- CHAPTER 10 -

CONTROLS AND RIGGING

(Plate No. 10.1)

10.1 Flying Controls (See Cockpit Layout - Plate No. 3.2)

10.1.1 The flying controls are conventional with a control stick and rudder pedals in each cockpit. Stick and pedals are removable. A hand lever on the starboard side of each cockpit operates the flaps. The control movements are transmitted by connecting rods and by cables running over pulleys.

Longitudinal trim is obtained by means of an elevator tab which is adjusted in flight by a hand-operated trimming wheel in each cockpit. Directional and lateral trim are obtained by ground adjustment of metal trailing edge tabs on the rudder and ailerons respectively.

Access to the flying controls in the fuselage is obtained by removing the seats and the control box covers. There is an additional external inspection panel in the fuselage belly behind the rear seat. The adjustable aileron and rudder control stops are located in the control box. The elevator control stops are on the elevator bellcrank support bracket, located on the aftmost fuselage bulkhead.

Cable runs in the wing may be inspected through zippered patches in the fabric undersurface of the wing.

Recommended cable tensions are:

Aileron	55 lb.
Elevator (Bottom Cable)	60 lb.
Rudder - per cable	60 lb.
Elevator trim tab	5 - 8 lb.

These should be checked periodically. Under winter conditions care should be taken to ensure that the tensions are correct in outdoor temperatures, not in a heated hangar.

Control surface movements and general rigging data are given in Plate 10.1.

10.1.2 Rudder

To adjust the rigging of the rudder:

1) Lock the rudder to fin with rudder clamp (Part No. 02011).
2) Remove rear seat and adjust turnbuckles so that rudder pedals are in neutral position. Cable tension should be 80 lb. per cable.
3) Remove clamp and examine rudder travel (Plate 10.1). Adjust travel to correct limits with stops on front rudder bar. Ensure that rudder control arms do not touch

10.1.2 (Cont'd)

fin post flanges when the rudder pedals are moved to full travel position against either stop.

4) Lock turnbuckles with 22 G. soft iron locking wire, or equivalent.

10.1.3 Elevator

To adjust the rigging of the elevator:

a) Examine elevator travel (Plate No. 10.1). Elevator stops are on the elevator layshaft support bracket on the rear fuselage bulkhead and are not adjustable. These stops are fitted and elevator travel checked on final assembly of the aircraft. If at some later inspection it is found that full elevator travel is not obtained, the elevator, control rod, layshaft and rear bulkhead should be examined for distortion.

b) Remove rear seat (or cover plate on rear fuselage belly) and with the elevator against the up travel stop, adjust the turn-buckles so that the control column clears the front edge of the seat by 0.125 inches minimum. Bottom cable tension should be 60 lb.

c) Check elevator travel.

d) Lock turnbuckles with 22 G. soft iron locking wire or equivalent.

10.1.4 Elevator Trim Tab

To adjust the rigging of the trim tab:

a) Adjust the turnbuckles on the inter-cockpit tab control cables until the two handwheels have their indexing marks in the same relative positions. Cable tension should be 5 to 8 lb.

b) Remove rear seat. Adjust turnbuckles in the rear fuselage circuit until, with the tab neutral, (flush with elevator trailing edge), the indexing mark on the rear cockpit handwheel is at the neutral position. Cable tension should be 5 - 8 lb.

c) Ensure that trim tab travels in the correct sense. When either handwheel is rotated in a nose down direction, the trim tab trailing edge should rise.

d) Lock turnbuckles with 22G. soft iron locking wire or equivalent.

10.1.5 Ailerons

To adjust the rigging of the ailerons:

a) Locate each aileron in the neutral position with incidence board (Part No. 00011). Set aileron sprocket to the neutral position (Plate No. 10.1) by applying rigging plate (Part No. 02012) and adjusting the length of the aileron push rod at the aileron end. Wire lock the rod in the adjusted position.

10.1.5 (Cont'd)

b) With the control column held in the neutral position by control lock (Part No. 01900), adjust the turnbuckles adjacent to each control chain so that the ailerons have no droop when approximately a 2-pound force is applied at the aileron trailing edge in an upward direction. Cable tension should be 55 lb.
c) Remove control column lock and adjust the aileron stops, located on the main rockshaft between the rear rudder pedals, to give the aileron travel shown on Plate No. 10.1. Check for correct sense of movement.
d) Lock turnbuckles with 22 G. soft iron locking wire or equivalent.

10.1.6 Flaps (Plate 3.4)

To adjust the rigging of the flaps:
a) Fully retract the flaps and set the flap control handle in the "flaps up" position.
b) Adjust the turnbuckles on the flap actuating cables, located inside the wing root fairing on each side, to take up cable slack. Do not tension the cables. The cables must be slack when the hand lever is in the "flaps up" position, to ensure that the flap up-lock functions properly.
c) Move the flap control handle to the "flaps down" position, and adjust the flap push rods at the flap end to give the correct flap down travel (Plate No. 10.1).
d) Lock the push rods and turnbuckles.

10.2 Engine Controls

The engine controls are conventional push-pull rods, etc., and may be inspected and adjusted to give the engine control travels noted in the engine handbook.

10.3 Control Surface Movements

10.3.1 Rudder

Current production aircraft incorporate rudder to Drawing No. 00413, which has a greater chord and larger area than earlier rudders to Drawing No. 0043. The latter were fitted to aircraft No.s 1 - 62 inclusive. In both cases, dimension "A" is measured from the most aft point of the bottom rudder rib (i.e. that portion parallel to the fuselage axis).

Rudder Drawing	A(INS.)	A(CMS.)	B(DEGREES)
0043) 00413)	9.90 + 0.64	25.1 + 1.63	$27\ ^{+2}_{-0}$

10.3.2 Elevator

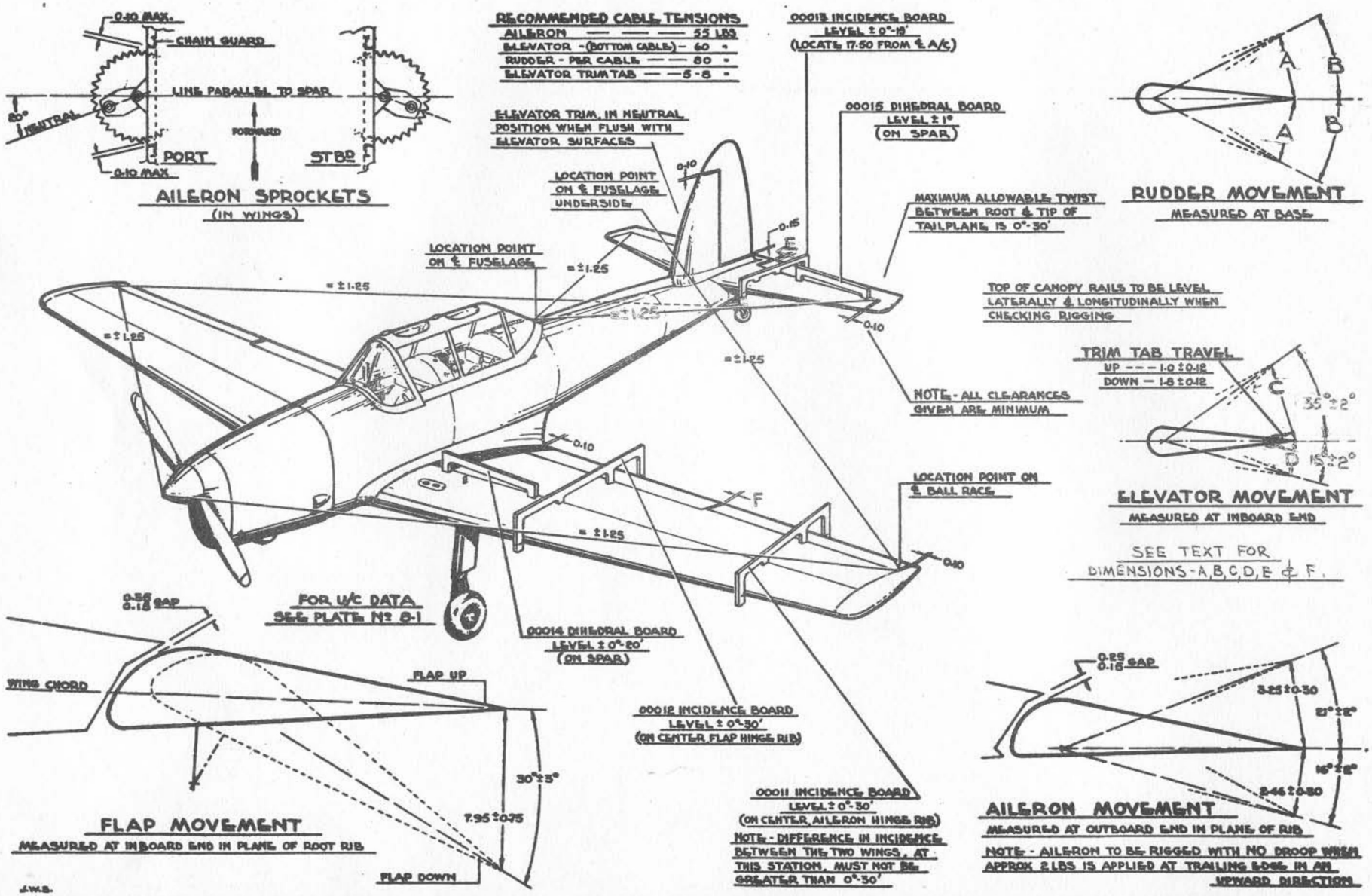
Earlier aircraft, No.s 1 - 62 inclusive, were fitted with elevators to Drawing No.s 0048-9. Current production aircraft incorporate elevators to Drawings No.s 00416-7, which have a greater chord and larger area than the earlier type.

Elevator Drawing	C(INS.)	C(CMS.)	D(INS)	D(CMS.)
0048-9	10.4 ± 0.6	26.4 ± 1.5	4.6 ± 0.6	11.7 ± 1.5
00416-7	11.5 ± 0.7	29.2 ± 1.8	5.0 ± 0.7	12.7 ± 0.7

10.4 Control Surface Clearances

Minimum clearances between movable surfaces and adjacent parts of the aircraft are shown on Plate No. 10.1. At points "E" and "F" values of 0.10 inches were specified for early production models.

Current production incorporates a narrower tailcone which provides at point "E" a clearance of 0.25 to 0.45 inches. The minimum clearance at point "F" has been increased to 0.4 inches on later production aircraft.



DHC 1 - CHIPMUNK ··· RIGGING DIAGRAM PLATE Nº 10.1

AMENDMENT Nº 1