

# Chapter 3C

## FLYING CONTROLS

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#### Introduction

1. This chapter contains descriptive and servicing information for the wing

flap controls. Component location is contained in fig.1, a theoretical circuit diagram in fig.2 and a routing chart in

fig.3. Further information on flying controls is contained in Sect.3, Chap.4 of this publication.

### DESCRIPTION AND OPERATION

#### WING FLAPS CONTROL

2. Hydraulic operation of the flap jack is controlled by two electrically-operated selector valves contained in a control assembly, Dowty Type C7333Y, Mk.U, beneath the flap jack cover. An electrically-operated restrictor valve, Type

C5941Y, which reduces the rate of movement of the flaps between 'take-off' and 'up' positions, is situated adjacent to the selector valve unit. The 28-volt, d.c. supply to the coil of the appropriate valve is controlled by a 3-position lever-operated switch, Type C1223Y, Mk.5 on the pilots' panel. A guard is fitted over the switch to prevent inadvertent operation.

3. Connected between the flaps control switch and the valve solenoid is a pre-selector drum switch, Type C1229Y, Mk.113. Movement of the drum switch segment is governed by an operating tube which is coupled to the flaps piston rod at the port side of the fuselage. The circuit from the control switch via the drum switch contact

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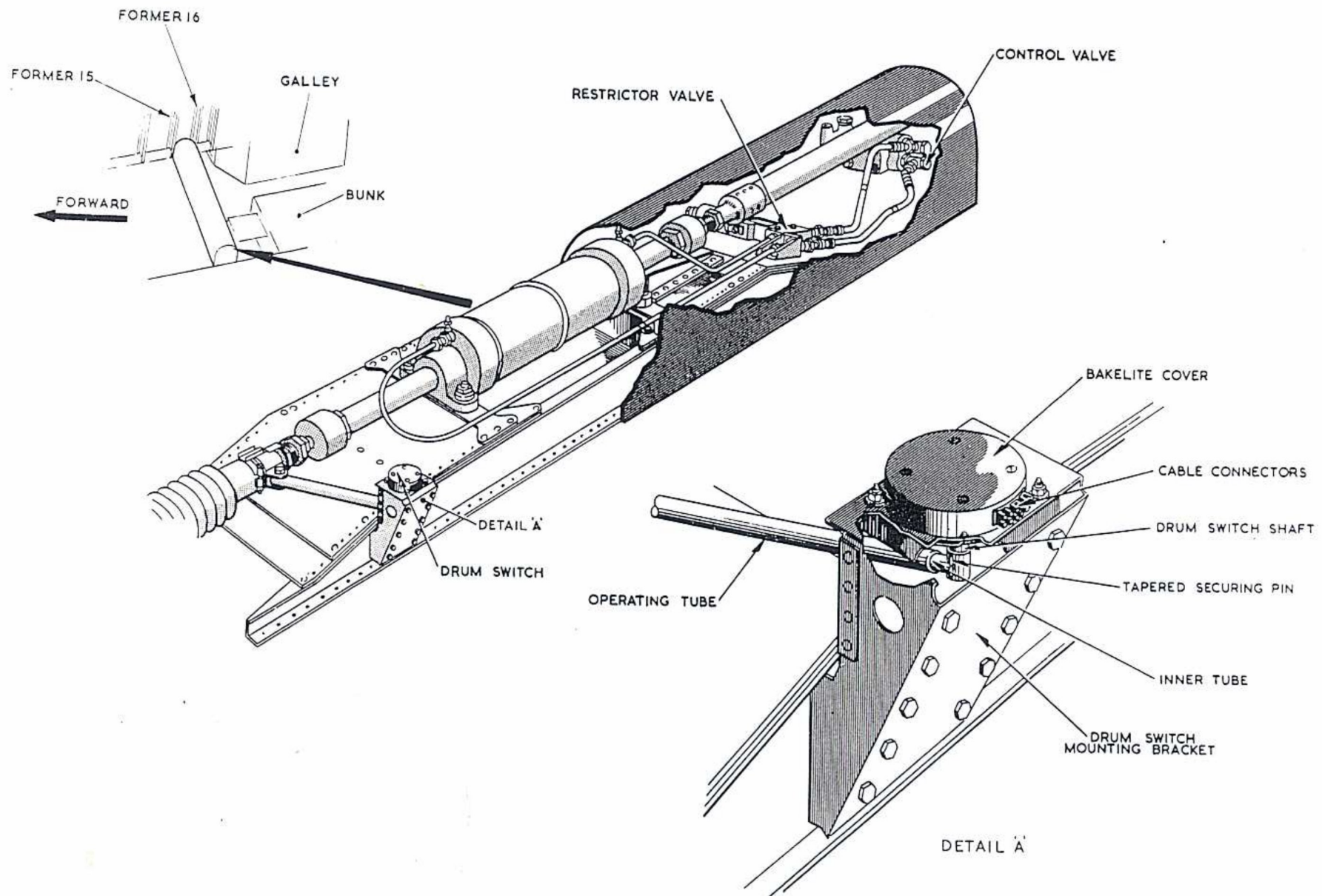


Fig.1 Location of flap components

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segment will be made to the coil of the 'up' or 'down' valve according to the position of the flaps at the time of selection. When the flaps reach the position selected, the circuit to the respective valve solenoid from the drum

switch is broken (fig.2).

4. When the flaps are moving from the 'take-off' to the 'up' position, the restrictor valve solenoid is energised through an auxiliary contact on the drum switch.

Under these conditions the valve will provide a further restriction in the rate of movement between the positions stated. The flap position indicator circuit is dealt with in Sect.7, Chap.2 of this publication.

## SERVICING

### WING FLAPS CONTROL

5. In view of the dual function of the electro-hydraulic valves used in the wing flaps circuit, it is essential that close co-operation is maintained between the electrical and airframe tradesmen when servicing the wing flaps system. Hydraulic servicing notes will be found in Sect.3, Chap.4 of this publication. For detailed information of the major components, reference must be made to the relevant A.P., whose number will be found in Table 1.

6. Operation of the electro-hydraulic controls can only be verified during hydraulic tests. These tests should be carried out in conjunction with the airframe fitter and the following procedure adopted:-

- (1) Move the selector switch on the pilots' panel progressively through its positions, checking that at each position the flaps stop at the selected position.
- (2) Check that when the selector switch is moved from TAKE OFF to UP, the rate of movement of the flaps is reduced, this will prove operation of the electrically-operated restrictor valve.
- (3) Ensure that the flap drum switch lever, connected between the flaps cross-shaft and drum switch, operates smoothly in its guide.
- (4) During this test the electrical supply should be OFF. Check the

emergency operation of the flaps by removing the access panel in the cross shaft cover and operating in turn the 'up' and 'down' push-buttons on the flap control valve assembly.

7. Apart from a routine check on the cleanliness and security of connections, the flap drum switch requires little attention.

8. The electrically-operated restrictor valve assembly should be removed from the aircraft at the periods stated in A.P.101B-1703-5B, and bench tested according to instructions given in A.P.1803D, Vol.1, Sect.8, Chap.2, App.2.

9. Testing of the main control valve assembly should be carried out to ensure that it operates satisfactorily at 16 volts, i.e. two-thirds of the nominal voltage of the aircraft electrical system. Tests to determine the ohmic resistance of the magnetic coil and its insulation resistance to earth, should be made in the following manner:-

- (1) Connect a suitable ohmmeter between the terminals of each magnetic coil in turn, and check the resistance: this should be between 104 and 106 ohms.
- (2) Using a 250 - volt insulation tester, test the insulation resistance between each coil terminal and the body of the unit. Under normally dry conditions the reading should be approximately 20 megohms.

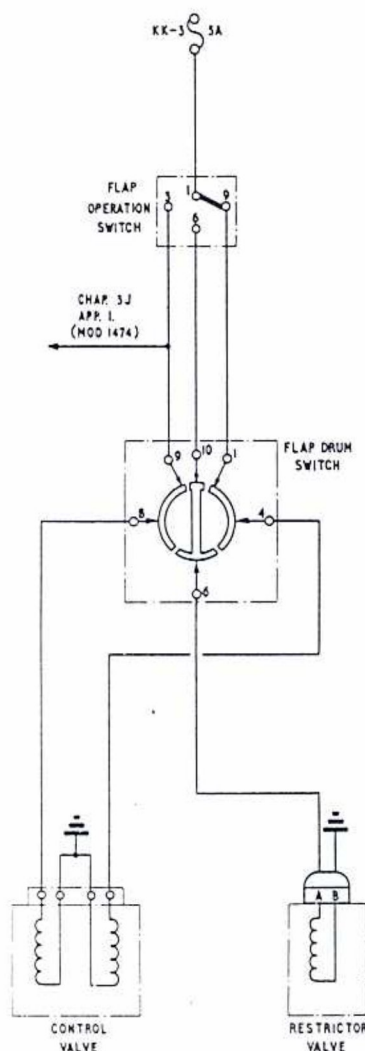


Fig.2 Wing flaps control

Flap drum switch contacts amended pictorially

## REMOVAL AND INSTALLATION

### Flap drum switch

10. Disconnect the cables and remove the shaft pin and the four bolts. The switch can then be removed.

11. When fitting a switch refer to Sect.3

of this publication, where details of the re-alignment will be found.

12. The removal of the restrictor valve is detailed in Sect.3 of this publication.

### Flap selector switch

13. The four panel securing screws must be removed to allow the switch to be withdrawn from the rear of the panel after disconnection of the electrical cables.

**TABLE 1**

Major items of equipment

Equipment	Type	Ref.No.	A.P. Reference
Control valve	C7333Y Mk.U	—	A.P.1803D, Vol.1, Book 3, Sect.8
Restrictor valve	C5941Y	—	
Flap operation switch	C1223Y Mk.5	5CW/4214	A.P.4343C, Vol.1, Book 1, Sect.1
Flap drum switch	C1220Y Mk. 113	5CW/4308	◀ A.P.113D-1209-1 ▶

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## REFERENCES