BEFORE STARTING ENGINE.

(1) Exterior Preflight -- COMPLETE.
(2) Seats, Belts, Shoulder Harnesses -- ADJUST and LOCK.
(3) Fuel Selector Valve -- BOTH.
(4) Radios, Autopilot, Electrical Equipment -- OFF.
(5) Brakes -- TEST and SET.

STARTING ENGINE.

(1) Mixture -- RICH.
(2) Carburetor Heat -- COLD.
(3) Master Switch -- ON.
(4) Prime -- AS REQUIRED (2 to 6 strokes; none if engine is warm).
(5) Throttle -- OPEN 1/8 INCH.
(6) Propeller Area -- CLEAR.
(7) Ignition Switch -- START (release when engine starts).
(8) Oil Pressure -- CHECK.

BEFORE TAKE-OFF.

(1) Parking Brake -- SET.
(2) Cabin Doors and Window -- CLOSED and LOCKED.
(3) Flight Controls -- FREE and CORRECT.
(4) Elevator Trim -- TAKE-OFF.
(5) Fuel Selector Valve -- BOTH.
(6) Mixture -- RICH (below 3000 ft.).
(7) Throttle -- 1700 RPM.
    a. Magnetos -- CHECK (RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between magnetos).
    b. Carburetor Heat -- CHECK (for RPM drop).
    c. Engine Instruments and Ammeter -- CHECK.
    d. Suction Gage -- CHECK.
(8) Flight Instruments and Radios -- SET.
(9) Optional Autopilot -- OFF.
(10) Throttle Friction Lock -- ADJUST.
(11) Wing Flaps -- UP.

TAKE-OFF.

NORMAL TAKE-OFF.

(1) Wing Flaps -- UP.
(2) Carburetor Heat -- COLD.
(3) Throttle -- FULL.
(4) Elevator Control -- LIFT NOSE WHEEL (at 60 MPH).
(5) Climb Speed -- 75 to 85 MPH.

MAXIMUM PERFORMANCE TAKE-OFF.

(1) Wing Flaps -- UP.
(2) Carburetor Heat -- COLD.
(3) Brakes -- APPLY.
(4) Throttle -- FULL.
(5) Brakes -- RELEASE.
(6) Airplane Attitude -- SLIGHTLY TAIL LOW.
(7) Climb Speed -- 68 MPH (until all obstacles are cleared).

ENROUTE CLIMB.

(1) Airspeed -- 80 to 90 MPH.

NOTE

If a maximum performance climb is necessary, use speeds shown in the Maximum Rate-Of-Climb Data chart in Section VI.

(2) Throttle -- FULL.
(3) Mixture -- FULL RICH (mixture may be leaned above 3000 feet).

CRUISE.

(1) Power -- 2200 to 2700 RPM (no more than 75%).
(2) Elevator Trim -- ADJUST.
(3) Mixture -- LEAN.

LET-DOWN.

(1) Mixture -- RICH.
(2) Power -- AS DESIRED.
(3) Carburetor Heat -- AS REQUIRED (to prevent carburetor icing).

BEFORE LANDING.

(1) Fuel Selector Valve -- BOTH.
(2) Mixture -- RICH.
(3) Carburetor Heat -- ON (apply full heat before closing throttle).
(4) Airspeed -- 70 - 80 MPH (flaps UP).
(5) Wing Flaps -- AS DESIRED.
(6) Airspeed -- 65 - 75 MPH (flaps DOWN).

BALKED LANDING.

(1) Throttle -- FULL.
(2) Carburetor Heat -- COLD.
(3) Wing Flaps -- 20°.
(4) Airspeed -- 65 MPH.
(5) Wing Flaps -- RETRACT (slowly).

NORMAL LANDING.

(1) Touchdown -- MAIN WHEELS FIRST.
(2) Landing Roll -- LOWER NOSE WHEEL GENTLY.
(3) Braking -- MINIMUM REQUIRED.

AFTER LANDING.

(1) Wing Flaps -- UP.
(2) Carburetor Heat -- COLD.

SECURING AIRCRAFT.

(1) Parking Brake -- SET.
(2) Radios, Electrical Equipment, Autopilot -- OFF.
(3) Mixture -- IDLE CUT-OFF (pulled full out).
(4) Ignition Switch -- OFF.
(5) Master Switch -- OFF.
(6) Control Lock -- INSTALL.

WING FLAP SYSTEM.

The wing flaps are electrically operated by a flap motor located in the right wing. Flap position is controlled by a switch, labeled WING FLAPS on the lower center portion of the instrument panel. Flap position is shown by an indicator on the lower right portion of the instrument panel below the right control wheel position.

To extend the wing flaps, the flap switch must be depressed and held in the DOWN position until the desired degree of extension is reached. Releasing the switch allows it to return to the center off position. Normal full flap extension in flight will require approximately 9 seconds. After the flaps reach maximum extension or retraction, limit switches will automatically shut off the flap motor.

To retract the flaps, place the flap switch in the UP position. The switch will remain in the UP position without manual assistance due to an over-center design of the switch. Full flap retraction in flight requires approximately 7 seconds. More gradual flap retraction can be accomplished by intermittent operation of the flap switch to the UP position. After full retraction, the switch is normally returned to the center off position.

CABIN HEATING, VENTILATING AND DEFROSTING SYSTEM.

For cabin ventilation, pull the CABIN AIR knob out. To raise the air temperature, pull the CABIN HT knob out approximately 1/4" to 1/2" for a small amount of cabin heat. Additional heat is available by pulling the knob out farther; maximum heat is available with the CABIN HT knob pulled out and the CABIN AIR knob pushed full in. When no heat is desired in the cabin, the CABIN HT knob is pushed full in.

Front cabin heat and ventilating air is supplied by outlet holes spaced across a cabin manifold just forward of the pilot's and copilot's feet. Rear cabin heat and air is supplied by two ducts from the manifold, one extending down each side of the cabin to an outlet at the front door post at floor level. Windshield defrost air is also supplied by a duct leading from the cabin manifold. Two knobs control sliding valves in the defroster outlet and permit regulation of defroster airflow.

Separate adjustable ventilators supply additional air; one near each upper corner of the windshield supplies air for the pilot and copilot, and two optional ventilators in the rear cabin ceiling supply air to the rear seat passengers.

SHOULDER HARNESSES.

Shoulder harnesses are provided as standard equipment for the pilot and front seat passenger, and as optional equipment for the rear seat passengers. Seat belts are standard equipment for all passengers.

Each standard front seat harness is attached to a rear door post just above window line and is stowed behind a stowage sheath mounted above each cabin door. The optional rear seat shoulder harnesses are attached just behind the lower corners of the aft side windows. Each harness is stowed behind a stowage sheath located above the aft side window.

To use a standard front or optional rear seat shoulder harness, fasten and adjust the seat belt first. Remove the harness from the stowed position, and lengthen as required by pulling on the end of the harness and the narrow release strap. Snap the harness metal stud firmly into the retaining slot adjacent to the seat belt buckle. Then adjust to length by pulling down on the free end of the harness. A properly adjusted harness will permit the occupant to lean forward enough to sit completely erect but is tight enough to prevent excessive forward movement and contact with objects during sudden deceleration. Also, the pilot will want the freedom to reach all controls easily.

Releasing and removing the shoulder harness is accomplished by pulling upward on the narrow release strap and removing the harness stud from the slot in the seat belt buckle. In an emergency, the shoulder harness may be removed by releasing the seat belt first and pulling the harness over the head by pulling up on the release strap.

INTEGRATED SEAT BELT/SHOULDER HARNESSES WITH INERTIA REEL.

Optional integrated seat belt/shoulder harnesses with inertia reels are available for the pilot and front seat passenger. The seat belt/shoulder harnesses extend from inertia reels located in the cabin ceiling to attach

able small dents appear in the propeller blades, they should be immediately corrected as described in Section V under propeller care.

Prior to take-off from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full-throttle, static runup.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

WING FLAP SETTINGS.

Normal and obstacle clearance take-offs are performed with wing flaps up. The use of 10° flaps will shorten the ground run approximately 10%, but this advantage is lost in the climb to a 50-foot obstacle. Therefore, the use of 10° flaps is reserved for minimum ground runs or for take-off from soft or rough fields. If 10° of flaps are used for minimum ground runs, it is preferable to leave them extended rather than retract them in the climb to the obstacle. In this case, use an obstacle clearance speed of 65 MPH. As soon as the obstacle is cleared, the flaps may be retracted as the aircraft accelerates to the normal flaps-up climb speed of 80 to 90 MPH.

During a high altitude take-off in hot weather where climb would be marginal with 10° flaps, it is recommended that the flaps not be used for take-off. Flap settings greater than 10° are not recommended at any time for take-off.

PERFORMANCE CHARTS.

Consult the Take-Off Data chart in Section VI for take-off distances under various gross weight, altitude, headwind, temperature, and runway surface conditions.

CROSSWIND TAKE-OFFS.

Take-offs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length to minimize the drift angle immediately after take-off. The aircraft is accelerated to a speed slightly higher than normal, then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB.

CLIMB DATA.

For detailed data, refer to the Maximum Rate-Of-Climb Data chart in Section VI.

CLIMB SPEEDS.

Normal climbs are performed at 80 to 90 MPH with flaps up and full throttle for best engine cooling. The mixture should be full rich below 3000 feet and may be leaned above 3000 feet for smoother engine operation or to obtain maximum RPM for maximum performance climb. The maximum rate-of-climb speeds range from 91 MPH at sea level to 80 MPH at 10,000 feet. If an enroute obstruction dictates the use of a steep climb angle, climb at 75 MPH with flaps retracted.

NOTE

Steep climbs at low speeds should be of short duration to improve engine cooling.

CRUISE.

Normal cruising is done at power settings up to 75% power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by using your Cessna Power Computer or the Operational Data in Section VI.

The Operational Data in Section VI shows the increased range and improved fuel economy that is obtainable when operating at lower power settings and higher altitudes. The use of lower power settings and the selection of cruise altitude on the basis of the most favorable wind conditions are significant factors that should be considered on every trip to reduce fuel consumption.

The Cruise Performance table on the following page shows the true airspeed and miles per gallon during cruise for various altitudes and percent powers. This table should be used as a guide, along with the available winds aloft information, to determine the most favorable altitude and power setting for a given trip.