172M

1976

PILOT'S OPERATING HANDBOOK

Cessna® 1976

Skyhawk

CESSNA MODEL 172M

SECTION 4
NORMAL PROCEDURES

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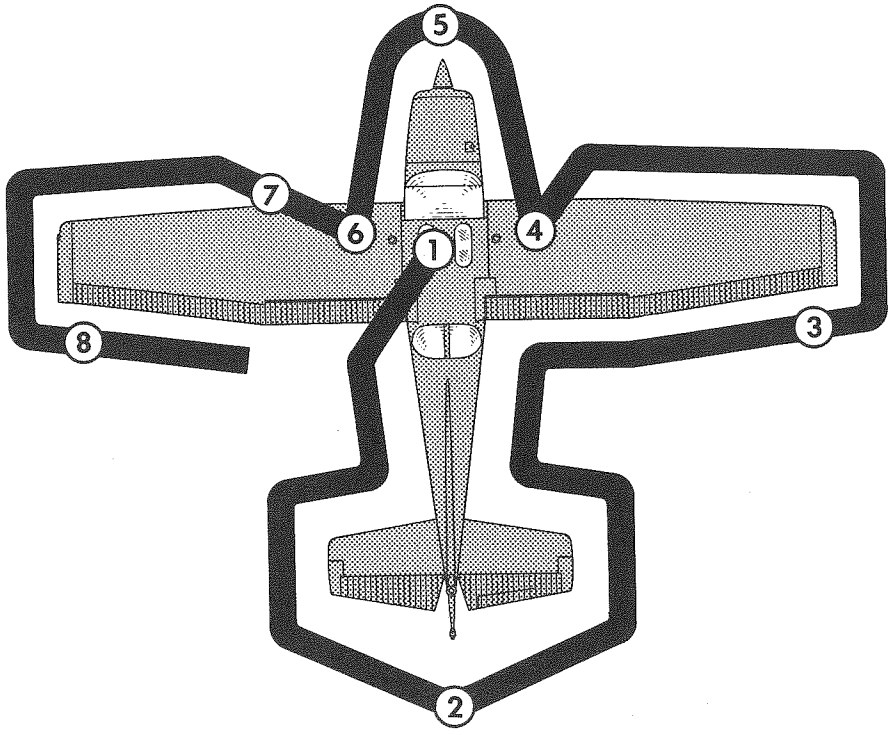

NOTE

Visually check airplane for general condition during walk-around inspection. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Figure 4-1. Preflight Inspection

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

(1) CABIN

(1) Control Wheel Lock -- REMOVE.
(2) Ignition Switch -- OFF.
(3) Master Switch -- ON.
(4) Fuel Quantity Indicators -- CHECK QUANTITY.
(5) Master Switch -- OFF.
(6) Baggage Door -- CHECK, lock with key if child's seat is to be occupied.

(2) EMPENNAGE

(1) Rudder Gust Lock -- REMOVE.
(2) Tail Tie-Down -- DISCONNECT.
(3) Control Surfaces -- CHECK freedom of movement and security.

(3) RIGHT WING Trailing Edge

(1) Aileron -- CHECK freedom of movement and security.

(4) RIGHT WING

(1) Wing Tie-Down -- DISCONNECT.
(2) Main Wheel Tire--- CHECK for proper inflation.
(3) Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment, and proper fuel grade (red).
(4) Fuel Quantity -- CHECK VISUALLY for desired level.
(5) Fuel Filler Cap -- SECURE.

(5) NOSE

(1) Engine Oil Level -- CHECK. Do not operate with less than six quarts. Fill to eight quarts for extended flight.
(2) Before first flight of the day and after each refueling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. Check strainer drain closed. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel tank sumps, and fuel

selector valve drain plug will be necessary.
(3) Propeller and Spinner -- CHECK for nicks and security.
(4) Landing Light(s) -- CHECK for condition and cleanliness.
(5) Carburetor Air Filter -- CHECK for restrictions by dust or other foreign matter.
(6) Nose Wheel Strut and Tire -- CHECK for proper inflation.
(7) Nose Tie-Down -- DISCONNECT.
(8) Flight Instrument Static Source Opening (left side of fuselage) -- CHECK for stoppage.

(6) LEFT WING

(1) Main Wheel Tire -- CHECK for proper inflation.
(2) Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment and proper fuel grade (red).
(3) Fuel Quantity -- CHECK VISUALLY for desired level.
(4) Fuel Filler Cap -- SECURE.

(7) LEFT WING Leading Edge

(1) Pitot Tube Cover -- REMOVE and check opening for stoppage.
(2) Fuel Tank Vent Opening -- CHECK for stoppage.
(3) Stall Warning Opening -- CHECK for stoppage. To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.
(4) Wing Tie-Down -- DISCONNECT.

(8) LEFT WING Trailing Edge

(1) Aileron -- CHECK for freedom of movement and security.

BEFORE STARTING ENGINE

(1) Preflight Inspection -- 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.
(6) Circuit Breakers -- CHECK IN.

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 TAKEOFF

(1) Cabin Doors and Window(s) -- CLOSED and LOCKED.
(2) Flight Controls -- FREE and CORRECT.
(3) Elevator Trim -- TAKEOFF.
(4) Flight Instruments -- SET.
(5) Radios -- SET.
(6) Autopilot (if installed) -- OFF.
(7) Fuel Selector Valve -- BOTH.
(8) Mixture -- RICH (below 3000 feet).
(9) Parking Brake -- SET.
(10) 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.
(11) Flashing Beacon, Navigation Lights and/or Strobe Lights -- ON as required.
(12) Throttle Friction Lock -- ADJUST.
(13) Wing Flaps -- UP.

TAKEOFF

NORMAL TAKEOFF

(1) Wing Flaps -- UP.
(2) Carburetor Heat -- COLD.
(3) Throttle -- FULL.
(4) Elevator Control -- LIFT NOSE WHEEL (at 55 KIAS).
(5) Climb Speed -- 70-80 KIAS.

MAXIMUM PERFORMANCE TAKEOFF

(1) Wing Flaps -- UP.

(2) Carburetor Heat -- COLD.
(3) Brakes -- APPLY.
(4) Throttle -- FULL OPEN.
(5) Brakes -- RELEASE.
(6) Elevator Control -- SLIGHTLY TAIL LOW.
(7) Climb Speed -- 59 KIAS (until all obstacles are cleared).

ENROUTE CLIMB

(1) Airspeed -- 70-90 KIAS.

NOTE

If a maximum performance climb is necessary, use speeds shown in the Rate Of Climb chart in Section 5.

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

CRUISE

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

DESCENT

(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 -- 60-70 KIAS (flaps UP).

(5) Wing Flaps -- AS DESIRED.
(6) Airspeed -- 55-65 KIAS (flaps DOWN).

BALKED LANDING

(1) Throttle -- FULL OPEN.
(2) Carburetor Heat -- COLD.
(3) Wing Flaps -- 20°.
(4) Airspeed -- 55 KIAS.
(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 AIRPLANE

(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.

takeoff run. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full-throttle, static runup before another takeoff is attempted. The engine should run smoothly and turn approximately 2300 to 2420 RPM with carburetor heat off and mixture full rich.

NOTE

Carburetor heat should not be used during takeoff unless it is absolutely necessary for obtaining smooth engine acceleration.

Full-throttle runups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be immediately corrected as described in Section 8 under Propeller Care.

Prior to takeoff 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 takeoffs 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 takeoff 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 55 KIAS. As soon as the obstacle is cleared, the flaps may be retracted as the aircraft accelerates to the normal flaps-up climb-out speed.

During a high altitude takeoff in hot weather where climb would be marginal with 10° flaps, it is recommended that the flaps not be used for takeoff. Flap settings greater than 10° are not approved for takeoff.

CROSSWIND TAKEOFFS

Takeoffs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length to minimize the drift angle immediately after takeoff. The airplane 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

Normal climbs are performed with flaps up and full throttle and at speeds 5 to 10 knots higher than best rate-of-climb speeds for the best combination of performance, visibility and engine cooling. The mixture should be full rich below 3000 feet and may be leaned above 3000 feet for smoother operation or to obtain maximum RPM. If an obstruction dictates the use of a steep climb angle, the best angle-of-climb speed should be used with flaps up and maximum power.

NOTE

Climbs at speeds lower than the best rate-of-climb speed should be of short duration to improve engine cooling.

CRUISE

Normal cruising is performed between 55% and 75% power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by using your Cessna Power Computer or the data in Section 5.

NOTE

Cruising should be done at 65% to 75% power until a total of 50 hours has accumulated or oil consumption has stabilized. This is to ensure proper seating of the rings and is applicable to new engines, and engines in service following cylinder replacement or top overhaul of one or more cylinders.

The Cruise Performance Table, Figure 4-3, illustrates the true airspeed and nautical miles per gallon during cruise for various altitudes and percent power. This table should be used as a guide, along with the avail-

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
	INCLUDES J30-A-1 AND REPLACES ITEMS B01-R, B04-R, BRAKE & NOSE WHEEL STEERING SYSTEMS. THE WT & ARM SHOWN ARE APPROXIMATE AND FOR REFERENCE ONLY. USE ACTUAL INSTALLED WT & ARM CHANGE.	0500083	21.7*	52.3*
J30-A-1	FLOATPLANE EQUIPMENT KIT, COMPLETE, OPTION A CONSISTS OF ITEMS		1.3	-41.4
	A33-O PROPELLER, FLOATPLANE, EXCHANGE	0550320	0.0	- -
	F01-O- PLACARD, FLOATPLANE OPERATION	0505053	0.0	- -
	G31-A CABLES, CORROSION RESIST, EXCH.	0500036	10.0	77.0
	G07-A CORROSION PROOFING, INTERNAL	0541115	1.7	49.1
	G58-A RINGS, AIRPLANE HOISTING	0513415	6.1	17.8
	J10-A STEP & HANDLE, REFUELING (OPT C)	0500083	1.1	45.5
	J13-A FUSELAGE MODIFICATION (INSTALLED)	0513003	0.4	26.2
	J15-A COWL DECK V-BRACE (INSTALLED)	0560012	NEGL	69.6
	COWL ASSY, INTERCONNECT SYSTEM, (NET CHANGE)	0552112-32	20.4*	- -
J30-A-2	FLOATPLANE EQUIPMENT KIT, PARTIAL OPTION B CONSISTS OF ITEMS	0500083	0.0	62.5*
	F01-O- PLACARD, FLOATPLANE OPERATION	0505053	0.0	- -
	G31-A CABLES, CORROSION RESIST, EXCH	0500036	10.0	77.0
	G07-A CORROSION PROOFING INTERNAL	0541115	1.7	49.1
	G58-A RINGS, AIRPLANE HOISTING	0513415	6.1	17.8
	J10-A STEP & HANDLE, REFUELING	0500083	1.1	45.5
	J13-A FUSELAGE MODIFICATION	0513003	0.4	26.2
	J15-A COWL DECK V-BRACE (STOWED)	0560012	NEGL	95.0
	COWL ASSY, INTERCONNECT SYSTEM (NET CHANGE)	0552112-32	10.4*	- -
J30-A-3	FLOATPLANE KIT B WITH NO INTERNAL CORROSION PROOFING, AIRPLANE HOISTING RINGS,	0500083-17	1.1	41.2*
	G07-A CORROSION PROOFING, INTERNAL	0541115		49.1
	G58-A RINGS, AIRPLANE HOISTING	0513415	1.7	17.8
	J10-A STEP & HANDLE, REFUELING	0500083	6.1	45.5
	J13-A FUSELAGE MODIFICATIONS (INSTALLED)	0513003	1.1	26.2
	J15-A COWL DECK V-BRACE (INSTALLED)	0560012	0.4	95.0
	COWL ASSY, INTERCONNECT SYSTEM (STOWED)	0552112-32	NEGL	- -
	FLOATPLANE (NET CHANGE)			

SECTION 7
AIRPLANE & SYSTEMS DESCRIPTIONS

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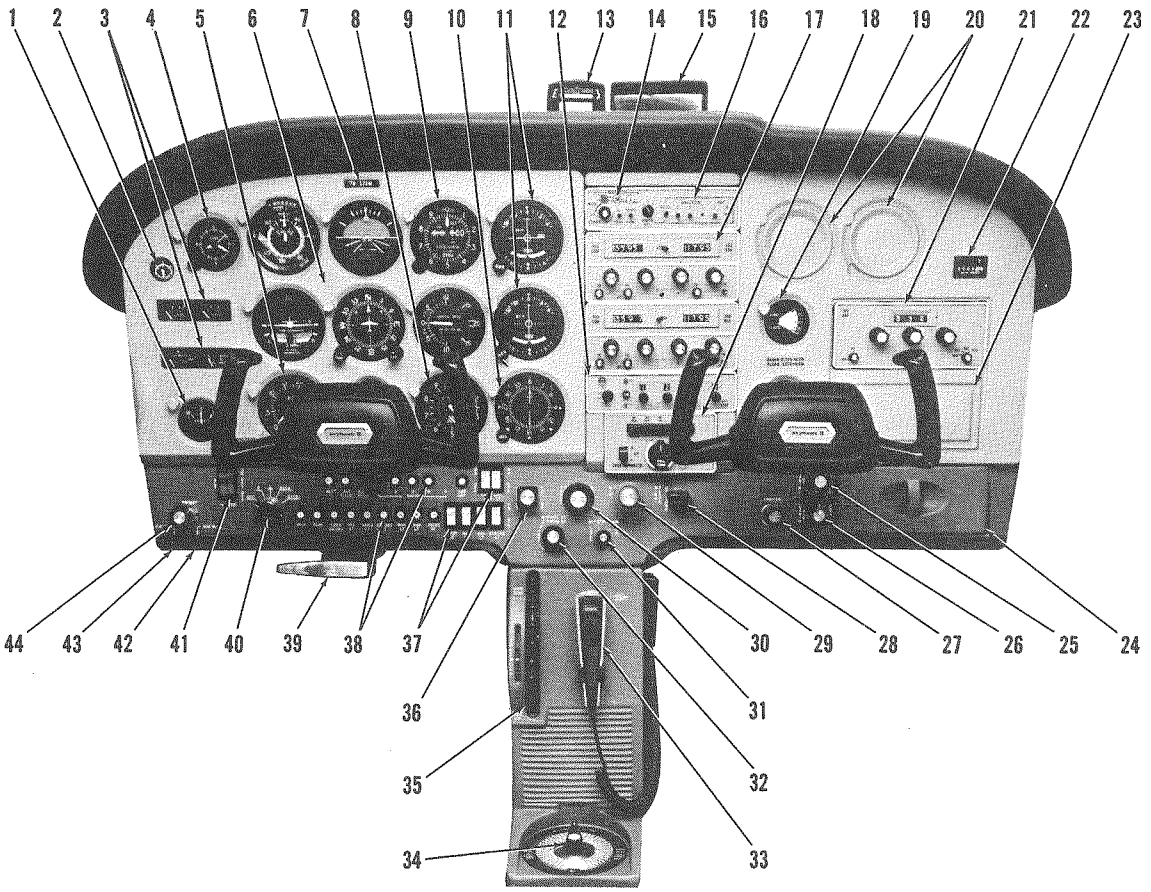

Figure 7-2. Instrument Panel (Sheet 1 of 2)

1. Ammeter
2. Suction Gage
3. Oil Temperature, Oil Pressure, and Left and Right Fuel Gages
4. Clock
5. Tachometer
6. Flight Instrument Group
7. Airplane Registration Number
8. Secondary Altimeter
9. Encoding Altimeter
10. ADF Bearing Indicator
11. Omni Course Indicators
12. Transponder
13. Magnetic Compass
14. Marker Beacon Indicator Lights and Switches
15. Rear View Mirror
16. Audio Control Panel
17. Radios
18. Autopilot Control Unit
19. Wing Flap Position Indicator
20. Additional Instrument Space
21. ADF Radio
22. Flight Hour Recorder
23. Additional Radio Space
24. Map Compartment
25. Cabin Heat Control Knob
26. Cabin Air Control Knob
27. Cigar Lighter
28. Wing Flap Switch
29. Mixture Control Knob
30. Throttle (With Friction Lock)
31. Static Pressure Alternate Source Valve
32. Instrument and Radio Dial Light Rheostats
33. Microphone
34. Fuel Selector Valve Handle
35. Elevator Trim Control Wheel
36. Carburetor Heat Control Knob
37. Electrical Switches
38. Circuit Breakers
39. Parking Brake Handle
40. Ignition Switch
41. Master Switch
42. Auxiliary Mike Jack
43. Phone Jack
44. Primer

Figure 7-2. Instrument Panel (Sheet 2 of 2)

bellcrank, left upper and lower "V" type corrugated skins, and right upper and lower "V" type corrugated skins incorporating a trailing edge cut-out for the trim tab. The elevator trim tab consists of a spar, rib, and upper and lower "V" type corrugated skins. The leading edge of both left and right elevator tips incorporate extensions which contain balance weights.

FLIGHT CONTROLS

The airplane's flight control system consists of conventional aileron, rudder, and elevator control surfaces (see figure 7-1). The control surfaces are manually operated through mechanical linkage using a control wheel for the ailerons and elevator, and rudder/brake pedals for the rudder.

TRIM SYSTEM

A manually-operated elevator trim tab is provided. Elevator trimming is accomplished through the elevator trim tab by utilizing the vertically mounted trim control wheel. Upward rotation of the trim wheel will trim nose-down; conversely, downward rotation will trim nose-up.

INSTRUMENT PANEL

The instrument panel (see figure 7-2) is designed around the basic "T" configuration. The gyros are located immediately in front of the pilot, and arranged vertically over the control column. The airspeed indicator and altimeter are located to the left and right of the gyros, respectively. The remainder of the flight instruments are located around the basic "T". Engine instruments and fuel quantity indicators are near the left edge of the panel. Avionics equipment is stacked approximately on the centerline of the panel, with the right side of the panel containing the map compartment, wing flap position indicator, space for additional instruments and avionics equipment, and cabin heat and air controls. The wing flap switch and engine controls are below the avionics equipment, and the electrical switches and circuit breakers are located below the pilot's control wheel. A master switch, ignition switch, and primer are located on the lower left corner of the panel. A pedestal is installed below the panel and contains the elevator trim tab control wheel and indicator, and provides a bracket for the microphone. The fuel selector valve handle is located at the base of the pedestal. A parking brake handle is located below the instrument panel in front of the pilot.

For details concerning the instruments, switches, circuit breakers,

and controls on this panel, refer in this section to the description of the systems to which these items are related.

GROUND CONTROL

Effective ground control while taxiing is accomplished through nose wheel steering by using the rudder pedals; left rudder pedal to steer left and right rudder pedal to steer right. When a rudder pedal is depressed, a spring-loaded steering bungee (which is connected to the nose gear and to the rudder bars) will turn the nose wheel through an arc of approximately 10° each side of center. By applying either left or right brake, the degree of turn may be increased up to 30° each side of center.

Moving the airplane by hand is most easily accomplished by attaching a tow bar to the nose gear strut. If a tow bar is not available, or pushing is required, use the wing struts as push points. Do not use the vertical or horizontal surfaces to move the airplane. If the airplane is to be towed by vehicle, never turn the nose wheel more than 30° either side of center or structural damage to the nose gear could result.

The minimum turning radius of the airplane, using differential braking and nose wheel steering during taxi, is approximately 27 feet 5 1/2 inches. To obtain a minimum radius turn during ground handling, the airplane may be rotated around either main landing gear by pressing down on a tailcone bulkhead just forward of the horizontal stabilizer to raise the nose wheel off the ground.

WING FLAP SYSTEM

The wing flaps are of the single-slot type (see figure 7-3) and are electrically operated by a 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 electrically indicated by a wing flap position indicator on the right side of the panel.

To extend the wing flaps, the flap switch, which is spring-loaded to the center, or off, position, must be depressed and held in the DOWN position until the desired degree of extension is reached. 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 a

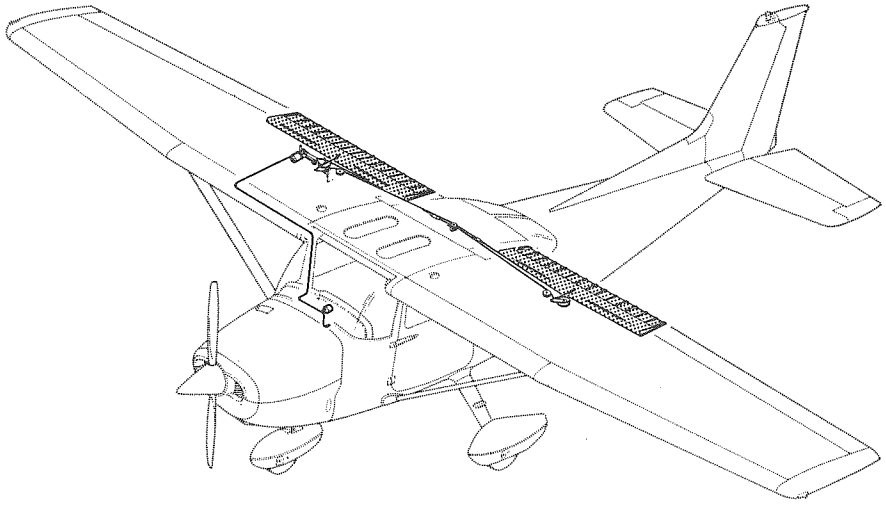

Figure 7-3. Wing Flap System

detent in 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 the switch should be returned to the center off position.

LANDING GEAR SYSTEM

The landing gear is of the tricycle type with a steerable nose wheel, two main wheels, and wheel fairings. Shock absorption is provided by the tubular spring-steel main landing gear struts and the air/oil nose gear shock strut. Each main gear wheel is equipped with a hydraulically actuated disc-type brake on the inboard side of each wheel, and an aerodynamic fairing over each brake.

BAGGAGE COMPARTMENT

The baggage compartment consists of two areas, one extending from the back of the rear passenger seats to the aft cabin bulkhead, and an additional area aft of the bulkhead. Access to both baggage areas is gained through a lockable baggage door on the left side of the airplane, or from within the airplane cabin. A baggage net with eight tie-down straps is provided for securing baggage and is attached by tying the straps to tie-down rings provided in the airplane. When loading the airplane, children should not be placed or permitted in the baggage compartment, unless a child's seat is installed, and any material that might be hazardous to the airplane or occupants should not be placed anywhere in the airplane. For baggage area and door dimensions, refer to Section 6.

SEATS

The seating arrangement consists of two separate adjustable seats for the pilot and front passenger, a split-backed fixed seat in the rear, and a child's seat (if installed) aft of the rear seats. The pilot's and front passenger's seats are available in two different designs: four-way and six-way adjustable.

Four-way seats may be moved forward or aft, and the seat back angle changed. To position either seat, lift the tubular handle under the center of the seat, slide the seat into position, release the handle, and check that the seat is locked in place. The seat back is spring-loaded to the vertical position. To adjust its position, lift the lever under the right front corner of the seat, reposition the back, release the lever, and check that the back is locked in place. The seat backs will also fold full forward.

The six-way seats may be moved forward or aft, adjusted for height, and the seat back angle is infinitely adjustable. Position the seat by lifting the tubular handle, under the center of the seat bottom, and slide the seat into position; then release the lever and check that the seat is locked in place. Raise or lower the seat by rotating a large crank under the right corner of the left seat and the left corner of the right seat. Seat back angle is adjustable by rotating a small crank under the left corner of the left seat and the right corner of the right seat. The seat bottom angle will change as the seat back angle changes, providing proper support. The seat backs will also fold full forward.

The rear passenger's seats consist of a fixed one-piece seat bottom with individually adjustable seat backs. Two adjustment levers, under the left and right corners of the seat bottom, are used to adjust the angle of the respective seat backs. To adjust either seat back, lift the adjustment lever and reposition the back. The seat backs are spring-loaded to the vertical position.

A child's seat may be installed aft of the rear passenger seats, and is held in place by two brackets mounted on the floorboard. The seat is designed to swing upward into a stowed position against the aft cabin bulkhead when not in use. To stow the seat, rotate the seat bottom up and aft