

Operation Manual
for
Cessna 120 Cessna 140

CESSNA AIRCRAFT COMPANY

PREFACE

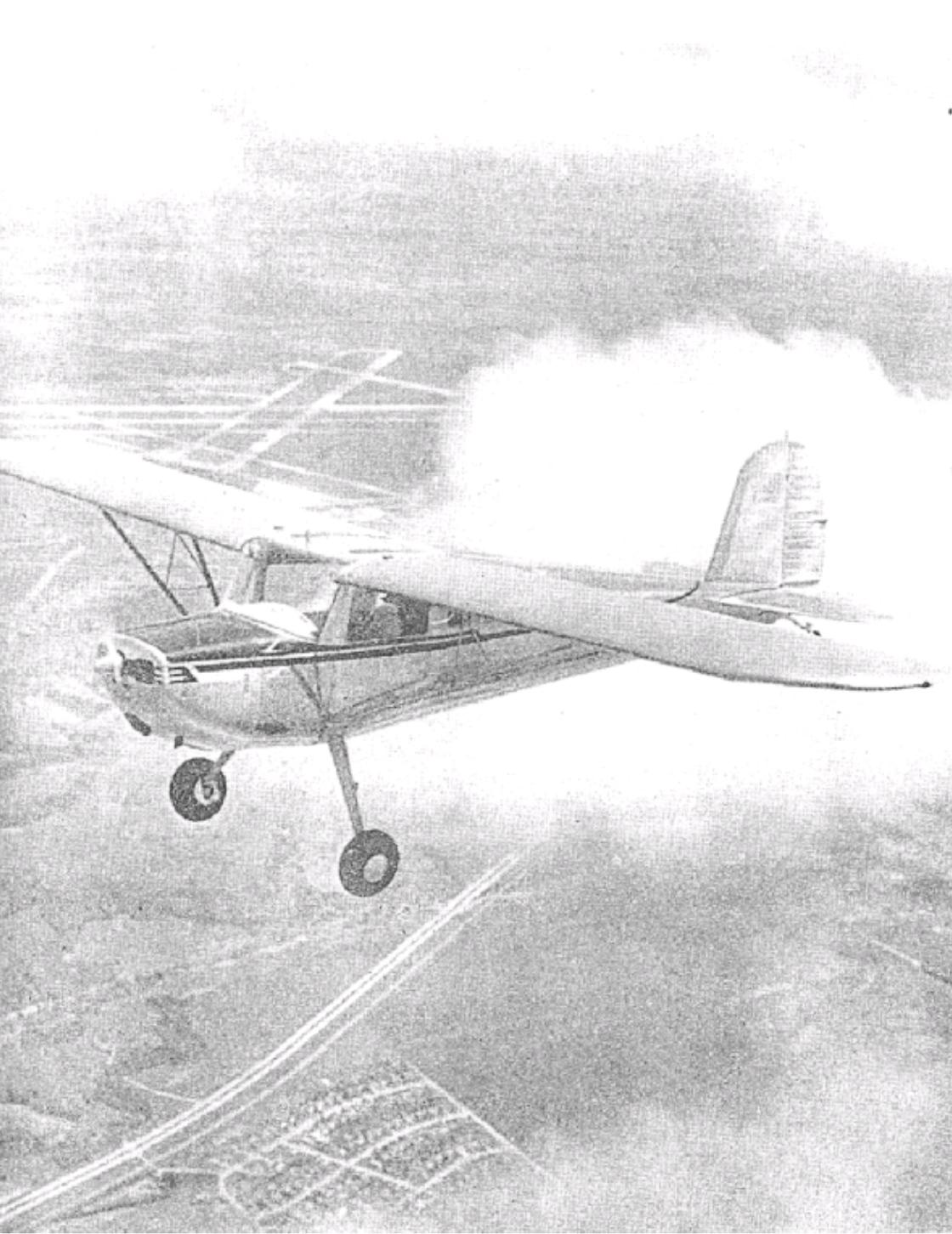
This book has been prepared for you as an owner and operator of Cessna 140 and Cessna 120 airplanes. It is written specifically for you - to help you get the best out of your airplane - for the longest period of time.

Your Cessna is a product of the best in aircraft engineering and production skill. The maintenance of the quality that is built into it will be assured by simple but necessary upkeep on your part. The purpose of this book is to acquaint you with the things you should know - both in operation and care of the airplane.

The book is divided into four basic sections. The first concern of the owner of any product is the operation of his equipment. The first section, therefore, sets forth in Pilot's Check List form the basic data that have been developed as the best operational methods for flying your Cessna. It is not a check list in its true form as it is considerably longer, but it does cover briefly all of the points that you would want to or should know concerning the operation of your airplane.

Section two of the book sets forth the operation limitations and performance data and should be of useful interest to those desiring the most in performance from their airplane.

In the third section are set forth details and explanations that are necessary to avoid complicating the check list to the point where it loses its purpose. The fourth section is devoted to care of the airplane itself and covers your responsibilities to help it perform faithfully and economically the many hours of fine flying that are built into it.



SECTION I - OPERATING CHECK LIST

The flight and operational characteristics of the Model 120 and 140 Cessna are normal in all respects. There are no “unconventional” characteristics or operations that need to be mastered. All controls respond in the normal way in the entire range of operation of the airplane.

A. BEFORE ENTERING THE AIRPLANE

- (1) Check oil level.
- (2) Make a visual check of the airplane.
- (3) Remove control locks, if installed.
- (4) On first flight of the day, drain a small (one-ounce) quantity of fuel from fuel strainer drain to insure that no free water is in the fuel line.

B. BEFORE STARTING THE ENGINE

- (1) Operate controls and make a rapid visual check for proper operation.
- (2) Make sure windshield is clean for maximum visibility.
- (3) Check brakes and set parking brake.
- (4) Adjust seat for comfort and distance to rudder pedals.
- (5) Fasten and check safety belt.
- (6) Check quantity of fuel (two gauges).

C. STARTING THE ENGINE

- (1) Set carburetor heat to “cold”.
- (2) Set mixture control (if any) to “full rich”.
- (3) Set fuel tank selector to fullest tank. (Do not take off on less than 1/4 tank.)
- (4) If engine is cold (50°F or below), prime the engine as follows:

Turn master switch “on” (when using starter).

Clear propeller.

Make certain magneto switch is “off” and throttle “closed” then give engine three or four strokes with the primer, as the engine is turned over by hand or by engaging the starter. (Ordinarily not required except at winter temperatures.)

OPERATING CHECK LIST

- (5) Turn magneto switches "on".
- (6) Open throttle 1/8 (to idle position) and start engine by pulling starter control or having propeller pulled through by hand.
Note: In extremely cold weather a few strokes of the primer as the engine fires will enable the engine to keep running. (Avoid over-priming.) After priming push primer all the way in and turn to locked position to avoid possibility of engine drawing fuel through the primer. Do not pull out on starter for a second starting attempt until engine has come to a complete stop from the first attempt. Failure to do this may result in damage to the starting gear.

D. WARM-UP AND GROUND TEST

- (1) Do not allow engine to operate at more than 800 r.p.m. for first 60 seconds after starting. (Especially important in cold weather as lubricating oil will be slow in circulating.) If oil gauge does not show pressure within 30 seconds after starting, stop engine and investigate. (Lack of oil pressure may cause serious engine damage.)
- (2) Apply full carburetor heat.
- (3) After two to three minutes running at 800 r.p.m., open the throttle gradually to 1200-1500 r.p.m. and allow to run for three to five minutes or until engine is sufficiently warm for take-off. Warm-up may be accomplished during taxiing. Do not overheat the engine by running engine at high speed while on the ground. It is not necessary to run the engine until oil is "hot"; if engine runs properly at full throttle and oil pressure is normal, you are ready for take-off.

E. BEFORE TAKE-OFF

- (1) Apply toe brakes.
- (2) Set altimeter.
- (3) Set trim tab to "take-off" position.
- (4) Check oil pressure - should show 30 to 40 lbs. sq. in. (Minimum idling oil pressure - 10 lbs. sq. in.)

OPERATING CHECK LIST

- (5) Check engine magnetos at 1800 r.p.m. by opening the throttle and switching off separately each magneto momentarily. Drop of r.p.m. from 1800 r.p.m. should not exceed 50 r.p.m. on the right magneto or 75 r.p.m. on the left magneto. Switch to both magnetos before continuing.
- (6) Full throttle r.p.m. check is optional. Engine should run smoothly and turn, with carburetor heat off, 1900 r.p.m. or more with wood prop, and 2100 r.p.m. or more with metal prop. Engine should idle between 500 and 550 r.p.m.

F. TAKE-OFF

- (1) Release brake.
- (2) For take-off use full throttle.
- (3) Turn carburetor heat "off."
- (4) Heels on the floor.
- (5) Climb at full throttle. Best rate of climb airspeed 73 m.p.h. indicated. The engine will turn 2250 to 2380 r.p.m.

G. CRUISING

- (1) Cruising r.p.m. 2400. (Do not exceed 2575 r.p.m.)
- (2) Trim airplane by adjusting elevator tab.
- (3) Oil pressure - 30-40 lbs. sq. in.
- (4) Oil temperature - maximum 220°F.
- (5) Above 5000 ft. lean mixture as required to obtain maximum r.p.m. (If mixture control installed.)

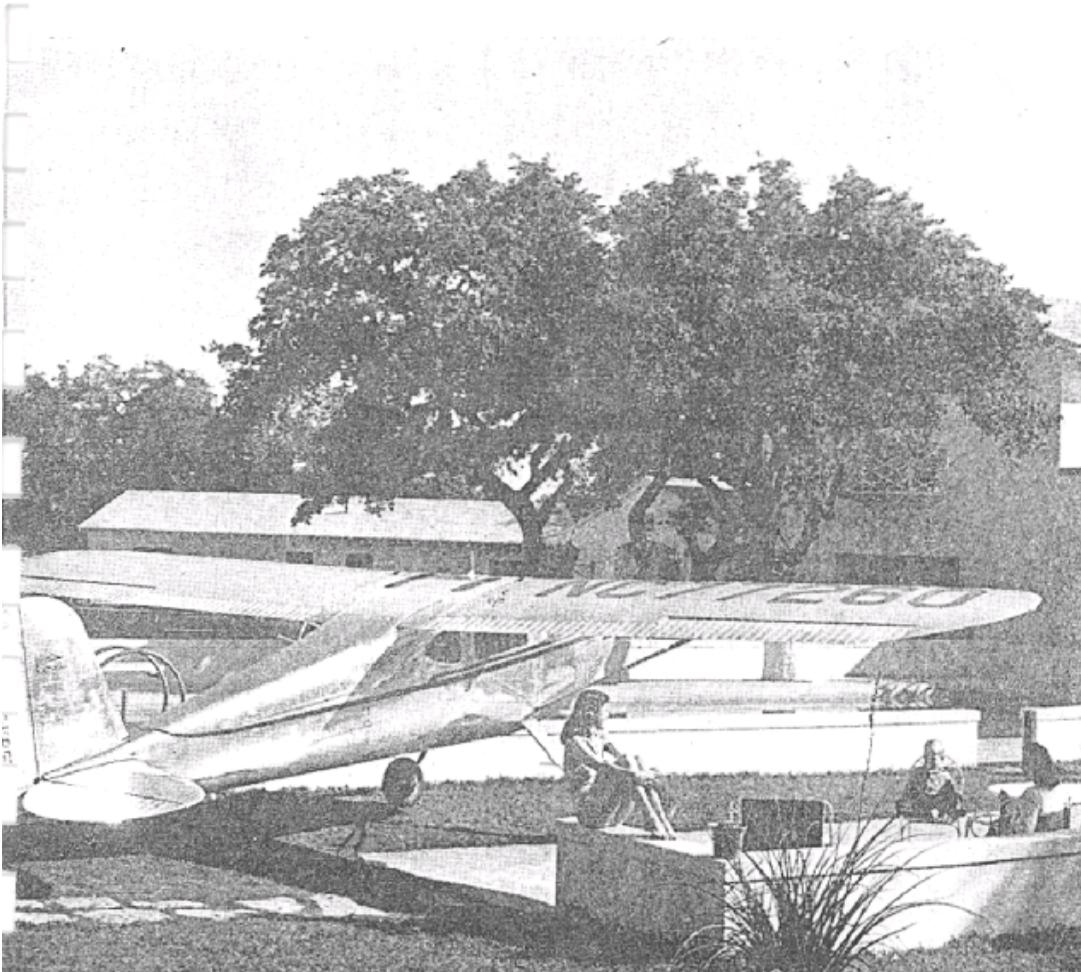
H. BEFORE LANDING

- (1) Set fuel valve to fullest tank.
- (2) Set mixture control full rich (if installed).
- (3) Apply full carburetor heat before closing throttle.
- (4) Suggested glide speed 65-70 m.p.h.
- (5) Use tab to relieve control wheel pressure when establishing glide.
- (6) Lower flaps as desired (do not lower flaps when indicated airspeed is above 82 m.p.h.)

OPERATING CHECK LIST

I. AFTER LANDING

- (1) Raise flaps.
- (2) Normal glide and taxiing should cool engine sufficiently; however, if excessive amount of taxiing is necessary, allow engine to cool before cutting ignition by allowing to idle slowly two to three minutes.
- (3) Turn magneto switches "off." (Open throttle to avoid pre-ignition when hot.)
- (4) Turn radio switch "off."
- (5) Turn master switch "off." Be sure — otherwise your battery will run down overnight.



SECTION II - OPERATION LIMITATIONS* AND PERFORMANCE DATA

OPERATIONS AUTHORIZED:

Your Cessna 120 or 140, licensed under CAA type certificate No. 768, is authorized for the following flight operations:

- Contact flight (day) - Model 120 and 140
- Contact flight (night) - Model 140 (Model 120 when equipped with electrical system including navigation lights.)
- Instrument (night) (not for hire) - Model 140, equipped with two-way radio, sensitive altimeter, turn and bank indicator, rate of climb indicator and clock with sweep second hand.

The Model 120 or 140 may be operated for hire, beyond the three mile radius from the airport, in the above categories when equipped with one landing light and certificated flare installation.

OPERATION LIMITATIONS:

Engine Limitations: The Continental C-85-12 or C-85-12F engine is limited to a maximum engine speed of 2575 r.p.m.

MANEUVERS:

The Cessna Model 140 and 120 are designed to the Civil Air Regulations Part 04A set forth by the United States Government for airworthiness of aircraft of this type. The limit load factors for this airplane are:

LIMIT LOADS:

<i>Gross Weight 1450 lbs.</i>		
CONDITION I OR III	CONDITION V	CONDITION VII
High or Low Angle of Attack	Inverted Flight	Flaps Down 40°
+4.57	-2.26	+1.97

The design load factors are 150% of the above and in all cases the structure meets or exceeds design loads.

*Your airplane must be operated in accordance with the CAA approved Airplane Flight Manual. If there is any information in this section which contradicts die CAA approved manual, it is to be disregarded.

OPERATION AND PERFORMANCE DATA

AIRSPEED LIMITATIONS:

The following are the certificated airspeed limits:

	LANDPLANE	SEAPLANE
Glide or Dive (smooth air)	140 m.p.h. (<i>red line</i>)	140 m.p.h. (<i>red line</i>)
Level Flight or Climb (normal range marked with green arc, caution range marked with yellow arc, 115 to 140 m.p.h.)	115 m.p.h.	105 m.p.h.
Flap Extension and Operation (flap operating range marked by a white arc)	82 m.p.h.	82 m.p.h.

All airspeeds are true indicated

The airplane is not designed for purely acrobatic flight. However, in the acquisition of various certificates by the pilot owner such as private pilot, commercial pilot, instrument pilot and flight instructor, certain maneuvers are required by the CAA. All of these maneuvers are permitted in the Cessna 140 and 120.

In connection with the above the following maneuvers may be performed:

	Recommended Entry Speed
(1) Steep Turns	90
(2) Spins	Use power to enter
(3) Stalls (except whip-stalls)	-
(4) Lazy Eights	100
(5) Chandelles	100

Spins with flaps down are prohibited due to the fact that recovery cannot be made without exceeding flap design speeds. Acrobatics that may impose high inverted loads should not be attempted. The important thing to bear in mind in flight maneuvers is that the Cessna 140 and 120 Models are exceptionally clean in aerodynamic design and will build up speed quickly with the nose down. Proper speed control is an essential requirement for execution of any maneuver and care should always be exercised to avoid excessive speed which in turn can impose excessive loads. In the execution of all maneuvers avoid abrupt use of controls.

OPERATION AND PERFORMANCE DATA

WEIGHT AND BALANCE:

The safety of an airplane is directly affected by its weight and balance simply because the airplane was designed for a certain limit load and balance condition. The weight and balance limitations for the 140 and 120 are as follows:

GROSS WEIGHT LIMIT

Landplane	Seaplane
1450 lbs.	1556 lbs.

CENTER OF GRAVITY LIMITS

Landplane
+13.5 aft of datum to +17.7 aft of datum
Seaplane
+13.7 aft of datum to +17.5 aft of datum

The horizontal datum is the leading edge of the wing with measurements considered + (aft) and - (forward) of this line.

To level the airplane during weighing, use the top edge of the fuselage skin sheet aft of the door.

A weight and balance report is furnished with each airplane which gives the weight and balance of that particular airplane. Also, an equipment list is furnished with the airplane which shows weights and arms for various equipment and accessory items.

The installation of any combination of these accessory items as original equipment has been approved by the CAA. Calculations show that a 120 or 140 having an empty weight center of gravity between the limits of 12.2" to 14.5" (the empty weight e.g. of your airplane appears on the weight and balance form with your airplane), the following equipment may be added or removed without exceeding the permissible gross weight center of gravity limits:

OPERATION AND PERFORMANCE DATA

ACCESSORY ITEMS

Fixed pitch metal propeller (McCauley 1A90)	22 lbs.
Landing light (Grimes G-3602 or D-3040A)	6 lbs.
Maguire radio receiver	5 lbs.
Cabin heater	4 lbs.
Loudspeaker installation	3 lbs.
Co-pilot brake pedals	2 lbs.
Carburetor mixture control	1 lb.
Radio shielding	2 lbs.
Fixed antenna	1 lb.
Electrical System (Model 120)	53 lbs.
General Electric AS1B radio	13 lbs.
Sensitive altimeter	1 lb.
Turn and bank indicator	2 lbs.
Rate of climb indicator	1 lb.
Clock	1 lb.

(Installations must be equivalent to approved installations.)

As the above outlined alterations do not affect the basic loading conditions of the airplane; as their effect on structure, powerplant operation, airworthiness and flight characteristics have been checked and approved by the CAA; and as they are accomplished by elementary installation or removal operations, they can be considered minor alterations. As such, a suitable entry should be made in the appropriate log book signed by the installing mechanic, and no formal CAA approval is necessary.

Equipment changes other than those listed above will require a check of weight and balance. Your Cessna distributor or dealer has experienced personnel to assist in the calculation or preparation of weight and balance data.

The actual loading of the airplane is up to the pilot. 1450 lbs. gross weight is not to be exceeded — and the useful load in the airplane can be distributed in any way the pilot desires, that is, in baggage (up to the baggage compartment placard limit), gasoline, or passenger load. These are all variables including the pilot's weight, and of course, baggage may be carried in the passenger's location instead of a passenger. It is the responsibility of the pilot and operator to see that the weight and balance are within limitations.

OPERATION AND PERFORMANCE DATA

OPERATIONAL DATA: PERFORMANCE INFORMATION

The following operational data are compiled from actual tests with airplane and engine in good condition and using average piloting technique. Data are based upon a gross weight of 1450 lbs. with standard Sensenich 74FK-49 propeller installed, and apply to both 120 and 140 models. Performance figures are for zero wind velocity and hard surface level runway. Speeds are true indicated airspeeds.

Airspeed	Indicated	40	60	80	100	120	140
Calibration	True Indicated	46	65	83	100	116	133

ITEM	ALTITUDE	OUTSIDE AIR TEMPERATURE					
		0°F	20°F	40°F	60°F	80°F	100°F
<i>Take Off Distance</i> (Ground Run in Feet) Airspeed 50 MPH Takeoff Full Throttle, Flaps Up	Sea Level	465	530	594	663	728	795
	2000 Ft.	600	689	761	842	923	1004
	4000 Ft.	760	857	956	1054	1152	1250
	6000 Ft.	980	1101	1222	1243	1464	1585

Take Off Correction: Reduce above distances 10% for each 5 MPH Wind Velocity.

<i>Landing Distance</i> (Ground Run in Feet) Approach at 70 MPH Flaps Up	Sea Level	233	266	299	332	365	398
	2000 Ft.	274	321	348	385	422	460
	4000 Ft.	329	372	414	457	500	542
	6000 Ft.	381	428	475	522	569	616

<i>Landing Distance</i> (Ground Run in Feet) Approach at 70 MPH Flaps Down	Sea Level	212	242	272	302	332	362
	2000 Ft.	252	286	320	354	388	422
	4000 Ft.	302	341	380	419	458	497
	6000 Ft.	352	396	439	483	527	570

Landing Correction: Reduce above distances 10% for each 5 MPH Wind Velocity.

<i>Normal Rate Climb</i> (Feet Per Minute) Flaps Up Full Throttle	AIRSPEED	81	Sea Level	740	710	675	640	605	570
		79	2000 Ft.	660	625	595	560	530	495
		76	4000 Ft.	555	520	490	460	425	395
		74	6000 Ft.	455	425	395	365	330	300

	Condition	Angle of Bank Degrees			
		0°	20°	40°	60°
<i>Stalling Speed</i> M.P.H. T.I.A.S.	Power Off; Flaps Up	49	50	56	69
	Power Off; Flaps Down	45	46	52	65
	Power On; Flaps Up	40	41	46	57
	Power On; Flaps Down	37	38	43	52

OPERATION AND PERFORMANCE DATA

CLIMB:

The rate of climb and speed for best climb at various altitudes for gross weight of 1450 lbs. and equipped with wooden Sensenich 74FK-49 propeller is given in the table below:

Attitude (ft.)	Sea Level	2500'	5000'	7500'	10,000'	12,500'	15,000'
Best Climb Speed (T.I.A.S.)	81	78	75	72	69	64	57
Rate of Climb (ft./min)	640	550	450	360	260	170	70

(1) Density altitude.

(2) Gross weight 1450 with 74FK-49 propeller.

The above table is for standard conditions.

CRUISING:

The following approximate cruising information is applicable at altitudes from sea level to 10,000 ft. It is based on total usable fuel with no allowance for reserve:

<u>R.P.M.</u>	<u>Max. Range</u>	<u>Miles/gal.</u>	<u>Gals./hr.</u>
2575	455	19.4	5.9
2500	485	20.7	5.3
2400*	506	21.5	4.8
2300	518	22.0	4.5
2200	521	22.1	4.2
2100	510	21.7	4.0

*Recommended cruising.

NOTE Cruising performance is dependent upon carburetor metering characteristics, engine and propeller condition, and turbulence of the atmosphere in addition to the controllable variables r.p.m., altitude, gross weight, etc. These undeterminate variables may account for variations of 10 per cent or more in the maximum range. The variation in range due to normal changes in gross weight and altitude is within this 10 per cent variation and in order to make the cruising data as readily usable as possible it is presented in this simplified form, using average values for altitude, gross weight, drag, carburetor and engine characteristics.

SECTION III — OPERATING DETAILS

The following paragraphs cover in somewhat greater detail the items entered as a Check List in Section I. Every item in the list is not included.

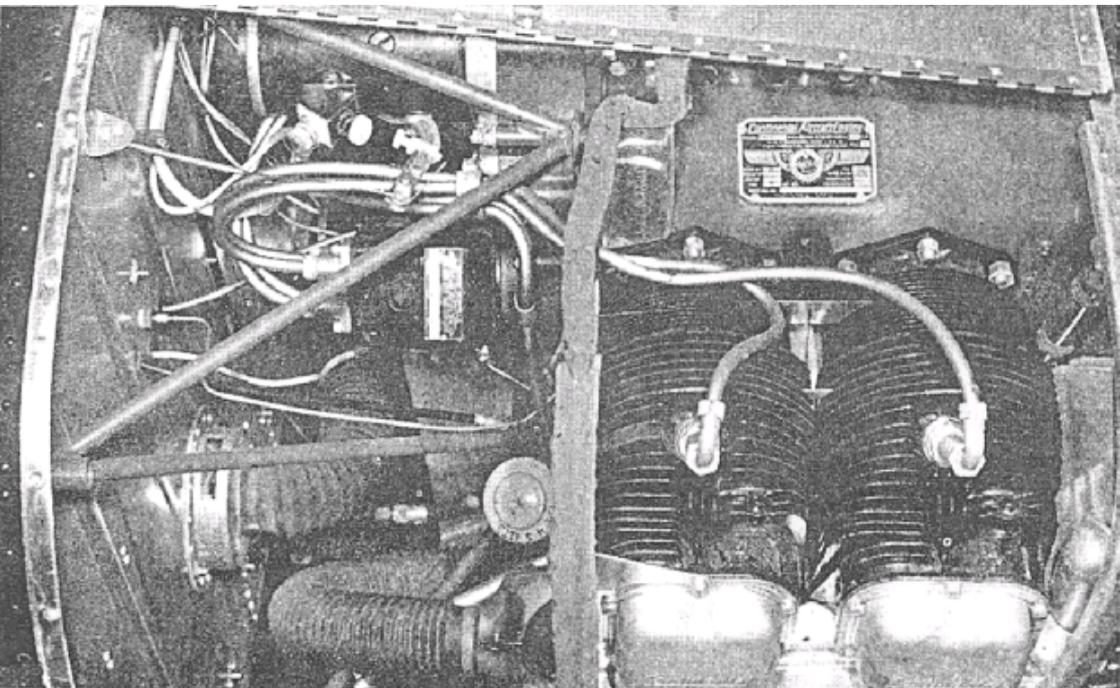
CLEARING THE PROPELLER:

“Clearing” the propeller should become a habit with every pilot. Making sure no one is near the propeller before the engine is started should be a positive action. Yelling “clear” in loud tones is best. An answering “clear” from ground crew personnel is the response that is required.

ENGINE

Oil Level: The oil capacity on the Continental C-85 is four and one-half quarts. The quantity can be checked easily by raising the hood on the right side and reading the quantity in the sump directly on the stick attached to the oil tank cap. In replacing the cap, make sure that it is on firmly and turned all the way to the stop at the right to prevent loss of oil through the filler neck.

Figure 1 — Continental 85 Engine Installation



OPERATING DETAILS

Fuel Strainer Dram: The fuel strainer drain is a valuable accessory. It provides a quick simple method of draining any water that might have collected in the fuel line. It is located just ahead of the firewall and is easily accessible by reaching in the bottom rear opening of the cowl. A quarter turn is all that is necessary. Make sure that the valve is closed before leaving it. The valve is spring loaded; allow it to snap closed to insure seating.

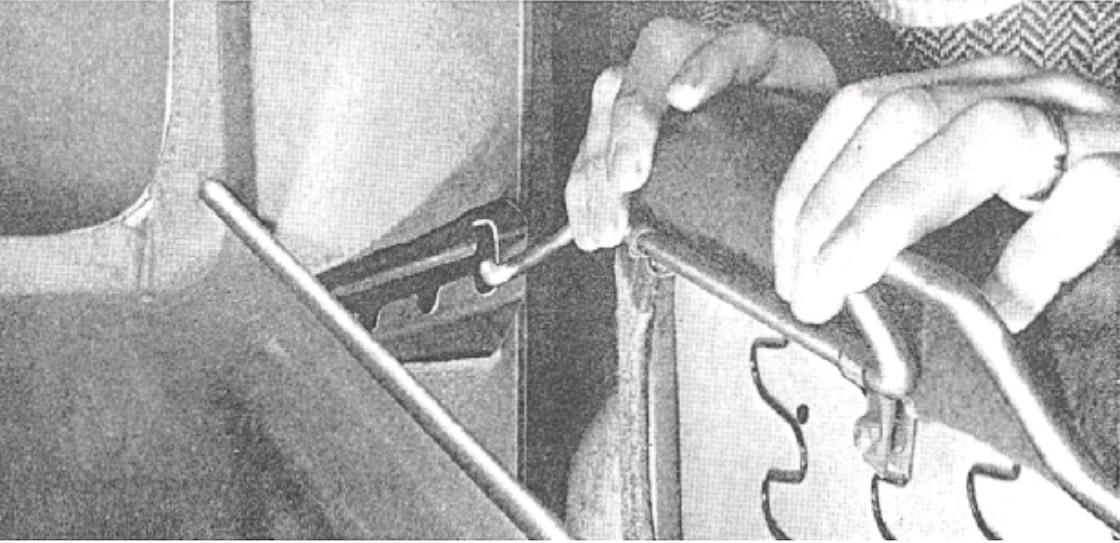
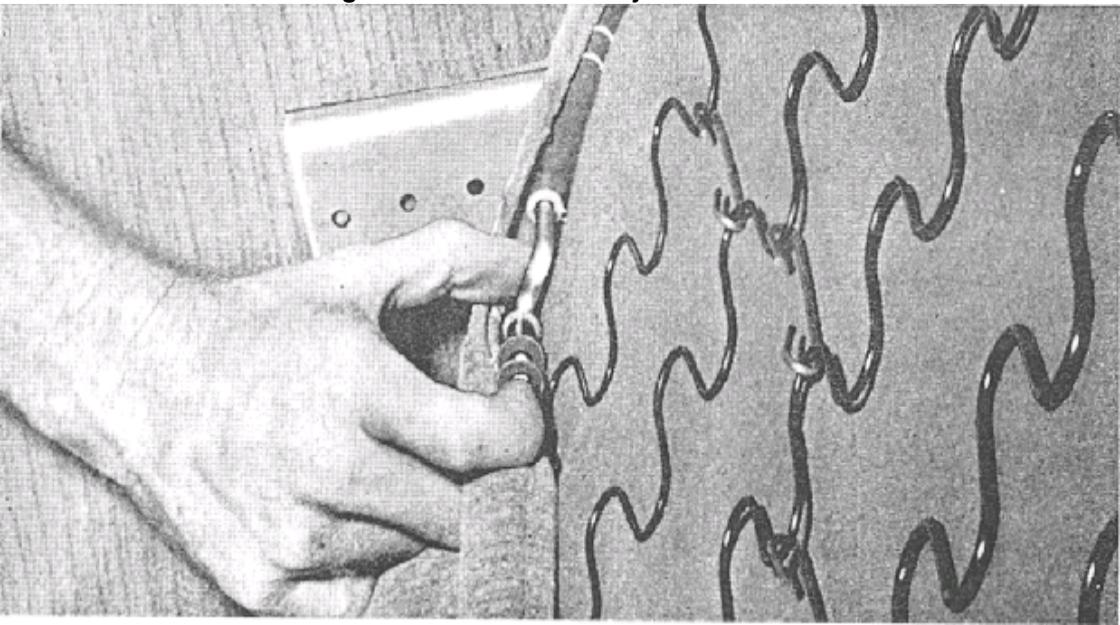


Figure 2 — Seat Back Adjustment — Top

Figure 3 — Seat Back Adjustment — Bottom



CABIN

Seat Adjustment: The seat back hinges at the bottom to provide easy access to the baggage compartment. The seat back also offers four fore and aft points of adjustment both at the bottom and top. Normally, while one person operates the airplane the correct seat adjustment can be determined at the outset and no further adjustment is necessary. Adjustment is accomplished on the bottom by pulling in the spring loaded pin on the seat, the fixed pin can then be placed in the desired hole and die spring loaded pin inserted in the hole on the other side. The top adjustment is accomplished in the slotted recesses using the same handle that is used to open the seat back for access to the baggage compartment.

PARKING BRAKE:

The parking brake control is operated in conjunction with the toe brake and is a part of the master brake cylinder. In setting the parking brake, first press the toe brake to the desired brake pressure then pull the control out to engage locking lever and release the toe brake pressure. To release the brake press parking brake control in, apply pressure to the brake pedals and then release them.

FUEL SYSTEM:

The quantity of fuel should be checked before each flight. There are two 12½ gallon tanks, one in each wing with direct reading gas gauges in the cabin at the wing root. A good precaution is to physically check the fuel quantity in die tank and security of tank caps before entering the airplane. The fuel system is shown diagrammatically in Figure 4. The fuel is brought to the engine by gravity flow through aluminum alloy tubing which runs aft of the cabin door post beneath the doorsill and across to the center of the ship where the two lines connect to the tank selector valve. A single fuel line runs forward from the selector valve to the fuel strainer on the firewall and thence to the carburetor. Fuel may be drained at the fuel strainer. The fuel tank selector valve provides fuel flow from either the right tank or the left tank and provides a shut-off for both tanks. The selector valve cannot be set to provide fuel flow from both tanks simultaneously. *Important* — The fuel valve *handle* indicates the setting of the valve by its position above the valve dial.

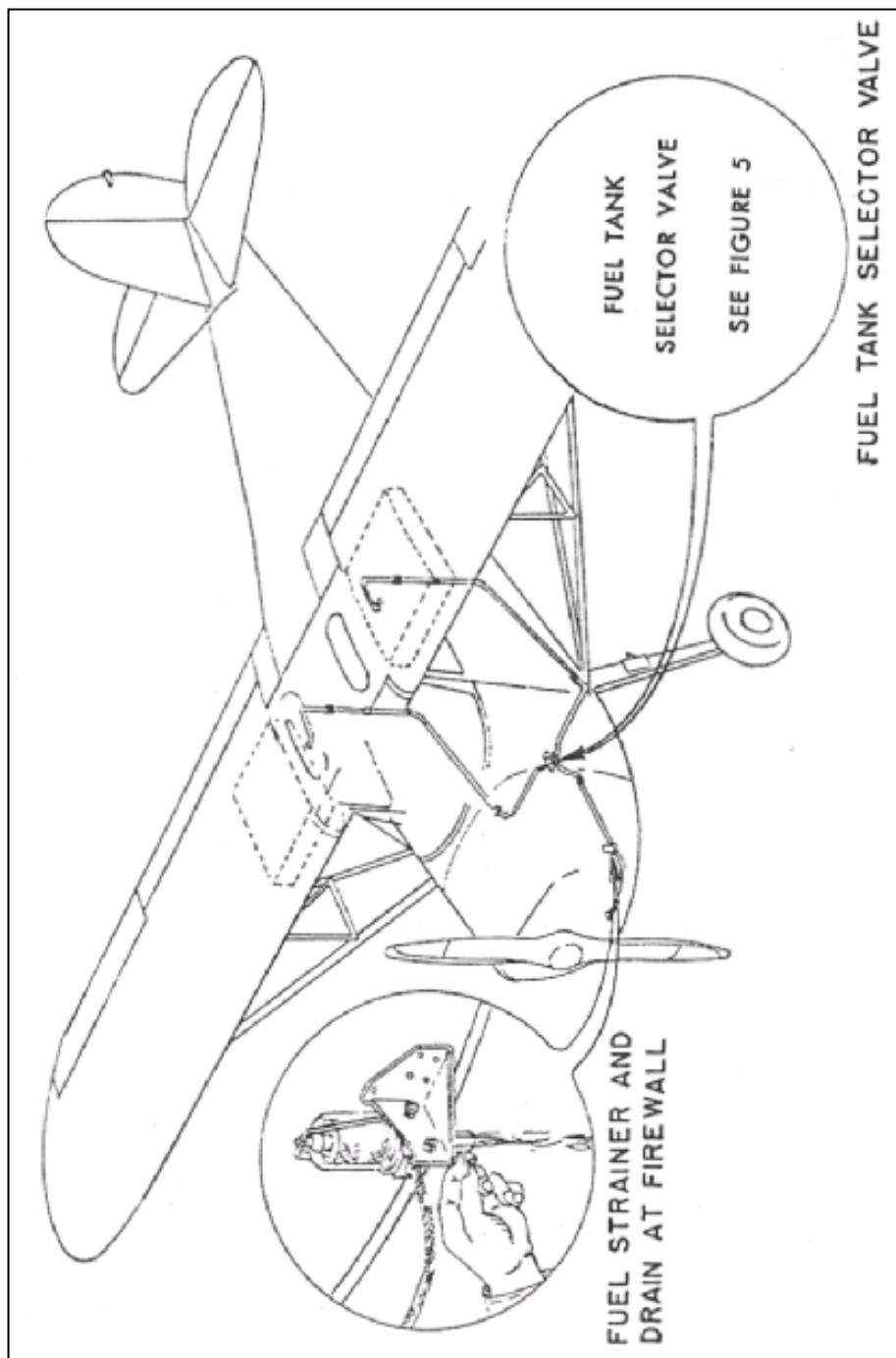


Figure 4 — Fuel System

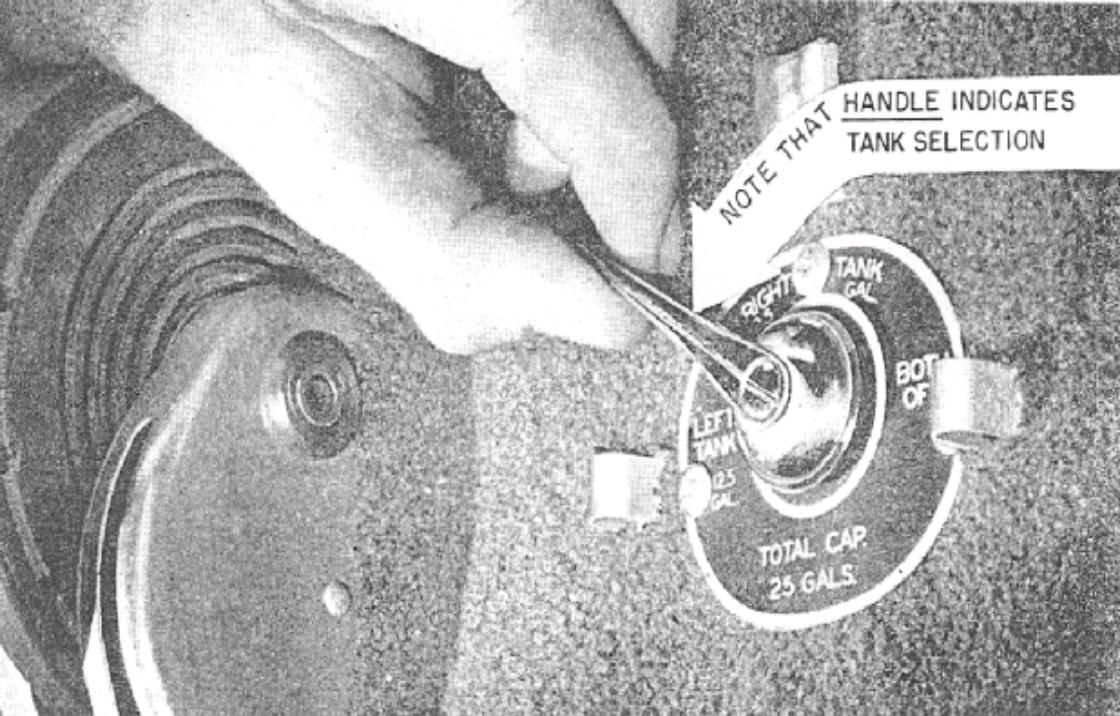


Figure 5 — Fuel Tank Selector Valve

MIXTURE CONTROL:

If installed as optional equipment, the mixture control is to be always set at “full rich” for starting and take-off purposes. Pulling out on the control leans the fuel mixture. The mixture control is not a device for cutting down fuel consumption but rather a device for obtaining better engine operation and performance at altitudes above 5000 feet. The mixture control should be used cautiously to lean mixtures to give maximum engine r.p.m. when flying above 5000 feet pressure altitude. Too lean a mixture will cause excessive engine heating and result in damage.

THE PRIMER:

The primer ordinarily is not required except at winter temperatures. It is used to supply an initial charge of raw fuel to the cylinders to aid in starting the engine. To operate, first unlock the plunger by pressing in and at the same time turning the knob to the left, then slowly pull the plunger all the way out and then push the plunger all the way in. This action is termed “one stroke of the primer.” Make sure that the magneto switch is “off” and throttle “closed,” then give the engine three or four strokes with the primer as the engine is turned over by hand or by engaging the starter.

OPERATING DETAILS

CARBURETOR AIR HEAT:

The carburetor air heat control is located on the instrument panel. The push-pull control operates the butterfly valve in the carburetor air intake which proportions the hot and cold air entering the carburetor. To provide heated air for the carburetor, pull out the control; to provide only cold air for the carburetor, push the control in all the way. Carburetor ice can form on the ground with the engine idling, therefore, just before take-off when you run the engine and test the magnetos be sure and have the carburetor heat in the "on" position. Leave it in that position until you open the throttle for the take-off run. Then move carburetor heat to the cold air position. This gives maximum power for the take-off. Then watch engine for any indications of ice (roughness or loss of r.p.m.) during climb and apply full carburetor heat if engine begins to ice. The correct way to use carburetor heat is to first use full heat to remove any ice that is forming. By trial and error determine the minimum amount of heat required to prevent ice forming each time removing any ice that is formed by applying full heat. On each subsequent trial, increase the amount of heat applied until no ice forms. On approach glide just before reducing power apply full carburetor heat and leave in full hot air position.

CABIN AIR HEAT:

The cabin air heater (and cold air intake) control, if installed as optional equipment, is located on the instrument panel. The push-pull control operates to open the heater valve allowing fresh warm air (or cold air if the heater muff is not installed) to enter the cabin when the control is pulled out. Intermediate positions of the control may be used as desired.

MASTER SWITCH:

The master switch operates the solenoid switch located at the battery turning on all electrical power at the battery. In the event of a short or a malfunctioning of the airplane electrical system, the master switch may be turned off and the engine will continue to run on the magneto ignition system.

MAGNETO SWITCHES:

The two magneto switches are either toggle switches located on the panel or are operated with a key. The panel placards indicate the right and left magnetos. The switches operate to ground out the indicated magneto when the switch is turned off.

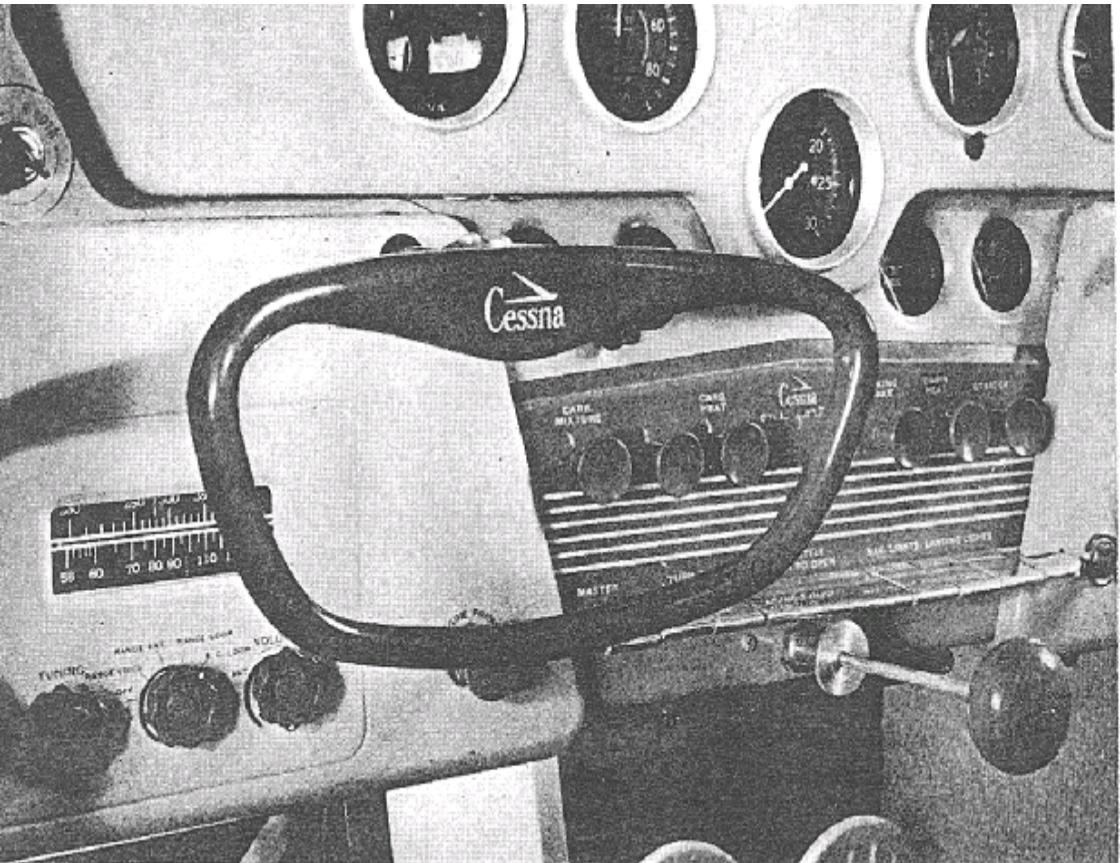


Figure 6 — Instrument Panel, Pilot's Side

TURN AND BANK:

The turn and bank indicator, if installed as optional equipment, is an electrically operated unit which operates when its switch on the instrument panel is placed in the "on" position.

NAVIGATION LIGHTS:

The navigation light switch is located on the instrument panel and controls the wing lights, rudder light, and the instrument panel lights in the Model 140. The later model of the 140 has an independent rheostat switch for the panel lights located on the bottom edge of the instrument panel just right of center. A word of precaution is worthwhile here. Prior to installation of the rheostat the instrument panel light bulbs used were Grimes T 3¼-3 CP having a rating of .33 amperes each. The bulbs used with the rheostat are G. E. No. 1826 having a .12 ampere rating. The earlier model bulbs have high enough ampere capacity to allow the rheostat to get too hot with possible burning out of the unit. Make sure when replacing

OPERATING DETAILS

instrument panel bulbs that the correct bulb is used as they will both go into the same socket. The model number of the bulb is marked on the base. The electrical System is available as optional equipment on the Model 120, but does not include the instrument panel lights.

LANDING LIGHTS:

The landing light switch or switches are located on the instrument panel if a landing light or landing lights are installed as optional equipment. The landing light switch controls both the extension and retraction of the light and also the turning off and on of the light, itself. When the switch is on, the lights will extend to the proper position and then turn on. If it is desired to turn off the light it is only necessary to place the switch in the "up" position and partially retract it. The light may then be turned back on by, placing the switch in the "on" position again. When desired to retract the lights, the switch is placed in the "up" position which turns off the light and retracts it.

FUSES:

Fuses for the various electrical devices are located beneath the electrical switches under the edge of the instrument panel. The fuse circuit and fuse capacity is indicated above the respective fuse retainers. Fuses may be removed by unscrewing the fuse retainers and lifting out the fuse. Spare fuses are located in a clip on the inside of the glove compartment door on the 140 and beneath right hand side of panel for 120.

CIGAR LIGHTER:

The cigar lighter, if installed as optional equipment, is located on the instrument panel. Push the lighter all the way in to heat the element and release. The lighter will pop part way out when sufficiently heated. When replacing lighter in holder press only part way in.

ELEVATOR TRIM TAB:

The elevator trim tab is an auxiliary movable control surface located on the trailing edge of the elevator. It is used to relieve control wheel pressures during flight. The tab is controlled by rotating the tab control wheel located vertically just at the edge of the seat between the pilot and passenger. The tab indicator adjacent to the wheel shows the relative position of the tab.

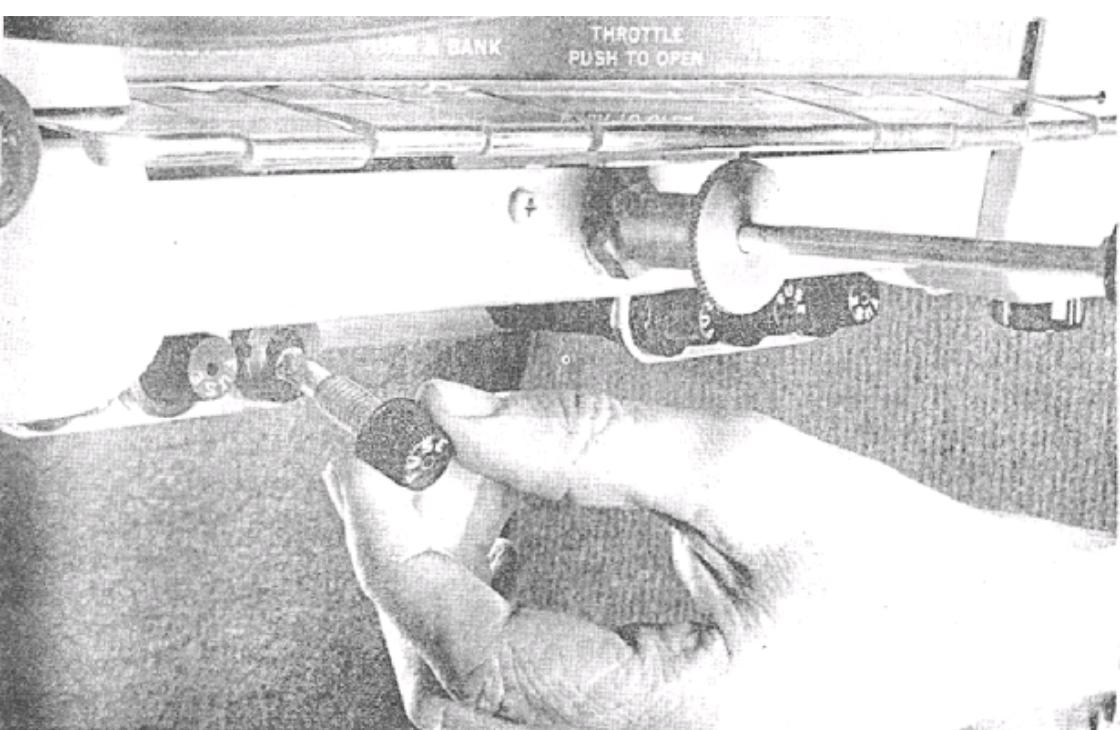
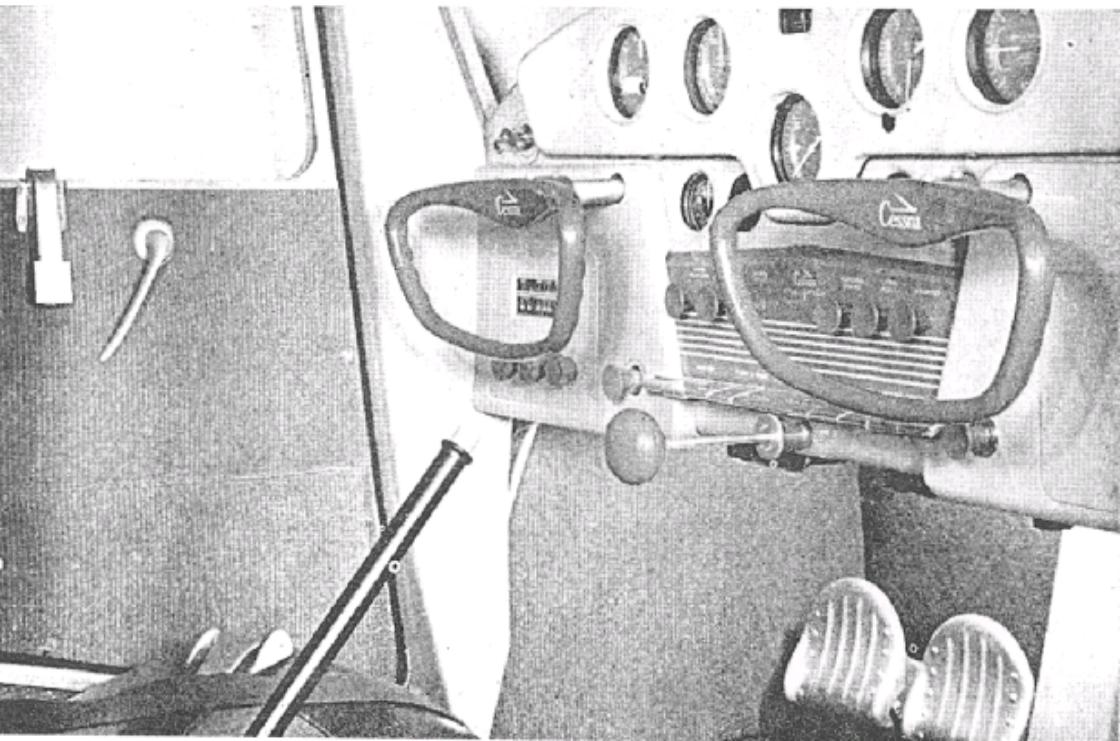


Figure 7 — Fuse Retainer, Method of Fuse Replacement

Figure 8 — Cabin, interior, Flap Handle Raised



OPERATING DETAILS

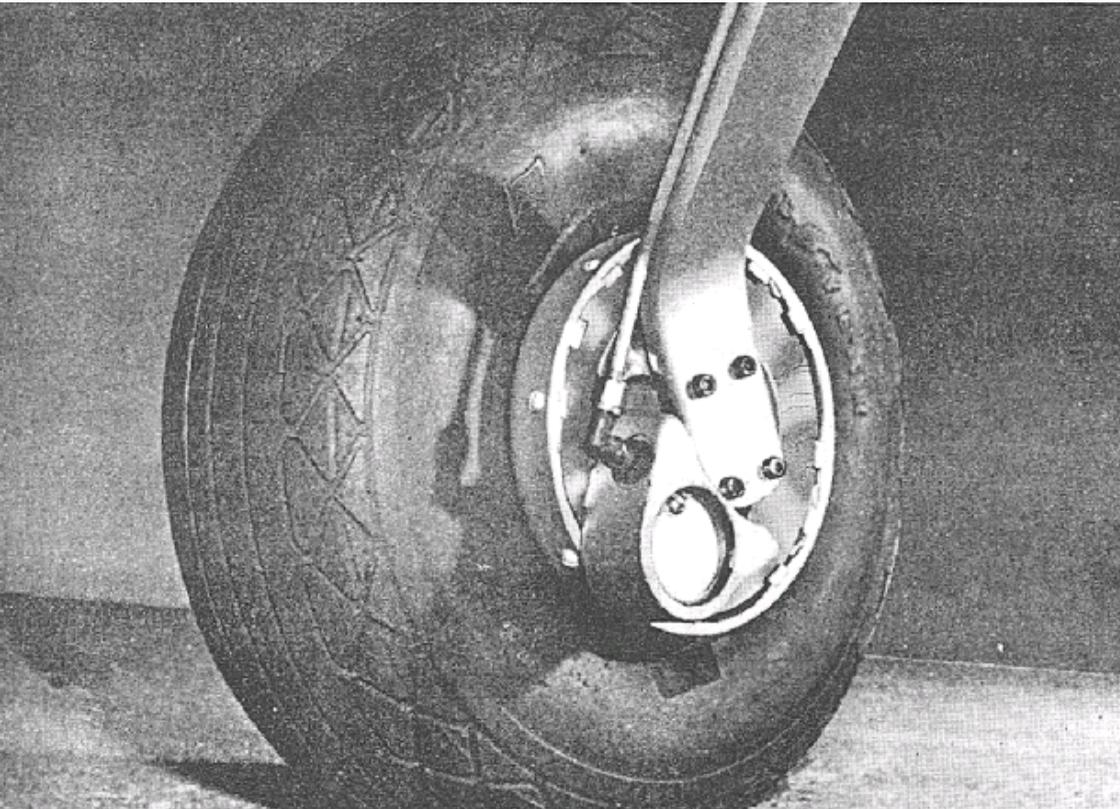
Forward movement of the wheel trims nose down and vice versa. This allows the airplane to be trimmed to fly level for a wide selection of load and speed conditions.

FLAPS:

Flaps installed only on the 140 are raised or lowered with the flap handle located between the pilot and the passenger. Flaps may be lowered or raised during normal flying whenever the airspeed is less than 82 m.p.h. Intentional spinning with "flaps down" is prohibited. The flaps supply some added lift and considerable drag; the resulting action steepens the glide of the airplane enabling the pilot to bring the airplane in over an obstruction and land shorter than could be done without flaps. Forward speed of the airplane is only slightly affected by the action of the flaps.

For unusually short fled take-offs the application of full flaps

Figure 9 — Wheel and Brake Installation



will be of assistance, applied just before the airplane is ready to leave the ground. The flaps should not be released until an altitude of at least 100 feet above the highest obstacle has been obtained.

BRAKES:

The hydraulic brakes are individually operated. The rudder pedals are pivoted so that braking action is applied by pressure with the toe on the rudder pedal to either or both wheels.

TAXIING:

Taxiing is facilitated by the use of a steerable tail wheel which is cable connected to the rudder. The steerable tailwheel is standard equipment on the Model 140 and optional on the Model 120. The tailwheel is steerable through approximately 66° to either side of the straight rearward trailing position and automatically becomes full swiveling when turned to a greater angle. The airplane may thus be turned about in its own length, if desired, yet is fully steerable while taxiing. By using the steerable tailwheel and by keeping the heels on the floor, excessive heat and unnecessary wear of the brakes can be avoided. The heels on the floor precaution applies also to take-off and landing procedure.

TAKE-OFF:

The shortest take-off run can be obtained by keeping the tail low during the whole procedure. The tab can be set to assist in this. With the tail just a little off the ground the wings begin to provide lift quickly. The airplane "breaks ground" at 40 m.p.h. and accelerates rapidly with complete control. From this point the best rate of climb can be easily established at 73 m.p.h. For a long climb at full throttle 80 to 90 m.p.h. is recommended.

GROUND HANDLING:

Proper tie down and ground handling (for instance, pushing and pulling the airplane around on the ground) are necessary if the airplane is to remain always airworthy.

Sufficiently strong (700 lbs. tensile strength) ropes fastened to suitably set tie down rings in the ground are required as shown in Figure 11 to properly fasten the airplane and prevent strong gusty winds from damaging the airplane. Also as mentioned in the fore part of the book, adequate measures must be taken to insure that the

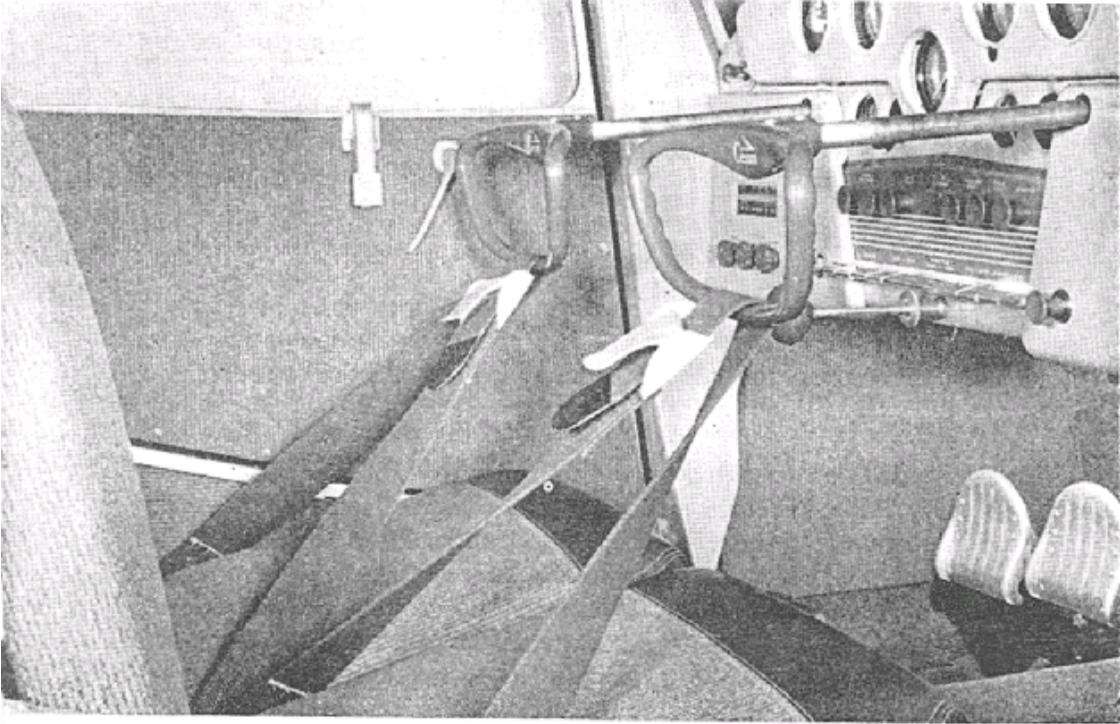
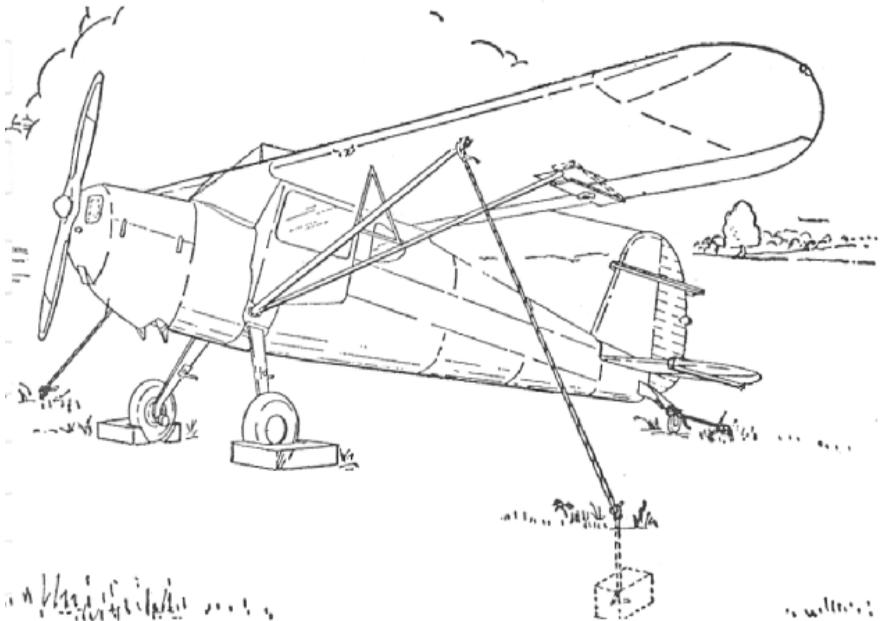


Figure 10 — Use of Seat Belt as a Control Lock

Figure 11 — Suggested Tie Down Procedure



flaps, ailerons and empennage will not be damaged in a high wind. Install the control lock.

Flaps are held in the up or “closed” position by springs. To prevent damage to surfaces, a surface control lock should be installed between the flap and the aileron on both right and left wing panels when the airplane is tied out in strong, gusty winds.

When moving the airplane about push at the root front edge of the stabilizer at the fuselage and at the landing gear or the strut root fitting. Do not lift the empennage by the tip of the stabilizer; likewise, do not shove sidewise on the upper portion of the fin.

There is an insert type handhold along the top edge of the cowl inside of the cabin. This handhold is to be used as an assist handle in getting into and out of the airplane. A suggested method of entrance into the airplane from the left side is to place the left foot on the step, put the right foot into the airplane, then place the left foot on into the cabin. The left hand should be placed in the handhold with the right hand on the top of the seat back. The door is not an assist handle and should not be used as such.

COLD WEATHER OPERATION:

Prior to starting on cold mornings, it is advisable to pull the propeller through several times by hand to “break loose” or “limber” the oil, thus conserving battery energy. The oil temperature indicator on current production airplanes registers a minimum of 100°F. During cold weather operations no indication, therefore, will be apparent on the gauge prior to take-off if outside air temperatures are very cold. After a suitable warm-up period with the oil pressure indicator in the operating range, it will not be necessary to wait for the oil temperature gauge to indicate 100°F.

For operation at temperatures consistently below freezing, a winterization kit consisting of plates for closing cowl openings and an asbestos covering for the oil sump is available at your distributor or dealer for a nominal charge.

The airplane is eligible for use with Federal skis. Your distributor or dealer will be glad to give you details on their installation on your airplane.

OPERATING DETAILS

HOT WEATHER OPERATION:

Your airplane is designed to perform the best under normal operating temperature conditions. Just as winterization is necessary when the airplane is flown in real cold outside air, a summerization kit is suggested when the airplane is flown continually under very hot outside air conditions. The summerization kit consists of a lip which is easily added to the bottom trailing edge of the engine cowl. This kit is available from your nearest Cessna dealer or distributor.

STORAGE:

The metal construction in your Cessna makes outside storage of it practical. Inside storage of the plane will increase its life just as inside storage does for your car. If an airplane must remain inactive for a time, cleanliness is probably the most important consideration — whether your airplane is inside or outside. A small investment in cleanliness will repay you many times in not only keeping your airplane *looking* like new but in *keeping* it new. A later section in this book on the care of aluminum surfaces and the use of it as a seaplane covers the subject in greater detail. Dirt and mud have the same effect as salt, only to a lesser degree. And do not neglect the engine when storing the airplane. Turn it over by hand or have it turned over every few days to keep the bearings, cylinder walls, and internal parts lubricated. Airplanes are built to be used and regular use tends to keep them in good condition. An airplane left standing idle for any great length of time is likely to deteriorate more rapidly than if it is flown regularly and should be carefully checked over before being put back into service.

SECTION IV — CARE OF THE AIRPLANE — OWNER'S RESPONSIBILITIES

In order that the airplane may give the performance, stamina and dependability built into it, certain requirements in its care, inspection and maintenance must be followed. These requirements will assure the owner of satisfactory service and in the long run pay for the effort many times over.

FUEL AND OIL REQUIREMENTS:

The airplane should be serviced with only the best lubricants and fuels. Aviation grade fuel will give better results than other grades of fuel and will be more economical in the long run. The recommended fuel is either 73 or 80 octane rating with a lead content of not more than ½ cc per gallon. Highly leaded fuels are not recommended.

Aviation grade oil is recommended; change the oil each 100 hours of operation. When adding or changing oil, use the "weights" in the following table:

<i>Outside Temperature</i>	<i>Recommended Oil Viscosity</i>
Below 32°	SAE 20
32° to 70°	SAE 30
Above 70°	SAE 40

POWER PLANT:

The power plant used in the Cessna 120 and 140 is an 85 horsepower Continental Model C-85 Engine. It is bolted to the engine mount through rubber bushings providing complete separation of the engine and air frame. An air filter is incorporated as a part of the air intake system.

Engine Maintenance is covered in the Continental Operator's Handbook.

LANDING GEAR, WHEELS, AND TIRES:

The landing gear consists of a single tapered spring leaf for each leg which replaces the shock strut, torque arms, coil springs, bearings, and plungers, used in conventional shock strut types. This spring is made from the highest quality chrome vanadium steel, heat

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treated and shot peened for added fatigue resistance. No maintenance of this spring is necessary other than occasional painting to prevent rusting. Operation of the gear actually makes ground handling, taxiing, and landing easier.

Correct tire pressure is essential to realize the full benefit of the spring landing gear properties and obtain maximum tire wear. Correct tire pressure is 16 lbs./sq. inch gauge pressure. The accumulation of oil and grease on tires will have an adverse effect on tire life and should be removed with soap and water. The 6:00 x 6 wheel is a two piece type cast of magnesium alloy and equipped with a single disc type brake. Tires are easily removed by jacking up the airplane, removing the wheel and disassembling the two piece wheel. Be sure that all of the air is out of the tire and tube before taking the wheel apart. The tire is reinstalled by reversing the procedure. In removing the wheel, it is necessary to remove the brake disc anti-rattle clips before the wheel can be taken off the axle. The wheel axle nut should be tightened finger tight plus one-half turn.

The wheel alignment has been properly set at the factory. Wheels should toe in one-eighth inch to one-quarter inch when the airplane is in the three point position. To establish the three point position each wheel should be lifted free of the ground and then set back on the ground with the weight of the airplane on it. Alignment is accomplished by the use of wedge shaped shims at the wheel.

The brake master cylinders located in the cabin at the rudder and brake pedals incorporate a reserve reservoir for brake fluid to replace leakage losses. The reservoir should be kept full and this should be checked periodically. Brake fluid should be Univis No. 34 or equivalent (specification 3580 or AN-VV-O-366) petroleum base hydraulic fluid. (Do not use castor oil base hydraulic fluid.) Adjustment of the brake is not necessary. Whenever the brakes feel spongy, bleed out the entrapped air from the top of the actuating cylinder at the brake and refill the hydraulic reservoir at the pedal.

The tailwheel mounting a solid rubber tire is the full swiveling type mounted on leaf springs and may be steered by the addition of chains from the wheel to the rudder control system. The tailwheel tire is removed and replaced by taking the tailwheel apart the same as the main wheel.

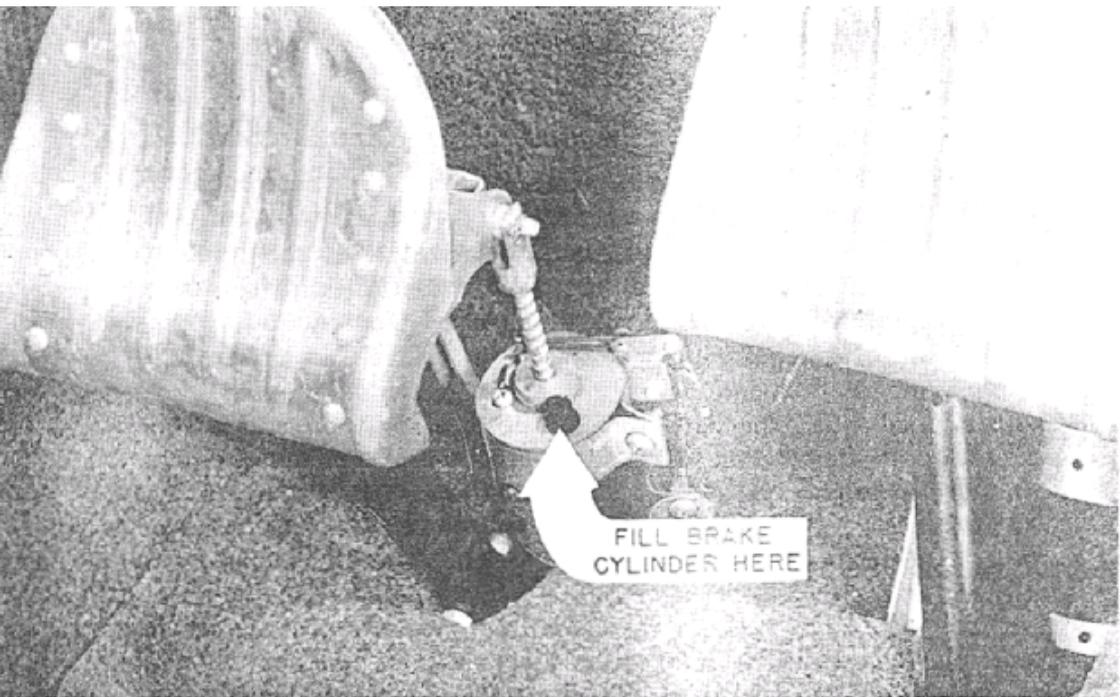
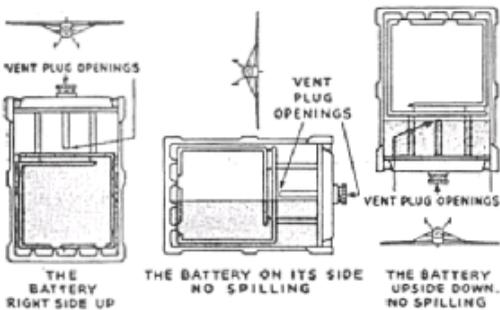


Figure 12 — Rudder Pedals, Pilot's Side

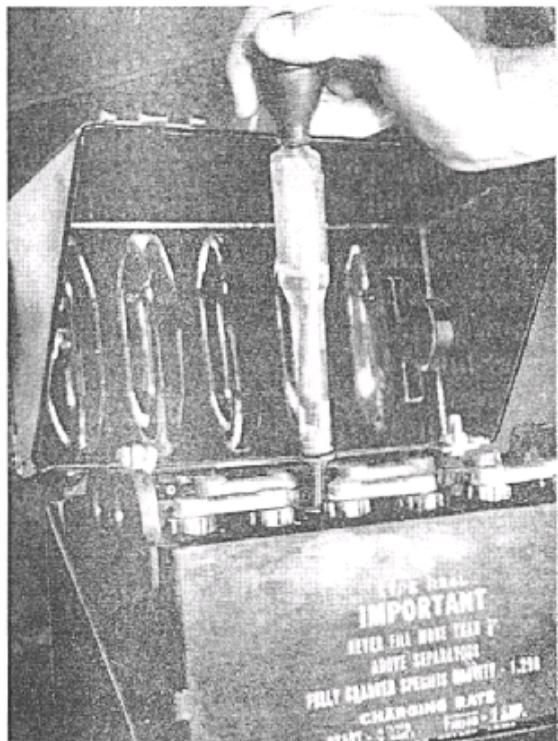
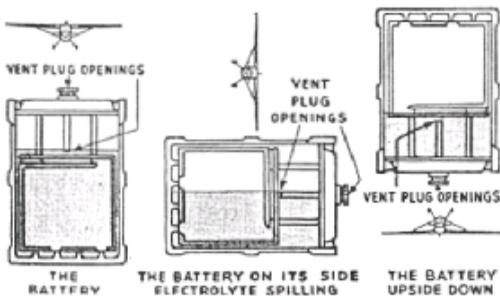
Figure 13 — Battery, Maintenance of Correct Electrolyte Level

The following diagram illustrates non-spill characteristics of Battery Type R24L

CORRECT LEVEL OF ELECTROLYTE



ELECTROLYTE LEVEL TOO HIGH



CARE — RESPONSIBILITIES

BATTERY:

The battery is located behind the baggage compartment and is reached by unfastening the snap fasteners holding the fabric partition.

Maintain the level of the battery electrolyte at the level of the horizontal baffle plate (the plate with the holes in it) which is approximately two inches below the filler plug by adding distilled water as required. Obtain the water level but do not fill above the plate mentioned above. This water level should be maintained when the battery is in the level position and, therefore, approximately the forward one-quarter of the plate should not be covered when the battery is in the airplane with the airplane in three point position on the ground. The space above the horizontal plate is a fluid reservoir when the battery is tipped to the side or inverted. See Figure 13. When the electrolyte level is too high, spillage of fluid will result when acrobatic maneuvers are performed and as a result, the proper concentration of acid will be destroyed. Wash off any spilled acid and corrosion products with soda water solution to neutralize acid, then rinse with clear water.

Keep battery connections tight and clean, otherwise excessive voltage may be generated and damage other electrical equipment. Control of the charging current and voltage is accomplished by the generator regulator mounted on the firewall. Only those persons familiar with the operation, adjustment, and repair of the control should be permitted to remove the cover of the device.

The ammeter indicates the generator charging rate which will normally be in the neighborhood of 4 amps. Discharge generally indicates electrical energy drain in excess of generator output — resulting from:

- (1) Use of a large number of electrical units.
 - (2) Malfunctioning generator.
 - (3) A short in the electrical system.
- (2) and (3) require corrective measures. Failure of the ammeter to indicate will generally be a wiring problem or a malfunctioning indicator.

The airplane should not normally be operated with the master switch in the “off” position nor should it be operated without a battery or with battery disconnected. Damage to the generator and the voltage regulator may be the result.

The master switch on the instrument panel operates a solenoid located at the battery. Occasionally when the battery is allowed to get sufficiently low, it will not have enough energy to actuate the solenoid when the master switch is turned on resulting in the generator being unable to charge the battery. In this case, the battery should be removed and recharged.

THE PLEXIGLAS WINDSHIELD AND WINDOWS:

The windshield is a single piece full floating molded unit of lifetime plastic. To clean plexiglass, wash with plenty of soap and water using the palm of the hand to feel and dislodge any caked dirt or mud. A soft cloth, sponge, or chamois may be used, but only as a means of carrying water to the plastic. Dry with a clean, damp chamois. Rubbing with a dry cloth builds up an electrostatic charge on the glass so that it attracts dust particles from the air. Wiping with a damp chamois will remove this charge as well as the dust and is therefore recommended. Remove oil and grease by rubbing lightly with a cloth wet with kerosene, hexane, naphtha or methanol. Do not use gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher, or de-icing fluid, lacquer thinner or glass window cleaning spray as they will soften the plastic and may cause crazing.

If after removing dirt and grease no great amount of scratching is visible, the plexiglas should be waxed with a good grade of commercial wax. These waxes will fill in minor scratches and help prevent further scratching. The wax should be applied in a thin even coat and brought to a high polish by rubbing lightly with a dry, soft cloth such as canton or domet flannel.

ALUMINUM SURFACES:

The Alclad 24ST used in the construction of Cessna 120 and 140 airplanes requires a minimum in care to keep the surface bright and polished, neat and trim looking. The airplane may be washed with clear water to remove dirt and with gasoline, carbon tetrachloride or other non-alkaline grease solvents to remove oil, grease, and paint.

Due to the fact that aluminum will not corrode without the presence of moisture, it is recommended that the surfaces be

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kept waxed to exclude all moisture and thus retain the bright appearance of the metal. Use only waxes and polishes containing no harsh abrasives or grit and only those which are neutral in reaction. Dulled aluminum surfaces may be cleaned effectively with Bon Ami. A cleaning solution consisting of about two quarts of alcohol, two quarts of water and a package of powdered Bon Ami will be found to be particularly effective, followed by waxing to retain the bright appearance.

THE SEAPLANE:

Whether the airplane is operated as a seaplane or a land plane near bodies of salt water, particles of salt remaining on the aluminum as a result of salt spray or salt water contact should be removed as soon as possible by rinsing thoroughly with clear fresh water, then cleaning and waxing as soon as practicable. Salt, if allowed to remain on the surface, will attack and corrode the aluminum alloy due to the moisture absorption of the salt and consequent chemical reaction and will eventually result in a permanent pitted and etched appearance of the metal. The Bon Ami cleaning procedure will remove salt water corrosion in its early stages. The best precaution against such an attack is the maintenance of an unbroken film of good wax and frequent washing with clean fresh water.

ENGINE COMPARTMENT:

The engine section should be kept free of an accumulation of oil, grease and dirt to prevent a fire hazard. Make sure that the drain holes in the reinforcement rib on the inside surface of the bottom cowl are open. The bulkhead between the cabin and the engine section is aluminized iron and may be cleaned with recommended solvent cleaners for grease and oil.

WING FABRIC COVER:

The wing is covered with Grade "A" predoped fabric and is finished with clear and pigmented cellulose nitrate dope which provides a weatherproof and sun resistant covering. The covering may be cleaned using soap and water to remove grease, oil, etc. A good grade of solvent cleaner specifically made for finished fabric is desirable. A polish or wax is also available for use on coated fabric surfaces which preserve and protect the covering. Fabric rejuvenators are not recommended. Standard patching methods

are applicable and presewn, predoped fabric envelopes are available for recovering. No rib stitching is necessary because of the spring clip fabric to wing rib attachment method used.

UPHOLSTERY:

Keeping the inside of your airplane clean is no more difficult than taking care of the rugs and furniture in your home. It is a good idea to occasionally take the dust out of the upholstery with a whisk broom and a vacuum cleaner.

If spots or stains get on the upholstery they should be removed as soon as convenient before they have a chance to soak and dry. Cleaning fluids having a carbon tetrachloride or a naphtha base are recommended. In using them:

- (1) Carefully brush off and vacuum all loose particles of dirt.
- (2) Don't use too much fluid. The seat cushions are padded with "foam rubber," and since volatile cleaners attack rubber, these paddings may be destroyed if the material gets soaked with the cleaner.
- (3) Wet a small, clean cloth with the cleaning solution, wring out thoroughly. Then open cloth and allow the fluid to evaporate a trifle.
- (4) Tap the spot lightly with the cloth, but don't rub it. This will pick up particles which are too embedded to be removed by brushing. Repeat several times, using a clean part of the cloth each time.
- (5) Moisten another piece of clean cloth with cleaner and allow to evaporate until barely damp. Now rub the spot lightly, working from the outside in toward the center. (This, as you probably know, keeps the spot from spreading and is less likely to leave a ring.) If necessary, repeat several times.
- (6) Brush again, to remove any further particles which may have become loosened.

PROPELLERS:

The life and satisfactory operation of the wood propeller is a function of how well the finish is kept intact. The maintenance of a good wax finish in addition to the finish already on the propeller is a good first step. Bruises, dents and breaks in the

Figure 14 - Flap Control System

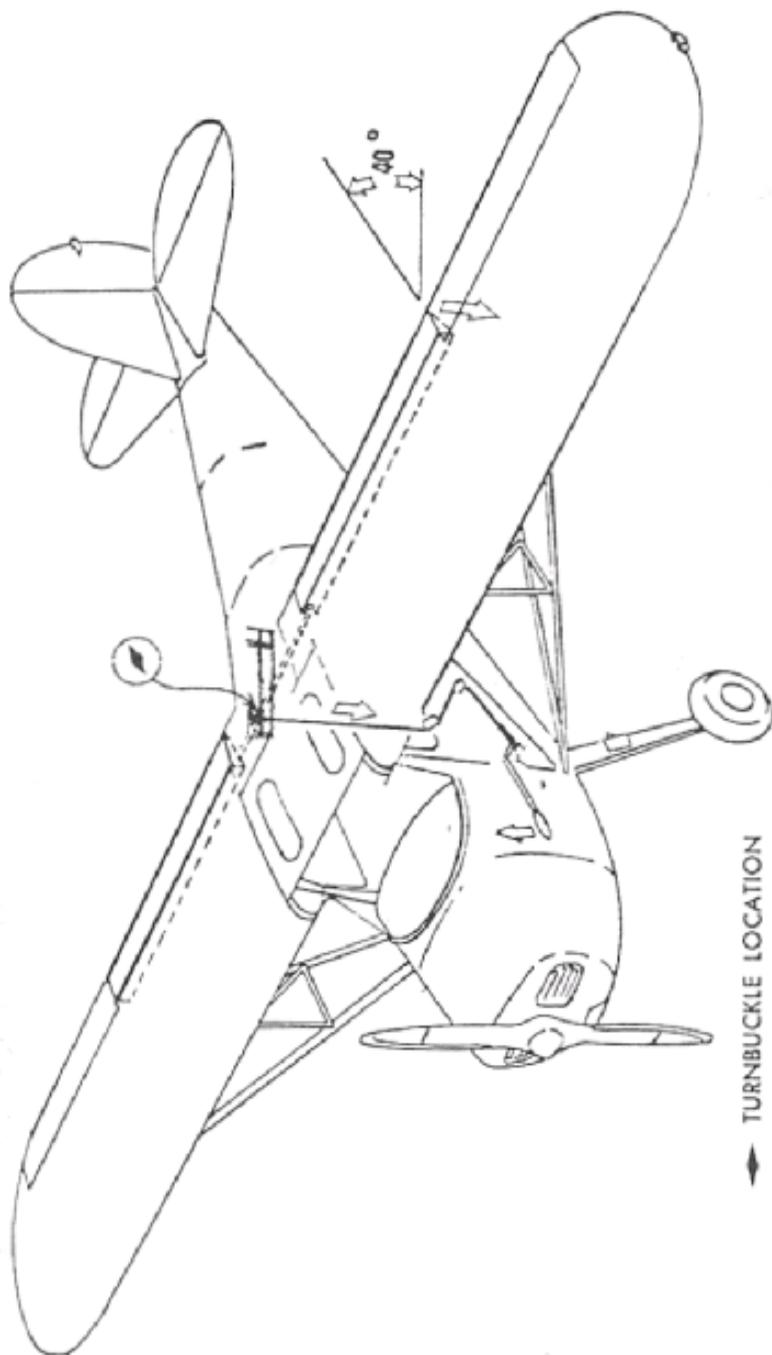
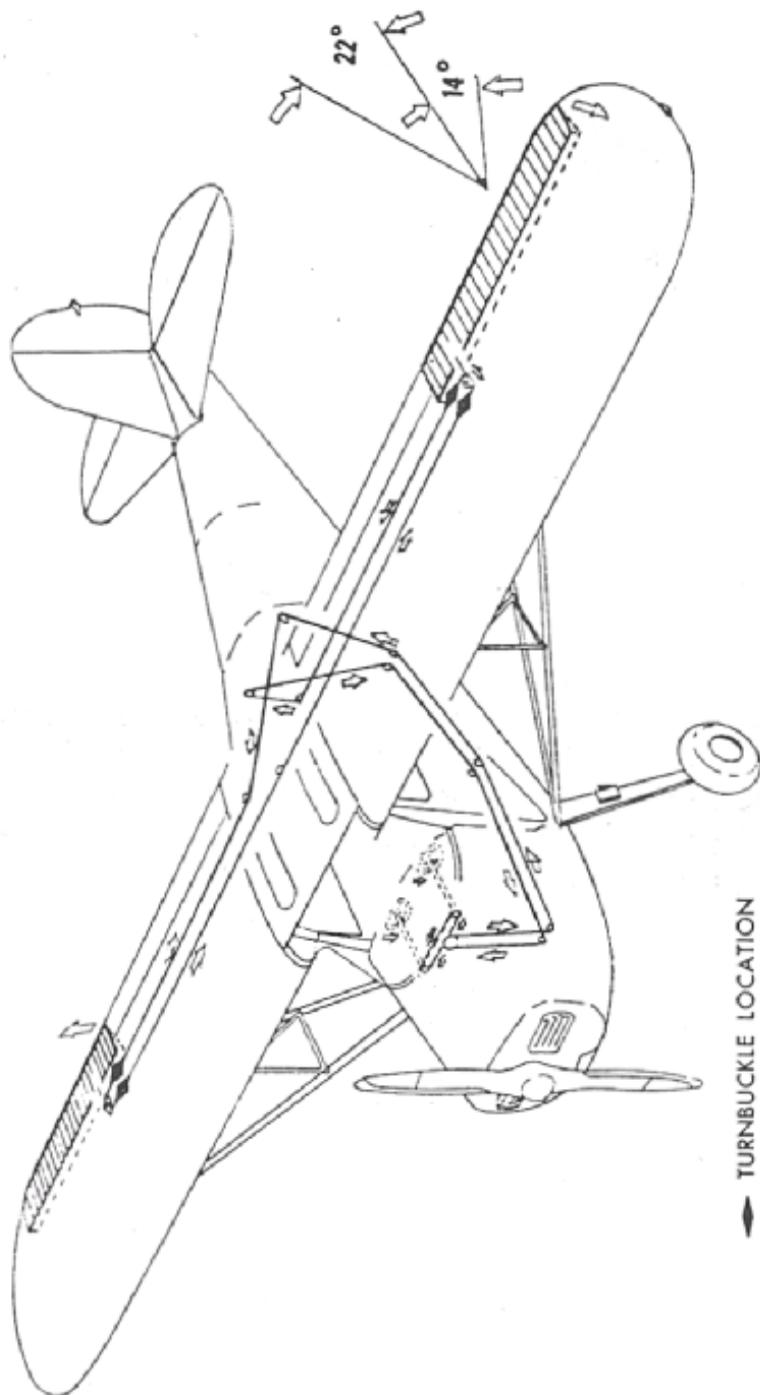


Figure 15 - Aileron Control System



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finish should be immediately repaired with shellac, varnish or other water repellent sealer. No break in the finish should be allowed to remain. This prevents moisture from entering or leaving the wood. The metal tips are designed so that they will crack through. Unless there is actual metal missing, the rivets are loose, or the tip has moved or slipped, the propeller is normal.

The occasional wiping of the metal propeller with an oily cloth will result in cleaning off grass and bug stains and will assist materially in corrosion proofing in salt water areas.

CONTROL SYSTEM:

Figures 14 to 18 incl. outline the control system including control travel limits, location of control stops, and the location of turnbuckles. The use of the single .040 brass wire for safetying of turnbuckles is satisfactory and CAA approved. Rigging method for the various systems is outlined below:

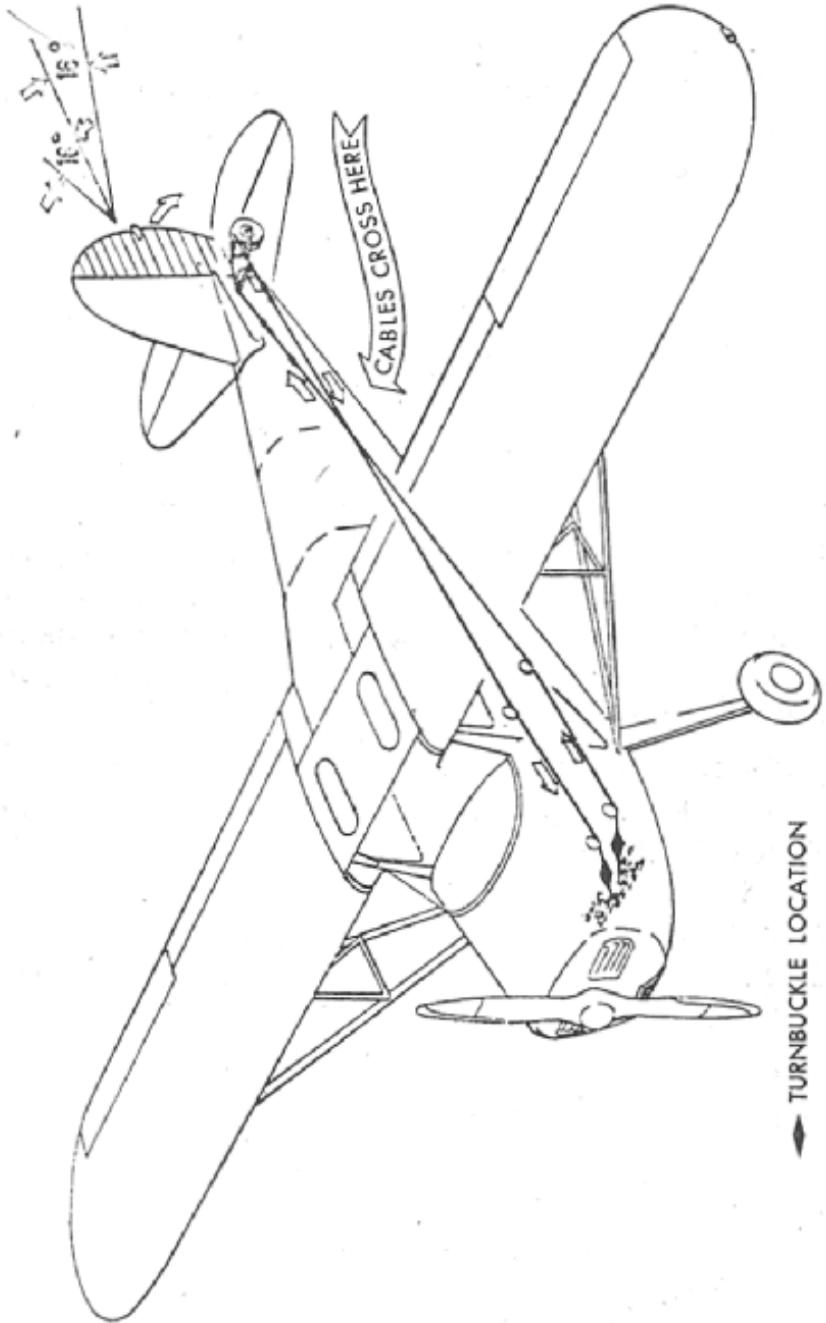
FLAPS (MODEL 140 ONLY):

1. The flaps are set in neutral position by two adjustable stops which are located in the trailing edge of the auxiliary spar ahead of the flaps. Set flaps to the contour of the wing.
2. Flap down travel is 40°. Adjustment is accomplished by changing turnbuckle in the cable system, located rear of baggage compartment.

AILERONS:

1. Place control wheels in neutral position and place a neutral bar across the top of both wheels, using tape or a clamp to secure them. Install chain over sprockets, leaving approximately nine links inboard of the chain guard on each side of the turnbuckle.
2. String cables back through system. Note: The aileron cables cross just back of the baggage compartment.
3. The ailerons on Models 120 and 140 are restricted in travel by a feature built into the bellcranks. Stops in the bellcrank allow a total travel of 36°. In rigging the ailerons, it is important that the bellcranks are neutralized. Connect the cables and adjust bellcrank to a position in which the three bolts are equidistant to the adjacent rib. This measurement is 2 17/32". Cable tension should be approximately 30 lbs., with the control wheels in full forward position. This position should also be maintained in checking the travel.

Figure 16 - Rudder Control System



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4. Adjust ailerons to neutral position, which is to the contour of the flaps. This adjustment is made by disconnecting the aileron push-pull tube (which operates from the bellcrank), and making adjustment on the rod end.
5. Check travel which should be 22° up and 14° down, with a tolerance of plus or minus 1°.
6. Any correction necessary on the travel can be made by tightening the direct cable and loosening the carry-through cable, or vice versa, whichever the case may be. Note: After corrections have been made, check aileron in neutral position and make adjustment per instructions in 4.

RUDDER:

Rudder travel is 16° from centerline of the airplane, with a tolerance of plus or minus 1°. Travel is controlled by stops located on the extreme rear bulkhead. Adjustment is made by increasing or decreasing washer thickness under the head of the bolts which serve as stops.

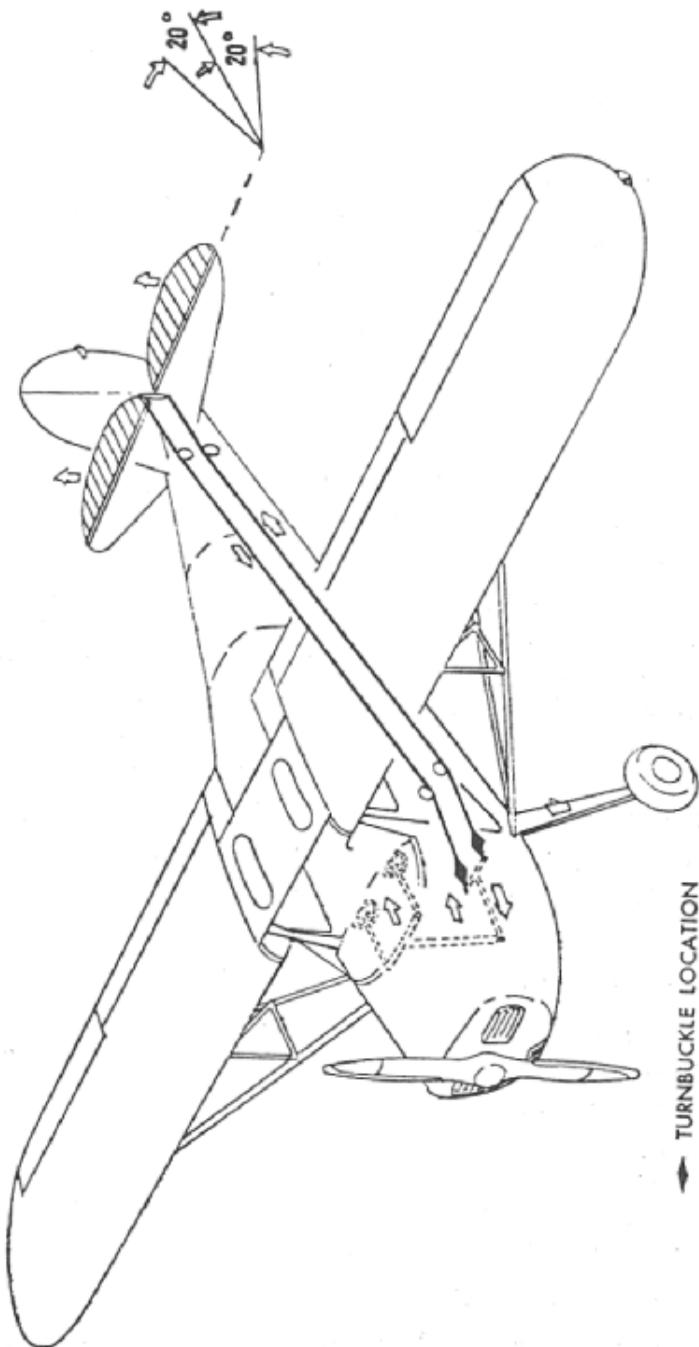
1. Rig stops to allow correct travel of rudder.
2. Install cables, and with the rudder in neutral position, tighten turnbuckles until rudder pedals are neutral, 6" aft of the firewall, measuring to the hingeline of the brake pedal.
3. Check to make sure cables do not rub side holes in bulkheads.

ELEVATORS:

Elevator travel is 20° up and down with a tolerance of plus or minus 1°. This travel is controlled by two stops located in the rear spar of the vertical fin.

1. Set stops so elevator has correct travel when in contact with them.
2. With elevator in full down position, the measurement from instrument panel to centerline of control wheel should be 7".
3. Tighten cables to approximately 30 lbs.

Figure 17— Elevator Control System



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RUDDER TAB:

The rudder tab is a fixed tab located on the trailing edge of the rudder and can be set by bending in either direction, the amount desired.

ELEVATOR TAB:

The elevator tab is actuated by a cable which has a chain incorporated in each end. The chain in front is actuated by the fingertip tab control, and the one at the rear operates a screwjack, which is mounted in the right half of the stabilizer. The travel is 6° up and 33° down, plus or minus 1°.

1. Install cables. Turn tab control wheel to full-forward position, and screwjack to full up position. Then turn screwjack back ½ turn, set the chain on sprockets at each end, allowing ½" to 1" overlap in direction of travel. Tighten cable tension to approximately 30 lbs.
2. To set tab travel, elevator **MUST BE** in neutral position.
3. Turn tab control to full-forward position, disconnect push-pull tube from tab and adjust it to hold the tab approximately 7°. (This can be done by screwing it in or out, whichever the case may be.) Connect the push-pull tube to the tab and turn the tab control to the full rearward position. The tab should be approximately 34°.
4. Set stops between first and second bulkheads rear of the baggage compartment on the cables for correct travel, which is 6° up and 33° down.

ELECTRICAL SYSTEM:

Figure 19 outlines a complete electrical system including electrical accessories. The numbers indicate wire numbers which can be found on each wire in the actual airplane.

LUBRICATION:

Figure 20 outlines the lubrication requirements for the Cessna Models 120 and 140.

LIFTING AND JACKING:

The airplane may be lifted by an appropriate sling at the engine mount fuselage attachment fitting or by lifting lugs on the engine and a sling around the aft section of the fuselage.

Figure 18 - Elevator Tab Control System

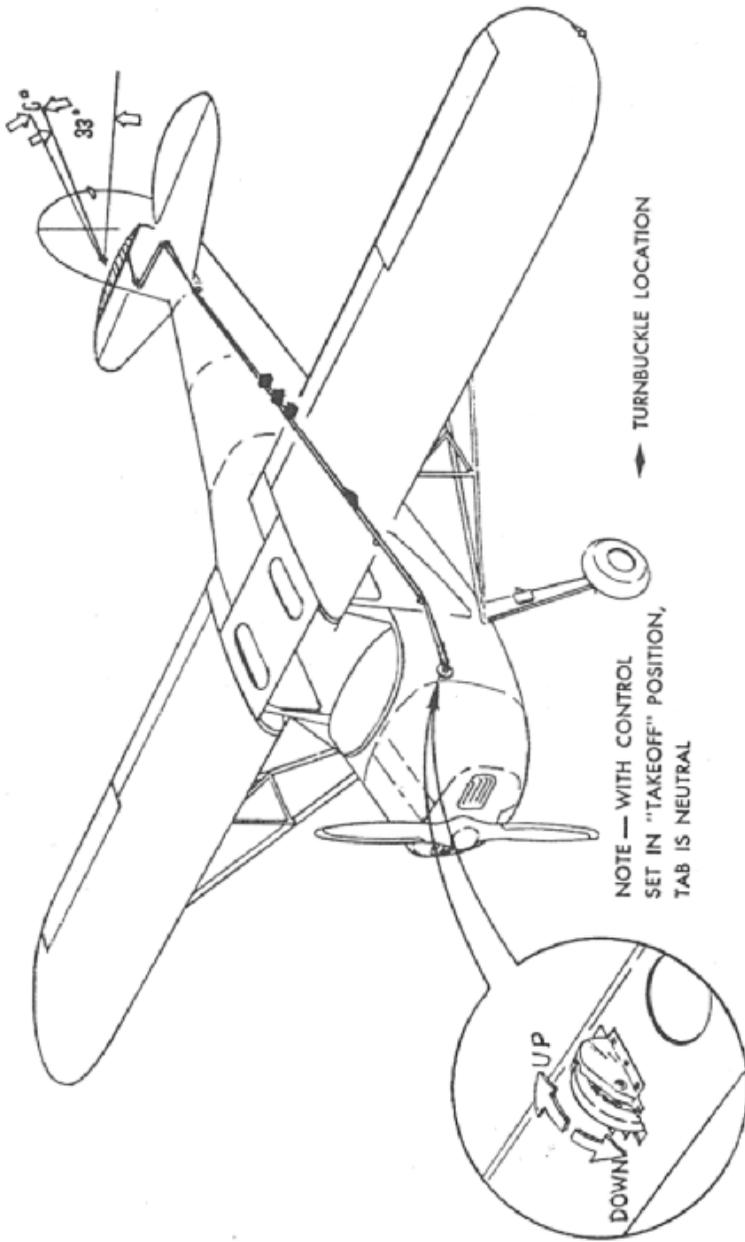
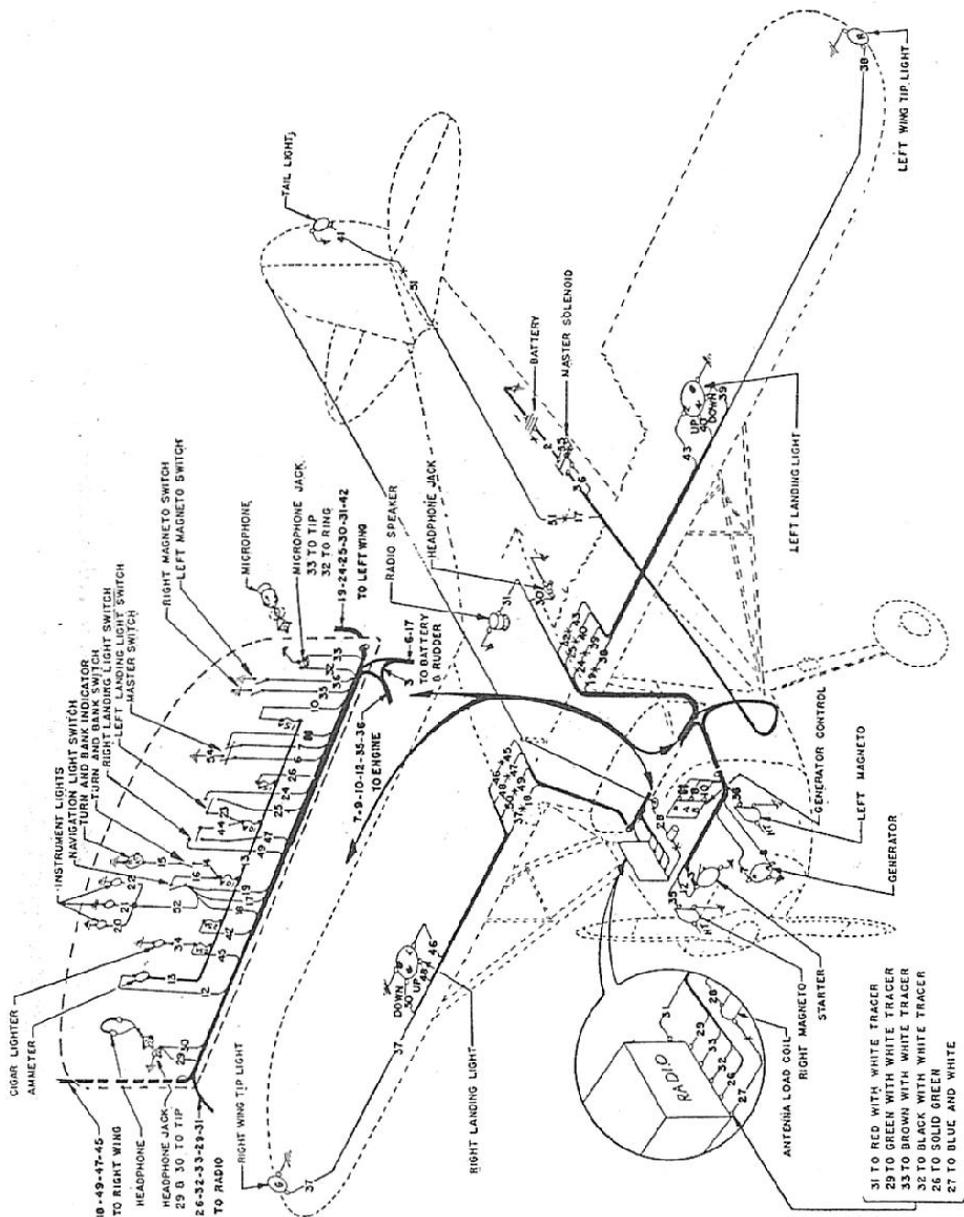


Figure 19 - Electrical Wiring Diagram



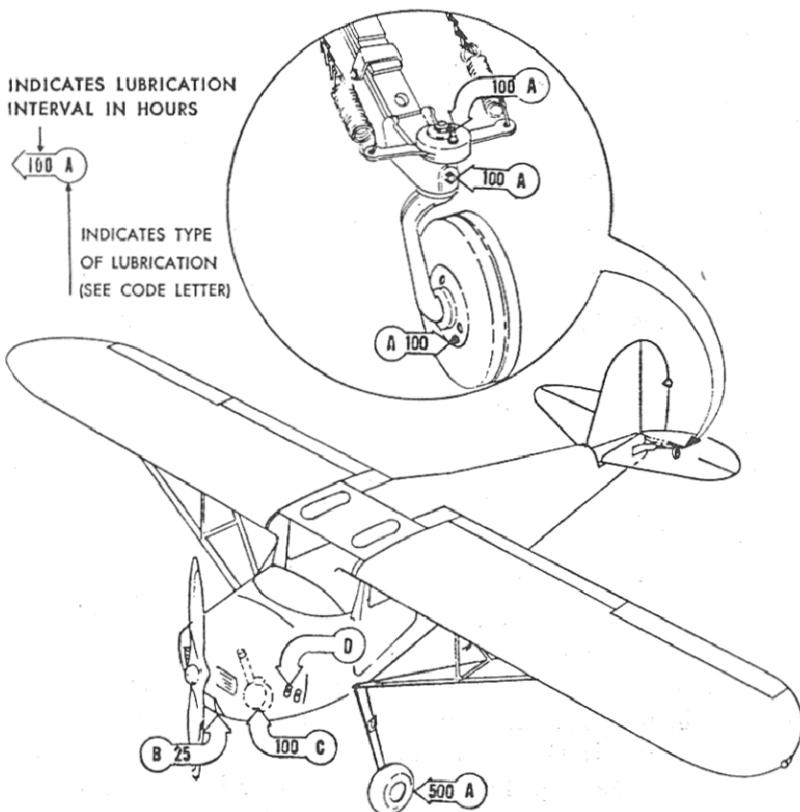


Figure 20 - Lubrication Diagram

Code Letter LUBRICATION CODE

A — AN-G-15 — Grease

B — Carburetor Air Filter — Wash in gasoline, coat both sides with (SAE 10) motor oil and allow to drain before re-installing. Service every 25 hours or oftener when operating in dusty conditions.

C — Engine Oil Tank — Check dip-stick before each flight. Drain and refill every 100 hours (4½ quarts), when carburetor air filter is serviced as B above and operating conditions are reasonably dust free. Under dirty and dusty conditions drain and refill each 25 to 30 hours.

D — Brake master cylinders — should be checked and refilled periodically with AN-VV-0-366 (3580-D) Oil-Hydraulic (Petroleum base).

NOTE 1. All pulleys, trim tab actuator rod, control surface hinge bearings, bellcrank clevis bolts, flap actuating handle, brake pedal pivots, rudder pedal crossbars, door hinge and mechanism, Bowden controls, throttle, control rod universal (if unsealed) and control column ball, should be lubricated with AN-O-6a General Purpose light machine oil as required or every 1,000 hours.

NOTE 2. In general, roller chain (Aileron, Tab wheel, tab actuator) and control cable tends to collect dust, sand, and grit when greased or oiled. More satisfactory operation except under sea coast conditions results when the chains are wiped clean occasionally with a clean dry cloth.

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The cowl upper halves need not be removed as they can be opened upward for application of the sling at the engine mount fuselage attachment fitting. A block of wood sawed at an angle to fit between the fuselage and the landing gear spring may be used as a jacking point to hold the airplane when working on a wheel or tire. Do not use the brake casting as a jacking point.

INSPECTION SERVICE AND INSPECTION PERIODS:

Plan to take your Cessna 140 and 120 back to your dealer or distributor after you have flown it for 30 days or about 25 hours, whichever comes first. This will permit him to check it over, to tighten rocker-box covers, the exhaust manifold installation, and to make any other minor adjustments that might appear necessary. This service at 25 hours is performed by your dealer or distributor for you at “no charge”.

The Civil Air Regulations require all airplanes to have an “annual inspection” as prescribed by the administrator, by a person designated by the administrator, and in addition, 100 hour periodic inspections made by an “appropriately rated mechanic” if the airplane is flown for hire. The Cessna Aircraft Company recommends the 100 hour periodic inspection for all 120 and 140 airplanes. The procedure for this 100 hour inspection has been carefully worked out by the factory and is followed by the Cessna dealer and distributor organization. The complete familiarity of the Cessna distributor and dealer organization with Cessna equipment and with Cessna procedures provides the highest type of service possible at lower cost.

Time studies of the 100 hour inspection at the factory and in the field have developed a standard flat rate charge of \$17.50 for this inspection at any Cessna Dealer or Distributor. Points which the inspection reveals require modification or repairs will be brought to the owner’s attention by the dealer or distributor and quotations or charges will be made accordingly. The inspection charge does not include the oil required for the oil change.

Before beginning the inspection shop foreman or mechanic runs the engine to check for magneto drop, generator charge and general smoothness of operation of the engine and records these facts as an aid to the mechanic. The inspection consists basically of the following procedure:

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- I. Remove all inspection plates and necessary fairing consisting of the following:
 1. The rectangular inspection plate in the luggage compartment.
 2. The two round inspection plates in the seat pan, and the two round inspection plates on the top side of the landing gear bulkhead.
 3. Remove center tunnel cover assembly between seat and the control tee.
 4. Remove rear strut inspection plates (both sides).
 5. Remove lower half wing root fairing (both sides).
 6. Remove lower engine cowl. Upper cowl can be clamped together and left on the airplane.
 7. Remove round inspection plate on underneath side of stabilizer.
 8. Remove tail group fairing.
- II. Engine Check.
 1. Remove heater mufflers. Inspect mufflers and exhaust stacks for possible cracks.
 2. Drain oil and clean oil strainer located on rear side of accessory case and replace oil.
 3. Check magneto, touching up points if necessary, and check timing. Right Magneto 28° B.T.C., Left Magneto 30° B.T.C.
 4. Remove spark plugs, clean if necessary, check gap spacing, and replace.
 5. Wash down engine.
 6. Check engine mount bolts for security.
 7. Check all wires forward of the firewall.
 8. Check all engine controls for travel and free movement.
 9. Remove and clean gasculator bowl.
 10. Check propeller track and inspect for bad nicks or cracks.
 11. Check starter travel.
 12. Clean carburetor air screen, re-oil and reinstall.
 13. Replace engine cowling.

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III. Wing Inspection.

1. Visually inspect fabric, watching for any sharp rise over the ribs. This will normally mean loose fabric clips.
2. Check for loose or broken drag wires by giving wing tip a sudden jar with the palm of your hand.
3. Check front and rear wing bolts attaching wing to fuselage (both wings).
4. Check front and rear strut bolts for security (both wings).
5. Check all wing control surface for freedom of movement and bolts for security.
6. Check aileron bellcranks (both sides).
7. Drain wing tank sumps.

IV. Empennage and Surfaces.

1. Check both stabilizer, and vertical fin, for possible kinks due to ground handling.
2. Check attaching bolts on both fin and stabilizer for security.
3. Check rudder and elevator attaching bolts for security and surfaces for freedom of movement.
4. Check elevator and rudder hinge connection for cracks.
5. Check surface travels to plus or minus 1°. Elevator 20° up and 20° down, Elevator tab 6° up and 33° down, Rudder travel 16° right 16° left, Aileron 22° up 14° down, and Flaps 40° down.
6. Clean tail wheel assembly. Check for security, freedom of operation. Grease (pack wheel at 500 hours).

V. Cabin Section.

1. Clean cabin section, vacuum it if possible.
2. Inspect rudder bar and brake assembly and the control tee for the security of mounting. Inspect cable connection points and check all cables for fraying. Check pulley installations.
3. Check battery water level.
4. Suspend landing gear wheels from floor and remove outer wheel fairings. Shake landing gear and wheels for

CARE — RESPONSIBILITIES

any sign of looseness. If necessary tighten landing gear bolt and wedges. Visually inspect landing gear spring leaf for cracks. (Remove landing gear wheels and pack with grease every 500 hours unless otherwise designated by owner.)

VI. Electrical System.

1. Check electrical system by operating the lights, starter, and all accessories which are incorporated in the electrical system.

VII. Recowl the engine. Replace all inspection plates and fairings.

VIII. Run engine.

1. Check magnetos for drop.
2. Check generator for proper charge.

Every effort is made to attract the best mechanics in each community to Cessna service facilities. Many distributors' mechanics have attended Cessna Aircraft Company schools and have received specialized instruction on maintenance and care of Cessna airplanes. Cessna Service instruction activity in the form of service bulletins and letters is constantly being carried on so that your enjoyment and safety in your Cessna will be complete and up-to-date when you have your inspection and service work performed by Cessna distributors and dealers mechanics.

Distributors carry a full complement of genuine Cessna service parts and are rapidly developing complete repair and service facilities including such specialized jigs and tooling as may be necessary. Cessna dealers maintain stocks of genuine Cessna parts and Service facilities consistent with the demand.

An illustrated Parts Catalog for the Model 140 and 120 Cessna airplane is available through distributors and dealers at a nominal price of \$2.50. The catalog lists optional equipment and kit lists as well as all standard parts. Your Cessna distributor or dealer will be glad to give you current price quotations on all parts that you might need and will be glad to advise you on the practicability of parts replacement versus repair that might from time to time be necessary.

AIRPLANE FILE:

There are miscellaneous data, information and licenses that are a part of the airplane file either to be carried at all times in the airplane or to be maintained separately. The following is a check list for that file:

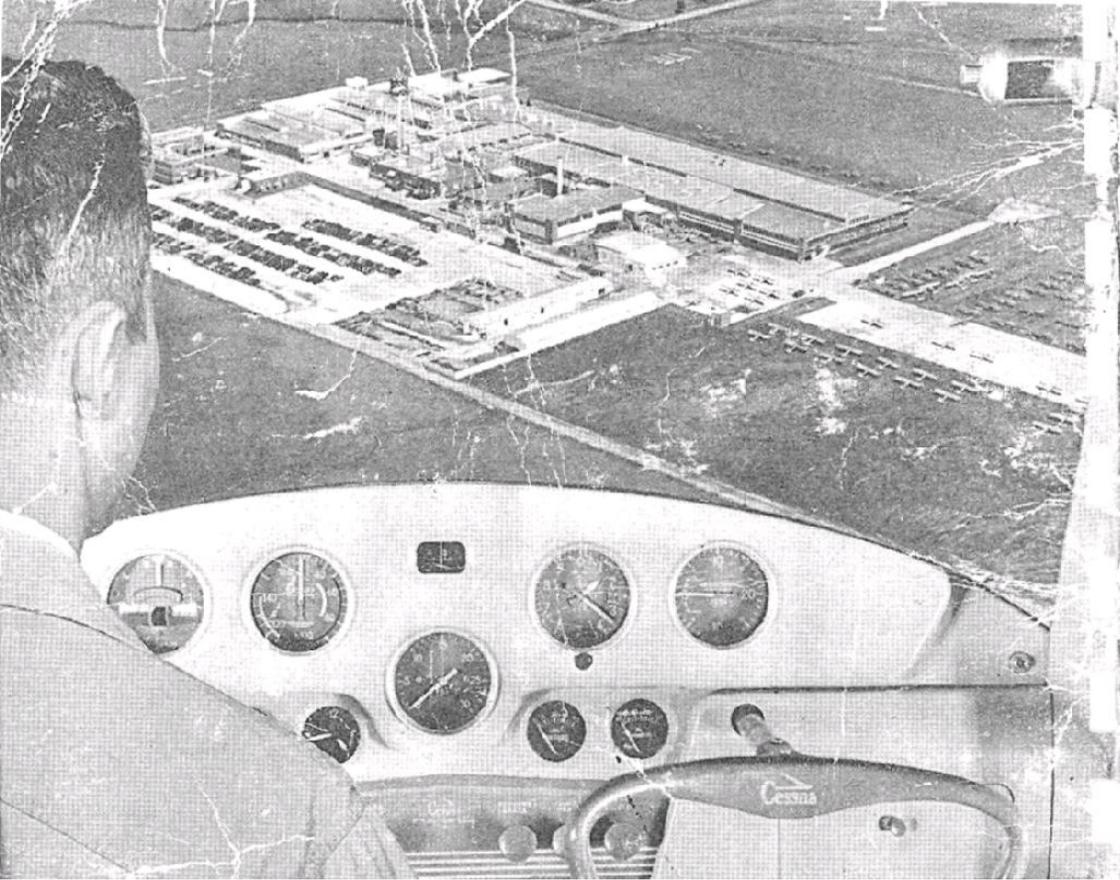
- A. To be carried in the airplane at all times:
 - (1) Aircraft Registration Certificate (Form ACA 500A)
 - (2) Aircraft Airworthiness Certificate (CAA Form ACA 1362)
 - (3) Airplane Radio Station License (if transmitter installed)
 - (4) Airplane Log Book
 - (5) Engine Log Book

- B. To be maintained but not necessarily carried in the airplane at all times:
 - (1) Weight and Balance report or latest copy of the Repair and Alteration Form 337
 - (2) Equipment List
 - (3) A form containing the following information:
Model, NC Number, Factory Serial Number, Date of Manufacture, Engine Number and Key Numbers
(duplicate keys are available through your Cessna dealer or distributor).

WARRANTY

The Cessna Aircraft Company warrants each new airplane manufactured to be free from defects in material and workmanship under normal use and service, provided, however, that this warranty is limited to making good at the Cessna Aircraft Company's factory any part or parts thereof which shall, within ninety (90) days after delivery of such airplane to the purchaser, be returned to the Company with transportation charges prepaid, and which upon Company examination shall disclose to the Company satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on the part of the Company, and the Company neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of its airplanes.

This warranty shall not apply to any airplane which shall have been repaired or altered outside the Company's factory in an)' way so as, in its judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident.



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