1962

Cessna 210B

OWNER'S MANUAL

performance - specifications

MODEL 310

GROSS WEIGHT . . . . . 3000 lbs
SPEED, BEST POWER MIXTURE:
  Top Speed at Sea Level . . . . . 196 mph
  Cruise, 75% Power at 7000 ft. . . . . 189 mph
RANGE, NORMAL LEAN MIXTURE:
  Cruise, 75% Power at 7000 ft. . . . . 845 mi
  63.5 Gallons, No Reserve 4.5 hrs
  186 mph
  Cruise, 75% Power at 7000 ft. . . . . 1065 mi
  80 Gallons, No Reserve . . . . . 5.7 hrs
  186 mph
  Optimum Range at 10,000 ft. . . . . 1215 mi
  63.5 Gallons, No Reserve 8.0 hrs
  152 mph
  Optimum Range at 10,000 ft. . . . . 1530 mi
  80 Gallons, No Reserve . . . . . 10.0 hrs
  153 mph
RATE OF CLIMB AT SEA LEVEL . . . . . 1270 fpm
SERVICE CEILING . . . . . 20,100 ft
TAKE-OFF:
  Ground Run . . . . . 695 ft
  Total Distance Over 50-foot Obstacle. . . . . 1510 ft
LANDING:
  Landing Roll. . . . . 695 ft
  Total Distance Over 50-foot Obstacle. . . . . 1510 ft
EMPTY WEIGHT (Approximate) . . . . . 1990 lbs
BAGGAGE . . . . . 180 lbs
WING LOADING: Pounds/Sq Foot . . . . . 17.1 lbs
POWER LOADING: Pounds/HP . . . . . 11.5 lbs
FUEL CAPACITY: Total
  Standard Tanks . . . . . 63 gal
  Optional Long Range Tanks . . . . . 84 gal
OIL CAPACITY: Total . . . . . 12 qts
PROPELLER: Constant Speed, Dia . . . . . 82 in
POWER:
  Continental Fuel Injection Engine . . . . . 311 hp
  260 rated HP at 2625 RPM

D-1311-13 UNIT 2000 10-11-61

Congratulations . . . . . .

Welcome to the ranks of Cessna owners! Your Cessna has been designed and constructed to give you the most in performance, economy, and comfort. You will find flying it, either for business or pleasure, a pleasant and profitable experience.

This Owner's Manual has been prepared as a guide to help you get the most pleasure and utility from your airplane. It contains information about your Cessna's equipment, operating procedures, and performance; and suggestions for its servicing and care. We urge you to read it from cover to cover, and to refer to it frequently.

Our interest in your flying pleasure has not ceased with your purchase of a Cessna. World-wide, the Cessna Dealer Organization backed by the Cessna Service Department stands ready to serve you. The following services are offered only by your Cessna Dealer:

FACTORY TRAINED MECHANICS to provide you with courteous expert service.

FACTORY APPROVED SERVICE EQUIPMENT to provide you with the most efficient and accurate workmanship possible.

A STOCK OF GENUINE CESSNA SERVICE PARTS on hand when you need them.

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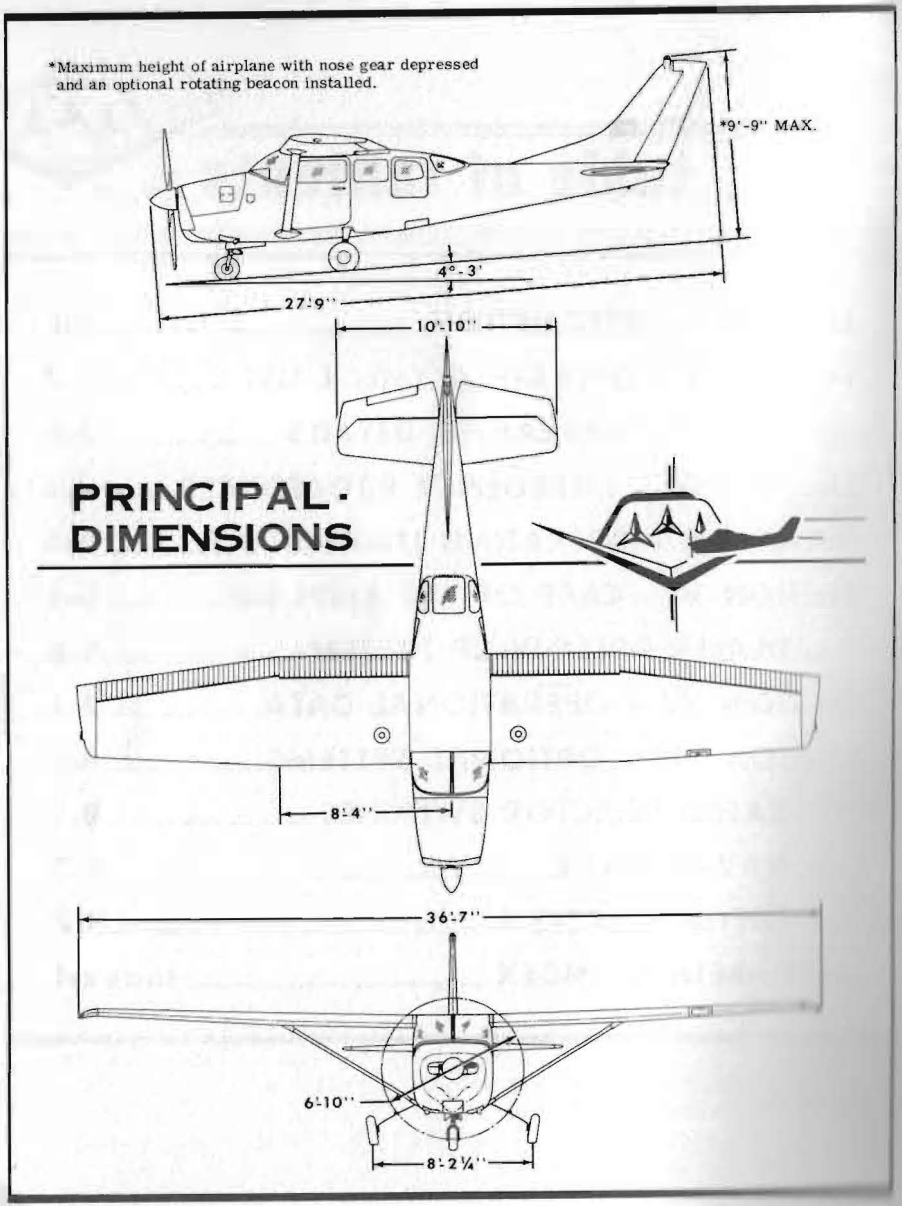


Section I
description

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 can best be done by reviewing this equipment while sitting in the airplane. Those items whose function and operation are not obvious are covered herein.

ENGINE CONTROLS.

THROTTLE, MIXTURE AND PROPELLER CONTROLS.

The push-pull throttle incorporates a lock button to secure it in any desired setting. To operate the throttle, depress the lock button, then adjust the control knob as necessary. Release pressure on the lock button to lock the control. To make minor adjustments simply screw the control in or out without pressing the button.

The push-pull mixture control incorporates a lock button to prevent inadvertent leaning or shutting off the fuel supply. To operate the control, depress the lock button, then push the knob in for rich mixture or pull it out for lean mixture. Pulling the knob all the way out is idle cutoff for stopping the engine. Release pressure on the lock button to lock the control. To make minor adjustments simply screw the control in or out without pressing the button.

The propeller control is the push-pull type and changes the setting of the propeller governor to regulate engine speed. It is identical, in operation, to the mixture control. Pushing the knob forward increases RPM; pulling the knob out decreases RPM.

For all ground operations, and for take-off, the propeller control should be full in (high RPM). After take-off, reduce throttle first, then reduce RPM. Since a small control movement will produce a considerable RPM change, you should set up climb and cruise RPM by screwing the knob in or out.

Propeller surging (RPM variation up and down several times before engine smooths out and becomes steady) can be prevented by smooth throttle and propeller control knob operation. Do not change the throttle and propeller control settings with jerky and rapid motions.

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 right exhaust manifold. 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.

The combination starter and ignition switch is key-operated. When the key is turned to the extreme clockwise "START-PUSH" position, the right magneto is inoperative and a series of high-voltage, retarded sparks are furnished for starting by a starting vibrator used in conjunction with the left magneto. Pushing in on the key, while holding it in the extreme clockwise position, engages the starter. When the key is released from the "START-PUSH" position, it automatically returns to "BOTH." Refer to page 3-9 for discussion of the use of the ignition-starter switch during hand-cranking.

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

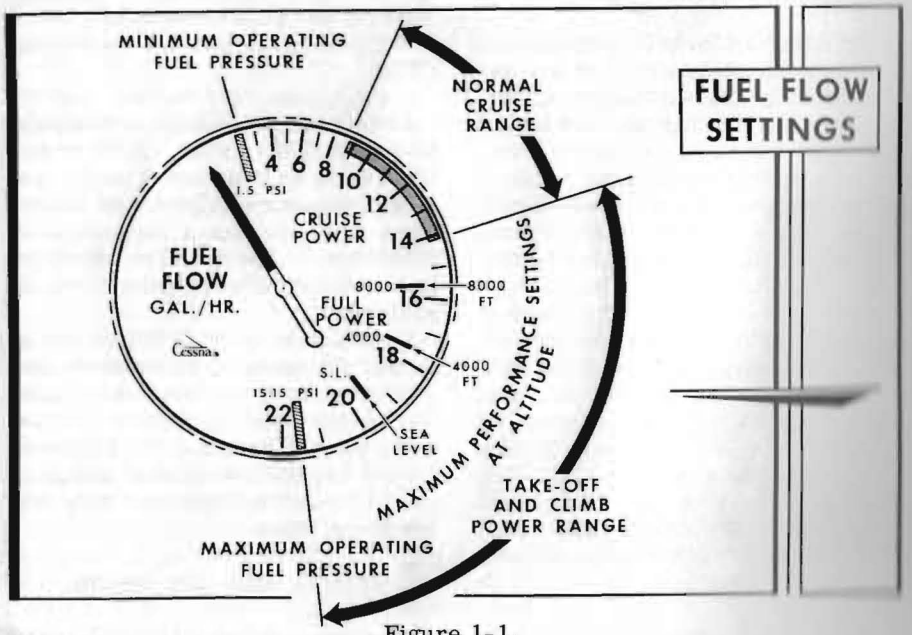


Figure 1-1.

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 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

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.

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.

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,

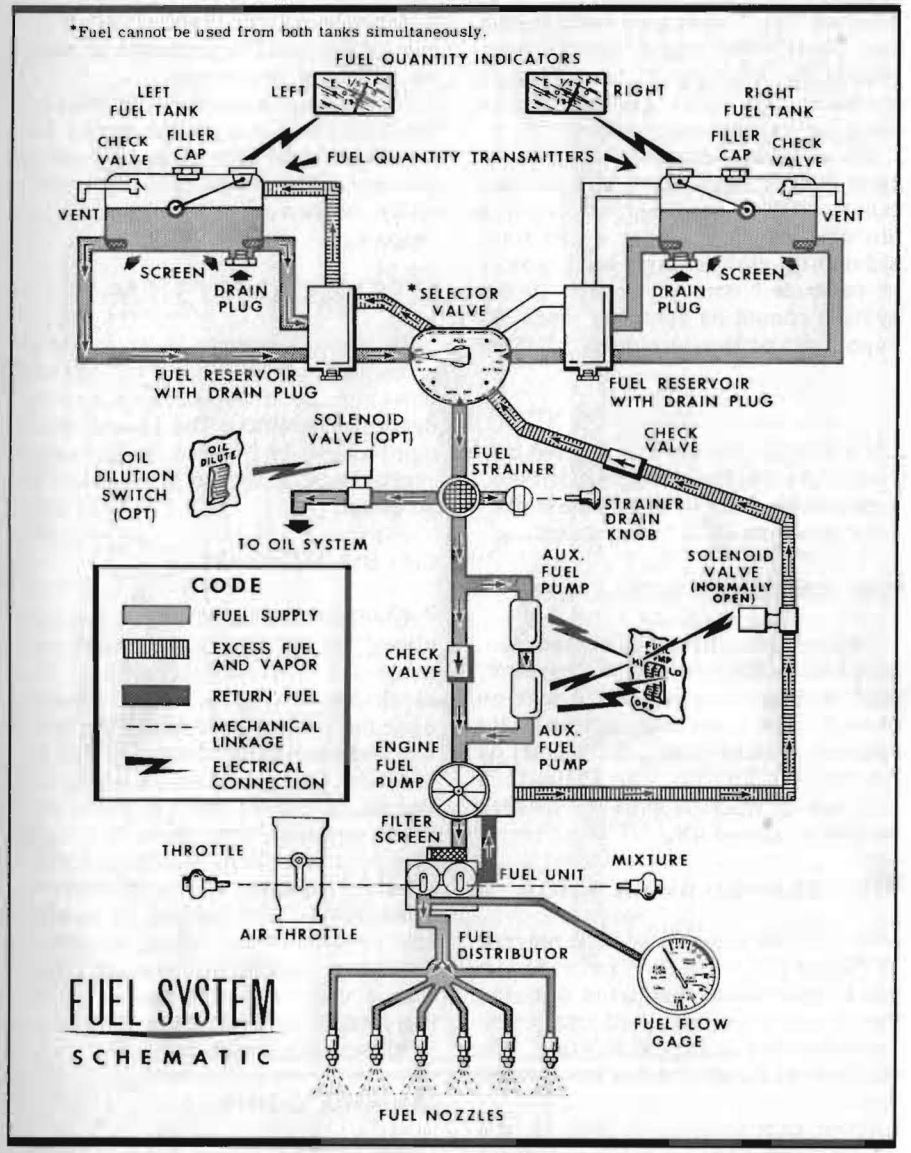


Figure 1-3.

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.

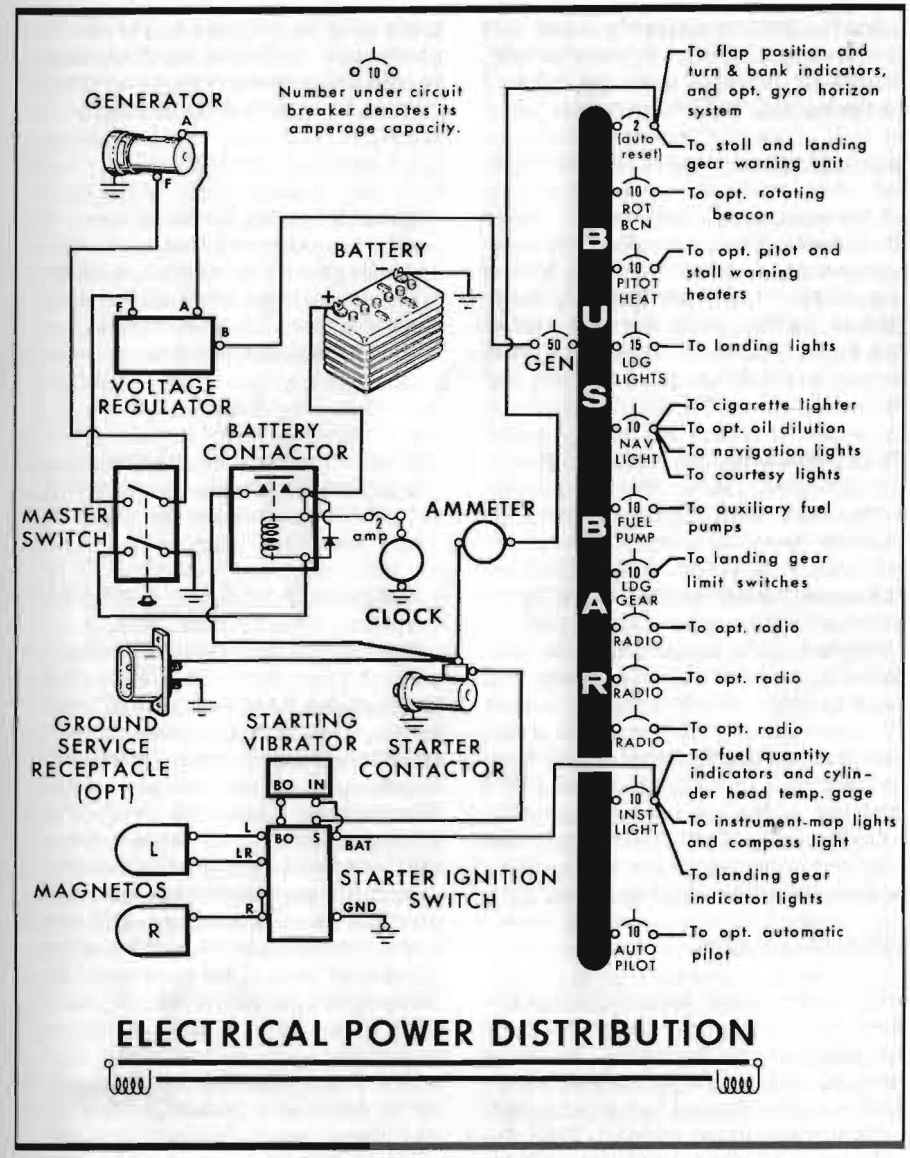
Electrical energy is supplied by a 12-volt, direct-current system powered by a 50-ampere engine-driven generator. The 12-volt storage battery is located on the upper right-hand forward portion of the firewall.

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 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



ELECTRICAL POWER DISTRIBUTION

Figure 1-4.

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."

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.

NOTE

Check to see that the baggage door is closed before operating the wing flaps. Also, retract the flaps before opening baggage door.

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.

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 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 two knobs on the instrument panel. The "CABIN AIR" knob operates the air scoop on each side of the fuselage and controls cool fresh air entering the manifold on the firewall. The "CABIN HEAT" knob regulates the amount of heat entering the cabin. Both control knobs are the double-button type having friction locks to permit intermediate settings. To operate either of the controls, squeeze the buttons, releasing the lock; then adjust the knob.

For cabin ventilation, pull the "CABIN AIR" knob out. To raise the air temperature, pull the "CABIN HEAT" knob out approximately 1/4" to 1/2" for a small amount of cabin heat. Additional heat is available by pulling the knob out farther; maximum heat is available with the "CABIN HEAT" knob pulled full out and the "CABIN AIR" knob pushed full in. When no heat is desired in the cabin, the "CABIN HEAT" knob is pushed full in.

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

Two ventilators, one in each upper corner of the windshield, are provided to supply additional ventilating air. To operate, pull the ventilator out and rotate to the desired position. Two additional ball and socket ventilators are installed just forward of each rear door post in the ceiling, for rear seat passengers. To regulate the air, turn the knurled ring on the rim of the ventilator.

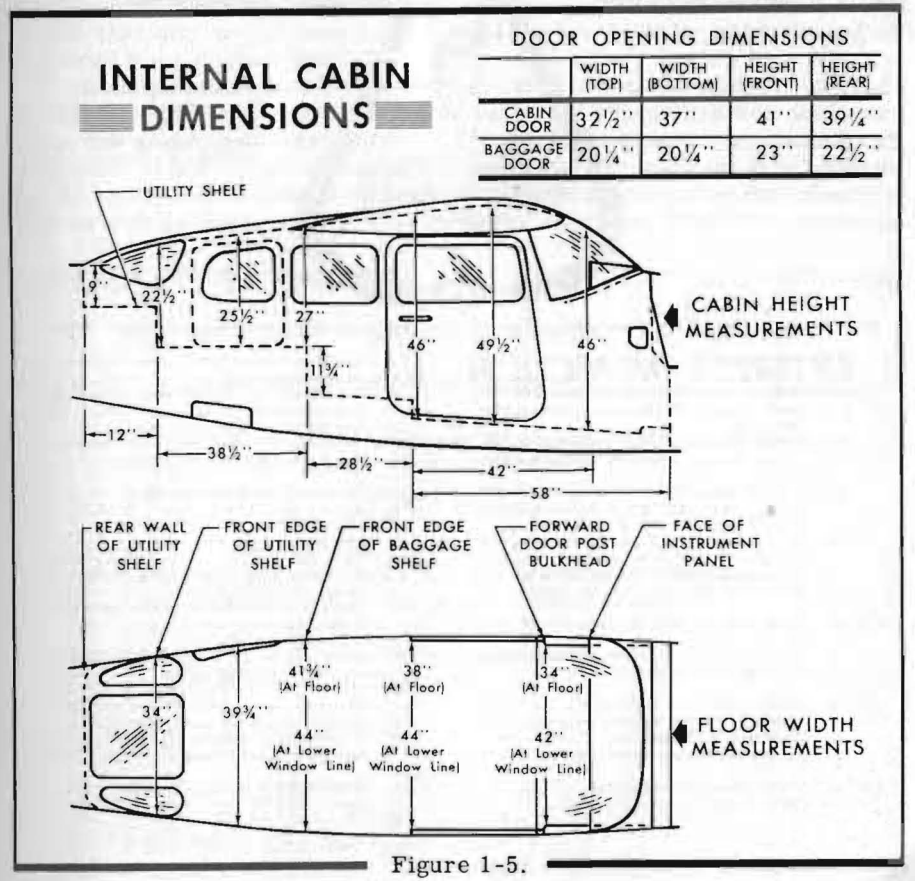
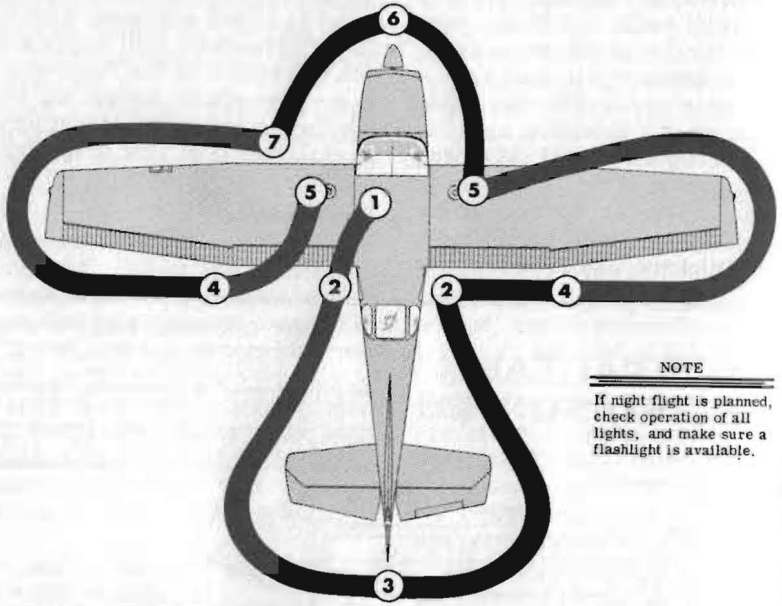


Figure 1-5.



NOTE

If night flight is planned, check operation of all lights, and make sure a flashlight is available.

EXTERIOR INSPECTION

(1) a. Turn on master switch and check fuel quantity indicators.
b. With master switch "ON," check operation of stall warning transmitter tab and warning horn.
c. Turn off master switch, check ignition switch "OFF," and check that fuel tank selector valve handle is on fullest tank.
d. On first flight of day, pull out strainer drain knob for about four seconds, to clear fuel strainer of possible water and sediment.
e. Remove control wheel lock, if installed.

(2) a. Check baggage door for security (left side only).
b. Inspect airspeed static source holes on sides of fuselage for stoppage.

(3) a. Remove gust locks, if installed.
b. Inspect tail surface hinges and hinge bolts.
c. Check trim tab for security.
d. Disconnect tie-down rope or chain.

(4) a. Check aileron and flap hinges.
b. Check navigation light for damage.

(5) a. Check main wheel tire for cuts, bruises and proper inflation.
b. Remove fuel tank cap and check fuel level for agreement with gage reading. Secure cap.
c. Disconnect tie-down rope or chain.
d. Check fuel tank vent opening for stoppage.
e. Check courtesy light for damage.

(6) a. Check windshield for cleanliness.
b. Check propeller and spinner for nicks and security.
c. Examine propeller for oil leaks.
d. Make visual check to insure that fuel strainer drain valve is closed after draining operation.
e. Check nose wheel strut for proper inflation.
f. Check nose wheel tire for cuts, bruises and proper inflation.
g. Disconnect tie-down rope.
h. Check induction air filter for restrictions by dust or other foreign matter.
i. Check oil level. Do not operate with less than nine quarts. Fill for extended flight.
j. Inspect cowl access doors for security.
k. Inspect radio ventilation air intake scoop on side of fuselage for stoppage (left side only).

(7) a. Remove pitot tube cover, if installed.
b. Inspect pitot tube opening for stoppage.

Figure 2-1.

Section II

operating check list

This section lists, in Pilot's Check List form, the steps necessary to operate your airplane 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 information you need for a typical flight.

The flight and operational characteristics of your airplane 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. All airspeeds mentioned in Sections II, III and IV are indicated airspeeds. Corresponding true indicated airspeeds may be obtained from the Airspeed Correction Table in Section VII.

BEFORE ENTERING THE AIRPLANE.

(1) Make an exterior inspection in accordance with figure 2-1.

BEFORE STARTING THE ENGINE.

(1) Pilot's Check List -- Review check list on left front doorpost.
(2) Seats and Seat Belts -- Adjust and lock.
(3) Flight Controls -- Check.
(4) Brakes -- Test and set.
(5) Master Switch -- On.
(6) Landing Gear -- Handle neutral and down light green.
(7) Landing Gear Lights and Horn -- Push to test.
(8) Cowl Flaps -- "OPEN."
(9) Elevator and Rudder Trim -- Set.
(10) Fuel Selector -- Fullest tank.

STARTING ENGINE.

(1) Mixture -- Rich.
(2) Propeller -- High RPM.
(3) Throttle -- Cracked (one inch).
(4) Auxiliary Fuel Pump Switch -- On "LO."

(5) Ignition Switch -- "START-PUSH" (when fuel flow is steady at 2 to 4 gal/hr). Hold until engine fires, but not longer than 30 seconds.
(6) Ignition Switch -- Release to "BOTH" (when engine fires).
(7) Auxiliary Fuel Pump Switch -- "OFF" (after engine starts).

HOT ENGINE STARTING PROCEDURE.

With vapor in the fuel system, the auxiliary fuel pumps on "LO" or "HI" will run with a deep growling or rattling sound until the vapor is purged. Under these conditions, start the engine as follows:

(1) Mixture -- Idle cut-off.
(2) Throttle -- Closed.
(3) Master Switch -- On.
(4) Auxiliary Fuel Pump Switch -- "HI" (until vapor is purged).
(5) Throttle -- Cracked (one inch).
(6) Ignition Switch -- "START-PUSH" to engage starter.
(7) Mixture -- Push to full rich.
(8) Ignition Switch -- Release to "BOTH" (when engine fires).

NOTE

The engine should start in 3 to 4 revolutions. If it does not, the mixture should be moved toward idle cut-off to lean out the fuel mixture in the cylinders. Again the engine should start in 5 to 7 additional revolutions; if it does not, stop cranking and start again from step (1) after a brief rest (approximately 30 seconds).

(9) Mixture -- Adjust (smoothly) between full rich and idle cut-off to obtain a fuel-air mixture that will accelerate engine to 1000 - 1200 RPM.
(10) Auxiliary Fuel Pump Switch -- "LO" after engine starts.
(11) Throttle -- Idle the engine 800 - 1000 RPM on "LO" and full rich mixture until there is no sign of vapor.

NOTE

Under severe vapor conditions it may take 2 to 5 minutes to purge the vapor from the system. If the auxiliary pump is not on, the engine RPM may slowly start to drop off as the fuel flow fluctuates with vapor; opening the throttle slightly and turning the auxiliary fuel pump on will stabilize engine operation.

BEFORE TAKE-OFF.

(1) Induction Air -- Cold.

(2) Throttle Setting -- 1700 RPM.
(3) Engine Instruments -- Within green arc.
(4) Ammeter -- Check
(5) Magnetos -- Check (125 RPM maximum drop).
(6) Propeller -- Check.
(7) Flight Controls -- Recheck.
(8) Wing Flaps -- 0° to 20°.
(9) Cowl Flaps -- Full "OPEN."
(10) Elevator and Rudder Trim -- Take-off setting.
(11) Cabin Doors -- Closed and locked.
(12) Flight Instruments and Radios -- Set.

TAKE-OFF.

NORMAL TAKE-OFF.

(1) Power -- Full throttle.
(2) Elevator Control -- Lift nosewheel at 60 MPH.
(3) Brakes -- Apply momentarily (when airborne).
(4) Landing Gear -- Retract (in climb-out).
(5) Wing Flaps -- Retract (if extended).

MAXIMUM PERFORMANCE TAKE-OFF.

(1) Wing Flaps -- 20°.
(2) Brakes -- Apply.
(3) Power -- Full throttle and 2625 RPM.
(4) Mixture -- Lean for field elevation.
(5) Brakes -- Release.
(6) Elevator Control -- Maintain slightly tail-low attitude.
(7) Climb Speed -- 64 MPH.
(8) Landing Gear and Flaps -- Retract after obstacles are cleared.

CLIMB.

NORMAL CLIMB.

(1) Air Speed -- 120 to 140 MPH.
(2) Power -- 24 inches and 2450 RPM.
(3) Mixture -- Lean for altitude as necessary.
(4) Cowl Flaps -- 1/2 to full "OPEN," as required.

MAXIMUM PERFORMANCE CLIMB.

(1) Air Speed -- 105 MPH (sea level) to 97 MPH (10, 000 feet).
(2) Power -- Full throttle and 2625 RPM.
(3) Mixture -- Lean for altitude.
(4) Cowl Flaps -- Full "OPEN."

CRUISING.

(1) Power -- 15-24 inches of manifold pressure and 2200-2450 RPM.
(2) Cowl Flaps -- Adjust to maintain normal cylinder head temperature.
(3) Elevator and Rudder Trim -- Adjust.
(4) Mixture -- Lean for cruise fuel flow as determined from your Cessna Power Computer or from the tables on pages 7-4 thru 7-8.

LET-DOWN.

(1) Mixture -- Rich.
(2) Power -- As desired.

BEFORE LANDING.

(1) Fuel Selector -- Fullest tank.
(2) Landing Gear Lever -- "DOWN" (below 160 MPH).
(3) Landing Gear Light -- Green.
(4) Flaps -- Down 10° (below 160 MPH).
(5) Mixture -- Rich.
(6) Airspeed -- 85-95 MPH (flaps retracted).
(7) Propeller -- High RPM.
(8) Flaps -- Down 10° - 40° (below 110 MPH).
(9) Airspeed -- 75 - 85 MPH (flaps extended).
(10) Elevator and Rudder Trim -- Adjust.

NORMAL LANDING.

(1) Touch Down -- Main wheels first.
(2) Landing Roll -- Lower nosewheel gently.
(3) Braking -- Minimum required.

AFTER LANDING.

(1) Cowl Flaps -- "OPEN."
(2) Wing Flaps -- Retract.
(3) Mixture -- Idle cut-off.
(4) Ignition Switch -- "OFF."
(5) Master Switch -- Off.
(6) Brakes -- Set.

Section III
operating details

The following paragraphs cover in somewhat greater detail the items entered as a Check List in Section II. Not every item in the list is discussed here. Only those items of the Check List that require further explanation will be found in this section.

PREFLIGHT CHECK.

The exterior inspection described in Section II is recommended for the first flight of the day. Inspection procedures for subsequent flights normally are limited to brief checks of the tail surface hinges, fuel and oil quantity, and security of fuel and oil filler caps. If the airplane has been subjected to long-term storage, recent major maintenance, or operation from marginal airports, a more extensive exterior inspection is recommended.

After major maintenance has been performed, the flight and trim controls should be double-checked for free and correct movement.

The security of all inspection plates on the airplane should be checked following periodic inspections. If the airplane has been waxed and polished, it is a good practice to check the external static pressure source holes for stoppage.

If the airplane has been exposed to much ground handling in a crowded hangar, it should be checked for dents and scratches on wings, fuselage, and tail surfaces, as well as damage to navigation and landing lights, and radio antennas. Outside storage for long periods may result in water and obstructions in the airspeed system lines, condensation in fuel tanks, and dust and dirt on the intake air filters and engine cooling fins.

If the airplane has been operated from muddy fields or in snow and slush, it is necessary to check the nosewheel and main gear wheel wells for obstructions and cleanliness. Operation from a gravel or cinder field will require extra attention to propeller tips and abrasion on leading edges of the horizontal tail. Stone damage to the outer six inches of the propeller tips can seriously reduce the fatigue life of the blades.

Airplanes that are operated from rough fields, especially at high altitudes, are subjected to abnormal landing gear abuse. A frequent check of all components of the landing gear retracting mechanisms, shock strut, tires, and brakes is important.

The interior inspection will vary according to the mission and the

optional equipment installed. Before high altitude flights, it is important to check the condition and quantity of oxygen face masks and hoses. The oxygen supply system should be functionally checked to insure that it is in working order. The oxygen pressure gage should indicate between 300 and 1800 psi, depending upon the anticipated requirements.

Satisfactory operation of the pitot tube and stall warning transmitter heating elements is determined by turning on the heater and cautiously feeling the heat of both devices.

If night flying is anticipated, all exterior and interior lights should be checked for proper illumination.

STARTING ENGINE.

Since each engine cylinder is fired by a single spark plug with starter engaged (refer to page 1-2), it is important to release the spring-loaded ignition and starter switch to the "BOTH" position immediately after the engine fires. This automatically provides dual ignition for better engine acceleration.

The starting system on this airplane requires a special procedure for hand-cranking the engine. Refer to page 3-9 for details.

The use of an external power source is recommended for starting in cold weather. Before connecting a generator type external power source it is important that the master switch be turned on. This will enable the battery to absorb transient voltages which otherwise might damage the transistors in the audio amplifier. When using a battery type cart the master switch should be turned off.

Unlike a carburetor, which supplies no fuel to the engine until an airflow has been induced by cranking, the continuous-flow fuel injection system will start spraying fuel in the intake ports as soon as the throttle and mixture controls are opened and the auxiliary pump is turned on. Thus, the fuel-injection engine needs no primer; at the same time, if the auxiliary pump is turned on accidentally while the engine is stopped, with the throttle open and the mixture rich, solid fuel will collect in the intake manifolds, the quantity depending on the amount of throttle opening and the length of time the pump has been operating. If this happens, it is advisable to wait a few minutes until this fuel drains away before starting the engine. To avoid flooding, be sure you are ready to crank the engine as soon as a steady fuel flow of 2 to 4 gal/hr is obtained.

In hot weather with a hot engine, a fluctuating fuel flow slightly lower than normal may be obtained. This is an indication of vaporized fuel and the starter should not be energized until a steady fuel flow is obtained by purging the system. To prevent flooding the engine while purging, set the mixture control in idle cut-off and close the throttle. Then turn the auxiliary fuel pump switch to "HI"; the auxiliary fuel pumps will run with a deep growling or rattling sound until the vapor is purged. After purging, open the throttle one inch, engage the starter and push the mixture control to full rich. After the engine starts, turn the auxiliary fuel pump switch to "LO." It may be necessary to readjust the mixture between full rich and idle cut-off for acceleration of the engine to 1000-1200 RPM. To assure complete elimination of vapor under severe conditions, idle the engine 800-1000 RPM with the auxiliary fuel pump switch on "LO" and with full rich mixture until there is no sign of vapor.

Engine mis-starts characterized by weak, intermittent explosions followed by puffs of black smoke from the exhausts are caused by over-priming or flooding. This situation is more apt to develop in hot weather, or when the engine is hot. If it occurs, repeat the starting routine with the throttle approximately 1/2-open, the mixture in idle cut-off and the auxiliary pump off. As the engine fires, move the mixture control to full rich and decrease the throttle to idle.

If the engine is under-primed, as may occur in cold weather with a cold engine, repeat the starting procedure with the auxiliary fuel pump switch on "HI" until the engine fires.

If prolonged cranking is necessary, allow the starter motor to cool at frequent intervals, since excessive heat may damage the armature.

TAXIING.

The induction hot air knob should be pushed full in during all ground operations unless heat is absolutely necessary for smooth engine operation. When the knob is pulled out to the heat position, air entering the engine is not filtered.

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 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 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 nosewheel 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 run-ups 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.

BEFORE TAKE-OFF.

Most of the warm up will have been conducted during taxi, and additional warm up before take-off should be restricted to the checks outlined in Section II. Since the engine is closely cowled for efficient in-flight cooling, precautions should be taken to avoid overheating on the ground. Full throttle checks on the ground are not recommended unless the pilot has good reason to suspect that the engine is not turning up properly.

If the ignition system check produces an engine speed drop greater than 125 RPM, the warm-up should be continued a minute or two longer prior to rechecking the system. If there is doubt concerning the operation of the ignition system, checks at higher engine speed may confirm the seriousness of the deficiency. A drop in excess of 125 RPM with more than 50 RPM differential between magnetos with a warm engine at 1700 RPM is considered excessive.

If instrument or night flights are contemplated, a careful check should be made of vacuum pump operation. A suction of 4.5 inches of mercury is desirable for gyro instruments. However, a range of 3.75 to 5.0 inches of mercury is considered acceptable. The condition of the generator is also important since satisfactory operation of all radio equipment and electrical instruments is essential to instrument flight. The condition of the generator is checked by noting that the ammeter is not showing a discharge with the engine speed above 1000 RPM.

A simple last-minute recheck of important items should include a glance to see that the mixture and propeller pitch knobs are full in, all flight controls have free and correct movement, and the fuel selector is on the fullest tank.

TAKE-OFF.

It is important to check full-throttle engine operation early in the take-off run. Any signs of rough engine operation or sluggish engine acceleration is good cause for discontinuing the take-off.

For maximum engine power, the mixture should be adjusted during the initial take-off roll to the fuel flow corresponding to the field elevation. The power increase is significant above 3000 feet and this procedure always should be employed for field elevations greater than 5000 feet above sea level.

Using 20° wing flaps reduces the ground run and total distance over the obstacle by approximately 10 per cent. Soft field take-offs are performed with 20° flaps by lifting the nosewheel off the ground as soon as practical and leaving the ground in a slightly tail-low attitude. However, the airplane should be leveled off immediately to accelerate to a safe climb speed of 70 MPH.

Take-offs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after take-off. The airplane is accelerated to a speed slightly higher than normal, then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

Landing gear retraction normally is started after reaching the point over the runway where a wheels-down, forced landing on that runway would become impractical. Since the landing gear swings downward approximately two feet as it starts the retraction cycle, damage can result by retracting it before obtaining at least that much ground clearance. In addition, the landing gear would extend slowly in the event of an engine failure during take-off, and might not be completely down while a wheels-down landing could still be made on the runway.

AFTER TAKE-OFF.

To set up the airplane in climb configuration, retract the landing gear, adjust power for climb, retract the wing flaps at a safe altitude and airspeed, and adjust the mixture for the power setting selected.

Power reduction will vary according to the requirements of the traffic pattern, surrounding terrain, gross weight, field elevation, temperature, and engine condition. However, a normal "after-take-off" power setting is 24 inches of manifold pressure and 2450 RPM.

Before retracting the landing gear, the brakes should be applied momentarily to stop wheel rotation. Centrifugal force caused by the rapidly-spinning wheel expands the diameter of the tire. If there is an accumulation of mud or ice in the wheel wells, the rotating wheel may rub as it is retracted into the wheel well.

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.

CLIMB.

A cruising climb at 24 inches of manifold pressure, 2450 RPM (approximately 75% power) and 120 to 140 MPH is recommended to save time and fuel for the overall trip. In addition, this type of climb provides better engine cooling, less engine wear, and more passenger comfort due to lower noise level.

The mixture should be leaned as necessary for the lower powers available at altitude.

If it is necessary to climb rapidly to clear mountains or reach favorable winds at high altitudes, the best rate-of-climb speed should be used

this airplane. Should an inadvertent spin occur, standard light plane recovery techniques should be employed.

LET-DOWN.

Let-downs should be initiated sufficiently before the destination is reached to permit a gradual rate of descent at cruising speed, using just enough power to hold engine temperature in the green arc range.

BEFORE LANDING.

In view of the relatively low drag of the extended landing gear and the high allowable gear down speed (160 MPH), the landing gear should be extended before entering the traffic pattern.

This practice will allow you more time to confirm that the landing gear is down and locked. As a further precaution, leave the landing gear extended in go-around procedures or traffic patterns for touch-and-go-landing.

Landing gear extension can be detected by a slight bump as the gear locks down, illumination of the gear down indicator light (green), absence of a gear warning horn with the throttle retarded below 12 inches of manifold pressure and visual inspection of the main gear position. Should the gear indicator light fail to illuminate, the light should be checked for a burned out bulb by pushing to test. A burned-out bulb can be replaced in flight with the bulb from the compass light or the landing gear up (red) indicator light.

LANDING.

Landings are simple and conventional in all respects. Either power-off or power-approach type landings can be executed with any flap setting. Although power-off approaches with full flaps are adequately steep, slips are permissible if necessary.

Approach speeds should be approximately 85 - 95 MPH with flaps up and 75 - 85 MPH with flaps extended.

The landing normally should be made on the main wheels with as little braking as practical during the landing roll.

COLD WEATHER OPERATION.

When very cold temperatures are anticipated, the oil should be diluted before stopping the engine if external pre-heat is not available. The starting procedure is normal, although starting can be expedited by switching the auxiliary fuel pumps to "HI" position for a few seconds.

The use of an external pre-heater and an external power source is recommended whenever possible to reduce wear and abuse to the engine and the electrical system. In addition, pre-heat will thaw the oil trapped in the oil cooler, which probably will be congealed prior to starting in extremely cold temperatures. If external pre-heat is used, the warm-up should be held to a minimum to prevent recongealing the oil in the oil cooler.

In very cold weather, no oil temperature indication need be apparent before take-off. After a suitable warm-up period (2 to 5 minutes at

1000 RPM), the airplane is ready for take-off if it accelerates smoothly and the oil pressure is normal and steady.

During let-down, observe engine temperatures closely and carry sufficient power to maintain them in the recommended operating range.

For continuous operation in temperatures consistently below 20° F, the Cessna winterization kit, available from your Cessna Dealer, should be installed to improve engine operation.

HAND-CRANKING THE ENGINE.

When no external power is available, and the battery does not have sufficient power to turn the engine, the engine may be started by turning the propeller by hand. When hand-cranking, it is important to use the following procedure:

(1) Push master switch on momentarily, then check that battery power is sufficient to close the battery solenoid and manual starting is possible. This is evidenced by operation of the fuel quantity indicators. If battery power is insufficient to close the solenoid, hand starting is impossible since the starting vibrator requires battery power.

(2) Be sure to use wheel chocks if available, and test and set the brakes.

(3) Set controls and switches for a normal start, except leave the ignition switch "OFF".

(4) Pull propeller through at least two full revolutions to prime each cylinder (ignition switch still "OFF").

NOTE

With the auxiliary fuel pump operating, engine flooding is possible. Avoid prolonged use of the pump in the priming operation.

(5) With ignition switch held in the "START" position (do not push in as this will engage the starter), hand-crank the engine.

IMPORTANT

Do not hand-crank with the ignition switch on "BOTH", "L", or "R". In these positions, kick-back or reverse rotation may occur, since the magnetos do not have impulse couplings to retard the spark. Retarded spark can be obtained only in the "START" position of the ignition switch.

(6) As soon as the engine fires, immediately release the spring-loaded ignition switch to "BOTH" for better engine acceleration.

OIL DILUTION SYSTEM.

If your airplane is equipped with an oil dilution system and very low temperatures are anticipated, dilute the oil prior to engine shut down by energizing the oil dilution switch with the engine operating at 1000 RPM, and with the auxiliary fuel pump switch in the "LO" position. (Refer to figure 3-2 for dilution time for the anticipated temperature). While diluting the oil, the oil pressure should be watched for any unusual fluctuations that might indi-

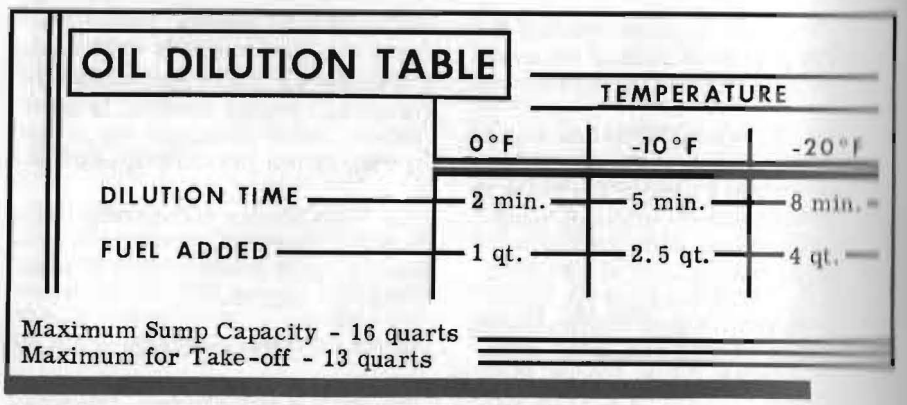


Figure 3-2.

cate a screen being clogged with sludge washed down by the fuel.

NOTE

On the first operation of the oil dilution system each season, use the full dilution period, drain the oil, clean the screen, refill with new oil and redilute as required.

If the full dilution time was used, beginning with a full oil sump (13 quarts), subsequent starts and engine warm-up should be prolonged to evaporate enough of the fuel to lower the oil sump level to 13 quarts prior to take-off. Otherwise, the sump may overflow when the airplane is nosed up for climb.

To avoid progressive dilution of the oil, flights of at least one hour's duration should be made between oil dilution operations.

Section IV
emergency procedures

SYSTEM EMERGENCY PROCEDURES.

FUEL SYSTEM—EMERGENCY OPERATION.

In the event of an engine-driven fuel pump failure, turn the auxiliary fuel pump switch to "HI." This will supply sufficient fuel flow for cruising flight; however, the mixture control must be reset. Land as soon as practical if fuel flow indication remains below normal.

A prolonged sideslip in the direction of the fuel tank in use can cause engine fuel starvation if the fuel quantity is low since the fuel tank outlet ports may be uncovered.

The quickest recovery of fuel flow to the engine can be accomplished in the following manner:

(1) Level the aircraft.
(2) Push the mixture control to full rich.
(3) Push the throttle full forward.
(4) Turn the auxiliary fuel pump switch to "HI."

Engine operation should resume within six seconds if this procedure is executed promptly.

LANDING GEAR—EMERGENCY OPERATION.

When the landing gear will not extend normally, it may be extended manually as follows:

NOTE

Prior to following emergency procedures, it is recommended that the landing gear handle be moved from "UP" to "DOWN" several times. In certain cases, this procedure can dislodge foreign matter which may be causing the malfunction.

(1) Place the gear handle in the full "DOWN" position.
(2) Pull the emergency hand pump out to its full extension.

(3) Operate the hand pump up and down until the down indicator (green) light comes on, and continue pumping until the landing gear handle returns to neutral.

NOTE

The landing gear cannot be retracted with the emergency hand pump. If the gear will not retract normally, extend the gear, land, and have the malfunction corrected.

If the wing flaps fail to extend normally, plan to make a flaps-up landing, unless there is another person aboard to assist. It is impractical for the pilot alone to hold down the spring-loaded flap handle, operate the hand pump, and fly the airplane at the same time.

LANDING EMERGENCIES (Except Ditching).

FORCED LANDING (Precautionary Landing with Power).

(1) Drag over selected field with flaps 20° and 90 MPH airspeed, noting type of terrain and obstruction.
(2) If surface is smooth and hard (pasture, frozen lake, etc), plan a wheels-down landing using full flaps and keeping nose wheel off ground as long as practical.
(3) If surface is rough or soft, plan a wheels-up landing as follows:
   a. Approach with flaps down at 75 to 85 MPH.
   b. Turn off all switches except ignition switch.
   c. Unlatch cabin door prior to flare-out.
   d. Reduce power to a minimum during flare-out.
   e. Prior to contact, turn ignition switch "OFF."
   f. Land in a slightly tail-low attitude.
   g. Attempt to hold the tail low throughout slide.

FORCED LANDING (Complete Engine Failure).

In the event of a complete engine failure, maximum gliding distance can be obtained by maintaining 95 MPH indicated air speed with the landing gear and wing flaps retracted. Refer to the Maximum Glide Diagram on page 4-3 for maximum glide data.
(1) Pull mixture control knob to idle cut-off.
(2) Turn fuel selector valve handle to "BOTH OFF."
(3) Turn off all switches except master switch.
(4) Approach at 85 to 95 MPH.
(5) If field is smooth and hard, extend landing gear within gliding distance of field.

(6) If engine is windmilling, extend flaps as necessary within gliding distance of field.

NOTE

The windmilling engine will provide sufficient power for extending the wing flaps. If the engine is not windmilling, plan to make a flaps-up landing.

(7) Turn off master switch.
(8) Make a normal landing, keeping nose wheel off ground as long as practical.
(9) If terrain is rough or soft, plan a wheels-up landing as follows:
   a. Approach at 85 to 95 MPH with gear and flaps retracted.
   b. If practical, extend flaps within gliding distance of field.
   c. Turn off master switch.
   d. Unlatch cabin door prior to flare-out.
   e. Land in a slightly tail-low attitude.
   f. Attempt to hold tail low throughout slide.

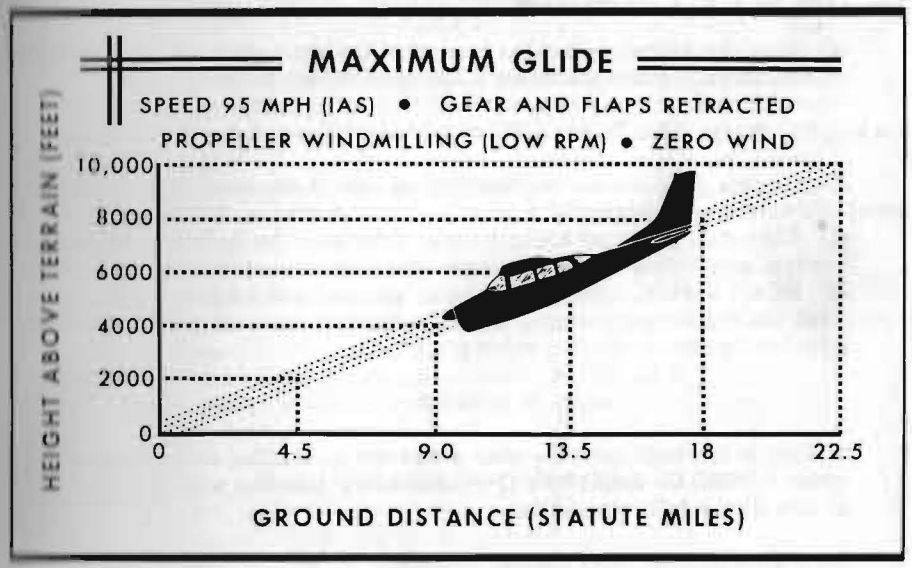


Figure 4-1.

LANDING WITHOUT POSITIVE INDICATION OF GEAR LOCKING.

Should a flickering, unsteady, or inoperative gear-down (green) light be obtained, and observers verify that the gear is down and apparently in the locked position, proceed as follows:

(1) Make a normal full-flaps approach.
(2) Holding the landing gear handle in the "DOWN" position and maintaining a minimum of 1000 RPM, complete the landing and taxi clear of the runway.

NOTE

Maintaining 1000 RPM and holding the gear handle "DOWN" secures the landing gear in the extended position by hydraulic pressure.

(3) BEFORE reducing engine RPM or releasing gear handle, have ground personnel depress the tail until nose gear is off ground.

NOTE

The nose gear requires hydraulic pressure to hold it in the "DOWN" position if it is not mechanically locked.

(4) Stop the engine and determine that the nose gear is mechanically locked down BEFORE lowering the nose wheel to the ground.

LANDING WITH ONE DEFECTIVE MAIN GEAR.

If one main gear should malfunction so that is does not extend, or only partially extends, prepare for a wheels-down landing as follows:

(1) Turn fuel selector valve handle to lighten the fuel load on the defective gear side as much as practical before attempting a landing.
(2) Select a wide, hard-surfaced or smooth sod runway. If a crosswind landing is necessary, select a runway with the crosswind from the side opposite the defective gear.

NOTE

If terrain is rough or soft, plan a wheels-up landing as presented under "FORCED LANDING (Precautionary Landing with Power)" in lieu of the following steps.

(3) Place landing gear handle "DOWN."
(4) Extend flaps to 40°.

(5) In approach, align airplane with edge of runway opposite the defective gear, allowing for a ground-loop toward the defective gear during the landing roll.
(6) Turn off master switch.
(7) Land slightly wing-low toward the operative gear, and lower the nose wheel immediately for positive steering.
(8) Pull mixture control knob to idle cut-off.
(9) Turn ignition switch "OFF."
(10) Use full aileron in landing roll to lower wing to the ground gently.
(11) Apply brake only to the operative gear as required to maintain directional control and minimize landing roll.
(12) Turn fuel selector valve handle to "BOTH OFF."
(13) Evacuate the airplane as soon as it stops.

LANDING WITH DEFECTIVE NOSE GEAR.

If the nose gear does not extend or only partially extends and observers verify that it is not down, prepare for a wheels-down landing as follows:

(1) Transfer movable load to baggage area, and front seat passenger to rear seat if a rear seat position is unoccupied.
(2) Select a hard-surfaced or smooth sod runway.

NOTE

If terrain is rough or soft, plan a wheels-up landing as presented under "FORCED LANDING (Precautionary Landing with Power)" in lieu of the following steps.

(3) Place landing gear handle "DOWN."
(4) Extend flaps to 40°.
(5) Turn off master switch.
(6) Land in a slightly tail-low attitude.
(7) Pull mixture control knob to idle cut-off.
(8) Turn ignition switch "OFF."
(9) Hold nose off the ground as long as possible.
(10) Turn fuel selector valve handle to "BOTH OFF."
(11) Evacuate the airplane as soon as it stops.

Notes

Section V
operating limitations

OPERATIONS AUTHORIZED.

Your Cessna with standard equipment, as certificated under FAA Type Certificate No. 3A21, 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 Cessna is eligible to obtain approval for its operation on single-engine scheduled airline service under VFR. Your Cessna Dealer will be happy to assist you in selecting equipment best suited to your needs.

MANEUVERS — NORMAL CATEGORY.

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

Maximum Gross Weight	3000 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 FAA-approved markings, placards, and check lists in the airplane. If there is any information in this section which contradicts the FAA-approved markings, placards, and check lists, it is to be disregarded.

AIRSPEED LIMITATIONS.

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

Never Exceed (Glide or dive, smooth air)	225 MPH (red line)
Caution Range	190-225 MPH (yellow arc)

Maximum Structural Cruising Speed . . . . . .190 MPH
(Level flight or climb)
Normal Operating Range. . . . . .65-190 MPH (green arc)
Maximum Speed, Gear Extended . . . . . .160 MPH
Maximum Speed, Flaps Extended
Flaps 10° . . . . . .160 MPH
Flaps 10° - 40° . . . . . .110 MPH
Flap Operating Range . . . . . .57-110 MPH (white arc)
Maneuvering Speed* . . . . . .132 MPH

*The maximum speed at which abrupt control travel can be used without exceeding the design load factor.

ENGINE OPERATION LIMITATIONS.

Power and Speed . . . . . .260 BHP at 2625 RPM

ENGINE INSTRUMENT MARKINGS.

OIL TEMPERATURE INDICATOR

Normal Operating Range . . . . . Green Arc
Do not exceed . . . . . Red Line

OIL PRESSURE GAGE

Idling Pressure . . . . . 10 psi (red line)
Normal Operating Range . . . . . 30-60 psi (green arc)
Maximum Pressure . . . . . 100 psi (red line)

MANIFOLD PRESSURE GAGE

Normal Operating Range . . . . . .15-24 in. Hg (green arc)

CYLINDER HEAD TEMPERATURE GAGE

Normal Operating Range . . . . . .300-460°F (green arc)
Do Not Exceed. . . . . 460° (red line)

TACHOMETER

Normal Operating Range . . . . . .2200-2450 rpm (green arc)
Maximum (Engine rated speed) . . . . . 2625 rpm (red line)

FUEL QUANTITY INDICATORS

Empty (.7 gallon unusable each tank). . . . . E (red line)

FUEL FLOW INDICATOR

Normal Operating Range . . . . . 8.75-14.13 gal/hr (green arc)
Minimum and Maximum . . . . . .2.0 and 21.7 gal/hr (red lines)
Maximum Performance Take-Off and Climb Settings at Altitude:
Sea Level . . . . . 19.5 gal/hr (white radial)
4000 Ft. . . . . 17.6 gal/hr (white radial)
8000 Ft. . . . . 15.8 gal/hr (white radial)

WEIGHT AND BALANCE.

The information presented in this section will enable you to operate your Cessna within the prescribed weight and center of gravity limitations.

In figuring your loading problems be certain that you use the Licensed Empty Weight of your particular airplane as shown on its Weight and Balance Data sheet. This sheet, plus an Equipment List, is included with each airplane as it leaves the factory. The FAA requires that any change in the original equipment affecting the empty weight center of gravity be recorded on a Repair and Alteration Form FAA-337.

READ BEFORE WORKING LOADING PROBLEM FOR YOUR AIRPLANE

To figure the weight for your airplane in the same manner as the sample problem on page 5-4, proceed as follows:

Step 1. Take the licensed Empty Weight and Moment/1000 from the Weight and Balance Data Sheet, plus any changes noted on forms FAA-337, carried in your airplane and write them down in two columns in the manner shown in the sample problem. These figures are non-variables and, unless your airplane or equipment if modified, these figures may be used every time you figure your weight and balance.

Step 2. Write down the weight and moment/1000 for the oil in the proper columns. Since you usually have a full load of oil for a trip, you figure 12 qts. at 22.5 lbs. and a moment of -0.4. You may use these same figures every time and consider this also a non-variable.

Step 3. Add the weight of yourself and the front passenger. Refer to the Loading Graph on page 5-5 and find this weight at the left side of the graph, then go across the graph horizontally to the right until you intersect the line identified as "PILOT AND FRONT PASSENGER." After intersecting the line, drop down vertically to the bottom line and read the moment/1000 given on the scale. Now write down this weight and moment/1000 for you and the front passenger in the proper columns.

SAMPLE LOADING PROBLEM

	Sample Airplane		Your Airplane	
	Weight (lbs)	Moment (lb - ins. /1000)	Weight ⋮	Moment ⋮
1. Licensed Empty Weight (Sample Airplane) ...	1810.0	62.6		
2. Oil - 12 Qts.*	22.5	-0.4	22.5	-0.4
3. Pilot & Front Passenger	340.0	12.2		
4. Fuel- (63.5 Gal at 6#/Gal)	381.0	18.3		
5. Rear Passengers	340.0	23.8		
6. Baggage	106.5	11.2		
7. Total Aircraft Weight (Loaded)	3000.0	127.7		

8. Locate this point (3000 at 127.7) on the center of gravity envelope, and since this point falls within the envelope the loading is acceptable.

*Note: Normally full oil may be assumed for all flights.

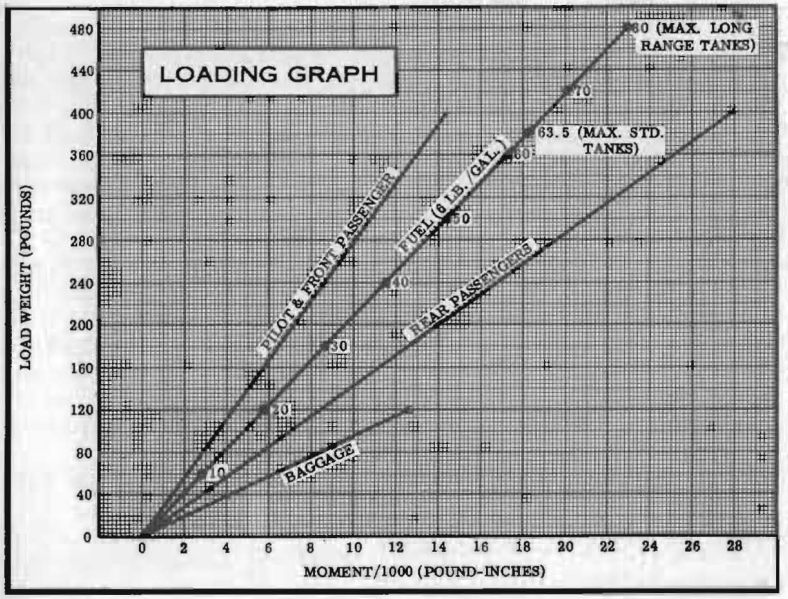
Step 4. Proceed as you did in step 3, except use the line identified as "FUEL" and 6 lbs. per gallon for the amount of gasoline you are carrying, and read the moment/1000 from the Loading Graph. Write the weight and moment/1000 in the proper columns.

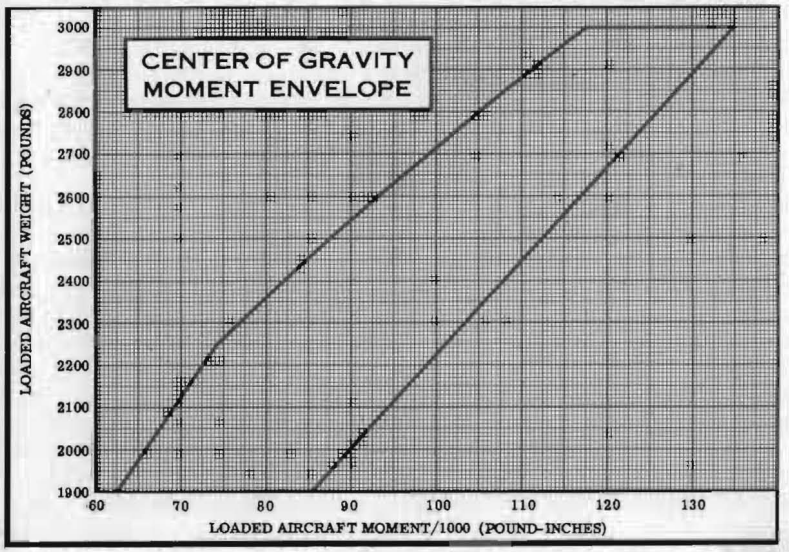
Step 5. Proceed as you did in step 3, except use the line identified as "REAR PASSENGERS," and read the moment/1000 for the combined weight of the rear passengers being carried. Write the weight and moment/1000 in the proper columns.

Step 6. Proceed as you did in step 3, except use the line identified as "BAGGAGE," and read the moment/1000 for the number of pounds of baggage being carried. Write the weight and moment/1000 in the proper columns.

Step 7. Add the weight column. The total must be 3000 lbs., or below, or you must lighten your aircraft load. Add the moment column (remember to subtract rather than add the oil moment because it is a minus quantity).

Step 8. Refer to the Center of Gravity Moment Envelope. Locate the total





weight on the scale on the left hand side of the graph and, from this point, follow a line horizontally to the right. Locate the total moment/1000 on the scale running across the bottom of the graph and, from this point, follow a line vertically up until you intersect the line running horizontally from your total weight. If the point where the two lines intersect is within the envelope, your airplane is loaded within approved limits. If the point of intersection falls outside the envelope, your load must be adjusted before flight.

Section VI
care of the airplane

If your airplane is to retain that new-plane performance and dependability, certain inspection and maintenance requirements must be followed. It is wise to follow a planned schedule of lubrication and preventative maintenance based on 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 a tow-bar attached to the nosewheel. Always use a tow-bar when one is available.

NOTE

When using tow-bar, do not exceed nosewheel turning radius of 30° either side of center.

When moving the airplane by hand and no tow-bar is available, push down at the front spar of the stabilizer beside the fuselage to raise the nosewheel off the ground. With the nosewheel clear of the ground the airplane can be turned readily in any direction by pivoting it around the main gear. Do not push down on the empennage by the tip of the elevator; nor shove sidewise on the upper portion of the fin. When moving the airplane forward, push at the wing strut root fitting or at the main gear strut.

MOORING YOUR AIRPLANE.

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 ropes or chains (700 pounds tensile strength) to the wing tie-down fittings at the upper end of each wing strut. Secure the opposite ends of these ropes or chains to tie-down rings.

(2) Tie a rope through the nose gear torque link and secure the opposite end to a tie-down ring.

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

(4) Install a surface control lock over the fin and rudder. 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.
(5) Install the control lock in the control wheel shaft.

STORAGE.

The all-metal construction of your Cessna makes outside storage of it practical, although inside storage will increase its life just as it increases the life of your car. If your airplane must remain inactive for a time, cleanliness is probably the most important consideration -- whether your airplane is inside or out. A small investment in cleanliness will repay you many times, not only in keeping your airplane looking like new but in keeping it new. A later paragraph in this section covers the subject in greater detail.

Do not neglect the engine when storing the airplane. Turn the propeller over by hand or have it turned over every few days to keep the engine bearings, cylinder walls and internal parts lubricated. If storage is to be for an extended period, and turning the propeller is impractical, see your Cessna Dealer for suggestions on preserving the engine and hydraulic system. If the airplane is stored outside, leave the propeller in a horizontal position to prevent water seepage into the hub mechanism. Filling the fuel tanks will help prevent condensation.

Regular use helps keep airplanes 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 before being put back into active service.

WINDSHIELD-WINDOWS.

The plastic windshield and windows should be kept clean and waxed at all times. To prevent scratches and crazing, wash them 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 with a dry cloth builds up an electrostatic charge so that it attracts dust particles in the air. Wiping 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 badly 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 may soften the plastic.

Do not use a canvas cover on the windshield unless freezing rain or sleet is anticipated. Canvas covers may scratch the plastic surface.

PAINTED SURFACES.

The painted exterior surfaces of your new Cessna have been finished with high grade synthetic materials selected for their toughness, elasticity, and excellent adhesion. With a minimum of care, they will retain their original beauty for many years.

As with any paint applied to a metal surface, the desired qualities of the paint develop slowly throughout an initial curing period which may be as long as 90 days after the finish is applied. During this curing period some precautions should be taken to avoid damaging the finish or interfering with the curing process. The finish should be cleaned only by washing with clean, cold water and mild soap, followed by a rinse with cold water and drying with cloths or a chamois. Do not use polish or wax, which would exclude air from the surface. Do not rub or buff the finish and avoid flying through rain, hail or sleet. Once the finish has cured completely, it may be waxed with a good automotive wax. A heavier coating of wax on the leading edges of the wings and tail and on the nose cap and propeller spinner will help reduce the abrasion encountered in these areas.

Fluids containing dyes, such as fuel and hydraulic oil, accidentally spilled on the painted 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.

PROPELLER CARE.

Preflight inspection of propeller blades for nicks, and wiping them occasionally with an oily cloth to clean off grass and bug stains will assure long, trouble-free service. It is vital that small nicks on the propeller, particularly near the tips and on the leading edges, are dressed out as soon as possible since these nicks produce stress concentrations, and if ignored, may result in cracks. Never use an alkaline cleaner on the blades; remove grease and dirt with carbon tetrachloride or Stoddard solvent.

Your Cessna Dealer should be consulted about other repair and maintenance work. Civil Air Regulations require that all maintenance except dressing small blade nicks, cleaning, minor repairs to the spinner, and lubrication which does not require disassembly, be done by an FAA - authorized propeller repair station.

LANDING GEAR CARE.

Cessna Dealer's mechanics have been trained in the proper adjustment and rigging procedures on the aircraft hydraulic system. To assure trouble-free gear operation, have your Cessna Dealer check the gear regularly and make any necessary adjustments. Only properly-trained mechanics should attempt to repair or adjust the landing gear.

INTERIOR CARE.

To remove dust and loose dirt from the upholstery and carpet, clean the interior regularly with a vacuum cleaner.

Blot up any spilled liquid promptly, with cleansing tissue or rags. Don't pat the spot - press the blotting material firmly and hold it for several seconds. Continue blotting until no more liquid is taken up. Scrape off sticky materials with a dull knife, then spot-clean the area.

Oily spots may be cleaned with household spot removers, used sparingly. Before using any solvent read the instructions on the container and test it on an obscure place in the fabric to be cleaned. Never saturate the fabric with a volatile solvent; it may damage the padding and backing materials.

Soiled upholstery and carpet may be cleaned with foam-type detergent, used according to the manufacturer's instructions. To minimize wetting the fabric, keep the foam as dry as possible and remove it with a vacuum cleaner.

The plastic trim, headliner, instrument panel and control knobs need only be wiped off with a damp cloth. Never use a volatile solvent on plastic.

INSPECTION SERVICE AND INSPECTION PERIODS.

With your airplane you will receive an Owner's Service Policy. Coupons attached to the policy entitle you to an initial inspection and the first 100-hour inspection at no charge. 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 it to your Dealer reasonably soon after you take delivery on it. This will permit him to check it over and to make any 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.

Civil Air Regulations require that all airplanes have a periodic (annual) inspection as prescribed by the administrator, and performed by a person designated by the administrator. In addition, 100-hour periodic inspections made by an "appropriately-rated mechanic" are required if the airplane is flown for hire. The Cessna Aircraft Company recommends the 100-hour periodic inspection for your airplane. 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 factory-approved procedures provides the highest type of service possible at lower cost.

Time studies of the 100-hour inspection at the factory and in the field have developed a standard flat-

rate charge for this inspection at any Cessna Dealer. Points which the inspection reveals require modification or repairs will be brought to the owner's attention by the Dealer, and quotations or charges will be made accordingly. The inspection charge does not include the oil required for the oil change.

Every effort is made to attract the best mechanics in each community to Cessna service facilities. Many Dealers' mechanics have attended Cessna Aircraft Company schools and have received specialized instructions 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 method.

Cessna Dealers carry a full complement of Cessna service parts and have complete repair and service facilities, including such specialized jigs and tools as may be necessary.

Your Cessna Dealer will be glad to give you current price quotations on all parts that you might need and advise you on the practicality of parts replacement versus repairs that may be necessary from time to time.

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 periodic check should be made of the latest Civil Air Regulations to insure that all data requirements are met.

A. To be displayed in the airplane at all times:
   (1) Aircraft Airworthiness Certificate (Form FAA-1362).
   (2) Aircraft Registration Certificate (Form FAA-500A).

B. To be carried in the airplane at all times:
   (1) Airplane Radio Station License (if transmitter installed).
   (2) Weight and Balance Report or latest copy of the Repair and Alteration Form (Form FAA-337).
   (3) Airplane Equipment List.
   (4) Airplane Log Book.
   (5) Engine Log Book.

C. To be maintained but not necessarily carried in the airplane at all times:
   (1) A form containing the following information: Model, Registration Number, Factory Serial Number, Date of Manufacture, Engine Number, and Key Numbers (duplicate keys are available through your Cessna Dealer).

Most of the items listed are required by the United States Civil Air Regulations. Since the regulations of other nations may require other documents and data, owners of exported airplanes should check with their own aviation officials to determine their individual requirements.

LUBRICATION AND SERVICING

Specific lubrication and servicing information is presented in the Servicing Diagram (figure 6-1). In addition, all pulleys, the trim tab actuator rod, control surface hinge bearings, bellcrank clevis bolts, brake pedal pivots, rudder pedal crossbars, shimmy dampener pivot bushings, door hinges and latches, Bowden controls (with the exception of their friction locking devices), propeller and cowl flap control ends, throttle and mixture control linkage, and any other friction points should be lubricated every 1000 hours, or oftener, with SAE 20 general-purpose oil. Do not lubricate friction locks.

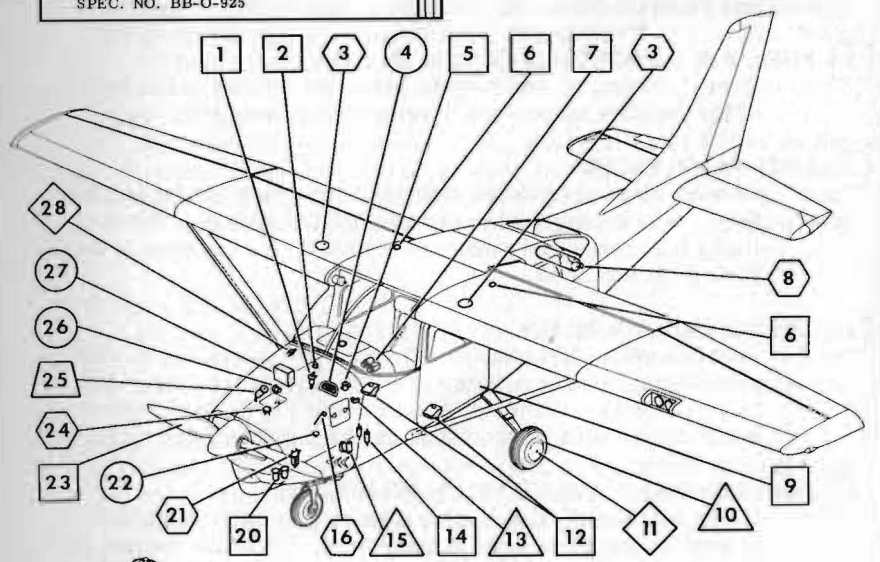
Generally, roller chains (aileron, elevator trim tab wheel and tab actuator) and control cables collect dust, sand and grit if they are greased or oiled. Except under seacoast conditions, chains and cables should be merely wiped clean occasionally with a dry cloth.

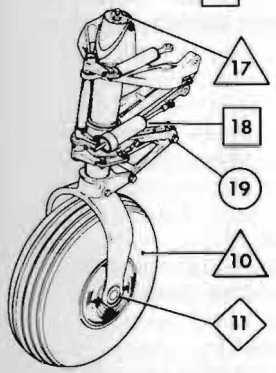
DEALER FOLLOW-UP SYSTEM

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 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.

RECOMMENDED FUEL:
AVIATION GRADE -- 100/130 OCTANE
RECOMMENDED ENGINE OIL:
AVIATION GRADE -- SAE 30 BELOW 40°F
SAE 50 ABOVE 40°F
HYDRAULIC FLUID:
SPEC. NO. MIL-H-5606
OXYGEN:
SPEC. NO. BB-O-925

SERVICING DIAGRAM





SERVICING INTERVALS

- CHECK OR SERVICE DAILY
- SERVICE EVERY 25 HOURS
- SERVICE EVERY 50 HOURS
- SERVICE EVERY 100 HOURS
- SERVICE EVERY 500 HOURS
- SERVICE AS REQUIRED

Symbol denotes servicing interval. Number within symbol refers to item to be serviced as shown in adjoining specifications.

Figure 6-1 (Sheet 1 of 6).

SERVICING PROCEDURES

[1] **VACUUM SYSTEM OIL SEPARATOR (OPT)**
Every 100 hours, remove separator and flush with Stoddard solvent (Fed. Spec. P-S-661), then dry with compressed air and reinstall.

[2] **FUEL/AIR CONTROL UNIT SCREEN**
Every 100 hours, remove and clean the screen in the bottom of the fuel/air control unit, reinstall and resafety.

⟨3⟩ **FUEL TANK FILLERS**
Service after each flight with 100/130 octane aviation grade fuel. The capacity of each tank is 32.5 gallons. When optional long range fuel tanks are installed, the capacity of each tank is 42.0 gallons.

(4) **INDUCTION AIR FILTER**
Service every 25 hours or oftener when operating in dusty conditions. Under extremely dusty conditions, daily maintenance of the filter is recommended. Service filter in accordance with instructions on the filter frame.

[5] **SUCTION RELIEF VALVE INLET SCREEN (OPT)**
Every 100 hours, check inlet screen for dirt or obstructions if suction gage readings appear high. Remove screen and clean with compressed air or wash with Stoddard solvent (Fed. Spec. P-S-661).

[6] **FUEL TANK SUMP DRAINS**
Every 100 hours, remove drain plugs, drain off water and sediment, and reinstall plugs. Safety wire plugs to adjacent safety screws.

[7] **GYRO INSTRUMENT AIR FILTERS (OPT)**
Replace every 100 hours and when erratic or sluggish responses are noted with normal suction gage readings.

⟨8⟩ **OXYGEN CYLINDER AND FILLER VALVE (OPT)**
Check oxygen pressure gage for anticipated requirements before each flight. Whenever pressure drops below 300 psi, use filler valve on left side of utility shelf and refill cylinder with aviator's breathing oxygen (Spec. No. BB-O-925). Maximum pressure, 1800 psi.

Figure 6-1 (Sheet 2 of 6).

[9] **LANDING GEAR DOWN LOCK PAWLS**
Every 100 hours, lubricate the down lock pawls through grease fittings, located near the pivot of the pawls, with MIL-G-7711 general purpose grease.

△10△ **TIRES**
Maintain 45 psi pressure on the nosewheel and 42 psi on the main wheels. Inflate tires with filler needle stored in map compartment. Remove oil and grease from tires with soap and water; periodically inspect them for cuts, bruises and wear.

◇11◇ **WHEEL BEARINGS**
Repack with MIL-G-7711 or aircraft wheel bearing grease at first 100 hours, 500 hours thereafter; oftener if more than the usual amount of water, mud, ice or snow is encountered.

[12] **FUEL RESERVOIR DRAIN PLUGS**
Every 100 hours, remove drain plug from bottom of each fuel reservoir, drain off water and sediment, and reinstall plug. Safety wire plug to adjacent fuselage structure.

△13△ **HYDRAULIC FLUID RESERVOIR FILLER**
Periodically check fluid level in hydraulic reservoir through sight window (just below the throttle on the control pedestal). Complete coverage of the window is desired, denoting that the reservoir is full (entire area of window appears red). Fluid level should not be allowed to go below the halfway portion of the sight window. Fill the reservoir with MIL-H-5606 (red) hydraulic fluid by removing the screw from the filler fitting and connecting a pressure filling unit. Fill the system until fluid begins to overflow from the reservoir vent line. After filling, reinstall screw in filler fitting. Every 100 hours, draw off a sample of hydraulic fluid and examine it for sediment and discoloration. Fluid which is clear and not appreciably darkened may be reused. Refer to the Service Manual for a detailed procedure for testing the fluid.

Figure 6-1 (Sheet 3 of 6).

[14] **BRAKE MASTER CYLINDERS**

Every 100 hours, check fluid level in brake master cylinders. Fill with MIL-H-5606 (red) hydraulic fluid. Filling with a pressure pot connected to the brake bleeder ports is preferable, although fluid may be poured through the plugs on the top of the master cylinders.

△15 **GROUND SERVICE RECEPTACLE (OPT)**

Connect to 12-volt, DC, negative-ground power unit for cold weather starting and lengthy ground maintenance of the electrical system. When an auxiliary power unit is used, the aircraft master switch should be left off until the plug has been pulled.

⟨16⟩ **OIL DIPSTICK**

Check oil level before each flight. Do not operate on less than 9 quarts and fill if an extended flight is planned. The oil capacity is 12 quarts (13 quarts capacity if an optional oil filter is installed).

△17 **NOSE GEAR SHOCK STRUT**

Keep strut inflated and filled with MIL-H-5606 (red) hydraulic fluid. See Service Manual for detailed instructions.

[18] **SHIMMY DAMPENER**

Every 100 hours, check fluid level in shimmy dampener. Fill with MIL-H-5606 (red) hydraulic fluid. See Service Manual for detailed instructions.

(19) **NOSE GEAR TORQUE LINKS**

Every 25 hours, lubricate through grease fittings with MIL-G-7711 general purpose grease. Wipe off excess.

[20] **AUXILIARY FUEL PUMP FILTERS**

Every 100 hours, remove and clean the screen in the bottom of each fuel pump.

⟨21⟩ **FUEL STRAINER**

Drain approximately two ounces of fuel before each flight and after refueling to remove water and sediment. Make sure drain valve is closed after draining. Disassemble and clean

Figure 6-1 (Sheet 4 of 6).

bowl and screen every 100 hours.

(22) **OIL SUMP DRAIN**

Every 25 hours, change engine oil. Drain oil by removing plug in oil sump. Provide protection for engine nacelle when draining. (See item 25 for servicing interval on aircraft equipped with an optional oil filter.)

[23] **PROPELLER**

The McCauley propeller mechanism is sealed and does not require lubrication between overhauls. Grease the Hartzell propeller every 100 hours. To prevent entrapping air and high pressure, remove grease fitting adjacent to fitting being greased. Fill each fitting until grease oozes from adjacent fitting hole. Add equal amounts of grease at each clamp to retain propeller balance. Refer to the Service Manual or see your Cessna Dealer for a list of approved greases for Hartzell propellers.

⟨24⟩ **OIL FILLER**

When preflight check shows low oil level, service with aviation grade engine oil; SAE 30 below 40°F. and SAE 50 above 40°F. Your Cessna was delivered from the factory with straight mineral oil (non-detergent) and should be operated with straight mineral oil for the first 25 hours. The use of mineral oil during the 25-hour break-in period will help seat the piston rings and will result in less oil consumption. After the first 25 hours, either mineral oil or detergent oil may be used. If a detergent oil is used it must conform to Continental Motors Corporation Specification MHS-24. Your Cessna Dealer can supply an approved brand.

△25 **OIL FILTER (OPT)**

Change engine oil and replace filter element every 50 hours. Oil should be changed at least every four months even though less than 50 hours have accumulated. If the engine is operated in extremely dusty areas, in cold climates where sludging conditions exist, or where short flights and long idle periods are encountered which cause sludging conditions, the interval for changing oil should be reduced from the 50 hour interval outlined above.

Figure 6-1 (Sheet 5 of 6).

(26) **ENGINE OIL SCREEN**

Remove and wash screen (located on right rear side of engine accessory section) with Stoddard solvent (Fed. Spec. P-S-661) whenever engine oil is changed. (On aircraft equipped with an optional oil filter, the engine oil screen has been removed and replaced with an adapter unit for oil filtration.)

(27) **BATTERY**

Check level of electrolyte every 25 hours (or at least every 30 days), oftener in hot weather. Maintain level by adding distilled water. DO NOT overfill. Immediately neutralize spilled electrolyte with baking soda solution, then flush with water. Keep battery clean and connections tight. Neutralize corrosion deposits with baking soda solution, then rinse thoroughly.

◇28◇ **HYDRAULIC SYSTEM FILTER**

Every 500 hours, separate filter body by removing four screws; then remove and clean the two screens in filter. Use new O-ring seal when reassembling filter after cleaning. Safety wire screws.

The military specifications listed are not mandatory, but are intended as guides in choosing satisfactory materials, Products of most reputable manufacturers meet or exceed these specifications.

Figure 6-1 (Sheet 6 of 6).

Section VII

operational data

The operational data charts on the following pages are presented for two purposes: first, so that you may know what to expect from your airplane under various conditions; and second, to enable you to plan your flights in detail and with reasonable accuracy.

A power setting selected from the range charts usually will be more efficient than a random setting, since it will permit accurate fuel flow settings and your fuel consumption can be estimated closely. You will find that using the charts and your Power Computer will pay dividends in overall efficiency.

The data in the charts has been compiled from actual flight tests with the airplane and engine in good condition and using average piloting techniques. Note also that the range charts make no allowances for wind, navigational errors, warm-up, take-off, climb, etc. You must estimate these variables for yourself and make allowances accordingly.

AIRSPEED CORRECTION TABLE

FLAPS 0°								
IAS - MPH	60	80	100	120	140	160	180	200
TIAS - MPH	69	82	100	119	139	160	181	202
***FLAPS 20°**								
IAS - MPH	40	50	60	70	80	90	100	110
TIAS - MPH	57	62	68	75	84	93	102	112
***FLAPS 40°**								
IAS - MPH	40	50	60	70	80	90	100	110
TIAS - MPH	57	62	68	75	83	92	102	111

*Maximum flap speed 110 MPH-TIAS

Figure 7-1.

STALL SPEED, POWER OFF

Gross Weight 3000 lbs. CONFIGURATION	ANGLE OF BANK 0°	20°	40°	60°
GEAR & FLAPS UP	65	67	74	92
GEAR DOWN, FLAPS 20°	61	63	70	86
GEAR DOWN, FLAPS 40°	60	62	69	85

SPEEDS ARE MPH, TIAS

Figure 7-2.

TAKE-OFF DATA

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

GROSS WEIGHT LBS.	IAS AT 50 FT. MPH	HEAD WIND MPH	AT SEA LEVEL & 59°F GROUND RUN	AT SEA LEVEL & 59°F TO CLEAR 50' OBSTACLE	AT 2500 FEET & 50°F GROUND RUN	AT 2500 FEET & 50°F TO CLEAR 50' OBSTACLE	AT 5000 FT. & 41°F GROUND RUN	AT 5000 FT. & 41°F TO CLEAR 50' OBSTACLE	AT 7500 FT. & 32°F GROUND RUN	AT 7500 FT. & 32°F TO CLEAR 50' OBSTACLE
2200	55	0	345	680	405	770	480	885	580	1040
		15	205	460	245	525	295	615	365	725
		30	100	275	120	320	155	380	195	460
2600	60	0	500	915	585	1045	705	1230	855	1470
		15	310	635	370	735	455	870	560	1055
		30	165	395	200	465	255	565	325	695
3000	64	0	695	1210	820	1405	990	1675	1205	2045
		15	450	855	535	1005	660	1215	815	1505
		30	250	555	310	665	390	820	500	1030

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

CLIMB DATA

GROSS WEIGHT LBS.	AT SEA LEVEL & 59°F BEST CLIMB IAS MPH	AT SEA LEVEL & 59°F RATE OF CLIMB FT/MIN	AT SEA LEVEL & 59°F GAL. OF FUEL USED	AT 5000 FT. & 41°F BEST CLIMB IAS MPH	AT 5000 FT. & 41°F RATE OF CLIMB FT/MIN	AT 5000 FT. & 41°F FROM S.L. FUEL USED	AT 10000 FT. & 23°F BEST CLIMB IAS MPH	AT 10000 FT. & 23°F RATE OF CLIMB FT/MIN	AT 10000 FT. & 23°F FROM S.L. FUEL USED	AT 15000 FT. & 5°F BEST CLIMB IAS MPH	AT 15000 FT. & 5°F RATE OF CLIMB FT/MIN	AT 15000 FT. & 5°F FROM S.L. FUEL USED	AT 20000 FT. & -12°F BEST CLIMB IAS MPH	AT 20000 FT. & -12°F RATE OF CLIMB FT/MIN	AT 20000 FT. & -12°F FROM S.L. FUEL USED
2200	96	1900	2.0	92	1530	2.9	88	1150	3.9	83	780	5.1	78	410	6.8
2600	100	1540	2.0	97	1210	3.1	93	890	4.4	88	580	6.1	84	250	8.6
3000	105	1270	2.0	101	980	3.4	97	690	5.0	94	400	7.3	90	120	11.5

NOTE: FULL THROTTLE, 2625 RPM, MIXTURE AT RECOMMENDED LEANING SCHEDULE, FLAPS AND GEAR UP. FUEL USED INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE.

Figure 7-3.

2500 CRUISE PERFORMANCE

NORMAL LEAN MIXTURE

Standard Atmosphere • Zero Wind • Gross Weight - 3000 Pounds

2500 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	24	76	180	14.3	4.4	800	5.6	1010
	23	71	177	13.4	4.7	835	6.0	1050
	22	67	173	12.7	5.0	865	6.3	1090
	21	63	169	11.9	5.3	900	6.7	1135
2300	24	68	174	12.8	4.9	860	6.2	1085
	23	64	170	12.1	5.2	890	6.6	1120
	22	61	166	11.4	5.6	925	7.0	1165
	21	57	163	10.8	5.9	960	7.4	1210
2200	23	60	166	11.3	5.6	930	7.1	1175
	22	56	162	10.7	6.0	965	7.5	1215
	21	53	158	10.0	6.3	1005	8.0	1265
	20	49	154	9.4	6.7	1035	8.5	1305
2100	22	52	157	9.9	6.4	1010	8.1	1275
	21	48	153	9.3	6.8	1045	8.6	1320
	20	45	148	8.7	7.3	1080	9.2	1360
	19	42	144	8.3	7.7	1105	9.7	1390
	18	39	139	7.8	8.1	1130	10.2	1420
	17	35	133	7.3	8.7	1150	10.9	1445
	16	32	126	6.9	9.2	1160	11.6	1460

Figure 7-4 (Sheet 1 of 5).

CRUISE PERFORMANCE 5000

NORMAL LEAN MIXTURE

Standard Atmosphere • Zero Wind • Gross Weight - 3000 Pounds

5000 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	24	79	187	14.8	4.3	800	5.4	1010
	23	74	183	14.0	4.5	830	5.7	1050
	22	70	179	13.1	4.8	870	6.1	1095
	21	65	175	12.3	5.2	905	6.5	1140
2300	24	71	180	13.3	4.8	860	6.0	1080
	23	67	177	12.6	5.0	890	6.4	1125
	22	63	173	11.8	5.4	925	6.8	1170
	21	59	169	11.1	5.7	965	7.2	1215
2200	23	62	172	11.7	5.4	935	6.8	1175
	22	58	168	11.0	5.8	970	7.2	1220
	21	55	165	10.4	6.1	1005	7.7	1265
	20	51	160	9.8	6.5	1040	8.2	1310
2100	22	53	163	10.1	6.3	1020	7.9	1290
	21	50	159	9.6	6.6	1055	8.4	1330
	20	46	154	9.0	7.1	1090	8.9	1370
	19	43	150	8.5	7.5	1115	9.4	1405
	18	40	145	8.1	7.9	1140	9.9	1435
	17	37	139	7.6	8.4	1160	10.6	1465
	16	34	132	7.1	8.9	1175	11.2	1480
	15	31	125	6.7	9.4	1180	11.9	1485

Figure 7-4 (Sheet 2 of 5).

7500 CRUISE PERFORMANCE

NORMAL LEAN MIXTURE

Standard Atmosphere • Zero Wind • Gross Weight-3000 Pounds

7500 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	22	72	186	13.6	4.7	870	5.9	1095
	21	67	182	12.7	5.0	910	6.3	1145
	20	64	178	12.0	5.3	945	6.7	1190
	19	59	173	11.1	5.7	990	7.2	1245
2300	22	65	179	12.2	5.2	930	6.6	1175
	21	61	175	11.5	5.5	970	7.0	1220
	20	57	171	10.8	5.9	1005	7.4	1270
	19	53	167	10.1	6.3	1040	7.9	1320
2200	22	61	175	11.4	5.6	970	7.0	1225
	21	57	171	10.7	5.9	1010	7.5	1275
	20	53	166	10.1	6.3	1045	7.9	1315
	19	50	162	9.5	6.7	1080	8.4	1360
2100	21	52	165	9.8	6.4	1060	8.1	1335
	20	48	160	9.3	6.8	1095	8.6	1380
	19	45	155	8.7	7.3	1125	9.2	1420
	18	42	150	8.3	7.7	1150	9.7	1450
	17	39	145	7.8	8.1	1175	10.2	1485
	16	35	138	7.4	8.6	1190	10.9	1500
	15	32	131	6.9	9.1	1200	11.5	1510

Figure 7-4 (Sheet 3 of 5).

CRUISE PERFORMANCE 10,000

NORMAL LEAN MIXTURE

Standard Atmosphere • Zero Wind • Gross Weight-3000 Pounds

10,000 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	20	65	184	12.3	5.2	950	6.5	1200
	19	61	179	11.5	5.5	995	7.0	1250
	18	57	174	10.7	5.9	1035	7.5	1305
	17	52	169	10.0	6.4	1075	8.0	1355
2300	20	59	177	11.1	5.7	1010	7.2	1275
	19	55	173	10.4	6.1	1050	7.7	1325
	18	51	168	9.8	6.5	1090	8.2	1370
	17	48	162	9.1	6.9	1125	8.7	1420
2200	20	55	173	10.4	6.1	1050	7.7	1325
	19	52	168	9.9	6.4	1085	8.1	1365
	18	48	163	9.2	6.9	1120	8.7	1410
	17	44	158	8.7	7.3	1155	9.2	1450
2100	20	50	166	9.5	6.7	1105	8.4	1390
	19	47	161	9.0	7.0	1135	8.9	1430
	18	44	156	8.5	7.4	1160	9.4	1465
	17	40	150	8.0	7.9	1185	9.9	1495
	16	37	144	7.6	8.4	1205	10.5	1520
	15	34	137	7.1	8.9	1215	11.2	1530
	14	30	126	6.6	9.6	1200	12.0	1510

Figure 7-4 (Sheet 4 of 5).

15-20,000 CRUISE PERFORMANCE

NORMAL LEAN MIXTURE

Standard Atmosphere • Zero Wind • Gross Weight-3000 Pounds

15,000 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	16	51	176	9.8	6.5	1140	8.2	1435
	15	47	170	9.1	6.9	1180	8.8	1485
	14	42	160	8.3	7.6	1220	9.6	1540
	13	39	152	7.8	8.1	1240	10.3	1565
2300	16	46	168	9.0	7.1	1190	8.9	1495
	15	43	162	8.4	7.5	1215	9.5	1530
	14	39	153	7.8	8.1	1245	10.3	1565
	13	35	144	7.3	8.7	1250	10.9	1575
2200	16	44	163	8.5	7.4	1210	9.4	1525
	15	40	156	8.0	7.9	1235	10.0	1555
	14	36	147	7.5	8.5	1250	10.7	1575
2100	16	40	155	7.9	8.0	1235	10.1	1560
	15	36	148	7.5	8.5	1250	10.7	1575
	14	33	136	7.0	9.1	1235	11.4	1555

20,000 FEET

RPM	MP	% BHP	TAS MPH	Gal/ Hour	63.5 Gal. (No Reserve) Endr. Hours	63.5 Gal. (No Reserve) Range Miles	80 Gal. (No Reserve) Endr. Hours	80 Gal. (No Reserve) Range Miles
2450	13.5	43	168	8.4	7.5	1265	9.5	1595
	13	41	165	8.2	7.7	1275	9.7	1605
	12	37	152	7.6	8.4	1275	10.6	1605
2300	13.5	39	159	7.9	8.1	1285	10.2	1620
	13	37	155	7.6	8.3	1285	10.5	1620

Figure 7-4 (Sheet 5 of 5).

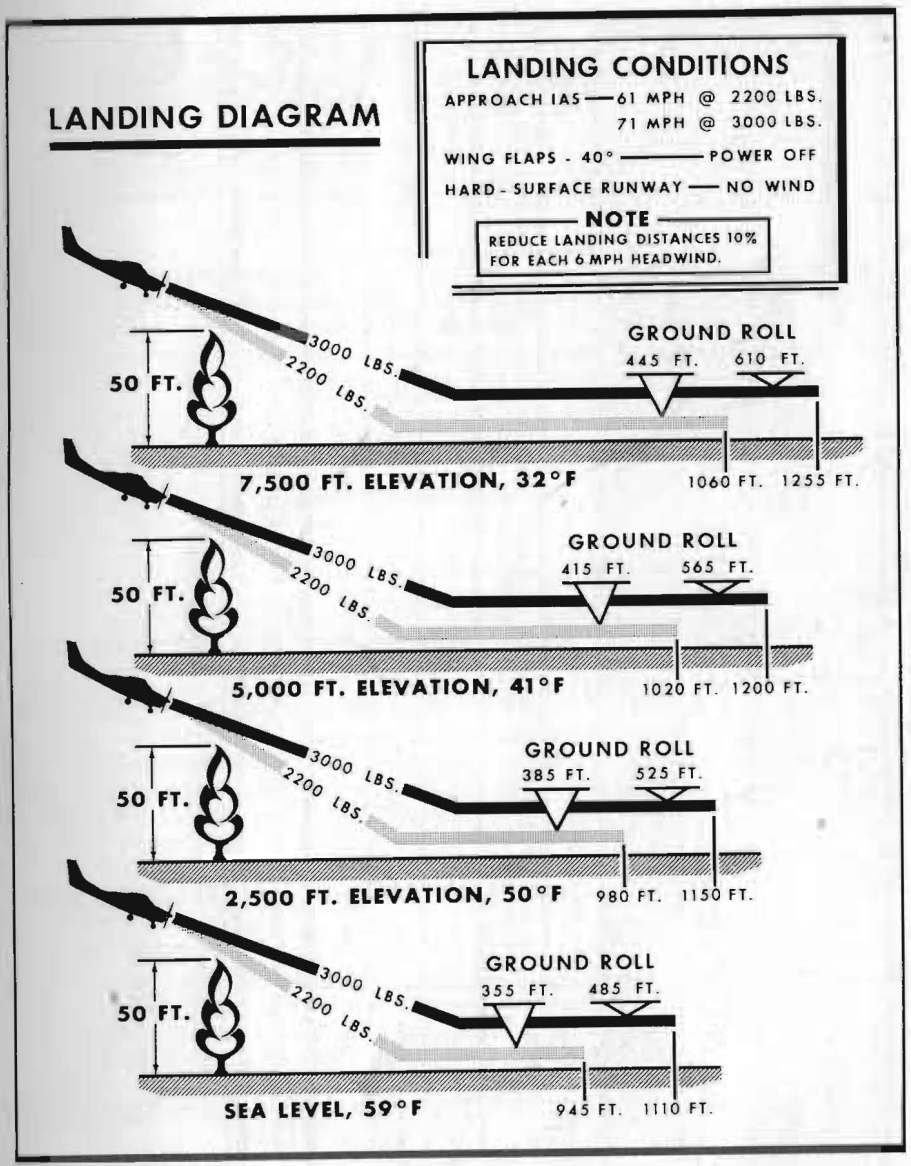
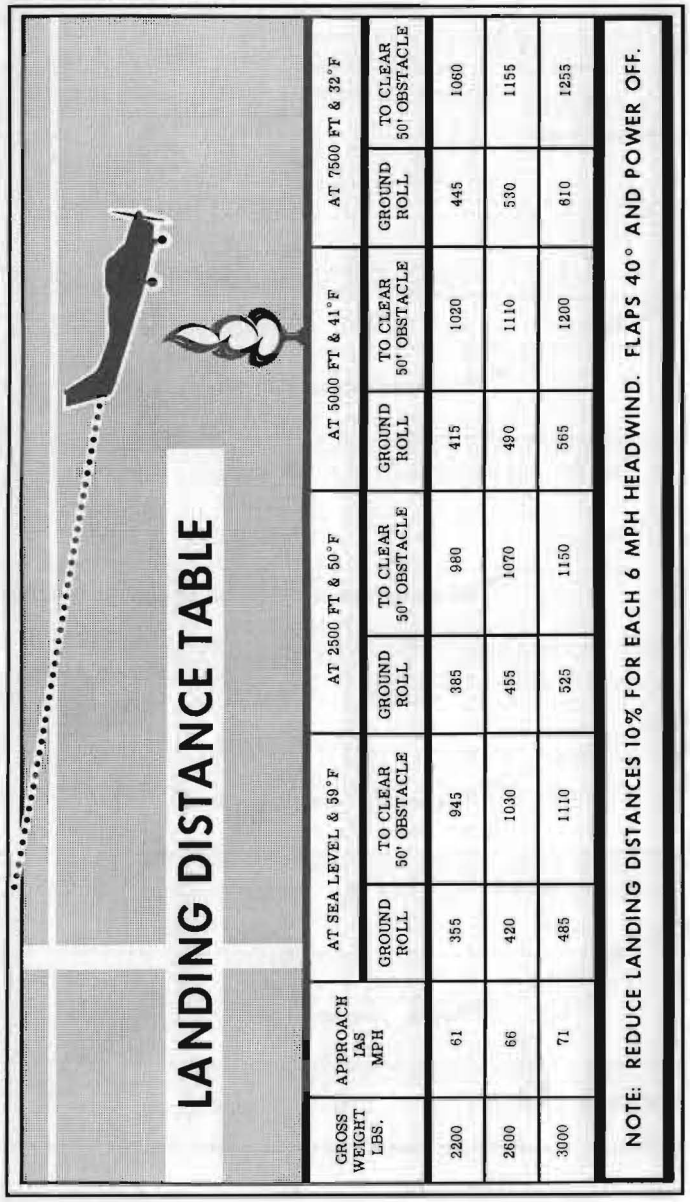


Figure 7-5.



LANDING DISTANCE TABLE

GROSS WEIGHT LBS.	APPROACH IAS MPH	AT SEA LEVEL & 59°F		AT 2500 FT & 50°F		AT 5000 FT & 41°F		AT 7500 FT & 32°F	
		GROUND ROLL	TO CLEAR 50' OBSTACLE	GROUND ROLL	TO CLEAR 50' OBSTACLE	GROUND ROLL	TO CLEAR 50' OBSTACLE	GROUND ROLL	TO CLEAR 50' OBSTACLE
2200	61	355	945	385	980	415	1020	445	1060
2600	66	420	1030	455	1070	490	1110	530	1155
3000	71	485	1110	525	1150	565	1200	610	1255

NOTE: REDUCE LANDING DISTANCES 10% FOR EACH 6 MPH HEADWIND. FLAPS 40° AND POWER OFF.

Figure 7-6.

Section VIII
optional systems

This section contains a description, operating procedures, and performance data (when applicable) for the "major item" optional equipment systems in your airplane. Only optional equipment requiring detailed coverage, for efficient utilization of the system, is discussed here. Optional equipment of a more simple nature is discussed in other portions of this manual.

RADIO SELECTOR SWITCHES

RADIO SELECTOR SWITCH OPERATION.

Operation of the radio equipment is normal as covered in the respective radio manuals. When more than one radio is installed, an audio switching system is necessary. The operation of this switching system is described below.

TRANSMITTER SELECTOR SWITCH.

The transmitter selector switch has two positions. When two transmitters are installed, it is necessary to switch the microphone and antenna to the radio unit the pilot desires to use for transmission. This is accomplished by placing the transmitter selector switch in position 1 or 2 corresponding to the radio unit which is to be used.

SPEAKER-PHONE SWITCHES.

The speaker-phone switches determine whether the output of the receiver in use is fed to the headphones or through the audio amplifier to the

speaker. Place the switch for the desired receiving system either in the up position for speaker operation or in the down position for headphones.

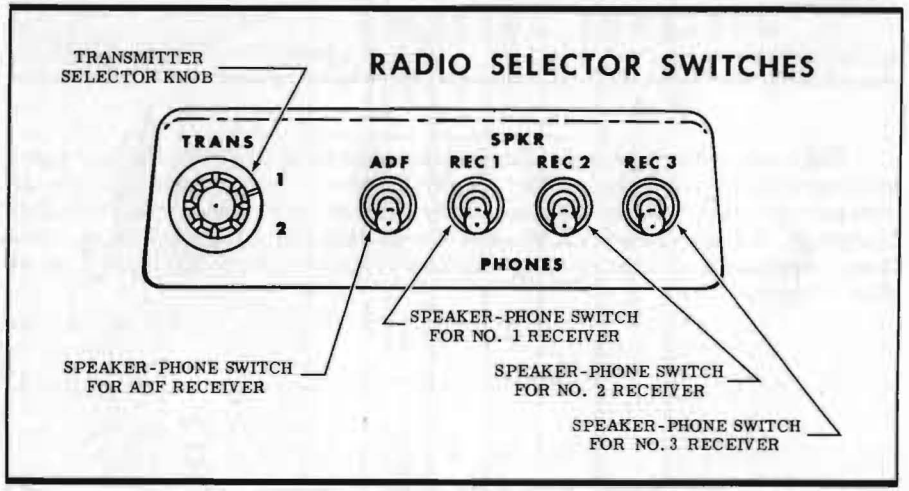


Figure 8-1.

NAV-O-MATIC

DESCRIPTION

NAV-O-MATIC.

The Cessna NAV-O-MATIC flight controller is an electronic, single-axis autopilot featuring a transistorized heading hold circuit.

The NAV-O-MATIC provides complete lateral stability, thereby giving the pilot additional time for navigational and visual flight operation by relieving him of most control duties between take-off and landing. The NAV-O-MATIC also provides heading holding capability. When the autopilot is engaged and trimmed, the airplane will hold a desired heading automatically. System components include a command control unit (see figure 8-2) and an inclined rate gyro mounted behind the instrument panel. The system also includes a signal amplifier with heading hold

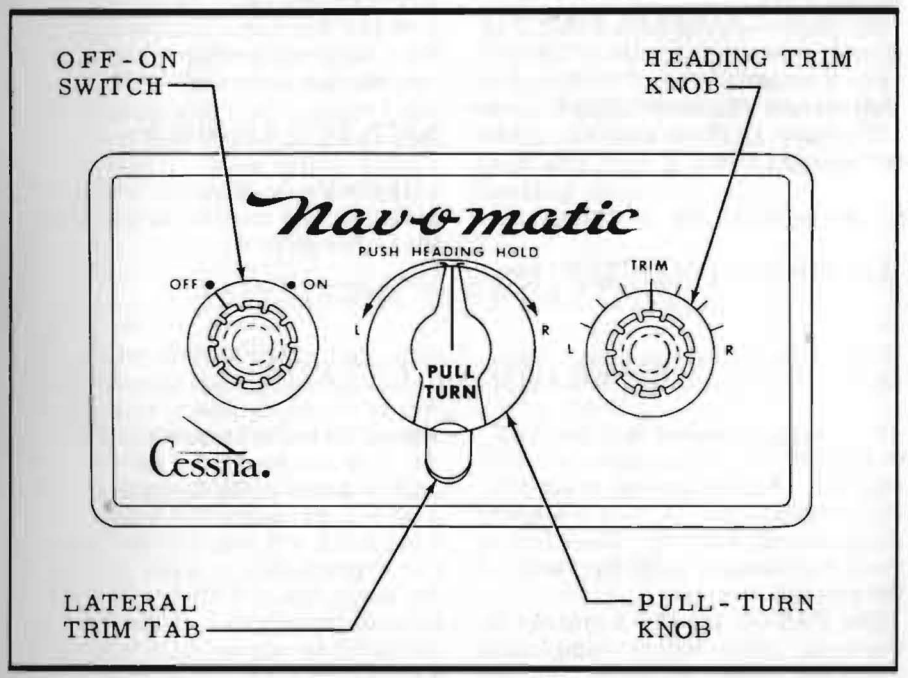


Figure 8-2.

circuit, motor driven servo with electro-magnetic clutch connected to the aileron bellcrank and the necessary wiring.

OPERATING CHECK LIST

TAKE-OFF.

(1) NAV-O-MATIC "OFF-ON" switch in OFF position.

CRUISE.

A. TO ENGAGE AUTOPILOT.

(1) Trim the aircraft for straight flight.
(2) Center LATERAL TRIM TAB (located below "PULL-TURN" knob).
(3) Center "PULL-TURN" knob.
(4) Center "HEADING TRIM" knob.
(5) Turn NAV-O-MATIC "OFF-ON" switch ON.

B. OPERATION OF AUTOPILOT.

(1) Pull out "PULL-TURN" knob.
(2) Adjust LATERAL TRIM TAB as required to level aircraft.
(3) Push in "PULL-TURN" knob to engage heading hold.
(4) Make fine adjustments to hold heading by use of the "TRIM" knob. After each new trim setting, disengage and re-engage "PULL-TURN" knob.
(5) To turn to new heading, pull out "PULL-TURN" knob and rotate it in the desired direction. Center knob and push in when aircraft is on new heading and wings are level.

BEFORE LANDING.

(1) NAV-O-MATIC "OFF-ON" switch in OFF position before entering traffic pattern.

OPERATING DETAILS

It is recommended that the NAV-O-MATIC not be engaged prior to take-off. Forces applied to the control system by the autopilot are easily overpowered; however, these forces could significantly alter the "feel" of the aircraft controls.

The NAV-O-MATIC requires no warm-up period before engagement since the system employs transistors and the rate gyro is operating when the aircraft's master switch is on. It is not mandatory that the procedure listed in the Operating Check List for engaging the autopilot be used, but it will result in the smoothest engagement. If the setting of the autopilot is different from the trim of the aircraft at the time the autopilot is engaged, it will cause a brisk change of attitude; however, no excessive loads will be imposed on the airplane.

Although the autopilot may be easily overpowered at any time, this practice should be minimized since some servo clutch wear will result from long periods of manually overpowering the system.

With the aircraft trimmed and the NAV-O-MATIC engaged, as outlined in the check list, the NAV-O-MATIC can then be adjusted to hold a heading. If, after a short period, the aircraft is found to be drifting from heading, the "HEADING TRIM" knob is used to compensate for this. Once the owner is experienced with the proper trimming of the heading hold circuit, it will be easy to find a setting that will allow the NAV-O-MATIC to hold a heading. Heading adjustment with the "TRIM" knob can be expedited by disengaging and re-engaging the "PULL-TURN" knob after each new trim setting. This action erases the memory of previous trim settings and airplane heading deviations, allowing the new trim signal to be transmitted more rapidly to the autopilot servos.

NOTE

An aircraft out of trim condition will result in the NAV-O-MATIC causing the aircraft to fly with one wing low to maintain a heading. If objectionable, this can be corrected by centering the ball in the turn and bank indicator with the rudder pedals or the rudder trim control.

The "PULL-TURN" knob can be used to turn to a new heading by pulling out to disengage the heading hold circuit and turning in the desired direction. When the aircraft is on the new heading, center the knob and push in to re-engage the heading circuit.

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 turning the NAV-O-MATIC "OFF-ON" switch OFF.

Notes

OXYGEN SYSTEM

An oxygen system, supplying oxygen through five individual outlets, is available as optional equipment. The system is completely automatic and requires no manual regulation for change of altitude or flow shut-off when the system is not in use.

The system consists of an oxygen cylinder, filler valve, pressure gage, pressure regulator, outlet couplings, and four disposable oxygen face masks, complete with vinyl plastic hoses and flow indicators. The face masks and hoses are stored in a plastic bag, normally stowed on the utility shelf when use is not anticipated.

The oxygen cylinder and shut-off valve are located aft of the baggage compartment. Oxygen, under high pressure, flows from the cylinder to an automatic pressure regulator which supplies filtered, low pressure oxygen to five individual outlets. The outlets, regulator, and a pressure gage that indicates oxygen cylinder pressure, are located in the overhead console panel. When the oxygen mask hoses are plugged into the quick-disconnect outlet couplings, a continuous flow of oxygen is supplied to each face mask. A flow indicator in each mask supply line shows if oxygen is flowing.

IMPORTANT

Permit no smoking when using oxygen. Oil, grease, soap, and other fatty materials in contact with oxygen constitute a serious fire hazard. Be sure hands and clothing are oil-free before handling oxygen equipment.

OXYGEN SYSTEM OPERATION

Prior to flight, check to see that the oxygen cylinder shut-off valve, located on the cylinder behind the baggage compartment rear wall, is full open (full counterclockwise). Note the oxygen pressure gage reading to be sure that there is an adequate oxygen supply for the trip. Refer to the Oxygen Duration Chart (figure 8-4). See that the plastic bag containing the face masks and hoses is accessible, and that the masks and hoses are in good condition.

To use the oxygen system, proceed as follows:

(1) Select mask and hose from plastic bag.
(2) If mask is not connected to hose, attach by inserting plastic tube on mask into rubber hose connector on delivery hose.
(3) Attach mask to face.
(4) Select oxygen outlet coupling in overhead console panel and plug delivery hose into it. Oxygen will flow continously at the proper rate-of-flow for any altitude without any manual adjustments.
(5) Check the flow indicator in the face mask hose. Oxygen is flowing if the red indicator compresses its return spring.

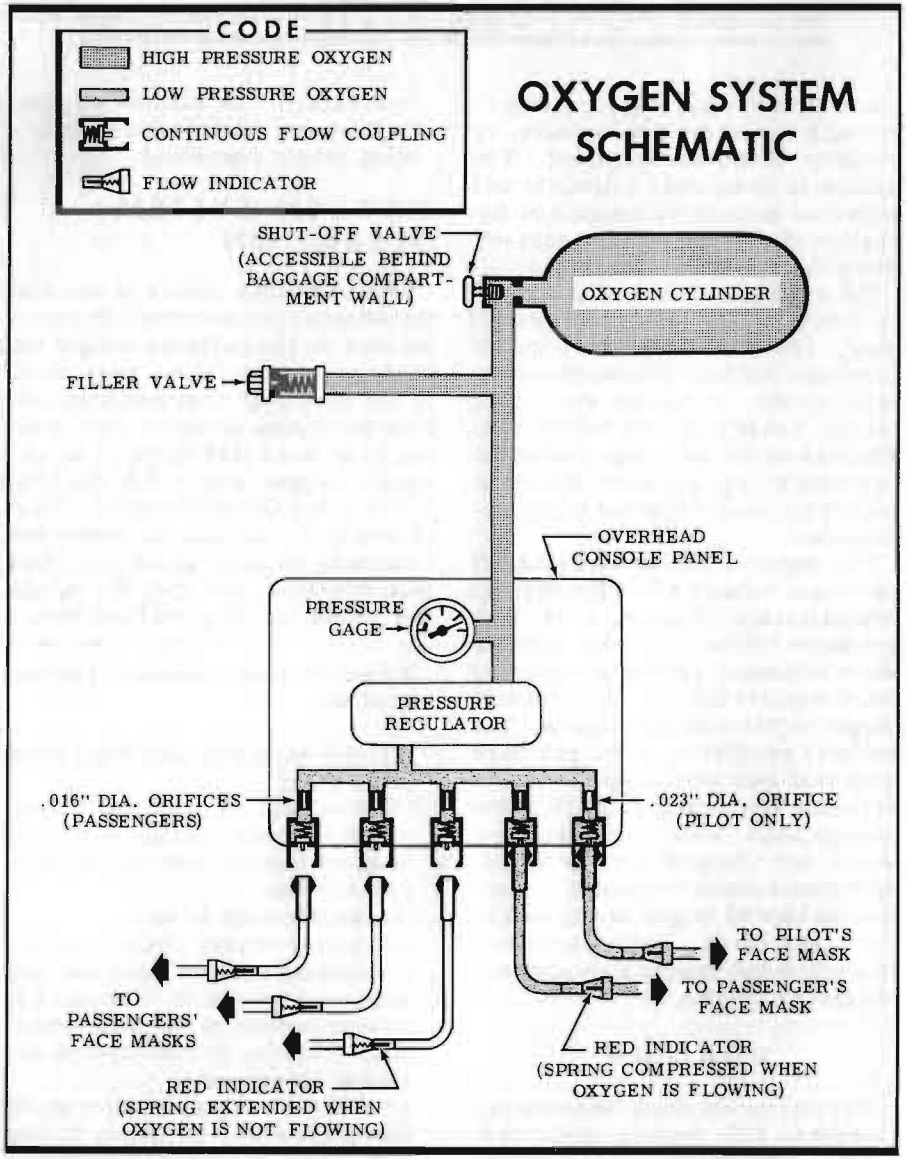


Figure 8-3.

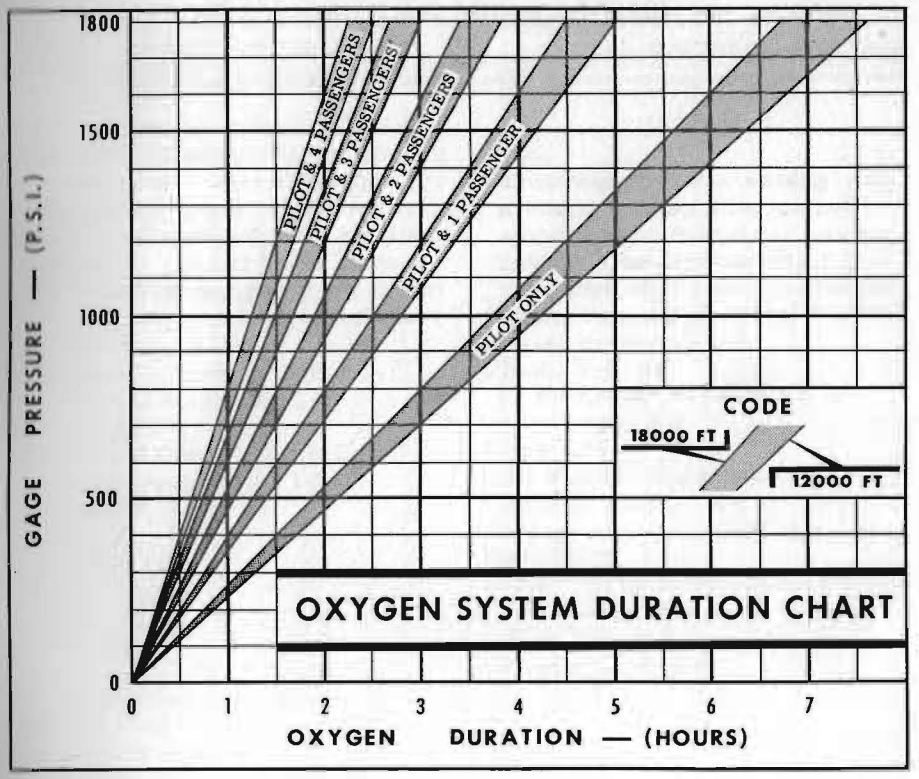


Figure 8-4.

NOTE

The left console outlet (labeled "PILOT") meters approximately twice the volume of oxygen metered by the other outlets.

(6) Unplug the delivery hose from the overhead console when discontinuing use of the oxygen system. This automatically stops the flow of oxygen.

OXYGEN SYSTEM SERVICING

The oxygen cylinder, when fully charged, contains 48 cubic feet of oxygen, under a pressure of 1800 psi at 70°F. It should be refilled, whenever the oxygen pressure gage indicates less than 300 psi, with aviators' breathing oxygen (Fed. Spec. No. BB-O-925, or equivalent). For servicing convenience, a filler valve is

located on the left side of the utility shelf near the baggage door.

IMPORTANT

Oil, grease, or other lubricants in contact with oxygen create a serious fire hazard, and such contact must be avoided. Only a thread compound approved under MIL-T-5542 can be used safely on oxygen systems. Apply only to the first three threads of male fittings to prevent thread seizure.

The face masks used with the oxygen system are the partial-rebreathing, disposable type. The masks are durable and the frequent user can mark his mask for identification and reuse it many times. Additional masks and hoses are available from your Cessna Dealer.

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WARRANTY

■ The Cessna Aircraft Company warrants each new aircraft manufactured by it to be free from defects in material and workmanship under normal use and service, provided, however, that this warranty is limited to making good at The Cessna Aircraft Company's factory any part or parts thereof which shall, within six (6) months after delivery of such aircraft to the original purchaser, be returned to Cessna with transportation charges prepaid, and which upon Cessna's examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on the part of Cessna, and Cessna neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of its aircraft.

■ This warranty shall not apply to any aircraft which shall have been repaired or altered outside Cessna's factory in any way so as, in Cessna's judgment, to affect the aircraft's stability or reliability, or which aircraft has been subject to misuse, negligence or accident.

"LOOK FOR THE RED AND
BLUE CESSNA PENNANTS
FOR THAT EXTRA SERVICE
WHERE IT COUNTS WHEN
YOU NEED IT".

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS