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1959

WORLD'S LARGEST PRODUCER OF GENERAL AVIATION AIRCRAFT SINCE 1956

MODEL 172 AND SKYHAWK

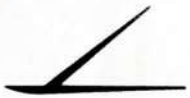
OWNER'S MANUAL

Congratulations . . .

■ You are now the owner of a truly outstanding airplane. The Cessna 172 has been engineered to give you the ultimate in performance, styling, durability, flying comfort, and economy for both business and pleasure.

■ We share your pride as a Cessna owner and have prepared this Owner's Manual as a guide to acquaint you with your airplane and its fine construction, equipment, ease of operation and its care.

■ Every fine possession is worth caring for, and this is especially true of your Cessna 172. This book is dedicated to help you obtain the utmost flying enjoyment and service from your airplane with a minimum of care.



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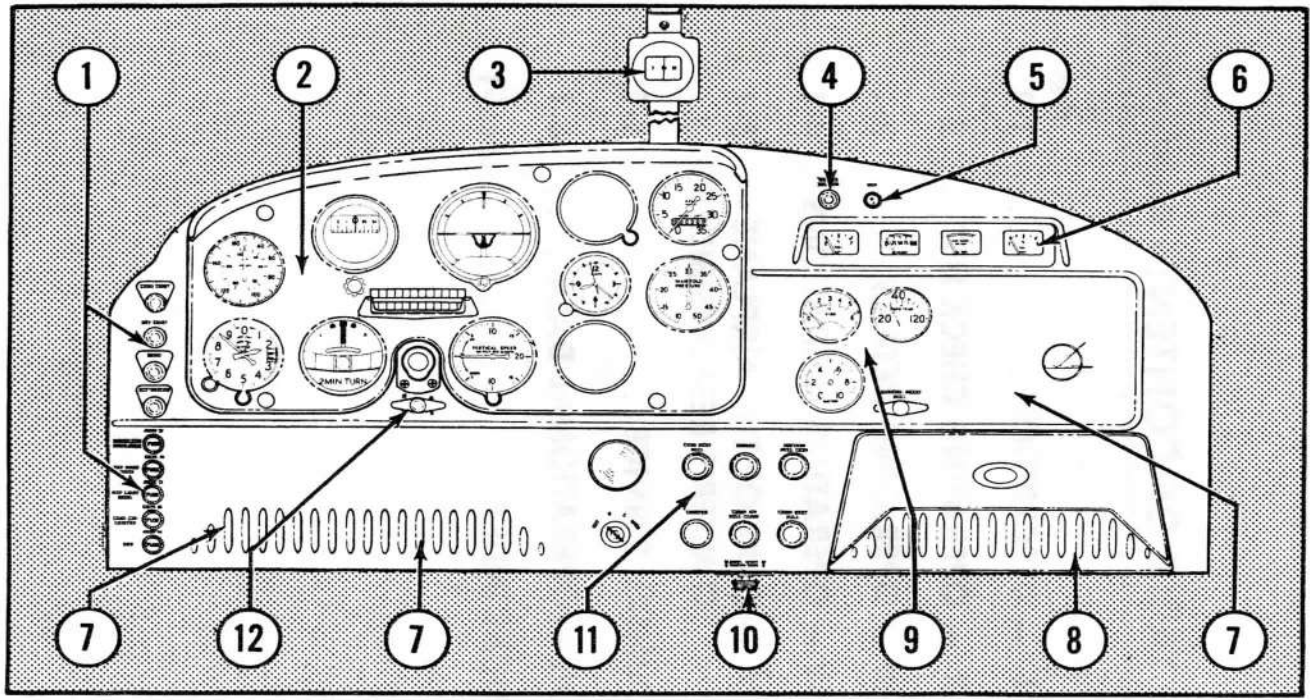

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Figure 1. Instrument Panel

SECTION I

description

ONE OF THE FIRST STEPS in obtaining the utmost performance, service, and flying enjoyment from your Cessna is to familiarize yourself with your airplane's equipment, systems, and controls. This section will tell you where each item is located, how it operates and its function.

ENGINE.

The power plant used in your Cessna 172 is a six cylinder, 145 horsepower, Continental Model O-300-A engine. Continental's accumulated years of experience in the manufacture of light aircraft engines assure you of a precision made, skillfully engineered product. The built in Red Seal quality, which is now yours, is your guarantee of maximum safety, trouble-free operation, and low maintenance cost.

ENGINE CONTROLS.

Throttle. The throttle (figure 2) is the largest of the engine controls and is a push-pull type control. Engine speed is increased by pushing the throttle in or decreased by pulling it out.

NOTE

To prevent creeping, tighten the knurled friction-type locknut on the control. Turning the nut clockwise increases friction on the throttle; turning it counterclockwise decreases friction.

Mixture Control Knob. The mixture control (figure 2) incorporates a locking lever to prevent inadvertent pulling out of the knob, resulting in leaning or shutting off the fuel supply in the carburetor. To lean the mixture, depress the locking lever while pulling out on the mixture control knob. This operation can be accomplished with one hand, using the thumb to depress the locking lever and two fingers to pull out the control. The locking lever is intended only to prevent inadvertent leaning; the control knob may be pushed in, for rich mixture, without depressing the lever.

The mixture control is normally set at "full rich" (all the way in) for starting, take-off, and climb. Maximum performance take-offs from high elevation fields may be made with the mixture leaned out for maximum engine r.p.m. However, a full rich mixture is preferred for better engine cooling.

Carburetor Air Heat Knob. The carburetor air heat knob (figure 2) is a push-pull control which operates the carburetor air intake butterfly to proportion the hot and cold air entering the carburetor. Pulling the control out raises the temperature of the carburetor air, while pushing it in de-

creases the temperature. The full-hot position is all the way out and full-cold is all the way in.

Air entering the engine through the heater muff does not pass through the intake filter. Therefore, carburetor heat should not be used when taxiing on dirty, dusty or sandy fields, except briefly to clear the engine immediately before take-off. After a full-stop landing under these conditions, return the heat control to the full cold position so the engine will receive filtered air.

Carburetor ice can form during ground operation with the engine idling. Just after the magneto check prior to take-off, pull the carburetor air heat knob full on to check the function of the carburetor air heater and to remove any ice in the carburetor. After this short check, be sure to push the carburetor air heat knob in to the full cold position. This will give maximum power for the take-off. During climb, watch the engine for any sign of icing (roughness or loss of rpm). If the engine begins to ice, apply full carburetor heat at once.

When full carburetor heat is applied the engine will lose about 275 RPM in cruising flight or 360 RPM at full throttle. In addition to the RPM loss, the engine will run roughly, due to excessively-rich mixture. Therefore, *it may be necessary to lean the engine when full carburetor heat is used.*

Excessively lean fuel-air mixture will cause overheating and possibly detonation. *Do not lean the mixture unless an increase in engine r.p.m. results.*

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 the ice from 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 this position. Refer to Cold Weather Operation, page 3-6, for use of carburetor heat in sub-zero temperatures.

Ignition Switch. The key-operated ignition switch (figure 1) controls the dual magneto ignition systems. There are four switch positions designated clockwise as follows: "OFF", "R", "L", and "BOTH". The engine should be operated on both magnetos ("BOTH" position). The "R" and "L" positions are for checking purposes only.

Engine Primer. The manual plunger-type engine primer delivers an initial charge of raw fuel to the cylinders, for easier starting *For an initial start in normal air temperatures, use two strokes of the primer. Usually, a hot engine will need no priming.*

To operate the primer, proceed as follows:

(a) First, unlock the plunger by turning the knob counter clockwise until the knob pops part way out.

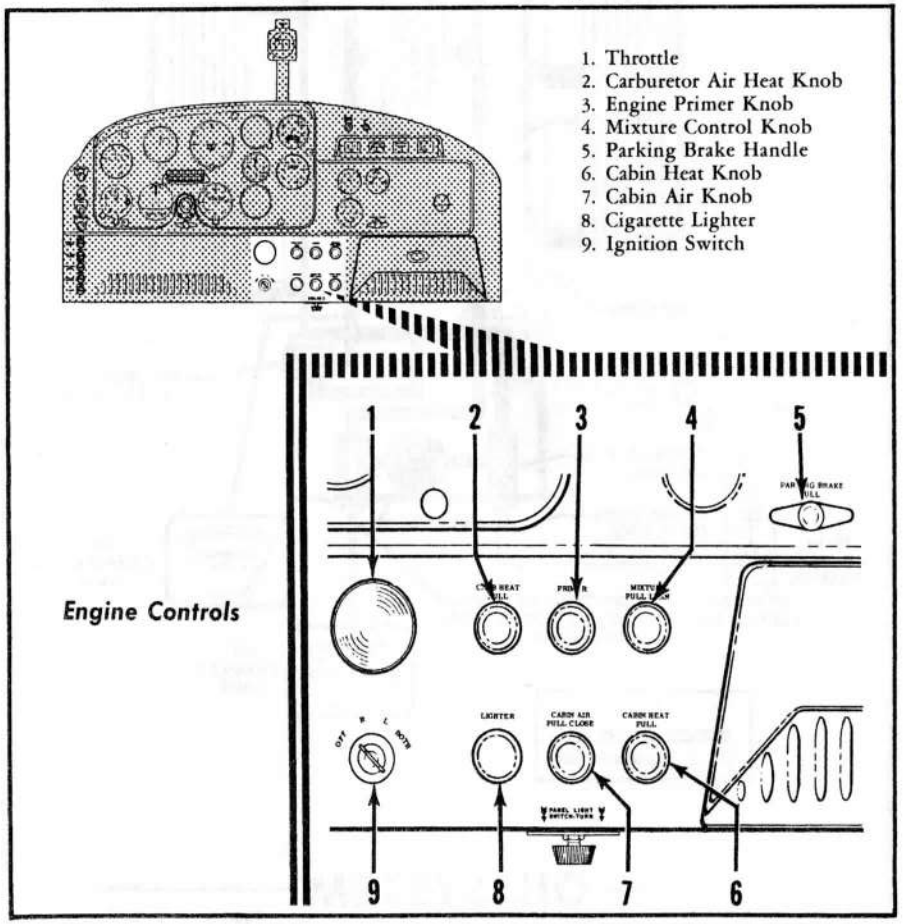
(b) Slowly pull the plunger all the way out and then push the

plunger all the way in. This action is termed "one stroke of the primer."

(c) Normal winter weather will require two to four strokes of the primer, and very cold (−20° F.) weather may require ten strokes.

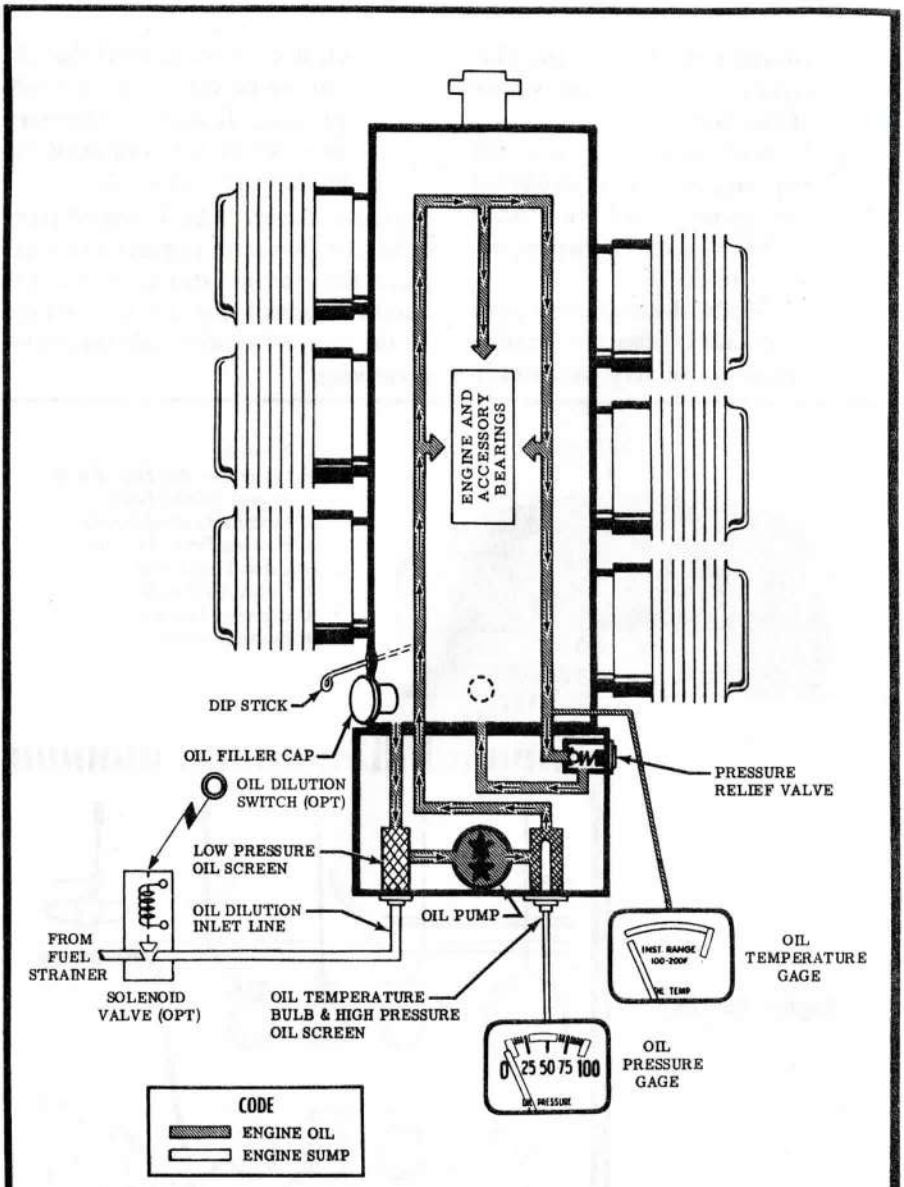
(d) Normally, the engine is started immediately after the priming operation. In very cold weather, it is recommended that the engine be turned over while priming. It may be necessary to continue priming until the engine runs smoothly.

Starter Handle. The T-shaped starter handle (figure 1) engages and energizes the engine starter when the handle is pulled out. *Do not pull out on the starter handle while the engine is running.*



Engine Controls

Figure 2.



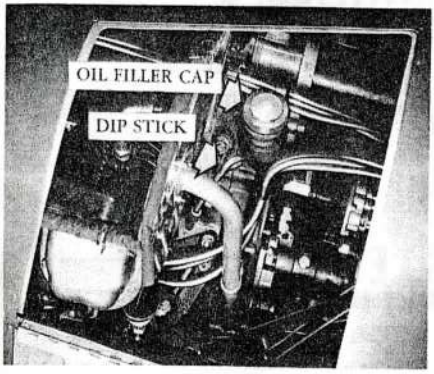
— OIL SYSTEM —
Schematic

CARBURETOR AIR FILTERING SYSTEM.

Dirt and other foreign matter is filtered from the carburetor air by a filter screen located in the air scoop on the bottom of the engine cowl. Proper cleaning and servicing of this air filter is important to increase life and maintain top efficiency of the engine. The filter should be serviced every 25 hours (during the regular oil change) or more often when operating in dusty conditions. *Under extremely dusty conditions such as operation from dirt runways or ramps, daily maintenance of the air filter is recommended.* Refer to the servicing instructions stamped on the carburetor air filter for the procedure to be used.

OIL SYSTEM.

Oil Level. The oil capacity on the Continental O-300-A engine is eight quarts. The quantity can be checked easily by opening the access door on the left side of the engine cowl and reading the oil level on the dip stick located adjacent to the oil tank cap. In replacing the dip 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 clockwise as far as it will go to prevent loss of oil thru the filler neck. While the minimum oil supply is four quarts, oil should be added if below six quarts and should be full if an extended flight is planned.



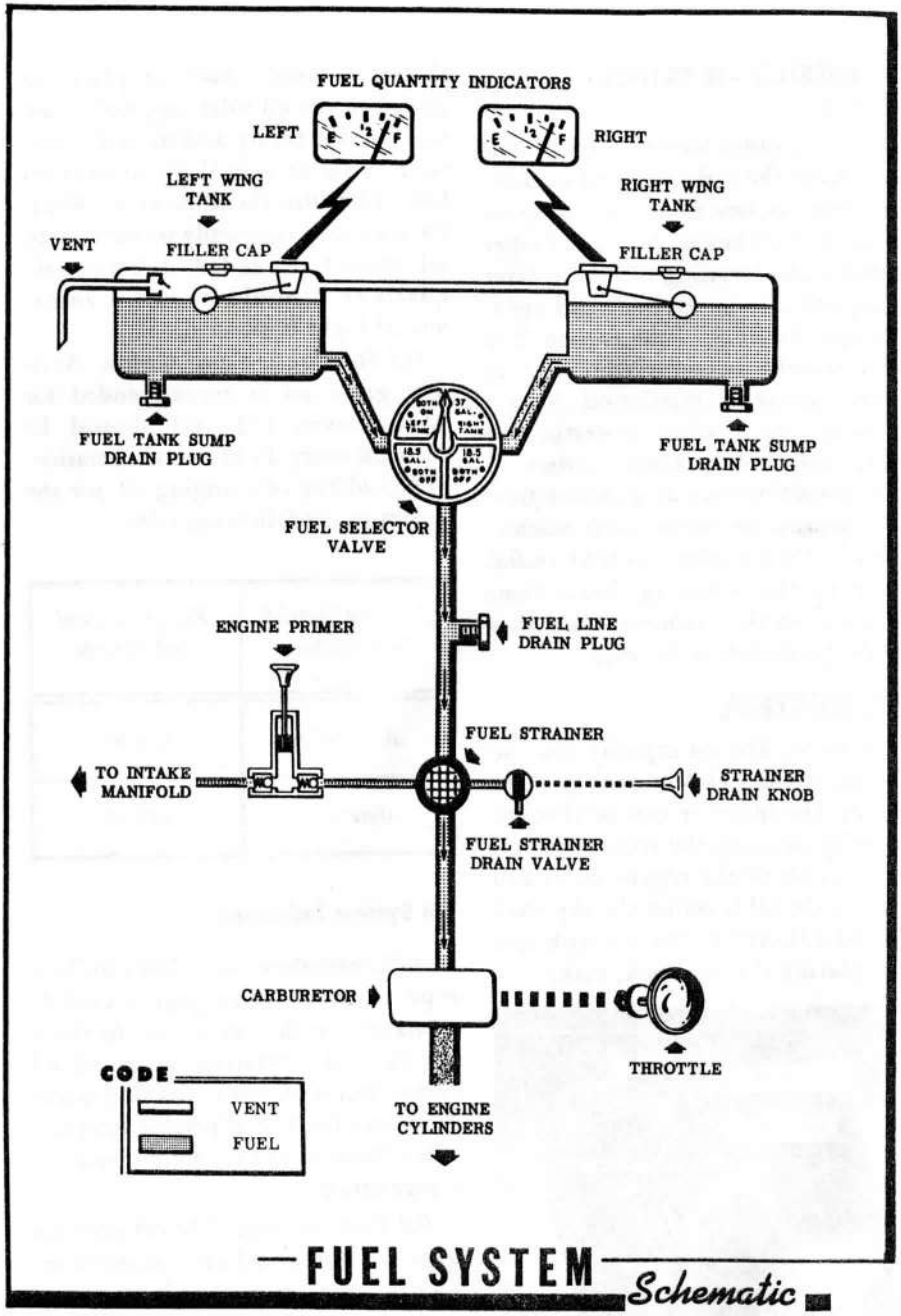
Oil Specification and Grade. Aviation grade oil is recommended for your Cessna 172 and should be changed every 25 hours of operation. When adding or changing oil, use the grades in the following table:

Average Outside Temperature	*Recommended Oil Grade*
Below 50° F.	*SAE 20*
Above 50° F.	*SAE 40*

Oil System Indicators

Oil Temperature Gage. The capillary-type oil temperature gage (figure 1) is marked with a green arc to show the normal operating range of oil temperatures. A red radial line marks the upper limit of allowable temperature. There is no minimum operating temperature.

Oil Pressure Gage. The oil pressure gage is a direct-reading instrument indicating pressure in pounds per square inch. A green arc on the dial defines the normal operating range. Red radial



—FUEL SYSTEM *Schematic*

lines mark the upper operating pressure limit and the minimum idling pressure.

Oil Dilution System (Optional Equipment)

To permit easier starting in extremely low temperatures, an optional oil dilution system is available. Used immediately before the engine is shutdown, this system injects fuel into the engine oil and reduces its viscosity. When the engine is again operated, the fuel evaporates and is discharged through the breather so the oil resumes its normal viscosity.

The oil dilution system consists of a solenoid valve on the engine firewall, connected to the fuel strainer outlet, and to a tapped plug in the end of the low pressure oil screen on the engine. The valve is opened by pressing a push-button switch on the instrument panel.

Detailed operating procedures for the oil dilution system are contained in Section III.

FUEL SYSTEM.

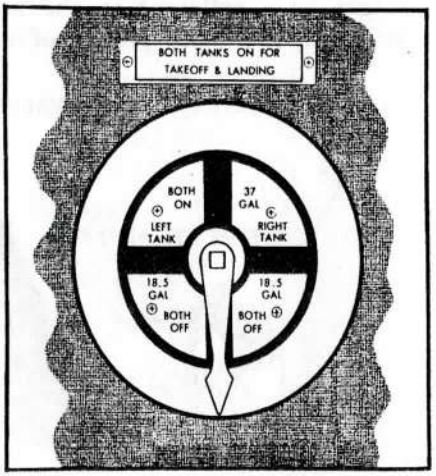
Fuel is supplied to the engine from two 21 gallon aluminum tanks, (of which 18.5 gallons in each tank are useable in all flight conditions) one located in each wing. From these tanks fuel flows by means of gravity through a fuel selector valve and fuel strainer to the engine carburetor.

Fuel Specification and Grade.

Aviation grade fuel should always be used except under emergency conditions. The recommended fuel is 80 octane rating minimum with a lead content of not more than ½ cc per gallon. Highly leaded fuels are not recommended. Filling the fuel tanks immediately after flight will reduce the air space and minimize the moisture condensation in the fuel tanks.

Fuel System Controls.

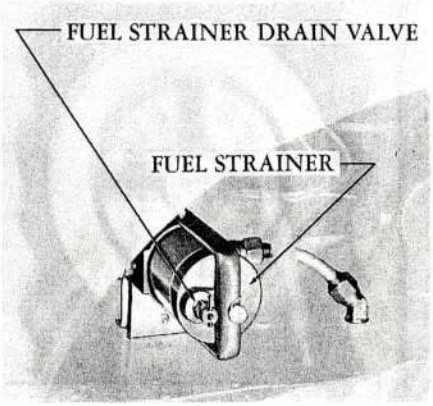
Fuel Selector Valve. A rotary type fuel selector valve is located at the aft end of the cabin floor tunnel between the front seats. The valve has four positions labeled "BOTH OFF", "LEFT



TANK", "RIGHT TANK", and "BOTH ON". The "BOTH OFF" position seals both wing tanks off from the rest of the fuel system and allows no fuel to pass beyond the selector valve. The "LEFT TANK" position allows fuel to flow from the left wing tank to the engine. The "RIGHT TANK" position permits fuel to flow from the right wing tank to the engine. The "BOTH ON" po-

sition provides fuel flow from both tanks simultaneously to provide maximum safety. *Important* — The fuel valve *handle* indicates the setting of the valve by its positions above the valve dial.

Fuel Strainer Drain Valve. A fuel strainer drain valve is located on the bottom of the fuel strainer and is accessible by reaching through the bottom rear opening of the engine cowl just forward of the firewall. This valve provides a quick simple method of draining any water or sediment that might have collected in the fuel strainer. A two ounce quantity of fuel



should be drained from the fuel strainer before the initial flight of the day or after each refueling operation.

Fuel Tank Sump Drain Plugs. A fuel tank drain plug is located on the underside of each wing in line with the rear edge of the cabin door and out a few inches from the fuselage. These plugs are used to drain any sediment or water that may collect in the fuel tanks. Draining the tank sumps is normally required only at each 100 hour inspection period.

Fuel Line Drain Plug. A fuel line drain plug is located on the under side of the airplane directly below the fuel tank selector valve. At each 100 hour inspection period, this plug should be removed to drain any sediment or water that might have accumulated in the fuel line.

FUEL QUANTITY INDICATORS.

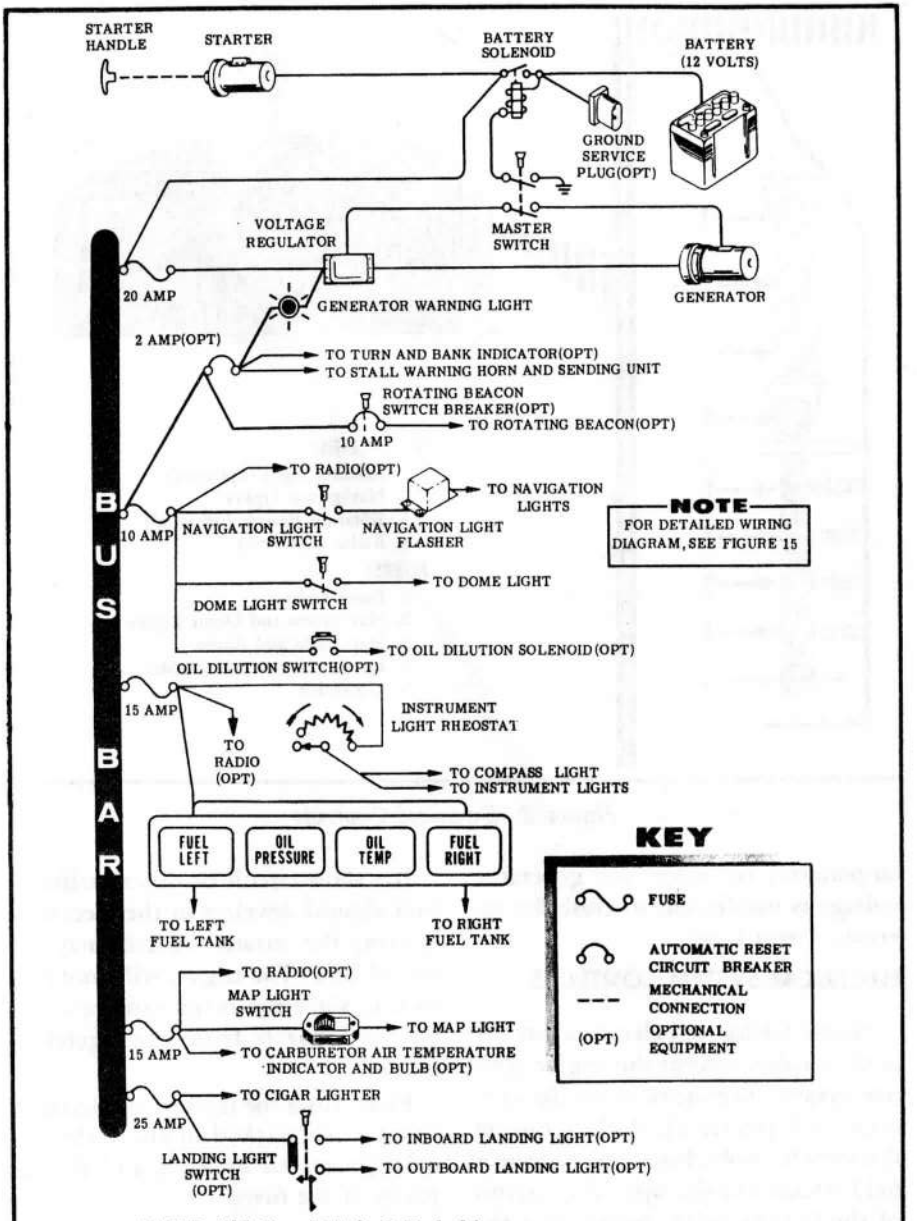
Electrically-operated fuel quantity indicators (figure 1), identified "LEFT" and "RIGHT," indicate the amount of fuel remaining in their respective tanks. A red arc extending from empty to ¼ full on each indicator dial warns that its tank is ¼ full or less. *Take-offs are not recommended when the fuel gage pointers are in the red arc.*

NOTE

After the master switch is turned on, a warming period is required before the indicator needles will arrive at the actual reading. Also, the needles will require several seconds to readjust themselves to the actual reading after any abrupt change in flight attitude of the airplane.

ELECTRICAL SYSTEM.

Electrical energy is supplied by a 12-volt, direct-current system powered by an engine-driven generator. A 12-volt storage battery serves as a stand-by power source, supplying current to the system when the generator is



WIRING DIAGRAM — *Schematic*

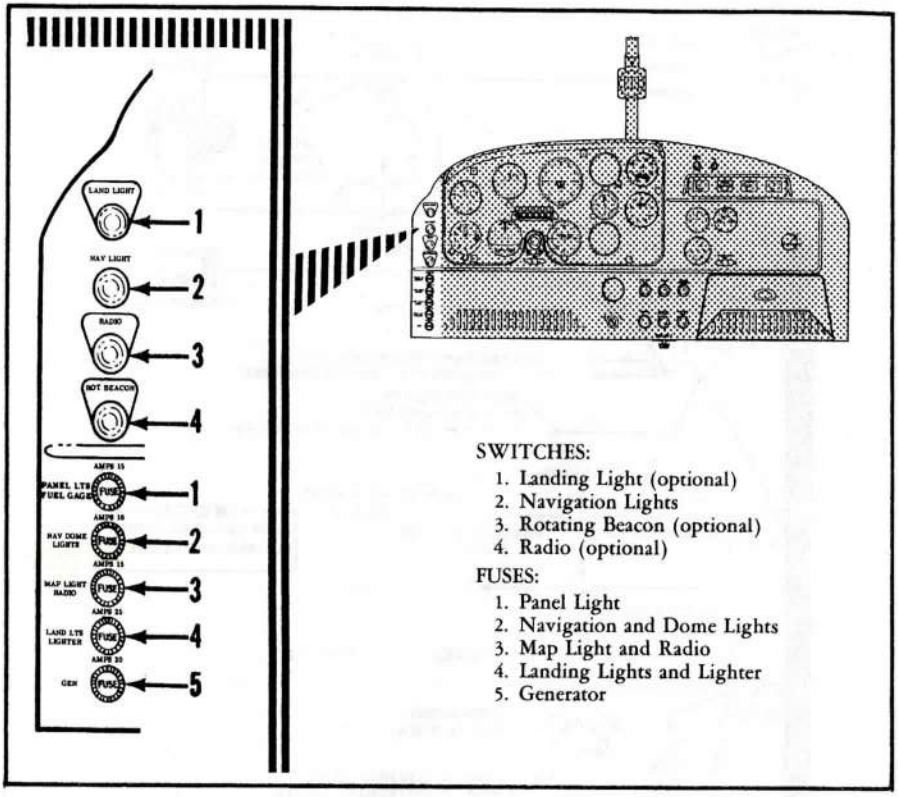


Figure 3. Electrical Controls

inoperative, or when the generator voltage is insufficient to close the reverse-current relay.

ELECTRICAL SYSTEM CONTROLS.

Master Switch. All electrical circuits in the airplane except the engine ignition system are controlled by the master switch (figure 1). Pulling out on the switch knob closes the generator field circuit and the operating circuit of the battery relay, permitting the generator to function and connecting the battery to the airplane bus.

If a short-circuit or other malfunction should develop in the electrical system, the master switch may be turned OFF. The engine will continue to run, since the magnetos are completely separate from the electrical system.

Fuses. Fuses for the various electrical devices are marked to show the circuits protected by each, and the capacity of the fuses.

Fuses are removed by unscrewing the fuse retainers and lifting out the fuse. Spare fuses are located in a clip

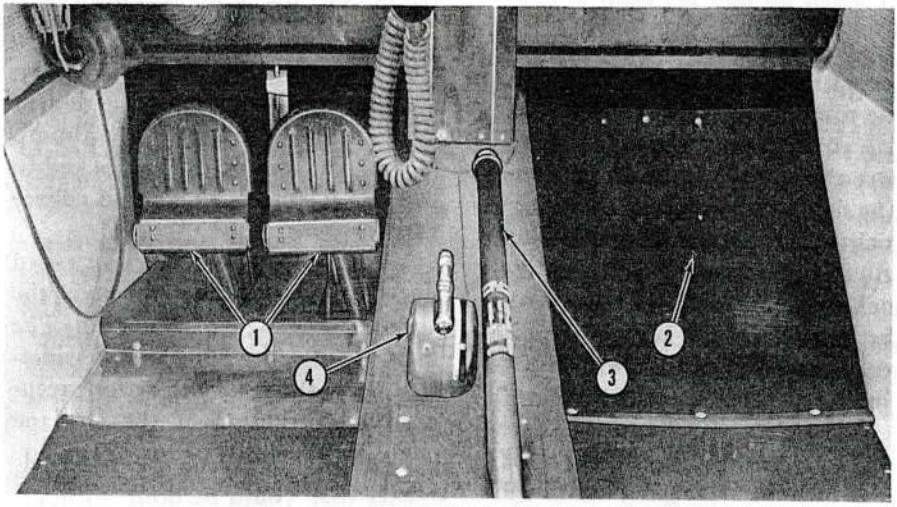


Figure 4. Lower Forward Section Of Cabin

1. Pilot's Rudder Pedals
2. Footrest
3. Wing Flap Handle
4. Elevator Tab Control Wheel

on the inside of the glove compartment door. The turn and bank indicator and stall warning indicator are protected with an automatically resetting circuit breaker which provides intermittent emergency operation of these devices in case of a faulty circuit.

GENERATOR WARNING LIGHT

The red generator warning light (figure 1) indicates generator output. The light remains off as long as the generator functions properly. If a malfunction interrupts generator output, the light will illuminate. It also will illuminate when the battery or external power is on, before starting the engine, and whenever engine speed is insufficient to produce generator output. The light does not show battery drain.

FLIGHT CONTROL SYSTEM.

Conventional wheel and rudder pedal controls are provided to operate the primary flight control surfaces (ailerons, rudder, and elevators). The elevator trim tab, located on the right elevator, is mechanically operated from the front seats. The rudder trim tab is adjustable on the ground only.

Controls Lock. To protect the ailerons and elevators from buffeting by wind while the airplane is parked, a controls lock is provided as standard equipment. The lock consists of a pin with a large red metal flag. *To install the lock,* the control wheel is pulled back halfway and centered, placing the elevators and ailerons in neutral. In this position, a hole in the control wheel shaft is aligned with holes in

the collar around the shaft at the instrument panel. The pin then is inserted in the collar and shaft from the top and right, so that the metal flag covers the starter handle. Make sure the pin is inserted completely. The flag serves as a reminder that the controls are locked and prevents operation of the starter handle until the lock is removed. When not in use, the lock should be kept in the glove compartment, where it will be available whenever needed.

NOTE

This controls lock is designed for use in moderately-gusty winds up to 30 or 40 mph. When storm conditions are forecast, additional precautions should be taken.

Elevator Tab Control Wheel. The elevator trim tab is an auxiliary movable control surface on the trailing edge of the right elevator, used to neutralize control wheel forces in flight. The tab is set by rolling forward or backward the tab control wheel on the floor between the two front seats. A tab position indicator, incorporated in the tab wheel mechanism, indicates the nose attitude of the airplane. Forward and aft movement of the wheel trims nose down and up, respectively. This allows the airplane to be trimmed to fly level with a wide selection of load and speed conditions. Take-off is made with the tab position indicator set in "TAKE-OFF" position.

Wing Flap Handle. The wing flaps are operated by moving the wing flap handle on the floor between the two front seats. The handle is operated by depressing the thumb button and moving the handle to the desired flap setting. By releasing the thumb button, the handle can be locked to provide 0, 10, 20, 30, and 40-degree flap positions.

The flaps may be lowered or raised during normal flying whenever the airspeed is less than 100 m.p.h. The flaps supply added lift and considerable drag; the resulting action steepens the glide angle of the airplane enabling the pilot to bring the airplane in over an obstruction and land shorter than could be done without flaps. The use of flaps is not recommended for cross-wind take-offs.

For unusually short field take-offs, apply 10° flaps (first notch) prior to take-off. An alternate procedure of applying 10° flaps just before the airplane is ready to leave the ground may be used in lieu of the above method of leaving the flaps in the 10° position throughout the entire ground run. For further discussion of the use of wing flaps for take-off, see page 3-4.

Wing Flap Settings

For Normal take-off	*Up (0°)*
For Shortest take-off	*1st notch (10°)*
For landing	*2nd notch (20°)*
	3rd notch (30°)
	4th notch (40°)

LANDING GEAR.

MAIN LANDING GEAR.

Your airplane is equipped with Cessna's patented Safety Landing

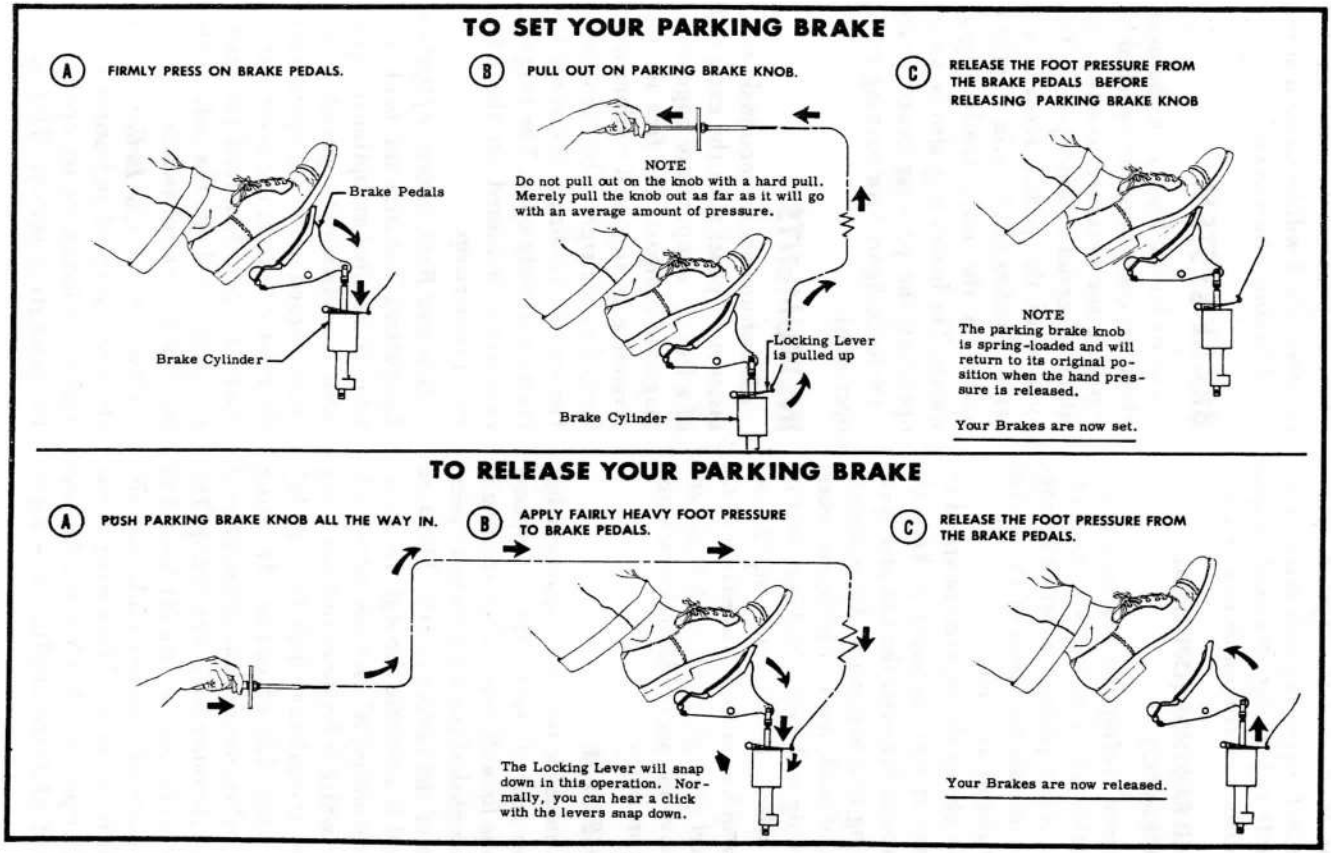


Figure 5. Parking Brake Operation

Gear. It consists of a tapered, spring steel leaf supporting each main wheel. Simple and strong, this landing gear requires a minimum of maintenance.

SPEED FAIRINGS (OPTIONAL EQUIPMENT).

Speed fairings are available as optional equipment for your airplane. The design purpose of speed fairings is to increase the speed of the aircraft and add to its beauty.

To obtain the maximum speed increase, it was necessary to keep the clearance between the tire and speed fairing to a minimum. An accumulation of mud, snow or ice in the wheel opening will have a braking effect on the wheel. If these elements cannot be avoided, make an inspection of the wheel fairings before each flight and remove any accumulations which may be forming.

NOSE GEAR.

A steerable nose gear, incorporating an air and oil shock strut, is mounted on the firewall. Nose wheel steering is accomplished through normal operation of the rudder pedals. The nose wheel is steerable through an arc of approximately 8° each side of neutral, after which it becomes free-swiveling up to a maximum deflection of 30° to either side of center. By using the brakes, the airplane can be pivoted about the outer wing strut fitting. The nose wheel is automatically located in the centered position while the aircraft is in the air. Movement of the rudder pedals will not affect the nose wheel while the airplane is in flight. Thus, the pilot has the assurance that the nose wheel will be straight at the initial landing touchdown.

BRAKE SYSTEM.

The hydraulic brakes on the main wheels are conventionally operated by applying toe pressure to either the pilot's or copilot's rudder pedals. The rotation of the pedals actuates the brake cylinders resulting in a braking action on the main landing gear wheels. The brakes may also be set by operating the parking brake knob. (Refer to figure 5 for parking brake operation).

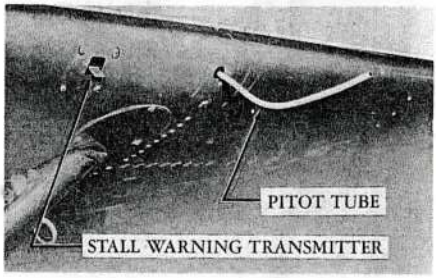
INSTRUMENTS.

All instruments are mounted on the instrument panel with the exception of a free air temperature gage and a magnetic compass. The free air temperature gage (optional equipment) is located in the right cabin ventilator. For correct readings, the ventilator must be slightly open. The magnetic compass is mounted on the windshield centerstrip.

Turn and Bank Indicator (Optional Equipment). The turn and bank indicator, if installed as optional equipment, is an electrically operated instrument. Turned on by the operation of the master switch, the indicator remains in operation until the master switch is turned off. The indicator has no separate control switch.

Pitot-Static System Indicators. The altimeter, airspeed and optional vertical speed indicators are operated by the pitot-static system. This system

measures the difference between the impact air pressure entering the pitot tube, mounted on the leading edge of the left wing, and static air pressure obtained from a static port mounted on the left forward side of the fuselage. To keep the pitot tube opening clean, a cover may be placed over the pitot tube whenever the plane is idle on the ground. *The static port should be kept free of polish, wax, or dirt for proper airspeed indicator operation.*



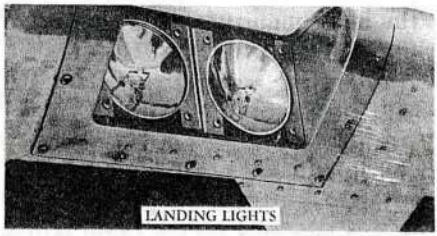
Stall Warning Indicator. The stall warning indicator is an electrically-operated horn which gives warning whenever a stall is approached, regardless of speed, attitude, altitude, weight or other factors which change the stalling speed. The stall warning horn transmitter is adjusted to give an audible warning approximately 5 mph above the normal straight ahead stalling speed. Other attitudes and speeds provide a wider margin.

The only time you may hear the Indicator under safe flight condition will be merely a short beep as you land. Usually no warning will be evident on a properly executed landing because the Indicator takes the ground effect into consideration. (If the airplane is leveled off high, however, the Indicator will signal.) The Indicator automatically cuts out on the ground, although high surface winds may give signals when taxiing. It therefore requires no silencing switch which might be inadvertently left off.

A manual is provided in the airplane kit which describes in detail the many useful purposes of this instrument.

LIGHTING EQUIPMENT.

Navigation Lights. The conventional navigation lights are controlled by the navigation lights switch (figure 2). The optional navigation lights flasher system uses a three-position switch. The middle detent on the switch is the steady position and all the way out is the flashing position.



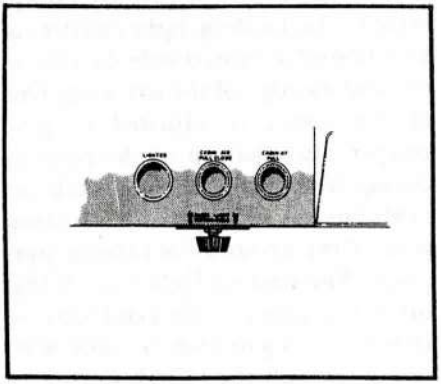
Landing Light. (Optional Equipment). The landing light consists of two lamps mounted side-by-side in the leading edge of the left wing. One of the lamps is adjusted to give proper illumination of the runway during landing and take-off while the other lamp is set to provide illumination of the ground for taxiing purposes. The landing light switch (figure 2) has three positions and turns on either one lamp or both. *To turn on the taxi light,* pull the switch out to the

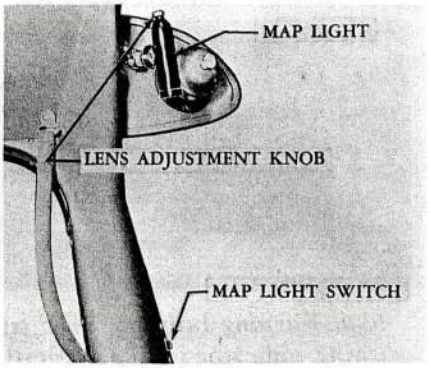
first stop. *To turn on both landing and taxi lights,* pull the switch out to the second stop. *To turn the lights off,* push the switch all the way in.

Rotating Beacon (Optional Equipment). A rotating, anti-collision beacon may be mounted on the tip of the vertical fin. In clear weather, its flashing red beam may be seen for several miles in all directions, making it particularly valuable in the high-density traffic around busy airports. It should not be used, however, when flying through clouds or overcast; its moving beam reflected from water droplets or particles in the atmosphere, particularly at night, can produce vertigo and loss of orientation.

The beacon is turned off and on by a push-pull circuit breaker switch on the instrument panel. *Pushing in* on the switch button turns on the beacon; *pulling it out* turns the beacon off. A short circuit or overload will trip the circuit breaker and force the switch button out.

Instrument Light. A red instrument light is mounted on the cabin ceiling to illuminate the instrument panel during night operation. A rheostat switch (figure 1) under the edge of the instrument panel controls both the instrument light and the compass light. *To turn on the compass and instrument lights,* rotate the instrument light rheostat switch clockwise until the desired illumination is obtained. *To turn the lights off,* turn the switch counterclockwise as far as it will go.



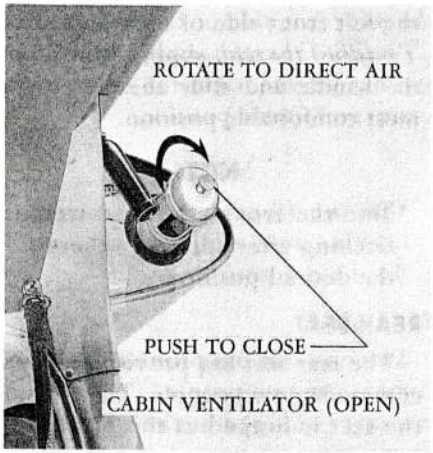


Map Light. A map light is mounted adjacent to the left cabin ventilator and is controlled by a slide switch mounted on the left door post. The light is fully adjustable to shine in any direction, and a lens adjustment knob integrally-mounted on the light makes it possible to change the beam from a spot to a flood illumination.

Dome Light. A dome light is mounted in the cabin ceiling and is controlled by a toggle switch mounted in the base of the dome light.

CABIN VENTILATORS.

All ventilation for the cabin area, excluding the ventilation obtained



through heater ducts, is provided by manually-adjusted cabin ventilators. Two ventilators are installed: one on the left side of the cabin in the upper corner of the windshield, and the other in the same position on the right side of the fuselage.

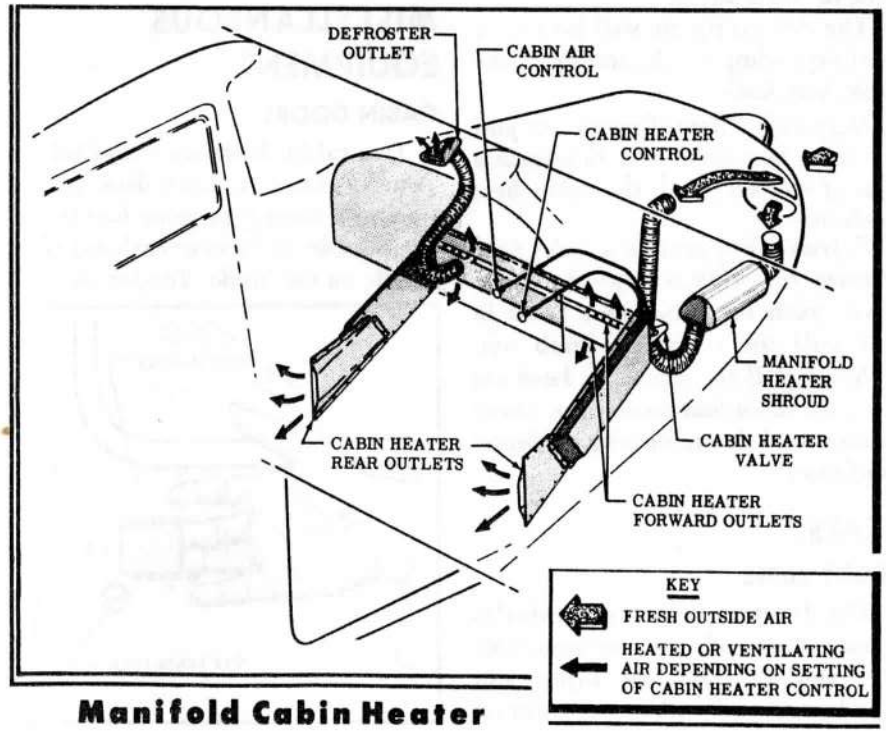
To provide a flow of air, pull ventilator tube out. The amount of air entering the cabin can be regulated by varying the distance that the ventilator tube is extended.

To change the direction of air flow, rotate the ventilator tube to the position desired.

To stop the flow of air, push the ventilator tube all the way in.

CABIN HEATER.

A manifold-type cabin heater, incorporating windshield defrosting ducts,



Manifold Cabin Heater

is standard equipment in your 172. The cabin heat knob (figure 2) moves a mixer valve to proportion hot and cold air for the desired cabin temperature. Pulling the knob out permits heated, fresh air to enter the cabin through holes in each end of a duct running completely across the firewall. The rear cabin area is heated and ventilated by ducts, one on either side of the cabin, extending along each wall and terminating at the door posts.

A defroster opening just behind the windshield provides a flow of air to keep the windshield free of condensation and frost. The defroster outlet has no separate control for either volume or temperature.

The defrosting air will be hot or cool depending on the setting of the cabin heat knob.

To provide a flow of warm air, pull the cabin heat knob out. *To provide a flow of cool air,* push the cabin heat knob in.

To prevent any air (hot or cold) from entering the cabin through the heater ducts, push the cabin heat knob in and pull the cabin air knob out.

Never pull the cabin air knob out when the cabin heat knob is out. Doing so may result in overheating the heater muff hoses.

SEATS.

FRONT SEATS.

The front seats are individually mounted on tracks and are adjustable fore and aft. The seat adjustment handle is located within easy reach on the left front side of each front seat. *To adjust the seat,* simply pull up on the handle and slide the seat to the most comfortable position.

NOTE

Test the front seats for secure latching after adjusting them to the desired position.

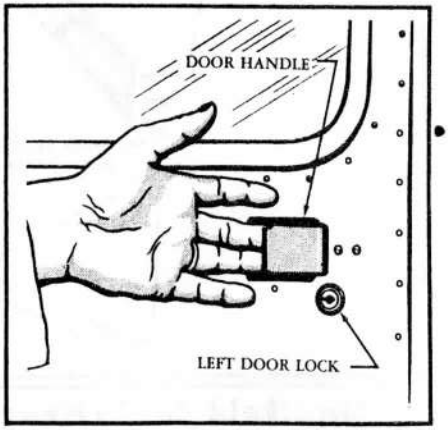
REAR SEAT.

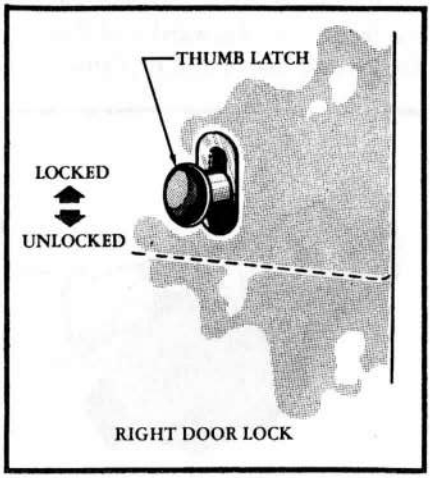
The rear seat has provisions to accommodate two people. The back of the seat is hinged at the bottom to permit seat adjustment and easy access to the baggage compartment. A seat adjustment handle is located behind and at the top of the rear seat back.

MISCELLANEOUS EQUIPMENT.

CABIN DOORS.

Two cabin doors are provided on your Cessna 172. Each door incorporates a flush type door handle on the outside and a conventional type handle on the inside. *To open the door*





RIGHT DOOR LOCK

from the outside, pull out on the forward edge of the flush type handle. *To open the door from the inside,* rotate the inside door handle down.

The right cabin door can be locked from the inside only. *To lock the door,* push up on the thumb latch located on the aft part of the door just below the window. *To unlock,* push down on the thumb latch.

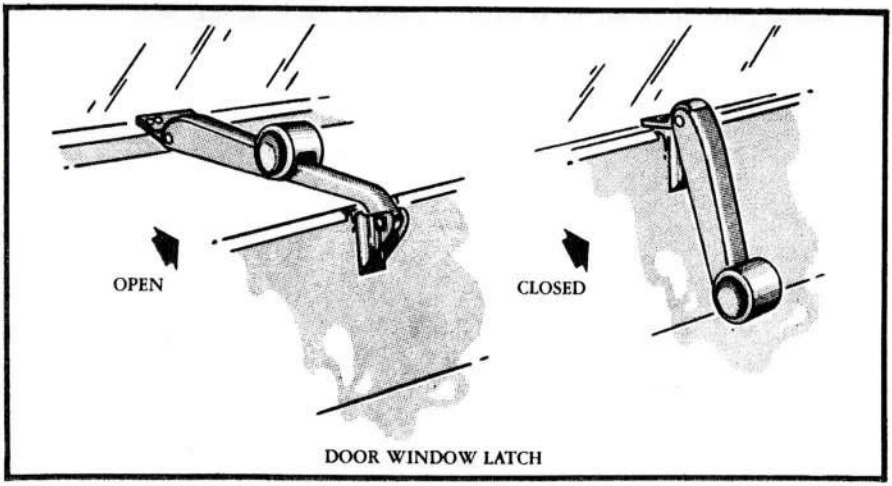
The left door can be locked from the outside only with a key operated lock. The same key that is used for the ignition is also used to lock the door.

CABIN WINDOWS.

All windows in the cabin with the exception of the left door window, are of the fixed type and do not open. The window mounted in the left door is hinged along the top of the window and opens out and up. *To open the door window,* pull up and push out on the window latch. With the window latch completely extended, the window will remain open. *To close the window,* pull the window latch in and down.

BAGGAGE COMPARTMENT.

A baggage compartment is located just aft of the rear seat. To reach the baggage compartment, grasp the seat adjustment handle in the center of the rear seat back and gently pull forward and down.



DOOR WINDOW LATCH

COAT HANGER HOOK.

For your convenience, a coat hanger hook has been installed in the cabin ceiling above the back of the rear seat. Your coats can be hung, full-length and wrinkle-free, between the back of the rear seat and the baggage shelf, without interfering with the comfort of rear-seat passengers.

UTILITY SHELF.

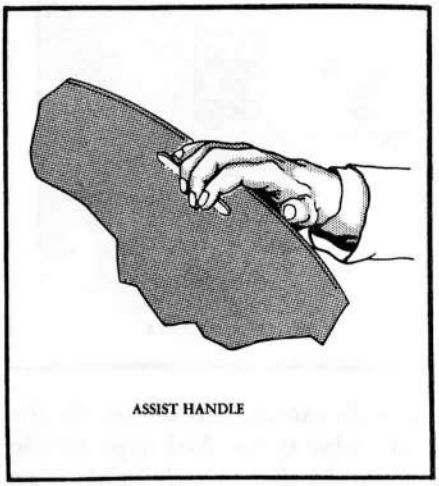
A utility shelf is located just above the baggage compartment. This shelf will prove very handy for storing hats, brief cases, and small articles.

MAP POCKET.

Maps and frequently-used flying aids may be stored in a map pocket in the left forward side panel, where they are in easy reach of the pilot's seat. Bulkier items, magazines, and small articles may be stored in the pockets on the backs of the front seats.

ASSIST HANDLE.

A raised ridge in the center of the instrument panel deck serves as an assist handle. It is useful when moving the front seats forward and for getting in and out of the airplane.



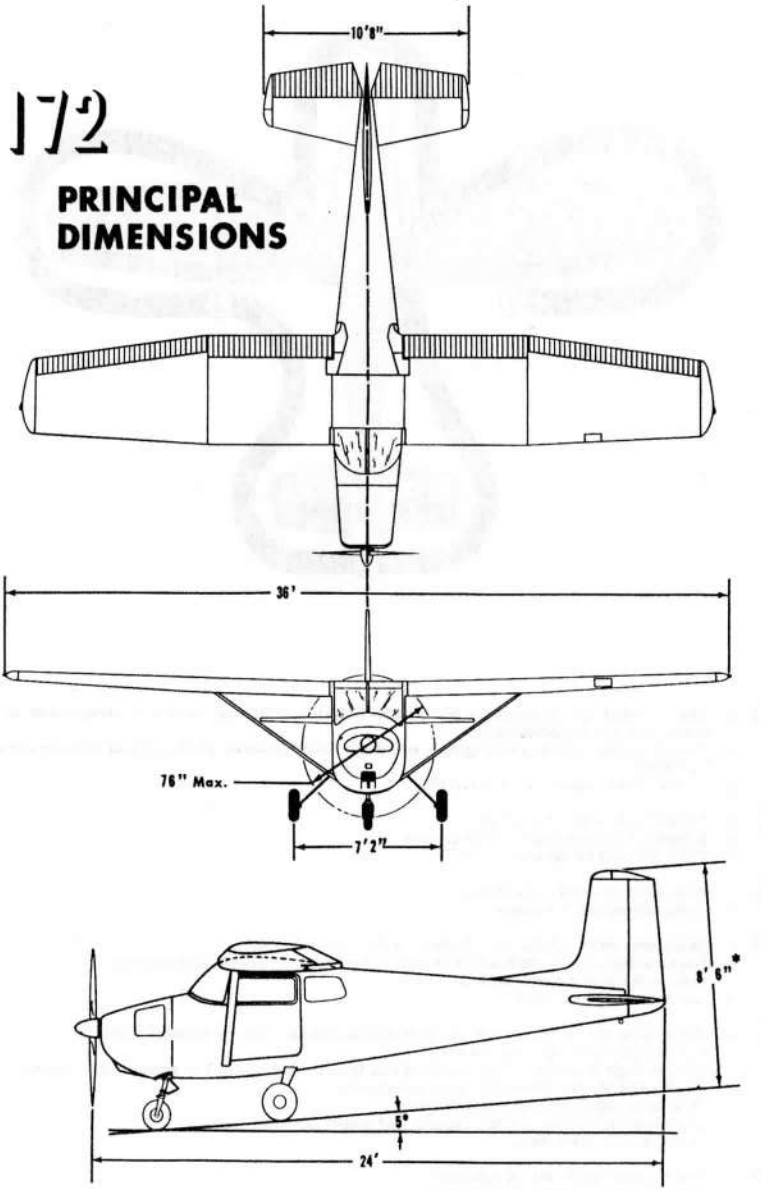
ASSIST HANDLE

LOADING YOUR MODEL 172

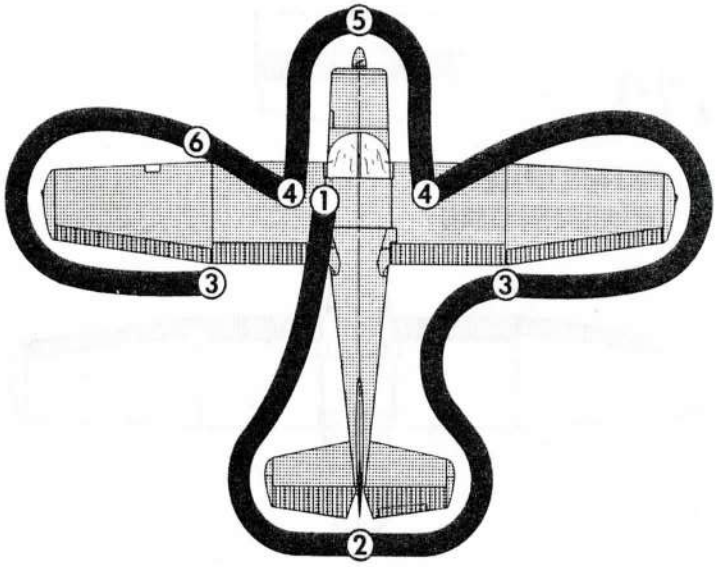
The recommended procedure for loading your Model 172 is as follows:
First, load the baggage compartment.
Next, load the front seats.
Finally, load the rear seat.

172

PRINCIPAL DIMENSIONS



* HEIGHT OF FIN AT MAXIMUM GROSS WEIGHT, NOSE STRUT INFLATED AS SPECIFIED, ENGINE STOPPED. WITH AIRPLANE EMPTY, HEIGHT IS 9'-2". IF A ROTATING BEACON IS INSTALLED ON THE FIN, ADD 2 1/2" TO BOTH DIMENSIONS.



(1)
a. Turn on master switch and check fuel quantity indicators. (Several seconds of warmup must be allowed for correct indication.)
b. Turn off master switch, check ignition switch for "OFF" position, check fuel tank selector valve handle on "BOTH."
c. Remove control wheel lock if installed.

(2)
a. Remove gust locks, if installed.
b. Inspect tail surface hinges and hinge bolts.
c. Check trim tab for security.

(3)
a. Remove aileron lock, if installed.
b. Check aileron and flap hinges.

(4)
a. Check main wheel tire for cuts, bruises, and proper inflation.
b. Inspect airspeed static source hole on side of fuselage for stoppage (left side only).
c. Remove fuel tank cap and check fuel level.
d. Disconnect tie-down chain.

(5)
a. Check oil level. Do not operate with less than six quarts. Fill for extended flight.
b. Inspect cowl access door for security.
c. On first flight of day, drain two ounces of fuel from the fuel strainer to remove water and sediment.
d. Check propeller and spinner for nicks and security.
e. Check nose wheel strut for proper inflation.
f. Check nose wheel tire for cuts, bruises, and proper inflation.
g. Disconnect tie-down chain.

(6)
a. Remove pitot tube cover, if installed.
b. Inspect pitot tube opening for stoppage.
c. Check fuel tank vent opening for stoppage.

Figure 6. Exterior Inspection Diagram

SECTION II

operating check list

AFTER FAMILIARIZING YOURSELF with the equipment of your Cessna 172, your primary concern will normally be the operation of your airplane. This section lists, in Pilot's Check List form, the steps necessary to operate your Cessna efficiently and safely. 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 Cessna 172.

The flight and operational characteristics of the Model 172 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 within the entire range of operation of the airplane. All airspeeds mentioned in sections II and III are indicated airspeeds. Corresponding true indicated airspeeds may be obtained from the airspeed correction table in section V.

A. BEFORE ENTERING THE AIRPLANE.

Perform an exterior inspection of the airplane. (See figure 6.)

B. BEFORE STARTING THE ENGINE.

(1) Operate controls and make a visual check for proper operation.
(2) Make sure windshield is clean for maximum visibility.
(3) Adjust seat for comfort and distance to rudder pedals.

NOTE

Test the front seats for secure latching after adjusting them to the desired position.

(4) Check brakes and set parking brake.
(5) Fasten and check safety belt.

C. STARTING THE ENGINE.

(1) Set carburetor heat to "cold" (Full in).
(2) Set mixture control to "full rich" (Full in).
(3) Set fuel tank selector to "both tanks". (Take-off on less than ¼ tank is not recommended.)
(4) For an initial start in normal air temperatures, use two strokes of the primer. Usually, a hot engine will need no priming.

(5) Clear propeller.
(6) Turn master switch "on".
(7) Turn ignition switch to "BOTH."
(8) Open throttle ⅛" (to idle position).
(9) Start engine by pulling starter control.

D. WARM-UP AND GROUND TEST.

(1) Do not allow the engine to operate at more than 800 r.p.m. for the first 60 seconds after starting. After starting if oil gage does not begin to show pressure within 30 seconds in the summertime and about twice that long in very cold weather, stop engine and investigate. Lack of oil pressure may cause serious engine damage.
(2) Avoid the use of carburetor heat unless icing conditions prevail.
(3) After one to two minutes running at 800 r.p.m., continue warm-up while taxiing to the active runway. Do not overheat the engine by running engine at high speed while on the ground. When the engine accelerates smoothly and oil pressure remains steady, you are ready for take-off.

NOTE

To avoid propeller tip abrasion, do not run up engine on loose cinders or gravel.

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 lb./sq. in.).
(5) Check engine magnetos at 1600 r.p.m. by switching off separately each magneto momentarily. The maximum allowable r.p.m. drop on either magneto is 100 r.p.m. Switch to both magnetos before continuing.
(6) Check carburetor heat and leave on full heat until take-off.
(7) Full throttle r.p.m. check is recommended only when condition of engine is in doubt. The engine should run smoothly and turn, with carburetor heat off, 2260 to 2360 r.p.m. The engine should idle between 400 and 500 r.p.m. Except for short check do not idle below 600 r.p.m.

F. TAKE-OFF.

NORMAL TAKE-OFF.

(1) Flaps 0° (retracted).

(2) Carburetor Heat — "OFF" (full in).
(3) Advance throttle slowly to full throttle.
(4) Avoid dragging brakes by keeping heels on floor.
(5) Apply slight back pressure on the elevator control to raise nosewheel when take-off speed is reached.

NOTE

Do not raise the nose of the airplane excessively high as this will only lengthen the take-off run.

(6) Climb at 80 MPH.

MINIMUM GROUND RUN TAKE-OFF.

(1) Wing flaps 10° (First notch).
(2) Apply full throttle while holding brakes.
(3) Release brakes.
(4) Take-off slightly tail low.

OBSTACLE CLEARANCE TAKE-OFF.

(1) Wing flaps 0° (retracted).
(2) Apply full throttle while holding brakes.
(3) Release brakes.
(4) Take-off slightly tail low.
(5) Level off momentarily to accelerate to best angle of climb speed (60 MPH).

SOFT OR ROUGH FIELD TAKE-OFF WITH NO OBSTACLE AHEAD.

(1) Wing flaps 10° (First notch).
(2) Apply full throttle and raise nosewheel clear of ground with elevator control back pressure.
(3) Take-off in a tail low attitude.
(4) Level off momentarily to accelerate to a safe airspeed.
(5) Retract flaps slowly as soon as a reasonable altitude is obtained. (see "Take-off" paragraph on page 3-4).

TAKE-OFF IN STRONG CROSSWIND.

(1) Flaps 0° (retracted).
(2) Apply full throttle and use sufficient aileron into the wind to maintain wings level.
(3) Hold nosewheel on ground 5-10 MPH above normal take-off speed.
(4) Take-off abruptly to prevent airplane from settling back to runway while drifting.

G. CLIMB.

(1) If no obstacle is ahead climb out with flaps up at 80-90 MPH with full throttle. If maximum rate of climb is desired use full throttle and 75 MPH, at sea level (see figure 18). Reduce climb speed about ½ MPH for every 1000 feet of altitude above sea level.

(2) To climb over an obstacle after take-off use the best Angle of climb speed of 60 MPH, with full throttle and flaps up.

(3) Mixture should be "Full Rich" unless engine is rough due to rich mixture.

H. CRUISING.

(1) Recommended cruising r.p.m. — 2450-2650 (See page 4-2).

(2) Trim airplane by adjusting elevator tab.

(3) Oil pressure — 30-40 lbs./sq. in.

(4) Oil temperature — within green arc range.

(5) Lean mixture to maximum r.p.m.; then enrichen mixture until r.p.m. begins to decrease.

(6) Lean mixture as required to obtain smooth engine operation when using carburetor heat in cruise.

I. LET-DOWN.

(1) Set mixture control "Full Rich" (full in).

(2) Reduce power to obtain desired let down rate at cruising speed.

(3) Apply enough carburetor heat to prevent icing if icing conditions exist.

J. BEFORE LANDING.

(1) Set fuel selector to "Both".

(2) Recheck mixture "Full Rich" (full in).

(3) Apply carburetor heat before closing throttle.

(4) Glide at 70-80 MPH, with flaps up.

(5) Lower flaps as desired below 100 MPH.

(6) Maintain 65-75 MPH, with flaps extended.

(7) Trim airplane with elevator trim tab for glide.

K. LANDING.

NORMAL LANDING.

(1) Landing technique is conventional for all flap settings.

SHORT FIELD LANDING.

(1) Make a power-off approach at 60 MPH, with flaps 40° (fourth notch).

(2) Land on main wheels first.
(3) Lower nosewheel to ground immediately after touchdown.
(4) Apply heavy braking as required.

NOTE

Excessive braking will skid tires, resulting in lengthened ground run and tire damage.

LANDING IN STRONG CROSSWIND.

(1) Use minimum flap setting required for field length.
(2) Use wing low, crab, or combination method of drift correction.
(3) Land in a nearly level attitude.
(4) Hold straight course with steerable nosewheel and occasional braking if necessary.

L. AFTER LANDING.

(1) Raise flaps after completion of landing roll.
(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 at 800 r.p.m. two to three minutes.
(3) Stop engine by pulling mixture control knob to full lean position. Do not open throttle as engine stops.
(4) After engine stops, turn ignition switch "off".
(5) Turn all switches "off". Be sure — otherwise your battery may run down over night.
(6) Set parking brake, if required.

MODIFIED FUEL MANAGEMENT PROCEDURES

With a combination of highly volatile fuel, high fuel temperature, high operating altitude, and low fuel flow rate in the tank outlet lines, there is a remote possibility of accumulating fuel vapor and encountering power irregularities on some airplanes. To minimize this possibility, the following operating procedures are recommended:

(1) Take-off and climb to cruise altitude on "both" tanks. (This is consistent with current recommendations.)
(2) When reaching cruise altitude above 5000 feet MSL, promptly switch the fuel selector valve from "both" tanks to either the "right" or "left" tank.
(3) During cruise, use "left" and "right" tank as required.
(4) Select "both" tanks for landing as currently recommended.

POWER RECOVERY TECHNIQUES

In the remote event that vapor is present in sufficient amounts to cause a power irregularity, the following power recovery techniques should be followed:

OPERATION ON A SINGLE TANK

Should power irregularities occur when operating on a single tank, power can be restored immediately by switching to the opposite tank. In addition, the vapor accumulation in the tank on which the power irregularity occurred will rapidly dissipate itself such that that tank will also be available for normal operation after it has been unused for approximately one (1) minute.

OPERATION ON BOTH TANKS

Should power irregularities occur with the fuel selector on both tanks, the following steps are to be taken to restore power:

(1) Switch to a single tank for a period of 60 seconds.
(2) Then switch to the opposite tank and power will be restored.

SECTION III

operating details

THE FOLLOWING PARAGRAPHS cover in somewhat greater detail the items entered as a Check List in Section II. Every item in the list is not discussed here. Only those items on the Check List that required further explanation will be found in this section.

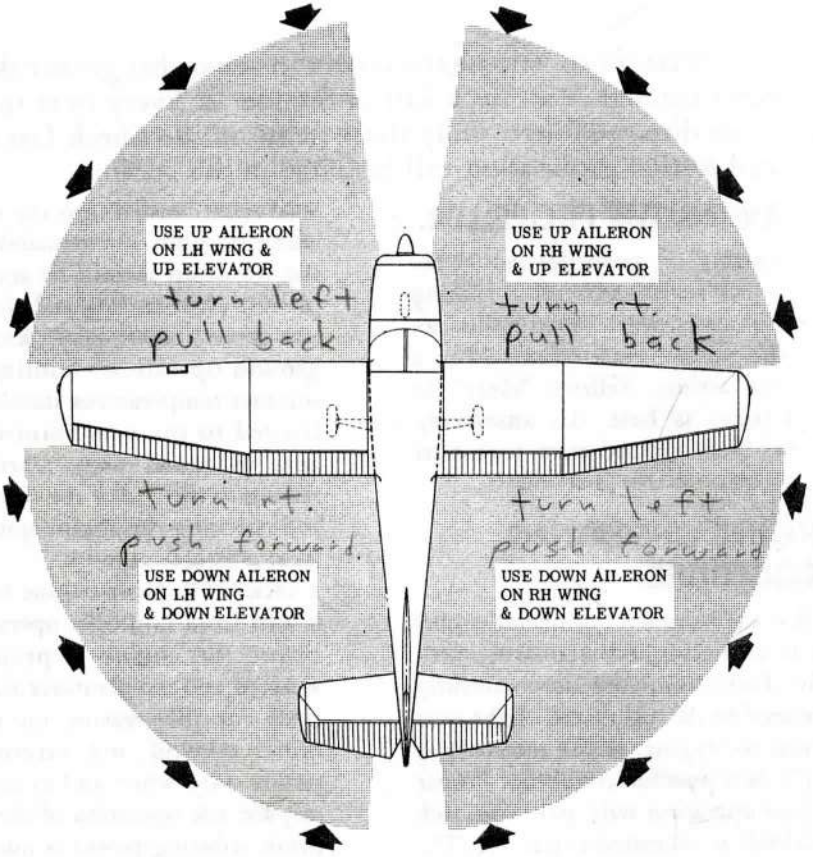
CLEARING THE PROPELLER.

"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 OPERATING PROCEDURE.

You have a new Continental engine made to the highest standards available. This engine has been carefully operated in its run-in and flight tests so that the engine, as you receive it, is in the best possible condition. Proper engine operation will pay you rich dividends in increased engine life. The following points are mentioned so that you may receive the maximum of trouble-free operation and low maintenance cost.

1. STARTING: Ordinarily, the engine starts best and smoothly with proper priming and the throttle opened ⅛ inch. Check the oil pressure as soon as engine is running.
2. WARM UP: Warm the engine for one or two minutes at 800 to 1000 rpm, headed into the wind where possible. The remainder of the warm-up should be accomplished while taxiing and should not exceed 1600 r.p.m. Engine ground operation or idling in summer temperatures should be limited to the very minimum and, in most cases, starting, taxiing to the end of the runway, and checking the engine quickly is an adequate amount.
3. TAKE-OFF: Most engine harm results from improper operation before the engine is properly warmed and temperatures stabilized. For this reason, on your initial take-off, use maximum power only when and as necessary for safe operation of the airplane, reducing power as quickly as possible.
4. CRUISING: The maximum recommended cruising rpm's are 2450 rpm at sea level, 2550 rpm at 5000 ft., and 2650 rpm at 10000 ft. These rpm's will produce approximately 70% power at the given altitudes. Greater range can be obtained at lower rpm settings as shown in the cruise performance chart. At any cruising altitude, adjust mix-



WIND DIRECTION

NOTE

Strong quartering tail winds require caution. Avoid sudden bursts of the throttle and sharp braking when the airplane is in this attitude. Use the steerable nose wheel and rudder to maintain direction.

TAXIING DIAGRAM

ture control for best power by pulling knob out until maximum r.p.m. is obtained with fixed throttle; then push control forward toward "full rich" until r.p.m. starts to decrease. Readjust for each change in power, altitude, or carburetor heat.

5. LET DOWN: The cruising glide should begin far enough away from destination so that a gradual descent can be made with power on, with mixture full rich. On approaching the landing field, the engine should be throttled down gradually and the glide, with closed throttle, should not be longer than necessary.
6. IDLING ENGINE: Your engine is set to idle well below 600 r.p.m., but at engine speeds below 600 r.p.m., satisfactory piston lubrication cannot be maintained. Therefore, it is recommended that the engine not be allowed to operate below 600 r.p.m. for prolonged intervals.
7. STOPPING ENGINE: The engine should always be allowed to idle (600 to 800 r.p.m.) for two to three minutes before stopping. This not only permits the temperature of the various engine parts to equalize, but works oil up around the pistons and rings, thus leaving the engine in good condition for the next start. Providing the engine has been idled for approximately two minutes, it is recommended that the engine be stopped by using the mixture control. The procedure should be to place the mixture control in full lean position (pull control out as far as possible). Do not open throttle as engine stops. After the engine stops, turn the ignition switch to the "off" position.

TAXIING.

Release the parking brake before taxiing and use the minimum amount of power necessary to start the airplane moving. During taxi, and especially when taxiing downwind, the r.p.m. should be held down to prevent excessive taxi speeds. Taxiing should be done at a speed slow enough to make the use of brakes almost entirely unnecessary. Using the brakes as sparingly as possible will prevent undue wear and strain on tires, brakes, and landing gear. Normal steering is accomplished by applying pressure to the rudder pedal in the direction the airplane is to be turned. For smaller radius turns, at slow speed, the brakes may be used on the inside wheel. At slow taxi speed, this airplane may be pivoted about the outboard strut fitting without sliding the tires. When taxiing in crosswinds it is important that speed and use of brakes be held to a minimum and that all controls be utilized (see taxiing diagram on page 3-2) to maintain directional control and balance.

NOTE

Caution should be used when taxiing over rough fields to avoid excessive loads on the nosewheel.

Rough use of brakes and power also add to nose wheel load. A good rule of thumb: "Use minimum speed, power, and brakes."

Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propeller tips. Full throttle runups over loose gravel are especially harmful to propeller tips. When take-offs 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 r.p.m. 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 V under propeller care.

TAKE-OFF.

Normal and obstacle clearance take-offs are performed with flaps retracted. 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. However, if 10° of flaps are used in the ground runs, it is preferable to leave them extended rather than retract them in the climb to the obstacle. The exception to this rule would be in a high altitude take-off in hot weather where climb would be marginal with flaps 10°.

Flap deflections of 30° and 40° are not recommended at any time for take-off. General rules for flap operation during take-off are as follows:

Don't under marginal conditions leave flaps on long enough that you are losing both climb and airspeed.

Don't release flaps with airspeed *below* flaps up stalling speed. (See stalling speed table on page 3-3).

Do slowly release the flaps as soon as you reasonably can after take-off, preferably 50 feet or more over terrain or obstacles.

Consult the take-off chart (figure 18) for take-off distances under various gross weight, altitude, and headwind conditions.

CLIMB.

For detailed data, see climb performance chart in Section VI. Normal climbs are conducted at 80-90 m.p.h. with flaps up and full throttle for best engine cooling. The best *rate-of-climb* speeds range from 75 m.p.h. at sea level to 70 m.p.h. at 10,000 feet. If an obstruction dictates the use of a steep climb angle, the best *angle-of-climb* speed should be used with flaps up and full throttle. These speeds vary from 56 m.p.h. at sea level to 63 m.p.h. at 10,000 feet.

NOTE

Steep climbs at these low speeds should be of short duration because of poor engine cooling.

CRUISE.

For cruise data, see cruise performance chart in Section VI.

Range and endurance figures are given for lean mixture, from 2500 feet to 12,500 feet and for rich mixture at •

STALLING SPEEDS

POWER OFF, MPH T.I.A.S.

Gross Weight 2200 lbs

CONDITION	ANGLE OF BANK 0°	20°	40°	60°
Flaps Up	58	60	66	82
Flaps Down 10°	56	58	64	79
Flaps Down 40°	52	54	59	73

altitudes of 2,500 feet and 5,000 feet. All figures are based on zero wind, 37 gallons of fuel for cruise, McCauley 7651 propeller, 2200 pounds gross weight, and standard atmospheric conditions. For lean mixture figures, mixture is leaned to maximum r.p.m. Allowances for fuel reserve, headwinds, take-offs and climb, and variations in mixture leaning technique should be made and are in addition to those shown on the charts. Other indeterminate variables such as carburetor metering characteristics, engine and propeller conditions, and turbulence of the atmosphere may account for variations of 10% or more in maximum range.

STALLS.

The stalling speeds shown above are for forward c.g., normal category, full gross weight conditions. Other loadings result in slower stalling speeds. The horn stall warning indicator produces a steady signal 5 to 10 m.p.h. before the actual stall is reached and remains on until the airplane flight attitude is changed. Fast landings will not produce a signal.

The stall characteristics are conventional for the flaps up and flaps down condition. Slight elevator buffeting may occur just before the stall with flaps down.

LANDING.

Normal landings are made power off with any flap setting. Slips are prohibited in full flap approaches because of a downward pitch encountered under certain combinations of airspeed and sideslip angle.

Approach glides are normally made

at 70-80 m.p.h. with flaps up, or 65-75 with flaps down, depending upon the turbulence of the air. The elevator trim tab is normally adjusted in the glide to relieve elevator control forces.

Landings are usually made on the main landing wheels to reduce the landing speed and the subsequent need for braking in the landing roll. The nose wheel is lowered gently to the runway after the speed is diminished to avoid unnecessary nose gear strain. This procedure is especially important in rough field landings.

Heavy braking in the landing roll is not recommended because of the probability of skidding the main wheels with the resulting loss of braking effectiveness and damage to the tires.

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. In extremely cold (−20° F) weather, prime the engine as follows:

(1) Clear propeller.
(2) Turn master switch "on".
(3) With magneto switch "off" and throttle closed, prime the engine four to ten strokes as the engine is being turned over.
(4) Turn magneto switches "on".
(5) Open throttle ⅛ (to idle position) and start engine by pulling starter control. Note: In extremely cold weather a few strokes of the primer as the engine fires will enable the engine to keep running. (Avoid overpriming.) 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.

During cold weather operations, no indication will be apparent on the oil temperature gage prior to take-off if outside air temperatures are very cold. After a suitable warm-up period (2-5 minutes at 1000 r.p.m.), accelerate the engine several times to higher engine r.p.m. If the engine accelerates smoothly and the oil pressure remains normal and steady, the airplane is ready for take-off.

When operating in sub-zero temperatures, avoid using partial carburetor heat. Partial heat may increase the carburetor air temperature to the 32° - 80° F. range, where icing is critical under certain atmospheric conditions.

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.

Oil Dilution (Optional Equipment). If your airplane is equipped with an oil dilution system, and very low temperatures are expected, dilute the oil

OIL DILUTION TABLE

	TEMPERATURE		
	0° F	-10° F	-20° F.
Dilution Time	1 min.	1½ min.	2¼ min.
Fuel Added	1 qt.	1½ qt.	2¼ qt.
Oil Drained (Sump Full)	0 qt.	½ qt.	1¼ qt.

Maximum sump capacity: 9 qt.
Maximum for take-off: 8 qt.

before stopping the engine. Determine the dilution time required for the anticipated temperature from the Oil Dilution Table. With the engine operating at 1,000 rpm, hold down the oil dilution switch button the necessary time. Fuel will flow into the oil pump at the rate of 1 quart every 60 seconds. If more than one minute of dilution (one quart of fuel) appears necessary to dilute the oil for the anticipated temperature, check the oil level before starting to dilute. With a full sump, only one quart may be added without risk of overflow and its attendant fire hazard. To make room for the additional fuel some oil must be drained before dilution. The table indicates the amount of oil to drain for various dilution times. The total volume of fuel and oil must not exceed 9 quarts.

During the dilution period, watch the oil pressure closely. A slight, gradual pressure drop is to be expected as the oil is thinned. Stop the engine, however, if any sharp fluctuation in pressure is observed; it may be caused by an oil screen clogged with sludge washed down by the fuel.

NOTE

When the dilution system is used for the first time each season, the oil should be changed and the oil screens cleaned to remove sludge accumulations washed down by the fuel. Use the full dilution period, drain the oil, clean the screens, refill with fresh oil and redilute as required for the anticipated temperature before the engine has cooled completely.

On starting and warm-up after diluting the oil, again watch the oil pressure closely for an indication of sludge blocking the screens. If the full dilution time was used, starting with a full sump, run the engine long enough to evaporate some of the fuel and lower the sump level before take-off. Otherwise, the sump may overflow when the airplane is nosed up for climb.

SECTION IV

operating limitations

OPERATIONS AUTHORIZED.

Your Cessna 172 with standard equipment as certificated under CAA Type Certificate No. 3A12 is approved for day and night operation under VFR.

Additional optional equipment is available to increase its utility and to make it authorized for use under IFR day and night. An owner of a properly-equipped 172 is eligible to obtain approval for its operation on single engine scheduled airline service on VFR.

MANEUVERS — NORMAL CATEGORY.

The Model 172 exceeds the requirements of the Civil Air Regulations, Part 3, set forth by the United States Government for airworthiness. Spins and aerobatic maneuvers are not permitted in normal category airplanes in compliance with these regulations. In connection with the foregoing, the following gross weights and flight load factors apply:

Gross Weight	2200 lbs.	
Flight Load Factor* Flaps Up	+3.8	−1.52
Flight Load Factor* Flaps Down	+3.5	

*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 all CAA approved markings, placards and check lists in the airplane. If there is any information in this section which contradicts the CAA approved markings, placards and check lists, it is to be disregarded.

MANEUVERS — UTILITY CATEGORY.

This airplane is not designed for purely aerobatic flight. However, in the acquisition of various certificates such as commercial pilot, instrument pilot and flight instructor, certain maneuvers are required by the C.A.A. All of these maneuvers are permitted in the Cessna 172 when operated in the utility category. In connection with the utility category, the following gross weight and flight load factors apply, with recommended entry speeds for maneuvers as shown.

Maximum Design Weight	1950 lbs.	
Flight Maneuvering Load Factor, Flaps Up	+4.4	−1.76
Flight Maneuvering Load Factor, Flaps Down	+3.5	

No acrobatic maneuvers are approved except those listed below:

Maneuver	*Entry Speed*
Chandelles	115 m. p. h. (100 knots)
Lazy Eights	115 m. p. h. (100 knots)
Steep Turns	115 m. p. h. (100 knots)
Spins	Slow Deceleration
Stalls (Except Whip Stalls)	Slow Deceleration

The baggage compartment and rear seat must not be occupied.

Aerobatics that may impose high inverted loads should not be attempted. The important thing to bear in mind in flight maneuvers is that the Cessna 172 is 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.

AIRSPEED LIMITATIONS.

The following are the certificated true indicated airspeed limits for the Cessna 172:

Maximum (Glide or dive, smooth air)	160 mph (red line)
Caution Range (Level flight or climb)	140-160 mph (yellow arc)
Normal Range (Level flight or climb)	59-140 mph (green arc)
Flap Operating Range	55-100 mph (white arc)

ENGINE OPERATION LIMITATIONS.

Power and Speed	145 bhp at 2700 rpm

ENGINE INSTRUMENT MARKINGS.

OIL TEMPERATURE GAGE.

Normal Operating Range	Green Arc
Maximum Allowable	Red Line

OIL PRESSURE GAGE.

Minimum Idling	5 psi (red line)
Normal Operating Range	30-45 psi (green arc)
Maximum	50 psi (red line)

FUEL QUANTITY INDICATORS.

Empty (2½ gallons unusable each tank)	E (red line)
*Not recommended for take-off	E to ¼ (red arc)

*This fuel available for all normal operations.

TACHOMETER.

Normal Operating Range:

At sea level	2200-2450 (inner green arc)

At 5000 feet .....2200-2550 (middle green arc)
At 10,000 feet .....2200-2650 (outer green arc)
Maximum Allowable.....2700 (red line)

WEIGHT AND BALANCE.

All aircraft are designed for certain limit loads and balance conditions. These specifications for your 172 are charted on page 4-1.

A weight and balance report and equipment list for your particular airplane when it left the factory is furnished. Changes in original equipment affecting empty weight c. g. are required by the C.A.A. to be recorded in the repair and alteration form 337. Using the empty weight, c. g. location, and moment derived from the latest of these two sources, and following the example shown, the exact moment may be readily calculated. This exact moment, when plotted on the center of gravity envelope, will quickly show whether or not the c. g. is within limits. Refer to the loading graph for moment values of items to be carried.

The utility category is solely for the purpose of instructing and training in certain flight maneuvers. The weight and balance considerations limit the airplane to a pilot with or without co-pilot, full gas, no baggage and no rear seat baggage *or passenger.* The utility category envelope has been included in the weight and balance charts. The weight and moment of your airplane in the utility category may be determined by following the example shown for figuring a normal category airplane weight and moment. The utility weight and moment, when plotted on the center of gravity envelope, should fall within the "Utility" portion of the envelope for safe operation.

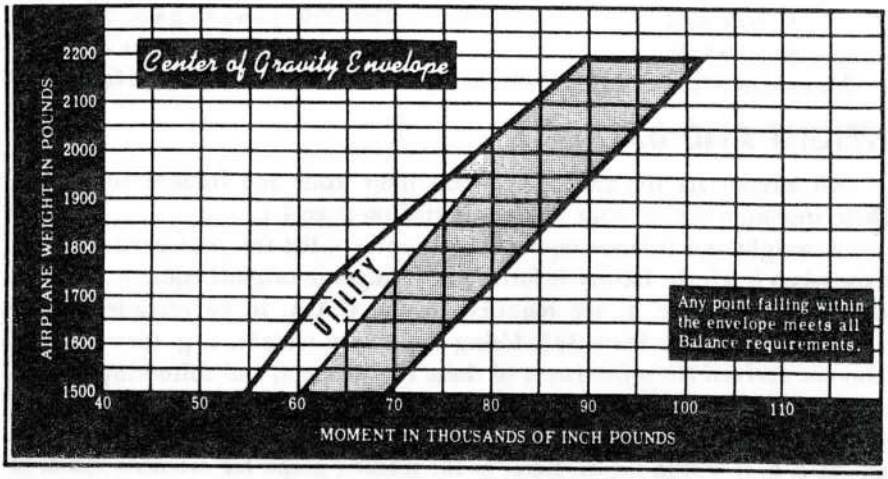
EXAMPLE FOR A NORMAL CATEGORY AIRPLANE WITH A LICENSED EMPTY WEIGHT OF 1290 LBS. AND A MOMENT OF 49,260 IN. LBS.

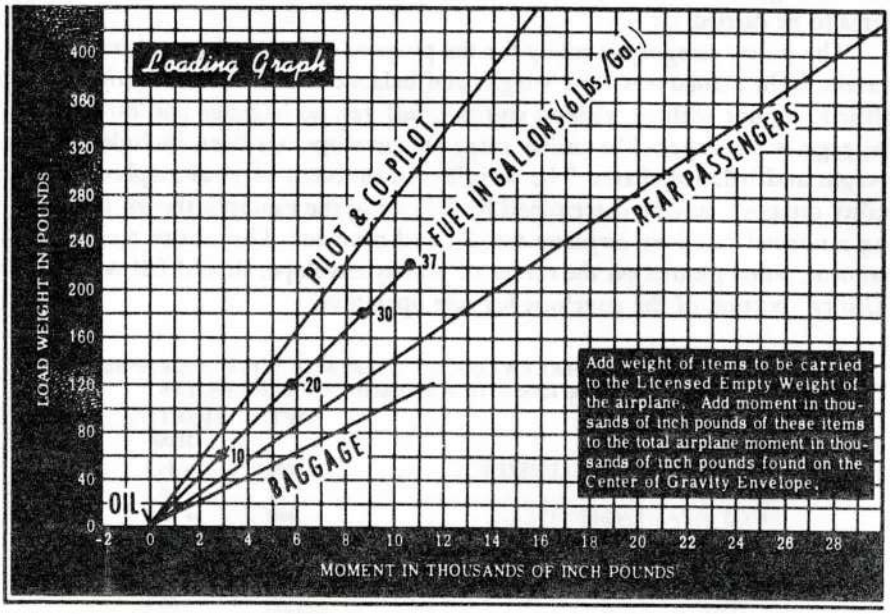
	WT.	MOMENT 1000
EMPTY WEIGHT (LICENSED)	1290	+49.3
OIL	15	− 0.3
PILOT & PASSENGER (1)	340	+12.2
REAR PASSENGERS (2)	290	+20.3
FUEL (MAXIMUM) 37 GAL.	222	+10.7
BAGGAGE (TO MAKE GR. WT.)	43	+ 4.1
Total	2200	96.3

Locate this point (2200 at 96.3) on the center of gravity envelope graph, and since the point falls within the envelope, the above loading meets all balance requirements.

NOTE

The above problem is an example of only one of many different loading configurations. To best utilize the available payload for your airplane, the loading charts on page 4-4 should be consulted to determine proper load distribution.


Center of Gravity Envelope
AIRPLANE WEIGHT IN POUNDS
2200
2100
2000
1900
1800
1700
1600
1500
40
50
60
70
80
90
100
110
MOMENT IN THOUSANDS OF INCH POUNDS
UTILITY
Any point falling within the envelope meets all Balance requirements.


Loading Graph
LOAD WEIGHT IN POUNDS
400
360
320
280
240
200
160
120
80
40
0
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
MOMENT IN THOUSANDS OF INCH POUNDS
PILOT & CO-PILOT
FUEL IN GALLONS (6 Lbs./Gal.)
REAR PASSENGERS
37
30
20
10
BAGGAGE
OIL
Add weight of items to be carried to the Licensed Empty Weight of the airplane. Add moment in thousands of inch pounds of these items to the total airplane moment in thousands of inch pounds found on the Center of Gravity Envelope.

SECTION V

care of the airplane— owner's responsibilities

IF YOUR AIRPLANE is to retain that new plane performance, stamina, and dependability, certain inspection and maintenance requirements must be followed. It is always wise to follow a *planned* schedule of lubrication and maintenance based on the climatic and flying conditions encountered in your locality.

Keep in touch with your Cessna dealer and take advantage of his knowledge and experience. He knows your airplane and how to maintain it. He will remind you when lubrications and oil changes are necessary and about other seasonal and periodic services.

GROUND HANDLING.

The airplane is most easily and safely maneuvered, during ground handling, by the use of a tow-bar attached to the nose wheel. Always use a tow-bar when one is available. When moving the airplane by hand and no tow-bar is available, push down at the front edge of the stabilizer adjacent to the fuselage to raise the nose wheel off the ground. When the nose wheel is held clear of the ground the airplane can be readily turned in any direction by pivoting it about the main gear. *Do not push down on the empennage by the tip of the elevator; likewise, do not shove sidewise on the upper portion of the fin.* When moving the airplane forward or backwards, push at the wing strut root fitting or at the main gear strut.

MOORING YOUR AIRPLANE. (See figure 7.)

Proper tie-down procedure is your best precaution against damage to your parked airplane by gusty or strong winds. To tie-down your airplane securely, proceed as follows:

(1) Tie sufficiently strong (700 pounds tensile strength) ropes or chains to the wing tie-down fittings located at the upper end of each wing strut.

(2) Secure the opposite ends of these ropes or chains to tie-down rings suitably anchored to the ground.

(3) Tie a rope or chain thru the nose gear tie-down ring and secure the opposite end to a tie-down ring in the ground.

(4) Securely tie the middle of a length of rope to ring at tail. Pull each end of rope away at 45° angle and secure to tie-down rings positioned on each side of tail.

(5) Install surface control locks between the flap and aileron of each wing.

(6) Install the control lock in the control wheel shaft.

(7) Install surface control lock over fin and rudder.

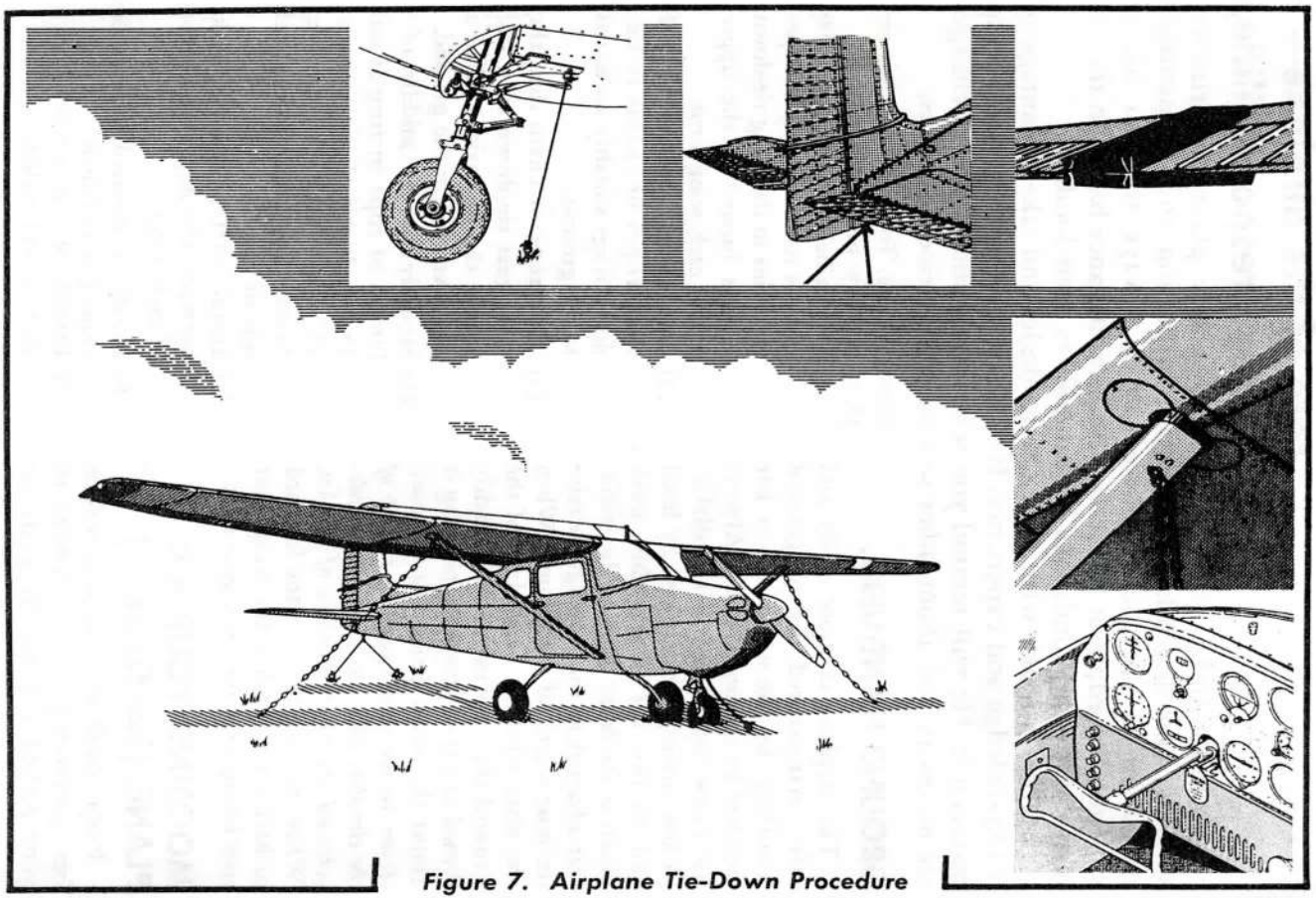


Figure 7. Airplane Tie-Down Procedure

STORAGE.

The all-metal construction of 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 paragraph in this section covers the subject in greater detail.

Do not neglect the engine when storing the airplane. Turn the propeller over by hand or have it turned over every few days to keep the engine bearings, cylinder walls and internal parts lubricated. Full fuel tanks will help prevent condensation and increase fuel tank life.

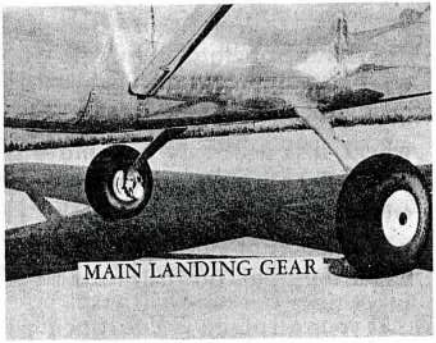
Airplanes are built to be used and regular use tends to keep them in good condition. An airplane left standing idle for any great length of time is likely to deteriorate more rapidly than if it is flown regularly, and should be carefully checked over before being put back into service.

LIFTING AND JACKING.

The airplane may be lifted by an appropriate sling at the engine mount fuselage attachment fitting and a sling around the aft section of the fuselage. The upper half of the cowl must be removed for application of the sling at the engine mount fuselage attachment fitting.

Jacking point brackets and hoisting rings are available as optional equipment and insure easy, safe handling of the airplane. A block of hardwood sawed at an angle to fit between the fuselage and the main landing gear spring may be used as a jacking point to hold the airplane when working on a main wheel or tire. Do not use the brake casting as a jacking point.

To remove the nose wheel, the airplane may be held in a nose high attitude by holding the tail down or by placing a padded support under the aft end of the nose gear support forging. Brake or block the main wheels when the nose wheel is being raised for removal.


MAIN LANDING GEAR

LANDING GEAR, WHEELS, AND TIRES.

The main landing gear consists of a single tapered spring leaf for each main gear. This spring is made from the highest quality chrome vanadium

steel, heat treated and shot peened for added fatigue resistance. No maintenance of this spring is necessary other than paint to prevent rusting.

The steerable nose wheel is mounted on an air-oil shock strut which incorporates a shimmy dampener to assure smooth operation. This nose gear makes ground handling, taxiing, and landing both easier and smoother.

Correct tire pressure is essential to realize the full benefit of the landing gear and to obtain maximum tire wear. Correct tire pressure for the main gear is 23 lbs. per sq. inch gage pressure and for the nose gear it is 26 lbs. per sq. inch. An accumulation of oil and grease on tires will have an adverse effect on tire life and should be removed with soap and water.

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.

If your airplane is equipped with optional "Speed Fairings," it will be necessary to remove the main wheel fairings and to disconnect the nose wheel fairing prior to removing the nose and main wheels and tires. To remove the wheels and tires for repair or replacement, use the following procedure:

Main Wheels and Tires

1. Remove bolt and washers from outboard side of fairing.
2. Remove seven screws and washers from inboard side of fairing.
3. Lift fairing from main wheel.
4. Remove main wheel and tire in the conventional manner.

Nose Wheel and Tire

1. Remove cotter pin, nut and washer from either side of fairing at axle location, and pull axle stud out of nose wheel axle.
2. Remove nut, washers and bolt from top attachment point on fairing.
3. Slide fairing upward to permit removal of wheel.
4. Remove nose wheel and tire in the conventional manner.

NOTE

Removal of the nose wheel fairing from the airplane will require disassembly of the strut.

When changing a tire with optional speed fairings, check the clearance between the tire and the mud scraper. Proper clearance is .19 to .31 inch on the nose wheel and .25 to .38 inch on the main wheels. To adjust a scraper, loosen the scraper attaching screws on each side of the fairing, move the scraper as required and retighten the screws. Do not pry between the scraper and the fairing. The clearance check is of particular importance if a recapped tire is installed, since the growth of the tire carcass in service may have increased its diameter.

The wheel alignment has been properly set at the factory. Excessive tire wear indicates an improper wheel setting for the "on the ground" weight at which you are operating. See your dealer for re-alignment.

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 fluid level must be checked periodically, and the reservoir kept full at all times. The brake master cylinders should be serviced, as required, with MIL-H-5606, a 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 pedals.

The nose gear air oil shock strut is filled as follows:

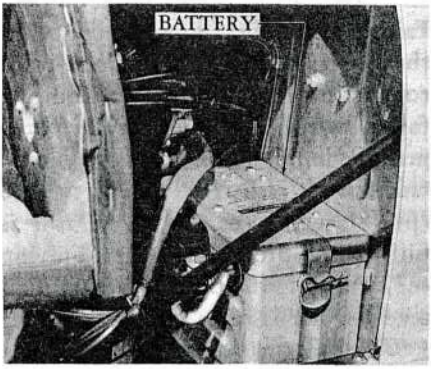
1. Remove valve cap and release all air.
2. Remove valve housing assembly.
3. Compress strut completely (stops in contact with outer barrel hub).
4. Oil level.
   a. Fluid used should comply with specification MIL-H-5606.
   b. Fill strut to bottom of valve installation hole.
5. Fully extend strut.
6. Replace valve housing assembly.
7. With strut fully extended and nose wheel clear of ground, inflate strut to 35 PSI.

The shimmy dampener fluid level should be checked at least every 25 hours. When filling the shimmy dampener, turn the nose wheel as far as it will go to the right. This eliminates the possibility of entrapping air behind the piston within the dampener assembly. Remove the cap from the reservoir and fill the reservoir with MIL-H-5606 hydraulic fluid. When disassembling the dampener for cleaning or repair it will be noticed that O-rings or wiper rings are never installed on the dampener piston even though provisions are made for such rings. When assembling the dampener, do not install an O-ring or a wiper ring on the piston.

BATTERY.

The battery is located under the cowling on the left side and is reached by raising the left cowl access door.

Maintain the level of the battery electrolyte at the level of the horizontal baffle plate (the plate with holes in it which is approximately two inches below the filler plug) by adding distilled water as required. Do not fill



above the baffle plate. This level should be measured with the battery in a level position.

When the battery is tipped to the side or inverted, the space above the baffle plate serves as a fluid reservoir. If 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. Sponge off any spilled acid and corrosion products with soda water solution to neutralize acid, then rinse with clear water. Do not use excessive amounts of soda water.

Keep the battery connections clean and tight to assure maximum electrical power. 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.*

The generator warning light, when on, indicates that the electrical system is receiving current from the battery and the generator is not functioning. Failure of the light to come on, when the master switch is turned on prior to starting the engine, will indicate faulty wiring, a dead battery, or a malfunctioning light. The light should fade out at approximately 700 to 1000 rpm showing that the generator is functioning properly and is supplying the system. If the light should illuminate above this rpm, a malfunctioning generator or voltage regulator, or a short in the generator circuit would be indicated. It is possible, under extreme electrical loads, to draw current from the battery to supplement the current of the generator; however, the generator warning light will not indicate this drain on the battery as long as the generator is functioning properly. Therefore, the generator warning light is not to be used as a battery charge indicator.

The airplane should not be operated without a battery, or with the battery disconnected; damage to the generator and voltage regulator may 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 recharged.

THE PLASTIC WINDSHIELD AND WINDOWS

The windshield is a single piece, full floating, "free blown" unit of "Long-life" plastic. To clean the plastic, 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

so that it attracts dust particles from the air. Wiping with a damp chamois will remove this charge as well as the dust and therefore is recommended.

Remove oil and grease by rubbing lightly with a cloth wet with kerosene. *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 will cause crazing.

If, after cleaning, no great amount of scratching is visible, wax the surface with a good grade of commercial wax. Waxing will fill in minor scratches and help avoid further scratching. Apply the wax in a thin, even coat and bring it to a high polish by rubbing lightly with a clean, dry, soft flannel cloth.

Do not use a canvas cover to protect the windshield when the airplane is tied out, unless freezing rain or snow is expected. Canvas covers may cause crazing.

ALUMINUM SURFACES.

The clad aluminum used for the external parts of Cessna airplanes needs 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. Household type detergent soap powders are effective cleaners, but should be used cautiously since some of them are strongly alkaline. 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 in cleaning the airplane.

PAINTED SURFACES.

With only a minimum of care, the lacquered exterior of your Cessna will retain its brilliant gloss and rich color for many years. The lacquer should not be waxed or polished for approximately 30 days after it is applied, so that any solvent remaining in the paint may escape. After this initial curing period, regular waxing with a good automotive wax will help preserve the lacquers luster and will afford a measure of protection from damage.

Spilled fluids containing dyes, such as fuel and hydraulic oil if accidentally spilled on the surface should be flushed away at once to avoid a permanent stain. Battery electrolyte must be flushed off at once, and the area neutralized with an alkali such as baking soda solution, followed by a thorough rinse with clear water.

ENGINE COMPARTMENT.

The engine section should be kept free of an accumulation of oil, grease, and dirt to prevent a fire hazard. The bulkhead between the cabin and the engine section is aluminized iron and may be cleaned with recommended solvent cleaners for grease and oil.

The oil filter screens should be removed and cleaned whenever the oil is changed. The carburetor air filter also should be serviced at 25-hour intervals under average conditions. Under more severe dust conditions, the filter should be serviced more frequently; daily servicing is recommended when extremely dusty conditions are encountered. The service instructions on the filter should be followed.

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. Soap or detergents and water are not recommended for use on the seats since this will remove some of the fire retardant with which the seats have been treated. When using recommended cleaners, the following method is suggested:

(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 imbedded too deeply 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. Working toward the center keeps the spot from spreading and lessens the possibility of leaving a ring. If necessary, repeat several times.

(6) Brush again, to remove any further particles which may have become loosened.

Spots or stains on the plastic headliner material and Royalite side panels are easily removed using a clean cloth slightly dampened with water. A few light strokes over the area usually removes all dirt. Persistent stains, requiring the use of cleaning fluid, may be removed as described in the preceding steps, 3 through 6.

METAL PROPELLER.

Little maintenance is required to keep your McCauley Met-L-Prop in air-worthy condition. The blades should be thoroughly inspected at

least every 25 hours for dents, nicks and scratches. When small dents and nicks appear, they should be carefully dished and shallowed out using a fine cut file, sandpaper and crocus cloth. An occasional wiping of the metal propeller with an oily cloth will clean off grass and bug stains and help prevent corrosion of the propeller in salt water areas.

CONTROL SYSTEM.

Figures 8 to 14 inclusive outline the control systems including control travel limits, location of control stops and the location of turnbuckles. The single-wrap method for safetying turnbuckles with .040 monel wire is satisfactory and CAA approved. Rigging methods for the various systems are outlined below:

FLAPS:

1. Place the flap handle in the 0° flap position.
2. Hold the flap in the full-up position by applying firm hand pressure upward and forward against the trailing edge of the flap.
3. Adjust the flap push-pull rod until the flap bellcrank is in the

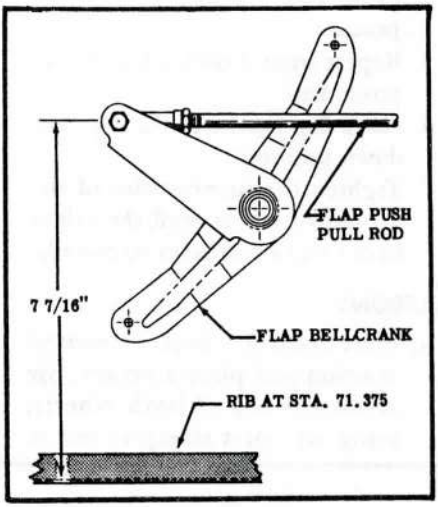


Figure 8. Flap Bellcrank Adjustment

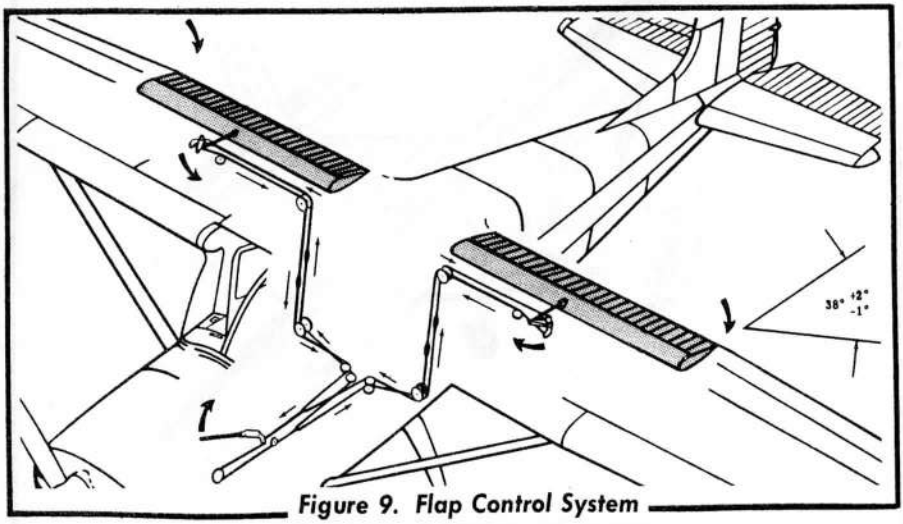


Figure 9. Flap Control System

position shown in figure 8.

4. Release the hand pressure that was applied to the flap trailing edge in step 2 and tighten the flap-up cable turnbuckle located behind the doorpost until the cable has a tension of 20-40 pounds.
5. Repeat steps 2 thru 4 for the opposite flap.
6. Move flap handle to the flap full-down position.
7. Tighten the turnbuckles of the flap-down cables until the cables have a tension of 20 to 40 pounds.

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.
3. The ailerons on the Model 172 are restricted in travel by a feature built into the bellcranks. Stops in the bellcrank allow a total travel of 34°. In rigging the ailerons, it is important that the bellcranks are neutralized. Connect the cables and adjust bellcrank to a position as shown in figure 11. Cable tension should be approximately 20 to 40 pounds with the control wheels in the full-forward position. Maintain this position when checking the cable tension.

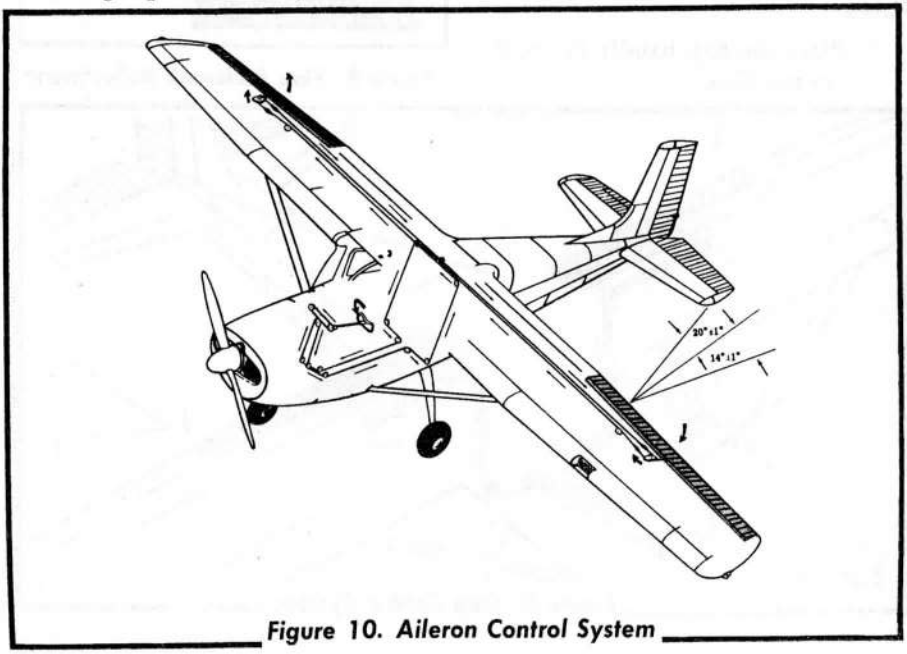


Figure 10. Aileron Control System

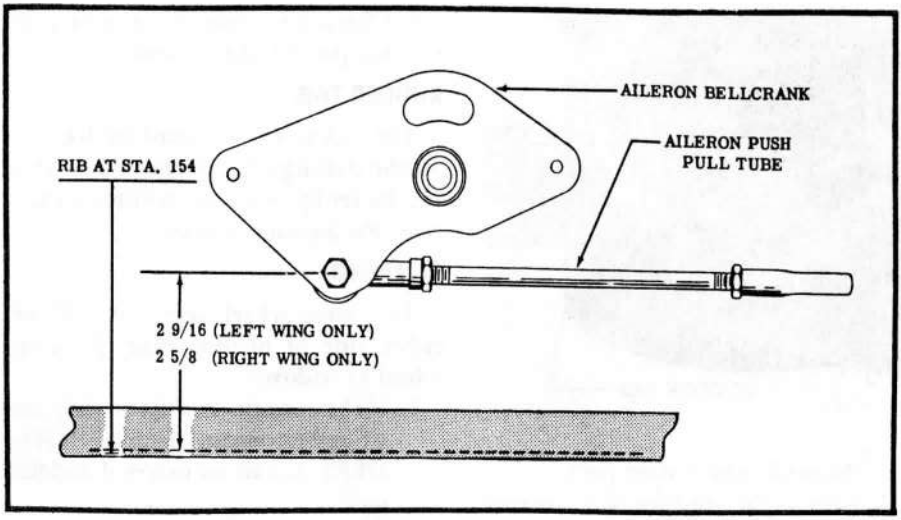


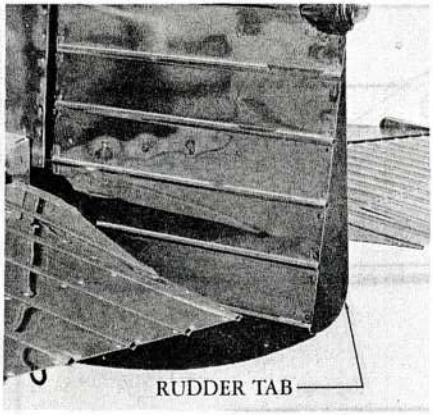
Figure 11. Aileron Bellcrank Adjustment

4. Adjust ailerons to neutral position, by reference to the wing flaps. This adjustment is made by disconnecting the aileron push-pull tube from the bellcrank, and making adjustment on the rod end at the aileron.
5. Check travel which should be 20° up and 14° down, with a tolerance of plus or minus 1°.
6. Check the ailerons for correct movement: wheel right, right aileron up and left aileron down.
7. 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 Step 4.

RUDDER.

Rudder travel is 16° ± 1° from the centerline of the airplane. Travel is limited by stop bolts on the last fuselage bulkhead which limit the travel of the rudder bellcrank. The travel is adjusted by increasing or decreasing the thickness of washers under the heads of the stop bolts. Rig the rudder as follows:

1. Disconnect the rudder cables at the cable turnbuckles and adjust the stop bolts for the correct rudder travel.
2. Secure the rudder in neutral, reconnect the cables and tighten them until both rudder pedals are 6½ inches from the firewall, measuring to the center of the brake pedal hinge.
3. Make sure the cables do not rub the holes in the bulkheads



through which they pass.

4. Check the rudder for correct movement.
5. Safety the turnbuckles.
6. Check the nose wheel steering for proper adjustment.

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.

STEERING.

The nose wheel travel is 30° to either side of neutral. Rig the nose wheel as follows:

1. Make sure the rudder pedals are rigged correctly (step 2, RUDDER). Install an external rudder lock.
2. Disconnect the steering tubes from the nose wheel strut.

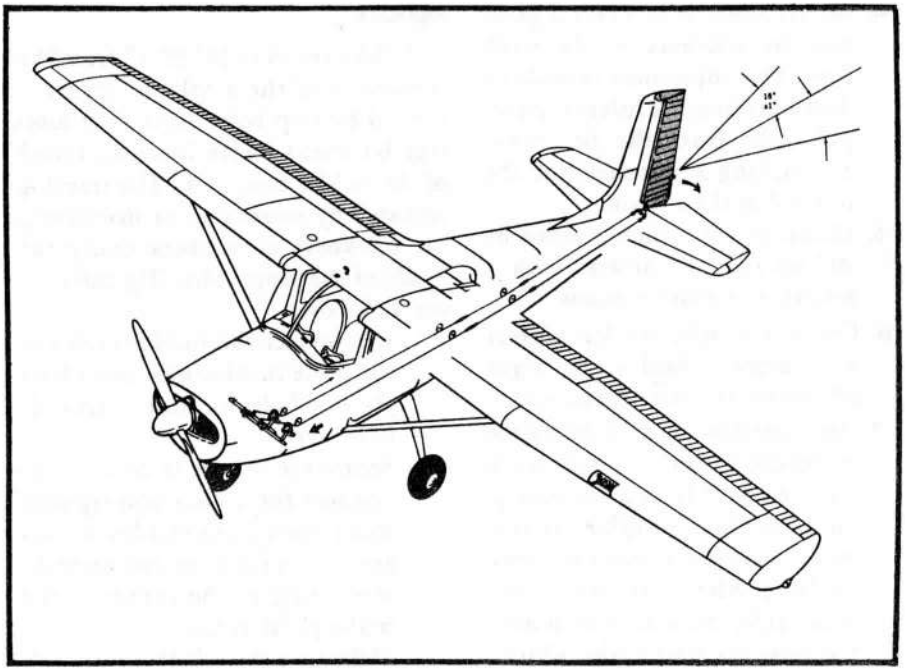


Figure 12. Rudder Control System

3. Raise the nose wheel clear of the ground, either by depressing the tail or hoisting the nose.
4. Make sure the nose wheel is centered correctly by the steering block.
5. Fully extend the steering tubes. Without compressing the internal springs, adjust the clevises as required and reconnect them to the strut steering arm.
6. Remove the rudder lock.

ELEVATORS.

Elevator travel is 28° + 1° — 0° up and 26° + 1° — 0° down. This travel is controlled by two stop bolts located in the stabilizer rear spar.

1. Set stop bolts so that elevator has correct travel when the aft elevator bellcrank is in contact with them.
2. With elevator in full down position, the measurement from firewall to the edge of the chain sprocket hub on the control column should be ½".
3. Tighten cables to approximately 20 to 40 pounds.
4. Check elevator for correct movement: wheel back, elevator up.

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 screw-

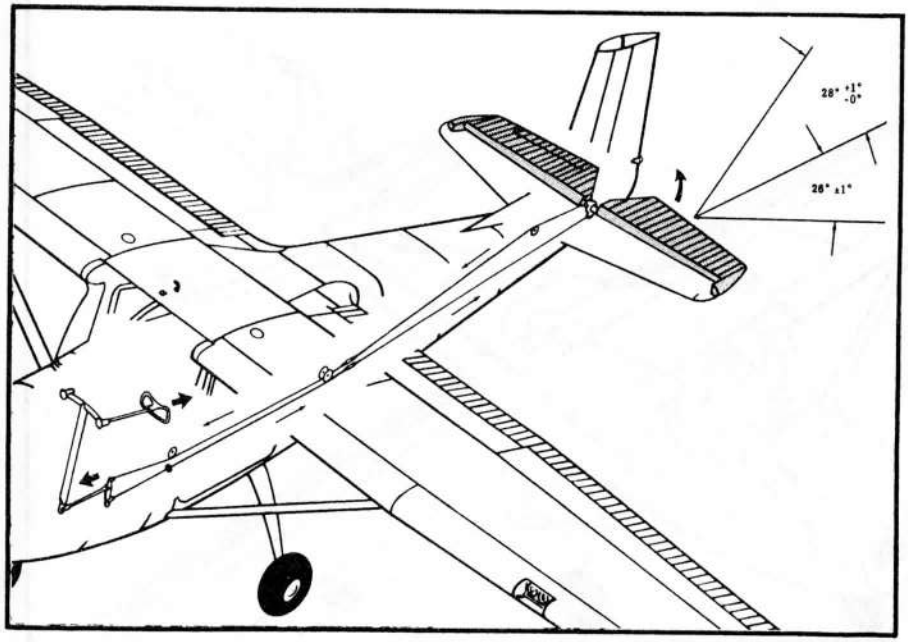


Figure 13. Elevator Control System

jack, which is mounted in the right half of the stabilizer. The travel is 28° up and 13° down, plus 1° or minus 0°.

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 15 to 20 pounds.
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 29°. (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 14°.
4. Set the tab travel to 28° up and 13° down by moving the stops

ELEVATOR TRIM TAB

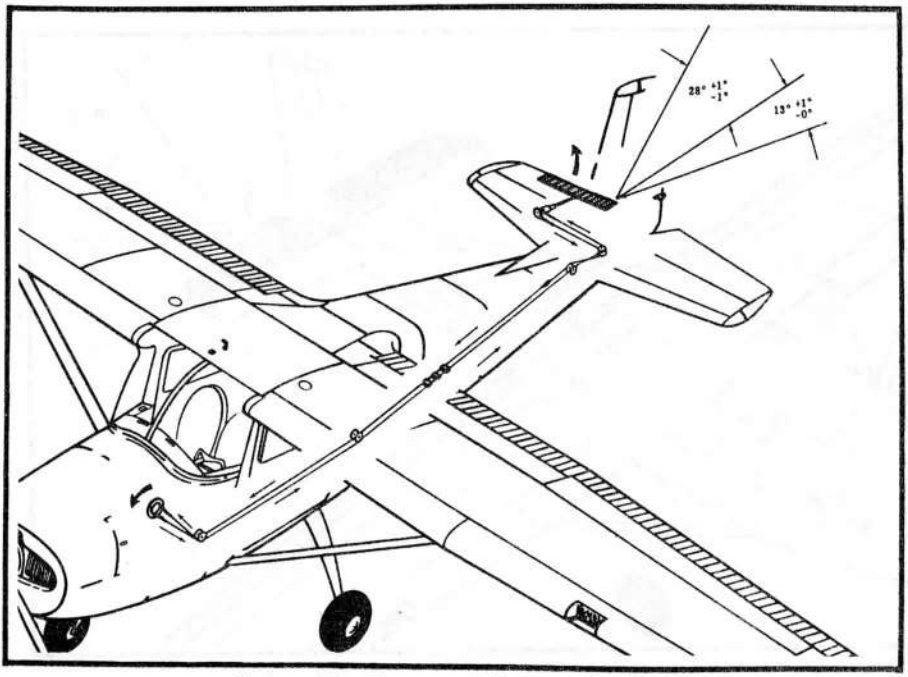
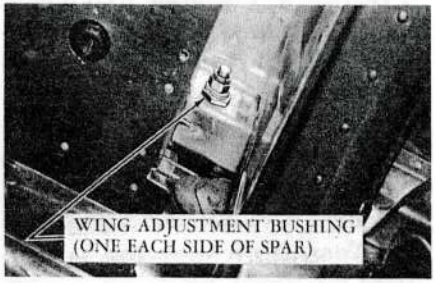


Figure 14. Elevator Tab Control System

located between the first and second bulkheads aft of the baggage compartment, on the trim tab cables.

WING ADJUSTMENT.

Initial rigging is accomplished by setting the two eccentric bushings on



each rear spar attachment at neutral position. These two eccentric bushings should always be rotated together whenever the setting is changed. Never rotate them separately. If flight test shows excessive wing heaviness, re-rig by rotating the proper bushings, which will increase or decrease the angle of attack of the wing.

AIRPLANE FILE.

There are miscellaneous data, information and licenses that are a part of the airplane file. 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, Registration Number, Factory Serial Number, Engine Number and Key Numbers (duplicate keys are available through your Cessna dealer).

Most of the requirements listed under items A and B, are requirements of the United States Civil Air Regulations. Since the requirements of other nations may differ from this list, owners of exported airplanes should check with their own aviation officials to determine their individual requirements.

INSPECTION SERVICE AND INSPECTION PERIODS.

With your airplane you will receive an Owner's Service Policy. This policy has coupons attached to it which entitle you to a no-charge initial inspection and a no-charge 100 hour inspection. If you take delivery from your Dealer, he will perform the initial inspection before delivery of the airplane to you. If you pick up the air-

plane at the factory, plan to take your Cessna 172 to your Dealer reasonably soon after you take delivery on it. This will permit him to check it over and to make any other minor adjustments that may appear necessary. Also plan an inspection by your Dealer at 100 hours or 90 days whichever comes first. This inspection also is performed by your Dealer for you at no charge. While these important inspections will be performed for you by any Cessna Dealer, in most cases you will prefer to have the Dealer from whom you purchase the airplane accomplish this work for you.

Civil Air Regulations require all airplanes to have a periodic (annual) inspection as required 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 the Model 172 airplanes. The procedure for this 100 hour inspection has been carefully worked out by the factory and is followed by the Cessna dealer organization. The complete familiarity of the Cessna 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 for this inspection at any Cessna Dealer. Points which the inspection reveals require modification or repairs will be brought to the owner's attention by the dealer and quotations or charges will be made accordingly. The inspection charge does not include the oil required for the oil change.

Every effort is made to attract the best mechanics in each community to Cessna service facilities. Many dealers' mechanics have attended Cessna Aircraft Company schools and have received specialized instruction in 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 when you have your Cessna inspected and serviced by Cessna dealers' mechanics the work will be complete and done in accordance with the latest approved methods.

Cessna dealers maintain stocks of genuine Cessna parts and Service facilities consistent with the demand.

Your Cessna 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 repairs that might from time to time be necessary.

100 HOUR INSPECTION.

Prior to the inspection, the engine should be run up to check for general engine smoothness, magneto drop, and generator operation. Any irregular engine indications should be noted.

During preliminary run-up:

a. Check all engine instrument readings.
b. Test-operate brakes and nose-wheel steering.
c. Perform magneto check.
d. Check response of engine controls.
e. Shut engine down.

I. Remove or open the following access openings, cowlings, fairings and inspection plates.
   1. Round inspection plates at upper end of wing struts.
   2. Lower half of wing root fairings.
   3. Round inspection plate at aileron bellcrank and at inboard end of ailerons on underside of wings.
   4. Round inspection plates at flap bellcrank and in wing flap well.
   5. Propeller spinner.
   6. Round inspection plates from the tailcone to the right of the dorsal fin and on left side just beneath stabilizer.
   7. Tail group fairings.
   8. Round plate on underside of the right stabilizer.
   9. Engine cowl.
   10. Two round inspection plates on the underside of the cabin section outside skins.
   11. Landing gear strut fairings.
   12. Two round plates along center of floorboard directly over landing gear bulkhead (carpeting must be loosened).
   13. Tunnel covers between the front seats.
   14. Open curtains at the aft end of the baggage compartment for access to the interior of the tail cone. Open the headliner zipper above the rear seat.
   15. Remove optional speed fairings (main wheels only).

II. Engine Check.
   1. Inspect cowling and propeller spinner for condition.
   2. Check starter and generator for leaks and security. Leakage at generator mounting may mean a defective or worn oil seal. Wipe or wash off any oil seepage at pinion gear shaft in starter adapter.
   3. Check oil pan and cylinder bases for oil leakage.
   4. Wash down the engine with a good solvent.
   5. Check engine mounting bolts for security.
   6. Remove rocker box covers and check general condition of valve parts to disclose any improper oiling or wear.

7. Check intake manifold, elbows and rubber connections for condition and security.
8. Remove spark plugs, clean, check gap clearance .015 to .018, test and replace, using solid copper gaskets.
9. Check high tension cables for security and condition.
10. Check propeller for track, dents, condition and security of mounting. Propeller should track within ⅛ inch.
11. Check for full range movement of carburetor throttle arm, mixture control lever, carburetor heater control valve and their controls.
12. Check all engine baffles for cracks, position and security of fastening.
13. Remove oil screens from bottom of crankcase cover. Clean, inspect and replace them. Use new gaskets.
14. Check magneto timing — Right magneto, 26° BTC, left magneto, 28° BTC.
15. Check the exhaust sysem for cracks, loose connections, leaks and condition.
16. Check cabin heat and carburetor heat hoses and shrouds for leaks, burning and general condition.
17. Check air box for cracks and leaks. Remove and service air filter. If flocking is worn or screen damaged replace filter.
18. Check starter engagement lever for proper clearance.

III. Fuel Drains.

1. With aircraft in tail-low attitude, drain wing tank fuel sumps.
2. Drain sediment and water by removing fuel line drain plug on the underside of the fuselage.
3. Remove and clean fuel strainer bowl and screen; replace, tighten and safety.
4. Remove drain plug from bottom of carburetor float chamber, remove and clean strainer. Turn fuel on and flush out any water or sediment or trapped air, replace strainer and plug. Safety plug.

IV. Landing Gear, Steering and Brakes.

1. Examine tires, wheels and struts for wear and damage. Check tire inflation.
2. Test operate brakes to disclose excess pedal travel or sponginess.
3. Check brake lining wear with feeler gage. Visually check condition of brake discs, disc keys and anti-rattle clips.
4. Check level of brake fluid.
5. Check nose wheel steering system for operation and condition.

6. Kick each main wheel fore-and-aft, observing strut-to-fuselage attachments. Check tightness and security of strut-attaching bolts and "U" bolts.
7. Check nose-gear strut for proper extension, hydraulic fluid level, inflation and for evidence of damage or leakage. Check fluid level in shimmy dampener.

V. Wings.
1. Check front and rear wing bolts attaching wings to fuselage.
2. Check strut bolts for security.
3. Check all wing control surfaces for freedom of movement and bolts for security.
4. Check aileron bellcranks, pulleys, cables. Check for correct aileron travel.
5. Check flap bellcranks, tracks, and pulleys. Check for correct flap travel.

VI. Empennage and Surfaces.
1. Check both stabilizer and vertical fin for possible damage.
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.
5. Check operation and travel of rudder, elevator and elevator trim control systems.

VII. Cabin and Fuselage.
1. Check cleanliness and condition of cabin, upholstery and transparent plastic areas.
2. Check front seat travel stops and seat adjustment mechanism.
3. Check seat belts, buckles and attaching fitting.
4. Check door hinges, door and window latches.
5. Replace instrument Air Filters (Optional Gyros only).
6. Check instruments for correct function and instrument dial markings for accuracy and legibility.

VIII. Electrical System.
1. Check electrical system by operating the lights, starter, radio and all accessories which are incorporated in the electrical system.
2. Check level and specific gravity of battery electrolyte. Check battery terminals and cables for corrosion and security.

ELECTRICAL SYSTEM.

Figure 15 shows in schematic form the various circuits, including optional electrical equipment, in the electrical system. The numbers shown on the wires in the diagram correspond to wire numbers on the actual wires in the airplane.

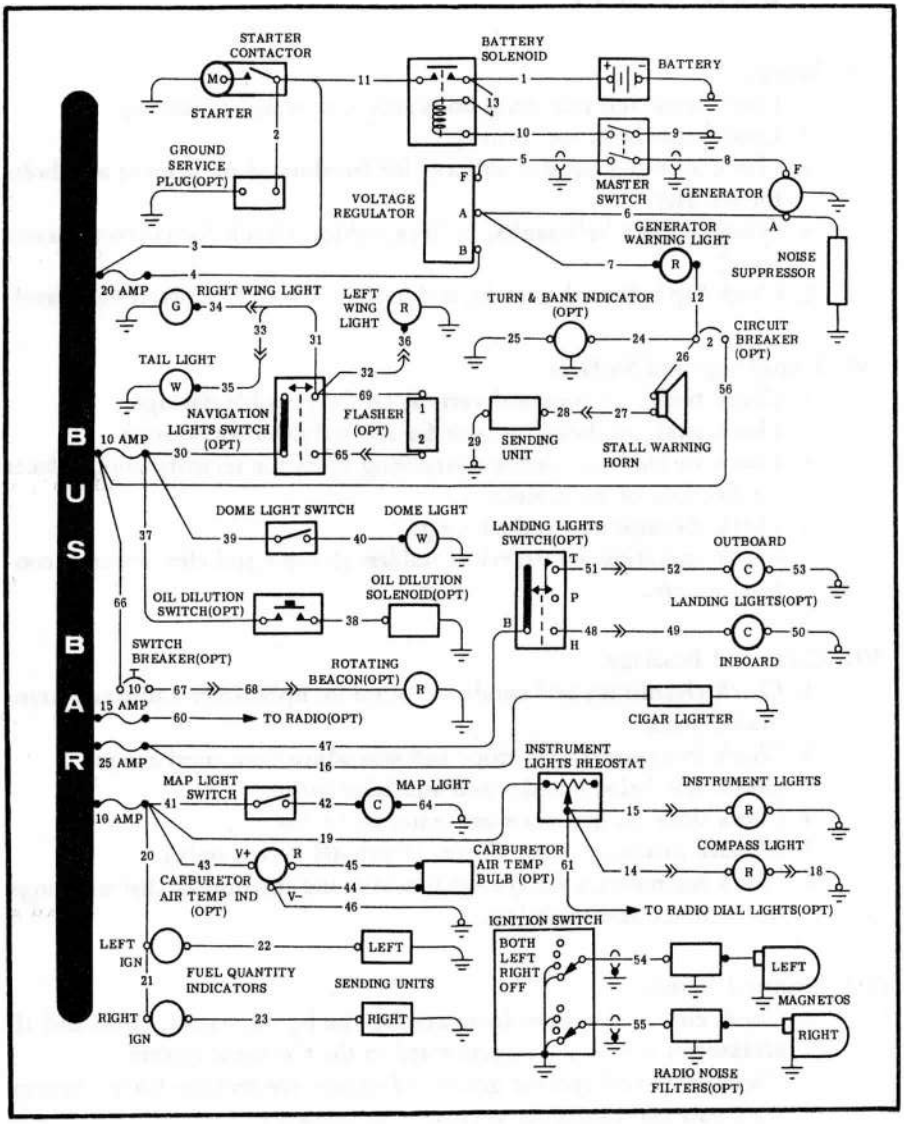
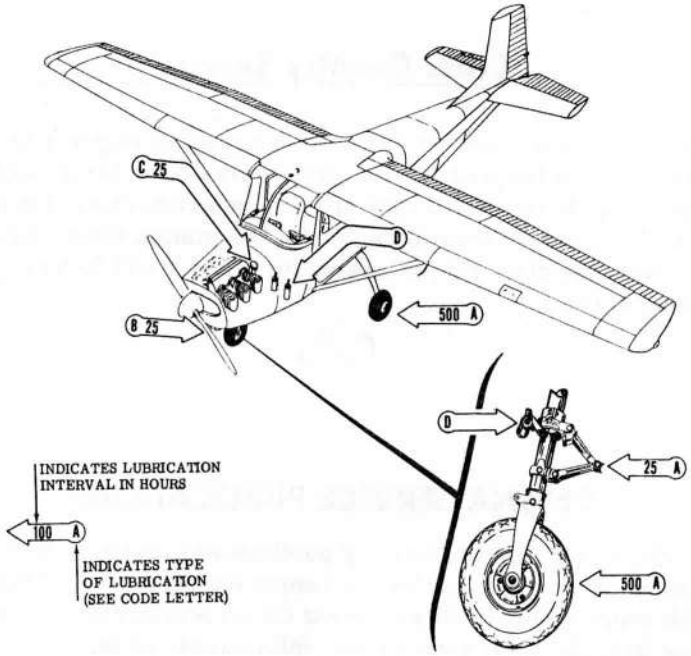


Figure 15. Electrical Wiring Diagram

LUBRICATION AND SERVICING.

Specific lubrication points, intervals and specifications are shown on figure 5-9. In addition, all pulleys, the trim tab actuator rod, control surface hinge bearings, bellcrank clevis bolts, flap actuating handle, brake pedal pivots, rudder pedal crossbars, shimmy dampener pivot bushings, door hinges and latches, Bowden controls, throttle and control rod universal (if unsealed), should be



Code Letter LUBRICATION CODE

A— MIL-L-7711 — Grease

B— Carburetor Air Filter — Service every 25 hours; oftener when operating in dusty conditions. Under extremely dusty conditions, daily maintenance of the air filter is recommended. Service the air filter in accordance with the servicing instructions stamped on the filter.

C— Engine Oil Tank — Check dip-stick before each flight. Drain and refill every 25 hours.

D— Brake Master Cylinders and Nose Gear Shimmy Dampener — Check and refill periodically with MIL-H-5606 hydraulic oil (petroleum base).

Figure 16. Lubrication Diagram

lubricated with SAE 20 General Purpose oil every 1,000 hours or oftener as required.

In general, roller chains (aileron, tab wheel, tab actuator) and control cables tend to collect dust, sand and grit when they are greased or oiled. Except under seacoast conditions, more satisfactory operation results when the chains are wiped clean occasionally with a clean, dry cloth.

Cross Country Service

On your cross country travels make it a point to stop at a Cessna service station for your service requirements. Your Dealer will be glad to supply you with a copy of a current service station list, or if you wish, you may write to the Service Department, Cessna Aircraft Company, Wichita, Kansas, asking for it and it will be promptly mailed to you.

Cessna

CESSNA SERVICE PUBLICATIONS

The Cessna Aircraft Company publishes and revises, as necessary, Manuals, Parts Catalogs, Service Letters and Service News Letters. This material goes to all authorized Cessna Service Stations so that they have the latest authoritative information for servicing your Cessna.

Your Cessna Dealer has an owner follow-up system to notify you when he receives information that applies to your Cessna. In addition, if you wish, you may choose to receive similar notification directly from the Cessna Service Department. A subscription card is supplied to you in your airplane file for your use, should you choose to request this service. Your Cessna Dealer will be glad to supply you with details concerning these follow-up programs, and stands ready through his Service Department to supply you with fast, efficient, low cost service.

SECTION VI

operational data

THE OPERATIONAL DATA shown on the following pages are compiled from actual tests with airplane and engine in good condition and using average piloting technique and best power mixture. You will find this data a valuable aid when planning your flights. However, inasmuch as the number of variables included precludes great accuracy, an ample fuel reserve should be provided. The range performance shown makes no allowance for wind, navigational error, pilot technique, warm-up, take-off, climb, etc. All of these factors must be considered when estimating reserve fuel.

To realize the maximum usefulness from your 172, take advantage of the high cruising speeds. However, if range is of primary importance, it may pay you to fly at a low cruising rpm thereby increasing your range and allowing you to make the trip non-stop with ample fuel reserve. Use the range table on page 6-3 to solve flight planning problems of this nature.

In the table, (Figure 19), range and endurance are given for lean mixture, from 2500 feet to 12,500 feet and for rich mixture at altitudes of 2,500 feet and 5,000 feet. All figures are based on zero wind, 37 gallons of fuel for cruise, McCauley 7651 propeller, 2200 pounds gross weight, and standard atmospheric conditions. For lean mixture figures, mixture is leaned to maximum r.p.m. Allowances for fuel reserve, headwinds, take-offs and climb, and variations in mixture leaning technique should be made and are in addition to those shown on the charts. Other indeterminate variables such as carburetor metering characteristics, engine and propeller conditions, and turbulence of the atmosphere may account for variations of 10% or more in maximum range.

AIRSPEED CORRECTION TABLE
FLAPS UP OR DOWN

IAS	40	50	60	70	80	90	100	110	120	130	140
TIAS	52	58	65	73	82	92	101	111	120	130	139

Figure 17. Airspeed Correction Table

TAKE-OFF DATA

TAKE-OFF DISTANCE WITH FLAPS UP FROM HARD SURFACE RUNWAY.

GROSS WEIGHT LBS.	IAS AT 50 FT.	HEAD WIND MPH	AT SEA LEVEL & 59° F		AT 2500 FT. & 50° F		AT 5000 FT. & 41° F		AT 7500 FT. & 32°F	
			GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50'OBSTACLE
1600	56	0	355	805	420	955	505	1145	610	1390
		15	230	525	275	630	335	765	375	950
		30	130	290	160	360	200	455	255	580
1900	63	0	515	1175	615	1400	750	1710	955	2175
		15	350	790	420	960	525	1190	675	1535
		30	210	475	260	590	330	745	435	990
2200	69	0	725	1650	880	2000	1080	2455	1365	3100
		15	505	1145	620	1405	775	1760	990	2255
		30	315	720	400	910	510	1160	675	1530

NOTE: INCREASE DISTANCES 10% FOR EACH 25 DEGREES F. ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

CLIMB DATA

GROSS WEIGHT LBS.	AT SEA LEVEL & 59° F			AT 5000 FT. & 41° F			AT 10000 FT. & 23° F			AT 15000 FT. & 5° F		
	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	GAL. OF FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	FROM S. L. FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	FROM S. L. FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	FROM S. L. FUEL USED
1600	70	1115	1.0	66	860	1.9	63	605	2.9	59	350	4.3
1900	72	860	1.0	70	640	2.2	67	410	3.5	63	190	5.8
2200	75	660	1.0	73	445	2.6	70	240	4.7	68	30	10.9

NOTE: FLAPS UP, FULL THROTTLE, AND MIXTURE LEANED FOR SMOOTH OPERATION ABOVE 5000 FT.
FUEL USED INCLUDES WARM-UP AND TAKE OFF ALLOWANCE.

Figure 18. Take-Off & Climb Chart

CRUISE PERFORMANCE WITH RICH MIXTURE

ALT	RPM	BHP	% BHP	TAS MPH	Gal./ Hour	End Hours	Mi./ Gal.	Range Miles
2,500	2100	66	45	94	7.2	5.1	13.1	484
	2200	74	51	102	7.8	4.7	13.0	482
	2300	83	57	108	8.5	4.4	12.8	474
	2400	92	64	114	9.2	4.0	12.4	458
	2500	103	71	120	10.1	3.7	11.9	440
	2600	116	80	126	11.2	3.3	11.3	417
	2700	128	89	131	12.6	2.9	10.3	382
5,000	2100	63	43	93	7.1	5.2	13.1	483
	2200	70	48	100	7.8	4.8	12.8	475
	2300	78	54	107	8.4	4.4	12.7	469
	2400	87	60	113	9.1	4.0	12.4	457
	2500	97	67	119	10.0	3.7	12.0	443
	2600	107	74	125	10.8	3.4	11.5	426
	2700	120	83	131	12.1	3.1	10.8	401

CRUISE PERFORMANCE WITH LEAN MIXTURE

2,500	2100	66	45	94	5.7	6.5	16.5	610
	2200	74	51	102	6.5	5.7	15.7	580
	2300	83	57	108	7.3	5.1	14.9	552
	2400	92	64	114	8.1	4.6	14.1	521
	2500	103	71	120	9.0	4.1	13.3	491
	2600	116	80	126	10.1	3.6	12.4	458
	2700	128	89	131	11.2	3.3	11.6	430
5,000	2100	63	43	93	5.5	6.7	16.8	621
	2200	70	48	100	6.1	6.0	16.3	601
	2300	78	54	107	6.8	5.4	15.6	578
	2400	87	60	113	7.6	4.8	14.8	546
	2500	97	67	119	8.5	4.3	14.0	518
	2600	107	74	125	9.4	3.9	13.3	491
	2700	120	83	131	10.5	3.5	12.4	460
7,500	2100	60	42	89	5.3	7.0	16.9	626
	2200	66	46	97	5.8	6.4	16.7	620
	2300	73	51	105	6.4	5.8	16.4	607
	2400	82	56	111	7.2	5.2	15.5	575
	2500	91	63	118	8.0	4.6	14.8	548
	2600	101	70	124	8.9	4.2	14.0	519
10,000	2100	58	40	84	5.0	7.3	16.6	614
	2200	63	44	94	5.5	6.7	17.0	629
	2300	70	48	102	6.2	6.0	16.6	613
	2400	77	53	109	6.8	5.5	16.1	596
	2500	86	59	117	7.5	4.9	15.5	574
	2600	93	64	122	8.2	4.5	14.9	552
12,500	2200	61	42	90	5.3	6.9	16.8	623
	2300	66	46	98	5.8	6.4	16.9	626
	2400	74	51	107	6.5	5.7	16.6	612
	2500	80	55	114	7.0	5.2	16.2	597

Shaded areas are cruising rpm settings that are not recommended for the given altitude.

Figure 19. Cruise Performance Chart

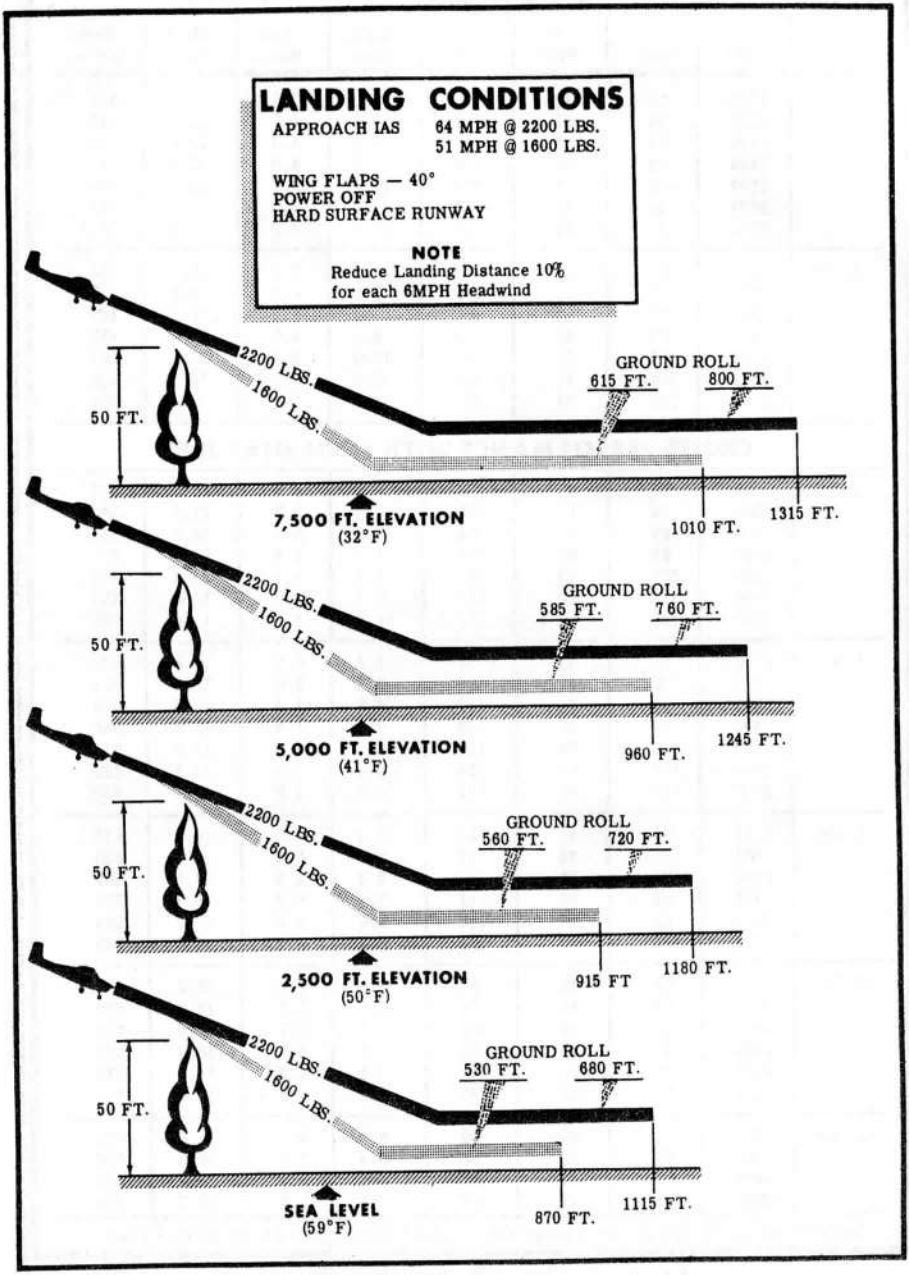


Figure 20. Landing Diagram

ALPHABETICAL INDEX

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

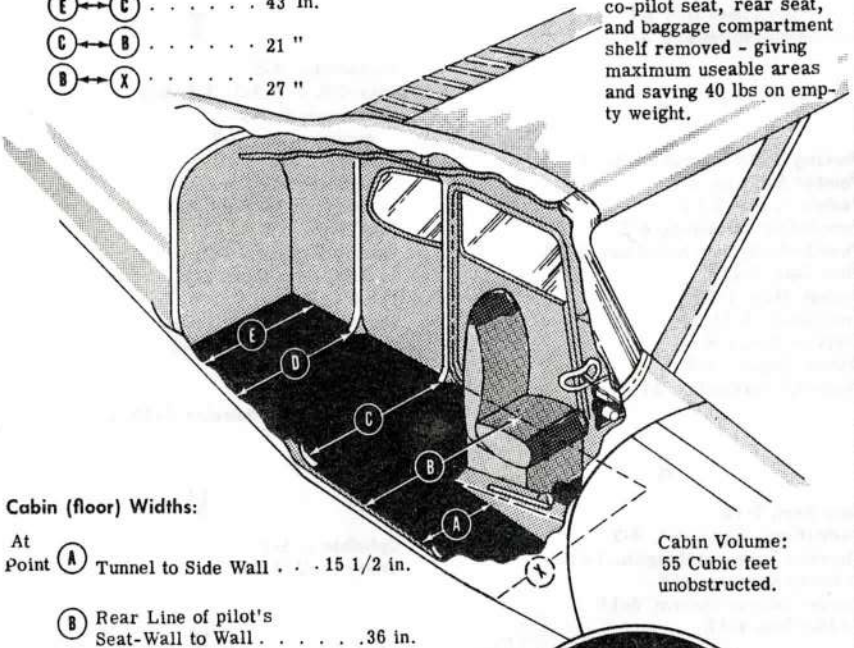
W

Cabin (floor) Lengths:

FROM	TO	
E	C	43 In.
C	B	21 "
B	X	27 "

NOTE

Measurements are with co-pilot seat, rear seat, and baggage compartment shelf removed - giving maximum useable areas and saving 40 lbs on empty weight.



Cabin (floor) Widths:

At Point (A) Tunnel to Side Wall . . . 15 1/2 in.

(B) Rear Line of pilot's Seat-Wall to Wall . . . . . 36 in.

(C) Aft Door Post Bulkhead . . . 31 in.

(D) Aft Section Bulkhead . . . . 30 in.

(E) Rear Wall-of Baggage Compartment . . . . . 30"

Cabin Volume: 55 Cubic feet unobstructed.

Cabin Heights:

AT:

(A) . . . . . 48 inches

(B) . . . . . 46 inches

(C) . . . . . 45 inches

(D) . . . . . 40 inches

(E) . . . . . 21 inches

INTERNAL CABIN MEASUREMENT

CESSNA

"TAKE YOUR CESSNA HOME
FOR SERVICE AT THE SIGN
OF THE CESSNA SHIELD".

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS