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SECTION 7

DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

7.1 THE AIRPLANE

The Cadet, designed and equipped for pilot training, is a single-engine, fixed gear monoplane of all metal construction, with low semi-tapered wings. The standard airplane has two place seating, with an optional bench seat available to provide four place seating. The baggage capacity is fifty pounds with either seating configuration.

7.3 AIRFRAME

The primary structure, with the exception of the steel tube engine mount, steel landing gear struts and isolated areas, is of aluminum alloy construction. Lightweight plastics are used extensively in the extremities - the wing tips, the engine cowling, etc - and in nonstructural components throughout the airplane.

The fuselage is a conventional semi-monocoque structure. On the right side of the airplane is a cabin door for entrance and exit. Access to the baggage area is gained through the cabin entrance.

The wing is of a conventional, semi-tapered design incorporating a laminar flow, NACA 652415, airfoil section. The cantilever wings are attached to each side of the fuselage by insertion of the butt ends of the main spars into a spar box carry-through which is an integral part of the fuselage structure. The spar box carry-through structure, located beneath the floor behind the pilots' seats, provides in effect a continuous main spar. The wings are also attached fore and aft of the main spar by an auxiliary front spar and a rear spar. The rear spar, in addition to taking torque and drag loads, provides a mount for flaps and ailerons. The four-position wing flaps are mechanically controlled by a handle located between the front seats. When fully retracted, the right flap locks into place to provide a step for cabin entry. Each wing contains one fuel tank.

The empennage consists of a vertical stabilizer, a rudder, and an all-moveable horizontal stabilator. The stabilator incorporates an anti-servo tab which improves longitudinal stability and provides longitudinal trim. The tab moves in the same direction as the stabilator, but with increased travel.

7.5 ENGINE AND PROPELLER

The PA-28-161 is powered by a four cylinder, direct drive, horizontally opposed engine rated at 160 hp at 2700 rpm. It is equipped with a starter, a 60 amp 14 volt alternator, a shielded ignition, two magnetos, vacuum pump drive, a fuel pump, and a wetted polyurethane foam induction air filter.

The engine compartment is accessible for inspection through top-hinged side panels on either side of the engine cowlings. The engine cowlings are cantilever structures attached at the firewall. The engine mounts are constructed of steel tubing, and dynafocal mounts are provided to reduce vibration.

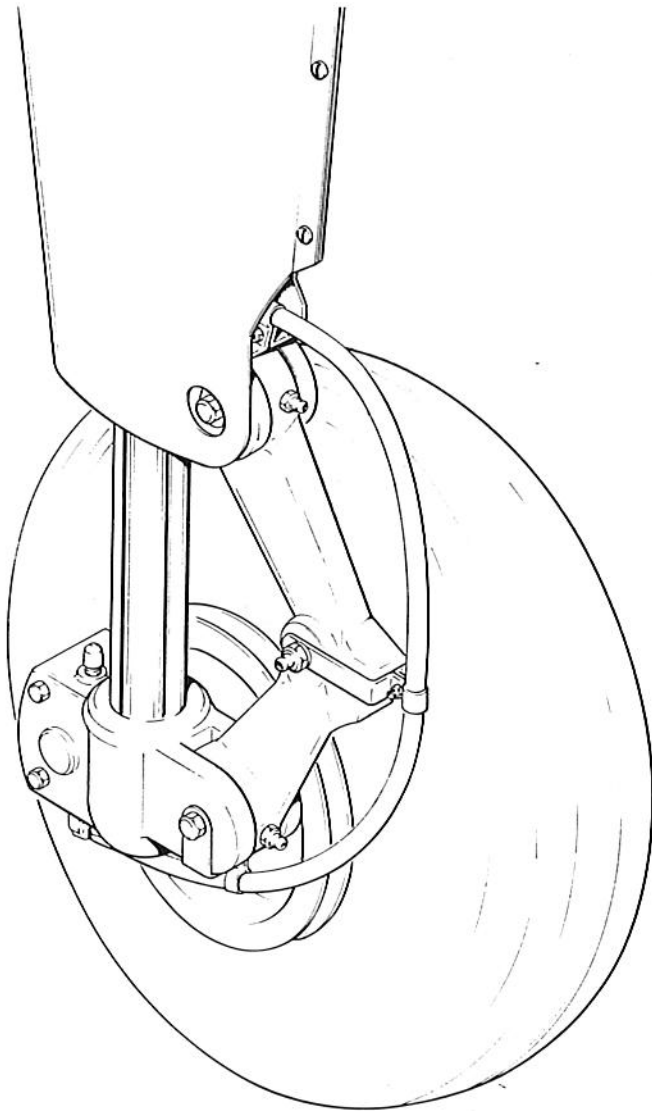
The exhaust system is constructed of stainless steel and incorporates dual mufflers with heater shrouds to supply heated air for the cabin, the defroster system and the carburetor deicing system.

An oil cooler is located on the left rear of the engine mounted to the engine baffling. Engine cooling air, which is picked up in the nose section of the engine cowling and carried through the baffling, is utilized on the left side for the oil cooler. A winterization plate is provided to restrict air during winter operation (refer to Section 8).

Engine air enters on either side of the propeller through openings in a nose cowling and is carried through the engine baffling around the engine and oil cooler. Air for the muffler shroud is also picked up from the nose cowling and carried through a duct to the shroud. Carburetor induction air enters a chin scoop on the lower right cowling and is passed through a wetted polyurethane filter to the carburetor air box. Heated air enters the carburetor air box through a hose connected to the heater shroud.

A fixed pitch propeller is installed as standard equipment. The propeller has a 74-inch diameter with a 58 or 60-inch pitch. The pitch is determined at 75% of the diameter. The propeller is made of an aluminum alloy.

The pilot should read and follow the procedures recommended in the Lycoming Operator's Manual for this engine in order to obtain maximum engine efficiency and time between engine overhauls.



MAIN WHEEL ASSEMBLY
Figure 7-1

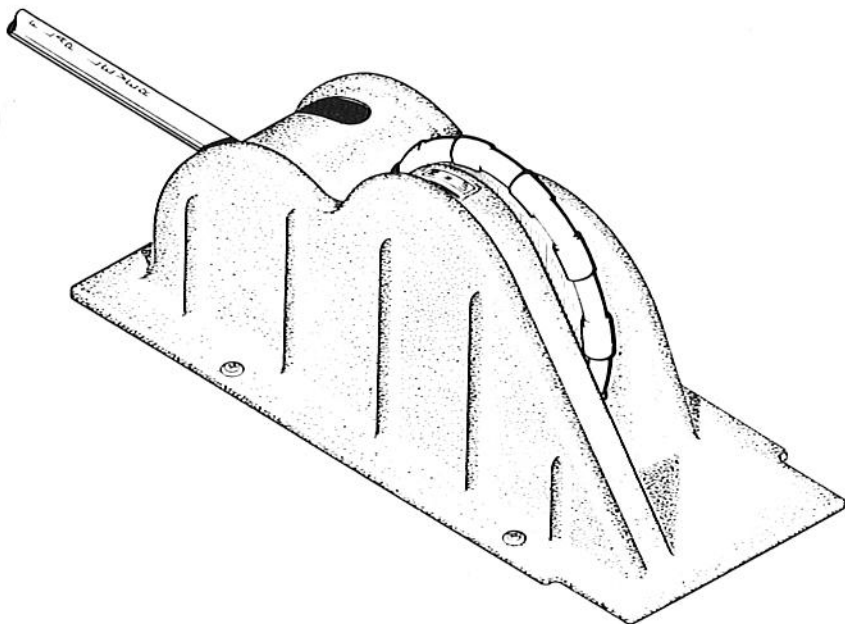
7.7 LANDING GEAR

The fixed-gear PA-28-161 is equipped with a 5.00 x 5 wheel on the nose gear and a 6.00 x 6 wheel on each main gear (Figure 7-1). Single disc hydraulic brake assemblies are provided on the main gear. The nose gear has a 5.00 x 5 four-ply tire, while the main wheel assemblies have 6.00 x 6 four-ply tires. At gross weight, the main gear tires require a pressure of 24 psi, and the nose gear tire requires a pressure of 30 psi.

A spring device is incorporated in the rudder pedal torque tube assembly to provide rudder trim. By using the rudder pedals and the brakes, the nose gear is steerable through a 20 degree arc each side of center. A shimmy dampener is also included in the nose gear.

The three struts are of the air-oil type with the normal static load extension being 3.25 inches for the nose gear and 4.50 inches for the main gear.

The brakes are actuated by toe brake pedals which are attached to the rudder pedals or by a hand lever and master cylinder located below and behind the center of the instrument sub panel. Hydraulic cylinders are located above each pedal and adjacent to the hand brake lever. The brake fluid reservoir is installed on the top left front face of the fire wall. The parking brake is incorporated in the master cylinder and is actuated by pulling back on the brake lever and depressing the knob attached to the left side of the handle. To release the parking brake, pull back on the brake lever to disengage the catch mechanism and allow the handle to swing forward (refer to Figure 7-5).



FLIGHT CONTROL CONSOLE

Figure 7-3

7.9 FLIGHT CONTROLS

Dual flight controls are provided as standard equipment. The flight controls actuate the control surfaces through a cable system.

The horizontal surface (stabilator) is of the flying tail design with a trim tab mounted on the trailing edge. This tab serves the dual function of providing trim control and pitch control forces. The trim tab is actuated by a trim control wheel located on the control console between the front seats (Figure 7-3). Forward rotation of the wheel gives nose down trim and aft rotation gives nose up trim.

The rudder is conventional in design and incorporates a rudder trim. The trim mechanism is a spring loaded recentering device. The trim control is located on the right side of the pedestal below the throttle quadrant (refer to Figure 7-5). Turning the trim control clockwise gives nose right trim and counterclockwise rotation gives nose left trim.

Manually controlled flaps are provided on the PA-28-161. The flaps are balanced and spring loaded to return to the retracted (up) position. A control handle, which is located between the two front seats on the control console (Figure 7-3), extends the flaps by the use of a control cable. To extend the flaps, the handle is pulled up to the desired flap setting of 10, 25 or 40 degrees. To retract, depress the button on the end of the handle and lower the control. When extending or retracting flaps, there is a pitch change in the airplane. This pitch change can be corrected either by stabilator trim or increased control wheel force. When the flaps are in the retracted (up) position the right flap, provided with an over-center lock mechanism, acts as a step.

NOTE

The right flap will support a load only in the fully retracted (up) position. When the flap is to be used as a step, make sure the flaps are in the retracted (up) position.

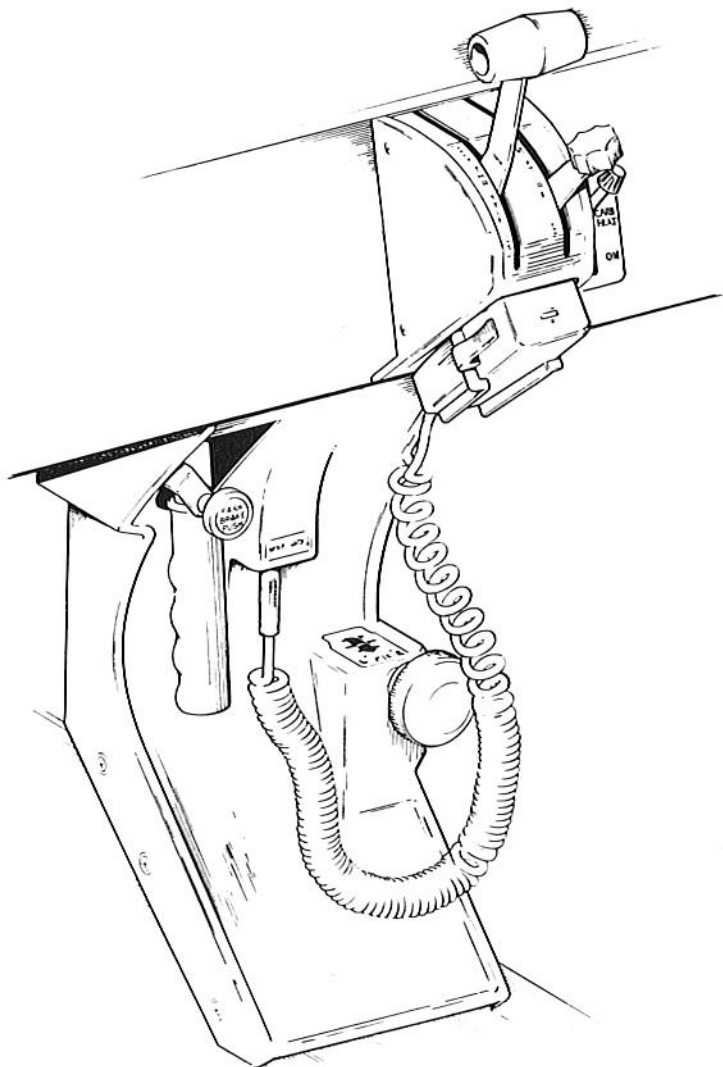
7.11 ENGINE CONTROLS

Engine controls consist of a throttle control and a mixture control lever. These controls are located on the control quadrant on the lower center of the instrument panel (Figure 7-5) where they are accessible to both the pilot and the copilot. The controls utilize teflon-lined control cables to reduce friction and binding.

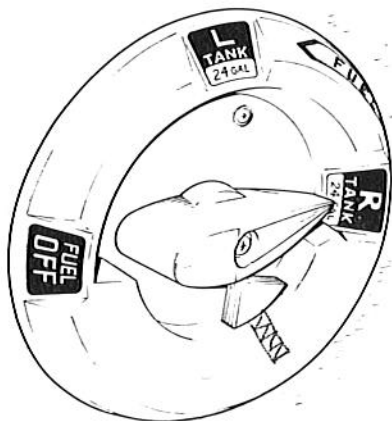
The throttle lever is used to adjust engine rpm. The mixture control lever is used to adjust the air to fuel ratio. The engine is shut down by the placing of the mixture lever in the full lean position. For information on the leaning procedure, see the Avco-Lycoming Operator's Manual.

The friction adjustment lever on the right side of the control quadrant may be adjusted to increase or decrease the friction holding the throttle and mixture controls or to lock the controls in a selected position.

The carburetor heat control lever is located to the right of the control quadrant on the instrument panel. The control is placarded with two positions: ON (down), OFF (up).



CONTROL QUADRANT AND CONSOLE
Figure 7-5



FUEL SELECTOR
Figure 7-7

7.13 FUEL SYSTEM

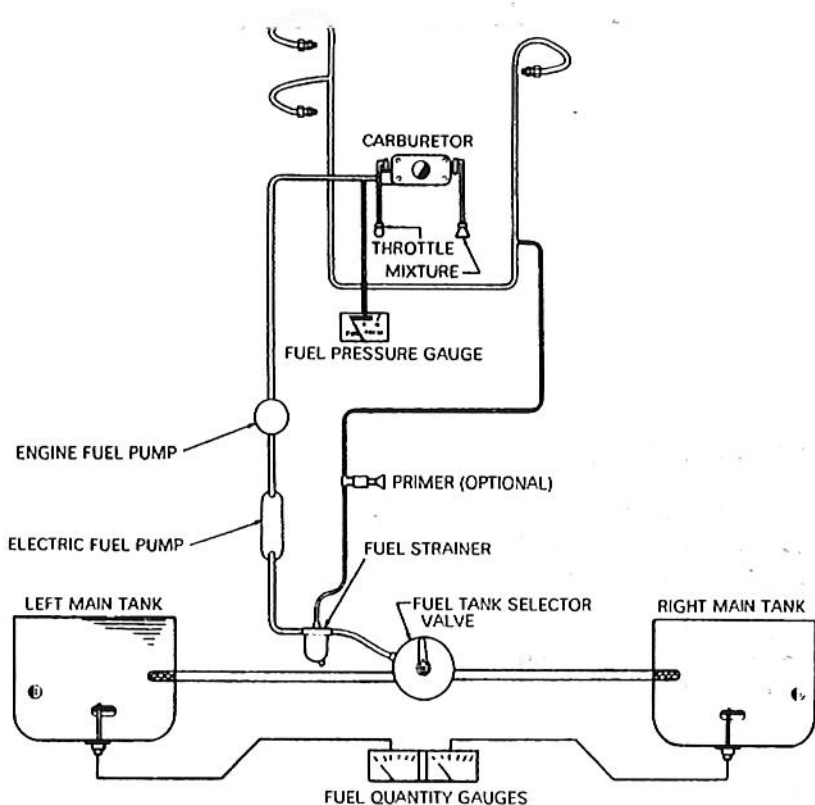
The Cadet has a total fuel capacity of 50 U.S. gallons stored in two 25 gallon wing tanks. Only 24 gallons of fuel are usable from each tank, which provides a total usable fuel capacity of 48 gallons. Each tank is equipped with a filler neck indicator tab to aid in determining fuel remaining when the tanks are not full. Usable capacity to the bottom of the indicator tab is 17 gallons. The tanks are secured to the leading edge of each wing with screws and nut plates. This allows removal for service or inspection.

The fuel tank selector control (Figure 7-7) is located on the left side panel forward of the pilot's seat. The button on the selector cover must be depressed and held while the handle is moved to the OFF position. The button releases automatically when the handle is moved back to the ON position.

An auxiliary electric fuel pump is provided in case of the failure of the engine-driven pump. The electric pump should be ON for all takeoffs and landings and when switching tanks. The fuel pump switch is located in the switch panel in the center of the instrument panel above the throttle quadrant.

Tabelle ungütig !

☞ Siehe Thielert AFM



FUEL SYSTEM SCHEMATIC

Figure 7-9

The fuel drains should be opened daily prior to first flight to check for water or sediment and proper fuel. Each tank has an individual drain at the bottom, inboard rear corner. A fuel strainer, located on the lower left front of the fire wall, has a drain which is accessible from outside the nose section. The strainer should also be drained before the first flight of the day. Refer to Section 8 for the complete fuel draining procedure.

Optional locking fuel caps are available for all fillers. A single key will fit the fuel caps, cabin door, and ignition lock.

Fuel quantity and fuel pressure gauges are mounted in a gauge cluster located on the left side of the instrument panel to the right of the control wheel (refer to Figure 7-15).

An optional engine priming system is available to facilitate starting. The primer pump is located to the immediate left of the throttle quadrant (refer to Figure 7-5).

7.15 ELECTRICAL SYSTEM

The electrical system includes a 14-volt, 60-amp alternator, a 12-volt battery, a voltage regulator, and a master switch relay (Figure 7-11). The battery is in a box mounted on the forward right face of the firewall. The voltage regulator is located on the forward left side of the fuselage behind the instrument panel.

Electrical switches are located on the right center instrument panel (refer to Figure 7-15), and the circuit breakers are located on the lower right instrument panel (refer to Figure 7-13). Two rheostat switches on the pilot's lower left instrument panel adjacent to the engine instruments control the switch, radio, and panel lights.

Standard electrical accessories include a starter, electric fuel pump, stall warning indicator, fuel gauge, ammeter, and annunciator panel.

The annunciator panel (Figure 7-15) contains alternator (ALT), low oil pressure (OIL), and low vacuum (VAC) warning lights. The annunciators are provided only to alert the pilot that a system may not be operating properly. If an annunciator light illuminates, the pilot should monitor the applicable system gauge to determine when, or if, any corrective action is necessary.

NOTE

When operating with light electrical load and a fully charged battery, the Alternator Inop. light may illuminate due to minimal alternator output. If the alternator is functional a slight increase in electrical load should extinguish the Inop. indication.

Electrical lighting accessories include navigation lights, landing light, instrument lighting, and cabin dome light. A light mounted in the cabin overhead panel just forward of the dome light, and controlled by an adjacent rheostat switch, provides additional instrument and cockpit lighting for night flying. The lens of this light has a map light window, which is opened or closed by a slide type switch just forward of the window. Circuits will also handle the addition of communications and navigational equipment.

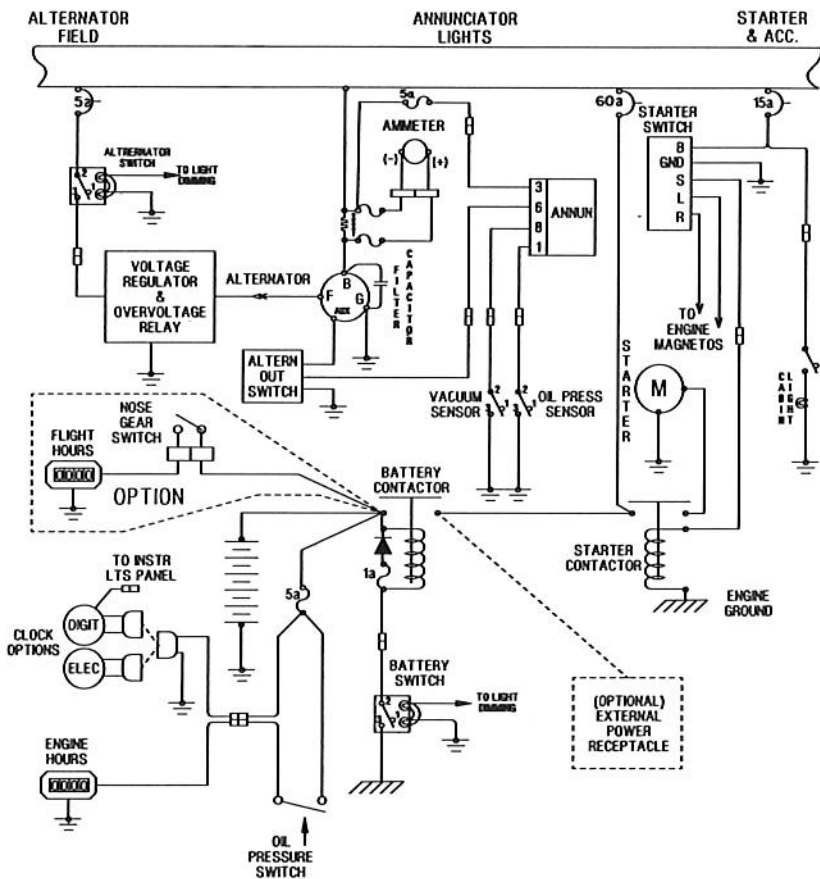
Optional electrical accessories include anti-collision lights, wing tip recognition/taxi lights, and an external power receptacle and power cable.

WARNING

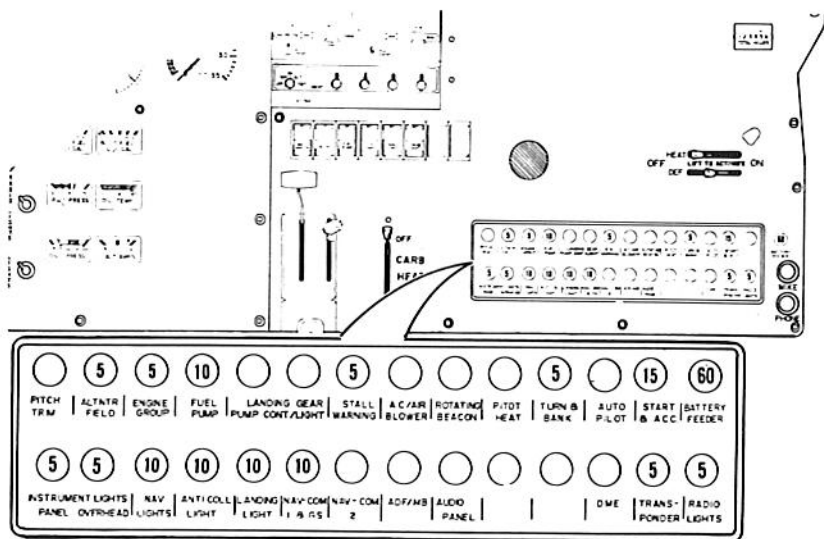
Anti-collision lights should not be operating when flying through cloud, fog or haze, since the reflected light can produce spatial disorientation. Strobe lights should not be used in close proximity to the ground such as during taxiing, takeoff or landing.

As installed, the ammeter does not show battery discharge; rather, it indicates the electrical load on the alternator in amperes. With all the electrical equipment off and the battery master and alternator switches on, the ammeter will indicate the charging rate of the battery. As each electrical unit is switched on, the ammeter will indicate the total ampere draw of all the units including the battery. For example, the average continuous load for night flight with radios on is about 30 amperes. This 30 ampere value plus approximately 2 amperes for a fully charged battery will appear continuously under these flight conditions. The amount of current shown on the ammeter will tell immediately if the alternator system is operating normally, as the amount of current shown should equal the total amperage drawn by the electrical equipment which is operating.

For abnormal and/or emergency operation and procedures, see Section 3.



ALTERNATOR AND STARTER SCHEMATIC
Figure 7-11



CIRCUIT BREAKER PANEL

Figure 7-13

7.17 VACUUM SYSTEM

The vacuum system is designed to operate the air-driven gyro instruments. This includes the directional and attitude gyros when installed. The system consists of an engine driven vacuum pump, a vacuum regulator, a filter and the necessary plumbing.

The vacuum pump is a dry-type pump. A shear drive protects the pump from damage. If the drive shears, the gyros will become inoperative.

A vacuum gauge, mounted on the far right instrument panel, provides a pilot check for the system during operation. Should system vacuum pressure decrease below that required for proper operation of the gyro instruments, the VAC light on the annunciator panel will illuminate. A pressure decrease in a system that remained constant over an extended period may indicate a dirty filter, dirty screens, a sticky vacuum regulator, or a leak in the system. Zero pressure would indicate a sheared pump drive, a defective pump, a defective gauge, or a collapsed line. In the event of any gauge variation from the normal, or illumination of the VAC annunciator light, have a mechanic check the system to prevent possible damage to system components or eventual system failure.

The vacuum regulator, located behind the instrument panel, is installed in the system to protect the gyros. The regulator is adjusted so that the vacuum gauge will normally indicate 4.8 to 5.1 inches of mercury, which is sufficient to operate all the gyros at their rated rpm. A higher setting will damage the gyros; at a lower setting the gyros would be unreliable. A low vacuum pressure reading will be observed at very high altitudes (above 12,000 ft), and at low engine rpm (usually during approach or training maneuvers). This is normal and should not be construed as a system malfunction or improperly adjusted regulator.

A standby electric driven vacuum pump is installed in Cadets equipped for IFR flight. Should the primary engine driven pump fail, the standby pump can be switched ON to maintain normal vacuum service to the gyros. (See Section 9, Supplement 4.)

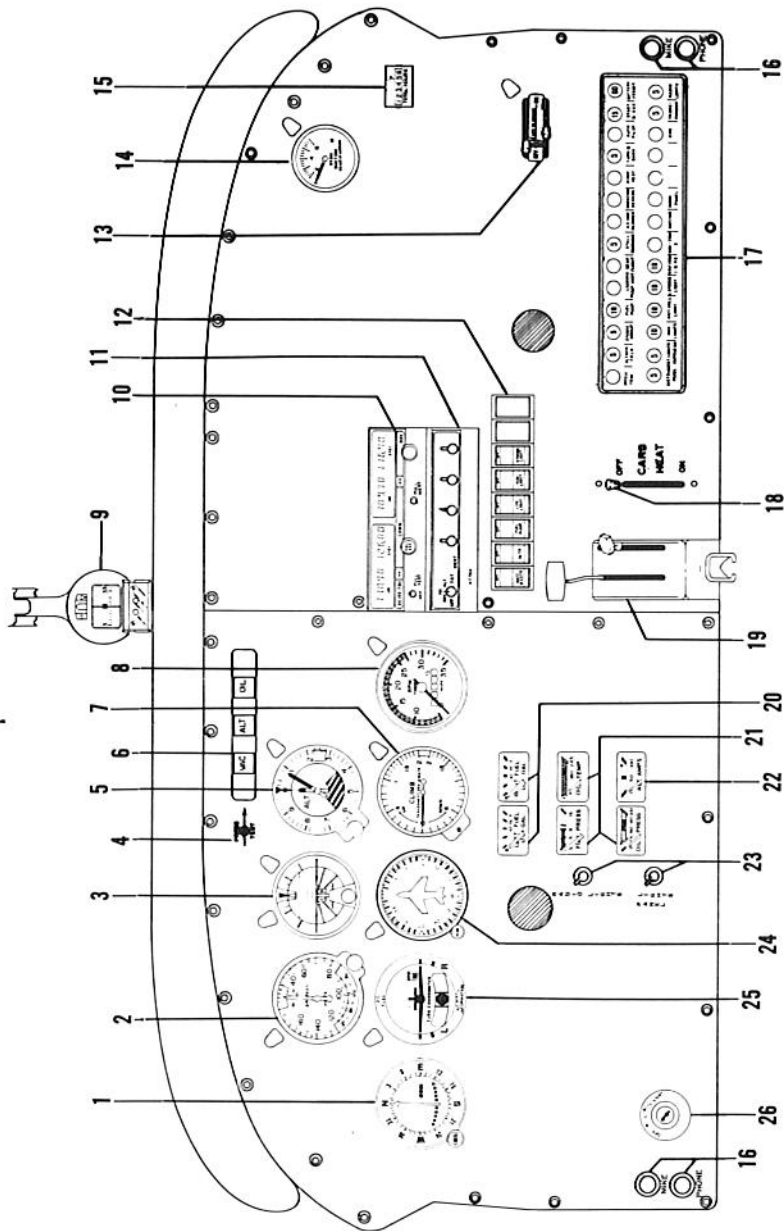
7.19 INSTRUMENT PANEL

The instrument panel (Figure 7-15) is designed to accommodate instruments and avionics equipment for VFR and IFR flights.

The radios and the circuit breakers are located on the center and lower right panel, respectively, and have circuits provided for the addition of optional radio equipment. When installed, the optional radio master switch is located on the switch panel in the center of the instrument panel above the throttle quadrant. It controls the power to all radios through the airplane master switch. An engine cluster is located to the right of the pilot control wheel and includes a fuel pressure gauge, a right and left main fuel quantity gauge, an oil temperature gauge, an oil pressure gauge, and an ammeter.

In addition to the engine cluster, standard instruments include a compass, an airspeed indicator, a tachometer, an altimeter, an ammeter, and an annunciator panel. The compass is mounted on the windshield bow in clear view of the pilot. The annunciator panel is mounted in the upper instrument panel to warn the pilot of a possible malfunction in the alternator, oil pressure, or vacuum systems.

Also included as standard instruments on the Cadet are a suction gauge, vertical speed indicator, attitude gyro, directional gyro, and a turn and slip indicator or turn coordinator. The attitude gyro and directional gyro are vacuum operated through the use of a vacuum pump installed on the engine, while the turn and slip indicator is electrically operated. The vacuum suction gauge is on the far right of the instrument panel.



TYPICAL INSTRUMENT PANEL

Figure 7-15

- | | |
|---------------------------------------------------|--------------------------------|
| 1. VOR/LOC NAVIGATION INDICATOR | 14. GYRO SUCTION GAUGE |
| 2. AIRSPEED INDICATOR | 15. HOUR METER |
| 3. ATTITUDE GYRO | 16. MIKE AND PHONE JACKS |
| 4. ANNUNCIATOR TEST SWITCH | 17. CIRCUIT BREAKER PANEL |
| 5. ALTIMETER | 18. CARBURETOR HEAT CONTROL |
| 6. ANNUNCIATOR LIGHTS | 19. ENGINE CONTROLS QUADRANT |
| 7. VERTICAL SPEED INDICATOR | 20. LEFT AND RIGHT FUEL GAUGES |
| 8. TACHOMETER | 21. ENGINE INSTRUMENTS |
| 9. MAGNETIC COMPASS | 22. AMMETER |
| 10. NAV/COMM TRANSCIVER | 23. INSTRUMENT/RADIO SWITCH |
| 11. TRANSPONDER | LIGHT CONTROLS |
| 12. SWITCH PANEL | 24. DIRECTIONAL GYRO |
| 13. CABIN HEAT AND
WINDSHIELD DEFROST CONTROLS | 25. TURN INDICATOR |
| | 26. MAGNETO SWITCH |

TYPICAL INSTRUMENT PANEL

Figure 7-15 (cont)

7.21 PITOT/STATIC SYSTEM

The system supplies both pitot and static pressure for the airspeed indicator, altimeter, and vertical speed indicator (Figure 7-17).

Pitot and static pressure are picked up by the pitot/static masthead installed on the bottom of the left wing, and carried through pitot and static pressure lines within the wing and fuselage to the gauges on the instrument panel.

An alternate static pressure source control valve is installed below the left side of the instrument panel on Cadets equipped for IFR flight. When the valve is set in the alternate position, the altimeter, vertical speed indicator and airspeed indicator will be using cabin air for static pressure. The storm window and cabin vents must be closed and the cabin heater and defroster must be on during alternate static source operation. The altimeter error is less than 50 feet unless otherwise placarded.

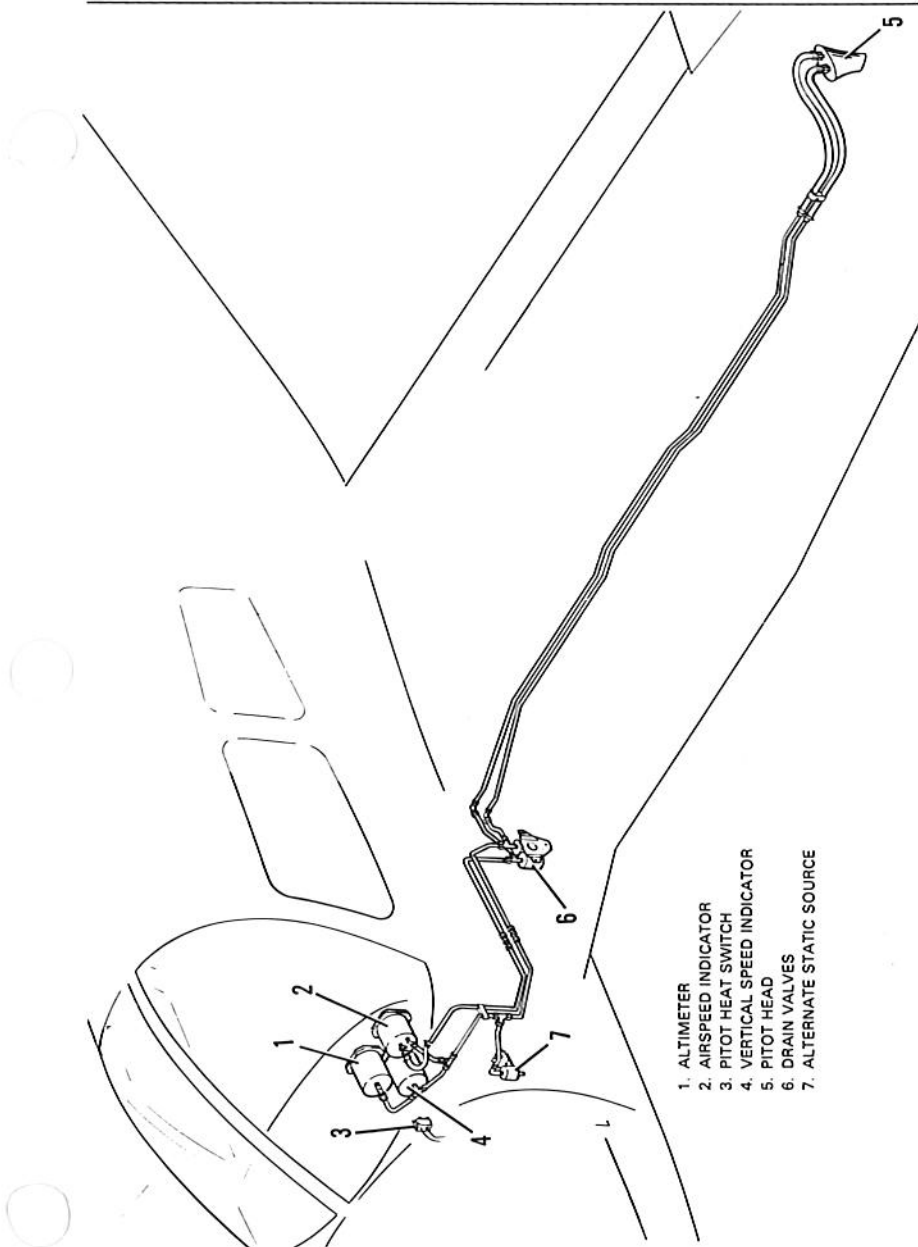
Moisture can be drained from both the pitot and static lines through separate drain valves located in a recess on the left lower side of the fuselage interior.

A heated pitot head, which alleviates problems with icing and heavy rain, is available as optional equipment. The switch for the heated pitot head is located on the switch panel in the center of the instrument panel above the throttle quadrant..

While the airplane is parked, a cover should be placed over the masthead to prevent insects and water from entering the pitot/static orifices. Partially or completely blocked pitot or static vents will result in erroneous, erratic, or zero readings on the associated instruments.

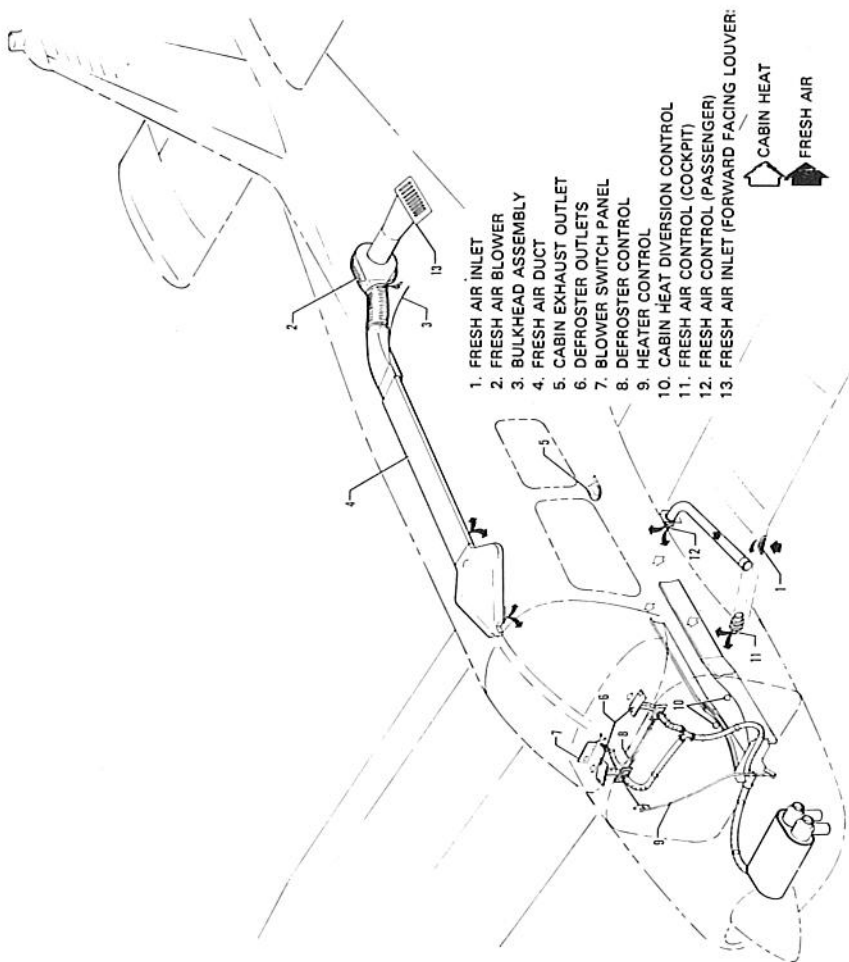
NOTE

During the preflight, check to make sure the pitot cover is removed.



PITOT-STATIC SYSTEM

Figure 7-17



HEATING AND VENTILATING SYSTEM

Figure 7-19

7.23 HEATING AND VENTILATING SYSTEM

Heat for the cabin interior and the defroster system is provided by a shroud attached to the muffler (Figure 7-19). The amount of heat can be regulated with the controls located on the far right side of the instrument panel.

Heated air flows into the cabin through ducting located above the floor between the seats. Two heat diversion controls, located atop the heated air ducts adjacent to the flap control handle, may be moved in a fore or aft direction to regulate airflow between the front and rear cabin areas.

CAUTION

When cabin heat is operated, heat duct surface becomes hot. This could result in burns if arms or legs are placed too close to heat duct outlets or surface.

Fresh air inlets are located in the leading edges of the wings near the fuselage. At each front seat location there is an adjustable fresh air outlet on the side of the cabin near the floor. Rear seat vents are optional. Cabin air is exhausted through outflow vents located on both sides of the aft cabin near the floor, and an outlet in the bottom center of the fuselage below the rear cabin area.

An optional overhead ventilating system with outlets over each seat is also available. An additional option to aid in fresh air circulation on models without air conditioning is a cabin air blower to force air through the overhead vent system. This blower is operated by a fan switch with four positions - OFF, LOW, MED, and HIGH. The switch is located on the right side of the instrument panel with the heater and defroster controls.

7.25 CABIN FEATURES

For ease of entry and exit, and for pilot-passenger comfort, the front seats are adjustable fore and aft. The right front seat tilts forward to allow easy entry to the rear seats (if installed) and baggage area. The cabin interior includes a pilot storm window, ash trays and armrests on each front seat, two map pockets and pockets on the backs of the front seats.

The front seats can be equipped with optional headrests and optional vertical adjustment.

Both front and rear seats (when installed), are equipped with fixed shoulder harnesses. Optional shoulder harness with inertia reels are available for all installed seats. A check of the inertia reel mechanism can be made by pulling sharply on the strap and checking that the reel will lock in place under sudden stress. This locking feature prevents the strap from extending and holds the occupant in place. Under normal movement the strap will extend and retract as required. Shoulder harnesses should be routinely worn during takeoff, landing and whenever an inflight emergency situation occurs.

7.27 BAGGAGE AREA

A 24 cubic foot baggage area, accessible from the cabin, is located behind the seats. Maximum capacity is 50 pounds. Tiedown straps are available and they should be used at all times.

NOTE

It is the pilot's responsibility to be sure that when baggage is loaded the aircraft C.G. falls within the allowable C.G. range. (See Weight and Balance Section.)

7.29 STALL WARNING

An approaching stall is indicated by an audible alarm located behind the instrument panel. The indicator activates between five and ten knots above stall speed.

7.31 FINISH

All exterior surfaces are primed with etching primer and finished with acrylic lacquer. To keep the finish attractive, economy size spray cans of touch-up paint are available from Piper Dealers.

An optional polyurethane finish is available.

7.33 *PIPER EXTERNAL POWER

An optional starting installation known as Piper External Power (PEP) is accessible through a receptacle located on the right side of the fuselage, forward of the wing. An external battery can be connected to the socket, thus allowing the operator to crank the engine without having to gain access to the airplane's battery. Instructions on a placard located on the cover of the receptacle should be followed before using the external power. For instructions on the use of the PEP see ENGINE START WITH EXTERNAL POWER in Section 4 - Normal Procedures.

7.35 *EMERGENCY LOCATOR TRANSMITTER

The Emergency Locator Transmitter (ELT), when installed, is located in the aft portion of the fuselage just below the stabilator leading edge and is accessible through a plate on the right side of the fuselage. This plate is attached with slotted-head nylon screws for ease of removal; these screws may be readily removed with a variety of common items such as a dime, a key, a knife blade, etc. If there are no tools available in an emergency, the screw heads may be broken off by any means. The ELT meets the requirements of FAR 91.52.

A battery replacement date is marked on the transmitter to comply with FAA regulations, the battery must be replaced on or before this date. The battery must also be replaced if the transmitter has been used in an emergency situation or, if the accumulated test time exceeds one hour, or if the unit has been inadvertently activated for an undetermined time period.

NOTE

If for any reason a test transmission is necessary, the test transmission should be conducted only in the first five minutes of any hour and limited to three audio sweeps. If the tests must be made at any other time, the tests should be coordinated with the nearest FAA tower or flight service station.

*Optional equipment

NARCO ELT 10 OPERATION

On the ELT unit itself is a three position switch placarded ON, OFF and ARM. The ARM position sets the ELT so that it will transmit after impact and will continue to transmit until its battery is drained. The ARM position is selected when the ELT is installed in the airplane, and it should remain in that position.

To use the ELT as a portable unit in an emergency, remove the cover and unlatch the unit from its mounting base. The antenna cable is disconnected by a left quarter-turn of the knurled nut and a pull. A sharp tug on the two small wires will break them loose. Deploy the self-contained antenna by pulling the plastic tab marked PULL FULLY TO EXTEND ANTENNA. Move the switch to ON to activate the transmitter.

In the event the transmitter is activated by an impact, it can only be turned off by moving the switch on the ELT unit to OFF. Normal operation can then be restored by pressing the small clear plastic reset button located on the top of the front face of the ELT and then moving the switch to ARM.

A pilot's remote switch located on the left side panel is provided to allow the transmitter to be turned on from inside the cabin. The pilot's remote switch is placarded ON and ARMED. The switch is normally in the ARMED position. Moving the switch to ON will activate the transmitter. Moving the switch back to the ARMED position will turn off the transmitter only if the impact switch has not been activated.

The ELT should be checked to make certain the unit has not been activated during the ground check. Check by selecting 121.50 MHz on an operating receiver. If there is an oscillating chirping sound, the ELT may have been activated and should be turned off immediately. This requires removal of the access cover and moving the switch to OFF, then press the reset button and return the switch to ARM. Recheck with the receiver to ascertain that the transmitter is silent.

NARCO ELT 10 OPERATION

On the ELT unit itself is a three position switch placarded ON, OFF and ARM. The ARM position sets the ELT so that it will transmit after impact and will continue to transmit until its battery is drained. The ARM position is selected when the ELT is installed in the airplane, and it should remain in that position.

To use the ELT as a portable unit in an emergency, remove the cover and unlatch the unit from its mounting base. The antenna cable is disconnected by a left quarter-turn of the knurled nut and a pull. A sharp tug on the two small wires will break them loose. Deploy the self-contained antenna by pulling the plastic tab marked PULL FULLY TO EXTEND ANTENNA. Move the switch to ON to activate the transmitter.

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7.37 *AIR CONDITIONING

The air conditioning system is a recirculating air system. The major items include evaporator, condenser, compressor, blower, switches and temperature controls.

The evaporator is located behind the left rear side of the aft close out panel. This cools the air that is used for air conditioning.

The condenser is mounted on a retractable scoop located on the bottom of the fuselage and to the rear of the baggage compartment area. The scoop extends when the air conditioner is ON and retracts to a flush position when the system is OFF.

The compressor is mounted on the forward right underside of the engine. It has an electric clutch which automatically engages or disengages the compressor to the belt drive system of the compressor.

An electrical blower is mounted on the aft side of the rear cabin panel. Air from the cabin area is drawn through the evaporator by the blower and distributed through an overhead duct to individual outlets located adjacent to each occupant.

The switches and temperature control are located on the lower right side of the instrument panel in the climate control center panel. The temperature control regulates the desired temperature of the cabin. Turn the control clockwise for increased cooling, counterclockwise for decreased cooling.

Located inboard of the temperature control is the fan speed switch and the air conditioning ON-OFF switch. The fan can be operated independently of the air conditioning. However, it must be on for air conditioner operation. Turning either switch off will disengage the compressor clutch and retract the condenser door. Cooling air should be felt within one minute after the air conditioner is turned on.

NOTE

If the system is not operating in 5 minutes, turn the system OFF until the fault is corrected.

*Optional equipment

7.37 *AIR CONDITIONING

The air conditioning system is a recirculating air system. The major items include evaporator, condenser, compressor, blower, switches and temperature controls.

The evaporator is located behind the left rear side of the aft close out panel. This cools the air that is used for air conditioning.

The condenser is mounted on a retractable scoop located on the bottom of the fuselage and to the rear of the baggage compartment area. The scoop extends when the air conditioner is ON and retracts to a flush position when the system is OFF.

The compressor is mounted on the forward right underside of the engine. It has an electric clutch which automatically engages or disengages the compressor to the belt drive system of the compressor.

An electrical blower is mounted on the aft side of the rear cabin panel. Air from the cabin area is drawn through the evaporator by the blower and distributed through an overhead duct to individual outlets located adjacent to each occupant.

The switches and temperature control are located on the lower right side of the instrument panel in the climate control center panel. The temperature control regulates the desired temperature of the cabin. Turn the control clockwise for increased cooling, counterclockwise for decreased cooling.

Located inboard of the temperature control is the fan speed switch and the air conditioning ON-OFF switch. The fan can be operated independently of the air conditioning. However, it must be on for air conditioner operation. Turning either switch off will disengage the compressor clutch and retract the condenser door. Cooling air should be felt within one minute after the air conditioner is turned on.

NOTE

If the system is not operating in 5 minutes, turn the system OFF until the fault is corrected.

*Optional equipment

The FAN switch allows operation of the fan with the air conditioner turned OFF to aid cabin air circulation if desired. A LOW, MED or HIGH flow of air can be selected to the air conditioner outlets located in the overhead duct. The outlets can be adjusted or turned off by each occupant to regulate individual cooling effect.

The DOOR OPEN indicator light is located to the left of the radio stack in front of the pilot. The light illuminates whenever the condenser door is open and remains on until the door is closed.

A circuit breaker located on the circuit breaker panel protects the air conditioning electrical system.

Whenever the throttle is in the full throttle position, it actuates a micro switch which disengages the compressor and retracts the scoop. This is done to obtain maximum power and maximum rate of climb. The fan continues to operate and the air will remain cool for approximately one minute. When the throttle is retarded approximately $\frac{1}{4}$ inch, the clutch will engage and the scoop will extend, again supplying cool, dry air.

7.39 *CARBURETOR ICE DETECTION SYSTEM

A carburetor ice detection system is available as optional equipment.

The system consists of a control box mounted on the instrument panel, a probe sensor mounted in the carburetor and a red warning light to indicate the presence of ice in the carburetor. If ice is present apply full carburetor heat. Refer to Carburetor Icing, Section 3, Emergency Procedures. To adjust the system for critical ice detection, first turn on the airplanes master switch and then turn on the ice detection unit. Turn the sensitivity knob fully counterclockwise causing the carb. ice light to come on. Now rotate the sensitivity knob back (clockwise) until the ice light just goes out. This establishes the critical setting.

WARNING

This instrument is approved as optional equipment only and Flight Operations should not be predicated on its use.

*Optional equipment