ARROW 1 SERVICE DATA

SECTION 25

ENGINE SERVICES

ELECTRICS

(This data supersedes previous issue dated 25 Feb 57)

15 JUN 58

CONFIDENTIAL

ARROW 1 SERVICE DATA

LIST OF REVISIONS

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ARROW 1 SERVICE DATA

ELECTRICAL SYSTEM

ENGINE SERVICES

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LIST OF ILLUSTRATIONS

ARROW 1 SERVICE DATA

DESCRIPTION

GENERAL

1 The electrical circuits of the engine services include instrument circuits, warning circuits, engine starting control, ignition and relight circuits. Electrically identical circuits are provided for each engine.

ENGINE STARTING AND IGNITION (Fig 1)

2 The engines are started by compressed air supplied from a mobile starter cart. The starting cycle is initiated and controlled by electrical circuits which are actuated by switches located in the front cockpit.

3 Interconnection between the starter cart and the aircraft is by a cable which plugs into an engine starting receptacle located on the lower section of the nose landing gear. The starter plug incorporates a lanyard type quick-release to prevent unnecessary delay in take-off after the engines have been started.

4 The starter cable consists of the starting control circuit wiring for two compressed air control valves, an interphone line, and two battery powered DC supply circuits. The interphone line permits intercommunication between the aircrew and the ground crew and the reception of telescramble communications from the operations control centre. The DC supply circuits are used to supply power to the battery bus-bar in lieu of the aircraft battery. When the starting cable plug is connected to the starting receptacle, the aircraft starting power relay is energized. This action isolates the aircraft battery and transfers the battery bus-bar load onto the external battery.

5 The starting circuits permit the engines to be started singly or simultaneously and facilitate interrupting the starting cycle.

6 The starting cycle is initiated by selecting the starting switch to the START position. This completes a supply circuit from the emergency DC bus-bar to the starting relay. The ground return for the starting relay is completed through a centrifugal control switch fitted on the engine starter. The starting relay, when energized, completes the following three circuits:

(a) A self-holding circuit which is operative until the engines are started or the starting cycle is interrupted.

(b) A supply circuit which opens the compressed air control valve on the engine starter cart.

(c) A preparatory supply circuit to a centrifugal advance switch fitted on the engine starter.

7 When the engine starter switch is released, the supply circuit for the engine starting relay is maintained through the relay open contacts of a manual reset relay.

8 The advance centrifugal switch closes when the starter attains 700 rpm. This action completes the preparatory supply circuit from the starting relay to an ignition relay. The ignition relay, when energized, completes the power supply circuits to the engine spark igniters.

9 The control centrifugal switch opens when the starter attains 3020 rpm. This action renders the starting circuits inoperative by interrupting the self-holding ground return circuit of the starting relay which interrupts the supply to the advance centrifugal switch and to the compressed air control valve.

10 If the engine fails to start, the starting cycle can be interrupted by selecting the RESET position on the engine starting switch. This selection energizes the manual relay which interrupts the power supply to the starting relay.

RELIGHTING (Fig 1)

11 A push-button relight switch is fitted on each power lever. When either switch is depressed, a circuit is completed from the emergency DC bus-bar to the relevant LH or RH ignition relay. The ignition relay, when energized, completes the power supply circuits to the engine spark igniters.

ARROW 1 SERVICE DATA

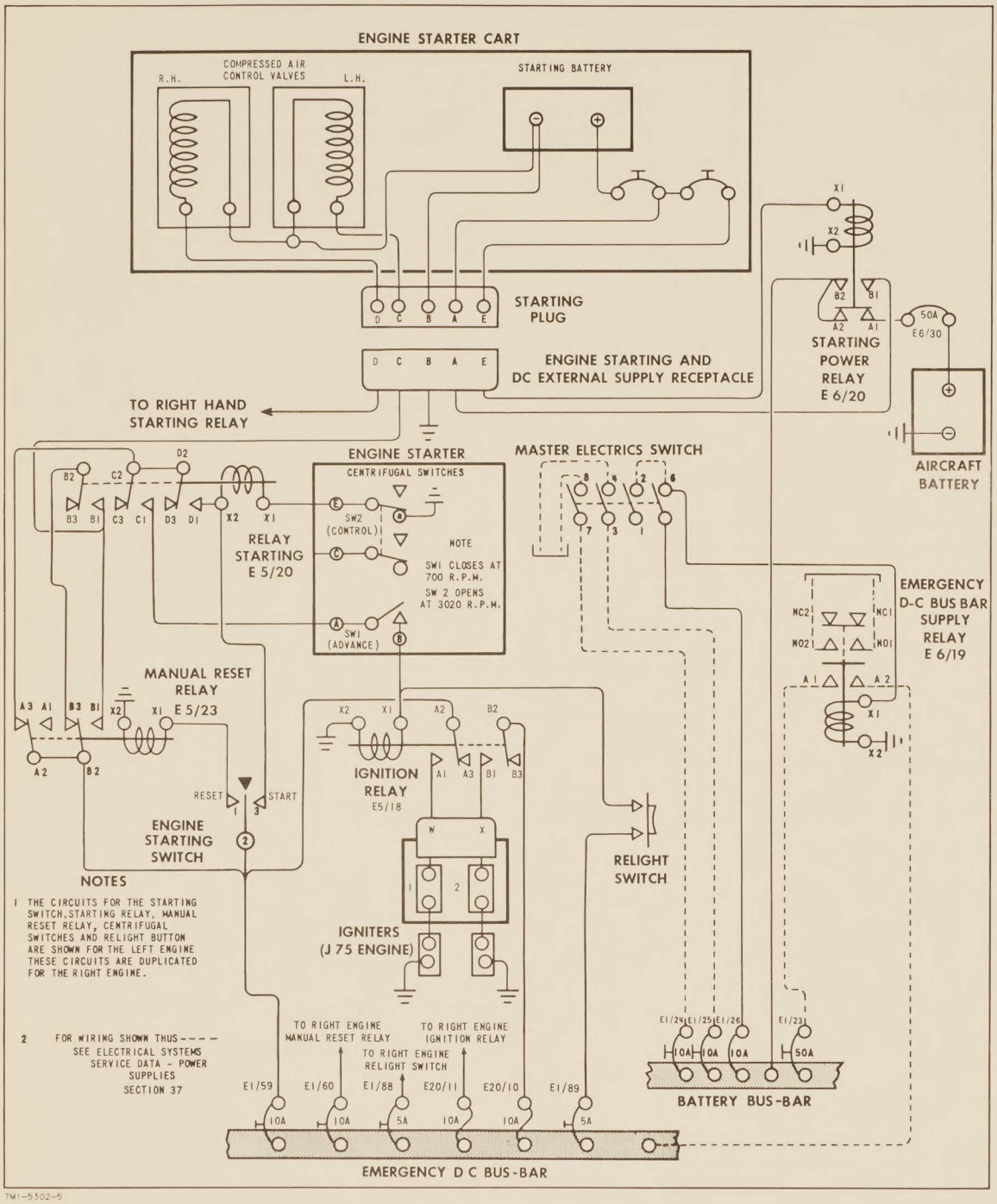

FIG. 1 ENGINE STARTING IGNITION SCHEMATIC

EXHAUST GAS TEMPERATURE INDICATION

12 Exhaust gas temperature indication for each engine is provided by two separate self-exciting chromel-alumel thermocouple circuits. Each circuit consists of a transistorized indicator actuated by four parallel-connected thermocouples located on the turbine discharge shroud ring of the engine. The indicators derive a 115 volts AC supply from "A" phase of the main bus-bars and incorporate two red warning flags which are visible when the power is off.

PRESSURE RATIO INDICATION

13 The pressure ratio between the engine air intake and the turbine discharge outlet is utilized by the pressure ratio indication system to provide a measure of thrust being developed by the engine. Two systems are provided, one for each engine, each consisting of a ratio indicator, or ratiometer, located on the main instrument panel in the front cockpit, and a pressure ratio transducer located at station 664 of the fuselage. Pressure indications, taken from the engine air intake and the turbine discharge outlet, are translated into an electrical signal by the pressure ratio transducer and transmitted to the ratio indicator. The system operates on 115 volts AC supply derived from "A" phase of the main bus-bars.

OIL PRESSURE WARNING (Fig 2)

14 An OIL PRESS warning light for each engine is fitted on the master warning panel. If the oil pressure of the LH or the RH engine drops below 25 psi, the appropriate L or R OIL PRESS warning light and the amber coloured master warning light illuminate. Each warning light is controlled by a pressure switch mounted on the LH side of the corresponding engine gear box. Both circuits derive their power supply from the main DC bus-bar via the master warning control unit.

ENGINE INLET FUEL PRESSURE WARNING (Fig 3)

15 A FUEL PRESS warning light for each engine is fitted on the master warning panel. If the LH or the RH engine inlet fuel pressure drops below 16.4 $\pm$ 0.5 psia, the appropriate L or R FUEL PRESS warning light and the amber coloured master light illuminate. Each

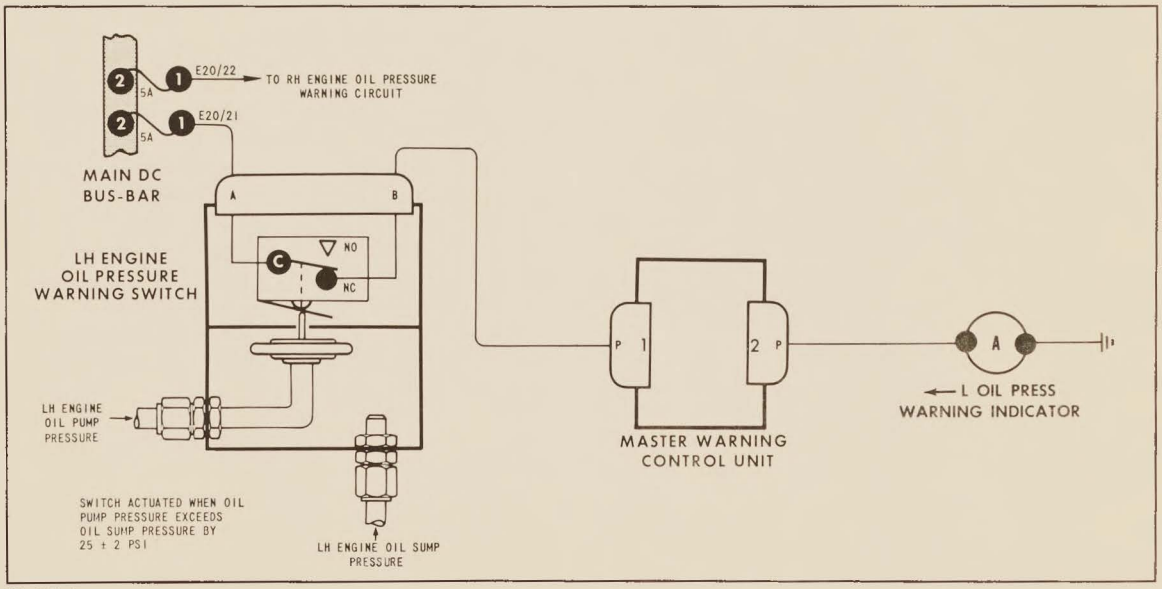

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FIG. 2 OIL PRESSURE WARNING SCHEMATIC

ARROW 1 SERVICE DATA

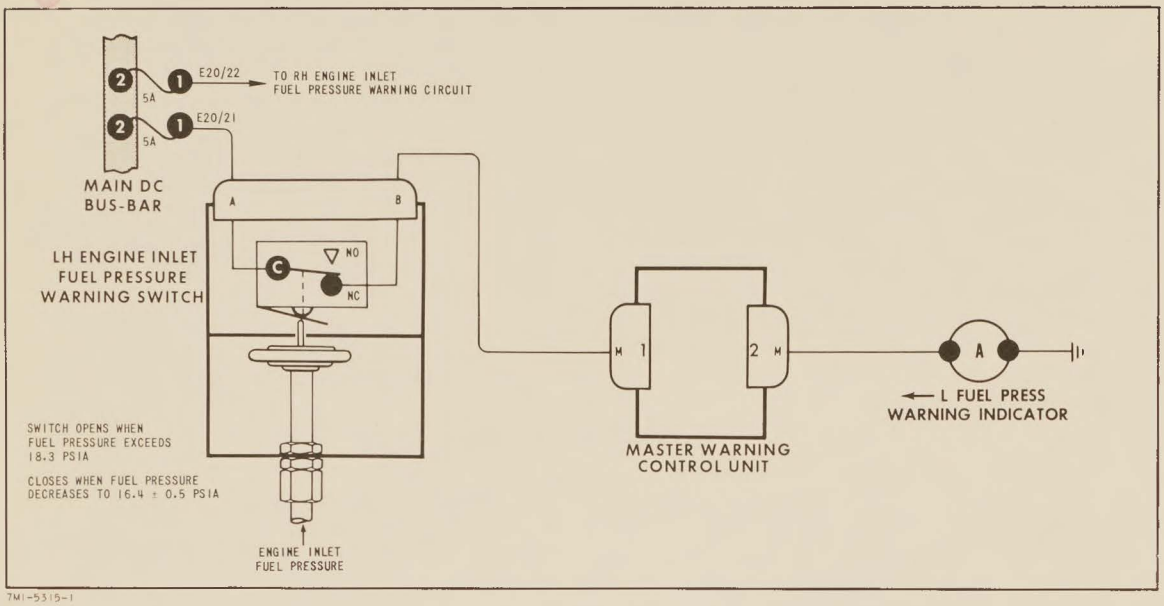

FIG. 3 ENGINE INLET FUEL PRESSURE WARNING SCHEMATIC

warning light is controlled by a pressure switch tapped into the corresponding engine fuel inlet line at station 549 of the fuselage which is downstream from the low pressure cock. Both circuits derive their power supply from the main DC bus-bar via the master warning system control unit.

AFTERBURNER OPERATION (Fig 4)

16 The afterburner is brought into operation by advancing the power lever to the afterburner range and then depressing the lever. This action closes a micro-switch fitted on the power lever assembly. The micro-switch, when closed, completes a supply to energize the afterburner relay which, in turn, completes circuits to initiate the operation of the hydro-mechanical unit and open the fuel-to-oil heat exchanger by-pass valve. The hydro-mechanical unit provides fuel to the afterburner igniters and fuel nozzles and opens the afterburner discharge nozzle. The fuel-to-oil heat exchanger by-pass valve, when open, permits engine oil to pass through the heat exchanger. A power supply for both circuits is derived from the main DC bus-bar.

ZONE 1 EJECTOR (Fig 5)

17 The zone 1 ejector is fitted to assist in engine cooling at low airspeeds and when ground running.

18 The system consists of a differential pressure switch which controls an ejector valve actuator. The pressure switch, located on the structure below the engine intake, is acted upon by the engine air intake pressure and atmospheric pressure. At low airspeeds or when ground running, a depression at the engine intake causes a pressure differential to exist across the pressure switch. When the pressure differential is such that atmospheric pressure exceeds engine intake pressure by 2.0 ± 0.25 inches of water, the pressure switch closes. This action completes a supply circuit to the ejector valve relay which completes a supply circuit to the ejector valve actuator to open the ejector valve. The ejector valve is fitted in the bleed line from the high pressure compressor and air is ejected to atmosphere through zone 1 of the engine bay. The system derives a power supply from the main DC bus-bar.

ARROW 1 SERVICE DATA

LOW PRESSURE COMPRESSOR OVERSPEED INDICATOR (Fig 6)

19 An ENG O'SPEED indicator light for each engine is fitted on the master warning panel. Steady illumination of a light denotes failure of the corresponding engine low pressure compressor speed limiter. Note that the light may illuminate momentarily when the afterburner is switched on and off. If the low pressure rotor speed increases to between 7260 and 7330 rpm, this will close a centrifugal switch incorporated in the speed limiter. When closed, the switch completes a supply circuit to the appropriate ENG O'SPEED indicator light and the amber coloured master light via the master warning control unit. Both circuits derive their power supply from the main DC bus-bar.

ENGINE EMERGENCY FUEL CONTROL AND WARNING (Fig 7)

20 The emergency fuel control provides an emergency fuel supply to the engine in the event of a malfunction of the hydro-mechanical fuel control unit. An ENG EMER FUEL ON warning light is fitted on the master warning panel and illuminates when either the LH or the RH engine fuel control unit is in the emergency selection.

21 Two solenoid operated control valves are incorporated in each engine fuel control unit. One valve controls the normal fuel flow to the engine, and the other the emergency flow to the engine.

22 Selecting the LH or the RH ENGINE FUEL switch, located on the fire and fuel panel, to

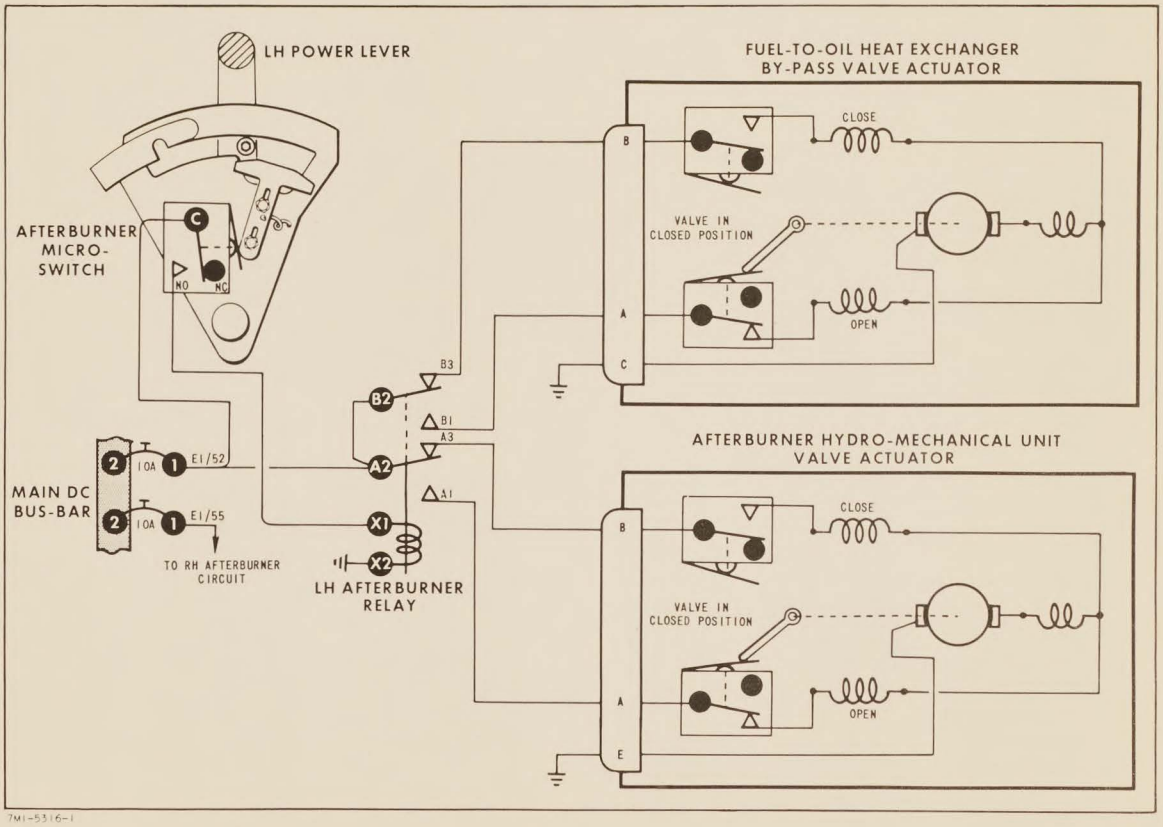

FIG. 4 AFTERBURNER CIRCUIT SCHEMATIC

ARROW 1 SERVICE DATA

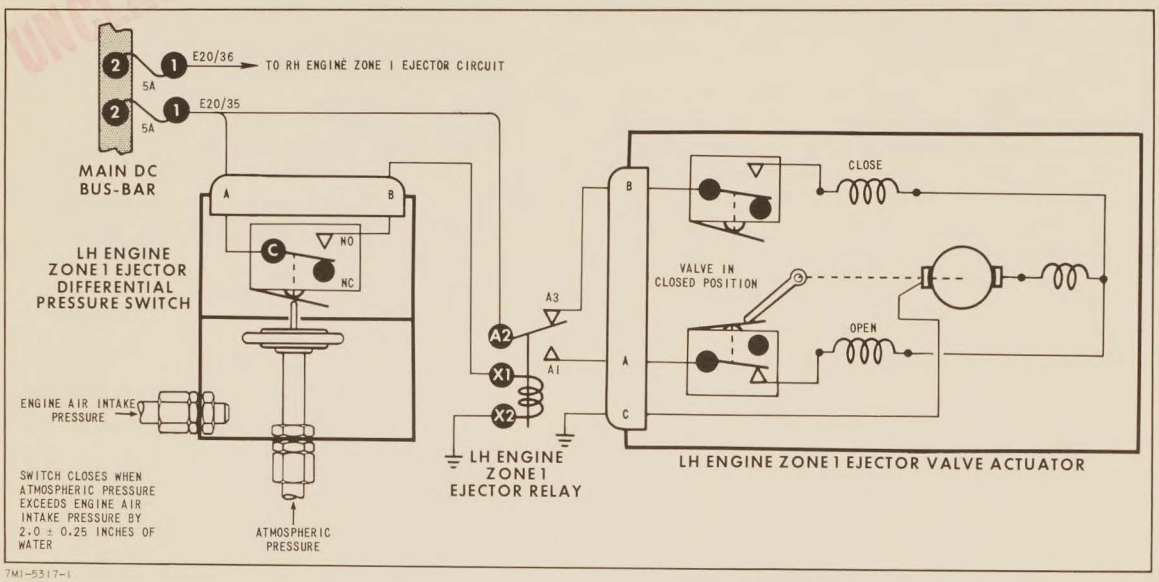

FIG. 5 ZONE 1 EJECTOR SCHEMATIC

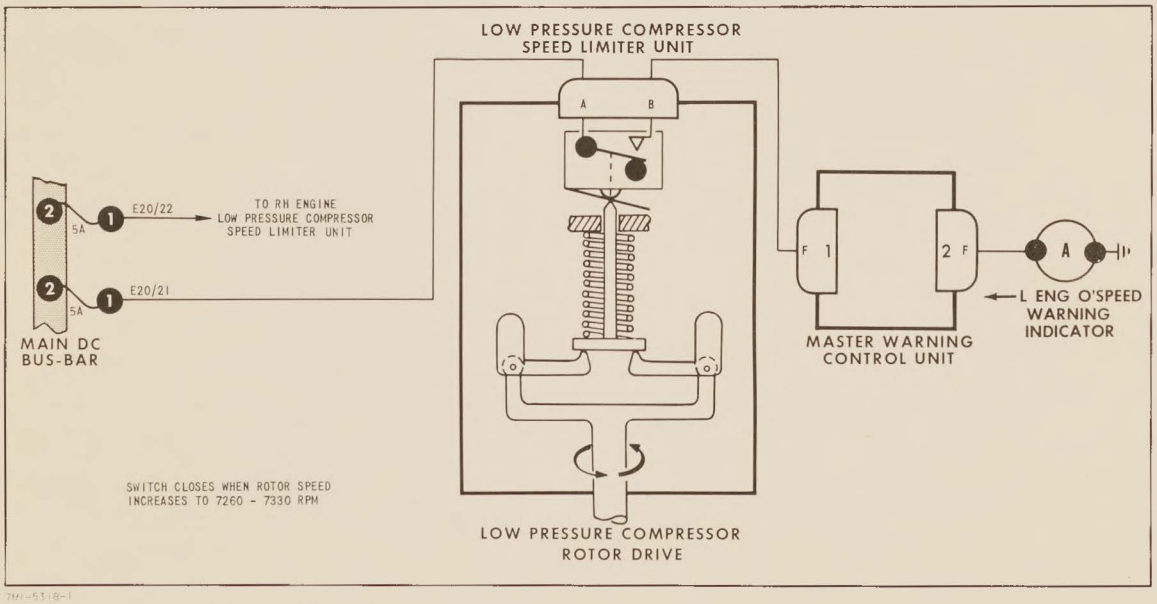

FIG. 6 LOW PRESSURE COMPRESSOR OVERSPEED INDICATION SCHEMATIC

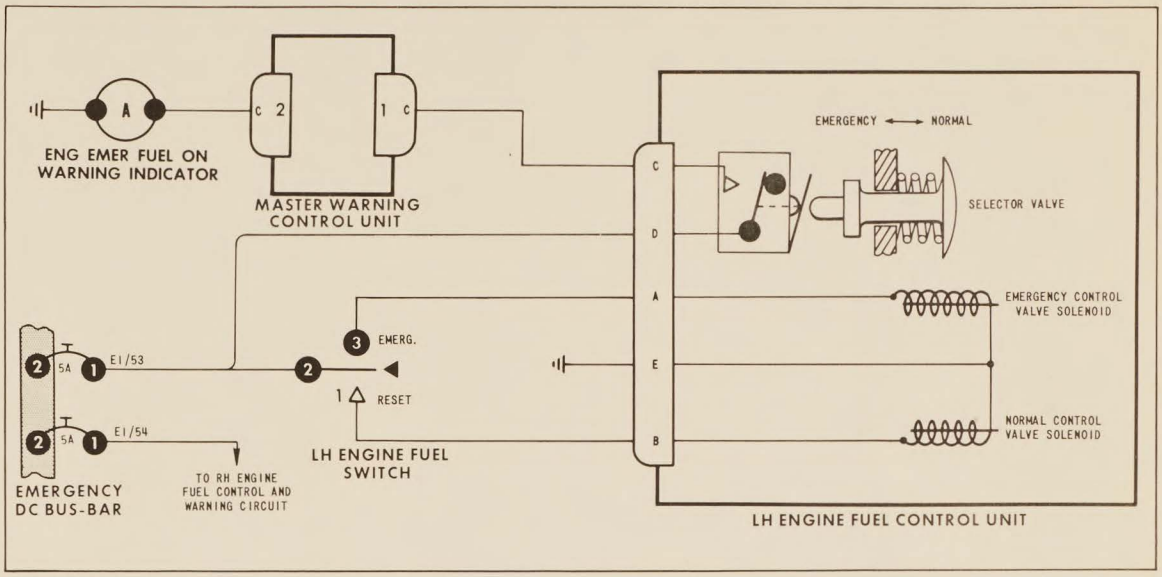

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FIG. 7 ENGINE EMERGENCY FUEL CONTROL AND WARNING SCHEMATIC

the EMERG position completes a supply circuit to the emergency control valve solenoid in the appropriate engine control unit. The solenoid, when energized, actuates the control valve to the open position to bleed off the fuel behind the selector valve. This action causes a pressure difference to exist across the selector valve which is sufficient to overcome the force of a spring on the valve seat and shuttle the valve to the emergency position. At the extreme end of its travel the valve closes a switch which completes a supply circuit to the warning light.

23 Holding the LH or the RH ENGINE FUEL switch to the RESET position completes a supply circuit to the normal control valve solenoid in the appropriate engine control unit. The solenoid, when energized, actuates the control valve to the open position allowing the fuel pressure to equalize across the selector valve. This action permits spring force to shuttle the selector valve to the normal position. A fail-safe feature is incorporated in the selector valve which hydraulically locks the valve in the last selected position.

R.P.M. INDICATION (Fig 8)

24 Engine R.P.M. indicators, graduated in percentage of maximum engine rpm, are fitted on the pilot's main instrument panel. The LH engine rpm indicator is electrically connected to a tachometer generator which is driven by the high pressure compressor gearbox of the LH engine; the RH engine rpm indicator is likewise connected to the RH engine. Each tachometer generator develops a three phase alternating current, the frequency of which varies directly with the speed of its respective engine. The indicators incorporate a self-starting synchronous AC motor which, when driven by the tachometer generator, rotates a magnet assembly at a speed relative to the frequency of the respective engine tachometer generator, in effect the speed of the appropriate high pressure compressor rotor. Rotation of the magnet assembly in turn exerts a magnetic torque on a drag disc to which a pointer is attached. The degree of pointer movement is proportionate to the magnet assembly speed and indicates the engine speed on the graduated dial.

FUNCTION TESTING

GENERAL

25 With the exception of the engine relighting circuits, the engine electrical systems are

ARROW 1 SERVICE DATA

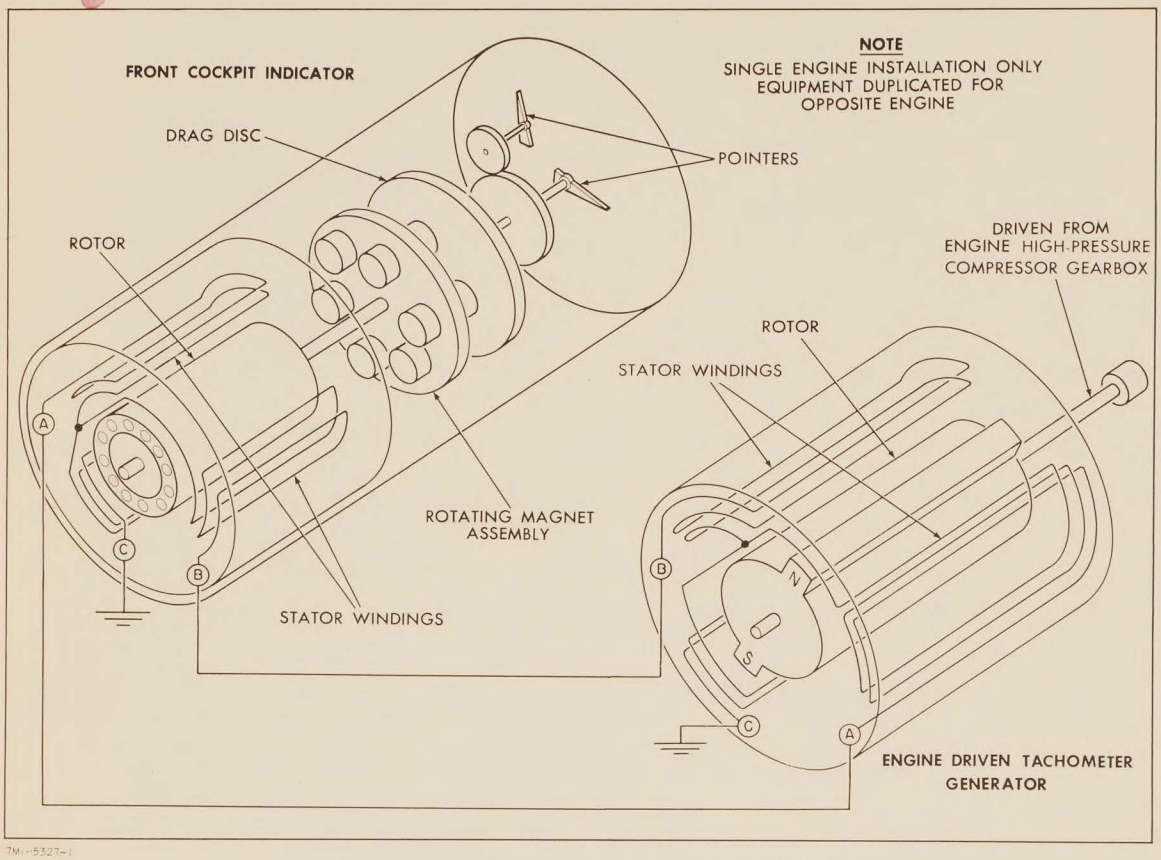

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FIG. 8 R.P.M. INDICATION SCHEMATIC

function tested during the engine run described in Arrow 1 Service Data, Power Plant - Section 23.

ENGINE RELIGHTING

26 To check the serviceability of the engine relighting circuits proceed as follows:

(a) Ensure that a source of AC power is connected to the external AC supply receptacle or, alternatively, connect a source of DC power to the engine starting receptacle on the nose gear leg. In either case, select the master electrical switch to the on position.

(b) Check that on panel E1, the circuit breakers marked L and R START, RIGHT RELIGHT, LEFT RELIGHT and EMERG DC are selected on.

(c) Remove current limiters L and R IGNITION #2 from panel E20.

(d) Depress the LH engine RELIGHT switch located on the LH power lever, and check for an audible indication that No. 1 spark igniter, on the LH engine, operates. Release the switch.

(e) Depress the RH engine RELIGHT switch located on the RH power lever, and check for an audible indication that No. 1 spark igniter, on the RH engine, operates. Release the switch.

(f) Refit current limiters L and R IGNITION #2 into their holders in panel E20, and on panel E1 switch off circuit breakers L and R START.

ARROW 1 SERVICE DATA

(g) Depress the LH engine RELIGHT switch and check for an audible indication that No. 2 spark igniter, on the LH engine, operates. Release the switch.

(h) Depress the RH engine RELIGHT switch and check for an audible indication that No. 2 spark igniter, on the RH engine, operates. Release the switch.

ARROW 1 SERVICE DATA

LOCATION OF ELECTRICAL COMPONENTS — ENGINE SERVICES

ITEM NO.	DESCRIPTION
E1	**CIRCUIT BREAKER PANEL**
-19	5A CB, EXHAUST GAS TEMPERATURE INDICATION, LH ENGINE
-20	5A CB, EXHAUST GAS TEMPERATURE INDICATION, RH ENGINE
-52	10A CB, AFTERBURNER FUEL CONTROL, LH ENGINE
-53	5A CB, FUEL CONTROL, LH ENGINE
-54	5A CB, FUEL CONTROL, RH ENGINE
-55	10A CB, AFTERBURNER FUEL CONTROL, RH ENGINE
-59	10A CB, STARTING CONTROL, LH ENGINE
-60	10A CB, STARTING CONTROL, RH ENGINE
-88	5A CB, RELIGHT, RH ENGINE
-89	5A CB, RELIGHT, LH ENGINE
E4	**DISTRIBUTION PANEL**
E5	**MAIN ACCESSORY PANEL**
-11	RELAY, ZONE 1 EJECTOR LH ENGINE
-16	RELAY, ZONE 1 EJECTOR RH ENGINE
-18	RELAY, IGNITION LH ENGINE
-19	RELAY, STARTING RH ENGINE
-20	RELAY, STARTING LH ENGINE
-22	RELAY, STARTING RESET RH ENGINE
-23	RELAY, STARTING RESET LH ENGINE
-32	RELAY, IGNITION RH ENGINE
-50	RELAY, AFTERBURNER LH ENGINE
-51	RELAY, AFTERBURNER RH ENGINE

ITEM NO.	DESCRIPTION
E6	**FORWARD RELAY PANEL**
-20	RELAY, STARTING POWER
E11	**MAIN INSTRUMENT PANEL**
-67	INDICATOR, EXHAUST GAS TEMPERATURE, LH ENGINE
-68	INDICATOR, EXHAUST GAS TEMPERATURE, RH ENGINE
-69	INDICATOR, PRESSURE RATIO LH ENGINE
-70	INDICATOR, PRESSURE RATIO RH ENGINE
-75	INDICATOR, RPM LH ENGINE
-76	INDICATOR, RPM RH ENGINE
E14	**FIRE AND FUEL PANEL**
-8	SWITCH, FUEL CONTROL LH ENGINE
-9	SWITCH, FUEL CONTROL RH ENGINE
E15	**MASTER WARNING PANEL**
-10	INDICATOR LIGHT, OIL PRESSURE, RH ENGINE
-11	INDICATOR LIGHT, OIL PRESSURE, LH ENGINE
-12	INDICATOR LIGHT, FUEL PRESSURE, RH ENGINE
-13	INDICATOR LIGHT, FUEL PRESSURE, LH ENGINE
-14	INDICATOR LIGHT, EMERGENCY FUEL, LH OR RH ENGINE
-19	INDICATOR LIGHT, ENGINE OVERSPEED, LH ENGINE
-20	INDICATOR LIGHT, ENGINE OVERSPEED, RH ENGINE

ITEM NO.	DESCRIPTION
E20	**AFT CIRCUIT LIMITER PANEL**
-10	10A FUSE, IGNITION NO 2 LH ENGINE
-11	10A FUSE, IGNITION NO 2 RH ENGINE
-21	5A FUSE, OIL AND FUEL PRESSURE WARNING, LH ENGINE
-22	5A FUSE, OIL AND FUEL PRESSURE WARNING, RH ENGINE
-33	5A FUSE, PRESSURE RATIO INDICATION, LH ENGINE
-34	5A FUSE, PRESSURE RATIO INDICATION, RH ENGINE
-35	5A FUSE, ZONE 1 EJECTOR, LH ENGINE
-36	5A FUSE, ZONE 1 EJECTOR, RH ENGINE
E1500	**POWER LEVER ASSEMBLY**
-2	PUSH SWITCH, RELIGHT LH ENGINE
-3	PUSH SWITCH, RELIGHT RH ENGINE
-4	MICRO-SWITCH, AFTERBURNER CONTROL, LH ENGINE
-5	MICRO-SWITCH, AFTERBURNER CONTROL, RH ENGINE
E16	**POWER AND STARTING PANEL**
-3	SWITCH, STARTING AND RESET LH ENGINE
-4	SWITCH, STARTING AND RESET RH ENGINE

FOR LOCATION OF COMPONENTS ON PANELS E1, E4, E5, E6, E11 AND E20 SEE ARROW 1 SERVICE DATA, ELECTRICAL SYSTEM - GENERAL INFORMATION, SECTION 36. FOR COMPONENTS ON PANEL E15 SEE ARROW 1 SERVICE DATA, ELECTRICAL SYSTEM MASTER WARNING, SECTION 38.

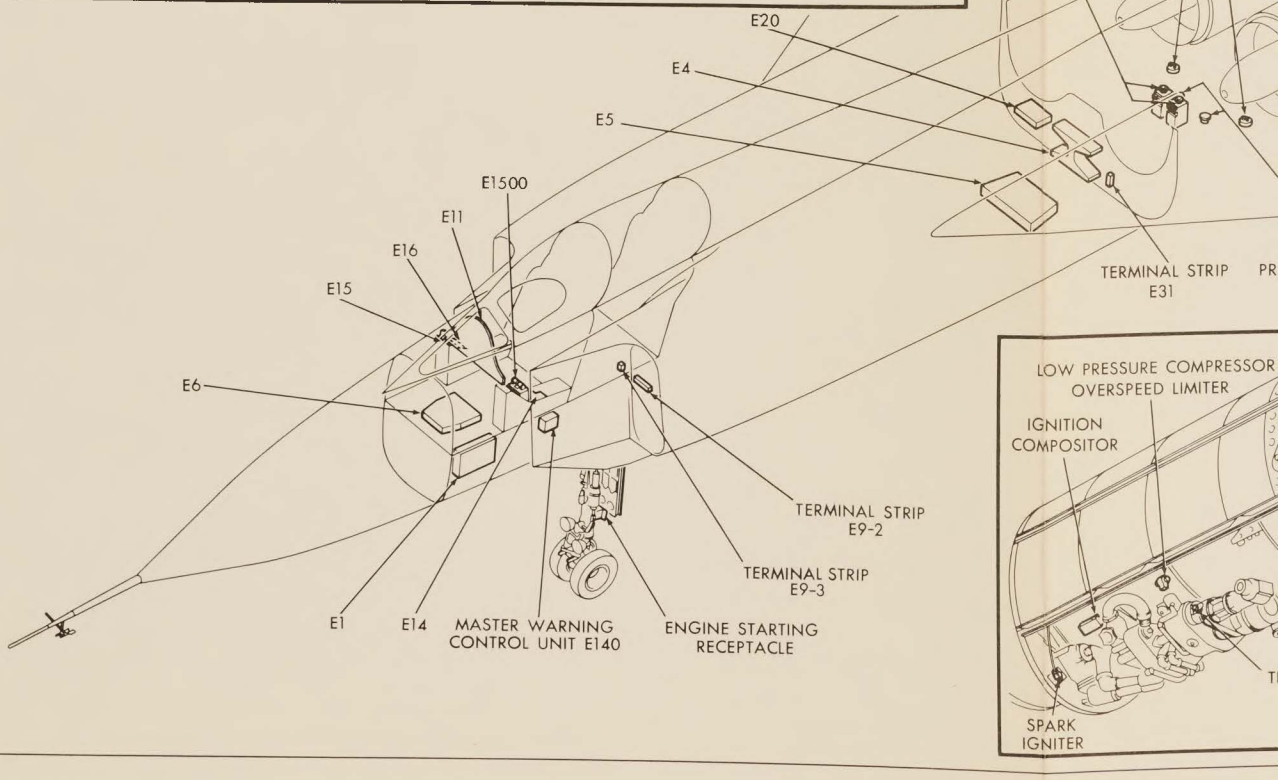

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FIG. 9 LOCATION OF ELECTRICAL COMPONENTS - ENGINE SERVICES

ARROW 1 SERVICE DATA

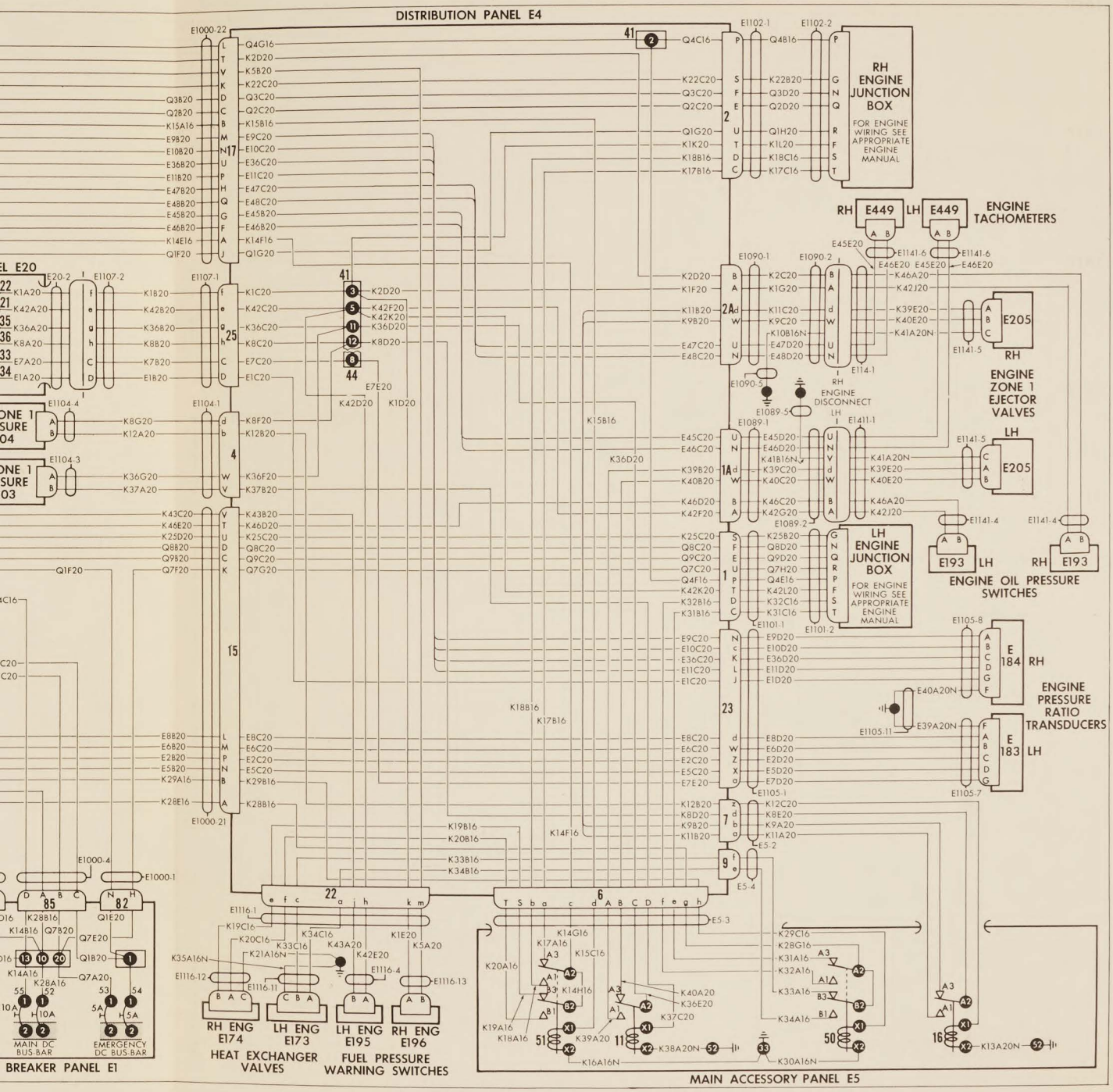


FIG. 10 ENGINE SERVICE CIRCUITS

ARROW 1 SERVICE DATA

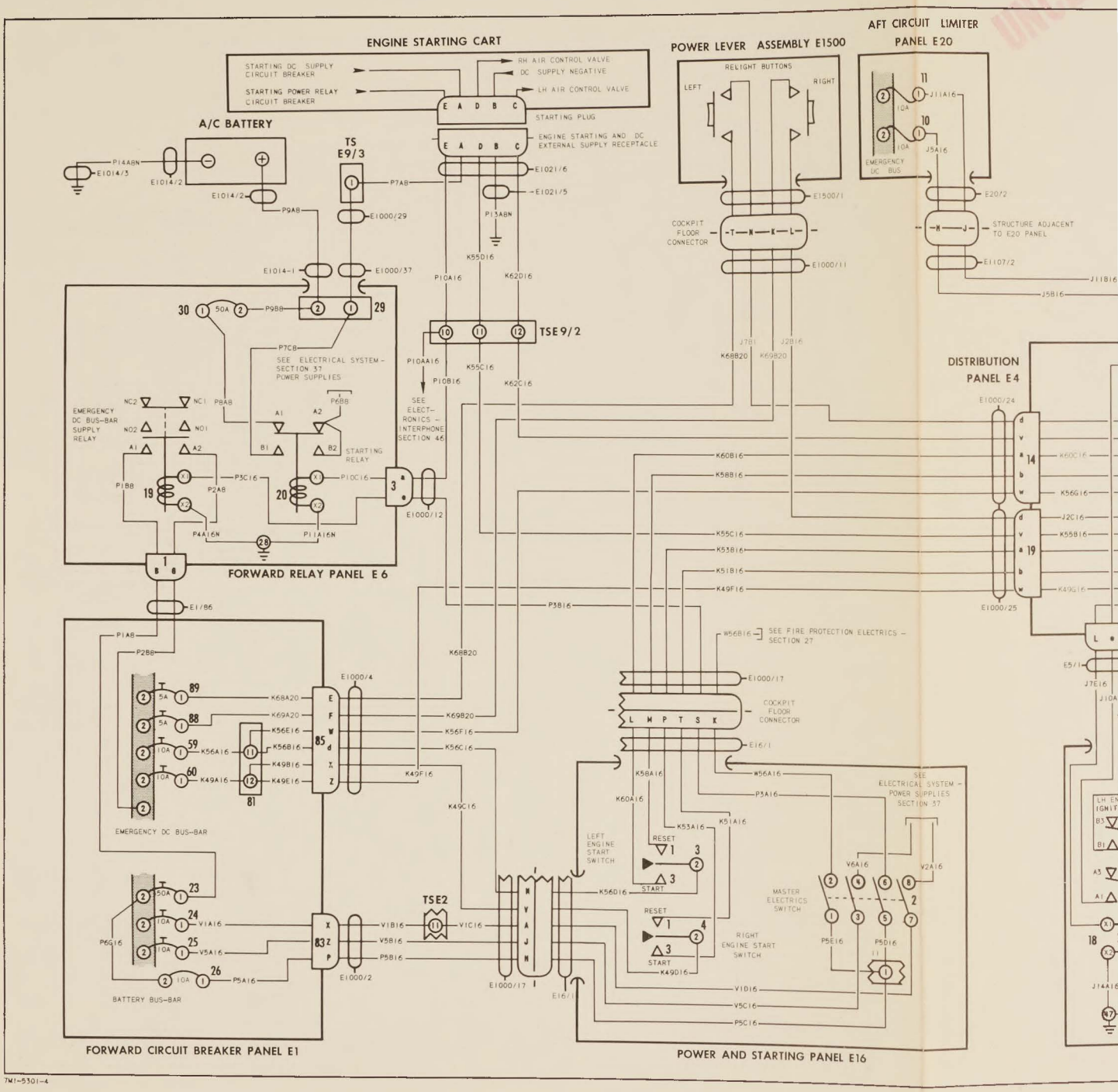
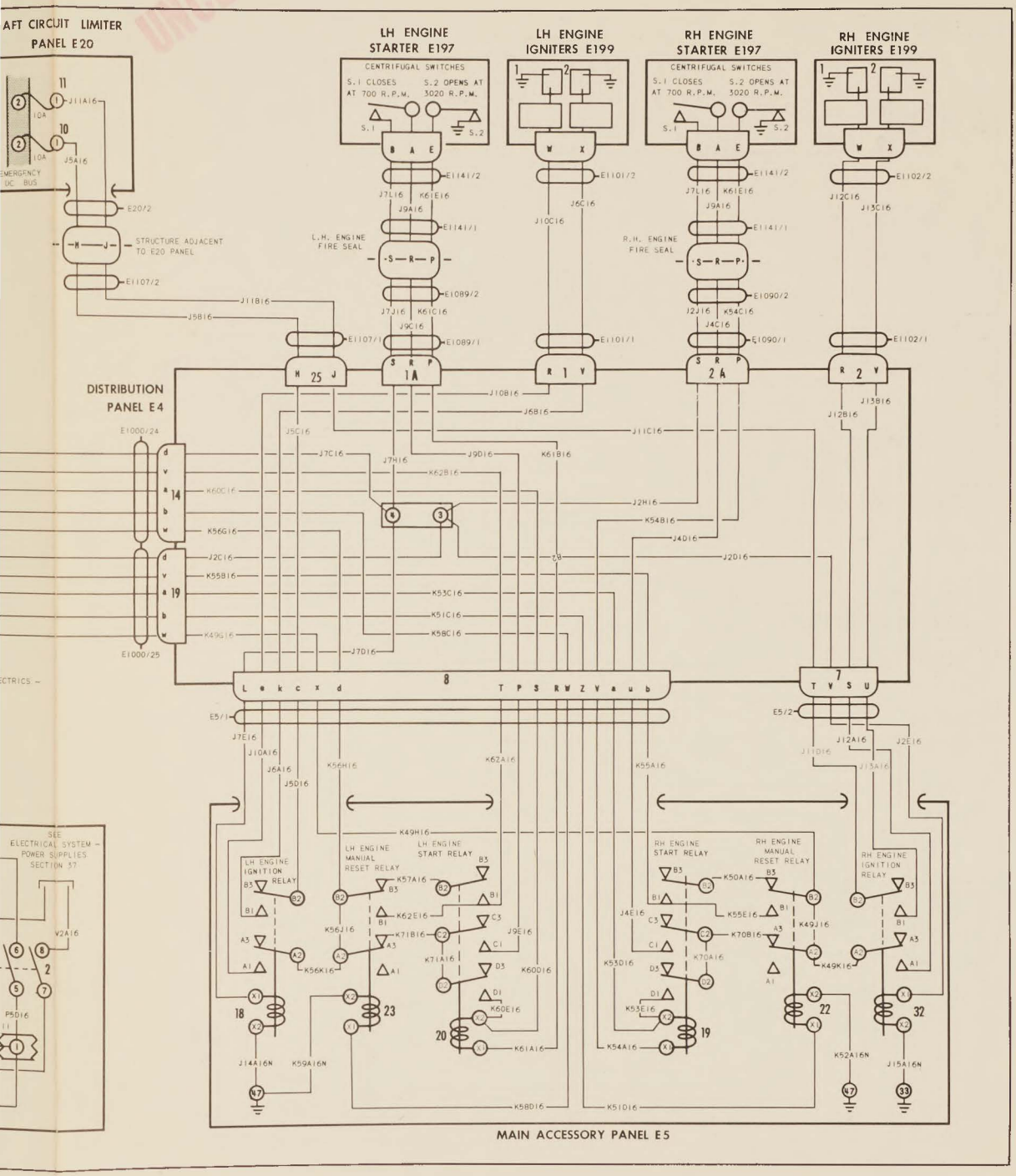


FIG. 11 ENGINE STARTING AND IGNITION



ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Engine Starting Switches - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Cutler-Hammer	8812K13	25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 1500 hours

FUNCTION

To energize the engine starting relays and, when required, interrupt the starting cycle. Individual switches are fitted for the LH engine starting relay, and the RH engine starting relay.

LOCATION

In front cockpit, RH console on panel E16.

ACCESS

MEN X MINUTES

Unobstructed, when panel E16 is removed from the RH console.

REPLACEMENT PROCEDURE

MEN X MINUTES

Fit and secure switch to panel with the lock washer and retaining nut supplied.
Fit and secure the circuit wiring to the switch terminals.
Refit the panel in the console and secure - four quick fasteners.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Operate the switches and check that the lever action is smooth and that the make and break is not sluggish or rough.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Starting Relays - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
		MS25024-1	25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To complete the starter circuits and open or close the starter cart compressed air control valve. The relays control the operation of their respective LH or RH system.

LOCATION

Main Accessories Panel E5 which is fitted on the armament bay roof.

ACCESS — MEN X MINUTES

Unobstructed, when the panel is released and lowered from its forward mounts by removing two pip pins.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure the relay to the panel - four mounting screws.
Fit and secure the circuit wiring to the relay terminals.
Raise and position Panel E5, secure by inserting the two pip pins.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the relays are securely fitted. Check that the circuit connections to the relays are properly and securely fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Manual Reset Relays - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CSR-133			25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 1500 hours

FUNCTION

When energized, by selecting the reset position on the LH or RH engine starting switch, interrupts the corresponding LH engine or RH engine starting cycle.

LOCATION

Main Accessories Panel E5 which is fitted on the armament bay roof.

ACCESS — MEN X MINUTES

Unobstructed when the panel is released and lowered from its forward mounts by removing two pip pins.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure the relay to the panel - two mounting screws.
Fit and secure the circuit wiring to the relay terminals.
Raise and position the panel, secure by inserting the two pip pins.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the relays are securely fitted. Check that the circuit connections to the relays are securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Starting Power Relay	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CS-R-128			25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

Transfers the battery bus load and, consequently, the emergency bus load from the aircraft battery to the external supply.

LOCATION

Relay panel E6 which is fitted on the roof of the nose wheel bay.

ACCESS

MEN X MINUTES

Unobstructed, when the cover of relay panel E6 is removed.

REPLACEMENT PROCEDURE

MEN X MINUTES

Fit and secure the relay to the panel - four mounting screws.
Fit and secure the circuit wiring to the relay terminals.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the relay is securely mounted. Check that the circuit connections to the relay are securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Relight Switch - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CS-S-151			25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 1500 hours

FUNCTION

To facilitate engine relight.

LOCATION

LH engine relight switch located on LH engine power lever.
RH engine relight switch located on RH engine power lever.

ACCESS

MEN X MINUTES

Remove the access plate on the side of power lever - four screws.

REPLACEMENT PROCEDURE

MEN X MINUTES

Draw the circuit wires out of the power lever and solder to the switch terminals.
Fit and secure the switch to the power lever with the lock washer and nut supplied.
Refit and secure the access plate - four retaining screws.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the circuit wires are soldered properly and securely. Operate the switch and check that the action is not rough.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Engine Starting and DC External Supply Receptacle	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
1CS-C-142	Albert & J.M. Anderson		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To facilitate interconnection between the engine starter cart and the aircraft. Interconnected circuits include battery supply, starting control and intercommunication.

LOCATION

Nose landing gear, lower section.

ACCESS | MEN X MINUTES

Unobstructed.

REPLACEMENT PROCEDURE | MEN X MINUTES

Fit and secure the receptacle to its mounting bracket - 4 bolts.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Inspect receptacle for signs of arcing or pitting of the contacts. Check that the receptacle is securely mounted.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Exhaust Gas Temperature Indicator	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1252-13	Minneapolis-Honeywell		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To indicate in degrees C the turbine outlet temperature.

LOCATION

Front cockpit, main instrument panel.

ACCESS — MEN X MINUTES

Unobstructed.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure the electrical connector.
Locate the indicator in the main instrument panel and secure - two screws.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the instrument is securely mounted. Check that the electrical connector is securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Ratiometer, Engine Pressure - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1252-16	Minneapolis-Honeywell		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 350 hours

FUNCTION

To transform electrical signals from a pressure ratio transducer into an indication of the engine pressure ratio which is a measure of thrust being developed by the engine.

LOCATION

Front cockpit, main instrument panel.

ACCESS | MEN X MINUTES

Unobstructed.

REPLACEMENT PROCEDURE | MEN X MINUTES

Fit and secure the electrical connector.
Locate the indicator in the main instrument panel and secure - two screws.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the instrument is securely mounted. Check that the electrical connector is securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Pressure Ratio Transducer LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1858-13	AiResearch		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 350 hours

FUNCTION

To resolve, as an electrical signal, pressure indications taken from the engine air intake and the turbine discharge outlet and transmit the resultant to the ratiometer in the front cockpit.

LOCATION

Station 664 inside the fuselage LH and RH.

ACCESS — MEN X MINUTES

Remove the hydraulic compensator access panel at station 665 - 26 screws.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure the unit to the structure - four mounting screws.
Fit and secure two pipe lines.
Fit and secure the electrical connector.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the unit is securely mounted. Check that the pipe lines are securely and properly fitted. Check that the electrical connector is securely and properly fitted.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Pressure Switch, Engine Oil - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1195-13	Century Electronics c/o Garrett		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 500 hours

FUNCTION

To complete a supply circuit to a warning indicator if the oil pressure drops below a limit of 25 psi.

LOCATION

Mounted on the engine gear box adjacent to the oil pressure relief valve.

ACCESS — MEN X MINUTES

Accessible through the front access door of the engine - seven latches and 30 camlocs.

REPLACEMENT PROCEDURE — MEN X MINUTES

Screw the switch onto the adaptor mount and then fit and secure the locknut.
Fit and secure the oil line.
Fit and secure the electrical connector.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the unit is securely mounted. Check that the electrical connector and the oil line are securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Pressure Switch, Engine Inlet Fuel - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1656-51	Hydra Electric		25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 500 hours

FUNCTION

To complete a supply circuit to a warning indicator if the engine inlet fuel pressure drops below a limit of 16.4 $\pm$ 0.5 psia.

LOCATION

Inside the fuselage at station 549, LH and RH, mounted on the base of a fitting at the outlet of the heat exchanger.

ACCESS — MEN X MINUTES

Remove the hydraulic bay access door - 52 camloc fasteners.

REPLACEMENT PROCEDURE — MEN X MINUTES

Locate the pressure switch on its mounting flange.
Fit and secure two retaining bolts and nuts.
Fit and secure the pressure line.
Fit and secure the electrical connector.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the unit is securely and properly fitted. Check that the pressure line and the electrical connector are securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Afterburner Micro-switches, LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CS-S-152			25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 500 hours

FUNCTION

To initiate the operation of the afterburner hydro-mechanical unit and open the fuel-oil heat exchanger valve when the throttle lever is in the afterburner range.

LOCATION

In the power lever box, LH console front cockpit.

ACCESS

MEN X MINUTES

Remove the power lever box from the console.

REPLACEMENT PROCEDURE

MEN X MINUTES

Fit and secure the micro-switch to its mounting bracket - two bolts and nuts.
Connect and secure circuit wiring to the micro-switch terminals.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the micro-switch is securely mounted. Check that the circuit wiring is securely and properly connected.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Zone 1 Ejector Valve - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1895-41	Barber-Colman c/o Rousseau		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 500 hours

FUNCTION

To control the supply of engine bleed air used to draw stagnant air from the engine compartment. The valve is controlled by the zone 1 ejector differential pressure switch.

LOCATION

In the LH engine air bleed line, station 538.7.

ACCESS

	MEN X MINUTES	
Remove the engine access door number 2 - 33 camlocs and 3 latches.		

REPLACEMENT PROCEDURE

	MEN X MINUTES	
Locate the valve in position on the engine bleed air duct, station 538.7. Locate the two stud screws, incorporated in the body of the valve, in the engine bleed air duct. Fit and secure two nuts and lockwashers. Connect and secure the electrical connector.		

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the unit is securely and properly fitted. Check that the electrical connector is securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Differential Pressure Switch, Zone 1 Ejector - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
7-1856-11	Parmatic Engineering		25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To control the operation of the zone 1 ejector valve by sensing the pressure differential between atmospheric pressure and the pressure at the engine air intake.

LOCATION

Duct bay at station 557-562, RH and LH.

ACCESS — MEN X MINUTES

Accessible by removing the hydraulic bay access door - 52 camlocs.

REPLACEMENT PROCEDURE — MEN X MINUTES

Locate the pressure switch on its mounting bracket between stations 557 and 562, ensuring that the vent tube from base of switch is located in the grommet fitted in the mounting bracket.
Fit and secure four mounting bolts and lock washers.
Fit and secure the pressure line.
Fit and secure the electrical connector.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the unit is securely and properly fitted. Check that the pressure line and the electrical connector are securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Ignition Relays LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CSR-122			25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To complete the power supply circuit to the engine spark igniters when energized.
Energizing circuit is completed when the engine attains 700 rpm or the relight switch is depressed.

LOCATION

Main Accessories Panel E5 which is fitted on the armament bay roof.

ACCESS

MEN X MINUTES

Unobstructed when the panel is released and lowered from its forward mounts by removing two pip pins.

REPLACEMENT PROCEDURE

MEN X MINUTES

Fit and secure the relay to the panel - four mounting screws.
Fit and secure the circuit wiring to the relay terminals.
Raise and position the panel, secure by inserting the two pip pins.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the relays are securely fitted. Check that the circuit connections to the relays are properly and securely fitted.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRICS	ENGINE SERVICES	Zone 1 Ejector Relays - LH and RH	11-2

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
CS-R-122			25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

To complete the supply circuit to the 'open' and 'close' fields of the Zone 1 ejector valve actuator.
In the de-energized condition, the relay completes the supply to the 'close' field.

LOCATION

Main Accessories panel E5 which is fitted on the armament bay roof.

ACCESS

MEN X MINUTES

Unobstructed when the panel is released and lowered from its forward mounts by removing two pip pins.

REPLACEMENT PROCEDURE

MEN X MINUTES

Fit and secure the relay to the panel - two mounting bolts.
Fit and secure the circuit wiring to the relay terminals.
Raise and position the panel, secure by inserting the two pip pins.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the unit is securely and properly fitted. Check that the pressure line and the electrical connector are securely and properly fitted.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS