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.

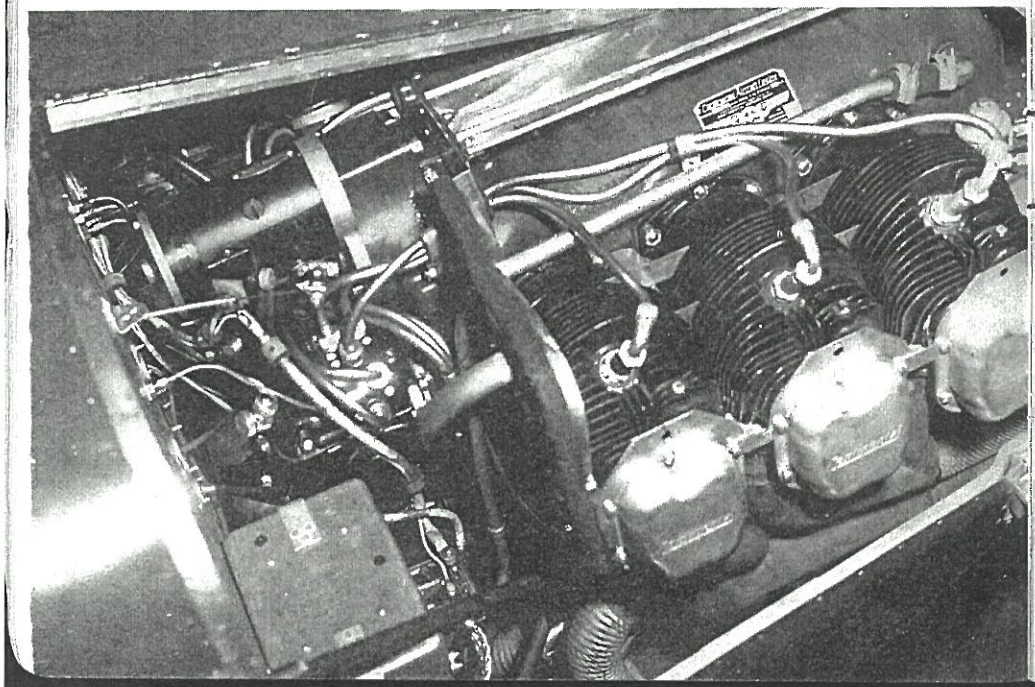
CLEARING THE PROPELLER:

"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-145 is eight quarts. The quantity can be checked easily by raising the hood on the left side and reading the quantity in the sump directly on the stick adjacent to the oil tank cap. In replacing the stick, make sure that it is firmly back in place. In replacing the oil filler 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 C-145 Engine Inst.



Fuel Strainer Drains: The fuel strainer drains provide a quick simple method of draining any water that might have collected in the fuel line. The two valves on the strainer located just ahead of the firewall are easily accessible by reaching in the bottom rear opening of the cowl. Make sure that the valves are closed before leaving them. The fuel tank sump drains are located on the underneath side of the wing in line with the rear edge of the door and out from the fuselage a few inches, one on each side of the fuselage. Water (if any) may be quickly drained from the tanks by a one-eighth turn. To close push up and turn until locked. Make sure valves are closed and locked.

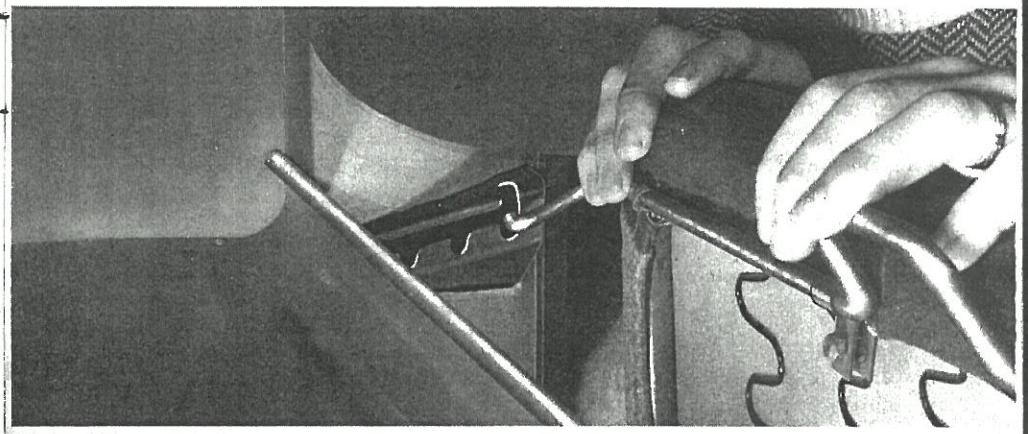


Figure 2 — Rear Seat Back Adjustment

Figure 3 — Front Seat Adjustment

CABIN

Seat Adjustment: The rear seat back hinges at the bottom to provide easy access to the baggage compartment. The rear seat back also offers four fore and aft adjustments at the top. This 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. The front seats are adjustable in a fore and aft direction. The seat adjusting lever is located on the left front side of each seat just under the edge of the seat – see Figure 3.

PARKING BRAKE:

The parking brake control is operated in conjunction with the toe brake and is a part of the master brake cylinders. In setting the parking brake, first press the toe brakes to the desired brake pressure then pull the control on the panel 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 tanks in each wing with direct reading gas gauges in the cabin at the wing root. A 12½ gallon tank is located in the left wing. The right wing has two inter-connected tanks having a total capacity of 25 gallons. One filler neck is provided in each wing panel. A good precaution is to physically check the fuel quantity in the 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 and fuel pump through aluminum alloy tubing which runs forward to and down the cabin door post 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. An emergency safety feature is incorporated in the fuel system. Should the fuel pressure drop to zero while in flight the fuel pump failure releases pressure on a check valve (see Figure 4) allowing normal gravity feed to supply fuel to the carburetor. Lack of fuel pressure of course indicates malfunctioning of the fuel system and a landing for repairs should be made as soon as practicable. Fuel may be drained at the fuel strainer. The fuel tank selector valve provides

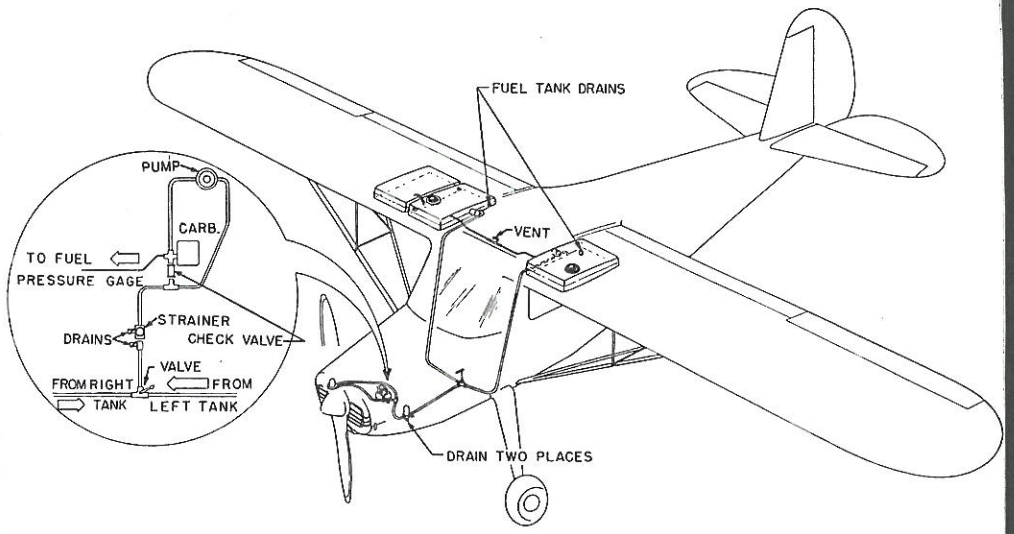
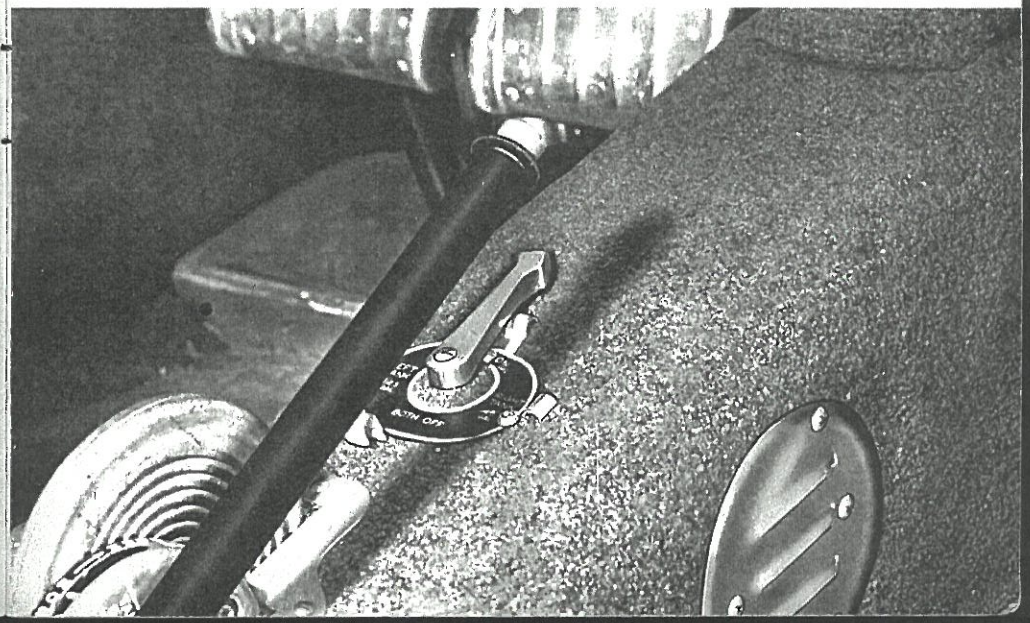


Figure 4 — Fuel System

fuel flow from either the right tank or the left tank, a shut-off for both tanks, and can be set to provide fuel flow from both tanks simultaneously to provide maximum safety. *Important* – The fuel valve *handle* indicates the setting of the valve by its position above the valve dial.

Figure 5 — Fuel Tank Selector Valve



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.

MIXTURE CONTROL:

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.

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.

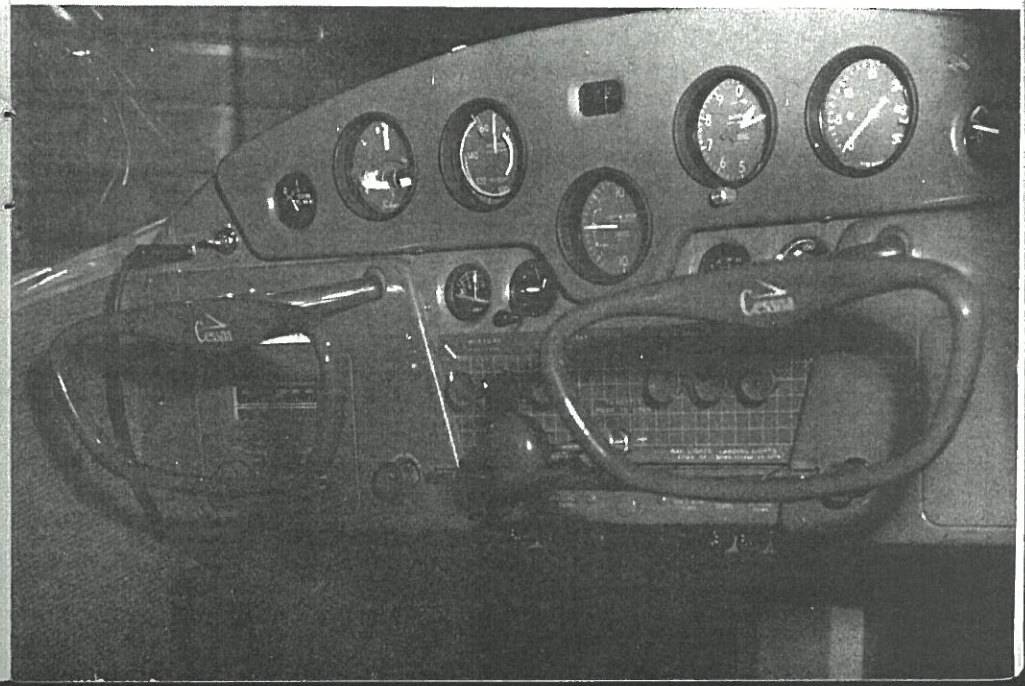
MASTER SWITCH:

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 magnetos are turned on and off through one switch operated with a key. The panel placard indicates 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



CABIN AIR HEAT:

The cabin air heater 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 to enter the cabin when the control is pulled out. Intermediate positions of the control may be used as desired.

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 and rudder light. The Model 170 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 caution is worthwhile here. The bulbs used with the rheostat are G. E. No. 1826 having a .12 ampere rating. Do not use higher ampere capacity bulbs as they allow the rheostat to get too hot with possible burning out of the unit. Make sure when replacing instrument panel bulbs that the correct bulb is used. The model number of the bulb is marked on the base.

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

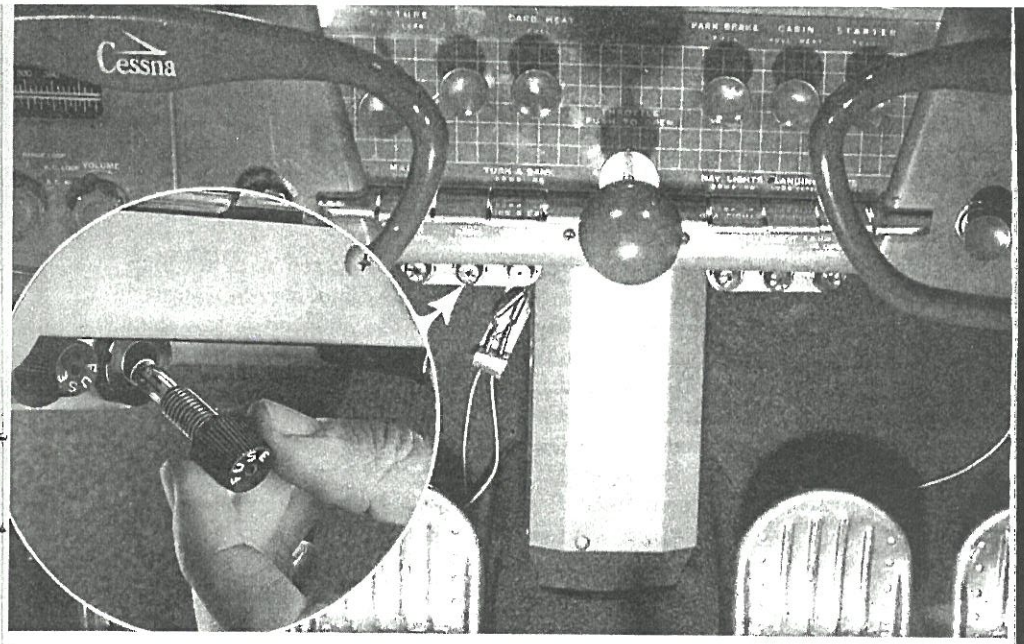


Figure 7 — Fuse Retainer, Method of Fuse Replacement

fuse circuit and fuse capacity are 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.

CIGAR LIGHTER:

The cigar lighter 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 just ahead of the front edge and between the two front seats. The tab indicator adjacent to the wheel shows the relative position of the tab. Forward movement of the wheel trims nose down and vice versa. This allows

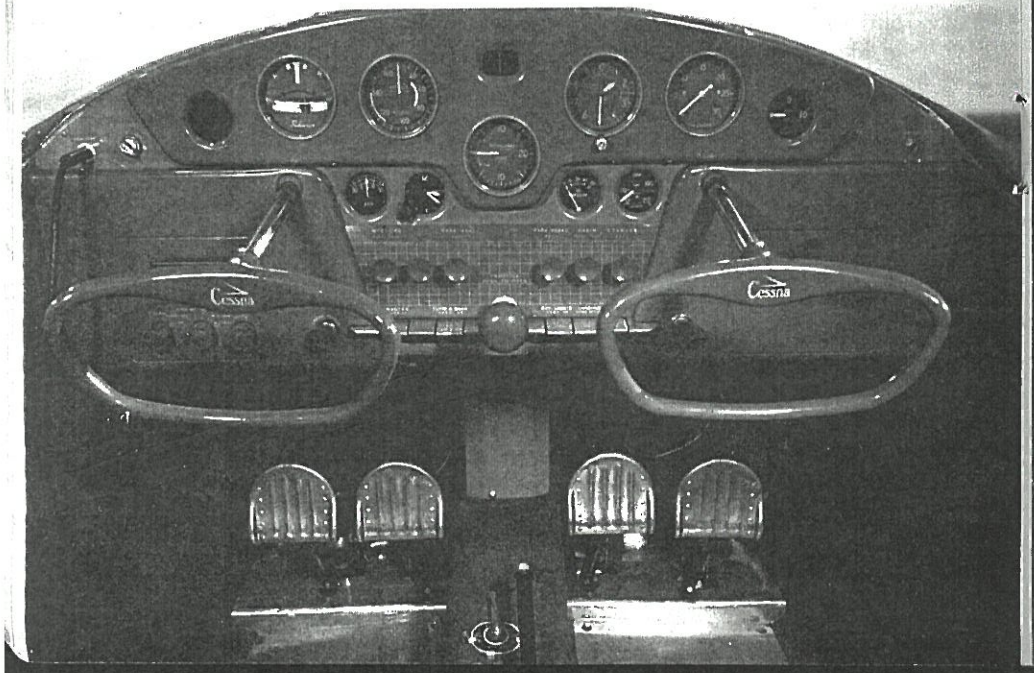
the airplane to be trimmed to fly level for a wide selection of load and speed conditions.

FLAPS:

Flaps installed on the 170 are raised or lowered with the flap handle located between the two front seats. Flaps may be lowered or raised during normal flying whenever the airspeed is less than 90 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 field take-offs the application of full flaps 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.

Figure 8 — Cabin Interior



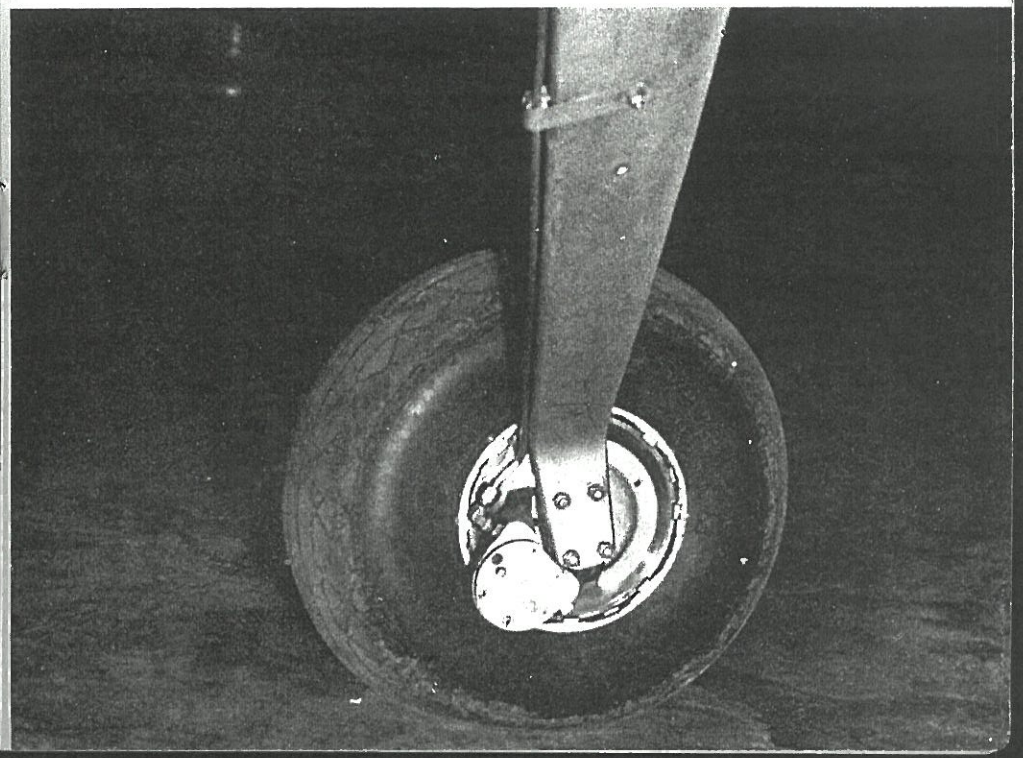
BRAKES:

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 tailwheel which operates with the rudder. 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 on the brakes can be avoided. The heels on the floor precaution applies also to take-off and landing procedure.

Figure 9 — Wheel and Brake Installation



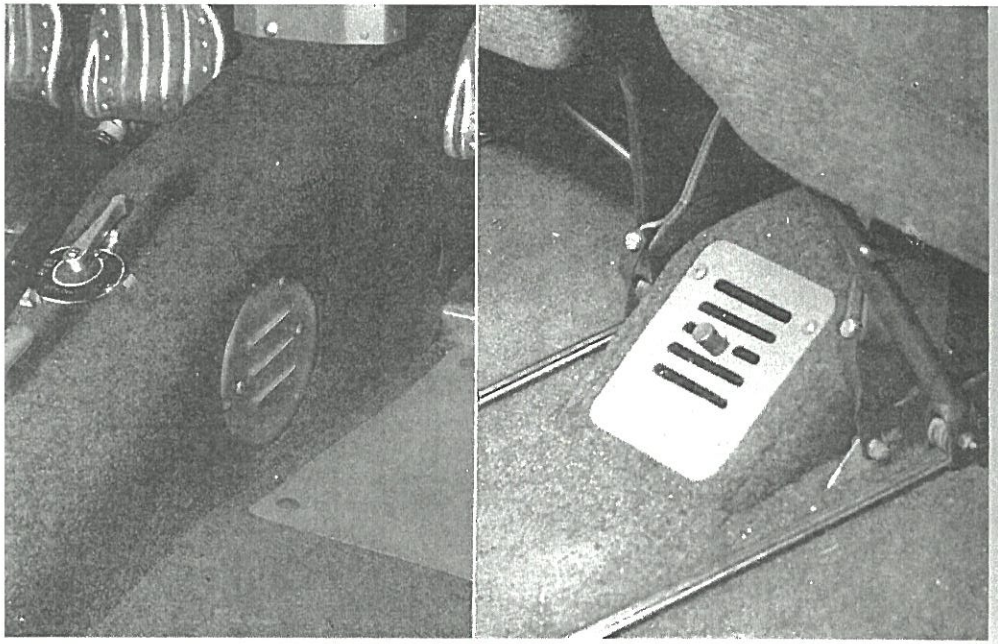


Figure 10 — Cabin Heater Installation

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" approximately at 50 m.p.h. and accelerates rapidly with complete control. From this point the best rate of climb can be easily established. For a long climb at full throttle 85 to 95 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 flaps, ailerons and empennage will not be damaged in a high wind. Install the control lock.

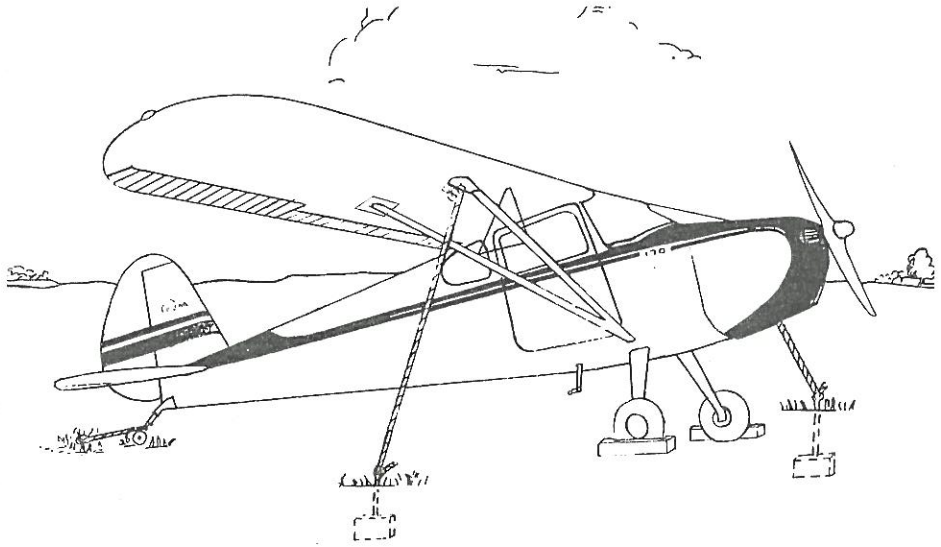
Flaps are held in the up or "closed" position by springs. To prevent damage to surfaces, a surface control lock should be installed between the flap and the aileron on both right and left wing panels when the airplane is tied out in strong, gusty winds. If not available put the flaps down.

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 for adjusting the front seats.

The suggested way of "loading up" the 170 is to load your baggage first behind the rear seat back. Next load the right front seat and the pilot's seat and finally the rear seat.

Figure 11 — Suggested Tie Down Procedure



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 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.

Where the oil pressure gauge is extremely slow in indicating pressure in cold weather it may be advisable to fill the pressure line to the gauge with kerosene.

For operation at temperatures consistently below freezing, a winterization kit consisting of plates for closing cowl openings 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.

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 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.