

INDUCTION HOT AIR KNOB.

The induction hot air knob is used to select either filtered cold air from the induction air scoop or heated air from the accessory compartment. In the unlikely event that ice should form in the induction system, as evidenced by an unexplained drop in manifold pressure, pull the induction hot air knob full out. Do not use an intermediate position.

IGNITION-STARTER SWITCH.

A five-position ignition-starter switch controls the dual magneto ignition and starter systems. The

switch positions are labeled clockwise as follows: "OFF," "R," "L," "BOTH" and "START."

The engine should be operated on both magnetos ("BOTH" position). The "R" and "L" positions are for checking purposes only. When the switch is turned to the spring-loaded "START" position, the starter turns over the engine for starting. As the switch is released, it automatically returns to "BOTH."

Refer to Sections II and III for further discussion on the use of the ignition-starter switch.

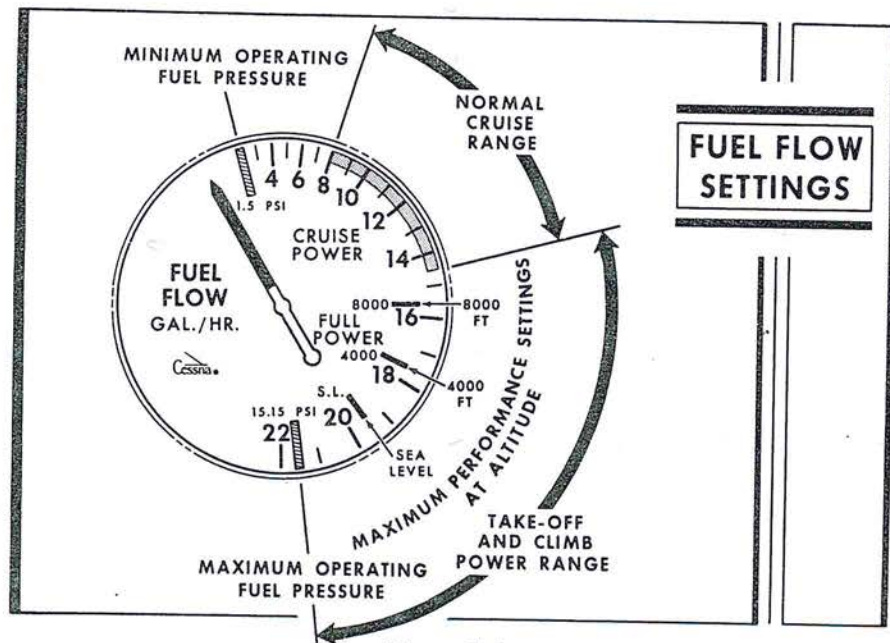


Figure 1-1.

ENGINE INSTRUMENTS.**FUEL FLOW INDICATOR.**

The fuel flow indicator used with the Continental fuel injection system is a fuel pressure gage calibrated to indicate the approximate gallons per hour of fuel being metered to the engine.

The indicator dial is marked with red radials at the minimum and maximum allowable operating fuel pressures. The low flow range of the indicator has a green arc for normal cruise fuel flows while the high flow portion has white radial lines for take-off and climb settings for full power at various altitudes. The full power markings represent maximum performance mixtures for the altitudes shown, making it practical to lean the mixture on a high altitude take-off and during full power climbs for maximum power and performance.

In the cruise power range the green arc covers the normal lean fuel flow required from 45 to 75% power. Your Cessna Power Computer or the cruise performance tables on pages 7-4 thru 7-8 show the normal lean fuel flow for cruising power settings.

NOTE

Best power mixture can be obtained for any power setting shown on your Cessna Power Computer by adding 1 GPH to the normal lean fuel flow on the computer.

Cruising climbs (page 3-5) should

be conducted at approximately 15 GPH up to 7000 feet and at 1 GPH more than the normal lean fuel flow shown on the Power Computer at higher altitudes and lower powers.

COWL FLAPS.

Cowl flaps, adjusted to the need, will meter enough air for the adequate cooling and maximum efficiency of the engine under varying conditions. Opening the cowl flaps, while on the ground, steps up the volume of air necessary for engine cooling. In flight, closing the cowl flaps, as required, restricts the flow of air through the engine compartment, thereby reducing the cooling and cowl flap drag to a minimum.

The cowl flaps are controlled by a lever on the control pedestal. Nine positions, including full open and full closed, are provided by means of locking holes in the lever mechanism. To change the cowl flap settings, move the lever to the left, out of the locking hole, then reposition. Make sure the lever moves into the locking hole at the new setting.

FUEL SYSTEM.

Fuel is supplied to the engine from two tanks, one in each wing (refer to figure 1-3). From each tank, fuel flows by gravity through a fuel reservoir tank to the fuel selector valve. Depending upon the setting of the selector valve, fuel from the left or right tank flows through a fuel strainer and check valve to the engine-driven fuel pump, by-passing

FUEL QUANTITY DATA (U.S. GALLONS)				
SELECTOR VALVE POSITION	USABLE FUEL (ALL FLIGHT CONDITIONS)	USABLE FUEL (LEVEL FLIGHT ONLY)	USABLE FUEL (CLIMBING-DESCENDING)	TOTAL VOLUME
STANDARD TANKS				
LEFT TANK	31.7	31.9	32.4	32.5
RIGHT TANK	31.7	31.9	32.4	32.5
LONG RANGE TANKS (OPTIONAL)				
LEFT TANK	40.0	41.0	41.9	42.0
RIGHT TANK	40.0	41.0	41.9	42.0

DECREASE IN USABLE FUEL IN ALL FLIGHT CONDITIONS IS DUE TO DETRIMENTAL EFFECTS OF UNCOORDINATED FLIGHT (SLIPS OR SKIDS) OR TURBULENT AIR THAT MAY BE ENCOUNTERED IN NORMAL FLYING CONDITIONS.

Figure 1-2.

two electric fuel pumps when they are not operating. Pressurized fuel from the fuel pump then flows through a fuel unit to a distributor manifold which disperses the fuel to a fuel nozzle on each engine cylinder. Vapor and excess fuel from the engine-driven fuel pump and fuel unit are returned to the main tank being used by way of the selector valve and reservoir tank.

Refer to figure 1-2 for fuel quantity data. See the Servicing Diagram (figure 6-1) for a summary of fuel system servicing information.

FUEL SELECTOR VALVE.

The rotary-type fuel selector valve has three positions, labeled "BOTH OFF," "LEFT ON" and "RIGHT 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 ON" position provides fuel flow from the left tank to the engine. Similarly, the "RIGHT ON" position provides flow from the right tank to the engine. Both the fuel feed and vapor return lines for each tank go through the selector valve, so that fuel returns to the tank from which it is drawn. Fuel cannot be used from both tanks simultaneously.

NOTE

The fuel selector valve handle indicates the setting of the valve by its position above the dial. Take off and land with the handle turned to the fullest tank.

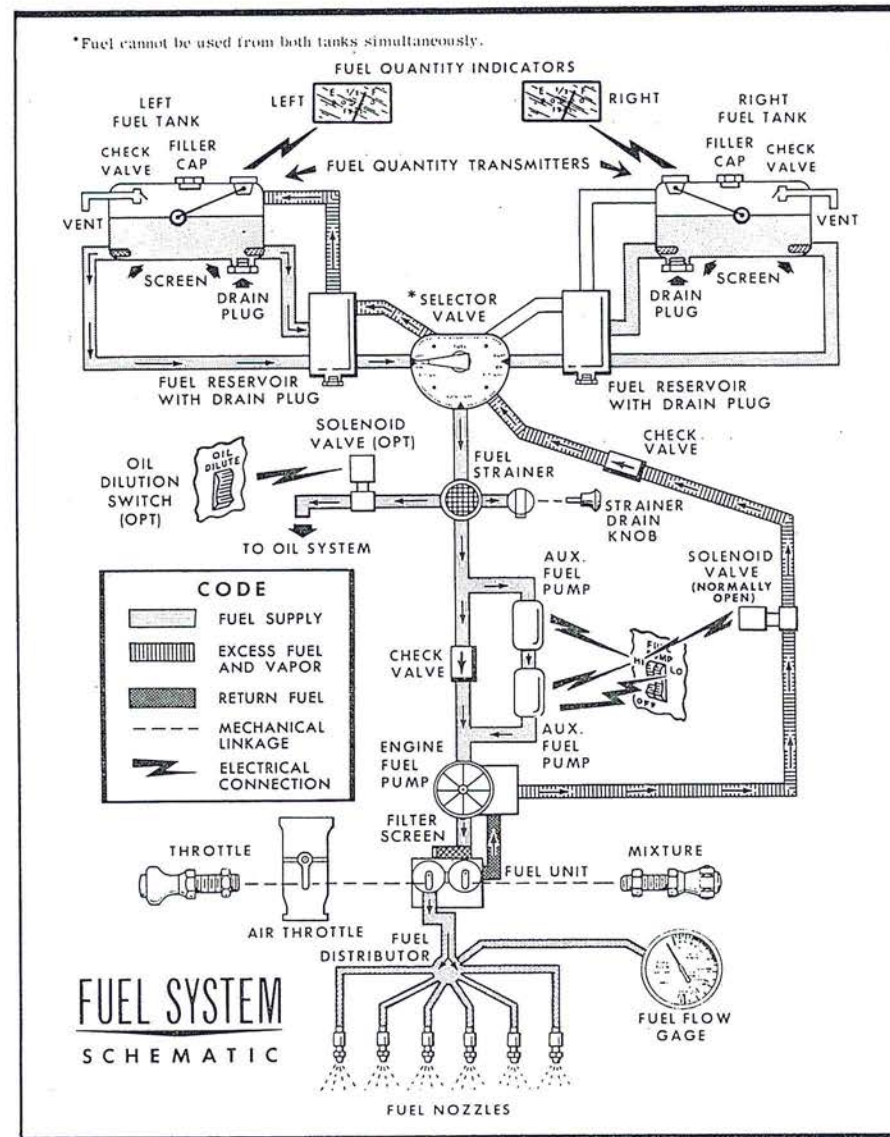


Figure 1-3.

AUXILIARY FUEL PUMP SWITCH.

The auxiliary fuel pump switch controls both of the electric auxiliary pumps which supply fuel flow for starting and for engine operation if the engine-driven pump should fail.

The switch is a split rocker type. The right half of the switch, labeled "LO," operates only one pump, providing sufficient fuel for priming and starting. The left half of the switch, labeled "HI," operates both pumps and closes the vapor return line, supplying sufficient fuel flow to maintain flight. This position is also used for vapor elimination.

The auxiliary system is not to be used during normal operation, because, with the engine-driven pump functioning, a fuel/air ratio considerably richer than best power is produced and any vapor in the system cannot be returned since the vapor return line is closed.

NOTE

If electric pumps are turned on with the engine stopped, intake manifolds will be flooded unless the mixture is in idle cut-off.

FUEL QUANTITY INDICATORS.

Two electrically-operated fuel quantity indicators are provided, each working in conjunction with an electric fuel level transmitter in its respective fuel tank. Turned on by the master switch, the indicators continue to function until the master switch is turned off.

FUEL STRAINER DRAIN KNOB.

The fuel strainer drain knob marked "STRAINER DRAIN" provides a quick, convenient method of draining water and sediment that may have collected in the fuel strainer. The strainer is located in the nose wheel well.

About two ounces of fuel (3 to 4 seconds of drain knob operation) should be drained from the strainer before the initial flight of the day to insure against the presence of water or sediment in the fuel.

The spring-loaded drain valve in the strainer is open when the fuel strainer drain knob is pulled out all the way. The drain valve automatically closes when the knob is released.

ELECTRICAL SYSTEM.

Electrical energy is supplied by a 12-volt, direct-current system powered by an engine-driven generator. The 12-volt storage battery is located on the upper right-hand forward portion of the firewall.

CIRCUIT BREAKERS.

All electrical circuits in the airplane, except the clock circuit, are protected by circuit breakers. The clock has a separate fuse mounted near the battery solenoid. The stall and gear warning, flap position indicator, turn-and-bank indicator and the optional gyro horizon test lights circuits are protected by a

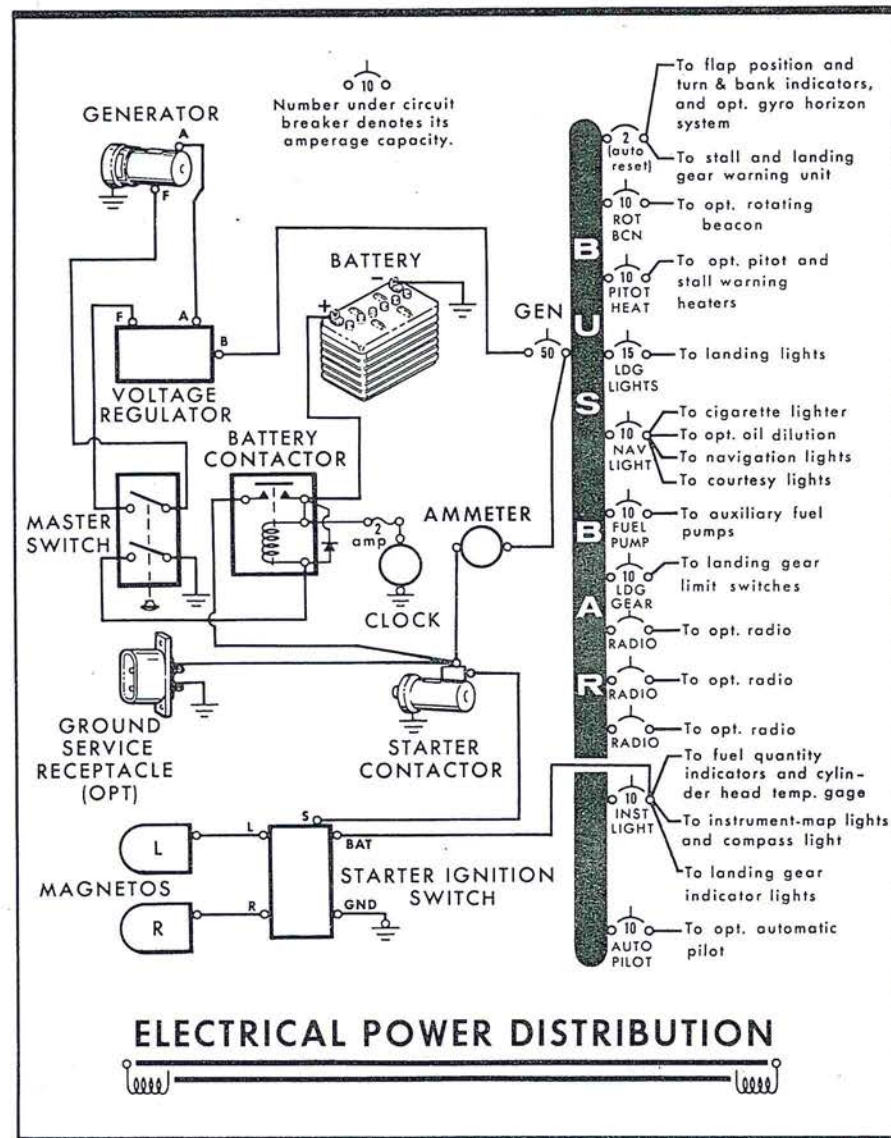


Figure 1-4.

Description

single automatically resetting circuit breaker mounted behind the instrument panel. The remaining circuits are protected by "push-to-reset" breakers on the instrument panel. These can be pulled out to isolate the circuit. The name of the circuit is shown above each breaker.

LANDING LIGHTS.

The landing lights switch is the split rocker type. To turn on one lamp for taxiing, push the right half of the switch "ON." To turn on both lamps for landing, push the left half of the switch "ON."

NAVIGATION LIGHTS.

The navigation light switch is the split rocker type. For flashing navigation lights, push the right half of the switch "ON." For steady navigation lights, push the left half of the switch "ON." To switch from steady to flashing, push the left half of the switch "OFF."

ROTATING BEACON.

The optional rotating beacon should not be used when flying through clouds or overcast; the moving beams reflected from water droplets or particles in the atmosphere, particularly at night, can produce vertigo and loss of orientation.

STALL WARNING INDICATOR.

The stall warning indicator is an electric horn controlled by a transmitter unit in the leading edge of the

left wing. This system is in operation whenever the master switch is turned on. The transmitter responds to changes in the airflow over the leading edge of the wing as a stall is approached. In straight-ahead and turning flight, the warning horn will sound 5 to 10 MPH ahead of the stall.

Under safe flight conditions, the only time you may hear the warning horn will be a short beep as you land.

WING FLAPS.

The wing flaps are operated hydraulically by the same system which operates the landing gear. The flaps are controlled by a lever on the control pedestal located below the center of the instrument panel. Flap deflection is shown by an electric indicator on the instrument panel. The flaps may be stopped in any desired position by releasing the flap control handle which is spring-loaded to return to its center (off) position.

NOTE

When mooring the airplane, do not use external locks between the flaps and ailerons, because accidental operation of the flaps could cause structural damage to both flaps and ailerons.

LANDING GEAR SYSTEM.

The retractable tricycle landing gear of your aircraft is essentially the familiar LAND-O-MATIC spring gear. It is extended and retracted

by hydraulic actuators, powered by an engine-driven hydraulic pump. The nose gear retracts forward and up and the main gear rotates aft and up, into wells under the fuselage.

Both the main and nose gear have positive mechanical up and down locks, operated by separate hydraulic actuators. The nose gear also has a hydraulic safety lock within its gear actuator. Limit switches control two position-indicator lights which show that the gear is either up or down and locked. The limit switches are connected in series, so that all three gears must be locked before either indicator light comes on. The indicator lights are the press-to-test type. The gear down indicator light (green) has two test positions; with the light pushed in approximately half-way (throttle pulled out) the gear warning horn should sound intermittently, and with the light pushed full in, the light should illuminate. The gear up indicator light (red) has only one test position; with the light pushed full in, it should illuminate. These tests assure proper operation of gear position indicator lights and warning horn. The indicator lights also contain dimming shutters for night operation. To dim the lights, turn the lens holder on the lights clockwise. For daytime operation, the lights should be full bright.

As an additional reminder that the landing gear is retracted, a warning horn sounds intermittently whenever the throttle is retarded with the gear up.

Description

Both the main and nose landing gear wheels are fully enclosed by doors. Except for the nose gear strut doors, which are linked mechanically to the strut, all the landing gear doors are operated by hydraulic actuators which open the doors to permit the gear to pass, then close once more, on both the extension and retraction cycles. The gear operating sequence, including opening and closing the doors, is completely automatic.

GEAR POSITION HANDLE.

The gear position handle has two neutral positions, slightly above center for gear-up and slightly below center for gear-down, which give a mechanical indication of the gear position. From either position, the handle must be pulled out to clear a detent before it can be repositioned; operation of the gear and doors will not begin until the handle has been repositioned. To reposition the gear, the handle is pulled out and moved to the desired position, then released. Pressure is created in the system by the engine-driven hydraulic pump and the gear is actuated to the selected position. A detent in the gear handle system holds the handle in the operating position until the cycle is completed, then the handle automatically returns to neutral and pressure in the system is relieved by a pump unloading valve. The valve continually recycles the fluid output of the pump, allowing no pressure build-up in the system, until the wing flap or landing gear handles are used to select a new

Description

flap or gear position.

IMPORTANT

The landing gear position handle should be returned to neutral manually if a malfunction occurs in the hydraulic system which prevents the gear position handle from returning to neutral after an extension or retraction cycle has been completed. Continuous operation with the handle out of neutral keeps the system pressurized and will eventually result in overheating and damage.

A safety switch, actuated by the nose gear strut, restricts the gear position handle to prevent inadvertent retraction, whenever the nose gear strut is compressed by the weight of the airplane.

During a normal cycle the gear locks up or down and the position indicator light comes on. When the light illuminates, hydraulic pressure is switched from the gear actuators to the door actuators to close the gear doors. When the doors are closed the gear handle returns to neutral and the cycle is complete. The normal time interval between the indicator lighting and the handle returning to neutral is 2-3 seconds. If the position indicator light does not light the gear doors will not close and hydraulic pressure will be maintained on the landing gear actuators.

EMERGENCY HAND PUMP.

For emergency use if the hydraulic

system fails, the hydraulic control unit contains a manual pump which may be used to extend the gear and operate the flaps. The system fluid reservoir is arranged to retain sufficient fluid to extend the gear and flaps with the hand pump if a failure between the engine-driven pump and the reservoir results in fluid loss. See Section IV for emergency operation of the hand pump.

STEERING.

The nose wheel of your Cessna is steerable through the rudder pedals in an arc of 15°, after which it becomes free-swiveling up to 30°, on each side of center.

The steering linkage is arranged to straighten the nose wheel as the gear retracts, even though some rudder is being carried. You need not neutralize the rudder to retract the gear.

CABIN HEATING AND VENTILATING SYSTEM.

Fresh air for heating and ventilating the cabin is supplied by a manifold cabin heater and two ventilating air scoops, one on each side of the fuselage just forward of the cabin door.

The temperature and amount of air entering the cabin is controlled by three knobs on the instrument panel. The "CABIN HEAT" knob operates a heat inlet valve at the firewall to regulate the amount of heat entering the cabin from the manifold heater.

The "CABIN AIR" knob operates the air scoop on the left side of the fuselage to regulate the amount of fresh air entering the cabin. Fresh air from this air scoop is used in conjunction with heat from the manifold heater for mixing the correct amount of heat and airflow into the cabin. The "AUX. CABIN AIR" knob operates the air scoop on the right side of the fuselage providing additional outside air for summer ventilation. All three control knobs are the double-button type having friction locks to permit intermediate settings. To operate the control knobs, squeeze the buttons, releasing the locks; then adjust the knobs.

For cabin ventilation, pull the "CABIN AIR" knob out. To raise the air temperature, pull the "CABIN HEAT" knob out approximately 1/2" for a small amount of heat. Additional heat is available by pulling the "CABIN HEAT" knob out farther; maximum heat is available with the "CABIN HEAT" knob pulled full out and the "CABIN AIR" knob pushed full in. The temperature and amount of flow into the cabin can be regulated to any degree desired by manipulation of these two controls in relation to each other. When additional ventilating air is desired, pull the "AUX. CABIN AIR" knob out.

A rotary type control knob, labeled "DEFROST" regulates the airflow for windshield defrosting. With the control knob rotated full counterclockwise, the flow of defrosting air is shut off; rotation of the knob clockwise permits air flow to the wind-

Description

shield, the amount depending upon the degree of rotation toward full open. The temperature of defrosting air is dependent upon the setting of the "CABIN AIR" and "CABIN HEAT" knob.

VENTILATORS.

Two ventilators, one in each upper corner of the windshield, are provided to supply additional ventilating air for the pilot and front seat passenger. To operate, pull the ventilator out and rotate to the desired position. Two additional ball and socket ventilators are installed in the ceiling of the rear cabin area, for ventilation to the rear seat passengers. To regulate the flow of air, turn the knurled ring on the rim of the ventilator.

BRAKES.

Single-disc type brakes on the main wheels are operated by conventional toe brakes on the rudder pedals. The brakes may be set for parking by turning the parking brake handle counterclockwise 1/4 turn (handle pointing downward) while pulling it out using moderate pressure.

NOTE

Toe pressure may be applied to the rudder pedals to aid in setting the brakes if desired; however, this operation is not necessary.

To release the parking brake, turn the handle clockwise 1/4 turn, and return it to its stowed position.