

 *Your* 1959  
**CESSNA**

175

**AND**

*Skylark*  


**Owner's  
Manual**



## *Congratulations ■ ■ ■*

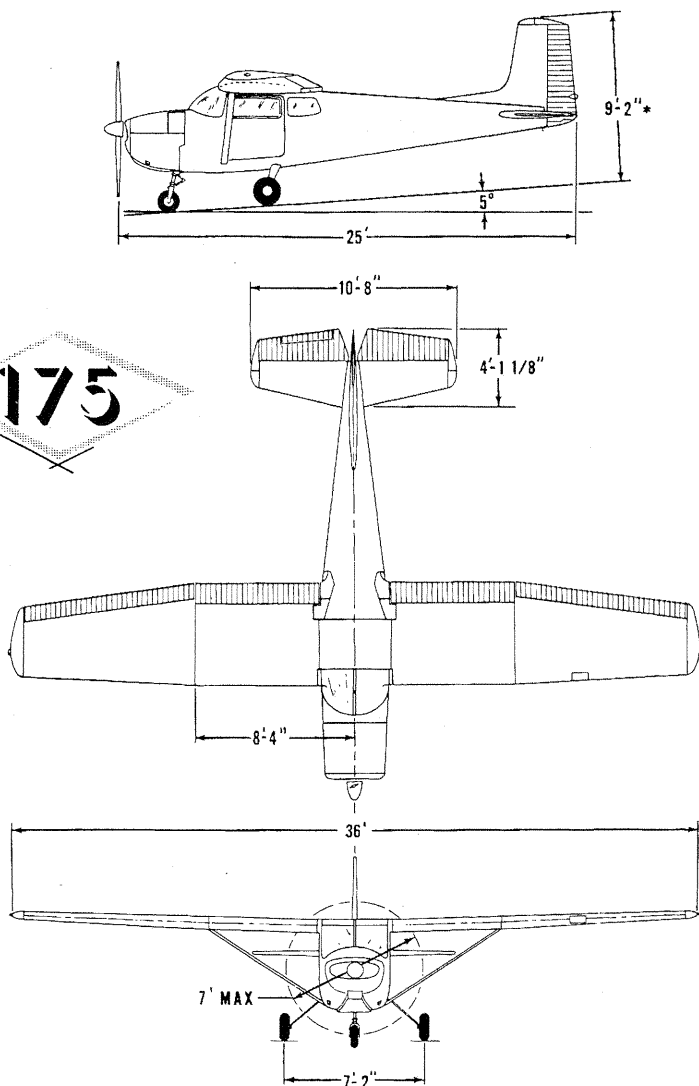
■ You are now the owner of a truly outstanding airplane. The Cessna 175 has been engineered to give you the ultimate in performance, styling, durability, flying comfort, and economy for both business and pleasure.

■ 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 175. This book is dedicated to help you obtain the utmost flying enjoyment and service from your airplane with a minimum of care.

*Additional copies of this manual*

175



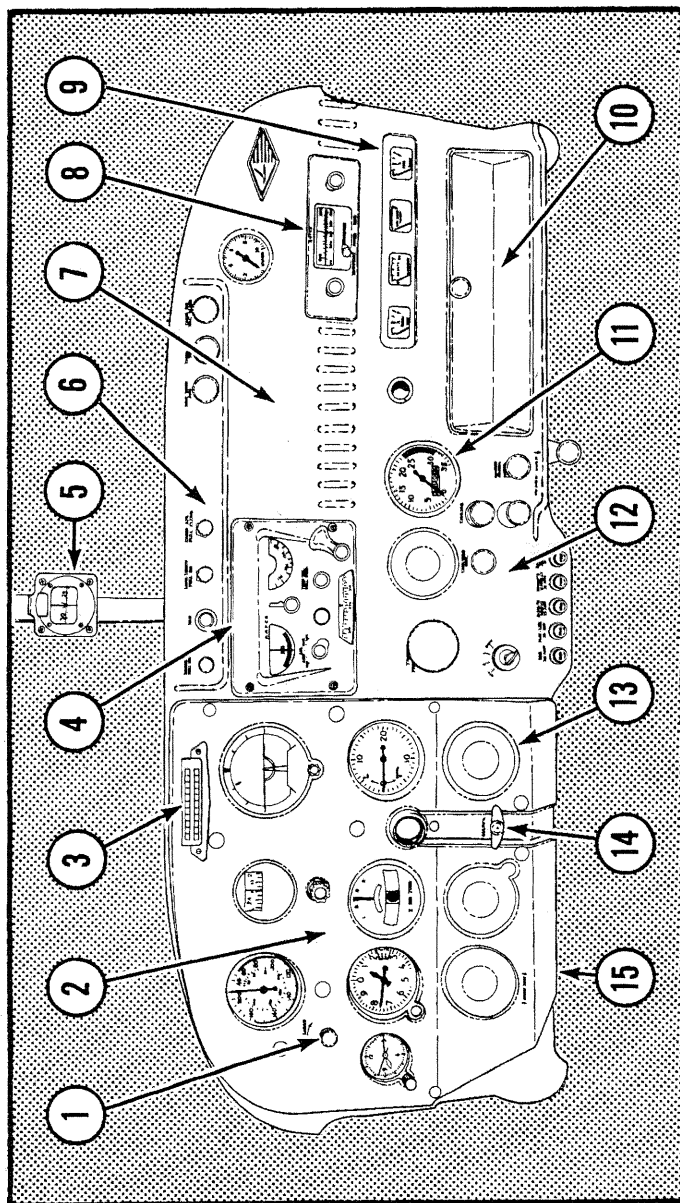
\*With optional rotating beacon installed, add approx. 2 1/2 in.

## PRINCIPAL DIMENSIONS



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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 is a geared type, six cylinder, 175 horsepower, Continental Model GO-300-A engine. The engine utilizes a wet sump oil system, dual-magneto ignition system, and an up-draft type carburetion system.

### ENGINE CONTROLS.

#### THROTTLE.

The throttle (figure 3) is centrally located on the instrument panel and is easily identified by its large, round knob. Engine rpm can be increased by pushing the throttle in toward the instrument panel or decreased by pulling the throttle out.

#### NOTE

To prevent "creepage" of the throttle, a knurled friction-type lock nut is incorporated on the throttle to secure it at any desired setting. Clockwise rotation of the nut increases the friction on the

throttle and counter-clockwise rotation decreases the friction.

### MIXTURE CONTROL KNOB.

The mixture control knob (figure 3) is located just below the tachometer and starter handle. A locking lever is incorporated on the control to prevent unintentional use of the mixture control knob. *To lean the mixture*, it is necessary to depress the locking lever while pulling the mixture control knob out. This operation can be accomplished with one hand by using the thumb to press the locking lever in and the index and middle fingers to pull the mixture control knob out. The locking lever is effective only in the leaning operation. Forward movement of the mixture control knob is not affected by the locking lever.

The mixture control knob 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 for maximum en-

## DESCRIPTION

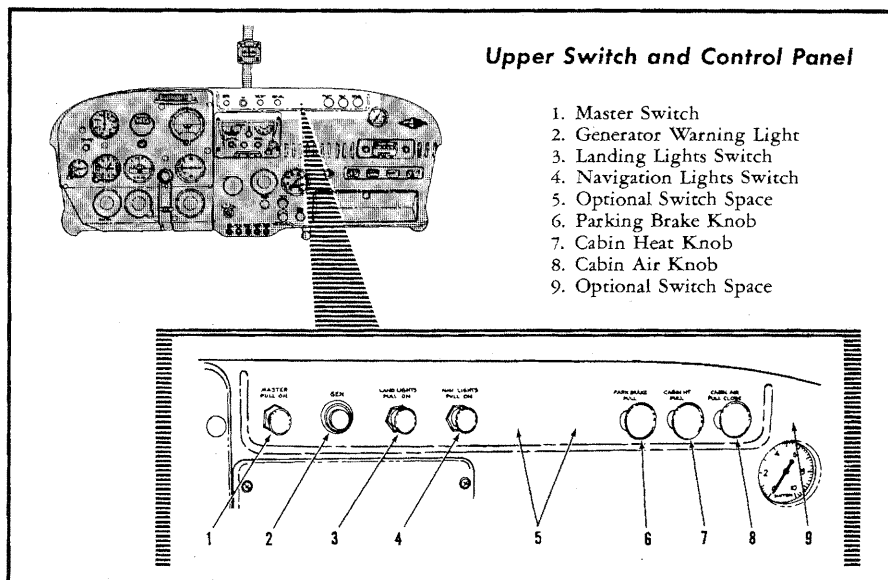


Figure 2.

gine rpm. However, a full rich mixture is preferred for better engine cooling.

### CARBURETOR AIR HEAT KNOB.

The carburetor air heat knob (figure 3) is located slightly below and to the right of the throttle. The push-pull knob operates the carburetor air intake butterfly valve, which proportions the hot and cold air entering the carburetor. Pulling the knob out provides heated air for the carburetor while pushing the knob all the way in provides only cold air for the carburetor.

Air pulled into the heater muff and subsequently into the engine does not pass through the carburetor air filter.

For this reason, when taxiing on dirty, dusty, or sandy fields, carburetor heat should not be used until the engine is cleared prior to take-off. After a full stop landing under these conditions, carburetor heat should be returned to full cold in order that the air filter becomes fully effective again.

Carburetor ice can form during ground operation with the engine idling. Therefore, just after the magneto check prior to take-off, pull the carburetor air heat knob "on" momentarily to check the operation of carburetor heat, and also to eliminate any ice forming in the carburetor. After this short check, be sure to move the carburetor air heat knob to the "cold air" position. This gives maximum

## DESCRIPTION

power for the take-off. Watch the engine for any indications of ice (roughness or loss of rpm) during climb and apply full carburetor heat if the engine begins to ice.

The correct way to use carburetor heat is to first use full heat to remove any ice that is forming. By trial and error, determine the minimum amount

of heat required to prevent 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. Ample carburetor heat has been provided in your airplane to assure positive ice elimination. When full carburetor heat is

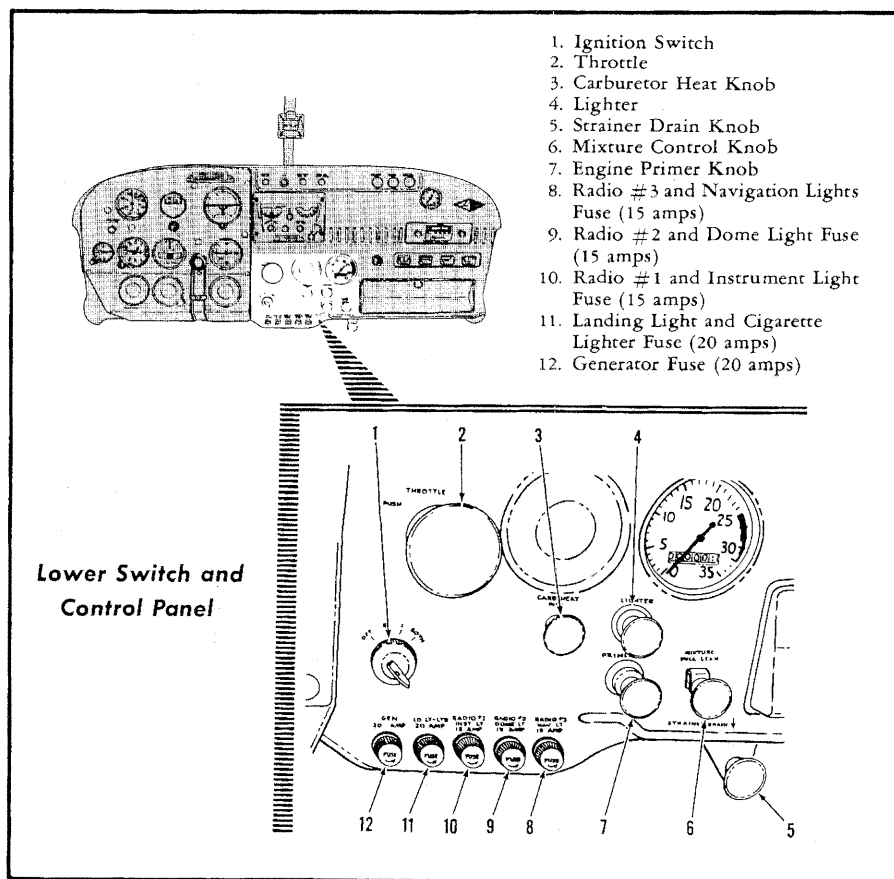


Figure 3.

## DESCRIPTION

applied at cruising power, rough engine operation will result. To avoid initial rough operation during let-downs, reduce power partially before applying carburetor heat, apply heat, then reduce power to the letdown setting.

When full carburetor heat is applied, the engine will lose up to 350 rpm in cruising flight. In addition to the rpm loss, the engine will run rough due to too rich a mixture. Therefore, *it may be necessary to lean the mixture whenever 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 rpm results.*

Refer to Cold Weather Operation, page 3-7, for carburetor heat procedures in sub-zero weather.

## IGNITION SWITCH.

The ignition switch (figure 3) is located just below the throttle. This switch is key operated and controls the dual magneto ignition systems. There are four switch positions designated clockwise as follows: "OFF", "R", "L", and "BOTH". The engine should normally be operated on both magnetos ("BOTH" position). The "R" and "L" positions are for checking purposes only.

## ENGINE PRIMER KNOB.

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 rotating the knob in either direction 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 ( $-20^{\circ}$  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 3) engages the starter drive and closes the starter motor switch. *To start the engine, pull out the starter handle; hold it until the engine begins firing, then release it. If the engine stops firing during the start, wait until both the engine and the starter motor have stopped turning, before engaging the starter again.*

## OIL SYSTEM.

### OIL LEVEL.

The oil capacity of the Continental GO-300-A engine is ten 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 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. The minimum oil supply is six quarts. Oil should be added if below six quarts and should be full if an extended flight is planned.

To obtain correct oil level readings, it is important that the engine be shut down at least 5 to 10 minutes prior to the oil check. This permits the engine oil to drain out of the engine oil passages into the oil sump giving a more accurate oil level reading.

### OIL SPECIFICATION AND GRADE.

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

| <i>Average Outside Temperature</i> | <i>Recommended Oil Grade</i> |
|------------------------------------|------------------------------|
| Below 40° F.                       | SAE 30                       |
| Above 40° F.                       | SAE 50                       |

### NOTE

During oil changes, remove and clean the oil filter screen located on the back side of the engine accessory section.

### OIL TEMPERATURE GAGE.

A capillary type oil temperature gage (figure 1) is mounted within the row of oil and fuel instruments on the right side of the instrument panel. A green arc on the gage dial indicates the normal operating range of oil temperatures. Refer to Section IV for instrument markings.

### OIL PRESSURE GAGE.

An oil pressure gage (figure 1) is mounted within the row of oil and fuel instruments on the right side of the instrument panel. The gage is calibrated in pounds per square inch. Refer to Section IV for instrument markings.

### OIL SUMP DRAIN HOSE AND PLUG.

An oil sump drain hose and plug are provided on your airplane to facilitate draining of the engine oil. The drain hose is connected to the oil sump drain port, and secured at the lower end at a location just forward of the firewall on the lower left side. The lower end of the hose is readily accessible for draining, even when the engine cowl is installed. A plug is used to seal the hose lower end. *To drain the engine oil*, simply remove the drain plug from the lower end of the oil drain hose. Reinstall drain plug after draining and safety.

DESCRIPTION

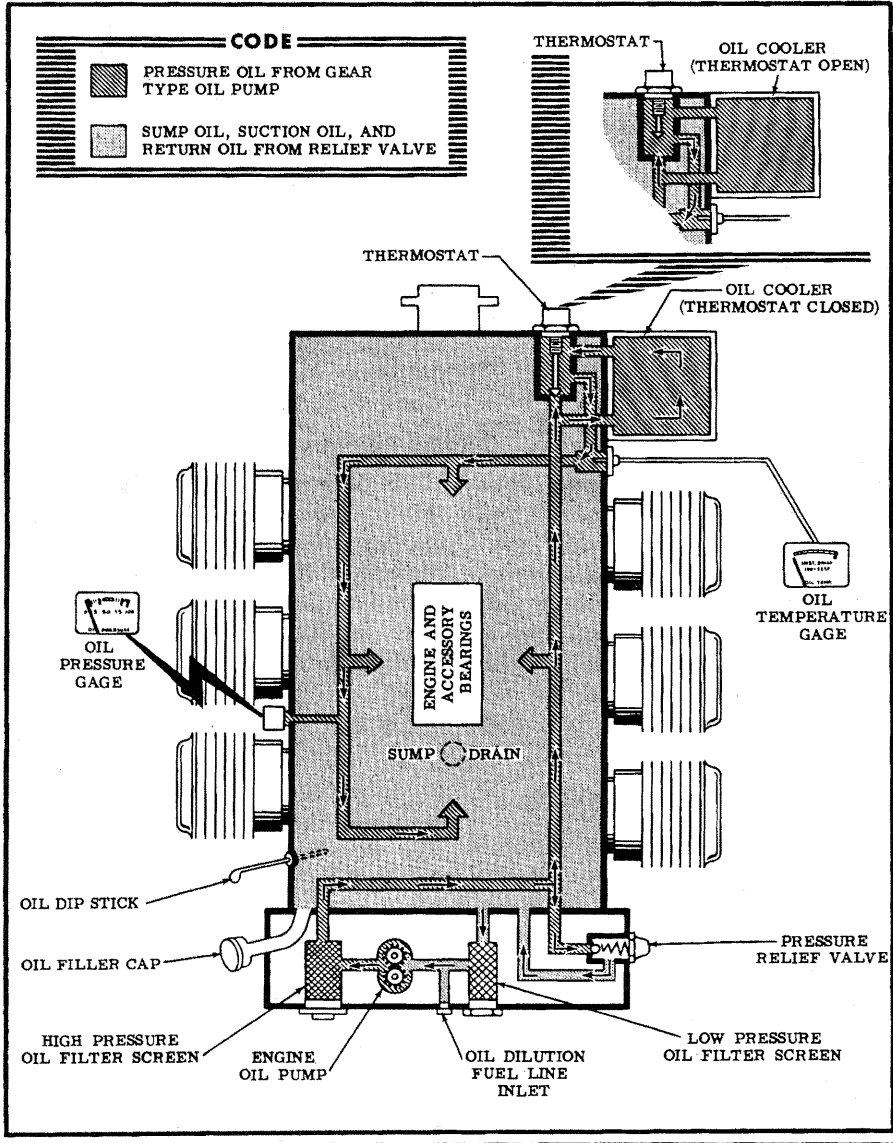


Figure 4. Oil System Schematic



**NOTE**

It is recommended that the engine be run prior to draining the oil so that the oil is hot. The oil will drain more readily and any dirt or deposits will be in a suspended state.

**AIR INDUCTION SYSTEM.**

Air is ducted to the carburetor from an air scoop located on the bottom of the engine cowl. Dirt and other foreign matter is filtered from the incoming air by a filter screen located in the air scoop. 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, 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.

**FUEL SYSTEM.**

Fuel is supplied to the engine from two 26 gallon aluminum tanks (of which 21.5 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.

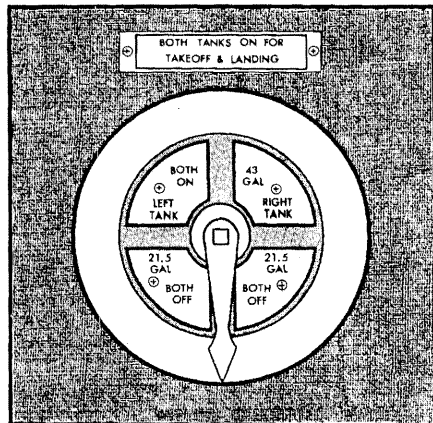
**FUEL SPECIFICATION AND GRADE.**

Aviation grade fuel should always

be used except under emergency conditions. The recommended fuel is 80 octane rating. 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 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"

DESCRIPTION

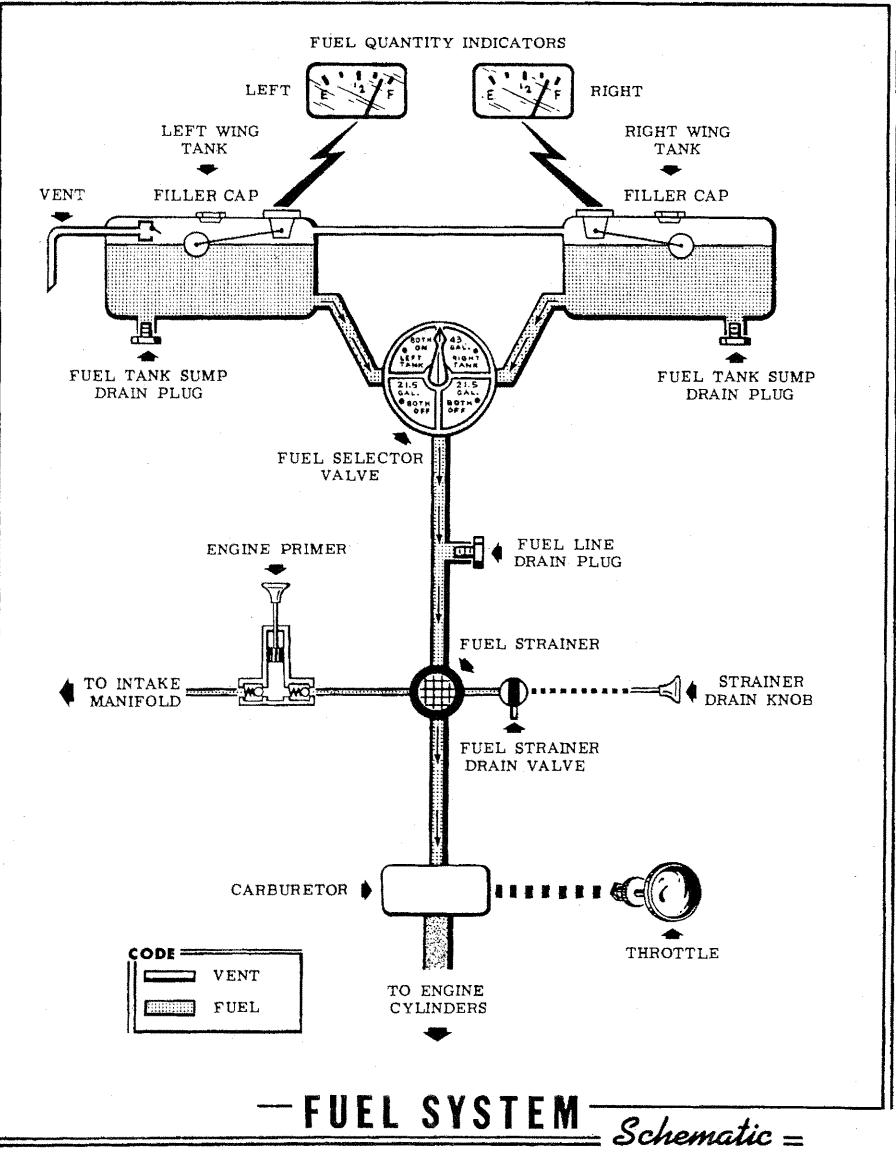


Figure 5.

position provides fuel flow from both tanks simultaneously to provide maximum safety.

### NOTE

The fuel selector valve handle indicates the setting of the valve by its position above the valve dial.

### FUEL STRAINER DRAIN KNOB.

The fuel strainer drain knob (figure 3) provides a quick, convenient method of draining water and sediment which may have collected in the fuel strainer.

Two ounces of fuel (about 3 or 4 seconds of drain knob operation) should be drained from the strainer before the first flight each day or after each refueling. The spring-loaded drain valve in the strainer opens when the strainer drain knob is pulled out all the way. When the knob is released, the valve closes.

### FUEL TANK SUMP DRAIN PLUGS.

A fuel tank sump 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 underside 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) are mounted within the row of fuel and oil instruments on the right side of the instrument panel.

### 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.

The indicators, identified "LEFT" and "RIGHT" indicate the amount of fuel remaining in their respective tanks. A red arc extending from the empty to  $\frac{1}{4}$  full range on each indicator dial warns the pilot that the respective tank is  $\frac{1}{4}$  full or less. *Do not take off if the pointer is in the red arc.*

### 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 standby power source, supplying current to the system when the generator is inoperative, or when the generator

## DESCRIPTION

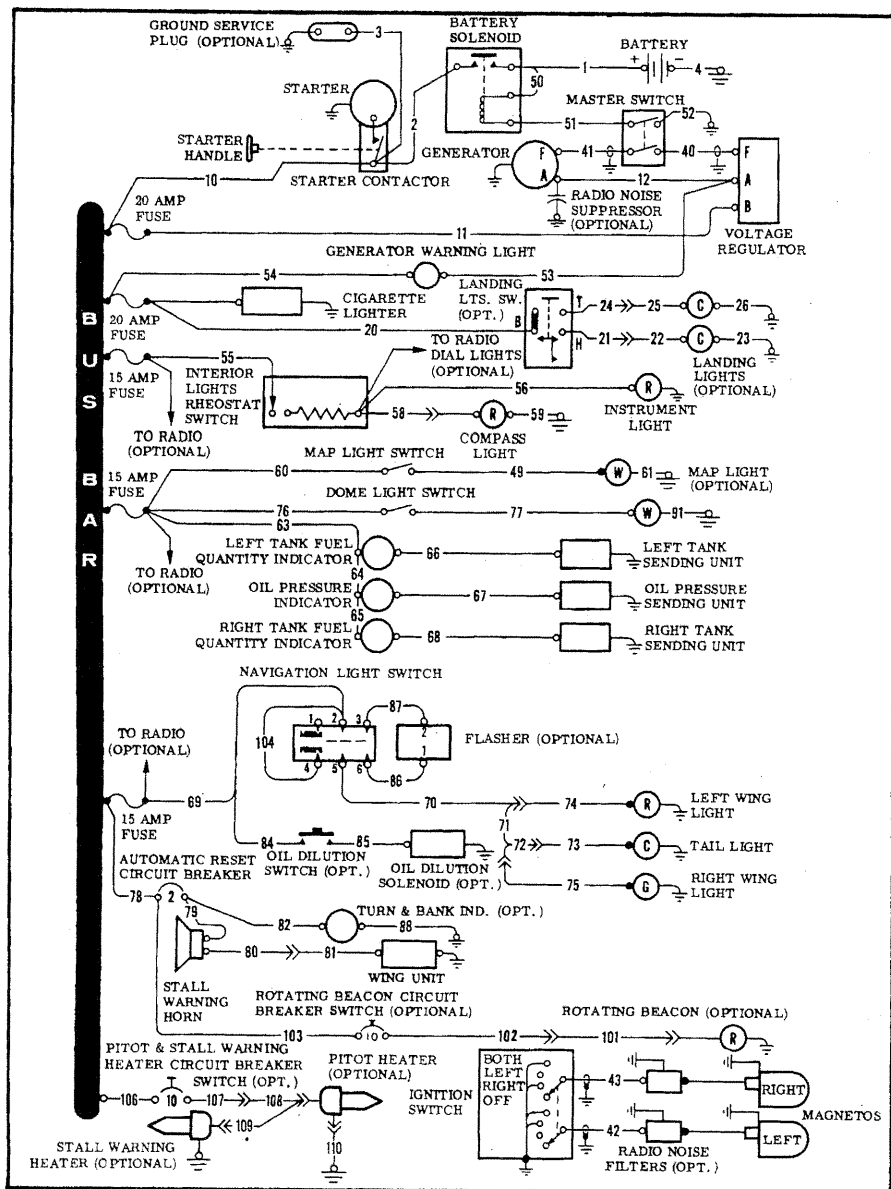


Figure 6. Electrical System Schematic

voltage is insufficient to close the reverse-current relay.

### **MASTER SWITCH.**

The master switch (figure 2) is the extreme left switch on the upper switch and control panel. Switch positions are "ON" (out position) and "OFF" (in position). When the master switch is turned "ON", a solenoid switch is energized and the electrical power of the battery is admitted into the electrical system. In event of a short or malfunctioning of the airplane electrical system, the master switch may be turned off and the engine will continue to run on the magneto ignition system.

### **FUSES.**

Fuses are provided to protect the majority of electrical circuits in your airplane. These fuses are located on the extreme lower portion of the lower switch and control panel. The fuse circuit and fuse capacity are indicated above the respective fuse retainers. Fuses may be removed by pressing the fuse retainers inward and rotating them counterclockwise until they pop part way out. The faulty fuse may be lifted out and replaced. Spare fuses are located in a clip on the inside of the glove compartment door. The stall warning indicator circuit, optional turn and bank indicator circuit, and optional flare circuit are protected by an automatically resetting circuit breaker which provides intermittent emergency operation of these devices in case of a faulty circuit.

### **GENERATOR WARNING LIGHT.**

A generator warning light (figure 2) is located just to the right of the master switch and is labeled "GEN". This red warning light is an indication of generator output. The light will remain off at all times when the generator is functioning properly. The light will not show drainage on the battery. It will illuminate when the battery or external power is turned on prior to starting the engine or when there is insufficient engine RPM to produce generator current.

### **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.

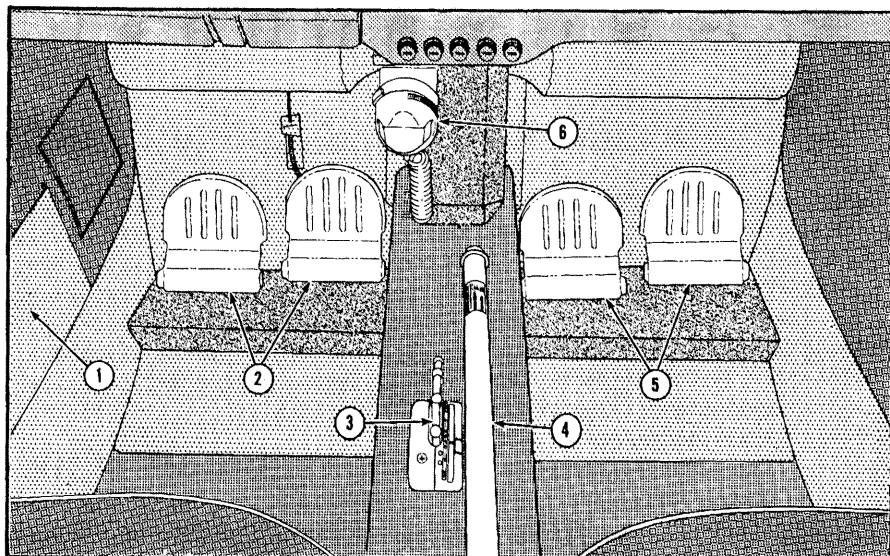
### **CONTROLS LOCK.**

A controls lock, standard equipment on the 175, locks the elevators and ailerons in neutral to protect them from buffeting in high winds or prop wash. The lock has a large red metal flag which covers the ignition switch, to remind you that the controls must be unlocked before starting the engine.

### **NOTE**

The 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.

## DESCRIPTION



- |                               |   |
|-------------------------------|---|
| 1. Map Pocket                 | 4. Wing Flap Handle                         |
| 2. Pilot's Rudder Pedals      | 5. Copilot's Rudder Pedals<br>(Opt. Equip.) |
| 3. Elevator Tab Control Wheel |   |
| 6. Microphone                 |   |

**Figure 7. Lower Forward Section of Cabin**

To install the controls lock, pull the control wheel back until the hole in the control wheel shaft is aligned with the hole in the collar assembly mounted on the instrument panel. Position the controls lock on the right side of the control wheel shaft adjacent to the instrument panel so that the lettering on the red flag is legible. Insert the short shaft of the controls lock down through the holes in the collar assembly and control wheel shaft. Check that the controls lock is fully inserted.

To remove the controls lock, pull it up and out of the collar assembly and control wheel shaft.

When not in use, the controls lock may be stored in the glove compartment.

### WING FLAP HANDLE.

The wing flaps are controlled by a wing-flap handle (figure 7) mounted 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 mph. 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 20° flaps (second notch) prior to take-off. An alternate procedure of applying 20° 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 20° 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 Short Take-off* . . . 1st notch (10°)

*For Shortest Take-off* . 2nd notch (20°)

*For Landing* —

*Select as desired* . . . . . Up (0°)

1st notch (10°)

2nd notch (20°)

3rd notch (30°)

4th notch (40°)

#### TACTAIR AUTOMATIC FLIGHT CONTROLS.

The optional Tactair automatic flight control system is a pneumatic system consisting of bellows attached to the manual control surface cables, specially-modified gyro instruments and a control head mounted on the instrument panel. The entire system is powered by the engine-driven vacuum pump.

The control surface servo bellows respond to pneumatic signals from the gyro instruments and the control head, to maintain the position set on the control head by the pilot. The servos may be overridden at any time, by operating the aileron and elevator controls. The pressure required to overpower the servos is not excessive and no damage to the system will result, even if the servos are overpowered for some time. When the controls are released, the autopilot will return the airplane to the position set on the control head.

The pickup units in the gyro instruments automatically change both the amount and the rate of change in their signals in accordance with the amount and rate of deviation of the airplane from the selected position. Thus, a large and rapid deviation will produce a large and rapid signal. The servo's response likewise will be large and rapid. However, as the airplane responds, the signals will diminish at a rate exactly proportional to the rate at which the airplane is returning to normal. The servos, in turn, bring the control surfaces back to neutral in the same pattern. The autopilot thus controls the airplane just as the human pilot would. Corrections are smooth and precise and at no time do they produce excessive flight loads on the airplane.

The Tactair system is available in three configurations. The T-1 Roll Stabilizer consists of the aileron servos, attitude gyro and a control head. As its name implies, its primary purpose

# DESCRIPTION

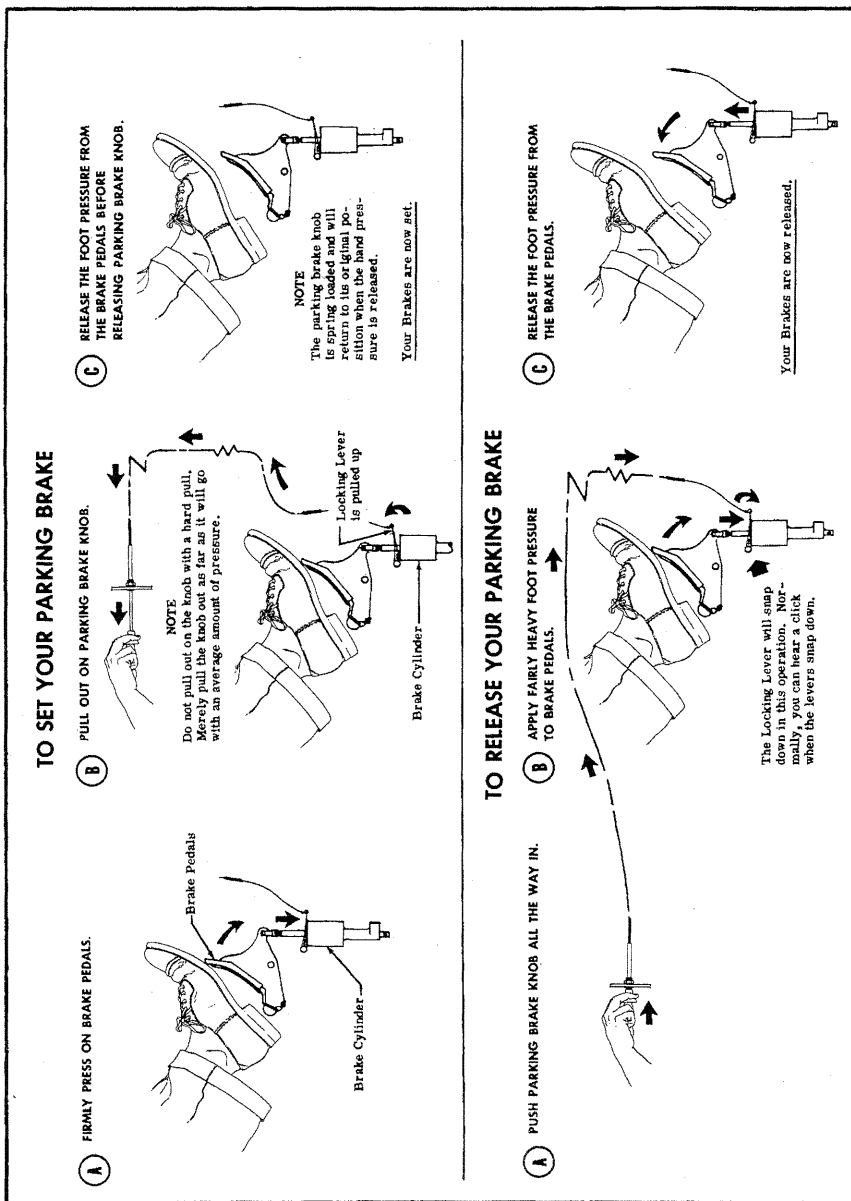


Figure 8. Parking Brake Operation



is to maintain lateral stability. The T-2 Heading Lock system uses a modified directional gyro coupled to the T-1 roll stabilizer system. In the T-2 system, both the attitude gyro and the directional gyro signal corrections to the aileron servos to provide both roll and directional stability. The T-3 autopilot system adds an elevator servo coupled to the attitude gyro. By adding elevator control to the roll stabilizer and heading lock, the T-3 controls pitch, roll and direction.

The directional gyro used in the T-2 and T-3 systems has an additional compass card placed above the regular card and linked to the heading lock pickups in the gyro. To set a course, rotate the course selector knob to the right of the compass card window until the desired heading on the upper card falls under the lubber line.

Detailed operating instructions are found in Sections II and III.

## **LANDING GEAR.**

### **MAIN LANDING GEAR.**

Your airplane is equipped with Cessna's "Land-O-Matic" landing gear. It consists of a tapered, spring steel leaf supporting each main wheel.

### **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° right or left of center. Thru the use of 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.

### **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. To accomplish this in the most efficient manner, and add to the beauty of the aircraft, it was necessary to reduce clearance in the wheel opening to a minimum to eliminate drag. An accumulation of mud, snow or ice in this opening would have a "braking effect" on the wheel. If these elements can not be avoided, make an inspection of the wheel fairings before each flight and remove any accumulations which may be forming.

### **BRAKE SYSTEM.**

The hydraulic brakes on the main wheels are conventionally operated by applying toe pressure to either the pilot's or co-pilot'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

## DESCRIPTION

operating the parking brake knob. (Refer to figure 8 for parking brake operation).

### SKIPLANE GEAR.

For operation from snow or ice, a skiplane configuration of the 175 is available. The skiplane uses special, heavy-duty axles on the main gear, with Federal Model A-3500A skis and a Federal Model NA-1200A ski on the nose gear. The skis and the conventional wheels and tires may be interchanged as necessary.

## 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.

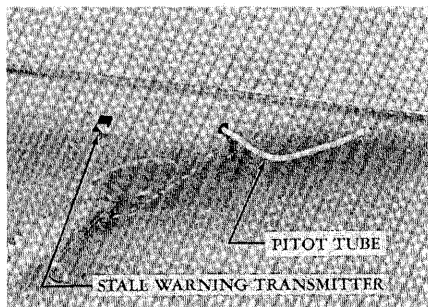
### TURN AND BANK INDICATOR (OPTIONAL EQUIPMENT).

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 airspeed indicator (figure 1), altimeter (figure 1), and optional rate-of-climb indicator (figure 1) are oper-

ated 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.

A stall warning indicator is mounted on the side of the glove compartment box adjacent to the instrument panel. This instrument gives your airplane full and complete protection from inadvertent stalls. It gives warning whenever a stall is approached regardless of speed, attitude, altitude, acceleration or other factors which change the stalling speed. The stall warning horn 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.

#### **CLOCK (OPTIONAL EQUIPMENT).**

An eight-day, stem wind, aircraft clock (figure 1) may be installed as optional equipment on the extreme left side of the instrument panel just to the left of the altimeter.

### **CABIN AIR TEMPERATURE SYSTEM.**

The cabin air temperature system in your airplane (see figure 9) is designed to provide fresh air to the cabin at all times, with a means of regulating the air temperature.

*To provide a flow of air,* push the control knob labeled "CABIN AIR, PULL CLOSE" inward until the amount of air desired is felt emitting from the outlets.

*If heated air is desired,* pull the control knob labeled "CABIN HT, PULL" out all the way. The knob, when pushed full in will provide only cool air.

#### **NOTE**

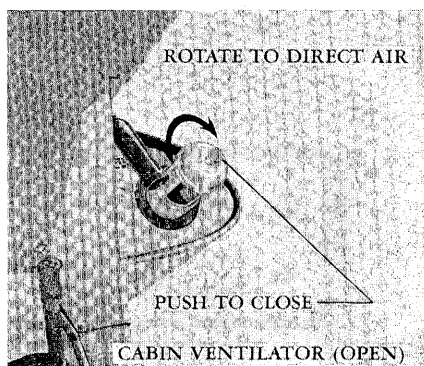
The temperature of the air may be varied to any degree by positioning the cabin heat knob in an intermediate setting between full out and full in.

*It is important to remember that the cabin air knob and the cabin heat knob should never be pulled full out at the same time. This may result in overheating of the heater system ducting hoses.*

Air for defrosting the windshield is taken from the cabin air duct and passes through a slotted defroster outlet on the instrument panel deck. The amount and temperature of the defroster air depends on the setting of the cabin air and cabin heat controls.

### **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



DESCRIPTION

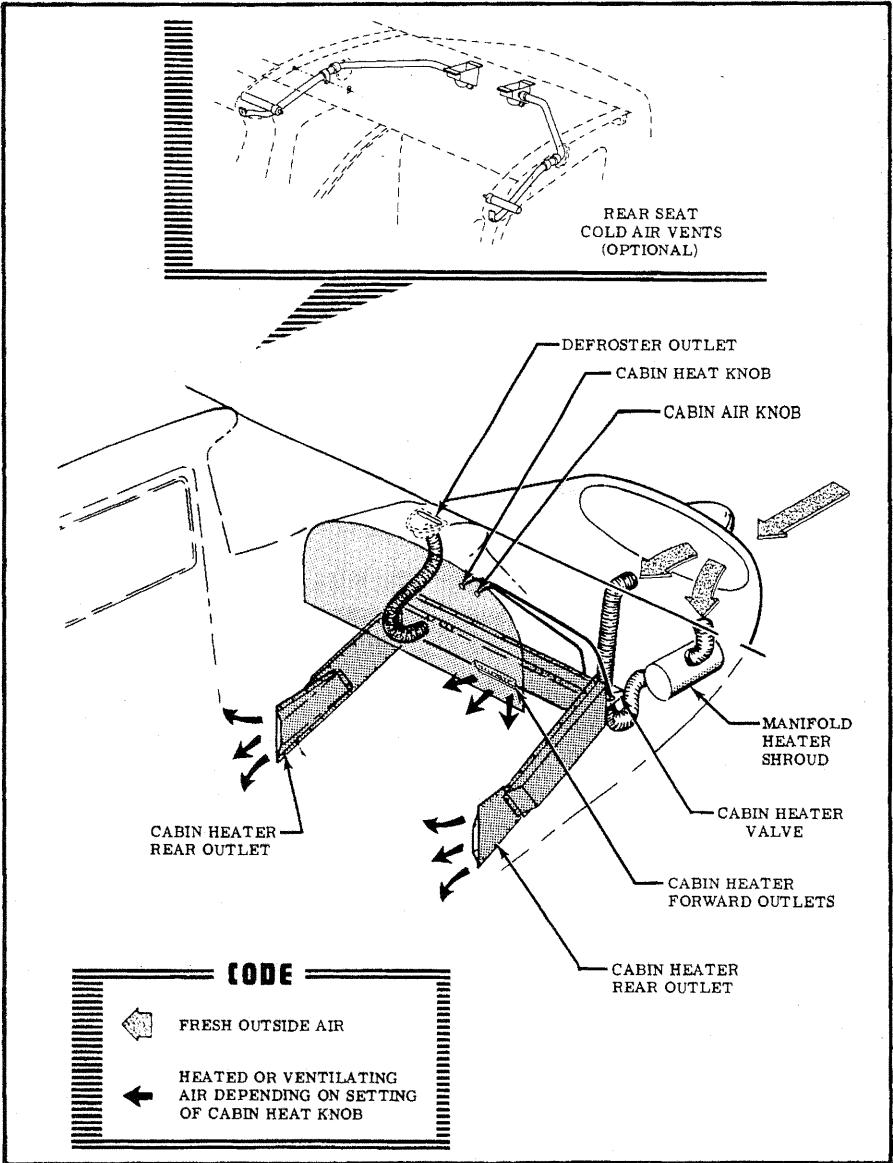


Figure 9. Cabin Air Temperature System

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.*

### REAR SEAT VENTILATORS.

Additional cold air for rear seat passengers is provided by the optional rear seat ventilator system. Cold air picked up by intakes at the upper corners of the windshield is discharged through ball-and-socket outlets in the cabin ceiling, just back of the loudspeaker. The outlets may be turned to direct the air as desired; the volume of air is regulated by turning a knurled ring on the end of each outlet. Turning the ring operates a butterfly in the outlet.

## LIGHTING EQUIPMENT.

### NAVIGATION LIGHTS.

Conventional navigation lights are controlled by a push-pull switch (figure 2). With the optional navigation lights flasher, a three-position push-pull switch is used. The middle detent on the switch is the steady position and all the way out is the flashing position. When the optional rotating beacon is on, the flasher should not be used since there is a possibility

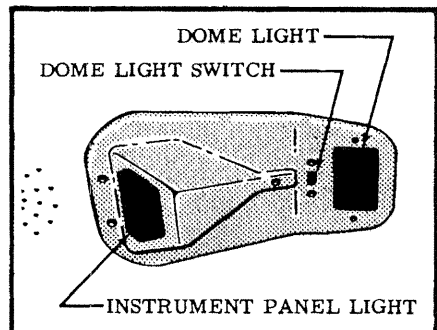
that the double flash will be confusing.

### LANDING LIGHTS (OPTIONAL EQUIPMENT).

The landing lights consist 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), labeled "LAND LIGHTS, PULL ON", is mounted on the upper right hand portion of the instrument panel. *To turn the taxi light on, pull the switch out to the first stop. To turn both the landing light and the taxi light on, pull the switch out to the second stop. To turn the lights off, push the switch all the way in.*

### INSTRUMENT LIGHTS.

A red instrument light is mounted on the cabin ceiling to illuminate the instrument panel during night operation. The light, in conjunction with



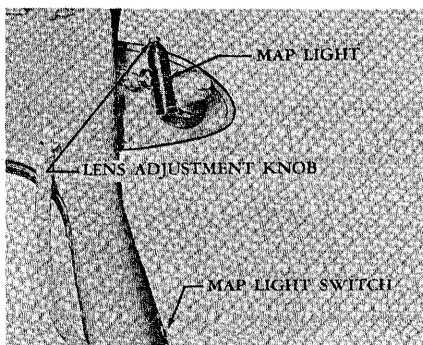
## DESCRIPTION

the compass light, is controlled by a rheostat switch (figure 1), labeled "INSTR LIGHTS", located slightly below and to the left of the airspeed indicator. *To turn the instrument and compass lights on*, rotate the instrument light rheostat switch clockwise until the desired illumination is obtained. *To turn the lights off*, turn the switch counter-clockwise as far as it will go.

Optional radio dial lights are controlled by the same rheostat switch which controls operation of the instrument and compass lights.

### MAP LIGHT.

An optional map light is mounted near 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 mounted on the light makes it possible to change the beam from a spot to flood illumination.



### DOME LIGHT.

A dome light is mounted in the cabin ceiling and is controlled by a

slide switch mounted just forward of the dome light.

### ROTATING BEACON (OPTIONAL EQUIPMENT).

A rotating beacon may be installed as optional equipment on the tip of the vertical fin. The light serves as an anti-collision light, and rotates through 360° at all times when the rotating beacon switch is turned on.

### NOTE

The rotating beacon should be turned off during flight through clouds to prevent a distracting glare.

The rotating beacon switch is mounted within the row of switches on the upper switch and control panel (figure 2). The switch incorporates a manually-set circuit breaker. Pushing the switch in closes the circuit breaker and turns the rotating beacon on. To turn the light off, pull the switch button out. A short in the circuit will also open the circuit breaker and force the switch button out.

## 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**

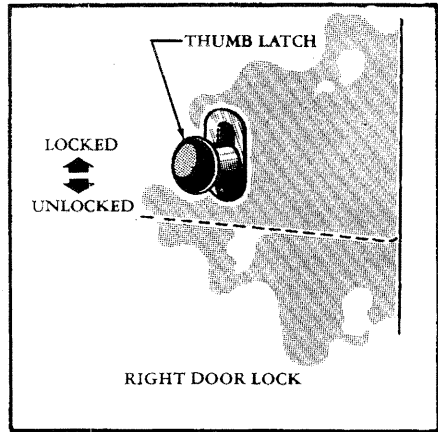
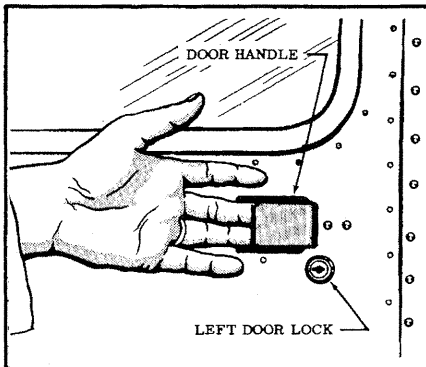
Test the front seats for secure latching after adjusting them to the desired position.

**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 airplane. Each door incorporates a flush type door handle on the outside and a conventional type handle on the inside. *To open the door 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.

## DESCRIPTION

### ASSIST STRAPS.

Two assist straps are mounted on the front door posts and are used as an aid in entering and leaving the airplane.

### ASH RECEIVERS.

Four ash receivers are provided in your airplane. Two ash receivers are located in the cabin walls adjacent to the windshield and are used by the occupants of the front seats. The remaining ash receivers are mounted on the cabin walls just aft of the rear door post bulkheads and are accessible to the rear seat passengers.

### BAGGAGE COMPARTMENT.

A baggage compartment is located just aft of the rear seat. *To gain access to the baggage compartment*, grip the adjustment handle behind the center of the rear seat and gently pull forward and down.

### 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.

## LOADING YOUR CESSNA.

There are several different ways to "load" your Cessna, all of which are satisfactory. However, from experience, we have found the following sequence of steps to be most satisfactory under average loading conditions:

*First*, load your baggage in the baggage compartment.

*Next*, load the front seats.

*Finally*, load the rear seat.



# **SECTION II**

## **OPERATING CHECK LIST**

AFTER FAMILIARIZING YOURSELF with the equipment of your Cessna 175, 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 175.

The flight and operational characteristics of the Model 175 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 VI.

### **BEFORE ENTERING THE AIRPLANE.**

- (1) Perform an exterior inspection of the airplane (see figure 10). On Ski-plane, make sure skis are not frozen down. When breaking loose frozen skis, avoid excessive side loads on the nose gear.

### **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**

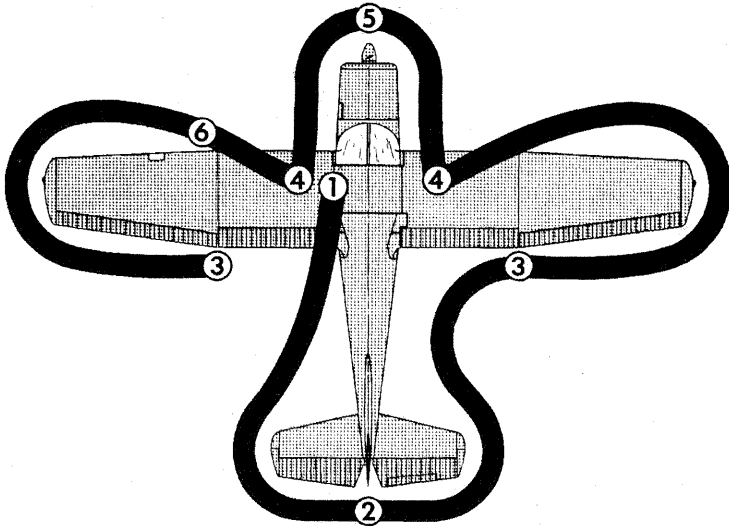
Test the front seats for secure latching after adjusting them to the desired position.

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

### **STARTING THE ENGINE.**

- (1) Set carburetor heat to "cold" (full in).
- (2) Set mixture control knob to "full rich" (full in).

## OPERATING CHECK LIST



- 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 tank selector on "BOTH".
  - c. On first flight of day, operate fuel strainer drain knob (pull out for approximately four seconds) to clear fuel strainer of any water or sediment.
  - d. Remove control wheel lock if installed.
- ②
  - a. Remove rudder lock, if installed.
  - b. Inspect tail surface hinges and hinge bolts.
  - c. Check trim tab for security.
  - d. Disconnect tie-down chain.
- ③
  - a. Remove alleron lock, if installed.
  - b. Check alleron 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. Make visual check to insure that drain valve in fuel strainer is securely closed after draining operation.
  - 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 10. Exterior Inspection Diagram

## OPERATING CHECK LIST

- (3) Set fuel tank selector to "both tanks". (Take-off on less than  $\frac{1}{4}$  tank is not recommended.)
- (4) For an initial start in normal air temperatures, use two strokes of the primer. Usually, a hot engine requires no priming.
- (5) Clear propeller.
- (6) Turn master switch "on".
- (7) Turn ignition switch to "both".
- (8) Open throttle  $\frac{1}{8}$ " (to idle position).
- (9) Start engine by pulling starter handle.

## WARM-UP AND GROUND TEST.

- (1) Do not allow the engine to operate at more than 1000 r.p.m. for the first 60 seconds after starting. After starting, if the oil pressure gage does not begin to show pressure within 30 seconds in the summer-time and about twice that long in very cold weather, stop the 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 1000 rpm, continue warm-up while taxiing to the active runway. Do not overheat the engine by running it at high speed while on the ground. When the engine accelerates smoothly and the oil pressure remains steady, you are ready for take-off.

### NOTE

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

## BEFORE TAKE-OFF.

- (1) Apply toe brakes.
- (2) Set altimeter.
- (3) Set elevator trim tab to "take-off" position.
- (4) Check oil pressure — should show 30 to 60 lbs./sq. in. (Minimum idling oil pressure — 5 lb./sq. in.).
- (5) Check engine magnetos at 2000 rpm by momentarily switching off each magneto separately. The maximum allowable rpm drop on either magneto is 125 rpm. Switch to both magnetos before continuing.
- (6) Check carburetor heat.
- (7) Make a full-throttle run-up only if the condition of the engine is in doubt. The engine should accelerate without hesitation and run smoothly at full throttle. Always run up with carburetor heat off and headed into the wind. The engine should idle between 500 and 600 RPM. Except for a brief check, do not idle under 800 RPM. Full-

## OPERATING CHECK LIST

throttle static RPM should be 2640 to 2740 with a 1A175 propeller or 2545 to 2645 with a 1B175 propeller.

- (8) Check autopilot disengaged.

## TAKE-OFF.

### NORMAL TAKE-OFF.

- (1) Flaps  $0^{\circ}$  (retracted).
- (2) Set carburetor heat to "cold" (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.

### CAUTION

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

- (6) Climb at 84 MPH.

### MINIMUM GROUND RUN TAKE-OFF.

- (1) Wing flaps  $20^{\circ}$  (second notch).
- (2) Apply full throttle while holding brakes.
- (3) Release brakes.
- (4) Take-off slightly tail low.

### OBSTACLE CLEARANCE TAKE-OFF.

- (1) Wing flaps  $20^{\circ}$  (second notch).
- (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  $20^{\circ}$  (second 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.

### 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 84 MPH, at sea level (see figure 25). Reduce climb speed about ½ MPH for every 2000 feet of altitude above sea level.
- (2) To climb over an obstacle after take-off use the best angle of climb speed of 61 MPH, with full throttle and flaps up.
- (3) Mixture should be "full rich" up to 5000 feet, and then leaned for smooth engine operation.

### CRUISING.

- (1) Recommended cruising rpm — 2400-3200 (see page 4-2).
- (2) Trim airplane by adjusting elevator tab.
- (3) Oil pressure — 30-45 lbs./sq. in.
- (4) Oil temperature — within green arc range.
- (5) Lean mixture to maximum rpm.
- (6) Lean mixture as required to obtain smooth engine operation when using carburetor heat in cruise.

### LET-DOWN.

- (1) Set mixture control knob to "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.

### BEFORE LANDING.

- (1) Set fuel selector to "both tanks".
- (2) Recheck mixture control knob to "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.

## **OPERATING CHECK LIST**

- (7) Trim airplane with elevator trim tab for glide.
- (8) Check autopilot disengaged.

## **LANDING.**

### **NORMAL LANDING.**

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

### **SHORT FIELD LANDING.**

- (1) Make a power-off approach at 63 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.

### **CAUTION**

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.

### **CAUTION**

If a go-around is necessary, push the carburetor air heat knob full in to assure rapid engine acceleration.

## **AFTER LANDING.**

- (1) Raise flaps after completion of landing roll.
- (2) Normal glide and taxiing should cool the engine sufficiently; however, if an excessive amount of taxiing is necessary, allow the engine to cool before cutting the ignition by allowing it to idle at 1000 rpm two to three minutes.
- (3) Stop engine by pulling the mixture control knob to full lean position. Do not open the throttle as the engine stops.
- (4) After the engine stops, turn the ignition switch "off".
- (5) Turn all switches "off". Be sure — otherwise your battery may run down overnight.
- (6) Set parking brake, if required.

# **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.

#### **STARTING.**

Ordinarily, the engine starts best and smoothly with proper priming

and the throttle opened  $\frac{1}{8}$  inch. Check the oil pressure as soon as the engine is running.

#### **WARM-UP.**

The engine should be warmed up 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 1800 rpm. 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.

#### **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.

Since the skiplane has no brakes, if a full-power run-up appears advisable

## OPERATING DETAILS

it should be made at the start of the take-off run. With the airplane moving, the engine should turn 2650 to 2750 RPM with a 1A175 propeller or 2600 to 2700 RPM with a 1B175 propeller.

### CRUISING.

The maximum recommended cruising rpm's are 2900 rpm at sea level, 3050 rpm at 5000 ft., and 3200 rpm at 10000 ft. These rpm's will produce approximately 72% 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 the mixture by pulling the mixture control knob out until the rpm decreases slightly and then enrichen to maximum engine rpm for that particular throttle setting. Airspeed must be held constant during leaning for maximum rpm since small changes in airspeed will result in small rpm changes. The maximum rpm increase which can be expected as the mixture is leaned from "full rich" is 30 to 50 rpm. Readjust the mixture for each change in power, altitude or carburetor heat.

### 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.

### IDLING ENGINE.

Your engine is set to idle well below

800 rpm, but at engine speeds below 800 rpm, satisfactory piston lubrication cannot be maintained. Therefore, it is recommended that the engine not be allowed to operate below 800 rpm for prolonged intervals.

### STOPPING ENGINE.

The engine should always be allowed to idle (800 to 1000 rpm) 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 knob. The procedure should be to place the mixture control knob in the full lean position (pull the knob out as far as possible). Do not open the throttle as the 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 rpm 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



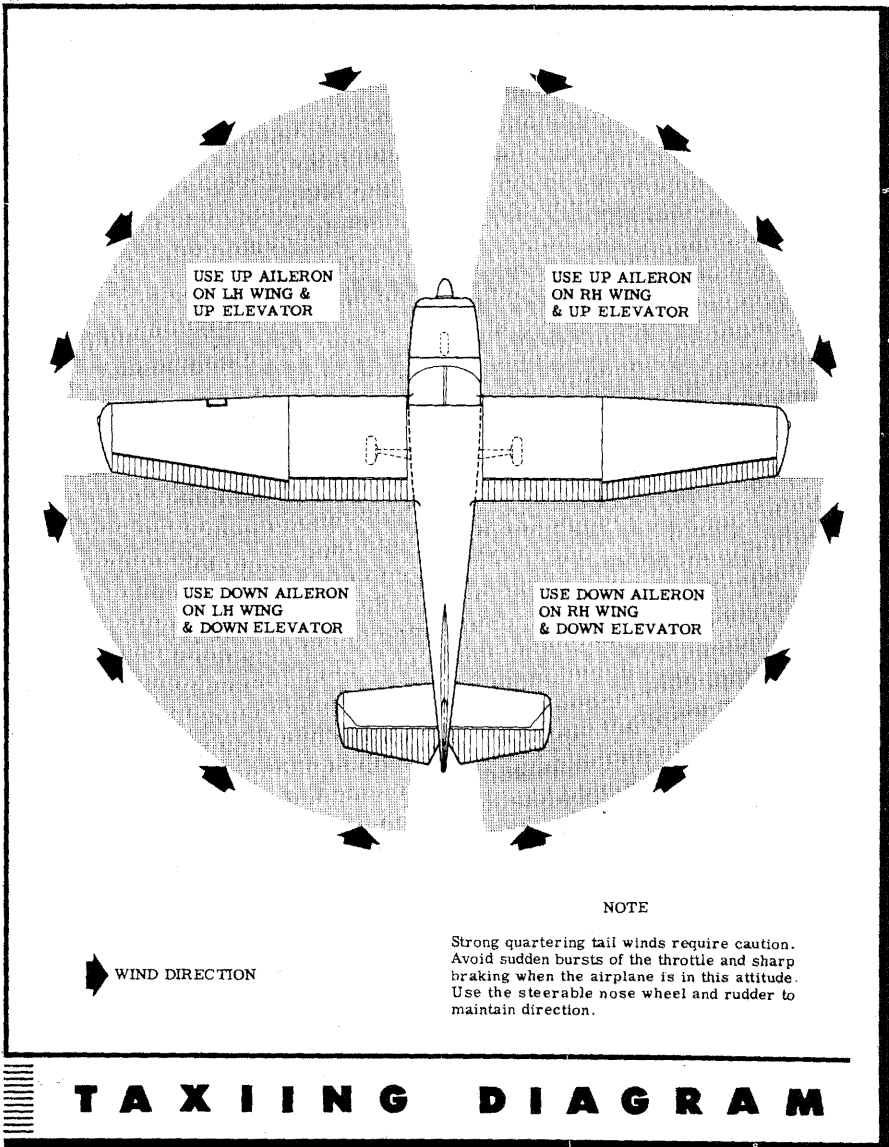


Figure 11.

## OPERATING DETAILS

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 3-3) 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 rpm is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be imme-

diately corrected as described in section V under propeller care.

On skis, the 175 taxis like any other skiplane. With nose ski steering and no brakes, its turning radius is greater than for the landplane with the inside wheel braked. The skiplane's turning radius center point is approximately 8 feet beyond the wing tip.

### TAKE-OFF.

Normal take-offs are performed with the flaps retracted. Minimum run, obstacle clearance and soft or rough field take-offs are all performed with 20° flaps. With the flaps extended 20°, ground run is reduced slightly, the total distance to clear a 50 foot obstacle is reduced approximately 10%, and take-off speed is approximately 5 MPH slower.

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 stall chart on page 3-5).

*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 24) for take-off distances under various gross weight, altitude, and headwind conditions.








| POWER<br>OFF  |  | <i>Stalling Speeds</i>  |  |  |  | MPH<br>TIAS |  |
|---|--|---|--|--|--|-------------|--|
| Gross Weight<br>2350 lbs.   |  | ANGLE OF BANK   |  |  |  |             |  |
| CONDITION   |  | <br>0° | <br>20° | <br>40° | <br>60° |             |  |
| Flaps Up   |  | 62  | 64   | 70   | 87   |             |  |
| Flaps 20°  |  | 54  | 56   | 62   | 77   |             |  |
| Flaps 40°  |  | 53  | 55   | 60   | 74   |             |  |

Figure 12. Stall Chart

**CLIMB.**

For detailed climb data, see climb performance chart in Section VI. Normal climbs are conducted at 80-90 MPH with flaps up and full throttle for best engine cooling. The best *rate-of-climb* speeds range from 84 MPH at sea level to 80 MPH 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 61 MPH at sea level to 70 MPH at 10,000 feet.

**NOTE**

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

Climb techniques and airspeeds for

the skiplane are identical to the landplane. The skiplane rate-of-climb is reduced slightly by the additional drag of the skis.

**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 altitudes of 2,500 feet and 5,000 feet. All figures are based on zero wind, 43 gallons of fuel for cruise, McCauley 8467 propeller, 2350 pounds gross weight, and standard atmospheric conditions. For lean mixture figures, the mixture is leaned until the rpm decreases slightly and then enriched to maximum rpm. Allowances for

## OPERATING DETAILS

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.

Skiplane cruise and range performance is given in the Skiplane Cruise Performance Chart in Section VI. Skiplane cruise techniques and engine limits are identical to those for the landplane.

### STALLS.

The stalling speeds shown (see stall chart) 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 MPH 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 MPH 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.

Skiplane stalling and landing speeds are identical to the landplane. However, since landing distances will vary greatly under different runway surface conditions, no landing distances are given.

## 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 ( $-20^{\circ}$  F) weather, prime the engine as follows:

- (1) Clear propeller.
- (2) Turn master switch "on".

- (3) With ignition switch "off" and throttle closed, prime the engine four to ten strokes as the engine is being turned over.
- (4) Turn ignition switch "on".
- (5) Open throttle  $\frac{1}{8}$  inch (to idle position) and start engine by pulling starter handle.

#### 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 the primer knob all the way in and turn to locked position to avoid possibility of engine drawing fuel through the primer. Do not pull out on the starter handle for a second starting attempt until the 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 rpm), accelerate the engine several times to higher engine rpm. If the engine accelerates smoothly and the oil pressure remains normal and steady, the airplane is ready for take-off.

To operate the engine in occasional outside air temperatures from 10° F to 20° F, the following procedure is recommended:

- (1) Use full carburetor heat during

engine warm-up and ground check.

- (2) Use minimum carburetor heat required for smooth operation in take-off, climb, and cruise.
- (3) Select relatively high rpm settings for optimum mixture distribution, and avoid excessive manual leaning in cruising flight.
- (4) Avoid sudden throttle movements during ground and flight operation.

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

#### OIL DILUTION SYSTEM.

If your airplane is equipped with an oil dilution system, and very low temperatures are expected, dilute the oil 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 90 seconds. If more than four quarts 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 four quarts may be added without risk of overflow and its attendant fire hazard. To make room for the additional fuel

## OPERATING DETAILS

some oil must be drained before dilution. The total volume of fuel and oil must not exceed 16 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

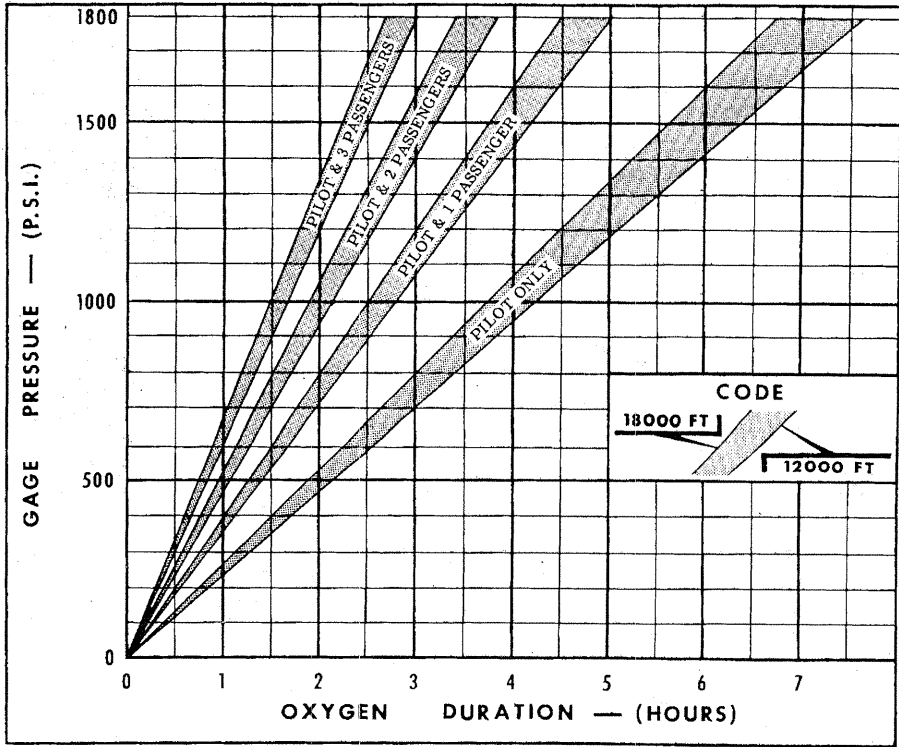
sludge blocking the screens. If the volume of diluted oil exceeds 11 quarts, run the engine long enough to evaporate some of the fuel and lower the sump level before take-off. Otherwise, the sump may overflow when the airplane is nosed up for climb.

## OXYGEN SYSTEM (OPTIONAL EQUIPMENT).

An oxygen system, capable of supplying oxygen for a pilot and three passengers, is available as optional equipment for your Cessna. It is completely automatic and requires no manual regulation.

The system consists of an oxygen cylinder, a pressure gage, pressure regulator, outlet couplings, and four disposable type oxygen masks, complete with rubber hoses and position indicators. The face masks and hoses are stored in a plastic bag on the utility shelf when not in use.

| OIL DILUTION TABLE   |         |        |         |
|--|---------|--------|---------|
| TEMPERATURE  |         |        |         |
|  | 0° F    | -10° F | -20° F  |
| Dilution Time .....  | 1½ min. | 3 min. | 4½ min. |
| Fuel Added .....   | 1 qt.   | 2 qt.  | 3 qt.   |
| Oil Drained .....  | 0 qt.   | 0 qt.  | 1 qt.   |
| (Sump Full)  |         |        |         |
| NOTE: Maximum sump capacity is 12 quarts.<br>Maximum fuel and oil in sump for take-off is 11 quarts. |         |        |         |



### OXYGEN SYSTEM OPERATION.

Prior to flight, check to see that the valve on the oxygen cylinder is full open (full counterclockwise). Note the oxygen pressure gage reading to be sure that there is an adequate supply of oxygen for the trip.

To use the oxygen system, proceed as follows:

- Select mask and hose from plastic bag on utility shelf.
- If mask is not connected to hose, attach by inserting short plastic

tube securely into oxygen delivery hose.

- Attach mask to face.
- Select oxygen coupling in overhead console panel. Push dust cover to one side and insert end of mask hose into coupling. Oxygen will start to flow and no further adjustments are necessary.

### NOTE

If the red oxygen flow indicator for the face mask hose line is out of sight, oxygen is flowing.

## OPERATING DETAILS

### TACTAIR AUTOMATIC FLIGHT CONTROLS.

Although it is possible to take off and land with the Tactair units engaged, merely by overpowering them, you will find that control forces are greater and your feel of the airplane is diminished. *Before taking off or landing make sure the master knob is off (pushed in).*

Since it is entirely pneumatic and operated by the engine-driven vacuum pump, the Tactair system needs no warm-up period before engagement. It may be used at any altitude up to 20,000 feet; above 20,000 feet, atmospheric pressure is insufficient to supply the necessary control forces.

Before engaging the system, trim the airplane straight and level and center the knobs on the control head. Then pull out the master knob. If the airplane is not trimmed, or the knobs are not centered, as soon as the unit is engaged the airplane's attitude will change. The change will not be abrupt and no excessive loads will be imposed on the airframe, but operation will be smoother if both airplane and control head knobs are trimmed before engagement.

#### T-1 ROLL STABILIZER OPERATION.

To operate the T-1 roll stabilizer unit, center the trim knob and pull on the master knob. With the roll trim knob centered, the unit will immediately level the wings from any attitude within the limits of the gyro. The trim knob may be rotated to obtain up to 10 degrees of bank. Sharp

turns may be made merely by overriding the unit with the control wheel.

#### T-2 HEADING LOCK OPERATION.

Engagement of the T-2 unit is identical to the T-1, except for the additional caging and setting of the directional gyro and setting the course selector card before engaging the unit. Once the unit is engaged, turns to a new heading may be made merely by turning the course selector knob to the new heading. If the new heading is within 80 degrees of the former heading, the unit will make approximately a one-degree-per-second turn to the new heading. (If the new heading is more than 80 degrees from the original, the autopilot will turn to the reciprocal of the new heading.) If the airplane hunts or oscillates, adjust the roll trim knob until the selector card and directional gyro are aligned. The airplane may be slightly wing-low; it is in this manner that the unit trims out torque effects.

Turns may be made by overriding the stabilizer unit. When you release the controls, the airplane returns to the course selector heading if it is within 80 degrees, or to its reciprocal.

Caging the directional gyro eliminates the heading lock feature; however, the relation of the two compass cards will result in a continuous signal to the control head. If the cards are aligned, the signal will be balanced and the wing will remain level as with the T-1. If the cards are not aligned, a continuous bank signal will be sent, attempting to match the com-



pass cards. As soon as the gyro is uncaged, the heading lock will function as usual.

### **T-3 AUTOPILOT OPERATION.**

To engage the T-3 autopilot, trim the airplane straight and level, hands-off. Set the autopilot pitch and turn knobs to center and the course selector card to coincide with the heading on the directional gyro. Then pull on the master knob.

The roll and heading lock functions of the T-3 unit are identical to the T-2, except that the heading lock knob on the control head must be pushed on to engage the heading lock. In addition, the turn knob on the control head may be used to make turns up to 28 degrees of bank. Displacing the turn knob automatically disengages the heading lock; after the turn knob is returned to center, the heading lock may be engaged once more and the airplane will return to the heading set on the course selector, or to its reciprocal, whichever is closer.

The tab under the turn knob can be moved left or right to change the roll zero point up to two degrees, if necessary, to trim out torque effects and prevent hunting. Move the tab until the course selector card and

directional gyro card are aligned. Changes in power settings may require readjustment of the tab.

The pitch control knob on the right side of the control head may be set to maintain a nose-up or nose-down attitude up to approximately 10 degrees down or 15 degrees up. For best results, the stabilizer should be adjusted with changes in attitude, power or center of gravity, just as you would in manual-control flight. The pitch control unit can overcome an out-of-trim condition, but it may produce oscillations in doings so since there is no automatic trim tab control. Your ride will be smoother if you adjust the trim manually.

### **EMERGENCY PROCEDURES.**

If a malfunction should occur in any of the autopilot units, it can be overridden merely with pressure on the normal flight controls and the entire autopilot may be disengaged by pushing in the master knob. Leaks in the system will produce only a loss of suction. If the suction gage reading falls below 3.5 in. Hg, push in the master knob to disengage the autopilot. All the available suction then will be directed to the instruments.



# SECTION IV

## OPERATING LIMITATIONS

### OPERATIONS AUTHORIZED.

Your Cessna 175 with standard equipment as certificated under CAA Type Certificate No. 3A17 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 175 is eligible to obtain approval for its operation on single engine scheduled airline service on VFR.

### MANEUVERS — NORMAL CATEGORY.

The Model 175 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.....                   | 2350 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.

### AIRSPEED LIMITATIONS.

The following are the certificated true indicated airspeed limits for the Cessna 175:

|  |                          |
|--|--------------------------|
| Maximum (Glide or dive, smooth air).....   | 176 mph (red line)       |
| Caution Range (Level flight or climb)..... | 140-176 mph (yellow arc) |
| Normal Range (Level flight or climb).....  | 62-140 mph (green arc)   |

## OPERATING LIMITATIONS

Flap Operating Range .....53-100 mph (white arc)  
Maneuvering Speed\*.....123 mph

\*(The maximum speed at which you can use abrupt control travel  
without exceeding the design load factor.)

## ENGINE OPERATING LIMITATIONS.

Power and Speed.....175 bhp at 3200 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.....30-60 psi (green arc)

### FUEL QUANTITY INDICATORS.

Empty (4½ gallon 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.....2400-2900 (inner green arc)  
At 5000 feet .....2400-3050 (middle green arc)  
At 10,000 feet .....2400-3200 (outer green arc)  
Maximum Allowable.....3200 (red line)

## WEIGHT AND BALANCE.

All aircraft are designed for certain limit loads and balance conditions. These specifications for your 175 are charted on pages 4-3 and 4-4.

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.

## OPERATING LIMITATIONS

is within limits. Refer to the loading graph for moment values of items to be carried.

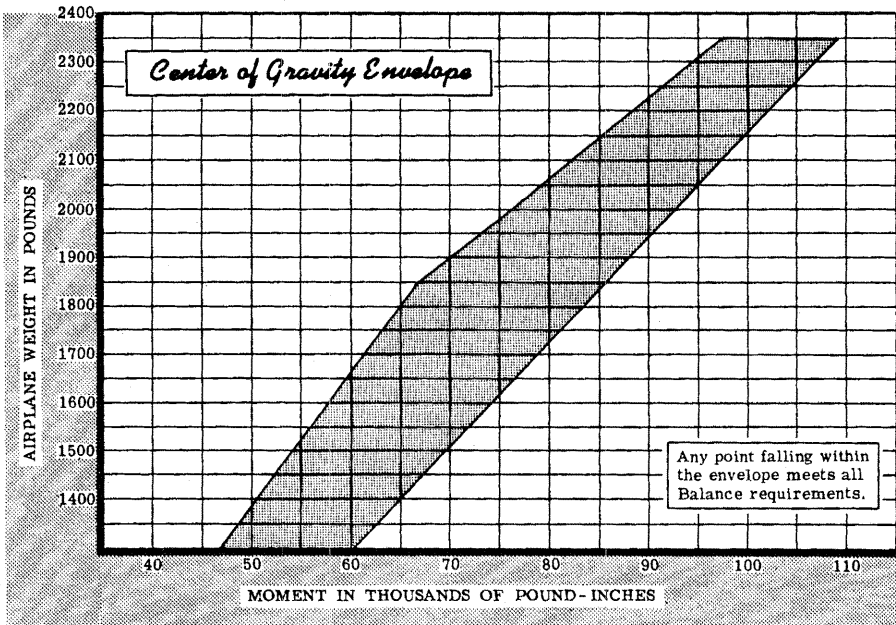
EXAMPLE PROBLEM FOR AN AIRPLANE WITH A LICENSED EMPTY WEIGHT OF 1386 LBS. AND A MOMENT OF 52,722 LB.-INS.

| ITEM                                   | WT.  | MOMENT<br>1000 |
|--|------|----------------|
| EMPTY WEIGHT (LICENSED).....           | 1386 | + 52.7         |
| OIL .....                              | 19   | - .4           |
| PILOT & FRONT PASSENGER .....          | 340  | + 12.2         |
| REAR PASSENGER (2).....                | 340  | + 23.8         |
| BAGGAGE .....                          | 20   | + 1.9          |
| FUEL TO GROSS WEIGHT (40.8 GAL.) ..... | 245  | + 11.8         |
| Total .....                            | 2350 | + 102.0        |

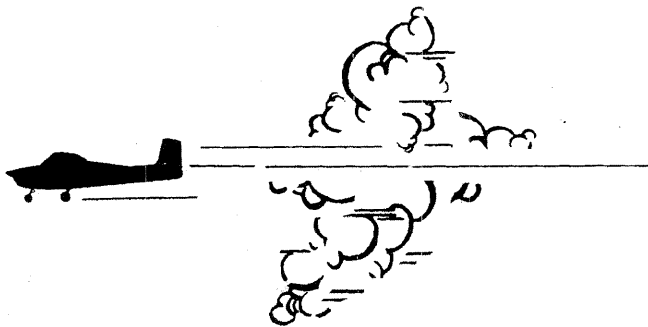
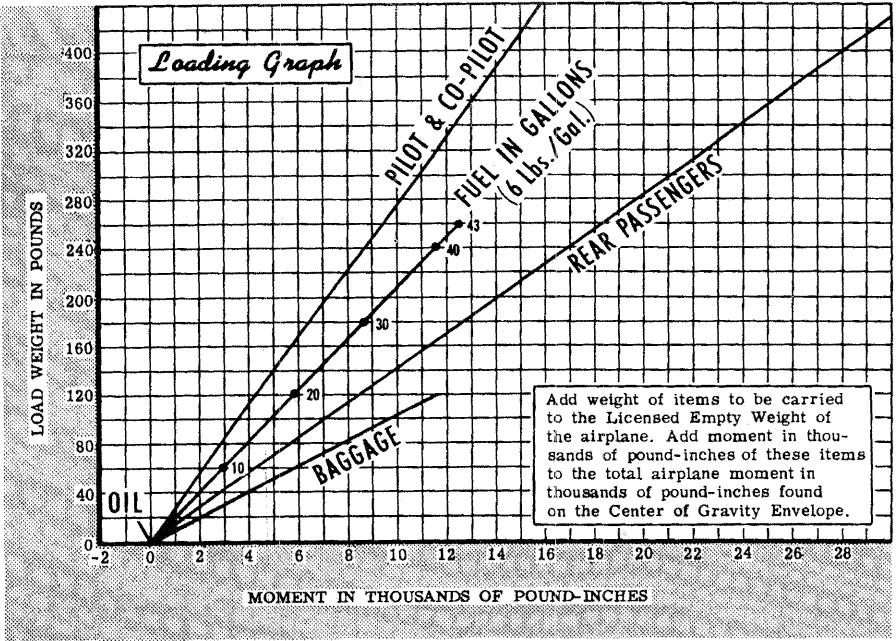
Locate this point (2350-102.0) on the center of gravity envelope graph, and, since the point falls within the envelope, the above loading meets all balance requirements.

### 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.



OPERATING LIMITATIONS



# SECTION V

## CARE OF THE AIRPLANE

IF YOUR AIRPLANE is to retain that new plane performance, stamina, and dependability, certain requirements in its care, inspection, and maintenance 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 an optional 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 sideways 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 13.)

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

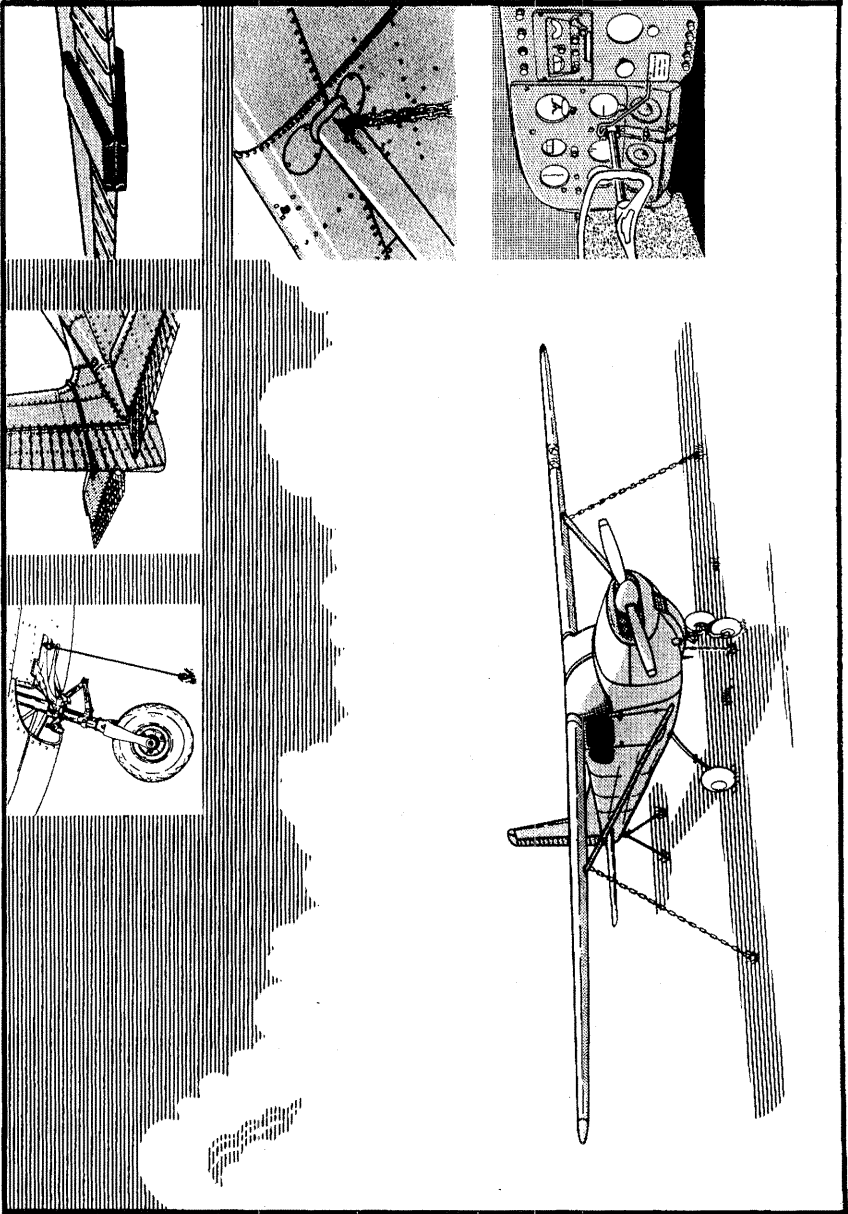


Figure 13. Airplane Tie-Down Procedure



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 controls lock on pilot's control column, or if controls lock is not available, tie pilot's control wheel back with front seat belt.
- (7) Install surface control lock over fin and rudder.

## STORAGE.

The all-metal construction of your Cessna makes outside storage practical. Inside storage 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 it over by hand or have it turned over every few days to keep the bearings, cylinder walls, and internal parts lubricated. Full fuel tanks will help prevent condensation and will 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 a 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 wheel when the nose wheel is being raised for removal.

## 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

## CARE OF THE AIRPLANE

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 (7) 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 a speed fairing, check the clearance between the tire and the mud scraper. Proper clearance is .19 to .31 inch on the nosewheel 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 and retighten the screws. Do not pry between the fairing and the scraper. The clearance check is particularly important if a recapped tire is installed, since the growth of the tire 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 should be checked periodically for correct fluid level, and refilled as necessary in accordance with the servicing instructions on the placard located on the strut.

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.

### **TUBELESS TIRES.**

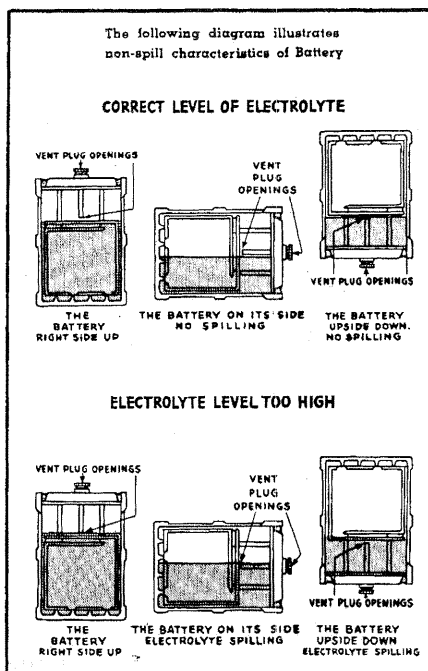
To check tire pressures or inflate the tires on airplanes equipped with tubeless tires, use the filler needle stowed in the glove box and follow the instructions which accompany it. To change a tubeless tire, remove the two-piece wheel from the airplane, completely deflate the tire and disassemble the wheel halves. With the wheel disassembled, protect from damage the inner wheel flanges and the large O-ring between the two halves, to prevent leaks. When reassembling the wheel halves, on both tubeless and tube-type wheels, torque the wheel-bolts to 83 pound-feet, drawing all of them down together to prevent warping the wheel. Inflate the tire to approximately  $1\frac{1}{2}$  times normal pressure, to seat the tire beads against the wheel flanges. When the beads snap into place, reduce pressure to normal.

### **BATTERY.**

The battery is located in the fuselage tailcone just aft of the baggage compartment, and is accessible by removing the battery access door on the left side of the fuselage.

Maintain the level of the battery electrolyte at the level of the horizontal baffle plate (the plate with the holes

## CARE OF THE AIRPLANE



in it) which is approximately two inches below the filler plug by adding distilled water as required. Obtain the water level but *do not* fill above the plate mentioned above. This water level should be maintained when the battery is in the level position.

The space above the horizontal plate is a fluid reservoir when the battery is tipped to the side or inverted. When the electrolyte level is too high, spillage of fluid may result. 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 battery connections tight and

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

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

## WINDSHIELD AND WINDOWS.

The windshield is a single, full-floating unit of free-blown "Longlife" plastic. To clean and prevent scratches and crazing, wash the windshield and plastic windows carefully with plenty of soap and water, using the palm of the hand to feel and dislodge dirt and mud. A soft cloth, chamois or sponge may be used, but only to carry water to the surface. Rinse thoroughly, then dry with a clean, moist chamois.

Rubbing the surface of the plastic builds up an electrostatic charge so

that it attracts dust particles in the air. Wiping it with a moist chamois will remove both the dust and this charge.

Remove oil and grease with a cloth moistened with kerosene. Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, fire extinguisher or anti-ice fluid, lacquer thinner or glass cleaner. These materials will soften the plastic and may cause it to craze.

After removing dirt and grease, if the surface is not seriously scratched it should be waxed with a good grade of commercial wax. The wax will fill in minor scratches and help prevent further scratching. Apply a thin, even coat of wax and bring it to a high polish by rubbing lightly with a clean, dry soft flannel cloth. Do not use a power buffer; the heat generated by the buffing pad will soften the plastic.

Do not use a canvas cover on the windshield unless snow or freezing rain is anticipated. Canvas covers may cause the plastic to craze.

## ALUMINUM SURFACES.

The clad aluminum surfaces of your Cessna require only a minimum of care to keep them bright and clean. The airplane may be washed with clear water to remove dirt; oil and grease may be removed with gasoline, naphtha, carbon tetrachloride or other nonalkaline solvents. While household detergent soap powders are effective they should be used cautiously since some are strongly alkaline and may attack the aluminum.

Dulled aluminum surfaces may be cleaned effectively with a mixture of about two quarts of denatured alcohol, two quarts of water and a package of powdered Bon Ami.

## 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 helps preserve the lacquer's luster and affords a measure of protection from damage.

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 stainless steel and may be cleaned with recommended solvent cleaners for grease and oil.

The oil filter screens should be cleaned every 25 hours (during the regular oil change). The carburetor air filter should also be serviced every 25

## CARE OF THE AIRPLANE

hours or oftener when operating in dusty conditions. Under extremely dusty conditions, daily maintenance of the air filter is recommended. The air filter should be serviced in accordance with the servicing instructions stamped on the filter.

### 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 which are too imbedded to be removed by brushing. Repeat several times, using a clean part of the cloth each time.
- (5) Moisten another piece of clean cloth with cleaner and allow to evaporate until barely damp. Now rub the spot lightly, working from the outside in toward the center. (This, as you probably know, keeps the spot from spreading and is less likely to leave a ring). If necessary, repeat several times.
- (6) Brush again, to remove any further particles which may have become loosened.

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 propeller 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 result in cleaning off grass and bug stains and will assist materially in corrosion proofing in salt water areas.

## FLIGHT CONTROL SYSTEMS.

Figures 14 to 20 inclusive outline the control systems, including control travel limits, location of control stops, and the location of turnbuckles. The use of the single wrap method using .040 monel wire for safetying turnbuckles is satisfactory and CAA approved. Rigging methods for the various systems are outlined below:

### FLAPS.

- (1) Place the flap handle in the  $0^\circ$  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

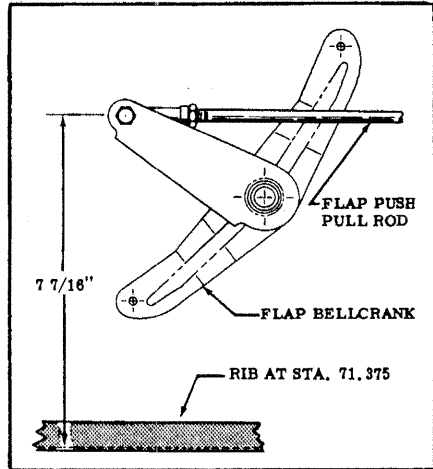


Figure 14. Flap Bellcrank Adjustment

until the flap bellcrank is in the position shown in figure 14.

- (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

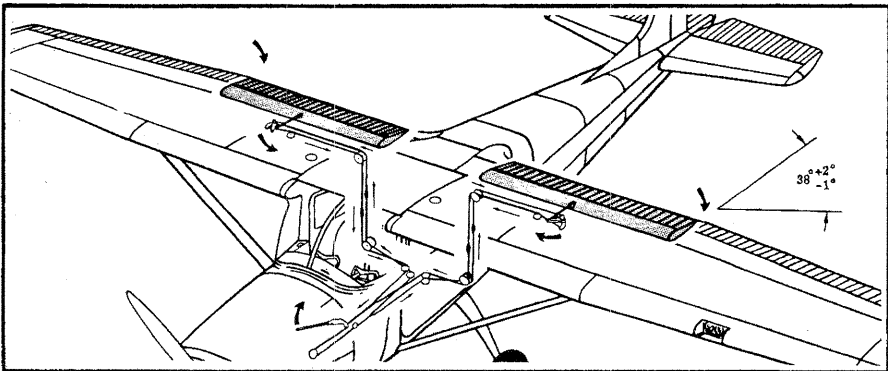


Figure 15. Flap Control System

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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 175 are restricted in travel by a feature built into the bellcranks. Stops in the bellcrank allow a total travel of  $35^{\circ}$ . 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 16. Cable tension should be 20 to 40 pounds with the control wheels in the full-forward position. This position should be maintained in checking the tension.
- (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  $20^{\circ}$  up and  $15^{\circ}$  down, with a

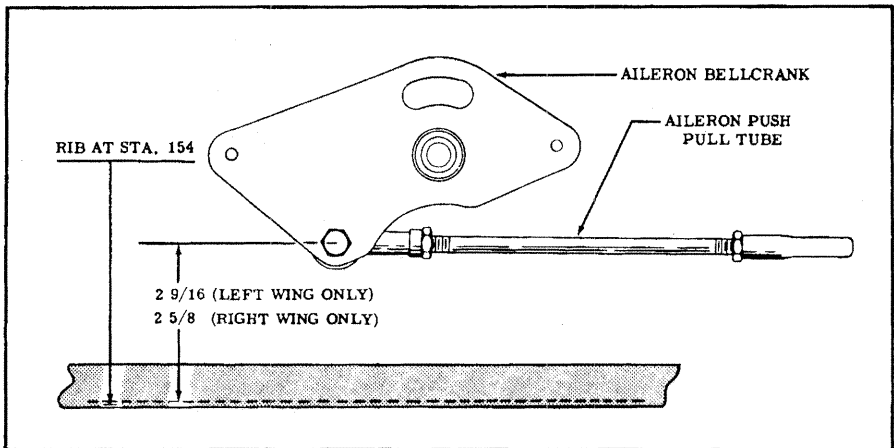


Figure 16. Aileron Bellcrank Adjustment



tolerance of plus or minus  $1^\circ$ . Make sure movement is correct.

- (6) Any correction necessary on the travel can be made by tightening the direct cable and loosening the carry-through cable, or

vice versa.

#### NOTE

After corrections have been made, check aileron in neutral position and make adjustment per instructions in step 4.

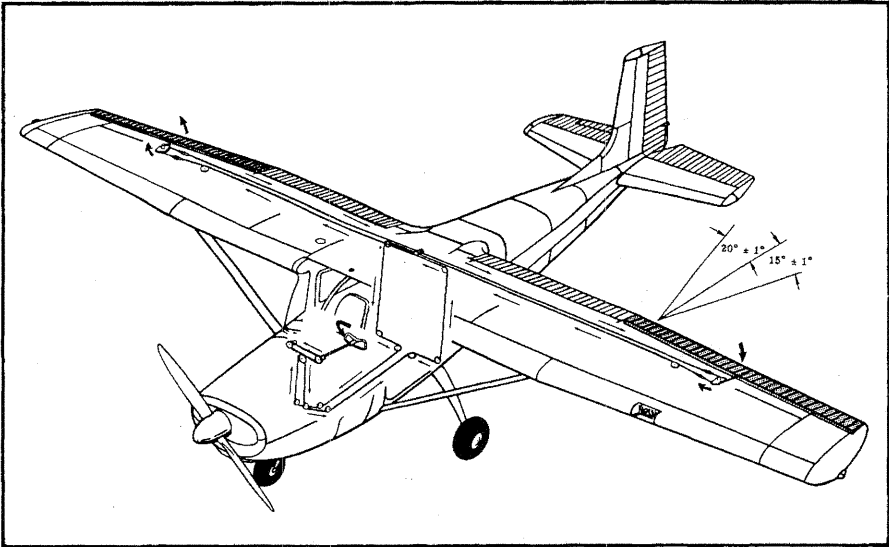


Figure 17. Aileron Control System

#### RUDDER.

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

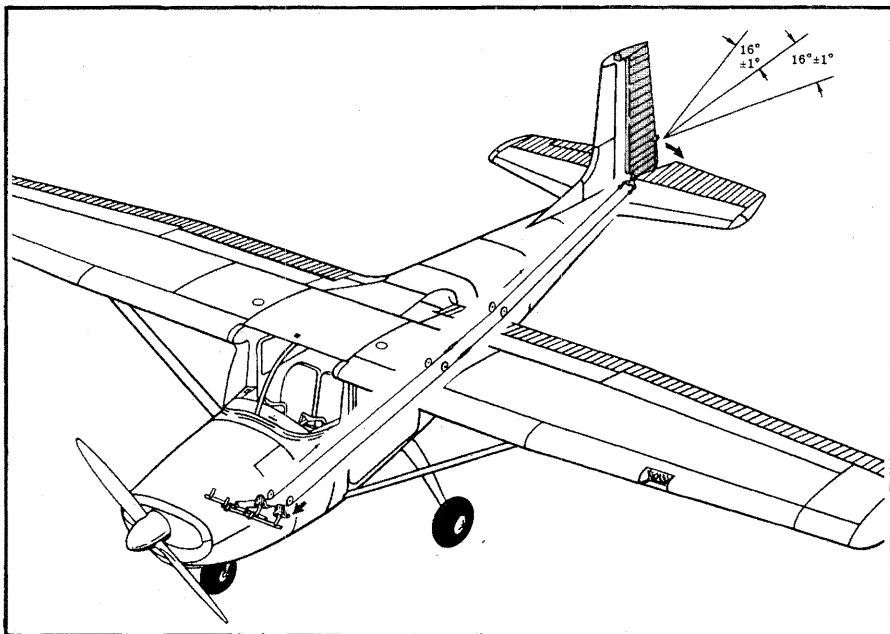
- (1) Rig stops to allow correct travel of rudder.
- (2) Install cables, and with the rudder in neutral position, tighten

turnbuckles until the rudder pedals are neutral,  $6\frac{1}{2}$ " aft of the firewall, measuring to the hingeline of the brake pedal.

- (3) Check to make sure that cables do not rub side holes in bulkheads.
- (4) Safety wire rudder cable turnbuckles.
- (5) Check rigging of nose wheel steering.

#### STEERING.

Nose wheel travel is  $30^\circ$  either side



**Figure 18. Rudder Control System**

of neutral. Rig nose wheel as follows:

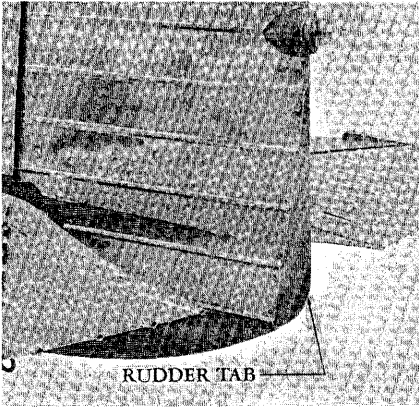
- (1) Disconnect steering tubes from the nose wheel strut.
- (2) Install surface control lock to hold rudder in neutral position.
- (3) Check that the rudder pedals, in neutral position, measure  $6\frac{1}{2}$ " from the firewall to the rudder pedal hingeline.
- (4) Raise the nose wheel clear of the ground, either by depressing the tail or hoisting the nose.
- (5) Check that the nose wheel is properly centered by the steering block.
- (6) With the steering tubes fully

extended, but not compressing the internal springs, adjust the clevis as required to attach the steering tubes to the strut steering arm.

- (7) Attach steering tubes to strut steering arms.
- (8) Lower nose wheel to ground and remove rudder surface control lock.

#### **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.



### ELEVATORS.

Elevator travel is  $28^{\circ} + 1^{\circ} - 0^{\circ}$  up and  $26^{\circ}$  plus or minus  $1^{\circ}$  down. This

travel is controlled by two stop bolts located in the stabilizer rear spar.

- (1) Set the stop bolts so that the elevator has correct travel when the aft elevator bellcrank is in contact with them.
- (2) With the elevator in the full down position, the measurement from the firewall to the edge of the chain sprocket hub on the control column should be  $\frac{1}{2}$ ".
- (3) Tighten the cables to a tension of 20 to 40 pounds.

### ELEVATOR TAB.

The elevator tab is actuated by a cable which has a chain incorporated in each end. The chain in front is actu-

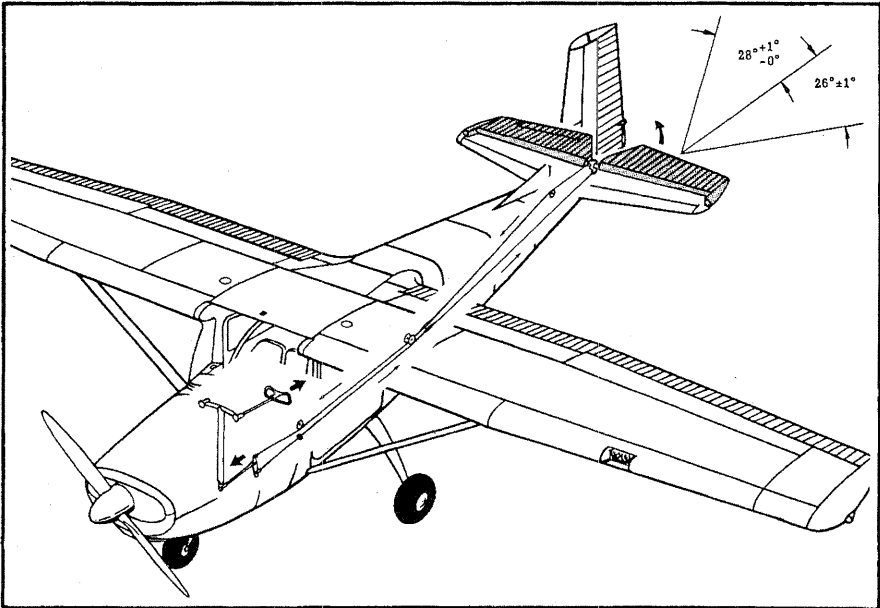
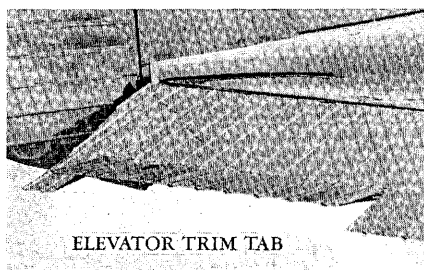


Figure 19. Elevator Control System

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ated by the fingertip tab control wheel, and the one at the rear operates a screwjack, which is mounted in the right half of the stabilizer. The travel is  $28^{\circ}$  up and  $12^{\circ}$  down, plus  $1^{\circ}$  or minus  $0^{\circ}$ .

- (1) Install cables. Turn tab control wheel to full-forward position,

and screwjack to full up position. Then turn screwjack back  $\frac{1}{2}$  turn. Set the chain on sprockets at each end, allowing  $\frac{1}{2}$ " to 1" overlap in direction of travel. Tighten the cables to a tension of 15 to 20 pounds.

- (2) To set tab travel, the elevators *MUST BE* in the neutral position.
- (3) Turn the tab control wheel to the full-forward position, disconnect push-pull tube from tab, and adjust it to hold the tab approximately  $29^{\circ}$ . (This can be done by screwing it in or out, whichever the case may be.) Connect the push-pull tube

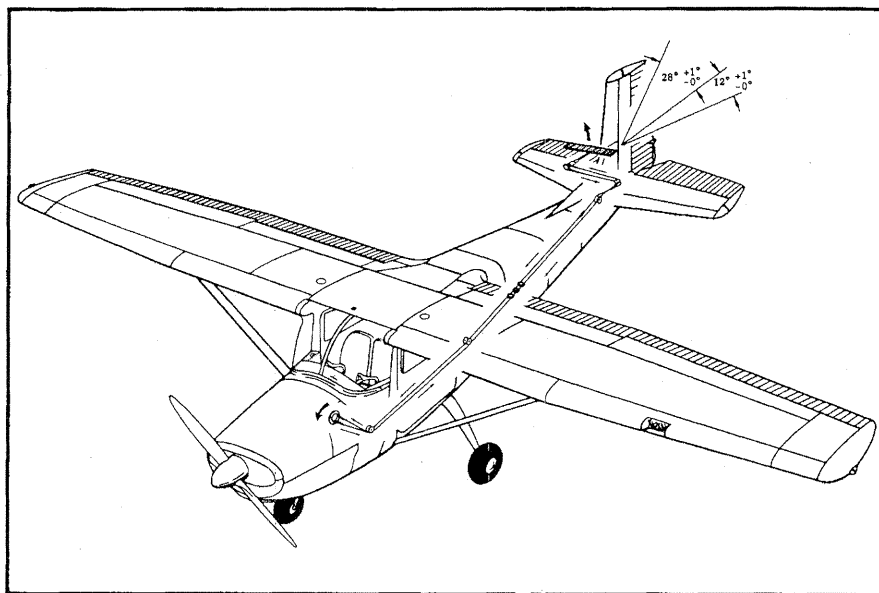


Figure 20. Elevator Tab Control System

to the tab and turn the tab control wheel to the full rearward position. The tab should be approximately  $14^{\circ}$ .

- (4) Set stops located between first and second bulkheads rear of the baggage compartment on the cables for correct travel, which is  $28^{\circ}$  up and  $13^{\circ}$  down.

### 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. In addition, a check should be made of the latest CAA Regulations to insure that all data requirements are met.

- 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 is installed).

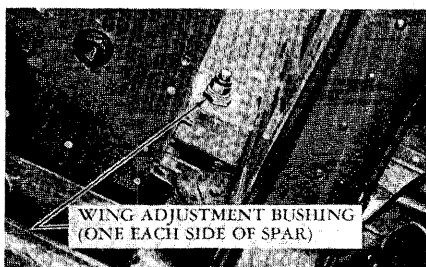


Figure 21.

- (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 airplanes registered in other countries should check with their own aviation officials to determine their individual requirements.

### INSPECTION.

With your airplane you will receive an Owner's Service Policy. This policy

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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 airplane at the factory, plan to take your Cessna 175 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.

The Civil Air Regulations require all airplanes to have a periodic (annual) inspection as prescribed by the administrator, by a person designated by the administrator, and in addition, 100 hour periodic inspections made by an "appropriately rated mechanic" if the airplane is flown for hire. The Cessna Aircraft Company recommends the 100 hour periodic inspection for the Model 175 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 lowest 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 practicality 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 nosewheel 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 plate from the tailcone to the right of the dorsal fin.
  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 tailcone. Open the headliner zipper above the rear seat.
  15. Remove optional speed fairings (main wheels only).
  16. Battery access cover.
- 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.

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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, (.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  $\frac{1}{8}$  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, using new gaskets. Replace optional oil filter.
  14. Check magneto timing — Right magneto,  $28^{\circ}$  BTC, left magneto,  $28^{\circ}$  BTC.
  15. Check the exhaust system 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 carburetor air box for cracks and leaks. Remove and service air filter. If flocking is worn or screen damaged replace filter.
- 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 the 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.
  4. Check level of brake fluid.
  5. Check nosewheel steering system for operation and condition.
  6. Kick each main wheel fore-and-aft, observing strut-to-fuselage at-



achments. 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 autopilot and instrument air filters (optional gyros only).
6. Check instruments for correct function and instrument dial markings for accuracy and legibility.
7. Check all push-pull controls for free operation and correct travel.

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.
3. Check all wiring for general condition and proper supports.

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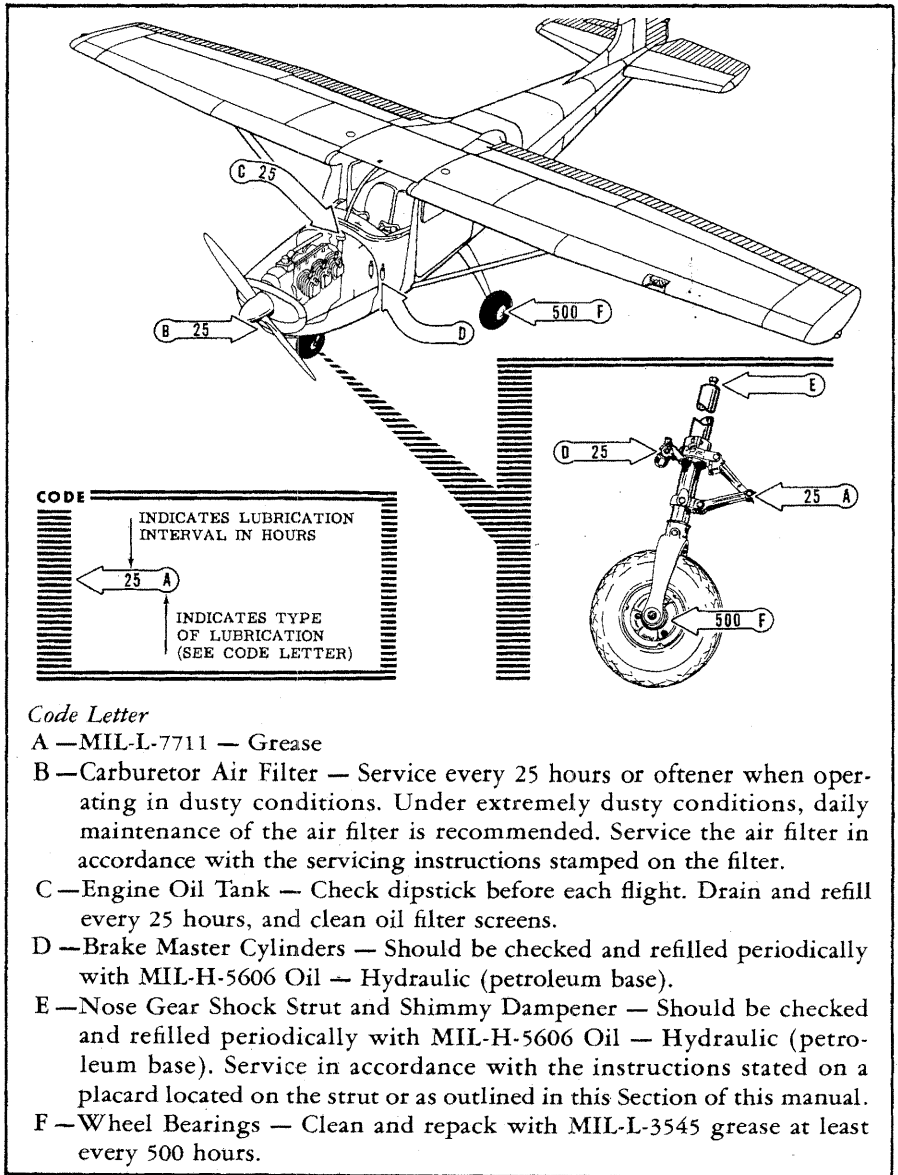


Figure 22. Lubrication Diagram

## LUBRICATION AND SERVICING.

Specific lubrication points, intervals and specifications are shown on figure 22. 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 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 current copy of the "Dealer Directory" of Cessna service stations, 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 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 175, 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 tables on pages 6-3 and 6-4 to solve flight planning problems of this nature.

In the tables, 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, 43 gallons of fuel for cruise, McCauley 8467 propeller, 2350 pounds gross weight, and standard atmospheric conditions. For lean mixture figures, mixture is leaned to maximum rpm. 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.

| 175 <i>Airspeed Correction Table</i> 175 |    |    |    |    |    |    |     |     |     |     |     |     |
|--|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| — FLAPS UP —                             |    |    |    |    |    |    |     |     |     |     |     |     |
| IAS                                      | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
| TIAS                                     | 59 | 63 | 68 | 74 | 82 | 89 | 98  | 107 | 116 | 126 | 136 | 146 |
| — FLAPS DOWN —                           |    |    |    |    |    |    |     |     |     |     |     |     |
| IAS                                      | 40 | 50 | 60 | 70 | 80 | 90 | 100 |     |     |     |     |     |
| TIAS                                     | 55 | 60 | 66 | 73 | 81 | 90 | 99  |     |     |     |     |     |

Figure 23. Airspeed Correction Table

# TAKE-OFF DATA

TAKE-OFF DISTANCE WITH FLAPS 20° FROM HARD SURFACE RUNWAY

| GROSS WEIGHT LBS. | IAS AT 50 FT. MPH | AT S. L. & 59°F |               | AT 2500 FT. & 50°F   |            | AT 5000 FT. & 41°F   |            | AT 7500 FT. & 32°F   |            |
|-------------------|-------------------|-----------------|---------------|----------------------|------------|----------------------|------------|----------------------|------------|
|                   |                   | GROUND RUN      | HEAD WIND MPH | TO CLEAR 50 FT. OBS. | GROUND RUN | TO CLEAR 50 FT. OBS. | GROUND RUN | TO CLEAR 50 FT. OBS. | GROUND RUN |
| 1700              | 51                | 345             | 0             | 680                  | 410        | 805                  | 490        | 940                  | 595        |
|                   |                   | 180             | 15            | 420                  | 220        | 505                  | 265        | 600                  | 335        |
|                   |                   | 65              | 30            | 210                  | 85         | 285                  | 110        | 320                  | 145        |
| 2000              | 55                | 495             | 0             | 950                  | 595        | 1120                 | 715        | 1330                 | 870        |
|                   |                   | 270             | 15            | 625                  | 335        | 725                  | 410        | 880                  | 515        |
|                   |                   | 110             | 30            | 330                  | 145        | 405                  | 185        | 505                  | 245        |
| 2350              | 60                | 735             | 0             | 1340                 | 875        | 1595                 | 1040       | 1980                 | 1295       |
|                   |                   | 420             | 15            | 875                  | 515        | 1065                 | 630        | 1345                 | 800        |
|                   |                   | 190             | 30            | 535                  | 245        | 630                  | 315        | 820                  | 415        |

Note..... INCREASE DISTANCES 10% FOR EACH 25°F ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

# CLIMB DATA

| GROSS WEIGHT LBS. | AT S. L. & 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 | GALS OF FUEL USED | BEST CLIMB IAS MPH | RATE OF CLIMB FT/MIN | GALS OF FUEL USED | BEST CLIMB IAS MPH  | RATE OF CLIMB FT/MIN | GALS OF FUEL USED | BEST CLIMB IAS MPH | RATE OF CLIMB FT/MIN | GALS OF FUEL USED |
| 1700              | 75                 | 1395                 | 1.2               | 72                 | 1090                 | 1.9               | 70                  | 790                  | 2.7               | 68                 | 475                  | 3.7               |
| 2000              | 79                 | 1105                 | 1.2               | 77                 | 840                  | 2.2               | 75                  | 575                  | 3.2               | 73                 | 310                  | 4.6               |
| 2350              | 84                 | 850                  | 1.2               | 82                 | 615                  | 2.5               | 80                  | 380                  | 4.1               | 79                 | 140                  | 6.6               |

Note..... FLAPS UP, FULL THROTTLE, MIXTURE LEANED FOR SMOOTH ENGINE OPERATION ABOVE 5,000 FT. FUEL USED INCLUDES WARM-UP AND TAKE-OFF ALLOWANCES.

Figure 24. Take-Off and Climb Chart

| CRUISE PERFORMANCE WITH RICH MIXTURE |      |          |     |                              |               |              |                |
|--------------------------------------|------|----------|-----|------------------------------|---------------|--------------|----------------|
| STANDARD ATMOSPHERIC CONDITIONS      |      |          |     | GROSS WEIGHT - - 2350 POUNDS |               |              |                |
| ZERO WIND                            |      |          |     | 43 GALLONS OF FUEL           |               |              |                |
| ALT                                  | RPM  | %<br>BPH | TAS | Gal./<br>Hour                | End.<br>Hours | Mi./<br>Gal. | Range<br>Miles |
| 2,500                                | 3000 | 74       | 133 | 12.0                         | 3.6           | 11.1         | 475            |
|                                      | 2900 | 67       | 128 | 10.8                         | 4.0           | 11.8         | 510            |
|                                      | 2800 | 61       | 122 | 9.8                          | 4.4           | 12.5         | 535            |
|                                      | 2700 | 55       | 117 | 8.8                          | 4.9           | 13.3         | 570            |
|                                      | 2600 | 49       | 111 | 8.0                          | 5.4           | 13.9         | 595            |
|                                      | 2500 | 45       | 106 | 7.4                          | 5.8           | 14.3         | 615            |
|                                      | 2400 | 40       | 100 | 6.9                          | 6.2           | 14.5         | 625            |
| 5,000                                | 3050 | 72       | 135 | 12.3                         | 3.5           | 10.9         | 470            |
|                                      | 3000 | 69       | 132 | 11.7                         | 3.7           | 11.3         | 485            |
|                                      | 2900 | 62       | 127 | 10.4                         | 4.1           | 12.2         | 525            |
|                                      | 2800 | 57       | 121 | 9.5                          | 4.5           | 12.8         | 550            |
|                                      | 2700 | 51       | 115 | 8.6                          | 5.0           | 13.4         | 575            |
|                                      | 2600 | 47       | 110 | 7.8                          | 5.5           | 14.1         | 605            |
|                                      | 2500 | 43       | 105 | 7.3                          | 5.9           | 14.4         | 620            |
|                                      | 2400 | 39       | 99  | 6.6                          | 6.5           | 15.0         | 645            |
| CRUISE PERFORMANCE WITH LEAN MIXTURE |      |          |     |                              |               |              |                |
| 2,500                                | 3000 | 74       | 133 | 10.6                         | 4.1           | 12.5         | 540            |
|                                      | 2900 | 67       | 128 | 9.7                          | 4.4           | 13.2         | 565            |
|                                      | 2800 | 61       | 122 | 8.9                          | 4.8           | 13.8         | 590            |
|                                      | 2700 | 55       | 117 | 8.2                          | 5.2           | 14.3         | 615            |
|                                      | 2600 | 49       | 111 | 7.5                          | 5.7           | 14.8         | 635            |
|                                      | 2500 | 45       | 106 | 6.9                          | 6.2           | 15.2         | 660            |
|                                      | 2400 | 40       | 100 | 6.3                          | 6.8           | 15.9         | 685            |
| 5,000                                | 3050 | 72       | 135 | 10.4                         | 4.1           | 12.9         | 560            |
|                                      | 3000 | 69       | 132 | 9.9                          | 4.3           | 13.4         | 575            |
|                                      | 2900 | 62       | 127 | 9.1                          | 4.7           | 13.9         | 600            |
|                                      | 2800 | 57       | 121 | 8.4                          | 5.1           | 14.4         | 620            |
|                                      | 2700 | 51       | 115 | 7.8                          | 5.5           | 14.8         | 635            |
|                                      | 2600 | 47       | 110 | 7.1                          | 6.0           | 15.5         | 665            |
|                                      | 2500 | 43       | 105 | 6.7                          | 6.4           | 15.7         | 675            |
|                                      | 2400 | 39       | 99  | 6.1                          | 7.0           | 16.3         | 700            |
| 7,500                                | 3100 | 70       | 136 | 10.1                         | 4.3           | 13.5         | 580            |
|                                      | 3000 | 64       | 131 | 9.3                          | 4.6           | 14.1         | 605            |
|                                      | 2900 | 58       | 125 | 8.6                          | 5.0           | 14.6         | 625            |
|                                      | 2800 | 53       | 120 | 7.9                          | 5.4           | 15.2         | 655            |
|                                      | 2700 | 48       | 114 | 7.3                          | 5.9           | 15.6         | 675            |
|                                      | 2600 | 44       | 109 | 6.8                          | 6.3           | 16.0         | 685            |
|                                      | 2500 | 40       | 104 | 6.3                          | 6.8           | 16.4         | 705            |
| 10,000                               | 3200 | 72       | 140 | 10.3                         | 4.2           | 13.6         | 585            |
|                                      | 3100 | 66       | 135 | 9.5                          | 4.5           | 14.2         | 610            |
|                                      | 3000 | 60       | 129 | 8.8                          | 4.9           | 14.7         | 630            |
|                                      | 2900 | 54       | 123 | 8.1                          | 5.3           | 15.2         | 655            |
|                                      | 2800 | 50       | 118 | 7.6                          | 5.7           | 15.5         | 670            |
|                                      | 2700 | 46       | 113 | 7.0                          | 6.1           | 16.1         | 695            |
|                                      | 2600 | 42       | 108 | 6.5                          | 6.6           | 16.6         | 715            |
|                                      | 2500 | 39       | 102 | 6.1                          | 7.0           | 16.8         | 720            |
| 12,500                               | 3100 | 61       | 134 | 8.9                          | 4.8           | 15.0         | 645            |
|                                      | 3000 | 56       | 128 | 8.3                          | 5.2           | 15.4         | 660            |
|                                      | 2900 | 52       | 122 | 7.8                          | 5.5           | 15.7         | 675            |
|                                      | 2800 | 47       | 117 | 7.2                          | 6.0           | 16.3         | 700            |
|                                      | 2700 | 44       | 112 | 6.7                          | 6.4           | 16.7         | 720            |
|                                      | 2600 | 39       | 105 | 6.2                          | 6.9           | 17.0         | 730            |

Figure 25. Cruise Performance Chart

# OPERATIONAL DATA

## CRUISE PERFORMANCE WITH RICH MIXTURE

STANDARD ATMOSPHERE CONDITIONS GROSS WEIGHT-- 2350 POUNDS  
ZERO WIND 43 GALLONS OF FUEL

| ALTITUDE | RPM  | %BHP | TAS | GAL<br>PER HR | END. HRS | MILES<br>PER GAL | RANGE<br>MILES |
|----------|------|------|-----|---------------|----------|------------------|----------------|
| 2500     | 3000 | 74   | 123 | 12.9          | 3.3      | 9.5              | 409            |
|          | 2900 | 67   | 117 | 11.5          | 3.7      | 10.2             | 438            |
|          | 2800 | 61   | 112 | 9.8           | 4.4      | 11.4             | 492            |
|          | 2700 | 56   | 107 | 9.0           | 4.8      | 12.0             | 514            |
|          | 2600 | 51   | 102 | 8.2           | 5.2      | 12.4             | 534            |
|          | 2500 | 47   | 96  | 7.6           | 5.7      | 12.7             | 547            |
|          | 2400 | 44   | 89  | 7.1           | 6.0      | 12.5             | 539            |
|          |      |      |     |               |          |                  |                |
| 5000     | 3050 | 73   | 124 | 12.4          | 3.5      | 10.0             | 434            |
|          | 3000 | 69   | 121 | 11.8          | 3.7      | 10.3             | 444            |
|          | 2900 | 63   | 116 | 10.6          | 4.1      | 11.0             | 472            |
|          | 2800 | 58   | 111 | 9.6           | 4.5      | 11.6             | 497            |
|          | 2700 | 53   | 106 | 8.8           | 4.9      | 12.0             | 517            |
|          | 2600 | 49   | 100 | 8.2           | 5.3      | 12.3             | 528            |
|          | 2500 | 46   | 94  | 7.6           | 5.6      | 12.2             | 526            |
|          | 2400 | 43   | 78  | 7.2           | 5.9      | 10.8             | 463            |

## CRUISE PERFORMANCE WITH LEAN MIXTURE

|       |      |    |     |      |      |      |     |
|-------|------|----|-----|------|------|------|-----|
| 2500  | 3000 | 74 | 123 | 10.6 | 4.07 | 11.6 | 500 |
|       | 2900 | 67 | 118 | 9.6  | 4.5  | 12.2 | 524 |
|       | 2800 | 61 | 112 | 8.8  | 4.9  | 12.7 | 546 |
|       | 2700 | 56 | 107 | 8.2  | 5.3  | 13.1 | 564 |
|       | 2600 | 51 | 102 | 7.6  | 5.7  | 13.4 | 578 |
|       | 2500 | 47 | 96  | 7.1  | 6.1  | 13.6 | 583 |
|       | 2400 | 44 | 89  | 6.7  | 6.4  | 13.3 | 573 |
|       |      |    |     |      |      |      |     |
| 5000  | 3050 | 73 | 124 | 10.4 | 4.2  | 12.0 | 517 |
|       | 3000 | 69 | 121 | 9.9  | 4.3  | 12.3 | 528 |
|       | 2900 | 63 | 116 | 9.1  | 4.7  | 12.8 | 550 |
|       | 2800 | 58 | 111 | 8.4  | 5.1  | 13.2 | 568 |
|       | 2700 | 53 | 106 | 7.8  | 5.5  | 13.5 | 581 |
|       | 2600 | 49 | 100 | 7.3  | 5.9  | 13.7 | 588 |
|       | 2500 | 46 | 94  | 6.9  | 6.2  | 13.5 | 580 |
|       | 2400 | 43 | 78  | 6.6  | 6.5  | 11.8 | 507 |
| 7500  | 3100 | 71 | 125 | 10.1 | 4.3  | 12.4 | 532 |
|       | 3000 | 65 | 120 | 9.3  | 4.6  | 12.9 | 554 |
|       | 2900 | 60 | 115 | 8.6  | 5.0  | 13.3 | 572 |
|       | 2800 | 55 | 110 | 8.1  | 5.3  | 13.6 | 585 |
|       | 2700 | 51 | 104 | 7.6  | 5.7  | 13.8 | 582 |
|       | 2600 | 48 | 97  | 7.2  | 6.0  | 13.6 | 585 |
|       | 2500 | 45 | 82  | 6.8  | 6.3  | 12.0 | 516 |
|       |      |    |     |      |      |      |     |
| 10000 | 3200 | 72 | 129 | 10.2 | 4.2  | 12.9 | 541 |
|       | 3100 | 67 | 124 | 9.5  | 4.5  | 13.0 | 559 |
|       | 3000 | 61 | 119 | 8.8  | 4.9  | 13.4 | 578 |
|       | 2900 | 57 | 114 | 8.3  | 5.2  | 13.7 | 590 |
|       | 2800 | 53 | 108 | 7.8  | 5.5  | 13.9 | 596 |
|       | 2700 | 49 | 101 | 7.4  | 5.8  | 13.7 | 588 |
|       | 2600 | 47 | 86  | 7.1  | 6.1  | 12.1 | 521 |
|       | 2500 | 45 | 72  | 6.8  | 6.3  | 10.5 | 451 |
| 12500 | 3100 | 63 | 123 | 9.0  | 4.8  | 13.6 | 584 |
|       | 3000 | 58 | 117 | 8.5  | 5.1  | 13.8 | 595 |
|       | 2900 | 54 | 111 | 8.0  | 5.4  | 13.9 | 600 |
|       | 2800 | 51 | 104 | 7.6  | 5.7  | 13.7 | 591 |
|       | 2700 | 49 | 88  | 7.3  | 5.9  | 12.1 | 521 |
|       | 2600 | 47 | 74  | 7.1  | 6.1  | 10.5 | 454 |

Figure 26. Skiplane Cruise Performance



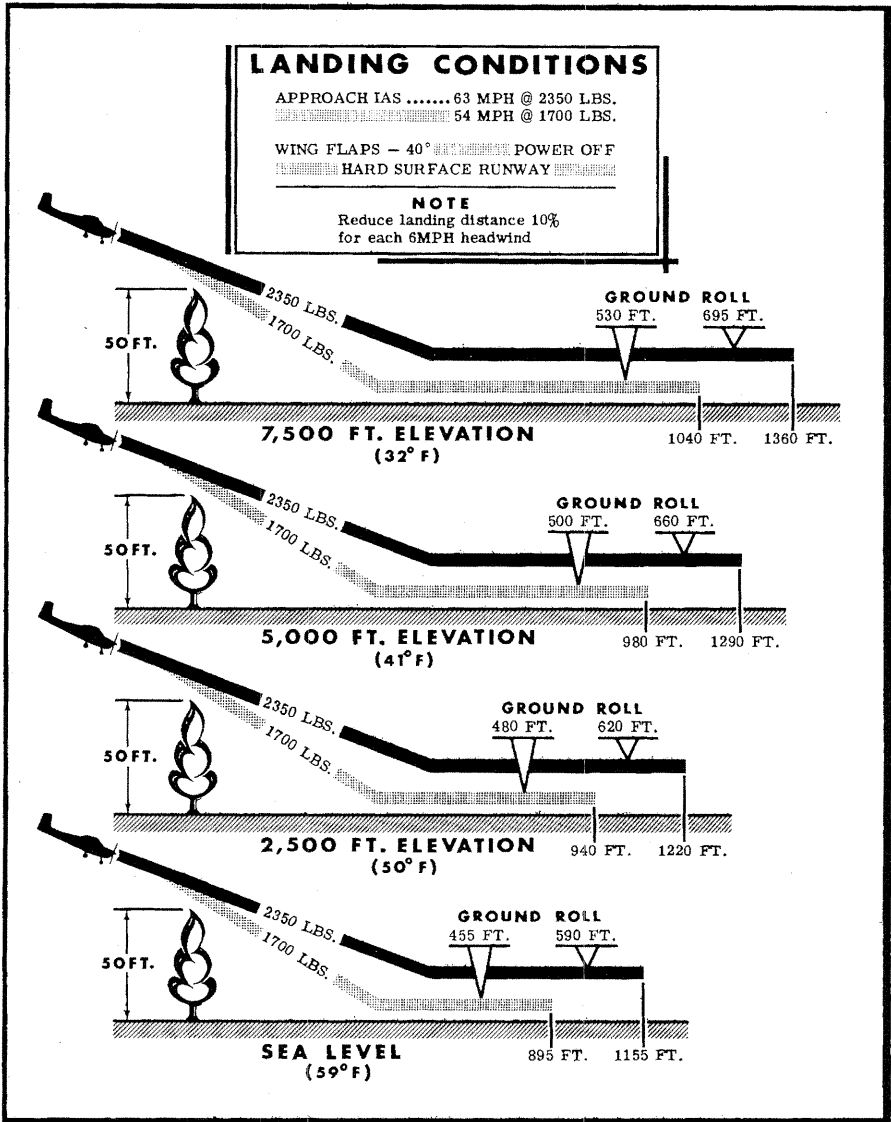


Figure 27. Landing Diagram

OPERATIONAL DATA

*Notes*

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