

GROUP 2.B

EXHAUST GAS THERMOMETER AND TOP TEMPERATURE CONTROL

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Equipment employed

1. The exhaust gas thermometer and top temperature control equipment employed in this aircraft are listed below, together with

Tumbler switch, S.P/C.O., Type XD.778/3					A.P.4343C, Vol. 1, Book 1, Sect. 1
Time switch, Type FHM/A/58					A.P.4343C, Vol. 1, Book 2, Sect. 3
Microswitch, Type C.1831Y, Mk. 2					A.P.4343C, Vol. 1, Book 1, Sect. 2
Magnetic amplifier, Type EC4/2, EC4/4 or A.234 (5CZ/5264)					A.P.4343E, Vol. 1, Sect. 12
Resistor, Type 22508/685	}	A.P.1275A, Vol. 1, Sect. 17			
Resistor, adjustable spool, Type FD871					
Thermometer, Type C					
Thermocouple, Type B.6					

the appropriate Air Publications to which reference should be made for a description and the necessary servicing required to maintain them in an efficient condition.

Introduction

2. This Group contains a description of the engine exhaust gas thermometer and top temperature control installation of this aircraft, together with routing and theoretical diagrams of the electrical circuits. A general description of the aircraft instrument installation, will be found in Group 1.A, the removal of the instrument panels is covered in Group 1.B and the location of the instruments and their associated equipment is given in Group 1.C. Detailed information on the standard components used, together with their method of operation will be found in the relevant Air Publications (listed in para. 1).

DESCRIPTION

Exhaust gas thermometer and top temperature control (Code ET)
General

3. The exhaust gas thermometer and top temperature control installation is provided to indicate and control the temperature of

the engine jet exhaust gases, in order that the engine top temperature limits are not exceeded.

Exhaust gas thermometer

4. The exhaust gas thermometer (*located on the centre instrument panel*) gives a continuous indication of the jet exhaust temperature from 0 to 800 deg. C. The instrument is a moving coil milli-voltmeter, which is actuated by eight thermocouples situated in the jet pipe, and the circuit incorporates a Sangamo Western adjustable resistor mounted on the supply panel. The indicator, adjustable resistor and thermocouples form a self-energized closed circuit linked, via the thermocouples to the top temperature control equipment.

Top temperature control

5. The top temperature control installation is provided to restrict the throttle movement to compensate for a rise in exhaust gas temperature above the permissible maximum. The installation incorporates a magnetic amplifier and a temperature trimmer resistor, which are both located at the top of the radio bay on the starboard side. The amplifier is fed with three-phase a.c. taken from the a.c. supplies circuit and the unit amplifies the output of the eight thermocouples located in the jet pipe. The output from the amplifier is used to operate a throttle trimmer actuator, which is located on the engine and linked with the throttle so as to partially close the throttle when the exhaust gas temperature is above the top limit and open it again when the temperature falls.

6. The installation is only operative when the aircraft is airborne, being overridden by a micro-switch, which controls a time switch. The micro-switch and time switch are located on the aft face of frame 3,

the micro-switch being operated by the nose wheel fairing door. An ON/OFF cut-out switch is provided on the cabin port shelf to enable the installation to be rendered inoperative, in flight, if an emergency should make this necessary. A test socket (*adjacent to frame 51*) is provided to ground test the installation.

Operation

Power supply

7. The top temperature control installation employs both a.c. and d.c. The a.c. supply is fed to the magnetic amplifier from the phase bus-bars in the a.c. supplies circuit. When the output from the inverter supplying the a.c. supplies circuit builds up to 100 volts at the phase bus-bars, the torque switch in the control box will close its contacts 4 and 5 thus allowing a d.c. supply to energize the relay. With the relay energized the Red and Blue phase a.c. supply will pass through its made contacts to the magnetic amplifier, the White phase being the earth return. In this condition the amplifier is ready to commence operation when the time switch, which is controlled by the micro-switch, completes its cycle.

8. When the aircraft is airborne and the undercarriage retracted, the nose wheel fairing door micro-switch is operated and energizes the time switch. After the required time sequence, the time switch contacts supply the magnetic amplifier, via the emergency cut-out switch when in the ON position, and render the installation operative.

Control of fuel flow

9. If the exhaust gas temperature, as measured by the thermocouples and fed to the magnetic amplifier, rises above the permissible maximum, the amplifier will feed the throttle trimmer actuator so that it

partially closes the throttle. When the exhaust gas temperature falls, the output of the thermocouples will decrease and the amplifier will then feed the actuator in such a manner so as to again open the throttle.

10. For a full description of the exhaust gas thermometer and engine top temperature control equipment, together with the principle of operation, reference should be made to the relevant Air Publications (*listed in para. 1*).

SERVICING

General

11. The servicing necessary to maintain the installation in an efficient condition and the standard serviceability tests, which should be applied, together with the equipment to be used and the method of conducting the tests is contained in the relevant Air Publications (*listed in para. 1*). Before servicing or removing any components of the installation, the aircraft must be rendered electrically safe (*Sect. 5, Chap. 1, Group A.1*).

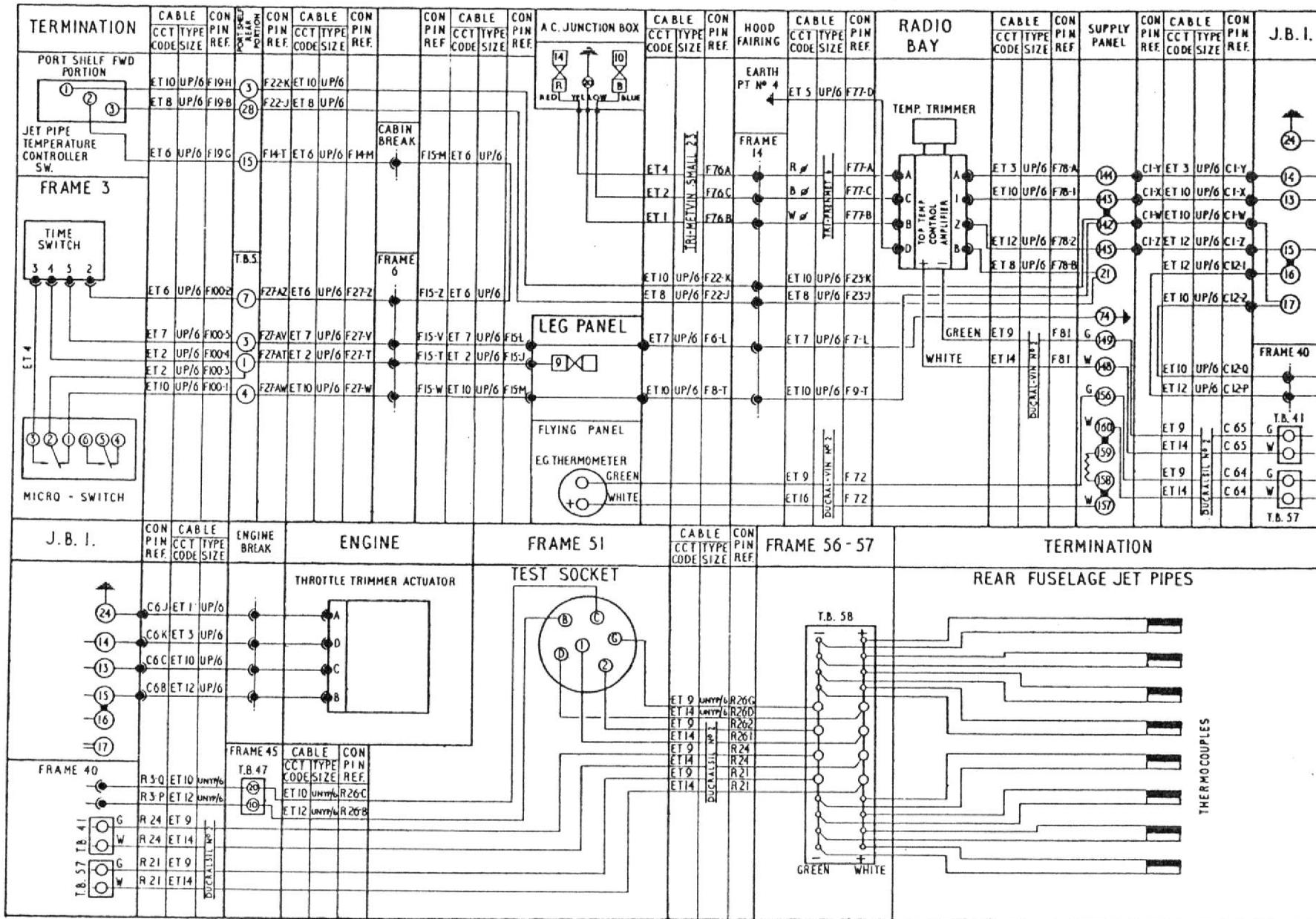
Exhaust gas thermometer and top temperature control tests

12. For detailed testing procedure of the exhaust gas thermometer and top temperature control installation, using the Ultra QT.221 test set, reference should be made to A.P.4343S, Vol. 1, Sect 23, Chap. 11.

REMOVAL AND ASSEMBLY

General

13. The removal of the centre instrument panel, which carries the exhaust gas thermometer is described in Group 1.B. Once access has been obtained, the removal of the remaining components should present no difficulties.



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Fig. 2. Exhaust gas thermometer and top temperature control (routing)



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