

CESSNA
MODEL U206G

COVERAGE/REVISIONS/
LOG OF EFFECTIVE PAGES

COVERAGE

The Pilot's Operating Handbook in the airplane at the time of delivery from Cessna Aircraft Company contains information applicable to the 1979 Model U206G airplane designated by the serial number and registration number shown on the Title Page of this handbook.

REVISIONS

Changes and/or additions to this handbook will be covered by revisions published by Cessna Aircraft Company. These revisions are distributed to all Cessna Dealers and to owners of U. S. Registered aircraft according to FAA records at the time of revision issuance.

Revisions should be examined immediately upon receipt and incorporated in this handbook.

NOTE

It is the responsibility of the owner to maintain this handbook in a current status when it is being used for operational purposes.

Owners should contact their Cessna Dealer whenever the revision status of their handbook is in question.

A revision bar will extend the full length of new or revised text and/or illustrations added on new or presently existing pages. This bar will be located adjacent to the applicable revised area on the outer margin of the page.

All revised pages will carry the revision number and date on the applicable page.

The following Log of Effective Pages provides the dates of issue for original and revised pages, and a listing of all pages in the handbook. Pages affected by the current revision are indicated by an asterisk (*) preceding the pages listed.

LOG OF EFFECTIVE PAGES

Dates of issue for original and revised pages are:

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Revision 2 5 December 1980

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NOTE

Refer to Section 9 Table of Contents for supplements applicable to optional systems.

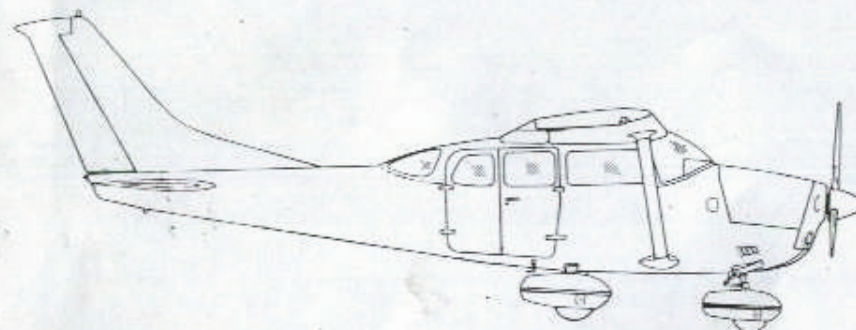
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THIS FLIGHT MANUAL FORMS PART OF
THE AIRCRAFT'S COFA TRAINING MANUALS ST BE
CARRIED IN THE AIRCRAFT FLIGHTS.

For Cessna 10-71

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL



CESSNA AIRCRAFT COMPANY

1979 MODEL U206G

THIS DOCUMENT MUST BE
CARRIED IN THE AIRPLANE
AT ALL TIMES.

TRAINING MANUALS 55



for Cessna

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE
FURNISHED TO THE PILOT BY CAR PART 3 AND CONSTITUTES
THE FAA APPROVED AIRPLANE FLIGHT MANUAL.

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WICHITA, KANSAS, USA

D1147-13PH-RPC-475-9/78

1 OCTOBER 1978

with an electrical load on the system, such as during a low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to de-activate the alternator system.

If the over-voltage sensor should shut down the alternator, a discharge rate will be shown on the ammeter followed by illumination of the low-voltage warning light. Since this may be a "nuisance" trip-out, an attempt should be made to reactivate the alternator system. To do this, turn the avionics power switch off, then turn both sides of the master switch off and then on again. If the problem no longer exists, normal alternator charging will resume and the low-voltage light will go off. The avionics power switch may then be turned back on. If the light illuminates again, a malfunction is confirmed. In this event, the flight should be terminated and/or the current drain on the battery minimized because the battery can supply the electrical system for only a limited period of time. If the emergency occurs at night, power must be conserved for later use of the landing lights and flaps during landing.

CARGO DOOR EMERGENCY EXIT

If it is necessary to use the cargo doors as an emergency exit and the wing flaps are not extended, open the forward door and exit. If the wing flaps are extended, open the doors in accordance with the instructions shown on the placard which is mounted on the forward cargo door.

EXCESSIVE FUEL VAPOR INDICATIONS

Excessive fuel vapor indications are most likely to appear during climb and the first hour of cruise on each tank, especially when operating at higher altitudes or in unusually warm temperatures.

Indications of excessive fuel vapor accumulation are fuel flow gage fluctuations greater than 1 gal./hr. This condition with leaner mixtures or with larger fluctuations may result in power surges, and if not corrected, may cause a large or total power loss.

To eliminate vapor and stabilize fuel flows, follow the Fuel Flow Stabilization Procedures checklist. If a large or total power loss occurs before the stabilization procedures can be started, immediately perform the In-Flight Engine Restarting Procedures checklist for prompt restoration of power.

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Revision 1 - 22 May 1979

evidence of spark plug or magneto trouble. Assuming that spark plugs are the more likely cause, lean the mixture to the recommended lean setting for cruising flight. If the problem does not clear up in several minutes, determine if a richer mixture setting will produce smoother operation. If not, proceed to the nearest airport for repairs using the BOTH position of the ignition switch unless extreme roughness dictates the use of a single ignition position.

MAGNETO MALFUNCTION

A sudden engine roughness or misfiring is usually evidence of magneto problems. Switching from BOTH to either L or R ignition switch position will identify which magneto is malfunctioning. Select different power settings and enrichen the mixture to determine if continued operation on BOTH magnetos is practicable. If not, switch to the good magneto and proceed to the nearest airport for repairs.

ENGINE-DRIVEN FUEL PUMP FAILURE

Failure of the engine-driven fuel pump will be evidenced by a sudden reduction in the fuel flow indication prior to a loss of power, while operating from a fuel tank containing adequate fuel.

In the event of an engine-driven fuel pump failure during takeoff, immediately hold the left half of the auxiliary fuel pump switch in the HI position until the airplane is well clear of obstacles. Upon reaching a safe altitude, and reducing the power to a cruise setting, release the HI side of the switch. The ON position will then provide sufficient fuel flow to maintain engine operation while maneuvering for a landing.

If an engine-driven fuel pump failure occurs during cruising flight, apply full rich mixture and hold the left half of the auxiliary fuel pump switch in the HI position to re-establish fuel flow. Then the normal ON position (the right half of the fuel pump switch) may be used to sustain level flight. If necessary, additional fuel flow is obtainable by holding the left half of the pump switch in the HI position.

LOW OIL PRESSURE

If low oil pressure is accompanied by normal oil temperature, there is a possibility the oil pressure gage or relief valve is malfunctioning. A leak in the line to the gage is not necessarily cause for an immediate precautionary landing because an orifice in this line will prevent a sudden loss of oil from the engine sump. However, a landing at the nearest airport would be advisable to inspect the source of trouble.

If a total loss of oil pressure is accompanied by a rise in oil tempera-

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THIS MANUAL WAS PROVIDED FOR THE AIRPLANE
IDENTIFIED ON THE TITLE PAGE ON _____.
SUBSEQUENT REVISIONS SUPPLIED BY CESSNA
AIRCRAFT COMPANY MUST BE PROPERLY IN-
SERTED.

CESSNA AIRCRAFT COMPANY, PAWNEE DIVISION

This is a duplicate manual issued to replace one
originally provided for the airplane identified on the
cover page on 10-18-78. All revisions, if
any, have been incorporated as of
8-14-84.

Subsequent revisions supplied by Cessna Aircraft
Company must be properly inserted.

Paul C. Million
Cessna Aircraft Co. Pawnee Div.

SECTION 1 GENERAL

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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. It is our desire that you will find flying it, either for business or pleasure, a pleasant and profitable experience.

This Pilot's Operating Handbook 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 Customer Services Department stands ready to serve you. The following services are offered by most Cessna Dealers:

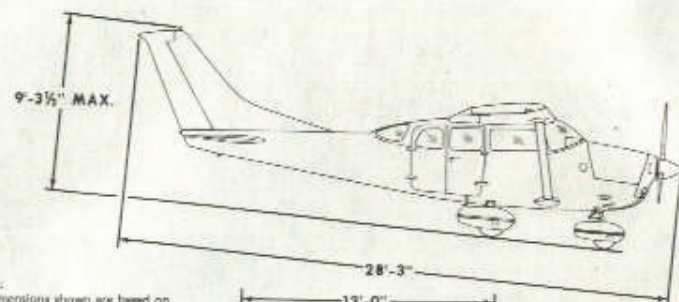
- THE CESSNA WARRANTY, which provides coverage for parts and labor, is available at Cessna Dealers worldwide. Specific benefits and provisions of warranty, plus other important benefits for you, are contained in your Customer Care Program book, supplied with your airplane. Warranty service is available to you at authorized Cessna Dealers throughout the world upon presentation of your Customer Care Card which establishes your eligibility under the warranty.
- FACTORY TRAINED PERSONNEL to provide you with courteous expert service.
- FACTORY APPROVED SERVICE EQUIPMENT to provide you efficient and accurate workmanship.
- A STOCK OF GENUINE CESSNA SERVICE PARTS on hand when you need them.
- THE LATEST AUTHORITATIVE INFORMATION FOR SERVICING CESSNA AIRPLANES, since Cessna Dealers have all of the Service Manuals and Parts Catalogs, kept current by Service Letters and Service News Letters, published by Cessna Aircraft Company.

We urge all Cessna owners to use the Cessna Dealer Organization to the fullest.

A current Cessna Dealer Directory accompanies your new airplane. The Directory is revised frequently, and a current copy can be obtained from your Cessna Dealer. Make your Directory one of your cross-country flight planning aids; a warm welcome awaits you at every Cessna Dealer.

SECTION 1 GENERAL

CESSNA
MODEL U206G



NOTES:

1. Dimensions shown are based on standard empty weight and proper nose gear and tire inflation.
2. Dimensions shown reflect standard nose and main gear tire installation.
3. Wing span shown with strobe lights installed.
4. Maximum height shown with nose gear depressed as far as possible.
5. Wheel base length is 69 1/4".
6. Propeller ground clearance is 11 3/4".
7. Wing area is 174 square feet.
8. Minimum turning radius (to pivot point to outboard wing tip) is 25'.

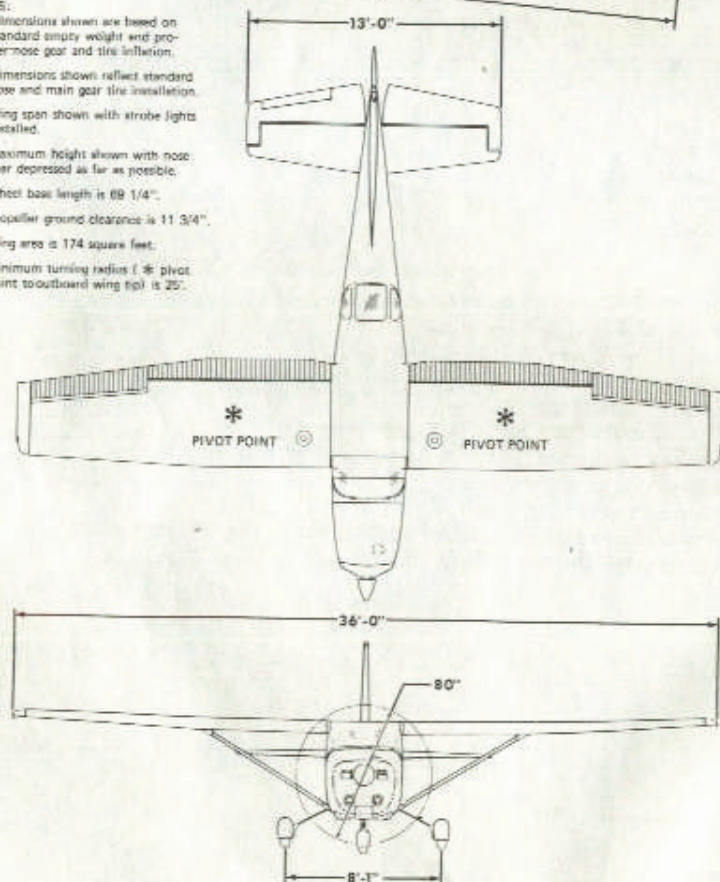


Figure 1-1. Three View

PERFORMANCE- SPECIFICATIONS

CESSNA
MODEL U206G

PERFORMANCE - SPECIFICATIONS

SPEED:

Maximum at Sea Level	156 KNOTS
Cruise, 75% Power at 6500 Ft	147 KNOTS

CRUISE: Recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve at 45% power.

75% Power at 6500 Ft	Range	725 NM
88 Gallons Usable Fuel	Time	5.0 HRS
Maximum Range at 10,000 Ft	Range	900 NM
88 Gallons Usable Fuel	Time	7.8 HRS

RATE OF CLIMB AT SEA LEVEL	920 FPM
SERVICE CEILING	14,800 FT

TAKEOFF PERFORMANCE:

Ground Roll	900 FT
Total Distance Over 50-Ft Obstacle	1780 FT

LANDING PERFORMANCE:

Ground Roll	735 FT
Total Distance Over 50-Ft Obstacle	1395 FT

STALL SPEED (CAS):

Flaps Up, Power Off	62 KNOTS
Flaps Down, Power Off	54 KNOTS

MAXIMUM WEIGHT:

Ramp	3612 LBS
Takeoff or Landing	3600 LBS

STANDARD EMPTY WEIGHT:

Stationair 6 (6 Seats)	1919 LBS
Stationair 6 II (6 Seats)	1980 LBS
Utility Option (1 Seat)	1817 LBS
II Utility Option (1 Seat)	1877 LBS

MAXIMUM USEFUL LOAD:

Stationair 6 (6 Seats)	1693 LBS
Stationair 6 II (6 Seats)	1632 LBS
Utility Option (1 Seat)	1795 LBS
II Utility Option (1 Seat)	1735 LBS

BAGGAGE ALLOWANCE

WING LOADING: Pounds/Sq Ft	20.7
POWER LOADING: Pounds/HP	12.0

FUEL CAPACITY: Total

OIL CAPACITY	92 GAL.
ENGINE: Teledyne Continental, Fuel Injection	12 QTS
300 BHP at 2850 RPM (5-Minute Takeoff Rating)	10-520-F

285 BHP at 2700 RPM (Maximum Continuous Rating)
PROPELLER: 3-Bladed Constant Speed, Diameter

80 IN.

STANDARD AIRPLANE WEIGHTS

Standard Empty Weight, Stationair 6 (6 Seats): 1919 lbs.
Stationair 6 II (6 Seats): 1980 lbs.
Utility Option (1 Seat): 1817 lbs.
II Utility Option (1 Seat): 1877 lbs.
Maximum Useful Load, Stationair 6 (6 Seats): 1693 lbs.
Stationair 6 II (6 Seats): 1632 lbs.
Utility Option (1 Seat): 1795 lbs.
II Utility Option (1 Seat): 1735 lbs.

CABIN AND ENTRY DIMENSIONS

Detailed dimensions of the cabin interior and entry door opening are illustrated in Section 6.

BAGGAGE SPACE AND CARGO DOOR ENTRY DIMENSIONS

Dimensions of the baggage/cargo area and cargo door opening are illustrated in detail in Section 6.

SPECIFIC LOADINGS

Wing Loading: 20.7 lbs./sq. ft.
Power Loading: 12.0 lbs./hp.

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

KCAS	Knots Calibrated Airspeed is indicated airspeed corrected for position and instrument error and expressed in knots. Knots calibrated airspeed is equal to KTAS in standard atmosphere at sea level.
KIAS	Knots Indicated Airspeed is the speed shown on the airspeed indicator and expressed in knots.
KTAS	Knots True Airspeed is the airspeed expressed in knots relative to undisturbed air which is KCAS corrected for altitude and temperature.
V _A	Maneuvering Speed is the maximum speed at which you may use abrupt control travel.

INTRODUCTION

This handbook contains 9 sections, and includes the material required to be furnished to the pilot by CAR Part 3. It also contains supplemental data supplied by Cessna Aircraft Company.

Section 1 provides basic data and information of general interest. It also contains definitions or explanations of symbols, abbreviations, and terminology commonly used.

DESCRIPTIVE DATA

ENGINE

Number of Engines: 1.
Engine Manufacturer: Teledyne Continental.
Engine Model Number: IO-520-F.
Engine Type: Normally-aspirated, direct-drive, air-cooled, horizontally-opposed, fuel-injected, six-cylinder engine with 520 cu. in. displacement.
Horsepower Rating and Engine Speed:
Maximum Power (5 minutes - takeoff): 300 rated BHP at 2850 RPM.
Maximum Continuous Power: 285 rated BHP at 2700 RPM.

PROPELLER

Propeller Manufacturer: McCauley Accessory Division.
Propeller Model Number: D3A34C404/80VA-0.
Number of Blades: 3.
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.5 inches.
Propeller Type: Constant speed and hydraulically actuated, with a low pitch setting of 11.0° and a high pitch setting of 27.0° (30 inch station).

FUEL

Approved Fuel Grades (and Colors):
100LL Grade Aviation Fuel (Blue).
100 (Formerly 100/130) Grade Aviation Fuel (Green).
Total Capacity: 92 gallons.
Total Capacity Each Tank: 46 gallons.
Total Usable: 88 gallons.

SECTION 1
GENERAL

CESSNA
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- V_{FE} **Maximum Flap Extended Speed** is the highest speed permissible with wing flaps in a prescribed extended position.
- V_{NO} **Maximum Structural Cruising Speed** is the speed that should not be exceeded except in smooth air, then only with caution.
- V_{NE} **Never Exceed Speed** is the speed limit that may not be exceeded at any time.
- V_S **Stalling Speed** or the minimum steady flight speed at which the airplane is controllable.
- V_{S_0} **Stalling Speed** or the minimum steady flight speed at which the airplane is controllable in the landing configuration at the most forward center of gravity.
- V_X **Best Angle-of-Climb Speed** is the speed which results in the greatest gain of altitude in a given horizontal distance.
- V_Y **Best Rate-of-Climb Speed** is the speed which results in the greatest gain in altitude in a given time.

METEOROLOGICAL TERMINOLOGY

- OAT **Outside Air Temperature** is the free air static temperature. It is expressed in either degrees Celsius or degrees Fahrenheit.
- Standard Temperature **Standard Temperature** is 15°C at sea level pressure altitude and decreases by 2°C for each 1000 feet of altitude.
- Pressure Altitude **Pressure Altitude** is the altitude read from an altimeter when the altimeter's barometric scale has been set to 29.92 inches of mercury (1013 mb).

ENGINE POWER TERMINOLOGY

- BHP **Brake Horsepower** is the power developed by the engine. Percent power values in this handbook are based on the maximum continuous power rating.
- RPM **Revolutions Per Minute** is engine speed.
- MP **Manifold Pressure** is a pressure measured in the engine's

SECTION 1
GENERAL

CESSNA
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OIL

Oil Grade (Specification):

MIL-L-6082 Aviation Grade Straight Mineral Oil: Use to replenish supply during first 25 hours and at the first 25-hour oil change. Continue to use until a total of 50 hours has accumulated or oil consumption has stabilized.

NOTE

The airplane was delivered from the factory with a corrosion preventive aircraft engine oil. This oil should be drained after the first 25 hours of operation.

Continental Motors Specification MHS-24 (and all revisions thereto), Ashless Dispersant Oil: This oil **must be used** after first 50 hours or oil consumption has stabilized.

Recommended Viscosity for Temperature Range:

SAE 50 above 4°C (40°F).
SAE 10W30 or SAE 30 below 4°C (40°F).

NOTE

Multi-viscosity oil with a range of SAE 10W30 is recommended for improved starting in cold weather.

Oil Capacity:

Sump: 12 Quarts.
Total: 13 Quarts (if oil filter installed).

MAXIMUM CERTIFICATED WEIGHTS

Ramp: 3612 lbs.
Takeoff: 3600 lbs.
Landing: 3600 lbs.
Weight in Baggage Compartment - Station 109 to 145: 180 lbs maximum

NOTE

Refer to Section 6 of this handbook for loading arrangements with one or more seats removed for cargo accommodation.

SECTION 2 LIMITATIONS

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induction system and is expressed in inches of mercury (Hg).

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Demonstrated Crosswind Velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown is not considered to be limiting.

Usable Fuel is the fuel available for flight planning.

Unusable Fuel is the quantity of fuel that can not be safely used in flight.

GPH is the amount of fuel (in gallons) consumed per hour.

NMPG is the distance (in nautical miles) which can be expected per gallon of fuel consumed at a specific engine power setting and/or flight configuration.

g is acceleration due to gravity.

WEIGHT AND BALANCE TERMINOLOGY

Reference Datum is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.

Station is a location along the airplane fuselage given in terms of the distance from the reference datum.

Arm is the horizontal distance from the reference datum to the center of gravity (C.G.) of an item.

Moment is the product of the weight of an item multiplied by its arm. (Moment divided by the constant 1000 is used in this handbook to simplify balance calculations by reducing the number of digits.)

Center of Gravity (C.G.) is the point at which an airplane, or equipment, would balance if suspended. Its distance from the reference datum is found by dividing the total moment

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GENERAL

CESSNA
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by the total weight of the airplane.

C.G.
Arm

Center of Gravity Arm is the arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.

C.G.
Limits

Center of Gravity Limits are the extreme center of gravity locations within which the airplane must be operated at a given weight.

Standard
Empty
Weight

Standard Empty Weight is the weight of a standard airplane, including unusable fuel, full operating fluids and full engine oil.

Basic Empty
Weight

Basic Empty Weight is the standard empty weight plus the weight of optional equipment.

Useful
Load

Useful Load is the difference between ramp weight and the basic empty weight.

Maximum
Ramp
Weight

Maximum Ramp Weight is the maximum weight approved for ground maneuver. (It includes the weight of start, taxi and runup fuel.)

Maximum
Takeoff
Weight

Maximum Takeoff Weight is the maximum weight approved for the start of the takeoff run.

Maximum
Landing
Weight

Maximum Landing Weight is the maximum weight approved for the landing touchdown.

Tare

Tare is the weight of chocks, blocks, stands, etc. used when weighing an airplane, and is included in the scale readings. Tare is deducted from the scale reading to obtain the actual (net) airplane weight.

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White Arc	46 - 100	Full Flap Operating Range. Lower limit is maximum weight V_{SO} in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Arc	55 - 149	Normal Operating Range. Lower limit is maximum weight V_S at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Arc	149 - 183	Operations must be conducted with caution and only in smooth air.
Red Line	183	Maximum speed for all operations.

Figure 2-2. Airspeed Indicator Markings

POWER PLANT LIMITATIONS

Engine Manufacturer: Teledyne Continental.

Engine Model Number: IO-520-F.

Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Power, 5 Minutes - Takeoff: 300 BHP.

Continuous: 285 BHP

Maximum Engine Speed, 5 Minutes - Takeoff: 2850 RPM.

Continuous: 2700 RPM.

Maximum Cylinder Head Temperature: 460°F (238°C).

Maximum Oil Temperature: 240°F (116°C).

Oil Pressure, Minimum: 10 psi.

Maximum: 100 psi.

Fuel Pressure, Minimum: 3.5 psi.

Maximum: 19.5 psi (25.2 gal/hr).

Propeller Manufacturer: McCauley Accessory Division.

Propeller Model Number: D3A34C404/80VA-0.

Propeller Diameter, Maximum: 80 inches.

Minimum: 78.5 inches.

Propeller Blade Angle at 30 Inch Station, Low: 11.0°.

High: 27.0°.

INTRODUCTION

Section 2 includes operating limitations, instrument markings, and basic placards necessary for the safe operation of the airplane, its engine, standard systems and standard equipment. The limitations included in this section and in Section 9 have been approved by the Federal Aviation Administration. Observance of these operating limitations is required by Federal Aviation Regulations.

NOTE

Refer to Section 9 of this Pilot's Operating Handbook for amended operating limitations, operating procedures, performance data and other necessary information for airplanes equipped with specific options.

NOTE

The airspeeds listed in the Airspeed Limitations chart (figure 2-1) and the Airspeed Indicator Markings chart (figure 2-2) are based on Airspeed Calibration data shown in Section 5 with the normal static source. If the alternate static source is being used, ample margins should be observed to allow for the airspeed calibration variations between the normal and alternate static sources as shown in Section 5.

Your Cessna is certificated under FAA Type Certificate No. A4CE as Cessna Model No. U206G.

SECTION 2 LIMITATIONS

CESSNA
MODEL U206G

POWER PLANT INSTRUMENT MARKINGS

Power plant instrument markings and their color code significance are shown in figure 2-3.

INSTRUMENT	RED LINE	GREEN ARC	YELLOW ARC	RED LINE
	MINIMUM LIMIT	NORMAL OPERATING	CAUTION RANGE	MAXIMUM LIMIT
Tachometer	---	2200 - 2550 RPM	2700 - 2850 RPM	2850 RPM
Manifold Pressure	---	15-25 in. Hg	---	---
Oil Temperature	---	100° - 240°F	---	240°F
Cylinder Head Temperature	---	200° - 460°F	---	460°F
Fuel Flow (Pressure)	(3.5 psi)	7.0 - 17.0 gal/hr	---	25.2 gal/hr (19.5 psi)
Oil Pressure	10 psi	30-60 psi	---	100 psi
Fuel Quantity	E (2.0 Gal Unusable Each Tank)	---	---	---
Suction	---	4.6 - 5.4 in. Hg	---	---

Figure 2-3. Power Plant Instrument Markings

WEIGHT LIMITS

Maximum Ramp Weight: 3612 lbs.
Maximum Takeoff Weight: 3600 lbs.
Maximum Landing Weight: 3600 lbs.
Maximum Weight in Baggage Compartment - Station 109 to 145: 180 lbs.

SECTION 2 LIMITATIONS

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AIRSPPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in figure 2-1.

	SPEED	KCAS	KIAS	REMARKS
V _{NE}	Never Exceed Speed	182	183	Do not exceed this speed in any operation.
V _{NO}	Maximum Structural Cruising Speed	148	149	Do not exceed this speed except in smooth air, and then only with caution.
V _A	Maneuvering Speed: 3600 Pounds 2900 Pounds 2200 Pounds	120 107 95	120 106 93	Do not make full or abrupt control movements above this speed.
V _{FE}	Maximum Flap Extended Speed: To 10° Flaps 10° - 40° Flaps	139 101	140 100	Do not exceed these speeds with the given flap settings.
	Maximum Window Open Speed	182	183	Do not exceed this speed with windows open.

Figure 2-1. Airspeed Limitations

AIRSPPEED INDICATOR MARKINGS

Airspeed indicator markings and their color code significance are shown in figure 2-2.

PLACARDS

The following information must be displayed in the form of composite or individual placards.

1. In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped.)

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Normal Category. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

No acrobatic maneuvers, including spins, approved.

Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate:

DAY - NIGHT - VFR - IFR

2. On control lock:

CONTROL LOCK - REMOVE BEFORE STARTING ENGINE.

3. On fuel selector plate, at appropriate locations:

WHEN SWITCHING FROM DRY TANK TURN AUX FUEL PUMP
"ON" MOMENTARILY.

TAKEOFF AND LAND ON FULLER TANK.
LEFT ON -- 44.0 GAL.
RIGHT ON -- 44.0 GAL.
OFF.

NOTE

Refer to Section 6 of this handbook for loading arrangements with one or more seats removed for cargo accommodation.

CENTER OF GRAVITY LIMITS

Center of Gravity Range:

Forward: 33.0 inches aft of datum at 2500 lbs. or less, with straight line variation to 42.5 inches aft of datum at 3600 lbs.

Aft: 49.7 inches aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

MANEUVER LIMITS

This airplane is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and turns in which the angle of bank is not more than 60°.

Aerobatic maneuvers, including spins, are not approved.

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors:

*Flaps Up: +3.8g, -1.52g

*Flaps Down: +2.0g

*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

KINDS OF OPERATION LIMITS

The airplane is equipped for day VFR and may be equipped for night VFR and/or IFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operating limitations placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

SECTION 2
LIMITATIONS

CESSNA
MODEL U206G

4. Forward of fuel tank filler caps:

FUEL
100LL/100 MIN. GRADE AVIATION GASOLINE
CAP. 46.0 U.S. GAL.
CAP. 32.0 U.S. GAL. TO BOTTOM OF FILLER COLLAR

5. Near manifold pressure/fuel flow indicator:

RPM	MIN. FUEL FLOWS AT FULL THROTTLE			
	S.L.	4000	8000	12000
2700	23 GPH	21 GPH	19 GPH	17 GPH
2850	24 GPH	22 GPH	20 GPH	18 GPH

6. On the flap control indicator:

UP to 10°	(Partial flap range with blue color code and 140 knot callout; also, mechanical detent at 10°.)
10° to 40°	(Indices at these positions with white color code and 100 knot callout; also, mechanical detent at 20°.)

7. On aft cargo door:

BAGGAGE NET 180 LBS MAX CAPACITY
REFER TO WEIGHT AND BALANCE DATA
FOR BAGGAGE AND CARGO LOADING.

8. On forward cargo door:

EMERGENCY EXIT OPERATION

1. ROTATE FORWARD CARGO DOOR HANDLE FULL FORWARD THEN FULL AFT.
2. OPEN FORWARD CARGO DOOR AS FAR AS POSSIBLE.
3. ROTATE RED LEVER IN REAR CARGO DOOR FORWARD.
4. FORCE REAR CARGO DOOR FULL OPEN.

SECTION 2
LIMITATIONS

CESSNA
MODEL U206G

FUEL LIMITATIONS

2 Standard Tanks: 46.0 U.S. gallons each.
Total Fuel: 92 U.S. gallons.
Usable Fuel (all flight conditions): 88 U.S. gallons.
Unusable Fuel: 4.0 U.S. gallons.

With low fuel reserves, do not allow the airplane to remain in uncoordinated flight for periods in excess of one minute.

Use fuller tank for takeoff and landing.

Approved Fuel Grades (and Colors):
100LL Grade Aviation Fuel (Blue).
100 (Formerly 100/130) Grade Aviation Fuel (Green).

OTHER LIMITATIONS

FLAP LIMITATIONS

Approved Takeoff Range: 0° to 20°.
Approved Landing Range: 0° to 40°.

SECTION 3 EMERGENCY PROCEDURES

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9. A calibration card is provided to indicate the accuracy of the magnetic compass in 30° increments.

10. On oil filler cap:

OIL
12 QTS

11. Near airspeed indicator:

MANEUVER SPEED
120 KIAS

12. In full view of the pilot:

MAJOR FUEL FLOW FLUCTUATIONS/POWER SURGES

1. AUX FUEL PUMP - ON, ADJUST MIXTURE.
2. SELECT OPPOSITE TANK.
3. WHEN FUEL FLOW STEADY, RESUME NORMAL OPERATIONS.

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9. Touchdown -- SLIGHTLY TAIL LOW.
10. Ignition Switch -- OFF.
11. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions, and SQUAWK 7700 if transponder is installed.
2. Heavy Objects (in baggage area) -- SECURE OR JETTISON.
3. Wing Flaps -- 40°.
4. Approach -- High Winds, Heavy Seas -- INTO THE WIND.
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
5. Power -- ESTABLISH 300 FT/MIN DESCENT AT 65 KIAS.
6. Cabin Doors -- UNLATCH.
7. Touchdown -- LEVEL ATTITUDE AT 300 FT/MIN DESCENT.
8. Face -- CUSHION at touchdown with folded coat.
9. Airplane -- EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so doors can be opened.
10. Life Vests and Raft -- INFLATE.

FIRES

DURING START ON GROUND

1. Ignition Switch -- START (continue cranking to obtain start).
2. Auxiliary Fuel Pump -- OFF.

If engine starts:

3. Power -- 1700 RPM for a few minutes.
4. Engine -- SHUTDOWN and inspect for damage.

If engine fails to start:

3. Ignition Switch -- START (continue cranking).
4. Throttle -- FULL OPEN.
5. Mixture -- IDLE CUT-OFF.
6. Fire Extinguisher -- OBTAIN (have ground attendants obtain if not installed).
7. Engine -- SECURE.
 - a. Ignition Switch -- OFF.
 - b. Master Switch -- OFF.
 - c. Fuel Selector Valve -- OFF.

INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. Emergency procedures associated with ELT and other optional systems can be found in Section 9.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:	
Wing Flaps Up	80 KIAS
Wing Flaps Down	70 KIAS
Maneuvering Speed:	
3600 Lbs	120 KIAS
2900 Lbs	106 KIAS
2200 Lbs	93 KIAS
Maximum Glide:	
3600 Lbs	75 KIAS
3200 Lbs	70 KIAS
2800 Lbs	65 KIAS
Precautionary Landing With Engine Power	70 KIAS
Landing Without Engine Power:	
Wing Flaps Up	80 KIAS
Wing Flaps Down	70 KIAS

OPERATIONAL CHECKLISTS

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle -- IDLE.
2. Brakes -- APPLY.
3. Wing Flaps -- RETRACT.
4. Mixture -- IDLE CUT-OFF.
5. Ignition Switch -- OFF.
6. Master Switch -- OFF.

8. Fire -- EXTINGUISH using fire extinguisher, wool blanket or dirt.

NOTE

If sufficient ground personnel are available (and fire is on ground and not too dangerous) move airplane away from the fire by pushing rearward on the leading edge of the horizontal tail.

9. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. Mixture -- IDLE CUT-OFF.
2. Fuel Selector Valve -- OFF.
3. Master Switch -- OFF.
4. Cabin Heat and Air -- OFF (except overhead vents).
5. Airspeed -- 105 KIAS (If fire is not extinguished, increase glide speed to find an airspeed which will provide an incombustible mixture).
6. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

1. Master Switch -- OFF.
2. Avionics Power Switch -- OFF.
3. All Other Switches (except ignition switch) -- OFF.
4. Vents/Cabin Air/Heat -- CLOSED.
5. Fire Extinguisher -- ACTIVATE (if available).

WARNING

If an oxygen system is available, occupants should use oxygen masks until smoke and discharged dry powder clears. After discharging an extinguisher within a closed cabin, ventilate the cabin.

If fire appears out and electrical power is necessary for continuance of flight:

6. Master Switch -- ON.
7. Circuit Breakers -- CHECK for faulty circuit; do not reset.
8. Radio Switches -- OFF.

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ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Airspeed -- 80 KIAS.
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (40° recommended).
6. Master Switch -- OFF.

ENGINE FAILURE DURING FLIGHT

1. Airspeed -- 75 KIAS.
2. Fuel Selector Valve and Quantity -- CHECK.
3. Mixture -- RICH.
4. Auxiliary Fuel Pump -- ON for 3-5 seconds with throttle 1/2 open; then OFF.
5. Ignition Switch -- BOTH (or START if propeller is stopped).
6. Throttle -- ADVANCE slowly.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Airspeed -- 80 KIAS (flaps UP).
70 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (40° recommended).
6. Master Switch -- OFF.
7. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
8. Touchdown -- SLIGHTLY TAIL LOW.
9. Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Airspeed -- 80 KIAS.
2. Wing Flaps -- 20°.
3. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
4. Electrical Switches -- OFF.
5. Wing Flaps -- 40° (on final approach).
6. Airspeed -- 70 KIAS.
7. Avionics Power and Master Switches -- OFF.
8. Doors -- UNLATCH PRIOR TO TOUCHDOWN.

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LANDING WITH A FLAT MAIN TIRE

1. Wing Flaps -- AS DESIRED (0° - 10° below 140 KIAS, 10° - 40° below 100 KIAS).
2. Make a normal approach.
3. Touchdown -- GOOD TIRE FIRST, hold airplane off flat tire as long as possible with aileron control.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

AMMETER SHOWS EXCESSIVE RATE OF CHARGE (Full Scale Deflection)

1. Alternator -- OFF.
2. Nonessential Radio/Electrical Equipment -- OFF.
3. Flight -- TERMINATE as soon as practical.

LOW-VOLTAGE LIGHT ILLUMINATES DURING FLIGHT (Ammeter Indicates Discharge)

NOTE

Illumination of the low-voltage light may occur during low RPM conditions with an electrical load on the system such as during a low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to de-activate the alternator system.

1. Avionics Power Switch -- OFF.
2. Master Switch -- OFF (both sides).
3. Master Switch -- ON.
4. Low-Voltage Light -- CHECK OFF.
5. Avionics Power Switch -- ON.

If low-voltage light illuminates again:

6. Alternator -- OFF.
7. Nonessential Radio and Electrical Equipment -- OFF.
8. Flight -- TERMINATE as soon as practical.

9. Avionics Power Switch -- ON.
10. Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localized.
11. Vents/Cabin Air/Heat -- OPEN when it is ascertained that fire is completely extinguished.

CABIN FIRE

1. Master Switch -- OFF.
2. Vents/Cabin Air/Heat -- CLOSED (to avoid drafts).
3. Fire Extinguisher -- ACTIVATE (if available).

WARNING

If an oxygen system is available, occupants should use oxygen masks until smoke and discharged dry powder clears. After discharging an extinguisher within a closed cabin, ventilate the cabin.

4. Land the airplane as soon as possible to inspect for damage.

WING FIRE

1. Navigation Light Switch -- OFF.
2. Pitot Heat Switch (if installed) -- OFF.
3. Strobe Light Switch (if installed) -- OFF.

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin, and land as soon as possible.

ICING

INADVERTENT ICING ENCOUNTER

1. Turn pitot heat switch ON (if installed).
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out and rotate defrost knob clockwise to obtain maximum windshield defroster effectiveness.
4. Increase engine speed to minimize ice build-up on propeller blades. If excessive vibration is noted, momentarily reduce engine speed to 2200 RPM with the propeller control, and then rapidly move the control full forward.

EXCESSIVE FUEL VAPOR

FUEL FLOW STABILIZATION PROCEDURES (If Fuel Flow Fluctuations Of 1 Gal/Hr Or More Or Power Surges Occur)

1. Auxiliary Fuel Pump -- ON.
2. Mixture -- RESET as required.
3. Fuel Selector Valve -- SELECT OPPOSITE TANK if vapor symptoms continue.

NOTE

If the opposite tank cannot be used because of a lack of fuel, then retarding the throttle quickly to 10 inches or less of manifold pressure for 30 seconds will also aid in eliminating vapor in the system. To restore power, switch auxiliary fuel pump OFF, advance the throttle (slowly at higher altitudes) and adjust the mixture as required to aid power restoration.

4. Auxiliary Fuel Pump -- OFF after fuel flow has stabilized.
5. Mixture -- RESET as required.
6. Fuel Selector Valve -- AS DESIRED after fuel flow has stabilized for one minute, provided there is fuel in the other tank.

IN-FLIGHT ENGINE RESTARTING PROCEDURES (If Large Or Total Power Loss Occurs From Excessive Vapor Accumulations)

1. Auxiliary Fuel Pump -- ON.
2. Fuel Selector Valve -- OPPOSITE TANK.
3. Throttle -- HALF OPEN.
4. Auxiliary Fuel Pump -- OFF.
5. Mixture -- LEAN from full rich until restart occurs.

NOTE

If propeller is windmilling, engine will restart automatically within a few seconds. If propeller has stopped (possible at low speeds), turn ignition switch to START, advance throttle slowly from idle, and (at higher altitudes) lean the mixture from full rich.

6. Mixture -- ADJUST as required as power is restored.
7. Throttle -- ADJUST power as required.
8. Fuel Selector Valve -- AS DESIRED after fuel flow is stabilized.

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NOTE

Cycling the RPM flexes the propeller blades and high RPM increases centrifugal force, causing ice to shed more readily.

5. Watch for signs of induction air filter ice and regain manifold pressure by increasing the throttle setting.

NOTE

If ice accumulates on the intake filter (causing the alternate air door to open), a decrease of 1 to 2 inches of full throttle manifold pressure will be experienced.

6. If icing conditions are unavoidable, plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.
7. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for a significantly higher power requirement, approach speed, stall speed, and landing roll.
8. Open the window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
9. Use a 10° - 20° landing flap setting for ice accumulations of 1 inch or less. With heavier ice accumulations, approach with flaps retracted to ensure adequate elevator effectiveness in the approach and landing.
10. Approach at 90-100 KIAS with 20° flaps and 105-115 KIAS with 0°-10° flaps, depending upon the amount of ice accumulation. If ice accumulation is unusually large, decelerate to the planned approach speed while in the approach configuration at a high enough altitude which would permit recovery in the event that a stall buffet is encountered.
11. Land on the main wheels first, avoiding the slow and high type of flare-out.
12. Missed approaches should be avoided whenever possible because of severely reduced climb capability. However, if a go-around is mandatory, make the decision much earlier in the approach than normal. Apply maximum power and maintain 95 KIAS while retracting the flaps slowly in 10° increments.

STATIC SOURCE BLOCKAGE (Erroneous Instrument Reading Suspected)

1. Vents and Windows -- CLOSED.
2. Alternate Static Source Valve (if installed) -- PULL ON.
3. Airspeed -- Consult calibration table in Section 5.

EMERGENCY OPERATION IN CLOUDS (Vacuum System Failure)

In the event of a vacuum system failure during flight, the directional indicator and attitude indicator will be disabled, and the pilot will have to rely on the turn coordinator or the turn and bank indicator if he inadvertently flies into clouds. The following instructions assume that only the electrically-powered turn coordinator or the turn and bank indicator is operative, and that the pilot is not completely proficient in instrument flying.

EXECUTING A 180° TURN IN CLOUDS

Upon inadvertently entering the clouds, an immediate plan should be made to turn back as follows:

1. Note the compass heading.
2. Note the time of the minute hand and observe the position of the sweep second hand on the clock.
3. When the sweep second hand indicates the nearest half-minute, initiate a standard rate left turn, holding the turn coordinator symbolic airplane wing opposite the lower left index mark for 60 seconds. Then roll back to level flight by leveling the miniature airplane.
4. Check accuracy of the turn by observing the compass heading which should be the reciprocal of the original heading.
5. If necessary, adjust heading primarily with skidding motions rather than rolling motions so that the compass will read more accurately.
6. Maintain altitude and airspeed by cautious application of elevator control. Avoid overcontrolling by keeping hands off the control wheel as much as possible and steering only with rudder.

EMERGENCY DESCENT THROUGH CLOUDS

If conditions preclude reestablishment of VFR flight by a 180° turn, a descent through a cloud deck to VFR conditions may be appropriate. If possible, obtain radio clearance for an emergency descent through clouds. To guard against a spiral dive, choose an easterly or westerly heading to minimize compass card swings due to changing bank angles. In addition, keep hands off the control wheel and steer a straight course with rudder control by monitoring the turn coordinator. Occasionally check the compass heading and make minor corrections to hold an approximate course. Before descending into the clouds, set up a stabilized let-down condition as follows:

AMPLIFIED PROCEDURES

ENGINE FAILURE

If an engine failure occurs during the takeoff run, the most important thing to do is stop the airplane on the remaining runway. Those extra items on the checklist will provide added safety after a failure of this type.

Prompt lowering of the nose to maintain airspeed and establish a glide attitude is the first response to an engine failure after takeoff. In most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions. Altitude and airspeed are seldom sufficient to execute a 180° gliding turn necessary to return to the runway. The checklist procedures assume that adequate time exists to secure the fuel and ignition systems prior to touchdown.

After an engine failure in flight, the best glide speed as shown in figure 3-1 should be established as quickly as possible. While gliding toward a suitable landing area, an effort should be made to identify the cause of the failure. If time permits, an engine restart should be attempted as shown in the checklist. If the engine cannot be restarted, a forced landing without power must be completed.

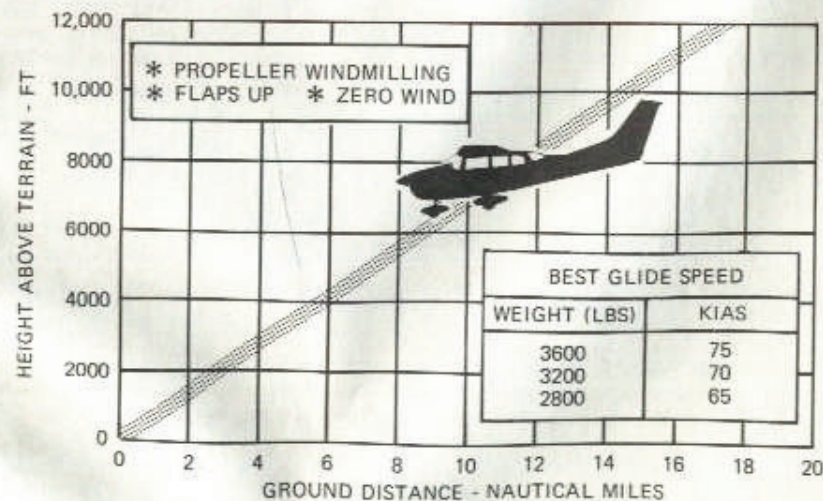


Figure 3-1. Maximum Glide

FORCED LANDINGS

If all attempts to restart the engine fail and a forced landing is imminent, select a suitable field and prepare for the landing as discussed under the Emergency Landing Without Engine Power checklist.

Before attempting an "off airport" landing with engine power available, one should fly over the landing area at a safe but low altitude to inspect the terrain for obstructions and surface conditions, proceeding as discussed under the Precautionary Landing With Engine Power checklist.

Prepare for ditching by securing or jettisoning heavy objects located in the baggage area and collect folded coats for protection of occupants' face at touchdown. Transmit Mayday message on 121.5 MHz giving location and intentions and squawk 7700 if a transponder is installed. Avoid a landing flare because of difficulty in judging height over a water surface.

LANDING WITHOUT ELEVATOR CONTROL

Trim for horizontal flight (with an airspeed of approximately 90 KIAS and flaps set to 20°) by using throttle and trim tab controls. Then do not change the trim tab setting and control the glide angle by adjusting power exclusively.

At flareout, the nose-down moment resulting from power reduction is an adverse factor and the airplane may hit on the nose wheel. Consequently, at flareout, the trim tab should be set at full nose-up position and the power adjusted so that the airplane will rotate to the horizontal attitude for touchdown. Close the throttle at touchdown.

FIRES

Improper starting procedures such as excessive use of the auxiliary fuel pump during a cold weather start can cause a backfire which could ignite fuel that has accumulated in the intake duct. In this event, follow the prescribed checklist.

Although engine fires are extremely rare in flight, the steps of the appropriate checklist should be followed if one is encountered. After completion of this procedure, execute a forced landing. Do not attempt to restart the engine.

The initial indication of an electrical fire is usually the odor of burning insulation. The checklist for this problem should result in elimination of the fire.

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1. Reduce power to set up a 500 to 800 ft./min. rate of descent.
2. Apply full rich mixture.
3. Adjust the elevator and rudder trim control wheels for a stabilized descent at 95 KIAS.
4. Keep hands off control wheel.
5. Monitor turn coordinator and make corrections by rudder alone.
6. Adjust rudder trim to relieve unbalanced rudder force, if present.
7. Check trend of compass card movement and make cautious corrections with rudder to stop turn.
8. Upon breaking out of clouds, resume normal cruising flight.

RECOVERY FROM A SPIRAL DIVE

If a spiral is encountered, proceed as follows:

1. Close the throttle.
2. Stop the turn by using coordinated aileron and rudder control to align the symbolic airplane in the turn coordinator with the horizon reference line.
3. Cautiously apply control wheel back pressure to slowly reduce the indicated airspeed to 95 KIAS.
4. Adjust the elevator trim control to maintain a 95 KIAS glide.
5. Keep hands off the control wheel, using rudder control to hold a straight heading. Use rudder trim to relieve unbalanced rudder force, if present.
6. Clear engine occasionally, but avoid using enough power to disturb the trimmed glide.
7. Upon breaking out of clouds, resume normal cruising flight.

INADVERTENT FLIGHT INTO ICING CONDITIONS

Flight into icing conditions is prohibited. An inadvertent encounter with these conditions can best be handled using the checklist procedures. The best procedure, of course, is to turn back or change altitude to escape icing conditions.

STATIC SOURCE BLOCKED

If erroneous readings of the static source instruments (airspeed, altimeter and rate-of-climb) are suspected, the alternate static source valve should be pulled on, thereby supplying static pressure to these instruments from the cabin.

NOTE

In an emergency on airplanes not equipped with an

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ture, there is good reason to suspect that an engine failure is imminent. Reduce engine power immediately and select a suitable forced landing field. Use only the minimum power required to reach the desired touch-down spot.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

Malfunctions in the electrical power supply system can be detected by periodic monitoring of the ammeter and low-voltage warning light; however, the cause of these malfunctions is usually difficult to determine. A broken alternator drive belt or wiring is most likely the cause of alternator failures, although other factors could cause the problem. A damaged or improperly adjusted alternator control unit can also cause malfunctions. Problems of this nature constitute an electrical emergency and should be dealt with immediately. Electrical power malfunctions usually fall into two categories: excessive rate of charge and insufficient rate of charge. The paragraphs below describe the recommended remedy for each situation.

EXCESSIVE RATE OF CHARGE

After engine starting and heavy electrical usage at low engine speeds (such as extended taxiing) the battery condition will be low enough to accept above normal charging during the initial part of a flight. However, after thirty minutes of cruising flight, the ammeter should be indicating less than two needle widths of charging current. If the charging rate were to remain above this value on a long flight, the battery would overheat and evaporate the electrolyte at an excessive rate.

Electronic components in the electrical system could be adversely affected by higher than normal voltage. The alternator control unit includes an over-voltage sensor which will automatically shut down the alternator if the voltage reaches approximately 31.5 volts. If the over-voltage sensor malfunctions or is improperly adjusted, as evidenced by an excessive rate of charge shown on the ammeter, the alternator should be turned off, nonessential electrical equipment turned off and the flight terminated as soon as practical.

INSUFFICIENT RATE OF CHARGE

NOTE

Illumination of the low-voltage light and ammeter discharge indications may occur during low RPM conditions

alternate static source, cabin pressure can be supplied to the static pressure instruments by breaking the glass in the face of the rate-of-climb indicator.

With the alternate static source on, adjust indicated airspeed slightly during climb or approach according to the alternate static source airspeed calibration table in Section 5.

SPINS

Intentional spins are prohibited in this airplane. Should an inadvertent spin occur, the following recovery procedure should be used:

1. RETARD THROTTLE TO IDLE POSITION.
2. PLACE AILERONS IN NEUTRAL POSITION.
3. APPLY AND HOLD FULL RUDDER OPPOSITE TO THE DIRECTION OF ROTATION.
4. JUST AFTER THE RUDDER REACHES THE STOP, MOVE THE CONTROL WHEEL BRISKLY FORWARD FAR ENOUGH TO BREAK THE STALL. Full down elevator may be required at aft center of gravity loadings to assure optimum recoveries.
5. HOLD THESE CONTROL INPUTS UNTIL ROTATION STOPS. Premature relaxation of the control inputs may extend the recovery.
6. AS ROTATION STOPS, NEUTRALIZE RUDDER, AND MAKE A SMOOTH RECOVERY FROM THE RESULTING DIVE.

NOTE

If disorientation precludes a visual determination of the direction of rotation, the symbolic airplane in the turn coordinator or the needle of the turn and bank indicator may be referred to for this information.

ROUGH ENGINE OPERATION OR LOSS OF POWER

SPARK PLUG FOULING

A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits. This may be verified by turning the ignition switch momentarily from BOTH to either L or R position. An obvious power loss in single ignition operation is

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. Small nicks on the propeller, particularly near the tips and on the leading edges, should be 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 Stoddard solvent.

ENGINE CARE

The engine may be cleaned with Stoddard solvent, or equivalent, then dried thoroughly.

CAUTION

Particular care should be given to electrical equipment before cleaning. Cleaning fluids should not be allowed to enter magnetos, starter, alternator and the like. Protect these components before saturating the engine with solvents. All other openings should also be covered before cleaning the engine assembly. Caustic cleaning solutions should be used cautiously and should always be properly neutralized after their use.

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 on 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.

INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in Section 9.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 3600 pounds and may be used for any lesser weight. However, to achieve the performance specified in Section 5 for takeoff distance and climb performance, the speed appropriate to the particular weight must be used.

Takeoff:

Normal Climb Out	70-80 KIAS
Short Field Takeoff, Flaps 20°, Speed at 50 Feet	65 KIAS

Enroute Climb, Flaps Up:

Normal	95-105 KIAS
Best Rate of Climb, Sea Level	84 KIAS
Best Rate of Climb, 10,000 Feet	78 KIAS
Best Angle of Climb, Sea Level	66 KIAS
Best Angle of Climb, 10,000 Feet	70 KIAS

Landing Approach:

Normal Approach, Flaps Up	75-85 KIAS
Normal Approach, Flaps 40°	65-75 KIAS
Short Field Approach, Flaps 40°	64 KIAS

Balked Landing:

Maximum Power, Flaps 20°	80 KIAS
--------------------------	---------

Maximum Recommended Turbulent Air Penetration Speed:

3600 Lbs	120 KIAS
2900 Lbs	106 KIAS
2200 Lbs	93 KIAS

Maximum Demonstrated Crosswind Velocity:

Takeoff or Landing	20 KNOTS
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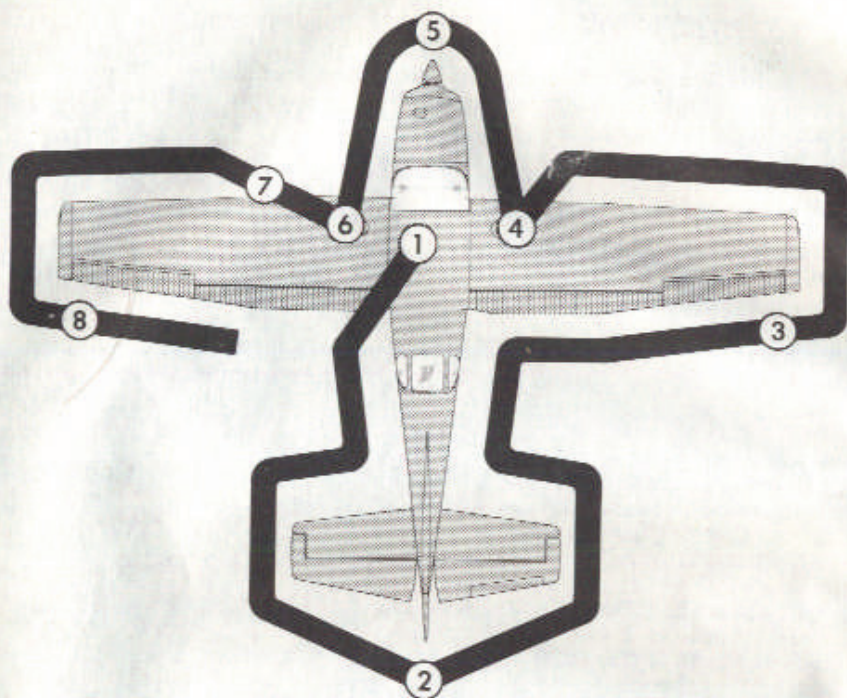
SECTION 4 NORMAL PROCEDURES

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NOTE

Visually check airplane for general condition during walk-around inspection. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater (if installed) is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Figure 4-1. Preflight Inspection

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PILOT OPERATING PROCEDURES-PREFLIGHT FUEL SYSTEM CHECK

Fuel sampling: Fuel strainer, wing tank and reservoir quick drains.

1. Place a suitable container under the fuel strainer drain outlet prior to operating the strainer drain control for at least 4 seconds. Check strainer drain closed.

2. Inspect the fluid drained from the fuel strainer and each wing tank quick drain for evidence of fuel contamination in the form of water, rust, sludge, ice or any other substance not compatible with fuel. Also check for proper fuel grade before the first flight of each day and after each refueling. If any contamination is detected, comply with 4 below.

3. Repeat Steps 1 and 2 on each wing tank quick drain.

4. If the airplane has been exposed to rain, sleet or snow, or if the wing fuel tanks or fuel strainer drains produce water, the fuel reservoir(s) must be checked for the presence of water by operating the fuel reservoir quick drains. The airplane fuel system must be purged to the extent necessary to insure that there is no water, ice or other fuel contamination. NOTE 1: The fuel reservoir(s) are located under the fuselage between the firewall and forward door post on all airplane models. Consult the Pilots Operating Handbook or Owners Manual in order to determine if one or two reservoir(s) are installed.

NOTE 2: A check for the presence of water using the fuel reservoir quick drains prior to the first flight of each day is considered good operating practice.

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

① CABIN

1. Pilot's Operating Handbook -- AVAILABLE IN THE AIRPLANE.
2. Control Wheel Lock -- REMOVE.
3. Ignition Switch -- OFF.
4. Avionics Power Switch -- OFF.
5. Master Switch -- ON.

WARNING

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

6. Fuel Quantity Indicators -- CHECK QUANTITY.
7. Master Switch -- OFF.
8. Fuel Selector Valve -- FULLER TANK.
9. Trim Controls -- NEUTRAL.
10. Static Pressure Alternate Source Valve (if installed) -- OFF.

② EMPENNAGE

1. Rudder Gust Lock -- REMOVE.
2. Tail Tie-Down -- DISCONNECT.
3. Control Surfaces -- CHECK freedom of movement and security.
4. Check cargo doors securely latched and locked (right side only). If cargo load will not permit access to the front cargo door inside handle, lock the door from the outside by pulling the handle from its recess, pulling outboard on the vertical tab behind the handle, and pushing the handle back into its recess. Door locking can be verified by observing that the inside door handle has rotated toward the locked position. The outside handle can then be locked using the key.

NOTE

The cargo doors must be fully closed and latched before

operating the electric wing flaps. A switch in the upper door sill of the front cargo door interrupts the wing flap electrical circuit when the front door is opened or removed, thus preventing the flaps being lowered with possible damage to the cargo door or wing flaps when the cargo door is open. If operating with the cargo doors removed and the optional spoiler kit installed, check that the wing flap interrupt switch cover plate is installed so that the wing flaps can be lowered in flight.

③ RIGHT WING Trailing Edge

1. Aileron -- CHECK freedom of movement and security.

④ RIGHT WING

1. Wing Tie-Down -- DISCONNECT.
2. Fuel Tank Vent -- CHECK for stoppage.
3. Main Wheel Tire -- CHECK for proper inflation.
4. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment, and proper fuel grade.
5. Fuel Quantity -- CHECK VISUALLY for desired level.
6. Fuel Filler Cap -- SECURE and vent unobstructed.

⑤ NOSE

1. Static Source Opening (both sides of fuselage) -- CHECK for stoppage.
2. Propeller and Spinner -- CHECK for nicks, security and oil leaks.
3. Landing and Taxi Lights -- CHECK for condition and cleanliness.
4. Nose Wheel Strut and Tire -- CHECK for proper inflation.
5. Nose Tie-Down -- DISCONNECT.
6. Engine Oil Level -- CHECK, do not operate with less than nine quarts. Fill to twelve quarts for extended flight.
7. Before first flight of the day and after each refueling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. Check strainer drain closed. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel tank sumps and reservoirs will be necessary.

⑥ LEFT WING

1. Main Wheel Tire -- CHECK for proper inflation.
2. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- 0° - 20°.
2. Power -- FULL THROTTLE and 2850 RPM.
3. Mixture -- LEAN for field elevation per fuel flow placard.
4. Elevator Control -- LIFT NOSE WHEEL at 50 KIAS.
5. Climb Speed -- 70-80 KIAS.
6. Wing Flaps -- RETRACT after obstacles are cleared.

SHORT FIELD TAKEOFF

1. Wing Flaps -- 20°.
2. Brakes -- APPLY.
3. Power -- FULL THROTTLE and 2850 RPM.
4. Mixture -- LEAN for field elevation per fuel flow placard.
5. Brakes -- RELEASE.
6. Elevator Control -- SLIGHTLY TAIL LOW ATTITUDE.
7. Climb Speed -- 65 KIAS until all obstacles are cleared.
8. Wing Flaps -- RETRACT after obstacles are cleared and 80 KIAS is reached.

NOTE

Do not reduce power until wing flaps have been retracted.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 95-105 KIAS.
2. Power -- 25 INCHES Hg and 2550 RPM.
3. Mixture -- LEAN to 18.0 gal./hr fuel flow.
4. Cowl Flaps -- OPEN as required.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 84 KIAS at sea level to 78 KIAS at 10,000 feet.
2. Power -- FULL THROTTLE and 2700 RPM.
3. Mixture -- LEAN for altitude per fuel flow placard.
4. Cowl Flaps -- OPEN.

- drain valve to check for water, sediment and proper fuel grade.
3. Fuel Quantity -- CHECK VISUALLY for desired level.
 4. Fuel Filler Cap -- SECURE and vent unobstructed.

7 LEFT WING Leading Edge

1. Pitot Tube Cover -- REMOVE and check opening for stoppage.
2. Stall Warning Vane -- CHECK for freedom of movement while master switch is momentarily turned on (horn should sound when vane is pushed upward).
3. Wing Tie-Down -- DISCONNECT.
4. Fuel Tank Vent -- CHECK for stoppage.

8 LEFT WING Trailing Edge

1. Aileron -- CHECK freedom of movement and security.

BEFORE STARTING ENGINE

1. Preflight Inspection -- COMPLETE.
2. Seats, Belts, Shoulder Harnesses -- ADJUST and LOCK.
3. Brakes -- TEST and SET.
4. Cowl Flaps -- OPEN (move lever out of locking hole to reposition).
5. Avionics Power Switch, Autopilot (if installed), Electrical Equipment -- OFF.

CAUTION

The avionics power switch must be OFF during engine start to prevent possible damage to avionics.

6. Master Switch -- ON.
7. Fuel Selector Valve -- FULLER TANK.
8. Circuit Breakers -- CHECK IN.

STARTING ENGINE

1. Mixture -- RICH.
2. Propeller -- HIGH RPM.
3. Throttle -- CLOSED.
4. Auxiliary Fuel Pump -- ON.
5. Throttle -- ADVANCE to obtain 8-10 gal/hr fuel flow, then return to CLOSED position.

CRUISE

1. Power -- 15-25 INCHES Hg, 2200-2550 RPM (no more than 75%).
2. Mixture -- LEAN for cruise fuel flow as determined from your Cessna Power Computer, or in accordance with the Cruise data in Section 5.
3. Elevator and Rudder Trim -- ADJUST.
4. Cowl Flaps -- AS REQUIRED.

DESCENT

1. Power -- AS DESIRED.
2. Mixture -- LEAN for smoothness in power descents. Use full rich mixture for idle power.
3. Cowl Flaps -- CLOSED.

BEFORE LANDING

1. Fuel Selector Valve -- FULLER TANK.
2. Mixture -- RICH (below 3000 ft.).
3. Propeller -- HIGH RPM.
4. Autopilot (if installed) -- OFF.

LANDING

NORMAL LANDING

1. Airspeed -- 75-85 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (0° - 10° below 140 KIAS, 10° - 40° below 100 KIAS).
3. Airspeed -- 65-75 KIAS (flaps DOWN).
4. Elevator Trim -- ADJUST.
5. Touchdown -- MAIN WHEELS FIRST.
6. Landing Roll -- LOWER NOSE WHEEL GENTLY.
7. Braking -- MINIMUM REQUIRED.

SHORT FIELD LANDING

1. Airspeed -- 75-85 KIAS (flaps UP).
2. Wing Flaps -- 40° (below 100 KIAS).
3. Airspeed -- MAINTAIN 64 KIAS.

6. Auxiliary Fuel Pump -- OFF.
7. Propeller Area -- CLEAR.
8. Ignition Switch -- START.
9. Throttle -- ADVANCE slowly.
10. Ignition Switch -- RELEASE when engine starts.

NOTE

The engine should start in two or three revolutions. If it does not continue running, start again at step 3 above. If the engine does not start, leave auxiliary fuel pump switch off, set mixture to idle cut-off, open throttle, and crank until engine fires or for approximately 15 seconds. If still unsuccessful, start again using the normal starting procedure after allowing the starter motor to cool.

11. Throttle -- IDLE.
12. Oil Pressure -- CHECK.

BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Cabin Doors and Window -- CLOSED and LOCKED.
3. Cowl Flaps -- OPEN.
4. Flight Controls -- FREE and CORRECT.
5. Flight Instruments -- CHECK.
6. Fuel Selector Valve -- FULLER TANK.
7. Mixture -- RICH (below 3000 ft.).
8. Elevator and Rudder Trim -- TAKEOFF setting.
9. Throttle -- 1700 RPM.
 - a. Magnetos -- CHECK (RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between magnetos).
 - b. Propeller -- CYCLE from high to low RPM; return to high RPM (full forward).
 - c. Engine Instruments and Ammeter -- CHECK.
 - d. Suction Gage -- CHECK (4.6 to 5.4 In. Hg.).
10. Avionics Power Switch -- ON.
11. Radios -- SET.
12. Autopilot (if installed) -- OFF.
13. Flashing Beacon, Navigation Lights and/or Strobe Lights -- ON as required.
14. Throttle Friction Lock -- ADJUST.
15. Parking Brake -- RELEASE.

AMPLIFIED PROCEDURES

STARTING ENGINE

Proper fuel management and throttle adjustments are the determining factors in securing an easy start from your continuous-flow fuel-injection engine. The procedure outlined in this section should be followed closely as it is effective under nearly all operating conditions.

Conventional full rich mixture and high RPM propeller settings are used for starting; the throttle, however, should be fully closed initially. When ready to start, place the auxiliary fuel pump switch in the ON position and advance the throttle to obtain 8-10 gal/hr fuel flow. Then close the throttle and turn off the auxiliary fuel pump. Place the ignition switch in the START position. While cranking, slowly advance the throttle until the engine starts. Slow throttle advancement is essential since the engine will start readily when the correct fuel/air ratio is obtained. When the engine has started, reset the throttle to the desired idle speed.

When the engine is hot or outside air temperatures are high, the engine may die after running several seconds because the mixture became either too lean due to fuel vapor, or too rich due to excessive prime fuel. The following procedure will prevent over-priming and alleviate fuel vapor in the system:

1. Set the throttle 1/3 to 1/2 open.
2. When the ignition switch is on BOTH and you are ready to engage the starter, place the right half of the auxiliary fuel pump switch ON until the indicated fuel flow comes up to 4 to 6 gal/hr; then turn the switch off.

NOTE

During a restart after a brief shutdown in extremely hot weather, the presence of fuel vapor may require the auxiliary fuel pump to operate in the ON position for up to 1 minute or more before the vapor is cleared sufficiently to obtain 4 to 6 gal/hr for starting. If the above procedure does not obtain sufficient fuel flow, fully depress and hold the left half of the switch in the HI position to obtain additional fuel pump capability.

3. Without hesitation, engage the starter and the engine should start in 3 to 5 revolutions. Adjust throttle for 1200 to 1400 RPM.

4. Elevator Trim -- ADJUST.
5. Power -- REDUCE TO IDLE as obstacle is cleared.
6. Touchdown -- MAIN WHEELS FIRST.
7. Brakes -- APPLY HEAVILY.
8. Wing Flaps -- RETRACT for maximum brake effectiveness.

BALKED LANDING

1. Power -- FULL THROTTLE and 2850 RPM.
2. Wing Flaps -- RETRACT to 20°.
3. Airspeed -- 80 KIAS.
4. Wing Flaps -- RETRACT slowly.
5. Cowl Flaps -- OPEN.

AFTER LANDING

1. Wing Flaps -- RETRACT.
2. Cowl Flaps -- OPEN.

SECURING AIRPLANE

1. Parking Brake -- SET.
2. Avionics Power Switch and Electrical Equipment -- OFF.
3. Mixture -- IDLE CUT-OFF (pull full out).
4. Ignition Switch -- OFF.
5. Master Switch -- OFF.
6. Control Lock -- INSTALL.

4. If there is fuel vapor in the lines, it will pass into the injector nozzles in 2 to 3 seconds and the engine will gradually slow down and stop. When engine speed starts to decrease, hold the left half of the auxiliary fuel pump switch in the HI position for approximately one second to clear out the vapor. Intermittent use of HI boost is necessary since prolonged use of the HI position after vapor is cleared will flood out the engine during a starting operation.
5. Let the engine run at 1200 to 1400 RPM until the vapor is eliminated and the engine idles normally.

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

After starting, if the oil pressure gage does not begin to show pressure within 30 seconds in normal temperatures and 60 seconds in very cold weather, shut off the engine and investigate. Lack of oil pressure can cause serious engine damage.

TAXIING

Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propeller tips. Refer to figure 4-2 for additional taxiing instructions.

BEFORE TAKEOFF

WARM-UP

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.

MAGNETO CHECK

The magneto check should be made at 1700 RPM as follows. Move ignition switch first to R position and note RPM. Next move switch back to BOTH to clear the other set of plugs. Then move switch to the L position, note RPM and return the switch to the BOTH position. RPM drop should not exceed 150 RPM on either magneto or show greater than 50 RPM differential between magnetos. If there is a doubt concerning operation of the ignition system, RPM checks at higher engine speeds will usually confirm whether a deficiency exists.

airplane should be leveled off immediately to accelerate to a safe climb speed.

If 20° wing flaps are used for takeoff, they should be left down until all obstacles are cleared. To clear an obstacle with 20° flaps, a 65 KIAS climb speed should be used. If no obstructions are ahead, a best rate-of-climb speed of 84 KIAS would be most efficient. Flap deflections greater than 20° are not approved for takeoff.

CROSSWIND TAKEOFF

Takeoffs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higher than normal, and 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.

ENROUTE CLIMB

A cruising climb at 25 inches of manifold pressure, 2550 RPM (approximately 75% power) and 95-105 KIAS is normally recommended. This type of climb provides better engine cooling, less engine wear, and more passenger comfort due to lower noise level, in addition to improved visibility ahead.

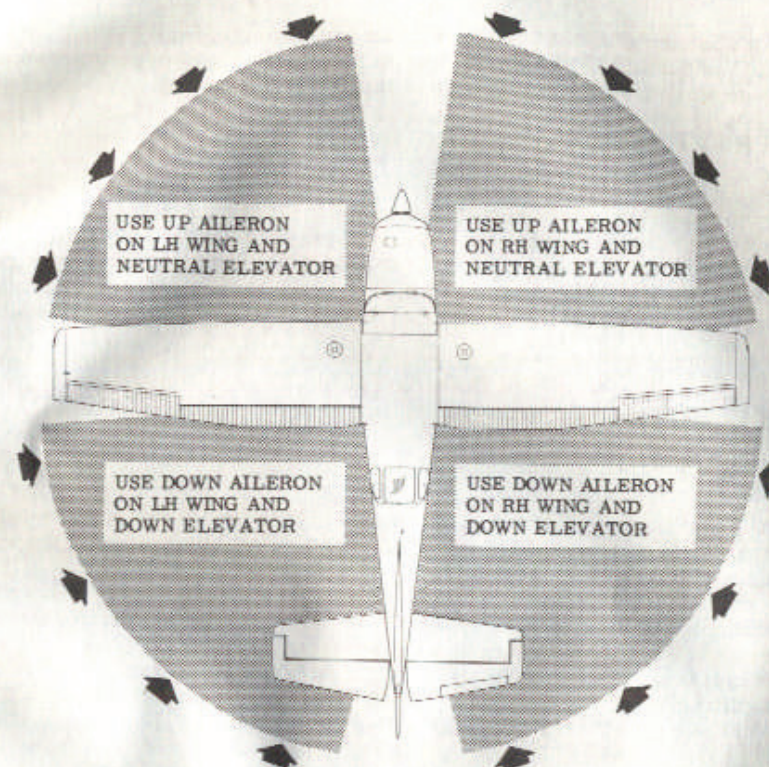
Cruising climbs should be conducted at 18 gal/hr up to 4000 feet and then at the fuel flow shown on the normal climb chart in Section 5 for higher altitudes.

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 with maximum continuous power (full throttle and 2700 RPM). This speed is 84 KIAS at sea level, decreasing to 78 KIAS at 10,000 feet. The mixture should be leaned as shown by the fuel flow placard located adjacent to the fuel flow indicator.

If an obstruction dictates the use of a steep climb angle, climb with flaps retracted and maximum continuous power at 66 KIAS at sea level to 70 KIAS at 10,000 feet.

CRUISE

Normal cruising is performed between 55% and 75% power. The



CODE

WIND DIRECTION ➔

NOTE

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

Figure 4-2. Taxiing Diagram

corresponding power settings and fuel consumption for various altitudes can be determined by using your Cessna Power Computer or the data in Section 5.

NOTE

Cruising should be done at 65% to 75% power until a total of 50 hours has accumulated or oil consumption has stabilized. This is to ensure proper seating of the rings and is applicable to new engines, and engines in service following cylinder replacement or top overhaul of one or more cylinders.

The Cruise Performance Table, figure 4-3, illustrates the advantage of higher altitude on both true airspeed and nautical miles per gallon. In addition, the beneficial effect of lower cruise power on nautical miles per gallon at a given altitude can be observed. This table should be used as a guide, along with the available winds aloft information, to determine the most favorable altitude and power setting for a given trip. The selection of cruise altitude on the basis of the most favorable wind conditions and the use of low power settings are significant factors that should be considered on every trip to reduce fuel consumption.

For reduced noise levels, it is desirable to select the lowest RPM in the green arc range for a given percent power that will provide smooth engine operation. The cowl flaps should be opened, if necessary, to maintain the cylinder head temperature at approximately two-thirds of the normal operating range (green arc).

For best fuel economy at 65% power or less, the engine may be operated at one gallon per hour leaner than shown in this handbook and on the power computer. This will result in approximately 6% greater range than

ALTITUDE	75% POWER		65% POWER		55% POWER	
	KTAS	NMPG	KTAS	NMPG	KTAS	NMPG
3000 Feet	142	9.0	134	9.9	124	10.6
6500 Feet	147	9.4	138	10.1	127	10.9
10,000 Feet	---	---	142	10.4	131	11.2
Standard Conditions						Zero Wind

Figure 4-3. Cruise Performance Table

An absence of RPM drop may be an indication of faulty grounding of one side of the ignition system or should be cause for suspicion that the magneto timing is set in advance of the setting specified.

ALTERNATOR CHECK

Prior to flights where verification of proper alternator and alternator control unit operation is essential (such as night or instrument flights), a positive verification can be made by loading the electrical system momentarily (3 to 5 seconds) with the landing light during the engine runup (1700 RPM). The ammeter will remain within a needle width of its original position if the alternator and alternator control unit are operating properly.

TAKEOFF

POWER CHECK

It is important to check takeoff power early in the takeoff run. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff.

Full power runups over loose gravel are especially harmful to propeller tips. When takeoffs 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.

After full power is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

For maximum engine power, the mixture should be adjusted during the initial takeoff roll to the fuel flow corresponding to the field elevation. (Refer to the fuel flow placard located adjacent to the fuel flow indicator.) The power increase is significant above 3000 feet and this procedure should always be employed for field elevations greater than 5000 feet above sea level.

WING FLAP SETTINGS

Using 20° wing flaps reduces the ground run and total distance over the obstacle by approximately 10 percent. Soft field takeoffs are performed with 20° flaps by lifting the nose wheel off the ground as soon as practical and leaving the ground in a slightly tail-low attitude. However, the

reduced to 20° immediately after full power is applied. After all obstacles are cleared and a safe altitude and airspeed are obtained, the wing flaps should be retracted.

COLD WEATHER OPERATION

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. Pre-heat will thaw the oil trapped in the oil cooler, which probably will be congealed prior to starting in extremely cold temperatures. When using an external power source, the position of the master switch is important. Refer to Section 9, Supplements, for Ground Service Plug Receptacle operating details.

In very cold weather, no oil temperature indication need be apparent before takeoff. After a suitable warm-up period (2 to 5 minutes at 1000 RPM), the engine is ready for takeoff 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.

HOT WEATHER OPERATION

The general warm temperature starting information in this section is appropriate. Avoid prolonged engine operation on the ground.

FLIGHT WITH CARGO DOORS REMOVED

When operating with the cargo doors removed, an optional spoiler kit must be installed to minimize strong air flow buffeting within the cabin. In addition, all loose equipment, including head rests, rear window sun shade, removable arm rests, safety belts, etc., should be removed or secured. Fifth and sixth seat passengers will receive a strong air blast, and face protection in the form of goggles or helmet is recommended.

The electric wing flap circuit is interrupted by a push-button switch (mounted on the upper sill of the cargo door opening) when the front cargo door is open or removed. Therefore, to have the use of wing flaps when the

shown in this handbook accompanied by approximately a 4 knot decrease in speed.

The fuel injection system employed on this engine is considered to be non-icing. In the event that unusual conditions cause the intake air filter to become clogged or iced over, an alternate intake air valve opens automatically for the most efficient use of either normal or alternate air, depending on the amount of filter blockage. Due to the lower intake pressure available through the alternate air valve or a partially blocked filter, full throttle manifold pressure can decrease approximately 1.5 in. Hg.

LEANING WITH A CESSNA ECONOMY MIXTURE INDICATOR (EGT)

Exhaust gas temperature (EGT) as shown on the optional Cessna Economy Mixture Indicator may be used as an aid for mixture leaning in cruising flight at 75% power or less. To adjust the mixture, using this indicator, lean to establish the peak EGT as a reference point and then enrichen the mixture by a desired increment based on the table below.

Continuous operation at peak EGT is authorized only at 65% power or less. This best economy mixture setting results in approximately 6% greater range than shown in this handbook accompanied by approximately a 4 knot decrease in speed.

NOTE

Operation on the lean side of peak EGT is not approved.

When leaning the mixture, if a distinct peak is not obtained, use the corresponding maximum EGT as a reference point for enrichening the mixture to the desired cruise setting. Any change in altitude or power will require a recheck of the EGT indication.

MIXTURE DESCRIPTION	EXHAUST GAS TEMPERATURE
RECOMMENDED LEAN (Pilot's Operating Handbook and Power Computer)	25°F Rich of Peak EGT
BEST ECONOMY (65% Power or Less)	Peak EGT

Figure 4-4. EGT Table

cargo doors are removed, it is necessary to install a switch depressor plate over the door switch button. Two screws secure the plate in position, depressing the switch button. Without this plate, the wing flaps could not be used unless a rear passenger was available to manually depress the door switch button during flap operation.

With the cargo doors removed, flight characteristics are essentially unchanged, except that a slightly different directional trim setting may be needed. With cargo doors removed, do not exceed 130 KIAS.

NOISE ABATEMENT

Increased emphasis on improving the quality of our environment requires renewed effort on the part of all pilots to minimize the effect of airplane noise on the public.

We, as pilots, can demonstrate our concern for environmental improvement, by application of the following suggested procedures, and thereby tend to build public support for aviation:

1. Pilots operating aircraft under VFR over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.
2. During departure from or approach to an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise-sensitive areas.

NOTE

The above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgment, an altitude of less than 2000 feet is necessary for him to adequately exercise his duty to see and avoid other aircraft.

The certificated noise level for the Model U206G at 3600 pounds maximum weight is 79.4 dB(A). No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of any airport.

STALLS

The stall characteristics are conventional and aural warning is provided by a stall warning horn which sounds between 5 and 10 knots above the stall in all configurations.

Power-off stall speeds at maximum weight for both forward and aft C.G. are presented in Section 5.

LANDINGS

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

SHORT FIELD LANDING

For short field landings, make a power approach at 64 KIAS with full flaps. After all approach obstacles are cleared, progressively reduce power. Maintain 64 KIAS approach speed by lowering the nose of the airplane. Touchdown should be made with the throttle closed, and on the main wheels first. Immediately after touchdown, lower the nose gear and apply heavy braking as required. For maximum brake effectiveness after all three wheels are on the ground, retract the flaps, hold full nose up elevator and apply maximum possible brake pressure without sliding the tires.

At light operating weights, during ground roll with full flaps, hold the control wheel full back to ensure maximum weight on the main wheels for braking. Under these conditions, full nose down elevator (control wheel full forward) will raise the main wheels off the ground.

CROSSWIND LANDING

When landing in a strong crosswind, use the minimum flap setting required for the field length. Although the crab or combination method of drift correction may be used, the wing-low method gives the best control. After touchdown, hold a straight course with the steerable nose wheel and occasional braking if necessary.

BALKED LANDING

In a balked landing (go-around) climb, the wing flap setting should be

INTRODUCTION

Performance data charts on the following pages are presented so that you may know what to expect from the airplane under various conditions, and also, to facilitate the planning of flights in detail and with reasonable accuracy. The data in the charts has been computed from actual flight tests with the airplane and engine in good condition and using average piloting techniques.

It should be noted that the performance information presented in the range and endurance profile charts allows for 45 minutes reserve fuel based on 45% power. Fuel flow data for cruise is based on the recommended lean mixture setting. Some indeterminate variables such as mixture leaning technique, fuel metering characteristics, engine and propeller condition, and air turbulence may account for variations of 10% or more in range and endurance. Therefore, it is important to utilize all available information to estimate the fuel required for the particular flight.

USE OF PERFORMANCE CHARTS

Performance data is presented in tabular or graphical form to illustrate the effect of different variables. Sufficiently detailed information is provided in the tables so that conservative values can be selected and used to determine the particular performance figure with reasonable accuracy.

SAMPLE PROBLEM

The following sample flight problem utilizes information from the various charts to determine the predicted performance data for a typical flight. The following information is known:

AIRPLANE CONFIGURATION

Takeoff weight	3500 Pounds
Usable fuel	88 Gallons

TAKEOFF CONDITIONS

Field pressure altitude	1500 Feet
Temperature	28°C (16°C above standard)
Wind component along runway	12 Knot Headwind
Field length	3500 Feet

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CRUISE CONDITIONS

Total distance	700 Nautical Miles
Pressure altitude	7500 Feet
Temperature	16°C (16°C above standard)
Expected wind enroute	10 Knot Headwind

LANDING CONDITIONS

Field pressure altitude	2000 Feet
Temperature	25°C
Field length	3000 Feet

TAKEOFF

The takeoff distance chart, figure 5-4, should be consulted, keeping in mind that the distances shown are based on the short field technique. Conservative distances can be established by reading the chart at the next higher value of weight, altitude and temperature. For example, in this particular sample problem, the takeoff distance information presented for a weight of 3600 pounds, pressure altitude of 2000 feet and a temperature of 30°C should be used and results in the following:

Ground roll	1200 Feet
Total distance to clear a 50-foot obstacle	2430 Feet

These distances are well within the available takeoff field length. However, a correction for the effect of wind may be made based on Note 3 of the takeoff chart. The correction for a 12 knot headwind is:

$$\frac{12 \text{ Knots}}{10 \text{ Knots}} \times 10\% = 12\% \text{ Decrease}$$

This results in the following distances, corrected for wind:

Ground roll, zero wind	1200
Decrease in ground roll (1200 feet × 12%)	<u>144</u>
Corrected ground roll	1056 Feet
Total distance to clear a 50-foot obstacle, zero wind	2430
Decrease in total distance (2430 feet × 12%)	<u>292</u>
Corrected total distance to clear a 50-foot obstacle	2138 Feet

The total estimated fuel required is as follows:

Engine start, taxi, and takeoff	2.0
Climb	3.9
Cruise	<u>69.4</u>
Total fuel required	75.3 Gallons

This will leave a fuel reserve of:

88.0
<u>-75.3</u>
12.7 Gallons

Once the flight is underway, ground speed checks will provide a more accurate basis for estimating the time enroute and the corresponding fuel required to complete the trip with ample reserve.

LANDING

A procedure similar to takeoff should be used for estimating the landing distance at the destination airport. Figure 5-10 presents landing distance information for the short field technique. The distances corresponding to 2000 feet pressure altitude and a temperature of 30°C are as follows:

Ground roll	830 Feet
Total distance to clear a 50-foot obstacle	1530 Feet

A correction for the effect of wind may be made based on Note 2 of the landing chart using the same procedure as outlined for takeoff.

DEMONSTRATED OPERATING TEMPERATURE

Satisfactory engine cooling has been demonstrated for this airplane with an outside air temperature 23°C above standard. This is not to be considered as an operating limitation. Reference should be made to Section 2 for engine operating limitations.

CRUISE

The cruising altitude should be selected based on a consideration of trip length, winds aloft, and the airplane's performance. A cruising altitude and the expected wind enroute have been given for this sample problem. However, the power setting selection for cruise must be determined based on several considerations. These include the cruise performance characteristics presented in figure 5-7, the range profile chart presented in figure 5-8, and the endurance profile chart presented in figure 5-9.

The relationship between power and range is illustrated by the range profile chart. Considerable fuel savings and longer range result when lower power settings are used.

The range profile chart indicates that use of 65% power at 7500 feet yields a predicted range of 781 nautical miles with no wind. The endurance profile chart shows a corresponding 5.7 hours. Using this information, the estimated distance can be determined for the expected 10 knot headwind at 7500 feet as follows:

Range, zero wind	781
Decrease in range due to wind (5.7 hours × 10 knot headwind)	<u>57</u>
Corrected range	724 Nautical Miles

This indicates that the trip can be made without a fuel stop using approximately 65% power.

The cruise performance chart for 8000 feet pressure altitude is entered using 20°C above standard temperature. These values most nearly correspond to the planned altitude and expected temperature conditions. The power setting chosen is 2550 RPM and 21 inches of manifold pressure which results in the following:

Power	65%
True airspeed	142 Knots
Cruise fuel flow	13.6 GPH

The power computer may be used to determine power and fuel consumption more accurately during the flight.

FUEL REQUIRED

The total fuel requirement for the flight may be estimated using the performance information in figures 5-6 and 5-7. For this sample problem, figure 5-6 shows that a normal climb from 2000 feet to 8000 feet at a weight

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of 3600 pounds requires 3.4 gallons of fuel. The corresponding distance during the climb is 21 nautical miles. These values are for a standard temperature and are sufficiently accurate for most flight planning purposes. However, a further correction for the effect of temperature may be made as noted on the climb chart. The approximate effect of a non-standard temperature is to increase the time, fuel, and distance by 10% for each 10°C above standard temperature, due to the lower rate of climb. In this case, assuming a temperature 16°C above standard, the correction would be:

$$\frac{16^{\circ}\text{C}}{10^{\circ}\text{C}} \times 10\% = 16\% \text{ Increase}$$

With this factor included, the fuel estimate would be calculated as follows:

Fuel to climb, standard temperature	3.4
Increase due to non-standard temperature (3.4 × 16%)	0.5
Corrected fuel to climb	3.9 Gallons

Using a similar procedure for the distance during climb results in 24 nautical miles.

The resultant cruise distance is:

Total distance	700
Climb distance	-24
Cruise distance	676 Nautical Miles

With an expected 10 knot headwind, the ground speed for cruise is predicted to be:

$$\begin{array}{r} 142 \\ -10 \\ \hline 132 \text{ Knots} \end{array}$$

Therefore, the time required for the cruise portion of the trip is:

$$\frac{676 \text{ Nautical Miles}}{132 \text{ Knots}} = 5.1 \text{ Hours}$$

The fuel required for cruise is:

$$5.1 \text{ hours} \times 13.6 \text{ gallons/hour} = 69.4 \text{ Gallons}$$

TAKEOFF DISTANCE
3300 LBS AND 3000 LBS

SHORT FIELD

REFER TO SHEET 1 FOR APPROPRIATE CONDITIONS AND NOTES.

WEIGHT LBS	TAKEOFF SPEED KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			GRND ROLL	TOTAL TO CLEAR 50 FT OBS ROLL	GRND ROLL	TOTAL TO CLEAR 50 FT OBS ROLL	GRND ROLL	TOTAL TO CLEAR 50 FT OBS ROLL	GRND ROLL	TOTAL TO CLEAR 50 FT OBS ROLL	GRND ROLL	TOTAL TO CLEAR 50 FT OBS ROLL
3300	51	62	660	1305	710	1395	760	1495	815	1605	875	1720
			720	1425	775	1530	830	1640	890	1760	955	1890
			2000	1565	845	1675	910	1805	975	1940	1045	2090
			3000	1720	925	1845	995	1990	1070	2145	1150	2315
			4000	1900	1015	2045	1090	2205	1175	2380	1260	2580
			5000	2105	1115	2270	1200	2455	1290	2660	1390	2890
			6000	2340	1230	2535	1320	2750	1420	2980	1530	3270
			7000	2625	1355	2850	1460	3105	1570	3395	1690	3735
			8000	2960	1495	3235	1610	3545	1735	3910	1870	4345
			S.L.	1050	570	1120	610	1195	655	1280	700	1370
3000	48	59	530	1140	620	1220	665	1305	715	1400	765	1500
			2000	1245	680	1335	730	1430	780	1535	835	1645
			3000	1365	740	1465	795	1570	855	1685	915	1810
			4000	1500	810	1610	870	1725	935	1855	1005	2000
			5000	1650	890	1775	955	1910	1030	2055	1105	2220
			6000	1825	980	1965	1050	2115	1130	2285	1215	2475
			7000	2025	1075	2185	1160	2360	1245	2555	1340	2775
			8000	2260	1185	2445	1275	2650	1375	2880	1480	3140
			S.L.	1050	570	1120	610	1195	655	1280	700	1370
			1000	1140	620	1220	665	1305	715	1400	765	1500

Figure 5-4. Takeoff Distance (Sheet 2 of 2)

AIRSPEED CALIBRATION

NORMAL STATIC SOURCE

FLAPS UP														
KIAS	60	70	80	90	100	110	120	130	140	150	160	170	180	
KCAS	68	75	82	92	101	110	120	129	139	149	158	168	178	
FLAPS 20°														
KIAS	50	60	70	80	90	100	---	---	---	---	---	---	---	---
KCAS	60	65	73	82	91	101	---	---	---	---	---	---	---	---
FLAPS 40°														
KIAS	50	60	70	80	90	100	---	---	---	---	---	---	---	---
KCAS	59	65	73	82	91	101	---	---	---	---	---	---	---	---

ALTERNATE STATIC SOURCE
VENTS AND WINDOWS CLOSED

FLAPS UP														
NORMAL KIAS	60	70	80	90	100	110	120	130	140	150	160	170	180	
ALTERNATE KIAS	63	73	82	94	104	114	125	135	145	156	165	176	186	
FLAPS 20°														
NORMAL KIAS	50	60	70	80	90	100	---	---	---	---	---	---	---	---
ALTERNATE KIAS	55	64	74	85	95	105	---	---	---	---	---	---	---	---
FLAPS 40°														
NORMAL KIAS	50	60	70	80	90	100	---	---	---	---	---	---	---	---
ALTERNATE KIAS	52	61	71	81	91	102	---	---	---	---	---	---	---	---

Figure 5-1. Airspeed Calibration

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RATE OF CLIMB

MAXIMUM

CONDITIONS:

Flaps Up
2700 RPM
Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flaps Open

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	23
4000	21
8000	19
12,000	17

AERO FLINT INC. TIP TANKS Fitted. wt 380lbs

WEIGHT LBS	PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM			
			-20°C	0°C	20°C	40°C
3600	S.L.	84	1080	990	895	805
	2000	83	940	855	770	680
	4000	82	810	725	640	555
	6000	81	680	595	515	430
	8000	79	550	470	390	310
	10,000	78	420	340	265	---
	12,000	77	295	220	145	---
3300	S.L.	82	1235	1145	1050	955
	2000	81	1090	1005	915	825
	4000	79	950	865	780	695
	6000	78	810	730	645	560
	8000	77	675	595	515	435
	10,000	76	540	460	385	---
	12,000	74	410	335	260	---
3000	S.L.	79	1420	1325	1225	1130
	2000	78	1260	1170	1080	985
	4000	77	1110	1025	940	855
	6000	76	965	880	800	715
	8000	74	815	740	655	575
	10,000	73	675	595	520	---
	12,000	71	535	460	385	---

Figure 5-5. Rate of Climb

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TEMPERATURE CONVERSION CHART

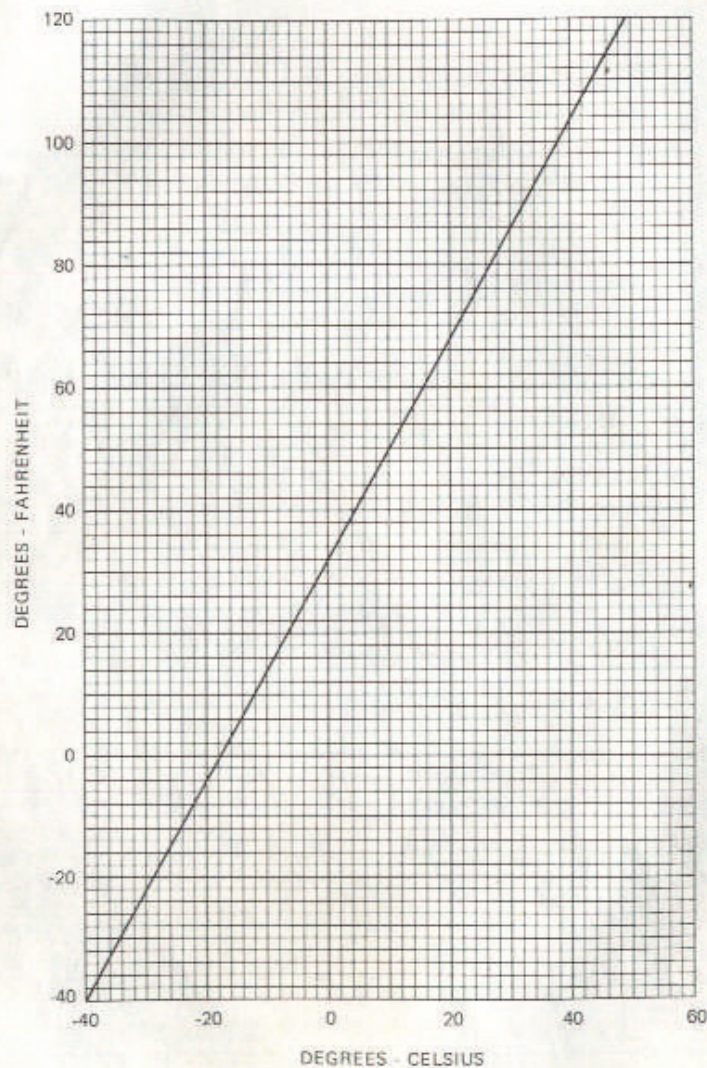


Figure 5-2. Temperature Conversion Chart

TIME, FUEL, AND DISTANCE TO CLIMB

MAXIMUM RATE OF CLIMB

CONDITIONS:

Flaps Up
2700 RPM
Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flaps Open
Standard Temperature

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	23
4000	21
8000	19
12,000	17

NOTES:

1. Add 2.0 gallons of fuel for engine start, taxi and takeoff allowance.
2. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
3. Distances shown are based on zero wind.

A FLINT AERO INC. TIPTANKS FITTED. MAX WT 3800

WEIGHT LBS	PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
				TIME MIN	FUEL USED GALLONS	DISTANCE NM
3600	S.L.	84	920	0	0	0
	2000	83	810	2	0.9	3
	4000	82	695	5	1.8	7
	6000	81	585	8	2.9	12
	8000	79	470	12	4.2	18
	10,000	78	360	17	5.7	26
	12,000	77	250	24	7.7	36
3300	S.L.	82	1075	0	0	0
	2000	81	955	2	0.7	3
	4000	79	835	4	1.6	6
	6000	78	715	7	2.4	10
	8000	77	600	10	3.4	15
	10,000	76	480	14	4.6	20
	12,000	74	365	19	6.0	28
3000	S.L.	79	1250	0	0	0
	2000	78	1125	2	0.6	2
	4000	77	995	4	1.3	5
	6000	76	870	6	2.1	8
	8000	74	740	8	2.9	12
	10,000	73	615	11	3.8	16
	12,000	71	495	15	4.9	22

Figure 5-6. Time, Fuel, and Distance to Climb (Sheet 1 of 2)

STALL SPEEDS

CONDITIONS:

Power Off

NOTES:

1. Maximum altitude loss during a stall recovery may be as much as 240 feet.
2. KIAS values are approximate.

MOST REARWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
3600	UP	41	62	44	67	49	74	58	88
	20°	44	57	47	61	52	68	62	81
	40°	34	54	37	58	40	64	48	76

MOST FORWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
3600	UP	55	67	59	72	65	80	78	95
	20°	50	60	54	65	59	71	71	85
	40°	46	57	49	61	55	68	65	81

Figure 5-3. Stall Speeds

TIME, FUEL, AND DISTANCE TO CLIMB

NORMAL CLIMB - 95 KIAS

CONDITIONS:

Flaps Up
2550 RPM
25 Inches Hg or Full Throttle
Cowl Flaps Open
Standard Temperature

NOTES:

1. Add 2.0 gallons of fuel for engine start, taxi and takeoff allowance.
2. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
3. Distances shown are based on zero wind.

MIXTURE SETTING	
PRESS ALT	GPH
S.L. to 4000	18
8000	16
12,000	14

WEIGHT LBS	PRESS ALT FT	RATE OF CLIMB FPM	FROM SEA LEVEL		
			TIME MIN	FUEL USED GALLONS	DISTANCE NM
3600	S.L.	600	0	0	0
	2000	600	3	1.0	5
	4000	590	7	2.0	11
	6000	480	10	3.1	17
	8000	375	15	4.4	26
	10,000	265	22	6.1	38
	12,000	155	32	8.5	57
3300	S.L.	720	0	0	0
	2000	720	3	0.8	4
	4000	710	6	1.7	9
	6000	595	9	2.6	14
	8000	480	12	3.6	21
	10,000	360	17	4.9	30
	12,000	245	24	6.5	43
3000	S.L.	860	0	0	0
	2000	860	2	0.7	4
	4000	850	5	1.4	8
	6000	725	7	2.1	12
	8000	600	10	3.0	17
	10,000	475	14	4.0	24
	12,000	345	19	5.2	34

Figure 5-6. Time, Fuel, and Distance to Climb (Sheet 2 of 2)

TAKEOFF DISTANCE MAXIMUM WEIGHT 3600 LBS

SHORT FIELD

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	24
2000	23
4000	22
6000	21
8000	20

CONDITIONS:

Flaps 20°
2850 RPM, Full Throttle and Mixture Set at Placard Fuel Flow Prior to Brake Release
Cowl Flaps Open
Paved, Level, Dry Runway
Zero Wind

NOTES:

1. Short field technique as specified in Section 4.
2. Where distance value has been deleted, climb performance after lift-off is less than 150 fpm at takeoff speed.
3. Decrease distances 10% for each 10 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2.5 knots.
4. For operation on a dry, grass runway, increase distances by 15% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
3600	53	65	S.L.	810	1600	870	1715	935	1845	1000	1985	1075	2135
			1000	885	1755	950	1890	1020	2035	1095	2190	1175	2365
			2000	965	1935	1040	2085	1115	2250	1200	2430	1290	2630
			3000	1060	2140	1140	2310	1225	2500	1320	2710	1415	2945
			4000	1165	2380	1250	2575	1345	2795	1450	3040	1560	3320
			5000	1280	2660	1375	2890	1485	3145	1595	3445	1720	3790
			6000	1410	2995	1520	3270	1635	3580	1765	3950	1900	4390
3300	53	65	7000	1555	3405	1680	3740	1810	4135	1950	4615	2090	5145
			8000	1720	3925	1860	4360	2005	4890	2150	5290	2300	5890
			S.L.	810	1600	870	1715	935	1845	1000	1985	1075	2135
			1000	885	1755	950	1890	1020	2035	1095	2190	1175	2365
			2000	965	1935	1040	2085	1115	2250	1200	2430	1290	2630
			3000	1060	2140	1140	2310	1225	2500	1320	2710	1415	2945
			4000	1165	2380	1250	2575	1345	2795	1450	3040	1560	3320
3000	53	65	5000	1280	2660	1375	2890	1485	3145	1595	3445	1720	3790
			6000	1410	2995	1520	3270	1635	3580	1765	3950	1900	4390
			7000	1555	3405	1680	3740	1810	4135	1950	4615	2090	5145
			8000	1720	3925	1860	4360	2005	4890	2150	5290	2300	5890
			S.L.	810	1600	870	1715	935	1845	1000	1985	1075	2135
			1000	885	1755	950	1890	1020	2035	1095	2190	1175	2365
			2000	965	1935	1040	2085	1115	2250	1200	2430	1290	2630

Figure 5-4. Takeoff Distance (Sheet 1 of 2)

CRUISE PERFORMANCE
PRESSURE ALTITUDE 6000 FEETCONDITIONS:
3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE
For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -17°C			STANDARD TEMPERATURE 3°C			20°C ABOVE STANDARD TEMP 23°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	24	---	---	---	78	148	16.2	75	149	15.7
	23	76	144	16.0	74	145	15.4	71	145	14.9
	22	72	141	15.1	69	141	14.5	67	142	14.1
	21	68	137	14.2	65	137	13.7	63	138	13.3
2500	24	78	145	16.3	75	146	15.8	73	147	15.2
	23	74	142	15.5	71	143	14.9	69	143	14.4
	22	70	139	14.6	67	139	14.1	65	140	13.7
	21	66	135	13.8	63	135	13.3	61	136	12.9
2400	24	73	141	15.2	70	142	14.7	68	142	14.2
	23	69	138	14.5	67	138	14.0	64	139	13.5
	22	65	134	13.7	63	135	13.2	61	135	12.8
	21	61	131	12.9	59	131	12.5	57	131	12.1
2300	24	68	137	14.3	66	138	13.8	64	138	13.4
	23	65	134	13.6	62	135	13.1	60	135	12.7
	22	61	130	12.9	59	131	12.4	57	131	12.1
	21	57	127	12.1	55	127	11.8	53	127	11.4
2200	24	63	132	13.3	61	133	12.8	59	133	12.4
	23	60	129	12.6	58	130	12.2	56	130	11.8
	22	57	126	12.0	54	126	11.6	53	126	11.2
	21	53	122	11.3	51	122	11.0	49	122	10.7
	20	50	118	10.7	48	118	10.3	46	117	10.0
	19	46	113	10.0	44	113	9.7	43	112	9.4

Figure 5-7. Cruise Performance (Sheet 3 of 6)

CRUISE PERFORMANCE
PRESSURE ALTITUDE 2000 FEETCONDITIONS:
3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE
For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -9°C			STANDARD TEMPERATURE 11°C			20°C ABOVE STANDARD TEMP 31°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	25	---	---	---	78	143	16.3	76	144	15.8
	24	77	139	16.0	74	140	15.4	71	141	14.9
	23	72	136	15.1	70	137	14.6	67	137	14.1
	22	68	132	14.2	65	133	13.7	63	133	13.3
2500	25	78	140	16.4	76	141	15.8	73	142	15.3
	24	74	137	15.5	72	138	15.0	69	139	14.5
	23	70	134	14.7	68	135	14.2	65	135	13.7
	22	66	131	13.8	64	131	13.4	62	132	12.9
2400	25	73	137	15.3	71	138	14.8	68	138	14.3
	24	69	134	14.5	67	134	14.1	65	135	13.6
	23	66	130	13.8	63	131	13.3	61	131	12.9
	22	62	127	13.0	59	127	12.5	57	128	12.2
2300	25	69	133	14.4	66	134	13.9	64	134	13.5
	24	65	130	13.7	63	130	13.2	61	131	12.8
	23	61	126	12.9	59	127	12.5	57	127	12.1
	22	58	123	12.2	56	123	11.8	54	123	11.5
2200	25	64	128	13.3	61	129	12.9	59	129	12.5
	24	60	125	12.7	58	126	12.3	56	126	11.9
	23	57	122	12.0	55	122	11.6	53	122	11.3
	22	53	119	11.4	51	119	11.0	50	119	10.7
	21	50	115	10.7	48	115	10.4	46	114	10.1
	20	46	110	10.0	45	110	9.7	43	110	9.5

Figure 5-7. Cruise Performance (Sheet 1 of 6)

CRUISE PERFORMANCE
PRESSURE ALTITUDE 8000 FEET

CONDITIONS:
3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE

For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -21°C			STANDARD TEMPERATURE -1°C			20°C ABOVE STANDARD TEMP 19°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	22	74	145	15.5	71	145	14.9	69	146	14.5
	21	70	141	14.6	67	141	14.1	65	142	13.6
	20	66	137	13.7	63	137	13.3	61	138	12.8
	19	61	133	12.9	59	133	12.4	57	133	12.0
2500	22	72	143	15.0	69	143	14.5	67	144	14.0
	21	68	139	14.2	65	140	13.7	63	140	13.2
	20	63	135	13.3	61	135	12.9	59	136	12.5
	19	59	131	12.5	57	131	12.1	55	131	11.7
2400	22	67	138	14.1	65	139	13.6	62	139	13.1
	21	63	135	13.3	61	135	12.8	59	135	12.4
	20	59	131	12.5	57	131	12.1	55	131	11.7
	19	55	126	11.7	53	126	11.4	51	126	11.0
2300	22	63	134	13.2	61	135	12.8	59	135	12.4
	21	59	131	12.5	57	131	12.1	55	131	11.7
	20	55	127	11.8	53	127	11.4	52	126	11.1
	19	52	122	11.1	50	122	10.7	48	121	10.4
2200	22	58	130	12.3	56	130	11.9	54	130	11.5
	21	55	126	11.6	53	126	11.3	51	126	10.9
	20	51	122	11.0	49	122	10.7	48	121	10.3
	19	48	117	10.3	46	117	10.0	44	116	9.7
	18	44	112	9.7	43	111	9.4	41	110	9.1

Figure 5-7. Cruise Performance (Sheet 4 of 6)

CRUISE PERFORMANCE
PRESSURE ALTITUDE 4000 FEET

CONDITIONS:
3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE

For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -13°C			STANDARD TEMPERATURE 7°C			20°C ABOVE STANDARD TEMP 27°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	24	79	143	16.4	76	144	15.8	73	145	15.3
	23	74	140	15.5	72	141	15.0	69	141	14.5
	22	70	136	14.6	67	137	14.1	65	137	13.7
	21	66	133	13.8	63	133	13.3	61	134	12.9
	20	62	130	13.0	60	130	12.5	58	129	12.1
2500	25	---	---	---	78	145	16.2	75	146	15.7
	24	76	141	15.9	74	142	15.4	71	143	14.9
	23	72	138	15.1	70	139	14.6	67	139	14.1
	22	68	135	14.2	65	135	13.7	63	136	13.3
	21	64	132	13.4	62	132	13.0	60	131	12.5
2400	25	75	140	15.7	72	141	15.1	70	142	14.6
	24	71	137	14.9	69	138	14.4	66	138	13.9
	23	67	134	14.1	65	135	13.6	63	135	13.2
	22	63	130	13.3	61	131	12.9	59	131	12.5
	21	59	127	12.5	57	127	12.1	55	126	11.7
2300	25	70	137	14.7	68	137	14.2	66	138	13.8
	24	67	134	14.0	64	134	13.5	62	135	13.1
	23	63	130	13.3	61	131	12.8	59	131	12.4
	22	59	127	12.5	57	127	12.1	55	127	11.8
	21	55	124	11.7	53	124	11.4	51	123	11.0
2200	25	65	132	13.6	63	132	13.2	61	133	12.8
	24	62	129	13.0	59	129	12.5	57	130	12.2
	23	58	126	12.3	56	126	11.9	54	126	11.6
	22	55	122	11.7	53	122	11.3	51	122	11.0
	21	51	118	11.0	50	118	10.7	48	118	10.4
	20	48	114	10.4	46	114	10.0	45	113	9.8
	19	44	110	9.7	43	109	9.4	41	108	9.1

Figure 5-7. Cruise Performance (Sheet 2 of 6)

RANGE PROFILE 45 MINUTES RESERVE 88 GALLONS USABLE FUEL

CONDITIONS:

3600 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

NOTES:

1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during a normal climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45% BHP and is 7.4 gallons.

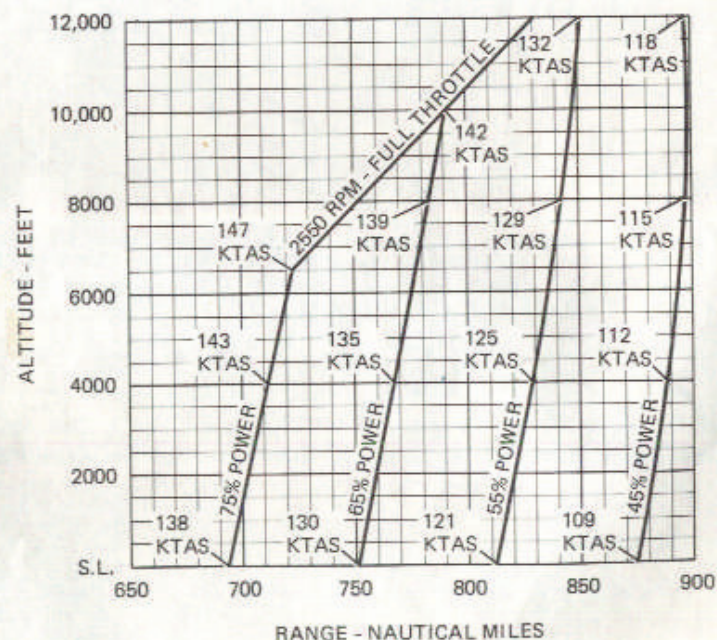


Figure 5-8. Range Profile

CRUISE PERFORMANCE PRESSURE ALTITUDE 10,000 FEET

CONDITIONS:

3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE

For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		20°C BELOW STANDARD TEMP -25°C			STANDARD TEMPERATURE -5°C			20°C ABOVE STANDARD TEMP 15°C		
RPM	MP	% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	20	68	141	14.2	65	142	13.7	63	142	13.2
	19	63	137	13.3	61	137	12.8	59	137	12.4
	18	59	132	12.4	56	132	12.0	55	132	11.6
	17	54	127	11.5	52	127	11.2	50	126	10.8
2500	20	65	139	13.7	63	140	13.3	61	140	12.8
	19	61	135	12.9	59	135	12.4	57	135	12.0
	18	57	130	12.0	55	130	11.6	53	130	11.3
	17	52	125	11.2	50	125	10.8	49	124	10.5
2400	20	61	135	12.9	59	135	12.4	57	135	12.0
	19	57	131	12.1	55	131	11.7	53	130	11.3
	18	53	126	11.3	51	126	11.0	49	125	10.6
	17	49	120	10.6	47	120	10.2	45	119	9.9
2300	20	57	131	12.1	55	131	11.7	53	130	11.4
	19	53	126	11.4	51	126	11.0	50	125	10.7
	18	50	121	10.7	48	121	10.3	46	120	10.0
	17	46	116	9.9	44	115	9.6	42	113	9.3
2200	20	53	126	11.3	51	125	11.0	49	125	10.6
	19	49	121	10.7	48	121	10.3	46	120	10.0
	18	46	116	10.0	44	115	9.7	43	114	9.4

Figure 5-7. Cruise Performance (Sheet 5 of 6)

ENDURANCE PROFILE

45 MINUTES RESERVE
88 GALLONS USABLE FUEL

CONDITIONS:

3600 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTES:

1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during a normal climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45% BHP and is 7.4 gallons.

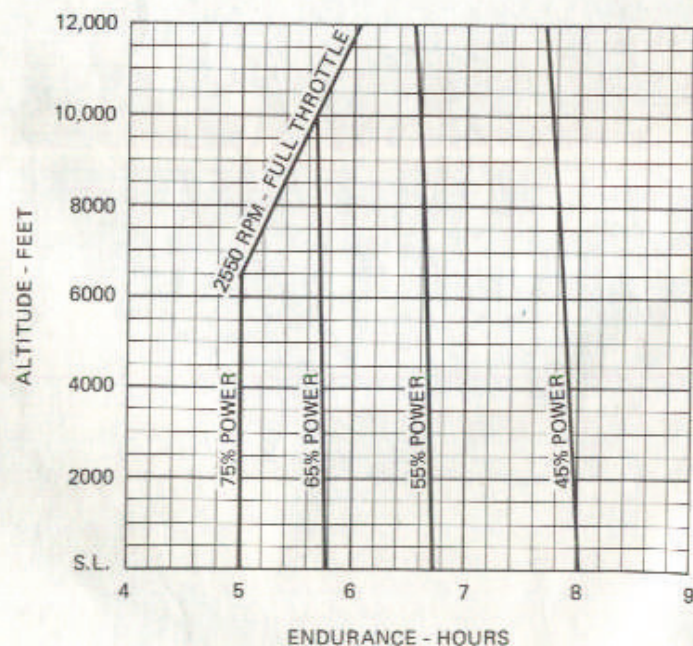


Figure 5-9. Endurance Profile

CRUISE PERFORMANCE

PRESSURE ALTITUDE 12,000 FEET

CONDITIONS:

3600 Pounds
Recommended Lean Mixture
Cowl Flaps Closed

NOTE

For best fuel economy at 65% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

RPM	MP	20°C BELOW STANDARD TEMP -29°C			STANDARD TEMPERATURE -9°C			20°C ABOVE STANDARD TEMP 11°C		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2550	18	61	137	12.8	58	137	12.3	56	137	12.0
	17	56	131	11.9	54	131	11.5	52	131	11.2
	16	51	126	11.0	50	125	10.7	48	124	10.3
	15	47	119	10.1	45	118	9.8	43	116	9.5
2500	18	59	134	12.4	57	134	12.0	55	134	11.6
	17	54	129	11.6	52	129	11.2	50	128	10.8
	16	50	123	10.7	48	122	10.4	46	121	10.0
	15	45	116	9.8	43	115	9.5	42	112	9.2
2400	18	55	130	11.7	53	130	11.3	51	129	11.0
	17	51	125	10.9	49	124	10.6	47	123	10.2
	16	47	119	10.1	45	117	9.8	43	115	9.5
2300	18	51	125	11.0	49	125	10.6	48	124	10.3
	17	47	120	10.3	46	119	9.9	44	117	9.6
	16	43	113	9.5	42	111	9.2	40	109	8.9
2200	18	48	120	10.3	46	119	10.0	44	118	9.7
	17	44	114	9.6	42	113	9.3	41	110	9.0

Figure 5-7. Cruise Performance (Sheet 6 of 6)

SECTION 6 WEIGHT & BALANCE/ EQUIPMENT LIST

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LANDING DISTANCE

SHORT FIELD

CONDITIONS:

Flaps 40°
Power Off
Maximum Braking
Paved, Level, Dry Runway
Zero Wind

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 10 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2.5 knots.
3. For operation on a dry, grass runway, increase distances by 40% of the "ground roll" figure.

WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
3600	64	S.L.	695	1340	720	1375	750	1415	775	1450	800	1490
		1000	720	1375	750	1415	775	1450	800	1490	830	1530
		2000	750	1415	775	1455	805	1495	830	1530	860	1575
		3000	775	1455	805	1495	835	1540	865	1580	890	1615
		4000	805	1495	835	1540	865	1580	895	1625	925	1665
		5000	835	1540	870	1585	900	1630	930	1675	960	1715
		6000	870	1590	900	1630	935	1680	965	1725	995	1770
		7000	905	1635	935	1680	970	1730	1000	1775	1035	1825
		8000	940	1680	970	1730	1005	1780	1040	1830	1075	1880

Figure 5-10. Landing Distance

[illegible]

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL U206G

WEIGHT AND BALANCE

The following information will enable you to operate your Cessna within the prescribed weight and center of gravity limitations. To figure weight and balance, use the Sample Problem, Loading Graph, and Center of Gravity Moment Envelope as follows:

Take the basic empty weight and moment from appropriate weight and balance records carried in your airplane, and enter them in the column titled YOUR AIRPLANE on the Sample Loading Problem.

NOTE

In addition to the basic empty weight and moment noted on these records, the C.G. arm (fuselage station) is also shown, but need not be used on the Sample Loading Problem. The moment which is shown must be divided by 1000 and this value used as the moment/1000 on the loading problem.

Use the Loading Graph to determine the moment/1000 for each additional item to be carried; then list these on the loading problem.

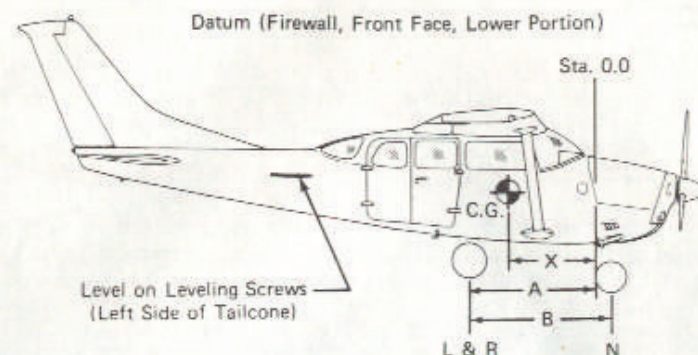
NOTE

Loading Graph information for the pilot, passengers and baggage or cargo is based on seats positioned for average occupants and baggage or cargo loaded in the center of these areas as shown on the Loading Arrangements diagram. For loadings which may differ from these, the Sample Loading Problem lists fuselage stations for these items to indicate their forward and aft C.G. range limitation (seat travel or baggage/cargo area limitation). Additional moment calculations, based on the actual weight and C.G. arm (fuselage station) of the item being loaded, must be made if the position of the load is different from that shown on the Loading Graph.

When a cargo pack is installed, it is necessary to determine the C.G. arm and calculate the moment/1000 of items carried in the pack. The arm for any location in the pack can be determined from the diagram on figure 6-5. Multiply the weight of the item by the C.G. arm, then divide by 1000 to get the moment/1000. The maximum loading capacity of the pack is 300 pounds.

SECTION 6
WEIGHT & BALANCE/
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Scale Position	Scale Reading	Tare	Symbol	Net Weight
Left Wheel			L	976.0
Right Wheel			R	982.0
Nose Wheel			N	861.0
Sum of Net Weights (As Weighed)			W	2019.0

$$X = \text{ARM} = \frac{(A) - (N) \times (B)}{W}; X = (\quad) - (\quad) \times (\quad) = (\quad) \text{ IN.}$$

Item	Weight (Lbs.)	X C.G. Arm (In.)	Moment/1000 (Lbs.-In.)
Airplane Weight (From Item 5, page 6-3)			
Add Oil:			
No Oil Filter (12 Qts at 7.5 Lbs/Gal)		-19.4	
With Oil Filter (13 Qts at 7.5 Lbs/Gal)		-19.4	
Add: Unusable Fuel (4 Gal at 6 Lbs/Gal)	24.0	48.0	1.2
Equipment Changes			
Airplane Basic Empty Weight			

Figure 6-1. Sample Airplane Weighing

Since your Cessna is capable of carrying large amounts of cargo, it will be necessary to properly secure this load before flight. A tie-down kit is available from any Cessna Dealer for airplanes with normal seating and airplanes with club seating. Provided in each kit are 12 tie-down blocks that fasten to the seat rails and three "D" rings on the floor at fuselage station 124. On airplanes equipped with club seating, eight of the tie-down blocks are designed for use on the larger seat rails used with the aft facing seats. Care must be taken to ensure that the proper sized tie-down blocks are used. If more tie-down points are needed, the seat belt attaching points, as well as shoulder harness attaching points, may be used. Rope, strap, or cable used for tie-down should be rated at a minimum of ten times the load weight capacity of the tie-down fittings used.

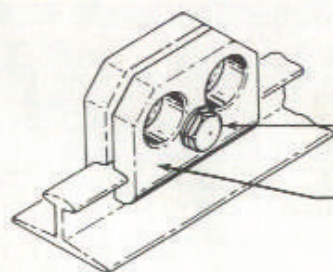
The following table shows the maximum allowable cargo weight for each type of attachment:

ITEM	LOCATION	*MAXIMUM LOAD (LBS.)
Seat Rail Tie-Down Assy	On Seat Rail Section Without Lock Pin Holes	200
Seat Rail Tie-Down Assy	On Seat Rail Section With Lock Pin Holes	100
"D" Rings	Floor only	60
Seat Belt Attachment	Floor or Side-Wall	200
Shoulder Strap	Cabin Top	175

*Rated load per attachment (Cargo Item Wt. ÷ No. Tie-Downs). A sufficient number of attachments to restrain the cargo from shifting should be used in addition to load requirements

FOR EXAMPLE:

A 400# load would require a minimum of four (4) tie-downs rated at 100# each.



MUST BE TIGHTENED TO A
MINIMUM OF 50 INCH POUNDS.

SEAT RAIL TIE-DOWN ASSEMBLY
(TWO SIZES REQUIRED
FOR CLUB SEATING)

Figure 6-4. Cargo Loading

NOTE

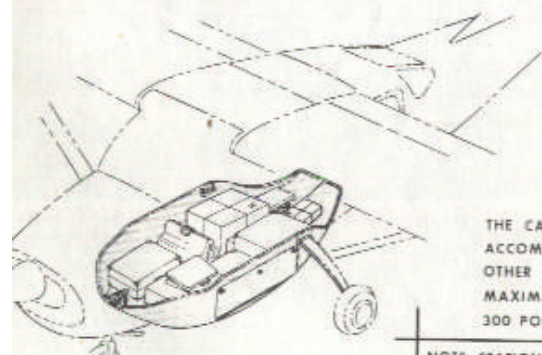
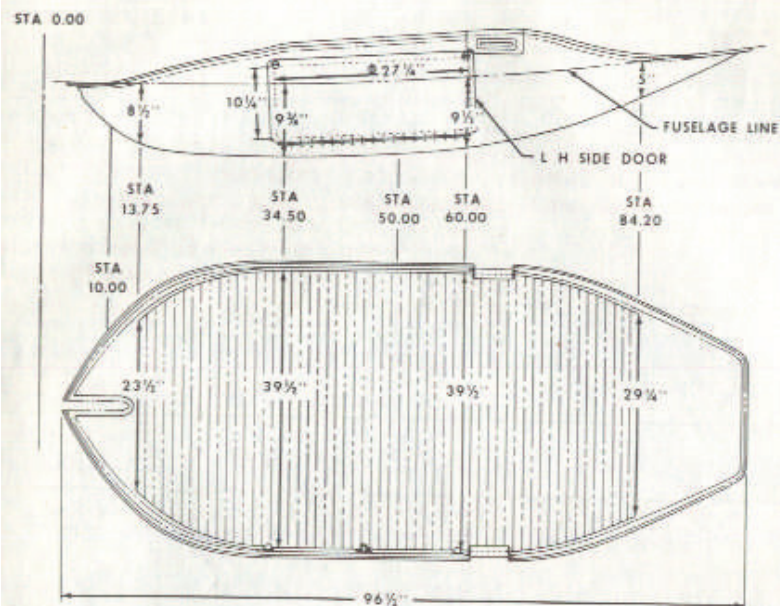
Each loading should be figured in accordance with the above paragraphs. When the loading is light (such as pilot and copilot, and no rear seats or cargo), be sure to check the forward balance limits. When loading is heavy (near gross weight), be sure to check the aft balance limits.

To avoid time consuming delays in cargo and/or passenger shifting, plan your load so that the heaviest cargo and/or passengers are in the forward part of the airplane or cargo pack, and the lightest in the rear. Always plan to have any vacant space at the rear of the airplane or pack. For example, do not have passengers occupy the aft seat unless the front and center seats are to be occupied.

Total the weights and moments/1000 and plot these values on the Center of Gravity Moment Envelope to determine whether the point falls within the envelope, and if the loading is acceptable.

SECTION 6 WEIGHT & BALANCE/ EQUIPMENT LIST

CESSNA
MODEL U206G



THE CARGO PACK WAS DESIGNED TO ACCOMMODATE THREE 'TWO-SUITERS' PLUS OTHER SMALL MISCELLANEOUS ARTICLES. MAXIMUM LOADING FOR CARGO PACK IS 300 POUNDS.

NOTE: STATION LOCATION AND C.G. ARM ARE IDENTICAL

Figure 6-5. Cargo Pack

1 October 1978

SECTION 6 WEIGHT & BALANCE/ EQUIPMENT LIST

CESSNA
MODEL U206G

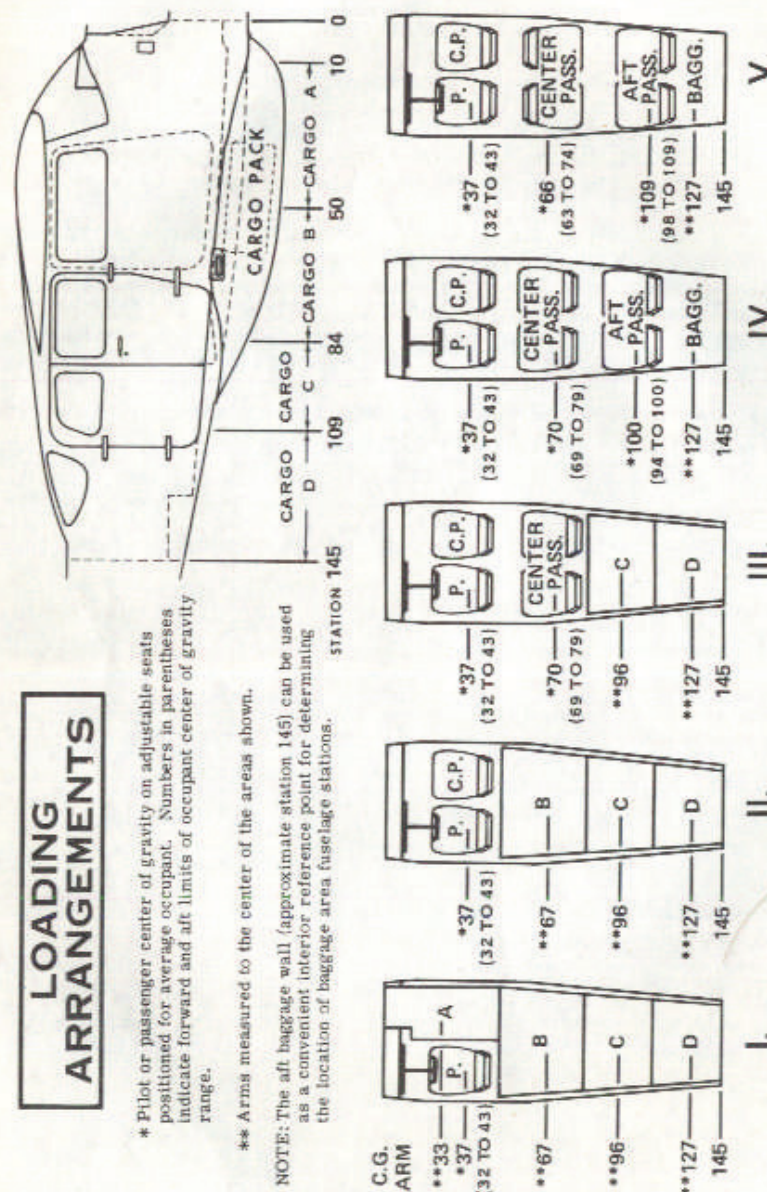


Figure 6-3. Loading Arrangements

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1 October 1978

SECTION 6
WEIGHT & BALANCE/
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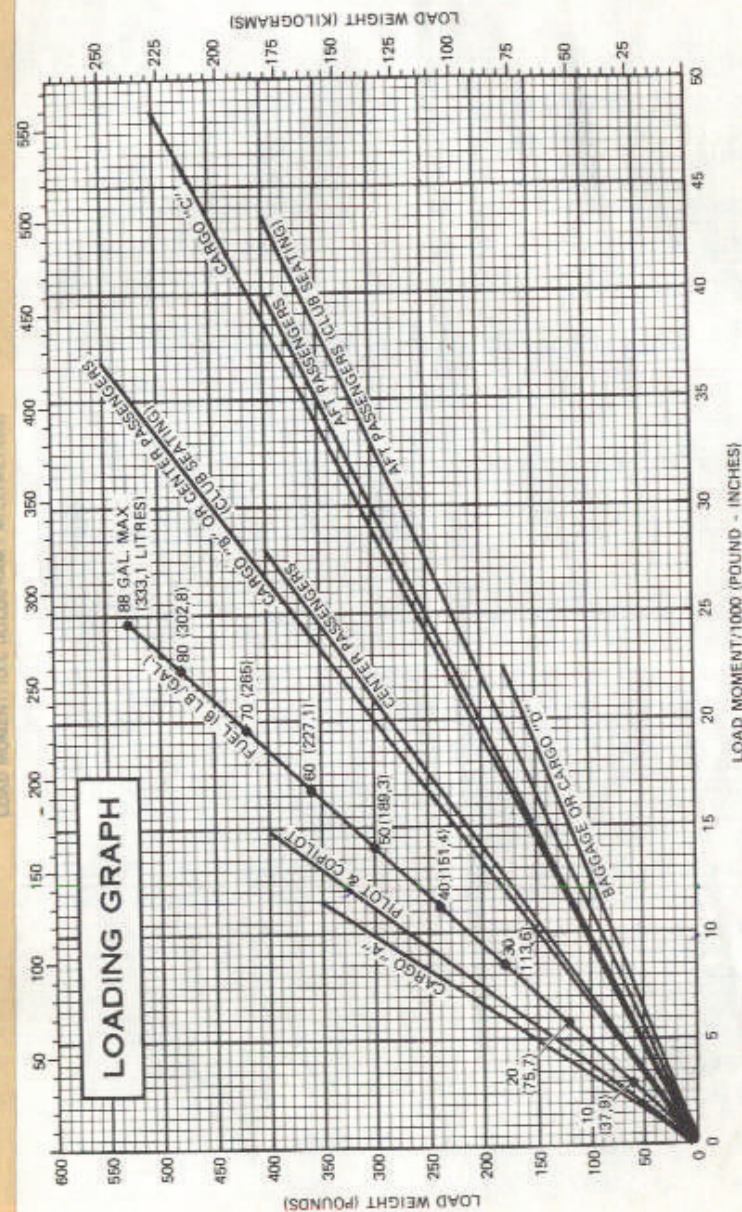
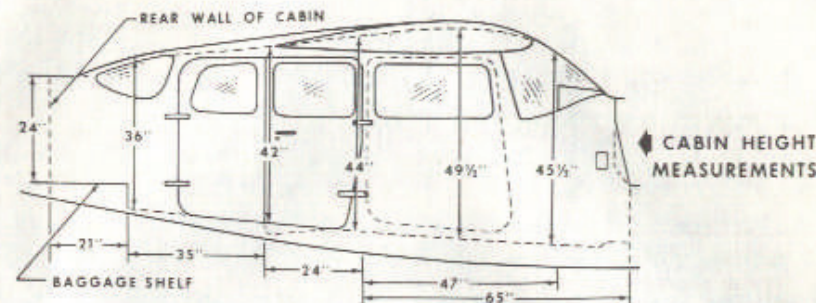


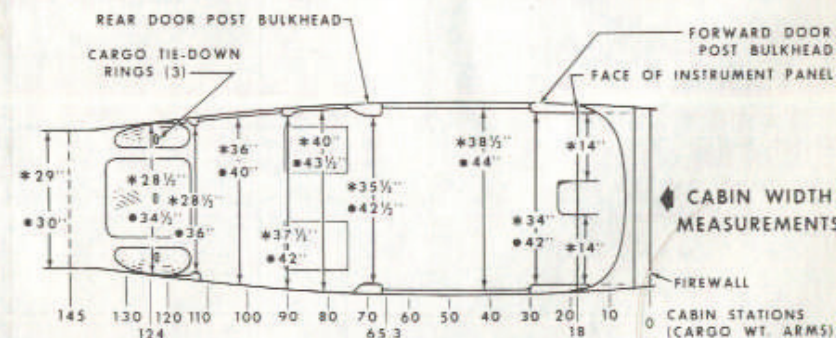
Figure 6-8. Loading Graph

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST



DOOR OPENING DIMENSIONS

	WIDTH (TOP)	WIDTH (BOTTOM)	HEIGHT (FRONT)	HEIGHT (REAR)
CABIN DOOR	32 1/2"	37"	41"	39"
CARGO DOORS	43"	40"	39 1/2"	37 1/2"



NOTES:

1. Use the forward face of the rear door post as a reference point to locate C.G. arms. For example, a box with its center of weight located 13 inches aft of the rear door post would have a C.G. arm of $(85.3 - 13.0 = 72.3)$ 72.3 inches.
2. Maximum allowable floor loading: 200 pounds/square foot. However, when items with small or sharp support areas are carried, the installation of a 1/4" plywood floor is highly recommended to protect the aircraft structure.

Figure 6-6. Internal Cabin Dimensions

SECTION 6
WEIGHT & BALANCE/
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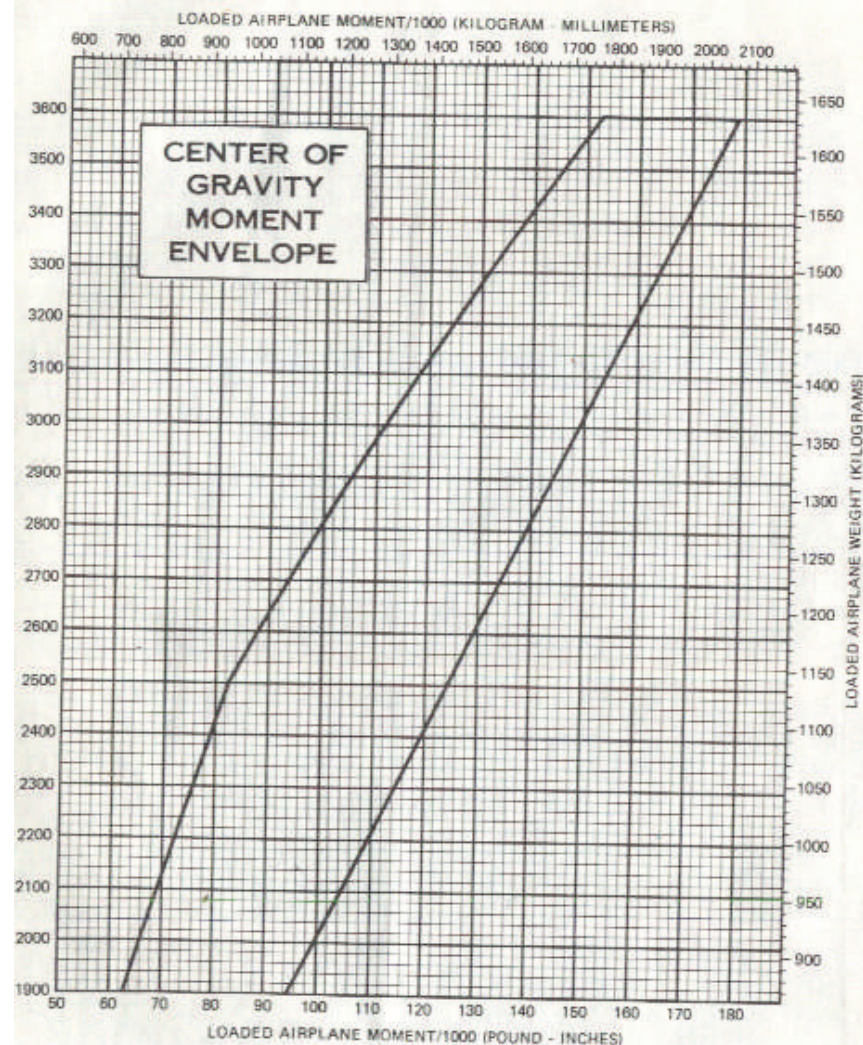


Figure 6-9. Center of Gravity Moment Envelope

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL U206G

SAMPLE LOADING PROBLEM	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (lb.-ins. /1000)	Weight (lbs.)	Moment (lb.-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	2019	76.4		
2. Usable Fuel (At 6 Lbs./Gal.) Standard Tanks (88 Gal. Max.) <i>46.6" arm</i>	528	24.6		
Reduced Fuel (60 Gal.)				
3. Pilot and Copilot (Sta. 32 to 43)	340	12.6		
4. Center Passengers Standard Seating (Sta. 69 to 79)	340	23.8		
Club Seating (Sta. 63 to 74)				
Aft Passengers Standard Seating (Sta. 94 to 100)	340	34.0		
Club Seating (Sta. 98 to 109)				
Baggage IV or V (Sta. 109 to 145, 180 Lbs. Max.)	45	5.7		
5. *Cargo "A" (Sta. 10 to 50)				
*Cargo "B" (Sta. 50 to 84)				
*Cargo "C" (Sta. 84 to 109)				
*Cargo "D" (Sta. 109 to 145)				
6. Cargo Pack (Sta. 10 to 84; 300 Lbs. Max.)				
7. RAMP WEIGHT AND MOMENT	3612	177.1		
8. Fuel allowance for engine start, taxi, and runup	-12	-.6		
9. TAKEOFF WEIGHT AND MOMENT (Subtract Step 8 from Step 7)	3600	176.5		
10. Locate this point (3600 at 176.5) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable. *Maximum allowable cargo loads will be determined by the type and number of tie-downs used, as well as by the airplane weight and C.G. limitations. Floor loading must not exceed 200 lbs. per square foot.				

Figure 6-7. Sample Loading Problem

EQUIPMENT LIST

The following equipment list is a comprehensive list of all Cessna equipment available for this airplane. A separate equipment list of items installed in your specific airplane is provided in your aircraft file. The following list and the specific list for your airplane have a similar order of listing.

This equipment list provides the following information:

An **item number** gives the identification number for the item. Each number is prefixed with a letter which identifies the **descriptive** grouping (example: A. Powerplant & Accessories) under which it is listed. Suffix letters identify the equipment as a required item, a standard item or an optional item. Suffix letters are as follows:

- R = required items of equipment for FAA certification
- S = standard equipment items
- O = optional equipment items replacing required or standard items
- A = optional equipment items which are in addition to required or standard items

A **reference drawing** column provides the drawing number for the item.

NOTE

If additional equipment is to be installed, it must be done in accordance with the reference drawing, accessory kit instructions, or a separate FAA approval.

Columns showing **weight (in pounds)** and **arm (in inches)** provide the weight and center of gravity location for the equipment.

NOTE

Unless otherwise indicated, true values (not net change values) for the weight and arm are shown. Positive arms are distances aft of the airplane datum; negative arms are distances forward of the datum.

NOTE

Asterisks (*) after the item weight and arm indicate complete assembly installations. Some major components of the assembly are listed on the lines immediately following. The summation of these major components does not necessarily equal the complete assembly installation.

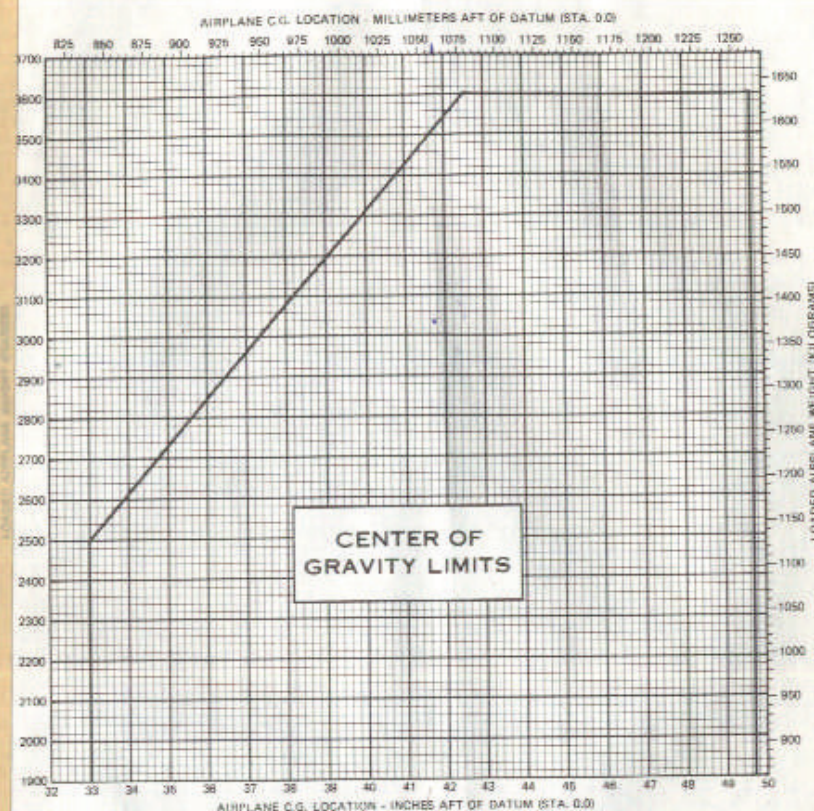


Figure 6-10. Center of Gravity Limits

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL U206C

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
A. POWERPLANT & ACCESSORIES				
A01-R	ENGINE, CONTINENTAL IO-570-C, SPEC. 18, (INCLUDES MAGNETO, DISTRIBUTOR, IGNITION, SPARK PLUGS, & STARTER)	1250601-12	450.0*	-17.0*
A05-R	FILTER, TORX, 28 VOLT, 60 AMP	1250704	1.0	-9.5
A09-R	OIL COOLER, NON-COOLING	C611503-0102	10.8	-6.0
A17-0	(REPLACES OIL COOLER IN ITEM A01-R AND CHANGES ENGINE DESIGNATION TO IO-520-F SPEC 11 (NET CHANGE))	TCM 639171	2.3	-32.5
A21-A	FILTER, FULL FLOW ENGINE OIL ADAPTER ASSEMBLY	0750604-9	4.5*	-5.0*
A33-R	FILTER CAN ASSEMBLY, AC 6436592 FILT, AC 6436583	1250922-1 C294502-0101	2.5	-3.3
A37-R-1	PROPELLER ASSY, 3-BLADE 60-INCH	C294502-0102	1.8	-4.8
A37-R-2	MCCALLEY HUB/BLADE D-3444/80A9	C161001-0102	0.3*	-4.0*
A41-R	GOVERNOR, PROPELLER (MCCALLEY 210007/T4)	C161002-0102	3.0	3.3
A61-A	SPINNER, 3-BLADED PROPELLER	C161003-1	3.3*	3.5
	VACUUM SYSTEM, ENGINE DRIVEN	1231005-1	1.8	-4.5*
	MELCUFF PUMP	C431003	1.8	-3.8
	MELCUFF VALVE	C482001-0501	0.9	-2.3
A70-A	MISC. HOSES, CLAMPS ETC.	1216612	0.9	-1.2
A73-A	OIL QUICK DRAIN VALVE (NET CHANGE)	1256011	1.0	-2.5
A88-R	AIR INDUCTION SYSTEM	1250702	0.3	-1.5
B. LANDING GEAR & ACCESSORIES				
B01-R-1	WHEEL BRASS, 6 TIRE, 6.00-6 CLEVELAND 50-52 BRAKE ARROW, 6 TIRE, 6.00-6 TUBE, (EACH) WHEEL BRASS, 6 WHEEL ASSY, 6 BRAKE ASSY, 6	1241108-1 C163303-0301 C163303-0304 C262003-0204 C262003-0102 C163306-0103 C163303-0205	3.2* 3.2* 2.8 2.8 1.7 4.2* 1.4 3.0	0.0* 0.0 0.0 0.0 0.0 0.0 0.0 0.0
B01-R-2	WHEEL BRASS, 6 TIRE, 6.00-6 CLEVELAND 50-52 BRAKE ARROW, 6 TIRE, 6.00-6 TUBE, (EACH) WHEEL BRASS, 6 WHEEL ASSY, 6 BRAKE ASSY, 6	1241108-1 C163303-0301 C163303-0304 C262003-0204 C262003-0102 C163306-0103 C163303-0205	3.2* 3.2* 2.8 2.8 1.7 4.2* 1.4 3.0	0.0* 0.0 0.0 0.0 0.0 0.0 0.0 0.0

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1 October 1978

CESSNA
MODEL U206G

SECTION 6

WEIGHT & BALANCE/ EQUIPMENT LIST

CESSNA
MODEL U206G

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
H01-A-1	CESSNA 300 ADF W/BFO, NO CARGO POD RECEIVER WITH BFO (P-546E) CONTROL INDICATOR (IN-346A) ACF LOOP ANTENNA & ASSOC. WIRING ACF SENSE ANTENNA CESSNA 300 ADF W/BFO & CARGO POD INSTALLED (SAME AS FC1-A-1 ABOVE EXCEPT THE LOOP ANTENNA IS MOVED FROM STA. 39.8 TO STA. 144.5 AND NEW LOOP CABLE USED)	3910159-6 3910159-1 3910159-2 3910159-3 3910159-4	8.5* 3.5* 3.0* 2.1* 9.5*	18.0* 19.0* 19.0* 20.0* 20.0*
H01-A-2	CESSNA 300 ADF W/BFO, NO CARGO POD RECEIVER WITH BFO (P-546E) CONTROL INDICATOR (IN-346A) ACF LOOP ANTENNA & ASSOC. WIRING ACF SENSE ANTENNA CESSNA 300 ADF W/BFO & CARGO POD INSTALLED (SAME AS FC1-A-1 ABOVE EXCEPT THE LOOP ANTENNA IS MOVED FROM STA. 39.8 TO STA. 144.5 AND NEW LOOP CABLE USED)	3910160-6 3910160-7 3910160-8 3910160-9 3910160-10 3910160-11 3910160-12 3910160-13 3910160-14 3910160-15 3910160-16 3910160-17 3910160-18 3910160-19 3910160-20 3910160-21 3910160-22 3910160-23 3910160-24 3910160-25 3910160-26 3910160-27 3910160-28 3910160-29 3910160-30 3910160-31 3910160-32 3910160-33 3910160-34 3910160-35 3910160-36 3910160-37 3910160-38 3910160-39 3910160-40 3910160-41 3910160-42 3910160-43 3910160-44 3910160-45 3910160-46 3910160-47 3910160-48 3910160-49 3910160-50 3910160-51 3910160-52 3910160-53 3910160-54 3910160-55 3910160-56 3910160-57 3910160-58 3910160-59 3910160-60 3910160-61 3910160-62 3910160-63 3910160-64 3910160-65 3910160-66 3910160-67 3910160-68 3910160-69 3910160-70 3910160-71 3910160-72 3910160-73 3910160-74 3910160-75 3910160-76 3910160-77 3910160-78 3910160-79 3910160-80 3910160-81 3910160-82 3910160-83 3910160-84 3910160-85 3910160-86 3910160-87 3910160-88 3910160-89 3910160-90 3910160-91 3910160-92 3910160-93 3910160-94 3910160-95 3910160-96 3910160-97 3910160-98 3910160-99 3910160-100 3910160-101 3910160-102 3910160-103 3910160-104 3910160-105 3910160-106 3910160-107 3910160-108 3910160-109 3910160-110 3910160-111 3910160-112 3910160-113 3910160-114 3910160-115 3910160-116 3910160-117 3910160-118 3910160-119 3910160-120 3910160-121 3910160-122 3910160-123 3910160-124 3910160-125 3910160-126 3910160-127 3910160-128 3910160-129 3910160-130 3910160-131 3910160-132 3910160-133 3910160-134 3910160-135 3910160-136 3910160-137 3910160-138 3910160-139 3910160-140 3910160-141 3910160-142 3910160-143 3910160-144 3910160-145 3910160-146 3910160-147 3910160-148 3910160-149 3910160-150 3910160-151 3910160-152 3910160-153 3910160-154 3910160-155 3910160-156 3910160-157 3910160-158 3910160-159 3910160-160 3910160-161 3910160-162 3910160-163 3910160-164 3910160-165 3910160-166 3910160-167 3910160-168 3910160-169 3910160-170 3910160-171 3910160-172 3910160-173 3910160-174 3910160-175 3910160-176 3910160-177 3910160-178 3910160-179 3910160-180 3910160-181 3910160-182 3910160-183 3910160-184 3910160-185 3910160-186 3910160-187 3910160-188 3910160-189 3910160-190 3910160-191 3910160-192 3910160-193 3910160-194 3910160-195 3910160-196 3910160-197 3910160-198 3910160-199 3910160-200 3910160-201 3910160-202 3910160-203 3910160-204 3910160-205 3910160-206 3910160-207 3910160-208 3910160-209 3910160-210 3910160-211 3910160-212 3910160-213 3910160-214 3910160-215 3910160-216 3910160-217 3910160-218 3910160-219 3910160-220 3910160-221 3910160-222 3910160-223 3910160-224 3910160-225 3910160-226 3910160-227 3910160-228 3910160-229 3910160-230 3910160-231 3910160-232 3910160-233 3910160-234 3910160-235 3910160-236 3910160-237 3910160-238 3910160-239 3910160-240 3910160-241 3910160-242 3910160-243 3910160-244 3910160-245 3910160-246 3910160-247 3910160-248 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3910160-415 3910160-416 3910160-417 3910160-418 3910160-419 3910160-420 3910160-421 3910160-422 3910160-423 3910160-424 3910160-425 3910160-426 3910160-427 3910160-428 3910160-429 3910160-430 3910160-431 3910160-432 3910160-433 3910160-434 3910160-435 3910160-436 3910160-437 3910160-438 3910160-439 3910160-440 3910160-441 3910160-442 3910160-443 3910160-444 3910160-445 3910160-446 3910160-447 3910160-448 3910160-449 3910160-450 3910160-451 3910160-452 3910160-453 3910160-454 3910160-455 3910160-456 3910160-457 3910160-458 3910160-459 3910160-460 3910160-461 3910160-462 3910160-463 3910160-464 3910160-465 3910160-466 3910160-467 3910160-468 3910160-469 3910160-470 3910160-471 3910160-472 3910160-473 3910160-474 3910160-475 3910160-476 3910160-477 3910160-478 3910160-479 3910160-480 3910160-481 3910160-482 3910160-483 3910160-484 3910160-485 3910160-486 3910160-487 3910160-488 3910160-489 3910160-490 3910160-491 3910160-492 3910160-493 3910160-494 3910160-495 3910160-496 3910160-497 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3910160-581 3910160-582 3910160-583 3910160-584 3910160-585 3910160-586 3910160-587 3910160-588 3910160-589 3910160-590 3910160-591 3910160-592 3910160-593 3910160-594 3910160-595 3910160-596 3910160-597 3910160-598 3910160-599 3910160-600 3910160-601 3910160-602 3910160-603 3910160-604 3910160-605 3910160-606 3910160-607 3910160-608 3910160-609 3910160-610 3910160-611 3910160-612 3910160-613 3910160-614 3910160-615 3910160-616 3910160-617 3910160-618 3910160-619 3910160-620 3910160-621 3910160-622 3910160-623 3910160-624 3910160-625 3910160-626 3910160-627 3910160-628 3910160-629 3910160-630 3910160-631 3910160-632 3910160-633 3910160-634 3910160-635 3910160-636 3910160-637 3910160-638 3910160-639 3910160-640 3910160-641 3910160-642 3910160-643 3910160-644 3910160-645 3910160-646 3910160-647 3910160-648 3910160-649 3910160-650 3910160-651 3910160-652 3910160-653 3910160-654 3910160-655 3910160-656 3910160-657 3910160-658 3910160-659 3910160-660 3910160-661 3910160-662 3910160-663 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3910160-830 3910160-831 3910160-832 3910160-833 3910160-834 3910160-835 3910160-836 3910160-837 3910160-838 3910160-839 3910160-840 3910160-841 3910160-842 3910160-843 3910160-844 3910160-845 3910160-846 3910160-847 3910160-848 3910160-849 3910160-850 3910160-851 3910160-852 3910160-853 3910160-854 3910160-855 3910160-856 3910160-857 3910160-858 3910160-859 3910160-860 3910160-861 3910160-862 3910160-863 3910160-864 3910160-865 3910160-866 3910160-867 3910160-868 3910160-869 3910160-870 3910160-871 3910160-872 3910160-873 3910160-874 3910160-875 3910160-876 3910160-877 3910160-878 3910160-879 3910160-880 3910160-881 3910160-882 3910160-883 3910160-884 3910160-885 3910160-886 3910160-887 3910160-888 3910160-889 3910160-890 3910160-891 3910160-892 3910160-893 3910160-894 3910160-895 3910160-896 3910160-897 3910160-898 3910160-899 3910160-900 3910160-901 3910160-902 3910160-903 3910160-904 3910160-905 3910160-906 3910160-907 3910160-908 3910160-909 3910160-910 3910160-911 3910160-912 3910160-913 3910160-914 3910160-915 3910160-916 3910160-917 3910160-918 3910160-919 3910160-920 3910160-921 3910160-922 3910160-923 3910160-924 3910160-925 3910160-926 39101		

ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
E34-A	UTILITY UP/DOLSTERY (NET DECREASE) (FOR USE WITH JC7-A-1, JC7-A-2, JC7-A-3, JC7-A-4)	1215086	-6.4	69.2
E35-A	LEAD SEATING INSTALLATION (NET CHANGE) (400S WEIGHT OF 1 C-3 LB. PER SEAT)	CES-1158	3.0	73.3
E37-D	WINDUP, FORWARD AND AFT CARGO DOORS, REMOVABLE (INCL. CARGO DOORS)	1211861 1211670 1200197	2.2 2.2 1.0	48.0 90.4 67.3
E41-A-1	SKYDIVING KIT, (INCL. CARGO CURTAIN SYSTEM, 48 CU. FT. CAPACITY OXYGEN CYLINDER & C166(C2-C4GL OXYGEN MASKS (1 PILOT, 5 PASSENGERS) 48 CU. FT. (1800 PSI) OXYGEN & O.832 LBS./CU. FT. IRRETRACTABLE (SET OF 2) CUP HOLDER, RETRACTABLE (SET OF 2) HEADRESTS, RETRACTABLE (SET OF 2) HEADRESTS, CROWDER SEAT (SET OF 2) SUN VISOR, CARGO RETAINING NET, CARGO RETAINING CARGO TIE DOWN PROVISIONS, STRUTTER (BOXED) (USE ACTUAL INSTALLED WT & ARM)	1211861 1211670 1200197 1200198 1200199 1200416-34 C166001-0601 C166005	2.1 1.3 3.4 2.2 3.2 1.0 1.4	69.7 108.5 108.6 149.9 61.2 149.0
E49-A-1	CUP HOLDER, RETRACTABLE (SET OF 2)	1201124-1	0.1	15.0
E50-A-2	HEADRESTS, RETRACTABLE (SET OF 2)	1211573	0.1	15.0
E51-A-1	HEADRESTS, CROWDER SEAT (SET OF 2)	1211573	1.1	74.0
E52-A-1	SUN VISOR, CARGO RETAINING	1211573	1.1	74.0
E53-A-2	NET, CARGO RETAINING	0500951-1	0.0	33.0
E59-A-1	CARGO TIE DOWN PROVISIONS, STRUTTER (BOXED) (USE ACTUAL INSTALLED WT & ARM)	1211339 1201124 0700164	1.0 0.2 2.1	33.0 12.1 11.5
E77-A	MORTUARY KIT (WITH OXYGEN BOTTLE) AMBULANCE KIT (WHEEL, PEDALS, ICE CONTROLS, HEEL, INCL. PURPOSE (NET CHANGE) CONTIN. HEATING, ENGINE EXHAUST SYS) CAB EXHAUST & HEATER, LEFT SIDE EXHAUST & HEATER, RIGHT SIDE	1210559-1 1210580 1260004 1260004 1250360 1250360 1250360 1250360	84.9 68.0 6.0 17.9 17.9 17.9 17.9	20.0 11.1 1.1 15.5 12.5 12.5 10.2
E85-A	F. PLACARDS, WARNINGS & MANUALS			
E89-A	PLACARD - OPERATIONAL, VFR (DAY-NIGHT) (STATIONARY)	0505087-8	NEGL	-
E93-R	PLACARD - OPERATIONAL, IFR (DAY-NIGHT)	0505087-9	NEGL	-

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SECTION 7

AIRPLANE & SYSTEMS DESCRIPTIONS

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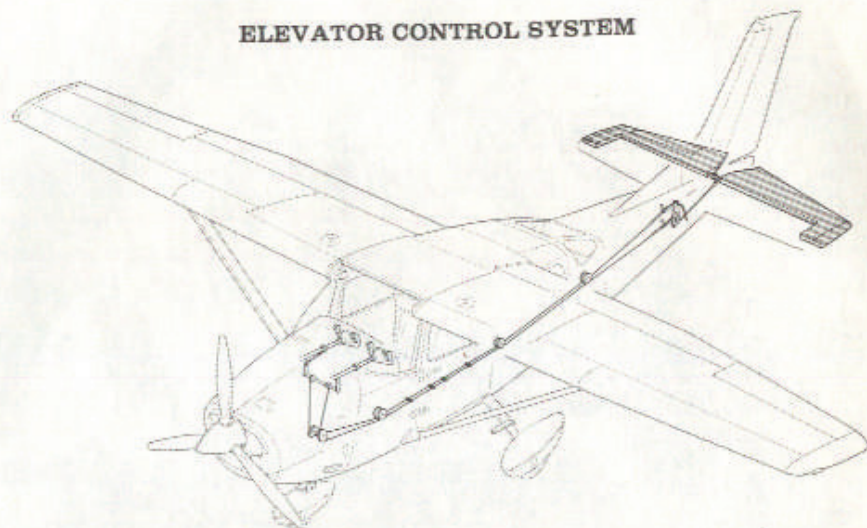
ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
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J30-A-3	INSTALLED DURING MANUFACTURE OF AIRCRAFT. CONSISTS OF THE FOLLOWING: AIRPLANE HOISTING RINGS (G07-A) CORROSION PROOFING, INTERNAL G13-A CORROSION RESISTANT CABLES (NET CHANGE) STEPS & HANDLES, REFUELING ASSISTANT FLASHING BEACON RUDDER (NET CHANGE) STING (NET CHANGE) VERTICAL FIN (NET CHANGE) STRUCTURAL REINFORCEMENT CN FIREWALL THE DOWN RINGS TAIL DUAL V-BRACE COWL DECK V-BRACE ITEMS INSTALLED AT THE TIME OF FLOAT INSTL. (INCLUDED IN ABOVE TOTAL OPTION 'A' KIT WEIGHTS AND CGS) EXHAUST PIPE EXTENSIONS VENTRAL FIN FLOATPLANE (EACH) WATER RUDDER BELL CRANKS (EACH) NOSE GEAR COVER PLATE BUNGEE (NET CHANGE) COWL FLAP EXTENSIONS (OPTION 'B' DELETED) FLOATPLANE KIT (HAS WHEEL FAIRING DELETED) STATIONAIR KIT (OPTION 'A' EXCEPT ADD UTIL LINE OPTION 'A') (SAME AS OPTION 'A') EXCEPT ADD FLOATPLANE STEERING BUNGEE (STOWED ITEM)	1201142-1 1201142-1 1260100-4 1260100-4 1242022-1 1231034-9 1212600 1231065-2 1242002-1 1233000 1242001-20 1213624-2 1242013 1233000-1 1242004 1242012 1260644 1201155 1260644-15 1213624-2 1201155	0.8 18.0 0.0 2.1 5.0 0.5 -0.4 0.8 0.1 1.5 0.6 1.2 4.5 1.3 0.3 0.0 21.8* 40.0*	74.4 81.7 - 13.6 263.5 270.0 230.0 0.0 229.6 22.5 -4.9 2.0 213.9 -4.3 0.0 - 147.1* 113.0*
J43-A-1	INSTALLED DURING MANUFACTURE OF AIRCRAFT. CONSISTS OF THE FOLLOWING: AIRPLANE HOISTING RINGS (G07-A) CORROSION PROOFING, INTERNAL G13-A CORROSION RESISTANT CABLES (NET CHANGE) STEPS & HANDLES, REFUELING ASSISTANT FLASHING BEACON RUDDER (NET CHANGE) STING (NET CHANGE) VERTICAL FIN (NET CHANGE) STRUCTURAL REINFORCEMENT CN FIREWALL THE DOWN RINGS TAIL DUAL V-BRACE COWL DECK V-BRACE ITEMS INSTALLED AT THE TIME OF FLOAT INSTL. (INCLUDED IN ABOVE TOTAL OPTION 'A' KIT WEIGHTS AND CGS) EXHAUST PIPE EXTENSIONS VENTRAL FIN FLOATPLANE (EACH) WATER RUDDER BELL CRANKS (EACH) NOSE GEAR COVER PLATE BUNGEE (NET CHANGE) COWL FLAP EXTENSIONS (OPTION 'B' DELETED) FLOATPLANE KIT (HAS WHEEL FAIRING DELETED) STATIONAIR KIT (OPTION 'A' EXCEPT ADD UTIL LINE OPTION 'A') (SAME AS OPTION 'A') EXCEPT ADD FLOATPLANE STEERING BUNGEE (STOWED ITEM)	1201142-1 1201142-1 1260100-4 1260100-4 1242022-1 1231034-9 1212600 1231065-2 1242002-1 1233000 1242001-20 1213624-2 1242013 1233000-1 1242004 1242012 1260644 1201155 1260644-15 1213624-2 1201155	0.8 18.0 0.0 2.1 5.0 0.5 -0.4 0.8 0.1 1.5 0.6 1.2 4.5 1.3 0.3 0.0 21.8* 40.0*	74.4 81.7 - 13.6 263.5 270.0 230.0 0.0 229.6 22.5 -4.9 2.0 213.9 -4.3 0.0 - 147.1* 113.0*

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ITEM NO	EQUIPMENT LIST DESCRIPTION	REF DRAWING	WT LBS	ARM INS
J43-A-2	DELETE--STANDARD SECOND ROW SEATS SECOND ROW SEAT BELTS (27-S) ADD --CLUB SEATS, SECOND ROW EC9-0-2 INCLUDE SEAT BELTS SEAT RAIL CHANGE FOR CLUB SEATS CLUB SEATING WITH WRITING TABLE J43-A-1 CLUB SEATING WRITING TABLE MOUNTED ON LH CABIN WALL CLUB SEATING WITH REFRESHMENT CENTER J43-A-3 REGULAR CLUB SEATING REFRESHMENT CENTER-OR Y TWEIGHT FOR NOMINAL REFRESHMENT CLUB SEATING WITH TABLE AND REFRESHMENT CENTER		-25.8 -20.0 40.0 1.0 18.2* 13.2 33.7* 12.2 21.5 5.0 39.7	79.0 74.0 63.0 71.5* 43.7 32.7 73.0* 40.3* 32.7 45.0 45.0

ELEVATOR CONTROL SYSTEM



ELEVATOR TRIM CONTROL SYSTEM

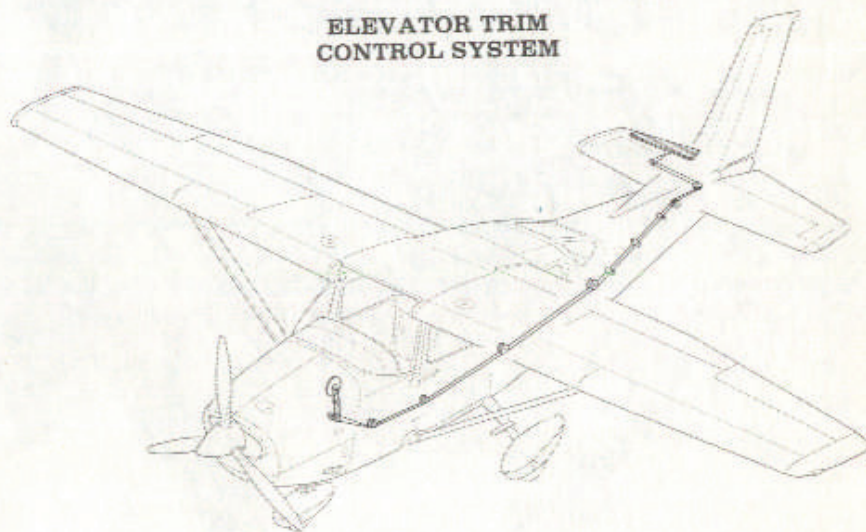


Figure 7-1. Flight Control and Trim Systems (Sheet 2 of 2)

INTRODUCTION

This section provides description and operation of the airplane and its systems equipment described herein is optional and may not be installed on the airplane. Refer to Section 9, Supplements, for details of optional systems and equipment.

AIRPLANE

The airplane is an all-metal, six-place, high-wing, single-engine airplane equipped with tricycle landing gear and designed for general aviation purposes.

The construction of the fuselage is a conventional formed sheet metal bulge-riveted, and skin design referred to as semimonocoque. Major structural members are the front and rear carry-through spars to which the wings are attached, a bulkhead and forgings for main landing gear attachment under the floorboard aft of the pilot and front passenger seats, and a bulkhead just aft of the instrument panel with attaching plates at its base for strut-to-fuselage attachment of the wing struts. Structural members are also incorporated on this airplane.

The externally braced wings, containing integral fuel tanks, are composed of a front and rear spar with formed sheet metal ribs, doublers, and ailerons. The entire structure is covered with aluminum skin. The front spars are equipped with wing-to-fuselage and wing-to-strut attaching fittings. The aft spars are equipped with wing-to-fuselage attaching fittings, aileron span spars. Frise-type ailerons and single-slot type flaps are attached to the trailing edge of the wings. The ailerons are constructed of a front and aft spar, formed sheet metal ribs, "V" type corrugated aluminum skin joined together at the trailing edge, and a formed leading edge with balance weights. The flaps are constructed basically the same as the ailerons, with the exception of the balance weights and the addition of a trailing edge stiffener.

The empennage (tail assembly) consists of a conventional vertical stabilizer, horizontal stabilizer, and elevator. The vertical stabilizer is composed of a forward and aft spar, formed sheet metal ribs and doublers, four skin panels, formed leading edge skins, and a dorsal. This is constructed of a forward and aft spar, formed sheet metal ribs and doublers, and a wrap-around skin panel. The top of the rudder features a leading edge extension which contains a balance weight. The horizontal stabilizer is constructed of a forward and aft spar, ribs and doublers, a center upper skin panel, and two left and two right wrap-around skins which also form the leading edges. The horizontal stabilizer

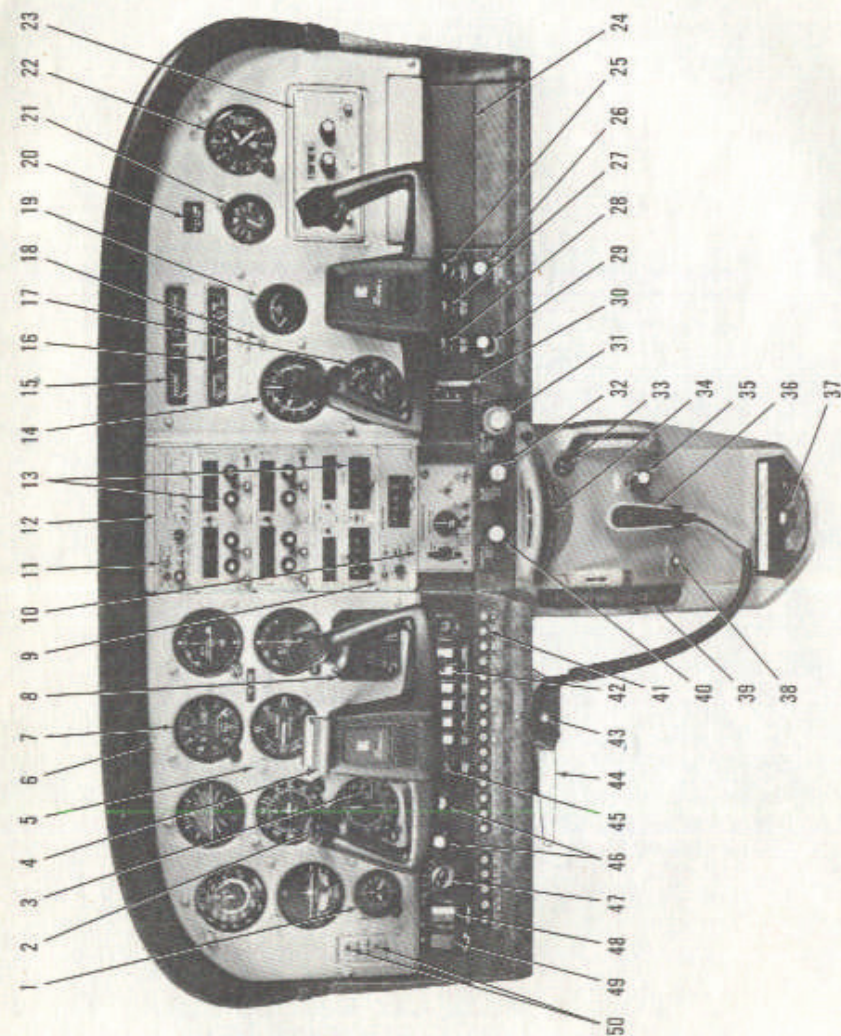
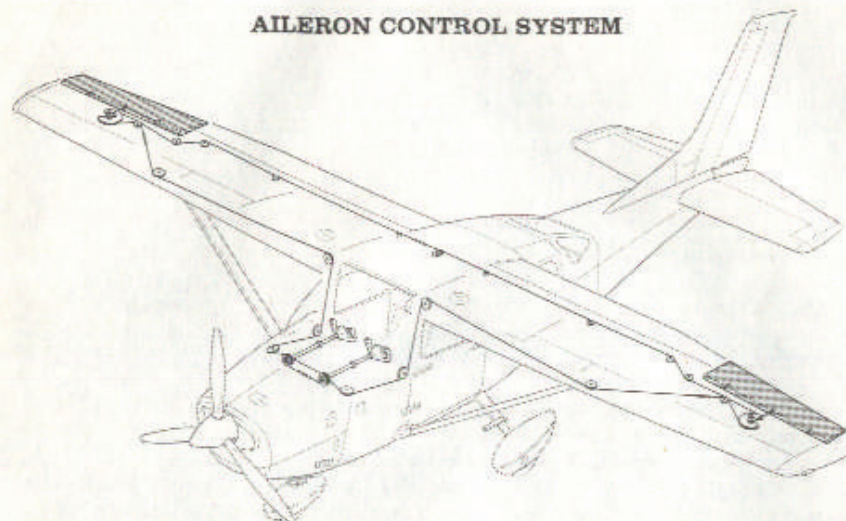


Figure 7-2. Instrument Panel (Sheet 1 of 2)

AILERON CONTROL SYSTEM



RUDDER AND RUDDER TRIM
CONTROL SYSTEMS



Figure 7-1. Flight Control and Trim Systems (Sheet 1 of 2)

left and right of the gyros respectively. The remainder of the flight instruments are located around the basic "T". Avionics equipment is stacked approximately on the centerline of the panel, with the right side of the panel containing the manifold pressure/fuel flow indicator, tachometer, map compartment, and space for additional instruments and avionics equipment. The engine instrument cluster, fuel quantity indicators, and suction gage are on the right side of the avionics stack near the top of the panel. A switch and control panel, at the lower edge of the instrument panel, contains most of the switches, controls, and circuit breakers necessary to operate the airplane. The left side of the panel contains the master switch, auxiliary fuel pump switch, ignition switch, light intensity controls, avionics power switch, electrical switches, and circuit breakers. The center area contains the throttle, propeller control, and mixture control. The right side of the panel contains the wing flap switch and indicator, cabin heat, cabin air, defroster, and auxiliary cabin air control knobs and the cigar lighter. A pedestal, extending from the edge of the switch and control panel to the floorboard, contains the elevator and rudder trim control wheels, cowl flap control lever, engine primer and microphone bracket. The fuel selector valve handle is located at the base of the pedestal. A parking brake handle is mounted under the switch and control panel, in front of the pilot. A static pressure alternate source valve control knob may also be installed beneath the switch and control panel.

For details concerning the instruments, switches, circuit breakers, and controls on this panel, refer in this section to the description of the systems to which these items are related.

GROUND CONTROL

Effective ground control while taxiing is accomplished through nose wheel steering by using the rudder pedals; left rudder pedal to steer left and right rudder pedal to steer right. When a rudder pedal is depressed, a spring-loaded steering bungee (which is connected to the nose gear and to the rudder bars) will turn the nose wheel through an arc of approximately 15° each side of center. By applying either left or right brake, the degree of turn may be increased up to 35° each side of center.

Moving the airplane by hand is most easily accomplished by attaching a tow bar to the nose gear strut. If a tow bar is not available, or pushing is required, use the wing struts as push points. Do not use the vertical or horizontal tail surfaces to move the airplane. If the airplane is to be towed by vehicle, never turn the nose wheel more than 35° either side of center or structural damage to the nose gear could result.

25. Defrost Control Knob
26. Auxiliary Cabin Air Control Knob
27. Cabin Air Control Knob
28. Cabin Heat Control Knob
29. Cigar Lighter
30. Wing Flap Switch and Position Indicator
31. Mixture Control Knob
32. Propeller Control Knob
33. Cowl Flap Control Lever
34. Rudder Trim Control Wheel
35. Primer
36. Microphone
37. Fuel Selector Valve Handle
38. Electric Elevator Trim Circuit Breaker
39. Elevator Trim Control Wheel
40. Throttle (With Friction Lock)
41. Circuit Breakers
42. Electrical Switches
43. Static Pressure Alternate Source Valve
44. Parking Brake Handle
45. Avionics Power Switch
46. Cabin Lighting Rheostats
47. Ignition Switch
48. Auxiliary Fuel Pump Switch
49. Master Switch
50. Phone and Auxiliary Mike Jacks

1. Clock
2. Electric Elevator Trim Switch
3. Electric Elevator Trim Disengage Switch
4. Approach Plate Holder
5. Flight Instrument Group
6. Map Light Switch and Light
7. Encoding Altimeter
8. DME
9. Transponder
10. Autopilot Control Unit
11. Marker Beacon Indicator Lights and Switches
12. Audio Control Panel
13. NAV/COM And Area Navigation Radios
14. Manifold Pressure/Fuel Flow Indicator
15. Fuel Quantity Indicators and Ammeter
16. Cylinder Head Temperature, Oil Temperature, and Oil Pressure Gages
17. Tachometer
18. Low-Voltage Warning Light
19. Economy Mixture Indicator
20. Flight Hour Recorder
21. Suction Gage
22. Secondary Altimeter
23. ADF Radio
24. Map Compartment

Figure 7-2. Instrument Panel (Sheet 2 of 2)

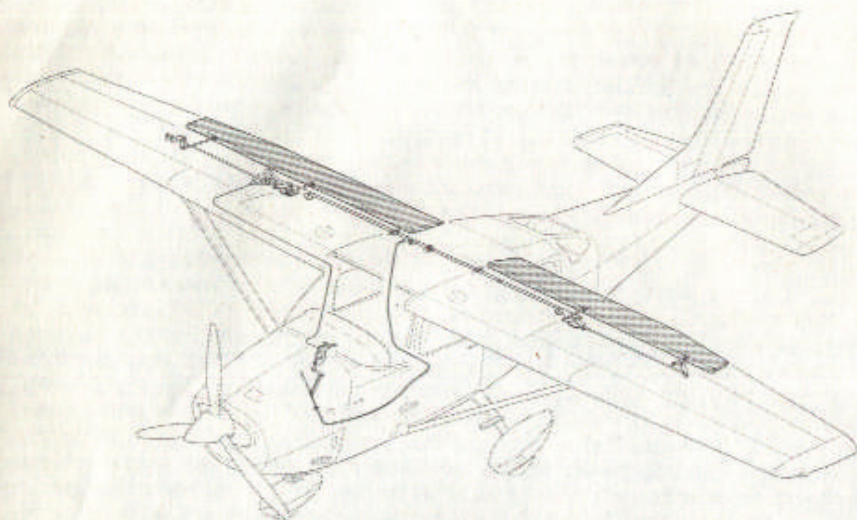


Figure 7-3. Wing Flap System

The minimum turning radius of the airplane, using differential braking and nose wheel steering during taxi, is approximately 25 feet.

WING FLAP SYSTEM

The wing flaps are of the large span, single-slot type (see figure 7-3), and are extended or retracted by positioning the wing flap switch lever on the instrument panel to the desired flap deflection position. The switch lever is moved up or down in a slotted panel that provides mechanical stops at the 10° and 20° positions. For flap settings greater than 10°, move the switch lever to the right to clear the stop and position it as desired. A scale and pointer on the left side of the switch lever indicates flap travel in degrees. The wing flap system circuit is protected by a 15-ampere circuit breaker, labeled FLAP, on the left side of the instrument panel.

LANDING GEAR SYSTEM

The landing gear is of the tricycle type with a steerable nose wheel and two main wheels. The landing gear may be equipped with wheel fairings.

also contains the elevator trim tab actuator. Construction of the elevator consists of a forward and aft spar, ribs, torque tube and bellcrank, left upper and lower skin panels, a formed one-piece left trailing edge, right upper and lower skin panels, and right inboard and outboard formed trailing edges. The elevator trim tab consists of a bracket assembly, hinge half, and a wrap-around skin panel. Both elevator tip leading edge extensions incorporate balance weights.

FLIGHT CONTROLS

The airplane's flight control system (see figure 7-1) consists of conventional aileron, elevator and rudder control surfaces. The control surfaces are manually operated through mechanical linkage using a control wheel for the ailerons and elevator, and rudder/brake pedals for the rudder. The elevator control system is equipped with downsprings which provide improved stability in flight.

Extensions are available for the rudder/brake pedals. They consist of a rudder pedal face, two spacers and two spring clips. To install an extension, place the clip on the bottom of the extension under the bottom of the rudder pedal and snap the top clip over the top of the rudder pedal. Check that the extension is firmly in place. To remove the extensions, reverse the above procedures.

TRIM SYSTEMS

Manually-operated rudder and elevator trim is provided (see figure 7-1). Rudder trimming is accomplished through a bungee connected to the rudder control system and a trim control wheel mounted on the control pedestal. Rudder trimming is accomplished by rotating the horizontally mounted trim control wheel either left or right to the desired trim position. Rotating the trim wheel to the right will trim nose-right; conversely, rotating it to the left will trim nose-left. Elevator trimming is accomplished through the elevator trim tab by utilizing the vertically mounted trim control wheel. Forward rotation of the trim wheel will trim nose-down; conversely, aft rotation will trim nose-up. The airplane may also be equipped with an electric elevator trim system. For details concerning this system, refer to Section 9, Supplements.

INSTRUMENT PANEL

The instrument panel (see figure 7-2) is designed around the basic "T" configuration. The gyros are located immediately in front of the pilot, and

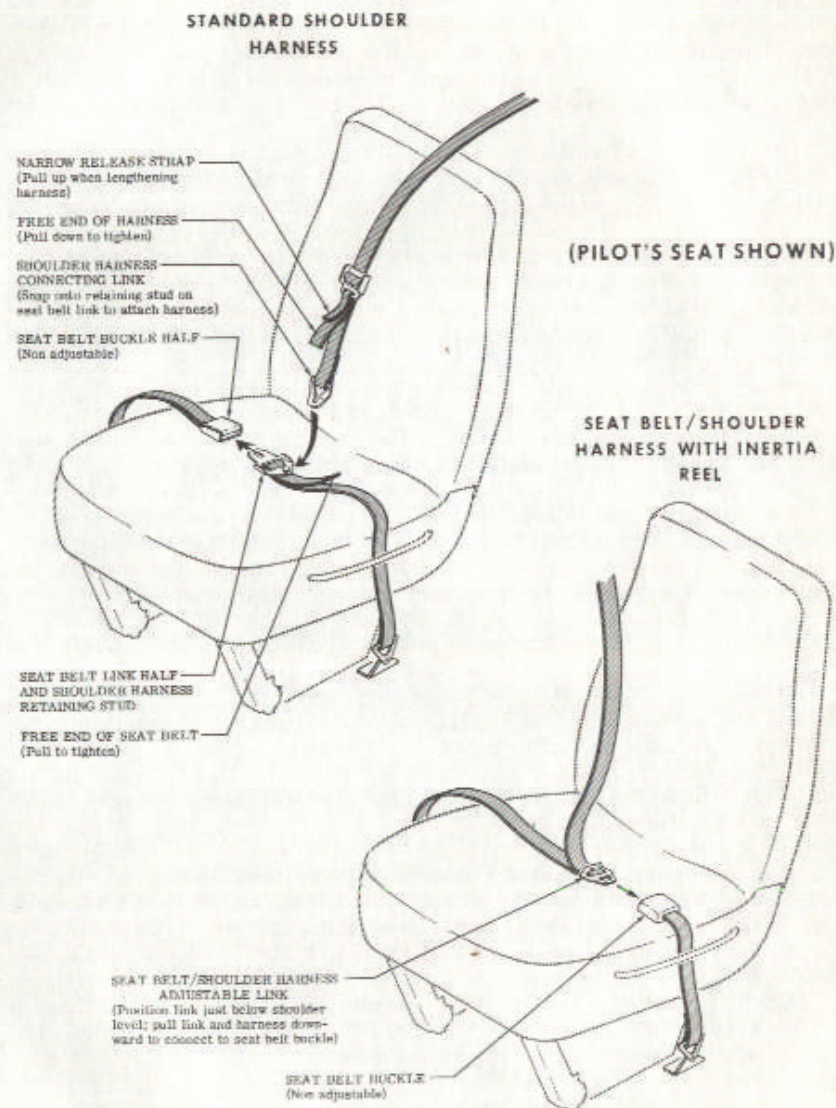


Figure 7-4. Seat Belts and Shoulder Harnesses

Shock absorption is provided by the flat leaf spring-steel main landing gear struts and the air/oil nose gear shock strut. Each main gear wheel is equipped with a hydraulically actuated disc-type brake on the inboard side of each wheel. When wheel fairings are installed, an aerodynamic fairing covers each brake.

BAGGAGE COMPARTMENT

The baggage compartment consists of the area from the back of the rear passenger seats to the aft cabin bulkhead. Access to the baggage compartment is gained through the cargo doors on the right side of the airplane, or from within the airplane cabin. A baggage net with six tie-down straps is provided for securing baggage and is attached by tying the straps to tie-down rings provided in the airplane. When utilizing the airplane as a cargo carrier, refer to Section 6 for complete cargo loading details. When loading the airplane, children should not be placed or permitted in the baggage compartment, and any material that might be hazardous to the airplane or occupants should not be placed anywhere in the airplane. For baggage/cargo area and door dimensions, refer to Section 6.

SEATS

The airplane may be equipped with either the conventional or club style six seat arrangement. Conventional seating consists of six separate four-way adjustable seats, and the club style seating utilizes four forward facing four-way adjustable seats and two aft facing two-way adjustable seats. The pilot's and front passenger's seats are also available in a six-way adjustable configuration.

A club style seating arrangement featuring two aft facing two-way adjustable seats in the center passenger seat positions may be installed in the airplane. Details of this installation are presented in Section 9, Supplements.

The four-way seats, used with the conventional and club style seating arrangements, may be moved forward and aft, and the seat back angle changed. Position the seat by lifting up on the tubular handle under the center of the seat bottom of the pilot and front passenger's seats, the handle under the left front corner of the center passenger's seats, or the lever on the front outboard corner of the rear passenger's seats and slide the seat

belt to a snug fit. To release the seat belts, grasp the top of the buckle opposite the link and pull upward.

SHOULDER HARNESSSES

Each front seat shoulder harness is attached above the aft edge of the front side window and is stowed behind a stowage sheath mounted above the side window. To stow the harness, fold it and place it behind the sheath. If the center and rear seats are equipped with shoulder harnesses, the center seat harnesses are attached above the window line aft of the seats and the rear seat harnesses are attached below the rear window. Center seat harnesses are stowed behind wire retaining clips above the window line, and rear seat harnesses are stowed behind clips located aft of the rear seats below the window line.

To use the shoulder harness, fasten and adjust the seat belt first. Lengthen the harness as required by pulling on the connecting link on the end of the harness and the narrow release strap. Snap the connecting link firmly onto the retaining stud on the seat belt link half. Then adjust to length. A properly adjusted harness will permit the occupant to lean forward enough to sit completely erect, but prevent excessive forward movement and contact with objects during sudden deceleration. Also, the pilot will want the freedom to reach all controls easily.

Removing the shoulder harness is accomplished by pulling upward on the narrow release strap, and removing the harness connecting link from the stud on the seat belt link. In an emergency, the shoulder harness may be removed by releasing the seat belt first and allowing the harness, still attached to the link half of the seat belt, to drop to the side of the seat.

INTEGRATED SEAT BELT/SHOULDER HARNESSSES WITH INERTIA REELS

Integrated seat belt/shoulder harnesses with inertia reels are available for the pilot and front seat passenger. The seat belt/shoulder harnesses extend from inertia reels located in the cabin top structure, through slots in the overhead console marked PILOT and COPILOT, to attach points inboard of the two front seats. A separate seat belt half and buckle is located outboard of the seats. Inertia reels allow complete freedom of body movement. However, in the event of a sudden deceleration, they will lock automatically to protect the occupants.

To use the seat belt/shoulder harness, position the adjustable metal link on the harness just below shoulder level, pull the link and harness downward, and insert the link in the seat belt buckle. Adjust belt tension across the lap by pulling upward on the shoulder harness. Removal is accomplished by releasing the seat belt buckle, which will allow the

into position; then release the handle and check that the seat is locked in place. The seat back angle may be adjusted by lifting the lever under the left front corner of the pilot and front passenger's seats, the aft inboard corner of the center passenger's seats or the front inboard corner of the rear passenger's seats. The seat backs will also fold full forward.

The six-way adjustable pilot's seat may be moved forward or aft, adjusted for height, and the seat back angle is infinitely adjustable. Position the seat by lifting the tubular handle, under the center of the seat bottom, and slide the seat into position; then release the handle and check that the seat is locked in place. Raise or lower the seat by rotating a large crank under the right corner of the seat. Seat back angle is adjustable by rotating a small crank under the left corner of the seat. The seat bottom angle will change as the seat back angle changes, providing proper support. The seat back will also fold full forward. If the front passenger's seat is six-way adjustable, it will function the same as the pilot's seat except the height adjusting and back reclining cranks will be opposite the respective adjustment cranks of the pilot's seat.

Headrests are available for the four-way and six-way seat configurations only. To adjust the headrest, apply enough pressure to it to raise or lower it to the desired level. The headrest may be removed at any time by raising it until it disengages from the top of the seat back.

SEAT BELTS AND SHOULDER HARNESSSES

All seat positions are equipped with seat belts (see figure 7-4). The pilot's and front passenger's seats are also equipped with separate shoulder harnesses; separate shoulder harnesses are available for the remaining seat positions. If club seating is installed, no shoulder harness is available for the aft facing seats. Integrated seat belt/shoulder harnesses with inertia reels can be furnished for the pilot's and front passenger's seat positions if desired.

SEAT BELTS

The seat belts for all seat positions are attached to fittings on the floorboard. However, if club seating is installed, the seat belts for the aft facing seats are attached to the seat frame. The buckle half is inboard of each seat and the link half is outboard of each seat.

To use the seat belts, position the seat as desired, and then lengthen the link half of the belt as needed by grasping the sides of the link and pulling against the belt. Insert and lock the belt link into the buckle. Tighten the

NOTE

Since the key-operated outside lock engages the door handle only, the forward cargo door cannot be secured for flight using only the key lock.

The left entry door is equipped with an openable window which is held in the closed position by a detent equipped latch on the lower edge of the window frame. To open the window, rotate the latch upward. The window utilizes a spring-loaded retaining arm which will help rotate the window outward and hold it there. An openable window is also available for the right front passenger's seat position, and functions in the same manner as

inertia reel to pull the harness inboard of the seat.

ENTRANCE DOORS AND CABIN WINDOWS

Entry to, and exit from the airplane is accomplished through an entry door on the left side of the cabin at the pilot's seat position and through double cargo doors on the right side of the cabin at the center and rear seat passenger's positions (refer to Section 6 for cabin and cabin door dimensions). The left entry door incorporates a recessed exterior door handle, a conventional interior door handle, a key-operated door lock, a door stop mechanism, and an openable window. The forward cargo door is equipped with a recessed exterior door handle, conventional interior door handle, a key-operated door lock, and a door stop mechanism. The aft door utilizes a locking pawl on the top and bottom of the door near the forward edge, a red handle on the forward edge of the door, and a door stop mechanism.

To open the left entry door from outside the airplane, utilize the recessed door handle near the aft edge of the door. Depress the forward end of the handle to rotate it out of its recess, and then pull outboard. To open or close the door from inside the airplane, use the conventional door handle and arm rest. The inside door handle is a three-position handle having a placard at its base with the positions OPEN, CLOSE, and LOCK shown on it. The handle is spring-loaded to the CLOSE (up) position. When the door has been pulled shut and latched, lock it by rotating the door handle forward to the LOCK position (flush with the arm rest). When the handle is rotated to the LOCK position, an over-center action will hold it in that position. The door should be locked prior to flight, and should not be opened intentionally during flight.

NOTE

Accidental opening of the cabin door in flight due to improper closing does not constitute a need to land the airplane. The best procedure is to set up the airplane in a trimmed condition at approximately 90 knots, momentarily shove the door outward slightly, and forcefully close and lock the door. If the forward cargo door should come unlatched and open slightly in flight, it is suggested that a landing be made at a suitable airport to close and latch the door, unless a passenger is available to close it. It cannot be reached by the pilot. It should be remembered that the wing flaps will not operate with the cargo door open, even very slightly, and the landing should be planned accordingly.

The double cargo doors are opened from outside the airplane by utilizing the recessed door handle near the aft edge of the forward door. Depress the forward end of the handle to rotate it out of its recess, and then pull outboard. After the forward door is opened, the aft door may be opened by grasping the red handle on the forward edge of the door and pulling downward to release the locking pawls. To close the cargo doors from inside the airplane, close the aft door first, with enough force to latch both locking pawls, and then close the forward door. When the forward door is closed and latched, rotate the door handle, labeled OPEN, CLOSE, and LOCK, to the locked position. Both doors must be securely closed and the forward door locked prior to flight, and they must not be opened intentionally during flight.

NOTE

A flap interrupt switch, on the upper sill of the forward cargo door opening, will stop flap operation regardless of flap position any time the forward cargo door is unlatched. The switch is intended to prevent lowering the flaps into the cargo door when it is open.

Flight operations with the cargo doors removed are not approved, unless a depressor plate is installed over the wing flap interrupt switch and a spoiler is installed on the forward edge of the cargo door opening. With the cargo doors removed and the above items installed, flight is restricted to 130 knots.

If necessary, the outside door handle can be used to lock the forward cargo door. Simply lift the handle out of its recess and grasp the vertical tab of the connecting link behind the handle. Pull the tab outboard until the connecting link engages a detent at its aft end. Push the handle back into its recess while observing the inside handle rotating toward the locked position through the cargo door window. The inside handle will not rotate fully forward.

CAUTION

If the cargo door is closed from the outside with passengers occupying the middle or rear seat rows, the inside door handle must be rotated fully forward to disengage the outside closing mechanism and allow the door to be opened from the inside.

The left entry door and the forward cargo door have key-operated locks which may be used to secure the aircraft during parking.

metered to the engine. The normal operating range (green arc) is from 7 to 17 gallons per hour, the minimum (red line) is 3.5 PSI, and the maximum (red line) is 25.2 gallons per hour (19.5 PSI).

An economy mixture (EGT) indicator is available for the airplane and is located on the extreme right side of the instrument panel. A thermocouple probe in the right exhaust collector measures exhaust gas temperature and transmits it to the indicator. The indicator serves as a visual aid to the pilot in adjusting cruise mixture. Exhaust gas temperature varies with fuel-to-air ratio, power, and RPM. However, the difference between the peak EGT and the EGT at the cruise mixture setting is essentially constant and this provides a useful leaning aid. The indicator is equipped with a manually positioned reference pointer.

NEW ENGINE BREAK-IN AND OPERATION

The engine underwent a run-in at the factory and is ready for the full range of use. It is, however, suggested that cruising be accomplished at 65% to 75% power until a total of 50 hours has accumulated or oil consumption has stabilized. This will ensure proper seating of the rings.

The airplane is delivered from the factory with corrosion preventive oil in the engine. If, during the first 25 hours, oil must be added, use only aviation grade straight mineral oil conforming to Specification No. MIL-L-6082.

ENGINE OIL SYSTEM

Oil for engine lubrication and propeller governor operation is supplied from a sump on the bottom of the engine. The capacity of the engine sump is 12 quarts (one additional quart is contained in the engine oil filter, if installed). Oil is drawn from the sump through a filter screen on the end of a pickup tube to the engine-driven oil pump. Oil from the pump passes through a pressure screen (full flow oil filter, if installed), a pressure relief valve at the rear of the right oil gallery, and a thermostatically controlled oil cooler. Oil from the cooler is then circulated to the left gallery and propeller governor. The engine parts are then lubricated by oil from the galleries. After lubricating the engine, the oil returns to the sump by gravity. If a full flow oil filter is installed, the filter adapter is equipped with a bypass valve which will cause lubricating oil to bypass the filter in the event the filter becomes plugged, or the oil temperature is extremely cold.

An oil dipstick is located at the rear of the engine on the left side, and an oil filler tube is on top of the crankcase near the front of the engine. The dipstick and oil filler are accessible through doors on the engine cowling. The engine should not be operated on less than 9 quarts of oil. To minimize

the window in the entry door. If required, either window may be opened at any speed up to 183 KIAS. All other cabin windows are of the fixed type and cannot be opened.

CONTROL LOCKS

A control lock is provided to lock the aileron and elevator control surfaces to prevent damage to these systems by wind buffeting while the airplane is parked. The lock consists of a shaped steel rod with a red metal flag attached to it. The flag is labeled CONTROL LOCK, REMOVE BEFORE STARTING ENGINE. To install the control lock, align the hole in the top of the pilot's control wheel shaft with the hole in the top of the shaft collar on the instrument panel and insert the rod into the aligned holes. Installation of the lock will secure the ailerons in a neutral position and the elevators in a slightly trailing edge down position. Proper installation of the lock will place the red flag over the ignition switch. In areas where high or gusty winds occur, a control surface lock should be installed over the vertical stabilizer and rudder. The control lock and any other type of locking device should be removed prior to starting the engine.

ENGINE

The airplane is powered by a horizontally-opposed, six-cylinder, overhead-valve, air-cooled, fuel injection engine with a wet sump oil system. The engine is a Continental Model IO-520-F and is rated at 300 horsepower at 2850 RPM for five minutes and 285 horsepower at 2700 RPM continuous. Major accessories include a propeller governor on the front of the engine and dual magnetos, starter, and belt-driven alternator on the rear of the engine. Provisions are also made for a vacuum pump and a full flow oil filter.

ENGINE CONTROLS

Engine manifold pressure is controlled by a throttle located on the lower center portion of the instrument panel. The throttle operates in a conventional manner; in the full forward position, the throttle is open, and in the full aft position, it is closed. A friction lock, which is a round knurled disk, is located at the base of the throttle and is operated by rotating the lock clockwise to increase friction or counterclockwise to decrease it.

The mixture control, mounted above the right corner of the control pedestal, is a red knob with raised points around the circumference and is equipped with a lock button in the end of the knob. The rich position is full forward, and full aft is the idle cut-off position. For small adjustments, the control may be moved forward by rotating the knob clockwise, and aft by

loss of oil through the breather, fill to 10 quarts for normal flights of less than three hours. For extended flight, fill to 12 quarts (dipstick indication only). For engine oil grade and specifications, refer to Section 8 of this handbook.

The oil cooler may be replaced by a non-congealing oil cooler for operations in temperatures consistently below 20°F (-7°C). The non-congealing oil cooler provides improved oil flow at low temperatures. Once installed, the non-congealing oil cooler is approved for permanent use in both hot and cold weather.

An oil quick-drain valve is available to replace the drain plug on the bottom of the oil sump, and provides quicker, cleaner draining of the engine oil. To drain the oil with this valve, slip a hose over the end of the valve and push upward on the end of the valve until it snaps into the open position. Spring clips will hold the valve open. After draining, use a suitable tool to snap the valve into the extended (closed) position and remove the drain hose.

IGNITION-STARTER SYSTEM

Engine ignition is provided by two engine-driven magnetos and two spark plugs in each cylinder. The right magneto fires the lower left and upper right spark plugs, and the left magneto fires the lower right and upper left spark plugs. Normal operation is conducted with both magnetos due to the more complete burning of the fuel-air mixture with dual ignition.

Ignition and starter operation is controlled by a rotary type switch located on the left switch and control panel. The switch is labeled clockwise, OFF, R, L, BOTH, and START. The engine should be operated on both magnetos (BOTH position) except for magneto checks. The R and L positions are for checking purposes and emergency use only. When the switch is rotated to the spring-loaded START position, (with the master switch in the ON position), the starter contactor is energized and the starter will crank the engine. When the switch is released, it will automatically return to the BOTH position.

AIR INDUCTION SYSTEM

The engine air induction system receives ram air through the left intake in the front of the engine cowling. Aft of the engine cylinders is an air filter which removes dust and other foreign matter from the induction air. Airflow passing through the filter enters an airbox at the rear of the engine. The airbox has a spring-loaded alternate air door. If the air induction filter should become blocked, suction created by the engine will open the door and draw unfiltered air from inside the upper cowl area. An open alternate air door will result in an approximate 10% power loss at full

rotating the knob counterclockwise. For rapid or large adjustments, the knob may be moved forward or aft by depressing the lock button in the end of the control, and then positioning the control as desired.

ENGINE INSTRUMENTS

Engine operation is monitored by the following instruments: oil pressure gage, oil temperature gage, cylinder head temperature gage, tachometer, and manifold pressure/fuel flow indicator. An economy mixture (EGT) indicator is also available.

The oil pressure gage, located on the upper right side of the instrument panel, is operated by oil pressure. A direct pressure oil line from the engine delivers oil at engine operating pressure to the oil pressure gage. Gage markings indicate that minimum idling pressure is 10 PSI (red line), the normal operating range is 30 to 60 PSI (green arc), and maximum pressure is 100 PSI (red line).

Oil temperature is indicated by a gage adjacent to the oil pressure gage. The gage is a Bourdon-type instrument connected by a capillary tube to a temperature bulb in the engine. Oil temperature limitations are the normal operating range (green arc) which is 100°F (38°C) to 240°F (116°C), and the maximum (red line) which is 240°F (116°C).

The cylinder head temperature gage, under the left fuel quantity indicator, is operated by an electrical-resistance type temperature sensor on the engine which receives power from the airplane electrical system. Temperature limitations are the normal operating range (green arc) which is 200°F (93°C) to 460°F (238°C) and the maximum (red line) which is 460°F (238°C).

The engine-driven mechanical tachometer is located on the lower right side of the instrument panel. The instrument is calibrated in increments of 100 RPM and indicates both engine and propeller speed. An hour meter below the center of the tachometer dial records elapsed engine time in hours and tenths. Instrument markings include a normal operating range (green arc) of 2200 to 2550 RPM, a five minute maximum power range (yellow arc) of 2700 to 2850 RPM, and a maximum (red line) of 2850 RPM.

The manifold pressure gage is the left half of a dual-indicating instrument mounted above the tachometer. The gage is direct reading and indicates induction air manifold pressure in inches of mercury. It has a normal operating range (green arc) of 15 to 25 inches of mercury.

The fuel flow indicator is the right half of a dual-indicating instrument mounted above the tachometer. The indicator is a fuel pressure gage calibrated to indicate the approximate gallons per hour of fuel being

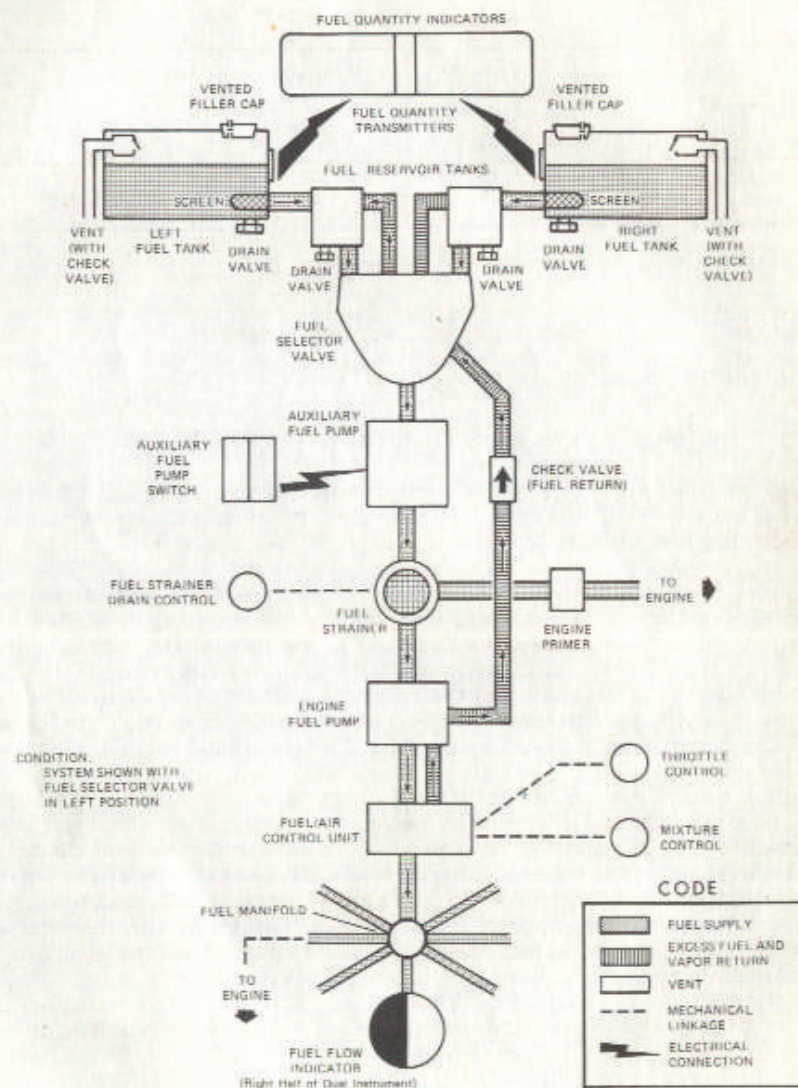


Figure 7-5. Fuel System

throttle. After passing through the airbox, induction air enters a fuel/air control unit behind the engine, and is then ducted to the engine cylinders through intake manifold tubes.

EXHAUST SYSTEM

Exhaust gas from each cylinder passes through riser assemblies to a collector and muffler on each side of the engine. The left muffler is constructed with a shroud around the outside which forms a heating chamber for cabin heater air.

FUEL INJECTION SYSTEM

The engine is equipped with a fuel injection system. The system is comprised of an engine-driven fuel pump, fuel/air control unit, fuel manifold, fuel flow indicator, and air-bleed type injector nozzles.

Fuel is delivered by the engine-driven fuel pump to the fuel/air control unit behind the engine. The fuel/air control unit correctly proportions the fuel flow to the induction air flow. After passing through the control unit, induction air is delivered to the cylinders through intake manifold tubes, and metered fuel is delivered to a fuel manifold. The fuel manifold, through spring tension on a diaphragm and valve, evenly distributes the fuel to an air-bleed type injector nozzle in the intake valve chamber of each cylinder. A pressure line is also attached to the fuel manifold, and is connected to a fuel flow indicator on the instrument panel.

COOLING SYSTEM

Ram air for engine cooling enters through two intake openings in the front of the engine cowling. The cooling air is directed around the cylinders and other areas of the engine by baffling, and is then exhausted through cowl flaps on the lower aft edge of the cowling. The cowl flaps are mechanically operated from the cabin by means of a cowl flap lever on the right side of the control pedestal. The pedestal is labeled COWL FLAP, OPEN, CLOSED. During takeoff and high power operation, the cowl flap lever should be placed in the OPEN position for maximum cooling. This is accomplished by moving the lever to the right to clear a detent, then moving the lever up to the OPEN position. Anytime the lever is repositioned, it must first be moved to the right. While in cruise flight, cowl flaps should be adjusted to keep the cylinder head temperature at approximately two-thirds of the normal operating range (green arc). During extended let-downs, it may be necessary to completely close the cowl flaps by pushing the cowl flap lever down to the CLOSED position.

A winterization kit is available for the airplane. Details of this kit are presented in Section 9, Supplements.

FUEL QUANTITY DATA (U. S. GALLONS)			
TANKS	TOTAL USABLE FUEL ALL FLIGHT CONDITIONS	TOTAL UNUSABLE FUEL	TOTAL FUEL VOLUME
STANDARD (46 Gal. Each)	88	4	92

Figure 7-6. Fuel Quantity Data

to a manifold which distributes it to each cylinder.

NOTE

Fuel cannot be used from both fuel tanks simultaneously.

Vapor and excess fuel from the engine-driven fuel pump and fuel/air control unit are returned by way of the selector valve to the reservoir tank of the wing fuel tank system being used.

Fuel system venting is essential to system operation. Complete blockage of the venting system will result in decreasing fuel flow and eventual engine stoppage. Venting is accomplished by check valve equipped vent lines, one from each fuel tank, which protrude from the bottom surface of each wing at the wing strut attach point. The fuel filler caps are equipped with vacuum operated vents which open, allowing air into the tanks, should the fuel tank vent lines become blocked.

Fuel quantity is measured by two float-type fuel quantity transmitters (one in each tank) and indicated by two electrically-operated fuel quantity indicators on the right side of the instrument panel. The fuel quantity indicators are calibrated in gallons (lower scale) and pounds (upper scale). An empty tank is indicated by a red line and the letter E. When an indicator shows an empty tank, approximately 2.0 gallons remain in the tank as unusable fuel. The indicators cannot be relied upon for accurate readings during skids, slips, or unusual attitudes. If both indicator pointers should rapidly move to a zero reading, check the cylinder head temperature and oil temperature gages for operation. If these gages are not indicating, an electrical malfunction has occurred.

The airplane may be serviced to a reduced capacity to permit heavier cabin loadings. This is accomplished by filling each tank to the bottom edge of the fuel filler collar, thus giving a reduced fuel load of 32.0 gallons in each tank (30.0 gallons usable in all flight conditions).

PROPELLER

The airplane has an all-metal, three-bladed, constant-speed, governor-regulated propeller. A setting introduced into the governor with the propeller control establishes the propeller speed, and thus the engine speed to be maintained. The governor then controls flow of engine oil, boosted to high pressure by the governing pump, to or from a piston in the propeller hub. Oil pressure acting on the piston twists the blades toward high pitch (low RPM). When oil pressure to the piston in the propeller hub is relieved, centrifugal force, assisted by an internal spring, twists the blades toward low pitch (high RPM).

A control knob on the lower center portion of the instrument panel is used to set the propeller and control engine RPM as desired for various flight conditions. The knob is labeled PROP PITCH PUSH INCR RPM. When the control knob is pushed in, blade pitch will decrease, giving a higher RPM. When the control knob is pulled out, the blade pitch increases, thereby decreasing RPM. The propeller control knob is equipped with a vernier feature which allows slow or fine RPM adjustments by rotating the knob clockwise to increase RPM, and counterclockwise to decrease it. To make rapid or large adjustments, depress the button on the end of the control knob and reposition the control as desired.

FUEL SYSTEM

The airplane fuel system (see figure 7-5) consists of two vented integral fuel tanks (one in each wing), two fuel reservoir tanks, a fuel tank selector valve, auxiliary fuel pump, fuel strainer, engine-driven fuel pump, fuel/air control unit, fuel manifold, and fuel injector nozzles.

NOTE

Unusable fuel is at a minimum due to the design of the fuel system. However, with 1/4 tank or less, prolonged uncoordinated flight such as slips or skids can uncover the fuel tank outlets, causing fuel starvation and engine stoppage. Therefore, with low fuel reserves, do not allow the airplane to remain in uncoordinated flight for periods in excess of one minute.

Fuel flows by gravity from the two wing tanks to two reservoir tanks, and from the reservoir tanks to a three-position selector valve labeled LEFT ON, RIGHT ON, and OFF. With the selector valve in the LEFT ON or RIGHT ON position, fuel from either the left or right tank flows through a bypass in the auxiliary fuel pump (when it is not in operation), and through a strainer to an engine-driven fuel pump. The engine-driven fuel pump delivers the fuel to the fuel/air control unit where it is metered and directed

decrease in braking action after brake application, noisy or dragging brakes, soft or spongy pedals, and excessive travel and weak braking action. If any of these symptoms appear, the brake system is in need of immediate attention. If, during taxi or landing roll, braking action decreases, let up on the pedals and then re-apply the brakes with heavy pressure. If the brakes become spongy or pedal travel increases, pumping the pedals should build braking pressure. If one brake becomes weak or fails, use the other brake sparingly while using opposite rudder, as required, to offset the good brake.

ELECTRICAL SYSTEM

The airplane is equipped with a 28-volt, direct-current electrical system (see figure 7-7). The system uses a battery, located on the upper left forward portion of the firewall, as the source of electrical energy and an engine-driven, 60-amp alternator to maintain the battery's state of charge. Power is supplied to most general electrical and all avionics circuits through the primary bus bar and the avionics bus bar, which are interconnected by an avionics power switch. The primary bus is on anytime the master switch is turned on, and is not affected by starter or external power usage. Both bus bars are on anytime the master and avionics power switches are turned on.

CAUTION

Prior to turning the master switch on or off, starting the engine, or applying an external power source, the avionics power switch, labeled AVIONICS POWER, should be turned off to prevent any harmful transient voltage from damaging the avionics equipment.

MASTER SWITCH

The master switch is a split-rocker type switch labeled MASTER, and is ON in the up position and off in the down position. The right half of the switch, labeled BAT, controls all electrical power to the airplane. The left half, labeled ALT, controls the alternator.

Normally, both sides of the master switch should be used simultaneously; however, the BAT side of the switch could be turned ON separately to check equipment while on the ground. To check or use avionics equipment or radios while on the ground, the avionics power switch must be turned on. The ALT side of the switch, when placed in the off position, removes the alternator from the electrical system. With this switch in the off position, the entire electrical load is placed on the battery. Continued operation with the alternator switch in the off position will reduce battery

The auxiliary fuel pump switch is located on the left side of the instrument panel and is a yellow and red split-rocker type switch. The yellow right half of the switch is labeled START, and its upper ON position is used for normal starting, minor vapor purging and continued engine operation in the event of an engine-driven fuel pump failure. With the right half of the switch in the ON position, the pump operates at one of two flow rates that are dependent upon the setting of the throttle. With the throttle open to a cruise setting, the pump operates at a high enough capacity to supply sufficient fuel flow to maintain flight with an inoperative engine-driven fuel pump. When the throttle is moved toward the closed position (as during letdown, landing, and taxiing), the fuel pump flow rate is automatically reduced, preventing an excessively rich mixture during these periods of reduced engine speed.

NOTE

If the engine-driven fuel pump is functioning and the auxiliary fuel pump switch is placed in the ON position, an excessively rich fuel/air ratio is produced unless the mixture is leaned. Therefore, this switch should be turned off during takeoff.

NOTE

If the auxiliary fuel pump switch is accidentally placed in the ON position with the master switch on and the engine stopped, the intake manifolds will be flooded.

The red left half of the switch is labeled EMERG, and its upper HI position is used in the event of an engine-driven fuel pump failure during takeoff or high power operation. The HI position may also be used for extreme vapor purging. Maximum fuel flow is produced when the left half of the switch is held in the spring-loaded HI position. In this position, an interlock within the switch automatically trips the right half of the switch to the ON position. When the spring-loaded left half of the switch is released, the right half will remain in the ON position until manually returned to the off position.

If it is desired to completely exhaust a fuel tank quantity in flight, the auxiliary fuel pump will be needed to assist in restarting the engine when fuel exhaustion occurs. Therefore, it is recommended that proper operation of the auxiliary fuel pump be verified prior to running a fuel tank dry by turning the auxiliary fuel pump ON momentarily and checking for a slight rise in fuel flow indication.

To ensure a prompt engine restart in flight after running a fuel tank dry, immediately switch to the tank containing fuel at the first indication of

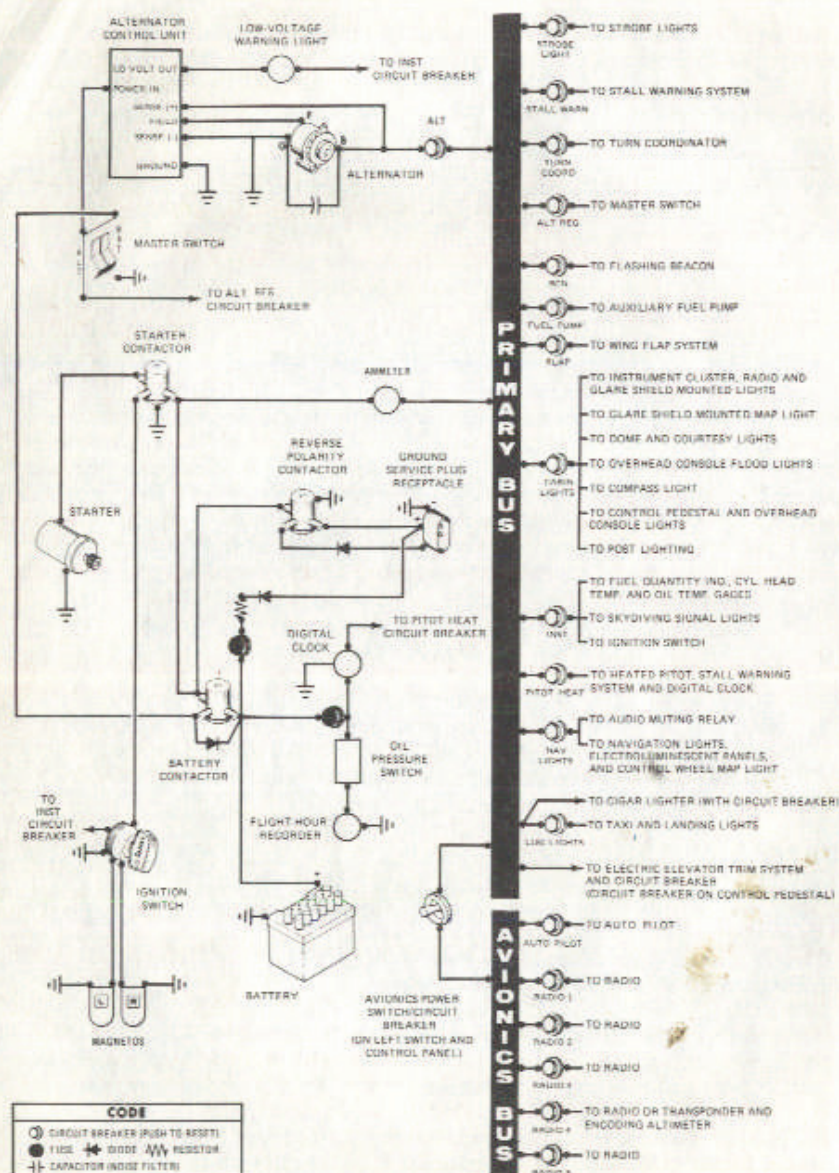


Figure 7-7. Electrical System

fuel pressure fluctuation and/or power loss. Then place the right half of the auxiliary fuel pump switch in the ON position momentarily (3 to 5 seconds) with the throttle at least 1/2 open. Excessive use of the ON position at high altitude and full rich mixture can cause flooding of the engine as indicated by a short (1 to 2 seconds) period of power followed by a loss of power. This can later be detected by a fuel flow indication accompanied by a lack of power. If flooding does occur, turn off the auxiliary fuel pump switch, and normal propeller windmilling should start the engine in 1 to 2 seconds.

If the propeller should stop (possible at very low airspeeds) before the tank containing fuel is selected, place the auxiliary fuel pump switch in the ON position and advance the throttle promptly until the fuel flow indicator registers approximately 1/2 way into the green arc for 1 to 2 seconds duration. Then retard the throttle, turn off the auxiliary fuel pump, and use the starter to turn the engine over until a start is obtained.

The fuel system is equipped with drain valves to provide a means for the examination of fuel in the system for contamination and grade. The system should be examined before the first flight of every day and after each refueling, by using the sampler cup provided to drain fuel from the wing tank sumps, and by utilizing the fuel strainer drain under an access panel on the left side of the engine cowling. Quick-drain valves are also provided for the fuel reservoir tanks. The valves are located under plug buttons in the belly skin of the airplane, and are used to facilitate purging of the fuel system in the event water is discovered during the preflight fuel system inspection. The fuel tanks should be filled after each flight to prevent condensation.

BRAKE SYSTEM

The airplane has a single-disc, hydraulically-actuated brake on each main landing gear wheel. Each brake is connected, by a hydraulic line, to a master cylinder attached to each of the pilot's rudder pedals. The brakes are operated by applying pressure to the top of either the left (pilot's) or right (copilot's) set of rudder pedals, which are interconnected. When the airplane is parked, both main wheel brakes may be set by utilizing the parking brake which is operated by a handle under the left side of the instrument panel. To apply the parking brake, set the brakes with the rudder pedals, pull the handle aft, and rotate it 90° down.

For maximum brake life, keep the brake system properly maintained, and minimize brake usage during taxi operations and landings.

Some of the symptoms of impending brake failure are: gradual

LIGHTING SYSTEMS

EXTERIOR LIGHTING

Conventional navigation lights are located on the wing tips and tail stinger, dual landing lights are installed in the cowl nose cap, and a flashing beacon is mounted on top of the vertical stabilizer. Additional lighting is available and includes a strobe light on each wing tip and two courtesy lights, one under each wing, just outboard of the cabin. Details of the strobe light system are presented in Section 9, Supplements. The courtesy lights are operated by a switch located on the left rear door post. All exterior lights, except the courtesy lights, are controlled by rocker type switches on the left switch and control panel. The switches are ON in the up position and off in the down position.

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

INTERIOR LIGHTING

Instrument and control panel lighting is provided by flood, and integral lighting, with electroluminescent and post lighting also available. Rheostats and control knobs, located on the left switch and control panel, control the intensity of all lighting. The following paragraphs describe the various lighting systems and their controls.

The left and right sides of the switch and control panel, and the marker beacon/audio control panel may be lighted by electroluminescent panels which do not require light bulbs for illumination. To utilize this lighting, turn the NAV light rocker switch to the ON position and rotate the inner knob labeled EL PANEL, ENG-RADIO, on the right dimming rheostat, clockwise to the desired light intensity.

Instrument panel flood lighting consists of four red flood lights on the underside of the glare shield, and two red flood lights in the forward part of the overhead console. The lights are utilized by adjusting light intensity with the large (outer) control knob of the concentric control knobs labeled POST, FLOOD. Flood lighting may be used in combination with post lighting by adjusting post light intensity with the small (inner) control knob.

The instrument panel may be equipped with post lights which are mounted at the edge of each instrument or control and provide direct lighting. To operate the post lights, adjust light intensity with the small (inner) control knob of the concentric control knobs labeled POST, FLOOD.

power low enough to open the battery contactor, remove power from the alternator field, and prevent alternator restart.

AVIONICS POWER SWITCH

Electrical power from the airplane primary bus to the avionics bus (see figure 7-7) is controlled by a toggle-type circuit breaker-switch labeled AVIONICS POWER. The switch is located on the left side of the switch and control panel and is ON in the up position and off in the down position. With the switch in the off position, no electrical power will be applied to the avionics equipment, regardless of the position of the master switch or the individual equipment switches. The avionics power switch also functions as a circuit breaker. If an electrical malfunction should occur and cause the circuit breaker to open, electrical power to the avionics equipment will be interrupted and the switch toggle will automatically move to the off position. If this occurs, allow the circuit breaker to cool approximately two minutes before placing the toggle in the on position again. If the circuit breaker opens again, do not reset it. The avionics power switch should be placed in the off position prior to turning the master switch on or off, starting the engine, or applying an external power source, and may be utilized in place of the individual avionics equipment switches.

AMMETER

The ammeter, located on the upper right portion of the instrument panel, indicates the amount of current, in amperes, from the alternator to the battery or from the battery to the airplane electrical system. When the engine is operating and the master switch is turned on, the ammeter indicates the charging rate applied to the battery. In the event the alternator is not functioning or the electrical load exceeds the output of the alternator, the ammeter indicates the battery discharge rate.

ALTERNATOR CONTROL UNIT AND LOW-VOLTAGE WARNING LIGHT

The airplane is equipped with a combination alternator regulator high-low voltage control unit mounted on the engine side of the firewall and a red warning light, labeled LOW VOLTAGE, under the oil temperature gage on the instrument panel.

In the event an over-voltage condition occurs, the alternator control unit automatically removes alternator field current which shuts down the alternator. The battery will then supply system current as shown by a discharge rate on the ammeter. Under these conditions, depending on electrical system load, the low-voltage warning light will illuminate when system voltage drops below normal. The alternator control unit may be

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To combine post and flood lighting, adjust flood light intensity with the large (outer) control knob.

The engine instrument cluster, digital clock, radio equipment, and magnetic compass have integral lighting and operate independently of post or flood lighting. The light intensity of instrument cluster, digital clock, magnetic compass, and radio equipment lighting is controlled by the large (outer) control knob of the concentric control knobs labeled EL PANEL, ENG-RADIO. If the airplane is equipped with avionics incorporating incandescent digital readouts, the ENG-RADIO (large outer) control knob controls the light intensity of the digital readouts. For daylight operation, the control knob should be rotated full counterclockwise to produce maximum light intensity for the digital readouts only. Clockwise rotation of the control knob will provide normal variable light intensity for nighttime operation.

The control pedestal has two post lights and, if the airplane is equipped with oxygen, the overhead console is illuminated by post lights. Pedestal and console light intensity is controlled by the large (outer) control knob of the concentric control knobs labeled EL PANEL, ENG-RADIO.

Map lighting is provided by overhead console map lights and a glare shield mounted map light. The airplane may also be equipped with a control wheel map light. The overhead console map lights operate in conjunction with instrument panel flood lighting and consist of two openings just aft of the red instrument panel flood lights. The map light openings have sliding covers controlled by small round knobs which uncover the openings when moved toward each other. The covers should be kept closed unless the map lights are required. A map light and toggle switch, mounted in front of the pilot on the underside of the glare shield, is used for illuminating approach plates or other charts when using a control wheel mounted approach plate holder. The switch is labeled MAP LIGHT ON, OFF and light intensity is controlled by the FLOOD (large outer) control knob. A map light mounted on the bottom of the pilot's control wheel illuminates the lower portion of the cabin in front of the pilot, and is used for checking maps and other flight data during night operation. The light is utilized by turning on the NAV LIGHTS switch, and adjusting light intensity with the rheostat control knob on the bottom of the control wheel.

The airplane is equipped with a dome light aft of the overhead console, which is operated by a slide-type switch, adjacent to the dome light.

The most probable cause of a light failure is a burned out bulb; however, in the event any of the lighting systems fail to illuminate when turned on, check the appropriate circuit breaker. If the circuit breaker has opened (white button popped out), and there is no obvious indication of a short circuit (smoke or odor), turn off the light switch of the affected lights,

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reset by turning the master switch off and back on again. If the warning light does not illuminate, normal alternator charging has resumed; however, if the light does illuminate again, a malfunction has occurred and the flight should be terminated as soon as practicable.

NOTE

Illumination of the low-voltage light and ammeter discharge indications may occur during low RPM conditions with an electrical load on the system, such as during a low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to de-activate the alternator system.

The warning light may be tested by turning on the landing lights and momentarily turning off the ALT portion of the master switch while leaving the BAT portion turned on.

CIRCUIT BREAKERS AND FUSES

Most of the electrical circuits in the airplane are protected by "push-to-reset" circuit breakers mounted on the lower left side of the instrument panel. The electric elevator trim system (if installed) is protected by a circuit breaker on the control pedestal. In addition to the individual circuit breakers, a toggle type circuit breaker-switch, labeled AVIONICS POWER, on the left switch and control panel also protects the avionics systems. The cigar lighter is protected a manually-reset type circuit breaker on the back of the lighter, and a fuse behind the instrument panel. The control wheel map light (if installed) is protected by the NAV LIGHTS circuit breaker and a fuse behind the instrument panel. Electrical circuits which are not protected by circuit breakers are the battery contactor closing (external power) circuit, clock circuit, and flight hour recorder circuit. These circuits are protected by fuses mounted adjacent to the battery.

GROUND SERVICE PLUG RECEPTACLE

A ground service plug receptacle may be installed to permit the use of an external power source for cold weather starting and during lengthy maintenance work on the electrical and electronic equipment. Details of the ground service plug receptacle are presented in Section 9, Supplements.