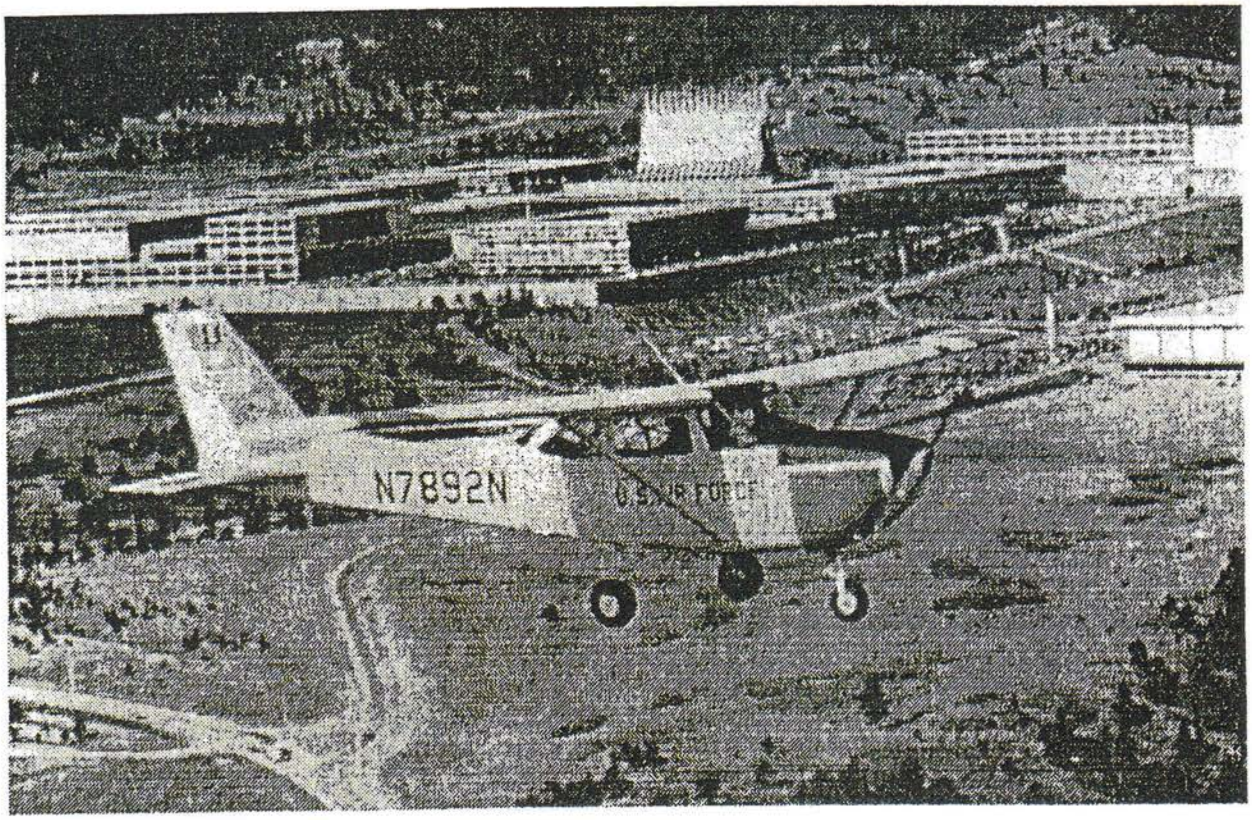
FLIGHT MANUAL

USAF SERIES
T-41C/D AIRCRAFT



F34601-90-D-0311

BASIC AND ALL CHANGES HAVE BEEN MERGED TO MAKE THIS A COMPLETE PUBLICATION.

DISTRIBUTION STATEMENT - Distribution authorized to the Department of Defense and U.S. DoD contractors only, Administrative and Operational Use, 15 September 1990. Other requests shall be referred to OC-ALC/TISDT, Tinker AFB, OK 73145-5990.

WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec. 2751 et seq.) or the Export Administration Act of 1979, as amended (Title 50, U.S.C., App. 2401 et seq.). Violations of these export laws are subject to severe criminal penalties.

HANDLING AND DESTRUCTION NOTICE - Handle in compliance with the distribution statement and destroy by any method that will prevent disclosure of the contents or reconstruction of the document.

COMMANDERS ARE RESPONSIBLE FOR BRINGING THIS PUBLICATION TO THE ATTENTION OF ALL AFFECTED PERSONNEL.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

AIR FORCE 13 May 91 / 865

B 15 SEPTEMBER 1990

CHANGE 1 15 APRIL 1991

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original ...0 ..15 Sep 90
Change ...1 ...15 Apr 91

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 90 CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Title	1
A	1
C	0
C1 Blank	0
i	1
ii - ix	0
x Blank	0
1-1	1
1-2 - 1-20	0
2-1 - 2-3	0
2-4 - 2-5	1
2-6 - 2-7	0
2-8 - 2-10	1
2-11	0
2-12	1
2-13 - 2-15	0
2-16 Blank	0
3-1 - 3-3	0
3-4 - 3-5	1
3-6 - 3-10	0
4-1	0
4-2 Blank	0
5-1	0
5-2	1
5-3	0
5-4	1
6-1 - 6-2	1
7-1	0
7-2	1
A-1	1
A-2 - A-13	0
A-14 Blank	0
G-1	0
G-2 Blank	0
Index-1 - Index-3	0
Index-4 Blank	0

*Zero in this column indicates an original page.

Technical Order/Equipment Configuration Status Record

ECP/TCTO NO.	TITLE	INCORP. DATE

Flight Manual, Safety Supplement, and Operational Supplement Status

This page is published with each Safety and Operational Supplement, and each Flight Manual Change or revision. It provides a comprehensive listing of the current Flight Manuals, Flight Crew Checklist, Safety Supplements, and Operational Supplements. If you are missing any publications listed on this page, see your Publications Distribution Officer and get your copy. Changes in preparation are shown in parentheses ( ).

FLIGHT MANUAL	*DATE*	*CHANGE*
T.O. 1T-41C-1	1 Aug 90	1 - 15 Apr 91

FLIGHT CREW CHECKLIST	*DATE*	*CHANGE*
T.O. 1T-41C-1CL-1	1 Aug 90	1 - 15 Apr 91

Flight Manual, Safety Supplement, and Operational Supplement Status

CURRENT SUPPLEMENTS

Number	*Date*	*Short Title*	*Flight Manual Pages Affected*

REPLACED/RESCINDED SUPPLEMENTS

Number	*Date*	*Disposition*

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Coding and Serialization

D Indicates information that applies to "D" modified airplanes.

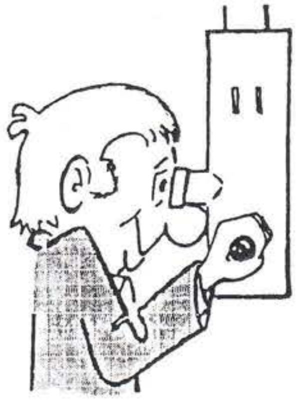
AIRCRAFT CODING "D" MODEL

69-7755

69-7756

All other airplanes are standard "C" models.

IMPORTANT! Read these pages carefully



SCOPE.

The information in the manual provides you with a general knowledge of the airplane, its characteristics, and specific normal and emergency operating procedures. Your flying experience is recognized; therefore, basic flight principles are avoided. This manual provides the best possible operating instruction under most circumstances, but are a poor substitute for sound judgement. Multiple emergencies, adverse weather, terrain, or extenuating circumstances may require modification of the procedure(s) presented in this manual.

FLIGHT MANUAL BINDERS.

Looseleaf binders and sectionalized tabs are available for use with your manual. They are obtained through local purchase procedures and are listed in the Federal Supply Schedule (FSC Group 75, Office Supplies, Part 1). Check with your supply personnel for assistance in procuring these items. Due to the size of section I it is suggested that dividers be used at the beginning of each system description.

PERMISSIBLE OPERATIONS.

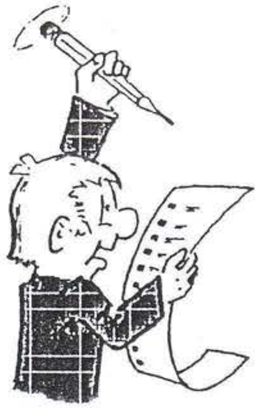
The Flight Manual takes a "positive approach" and normally states only what you can do. Usually operations or configurations which exceed the limitations as specified in this manual are prohibited, except in actual emergencies, unless authorized by HQ USAF ACADEMY/CWO.

HOW TO BE ASSURED OF HAVING LATEST DATA . . .

You must remain constantly aware of the latest manual, checklists and status of supplements. T.O. 0-1-1-3 (supplemented monthly) and the latest flight manual or supplement status page provide a listing of the current flight manuals, checklists and supplements.

ARRANGEMENT.

This manual is divided into seven interdependent sections to simplify reading it straight through or using it as a reference manual. For convenience, section I has been divided into 20 subsections, describing major systems or groups of related systems. You must be familiar with the system operating instructions in section I, the limitations in section V and the flight characteristics in section VI, to perform the procedures sections II, III, and IV. In adverse weather conditions, the procedures in sections II and III shall be modified as shown in section VIII.



CHECKLISTS.

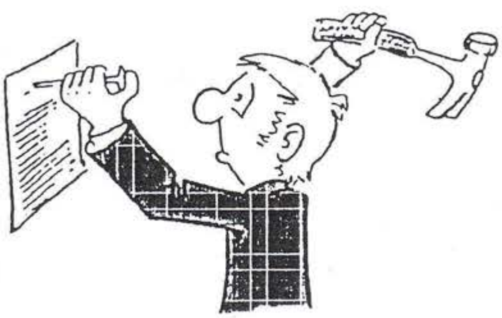
The Flight Manual contains the amplified checklists. Abbreviated checklists have been issued as separate technical orders. See the latest supplement status page for current applicable checklists. Line items in the Flight Manual and checklists are arranged in the same order. If authorized by an interim Safety or Operational Supplement that affects a checklist, write in the applicable change on the affected checklist page. If a printed supplement contains a replacement checklist page, file the page in front of the existing checklist page, but do not throw out the old page (in case the supplement is cancelled).

HOW TO GET PERSONAL COPIES.

Each flight crew member is entitled to personal copies of the Flight Manual, Safety Supplements, Operational Supplements, and Checklists. The required quantities should be ordered before you need them to assure their prompt receipt. Check with your Flight Manuals personnel - it is their job to fulfill your Technical Order requests. Basically, you must order the required quantities on the publication Requirements Table (T.O. 0-1-1-3). Technical Orders 00-5-1 and 00-5-2 give detailed information for properly ordering these publications. Make sure a system is established at your base to deliver these publications to the flight crews immediately upon receipt.

SAFETY AND OPERATIONAL SUPPLEMENTS.

Safety supplements are a rapid means of transmitting information about hazardous conditions or safety problems. These supplements contain operating instructions, or restrictions that affect safety or safety modifications. Operational supplements are a rapid means of transmitting information not involving safety. Supplements are issued by teletype (interim) or as printed (formal) supplements. Interim supplements are either replaced by a formal printed supplement (with a new number) or by a quick change to the manual. Formal supplements are identified by red letters "SS" or by black letters "OS" around the borders of the pages.

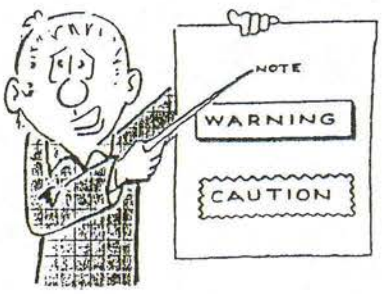


All supplements are numbered in sequence. A safety supplement has the letters 'SS ' in the number. An operational supplement has the letter "S" in the number. All current supplements must be complied with. A safety and operational supplement status page is in each printed supplement and each change to this manual (pages i and ii) to show the current status of supplements and checklists. These pages are only current when prepared. To be sure of the latest information check the index, T.O. 0-1-1-3. The title page of this manual and the title block of each supplement show the effect of each change on supplements. File supplements in front of the manual, with the latest on top, regardless of whether it is an operational supplement or safety supplement.

CHANGE SYMBOL

The change symbol, as illustrated by the black line in the margin of this paragraph, indicates text changes made to the current revision. Changes to illustrations are indicated with a miniature hand.

WARNINGS, CAUTIONS, AND NOTES.



The following definitions apply to "Warnings," "Cautions," and "Notes" found through the manual.

WARNING

Operating procedures, techniques, etc., which can result in personal injury or loss of life if not carefully followed.

CAUTION

Operating procedures, techniques, etc., which can result in damage to equipment if not carefully followed.

NOTE

An operating procedure, technique, etc., which is considered essential to emphasize.

The following definitions apply to the words "shall," "will," "should," and "may":

SHALL or WILL

Used to express that the requirements are binding and mandatory.

SHOULD

Used to express a non-mandatory desire or preferred method of accomplishment and shall be construed as a non-mandatory provision.

MAY

Used to express an acceptable or suggested means of accomplishment and shall be construed as a non-mandatory provision. Not used to express possibility ("might").

YOUR RESPONSIBILITY — TO LET US KNOW .

Every effort is made to keep the Flight Manual current. Review conferences with operating personnel and a constant review of accident and flight reports assure inclusion of the latest data in the manual. However, we cannot correct an error unless we know of its existence. Comments, corrections and questions regarding this manual or any phase of the Flight Manual program are welcomed. These should be forwarded through your major command on AF Form 847 to Oklahoma City ALC/TISDTM Tinker AFB, Oklahoma 73145-5990.

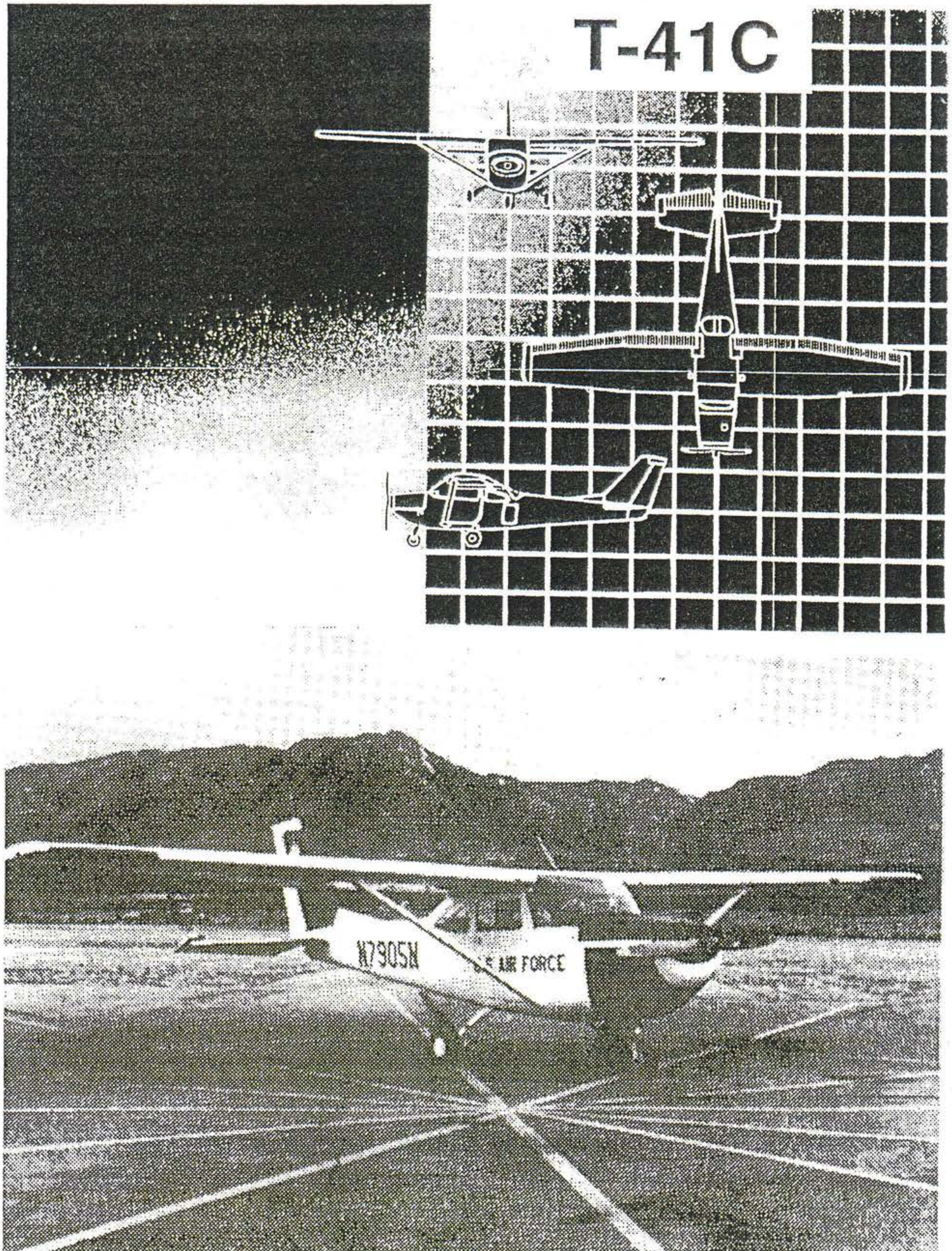


Figure 1. The T-41C Aircraft

SECTION I

DESCRIPTION AND OPERATION

Table of Contents

THE AIRCRAFT

The T-41C, designed and manufactured by Cessna Aircraft Company, is an all metal, single-engine, strut-balanced, high wing monoplane. Distinguishable features of the aircraft are its single engine placed forward on the fuselage centerline and fixed tricycle landing gear. The propeller is all metal, fixed pitch, and designed for best climb. Aircraft are generally configured with two forward side-by-side seats with the capability of conversion to four-place seating. On T-41D aircraft, the T-41D has the same characteristics as T-41C. The T-41D has a variable pitch propeller which improves performance.

Dimensions

The overall dimensions of the aircraft are as follows: (Figure 1-1)

Wing Span .... 36'2"
Height .... 8' 9 1/2"
Length .... 25'11"
Wheel Base .... 7'2"
Propeller .... 6'6"

Gross Weight

This aircraft is FAA-certified in both the normal and utility categories. Maximum gross weights are as follows:

Normal .... 2,500 lbs
Utility .... 2,200 lbs
D Normal .... 2,550 lbs
D Utility .... 2,250 lbs

Refer to Section V, Weight Limitations, for additional information.

ENGINE

The aircraft is powered by a horizontally-opposed, fuel-injected, six-cylinder Continental Model IO-360-D engine, rated at 210 bhp at 2,800 RPM. As an internal combustion engine, power to turn the propeller is derived from the ignition of fuel and air in the six cylinders. Spark to ignite the fuel and air is provided by two magnetos and is controlled by the ignition switch. The ratio of fuel and air ignited in the cylinders is determined by atmospheric pressure (see engine-driven fuel pump) and the position of the throttle and mixture knobs in the cockpit.

Ignition System

Anytime the engine is turning, ignition is supplied by two magnetos. Each magneto supplies power to its associated set of spark plugs. The magnetos are engine-driven and self-contained. They are independent of the aircraft electrical system and of each other. Magneto operation is checked as outlined in Section II, Before Takeoff Check.

Ignition Switch

The ignition switch, located on the left lower switch panel, controls the ignition system (figure 1-2). The switch is labeled OFF, R, L, BOTH, START, in a clockwise direction. The R and L positions are for checking the magneto system or emergency purposes only. The position of the ignition switch determines which portions of the system are operating.

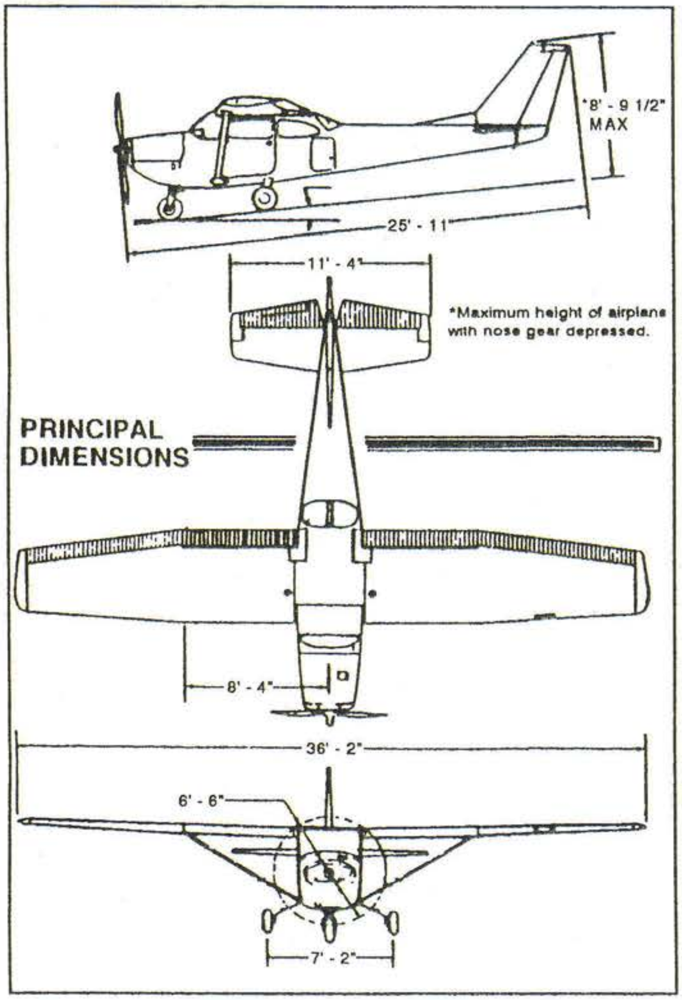


Figure 1-1. Principal Dimensions

Starting System

Electrical power for energizing the starter may be supplied by the aircraft battery or an external power source. When the ignition switch is turned to the spring-loaded START position (with the master switch ON) the starter solenoid closes allowing voltage to flow to the starter motor, cranking the engine. As the switch is released, it automatically returns to the BOTH position.

CAUTION

Release the starter as soon as the engine fires. Never engage the starter while the propeller is turning. Do not operate the starter motor more than a total of 30 seconds at one time. If the engine fails to start within 30 seconds of cumulative cranking, allow a 3 minute cooling period before reengaging the starter.

Mixture Control

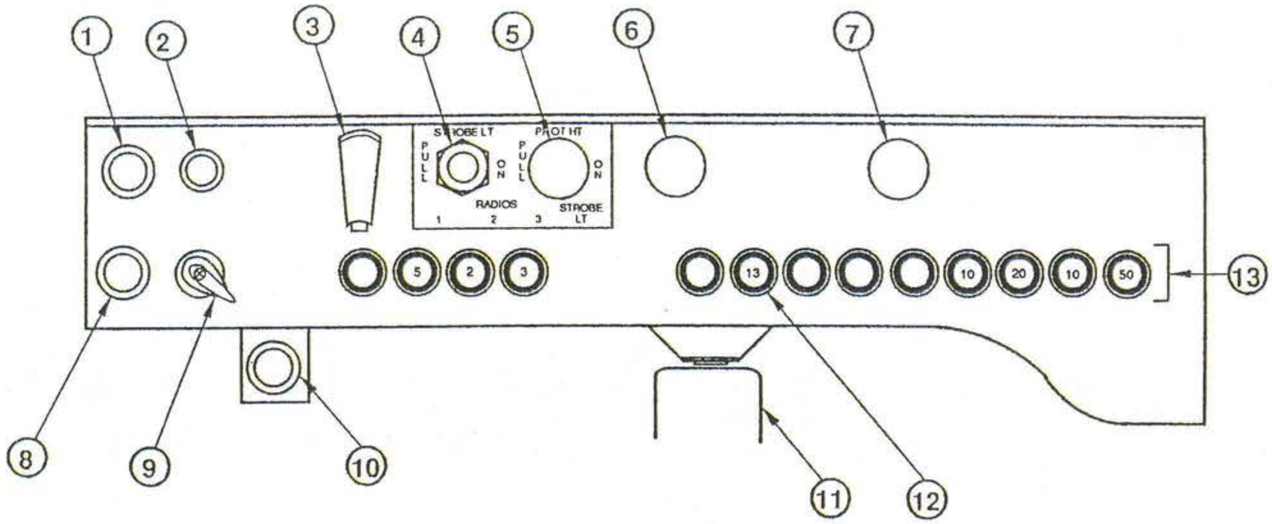
The mixture control knob is to the right of the throttle and is identified by a red knob with a silver push button lock in the center. Moving the control knob forward or aft to adjust the mixture is accomplished by rotating the knob clockwise toward full rich or counterclockwise toward full lean. If large or rapid changes are required, depress the lock button on the control knob and position the control forward or aft as required.

Throttle

Engine power is controlled by the throttle which is identified by its smooth, round white knob. The throttle is operated in the conventional manner - in the forward position the throttle is open, and in the aft position it is closed.

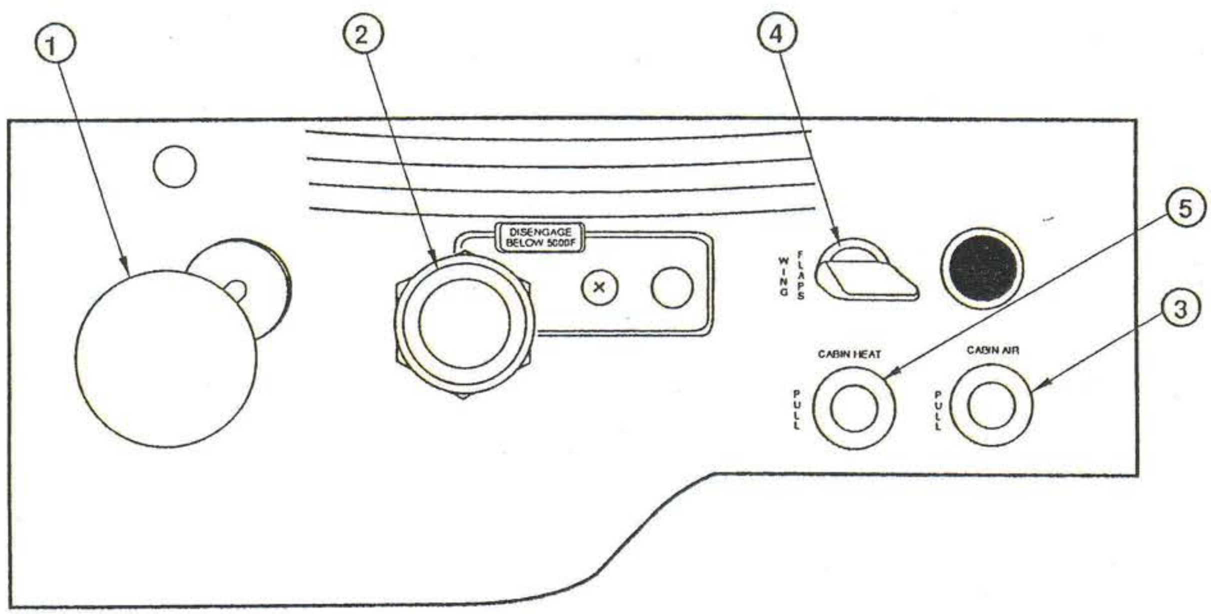
FUEL INJECTION/AIR INDUCTION SYSTEM

Fuel and air arrive at the cylinders for combustion separately, via the fuel injection system and air induction manifold. Fuel flow is metered by the aneroid in the engine-driven rotary vane fuel pump. The aneroid automatically changes the mixture with altitude changes. The mixture unit also meters fuel based on the position of the mixture control knob.



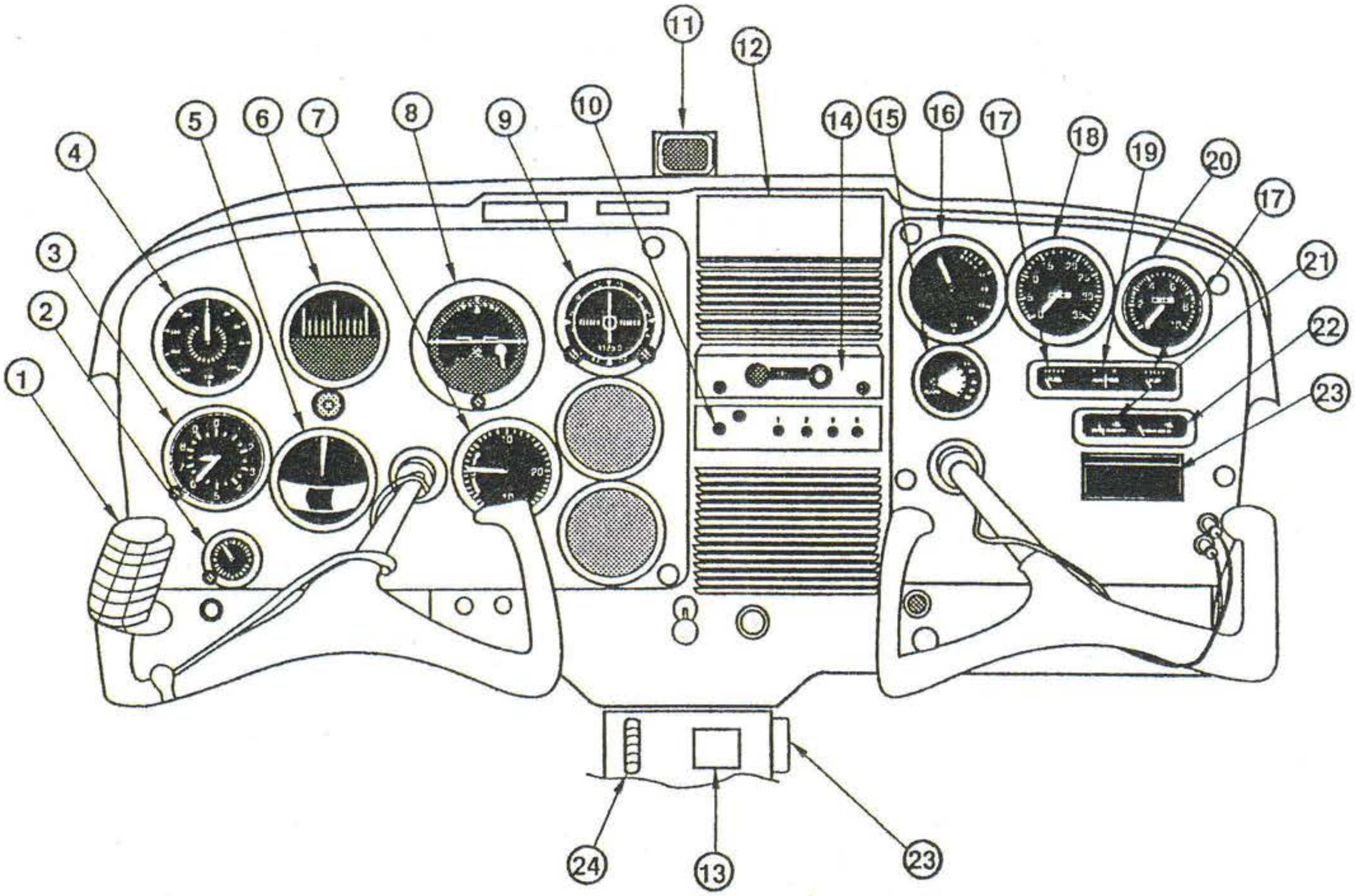
1. FUEL STRAINER KNOB
2. MASTER SWITCH
3. AUXILIARY FUEL PUMP SWITCH
4. STROBE LIGHT SWITCH
5. PITOT HEAT SWITCH
6. NAVIGATION LIGHT SWITCH
7. LANDING/TAXI LIGHT SWITCH
8. MANUAL PRIMER KNOB
9. IGNITION SWITCH
10. FUEL SHUTOFF KNOB
11. PARKING BRAKE
12. FLAP CIRCUIT BREAKER
13. CIRCUIT BREAKERS

Figure 1-2. Left Lower Switch Panel



1. THROTTLE
2. FUEL MIXTURE KNOB
3. CABIN AIR KNOB
4. FLAP SWITCH
5. CABIN HEAT KNOB

Figure 1-3. Right Lower Switch Panel



1. MIKE BUTTON (ON YOKE)
2. CLOCK
3. ALTIMETER
4. AIRSPEED INDICATOR
5. TURN & BANK INDICATOR
6. DIRECTIONAL INDICATOR
7. VERTICAL VELOCITY INDICATOR
8. ATTITUDE INDICATOR
9. VOR (NAV)
10. TRANSPONDER
11. MAGNETIC COMPASS
12. FREQUENCY PLACARD
13. CARBON MONOXIDE DETECTOR
14. RADIO
15. FLAP INDICATOR
16. FUEL FLOW INDICATOR
17. FUEL QUANTITY INDICATOR
18. TACHOMETER
19. AMMETER
20. SUCTION GAUGE
21. OIL TEMPERATURE INDICATOR
22. OIL PRESSURE INDICATOR
23. AUXILIARY MIKE JACK
24. TRIM TAB

Figure 1-4. Cockpit Forward View

From the mixture unit fuel flows to the fuel and air control unit. Air enters the fuel-air control unit from the air filter. Alternatively, if the air filter becomes clogged, suction from the engine opens a spring-loaded door, permitting air to be drawn from the engine compartment into the system. The throttle simultaneously controls the fuel and air valves in the fuel-air control unit delivering the correct ratio of fuel to the fuel distributor and air into the air induction manifold. At the fuel distributor, fuel is evenly distributed to the cylinders through the fuel injection nozzles. Air from the induction manifold enters the cylinders through the intake valves. Fuel injection nozzles and the intake valves are installed on the top side of the cylinders. Drain lines are installed on the bottom of the intake ports to drain any fuel which may accumulate during engine shutdown or priming.

Propeller

D The aircraft is equipped with an all metal, two-bladed, constant-speed, governor regulated propeller. Propeller operation is controllable by means of a propeller control knob which is mechanically linked to the engine-driven propeller governor on the engine. A setting introduced into the governor establishes the engine speed to be maintained, and the governor then controls flow of engine oil, boosted to high pressure by the governing pump, to or from the piston in the propeller hub. Oil pressure acting on the piston twists the blades toward high pitch (low RPM). When oil pressure from the governor to the piston is relieved, centrifugal force, assisted by an internal spring, twists the blades toward low pitch (high RPM).

The constant-speed propeller automatically keeps the blade angle adjusted for maximum efficiency for most conditions encountered in flight. During takeoff, when maximum power and thrust are required, the constant-speed propeller is at a low propeller blade angle or pitch. The low blade angle keeps the angle of attack small and efficient with respect to the relative wind. At the same time, it allows the propeller to handle a smaller mass of air per revolution. This light load allows the engine to turn at high RPM and to convert the maximum amount of fuel into heat energy in a given time. The high RPM also creates maximum thrust; for, although the mass of air handled per revolution is small, the number of revolutions per minute is many, the slipstream velocity is high, and with the low airplane speed, the thrust is maximum.

After lift-off, as the speed of the airplane increases, the constant-speed propeller automatically changes to a higher angle (or pitch). Again, the higher blade angle keeps the angle of attack small and efficient with respect to the relative wind. The higher blade angle increases the mass of air handled per revolution. This decreases the engine RPM, reducing fuel consumption and engine wear, and keeps thrust at a maximum.

After the takeoff climb is established the pilot reduces the power output of the engine to climb power by first decreasing the manifold pressure and then increasing the blade angle to lower the RPM.

At cruising altitude, when the airplane is in level flight and less power is required than is used in takeoff or climb, the pilot again reduces engine power by reducing the manifold pressure and then increasing the blade angle to decrease the RPM. Again, this provides a torque requirement to match the reduced engine power; for although the mass of air handled per revolution is greater, it is more than offset by a decrease in slipstream velocity and an increase in airspeed. The angle of attack is still small because the blade angle has been increased with an increase in airspeed.

The T-41C with its fixed-pitch propeller has only one main power control - the throttle. In that case, the setting of the throttle will control both the amount of power and the propeller or engine RPM.

D Manifold Pressure & Engine RPM

On the other hand, the T-41D with its constant-speed propeller has two main power controls - the throttle and the propeller control. The throttle controls the engine's power output which is indirectly indicated on the manifold pressure gauge. The propeller control changes the pitch of the propeller blades and governs the RPM which is indicated on the tachometer. As the throttle setting (manifold pressure) is increased, the pitch angle of the propeller blades is automatically increased through the action of the propeller governor system. This increase in propeller pitch proportionately increases the air load on the propeller so that the RPM remains constant. Conversely, when the throttle setting (manifold pressure) is decreased, the pitch angle of the propeller blades is automatically decreased. This decrease in propeller pitch decreases the air load on the propeller so that the RPM remains constant.

For any given RPM, there is a manifold pressure that should not be exceeded. If an excessive amount of manifold pressure is carried for a given RPM, the maximum allowable pressure within the engine cylinders could be exceeded, placing undue stress on them. If repeated too frequently, this undue stress could weaken the cylinder components and eventually cause engine structural failure.

In order to avoid conditions that would possibly overstress the cylinders there must be a constant awareness of the tachometer indication, especially when increasing the throttle setting (manifold pressure). The combination to avoid is a high throttle setting (manifold pressure) and low RPM.

WARNING

Except during full throttle/prop FULL INCREASE operations such as takeoffs and go-arounds, never allow manifold pressure to exceed engine RPM.

When both manifold pressure and RPM need to be changed significantly, the pilot can further help avoid overstress by making power adjustments in the proper order. When power settings are being decreased, reduce manifold pressure before RPM. When power settings are being increased, reverse the order - increase RPM first, then manifold pressure.

CAUTION

If RPM is reduced before manifold pressure, manifold pressure will automatically increase and possibly exceed the manufacturer's tolerances.

ENGINE INSTRUMENTS

D Manifold Pressure Gauge

The left half of a dual indicating instrument located on the right side of the panel indicates induction air manifold pressure in inches of mercury. Manifold pressure is controlled by the throttle.

Fuel Flow Indicator

Fuel flow is indicated by the right half of a dual indicating instrument located on the right side of the panel. It is a direct reading fuel pressure gauge, calibrated to indicate approximate gallons per hour of fuel being metered to the engine. D Fuel flow will vary with throttle and propeller settings, but cruise fuel flow can be set with the mixture control knob.

WARNING

If the fuel flow gauge malfunctions, fuel or fuel fumes may enter the cockpit.

D Cylinder Head Temperature

The cylinder head temperature gauge located on the right side of the instrument panel indicates number 3 cylinder head temperature in degrees Fahrenheit. The gauge is controlled by an electrical-resistance type temperature bulb which receives its power from the aircraft electrical system.

D Propeller Control Knob

Control of engine RPM is accomplished by operation of the propeller control knob next to the throttle. Placing the knob in the full forward position decreases the blade angle and provides the highest RPM setting. Moving the control knob aft progressively increases the propeller blade angle and decreases engine RPM. Moving the control knob forward or aft to adjust RPM, is accomplished by rotating the knob clockwise to increase RPM or counter-clockwise to decrease RPM. If large or rapid changes are required, depress the lock button on the control knob and position the control forward or aft as required.

Tachometer

The tachometer is a mechanical indicator driven by a flexible shaft connected to the oil pump shaft. The tachometer indicates engine speed in RPM X 100 (e.g., 12 = 1200 RPM) .

Oil Temperature Gauge

The oil temperature gauge is located on the right side or the instrument panel (figure 1-4). Heat from engine oil causes the liquid in the line connecting the oil system and the gauge to expand. The gauge is direct reading and measures this expansion.

Oil Pressure Gauge

A direct-reading gauge displays oil pressure in psi. It is located adjacent to the oil temperature gauge on the right instrument panel (figure 1-4).

WARNING

> Should the oil pressure indication become abnormal in cold weather for no apparent reason, the problem may be condensation in the line from the system to the gauge. Turning the cabin heat off may correct the problem. However, be watchful for other signs of engine problems. In any case, declare an emergency and land as soon as practical.

OIL SYSTEM

Oil for engine lubrication and cooling is supplied by a wet sump pressure splash gravity return system. The capacity of the sump is 10 US quarts. Oil is drawn from the sump through a low pressure filter screen into the engine-driven oil pump. A pressure relief valve in line from the oil pump automatically regulates pressure between 30 and 75 psi. When this valve opens it ports oil back to the sump reducing the oil pressure in the system. From the pump, oil is forced through a high pressure screen to a thermostat in the oil cooler. The thermostat opens and allows oil to bypass the oil cooler when the oil is cold. When the oil is hot, the thermostat closes causing the oil to be forced through radiator passages in the oil cooler, thus controlling engine oil temperature. Oil is then circulated to various engine parts for lubrication and returned to the sump by gravity flow.

The engine uses mineral oil for the first 100 hours to ensure better engine break in. After this break in period, the mineral oil is replaced with detergent oil. A white oil filler cap identifies an engine with mineral oil, a yellow filler cap indicates detergent oil. An oil filler cap is located on the top side of the engine. The oil dipstick is located on the left side of the engine just above the oil cooler. Both the filler cap and the dipstick are accessible through the oil access door on he engine cowling.

FUEL SYSTEM

Fuel is supplied to the engine from two 26-gallon tanks, one in each wing. Fuel from each tank flows by gravity to a three-position selector valve, labeled LEFT, BOTH, and RIGHT. Fuel then flows to a fuel reservoir tank and a manually operated fuel shutoff valve. A push-pull knob labeled FUEL, PUSH ON operates the shutoff valve (figure 1-2).

CAUTION

> To prevent wear of the cable assembly, and to prevent a partially closed position of the fuel shutoff valve, the fuel shutoff valve should be left in the PUSH ON position, except during emergency engine shutdowns.

After passing through the fuel shutoff valve, the fuel is routed through a fuel strainer, located in the nosewheel compartment, and through a bypass check valve in the electric fuel pump (auxiliary fuel pump), when the pump is not being used. The fuel strainer is the lowest portion of the fuel system and is provided as a means of collecting any water that may have accumulated in the system. Any collected water will be drained overboard by pulling the fuel strainer knob located on the left lower switch panel. Additional water may also be drained through four valves (two beneath the forward fuselage and one on each wing root) with the use of a fuel sample cup. Fuel is then routed to the engine-driven fuel pump and mixture unit. From there, fuel is distributed to the engine via the fuel and air throttle unit and the fuel distribution manifold. Vapor and excess fuel from the engine-driven fuel pump and mixture unit are returned to the fuel reservoir tank. Due to gravity flow and fuel line placement, 1/2 gallon in each tank is not usable during straight and level flight; during maneuvering flight, 3 gallons in each tank are unusable (figure 1-7).

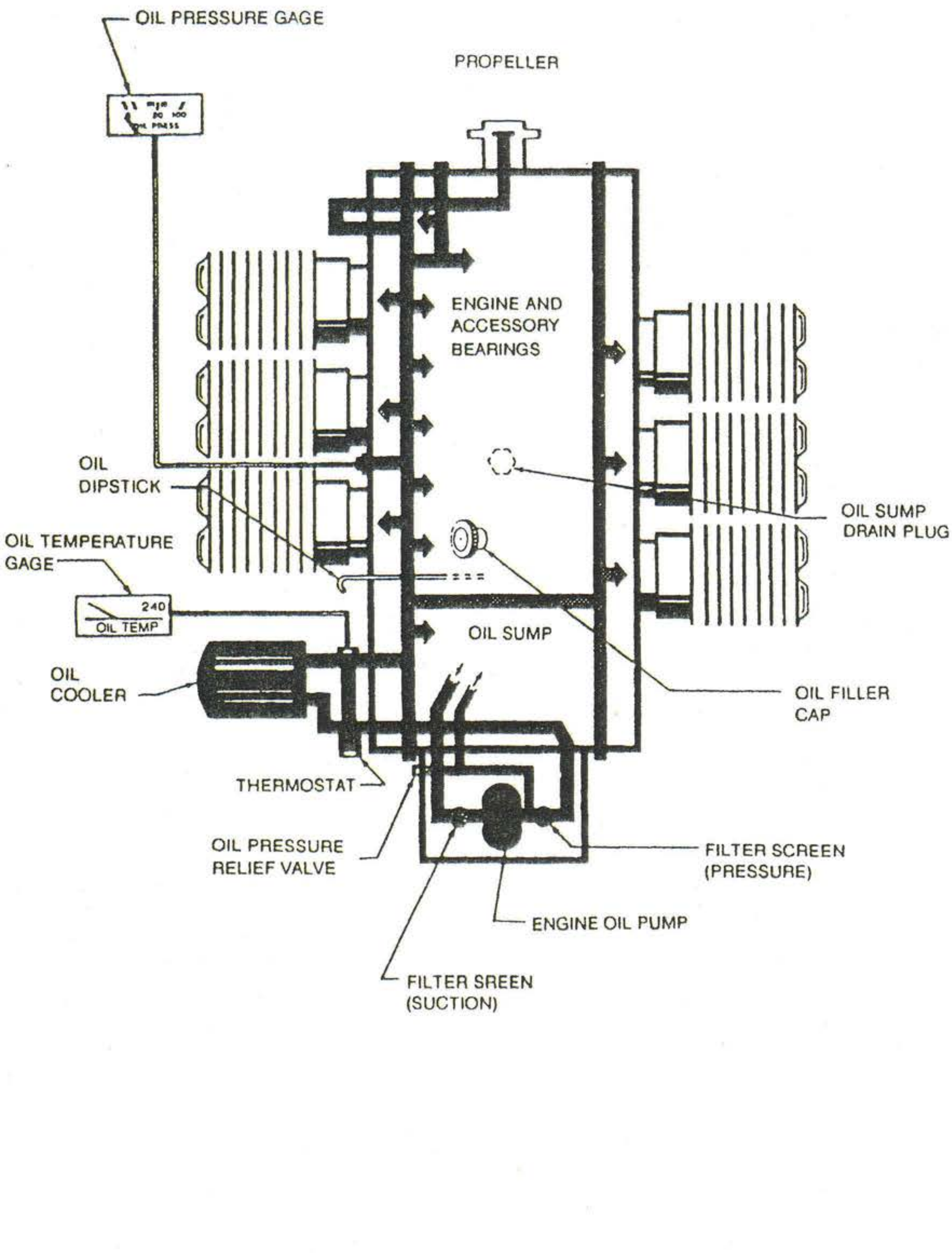


Figure 1-5. Oil System Schematic

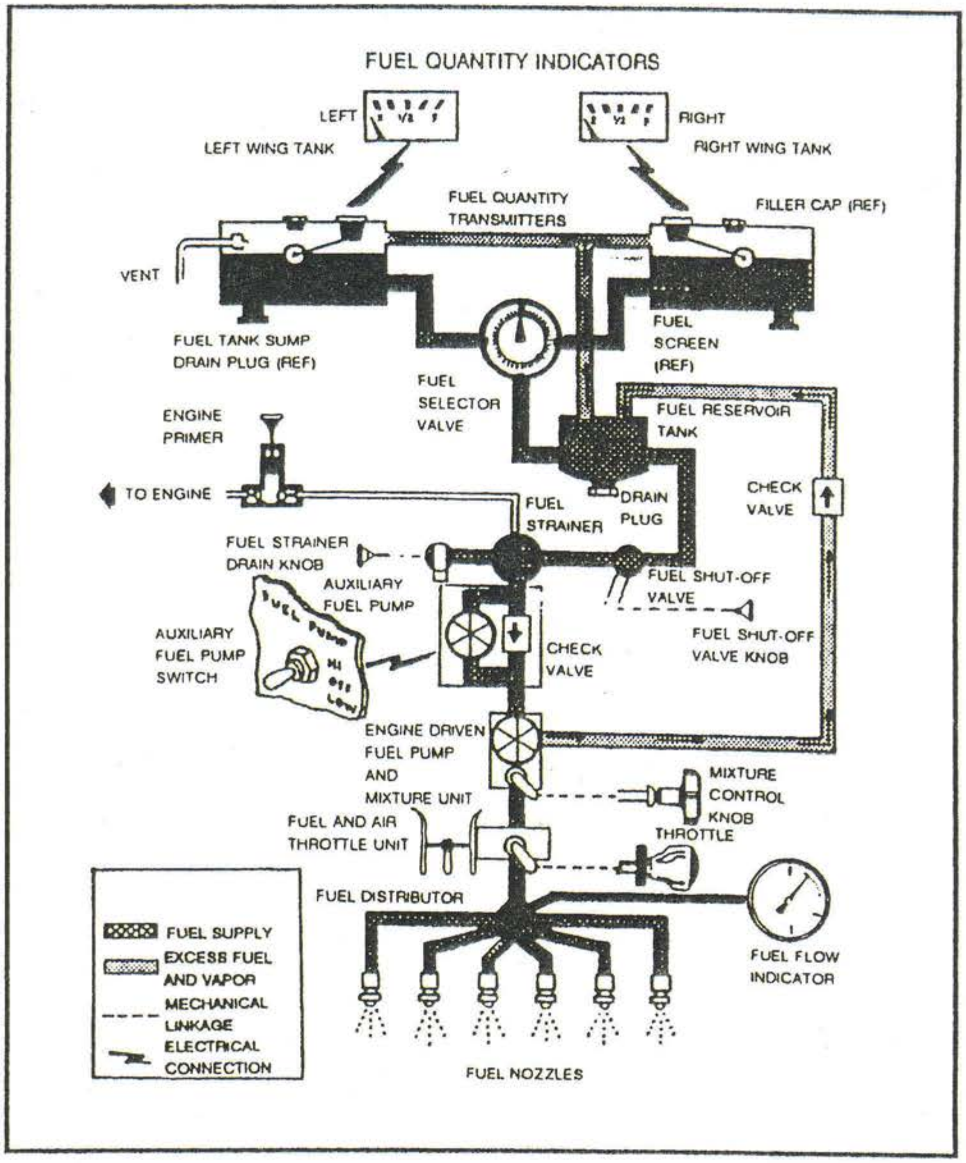


Figure 1-6. Fuel System Schematic

NOTE

- With the fuel selector valve on BOTH, the total usable fuel for all flight conditions is 46 gallons, and in level flight is 51 gallons.
- On 1969 model aircraft, the fuel strainer knob is located in the engine compartment and is accessible through the oil access door.
- On 1968 model aircraft, the fuel strainer knob is located on the instrument panel in the lower left corner.

Engine-Driven Fuel Pump

The engine-driven fuel pump has an aneroid which provides automatic fuel mixture for existing ambient conditions. It provides a more desirable fuel mixture control throughout the operational range, particularly at low and idle power settings.

The mixture unit is also an integral part of the engine-driven fuel pump controlling fuel flow through a mechanical linkage from the mixture control knob.

CAUTION

Should the aneroid in the engine-driven fuel pump fail, it will fail to the FULL LEAN position and use of the auxiliary fuel pump on LOW accompanied by manual leaning may be required .

Auxiliary Fuel Pump

An electric auxiliary fuel pump supplies fuel flow for starting and for engine operation following failure of the engine-driven fuel pump and for vapor purging. The auxiliary fuel pump switch (figure 1-2), located on the left lower switch panel, is a guarded, three-position, center-off switch. The down position, labeled LOW, operates the pump at one of two possible speeds depending on throttle position. With the throttle at a cruise setting and the auxiliary fuel pump switch in the LOW position, sufficient fuel flow is provided for cruise flight operation with a failed engine-driven fuel pump. When the throttle is moved towards the idle position, a microswitch is tripped which causes the auxiliary fuel pump flow rate to reduce, thus preventing an excessively rich mixture during periods of low engine speed. The pump will switch to the alternate flow rate at a throttle setting of approximately 2100 rpm. The up position of the auxiliary fuel pump switch, labeled HIGH, operates the pump at its highest rate. The HIGH position is used for engine priming, for vapor purging during hot weather operations, or for alternate engine operation if the engine-driven pump should malfunction. The switch is spring-loaded to OFF from the HIGH position and must therefore be held in HIGH when used.

NOTE

If the auxiliary fuel pump switch is accidently turned on with the master switch ON, the engine stopped, and the mixture control knob not at FULL LEAN, the cylinder intake ports will flood and fuel will drain overboard.

The auxiliary fuel pump is not used while the engine is running during normal operations. With the auxiliary fuel pump and the engine-driven fuel pump both functioning, an excessively rich fuel-air ratio will result.

Manual Primer

A manual primer, located on the left lower switch panel (figure 1-2), is provided to aid in starting the engine. It sprays fuel into the elbows of the engine induction manifolds for improved starts.

Fuel Quantity Indicator

The two electrically operated fuel quantity indicators are located on the right instrument panel (figure 1-4). The instruments indicate the fuel in the tanks from empty to full graduated in quarters. The indicators receive their inputs from fuel level transmitters in each wing tank any time the master switch is ON.

NOTE

Fuel quantity indicators are accurate only in stabilized straight and level flight.

ELECTRICAL SYSTEM

Electrical energy is supplied by a 14-volt, direct current system powered by a 60-ampere, engine-driven alternator. A 12-volt battery, located aft of

FUEL QUANTITY DATA (U.S. GALLONS)					
TANK	NO.	USABLE FUEL ALL FLIGHT CONDITIONS	ADDITIONAL USABLE FUEL (LEVEL FLIGHT)	UNUSABLE FUEL (LEVEL FLIGHT)	TOTAL FUEL VOLUME EACH
LEFT WING	1	23 gal.	2.5 gal.	0.5 gal.	26.0 gal.
RIGHT WING	1	23 gal.	2.5 gal.	0.5 gal.	26.0 gal.

Figure 1-7. Fuel Quantity Data (U.S. Gallons)

the rear cabin bulkhead, is used to supply electrical power for starting. It also serves as an alternate source of electrical power in case of alternator or regulator failure.

Power is supplied to all electrical circuits through a split bus bar (figure 1-8). The electronic bus contains the strobe lights, VHF radio, VOR receiver, transponder, and the pitot heat circuits. The primary bus contains all other electrical system circuits. With the master switch ON, both sides of the bus are normally powered. However, when either an external power source is connected, or the ignition switch is turned to START, a power contactor automatically deactivates the circuit to the electronic bus. Isolating the electronic circuits prevents transient voltages from damaging the semiconductors in the electronic equipment.

Master Switch

The master switch controls electrical power to the aircraft electrical system. On 1968 model aircraft, the switch is a push-pull type and is located on the left lower switch panel (figure 1-2). On 1969 model aircraft, the master switch is a two-piece split switch which should be used as one switch during normal operations.

NOTE

On 1969 model aircraft, the split master switch may be beneficial during abnormal situations. The left switch serves to disconnect the alternator while the right side disconnects the battery.

Ammeter

All aircraft are equipped with an ammeter that indicates the amount of current flowing either to or from the battery. The ammeter is located between the fuel quantity indicators on the right instrument panel (figure 1-4). Normally, the ammeter will remain within 0 to +2 needle widths if the alternator is operating properly and the battery is in a normal state of charge. Extreme charge or discharge rates for any duration are indications of an electrical system malfunction.

NOTE

A weak battery or a prolonged starting period may cause a high ammeter reading. This is normal; however, do not take off until the ammeter is within the normal range of 0 to +2 needle widths.

External Power Receptacle

A ground service plug receptacle is installed to permit the use of an external power source for cold weather starting. The receptacle is located on the lower left side of the engine compartment, behind an access plate. The master switch should be ON before connecting an external power source.

WARNING

Before starting the engine using an external power source, be sure that all ground personnel are well clear of the propeller danger area.

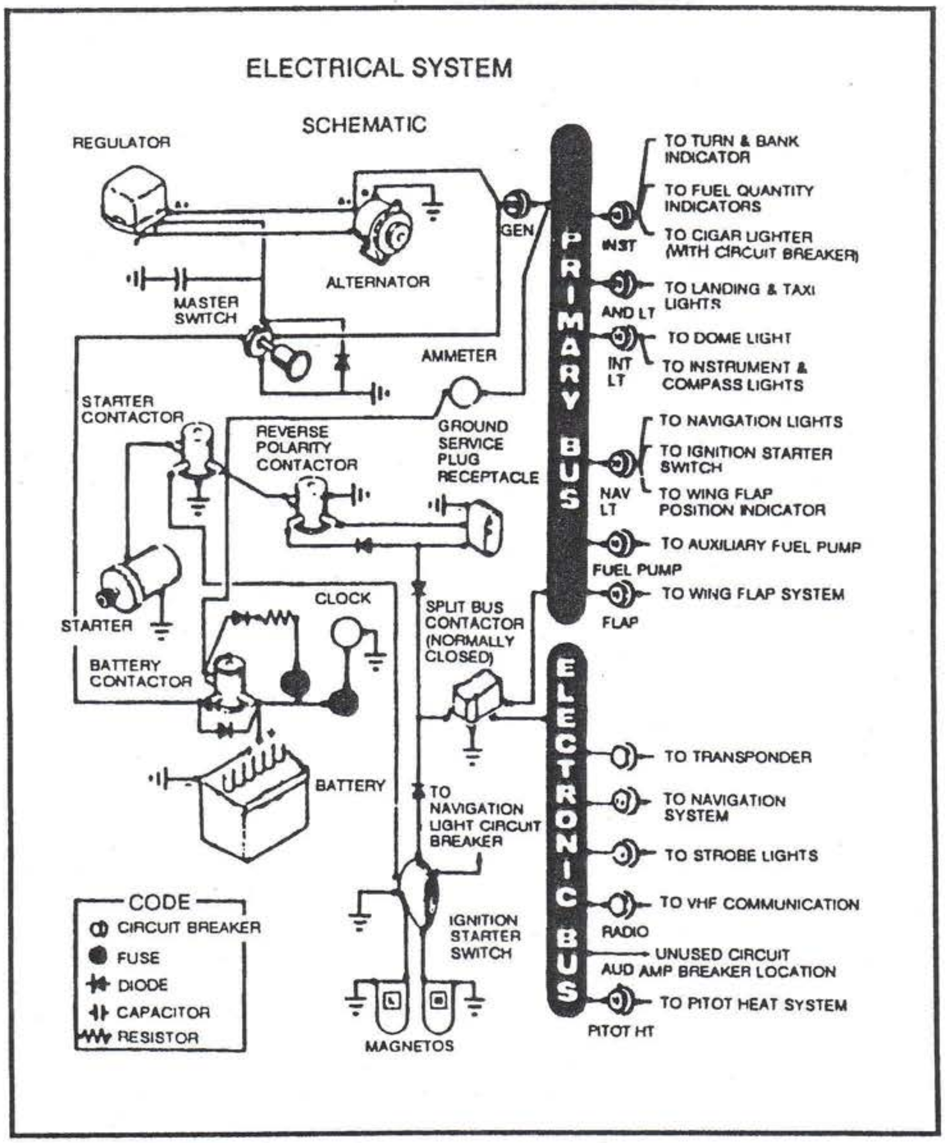


Figure 1-8. Electrical System Schematic

CAUTION

Use of other than a 12-volt power source may damage electrical systems. The ground service plug receptacle circuit incorporates polarity protection. Power from the external source will flow only if the service plug is connected to the aircraft properly.

Circuit Breakers and Fuses

The majority of electrical circuits in the aircraft are protected by "push to reset" circuit breakers located on the left lower switch panel (figure 1-2). Exceptions are the external power circuit and the clock circuit which are protected by fuses located near the battery.

CAUTION

If a circuit breaker pops out, it may be reset once if no other electrical malfunctions exist. If the circuit breaker pops out after being reset, do not attempt to reset it again. Terminate the mission and land as soon as conditions permit.

NOSEWHEEL STEERING SYSTEM

Nosewheel steering is accomplished through use of the rudder pedals. The nosewheel is steerable up to approximately 10 degrees each side of neutral, after which it becomes free wheeling to a maximum deflection of 30 degrees right or left of center when differential braking is used. A shimmy damper is provided to minimize nosewheel shimmy.

BRAKE SYSTEM

The hydraulic disc brakes on the main wheels are individually operated by applying toe pressure to the upper portion of either set of rudder pedals. Depressing the pedals activates the brake cylinders, resulting in a braking action on the main landing gear wheels. A master cylinder attached to each of the left seat (pilot) pedals transmits hydraulic pressure to the respective main wheel brake cylinder, thus applying brakes. The right seat brake pedals are connected by mechanical linkage to the pilot's brake pedals, and pressure applied to the right seat pedals is transmitted mechanically to the master cylinders.

CAUTION

If a sharper turn is desired than can be made with the rudder pedal steering mechanism, use the brakes to establish the rate of turn desired. While making a turn in this manner, keep the inside wheel rolling. Any attempt to pivot the aircraft on a locked inside wheel may damage the wheel, tire or strut. This is particularly dangerous because the damage may not be apparent. To make sure that the inside wheel rolls, release the inside brake intermittently. Apply the brakes smoothly, evenly, and cautiously at all times.

Parking Brake

The parking brake handle is located beneath the left lower switch panel (figure 1-2) and is used to set the brakes. The handle-and-rachet mechanism is connected by a cable to linkage at the master cylinders. Pulling out the handle depresses both master cylinder piston rods and the rachet locks the handle in this position until the handle is turned and released. To set the brakes, pull the parking handle out and turn it to the 6 o'clock position. To release the parking brake, rotate the handle 90 degrees clockwise to the 9 o'clock position and let it return to the original retracted position.

WING FLAP SYSTEM

The wing flaps are electrically operated and are controlled by a three-position switch on the right lower switch panel (figure 1-3). This switch, spring-loaded to the off position, controls an electric motor that raises or lowers the flaps by means of cables and push-pull rods. The motor is protected from shorts and overheat by a circuit breaker located on the circuit breaker panel. The electrically-operated flap position indicator is calibrated in degrees of flap extension from 0 to 40 degrees.

CAUTION

Holding the wing flap switch in the full up or down position for extended periods may cause the flap motor to overheat and the circuit breaker to pop.

FLIGHT CONTROL SYSTEM

The aileron, elevator, and rudder control systems are comprised of push-pull rods, bellcranks, cables, and pulleys. The aileron and elevator systems are connected to the control wheel. The rudder system is connected to the rudder pedals.

Properly adjusted controls, when operated, move in the correct direction, are free of binding, and do not require excessive force for application.

CAUTION

Excessive force or abrupt control inputs may cause control system damage.

Trim System

A trim lab is provided on the trailing edge of the right elevator to reduce control wheel forces and lo allow hands-off flight at normal airspeeds. An elevator trim wheel, mounted in the center pedestal (figure 1-4), provides manual adjustment of the trim tab. The trim wheel and the adjacent pointer are labeled from top lo bottom, NOSE DOWN, TAKEOFF, and NOSE UP. The pointer indicates the elevator trim position. Forward rotation of the wheel provides nose-down trim. Aft rotation provides a nose-up setting. Positioning the pointer abeam the white marker at the TAKEOFF label provides the normal takeoff trim setting.

Control Lock/Gust Locks

When the aircraft is on the ground unattended, a control lock is used to lock the elevator and aileron control systems to prevent damage from wind gusts. The lock is designed to engage a hole in the pilot's control wheel shaft and instrument panel mounted bracket. A flag on the end of the control lock covers the ignition switch to warn against starting the engine with the lock installed. The rudder is protected from minor buffeting by the linkage between the nosewheel and rudder system.

External gust locks are also provided for all flight control surfaces for use when strong winds are expected.

CAUTION

Crew members should be sure the control wheel is properly positioned prior to installing the control lock. On 1969 model aircraft, the control lock should be removed prior to installing the gust lock on the elevator.

STALL WARNING HORN

The stall warning horn is a pneumatic device, automatically activated by differential air pressure. The system includes an opening in the leading edge of the left wing, for sensing pressure, and a reed type horn located in the upper left side of the cabin. As the wing approaches a stall, airflow over the wing creates a low pressure condition in the area of the wing opening. This condition causes air to be drawn from the cockpit through the horn, resulting in an audible warning at airspeeds 5 to 10 mph above the stall in all configurations.

INSTRUMENTS

The following paragraphs cover only those instruments which are not part of a complete system such as the fuel system, engine, etc. The flight instruments consists of an airspeed indicator, vertical velocity indicator, altimeter, turn-and-slip indicator, attitude indicator, heading indicator, magnetic compass, and clock. All flight instruments are located in the left instrument panel directly in front of the pilot (figure 1-4), except the magnetic compass which is located on the top of the dash panel.

Pitot-Static System and Instruments

The pitot-static system supplies air pressure to operate the airspeed indicator. The static portion of the system supplies the operating pressures for the vertical velocity indicator, altimeter, and airspeed indicator. The pitot-static system is composed of an electrically heated pitot tube mounted under the left wing, two external static ports, located on either side of the aircraft fuselage, and the associated plumbing necessary to connect the instruments to their sources.

Pitot Heat

A push-pull pitot heat switch, labeled PITOT HEAT, is located on the left lower switch panel (figure 1-2).

When the switch is placed in the ON position, the pitot tube is electrically heated. Pitot heat is provided for flight in areas of visible moisture.

WARNING

The pitot tube becomes very hot without cooling airflow. To prevent burn injury to ground personnel, the pitot heat switch should be OFF during ground operations.

Airspeed Indicator

The airspeed indicator is operated by pitot and static pressures sensed by the pitot-static system. Airspeed is indicated in miles per hour.

WARNING

Slips may result in airspeed errors. Also, large errors in indicated airspeed will occur near stalling speed.

Vertical Velocity Indicator (VVI)

The vertical velocity indicator depicts aircraft rate of climb or descent up to 2,000 feet per minute. The pointer is actuated by an atmospheric pressure change sensed through the static ports.

WARNING

The pointer does not stop at the 2,000 ft/min rate of deflection. A climb in excess of 2,000 ft/min could be indicated as a descent on the VVI, and vice versa.

Altimeter

The altimeter is a barometric type instrument which operates on static pressure. A barometric pressure set knob on the lower left corner of the indicator provides adjustment of the barometric scale for changes in atmospheric pressure. The short needle indicates thousands of feet while the long needle indicates hundreds of feet.

Turn-and-Slip Indicator

The turn-and-slip indicator is composed of a turn needle and an inclinometer. The principal functions of the turn-and-slip indicator are to provide an alternate source of bank control, and to indicate rudder coordination. The turn needle, driven by an electrical gyro, indicates the rate of heading change and direction of turn. The inclinometer, a ball in a liquid filled glass tube, indicates coordination. Gravity and centrifugal force act on the ball. When the aircraft is in coordinated flight, the ball will be centered.

Vacuum System

Suction to operate the heading indicator and attitude indicator gyros is provided by an engine-driven vacuum pump. The vacuum pump is mounted on the engine accessory case. A suction relief valve is used to control system pressure. The suction gauge, located on the right instrument panel (figure 1-4), is calibrated in inches of mercury and indicates the suction available for operation of the attitude and heading indicators.

NOTE

System leaks or other malfunctions may be indicated by abnormal suction gauge readings and may cause incorrect indication of attitude and heading.

Attitude Indicator

The vacuum-powered attitude indicator gives a gyro stabilized visual indication of aircraft attitude. The indicator is reliable through 60 degrees of climb and dive and 100 degrees of bank. Bank is presented by a bank pointer relative lo a bank scale. This scale is marked with degree indices.

The horizon bar provides sensitive reference near a level flight altitude. A pitch trim knob is included to adjust the miniature aircraft in relation lo the horizon bar. A caging knob facilitates rapid manual erection of the gyro. If it is necessary to uncage the gyro in flight, the aircraft should be straight-and-level. On 1969 model aircraft there are no provisions for caging the attitude indicator.

Heading Indicator

The vacuum-powered heading indicator displays aircraft heading. The indicator is reliable through 55 degrees of dive, climb, and bank. On 1968 aircraft, a caging knob allows caging of the gyro during maneuvers beyond the limits of the gyro. On 1969 model aircraft there are no provisions for caging the heading indicator.

Magnetic Compass

A magnetic compass is centrally mounted on top of the glare shield. The compass is liquid filled, free floating, and reliable only in straight-and-level unaccelerated flight.

NOTE

Use of the landing/taxi light causes erroneous indications in the magnetic compass due to the creation of an electromagnetic field. Do not use the magnetic compass lo reset the heading indicator when the landing/taxi light is on, or when headsets are placed near the magnetic compass.

Clock

The clock is electrically operated and is on at all times. The setting knob is located on the lower left side of the instrument panel.

COMMUNICATIONS/NAVIGATION EQUIPMENT

Interphone System

The interphone system consists of microphone buttons, located on each control wheel, and headsets. On four-seat aircraft, a third interphone headset is provided for use by a rear seat passenger. The system allows unrestricted communication within the aircraft communication beyond the aircraft by integration with the radio equipment, and monitoring of radio and NAVAID signals. The system is powered by the electrical system and is activated by the radio function switch.

NOTE

The only volume control on the interphone system is on the headset. Transmission volume can be adjusted only by varying the distance between the microphone boom and your mouth. Headset volume should be set prior to adjusting radio volume.

Overhead Speaker System

An overhead speaker and hand-held microphone are provided should the headsets system fail. The microphone is stored in the map case on the right instrument panel. A jack to plug in the microphone and a toggle switch to turn on the overhead speaker are located on the right side of the center pedestal. The toggle switch, when placed in the up position, activates the speaker.

NOTE

Feedback through radio and/or interphone may be heard if the headset is used or plugged in when the overhead speaker switch is turned on.

VHF Radio

A Narco Com 120 transistorized radio provides VHF communications capability (figure 1-9). The radio has line-of-sight reception and provides voice transmission and reception on 720 frequencies in the range of 118.000 to 135.975 MHz by 0.025 MHz increments. The large control knobs on either side of the frequency readout window control frequency selection. To activate the radio, turn the function switch clockwise to ON.

NOTE

No warmup time is required for the Com 120 radio due to its 100 percent solid state design.

To test the radio, rotate the function switch clockwise to TST. This position disables the unit's automatic squelching circuitry and allows the characteristic "rush sound" of unsquelched receiver audio to be heard. The "rushing sound" indicates electrical power is present and key elements are operating properly. Volume is controlled by a small knob marked VOLUME. Rotating the knob clockwise will increase the volume and counterclockwise will decrease the volume. The small amber light, located below the frequency readout window, is a transmit-monitor light and illuminates when the transmitter is activated The light varies in brightness to indicate transmitter strength.

VOR Receiver

A Narco Nav 121 transistorized VOR receiver provides VOR navigation capability (figure 1-10). The VOR unit has line-of-sight reception and may be tuned in the frequency range of 108.00 to 117.95 MHz by 0.05 MHz increments. The concentric knobs, in the lower right corner of the instrument, control the frequency selection.

To activate the unit, turn the function knob, located in the upper right corner of the instrument, clockwise until it clicks on.

NOTE

> No warmup period is required for the Nav 121 unit due to its 100 percent solid state design.

To identify a VOR station, pull out the function knob and rotate it clockwise until the audio signal can be heard. To select a VOR course, rotate the knob in the lower left corner of the instrument until the desired course appears beneath the vertical index line, located at the 12 o'clock position on the instrument. The course deviation from the selected course, appearing under the vertical index. A TO/FROM indicator shows whether the selected course, if flown, would take the aircraft to or from the station.

NOTE

> A red flag labeled NAV will appear in place of the TO/FROM if:
>
> - The course selected is perpendicular to the course to the station.
> - Signal reception is too weak.
> - The aircraft flies over the station (during station passage).
> - The Nav 121 unit is turned off.

To test the unit, select a nearby VOR station, rotate the course selection knob until either 0 degrees or 180 degrees is under the vertical index, then push the course selection knob in and hold it for a few seconds. The course deviation indicator needle should center and the TO/FROM indicator should show TO if 0 degrees was selected or FROM if 180 degrees was selected.

Transponder

A Narco AT 150 transistorized transponder provides positive radar identification to ground agencies and is capable of responding to interrogations on any of 4096 codes (figure 1-11). These codes are selected by rotating the four, eight-position code selector knobs.

A five-position, rotary function switch activates and controls unit operation. The five positions are:

OFF. Turns off all power to the transponder.

SBY (Standby). Turns the transponder on for warmup but does not reply to any interrogations. (Warmup requires 20 seconds.)

ON. The transponder will respond to any interrogation.

ALT (Altitude). Operates the same as the ON mode. Altitude reporting Mode is operational.

TST (Test). Causes an internal test signal to be generated which illuminates the reply lamp. This position is spring-loaded to ALT.

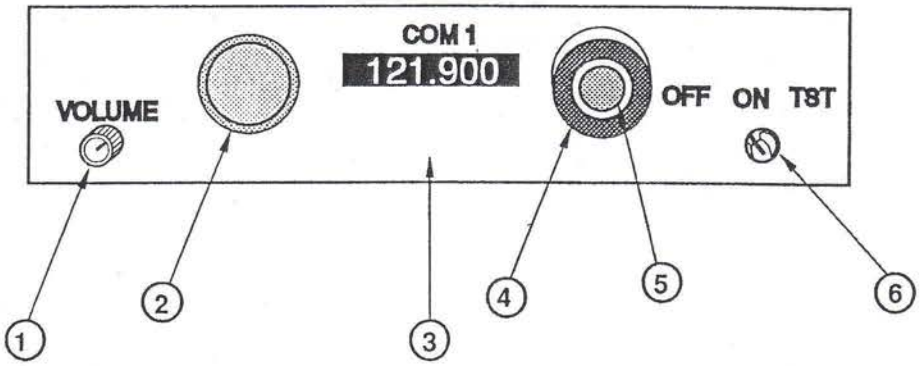
The IDENT push-button is used to reply to an agency when asked lo "Squawk IDENT." Momentarily depressing the button will activate a special signal for approximately 20 seconds and will illuminate the reply lamp, located within the IDENT push-button, for the duration of the special signal. During normal operation, the reply lamp will blink whenever the transponder is being interrogated. Rotate the button to control reply lamp brightness.

LIGHTING

All exterior and interior lighting is controlled from within the cabin. Exterior lighting equipment consists of navigation lights, landing and taxi lights, and strobe lights. The switches for these lights are located on the left lower switch panel beneath the control wheel (figure 1-2), and are of the pull-on, push-off type. Interior lighting is composed of instrument and radio control panel lights and a cabin dome light. The switches for the interior lights are located on the ceiling console.

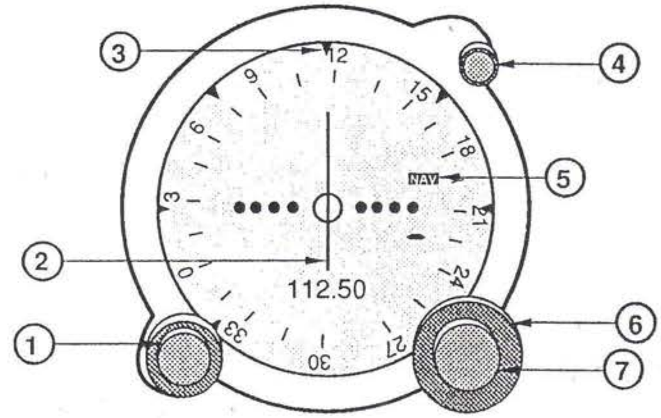
Navigation Lights

Conventional red (left), and green (right), navigation lights are mounted on the wingtips. A white



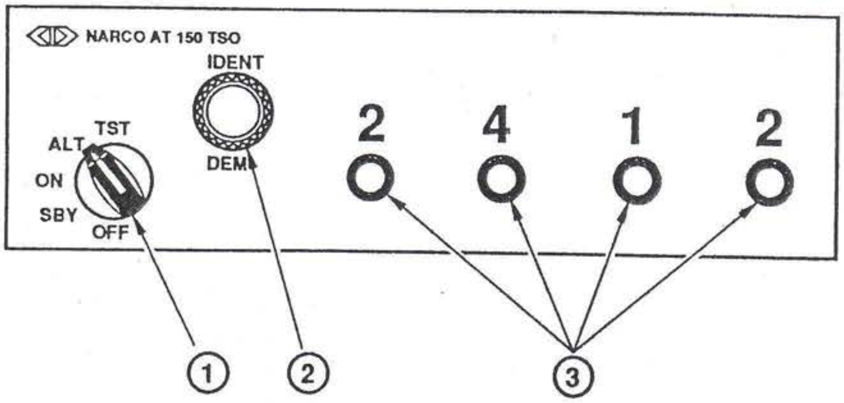
1. Volume Control
2. Frequency Selector (Whole MHz)
3. Transmit Indicator
4. Frequency Selector (.X MHz)
5. Frequency Selector (.OXX MHz)
6. Function Switch

Figure 1-9. VHF Radio



1. Course Selector/Test Knob
2. Course Deviation Indicator
3. Vertical Index Line
4. Function Switch
5. TO/FROM Indicator
6. Frequency Selector (Whole MHz)
7. Frequency Selector (.XX MHz)

Figure 1-10. VOR Receiver



1. Function Switch
2. IDENT Push-Button/Reply Lamp
3. Code Selectors

Figure 1-11. Transponder

navigation light is mounted on the upper aft portion of the vertical stabilizer.

Landing and Taxi Lights

Landing and taxi lights are located in the leading edge of the left wing. The taxi light is focused to provide illumination of the area forward of the aircraft during ground operation and taxiing. The landing light is focused to provide illumination forward and downward during takeoff and landing. Pulling the landing/taxi light switch out one click turns on the taxi light, while pulling it out all the way illuminates both the landing and the taxi lights. Both lights are high intensity and require cooling airflow for continuous operation.

CAUTION

Excessive use of the landing/taxi lights, while on the ground may damage the protective lenses.

Strobe Lights

A strobe light is located in each wingtip next to the position light and on the top of the vertical stabilizer.

WARNING

The strobe lights produce intense light and heat. Do not look directly into operating lights, or touch bulbs during or immediately after operation.

Interior Lighting

Interior instrument and radio lighting is controlled by a rheostat located above the seats on the cabin ceiling. The rheostat on the right side controls instrument lights; the rheostat on the left side controls radio lighting. The cabin dome light is located behind the rheostat unit and is controlled by an on-off switch located adjacent lo the light.

CABIN HEATING AND VENTILATION SYSTEM

Cabin heat, defrosting, and ventilation are provided by manifold heaters, ducting, and valves which allow the entry of heated or unheated air to the cabin. The cabin heat knob, located on the right lower switch panel (figure 1-3), controls the amount of heat supplied to the cabin. The full out position provides maximum heating and defrosting. The cabin air knob (figure 1-3), controls the amount of fresh air entering the cabin from the air scoop door on the forward right side of the fuselage. The full out position provides maximum fresh air. Separate adjustable ventilators near each upper corner of the windshield supply additional fresh air.

WARNING

The exhaust system is subject to cracking and deterioration. If the cabin heat is used and the exhaust heat exchanger is defective, carbon monoxide will enter the cabin. Do not use cabin heating without cabin air or ventilators open to supply a source of fresh air.

Carbon Monoxide Detector

A small carbon monoxide detector is located on the center pedestal (figure 1-4). On the lower center of the detector is an indicator that is sensitive to carbon monoxide. If carbon monoxide is introduced into the cabin, the indicator will darken.

WARNING

Should the indicator on the carbon monoxide detector become dark, proceed with the Smoke and Fume Elimination procedure in your checklist.

CABIN DOORS

Cabin doors are located on each side of the cabin. They incorporate an exterior door handle, interior three-position door handle (open, closed, locked), and a door stop mechanism. The left door has a movable window. The right door has a fixed window.

Cabin Door Movable Window

The movable window in the left cabin door is hinged at the top. The window is secured by a latch handle located on the bottom edge. When locking the window, the button should pop out as the latch handle is rotated to the closed position.

CAUTION

Unlocking the window without depressing the button will cause internal damage to the latch.

SEAT OPERATION

The seats are fore and aft adjustable, with manually operated reclining seat backs. The fore and aft adjustment levers are located under the left front of each seat. On 1968 model aircraft, the manual releases for the seat backs are located on the right rear corner of each seat. On 1969 model aircraft, the release for the seat back is located under the right front of each seat. Rollers permit the seats to slide fore and aft on seat rails. Pins which engage various holes in the seat rails lock the seats in the selected positions. A seat stop limits travel of the left seat.

SEAT BELTS AND SHOULDER HARNESSES

Seat belts and shoulder harnesses are provided for both front seats. The rear seat, on four-seat models, is equipped with seat belts only. The shoulder harnesses are attached to cables which are routed to inertia reels located on the cabin side walls just aft of the rear door posts near floor level. A two-position control lever is mounted on the left side of each seat to control the operation of the inertia reels. The aft position is labeled AUTOMATIC. When the control lever is placed in the AUTOMATIC position, the shoulder harnesses will permit free movement fore and aft, as long as a sudden forward movement is not attempted. Sudden forward movement will lock the inertia reel and permit only aft movement. To unlock the reel, the control lever must be cycled to MANUAL, then back to AUTOMATIC. Placing the control lever in the forward position, labeled MANUAL, will lock the shoulder harness at the existing position. With the control lever in the MANUAL position, the inertia reel will allow aft movement only.

NOTE

Seat adjustment may be difficult if the seat belts and shoulder harness are tightened prior to adjusting the seat. .

SECTION II

NORMAL PROCEDURES

Table of Contents

INTRODUCTION

Visual inspection of the aircraft is a very important part of each mission. Start your preflight inspection as you approach the aircraft. Look at the overall aircraft condition, chocks, tiedowns, and any unusual wet spots under the aircraft which may indicate leaks. Look at the proposed taxiing routes for any possible obstruction such as ground repair work, fire extinguishers on the ramp, or other equipment that could cause a taxi accident.

The checklist outlines procedures but never takes the place of good judgment. Checklist items preceded by an asterisk (*) are challenge response items.

INTERIOR INSPECTION

1. AFTO Form 781 - CHECK

   The AFTO Form 781 is the official log of aircraft operation, refueling, and maintenance. Do not accept an aircraft unless the Form 781 properly indicates the aircraft status and that the aircraft has been cleared for flight.

2. Required Publications- ON BOARD.
3. Parking Brake - SET.
4. Control Lock - REMOVE.

CAUTION

Allowing the control wheel to slam forward when removing the control lock could cause damage to the controls and/or instrument panel.

5. Master Switch - OFF.
6. Ignition Switch - OFF.

   A worn switch may appear to be off when it is not. Physically ensure the switch is in the off detent.

7. Auxiliary Fuel Pump Switch - GUARDED.
8. Primer- LOCKED.
9. Fuel Shutoff Knob - IN.