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11-1

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Date 30 Sept 86
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Unit / Dept / Age ELECTRICS - 71/MAINT 11/1
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SECURITY CLASSIFICATION - CONFIDENTIAL

ARROW 1
MAINTENANCE INSTRUCTIONS

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FIRE DETECTION & PROTECTION - ELECTRICS

71/MAINT 11/1

7 October 1957

Prepared: [Signature]
For Maintenance and Reliability
Section

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For Technical Design Group

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For Equipment Design Group

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Project Designer

ENGINEERING DIVISION, AVRO AIRCRAFT LIMITED, MALTON, ONTARIO



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COMPONENT DATA

M.D.R. 11-E3/5	Relay Left Engine Lock-On
M.D.R. 11-E3/6	Relay Right Engine Lock-On
M.D.R. 11-E5/26	Resistor Right Engine Fire Detector
M.D.R. 11-E5/28	Resistor Left Engine Fire Detector
M.D.R. 11-E5/36	Resistor Hydraulic Bay Fire Detector
M.D.R. 11-E5/69	Fire Detector Control Unit L Eng.
M.D.R. 11-E5/70	Fire Detector Control Unit R Eng.
M.D.R. 11-E5/71	Fire Detector Control Unit Hyd. Bay
M.D.R. 11-E6/9	Relay Hydraulic Bay Lock-On
M.D.R. 11-E6/21	Relay 2nd Shot
M.D.R. 11-E14/5	Switch Left Eng Fire Warning and Extinguisher
M.D.R. 11-E14/6	Switch Right Eng Fire Warning and Extinguisher
M.D.R. 11-E14/7	Switch Hyd. Bay Fire Warning and Extinguisher
M.D.R. 11-E14/10	Switch Second Shot
M.D.R. 11-E16/2	Switch - Aircraft Master
M.D.R. 11-E21/8	Switch Ground Test
M.D.R. 11-E21/12	Resistor Current Limiting
M.D.R. 11-E177	Fire Extinguisher Supply Unit
M.D.R. 11-E1525	Fire Detection Loop Hyd. Bay
M.D.R. 11-E1526	Fire Detection Loop Engine Zone #1
M.D.R. 11-E1527	Fire Detection Loop Engine Zone #2



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1. DESCRIPTION

1.1 General

1.1.1 The fire protection system is comprised of fire detection and fire extinguisher actuation circuits.

1.1.2 The fire detection circuits detect and indicate fire conditions in the LH engine compartment, the RH engine compartment and the hydraulic bay which is the section of the fuselage between the engine compartments. In addition to the hydraulic equipment, fuel system and electrical system components are located in this section.

In the extinguisher actuation circuits, two fire extinguishers are fitted which can be discharged individually into any two of the three fire detection areas. Alternatively, both extinguishers can be discharged into any one of the three areas.

1.2 Fire Detection Circuits

1.1.2 The three fire detection circuits are electrically identical. Each circuit is comprised of a number of lengths of a specially constructed heat detector conduit, a detector unit and a combined fire warning indicator and switch which, when depressed, actuated the corresponding actuation circuit of the extinguishers.

1.2.2 The detector conduit consists of two uninsulated wires embedded in an insulating material which has a negative co-efficient of temperature, i.e. a rise in temperature results in a drop in the insulation resistance value. The wires and the insulating material are contained in a conductive sheathing of Inconel which is grounded at intervals to the aircraft structure. One of the core wires is connected to the sheathing, and the other is connected to a transistorized sensing circuit in the detector unit.

1.2.3 The transistorized sensing circuit of the detector unit receives a d-c supply from the emergency d-c bus. If a fire condition occurs, the leakage current across the core wires at a predetermined temperature will be sufficient to allow a relay located in the control unit to be energized. The relay, when energized, completes a supply circuit from the emergency d-c bus to the fire warning indicator, located in the cockpit.



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1.2.4 The lengths of detector conduit can be constructed to have different operating limits by increasing or decreasing the leakage current flow for any given temperature. This permits a complete circuit to indicate fire conditions at different temperatures along its length. The detector circuits of the engine compartments are assembled in this manner.

1.2.5 The detector conduit loops located forward of the engine fire-wall, aft of the engine fire wall and in the hydraulics bay are constructed to permit sufficient leakage current to flow and energize their detector relays when the equivalent total temperature of each individual detector loop is 425°F. (204°C)

If less than the full length of the detector loop is heated to a higher temperature, sufficient leakage current would energize the detector relay.

1.2.6 A resistor fitted externally on each detector control unit facilitates calibration of the relevant system to the required temperature operating limits. These calibrating resistors are, in effect, in parallel with the detector conduit core wires and provide a small, standing current through the relay coil of the detector unit. By altering the ohmic value of the calibrating resistors, the leakage current flow between the core wires required to energize the corresponding detector unit relay will be increased or decreased. Increasing the ohmic value of the calibrating resistors, with respect to the core wire resistance, will increase the operating temperature limit. Conversely, decreasing the ohmic value will decrease the operating temperature limit.

1.2.7 As the detector circuits are formed in loops, they will continue to operate normally despite a break occurring in the live core wire. To facilitate checking this core wire for continuity, a switch is provided to interrupt the loop and ground the core wire. This simulates a leakage current to ground and continuity of the wire will be indicated if the relevant fire warning lights illuminate. The switch is a three-pole type and grounds all three detection circuits simultaneously. To restrict the current flow when the detector circuits are grounded, a current limiting resistor for each circuit is inserted between the test contacts of the switch and ground.



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1.3 Extinguisher Actuation Circuits

- 1.3.1 Two fire extinguisher actuation circuits, namely a first shot circuit and a second shot circuit, are provided for each one of the three fire detection areas. The first shot circuits are actuated by depressing the relevant fire warning indicator. A single second shot switch will energize the second shot circuits. These circuits are inoperative until the corresponding first shot circuits have been selected.
- 1.3.2 Due to the fact that the first shot circuit of the LH engine compartment and the hydraulic bay discharge the same extinguisher, the operation of these circuits is interrelated. When the fire warning indicator of the LH engine is depressed, a supply circuit is completed to a lock on relay. The lock on relay, when energized, does the following:
- (a) Completes a self-holding circuit which holds the relay in the energized position until the supply circuit is interrupted, i.e. selecting the Master Power switch to OFF.
 - (b) Completes a preparatory supply circuit to the relay-open contact of a second shot relay.
 - (c) Transfers the hydraulic bay first shot circuit to the remaining extinguisher.
- 1.3.3 The hydraulic bay extinguisher circuit, when actuated by depressing the hydraulic bay fire warning indicator, completes a supply circuit to a lock-on relay and, via the relay-open contacts of the LH engine lock-on relay, to the relevant extinguisher. If the LH engine extinguisher circuit has been actuated prior to the hydraulic bay, this lock-on relay will be energized which transfers the supply through the relay closed contacts to the remaining extinguisher. The hydraulic bay lock-on relay, when energized, completes a self-holding circuit and a second shot preparatory circuit and transfers the LH engine first shot circuit to the remaining extinguisher.
- 1.3.4 A lock-on relay is incorporated in the RH engine extinguisher circuit. When the RH engine fire warning light is depressed, a supply circuit is completed to the lock-on relay. The lock-on relay, when energized, completes a self-holding circuit and a second shot preparatory circuit.



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- 1.3.5 The second shot circuits are identical in operation. Operating the 2nd SHOT switch will complete a supply circuit to the second shot relay. This relay, when energized, completes all three second shot circuits, but only one will be alive due to the operation of the first shot circuit.



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2. FUNCTIONAL CHECK

2.1 Introduction

2.1.1 This functional check is to ensure that the electrical components of Fire Detection and Fire Protection systems are functioning correctly. (Refer to Avro Drawing 7-1100-3 sht 8)

2.1.2 The electrical solenoids on the Fire Extinguishing Units may be removed by unscrewing a gland nut. On a bench check the operation of the solenoid may be checked by energizing the solenoid and ensuring that the plunger moves $.028 \pm .001$ inches.

2.2 Ground Test Equipment

2.2.1 A.C. Ground Power Supply Trailer

2.2.2 Tester Ohmmeter

2.2.3 Fire Extinguisher Supply Unit Ground Test Panel

2.3 Functional Checking

2.3.1 Fire Detection

2.3.1.1 Select the "MASTER ELECTRIC" switch to the "ON" position.

2.3.1.2 Select the "GROUND TEST" switch, located on E21 panel, to the "TEST" position. The fire warning lights, "HYDRAULIC BAY", "LEFT ENGINE" and "RIGHT ENGINE" should be illuminated.

2.3.1.3 Select the "GROUND TEST" switch to the "OFF" position, the fire warning lights should go out.

2.3.1.4 To check the fire detector loops for correct resistance, disconnect the electrical connector from each of the fire detector control units, then with a resistance test meter, connected to pin C and L (cable connector), check for correct resistance, (Resistance details to be supplied at a later date)

2.3.1.5 Reconnect the electrical connector to the fire detector control units.

2.3.1.6 Select the "MASTER ELECTRIC" switch to the "OFF" position.

2.3.2 Fire Protections

2.3.2.1 Disconnect the three electrical connectors from each of the fire extinguishing supply units, and connect them to the fire protection test panel (Figure 1).

2.3.2.2 Select the "MASTER ELECTRIC" switch to the "ON" position.



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- 2.3.2.3 Select and hold the left engine fire warning and extinguisher No. 1 shot switch. The No. 1 fire extinguisher supply unit zone No. 1 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.4 Select and hold the 2nd shot switch. The No. 2 fire extinguisher supply unit zone No. 1 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.5 Select the "MASTER ELECTRICS" switch to the "OFF" position.
- 2.3.2.6 Select the "MASTER ELECTRICS" switch to the "ON" position.
- 2.3.2.7 Select and hold the right engine fire warning and extinguisher No. 1 shot switch. The No. 2 fire extinguisher supply unit zone No. 2 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.8 Select and hold the 2nd shot switch. The No. 1 fire extinguisher supply unit zone No. 2 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.9 Select the "MASTER ELECTRICS" switch to the "OFF" position.
- 2.3.2.10 Select the "MASTER ELECTRICS" switch to the "ON" position.
- 2.3.2.11 Select and hold the hydraulic bay fire warning and extinguisher No. 1 shot switch. The No. 1 fire extinguisher supply unit zone No. 3 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.12 Select and hold the 2nd shot switch. The No. 2 fire extinguisher supply unit zone No. 3 lamp on the test panel should illuminate. Release the switch and the lamp on the test panel should go out.
- 2.3.2.13 Select the "MASTER ELECTRICS" switch to the "OFF" position.
- 2.3.2.14 Select the "MASTER ELECTRICS" switch to the "ON" position.



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- 2.3.2.15 This check is to ensure that when the fluid from one of the fire extinguisher supply units is discharged into one of the three fire zones, the fluid from the remaining fire extinguisher supply unit may be discharged into either of the remaining zones.

Select and hold one of the three fire warning and extinguisher No. 1 shot switches. The appropriate lamp on the test panel should illuminate. Release the switch and the lamp should go out.

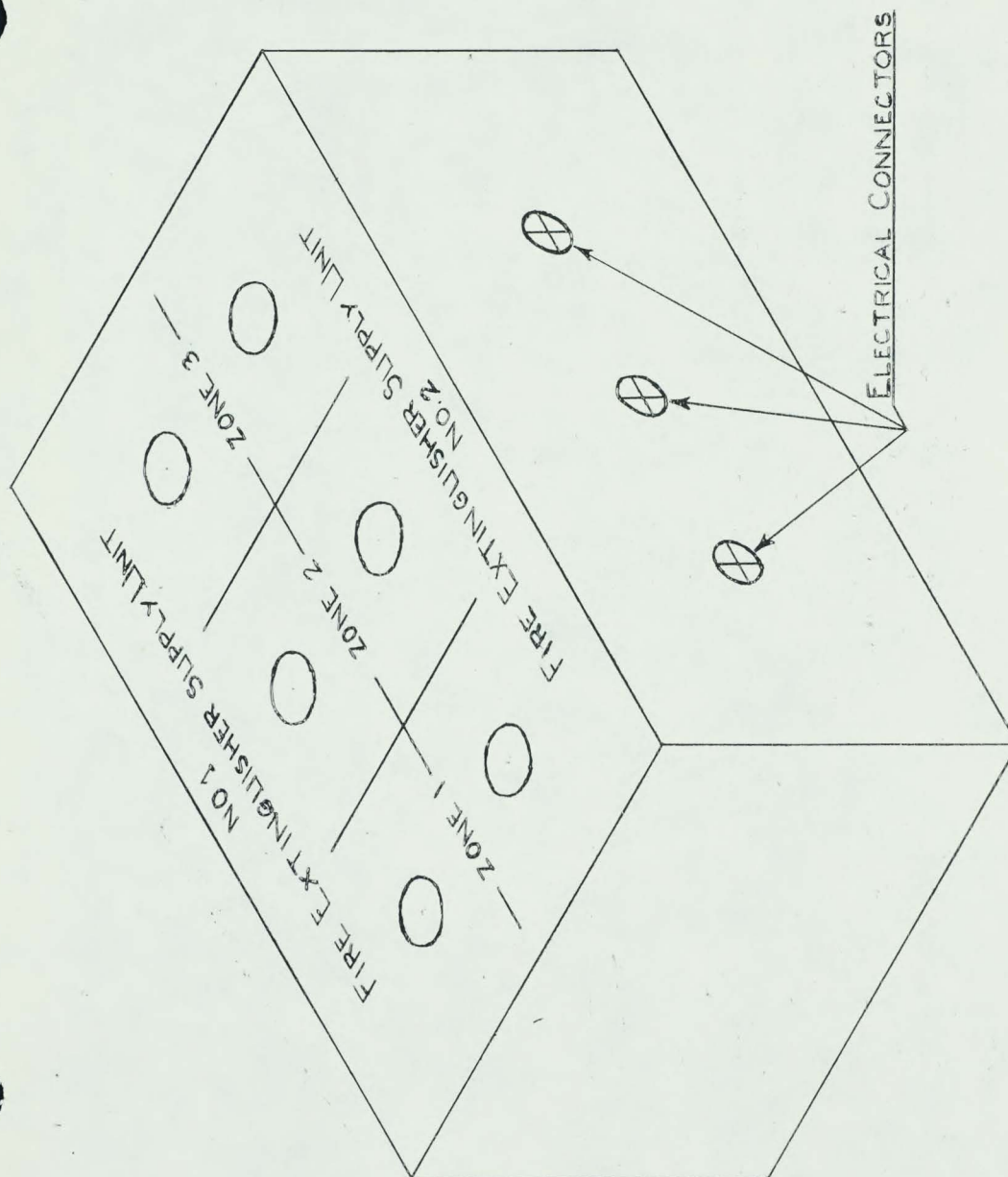
Select and hold either of the remaining fire warning and extinguisher No. 1 shot switches. The appropriate warning light for the other fire extinguisher supply unit should illuminate. Release the switch and the lamp should go out.

- 2.3.2.16 Remove the electrical connectors from the test panel, with a voltmeter ensure that there is no voltage at the electrical connections then re-connect them to their appropriate fire extinguisher supply units.
- 2.3.2.17 Select the "MASTER ELECTRICS" switch to the "OFF" position.
- 2.3.2.18 Using an ohmmeter, check each solenoid of the fire extinguisher supply units for correct resistance. (Resistance details to be supplied at a later date).



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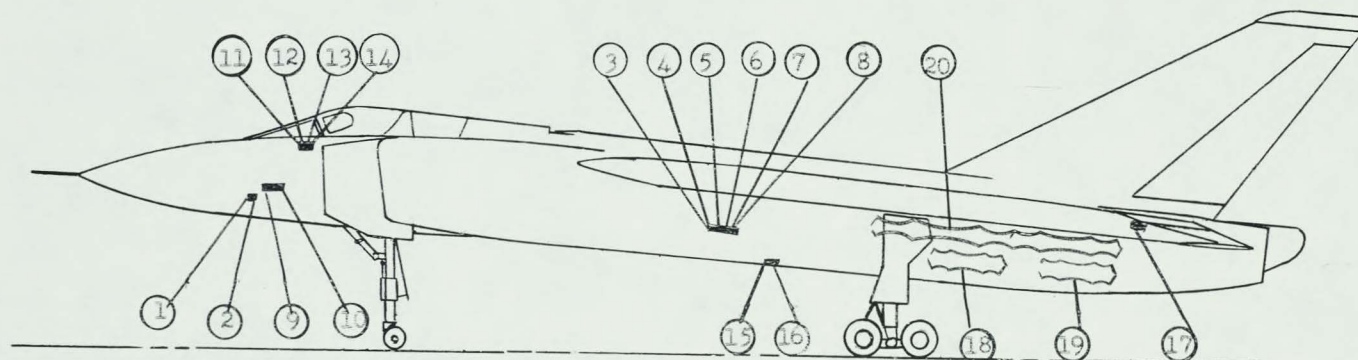


FIRE EXTINGUISHER SUPPLY UNIT GROUND TEST PANEL

FIGURE 1.



1. Relay Right Engine Lock-on
2. Relay Left Engine Lock-on
3. Fire Detection Control Unit Right Engine
4. Fire Detection Control Unit Left Engine
5. Fire Detection Control Unit Hyd. Bay
6. Resistor - Fire Detection Right Engine
7. Resistor - Fire Detection Left Engine
8. Resistor - Fire Detection - Hyd. Bay
9. Relay - Second shot
10. Relay - Hyd. Bay Lock-on



11. Switch - Right Eng. Fire Warning and Extinguishing
12. Switch - Left Eng. Fire Warning and Extinguishing
13. Switch - Hyd. Bay - Fire Warning and Extinguishing
14. Switch - Second Shot
15. Resistors - Current Limiting
16. Switch - Ground Test
17. Fire Extinguisher Supply Units
18. Fire Detection Loop Engine Zone #1
19. Fire Detection Loop Engine Zone #2
20. Fire Detection Loop Hydraulic Bay

COMPONENT LOCATION

FIGURE 2

MAINTENANCE DATA RECORD				SYSTEM		REF. NO.	
AVRO AIRCRAFT LTD. Engineering Div.				ELECTRICS		11-E3/5	
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Relay Left engine lock-on			
MANUFACTURER'S PART NO.				AVRO PART NO.			
MANUFACTURER'S NAME				MS 25024/1			
AVROCAN SPEC. E.O. NO.				REF. DWGS.			
ENVELOPE SIZE 2.625" x 2.687" x 3.312" WEIGHT 0.8 LB.				7-1100-2 sht 11 7-1100-3 sht 8			
LOCATION Panel E3, located on the R.H. side of the nose wheel well				REF. M.D.R.			
FUNCTION When energized, by depressing the left engine fire warning and extinguisher switch the relay transfers the hydraulic bay extinguisher actuation to the remaining extinguisher and completes a circuit for a second shot				11-E3			
				RELIABILITY			
				OVERHAUL LIFE 1500 HRS.			
				WASTAGE			
				Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED		MEN X MINUTES			
				EST.		ACTUAL	
25 Hrs.		Check that the relay is securely mounted. Check that the circuit wiring is securely and properly connected to the relay terminals. Function check. (See Maintenance Instructions Report 71/MAINT 11/1)		1 x 5			
		ACCESSIBILITY					
		Mounted on panel E3					
ISSUE	1						
DATE	17 July 57						
COMPILED	WO2 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

LUBRICATION NIL				
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS
DETAILS:				
GROUND SUPPORT EQUIPMENT				
SPECIAL TOOLS FOR AIRCRAFT USE		SPECIAL TOOLS FOR BENCH USE		
NIL		NIL		
GROUND TESTING EQUIPMENT		GROUND HANDLING EQUIPMENT		
Electrical Ground Power Unit		Maintenance Platform 4G/1596		
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS		MEN X MINUTES
REPLACEABLE				EST.
1. Remove 4 mounting bolts. 2. Disconnect 6 electrical connections from the relay terminals. Remove and Replace		1 x 10		

MAINTENANCE DATA RECORD				SYSTEM ELECTRICS (Fire Detection)		REF. NO. 11-E5/28	
AVRO AIRCRAFT LTD. Engineering Div.							
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Resistor Left engine fire detector			
MANUFACTURER'S PART NO. RW 20V900 MANUFACTURER'S NAME International Resistance Co. AVROCAN SPEC. E.O. NO.				AVRO PART NO.			
ENVELOPE SIZE 2.5" x 1.25" x .5" WEIGHT LB.				REF. DWGS. 7-1100-2 sht 19 7-1100-3 sht 8 7-4511-4			
LOCATION Mounted on panel E5 located on missile bay roof.				REF. M.D.R.			
FUNCTION An external trip point adjusting resistor, for the left engine fire detector control unit.				RELIABILITY OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED		MEN X MINUTES			
				EST. ACTUAL			
25 Hr.		Check for security and damage.		1 x 2			
ACCESSIBILITY On panel E5							
ISSUE	1						
DATE	17 July 57						
COMPILED	WO2 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

MAINTENANCE DATA RECORD				SYSTEM		REF. NO.	
AVRO AIRCRAFT LTD.				ELECTRICS		11-E5/70	
Engineering Div.							
DISTRIBUTION: STANDARD +		A/C TYPE - Arrow 1		COMPONENT			
S. Brown		EFF. A/C - 25201		Fire detection control unit right engine.			
MANUFACTURER'S PART NO. 871510				AVRO PART NO.			
MANUFACTURER'S NAME Walter Kidde				7-1154-18			
AVROCAN SPEC. E420 E.O. NO.							
ENVELOPE SIZE 2.5" x 2.5" x 2.9" WEIGHT LB.				REF. DWGS.			
LOCATION Panel E5, located on roof of missile bay				7-1100-2 sht 18 7-1100-3 sht 8			
FUNCTION To complete a supply circuit to the right engine fire warning light when fire conditions are indicated.				REF. M.D.R.			
				11-E5			
				RELIABILITY			
				OVERHAUL LIFE 1500 HRS.			
				WASTAGE			
				Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED			MEN X MINUTES		
					EST. ACTUAL		
25 Hrs.		Check mounting for security. Check electrical connector for security			1 x 2		
ACCESSIBILITY							
Mounted on panel E5							
ISSUE	1						
DATE	17 July 57						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

LUBRICATION				
NIL				
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS
DETAILS:				
GROUND SUPPORT EQUIPMENT				
SPECIAL TOOLS FOR AIRCRAFT USE		SPECIAL TOOLS FOR BENCH USE		
NIL		NIL		
GROUND TESTING EQUIPMENT		GROUND HANDLING EQUIPMENT		
Electrical Ground Power Unit		NIL		
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS		MEN X MINUTES
REPLACEABLE				EST.
1. Remove 2 mounting bolts 2. Disconnect 1 electrical connector Remove and Replace		1 x 5		

MAINTENANCE DATA RECORD				SYSTEM	REF. NO.
AVRO AIRCRAFT LTD.		Engineering Div.		ELECTRICS	11-E6/9
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Relay Hydraulic Bay lock-on	
MANUFACTURER'S PART NO.				AVRO PART NO.	
MANUFACTURER'S NAME				MS 25024-1	
AVROCAN SPEC. E.O. NO.				REF. DWGS.	
ENVELOPE SIZE 2.625" x 2.687" x 3.312" WEIGHT 0.8 LB.				7-1100-2 sht 10 7-1100-3 sht 8	
LOCATION Panel E6 located on the roof of the nose wheel well				REF. M.D.R. 11-E6	
FUNCTION When energized, by depressing the hydraulic bay fire warning and extinguishing switch, the relay transfer the LH engine extinguisher actuation to the remaining extinguisher and completes a circuit in preparation for a second shot.				RELIABILITY	
				OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.	
INSPECTION PERIOD	OPERATION TO BE PERFORMED			MEN X MINUTES	
				EST.	ACTUAL
25 Hr.	Check that the relay is securely mounted Check that the circuit wiring is securely and properly connected to the relay terminals. Function check. (Seen Maintenance Instructions Report 71/MAINT 11/1)			1 x 5	
ACCESSIBILITY					
Mounted on Panel E6					
ISSUE	1				
DATE	17 July 57				
COMPILED	W02 Wentworth				
CHECKED	J. Ferguson				
APPROVED	R.F. Reid				

MAINTENANCE DATA RECORD				SYSTEM ELECTRICS		REF. NO. 11-E14/5	
AVRO AIRCRAFT LTD.		Engineering Div.					
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Switch L. engine fire warning and extinguishing #1 shot			
MANUFACTURER'S PART NO. A 3084B-BX				AVRO PART NO. CS-S-155			
MANUFACTURER'S NAME Hetherington							
AVROCAN SPEC. E287 E.O. NO.							
ENVELOPE SIZE .75" dia. x 2 13/64" WEIGHT 0.1 LB.				REF. DWGS. 7-1100-2 sht 5 7-1100-3 sht 8			
LOCATION Panel E14, located on pilots L.H. console							
FUNCTION To serve as a combined fire warning indicator and fire extinguisher actuation switch.				REF. M.D.R. 11-E14			
				RELIABILITY OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED			MEN X MINUTES		
					EST.		ACTUAL
Primary		Check lamp for serviceability (See Maintenance Instructions Report 71/MAINT 11/1)			1 x 1		
25 Hrs.		Check switch for security of mounting.			1 x 2		
ACCESSIBILITY							
Mounted on panel E14							
ISSUE	1						
DATE	17 July 1957						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

MAINTENANCE DATA RECORD				SYSTEM		REF. NO.	
AVRO AIRCRAFT LTD.				ELECTRICS		11-E14/6	
Engineering Div.							
DISTRIBUTION: STANDARD +		A/C TYPE - Arrow 1		COMPONENT			
S. Brown		EFF. A/C - 25201		Switch R. engine fire warning and extinguishing #1 shot			
MANUFACTURER'S PART NO. A3084R-BX				AVRO PART NO.			
MANUFACTURER'S NAME Hetherington				CS-S-155			
AVROCAN SPEC. E287 E.O. NO.				REF. DWGS.			
ENVELOPE SIZE .75" x 2.203" WEIGHT 0.1 LB.				7-1100-2 sht 5 7-1100-3 sht 8			
LOCATION Panel E14, located in pilots cockpit L.H. side.				REF. M.D.R.			
FUNCTION To serve as a combined fire warning indicator and fire extinguisher actuation switch.				11-E14			
				RELIABILITY			
				OVERHAUL LIFE 1500 HRS.			
				WASTAGE			
				Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED		MEN X MINUTES			
				EST.		ACTUAL	
Primary		Check lamp for serviceability (See Maintenance Instructions Report 71/MAINT 11/1)		1 x 1			
25 Hrs.		Check switch for security of mounting Check electrical connections for security		1 x 2			
ACCESSIBILITY							
Mounted on panel E14							
ISSUE	1						
DATE	17 July 1957						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

LUBRICATION				
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS
DETAILS:				
GROUND SUPPORT EQUIPMENT				
SPECIAL TOOLS FOR AIRCRAFT USE		SPECIAL TOOLS FOR BENCH USE		
NIL		NIL		
GROUND TESTING EQUIPMENT		GROUND HANDLING EQUIPMENT		
Electrical Ground Power Unit		Cockpit Access Stand		
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS		MEN × MINUTES
REPLACEABLE				EST.
1. Remove mounting nut & lock washer 2. Disconnect 3 electrical connections		Remove and Replace		1 x 5

MAINTENANCE DATA RECORD				SYSTEM		REF. NO.	
AVRO AIRCRAFT LTD. Engineering Div.				ELECTRICS		11-E14/7	
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Switch Hydraulic bay fire warning and extinguishing #1 shot			
MANUFACTURER'S PART NO. A 3084 R-BX MANUFACTURER'S NAME Hetherington AVROCAN SPEC. E287 E.O. NO. ENVELOPE SIZE .75" dia. x 2.203" WEIGHT 0.16 LB. LOCATION Panel E14, pilots cockpit L.H. console FUNCTION To serve as a combined fire warning indicator and fire extinguisher actuation switch.				AVRO PART NO. CS-S-155 REF. DWGS. 7-1100-2 sht 5 7-1100-3 sht 8 REF. M.D.R. 11-E14 RELIABILITY OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED			MEN X MINUTES		
					EST.		ACTUAL
Primary		Check lamp for serviceability (see Maintenance Instructions Report 71/MAINT 11/1)			1 x 1		
25 Hrs.		Check switch for security of mounting Check electrical connections for security.			1 x 2		
ACCESSIBILITY							
Mounted on panel E14							
ISSUE	1						
DATE	17 July 1957						
COMPILED	WO2 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

LUBRICATION					NIL	
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS		
DETAILS:						
GROUND SUPPORT EQUIPMENT						
SPECIAL TOOLS FOR AIRCRAFT USE			SPECIAL TOOLS FOR BENCH USE			
NIL			NIL			
GROUND TESTING EQUIPMENT			GROUND HANDLING EQUIPMENT			
Electrical Ground Power Unit			Cockpit Access stand			
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS			MEN X MINUTES	
REPLACEABLE					EST.	ACTUAL
1. Remove mounting nut & lock washer 2. Disconnect 3 electrical connections Remove and Replace					1 x 5	

MAINTENANCE DATA RECORD				SYSTEM ELECTRICS		REF. NO. 11-E14/10	
AVRO AIRCRAFT LTD. Engineering Div.							
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Switch (second shot)			
MANUFACTURER'S PART NO. 8811K15 MANUFACTURER'S NAME Cutler Hammer AVROCAN SPEC. E.O. NO. ENVELOPE SIZE 1.125" x 1.046" x .625" WEIGHT 0.08 LB. LOCATION Panel E14 located in pilots cockpit L.H. console. FUNCTION To energize circuitry to direct the remaining fire extinguisher to the area selected by the first shot switch.				AVRO PART NO. 8811K15			
				REF. DWOS. 7-1100-2 sht 5 7-1100-3 sht 8			
				REF. M.D.R.			
				RELIABILITY OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED			MEN X MINUTES		
					EST. ACTUAL		
25 Hr.		Check for security and damage. Function check (see Maintenance Instructions Report 71/MAINT 11/1)			1 x 10		
		ACCESSIBILITY Mounted on panel E14					
ISSUE	1						
DATE	17 July 1957						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

MAINTENANCE DATA RECORD				SYSTEM		REF. NO.	
AVRO AIRCRAFT LTD. Engineering Div.				ELECTRICS		11-E16/2	
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - Arrow 1 EFF. A/C - 25201		COMPONENT Switch A/C Master			
MANUFACTURER'S PART NO. 7660K9				AVRO PART NO. 7660K9			
MANUFACTURER'S NAME Cutler Hammer							
AVROCAN SPEC. E.O. NO.							
ENVELOPE SIZE 1.3125" x 1.203" x .75" WEIGHT 0.16 LB.				REF. DWGS. 7-1100-2 sht 6 7-1100-3 sht 8			
LOCATION Panel E 6 - located in pilots cockpit R.H. console.							
FUNCTION Aircraft electrical master switch (four pole lever switch)				REF. M.D.R.			
				RELIABILITY OVERHAUL LIFE 1500 HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED			MEN X MINUTES		
					EST.	ACTUAL	
25 Hrs.		Check for security and damage.			1 x 1		
ACCESSIBILITY							
In pilot's cockpit.							
ISSUE	1						
DATE	17 July 1957						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

LUBRICATION				
NIL				
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS
DETAILS:				
GROUND SUPPORT EQUIPMENT				
SPECIAL TOOLS FOR AIRCRAFT USE		SPECIAL TOOLS FOR BENCH USE		
NIL		NIL		
GROUND TESTING EQUIPMENT		GROUND HANDLING EQUIPMENT		
A/C Ground Power Unit		Cockpit access stand		
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS		MEN X MINUTES
REPLACEABLE				EST.
1. Disconnect 8 electrical connections 2. Remove one mounting nut		Remove and Replace		1 x 10

LUBRICATION					NIL	
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS		
DETAILS:						
GROUND SUPPORT EQUIPMENT						
SPECIAL TOOLS FOR AIRCRAFT USE			SPECIAL TOOLS FOR BENCH USE			
NIL			NIL			
GROUND TESTING EQUIPMENT			GROUND HANDLING EQUIPMENT			
Electrical Ground Power Unit			NIL			
INTERCHANGEABLE	☒	REMOVAL INSTRUCTIONS			MEN X MINUTES	
REPLACEABLE					EST.	ACTUAL
1. Remove mounting nut and lock washer 2. Disconnect 9 electrical connections Remove and Replace					1 x 5	

MAINTENANCE DATA RECORD				SYSTEM ELECTRICS		REF. NO.	
AVRO AIRCRAFT LTD.				Fire Protection		11-E21/12	
Engineering Div.							
DISTRIBUTION: STANDARD +		A/C TYPE - Arrow 1		COMPONENT			
S. Brown		EFF. A/C - 25201		Resistors Current Limiting			
MANUFACTURER'S PART NO. RW20V201				AVRO PART NO.			
MANUFACTURER'S NAME International Resistance Co.							
AVROCAN SPEC. E.O. NO.							
ENVELOPE SIZE 2.5" x 1.25" x 0.5"		WEIGHT		REF. DWGS.			
		LB.		7-1156-19 7-1100-2 sht 23 7-1100 - 3 sht 8			
LOCATION Panel E21 located fwd of LH speed brake							
FUNCTION A current limiting resistor to protect the first detector controller when the ground test switch is selected to "TEST" position.				REF. M.D.R. 11-E21/13 11-E21/14			
				RELIABILITY			
				OVERHAUL LIFE HRS. WASTAGE Q.T.R.			
INSPECTION PERIOD		OPERATION TO BE PERFORMED		MEN X MINUTES			
				EST.		ACTUAL	
Primary		Check for continuity (See Maintenance Instructions Report 71/MAINT 11/2)					
ACCESSIBILITY							
On panel E21							
ISSUE	1						
DATE	17 July 57						
COMPILED	W02 Wentworth						
CHECKED	J. Ferguson						
APPROVED	R.F. Reid						

MAINTENANCE DATA RECORD				SYSTEM	REF. NO.
AVRO AIRCRAFT LTD.		Engineering Div.		FIRE PROTECTION	23-1 11-177
DISTRIBUTION: STANDARD + S. Brown		A/C TYPE - ARROW 1 EFF. A/C - 25201		COMPONENT Fire Extinguisher Supply Unit	
MANUFACTURER'S PART NO.				AVRO PART NO.	
MANUFACTURER'S NAME Walter Kidde				7-2358-21	
AVROCAN SPEC. E379 & E405 E.O. NO.				REF. DWGS.	
ENVELOPE SIZE 18.0" x 18.0" x 8.5"		WEIGHT 60.0 full 36.0 empty LB.		7-1100-3 Sht. 8 7-2300-2 7-2358-5	
LOCATION Fuselage station 724				REF. M.D.R.	
FUNCTION A storage unit for fire extinguisher fluid, (Freon 1282) discharged by a switch in the pilot's cockpit.				E-178	
				RELIABILITY	
				OVERHAUL LIFE 1500 HRS.	
				WASTAGE	
				Q.T.R. Pending	
INSPECTION PERIOD		OPERATION TO BE PERFORMED		MEN X MINUTES	
				EST.	ACTUAL
Primary Airframe		Check pressure at pressure gauges on unit. Check condition of safety disc. Check discharge parts and control valves.		1 x 5	
Primary Electrics		Check electrical connectors for security and damage.		1 x 3	
25 Hrs. Electrics		Function check electrical solenoids. (Ref. Maintenance Instructions Report 71/Maint 11/1)		1 x 15	
ACCESSIBILITY					
Through service door No. 4 - (28 Camlocs)					
Remove and Replace				1 x 2	
ISSUE	1	2	3	4	
DATE	May 4/56	July 13/56	December 28/56	August 20/57	
COMPILED	WO2 Wentworth	WO2 wentworth	D. Collingwood	WO2 wentworth	
CHECKED	G. Emmerson	D. Collingwood	WO2 Wentworth	J. Ferguson	
APPROVED		G. Emmerson	R.F. Reid	R.F. Reid	

LUBRICATION				
APPLICATION	MATERIAL	SPECIFICATION	FREQUENCY	ACCESS
DETAILS:				
GROUND SUPPORT EQUIPMENT				
SPECIAL TOOLS FOR AIRCRAFT USE		SPECIAL TOOLS FOR BENCH USE		
NIL		NIL		
GROUND TESTING EQUIPMENT		GROUND HANDLING EQUIPMENT		
Electrical Ground Power Unit Ohmeter		Maintenance Platform Winch		
INTERCHANGEABLE	X	REMOVAL INSTRUCTIONS		MEN X MINUTES
REPLACEABLE				EST.
<u>Electrics</u>		Disconnect 6 electrical connectors. Remove and Replace		1 x 6
<u>Airframe</u>		(1) To remove fire extinguisher bottle assy. (a) Remove locking wire from mounting bolts. (b) Remove 6 mounting bolts. (c) Disconnect 3 pipe lines. (d) Lower unit from aircraft. (e) Remove 1 strut - 2 bolts. Remove and Replace		2 x 40
(2) To remove a bottle from the assembly. (a) Remove 2 mounting bolts. (b) Disconnect 3 pipe lines. (c) Remove bottle. Remove and Replace		1 x 15		