

## GROUP D.4

## FLAP CONTROL (CODE F)

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## Equipment employed

1. The major components employed in the flap control circuit are listed below, together with the appropriate Air Publications to which reference should be made for a detailed description and the necessary servicing required to maintain them in an efficient condition.

## DESCRIPTION

## Flap control

## Selector switch

2. The electrical control circuit for the hydraulically-operated flaps consists of a lever operated, multi-position selector switch located on the port instrument panel. The switch controls the two solenoids of an electro-hydraulic selector valve, which is mounted on the front spar in the port wheel bay, via a flap operated, multi-

position follow-up drum switch located in the port wing root. The flap position indicator circuit is described in Section 5, Chapter 2.

## Emergency override

3. The earth return for the solenoids of the selector valve is taken through the normally closed contacts of a micro switch which is operated to open circuit the earth return, when the flap emergency lowering control is used. This is to prevent the valve solenoids being energized, as the flaps lower, with the resultant loss of hydraulic oil via the jettison valve in the hydraulic emergency system. With the solenoids de-energized, a slide, within the valve housing adopts a neutral position thus blanking off both ports so that only the hydraulic oil in the lower ends of the jacks is jettisoned. This prevents the possibility of manual

TABLE 1

Equipment type and Air Publication reference

Equipment Type	Air Publication
Selector switch, Type C.1223Y, Mk.15 N or Mk.27 (post Mod.1352)	A.P.4343C, Vol.1, Book 1, Sect.1.~▶
Drum switch, Type C.1220Y, Mk.111	A.P.4343C, Vol.1, Book 1, Sect.2.
Micro switch, Type 1.A	
Control valve, Type 08817Y.A05	A.P.1803D, Vol.1, Book 3.

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reversion of the powered flying controls occurring due to loss of hydraulic oil.

### Operation

#### *Full UP or DOWN*

4. To understand the operation of the flap control circuit, it must be noted that the drum switch is not in circuit, to control the flap selector valve, when the selector switch is in either the fully UP or fully DOWN positions. In these positions the circuit is from the fuse and through the selector switch, to the appropriate solenoid of the selector valve via common terminals on the drum switch. This arrangement ensures that the flaps are held in the up or down position by hydraulic pressure.

#### *Intermediate positions*

5. The function of the drum switch in all its intermediate positions is to complete a circuit, from the selector switch to either the UP or DOWN solenoids of the selector valve, according to the position of the drum switch, centre spindle at the time of operation, and to break this circuit when the selected position is attained. The drum switch spindle is rotated by a mechanical linkage from the flaps, causing the drum contacts to open and close, in succession. The flaps are thus raised or lowered in a series of steps corresponding to the movement of the selector switch.

6. The circuit diagram (fig.1), is drawn in the intermediate position, corresponding

to that found when the flaps are  $37\frac{1}{2}$  deg. down. It will be seen that contact 6 of the selector switch is made to feed contact 1 of the drum switch. As the flaps have attained their selected position, the contact arcs on the drum switch have rotated until contact 1 has been lifted clear of the cam, thus breaking the circuit to the flap selector valve.

7. If the selector switch is moved either up or down in its gate it will make contacts 5, 4, 3 and 2 or 7, 8, 9 and 10, in turn, depending on the direction in which it is moved. Should it be moved up to raise the flaps contact 7 will be made first and feed contact 6 of the drum switch. Contact 6 of the drum switch is in contact with the contact arc feeding terminal 8 of the unit. The current will now be conducted from the fuse through the selector switch and drum switch to the UP solenoid of the flap selector valve.

8. When this solenoid is energized, it allows the hydraulic pressure to move the slide within the valve housing in such a direction as to supply hydraulic pressure to the flap jacks and raise the flaps. As the flaps move up, the drum switch spindle and its contact arcs are rotated by the mechanical linkage, until contact 6 is lifted clear and breaks the circuit thus de-energizing the UP solenoid.

9. When the solenoid is de-energized the valve will cut off the hydraulic pressure

to the flap jacks, which will then stop at the selected position, and be held by the pressure locked in the jacks. A similar sequence of operations occurs at all intermediate positions of the selector switch until an extreme position is reached, where the drum switch is out of circuit and the relevant valve solenoid energized, as described in para.4.

## SERVICING

### General

10. For general servicing of the electrical system, reference should be made to Group A.1. Apart from keeping all the components clean and carrying out the normal routine tests of security and serviceability the only other servicing necessary is the electrical tests of the electro-hydraulic selector valve as described in the appropriate Air Publication quoted in para.1. The method of adjusting the linkage between the flaps and the drum switch is described in Sect.3, Chap.4.

## REMOVAL AND ASSEMBLY

### General

11. Once access has been obtained, the removal and assembly of the components forming the flap control circuit, should present no unusual difficulties. The location and access to all the components is indicated in Group A.3.

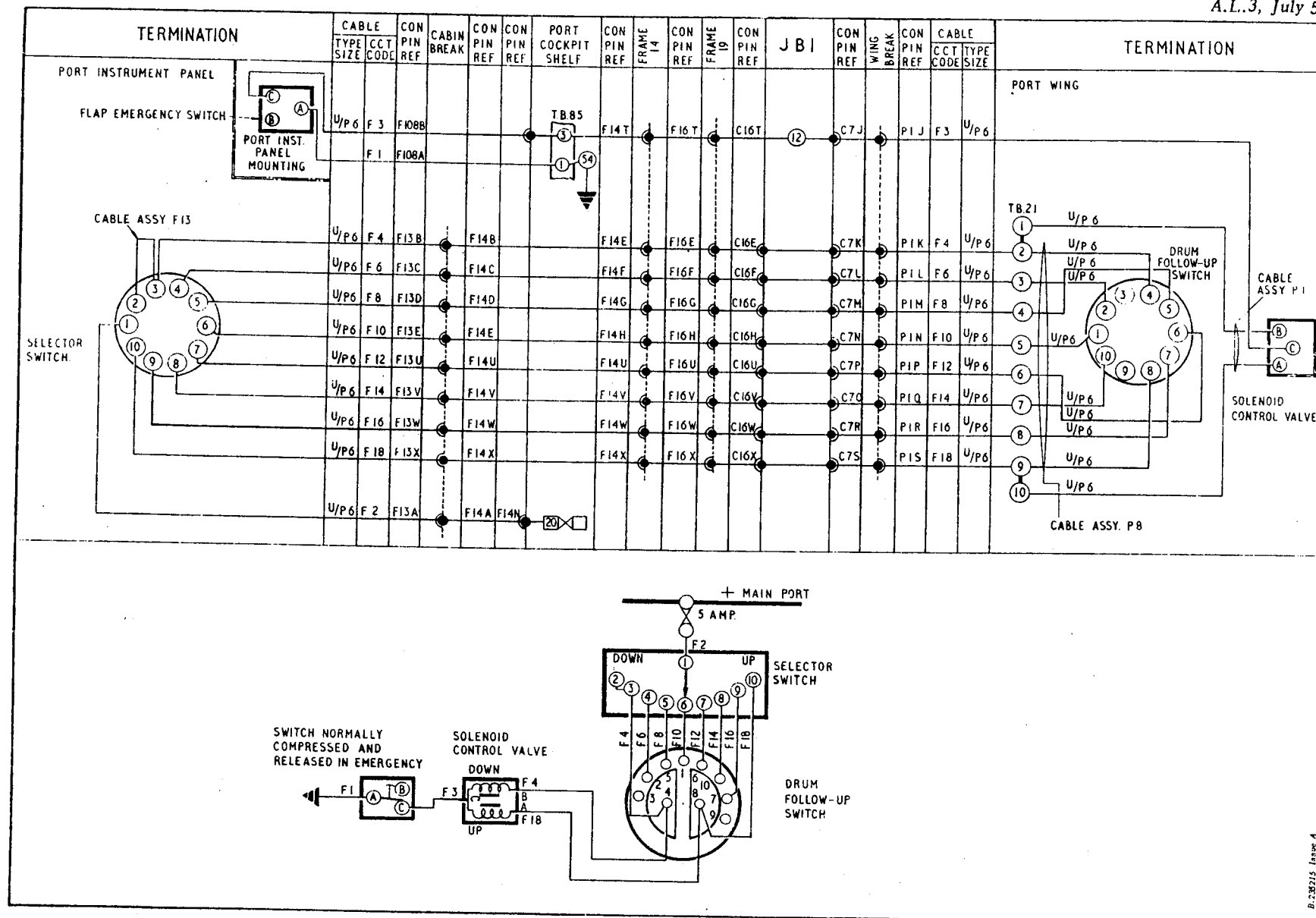


Fig.1. Flap control (routing and theoretical)

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