

## Part IV

Chapter 4—Asymmetric Flying and Handling with  
PFCU's Failed

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**1 Handling in flight**

(a) Flight with one engine stopped presents no unusual handling problems and under certain conditions may be indistinguishable from four-engine flying. Any rudder loads may easily be trimmed out. With two engines on one side stopped it is possible to trim out all loads in cruising flight. However, if two engines on the same side are stopped at high altitude at speeds above 0.75M severe buffet is experienced due to the choking of the stopped engines air intake. This buffet is less marked at lower altitudes and lower airspeeds.

(b) The stopping of any engines entails loss of electrical supply from the associated alternators, and the electrical system should be managed in accordance with the relevant instructions in Part I and Part V. If two engines on one side are stopped and the bus-bars are not paralleled, one sub-unit in each PFCU is inoperative. Only gentle manoeuvres are permitted under these conditions and the aircraft should be landed as soon as possible.

**2 Approach and landing**

(a) As long as the necessary total power can be obtained from the operative engines, the techniques for approach and landing using three engines should be as normal, except that the lowering of full-flap should be delayed until it is certain that a landing can be made.

(b) During an approach using two engines, the calculated approach speed for the weight should be maintained down to the decision height of 200 feet above the airfield level. Full flap should then be lowered when required.

**3 Overshooting**

(a) With one engine stopped it is possible to climb away after a baulked landing with the main flaps and undercarriage down at all weights. The airbrakes should be closed as soon as the overshoot is initiated.

(b) With two engines stopped the aircraft can climb away with full flap and undercarriage down, airbrakes in, at the normal landing weight. The overshoot must be commenced at or above the decision height and the approach speed. During the climb away to a safe height the speed should be maintained at or above the pattern speed.

#### 4 Flight with PFCU's failed

##### (a) Failure of any one PFC sub-unit

The failure of a PFC sub-unit has a negligible effect upon aircraft handling within the flight limitations stated in Part II.

##### (b) Failure of a complete elevator PFCU

The degree of control available following the failure of a complete elevator PFCU is sufficient for all normal manoeuvres, but landing in this condition requires considerable concentration, as control

forces are higher than normal and response is less. The most critical period occurs during the round out and, to ensure that sufficient control is retained to accomplish this manoeuvre, it is recommended that the landing is made using take-off flaps only and the threshold speed increased by 20 knots.

##### (c) Failure of a complete aileron PFCU

The failure of an aileron PFCU produces considerable disharmony of the controls and results in a much reduced maximum rate of roll. Despite these effects the degree of control remaining is sufficient for all normal manoeuvres and, in calm weather conditions, a landing may be made using the normal technique and threshold speed. The increased control force and reduced aircraft response, however, demand that special care is taken to avoid having to make large rolling corrections at a late stage on the approach. In gusty or cross-wind conditions the threshold speed should be increased by 20 knots.

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