8 panel, pull the APU fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, you must push the manual fire override switch, located behind the fire handle. When you turn the fire handle, you must hold the handle against the stops while the voltage is measured.

- S 765-067
- (8) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts.

- S 765-101
- (9) Make sure that the BOTTLE DISCHARGE light on the squib circuit test box stays off.

- S 865-063
- (10) Turn and hold the APU fire handle fully counterclockwise.

- S 765-064
- (11) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

- S 975-065
- (12) Make sure that the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If voltage is less than 16 volts, the circuit may not provide sufficient current to fire the squib.

- S 985-068
- (13) Release the APU fire handle and make sure the fire handle moves quickly toward center about 10 degrees.

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S 765-069

- (14) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 765-141

- (15) Turn and hold the APU fire handle fully clockwise.

S 975-142

- (16) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 985-143

- (17) Make sure the multimeter on the squib circuit test box shows more than 16 volts.

NOTE: If the voltage is less than 16 volts, the circuit may not provide sufficient current to fire the squib.

S 765-144

- (18) Release the APU fire handle and make sure the fire handle moves quickly toward center about 10 degrees.

S 765-145

- (19) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 985-070

- (20) Push the fire handle in to the normal (locked) position.

S 865-072

- (21) Make sure this circuit breaker on the P11 panel is closed:
(a) 11B33, APU REMOTE FIRE IND

S 865-073

- (22) Make sure that the BAT switch on the P5 panel is in the ON position.

S 865-074

- (23) Push and release the APU FIRE SHT DN switch on the APU SHUTDOWN Remote Control panel, P62.

S 865-076

- (24) Push and hold the APU BTL DISCH switch on the APU SHUTDOWN Remote Control panel, P62.

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S 765-078

- (25) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts.

S 865-079

- (26) Release the APU BTL DISCH switch.

S 765-081

- (27) Make sure the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 865-082

- (28) Open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11B33, APU REMOTE FIRE IND

S 865-175

- (29) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6G1, FIRE EXT APU

S 025-083

- (30) Disconnect the APU extinguisher squib electrical connector D2262 from the squib circuit test box adapter cable.

S 865-085

- (31) Set the LOAD CHECK switch on the squib test box to OFF.

NOTE: Adapter cables are included with the squib circuit tester and must have the correct connectors.

F. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 435-155

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

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S 865-193

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).
- (a) If a protective cap is installed, remove the protective cap.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter to remove any stray voltage from the electrical connector.

- (c) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

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- 4) Connect the electrical connector to the fire bottle squib.
G. Do the Test of the Squib Connection and Squib Test Control Panel.

S 425-112

- (1) Do the Squib Electrical Connection procedure to connect the electrical connector D2262 to the fire bottle squib.

S 865-114

- (2) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6G1, FIRE EXT APU

S 865-116

- (3) Remove the DO-NOT-CLOSE tags and close this circuit breaker on the P11 panel:
(a) 11B33, APU REMOTE FIRE IND

S 865-120

- (4) At the SQUIB TEST control panel, P61, push and hold the TEST switch.

S 745-122

- (5) Make sure the green APU squib light on the SQUIB TEST control panel comes on.

S 865-123

- (6) Release the TEST switch.

S 745-125

- (7) Make sure the APU squib light goes off.

- H. Put the Airplane Back to Its Usual Condition

S 865-118

- (1) Remove electrical power if it is not necessary (AMM 24-22-00).

S 415-119

- (2) Close the controls bay access door 313AL.

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APU FIRE EXTINGUISHER BOTTLE/DISCHARGE CARTRIDGE – REMOVAL/INSTALLATION

1. General

- A. One APU fire extinguisher bottle is on the forward side of the APU firewall. The APU fire extinguisher bottle has one discharge cartridge (squib).
- B. The removal/installation procedure contains four tasks. The first two tasks remove and install the discharge cartridge from the APU fire extinguisher bottle. The last two tasks remove and install the APU fire extinguisher bottle.

TASK 26-22-01-024-091

2. Remove the APU Fire Extinguisher Bottle Discharge Cartridge

A. Equipment

- (1) Squib Protective Cap
M83723/60-18-AN or AC (Engine or APU)
M83723/60-110-AN or AC (Engine or APU)
- (2) Discharge Port Cap – (Provided with fire extinguisher bottles).

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Electrical Connector, D2264	26-22-01	01	405
	2	Nuts, bolts			14,15K,20J
	3	Electrical Connector, D2262			410
	4	Ground Strap			80
	5	Squib			356
	6	Discharge Hose			100

C. References

- (1) AMM 20-10-33/401, Electrostatic Discharge Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power – Control
- (3) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels

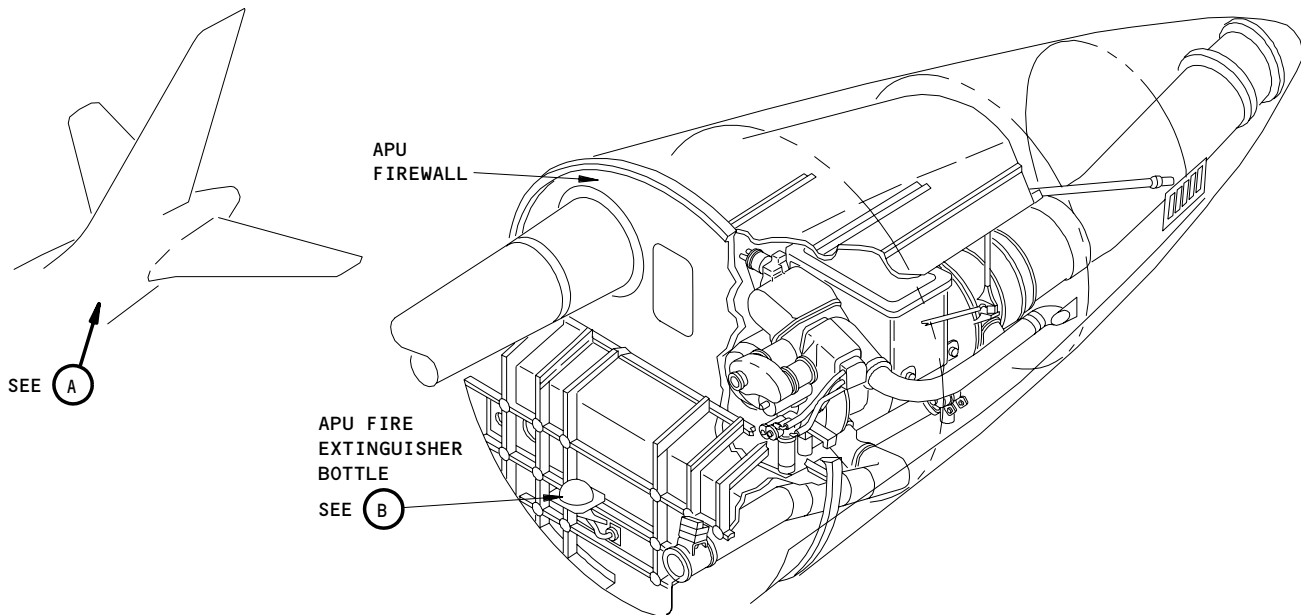
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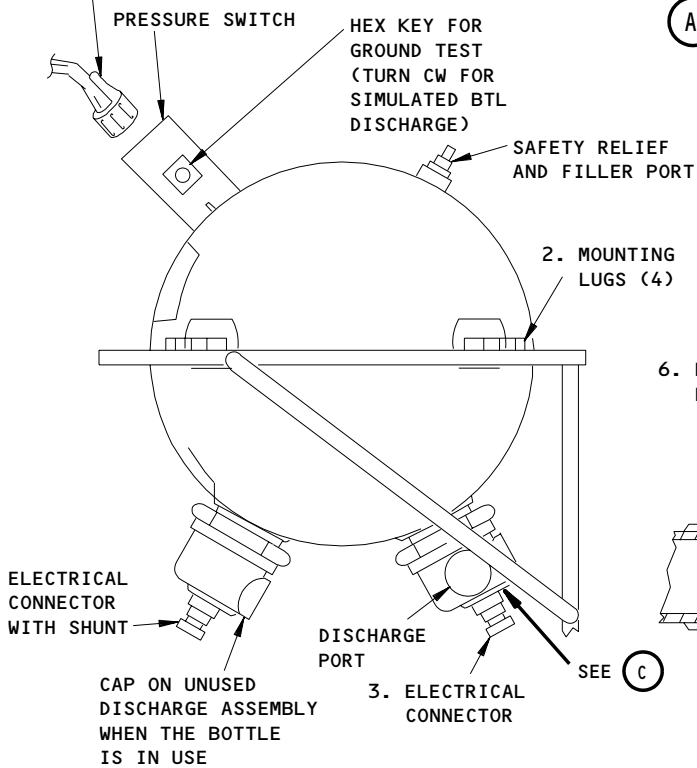
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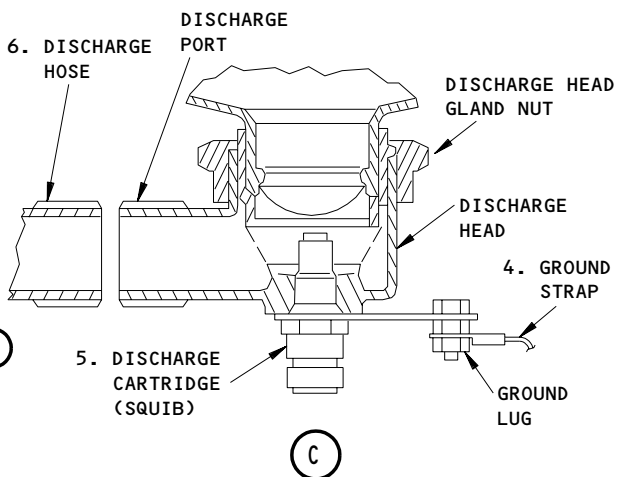


1. ELECTRICAL CONNECTOR



APU FIRE EXTINGUISHER BOTTLE

(B)



APU Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 401

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D. Access

(1) Location Zones

- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
- 315AL APU Access Door
- 316AR APU Access Door

E. Remove the Discharge Cartridge (Squib) (Fig. 401)

S 864-001

- (1) Open this circuit breaker on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:
- (a) 6G1, FIRE EXT APU

S 944-003

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (2) Open the controls bay access door, 313AL (AMM 06-42-00/201).

S 944-116

- (3) Find the APU extinguisher bottle in the APU compartment.

S 864-128

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 034-004

- (5) Disconnect the electrical connector (3) from the discharge squib (Ref Table 401).

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S 434-084

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

(6) Put a protective cap on the fire bottle squib (5).

S 014-007

(7) Turn and remove the squib (5).

TASK 26-22-01-424-092

3. Install the APU Fire Extinguisher Bottle Discharge Cartridge

A. Equipment

- (1) Voltmeter - 28 vdc
- (2) 10 kohm resistor

B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (3) AMM 24-22-00/201, Electrical Power - Control

C. Access

(1) Location Zones

- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
- 315AL APU Access Door
- 316AR APU Access Door

D. Install the Discharge Cartridge (Squib) (Fig. 401)

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S 944-008

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (1) Open the controls bay access door, 313AL (AMM 06-42-00/201).

S 864-129

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 434-009

- (3) Install the squib (5).

S 434-093

- (4) Tighten the squib (5) to 80-100 pound-inches.

E. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 434-085

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

S 864-130

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).
 - (a) If a protective cap is installed, remove the protective cap.

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CAUTION: IF A SHUNT PLUG IS INSTALLED, PULL THE SHUNT PLUG STRAIGHT OFF THE FIRE BOTTLE SQUIB. IF YOU TWIST OR WIGGLE THE SHUNT PLUG, YOU CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (b) If a shunt plug is installed, pull the shunt plug straight off the squib and discard the shunt plug.

NOTE: Shunt plugs should not be used to cover the fire bottle squibs because they can cause damage to the squib pins.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (d) Make sure the squib pins are not bent or damaged.
(e) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (f) Install the electrical connector to the squib (Ref Table 401).

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TABLE 401
APU FIRE BOTTLE CONNECTIONS

Connector	Bottle Connected To:
D2262 D2264	Bottle 1 - APU Discharge Squib Bottle 1 - Pressure Switch

(g) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector (3) from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- 4) Connect the electrical connector to the fire bottle squib.

S 864-013

- (3) Remove the DO-NOT-CLOSE tag and close this P6 panel circuit breaker:
 - (a) 6G1, FIRE EXT APU

F. Test the installation of the squib:

S 864-015

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

S 864-094

- (2) Make sure this circuit breaker on the P6 panel is closed:
 - (a) 6G1, FIRE EXT APU

S 984-016

- (3) Push the TEST switch on the SQUIB TEST control panel at the right side of the P61 panel.

S 214-019

- (4) Make sure that the green APU squib light on the SQUIB TEST control panel, P61, comes on.

S 214-020

- (5) Release the TEST switch.

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S 214-079

- (6) Make sure the test light goes off.

S 464-023

- (7) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 26-22-01-024-100

4. Remove the APU Fire Extinguisher Bottle

A. Equipment

- (1) Squib Protective Cap

M83723/60-18-AN or AC (Engine or APU)

M83723/60-110-AN or AC (Engine or APU)

- (2) Discharge Port Cap - (Supplied with the fire extinguisher bottles).

B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
(2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
(3) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zones

211	Flight Compartment (Left)
212	Flight Compartment (Right)
315	APU Compartment (Left)
316	APU Compartment (Right)

- (2) Access Panels

313AL	Control Bay Access Door
315AL	APU Access Door
316AR	APU Access Door

D. Remove APU Fire Extinguisher Bottle (Fig. 401)

S 864-024

- (1) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6G1, FIRE EXT APU

S 944-026

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL, AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (2) Open the controls bay access door, 313AL (AMM 06-42-00/201).

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S 864-131

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 034-027

- (4) Disconnect the electrical connectors (1,3) from the bottle squib and pressure switch. Refer to Table 401.

S 434-086

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (5) Put a protective cap on the fire bottle squibs.

S 034-031

- (6) Remove the ground strap (4) from the bottle ground lug.

S 034-032

- (7) Disconnect the discharge hose (6).

S 434-033

- (8) Install a cap on the bottle discharge port.

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S 034-034

- (9) Remove the nuts and bolts (2)(four places) from the mounting lugs.

S 024-035

- (10) Remove the extinguisher bottle.

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5. Install the APU Fire Extinguisher Bottle

A. Equipment

- (1) Voltmeter - 28 vdc
(2) Resistor - 10 Kohm

B. Consumable Materials

- (1) Use one of these corrosion inhibiting compounds:
(a) D50004 - Compound - Antiseize, BMS 3-28 (preferred)
(b) C00913 - Compound - Nondrying Resin Mix Corrosion Inhibiting, BMS 3-27 (alternative)
(c) G50136 - Paste - Corrosion Inhibiting, Non-drying, BMS 3-38 (alternative)

C. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
(2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
(3) AMM 24-22-00/201, Electrical Power - Control

D. Access

(1) Location Zones

- 211 Flight Compartment (Left)
212 Flight Compartment (Right)
315 APU Compartment (Left)
316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
315AL APU Access Door
316AR APU Access Door

E. Install the APU Fire Extinguisher Bottle (Fig. 401)

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S 944-036

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL, AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (1) Open the controls bay access door, 313AL (AMM 06-42-00/201).

S 864-132

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

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S 214-037

WARNING: DO NOT MOVE THE BOTTLE WITHOUT A CAP ON THE PORT. DO NOT LET THE BOTTLE HIT THE AIRPLANE. BE CAREFUL NOT TO DAMAGE THE BOTTLE. IF THE BOTTLE IS ACCIDENTALLY FIRED, IT CAN CAUSE INJURY TO PERSONS.

- (3) Before you install the bottle, make sure that its weight is $+0/-0.1$ pounds from the weight shown on the bottle.

NOTE: The measured weight of the bottle includes the charged bottle, the inspection tag on the bottle and the swivel assemblies. If the squib cartridge is not installed on the fire extinguisher bottle, do not install it. Weigh the squib cartridges as loose parts. Include the weight of the squib cartridges in the measured weight. If the squib cartridges are installed, weigh the bottle with the cartridges installed. Remove all protective caps when the parts are weighed.

NOTE: The fire bottle may be installed without the bottle weight check provided the following conditions are met:

- The bottle weight is verified by the airline before being placed in storage.
- Bottles in storage that exceed 5 years since last weight check must be reweighed.
- The bottle assembly is examined and show no damage, scratches or dents prior to installation.

S 434-107

- (4) If the discharge cartridge is not installed on the fire extinguisher bottle, do the procedure Install the Discharge Cartridge (Squib).

S 434-038

- (5) Set the bottle mounting lugs on the support bracket.

S 434-039

- (6) Install the mounting nuts and bolts (2) (four places).

S 824-040

- (7) Loosen the discharge head gland nut and adjust the discharge head so the discharge port is turned to provide the best possible hose connection.

S 434-041

- (8) Tighten the gland nut to 55 - 65 pound-feet.

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S 434-042

- (9) Attach a lockwire from the gland nut to the discharge head.

S 434-043

- (10) Remove the discharge port cap.

S 434-167

- (11) Make sure there is a cap and a shunt correctly installed on the unused discharge assembly.

S 624-164

- (12) Apply a layer of BMS 3-28 (preferred) to the outlet threads, outlet end, and outlet inner diameter where the tube assembly attaches to the discharge head.

(a) BMS 3-27 or BMS 3-38 are also acceptable alternatives as anti-corrosion compounds to use in this location.

S 434-080

- (13) Connect the discharge hose (6) to the port.

S 434-044

- (14) Install the ground strap (4) to the ground lug.

S 434-089

- (15) Install the electrical connector (1) to the bottle pressure switch. Refer to Table 401.

F. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 434-087

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.

S 864-133

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

(a) If a protective cap is installed, remove the protective cap.

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CAUTION: IF A SHUNT PLUG IS INSTALLED, PULL THE SHUNT PLUG STRAIGHT OFF THE FIRE BOTTLE SQUIB. IF YOU TWIST OR WIGGLE THE SHUNT PLUG, YOU CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (b) If a shunt plug is installed, pull the shunt plug straight off the squib and discard the shunt plug.

NOTE: Shunt plugs should not be used to cover the fire bottle squibs because they can cause damage to the squib pins.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (d) Make sure the squib pins are not bent or damaged.
(e) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (f) Connect the electrical connector (3) to the fire bottle squib. Refer to Table 401.
(g) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- 4) Connect the electrical connector to the fire bottle squib.

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G. Do a test of the squib connection of the fire extinguisher bottle:

- S 864-081
(1) Supply electrical power (AMM 24-22-00).
- S 434-082
(2) Do the Squib Electrical Connection procedure to connect the electrical connector D2262 to the fire bottle squib.
- S 864-049
(3) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6G1, FIRE EXT APU
- S 864-064
(4) At the SQUIB TEST control panel, P61, push and hold the TEST switch.
- S 744-066
(5) Make sure the green APU squib light on the SQUIB TEST Control panel, P61, comes on.
- S 864-067
(6) Release the TEST switch.
- S 744-069
(7) Make sure the APU squib light goes off.

H. Do a test of the pressure switch of the fire extinguisher bottle.

- S 214-078
(1) At APU fire extinguisher bottle, turn the pressure switch test hex key clockwise.
- S 214-054
(2) Make sure the yellow APU BTL DISCH light on the pilots' aft control stand panel, P8, comes on.
- S 214-160
(3) Make sure the EICAS message, APU BTL, shows on the top display.
- S 214-056
(4) Release the hex key.
- S 214-060
(5) Make sure the APU BTL DISCH light goes off.
- S 214-162
(6) Make sure the EICAS message, APU BTL, does not show on the upper display.
- S 864-062
(7) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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- S 414-063
(8) Close the controls bay access door 313AL (AMM 06-42-00).

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APU FIRE EXTINGUISHING: APU FIRE SWITCH -
INSPECTION/CHECK

1. General

- A. This procedure will do a check of these APU Fire Switch functions:
- (1) APU fire discharge circuit
 - (2) APU generator field control relay
 - (3) APU fuel valve operation
 - (4) APU air supply valve operation
 - (5) APU shutdown

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2. APU Fire Discharge Circuit Check

A. General

- (1) This procedure makes sure the APU fire discharge circuit operates correctly.

B. References

- (1) AMM 06-42-00/201 - Empennage (Major Zone 300)
Access Doors and Panels
- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (3) AMM 24-22-00/201 - Electrical Power-Control

C. Access

(1) Location Zones

- | | |
|-----|----------------------------|
| 211 | Flight Compartment (Left) |
| 212 | Flight Compartment (Right) |
| 315 | APU Compartment (Left) |
| 316 | APU Compartment (Right) |

(2) Access Panels

- | | |
|-------|-------------------------|
| 313AL | Control Bay Access Door |
| 315AL | APU Access Door |
| 316AR | APU Access Door |

D. Equipment

- (1) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System -
A26001-187 (Recommended)
- (2) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System -
A26001-165 (Alternative)

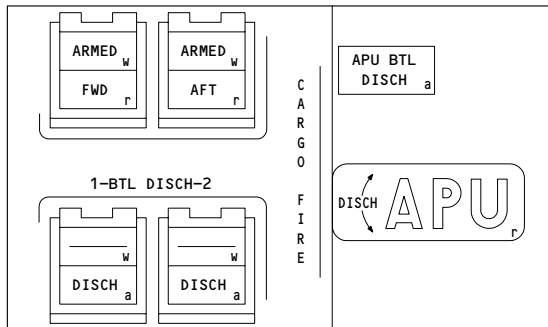
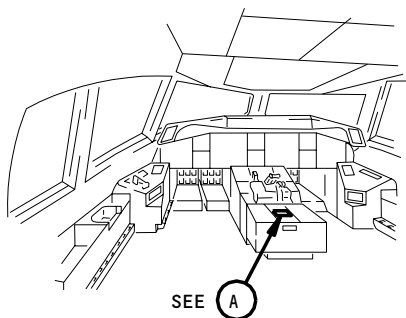
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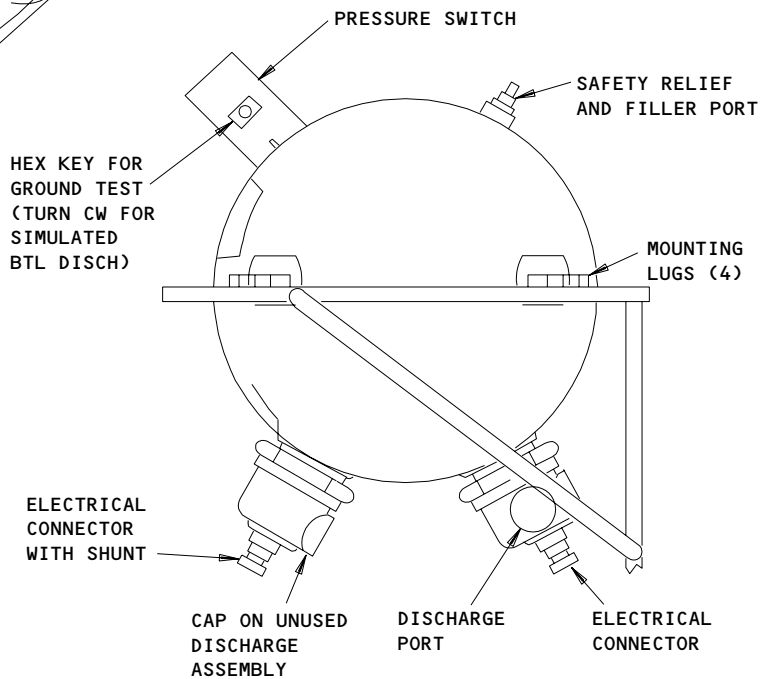
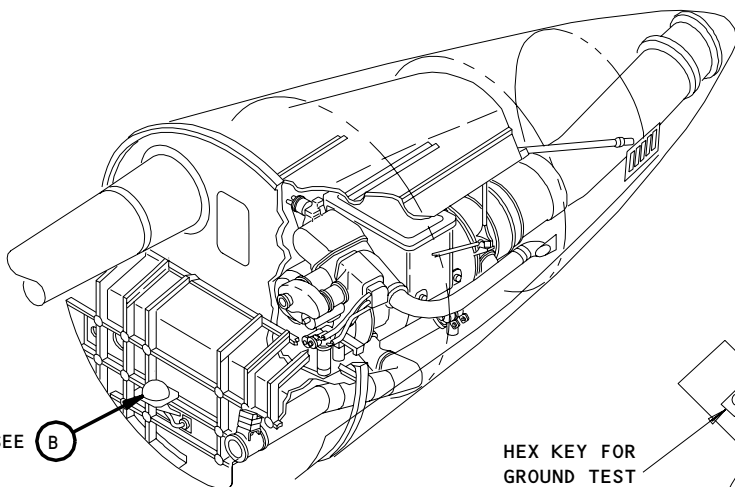
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APU AND CARGO FIRE CONTROL PANEL

(A)



APU FIRE EXTINGUISHER BOTTLE

(B)

APU Fire Extinguisher System Component Location
Figure 601

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- (3) Electrical Test Equipment - Bottle Squib, Fire Extinguisher System - A26001-174 (Alternative)

NOTE: The A26001 test box does not include the test adapter cables. The test adapter cables must be ordered separately. Refer to the A26001 drawing for the required cables.

- (4) Voltmeter - 28 vdc
- (5) Squib Protective Caps
M83723/60-18AN or AC
M83723/60-110AN or AC
- (6) 10 kohm resistor
- (7) Multimeter-0-1000VDC $\pm 1\%$, 0-750 AC, 0-2 AMPS, 0-2 MEG OHMS - (commercially available)

E. Prepare for Check

S 866-002

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

S 016-003

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ELEVATOR CONTROL ACCESS DOOR, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (2) Open the APU controls bay access door, 313AL (AMM 06-42-00/201).

S 866-004

- (3) Open this circuit breaker on the main power distribution panel, P6, and attach DO-NOT-CLOSE tag:
 - (a) 6G1, FIRE EXT APU

S 866-006

- (4) Find the APU fire extinguisher bottle in the APU compartment.

S 866-196

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 026-008

- (6) Disconnect the APU fire extinguisher electrical connector from the bottle discharge squib (Table 601).

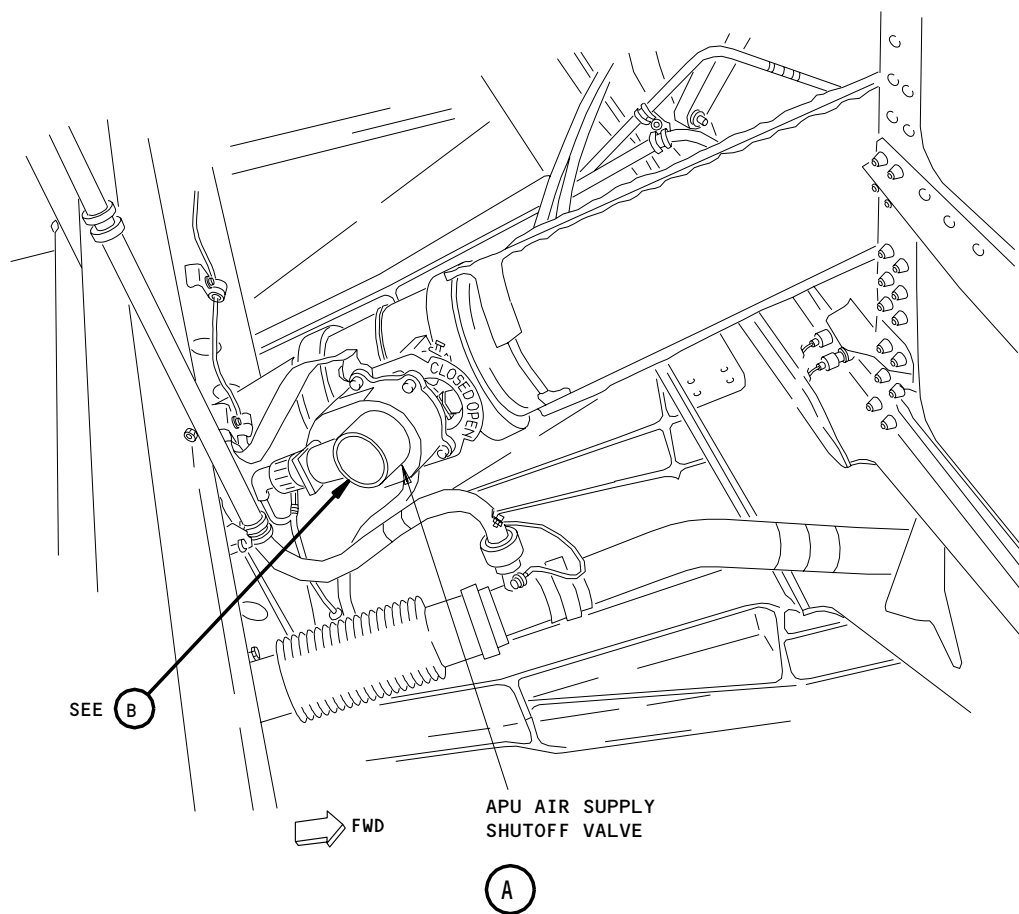
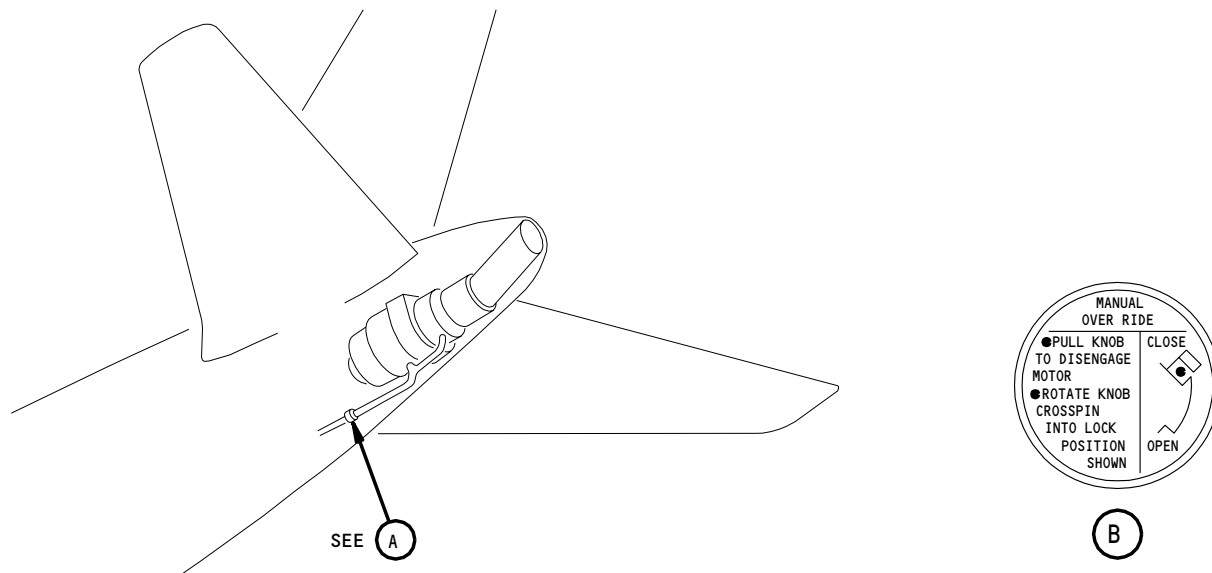
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APU Fire Switch - Inspection Check
Figure 602

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F50113

TABLE 601 APU FIRE BOTTLE CONNECTIONS	
Connector	Bottle Connected To:
D2262	Bottle 1 - APU Discharge Squib

S 436-010

WARNING: PUT PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL.

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (7) Install protective caps on the fire bottle squibs.
- F. Do the APU Fire Switch Squib Discharge Circuit Check

S 866-197

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 486-011

WARNING: DO NOT INSTALL THE ELECTRICAL CONNECTOR TO THE BOTTLE SQUIB WHEN YOU DO A TEST. IF THE BOTTLE SQUIBS ARE ACCIDENTALLY FIRED, IT CAN CAUSE INJURY TO PERSONS.

- (2) Attach the adapter cable to the connector on the squib circuit test box.

S 426-012

- (3) Set the LOAD CHECK switch on the squib circuit test box to OFF.

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S 866-013

- (4) Connect the APU squib connector, D2262, to the squib test circuit box adapter cable.

NOTE: Adapter cables are included with the squib circuit tester and must have the correct connectors.

S 986-015

- (5) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6G1, FIRE EXT APU

S 866-016

- (6) Connect the multimeter to the voltmeter jacks on the squib circuit test box.

S 866-017

- (7) Set the LOAD CHECK switch on the squib circuit test box to ON.

S 766-018

- (8) On the P8 panel, pull the APU fire handle out to the emergency fire position.

NOTE: When you pull the fire handles into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle. When you turn the fire handle, it is necessary to hold the handle against the stops while the voltage is measured.

S 766-019

- (9) Make sure the multimeter on the squib circuit test box shows 0 +/- 2 volts.

S 866-020

- (10) Make sure the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 766-021

- (11) Turn and hold the APU fire handle fully counterclockwise.

S 976-022

- (12) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

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S 766-023

- (13) Make sure that the multimeter on the squib circuit test box shows more than 16 volts.

NOTE: If the voltage is less than 16 volts, the circuit may not provide sufficient current to fire the squib.

S 766-024

- (14) Release the APU fire handle and make sure the fire handle moves quickly toward center about 10 degrees.

S 986-025

- (15) Make sure the multimeter on the squib circuit test box shows 0 +/- 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 766-026

- (16) Turn and hold the APU fire handle fully clockwise.

S 976-027

- (17) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 766-028

- (18) Make sure the multimeter on the squib circuit test box shows more than 16 volts.

NOTE: If the voltage is less than 16 volts, the circuit may not provide sufficient current to fire the squib.

S 766-029

- (19) Release the APU fire handle and make sure the fire handle moves quickly toward center about 10 degrees.

S 976-030

- (20) Make sure the multimeter on the squib circuit test box shows 0 +/- 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 866-031

- (21) Put the fire handle to the normal (horizontal) position.

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S 866-199

- (22) Make sure this circuit breaker on the P11 panel is closed:
(a) 11B33, APU REMOTE FIRE IND

S 866-200

- (23) Make sure that the BAT switch on the P5 panel is in the ON position.

S 866-201

- (24) Push and release the APU FIRE SHT DN switch on the APU SHUTDOWN Remote Control Panel, P62.

S 866-202

- (25) Push and hold the APU BTL DISCH switch on the APU SHUTDOWN Remote Control panel, P62.

S 866-203

- (26) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts.

S 866-204

- (27) Release the APU BTL DISCH switch.

S 866-205

- (28) Make sure the multimeter on the squib circuit test box shows 0 +/- 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

G. Do the APU Fire Auto-Bottle Discharge Circuit Check

S 866-292

- (1) Open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11B33, APU REMOTE FIRE IND

S 866-250

- (2) Close the following circuit breakers on the P11 panel:
(a) 11B24, FIRE DETECTION APU 1

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- (b) 11B25, FIRE DETECTION APU 2
- (c) 11B31, ENG SPEED CARD L
- (d) 11B32, ENG SPEED CARD R

S 026-251

- (3) Remove the K10335 Test Relay on the MISC ELEC EQUIPMENT panel, P36.

S 486-252

- (4) Install jumper wire from pin 2 to pin 4 on the test relay connector D4398.

S 866-253

- (5) Push and hold the ENG/APU/CARGO TEST switch on the FIRE/OVHT TEST panel, P8.

S 766-254

- (6) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts after approximately 15 seconds.

S 486-255

- (7) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST JACK;
Install a jumper from test jack J1 on the M10298 Left Engine Speed Card (P50 panel) to airplane ground.

S 866-256

- (8) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST SWITCH;
Put the test switch on the M10298 Left Engine Speed Card (P50 card file) to the TEST position.

S 766-291

- (9) Make sure that the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.

S 026-257

- (10) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST JACK;
Disconnect jumper between test jack J1 on the M10298 Left Engine Speed Card, and airplanes ground.

S 866-258

- (11) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST SWITCH;
Put the test switch on the M10298 Left Engine Speed Card to the NORMAL position.

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- S 866-259
- (12) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts after approximately 15 seconds.
- S 486-260
- (13) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST JACK;
Install a jumper from test jack J1 or the M10311 Right Engine Speed Card (P50 card file) to airplanes ground.
- S 866-261
- (14) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST SWITCH;
Put the test switch on the M10311 Right Engine Speed Card (P50 card file) to the TEST position.
- S 766-262
- (15) Make sure that the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- S 026-263
- (16) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST JACK;
Disconnect jumper between test jack J1 on the M10311 Right Engine Speed Card, and airplanes ground.
- S 866-264
- (17) AIRPLANES WITH ENGINE SPEED CARDS WITH A TEST SWITCH;
Put the test switch on the M10311 Right Engine Speed Card to the NORMAL position.
- S 766-265
- (18) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts after approximately 15 seconds.
- S 866-266
- (19) Make sure the following circuit breaker on the P11 panel is closed.
(a) 11S15, LANDING GEAR AIR/GND SYS 1
- S 486-267
- (20) Install a deactuator plate between actuator and sensor S10060 (Sys 1 RIGHT) and S10062 (Sys 1 LEFT).
- S 766-268
- (21) Make sure that the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- S 026-269
- (22) Remove deactuator plates from S10060 and S10062.

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- S 766-270
- (23) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on and the multimeter on the squib circuit test box shows more than 16 volts after approximately 15 seconds.
- S 866-271
- (24) Release the ENG/APU/CARGO TEST Switch.
- S 766-272
- (25) Make sure that the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- S 026-273
- (26) Remove the jumper wire from connector D4398.
- S 486-274
- (27) Install Test Relay K10335.
- S 866-275
- (28) Push and hold the ENG/APU/CARGO TEST switch.
- S 766-276
- (29) Make sure that the multimeter on the squib circuit test box shows 0 ± 2 volts and the BOTTLE DISCHARGE light on the squib circuit test box stays off.
- S 866-277
- (30) Release the ENG/APU/CARGO TEST switch.
- S 866-032
- (31) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
- (a) 6G1, FIRE EXT APU

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S 026-033

- (32) Disconnect the APU extinguisher squib electrical connector D2262 from the multimeter.

S 866-207

- (33) Set the LOAD CHECK switch on the squib test box to OFF.

NOTE: Adapter cables are included with the squib circuit tester and must have the correct connectors.

H. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 436-295

- (1) Do the steps that follow to connect electrical connector D2262 to the fire bottle squib.

S 866-198

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).
(a) If a protective cover is installed, remove the protective cover.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter to remove any stray voltage from the electrical connector.

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- (c) Make sure the squib pins are not bent or damaged.
- (d) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (e) Connect the electrical connector to the fire bottle squib.

S 946-058

- (3) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- (a) Disconnect the electrical connector from the fire bottle squib.
- (b) Make sure the squib electrical pins are not bent or damaged.
- (c) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the electrical connector if the pins do not enter the connector receptacles.

- (d) Connect the electrical connector to the fire bottle squib.

I. Do the Test of the Squib Connection and Squib Test Control Panel

S 946-061

- (1) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6G1, FIRE EXT APU

S 866-062

- (2) At the SQUIB TEST control panel, P61, push and hold the TEST switch.

S 216-066

- (3) Make sure the green APU light comes on.

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- S 866-067
(4) Release the TEST switch.

- S 216-071
(5) Make sure the green APU light goes off.

- S 946-078
(6) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6G1, FIRE EXT APU

J. Do the APU Fire Handle Unlock Solenoid Circuit Check

- S 866-279
(1) Supply electrical power (AMM 24-22-00/201).

- S 866-280
(2) Make sure these systems operate:
(a) EICAS (AMM 31-41-00/501)
(b) Warning System (AMM 31-51-00/501)
(c) Master Dim and Test System (AMM 33-16-00/501)

- S 866-281
(3) Make sure this circuit breaker on the P6 is open:
(a) 6G1, FIRE EXT APU

- S 866-285
(4) Make sure the following circuit breakers on the P11 panel are closed.
(a) 11A32, IND LIGHTS 1
(b) 11A35, IND LIGHTS 4
(c) 11B24, FIRE DET APU 1
(d) 11B25, FIRE DET APU 2
(e) 11B18, WARN ELEX B
(f) 11J33, WARN ELEX A

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(g) 11P29, R IND LTS 2

S 286-286

- (5) Pull the APU fire handle or the aft pilot's control stand P8, and make sure that it is locked into its usual position.

S 866-287

- (6) Push and hold the ENG/APU/CARGO TEST switch on the P8 panel.
(a) Make sure the APU fire handle light comes on.

S 866-288

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE, THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

- (7) Pull the APU fire handle into the FIRE position.
(a) Make sure the APU fire handle releases from its usual position.
(b) Make sure the APU handle light remains on when the handle is pulled.

S 866-289

- (8) Put the APU fire handle back to its usual position.

S 866-290

- (9) Release the ENG/APU/CARGO TEST switch.

S 866-294

- (10) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11B33, APU REMOTE FIRE IND

TASK 26-22-02-716-079

3. APU Generator Field Control Relay Check

A. General

- (1) This procedure makes sure the APU generator field control relay opens when you pull the APU fire switch.

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B. Reference

- (1) AMM 24-22-00/201 - Electrical Power - Control

C. Access

(1) Location Zones

- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
- 315AL APU Access Door
- 316AR APU Access Door

D. Prepare for Check

S 866-080

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

E. Do the APU Generator Field Control Relay Open Check due to the APU Fire Switch Activation.

S 716-081

CAUTION: DO NOT TURN THE FIRE HANDLE WHEN YOU PULL IT INTO THE EMERGENCY FIRE POSITION. IF YOU TURN THE FIRE HANDLE THE CONTENTS OF THE FIRE BOTTLE CAN BE LET OUT.

(1) AIRPLANES WITH FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;

Do the operational check for the APU Fire Switch:

- (a) Put the APU GEN switch on the pilots' overhead panel P5 to the OFF (out) position.
- 1) Make sure the yellow OFF light in the APU GEN switch comes on.
 - 2) Make sure the white FIELD OFF light on the APU GEN FIELD MANUAL RESET switch is on.

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- (b) Push the APU GEN FIELD MANUAL RESET switch on the P61 panel.
 - 1) Make sure the FIELD OFF light goes off.
- (c) Pull the APU fire handle on the P8 panel out to the emergency fire position.
 - 1) Make sure the white FIELD OFF light comes on after 5 seconds.
- (d) Push the APU fire switch to its normal position.
- (e) Put the APU GEN switch on the pilots'overhead panel P5 to the ON (in) position.
 - 1) Make sure the white ON light in the APU GEN switch comes on.

S 716-082

- (2) AIRPLANES WITHOUT FIELD OFF LIGHTS ON THE P61 RIGHT SIDE PANEL;
Do the operational check for the APU Fire Switch:
 - (a) Open the APU access doors and install door support rods.
 - (b) Disconnect the electrical connector from the APU generator.
 - (c) Set the BAT Switch to OFF then to ON.
 - (d) Set the STBY POWER Switch to AUTO.
 - (e) Set the GEN CONT switch to OFF (OUT) then to ON (IN) position.
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 Kohm.
 - (f) Pull the APU Fire Switch, on the P8 panel.
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is less than 250 ohms.
 - (g) Push the APU Fire Switch to its normal position.
 - (h) Turn the Generator Control Switch to off and then to on.
 - 1) Make sure the resistance between pins 9 and 10 of the electrical connector is greater than 1 Kohm.
 - (i) Connect the electrical connector to the APU Integrated Drive Unit.
 - (j) Remove the door support rods and close the APU access door.

TASK 26-22-02-716-083

4. APU Fuel Valve Operation Check

A. General

- (1) This procedure makes sure the APU fuel valve is closed when you pull the APU fire switch.

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B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power - Control

C. Access

(1) Location Zones

- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
- 713 Left Main Landing Gear Door

D. Prepare for Check

S 866-084

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

S 016-085

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ELEVATOR CONTROL ACCESS DOOR, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (2) Open the left main landing gear door, 713 (AMM 06-42-00/201).

E. Do the APU Fuel Valve Operation Check due to the APU Fire Switch Activation

S 986-086

CAUTION: DO NOT PUT THE APU MASTER CONTROL SWITCH TO THE START POSITION. IF THE APU STARTS, IT CAN CAUSE INJURY TO PERSONS.

- (1) On the pilots' overhead P5 panel, turn the APU master control switch to the ON position.

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S 866-087

- (2) Find the APU fuel shut off valve actuator on the left inboard rear spar.

S 746-088

- (3) Make sure the manual override handle on the APU fuel shutoff valve actuator is in the OPEN position.

S 986-089

- (4) Pull the APU fire handle out to the emergency fire position.

NOTE: When you pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

S 746-090

- (5) Make sure the manual override handle on the APU fuel shutoff valve actuator is in the CLOSE position.

S 986-091

- (6) Put the APU fire handle to the normal (horizontal) position.

S 986-092

- (7) On the P5 panel, turn the APU master control switch to the OFF position.

TASK 26-22-02-716-093

5. APU Air Supply Valve Operation Check

A. General

- (1) This procedure makes sure the APU air supply valve is closed when you pull the APU fire switch.

B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power - Control

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C. Access

(1) Location Zones

- 153 Aft Cargo Compartment (Left)
- 154 Aft Cargo Compartment (Right)
- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

(2) Access Panels

- 313AL Control Bay Access Door
- 315AL APU Access Door
- 316AR APU Access Door
- 822 No. 2 Cargo Door

D. Prepare for Check

S 866-094

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

S 866-095

- (2) Make sure the left engine fire handle is in the usual (down) position.

E. Do the APU Air Supply Valve Operational Check due to the APU Fire Switch Activation (Fig. 602).

S 866-096

- (1) Open these circuit breakers on the P11 panel and attach a DO-NOT-CLOSE tag:
- (a) 11A35, INDICATOR LIGHTS 4
 - (b) 11Q23, AIR SUPPLY APU BLEED CONT

S 866-296

- (2) AIRPLANES WITH THE APU START PANEL M10324;
Do the steps that follow:

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- (a) Open this circuit breaker on the E6 rack in the Aft Equipment Center and attach a DO-NOT-CLOSE tag:
 - 1) 6E6, APU START
- (b) Remove the APU Start Control relay, K10030, from the E6 rack in the Aft Equipment Center.
- (c) Connect a jumper wire between pin B1 and ground of connector D2436 on the APU START CONTROL relay.
- (d) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the E6 rack:
 - 1) 6E6, APU START

S 866-299

- (3) AIRPLANES WITH THE APU CONTROL PANEL M1;
Do the steps that follow:
 - (a) Remove APU Control panel, M1, from the pilots' overhead panel P5.
 - (b) Remove the electrical connector D3576 from the APU Control panel.
 - (c) Connect a jumper wire between pin 22 and ground of connector D3576 on the APU Control panel.

S 866-110

- (4) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:
 - (a) 11Q23, AIR SUPPLY APU BLEED AIR CONT
 - (b) 11A35, INDICATOR LIGHTS 4

S 866-111

- (5) Push the APU BLEED AIR VALVE switch on the BLEED AIR CONTROL PANEL, (M10259), to the open position.

S 746-112

- (6) Make sure that the VALVE light comes on and then goes off.

S 746-113

- (7) Make sure the white bar light on the APU BLEED AIR VALVE switch comes on.

S 016-114

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ELEVATOR CONTROL ACCESS DOOR, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (8) Open the APU controls bay access door, 313AL (AMM 06-42-00/201).

S 866-115

- (9) Find the APU air supply shutoff valve in the APU compartment.

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S 746-116

- (10) Make sure that the manual override handle on the APU air supply shutoff valve is in the OPEN position.

S 986-117

- (11) Pull the APU fire handle out to emergency fire position.

NOTE: When you pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.

S 746-118

- (12) Make sure the manual override handle on the APU air supply shutoff valve is in the CLOSED position.

S 986-119

- (13) Put the APU fire handle to the normal (horizontal) position.

S 866-120

- (14) Push the APU BLEED AIR VALVE switch on the BLEED AIR CONTROL panel, M10259, to the closed position.

S 746-121

- (15) Make sure that the VALVE light comes on and then goes off.

S 746-122

- (16) Make sure the white bar light on the APU BLEED AIR VALVE switch goes off.

S 866-125

- (17) Open these circuit breakers on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11Q23, AIR SUPPLY APU BLEED CONT

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(b) 11A35, INDICATOR LIGHTS 4

S 866-297

(18) AIRPLANES WITH APU CONTROL PANEL M1;

Do the steps that follow:

- (a) Remove the jumper wire between pin 22 and ground of connector D3576 on the APU Control panel.
- (b) Connect the electrical connector D3576 to the APU Control panel, M1.
- (c) Install the APU Control panel to the pilot's overhead panel, P5.

S 866-298

(19) AIRPLANES WITH THE APU START PANEL M10324;

Do the steps that follow:

- (a) Open this circuit breaker on the E6 rack in the Aft Equipment Center and attach a DO-NOT-CLOSE tag:
 - 1) 6E6, APU START
- (b) Remove the jumper wire between pin B1 and ground of connector D2436 on the APU START CONTROL relay.
- (c) Install the APU START CONTROL relay, K10030, on the E6 rack relay panel in the Aft Equipment Center.
- (d) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the E6 rack:
 - 1) 6E6, APU START

S 866-133

(20) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:

- (a) 11A35, INDICATOR LIGHTS 4
- (b) 11Q23, AIR SUPPLY APU BLEED CONT

TASK 26-22-02-716-134

6. APU Shutdown Function Check

A. General

- (1) This procedure makes sure the APU Air Intake door is opened and then closed when you pull and release the APU fire switch.

B. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power - Control

C. Access

(1) Location Zones

- 211 Flight Compartment (Left)
- 212 Flight Compartment (Right)
- 315 APU Compartment (Left)
- 316 APU Compartment (Right)

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- (2) Access Panels
 - 313AL Control Bay Access Door
 - 315AL APU Access Door
 - 316AR APU Access Door

D. Prepare for Check

S 866-135

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

S 016-136

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ELEVATOR CONTROL ACCESS DOOR, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

- (2) Open the APU controls bay access door, 313AL (AMM 06-42-00/201).

S 016-137

- (3) Open the APU access doors and install door support rods.

E. Do the APU Shutdown Function Check due to the APU Fire Switch Activation (Fig. 602).

S 866-138

- (1) Open this circuit breaker on the E6 rack in the aft equipment center and attach a DO-NOT-CLOSE tag:
 - (a) E6, APU INLET DR ACT (C1385)

S 866-139

CAUTION: DO NOT PUT THE APU MASTER CONTROL SWITCH TO THE START POSITION. IF THE APU STARTS, IT CAN CAUSE INJURY TO PERSONS.

- (2) Turn the APU master control switch on the pilots' overhead P5 panel to the ON position.

S 746-140

- (3) Make sure the EICAS message, APU D00R, shows on the bottom display after 60 seconds.

S 866-141

- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the E6 rack:
 - (a) E6, APU INLET DR ACT (C1385)

S 746-142

- (5) Make sure the APU air intake door opens within 10-35 seconds.

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- S 866-143
- (6) Make sure the EICAS message, APU DOOR, does not show on the bottom display.
- S 986-144
- (7) Pull the APU fire handle out to the emergency fire position.
- NOTE:** When you pull the fire handle into the emergency fire position, it is necessary to use the manual fire override switch behind the fire handle.
- S 716-145
- (8) Make sure the APU air intake door closes.
- S 986-146
- (9) Put the APU master control switch on the pilots' overhead P5 panel to the OFF position.
- S 986-147
- (10) Put the APU fire handle to the normal (horizontal) position.
- F. Put the Airplane Back to Its Usual Condition
- S 866-150
- (1) GUI 115 WITH BUS POWER CONTROL UNIT (BPCU) SUNDSTRAND PART NUMBER 734285 OR 734285A;
Do the steps that follow:
- (a) Push the RESET button on the BPCU, M116, on the E5-3 rack in the main E/E equipment center.
- (b) Make sure that these messages show on the display:
- 1) EXTERNAL PWR SYSTEM
 - 2) LEFT GEN POWER SYSTEM
 - 3) RIGHT GEN POWER SYSTEM
 - 4) APU GEN POWER SYSTEM
- S 866-151
- (2) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6G1, FIRE EXT APU
- S 866-153
- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).
- S 416-154
- (4) Close controls bay access door 313AL.

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APU FIRE EXTINGUISHING- APU/CARGO FIRE CONTROL PANEL
REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks. The first task removes the APU/CARGO FIRE Control Panel and the second task installs and tests it.

TASK 26-22-03-004-019

2. Remove the APU/CARGO FIRE Control Panel (Fig. 401)

A. General

- (1) The APU/CARGO FIRE Control Panel, M10444, is on the aft pilot's control stand, P8.

B. Access

- (1) Location Zone
211/212 Flight Compartment

C. Prepare for Removal

S 864-019

- (1) Open these circuit breakers on the main power-distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6B3, GEN CONT UNIT APU
 - (b) 6E3, FUEL VALVES APU
 - (c) 6G1, FIRE EXT APU
 - (d) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (e) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 864-020

- (2) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11A32, INDICATOR LIGHTS 1
 - (b) 11A33, INDICATOR LIGHTS 2
 - (c) 11B18, WARN ELEX B
 - (d) 11B20, FIRE DETECTION L ENGINE 1
 - (e) 11B21, FIRE DETECTION L ENGINE 2
 - (f) 11B22, FIRE DETECTION R ENGINE 1
 - (g) 11B23, FIRE DETECTION R ENGINE 2
 - (h) 11B24, FIRE DETECTION APU 1
 - (i) 11B25, FIRE DETECTION APU 2
 - (j) 11B26, CARGO SMOKE DET 1
 - (k) 11B27, CARGO SMOKE DET 2
 - (l) 11B33, APU REMOTE FIRE IND
 - (m) 11J24, FIRE DET ALTN PWR CARGO
 - (n) 11J25, FIRE DET ALTN PWR APU
 - (o) 11J26, FIRE DET ALTN PWR ENGINE LEFT
 - (p) 11J27, FIRE DET ALTN PWR ENGINE RIGHT
 - (q) 11J33, WARN ELEX A

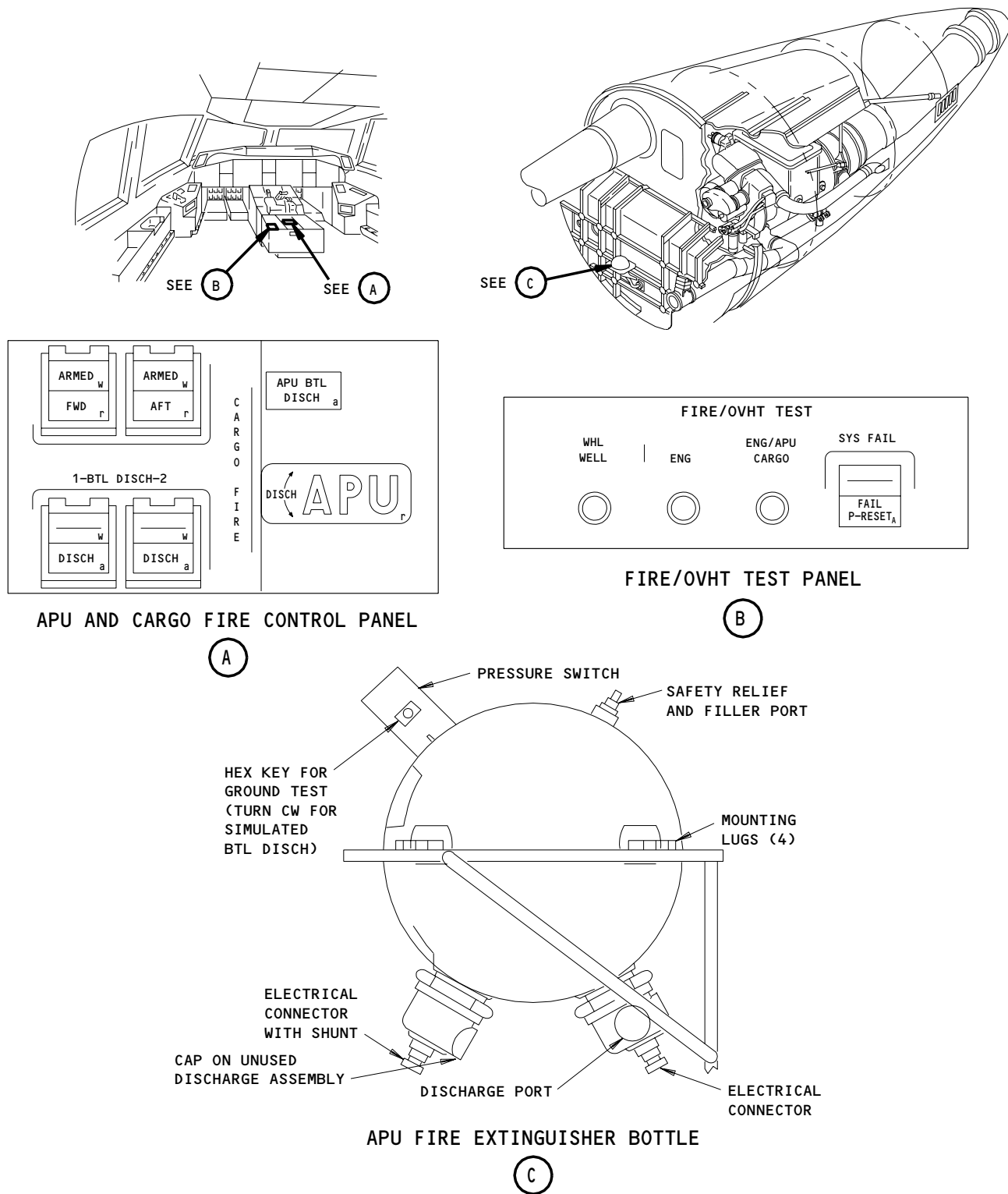
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APU Fire Extinguisher System Component Location
Figure 401

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- (r) 11Q22, APU BLEED PWR
 D. Remove the APU/CARGO FIRE Control Panel

S 034-021

- (1) Loosen the four screws which hold the APU/CARGO FIRE Control Panel to the P8 panel.

S 014-023

- (2) Lift the APU/CARGO FIRE Control Panel out of the P8 panel until you can get access to the electrical connectors on the rear of the panel.

S 034-024

- (3) Disconnect the electrical connectors.

S 024-025

- (4) Remove the APU/CARGO FIRE Control Panel from the P8 panel.

TASK 26-22-03-404-020

3. Install the APU/CARGO FIRE Control Panel

A. General

- (1) This task installs and tests the APU/CARGO FIRE Control Panel. A number of tests are included to make sure that the panel is installed and connected correctly.

B. Equipment

- (1) Service Platform - Controls Bay Access Door,
 313AL - A51001-19

C. References

- (1) AMM 06-42-00/201, Empennage (Major Zone 300) Access Doors and Panels
 (2) AMM 24-22-00/201, Electrical Power - Control
 (3) AMM 26-16-00/501, Cargo Smoke Detection
 (4) AMM 26-22-02/601, APU Fire Switch
 (5) AMM 26-23-01/601, Cargo Fire Extinguishing Armed Switches
 (6) AMM 31-41-00/501, Engine Indication and Crew Alerting System
 (7) AMM 31-51-00/501, Warning System
 (8) AMM 33-16-00/501, Master Dim and Test

D. Access

- (1) Location Zones

211/212	Flight Compartment
310	Fuselage Body Section 48
710	Nose Landing Gear

- (2) Access Panel

313AL	Controls Bay Access Door
821	Forward Cargo Compartment Door

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E. Install the APU/CARGO FIRE Control Panel

S 014-027

- (1) Lower the APU/CARGO FIRE Control Panel until the electrical connectors can be connected to the connectors to the rear of the panel.

S 434-028

- (2) Connect the electrical connectors to the applicable connectors.

S 424-029

- (3) Lower the APU/CARGO FIRE Control Panel into the P8 panel.

S 434-031

- (4) Tighten the four screws until the APU/CARGO FIRE Control Panel is tight in the P8 panel.

S 864-032

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6B3, GEN CONT UNIT APU
 - (b) 6E3, FUEL VALVES APU
 - (c) 6G1, FIRE EXT APU
 - (d) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (e) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 864-033

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11A32, INDICATOR LIGHTS 1
 - (b) 11A33, INDICATOR LIGHTS 2
 - (c) 11B18, WARN ELEX B
 - (d) 11B24, FIRE DETECTION APU 1
 - (e) 11B25, FIRE DETECTION APU 2
 - (f) 11B33, APU REMOTE FIRE IND
 - (g) 11J33, WARN ELEX A
 - (h) 11Q22, APU BLEED PWR

F. Test the APU/CARGO FIRE Control Panel installation by use of the ENG/APU/CARGO test switch on FIRE/OVHT Test Panel, M10445.

S 864-034

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

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S 864-035

- (2) Make sure these systems operate:
- (a) EICAS (AMM 31-41-00).
 - (b) Warning System (AMM 31-51-00).
 - (c) Master Dim and Test System (AMM 33-16-00).

S 284-040

- (3) Try to pull the APU fire switch handle out, on the aft pilot's control stand, P8. See that it is locked in place.

S 864-041

- (4) Push the ECS/MSG switch on the EICAS MAINT panel on the right side panel, P61.

S 864-042

- (5) Push and hold the ENG/APU/CARGO test switch on the FIRE/OVHT Test Panel, P8.

NOTE: Use the ECS/MSG switch as necessary to advance EICAS pages until all messages have been shown.

- (a) Make sure that the EICAS maintenance messages APU FIRE LP 1 and 2 are shown on the bottom display.
- (b) After a 2-4 second delay, make sure that these conditions occur:
 - 1) The red APU fire switch handle, on P8, lights up.
 - 2) The red FIRE light, on captain's instrument panel P1-3, comes on.
 - 3) The EICAS warning message, APU FIRE, is shown on the top display.
 - 4) The red master WARNING lights, on glareshield panels P7, come on.
 - 5) The fire bell can be heard on the flight deck aural warning speakers.
 - 6) The red APU FIRE light, on Lts/APU/Interphone panel P62, comes on. P62 is located on the right side of the nose landing gear.
 - 7) The APU fire warning horn, on P62, can be heard, when the airplane is on the ground.

S 864-045

- (6) Pull the APU fire switch handle out (P8). Do NOT turn the handle.
- (a) Make sure these conditions occur:
 - 1) The fire bell goes off.
 - 2) The red APU FIRE light (on P62) goes off.

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3) The APU fire warning horn stops.

S 864-047

(7) Push the APU fire switch back in.

S 864-048

(8) Release the ENG/APU/CARGO switch.
(a) Make sure that all the above conditions stop.

S 864-001

(9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

- (a) 11B20, FIRE DETECTION L ENGINE 1
- (b) 11B21, FIRE DETECTION L ENGINE 2
- (c) 11B22, FIRE DETECTION R ENGINE 1
- (d) 11B23, FIRE DETECTION R ENGINE 2
- (e) 11B26, CARGO SMOKE FIRE DET 1
- (f) 11B27, CARGO SMOKE FIRE DET 2
- (g) 11J24, FIRE DET ALTN PWR CARGO
- (h) 11J25, FIRE DET ALTN PWR APU
- (i) 11J26, FIRE DET ALTN PWR ENGINE LEFT
- (j) 11J27, FIRE DET ALTN PWR ENGINE RIGHT

G. Test the APU/CARGO FIRE Control Panel installation by use of the pressure switch manual-override button.

S 864-050

(1) Make sure that this circuit breaker on the P6 panel is closed:
(a) 6G1, FIRE EXTINGUISHING APU

S 014-021

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL AND THE ELEVATOR CONTROL ACCESS DOOR, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

(2) Open the controls bay access door, 313AL (AMM 06-42-00).

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S 864-060

CAUTION: DO NOT TURN THE HEX KEY MORE THAN 1/4 OF A TURN. IF YOU TURN THE HEX KEY MORE THAN 1/4 OF A TURN, DAMAGE TO THE SWITCH MAY OCCUR.

- (3) Turn and hold the ground test hex key 1/4 turn clockwise on the APU fire extinguisher bottle.
- (a) Make sure these conditions occur:
- 1) The yellow APU BTL DISCH light on the APU/CARGO FIRE Control Panel, P8, comes on.
 - 2) The EICAS message, APU BTL, is shown on the top display.

S 864-070

- (4) Release the ground test hex key.
- (a) Make sure that all the indications go off and stay off.

S 864-092

- (5) Make sure these circuit breakers on the P6 panel are closed:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 844-023

- (6) Gain access to the cargo compartment fire extinguisher bottles in the AFT cargo compartment.

S 864-093

- (7) Push and hold the pressure switch manual-override button on the number 1 cargo compartment fire extinguisher bottle.
- (a) Make sure these conditions occur:
- 1) The yellow BTL DISCH 1 light on the APU/CARGO FIRE Control Panel, P8, comes on.
 - 2) The EICAS message, CARGO BTL 1, is shown on the top display.

S 864-095

- (8) Release the pressure switch manual-override button.
- (a) Make sure that all the indications stop.

S 864-097

- (9) Push and hold the pressure switch manual-override button on the on the number 2 cargo compartment fire extinguisher bottle.
- (a) Make sure these conditions occur:
- 1) The yellow BTL DISCH 2 light on the APU/CARGO FIRE Control Panel, P8, comes on.
 - 2) The EICAS message, CARGO BTL 2, is shown on the top display.

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- S 864-099
- (10) Release the pressure switch manual-override button.
(a) Make sure that all the indications stop.
- S 914-064
- (11) Do the Cargo Fire Extinguishing Armed Switch Activation Check (AMM 26-23-01).
- S 914-065
- (12) Do a cargo compartment smoke test (AMM 26-16-00).
- S 914-066
- (13) Do the APU Fire Switch Inspection Check (AMM 26-22-02).

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CARGO COMPARTMENT FIRE EXTINGUISHING – DESCRIPTION AND OPERATION

1. General

- A. The cargo compartment fire extinguishing system has controls that release one or two applications of fire extinguishing agent to a fire in either cargo compartment. The system has test capability.
- B. ALL EXCEPT GUI 115;
The cargo fire extinguishing system includes the following: two cargo fire extinguisher bottles, APU/CARGO fire control panel, and the squib test control panel.
- C. GUI 115;
The cargo fire extinguishing system includes the following: two cargo fire extinguisher bottles, APU/CARGO fire control panel, squib test control panel, two in-line pressure switches, two filter/driers and one regulator.
- D. The cargo fire extinguishing system receives power from the 28 vdc hot battery bus, through a circuit breaker on main power distribution panel P6. The FIRE EXTINGUISHING CARGO BTL 1 AND BTL 2 circuit breakers on main power distribution panel P6 controls power to the system.

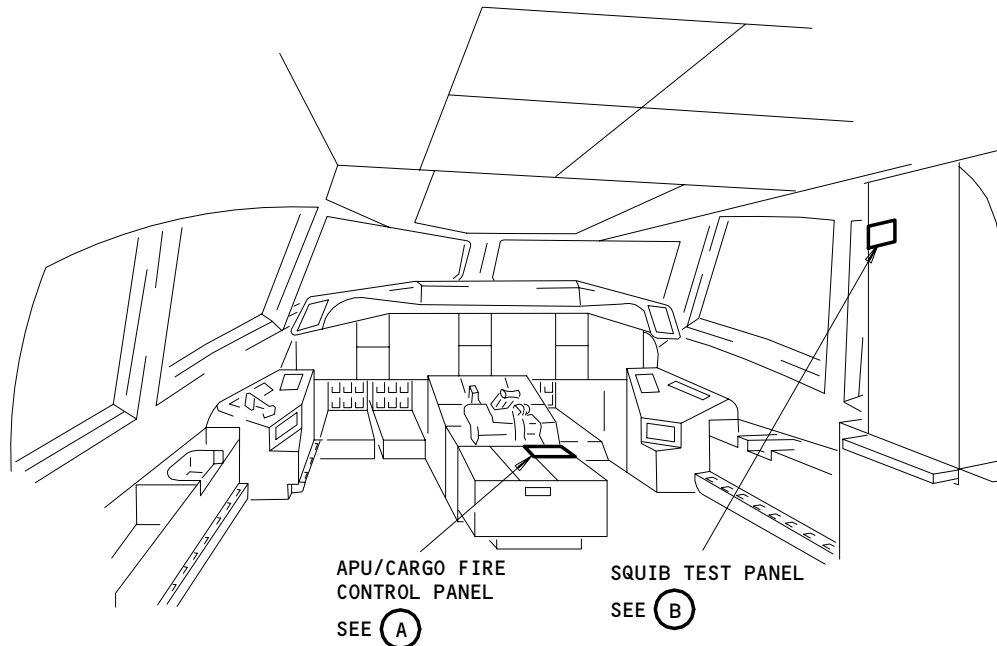
2. Component Details (Fig. 1)

- A. Cargo Compartment Fire Extinguisher Bottle
 - (1) Two cargo compartment fire extinguisher bottles are located forward of the aft cargo compartment. The extinguisher bottle includes two squib cartridges, a pressure switch, and the combined safety relief and filler port.
 - (2) Two squib cartridges are on the discharge valves of each extinguisher bottle. When detonated, the cartridge ruptures a retaining disc in the valve releasing the extinguishing agent.
 - (3) The pressure switch detects a decrease in bottle pressure and activates the bottle discharge lights. The pressure switch can be manually tested by the push of the button or the turn of the hex key located on the switch.
 - (4) The safety relief valve is a thermal expansion over-pressure rupture disc. If bottle pressure is too high, the safety relief ruptures, allowing the bottle to discharge. The filler port is for introducing the extinguishing agent and pressurizing gas into the bottle.
 - (5) The extinguishing agent is bromotrifluoromethane (halon), and the pressurizing gas dry nitrogen. The agent leaves no residue when discharged.
- B. APU/CARGO Fire Control Panel
 - (1) The FWD/AFT ARMED and BTL 1/2 DISCH switches are located on the APU/CARGO fire control panel at pilots' aft control stand P8. When a cargo compartment fire is detected, the red FWD or AFT warning light comes on. The ARMED switch on the panel, when pressed, arms the extinguisher bottle for discharge to the compartment desired. When the bottle is armed, a white (ARMED) light appears on the switch. To discharge the extinguishing agent, press the BTL DISCH 1 or 2 switch. Cargo bottle 1 or 2 will be discharged depending on the switch selected. The amber DISCH light comes on when the bottle discharges.

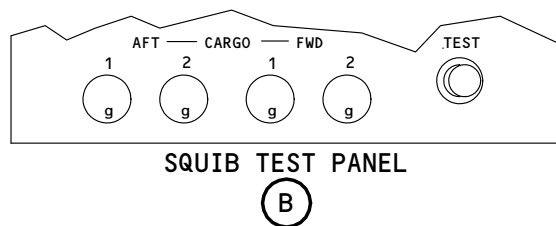
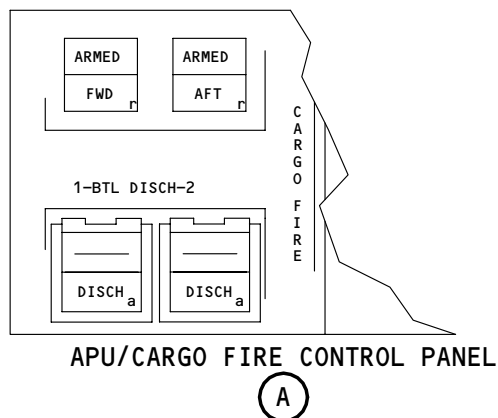
EFFECTIVITY

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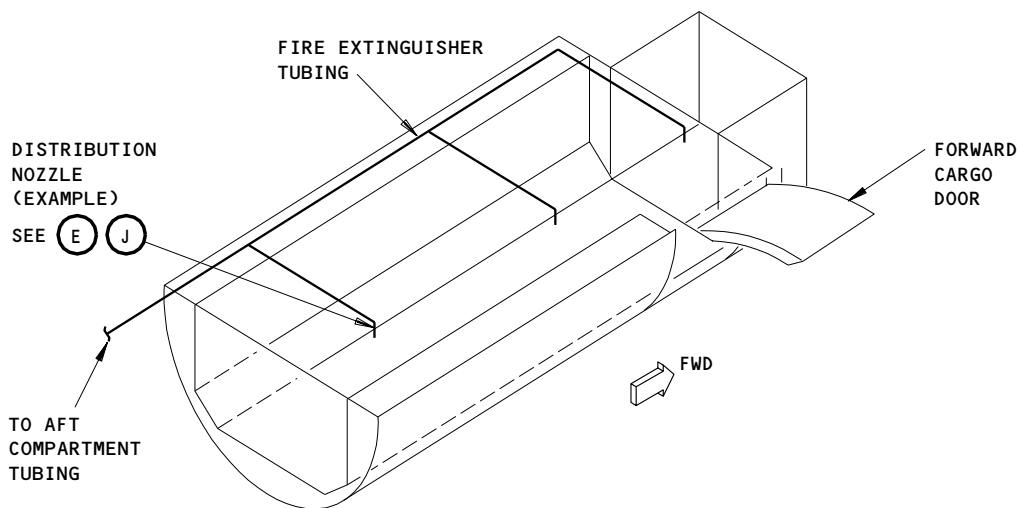
FLIGHT COMPARTMENT



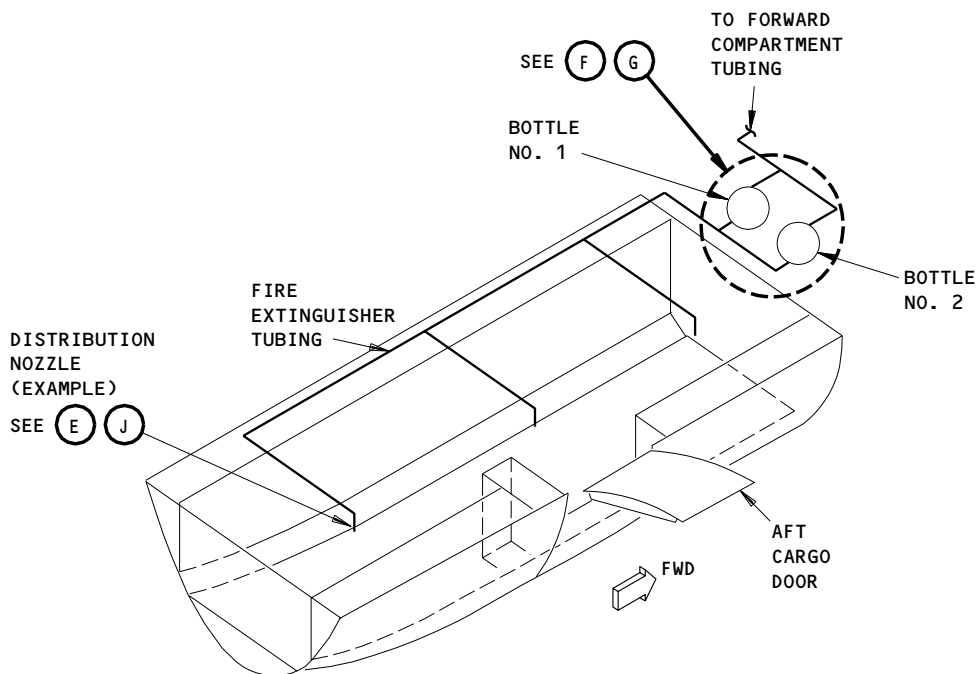
Cargo Compartment Fire Extinguishing System - Component Location
Figure 1 (Sheet 1)

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FORWARD CARGO COMPARTMENT

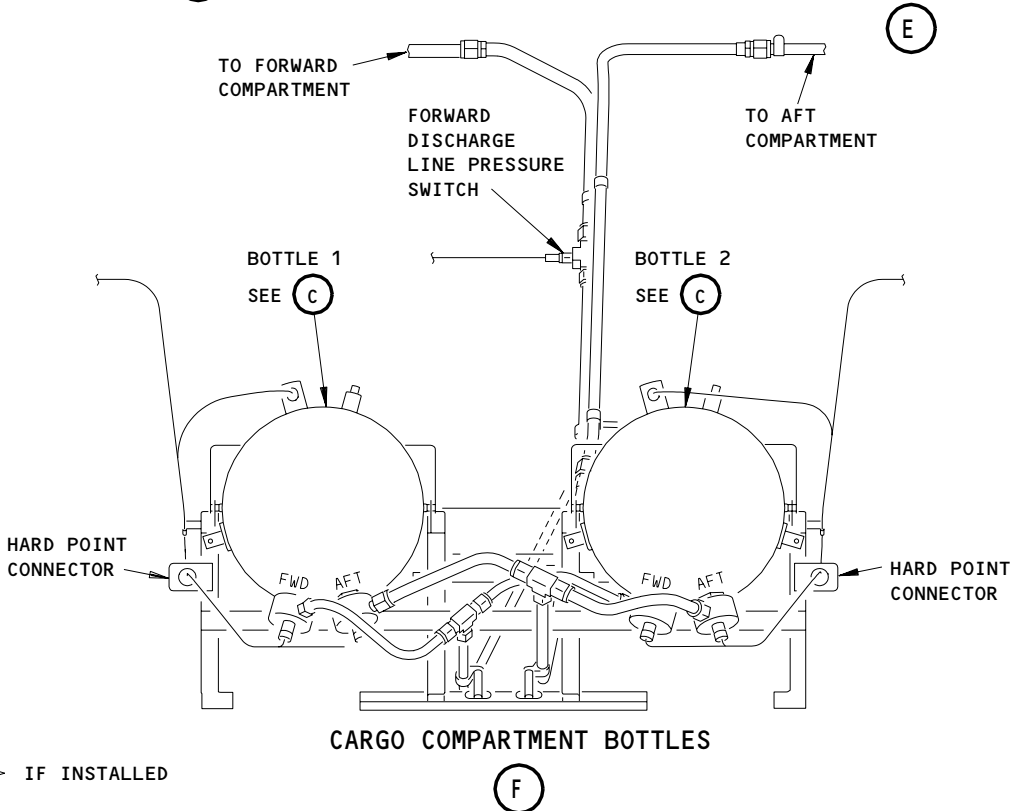
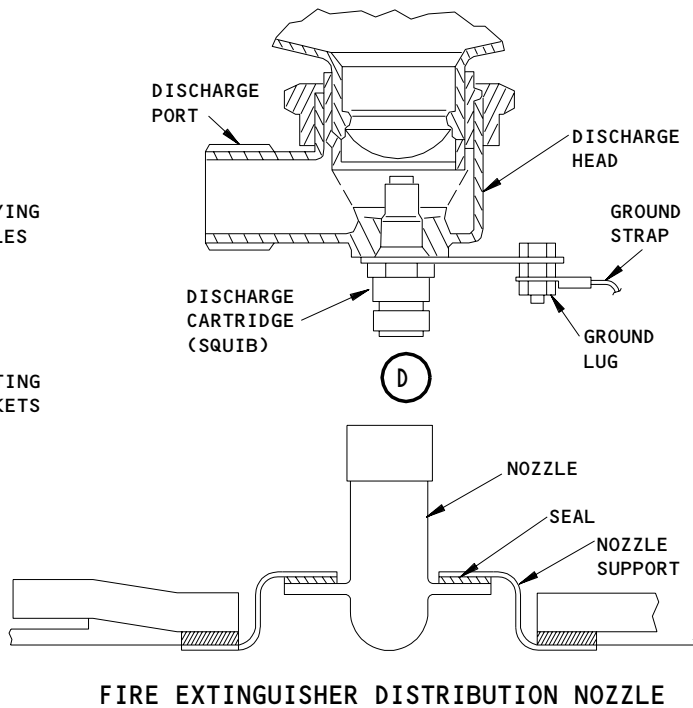
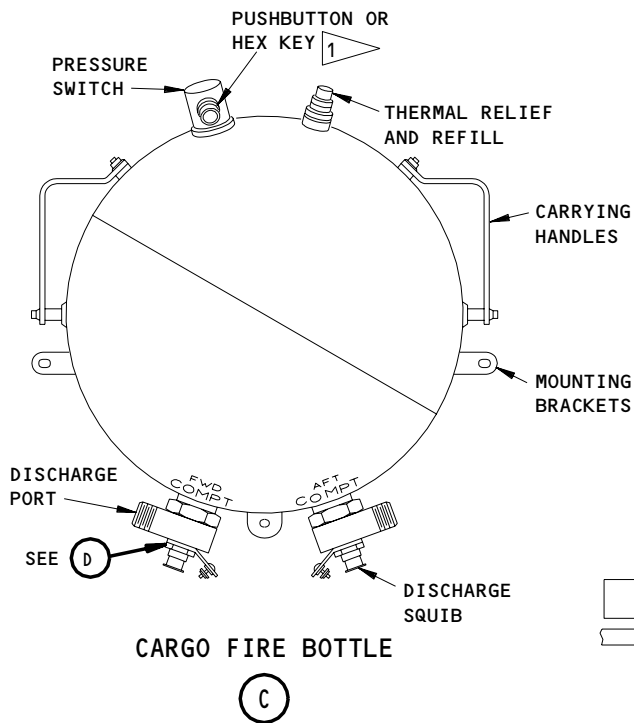


AFT CARGO COMPARTMENT

Cargo Compartment Fire Extinguishing System – Component Location
Figure 1 (Sheet 2)

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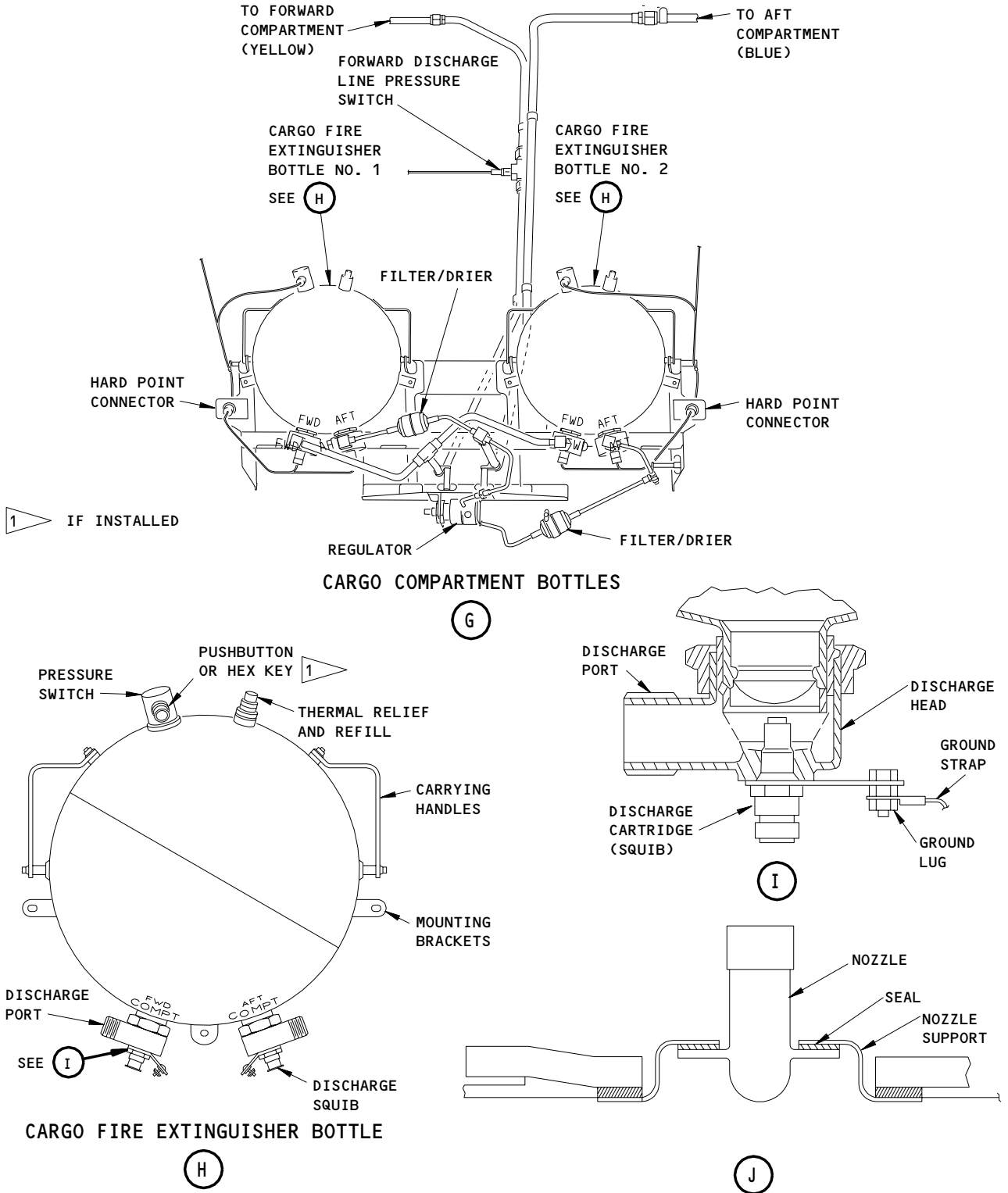


1 IF INSTALLED

Cargo Compartment Fire Extinguishing System - Component Location
Figure 1 (Sheet 3)

EFFECTIVITY
GUI 001-114, 116-999

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Cargo Compartment Fire Extinguishing System - Component Location
Figure 1 (Sheet 4)

EFFECTIVITY
GUI 115

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A73738

C. Squib Test Panel

- (1) The squib test panel is located on the P61 right side panel. The TEST switch on the panel is used to check extinguisher bottle squib cartridges. When pressed, the TEST switch on the panel checks continuity through the squib cartridges. A green test light for each squib comes on for a successful test.

D. Filters/Driers

- (1) GUI 115;
The filter/driers are located in the aft cargo compartment near the cargo fire extinguisher bottles. Only the discharge lines to the aft cargo compartment have filter/driers. The filter/drier filters water from the extinguishing agent to prevent the outlet nozzles from freezing. Filter/driers must be replaced after use.

E. Regulators

- (1) GUI 115;
The discharge line from bottle 2 to the aft cargo compartment has one regulator located near the fire extinguisher bottles, forward of the aft cargo compartment. The extinguishing agent passes through the regulator after the filter/drier. The regulator releases the extinguishant at a constant rate to the cargo compartment. Regulators must be replaced after the fire bottles are discharged.

3. Operation (Fig. 2)

A. Functional Description

- (1) When a fire is detected in a cargo compartment (forward or aft), the appropriate red light (FWD or AFT) on the APU/CARGO fire control panel comes on.
- (2) The discharge circuit for the appropriate cargo compartment is armed by pressing the ARMED switch on the APU/CARGO fire control panel. A white light in the switch will come on to verify the extinguisher bottle is armed.
- (3) When the FWD ARMED switch is pressed, the following functions are accomplished:
 - (a) Turns off forward cargo heat system
 - (b) Turns off both left and right air conditioning recirculation fans
 - (c) Opens overboard exhaust valve
 - (d) Switches both air conditioning packs to high flow mode
 - (e) Silences fire warning bell
 - (f) Disables forward squib test function
- (4) When the AFT ARMED switch is pressed, the following functions are accomplished:
 - (a) Turns off the aft cargo heat system
 - (b) Turns off right air conditioning recirculation fan
 - (c) Switches the right air condition packs to high flow mode
 - (d) Silences the fire warning bell
 - (e) Disables aft squib test function

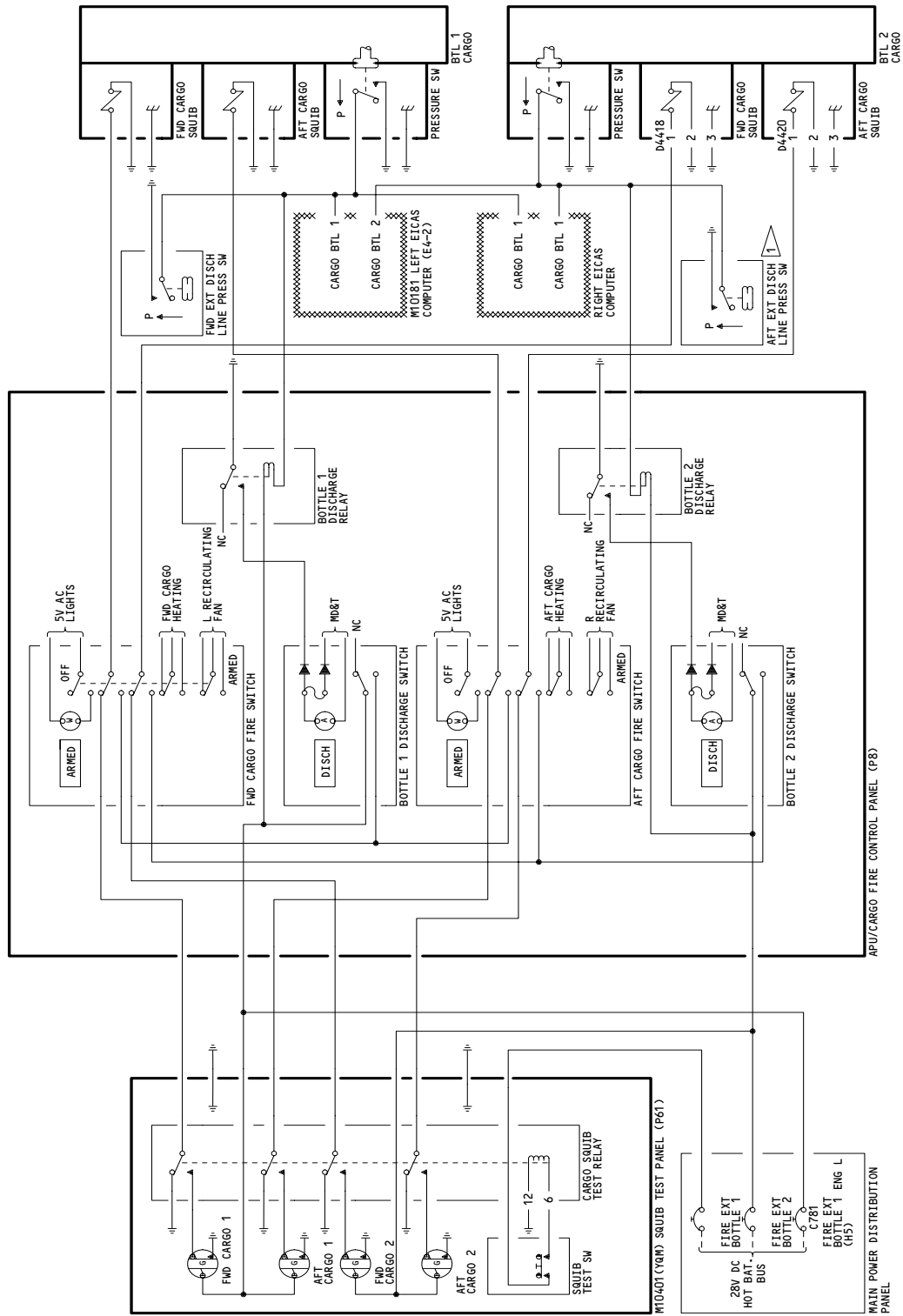
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Cargo Compartment Fire Extinguishing Schematic
Figure 2

GJI 115

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- (5) To discharge an extinguisher bottle into the selected compartment, press the appropriate DISCH (bottle 1 or 2) switch on APU/CARGO fire control panel. The electrical signal from the bottle discharge switch detonates the squib cartridge, rupturing a retaining disc, and releasing the extinguishing agent. Extinguishing agent is discharged into distribution tubing leading to outlet nozzles in the compartment. The forward and aft compartments each have three nozzles in the ceiling. The spray hole pattern is designed to give maximum extinguishing agent coverage to the compartment areas. The aft nozzle in the aft compartment area satisfies requirements in the bulk cargo compartment area.
- (6) GUI 001-114, 116-999;
A discharge line pressure switch (S633) on the forward distribution tubing is connected in parallel to the pressure switch on extinguisher bottle 1. The discharge line pressure switch recognizes bottle discharge prior to the temperature compensated pressure switch on the extinguisher bottle. The discharge line pressure switch gives an immediate indication (EICAS message: CARGO BTL 1) that extinguishing agent is being released in the forward compartment. A reset switch on the discharge line pressure switch should be pressed after servicing the fire extinguishing system.
- (7) GUI 115;
A discharge line pressure switch (S633) on the forward distribution tubing is connected in parallel to the pressure switch on extinguisher bottle 1. Discharge line pressure switch (S10565) in the forward compartment distribution tubing for extinguisher bottle 2 is connected in parallel with the pressure switch on extinguisher bottle 2. The discharge line pressure switch recognizes bottle discharge prior to the temperature compensated pressure switch on the extinguisher bottle. The discharge line pressure switch gives an immediate indication (EICAS message: CARGO BTL 1) that extinguishing agent is being released in the forward compartment. A reset switch on the discharge line pressure switch should be pressed after servicing the fire extinguishing system. The regulators in the forward cargo compartment distribution tubing for bottle 2 provide a metered release of the extinguishing agent to provide fire protection. This, coupled with the protection from bottle 1 provides 120 minutes of fire protection for the forward and aft cargo compartment.
- (8) Decreasing bottle pressure, by discharge or leakage, activates the temperature compensated pressure switch. The switch sends a signal which turns on the appropriate amber DISCH light on the APU/CARGO fire control panel, and generates a CARGO BTL 1/2 DISCH message on the EICAS display.

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B. Cargo Fire Extinguishing System Test

(1) Squib Test

- (a) The squib test control panel checks the integrity of extinguisher bottle squibs. Pressing the TEST switch sends a signal to all extinguisher bottle squib discharge cartridge. If the squibs are good, the green CARGO FWD/AFT 1/2 lights on the panel will come on.

NOTE: When the forward or aft system is armed the corresponding squibs will not test. (System must be disarmed to conduct squib test.)

(2) Pressure Switch Test

- (a) Manual activation of the bottle pressure switch will do a test of the discharge light circuit continuity. Push the button or turn the hex key on the switch to simulate a bottle discharge. The appropriate amber DISCH light will come on and a CARGO BTL 1/2 DISCH message will appear on the EICAS display as a result of the test.

C. Control

- (1) Provide electrical power (Ref 24-22-00).
(2) To place the system in operation, check that the following circuit breakers on main power distribution panel P6 are closed:
(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
(b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

EFFECTIVITY




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
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CARGO COMPARTMENT FIRE EXTINGUISHING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
BOTTLE - CARGO FIRE EXTINGUISHING, M10466, M10467	--	2	822, AFT CARGO COMPT	26-23-02
CIRCUIT BREAKERS			FLT COMPT, P6	
FIRE EXTINGUISHING CARGO BTL 1, C781		1	6H5	*
FIRE EXTINGUISHING CARGO BTL 2, C773		1	6H6	*
FIRE EXTINGUISHING ENG L BTL 1, C778		1	6H1	*
COMPUTERS - (31-41-00/101)				
EICAS L, M10181				
EICAS R, M10182				
FILTER/DRYER 	--	2	FWD AND AFT CARGO COMPT CEILING	
LIGHT - AFT CARGO 1, YQML8	--	1	FLT COMPT, P61, SQUIB TEST PANEL, M10401	*
LIGHT - AFT CARGO 2, YQML9	--	1	FLT COMPT, P61, SQUIB TEST PANEL, M10401	*
LIGHT - FWD CARGO 1, YQML6	--	1	FLT COMPT, P61, SQUIB TEST PANEL, M10401	*
LIGHT - FWD CARGO 2, YQML7	--	1	FLT COMPT, P61, SQUIB TEST PANEL, M10401	*
PANEL - (26-21-00/101)				
SQUIB TEST CONTROL, M10401				*
PANEL - APU/CARGO FIRE CONTROL, M10444	--	1	FLT COMPT, P8	
REGULATOR 	--	1	AFT CARGO COMPT CEILING	
SWITCH - AFT CARGO DISCHARGE LINE PRESSURE, S10565 	--	1	821, FWD CARGO COMPT, DISCHARGE LINE	*
SWITCH - AFT CARGO FIRE, YQPS2	--	1	FLT COMPT, P8, APU/CARGO FIRE CONTROL PANEL, M10444	26-23-01
SWITCH - BTL 1 DISCH, YQPS3	--	1	FLT COMPT, P8, APU/CARGO FIRE CONTROL PANEL, M10444	*
SWITCH - BTL 2 DISCH, YQPS4	--	1	FLT COMPT, P8, APU/CARGO FIRE CONTROL PANEL, M10444	*
SWITCH - FWD CARGO DISCHARGE LINE PRESSURE, S633	--	1	821, FWD CARGO COMPT, DISCHARGE LINE	*
SWITCH - FWD CARGO FIRE, YQPS1	--	1	FLT COMPT, P8, APU/CARGO FIRE CONTROL PANEL, M10444	26-23-01
SWITCH - TEST, YQMS1	--	1	FLT COMPT, P61, SQUIB TEST PANEL, M10401	*

* SEE THE WDM EQUIPMENT LIST

 GUI 115

 Cargo Compartment Fire Extinguishing System - Component Index
 Figure 101

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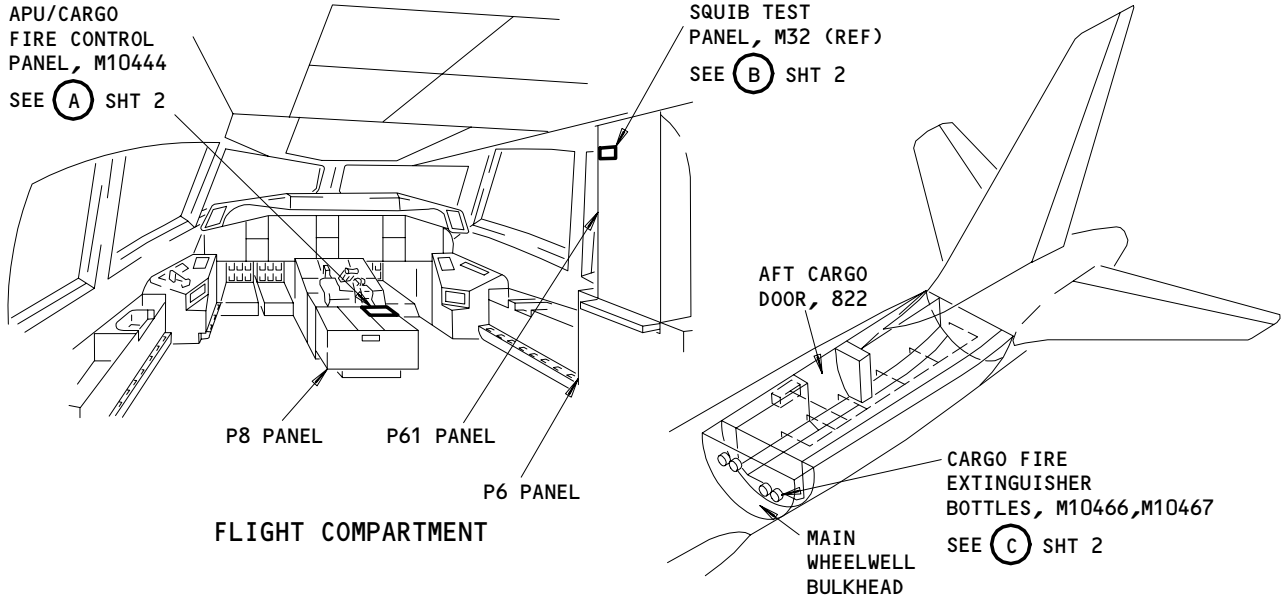
BOEING

757

FAULT ISOLATION/MAINT MANUAL

APU/CARGO
FIRE CONTROL
PANEL, M10444
SEE (A) SHT 2

SQUIB TEST
PANEL, M32 (REF)
SEE (B) SHT 2



FLIGHT COMPARTMENT

CARGO FIRE
EXTINGUISHER
BOTTLES, M10466, M10467
SEE (C) SHT 2

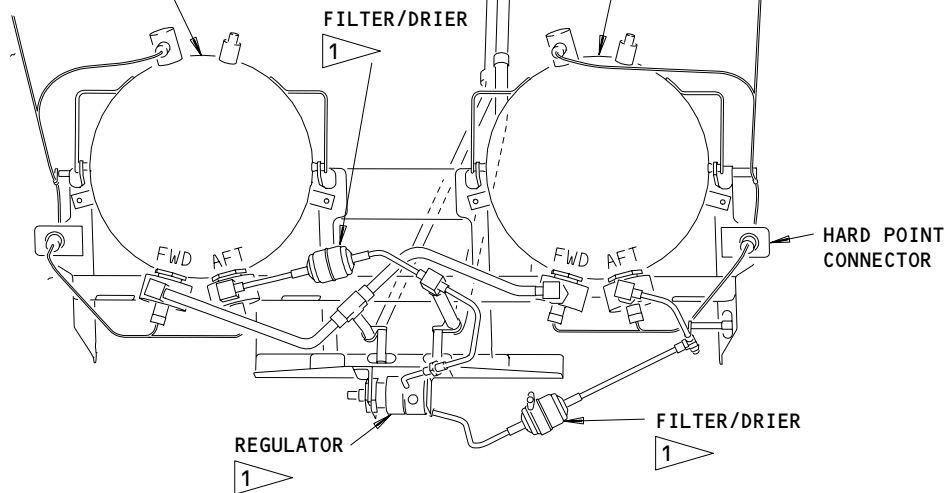
TO FORWARD
COMPARTMENT
(YELLOW)

TO AFT
COMPARTMENT
(BLUE)

FORWARD DISCHARGE
LINE PRESSURE
SWITCH

CARGO FIRE
EXTINGUISHER
BOTTLE NO. 1,
M10466
SEE (C) SHT 2

CARGO FIRE
EXTINGUISHER
BOTTLE NO. 2,
M10467
SEE (C) SHT 2



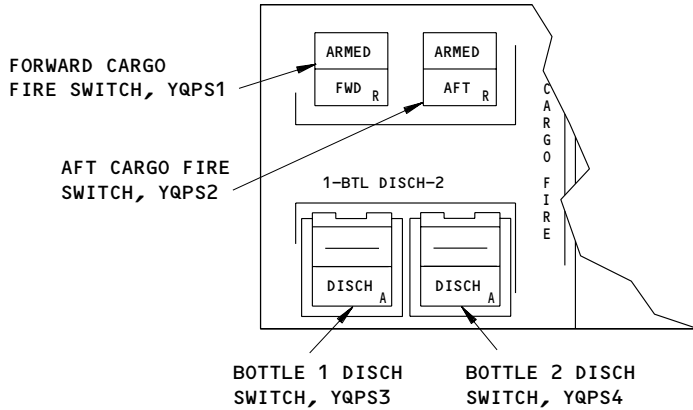
CARGO COMPARTMENT FIRE EXTINGUISHER BOTTLES

1 GUI 115

Component Location
Figure 102 (Sheet 1)

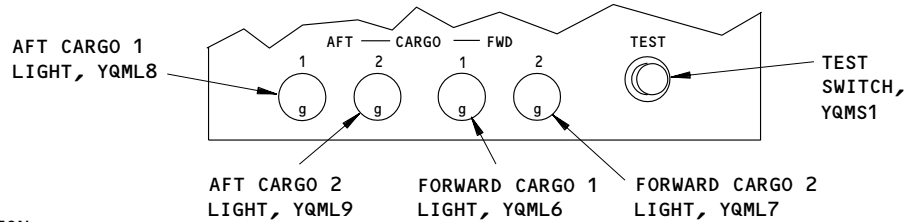
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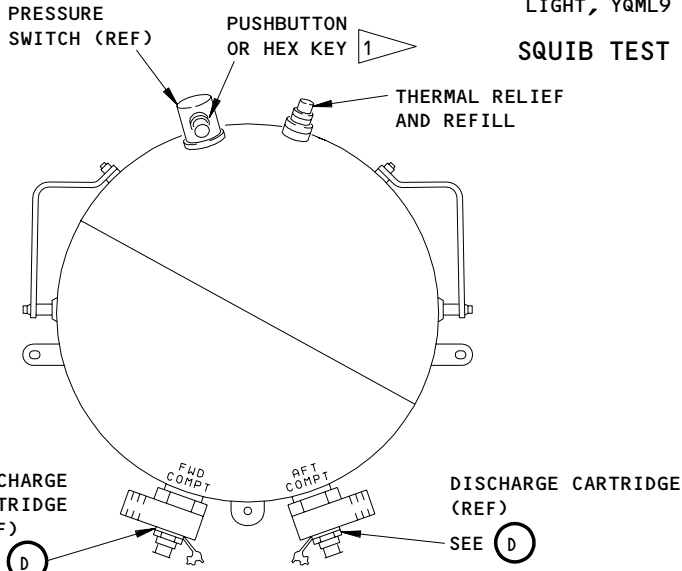
APU/CARGO FIRE CONTROL PANEL, M10444

(A) FROM SHT 1



SQUIB TEST CONTROL PANEL, M10401 (REF)

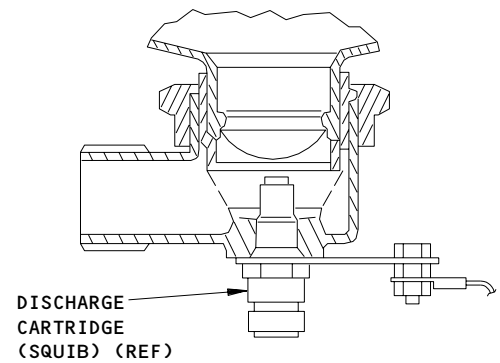
(B) FROM SHT 1



CARGO COMPARTMENT FIRE EXTINGUISHING BOTTLE, M10466, M10467

(C) FROM SHT 1

1 IF INSTALLED



DISCHARGE CARTRIDGE (REF)

(D)

Cargo Compartment Fire Extinguishing System – Component Location
Figure 102 (Sheet 2)

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26-23-00

CARGO FIRE EXTINGUISHING SYSTEM – ADJUSTMENT TEST

1. General

- A. The cargo fire extinguishing system has two fire bottles in the front part of the aft cargo compartment, a cargo fire control panel, and a squib test control panel. The bottle plumbing is connected to the forward and aft cargo compartments, which lets the compartment receive extinguishing agent from the two bottles. Each cargo compartment has an independently operated fire extinguishing system.
- B. This section contains procedures to perform the tests that follow:
 - (1) The operational tests make sure the system operates correctly. They can be done in a minimum of time and use only the equipment installed in the airplane.
 - (2) The system test has different tests for each part of the system. When all the tests are done, the cargo fire extinguishing system is ready to operate correctly.
 - (3) The discharge line test makes sure the connections are correct from the fire extinguisher bottles to the discharge nozzles.

TASK 26-23-00-715-332

2. Operational Test – Bottle Pressure Switch

- A. References
 - (1) AMM 24-22-00/201, Electrical Power – Control
 - (2) AMM 31-41-00/501, EICAS
- B. Access
 - (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
 - 211/212 Flight Compartment
- C. Prepare for Test
 - S 865-001
 - (1) Supply electrical power (AMM 24-22-00/201).
 - S 865-002
 - (2) Make sure that EICAS operates (Ref 31-41-00).

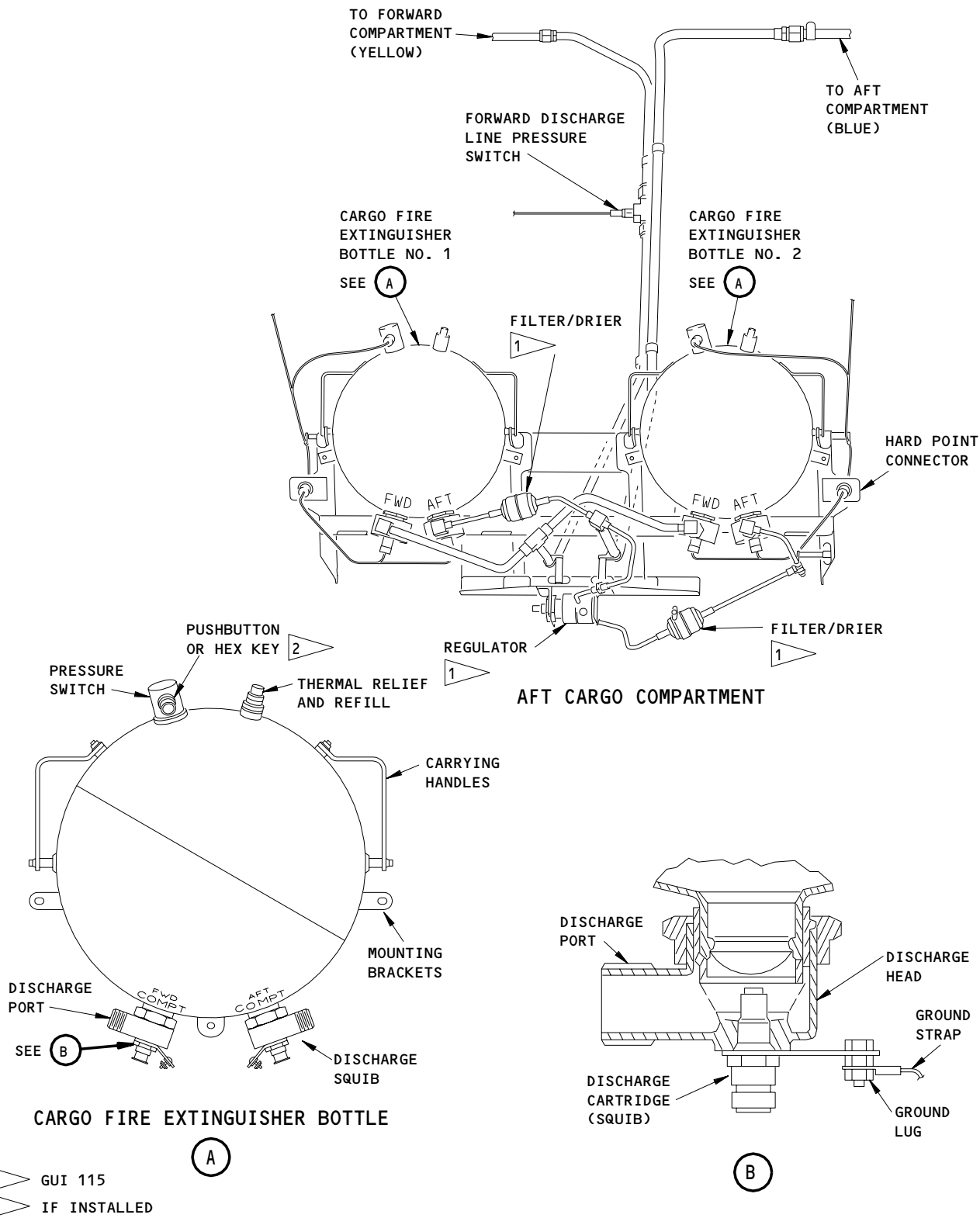
EFFECTIVITY

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Cargo Compartment Fire Extinguishing System
Figure 501

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S 865-334

- (3) Make sure these circuit breakers on the main power distribution panel, P6, are closed:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- D. Do a Test of the Fire Extinguisher Bottle 1 Pressure Switch

S 825-451

CAUTION: IF THE HEX KEY IS ROTATED MORE THAN 1/4 TURN, DAMAGE TO THE SWITCH MAY OCCUR.

- (1) AIRPLANES WITH MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; On cargo fire extinguisher bottle number 1, push and hold the pressure switch manual-override button or turn and hold the ground test hex key 1/4 turn clockwise.
 - (a) Make sure the yellow DISCH light in the BTL DISCH 1 switch on the APU/CARGO Fire Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, CARGO BTL 1, shows on the top display.

S 825-660

- (2) AIRPLANES WITHOUT MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Disconnect connector D4410 from bottle number 1 and connect a jumper wire between pins 2 and 3 of D4410.
 - (a) Make sure the yellow DISCH light in the BTL DISCH 1 switch on the APU/CARGO Fire Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, CARGO BTL 1, shows on the top display.

S 865-006

- (3) AIRPLANES WITH MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Release the pressure switch manual-override button or the ground test hex key.
 - (a) Make sure the yellow DISCH light goes off.
 - (b) Make sure the EICAS message, CARGO BTL 1, does not show on the top display.

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S 865-662

- (4) AIRPLANES WITHOUT MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Disconnect jumper wire between pins 2 and 3 of connector D4410 and connect D4410 to bottle number 1.
 - (a) Make sure the yellow DISCH light goes off.
 - (b) Make sure the EICAS message, CARGO BTL 1, does not show on the top display.

E. Do a Test of the Fire Extinguisher Bottle 2 Pressure Switch

S 865-009

- (1) AIRPLANES WITH MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; On cargo fire extinguisher bottle number 2, push and hold the pressure switch manual-override button or turn and hold the ground test hex key 1/4 turn clockwise.
 - (a) Make sure the yellow DISCH light in the BTL DISCH 2 switch on the APU/CARGO Fire Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, CARGO BTL 2, shows on the top display.

S 865-665

- (2) AIRPLANES WITHOUT MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Disconnect connector D4416 from bottle number 2 and connect a jumper wire between pins 2 and 3 of D4416.
 - (a) Make sure the yellow DISCH light in the BTL DISCH 2 switch on the APU/CARGO Fire Control Panel, P8, comes on.
 - (b) Make sure the EICAS message, CARGO BTL 2, shows on the top display.

S 865-013

- (3) AIRPLANES WITH MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Release the pressure switch manual-override button or the ground test hex key.
 - (a) Make sure the yellow DISCH light goes off.
 - (b) Make sure the EICAS message, CARGO BTL 2, does not show on the top display.

S 865-661

- (4) AIRPLANES WITHOUT MANUAL OVERRIDE BUTTON OR HEX KEY ON THE FIRE BOTTLE; Disconnect jumper wire between pins 2 and 3 of connector D4416 and connect D4416 to bottle number 2.
 - (a) Make sure the yellow DISCH light goes off.

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- (b) Make sure the EICAS message, CARGO BTL 2, does not show on the top display.

S 865-387

- (5) Remove electrical power if it is not necessary (Ref 24-22-00).

TASK 26-23-00-715-388

3. Operational Test - Squib Circuit

A. References

- (1) 24-22-00/201, Electrical Power - Control
- (2) 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)

B. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
 - 211/212 Flight Compartment

C. Prepare for Test

S 865-389

- (1) Supply electrical power (Ref 24-22-00).

S 865-390

- (2) Make sure that EICAS operates (Ref 31-41-00).

S 865-391

- (3) Make sure these circuit breakers on the main power distribution panel, P6, are closed:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

D. Do a Test of the Fire Extinguisher Bottle Squib Circuit

S 865-018

- (1) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD and CARGO AFT (1 and 2) squib test lights on the SQUIB TEST Control Panel come on.

S 865-021

- (2) Release the TEST switch.
 - (a) Make sure the green CARGO FWD and AFT (1 and 2) squib test lights go off.

S 865-028

- (3) Remove electrical power if it is not necessary (Ref 24-22-00).

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TASK 26-23-00-735-333

4. System Test

A. Equipment

- (1) Electrical Test Equipment - Bottle Squib
Circuit, Fire Extinguisher System - A26001-187
(Recommended)
- (2) Electrical Test Equipment - Bottle Squib
Circuit, Fire Extinguisher System - A26001-174
(Alternative)
- (3) Electrical Test Equipment - Bottle Squib
Circuit, Fire Extinguisher System - A26001-165
(Alternative)

NOTE: The A26001 test box does not include the test adapter cables.
The test adapter cables must be ordered separately. Refer to
the A26001 drawing for the required cables.

- (4) Voltmeter - with a 10k ohm or greater
resistance
- (5) Squib Protective Caps
M83723/60-28-AN or -AC
M83723/60-210-AN or -AC
M83723/60-110-AN or -AC
- (6) Multimeter-0-1000 VDC +/- 1%, 0-750 AC, 0-2
AMPS, 0-2 MEG OHMS - (commercially available)

B. References

- (1) AMM 24-22-00/201 Electrical Power - Control
- (2) AMM 20-41-01/201, Electrostatic discharge Sensitive Devices
- (3) AMM 31-41-00/501, EICAS

C. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

D. Prepare For Test

S 865-433

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES
THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC
DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS
SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are
sensitive to electrostatic discharge (AMM 20-41-01/201).

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- S 865-029
- (2) Supply electrical power (AMM 24-22-00/201).
- S 865-030
- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2.
- S 865-411
- (4) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11J2, INSTRUMENTS EICAS CMPTR LEFT
 - (b) 11J29, INSTRUMENTS EICAS CMPTR RIGHT

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S 035-031

- (5) In the lower cargo compartment, disconnect each electrical connector in Table 501 from the discharge squib shown.

TABLE 501 CARGO FIRE BOTTLE CONNECTIONS	
Connector	Bottle Connected to:
D4412	Bottle 1 - Fwd Cargo Discharge Squib
D4414	Bottle 1 - Aft Cargo Discharge Squib
D4418	Bottle 2 - Fwd Cargo Discharge Squib
D4420	Bottle 2 - Aft Cargo Discharge Squib

S 435-405

WARNING: PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLES CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (6) Put the protective caps on all the fire bottle squibs.

S 435-032

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. THE SQUIB IS AN ELECTRICALLY FIRED EXPLOSIVE. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 865-034

- (8) On the SQUIB TEST Control Panel, P61, push the FWD CARGO and AFT CARGO (1 and 2) test lights (4 places).
- (a) Make sure all the green cargo squib test lights come on.

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S 865-038

- (9) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 495-039

- (10) Connect the multimeter to the squib circuit test box.

S 495-040

- (11) Attach the adapter cable to the connector on the squib circuit test box.

NOTE: Adapter cables are included with the squib circuit test box and the appropriate adapter cable must be attached to match the electrical connectors from the squibs.

E. Test Extinguisher Bottle 1 Squib Discharge Circuit

S 215-335

- (1) Make sure the APU/CARGO Fire Control Panel looks like this:
- (a) The FWD and AFT Cargo Fire ARMED switchlights are OFF.
 - (b) The DISCH light in the BTL DISCH 1 and 2 switches is off.

S 865-043

- (2) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

S 435-044

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

- (3) Connect the bottle 1 FWD cargo squib connector, D4412, to the squib circuit test box, adapter cable.

S 865-045

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 865-046

- (5) Push the FWD Cargo Fire switch.
- (a) Make sure the FWD ARMED switchlight is ON.

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- S 865-048
- (6) Push and hold the BTL DISCH 1 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
- S 865-051
- (7) Open this circuit breaker on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 215-338
- (8) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
- S 865-386
- (9) Close this circuit breaker on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 215-340
- (10) Make sure the multimeter on the squib circuit test box shows 23 volts minimum.
- S 865-055
- (11) Set the LOAD CHECK switch on the squib circuit test box to the ON position.
- (a) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.
- NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.
- S 865-057
- (12) Release the BTL DISCH 1 switch.
- (a) Make sure the multimeter on the squib circuit test box shows 0 volts.
- (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
- S 865-061
- (13) Push and hold the BTL DISCH 2 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.
- S 865-063
- (14) Release the BTL DISCH 2 switch.
- S 865-064
- (15) Push the FWD Cargo Fire switch and release.
- (a) Make sure the FWD ARMED switchlight is OFF.

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- S 865-066
- (16) Push the AFT Cargo Fire switch.
(a) Make sure the AFT ARMED switchlight is ON.
- S 865-068
- (17) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.
- S 865-071
- (18) Release the BTL DISCH 1 switch.
- S 865-073
- (19) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.
- S 865-075
- (20) Release the BTL DISCH 2 switch.
- S 865-076
- (21) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.
- S 865-078
- (22) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 035-079
- (23) Disconnect the bottle 1 FWD cargo squib connector, D4412, from the squib circuit test box adapter cable.
- S 865-080
- (24) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.
- S 435-081
- WARNING:** DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE SQUIB IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.
- (25) Connect the bottle 1 AFT cargo squib connector, D4414, to the squib circuit test box, adapter cable.

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- S 865-082
- (26) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 865-083
- (27) Push the AFT Cargo Fire switch.
- (a) Make sure the AFT ARMED switchlight is ON.
- S 865-085
- (28) Push and hold the BTL DISCH 1 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
- S 865-088
- (29) Open this circuit breaker on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 215-343
- (30) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.
- S 865-090
- (31) Close this circuit breaker on the P6 panel:
- (a) 6H5, CARGO FIRE EXTINGUISHING CARGO BTL 1
- S 765-091
- (32) Make sure the multimeter on the squib circuit test box shows 23 volts minimum.
- S 865-092
- (33) Set the LOAD CHECK switch on the squib circuit test box to the ON position.
- (a) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.
- NOTE:** If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.
- S 865-094
- (34) Release the BTL DISCH 1 switch.
- (a) Make sure the multimeter on the squib circuit test box shows 0 volts.
 - (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

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- S 865-097
- (35) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.
- S 865-099
- (36) Release the BTL DISCH 2 switch.
- S 865-100
- (37) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.
- S 865-102
- (38) Push the FWD Cargo Fire switch.
(a) Make sure the FWD ARMED switchlight is ON.
- S 865-104
- (39) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.
- S 865-107
- (40) Release the BTL DISCH 1 switch.
- S 865-109
- (41) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.
- S 865-111
- (42) Release the BTL DISCH 2 switch.
- S 865-112
- (43) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.
- S 865-114
- (44) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 035-115
- (45) Disconnect the bottle 1 AFT cargo squib connector, D4414, from the squib circuit test box, adapter cable.
- S 865-116
- (46) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

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F. Test Extinguisher Bottle 2 Squib Discharge Circuit

S 215-345

- (1) Make sure the APU/CARGO Fire Control Panel looks like this:
 - (a) The FWD and AFT Cargo Fire ARMED switchlights are OFF.
 - (b) The DISCH light in the BTL DISCH 1 and 2 switches is off.

S 035-119

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

- (2) Connect the bottle 2 FWD cargo squib connector, D4418, to the squib circuit test box adapter cable.

S 865-120

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 865-121

- (4) Push the FWD Cargo Fire switch.
 - (a) Make sure the FWD ARMED switchlight is ON.

S 865-123

- (5) Push and hold the BTL DISCH 2 switch.
 - (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.

S 865-126

- (6) Open this circuit breaker on the P6 panel:
 - (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 215-348

- (7) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 865-128

- (8) Close this circuit breaker on the P6 panel:
 - (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 765-129

- (9) Make sure the multimeter on the squib circuit test box shows 23 volts minimum.

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S 865-130

- (10) Set the LOAD CHECK switch on the squib circuit test box to the ON position.
- (a) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-132

- (11) Release the BTL DISCH 2 switch.
- (a) Make sure the multimeter on the squib circuit test box shows 0 volts.
- (b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 865-136

- (12) Push and hold the BTL DISCH 1 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-138

- (13) Release the BTL DISCH 1 switch.

S 865-139

- (14) Push the FWD Cargo Fire switch and release.
- (a) Make sure the FWD ARMED switchlight is OFF.

S 865-141

- (15) Push the AFT Cargo Fire switch.
- (a) Make sure the AFT ARMED switchlight is ON.

S 865-143

- (16) Push and hold the BTL DISCH 1 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-146

- (17) Release the BTL DISCH 1 switch.

S 865-148

- (18) Push and hold the BTL DISCH 2 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-150

- (19) Release the BTL DISCH 2 switch.

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- S 865-151
- (20) Push the AFT Cargo Fire switch and release.
- (a) Make sure the AFT ARMED switchlight is OFF.
- S 865-153
- (21) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 035-154
- (22) Disconnect the bottle 2 FWD cargo squib connector, D4418, from the squib circuit test box adapter cable.
- S 865-155
- (23) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.
- S 435-156
- WARNING:** DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.
- (24) Connect the bottle 2 AFT cargo squib connector, D4420, to the squib circuit test box adapter cable.
- S 865-157
- (25) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 865-158
- (26) Push the AFT Cargo Fire switch.
- (a) Make sure the AFT ARMED switchlight is ON.
- S 865-160
- (27) Push and hold the BTL DISCH 2 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box comes on.
- S 865-163
- (28) Open this circuit breaker on the P6 panel:
- (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 215-352
- (29) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

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S 865-165

- (30) Close this circuit breaker on the P6 panel:
(a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 215-354

- (31) Make sure the multimeter on the squib circuit test box shows 23 volts minimum.

S 865-167

- (32) Set the LOAD CHECK switch on the squib circuit test box to the ON position.
(a) Make sure the multimeter on the squib circuit test box shows 16 volts minimum.

NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 865-169

- (33) Release the BTL DISCH 2 switch.
(a) Make sure the multimeter on the squib circuit test box shows 0 volts.
(b) Make sure the BOTTLE DISCHARGE light on the squib circuit test box goes off.

S 865-173

- (34) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-175

- (35) Release the BTL DISCH 1 switch.

S 865-176

- (36) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.

S 865-178

- (37) Push the FWD Cargo Fire switch.
(a) Make sure the FWD ARMED switchlight is ON.

S 865-180

- (38) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-183

- (39) Release the BTL DISCH 1 switch.

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S 865-185

- (40) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib circuit test box remains off.

S 865-187

- (41) Release the BTL DISCH 2 switch.

S 865-188

- (42) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.

S 865-190

- (43) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 035-191

- (44) Disconnect the bottle 2 AFT cargo squib connector, D4420, from the squib circuit test box adapter cable.

S 865-192

- (45) Set the LOAD CHECK switch on the squib circuit test box to the OFF position.

G. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 865-434

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 435-406

- (2) Do the steps that follow to connect an electrical connector to a fire bottle squib.
(a) Make sure these circuit breakers on the P6 panel are open:
1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
2) 6H5, FIRE EXTINGUISHING CARGO BTL 1
3) 6H6, FIRE EXTINGUISHING CARGO BTL 2
(b) Remove the protective cap from the fire bottle squib.

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WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: If you use a voltmeter with a 10k ohm or greater resistor, you will remove the stray voltage from the electrical connector.

- (d) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (e) Connect the electrical connector to the fire bottle squib.
(f) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 2) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - 3) 6H6, FIRE EXTINGUISHING CARGO BTL 2

H. Connect the Squib Connectors

S 435-407

- (1) Do the Squib Electrical Connection procedure to connect the electrical connector, D4412, to the FWD squib of bottle 1.

S 865-227

- (2) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1 squib test light on the SQUIB TEST Control Panel comes on.
 - (b) Make sure the CARGO AFT 1, CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.

S 865-231

- (3) Release the TEST switch.
- (a) Make sure the CARGO FWD 1 squib test light goes off.

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- S 025-237
- (4) Do the Squib Electrical Connection procedure to connect the electrical connector, D4414, to the AFT squib of bottle 1.
- S 865-239
- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1 and CARGO AFT 1 squib test lights on the SQUIB TEST Control Panel come on.
- (b) Make sure the CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.
- S 865-243
- (6) Release the TEST switch.
- (a) Make sure the CARGO FWD 1 and CARGO AFT 1 squib test lights go off.
- S 435-408
- (7) Do the Squib Electrical Connection procedure to connect the electrical connector, D4418, to the FWD squib of bottle 2.
- S 865-250
- (8) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1, CARGO AFT 1, and CARGO FWD 2 squib test lights on the SQUIB TEST Control Panel come on.
- (b) Make sure the CARGO AFT 2 squib test light stays off.
- S 865-261
- (9) Release the TEST switch.
- (a) Make sure the CARGO FWD 1, CARGO AFT 1 and CARGO FWD 2 squib test lights go off.
- S 425-266
- (10) Do the Squib Electrical Connection procedure to connect the electrical connector, D4420, to the AFT squib of bottle 2.
- S 865-268
- (11) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1, CARGO FWD 2, and CARGO AFT 1 and CARGO AFT 2 squib test lights on the SQUIB TEST Control Panel come on.
- S 865-272
- (12) Release the TEST switch.
- (a) Make sure the green CARGO FWD 1 and 2, CARGO AFT 1 and 2 squib test lights go off.

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I. Put the Airplane back to its initial condition.

S 865-417

- (1) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11J2, INSTRUMENTS EICAS CMPTR LEFT
 - (b) 11J29, INSTRUMENTS EICAS CMPTR RIGHT

S 865-418

- (2) Remove electrical power if it is not necessary (Ref 24-22-00).

TASK 26-23-00-705-392

5. Cargo Fire Extinguisher Discharge Lines System Test

A. Equipment

- (1) Pneumatic Air Source (approved to supply 145 to 155 psig dry air, 32 degrees F dew point and filtered to 5 micron)
- (2) Distribution Nozzle Caps - B26002-1
- (3) AIRPLANES WITH METERED CARGO FIRE EXTINGUISHING SYSTEM;
Regulated source of dry nitrogen (Capable of supplying 135-155 psig)
- for the metered discharge lines

B. Access

(1) Location Zones

- | | |
|-----|-----------------------------------|
| 121 | Forward Cargo Compartment (Left) |
| 122 | Forward Cargo Compartment (Right) |
| 153 | Aft Cargo Compartment (Left) |
| 154 | Aft Cargo Compartment (Right) |

(2) Access Panels

- | | |
|-----|--------------------------------|
| 821 | Forward Cargo Compartment Door |
| 822 | Aft Cargo Compartment Door |

C. Prepare For Test

S 865-274

- (1) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) Main Power Distribution Panel, P6:
 - 1) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - 2) 6H6, FIRE EXTINGUISHING CARGO BTL 2.

D. Test Forward Discharge Line

S 025-275

- (1) Disconnect the FWD discharge hoses from the FWD discharge ports of bottle 1 and bottle 2.

S 485-276

- (2) Connect the dry air source to the FWD discharge hose of bottle 1.

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S 785-504

CAUTION: APPLY PRESSURE ONLY TO TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO DISCHARGE PORTS CAN OCCUR.

- (3) Start the dry air source and apply pressure between 145 psig minimum and 155 psig maximum to the forward cargo compartment.
 - (a) Make sure that air flows freely from the FWD discharge hose of bottle 2.

S 865-279

- (4) Stop the dry air source.

S 435-280

- (5) Cap the FWD discharge hose of bottle 2 with a suitable cap.

S 785-281

CAUTION: APPLY PRESSURE ONLY TO TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO DISCHARGE PORTS CAN OCCUR.

- (6) Start the dry air source and apply pressure between 145 psig minimum and 155 psig maximum to the forward cargo compartment.
 - (a) Make sure that air flows freely from all three distribution nozzles in the center of the forward cargo compartment ceiling.
 - (b) Make sure that no air flows from the four distribution nozzles in the center of the aft cargo compartment ceiling.

S 865-285

- (7) Stop the dry air source.

S 425-393

- (8) Install the nozzle caps to the distribution nozzles in the FWD cargo compartment ceiling.

S 785-394

- (9) Apply pressure of 50 +/- 5 psig to the tubing.

S 865-395

- (10) Stop the pressurization, and observe the pressure decay for ten minutes.

S 785-396

- (11) Make sure the pressure has not decreased by more than 0.5 psig.

S 785-397

- (12) Release the pressure from the FWD cargo compartment tubing.

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S 035-398

- (13) Remove the nozzle caps from the distribution nozzles in the FWD cargo compartment.

S 985-286

- (14) Disconnect the dry air source from the FWD discharge hose of bottle 1.

S 035-287

- (15) Remove the cap from the bottle 2 discharge hose.

S 425-288

- (16) Connect the FWD discharge hoses to the FWD discharge ports of bottles 1 and 2.
(a) Tighten the discharge hoses to 280 pound-inches for 1/2-inch connectors and 360 pound-inches for 5/8-inch connectors.

S 215-409

- (17) Do these steps:
- (a) Close these circuit breakers and remove the DO-NOT-CLOSE tags:
 - 1) Main Power Distribution Panel, P6:
 - a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - b) 6H6, FIRE EXTINGUISHING CARGO BTL 2.
 - (b) Make sure the DISCH light in the BTL 1 DISCH switch on the APU/CARGO Fire Control Panel, P8, is on.
 - (c) Make sure the red reset button on the forward discharge line pressure switch, S633, is extended.
 - (d) Push the red reset button on the forward discharge line pressure switch, S633.
 - 1) Make sure the DISCH light in the BTL 1 DISCH switch on the APU/CARGO Fire Control Panel, P8, goes off.
 - (e) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
 - 1) Main Power Distribution Panel, P6:
 - a) 6H5, FIRE EXTINGUISHING CARGO BTL 1

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- b) 6H6, FIRE EXTINGUISHING CARGO BTL 2.
E. AIRPLANES WITH NON-METERED CARGO FIRE EXTINGUISHING SYSTEM;
Test Aft Discharge Line

S 025-301

- (1) Disconnect the AFT discharge hoses on the AFT discharge ports of bottle 1 and bottle 2.

S 485-302

- (2) Connect the dry air source to the AFT discharge hose of bottle 1.

S 785-503

CAUTION: APPLY PRESSURE ONLY TO TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO DISCHARGE PORTS CAN OCCUR.

- (3) Start the dry air source and apply pressure between 145 psig minimum and 155 psig maximum to the aft cargo compartment.

(a) Make sure that air flows freely from the AFT discharge hose of bottle 2.

S 865-305

- (4) Stop the dry air source.

S 435-306

- (5) Cap the AFT discharge hose of bottle 2 with a suitable cap.

S 785-416

CAUTION: APPLY PRESSURE ONLY TO THE TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO THE DISCHARGE PORTS CAN OCCUR.

- (6) Start the dry air source and apply pressure between 145 psig minimum and 155 psig maximum to the aft cargo compartment.

(a) Make sure that air flows freely from all four distribution nozzles in the center of the aft cargo compartment ceiling.

(b) Make sure that no air flows from the three distribution nozzles in the center of the forward cargo compartment ceiling.

S 865-257

- (7) Stop the dry air source.

S 425-399

- (8) Install the nozzle caps to the distribution nozzles in the AFT cargo compartment ceiling.

S 785-400

- (9) Apply pressure of 50 +/- 5 psig to the tubing.

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S 865-401

- (10) Stop the pressurization, and observe the pressure decay for ten minutes.

S 785-402

- (11) Make sure the pressure has not decreased by more than 0.5 psig.

S 785-403

- (12) Release the pressure from the AFT cargo compartment tubing.

S 035-404

- (13) Remove the nozzle caps from the distribution nozzles in the AFT cargo compartment.

S 085-309

- (14) Disconnect dry air source from the AFT discharge hose of bottle 1.

S 035-310

- (15) Remove the cap from the bottle 2 discharge hose.

S 425-311

- (16) Connect the AFT discharge hoses to the AFT discharge ports of bottles 1 and 2.

(a) Tighten the discharge hoses to 280 pound-inches for 1/2-inch connectors and 360 pound-inches for 5/8-inch connectors.

F. AIRPLANES WITH METERED CARGO FIRE EXTINGUISHING SYSTEM;
Test the aft metered discharge line.

S 865-374

- (1) Open both the Forward and Aft Cargo Compartment Doors.
(a) Leave both the doors open for this part of the test.

S 025-375

- (2) Disconnect the AFT discharge hoses on the AFT discharge ports of bottle 1 and bottle 2.

S 865-379

WARNING: DO NOT LET THE NITROGEN FLOW INTO THE AFT CARGO COMPARTMENT ANY LONGER THAN REQUIRED TO COMPLETE THE TEST. A CONTINUOUS FLOW OF NITROGEN MAY DECREASE THE OXYGEN IN THE CARGO COMPARTMENT. INJURY TO PERSONS MAY OCCUR.

- (3) Connect the dry nitrogen source to the AFT discharge hose of bottle 2.

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S 785-628

CAUTION: APPLY PRESSURE ONLY TO TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO DISCHARGE PORTS CAN OCCUR.

- (4) Start the dry nitrogen source and apply pressure between 100 psig minimum and 120 psig maximum to the aft cargo compartment.
 - (a) Make sure that nitrogen flows freely from the AFT discharge hose of bottle 1.

S 865-607

- (5) Stop the dry nitrogen source.

S 425-608

- (6) Cap the AFT discharge hose of bottle 1 with a suitable cap.

S 785-627

CAUTION: APPLY PRESSURE ONLY TO THE TUBING. DO NOT PRESSURIZE THE FIRE BOTTLES. DAMAGE TO THE DISCHARGE PORTS CAN OCCUR.

- (7) Start the dry nitrogen source and apply pressure between 100 psig minimum and 120 psig maximum to the aft cargo compartment.
 - (a) Make sure that nitrogen flows freely from all four distribution nozzles in the center of the aft cargo compartment ceiling.
 - (b) Make sure that no nitrogen flows from the three distribution nozzles in the center of the forward cargo compartment ceiling.

S 865-610

- (8) Stop the dry nitrogen source.

S 425-611

- (9) Install the nozzle caps to the distribution nozzles in the AFT cargo compartment ceiling.

S 785-600

- (10) Apply pressure between 50 and 55 psig.

S 865-601

- (11) Stop the pressurization, and observe the pressure decay for ten minutes.

S 785-602

- (12) Make sure the pressure has not decreased by more than 0.5 psig.

S 785-603

- (13) Release the pressure from the AFT cargo compartment tubing.

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- S 035-604
- (14) Remove the nozzle caps from the distribution nozzles in the AFT cargo compartment.
- S 035-605
- (15) Remove the cap from the bottle 1 discharge hose.
- S 025-606
- (16) Disconnect the dry nitrogen source from the AFT discharge hose of bottle 2.
- S 425-385
- (17) Connect the AFT discharge hoses to the AFT discharge ports of bottles 1 and 2.
- (a) Tighten the discharge hoses to 280 pound-inches for 1/2-inch connectors and 360 pound-inches for 5/8-inch connectors.
- S 865-675
- (18) Close these circuit breakers and remove the DO-NOT-CLOSE tags:
- (a) Main Power Distribution Panel, P6:
- 1) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- 2) 6H6, FIRE EXTINGUISHING CARGO BTL 2.
- S 215-373
- (19) Make sure the DISCH light in the BTL DISCH 2 switch on the APU/CARGO Fire Control Panel, P8, comes on.
- S 865-485
- (20) Push the red reset button on the aft discharge line pressure switch, S10565.
- (a) Make sure the DISCH light in the BTL DISCH 2 switch on the APU/CARGO Fire Control Panel, P8, goes off.
- S 865-619
- (21) Put the Airplane back to its initial condition.

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CARGO FIRE EXTINGUISHING SYSTEM TUBING AND NOZZLE OUTLETS – CLEANING

1. General

- A. This procedure contains a task. This task gives the instructions to clean the cargo fire extinguishing tubing and the nozzle outlets.

TASK 26-23-00-107-019

2. Clean the Cargo Fire Extinguishing Tubing and the Nozzle Outlets

NOTE: GUI 001-114, 116-999;
Clean the FWD and AFT Fire Extinguishing Tubing and the Nozzle Outlets

NOTE: GUI 115;
Clean only the FWD Fire Extinguishing Tubing and the Nozzle Outlets

A. References

- (1) AMM 25-50-03/401, Bulkhead Lining – Removal and Installation

B. Access

- (1) Location Zones

211/212	Flight Compartment
121/122	Forward Cargo Compartment
153/154	Aft Cargo Compartment

- (2) Access Panels

821	Forward Cargo Compartment Door
822	Aft Cargo Compartment Door

C. Prepare to clean the discharge lines.

S 867-004

- (1) Open the forward cargo door N0.1 and the aft cargo door N0.2

S 867-005

- (2) Get access to the fire extinguisher bottles which are located behind the forward bulkhead lining of the aft cargo compartment, (AMM 25-50-03/401).

S 867-006

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

D. Procedure.

S 167-012

- (1) Do the steps that follow:
- (a) Remove the discharge tubing from bottle 1 and bottle 2 forward discharge heads.
 - (b) Connect dry plant air source to bottle 1 forward discharge hose.

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- (c) Supply pressure between 45 psig and 55 psig to the bottle 1 discharge hose until it's free of unwanted materials.
- (d) Remove pressure from the bottle 1 discharge hose.
- (e) Seal bottle 2 forward discharge hose with a cap.
- (f) Remove all the forward cargo compartment nozzle outlets that are installed in the ceiling panel.
- (g) Make a visual inspection of the nozzle outlets for unwanted materials that are collected within the nozzle orifices.
- (h) Clean and make sure the nozzle is free of unwanted materials.
- (i) Supply pressure intermittently until the discharge lines are free of unwanted materials.
- (j) Remove pressure and disconnect the air source from the forward cargo compartment discharge hose.
- (k) Install the forward compartment nozzle outlets , seal and tighten to 360 inch-pounds per BAC 5001.
- (l) Connect the forward discharge hose to bottle 1 "FWD" discharge port, seal and tighten to 280 inch-pounds per BAC 5001.
- (m) Remove the cap from bottle 2 discharge hose.
- (n) Connect the hose to the "FWD" discharge port, seal and tighten to 280 inch-pounds per BAC 5001.
- (o) Push the reset button on the forward in line pressure switch (S633).
- (p) Remove the discharge tubing from bottle 1 and bottle 2 aft discharge heads.
- (q) Connect dry plant air source to bottle 1 aft discharge hose.
- (r) Supply pressure between 45 psig and 55 psig to the bottle 1 discharge hose until it's free of unwanted materials.
- (s) Remove pressure from the bottle 1 discharge hose.
- (t) Seal bottle 2 aft discharge hose with a cap.
- (u) Remove all the aft cargo compartment nozzle outlets that are installed in the ceiling panel.
- (v) Make a visual inspection of the nozzle outlets for unwanted materials that are collected within the nozzle orifices.
- (w) Clean and make sure the nozzle is free of unwanted materials.
- (x) Supply pressure intermittently until the discharge lines are free of unwanted materials.
- (y) Remove pressure and disconnect the dry air source from the aft cargo compartment discharge hose.
- (z) Install the aft compartment nozzle outlets , seal and tighten to 360 inch-pounds per BAC 5001.
- (aa) Connect the aft discharge hose to bottle 1 "AFT" discharge port.
- (ab) Remove the cap from bottle 2 discharge hose and connect the hose to the bottle 2 "AFT" discharge port.

S 867-003

- (2) Close these circuit breakers on the P6 panel and remove the DO-NOT-CLOSE tags:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

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- S 867-007
(3) Install or close the bulkhead lining (AMM 25-50-03/401).
- S 867-008
(4) Close the cargo doors.

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CARGO FIRE EXTINGUISHING ARMED SWITCHES – INSPECTION/CHECK

1. General

- A. This procedure does a check of the cargo fire extinguishing armed switches to make sure the firing circuit operates correctly, and to verify cargo compartments isolation after the fire armed switches are activated.
- B. This procedure contains these tasks:
 - (1) Cargo Fire Extinguisher Armed Switch Activation Check
 - (2) Forward Cargo Heat Stops after the FWD ARMED Switch Activation Check
 - (3) Aft Cargo Heat Stops after the AFT ARMED Switch Activation Check
 - (4) Left and Right Air Conditioning Recirculation System Stop and Overboard Exhaust Valve Opens after the FWD ARMED Switch Activation Check
 - (5) Right Air Conditioning Recirculation System Stops after the AFT ARMED Switch Activation Check

TASK 26-23-01-706-182

2. Cargo Fire Extinguishing Armed Switch Activation Check (Fig. 601)

A. Equipment

- (1) Multimeter 0-1000 VDC \pm 1%, 0-750 VAC 0-2 AMPS, 0-2, MEG OHMS. Commercially available
- (2) Voltmeter – with a 10k ohm or greater resistance
- (3) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-187 (Recommended)
- (4) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-174 (Alternative)
- (5) Electrical Test Equipment – Bottle Squib, Fire Extinguisher System – A26001-165 (Alternative)

NOTE: The A26001 test box does not include the test adapter cables. The test adapter cables must be ordered separately. Refer to the A26001 drawing for the required cables.

B. References

- (1) AMM 24-22-00/201, Electrical Power
- (2) AMM 32-09-02/201, Air/Ground Relays

C. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

D. Prepare for Test

S 866-001

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

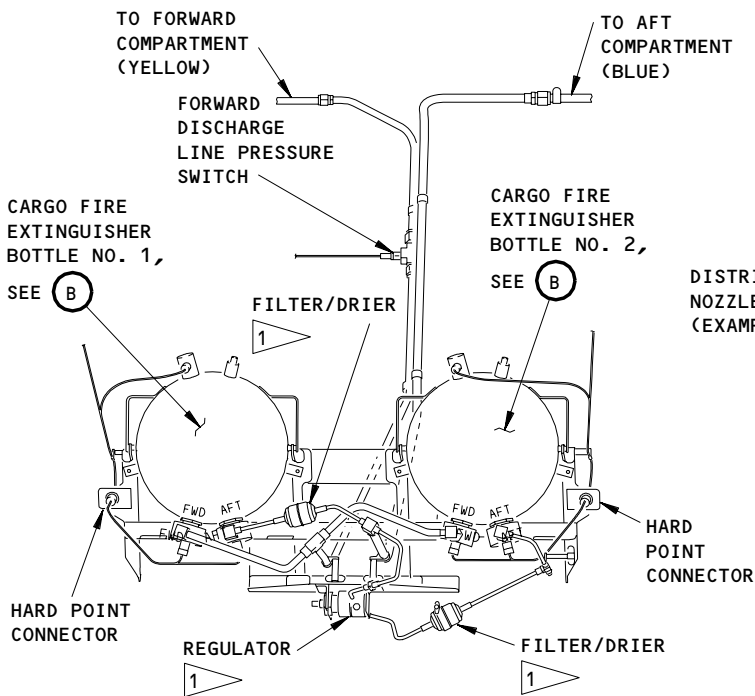
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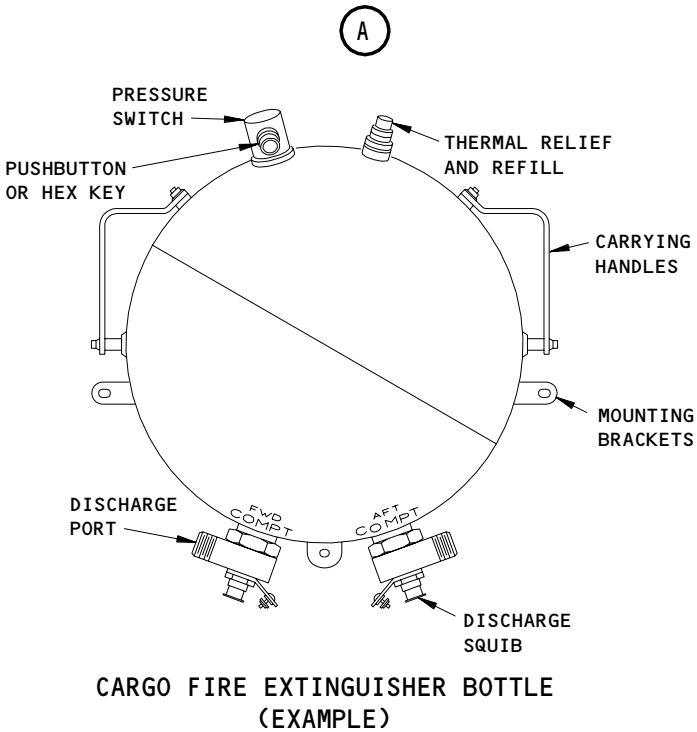
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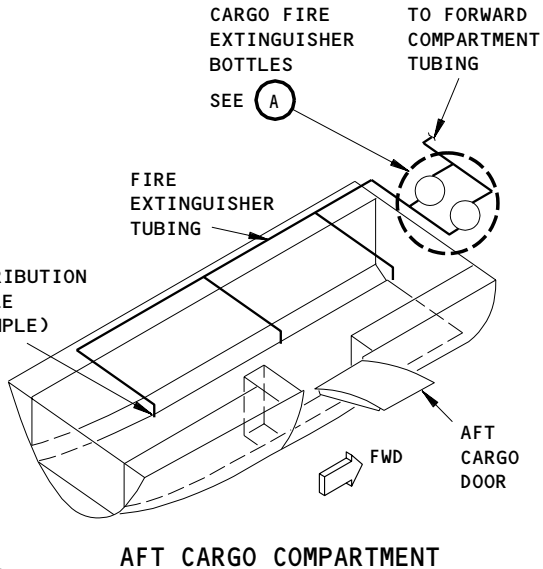
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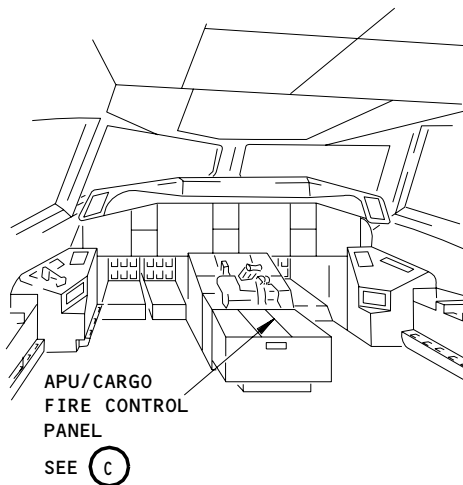
CARGO FIRE EXTINGUISHER BOTTLES
(VIEW IN THE FORWARD DIRECTION)



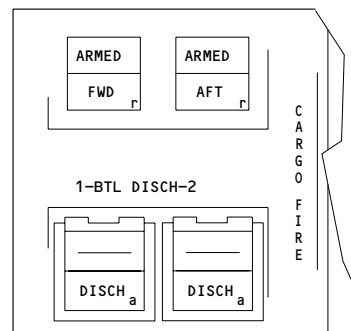
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AFT CARGO COMPARTMENT



FLIGHT COMPARTMENT



APU/CARGO FIRE CONTROL PANEL

Cargo Compartment Fire Extinguishing System
Figure 601

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S 866-002

- (2) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 866-172

- (3) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11J2, INSTRUMENTS EICAS CMPTR LEFT
 - (b) 11J29, INSTRUMENTS EICAS CMPTR RIGHT

S 016-189

- (4) Gain access to the lower cargo fire extinguishing bottles. The bottles are located behind the liners located in the forward end of the aft cargo compartment.

S 426-003

- (5) On the lower cargo compartment fire extinguisher bottles 1 and 2, disconnect these connectors per Table 601:

Cargo Fire Bottle Connections Table 601:

Connector	Bottle Connected To:
D4412	Bottle 1 - Fwd Cargo discharge Squib
D4414	Bottle 1 - Aft Cargo discharge Squib
D4418	Bottle 2 - Fwd Cargo discharge Squib
D4420	Bottle 2 - Aft Cargo discharge Squib

S 436-173

WARNING: PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS. IF YOU DO NOT PUT THE PROTECTIVE CAPS ON THE FIRE BOTTLE SQUIBS, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY. THIS CAN CAUSE INJURIES TO PERSONNEL..

CAUTION: DO NOT PUT SHUNT PLUGS ON THE FIRE BOTTLE SQUIBS. THE SHUNT PLUGS CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (6) Put the protective caps on all the fire bottle squibs.

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S 436-183

- (7) Connect the multimeter to the squib test box.

S 436-184

- (8) Attach the adapter cable to the connector on the squib test box.

NOTE: Adapter cables are included with the squib test box and the appropriate adapter cable must be attached to match the electrical connectors from the squibs.

E. Do a test of the Cargo Fire Extinguisher Bottle 1 Squib Discharge Circuit

S 216-181

- (1) Make sure the APU/CARGO Fire Control Panel looks like this:
(a) The FWD and AFT Cargo Fire ARMED switchlights are OFF.
(b) The DISCH light in the BTL DISCH 1 and 2 switches is off.

S 866-044

- (2) Set the LOAD CHECK switch on the squib test box to the OFF position.

S 436-182

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

- (3) Connect the bottle 1 FWD cargo squib connector, D4412, to the squib test box adapter cable.

S 866-050

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 866-183

- (5) Push the FWD Cargo Fire switch.
(a) Make sure the FWD ARMED switchlight is ON.

S 866-184

- (6) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

S 866-052

- (7) Open this circuit breaker on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1

S 216-053

- (8) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

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- S 746-054
- (9) Close this circuit breaker on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 216-056
- (10) Make sure the multimeter on the squib test box shows 23 volts minimum.
- S 866-057
- (11) Set the LOAD CHECK switch on the squib test box to the ON position.
(a) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

- S 866-059
- (12) Release the BTL DISCH 1 switch.
(a) Make sure the multimeter on the squib test box shows 0 volts.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

- S 866-060
- (13) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

- S 866-061
- (14) Release the BTL DISCH 2 switch.

- S 866-062
- (15) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.

- S 866-063
- (16) Push the AFT Cargo Fire switch.
(a) Make sure the AFT ARMED switchlight is ON.

- S 866-064
- (17) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

- S 866-066
- (18) Release the BTL DISCH 1 switch.

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S 866-068

- (19) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

S 866-069

- (20) Release the BTL DISCH 2 switch.

S 866-070

- (21) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.

S 866-071

- (22) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 036-072

- (23) Disconnect the bottle 1 FWD cargo squib connector, D4412, from the squib test box adapter cable.

S 866-073

- (24) Set the LOAD CHECK switch on the squib test box to the OFF position.

S 436-074

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE SQUIB IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

- (25) Connect the bottle 1 AFT cargo squib connector, D4414, to the squib test box adapter cable.

S 866-075

- (26) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 866-076

- (27) Push the AFT Cargo Fire switch.
(a) Make sure the AFT ARMED switchlight is ON.

S 866-077

- (28) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

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- S 866-081
- (29) Open this circuit breaker on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 216-082
- (30) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
- S 866-083
- (31) Close this circuit breaker on the P6 panel:
(a) 6H5, CARGO FIRE EXTINGUISHING CARGO BTL 1
- S 766-085
- (32) Make sure the multimeter on the squib test box shows 23 volts minimum.
- S 866-086
- (33) Set the LOAD CHECK switch on the squib test box to the ON position.
(a) Make sure the multimeter on the squib test box shows 16 volts minimum.
- NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.
- S 866-087
- (34) Release the BTL DISCH 1 switch.
(a) Make sure the multimeter on the squib test box shows 0 volts.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
- S 866-089
- (35) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.
- S 866-090
- (36) Release the BTL DISCH 2 switch.
- S 866-091
- (37) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.
- S 866-092
- (38) Push the FWD Cargo Fire switch.
(a) Make sure that ARMED is shown.
- S 866-093
- (39) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

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S 866-095
(40) Release the BTL DISCH 1 switch.

S 866-306
(41) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

S 866-307
(42) Release the BTL DISCH 2 switch.

S 866-099
(43) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.

S 866-100
(44) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 036-101
(45) Disconnect the bottle 1 AFT cargo squib connector, D4414, from the squib test box adapter cable.

S 866-102
(46) Set the LOAD CHECK switch on the squib test box to the OFF position.
F. Do a test of the Cargo Fire Extinguisher Bottle 2 Squib Discharge Circuit

S 216-103
(1) Make sure the APU/CARGO Fire Control Panel looks like this:
(a) The FWD and AFT Cargo Fire ARMED switchlights are OFF.
(b) The DISCH light in the BTL DISCH 1 and 2 switches is off.

S 036-163

WARNING: DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.

(2) Connect the bottle 2 FWD cargo squib connector, D4418, to the squib test box adapter cable.

S 866-104
(3) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

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- S 866-105
- (4) Push the FWD Cargo Fire switch.
(a) Make sure the FWD ARMED switchlight is ON.
- S 866-308
- (5) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.
- S 866-110
- (6) Open this circuit breaker on the P6 panel:
(a) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 216-111
- (7) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
- S 866-112
- (8) Close this circuit breaker on the P6 panel:
(a) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 766-114
- (9) Make sure the multimeter on the squib test box shows 23 volts minimum.
- S 866-115
- (10) Set the LOAD CHECK switch on the squib test box to the ON position.
(a) Make sure the multimeter on the squib test box shows 16 volts minimum.
- NOTE:** If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.
- S 866-116
- (11) Release the BTL DISCH 2 switch.
(a) Make sure the multimeter on the squib test box shows 0 volts.
(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.
- S 866-118
- (12) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.
- S 866-120
- (13) Release the BTL DISCH 1 switch.

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- S 866-121
- (14) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.
- S 866-122
- (15) Push the AFT Cargo Fire switch.
(a) Make sure the AFT ARMED switchlight is ON.
- S 866-123
- (16) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.
- S 866-309
- (17) Release the BTL DISCH 1 switch.
- S 866-127
- (18) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.
- S 866-310
- (19) Release the BTL DISCH 2 switch.
- S 866-129
- (20) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.
- S 866-130
- (21) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 036-131
- (22) Disconnect the bottle 2 FWD cargo squib connector, D4418, from the squib test box adapter cable.
- S 866-132
- (23) Set the LOAD CHECK switch on the squib test box to the OFF position.
- S 436-133
- WARNING:** DO NOT INSTALL ELECTRICAL CONNECTORS ON THE BOTTLE SQUIBS DURING THE TEST. IF THE BOTTLE IS ACCIDENTALLY FIRED, INJURY TO PERSONS CAN OCCUR.
- (24) Connect the bottle 2 AFT cargo squib connector, D4420, to the squib test box adapter cable.

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S 866-134

- (25) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 866-135

- (26) Push the AFT Cargo Fire switch.
- (a) Make sure the AFT ARMED switchlight is ON.

S 866-136

- (27) Push and hold the BTL DISCH 2 switch.
- (a) Make sure the BOTTLE DISCHARGE light on the squib test box comes on.

S 866-140

- (28) Open this circuit breaker on the P6 panel:
- (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 216-141

- (29) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

S 866-142

- (30) Close this circuit breaker on the P6 panel:
- (a) 6H6, CARGO FIRE EXTINGUISHING CARGO BTL 2

S 216-144

- (31) Make sure the multimeter on the squib test box shows 23 volts minimum.

S 866-145

- (32) Set the LOAD CHECK switch on the squib test box to the ON position.
- (a) Make sure the multimeter on the squib test box shows 16 volts minimum.

NOTE: If the voltage is less than 16 volts, the circuit may not give sufficient current to fire the squib.

S 866-146

- (33) Release the BTL DISCH 2 switch.
- (a) Make sure the multimeter on the squib test box shows 0 volts.

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(b) Make sure the BOTTLE DISCHARGE light on the squib test box goes off.

S 866-148

- (34) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

S 866-149

- (35) Release the BTL DISCH 1 switch.

S 866-150

- (36) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.

S 866-151

- (37) Push the FWD Cargo Fire switch.
(a) Make sure the FWD ARMED switchlight is ON.

S 866-152

- (38) Push and hold the BTL DISCH 1 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

S 866-154

- (39) Release the BTL DISCH 1 switch.

S 866-156

- (40) Push and hold the BTL DISCH 2 switch.
(a) Make sure the BOTTLE DISCHARGE light on the squib test box remains off.

S 866-157

- (41) Release the BTL DISCH 2 switch.

S 866-158

- (42) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.

S 866-159

- (43) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 036-160

- (44) Disconnect the bottle 2 AFT cargo squib connector, D4420, from the squib test box adapter cable.

S 866-161

- (45) Set the LOAD CHECK switch on the squib test box to the OFF position.

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G. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 436-174

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.
- (a) Make sure these circuit breakers on the P6 panel are open:
- 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 2) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - 3) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- (b) Remove the test equipment shorting plug from the fire bottle squib.

WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (c) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (d) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- 4) Connect the electrical connector to the fire bottle squib.
- (e) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 2) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - 3) 6H6, FIRE EXTINGUISHING CARGO BTL 2

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H. Connect the Squib Connectors

- S 436-175
- (1) Do the Squib Electrical Connection procedure to connect the electrical connector, D4412, to the FWD squib of bottle 1.
- S 866-164
- (2) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD 1 squib test light on the SQUIB TEST Control Panel comes on.
 - (b) Make sure the CARGO AFT 1, CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.
- S 866-166
- (3) Release the TEST switch.
 - (a) Make sure the CARGO FWD 1 squib test light goes off.
- S 436-176
- (4) Do the Squib Electrical Connection procedure to connect the electrical connector, D4414, to the AFT squib of bottle 1.
- S 866-312
- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD 1 and CARGO AFT 1 squib test lights on the SQUIB TEST Control Panel come on.
 - (b) Make sure the CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.
- S 866-170
- (6) Release the TEST switch.
 - (a) Make sure the CARGO FWD 1 and CARGO AFT 1 squib test lights go off.
- S 436-177
- (7) Do the Squib Electrical Connection procedure to connect the electrical connector, D4418, to the FWD squib of bottle 2.
- S 986-200
- (8) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD 1, CARGO AFT 1, and CARGO FWD 2 squib test lights on the SQUIB TEST Control Panel come on.
 - (b) Make sure the CARGO AFT 2 squib test light stays off.
- S 866-174
- (9) Release the TEST switch.
 - (a) Make sure the CARGO FWD 1, CARGO AFT 1 and CARGO FWD 2 squib test lights go off.
- S 426-176
- (10) Do the Squib Electrical Connection procedure to connect the electrical connector, D4420, to the AFT squib of bottle 2.

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S 866-177

- (11) On the SQUIB TEST Control Panel, P61, push and hold the test switch.
(a) Make sure the green CARGO FWD 1, CARGO FWD 2, and CARGO AFT 1 and CARGO AFT 2 squib test lights on the SQUIB TEST Control Panel come on.

S 866-179

- (12) Release the TEST switch.
(a) Make sure the green CARGO FWD 1 and 2, CARGO AFT 1 and 2 squib test lights go off.

S 866-311

- (13) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11J2, INSTRUMENTS EICAS CMPTR LEFT
(b) 11J29, INSTRUMENTS EICAS CMPTR RIGHT

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3. Forward Cargo Heat Stops After the FWD ARMED Switch Activation Check

A. Access

(1) Location Zones

121	Forward Cargo Compartment (Left)
122	Forward Cargo Compartment (Right)
211/212	Flight Compartment

(2) Access Panels

821	Forward Cargo Compartment Door
-----	--------------------------------

B. Do a check of the Forward Cargo Heat Stops after FWD ARMED Switch Activation

S 866-212

- (1) Make sure that these circuit breakers on the P11 panel are closed:
(a) 11N1, INSTRUMENT AND PANEL AISLE STAND

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- (b) 11N12 or 11N17, FAN CONTROL FWD CARGO or CARGO HEAT FAN FWD
- (c) 11S15, AIR/GND SYS 1
- (d) 11S19, AIR/GND SYS 2

S 866-213

- (2) Make sure that this circuit breaker on the P70 panel is closed:
 - (a) 70B8, FWD CARGO FAN

S 866-214

- (3) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 746-215

- (4) Make sure the FWD Cargo Fire ARMED switchlight is OFF on the aft pilot's control stand, P8.

S 886-216

- (5) If the temperature in the Forward Cargo Compartment is above 50°F, do one of the following steps to decrease the temperature control switch to 50°F maximum by:

NOTE: The Temperature Control Switch can be found below the Forward Cargo Heating Intake Duct.

- (a) Use an ice pack to cool the Temperature control Switch.
- (b) Insert a jumper between pins 1 and 2 of the electrical connector D2252 on the Temperature Control Switch.

S 716-217

- (6) Take your hand and feel the air intake at the inlet (STA 844, WL177, LBL 40) to make sure that the FWD Cargo Compartment heating fan starts.

S 866-218

- (7) Push the FWD Cargo Fire switch on the APU/CARGO Fire Control panel, P8.
 - (a) Make sure the FWD ARMED switchlight is ON.
 - (b) Make sure the EICAS message, FWD CARGO FAN, shows on the lower display.
 - (c) Make sure the FWD Cargo compartment heating fan stops.

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S 866-219

- (8) Push the FWD Cargo Fire switch and release.
(a) Make sure the FWD ARMED switchlight is OFF.
(b) Make sure the FWD Cargo Compartment heating fan starts.

S 866-313

- (9) Erase the ECS/MSG EICAS messages that are kept in non-volatile memory (NVM).
(a) Press the ECS/MSG switch on the P61 panel.
(b) Press the AUTO-EVENT READ switch on the P61 panel.
(c) Press and hold the ERASE switch for 3 seconds.

NOTE: If PAGE indication show more pages of messages, press and hold the ERASE switch for 3 seconds. The next page of messages will then show. Continue until no PAGE indication shows.

- (d) Press the ECS/MSG switch to view all maintenance messages.
(e) Make sure the EICAS message, FWD CARGO FAN, does not show on the lower display.

S 866-222

- (10) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

TASK 26-23-01-716-179

4. Aft Cargo Heat Stops After the AFT ARMED Switch Activation Check

A. Access

(1) Location Zones

153	Aft Cargo Compartment (Left)
154	Aft Cargo Compartment (Right)
211/212	Flight Compartment

(2) Access Panels

822	Aft Cargo Compartment Door
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B. Do a check of the Aft Cargo Heat Stops After the AFT ARMED Switch Activation

S 866-223

- (1) Make sure these circuit breakers on the P11 panel are closed:
(a) 11N1, INSTRUMENT AND PANEL AISLE STAND

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- (b) 11N18, CARGO HEAT AFT or AFT CARGO HEAT
- (c) 11N21 or 11N22, FAN CONT AFT CARGO or CARGO HEAT FAN AFT
- (d) 11S15, AIR/GND SYS 1
- (e) 11S19, AIR/GND SYS 2

S 866-224

- (2) Make sure this circuit breaker on the P37 panel is closed:
 - (a) 37C2, AFT CARGO FAN

S 866-225

- (3) Make sure this circuit breaker on the P70 panel is closed:
 - (a) 70C8, AFT CARGO HTR

S 866-226

- (4) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 746-227

- (5) Make sure the AFT Cargo Fire ARMED switchlight is OFF on the aft pilot's control stand, P8.

S 886-228

- (6) If the temperature in the Aft Cargo Compartment is above 50°F, do one of the steps that follow to decrease the temperature control switch to 50°F maximum:

NOTE: The Temperature Control Switch can be found below the Aft Cargo Heating Intake Duct.

- (a) Use an ice pack to cool the Temperature Control Switch.
- (b) Insert a jumper between pins 1 and 2 of the electrical connector D1638 on the Temperature control Switch.

S 716-229

- (7) Take your hand and feel for the airflow at the nozzle (STA 1210, LBL 50, WL 170) to make sure that the Aft Cargo Compartment heating fan starts.

S 866-230

- (8) Push the AFT Cargo Fire switch.
 - (a) Make sure these conditions occur:
 - 1) AFT ARMED switchlight is ON.
 - 2) The EICAS message, AFT CARGO FAN, is shown on the Lower display.
 - 3) The AFT Cargo compartment heating fan stops.

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S 866-232

- (9) Push the AFT Cargo Fire switch and release.
- (a) Make sure these conditions occur:
 - 1) AFT ARMED switchlight is OFF.
 - 2) The AFT Cargo Compartment heating fan starts.

S 866-314

- (10) Erase the ECS/MSG EICAS messages that are kept in non-volatile memory (NVM).
- (a) Press the ECS/MSG switch on the P61 panel.
 - (b) Press the AUTO-EVENT READ switch on the P61 panel.
 - (c) Press and hold the ERASE switch for 3 seconds.

NOTE: If PAGE indication show more pages of messages, press and hold the ERASE switch for 3 seconds. The next page of messages will then show. Continue until no PAGE indication shows.

- (d) Press the ECS/MSG switch to view all maintenance messages.
- (e) Make sure the EICAS message, AFT CARGO FAN, does not show on the lower display.

S 866-234

- (11) Close these circuit breakers on the P6 panel and remove DO-NOT-CLOSE tags:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

TASK 26-23-01-716-180

5. Left and Right Air Conditioning Recirculation System Stops and Overboard Exhaust Valve (OEV) Opens After the FWD ARMED Switch Activation Check

- A. Do a check of the Left and Right Air Conditioning Recirculation System Stops and the Overboard Exhaust Valve Opens After the FWD ARMED Switch Activation Check

S 866-235

- (1) Make sure these circuit breakers on the P11 panel are closed:
- (a) 11P14, RECIRC CARGO FIRE CONT LEFT or RECIRC FAN L

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- (b) 11P23, RECIRC CARGO FIRE CONT RIGHT or RECIRC FAN R
- S 866-236
- (2) Make sure these circuit breakers on the P70 panel are closed:
- (a) 70B16, L RECIRC FAN CONT
 - (b) 70C10, RECIRC FAN L
- S 866-237
- (3) Make sure these circuit breakers on the P37 panel are closed:
- (a) 37D7, R RECIRC FAN CONT
 - (b) 37J5, RECIRC FAN R
- S 866-315
- (4) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 716-238
- (5) Make sure the ground air is not in operation.
- S 746-398
- (6) Make sure the EQUIP COOLING ALTN switch-light on the P5 panel is at the NORMAL position.
- S 746-239
- (7) Make sure the L and R PACK selectors on the P5 panel are in the OFF position.
- S 866-240
- (8) Push the RECIRC FAN switches (L and R) on the P5 panel, to the on position .
- (a) Make sure the ON lights in the L and R RECIRC FAN switches come on.
- S 716-242
- (9) Listen for fan noise or feel for air flow at any passenger cabin conditioned air outlet to make sure the recirculation fan operates.
- S 866-243
- (10) Push the FWD Cargo Fire switch on the APU/CARGO Fire Control panel, P8.
- (a) Make sure the FWD ARMED switchlight is ON.
 - (b) Make sure the L and R RECIRC INOP lights come on.
 - (c) Listen for the fan noise or feel for air at the outlet to make sure the recirculation fans (L and R) stop.
 - (d) Make sure that the EICAS messages, L RECIRC FAN and R RECIRC FAN, are shown on the top display.

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S 866-248

- (11) Push the FWD Cargo Fire switch and release.
- (a) Make sure the FWD ARMED switchlight is OFF.
 - (b) Make sure the L and R RECIRC FAN INOP lights go off.
 - (c) Make sure the EICAS messages, L RECIRC FAN and R RECIRC FAN, do not show on the top display.
 - (d) Make sure the fan noise comes on again and feel for the air flow at any passenger cabin conditioned air outlet.

S 866-421

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

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

S 866-401

- (13) Do the EICAS maintenance message erase procedure (AMM 31-41-00/201).

S 866-455

WARNING: OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (14) Put the air/ground relay system in the air mode (AMM 32-09-02/201).

S 866-503

- (15) On the Main Equipment Center Service Panel, set the EICAS MAINTENANCE ENABLE BYPASS switch S10446 to the NORM position.

S 866-402

- (16) Push the ECS/MSG pushbutton on the EICAS maintenance panel on the P61 panel.

S 866-403

- (17) Push the R RECIRC FAN switch on the P5 panel to the off position.
- (a) Make sure the R RECIRC FAN INOP light comes on.
 - (b) Make sure the EICAS message, R RECIRC FAN, is shown on the top display.
 - (c) Make sure the EICAS message, OVBD EX VAL OPEN, does NOT show on the bottom display.

S 866-404

- (18) Push the FWD Cargo Fire switch on the APU/CARGO Fire Control panel, P8.
- (a) Make sure the FWD ARMED switchlight is ON.

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- (b) Make sure the L RECIRC FAN INOP light comes on.
- (c) Listen for the fan noise or feel for air at the outlet to make sure the Left recirculation fan stops.
- (d) Make sure that the EICAS messages, L RECIRC FAN, is shown on the top display.
- (e) Make sure the EICAS message, OVBD EX VAL OPEN, is shown on the bottom display.

S 866-405

- (19) Push the FWD Cargo Fire switch and release.
 - (a) Make sure the FWD ARMED switch-light is OFF.
 - (b) Make sure the L RECIRC FAN INOP light goes off.
 - (c) Make sure the EICAS message, L RECIRC FAN, does NOT show on the top display.
 - (d) Make sure the fan noise comes on again and feel for the air flow at any passenger cabin conditioned air outlet.

S 866-456

- (20) Put the air/ground relay system back to the ground mode (AMM 32-09-02/201).

S 866-440

- (21) Do the EICAS maintenance message erase procedure (AMM 31-41-00/201).
 - (a) Make sure the EICAS message, OVBD EX VAL OPEN, does NOT show on the bottom display.

S 716-407

- (22) Do the activation procedure for the spoilers (AMM 27-61-00/201) if you did the deactivation procedure.

S 866-408

- (23) Push the L RECIRC FAN switch to the off position.
 - (a) Make sure the L RECIRC FAN INOP light comes on.

S 866-194

- (24) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

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TASK 26-23-01-716-181

6. Right Air Conditioning Recirculation System Stops After the AFT ARMED Switch Activation Check

A. Do a check of the Right Air Conditioning Recirculation System Stops After the AFT ARMED Switch Activation

S 866-252

- (1) Make sure these circuit breakers on the P11 panel are closed:
 - (a) 11P14, RECIRC CARGO FIRE CONT LEFT or RECIRC FAN L
 - (b) 11P23, RECIRC CARGO FIRE CONT RIGHT or RECIRC FAN R

S 866-423

- (2) Make sure these circuit breakers on the P70 panel are closed:
 - (a) 70C10, RECIRC FAN L

S 866-253

- (3) Make sure these circuit breakers on the P37 panel are closed:
 - (a) 37J5, RECIRC FAN R

S 866-316

- (4) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 716-254

- (5) Make sure the ground air is not in operation.

S 746-255

- (6) Make sure the L and R PACK selectors on the P5 panel are in the OFF position.

S 866-256

- (7) Push the L and R RECIRC FAN switches on the P5 panel to the on position.
 - (a) Make sure the ON lights in the L and R RECIRC FAN switches come on.

S 716-258

- (8) Listen for the fan noise or feel for the air flow at any passenger cabin conditioned air outlet to make sure the fan operates.

S 866-259

- (9) Push the AFT Cargo Fire switch on the APU/CARGO Fire Control Panel, P8.
 - (a) Make sure the AFT ARMED switchlight is ON.
 - (b) Make sure the L RECIRC FAN INOP light does not come on.
 - (c) Make sure the R RECIRC FAN INOP light comes on.
 - (d) Make sure the EICAS message, R RECIRC FAN, shows on the top display.

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S 866-264

- (10) Push the AFT Cargo Fire switch and release.
(a) Make sure the AFT ARMED switchlight is OFF.
(b) Make sure the R RECIRC FAN INOP light goes off.
(c) Make sure the EICAS message, R RECIRC FAN, does not show on the top display.

S 866-268

- (11) Push the L and R RECIRC FAN switches to the off positions.
(a) Make sure the L and R RECIRC FAN INOP lights come on.

S 866-317

- (12) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

B. Put the Airplane Back to Its Usual Condition

S 866-502

- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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CARGO COMPARTMENT FIRE EXTINGUISHER BOTTLE/DISCHARGE CARTRIDGE -
REMOVAL/INSTALLATION

1. General

- A. Two cargo fire extinguisher bottles are in the lower aft cargo compartment, forward of the aft cargo compartment forward endliner panel. Each fire extinguisher bottle has two discharge cartridges (squibs).
- B. The removal/installation procedure contains four tasks. The first two tasks remove and install the discharge cartridge from the cargo fire extinguisher bottle. The last two tasks remove and install the cargo fire extinguisher bottle.
- C. The removal/installation procedure is the same for both bottles and their squibs.

TASK 26-23-02-024-019

2. Remove the Cargo Fire Extinguisher Bottle Discharge Cartridge (Squib)

A. General

- (1) This task gives the instructions to remove the discharge cartridge from the cargo fire extinguisher bottle.

B. Equipment

- (1) Squib Protective Cap
M83723/60-210-AN or AC
M83723/60-110-AN or AC

Industrial Automation Inc.
1421 South 93rd Street
Seattle, WA 98108
Attn: Byron Woolsey
Tel: (206) 763-1025

C. Reference

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 20-10-33/401, Electrostatic Discharge Sensitive Devices

D. Access

- (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)
- (2) Access Panels
 - 822 Aft Cargo Compartment Door

E. Remove the Applicable Discharge Cartridge (Squib) (Fig. 401)

S 864-011

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1

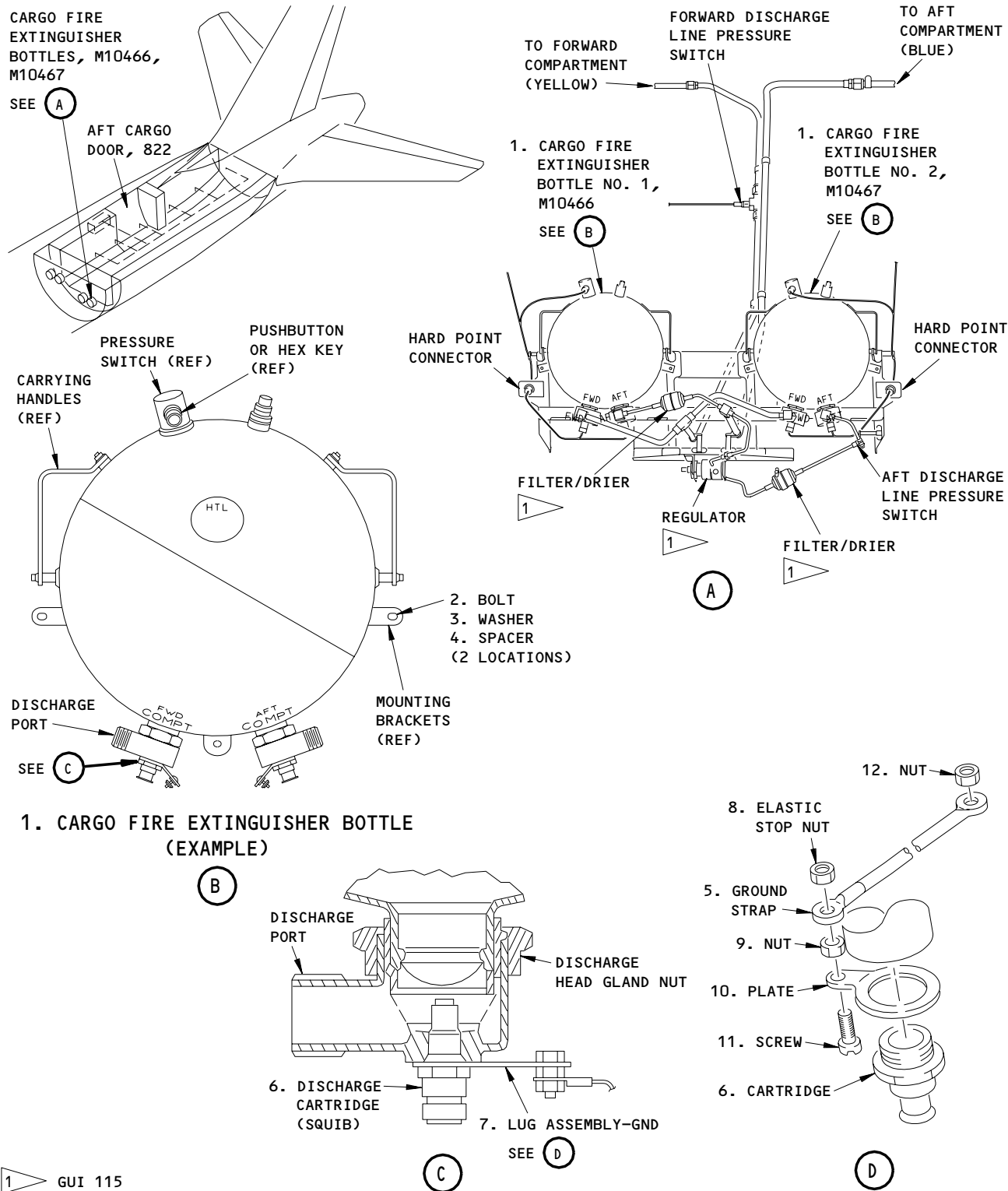
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Cargo Fire Extinguisher Bottle/Discharge Cartridge Installation
Figure 401

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(b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 864-114

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201)

S 034-012

- (3) Disconnect the electrical connector from the discharge squib as applicable (Ref Table 401).

S 434-026

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (4) Put a protective cap on the fire bottle squibs.

S 014-014

- (5) Turn and remove the squib and the ground lug assembly.
(a) Keep the ground lug for when you install the squib.

TASK 26-23-02-424-020

3. Install the Cargo Fire Extinguisher Bottle Discharge Cartridge (Squib)

A. General

- (1) This task gives the instructions to install the discharge cartridge to the cargo fire extinguisher bottle.

B. Equipment

- (1) Voltmeter - with a 10k ohm or greater resistance

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C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Bottle and Valve Assy	26-23-02	01	25,30
	2	Bolt			
	3	Washer			
	4	Spacer			
	5	Jumper Assy (Ground)			
	6	Cartridge			
	7	Lug Assy - GND			
	8	Elastic Stop Nut			
	9	Nut			
	10	Plate			
	11	Screw			
	12	Nut			

D. References

- (1) 24-22-00/201, Electrical Power - Control

E. Access

- (1) Location Zones

- 153 Aft Cargo Compartment (Left)
- 154 Aft Cargo Compartment (Right)

- (2) Access Panels

- 822 Aft Cargo Compartment Door

F. Install the Applicable Discharge Cartridge (Squib) (Fig. 401)

S 864-115

WARNING: DO NOT TOUCH THE SQUIB BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE THE FIRE BOTTLE TO RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Before you touch the squib, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

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- S 434-015
- (2) Install the ground lug assembly (7) and the squib (6) to the fire bottle.
- S 434-005
- (3) Tighten the squib to 90-100 pound-inches.
- S 434-016
- (4) Install a lockwire from the squib (6) to the discharge port body.
- S 864-017
- (5) Supply electrical power (Ref 24-22-00).
- S 864-018
- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 864-019
- (7) Push the TEST switch on the SQUIB TEST Control Panel on the right side panel, P61.
- (a) Make sure the applicable test light, CARGO FWD (AFT) 1 (2), does not come on.
- S 864-023
- (8) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 434-027
- (9) Do the steps that follow to connect an electrical connector to a fire bottle squib.
- (a) Remove the protective cap.

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WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (c) Make sure the squib pins are not bent or damaged.
- (d) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (e) Connect the electrical connector to the fire bottle squib. Refer to Table 401.

Table 401
Cargo Fire Bottle Connections

CONNECTOR	IS CONNECTED TO BOTTLE
D4410	M10466, Bottle 1 - Pressure Switch
D4412	M10466, Bottle 1 - Forward Cargo Discharge Squib
D4414	M10466, Bottle 1 - Aft Cargo Discharge Squib
D4416	M10467, Bottle 2 - Pressure Switch
D4418	M10467, Bottle 2 - Forward Cargo Discharge Squib
D4420	M10467, Bottle 2 - Aft Cargo Discharge Squib

- (f) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.

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3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

4) Connect the electrical connector to the fire bottle squib.

S 864-026

(10) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

(a) 6H1, FIRE EXTINGUISHING ENG L BTL 1

(b) 6H5, FIRE EXTINGUISHING CARGO BTL 1

(c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

G. Do a Test of the squib connections:

S 864-027

(1) Push the TEST switch on the SQUIB TEST Control Panel on the right side panel, P61.

(a) Make sure the squib test lights CARGO FWD 1 and 2, and CARGO AFT 1 and 2, come on.

S 864-119

(2) Release the TEST switch.

(a) Make sure the squib test lights CARGO FWD 1 and 2, and CARGO AFT 1 and 2, come off.

S 864-031

(3) Remove electrical power if it is not necessary (Ref 24-22-00).

TASK 26-23-02-024-021

4. Remove the Cargo Fire Extinguisher Bottle

A. General

(1) This task gives the instructions to remove the cargo fire extinguisher bottle.

B. Equipment

(1) Squib Protective Cap

M83723/60-28-AN or AC

M83723/60-210-AN or AC

M83723/60-110-AN or AC

(2) Discharge Port Cap - (Supplied with the fire extinguisher bottles)

C. References

(1) AMM 24-22-00/201, Electrical Power - Control

D. Access

(1) Location Zones

153 Aft Cargo Compartment (Left)

154 Aft Cargo Compartment (Right)

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- (2) Access Panels
 - 822 Aft Cargo Compartment Door

E. Remove the Cargo Fire Extinguisher Bottle 1 or 2 as applicable (Fig. 401)

S 864-032

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 904-157

- (2) When fire bottle 2 releases its fire extinguishing agent, the filter/drier and the regulator in the related forward or aft discharge line must be replaced along with the fire extinguisher bottle.
 - (a) Do a check of the airplane log book or the squibs to determine if the fire bottle has released its agent into the fwd or aft cargo compartment.
 - (b) Replace the related filter/drier, and regulator.

S 034-033

- (3) Disconnect the electrical connectors from the applicable bottle squibs and pressure switch. Refer to Table 401:

Table 401
Cargo Fire Bottle Connections

CONNECTOR	IS CONNECTED TO BOTTLE
D4410	M10466, Bottle 1 - Pressure Switch
D4412	M10466, Bottle 1 - Forward Cargo Discharge Squib
D4414	M10466, Bottle 1 - Aft Cargo Discharge Squib
D4416	M10467, Bottle 2 - Pressure Switch
D4418	M10467, Bottle 2 - Forward Cargo Discharge Squib
D4420	M10467, Bottle 2 - Aft Cargo Discharge Squib

S 434-028

WARNING: PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB. IF YOU DO NOT PUT A PROTECTIVE CAP ON THE FIRE BOTTLE SQUIB, THE FIRE BOTTLE CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PUT A SHUNT PLUG ON THE FIRE BOTTLE SQUIB. THE SHUNT PLUG CAN CAUSE DAMAGE TO THE SQUIB PINS.

- (4) Put a protective cap on the fire bottle squibs.

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- S 034-035
- (5) Remove the ground strap (5) from the bottle ground lug (7) if it is installed.
- S 864-036
- (6) Make a mark on the discharge hoses to identify the FWD and AFT discharge lines.
- S 034-037
- (7) Disconnect the discharge hoses from the bottle discharge ports.
- S 434-038
- (8) Install the discharge port caps on the bottle discharge ports.
- S 034-039
- (9) Remove the mounting bolts (2), washers (3), and spacers (4) from mounting brackets.
- S 024-040
- (10) Use the service handles to remove the extinguishing bottle.

TASK 26-23-02-424-022

5. Install the Cargo Fire Extinguisher Bottle

A. General

- (1) This task gives the instructions to install the cargo fire extinguisher bottle.

B. Equipment

- (1) Voltmeter - with a 10k ohm or greater resistance

C. Consumable Materials

- (1) Use one of these corrosion inhibiting compounds:
- (a) D50004 - Compound - Antiseize, BMS 3-28 (preferred)
 - (b) C00913 - Compound - Nondrying Resin Mix Corrosion Inhibiting, BMS 3-27 (alternative)
 - (c) G50136 - Paste - Corrosion Inhibiting, Non-drying, BMS 3-38 (alternative)

D. Parts

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MM		NOMENCLATURE	IPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Bottle and Valve Assy	26-23-02	01	25,30
	2	Bolt			
	3	Washer			
	4	Spacer			
	5	Jumper Assy (Ground)			
	6	Cartridge			
	7	Lug Assy - GND			
	8	Elastic Stop Nut			
	9	Nut			
	10	Plate			
	11	Screw			
	12	Nut			

E. References

(1) AMM 24-22-00/201, Electrical Power - Control

F. Access

(1) Location Zones

153 Aft Cargo Compartment (Left)

154 Aft Cargo Compartment (Right)

(2) Access Panels

822 Aft Cargo Compartment Door

G. Install the Cargo Fire Extinguisher Bottle 1 or 2 (as applicable)
(Fig. 401)

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S 214-041

WARNING: DO NOT MOVE THE BOTTLE WITHOUT A CAP ON THE PORTS. DO NOT LET THE BOTTLE HIT THE AIRPLANE. BE CAREFUL NOT TO DAMAGE THE BOTTLE. IF THE BOTTLE IS ACCIDENTALLY DISCHARGED, IT CAN CAUSE INJURY TO PERSONS.

- (1) Before you install the bottle, make sure that its weight is $+0/-0.1$ pounds from the weight shown on the bottle.

NOTE: The measured weight of the bottle includes the charged bottle, the discharge outlets, the ground lug and the squib cartridges. If the squib cartridges are not installed on the cartridges, do not install them. Weigh the squib cartridges as loose parts. Include the weight of the squib cartridges in the measured weight but do not install them. If the squib cartridges are installed, weigh the bottle with the squib cartridges installed. Remove the protective caps when the parts are weighed.

NOTE: The fire bottle may be installed without the bottle weight check provided the following conditions are met:

- The bottle weight is verified by the airline before being placed in storage.
- Bottles in storage that exceed 5 years since last weight check must be reweighed.
- The bottle assembly is examined and show no damage, scratches or dents prior to installation.

S 434-032

- (2) If the discharge cartridge is not installed on the fire extinguisher bottle, do the procedure Install the Discharge Cartridge (Squib).

S 434-042

- (3) Lift the bottle by the service handles and install the bottle mounting lugs on the support bracket.

S 434-043

- (4) Install the mounting bolts (2), washers (3), and spacers (4) in two places.

S 824-044

- (5) Loosen the discharge head gland nuts and adjust the discharge heads to give the best possible access to the hose connections.

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S 624-183

- (6) Apply a layer of BMS 3-28 (preferred) to the outlet threads, outlet end, and outlet inner diameter where the tube assembly attaches to the discharge head.
- (a) BMS 3-27 or BMS 3-38 are also acceptable alternatives as anti-corrosion compounds to use in this location.

S 434-045

- (7) Remove the discharge port caps and connect the discharge hoses to the ports. Refer to the outlet identification above each discharge outlet.

S 434-046

- (8) Tighten the gland nuts to 45-55 pound-feet.

S 434-047

- (9) Attach a lockwire from the gland nuts to the other discharge port on the bottle.

S 824-048

- (10) Tighten the discharge hoses to 280 inch-pounds for 1/2 inch connectors and 360 inch-pounds for 5/8 inch connectors.

S 434-049

- (11) Install the ground straps (5) to the ground lugs (7).

S 434-037

- (12) Install the electrical connector to the pressure switch per Table 401.

H. Squib Electrical Connection Procedure

NOTE: Do this procedure each time you connect an electrical connector to a fire bottle squib.

S 434-029

- (1) Do the steps that follow to connect an electrical connector to a fire bottle squib.
- (a) Remove the protective cap.

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WARNING: MAKE SURE THERE IS NO VOLTAGE AT THE ELECTRICAL CONNECTOR. IF THERE IS A VOLTAGE AT THE ELECTRICAL CONNECTOR, THE SQUIB CAN RELEASE ITS CONTENTS SUDDENLY AND CAUSE INJURY TO PERSONS.

- (b) Make sure there is no voltage between pins 1 and 2 of the electrical connector.

NOTE: Connect a 10 Kohm resistor across the meter leads to remove any stray voltage from the electrical connector.

- (c) Make sure the squib pins are not bent or damaged.
(d) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- (e) Connect the electrical connector to the fire bottle squib.
(f) Do the steps that follow to make sure you did not bend or damage the squib pins.

NOTE: This step is necessary because the pins are most likely to be damaged the first time an electrical connector is connected to the squib.

- 1) Disconnect the electrical connector from the fire bottle squib.
- 2) Make sure the squib pins are not bent or damaged.
- 3) Make sure the electrical connector is not damaged.

NOTE: The squib pins can cause damage to the connector if the pins do not enter the electrical connector receptacles.

- 4) Connect the electrical connector to the fire bottle squib.

I. Connect the bottle 1 squib connectors, if applicable.

S 864-052

- (1) Make sure this circuit breaker on the P6 panel is open:
(a) 6H5, FIRE EXTINGUISHING CARGO BTL 1

S 434-030

- (2) Do the Squib Electrical Connection procedure to connect the electrical connector, D4412, to the FWD squib of bottle 1.

S 864-054

- (3) Supply electrical power (Ref 24-22-00).

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- S 864-008
- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 864-056
- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1 squib test light on the SQUIB TEST Control Panel comes on.
 - (b) Make sure the CARGO AFT 1, CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.
- S 864-060
- (6) Release the TEST switch.
- (a) Make sure the CARGO FWD 1 squib test light goes off.
- S 864-062
- (7) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 434-063
- (8) Do the Squib Electrical Connection procedure to connect the electrical connector, D4414, to the AFT squib of bottle 1.
- S 864-064
- (9) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
- S 864-065
- (10) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
- (a) Make sure the green CARGO FWD 1 and CARGO AFT 1 squib test lights on the SQUIB TEST Control Panel come on.
 - (b) Make sure the CARGO FWD 2 and CARGO AFT 2 squib test lights stay off.
- S 864-069
- (11) Release the TEST switch.
- (a) Make sure the CARGO FWD 1 and CARGO AFT 1 squib test lights go off.
- S 864-071
- (12) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
- (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

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J. Connect the bottle 2 squib connectors, if applicable.

S 864-072

- (1) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE identifier:
 - (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 434-073

- (2) Do the Squib Electrical Connection procedure to connect the electrical connector, D4418, to the FWD squib of bottle 2.

S 864-074

- (3) Supply electrical power (Ref 24-22-00).

S 864-025

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 864-076

- (5) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD 2 squib test light on the SQUIB TEST Control Panel comes on.
 - (b) Make sure the CARGO FWD 1, CARGO AFT 1, and CARGO AFT 2 squib test lights stay off.

S 864-080

- (6) Release the TEST switch.
 - (a) Make sure the CARGO FWD 2 squib test light goes off.

S 864-082

- (7) Open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
 - (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 434-083

- (8) Do the Squib Electrical Connection procedure to connect the electrical connector, D4420, to the AFT squib of bottle 2. Refer to Table 401.

S 864-084

- (9) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
 - (a) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 864-085

- (10) On the SQUIB TEST Control Panel, P61, push and hold the TEST switch.
 - (a) Make sure the green CARGO FWD 2 and CARGO AFT 2 squib test lights on the SQUIB TEST Control Panel come on.

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- (b) Make sure the CARGO FWD 1 and CARGO AFT 1 squib test lights stay off.

S 864-089

- (11) Release the TEST switch.
 - (a) Make sure the CARGO FWD 2 and CARGO AFT 2 squib test lights go off.

K. Do a Test of the Fire Extinguisher Bottle Installation.

S 744-094

- (1) Push the TEST switch on the SQUIB TEST Control Panel on the right side panel, P61.
 - (a) Make sure the green CARGO FWD 1 and 2, and CARGO AFT 1 and 2 squib test lights come on.

S 444-109

- (2) Push the forward end-line pressure switch reset button, S633, if the cargo fire extinguisher bottle 1 had been discharged into the FWD compartment.

S 444-150

- (3) AIRPLANES WITH METERED CARGO FIRE EXTINGUISHER SYSTEM;
Push the aft discharge line pressure switch reset button, S10565, if the cargo fire extinguisher bottle 2 had been discharged into the AFT compartment.

S 444-110

- (4) Push and hold the pressure switch manual-override button on the fire extinguisher bottle 1 or 2 (as applicable).
 - (a) Make sure the yellow DISCH light in the BTL DISCH 1 or 2 switch (as applicable) on the APU/CARGO Fire Control Panel, P8, comes on.

S 864-111

- (5) Release the pressure switch manual-override button on the fire extinguisher bottle 1 or 2 (as applicable).
 - (a) Make sure the DISCH light on the APU/CARGO FIRE Control Panel, P8, goes off.

S 864-112

- (6) Remove electrical power if it is not necessary (Ref 24-22-00).

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REGULATOR - REMOVAL/INSTALLATION

1. General

- A. The regulator is installed near the cargo fire extinguisher bottles, forward area of the aft cargo compartment forward endliner panel.
- B. After the cargo fire extinguishing bottles are discharged, you must replace the fire extinguishing bottles, the squibs, and the applicable filter and regulator.

TASK 26-23-03-004-001

2. Remove the Regulator (Fig. 401)

A. Access

(1) Location Zones

- 153 Aft Cargo Compartment (Left)
- 154 Aft Cargo Compartment (Right)

B. Procedure

S 864-002

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tags:
 - (a) 6H1, FIRE EXT BTL 1 ENG L
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 014-003

- (2) Get access to the regulator.

S 034-004

- (3) Loosen the connectors to disconnect the tubing from the regulator.

S 034-005

- (4) Loosen the jam nut.

S 034-006

- (5) Remove the two bolts and washers which connect the top support bracket to the regulator.

S 034-007

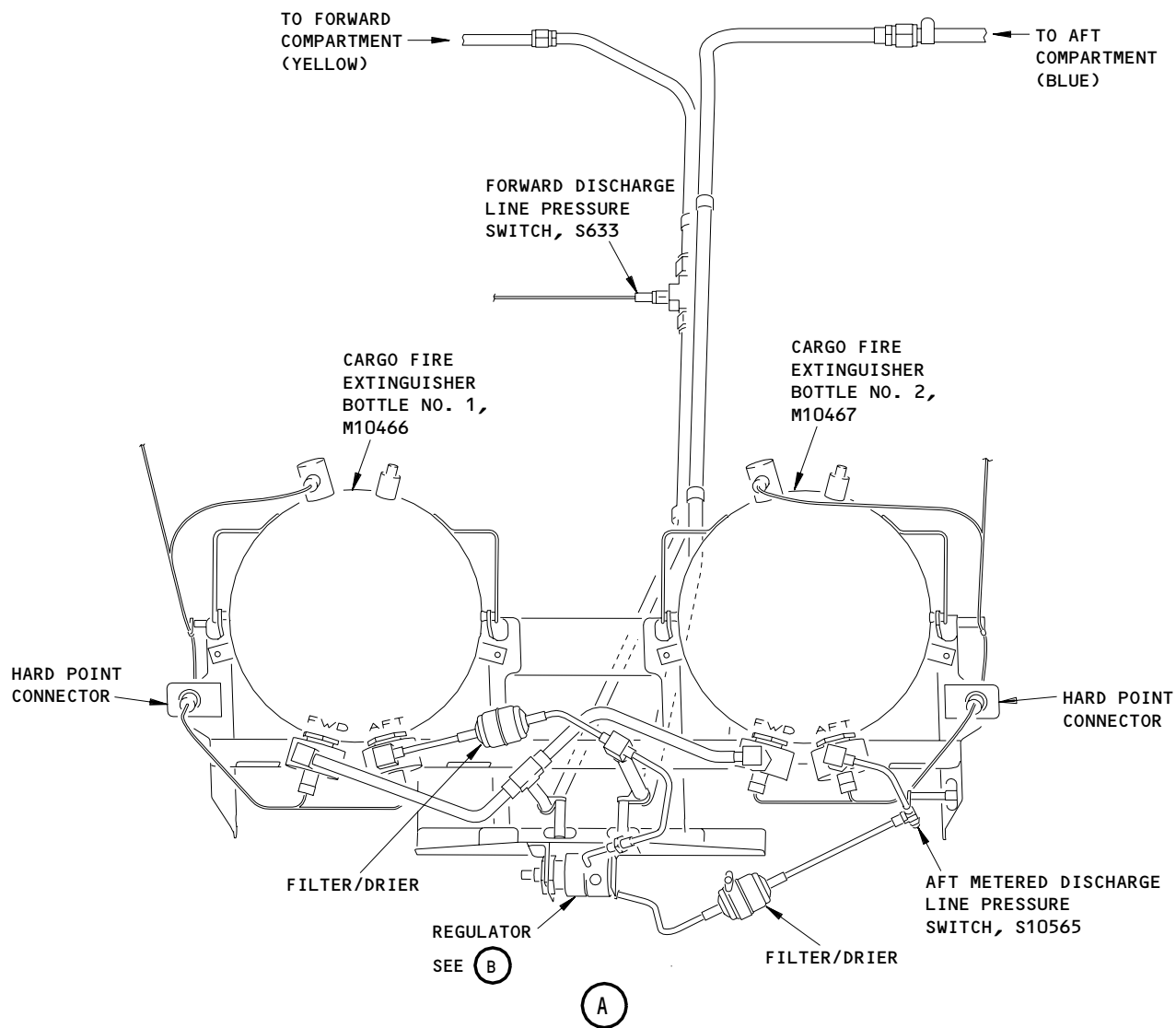
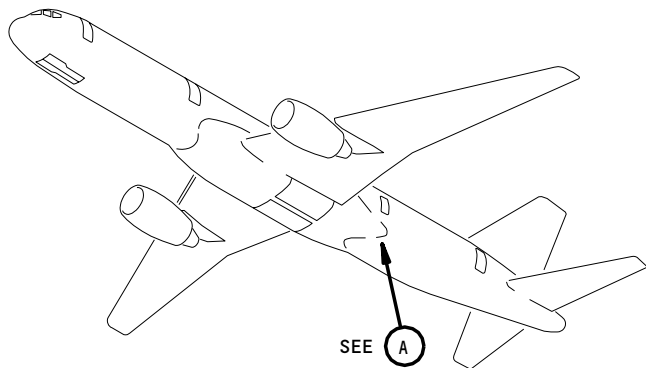
- (6) Remove the two bolts, nuts, and washers which connect the bottom support bracket to the regulator.

S 024-008

- (7) Remove the regulator from the bottom U-shaped support bracket.

EFFECTIVITY
AIRPLANES WITH METERED CARGO FIRE
EXTINGUISHING SYSTEM

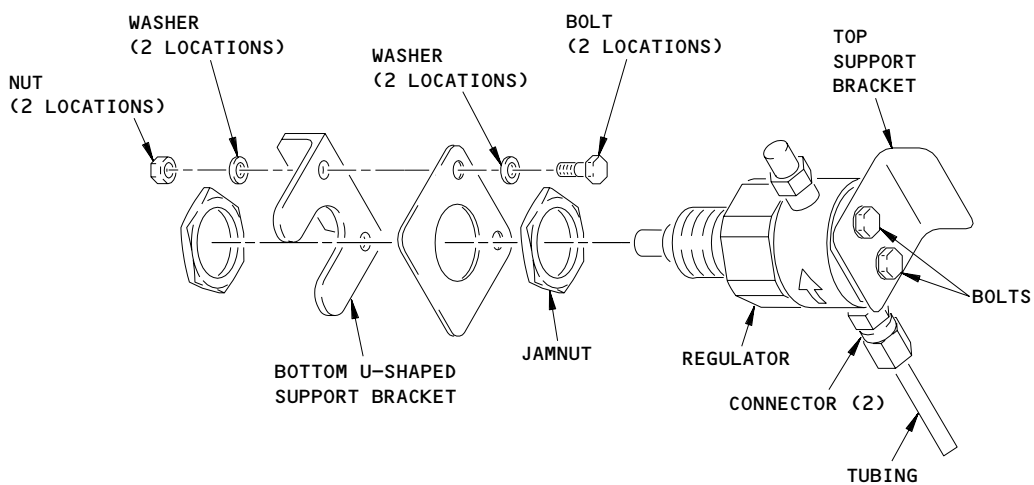
26-23-03



Regulator Installation
Figure 401 (Sheet 1)

EFFECTIVITY
AIRPLANES WITH METERED CARGO FIRE
EXTINGUISHING SYSTEM

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(B)

Regulator Installation
Figure 401 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH METERED CARGO FIRE
EXTINGUISHING SYSTEM

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TASK 26-23-03-404-010

3. Install the Regulator (Fig. 401)

A. References

- (1) 26-23-00/501, Cargo Fire Extinguishing System - Adjustment/Test
- (2) IPC 26-23-51-02

B. Access

(1) Location Zones

- | | |
|-----|-------------------------------|
| 153 | Aft Cargo Compartment (Left) |
| 154 | Aft Cargo Compartment (Right) |

C. Procedure

S 414-011

- (1) Get access to the applicable cargo area to install the regulator.

S 434-012

CAUTION: YOU MUST INSTALL THE REGULATOR IN THE CORRECT POSITION AND FLOW DIRECTION. IF IT IS INSTALLED INCORRECTLY THE SYSTEM WILL NOT OPERATE CORRECTLY.

- (2) Put the regulator in the correct position in the bottom U-shaped support bracket.

S 434-013

- (3) Tighten the jam nut.

S 434-014

- (4) Install the two bolts and washers which connect the top support bracket to the regulator.

S 434-015

- (5) Install the two bolts, nuts, and washers which connect the bottom support bracket to the regulator.

S 434-016

- (6) Install the connectors to attach the tubing to the regulator.

- S 864-017
- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6H1, FIRE EXT BTL 1 ENG L
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2
- S 734-018
- (8) Do the System Test for the Metered Fire Extinguisher Discharge Lines (AMM 26-23-00/501).

EFFECTIVITY
AIRPLANES WITH METERED CARGO FIRE
EXTINGUISHING SYSTEM

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FILTER/DRYER - REMOVAL/INSTALLATION

1. General

- A. The filter/dryer is installed near the cargo fire extinguishing bottles, forward area of the aft cargo compartment forward endliner panel.
- B. After the cargo fire extinguishing bottles are discharged, you must replace the fire extinguishing bottles, the squibs, and the applicable filter and regulator.

TASK 26-23-04-004-001

2. Remove the Filter/Dryer (Fig. 401)

A. Access

(1) Location Zones

- 153 Aft Cargo Compartment (Left)
- 154 Aft Cargo Compartment (Right)

B. Procedure

S 864-002

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6H1, FIRE EXT BTL 1 ENG L
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 014-003

- (2) Get access to the filter/dryer.

S 034-004

- (3) Loosen the nuts that connect the tubing to the filter/dryer.

S 024-005

- (4) Remove the filter/dryer.

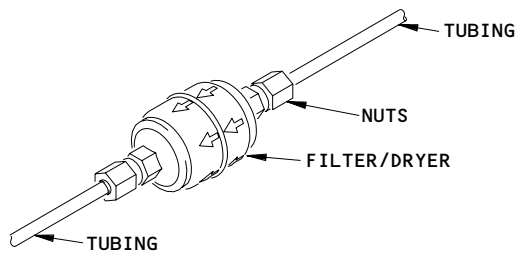
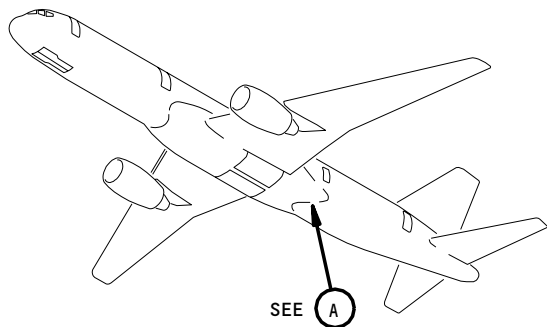
NOTE: If the fire bottle was discharged through the filter/dryer, you must replace the filter/dryer with a new one. The filter/dryer will only work one time.

TASK 26-23-04-404-006

3. Install the Filter/Dryer (Fig. 401)

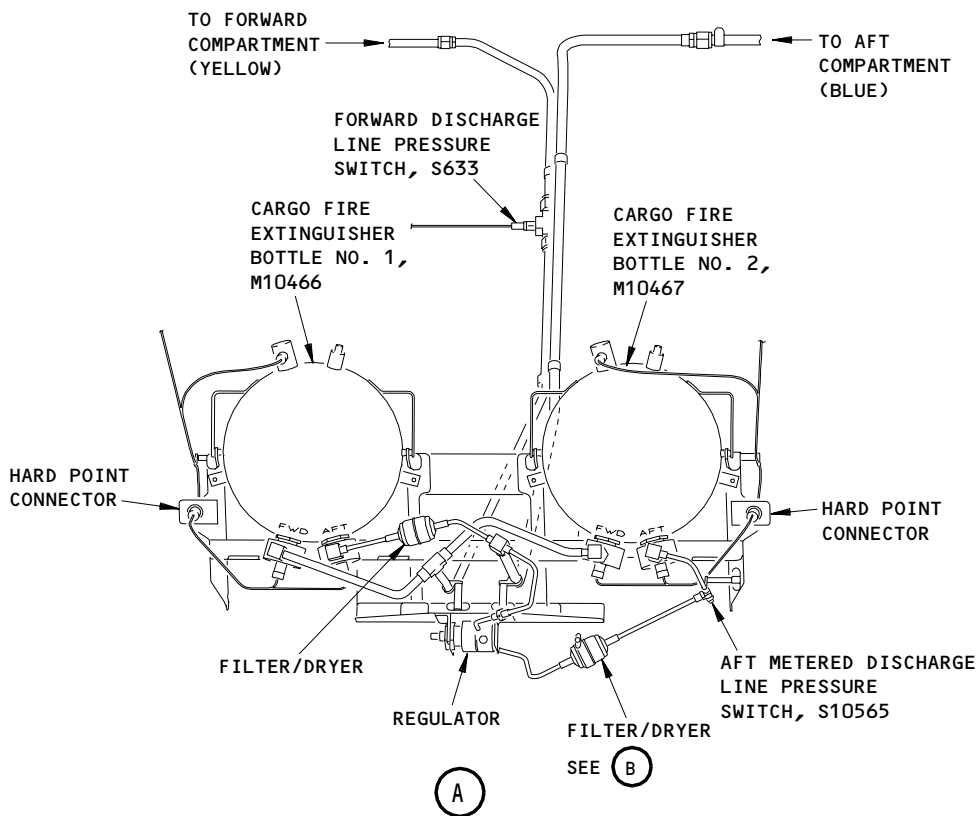
A. References

- (1) 26-23-00/501, Cargo Fire Extinguishing System - Adjustment/Test



FILTER/DRYER

(B)



Filter/Dryer Installation
Figure 401

EFFECTIVITY
AIRPLANES WITH METERED CARGO FIRE
EXTINGUISHING SYSTEM

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- (2) IPC 26-23-51-02
- B. Access
 - (1) Location Zones
 - 153 Aft Cargo Compartment (Left)
 - 154 Aft Cargo Compartment (Right)

C. Procedure

S 864-007

- (1) Make sure the inner part of the filter/dryer is not broken.

S 434-008

- (2) Put the filter/dryer in position between the ends of the tubing.

S 424-009

CAUTION: YOU MUST INSTALL THE FILTER/DRYER IN THE CORRECT POSITION AND AND FLOW DIRECTION. IF IT IS INSTALLED INCORRECTLY, THE SYSTEM WILL NOT OPERATE CORRECTLY.

- (3) Connect the filter/dryer to the tubing with the nuts.
 - (a) Make sure that the filter/dryer is installed tightly on the tubing.

S 864-010

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6H1, FIRE EXT BTL 1 ENG L
 - (b) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (c) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 734-011

- (5) Do the System Test for the Metered Fire Extinguisher Discharge Lines (AMM 26-23-00/501).

IN-LINE PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the in-line pressure switch for the lower cargo fire extinguishing system.
 - (2) An installation of the in-line pressure switch.
- B. The removal/installation procedure is the same for each in-line pressure switch.
- C. The in-line pressure switches are located in the area of the cargo fire extinguisher bottles, in the lower aft compartment, forward of the aft cargo compartment forward end liner panel.

TASK 26-23-05-004-001

2. Remove the In-Line Pressure Switch (Fig. 401)

- A. References
 - (1) AMM 25-50-03/401, Bulkhead Lining - Removal/Installation
- B. Access
 - (1) Location Zones
 - 151 Forward of Aft Cargo Compartment (Left)
 - 152 Forward of Aft Cargo Compartment (Right)
- C. Prepare for the Removal
 - S 864-002
 - (1) Open these circuit breakers on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
 - S 014-017
 - (2) Open the door to the aft cargo compartment.
 - S 014-003
 - (3) Remove the bulkhead lining from the forward wall of the cargo compartment to get access to the pressure switch (AMM 25-50-03/401).
- D. Removal
 - S 024-013
 - (1) Loosen the connector on the inlet tube.

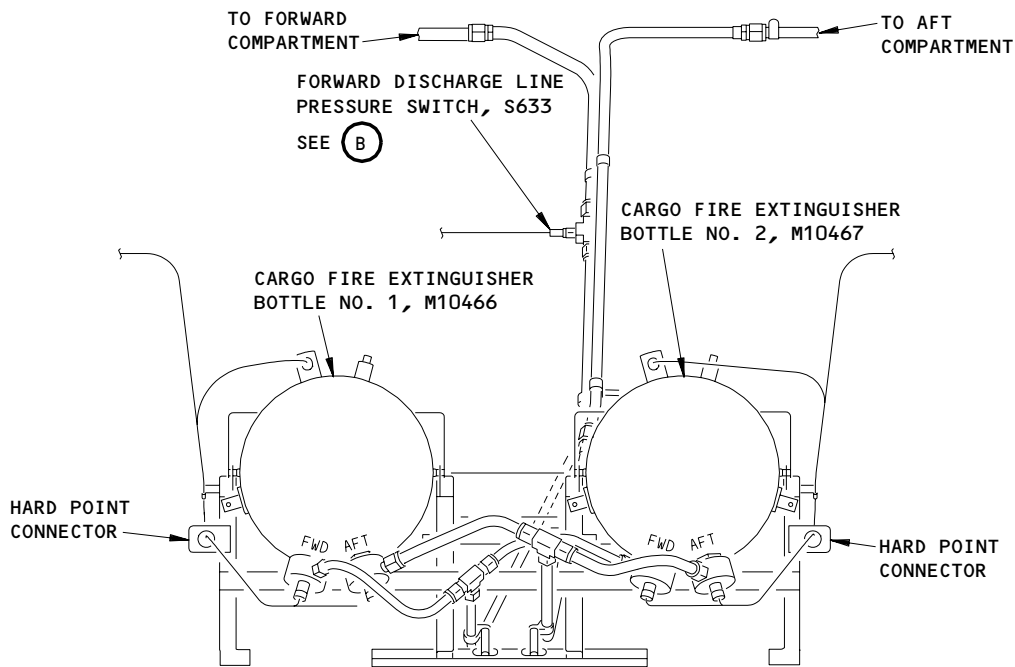
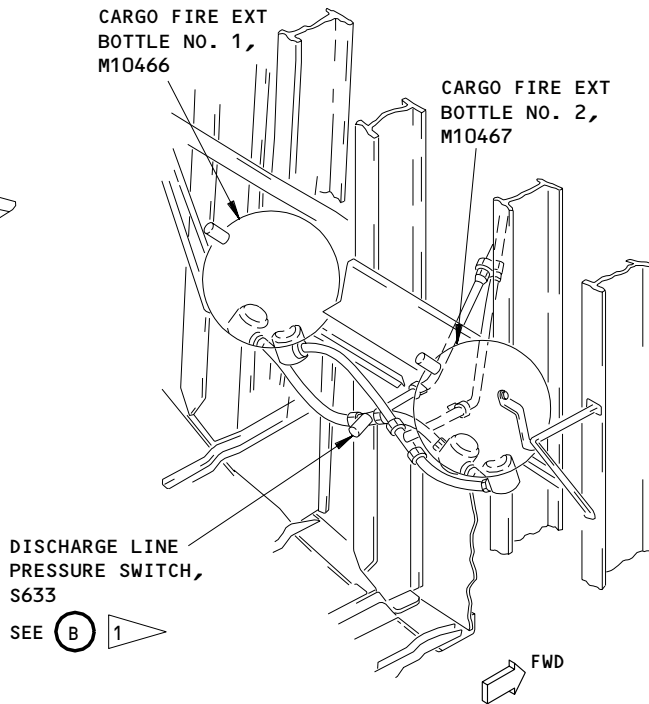
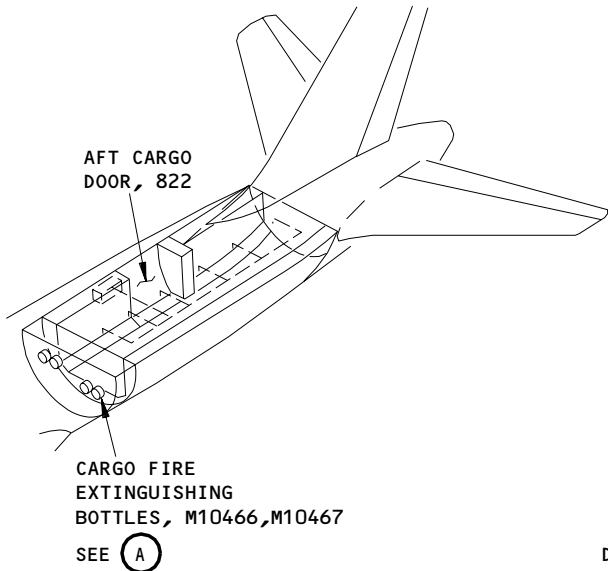
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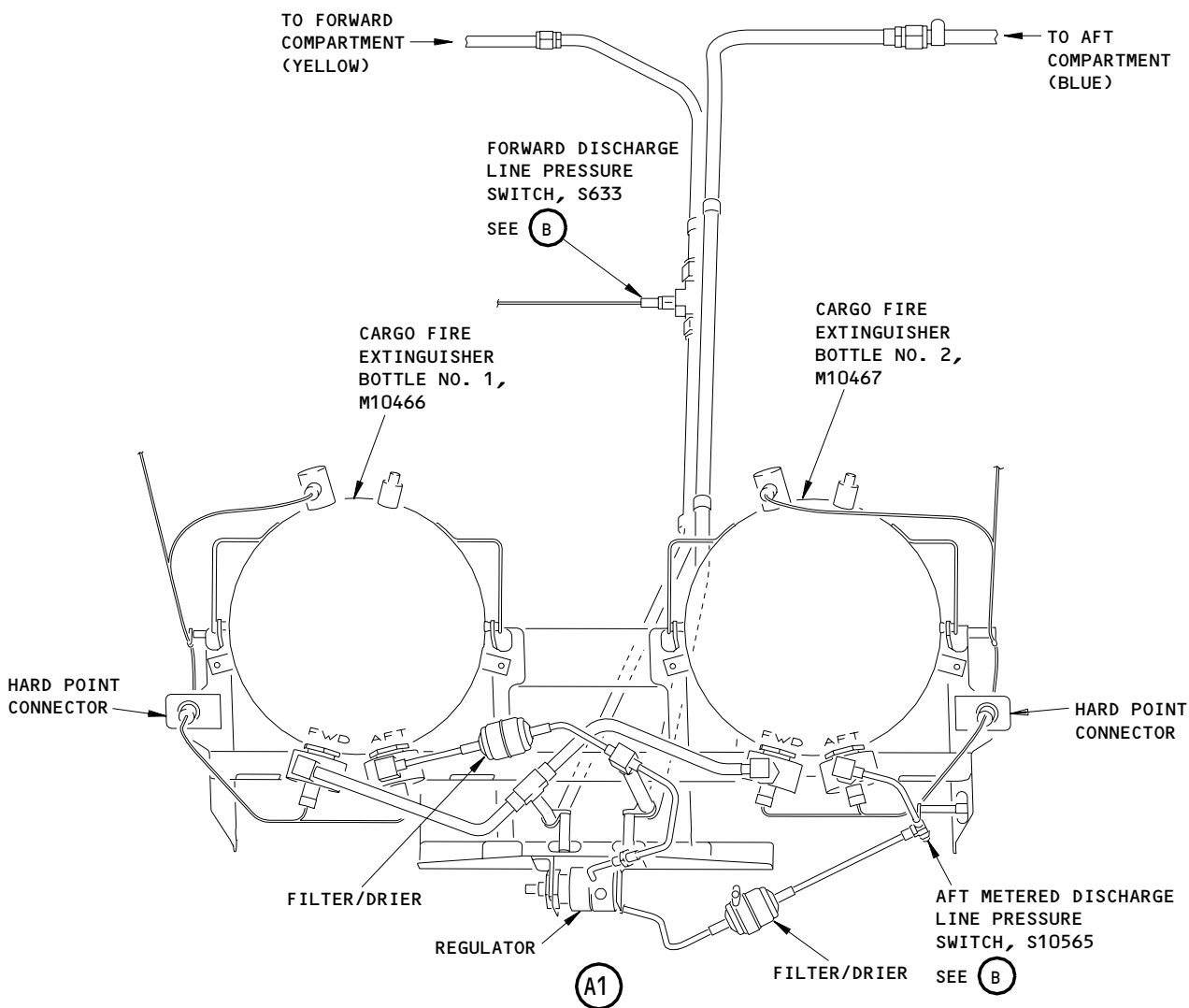
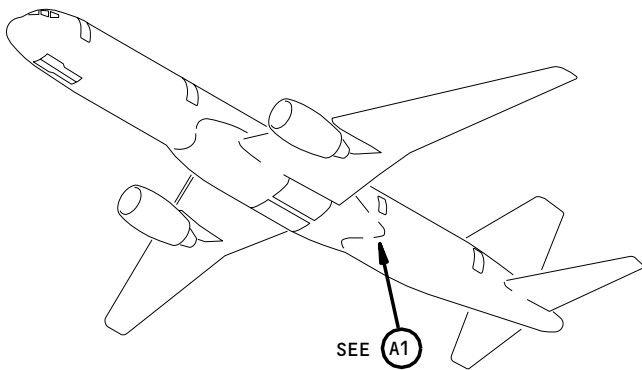
- 1 AIRPLANES PRE-SB 26-20
- 2 AIRPLANES POST-SB 26-20

(A) 2

Cargo Fire Extinguisher Bottle/Discharge Line Pressure Switch Installation
Figure 401 (Sheet 1)

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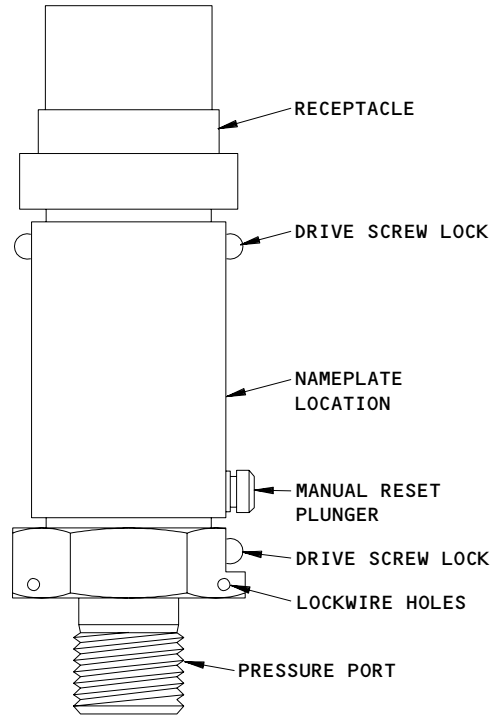
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Cargo Fire Extinguisher Bottle/Discharge
Line Pressure Switch Installation
Figure 401 (Sheet 2)

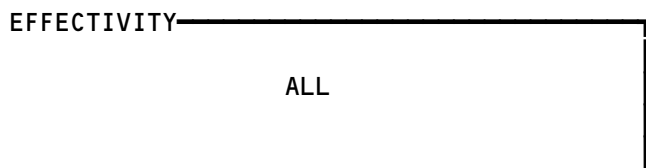
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(B)

Cargo Fire Extinguisher Bottle/Discharge
Line Pressure Switch Installation
Figure 401 (Sheet 3)



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- S 024-014
- (2) Disconnect the inlet tube from the pressure switch.

- S 034-005
- (3) Disconnect the electrical connector from the pressure switch.

- S 034-006
- (4) Remove the screw, washer and clamp that hold the pressure switch to the airplane structure.

- S 024-007
- (5) Remove the pressure switch.

TASK 26-23-05-404-008

3. Install the In-Line Pressure Switch (Fig. 401)

A. References

- (1) AMM 26-23-00/501, Cargo Fire Extinguishing System - Adjustment/Test
- (2) AMM 25-50-03/401, Bulkhead Lining - Removal/Installation

B. Access

- (1) Location Zones
 - 151 Forward of Aft cargo Compartment (Left)
 - 152 Forward of Aft Cargo Compartment (Right)

C. Prepare for the Installation

S 864-010

- (1) Make sure these circuit breakers are open.
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2

S 414-009

- (2) Open the door to the aft cargo compartment.

S 014-010

- (3) Make sure the forward bulkhead lining is removed from the aft cargo compartment (AMM 25-50-03/401).

D. Installation

S 424-011

- (1) Put the pressure switch in its position on the airplane structure.

S 424-021

- (2) Install the screw, washer and clamp that hold the pressure switch to the airplane structure.

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- S 434-013
- (3) Connect the inlet tube to the pressure switch.
- S 424-014
- (4) Tighten the connector on the inlet tube.
- S 424-015
- (5) Connect the electrical connector to the pressure switch.
- S 864-016
- (6) Push the reset button on the pressure switch.
- E. Do an installation test
 - S 864-017
 - (1) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P6 panel:
 - (a) 6H5, FIRE EXTINGUISHING CARGO BTL 1
 - (b) 6H6, FIRE EXTINGUISHING CARGO BTL 2
 - S 714-012
 - (2) Do this task: Operational Test - Bottle Pressure Switch (AMM 26-23-00/501).
- F. Put the Airplane Back to Its Usual Condition
 - S 424-016
 - (1) Install the forward bulkhead lining in the aft cargo compartment (AMM 25-50-03/401).
 - S 414-011
 - (2) If it is necessary, close the aft cargo compartment door.

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LAVATORY WASTE COMPARTMENT AUTOMATIC FIRE EXTINGUISHING -
DESCRIPTION AND OPERATION

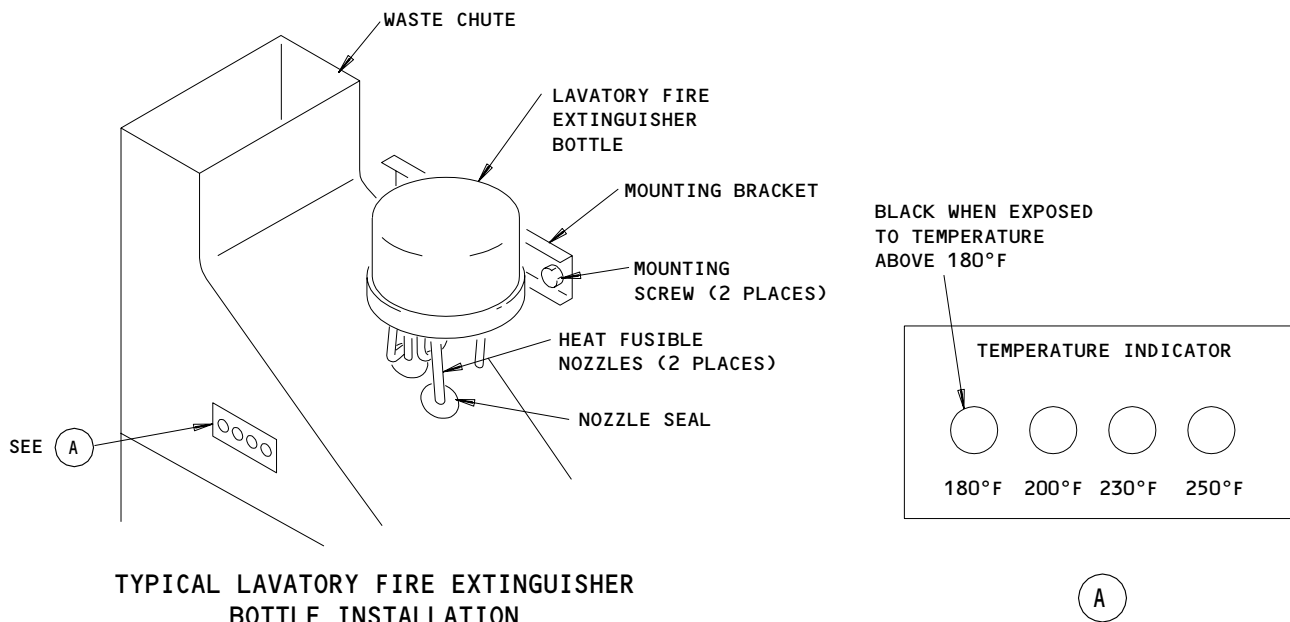
1. General

A. The lavatory waste compartment automatic fire extinguishing system provides fire extinguishing capability to the lavatory waste compartment. Extinguishing occurs by flooding the lavatory waste compartment with an inert gas.

2. Component Details (Fig. 1)

A. Fire Extinguisher Bottle

- (1) The fire extinguisher bottle includes an elongated spherical steel container with discharge tubes (fusible tips) and mounting bracket. The container is about 2.5 inches in diameter with volume of approximately 10 cubic inches. The container is filled with a halon extinguishing agent which leaves no residue when discharged.
- (2) The fire extinguisher bottle is mounted inside the lavatory cabinet assembly on the waste disposal chute. The two discharge tubes extend into the waste container.



TYPICAL LAVATORY FIRE EXTINGUISHER
BOTTLE INSTALLATION

Waste Compartment Automatic Fire Extinguishing - Component Location
Figure 1

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B. Temperature Indicator

- (1) The temperature indicator is a thin vinyl plate containing four heat sensitive patches. Each patch will change color from grey to black when exposed to temperatures from 180 to 250°F.
- (2) The temperature indicator, with self-adhesive backing, is located inside the lavatory cabinet assembly below the extinguisher bottle discharge tubes.

3. Operation

A. Functional Description

- (1) The lavatory waste compartment fire extinguishing system is completely self-contained and automatic. The extinguisher bottle contains two fusible tips which have a melting temperature of 174°F. When a fire or overheat condition occurs in the lavatory waste compartment raising the ambient temperature above 174°F, the tips will melt causing the bottle to discharge.

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AUTOMATIC FIRE EXTINGUISHER – MAINTENANCE PRACTICES

1. General

- A. The following procedure includes removal/installation of the lavatory waste compartment automatic fire extinguisher (par. 2). An inspection/check of waste compartment fire extinguishing system is also included (par. 3).

TASK 26-24-01-022-001

2. Automatic Fire Extinguisher Removal/Installation (Fig. 201)

A. Remove The Fire Extinguisher

S 012-002

- (1) Open the sink cabinet waste compartment door.

S 022-003

- (2) Access the extinguisher and remove the mounting screws (2 places).

S 022-004

- (3) Hold the extinguisher bottle and carefully remove the extinguisher nozzles through the holes in seal.

B. Install The Fire Extinguisher

S 422-005

- (1) From the sink side of the waste chute, carefully insert the extinguisher nozzles through the holes in the seal and position the extinguisher over the mounting holes.

S 752-006

- (2) Make sure the extinguisher nozzles go inside the waste chute.

S 432-007

- (3) Attach the mounting screws (2 places).

S 432-008

- (4) Replace the seals around the nozzles if necessary.

S 432-009

- (5) Close the sink cabinet waste compartment door.

TASK 26-24-01-702-010

3. Automatic Fire Extinguisher – Temperature Indicator Inspection/Check

A. Procedure

S 012-011

- (1) Open the sink cabinet waste compartment door to access the temperature indicator mounted on the inside of the waste disposal chute.

S 752-012

- (2) Make sure the temperature indicator is all gray instead of black.

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S 432-013

- (3) If one or more of the patches are black, replace the temperature indicator and make a check of the bottle for melted fusible tips. If the fusible tips are melted, the bottle has discharged.

S 432-014

- (4) If the bottle has discharged, replace the bottle.

TASK 26-24-01-702-015

4. Automatic Fire Extinguisher Bottle - Inspection/Check

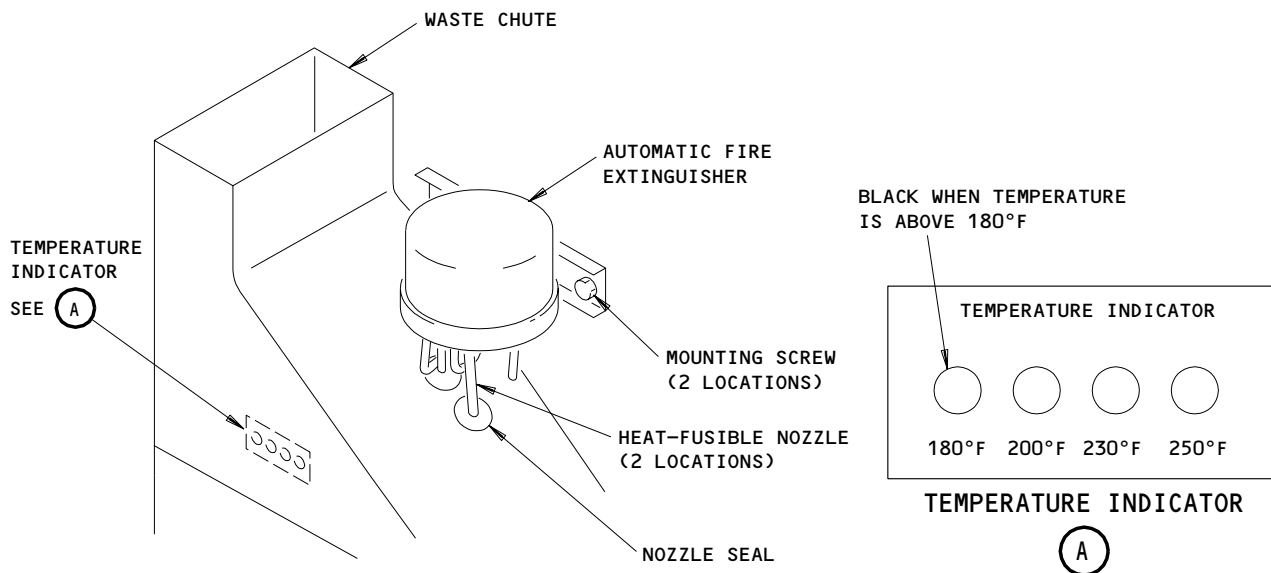
A. Procedure

S 022-016

- (1) The total weight of the halon and the bottle is provided on the label of each bottle. Replace the bottle if its weight is 10 grams less than weight marked on bottle.

S 752-017

- (2) Check the bottle for corrosion, scratches, dents or leakage by weighing). Dents deeper than 1/16 inch per inch of average dent diameter or scratches deeper than 0.004 inch are cause for rejection and replacement.



Automatic Fire Extinguisher - Installation
Figure 201

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PORTABLE FIRE EXTINGUISHING – DESCRIPTION AND OPERATION

1. General

- A. Portable fire extinguishers can be installed in several general locations in the airplane. If the extinguisher is not easy to see, the location will be identified with a placard. The extinguishers are usually installed in one or more of these areas: galley or lavatory stowage areas, closets, or near attendant seats. A fire extinguisher is also installed in the flight compartment.
- B. The portable extinguishers are attached to wall-mounted brackets by quick-release mounting straps.

2. Component Details (Fig. 1)

A. Halon Extinguishers

- (1) Halon extinguishers are used to extinguish electrical and flammable liquid fires.
- (2) The halon extinguisher is rechargeable. A pressure gage shows when you must recharge or replace the fire extinguisher.
- (3) To operate the extinguisher, pull the handle locking pin. Hold the extinguisher upright and squeeze the handle and lever together. Point the nozzle flow at the base of the fire. The halon extinguishing agent leaves no residue after discharge.

B. Pressurized Water Extinguishers

- (1) Pressurized water extinguishers are used to extinguish nonelectrical fires.
- (2) The water extinguisher is rechargeable. An antifreeze is added to the water to prevent freezing.
- (3) A carbon dioxide cartridge is mounted on the handle of the extinguisher. To operate the extinguisher, turn the cartridge. This punctures the cartridge and pressurizes the water container. Push the trigger and aim the nozzle flow at the base of the fire.

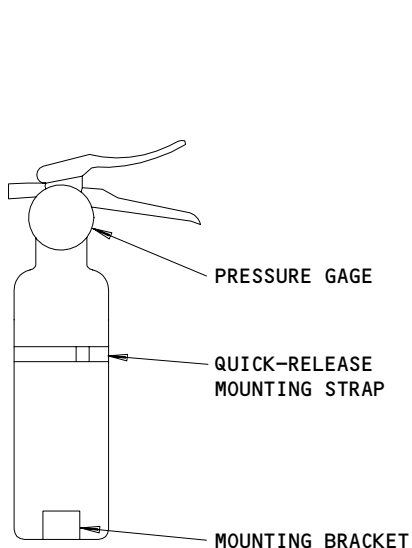
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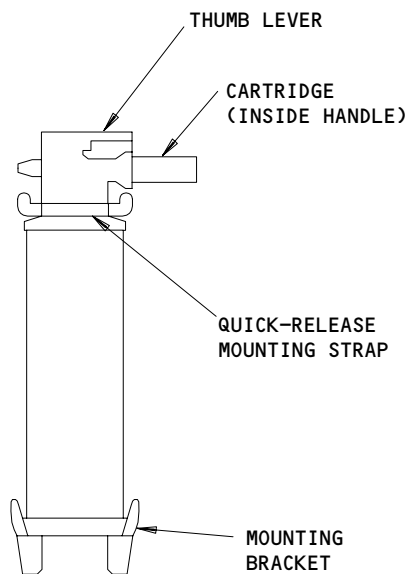
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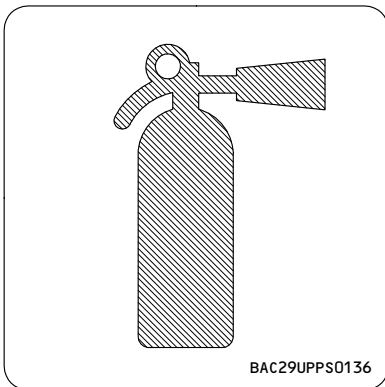
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HALON FIRE EXTINGUISHER
(EXAMPLE)



PRESSURIZED WATER
FIRE EXTINGUISHER
(EXAMPLE)



PORTABLE FIRE EXTINGUISHER
PLACARD

Portable Fire Extinguishers
Figure 1

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HALON FIRE EXTINGUISHER – INSPECTION/CHECK

1. General

- A. This procedure has a task to inspect the portable halon fire extinguishers.
- B. The portable fire extinguishers can be installed in several general locations in the airplane. If the extinguisher is not easy to see, the location will be identified with a placard. The extinguishers are usually installed in one or more of these areas: galley or lavatory stowage areas, closets, doghouses, or near attendant seats. There is one halon extinguisher installed in the flight compartment.
- C. To service or recharge the fire extinguisher, refer to the applicable vendor manuals or the decals on the fire extinguisher.

TASK 26-26-01-216-001

2. Halon Fire Extinguishers Inspection/Check

- A. References
 - (1) IPC 26-26-00
- B. Access
 - (1) Location Zones
 - 200 Upper Half of Fuselage
 - 211 Flight Compartment
 - 212 Flight Compartment
- C. Procedure
 - S 216-004
 - (1) Make sure the instruction decal and the nameplate are in good condition.
 - S 216-005
 - (2) Make sure the mounting bracket is attached correctly to the airplane.
 - S 216-002
 - (3) Make sure the extinguisher is installed tightly to the mounting bracket.
 - S 216-003
 - (4) Make sure the lock-pin or lock-wire is correctly installed on the handle.
 - S 216-008
 - (5) Examine the pressure gage and make sure the extinguisher has the correct pressure.

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- S 216-009
- (6) Make sure there is no physical damage to the extinguisher.
- S 216-006
- (7) Make sure the weight of the extinguisher is not less than the weight shown on the extinguisher nameplate.
- S 216-007
- (8) If there are other manufacturer inspection or maintenance procedures that show on the extinguisher, do these procedures.

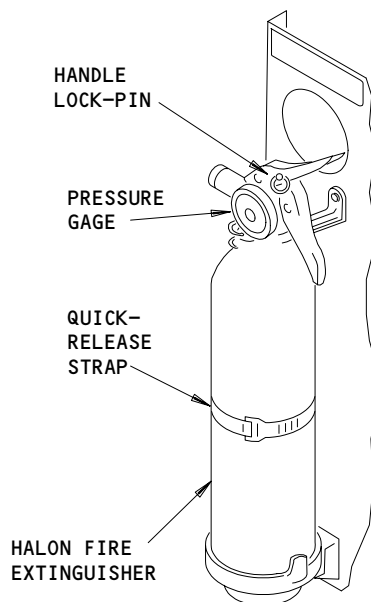
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Halon Fire Extinguisher (Example) - Inspection/Check
Figure 601

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WATER-TYPE FIRE EXTINGUISHERS - INSPECTION/CHECK

1. General

- A. This procedure has a task to inspect the portable water fire extinguishers.
- B. The portable fire extinguishers can be installed in several general locations in the airplane. If the extinguisher is not easy to see, the location will be identified with a placard. The extinguishers are usually installed in one or more of these areas: galley or lavatory stowage areas, closets, doghouses, or near attendant seats.
- C. To service or recharge the fire extinguisher, refer to the applicable vendor manuals or the decals on the fire extinguisher.

TASK 26-26-02-216-001

2. Water Fire Extinguishers Inspection/Check

- A. References
 - (1) IPC 26-26-00
- B. Access
 - (1) Location Zones
200 Upper Half of Fuselage
- C. Procedure
 - S 216-002
 - (1) Make sure the instruction decal and the nameplate are in good condition.
 - S 216-003
 - (2) Make sure the mounting bracket is attached correctly to the airplane.
 - S 216-004
 - (3) Make sure the extinguisher is installed tightly to the mounting bracket.
 - S 216-005
 - (4) Make sure the lock-pin or lock-wire is correctly installed on the handle.
 - (a) If the lock-pin or lock-wire is not correctly installed then install them.

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- S 216-006
- (5) Examine the pressurized cartridge and make sure it is correctly installed and in good condition.
- S 216-007
- (6) Make sure there is no physical damage to the extinguisher.
- S 216-009
- (7) Make sure there are no leaks in the extinguisher.
- S 216-010
- (8) If there are other manufacturer inspection or maintenance procedures that show on the extinguisher, do these procedures.

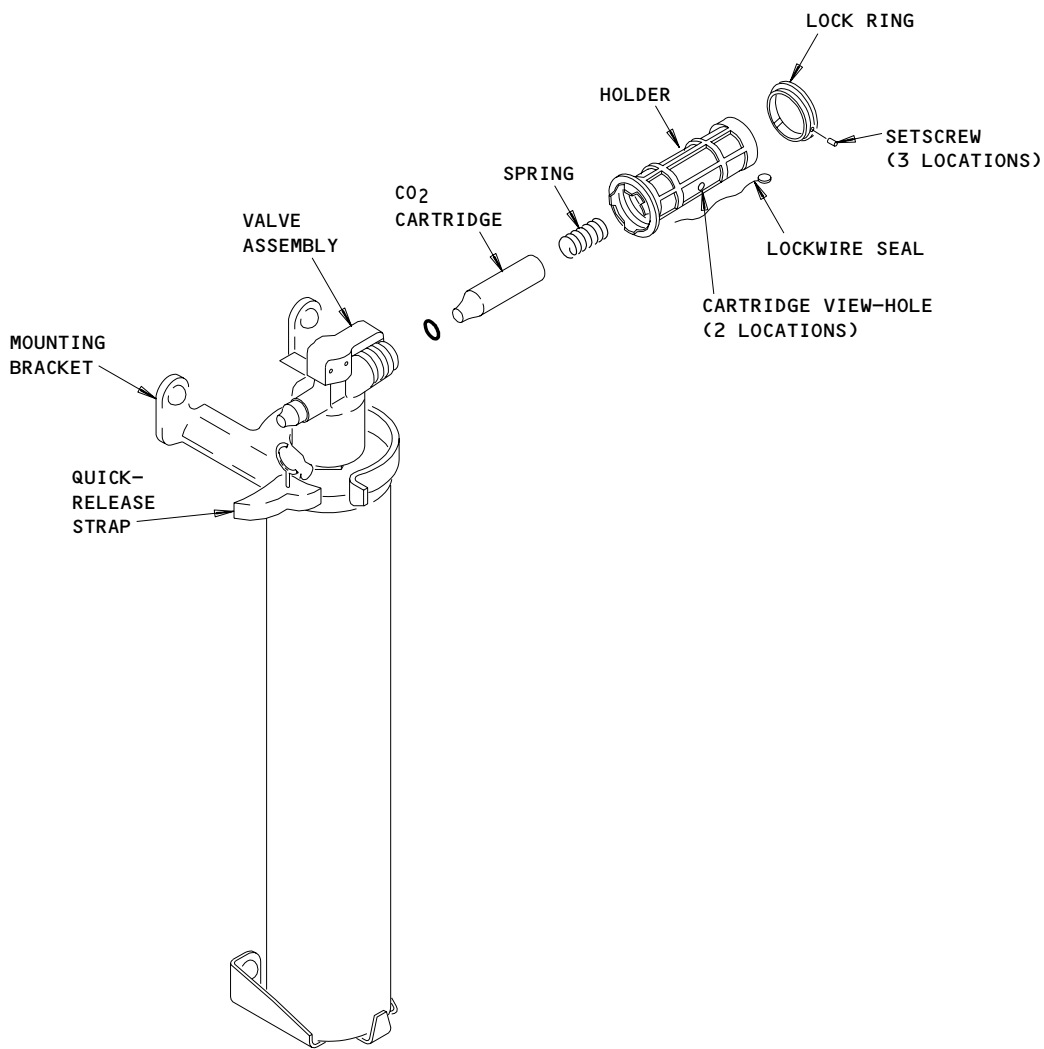
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Water-Type Fire Extinguisher (Example) - Inspection/Check
Figure 601

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