

Section I

1.11.2 ELEVATOR TRIM

The elevator trim is adjusted by twin handwheels on the cockpit roof, operating in the natural sense. A pointer and scale, between the handwheels, marked NOSE UP, NOSE DOWN, indicate the direction and degree of trim applied.

1.11.3 RUDDER TRIM

The rudder trim is adjusted by a handwheel on the cockpit roof, just aft of the elevator trim handwheels. A pointer and a scale, marked LEFT and RIGHT indicate the direction and degree of the trim applied.

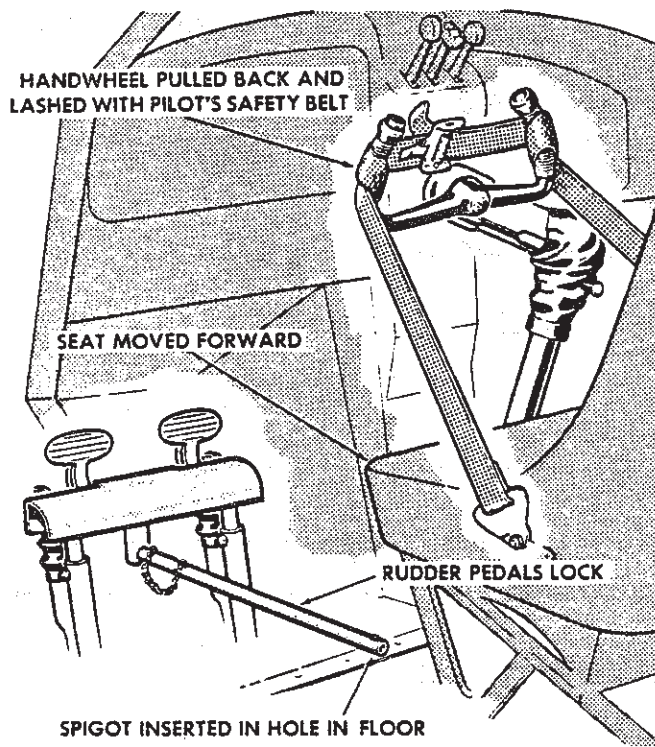


FIG 1-9 FLIGHT CONTROL LOCKS

1.11.4 CONTROL LOCKS

The control column and handwheel are locked by strapping them to the pilot's seat with the safety belt. The rudder pedals are locked by a pedal lock which, when not in use, is stowed in the baggage compartment behind the cabin rear partition.

To lock the pedals, the channel portion of the lock must be fitted over the pedals and the spigots at the end of the lock-rod, which

is attached to the channel portion by a chain, must be inserted into a hole in the channel and in a corresponding hole in the cockpit floor, forward of the pilot's seat.

1.12 WING FLAPS

The wing flaps are of the slotted type and extend from the wing roots to the inboard ends of the ailerons which also droop in conjunction with the flap movement. The flaps are operated by an actuating cylinder located in the fuselage at the left-hand wing root. Hydraulic fluid is supplied to the actuating cylinder by a handpump, under the pilot's seat. This handpump has an integral reservoir, a selector valve, and a relief valve. The relief valve is set at 1,000 psi.

1.12.1 WING FLAPS HAND PUMP LEVER

The wing flap hand pump lever is at the right-hand side of the pilot's seat and is operated in a fore-and-aft direction.

1.12.2 WING FLAPS SELECTOR LEVER

The wing flaps selector lever is located on the right-hand side of the pilot's seat. It has two marked positions, UP and DOWN. Intermediate positions of the wing flaps are selected by moving the selector lever to UP or DOWN then pumping the wing flaps with the hand pump lever to the desired position, as shown on the wing flaps indicator.

WARNING

If the flaps are in any lowered position, it is essential that the selector lever is retained in the DOWN position. When the flaps are retracted, the selector lever must be retained in the UP position. Once the selector lever is set to DOWN and the flaps are pumped to the desired position, the selector lever must not be moved until it is desired to change the flap position.

1.12.3 WING FLAPS INDICATOR

A wing flaps position indicator is

situated above the flight instrument panel. It is marked FULL FLAP, LANDING, TAKE-OFF, CLIMB and CRUISE. FULL FLAP is only required for emergency landing in very restricted areas.

1.13 LANDING GEAR SYSTEM

The main wheel units and the tailwheel unit are not retractable. For water based operations the wheel units are replaced by two floats which are attached to the fuselage by struts.

For winter operations the main wheels and tailwheel may be replaced by skis.

1.13.1 TAILWHEEL STEERING

The tailwheel is steerable by operation of the rudder pedals, for 25° each side of the longitudinal centre line of the aircraft. Outside of these limits, the tailwheel automatically disengages from the steering range and becomes fully castoring. The tailwheel is brought back into steering range by taxiing straight forward and centering the rudder pedals at the same time. Engagement of the steering mechanism has been achieved when a slight resistance to the movement of the rudder pedals is felt.

1.13.2 BRAKE SYSTEM

The main landing gear wheels are each fitted with a hydraulic brake unit which is individually actuated through an independent hydraulic line and brake master cylinder. Each brake master cylinder has an integral fluid reservoir and is connected by an adjustable linkage to its relative toe pedal. Depression of the toe pedal operates the piston in the relevant master cylinder which causes pressure to be applied, through flexible and rigid fluid lines and a brake valve, to the wheel brake unit concerned. A parking brake is incorporated in the brake system. Operation of the parking brake handle in the cockpit after the toe pedals have been depressed, locks the brake units in the "on" position.

1.13.3 TOE PEDALS

Pressure on the toe pedals, which are the upper portions of the rudder pedals, actuates the pistons in the master cylinders and displaces hydraulic fluid into the brake

units where the shoes are applied to the brake discs. The toe pedals are adjustable relative to the rudder pedals by adjusting the lengths of the master cylinder connecting rods.

The removable rudder pedals for the co-pilot are not connected to the brake system.

1.13.4 PARKING BRAKE

When the parking brake handle (figure 1-4) is pulled, after the toe pedals have been depressed to build up pressure in the brake system, pressurized fluid is trapped in the lower part of the brake system and locks the brake units.

If the aircraft is fitted with the new type parking valve (Part No. C2-CF-1711A) and the brake toe pedals are operated while the parking brake is set, hydraulic pressure greater than that existing in the system below the parking valves is created in the master cylinders and this additional pressure will push back the locking plunger of the parking valve and disengage the parking brake.

WARNING

In the event of a defective parking brake valve permitting loss of pressure after the brakes have been on for 6 to 10 minutes, the brakes will slip; and, if the engine is running, the aircraft will move forward.

If the aircraft is fitted with a Scott Pat No. 4200 parking valve, it is then necessary to release the parking brake handle before the toe brakes can be used to stop the aircraft. The parking brake with above valve will hold the aircraft at engine speeds up to 1900 rpm, if normal toe pressure was applied when locking the brake system.

1.14 INSTRUMENTS

A shock-mounted flight instrument panel is provided for the pilot and incorporates an altimeter, turn-and-bank indicator, rate-of-climb indicator, air speed indicator, directional gyro and artificial horizon.

1.14.1 PITOT STATIC OPERATED INSTRUMENTS

The airspeed indicator, altimeter,

(b) Fuel selector to fullest tank (if wing tip tanks are installed, select FRONT TANK or if belly tank is installed select CENTRE TANK).

(c) Propeller lever full INCREASE RPM.

(d) Set throttle lever to give 1750 rpm.

(e) Select magneto switch to "L". Return switch to "BOTH" to allow engine speed to stabilize itself before switching to "R". Return to "BOTH".

The drop in rpm should not exceed 100 rpm; it is normally in the region of 50 to 75 rpm. (In cold weather keep the carburettor mixture temperature at 40°F (4°C) for this check).

(f) If magneto drop is more than 100 rpm re-check at aerodrome pressure.

(g) Set throttle lever to give 600 rpm.

(h) Momentarily turn ignition switch OFF. The engine should stop firing completely.

NOTE

This last check should be carried out with the minimum delay in the OFF position to prevent backfiring when the switch is returned to "BOTH".

WARNING

If the engine does not momentarily stop firing completely, stop the engine by selecting the mixture lever to IDLE CUT-OFF. Warn personnel to stay clear of the propeller and have ignition switch and magneto ground lead checked.

(j) Open throttle until manifold pressure is equal to aerodrome pressure.

(k) Check that generator cuts in at 1400 rpm approximately.

(l) Check rpm 2100 plus or minus 20 approximately.

(m) Check oil, fuel and vacuum pressures, cylinder head and oil temperatures within ranges.

(n) Retard throttle to give 1600 rpm.

(o) Move propeller lever to COARSE PITCH then return to full INCREASE RPM position. Note recover of rpm to 1600 rpm.

2.7 TAXIING

(a) Flaps at CRUISE POSITION.

(b) Propeller lever - full INCREASE rpm.

(c) Watch oil and cylinder temperatures. If necessary, run engine at higher rpm to provide additional cooling during taxiing.

(d) Make brake test as soon as aircraft starts moving.

(e) Operate rudder pedals to steer aeroplane by means of steerable tailwheel (25° to each side). Use brakes for larger tailwheel angles.

(f) Run engine at 1200 - 1400 rpm when aircraft is stopped during taxiing, to prevent spark plug fouling and to create a propeller blast for engine cooling.

WARNING

While on the ground, avoid prolonged engine running above 1400 rpm, particularly in hot weather, to prevent overheating of the installation.

2.8 TAKE-OFF CHECK

(a) All doors and windows closed.

(b) Elevator trim to meet CG requirements.

(c) Mixture lever - AUTO RICH.

(d) Propeller lever - INCREASE RPM.

(e) Fuel selector to desired tank position.

(f) Flaps - TAKE-OFF position.

(g) Directional gyro and artificial horizon - uncaged and set.

(h) Pitot heat ON if necessary in cold weather or when icing conditions are anticipated.

(j) Carburettor heat - COLD.

Section II

2.9 TAKE-OFF

- (a) Make sure cylinder head temperature is below 450°F (230°C).
- (b) Adjust throttle lever friction knob.
- (c) Line up on take-off runway.
- (d) Open the throttle smoothly to maximum permissible take-off power. See Figure 4-1.
- (e) Anticipate tendency of aircraft to swing to the left.
- (f) Allow aircraft to fly itself off at 55 to 65 mph. in a tail down attitude and climb at 65 mph.
- (g) As soon as safe height has been attained, reduce power to 33.5 In.Hg. and 2200 rpm if aircraft is fully loaded, or 30 In.Hg. and 2000 rpm for normal weight.
- (h) Slowly increase airspeed to 80 mph and retrim.
- (j) At altitude of 500 ft. - flaps to CLIMB and retrim.

2.10 CLIMB

Best rate of climb is obtained using Maximum Continuous Power (2200 rpm, 33.5 In.Hg.). Speed for best rate of climb is 95 mph IAS; speed for best angle of climb is 80 mph IAS.

Where circumstances warrant, Maximum Continuous Power may be used giving the rates of climb as stated in paragraph 4.10.

However, the engine manufacturer recommends, for reduced engine wear, that 2000 rpm and 30 In.Hg. AUTO RICH be used. The rates of climb will then be 540 fpm for the landplane, 460 fpm for the seaplane.

Refer to Cruise Power Chart in Appendix for recommended settings.

Keep cylinder head temperature consistent with limits in Figure 4-1. Low rpm at High Manifold Pressure helps to maintain climbing mixture strength and materially assists engine and oil cooling.

2.11 CRUISE

For continuous cruise, use Maximum Weak Mixture Power or less, taking the following steps:

- (a) Flaps to "Cruise".
- (b) Throttle back to 29.7 In.Hg. or less Manifold Pressure.
- (c) Propeller lever to give 2000 rpm or less.
- (d) Mixture lever to AUTO LEAN. Carburettor mixture temperature 40°F (4°C).
- (e) Keep cylinder head temperature and oil inlet temperature consistent with limits in Figure 4-1.

For Cruising power reduced below that obtained at maximum weak mixture use settings in Cruise Power Chart on page V in Appendix.

2.11.1 FUEL MANAGEMENT

For favourable CG travel, without long-range tanks:

- (a) Empty rear tank first, if aircraft is fully loaded, in order to move the CG progressively forward.

Operation on long range tanks

Since both long range belly tank and wing tip tanks contain more fuel (5 Imp. - 7 U.S. gal.) than the front or centre fuselage tank will hold (see para 1.8.2), fuel from long range tanks must be transferred in two stages.

When wing tip tanks are installed

CAUTION

On aircraft having rubber liners in the main fuel tanks (Modification 2/1376) and equipped with C2-PT-445A and C2-PT-446A wing tip tanks, transfer of fuel to the front main tank should be avoided during flight through snow or ice conditions. The air scoop at each tank vent may become blocked in these conditions and prevent fuel transfer. Transfer of fuel is dependent on gravity feed assisted by air pressure from the wing tip tank air scoops.

Section IV

4.5.2 NORMAL OPERATING LIMIT SPEED

Landplane)
Skiplane) 145 mph IAS
Seaplane)

Normal cruising flight operations should be confined to speeds below this value.

The range of speed between normal operating limit speed and the maximum permissible diving speed should be intentionally entered only with due regard to the prevailing flight and atmospheric conditions, in particular turbulence.

4.5.3 MANOEUVRING SPEED

125 mph IAS. Manoeuvres which involve an approach to stall conditions, or full application of rudder or aileron control, should be confined to speeds below this value.

4.5.4 MAXIMUM SPEED FOR LOWERING FLAPS

105 mph IAS.

4.6 ACCELERATION LIMITS

Limit load factors are the maximum values which the airframe may safely be subjected to in flight.

When flying in very rough air, or if it is necessary to perform forcible manoeuvres including full application of aileron and rudder, the airspeed should not be permitted to exceed 145 mph IAS.

4.6.1 LOAD FACTORS

In tight turns, flight load factors may reach the limit loads, and may also increase the danger of an unintentional stall.

The variation of flaps-up stalling speed and load factor's with angle of bank are given below:

Angle of Bank	Stalling Speed mph IAS	Load Factor
0°	60	1.0
50°	85	1.5
60°	105	2.0
65°	115	2.5
70°	130	3.0

4.7 WEIGHT AND BALANCE LIMITATIONS

4.7.1 GENERAL

The Design Gross Weight of the aircraft is 5,100 lb. At this weight it complies with the general performance and strength criteria.

In the interest of airworthiness it is important that the weight and balance limits for this airplane be adhered to in accordance with the recommendations and information given in the following paragraphs, tables and diagrams.

4.7.2 WEIGHT DEFINITIONS

The Tare Weight is the weight of the aircraft with the minimum equipment essential to airworthiness, e.g. pilot's seat, flight and engine instruments, battery and the like.

Hence equipment changes in the field will not normally change the tare weight figure.

The tare weight will be appropriate to the configuration, i.e. the landplane, ski-plane and seaplane values will differ.

The Basic Weight includes all other installed equipment both fixed and removable, e.g. radio, exterior finish (paint), furnishings and such equipment is defined by the item ticked off in the Weight and Balance Report under the heading "Equipment Check List" and "Basic Weight Change Record".

The Operational Load comprises crew, oil and fuel, and payload weights.

The Payload consists only of passenger(s), baggage and cargo. Maximum values of payload vs. range for various basic weights are given in the Appendix pages VI and VIA.

The All-Up Weight (A.U.W.) is the sum of basic weight plus operational load and must not exceed 5,100 lbs. for the landplane and skiplane, 5,090 for the seaplane.

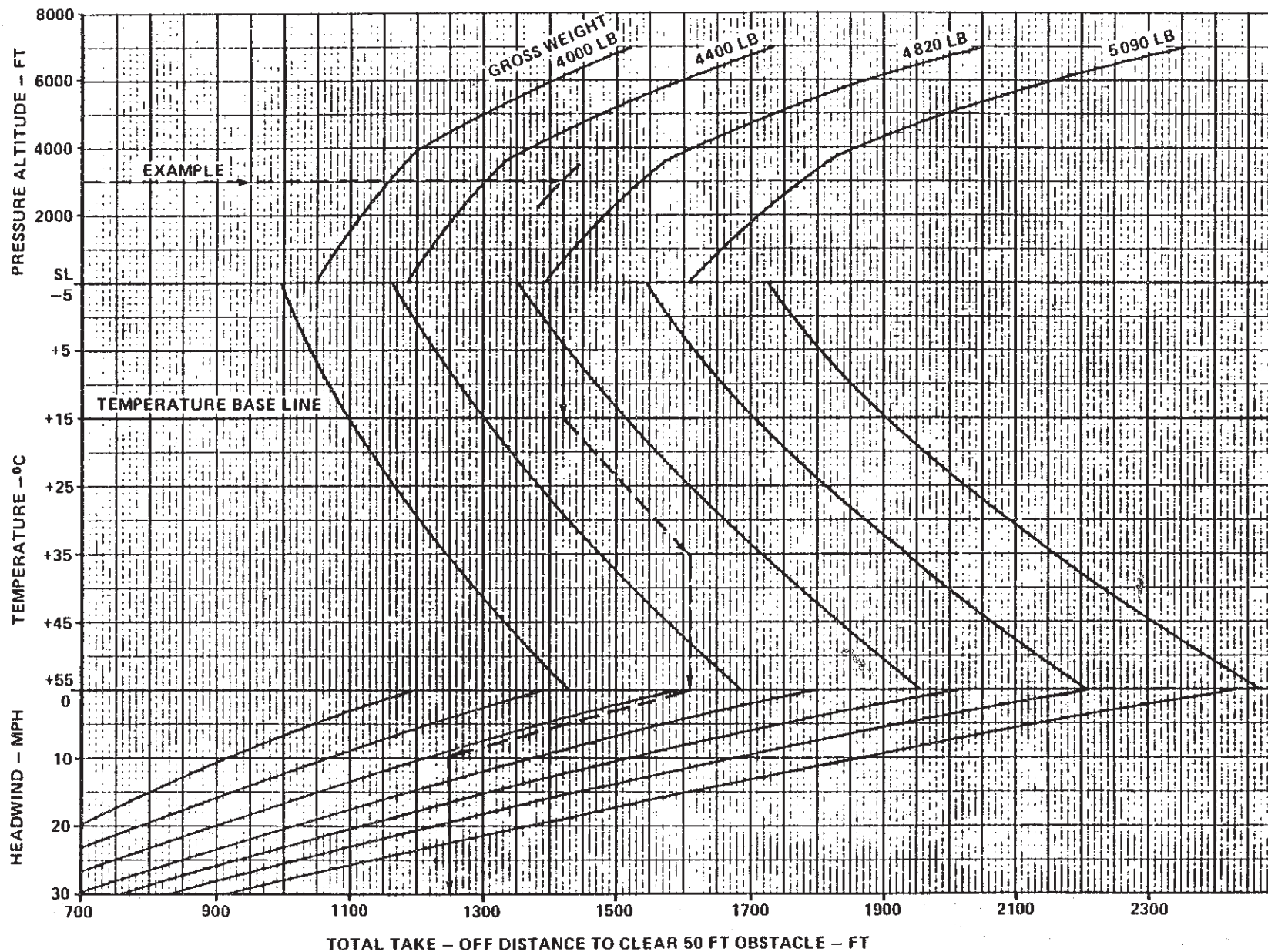
4.7.3 FUEL ALLOWANCES

It should be noted that fuel allowances are included for 10 minutes warm-up,

TOTAL TAKE - OFF DISTANCE TO 50 FT - SEAPLANE

REMARKS:

1. Water: Calm
2. Flaps: "Take-off"
3. Water run is approximately 68% of total distance
4. Data: Estimated (ICAO technique)



EXAMPLE:

Follow example line using procedure given for landplane take-off and read:

Total take-off distance to clear 50 ft obstacle = 1250 ft